

My association with the Tiger Moth began with a couple of familiarisation flights with two friends from the BA Concorde fleet. The late Captain David Ross, who at the time was my Route Training Captain, gave me my first taste of open cockpit flying out of White Waltham.

I enjoyed the experience immensely; it was a combination of sensations that sparked my joy of the type. Just walking around the aircraft brought back the romance of the early days of flying. The construction of canvas over wood along with the swinging of the propeller to start the engine reminded me of the balsawood models I built as a schoolboy which gave so much fun. With the smell of fresh-cut grass mixed with the smells of burning fuel/oil and hot engine enamel in the breeze of the propeller slipstream, I soon realised as we taxied out to the take-off point on that warm, calm summer evening that I, like so many others, was truly hooked.

Since most of the checks were completed before taxiing it did not take long for David to complete his before-take-off checks from behind me and the next thing I knew we were at 45kts and leaving the ground.

Some say – including my 84-year-old aunt, who I took Tiger Moth flying for the second time last summer – that it's like motor cycling with wings. For me it all seemed so natural. The panorama was amazing, even looking through goggles (it is much easier keeping goggles clean than Perspex windows), and to me what made the Tiger Moth such a unique open cockpit experience was the sound of the Gypsy Major engine.

My second Tiger Moth flight was with another friend from the Concorde fleet, Steve Bohill-Smith, who as a very experienced and enthusiastic Tiger pilot was part of the Diamond Nine display team. I was lucky enough to be with him while practicing in

formation, again out of White Waltham. To see so many Tiger Moths around us in the air was amazing – they all looked in such beautiful condition. The DH82 Tiger Moth first flew on the 26th October 1931. Nearly 9,000 were produced, and around a tenth of those are still flying. Given the fact that there are so many Tiger Moth enthusiasts around the world – supported by the excellent de Havilland Moth Club which is highly active in organising events such as the annual gathering of de Havilland aircraft at Woburn Abbey each August, and providing technical and operational support – it is no wonder that the Tiger has lasted so well.

After many years of perfecting Tiger Moth G-AOBX to concours condition, David Ross, the man who introduced me to Tiger flying, sadly died and his wife sold his aircraft to a group of work colleagues who formed the David Ross Flying Group. As part of that group I suddenly found that I had to carry out an unusual conversion to go from flying a supersonic airliner to flying a WW2 elementary trainer.

Under JAR, whether a PPL or an ATPL with a current SEP rating, you cannot just read the handling notes and jump into a Tiger Moth and go flying. Unless you are current on taildraggers from before JAR or have had your log book signed by an instructor who is satisfied that you are competent to operate that type of aircraft after a course of instruction, you are not legal to fly. Even if you are legal it is still a very good idea to practice with someone who is current before setting off on your own. I managed to become qualified to fly

*Right: the Tiger is a delight to fly once you get used to the sensitive pitch control
Below: Les Brodie swings the prop of David Ross Flying Group Tiger G-AOBX*

the Tiger in the summer of 2003, and since then have flown only 35 hours in OBX, so I regard myself as inexperienced on type and treat the aircraft with a great deal of respect.

De-skilled feet

I found that to fly the Tiger I had to go back to basics and learn once again to use my feet as much if not more than my hands. Modern aircraft, and in particular airliners, de-skill your feet. With auto rudder control, balance turns are a piece of cake, and with thrust asymmetry control you only have to follow through as the rudder moves in an engine failure case. The only real need to use the rudder on such types is to remove drift before touchdown. I remember having to do that manoeuvre once with only half a rudder following a rudder detachment during a flight to JFK with no real problem. I would



certainly not relish the idea of flying a Tiger without full rudder control.

With the Tiger, from the moment you set off to taxi to the takeoff point you have to 'fly' the aircraft. The spring bias pitch trim (a very similar device was used on the Concorde) is set fully aft and the stick held back to keep reaction on the tailskid. The tailskid moves with the rudder to give directional control. Wind direction and strength is noted so that the ailerons can be used to prevent wings from lifting. The aircraft wants to weathercock into wind and may require ground handlers to assist if there is more than 15kts. With a downhill surface and the wind coming up the slope there can be a problem since you need to turn out of wind and up the slope to slow down/stop, as there are no brakes fitted to the type as standard. If things get out of hand then the only recourse is to turn off the magnetos,

jump out and grab hold. All of this can be avoided by thinking ahead and staying clear of trouble spots. With little or no wind it is easy to taxi a Tiger Moth, but like in a boat, you have to make way before gaining directional control. With limited forward visibility it is important to weave the nose from side to side to see ahead and avoid obstacles. Speed control and stopping is carried out using the throttle. Open the throttle to move off and go faster, close the throttle to slow down and stop. Keeping the stick right back helps the stopping.

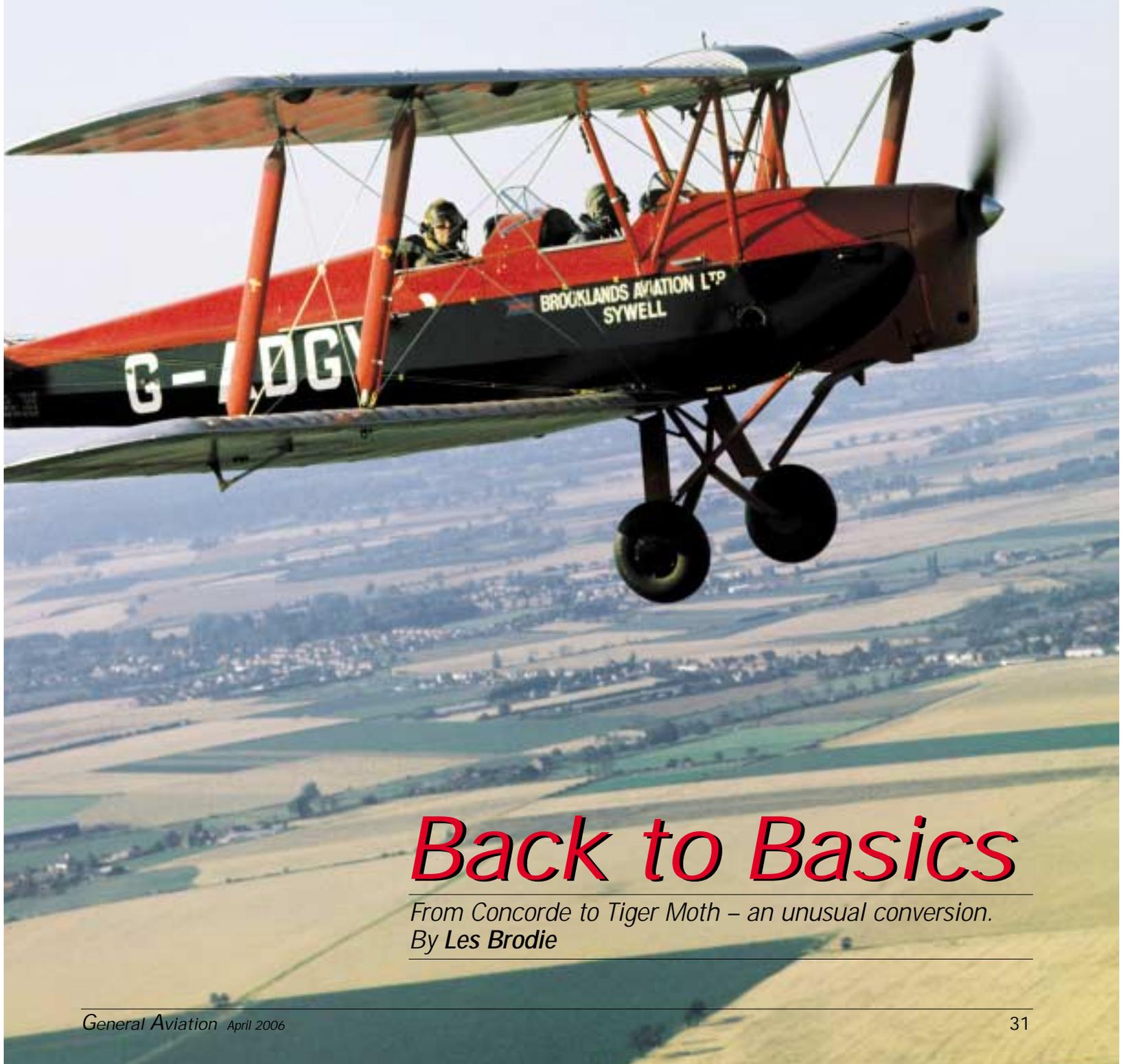
The leading edge devices (auto slats) used for take off, approach and landing are locked for taxi using a lever on the right of the rear cockpit, otherwise they will bang in and out while moving – especially over bumpy ground – and may get damaged. With the narrow track of the landing gear the wing tips of the lower wing seem to come perilously close to

touching as they rock to and fro over the bumps, so a slow taxi speed is essential.

At the take-off point, since the engine checks are carried out earlier with chocks in place after a four minute warm up from start, all that has to be done before take off is to make sure that the fuel is on and sufficient (seen from the rear cockpit the level is checked through a sight glass above the 19 gallon tank between the top wings), the trim is set two thirds forward, oil pressure checked, slats unlocked and all hatches/harnesses are secure.

The takeoff should be into wind but if a crosswind is unavoidable (no more than 10kts is recommended) then as usual full aileron into wind should be applied, with control application reducing as speed increases. The plan is to prevent the into-wind wing from lifting rather than reacting to such an event.

PhotoLink



Back to Basics

*From Concorde to Tiger Moth – an unusual conversion.
By Les Brodie*



Les flew with Steve Bohill-Smith practising with the Diamond Nine formation



Take-off calls for active feet in crosswinds



Going for a three-point landing means crossing the threshold at 58 knots

This really sums up safe flying, and in particular safe Tiger Moth flying, where there may be less control power/more adverse effects to consider – *prevent difficulties rather than overcome them.*

The takeoff involves a bit of a balancing act. To begin with the tail needs to be kept down to maintain directional control, but once enough airspeed is achieved to give elevator control the stick is moved forward to lift the tail. The input should be measured to ensure that there is a slow movement to the level attitude; too much input can result in a nose-over. As ever, a point on the horizon is chosen as an aiming point, and left rudder is required to counteract the yaw from the propeller slipstream as full power is applied. The throttle has to be fully forward to mechanically cut off the carburettor heat to give full power. In light winds there are no problems with directional control but with gusty or crosswind conditions those feet will again be active in *preventing* a swing away from the aiming point. Lift off at 45kts requires a gentle back pressure; speed is increased to 58kts for climb whilst in ground effect. The

turn and slip indicator should be brought into the scan at this stage and kept in scan throughout the flight. For efficient and comfortable flight with least strain on the airframe the slip needle should be kept vertical whenever possible by correct use of rudder. The rudder bar does have a spring bias trim system but this can only be set on the ground for the rudder to be in trim during cruise.

The Tiger Moth is a delight to fly once you get used to the fairly sensitive pitch control. The elevator is light and responsive therefore it is easy to over-control. By keeping in trim and using the fly screen as an attitude reference, climbing, descending and flying level become easy tasks, especially as the aircraft has good longitudinal stability. We had a pop-up frame on top of the coaming of the Concorde for use as a pitch attitude reference during approach and landing – so along with the similar trim system on both types, perhaps the conversion from SST to DH82a wasn't that unusual after all.

Turning is also no problem as long as you realise that you are using simple ailerons (Frise Differential ailerons were not available for the

Tiger) that do suffer from adverse yaw. It is essential to apply rudder along with aileron to initiate and balance turns. This soon becomes a habit as it feels uncomfortable through the seat of your pants if you get it wrong.

The Tiger is pleasure to fly cross country; you feel a part of the environment as you cruise along looking down at beautiful countryside. The downside is that sometimes you can smell the pollution we put into the air, especially on high pressure days, whether it is from bonfires or industry. With a maximum take off weight of 1825 lbs (830kgs) the aircraft can be loaded with 400 lbs of payload and a full tank of fuel (19 l.g.) and still operate from strips as little as 500m in length. The aircraft will climb at 600ft/min in this condition.

With a 6.5gph fuel consumption the Tiger has an endurance of 2.5 hours and at 70kts cruise speed its range is 140 nm still air with 30 minutes reserve. Some aircraft were fitted with an extra 10 gal fuel tank in the forward cockpit to increase range. With a gravity fed fuel system this required a hand pump in the cockpit to move the extra fuel up to the overhead tank to reach the engine. Incidentally the Tiger has a service ceiling of 15,800 feet if you are looking to go higher for greater TAS. The snag is the temperature will be around minus fifteen up there.

For general handling the Tiger's effective and predictable controls make manoeuvring, whether at Vne (139kts) or Vs (38kts), a straightforward operation. The aircraft is easy to control in steep turns – again keep an eye on the slip indicator – and slow flight is no problem especially as you have the slats popping out to warn you that you are approaching the stall. The stall itself is benign and with standard stall recovery barely 50 feet is lost. No wonder this aircraft was such a successful basic trainer.

Landing the Tiger Moth is very satisfying when you get it right. The normal landing is a three pointer but in crosswind conditions it is recommended to land on the main wheels first after removing drift, keeping straight with the rudder. The into wind wing is kept from lifting by use of aileron and as the speed decreases the tailskid is lowered to the ground.

The three pointer involves crossing the threshold at 58kts, closing the throttle and holding the aircraft off about one to two feet above the ground. As the speed decays the attitude is gradually increased until the aircraft touches down on all three. Once you have finished congratulating yourself on such a wonderful landing or worked out some excuses as to why the aircraft bumped down, you soon realise that the job is not complete as once again the feet go into action to keep straight towards a reference point while the stick is kept right back to maximise braking and directional control from the tail skid. The trim is put fully aft and the slats locked to taxi in.

Having written this article I can't wait to get back in the air in our Tiger Moth G-OABX, which is presently having its C of A renewed, including a wing inspection that has involved removing the wings from the aircraft. The C of A shows that our aircraft was built at Morris Motors Ltd, Cowley, near Oxford, as were three quarters of the around 4,000 DH82a Tiger Moths built during WW2.

Operating vintage aircraft does involve more effort and expense with regard to maintenance but on a summer's day, flying towards a grass strip in a beautiful aircraft making a beautiful sound, to drop in for lunch – that is not soon forgotten. ■