

## Gyroplane Flying by Jane Robens



I first saw gyrocopters in the 1980's when I was flying gliders with the Mid Atlantic Soaring Association - MASA from the Frederick Airport - FDK. The gyrocopters were operating there also - in a different part of the field, but we could easily see them from a short distance away. Mostly MASA members looked down upon them and thought they were exceedingly unsafe. By today's standard these Benson gyrocopters were difficult to operate safely with no horizontal tail and no windscreen, and their engines lacked the reliability of today's Rotax engines. Then, 30 years later I saw pictures of modern gyroplanes and immediately wanted to know more. The US dealership for the German Autogyro was in Stevensville MD, so I visited and at least got to talk to a builder (their gyros were all experimental at that time) and pilot in training who was very enthusiastic. The dealer seemed to be too busy to speak with me at any length. Subsequently, I found out that a friend had actually received a gyroplane rating some ten years ago although he had never pursued it with a gyro of his own. He did refer me to Ollie Nelsen in northern New Jersey who has a Calidus Autogyro, and Ollie subsequently gave me a wonderful ride in the area just north of Interstate 80 in Warren County. I immediately wanted to pursue getting a rating so Ron Daniels steered me to Ron Menzie in Searcy Arkansas. I met Ron Menzie at the PRA Fly In in Mentone Indiana in August 2018 and arranged to come to Searcy-SRC for a week of flying lessons from him in October.

Ron Menzie has been flying gyros for most of his life and he was self-taught as were many of his generation, in a gyro glider. This is not a contradiction of terms

although it comes close. A gyro without an engine is pulled behind a car until the rotor blades become a spinning, lifting disc and it becomes airborne. The car gets out of the way and the gyro is landed straight ahead, very soon, as a gyro is the antithesis of a glider with its long thin wings, and the gyro comes down fast. This method does have the advantage of providing for many take offs and landings at very low cost as long as you can find a friendly, willing car driver, a short straight runway, and another friend to start the rotor blades in motion.

I had chosen October for lessons as I did not want to cope with either hot summers or cold winters in AR. The end of September would have been preferable as by the time I arrived, it was chilly in an open gyroplane, open as with a motorcycle, with which gyros are often compared. But I know how to layer on wool clothes and Ron provided good motorcycle jacket and helmet with face screen and built in intercom. The tandem Autogyro MTO is a wonderful and comfortable machine with a large windshield for each pilot, adjustable seats and 4-point safety harnesses.

Gyrocopters are not helicopters, although they may be easily confused. The rotor of a helicopter is attached directly to the engine, while the rotor of a gyrocopter is free spinning in the oncoming air pushed through its blades. The engine at the rear of the gyro is to provide forward motion. Gyros cannot take off and land vertically although the required distances are short compared to those of most airplanes. Gyros are flown like airplanes and most people fly them for fun, just as they may ride motorcycles for fun, but in Europe, some gyros find use as mounts for city policemen, and a city in Texas has followed suit with this use. Gyros have adapted the term 'cyclic' from helicopters for the control stick which moves the position of the rotor disc for flight control.

Ron Menzie is retirement age for most of us but he loves what he is doing and maintains his teaching business in a spotless well-appointed hanger at the Searcy Municipal Airport. Madison, a well-behaved and very large, 25-30 pound, Boston Bull Terrier provides rest and relaxation after sometimes too tense flights. I was his only student most of the time that I was there. I started flying in the older of his two Autogyros, the red one, as the newer yellow machine, needed a replacement part for the pre-rotator and some adjustments.

The first step in flying any aircraft is to perform a thorough preflight check, which in a gyro includes such items as cleaning the rotor blades, particularly the leading edges, and assuring that the pre-rotation and teeter head systems for the rotor are in

ship shape. This is in addition to the more usual airplane items, such as, checking oil and antifreeze (in a Rotax engine), gasoline amount and freedom from contaminants, cleaning the windshield, assuring that the moving parts do so smoothly, and that all fasteners are tight and secure.

Finally, we were ready to fly and I was strapped into the front seat. The seat is adjustable so my feet easily reached the rudder pedals, and I could reach all the controls and required items on the panel. Ron talked me through the start procedure and soon we were taxiing with Ron working the throttle while I was controlling the cyclic in front of him. This degree of control scared me at first, but I soon felt confident in Ron's arrangement, and we were following the 'yellow brick road' taxiway, to the takeoff end of the runway. At this point we circled into the runup area and just as with an airplane allowed the oil temperature to climb to operating levels. We checked engine operation with each magneto separately at 3500 rpm and then taxied onto the runway. The rotor brake was released and pre-rotation was started. The engine powers pre-rotation, not a human arm as with the previously mentioned gyro gliders. As the rotor blades came up to speed we started to move forward slightly, and as rotor speed came toward 200 rpm, Ron applied additional throttle. Soon we were flying and then climbing into the air. The rotor disc can't support itself until the blades reach flying RPM (indicated by the nose wheel lifting).

Now I had to first reach and then maintain an airspeed of 60 miles an hour with very tiny backwards and forward movements of the cyclic while climbing straight ahead to 1000ASL, and then maintaining this altitude until turning final in the flight pattern around the airport. I thought that I had learned the use and the importance of RIGHT rudder with my hours of flying taildraggers, but Ron never ceased to tell me: use just a little more right rudder when you take off, don't let the gyro veer to the left. I also had to learn to keep the cyclic centered during takeoff.

The controls of a gyroplane are much more sensitive than those of an airplane due to the low mass of the gyro, in particular, the rotor blades are a fraction of the weight and area of airplane wings, this allows for its ease in turning left or right and nose up or nose down. The greater part of my time in training was spent learning to make these gentle but precise movements both smoothly and firmly at exactly the right time, that is, anticipating what was going to happen and acting accordingly.

Gyros are the same as airplanes in that the throttle controls altitude and that the stick or yoke equivalent, that is the cyclic, controls speed. The cyclic must generally be centered when going straight ahead, but some movement to the appropriate side may be required in a cross wind. Side to side movements make right or left turns when coordinated with the movement of the rudder pedals, and for the same reasons as an airplane, it is mostly right rudder. Landing meant maintaining 60 mph with the cyclic, but decreasing engine speed smoothly to decrease altitude; Ron did this for the first 2-3 days, but then it was time for me to begin taking over the throttle. The throttle is spring loaded to full throttle as a safety measure, and this becomes particularly evident at approximately 3800 to 4800 rpm. I learned that I needed to actively hold it back to prevent climbing above pattern altitude or failing to lose altitude when I was on base and about to turn final. A small exception to the 60 mph final is a steep descent to quickly lose altitude. When the nose is pulled up to 40 mph and the gyro descends fast - you are behind the power curve - until 300 to 400 feet above the ground when you must return to 60 mph to have sufficient energy for the flare prior to landing. An airplane requires slipping with cross controls or use of 40 degrees of flaps to achieve anywhere near this gyro descent rate.

Landing the gyro, like landing an airplane is the most difficult part, and must be thoroughly mastered. I had to learn to flare correctly, that is to pull back on the cyclic at the correct height above the ground, and to pull back further as necessary, when to let the gyro settle to the ground, and when to ease in a little more power to keep from bouncing. All of this is similar to an airplane, although with a gyro you have an advantage in that you can more easily see the ground next to you, 'up close and personal'. After landing we either took off immediately with full engine power applied smoothly and coordinated with nose up attitude, or at the end of the lesson we would fly the length of the runway at 50 to 100 feet and land at the other end to be near the exit taxiway. After you are firmly on the ground, the rotor brake is applied. The cyclic must be held fully forward while the rotor is being stopped, then you can taxi back to the hanger.

Round and round we went with seven or eight take offs and landings in each hour's training period. We did not leave the airport environment because Ron considered it a waste of time and I agree. All the skills I needed could be developed during takeoffs and landings and flying the pattern. We did, however, do many 360 degree turns, either or both right and left during the downwind leg, when it would not interfere with other airport traffic, or to avoid other traffic. An hour of flying was

enough for me at any one time. However, we tried to get in more than one flight each day and mostly succeeded when the weather cooperated. Wind and rain came more frequently than I had hoped for. All of these gyro systems and controls were reinforced by Ron, that is I had a personalized ground school. To make sure that I understood everything, Ron had a set of 38 written questions covering aerodynamics and principles of flight which I answered in writing prior to sitting down together to discuss each of them.

Ron was able to repair the rotor clutch mechanism for the 2017 MTO N724JF so I was able to make the transition to the newer yellow gyroplane. It did fly just a little differently than 677KM as it was a little heavier, the wind screen was larger, and the instruments were more complete. Ron's altimeter in the back read 100 feet lower than mine in the front seat which gave him constant excuses to correct my altitude; the addition of a vertical speed indicator for me in front was extremely helpful in my learning to anticipate what the gyro would do next.

In spite of their sensitivity to control input gyros can be flown safely in quite windy conditions. I was amazed at the wind in which I was flying – much stronger than I would have felt comfortable with in a light sport airplane particularly out of my home airport at Piseco NY - K09. I was also amazed that I was able to function fairly well with the wind on my body. When it comes directly at you, wind is helpful in both take offs and landings, but cross winds are another challenge to learn. The control movements in a crosswind are a carryover from airplanes so that made learning a little easier.

I made good progress according to Ron in the 7 days in which I was able to fly in 2018, but I was still far from my goal of receiving a light sport sign off. I agreed to come back in the spring of 2019 which seemed agreeable to Ron. Thus I drove the long 2 day trek to Searcy again in early April 2019. I was pleasantly surprised with how much I actually remembered in flying 724JF. Spring weather was better than in the fall, less rain, but the winds were as strong.

I continued to make steady progress, fully enjoying it all. Soon it was time to actually think about my check ride, and oral examination which covered the same written material and questions which I had studied in October. Ron is a DPE, Designated Pilot Examiner for gyroplanes, but he could not both recommend me and perform the check ride. Thus another gyro instructor was required, and he called upon Scott H. from Jonesboro AR. Scott has a wide variety of experience with crop dusters, helicopters, and of course gyros. He is a little heavier than Ron

and I was concerned how this would affect the gyro performance but it turned out to not be a problem, the 100 hp Rotax easily handled us both, and I actually believe my few landings with Scott were easier.

However, we got off to a rough start in our flight, as we did not know what each other would do. Pre-rotation did not occur as it had previously. There is a sweet spot in the cyclic placement that must be found before pre-rotation starts, and since Scott had hold of the cyclic with a strong arm while I was trying to start pre-rotation, nothing occurred. We needed to return to the beginning of the procedure to start it again, a couple of times, before we were off and running. Finally, when we were in the air at close to pattern altitude Scott relaxed and I did also and was able to fly the gyro as I had been practicing. We left the airport environment for about a mile and found an area of straight roads and a straight railroad track. Scott proceeded to teach me the FAA required maneuvers of 360 turns about a point, rectangular patterns and S turns over a fixed reference line. These are maneuvers that I had learned long ago for airplanes, but in spite of the stiff wind at 1200 feet ASL from the north, I actually found them easier. I could see the ground easily on both sides as no wing was in the way; and I found that the gyroplane can turn with a very small radius so I could generally make up for not starting my turn in time to arrive at the point I was trying to reach with the wind constantly pushing me away.

Scott then said it was time to return to the airport and do some take offs and landings, I think we made three altogether. The last was a power off emergency landing, and with Scott talking me through it and my using the steep descent skills that I had learned earlier, I made an acceptable landing. And best of all Scott recommended me for the final check ride with Ron. Even though both of them thought that I flew acceptably, I was still a little nervous while I waited for the check ride the next morning at 8:30 AM, Friday April 12. Happily, the winds were straight down the runway 01 and not too strong. Everything went fine, however I missed Ron's constant comments of 'you are getting a little low', or 'just a little more right rudder as you touch down'. But I passed, I have now met the requirements of Section 61.309 and 61.311 of the FARs and have been determined to be proficient to act as PIC gyroplane light sport aircraft. I had met my challenge to myself and had a wonderful adventure with a great gyro flight instructor.

I left for home soon after Ron completed all of the required paperwork, but not before going by Daisy's, a restaurant in downtown Searcy. It was Ron's and my favorite lunch spot and I knew what delicious baked goods they made. I bought an

apple pie to take to granddaughter Heidi in Lexington KY which is my stop over point in driving between Piseco and Searcy. Flying is now in the family as Heidi is learning to fly a Cessna 172, and I am thrilled that she shares my enthusiasm.