



The ultimate WW I two-seat fighter was the Bristol F2b, here gloriously represented by The Vintage Aviator in New Zealand. (Photo by Luigino Caliaro)

TWO-HOLE KILLERS



THE TRADITION OF THE TWO-SEAT FIGHTER

BY **BARRETT TILLMAN**

FRANCE, OCTOBER 5, 1914.

Sergeant Josef Frantz and mechanic Louis Quenaut were in a Voisin III biplane returning from a bombing mission along the Belgian border. En route home, they engaged a German Aviatik B observation plane over Johchery-sur-Vesle near Reims. The French crew immediately attacked, making at least two runs. From that point, accounts vary. Reportedly, Quenaut's pedestal-mounted Hotchkiss machine gun suffered a malfunction, prompting the German observer, 31-year-old Lt. Fritz von Zangen, to return fire with a rifle. Quenaut then unlimbered his own rifle and shot down Sgt. Wilhelm Schlicting and von Zangen. The Aviatik dived to earth, killing the crew in the first recorded aerial victory.



IRAQ, FEBRUARY 14, 1991.
 In the 3:00 a.m. darkness, two 4th
 Fighter Wing F-15E Strike Eagles
 searched for Scud missiles near the
 Syrian border. However, Capt. Tim

Bennett and
 his wingman learned of Iraqi
 helicopters airborne, and got permission
 from their controller to investigate.
 Bennett's weapon systems operator,
 Capt. Daniel Bakke, illuminated the
 grounded enemy chopper (it looked like
 a Hind), and Bennett released his laser-
 guided bomb. As the LGB tracked to the
 target, the helo lifted off and Bennett
 doubted that the bomb would hit. But
 it did. The helo exploded in midair. It
 was the last aerial victory for a two-seat
 fighter.

THOSE TWO UNLIKELY INCIDENTS, more than three quarters of a century apart, span the evolution of military aviation. Today, when air combat is nonexistent (the last shutdown was 1999), it's time to reflect on the evolution and influence of the two-seat fighter aircraft.

Above: The ultimate Eagle the F-15E is still the USAF's premier long-range interdiction and strike aircraft that retains its air superiority lethality. This "E" model operates with the 336th TFS of the 4th TFW at Seymour Johnson AFB entering service in 1989. (Photo courtesy of Stan Piet)

Right: The precarious nature of an FE-2 gunner's work is well illustrated in this aerial shot. (Photo by Luigino Callaro)

When aerial combat became more than an oddity in 1914, dedicated fighter aircraft appeared within months. On the Allied side of the lines, the lack of a synchronizer or interrupter gear prevented aviators from shooting forward, through the propeller arc. Consequently, the configuration of early fighters was driven by the need to put the gunner ahead of the engine. Pusher biplanes became the preferred configuration.

First up was the Vickers FB.5 Gunbus, a prewar concept that arrived in British squadrons in late 1914. With an unobstructed field of fire, the gunner could bring his .303 caliber Lewis to bear on targets in the forward hemisphere—a decided advantage over most two-seaters. But the weight of two crewmen and the 100-horsepower rotary engine limited performance: the Gunbus was only rated at 70mph. Nevertheless, it was the best option available and served in a dozen RFC squadrons before being driven from French skies by Fokker Eindeckers in 1915.

Next, the Royal Aircraft Factory fielded the FE-2, a larger, more capable machine with a far better powerplant. Propelled by a 160-horsepower liquid-cooled engine, the "Fee" (Fighter Experimental) topped 90mph and boasted two or three machine guns: two for the observer (one forward, one

rearward) and sometimes a fixed Vickers for the pilot.

Duty as an FE gunner was not for the dilettante.



In order to fire astern, over the top wing, the observer had to unstrap and stand up in the 90mph slipstream to swap lead with Baron von Richthofen and company.

Actually, Fee gunners seldom got that opportunity. The Germans immediately noted the design's vulnerability and preferred a six o'clock low attack, out of the view of pilot or gunner.

Nevertheless, FE-2Bs and Ds served long and well, escorting observation and bombing missions. Some crews rang up impressive records. Frederick Thayre was a 22-year-old captain credited with 19 victories (17 destroyed), mostly with observer Francis Cubbon. They were killed in June 1917.

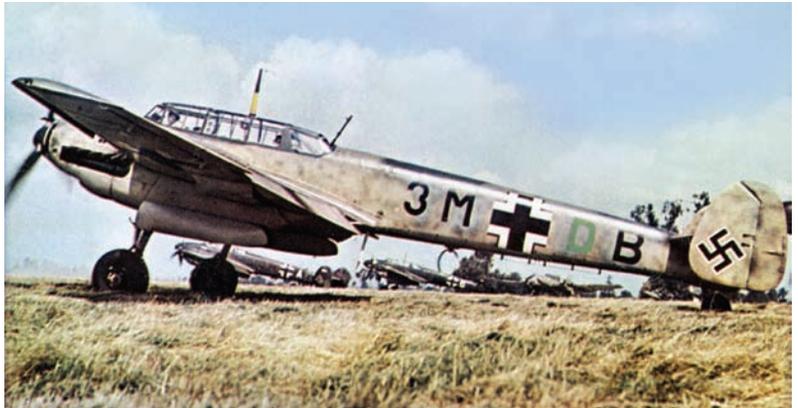
By late 1916, the FB/FE concept had become an obvious dead end. Availability of machine guns firing through the prop arc revolutionized Allied fighter design and tactics, leading to arguably the finest two-seater of the war, Bristol's magnificent F.2. Big, powerful, and surprisingly agile, the Bristol Fighter overcame its embarrassing debut in April 1917 when No. 48 Squadron used it as a conventional two-seater. Thereafter, the "Brisfit" was flown aggressively, and arguably became the RFC/RAF's most versatile aircraft: fighting, escort, ground attack, and reconnaissance. In aerial combat, the observer protected the tail with twin Lewis while the pilot tended to business with a Vickers.

A passel of Brisfit aces arose in 1917-1918, paced by Canadian Andrew McKeever and his gunner with 31 victories; and S.F. Thompson with 30 (both credited with 18 destroyed.) Thompson was lost in 1918, but 10 others gained 20 victories or more, including New Zealander Keith Park, a critical RAF commander in the Battle of Britain 28 years later.

Throughout the war, nearly three dozen German aces were downed attacking Allied two-seaters, including ten by FEs and six by Brisfits. Ten wore the Pour le Merite, including Max Immelmann, who may have succumbed to mechanical failure, and von Richthofen, likely wounded by friendly fire.

The next-generation two-seaters

Between the wars, two-seat fighters proliferated, many with bomber-type turrets in single-engine aircraft. The problem was weight. The turret



alone in the Boulton Paul Defiant weighed 360 pounds, which with the gunner and accessories, boosted the weight to 8,300 pounds or 1,650 more than the Hurricane Mk I, with the same engine. Max speed was rated at 305mph, probably an optimistic figure considering that the Hurricane only knocked off 325. Nevertheless, more than 1,000 Defiants were built—far more than could be gainfully used.

Ironically, the Defiant's four .303 caliber guns were considered "heavy armament" in some circles though it was half of the Spitfire and Hurricane's battery. Nonetheless, eight Defiant pilots achieved ace status, all from No. 264 Squadron. The most successful crew was Squadron Leader E.L. Thorn and Leading Aircraftman F.J. Barker, credited with 12.33 victories during the Defiant's heyday of May 1940.

Top: The Blackburn Skua was the Fleet Air Arm's first service monoplane. (Photo courtesy of Joe Gertler)

Above: Taken during the Battle of Britain, these Bf 110 Ds belonging to Zerstörergeschwader Z.G. 2 were operating from French airfields during the summer of 1941. The aircraft in the foreground coded 3M+DB belonged to the I. Gruppe Stab (Officer Squadron), which can be identified by the green letter "D" followed by the black letter "B." (Photo courtesy of EN Archive collection)



Early in WW II, Boulton-Paul Defiants were used as night fighters. (Photo courtesy of Joe Gertler)

Below: Fairey Fulmars racked up more than one-fourth of all FAA WW II air victories. (Photo courtesy of Joe Gertler)

Bottom left to right: Successful in a wide variety of roles, nearly 7,800 de Havilland 98 Mosquitos were produced. (Photo courtesy of Joe Gertler)
 ■ This early Bf 110 C belonging to 5./Z.G. 26 carried four MG 17 machine guns in the nose and also operated from France during the Battle of Britain. The “Ace of Spades” badge on the nose was the 5. Staffel emblem and at this time, aircraft belonging to this unit would have carried the unit code of U8 which was changed to 3U just after July 1941. (Photo courtesy of EN Archive collection)

■ Almost 6,000 Beaufighters were widely used by more than a dozen Air Forces. (Photo courtesy of Joe Gertler)

■ 75 P-38Ls were converted to Night Lightning P-38Ms for the invasion of Japan. (Photo courtesy of Stan Piet)

■ The P-61 night fighter served in all operating theaters in WW II. (Photo courtesy of Stan Piet)

Flight Lt. Nicholas Cooke and Corp. Albert Lippett claimed 9.33 kills including 8.66 in three sorties over Dunkirk on May 29. That same day, No 264 received credit for an incredible 37 victories, mainly Stukas. Sadly, Cooke and Loppett were lost two days later.

The “Deffie’s” resemblance to the Hurricane provided a brief tactical advantage, as Luftwaffe fighters attacked from six o’clock high. The RAF gunners were waiting for the Bf 109s, and delivered a lesson. After that, the advantage passed to the Messerschmitts. In one July combat, 109s jumped nine planes No. 141 Squadron which lost 10 aircrew and seven planes, with no

FLYING, NAVIGATING, AND INTERCEPTING ENEMY AIRCRAFT AT NIGHT COULD OVERLOAD MANY ACCOMPLISHED PILOTS.

Germans downed. Against single-engine fighters, Defiants only could hope to survive with a purely defensive maneuver like the Lufbery circle, but gained nothing offensively. On August 24, six more Defiants were lost. Thereafter, Deffies were committed to night missions and did reasonably well with early Air Intercept radar.

The British Navy’s counterpart to the Defiant was the Roc. Designed by Blackburn and built by Boulton Paul, it also was armed with a four-gun turret. However, only 136 were built, and the last Rocs were withdrawn from service in 1941.

Blackburn’s Skua, a 1937 carrier-based fighter-bomber, had a conventional rear gunner. Flying from HMS Glorious and Ark Royal during April and May 1940, Lt. Cdr. William P. Lucy shared

in seven victories off Norway—mostly He 111s—for a decimal equivalent of 3.33. On May 14, he attacked a Heinkel formation but drew fire from several bombers. Lucy’s Skua exploded, and he was killed with his gunner, Lt. W.C. Hanson. In all, Skuas were credited with 44 aerial victories during their brief combat service.

The Royal Navy’s next fighter also was a two-seater, minus a turret. Conventional wisdom held that carrier aviators needed a navigator, so the Fairey Fulmar had a cockpit for that purpose. It was reasonably fast, rated at 270mph, versus about 225 for the Roc and Skua.

The Fulmar (like the others, named for sea birds) entered service in 1940, and was far more successful than its predecessors, with the 600 examples remaining in use until 1945. Its leading exponent was Lt. S.G. Orr, who had failed the RAF vision test. Flying from carriers and from shore in the Mediterranean, he was credited with 8.5 victories in 1940-1941. All but three of his Fulmar claims were Italians, mostly recon aircraft snooping the task force. Orr finished his combat flying Hellcats against the Germans in Norwegian waters.

Six other “Fulmar merchants” also rated as aces, as the Fairey fighter accounted for 122 of the Fleet Air Arm’s 455 aerial victories during the war—far more than any other type. In 1945, the navigator’s cockpit was found useful for a radar operator, and the Mk II night fighter saw brief service.

A follow-on design, the Fairey Gannet, entered service in 1944 with the Fulmar’s two-seat configuration. Powered by the Rolls-Royce



Griffin, the Gannet was rated at 315mph but was employed more as a strike aircraft than a fighter, with only nine shootdowns credited.

RAF night fighters followed the two-seat configuration, with good reason. Flying, navigating, and intercepting enemy aircraft at night could overload many accomplished pilots. Consequently, the Bristol Beaufort and de Havilland Mosquito excelled at the nocturnal role through a combination of performance, armament, radar, and a high standard of aircrew. The Mossie was deemed superior because its side-by-side seating enhanced crew coordination, whereas the “Beau’s” RO sat far behind the plot.

At least 16 British and Commonwealth crews became night double aces. Squadron Leader Bob Braham notched his 20th victory in September 1943, a record until John Cunningham reached the mark in January 1944. Braham made ace in both types, an achievement matched by only three other pilots.

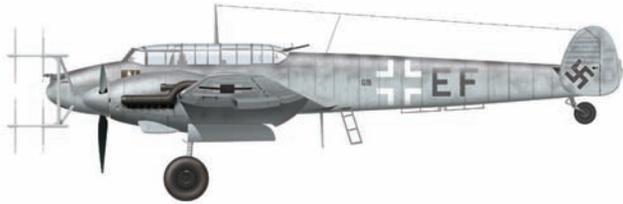
Today, the Beaufighter is little known compared to the Mosquito but both types did well in the role. In fact, more aces made their records in Bristols than in Mosquitos. Of the RAF’s top three night fighter pilots, Bob Braham and John Cunningham favored the Beaufighter while Squadron Leader Brance Burbridge excelled in the Mossie.

Flight Lts. Douglas Oxby and Bill Skelton finished as the RAF’s outstanding radar operators, each partnered in 20 or 21 shootdowns.

The hazards of night

The Luftwaffe fielded several two-seaters in WW II, most prominently the Bf 110 Zerstorer or twin-engine Destroyer. With a pilot and gunner, the 110 possessed range, speed, and lethality with two nose-mounted 20mm cannon and two machine guns. But it fared poorly against single-seat opponents possessing superior maneuverability. During the 1940 Battle of Britain, the Luftwaffe lost as many as 30 Zerstorer, a day, with 223 overall—more than 90 percent of the number deployed three months previously.

Nevertheless, the 110 remained in production until 1944 with some 6,000 built. It became the backbone of Germany’s night fighter force until the more powerful, more versatile three-seat Junkers 88 was adapted nocturnally. Loaded with radar and a third crewman to operate the radar,



Top: Bf 110G, Maj. Heinz Schnauffer, 1944.
Above: Heinkel He-219A Owl I./NJG 1 Ernst-Wilhelm Modrow 1944. (Illustrations by Tom Tullis)

the 110 often operated at gross weight. Yet, a handful of stellar pilots proved the type’s worth, most notably Maj. Heinz Schnauffer who downed 121 British bombers.

Follow-on Zerstorer were Messerschmitt’s notoriously unsuccessful Me 210 and the much improved 410. Neither left a lasting effect upon the air war.

The most impressive German two-seater was Heinkel’s 219, a dedicated night fighter that appeared in 1943. With a pilot and radar operator, the Owl (Uhu) possessed speed (380mph) and lethality with four to eight 20 and 30mm cannon, depending on variant. However, fewer than 300 were built.



This was one of the final production P-38Ms that shows both cockpits. The radar operators had to be of small frame because of the tight, uncomfortable space in the R/O’s cockpit. (Photo courtesy of Warren Thompson)

The hazards of night fighter missions were many and varied including darkness, weather, bomber gunners, and friendly flak. One example was provided by Lt. Dieter Musset of NJG 1 in an August 1943 mission. After downing four bombers in 16 minutes, Musset was seen by a British gunner. “I suffered hits in my own port engine. At the same time, I came under fire from enemy aircraft on the starboard beam, which wounded my radio operator in the left shoulder and set my 110’s port engine on fire. Thereupon, I broke off the action, cut my port engine and flew away from the target





Above: This rare F7F-3P Grumman Tigercat—the Navy’s first twin-engine fighter, now owned by Rod Lewis as part of the Lewis Air Legends collection, is one of only five flyable in the world today. (Photo by Paul Bowen)

Below left: The Northrop F-89 Scorpion was one of the most valuable assets for U.S. Air Defense over North America in the 1950s. This F-89D is shown flying over Iceland in 1955. It was assigned to the 57th FIS. (Photo courtesy of Warren Thompson)
Below right: Built as trainers, a number of F-model Super Sabres were utilized as Fast-FAC or modified for Wild Weasel missions in Vietnam. (Photo courtesy of Stan Piet)

area ... As I was constantly losing height, at 2,000 meters I gave the order to bail out.

“As I did so, I struck the tail unit with both legs, breaking my right thigh and left shinbone. After normal landings by parachute, my radio operator and I were taken to the hospital at Gustrow.”

America’s dedicated night fighter was Northrop’s P-61 Black Widow, the size of a B-25. Normally carrying a three-man crew, the gunner often was

HARDCORE SINGLE-SEAT PILOTS SNEERED AT THE IDEA OF A “GUY IN BACK”

left behind since the top-mounted turret imposed weight and drag. The pilot’s four 20mm cannon were ample to destroy any Axis aircraft.

Japan’s two-seat fighters were the Army Kawasaki Ki-45, Nick to the Allies, and the Imperial Navy’s Nakajima J1N, called Irving. Both were heavily committed to night fighter units with the Nakajima usually employing radar. Defending homeland airspace from B-29s in 1944-1945, the Nick and Irving claimed some spectacular results. A Nick pilot, Capt. Fujitaro Ito, was credited with a dozen or more American bombers but U.S. records confirm very few.



Introduced as a very long-range escort, the P-82 was later developed as a potent all-weather air defense variant serving in Korea. (Photo courtesy of Stan Piet)

Korean skies

During the Korean War, the Air Force, Navy, and Marine Corps used a variety of two-seaters, mainly as night fighters. The 1946 North American P-82 mated two P-51H fuselages with adjoining wings and horizontal stabilizers, originally as a long-range escort fighter. However, jets quickly rendered props obsolete by day so the Twin Mustang became a night fighter. Ironically, its only two kills in Korea—America’s first of the war—occurred in daylight in June 1950.

A WW II development was Grumman’s spectacular F7F Tigercat, which was land-based throughout its service. Equipped with radar, it was a potent night stalker, scoring two kills in a Marine squadron, VMF-513.

Two-seat jets also appeared in Korean skies. The Navy and Marines deployed the Douglas F3D Skyknight, ashore and afloat, which escorted B-29 night missions. Featuring side-by-side seating, crew coordination was excellent, and naval ROs guided pilots to six victories for one loss.

The Air Force deployed four squadrons of Lockheed F-94s, seriously overmatched against low and slow Communist hecklers. In early 1953, Starfighters of the 319th Fighter Squadron claimed four kills including three jets, though one Starfighter was lost when it stalled while stalking a Po-2 biplane.

The jet age

In the jet age, the transition to multi-purpose fighters inevitably meant a second seat. Hardcore single-seat pilots sneered at the idea of a “guy in back,” preferring 200 pounds of fuel over a Navy





Above: The classic Cold War fighter/bomber, the F-4 Phantom II, is still operating with a handful converted as drone controllers at Tyndall AFB, Florida. (Photo courtesy of Stan Piet)

Below left: The 319th Fighter Squadron was heavily involved in the all-weather business during the Korean War. This was taken over South Korea in 1952 when the squadron was based out of Suwon Airbase. (Photo courtesy of Warren Thompson)

Below right: The Interceptor version of the F-101, the B model, was armed strictly with Falcon or Genie missiles. (Photo courtesy of Stan Piet)

SELECTED LIST OF TWO-SEAT FIGHTERS

BRITAIN

Vickers Gunbus
FE-2b/d
Bristol Fighter
Blackburn (Boulton-Paul) Roc
Blackburn Skua
Boulton-Paul Defiant
Bristol Beaufighter
Fairey Fulmar
de Havilland Mosquito
de Havilland Sea Vixen
Panavia Tornado ADV (Air Defence Variant)

GERMANY

Heinkel 219
Messerschmitt 110
Messerschmitt 210/410

JAPAN

Kawasaki Ki-45 Nick
Nakajima J1N Irving

USA

Grumman F7F Tigercat (limited Korea use)
Lockheed P-38M (limited WW II use)
Northrop F-89 Scorpion
Lockheed F-94 Starfire (limited Korea use)
Northrop P-61 Black Widow
North American F-82 Twin Mustang (limited KW use)
F-4 Phantom series
F-100F Super Sabre ("Fast FAC" Vietnam)
F-14 Tomcat series
F-15E Strike Eagle
F-16D/F Fighting Falcon
F/A-18D/F Hornet
E/A-18G Growler

radar intercept officer (RIO) or Air Force weapon system officer (WSO). But that chilly attitude evaporated in the heat of combat, where a second pair of eyes could be invaluable, let alone splitting the cockpit tasking in a multi-threat environment. Perhaps the ultimate statement on the subject came from Col. Robin Olds who said of WSOs, "I didn't always need to hear from them, but I damn sure wanted them to hear me!"

Perhaps the ultimate expression of the two-seat fighter was the versatile, long-lived McDonnell Douglas Phantom II. Originally conceived as a fleet defense aircraft, it entered Navy service in 1961 and was adopted by the Air Force two years later. In the decade-long Indochina nightmare, Phantoms accounted for 145 of nearly 200 American aerial victories, representing 78 percent of the Air Force claims and 65 percent of the naval claims. America's two fighter aces from the Vietnam War both flew Phantoms.

Eventually, 11 other nations purchased the Phantom, with Israel making especially good use of the type. Its versatility was illustrated in the 1973 Yom Kippur War, when IAF Phantom crews claimed 28 kills versus nearly 200 by Mirages and Neshers. The F-4's potent offensive capability was focused on strike missions rather than aerial combat.

Some two-seat fighters were used on other missions. The mighty F-105 Thunderchief, the Air Force's heavy hitter in North Vietnam, mostly was employed as a single-seat strike aircraft. However, the two-seat F model was well suited for the anti-SAM "Wild Weasel" mission with the WSO (affectionately termed a "trained bear") in the rear pit. One sterling example occurred in April 1967 when Maj. Leo Thorsness and his "bear," Capt. Harold Johnson, capped their wingman who had been shot down near Hanoi. Thorsness and Johnson survived 40 minutes under fire from flak, SAMs and MiGs, using bombs and Shrike missiles to destroy SA-2 sites, but gunned a MiG as well. Similarly, Phantoms and F-100F Super Sabres became "Fast FACs" on forward air controller missions throughout Indochina.

The current generation

Engineers consider post-Vietnam designs as "fourth-generation" jet fighters, exemplified by the Grumman F-14 Tomcat, McDonnell's F-15





Above: This FA-18F Super Hornet of VFA-2 continues the U.S. Navy concept of two-seat strike-fighters dating from the Curtiss F8C of 1928. (Photo by Rick Llinares)

Below left: An F-4 Phantom II assigned to Fighter Squadron (VF) 41 climbs after being catapulted off the flight deck of the carrier *Independence* (CVA 62) during 1965. (Photo courtesy of Hill Goodspeed, National Naval Aviation Museum)

Below center: The Navy's only multi-role fighter bomber for the early 21st century the F/A-18F has been in service since 1999. (Photo courtesy of Stan Piet)

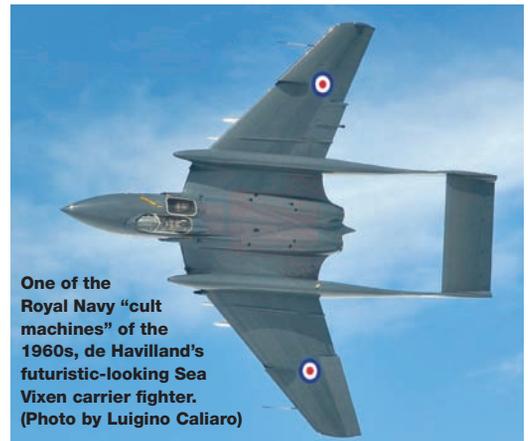
Below right: F-14A, VF202, over CVN-69 *Ike*. (Photo by George Hall/Check Six)

Eagle, and the MiG-29 and beyond. The two-seat F-15B trainer weighed only 800 pounds more than an A model Eagle with no loss of internal fuel. However, the two-seat F-16 sacrificed 1,200 pounds of fuel for the second seat. The two-seat FA-18D Hornet was followed by the F model "Super Hornet", and now the type is adapted to electronic countermeasures in the EA-18 Growler.

Simulator studies in the late 1970s demonstrated an irony: two-seat fighters did better as the threat increased, but only to a point. When front-backseat communication diminished owing to multi-tasking, the single-pilot airplane coped better because of less confusion. However, with the decline of air combat at the end of the twentieth century, fighters have focused on other missions, especially close air support.

Real-life Luke Skywalker conceivably could enter combat with an R2D2 "RIO", but that's unlikely. The current generation of fighters may well be the last of the breed with humans on board. The ability of drones to pull 40 Gs combined with near-universal situational awareness from air and ground could foreshadow the end of the fighter's century-long run—with one seat or two. †

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One of the Royal Navy "cult machines" of the 1960s, de Havilland's futuristic-looking Sea Vixen carrier fighter. (Photo by Luigino Caliaro)



Three versions of the Panavia Tornado have operated with the German Luftwaffe and Navy. (Photo courtesy of Stan Piet)

