

HEROES OF AVIATION

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**Eric 'Winkle' Brown
1919 - 2016**



Widely regarded as one of the greatest – if not the greatest – test pilot of all time, Eric 'Winkle' Brown was the most decorated Navy pilot in British history. Dave Unwin spoke to him on behalf of Jets just a few weeks before he died

The first high performance twin engined aircraft, and the first tricycle undercarriage aircraft to land on an aircraft carrier. The first jet and the first twin engined jet to land on a carrier, and also the first pick-up from a submarine at sea by helicopter. Every one of these events is a milestone in maritime aviation, although what makes them even more remarkable is that they were all accomplished by the same man. In fact, his career was so astonishing that if it were a work of fiction most would consider it too far-fetched, for as a test pilot during the highly dangerous transonic years Captain Brown flew practically everything in the inventories of both the Allied and Axis air forces. Indeed, he is listed in the *Guinness Book of Records* as having flown the greatest variety of types: an astounding 487 basic types – not counting subtypes or variants. He also logged the greatest number of catapult launches and carrier arrested landings.



Eric flew the Grumman Martlet on operational carrier missions during the early days of World War Two

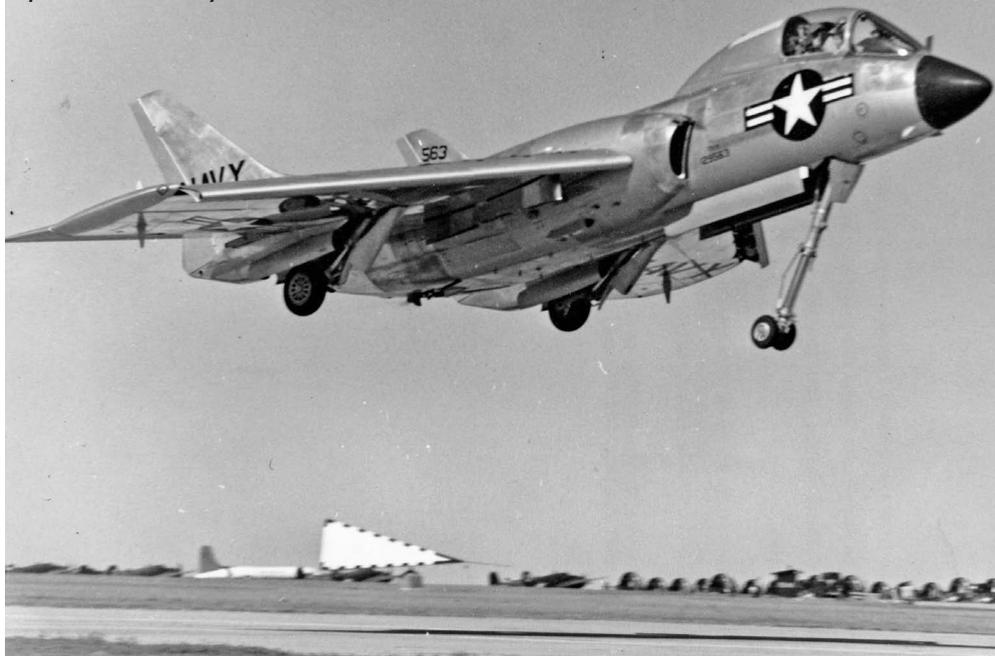
I visited Eric only a couple of weeks before he died, to interview him for both *Jets* and our sister magazine *FlyPast*. His career as both a naval aviator and test pilot has been so well documented that I decided to focus on two specific subjects: his time as a Martlet pilot operating from the first-ever escort carrier (see *FlyPast* May 2016) and his experiences testing early jets. Then *Jets'* editor realised that with more than 40 jet fighters in Eric's logbook even that wasn't

going to work, so we settled on examining a dozen or so different types – some well-known, others less so.

Earliest jets

Incredibly, Eric was actually present at the dawn of the jet age. As a young Fleet Air Arm sub-lieutenant he had diverted in his Martlet into RAF Cranwell on May 14, 1941 when he ran into bad weather over Lincolnshire. The following evening he

In July 1951 Eric was posted to the US Navy's Flight Test Division at the Naval Air Test Center, Patuxent River, Maryland. Here, he got to fly many first and second-generation Navy jets including the Chance-Vought Cutlass, which he described as "not a pleasant aircraft at all – and a positive menace anywhere near a carrier!"





The first jet Eric encountered was the Gloster E.28/39. He came across Britain's first jet at RAF Cranwell when he diverted to the airfield. Little did he realise that he would be later invited to fly the top-secret machine for himself. He described the aircraft as "quite easy to land 'dead stick' – which was just as well as the engine wasn't that reliable"



Having also flown the Bell Airacomet Eric described it as "as dull as it looked"

watched as a small aircraft with a tricycle undercarriage took off – without a propeller! This was the Gloster E.28/39 of course, and three years later Eric flew the very same aircraft at RAE Farnborough, becoming one of the world's first jet pilots in the process.

a fine field of view. It was also quite easy to land 'dead stick' – which was just as well as the engine wasn't that reliable" he laughed. Having also flown the Bell Airacomet, which was "as dull as it looked", the de Havilland Vampire and the Gloster Meteor I, which

because they were badly designed. The Germans simply didn't have access to the exotic alloys necessary to build an axial-flow turbojet. In fact, the Junkers Jumo 004B only had a Time Between Overhaul (TBO) of ten hours, and as all the engine logs had been destroyed nobody knew how many hours were left on any of the engines. And as if the above wasn't enough, the minimum airspeed at which control could be maintained on one engine was a very fast 156kts!" Eric admitted to being very impressed by the Schwalbe, describing it as "unquestionably the foremost warplane of its day, with plenty of firepower and a tactical usability of Mach 0.82". While in Germany he also flew the Arado Ar 234B extensively, eventually logging more time in this twin-jet bomber than any other high performance German aircraft.

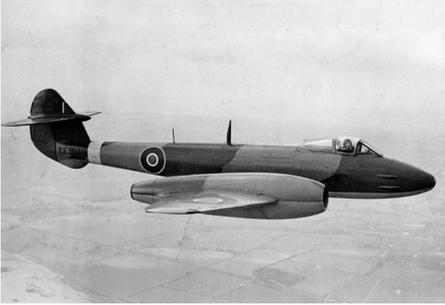
"I consider the Phantom one of the greatest aeroplanes I ever flew!"

Eric told me that "it was a delightfully simple aeroplane; easy to taxi, easy to fly and easy to land. Of course, as it was designed primarily as an engine test-bed [although a pair of machine guns were included in the original specification they were never fitted] it only weighed about 3,700lbs, and really was very nice to fly, with good handling and

Eric told me was "both under-powered and sluggish to handle" he was soon flying captured German jets. "Now, the Me 262", he began in his soft Scottish brogue, "that was an amazing – and exciting, aircraft. Its aerodynamics were – for the time, quite something – but its engines were something else! They were very unreliable, but not



Eric's experience on the early jets and his impeccable German meant he was sent to Germany at the end of the war to evaluate the Luftwaffe's cutting edge aircraft. It was here that he first flew a captured Messerschmitt Me 262. He described the '262 as "an amazing – and exciting, aircraft. Its aerodynamics were – for the time, quite something – but its engines were something else! They were very unreliable, but not because they were badly designed. The Germans simply didn't have access to the exotic alloys necessary to build an axial-flow turbojet"



Eric flew both the earlier de Havilland Vampire and the Gloster Meteor I (illustrated) and considered both to be “under-powered and sluggish to handle”



Eric was actually the second pilot to fly a Hawker jet, for although Hawker’s Chief Test Pilot Bill Humble made the maiden flight of the prototype P.1040, he had very little jet time, and when the aircraft exhibited peculiar vibrations he asked him for his opinion

Eric described the Blitz as “a magnificent aeroplane – we had nothing like it. It had good handling – particularly at high altitude. The brakes weren’t very good – they rarely were on German aircraft of this vintage – but it did at least also have a brake chute.” Eric also flew the Heinkel He 162, which he told me was “nice to fly but tricky to take-off and land.” The Volksjäger was powered by a single BMW 003 turbojet, which Eric noted was “less prone to overheating than the Jumo, although it still needed very careful handling!”

Handling the Hawkers

Back in Britain, many of the UK’s countless aircraft manufacturers were building jets, and as one of the few test pilots with jet experience, Eric was in constant demand. Having flown both the Hawker Hurricane and Supermarine Spitfire during the war, he was looking forward to sampling these two famous manufacturers’ first forays into the world of jets, although the results were mixed, to say the least. Eric was actually the second pilot to fly a Hawker jet, for although Hawker’s Chief Test Pilot Bill Humble made the maiden flight of the prototype P.1040, he had very little jet time, and when the aircraft exhibited peculiar vibrations he asked Eric for his opinion. This machine eventually became the Sea Hawk, which Eric told me was “a delight to fly, with very good handling and excellent visibility – although to be honest it was a better ground attack aircraft

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than fighter.” However, although Hawker’s first jet was something of a triumph, Eric was less impressed by the Supermarine Attacker, particularly as it was (“bafflingly”) fitted with a tailwheel. This trend continued over the next decade, with Eric being very impressed by the Hawker Hunter, but less so with Supermarine’s Scimitar.

Although Eric may have appeared to have led a charmed life, it rapidly became apparent to me during our conversation that this was less a product of luck, or even skill, (although he is obviously an exceptional

airman, as his initial grades during training show) than of careful and prudent planning. During a previous visit to Eric’s house he’d shown me a well-worn book which contained the pertinent facts about each and every type that he flew, and he was the only test pilot at RAE that did this. At this time in aviation the test pilot was still mainly self-taught (the Empire Test Pilot School was the first such school, and was not established until 1943) and the old “Kick the tyres and light the fires” attitude was still prevalent. However, the infinitely

Many of Eric’s test pilot colleagues died as the myriad problems of compressibility were explored and even in Eric’s last few weeks at RAE he was nearly killed twice: first when the high-speed DH.108 Swallow (illustrated) had a runaway divergent longitudinal oscillation at Mach 0.88 and 4,000ft and then in the crash of the Saunders-Roe SR/A.1 twin jet flying boat fighter





When the new British steam catapult BXS-1 arrived in the US aboard HMS Perseus the top brass were keen to see it demonstrated. Despite there being a 5kt tailwind Eric was sent aloft in a Grumman F9F-2 Panther

After a posting as Naval Attaché to Germany Eric took command of RNAS Lossiemouth, where he mostly flew Buccaneers and occasionally Sea Venoms, as well as helicopters

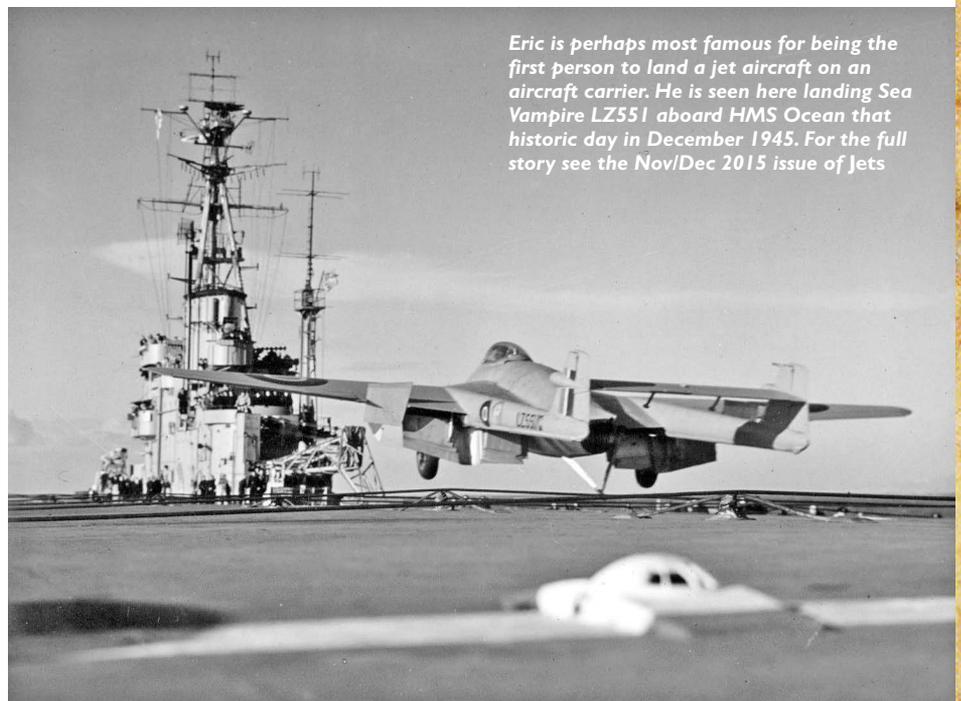


more complex and vastly more powerful aircraft of the transonic era required a more systematic, analytical approach.

Eric finally left RAE Farnborough after six years and went to the school of Naval Air Warfare. It is quite possible that 1943-1949 was the most exciting period in aviation history – as well as being the most dangerous. During this time, rotary wing and jet flight became practical and new, revolutionary designs were pouring out of literally dozens of factories. The sound barrier was also being steadily approached and many of the flights were in the transonic regime. Numerous test pilots died as the myriad problems of compressibility were explored and even in Eric's last few weeks at RAE he was nearly killed twice: first when the high-speed DH.108 Swallow had a runaway divergent longitudinal oscillation at Mach 0.88 and 4,000ft (the same event had killed Geoffrey de Havilland Jr when the first Swallow broke up in 1946) and then in the crash of the Saunders-Roe SR/A.1 twin jet flying boat fighter. During the few months that Eric was at the school, the next two Commanding Officers of the Aero Flight test flying organisation were killed.

US Navy Days

In July 1951 Eric was posted to the US Navy's Flight Test Division at the Naval Air Test Center, Patuxent River, Maryland. Here he got to fly many first and second-generation Navy jets, such as the Grumman Cougar and Panther, Douglas SkyKnight and Skyray, McDonnell Banshee and Chance-Vought Cutlass, as well as the navalised version of the famous North American F-86 Sabre, the Fury. Unsurprisingly, the quality of these aircraft varied enormously. Eric said that "the Fury was a great aeroplane, but it hadn't been bred to the sea – and it showed. However, it was



Eric is perhaps most famous for being the first person to land a jet aircraft on an aircraft carrier. He is seen here landing Sea Vampire LZ551 aboard HMS Ocean that historic day in December 1945. For the full story see the Nov/Dec 2015 issue of Jets

infinitely better than the Cutlass, which really was not a pleasant aircraft at all – and a positive menace anywhere near a carrier!" The Cutlass, sometimes referred to as 'the gutless' had a reputation as an 'ensign eliminator', with indifferent handling, slow-accelerating engines and a complex hydraulic control system that used elevons

catapult demonstrated but instead of the hoped-for 10kt headwind there was actually a tailwind. However, the brass had come to see the catapult work and its inventor, Commander Mitchell said that it would. So, despite the ship being tied up in dock with a 5kt tailwind, *Perseus's* engineering officer bravely volunteered Eric to be launched,

“His log book had accumulated over 12,000 hours”

(Chance-Vought preferred to call them ailavators) for both pitch and roll.

Even now Eric was still pushing his luck, or other people were pushing it for him, such as when the new British steam catapult BXS-1 arrived in the US aboard HMS *Perseus*. The carrier was crawling with VIPs and 'brass hats' keen to see the steam

essentially saying "We'll risk the pilot if you'll risk the plane." Needless to say, nobody asked Eric his opinion and he was catapulted off at 4.3G in a Grumman F9F-2 Panther.

The Americans loved this catapult and also the plans for the angled flight deck, thought up by Lewis Boddington and Captain Cambell during the flexible deck



Several flights in the F-4 Phantom convinced Eric that it was the right aircraft for the Royal Navy's new carriers. "It had it all" he said, "plenty of power, good handling, range, speed – it was a magnificent machine, so far ahead of anything we had at the time. I consider it one of the greatest aeroplanes I ever flew!"

trials. Contrary to some accounts that have been published, there was no subterfuge involved in the Americans obtaining these plans, for Eric brought them over as a gift from the Admiralty to the US Navy. In no time at all they had a mock-up painted on the USS *Midway* (without wires) and were building a proper one on the USS *Antietam*. It was now possible to launch and recover aircraft simultaneously and of course it was also possible to make a missed approach as the barrier (and its associated crash) was now redundant. In fact, the combination of the steam catapult, angled deck and mirror landing system (all British inventions) all contributed to making carrier operations

considerably safer than they had been, although test-flying remained as dangerous as ever. Eric was at 'Pax River' for 18 months, and during that time five test pilots were killed in accidents. Interestingly, the incidence of engine failures during Eric's time with the

I was particularly interested to learn how these Douglas, Grumman and McDonnell machines compared with those built by de Havilland, Hawker and Supermarine, and Eric told me that "the American aircraft always seemed to have a longer range and

"Eric was in constant demand"

US Navy was actually higher than during his previous posting at the RAE, even though the American aircraft were mostly fitted with Rolls-Royce engines built under licence in the US (these failures were eventually traced to a modification introduced by the Americans.)

also superior performance than British machines, although I always thought ours handled better."

As the science of ergonomics has always fascinated me I asked him if either American or British aircraft were superior in this regard, and pointed out how I'd never understood why the British insisted on showing rpm as an actual number (for example, take-off power in a Sea Hawk is 12,350rpm, but in a Sea Venom its 10,250rpm) for so long, whereas the Americans settled on showing jet power as a percentage from the P-80 Shooting Star onwards. Eric replied that all manufacturers had their own foibles, but that using percentage as the primary power indicator was certainly more logical.

British Naval Air Mission

After Patuxent River and some time at sea to qualify for his watchkeeping certificate (vital if he was to attain high rank in the Navy), Eric spent some time converting 804 Squadron from Sea Furies to Sea Hawks and then a year on various staff college courses. In 1958 he was posted to Germany as Head of the British Naval Air Mission to help set up and train their Naval Air Arm, the Marineflieger. For a variety of reasons, both operational and political, this was a major undertaking and it was a proud



Eric enjoyed flying the Buccaneer. "The early ones were a bit underpowered," he admitted "but once they'd replaced the de Havilland Gyron Juniors with a pair of Rolls-Royce Speys it really performed well, although it was prone to inertia cross-coupling if mis-handled. Then it could bite!"



In November 2014 Eric was the guest for the 3,000th edition of BBC Radio 4's Desert Island Discs. During the programme he revealed that, at the age of 95, he still enjoyed driving and had just bought himself a new sports car! BBC



Eric remained active on the lecture circuit right up until his passing. He was also a prolific author and gave his views and opinions freely to those who were interested. He is, undoubtedly, Britain's best ever pilot and it is unlikely anybody will ever surpass the 487 aircraft types he flew during his remarkable career

day for Eric when squadrons from the Marineflieger went operational with NATO in 1960. Eric had risen steadily through the ranks and was a Captain when, in the early 1960s, he headed the team in the Directorate of Naval Warfare responsible for designing the Royal Navy's new aircraft carrier, which would have a revolutionary type of flight deck. This new vessel featured a multitude of innovative ideas and Eric was heavily involved with the design of the proposed 53,000 ton CVA-01, and of course the aircraft which would constitute its air group. By now, straight-wing Royal Navy jets such as the Sea Venom and Sea Hawk were decidedly dated, and even the Sea Vixen and Scimitar were showing their age. Although there was considerable pressure from both government and the RAF for a joint solution to the fighter requirement (the RAF very much favoured Hawker's proposed VTOL P.1154), Eric had already begun to suspect that future navy fighters would probably need both twin engines and two crew members, and felt that McDonnell's Phantom II would probably be the best aircraft for CVA-01.

Several flights in the Phantom (including one to Mach 2.5 and 57,000ft, plus some landings aboard the carrier USS *Forrestal*) convinced Eric that the F-4 was the right aircraft. I asked him why he'd been so taken with the Phantom; "it had it all: plenty of power, good handling, range, speed – it was a magnificent machine, so far ahead of anything we had at the time. I consider it one of the greatest aeroplanes I ever flew!"

Perhaps unsurprisingly, given Eric's wealth of experience, his glowing assessment of the Phantom proved to be spot on. It eventually served with the US Air Force, Navy and Marine Corps, the RAF and RN, and the air forces of many different countries. With more than 5,100 built, it remains the most-produced Western jet fighter (see p22).

After a posting as Naval Attaché to Germany (where Eric was checked out in a Marineflieger Starfighter by one of his former students), he took command of RNAS Lossiemouth, where he mostly flew Buccaneers and occasionally Sea Venoms, as well as helicopters. Eric described the Sea Venom as "a simple first generation jet", which – with its straight wing and centrifugal flow engine – quickly became obsolete. "However," he continued, "the Buccaneer

pilots he quickly became involved in civil helicopter operations, particularly in the oil and gas fields of the North Sea. When he finally stopped flying in 1991 his logbook had accumulated over 12,000 hours, very few of which had been on autopilot. Over his 50-year flying career, he flew almost 500 different types, including fighters that ranged in performance from the 200kt Gloster Gauntlet to the Mach 2+ Phantom.

Eric remained active on the lecture

"We'll risk the pilot if you'll risk the plane"

was a much more capable machine, which was very exhilarating to fly at low-level. The early ones were a bit underpowered," he admitted "but once they'd replaced the de Havilland Gyron Juniors with a pair of Rolls-Royce Speys it really performed well, although it was prone to inertia cross-coupling if mis-handled. Then it could bite!"

Eric retired from the Royal Navy in 1970 and as one of the original British helicopter

circuit right up until his death, and wrote a number of books about test flying and naval aviation. A Master Pilot of Russia and an Honorary Fellow of the American Society of Experimental Test Pilots, Eric's many highly-deserved awards (he was the most decorated Fleet Air Arm pilot) included the MBE, CBE, DSC, AFC and the King's Commendation for Valuable Service in the Air. ●

Involved to the very end

As we chatted away the morning, Eric's partner Jean came into the lounge with coffee for us, and reminded him that he had an appointment with his doctor later that day. With such a wide choice of aircraft to talk about we didn't get a chance to discuss three aircraft that have always fascinated me: the Lockheed F-104 Starfighter, Vought F-8 Crusader and Hawker P.1127. Part of the reason that we ran out of time was that – as always – Eric had asked me what I was up to, and when I revealed I was the project test pilot for the Glowfly, (an intriguing jet/electric hybrid SSDR SLMG) he was immediately

interested, and asked several probing and pertinent questions about the wing loading, thrust-to-weight ratio and hybrid propulsion system. Although seeming frailer in body than when we'd last met in 2014, Eric's massive intellect appeared undiminished and he was genuinely fascinated by the hybrid propulsion system of a small turbojet and electrically-driven mainwheels. I really think he would've relished the opportunity to get behind the controls, and as I left his parting words were "give me a call and let me know how you get on with it Dave" – and it saddens me greatly that I'll never get the chance. *Requiescat in pace sir, you deserve it.*