

**RUSSIAN JETLINERS EXPOSED**

# AVIATION

NEWS

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## RUSSIAN AIRLINER

**Tu-154** Tupolev's Trijet  
**Il-86** First Soviet Widebody  
**Yak-40** Early Regional Jet

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**ALCONBURY TR-1s**  
Stratospheric Cold War Warriors



**EXCLUSIVE**



**JAPANESE  
PHANTOMS**  
Approaching Sunset

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**KEY**





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## HISTORY OF THE NORTH AMERICAN AVIATION P-51 MUSTANG

The North-American P-51 Mustang was an American fighter designed in the early 1940s and is considered the best US fighter of WWII. It was widely exported to countries in Europe, Asia, Africa and South America. The most famous Mustang version was the P-51D with teardrop (or bubble) canopy. The main problem for the pilots of the earlier variants was a huge blind spot at the rear of the aircraft due to the canopy design. The canopy had no framework and offered near 360-degree vision. The inaugural flight of the new P-51D took place at Inglewood, California on 17th November 1943.

### PRO:

- Great performance at altitude
- Very fast at all altitudes
- Very agile at high speeds
- Good turn radius at high speeds

### CONS:

- Can't sustain much damage
- Sluggish at low speeds
- High stall speed
- Average climb rate.

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Cover (main image): An Aeroflot Tupolev Tu-154M captured on approach to Moscow's Sheremetyevo International Airport. AirTeamImages.com/Alexander Mishin. Inset (lower right): An example of the Lockheed TR-1As which flew from RAF Alconbury. Peter R Foster. Inset (lower centre): A Japanese Air Self Defense Force RF-4E of 501 Hikotai climbs away on take-off. Rich Cooper/COAP



# 777X Takes Flight



After several delays, the first Boeing 777X took to the air for an initial 3hrs 51mins sortie from Paine Field to Boeing Field in Washington state on January 25.

The manufacturer had initially pencilled in a maiden flight for January 23, but was forced to postpone due to inclement weather. A second attempt the following day was blighted by strong winds, with the jet spending more than an hour on Paine Field's Runway 34L threshold in the hope of better conditions. A breakthrough came two days later than scheduled, with the widebody departing the Everett, Washington plant at 10.09am local time.

**The 777X making its first landing at Boeing Field, following its January 25 maiden flight.**  
AvStock/Huy Do

Captain Van Chaney, 777/777X chief pilot for Boeing Test & Evaluation, said: "The 777X flew beautifully, and today's testing was very productive. Thank you to all the teams who made today possible. I can't wait to go fly your airplane again."

Chaney, along with Boeing chief pilot Craig Bomben, worked through a detailed test plan to exercise the aircraft's systems and structures, while the team in Seattle monitored the data in real time.

Stan Deal, president and CEO of Boeing Commercial Airplanes, said: "Our Boeing team has taken the most successful twin-aisle jet of all time and made it even more efficient, more capable and more comfortable for all. Today's safe first flight of the 777X is a tribute to the years of hard work and dedication from our teammates, our suppliers and our community partners in Washington state and across the globe."

The 251ft 9in (76.7m) long airliner, N779XW (c/n 64240), is the first of four flight test aircraft which will be used to certificate the new type ahead of an initial delivery to Lufthansa scheduled for early 2021.

## Coronavirus Prompts Precautions

The Coronavirus outbreak has had a serious impact on air travel to and from China. British Airways and Virgin Atlantic suspended flights to the country for at least a month from the end of January. Most European airlines with services to China have taken similar steps. North American carriers – Air Canada, American Airlines and United Airlines – have also suspended flights for up to two months. Most of the main Asia-Pacific carriers have followed suit, although some, including Singapore Airlines, Korean Air and Japan Airlines, are still running some services to mainland China as of press date.

In response to the lockdown of Wuhan, the most affected city, the UK Foreign and Commonwealth Office chartered a 747 from Spanish firm Wamos Air to fly British citizens from the central Chinese city to RAF Brize Norton, arriving on January 31. The

passengers were then driven by coach to quarantine at an NHS facility in the Wirral. A second flight arrived on February 9, with passengers going to Milton Keynes.

The virus also affected the biennial Singapore Air Show, being held over February 11-16. Several major exhibitors, including Lockheed Martin, Textron, Bombardier and Piaggio, withdrew from the event, as did ten Chinese companies and South Korea's Black Eagles aerial demonstration team. Surprisingly, on February 5, China's August 1 display team arrived in Singapore, not having been previously announced by organisers. Their seven J-10 fighters were supported by two Il-76 transports from the PLAAF's 13th Transport Division based in Hubei province, the epicentre of the Coronavirus outbreak. Show organisers said the Chinese personnel were being regularly monitored for signs of the virus.

## Leonardo Buys Kopter



Leonardo is to purchase Kopter Group AG, which has developed the SH09 light helicopter in Switzerland. The five-to-eight-seat SH09 first flew in 2014 and is largely made of carbon composite materials. It has a maximum takeoff weight of 6,283lb (2,850kg) and a 497-mile (800km) maximum range. The deal, which is worth \$185m plus future payouts linked to the success of the programme, was announced at the Helicopter Association International (HAI) Heli-Expo convention at Anaheim, California on January 28. Kopter will remain an autonomous legal entity. Leonardo says that the acquisition will replace its own planned investment to develop a new single-engine helicopter for its rotorcraft range.

**A SH09 on display at Heli-Expo, Anaheim.** Barry Ambrose



# RAF Poseidon Arrives in the UK



**The first RAF P-8A touches down at Kinloss Barracks on February 4.** MOD Crown Copyright 2020/Sgt Ashley Keates RAF

The first Boeing Poseidon MRA1 for the RAF arrived in the UK on February 4. Flying in from NAS Jacksonville, Florida, ZP801 *Pride of Moray* touched down at Kinloss Barracks (formerly RAF Kinloss) after a flypast flanked by two Typhoon fighters. The nine Poseidons on order will be operated by 120 and 201 Sqns from RAF Lossiemouth upon completion of runway and infrastructure work in October.

ACM Mike Wigston, Chief of the Air Staff, said: "The Poseidon MRA1 is a game-

changing maritime patrol aircraft. I am delighted and proud to see the *Pride of Moray* and her crews returning to maritime patrol flying from Scotland, working alongside the Royal Navy to secure our seas and protect our nation."

Defence Minister Anne-Marie Trevelyan said: "Our Poseidon fleet will soon join an integrated UK force of fighter jets, ships, submarines, helicopters and highly-trained Royal Marines, ready to operate in Arctic conditions. The UK

will not stand by if peace in the Arctic region is threatened.

"RAF Lossiemouth's strategic northerly location makes it one of the most important air stations in the UK: already home to half of the UK's Typhoon Force, and now sitting at the heart of our anti-submarine operations."

The P-8 was ordered in November 2015, following the cancellation of the Nimrod MRA4 programme in October 2010, leaving an MPA 'capability gap' of nearly a decade, filled in part by other NATO nations. In July 2012, RAF Kinloss was handed over to the army, but retained its runway and aviation infrastructure.

The following day, the second Poseidon, ZP802, *City of Elgin* arrived at NAS Jacksonville, Florida and was handed over to the RAF. It is expected to fly to Kinloss in March.

## Airbus Hit With Huge Fine

Airbus has been ordered to pay a fine of €3.98bn in settlement of a bribery case. The manufacturer agreed to pay the fine in exchange for suspending the prosecution of alleged bribery. The deferred prosecution agreement will see France paid €2.08bn, the UK €991m and the US €525m.

The High Court in London ruled on January 31 that the European aerospace giant had used a network of agents around the world to secretly bribe officials in order to win high-value

contracts. The case involved AirAsia, AirAsia X, Citilink, Sri Lankan Airlines and TransAsia Airways.

Justice Victoria Sharp said in her ruling that "The seriousness of the criminality in this case hardly needs to be spelled out. As is acknowledged on all sides, it was grave. The conduct took place over many years."

The settlement brings to an end a probe begun by investigators in the UK, US and France four years ago. The conclusion of the case has triggered

other investigations elsewhere. After the ruling, AirAsia Group said its chief executive Tony Fernandes and chairman Kamarudin Meranun would step aside for at least two months while both the airline and the Malaysian government probed allegations. In a joint statement, the pair denied any allegations of wrongdoing or misconduct as directors of AirAsia. "We would not harm the very companies that we spent our entire lives building up to their present global status," they said.

## Finland Evaluates HX Contenders



**The two 41 Sqn Typhoons which flew to Finland for the H-X demonstration.** Eurofighter

Sqn Typhoons, which were deployed to Tampere-Pirkkala Air Base over January 9-17. They were followed by two Dassault Rafale Bs on January 20-28. Saab sent Gripen E 39-10 and the two-seat Gripen Demo 39-7 to Pirkkala between January 29 and February 6. The Gripen E was equipped with Meteor and IRIS-T air-to-air missiles and the company's new electronic attack jammer pod. During the evaluation, a GlobalEye AEW&C flew over Finland to demonstrate its capabilities. Saab's proposal includes GlobalEye, but the company declines to say how many aircraft they are offering in total for the Finnish requirement.

The next challenger is the Lockheed Martin F-35A Lightning II with examples due in Finland around the time the magazine was going to press. They were due to be followed by the Boeing Super Hornet and Growler from February 18-26.

On January 31, all five companies submitted updated offers in response to Finland's revised Request for Quotation. Finland has a requirement to replace its 62 Hornets with deliveries beginning in 2025. The best and final offers from all companies are due in July this year, and a contract signature is anticipated in 2021.

The competition to replace Finland's 55 F-18C and seven F-18D Hornets has reached the evaluation stage, named HX Challenge, in which contending aircraft perform various tests under Finnish winter conditions. Eurofighter kicked off the challenge with two RAF 41



# Etihad Greenliner



Newly delivered Etihad 787-10, A6-BMH, made its first revenue flight, to Manchester, on January 25. In a partnership with Boeing, the 'Greenliner' is being used to test products, procedures and initiatives designed to reduce aircraft carbon emissions. Ashley French

## RAM Joins oneworld

Airline alliance oneworld is to induct its first African carrier as a full member, with Royal Air Maroc (RAM) due to join the group from April 1. The airline's regional arm, Royal Air Maroc Express will also become an affiliate partner in the tie-up. Previously, the alliance was only represented on the continent by British Airways' franchisee Comair, which holds affiliate status. Rob Gurney, CEO of oneworld, said: "The quality [of] service and global network offered by Royal Air Maroc will position oneworld as the preferred alliance in Africa."

RAM's network will add 39 new destinations in 23 countries to oneworld's existing route map of 1,100 destinations in 180 territories. This will enable users of the carrier's Safar Flyer

programme to redeem and earn awards with fellow oneworld partners, with customers in the top tier having access to priority boarding/check-in and 650 global lounges. Joining the alliance is a milestone in the airline's efforts to increase its passenger numbers to 13m annually within five years and to create a new African hub located at its Casablanca base.

The company has expanded its international network in recent times. A thrice-weekly Beijing/Daxing rotation was added in January, while the carrier has increased the number of destinations in the United States, introducing links to Miami and Boston last year, which builds on existing New York/JFK and Washington/Dulles flights.

## Aeroflot's First A350 Breaks Cover

The first Airbus A350 for Russian flag carrier Aeroflot has rolled out of the paint shop in the company's modified corporate livery.

Aeroflot's A350-900s are configured to carry a total of 316 passengers, in a three-class layout comprising 264 in economy, 24 in premium economy and 28 in business. The initial A350 for the Russian firm was due to be delivered to Moscow/Sheremetyevo in February and scheduled to deploy on the London/Heathrow link (SU2578/79) from June. The Moscow-based carrier plans to introduce the type to further destinations, with Los Angeles and Osaka/Kansai already announced.

VQ-BFY will join the airline's existing 125-strong Airbus fleet, comprising 74 A320neos, 33 A321neos and 18 A330-200/300neos. With the A330s ageing and



Aeroflot's first A350-900, currently with test registration F-WZGT (c/n 383), is to become VQ-BFY upon delivery. Yannick Delamarre

inefficient compared with next generation widebodies, they are earmarked to be fully replaced by Airbus's newest Rolls-Royce Trent XWB product. Ahead of the new arrivals, Aeroflot has already taken several older aircraft out of service and into storage.

The carrier has recently shaken up its widebody order book, cancelling eight of the now-shelved A350-800 variants without replacement, while awaiting the full contingent of 14 A350-900s to be delivered.

## Dash 8-400s for Philippine Airlines

Dutch lessor TrueNoord has agreed long leases for two de Havilland Canada Dash 8-400s to Philippine Airlines (PAL). The first of the newly built turboprops, RP-C5915 was delivered to the airline in January. A second is expected in February.

Anne-Bart Tieleman, the chief executive of TrueNoord, said: "The Dash 8-400 aircraft is known as the 'network builder' due to its short take-off and landing capabilities and efficient

regional operations... [allowing] Philippine Airlines to service their expanding route network and increasing passenger demand for regional connectivity. These Dash 8-400 aircraft bring our total up to 16 out of a fleet comprising 47 aircraft, including Embraer and Bombardier regional jets." The new turboprops are to be deployed exclusively on domestic rotations from Clark Airport, situated on the island of Luzon.



# National Geographic 757



In collaboration with National Geographic, Icelandair has refitted 757-200 TF-FIS with only 75 seats for a series of luxury world tours taking in 15 UNESCO World Heritage sites. Passengers will be accompanied by experts in various fields, from photography to conservation, who will give lectures along the way. The specially marked jet was photographed at Lima, Peru, en route from Washington DC to the Galapagos Islands on January 9. Aldo Martinelli/AvStock

## Condor Future Confirmed

German carrier Condor is to be acquired by Polish Aviation Group (PGL), the owner of LOT Polish Airlines. PGL's plans include Condor becoming its main leisure arm, with an aim to grow markets in Germany and beyond. The new combined group estimate they will be flying up to 20m customers a year.

Ralf Teckentrup, Condor chief executive, commented: "[Condor has] gained stable, experienced and dynamically developing partners who secured the future of our business. Together we will serve twice as many passengers, thus forming one of the largest aviation groups and [becoming] the leading

leisure airline group in Europe. Our partners and customers can safely plan their holiday flights with Condor."

Following the demise of Thomas Cook Group, Condor's future was thrown into doubt, as the UK company held a 49% stake in the company. Germany's federal government secured the airline's future with a €380m bridging loan. PGL will help the airline pay back the full amount after the takeover, effectively lifting them out of protective shield proceedings.

The deal is expected to be complete by April this year, subject to regulatory approval.

## EgyptAir's Dublin Link

The first regular air connection between Ireland and Egypt is set to begin on June 5, when Egyptair opens a new route from Cairo to Dublin with Airbus A320neos operating four flights weekly. Its initial CFM International LEAP-1A-powered jet, due to enter service in February, will be configured with 126 economy and 16 business seats. Vincent Harrison, Dublin Airport's managing director commented on the new link: "Cairo is one of the world's great cities and we will be working closely with EgyptAir to promote this new route, which will be welcomed by both business and leisure travellers."

The new connection – the first scheduled service between the two countries – will give Irish travellers access to EgyptAir's substantial regional network that includes 18 destinations within Africa and 17 in the Middle East. His Excellency Khaled Sarwat, the Egyptian ambassador to Ireland added that the new route will: "further enhance and deepen the bilateral relations between Egypt and Ireland and boost [our] mutual investment, trade and tourism."

## Swiss A320neo Flies



The first A320neo for Swiss made its maiden flight at Finkenwerder on February 3. The airline ordered 17 A320neos and eight A321neos in September 2014. V1images.com/Dirk Grothe

## Boeing 777 for Surinam Airways

With the delivery of 777-200ER, PZ-TCU (c/n 32336), Surinam Airways has received its first twin-engined widebody airliner. The 2002-built Boeing was ferried from Frankfurt to the carrier's Paramaribo/Johan Adolf Pengel base on December 21. The South American airline had previously operated Airbus A340-300s on the route, but following the retirement of its last example on October 27, it has wet leased Evelop Airlines A330s, a Privilege Style 777-200ER and A340s belonging to Maleth-Aero and Air Belgium.

The jet – which had yet to enter service as of January 30 – is expected to spend less than two years with the company, which is reportedly due to take delivery of a 787 Dreamliner in 2022. Initially delivered to Singapore Airlines as 9V-SVL in November 2002, the example spent 16 years with the Asian carrier before being returned to the lessor in March 2018. It completed 12 months with Air New Zealand from May 2018 as the airline looked to shore up capacity while its Rolls-Royce Trent 1000-powered 787-9 Dreamliners were grounded owing to ongoing engine issues.



# EHang Flying Taxi Starts FAA Certification



One of the first steps towards a practical flying taxi service in the USA has been taken by the Chinese company EHang, which has started FAA certification testing for its

EHang 216. Exhibited at last year's EBACE exhibition in Geneva, this autonomous electric VTOL machine has a central pod containing two passenger seats, along with

The pilotless EHang VTOL craft has begun the path to certification as an aerial taxi. Rod Simpson

a battery pack plus eight outrigger arms, each mounting two mini rotors. Modified to FAA requirements, it is the latest version of EHang's AAV (Autonomous Aerial Vehicle), 38 of which have already been delivered to international customers. The company's new unit, based in Raleigh, North Carolina, was registered as a US public company on December 12, 2019 and has raised new capital of \$46m on the NASDAQ exchange to finance development. EHang aims to have a fleet of these machines to provide urban transport in the USA. Other competing projects include Boeing's Aurora PAV, the Airbus Vahana and the German Volocopter. **Rod Simpson**

## Braathens Cancels A220s, Leases E190s

Swedish carrier Braathens Regional Airlines (BRA) has cancelled its order for ten Airbus A220s and has now opted to wet-lease five Embraer 190s instead, sourced from German firm WDL Aviation. The original deal for the narrowbody came in 2011, placed

by Malmö Aviation, which was one of three carriers consolidated to form BRA – the initial A220 order would have made them the launch customer. BRA was to acquire ten A220-100s. Recent years have seen BRA begin to phase out older models in the fleet, with BAE

Avro RJ85/100s in the process of being retired. Of 13 examples, just six remain, replaced in most part by new-build ATR 72-600s, in addition to further aircraft on lease.

Based at Stockholm/Bromma, BRA carries an average of 2.2m customers annually.

## Bamboo to Prague

Vietnamese airline Bamboo Airways will inaugurate European services in the coming months. From April, the carrier plans to serve Prague/Václav Havel three times weekly from Hanoi/Noi Bai, using newly delivered Boeing 787s. The jets seat 294 in a three-class layout, with 247 economy, 21 premium economy and 26 business seats. Duong Thi Mai Hoa, the airline's former chairwoman and deputy general director having since left the company, said: "The Vietnamese community in the Czech Republic is extremely large, at nearly 70,000 people, but passengers who want to fly from Vietnam to the Czech Republic still have to catch transit flights. [The] new direct flights will serve as a bridge, fostering bilateral economic co-operation, as well as travel and trade activities."

Bamboo will go head-to-head with flag carrier Vietnam Airlines. The former is considering expansion plans that could bring direct competition on many key European routes by 2025. The airline is due to receive 30 Dreamliners from Boeing, after increasing an original deal for 20 in February 2019.

## Beluga XL Enters Service

The BelugaXL outsize freighter has begun operations with Airbus following certification by the European Union Aviation Safety Agency (EASA) towards the end of last year. The first in-service visit of the XL to the UK occurred on January 14, 2020, when F-GXLH (c/n 1853) landed at Hawarden Airport, North Wales.

The Rolls-Royce Trent 700-powered A330-700 design offers 30% more space over its A300-600-based predecessor. Further advantages include a higher gross

weight of 56.2 tons (51 tonnes) and a payload range of 2,200nm (4,000km). This enables the outsized cargo aircraft to transport two A350 wings at a time. Both versions of the Beluga will operate alongside each other until the older ST is phased out. It is expected that the BelugaXL fleet will be at the full complement of six in three years' time. Originally, only five were planned to be built, until it was established that six were better suited to Airbus's future needs.

## ANA's Hawaiian Sunset A380



The third and final Airbus A380 for All Nippon Airways (ANA), JA383A, emerged from the paint shop at Finkenwerder Airport, Hamburg, on January 24 in a livery inspired by the Hawaiian sunset. All three 'Flying Honu' schemes depict the Hawaiian Green Sea Turtle. This one, 'Ka La', is mainly orange, while JA381A, 'Lani' represents the blue skies and JA382A 'Kai' the emerald waters of Hawaii. [V1images.com/Dirk Grothe](http://V1images.com/Dirk_Grothe)

# Azimuth's New Munich Route



Russia's Azimuth Airlines has begun a twice-weekly service to Munich from the southern Russian city of Krasnodar. The new route launched on December 22 with a flight by Sukhoi SSJ-100 RA-89096 (c/n 95152), which was delivered to the carrier in April 2018. Tom Ing/Aeromedia

## CIVIL ORDERS

| Purchaser                    | Aircraft | Number | Order Placed | Notes                                 |
|------------------------------|----------|--------|--------------|---------------------------------------|
| Nordic Aviation Capital      | A220     | 20     | "End 2019"   | Announced January 23                  |
| China Aircraft Leasing Group | A321neo  | 40     | January 17   |                                       |
| China Aircraft Leasing Group | A321neo  | 15     | January 17   | Converted from previous A320neo order |
| Skywest Airlines             | E175     | 20     | January 30   |                                       |

## Stansted-Mumbai Connection

Air India has added a thrice-weekly Mumbai service to London/Stansted. The new link is rostered for a 256-seat Boeing 787 arranged in a two-class configuration during the winter season. In October 2019, the airline launched its first flight from Stansted, which is the only direct link from London to Amritsar/Sri Guru Ram Dass Jee.

Ken O'Toole, Stansted Airport's chief executive, said: "With London Stansted

sitting in one of the most vibrant, exciting and innovative regions in the UK, it should come as no surprise that Air India has decided to launch this new service to one of the world's most important economic hubs." Air India and Stansted said the new route would provide greater choice and cut down unnecessary journeys. More than 200,000 people a year travel to Mumbai from other airports in Stansted's catchment area.

## IN BRIEF

With the retirement of the last three examples, FEDERAL EXPRESS has ended association with the Airbus A310. In its history, the cargo firm has operated 70 of the type. While its bigger Airbus sibling, the A300, carries on, FedEx has phased out less efficient aircraft in recent years, replacing them for the most part with new-build Boeing 767/777s.

On January 11, ERNEST AIRLINES ceased operations after losing its operating licence. Italy's civil aviation authority, Ente Nazionale per l'Aviazione Civile, made the decision, citing a lack of required guarantees. Ernest had three Airbus A320neos and a single A319neo. The outfit's main destinations included Albania and Ukraine, which were served from multiple Italian gateways, including its base at Milan/Malpensa. In the wake of Ernest's collapse, both Wizz Air and Ukrainian carrier SkyUP aim to re-introduce previous connections.

Canadian carrier WESTJET is to launch services from Halifax/Stanfield in Nova Scotia to Manchester from June 5. The connection will become the carrier's first service into the northwest gateway. Flown by the firm's Boeing 737-700, the seasonal link is to be operated four times weekly until October 24. With the addition of Manchester, this becomes WestJet's third British destination after London/Gatwick and Glasgow.

UK regional airline EASTERN AIRWAYS is to introduce three Embraer 190s later this year. It is also re-introducing the smaller E170, having operated two of the type until the fourth quarter of 2018, before putting them in storage. The arrival of the E-Jets is intended to help Eastern's growing charter division. The Humberside-based company currently flies two ERJ145s, six Saab 2000s and two ATR 72-600s.

## Airbus Plans A321 Line for Toulouse

With the drawdown in A380 production, Airbus is to boost A320 Family production at its Toulouse/Blagnac site. The European aerospace giant plans to open a "digitally-enabled A321 line" in its existing Jean-Luc Lagardère final assembly facility by mid-2022. Currently, the only European Final Assembly Line to produce A321s is at Airbus' Hamburg/Finkenwerder site, although examples are

also assembled and delivered from Mobile, Alabama. More than 7,100 A320neo Family aircraft have been ordered since the type was launched in December 2010. In its most recent orders and deliveries update, the manufacturer advised it had 6,563 aircraft still to complete as of January 1. Almost 500 of the outstanding commitments are for the A321XLR, launched at the Paris Air Show last June.

## A380 Back to Glasgow

Emirates is reintroducing the A380 on the Dubai-Glasgow service from late March. Currently, the airline flies two 777s daily on what is Scotland's busiest long-haul route. The superjumbo first appeared at Glasgow in 2014 and operated some Dubai services in 2019, but will now operate all year round. The A380 will fly the afternoon service, while the evening flight will remain a 777. More than 4.8m passengers have travelled between the two cities since Emirates began operations from Glasgow in 2004.



## Zipair Getting Ready

The first aircraft for JAL's low-cost subsidiary Zipair Tokyo, Boeing 787-8, JA822J (c/n 34832), was spotted on January 18 during a training flight at Nagoya's Chubu/Centrair airport. Operations are expected to launch on May 14 from its Tokyo/Narita base, with connections to Bangkok/Suvarnabhumi, followed by Seoul/Incheon on July 1. Kuwabara Akira



# First CMV-22B Flies



The first CMV-22B carrier onboard delivery (COD) version of the Osprey tiltrotor took to the air at Bell's facility in Amarillo, Texas, on December 19. The Osprey, BuNo 169435, is the first of 39 that will be delivered to the US Navy as replacements for its C-2A Greyhounds. Bell Helicopter

## Airbus Helicopters Protests Award to Leonardo

Airbus Helicopters lodged a formal protest with the US Government Accountability Office (GAO) on February 3 over the US Navy's decision to award its new helicopter trainer contract to Leonardo's single-engine TH-119, which in service will be known as the TH-73A. The manufacturer believes certain technical aspects of its H135 proposal were not assessed accurately during the Advanced Helicopter Training System (AHTS) competition.

Leonardo's bid was announced as the winner on January 13, having been selected over Bell's single-engine 407GX and Airbus Helicopters' twin-engine H135. Its subsidiary, AgustaWestland Philadelphia Corporation, is due to build and deliver the

type, initially manufacturing a batch of 32 helicopters; the total requirement is for 130 aircraft. These are intended to replace the service's ageing TH-57B/C Sea Rangers that support the Naval Undergraduate Flight Training Systems programme with training air wing TAW-5 at NAS Whiting Field, Florida.

Deliveries were expected to begin later this year and run through to 2024, however this could change depending on the outcome of the Airbus Helicopters complaint.

The US Navy must now file a report within 30 days to explain why it chose Leonardo and the GAO has up to 100 days to decide whether to uphold or dismiss the

case, during which time Leonardo will be unable to perform work on the contract.

The TH-73A is intended to fulfil advanced rotary-wing and intermediate tiltrotor training requirements for the US Navy, US Marine Corps and US Coast Guard through to 2050. Phase-out of the TH-57 will begin in 2022 and conclude in 2024.

This was the second major contract that the US military had awarded to Leonardo following on from the selection of the larger, twin-engine AW139 by the USAF as a replacement for its UH-1N fleet in September 2018. Boeing serves as the prime contractor for the \$2.38bn MH-139A project.

## New F-16 Production Line Opens

A new production line was formally opened on December 17 by Lockheed Martin at Greenville, South Carolina for the F-16. The company has stopped building the fighter at its Fort Worth, Texas, facility. The new line will initially support production of 16 F-16s for the Royal Bahraini Air Force under a \$1.12bn contract that will also see 70 older F-16C/Ds upgraded to the latest configuration. The company will also produce fighters for Bulgaria, Slovakia, and for Taiwan, which was cleared to purchase 66 fighters by the US State Department last year.

## Kingsley Field Heritage Jet



The 173rd Fighter Wing at Kingsley Field, Oregon, unveiled a special colour scheme on one of its F-15C Eagles on January 10. The livery commemorates USAAF bombardier Lt David R Kingsley, who gave his parachute to a wounded crewman and died when the B-17 crashed in Bulgaria on June 23, 1944. The F-15 is named *Sandman*, which was Kingsley's regular 341st BS, 97th BG Flying Fortress, although his crew were flying B-17F 42-5951 *O Pissonya* on their last mission. Kingsley Field was named for the Oregon native in 1957.

The 173rd FW's F-15C, 78-0543, marked to represent B-17G *Sandman* of the 341st BS, 97th BG in 1944. ANG

The F-15s underlying paint scheme is inspired by the B-17 with mottled green and brown camouflage on the top and light grey paint on the bottom. The wings both have black and white 'invasion stripes' denoting an allied aircraft in mid-1944. The inside of the fin features a portrait of Kingsley with a background of local landmark Crater Lake.

# Contract for Gabriel Successor

On December 30, France's defence procurement agency, the Direction générale de l'armement (DGA), placed a contract for the first two of a planned three Archange (Avion de Renseignement à Charge utile de Nouvelle Génération – intelligence aircraft with new-generation payload) strategic signals intelligence (SIGINT) jets. The Archange will be based on the Dassault Aviation Falcon 8X and equipped with a Thales CUGE (Capacité Universelle de Guerre Électronique,



An artist's impression of the Falcon 8X-based Archange SIGINT platform in French service. Dassault

universal electronic warfare capability) payload and, from 2025, will replace the two C-160 Gabriel aircraft currently serving with the Armée de l'Air (French Air Force).

According to Thales, the CUGE system will "detect and analyse radar and radar signals simultaneously for the first time...

thanks to multi-polarisation antennas and artificial intelligence technologies to automate data processing." Information collected will be analysed by monitoring and intelligence specialists, then fed into armed forces databases. The programme also includes a ground-based training platform.

## F-35 Latest

The F-35As of the Republic of Korea Air Force from the 17th Fighter Wing's 151st Fighter Squadron at Cheongju Air Base in North Chungcheong Province achieved initial operational capability on December 16. Since the arrival of the first two fighters in March 2019, the air force has received 12 F-35As and expects a further 14 to be delivered by the end of 2020. The remaining examples from the initial order of 40 will follow in 2021. In October 2019, South Korea's Defense

Acquisition Program Administration (DAPA) announced plans to acquire 20 more Lightning II.

In other F-35 news, the training of Royal Australian Air Force (RAAF) pilots and maintainers at Luke AFB, Arizona, concluded in December 2019 when the final group of personnel completed their conversion to the F-35A. Since training began with the 61st Fighter Squadron and 61st Aircraft Maintenance Unit in December 2014, 34 pilots and

16 instructor pilots have been certified to fly the aircraft. All future training will be carried out by the RAAF's No.2 Operational Conversion Unit (OCU) at RAAF Base Williamtown, New South Wales, beginning in late 2020.

Meanwhile, the Israeli Air Force stood up a second F-35I unit when 116 Squadron was reactivated on January 16. Known as the 'Lions of the South', the squadron is stationed at Nevatim in the Negev desert.

## Alpha Jets at Wittmund



Top Aces' Alpha Jet A C-GITA '040' (c/n 0040, ex Luftwaffe 40+40) lands at Wittmund at the end of its first test flight. Kees van der Mark

Two Alpha Jet As have joined Canadian contractor Top Aces' existing fleet of seven A-4Ns at Wittmund air base in Germany. An increase in required flying hours for the Bundeswehr support contract necessitated the fleet's increase from seven to nine jets.

The Alpha Jets recently arrived by ship from Australia, where they were among three operated from RAAF Base Williamtown in support of the Royal Australian Air Force over the past two years. After reassembly and ground testing, both jets made initial test flights from Wittmund on January 16. The two are former Luftwaffe Alpha Jet As

acquired by Top Aces in the early 2000s: C-GITA '040' (c/n 0040, ex Luftwaffe 40+40) is finished in a three-tone blue/grey camouflage, while C-GLTO '069' (c/n 0069, ex Luftwaffe 40+69) wears a three-tone green/brown/sand scheme.

Top Aces commenced flying for the Bundeswehr on January 1, 2015, taking over from BAE Systems Flight Systems, which flew F-100Fs from Wittmund from 1991 to 2002 and A-4Ns between 2002 and 2014. Top Aces operates seven former Israeli A-4Ns as part of a five-year contract in support of the German military.

## IN BRIEF

Germany has cancelled a \$2.5bn deal for four NORTHROP GRUMMAN MQ-4C TRITON unmanned signals intelligence platforms. After concluding that the drone would be unable to operate safely in European airspace by 2025, Berlin will instead acquire sensor-equipped Bombardier Global 6000s.

The Italian defence ministry has ordered nine PIAGGIO AVANTI EVO aircraft from Piaggio Aerospace in a deal worth €196m. Five of these will be configured for passenger transport and air ambulance work, while four will be used for flight inspection/calibration. The aircraft are due for delivery by 2024.

Following delivery of the first RQ-4D PHOENIX remotely piloted aircraft for the NATO Alliance Ground Surveillance (AGS) system on November 21, the second aircraft took off from Edwards Air Force Base in California on December 18, landing around 20 hours later at the AGS Main Operating Base in Sigonella, Sicily. All five are due to arrive in Italy before the end of the year.

Airbus Helicopters is to provide four additional JUPITER HT1 (H145) helicopters as part of a £183m investment in the UK's Military Flight Training System (MFTS). The new helicopters will be delivered this year to join the existing MFTS fleet of 29 Junos (H135) and three Jupiters.



## Vance Talon in Legacy Scheme

The latest T-38C Talon to receive a legacy paint scheme is serial 65-01335, operated by the 71st Flying Training Wing's 25th Flying Training Squadron at Vance AFB, Oklahoma. The design mimics the scheme carried by army air corps training aircraft from the mid-1930s to the early 1940s. USAF/SrA Octavius Thompson



## New US Defence Budget

The US government is providing funding for 122 fighter aircraft including 90 Lightning IIs – 60 F-35As for the USAF, ten F-35Bs for the US Marine Corps and 20 F-35Cs for the US Navy. The decision was formalised when President Donald Trump signed the Fiscal Year 2020 National Defense Authorization Act (NDAA) and the Department of Defense Appropriations Act bills on December 20, 2019. Additionally, approval has been given to purchase 24 F/A-18E/Fs for the US Navy and eight F-15EXs for the USAF. However, the bill does stipulate that the service can only procure two F-15EX prototypes and long-lead items for up to six additional fighters until it has submitted a report detailing its acquisition, test and evaluation, logistics, and post-production fielding strategies along with cost and schedule estimates. The USAF also received \$905m for the Next Generation Air Dominance (NGAD) programme and \$2.98bn for the B-21 Raider.

Furthermore, the budget authorised the USAF's acquisition of F-35As previously

designated for Turkey. But before entering service, these Lightning IIs will be converted to the same configuration as the USAF fleet. Savings realised as part of the programme's Lot 12, Lot 13 and Lot 14 price negotiations will be used to fund the conversions. Turkey had planned to purchase up to 100 F-35As and at least six had already been completed. Although the first Turkish Lightning II was accepted in June 2018 the completed jets had been operating from Luke AFB, Arizona, and none had been flown to Turkey. The US Department of Defense announced on July 17, 2019 that Turkey was being expelled from the programme because it had purchased the Russian S-400 air defence system.

The USAF's air reserve component will gain four C-130Js that were not part of its request, while the US Navy gains one additional E-2D, three P-8As and four MV-22Bs for a total of five, nine and 14, respectively.

Although the US Army received full funding for its production helicopter programmes, the budget reduced

the allocation for its Future Attack Reconnaissance Aircraft (FARA) Competitive Prototype (CP) project by around \$34m. Despite the cut, the service still plans to select two teams to build prototypes this March with a fly-off following in 2023. The army plans to transition FARA into a formal programme of record in Fiscal Year 2024. Its aggressive schedule calls for the first unit to be equipped by 2028. Increment 1 of the FARA will fulfil the scout/attack mission that is currently conducted by the AH-64D/E. In April 2019, the service awarded five Other Transaction Authority (OTA) agreements for the FARA CP to Bell, Boeing, Sikorsky and teams comprising AVX Aircraft/L3Harris Technologies, Karem Aircraft/Northrop Grumman/Raytheon.

The defence bill provided the military services with a total of \$738bn and included a provision to establish a sixth armed service by re-designating the Air Force Space Command as the US Space Force (USSF).

## Last of the Spanish Tigres

The final Tigre HAD-E for Spain's Fuerzas Aeromóviles del Ejército de Tierra (FAMET, Army Airmobile Forces) was delivered on January 14. Serial HA.28-24 'ET-724' took off from the Airbus Helicopters factory in Albacete for the short ferry flight to Almagro air base, where it joined the other 17 Tigre HAD-Es and six Tigre HAPs assigned to the Batallón de Helicópteros de Ataque I (BHELA I).

Although HA.28-24 had been noted undergoing flight trials at Albacete in full FAMET colours since mid-2018, it is actually the first Spanish HAD-E built and originally took to the air in 2010.

Now that the order has been completed, Airbus is continuing to retrofit the first HAD-Es. In future, the company expects to carry out a further upgrade to the new Tigre MkIII standard, now under development.

**Roberto Yáñez**

## Crowsnest Trials Continue at Yeovil



Merlin HM2 ZH831 on a test flight with the Crowsnest radome deployed. Chris Gilligan

Merlin HM2 ZH831 has been undergoing test flights with its Crowsnest radome deployed. The airborne early warning and control (AEW&C) helicopter was noted flying from the Leonardo Helicopters facility at Yeovil, Somerset, on January 29. This aircraft was the first to be fitted with the Crowsnest system and began test flying last year. Following several initial test sorties last March, the helicopter made its official maiden flight

on March 28, three days before the contractual deadline for this milestone. Initially, the inflatable radome, fitted on the port-side weapon station, remained in the stowed position.

Crowsnest is intended to achieve initial operational capability later this year as part of the RN's future Carrier Enabled Power Projection (CEPP) capability, replacing the now-retired Sea King ASaC7.

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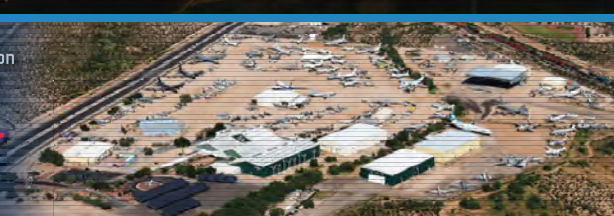
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# Spitfire Honours Aussie Ace



Former Lone Star Flight Museum Spitfire Mk.XVIe TE392 (VH-XWF) made its first flight in Australia from Archerfield, Queensland, on January 13 with Richard Grace at the controls. It arrived in Australia in 2018. The former RAF machine has been painted to represent the aircraft flown by Australian ace Sqn Ldr Tony Gaze DFC\*\*. The Spitfire also completed a second test flight on the same day. Gavin Conroy

## Bolingbroke to Inspire Young Restorers

The Bristol Aero Collection Trust is set to open a Conservation-in-Action workshop at the Filton-based Aerospace Bristol attraction this summer. At the facility, experienced volunteers will work alongside young people to conserve aircraft, including Bristol Bolingbroke Mk.IV 9048. The work will take place inside a Grade II listed building, dating back more than a century. As well as preserving the city's aviation heritage, the project aims to inspire the engineers of the future and enable those with a taste for aircraft preservation to gain practical experience.

The Bolingbroke was donated by Bristol Aero Collection co-founder Graham

Kilsby in memory of this father, aviation historian and photographer W K Kilsby. It served with the RCAF in Nova Scotia and Alaska, before falling into disrepair while being stored in Los Angeles, California. Graham acquired the airframe several years ago and brought it to the UK. Once the workshop is established, 9048 will be restored by volunteers and apprentices to static display condition. To ensure it can meet the funding required to open the new workshop on time, Aerospace Bristol has launched an Engineering Futures appeal:

[www.aerospacebristol.org/engineering-futures-appeal](http://www.aerospacebristol.org/engineering-futures-appeal)

## New Home for Swiss Hunter at Beauvechain

On December 18, former Swiss Air Force Hawker Hunter F.58 J-4077 was delivered to the 1st Wing Historical Center at Beauvechain, Belgium. The attraction is home to around 25 airframes, focusing on types that previously served at the base, and is currently raising funds to acquire a Spitfire replica. Hunter J-4077 was last flown on October 4, 1995, and later stored at Weelde. [www.musee.1wing.free.fr](http://www.musee.1wing.free.fr)

# Photoshoot Diary 2020



Use our aviation photoshoot calendar to keep up to date with forthcoming photographic events. If you'd like to see your shoot listed here for free, just send the details to editor Dino Carrara at [dino.carrara@keypublishing.com](mailto:dino.carrara@keypublishing.com)

## MARCH

### 01: East Midlands Aeropark Takeover

Donington, Leicestershire  
[www.threshold.aero](http://www.threshold.aero)  
£25

### 07: Gatwick Aviation Museum Nightshoot II

Charlwood, Surrey  
[www.threshold.aero](http://www.threshold.aero)  
£30

### 19: Night Photoshoot XXVII

RAF Northolt, Middlesex  
[www.northoltnightshoots.com](http://www.northoltnightshoots.com)  
£25 + £2-10 aircrew accommodation surcharge (the latter amount TBC)

### 21: Avro Vulcan shoot with XL426

Southend Airport, Essex  
[www.timelineevents.org](http://www.timelineevents.org)  
£65

Readers are strongly urged to seek confirmation that photoshoots are definitely taking place before travelling – photography events can move location, date or be cancelled, and this listing should only be used as an outline. For more information, check out individual websites, all of which are listed here where possible.

# Jet Art Acquire Tornado F2 and ASTRA Hawk



Tornado F.2, ZD899, being removed from the fire training school at Bury for transport to Jet Art's Yorkshire workshop. Jet Art

Yorkshire-based Jet Art Aviation welcomed the arrival of a very significant airframe, Tornado F2 ZD899, in December. This is not only a rare survivor of the F2 version, but was also the first production ADV Tornado (Air Defence Variant).

This example never entered RAF. It was one of only 18 production Tornado F2s built for the RAF, eight of which

(including this one) were fitted with dual controls and were unofficially known as F.2(T)s. The aircraft was allocated to A&AEE (Aeroplane & Armament Experimental Establishment) for radar/weapon systems proving work and effectively became the 'F.3 avionics prototype' as it was equipped with the twin inertial navigation system that

would be used on that variant. The aircraft was later used by BAe for trials work. It has spent the last two years with the Greater Manchester Fire and Rescue Service as a crash rescue trainer. The aircraft was removed by Jet Art Aviation in November.

The company has also taken delivery of the Advanced Stability Training and Research Aircraft – ASTRA Hawk for short – XX341 was one of three T1s ordered for the Empire Test Pilots' School in 1981. It was fitted with special avionics and software to mimic the characteristics of a different aircraft or to simulate adverse flight conditions to help train test pilots. Jet Art plans to return the aircraft, currently painted black, to its famous 'Raspberry Ripple' livery along with Empire Test Pilots' School markings.

Both aircraft are to be restored to static display condition and are being offered for sale.

## Super Saeta Soars Again

One of only two Hispano Aviación HA-220 Super Saetas flying in Spain, 22-119 (EC-DXJ), took to the air again in December 2019 after overhaul at Cuatro Vientos Airport, Madrid. Now privately owned by Victor Lleó, the former Spanish Air Force jet will be ferried to Valencia following the completion of paperwork. The 1972-built machine flew from Morón with Ala 21 as A.10C-114/214-114, but now wears A.10C-109/214-109. After withdrawal from service it was offered for sale and joined the Spanish civil register in June 1985.



Hispano Super Saeta, EC-DXJ, flew at Cuatro Vientos on December 7. Roberto Yáñez

The other airworthy example, EC-GZN, is based at Sabadell with FPAC (Fundació Parc Aeronàutic de Catalunya). A third airframe is registered EC-IFJ with the FACV (Fundación

Aérea de la Comunidad Valenciana) but has recently been grounded and is destined to be put on static display at the organisation's Requena, Valencia base. **Roberto Yáñez**

## APRIL

### 01: Night at the Museum 2

Fleet Air Arm Museum, Yeovil, Somerset  
[www.threshold.aero](http://www.threshold.aero)  
£30

### 16: RAF Cosford Nightshoot III

RAF Museum, Cosford, Shropshire  
[www.threshold.aero](http://www.threshold.aero)  
£30

## JUNE

### 11: Spitfire Day at Old Warden

The Shuttleworth Collection, Old Warden, Bedfordshire  
[www.darrenharbar.co.uk/events](http://www.darrenharbar.co.uk/events)  
£175

## AUGUST

### 5: Spitfire Day at Old Warden

The Shuttleworth Collection, Old Warden, Bedfordshire  
[www.darrenharbar.co.uk/events](http://www.darrenharbar.co.uk/events)  
£175

## OCTOBER

### 3: Threshold Takeover

Cornwall Aviation Heritage Centre, Newquay

[www.threshold.aero](http://www.threshold.aero)  
£30 day or night shoot, £50 for both

### 10: Lancaster Bomber Just Jane Sunset and Night Shoot

East Kirkby, Lincolnshire  
[www.timelineevents.org](http://www.timelineevents.org)  
£69.00

## NOVEMBER

### 21: RAF Museum Nightshoot

RAF Museum London, Hendon  
[www.threshold.aero](http://www.threshold.aero)  
£25

## Ex-Police Bo 105 for Buenos Aires Museum

A German-built MBB Bo 105 CBS-2, LQ-AOF, has been donated to the Buenos Aires-based Museo Nacional de Aeronáutica (National Museum of Aeronautics, NMA) by the Policía Federal Argentina (Argentinian Federal Police). The service was the second police force in the world after Germany to adopt the type. Eight examples served the South American nation in roles such as aerial surveillance and medevac. The museum's aircraft operated from 1981 until 2009 and was restored to static display condition by its former owners before being transferred in December. The NMA is also home to a second Bo 105, an early A model registered LV-LGR. **Ramiro Piacenza**



# New Schemes for Pima Pair



Focke-Wulf Fw 44J Stieglitz SZ-19 is now displayed in its original Finnish Air Force colours. Both photos courtesy Brad Elliott/Pima

Two exhibits at the Pima Air & Space Museum in Tucson, Arizona are being repainted to tell new stories.

The attraction's composite Hawker Hurricane Mk.II is being modified to represent Mk.IIb Trop BG974, a fighter flown in 1942 by the RAF's 33 Sqn. The aircraft was originally built from parts of at least five Hurricanes, with the majority sourced from a Canadian-built machine. With a new engine dust filter and desert camouflage paint scheme, this example will tell the story of US pilot L C 'Lance' Wade.

Having learned to fly in Tucson, Lance volunteered for service with the

**Previously painted as Bob Stanford-Tuck's 257 Sqn aircraft, the Hurricane is shown in the process of receiving desert camouflage.**

RAF and flew BG974 in North Africa. On May 28, 1942, he used it to shoot down a Macchi C.202 and a Junkers Ju 87. He continued to fly with the RAF until his death in 1944, by which time he had been credited with 23 victories, making

him the most successful American ace of World War Two to serve with a foreign air force.

Pima has also recently returned Focke-Wulf Fw 44J Stieglitz 2827 SZ-19 to its original Finnish Air Force livery. The 1940-built aircraft was the 19th of 33 Fw 44s delivered to Finland. It served until the late 1950s, when it was transferred to the country's Pori Aeroclub. Acquired by American pilot John Moore in 1970, the Stieglitz was brought to the US, where it was repainted in Luftwaffe markings before eventually being donated to Pima. With thanks to **Brad Elliott/Pima** [www.pimaair.org](http://www.pimaair.org)



## New Campaign to Raise Vulcan Funds

To celebrate the 60th anniversary of the first test flight of XH558, the last airworthy Vulcan bomber, people are being given the opportunity have their names applied under her wing. The charity responsible for XH558, the Vulcan To the Sky Trust, is asking for donations of £30 per name to celebrate the Diamond Anniversary of this remarkable aircraft.

The names will be added to plaques that have been allocated space on the wing and will be visible on close viewing, to avoid detracting from the aesthetics of this iconic aircraft.

On other news from the Trust, Dr Robert Fleming, who leads the charity, said: "Planning permission is now in place to build a new hangar for XH558 in Doncaster. Our objective remains to find an investor to enable us to build a home for XH558 where

supporters can admire this magnificent aircraft close up once again, can hear about her story, and where we can excite and inspire youngsters in aviation and engineering.

"We have worked closely with Doncaster Sheffield Airport, where the aircraft is based, and are extremely pleased to now have monthly visits for her supporters to get close to XH558. Numbers are limited but the first experience saw 60 people get to see this magnificent aircraft and learn from those who spend time looking after her."

The Names Under the Wing campaign marks the diamond anniversary of the first test flight in May 2020 and the names will be added to the wing ahead of the 60th anniversary of the aircraft's entry into RAF service on July 1, 1960, as the first Vulcan B.2. [www.vulcantothesky.org](http://www.vulcantothesky.org)

## Winjeel and Macchi Move to Moorabbin

Two new exhibits have joined the Australian National Aviation Museum in Moorabbin, Victoria, Australia.

The collection has acquired Commonwealth Aircraft Corporation (CAC) CA-22 Winjeel prototype A85-364, which had previously been on display at the Royal Australian Navy's Fleet Air Arm Museum in Nowra, New South Wales (NSW). First flown on February 2, 1952, it did not serve with either the navy or RAAF but was used by its manufacturer as a trials aircraft.

Once its flying days were over it became an instructional airframe at the RAAF's technical school in Wagga Wagga, NSW. CAC-built Macchi MB-326H A7-047 is also reported to have arrived at the Moorabbin attraction. The jet made its first flight in May 1969 and during the 1980s was flown in a special colour scheme by Chief of Air Staff AM Ray Funnell. It ended its military days at Wagga Wagga before being delivered to the RAAF Amberley Aviation Heritage Centre in March 2014. [www.aarg.com.au](http://www.aarg.com.au) **Phil Buckley**

## Ex-Honduran Corsair Flying Again

Vought F4U-5N Corsair VH-III (BuNo 123168) made its first flight since a wheels-up landing nearly three years ago when it returned to the skies on December 16 at Tyabb, Australia. The 1951-built aircraft is listed for sale through warbird and classic aircraft broker Platinum Fighters. The former US Navy and Honduran Air Force machine is currently based in Melbourne. [www.platinumfighters.com/f4u5n](http://www.platinumfighters.com/f4u5n)

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| 01 APR | <b>Fleet Air Arm Museum</b><br>Flight Deck Experience Photoshoot                  | £30 |
| 04 APR | <b>Shackleton WR963</b><br>Day & Night Photoshoot with Running WR963              | £30 |
| 16 APR | <b>RAF Cosford Nightshoot III</b><br>Photography, Workshops & Talks in the Hangar | £30 |
| 29 APR | <b>Navy Wings Hangar Day</b><br>Photography, Workshops & Talks in the Hangar      | £25 |

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# Luton Airport's Expansion Plans

London Luton Airport is the fifth-busiest airport in the UK. If its ambitious expansion plan gets the go-ahead it will nearly double passenger numbers over the next 20 years, reports **Barry Lloyd**.



It has been a period of extensive development at London Luton Airport in recent years. In 2016 a project to expand the terminal was completed two years later. Such has been the growth that soon after in December last year the airport reached its capacity of 18m passengers a year. Prior to this in December 2018 a three-year redevelopment, to include new shops, more gates and a new pier was launched.

These improvements have been delivered by London Luton Airport Operations Ltd (LLAOL) which runs the airport. Luton Borough Council (LBC) and the owner, London Luton Airport Ltd (LLAL) entered into a concession agreement with LLAOL in 1998 for the management, operation and development of Luton. This agreement will be in place until 2031.

LLAL is looking at the possibility of further growth. In December 2017, it

**Main photo: The low-cost carrier Wizz Air bases five aircraft at Luton, serving destinations in 22 European countries and Israel. More A321s are being used to increase capacity.**

*AirTeamImages.com/Darryl Morrell*

announced a long-term development plan that includes a request to expand the airport's capacity to 32m passengers a year by 2039. This would necessitate the building of a second terminal, but the enlarged airport would continue to operate using the existing single runway.

LLAL is currently processing and analysing the high volume of responses received during a second consultation held in autumn 2019. This will lead to a period of further consideration on how the proposals can be improved. Such is the scale of the development that the application for planning permission must be submitted to central government

during 2020 in what is known as a Development Consent Order. In this case, the final decision will rest with the Secretary of State for Transport, rather than Luton Borough Council (LBC), which holds 100% of the shares in LLAL. LBC and LLAL entered into a concession agreement with London Luton Airport Operations Ltd (LLAOL) in 1998 for the management, operation and development of Luton. This agreement will be in place until 2031. Alberto Martin, the chief executive at London Luton Airport (LLA), said: "LLA has invested over £160m to transform the airport and increase capacity to 18m passengers. The renovated terminal opened in December 2018 and we are now focused on transforming the experience our passengers have with us, just as successfully as we transformed our infrastructure and facilities."



The centrepiece of the airport's recent £160m expansion is the rebuilt terminal, opened in December 2018. London Luton Airport



"As the operator of the airport until 2031, we continue to explore all options for sustainable growth within our remaining concession period, while the airport owner is progressing its longer-term vision for an airport serving 32m passengers per year."

LLAL outlined four options in summer 2018 for the site of the second terminal,

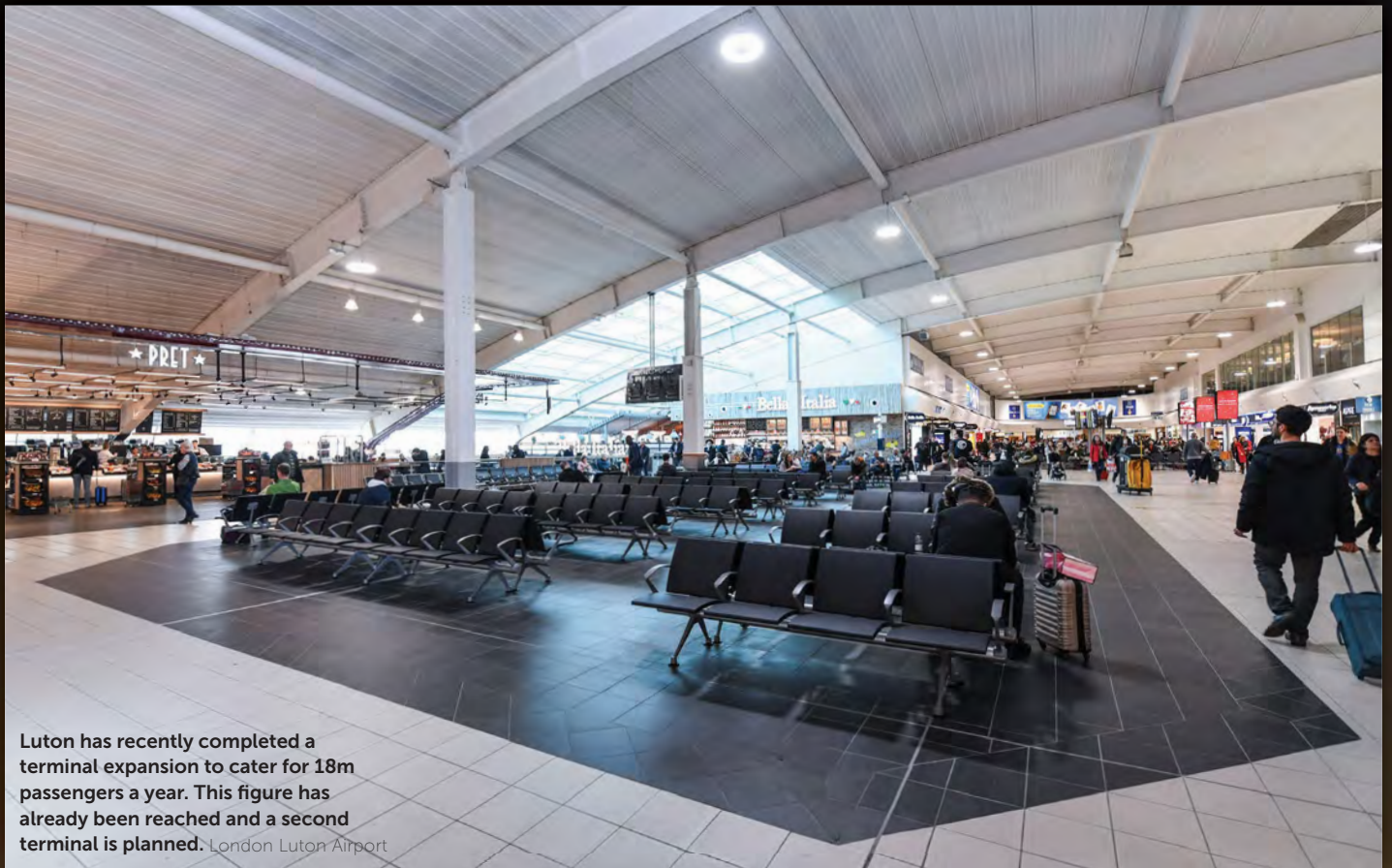
with the favoured one selected in February 2019. The council company's plans, if approved, would involve considerable changes to Wigmore Valley Park, which is one of Luton's largest parks. It also has official recognition as a County Wildlife Site and has two asset-of-community-value orders placed on it by neighbouring parish councils. Cllr

Andy Malcolm, the chair of LLAL, said that the proposed development of a second terminal "north of the runway safeguards as much land as possible within Wigmore Valley Park, and provides a new footprint for the parkland and open space which is 10% bigger than the existing [areas]." Some local residents have formed groups objecting to the proposals, while a ▶

A view of London Luton Airport with the existing terminal to the left of the orange easyJet hangar. London Luton Airport







Luton has recently completed a terminal expansion to cater for 18m passengers a year. This figure has already been reached and a second terminal is planned. London Luton Airport

spokesman for LLAL said others have expressed support for an enlarged airport which will support economic benefits and 16,000 new jobs.

Long a hub for low-cost and charter airlines, Luton houses easyJet's headquarters and is a significant base for TUI, Ryanair and Wizz Air. Currently most of the routes served are within Europe, with some charter and scheduled routes to destinations in North Africa

**"in December 2018 a three-year redevelopment, to include new shops, more gates and a new pier was launched."**

and Asia. Two business-class-only routes have also operated from Luton. Silverjet operated services to Dubai and New York, but these ceased in 2008, following which La Compagnie operated a similar service to New York's Newark airport until September 2016.

The airport previously served as a base for Monarch Airlines until it ceased operations in October 2017. Such is the pace of expansion at Luton that the







Plans for the airport include a second terminal and a light rail link to the nearby station, replacing the current shuttle bus service. The additional area planned for business jets is apron with remote stands to the east of the proposed new terminal. London Luton Airport Ltd

Monarch slots were quickly taken by Wizz Air, which has added several new destinations. Additionally, many of its flights are operated by Airbus A321s, thus offering more passenger capacity on the same routes. In a similar move, easyJet is also using more A320s than A319s on its routes.

## EXECUTIVE MOVEMENTS

From the early days of McAlpine Aviation in 1957, Luton has been popular with many business jet operators. It attracts a considerable amount of the traffic into the London area. There are two fixed base operators (FBOs), Signature Flight Support

and Harrods Aviation. Luton has a licence to operate 24 hours a day, but during the summer months the late arrival of scheduled flights, coupled with the night-time noise limits required by the council in its role as the local planning authority mean it is difficult to get arrival and departure slots for business jets for late evening or ▶

Luton is a major business jet centre, with a licence for 24-hour operations. In practice, lack of ramp space, noise limits and pressure on slot times causes limits on business jet flights at night. London Luton Airport





Headquartered at Luton, easyJet flies to 53 domestic and international destinations from the airport. The airline is using more A320s at Luton to increase capacity. London Luton Airport



early morning. Additionally, it is difficult to get slots during the morning peak times. As part of its future development, LLAOL has announced that it intends to build a new apron to provide additional parking areas for business jets.

In addition to the mainstream airline and business jet traffic, the two other main activities at Luton are scheduled cargo operations and maintenance. Typically, Luton airport handles about 28,000 tonnes of cargo a year at its dedicated cargo centre. Operators which currently use the facilities include DHL and MNG Airlines. Two parking stands are allocated for cargo aircraft.

Monarch Aircraft Engineering, the engineering arm of Monarch Airlines, could not be saved when the parent company

collapsed in 2017 and the three buildings it formerly occupied have remained empty since. They are currently being marketed and consist of two aircraft hangars, constructed during the 1980s and 1990s, both of which can accommodate a Boeing 767 or two single-aisle-sized aircraft, plus a third smaller building previously used as a storage facility. The former Monarch headquarters has been refurbished, with the top floor being taken over by the airport's operator LLAOL. EasyJet also has full hangarage and maintenance facilities on site.

LLAL is already building the DART (Direct Air-Rail Transit) system, an automated light rail service, which will connect the nearby Luton Airport Parkway station and the airport via a 1.4-mile (2.3km) link. This service is currently operated by shuttle buses, but with completion of DART

currently planned for 2021, the need for these will soon be eliminated.

Luton Borough Council and the residents of the area are benefitting from the success of the airport even if they don't use the facility, as last year LLAL provided a £20.2m dividend for the council to invest in frontline services for the people of Luton. It is hoped that this figure could grow if the expansion plans get the green light.

The entities involved in running the airport are clearly preparing for expansion. Other airports are not standing still and with Farnborough gearing up to handle more business traffic, London Southend Airport also now playing host to easyJet, Ryanair and Wizz Air, and London Stansted Airport's annual passenger total hitting 28m in 2018, the competition from other airports around London will continue to intensify. **AN**

The proposed Terminal 2 would allow Luton to handle 32m passengers annually by 2039, but it faces some planning hurdles. London Luton Airport Ltd





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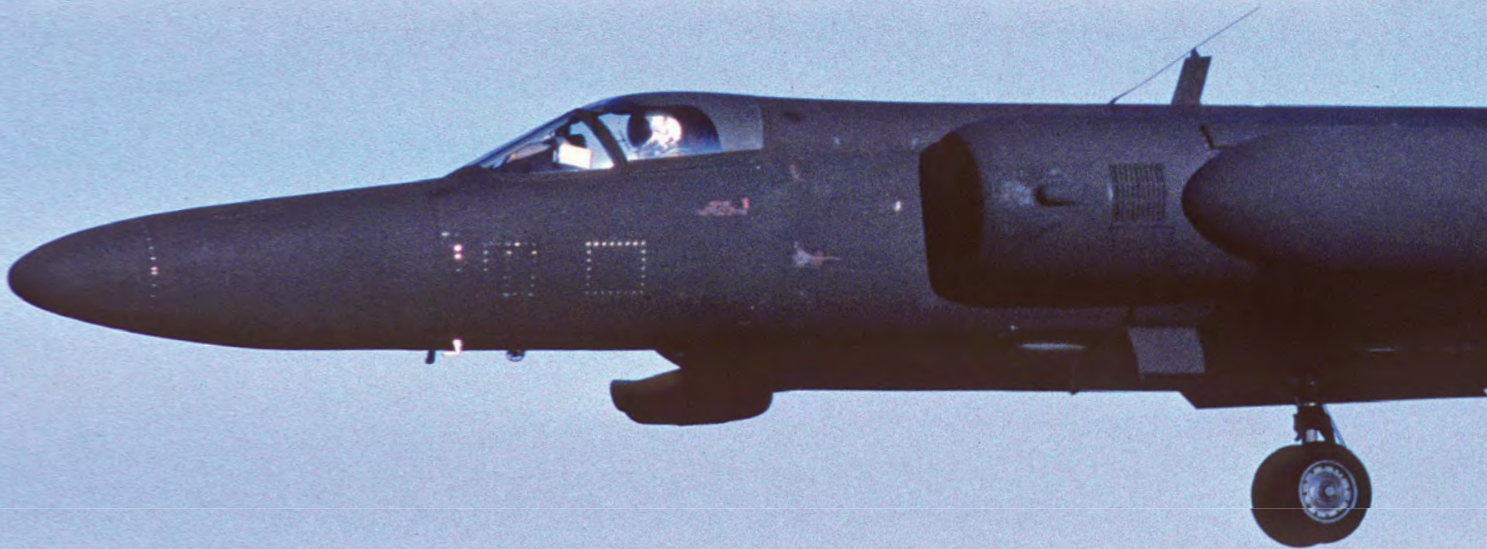
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# Stratospheric Cold War Warriors

## Alconbury TR-1As

In 1983, the first Lockheed TR-1As arrived at RAF Alconbury to fly reconnaissance missions and gather intelligence on the Warsaw Pact. **Dr Kevin Wright** talks with **Lt Col Bruce Jinneman (ret'd)** about his time flying the aircraft from the Cambridgeshire base.



**D**esigned to carry high-altitude standoff sensors, the first production TR-1 performed its maiden flight on August 1, 1981. Lt Col Bruce Jinneman (ret'd) said: "When they reopened [U-2] production, one aircraft off the line was a U-2 and the next, destined for England, a TR-1." There were no significant differences between the two types and the TR-1 name was adopted to try and dissociate the aircraft from the earlier politically sensitive CIA U-2 missions and also reflect the more tactical role of the Alconbury-based aircraft.

To manage TR-1 operations, Strategic Air Command (SAC) activated the 17th Reconnaissance Wing (RW) on October 1, 1982, with the 95th Reconnaissance Squadron (RS) its flying component. Mission tasking was provided by USAF. The first 95th RS aircraft, 80-1068, arrived at RAF Alconbury in Cambridgeshire on February 12, 1983, having been flown

non-stop from Beale AFB, California, by Capt Mark Spencer. The second, 80-1070, followed a few days later.

Bruce had begun flying the U-2 in 1982: "By 1985, I had accumulated around 500 hours U-2 stick time. I had recently been upgraded to Instructor Pilot when posted to Alconbury. When I arrived in March 1985, construction work had yet to start on the large complex of TR-1-sized special hardened aircraft shelters and facilities on the airfield's northern side. We had very basic shelters to keep the aircraft out of the weather and that was about all. At first we were a small group of just nine pilots – about half of them I already knew from Beale. I loved Alconbury – a good group of people and great flying. Early on, with just three airplanes available, we flew roughly every other day."

The tempo of operations increased as more aircraft arrived and peaked during April and September, Warsaw Pact exercise seasons.

"Our main operational task, codenamed 'Creek Spectre', was over West Germany," said Bruce (who during his time at Alconbury was initially a captain and then was promoted to major). "These were nine-hour missions, which required a roughly 90-minute transit to get on station. We mostly flew north-south runs along the Inner German Border, no closer than 12 miles, then reversing course. Each leg took about 30-40 minutes. We repeated this for the next six hours before heading home again; another 90 minutes. For pilots it was a familiar mission, although the sensors we carried varied."

### FLIGHT PLANNING

Jinneman recalled the pre-flight process before a TR-1A mission: "Planning was completed the day before each flight by one of our dedicated team of mission planners, all experienced Air Force navigators. The mission changed little, just minor variations in the orbit over Germany,





Left: Bruce Jinneman in front of an Alconbury TR-1A. He was based with the 95th RS in England from 1985 to 1989. Via Bruce Jinneman

Main photo: The TR-1A was a U-2R by another name. From 1983 to 1995, the 'Dragon Lady' was a frequent sight over East Anglia. Peter R Foster

Below left: Bruce Jinneman being helped to a TR-1A in full pressure suit. For an hour beforehand he would have been breathing 100% oxygen. Via Bruce Jinneman



plus a few other oddball routes we sometimes flew. After they worked through all the detail, we reviewed what they had done, so mission planning was not that complex for the pilots."

Pre-flight preparation was pretty standard: "We arrived about three hours

prior to take-off, got a mini-physical to ensure we were fit to fly and looked over the mission plan one last time.

"An hour-and-a-half before scheduled take-off, we started getting dressed. We wore a full pressure suit because of the extreme altitudes we operated at. It was a

pain to get on. We had to have a couple of people help us, but once fitted in the suit it was pretty comfortable. We pre-breathed 100% oxygen for the hour before take-off. Once ready, it was out to the airplane to strap in. Movement inside the cockpit was limited – we could just about comfortably reach all the aircraft instruments. We were assisted by a Mobile Officer, another U-2 pilot who pre-flighted the aircraft for you. He was the same pilot who followed down the runway in the chase car on our departure and return.

"U-2/TR-1 pilots carried no take-off data cards because, as the aircraft took off so quickly, it was not necessary. On a fully loaded mission aircraft we were airborne in about 1,200ft. On a training sortie, without the sensors loaded, we were airborne in 400ft.

"As we accelerated on the take-off run, the wings quickly developed lift and flexed upwards, which allowed the underwing 'pogo' wheels to fall away from the aircraft ►





Above: **The TR-1 did not require much of Alconbury's runway to get airborne. Here, a 17th RW TR-1 takes off on a mission in October 1989.** CMSgt Don Sutherland

Right: **Maintenance personnel from the 17th RW work on a TR-1's Pratt & Whitney J-75 engine at Alconbury.** CMSgt Don Sutherland

as we lifted off. Every once in a while, one failed to separate. In that situation, we circled the airfield and passed over the runway again, gently rocking the wings to shake the pogo loose. Flying the TR-1 was all manual inputs, there were no hydraulics. Doing circuits in the traffic pattern, it flew like a truck, but above 50,000ft it handled really well."

## FLYING SKILLS

The distinctive design of the TR-1A meant there was a knack to flying it, as Bruce recalled: "[It] had 'coffin corner' issues because of the original U-2's unique design, flying at just two knots above stall and three below its 0.8 Mach limit. Once above 52,000ft, we engaged the 'Mach hold' on the autopilot, [which] maintained the aircraft at 0.8 Mach. So we never really hand-flew it above that altitude – it was all done by the autopilot. If we were flying at 60,000-65,000ft and lost the autopilot, it was almost an emergency procedure to descend to 'thicker' air below 50,000ft as soon as possible. We dropped the nose to descend, then, as speed increased to near limits, we brought the nose up a little until we were close to the stall again. Repeating this, we flew a gradual, halting descent until we were comfortably able to manually fly it again.

"The autopilot was pretty reliable, unless there was an aircraft-wide malfunction. The only time it tended to kick out was in high-altitude turbulence. For example, when we were flying similar missions from Korea, we sometimes got winds off the Himalayas and experienced horrible turbulence even at 65,000-70,000ft. The air temperature sometimes fluctuated considerably too, and as our airspeed was interrelated to air temperatures, so the autopilot kept searching for the appropriate Mach number. Unable to lock on, the autopilot repeatedly

kicked out. But in Europe, its performance was pretty solid.

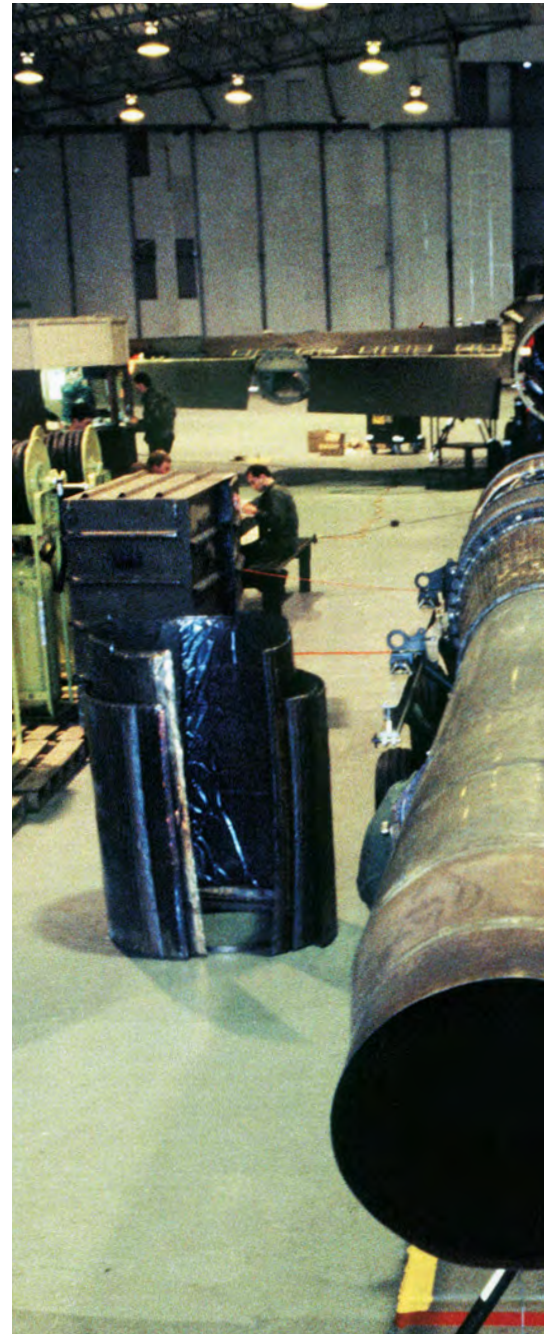
"Space in the cockpit was limited. I am 5ft 8in tall and fitted quite well into the cockpit, but other pilots who were perhaps 6ft and a bit heavier were pretty tight. It is like flying airline economy class on a long non-stop journey, without the luxury of being able to get up and walk around. We recorded critical fuel and engine readings hourly on a special 'green card' with a pencil. If we dropped it, we had to open out the navigational map dividers we carried and [use them] to reach down to the floor and stab the pencil to pick it up again."

## SENSOR PAYLOADS

On operations from Alconbury, the TR-1As usually carried the Senior Spear COMINT (communications intelligence) system to listen in on Warsaw Pact voice and data transmissions via more than 20 onboard receivers. The system covered a wide range of frequencies and had a direction-finding capability. This was externally distinguishable by the large 'aerial farm' on the aircraft underside.

The TR-1A's wing 'superpods' contained some of the Senior Spear equipment but, when fitted, their flat sides also housed sensors for the Senior Ruby ELINT (electronic intelligence) system that rapidly detected, processed and classified multiple radar emissions. Combined, these two systems represented a formidable signals intelligence collection capability.

Two additional sensors considerably enhanced the TR-1A's collection capabilities. The ASARS-2 (Advanced Synthetic Aperture Radar System) was not ready for deployment until July 1985. It saw through typically murky European weather to produce high-quality imagery. This



system was externally distinguished by the aircraft's extended nosecone.

The SYERS (Senior Year Electro-optical Reconnaissance System) was a powerful digital photographic system, derived from research for the KH-11 satellite. The camera was nose-mounted in the TR-1A, its cone rotating left and right to collect imagery through a glass aperture.

On occasion the TR-1As carried the KA-80 Optical Bar Camera. This wet film device produced very high resolution imagery. The KA-80's 24in (61cm) lens rotated through 120° to give a panoramic field of view.

Jinneman explained: "We always carried the COMINT/ELINT package and either the ASARS radar or SYERS camera in the nose. The different noses for these two configurations could be switched over in just a few hours."

## METRO TANGO

"We did not control the TR-1's sensors. They were operated by the ground station



The KA-80 camera was sometimes fitted and its window is visible below and behind the cockpit of this TR-1A at Alconbury. Peter R Foster





personnel at the Metro Tango (MT) facility near Hahn AB, West Germany," recalled Jinneman. This was designed to be mobile and described as 'a Transportable Ground Intercept Facility (TGIF) based around several trailers'. It was set up at a semi-permanent location as an interim arrangement, pending completion of a permanent, hardened facility. The trailers housed all the associated electronic and processing equipment together with a team of operators and linguists. The TR-1As transmitted data to MT, providing near real-time intelligence as long as the aircraft remained within its line of sight. The distinctive Senior Span system with its huge – approximately 17ft (5.18m) – dorsal radome housed an antenna that transmitted data from the TR-1A to US space satellites in low Earth orbit, freeing it from the TGIF's line of sight constraints. The first visit of an aircraft to Alconbury which was fitted with Senior Span took place in March 1989.



**Sporting the large Senior Span antenna and chalk tail art, TR-1A 80-1070 lands at Alconbury in April 1989. The system allowed direct transmission of data to satellites.** Peter R Foster

## EMERGENCY

Jinneman's first operational mission turned into a significant event: "In April 1985, I had just arrived at Alconbury. Normally, before our first operational trip, we did an orientation ride to get used to working with British air traffic control and familiarise ourselves with the airfield. We were short of pilots then and I was unable to fly my orientation sortie before my commander said to me 'You were an IP at Beale and we need to fly on Sunday, would you mind passing on your orientation ride and go

fast that by the time I figured out what was happening the engine flamed out on me.

"At around 50,000ft over the English Channel, the only instrument I had working was a magnetic compass. All the electrical equipment had died. I talked to London ATCC [Air Traffic Control Centre], using the battery-powered radio and they did a good job of getting me towards base. However, it was a cloudy day... At about 15,000ft over what I thought was Alconbury, through a break in the cloud, I saw a lot of construction equipment on a runway, so

**"On a fully loaded mission aircraft we were airborne in about 1,200ft. On a training sortie, without the sensors loaded, we were airborne in 400ft."**

straight into an operational mission?' Of course, I had to say yes to my first Creek Spectre flight from Alconbury. I got there OK and flew my mission as required. Heading back to the UK, I began my descent."

It was at this point that things began to go wrong: "As I was heading back, the last fuel from the TR-1's outer wing cells should have been draining from the outboard to the inboard and then into fuselage centreline sump tanks. I thought initially the fuel gauge was wrong. While [I was] trying to figure out what was happening, the sump tank – which held just 50 gallons – was rapidly draining. Clearly, something was wrong. Our flight manual procedure said that in such situations you can anticipate a flameout, so you should shut down the engine to conserve the remaining fuel until you are ready to land. But it dropped so

I knew it was not Alconbury. A quick radio exchange with our Mobile Officer confirmed that I was over nearby RAF Wyton, less than eight miles east of home. I worked my way across, did a couple of circuits overhead to lose altitude and landed just fine. Fortunately, we regularly practiced flameout landings, so other than the aircraft being heavy because it was fitted with mission equipment, it was quite straightforward."

The flameout had been caused by maintenance work the previous day. During the work, a fuel shut-off valve between the outer and inner wing tanks was closed and inadvertently left that way, so fuel was unable to drain from the outer tank.

## INTERCEPTIONS

Flying such covert missions always risked interception by adversaries, as



**With airmen ensuring clearance for the wingtips, a TR-1A is towed across Alconbury in July 1986.** Peter R Foster





**Large hardened aircraft shelters were built at Alconbury to house the TR-1s and can be seen at the top of the photo.** USAF/SSgt David S Nolan

Jinneman was aware: "We were not actively intercepted by the East Germans, but once in a while East German fighters shadowed us along our track, at least 25,000ft below us. Toward the end of my tour at Alconbury, we had a mission route that took us quite a bit further north than our usual track. On one occasion, a colleague had a Russian interceptor use a ballistic climb manoeuvre to make a pass on the left of his TR-1. The Russians couldn't reach our altitudes in level flight. As he passed by, the Russian pilot came up on the international emergency frequency and greeted him. As far as I know, it only happened once.

"On these long-duration missions, flying the aircraft became a little boring, so we unofficially carried a book or something to read. On a later Creek Spectre sortie, my Mobile Officer forgot to place any reading material on board for me. About five hours into the flight, with nothing else to read, as the sun was beginning to go down, I decided to look through the aircraft's

emergency checklists. I had just completed the electrical system list when, literally seconds later, there was a total electrical failure. I had no navigation system, so simply headed towards the sun setting in the west. I was again reliant on the battery-powered standby radio, conserving radio power until approaching the UK. London air traffic control guided me back towards Alconbury."

Even routine missions had their pitfalls: "As well as operational missions, we usually flew a training sortie or two each week. These often involved working local traffic patterns, with occasional approaches at Lakenheath and Mildenhall. This was important because crosswinds were always a bit of an issue at Alconbury. We had special dispensations to operate from there in lower visibility and cloud ceilings than U-2s were permitted to elsewhere. When we required our annual instrument proficiency checks, a two-seat trainer was brought over from the US for about three weeks for us all to complete our check rides.

"Recovery to Alconbury, weather permitting, was normally a straight-in approach. The Mobile Officer pursued you down the runway in a powerful chase car. He counted down the final few feet until touchdown. The ground crew refitted the 'pogo' wheels once we came to a halt. We taxied back to a parking spot, shut down the engine and the Mobile Officer greeted us with a very welcome beer."

Bruce Jinneman left Alconbury in 1989 and, following postings at the Pentagon and command positions within the U-2 community, retired from the air force in 1999. After operating TR-1As from King Fahd AB in Saudi Arabia during the 1990-91 Gulf War, the 17th RW was deactivated in July 1991. Alconbury was downgraded to 'Operating Location' status and its control passed to the 9th RW at Beale AFB. The aircraft were now described as U-2Rs and operations gradually ran down, with the last one departing Alconbury in 1995. **AN**

**Once a year, a two-seat TR-1B would fly over from California to give the 17th RW pilots instrument proficiency checks.** Peter R Foster





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# Airshow Preview 2020

**Aviation News** presents its annual air events calendar, covering over 450 airshows, displays, fly-ins, trade exhibitions and collectors' events in the UK, Europe, North America and worldwide.

## TRADE SHOWS

As always there is a good variety of international aerospace trade events on the calendar, most of which operate on a biennial basis and usually offer one or more public days. Among this year's is Farnborough International, held the week following RIAT, which has revised its format and is no longer holding a public weekend, but the Friday will be open to both trade and public visitors who pre-register. One confirmed attendee so far is the Orbis MD-10 Flying Eye Hospital.

ILA Berlin takes place in May, which, not surprisingly, always incorporates a substantial German military presence and often boasts some interesting visitors from countries further east. In 2018 the latter included an

Ilyushin IL-2 Sturmovik from Russia and the giant Antonov An-225 from Ukraine. The FIDAE (Feria Internacional del Aire y del Espacio) in Chile at the end of March provides a showcase for Latin American aviation and usually attracts the big international manufacturers as well as a large US military contingent. In Africa there is a new event taking place in Tunisia in March, the International Aerospace & Defence Exhibition (IADE), which has a public weekend with a four-hour flying display each day. At the other end of the continent is South Africa's AAD (African Aerospace and Defence) Expo at Waterkloof in September, which is likely to feature some special displays marking the centenary of the South African Air Force this year. Assuming travel disruption caused

by the coronavirus outbreak is no longer an issue by November, Airshow China in Zhuhai promises again to provide a rare window into the Chinese aerospace industry. One of the highlights of the 2018 edition was the first public display by the Chengdu J-20 Mighty Dragon stealth fighter.

## UNITED KINGDOM

With 2020 being the 80th anniversary of the Battle of Britain, there are several airshows which will be making particular efforts to commemorate the events of 1940, including the displays at Headcorn in July and Duxford in September. It is also the 75th anniversary of VE day and the Shuttleworth Collection will mark this with its season premiere show in May.







Above: **The biennial Farnborough International showcases the latest military and civilian aerospace technology.** From this year on the show will no longer include the traditional public weekend. Key-Dino Carrara

Main photo: **The ILA trade show at Berlin's ExpoCenter Airport at Schönefeld offers a rare opportunity to see large numbers of German military aircraft in the air and on the ground.** Messe Berlin GmbH



July's Royal Navy International Air Day at RNAS Yeovilton will feature the UK show debut of a Royal Danish Air Force MH-60R Seahawk, and the last appearance by the French Navy's Lynx. Two examples from the eight remaining in service with Flotille 34F will be in the static display, with the unit promising they will have special 'farewell' markings – one in an historic camouflage scheme and the other with nose art.

The organisers of the Royal International Air Tattoo (RIAT) have announced this year's themes: Fast Jet Combat Air Power and Intelligence, Surveillance & Reconnaissance (ISR). The Battle of Britain will also be a focus of the show, held at RAF Fairford in July.

## EUROPE

Tiger Meet is an annual air exercise for those NATO squadrons that feature a feline in their unit badge and members usually present their aircraft in suitable big cat colour schemes. This year it is being held at Beja in Portugal over May 10-22. A public open day is scheduled for May 17, and there will also be one or two spotters' days – dates are yet to be confirmed but prior application is required via [www.natotigers.org](http://www.natotigers.org). Another colourful European event should be the 60th anniversary of Italy's Frecce Tricolori aerobatic team at Rivotto in September, which is sure to involve participation by other national display teams.

## NORTH AMERICA

Billed as the 'world's greatest aviation celebration' July's AirVenture at Oshkosh, Wisconsin, has something for everyone, from microlights to military aerobatic teams, from the B-29 Superfortress to the B-2 Spirit. This year the event will highlight USAF Special Operations, and various types not often seen in public are expected to take part in both static and flying displays.

Held in Reno, Nevada since 1964, September's National Championship Air Races are an impressive spectacle of high-speed low-level flying, particularly in the Unlimited Class for which modified warbirds exceed speeds of 500mph (805km/h) only 100ft (30m) above the desert floor. There are also other racing classes which feature a range of aircraft types. Aerial display teams can also usually be seen performing their routines. The five-day event culminates with the Unlimited Gold Race, won in 2019 by the R-3350-powered Sea Fury T.20 *Dreadnought*.

In October, legendary flight test base Edwards AFB, California, will be hosting an event for the first time since 2009. The Mojave Desert base is expecting over 60 aircraft and 50,000 spectators over the two days. It is being held in partnership with the organisers of Los Angeles County Air Show, which is taking place at William J Fox Airfield, Lancaster, California in March and the events will share 'Aerospace Valley' branding and will alternate annually from 2021.

## REST OF THE WORLD

In New Zealand over Easter, Warbirds Over Wanaka promises a wide variety of vintage military and civil aircraft, plus participation by modern types from the RNZAF and RAAF. A country that rarely appears on the calendar listing is Jordan, but in March the first Aqaba Air Show will be held at the Red Sea resort town. Japan has numerous air events each year, but the details tend to be released much closer to when they are taking place and only a handful of 2020's dates were available at press time, including Kanoya in April and Iruma in November. *Aviation News* will update this listing each month to bring you the additions and/or cancellations as they come in. **AN**



# Aviation Events Calendar



## UNITED KINGDOM

### FEBRUARY

**29 Popham, Hants:** VAC Fly-in – 01256397733 [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

### MARCH

**5-6 Yeovilton, Somerset:** FAAM Cobham Hall Reserve Collection tours – 01935 840565 [www.fleetairarm.com/events-exhibitions-family-activities.aspx](http://www.fleetairarm.com/events-exhibitions-family-activities.aspx)

**7 Compton Abbas, Dorset:** Vintage Fly-in – [comptonabbasairfield.co.uk](http://comptonabbasairfield.co.uk)

**21-22 The Helicopter Museum, Weston-super-Mare, Somerset:** Behind the Scenes Spotters Weekend – [www.helicoptermuseum.co.uk/events.htm](http://www.helicoptermuseum.co.uk/events.htm)

### APRIL

**4 Compton Abbas, Dorset:** Vintage Fly-in – [comptonabbasairfield.co.uk](http://comptonabbasairfield.co.uk)

**4 Newark Air Museum, Notts:** Indoor Aeroboot/Aerofumble – [www.newarkairmuseum.org/2020\\_Special-Events](http://www.newarkairmuseum.org/2020_Special-Events)

**11-12 Easter, Ross-Shire:** Easter@Easter fly-in – [www.easterairfield.co.uk](http://www.easterairfield.co.uk)

**12 Popham, Hants:** Jodel Club Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

**19 Crawley, West Sussex:** LGW 2020 Gatwick International Aircraft Enthusiasts' Fair – 01403 252628

**19 Henstridge, Somerset:** LAA Wessex Strut Fly-in – [www.wessexstrut.org.uk](http://www.wessexstrut.org.uk)

**19 Old Buckenham, Norfolk:** American Fly-in – [oldbuck.com/en/home](http://oldbuck.com/en/home)

**19 Fenland, Lincs:** VAC Daffodil Fly-in – <http://www.vintageaircraftclub.org.uk/calendar.php>

**24 Compton Abbas, Dorset:** Evening Fly-in & Curry – [www.comptonabbasairfield.co.uk](http://www.comptonabbasairfield.co.uk)

**25 IWM Duxford, Cambs:** General Aviation Expo 2020 – 0207 4165000 <https://www.iwm.org.uk/events/general-aviation-expo>

**25-26 Sywell, Northants:** International Eurostar EV-97 Fly-In – [www.bmaa.org/events/international-eurostar-ev-97-fly-in-2020](http://www.bmaa.org/events/international-eurostar-ev-97-fly-in-2020)

### MAY

**2 Compton Abbas, Dorset:** Vintage Fly-in – [comptonabbasairfield.co.uk](http://comptonabbasairfield.co.uk)

**2-3 Popham, Hants:** Microlight Trade Show – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

**3 Old Warden, Beds:** Season Premiere (VE Day) – [www.shuttleworth.org/events/seasonpremiere](http://www.shuttleworth.org/events/seasonpremiere)

**10 Popham, Hants:** Auto-Aero Jumble, Fly-in & Classic Vehicle Show Rally – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

**10 Kempton Park Racecourse, Middlesex:** Heathrow Aircraft Enthusiasts Fair – [www.aircraftenthusiastfair.co.uk](http://www.aircraftenthusiastfair.co.uk)

**15-16 Compton Abbas, Dorset:** British Aerobatic Association Competition – <https://comptonabbasairfield.co.uk/events>

**16 Old Warden, Beds:** May Evening Airshow (Spies and Intrigue) – [www.shuttleworth.org/events/mayeveningairshow](http://www.shuttleworth.org/events/mayeveningairshow)

**16 Sandown, Isle of Wight, Hants:** Mary Ellis Memorial Vintage Fly-in – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)

**16-17 Newark Air Museum, Notts:** Cold War Call Up 20 – [www.newarkairmuseum.org/2020\\_Special-Events](http://www.newarkairmuseum.org/2020_Special-Events)

**16-17 North Coates Airfield, Lincs:** Spring Flying Meeting – <https://northcoatesflyingclub.com/flying-events>

**17 Abingdon, Oxon:** Air & Country Show – <https://www.abingdonairandcountry.co.uk/>

**22-25 Wrenbury, Nantwich, Cheshire:** NWBAC Balloon Meet – [www.nwbac.com](http://www.nwbac.com)

**23-24 Duxford Airfield, Cambs:** Duxford Air Festival – <https://www.iwm.org.uk/airshows/duxford-air-festival>

**23-24 Eshott, Northumberland:** Big North Fly-in & Meet the LAA – [www.eshottairfield.com](http://www.eshottairfield.com)

**23 & 25 East Kirkby, Lincs:** Lanc, Tank & Military Machines – <https://www.lincsaviation.co.uk/events/Special-Events/lanc-tank-and-military-machines.htm>

**24 Teesside International Airport:** Teesside Airshow – [www.teesvalleyairshow.co.uk](http://www.teesvalleyairshow.co.uk)

**31 Stow Maries, Essex:** Wings & Wheels – [www.stowmaries.org.uk/whats-on](http://www.stowmaries.org.uk/whats-on)

**23-30 Long Mynd, Salop:** Midland Gliding Club Vintage Rally 2020 – <https://vintagegliderclub.org/events-rallies>

**24 Popham, Hants:** Bulldog & Beagle Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

**29 Compton Abbas, Dorset:** Evening Fly-in & Curry – [www.comptonabbasairfield.co.uk](http://www.comptonabbasairfield.co.uk)

### JUNE

**5-7 Sandown, Isle of Wight, Hants:** Spamfield Microlight Rally – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)

**5-7 Guernsey, Channel Islands:** 48th Guernsey Air Rally – [guernseyaeroclub.com](http://guernseyaeroclub.com)

**6 Compton Abbas, Dorset:** Vintage Fly-in – [comptonabbasairfield.co.uk](http://comptonabbasairfield.co.uk)

**6-7 Torbay, Devon:** English Riviera Airshow – <https://englishrivieraairshow.co.uk/>

**7 Old Warden, Beds:** Shuttleworth Flying Festival – [www.shuttleworth.org/events/flyingfestival](http://www.shuttleworth.org/events/flyingfestival)

**11-13 Wycombe Air Park, Bucks:** Aero Expo UK – <https://www.aeroexpo.co.uk/>

**12 Popham, Hants:** LAA Andover Strut & Gyrocopter Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)



An aerial view of the aircraft static park of 2019's Royal International Air Tattoo at RAF Fairford. This year's event takes place over July 17-19. RIAT



**12-14 Newark Showground, Notts:** Retro Festival – [www.retrofestival.co.uk/newark/airshows](http://www.retrofestival.co.uk/newark/airshows)  
**14 RAF Cosford, Salop:** Royal Air Force Cosford Air Show – 01902377922 <https://www.cosfordairshow.co.uk/>  
**20 Old Warden, Beds:** Evening Airshow (Biggles) – [www.shuttleworth.org/events/juneeveningairshow](http://www.shuttleworth.org/events/juneeveningairshow)  
**20 Wormingford, Essex:** Wormingford Wings and Wheels – [www.facebook.com/events/520645082000648/](http://www.facebook.com/events/520645082000648/)  
**20-21 Easter, Ross-Shire:** Summer Solstice and longest day fly-in – [www.easterairfield.co.uk](http://www.easterairfield.co.uk)  
**20-21 Newark Air Museum, Notts:** Cockpit-Fest & Aeroboot – [www.newarkairmuseum.org/2020\\_Special-Events](http://www.newarkairmuseum.org/2020_Special-Events)  
**20-21 Turweston Aerodrome, Bucks:** Air-Britain Fly-In – [air-britain.com/web/flyin](http://air-britain.com/web/flyin)  
**21 Compton Abbas, Dorset:** Flyer Magazine Fly-in – [www.comptonabbasairfield.co.uk](http://www.comptonabbasairfield.co.uk)  
**26 Compton Abbas, Dorset:** Evening Fly-in & Curry – [www.comptonabbasairfield.co.uk](http://www.comptonabbasairfield.co.uk)  
**27 Scarborough, North Yorkshire:** National Armed Forces Day – <https://www.discoveryyorkshirecoast.com/whats-on/major-events/armed-forces-day.aspx>  
**27-28 Headcorn, Kent:** Battle of Britain Air Show 2020 – 0845 6526263 [www.headcornevents.co.uk/Events/Battle\\_of\\_Britain\\_Air\\_Show](http://www.headcornevents.co.uk/Events/Battle_of_Britain_Air_Show)  
**27-28 Weston-super-Mare, Somerset:** Weston Air Festival – [westonairfestival.com/](http://westonairfestival.com/)  
**27-28 Heveningham Hall, Heveningham, Suffolk:** Country Fair (including airshow and fly-in) – <http://www.countryfair.co.uk>  
**29-31 Perth, Perth & Kinross:** Scottish Aero Club Fly-in and Meet the LAA – [www.scottishaeroclub.org.uk](http://www.scottishaeroclub.org.uk)

## JULY

**4 Swansea Bay, Swansea:** Wales Airshow – 01792637300 [www.walesnationalairshow.com](http://www.walesnationalairshow.com)  
**4-5 Shobdon, Herefordshire:** Food and Flying Festival – [www.shobdonfoodandflyingfestival.co.uk](http://www.shobdonfoodandflyingfestival.co.uk)  
**5 Old Warden, Beds:** Shuttleworth Military Airshow – [www.shuttleworth.org/events/militaryairshow](http://www.shuttleworth.org/events/militaryairshow)  
**9-12 Goodwood, Sussex:** Festival of Speed – [www.goodwood.com/motorsport/festival-of-speed](http://www.goodwood.com/motorsport/festival-of-speed)  
**10 The Helicopter Museum, Weston-super-Mare, Somerset:** Behind the Scenes Spotters Day – [www.helicoptermuseum.co.uk/events.htm](http://www.helicoptermuseum.co.uk/events.htm)  
**11 Middle Wallop, Hants:** Wallop Wheels and Wings – [www.armyflying.com/events/family-events/wallop-wheels-and-wings-2020](http://www.armyflying.com/events/family-events/wallop-wheels-and-wings-2020)  
**11 RNAS Yeovilton, Somerset:** Royal Navy International Air Day – [www.royalnavy.mod.uk/yeovilton-airday](http://www.royalnavy.mod.uk/yeovilton-airday)  
**11 Sandown, Isle of Wight, Hants:** Wingly Fly-in and BBQ – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)  
**11-12 IWM Duxford, Cambs:** Flying Legends Airshow – [www.flyinglegends.com](http://www.flyinglegends.com)  
**17-19 Fairford, Gloucs:** Royal International Air Tattoo – <https://www.airtattoo.com/>  
**18 Old Warden, Beds:** Evening Airshow with the LAA – [www.shuttleworth.org/events/julyeveningairshow](http://www.shuttleworth.org/events/julyeveningairshow)  
**18 Sandown, Isle of Wight, Hants:** Round-Island Air Race – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)  
**18-19 Stow Maries, Essex:** Stow Maries at War – [www.stowmaries.org.uk/whats-on](http://www.stowmaries.org.uk/whats-on)  
**20-24 Farnborough, Hants:** Farnborough International Airshow – [www.farnboroughairshow.com](http://www.farnboroughairshow.com)  
**24-26 Enstone, Oxon:** BMAA Freedom Rally – [www.bmaa.org/information-library/events/bmaa-freedom-rally--ssdr](http://www.bmaa.org/information-library/events/bmaa-freedom-rally--ssdr)  
**25-26 North Coates Airfield, Lincs:** Wings & Wheels – <https://northcoatesflyingclub.com/flying-events>  
**24-26 Sunderland, Tyne & Wear:** Sunderland Airshow – [www.sunderlandinternationalairshow.co.uk](http://www.sunderlandinternationalairshow.co.uk)  
**26 Compton Abbas, Dorset:** PA-28 Fly-in – [comptonabbasairfield.co.uk](http://comptonabbasairfield.co.uk)

## AUGUST

**1-2 Headcorn, Kent:** Fire Show – [www.headcornevents.co.uk/Events/Fire%20Show](http://www.headcornevents.co.uk/Events/Fire%20Show)  
**1-2 Old Buckenham, Norfolk:** Old Buckenham Airshow – [oldbuckenhamairshow.com](http://oldbuckenhamairshow.com)  
**2 Old Warden, Beds:** Family Airshow (At the Movies) – [www.shuttleworth.org/events/militaryairshow](http://www.shuttleworth.org/events/militaryairshow)  
**3 East Kirkby, Lincs:** East Kirkby Air Show – [www.lincsaviation.co.uk/events/](http://www.lincsaviation.co.uk/events/)  
**6-9 Ashton Court, Bristol:** Bristol Balloon Fiesta – <http://bristolballoonfiesta.co.uk>  
**7-9 Newbury Showground, Berks:** Retro Festival – [www.retrofestival.co.uk/newbury/airshows](http://www.retrofestival.co.uk/newbury/airshows)  
**8-9 Headcorn, Kent:** Combined Ops Military & Aircraft Show – [www.headcornevents.co.uk/Events/Combined\\_Ops](http://www.headcornevents.co.uk/Events/Combined_Ops)  
**9 Popham, Hants:** Motorcycle Megameet, Jumble & Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)  
**13-16 Eastbourne sea front, East Sussex:** Eastbourne International Airshow – [www.eastbourneairshow.com](http://www.eastbourneairshow.com)  
**15 Old Warden, Beds:** Flying Proms – [www.shuttleworth.org/events/flyingproms](http://www.shuttleworth.org/events/flyingproms)  
**16 The Helicopter Museum, Weston-super-Mare, Somerset:** World Helicopter Day – [www.helicoptermuseum.co.uk/events.htm](http://www.helicoptermuseum.co.uk/events.htm)  
**20-23 Bournemouth sea front, Dorset:** Bournemouth Air Festival – <https://bournemouthair.co.uk>

**22-23 Sandown, Isle of Wight, Hants:** Battle of Britain Celebration – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)  
**27-28 Clacton-on-Sea, Essex:** Clacton Airshow – [clactonairshow.com](http://clactonairshow.com)  
**29 Henstridge, Somerset:** Wings & Wheels – [wingsandwheelshenstridge.com](http://wingsandwheelshenstridge.com)  
**30 Little Gransden, Cambs:** Little Gransden Air and Car Show – <https://littlegransdenairshow.co.uk>

## SEPTEMBER

**4-6 Ayr Low Green, Ayrshire:** Scottish International Airshow – [www.tsia.scot](http://www.tsia.scot)  
**4-6 Sywell, Northants:** LAA Rally – [www.lightaircraftassociation.co.uk](http://www.lightaircraftassociation.co.uk)  
**5 Brooklands, Surrey:** Brooklands Museum Aviation Day – [www.brooklandsmuseum.com/whats-on/brooklands-aviation-day](http://www.brooklandsmuseum.com/whats-on/brooklands-aviation-day)  
**5-6 North Coates Airfield, Lincs:** 25th Anniversary Fly-in – <https://northcoatesflyingclub.com/flying-events>  
**6 Popham, Hants:** Auster Aircraft Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)  
**6 Old Warden, Beds:** Vintage Airshow (Clayton & Shuttleworth Showcase) – [www.shuttleworth.org/events/vintage-airshow](http://www.shuttleworth.org/events/vintage-airshow)  
**10 St Aubin's Bay, Jersey:** Jersey International Air Display – [www.jerseyairdisplay.org.uk](http://www.jerseyairdisplay.org.uk)  
**11-13 Goodwood, Sussex:** Goodwood Revival – [www.goodwood.com/hospitality/goodwood-revival](http://www.goodwood.com/hospitality/goodwood-revival)  
**11-13 Southport seafront, Merseyside:** Southport Air Show – [www.visitsouthport.com/airshow](http://www.visitsouthport.com/airshow)  
**12-13 Sandown, Isle of Wight, Hants:** Gyro Fly-in – [www.eghn.org.uk/calendar](http://www.eghn.org.uk/calendar)  
**18 Midland Air Museum, Coventry Airport:** Midland Air Museum Aviation Fair – [www.aircraftenthusiastfair.co.uk](http://www.aircraftenthusiastfair.co.uk)  
**19-20 IWM Duxford, Cambs:** 80th Anniversary Battle of Britain Air Show – [www.iwm.org.uk/airshows/duxford-battle-of-britain-airshow](http://www.iwm.org.uk/airshows/duxford-battle-of-britain-airshow)  
**19-20 The Helicopter Museum, Weston-super-Mare, Somerset:** Behind the Scenes Spotters Weekend – [www.helicoptermuseum.co.uk/events.htm](http://www.helicoptermuseum.co.uk/events.htm)  
**27 Popham, Hants:** Solent Aviation Fly-in – [www.popham-airfield.co.uk](http://www.popham-airfield.co.uk)

## NOVEMBER

**15 Middle Wallop, Hants:** Aircraft Enthusiasts Fair and Model Show – [www.armyflying.com/events/special-events/aircraft-enthusiasts-fair-and-model-show](http://www.armyflying.com/events/special-events/aircraft-enthusiasts-fair-and-model-show)  
**22 Kempton Park Racecourse, Middlesex:** Heathrow Aircraft Enthusiasts Fair – [www.aircraftenthusiastfair.co.uk](http://www.aircraftenthusiastfair.co.uk)

## EUROPE

### APRIL

**1-4 Friedrichshafen, Germany:** Aero Friedrichshafen – [www.aero-expo.com](http://www.aero-expo.com)  
**13-19 Bienenfarm, Germany:** Quax Ausmotten Fly-in – [www.quax-flieger.de/veranstaltungen/ausmotten-2020](http://www.quax-flieger.de/veranstaltungen/ausmotten-2020)  
**22-26 Antalya International Airport, Turkey:** Eurasia Airshow '20 – [www.eurasiaairshow.com](http://www.eurasiaairshow.com)  
**25-26 Plasy, Czech Republic:** Plasy Air Day – [www.denvevzduchu.cz](http://www.denvevzduchu.cz)

### MAY

**02-03 Arbon, Switzerland:** Arbon Classics – [www.arbon-classics.ch/arbonclassics](http://www.arbon-classics.ch/arbonclassics)



An impressive number of business aircraft were exhibited at 2019's EBACE show at Geneva Airport. The event this year will take place from May 26-28. [AirTeamImages.com/Matthieu\\_Douhaire](http://AirTeamImages.com/Matthieu_Douhaire)



**08-10 Piešťany, Slovakia:** Festival Letectva (Air Festival) Piešťany – <https://festivalletectva.sk>  
**09 Moscow, Russia:** Victory Day Parade – [mil.ru/files/files/parad2015/1-moscow.html](http://mil.ru/files/files/parad2015/1-moscow.html)  
**13-14 Istres, France:** AeroSPI International Air Show – [www.aerospi.fr](http://www.aerospi.fr)  
**13-17 Berlin ExpoCenter Airport, Schönefeld:** ILA Berlin Air Show – [www.ila-berlin.de](http://www.ila-berlin.de)  
**15-17 Bienenfarm, Germany:** Quax Ost-Block Fly-In – [www.quax-flieger.de/veranstaltungen/ostblock-fly-in-2020](http://www.quax-flieger.de/veranstaltungen/ostblock-fly-in-2020)  
**16-17 BA 116 Luxeuil, France:** Porte Ouvertes (Open Days)  
**16 Hradec Králové, Czech Republic:** Helicopter Show – [www.helicoptershow.cz](http://www.helicoptershow.cz)  
**16-17 Grossenhain, Germany:** Grossflugtage Grossenhain – [www.grossflugtage.com/grossenhain-2020](http://www.grossflugtage.com/grossenhain-2020)  
**17 Beja Air Base, Portugal:** Tiger Meet Open Day – [www.natotigers.org/tiger-meets/2020](http://www.natotigers.org/tiger-meets/2020)  
**21-23 Moscow, Russia, Crocus Expo:** HeliRussia – <https://helirussia.ru>  
**23 Muret-Lherm, France:** AirExpo 2020 – [airexpo.org](http://airexpo.org)  
**26-28 Geneva, Switzerland:** EBACE 2020 – <https://ebace.aero/2020>  
**30 Zadar, Croatia:** Croatia International Air Show  
**30-31 Cerny, France:** La Ferté-Alais Meeting Aérien: Le Temps des Hélices – [www.ajbs.fr](http://www.ajbs.fr)  
**30-31 Pardubice, Czech Republic:** Pardubice Airshow – <https://aviatickapout.cz>

## JUNE

**1 Villeneuve-sur-Lot, France:** Villeneuve Air Show – [www.villeneuveairshow.com](http://www.villeneuveairshow.com)  
**4-6 Lyon-Bron, France:** France Air Expo Lyon – <https://franceairexpo.com>  
**6 Rygge Air Base, Norway:** Rygge Airshow – <https://forsvaret.no/en/rygge-air-show-2020>  
**6-7 Świdnik, Poland:** Świdnik Air Festival – <https://air-festival.swidnik.pl>  
**7 Laval-Entrammes, France:** Laval Aéro Show – <https://laval-aeroshow.com>  
**11-14 Kehl-Sundheim, Germany:** Kehler Flugtage (flight days) – [www.kehler-flugtage.de](http://www.kehler-flugtage.de)  
**13 Laage, Germany:** Tag der Bundeswehr (Armed Forces Day) – <https://tag-der-bundeswehr.de>  
**13 Sørstokken, Norway:** Stord Airshow – [www.stordairshow.no](http://www.stordairshow.no)  
**13 Mladá Boleslav, Czech Republic:** Historical Airshow – [www.historical-airshow.com](http://www.historical-airshow.com)  
**13-14 BA709 Cognac, France:** Meeting de l'Air – [www.fosa.fr/meetingdelair](http://www.fosa.fr/meetingdelair)  
**13-14 Maribor, Slovenia:** AEROS – <https://aeros.si>  
**13-16 Biscarosse, France:** Rassemblement international d'Hydravions (International Gathering of Seaplanes) – [www.biscagrandslacs.com/rassemblement-international-d-hydravions](http://www.biscagrandslacs.com/rassemblement-international-d-hydravions)  
**14 Karup, Denmark:** Danish Air Show 2020 – <https://danishairshow.dk>  
**14 Skedsmo, Norway:** Kjeller Flydag (Flight Day) – <http://www.flydagen.no>

**19-21 Gelnhausen, Germany:** Flugplatz-Kerb – [www.flugplatzkerb-gelnhausen.de](http://www.flugplatzkerb-gelnhausen.de)  
**20-21 Breda International Airport, Netherlands:** Classic Cars & Aeroplanes – <https://cca-seppe.nl>  
**20-21 Annecy, France:** AéroLac Annecy 2020 – [www.aerolac.org](http://www.aerolac.org)  
**21 Motril, Granada, Spain:** Festival Aéreo Internacional de Motril – [motrilairshow.com](http://motrilairshow.com)  
**26-28 Leszno, Poland:** SoundAir Festival Leszno – [soundair.pl](http://soundair.pl)  
**27-28 Ussel, Belgium:** Usselavia 2020 – <https://usselavia.be>  
**28 Meaux, France:** Meux Airshow 2020 – [www.meaux-airshow.fr](http://www.meaux-airshow.fr)

## JULY

**3-4 Weston Airport, Dublin, Ireland:** Private Flyer Ireland – [www.privateflyershow.com](http://www.privateflyershow.com)  
**3-5 Bienenfarm, Germany:** Quax Stearman & Friends Fly-In – [www.quax-flieger.de/veranstaltungen/stearman-and-friends-2020/](http://www.quax-flieger.de/veranstaltungen/stearman-and-friends-2020/)  
**5 Grenoble, France:** Grenoble Air Show – [grenobleairshow.fr](http://grenobleairshow.fr)  
**11 Genk-Zwartburg, Belgium:** Black Mountain Fly-In – [www.ebzw.be/events](http://www.ebzw.be/events)  
**12 Albertville, France:** Fête Aérienne (Air Festival) – [www.acalbertville.com/fete-de-laerodrome-dalbertville](http://www.acalbertville.com/fete-de-laerodrome-dalbertville)  
**12 Vélez-Málaga, Spain:** Festival Aéreo Internacional Torre del Mar – <https://festivalaereotorredelmar.com>  
**14 Paris, France:** Bastille Day parade  
**25-26 Bray Seafort, Ireland:** Bray Air Display – <https://brayairdisplay.com>  
**26 Playa San Lorenzo, Gijón, Spain:** Festival Aéreo de Gijón – [www.festivalaereogijon.com](http://www.festivalaereogijon.com)

## AUGUST

**01-02 Jūrmala, Latvia:** Wings Over Baltics Airshow – [www.wingsoverbaltics.com](http://www.wingsoverbaltics.com)  
**01-02 Aurillac, France:** Meeting Aérien Aurillac – [www.aurillac-airshow.fr](http://www.aurillac-airshow.fr)  
**05 Birr, Co Offaly, Ireland:** Birr Air Display – [birrairdisplay.com](http://birrairdisplay.com)  
**06-09 Bienenfarm, Germany:** International An-2 Meeting – [www.quax-flieger.de/veranstaltungen/22stes-internationales-antonov-an-2-treffen-2020](http://www.quax-flieger.de/veranstaltungen/22stes-internationales-antonov-an-2-treffen-2020)  
**07-09 Bautzen-Litten, Germany:** Flugtage Bautzen – [www.flugtage-bautzen.de](http://www.flugtage-bautzen.de)  
**07-09 Gdynia, Poland:** Gdynia AeroBaltic 2020 – <https://aerobaltic.pl>  
**08-09 Ussel, Belgium:** Wings & Wheels Ussel – [wingsandwheels.be/en](http://wingsandwheels.be/en)  
**08-09 Friedrichshafen, Germany:** Dornier Museum DO-DAYS – [www.dorniermuseum.de/museum/do-days/uebersicht](http://www.dorniermuseum.de/museum/do-days/uebersicht)  
**15 Belvès, France:** Meeting Aérien à Belvès – [www.perigueux-city.com/meeting-aerien-a-belves.html](http://www.perigueux-city.com/meeting-aerien-a-belves.html)  
**15-16 Schaffen-Diest, Belgium:** International Old-Timer Fly/Drive-In – <https://flyin.dac.be>

**20-23 Lolland Falster Airport, Denmark:** Vintage Aerobatic World Championship – <https://vintageaerobatic.com>  
**21-23 Texel, Netherlands:** Texel & AOPA Fly-In – [www.texelflyin.nl](http://www.texelflyin.nl)  
**22 St Stephan, Switzerland:** Hunterfest 2020 – [www.hunterverein.ch](http://www.hunterverein.ch)  
**22-23 Cheb, Czech Republic:** Letecký Den (airshow) Cheb 2020 – [www.letistecheb.cz](http://www.letistecheb.cz)  
**23-29 Patriot Expo, Kubinka Air Base and Alabino military training grounds, Moscow region, Russia:** ARMY 2020 International Military-Technical Forum – [www.rusarmyexpo.com](http://www.rusarmyexpo.com)  
**29 Sätenäs, Sweden:** Flygdag Skaraborgs Flygflottill F7 (Air Day Skaraborg Wing) – [www.forsvarsmakten.se/sv/aktuellt/uppvisningar-och-evenemang/flygdagen](http://www.forsvarsmakten.se/sv/aktuellt/uppvisningar-och-evenemang/flygdagen)  
**29-30 Bern-Belp, Switzerland:** 40 Years Mountain Flyers Open Days – [www.mountainflyers.ch](http://www.mountainflyers.ch)  
**29-30 Sliac Air Base, Slovakia:** Slovak International Air Fest 2020 – [www.siaf.sk](http://www.siaf.sk)  
**29-30 Breitscheid, Germany:** Airshow Breitscheid 2020 – <https://airshow-breitscheid.com>  
**29-30 Dittinger, Switzerland:** Dittinger Flugtage (Air Days) 2020 – [flugtage.ch](http://flugtage.ch)  
**29-30 Albstadt-Degerfeld, Germany:** Degerfeld Flugplatzfest (Airfield Festival) – <https://flugplatzfest.lsv-degerfeld.de>  
**30 Tuven, Norway:** Telemark Airshow 2020 – <https://telemarkairshow.no>

## SEPTEMBER

**5 Aurel Vlaicu International Airport, Romania:** Bucharest International Air Show – [www.bias.aero](http://www.bias.aero)  
**5-6 Gatow, Berlin, Germany:** Luftwaffenmuseum Flugplatzfest (Airfield Festival) – [luftwaffenmuseum.org](http://luftwaffenmuseum.org)  
**5-6 Saint-Junien, France:** Légend'Air en Limousin – <https://legendairelimousin.blogspot.com>  
**5-6 Wershofen/Eifel, Germany:** Flugplatzfest (Airfield Festival) Wershofen – [www.flugtag-wershofen.de](http://www.flugtag-wershofen.de)  
**06 Bad Vöslau Airport, Austria:** Austrian AIRFEST 2020 – <https://airfest.at>  
**06 Cambrai, France:** Meeting Aérien Cambrai – [www.facebook.com/events/aeroclub-louis-blériot/meeting-aerien-de-cambrai-2020/332181587641288/](http://www.facebook.com/events/aeroclub-louis-blériot/meeting-aerien-de-cambrai-2020/332181587641288/)  
**11, 13 Sanicole Airfield, Hechtel, Belgium:** International Sanicole Air Show – [www.sanicole.com](http://www.sanicole.com)  
**11-13 Bienenfarm, Germany:** Quax Flugtag 2020 – [www.quax-flieger.de/veranstaltungen/flugtag-2020](http://www.quax-flieger.de/veranstaltungen/flugtag-2020)  
**11-13 Szeged, Hungary:** Szeged International Airshow – [www.facebook.com/airshowszeged](http://www.facebook.com/airshowszeged)  
**12 Kleine Brogel Air Base, Belgium:** Spottersday Kleine Brogel – [www.spottersday.be](http://www.spottersday.be)  
**12-13 Sivrihisar, Turkey:** SHG Airshow – [www.shgairshows.com](http://www.shgairshows.com)  
**19-20 Besançon-Thise, France:** Grand Rassemblement International de Biplans (Grand International Biplane Gathering) – [aerofc.fr/aerofc/site/grand-rassemblement-international-de-biplans-19-20-septembre-2020](http://aerofc.fr/aerofc/site/grand-rassemblement-international-de-biplans-19-20-septembre-2020)  
**19-20 Tanagra Air Base, Greece:** Athens Flying Week 2020 – [www.athensflyingweek.gr](http://www.athensflyingweek.gr)  
**19-20 Ostrava, Czech Republic:** NATO Days in Ostrava/ Czech Air Force Days – [www.natoday.cz](http://www.natoday.cz)  
**19-20 Rivolto, Italy:** Freccie Tricolori 60th Anniversary Airshow  
**20 Saint Léger sur Roanne, France:** Meeting Aérien de Roanne 2020 – [www.meeting-roanne.net](http://www.meeting-roanne.net)  
**25-27 Saint-Yan, France:** Air France Fly-in and Meeting-flyin.lfbk.free.fr  
**26-27 Luqa Airport, Malta:** Malta International Air Show – [www.maltairshow.com](http://www.maltairshow.com)  
**26-27 Toulouse Francazal Airport, France:** Meeting Aérien Des Étoiles et des Ailes (Stars and Wings Airshow) 2020 – [www.meeting.desetoilesetdesailes.com](http://www.meeting.desetoilesetdesailes.com)  
**30-04 Oct Issoire le-Broc, France:** Ailes et Volcans – [www.ailes-et-volcans.fr](http://www.ailes-et-volcans.fr)

## OCTOBER

**01-04 Istanbul Atatürk Airport, Turkey:** Istanbul Airshow 2020 – [www.istanbulairshow.com](http://www.istanbulairshow.com)  
**13-14 Axalp-Ebenfluh, Switzerland:** Axalp Swiss Air Force Live Fire Demo – [www.vtg.admin.ch/de/organisation/kdo-op/lw/flpl-meivorschau-axalp.html](http://www.vtg.admin.ch/de/organisation/kdo-op/lw/flpl-meivorschau-axalp.html)

## NOVEMBER

**10-12 Koelnmesse, Cologne Germany:** European Rotors – [www.europeanrotors.eu](http://www.europeanrotors.eu)



Whiteman AFB, Missouri is the home of the B-2 Spirit, but the airshow there also provides an opportunity to see the base's resident A-10 Thunderbolt IIs as well. USAF/Tech Sgt Alexander W Riedel



# NORTH AMERICA

## FEBRUARY

**16 Laredo, Texas:** Stars & Stripes Air Show Spectacular – [www.wbcalaredo.org/event/wbca-stars-and-stripes-air-show-spectacular-sponsored-by-miller-lite/](http://www.wbcalaredo.org/event/wbca-stars-and-stripes-air-show-spectacular-sponsored-by-miller-lite/)  
**22 Plant City, Florida:** Planes, Trains & Automobiles – [www.plantcity.org/events/details/planes-trains-automobiles-10-yr-anniversary-event-10531](http://www.plantcity.org/events/details/planes-trains-automobiles-10-yr-anniversary-event-10531)  
**22-23 Puyallup, Washington state:** Northwest Aviation Conference & Trade Show – [www.washington-aviation.org/NAC&TS.html](http://www.washington-aviation.org/NAC&TS.html)

## MARCH

**06-07 Casa Grande, Arizona:** Cactus Antique Fly-In – [www.cactusflyin.org](http://www.cactusflyin.org)  
**13-14 MCAS Yuma, Arizona:** MCAS Yuma Air Show – [www.yumaairshow.com](http://www.yumaairshow.com)  
**14 Laughlin AFB, Del Rio, Texas:** Laughlin AFB Fiesta of Flight 2020 – [www.laughlin.af.mil/Fiesta-of-Flight-2020](http://www.laughlin.af.mil/Fiesta-of-Flight-2020)  
**14 NAF El Centro, California:** NAF El Centro Air Show – [www.elcentroairshow.com](http://www.elcentroairshow.com)  
**21-22 Luke AFB, Arizona:** Luke Days 2020 – [www.luke.af.mil/Luke-Days-2020](http://www.luke.af.mil/Luke-Days-2020)  
**21-22 William J Fox Airport, Palmdale, California:** Los Angeles County Air Show – <https://lacountyairshow.com>  
**27-28 DeFuniak Springs, Florida:** Marvel of Flight Fly-in & Expo – <https://www.defuniaksprings.net/1217/Marvel-of-Flight>  
**28 Falcon Field, Mesa, Arizona:** Falcon Field Airport Open House – <https://www.falconfieldairport.com>  
**28-29 March ARB, California:** March Field Air-Space Expo 2020 – [marchairshow.com](http://marchairshow.com)  
**28-29 MacDill AFB, Florida:** Tampa Bay AirFest 2020 – [www.tampabayairfest.com](http://www.tampabayairfest.com)  
**31-05 Apr Lakeland-Linder Airport, Florida:** Sun 'n Fun Fly-In – [www.flysnf.org](http://www.flysnf.org)

## APRIL

**04-05 NAS Kingsville, Texas:** Wings Over South Texas – [www.wingsoversouthtexas.com](http://www.wingsoversouthtexas.com)  
**04-05 Waco Airport, Texas:** The Heart of Texas Airshow – [www.heartoftexasairshow.com](http://www.heartoftexasairshow.com)  
**18 Waterfront Park, Louisville, Kentucky:** Thunder Over Louisville – <https://thunderoverlouisville.org>  
**18-19 Maxwell AFB, Montgomery, Alabama:** Maxwell AFB Air & Space Show – [www.maxwell.af.mil/Air-Space-Show](http://www.maxwell.af.mil/Air-Space-Show)  
**18-19 Joint Base Charleston, South Carolina:** JB Charleston Air & Space Expo 2020 – [www.jbcharleston.jb.mil](http://www.jbcharleston.jb.mil)  
**25-26 Columbus AFB, Mississippi:** Columbus AFB Open House Air & Space Show – [wingsovercolumbus.net](http://wingsovercolumbus.net)  
**25-26 Beaumont, Texas:** Southeast Texas Freedom Flight AirFest  
**25-26 Courtland, Alabama:** Wings Over Courtland – [www.wingsovercourtland.com](http://www.wingsovercourtland.com)

## MAY

**01-03 MCAS Cherry Point, North Carolina:** Cherry Point Air Show – [www.cherrypointairshow.com](http://www.cherrypointairshow.com)  
**02 Manassas Regional Airport, Virginia:** Leaseweb Manassas Airshow – [www.manassasairshow.com](http://www.manassasairshow.com)  
**02-03 Fort Lauderdale Beachfront, Florida:** Fort Lauderdale Air Show – <https://fortlauderdaleairshow.com>  
**02-03 Falcon Field, Peachtree City, Georgia:** CAF Dixie Wing WWII Heritage Days – <https://wwiideays.org>  
**02-03 Chino Airport, California:** Planes of Fame Air Show – <https://planesoffame.org>  
**02-03 Ted Stevens International Airport, Anchorage, Alaska:** Great Alaska Aviation Gathering – [www.greatalaskaaviationgathering.org](http://www.greatalaskaaviationgathering.org)  
**07-08 National Mall, Washington, DC:** Arsenal of Democracy WWII Victory Capitol Flyover – <https://ww2flyover.org>  
**08-10 Valdez Pioneer Field, Alaska:** Valdez May Day Fly-in and Air Show – [www.valdezflyin.com](http://www.valdezflyin.com)  
**09 Paso Robles Municipal Airport, California:** Estrella Warbirds Wings & Wheels – [www.ewarbirds.org/www12/index.shtml](http://www.ewarbirds.org/www12/index.shtml)  
**09-10 Beale AFB, California:** Beale AFB Air & Space Expo 2020 – [www.bealeairandspaceexpo.com](http://www.bealeairandspaceexpo.com)  
**09-10 Dyess AFB, Abilene, Texas:** Dyess Big Country Air Fest 2020 – [www.bigcountryairfest.org](http://www.bigcountryairfest.org)  
**09-10 Dalton Municipal Airport, Georgia:** Wings Over Dalton, Georgia – [www.wingsoverdaltonga.com](http://www.wingsoverdaltonga.com)



Thousands of aircraft attend AirVenture at Oshkosh, Wisconsin every year. Experimental Aircraft Association

**15-17 Virginia Beach Airport, Virginia:** Warbirds Over The Beach 2020 – <https://militaryaviationmuseum.org/airshows/wotb>  
**16 Peru, Illinois:** TBM Avenger Salute to Veterans – <https://tbmreunion.org>  
**16-17 Joint Base McGuire-Dix-Lakehurst, New Jersey:** Power in the Pines Open House and Air Show – [www.jbmdljb.mil/Power-in-the-Pines-2020](http://www.jbmdljb.mil/Power-in-the-Pines-2020)  
**16-17 Shaw AFB, South Carolina:** Shaw Air Expo 2020 – [www.shawairexpo.com/2020/index.php](http://www.shawairexpo.com/2020/index.php)  
**16-17 Falcon Field, Peachtree City, Georgia:** Atlanta Air Show – <https://airshowatlanta.com>  
**16-17 Joint Base Langley-Eustis, Virginia:** AirPower Over Hampton Roads  
**20 US Naval Academy, Annapolis, Maryland:** Blue Angels display – [www.visitannapolis.org/events/annual/commissioning-week](http://www.visitannapolis.org/events/annual/commissioning-week)  
**23-24 South Beach, Miami Beach, Florida:** Miami Beach Air & Sea Show 2020 – <https://usasalute.com/the-air-sea-show>  
**23-24 Jones Beach, Wantagh, New York:** Bethpage Air Show at Jones Beach – [bethpageairshow.com](http://bethpageairshow.com)  
**23-24 Millville, New Jersey:** Millville Wings & Wheels Airshow – [www.millvilleairshow.com](http://www.millvilleairshow.com)  
**29-30 San Marcos Regional Airport, Texas:** Go Wheels Up! – <https://gowheelsup.live>  
**30-31 Anderson Regional Airport, South Carolina:** Anderson Regional Airshow – [andersonairshow.com](http://andersonairshow.com)  
**30-31 Redlands Municipal Airport, Redlands, California:** Hangar 24 Craft Brewery AirFest – [www.hangar24airfest.com](http://www.hangar24airfest.com)

## JUNE

**5-6 Skypark Airport, Woods Cross, Utah:** Skypark Aviation Festival 2020 – [www.skyparkutah.com/festival](http://www.skyparkutah.com/festival)  
**5-7 Reading Regional Airport, Reading, Pennsylvania:** Mid-Atlantic Air Museum's 30th Anniversary World War II Weekend – [www.maam.org/maamwwii.html](http://www.maam.org/maamwwii.html)  
**5-7 North Wildwood, New Jersey:** Wildwood Airshow – [www.facebook.com/events/wildwood-new-jersey/wildwood-airshow/820553548374743](http://www.facebook.com/events/wildwood-new-jersey/wildwood-airshow/820553548374743)  
**6 DeKalb-Peachtree Airport, Atlanta, Georgia:** Good Neighbor Day PDK Airshow – [www.pdkairshow.com](http://www.pdkairshow.com)  
**6-7 Salinas Municipal Airport, California:** California International Airshow – <https://salinasairshow.com>  
**6-7 Scott AFB, Illinois:** Scott AFB Air Show & Open House – [www.scott.af.mil/About-Us/Airshow](http://www.scott.af.mil/About-Us/Airshow)  
**6-7 Selfridge ANGB, Michigan:** Selfridge ANGB Open House & Air Show – [www.facebook.com/events/309571579684037/](http://www.facebook.com/events/309571579684037/)  
**6-7 Jimmy Stewart Airport, Indiana, Pennsylvania:** Jimmy Stewart Airshow – [www.jimmystewartairport.com/airshow](http://www.jimmystewartairport.com/airshow)  
**6-7 Bolingbrook, Illinois:** Cavalcade of Planes – <https://cavalcadeofplanes.com>  
**10 North Bay, Ontario:** North Bay Armed Forces Day 2020 – [www.armedforcesday.ca](http://www.armedforcesday.ca)

**12-14 Toughkenamon, Pennsylvania:** Festival of Flight Air & Car Show – [www.newgardenflyingfield.com/index-8.html](http://www.newgardenflyingfield.com/index-8.html)  
**12-14 Ocean City, Maryland:** OC Air Show 2020 – [www.ocairshow.com](http://www.ocairshow.com)  
**13-14 Eau Claire, Wisconsin:** Chippewa Valley Air Show – <https://chippewavalleyairshow.com>  
**13-14 West Milford, New Jersey:** Greenwood Lake Air Show – [www.greenwoodlakeairshow.com](http://www.greenwoodlakeairshow.com)  
**13-14 Whiteman AFB, Missouri:** Wings over Whiteman 2020 – [www.whiteman.af.mil/WOW](http://www.whiteman.af.mil/WOW)  
**13-14 CFB Borden, Ontario:** Borden Canadian Armed Forces Days & Air Show – [bordenairshow.ca](http://bordenairshow.ca)  
**17 Thompson, Manitoba:** Snowbirds display  
**19-20 Grant County International Airport, Moses Lake, Washington state:** Moses Lake Air Show – [www.moseslakeairshow.com](http://www.moseslakeairshow.com)  
**20 Indianapolis International Airport, Zionsville, Indiana:** CAF Wings Over Indy – [www.wingsoverindy.com](http://www.wingsoverindy.com)  
**20 Virginia Beach Airport, Virginia:** Military Aviation Museum Flying Proms – <https://militaryaviationmuseum.org/airshows/flying-proms>  
**20-21 Millington Regional Jetport, Tennessee:** Memphis Air Show – [www.memphisairshow.org](http://www.memphisairshow.org)  
**20-21 Youngstown ARS, Ohio:** Thunder Over the Valley – <https://youngstownairshow.com>  
**20-21 Southport Airport, Portage la Prairie, Manitoba:** Manitoba Air Show 2020 – <https://mbairshow.ca>  
**20-21 Quonset State Airport, Rhode Island:** Rhode Island Open House and Air Show – [www.facebook.com/riairshow](http://www.facebook.com/riairshow)  
**20-21 Olympia Regional Airport, Washington:** Olympic Airshow – [olympicairshow.com](http://olympicairshow.com)  
**24 Aéroport St Georges de Beauce, Quebec:** Aérofête de Beauce – <https://www.facebook.com/AerofetedBeauce>  
**26-28 St Thomas Municipal Airport, Ontario:** Great Lakes International Airshow – [glias.ca/site2020](http://glias.ca/site2020)  
**27 Carson City, Nevada:** Carson City Airport Open House – <https://flycarsoncity.com/open-house>  
**27-28 Hill AFB, Utah:** Utah Air Show - Warriors Over the Wasatch – [theutahairshow.com](https://theutahairshow.com)  
**27-28 Dayton International Airport, Ohio:** Dayton Air Show – <https://daytonairshow.com>  
**27-28 Waterloo, Ontario:** Waterloo Airshow – [www.facebook.com/WaterlooAirshow](http://www.facebook.com/WaterlooAirshow)

## JULY

**01-05 Kellogg Airport, Battle Creek, Michigan:** Battle Creek Field of Flight Air Show & Balloon Festival – <https://www.bcballoons.com>  
**02-04 Gateway Arch, St Louis, Missouri:** Fair St Louis – [www.fairsaintlouis.org/air-show](http://www.fairsaintlouis.org/air-show)  
**03 USCG Air Station, Traverse City, Michigan:** National Cherry Festival USCG Open Ramp – [www.cherryfestival.org/events/2020/us-coast-guard-open-ramp](http://www.cherryfestival.org/events/2020/us-coast-guard-open-ramp)  
**03 Mississippi River, Dubuque, Iowa:** Dubuque Air Show & Fireworks – <https://fireworks.radiodubuque.com/air-show>





**Bill Muszala in SNJ-5 Texan *Miss Ellaneous* being pursued around the National Championship Air Races T-6 course in Reno, Nevada by Greg McNeely in the AT-6G Texan *Almost Perfect*.**

Frank Mormillo

**03 Addison Airport, Texas:** Kaboom Town - Addison Airport Air Show - [addisonkaboomtown.com/air-show](http://addisonkaboomtown.com/air-show)  
**04 Racine, Wisconsin:** Racine Airshow - Thunder Over North Beach - <https://racineairshow.com>  
**04-05 Traverse City, Michigan:** National Cherry Festival Airshow - <https://www.cherryfestival.org/p/events/air-show>  
**04-05 Commencement Bay, Tacoma, Washington state:** Tacoma Freedom Fair Air Show - [www.freedomfair.com/air-show](http://www.freedomfair.com/air-show)  
**04-05 Tacoma Narrows Airport, Washington:** Tacoma Freedom Fair Wings & Wheels - <http://www.freedomfair.com/wings-and-wheels>  
**04-05 Pierre, South Dakota:** Let Freedom Fly International Air Show - <https://pierreairstow.com/>  
**11 Pensacola Beach, Florida:** Pensacola Beach Airshow: visitpensacolabeach.com/whats-happening-blue-angels/  
**11 Goshen Municipal Airport, Indiana:** America's Freedom Fest - [www.americasfreedomfest.net](http://www.americasfreedomfest.net)  
**11 Truckee-Tahoe Airport, California:** Truckee Tahoe Airshow & Family Festival - [www.truckeeatahoeairshow.com](http://www.truckeeatahoeairshow.com)  
**11 Ingalls Field Airport, Hot Springs, Virginia:** Wings & Wheels Bath County - <https://www.wingsandwheelsbathcountyva.com>  
**11-12 Joint Base Elmendorf, Alaska:** Arctic Thunder Air Show 2020 - [www.arcticthunderopenhouse.com](http://www.arcticthunderopenhouse.com)  
**11-12 Yellowknife Airport, Northwest Territories:** Yellowknife International Air Show - <https://ykonline.ca/event/2020-yellowknife-international-air-show>  
**12 Campbell River Airport, British Columbia:** Campbell River Wings 'n' Wheels - <https://teenflight.ca/wings-n-wheels-2020>  
**15 Whitehorse, Yukon:** Snowbirds display  
**18 Kingsley ANGB, Klamath Falls, Oregon:** Exercise Sentry Eagle 2020 Open House - [www.facebook.com/events/kingsley-field-air-national-guard-base/sentry-eagle-2020-open-house/754435798362945](http://www.facebook.com/events/kingsley-field-air-national-guard-base/sentry-eagle-2020-open-house/754435798362945)  
**18 Boundary Bay Airport, British Columbia:** Boundary Bay Airshow 2020 - [czbairshow.ca](http://www.czbairshow.ca)  
**18-19 Duluth International Airport, Minnesota:** Duluth Air & Aviation Expo - [duluthairshow.com](https://duluthairshow.com)  
**18-19 CFB Cold Lake, Alberta:** Cold Lake Air Show - [coldlakeairshow.com](https://coldlakeairshow.com)  
**18-19 Flying Cloud Airport, Eden Prairie, Minnesota:** AirExpo 2020 - [www.wotn.org/airexpo](http://www.wotn.org/airexpo)  
**19 O'Neill, Nebraska:** Nebraska State Fly-in and Airshow - [nebraskaaviationcouncil.org/state-fly-in](http://nebraskaaviationcouncil.org/state-fly-in)  
**20-26 Wittman Regional Airport, Oshkosh, Wisconsin:** Oshkosh AirVenture - [www.eaa.org/en/airventure](https://www.eaa.org/en/airventure)  
**22 Cheyenne, Wyoming:** Cheyenne Frontier Days - Thunderbirds display - [www.cfdrodeo.com/event/usaf-thunderbirds](http://www.cfdrodeo.com/event/usaf-thunderbirds)  
**25-26 Ellsworth AFB, North Dakota:** Ellsworth AFB Air Show - [www.ellsworth.af.mil](http://www.ellsworth.af.mil)  
**25-26 Milwaukee Lakefront, Wisconsin:** Milwaukee Air & Water Show - [mkeairwatershow.com/](https://mkeairwatershow.com/)  
**25-26 Pasco, Washington:** HAPO Over the River Airshow - [waterfolies.com/water-folies-experience/airshow](https://waterfolies.com/water-folies-experience/airshow)  
**29 English Bay, Vancouver, British Columbia:** Snowbirds display

**01-02 Lake Washington, Seattle:** Seafair Air Show - [www.seafair.com](http://www.seafair.com)  
**01-02 Vanderhoof, British Columbia:** Vanderhoof International Airshow [www.vanderhoofairshow.ca](http://www.vanderhoofairshow.ca)  
**01-02 Lethbridge Airport, Alberta:** Lethbridge International Air Show  
**01-02 Ernie Hall Aviation Museum, Warren, Ohio:** Wings-n-Wheels - [www.erniehallaviationmuseum.org](http://www.erniehallaviationmuseum.org)  
**05 Rocky Mountain House, British Columbia:** Rocky Mountain House Airshow - [www.facebook.com/RockyMtnHouseAirshow](http://www.facebook.com/RockyMtnHouseAirshow)  
**07-09 Abbotsford, British Columbia:** Abbotsford International Airshow - [abbotsfordairshow.com](https://abbotsfordairshow.com)  
**08 Plymouth Municipal Airport, Maine:** Plymouth Air Show - [www.plymouthairshow.com](http://www.plymouthairshow.com)  
**08 Ames Municipal Airport, Iowa:** Fly Iowa 2020 - [flyiowa.org/fly-iowa-2020](http://flyiowa.org/fly-iowa-2020)  
**09-09 McNary Field, Salem, Oregon:** Warbirds Over The West 2020 - [www.b17alliance.com/warbirds-over-the-west](http://www.b17alliance.com/warbirds-over-the-west)  
**09 Oakland County International Airport, Waterford, Michigan:** OCIA Air Show and Open House - [www.oakgov.com/aviation/airports/ocia/Pages/Air-Show.aspx](http://www.oakgov.com/aviation/airports/ocia/Pages/Air-Show.aspx)  
**12 White Rock, British Columbia:** Snowbirds Fly For CH.I.L.D - [www.child.ca/upcoming-events/snowbirds-fly-for-ch-i-l-d](http://www.child.ca/upcoming-events/snowbirds-fly-for-ch-i-l-d)  
**14-16 Arlington Airport, Washington state:** Arlington Fly-In - <https://www.arlingtonflyin.org>  
**15-16 Lake Michigan Lakefront, Chicago, Illinois:** Chicago Air & Water Show - [https://www.chicago.gov/city/en/depts/dca/supp\\_info/chicago\\_air\\_and\\_watershow.html](https://www.chicago.gov/city/en/depts/dca/supp_info/chicago_air_and_watershow.html)  
**15-16 Brunswick Executive Airport, Maine:** Great State of Maine Air Show - [www.facebook.com/mainearshow](http://www.facebook.com/mainearshow)  
**15-16 Villeneuve Airport, Edmonton, Alberta:** Edmonton Air Show - [edmontonairshow.com](http://www.edmontonairshow.com)  
**15-16 Camarillo Airport, California:** Wings Over Camarillo Air Show - [wingsovercamarillo.com](http://wingsovercamarillo.com)  
**15-16 Akron-Fulton International Airport, Ohio:** Props and Pistons Festival - <https://flyohio.wixsite.com/papf>  
**20-22 Conneaut, Ohio:** D-Day Conneaut - [www.ddayohio.us](http://www.ddayohio.us)  
**22-23 Wilkes-Barr Scranton International Airport, Pennsylvania:** Northeastern Pennsylvania Air Show - [nepairshow.com](https://nepairshow.com)  
**26 Atlantic City seafont, New Jersey:** Atlantic City Air Show - Thunder over the Boardwalk  
**28-29 Madras Municipal Airport, Oregon:** Airshow of the Cascades - [www.cascadeairshow.com](http://www.cascadeairshow.com)  
**29 Coles County Memorial Airport, Illinois:** Wings Over Mattoon - [www.colescountyairport.com/airshows](http://www.colescountyairport.com/airshows)  
**29-30 Stewart International Airport, Newburgh, New York:** New York Air Show - [airshowny.com](https://airshowny.com)  
**29-30 Willow Run Airport, Ypsilanti, Michigan:** Thunder Over Michigan - [yankeearmuseum.org/airshow/](http://yankeearmuseum.org/airshow/)  
**29-30 Debert Airport, Nova Scotia:** Atlantic Canada International Air Show 2020 - [www.airshowatlantic.ca](http://www.airshowatlantic.ca)

## SEPTEMBER

**02 Brantford Municipal Airport, Ontario:** Brantford Community Charity Airshow - [www.communitycharityairshow.com](http://www.communitycharityairshow.com)  
**05 Marion Municipal Airport, Indiana:** 30th Anniversary Fly/In Cruise/In - [www.flyincruisein.com](http://www.flyincruisein.com)  
**05-06 New Century AirCenter, Gardner, Texas:** Kansas City Air Show - [www.kcairshow.org](http://www.kcairshow.org)

**05-07 Burke Lakefront Airport, Cleveland, Ohio:** Cleveland National Air Show - [www.clevelandairshow.com](http://www.clevelandairshow.com)  
**05-7 Canadian National Exhibition, Toronto, Ontario:** Canadian International Air Show - <https://theex.com/main/entertainment/canadian-international-air-show>  
**9-14 Ft McHenry, Baltimore, Maryland:** Maryland Fleet Week & Air Show Baltimore - [www.visitmaryland.org/things-to-do/fleet-week](http://www.visitmaryland.org/things-to-do/fleet-week)  
**11-13 London International Airport, Ontario:** Airshow London - <https://airshowlondon.com>  
**12 Camdenton Memorial Lake Regional Airport, Missouri:** Lake of the Ozarks Air Show 2020 - [www.lakeoftheozarksairshow.com](http://www.lakeoftheozarksairshow.com)  
**12 Waukegan National Airport, Illinois:** Northern Illinois Airshow - [northernillinoisairshow.com](http://northernillinoisairshow.com)  
**16 Fort Erie, Ontario:** Fort Erie Snowbirds display  
**16-20 Reno-Stead, Nevada:** Reno National Championship Air Races - <https://airrace.org>  
**18-20 Gatineau, Quebec:** Aero Gatineau-Ottawa Airshow - [aerogatineauottawa.com/aero-gatineau-ottawa-2020](http://aerogatineauottawa.com/aero-gatineau-ottawa-2020)  
**18-20 Huntington Beach, California:** The Great Pacific Airshow - <https://pacificairshow.com>  
**19 Ocean City Municipal Airport, New Jersey:** Ocean City Airport Festival - [www.ocnj.us/Events2019](http://www.ocnj.us/Events2019)  
**19 Skagit Regional Airport, Burlington, Washington:** Heritage Flight Museum Warbird Weekend - [heritageflight.org/hfm-events/warbird-weekend](http://heritageflight.org/hfm-events/warbird-weekend)  
**20 Ocean City Boardwalk, New Jersey:** Boardwalk Aerobatic Air Show - [www.ocnj.us/Events2019](http://www.ocnj.us/Events2019)  
**19-20 NAS Oceana, Virginia:** NAS Oceana Air Show - [www.oceanaairshow.com](http://www.oceanaairshow.com)  
**19-20 Hammond Northshore Regional Airport, Louisiana:** Hammond Northshore Regional Airshow - [www.hammondairshow.com](http://www.hammondairshow.com)  
**19-20 Montrose Regional Airport, Colorado:** Tribute to Aviation 2020 static display - [www.tributetoaviation.com](http://www.tributetoaviation.com)  
**20 Hayward Executive Airport, California:** Open House - [www.hayward-ca.gov/airport](http://www.hayward-ca.gov/airport)  
**24-27 Montréal-Mirabel International Airport, Quebec:** Volaria Festival Aéronautique - <https://volaria.ca>  
**24-27 MCAS Miramar, California:** MCAS Miramar Air Show - [www.miramarairstow.com](http://www.miramarairstow.com)  
**25-27 McMinnville, Oregon:** Oregon International Air Show - <https://www.oregonairshow.com>  
**26 Madison Municipal Airport, Indiana:** Madison Airport Aviation Day/Fly-In - [www.madisonmunicipalairport.com/airshow.html](http://www.madisonmunicipalairport.com/airshow.html)  
**26 Crossville Memorial Airport, Tennessee:** Crossville Open House & Fly-In - [www.facebook.com/flykcsv](http://www.facebook.com/flykcsv)

## OCTOBER

**03 Ranger Municipal Airport, Texas:** Ranger Old School Fly-in & Airshow - [www.rangerairfield.org/airshow](http://www.rangerairfield.org/airshow)  
**03 Prescott Municipal Airport, Texas:** Wings Out West Air Show - [prescott.erau.edu/octoberwest/wings-out-west-airshow](http://prescott.erau.edu/octoberwest/wings-out-west-airshow)  
**03 Delaware Coastal Airport, Georgetown, Delaware:** Wings & Wheels - A Georgetown Fall Festival - [www.wings-wheels.com](http://www.wings-wheels.com)  
**03 Benton Air Park, Redding, California:** Benton Air Faire - [bentonairfaire.com](http://bentonairfaire.com)  
**03-04 Minden-Tahoe Airport, Nevada:** Minden-Tahoe Aviation Roundup - [www.aviationroundup.com](http://www.aviationroundup.com)  
**03-04 Naval Base Ventura County, Pt Mugu, California:** Naval Base Ventura County Point Mugu Air Show - <https://www.facebook.com/events/NavalBaseVenturaCounty/naval-base-ventura-county-point-mugu-air-show>  
**03-04 Mather Airport, Sacramento, California:** California Capital Airshow - [californiacapitalairshow.com](https://californiacapitalairshow.com)  
**03-04 Aéroport Roland-Désourdy, Bromont, Quebec:** Spectacle Aérien des Cantons de l'Est - [www.facebook.com/spectacleaerien](http://www.facebook.com/spectacleaerien)  
**03-04 Port Isabel-Cameron County Airport, Los Fresnos, Texas:** CAF RGV Wing Airshow - [rgvcf.org/airshow20.html](https://rgvcf.org/airshow20.html)  
**03-04 Virginia Beach Airport, Virginia:** Military Aviation Museum Biplanes & Brews - <https://militaryaviationmuseum.org/airshows/biplanes-and-brews>  
**09-11 San Francisco waterfront, California:** San Francisco Fleet Week Air Show - <https://fleetweeksf.org/air-show>  
**09-11 Lakefront Airport, New Orleans, Louisiana:** WWII Air, Sea & Land Festival - <https://airsealandfest.com>  
**10 Jacqueline Cochran Regional Airport, Thermal, California:** Jacqueline Cochran Air Show - [jcairshow.com](http://jcairshow.com)

## AUGUST

**01-02 Grand Forks AFB, North Dakota:** Grand Forks AFB Air Show - <https://www.grandforks.af.mil>



**10-11 Edwards AFB, California:** Aerospace Valley Air Show – [avairshow.com](http://avairshow.com)  
**10-11 Ellington Field, Houston, Texas:** Wings Over Houston Air Show – <https://wingsoverhouston.com/>  
**16 CFB Moose Jaw, Saskatchewan:** Snowbirds 50th Anniversary Show  
**16-17 NAS Pensacola, Florida:** Open House and Blue Angels Homecoming Air Show – <https://www.naspensacolaairshow.com>  
**17 Apple Valley Airport, California:** Apple Valley Airshow – [applevalleyairshow.com](http://applevalleyairshow.com)  
**17-18 Fort Worth Alliance Airport, Texas:** Bell Fort Worth Alliance Air Show – [www.allianceairshow.com](http://www.allianceairshow.com)  
**17-18 Santa Maria Public Airport, California:** Central Coast AirFest – [centralcoastairfest.com](http://centralcoastairfest.com)  
**23-25 Charlotte County Airport, Punta Gorda, Florida:** Florida International Airshow – [www.floridaairshow.com](http://www.floridaairshow.com)  
**23-25 Dallas Executive Airport, Texas:** CAF Wings Over Dallas WWII Airshow – <https://wingsoverdallas.org>  
**24-25 Russell Regional Airport, Rome, Georgia:** Wings Over North Georgia – [www.wingsovernorthgeorgia.com](http://www.wingsovernorthgeorgia.com)  
**24-25 Little Rock AFB, Arkansas:** Little Rock AFB Thunder Over the Rock Air Show – [www.thunderovertherock.com](http://www.thunderovertherock.com)  
**31-01 Nov Orlando Sanford International Airport, Florida:** Lockheed Martin Space & Air Show – <https://spaceandairshow.com>

## NOVEMBER

**07-08 NAS JRB New Orleans:** New Orleans Air Show – [www.neworleansairshow.com](http://www.neworleansairshow.com)  
**07-08 San Bernardino Airport, California:** San Bernardino Fest 2020 – [www.sdbfest.com](http://www.sdbfest.com)  
**14-15 Joint Base San Antonio, Texas:** Air Show & Open House – [www.jbsa.mil](http://www.jbsa.mil)  
**14-15 Lake Havasu City Airport, Arizona:** Hangar 24 Craft Brewery AirFest – [hangar24brewing.com](http://hangar24brewing.com)

## REST OF THE WORLD

### FEBRUARY

**17-20 Tauranga Airport, New Zealand:** Flying NZ National Championships – [flyingnz.co.nz/competitions.html](http://flyingnz.co.nz/competitions.html)  
**19-23 Napier, New Zealand:** Napier Art Deco Festival – [www.artdeconapier.com/Events.html](http://www.artdeconapier.com/Events.html)  
**21-23 Chiang Mai, Thailand:** Chiang Mai Airshow – <https://www.chiangmaiairshow.com/>  
**27-03 Hood Aerodrome, Masterton, New Zealand:** NZ Aerobatic Club Nationals – <http://aerobatics.nz>

### MARCH

**03-05 Toluca International Airport, Mexico:** AeroExpo 2020 – [www.aeroexpo.mx/2020.php](http://www.aeroexpo.mx/2020.php)  
**04-06 Al Bateen Executive Airport, Abu Dhabi, UAE:** Abu Dhabi Air Expo & Heli Expo 2020 – [abudhabiairexpo.com](http://abudhabiairexpo.com)  
**04-08 Djerba-Zarzis International Airport, Tunisia:** IADE Tunisia International Aerospace and Defense Exhibition – [www.iadetunisia.com](http://www.iadetunisia.com)

**08 Tyabb Airport, Tyabb, Victoria, Australia:** Tyabb Air Show 2020 – [www.tyabbairshow.com](http://www.tyabbairshow.com)  
**15 Ardmore Airport, Auckland, New Zealand:** Warbirds on Parade – <https://nzwarbirds.org.nz/news-and-events.html>  
**20-21 Aqaba, Jordan:** Aqaba Air Show 2020 – <https://aqabaairshow.com>  
**21 Temora Airport, NSW Australia:** Temora Aviation Museum Aircraft Showcase – <https://aviationmuseum.com.au/upcoming-events>  
**22 Xieng Khouang, Laos:** Air Force Day airshow  
**22 Stellenbosch, Western Cape, South Africa:** Stellenbosch Flying Club Airshow – [stelfly.co.za/page/events](http://stelfly.co.za/page/events)  
**27-29 Wangaratta, Victoria, Australia:** Australian Antique Aeroplane Association (AAAA) National Fly-In – <https://www.antique-aeroplane.com.au/event-2891291>  
**31-05 Apr Santiago International Airport, Chile:** FIDAE 2020 – [www.fidae.cl](http://www.fidae.cl)

## APRIL

**04 Uitenhage Airfield, South Africa:** Wings & Wheels Festival Uitenhage – [wingsandwheelsfestivaluitenhage.co.za](http://wingsandwheelsfestivaluitenhage.co.za)  
**10-12 Wanaka Airport, New Zealand:** Warbirds Over Wanaka – [www.warbirdsoverwanaka.com](http://www.warbirdsoverwanaka.com)  
**11 NAF Atsugi, Japan:** Spring Festival – [www.facebook.com/naf.atsugi](http://www.facebook.com/naf.atsugi)  
**11-13 Shanghai Hongqiao Airport, China:** ABACE2020 Asian Business Aviation Conference & Exhibition – <https://abace.aero/2020>  
**25 George, Western Cape, South Africa:** Garden Route Airshow 2020 – <https://gardenrouteairshow.co.za>  
**25 Temora Airport, NSW, Australia:** Temora Aviation Museum ANZAC Aircraft Showcase – <https://aviationmuseum.com.au/upcoming-events>  
**26 Mudgee Airport, Mudgee, NSW Australia:** Wings, Wheels & Wine – [www.wingswheelsandwine.com.au](http://www.wingswheelsandwine.com.au)  
**26 JMSDF Kanoya, Japan:** Kanoya Air Show – [air-memo.com](http://air-memo.com)  
**26 Goolwa Airport, South Australia, Australia:** Goolwa Airshow – [www.facebook.com/goolwaairshow](http://www.facebook.com/goolwaairshow)

## MAY

**02-03 Illawarra Regional Airport, Wollongong, NSW, Australia:** Wings Over Illawarra - The Sydney Airshow – [www.wingsoverillawarra.com.au](http://www.wingsoverillawarra.com.au)  
**05 MCAS Iwakuni, Japan:** MCAS Iwakuni Friendship Day – [www.friendship-day.net](http://www.friendship-day.net)  
**16 Nelspruit Airport, South Africa:** Lowveld Air Show – <https://lowveldairshow.co.za>  
**17 Toowoomba Airport, Toowoomba, Queensland, Australia:** David Hack Classic Meet – [www.facebook.com/davidhackclassic](http://www.facebook.com/davidhackclassic)  
**24 Tauranga Airport, New Zealand:** Classic Flyers Open Day – [www.classicflyersnz.com/About+Us/ACTIVITIES++EVENTS.html](http://www.classicflyersnz.com/About+Us/ACTIVITIES++EVENTS.html)  
**24 Sapporo Airport, Japan:** Sapporo Airshow  
**28-31 Nur-Sultan International Airport, Kazakhstan:** KADEX 2020 – <https://kadex.kz/eng>  
**30 Matsieng Aerodrome, Botswana:** Botswana International Air Show 2020 – [www.botswana-airshow.com](http://www.botswana-airshow.com)

## JUNE

**06 Newcastle, South Africa:** Newcastle Airshow – <https://kznairshow.co.za>  
**06 Temora Airport, NSW Australia:** Temora Aviation Museum Aircraft Showcase – <https://aviationmuseum.com.au/upcoming-events>

## JULY

**02-04 Wonderboom Airport, Pretoria, South Africa:** AERO South Africa – <https://aerosouthafrica.com>  
**04-05 Watts Bridge Memorial Airfield, Cressbrook, QLD Australia:** The Brisbane Airshow – [www.brisbaneairshow.com.au](http://www.brisbaneairshow.com.au)

## AUGUST

**29 Temora Airport, NSW Australia:** Temora Aviation Museum Aircraft Showcase – <https://aviationmuseum.com.au/upcoming-events>

## SEPTEMBER

**16-20 Waterkloof AFB, South Africa:** Africa Aerospace & Defence (AAD) 2020 – [www.aadexpo.co.za](http://www.aadexpo.co.za)  
**19 Parque O'Higgins, Santiago, Chile:** Armed Forces Day parade and flypast  
**19-20 Scone & Upper Hunter Airport, Scone, NSW Australia:** Warbirds Over Scone – [www.warbirdsoverscone.com.au](http://www.warbirdsoverscone.com.au)  
**22-25 Sacheon Airport, Gyeongnam, South Korea:** Aerospace Expo – [festival.aerospace.go.kr](http://festival.aerospace.go.kr)

## OCTOBER

**17-18 October Temora Airport, NSW Australia:** Warbirds Down Under – <https://aviationmuseum.com.au/upcoming-events>

## NOVEMBER

**03 JASDF Iruma, Japan:** Airshow  
**04-07 Jakarta International Expo, Kemayoran, Jakarta, Indonesia:** Indo Aerospace 2020 – <https://indoaerospace.com>  
**10-15 Zhuhai, Guangdong, China:** Airshow China 2020 – [www.airshow.com.cn](http://www.airshow.com.cn)  
**18-20 Sakhrir Air Base, Bahrain:** Bahrain International Airshow – [www.bahraininternationalairshow.com](http://www.bahraininternationalairshow.com)

Readers are strongly advised to seek confirmation that shows are definitely taking place before travelling – events can move location, date or be cancelled, and this guide should only be used as an outline. For more information, check out individual websites, all of which are listed here where possible.

At the time of going to press the spread of coronavirus was restricting the free flow of air travel in certain regions – readers should be aware that any future restrictions may affect their plans to visit specific events on the calendar.



One of the undoubted highlights of Airshow China in 2018 was a display by a pair of PLAAF Chengdu J-20s. [AirTeamImages.com/Weimeng](http://AirTeamImages.com/Weimeng)



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# Flight Bag

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## THE LION OF THE RAF: THE EXTRAORDINARY LIFE OF GEORGE BEAMISH, SECOND WORLD WAR HERO AND RUGBY STAR

Book: 286-page hardback

Written by: Paul McElhinney

Price: £20

This is the story of a man from rural Cork in the Republic of Ireland who rose to the heights of the RAF and excelled as a major player in international rugby in the 1920s and 1930s. George Beamish was one of the famous Flying Beamishes, six brothers who were all members of the RAF – a record they hold to this day. After developing an interest in rugby at school, George joined the RAF in 1924, taking advantage of leaves of absence during his years of service to take part in matches.

The author has made an excellent job of describing the complicated background to his subject's wartime career. After pilot training and service with Nos.100 and 45 Sqns, George was selected to attend the RAF Staff College at Cranwell in 1937. By 1939, he was a squadron leader on the RAF staff in the Middle East, before being promoted to senior air officer in Crete, his first command of real significance. The British Army had withdrawn to the island from mainland Greece and Beamish had the task of organising an evacuation. He was successful in saving considerable manpower and equipment to fight another day. He went on to serve in a senior staff capacity in North Africa, then took part in planning the invasion of Sicily during 1943. He progressed to commanding RAF ferry and transport groups, followed by a series of high-profile assignments that culminated in his becoming chief of RAF Transport Command in 1954. After a spell of running Technical Training Command, he retired in 1958.

Published by Amberley Publishing: ISBN9781445690612; available from [www.amberley-books.com](http://www.amberley-books.com)



## THE FIRST HELICOPTER BOYS: THE EARLY DAYS OF HELICOPTER OPERATIONS – THE MALAYAN EMERGENCY 1947-1960

Book: 315-page hardback

Written by: David Taylor

Price: £25

In the late 1940s with Malaya still under British rule, the RAF was called upon to support troops fighting the forces of the Malayan Communist Party. At the time, the helicopter was still under development and this tropical country with its dense rainforests, high temperatures and frequent thunderstorms was a challenging place to gain experience. During ten years of Malayan operations, RAF helicopters lifted 110,000 troops, 19,000 other passengers and 25,000,000lb (11,339,810kg) of cargo. The Westland Dragonfly was the first type to serve the RAF, but its lifting ability was limited by the hot conditions and it was mainly used for single casualty evacuation. Its replacement was the Bristol Sycamore, with better performance and serviceability. The S.55 Whirlwind was a vast improvement on both and enabled troop insertions when required. All of these are well depicted in 134 black-and-white photographs.

With the enemy only having rifles, among aircrew it was said the main danger was the aircraft themselves.

There are many stirring stories in these pages, including some firsthand accounts of epic rescues. The trials of maintaining these complicated machines in far from ideal conditions are also well described. It all adds up to a very readable account of helicopters distinguishing themselves in an almost forgotten conflict.

Published by Air World: ISBN9781526754134; available from [www.pen-and-sword.co.uk](http://www.pen-and-sword.co.uk)



## X PLANES No.13: THE WRIGHT FLYERS 1899-1916 – THE KITES, GLIDERS, AND AIRCRAFT THAT LAUNCHED THE "AIR AGE"

Book: 80-page softback

Written by: Richard P Hallion

Price: £13.99

Illustrated with 50 black-and-white and five colour photographs, along with four colour plates, this extraordinary book explodes the myth that the Wright brothers were simply shrewd bicycle-makers who turned their attention to inventing the aeroplane. They had been closely following European advances in aeronautical theory for some years before successfully experimenting with gliders in 1901 and 1902. On December 17, 1903, Orville Wright made the first man-carrying powered flight. Its 12-second duration was soon eclipsed by brother Wilbur, who remained aloft for 59 seconds later the same day. Further development produced a similar machine which, in 1905, achieved a circling flight of 24 miles (39km). Subsequent flights in Europe lasted up to 2½ hours. Next came trials which convinced the US military that aircraft had major potential.

After the death of Wilbur from natural causes in 1912, the Wright Company's fortunes declined, mainly owing to the limitations of the aircraft, which all had canard pusher design features – the future clearly lay with engines and propellers at the front. The Wrights' achievements also included the first passenger to be carried aloft, the world's first production aeroplane (the Wright Model A) and the first military aircraft (a Wright Model B fitted with a machine gun). Superbly told here, this is an amazing story.

Published by Osprey Publishing: ISBN97814728337769; available from [www.ospreypublishing.com](http://www.ospreypublishing.com)



## DANCING THE SKIES: A LIFE – AND A LOVE – OF FLYING

Book: 262-page softback

Written by: David Roome

Price: £12.99

This is a personal account of the eventful flying career of Gp Capt David Roome who joined the RAF at 18, aiming to become a pilot. Progressing from the Chipmunk to the Jet Provost, he was selected for fast jet training on the Gnat at RAF Valley on Anglesey. The next step was a conversion course onto the Hunter at RAF Chivenor, Devon, during which he had to eject when his engine seized. The accident report makes fascinating reading. On graduation, he was posted to 74 Sqn in Singapore to fly the Lightning. The routines of squadron life in the Far East, both operational and social, are well described with many interesting and amusing anecdotes.

By the end of Roome's overseas tour in 1971, he had flown no less than 925 hours on the Lightning. After a short instructor's course, he was sent back to Valley to teach on the Gnat and Hunter. Further tours followed on the Phantom and with the Central Flying School's Examining Wing, the so-called 'trappers'. After a ground tour as a member of a team assessing the readiness of all frontline RAF stations and units for war, he took command of 228 OCU/64 Sqn and its Phantoms for three years. Having held various senior staff jobs, he retired from the RAF in 2001 and subsequently flew historic jets from Kemble, then Hawks in support of Royal Navy ships training off the South Coast. Overall, this is a fascinating insight into life within the RAF inside and outside the cockpit.

There are 47 colour and 15 black-and-white photographs. Published by The Book Guild Ltd: ISBN9781912881901; available from [www.bookguild.co.uk](http://www.bookguild.co.uk)





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# Ilyushin Il-86

## First Soviet Widebody

**Alexander Mladenov and Krassimir Grozev**  
examine the Il-86's development and service career.

In the late 1960s the Soviet Union's civil aviation sector saw a rapid growth thanks to the expanding domestic route network. Aeroflot, the monopoly airline in the Soviet Union, articulated the need for a large-capacity airliner to be used on the busiest routes between several hubs. The initial set of requirements for the new design, expected to facilitate a further growth of the domestic passenger operations, was defined in 1967. Aeroflot asked the Soviet Union's aircraft industry to provide an all-new aircraft for transporting 250 to 300 passengers over a 1,944nm (3,600km) distance. It was required to feature an 88,185lb (40 tonne) maximum payload and be capable of operating from runways no longer than 8,530ft (2,600m).

At that time the Moscow-based Ilyushin Design Bureau, also known as OKB-240, was busy with work on the Il-62 long-range jet airliner and in order to satisfy the new Aeroflot requirement it offered a straightforward solution. It presented an extended-body Il-62 derivative, dubbed Il-62M-250, stretched by about 22ft (6.8m) compared to the standard Il-62 and equipped with 250 seats. Aeroflot, however, was not happy with this solution, but Ilyushin continued offering new Il-62 derivatives for some time, including a double-deck concept and a dual-fuselage concept utilising two bodies parallel to each other. All of these concepts were eventually shelved and, in February 1970, Ilyushin

received a government order to design a widebody airliner with 350-seat capacity and medium distance capability.

The new four-engine airliner was designated Il-86 in March that year. The preliminary design, presented in 1971, combined a wide body with an engine mounting arrangement borrowed from the Il-62, in horizontal pairs on each side of the rear fuselage, together with a T-shaped tailplane and clean wings for maximising aerodynamic efficiency.

Work on the Il-86 project was formally authorised by the Soviet Union's Council of Ministers on March 9, 1972. Its decree referred to the aircraft as an aerobus (air bus), which had to be able to use the existing airport infrastructure across the Soviet Union.

**An Il-86 wearing the classic Soviet-era Aeroflot livery taking off from Düsseldorf in 1994. The type remained in active service with Aeroflot until 2008.** [AirTeamImages.com/Wolfgang\\_Mendorf](http://AirTeamImages.com/Wolfgang_Mendorf)







Above: **The Il-86's standard flight crew comprised two pilots and a flight engineer, with provision for a navigator.** Ilyushin via Alexander Mladenov

Below: **Up to 350 passengers could be transported in basic nine-abreast seating throughout. The cabin has two aisles, with passengers embarking via three airstair doors.** Ilyushin via Alexander Mladenov

In order to ease passenger boarding and disembarking the Il-86 borrowed a concept from bus transportation. Passengers would enter the aircraft via built-in stairs leading into the lower deck where they would place their luggage in the aircraft's baggage storage compartment and proceed upstairs to find a seat. Once aboard they would purchase a ticket.

During the aircraft's detailed design the engine configuration was changed to move them under the wings. The baggage compartment was initially placed on the passenger deck but this solution reduced the space available for passenger seats. As a result the aircraft received a two-deck layout, with its baggage compartments accommodated on the lower deck.

## ENGINE CHOICE

The biggest problem the team had faced from the very beginning was related to the engine choice. In the early 1970s the Soviet Union lagged seriously behind the West in engine design for powering large-size passenger and cargo aircraft. While the Western world used high bypass-ratio turbofan units (with a ratio between 4:1 and 5:1) for reduced fuel consumption, less exhaust gas emissions and noise, the best product offered by the Soviet

aero engine industry at the time was the Soloviev D-30KU featuring a bypass ratio of only 2.4:1.

Initially, the D-30KU was the Ilyushin design team's choice for powering the Il-86, which had a planned maximum take-off weight of 473,994lb (215 tonnes). In the event, they considered that this

engine, rated at 24,346lb st at take-off, would render the Il-86 seriously underpowered. Despite Soloviev's promise to develop an increased thrust derivative of the D-30KU, Ilyushin eventually decided to use a development of another well-known engine, the Kuznetsov NK-8 turbojet, which powered the Il-62. The NK-86, rated at 28,660lb st for take-off, was deemed suitable for the Il-86. Later on, however, this choice has proved to be something of a pact with the devil, as it squeezed out all growth

potential from the original variant, resulting in moderate performance and lack of any prospects for future improvements to enable new heavier versions of the Il-86.

The thrust rating rendered the NK-86 only marginally suitable for the fully loaded airliner while its bypass ratio was also marginal, being only 1.18:1. As expected, this choice led to excessive fuel consumption and noise, even for the rather relaxed Soviet standards of the time. ▶

## Il-86 Specifications

|                            |                       |
|----------------------------|-----------------------|
| Wingspan                   | 157ft 7in (48.06m)    |
| Length                     | 196ft 8in (59.94m)    |
| Height                     | 51ft 10in (15.81m)    |
| Fuselage diameter          | 19ft 11in (6.08m)     |
| Operating weight, empty    | 258,970lb (117,500kg) |
| Maximum take-off weight    | 473,860lb (215,000kg) |
| Cruise speed               | 486kt (900km/h)       |
| Range with max payload     | 1,944nm (3,600km)     |
| Maximum passenger capacity | 350                   |







## TEST FLIGHTS

The Il-86 prototype, wearing the appropriate registration CCCP-86000, took to the air on its maiden flight on December 22, 1976 at the now closed Khodynka airfield in Moscow, where Ilyushin had its headquarters and experimental aircraft building plant. The 40-minute flight ended with a landing at Zhukovsky airfield south of Moscow, also known as Ramenskoye, the home of Ilyushin's flight-test department. Chief test pilot Eduard Kuznetsov headed up the crew.

The second prototype aircraft, CCCP-86001, took to the air on October 24, 1977. The factory-testing phase was completed in October 1978 and shortly afterwards the second prototype was converted for static testing while the first continued flying until 1988.

The Il-86 had the distinction of being the first large passenger aircraft in the Soviet Union to complete its certification testing in accordance with the new NLGS (Norm Letnoy Godnosti Samoletov/Civil Aircraft Airworthiness Specifications) rules. This phase began in April 1979 and was originally slated to finish in July or August 1980, coinciding with the Summer Olympic Games in Moscow. This plan however, failed due to the high level of complexity of the Il-86's design and testing was not completed until December 1980 when it was issued with its type certificate No 10-86 by the Soviet Union's State Aviation Register. Not only was the Il-86 the first Soviet-made passenger

**Atlant-Soyuz Airlines was a Russian airline that operated its five Il-86s on passenger charters until 2010 when it ceased operations.**

[AirTeamImages.com/TT](http://AirTeamImages.com/TT)

aircraft provided with a purely civil type certificate but it proved remarkably trouble-free during its entry-into-service period.

Aeroflot took delivery of its first Il-86, CCCP-86004, on September 24, 1979 and it flew the first revenue service between Moscow and Tashkent on December 26, 1980.

## TECHNICAL FEATURES

The Il-86 is a monoplane with wings mounted in low-mid position on the fuselage swept back 35° at quarter chord. It has numerous mechanical lift-aiding devices in an effort to compensate for the relatively low thrust of the four NK-86 engines, consisting of large double-slotted three-section trailing-edge flaps, full-span leading-edge slats and spoilers.

The engines are mounted on pylons forward of the wing leading edges and fitted with thrust reversers. The integral fuel tanks in the wings offered a total capacity of 18,492 US gal (70,000 lit) of kerosene. The powerplants proved to be the Achilles' heel of the Il-86 due to their insufficient thrust, causing stringent take-off weight restrictions on hot days. The rate of climb following take-off was, as a rule, below 1,968ft per min (10m/sec) and on hot days was reduced to the unimpressive 787ft per min (4m/sec). The

aircraft had difficulties climbing to higher flight levels, which affected the efficiency of flight operations due to the notably increased fuel burn. The four-unit undercarriage comprised a twin-wheel nose unit and three four-wheel main units – two of these retracting inward and the central unit retracting forward. The conventional semi-monocoque fuselage had a main deck and a lower deck. The latter had three airstair doors on the port side for loading the passengers and cargo, and housed the baggage storage compartments used for passenger coats and hand luggage, in addition to cargo holds for registered baggage and cargo containers, three kitchens and the avionics bays. The upper deck had eight more doors – four on each side, used as emergency exits or for boarding from bridges or high-level boarding steps. The decks were connected with three staircases and three elevators for meal supply. The main desk had a basic single-class layout for 350 passengers in nine-abreast seating with two aisles, divided into three cabins and had eight lavatories.

The Il-86 represented a big leap forward for Aeroflot in terms of passenger comfort thanks to the large cabins, comfortable seating and wide aisles. It was also the first Soviet-made airliner to have an in-flight entertainment system, showing movies and providing passengers with a choice of 12 recorded audio programmes.

The cockpit was equipped for a standard crew of four – captain, co-pilot, navigator

**The Il-86 was operated by Russian airline KrasAir until it ceased trading in 2008. Its fleet included four of the type.** [AirTeamImages.com/JHribar](http://AirTeamImages.com/JHribar)





Kazakhstan Airlines was among the post Soviet era operators to receive IL-86s. The airline, which changed its name to Air Kazakhstan in 1997, was declared bankrupt in 2004. Richard Vandervord



and flight engineer. In the late 1980s, the IL-86s serving the short domestic routes began flying without a navigator. The IL-86 featured the Pizhma-1 flight/navigation system enabling automatic flight on a route with 30 waypoints and automatic landing in International Civil Aviation Organisation (ICAO) Cat II conditions, using updates from the Omega long-range radio navigation system or VOR or VOR/DME radio beacons. The flight controls used four completely self-contained hydraulics systems, each operated by one of the engines, for actuating the control surfaces and other devices.

Airframe service life was initially set at 20 years and 10,000 landings, whichever was reached first, later on this was extended to 25 and finally to 30 years.

## IN SERVICE WITH AEROFLOT

The IL-86 commenced its regular commercial service in February 1981. Initially, it was used on the busy domestic routes, while that July the new airliner flew its first international rotation between Moscow and East Berlin. In October 1981, the type began serving Aeroflot routes to selected Western European destinations.

Experimental long-range flights began in 1982, with the IL-86 going between Moscow and Havana, Cuba, with refuelling stops at Shannon in Ireland and Gander in Canada. These services were possible with reduced payload. In the event, the long-range flights were discontinued due to the better efficiency offered by the IL-62M.

In the 1980s Aeroflot received between eight and ten IL-86s annually, enabling the carrier to vastly expand its scheduled

domestic services. By the decade's end, the IL-86 transported no fewer than 25% of Aeroflot's passengers. Its fleet hauled some 70,000 passengers daily during the summer months. The holiday route between Moscow/Vnukovo and Sochi on the Black Sea was among the busiest ones, featuring seven services daily, each with 100% capacity utilisation. The annual utilisation of each IL-86 in the Aeroflot's fleet accounted for 1,000-1,100 flight hours. More than half of the fleet was based at its three Moscow bases – Sheremetievo, Vnukovo and Domodedovo.

The original 'aerobus' concept dating from the early 1970s was only partially used in regular operations. Selling tickets directly on board proved next to impossible and the baggage continued to be registered at check-in counters as experiments showed that self-loading by 350 passengers would result in a chaotic situation, with the process taking more than an hour to complete.

In fact, the passengers were allowed to carry only their hand luggage which they then stored themselves on the lower deck. The lower deck doors were often used for faster passenger embarking and disembarking.

The IL-86 gained a solid reputation as a reliable airliner and it is noteworthy that its commercial service with Aeroflot and the other operators after 1991 continued safely to the very end (there was only one accident during a ferry flight at Sheremetievo in 2002, with 14 killed due to a technical failure). This is testimony to the high level of redundancy of all critical aircraft systems and the fact that only the most experienced aircrews were selected by Aeroflot to fly its first widebody airliner.

There were no serious export attempts for the IL-86 as the production line at the Voronezh aircraft plant proved barely able to satisfy Aeroflot's needs at the time. Only in the late 1980s did Interflug of East Germany almost agree the delivery of two IL-86s but then refused the purchase at the last moment instead opting to take a pair of Airbus A310s.

## POST-SOVIET SERVICE

The Soviet Union's break-up on December 25, 1991 led to the dismantling of Aeroflot and a sharp reduction of its IL-86 fleet. The regional detachments of the once-giant airline were re-formed into independent airlines in Russia and some of the other former Soviet states. In addition, the wild capitalism experienced by Russia in the early 1990s led to the establishment of a large number of privately owned airlines and some of these began operating ex-Aeroflot IL-86s.

This way, a serious proportion of Aeroflot's IL-86 fleet was channelled to about 30 new airlines. Post-Soviet era Aeroflot, now transformed into Russia's premier international service airline, also continued operating the type, mainly on international routes. The IL-86 was also flown by airlines registered in Armenia, Georgia, Kazakhstan and Uzbekistan and three aircraft were even leased by China Xinjiang Airlines.

The Russian airline market in the 1990s and early 2000s, however, proved to be ill suited to the IL-86 due to the low passenger load factors, a consequence of high fares for the scheduled routes. In the event, the aircraft found a new market niche where it enjoyed a healthy demand for a while, mainly for ferrying



This IL-86 wears the colours of China Xinjiang Airlines, which leased three examples. Richard Vandervord





**Sibir or Siberia Airlines, now operating under the S7 brand, had a fleet of nine Il-86s. All of these were grounded in August 2009 due to their excessive fuel consumption.** [AirTeamImages.com/](#)  
Serge Baileul

holidaymakers from Russia to international destinations in Egypt, Turkey and Bulgaria.

Production of the Il-86 at the Voronezh aircraft plant, known as VASO in the 1990s, was officially stopped in 1993. In 1995 and 1997, however, two more aircraft were built by using incomplete airframes. These final aircraft brought the total number of Il-86s built to 106, including the two prototypes. At the peak of Il-86 operations in the early 1990s accounted for about 90 aircraft in regular use at any given moment.

After 2000 it began to be replaced en masse by more fuel-efficient Western-made types. Aeroflot, the biggest Il-86 operator, discontinued scheduled services in 2001 while continuing its use for charter flights for a while. A total of 64 aircraft were maintained in active use in 2002 but the rising oil costs in the following years curtailed the Il-86's operations; in addition the type began suffering from obsolescence issues and sharply increased engine maintenance costs due to the extensive wear and tear caused by short-range flights.

## EUROPEAN UNION BAN

In 2002, the Il-86 was banned from flying in European Union countries due to the failure to meet the noise

level requirements. This limited the destinations it could fly to, prompting the few remaining operators to accelerate their type replacement programmes. The last nail in the Il-86's coffin was placed in 2008, with yet another increase in the oil price combined with the onset of a sharp economic crisis in Russia. By that time the combined Il-86 fleet in active operation accounted for 20 aircraft serving with Aeroflot, KrasAir, GTK Rossia and S7 Airlines. All of these operators discontinued their Il-86 operations in 2008.

Another commercial operator, Moskva, discontinued the type's use for scheduled flights in October 2010 and a month later the charter services followed suit. The last operator, Donavia, continued operating its Il-86s for charter flights to holiday destinations in Turkey until 2011.

By mid-2019 only four aircraft remained in active operation. All of these are Il-80 command and control aircraft of the Russian Air and Space Forces (RuASF), based at Chkalovsky airfield near Moscow.

In general, the Il-86 proved to be a successful airliner for the Soviet Union's rather specific operational and economic conditions in the 1980s, operated by the monopolistic airline Aeroflot, which enjoyed a generous government subsidy

## Il-80 Command Post

The Il-86 was built in a single version for passenger transport and the only derivative of the type was developed for the Soviet military in the second half of the 1980s. Dubbed Il-80, it is an aerial command post for strategic nuclear forces in wartime.

A total of four Il-86s were reworked into Il-80s, NATO codename *Maxdome*, with the first of these taking to the air in May 1985. The Il-80 can be easily distinguished from the baseline version thanks to the large fairing on top of the forward fuselage housing satellite communication antennas. The aircraft lacked windows, retained only the forward doors and its fuselage was endowed with various antennas in addition to an in-flight refuelling probe. There are also two electrical generators suspended on pylons between the fuselage and inner engines (one under each wing) to satisfy the sharply increased power supply requirements of the aircraft's mission suite.

The Il-80 remains among the most secretive RuASF aircraft, with little or no credible information about its true capabilities and mission equipment. It is believed that two or three out of the four aircraft, based at Chkalovsky and operated by the 8th Special-Purpose Aviation Division, are maintained in flightworthy condition.

In May 2019, the Russian deputy minister of defence, Alexey Krivoruchko, announced that the aging Il-80 fleet was earmarked for a significant upgrade of its mission suite to enable it to remain in operations for many years to come.

for its domestic services. In the new market economy conditions, established soon after the Soviet Union breakup, the type proved to be a dinosaur from a past era, barely surviving due to rising fuel and maintenance costs.

During the last years of the Soviet Union's existence the Il-86 was used as a baseline for designing the Il-96. The new aircraft, powered by four high bypass-ratio turbofans, inherited the fuselage of its predecessor and was provided with the long-distance capabilities that the Il-86 had never enjoyed. The Il-96 programme experienced difficulties in the 1990s and 2000s, and the type has not been produced to the same level in terms of airframes as its predecessor. **AN**

**The Russian Aerospace Forces retains its fleet of four Il-80s, which remain among the most secretive aircraft in Russian military service. Currently undergoing a comprehensive mission suite upgrade, they are set to continue in service for at least another decade.** [AirTeamImages.com/Artyom Anikeev](#)





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# Tu-154

## Tupolev's Trijet Airliner

The Tupolev Tu-154 trijet was a workhorse of Aeroflot in the 1970s and 1980s. In the years after the fall of the Iron Curtain the type remained in widespread commercial service worldwide. **Alexander Mladenov** and **Krassimir Grozev** tell the story of the popular Soviet-era jet airliner.



**T**he Tupolev Tu-154 was conceived in the late 1960s, when Aeroflot operated three different airliner types to serve its mid-range routes of 540nm to 1,620nm (1,000km to 3,000km). These comprised the Tu-104 jet in addition to the Antonov An-10 and Ilyushin Il-18 turboprops. The airline's new concept called for a single jet-powered type to replace all these aircraft, transporting up to 140 passengers over 1,620nm (3,000km).

The Tupolev Design Bureau, then known as OKB-156 and later renamed the MMZ Opyt, was keen to face the challenge of designing the new airliner. Chief designer was Dmytry Markov, who had a wealth of experience gained when working on the Tu-104 and its follow-on developments, the Tu-124 and Tu-134. He decided to use the well-known Tu-104 structural design as a baseline, extending the fuselage length and

adding more engines. Initially, the design team was to select between three or four Kuznetsov NK-8 engines for the new airliner but, in 1963, Markov opted for the three-engine scheme – two on the rear fuselage sides and the third in the base of the fin.

In 1964, the team got a new chief designer, Sergey Yeager, who decided to proceed with an all-new fuselage, much more advanced than that of the Tu-104, while facing the same dilemma of fitting three or four engines. In the event, the trijet concept was chosen, combined with a T-tail.

### Tu-154 LAUNCHED

The design of the new airliner was to be capable of transporting up to 144 passengers in a two-class cabin layout, while the alternative single-class cabin accommodated 164 seats. The only real competition at the time in the Soviet Union was the Il-74, an

airliner project with three engines and a T-tail, a layout similar to that offered by Tupolev. The Tupolev design team, however, promised to deliver a much lighter airliner, which eventually turned the table in their favour.

The Tu-154's full-scale development was launched by a decree of the Soviet Union's Council of Ministers dated August 24, 1965, which tasked Tupolev to begin work on a new-generation airliner, powered by three Kuznetsov NK-8-2 turbofans, capable of accommodating up to 160 passengers and ferrying 18 tonnes of payload over 1,890nm (3,500km).

The design layout offered by Yeager was frozen by mid-1966. The airliner featured a large-diameter cabin measuring 11ft 9in (3.68m) wide and a remarkably high power-to-weight ratio, thanks to the use of three powerful engines. This feature brought a desirable effect, as the new airliner was





Top: **One of the Tu-154 prototypes seen during a sales visit to Sofia, Bulgaria.** Tupolev via Alexander Mladenov

Above: **Seen in the classic Aeroflot scheme, but with post-Soviet registration, Tu-154B RA-85016 went on to serve with UTair, which was one of the last Russian operators of the Tu-154.** Key Collection

Main photo: **One of the most colourful schemes worn by the Tu-154 was that of S7 Airlines. Tu-154M RA-85829 flew with the carrier from 2005-2008.** AirTeamImages.com/ Artoym Anikeev

required to operate from hot-and-high locations in the Central Asian republics of the Soviet Union. The necessity for using the Tu-154 from poorly prepared runways and austere airports called for six wheels on the main undercarriage units and an auxiliary power unit (APU).

The construction of the first pair of Tu-154 prototypes began in late 1966 at the Tupolev plant in Moscow. The first of these was intended for flight testing and the second for static testing. The initial schedule called for the prototype for the flight tests to be ready by the autumn of 1967, but it was not rolled out until February 1968. At the time, the Tu-154 was overshadowed by the supersonic Tu-144, which absorbed most of the government funding and resources allocated by the design bureau head and founder, Andrey Tupolev. In the event, this issue caused a delay of about six months.

The first prototype, wearing the registration CCCP-85000, made its main flight on October 3, 1968, from Zhukovsky, the main test airfield of the Soviet aircraft industry, with Yury Sukhov as the captain. In December 1968, after completing only 12 sorties, the joint testing phase was launched, run by the Soviet Ministry of Civil Aviation together with Tupolev. It set out to evaluate if the new aircraft met the technical specification.

One serious issue that had to be solved at the beginning of the programme was related to the production plant for the Tu-154. The Tupolev plant in Moscow was for producing prototype aircraft only and so another facility in the city was initially earmarked – Aircraft Plant No.30 'Znamya Truda'. It turned out the plant was overloaded with military projects so an alternative was needed. It was decided

the new airliner should be produced at the Kuybyshev-based Aircraft Plant No.18, which at the time was completing the manufacture of the Tu-95 strategic bomber and its derivatives. In 1969, the plant began to manufacture the first two pre-production Tu-154s, intended for testing purposes. In the same year, the Tu-154 prototype was displayed at the Paris Air Show.

## DESIGN SHORTCOMINGS

The test programme showed a number of shortcomings in the Tu-154's design. The new trijet had rather complex handling characteristics, necessitating experienced aircrews. Flying at a high angle of attack tended to cause engine surges and loss of effectiveness of the horizontal stabiliser, eventually resulting in stalling or the beginning of a flat spin. The aircraft also proved too heavy and with 18 tonnes of commercial payload its range was only 1,382nm (2,560km) – 540nm (1,000km) less than the range set in the technical specification. Tests showed that the wing had a considerably shorter life than the required 15,000 landings, with dangerous fatigue effects appearing after just 2,500 landings. The ABSU-154 automated





**The Tu-154M's cockpit offers a 1970s-vintage working environment for the three crew members, comprising the pilot, co-pilot and flight engineer.** Alexander Mladenov

flight control system also demonstrated disappointingly low reliability.

Despite the numerous shortcomings of the Tu-154 design revealed by tests, the Soviet authorities took the decision to launch the new jet airliner in serial production, in parallel with continuing the exhaustive operational testing and evaluation effort. Ironing out the problems necessitated the use of no fewer than nine pre-series aircraft.

## IN PRODUCTION

The first production-standard Tu-154, CCCP-85010, was completed in early 1971 and had a design identical to the pre-series aircraft. It was handed over to Aeroflot's Vnukovo branch, designated as the lead unit for inducting the brand-new trijet into service.

Vnukovo also got as many as five pre-series Tu-154s, augmented by the first production-standard example in May 1971. Until early 1972 the branch was busy with aircrew training and proving flights carrying mail only, before the first passenger revenue flight between Moscow/Vnukovo and Mineralnye Vody took off on February 9, 1972. Two months later, the first domestic scheduled service with the type commenced between Moscow/Vnukovo and Simferopol in Crimea. In the summer of that year, the number of destinations served by the new airliner was significantly expanded.

Balkan Bulgarian Airlines was the second Tu-154 operator, inducting the trijet in revenue service almost simultaneously



**Above: Under Balkan Holidays branding, Bulgarian charter airline BH Air's Tu-154Ms were frequent visitors to the UK in the early 2000s.** Key Collection

**Below: A Malév Tu-154B2. The Hungarian airline used the type from 1974-2001, after which it was phased out in favour of Boeing 737NGs.** Key Collection







**The Tu-154M flight engineer's workstation, crammed with instruments for engine and systems monitoring and control.** Alexander Mladenov

with Aeroflot. It took its two aircraft in June 1972 and reported its first Tu-154 passenger revenue flights in August that year.

The second version, dubbed Tu-154A, appeared in early 1974. It featured an expanded fuel capacity, while the maximum take-off weight rose from 94 to 96 tonnes. It was also powered by uprated NK-8-2U turbofans, operating at 103kN (23,150lb) compared to the 93.2kN (20,950lb) of the baseline NK-8-2, while the maximum fuel capacity was raised to 87,630lb (39,750kg). The Tu-154A also featured a slightly improved aerodynamic performance due to a refined wing design introduced to solve the issue of insufficient flight range.

The Tu-154B, tested for the first time in 1975, featured a redesigned wing with new aluminium alloys to improve fatigue issues. The maximum take-off weight was further increased, reaching 96 tonnes. It also featured emergency exits on the wing and an upgraded flight control system.

In 1975, the Tu-154 programme got a new chief designer, Alexander Shengardt, who remained in this position until the end of the type's serial production.

The Tu-154B remained in production for a relatively short period before being superseded by the Tu-154B-1, which had improved electrical, fuel, environment control and navigation systems. There were also design improvements to the undercarriage, and the passenger cabin was configured for 160 passengers. The Tu-154B-2, which appeared almost in parallel with the B-1, featured an easily removable galley in the middle of the cabin, allowing for the installation of 180 seats. During their heavy maintenance checks, the vast majority of the Tu-154s and Tu-154As were rebuilt to the B-1 or B-2 standards.

In the late 1970s and early 1980s, Aeroflot also embraced the idea of converting early-production aircraft for cargo transport.

Dubbed the Tu-154C, this derivative used the Tu-154A fuselage with the passenger seats removed and cabin floor reinforced, adding a large-size port cargo door. The maximum payload of the Tu-154C was to reach 20 tonnes, with range of 1,565nm (2,900km).

The first Tu-154C, converted from a Tu-154A and wearing the registration CCCP-85086, performed its maiden flight on February 1, 1982. Two more aircraft were converted and the certification testing was completed in March 1984, with the recommendation to begin with the serial conversion of Aeroflot's aging Tu-154A fleet. The plans at the time called for as many as 20 aircraft for Aeroflot, but only nine were cycled through the programme, with the last of these remaining in service until 1999.

The Tu-154B was more or less the airliner the Aeroflot needed in the second half of the 1970s, but the design still had development potential, especially regarding its engines. The NK-8 was a good

**In military service, the Tu-154 has the NATO codename *Careless*. This example is still in service with the Russian Aerospace Forces.** AirTeamImages.com/Alexander Mishin





## Tu-154 PRODUCTION

Except for the two prototypes, all the other Tu-154s were rolled out at the aircraft plant in Kuybyshev, now known as the Aviakor Company, while the city has been renamed Samara. A total of 923 aircraft were produced, including two prototypes (one of these for ground testing) and nine pre-series examples. The series production accounted for 912 examples, including 112 baseline Tu-154s and Tu-154As, plus 486 Tu-154Bs and 314 Tu-154Ms. The peak in production was in 1979 and 1980, when the plant rolled out 71 and 72 aircraft respectively.

Full-rate production continued until 1993, with 35 Tu-154s rolled out at Aviakor, with annual output dropping to nine aircraft in 1994 and 1995. The last Tu-154M sold to an airline was produced in 2007 and delivered to Samara Airlines (which went out of business in 2008).

The Russian government continued placing occasional orders in an effort to support Aviakor in the following years. The last Tu-154M built was handed over to the Russian MoD on February 19, 2013.

turbojet, but was plagued by very high fuel consumption and noise levels.

The replacement engine touted for the Tu-154, the Soloviev D-30KU, was a new-generation turbofan with significantly lower fuel consumption. The development of the new Tu-154 version, powered by the D-30KU-154-II rated at 104kN (23,380lb), was ordered by a decree of the Soviet Union Council of Ministers in August 1978. The project was initially known as the Tu-160A, then the Tu-164, but was eventually designated the Tu-154M.

Powered by the Soloviev engines, the Tu-154M featured an enlarged centre air intake and redesigned nacelles. The TA-92 APU was moved to the fuselage from its former position just above the tail nozzle. It also gained new wing control surfaces and a larger horizontal stabiliser. Almost all onboard systems were significantly redesigned or replaced

with all-new ones. The maximum take-off weight was increased to 100 tonnes and later to 102 tonnes.

Thanks to the much more fuel-efficient engines, the Tu-154M boasted 15 to 20% lower hourly fuel consumption than the Tu-154B when serving routes up to 1,620nm (3,000km), while on routes up to 2,160nm (4,000km) its fuel consumption was 40% less than its predecessor. This, together with the increased take-off weight, enabled the new derivative to fly up to 2,808nm (5,200km) with 12 tonnes of commercial payload.

The new derivative was offered with several cabin configurations, including eight first-class seats and 146 in economy. The three single-class configurations on offer included 164, 176 or 180 seats.

The first Tu-154M was converted from a production-standard Tu-154B-2, CCCP-85317. However, the flight-testing period proved to be protracted, with the first newly produced Tu-154M, CCCP-85606, not taking to the air for the first time until July 1984.

The permission for use on regular passenger service was granted by the Russian Ministry of Civil Aviation almost two years later, in June 1986, with the first revenue operations beginning a month after that.

Tu-154B production came to an end in 1984, after which the factory at Kuybyshev rolled out Tu-154Ms only.

## AEROFLOT SERVICE

Aeroflot was the Tu-154's largest operator, with nearly two-thirds of the aircraft built included in its fleet. At the start, operation with the new type was particularly painful due to low reliability causing prolonged groundings. The Soviet Ministry of Civil Aviation had rushed it into revenue service before many teething problems were fixed, and maintenance organisations had little experience with the type, leading to slow repairs.

The first accident with the trijet happened almost one year after the launch of revenue operations. On February 19, 1973, an Aeroflot Tu-154 crashed during landing at Prague, killing 66 passengers and crew from a total of 100 people on board. The investigation found out that the aircrew had a poor knowledge and understanding of the operation of the systems and made mistakes in operating the fin and tailplane. Three months later, there was another accident, this time on take-off at Vnukovo during a training sortie. The aircrew survived but the aircraft was a write-off, with the cause of the accident said to be wing mechanism failure.

Following the accidents, Aeroflot personnel formed a negative attitude to the aircraft, with numerous voices calling for suspension of operation until all design shortcomings were fixed. These included non-compliance with the technical requirements, such as a shorter range than specified, complicated handling characteristics and lower wing strength than was needed. The airline management, however, countered these claims and instead decided to invest in better aircrew training and raising the bar of the entry requirements for the qualification of new pilots converting to the type.

The Tu-154 had a reputation for highly demanding handling characteristics. In addition to the two pilots, Aeroflot operated with a dedicated navigator included in the standard crew as the pilots were overloaded with tasks. The vastly improved Tu-154M dispensed with the navigator, but only on simpler and shorter routes.

The Tu-154 handled like a sports car thanks to its high power-to-weight ratio, enabling the aircraft to fast-climb to cruise level, while its cruise speed reached 513kt (950km/h). A typical sortie from Moscow to Krasnodar took one hour and 45 minutes, while the Tu-134 twinjet was 15 minutes slower.

Passengers liked the Tu-154 as it offered a comfortable ride and a spacious and quiet cabin, which was considered luxurious for the time. In the late 1970s and early 1980s, passenger comfort was reduced as Aeroflot began reconfiguring its Tu-154 fleet with an 180-seat layout in order to cope with the rapidly growing number of passengers each year.

In the late 1980s, the Tu-154 was Aeroflot's workhorse, accounting for about 52% of the passengers of the giant airline. The longest scheduled non-stop route served by the type was from Moscow to Mirny in the remote Sakha Republic in Siberia, a distance of 2,808nm (5,200km).

In addition to the Soviet Union, the Tu-154 was inducted into commercial operation in almost all the other countries under Soviet political and economic influence, including Bulgaria, East Germany, Czechoslovakia, Hungary, Poland, Romania, Syria, Egypt, Cuba, Mongolia, North Korea, Vietnam and Iraq.



Above: Based on Iran's Kish Island, Kish Air started operations in 1990 with leased Tu-154Ms. This aircraft, EP-LBS, was a later purchase, operated in 1999-2000. Key Collection

Below: Sichuan Airlines now has an all-Airbus fleet, but operated six Tu-154s in the 1990s. Key Collection





## POST-SOVIET PROLIFERATION

Following the Soviet Union's dissolution in 1991, the Tu-154 began to be used by newly established airlines in all ex-Soviet states, as well as by operators in Croatia, Turkey, Macedonia, Iran and Pakistan.

The Chinese government was among the new customers for the type, opting to purchase 12 new-build Tu-154Ms in the early 1990s. These aircraft were used for a variety of special military missions, including signals intelligence (SIGINT) and electronic intelligence (ELINT).

The Tu-154M continued in full-rate production in the early 1990s, as the airliner was still being deemed adequate from an economic point of view. Tupolev even launched a project to upgrade the type with Western-made avionics in addition to new cabin equipment. The empty weight of this newly built version, sometimes referred to as the Tu-154M-100, was about four tonnes less than the baseline Tu-154M, while the maximum take-off weight reached 104 tonnes. However, commercial interest was low and only three Tu-154M-100s were rolled out in the late 1990s. They were delivered to Slovak Airlines and then after a few years of service sold to Russian operators.

By 1994, the Tu-154 fleet operated worldwide numbered more than 500 aircraft and the trijet continued to dominate commercial air transport in the former Soviet Union and Eastern Europe. However, in the late 1990s, an increasing number of air operators began to phase it out, replacing it with twin-engine airliners such as the Airbus A320, Boeing 737 and MD-80, which offered much better fuel efficiency. Furthermore, in 2002 and 2006, the European Union brought in new noise rules for aircraft that wanted to fly in its territory which earlier Tu-154s exceeded. Only the Tu-154M complied with these



Above: **Air Koryo of North Korea still operates two Tu-154Bs.** AirTeamImages.com/Simon Willson

Below: **China's People's Liberation Army Air Force still operates Tu-154Ms, some of which are used for electronic intelligence gathering.** Japanese MoD



and so only this variant could be flown for commercial use in the EU.

The beginning of the end of the type's mass commercial service in Russia came with the 2008 economic crisis and increased fuel prices. The largest operators using the type, such as S7 Airlines and Rossiya, began retiring their aircraft. The

**"The Tu-154 handled like a sports car thanks to its high power-to-weight ratio"**

last revenue flight in Aeroflot colours was reported on December 31, 2009. That year, the type accounted for barely 9.7% of the passengers flown by Russian commercial air transport operators and only 100 aircraft were in active use. In 2013, the passenger figure fell to 0.26% and the last big Russian operator still using the trijet, UTair, discontinued Tu-154 operations.

Another prominent operator, Belavia of Belarus, retired its three Tu-154Ms in December 2016.

By early 2020, there were only three airlines around the world operating the Tu-154 in revenue service. North Korea's Air Koryo flies two Tu-154Bs on its scheduled routes, while Air KG of

Kyrgyzstan operates a single Tu-154M, also serving scheduled routes, and the Russian operator Alrosa has a single Tu-154M.

China ordered 12 Tu-154Ms for government service and continues to use the type for transport, testing purposes, ELINT and SIGINT missions. The Russian military is still using the Tu-154B/M in some numbers, with about 20 aircraft in service for passenger and VIP transport, and LII Mikhail Gromov, the Russian Flight Test Research Institute, has a single Tu-154M used for test purposes. **AN**

**Only one civilian operated Tu-154 remains in service in Russia – RA-85757 with Alrosa.**

AirTeamImages.com/Alexander Mishin







# Yak-40

## The USSR's Regional Jet

In the early 1960s, Alexander Yakovlev, head of the OKB-115 (Opytnoye Konstruktorskoye Byuro; experimental design bureau) in Moscow, submitted an offer to develop the Yak-40 jet for 20 passengers, later increased to 24. Rival designs were proposed by Ilyushin (Il-70) and the combined team of Antonov and Beriev (An-Be-20). The idea was to replace the Lisunov Li-2 – the Soviet-licensed copy of the Douglas DC-3 – and the Ilyushin Il-14 used on local routes with an equally simple and undemanding aircraft, but capable of reaching twice the speed.

### DESIGN PHILOSOPHY

In the 1960s, there were 2,980 airfields in the USSR suitable for small airliners. A thousand of them had grass runways under 2,297ft (700m) in length, suitable only for 12-seat An-2 biplanes or even smaller four-seat Yak-12s. Another 1,250 airports had soft-surface or concrete strips, 2,297ft (700m) to 3,937ft (1,200m) in length, and most of those received Li-2s and Il-14s; these were the places the new Yak-40 was intended to serve. The remaining 750 runways exceeded 3,937ft (1,200m).

The Yak-40 brought jet travel to the remoter parts of the Soviet Union and faithfully served the airlines of the Eastern Bloc. As **Piotr Butowski** recalls, it had only limited success in the West, but can still be found in various corners of the world.

The lowest class of airports had no infrastructure and the level of service was equally low, so the aircraft had to be of a very simple design. Complex high-lift wing devices were out of the question, so the wing area had to be large. That is why the Yak-40 received a long, unswept wing, with a relatively thick profile and only simple slotted flaps. The low-wing configuration allowed simplification of the landing gear, which had large diameter wheels and soft shock absorbers.

The Yak-40's powerplant consisted of three Ivchenko AI-25 turboprops, each





Built in early 1972, the RSK MiG Corporation's Yak-40 '48112' operated with General Air as D-COBB and is now the oldest example still flying. Piotr Butowski

by truck from Moscow to Zhukovsky, assembled there and prepared for flight tests. The designer running the Yak-40 project at OKB-115 was Yevgeny Adler. In the 1970s, he was replaced by Sergei Yakovlev, son of Alexander, and then, in 1991, by Alexei Rakhimbayev.

The Yak-40 flew for the first time at Zhukovsky on October 21, 1966, with pilot Arseny Kolosov and co-pilot Yuri Petrov at the controls. The prototype was then registered CCCP-1966, which was later changed to CCCP-19661. The state trials of the Yak-40 lasted a year, from August 9, 1967, to August 21, 1968. The results confirmed most of the performance required by the government resolution of 1965, including the range of 600km (373 miles) with 24 passengers and a cruise speed of 550km/h (342mph). In two cases, the real data turned out to be significantly worse than the requirement: the take-off weight was 13,700kg (30,203lb) instead

The first flight of the Yak-40 prototype on October 21, 1966. Yakovlev via author



generating 14.7kN (3,307lbf) thrust, located in the tail. Compared to a conventional propeller-driven airliner, there were several disadvantages of such a propulsion system: high fuel consumption, greater airframe weight, a rearward-shifted centre of gravity and a propensity for the wing to flutter. High thrust was necessary for a short take-off with the straight, thick wing. On the other hand, three engines were also safer: the airplane could take off or abort without a problem if one engine failed, and continue flying even after the failure of two engines. The Yak-40 received an Ivchenko AI-9 auxiliary power unit, making it independent of airport equipment.

At the airport, airstairs were unnecessary as the passengers could use the built-in gangway at the rear of the fuselage. On the way to their seat, they passed through the cloakroom and luggage room before entering the passenger cabin.

The Yak-40 was chosen from among the three competitors and was given the go-ahead by a government resolution of April 30, 1965. On August 31 the following year, the Yakovlev design bureau's workshop completed construction of the prototype, which was transported

## Yakovlev Yak-40 Specifications (Late Production Series)

|                             |                                                      |
|-----------------------------|------------------------------------------------------|
| Crew                        | Two                                                  |
| Passengers                  | 32                                                   |
| Length                      | 66ft 10in (20.36m)                                   |
| Wingspan                    | 82ft (25m)                                           |
| Height                      | 21ft 4in (6.5m)                                      |
| Wing area                   | 753sq ft (70m²)                                      |
| Cabin length, width, height | 23ft 2in x 7ft 1in x 6ft 1in (7.07m x 2.15m x 1.85m) |
| Max take-off weight         | 9,766lb (4,430kg)                                    |
| Max speed                   | 302kts (560km/h)                                     |
| Cruise speed                | 275kts (510km/h)                                     |
| Ceiling                     | 26,575ft (8,100m)                                    |
| Range with max payload      | 540nm (1,000km)                                      |
| Max range                   | 1,800km (972nm)                                      |
| Take-off run                | 2,346ft (715m)                                       |
| Landing run                 | 2,461ft (750m)                                       |
| - with thrust reverse       | 1,804ft (550m)                                       |

of 12,500kg (27,558lb), while the take-off distance needed to clear a 10m/33ft-high obstacle with one engine out was 1,150m (3,773ft) instead of 700m (2,297ft).

## IN PRODUCTION

Series production of the Yak-40 was launched at a factory in Saratov, while the wings were manufactured by the Smolensk plant, the undercarriage by the Gorky facility (today Nizhny Novgorod) and the engines were supplied from Zaporizhzhia. The first aircraft made in Saratov but the second Yak-40, number 00-01 (the first example of the zero series) with the registration CCCP-1967, took off on March 6, 1967. In total, ten aircraft of the zero production series were built. The first four, from 01 to 04, participated in state trials along with the prototype made by Yakovlev's OKB-115 in Moscow. From the end of 1967 to mid-1968, aircraft 04 to 10 participated in operational tests and technical flights without passengers. On September 30, 1968, two Yak-40s inaugurated regular passenger flights on the route between Moscow/Bykovo and Kostroma, replacing Li-2s.





The Yak-40 production line at Saratov. Yakovlev via author

The pace of Yak-40 production increased quickly. In 1972, it exceeded eight aircraft per month and, in 1975, it reached its peak of 12 per month. Later, production began to slow down and, from mid-1978, stopped almost completely. In 1979, 12 Yak-40s were manufactured, with a further eight in 1980. In 1981, the final two were built and the plant at Saratov switched to production of the larger, 102-seat Yak-42. In total, 1,010 Yak-40s were produced, with Aeroflot operating about 840 of them.

The introduction of the Yak-40 raised local passenger transport in the USSR to

a new level, with the quality of service for local route travellers coming closer to the service delivered on large aircraft. During the period of large-scale operation by Aeroflot, they each performed an average of 3.3 flights per day.

## CONFIGURATIONS

Early-series aircraft carried 24 passengers in eight rows of three seats; 122 were made in this version. Then, without touching the hull structure and changing only the configuration of the cabin, two of the most common variants of the Yak-40 were developed, for 27 and 32 passengers.

Production of the 27-seat version began in late 1970. The cabin had nine rows of three seats and a smaller luggage compartment. In 1971, a thrust reverser was installed for the centre engine, but is part of the airframe rather than the powerplant and consequently all three engines were still interchangeable. Later, a cone fairing in front of the tailfin tip was removed. From 1972, the capacity of the fuel tanks was increased from 3,080kg (6,790lb) to 4,430kg (9,766lb).

In 1972, the 32-seat version entered production, in which eight rows of four seats were installed, with a narrow aisle between them, and the luggage compartment and cloakroom were enlarged again. With this cabin configuration, however, there were difficulties with balancing the aircraft, so control during take-off and landing became harder. Therefore, in 1975, the front pair of seats on the right-hand side was moved to the rear of the left-hand side.

In addition to the standard 27- and 32-seat versions, Yak-40s with more comfortable types of cabin were manufactured. Today we would call them business jets or VIP versions, but in the USSR they were described as 'administrative versions' or 'salons'. Two standard versions went into production, a simpler one called 'Salon 2nd Class' and the more luxurious 'Salon 1st Class'. The latter's cabin was divided into two compartments with a sofa, a work table and two armchairs in the forward part for VIPs, along with six seats for their entourage in the rear. About 30 administrative versions were produced by the Saratov plant, with more created in later years as conversions of other aircraft.

In 1974, production of a 'combi' passenger/freight Yak-40K version began. This had a 60in x 50in (152cm x 127cm) door opening upwards on the left-hand side of the front fuselage, through which a cargo container could be inserted. The interior of the Yak-40K could be converted (K stood for konvertiruyemyi/convertible) between cargo use for two containers, a mixed configuration with one container and 12 passengers, or a passenger layout with 32 seats.

## PROTOTYPE VERSIONS

Under the government resolution of 1965, Yakovlev was charged with developing the tourist Yak-40T (Turistsky) variant for 34-38 passengers – today, we would call it the 'low-cost airline' configuration. In 1970, 34 seats (11x3 plus 1) were inserted in the eighth aircraft of the zero series (00-08) at the expense of the baggage room, but this variant was not put into production.

Another way to get 40 seats in was by extending the fuselage with two 31.5in (0.8m) inserts. In 1968, aircraft 00-03 was converted into just such a version,



The first export Yak-40s – for customers in Afghanistan and Yugoslavia – await delivery at Sheremetyevo Airport, Moscow in July 1971. Yakovlev via author



A Yak-40D in Aeroflot service. The tri-jet improved the connections for many far-flung towns in the USSR. Richard Vandervord



called the Yak-40M. The take-off weight increased to 17,300kg (38,140lb), at which the aircraft could only be used from concrete runways, and the AI-25T engines were uprated to 17.2kN (3,858lbf). This project did not go beyond the prototype.

Every aircraft manufactured in the Soviet Union, including passenger ones, was considered for possible military use from the outset. The Yak-40DTS (Desantno-Transportnyi Sanitarnyi; landing-transport and medical) was intended for tactical airlift and medical evacuation; one configuration could drop 20 paratroopers. Two Yak-40DTS aircraft were constructed in 1971-1973.

In Poland, four Yak-40 aircraft were adapted to tow a target sleeve for anti-aircraft artillery. A drum for winding the 9,843ft (3,000m) cable, a motor and a control panel were mounted in the passenger cabin. The cable came out through the hole in the rear hatch which had the stairs removed and a window so the technician could observe the sleeve. The Yak-40 target tugs served from 1979-1999 in the 19th Air Towing Squadron in Stupsk; the air defence training ground was located on the Baltic coast, 19 miles (30km) from the air base.

Some Yak-40s were modified at Civil Aviation Plant No.407 in Minsk, Belarus for various Soviet institutions to undertake scientific research and the testing of equipment. The largest group of these was atmospheric research aircraft: CCCP-87536 (which was given the name *Liros*), CCCP-87537 (*Meteo*), CCCP-87937 (*Aqua*) and CCCP-87992 (*Shtorm*), among others. Some were fitted with launchers

for cartridges containing chemicals to create rain. The Yak-40, CCCP-87304 (*Fobos/Phobos* – a moon of Mars), was used to test spacecraft equipment. The Yak-40REO (CCCP-88238; REO means Radio-Elektronnoye Oborudovaniye/ Radio-Electronic Equipment) was for tests of equipment including inertial navigation systems, Doppler radars and altimeters. One aircraft was designated as a Yak-40-25, which had the nose of a MiG-25R fitted for testing reconnaissance sensors.

In Czechoslovakia in 1984, the nose of the Yak-40 registered OK-020 was rebuilt to install an M-601E turboprop engine with a V-510 propeller to test the powerplant for the LET L-410UVP-E. An M-602 engine with a V-518 propeller and other combinations of power units were also tested for the proposed LET L-610.

## WORLDWIDE PROMOTION

The Yak-40 was the first Soviet aircraft to be widely advertised and sold around the world. The first international exhibition it attended was Paris-Le

Bourget in 1967, where prototype CCCP-19661 appeared. The Yak-40 was shown at Le Bourget several times and performed at ILA in Hannover, Germany, and at other smaller airshows.

In February 1972, a promotional tour of Yak-40 CCCP-87791 in the Americas began. During this, the aircraft took off from the airport of La Paz (Bolivia), located at an altitude of 13,288 (4,050m) above sea level. In May that year, the Yak-40 reached Canada, where local pilots rated it as a successful passenger aircraft with STOL characteristics, capable of operating from undeveloped airfields. The noise level in the cabin was low, as is the case with all aircraft with the engines at the rear. However, they pointed out several disadvantages of the aircraft: it was inconvenient to fuel it through the receptacles on the upper wing surface and the airframe finish was of a low standard, as was the passenger compartment furniture. "The cabin décor could best be described as austere by Western standards but far from the army barracks motif we had

been led to expect," reported Canadian aviation trade magazine *Sky-ADS* in its June 1972 issue. It added: "Passengers find it difficult to look outside through small round windows, unlike the crew, which has a good view and ample lighting. The bathroom is relatively crude by Western standards, but it exists and does its job."

The Americas tour, covering 62,000nm (115,000km) with 260 landings at various airports and in various weather conditions, showed the reliability of the Yak-40, with the aircraft operating without problems for many months



General Air of West Germany operated the Yak-40FG. The small airline operated five of this model in the early 1970s. Key Collection



The Yak-40 was known to NATO as the *Codling* and was used by the air forces of several Warsaw Pact countries, including Czechoslovakia. Key Collection



In the early 1970s, Italian airline Aertirrena received three Yak-40s. The aircraft were also used by other Italian carriers, such as Cadabo pictured here, and two of them for a time by Olympic Airways.  
AirTeamImages.com/Wolfgang Mendorf



away from its base. The following year, from January to March 1973, the Yak-40 continued its tour through Africa and, in 1974-1975, it undertook a series of demonstration flights in European countries. Even earlier, in the summer of 1971, a Yak-40 registered I-JAKA from the Italian regional airline Aertirrena and piloted by an Italian crew made a promotional tour of Asia and Australia. In total, Yak-40s were demonstrated in 75 countries across all continents.

## LOOKING WEST

Yak-40 was the first – and only – Soviet passenger aircraft certified in the West. This required a great deal of work for which the USSR's aviation industry was completely unprepared. In addition to further evaluation of the aircraft's characteristics, it was necessary to modify some components, including the avionics. The Yak-40EC (standing for Export with Collins) was intended for sale to the West with an integrated Collins AP-104/FD-108 avionics suite. In March 1972, the Yak-40EC received a certificate of compliance with the FAR-25 standards in Italy and, six weeks later,

was certified in Germany. Tests for the British BCAR (JAR-25) certificate were also completed, but the document was never formally issued.

Thanks to the work done on the Yak-40's certification in the West, the first modern aviation requirements were formulated in the USSR. In February 1973, the first Soviet aircraft certification body (the State Air Register) was created.

Despite active promotion, the Yak-40 did not succeed in the West. Only eight aircraft ever operated there, three in Italy and five in West Germany. Aertirrena leased three Yak-40s from Aeroflot; one of them, I-JAKA, was returned to the USSR in 1972, while the second, I-JAKE, crashed on landing at Genoa, Italy, in May 1977, and the third, I-JAKI, served with various Italian airlines until the early 1990s.

From June 1972, five aircraft were operated by the West German regional airline General Air. In West Germany, the type received its own designation of Yak-40FG. One of these, D-COBD, crashed in February 1975 at Saarbrücken. In January 1976, General Air went bankrupt, and the remaining four aircraft returned to the

USSR. The most interesting subsequent career of these aircraft was D-COBB, which became the company aircraft of the MiG design bureau, now RSK MiG. This aircraft, '48112', is still in use and is the oldest flying Yak-40.

There were many barriers discouraging Western airlines from purchasing the Yak-40, not least the difficulty of ensuring fast delivery of spare parts from the USSR. However, the main reason for the lack of success of the Yak-40 in the West was the fuel crisis following the Arab-Israeli War of 1973, when the cost of aviation fuel increased steeply. The Yak-40 was consuming 2,205-2,425lb (1,000-1,100kg) of fuel per flight hour. This did not affect Soviet Aeroflot, but for commercial users elsewhere high fuel consumption was an issue.

## FOREIGN USERS

According to the Saratov plant, 119 Yak-40s were sold abroad, which slightly disagrees with other data that quotes overseas sales of 123-125 aircraft. The vast majority were sold to so-called traditional customers of

Polish Air Force Yak-40 047 was a Salon 2nd Class VIP version. Today it is preserved at Koszalin. Piotr Butowski





The beefy undercarriage and small windows of the Yak-40 are clearly seen on this LOT Polish Airlines example. The airline used this example, SP-GEA, from 1981-1995. Key Collection



Soviet technology – that is, countries dominated by the USSR and having little choice. As many as 26 aircraft went to Czechoslovakia, 18 purchased by state airline ČSA and eight by the government and the air force. Poland bought 19 aircraft, comprising 18 for the air force (including for governmental transport) and one for the Warsaw Institute of Aviation. The first example was delivered in 1972. Between 1981 and 1995, LOT Polish Airlines operated the aircraft from the Institute of Aviation and from 1988 to 1991 leased five of the air force Yak-40s. The last four aircraft in air force service were withdrawn in 2011. Eighteen Yak-40s flew in Cuba, including 12 for Cubana and six for the air force. Bulgaria bought 13 and another dozen countries purchased a few examples each.

Forty years after production ended, Yak-40s have dispersed throughout the world, changing owners many times, and it is difficult to know exactly how many are still in use. It's likely there are about 50 left, scattered in ones and twos between many operators. One of the most important users in Russia is the Special Flight Detachment servicing the country's highest authorities, which currently has three aircraft. Apart from Russia, the largest

number of Yak-40s – approximately ten – remain in Kazakhstan.

In 1992, the plant at Smolensk developed the Yak-40D and Yak-40KD (Dalniy; long range) conversions with fuel capacity increased once again to 13,228lb (6,000kg). The range increased to 1,350nm (2,500km), but with a limited payload. In practice, such modernisation was justifiable only for VIP versions. Currently, the only place where the Yak-40s are being repaired is the Civil Aviation Plant No.407 in Minsk, Belarus.

## NEW ENGINE OPTIONS

After 1973, the engines became the Yak-40's Achilles' heel. In 1978, ICX Aviation from Youngstown, Ohio, proposed equipping the Yak-40 airframe with Garrett TFE731-3 engines and Western systems. The aircraft was to be sold in the West under the name X-Avia, but these plans were never realised.

In 1984, Yakovlev designed the Yak-40V, where three AI-25 turboprops were replaced by two Klimov TV3-117 turboprops with pusher propellers. In 1991, Yakovlev announced the Yak-40TL project, fitted with two Textron Lycoming LF507-1H geared turboprops; the range was claimed to be increased by 25% compared to the AI-25 version.

Despite many earlier plans, the re-engining of the Yak-40 has only been carried out quite recently. The Siberian Aviation Science and Research Institute (SibNIA) based at Novosibirsk, which re-engines An-2 biplanes, tried its hand on the Yak-40. On December 8, 2012, the SibNIA Yak-40, 87216, with one Honeywell TFE731-3 engine and two standard AI-25s took off from the Yeltsovka airfield in Novosibirsk. On May 20, 2013, the same aircraft flew with two TFE731s and one (central) AI-25. In the next stage, the central engine was removed and, on November 29, 2016, the Yak-40 flew with two more powerful TFE731-5BRs delivering 21.1kN (4,750lbf) each; the re-engined aircraft consumed 1,213-1,433lb (550-650kg) of fuel per flight hour.

On December 18, 2018, an experimental SibNIA STR-40DT aircraft took off. This is a heavily modified Yak-40 using two Honeywell turboprops and a new composite wing. The aspiration is to follow it with a completely new construction entirely made of composites. It will be interesting to watch the progress of this project.

The Yak-40 served the purpose well for which it was designed and is still finding utility with some operators. **AN**

The Serbian Air Force operated six Yak-40s, including one in the ELINT role. This VIP example, 71503, is believed to still be active. Piotr Butowski

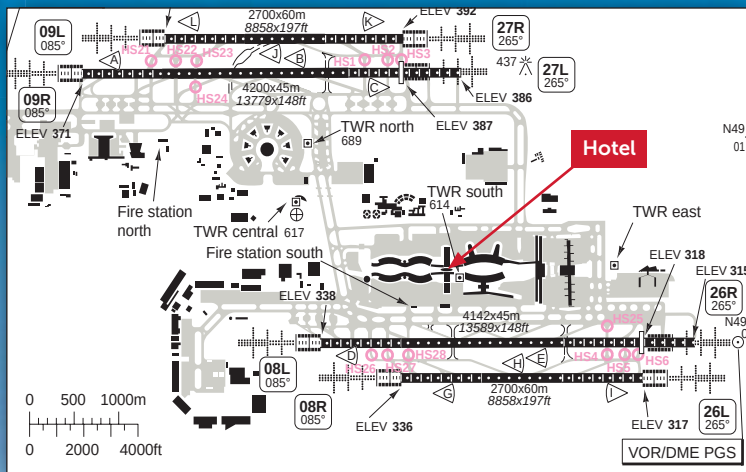




ROOM WITH A VIEW...

# Paris

**Michael Kelly** reveals the photographic opportunities from a hotel at one of the world's busiest airports.



**AIRPORT: PARIS-CHARLES DE GAULLE AIRPORT**

**HOTEL: SHERATON PARIS AIRPORT HOTEL & CONFERENCE CENTRE**



**P**aris-Charles de Gaulle Airport opened in 1974 and has grown massively in terms of infrastructure and passenger numbers. In 2018, the most recent year with statistics available, it handled just over 72m passengers. The airport has three terminals: Terminal 1 is a circular building with seven satellites, the newer Terminal 2 is a massive facility and home to Air France, and Terminal 3 is the smallest of the three.

The Sheraton Paris Airport Hotel & Conference Centre is situated in the centre of the Terminal 2 complex. Below is the main train station with connections to central Paris and the capital's Orly airport. Although built over the train station, the soundproofing is very good.

The hotel has four floors, 240 rooms and 12 suites. Each standard room is well appointed and includes desk-level

electrical outlets, some of which are dual voltage, as well as air conditioning, Wi-Fi, coffee/tea-making facilities and a flatscreen TV. This four-star hotel has two restaurants, a bar and a gym.

## VIEW

To get the best view it is advisable to request a room on the highest floor possible. The fourth floor is the Club Level and usually

Above right: **An airfield chart of Paris-Charles de Gaulle Airport with the location of the hotel marked.** Not for airborne/operational use, Navblue

Below: **This photo shows the location of the hotel in the Terminal 2 complex at Charles de Gaulle airport.** Sheraton Paris Airport Hotel & Conference Centre





An overview of the busy south ramp area from a third-floor room with an Air France A319 on approach to Runway 08R in the distance.



Left: A Xiamen Air Boeing 787-8 Dreamliner, taken at 150mm, pushes back from its stand.



Above: This Air France Airbus A380 is lifting off from Runway 26R and was shot at 350mm.

Below: A King Executive Guest Room at the hotel. Sheraton Paris Airport Hotel & Conference Centre



## HOTEL DETAILS

**Floors:** Four

**Rooms:** Best views from third and fourth floors

**Rating:** 4 stars

**Parking:** On-site parking €8 hourly, €59 daily

**Internet access:** Free Wi-fi. Enhanced high-speed internet (wired) is available at €14.90 for 24 hours

**Website:** [www.marriott.com/hotels/travel/parsi-sheraton-paris-airport-hotel-and-conference-centre/](http://www.marriott.com/hotels/travel/parsi-sheraton-paris-airport-hotel-and-conference-centre/)

**Telephone:** +33 1 49197070

reserved for Sheraton/Marriott guests in the Frequent Stayer programme. However, these rooms can be booked subject to availability and one of the benefits is access to the Club Lounge with complimentary food and drink.

Rooms on either side of the hotel offer vistas of aircraft parking stands, although those that are south-facing give photographic opportunities of Runways 08L/26R (nearest) and 08R/26L. An Airbus A380 using the former runway will require a focal length of around 350mm on a crop sensor digital camera. For widebody aircraft using the taxiways in front of the runways 300mm will be adequate.

Facing in this direction also means aircraft can be seen climbing out of Le Bourget airport, depending on the runway in use. The downside is that, from a photography perspective, the sun is facing you for the majority of the day. North-facing rooms have more distant views of Runways 09L/27R and 09R/27L.

For aircraft on the ramps in front of the hotel, 200mm focal length will suffice. The windows are triple-glazed, but good images can be obtained in the right light and if you're not shooting at an angle.

To photograph aircraft at Charles de Gaulle requires a permit to be obtained from the French authorities. Please allow 15 days for the application to be processed. The request should be made to xavier.huby@seine-saint-denis.gouv.fr

With a large number of airlines from all over the world frequenting Charles de Gaulle, it is an airport well worth visiting and the Sheraton provides an ideal location to watch the action. **AN**



# Japanese Phantoms

## Approaching Sunset

Japan Air Self-Defense Force (JASDF) Phantoms have been protecting the nation's airspace and serving as a deterrent force from the early 1970s. Even as they count down to retirement, they are still flying to protect Japan alongside their successor, the Lockheed Martin F-35A Lightning II, writes **Midori Fukakusa**.



A trio of JASDF Phantoms of 301 Hikotai armed with AIM-9 Sidewinders. The five stars on the frog's scarf signify assignment to 5 Kokudan (Wing) at Hyakuri, to where the squadron moved in 2016. JASDF





**T**he Japan Air Self-Defense Force (JASDF) was established in 1954. Its first fighter, from 1955, was the North American F-86F Sabre followed by the F-86D from 1958 and the Lockheed F-104 Starfighter from 1961.

In April 1966, a study for a new fighter project (F-X) was listed in Japan's 3rd Defense Build-up Program. In October 1967, teams from the JASDF visited the US and European countries to investigate nine candidate fighters: the General Dynamics F-111, the McDonnell Douglas F-4E, the Northrop F-5 and P-530, the Lockheed CL-1010, the BAC Lightning, the SEPCAT Jaguar, the SAAB 37 Viggen and the Dassault Mirage F1C. After this first investigation, the candidates were narrowed down to three: the F-4E, Mirage F1C and CL-1010. From July to September 1968, the JASDF dispatched a second team to each manufacturer, after which the F-4E was selected. With a recommendation of the chief of the Japan Defense Agency, the government gave its approval to acquire the F-4E on November 1.

The reasons for choosing the F-4E were that it had the latest high-thrust engines that provided enough speed, climb rate and acceleration performance to intercept high-speed targets and it also had a large combat radius, excellent take-off and landing performance and, lastly, an exceptional radar and weapons capability.

Since the F-4E had such good performance, opposition parties and some media criticised it for having too much ground attack capability and too great a combat radius – which went against a national policy of having exclusively

**The F-4EJs of 301 Hikotai at Komatsu were wearing a mix of colour schemes in November 1981. At the time the unit belonged to 7 Kokudan. T Matsuzaki**

defensive equipment – and that it might pose unnecessary threats to neighbour countries.

To meet these criticisms, the JASDF decided to downgrade the F-4E by focusing on its interceptor operations only and omitting unnecessary equipment related to ground attack missions. This Japanese variant was designated the F-4EJ.

**“The leader of the interceptors fired warning shots from his cannon to the front and right of the Tu-16P...”**

## **ORDER, PRODUCTION AND DEPLOYMENT**

On January 10, 1969 the National Defense Committee decided on indigenous production and deployment of 104 F-4EJs. Mitsubishi Heavy Industries (MHI) was in charge of manufacturing the main airframe, while Ishikawajima Harima Heavy Industry (IHI) was responsible for building the engines under licence. After the reversion of Okinawa to Japanese administration in 1972, the total number was increased to 140. Procurement was started from 1969 and deliveries were completed in the financial year (FY) 1981.

The first and second F-4EJs were built in the US by McDonnell Douglas and 17-8301 completed its first flight on January 14, 1971 at St Louis, Missouri. The JASDF accepted the first and second aircraft there on July 16, and American pilots flew them to MHI's Komaki factory in Aichi Prefecture on July 25. These two aircraft were tested by the Air Proving Group (APG) – which in 1974 became the Air Proving Wing (APW) and since 1989 the Air Development and Technical Wing (ATDW). After APG tests they were then issued to a unit designated the 'Temporary F-4 Squadron'.

Manufacture of the Phantom in Japan was built up in stages. After importing two fully US-made F-4EJs, 11 F-4EJs were manufactured from knockdown kits. In February 1971, MHI received the first kit from McDonnell Douglas, which was assembled and the aircraft completed its maiden flight on May 12, 1972. After the first 13 aircraft, MHI gradually increased the proportion of domestically manufactured parts. The final F-4EJ, the 140th, was delivered on May 20, 1981. Since the last F-4 manufactured by McDonnell Douglas was delivered to the Republic of Korea Air Force on October 25, 1979, this aircraft (17-8440) was the last Phantom out of 5,195 built.

On July 31, 1972, the chief of the Japan Defense Agency (JDA) approved the use of F-4s by operational squadrons and, on August 1, what was called the Temporary F-4EJ Squadron was established at Hyakuri Air Base under 7 Kokudan (Air Wing). The commanding officer was Col Yoshihiko Ozai. After 11 months of working up, this squadron was scheduled to be formally designated as 301 Hikotai (Squadron) ▶



**A long-nosed goblin featured on the insignia of 304 Hikotai, based at Komatsu from 1978 to 1990. T Matsuzaki**





Taxying at Hyakuri in February 1984 – this F-4EJ was operated by the Komatsu-based 306 Hikotai. T Matsuzaki

but on May 1, 1973, the fourth F-4EJ (27-8304) crashed and killed Col Ozaki and Maj Masayasu Abe. The JASDF prioritised investigating the root causes of the accident and this caused some delay to the squadron establishment and 301 Hikotai formally stood up on October 16. The primary role of 301 Hikotai was training of

Phantom crews as a conversion training squadron in addition to standing alert to protect the capital zone.

Following 301 Hikotai, five other interceptor squadrons were established, numbered 302 to 306 Hikotai. The only reconnaissance squadron in the JASDF, 501 Hikotai also replaced its RF-86F Sabres with

14 St Louis-built RF-4Es. In addition to these operational squadrons, the APG (now ADTW) has used a number of F-4s for test purposes.

## FOXBAT DEFECTION

On September 6, 1976 a Soviet pilot, Lt Viktor Ivanovich Belenko landed his MiG-25 *Foxbat* at Hakodate Airport in northern

## JASDF F-4 SQUADRONS

### 301 Hikotai (August 1, 1972 – Present)

The last remaining F-4 interceptor squadron in the JASDF was also the first with 301 Hikotai established on August 1, 1972 as the Temporary F-4EJ Squadron at Hyakuri AB. Initially, this squadron trained instructors and, from February 25, 1972, started conversion courses for operational pilots. The Temporary F-4EJ Squadron formally became 301 Hikotai on October 16 and was assigned to 7 Kokudan. On March 2, 301 Hikotai was assigned to 5 Kokudan and moved to Nyutabaru AB. From April 1991, 301 Hikotai started to convert to the F-4EJ Kai. On October 31, 2016, 301 Hikotai returned to Hyakuri AB. The squadron will retire its Phantoms at the end of March 2021.

The tail marking of 301 Hikotai is derived from a toad (*gama*) living on Tsukuba Mountain, near Hyakuri AB in Ibaraki Prefecture. The number of stars on the yellow scarf wrapped around the toad's neck indicates the number of the assigned air wing.

### 302 Hikotai (July 18, 1974 – March 25, 2019)

Before the formal establishment of 302 Hikotai, the Temporary F-4EJ Squadron was established on July 18, 1974 at Chitose AB. This squadron officially became 302 Hikotai on October 1 and was assigned

to 2 Kokudan. On November 29, 1985, the squadron was assigned to 83 Air Group (9 Kokudan since 2016) and moved from Chitose to Naha AB. In 1991, the squadron started to convert to F-4EJ Kai and completed this in 1993. On March 13, 2009, the 302 Hikotai moved to Hyakuri AB and on March 26 the squadron was re-assigned to 7 Kokudan.

In December 2017, the Temporary F-35A Squadron was established in Misawa AB and became 302 Hikotai on March 26, 2019. The day before, the F-4 302 Hikotai was disbanded. There were almost no crews that transitioned from the F-4s to F-35s. The F-4EJ Kai and related equipment were transferred to 301 Hikotai.

The tail marking was derived from the white-tailed sea eagle. The bird's wing depicts a stylised '3', its tail shows '0' and the yellow circle, '2', and in combination represents the squadron number 302.

### 303 Hikotai (October 26, 1976 – November 30, 1987)

The third squadron, 303 Hikotai, was established on October 26, 1976 at Komatsu AB under 6 Kokudan. It first competed in the JASDF's combat competition in 1978 against three other F-4 squadrons and won its initial victory in 1981. At that time, one of their aircraft wore a 'sharkmouth' marking for the first time on a JASDF Phantom. The Phantoms of 303 Hikotai

often responded to reconnaissance flights by Soviet aircraft including the Tu-16 *Badger* and M-4 *Bison*. On December 1, 1987 the squadron completed conversion to the F-15J/DJ.

The first squadron tail marking was a design inspired by the number of their assigned air wing (6 Kokudan). In 1981, they adopted a new marking derived from a dragon. Originally, it was a green dragon's head and later it was changed to a monotone dragon's upper body and wing.

### 304 Hikotai (August 1, 1977 – January 11, 1990)

Established at Tsuiki AB on August 1, 1977, 304 Hikotai was assigned to 8 Kokudan as the first Phantom squadron under the West Air Defense Force. Since the squadron had many experienced pilots who used to fly the F-86F, it won the combat competition the first time it participated after only nine months of Phantom operations. The air wing has both interceptor squadrons and a fighter support squadron (6 Hikotai) and is responsible for airspace incursion-prone zones such as the western Japan Sea, Tsushima Straits and East China Sea. The squadron started to convert to Eagles from April 1989 and this process was completed on January 11, 1990.

The tail marking of the squadron was derived from



The black panther tail marking identify this upgraded F-4EJ Kai as belonging to 8 Hikotai. The squadron flew Phantoms from 1997 to 2009 in the fighter support (ground attack) role. R Yamada





An F-4EJ in the markings of the Air Proving Wing at Gifu, in November 1984. In 1989 this unit was renamed the Air Development and Technical Wing (ADTW). T Matsuzaki

Japan with the intention of defecting to the US. This event revealed the weak points of both the defence system of Japan and F-4EJ's radar capability.

On that day, Lt Belenko and his MiG-25 entered the ADIZ (Air Defence Identification Zone) of Japan and climbed up to 19,685ft so that Japanese radar would detect him. At

1311hrs, the Okushiri Island radar site picked up the MiG-25. Immediately, the Air Defense Control Center in Misawa issued an alert and two F-4EJs of 302 Hikotai scrambled. At 1325hrs, they detected the *Foxbat* to the east of Okushiri Island.

However, due to dense cloud, Belenko lost visual contact with the ground

and lowered his altitude. Following this manoeuvre, the MiG-25 disappeared from the Phantom's APQ-120 radars because of their poor detection capability against aircraft flying at lower altitudes. After 25 minutes without being tracked by the JASDF, Lt Belenko landed at Hakodate Airport. Learning from this, the JASDF

Tengu, a long-nosed goblin allegedly living on Hiko Mountain near Tsuiki AB. The unit now flies the F-15J/DJ.

### 305 Hikotai

(December 1, 1978 – August 1, 1993)

The second Phantom squadron for 7 Kokudan, 305 Hikotai, was established on December 1, 1978. With its sister squadron, 301 Hikotai, 305 Hikotai was responsible for air defence of the National Capital Region. The squadron completed conversion to F-15s on August 2, 1993.

The squadron's tail marking was derived from the plum blossom of Kairakuen, a traditional Japanese garden near Hyakuri AB. The current 305 Hikotai still uses this symbol on its F-15s.

### 306 Hikotai

(June 30, 1981 – March 16, 1997)

The sixth and last F-4EJ interceptor squadron, 306 Hikotai, was established on June 30, 1981 at Komatsu AB and assigned to 6 Kokudan. This squadron became the first unit to receive the F-4EJ Kai in November 1989 and completed its conversion by end of March 1990. Since this squadron was first the F-4EJ Kai unit, it conducted various operational tests for the Japanese ASM-1 anti-ship missile. This experience was shared when this squadron handed over its crews and equipment to 8 Hikotai. From August 1996 to March

17, 1997, 206 Hikotai converted to F-15s. The F-4EJ Kai used in this squadron were transferred to 8 Hikotai at Misawa AB to replace its F-1s.

The tail marking of 306 Hikotai are derived from the Golden Eagle, which is the official bird of Ishikawa Prefecture, where Komatsu AB is located.

### 8 Hikotai

(March 30, 1997 – March 25, 2009)

On October 29, 1960, 8 Hikotai was established at Matsushima AB with F-86Fs. On June 30, 1979, the squadron started to convert to F-1s and completed this process on February 29, 1980. In the mid-1990s, it was decided to convert 8 Hikotai to F-4EJ Kai as a temporary measure until completion of F-2 development. Over March 17-18, 1997, crews and aircraft of the former 306 Hikotai were transferred to Misawa and formed 8 Hikotai as the first F-4 fighter support squadron.

For 12 years, 8 Hikotai used the F-4EJ Kai. In 2005 and 2006, they participated in the Cape North exercise held at Andersen AFB, Guam, and dropped live 500lb (227kg) bombs for the first time in JASDF history. The first F-2s arrived in April 2008 and the squadron started its conversion. On March 26, 2009, 8 Hikotai was converted to an F-2 Squadron and the service of the F-4EJ Kai ended with the unit.

The tail marking of 8 Hikotai was a black panther.

### 501 Hikotai

(December 3, 1974 – Present)

No.501 Hikotai had been resident at Matsushima AB since being established in 1961. While flying the RF-86F it moved to Iruma AB. In 1974, the squadron dispatched an advance team to Hyakuri AB to receive RF-4Es and later the unit took up residence at the base.

When the F-4EJs were modernised, some of them were converted to the reconnaissance role and designated RF-4EJ. In total, 15 aircraft were modified and deployed with 501 Hikotai from 1992 to 2000.

Originally the tail marking of 501 Hikotai was a blue and yellow chevron, but from February 25, 1981 the squadron changed it to a woodpecker, derived from the squadron emblem in which a woodpecker holds a telescope and map.

### Air Development and Technical Wing

The ADTW operates almost all aircraft types used in the JASDF for test, evaluation and development of new equipment. Today, they still use the F-4EJ and F-4EJ Kai for testing various systems and weapons and for pilot training.

The wing plans to retire the Phantom when all other operational squadrons have completed their service.

The stylised sea eagle marking graced 302 Hikotai's Phantoms from 1974 to 2019.

It was based at Hyakuri for its last decade of F-4 operations. Rich Cooper/COAP





The Air Development Test Wing at Gifu has regularly painted Phantoms in special schemes to mark various anniversaries. This example marked 40 years of the unit in 1995. T Matsuzaki



replaced the F-4EJ's radar in the F-4EJ Kai with the APG-66J, which has a look-down/shoot-down capability.

## FIRST WARNING SHOTS

Another Cold War incident that made headlines around the world took place on December 9, 1987. At around 1030hrs,

Soviet aircraft violated the airspace of Japan. At 1045hrs, two F-4EJs of 302 Hikotai scrambled to intercept these four unknown aircraft, and launched four more fighters for back up. After voice warnings, three of the four intruders flew away from the ADIZ at 1120hrs, but one of them, a Tu-16P *Badger*, remained in violation and

headed towards Okinawa's main island. After it reached the island, it flew past a JASDF base and US facilities. The leader of the interceptors fired warning shots from his cannon to the front and right of the Tu-16P at 1125hrs. The Tu-16P ignored the warning and left the ADIZ at 1131hrs, but about ten minutes later, returned to the ADIZ and violated airspace again over Okinoerabujima Island and Tokunoshima Island. At 1140hrs, a second burst of warning shots was fired and finally, at 1150hrs, the *Badger* departed Japan's ADIZ. These were the first warning shots in the history of the JASDF and the only instance as of today.

## CONVERT AND UPDATE

From 1981, the McDonnell Douglas F-15J and 'DJ Eagle entered JASDF service, replacing fighters of previous generations. With this more powerful fourth-generation fighter, some F-4EJ squadrons relocated base and some of them were converted

Sharkmouths have appeared from time to time on JASDF Phantoms, including this F4EJ of 303 Hikotai, photographed at Komatsu in June 1982. T Matsuzaki



The Hyakuri ramp in February 2018 – there were still three F-4 squadrons based there at the time, including 501 Hikotai with reconnaissance Phantoms. The base north of Tokyo has long been a must-visit destination for aviation photographers. Rich Cooper/COAP



to the Eagle. Three Phantom squadrons were converted to F-15s and, for the other three, the JASDF decided to modernise the remaining F-4EJs.

The F-4EJ update project caused some discussion in the Japanese parliament (Diet) for its planned bombing capability, but the budget for updating one aircraft was approved in FY 1982. The first upgraded F-4EJ (07-8431) completed its maiden flight on July 17, 1984 and was sent to the APW for operational test. In total, 96 F-4EJs were upgraded. The formal designation of the modernised F-4EJ was 'F-4EJ Improved Capability', but it is generally called 'F-4EJ Kai'. The word Kai means 'modified' in Japanese.

The first production model of the F-4EJ Kai was deployed in November 1989 at 306 Hikotai based at Komatsu AB. Following this, 301 Hikotai at Nyutabaru AB and 302 Hikotai at Naha completed conversion

in 1991 and 1993, respectively. In August 1996, 306 Hikotai started to convert from the F-4EJ Kai to the Eagle and became operational on the new type on March 17, 1997. This left only two F-4EJ Kai interceptor squadrons in the JASDF.

At same time, JASDF had three Mitsubishi F-1 Hikotai as fighter support (FS) squadrons. Even though the name is fighter support, they are assigned to the anti-shipping role – in other words, attack aircraft. Due to ageing of the F-1 and delay of development of the new FS aircraft, the Mitsubishi F-2, it was decided that F-1 unit 8 Hikotai would convert from F-1 to F-4EJ Kai, which has the capability of carrying the ASM-1 indigenous anti-ship missile. Over March 17-18, 1997, aircraft and crews of the former 306 Hikotai moved from Komatsu AB to Misawa AB and became the new 8 Hikotai and the first JASDF FS squadron using the F-4EJ Kai.

In April 2008, 8 Hikotai started to convert to the F-2 and completed the process on March 26, 2009 leaving only two F-4EJ Kai squadrons in the JASDF, plus one reconnaissance squadron, 501 Hikotai.

## CHOOSING A SUCCESSOR

Japan began considering a successor for the F-4EJ Kai in the early 2000s. At the beginning, the leading candidate was the Lockheed Martin F-22 Raptor, but it became clear that the US would never authorise the export of the F-22 to Japan. The JASDF announced that "the successor of the F-4 should be decided by the end of 2007 at the latest", but selection was repeatedly put off until December 2011 when the Lockheed Martin F-35A Lightning II was finally chosen.

Under the original plan, 42 F-35As would be procured to replace two



A pair of 305 Hikotai F-4EJs take off from Hyakuri in 1982. The unit has flown the F-15J Eagle since 1993. T Matsuzaki





## JASDF PHANTOM VARIANTS

### F-4EJ

The F-4EJ was a downgraded version of the F-4E. For political reasons, the F-4EJ lacked some equipment related to ground attack such as the DCU-9/A nuclear weapon control system, the AJB-7 bomb computer system, the ASQ-91 weapons release computer and ARW-77 Bullpup air-to-ground missile guidance system. To limit its combat radius, the air-refuelling receptacle was modified for ground refuelling only.

The F-4EJ had some indigenous equipment such as the APR-620 onboard data link for the BADGE (Base Air Defense Ground Environment) system (later replaced by APR-670) and J/APR-2 radar warning receiver (RWR).

The F-4EJ had the ability to carry the AIM-7 Sparrow air-to-air missile and was the first all-weather fighter in the JASDF. In addition

to the AIM-7, the F-4EJ was able to carry some infrared guided missiles such as the AIM-4D Falcon, AIM-9 Sidewinder and the domestically produced AAM-3, in addition to other munitions such as bombs, rockets and the internal M61A 20mm Vulcan cannon with 640 rounds of ammunition.

### F-4EJ Kai

In 1980, research was started into the modernisation plan for the F-4EJ's avionics and the Aircraft Structural Integrity Program (ASIP). Under ASIP, each component of the aircraft structure is managed by computer for operational safety, so that, in comparison with conventional operating limits based on design lifetimes, the operator can know more accurately the remaining life of components. Since the avionics of the F-4EJ were designed

based on 1960s' technology, by the 1980s there were some capabilities lacking. For example, the APQ-120 radar has no look down/shoot down ability. In addition, the programme called for reinstatement of bombing-related equipment. The first F-4EJ modernisation project was approved in FY 1982 and the first upgraded F-4EJ completed its first flight on July 17, 1984. In total, 96 F-4EJs were upgraded and these aircraft were named F-4EJ Improved Capability but are usually referred to as F-4EJ Kai. They were equipped with the latest equipment, such as AN/APG-66J radar, which was equivalent to the F-16's at that time. The lead computing optical sight (LCOS) was replaced by a head up display (HUD) and there was much indigenous equipment, including the new J/AYK-1 central computer, new J/ASN-4 INS and J/APR-6 RWR. Also, the capability to



Hyakuri became the home of all operational JASDF Phantoms in October 2016 when 301 Hikotai left Nyutabaru. Rich Cooper/COAP

F-4EJ Kai squadrons, but in December 2018, the Japanese government decided it would purchase a total of 105 F-35As and 42 F-35Bs. Firstly, 302 Hikotai was converted to the F-35A but in reality, one squadron replaced another. On March 25, 2019, 302 Hikotai concluded all its operations and closed. The next day, on March 26, the 'Temporary F-35A Squadron' based at Misawa AB took over its name and tail markings to become the new 302 Hikotai.

As of February 2020, there are only two F-4 squadrons in the JASDF, 301 and 501 Hikotais. The former will use about 20 F-4EJ Kai until the end of March 2021. After that, 301 Hikotai will be replaced by a 'new' 301 Hikotai with F-35As in the same manner as 302 Hikotai. Reconnaissance unit 501 Hikotai operates the RF-4E and RF-4EJ, and it will retire its Phantoms by the end of March this year. There are other F-4s in the ADTW, but it also plans to retire them when all operational F-4s leave service.

## FINAL YEARS

In the original plan, the F-4 was supposed to retire in the 2010s, but its service period was repeatedly extended and they are still in use. To reduce airframe fatigue and keep Phantoms in operable condition, F-4 squadrons have made a lot of effort such as completing pilot training at a relatively early stage, and no longer participating in the JASDF's combat competition (2013 was the last year for the F-4). One episode illustrates the F-4's ageing. In October 2017, when F-4EJ Kai, 87-8408, was taxiing to the runway, its landing gear broke suddenly and the aircraft was disabled on the taxiway. The squadron commander at that time said: "We never expected such an accident because the F-4 was designed as a robust carrier-based aircraft. However, due to serious fatigue, this accident was unavoidable."

The F-4 is scheduled to be retired from the JASDF by the end of March 2021. Since 1971, when the JASDF received its first F-4EJ, Phantoms have been in service for 48 years. For now they will continue to fly but next year will hand over to the new F-35A and the sun will set on the career of the Japanese Phantoms. **AN**



In 2015 501 Hikotai painted one of its RF-4Es in an attractive blue scheme similar to that worn by JASDF Mitsubishi F-2s, followed by a second a year later. The squadron also flies the RF-4EJ with reconnaissance pods and a standard nose. Rich Cooper/COAP



carry the ALQ-131 ECM pod was introduced. There were a few external changes including semi-spherical RWR antennas added on the wingtips and the top of the vertical stabiliser and a UHF antenna on the spine. Combat capability of F-4EJ Kai was dramatically increased in both air-to-air and air-to-surface combat as it can now carry newer AIM-7F/M Sparrows, indigenous ASM-1/-2 anti-ship missiles and GCS-1 infrared guided bombs.

### RF-4E

The JASDF used the RF-86F as its airborne reconnaissance workhorse in 501 Hikotai from its establishment in 1961. With the Sabre becoming obsolete and F-4EJs being delivered it was decided to introduce reconnaissance Phantoms and an order for 14 RF-4Es was placed with McDonnell Douglas

under the FY 1972 budget. The RF-4E was an export model of the RF-4C manufactured for the USAF. Japan's aircraft received the J/ APR-2 radar as used in the F-4EJ. The JASDF imported all 14 aircraft from the USA and the first pair of them (47-6901 and 47-6902) was delivered to Hyakuri AB on December 3, 1974 – all aircraft were delivered by June 1975. The RF-4E can carry a range of cameras for its reconnaissance role.

### RF-4EJ

When the F-4EJ modernisation programme started, not all aircraft were required to be upgraded, since enough F-15s were already in service. Of the non-modernised F-4EJs, 17 were converted to the RF-4EJ reconnaissance version. The first RF-4EJ (87-6406) completed its maiden flight on February 4, 1992.

The RF-4EJ was equipped with the same AN/ APQ-120 radar as the F-4EJ, but some avionics were replaced with new ones such as the J/ ASN-6 ring laser gyro INS, radio altimeter and HF radio. Reconnaissance equipment was stored inside a pod mounted on the centreline of the airframe, unlike the RF-4E, which mounted all sensors and cameras inside. There were three reconnaissance pods for the RF-4EJ: the TAC camera pod, LOROP and the TACER (Tactical Electronic Reconnaissance) pod. Also, the RF-4EJ can carry the AN/ALQ-131 ECM pod designed for the RF-4E. Unlike the RF-4E, the RF-4EJ still has combat capability with the 20mm Vulcan cannon and AIM-9L Sidewinder. It also has the AN/ALE-40 chaff/flare dispenser as on the RF-4E. Later versions of the RF-4EJ replaced its RWR with the J/APR-5 to improve survivability.



Above and below: **Two special schemes marked the end of 302 Hikotai as a Phantom unit. In March 2019 it closed down and re-formed as an F-35A squadron at Misawa.** Both Rich Cooper/COAP





# Register Review

The latest changes on the UK, Irish, Isle of Man and Guernsey registers.



**This Boeing 737-8AS, wearing the colours of Chinese carrier Okay Airways (though branded as OKAIR), arrived at Leeds Bradford Airport on December 24. It was previously registered B-5575 and is shown as G-DRTY in advance of it entering service with Jet2.** Pete Gibson

## RESTORATIONS

| REG'N  | MODE(S) | TYPE                                                                   | C/N       | OWNER                                                                                        |
|--------|---------|------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------|
| G-BKMI | 40205A  | Supermarine Spitfire VIII (built by Vickers-Armstrongs (Aircraft) Ltd) | 6S-583793 | Max-Alpha Aviation GmbH, Bremgarten, Baden-Württemberg, Germany                              |
| G-BVPD | 403934  | CASA 1-131E Jungmann Series 2000                                       | 2086      | IV Staines, Brighton, East Riding of Yorkshire                                               |
| G-BWWX | 403CCC  | Yakovlev Yak-50                                                        | 850003    | DP McCoy (Wicklow, Republic of Ireland)                                                      |
| G-ENTL | 406635  | P & M QuikR                                                            | 8590      | DA Hopkinson, East Fortune, East Lothian                                                     |
| G-MCCY | 404CC5  | IAv Bacau Yak-52                                                       | 9011112   | DP McCoy (Wicklow, Republic of Ireland)                                                      |
| G-UHGB | 405EA0  | Bell 205A-1                                                            | 30291     | SJ Contracting Services Ltd trading as Heli-Lift Services, Cedar House, Beckley, Oxfordshire |

## NEW REGISTRATIONS

| REG'N  | MODE(S) | TYPE                                                    | C/N            | OWNER                                                                          |
|--------|---------|---------------------------------------------------------|----------------|--------------------------------------------------------------------------------|
| G-CLKB | 407935  | Cessna 172N Skyhawk II                                  | 172-69903      | SP Vincent, Wolverhampton Halfpenny Green, Staffordshire                       |
| G-CLKJ | 40794C  | Aurore MB02 Souricette                                  | ARH1           | AR Hawes, (Needham Market, Suffolk)                                            |
| G-CLKN | 407967  | Supermarine Aircraft Spitfire Mk.26                     | PFA 324-14634  | IV Staines, Brighton, East Riding of Yorkshire                                 |
| G-CLKR | 407949  | ICA-Brasov IS-28M2A                                     | 34             | MJ Lake, (Worthing, West Sussex)                                               |
| G-CLKT | 407955  | Mead BM-77 (built by C Timbrell)                        | CT01           | (Redditch, Worcestershire)                                                     |
| G-CLKV | 40797D  | Bucker Bu.131 Jungmann (built by Dornier-Werke AG)      | 46             | N Barnard, (London SW18)                                                       |
| G-CLLI | 40798B  | de Havilland DHC-1 Chipmunk 22                          | C1/0508        | R and K Geenty, (Great Horkesley, Essex)                                       |
| G-CLWP | 407723  | Sportine Aviacija LAK-17B FES                           | 252            | JA Thomson, Easterton, Moray                                                   |
| G-CLXO | 40788E  | Schempp-Hirth Ventus-3M                                 | 076 MP         | JP Galloway, Portmoak, Perth & Kinross                                         |
| G-CRWL | 407933  | Leonardo AW169                                          | 69100          | Specialist Aviation Services Ltd, Gloucestershire (for Cornwall Air Ambulance) |
| G-DAYF | 40707D  | Agusta AW109SP Grand New                                | 22216          | Sky Border Logistics Ltd, Carlisle Lake District, Cumbria                      |
| G-DRTY | 407913  | Boeing 737-8AS                                          | 33554          | Dart Group PLC, Leeds-Bradford, West Yorkshire (NB) (operated by Jet2)         |
| G-DRTZ | 407914  | Boeing 737-8AS                                          | 33557          | Dart Group PLC, Leeds-Bradford, West Yorkshire (NB) (operated by Jet2)         |
| G-ERFX | 407902  | Embraer Legacy 600                                      | 14500952       | Flexjet Ltd, Birmingham, West Midlands                                         |
| G-FOCX | 407601  | Aeropro EuroFOX 2K (assembled by Ascent Industries Ltd) | 57319          | PR Simmonds-Short (Totton, Hants)                                              |
| G-FOXV | 406950  | Aeroprakt A22-LS Foxbat (built by A Everitt)            | LAA 317B-15186 | R Everitt, (Glyn Ceiriog, Clwyd)                                               |
| G-HASS | 407954  | Hawker 850XP (built by Raytheon Aircraft Company)       | 258790         | Bookajet Aircraft Management Ltd, Farnborough, Hampshire                       |

|        |              |                                                             |           |                                                                                |
|--------|--------------|-------------------------------------------------------------|-----------|--------------------------------------------------------------------------------|
| G-HODD | 407953       | Schleicher ASH-29E (officially registered as an ASW-27-18E) | 29507     | AK Eckton and K Tipples (East Grafton, Wiltshire & Staple Fitzpaine, Somerset) |
| G-HOOZ | 407927       | Kettlety N-77 (built by JEF Kettlety)                       | JEFK-01   | (HD Jones, Moelfre, Powys)                                                     |
| G-ICRR | 407966       | Aeronca 11AC Chief                                          | 11AC-1605 | JRM Hore, Trustee of The Chieftains Flying Group, White Waltham, Berkshire     |
| G-ISAS | 4077C8       | Airbus MBB BK 117D-2                                        | 20299     | Airbus Helicopters UK Ltd, Oxford, Oxfordshire (for Scottish Air Ambulance)    |
| G-KZEN | 40797E       | Lange E1 Antares                                            | 45E41     | IC Baker, Gransden Lodge, Cambridgeshire                                       |
| G-LCTH | 40790E       | Piper PA-28-181 Archer TX                                   | 2881196   | Escola de Aviação Aerocondor SA, Ponte de Sor, Portugal                        |
| G-LHXB | 407937       | Diamond DA42NG Twin Star NG                                 | 42.N252   | L3 CTS Airline and Academy Training Ltd, Bournemouth, Dorset                   |
| G-NEOX | 40780D       | Airbus A321-251NX                                           |           | British Airways PLC, London Heathrow, Middlesex                                |
| G-OBIC | 404343       | Robin DR400/180R Remorquer                                  | 1545      | The Windrushers Gliding Club Ltd, Bicester, Oxfordshire                        |
| G-OGFC | 40788C       | ATR 72-212A                                                 | 1595      | Aurigny Air Services, Guernsey, Channel Islands                                |
| G-ROBX | 407883       | Cameron Sport-80                                            | 12335     | RP Cross, (Ramsbury, Wiltshire)                                                |
| G-SJMW | 407976       | Spacek SD-1 Minisport                                       | 290       | MA Wood, (Muiryhall, Moray)                                                    |
| G-SLYY | 407871       | UltraMagic M-105                                            | 105/237   | JA Lawton, (Eton, Surrey)                                                      |
| G-UZLJ | 407836       | Airbus A320-251N                                            | 9171      | easyJet Airline Company Ltd, London Luton, Bedfordshire (NB)                   |
| G-XSCP | 40791D       | Piper PA-46-600TP M600                                      | 4698108   | British European Aviation Ltd, Wycombe Air Park, Buckinghamshire               |
| G-XWBD | 40779A       | Airbus A350-1041                                            | 374       | British Airways PLC, London Heathrow, Middlesex                                |
| G-YBES | 407980       | Eurocopter EC130B4                                          | 4590      | GYBE HO Air LLP, Elstree, Hertfordshire                                        |
| G-ZOZO | 407861       | Cameron R-77                                                | 12247     | Cameron Balloons Ltd, (Bristol, City of Bristol)                               |
| EI-GPF | Not Allotted | Comco Ikarus C22C Fox                                       | 9107-3348 | Tibohine Flying Club Ltd, Tibohine, Co. Roscommon                              |
| EI-GRJ | 4CAAC1       | Boeing 737-81M                                              | 37161     | Macquarie Aerospace Ireland Ltd, Milan-Malpensa, Italy (leased to Neos)        |
| M-ABMN | 424B70       | Embraer 190                                                 | 19000483  | GY Aviation Lease 1816 Ltd, (stored Guangzhou, China, for Amazonas, Bolivia)   |
| M-LEOG | 424B6C       | Leonardo AW109SP Grand New                                  | 22412     | Leo Aviation Ltd, (Halifax, West Yorkshire)                                    |
| M-PORT | 424B68       | Bombardier Global 5000                                      | 9868      | Sirom Aviation Ltd, Liverpool John Lennon, Merseyside                          |
| M-SALT | 424B69       | Bell 429 Global Ranger                                      | 57372     | Ridler Verwaltungen und Vermittlungs GmbH, (Munich, Germany)                   |



|        |        |                                                    |          |                                                                    |
|--------|--------|----------------------------------------------------|----------|--------------------------------------------------------------------|
| M-YIGO | 424B6D | Hawker 850XP ((built by Raytheon Aircraft Company) | 258827   | NNG Aviation Ltd, TBA                                              |
| 2-AVLC | TBA    | Boeing 737-86N                                     | 34258    | Avolon Aerospace (Ireland) AOE 60 Ltd, (for GOL, Brazil as PR-GZZ) |
| 2-CINE | TBA    | Aérospatiale AS355N Ecureuil II                    | 5713     | Pursuit Aviation UK Ltd, Denham, Buckinghamshire                   |
| 2-CRGD | TBA    | Piper PA-34-220T Seneca V                          | 3449300  | Private, Southampton, Hampshire                                    |
| 2-EMBR | 43ED51 | Embraer Phenom 300                                 | 50500544 | X'Air Ltd, Birmingham, West Midlands                               |
| 2-HOPL | TBA    | ATR 72-212A                                        | 1283     | SAFE Capital 2015-1 LLC, (stored Toulouse-Franccazal, France)      |
| 2-KNOW | TBA    | Cirrus SR22                                        | 1367     | Private, Guernsey                                                  |
| 2-YELL | TBA    | Piper PA-28R-201 Arrow III                         | 2844118  | Private, Guernsey                                                  |



**Aurigny Air Services has added ATR 72-212A, G-OGFC, to its fleet.**  
 AirTeamImages.com/Simon Willson

### CANCELLATIONS

| REG'N  | TYPE                                     | C/N               | REASON                                                                                                   |
|--------|------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------|
| G-AKVP | Luscombe 8A                              | 5549              | Cancelled as Destroyed (crashed on take-off from Charity Farm, Baxterley, Warwickshire 19.04.19)         |
| G-AXXC | Piel CP301B (modified)                   | 117               | To Republic of Ireland                                                                                   |
| G-AYXU | Bellanca 7KCAB Citabria                  | 232-70            | Cancelled as Permanently WFU (CofA current to 28.03.20, last noted at Gloucestershire 11.19)             |
| G-BEVT | Britten-Norman BN-2A Mk.III-2 Trislander | 1057              | Cancelled as Permanently WFU (CofA expired 13.07.17, preserved at Duxford, Cambridgeshire)               |
| G-BFKL | Cameron N-56                             | 369               | Cancelled as Permanently WFU (CofA expired 17.07.92)                                                     |
| G-BIZE | SOCATA TB9 Tampico                       | 209               | To Germany                                                                                               |
| G-BNLN | Boeing 747-436                           | 24056             | Cancelled as Permanently WFU (CofA 01.07.19, flown London Heathrow to St Athan 22.06.19 for parting out) |
| G-BOXR | Grumman American GA-7 Cougar             | GA7-0059          | Cancelled as Permanently WFU (badly damaged when nosewheel collapsed on landing at Stapleford 19.02.19)  |
| G-BRSD | Cameron V-77                             | 2174              | Cancelled by CAA (CofA expired 02.04.13)                                                                 |
| G-BSAV | Thunder AX7-77                           | 1555              | Cancelled by CAA (CofA expired 22.06.03)                                                                 |
| G-BSUB | Colt 77A                                 | 1801              | Cancelled as Permanently WFU (CofA expired 11.08.13)                                                     |
| G-BUCG | Schleicher ASW-20 TOP                    | 20396             | To Argentina                                                                                             |
| G-BWNP | Cameron Club-90                          | 1717              | Cancelled as Permanently WFU (CofA expired 12.07.12)                                                     |
| G-BZFC | Pegasus Quantum 15                       | 7640              | Cancelled by CAA (Permit to Fly expired 14.09.19, last noted at East Fortune West 07.19)                 |
| G-CBOV | Mainair Blade 912                        | 1327-0502-7-W1122 | To Spain                                                                                                 |
| G-CDOM | Pegasus Quik                             | 8118              | Cancelled as Permanently WFU (Permit to Fly expired 29.10.19)                                            |
| G-CEEZ | Piper PA-28-161 Warrior III              | 2842161           | To San Marino                                                                                            |
| G-CERY | SAAB 2000                                | 2000-008          | Cancelled by CAA (CofA expires 20.09.20, flown Aberdeen to Orebro, Sweden for storage 26.03.19)          |
| G-CHSY | Aeroprakt A22-LS Foxbat                  | LAA 317B-15186    | Re-registered as G-FOXV                                                                                  |
| G-CILN | Agusta AW139                             | 31586             | To Spain as EC-NGO                                                                                       |
| G-CKTY | Avro RJ100                               | E3324             | Cancelled as Permanently WFU (No UK CofA issued, stored at Cranfield 12.19)                              |

### PREVIOUS IDENTITIES

| REG'N  | P.I.                               | REG'N  | P.I.      |
|--------|------------------------------------|--------|-----------|
| G-AWGB | ex N308WK                          | G-OBIC | ex G-OTIB |
| G-BKMI | ex D-FEUR                          | G-OGFC | ex F-WWFF |
| G-CLKB | ex OY-CLA                          | G-UHGB | ex N35EH  |
| G-CLKR | ex SE-TTO                          | G-UZLJ | ex D-AVVA |
| G-CLKV | ex I-BUCK                          | G-XWBD | ex F-WZNR |
| G-CLLI | ex N458BG                          | G-YBES | ex F-HANA |
| G-CLWP | ex LY-GRT                          | EI-GPF | ex D-MSAT |
| G-CRWL | ex I-RAIK                          | EI-GRJ | ex F-WTBC |
| G-DAYF | ex G-SKBH                          | M-ABMN | ex B-3148 |
| G-DRTY | ex B-5575                          | M-LEOG | ex I-EASQ |
| G-DRTZ | ex B-5577                          | M-PORT | ex C-GFET |
| G-ENTL | ex 74AJP (French Ultralight marks) | M-SALT | ex C-GKUJ |
| G-ERFX | ex N910FL                          | M-YIGO | ex G-HSXP |
| G-FOXV | ex G-CHSY                          | 2-AVLC | ex B-5176 |
| G-HASS | ex TC-TKC                          | 2-CINE | ex 3A-MXL |
| G-HODD | ex OY-SXA                          | 2-CRGD | ex G-CRGD |
| G-ICRR | ex EI-CRR                          | 2-HOPL | ex F-HOPL |
| G-KZEN | ex D-KZEN                          | 2-KNOW | ex 2-OFUS |
| G-LCTH | ex N8053W                          | 2-YELL | ex 2-YULI |
| G-NEOX | ex D-AZAS                          |        |           |

|        |                                          |                 |                                                                                                                   |
|--------|------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------|
| G-CLDG | Airplay Snake/Fox 13T                    | DA153           | Cancelled as Destroyed (details unknown, SSDR microlight so no Permit to Fly required)                            |
| G-CLEJ | MD Helicopter MD-500N                    | LN067           | To USA as N150WF                                                                                                  |
| G-CLIU | Gefa-Flug AS 105 GD                      | G0036/H0070     | To Turkey                                                                                                         |
| G-CLJJ | Lindstrand LBL 90A                       | 11811           | To Turkey                                                                                                         |
| G-CPEV | Boeing 757-236                           | 29943           | To USA as N223SA                                                                                                  |
| G-CRGD | Piper PA-34-220T Seneca V                | 3449300         | To Guernsey                                                                                                       |
| G-CTUG | Piper PA-25-235 Pawnee                   | 25-4448         | To Germany                                                                                                        |
| G-DCHC | Bölkow Phoebus C                         | 858             | To Germany                                                                                                        |
| G-EGKB | BAe 125-800B                             | 258021          | To Morocco                                                                                                        |
| G-EMMM | Diamond DA40 Star                        | 40.753          | To Austria as OE-KBL                                                                                              |
| G-ERKN | Eurocopter AS350B3 Ecureuil              | 3587            | To South Africa                                                                                                   |
| G-EZEG | Airbus A319-111                          | 2181            | Cancelled as Permanently WFU (CofA expires 16.02.20, flown London Gatwick to St Athan 04.11.19 for parting out)   |
| G-FDZX | Boeing 737-8K5                           | 37258           | To Canada as C-GLZX                                                                                               |
| G-GAEE | Tecnam P2010                             | 037             | To Netherlands                                                                                                    |
| G-GDFE | Boeing 737-3Q8                           | 24131           | (CofA expired 30.11.20, flown Leeds Bradford to Cotswold 05.11.19 for parting out)                                |
| G-GILB | Cessna 510 Citation Mustang              | 510-0241        | To USA as N217GR                                                                                                  |
| G-HOLI | UltraMagic M-77                          | 77/294          | To Germany                                                                                                        |
| G-HSXP | Hawker 850XP                             | 258827          | To Isle of Man as M-YIGO                                                                                          |
| G-ISII | Pitts S-25                               | 3000            | Cancelled as Permanently WFU (no UK Permit to Fly issued, rebuild believed not completed)                         |
| G-JBLZ | Cessna 550 Citation Bravo                | 550-1018        | To USA as N95PW                                                                                                   |
| G-LCFC | Agusta A109S Grand                       | 22137           | To Malta                                                                                                          |
| G-MMTL | Mainair Gemini Sprint                    | 268-1084-2-P576 | Cancelled by CAA (Permit to Fly expired 03.08.05)                                                                 |
| G-MTBL | Solar Wings Pegasus XL-R                 | SW-WA-1117      | Cancelled as Permanently WFU (Permit to Fly expired 16.07.04)                                                     |
| G-MVTF | Aerial Arts Chaser S                     | CH808           | Cancelled as Permanently WFU (SSDR microlight, no Permit to Fly required)                                         |
| G-MWWC | Mainair Gemini Flash IIA                 | 868-1191-7-W663 | To Poland                                                                                                         |
| G-OGES | Enstrom 280FX                            | 2078            | To France                                                                                                         |
| G-OSTY | Reims Cessna F150G                       | 0129            | To Hungary                                                                                                        |
| G-OTIB | Robin DR400/180R Remorquer               | 1545            | Re-registered as G-OBIC                                                                                           |
| G-RLON | Britten-Norman BN-2A Mk.III-2 Trislander | 1008            | Cancelled as Permanently WFU (CofA expired 16.12.17, stored at Solent Airport for Solent Sky Museum, Southampton) |
| G-SKBH | Agusta AW109SP Grand New                 | 22216           | Re-registered as G-DAYF                                                                                           |
| G-SLMG | Diamond HK 36 TTC Super Dimona           | 36.727          | To Belgium                                                                                                        |





**Cessna 550 Citation Bravo, G-JBLZ, has joined the US register as N95PW.** AirTeamImages.com/Paul Buchroeder

|        |                                |               |                                                                                                  |
|--------|--------------------------------|---------------|--------------------------------------------------------------------------------------------------|
| G-SPJE | Robinson R44 Raven II          | 12026         | Cancelled as Destroyed (crashed on take-off at Shilton Road, Barwell, Leicestershire 03.08.19)   |
| G-STNK | Pitts S-1-11 Super Stinker     | LAA 273-15438 | Cancelled as Permanently WFU (no Permit to Fly issued, believed not completed)                   |
| G-TAWA | Boeing 737-8K5                 | 37264         | To Canada as C-FVWA                                                                              |
| G-TAWB | Boeing 737-8K5                 | 37242         | To Canada as C-GWVB                                                                              |
| G-TCDR | Airbus A321-211                | 6815          | To Austria as OE-IKL                                                                             |
| G-TCDW | Airbus A321-211                | 1921          | To France                                                                                        |
| G-TIGV | Aérospatiale AS332L Super Puma | 2099          | To Canada as C-FFCL                                                                              |
| G-TRIM | Monnett Moni                   | 00258T        | Cancelled by CAA (no Permit to Fly issued, believed not completed)                               |
| G-TYPH | BAe 146-200                    | E2200         | Cancelled as Permanently WFU (dismantled at Cranfield 11.19, roaded to Cotswold for parting out) |
| G-VETS | Enstrom 280C-UK                | 1015          | Cancelled as Permanently WFU (CofA expired 28.07.02)                                             |
| G-WNSI | Sikorsky S-92A                 | 920024        | Cancelled as Permanently WFU (parted out at Aberdeen 11.19)                                      |
| EI-CJY | Boeing 757-2Y0                 | 26161         | Cancelled as Removed from Service (flown to Cotswold Airport 29.12.18 for parting out)           |
| EI-CSG | Boeing 737-8AS                 | 29922         | Cancelled as Removed from Service (flown to St. Athan 12.12.19 for parting out)                  |
| EI-DAC | Boeing 737-8AS                 | 29938         | To USA as N541CC                                                                                 |
| EI-ESW | Boeing 737-8AS                 | 34997         | To Brazil as PR-GZS                                                                              |
| EI-ESX | Boeing 737-8AS                 | 34998         | To Brazil as PR-GZU                                                                              |
| EI-EWY | Van's RV-6A                    | 60380-1065    | To United Kingdom as G-IFDA                                                                      |
| EI-FHS | Boeing 737-8JP                 | 39021         | To Sweden as SE-RPB                                                                              |
| EI-FHY | Boeing 737-8JP                 | 39020         | To Sweden as SE-RRU                                                                              |
| EI-FIA | Boeing 737-8AS                 | 44691         | To Malta as 9H-QAO                                                                               |
| EI-FIB | Boeing 737-8AS                 | 44692         | To Malta as 9H-QAR                                                                               |
| EI-FJK | Boeing 737-8JP                 | 42072         | To Sweden as SE-RPI                                                                              |
| EI-FJM | Boeing 737-8JP                 | 42074         | To Sweden as SE-RPE                                                                              |
| EI-FJN | Boeing 737-8JP                 | 41152         | To Sweden as SE-RPD                                                                              |
| EI-FJU | Boeing 737-8JP                 | 42273         | To Sweden as SE-RPM                                                                              |
| EI-FJW | Boeing 737-8JP                 | 42286         | To Sweden as SE-RPA                                                                              |
| EI-FJX | Boeing 737-8JP                 | 42271         | To Sweden as SE-RPC                                                                              |
| EI-FOB | Boeing 737-8AS                 | 44710         | To Malta as 9H-QBN                                                                               |
| EI-FOL | Boeing 737-8AS                 | 61580         | To Malta as 9H-QBX                                                                               |
| EI-FOM | Boeing 737-8AS                 | 44720         | To Malta as 9H-QBY                                                                               |
| EI-FOR | Boeing 737-8AS                 | 44718         | To Malta as 9H-QCC                                                                               |
| EI-FRB | Boeing 737-8AS                 | 44726         | To Malta as 9H-QCI                                                                               |
| EI-FRC | Boeing 737-8AS                 | 62690         | To Malta as 9H-QCJ                                                                               |
| EI-FRO | Boeing 737-8AS                 | 44742         | To Malta as 9H-QCT                                                                               |
| EI-FRT | Boeing 737-8AS                 | 44740         | To Malta as 9H-QCX                                                                               |
| EI-FTA | Boeing 737-8AS                 | 44751         | To Malta as 9H-QDB                                                                               |
| EI-FTB | Boeing 737-8AS                 | 44752         | To Malta as 9H-QDC                                                                               |
| EI-FVH | Boeing 737-800                 | 42083         | To Sweden as SE-RRZ                                                                              |
| EI-FVI | Boeing 737-800                 | 42274         | To Sweden as SE-RRY                                                                              |
| EI-FWA | Sukhoi RRJ-95B                 | 95102         | To Malta as 9H-SJA                                                                               |
| EI-FWB | Sukhoi RRJ-95B                 | 95108         | To Malta as 9H-SJB                                                                               |
| EI-FWC | Sukhoi RRJ-95B                 | 95111         | To Malta as 9H-SJC                                                                               |
| EI-GBG | Boeing 737-8JP                 | 39023         | To San Marino as T7-GBG                                                                          |
| EI-GIW | ATR 72-212A                    | 1064          | To Estonia as ES-STH                                                                             |
| EI-GJM | Boeing 737-800                 | 44827         | To Malta as 9H-QEN                                                                               |
| EI-GJO | Boeing 737-800                 | 44833         | To Malta as 9H-QCN                                                                               |

|        |                             |            |                                                                                                                                 |
|--------|-----------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------|
| EI-LBS | Boeing 757-2Q8              | 27623      | To USA as N726WN                                                                                                                |
| EI-REM | ATR 72-212A                 | 760        | To France as F-WTBZ                                                                                                             |
| EI-RJR | BAe Avro RJ85               | E2364      | To USA as N248AC                                                                                                                |
| EI-RJY | BAe Avro RJ85               | E2307      | To USA as N285AC                                                                                                                |
| M-ABMG | ATR 72-212A                 | 843        | To India as VT-TMN                                                                                                              |
| M-BEST | Cessna 750 Citation X       | 75-0277    | To Kazakhstan                                                                                                                   |
| M-LJGI | Dassault Falcon 7X          | 178        | To USA as N950MR                                                                                                                |
| M-MDMH | Embraer Legacy 500          | 55000046   | To Germany                                                                                                                      |
| M-ODEM | Bombardier Challenger 605   | 5952       | To USA as N626KS                                                                                                                |
| 2-AVLC | Boeing 737-86N              | 24258      | To Brazil as PR-GZZ                                                                                                             |
| 2-EALA | Airbus A340-642             | 1040       | To Malta (but actually became EC-NFQ)                                                                                           |
| 2-JACC | Fokker 70                   | 11585      | To Netherlands Antilles as PJ-JAB                                                                                               |
| 2-JFBH | Boeing 737-86N              | 39401      | To India as VT-TGI                                                                                                              |
| 2-JFCG | Boeing 737-86N              | 38030      | To India as VT-SYV                                                                                                              |
| 2-NICE | Bombardier Challenger 604   | 5505       | To USA as N5505T                                                                                                                |
| 2-NITE | Bombardier Challenger 604   | 5520       | To Isle of Man as M-AKAL                                                                                                        |
| 2-OFUS | Cirrus SR22                 | 1367       | Re-registered as 2-KNOW                                                                                                         |
| 2-PKCD | Embraer 190                 | 19000431   | To Kenya as 5Y-FFM                                                                                                              |
| 2-POSH | Cessna 525B CitationJet CJ3 | 525B0156   | To USA as N981AM                                                                                                                |
| 2-RLBJ | Boeing 737-85R              | 34803      | To India as VT-SYZ                                                                                                              |
| 2-RLBN | Boeing 777-31H              | 29063      | To USA as N906CL                                                                                                                |
| 2-RLBR | Airbus A320-232             | 2148       | To USA as N948BA                                                                                                                |
| 2-RORO | Cirrus SR22T                | 0701       | Cancelled as Destroyed (crashed on take-off from an airstrip at Abergavenny on 12.05.19. It was consumed by a post-impact fire) |
| 2-STND | Boeing 737-86N              | 36815      | To South Korea as HL8378                                                                                                        |
| 2-STRW | Boeing 757-2Q8              | 30045      | Cancelled as Withdrawn from Service (flown to Phoenix-Goodyear, Arizona 17.01.18)                                               |
| 2-TAXI | Piper PA-34-200T Seneca II  | 34-8070003 | To Germany                                                                                                                      |
| 2-TJTH | Boeing 737-8KN              | 40233      | To Bermuda as VP-BSC                                                                                                            |
| 2-TJTK | Boeing 737-8KN              | 40235      | To Brazil as PR-GZV                                                                                                             |
| 2-TJTN | Boeing 737-8KN              | 40236      | To Bermuda as VP-BSE                                                                                                            |
| 2-VAZV | Embraer Legacy 600          | 145516     | To Bermuda (but actually became UP-EM018)                                                                                       |
| 2-VJTF | Boeing 737-86N              | 36813      | To Bermuda as VQ-BAA                                                                                                            |
| G-VJTG | Boeing 737-86N              | 36815      | To South Korea as HL8378                                                                                                        |
| 2-WTAB | Boeing 737-86N              | 36802      | To Thailand as HS-SJB                                                                                                           |
| 2-WTAC | Boeing 737-86N              | 37886      | To South Korea as HL8375                                                                                                        |
| 2-YHNU | Airbus A319-132             | 3801       | Cancelled as Withdrawn from Service (flown to Tucson, Arizona 07.09.19)                                                         |
| 2-YULI | Piper PA-28R-201 Arrow III  | 2844118    | Re-registered as 2-YELL                                                                                                         |

Key: NB – Nominal Base

A place name in brackets relates to the owner's address as where the aircraft is based is unknown.

## UPDATES & CORRECTIONS

| REG'N  | DETAILS                                                         |
|--------|-----------------------------------------------------------------|
| G-BRDW | Became D-ERDC NTU, then D-EFDW 18.09.19                         |
| G-BTBW | Became D-EIAK 20.09.19                                          |
| G-CINF | Became D-EBBF 23.08.19                                          |
| G-CKMN | Became F-HBIC 03.09.19                                          |
| G-ECNX | Became D-ECNX 10.19                                             |
| G-ERLI | Became S5-CMS 11.19                                             |
| G-FAJM | Became N271FK 11.12.19                                          |
| G-GAEA | Became PH-BAA 26.11.19                                          |
| G-GAED | Became PH-BAG 19.11.19                                          |
| G-GIBI | Became JA109K 18.11.19                                          |
| G-IREL | Type officially changed to a C42 FB80 Bravo 18.12.19            |
| G-RVDP | Became F-PVDP 06.12.19                                          |
| G-SCII | Became 2-SCII 29.11.19                                          |
| G-TDJN | Became OO-JOY 16.12.19                                          |
| G-WPKR | Became N229SH 05.12.19 (NB actually cancelled as PWFU 03.10.19) |
| EI-CRR | Became G-ICRR 02.12.19                                          |
| M-IBAC | Became 9N-ANI 09.19                                             |
| 2-CLES | Registered owner is actually C&L Engine Solutions LLC           |



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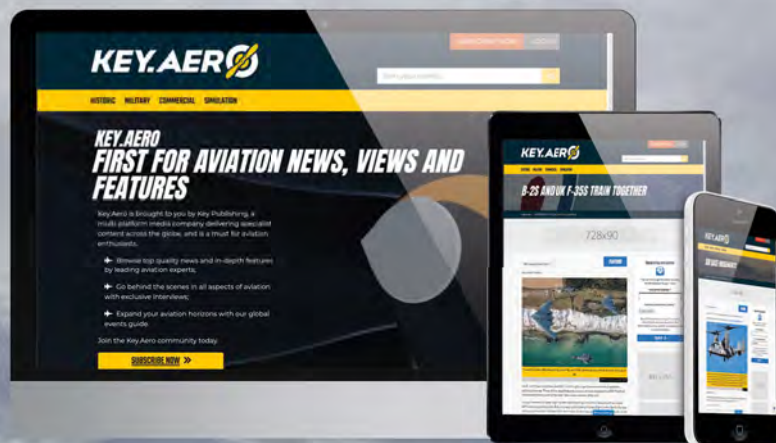
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# Airport Movements

A round-up of notable aircraft visiting UK airports.



## ABERDEEN INTERNATIONAL AIRPORT

**1/12** SP-ENL 737-8CX Enter Air; T7-PBL PC-12. 2/12 PH-BBJ Citation 560XLS+.. 5/12 D-CAPB Citation 560 Encore+. 9/12 CS-LAM Global Express; EC-LYO Gulfstream G550. 11/12 N143HJ HondaJet. 12/12 OY-RUR ATR 72-201 Danish Air Transport; D-IJET Avanti. 13/12 2-RNWL Citation 525M2. 15/12 9H-ALL CitationJet 525A CJ2; OE-UDK DA62; D-IHKW CitationJet 525 CJ1+; D-CGAA Citation 560XLS+. **18/12** OO-ACO Citation 510 Mustang; 9A-JIP CitationJet 525A CJ2. 19/11 2-SNOW PA-46-350P. **23/12** CS-TFR Learjet 45.

## BIRMINGHAM AIRPORT

**1/11** N682GD Gulfstream G650ER. 4/11 N360PZ Falcon 7X also 8th. 5/11 OE-LOT A320-232 Laudamotion f/v; D-FABS PC-12. 6/11 D-CHMD Phenom 300; EC-LCX Citation 510 Mustang; N737AT BBJ1. 7/11 OE-LOQ A320-214 Laudamotion f/v; EC-MRL Gulfstream G550. 8/11 2-MLBU PA-46-350P; C-FSEP Challenger 605; D-ISAR Premier 1A. 9/11 OE-LMB A320-232 Laudamotion f/v; OK-BII Beech 400A. 10/11 D-IAAD Phenom 100. 11/11 OY-SRF 767-219(BDSF) Star Air; D-CYES Learjet 35A; EC-LYL Citation 560XLS+; F-HLPM Falcon 2000EX; LX-ONE Learjet 45. 12/11 **N782SP DC-8-72CF Samaritan's Purse n/s, also 24th n/s**; OE-LOS A320-214 Laudamotion f/v. 13/11 D-CBAY Citation 680 Sovereign. 14/11 OE-LOB A320-232 Laudamotion f/v. 16/11 OE-LOU A320-214 Laudamotion f/v;

An Iran Air Airbus A310-300 made a rare appearance at Heathrow Airport on January 28 operating flight IR711 from Tehran. Treflyn Lloyd-Roberts

T7-CJK Global 6000. 17/11 EI-JSK Gulfstream G650; LX-WJD HondaJet. 19/11 OE-LOA A320-214 Laudamotion f/v; UR-CQV An-26B Vulkan Air; CS-DGW CitationJet 525B CJ3. 21/11 HB-AZA E190E2 Helvetic Airways op for Swiss f/v; OE-IHD A320-232 Laudamotion f/v. 24/11 UR-CJN An-12B Cavok Air; N193LA Global 6000; OY-SRM 767-25E(BDSF) Star Air; N656TT Gulfstream G650ER. 26/11 OE-LCO A320-214 Laudamotion f/v; ES-ACH CRJ900ER Nordica op for SAS f/v; D-CSOS Learjet 45; OH-ZRH PC-12. 28/11 TC-RSD Learjet 45.

## BLACKPOOL AIRPORT

**4/11** D-BFIL Legacy 450 also 14th. 7/11 OO-GEE PC-12. 8/11 EI-KEL EC135T2+ Babcock MCS Onshore. 13/11 F-HATG CitationJet 525C CJ4; OO-KIN Citation 680 Sovereign dep 15th also 21st. 21/11 D-IAAW Phenom 100 n/s. 22/11 2-LIVE PC-12 dep 24th. 28/11 N280EX Gulfstream G280 dep 30th.

## BRISTOL AIRPORT

**1/10** YU-FNR CitationJet 525 CJ1. 2/10 HB-IGV Falcon 50EX. 3/10 F-GYGM DA42. 4/10 LX-MIC Falcon 2000S; OO-LET Beech 200 also 5th & 6th. 10/10 D-CHIC Phenom 300. 17/10 9H-JAD Challenger 850 Air X Charter. 18/10 D-ILUI CitationJet 525A CJ2+ also 21st n/s. 24/10 A9C-BAH Gulfstream G650 Bahrain Air Wing n/s; **8P-ASD Gulfstream G650ER**. 29/10 OK-AML Citation 510 Mustang.

## EAST MIDLANDS AIRPORT

**1/11** N29DE Cirrus SF50. 3/11 YU-PCC Citation 560XLS+. 4/11 D-ACLG 737-46J(SF) CargoLogic Germany; LX-ALX Challenger 300 also 12th. 5/11 D-ACNQ CR-900LR Lufthansa Regional for painting; PH-EXM E175STD KLM Cityhopper Norwich diversion. 6/11 D-ACLO 737-4H6(SF) CargoLogic Germany; YR-FZA Fokker 100 Carpatair. 7/11 A6-DDC 777-FFX Etihad Cargo; C-FEMF Learjet 40. 8/11 RA-82078 An-124-100M-150 Volga-Dnepr Airlines. **10/11** CS-DGR Citation 650 VII. 11/11 EC-MNH Global Express. 12/11 A7-BFH 777-FFZ Qatar Cargo; D-CLAV Phenom 300; TF-FXB Dash 8-Q402 Air Iceland Connect; EC-MLV Citation 680 Sovereign. **13/11** D-ACNR CRJ900LR Lufthansa Regional for painting; EC-HEK CRJ200ER Iberia Regional; 2-RNWL Citation 525M2. 17/11 N673HA Gulfstream G650. 19/11 A7-BFM 777-FFZ Qatar Airways Cargo; TC-MCG A300B4-622R(F) MNG Airlines. 20/11 LX-JFZ PC-12; D-ACNT CRJ900LR Lufthansa Regional for painting. 21/11 T7-APG HondaJet also 25th. 23/11 D-CAMB Learjet 31A; OO-PCK PC-12. 26/11 G-CLAB 747-83QF CargoLogicAir.

## EXETER AIRPORT

**1/10** OO-PCN PC-12. 2/10 D-CFIV Learjet 35A. 3/10 LX-SEB CitationJet 525B CJ3. 5/10 N650MS Gulfstream G650. 6/10 F-HLRZ Phenom 100; D-CDAS Phenom 300. 7/10 D-FUDA PC-12. 11/10 CS-DGR Challenger 650. 14/10 PH-CTH Falcon 2000LX; D-CDOC Learjet 45. 15/10 F-HEGA Phenom 300; OO-PCI PC-12. 18/10 OK-JFA Beech 400XT. 19/19 9H-AOA Citation 680A Latitude; D-AWIN Legacy 650. **21/10 5Y-JXI Dash 8-Q402 Jambojet on delivery**; OO-PCI PC-12. 22/10 N420FX Legacy 450. 23/10 9A-JIP CitationJet 525A CJ2; OO-PCM PC-12; F-HLRZ Phenom 100. 24/10 54+21 A400M LTG62, German AF; LX-PCB PC-24; EC-MSS Citation 560XLS+. 25/10 N707SN Cirrus SF50. 27/10 D-CGBR Learjet 55. 28/10 PH-MDG Citation 680 Sovereign+. 29/10 OO-PCI PC-12; OK-PBK CitationJet 525B CJ3. 31/10 D-CROG Phenom 300.



French Air Force Xingu, 099/YP, visited Cambridge Airport on January 29. Justin Ward



## Flybe Aviation Services

**5/10** D-ABQH Dash 8-Q402 Eurowings dep.

## GATWICK AIRPORT

**1/12** A7-ALU A350-941 Qatar Airways f/v. 2/12 A7-ALJ A350-941 Qatar Airways f/v. 3/12 A7-ALB A350-941 Qatar Airways f/v. B-1080 A359-941 Air China f/v. 4/12 A7-BAL 777-3DZER Qatar Airways f/v. 9K-CBC A320-251N Jazeera Airways f/v. 6/12 A7-ALW A350-941 Qatar Airways f/v. 7/12 A7-ALF A350-941 Qatar Airways f/v. B-1083 A350-941 Air China f/v. 8/12 A7-ALD A350-941 & A7-BES 777-3DZER Qatar Airways both f/v. SE-RPC 737-8JP Norwegian Air Sweden f/v. YL-AAU A220-300 Air Baltic 9/12 EC-NCY 787-9 Air Europa f/v. SE-RRC 737-8JP Norwegian Air Sweden f/v. 10/12 A7-ALI A350-941 Qatar Airways f/v. CS-TVG A320-251N TAP Air Portugal f/v. HA-LYT A320-232(SL) Wizz Air f/v. 11/12 A7-ANE A350-1041 Qatar Airways f/v. HA-LWG A320-232 Wizz Air f/v. 12/12 A7-ALS A350-941 Qatar Airways f/v. CS-TXD A321-251NX TAP Air Portugal f/v. OH-LZT A321-231 Finnair f/v. **13/12** EI-FCB 717-2BL Volotea Airlines f/v. 14/12 A7-AMH A350-941 Qatar Airways f/v. TC-LSM A321-271NX Turkish Airlines f/v. 15/12 A7-ALN A350-941 Qatar Airways f/v. B-6546 A330-243 China Eastern Airlines f/v. SE-RPE 737-8JP Norwegian Air Sweden f/v. 16/12 EC-NFK A320-271N Vueling f/v. SE-RRU 737-8JP Norwegian Air Sweden f/v. D-FOUR TBM 930 f/v. 17/12 N801KB Challenger 350 f/v. 18/12 A7-AME A350-941 Qatar Airways f/v. 9K-CAQ A320-251N Jazeera Airways f/v. 20/12 A6-EVI A380-842 Emirates f/v. CS-TJP A321-251NX TAP Air Portugal f/v. EC-MTV 737-8K5 AlbaStar ops for TUI f/v. SE-RET 737-76N SAS f/v. TC-LSP A321-271NX Turkish Airlines f/v. 21/12 OE-FMT Phenom 100 f/v. 23/12 SE-RPI 737-8JP Norwegian Air Sweden f/v. 24/12 YL-AAV A220-300 Air Baltic f/v. 25/12 A7-ALC A350-941 Qatar Airways f/v. 9K-CBD A320-251N Jazeera Airways f/v. 9H-JAD Challenger 850 Air X Charter f/v. 26/12 A7-ANA A350-941 Qatar Airways f/v. SP-ESB 737-8Q8 Enter Air f/v. 28/12 A6-EVK A380-842 Emirates f/v. 30/12 A7-ALO A350-941 Qatar Airways f/v. 31/12 A7-BEM 777-3DZER Qatar Airways f/v.

## GLASGOW AIRPORT

**1/11** G-988 C-130H 336 Sqn, Royal Netherlands AF; OE-GFC Gulfstream G100. 2/11 N166CK Falcon 7X. **5/11** D-CASH Phenom 300. 6/11 9H-SOL A340-313X Hi Fly. 7/11 OO-KIN Citation 680 Sovereign. **8/11** LN-KGW Beech 200GT; SE-RFH Citation 680 Sovereign; D-ICEE CitationJet 525 CJ1. 11/11 N903G Gulfstream G450. 13/11 OE-IGL Global 6000; 2-RBTS CitationJet 525B CJ3. 14/11 168209 UC-12W



**Fokker 100, VH-UQG, of Alliance Airlines was previously operated by Austrian Airlines as OE-LVG. It has been in storage at Bratislava for three years. The aircraft arrived at Norwich Airport on December 18 and has been painted in this special scheme commemorating Sir Charles Kingsford Smith's epic flight in 1931 when he piloted an Avro 616 Avian, named Southern Cross Minor, from Wyndham in Australia to London. The Fokker 100, which by chance was assigned the same registration as Kingsford Smith's aircraft, departed the Norfolk airport on January 10.** Matt Varley

USMC. 15/11 **C-GZRJ RJ100 Summit Air.** 17/11 OY-EJD Falcon 7X; EI-GFO A319-111 I-Fly. 18/11 D-ASSK A319-111 Sundair; OE-HDC Challenger 300; D-ITRA CitationJet 525 CJ1. 19/11 OK-SKS Citation 560XLS. **22/11** N314MA TBM 940 c/n 1307 on delivery; D-IAAY Phenom 100. 23/11 C-GOIF A321-27NX Air Transat f/v. OH-JEM PC-12. 26/11 D-IAAT Phenom 100. 27/11 9H-WIT PC-12; OE-FTP Phenom 100; 9H-OME 737-505 Air X Charter; OE-LLL Gulfstream G650ER. 28/11 PH-HXM 737-8K2 Transavia; OE-HLL Challenger 300. 29/11 N949DK TBM 940 c/n 1312 on delivery. 30/11 N202N Learjet 60.

## HEATHROW AIRPORT

**1/10** EI-LRB A321-253NX Aer Lingus f/v. 2/10 UR-PRT Hawker 800XP f/v. 4/10 A7-ANJ A350-1041 Qatar Airways f/v. 5/10 EI-LRA A321-253NX Aer Lingus f/v. 7/10 EC-NER A320-251N Iberia f/v. 8/10 TC-LLD 787-9 Turkish Airlines f/v. 10/10 EC-MSY A330-202 Iberia f/v. 15/10 TC-LLE 787-9 Turkish Airlines f/v. 18/10 A7-AML A350-941 Qatar Airways f/v. D-AIWK A320-214(SL) Lufthansa f/v. 19/10 N711SW Global 6000 f/v. 21/10 EI-LRC A321-253NX Aer Lingus f/v. 22/10 D-AIED A321-271NX Lufthansa f/v. 23/10 A9C-FG 787-9 Gulf Air f/v. 24/10 CS-TUI A330-941N TAP Air Portugal f/v. 25/10 G-NEOW A321-251NX British Airways on delivery f/v. 26/10 B-1167 787-9 China Southern Airlines f/v. HL8362 A350-941 Asiana f/v. SP-LWF 737-86N LOT f/v. **27/10** B-1169 787-9 China Southern Airlines f/v.

**1/11** A7-TAA Global 6000 f/v. B-20AL 787-9 Hainan Airlines f/v. VH-ZNI 787-9 Qantas f/v. 3/11 A6-BND 787-9 Etihad Airways f/v. B-209D 787-9 China Southern Airlines f/v. 4/11 JA863J 787-9 Japan Airlines f/v. 6/11 HL7623 747-8F Korean Air f/v. 8/11 HB-IGO Falcon 2000LX f/v. JA794A 777-300ER All Nippon Airways f/v. 10/11 HL8346 777-300ER

Korean Air f/v. HB-JVT E190LR Helvetic Airways op for Swiss f/v. 11/11 TC-LSJ A321-271NX Turkish Airlines f/v. 12/11 HL8347 777-300ER Korean Air f/v. TC-LSK A321-271NX Turkish Airlines f/v. 13/11 HL7617 747-8F Korean Air Cargo f/v. VH-ZNJ 787-9 Qantas f/v. 14/11 OE-LZD A320-214 Austrian Airlines f/v. 15/11 D-AGBH Falcon 7X f/v. 19/11 A7-CGF Gulfstream G650ER f/v. 20/11 HL7609 747-8F Korean Air Cargo f/v. SE-ROJ A320-251N SAS f/v. **25/11** A7-BFH 777-FDZ Qatar Airways f/v. 26/11 G-XWBC A350-1041 British Airways on delivery. **28/11** EC-NDC A320-271N Vueling f/v. JA797A 777-300ER All Nippon Airways f/v. 30/11 TC-LSM A321-271NX Turkish Airlines f/v.

## LEEDS BRADFORD AIRPORT

**1/10** HB-JST Falcon 7X f/v. 14/10 N588AT Gulfstream V f/v. 9H-PLM Citation 650 VI f/v. 19/10 I-TOPH Hawker 850XP f/v. 20/10 D-BOLD Legacy 450. 25/10 F-HLRZ Phenom 100. 26/10 I-MOFI Falcon 2000LX f/v. 28/10 G-CELE 737-33A Jet2 dep to St Athan for scrapping. 30/10 **8P-ASD Gulfstream G650ER f/v.** OO-DFG Falcon 2000ER f/v.

## LIVERPOOL AIRPORT

**1/10** C-GSAP Global 6000; F-GZTZ 737-8K5 ASL Airlines also 2nd n/s; UR-CAJ An-12BK Ukraine Air Alliance; UR-CNT An-12BK Ukraine Air Alliance also 3rd, OE-GDR CitationJet 525C CJ4. 2/10 F-OFDF A330-223 & F-ORLY A330-323 Air Caraïbes both n/s; YR-FKB Fokker 100 Carpatair n/s; OE-HPG Challenger 350 n/s; OE-FSL PA-31-310 n/s; OO-ASL Beech 200C dep 6th; D-CTIL Learjet 35A; D-CHZF Citation 550 Bravo n/s. 3/10 LX-EAA Learjet 45; UR-CEZ An-12B Cavok Air also 4th, 5th, 6th, 8th; ES-LSB Saab 340A/F Airst Cargo. 4/10 UR-CZZ An-12BP Ukraine Air Alliance; SE-RIL Citation 560XLS; OE-GPS & YU-BTB Citation 550 Bravos; OK-JFA Beech 400XT. 5/10 LN-RTO Falcon 2000LX n/s; F-HRGD ERJ145LU Amelia; **HS-KVS Gulfstream G650;** YU-BZZ Citation 550 Bravo. 6/10 PH-TXA Citation 510 Mustang n/s. 9/10 ES-NSA Saab 340A/F NyxAir n/s. 10/10 D-CURT Learjet 31; D-CARO Citation 680 Sovereign; 252 CN235MPA 101 Sqn, Irish Air Corps; 258 Learjet 45 102 Sqn, Irish Air Corps; D-CULT Do.228-100 Businesswings; OH-ZRH PC-12 also 11th n/s. 13/10 UR-CSI An-12BP Cavok Air. **14/10** OE-FMO Eclipse EA500; D-FALK Cessna 208 Businesswings. 15/10 N685DC Falcon 7X; 9H-GIO CitationJet 525 CJ1. 16/10 OO-ACC CitationJet 525A CJ2+. 17/10 9H-BIO CitationJet 525 CJ1. 19/10 LX-EVM Falcon 2000LX. 22/10 OK-AOA Challenger 300. 24/10 LN-WDF Dash 8-Q402 Widerøe; D-GFPI Partenavia P68B on delivery to Ravenair; D-CHIC



**Chad-registered Hawker 900XP, TT-DAB, arrived at Doncaster Sheffield Airport on January 15 for maintenance with Textron Aviation.** vImages.com/Jason Nicholls





**Reims-Cessna F182Q Skylane II, F-HCDM, was photographed at Exeter Airport on January 20.**  
Ian Simpson

Phenom 300 also 29th; YU-RDI Citation 560XLS+. **26/10** CS-TFR Learjet 45XR n/s; OE-GGO Phenom 300. 27/10 LN-XAX Falcon 8X; LN-RDA Dash 8-Q402 Widerøe. 28/10 D-IPCH CitationJet 525A CJ2 also 29th; OE-IBJ A320-232 Laudamotion, new Vienna service; 2-RBTS CitationJet 525B CJ3.

## LONDON LUTON AIRPORT

**1/12** N751EM Citation 750 X; D-ACEV Global Express. 2/12 N30LB Falcon 7X. 4/12 I-KRFX Legacy 600; N812RX Falcon 2000LX; OE-LLL Gulfstream G650ER. 5/12 N424U Falcon 900EX; N67WV Gulfstream G650ER. 8/12 VQ-BLX BBJ1; N757PL Gulfstream G650ER. 10/12 D-IGRO CitationJet 525A CJ2; N600GS Gulfstream G600; C-GDRX Global 6000. 11/12 N821CN Gulfstream G450; N556CH Gulfstream G650ER; N888XM Gulfstream G650. **12/12** N724AM Global 6000. 13/12 HB-FXG PC-12. **14/12** 9H-LGM Phenom 100; OE-ILX Challenger 605. 15/12 XA-CHR Gulfstream G650; N47EL Gulfstream G450. 16/12 OE-GGM Citation 680A Latitude. 17/2 HB-FXM PC-12. 20/12 LN-AOC Gulfstream G280; 557 Gulfstream IV Oman Air Force for maintenance; VP-CRH Gulfstream G550. 22/12 HB-IGO Falcon 2000LX. 23/12 N219BY Global 6000. **25/12** T7-NMN Challenger 604. 26/12 D-ILOU CitationJet 525A CJ2; T7-MND CitationJet 525 CJ1. **27/12** CN-GMT Gulfstream G450; N107KG Falcon 7X. 31/12 N343MG Falcon 7X; LX-LQD Dash 8-Q402 Luxair, London City diversion; A7-CGS Gulfstream G500.

## LONDON SOUTHEND AIRPORT

**1/12** OO-AMR CitationJet 525A CJ2+ dep 3rd; HA-LWY A320-232(SL) Wizz Air f/v. 3/12 OO-ELF

& PH-DFB DA42s. 5/12 D-CAPB Citation 560 Ultra. **6/12** OE-ICM A320-214(SL) easyJet Europe f/v, to Air Livery; LX-ONE Learjet 45. 7/12 2-FLYT PC-12; HA-LWO A320-232 Wizz Air f/v; OY-GMF Global Express. 8/12 HA-LYK A320-232 Wizz Air f/v. 10/12 LX-LGN & LX-LQJ Dash 8-Q402s Luxair, London City diversions; OM-LAT Citation 680A Latitude f/v, dep 12th; HA-LWT A320-232 Wizz Air f/v. 11/12 OY-CLY ATR 72-212A; D-CAWB Citation 680 Sovereign n/s; HA-LPU A320-232 Wizz Air f/v. 12/12 D-IROL Do.228-100 Businesswings n/s. 13/12 VP-BZE Falcon 7X. 14/12 OE-LKM A319-111 easyJet Europe f/v, to Air Livery for painting dep 22nd. 17/12 ER-00005 A320-232 FlyOne also 24th; HA-LWM A320-232 Wizz Air f/v. 18/12 HA-LYA A320-232(SL) Wizz Air f/v. **19/12** LX-TAC Phenom 300; LX-PFF CitationJet 525B CJ3 f/v. 22/12 HA-LYB A320-232(SL) Wizz Air f/v. 27/12 HA-LWV A320-232 Wizz Air f/v. 28/12 PH-TXA Citation 510 Mustang. 30/12 LX-LGF Dash 8-Q402 Luxair, London City diversion; SP-LMA E190STD LOT f/v, London City diversion. 31/12 EI-RNA E190STD Alitalia, London City diversion.

## MANCHESTER AIRPORT

**1/12** ET-AXK 787-9 Ethiopian Airlines f/v; M-YNNS Gulfstream G650ER f/v; N177CK Eclipse EA500 f/v. **2/12** TC-LSM A321-271NX Turkish Airlines f/v; EC-NEA A320-271N Vueling f/v. 3/12 A6-BMG 787-10 Etihad Airways f/v; 9H-QAN 737-800 Malta Air f/v; N300CR Falcon 7X f/v. 4/12 4X-EHE 737-958(ER) EI Al f/v. 5/12 OE-HDU Challenger 300 f/v; N235QS Challenger 650 f/v; D-FLYV PA-46-500TP f/v. 6/12 N188W Gulfstream G650 f/v; LX-WEB CitationJet 525B CJ3 f/v. 7/12 CS-TJO A321-251NX(SL) TAP Air Portugal f/v; F-HBNE A320-214 Air France f/v; PH-DWA ERJ145LI Jet Netherlands f/v. 8/12 LN-AWC

Learjet 45 f/v; D-ILOU CitationJet 525A CJ2+ f/v. **9/12** SP-KPG Saab 340A Sprint Air. 11/12 YR-BMP 737-883 Blue Air f/v, Liverpool diversion; OE-LYY A319-132 Eurowings Austria f/v, Liverpool diversion; N28ZD Global 6000 f/v. 12/12 N651UA 767-322ER United Airlines f/v; PH-HZO & PH-HZK 737-8K2s Transavia; TC-TJN 737-85P Corendon; N626LA Citation 680A Latitude f/v. 13/12 N652UA 767-322ER United Airlines f/v. LX-PCA Pilatus PC-24 f/v. **14/12** TC-LSP A321-271NX Turkish Airlines f/v. 15/12 CS-TVG A320-251N TAP Air Portugal f/v; N642UA 767-322ER United Airlines technical diversion Paris-Chicago. 16/12 VP-BJR Citation 560XLS+ f/v. 18/12 TC-NBE A320-251N Pegasus Airlines f/v; A7-BEU 777-300 Qatar Airways f/v. 19/12 SE-ROG A320-251N SAS f/v. 20/12 OM-HEX 737-81Q Air Explore f/v, op for TUI. 21/12 OE-LKA A319-111 easyJet Europe f/v; HB-JYN A319-111 easyJet Switzerland f/v. 22/12 ET-AXL 787-9 Ethiopian Airlines f/v; PH-BCL 737-800 KLM f/v; LX-SEB CitationJet 525B CJ3 f/v. 23/12 SP-ESB 737-8Q8 Enter Air f/v. 24/12 A7-BEO 777-3DZER Qatar Airways f/v. 26/12 D-AIRZ Legacy 650E f/v. 27/12 D-AEUB A321-211 Eurowings f/v. 28/12 I-KRFX Legacy 600 f/v. 29/12 OO-SCT CitationJet 525C CJ4 f/v.

## NORWICH AIRPORT

**1/10** D-CTWO Learjet 35A. 2/10 D-CBCT CitationJet 525C CJ4; D-AILD A319-114 Lufthansa to Satys Air Livery, dep 11th; F-HTAG 757-256 La Compagnie to Satys Air Livery, dep 14th. 3/10 OO-AMR CitationJet 525A CJ2; HB-JTQ Challenger 604; F-HSFJ Citation 680A Latitude. D-INOB CitationJet 525A CJ2. 7/10 T-752 Challenger 604 LTDB, Swiss AF; D-CHRA CitationJet 525C CJ4 also 9th & 21st. 9/10 SE-MAC Dash 8-311 Swedish Coast Guard; D-CTRL Learjet 35A. 10/10 OO-ACC CitationJet 525A CJ2; 2741 EC225LP French AF. 11/10 D-AIZM A320-214 Lufthansa to Satys Air Livery, dep 21st. 13/10 OO-JOS TUI to Satys Air Livery, dep 21st. 14/10 OY-NPG Metro 23 North Flying. 15/10 F-HANA EC130B4; T-751 Challenger 604 LTDB, Swiss AF. 18/10 OK-BEE Beech 400A. 21/10 D-AIZN A320-214 Lufthansa to Satys Air Livery, dep 28th; SE-MDB ATR 72-212A Braathens Regional to KLM Maintenance, dep 25th. **22/10** F-GZJH 737-8K2 Transavia France to KLM Maintenance dep 26th. 23/10 103 TBM 700A French AF. 27/10 OO-JAF 737-8K5 TUI.

## TEESIDE INTERNATIONAL AIRPORT

**4/11** SE-DDY Citation 550 II. 5/11 D-CFAX Learjet 60 n/s. 7/11 9H-WIT PC-12; 2-COOK PA-46-500TP; 9A-JSD CitationJet 525A CJ2 n/s; OO-PCJ & OO-PCM PC-12s both n/s; 9H-AOA Citation 680A Latitude. 10/11 OH-RBX Citation 560XL dep 12th. **11/11** 2-JEZA Eclipse EA500. 13/11 2-RNWL Citation 525M2. 16/11 T-784 Citation 560XL LTDB, Swiss AF also 30th. 17/11 2-SLOW Challenger 604. 21/11 D-CAAM Do.228-212 Arcus Air; OE-IGA Challenger 650 dep 24th; N707SN Cirrus SF50 dep 23rd. 22/11 OO-EUR CitationJet 525 CJ1 n/s; 9H-FAM Phenom 100. 23/11 D-CSOS Learjet 45. 24/12 HB-SFJ DA40. **26/11** D-ARMY Legacy 650. 27/11 N52AG Cirrus SF50

Key: f/v first visit; n/s nightstop; o/s overshoot.



**De Havilland Canada Dash 8-200, C-GKJQ, of Avmax, passed through London Southend Airport on January 15.** Simon Murdoch

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# Air Base Movements

A selection of the most interesting aircraft to visit air bases in the UK recently.



Czech Air Force C295M, s/n 0454, visited RAF Brize Norton on January 19. Richard Eccleston

## RAF BENSON

**2/12** ZJ226 Apache AH1 4 Regt, AAC. 3/12 ZZ511 Wildcat AH1, 1 Regt, AAC. 9/12 ZZ390 Wildcat AH1, 1 Regt, AAC.

## MOD BOSCOMBE DOWN

**03/12** ZA681 Chinook HC6A 19 Sqn; GZ100 AW-109SP 32(TR) Sqn. XW224 & XW232, ZJ956 & XW213 Puma HC2s, Benson Wing, RAF. 10/12 XW232, ZJ956, XW213 & ZA940 Puma HC2s, Benson Wing, RAF. 13/12 ZJ123/G Merlin HC4, 846 NAS, RN.

## RAF BRIZE NORTON

**1/12 N470QS G450 n/s.** 2/12 11-5731 MC-130J 67th SOS, USAF also 5th & 20th. 4/12 E142, E157 & E176 Alpha Jet Es EAC00.314, French AF. 5/12 MAE C-17A Qatar Emiri AF; **NZ7572 757-2K2 40 Sqn, RNZAF dep 10th.** 6/12 KAF327 KC-130J Kuwait AF. OE-GLR Citation Sovereign n/s, also 7th n/s. **9/12 Z21122 C-130J-30 Tunisian AF also 15th.** **13/12 MAB C-17A Qatar Emiri AF. 14/12 KC-3813 KC-130J Indian AF dep 16th.** 17/12 N419MC Boeing 747-400F Atlas Air. 19/12 **86001/861 Tp-86 Sabreliner Royal Swedish AF.**

## RNAS CULDROSE

**13/12** N-229 NH90-NFH 860 Sqn, Royal Netherlands Navy.

## RAF LEEMING

**2/12** T-752 Challenger 604 also 3rd, N37566 Cessna O-2A. 5/12 T-785 Falcon 900EX LTDB, Swiss AF also 9th. 06/12 HB-JVT E190AR Helvetic Airways. 11/12 T-751 Challenger 604 also 12th & 17th.

## RAF FAIRFORD

**2/12** 07-7176 C-17A 436th/512nd AW, USAF. 3/12 84-0061 C-5M 436th/512nd AW, USAF. 5/12 10-0223 C-17A 437th/315th AW, USAF.

## RAF LAKENHEATH

**2/12 12-1044, 12-1081 & 12-1082 F-15SAs Royal Saudi AF, all dep 5th; 12-1062 & 12-1080 F-15SAs Royal Saudi AF, both dep 16th, all on delivery.**

## LEUCHARS STATION

**4/12** E142. E157 & E176 Alpha Jet Es EAC00.314, French AF. 08-0050 & 07-0033 CV-22B 7th SOS, USAF.

## RAF MARHAM

**4/12** CE-01 ERJ135LR 15 Wing, Belgian Defence - Air Component also 6th. 9/12 015 C-295M 13 ELTr, Polish AF n/s. 13/12 J-881 F-16AM Royal Netherlands AF\*.

## RAF MILDENHALL

**2/12** 09-0017 C-32A 89th AW, USAF dep 4th.

**3/12** 166472 KC-130J VMGR-252, USMC. 7/12 87-0039 C-5M 337th AS, AFRC dep 11th. 22/12 87-0035 C-5M 436th/512nd AW, USAF; 165161 C-130T VR-64, USN dep 27th. 28/12 87-0043 C-5M 337th AS, AFRC dep 30th.

## RAF NORTHOLT

**1/12 163259 & 163264 VH-60Ns HMX-1, USMC;** 13-08436, 13-08437, 13-08432 & 13-08134 CH-47Fs B/1-214th AVN, US Army, all dep 5th; 01-0030 C-37A 89th AW, USAF also 4th. 2/12 C-215 Challenger 604 Esk 721, Royal Danish AF. **3/12** C-168 Challenger 604 Esk 721, Royal Danish AF n/s; T.18-1/45-40 Falcon 900B Gr.45, Spanish AF; MM62243 A319CJ 31° St, Italian AF n/s; 2/RAFP Falcon 900EX ET00.060 French AF n/s; 86/F-RAFB Falcon 7X ET00.060, French AF n/s; 9A-CRO Challenger 604 Govt of Croatia n/s; MM62244 Falcon 900EX 31° St, Italian AF. 4/12 TC-ATA Gulfstream IV Govt of Turkey. 5/12 04-4137 C-17A 305th/514th AMW, USAF picked up 163259; 96-0005 C-17A 137th AS, NY ANG picked up 163264. **5/12** 900531 C-26D AOD Naples, USN.

## RAF WADDINGTON

**2/12** J-5236 F/A-18D Swiss AF, Leeming diversion n/s; ZM323 Texan T1 72 Sqn\*, RAF. 16/12 62-4127 OF TC-135W 55th Wg, USAF dep 19th.



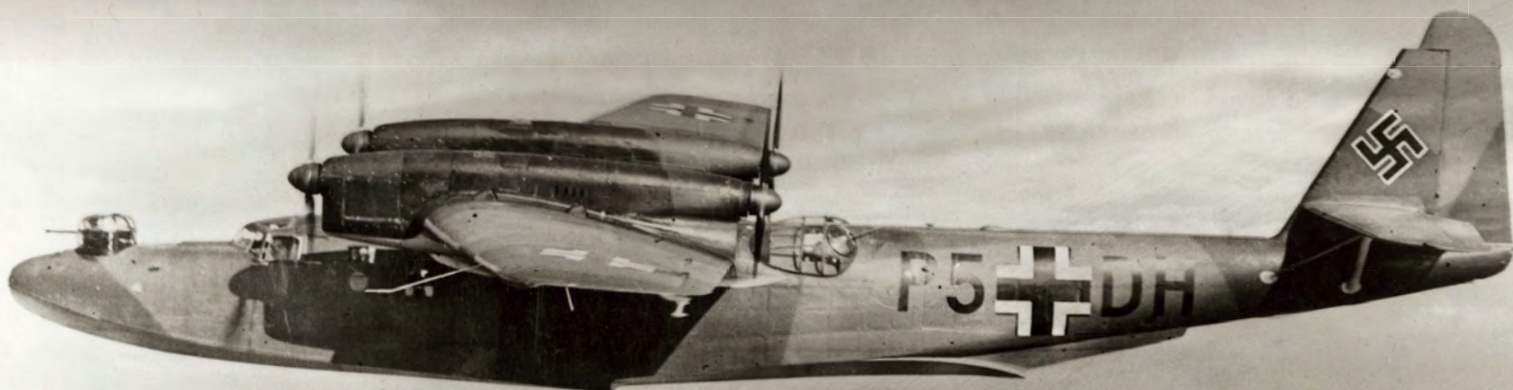
This heavily-modified Beech 300, N334CA, was photographed at RAF Mildenhall on February 5. Peter R Foster



# Dornier Do 26

## Germany's Elegant Flying Boat

**Chris Goss** tells the story of the Dornier Do 26 flying boats which were intended for Deutsche Lufthansa but assigned to the Luftwaffe.



**O**n October 1, 1936, the German Air Ministry (Reichsluftfahrtministerium) issued a requirement for what was described as a "four-engined trans-ocean flying boat". However, since as early as July 1936, Dornier-Werke had been designing just such a craft for Deutsche Lufthansa (DLH). Their design was for a gull-winged aircraft with a crew of four, capable of carrying a payload of 1,100lb (500kg) or four passengers on the DLH Lisbon to New York route.

What was to become the Dornier Do 26 was different to other Dornier flying boats. It was slimmer and sleeker, of all-metal construction and the hull had a central keel with a defined step. The outer section of the wings had fully retractable narrow wing-floats for lateral stabilisation. It was powered by four Junkers Jumo 205C diesel engines mounted in pairs, one facing forward and one aft. The rear propeller shafts were also hinged, to raise the blades clear of spray on take-off or landing.

Unusually for a German aircraft of the era, the emerging Do 26 was not hindered by political interference or problems with engines. In 1937, DLH ordered three and on May 21, 1938, the first prototype, Do 26V1, registered D-AGNT, was flown by Erich Gundermann, and Do 26V2 (D-AWDS) followed on November 23, 1938, piloted by Egon Fath.

Main photo: **This Do 26 of Sonderstaffel Tranzocean was Werk Nummer 794, the fourth aircraft manufactured. Its eventual fate is unknown.** Key Collection

The aircraft then moved to Travemünde for further trials, which included being catapulted from the ship *Friesenland*. The trials were deemed successful. Soon after DLH captain Siegfried Graf Schack von Wittenau flew in V2 from Lisbon to Rio de Janeiro on February 14, 1939, taking medical supplies

**"During the Norwegian campaign, we flew an almost constant round of sorties bringing in anti-tank guns, munitions, mines and mountain troops for Narvik."**

for earthquake victims in Chile, a 36-hour round trip of 6,600 miles (10,722km).

DLH's intended concept of operations involving ships were for the vessels to be docked at certain locations where a Do26 would land and be lifted onto the ship for launching by catapult for its next leg. This was felt worthwhile to save fuel on take-off which would give the aircraft extra range.

These first two aircraft were named *Seeadler* (Sea Eagle) and *Seefalke* (Sea Falcon) respectively, and when V3 D-ASRA emerged from the production line, it was named *Seemöwe* (Seagull).

### INTO WAR

Following the outbreak of war, the value of a flying boat with a maximum range of 4,412 miles (7,100km) was not lost on the Luftwaffe and Kriegsmarine. The three aircraft were given the codes P5+AH (Werk Nummer 791), P5+BH (Wk Nr 792) and P5+CH (Wk Nr 793) respectively. A turret was installed in the nose and fitted with a 20mm MG FF cannon. Three MG 15 machine guns were also added.

In December 1939, the three aircraft formed Sonderstaffel Tranzocean, subordinate to Kampfgeschwader zur besonderen Verwendung (KGzbV) 108, and based at Travemünde. The unit was further reinforced by the arrival of Do 26 V4, Wk Nr 794 P5+DH, which first flew at the end of January 1940. Known aircraft commanders at this

time were Hptm Hans-William Brockmann, Oblt Wilhelm Reicke, Oblt zur See Helmut Groos, Fw Ernst-Wilhelm Modrow and Oblt Siegfried Graf Schack von Wittenau, the latter two former DLH pilots. Command of the squadron went to Maj Friedrich von Buddenbrock, formerly the transatlantic flight manager for DLH.

The Do 26's baptism of fire came following the German invasion of Norway, in particular the campaign in Narvik. Ofw Wilhelm Küppers, a Bordfunker (radio operator) with Oblt Schack von Wittenau's crew, recalled: "During the Norwegian





campaign, we flew an almost constant round of sorties, bringing in anti-tank guns, munitions, mines and mountain troops for Narvik. These flights were combined with reconnaissance along the Norwegian coast. The more perilous moments of any such sortie were the landings on the narrow fjords around Narvik and the subsequent take-offs. We skirted along neutral Swedish airspace to avoid anti-aircraft fire before diving down almost vertically – almost helicopter-like – for the surface of the water with our engines throttled back.

"The aircraft had to be rapidly unloaded, but it was amazing what could be achieved with the threat of death so close – we

**One of the first Do 26s getting airborne – a lack of markings means it cannot be positively identified. Note the outer floats retracting inwards.** Key Collection

expected naval or artillery fire to come crashing down around us at any moment. Two tons of equipment could be off-loaded under such circumstances – with much sweat and cursing – in less than 20 minutes. Take-offs were just as 'suicidal', especially in the narrow Beisfjord, with its high cliffs. Taxiing out into the middle of the fjord was often done under fire from British ships. Our take-off runs had to be finely judged in order to avoid the cliffs. Engines were run up to full power and we were lucky if we

managed to pass more than 10 metres over these obstacles. Each successful take-off under such circumstances represented a considerable feat of airmanship for such a large and heavy seaplane".

## FIRST LOSS

However, it was not long until the first loss occurred. On the afternoon of May 8, 1940, two Do 24s and four Do 26s carried 103 men of 3/Gebirgsjäger Regiment (GJR) 138 from Trondheim. They followed He 111s of Kampfgeschwader 26 (KG 26) and Ju 88C heavy fighters of Z/KG 30 to Rombaksfjord, but due to bad weather a number of aircraft turned back. One Do 26 went on to land



Above left: Catapult trials for the Do 26V1 on the seaplane tender *Friesenland*. Built for Lufthansa, the ship was used by the Kriegsmarine after 1939 and survived the war. Via Chris Goss



Above right: An overhead view of the first Do 26, clearly showing the type's unique engine arrangement. Via Chris Goss

Below: The elegant lines of Do 26V1 Seeadler. As P5+AH it was destroyed by Royal Navy Skuas in the Norwegian campaign. Via Chris Goss





at Rombaksfjord, but a second, which attempted to land at the same location, was fired on by warships and took off again at once, landing instead at Beisfjord.

Do 26, P5+BH, was engaged by three Blackburn Skuas of 803 Naval Air Squadron as it approached the Narvik area. The Skuas had taken off on patrol from HMS *Ark Royal* and were flown by Lt Leslie 'Skeets' Harris (Royal Marines), Sub Lt Noel Charlton and Petty Off A G Johnson. The flying boat, flown by Oblt Schack von Wittenau, was intercepted at 1615hrs, and was last seen diving away south of Ofotfjord, the RN pilots believing that they had disabled it. The Dornier, with three of its four engines out of action, then force-landed by the east bank of the entrance to Vestfjord, where the crew destroyed the aircraft. They and 17 passengers escaped, but were captured eight days later.

Twenty days later, a further two aircraft were lost. During the morning of May 28, two Do 26s flew to Rombaksfjord carrying a 75mm mountain gun of Gebirgs-Artillerie-Abteilung 112, which was manhandled ashore with great difficulty, and its crew. Shortly after 1900hrs that evening, two more Do 26s landed, carrying three more guns. These were P5+AH and P5+CH and were spotted being unloaded by three Hurricanes of 46 Sqn flown by Flt Lt Pat Jameson, Fg Off Herbert Knight and Plt Off Allan Johnson, who dived to attack, setting both Do 26s on fire. They then circled and watched as the Germans struggled to get equipment out of the wrecked aircraft to the shore.

German records state that Fw Modrow – who later became a successful night-fighter pilot, ending the war with the Ritterkreuz (Knight's Cross) and 34 victories – was wounded in P5+AH alongside two others. Uffz Henry Kiel was killed in P5+CH. Modrow's wounds meant he never returned to the Sonderstaffel.

## OPERATIONS IN THE ATLANTIC

In June 1940, the surviving V4 P5+DH was joined by V5 (P5+EH Wk Nr 795) and V6 (P5+FH Wk Nr 769). These three were



Do 26V1 D-AGNT in Lufthansa service about to be hoisted aboard a tender. Via Chris Goss

built and designated Do 26C and powered by the improved Jumo 205D engines (V1-V3 had been retrofitted with the new engines before their loss). In July 1940, Buddenbrock handed over command to Hans-Wilhelm Brockmann and in August 1940, P5+DH and Brockmann's crew moved to Brest-Hourtin in Brittany to be subordinate to Maj Joachim Hahn's Do 17-equipped Küstenfliegergruppe 606. There they flew operations over the Atlantic – the first, commanded by Brockmann and piloted by Lt Wolfgang Blume (another former DLH captain), took off at 0850hrs on August 16, 1940, and landed after an uneventful reconnaissance mission at 2127hrs, a flight time of more than 12-and-a-half hours.

Four days later, the other two Do 26s, commanded by Helmut Groos (P5+EH) and William Reicke (P5+FH) arrived. All three aircraft carried out a long-range reconnaissance on August 22, 1940.

However, the part they continued to play in the Battle of Britain was minimal.

This was not helped when, on November 16, 1940, P5+EH crashed following a catapult launch from the *Friesland* at Brest, killing Helmut Groos and all of his crew. Following the arrival of more Fw 200s, which were better suited to long-range armed reconnaissance, V4 and V6 returned to Germany at the end of January 1941 and the Sonderstaffel was disbanded. Of the surviving aircraft commanders, Oblt Wilhelm Reicke was killed over the Bay of Biscay on January 30, 1943, commanding the Ju 88C-6 equipped 14. /KG 40. His co-pilot, Lt Rudolf Mayr, another former DLH pilot, was awarded the Ritterkreuz flying Fw 200s with KG 40 and returned to Lufthansa after the war. Wilhelm Brockmann survived the war, while his pilot, Lt Wolfgang Blume, continued to fly the Do 26 until at least early summer 1943.

## AFTERMATH

The remaining two Do 26s probably flew with the Erprobungsstelle trials unit at Travemünde for much of the

A head-on view of one of the early prototypes shows the large wingspan of the Do 26. Via Chris Goss





remainder of the war, carrying out various trials and long-range missions. For example, on June 7, 1943, Do 26 V6 Wk Nr 796 took off by catapult from the *Schwabenland* to supply the German meteorological station on eastern Greenland, which had been discovered and subsequently attacked by Allied forces. Ten days later, Flugkapitän Hptm Wolfgang Blume and his three-man crew succeeded in evacuating the weather station of all 22 members, including some sledge dogs.

The two Do 26s were last recorded with Luftzeuggruppe (See) at Kiel-Holtenau in the middle of May 1944 and no complete examples of this unique aircraft survived the war. However, for those skilled or hardy enough, it is possible to see the remains of one Do 26. After it was strafed and sunk on May 28, 1940, the remains of P5+CH were removed following the war and although some items from P5+AH are on display at the Narvik Red Cross Museum, the major components still lie at the bottom of Rombaksbotn, which has been a popular and well-filmed dive site for many years. **AN**



Photographed on February 18, 1941, P5+DH appears to be receiving passengers. By this time the Do 26s had mostly been replaced by Fw 200s for long-range patrol missions. Via Chris Goss

The fourth Do 26, P5+DH (Wk Nr 794), in Luftwaffe service.  
Note the rear engines canted up for take-off. Via Chris Goss



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