

Photograph album of aircraft at the Midland Air Museum, Baginton, Coventry



Michael Pierre de Villiers

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Title page: Midland Air Museum assortment of outdoor exhibits. The green restoration hanger is in the left background with Coventry Airport and runway in the distant right background.

ABOUT THE AUTHOR

Michael Pierre de Villiers was born in Durban, South Africa. He was trained to World Meteorological Organization class one meteorologist and multi-discipline weather forecaster in the South African Weather Service where he reached the rank of Director. He served on a weather ship in the South Atlantic. He served on World Meteorological Organization expert teams and was World Meteorological Organization rapporteur for the Africa region. He was also a commercial pilot and flying instructor. More recently he was a weather forecaster in the United Arab Emirates, then in England. Now retired.

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INTRODUCTION

This album/article consists of aircraft photographed by the author at the Midland Air Museum, incorporating The Sir Frank Whittle Jet Heritage Centre, situated at Coventry Airport, Baginton, in the south-east of Coventry.

Coventry, 72 Newcombe Road Earlsdon to be exact, was the birth place of Frank Whittle the inventor of the jet engine. The flight of the first British jet-powered aircraft was from RAF Cranwell on the 15th May 1941.



Photograph 2023-12-08. The W2/700.

In 1923, Frank Whittle started as an apprentice engineer at Cranwell, went on to become a RAF pilot 1926. In 1936, with the help of two ex-RAF officers, an engineer and funding from an investment bank founded Power Jets Ltd and went on to build jet engines. Culminating in the W2/700, the first British production jet engine that powered early models of the Gloster Meteor. A statue commemorating Air Commodore Sir Frank Whittle, OM, KBE, CB, FRS, FRAeS, stands under the Whittle Arches at Millennium

Place, central Coventry. By the way; OM = Order of Merit. Recognition of military or civil merit, KBE = Knighthood of the Order of the British Empire, FRS = Fellow of the Royal Society, FRAeS = Fellow of the Royal Aeronautical Society.

The aircraft at the museum are displayed, not in any apparent order, on open ground in the best way possible given the limited space available and very little indoor space in one hanger. The photographed aircraft presented, during visits in 2006-10-31 and 2023-12-08, have been arranged in alphabetical order according to manufacturer's name at the time the aircraft were built. Some have been subsequently been restored in a different livery. Many of these manufacturers are no longer in existence, or have been incorporated into new combined groups such as BAE Systems, which has also undergone change from British Aerospace to BAe, now BAE Systems. The photographs do not include all aircraft at the museum. Some being restored at the time, such as a de Havilland Vampire T.11 XD626 and a Kaman HH-43B Huskie 62-4535.

Rather than clutter the text with the many admittedly deserved references, all references have been listed in the Bibliography. I hope this does not cause offence. The author is particularly indebted to the Midland Air Museum for the information boards provided with the aircraft on display and information available on the Midland Air Museum website, including a list of aircraft in their possession. Their website address is included in the Bibliography.

On odd occasions there are data differences between reference sources, for example, aircraft specifications due to often numerous model variants. Sometimes even differences for a specific

model variant, such as maximum speed, makes it difficult to know whether the correct specifications for the variant are provided. The author apologises for any errors.

Aircraft specifications such as speed, distance, altitude and engine power have been given in metric and non-metric terms. Regarding speed and altitude, preference has been given to knots (kt) and feet (ft) in accord with common practise in aviation. Preference has also been given to nm (nautical miles) distance. Other abbreviations are; for speed kph (kilometres per hour) and mph (miles per hour), for altitude m (metres), for distance km (kilometres) and mi (miles). Engine performance for jets kN (kilonewton) and lb (pounds), for engines driving a propeller, kW (kilowatt) and lb (pounds).

The aviation profession abounds with acronyms that are frequently used, including in this article. Each time one is used for the first time, it is first defined in full.

THE AIRCRAFT

Armstrong Whitworth Argosy 650 G-APRL



Photograph 2006-10-31.

The Argosy was a high wing, four engine cargo and general transport aircraft. It was built in Baginton, Coventry, first flying 1959. Seventy-three were built, Seventeen civilian 650s and fifty-six military 660s for the Royal Air Force (RAF). Standard capacity was 83 passengers, or 36 passengers plus cargo, or all cargo. Maximum payload 14515kg (31000lb).

The aircraft is instantly recognised by its cylinder pod shaped fuselage and a tailplane on twin booms that extended from the wing inner engine nacelles. This meant the rear was available for two large cargo doors that

opened on each side for easy loading. It also had a nose cargo loading door that opened to one side, shown partially open in the photograph.

The display aircraft was the second prototype. After use by Armstrong-Whitworth for vibration, engineering and tropical trials, it was sold in 1961 to Riddle Airlines in Florida, United States of America (USA). After use by a number of different USA operators, it returned to the United Kingdom (UK) in 1974. The last operator was Elan Parcel Services. The museum acquired the aircraft keeping the company's livery. Its last flight was on the 20th February 1987 back to its birthplace Baginton, Coventry. It was also the last flight of an Argosy in the UK. It is also one of only seven complete examples left in the world.

G-APRL had four 1663kW (2230hp) Rolls-Royce Dart 532 turboprop engines, fitted in nacelles (similar to those of the Vickers Viscount 800) that powered four blade Rotol propellers. Cruising speed was 248kt (459kph, 285mph at 18000ft (5486m). Range with maximum fuel 1434nm (2655km, 1650mi).

Armstrong Whitworth Sea Hawk FGA.6 WV797



Photograph 2013-08-31.

was acquired by the museum in 1985, a return to its home at Baginton, where it was built by Armstrong-Whitworth.

An information board says the Sea Hawk had a 24.5kN (5400lb) Rolls-Royce Nene 103 centrifugal turbojet. Maximum speed 521kt (964kph, 599mph). Service ceiling 44500ft. Armament four 20mm Hispano cannons with six underwing hardpoints for unguided rockets or two 227kg (500lb) bombs.

Avro Vulcan B2 XL360



Photograph 2006-10-31.

than the B1. It had a larger wing, more powerful engines, improved electrical system and electronic countermeasures.

The displayed Vulcan flew to the museum in 1983. Operational history: Waddington Wing 44, 101,35 and 616 Sqns and 230 OCU. It had four 89kN (20000lb) thrust Rolls-Royce Olympus 301 two shaft turbojet engines. Maximum speed was 560kt (1037kph, 644mph). Service ceiling 60000ft (18288m).

The Sea Hawk was a single seat fighter/bomber aircraft designed specifically to operate from aircraft carriers. It included folding wings so that it fitted on the lift to lower aircraft below deck. The Royal Navy (RN) Fleet Air Arm began using the Sea Hawk in 1953 to 1969 when its replacement was the de Havilland Sea Vixen.

The first jet design from the designer of the Hurricane, the Sea Hawk first flew in 1947 and took part in the Suez conflict. The museum aircraft wears Suez invasion stripes. That is, the ill-advised Anglo-French 1956 invasion of the Suez Canal zone. The aircraft

The Vulcan was a five seat, delta wing, long range, strategic nuclear and conventional bomber. It was one of three strategic nuclear bombers, or V bombers. It later served as a conventional bomber. It only experienced combat in the conventional bombing role during the 1982 Falklands War. The Vulcan was the world's first large bomber to use a delta-wing shape. The benefits being high subsonic speed at high altitude, long range and good load carrying. The Vulcan entered Royal Air Force (RAF) service in 1956, retired in December 1982. The B2 was bigger



Photograph 2023-12-08. Vulcan cockpit.

Range with bomb load 4000nm (7400km (4600mi). Armament was one Blue Steel rocket propelled air to ground nuclear stand-off missile, a free fall nuclear bomb, or twenty-one 454kg (1000lb) conventional high explosive (HE) bombs.

British Aerospace Sea Harrier FA2 ZE694



Photograph 2013-08-31.

The Sea Harrier was a single seat aircraft carrier-based V/STOL (Vertical/Short Take-Off and Landing) jet fighter-bomber. The Sea Harrier was a variant of the revolutionary Hawker-Siddeley Harrier. The design was revolutionary because rotating jet nozzles were used to vector the thrust from a jet engine so that the aircraft could take-off and land vertically, hover, move sideways, forward and slowly backward.

A prototype Hawker-Siddeley P117 landed on the aircraft carrier HMS Ark Royal in 1963. The RN already operated Harrier GR variants. However, it was not until 1978 that

a navy version flew. The BAe Sea Harrier FRS1 entered service with the RN in 1980. Its role was to provide air defence for naval aircraft carriers and surface ships. Operating mainly from aircraft carriers, the Sea Harrier serviced with distinction during the 1980 Falklands War, as well as, in the Gulf Wars of 1990-1991 and 2003-2011, the Balkans conflict and Sierra Leone civil war.

The FA2 was a 1993 improved variant with a more powerful engine, improved weapon systems and enhanced air-to-air capability. Production ceased in 1998 and the last Sea Harrier flying in 2006.

The museum's Sea Harrier FA2 ZE694 acquired in 2005, was built in 1988. It had a 95.6kN (21500lb) thrust Rolls-Royce Pegasus Mk106 engine. Maximum speed 640kt (1168kph 736mph). Armament was four AIM-12 AMRAAM, or four AIM-9 Sidewinder missiles. AIM = Air Interceptor Missile, AMRAAM = Advanced Medium-Range Air-to-Air Missile. It was built as a FRS1, converted to a FA2 in 1995 serving on RN aircraft carriers with RN 800, 801 and 899 Squadrons.



Photograph 2023-12-08.

Boulton Paul P.111A VT935

The P.111A was a one-off, single-seat experimental, tailless, delta wing aircraft built in Wolverhampton to explore and test the aerodynamic properties of delta wing designs at transonic speeds between 1951 to 1958. The wing had removable tips that could be exchanged for different shapes to investigate aerodynamic effects. It also had an early powered flight control system and a Martin-Baker ejection seat.

After a crash landing when the undercarriage would not extend, the unpainted silver metal P.111 was repaired and modified to improve flight characteristics and reclassified as a P.111A. At the same time, it was painted bright yellow. Modifications included fuselage air brakes and redesigned undercarriage doors to reduce trim change. The anti-spin parachute on the rear port (left) fuselage was strengthened to use as an after-landing braking parachute. It was powered by a 23kN (5100lb) thrust Rolls-Royce Nene 3 RN 2 turbojet. Maximum speed was 563kt (1043kph, 648mph).

The Museum acquired the aircraft in 1975.

Chester-Miles Consultants Leopard G-BRNM



Photograph 2023-12-08.

The Leopard was a four seat, rear mounted twin-engined, transonic mid-wing monoplane of carbon/aramid/glass composite construction private/business jet in development since 1982. Styled like a fighter jet, all flying surfaces were swept and had a cabin canopy. The canopy hinged forward to allow four passengers, including the pilot, access to reclining seats.

The display model was the second prototype. The first prototype flew in 1988 but after the engine manufacturer folded, this second

refined aircraft was built using two 3.1kN (700lb) thrust Williams FJX-1 turbofan jet engines and added cabin pressurisation, fluid-type wing, tail, screen de-icing. Flight control is by an all-moving fin and taileron surfaces. A taileron doubles as an elevator and aileron. It also has an electronic flight instrument system (EFIS). That is, a display system that displays flight data electronically rather than electromechanically. More commonly known as a glass cockpit. All in all, a remarkably modern and well-equipped little aircraft.

Eighty-four development flights were made after it first flew in 1997. The aircraft was donated to the Midland Air Museum by Ian Chichester-Miles after being on display at the Bournemouth Aviation Museum. A six-seater was proposed. However, the project ceased in 2009.

Dassault Mystere IVA 70



Photograph 2006-10-31.

The Mystere IVA 70 was a single seat jet fighter bomber aircraft. First flown in 1952, in total 411 Mystere IVs were built, serving with the air forces of France, Israel and India. Initially it was equipped with the Rolls-Royce Tay jet engine. Later aircraft, including the IVA, were powered by the 34kN (7710lb) Hispano-Suiza Verdon 350 (a more powerful version of the Tay). Maximum speed was 605kt (1120kph, 696mph). Maximum altitude 49200ft (15000m).

The display aircraft is painted in the colours of Le Patrouille de France, the French Air Force formation display team during 1957 to 1964.

de Havilland Beaver DHC-2/L-20 58-2062



Photograph 2006-10-31.

The de Havilland Canada DHC-2 Beaver is a single-engined, propeller driven, high-wing and all metal aircraft that first flew in 1947. It was purpose built by de Havilland Canada as a bush aircraft after a 1946 questionnaire sent to Canadian bush pilots. With its powerful engine and wing/flap system it was an excellent Short Take Off and Landing (STOL) aircraft. Apart from its rough and ready bush role, the Beaver was/is used in numerous utility cargo and passenger roles. Around 1800 were built by 1968.

The display Beaver is in the markings of the US Army and was used to patrol the Berlin Wall (1961 to 1989) during the Cold War generally regarded as 1945-1991. It has a 335.7kW (450hp) Pratt & Whitney R985-AN-1 or An-3 Wasp Junior piston radial engine. Maximum speed was 139kt (258kph, 160mph).

The display Beaver is in the markings of the US Army and was used to patrol the Berlin

de Havilland Dove Mk 2 G-ALVD



Photograph 2006-10-31.

The Dove was a twin engine, low wing monoplane, retractable tricycle undercarriage aircraft designed for light passenger transport. It first flew in 1945 and was the first post World War II new build commercial aircraft to fly in the UK. It had two crew and could carry eight passengers, eleven if the lavatory compartment, or the rear baggage area, was removed.

Over 500 were built and operated worldwide. The aircraft also served with the RAF (as the Devon C Mk 1) and the RN (as the Sea Devon C Mk 20).

The Dove on display was first owned by an Indian Maharaja and used as his personal aircraft, but now has the livery of a Dunlop-owned example that used to operate from Baginton as G-ALVD. It has two de Havilland Gypsy Queen 257.3kW (345hp) in line piston engines. Maximum speed was 183 kt (338kph, 210mph).

de Havilland DH110 Sea Vixen FAW 2 XN685

The Sea Vixen was a two-seat, swept and folding wing, twin-boom tail, aircraft carrier-based, all-weather fighter, first flown in 1951. The Sea Vixen FAW.2 is easily identified by extension of the two tail booms forward of the wing leading edge. The purpose being to increase the internal fuel volume.



Photograph 2013-08-31.

The de Havilland design was in competition with the Gloster Javelin for new RAF all-weather fighter requirement. The RAF selected the Javelin. However, the RN believed that the Sea Vixen was better suited as a carrier-based fleet defence strike fighter. A much-modified version, incorporating features such as folding wings, stronger undercarriage and armament capability entered service with the RN in 1959. It served until 1972 when three were converted to target drones until 1993.

The Sea Vixen had two 48.9kN (11000lb) Rolls-Royce Avon 208 turbojet engines. Maximum speed 600kt (1110kph, 690mph). Range 800mi with internal fuel only. Armament with six hardpoints could carry combinations of four Red Top or Firestreak air to air missiles, four 454kg (1000lb) bombs, 28 folding fin rockets in a flip out launcher under the nose. It could also carry a phot-reconnaissance pod and drop tanks. Combat air patrol was 2 hours 15 minutes.

The Museum acquired XN685 in 1992. It operated with RN 890 766 893 Squadrons.

de Havilland Vampire F.1 VF301



Photograph 2006-10-31.

The distinctive twin tail boom Vampire first flew in 1943 and entered service in late 1945 after World War II had ended. A popular aircraft with over 4000 produced. It was the first RAF aircraft able to exceed 500 mph. It was also the first jet aircraft to take off and land from an aircraft carrier. An experimental version with an extended wingspan set a World Altitude record of 59446ft (18119m) in March 1948.

The Vampire was also interesting because it was partially plywood constructed. One could walk around the aircraft tapping it and hearing the different sound between the

plywood forward egg shape fuselage and the aluminium at the aft hot engine section.

It was followed by numerous fighter (F) versions and marks, culminating in the FB.53 fighter bomber. Initially a single seat jet fighter, two seat trainers were built and single seat fighter bombers and night fighters.

After the initial three prototypes, 244 Vampire F.1s were built. Initial production F.1s had square top fins, as seen in the photograph (from the F.3 variant onward they were rounded). Initially they had a 12.0kN (2700lb) thrust de Havilland Goblin 1 engine. After the 40th aircraft it was powered by a 13.8kN (3100lb) Goblin 2. From 51st aircraft there was provision for a pressurised cockpit and drop tanks. Armament consisted of four 20mm Hispano cannon with

underwing provision for two 454kg (1000lb) bombs, or eight 76mm (3in) rockets, or two drop tanks.

VF301 is one of only two F.1s in existence and the only one in the UK. It is displayed in the colours of 605 "County of Warwick" Squadron RAuxAF (Royal Auxiliary Air Force).

English Electric (BAC) Canberra PR3 WF992



Photograph 2006-10-31.

The first flight of the jet powered medium Canberra was in 1949, entering service with the RAF in 1951. It was also the RAF's first jet bomber. At the time it flew higher and faster higher than any other bomber, setting an altitude record of 70310ft (21430m) with a Scorpion Rocket Motor in 1957 and setting point to point speed records. Such as crossing the Atlantic from Aldergrove in England to Gander, Newfoundland, Canada, in 4 hours 18 minutes in a early B.2 version in 1952 and London, England to Darwin, Australia, in 22 hours and 21 seconds in a PR.3 in 1953. Wingtip fuel tanks were added on some types to increase range. The Canberra was

unarmed, using its speed and altitude as its defence. Its bomb payload was 2720kg (6000lb) and range 2301nm (4280km, 2660miles).

Its high service ceiling and speed made it ideal for photographic reconnaissance. There were three Canberra versions; the B (bomber), T (trainer) and PR (photographic reconnaissance). The distinguishing difference between the B and other two variants was an offset single pilot teardrop canopy for the pilot and glazed nose for the bomb-aimer/navigator in the B version and side by side oval canopy for the T and PR version with no glazed nose.

It retired from the RAF in 2006. In total 1376 were built and operated in 15 countries. With some built under licence in Australia and the USA.

The early model PR.3 on display had two 3402kg (7500lb) Rolls-Royce Avon 109 turbojet engines. Maximum speed 504kt (933kph, 580mph), service ceiling 48000ft (14630m), range 700nm (1295km, 805mi), ferry range 3154nm (5842km, 3630mi). It served with RAF 39, 69 58 and 82 Squadrons before retirement in 1975.

English Electric (BAC) Lightning F-6 XR771

The F-6 Lightning was a single-seat, all weather interceptor and the ultimate variant for the RAF. The Lightning was also the first and last all-British supersonic fighter. The Lightning first flew as the P.1A in 1954, serving with the RAF from 1959 until 1988. It also served with the Kuwait and Saudi Arabia air forces.

The intention was to climb as rapidly as possible to intercept incoming high altitude enemy aircraft. To do this it had an exceptional rate of climb being 20000ft (6096m) per minute. Service ceiling was in excess of 60000ft (18288m). Maximum speed was 1303kt (2415kph, 1500mph). Range on internal fuel was 695nm (1287km, 800mi) on internal fuel. For its time,



Photograph 2006-10-31.

The Red Top was a successor to the Firestreak.

Lightning F-6 XR771 is now preserved at the museum in RAF 5 Squadron colours, but last flew with 11 Squadron.

the Lightning's performance was phenomenal, but at the cost of its fuel load. In view of its role as primarily close airport defence this was not an important consideration.

The Lightning was unique in that its two turbojet engines were vertically staggered within the fuselage. The F-6 was fitted with two 71.17kN (16000lb) thrust Rolls-Royce Avon 301R or 302 turbojets with afterburner. Armament was two 30mm Aden cannon and two Red Top air to air guided missiles on the forward part of the fuselage at the wing root.



Photograph 2006-10-31.

English Electric (BAC) Lightning T-55 ZF598/55-713

The T-55 was a two-seat conversion trainer, equipped as an all-weather interceptor. It had two 71.14kN (15680lb) thrust Rolls-Royce Avon 302c turbojets with afterburner. Performance and armament was similar to the F-6.

T.55 55-713 was one of a number of fighters and trainers built for the Royal Saudi Air Force. It is the only ex-Saudi example preserved in the UK wearing authentic markings.

Fairy Ultralight G-APJJ

The Fairy Ultralight was designed for observation and general duties on the battlefield. Six were built.

Apart from its small size the late 1950s two crew Fairey Ultralight is unusual in that the rotor was powered by tip jets rather than turboshaft drive. High pressure air mixing with fuel was burned in small pods at the ends of the rotor blades provided jet propulsion. An adapted Blackburn Palouste turbojet engine located at the rear of the small almost spherical fuselage provided compressed air for the tip jets. This did away with having to provide a shaft from the engine to the rotor.

Unfortunately, a better photograph was not obtained. At the time the small helicopter was not noticed when the Leopard was photographed. By combining parts of two photographs, an attempt has been made at showing the aircraft cabin in the right image and its tail in the left image. Unfortunately, its turbojet engine protruding from the rear of the cabin is not visible.



Photographs 2023-12-08.

Fairey Gannet T-2 XA508



Photograph 2013-08-31.

The Fairey Gannet was a RN three or four seat, anti-submarine and torpedo bomber for aircraft carrier operation and folding wings. First flown in 1949, the Gannet was later modified to produce an airborne early warning version with radar mounted below the fuselage.

The Gannet had a single Armstrong Siddeley Double Mamba 100 turboprop producing 2200kW (2950hp) driving two contra-rotating propellers through a co-axial shaft. Maximum speed 261kt (497kph, 300mph). Service ceiling 25000ft (7625m). Range 695nm (1287km, 800mi). Armament two

torpedoes in weapons bay or 907kg (2000lb) of bombs, depth charges, mines, or rockets on wing racks.

The Museum's example is a T.2 XA508 trainer variant, the first to be delivered and the only one left in the World. XA508 had a short service life from first flight in 1955 (where it served with RN 737 Squadron), to ground instruction use in 1957. On to the RN Fleet Air Arm Yeovilton museum in 1975, then on loan to the Midland Air Museum in 1982.

Flettner Fl 282 Kolibri (Hummingbird) Werknummer 28368

The museum has an extremely rare exhibit, the world's only surviving WWII German Flettner Fl282 Kolibri (Humming Bird). It was a single or two seat observation/artillery spotting helicopter with two contra-rotating, intermeshing rotors. The two-seat version had an observer sitting facing rearward to the rear of the engine and forward of the tail.

The engine was a seven-cylinder, 119kW (160hp) Bramo Sh 14 radial engine. An engine driveshaft connected to the gearbox which split the power into two contra-rotating driveshafts that turned the rotors. Maximum speed was 81kt (150kph, 93mph). Service ceiling was 10827ft (3300m). Range 162nm (300km, 185mi). Construction was steel tube covered with metal



Photograph 2023-12-08.

panels and doped fabric with fixed undercarriage. Rotors and undercarriage could be removed for compact storage.

After twenty-five years of restoration, it is now complete and on display in the main hanger. Previously it was in storage from the 1970s. It was minus an engine and instrument panel. An engine, a seven-cylinder, 160hp Siemens-Halske Sh 14 radial engine was obtained from the USA and a 3D printed instrument panel was made.

The Kolibri's first flight was the 30th October 1941. It is understood that 30 prototypes and 15 pre-production examples were built. A contract to build 1000 was awarded to BMW. However, they were only able to build 24 before the factory was destroyed by Allied bombing. A small number flew from Kriegsmarine vessels in the Baltic, Mediterranean and north Aegean in the reconnaissance role. A few were delivered to the Luftwaffe with probably limited use as artillery spotters. Most were destroyed by Soviet fighter aircraft and anti-aircraft artillery fire. One was sent to the USA for testing, one to the Soviet Union and 28368 to the UK, now the only one left.

Folland Gnat F.1 XK724 or KXK741



Photograph 2023-12-08.

An apparently complete Folland Gnat F.1 in RAF markings and camouflage was photographed in the restoration hanger 8th December 2023. Next to the office door entrance to the hanger was the decrepit fuselage of a Folland Gnat F.1 in faded colours of the Finnish Air Force. According to the list of aircraft at the museum, this is Gnat F1 XK741 painted as GN-101. The other Gnat F.1 is XK724 according to Wikipedia's list of surviving Folland Gnats. To add to the confusion, BAE Systems states that the RAF never operated the F.1, only the

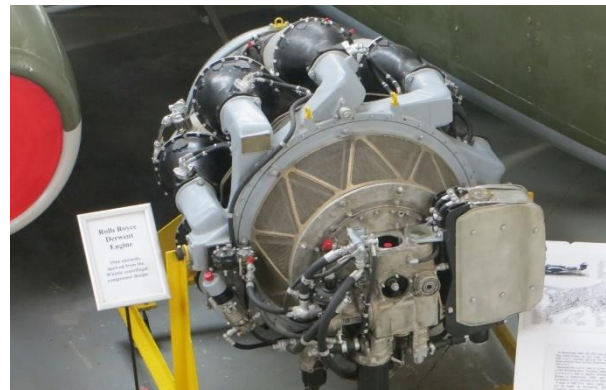
trainer version. F.1s were operated by the Finnish Air Force and 213 for the Indian Air Force, 175 of which were built under licence by Hindustan Aircraft Limited, India. Be that as it may, there is a Folland Gnat F.1 nearing completion.

The Folland Gnat F.1 was a retractable tricycle undercarriage, single seat, single engine. swept high wing light fighter. It was powered by a 20.9kN (4705lb) Bristol Siddeley Orpheus 701-01 turbo jet. Maximum speed was 604kt (1120kph, 695mph) at 20000ft (6096m), range 434nm (800km, 500mi). Armament two 30mm Aden guns and two 227kg (550lb) bombs or 18 (75mm (3in) rockets.

Gloster Meteor F.4 EE531 and Armstrong Whitworth Meteor NF14 WS838

The Gloster Meteor was the first British and RAF jet fighter and the Allies' only operational jet aircraft during the late part of World War II. It first flew in 1943 and began operational use in July 1944. It was a single seat, all-metal aircraft, low wing aircraft with two mid-mounted

turbojet engines and retractable tricycle undercarriage. It had a high-mounted tailplane (almost a T-tail) that was clear of the jet exhaust.



Photographs 2023-12-08. Meteor F.4 and its Rolls-Royce Derwent turbojet engine.



Photograph 2023-12-08. Cockpit view.

In total, 3875 Gloster Meteors were built. More than any other British jet aircraft at the time and widely exported. In the UK, 3545 were built by Gloster Aircraft Company and by Armstrong Whitworth. The latter built 1050 at Baginton, Coventry.

The Meteor was developed into a large number of different variants. The F.4 fighter version flew in 1945. It was a significant improvement on the F.1 and F.3, with over 700 of this mark produced, serving with air forces all over the world. The F.4 had two

15.56kN (3500lb) Rolls Royce Derwent 5 engines, later increased to 31.13Kn (7,000lb). Armament was four 20mm Hispano Mk.III cannon in the nose.

EE531 is the oldest surviving production Meteor in the UK and the second oldest in the world.



Photograph 2023-12-08. NF14 WS838.

The Armstrong Whitworth Meteor NF14 WS838 was a two-seat night fighter, one of the 1050 built at Coventry. It had two 16.1kN (3600lb) thrust Rolls-Royce Derwent RD-8 centrifugal turbojets. Maximum speed was 508kt (941kph, 585mph). Service ceiling 44000ft (13411m). Range 869nm (1609km, 1000mi).

The first night fighter version (the NF.11) flew in 1950. Around 550 NF.11s, 12s and 14s were built. WS838 was first flown in 1954, retired in 1971. It is on loan/donated

from the Royal Air Force Museum at Cosford and was repainted in her original RAF 64 Squadron colours. However, it is again being restored, as shown stripped in this 8th December 2023 photograph.

Gloster Javelin FAW.5 XA699



Photograph 2013-08-31.

The Javelin was a two seat, T-tail, all-weather fighter in service with the RAF from 1954 to 1968. FAW means Fighter All Weather. It first flew in 1951 and was also the first twin-jet delta-wing all-weather fighter in the world. Nearly 400 were built. It was designed to intercept bombers approaching at high altitude and subsonic speed. It did not entirely live up to expectations, but it did improve with later modifications by the time the FAW.5 entered service.

The FAW.1 had two 37.66kN (8300lb) Bristol Siddeley Sapphire turbojets. Maximum speed was (1094kph, 680mph).

Service ceiling 49500ft. Range with drop tanks 1530km (950mi). Armament was four 30mm Aden cannons in wings and four Firestreak missiles on underwing pylons. The FAW.5 had two 44.5kN (10000lb) thrust Armstrong Siddeley Sapphire Mk.10202 or 10302 engines. Maximum speed was 616kt (1141kph, 708.98mph). Armament was still the same.

The museum's restored example is the only remaining Mk.5 in existence. It served with RAF 5 and 151 Squadrons.

Hawker Hunter F-6a XF382



Photograph 2013-08-31.

The single seat Hawker Hunter first flew in 1951. It went on to become an excellent, durable and famous fighter aircraft with nearly 2000 built, serving in air forces worldwide. It was a fighter that developed to ground attack, reconnaissance and trainer variants. Toward the end of its life some were used towing targets for artillery practise. The F.6A was a modified F.6 with strengthened the wings to carry a greater load in the ground-attack role.

The museum acquired F-6a XF382 in 1987. It is displayed in the colours of RAF 234 Squadron as it was in 1976. It had one Rolls-

Royce Avon 203 single shaft turbojet. Maximum speed 617kt (1144kph, 710mph). Operational history 92, 63, 65 Sqns, OCU 1 Tactical Weapons Unit (shadow 234 Sqn).

A Hawker Hunter is also famous for flying through the span of London's Tower Bridge. On the 5 April 1968, RAF pilot Alan Pollock, unauthorised, flew low over the Houses of Parliament (and other landmarks, plus RAF airfields) in a demonstration against defence cuts. On the spur of the moment, he flew through the span of Tower Bridge on the River Thames in a Hawker Hunter FGA.9 number XF442. FGA = Fighter Ground Attack. Needless to say, it was the end of his RAF flying career.

Lockheed T-33 Shooting Star 51-7473 and Lockheed T-33 Shooting Star 51-4419



Photographs 2023-12-08. T-33 51-7473 (left), T-33 51-4419 right.



Photograph 2023-12-08. T-33 51-4419 cockpit.

The T-33 was a two-seat jet trainer used to train many USA and North Atlantic Treaty Organization (NATO) military alliance aircrew. First flown in 1950, the T-33 was derived from the P-80 fighter.

It had one 23.1kN (5200lb) thrust Allison J-33-35 turbojet. Maximum speed was 527kt (975kph, 606mph), service ceiling 48000ft (14630m). Range 956nm (1770km, 1100mi). It was unarmed. However, the two-seat attack AT-33 had two hardpoints for a total of 907kg (2000lb) bombs or rockets and two 12.7 Browning heavy machine guns in the nose.

T-33 Shooting Star 51-7473 is a Canadian-built ex-French Air Force aircraft that was displayed in the colours of the Canadian Red Knight aerobatic team during 1958 to 1969. However, it is in now Italian Air Force livery and markings with the number 117529.

Meanwhile, in the main hanger, there is a T-33 Shooting Star, ex-French Air Force (delivered in 1952) that was in service Morocco before being retired in 1977. It now bears the number 51-4419 in the colours of Keflavik (Iceland) based 57th Fighter-Interceptor Squadron of the United States Air Force (USAF).

Lockheed F104G Starfighter 64-17756 R-756

A truly remarkable strike jet fighter and distinctive. Its wings were short and thin. The wing span was about 6.7m (less than 22ft), 10cm (4 inches) at the wing root and less than 19m² (200ft²). Often referred to as a missile with wings, or a missile with a pilot in it.

Wing leading and trailing edges were sharp enough that they had special covers to prevent injury during maintenance. Air from the jet was blown over the flaps to increase lift at low speeds. Most unusual was the downward firing ejection seat. No zero speed zero altitude for these seats.

The Lockheed XF-104 first flew in 1954 and had a troubled development culminating in limited use in the USAF from 1958 to 1969 and the National Guard until 1975. However, it



Photograph 2006-10-31.

was widely exported at bargain prices to NATO air forces and Japan. A high accident and fatality rate with the German Luftwaffe and Marineflieger earned in the nicknames flying coffin and widow maker.

The museum's Starfighter 64-17756 served with the Danish Air Force Esk 726. It had one 44.5kN (10000lb) thrust General Electric J79-GE-11A jet engine, 70.3kN (15800lb) with afterburner (re-heat). Maximum speed 1260kt (2330kph, 1450mph). Armament was one 20mm cannon, four AIM-9 AAMs, or up to 4000lb of bombs/fuel in an auxiliary tank.

McDonnell F-101B Voodoo 56-0312



Photograph 2023-12-08.

The F-101B was a two-seat, all-weather, long range, fighter interceptor. The F-101 first flew in 1948 as the XF-88. Originally it was designed as a long-range bomber escort. Subsequently developed into fighter-bomber, interceptor, photographic reconnaissance and trainer versions.

An information board next to the museum's displayed Voodoo identifies it as a TF-101B trainer/fighter. On their website it is identified as a F-101B all-weather interceptor/trainer. Some F-101Bs were built as dual-control operational trainer aircraft

dubbed TF-101Bs.

Irrespective whether it is a T-101B or a TF-101B, the displayed Voodoo first flew in 1954 or 1956. It served with the USAF Kentucky Air National Guard and restored in Happy Hooligans colours. As photographed on the 8th December 2023, it is now in the colours of Royal Canadian Air Force. The aircraft was powered by two Pratt & Whitney J57 turbojets with re-heat (afterburner). Maximum speed was 1066kt (1963kph, 1227mph). Armament was three Falcon AIM-4D AAM's, two AIR-2A Genie nuclear AAM's.

McDonnell Phantom II F-4C 63-7699

The F-4 was a tandem two seat crew, twin engine, supersonic, all-weather, long-range land and aircraft carrier-based fighter-bomber. The F-4C identified as USAF aircraft, while the F-4B was the United States Navy (USN) version with differences such as folding wing tips for storage, arrestor hook and catapult launch. The aircraft was flown by a pilot plus, in the USAF weapons systems officer while in the USN it was a radar intercept officer. It was fast, at around Mach 2.23, that is over twice the speed of sound and a fast climber at around 41000ft per minute (210m per second).



Photograph 2013-08-31.

The Phantom was conceived as a carrier-borne fighter bomber for the USN, but soon served with the land-based USAF. It was flown by numerous nations including the UK, nearly 5200 were built. At the height of the Vietnam War over 70 a month were being built.

F-4C 63-7699 fighter bomber on display was built in 1958. This aircraft was in combat in Vietnam and has a red star "kill" marking on the left intake splitter plate. It had two General Electric J79-GE-15 turbojet engines with afterburner (re-heat). As an example of thrust, the 17A had 52.96kN (11905lb) per engine, 79.4kN (17845lb) with afterburner. Maximum speed information provided with the display aircraft was 1396kt (2585kph, 1606mph), but varied across variants. Its armament is listed as four Raytheon AIM-7E Sparrow IIIBs, or four NWC AIM-9B Sidewinder 1As. However, it could also have a 20mm cannon gunpod mounted under the nose. Generally, F-4 armament was widely varied.

Mikoyan-Gurevich MiG-21 PFM 959



Photograph 2013-08-31.

The Soviet MiG-21 is a single-sear, single engine, all-weather, supersonic interceptor fighter. Faster than Mach 2, the first Soviet fighter capable of doing so. It first flew in 1955. It is estimated that 11500 were built, used in at least 55 air forces and been involved in 30 wars. Some war examples are; Vietnam (1955-1975), the Arab-Israeli Wars (intermittently after 1960-1982), Iran-Iraq War (1980-1988), Afghanistan (1978-1989) and the first Gulf War (1991) also known as Desert Storm.

It is a rugged aircraft, simply built with traditional materials and basic design so that it could be mass produced quickly and cheaply. It could operate from unprepared airfields and simple to maintain.

A typical jet engine was the 40.2kN (9030lb) thrust Tumansky R-25-300 turbojet, 69.6kN (15640lb) with afterburner. Maximum speed 1174kt (2175kph, 1351mph). Service ceiling 57400ft (17500m). Armament; one 23mm GSh-23L cannon. Four underwing hardpoints for rockets, rocket pods or air to air missiles or conventional bombs. A fuel drop tank could be carried on a under fuselage hardpoint.

The MiG-21PFM in the photograph at the museum is an ex-East German Air Force example acquired in 2001. The PF had an updated more powerful afterburning engine (probably a R-11F2-300 turbojet) and the pitot probe moved to the nose top. It also had new system for controlling the variable air intake at the nose. The larger intake contained a new RP-21

search/track radar, giving all-weather capability. M was an East German designation for the MiG-21PF. The variant also dispensed with the cannon in favour of air-to-air missiles and rocket pods.

Mil Mi-24D 06 RED 353246405029



Photograph 2013-08-31. Rotors alongside.

The Soviet Mi-24D (NATO name Hind) first flew in 1969. It is a large helicopter gunship and able to carry eight troops. Unusual to carry troops in a gunship. Over 2000 have been built, serving with more than 30 nations and still in service with many air forces.

The example aircraft at the museum was bought from Latvia by BAE Systems as part of an upgrade programme, with which they were involved, with modern NATO avionics and for display at the 2004 Society of British Aerospace Companies (SBAC) show at Farnborough.

Subsequently, Mi-24C, registration 06 RED, construction number 353246405029, was acquired by the museum in 2005. It had two 1600kW (2200hp) Izotov TV3-117 gas turbine engines. Maximum speed was 182kt (335kph, 209mph). Service ceiling 16100ft (4900m). Range 240nm (450km, 280mi). Armament consisted of a nose mounted flexible machine gun with twin pylon missile racks on each of two 6.54m (21.5ft) stub wings. Wing-tip pylons can only carry the 9M17 Falanga Anti-Tank Guided Missile (ATGM).

North American F-86A Sabre FU-242 48-0242



Photograph 2023-12-08. Earlier images had a horizontal yellow band on the tail.

The North American F-86 Sabre was a single-seat, retractable tricycle undercarriage, transonic jet fighter aircraft that first flew in October 1947. It set a world speed record of 583kt (1079.7kph, 670.9mph) less than a year later in September 1948. It was also the USA's first swept-wing fighter that could compete with the swept-wing Soviet MiG-15 in jet dogfights in the Korean War of 1950 to 1953, shooting down enemy aircraft at a ratio of 10 to every 1 Sabre lost. Developed in the late 1940s, it was already outdated by the end of the 1950s. More than 5500 Sabres were built in the USA and Canada. Some sources give total

production as high as 9860 units worldwide, including nearly 2000 built by Canadair and some in Australia.

The F-86A had a 23kN (5200 lb) thrust General Electric J47 turbojet engine. Maximum speed was 582kt (1078kph, 685mph). Service ceiling 14935m (49000ft). Armament was six 1.27cm (0.5in) machine guns fixed in the nose with underwing eight 12.7cm (5.0in) rockets or 907kg (2000lb) bombs.

North American F-100D Super Sabre 54-2174



Photograph 2023-12-08.

The Super Sabre was a single seat fighter bomber, first flown in 1953. The F-100 was highly successful and the first aircraft to exceed the speed of sound in level flight reaching Mach 1.2. When production ended in 1959, 2294 F-100s were built of which 1274 were D variants.

The Super Sabre was in action in the 1955-1975 Vietnam war where it was used as a ground support fighter bomber.

The museum's aircraft, circa 1953 and acquired in 1978, is ex-French Air Force, but painted to represent a Vietnam-era USAF aircraft. It had one Pratt & Whitney J57-21V turbojet rated at 75.4kN (16950lb) with afterburning. Maximum speed was 751kt (1391kph, 864mph), service ceiling 45000ft (13716m) and range 1734nm (3211km, 1995mi) with drop tanks. Armament was four Colt M-39E 20mm cannons with six underwing hardpoints for up to 3400kg (7500lb) missiles, rockets or bombs.

Panavia Tornado GR4 ZA452



Photograph 2023-12-08.

The Panavia Tornado was a tri-nation aircraft developed and manufactured between the UK, Germany and Italy that first flew in 1974. It is a two seat, all weather, twin engine, variable-sweep wing, multirole aircraft which meant that it was able to replace several different fleets of aircraft. Tornados also flew with the Royal Saudi Air Force.

The displayed Tornado was an interdiction/ground strike aircraft with two 71.7kN (16075lb) Turbo Union RB199-103 turbofan engines with afterburning. Maximum speed was Mach 2.2 (1295kt, 2398kph, 1490mph), service ceiling 50000ft (15240m), range 1500nm (2778km, 1726mi). Armament one Mauser 27mm cannon and a wide range of fuselage and wing pylon mounted missiles and bombs up to 8165kg (18000lb)

ZA452 first flew in 1983 as a GR.1 then modified to GR.1B and GR.4 in 1991. Operated with RAF 20, 15, 9, 31 and 2 Squadrons. Took part in the 1st Gulf War 1990-1991. Its last flight was in 2013.

Percival Prentice T.1 VS623/G-AOKZ

The Prentice was a two or three seat, low wing, fixed taildragger undercarriage, basic trainer used by the RAF and Indian Air Force. First flown in 1946. It was a replacement for the much simpler pre-World War I Tiger Moth with more power, flaps, radio and enclosed tandem cockpit. It had one de Havilland Gypsy Queen 32 straight six-cylinder 187kW (251hp) engine driving a variable pitch two blade propeller. Maximum speed was 145kt (269kph, 167mph).



Photograph 2013-08-31.

The RAF had 349 aircraft, 100 were sold to Argentina and 42 of the more powerful T.3 were licence built in India for the Indian Air Force. They were withdrawn from RAF service in 1956.

The museum's VS623, shown in RAF livery, served with the RAF 2 and 22 Flight Training Schools. It was one of many sold off to civilian owners, VS623 became G-AOKZ and ended up as an instructional airframe at Chelsea College before being acquired by the Museum and restored to her original RAF colours.

PZL Mielec TS-11 Iskra 408 1706



Photograph 2013-08-31.

The Polskie Zakłady Lotnicze (Polish Aviation Works) Iskra (Spark), first flown in 1960, was a successful Polish two seat, all-metal, mid-wing, primary jet trainer, in the fashion of the Hunting Aircraft Jet Provost T3. The student sat in the front of the tandem cockpit, instructor in the rear. More than 500 were built. The aircraft flew with the Polish Air Force and Navy as well as the Indian Air Force.

The displayed Iskra, restored and painted in Polish Air Force livery, had a Polish 10.8kN (2420lb) thrust WSK SO-3W turbojet with twin wing root embedded air intakes.

Maximum speed 388kt (719kph, 447mph) at 16400ft (4999m), service ceiling 36000ft (10973m) and range 674nm (1249km, 776mi).

Armament was one 23mm cannon in the nose with four underwing pylons that could carry unguided rocket pods, gun packs or conventional bombs.

Saab J-29F Tunnan 29640

The J-29F (nickname Tunnan, or barrel) was a single seat, retractable tricycle undercarriage, single engine, mid and swept-wing, transonic jet fighter that made its first flight 1948. Designed as an interceptor fighter, it served with the Royal Swedish Air Force from 1951 to 1976. Ground attack and photographic reconnaissance variants were also developed and produced. In total 662 J-29s were built. It also served with the Austrian Air Force and the United Nations peacekeeping force in the Congo in 1961 to 1963.

The air flow from the nose to the rear directly through the barrel shaped fuselage maximised thrust. At the time it was a technologically advanced aircraft, incorporating features such as; automatic-locking wing leading edge slots that were connected with the flaps for lateral stability during take-off and landing; main undercarriage which retracted into the fuselage meant thinner less drag wings; and dive brakes. It also had an explosive ejector seat system.



Photograph 2023-12-08.

For a fighter it was small, but fast. Maximum speed was 559kt (1035kph, 643mph) without afterburner. Service ceiling was 45000ft (13700m) and range 810nm (1500km, 932mi). The engine was a 73.8kN (16600lb) de Havilland Ghost 50 turbojet. Armament was four nose located 20mm Hispano Mk.4 cannon. As well as combinations of AIM-9 sidewinder missiles, air to air rockets, anti-armour and anti-ship rockets and fuel drop tanks. In the photographic reconnaissance role, it would have four Ska 10 cameras.

The museum's example, donated by the Royal Swedish Air Force, is the only J-29 in Britain.

Vickers Viscount 708 F-BG NR



Photograph 2013-08-31.

The four engine, low wing, passenger Vickers Viscount was first turboprop airliner in the world. The first prototype Viscount first flew in 1948 with a total of 445 built of all series (700, 800 and 810), plus 3 prototypes. Passenger capacity was 43 to 65 seats, the higher capacity being in the longer fuselage 800s and 810s.

The 700 series was the first production variant, entering full passenger service in 1953. The Viscount was immediately popular for its smooth and quite ride and large windows being was sold worldwide. The 700 had four 1154kW (1547hp) Rolls-Royce Dart

505 turboprop engines. Maximum cruising speed was 290kt (537kph, 334mph). Maximum Range at economy cruising speed 275kt (510kph, 317mph) 1738nm (3219km, 2000mi) at 21000ft (6400m). At maximum payload 1503nm (3219km, 1730mi).

The museum owned Viscount 708 F-BG NR (construction number 35), ex-Air France, was built in 1954. It has been restored in the livery of Air Inter. Air Inter was a French domestic airline that merged with Air France.



Photograph 2006-10-31.

Westland WS-55 Whirlwind series 3 G-APWN

The Westland Whirlwind utility helicopter was a licence-built version of the Sikorsky S.55. To meet British standards, modifications had to be made. Such a revised main-rotor gearbox. It first flew in 1953.

The WS-55 series 1 to 3 s were built for civilian use. The series 3 first flew in 1959. It

had a 783kW (1050hp) Bristol Siddeley Gnome 101 turboshaft engine. Cruising speed was 90kt (167kph, 104mph) and service ceiling 15976ft (4870m). Range with maximum fuel 450nm (834km, 518mi) and maximum payload 94nm (174km, 108mi). Excluding the two pilots, the Whirlwind could carry up to ten passengers, six stretchers, or cargo.

The displayed WS-55 Whirlwind series 3 G-APWN flew with Bristow Helicopters. Shown in its colours when the photograph was taken in 2006.

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