PILOT'S VIEW

DE HAVILLAND Tiger Moth

Colin Dodds takes a flight to Edinburgh in a Tiger Moth and reveals some of the delights and drawbacks of this classic trainer and tourer.

NOT A GOOD travelling aircraft, uncomfortable, poor handling in adverse weather conditions, is slow, and needs a grass strip into wind for landing – a dispassionate view of the Tiger Moth. Yet airworthy examples are again increasing in number, year by year, despite the last one having been built in 1944. This presumably means that I am not the only pilot who gains more pleasure from the sheer fun flying that the Tiger provides than from most other aircraft.

I must admit to being a touch biased towards the Tiger. The first aircraft I ever flew, when, as an impressionable seventeen year old, I gained my Pilot's licence with a considerable amount of help from the Tigers of the Newcastle Aero Club. That initial contact with the aircraft created within me great respect and friendship for the 82nd design from the de Havilland Company.

As an enthusiastic prospective pilot, brought up on vast amounts of information on the current Air Force jets, I will admit that my first view of the aircraft I was due to learn to fly on, was a disappointment. Here was an obviously pre-war biplane, with an open cockpit, bracing wires holding it together, sitting in an old fashioned nose-up attitude on the grass alongside several other veterans. Not the thing for an incipient *modern* pilot at all.

Once I started my training, I soon came to realise my good fortune in having this stalwart machine as my companion when learning the real basics of flying, rather than a bland and less capable modern machine. I shall attempt to pass on some of my feelings for this aircraft through the means of a journey I undertook a few years ago in my favourite Tiger, from the South Coast to Edinburgh.

As is often the case, on this particular trip, I have to open up the hangar myself, ease the Tiger out of the cluttered jumble of aircraft, then lift the tail and trundle the machine on its mainwheels like a wheelbarrow out onto the grass for this early morning start. I have already topped up with 80/87 AVGAS, and W80 oil, so my main concerns this morning are the navigation requirements and the stowage of all my kit into the small luggage locker behind my seat. Another unknown for such a long winter trip is whether I have the right type and amount of clothing for a five hour cold soak at temperatures below freezing.

I stow my set of maps in suitable places around the cockpit, and tuck my other documents under my seat, where I can reach it in flight, before starting my external inspection. Checking both sets of magneto switches Off and the fuel cock On, I can then complete the customary check of fabric, fittings, and condition of the whole aircraft moving clockwise from the cockpit. I pause to make sure that the chocks are in position (no brakes on this old girl) then have a good look under the bonnet for fuel and electric connections, and check the port side oil dipstick.

A careful check of the propeller comes next, then I can move round to take off the pitot cover, and check the front cockpit straps for security, as I will be flying from the back seat as normal. By this time, one of the local engineers, Peter, has arrived, so I ask him to do the honours with the fuel priming, while I climb aboard.

At this point, I am reminded of the Tiger's homely but sparse cockpit layout. The accompanying photographs show that the Tiger's 'office' takes the form of a slot cut out of the plywood top fuselage deck, with two small hinged doors for access to each cockpit, and for aiding lookout while taxying. Behind each tiny windscreen is a deep leather 'bumper' about 12" from my head, which acts as a cushion in emergencies. Outside, below the windscreen on the port side, are the two magneto switches, the front seat occupant having another set for himself.

The interior is small but practically laid out. The seat is a fixed bucket, designed to take an Irvin parachute, but which nowadays usually has a large cushion instead. My feet slide down into recesses on either side of the front seat, and rest on rudder pedals which provide de Havilland's only concession to differing sizes of pilot, as they have three adjustment holes to satisfy different leg lengths.

My right hand falls naturally onto the man-sized control column, which sits in the centre of the cockpit. I believe that this is the best positioned of all the Moths columns. It is just right for the job, as it feels solid, works in a completely natural way, in both pitch and roll and has just the right amount of displacement. It is not long and unweildy like the Leopard Moth's, and is not awkwardly offset like the Hornet Moth's. This is another reason for the Tiger's success as a trainer.

I find the seating position comfortable enough, being over six feet tall, but sometimes wonder how my first CFI, a stocky five footer with red hair and a spirit to match, coped with seeing anything out of this restricted area, particularly on the ground. I suppose that as the CFI, he merely *willed* everybody out of his way, on *HIS* airfield. Or he could have used a lot of cushions!

Controls are pretty basic, and fall easily to hand. On the left cockpit wall are the throttle and elevator trim levers, and forward of these is the small knob which controls the fuel cock. From here my eye moves naturally upwards to the simple instrument panel, with all of six instruments set out on it in somewhat haphazard manner. Two of the instruments are for the engine, so in modern terms, this really is a limited panel. On the right wall is the quadrant control for the slats, which moves rearwards to lock, and below that is the fire extinguisher. In front of the control column is the only allowance on this aircraft to the more complicated process of modern flight, the 360 channel radio, which has an intercomm system and is powered by a dry battery.

By this time, Pete has primed the engine, and closed the cowling, so it's time to get the engine started, which is a two man task here as with most old aircraft. I have no need to remind Pete of the rules for hand-swinging, as he is quite

'Alpha Zulu' before the warpaint, seen here with the Tiger Club at Redhill in August 1960. Behind another Tiger, a Bristows Hiller, a Rollason Turbulent and the Arrow Active G-ABVE. (Michael Stroud)

used to the system, so he begins the routine by calling "Fuel On, Chocks In, Throttle Closed, Switches Off". I repeat the actions back to him then he 'sucks in' by turning the prop over four times. I find that *Alpha Zulu* likes a small amount of throttle for the sucking-in process, then starts on the first or second pull of the prop.

Pete then calls "Throttle Set", and after putting on the front set of switches, "Contact". He grasps the prop as high up towards the tip as possible, then swings it down, following through to avoid being caught by the blade as it continues round its revolution. The early morning sounds are over-powered by the Gipsy's clatter as she signals her willingness to start the day's work, settling down at around 650 rpm.

I then switch on the other magneto, and increase rpm for the engine to warm up. Oil pressure has risen to about 42 psi, so I now have to wait four minutes for the engine temperature to rise before checking that I can get full power and only a small Magneto drop. While I wait, I test the radio and the intercom, and make sure I have the right heading on the compass and the right half million map in my flying suit pocket.

I know the route pretty well for the first hour, but want to have an early check of track and groundspeed during the first half hour, so that I can confirm the winds are as forecast. I find that marking-off ten minute sections is the best way to navigate when I operate several types which all fly at different speeds. I also check that I have the relevant frequencies on the chart, as in this cold weather, my fingers get pretty numb fairly soon, and turning pages in a flight document is not a task I want to do too often.

I poke my head out to indicate to Pete that I'm ready for the engine check, and am surprised by how cold the breeze is. I ease up to full throttle while Pete leans over the rear fuselage to stop the tail lifting, and I then have the rpm needle hovering around the 2,100 mark, with 42 psi on the oil pressure gauge. A quick check of the two magnetos, then I signal Pete to remove and stow the chocks, as I'm eager to get away.

An application of full rudder in each direction confirms to me that I should have no problems taxying in this light wind. Above fifteen knots, the wind causes the Tiger difficulties with a tendency to weathercock into the wind during taxying. I still have to keep up the weaving as I head for the runway, as the high nose and wings blank off the area immediately in front of me and also tend to hide from view nasty wooden marker boards or hazard indicators. A continuous weave and a good lookout on both sides of the fuselage are essential habits in the Tiger.

Keeping the engine running at reasonable rpm to prevent oiling of the plugs, I meander across to the marshalling point, where I can complete my pre-take off checks. These are simple, involving Trim, Throttle friction, Fuel, Slats, Instruments, Harness and Hatches, so, with Air Traffic's blessing, I can line up on the grass, allowing a slight angle off the centre line to point exactly into the southerly wind. This inclination to point as nearly into wind as possible when near the ground in any tail-skid (or tail-wheel) aircraft, is because of my belief that the further out of the wind you operate, the greater will be your handling problems such as weathercocking, unwanted drifting, and lifting of the into-wind wing.

It's time to be off, so with a last glance around for other traffic, I move the throttle up to it's forward stop, feeling the immediate effect of the slipstream through the rudder pedals. The aeroplane comes to life rapidly, shaking off the damp and languor of the ground, allowing me to feel it working through my gloved hands, as if to show it's own eagerness to be free of the earthly element, and off into it's happier environment, the air.

Quickly, I ease the stick forward, lifting the tail and letting the pliant mainwheels take the bumps, as I keep the nose pointing towards the distant church spire through use of rudder, as the speed builds rapidly towards forty knots. I have time to glance at the rpm and oil pressure and then we're at forty knots and the old girl is eager to be off, so I allow her to fly herself off into the smooth morning air and hold the stick central until I see my climbing speed of 55 knots coming up on the clock.

The engine sounds good and the gauges confirm that feeling, so I can now throttle back a fraction to ease the strain on the engine, and we're already climbing like a lift, after a nice short take off run. Turning right onto my northerly heading, I continue on up to the cruising altitude of 1,500 feet. Air Traffic gives me a cheery farewell, then I change to London Information for traffic information.

Settling down in the cruise I select 1,900 rpm for best fuel consumption, which gives me around 73 knots airspeed, and should provide a consumption of about seven gallons of Carless' best brew per hour. With my full load of nineteen gallons (with the tail on a trestle to allow the complete tank to be topped up) I should have a safe 2½ hour's endurance. Unusually for me, I have a tailwind, so I'm happy with a one hour forty minute transit to Cranwell, followed by an hour's leg to Leeming, then a final one hour and forty five minutes to Turnhouse.

Once I have trimmed the machine level, I can start a check of the heading and the timing, to confirm my flight plan, and then experiment with ways of keeping various parts of my anatomy from freezing solid, as the freezing level is only about 500 feet above me at this stage. In level flight the Tiger's structure creates an eddy current which invariably blows into the rear cockpit, producing a blast of super-cooled air in the region of the stick, and so affecting my right hand, which sits dutifully holding the aircraft in straight and level flight. But the blast of air also affects other parts of the body in the same region, and I now begin to discover that there is a design fault in my Acrilan pile bunny suit which I am wearing under my flying suit, as the gap thoughtfully provided for certain bodily functions now lies in the direct path of the seventy knot eddy current, causing a modicum of discomfort!

After half an hour's experimenting, I find the simplest solution is to keep my folded map covering the nether regions and so deflect some of the blast. This same stream of air is also affecting my right hand, and after half an hour's treatment, it becomes almost numb, so I have to resort to my old habit of taking the stick with my left hand, while I tuck the other under my right thigh, where there is some warmth. This becomes a ten-minute changeover routine throughout the trip. Well, I suppose it stops me from getting bored with the navigation.

This is not intended to give the impression that all Tiger flying is a physical torture. The journey in question was a five hour trip in winter, whereas most sensible people fly Tigers in the warmer months, and for a shorter time. Furthermore, one of the greatest pleasures in aviation is to climb into a Tiger on a hot summer's day in shirt sleeves and experience the exhilaration of the cooling breeze whilst performing aerobatics from an open cockpit.

Discussion of the hand-swapping routine prompts me to mention the handling qualities of the Tiger. I need to have one hand on the

controls at all times, because the aircraft is built in such a way that a couple of minutes of inattention will allow the aircraft to wander off heading and height, gradually but definitely. No amount of careful trimming will prevent this, so a constant watch has to be kept on height, heading and speed. This of course is another reason for the Tiger being such a good mount for the training pilot.

I find the controls quite well harmonised, and adequate for their task. Elevator and rudder are firm and positive, but the ailerons produce a low rate of roll and a good deal of adverse yaw, due to the fact that ailerons are only fitted to the lower wings. Rolls and turns have to be accompanied by moderate amounts of co-ordinating rudder in the same sense as the turn. The habit of checking the top needle of the Turn and Slip indicator to confirm that every turn is correctly balanced soon becomes second nature to all Tiger pilots.

My flight-plan timing has been fairly accurate, which is unusual in such a slow aircraft, affected as it is by any change in wind, so I don't expect too much change from my forecast conditions. The little radio has been giving good service throughout the trip, producing up to 35 miles' range at 2,000 feet, but I cannot pick up Cranwell, which concerns me a little. However, the visibility is still good, and I believe I can now see Cranwell's main airfield coming into view, which presages relief, in several senses. I may even get a cup of coffee to warm up my insides!

The grass landing area is now appearing from behind the trees, and as I fly over the southern airfield, the windsock indicates a reasonable south-westerly at about ten to twelve knots. That means a quick left hand base towards 'The Towers' in the area beyond the trees.

Checks for the approach and landing are pretty basic, so I use my standard light aircraft FREDA approach drills, then merely check Fuel, Slats unlocked and Harness before hearing a call from Cranwell Base telling me that the grass area is clear and confirming wind speed and direction. I gratefully acknowledge, then being a great self-preservationist, wait until I can be sure of making the field, then throttle back to idle, allowing the speed to decrease to sixty knots, and let the nose come down into the glide attitude. A little trim now allows me to glide hands off if needed, and then I can keep an eye on my touchdown point and the windsock while turning a gentle left base leg.

As expected, by the time I reach 500 feet on the approach, at sixty knots, I am a little high, so instead of rolling out to point my nose at the field, I feed in right rudder, and point the stick towards the airfield, taking up a side-slip attitude. This lets me keep a good view of the point of touchdown and also increases my rate of descent, whilst keeping the speed at sixty.

At about 100 feet, there is plenty of airfield ahead, so I feed in left rudder, reverting to straight flight, bring the speed back to 55 knots, then ease back to fifty just before round-out at about twenty feet, when I can progressively reduce the rate of descent and convert to a three point attitude, before the wheels and skid touch, together, at around forty knots.

My cold hands don't get it exactly right so there's a slight bump as I touch the Cranwell grass, and then I allow the aircraft to roll on towards the flying club's hut, where the club secretary is waiting to provide liquid refreshment for the Tiger and me. He had obligingly made the R/T call, using the club's ground radio, and had only just arrived before me, hence the earlier lack of response.

Half an hour on the ground is all I need here, and the refuelling is very kindly completed for me by the Cranwell team. A quick swing of the prop, and *Alpha Zulu* is humming again, so with a grateful wave to my helpers, I'm off to the other side of the airfield, ready for a take off to the south west. As I pass over the main camp buildings, and turn right on track, I have a lovely view of the front facade of 'The Towers', then head off towards Waddington and climb up to 2,000 feet on my way to Leeming. The visibility and cloud base are good, and the wind is still light and westerly.

The next forty minutes are pretty uneventful, being a repeat of the first leg until I pick up the weekend controller at Leeming from just north of Ferrybridge, and remind him that I would like to use the grass strip for landing. My messages of the past weeks requesting use of the grass have obviously not percolated down to this controller, and despite my protestations, he insists on my using the 7,500-odd feet of Runway 36.

I am not happy, but cannot get any change. This is something I had not wanted on this trip, as here were two recipes for difficulty; a crosswind landing, and a tarmac runway. At least the wind is not strong, so I agree to give it a try, but warn the controller that I will probably need wing walkers to help me taxi in. (And I suppose I'll just have to accept all that wear on my tailskid, with those acres of concrete to traverse!)

Fifteen minutes later, Leeming's northerly runway is right on my nose, so I let the nearest end of that long concrete finger disappear from view below me, before throttling back and then heading straight on for a touchdown half way down the concrete, as I want the shortest possible taxying distance. The crosswind from the left makes an approach angled to the left of the runway seem reasonable, so I touch down on the mainwheels only at about 45 knots near the right hand edge, and head left of centre while slowing down. There are no gusts to cause any unexpected bumps, so the landing is smooth, and in the place I intend.

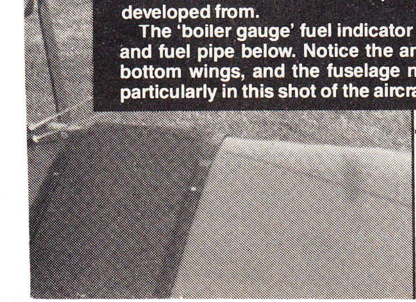
With no brakes and a low friction runway surface, I roll a fair way before stopping, and take the precaution of moving the stick towards the windward side to prevent any wing lifting. I keep the tail off as long as possible and maintain direction with small amounts of rudder until the speed is low enough to allow me to put the skid down. But then I find that I cannot get

Above: This is almost exactly the view I get from the rear seat when looking out and up in the landing attitude. The fuselage blocks a good deal of the landing path, and the scene immediately ahead can only be seen by swinging the nose from side to side. I use as a reference the two square connectors at the junction of the cross bracing wires, just visible above the front coaming. These intersect the horizon in normal flight, and the wires act as a guide to bank angle, being at 45° to the aircraft's axis.

Controls are pretty rudimentary, with throttle on the left, and elevator trimmer below, out of sight here. Forward of this can be seen the fuel cock. In the centre are the control column and, ahead of it, the VHF radio. On the panel can be seen ASI, Turn and Slip indicator, Altimeter, P11 compass, with rpm indicator and Oil pressure gauge on the right. The magneto switches are outside the cockpit on the left, presumably so that the starter can see their condition, then on the right wall is the slat operating knob.

Left: This view gives a good impression of the two cockpits, in relation to the rest of the aircraft. The aircraft is always flown solo from the rear seat, with the instructor or passenger in the front seat. Access to the rear is easy, via the walkway, then over the open hatch into the cockpit, but the front seat has the fuel tank and it's bracing struts causing more of an obstruction. The position of the metalwork should be compared with that of the earlier 60T Moth, which the Tiger Moth was developed from.

The 'boiler gauge' fuel indicator can be seen at the top rear of the fuel tank, with the drain cock and fuel pipe below. Notice the amount of structure in the way of the pilot's view, with top and bottom wings, and the fuselage nose taking up a large proportion of the forward field of view, particularly in this shot of the aircraft in the landing attitude.



G-ARAZ in her current markings, at Sywell.

PILOT'S VIEW

enough use out of the steerable skid to let me turn right (out of wind) to reach the turn-off into the refuelling dispersal. A burst of power with aileron and full rudder can usually do the trick on grass, but here it is impossible.

All I can do is to get closer to the left hand edge of the runway and the nasty-looking gutters alongside it. The more speed I achieve, the more I weathercock into the wind from the left. So I call the tower and request assistance from the crash-crew, to help by 'walking the wings'. The RAF firemen are a great help and do not appear to mind their quiet Sunday being disturbed by the antics of this ancient biplane and its apparently incapable pilot. (He must be surely be useless if he has to be *helped* across a runway by two men holding the wings!)

That grind across Leeming's tarmac takes me nearly fifteen minues and about ¼ inch off my tailskid, but at least I pick up my fuel and have another life-saving cup of steaming coffee, courtesy of a now understanding and apologetic air traffic staff. I find I need nearly all of my hour on the ground to thaw out my hands so that I can write the cheque for the fuel.

At least I am able to use the grass strip for take off into wind, which makes a good start for my final leg to Edinburgh. The weather forecast has not changed, so I feel contented as I fly on past my old training haunts at Newcastle, and with a moderate tailwind, am pleased with my progress. But, (and there is always a 'but' in old aeroplane journies) it could not last.

As I reach the Scottish border, the previously high cloudbase begins to fade, almost imperceptibly, into patchy cloud and rain, and the visibility gradually deteriorates. I have to keep clear of cloud and rain because of the chance of carburetter icing but also because the Tiger is not an IFR aircraft, so having earlier elected to go the direct route across the Scottish lowlands, to the south of Edinburgh, I am forced to descend and fly lower than I would like, and eventually to divert off my route over the higher ground, down the cloud clear valleys towards the sea.

Luckily, I am able to keep a fair indication of my position, and when I run clear of the higher ground, find that Turnhouse is only about twenty miles ahead, and in clear visibility, so it's up to 2500 feet once again. I had been surprised by the earlier unexpected deterioration in weather, but, apart from being bounced around more than usual, found that the only effect of the heavy rain was for the visor of my bone-dome to get wet when I poked my head out to see ahead. Otherwise the cockpit had remained quite dry.

On calling Turnhouse, I am not really surprised when they tell me that moderate showers are now expected and that the wind is getting up to 25 knots at times, which is quite different from my forecast, but no real problem, as long as it is fairly steady. Unfortunately, the wind direction has swung round to south westerly, so the thoughtful controller, knowing of my need to land on grass, has checked the condition of an into-wind triangle of grass between the three short runways, as opposed to the out-of-wind strip we had previously agreed I should use. He also had the crash crew standing by to hold the wings when I landed. What a good man, as that wind could get tricky if it increases any more. The turbulence builds up as I begin the long slow approach towards the tiny triangle of grass over the familiar golf course. With checks complete, I keep as nearly as possible into wind on the approach and judge that I have plenty of grass to allow me to land into wind, and also plenty of fuel to hold off for another 30 minutes if I so need, in case the turbulence makes a landing difficult. At least I will not need to use much of the area with this wind.

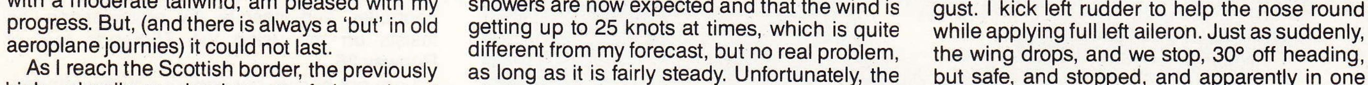
In the event, the final wind during my approach goes up to 35 knots, so I keep a good deal of power on, to allow me to have some sort of ground speed. With seventy knots on the clock to give me some speed in hand, the gusts are causing speed fluctuations of fifteen knots up and down. This is not a normal Tiger Moth approach!

Being ready to begin a rapid overshoot at any point if the gusts are too strong, I bump slowly on towards the little triangle, being bounced around by the turbulence all the while, and maintain something near seventy knots until, at about 100 feet and lined up nicely, I consider the gusts to be acceptably steady, so I allow the speed to come back to sixty knots and ease down towards the first 100 yards of grass.

The mainwheels are put firmly on the grass, and, in a 'wheeler' attitude, tail high, I am almost stopped in about fifty yards. Then, as it is almost over, I am almost over too. With virtually no forward speed, the left wing suddenly lifts high into the air with an awkward gust. I kick left rudder to help the nose round while applying full left aileron. Just as suddenly, the wing drops, and we stop, 30° off heading, but safe, and stopped, and apparently in one piece.

As I wait, head into wind and stick central, for the crash crew to arrive, I mutter grateful thanks for the Tiger's sturdiness.

With one man on each wing tip, we taxi back across the grass and then into the safety of the Turnhouse hangar, out of the wind and rain, thereby ending another exciting and quite different Tiger trip. The simple shut down checks are soon completed, and that good old Gipsy stops, having given steady service for another five hours, without missing a single beat.



Line-up of 1 EFTS Tigers at Hatfield, 1939 – DH Flamingo in the background. (via Author)