Can the Tutor teach?

As a trainer of the thirties the Tutor was almost luxurious and very pleasant to fly, but was it too short of vices?
By ***David Ogilvy***

In the very early days of flying there was no organised pattern of training for pilots; not until 1915 did the Smith-Barry system, introduced on Avro 504s at Gosport, bring into use some form of set sequence. This was the start of serious dual as we know it and the manuals of the time provided laid-down 'patter' for instructors to blow down their rubber Gosport tubes, hopefully into the ears of their suffering pupils.

Flying in World War 1 happened on a far larger scale than most people realise; almost 9,000 Avro 504s were built, which is far more than any British Service trainer since then. When the need came for a new machine to replace the 504, two types entered the field. One was Hawker's Tomtit, which was produced in small numbers, but the overall winner of the contest was the Tutor from the Avro stable, whose designers had a solid background on which to build. By the early thirties the RAF had settled into a relatively small peacetime organisation and the requirement was fulfilled with the production of only 394 machines; even this, though, compares favourably with the situation today, for which only 99 Grob Tutors were ordered.

The Avro Tutor entered service in 1932 and soon equipped the majority of flying schools. Training of the time concentrated on pure flying, stressing the need for good judgment. Very sensibly the normal way to land was from a glide approach, which was useful in establishing sound practice for forced landings, while aerobatics and formation flying held high places on the priority list. The aircraft had no radio, navigational aids were mainly in a pilot's head, instrument flight was at a relatively rudimentary development stage and there were few complications in the cockpit. Even the much heralded (and very successful) British standard panel of six flight instruments had not been introduced.

Despite its relative simplicity, the Tutor was ahead of its time with efficient brakes, a tailwheel that usually faced the right way, surprisingly roomy cockpits with adjustable seats and rudder pedals and an all-flying variable incidence tailplane. It was a tough horse, with a span of thirty four feet, an all-up weight of 2400 lbs (tare 1,722) and a generous fuel capacity of thirty two gallons to feed a seven-cylinder Armstrong-Siddeley Lynx radial engine developing 215hp. Economically, regarding both initial purchase and operating expenditure, this relatively large beast must have been unpopular among those whose lot it was to protect the Service purse, but for others who instructed on it the Tutor could have produced few complaints. Certainly its successors – the Tiger Moth and Magister – were lighter, less sophisticated and less expensive, yet each fulfilled its allotted

Above: K3241's startling sun-ray colour scheme was added after major overhaul in 2006
Right: Tutor is relatively big and heavy compared to earlier and later trainers

role admirably.

Today, only one Tutor remains. As K3215 it served from 1933 until 1936 with the RAF College at Cranwell and then moved to the Central Flying School; it was the last machine of the type to be retired from RAF service, somehow remaining on strength until December 1946, which most probably was two years later than any other example. One can do no more than surmise about its extended Service life, but presumably some fortunate station commander managed to keep it under his watchful eye; at that time such a commendable practice was not uncommon. After demob, this sole survivor was registered G-AHSA, based at the now long-closed Derby (Burnaston), but whilst being used for the film 'Reach for the Sky' it suffered a crankshaft failure and subsequently was grounded for a considerable time. Eventually, though, a nationwide search revealed three specimens of the Lynx in various states of disrepair and, from these, Armstrong-Siddeley of Coventry built up one good unit. Then G-AHSA/K3215 started a new life with the Shuttleworth Collection at Old Warden, where I was fortunate to be able to fly it on more than 20 occasions spread over almost 25 years.

From outside, the Tutor can offer several features of practical merit. Basically an all-metal aeroplane with a fuselage structure of welded steel tube with fabric covering on wooden stringers, the one-piece side panels, each running along the entire length of the two tandem cockpits, can be removed for ease of inspection and servicing. The engine, too, is easily accessible and much routine maintenance can be carried out without taking off the Townend exhaust ring that surrounds it.

Once aboard, the aeroplane's relatively massive bulk again comes to the fore, for I know of no other light aeroplane with individual cockpits that can offer such an enormous amount of space and comfort. Yes, comfort! The rudder pedals are easily adjustable for distance and the bucket seat travels up and down through a range to suit the whims and reach of any pilot of any size. An enormous trim wheel and a thick brake lever, which can be set up on the notched basis, add to the atmosphere of size and solidity that accompanies everything about this machine.

Starting offers the first and only inconvenience, for in keeping with the traditions of the time, and in common with most other Armstrong-Siddeley radials, the Lynx is brought to life via a starter magneto (which necessitates a third ignition switch) and some energetic hand-cranking from within. If, as has happened many times, a pilot straps himself in tightly before this stage, he may have difficulty in reaching the cranking handle, which is on the right wall in front of, and reached from under, the instrument panel. The Tutor offers a choice of three alternative starting methods, including a dog on the front of the propeller to engage the cross-head from a mobile Hucks starter, but the standard method is far more basic. Two men, with hands linked, prepare for a hand-swing and, after all the normal setting-up has been completed the pilot calls 'one, two, three, go'. On this last word, the swingers swing; the pilot turns the crank as energetically as its inaccessible position allows, and he keeps turning until the engine fires steadily. Then he switches off the third magneto. As an alternative to hand-swinging, an engineer can activate things by winding an external cranking handle. There are, of course, a few other things to do, such as remembering to switch off the priming cock, which cannot be reached at all from the rear cockpit without standing upright! An intriguing feature of the Lynx and its sister engines, including the earlier Mongoose in the Tomtit, is that they will run happily whilst turning either way; it is not uncommon for an unsuspecting pilot, who at first sound thinks all is well, to see the engineers' hands waving for him to switch off and try again in the hope that it will obey its left-hand tractor specification at the next attempt.

At this point we revert to relative normality. Oil pressure rises to about 90 lbs per square inch and on a radial it is particularly important that it should do so fairly quickly; then we wait for some positive action by the oil temperature gauge before the run-up, for this engine likes a heavy oil (straight 100 is used), which keeps the consumption to an acceptable figure. As with most radials, the Lynx runs slowly and a full-power check gives only 1,675 rpm or so. Once on the move the efficient brakes, which are as good as those of a Chipmunk and far better than those of the Magister, which is one of the types that replaced the Tutor, provide a pleasant surprise to anyone who has flown other (mostly brakeless) machines of the period.

The weight reveals itself on take-off. Despite an alleged 215 hp, acceleration is remarkable for being so unspectacular; the entire ground run is fairly ponderous, but only a little guidance is required for keeping straight and once the Tutor is airborne it seems to be relieved of its troubles and settles into a tolerable climb rate of 750 feet per minute against a book figure of 1,000. It beats its way

commendably through the bumps and behaves best if left alone.

The cruise is comfort itself. The cockpit provides scope for an airborne picnic, if required, but equally it offers really worthwhile space for the more conventional pastimes such as furling and unfurling maps. It is sensible to keep goggles on as a secondary windscreen,

Left: despite 215hp, acceleration is slow and the ground run ponderous
Above: goggles are advisable, although the windscreen does an adequate job
Right: ailerons are mushy at low speeds

but the one fitted to the aeroplane is sufficiently workmanlike to permit periodical doses of bare-eyed flight. The makers' very precise setting of 1,620 rpm for the cruise gives 90 mph on the dial.

At lower speeds the handling characteristics are not outstanding, and despite ailerons on all four wings, certainly not crisp. Understandably, this is most marked at the 65-70 mph IAS in the climb, but an airspeed increase of only about twenty per cent produces a response that is much more alert. Throughout the speed range, though, control displacement is unusually marked and in snappy reverse-direction turns the control column really moves across the width of the broad cockpit. However, there is more overall control improvement with speed increase than the unwary pilot might expect from the initial sluggishness, for from a little more than normal cruise of 90 mph the machine can be rolled into and out of turns with some spirit. This must have been a marvellous asset for any ab-initio instructor whose task was to teach the varying effects of controls and subsequent exercises at different airspeeds.

In the interests of long life of both airframe and engine (which must always be to the fore in a pilot's mind throughout any flight) aerobatics are kept to an absolute minimum and manoeuvres that involve negative G are banned. As a result, one does not indulge in prolonged series of aerobatics either for practice or personal pleasure; no doubt those who flew Tutors regularly when there were plenty of them reached high standards (and certainly the CFS team members, who specialised in inverted formation, achieved this) but from the odd few loops and some rolls-off I can claim neither expert knowledge nor a clear conscience to investigate. The machine is extremely pleasant to fly and, of all the earlier types held at Old Warden, it is by far the most practicable and satisfactory specimen for general and cross-country work; it is the oldest machine of all that can tolerate a fair cross-wind for landing and can be taxied anywhere without help, but it does not ask specifically to be aerobatted, especially when

compared with, say, the Chipmunk, which does. As the Tutor is a heavyish aeroplane, airspeed diminishes rapidly in the first part of a loop, and it is easy to run short of it at the top; if one makes this mistake – as, alas, I know from experience – nothing drastic happens, but there is a strange and protracted feeling of empty nothingness as the machine seems to flop its way round into the descent, still very considerately facing the right way.

A feature that finds the underlying truth in any aeroplane is its manner at and near the stall. Here the Tutor is very kind; perhaps too much so for a trainer. As airspeed decreases, a marked control woolliness displays itself, especially with the ailerons, but despite this they are usable down to the breakaway, which occurs at 42 mph IAS. From a gradual, level approach to the stall, the result is very tame, with a fairly positive nosedrop but almost no tendency for a wing to go down. If put to the test in slightly less textbook conditions, such as a more rapid movement in pitch and a spot of built-in yaw, slight spirit displays itself and I have no doubt that if left alone, it would enter a spin; respect for the Tutor's age, though, has meant not waiting to find out.

The big trim-wheel is heavily geared and a lot of winding is needed to produce a small change in tailplane incidence. This means, of course, that large movements are called for in order to remove stick loads, which are more than moderately pronounced with changes in airspeed. Not surprisingly, this is most noticeable between level flight and a glide approach, and shows most at the end of a demonstration flight, when the average operating speed has been a little higher than that of a routine cruise. Alterations in power, too, create moderate load changes.

Generally, the view is good in all directions, but the exhaust collector ring and its external cowling protrude well outside the fuselage line and this creates some visual obstruction on the final approach and hold-off. However, the landing itself is completely uncomplicated, for a gorgeously soft undercarriage absorbs most of the loads that one may place upon it. Although the Tutor can bounce from a premature touchdown during the round-out, its general tolerance is most comforting. In normal conditions there is little tendency to swing during the land run, although the tailwheel encourages a longer roll than might be anticipated; if needed, though, brakes provide solutions to both situations.

Top: Lynx radial will happily run both ways
Above: fuselage is welded steel tube with fabric covering
Below: soft undercarriage absorbs most landing loads

General reactions are very favourable. Everyone who has flown the Tutor likes it. It is a gentleman's aeroplane in its roominess and docility, while the powerful response from the ailerons at the high end of the speed scale helps to produce a positive feeling of being in control of the situation. Assessing it as an aeroplane to fly, it qualifies as excellent; judging it as a trainer on which to teach, it fails to object sufficiently strongly to minor mishandling, so an instructor might not find his pupils' (not students in the thirties!) errors standing out as glaringly as they should.

Most aeroplanes in the Shuttleworth Collection retain their original military or civil identities; however, in 2006 the Tutor emerged from a major overhaul as K3241, in a startling fresh sun-ray colour scheme to represent a machine used by the RAF's Central Flying School Aerobatic Team in the mid thirties. This policy of re-creating a 'new' historic aeroplane from time to time has a positive reaction among enthusiasts, especially photographers, whose interest in a specific machine is suddenly reactivated.

Colours apart, the world's only surviving Avro Tutor has a significant place in the Collection's range of Service trainers, all of which from the Avro 504 of 1914 to the Chipmunk and Provost of the early nineteen fifties are represented. No other organisation can make this claim. ■

Photos: Darren Harbar
website www.focalplaneimages.co.uk