

# Vulcan test pilot

*Former Avro Chief Test Pilot Tony Blackman talks to Pat Malone about aviation past, present and future*



Fifty years ago next month, the first Avro Vulcan Mk 2 was delivered to the RAF at Waddington. That aircraft, X558, is now the last Vulcan flying, coddled and cosseted back to life by a dedicated band of volunteers and their sponsors. If at all possible it will take to the sky on that anniversary, and there to see it will be Tony Blackman, the Avro test pilot who flew it to Waddington on July 1st, 1960.

Tony Blackman is every bit as remarkable as the Vulcan. Scientist, polymath, author, politician, marketing man and corporate fixer, he was one of a new breed of test pilot who spoke the language of the engineer and designer and understood in depth the aircraft's increasingly sophisticated systems. When he rolled the Vulcan off the top of a loop at Farnborough he was able to analyse every aspect of the manoeuvre scientifically, as well as getting a yee-har thrill out of it.

The fifties was a golden age in British aircraft manufacturing, and Tony Blackman was there to ride the wave. Dozens of companies were competing to produce better aircraft, military and civilian, more efficient engines, avionics for navigation, world-leading blind landing systems, missiles and weapons platforms. The V-bombers were brought to the runway, TSR2 was on the drawing board,

Concorde was a twinkle in the eye and legions of test pilots were needed to keep the show on the road. Names like Avro, Vickers, Handley Page, de Havilland, Armstrong Whitworth, Saunders Roe, Westland Aircraft, English Electric, Fairey, Gloster, Shorts competed on airframes while Bristol, Armstrong Siddeley and Rolls Royce produced jet engines; lower down the market there were dozens of companies like Miles and Auster in the light aviation field. With due respect to Rolls Royce and BAE, we cannot be said to have built well on those foundations; how did we contrive to blow it? Bureaucratic meddling, politically-driven company amalgamations, industrial strife and poor management all played a part, but ultimately, says Tony Blackman, the British just don't get it. "Politicians have never understood how important it is to keep technology at the cutting edge," he says. "The cost of these projects is never measured against the cost of not doing them. We don't realise how important manufacturing is, although our politicians pay lip service to it.

"The French, on the other hand, know the value of technology; French civil servants and politicians have a much better grasp of reality than our own, unfortunately. People once laughed at the Airbus, but we didn't realise

**Above: Tony Blackman at home in Hamble today with a painting of A.V. Roe's original Hamble airfield**

what was going to happen. Multi-national collaboration was the way forward, but we're not very good at working with others; we weren't really prepared to work with the French. We would have cancelled Concorde had we been able to do so – the French were the drivers all the time, and I admire and envy their approach tremendously.

"When I was at ETPS we had talks by test pilots like Neville Duke, Roly Falk, Peter Twiss, Brian Trubshaw and Roland Beamont, and all of us had ambitions to one day step into their shoes. We didn't realise that the days of an abundance of prototypes were coming to an end, aircraft firms were going to reduce in number, programmes were going to be cut, and the need for test pilots was going to diminish."

Tony Blackman caught the best of it; destined to become Avro's chief test pilot, he helped develop the Shackleton, the Nimrod, the Victor K2, the Vulcan – testing 105 of the 135 that were built – and the HS748, certificating many variants and demonstrating



Left: a young Tony Blackman climbing into a Harvard

Above: Tony with a de Havilland Venom

Right: in an F86 Sabre



Left: Tony piloted this B52, 20008, after flying Vulcan XH535 in formation with the B52 over Edwards Air Force Base, below

Below left: Tony with Avro's chief test pilot, Jimmy Harrison at the SBAC show, Farnborough 1958



it on some of the world's worst airfields. He was also the first project pilot on the HS146 before the programme was stopped in 1973. These latter aircraft carry confusing designations; they were started by companies which were later forced to amalgamate, and some had three sets of initials in their names at different times. Each change was a little death for the industry and for the aircraft as tradition was lost, expertise squandered, marketing made difficult.

Today, Tony Blackman lives in Hamble, a stone's throw from the churchyard in which A.V. Roe is buried, and not far from the house in which Roy Chadwick lived when Avro created Hamble airfield. These facts played no part in Tony's decision to move there; he and his wife Margaret simply wanted to be closer to their children. Tony has never had the sort of interest in aviation *per se* that animates most of us; as a youth he was obsessed with mathematics and the exciting new science of computing. A Cambridge physics graduate, he

designers and engineers of increasingly complex aircraft." Test flying became teamwork, and it was no longer tenable for the test pilot to fly the aircraft, then tell the engineers what needed to be done.

"Some great test pilots, like Roly Falk (who hired Tony at Avro) were handicapped because they were so good that they didn't understand that we mere mortals had difficulty putting up with some bad handling feature – their skills masked imperfections which were unacceptable. When you're testing an aircraft that may have to be flown by the world's worst airline pilot, it's an advantage to be less than perfect."

In fact, Tony was almost scrubbed at the ab initio stage because he found landings difficult – he didn't go solo until his 13<sup>th</sup> hour. But

**Below: Tony Blackman, front and centre, with friends and colleagues from the test flying world, including some of the most famous names in the business**

amazon.co.uk refers. Suffice it to say that he performed well enough on the Vampire and Venom to be sent to No 13 ETPS at Farnborough in 1954, and was thought to be the first university graduate on the course, getting a distinguished pass. It was, incidentally, the first ETPS course to feature helicopters, which Tony disliked. "I thought they were bloody dangerous," he says. "I was dead scared that I'd get sent to D Squadron, the helicopter test squadron – that's what could happen if you got on the wrong side of Group Captain Sammy Wroath, who was commandant of ETPS at the time. I regret now not having done more with helicopters, which are not as unsafe as they were then."

As an RAF acceptance test pilot for the Mk 1 Vulcan, Tony became well-known at Avro, and when Avro won the contract for a titanium steel Mach 3 aircraft designated the 730 he was recruited to do the test flying. The 730 was cancelled at the time of the notorious 1957 White Paper, but Avro had plenty of



was called up to do national service teaching maths and physics to pilots and navigators. "It struck me that at the time a lot of the test pilots had had no chance to have proper technical training, so I joined one of the courses I was teaching, solely with a view to becoming a test pilot," he says. "The older test pilots had a lot of experience of flying, but they didn't have the scientific background to translate that into useful information for the

once he'd got the hang of it, he never looked back. From being the worst pilot in the squadron on the Prentice, he became the best on the Harvard, and was sent direct from Ternhill to Germany for front-line conversion onto the Vampire 5 via the Meteor. We'll skim over his progress because it's all set out in two autobiographical works, 'Tony Blackman, Test Pilot', and 'Vulcan Test Pilot' which really ought to be gracing your bookshelf –

development projects and Tony was kept busy. Remarkably, he'd gone from maths teacher to Avro test pilot via initial training, Squadron service, ETPS and 18 months at Boscombe Down, in just six years.

It must be somewhat frustrating for men like Tony Blackman to have to hang around while slower mortals are catching up – indeed, he had a reputation for doing more than anyone, faster than anyone. Generally he'd have all



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Above left: at Avro Tony helped develop the Shackleton

Above: Tony flew all the V-bombers; this is the Handley Page Victor

Left: at Hawker Siddeley Tony test flew the Nimrod



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Left: Tony Blackman landing the Avro 748 on a rough strip in South America

Above: demonstrating the Avro 748 to a potential customer



four of the Vulcan's engines started before his co-pilot was strapped in; Sir Charles Masefield recalls that on his first Vulcan flight, Tony handed him the controls as the wheels came up, then took out a screwdriver and dismantled the radios. Tony thinks this is a confusion; it was the Avro 748 where the radios needed tweaking. But he accepts that patience was never his long suit, nor was he a natural co-pilot. The manner in which test

pilots express their opinions firmly can sometimes be taken for arrogance, but it's in the nature of the job to defend an opinion, properly arrived at – that's what they're paid for. They're also required to do the job meticulously, however repetitive, until every base had been covered. Tony recalls that high altitude performance tests in the Vulcan were very tedious and could be ruined by the Pennines 40,000 feet below – runs had to be

stabilised at a climb rate of 30 feet per minute with the correct combination of altitude, temperature, power and aircraft weight, and a brief bit of turbulence could upset twenty minutes work.

"Displaying at Farnborough was always a thrill, but demanding because you were often flying near the structural limit and it was important not to offend the flying control committee by going too low or crossing the

display line; there was an unfortunate remark going round at the time that you could tell how good a display pilot was by the angle at which he hit the ground."

The Vulcan had 14 fuel tanks and 14 pumps, and the pilot had a slide rule to help calculate the ever-changing C of G. Tony discovered that it came in handy because if he was flying the aircraft without a co-pilot the only things he couldn't reach from the left seat were the pressurisation switches, but he could poke them on with his slide rule. He couldn't poke them off again, however, so he used to open the small direct vision window to ensure that the aircraft was depressurised on landing. He occasionally flew with a non-pilot, including once with Margaret in the right seat – the first woman ever to do so.

Brian Trubshaw asked Tony to join him for dinner and offered him a job in the Concorde team but he decided to stay with Avros. He did manage to have one flight in Concorde, flying G-AXDN from Fairford, by swapping with Jock Cochrane for a go in the Vulcan. "I think it was the best landing I ever made," he says. "I got more and more frightened as the speed got lower and lower and nothing seemed to be happening, but they had just resurfaced the runway and we genuinely didn't know I'd landed. I should have quit while I was ahead, but unfortunately I did another one, this time without the auto-throttles, and I found it was much harder to land than the Vulcan."

While test flying the Vulcan, the Valiant, the Victor and innumerable other aircraft, Tony

came to the conclusion he was not being mentally stretched and signed up for an economics degree course at Manchester University; unfortunately the Avro 748 programme started after a year and he needed a civilian flying qualification to fly passengers on airliners so he quit economics to do his ATPL by correspondence course. It took only four weeks and he passed with spectacularly high marks. His economics tutor remarked rather grumpily that as a test pilot, 'he had a good brain going to waste'.

It's something of a relief to note that Tony

approached VFR flights in a piston single with a certain wide-eyed innocence. When Charles Masfield brought his private Beagle Pup to Woodford, Tony found himself having to prepare carefully for going anywhere, poring over VFR charts, trying to work out how you got to Paris without going through controlled airspace. This strange beast had no ILS, not even a DME, just one VHF set – he crossed the Channel at 5,000 feet, hoping the engine wouldn't fail.

The most surreal episode in his life came in 1973 when Howard Hughes decided to get back into flying, and his factotum Jack Real contacted Hawker Siddeley to have him checked out on the 748. Hughes owned the airline Hughes Airwest, and with visions of

landing him as a launch customer for the HS146, Tony arranged to facilitate Hughes's whim. Howard Hughes was already reclusive and fairly loosely hinged, but Tony says: "He was a delightful man, always quiet and courteous. He was lonely and I felt sorry for him – there were a lot of people freeloading at his expense. If he'd been able to bring himself to trust Jack Real rather more, things might have turned out differently."

Hughes and his entourage had taken several floors at the Inn on the Park in London. He arrived at Hatfield via a rear entrance in a

blacked-out Daimler which was driven into the hangar, with the doors closed behind it. Tony says: "Hughes was 68 years old, grey and quite frail and unsteady on his feet. He hadn't flown for

13 years and had no licence; he wouldn't put on his shoulder straps but I persuaded him to wear a headset so we had good communication. He took off with me handling the throttles, and we flew to Bitteswell for circuits. He insisted on approaching below the glide slope because, he said, landing anywhere other than at the very start of the runway was 'sloppy flying'. He had lost none of his flying skill since he knew exactly where the ground was but unfortunately it wasn't the piece of ground I had in mind. I took control and put the aircraft so high on downwind that he couldn't undershoot however hard he tried. As it got dark we moved on to East Midlands, where he had red lights showing permanently on the VASIs on his final approaches, then went back to Hatfield where Hughes made a good landing and was justifiably pleased."

Over the following weeks Hughes's unpredictability made for several false starts and much disruption. He next turned up at Hatfield to make a landing in Ostend to renew his visitors permit. There was thick fog, and he had to be taken out via Stansted, where RVR was less than 100 yards, to clear customs. Tony says: "My marketing instincts got the better of me. I had certificated the 748 autopilot for ILS landings and had done a series of simulator tests establishing the minimum visibility in which it was possible to land an aircraft manually. At Stansted I briefly saw the loom of the approach lights below me at 200 feet and unwisely decided to give it a few more seconds. I saw something ahead, decided I'd better disengage the autopilot and reduce the rate of descent and to my slight surprise found that we were on the ground." The onward flight to Ostend was abandoned after a touch and go and the aircraft returned to Stansted for another, only slightly less blind landing.

Three weeks later Hughes was back for a flight in the HS125, one of which he owned; it was a success, and Tony even managed to introduce the topic of buying the 146 for Hughes Airwest. Hughes was interested and asked to see the mock-up. There was a fourth flight in the 125 to Woodford and Stansted before Hughes was shown over the 146 mock-up at Hatfield. Tony says: "I lent him my jacket because it was cold, and it was given back to me later at the hotel. I kept it for years, realising it was the last jacket he ever wore, then gave it to the Evergreen Aviation Museum where the Spruce Goose is kept."

Howard Hughes fractured his hip getting out of the shower and was never actively involved

**"He had lost none of his flying skill since he knew exactly where the ground was but unfortunately it wasn't the piece of ground I had in mind."**

## The blind landing the blind

Tony Blackman's book *Blind Landing* turns on five safety themes which are crucial if the accident record is to improve. First is the unmonitored nature of the certification authority, EASA. Second is the use of satellite navigation systems to land in very poor weather conditions. Third is the pervasive presence of system software, controlling emergency as well as normal operation. Fourth is the need to ensure that investigators are unaffected by commercial pressures, and fifth questions the logic of the certification and operating requirements are the same for all aircraft regardless of size.

- EASA's certification is binding on all European nations, but the system of checks and balances – in the UK, the CAA's Safety Regulation Group used to be tested by the Airworthiness Requirements Board – has been abandoned. An organisation without monitoring can sometimes take unwise decisions, especially under commercial pressure.

- Satellite navigation is increasingly used for approach and landings, statistically the most dangerous part of a flight, but it depends entirely on the combined accuracy of the satellite system, the airfield data and the design and integrity of on-board system software. It is imperative that a reliable warning system alert crew and tower to departures from centreline or glideslope.

- Ensuring that critical software is 'absolutely safe' is not that simple. The crew have to rely almost completely on the information on the flight deck displays. We presume that every possible circumstance is foreseen and has been catered for; we presume wrongly.

- Accident investigation must be unaffected by commercial or political pressure. European certification is centralised but accident investigation is national. Because of the enormous financial and insurance implications, external influences on investigators are never far away. A national authority may be susceptible to pressure from airlines, manufacturers and EASA.

- Certification and operating rules for large aircraft are basically the same as for smaller ones. Is this wise, given the potential for enormous loss of life? Is two crew enough?

These vital issues, difficult to deconstruct in the real world, can be dissected and analysed in depth in a work of fiction, and that is what Tony Blackman does in his books. See [www.blackmanbooks.co.uk](http://www.blackmanbooks.co.uk)





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Left: Tony Blackman in the HS146 mockup

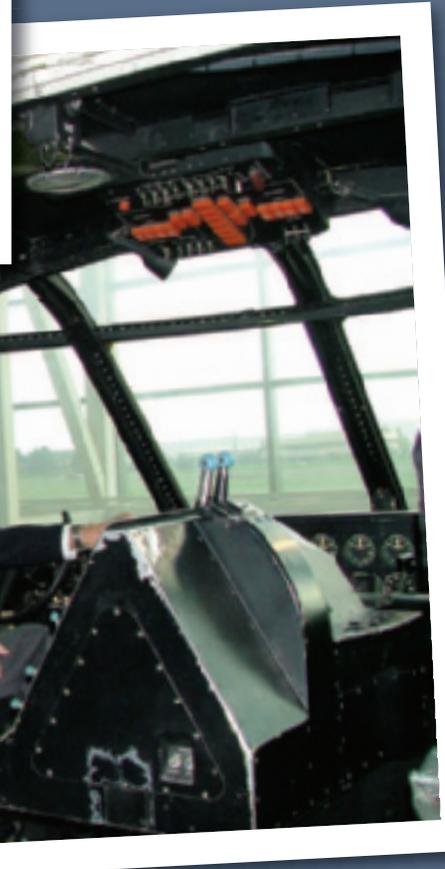
Right: in the HS146 simulator flight deck

Above: the HS146 became the BAe146 then the Avro RJ



Above: Tony tried to persuade Howard Hughes, owner of the airline Hughes Airwest, to be launch customer for the HS146. Hughes is seen here at the controls of the Spruce Goose

Right: Tony Blackman in the Spruce Goose at the Evergreen Museum in McMinnville, Washington state



in aviation thereafter; he died in 1976 on a plane home from Mexico with Jack Real at his side. Tony says: "Many myths have grown around him, and I wasn't happy with the portrayal of him by Leonardo DiCaprio in the film *The Aviator*. If Howard was as bad as he was depicted then, I don't believe that all those years later he would have been the normal, delightful man that I knew."

Much of this is dealt with in greater detail in his books, but Tony Blackman also writes aviation fiction – partly, he says, because you can create scenarios and issue warnings that you can't if you stick to history and fact. His works of fiction, *The Final Flight*, *The Right Choice*, *A Flight too Far*, *Flight to St Antony* and *Now You See It*, feature an insurance investigator called Peter Talbert, who goes about troubleshooting after aircraft accidents trying to protect the interest of the pilots, insurers and other interested parties. Unlike an AIB investigator, he can apportion blame and decide who pays. Meticulously plotted and presented, they cover topics that are difficult to deal with in other ways. *The Right Choice* draws on Tony's experiences of demonstrating the HS748, where a reasonable man might assume that inducements had to be made to help a potential buyer make the right choice of aircraft – yours. Things are different today, when we have passed laws that outlaw such necessities. "The French and the Germans must think it's Christmas," he says. Other Blackman books deal with the downside of ETOPS and of taking pilots out of the loop, which Tony says must be guarded against.

"There are dangers in over-automation; nowadays software affects not only the flying controls but also the operation of the electrics, hydraulics, pressurisation and all the other

systems. The pilot has to be able to deal with all the malfunctions that will inevitably occur and, because of the sophistication of the flying controls and the systems, the actions to be taken by the pilots are carried on the electronic displays. However, one has to be concerned with the situations that will happen which the designers and regulators haven't catered for, and aren't displayed on the screens. Accidents are generally not due to one fault, but a combination of circumstances. Unbiased accident investigation is vital to ensure that the correct lessons are learnt, not only on the aircraft concerned but also on the way aircraft are regulated. Sometimes it is too easy to blame the pilots when the fault lies with poor interface with the systems, with modifications not completed or with a host of other reasons."

What does he think of the Multi Crew Pilots Licence, which teaches the 'pilot' no stick and rudder skills but instead gives him or her the knowledge to manage the systems which fly the aircraft? "I would have thought instinctively that the MPL was not a good idea. In terms of the overall cost of things, teaching someone to fly is such a small amount, and however good your systems are, experience of handling asymmetric flight in a small twin is of value.

"There is a challenge here for regulators –

technology is being pushed to the limit to improve aircraft efficiency, and at that limit, you must not lower the level of safety. Does it matter how large an aircraft gets? Can you still have just two pilots operate it safely? The challenge is the management of systems failures. We need a strong regulator, but EASA

is responsible to nobody with any technical expertise. Only the FAA keeps EASA on track – because of mutual certification, the FAA will pick up on

issues that EASA may have finessed. I don't like EASA not being supervised by an independent body with technical expertise as we did in the UK; history is littered with examples of how organisations behave if they are not being watched."

Tony Blackman no longer flies – indeed, he gave it up when he stopped being a test pilot and joined Smiths Industries to help develop avionics. "I did get some joy out of flying at the beginning," he says, "but if you've been a test pilot you don't quite get the same thrill from GA aircraft. Test flying was a job. I thought I could fly well, but my forte was technical; I became a technical member of the CAA Board. I thought I was too old at fifty – too set in my ways, too resistant to change – so I quit. However I must confess I am looking forward for XH558 arriving at Waddington on July 1<sup>st</sup> a half century after I delivered it – a great moment for the dedicated team that made it happen, for the people who spent their money supporting the aircraft and, I must confess, for me personally. Long may it carry on flying." ■

***"I did get some joy out of flying at the beginning, but if you've been a test pilot you don't quite get the same thrill from GA aircraft"***

**Below: Vulcan X558 will fly again on July 1st, 50 years after Tony Blackman first delivered it to RAF Waddington**



Keith Wilson

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# Small is beautiful

*The Topsy Nipper is an attractive single seater with much to offer in minimal space, says **David Ogilvy***

Some aircraft have very appropriate names and, with a span of under twenty feet, the Topsy Nipper falls neatly into this category. Although encouragingly basic, with no 'sales frills', this intriguing little aeroplane is clearly the result of some well-thought-out planning at the early design stage. It was the brainchild of Monsieur E.O. Tips of Avions Fairey in Belgium who, in pre-World War II days, had created the attractive Topsy B two-seater.



Among the Nipper's many favourable features is a good view in most directions (with downward vision panels in the wing roots) an all-flying fin/rudder, a simple undercarriage with disc brakes and an ingenious facility for accommodating a large person in a very small cockpit. The prototype took to the air late in 1957 and all early specimens were Belgian built, appearing on the market about 18 months later at a fly-away at £818.

In 1967 the design rights were obtained by Nipper Aircraft Limited, who arranged for series production by Slingsby Sailplanes of Kirkbymoorside in Yorkshire. In 1968 a factory fire put an end to that, after which plans were made available for use by amateur constructors. Altogether 14 Belgian

built and 32 from Yorkshire appeared on the UK civil register. Since then considerable numbers have been home-built and eight such machines are airworthy out of 21 Nippers with current LAA permits.

My introduction to the Nipper in 1962 led to a friendship with G-ARBP, then owned by the late David Greenland, who was an instructor colleague with the London School of Flying at Elstree. 'BP was one of the early Belgian batch produced in 1960 and survived until cancellation from the register in 2008, completing two years short of a half century of active life.

The Nipper has a welded steel-tube fuselage and a one-piece wooden wing; the airframe is well suited to the tasks to which it has been put, including, after some

modifications, success in aerobatic competitions. For this the original 1600cc converted VW engine was replaced by an 1834cc unit with much improved inverted performance. The machine that I flew, though, had the earlier lower-powered unit.

Getting into the Nipper is not the easiest of tasks, but once aboard there is a pleasant surprise. Because of the slim fuselage the cockpit is unavoidably narrow, but this is offset by an ingenious design feature: the wing roots are hollow and it is practicable to place one's elbows within them, so all but the broadest of people can be accommodated in reasonable comfort. Everything within is minimal, but no frills are needed: the small instrument panel sits just above the straight-through main spar and its



Photos via Philip Jarrett