

So you want to fly an autogyro...

Contributed by
Lloyd Heslop

Lloyd Heslop is an Autogyro Instructor based in Nelson. In this article, he takes readers through the basics of an introductory flight at Nelson Airport.

I WOULD recommend to anybody interested in the sport of gyro flying that they take a trial flight with an instructor. To date, I have had only one person who has decided that gyro flying wasn't for them, plus lots of converts from the fixed wing brigade who proclaimed that they would never set foot in the machine only to find they quite enjoyed the experience.

Fixed wing pilots who fancy an adventure to the dark side will find that the airborne flight is similar, although considerably more manoeuvrable and sensitive (in a good way!). Rotorcraft in general must fly with the rotors loaded at all times, that is with positive G throughout all manoeuvres, so any fixed wing pilot tendency towards negative G situations must be avoided to eliminate the risk of an unrecoverable rotor stall.

A student pilot must learn that pushing the stick forward is done with very gentle ease, remaining in positive G. The correct reaction to any turbulence or uncertain flight condition is to move the stick rearward and reduce power. A gyro can not stall (in the fixed wing sense) at a low or even zero forward airspeed, although it will descend under full control when below a minimum straight and level airspeed.

Climb aboard for take-off

Let's talk through a circuit of Nelson on a nice day. The sequence starts with removing the machine from the hanger and completing a thorough pre-flight inspection.

Then climb aboard ensuring that the passenger is briefed on what to stay clear of and that hatches and harnesses are correctly fitted. Look out, call "CLEAR PROP" and start the engine. Warm up takes 4-5 minutes during which time we obtain the ATIS. Warm up complete, check gauges and taxi out to the Hold point. Call the Tower and obtain permission to taxi to Hold at Charlie for circuits. At the hold point, we turn the machine directly into wind and complete our final set of checks.

Holding the stick forward and central, we engage the pre-rotator. As the rotor blade speed increases past 70 RPM we check the rotor response to stick commands, ending with the stick full back and central. At this time, the blades will be rotating at around 100 RPM and any wind present will be driving the blades.

Now call the Tower to obtain take off clearance and taxi out to the runway. If the wind is exceeding 6 knots, lean the blades toward

the wind when moving crosswind. Once lined up and rolling, gently increase engine revs observing the rotor RPM rising and as it rises, add more power. The stick is full back and central at this time. Once the rotor RPM hits around 200 RPM, the machine will rotate ie. the nose rises. The take off consists of balancing the machine on the main wheels until take off air speed is reached at around 50mph.

From the 200 rotor RPM mark, full power can be applied. To keep the machine balancing on the main wheels then requires forward stick. During this time rotor speed will increase up to a flight speed of approximately 330 RPM. Depending on the aircraft design, it is common for rudder and stick adjustments to be required as we break ground to compensate for the torque of the engine.

Airborne !

We are now airborne and climbing straight ahead until minimum circuit height is reached, then throttle back into a left hand climbing turn for the crosswind leg. Once flying down wind, trim for speed and roll can be adjusted. Altitude is controlled by power ie. throttle off to descend, on to climb. Air speed is controlled by attitude of the blades to forward flight.

When tracking downwind, straight and level we obtain a clearance to land. To descend, the throttle needs to be closed and a landing speed of 60 mph maintained. Most gyros with the throttle fully closed descend at a ratio of approx 1 to 4, considerably steeper than a fixed wing. At about 30 feet AGL, maintaining 60 mph we add some mild back stick pressure to start a gentle round-out, remaining just above the ground - still with airspeed. If necessary, some power could be applied to stabilise the machine in the direction of travel, then as airspeed washes off, more gradual back stick is required to keep the gyro off the ground before a gentle touch down in the flare position - often with an airspeed of less than 10mph. Now full back stick to a halt, then stick forward and centre until the rotor RPM drops below 200 to prevent becoming airborne again unexpectedly.

Note also that if it is windy then particular care in rotor management is required to prevent blade flap (or sailing) during slow down ie. the wind can push the blades in excess of their teeter movement with significant damage resulting. The normal procedure is stick hard forward, blades leaning slightly into wind until they stop rotating. If ground conditions are rough, then taxi with blades rotating above flapping speed to prevent damage.



Lloyd Heslop and RAF2000 Hybrid gyro at Nelson.



Impressive scenery from Lloyd's advanced training patch.



Training is also available from Tony Unwin at Tauranga in this MT-03 Eagle gyro. For more info www.gyrate.co.nz



So you can fly...

Most students master the take off in 4 to 5 hours but the landing takes more practice and in most cases solo is somewhere around the 12 to 14 hour mark.

One of the great things about gyros is that they are constantly in auto-rotation making a total power off landing with very short or even zero ground roll quite achievable. In-flight slow speeds of say 20 mph can be sustained with high power settings and a nose up attitude - it's a balance of maintaining height without getting behind the power curve which will cause descent.

Have I put you off yet?

If not, then I encourage you to take an introductory flight with an Instructor this Summer. I train at Nelson airport. We are the fourth busiest airport in New Zealand and our weather is some of the best in the country allowing flight throughout the year. I fly most weekends and during the week by appointment.

My current machine is an RAF 2000 Hybrid ZK-RAE and I am currently training owners of Sparrowhawk and RAF gyros on field in their own machines. On site we also have a SAC examiner and fixed wing instructor on a RANS SE6 Coyote.

Gyros of the single place variety are often very territorial due to the pilot being exposed to the elements, however more larger 2-place fully enclosed machines are becoming available with an extended range and 200 mile flights are easily achievable. Cross country in New Zealand can lead you over some very inhospitable territory, so thorough flight planning and avoidance of unnecessary risk is essential. My experience from Matamata-Dunedin and through the Southern Alps has been most enjoyable @ 60 knots. Perhaps some day you could share the experience.

Obtaining a licence

Yes, you do need a licence, the same as any other aircraft in the microlight category. As with other forms of aviation, the first necessity is a medical, not to the GA standard - and your local Doctor can fill in the necessary form obtainable from either Sport Aviation Corporation or RAANZ, the CAA Part141 organisations of which you must be a member in order to obtain a provisional licence. The New Zealand Autogyro Association (NZAA) is also a must as this connects you with a newsletter and many other people involved in the sport plus an annual fly-in currently held at Dannevirke in late January every year. A new member also receives a package of information relevant to gyros. Check out the NZAA web site www.autogyro.org.nz

For those who wish to know more, don't hesitate to call or if in Nelson, I would be delighted to take you for a trial flight. Contact me on 027 442 4500.

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