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RACING TO LEARN

By: Elizabeth A. Tenneyson

A Cross-Country Adventure New Pilots Can Share

Full throttle, full prop, and dive at the runway. Level out 300 feet above the ground, perform a fly-by past the terminal, then climb back to pattern altitude, make a screaming left turn, and land as quickly as you can. Sound like a fighter-pilot moment? Well, it might be if you were in a fighter, but this is a Cessna 182RG.

It's all part of air racing, and you may be surprised to learn that you don't have to be a 1,000-hour pilot to do it. In fact, all you really need is a pilot certificate, a sense of adventure, and an expert to show you the ropes. In some races, even students can participate as passengers, although that title can be deceptive because passengers are kept busy with charts, tracking the course, timing, and making fuel and airspeed calculations.

As a relatively low-time pilot - fewer than 200 hours - and a first-time racer, I knew I had a lot to learn about flying. What I didn't realize was just how much I would learn while racing across the country with 30 other teams of women pilots as part of the twenty-fifth annual Air Race Classic, the successor to the famous Powder Puff Derby races.

I would serve as copilot for race team 29 along with pilot Gretchen Jahn, who would be competing in her tenth Air Race Classic. The course covered 2,225 nautical miles along a winding route across deserts, mountains, plains, and valleys. We would start in San Diego, California, and go on to stops in Williams, Arizona; Gallup and Fort Sumner, New Mexico; Pratt, Kansas; Hot Springs, Arkansas; Fayetteville, Tennessee; and Batavia, Ohio.

The learning process for a first-time racer begins long before the airplane is flagged off at the start. In fact, preparation for a race like this begins months in advance. The airplane must be inspected and prepared so that it will be in top form when race day arrives. A system of handicaps allows a variety of airplanes to compete against each other. In this year's Air Race Classic, participating aircraft included several Cessna 172s and 182s as well as Piper Cherokees, a Mooney M20R, a twin-engine Piper Comanche, and a Cessna 180 taildragger.

The pilots in a race like this one are as varied as the aircraft they fly. At 84, Ruby Sheldon is something of a legend in women's air racing. Not only has she competed in dozens of air races, but she shows no signs of slowing down. On the opposite end of the age and experience scale are teams of racers from Purdue University and Western Michigan University. Each year these schools sponsor a team composed of one newcomer and one racer from the previous year's team. It's a tradition of friendly competition - and a tremendous learning experience - that these young racers are delighted to be part of. The youngest participant, Katie Curtis, is a 19-year-old from Kansas who served as a working passenger for race team 9. Other participants included a flight instructor from Texas who brought her newly certificated former student along as copilot, a team of identical twin sisters, and two racers who recently finished the London to Sydney air race.

As each team prepared its airplane, it also prepared the route, collecting, marking, and studying charts and airport diagrams for each leg of the course. The first step is drawing lines between the required stops along the way. Then it's time to look carefully at exactly where those lines go. Jahn, who briefs first-time racers before the start of the Air Race Classic, suggests looking at the chart as an obstacle course. "Ask yourself what challenges this leg will present, and then decide how you're going to meet those challenges," she advises.

Sometimes those challenges are literally in the form of obstacles, such as the 12,633-foot peak that rose out of the desert and blocked our path between Williams and Gallup. Other times they take the form of airspace, such as the Class C surrounding Albuquerque International Airport between Gallup and Fort Sumner. The challenge for racers is to decide whether it is faster to go over, around, or through (where possible) such obstacles.

Weather is another challenge, and pilots who want to race must learn to interpret both big-picture weather and the details that can make or break their time. For example, when and at what altitude will the winds be most favorable? What is the time penalty for climbing to find better winds? When is bad weather likely to clear from the route? Is it better to deviate around isolated storms - this is a VFR-only race - and pick up good winds, or wait until the weather clears, knowing you can fly a straight line but may have a less favorable wind? None of these decisions can be made in isolation. You may decide it's better to fly over Class C airspace than to deviate around or risk being vectored off course by controllers. But what if the top of that airspace is at 10,000 feet and the best winds are at 3,000?

To make the best possible decision, pilots need as much information as they can get. That's why it's important to have an intimate knowledge of the performance characteristics of your particular airplane. That's also why it's a good idea to begin studying weather patterns along the race route well in advance. Understanding those patterns can help pilots to predict what is likely to happen under a given set of circumstances. In addition, pilots must get thorough weather briefings from flight service specialists. While many pilots who fly for leisure take briefers at their word, pilots who race soon learn to dig deeper, asking for more information than is contained in a standard weather briefing, especially if something in the briefing doesn't seem to fit the patterns they have been observing.

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Spring is just around the corner...and so are birds

In addition to getting normal weather briefings, many competitors hire outside weather consultants to help them interpret the data and select the best altitude, time, and course for their route. Unlike flight service briefers, these private consultants can and do offer advice about when to take off and when to wait on the ground.

Just as race pilots must prepare their airplanes and charts, they must also prepare themselves. This is a type of flying that requires top proficiency and the kind of precision that few of us practice when we're out for a \$100 hamburger. Before flying in a race, it's important to practice in the race airplane. If that's not possible, be sure to spend some time in an airplane of the same make and model. Even if you have hundreds of hours in a particular type of airplane, it's a good idea to do some race-specific preparation before the event. That preparation should include getting to know any quirks of the aircraft you'll fly. For example, the Cessna 182RG we used has a tendency to burn more fuel from the left tank - a fact that we would need to compensate for to keep everything in balance and the fuel flowing.

Pilots preparing for a race must understand their own limits and practice to extend them. As an East Coast pilot, I know very little about flying in the mountains and even less about flying in the high desert on a 100-degree day. As a result, Jahn and I arranged for me to practice judging the best way to approach a mountain, altitude over a mountain pass, leaning, and high-density altitude takeoffs as we ferried her airplane from its home field near Denver, Colorado, to the race start in San Diego. Even then, I didn't always get it right, which is just one reason it's important for a new racer to have a more experienced pilot at her side.

Other practice exercises included maneuvering close to the ground, as is sometimes required for the fly-bys that start and end each leg of the race, holding a heading and altitude precisely for hours at a time, and making landing approaches at somewhat higher-than-normal speeds.

Racers must arrive at the starting point several days in advance to have their aircraft inspected. This is also a good chance to perform last-minute tasks like attaching the race numbers to the tail and polishing the airplane - every little bit of speed counts, and traditional wisdom says dead bugs, bird droppings, and grime can slow you down. All racers must also attend weather and safety briefings in the days before the race begins.

First-time racers receive a special briefing explaining procedures and answering questions about fly-bys. In day-to-day flying, it's a bad idea to buzz an airport tower at low altitude and top speed, so few first-timers have performed this maneuver. To complicate matters, each fly-by is a little different, so it's a good idea to blow up the best airport diagram you can find and mark the instructions for the fly-by and the location of the timing line right on it. The copilot can use this sheet to guide the pilot to the right spot and altitude for the fly-by. Any deviation from the instructions can lead to a penalty or disqualification.

When race day finally arrives, all that preparation pays off - you hope. After an early morning breakfast and weather briefing, we synchronized our watches and set off for the airport. Pilots and crews raced around wiping dust from their airplanes, reviewing charts, and doing anything else they could think of to burn off nervous energy. All 31 aircraft were soon pulled from their parking places along the ramp, and the signal came for the first 10 airplanes to start their engines and taxi to the runway.

In the Air Race Classic, airplanes are launched 30 seconds apart in the order in which they registered for the race, meaning fast airplanes may lift off soon after much slower competitors. Our 182RG was fast compared to many airplanes. That made the first leg an exercise in collision avoidance as we passed many of the 26 aircraft that departed ahead of us. Because all contestants were following essentially the same course line and many were flying at the same altitude to take advantage of the wind, it was especially important to keep all eyes on the skies.

The launch itself was an exciting moment. The tower cleared us for takeoff using our special race call sign, "Classic 29." We pulled into position at the end of the runway, held the brakes, and added full power. When the flag went down, we released the brakes and took off, retracting the gear as soon as possible so we'd achieve maximum speed by the time we crossed the timing start line about three-quarters of the way down the runway.

During climbout we passed the C172 that had launched immediately ahead of us, and soon we were passing other airplanes as well. We were grateful for the relative coolness of the early morning air, because racing means keeping air vents closed tightly to make the airplane as aerodynamic as possible. We were equally grateful for the smoothness of the ride as we swept up the 280 nm of desert that lay between us and our first stop.

During the trip we tuned in the air-to-air frequency of 122.75 and listened to what's affectionately called "flying and lying." With all the racers so close together, the frequency was alive with banter as racers told tall tales about their altitude, distance from the destination, and airspeed in a light-hearted attempt to sucker others into wasting time by changing altitude or course in search of higher speeds. On a more serious note, the frequency served as a good way to let other pilots know when you were going to pass them and your position relative to theirs.

By the time we reached the first stop in Williams, Arizona, several planes were bunched together, and it had begun to rain. Two aircraft may not perform the timing fly-by at the same time, so a group of us raced to turn toward the airport, which is nestled between a cluster of hills, and get in front before crossing the airport boundary. Once inside the boundary, airplanes may not pass. Those who disregard that rule are penalized. Between the rain and the hills, we had trouble identifying the small field and found ourselves making a sharp left turn to get aligned with the runway in time to make the required fly-by. This sort of low-to-the-ground maneuvering is an important part of racing as well as a good skill to practice before the race.

After a low pass over the field, we turned on course to continue the next leg to Gallup. Most airplanes stopped to refuel. Time spent on the ground does not count against competitors in this race, but our long-range fuel tanks gave us enough avgas to go on, trying to beat the afternoon buildup of thunderstorms that was expected along the way. All airplanes must take off with full fuel tanks at the start of the race - a factor that initially weighed against us when we were forced to carry 20 gallons more fuel for the first leg than other aircraft of our type. That extra weight slowed us down, as did a large ADF antenna and other accessories that reduced the aerodynamic sleekness of the airframe.

After being forced to wait in line to refuel, several of the slower aircraft decided to spend the first night in Williams because the pilots were concerned that they would not be able to beat the building weather. This is the sort of judgment that racing requires - recognizing that the capabilities of each aircraft and pilot are different. It's tremendously tempting to take off when you see others around you starting their engines and heading for the runway. But, if you can successfully resist the temptation during a race - when you know time is of the essence - you'll probably never suffer from get-there-it-is again.

We made it to Gallup without incident and without seeing any threatening weather. We lined up miles out for a fly-by then swung around to land while avoiding aircraft behind us that needed to make their own fly-bys for timing. Although aircraft are timed during fly-bys after takeoff and before landing, it's still important to get on the ground quickly. There's always the possibility that you made a mistake during the fly-by. Failure to correctly follow the fly-by procedures results in penalties that may include being timed wheels-on. But racers are cautioned that the competition airports are not closed to regular traffic, and safety is paramount. If doing something dangerous doesn't abruptly end your flight, it will end your race. Unsafe flying or disregarding either the race rules or the federal aviation regulations means disqualification.

In fact, the lesser offense of being discourteous can lead to penalties, too. Sportsmanship is an important part of the race, and competitors are encouraged to be courteous at all times. A pilot who interferes with another aircraft can expect a stiff penalty, including time penalties and possible disqualification.

Once on the ground in Gallup, we had to put our ground plan into action. In fact, crew coordination is at least as important on the ground as it is in the air. While Jahn measured the fuel in the tanks and determined how much avgas to add to get us to our next destination with an ample reserve, I called our weather consultant for a briefing about what to expect on the next leg. While Jahn monitored the refueling and paid for the fuel, I called flight service for an official weather briefing and filed our flight plan.

The winds looked good for the next leg from Gallup to Fort Sumner, New Mexico. More importantly, it looked as though the winds for the following leg from Fort Sumner to Pratt, Kansas, would be significantly better than forecast for the following day. That meant we had to hustle if we wanted to complete the fourth leg and land in Pratt before the day's deadline of official sunset.

Because the Air Race Classic is a VFR, day-only race, racers may only fly between the official race start hours, usually an hour or two after sunrise, and official sunset. Failure to do so means - you guessed it - disqualification. Although the race can only be flown under VFR conditions, for the sake of safety one pilot on each crew must be instrument rated.

Our turnaround time at Gallup was good, and we were feeling confident about the next leg of the race. We took off, climbed, and decided to go over Albuquerque's Class C airspace rather than trying to go around it or risk talking to controllers who might choose to vector us off our desired course. But as we approached the airport, we could see a few small thunderstorms beginning to dump rain on one side of our course. Listening to approach control we learned that the storms were relatively small isolated Level 2 cells.

But a thunderstorm of any size is nothing to mess with. With some help from our Strikefinder to tell us where lightning strikes were occurring, we deviated to the right of our course to get around the cells. We later learned that that deviation cost us more time than we gained from the wind at our back, but that's what racing is all about - making informed decisions and hoping they're the right ones. It turned out that waiting an hour to let the storms move off to the north of our course probably would have been a better decision. But, had we done that, we might not have been able to make it to Pratt before the sunset deadline.

During some past races, contestants have taken off hoping that weather at their destination would dissipate or move before they arrived. When that hasn't happened, those contestants have been forced to land at an intermediate airport and wait for the weather to clear. While time spent on the ground at an official race stop does not count against contestants, time spent on the ground anywhere else does. Once you've flown the timing line to start a leg, the clock keeps running until you land at the next official airport. Fortunately, the weather was nowhere near that bad, but it had been enough to keep other racers on the ground.

In Fort Sumner we repeated the refueling, weather briefing, flight plan filing routine. Our turnaround was quick, but when we did the runup for takeoff, we noticed that the engine was running a little rough. After leaning the mixture to burn off any carbon that might have collected on the plugs, the engine sounded better, and we launched.

The last leg of the day from Fort Sumner into Pratt was the toughest. Although we had traded flying legs, we were beginning to get tired, and we were definitely hot. The temperature was hovering around 100 degrees, and we were flying with all the vents closed.

Because the strongest tail winds were close to the ground, we were also flying low over the terrain and getting bumped around as we made the transition from high desert to plains. Even if you've never felt queasy in the air, racing can make you sick. There are few things worse than flying in the bumps and heat when you haven't eaten anything more substantial than beef jerky. We had to keep reminding each other to drink water and stay focused.

After a trek around the Albuquerque thunderstorms, we were relieved to find no sign of convective activity anywhere. Regular updates from Flight Watch told us that the conditions should remain stable long enough for us to reach our destination. Those who arrived in Fort Sumner after us, however, never got the chance to take off again. Shortly after we left, a thunderstorm suddenly popped up off the end of the runway.

We arrived in Pratt just after 7 p.m. We had been in the air more than seven hours, and we were beat. But we saw only one other airplane on the ramp. *Oh no*, we thought, *everyone else has gone on*. But recognizing our fatigue and the lateness of the hour we agreed that we would stop for the night.

To our surprise, no one else had gone on. In fact, no one else had arrived. We were one of only two teams to make it so far in the first day. That was when we knew that going all the way to Pratt was either the best or worst decision we could have made. If the weather forecasters were right and we had found the best winds, we would have a huge advantage over competitors heading our way the next morning. If the forecasters were mistaken - and our relatively low ground speed on the leg told us they might be - we'd slide well down in the rankings. But we wouldn't know how our decision would affect us until the end of the race.

With the help of fellow racers who had waited at the airport to see if anyone else would make it in for the night, we found our way to a hotel, grabbed something to eat, and went to sleep, knowing we'd have to be at the airport by 6:30 the following morning. The camaraderie of pilots in this race was exceptional. While everyone wanted to perform well, most competitors were more interested in challenging themselves than the clock. So after each day's racing was done, racers gathered to eat, rest, and share tall tales.

Having watched The Weather Channel and talked with our weather consultant, we knew what to expect when we reached the airport in the morning, but we decided to talk to the briefers at the mobile flight service station that had been set up at the Pratt airport to assist us. All the sources agreed - we wouldn't be going to Hot Springs, Arkansas, that

day. A cutoff low pressure system had moved into the area bringing severe thunderstorms and heavy rain that wasn't likely to budge.

That turned out to be for the best. We decided to give the airplane a good look over and get the plugs cleaned in hopes of solving the engine roughness problem. Then Jahn noticed a pool of pink hydraulic fluid under the nosewheel.

Unfortunately, no one at the airport was qualified to fix the hydraulic leak, and we were left with a handful of options: try to get permission from the race directors to have it fixed elsewhere, then fly with the gear down to an airport that could handle it; fly the rest of the race with the gear down; or keep pouring fluid into the reservoir and hope that there would be enough pressure to get the gear up and down again on the next leg of the race. We chose the first option. With the help of the folks at Pratt and the permission of the stop chairman, we were soon on our way to Hutchinson, Kansas, 50 miles away. With clean plugs, the engine ran more smoothly, but it still wasn't perfect. Only after the race was over, when the engine roughness increased, did Jahn discover a stuck cylinder valve. No doubt the beginnings of that problem had been behind the rough-running engine and our slower-than-expected time on the Fort Sumner to Pratt leg.

At Hutchinson, a team of mechanics was awaiting our arrival. They had our airplane pushed inside the maintenance hangar before we could even open the doors and jump out. They lifted the airplane up on jacks and repaired the leak by replacing two O-rings. Less than two hours and 75 cents in parts later, we were back in the air with fully functional landing gear.

By the time we returned to Pratt, another dozen or so race aircraft had arrived. Like us, they had obtained weather briefings and had decided that Pratt was a good place to spend the night. Before the evening was over, all 31 race teams had congregated in the Kansas town of 7,000. Back in their respective hotel rooms, race teams spent much of the evening watching television weather and speculating about the likelihood that we'd be flying to Arkansas the next day. The prospects didn't look good. Most forecasts depicted the entire state covered by an enormous red blob of Level 4 and Level 5 thunderstorms.

Late in the evening race officials met and decided that if the weather didn't improve they would call the race early. A mandatory 6:30 a.m. weather briefing the following morning showed that there would likely be a brief break in the weather, but the slower aircraft had no hope of making it to Hot Springs. And chances were that none of the airplanes would be able to leave once they arrived. So, to ensure everyone's safety, the race committee announced that the race would end in Pratt, marking only the second time in the event's 25-year history that it had ended short of the final destination.

Though they were disappointed at not being able to finish as planned, racers were clearly relieved that they wouldn't have to find their way through the threatening weather. While racing may sound like a daredevil sport, flying in a race is a good way to heighten your safety consciousness. Pilots are repeatedly called on to make the safe, smart decision, despite temptation bred by competition.

With the race over, each team had to find its own way to the finish line in Batavia, Ohio. While the fly-bys, timing, and mandatory airport visits were finished, teams were still required to file and activate flight plans and arrive in Batavia by the original deadline of 5 p.m. the following day. Once there, Sporty's Pilot Shop hosted the group and provided a barbecue and fireworks display. Awards were given out at a closing banquet the following day. Longtime participants Dene Chabet-Fence of Carson City, Nevada, and Gloria May of Kerman, California, won the race. Second place went to Sophia Payton of Clearwater, Florida, and Bernice Barris of Cleveland, Ohio. Joyce Wells of Larkspur, California, and Kathleen Walton of Ione, California, placed third. We placed eighteenth in the field of 31 aircraft that completed the race.

From planning to final touchdown, the race was an incredible learning experience. While we finished in the middle of the pack, we weren't disappointed by the results. Air Race Classic veterans say the real object in this kind of race is to fly the perfect cross-country, and that's what we tried to do. In the process, a low-time pilot - and even a high-time one - can learn more than you might guess.

For many of us, the typical cross-country flight involves a \$100 hamburger and doesn't venture far into new territory. But a cross-country that really crosses the country requires pilots to use all their skills from communicating with air traffic controllers to calling flight watch for weather updates using remote communications outlets. For lowland and cool climate pilots, a review of proper leaning techniques is crucial. After all, they will be asking their airplanes to take off from high elevation fields on 100-degree days. For pilots accustomed to flying in the West where visibility is often unlimited, the experience of flying in the hazy, marginal visibility summertime conditions of the South and East is an equally good learning opportunity. And while a quick review of the chart may be enough for a local flight, racers must study their charts for the nuances of terrain, airspace, and obstacles, gathering as much information as they can from that simple, underutilized tool. At the same time, remembering the gist of the regulations may be enough for everyday flying, but in a race you need to be absolutely positive about the rules and regulations governing your flight.

In short, flying a long race is the culmination of every skill and piece of knowledge pilots must cram into their heads to earn their certificates. The preparation is a great way for pilots of any skill level to reach new heights of proficiency. And the execution is a fun and exciting way to test that proficiency and expand your horizons.

Getting Started

Pilots who are interested in racing should contact pilot organizations and flying clubs in their area. The Air Race Classic is sponsored by The Ninety-Nines, but it is by no means the only race out there. Just about any Internet search will turn up a variety of races from the cross-country Marion Jayne Air Race to local proficiency races where the pilot must not only finish fast, he or she must also accurately estimate fuel burn, time en route, and other factors that show mastery of flight planning skills. A visit to the Air Race Central Web site (www.us-airrace.org/cent.htm) can also help you to find upcoming events around the country.

Each race has its own rules, but most require two-pilot crews. Generally, at least one pilot must have an instrument rating, but many races allow private pilots without instrument ratings to fill the second crew spot. To encourage new pilots to get involved in racing, some events, including the Air Race Classic, allow student pilots to participate as passengers.

If you are interested in being teamed up with an experienced racer, contact race organizers as early as possible and let them know. It's not unusual for a practiced racer to be looking for a partner to share the cost and the piloting duties. In addition, get involved with local pilot organizations such as flying clubs or local chapters of national organizations.

Attend meetings and let your fellow members know that you're looking for an experienced race partner. You might be surprised by how many people are willing to guide a newcomer to the sport.

If you can't find an experienced partner to fly with, but you want to try racing anyway, see if the sponsoring organization offers any special assistance. The Air Race Classic, for example, assigns a "mother bird" to teams of new racers. This experienced race pilot guides newcomers through the process and answers any questions they may have.

Be sure that you and your race partner are compatible before you start the race. Racing can be high-stress and uncomfortable, so tempers can flare. More than one race team has dropped out because of conflict in the cockpit. Make sure you and your copilot also agree in advance how duties will be divided, including preparation tasks such as having the airplane inspected, en-route tasks such as flying and navigating, and ground tasks such as monitoring fueling and filing flight plans.

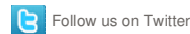
How much you will spend on an air race depends largely on how much distance you will cover. For one-day races, the entrance fees are typically minimal - perhaps \$50 - and beyond that you'll need to pay only for airplane rental and fuel.

For longer races, the costs go up significantly. Entrance fees for the Air Race Classic are about \$350 with approximately another \$200 in fees for the opening and closing events. In addition, you can expect to spend about \$350 if you hire a weather consultant. Add fuel, aircraft rental fees, and hotels along the route. Fortunately, most of the costs associated with races are predictable so you can make a good estimate of what you'll spend before you sign up. Determine how much fuel you'll burn, an average hotel rate, entrance and weather fees, and meals for the duration of the race.

Remember that you can typically expect to split entrance and weather fees, fuel and airplane costs, and hotel rooms with your copilot to keep expenses down.



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