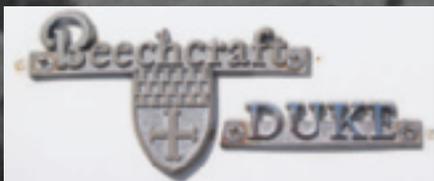


The rare Duke



*You don't see many of them about –
a hungry but happy **Les Brodie** test-flies the beautiful,
high-performance Beech Duke*

With only two Beechcraft Duke aircraft based in the UK, it was truly a rare opportunity for me to visit Haverfordwest in deepest South West Wales to fly in one of them. The aircraft I was lucky enough to sample was N60NZ, a 1975 Beech B 60 Duke owned by entrepreneur David Keedy. This aircraft (Serial No P-339) is one of 584 Dukes that rolled out of Beechcraft's Salina, Kansas factory between 1968 and 1982, making the Duke perhaps not so rare after all.

It is only in the UK that there is a lack of Dukes (of the aircraft variety, that is) probably due to the fact that it not possible to put them on the UK register. There are issues regarding the operation of the landing gear under

electrical failure conditions that prevent this, as the Duke's set up falls foul of UK requirements.

Beechcraft designed the Model 60 Duke in 1965 to fill the gap between the Baron and the Queen Air with a six place turbocharged and pressurised high performance piston twin. The prototype had its maiden flight on December 29th 1966. After the FAA issued a Type Certificate on February 1st 1968, deliveries commenced in July of that year. Only 113 Beech 60 Dukes were made before the Beech A60 Duke was introduced in 1970 with improved pressurisation and lighter and more efficient turbochargers along with improved elevators. In 1974 the final version of the Duke appeared, the Beech B60 with a

longer and wider cabin plus further improvements to turbochargers. David's aircraft was the fifth B60 to be produced.

Having spent 70 hours flying Beechcraft Baron B55s fitted with 285 hp Continental IO520s during my training for an ATPL at the College of Air Training, Hamble in 1973 I was very pleased at the prospect of flying in a Beech twin again, as was my cameraman Trefor Fisher who was on the same course – 721. We were all very fond of the shiny new Barons that had replaced the less-loved Apaches at the College. The added bonus was that we were based at Bournemouth Hurn for that phase of the training. After the grass operations at Hamble, with military style accommodation and discipline, for our initial



**Left: almost 600 Dukes were made, but they cannot be registered in Britain
Below: family resemblance – the Duke filled the gap between the Baron and the Queen Air
Bottom: 'excellent Beechcraft build quality is apparent both inside and out'**

Instead, if you were good enough to complete the course in minimum time there would be enough hours left to take your instructor and co-students for a Moules Frite night stop in Biarritz, armed with a brand new Instrument Rating in case the weather turned inclement for the return.

It was inclement weather that seemed to make it impossible to arrange our Duke flight. To get three very busy people together on a suitable day this summer was quite a challenge but on our fourth attempt Trefor and I managed to find a route over the Brecon area that avoided the clouds and the hills as we made our way towards Haverfordwest in his Cessna 172. Our flight from White Waltham was into a fairly strong south-westerly wind and it took over two hours to reach our destination. As is often the case, this wind was to disappear for our return flight. With LARS available from Benson, Lyneham, Filton and Cardiff we were blessed with radar information for nearly the entire route. As ex-airline pilots who were used to radar cover even while on the ground we certainly appreciated this ATC service.

Haverfordwest on the day was Notamed as single runway; the main runway 03/21 was closed to accommodate the parking and exhibits for the 2008 Welsh Show. The wind was pretty well down runway 27 so no problem there. Apart from talk of also closing runway 09/27 to meet the demand for additional car parking, the main effect of the Show for us was that the airfield restaurant was closed, so the bacon and egg sandwich that we had been looking forward to for two hours was not available. On arrival we were able to park close to the Duke, and David was there to greet us and soon took our minds off our hunger by procuring some coffee. The Duke looked wonderful, both with regard to shape and condition. Like the Baron its outline can only be described as sleek and purposeful, and on closer inspection the excellent



training on the Cherokee and Chipmunk this was total luxury – a tarmac runway and a guest house close to the beach (not the Beech) with relative freedom. What happy teens and twenties we were, flying around the UK and sometimes into France in such high performance twins. The only thing that spoilt our aviation utopia was the fear of being chopped at the next progress test, or worse, not getting over the final hurdle of passing the CPL and IR. No such fears for the Duke flight; that was going to be more akin to the no-pressure hour building sorties we flew after the tests were complete. The prospect of flying the B55 for fun actually added pressure to the test itself since you didn't want to waste any of those precious allocated hours on retests.

Colour photos: Trefor Fisher



Beechcraft build quality became apparent both inside and out. When David took delivery of his aircraft in the USA he had special training at the 'Duke School' run by Hoffman Aviation Services at Springfield-Branson National Airport in Missouri, which he would recommend to any would-be Duke pilot. Not only do you learn how to fly the type safely, you are also shown how to get full benefit from the comprehensive range of equipment, along with tips on how to operate to get maximum life out of the engines, turbochargers and pressurisation. Time Between Overhauls for the power plants is 1600 hours, but this can be drastically reduced if they are not handled correctly. For example, there is a requirement for a four minute cooling down period for the turbocharger turbines before shutting the engines down after flight. At the end of the course you receive a course completion certificate that leads to cheaper insurance.

The B60 Duke is fitted with two 380HP (285kW) Lycoming T10-541-E1C2 six cylinder engines driving 74 inch three-bladed



Left: de-icing panel includes fuel vents and dual pitot heaters as well as windshield, boots and electric prop heater

Above: the Duke's comprehensive equipment makes a trip to 'Duke School' a good idea
Right: spacious cabin interior has club layout with ample legroom for passengers
Below: noise levels are remarkably low – especially after two hours in a C172



Hartzell constant speed propellers with of course the ability to fully feather. The engines started easily from cold after a 3-6 second prime with the electric pumps. The after-start checks had additional items compared to the Baron, with pressurisation and air-conditioning having to be selected. From the right hand seat I could see the air-con go into action as the heat exchanger air intake situated on top of the right-hand engine nacelle moved automatically to the open position. The engines sounded and felt very smooth from the start and the cabin noise level seemed remarkably low (especially so after spending two hours in a C172). The fuselage is of a bonded honeycomb construction which must help when it comes to cabin noise reduction.

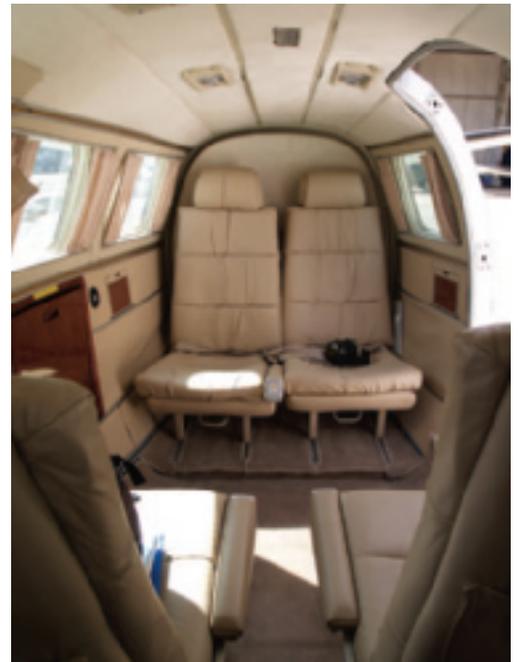
The takeoff was from a standing start with full power set (41.5 IN Hg @ 2900 rpm) and a takeoff weight of around 1000 lbs lighter than the maximum TOW (6775lbs). At that power-to-weight ratio we were soon airborne. The manual says only 320 meters are needed to become airborne. On a rare summer's day with 30°C, no wind and at maximum weight a 740 meter ground run is required, making the aircraft versatile with regard to choice of airfields from which to operate.

The two-engine climb performance was as expected from the performance data, with over 2000 feet per minute rate of climb at the recommended power setting of 35in Hg @ 2750 rpm and 120kts IAS. On a standard day at maximum weight this falls back to 1650 feet per minute. David told me that Duke School recommended maintaining full climb power up to 24000 feet then reducing the manifold pressures, again to protect the turbines. The aircraft is fitted with an EDM



760 engine management system which monitors CHT, EGT and the all important Turbine Inlet Temperature. This value is monitored during the climb and maintained below 800 degrees. In the cruise with less power selected 860 degrees is recommended with a maximum of 875. Fuel management and monitoring is achieved through another fitment, the Shadin Digiflo-L fuel management system. Looking around the panel and seeing all the other equipment including dual King KT76 transponders, Bendix weather radar, Trimble TNL 2000T GPS linked to an Argus 5000 moving map, and at centre stage a Garmin GNS 530, I could understand why it is best to go to school before flying this aircraft.

During the climb I also looked at the single engine handling and performance of the Duke both at Best Angle speed, 115mph/100kts, and Blue Line (best rate) speed 127mph/110kts. The aircraft handled perfectly, just as I remembered the Baron on single engine. The Red Line speed for the Duke is 98mph/85kts. At the latter part of our training on the Baron our individual single engine critical speed was recorded, which mainly depended on the strength of your leg muscles. I remember carrying out this exercise over Longleat Safari Park in Wiltshire, and my



instructor saying that I must be precise in controlling the aircraft or we would be eaten by lions. That turned out to be one of my best performances in asymmetric flight. The Duke climbed away at 500 feet/min with ease at Blue Line speed, with the left engine back at zero thrust. Even at maximum weight the performance data shows that over 300 feet/min could be expected on a standard day.

Our route from Haverfordwest was to the north west towards Strumble, then out to the St George's Channel. With perfect visibility, fluffy white clouds and beautiful coastal scenery to look out at, this was Duke flying at its best. We levelled at 5000 feet to cruise with the engines purring at 32in Hg and 2500rpm. The IAS settled down at 185kts, which resulted in over 200kts TAS. The Duke is definitely a hot ship and a practical people carrier. With its empty weight of 4425lbs/2137kgs and maximum weight of 6725lbs/3050kgs the payload is high enough to carry four people their baggage and full fuel. With full tanks at 202 US gallons the B60 has a still air range of 1010 nm. The performance data shows that the aircraft can cruise efficiently at 26000 feet with a TAS of 240kts, burning 260 lbs/hour – pretty impressive for a piston powered twin. David mentioned that



Above: Lycomings can be replaced with P&W PT6 turboprops with 550 hp a side
Below: 'like the Baron, the Duke's outline is sleek and purposeful'
Right: the South Wales coast on a rare day of perfect visibility and fluffy clouds



you can improve the performance of the Duke by replacing the engines with Pratt & Whitney PT6A turboprops. This can be done by Rocket Engineering of Spokane, Washington. For around £450,000 you can have 550shp on each wing, giving 4000 feet/min rate of climb and a TAS of 301kts. Although this is initially an expensive modification, over a long period it makes sense as the PT6 can run 3600 hours between overhauls and of course all of these hours are fuelled by relatively cheap Jet-A1.

Over St George's Channel I checked out how the aircraft handled in a steep turn followed by a clean stall. The B60 is very controllable and stable in pitch and roll making the steep turn manoeuvre a joy. The stall was also straightforward the aircraft stopped flying at just under 72kts and was soon flying again after the standard stall recovery. At max takeoff weight the stall speed is quoted at 76kts.

The air was smooth for our descent back to the circuit so David encouraged me to increase the IAS to 220kts by leaving cruise power set as we made our way down, a technique I am used to when flying Turbo Commanders. With its Vne of 248kts the B60 can fit in with airline traffic when descending into busy TMAs using this method. If the air is turbulent the descent speed should be limited to 207kts.

I enjoyed flying the Duke so much I did not use the autopilot at any point. After shut down I asked David what he thought of the Century V autopilot/flight director with yaw damper fitted to the Duke. He coolly replied that it was very useful during his solo flight when he brought the aircraft back from the USA. Having been part of a two-crew ferry flight of a Piper Chieftain from Oklahoma to Sweden a few years ago I was very impressed with his achievement and wanted to find out more about the flight.

David took delivery of his Duke in June 2003 at Dallas Executive Airport Texas, where the aircraft had been refurbished inside and

out. The first leg of his journey home was a 350nm hop to Springfield National Airport, Missouri, during which he completed his Duke School training. After a night stop David left Springfield alone in his Duke with his newly acquired course completion certificate for the 640nm flight across the Great Lakes to Sault Ste. Marie Airport, Ontario, Canada (N46°30'W084°30') to refuel before continuing another 505nm to La Grande Rivière, Quebec (N53°37'W077°43'). What an amazing way to consolidate your training.

La Grande Rivière Airport is situated near Radison, Quebec, east of James Bay which lies to the south of the mighty Hudson Bay. The airfield's main purpose is to serve the hydroelectrical industry but with only one hour of darkness in June it also provided a weary ferry pilot with a well deserved rest and good food. The next leg was 510nm to Kangiqsualujuaq Georges River Airport (N58°40'W66°00') near Nunavik in northern Quebec to refuel before continuing for another 520nm to Nuuk Airport on the west coast of Greenland. Having arrived at Nuuk on a Saturday David was enticed into staying for two nights as it would have cost an extra \$700 to depart on the Sunday, when the airport is normally closed. David told me that on reflection he wished he had paid the fee and completed the planned flight to Reykjavik via Kulusuk (on the east coast of Greenland) on the Sunday when the weather was good. As it turned out the weather on Monday turned foul and the plan to go to Kulusuk was ruined by their fuel tanker becoming trapped in ice, making it impossible to refuel. Instead the plan was changed to fly 250 nm in moderate icing followed by an on-limits procedural NDB/DME approach into Narsarsuaq to refuel before flying another 700nm to Reykjavik.

The Duke is cleared to operate in known icing conditions with de-icing boots, electrical prop anti-ice and separate pitot heaters. It also

has its fuel vents and stall warning vane protected from ice. David said that this all worked very well during the flight, but he was startled at one point when a lump of ice shed from the prop and hit the fuselage. The worst part of this was that it damaged the new paintwork on the nose, making the \$700 departure fee the previous day seem even better value.

The approach into Narsarsuaq was made more difficult by a Danish B757 which did not slow down and forced David hold off while it landed. The pilot of the jet had obviously forgotten how high the workload can be when operating as single crew on a non-precision approach in IFR at an airfield surrounded by high terrain. David regained his faith in human nature when he was helped by the crew of a Luthansa aircraft en route from New York to Germany who relayed his position reports to Goose Bay while he was outside VHF coverage on his way to Reykjavik. This contact with those above, along with the big bag of Smarties and bottle of Diet Coke that were acquired in Narsarsuaq, would bring great comfort to David on this long and somewhat lonely sector. From experience, Smarties and Diet Cokes are about all you can pick up in Narsarsuaq.

After a night stop in Iceland it was another 640nm to Wick to refuel for the final 470nm to Goodwood. David did say that were he to do it again, he would go VFR for the final leg as the IFR route was somewhat tedious. It is a great feeling of elation to reach your final destination after flying a total distance of 4585nm and the equivalent of spending a whole day in the air. This must be especially so if you have completed all of that flying solo.

For the last five years David has enjoyed using his Duke for fast and comfortable business transport between France and the UK, avoiding the ever increasing strain of airline travel. His latest venture though involves a cruise liner in the Maldives, which is somewhat out of range for the Duke to fly on a regular basis, so the aircraft is now up for sale. If you are interested in purchasing a rare but wonderful twin go to www.derrickings.com for further details. ■