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Aero AT-3
The light fantastic

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The light fantastic

*With the caveat that one tends to accentuate the negative when writing an aircraft review, **Andy Raymond*** gives his in-service appraisal of the Aero AT-3*

When undertaking a review of an aeroplane, I find it difficult to be entirely positive about the joys of flying it because I am also the one responsible for looking after the operation and maintenance of the plane, and thus I am acutely aware of the problems that exist on the ground. So the club member who turns up to fly on a nice day blissfully unaware of all the background issues would probably paint a much rosier – if not as informative – a picture. However, these experiences should not go unrecorded, so what follows is an appreciation of what it is like to operate an Aero AT-3 on a club.

The story begins some long time ago when, having made the decision to buy a VLA mainly

for cost reasons but also to meet the aspirations of the membership, we chose to buy the AT-3. These aeroplanes are manufactured in Poland with a delivery time of five to six months, although this may have changed since we took delivery in April of 2007. We chose the 'club' version, which seemed to have the right balance between cost and equipment. Extras selected were a Mode S-ready transponder, a tinted canopy and the three-bladed propeller. In addition, we chose the basic paint scheme of white with two ribbon stripes along the fuselage and fin, one red and one silver. These are the club's colours, and have been so since its inception in 1931.

It's worth noting here that the selection of a colour scheme should be considered on the basis of what is desirable generally, rather than what you like. If you are the person who will eventually be responsible for selling the machine, you may have a hard time persuading a potential buyer to part with his money for an unusual paint scheme. I have sold aeroplanes with red fuselages and silver wings, and believe me, it wasn't easy.

The selection of this particular aeroplane was the result of trials undertaken at our home aerodrome on aircraft from two manufacturers, where the club members tried the Tecnam Sierra and the Aero AT-3. The AT-3 was finally chosen as it was considered at the time to be slightly more robust in the club environment.

So what's it been like?

As with all low wing aeroplanes, you have some advantage if you are a trainee contortionist when trying to get in or out. Getting in to the AT-3 involves climbing onto the wing, placing your hand between the seat backs and stepping into the footwell without kicking the joystick or controls. This is not easy, and something you might not like to witness a refined lady doing in very feminine clothes. However, our oldest member is eighty-nine and manages it unaided. Most find the cockpit comfortable, but some prefer cushions behind them as there is no seat or pedal adjustment. Cabin width is acceptable, but I wouldn't want to get in with somebody who has halitosis. Some aeroplanes which are considered 'lesser', such as the CTSW microlight, have much bigger cabins and are easier to get in to and out of as they have high wings and 'gull wing' doors.

Before flying, the usual walk-round checks have to be undertaken, but the AT3 has some unusual requirements. The Rotax engine has a dry sump, so in order to check the oil level the propeller has to be turned over several times in the direction of rotation with the oil filler cap off, until a gurgle is heard. This effectively pumps all the oil into the remote oil tank so that it can be measured. The engine uses semi-synthetic oil manufactured by Shell called VSX 4 and is generally used in motorcycles. Checking the fuel level involves a combined dipper and filler cap placed immediately in front of the canopy and leading to the single fuel tank. The Rotax engine is designed to run on mogas but none is available at our home aerodrome so we are

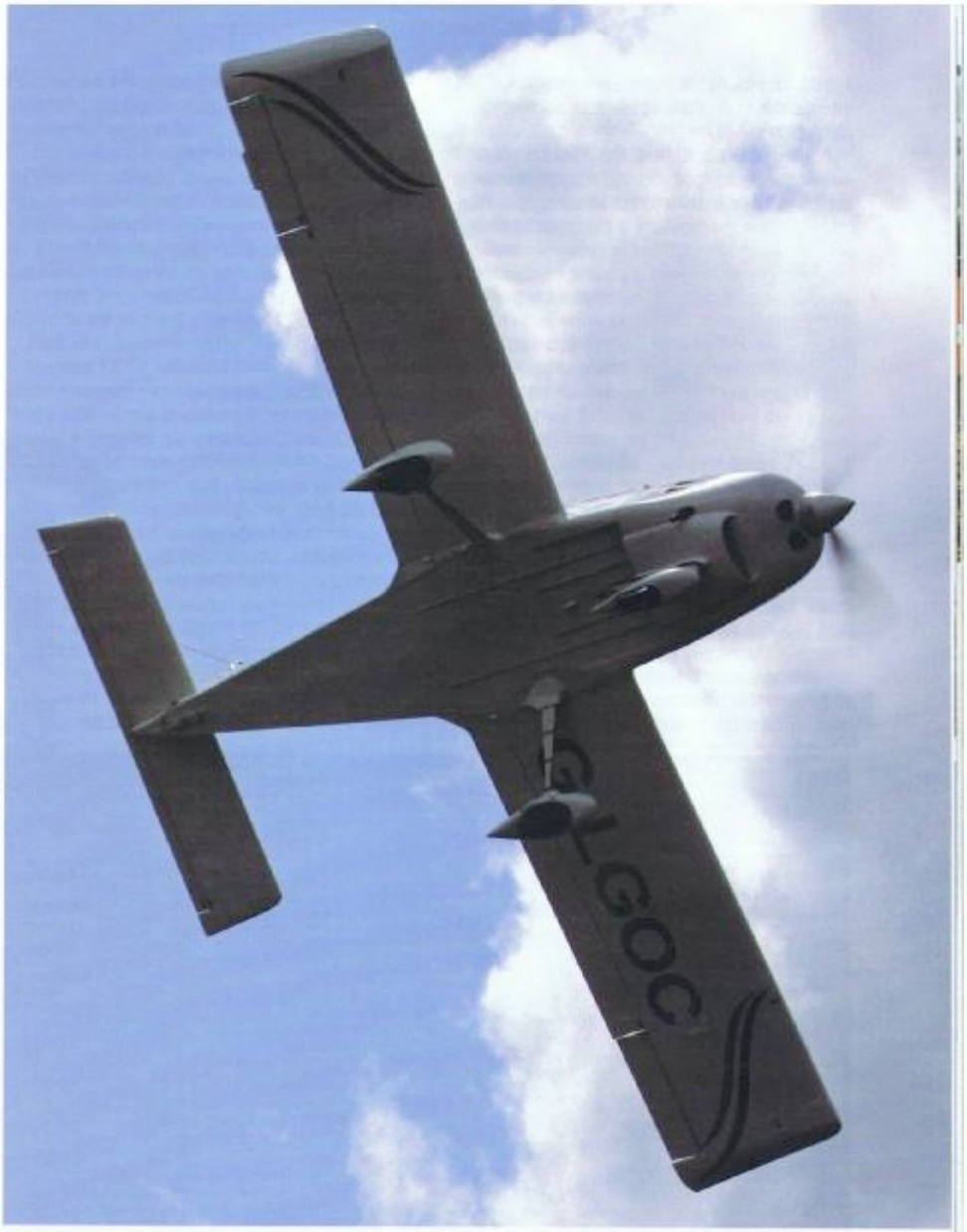
obliged to use avgas. This also means that we change the oil every 50 hours rather than 100 hours, as I understand the oil gets contaminated when using avgas. In addition, the exhaust is slung beneath the engine and is suspended with several coil springs. Rumour has it that these springs get hot, fatigue and break with monotonous regularity. We have had one break so far at about the 90-hour engine-time point. Anyway, these need to be checked before every flight.

In the cockpit, those used to an American aeroplane will note the absence of both a primer and a mixture control. In place of the primer is a yellow choke knob that has to be pulled out when the engine is cold. However, there is a blue carburettor heat control and a brown oil 'heater' control not normally found in aeroplanes with Lycoming engines. It's worth mentioning here that the Rotax engine doesn't seem to have the same susceptibility to carb icing as other engines, possibly due to the fact that the carburettors (there are two of them) are mounted above the engine and are side draught rather than updraught as in the Lycoming. Touching the Rotax inlet manifold after flying will show you that it is hot from the engine's labours and therefore so is the carburettor base, and presumably the butterfly. The fact that the Rotax has a gearbox allows some space between the engine and the propline that allows some space for the carburettors without impinging on the cowling line. The brown oil heater control merely blanks out a section of the oil cooler and in theory encourages a higher oil temperature. However, this seems to have little effect on the oil temperature, which seems to stay stubbornly just inside the green arc, if you're lucky.

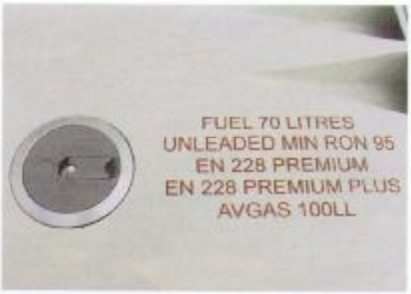
Flaps are of the split type and are very effective (more about this later): they are controlled by a conventional lever that has two positions, take off and landing. The throttle control has two plungers and is of the dreaded Rotax type that has to have constant friction applied lest it go to full throttle. Why, I ask? One of the problems we experienced when we first began to use the aeroplane was that we couldn't get the engine to idle at the Pilots Operating Handbook speed even with the plunger fully retracted. This encouraged pilots to pull over-heavily on the plunger and make the whole thing worse by stretching the cable and thus preventing the carburettor idle adjustment screws from reaching their stops. Would somebody please explain why the engine is designed to go to full throttle if the cable breaks or the friction nut is released? How will this affect the twin-carburettor arrangement if just one of the two cables breaks?

Anyway, having started the engine and waited a few minutes until the gauges show green, taxying is the next task. The AT-3 has a castoring nose wheel and steering is achieved by using the brake pedals, to be found in the normal place above the rudder pedals. Steering along a relatively straight taxiway can be achieved by use of rudder and engine alone, but when undertaking sharp corners the brakes must be used. A minor irritation is the propensity for pilots to 'ride'

Below: old and new - London Transport Flying Club's AT-3 with a venerable Routemaster bus
Right: small wheels and castoring nosewheel don't like bumpy ground



Left: rudder is light, effective and often needed
Below: oil is changed every 50 hours when using avgas
Right: Rotax engine is designed to run on mogas, but licensed clubs must use fuel from an aviation source



the brakes all the way up to the hold against the power of the engine, making me wonder what the cost of continually replacing the pads will be. The run-up is reasonably conventional. Both magnetos are tested, as is the carburettor heat, but a full power test is required by the P.O.H. This worries me, partly because the aforementioned cable might snap when perhaps close to other machines running-up for take-off, but more seriously because the aeroplane certainly does not lack power when solo with little fuel on board, and I have experienced the locked wheels 'skiing' on wet grass, particularly the right wheel – possibly because of the combined effects of an empty right seat and the helix effect of the propeller. "So don't run-up on wet grass, then," I hear you all say, but sometimes at grass fields there is no choice.

The bubble-like canopy does allow an exceptional view through almost 360 degrees but it is advisable to wear dark clothing as the reflection of lighter colours on the canopy can be irritating. In addition, the club's sales of white baseball caps have increased markedly due to the sun beating down on the occupants' heads while flying the AT-3.

The take-off and climb could best be described as eventful, due to the combination of the castoring nose wheel and the effects of the propeller. Various techniques have been tried to prevent the aeroplane turning left when the throttle is opened, such as full right rudder pedal from the standing start, and varying the time from idle to full throttle. However, dabbing the right brake, with its retarding effect on the speed, seems to be the only real solution to keep the aeroplane running straight. If the wind is only slightly from the left it exacerbates the situation greatly. In the climbout, right rudder needs to be kept on in order to maintain balanced flight, even in the left hand turn into the circuit. Best climb speed for comfort is 65 knots which will achieve about the optimum 1,000 fpm. The aeroplane will certainly achieve greater rates of climb and steeper angles, particularly when solo with little fuel on board, but I have never seen the need to achieve rates-of-climb of more than

1,000 fpm in a club machine unless your intention is to frighten your unsuspecting passengers.

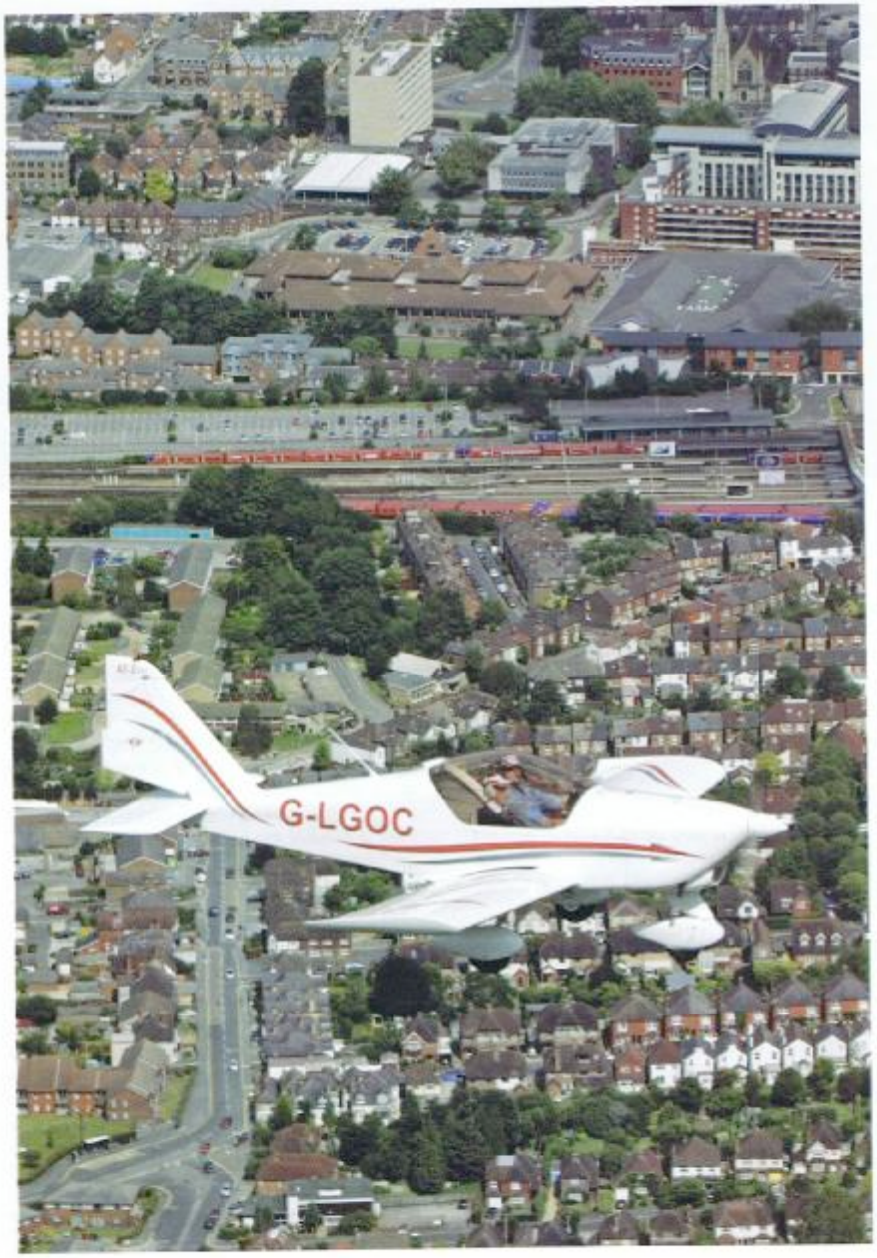
A word about operating the AT-3 on grass airfields. Anything other than smooth tarmac seems to have a detrimental effect on the take-off technique, particularly if the grass is not very short and the ground is lumpy. I have tried this many times and I haven't yet found a satisfactory technique. The castoring nose wheel will react to any slight imperfection in the surface and take you where you don't want to go. I have pondered on this greatly. A recent club visit to the RAF museum had me examining the tyre sizes of all of the pre-second-world-war aeroplanes and coming to the conclusion that they all seemed to be at least a foot in diameter and generally larger. The current fashion for small wheels with spats might be the problem, especially with castoring nosewheels.

Depending on weight, the aeroplane will cruise happily at between 4000 and 5000 rpm but turbulence will mean something less than 5000 rpm will have to be used to avoid exceeding the maximum manoeuvring speed of 112 knots. Journeys of much more than an hour in summer turbulence are tiring and uncomfortable, probably due to the aeroplane's light weight and short stiff wings. The ailerons seem very stiff in the cruise but the pitch is very light, as is the rudder. It is important to trim the pitch as closely as possible in order to maintain height station as the aeroplane must be 'flown' at all times. 4000 rpm will achieve about 80-85 knots in reality when flown by an average club pilot, and not the pilot that seems to live only in aircraft sales literature, and about 95-100 knots with the rpm set at 5000. When undertaking long journeys (more than thirty-eight minutes) just over 5100 rpm will take you close to the maximum manoeuvring speed. However, 90 knots is a-mile-and-a-half a minute and useful for pilot navigation purposes. Many club PPLs seem to get all aroused by machines that can allegedly achieve breathtaking speeds and dream of the day when they might realise their ambition, when in truth, all it will do is get them lost and into trouble quicker; they will also spend half-an-hour when back on the ground telling you how they saved ten minutes on their journey, because their aeroplane is faster than yours.

Level turns and climbing and descending ones are pretty much conventional. However, increases and decreases in the throttle setting will have much more effect on the controls than say a PA-28, probably due to the aeroplane's comparative lightness. It's worth revisiting your textbooks before flying the AT-3 as it exhibits all the characteristics you have read about when undergoing training that the vast majority of American trainers have had designed out.

Now the scary bits. The stall in different configurations is nothing to worry about, just the normal slight juddering and screaming stall warner and a tendency to drop a wing quite gently. A strange but useful characteristic is the tendency for the aeroplane to roll wings level when simulating the stall in a turn onto final. This is practiced at a safe height, of course. The AT-3 is not cleared for spinning or any aerobatics, and of course is only to be flown VFR and not at night. Simulated instrument flying in the AT-3 is possible but not easy to achieve even in stable conditions.

The initial approach is generally made at between 60 and 70 knots with the first stage of flap being lowered on base leg and the final stage at the last minute on final, which is flown at 55 knots with the power left on at between 2500 and 3000 rpm. If the power is taken off before touchdown, the very effective flaps combined with the lack of inertia of the aeroplane will result in a heavy landing as it drops from the sky. Landing is something that we have had problems with as a club, as the technique is different from the PA-28s we have flown for many years. Familiarisation generally takes about two hours or more. We have also twice experienced scuff damage to the front of the nose wheel spat due to porpoising. If there is even a slight crosswind from the left, landing and roll-out is considerably more difficult, and as a consequence we have a club crosswind limit of 10 knots. As the aeroplane slows down in the roll-out the rudder becomes less effective and the machine becomes more susceptible to the wind and surface condition, so using the rudder pedals and brakes to rest your feet on is not an option.



Left: author rates the Aero AT-3 highly and tends not to want to fly anything else

As the AT-3 is relatively new in this country there are few maintenance organisations with any experience that are authorised to undertake maintenance and repairs to the type. However, just around the corner (of the London Control Zone) is White Waltham and the West London Aero Club, whose maintenance wing are now our partners in looking after the plane. One good aspect of the Rotax engine is the cost and availability of spare parts. As our aeroplane is certified as a VLA, every part that we use has to have the accompanying paperwork which, although it attracts a small premium, costs a fraction of that of a Lycoming. The bits are readily available usually by post from 'Skydrive'. Other bits for the airframe and undercarriage are available from Trevor Archer of S2T Aviation, the type's importer.

In summary... I did begin this article by saying that I always find it difficult to be positive about aeroplanes I have flown. However, although I find the aeroplane challenging to fly, it is still a great joy and I tend not to want to fly anything else. The cost of flying the AT-3 is 15% less than our Warrior, which is obviously another attraction.

**Andy Raymond is chairman of the Fairoaks-based London Transport Flying Club.* ■