



four; the *Guinness Book of Records* credits him with 487, and it counts 14 marks of Spitfire as one type. His bag includes all the early jets, British and German, and the extraordinary Me 163 rocket plane, which was one of many aircraft that really should have bumped him off – an analyst has calculated that while there have been countless close shaves, there were eleven accidents in which Capt Brown really had no right to survive.

Not only did he fly all of the Luftwaffe's hairiest experimental aircraft, but being a fluent German speaker – he was in Germany before the war, flew with Ernst Udet and saw Hanna Reitsch fly the Focke-Achgelis Fa-61 helicopter in 1939 – he was called in to help interrogate leading Nazis. He spoke to Himmler, interrogated Göring, Messerschmitt, Heinkel, Kurt Tank and Wernher von Braun as well as the 'Beast of Belsen' Josef Kramer and his psychopathic woman deputy Irma Griesel, described by Capt Brown as 'the worst human being I have ever met'.

His test pilot career took him into the poorly-understood transonic zone in a succession of ropery prototypes, and virtually every day he took risks that would now be thought unacceptable. After Geoffrey de Havilland died testing the tailless DH 108 Swallow, Capt Brown took it up to see what killed him – and he found out, too!

Winkle: the world's best test pilot

*No aviation career has been more extraordinary than that of Capt Eric 'Winkle' Brown. He talks to **Pat Malone***

'A flawless pilot in every respect... an acute analytical mind makes him one of the country's finest test pilots. A brilliant aerobatic flyer.'

The words of Group Captain Alan Hards, OC RAE Farnborough, entered into the log book of Captain Eric 'Winkle' Brown in 1945 and never since gainsaid. Indeed the only quibble that might be raised is Hards' use of the phrase 'one of', for there are many knowledgeable men – not just Navy, and not just British – who will tell you that Capt Brown was the best test pilot in the world, ever, bar none.

I cannot in this short article begin to do justice to the extraordinary feats of Winkle Brown; for that you must delve into his best-selling books, particularly *'Wings on my Sleeve'*, an autobiography which, if it were a work of fiction, you'd throw away in disbelief; nobody could do so much in one lifetime. Capt Brown has flown more aircraft types than any other human being, probably by a factor of



He was the first man to land a jet on an aircraft carrier, one of his record-breaking 2,407 carrier landings, and he would have been the first man through the sound barrier had we not inexplicably cancelled the Miles M.52.

Yet for all the risks he has taken, Capt Brown had attained the age of 90 and remains hale and hearty and as acute and analytical as ever. He doesn't *entirely* accept that he should be dead eleven times over, but he allows that his survival runs markedly against the odds. "As a test pilot, you're in the game for the risk," he says in his soft Scottish Borders burr. "You're not in there to do the things that have been done already. You can't sit and think, oh well, I'm not prepared to do this... that's your job, to take on risk. I never in my life refused to fly an aircraft – I do love a challenge."

He attributes his survival to three things. "Firstly, I prepared myself very, very carefully for every flight. Secondly, my size worked in my favour – in the Swallow, in the crash of an Me 163 at Wittering and in other cases, I would have been killed, or at least lost my legs, had I been taller." (He's five foot seven). "Thirdly, there's a small element of luck, whatever that is."

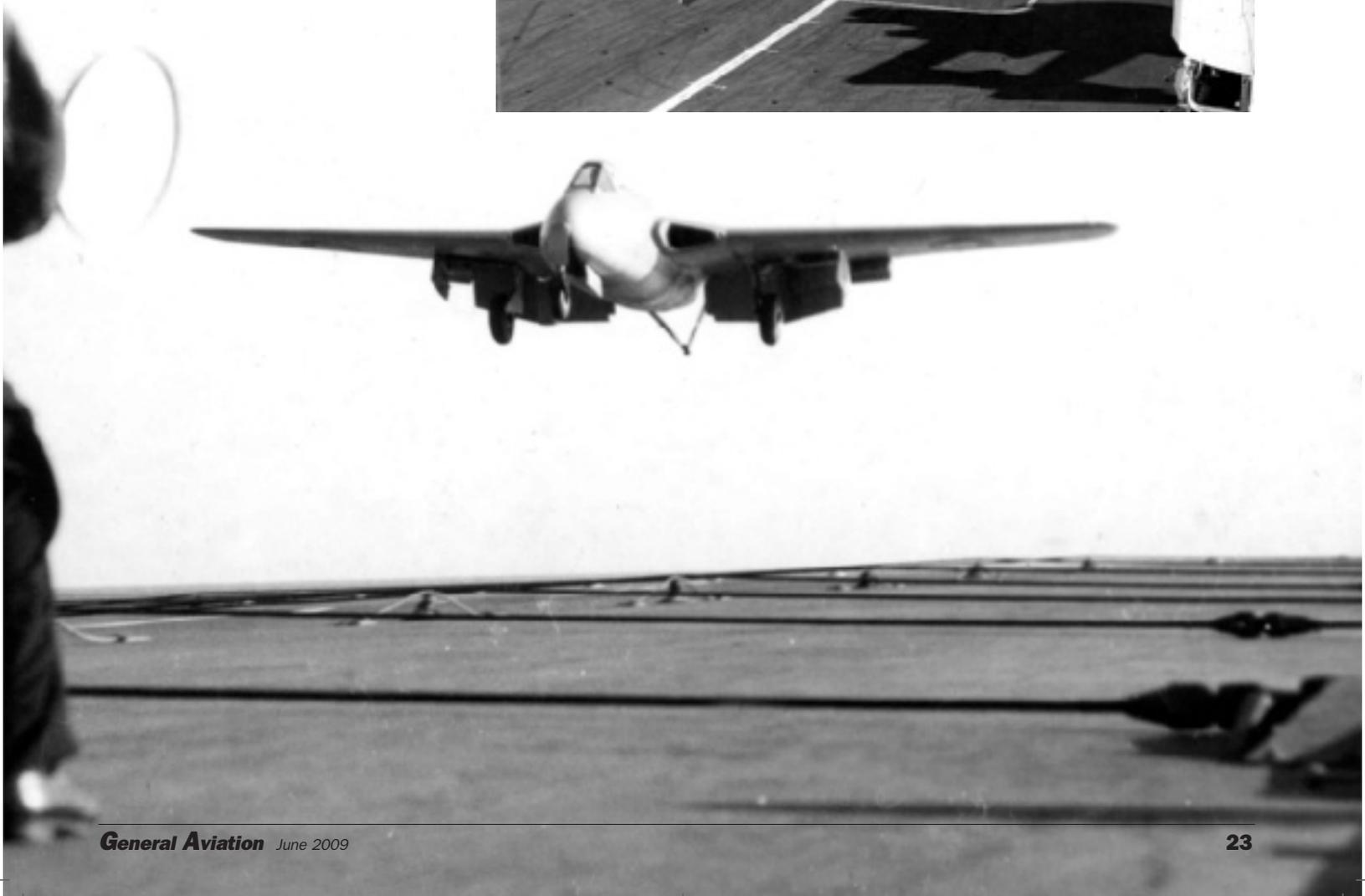
Captain Eric Melrose 'Winkle' Brown CBE, DSC, AFC, FRAeS, RN now lives in active semi-retirement in Copthorne, in West Sussex,



B/W photos via Phillip Jarrett

Above: Capt Brown saw Hanna Reitsch fly the Focke-Achgelis Fa-61 helicopter indoors in 1939

Left: Captain Eric 'Winkle' Brown at 90, in the garden of his home in Copthorne
Right and below: Capt Brown was the first man to land a jet on an aircraft carrier, flying a de Havilland Vampire onto HMS Ocean on December 4th 1945. The picture at right shows the first take-off, achieved with ample deck to spare



surrounded by aviation memorabilia and paintings of his favourite aircraft. He still consults, writes articles and makes speeches, but far from dwelling on past achievements he looks to the future as a great age in aviation, particularly naval aviation, where his heart lies. He has been directly involved in planning for the Royal Navy's new aircraft carriers *Queen Elizabeth II* and *Prince of Wales* and is filled with enthusiasm and optimism for their prospects. As Deputy Director of Naval Warfare in 1962, Capt Brown headed the think-tank responsible for a new large strike carrier designated CVA 01, cancelled in February 1966. Much of the data on that project has been lost, and the Navy is keen to ensure that none of the expertise that went into that project was wasted.

"The new carriers incorporate some of the features of CVA 01," he says. "The parallel deck is the main thing, as opposed to the angled deck. The angled deck removed the problem of needing a barrier, which caused god knows how many losses of aircraft, but it created other problems. If the angle gets too wide – and in one carrier we went up to ten degrees – it is difficult for the pilot turning in at the final stages, particularly in bad weather. When you break out in very low cloud, the first thing you see is the phosphorescent wake of the ship, which is an absolutely straight line, and it's not the line of the deck.

"When you go parallel, you have a landing lane, a separate taxi lane, and a catapult lane for take-off. Originally one had to limit the width of a carrier to make sure it could go through the Panama Canal, but with the new ships, much of the deck is overhang so that's not a problem.

"I think that the potential is there for a really perfect defence facility for this country provided we make all the right choices. We must closely examine everything to make sure we've got it right, and leave ourselves with options to change when necessary.

"We had a lot of discussion about VTOL versus conventional carrier aircraft, and there are advantages to both types. There's a penalty to pay for VTOL, mainly in weight carrying capability. You may go off on a sortie with weapons aboard your aircraft, and if for some



Top: the future aircraft carrier *Queen Elizabeth II* as she will look in service

Above: the Lockheed Martin F35 - which Capt Brown has flown in the simulator at Fort Worth

Left: the Shorts S29, a half-scale Stirling - one of many aircraft which Capt Brown flew without dual instruction

Below: the Dornier Do335 centreline thrust twin flown at Farnborough by 'Winkle' Brown; this aircraft later crashed killing the CO Experimental Flying, Group Captain Alan Hards

reason you can't carry out your sortie, you're left with your weapons. Do you jettison them? Nowadays you're dumping a huge amount of money, so it is necessary to bring your weapons back to the ship. I have argued that they should have arrestor gear on to allow landing at a very low speed, maybe 50 knots. A facility has been made for arrestor gear to be put in, but they want to leave that until after two years in service.

"The F35 is going to be an outstanding aircraft for these carriers. I was invited by Lockheed Martin to fly the simulator at Fort Worth, and it's very impressive. The US Navy has gone for the conventional model, the US Marine Corps and ourselves for the STOVL



version. The lift engine depends for its operation on a clutch, which is another good reason to ensure that you have arrester gear available should it fail – otherwise you'd have to ditch, and you'd be ditching a very expensive piece of machinery."

Capt Brown believes it would be very difficult for any government now to pull the rug from under the carriers, as happened to CVA 01. "Back then the cancellation was not a great shock," he says. "Once I saw TSR2 gone, I certainly had the shakes. But the political landscape is different today. Events have shown that the projection of global power requires large carrier capability. The method of construction is to build all at one time in different modules, then to bring the modules together. Each module is a separate contract



so it would be very difficult to cancel the programme.

"I was called to the House of Commons recently to discuss the carriers with Lady Thatcher, who despite what the newspapers say is sharp as a tack. She was very enthused about carriers in the Falklands and was convinced that the war wouldn't have been won without them. She sees the potential here again for a proper weapon in our armoury. We discussed the possibility of cancellation, and she said: 'If I were you I'd forget it because the Navy's been damnably clever by calling the first carrier *Queen Elizabeth II*. It would be a brave politician who goes up to Buckingham Palace and says Ma'am, we've just cancelled you.'

"If CVA 01 had been built we would not have gone VTOL, which was effectively forced on the Navy when it looked as if we were going to be wiped out by Denis Healey as a naval air arm. God bless the lot who bamboozled the politicians into believing that what they called 'through-deck cruisers' were not carriers. But the kind of carrier that evolved could only deal with VTOL aircraft.

"If we'd had CVA 01 at the Falklands we'd have had Phantoms and AEW Gannets aboard, and I reckon it would be all over in a couple of weeks. The Harriers has limitations; the carrier they flew from had to stand off 70 miles from the Falklands. By the time you've taken your Harrier 70 miles to the Falklands, kept it on CAP – combat air patrol – for half an hour and got it back to the carrier, you've just about used up your fuel. With the Phantom you could have gone halfway to Argentina and killed them a long way out."

One thing that remains constant as technology changes, says Capt Brown, is the calibre of pilot required for combat flying. "The only difference between the pilots of the 1940s and today is that they must now be very technically capable," he says. "The F35 pilot will depend so much on computery, and his cockpit is going to be totally different to what has gone before. He's going to have a mass of data available to him and so much of it will be resolved for him by computerisation, but he's always got to be ready for the inevitable failure – he won't have a heavy workload when things are working, but he

**Left: Scott Crossfield's X-15, which Capt Brown regrets not having flown
Below: Me 262 had no dive brakes and was a sitting duck on final approach**



must be prepared to take on a heavy workload when things go wrong.

"Beyond that, he's no different from the pilot I knew in the 40s. An exceptional pilot is born, I think, rather than made – there are people who've just 'got it', so to speak. A natural pilot tends to be a natural combat pilot, too; I think a fighting man's instinct, a killer instinct, is absolutely essential if you're going to succeed. You can sense it in a man before he gets near a plane, you can see it in his approach to sport, to life in general."

Among the most exceptional test pilots, Capt Brown numbers Scott Crossfield, Neil Armstrong and Jeffrey Quill, all of whom were personal friends. "The X15 pilot Scott Crossfield was highly technically qualified, he was highly motivated, and I would say – and this may strike you as strange – he was modest. He was a superb pilot, he must have known it, but he never projected an I-know-it-all attitude. There have been notable exceptions to this.

"Neil Armstrong is in the same stamp as Scott Crossfield. Nowadays I see quite a bit of Neil; we have lectured together, we were both made honorary doctors by Edinburgh University last year, and we received the Guild's Award of Honour at the same time. Oddly enough, my grandfather knew of Neil's grandfather when they lived in the Scottish Borders; Neil was given the Freedom of Langholm, his ancestral home, in 1972 and he's very proud of it. We both came of Border Reiver stock – have a go at the English, steal their cattle and run back over the border.

"I also have high regard for Jeffrey Quill, who had all the qualities, natural ability and motivation. Jeff and I were of the same mind – we were both prepared to accept all the risks the job entailed. What sets Scott, Neil and Jeff apart is the degree to which they were prepared to do their homework. None of us believed in the attitude some young test pilots had of kick the tyres, light the fires and last one off's a cissy. That attitude is doomed to disaster. We had a high casualty rate at Farnborough – up to 25 percent a year – because we jumped from aircraft to aircraft and some of them didn't bother to do their homework.

"But it was a marvellous era to be a test pilot, with the V-bombers coming along, we were working towards TSR-2 and Concorde, and a lot had to be learned, some of it so obvious today. The original jets that we and the Germans built went very fast, but we'd forgotten we had to slow them down – they didn't have dive brakes. Very few if any Me262s were shot down except on take-off or landing – mainly on landing, because they had to do a long, draggy low approach and they were absolute sitting ducks if an enemy fighter came over the airfield at that time.

"As head of the RAE's Enemy Aircraft Flight I flew the Me 262 quite a bit, and luckily I managed to fly the Me 163, under power rather than as a glider, which very few people did."

The story of Capt Brown's pursuit of the Me 163 is told in *Wings on my Sleeve* and seems to have become an obsession – and a dangerous one, too. The volatility of the 163's rocket fuel was such that a single drop could blow your head off, but Capt Brown was so determined to fly it that he did so clandestinely. "I could have avoided it," he says, "but yes, it had become an obsession with me. I wanted a rocket under my bottom, and I got one... I was glad to have done it, and I didn't really fancy doing it again.

"The problem with the 163 was that when

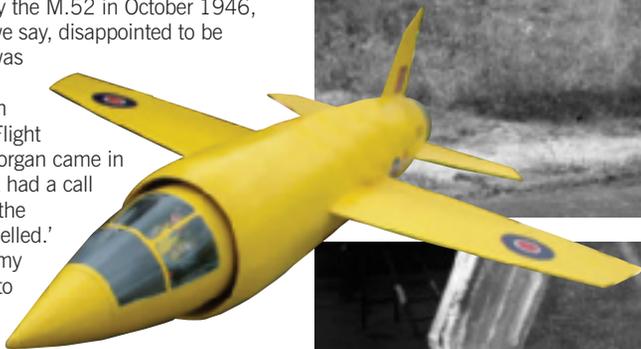
you were landing, you had to make utterly sure there wasn't a drop of fuel left in the tanks. You only needed a cupful and the impact of touchdown would explode it, and the result was a total fatal accident – it just blew the aircraft to smithereens, and the pilot.

"I flew it partly because in the back of my mind was the Miles M.52. Deep down, I was really preparing myself for that, to be the first man to break the sound barrier. What I wanted was experience of the sensation of rocket-like acceleration that the Whittle engine in the M.52 would give us.

"I was due to fly the M.52 in October 1946, and I was, shall we say, disappointed to be robbed of that. I was sitting at Farnborough when the head of Aero Flight Section Morien Morgan came in and said, 'I've just had a call from Miles to say the M.52's been cancelled.' I absolutely blew my top, I charged off to see Sir Ben Lockspeiser, who lived around the corner from me and was chairman of the Supersonic Committee which had cancelled it. In his official statement he's said 'in view of the unknown hazards near the speed of sound it is considered unwise to proceed with the full scale experiments.' He knew me, and he received me, but I didn't get any change out of him. He just said, 'Maybe it's for the better'. I was so furious with him that I signed his son David into the RAF, because Ben was prevaricating."

(David Lockspeiser went on to become a Hawker test pilot. In 1948, a third scale model

Top right: a single drop of the Me 163's volatile fuel could blow your head off
Right: Me 163 cockpit - Capt Brown almost lost his legs crashing one at Wittering
Above: the Miles M.52 in which Capt Brown says he'd have been the first man through the sound barrier



of the M.52 attained Mach 1.38.)

"The Americans will not admit that the flying tail which was on the M.52 was what let the Bell X1 break the sound barrier," Capt Brown says. "Chuck Yeager had run into severe compressibility trouble at Mach .94. In fact, General Albert Boyd, head of the Flight Test Division at Wright Patterson AFB, had said, well fellers, this is the end of the road. Then three days later Bell came charging down with this all-flying tail, designed by a guy who had been to Woodley and had seen the tail on the M.52. He'd done some work on it, but basically it was the M.52's tail, which he admitted more or less on his deathbed. They popped it straight onto the X1 there and then, and it did the trick."

The sound barrier aside, Capt Brown's sole regret is not having flown the X 15, which reached a speed of 4,500 mph and an altitude of 67 miles, qualifying pilot Joe Walker for astronaut wings. "I wasn't short of support from the American test pilots, but the Secretary of State said I'd have to become an American citizen," he says, "so that wasn't an option."

The X 15 was based on a design by Walter Dornberger, one of Wernher von Braun's V2 team, many of whom Capt Brown met in 1945. "The Americans captured von Braun, who was the most self-confident man I've ever

met," he says. "We had him to interrogate and his attitude was, aren't the Americans just the lucky ones to get me! Britain, in contrast, wouldn't accept the FW 190 designer Kurt Tank. Of all the designers, Tank impressed me most. I didn't interrogate him, rather he interrogated me. He wanted to know what I

thought of every one of his aeroplanes that I'd flown. Not only was he Focke Wulf's chief designer, he was their assistant chief test pilot. I think when you have that, you're away out front.

"We brought 26 aerodynamicists and engineers back to Farnborough but authority



Capt Brown flew the tailless DH 108 Swallow to find out what killed Geoffrey de Havilland



Capt Brown in the FW 190, the first captured German aircraft he was able to fly

refused to have Tank or Dr Heinkel to stay in this country. We kept those 26 until 1947, then we offered a certain number permanent jobs as civil servants at Farnborough and the best two accepted, and stayed until they died. One was in fact the catalyst for Concorde, Dr Dietrich Küchemann.

"A meeting was called by Morien Morgan in 1947 – just five people, Morien, his deputy P.A. Hufton, Küchemann, Dr Karl Doetsch and me. Morien asked me for a report on the flying characteristic of the five tailless types of aircraft I had flown. 'We're thinking of a supersonic transport,' he said. I did my party piece, then we started a discussion of what shape it would be. Küchemann said nothing until right at the end. 'I've done a lot of work in the wind tunnels at Vålkenrode and in my opinion the way we should go is the slender delta wing,' he said. 'But I have a reservation – the war ended before I could work on the slow speed side of the delta wing, I can't vouch for that.'

"A few years later, Morien Morgan, as head of the Supersonic Transport Aircraft Committee, raised a contract with Handley Page for the HP115 to test the slender delta's slow speed flying characteristics. They relied a huge amount on Küchemann at the beginning – and he also did all the pioneering work on fly by wire. We picked up an absolute gem there.

"Of the others, Willy Messerschmitt I found to be arrogant. He refused to give any credit to Alexander Lippisch, who designed the Me 163. I taxed him with being short of structural integrity in his aircraft. Look at your Me 109, I

said, the wings kept coming off in combat. I reckon you were paring down the structural strength of the wings. And he admitted it; he said that if you wanted to get the performance the pilots demanded, you had to make savings somewhere. Messerschmitt had the ear of the Nazi party and that's why he got the contract for the 109 – it should have gone for the Heinkel 112, which was a better aircraft, according to the test flight centre at Rechlin.

"I had the greatest respect for the German fighter pilots – they had to be good to survive the war. I went on a lecture tour of Ireland with Adolf Galland, and I liked him well enough. I got an insight into him from my interrogation of Göring, when I asked Göring why he'd fallen out with Galland. He said because he was insubordinate, and anyway he never wanted him to be General der Flieger – the man he wanted was Werner Mölders, but he was killed in a Heinkel 111 going to Udet's funeral in 1941. He felt Galland didn't have the intellect of Mölders, nor his tactical ability. Göring thought Mölders was probably the best tactician the Luftwaffe had, and I would agree with that. Mölders came up with the Finger Four in the Spanish Civil War, which to this day remains the tactical unit for fighting with aircraft.

Below: the Sikorsky R4 which Capt Brown flew without helicopter lessons
Right: Eric Brown receives an honorary doctorate from Edinburgh University in 2008



"Erich Hartmann was interesting – he was the Luftwaffe's top scorer with 352 victories. I quizzed him on how he got them and he was very open. The tactical naivete of the Russians was unbelievable, he said. 'We were mainly operating against the Ilyushin 2, the Sturmovik,' he said. 'They would get themselves into huge formations, like the B17s, and they thought they defend themselves – but the B17 had huge firepower, ten guns on every ship. The Sturmovik had one .3 peashooter in the back. I didn't mind them firing at me because the .3 did nothing against the 109. I waited until the aircraft filled my windscreen – not my gunsight, my windscreen – and I could get five or six in a sortie. They never even took evasive action, and half the pilots were women.'

"I asked him how he thought he'd have fared on the western front. 'I know how I'd have fared, because I was sent there for a month,' he said. 'I was scared out of my wits and I never had a single kill.'"

After a term as Naval Attache in Bonn Capt Brown commanded RNAS Lossiemouth before leaving the service in 1970 to become Chief Executive of the British Helicopter Advisory Board and the European Helicopter Association – he had the distinction of having flown his first helicopter, the Sikorsky R4, without benefit of lessons. He gave up flying in 1992. "I had to accept that I was getting older, that my reactions were not what they'd once been," he says. "I didn't feel any pressure to give up, but I often thought about boxers... look at Muhammad Ali, you go on until you get your brains beaten out. I thought it was getting harder to keep up with the pace of modern technology. And I have to say, after what I'd done before, poling a JetRanger could get a little *ordinaire*."

"I missed is desperately for about a year; it was like withdrawal from a drug of addiction, but the feeling slowly wore off and I've long ago come to terms with it. But I think it's a wonderful time to be just starting out in naval aviation today, because the F35 and the new carriers offer a very bright future." ■

