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FIREFIGHTING
BAe 146s & RJ85s
Next-gen Airtankers



SUKHOI SUPERJET
Russia's Rising Star

A-7 CORSAIR II
LTV's Bomb Truck





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Main image: Norwegian's Boeing 787-8 Dreamliner EI-LND. AirTeamImages.com/Sandro Koster. Inset (top): Sea King HAR3A ZH544. Key-James Ronayne. Inset (left): Aero-Flite Avro RJ85 N539AC dropping retardant. Conair. Inset (middle): Interjet Sukhoi Superjet 100 RA-97002 in flight. SJI/Caliaro Luigino. Inset (right): A US Navy A-7E Corsair II of VA-146. Peter Foster

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CS100 Certified



Transport Canada awarded Type Certification to Bombardier's CS100 airliner on December 18. This was achieved after more than 3,000 flight test hours and paves the way for delivery and entry into service of the CS100 with launch customer Swiss in the second quarter of this year.

Fred Cromer, President, Bombardier Commercial Aircraft, said: "This is an historic moment for Bombardier. Years of dedicated efforts and collaboration culminate today in a

Bombardier's CS100 has been awarded its Type Certificate by Transport Canada. Patrick Cardinal via Bombardier

very proud moment for many as we celebrate the CS100 aircraft's Transport Canada Type Certification. I heartily congratulate our teams for their commitment to developing, testing and certifying the CS100 aircraft. Bringing to market the only new family of aircraft developed for the 100- to 150- seat market segment in close to 30 years is a standout accomplishment – the C Series

aircraft is now well on its way to opening up new opportunities for operators, while delivering unrivalled economic advantages, performance, and environmental credentials."

The larger CS300 remains on track to obtain its Type Certificate within the next six months. Bombardier will continue to work with Transport Canada to validate the CS100 aircraft's training syllabus.

First Il-76MD-90A Handed Over



After a year-long delay, the first Il-76MD-90A was delivered to the Russian Air Force during an official handover ceremony at Ivanovo Air Base.

The aircraft, RF-78653, which arrived from Ulyanovsk on December 3, has

The Russian Air Force recently took delivery of its first Il-76MD-90A, RF-78653. Nikolai Krasnov

entered service with the 1st Instructor Military-Transport Aviation Squadron of the Russian Air Force's 610th Center for Combat Employment and Retraining of Personnel

VTA. It will be used to train future Il-76MD-90A pilots as well as those who will fly the A-100 AWACS variant, which is planned to enter service in 2017. **Babak Taghvaei**

South East Expansion Decision Delayed

A long-awaited decision on whether to build a third runway at Heathrow has been delayed until the summer by the British Government.

Prime Minister David Cameron had previously indicated a final decision would be made by the end of 2015 after the Airports Commission, led by Sir Howard Davies, unanimously backed Heathrow's proposal in a 342-page report issued on July 1. But in a December 10 announcement, the government said all three shortlisted options – including expansion at Gatwick – were still under consideration.

The Airports Commission firmly supported a third runway at Heathrow, saying: "a new northwest runway, combined with a significant package of measures to address its environmental and community impacts, presents the strongest case of the three shortlisted options and offers the

greatest strategic and economic benefits."

But the House of Commons Environmental Audit Committee wants Heathrow to demonstrate it could meet key environmental conditions on climate change, air quality and noise before approval is granted. It believes failure to deal with these concerns could expose the scheme to legal challenges.

The latest statement from the Department for Transport stressed the need for further environmental work, including testing the Airports Commission's air quality analysis. It added that the location decision for extra airport capacity would be "subject to further consideration on environmental impacts and the best possible mitigation measures."

Secretary of State for Transport Patrick McLoughlin said: "The case for aviation expansion is clear – but it's vitally important we get the decision right so that it will benefit generations to come."

"We must develop the best possible package of measures to mitigate the impacts on local people. We will continue work on all the shortlisted locations, so that the timetable for more capacity set out by Sir Howard is met."

Heathrow responded, saying it: "has full confidence that expansion can be delivered within environmental limits."

The government's announcement has drawn criticism from various quarters including the British Chamber of Commerce, which branded the decision as "gutless."

Meanwhile, Jim McAuslan, General Secretary of the British Airline Pilots' Association (BALPA), commented: "This is disappointing, but not unexpected news. We're pleased that the government has accepted the case for airport expansion, but it appears that the politics of the South East continues to paralyse the final decision-making."

MAX Makes Debut

Boeing unveiled its first flight test 737 MAX 8 to employees and suppliers on December 8. The aircraft, N8701Q (c/n 42554) *Spirit of Renton*, was rolled out at the company's Renton factory wearing a special teal version of the manufacturer's livery. It will now undergo pre-flight preparation before going to Renton Field for further testing ahead of its maiden flight in early 2016.

Keith Leverkuhn, Vice President and General Manager, 737 MAX, said: "Today marks another in a long series of milestones that our team has achieved on time, and to plan. With the roll-out of the new 737 MAX – the first new aeroplane



Boeing introduced the latest incarnation of its highly successful 737 family when it rolled out the first of its new generation MAX 8 aircraft at Renton on December 8. Boeing

of Boeing's second century – our team is upholding an incredible legacy while taking the 737 to the next level of performance."

Boeing says the second and third test aircraft are currently in final assembly, while

the fourth (and last) is in sub-assembly and the programme remains on track to deliver the first production aircraft to launch customer Southwest Airlines during the third quarter of 2017.

KAI Unveils its T-X Prototype

Korea Aerospace Industries (KAI) unveiled a prototype of its development of the T-50 Golden Eagle, to be offered for the USAF's T-X next-generation trainer competition, during a ceremony at the company's Sacheon plant on December 17.

The aircraft will be proposed for the requirement in a joint bid with Lockheed Martin, which provided technology transfer for the original T-50 design, and is expected to make its maiden flight this year, with trials in the USA following in 2017.

The most noticeable feature externally on the new variant is a distinctive dorsal hump. No specific details of the changes



KAI revealed its development of the T-50 Golden Eagle it is proposing for the USAF's T-X next-generation trainer competition. KAI

in configuration to the aircraft have been revealed, although last year Lockheed Martin officials said it would include an upgraded cockpit, new embedded systems to support fifth-generation training requirements and probably an aerial refuelling capability.

The USAF plans to purchase up to 350 aircraft to meet the T-X requirement, replacing the current Northrop T-38 Talon fleet. Other contenders include Alenia Aermacchi with its M346-based T-100, Boeing with a clean-sheet design being developed in collaboration with Saab and Northrop Grumman, which is also proposing a new type.

Real Madrid Flying High



Emirates Airbus A380-861 A6-EOA visited Düsseldorf on December 17 wearing its new Real Madrid decals. Marcus Steidele

Emirates has celebrated its partnership with Spanish football club Real Madrid by applying a large decal of six of the club's players on Airbus A380-861 A6-EOA (c/n 159). Cristiano Ronaldo, Gareth Bale, Sergio Ramos, James Rodríguez, Karim Benzema and Marcelo feature on both sides of the aircraft with the entire decal covering more than 5,382sq ft (500m²). The Dubai-based airline is Real

Madrid's shirt sponsor and the decals will remain on the aircraft for six months.

In other news, Emirates will upgrade its EK39/40 service between Dubai and Birmingham to an Airbus A380 from March 27. The two-class A380 has 557 seats in Economy Class and 58 in Business Class and replaces the Boeing 777 on the flight. The upgrade will increase daily capacity by

15% and means the carrier offers 77 A380 flights into the UK each week.

Emirates has also announced plans to retire 26 aircraft this year, including 12 Airbus A330-300s, four A340-300s, an A340-500, six Boeing 777-200ERs, two 777-300s and a 777-300ER. Another 13 aircraft will be retired in 2017 and 13 more in 2018. Meanwhile it will acquire 20 A380s and 16 777-300ERs this year.

Heathrow Trial Enters Full Operational Service

A trial to cut aircraft holding times at Heathrow Airport has been so successful that the procedure has now entered permanent operational service. Known as cross-border arrivals management – or XMAN – it sees NATS controllers in the UK working with those in the surrounding airspace in France, Ireland, Belgium and the Netherlands to slow aircraft down up to 350 miles (563km) away from London in order to minimise holding times on arrival.

Heathrow is scheduled at 98% capacity and relies on the continuous flow of traffic that the stacks provide, although NATS

always aims to minimise the amount of time aircraft spend in them. Traditionally, NATS could only influence an aircraft's approach once it entered UK airspace, which can be only 80 miles (129km) from the airport. This previously limited the chance to manage the inbound flow of traffic. Absorbing delay in the en route phase, when aircraft are higher and more efficient, saves fuel and reduces CO₂ emissions while minimising noise for the communities living beneath the stacks.

The project is an inter-FAB (Functional Airspace Block) collaboration between the UK-Ireland FAB and FABEC (Functional

Airspace Block Europe Central). It is led by NATS at Swanwick and Prestwick in partnership with DSNA (direction des services de la Navigation aérienne) in France, the Irish Aviation Authority, EUROCONTROL in Maastricht and Heathrow Airport and is part of a broader strategy to eliminate stack holding for Heathrow in the longer term. XMAN is a key SESAR (Single European Sky ATM Research) concept as part of the Single European Sky initiative, which will require 24 airports across Europe to deploy XMAN procedures by 2024. **David J Smith**

Cathay Heads for Gatwick

Cathay Pacific Airways will launch a non-stop service between Hong Kong and London Gatwick Airport on September 2, subject to government approval. The flight will be operated by the airline's new Airbus A350-900 aircraft and will arrive at Gatwick's South Terminal. Flight CX349 is due to arrive at Gatwick at 0710hrs and depart for Hong Kong as CX344 at 1235hrs on a Monday, Wednesday, Friday and Sunday. In the winter the service will arrive at Gatwick at 0550hrs and depart at 1135hrs.

Purple Promotion



Flybe is promoting Cancer Research UK's Kids & Teens campaign on Embraer 195 G-FBEM (c/n 19000204), courtesy of this striking design by Meg Clark. The five-year-old from Kent won a UK-wide art competition run by the airline in support of the charity, and her design was applied to the jet by Airbourne Colours at East Midlands in early December. **Nik French**

Air Canada rouge Welcomes A321s



Air Canada rouge has taken delivery of its first Airbus A321s. The aircraft are the carrier's first new airframes, the rest of its fleet having been transferred from Air Canada. The initial example, C-FJOK (c/n 6844), was delivered to Toronto Lester B Pearson International Airport on November 3 and after modifications at Montréal/Mirabel, entered service on November 26 on the Toronto-Punta Cana (Dominican Republic) service. It has since

Air Canada rouge's maiden Airbus A321-211 C-FJOK at Toronto Lester B Pearson International Airport on December 3. Andrew H Cline

been joined by C-FJOU (c/n 6873), C-FJQD (c/n 6884) and C-FJQH (c/n 6905) with C-FJQL still to be delivered.

They are being used from Toronto to Fort Lauderdale, Phoenix, Punta Cana, Sarasota and Varadero in Cuba and between Montréal and Fort Lauderdale. **Andrew H Cline**

First Flight for Rutan SkiGull

Innovative American designer Burt Rutan flew the prototype of his new SkiGull light aircraft for the first time at Coeur d'Alene, Idaho, on November 24. The SkiGull, which is tailored for non-airport operation, is an all-composite tandem two-seater with an amphibious hull. Its complex landing gear, consisting of retractable skis, allows it to take off and land on any surface.

The aircraft has a pylon-mounted high aspect ratio wing that folds to allow ground transportation and storage. Its Rotax engine is mounted on the centre pylon above the wing but the aircraft also has an auxiliary electric motor to assist docking while on water. It also has a very long range – sufficient for a flight from Hawaii to California – and will cruise at 140kts. Rutan has not announced plans for production but the SkiGull may be made available as a kit for amateur construction. **Rod Simpson**

New Operators for Luton

Vueling Airlines and Transavia France plan to launch services to London Luton Airport (LLA) later this year. Spanish carrier Vueling will operate four daily flights from Barcelona and Amsterdam with Transavia linking the Bedfordshire airport with Paris Orly 12 times a week.

In addition to this, existing carrier Blue Air

has announced it is adding services to the Cypriot city of Larnaca and Turin in Italy as part of its summer schedule.

The news comes on the back of a record year for the airport which handled 12.3m passengers in 2015, making it the busiest 12 months in its 77-year history.

Nick Barton, CEO of LLA, said: "The

arrival of IAG's Vueling and Air France-KLM's Transavia is another major coup for LLA.

We have now added six new airlines to our network in the past 12 months as well as seeing rapid growth in passenger numbers. With development under way our aim is to offer an ever wider choice of destinations and the best possible experience for our passengers."

Flybe Eyes Northolt Ops

Regional operator Flybe has urged the UK Government to open up RAF Northolt to scheduled commercial traffic. The airline has submitted a request to use the military airfield in northwest London, currently home to the Royal Air Force's VIP fleet and also used by business aircraft, to start twice-daily return flights to five currently underserved domestic destinations.

The regional carrier's CEO, Saad Hammad, said: "Northolt has for too long been the preserve of the elite with their private jets. The government is in danger of turning its back on an opportunity that would benefit hundreds of thousands of people in giving immediate regional air connections to London and beyond through Heathrow's long-haul network."

The airline says flying from RAF Northolt would generate an estimated £3m for the RAF and a further £4m in Air Passenger Duty, and could serve up to 300,000 passengers a year.

Namibian Regional Jet



Namibian charter operator Westair has taken delivery of its first Embraer ERJ 145MP, V5-WIN (c/n 145285). The aircraft was originally operated by LOT and has been stored at Exeter as G-CGUS prior to joining Westair. Ashley Stevens

Turkish Delight



Turkish Airlines has rolled back the years, applying this superb retro livery to Airbus A330-203 TC-JNC (c/n 742). The aircraft visited Manchester on November 23. Spencer Bennett

African Gem



Nyassa Air Taxi de Havilland Canada DHC-5 Buffalo 7Q-STB departing Ostend, Belgium on December 15 wearing United Nations Humanitarian Air Service and World Food Programme (WFP) titles. The aircraft had arrived the previous night from Keflavík, Iceland and headed to Brindisi, Italy on its departure, continuing on to Aswan (Egypt) and Khartoum (Sudan) before arriving in Juba in South Sudan. Here it will operate humanitarian missions for the WFP. Paul Sanders

Qatar Executive Welcomes G650ER

Gulfstream handed over Qatar Executive's first G650ER long-range business jet at a ceremony at its headquarters in Savannah, Georgia, on December 14. The jet, registered A7-CGA (c/n 6153), is the first of 30 Gulfstream aircraft Qatar Executive has on order. Gulfstream President Mark Burns handed the aircraft over to Qatar Airways Group Chief Executive Akbar Al Baker at the ceremony.

Plans Unveiled for New Sydney Airport

A draft Airport Plan and Environmental Impact Statement for the new Western Sydney Airport has been released by the Australian Government.

After studying 80 alternative sites, the previously proposed Badgerys Creek is still said to represent the least environmental impact as well as benefiting from close proximity to existing road and rail links to the city.

The new airport is expected to open in the mid-2020s and will cater for demand that Sydney Airport cannot accommodate even if restrictions on operations and development at the existing facility were to be lifted. The Western Sydney Airport will initially have a single 12,140ft (3,700m) runway and a capacity for approximately five million passengers per annum (mppa), increasing to

10 million within five years. A second runway is part of the facility's future development to meet forecasted increases in demand, and it is expected to have the capacity to handle 37mppa by 2050.

The documents were available for inspection at a public exhibition that ran until December, with assessment and finalisation of the plans expected by June this year.

Delay for MRJ

Delivery of the first Mitsubishi Regional Jet (MRJ) to launch customer All Nippon Airways has been pushed back 12 months to the second quarter of 2018.

Mitsubishi Aircraft said the type's maiden flight and subsequent flight tests had proven satisfactory, but recognised "several issues" it needs to resolve which has led to the revised delivery schedule.

In a statement posted on its website, Mitsubishi Aircraft said: "In the progress

of our engineering work together with experts in the United States, we have made additions to and revisions of test items in order to complete a better-integrated aircraft. These have been reflected in the new delivery schedule. In addition, we have undertaken an overall review with our partners, and reflected this in our development schedule."

It added that the aircraft's flight test campaign would begin in North America "as soon as feasible".

Maiden A350 for TAM

TAM Airlines has received its first Airbus A350-941, PR-XTA (c/n 024). The aircraft was delivered from the manufacturer's facility at Toulouse to São Paulo on December 17, making TAM the first carrier in the Americas to operate the type. This is the first of 27 examples the LATAM Airlines Group has on order. TAM plans to debut the A350 in January between São Paulo and Manaus. This will be followed by international rotations from São Paulo to Miami, Madrid and Orlando.

SPOTTING INFO ...

Ramp tours are being offered at **Van Nuys Airport**, California. During the 90-minute tours, guests are driven around the aprons and FBOs, although no ramp access is granted at any of the FBOs and photography is from behind the glass. Guests are allowed off the bus at the Los Angeles Fire Department to photograph the firefighting aircraft and any aircraft arriving or departing. A tour of the HQ of the Condor Squadron, which operates Harvards and Texans, can be arranged through a tour guide on the day. The ramp tours for up to 33 people are free and are arranged monthly on various dates. Other tours can be organised for a minimum of five, but these smaller group visits are dependent on airport staff availability. Please e-mail Mark Ollier mollier1@ca.rr.com at SoCal Spotters for details.

Saudia A319 Painted



PrivatAir Airbus A319-112 D-ASPA (c/n 1598) has been painted into the colours of Saudia, by Air Livery at Manchester, prior to wet lease. A second example, D-ASPB (c/n 1625), is also expected to join the Saudi Arabian carrier. Gary Claridge-King

United Aircraft Corporation (UAC) is a state owned industrial giant of Russia combining leading national aviation brands such as Sukhoi, MiG, Ilyushin and Tupolev among others. The Corporation employs over 98,000 people and has an annual turnover of more than \$7 billion. Yuri Slyusar, UAC President recently announced some new twists in the company's strategy.



A New Strategy for UAC

United Aircraft Corporation (UAC) has unveiled plans for a revised industrial model.

The first element focuses on building new relationships, and strengthening existing co-operation, with both domestic and international manufacturers with the aim of opening the UAC production facilities to its partners. The Corporation will also look to increase the volume of outsourcing, and expects to decrease the number of final assembly plants. Secondly, UAC plans to adjust the number of aircraft models in its portfolio to meet current and future demand. In addition to the top priority commercial aircraft, such as SSJ 100 regional jet and MC-21 medium-range airliner, UAC is intending to add the Il-114 turboprop that was previously produced in Tashkent. The Corporation is planning to use between eight and 12 airframes that have been partially assembled at the Uzbekistan-based plant as the basis to start a new production line at one of its existing facilities in Russia. Possible contenders include factories in Kazan, Ulyanovsk, Voronezh and Nizhny Novgorod. The total investment in the programme is estimated at about \$220 million, of which \$150 million will be spent on production modernisation. A



further \$60 million will fund the TV7-117ST engines being developed for the Il-112V military transport.

The third step of the reform is to establish five UAC sub-holdings, which will be responsible for commercial, combat, transport and special purpose aviation as well as aircraft maintenance and support. The Russian state has given UAC its full support as one of the key drivers in the nation's industrial sector. The State Transport Leasing Company (STLC) recently received around \$500 million from the state, which allowed the company to attract several customers for SSJ 100.

This included an order for 25 examples from Yamal Airlines, which was signed at the recent MAKS 2015 aerospace event, while an agreement was also reached with Kazakhstan's SCAT Airlines for the delivery of 15 SSJ 100s plus five options. The aircraft will be delivered by UAC subsidiary Sukhoi Commercial Aircraft over the next two years.

Several Russian regional carriers from Orenburg, Tuva and Buryatia have also expressed interest in the type while UAC expects that Red Wings Airlines, which has enjoyed a very positive experience with SSJ 100, will extend its fleet further. The most recent

customer for the aircraft was the Russian Federation Administration and Ministry of Emergency, which received two SSJ 100s each during December. The Corporation is optimistic it can build on the type's recent success by securing orders from India, one of the fastest growing markets in the world.

On its military portfolio, UAC's most advanced product, is the PAK FA T-50 fifth-generation fighter. The type was presented for joint state trials in 2014 with five prototypes now taking part in the flight test programme. Two more examples are expected to join these trials imminently, and static rig tests are also well under way.

The T-50 has achieved reliable results on sub and supersonic speeds, at low and high altitudes and at critical angles of attack. The avionics testing is ongoing, and successful in-flight refuelling trials

have been carried out as well as aircraft performance tests in various configurations. "The main task of the flight test programme now is combat mode performance tests, along with weaponry integration and use", UAC's President Yuri Slyusar said.

In comparison with the previous generation fighters, PAK FA enjoys a number of unique features to combine functions of both a fighter and a strike aircraft. The fifth-generation aircraft has been equipped with a new highly integrated avionics system with a high level of automated control, which reduces the pilot's workload and enables them to concentrate on tactical mission completion. PAK FA T-50 is also to become a basis for the Indian Air Force fifth-generation fighter and the UAC President is sure the programme will be successful.



Jumbo for Virgin Galactic



Virgin Galactic has added a Boeing 747-400 to its fleet that will be used as a dedicated launch platform for its LauncherOne orbital vehicle. The aircraft, N744VG (c/n 32745), was previously operated by Virgin Atlantic Airways as G-VWOW (*Cosmic Girl*).

George Whitesides, Virgin Galactic's CEO said: "Air launch enables us to provide a rapid, responsive service to our satellite customers on a schedule set by their business and operational needs. Selecting the 747 airframe provides a dedicated platform that gives us

Virgin Galactic will use a former Virgin Atlantic Airways Boeing 747-400 as a launch platform for its LauncherOne orbital vehicle.
Virgin Galactic

the capacity to substantially increase our payload to orbit without increasing our prices." The LauncherOne rocket will be mounted on the 747 under its left wing, adjacent to the position that has been used to ferry a fifth engine. The aircraft will undergo scheduled maintenance prior to the start of a wing modification programme.

NHV Moves in at Aberdeen

Belgian operator NHV has based two Airbus H175 helicopters at its newly opened Aberdeen International Airport facility.

The company's Aberdeen complex comprises a 25,833sq ft (2,400m²) hangar with offices and a passenger terminal with check-in, X-ray, security, safety equipment storage and issue facilities, and safety briefing rooms. The ground floor serves as a general waiting area and on the upper floor there is a dedicated passenger lounge.

Eric Van Hal, CEO NHV Group, said: "The opening of our Aberdeen base and the first Aberdeen-based contract with Chevron North Sea Limited will start on January 1 with two H175s. These are strategically very important achievements which were only possible thanks to the commitment from all our stakeholders, our employees, our customers, our partners and our majority shareholder, Ardian."

HondaJet Certificated

Honda Aircraft Company received its type certificate for the HA420 HondaJet light business jet on December 8.

The aircraft has been 12 years in development with the prototype (N420HA, c/n P.0001) making its first flight as long ago as December 3, 2003. The HondaJet is powered by a pair of 2,095lb.s.t. HF120 turbofans which have been jointly developed by Honda and GE and are, unusually, mounted on pylons above the wings. Classed as an

'entry-level' jet, the HA420 competes with the Embraer Phenom 100E and the Cessna 510 Citation Mustang and has a cruise speed of 420kts.

Four flying prototypes were used for certification and Honda Aircraft has already built five production aircraft with another 25 in final assembly. Production is planned to build up to three to four units a month in 2016 with most initial deliveries to US customers.

Rod Simpson

EASA Certifies High Density ATR 72

Franco/Italian manufacturer ATR has received EASA certification for its high-density seating configuration for the ATR 72-600. Using the existing airframe, the new layout optimises the pitch as well as adjusting the forward cargo compartment, bringing the aircraft's maximum capacity from 74 to 78 seats. The option will also be available as a retrofit. Cebu Pacific is the launch customer for the new configuration under a deal for 16 new aircraft announced at the last Paris Airshow. Its first aircraft will enter service in August.

SPOTTING INFO ...

The **Gazelle Squadron** is holding its second nightshoot at its Bourne Park, Hampshire, base on Saturday, March 5.

Following the success of the organisation's first event, the same format will allow enthusiasts to photograph both static and running Gazelle helicopters as well as a number of other based and visiting aircraft and helicopters. The event runs from 5.30pm to 9pm with aircraft lit and, in most cases, run individually. Entry is £20 per person and includes on-site car parking and free tea and coffee. For more information or to register for the nightshoot, email visits@thegazellesquadron.com with the subject line 'BPNS2'.

AIRLINE ORDERS

Airline	Aircraft	Number	Order Placed	Notes
Jet2	Boeing 737-800	3	December 17	
China Southern Airlines	Boeing 737 MAX	50	December 17	
China Southern Airlines	Boeing 737NG	30	December 17	
China Postal Airlines	Boeing 737-800 BCF	10	December 15	
China Postal Airlines	Boeing 757-200	7	December 15	
Braathens Aviation	ATR 72-600	4	December 14	
International Airlines Group	Airbus A320neo	15	December 21	Firms up options
Private Customer	Airbus A330-200	1	November 30	

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American Airlines Boeing 737-823 N915NN has been painted in the colours of TWA as part of the carrier's heritage fleet. American Airlines

Fighters in Trilateral Exercise



Eight RAF Typhoons from XI Sqn deployed to Joint Base Langley-Eustis, Virginia in December to take part in an anti-access/area denial exercise alongside USAF F-22A Raptors and six French Air Force Rafale Cs.

Running from December 2 to 18, the inaugural trilateral exercise was hosted by the USAF's 1st Fighter Wing and followed the re-signing of the Trilateral Strategic Initiative by each of the three country's most senior air force officers last July.

It focused on procedures in a highly contested operational environment through

A Royal Air Force Typhoon FGR4 and French Air Force Rafale flank a USAF F-22A Raptor during the inaugural trilateral exercise. USAF/Senior Airman Kayla Newman

a variety of simulated adversary scenarios. RAF Chief of the Air Staff, Air Chief Marshal Sir Andrew Pulford, said: "This is a fantastic opportunity for the European air forces to get alongside the United States Air Force to start delivering true interoperability across Europe and across NATO."

While the initial stage of the exercise pitted the aircraft against each other, the jets were flown collaboratively on most of the training sorties. Exact details of

exercise sorties have been kept secret, but they would typically start with a group of RAF Typhoons or French Rafales pushing ahead into 'enemy territory', supported at a significant distance behind by half their number of USAF Raptors. Red Air duties were performed by USAF F-15E Strike Eagles from the 4th Fighter Wing at Seymour Johnson AFB, North Carolina, and T-38 Talons from the resident 71st Fighter Training Squadron.

First Hong Kong Challenger Delivered



Bombardier has delivered the first of two specialised Challenger 605 aircraft ordered by the Hong Kong Government Flying Service (GFS). The Canadian manufacturer announced that B-LVB (c/n 5898, ex C-GNVU) had been handed over on December 3. The second aircraft will be B-LVA.

This multi-role aircraft can be used for search and rescue, VIP transportation, medical evacuation, as well as other special missions. The Challengers will replace the existing Jetstream 41s currently operated by

The Hong Kong Government Flying Service took delivery of its first Bombardier Challenger 605 on December 3. Bombardier

the GFS for long-range search and rescue operations, which have been in service since 1999.

The first aircraft, C-GNVU, has spent the last three years being outfitted with its specialist equipment at Montréal/Mirabel International Airport, Quebec, where it had arrived on September 28, 2012, from Montréal-Pierre Trudeau International Airport.

Saudi An-178 Deal

Antonov has signed a memorandum of understanding (MOU) with the Saudi Arabia-based Taqnia Aeronautics Company to deliver 30 An-178 multi-purpose aircraft to the Royal Saudi Air Force (RSAF).

The deal, which was signed on December 17, further extends co-operation between the two companies – Antonov announced on May 13 that it was developing the new An-132 multi-purpose transport aircraft in association with Taqnia, which will build the type in Saudi Arabia.

Under the new MOU, the two companies will undertake joint marketing of the An-178 to other Middle Eastern countries and further promote special-purpose variants of the An-148. Retired Major General Ali Mohammed Al-Ghamdi, President of Taqnia Aeronautics, said the An-178 had been selected due to its advantageous characteristics, price and low operating costs, compared with other types in its class.

Argentine Mirages Bow Out

Argentina retired its fleet of Mirages on November 29, more than 43 years after the type first entered service.

A ceremony took place at the 6th Air Brigade, Tandil, Buenos Aires, formally marking the withdrawal of the type from active service after more than 131,000 flight hours.

The ceremony was hosted by the Argentine Air Force Chief of Staff, Brigadier General Mario Miguel Callejo, who flew the Mirage 5 Dagger during the Falklands War. The remaining aircraft received commemorative paint schemes for their retirement. Mirage 5 Mara C-630 wore the desert scheme, inherited from the Peruvian Air Force, while Mirage 5 Finger C-408 received a camouflage scheme and yellow stripes that had been applied during the Falklands conflict. Mirage M-IIIEA wore a commemorative scheme marking 43 years of service based on the M-III Squadron badge,



Mirage 5 C-408 wore a scheme from the Falklands War period for the farewell event. Esteban Brea

while M-IIIDA I-002 was painted with the colours of the Argentine flag. Mirage M-5 Dagger B C-426 wore special markings on its tail.

The event opened with four of these aircraft performing a flypast. Once they had

landed and been placed on display in front of the dignitaries, their replacements, two IA-63 Pama II, were presented. The ceremony ended with a flypast of I-002, which had the honour of concluding the Mirage's career with the Argentina Air Force. **Esteban Brea**

End of UK Military SAR

UK military search and rescue helicopter operations ended on December 31, when the Royal Navy's 771 NAS stood down from standing alert. Based at RNAS Culdrose with a detachment at HMS Gannett at Prestwick, the SAR role has been taken on by Bristow Helicopters from January 1 using Sikorsky S-92s at both Newquay Airport and Prestwick.

Two RAF 1563 Flight Sea King HAR3s continue to fulfil the SAR role at Mount Pleasant in the Falkland Islands, until the end of March when a civilian consortium will take over. See the article starting on page 32 for more on UK military Sea Kings.

Spanish A400M

Production of the maiden Ejército del Aire (EdA – Spanish Air Force) A400M, T.23-01 (c/n 0044), is progressing well at Airbus Defence and Space's Seville-San Pablo facility.

The nose section was delivered to Seville on December 21 and final assembly has begun, which will lead to delivery to the EdA in the second quarter this year.

Spain had planned to purchase 27 A400Ms, but as the delivery schedule slipped and the country's defence budget came under pressure, that requirement has been reduced to 14. Spain is seeking buyers for the remaining 13 aircraft to avoid penalty charges for cancellation.

Italy Orders P2006Ts

Tecnam has won an order from the Italian Air Force for three twin-engine Tecnam P2006Ts. The contract, announced on December 21, covers an integrated training system (ITS) and includes the delivery of a flight simulator, training for pilots and technicians, together with maintenance and assistance for three years and 3,600 hours in total. Tecnam will incorporate small design changes in the aircraft to meet Italian Air Force training requirements and the aircraft will fly in Italian military markings, once the validation from EASA CS-23 to AER/AMI certification has been achieved.

First Swedish NH90 ASW

Airbus Helicopters has delivered the first Swedish NH90 in full anti-submarine warfare (ASW) configuration to the Swedish Försvarets Materielverk (FMV – Defence Materiel Administration). It was handed over on December 17 at the company's facility in Donauwörth, Germany, and has an entirely customized mission system including underwater sonar, tactical radar and high cabin for improved interior space.

In total, Sweden has ordered 18 NH90s (local designation Hkp14), 13 equipped for search-and-rescue (SAR) missions and five in ASW configuration. A contract has also been signed to modify four already delivered NH90s from SAR to ASW configuration, bringing the total Swedish NH90 fleet to nine ASW and nine SAR aircraft.

Prior to delivery, the aircraft was thoroughly tested by the Swedish acceptance team in Donauwörth and over water from Marignane, France.

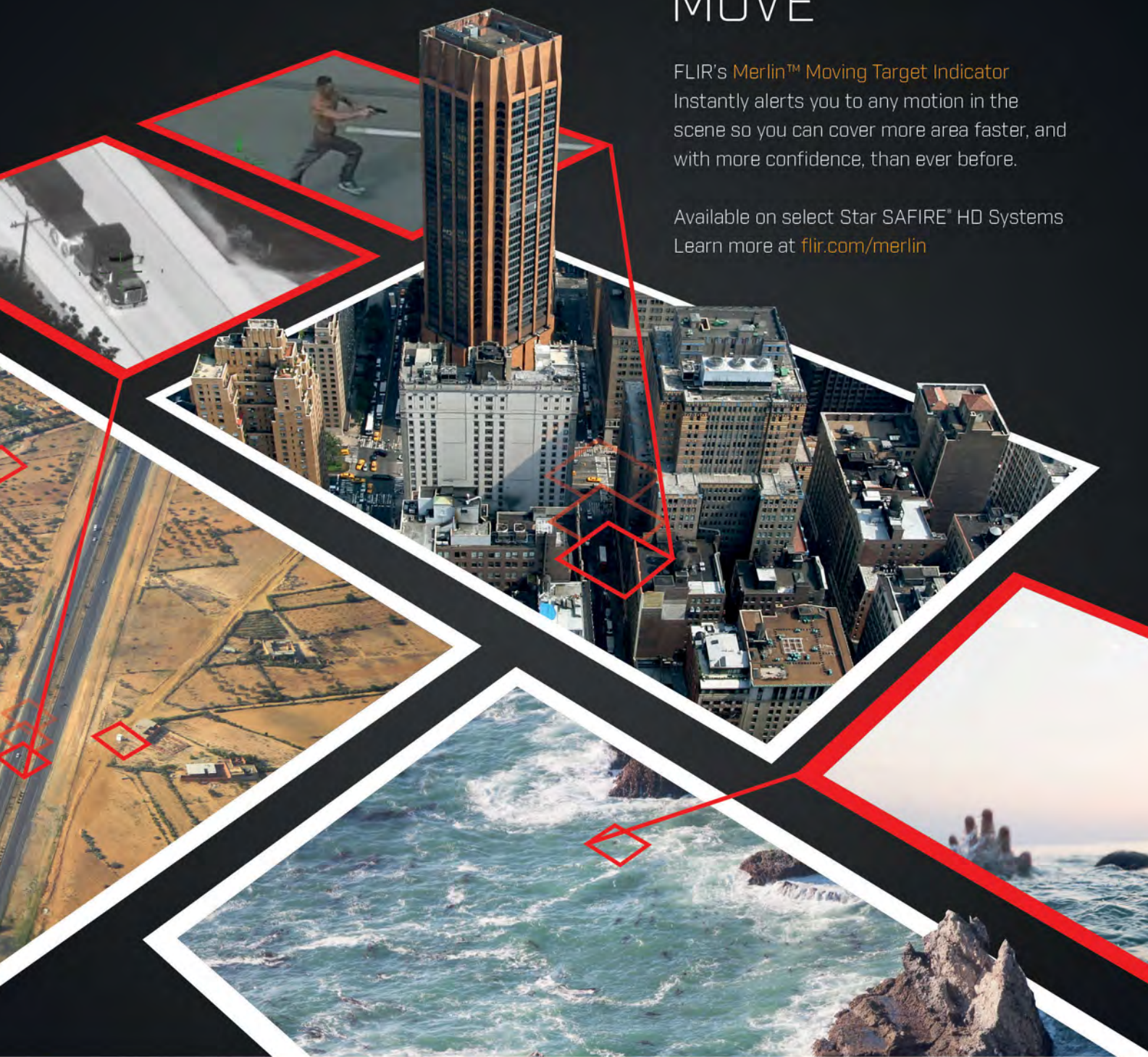


Sweden has taken delivery of its first NH90 in full ASW configuration. Airbus Helicopters

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German Armed Forces gets H145Ms

The German Armed Forces has taken delivery of the first two of 15 H145M helicopters it has on order.

Airbus Helicopters



Launch customer, the German Armed Forces, has received its first two H145M lightweight multi-role helicopters from Airbus Helicopters. They will be used by the Kommando Spezialkräfte (KSK), the German Army's special forces, in Laupheim and are equipped with a fast roping system for troops, cargo hooks, hoists, a pintle-mounted door

gun, ballistic protection and an electronic countermeasures system. Mission equipment includes a helmet-mounted sight and display as well as a self-sealing fuel supply tank. The H145M, which has a maximum take-off weight of 3.7 tons, is powered by two Turbomeca Arriel 2E engines, and is equipped with full authority digital engine control (FADEC).

Skyhawks Retired

Israel has retired its last A-4 Skyhawks after 48 years of service. A ceremony marked the occasion on December 13 and a formation of jets performed a flypast at all the Israeli Air Force (IAF) bases before landing back at Hatzerim AB.

The IAF had operated A-4N, TA-4H and TA-4J variants, the last of which were flown by 102 'Flying Tiger' Squadron at Hatzerim in the training role. They have now been replaced by the new Alenia Aermacchi M-346 Lavi, 30 of which have been ordered.

IN BRIEF

The BULGARIAN AIR FORCE marked the retirement of its final MiG-21 fighters with a ceremony at Graf Ignatievo Air Base on December 18.

Russian news agency TASS is reporting that EGYPT has signed a deal through arms exporter Rosoboronexport for 46 Ka-52 Alligator helicopters.

Dutch Alouettes Finale

A ceremony at Gilze-Rijen AB on December 15 marked the retirement of the Alouette III from the Royal Netherlands Air Force (RNLAf) after 51 years service. Two of the last four helicopters flying with 300 Squadron performed a final flypast at the base before landing and taxiing in to a traditional water cannon salute. The type formally ended service on December 31.

The RNLAf first put the SE3160 Alouette III into service in 1964, and eventually operated 72 of the type. Although most were progressively withdrawn from use, four were upgraded to SA316Bs in 2004-5 by RUAG in Switzerland and remained in service. The final four comprised A-247, A-275, A-292 and A-301.

Italians Receive Maiden F-35

A ceremony was held on December 3 to mark the formal delivery of the first Italian Air Force F-35A Lightning II.

The first AMI F-35A, MM7332 '32-01' (c/n 5062/AL-1) was handed over at the F-35 Final Assembly and Check Out (FACO) facility in Cameri, making Italy the sixth nation to receive the type, joining Australia, the Netherlands, Norway, the United Kingdom and the US.

A further seven F-35As are currently in production for Italy at Cameri. These are AL-2/12-5063, AL-3/12-5064, AL-4/13-5084, AL-5/13-5085, AL-6/13-5086, AL-7 and AL-8. Italy has a requirement for 90 F-35s.

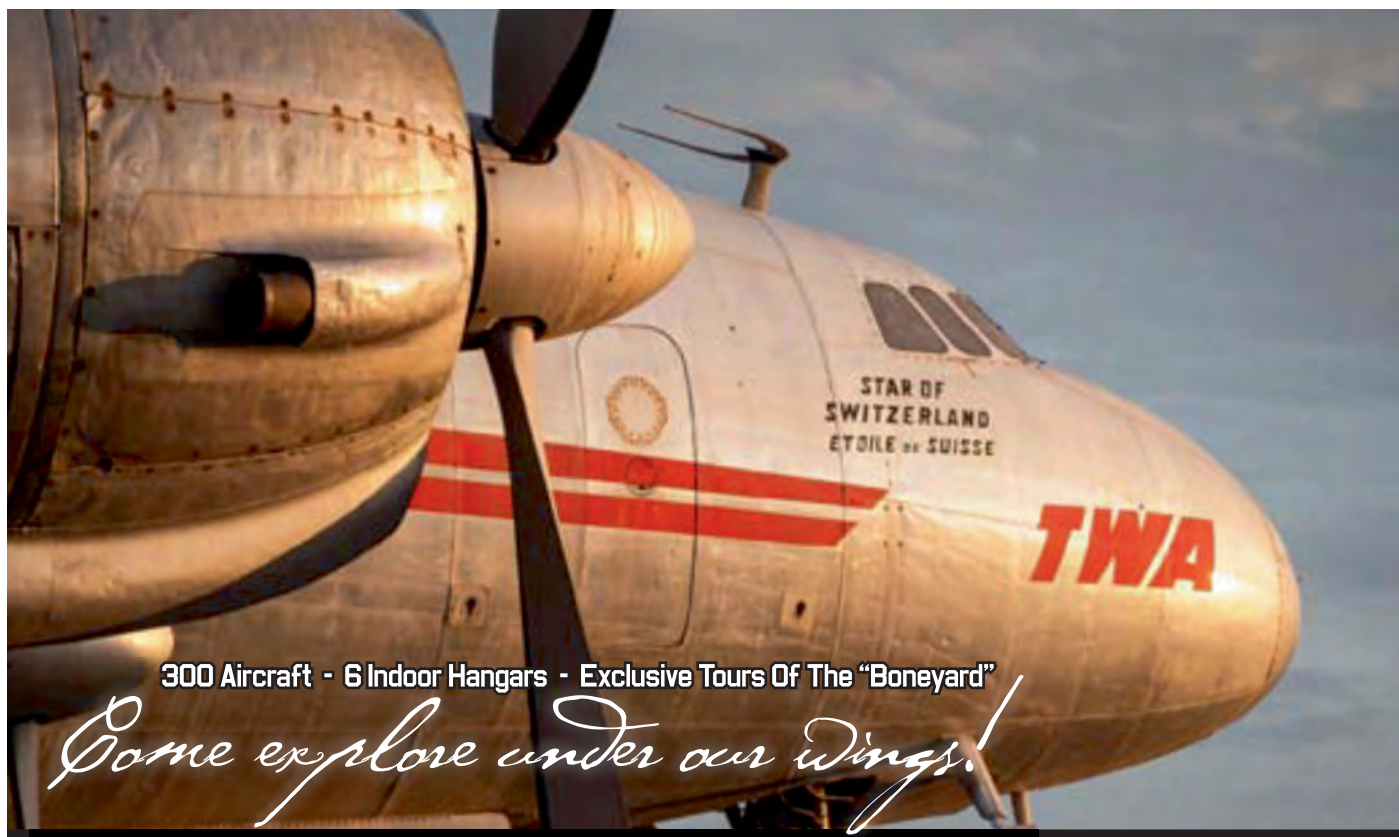
Italy's first two pilots have started flight training at Luke AFB, Arizona, where Cameri-built F-35As will be delivered later in 2016 to support international pilot training.

MILITARY AIRCRAFT ORDERS

Air Arm	Company	Number and Type	Contract Date	Delivery Date and Notes
French Air Force	Airbus Defence and Space	8 x A330MRTT	December 15	
French Army Air Corps	Airbus Helicopters	7 x Tigre HAD	December 17	Delivery in 2017/18
Royal Saudi Navy	Lockheed Martin	10 x MH-60R	December 17	Estimated completion date October 31, 2018
Royal Saudi Air Force	Antonov	30 x An-178	December 17	MOU
USAF	Lockheed Martin	28 x F-35A Lightning II	December 21	
Royal Norwegian Air Force	Lockheed Martin	6 x F-35A Lightning II	December 21	
Turkish Air Force	Lockheed Martin	4 x F-35A Lightning II	December 21	
Royal Netherlands Air Force	Lockheed Martin	8 x F-35A Lightning II	December 21	
Royal Australian Air Force	Lockheed Martin	8 x F-35A Lightning II	December 21	
Israeli Air Force	Lockheed Martin	10 x F-35A Lightning II	December 21	
Japan Self-Defense Force	Lockheed Martin	6 x F-35A Lightning II	December 21	
Republic of Korea Air Force	Lockheed Martin	10 x F-35A Lightning II	December 21	
US Marine Corps	Lockheed Martin	6 x F-35B Lightning II	December 21	
Royal Air Force	Lockheed Martin	1 x F-35B Lightning II	December 21	
US Navy	Lockheed Martin	4 x F-35C Lightning II	December 21	
Italian Air Force	Tecnam	3 x P2006T	December 21	
Indian Air Force and Army	Rostec	200 x Kamov Ka-226T	December 24	
Royal Australian Air Force	L-3 Communications	2 x Gulfstream G550	December 28	Contract completion anticipated by November 30, 2017
USAF	Lockheed Martin	13 x C-130J-30	December 30	
USAF	Lockheed Martin	5 x HC-130J	December 30	
USAF	Lockheed Martin	11 x MC-130J	December 30	
United States Coast Guard	Lockheed Martin	1 x HC-130J	December 30	
US Marine Corps	Lockheed Martin	2 x KC-130J	December 30	
USAF	Lockheed Martin	1 x C-130J-30	December 30	
USAF	Lockheed Martin	3 x HC-130J	December 30	
USAF	Lockheed Martin	2 x MC-130J	December 30	
US Marine Corps	Lockheed Martin	3 x KC-130J	December 30	
United States Coast Guard	Lockheed Martin	2 x HC-130J	December 30	

SPOTTING INFO ...

The dates for this year's **Joint Warrior** exercises have been announced. The first will take place between April 10 and 22 with JW16-2 running from October 9 to 21.



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Californian Phantom Restoration



Work to return the Wings and Rotors Air Museum's McDonnell F4H-1F Phantom II 145310 to airworthy status continues at French Valley Airport in Murrieta, California.

Patrick Rodgers, the museum's director of maintenance and restoration, anticipates that this long-term and very ambitious project should take to the sky after a few more years of work.

The Wings and Rotors Air Museum's Phantom II on display at French Valley Airport on November 7. Frank B Mormillo

The jet is the 11th pre-production F-4 Phantom II and was on static display during the airport's airshow in November. Delivered to the US Navy in August 1959, it was flown for almost 1,000 hours on various flight tests

and weapons trials before being retired in September 1964. After spending more than three decades at various storage facilities across the US, the jet was finally sold off as surplus in 2000. The aircraft was saved from the scrapman by museum staff who have been working on it ever since. www.wingsandrotors.org **Frank B Mormillo**

Shackleton on the Move

Avro Shackleton MR.2C WL795 has been moved from RAF St Mawgan to its new home as the gate guardian for the Newquay Aerohub.

Known as *Rosalie*, the aircraft was retired from service in 1981 and had been on display at RAF St Mawgan for the past 25 years.

When the MOD announced it was disposing of the aircraft, the 'Save Our Shackleton' group stepped in. It has worked tirelessly alongside volunteers and many

Cornish companies to prepare the aircraft for its final move. Having been stripped of its wings, engines, tail fins and tail surfaces, the Shackleton was towed the three-quarters of a mile down the road to its new home.

After restoration *Rosalie* will be used as an educational tool to help teach science, technology, engineering and mathematics.

Wg Cdr Guy Bazalgette, RAF St Mawgan's Station Commander, said: "We had no say in how *Rosalie* would be

disposed of, the process being that she went simply to the highest bidder. Therefore, I am delighted that she is both staying in one piece and staying in Cornwall. I look forward to seeing *Rosalie* returned to her former glory at the Aerohub next to RAF St Mawgan, where she will delight aviation enthusiasts and should prove to be a valuable aid to enthuse students about the vital importance of science, technology, engineering and maths."

Skytrain to Fly Once More

The Air Heritage Museum's Douglas C-47B Skytrain 43-48716 *Luck Of The Irish* is being restored to fly in the colours it wore on its last World War Two mission on May 28, 1945.

The Skytrain arrived at the Beaver Falls, Pennsylvania attraction in January 2013 but it wasn't until staff made contact with its wartime pilot, Capt Edward 'Elmo' Frome, that its full military history came to light. With the help of the 95-year-old veteran and his daughter, the museum compiled a complete combat record for the aircraft, which undertook 96 missions.

The C-47 was delivered to the Ninth Air Force's 75th Troop Carrier Squadron on September 30, 1944. It flew twice over the Battle of the Bulge on December 24 and



Douglas C-47B Skytrain 43-48716 is being repainted into its wartime livery. Tony Sacketos

December 26 of that year, dropping vital supplies to troops in Bastogne. It also towed Waco CG-4A gliders during Operation Varsity on March 24, 1945, the largest airdrop of troops and supplies ever undertaken in a single day.

The museum hopes to raise \$150,000 (£97,000) to repaint the aircraft and return it to the air. Any money raised beyond its goal will go towards the machine's future maintenance, and will allow it to attend airshows well into the future. www.airheritage.org

American Classic Arrives at Old Warden

Ryan ST-A NC18923 was delivered by road to its new home at Old Warden, Bedfordshire, on November 21.

The aircraft was previously based at Paderborn in Germany. Its proud new owner Peter Holloway said: "I first saw the aircraft several years ago in the hangar of the Quax Club at Paderborn and thereafter failed repeatedly over the years to persuade the owner to sell it. He sadly passed away recently and his entire aircraft collection was put up for sale. Following deep maintenance and reassembly, the aircraft will be exhibited within the Shuttleworth Collection and will be displayed next season."

As well as flying his new acquisition at airshows, Peter is also hoping that the 1939-built aircraft's distinctive appearance will attract customers wishing to use it for advertising or promotional work. **Darren Harbar**



Ryan ST-A NC18923 is unloaded at Old Warden on November 21. Darren Harbar

Pearl Harbor Relic

Students from the University of Hawaii Marine Option Program have conducted a detailed archaeological survey of the final resting place of a Consolidated PBV Catalina that was destroyed in the attack on Pearl Harbor.

Minutes before the attack on December 7, 1941, Japanese Imperial Navy aircraft bombed the nearby US Naval Air Station on the east coast of Oahu. Twenty-seven Consolidated PBV Catalina flying boats on the ground or moored on Kaneohe Bay were destroyed, and six others were damaged. The strike on the seaplane base was a significant loss for the US military, as these long-range patrol bombers could

have followed the Japanese planes back to their carriers.

In 1994, Kaneohe Bay's murky waters thwarted a University of Hawaii dive team's attempt to photograph the wreck of one of the Catalinas. A second effort in 2008 by a local sport diving group also had limited success.

In June, with better visibility and using improved camera equipment, the team of students returned to the wreck and produced the first systematic photo and video documentation of the entire site. Details have recently been made public to coincide with the anniversary of the Pearl Harbor attack. The student effort

was coordinated by Hans Van Tilburg, a maritime archaeologist with the National Oceanic and Atmospheric Agency's Office of National Marine Sanctuaries. Van Tilburg says that while the precise identity of the aircraft remains unknown, it is possible the crew died while attempting to take off in the face of the attack. The aircraft, which rests in three large pieces at a depth of 30ft (9m), is protected by the Sunken Military Craft Act of 2004, which prohibits unauthorised disturbance of military vessels or planes owned by the US Government, as well as foreign sunken military craft that lie within US waters.

David J Smith



Mil Mi-2 in the Netherlands

Baarlo-based PS Aero has taken delivery of Mil Mi-2 *Hoplite* SP-ZXH. The helicopter flew search and rescue operations in Poland and is still painted in its original high-visibility markings. The Mi-2 was produced exclusively at the WSK PZL factory in the Polish city of Świdnik. PS Aero is a supplier of former military aircraft, engines and spares. www.psaero.com Roger Soupart

Bronco Flies Again



North American Rockwell OV-10B Bronco 99+26 (G-BZGL) took to the skies on November 25 following restoration work at Duxford, flying to the Bronco Demo Team's base at Kortrijk-Wevelgem in Belgium.

Over the next few months further work will be carried out, including a full repaint that will see the aircraft returned to the condition it was in when it left the factory at Columbus, Ohio, some 45 years ago.

The former Luftwaffe machine first arrived

OV-10B Bronco 99+26 (G-BZGL) flying at Duxford on November 25. Jessie De Cooman-BDT

at Duxford on September 13, 2001 after a ferry flight from Fassberg, Germany.

Significant work has been undertaken to remove the ABDR (Aircraft Battle Damage Repair) which was applied when it was an educational airframe at Fassberg's technical school. Major components – such as the flight controls, engines, propellers and

landing gear – have also been overhauled, effectively returning the Bronco to 'as new' condition.

The Bronco Demo Team was created in 2010 by a group of OV-10 enthusiasts, and has performed at numerous airshows throughout Europe. The team operates ex-Luftwaffe OV-10B 99+18 from Belgium in its original colour scheme – 99+26 is expected to join it later this year. www.broncodemoteam.com

De Havilland Museum Launches New Project

The de Havilland Aircraft Museum is inviting World War Two veterans to record their recollections as part of a new social history project.

Those who flew in DH Mosquito fighter-bombers, groundcrew who helped maintain the aircraft and civilians who built them, are being asked to record their memories. Among the first to face the film unit were veterans who attended the London Colney museum's

celebration of the 75th anniversary of the Mosquito's maiden flight on November 25. Interviewees included Reg Davies, 93, a wartime navigator, who lives in nearby Barnet.

Director Richard Knapman is hoping to place the experiences of many others on permanent record. Mosquito veterans and former de Havilland workers can contact him at: rakmuseum@gmail.com

Islander Arrives

Middle Wallop's Museum of Army Flying has taken delivery of former Army Air Corps Defender AL1 ZG993. It was delivered by road from RAF Shawbury, Shropshire, on November 25 and will be placed into storage until the museum's new extension has been completed.

Quax-Flieger Adds Pilatus P-2

Paderborn-based Quax-Flieger has expanded its collection of airworthy historic aircraft with the acquisition of Pilatus P-2 D-EGAW. The group, which is currently celebrating its tenth anniversary, now consists of over 550 members. The Pilatus, previously based at Oldenburg-Hatten in northern Germany, is the first of several planned additions for 2016. www.quax-flieger.de **Stefan Schmoll**

WG.30 Returns to Weston-super-Mare



Former British Airways and British International Helicopters Westland WG.30 Srs100 G-BKGD has returned to The Helicopter Museum at Weston-super-Mare following long-term loan to the City of Bristol College at Stoke Lodge Adult Learning Centre. It has been placed as a 'Gate Guard' at the museum's entrance, together with WG.30 Srs 200, G-ELEC. **Geoff Jones**

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SPAIN'S MULTI-ROLE BOEING 707s

Rodrigo Rodríguez Costa details the career of the Spanish Air Force's Boeing 707s which have served the country's armed forces since the late 1980s.

The Ejército del Aire has had the Boeing 707 in its inventory since 1988. The type was a controversial choice due to the age of the selected aircraft.

During the early 1980s, the Ejército del Aire (the literal translation of which is Army of the Air, but more commonly referred to in English as the Spanish Air Force) started to consider renewal of its VIP aircraft, which at that time were two McDonnell Douglas DC-8-52s, bought second-hand from Iberia in April 1978 and February 1980. Owing to their

advanced years the Spanish Government decided to purchase two Boeing 707s, also second-hand, with the aim of not just using them in the VIP and transport roles, but also as air-to-air refuelling tanker aircraft.

A contract was signed with Boeing to modify these two aircraft for their new roles. Part of the work included installing advanced communications equipment for use by members of the country's royal family or senior government officials, and also to enable the aircraft to act as an airborne command centre.

During the process of negotiation and airframe selection with Boeing, and due to the 'new' aircraft being almost 20 years old (similar to the DC-8s they were to replace but with better performance) with an accumulated 65,000 flying hours between them, the Spanish Air Force decided to buy a third aircraft that would be configured for VIP and general transport, with the purpose of supporting T.17-1. This back-up aircraft, a 707-368C (T.17-3/45-12), was considered essential, given that the number of overseas visits had increased significantly due to



Above: **One of the four Boeing 707s to have served with the Spanish Air Force.** Antonio Camarasa

Below: **Boeing 707-331B TK.17-1/47-01 used to wear the white scheme, but was re-painted grey and then mostly used for air-to-air refuelling. The aircraft is pictured taxiing at Gando Air Base which shares runways with Las Palmas Gran Canaria Airport.** Rodrigo Rodríguez Costa

international agreements signed by the Spanish authorities. For example, in 1986 Spain had joined the European Economic Community (EEC) and also NATO.

This third aircraft had made its maiden flight in 1977 and had been bought by Saudi Arabian Airlines with which it served until 1986. During that time it flew 20,000 hours. A year later it was acquired by Boeing which sold it to the Spanish Government.

The first converted aircraft to be delivered was a 707-331B, given the serial T.17-1 and coded 45-10 (it had first flown in 1968 and entered service with TWA), which arrived on March 30, 1988 for use in the VIP and tanker roles. The second example, a 707-331C, T.17-2/45-11 (which had its inaugural flight

in 1964 before joining TWA), was assigned to the regular transport role as well as being a tanker, as it hadn't been configured for VIP duties. The arrival of the first two 707s enabled the DC-8s to be retired.

The three 707s were initially assigned to 45 Grupo (45 Group), established in 1987, and more specifically by 451 Escuadrón (451 Squadron), which had its base in the military area of Madrid's Barajas International Airport. With the departure of the USAF's 401 Tactical Fighter Wing and its F-16 Fighting Falcons from Torrejón de Ardoz air base, which is on the outskirts of the capital, the Spanish Air Force decided to take advantage of the newly vacant ramp space and hangars for use by its own units,

and one of the beneficiaries was 45 Grupo. The 707s were transferred to Torrejón in January 1993, where they have been based ever since.

CHANGE TO 47 GRUPO

Due to the age and resulting maintenance issues with the Boeing 707s two Airbus A310-300s were acquired and entered service in 2003 at which point the 707s gave up their VIP role. It was decided to create a new unit to operate the 707s and, in 2004, 47 Grupo Mixto de Fuerzas Aéreas (47 Joint Air Forces Group) was formed at Torrejón. In addition to the missions of general transport, airborne command centre and in-flight refuelling, the 707s were also assigned to ►





Above: **The cockpit of one of the 707s used in the VIP role.** Ejército del Aire

Below: **The tanking capability of the 707s gave the Spanish Air Force enhanced expeditionary capability.** Ejército del Aire



While two of the 707s were undertaking VIP duties the fleet was assigned to 45 Grupo, note the code on the rear fuselage. On relinquishing this role they were transferred to 47 Grupo. AirTeamImages.com/Carl Ford

medical evacuation. The aircraft of the Air Intelligence Centre and its 408 Escuadrón, operating a further Boeing 707, one CASA 212-100 Aviocar and two Dassault Falcon 20s, which undertakes electronic warfare (EW) and intelligence gathering duties as well as radar calibration, were placed under the control of 47 Grupo. The three transport 707s were assigned to 471 Escuadrón while another example, TM.17-4/47-04, which will be described later on and is used for EW and intelligence gathering, was also re-allocated to this unit. The CASA and Falcon 20s went to 472 Escuadrón.

The three transport 707s were modified and among the changes were that they converted to a mixed cargo and passenger configuration, plus a large cargo door was installed in the forward left hand side of the fuselage. This eases the loading of cargo and is also useful in the medical evacuation role for the boarding of stretchers and related equipment.

Aircraft, T.17-1 was re-serialised TK.17-1 (now coded 47-01), painted grey and then mainly used as a tanker, while the other two (47-02 and 47-03) have kept their colour schemes of white with a red band.

TANKER

The Spanish Air Force's only tankers for most of the 1980s were the KC-130Hs of Ala 31. However, the type lacked speed, range and the necessary fuel-carrying capacity to adequately meet the needs of the RF-4C Phantom, Mirage F1, EF-18 Hornet and the Arma Aérea de la Armada's



Above: **Boeing 707-351C, TM.17-4/47-04** was used for electronic intelligence gathering and jamming as well as command and control. Note the lumps and bumps on the aircraft's fuselage for its specialised equipment.

Antonio Camarasa

Left: **One of the 707s involved in a medical evacuation mission.** Ejército del Aire



(Naval Air Arm) EAV-8B Matador IIs. This limited the country's expeditionary capability. The problem of low refuelling speeds was especially troublesome for the F1. With the arrival of the 707s this issue was resolved. They received the Sargent Fletcher SFC-34-000 hose and drogue system which was installed on each wing making them two-point tankers. The aircraft are capable of transferring 158,000lb (71,667kg) of fuel, although 90,000lb (40,823kg) is the most that has ever been passed to receivers during a sortie as to carry a full load would cause excessive fatigue on the airframe.

As well as keeping the nation's fast-jet aircrew current in air-to-air refuelling (the RF-4Cs and F1s have been retired but Eurofighter EF2000s are now in service), the 707 tankers have also been used for long distance deployments, for example assisting fast-jets to get to exercises in North America such as Red Flag, Green Flag and Cope Thunder. The first such trail took place in 1994 when the Spanish Air Force participated in Red Flag at Nellis AFB, Nevada for the first time. Two 707s accompanied four Hornets each, with stops in Lajes AB in the Azores and Langley AFB, Virginia.



A close-up of one of the 707's Pratt & Whitney JT3D-7 turbofans. Rodrigo Rodríguez Costa

Boeing 707, TK.17-1/47-01 participated in Operation Unified Protector in Libya in 2011, providing fuel to Spanish Hornets and other coalition aircraft. From March 19 until June 20 that year, the 707 undertook 68 refuelling missions, involving 384 flying hours, transferring 1.5 million litres of fuel. This aircraft (together with a KC-130H) remained assigned to this tasking until October 31, 2011.

TRANSPORT DUTIES

Despite giving up the VIP duties there are plenty of other general transport tasks that have been fulfilled by the 707s, such as weekly logistical support flights to the air bases of Gando on Gran Canaria in the Canary Islands and Son San Juan on Majorca in the Balearics.

The type has been employed in almost every international mission of the Spanish armed forces, from Africa to Central America and Afghanistan. Among the first such missions was to support naval units deployed in the Persian Gulf from 1990 onwards after Iraq invaded Kuwait, flying to several destinations in the Middle East and undertaking personnel rotations and the transport of materiel. In the 1990s numerous flights were conducted carrying troops to the former Yugoslavia.

More recently, the 707s were supporting operations in Afghanistan. There were regular flights to Manas in Kyrgyzstan transporting personnel and materiel that were then transferred to a C-130H for the last leg to Herat, where the Spanish headquarters were located. From 2010 the aircraft made use of the transit centre established by the US military at Dushanbe, Tajikistan until the coalition managed to make Herat Airport operational for commercial flights which simplified the



Above: Aircraft T.17-2/47-02 taking off from Torrejón. It was delivered to the Spanish Air Force in 1988. Rodrigo Rodríguez Costa

Below: A Spanish Air Force Boeing 707 on finals at Herat in Afghanistan on April 11, 2011. This was the first time one of the 707s was able to land there thanks to improvements to the airport. Ejército del Aire



logistics for handling transport aircraft. On April 11, 2011 the first Spanish 707 to land there was T.17-2/47-02 flying direct from Torrejón on a medical evacuation mission.

The aircraft have also been used for humanitarian aid flights. The initial one took place on December 31, 2004 and headed to Sumatra after the earthquake and tsunami on December 26.

The lesser-known role of the 707s is as an airborne command centre, which is

regularly practised during exercises. Senior military staff use the aircraft's advanced communications systems to link with senior government officials and commanders in the field.

SANTIAGO PROGRAMME

In 1991, as part of an ambitious programme of modernisation of Spanish aircraft capabilities, the government started the Santiago Programme, also known as the

Combined System of Electronic Procurement and Production. This brought together laboratories, a centre for interpretation of information and intelligence, and a variety of sensors for the gathering of all types of intelligence by a range of aircraft types to work together in an integrated way and report directly to the Chief of the Air Staff. However, the 'jewel in the crown' was without doubt the 707 acquired as part of this programme. A 707-351C was bought from Olympic Airways (it had first flown in 1966 and been delivered to Northwest Orient) and comprehensively modified by INDRA of Spain and IAI of Israel. The upgrade included the installation of the ELTA EL/L-8300 electronic intelligence (ELINT) and communications intelligence (COMINT) EL/K-7032 systems. As well as gathering intelligence, it could jam radars and radio communications. It also conducted optical intelligence (OPTIN) and boasted command and control capabilities. This 707 was the most secret aircraft in the Spanish armed forces, carried the serial TM.17-4 and was coded 408-21 until the creation of 47 Grupo, when it became 47-04.

The aircraft arrived in Spain in March 1996, reaching its initial operating capability (IOC) at the end of that year. It did not reach its full operational capability (FOC) until the beginning of 1999 and was continually upgraded. Such was the sensitivity of its work that little information on what operations it has been involved in has been released except that it did fly missions in the Balkans.

Today, only T.17-3/47-03 remains in service and this aircraft is due to be retired this year. The Spanish Air Force is hoping to acquire Airbus A330 Multi Role Tanker Transport aircraft to replace the 707s. The famous Boeing design has performed admirably over the years for the Spanish Air Force in a number of roles. **AN**

Aircraft TK.17-1/47-01 performed numerous air-to-air refuelling missions in 2011 supporting Spanish and Coalition aircraft for operations over Libya. Antonio Camarasa





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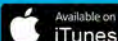
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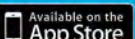
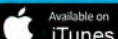
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BAe 146 & RJ85 Airtankers



In the North America and Australia, converted BAe 146 and RJ85 airliners are being given a new lease of life working as airtankers, as **Frédéric Marsaly** explains.

After a near decade-long search for a next-generation airtanker, the BAe 146 and Avro RJ85 are proving more than capable of succeeding ageing aircraft such as Lockheed P2V Neptunes and P-3 Orions fighting fires in the US.

Following crashes in 2002 involving a Lockheed C-130A Hercules and a Consolidated PB4Y-2 Privateer, older tankers were banned from US Forest Service (USFS) contracts and phased out two years later. As a result the federal fleet decreased from 44

Above: BAe 146 and Avro RJ85 airliners, such as this Aero-Flite example, have been given a new lease of life as airtankers, used to fight fires in North America and Australia. Conair

aircraft to a mere 20. All that was left were P-3 Orions from Aero Union and P2V Neptunes of Neptune Aviation and Minden Air.

The need for a new generation of airtanker was obvious but contenders were scarce. Airtankers used in the US have always been converted airliners, cargo or patrol aircraft because this business cannot sustain the costs of acquiring and converting new aircraft.

While aircraft from the 1950s are sturdy and reliable, with thick wings perfect for low-level flights, modern aircraft are optimised for high-level cruise, and therefore less suitable. Amphibious aircraft, such as the Bombardier 415, were not considered because the use of retardant is the main way to fight fires in the US.

This is because there are plenty of places where it's easier to find a runway where you can refill an aircraft with retardant from a mobile reloading station than it is to scoop water.



Above: **Five of Neptune Aviation's BAe 146s on the ramp at the company's Missoula, Montana base.** Neptune Aviation via author

announced the conversion of BAe 146-200 N606AW (c/n E2033) which began in 2005.

At the time, the British-built jet was becoming more available on the second-hand market and at affordable prices.

DEVELOPMENT

Founded in 2001, Tronos is a UK-owned aircraft leasing, major-modification and maintenance firm specialising in 146s and RJs with its conversion activity based at Summerside Airport in Prince Edward Island, Canada. Minden Air has been one of the US Forest Service's contractors and is based at Minden-Tahoe Airport, Nevada.

In 2007 the conversion of N606AW was abandoned and the unfinished aircraft later scrapped.

Meanwhile, Tronos was developing its own plans for an airtanker and design for a

Supplemental Type Certificate (STC) and work resumed on another BAe 146-200, N608AW, which soon became N146FF.

It has been fitted with a 3,000 US gal (11,356lit) tank, which puts it in Category 1 of the Interagency Air Tanker Board (IAB) classification. The IAB is the committee in charge of reviewing all the data concerning airtankers – fixing standards, validating their performance and approving use after evaluation.

The drop system chosen for the aircraft is similar to that adopted on Evergreen's Boeing 747 Supertanker: after being put under pressure while in flight, the retardant is dropped through underbelly nozzles, just behind the main landing gear.

This complex system has the benefit of not requiring major and heavy structural modification. However, it is much less

The first activity to convert a BAe 146 into a fire bomber began in early 2004 when US operator Minden Air led flight tests with a Tronos-owned 146-100, N81HN (c/n E1081), crewed by a BAE Systems test pilot and the Minden Air Chief Test Pilot in a jointly-funded exercise. These focused on handling and manoeuvrability to validate the type's flying qualities for the firefighting mission. The jet was fitted with a 10-ton (9,072kg) load and practised low-level flights to simulate missions. Following this successful flight test campaign Minden Air and Tronos



Above: **Minden Air's Tanker 46 has been converted with a 3,100-US gal constant flow tank and performed its first drop in June 2014.** Minden Air Corp via Author



A test drop by BAE 146-200 N608AW that had been modified by Tronos. Tronos

convincing than traditional doors for direct drops, in which the direct blast of the liquid mass is as important as the quantity of water, foam or retardant used – but it is effective to draw retardant lines, which are used to contain fires.

The new tanker made its first drop test on October 28, 2009 in Canada while, at around the same time, BAE Systems, working with other airtanker operators conducted a series of flight tests at low altitude with BAE 146-200 G-BRXT (c/n E2115) in Scotland to validate the behaviour of the aircraft for firefighting missions.

Looking for a customer for its aircraft, Tronos signed an agreement with Neptune Aviation, based in Missoula, Montana.

In May 2011, N146FF (Tanker 40) was delivered to Missoula and began a test campaign scheduled to last all summer. At the end of July, the Forest Service abruptly cancelled its contract with Aero Union for its seven P-3s, the agency justifying its decision by claiming the aircraft no longer met its maintenance requirements.

With the aircraft grounded, the USFS fleet was reduced to only 11 P2Vs from Neptune Aviation and Minden Air – and with huge fires burning in the western States, it was a tricky situation.

To remedy this, Neptune Aviation was allowed, with an “interim approval,” to engage its first BAE 146. On September 30, Tanker 40 proceeded to its first operational drop over a fire in Texas. The following month, it received a temporary authorisation from the IAB to conduct operational missions and in December it was engaged against fires in California.

Despite Tanker 40 making only six operational drops, all were successful and Neptune Aviation was awarded a one-year USFS contract.

In early February 2012, the USFS issued details about the performance requirements for its next generation of airtankers, stating aircraft for future contracts must be equipped

with jet or turbine engines rather than piston powerplants, must contain a minimum of 1,800 US gal (6,814lit) of retardant – with 3,000 US gal (11,356lit) as a target – and have a cruise speed of 300kts. The BAE 146 met all these specifications.

Tom Harbour, Director of Fire Aviation Management for the Forest Service, explained: “The BAE 146 is the kind of platform we’re looking for – it holds a heavier load, is more fuel efficient and we have one right now.”

For the 2012 season, five pilots were qualified to fly Tanker 40 and ready to intervene anywhere in the US from February to the end of fire season in October. With only interim approval behind it, the season was important to achieve full approval and confirm the new fire bomber as suitable for a full USFS contract.

MISSION ACCOMPLISHED

Tanker 40 was later awarded a five-year contract with the option of five more years by the USFS. Over 160 days a year and

250 flight hours, the USFS provides fuel and retardant.

Neptune took on its second aircraft, Tanker 41 (N471NA, c/n E2136), in early August 2012, and after a few trial flights it entered service on September 1, flying to Nebraska to tackle a blaze.

The first operations with Tankers 40 and 41 highlighted issues with the drop system, so it was modified in 2013 on the new Tanker 10 (N472NA, c/n E2138), with two more drop nozzles forward of the main landing gear.

As a result the drop flow was doubled, significantly increasing the retardant coverage. With the drop now being split both aft and forward of the aircraft’s centre of gravity, it also limited the ‘pitch up’ and reduced the structural strain on the airframe. All Neptune Aviation 146s have subsequently had the modification, called REV 3.

Dan Snyder, Neptune’s Chief Operating Officer, said: “The new gating system can be adjusted during a drop. Enhanced computer sensing and control have taken constant



Above: Tanker 162 (N355AC) arrives in Australia ahead of the 2014 fire season.
Royal Australian Air Force via author



Above: Canada's Conair group uses an external conformal underbelly tank with a full capacity of 3,300 US gal and a constant flow drop system. Martin Cooper

flow tanking to a new height, 'Active Control', [which] allows the computer to actively monitor the flow performance and modify the exits to maintain the selected coverage level, based on aircraft ground speed, tank flow rate, g-loading and aircraft pitch attitude."

During the June 2013 Powerhouse fire, where 30,000 acres were burned in California, Neptune engaged two P2Vs and a BAe 146. Snyder revealed that the aircraft had all flown ten to 12 missions a day, but that the 146 had covered a larger area and had greater response times, while its turn-time on the ground was 50% better than the P2Vs'.

Neptune currently has six BAe 146s available, five of them contracted with the USFS and a sixth operating for CAL FIRE, the California Department of Forestry and Fire Protection. A seventh aircraft is under conversion.

While Neptune has the largest fleet of BAe 146 fire bombers it's not the only operator. Minden continued to look at the 146 as a replacement for its ageing Neptunes and converted an airframe with a 3,100 US gal (11,735lit) constant flow tank.

The jet has been assigned the Tanker 46 (N446MA, c/n E2111) number.

Reliable and efficient, the constant flow drop is driven by gravity through two computer-controlled doors. The crew chooses a quantity to drop and a coverage level, and the computer opens the doors accordingly. This versatile system requires more radical changes for the large underbelly drop doors installation.

Tanker 46 first flew in this new configuration on June 9, 2013 but its first drop was not performed until 12 months later.

It was intended that for the 2014 fire season the USFS would award a contract to Minden Air, but this has not materialised and the current status of Tanker 46 and another BAe 146 acquired by Minden for conversion (N556MA c/n E2106) is unclear at present.

CANADIAN CONTENDERS

Another firefighting contender comes from Canada in the shape of Conair, an Abbotsford, British Columbia-based firm contracted by many Canadian provinces and US states to fight fires with its fleet of Convair 580s, single engine airtankers (such

as the AT-802F and amphibian Fire Boss) and a Lockheed Electra.

Conair also has a long history of converting aircraft into tankers for customers in Canada and France. At the end of 2011, it announced its future tanker would be based on the Avro RJ85. The first, Tanker 160 (N839AC, c/n E2270), took its maiden flight on September 11, 2013. The company chose an external conformal underbelly tank, as it did for its two Bombardier Dash 8-Q400-MR Fireguards in service with France's Sécurité Civile.

With a full capacity of 3,300 US gal (12,492lit) and a constant flow drop system, the RJ85 became fully operational at the end of July 2014 when Tankers 160 and 161 (N354AC, c/n E2256) gained their supplemental type certificate approval. Tanker 162 (N355AC, c/n E2293) was delivered in late 2014.

The RJ85s modified by Conair are used by subsidiary Aero-Flite of Spokane, Washington state, which has a history of using Canadair water scoopers, notably under a Minnesota state contract. During the 2014 fire season, Aero-Flite was awarded a USFS 'next-gen' contract for Tankers 160 and 161.

For the second year running, the Australian state of Victoria has contracted two large airtankers. Along with Coulson C-130 Tanker 131 (N130FF), RJ85 Tanker 162 has made the trip down to Australia following a successful debut in 2014.

Initially based at Avalon Air Base, Victoria, last year Tanker 162 was dispatched to Perth in Western Australia, Edinburgh in Adelaide, South Australia and Tasmania. The RJ85 fought fires in all terrain and returned to the US in March after a successful mission 'down under'.

Ray Horton, a Conair airtanker pilot for more than 30 years and Tanker 162's captain in Australia, explained: "As expected, the RJ85 has adapted to its new role extremely well. The handling characteristics and performance of the tank/airplane ▶

Right: This image highlights the additional nozzles added forward of the main landing gear added to Neptune Aviation's 146s after initial operations. Martin Cooper





Above: **Tanker 10 was the first Neptune aircraft equipped with the 'REV3' system, with two additional drop nozzles forward of the main landing gear. The modification significantly increases the retardant coverage and reduces the structural strain on the airframe.**

J Brecht via Neptune Aviation

Below: **One of the BAe 146s Air Spray USA has modified at its facility in Chico, California. The company expects to have two aircraft available for this year's fire season.** Author



combination have come through as expected and allowed it to become an excellent airtanker."

In 12 weeks of operations, Tanker 162 and Tanker 131 conducted 81 drops.

The latest BAe 146 tanker project also comes from a Canadian company, Air

Spray, which created a subsidiary in Chico, California. Using the former Aero Union facilities at California Regional Airport, it began modifying two BAe 146-200s in 2013 with 3,000 US gal (11,356lit) constant flow tanks. The company is planning to have two aircraft available for the 2016 fire season and

has acquired a further three airframes for conversion.

The jets will succeed Air Spray's fleet of ten Lockheed L-188 Electras on seasonal firefighting contracts with Alberta, British Columbia, Northwest Territories and the Yukon states in Canada – and sometimes California, too.

With an increasing fleet in service and with the USFS agreement, it seems the BAe 146 and the RJ85 have proven themselves worthy airtankers.

Currently 16 out of 22 large airtankers in the USA that are earmarked for six-year 'Call When Needed' contracts by the USFS are BAe 146/Avro RJs. In addition, eight of the 14 next-gen airtankers contracted for Exclusive Use by the USFS are BAe 146s (Neptune with four) and RJ85s (Aero-Flite with four). So the aircraft has really made its mark.

This is enhanced by the support of BAE Systems Regional Aircraft at Prestwick in Scotland as the Original Equipment Manufacturer (OEM). From the outset the involvement of BAE Systems in a supportive role and with specialist engineering expertise has been very important to the US Federal authorities.

While the individual conversions and their designs are very much the work of the airtanker companies and their chosen contractors, BAE Systems has made itself available to provide specialist expertise to help the companies create what have proved excellent airtankers out of the BAe 146-200 and Avro RJ85.

With Conair, BAE Systems analysed the structure and aerodynamic shape of the external wrap-around tank design it chose for the RJ85 and supplied a pilot to help them assess what turned out to be a remarkably benign aerodynamic effect on the aircraft.

The company is also working closely with Air Spray on its conversions and is providing design and engineering services including aerodynamic and computational fluid dynamics analysis; dynamic loads assessment and structural analysis.

A fire bomber's life is not an easy one but this British jetliner is well suited for the job. **AN**

Below: **Aero-Flite's Tanker 161 on short final approach to Runway 16 at Redding Municipal Airport, California. The firm operates RJ85s converted by Conair.** Martin Cooper



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SEA KING SALUTE

Tim Ripley
looks at the
Westland Sea
King in UK
military service.

Westland's Sea King helicopter must be one of the few aircraft to warrant the tag 'iconic'.

The helicopter has been at the centre of almost every British military operation since the first example entered service in 1969. However, variants are being retired and the end is in sight for the famous Sea King in UK military service.

Britain's Sea Kings look superficially similar to the original Sikorsky SH-3s that first flew in the US in 1959. The Royal Navy immediately saw the potential of the new design but wanted several improvements, centred on replacing the American General Electric T58 engines with two Rolls-Royce Gnomes, as well as a whole host of UK-supplied avionics and other components. The result

was a more powerful, capable and effective helicopter.

The Royal Navy eventually ordered just over 150 new-build Sea King helicopters during the 1960s and 1970s, with the first variants entering service in 1969. The Fleet Air Arm was first interested in employing the helicopter in the anti-submarine role, equipped with a dipping sonar, sonar buoys and

Left: **Two Sea King HC4 'Junglies' fly over the barren Afghanistan landscape while deployed in support of Operation Herrick.** Crown Copyright

Right: **A Royal Navy Sea King HU5 from 771 NAS at RNAS Culdrose flies low over a beach. Search and rescue was one of the most high-profile roles carried out by the Sea King.** Crown Copyright

torpedoes. The first version was designated HAS1 and had the Ecko AW 391 search radar, Plessey 195 dipping sonar and could be armed with Mk.44 and Mk.46 torpedoes. Later versions were the HAS2, HAS5 and the ultimate sub-hunter variant, the HAS6. The HAS5 and HAS6 were equipped with the MEL/Thorn-EMI ARI 5991 Super Search radar, Plessey 2069 dipping sonar, CAE AN/ASQ-504(V) magnetic anomaly detector (MAD), could drop sonar buoys and be armed with Mk.44, Mk.46 and Stingray torpedoes. Some one-hundred anti-submarine Sea Kings entered service and many were rebuilt or upgraded over their careers.

Forty-two HC4 Commando or support helicopter variants were built, intended for carrying Royal Marines during amphibious operations. The variant entered squadron service in 1979.

The most high-profile variant of the Sea King is the HAR3/3A, which were purpose-designed for SAR operations by the RAF. Their yellow paint schemes became famous in numerous rescue missions over the years.

One of the most significant Sea King variants is the airborne early warning (AEW) model. The Falklands War led to conversion work starting in April 1982 to produce the AEW2 to help provide protection to the fleet from Argentine air attack. The new variant embarked HMS *Illustrious* when it headed south to the Falklands in June, however the war was over before the ship arrived.

Nine AEW2s were produced and fitted with Thorn-EMI ARI 5930/3 Searchwater radars attached to the helicopter's fuselage on a swivel arm and protected by an inflatable dome, hence the nickname 'Baggers'. The original four helicopters, plus an extra example, were converted to AEW5 standard. Some 13 Sea Kings have been modified to the current ASaC (Airborne Surveillance and Control)7 variant. The ASaC7s have the Thales Searchwater 2000 radar and Cerberus mission system.



FALKLANDS WAR

The invasion and occupation of the Falkland Islands in March 1982 prompted the British Government to launch a counter-offensive to recapture the South Atlantic islands. A Royal Navy task force of more than 30 warships and dozens of support vessels was dispatched to the South Atlantic, with almost every helicopter the Royal Navy could muster on their flight decks.

As the Fleet Air Arm's newest and most powerful helicopters, Sea Kings were at the forefront of Operation Corporate. Some 48 Sea Kings – 15 HAS2s, 18 HAS5s and 15 HC4s – were mobilised, as well as their most famous pilot, a 22-year old Lieutenant, HRH Prince Andrew, now the Duke of York.

The anti-submarine warfare Sea Kings on the task force's two carriers were airborne around the clock throughout the campaign to keep the Argentine Navy's diesel powered submarines at bay. The Sea Kings of 826 Naval Air Squadron (NAS) worked from the task force flagship HMS *Hermes* and 820 NAS, including Prince Andrew, flew from HMS *Invincible*. The British anti-submarine warfare (ASW) screen had several contacts with the Argentine submarine *San Luis* as it tried to get close to British warships. Two ASW Sea Kings were lost on these operations, which were later expanded to flying airborne radar decoys to divert Argentine Exocet anti-ship missiles.

Some 15 Sea King HAS2s were used by 824 and 825 NAS as utility helicopters on Royal Fleet Auxiliary (RFA) support ships and

merchant ships taken up from trade, including the liner *RMS Queen Elizabeth 2*.

The most high-profile Sea King unit of the Falklands War must be 846 NAS, which flew the HC.4 variant on some of the most daring Special Air Service (SAS) missions in British military history. SAS troops were landed on Pebble Island by 846 NAS and a large force of SAS men and Royal Marines were flown in a daring night-time raid to seize Mount Kent from Argentine troops. One of the squadron's helicopters was destroyed in Chile during an abortive mission to land an SAS team on the Argentine coast to attack an airfield. Two others were lost in accidents, one of which led to the death of 21 SAS men and naval aviators.

TO IRAQ AND KURDISTAN

When Kuwait was invaded by Iraqi troops in August 1990, the British Government dispatched more than 40,000 troops to be part of the international coalition gathering in the Middle East to confront Saddam Hussein's army.

The British Army's 1 (UK) Armoured Division was placed under US command for the assault to surround and destroy the Iraqi occupation force in Kuwait, which kicked off in the last week of February 1992. To assist this tank attack, the RAF and Royal Navy set up a Support Helicopter Force combining RAF *Aérospatiale Puma* HC1, RAF *Boeing Chinook* HC2 and Sea King HC4s of 845 NAS and 846 NAS. All these helicopters worked behind the advance, moving up supplies and personnel, as well as evacuating the wounded.

In the aftermath of the defeat of the Iraqis in Kuwait, a humanitarian disaster unfolded in the mountains of Kurdistan astride the Turkish-Iraqi border. Hundreds of thousands of Kurdish civilians fled Iraqi troops and an international force was dispatched to rescue them. American and British Marines moved into the mountains to set up a 'safe haven' for the Kurds. The ships carrying 845 and 846 NAS' helicopters back to the UK from Kuwait were diverted to Turkey and within days they were flying Royal Marines of 3 Commando Brigade into Kurdistan. In the face of overwhelming force, the Iraqis backed down without a shot being fired. ▶



Sea King HAS2 XV655 displays the original blue scheme worn by the Royal Navy's helicopters prior to adopting grey for the ASW variants. Peter Foster



A man is winched to safety from a 'flooded' caravan by the crew of an RAF Sea King HAR3 during Exercise Berwyn at Bala Lake in North Wales. Crown Copyright



A Harrier GR9 launches from HMS Ark Royal with a Sea King ASaC7 hovering in the background. POA(Phot) Ray Jones/Crown Copyright

BALKAN RESCUES

In the new world disorder of the 1990s, it was only a matter of time before Commando Sea King squadrons were back in action. The disintegration of the former Yugoslavia in 1991 and 1992 led to the establishment of the United Nations Protection Force (UNPROFOR) to deliver humanitarian aid to Muslim enclaves besieged by Serbian forces.

In the autumn of 1992, the British Government dispatched the Cheshire Regiment to Bosnia to escort aid convoys into the heart of the war-torn country. To provide casualty evacuation support for the British contingent, 845 NAS was deployed to

the Croatian port of Split to set up a forward operating base at a former Yugoslav army base. Divulje Barracks was soon nicknamed Naval Air Station Banana Split by the aviators of 845 NAS after the children's television show.

However, their mission was deadly serious and within weeks the squadron's four Sea King HC4s were venturing deep into Bosnia to rescue wounded British and United Nations soldiers. As the war worsened, the Sea King crews were increasingly called upon to pick up badly wounded civilians and air-lift them out for treatment away from the fighting.

One of 845 NAS's most dangerous missions took place in March 1993 when senior UN officers travelled into the besieged enclave of Srebrenica to arrange for ceasefire to be put in place to allow thousands of desperate civilians to escape. British Sea Kings flew in along with French Army Pumas to bring out the first batch of refugees when Serb artillery opened fire on the landing zone. Several civilians were killed and wounded and the UN helicopters only just managed to get airborne and escape.

Over the next two-and-half years, day in, day out, the Sea King crews stood on alert at



Two 845 NAS Sea King HC4s fly in close formation over the Norwegian Arctic during a training exercise. Crown Copyright

Divulje and at Gornji Vakuf in central Bosnia for casualty evacuation missions. When the crews got the call, it invariably involved being shot at or lifting wounded people from minefields. One of these missions involved a Sea King hovering in a narrow gorge under artillery fire to winch up a badly wounded civilian. The crews of 845 NAS took turns to sustain the detachment at Divulje Barracks while, at the same time, its sister unit 846 NAS took on the burden of sending crews to Northern Ireland (and routine exercises in Norway). The HC4s undertook ongoing detachments in Northern Ireland for many years, including at the height of the Troubles, carrying soldiers and supplies in support of Operation Banner.

The mission of 845 NAS changed in December 1995 from UN peacekeeping to peace enforcement under the flag of NATO's Implementation Force (IFOR). During the first days of 1996, the expanded British contingent moved into northwest Bosnia to separate Bosnian, Croat and Serbian forces. After repainting its helicopters in green and white tiger stripes, 845 NAS flew into Bosnia to support the IFOR troops as they moved forward. In a dramatic show of force to intimidate the warring factions into standing down, the Sea Kings air-lifted Royal Artillery 105mm Light Guns and their crews into frontline positions.

NATO's intervention succeeded in bringing peace to Bosnia, but this did not mean the Royal Navy's Sea King HC4s could come home. They stayed in place in Bosnia until 2005 supporting NATO and then European Union peacekeeping troops.

OPS TELIC, HERRICK AND ELLAMY

Even before its Balkan mission was over, the Commando Helicopter Force (CHF) was mobilised for another campaign, this time in the Middle East to spearhead the invasion of Iraq.

Virtually all of 3 Commando Brigade, backed by ten Sea Kings of 845 NAS embarked on HMS *Ocean* and HMS *Ark Royal*, sailed into the Arabian Gulf. In March 2003, the assault force went ashore on the Al Faw Peninsular to seize Iraq's main offshore oil pumping stations. Flying in formation with RAF Chinooks HC2s, 845 NAS's Sea Kings landed hundreds of Royal Marines on to 'hot' landing zones in the face of fierce resistance from Iraqi troops.

Over the next month, the Royal Marines advanced towards the city of Basra, fighting through palm groves along the Shatt al-Arab waterway.

Watching overhead were Sea King ASaC7s of 849 NAS, who were using their Searchwater 2000 radars to detect Iraqi tanks massing to counter attack. Onboard controllers passed this vital intelligence to the Marines on the ground or vectored UK and US strike jets and attack



Sea King HAS6 ZA135 lifts off from RNAS Culdrose. The HAS6 was used in the anti-submarine role. Key Collection

helicopters to engage the targets. Seven crewmen were killed when two of 849 NAS' helicopters collided over the Gulf, the biggest loss to hit the Sea King force since the Falklands.

The CHF then found itself committed to support the British occupation force in southern Iraq for the next four years. At first it carried troops and rescued wounded soldiers but the Sea King detachment at Basra Airport was soon equipped with a new video surveillance system (using a L-3 WESCAM MX-15 electro-optical infrared turret) dubbed Broadsword which enabled the helicopter to monitor ground activity at day or night. Broadsword proved its worth in September 2005 when two SAS men were seized by rogue police in Basra. A Sea King was able to use its cameras to track the hostage-

takers and passed on the information to an awaiting rescue force that was able to free the captured soldiers. Both 845 and 846 NAS took turns to provide six-month-long detachments at Basra through to the autumn of 2007. At its peak in 2005 and 2006, ten Sea King HC4s were based in Iraq.

The rundown of the Iraq campaign in 2007 did not mean the CHF would be given a break from operations. The Afghanistan campaign, Operation Herrick, was escalating dramatically during 2007 with heavy fighting across Helmand province and British troops were in combat on daily basis.

A Sea King detachment was soon established at Camp Bastion, alongside RAF and Army Air Corps helicopters to support British forces, as well as US, NATO and Afghan allies. Again, both the Sea

King HC4 squadrons took their turns over the next four years and were in the thick of the action on a daily basis flying troops and vital supplies to remote outposts. The hot and high conditions were a real challenge for the veteran Sea King, even when fitted with the new composite Carson blades, but the navy helicopters filled a vital gap carrying small contingents of troops on distinct operations.

In May 2009 the Sea King ASaC7 squadrons had the opportunity to bring their capabilities to bear in the fight against the Taliban by monitoring the huge Helmand desert for suspicious activity. On a daily basis the 'Baggers' would fly from Camp Bastion and use their Searchwater 2000 radar to detect Taliban supply columns moving north from Pakistan. Then the navy crews would task helicopter-borne reaction forces to fly out to intercept the enemy. To help with the challenging conditions in Afghanistan four sets of Carson rotor blades were purchased and five-blade tail rotors replaced the six-blade examples.

By using the radar-equipped helicopters to monitor the open flank of Task Force



Two Royal Marines take cover as a Sea King HC4 from 845 NAS hovers low overhead ready to pick up an underslung load during an exercise in Jordan. Crown Copyright

ROYAL NAVY AND ROYAL AIR FORCE SEA KING UNITS AND HOME BASES, 1969-2018

Royal Navy

RNAS Culdrose

700S Naval Air Squadron (1969-1970) HAS1
 706 Naval Air Squadron (1970-1998) HAS1, 2, 5
 771 Naval Air Squadron (1988-2015) HU5
 810 Naval Air Squadron (1983-2001) HAS5, 6
 814 Naval Air Squadron (1976-2000) HAS1, 2, 5, 6
 820 Naval Air Squadron (1972-2003) HAS1, 5, 6
 824 Naval Air Squadron (1970-1989) HAS1, 2, 5, AEW2
 825 Naval Air Squadron (1982) HAS2, 2A
 826 Naval Air Squadron (1970-1991) HAS1, 2, 5, 6
 849 Naval Air Squadron (1984-2018) AEW2, 5, ASaC7
 854 Naval Air Squadron (2006-2018) ASaC7
 857 Naval Air Squadron (2006-2018) ASaC7

RNAS Yeovilton – Commando Helicopter Force

707 Naval Air Squadron (1983-95) HC4
 845 Naval Air Squadron (1979-2015) HC4, HAS6(CR)
 846 Naval Air Squadron (1979-2013) HC4, HAS6(CR)
 848 Naval Air Squadron (1991, 1995-2013, 2015-2016) HC4, HAS6(CR)

HMS Gannet, Glasgow Prestwick Airport

814 Naval Air Squadron (1973-1976) HAS1, 2, 2A, 5, 6
 819 Naval Air Squadron (1971-2001) HAS1, 2, 5, 6
 HMS Gannet SAR Flight (2001-2015) HU5

RNAS Portland

737 Naval Air Squadron (1970-1975, 1982-1983) HAS1
 772 Naval Air Squadron (1988-1995) HC4

Royal Air Force (HAR3/3A)

RAF Finningley

HQ SAR Wing (1978-1996)
 HQ 22 Squadron (1978-1996)
 HQ 202 Squadron (1978-1992)

RAF Valley

HQ SAR Force (2008-2015)
 HQ 202 Squadron (2008-2015)
 'C' Flight 22 Squadron (1997-2015)

RMB Chivenor*

HQ 22 Squadron (1997-2015)
 'A' Flight 22 Squadron (1994-2015)

Wattisham Flying Station*

'B' Flight 22 Squadron (1994-2015)

RAF Boulmer

HQ 202 Squadron (1992-2008)
 'A' Flight 202 Squadron (1978-2015)

RAF Brawdy

'B' Flight 202 Squadron (1978-1994)

RAF Coltishall

'C' Flight 202 Squadron (1979-1982, 1985-1988)

RAF Manston

'C' Flight 202 Squadron (1988-1994)

RAF Mount Pleasant, Falkland Islands

'C' Flight 202 Squadron (1982-1983)
 1564 Flight (1983-2016) (part 78 Squadron 1986-2007)

RAF Lossiemouth

'D' Flight 202 Squadron (1978-2015)

RAF Leconfield

'E' Flight 202 Squadron (1988-2015)

RAF St Mawgan

HQ SAR Force (1992-2008)
 HQ 22 Squadron (1994-1997)
 203 (Operational Conversion Unit) Squadron (1996-2008)

RNAS Culdrose

RAF Sea King Training Unit (1978-1993) HAR3

Notes: RMB Chivenor was previously RAF Chivenor, while Wattisham Flying Station was formerly RAF Wattisham.

Helmand, British commanders were able to free up hundreds of troops who would otherwise have had to be sent to patrol the desert region. The importance of the Sea King ASaC7s to Operation Kindie, as the interdiction mission was codenamed, was signified by the fact that the 'Bagger' squadrons were kept in Afghanistan right

up to almost the end of the British mission in Helmand in the summer of 2014. Each of the three ASaC7 squadrons took their turns to operate in Helmand during the campaign, serving four-month-long deployments.

This deployment pattern was interrupted in 2011 by the Libya campaign, which saw the

ASaC7 squadrons having to simultaneously sustain its Op Herrick commitment and deploy helicopters on board HMS *Ocean* in the Mediterranean.

Operation Ellamy, as the Libya campaign was codenamed saw the Baggers prove their effectiveness yet again, not only providing airborne early warning and surface

Seven Sea King HU5s from 771 NAS at RNAS Culdrose in formation over St Michael's Mount at Marazion, near Penzance. Crown Copyright



surveillance for the Royal Navy task force off the Libyan coast, but also identifying ground targets for allied air forces to attack. The ASaC7 crews teamed up with Army Air Corps Apache AH1 attack helicopters embarked on HMS *Ocean* to launch night-time strike missions against Libyan tank columns deep inland.

The effectiveness of the ASaC7s in the Libya operations was a major factor in securing funding to develop a successor system, known as Crowsnest, for AgustaWestland Merlins that will be embarked on the new Queen Elizabeth Class aircraft carriers.

UK SAR FORCE

Perhaps the most high-profile role of the Westland Sea King has been SAR around the UK. Although the original justification for the establishment of the military SAR force around the country was to recover downed military aviators, it increasingly became used for the rescue of civilian mariners in trouble at sea, mountaineers lost in remote areas or dramatic interventions during large-scale natural disasters.

The Royal Navy Sea Kings augmented the Wessex in the SAR role when extra range was required on a mission. The first Sea King HU5 to take over fully from the Wessex stood SAR alert from April 1988.

Fleet Air Arm crews had responsibility for the South West and South Coast from RNAS Culdrose in Cornwall and also stood alert to cover the southwest of Scotland and surrounding area from the HMS Gannet base at Prestwick airport.

The yellow-painted Sea Kings of the RAF SAR Force covered Wales, northern Scotland and the east coast of England. The RAF first Sea King HAR3s entered service in 1978 with 19 delivered in all. For their SAR role they were fitted with the MEL ARI 5955 search radar. Six more Sea Kings were purchased and were designated HAR3A. The main difference was they had more modern cockpit avionics as well as an improved MEL ARI 5955/2 search radar and a better navigation radar. The first of these variants entered service in 1996.

For more than 30 years the military SAR crews stood alert duty 24/7 to scramble to rescue people in distress. Over this time, several high profile operations defined them as calm professionals, who regularly saved several hundred lives each year.

The 1979 Fastnet disaster was the first large-scale rescue operation involving Royal Navy Sea Kings when the famous yacht race was hit by force 10 winds and mountainous seas. Culdrose mobilised its Sea King force to pick up scores of survivors from life rafts or rescue others from overturned yachts.

For the RAF SAR Force, the biggest test came in 1988 when the *Piper Alpha* oil platform exploded in the North Sea. Sea Kings from RAF Lossiemouth and Boulmer and Coastguard Sikorsky S-61s winched dozens of men from the sea as the oil



Royal Navy Sea Kings prior to departure from RNAS Yeovilton in November 1992. Four helicopters embarked RFA *Argus* bound for Bosnia where they operated with UNBRITFOR in the casualty evacuation role. The fifth example was an air spare. Key Collection

platform burned a few hundred yards away.

The Royal Navy SAR Sea Kings used the MEL Sea Searcher radar, mounted above the cabin behind the rotor hub, to locate their 'target' of interest.

Under a \$12m contract awarded in 2001, the RAF's Sea Kings were fitted with FLIR Systems' Star-Q multi sensor system, which comprises of a thermal imaging system and a daytime TV camera. The Royal Navy's HU5s became operational with FLIR Systems' Star SAFIRE III electro-optical/infrared turret in September 2009.

The Sea King was in the news again when seven RAF and RN helicopters plucked 150 stranded people from the roofs of houses and cars when the Cornish village of Boscastle was engulfed by flash floods in 2004. Dramatic video footage showed the streets being turned into rivers. Helicopters from Culdrose and nearby RMB Chivenor were on the scene in minutes and began lifting people to safety. A small team of RAF officers arrived to co-ordinate the rescue with the police and make sure a flow of helicopters kept arriving over the town. Miraculously, everyone in danger was lifted to safety by the Sea Kings.

Three years later, when large areas of the west of England were submerged by

flooding, the RAF SAR Force was mobilised again and set about rescuing those cut off by the deluge, recovering 120 across the country. At the height of the floods, iconic television imagery showed RAF Sea Kings saving people from farmhouse roofs within sight of Tewkesbury Abbey. The fame of the RAF SAR force was further enhanced when HRH Prince William served an operational tour as a Sea King pilot with 'C' Flight of 22 Sqn at RAF Valley, Anglesey, in 2010.

RETIRING THE SEA KING

The Royal Navy and RAF have been looking to retire their Sea Kings since the mid-1980s when the project to develop the Westland Merlin started. The first to be replaced were the anti-submarine Sea King HAS6s squadrons, which traded in their veteran helicopters for Merlin HM1s between 1989 and 2003. Five surplus ASW HAS6s were converted to HAS6(CR) standard for the utility role and used by the CHF. This variant entered service in 2004 and was retired in 2010.

The original plan was to replace the SAR Sea Kings with helicopters purchased with private finance but operated partly by military crews. The 2010 Strategic



The FLIR Systems' Star-Q multi sensor system turret can be seen inboard of the left sponson. Crown Copyright



Above: **The Sea King ASaC7 will be the last in UK service, with a scheduled retirement date of 2018.** Crown Copyright



Above: **RAF Sea King HAR3A ZH544 performs a low flyby at RMB Chivenor during a media event marking the type's retirement from UK SAR duty.** Chivenor's 22 Sqn 'A' Flt was the last RAF SAR unit to stand down. Key-James Ronayne

Below: **The sun-kissed mountains of Helmand Province provide a stunning backdrop to this Sea King HC4 while on an Operation Herrick mission.** Crown Copyright



Defence and Security Review put an end to this idea and set out to completely end military involvement in UK SAR operations.

Two RAF SAR bases closed on April 1 last year as part of a phased process to handover to a civilian operator, when the detachments of 202 Sqn at RAF Lossiemouth in Moray and RAF Leconfield in Humberside stood down. No.202 Sqn's 'A' Flight at RAF Boulmer, Northumberland, closed on October 1 and its sister unit, 22 Sqn, shut its rescue detachments at RAF Valley (July 1), Wattisham Flying Station in Suffolk (August 13) and RMB Chivenor in Devon (October 4).

Bristow Helicopters-operated Sikorsky S-92 and AgustaWestland AW189 helicopters have taken over the role.

The final military SAR in the UK was provided by the Royal Navy at RNAS Culdrose and at Prestwick which both stood down at 00:01hrs on January 1, 2016. The last Sea King HU5 will be retired in March this year.

Down in the Falkland Islands, 1564 Flight will continue to provide SAR cover with Sea King HAR3s until the end of March.

As this drawdown was under way, the CHF was also in the process of handing in its Sea King HC4s and taking on charge ex-RAF Merlin HC3/3As at RNAS Yeovilton. The final unit operating the HC4, 848 NAS, will retire the type on March 31 this year.

The last nine Sea King ASaC7s have been extended in service until 2018 to provide airborne early warning coverage for the Royal Navy's new Queen Elizabeth Class aircraft carriers.

MIGHTY HELICOPTER

With the sun setting on the operational life of the Westland Sea King, its contribution to British military operations in a career lasting over four decades can be assessed. Without a doubt, Britain's Sea Kings have been the 'essential helicopter' from the Falklands to the mountains of Bosnia, the deserts of Iraq to the badlands of Afghanistan. Its rescue work around the UK will live long in the memory. Personnel from the RAF and Royal Navy's Sea King squadrons can march off parade when the last of the helicopters retire, proud of a job well done. **AN**

The World's Sixth Sense™

FLIR Systems is proud to be associated with the long history of service of the Sea King helicopter.

Sea Kings first entered service with the Royal Navy in the late 1960s. In addition to deployment on 4 aircraft carriers, 2 Tiger Class cruisers and Royal Fleet Auxiliaries, they replaced the Wessex as the standard Commando helicopter. The Sea King played a pivotal role in the Falklands conflict in Commando, Anti-Submarine, Search and Rescue and replenishment roles, and via an Urgent Operational Requirement, as an Airborne Early Warning & Control variant (known as 'Baggers' due to its inflatable radome).

Electro-optical and Infrared (EO/IR) imaging is an essential tool to support SAR services. Although FLIR supported UK SAR services with turrets fitted to the Sikorsky S-61, FLIR's initial involvement with the Sea King was in 2003 when the FLIR Star-Q® was selected to equip the RAF fleet of 22 Sea King Mk111s. The availability of IR transformed the capability of the aircraft, particularly at night. Involvement increased with the selection of the FLIR Star SAFIRE® III for Royal Navy SAR Sea Kings which also used the equipment for maritime counter terrorism (MCT).

FLIR's commitment to Sea King and SAR continued from that date, and FLIR is honoured to be associated with the transition of SAR services from military to civilian operation.

The change of philosophy towards privatisation and with the Sea King approaching the end of its life, resulted in a competition for which Bristow Helicopters was selected to provide the UK SAR service with a combination of Sikorsky S-92 and AgustaWestland AW189 aircraft.

Bristow selected FLIR's highest specification turret, the Star SAFIRE® 380-HD, for all its new UK SAR aircraft. In addition to the best multispectral sensors available, Bristow selected the MERLIN™ video analytics tool. MERLIN™ recognizes and highlights moving objects at pixel level based on user-configurable parameters, providing wider fields of view with better detection rates. Aircraft can then cover more area faster and from greater altitude for safer, more effective operations. Operators are automatically alerted, even if the objects are as small as a single pixel.

SAR operations were not limited to the UK. Since the 1982 conflict, the RAF has maintained a Sea King SAR capability on the Falkland Islands. With Sea Kings leaving service in 2016, a separate competition was launched for the provision of SAR services on the Falkland Islands,

won by the team comprising AAR Airlift and British International Helicopters. The service will be provided by AgustaWestland AW189 SAR and Sikorsky

S-61 helicopters. The FLIR Star SAFIRE® 380-HD turret was selected for these aircraft.

An independent audit of UK SAR operations showed that FLIR achieved 99.95% operational availability. Both Bristow in the UK and AAR in the Falkland Islands have committed to similarly high levels of availability. A modern SAR aircraft is unserviceable without its EO/IR sensor.

Accordingly, FLIR has contracted to meet these onerous availability requirements, on a 24/7, 365 days per year basis.

FLIR is both honoured and proud to continue its supply and support of EO/IR sensors in support of both the UK and Falkland Islands' SAR programmes. In addition, FLIR will be looking to resurrect its annual trophy for Outstanding SAR Achievement. FLIR would strongly support the trophy being awarded to civilian recipients in future and looks forward to supporting with Bristow and AAR/BIH to achieve this.



Flight Bag

The latest products for the discerning aviation enthusiast

DOUGLAS DC-3 – 80 GLORIOUS YEARS

Book

Written by: Geoff Jones

Price: £20

Early on in his narrative, Geoff Jones mentions the plethora of DC-3 and C-47 books published over the years, taking the 80th anniversary of the type's first flight in 1935 as his reason for writing another. In fact, he has succeeded in providing a modern perspective on an aircraft that remains in commercial service and is still an economically viable subject for upgrade.

Alongside a comprehensive history of the DC-3, from its DC-1 origins and including a brief look at the even larger military C-47 story, Jones details the various turbine conversions that have helped ensure the DC-3's longevity. He also looks at the surviving aircraft, in service with civilian and military organisations, flying as warbirds and in museums.

The book is comprehensively illustrated and every photograph has an informative caption. An expansive set of colour plates carries 70 beautifully reproduced archive and contemporary photographs, showing original and restored aircraft, as well as some that have never taken a break from flight. The remainder of the photographs are in black and white, but equally well reproduced.

Detailed lists of operators and registrations complete a delightful volume on an endlessly fascinating aircraft in a story that continues to unfold.

Published by Fonthill Media; ISBN9781781551035 and is available from www.fonthillmedia.com

THE WORLD'S GREATEST MILITARY AIRCRAFT – AN ILLUSTRATED HISTORY

Book

Written by: Thomas Newdick

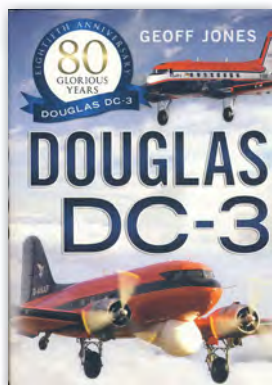
Price: £19.99

Fifty-two aircraft are covered in this 224-page book, each with a selection of artwork and a photograph. There are excellent colour profiles and plan views, and three-quarter 'action' views, almost all of them beautifully produced. The exceptions are some of the artwork for the F-22, Typhoon and F-35, which are of lower quality compared with the rest.

Given that author Thomas Newdick is assistant editor at *Combat Aircraft* and a respected authority on military aviation, the content is written to a predictably high standard, delivering as much detail as possible within the space available. He succeeds in telling enough of a type's story to satisfy the casual reader, while creating a useful primer for those looking to delve deeper from other sources.

If you're looking for easily accessible information on a range of important and fascinating military aircraft, this should be right up your street.

Published by Amber Books; ISBN9781782742630 and is available from www.casematepublishing.co.uk



DEVOTION – AN EPIC STORY OF HEROISM, BROTHERHOOD AND SACRIFICE

Book

Written by: Adam Makos

Price: £20

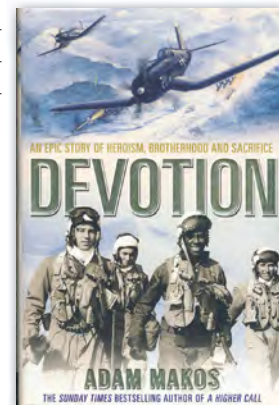
This story of Lt Tom Hudner and Ensign Jesse Brown is told with fantastic style.

Hudner and African-American Brown hailed from opposite ends of the social spectrum, at a time when segregation between white and black was commonplace in the US. Brown overcame deep prejudice to become the US Navy's first black carrier pilot, serving in VF-32 alongside Hudner, the two striking up a friendship that ultimately ended in tragedy.

Flying Vought Corsairs off the USS *Leyte* in combat missions over Korea the author's descriptions of VF-32's attack missions are enthralling, thanks to his extensive research, understanding of the subject and writing flair.

The entire work is rooted in thorough research as Makos not only produces a story about two fighter pilots, but also introduces their families, loves, losses and aspirations. It would be a shame to spoil the story, but suffice to say that Hudner and Brown deserve their place in the annals of the greatest military flying stories.

Published by Atlantic Books; ISBN9781782395744 and is available from www.atlantic-books.co.uk



PROJECT TECH PROFILES: HAWKER P.1103 & P.1121 – CAMM'S LAST FIGHTER PROJECTS

Book

Written by: Paul Martell-Mead and Barrie Hygate

Price: £11.95

The 1950s were exciting times for the British aerospace industry as high-performance prototypes and even more dramatic design concepts emerged from the nation's aircraft companies. With first-generation jets established in service, the industry and its military customers were looking towards practical supersonic performance. There was a dawning realisation that future combat aircraft would need to combine complex mission systems if they were to achieve success.

Created under the genius guidance of Sir Sidney Camm, Hawker's P.1103 and P.1121 designs were its vision of a Hunter follow-on, offering supersonic speed and boasting weapons systems comprising guided missiles and powerful radar. Neither aircraft made it to hardware, but this book makes excellent use of technical drawings and 'what-if?' artwork to portray them.

The majority of the photos illustrate mock-ups, components and models and there are drawings such as 1:144 scale plans. More plans and other material are available by registering at the URL included in the book.

The text is extremely detailed and the images are well captioned. The inclusion of sections on proposed powerplants, radar systems and weapons is particularly welcome and completes a worthy addition to the literature on post-war British aircraft design.

Published by Blue Envoy Press; ISBN9780956195159 and is available from blue.envoy.services@googlegmail.com



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The Editor reserves the right to edit all letters.



Blue Skies for the RAF

At last some good news for the RAF. The recent Strategic Defence and Security Review provided some much-needed cheer following the savage cuts implemented in the previous review of 2010.

The headline news was of course the decision to acquire nine Boeing P-8A Poseidon maritime patrol aircraft (MPA) to fill the gaping hole left by the scrapping of the Nimrod MRA4. Recent incidents have highlighted this embarrassing shortcoming in the military's capabilities as allied nations have been called upon to provide MPAs to help hunt for Russian submarines in UK waters. You'd like to think that as an island

nation, our requirement for an MPA platform would be obvious. At least steps have now been taken to rectify this. The decision to opt for the Poseidon came as little surprise to me. With UK service personnel having already gained experience on the platform, under the Seedcorn initiative, it made the decision a no-brainer in my mind.

Sentinel, which seems to have had the axe hanging over it for years, lives to fight another day, earning a stay of execution thanks to the invaluable service it has given on recent operations while the decision to retain 14 C-130Js to support special forces is also sensible, given its smaller size

LETTER OF THE MONTH

Welcome to the Aviation News incorporating Classic Aircraft letters page.

The writer of the Letter of the Month, Roger Edge, will receive three DVDs: *Pilot Diaries – F-105 Thunderchief*, *Magic of Flight – Boeing 757-200* and *Military Helicopters – Military Aircraft of the 20th Century*.

compared with the A400M making it more suitable for such missions.

Rupert Barnes,
Royal Tunbridge Wells

Cargo Developments



The article on Cargolux in the November issue illustrated the significant advances made in the airfreight business since Cargolux was formed, relating not just to the aircraft but also to the airports and to the freight handling facilities.

Some of the ways things used to be

are shown in the supplied photograph of Cargolux CL-44 TF-LLJ taken in January 1974 from the rooftop viewing area of the passenger terminal at Singapore Paya Lebar Airport, which was the international airport of Singapore until replaced by Changi in 1981.

One important feature that has been retained by Cargolux is the ability to load outside cargo – originally via the swing-tail of the CL-44 and later via the nose opening of the 747.

David Smith,
Leamington Hastings, Warwickshire

Lightning Visit

Having just read the January issue, my interest was piqued by the article 'Lightning Over Britain' and in particular the references to the Lightning F.2 and 2A. I was stationed in the 1970s at the Central Servicing and Development Establishment (CSDE) RAF Swanton Morley as a tech author maintaining the servicing schedules for the aircraft of the RAF.

Our team, part of Schedule

Maintenance Squadron, had the Lightning as part of our complement. We were tasked with the rewriting of the F.2 and F.2A schedule and as normal we would spend some time on a station finding out what the engineers would want to be included or altered.

Nos.19 and 92 Squadrons operated the Lightning F.2 and F.2A at RAF Gütersloh in West Germany, although at the time

its runway was being resurfaced and the squadrons were detached to RAF Bruggen, and that is where we caught up with them. We spent a week ironing out any problems they might have had and then returned to Swanton Morley to deliver the goods. It made a pleasant change to be 'abroad' instead of swanning around Britain.

Roger Edge,
Grantham



SUKHOI SUPERJET

RUSSIA'S RISING STAR

Aviation News Assistant Editor James Ronayne profiles the Russian regional jet with global ambitions.

Russia has a long and proud history when it comes to producing airliners. The latest is the Sukhoi Superjet 100, a regional aircraft with seating for up to 103 passengers and a 769cu ft (22m³) cargo capacity.

From the hot and high conditions of Mexico to the extreme freezing temperatures of the far east of Russia, the Superjet is slowly growing its reputation as a capable and comfortable airliner.

Designed and built by the Sukhoi Civil Aircraft Company (SCAC), a Sukhoi Aviation Holding and Finmeccanica-Alenia Aermacchi company, the prototype SSJ100 was rolled out from the company's Komsomolsk-on-Amur final assembly plant in September 2007, making its first flight on May 19 the following year.

In January 2011 the SSJ100 obtained its Interstate Aviation Committee AR Type Certificate in Russia and 11 months later the

Above: One of the Sukhoi Superjet's biggest success stories has been in Mexico with low-cost carrier Interjet. The airline has ordered 30 aircraft and uses them on domestic and international services.

SJI/Caliaro Luigino

SSJ100-95B (B for Basic) was awarded its Type Certificate from the European Aviation Safety Agency (EASA).

SCAC's original plans called for a family of three aircraft – a 60-seater, a 75-seater and a 95-seater. However, during development it was apparent that demand for the 60-seat variant had dried up and the idea was shelved. The 75-seat model met the same fate not long after SCAC delivered the initial SSJ100-95.

The type's first commercial flight took place on April 21, 2011 when launch customer Armavia flew EK-95015 (c/n 95007) from Zvartnots International Airport in the Armenian capital Yerevan, to Moscow's

Sheremetyevo International Airport.

The Superjet's darkest hour came on May 9, 2012 when 97004 (c/n 95004) crashed into the side of Mount Salak in Indonesia while conducting a demonstration flight with the loss of all 45 people on board. The final report from Indonesia's National Transportation Safety Committee said that, "there was no evidence that the aircraft had any system malfunction during the flight" and the crash was attributed to human error.

ITALIAN COLLABORATION

Sukhoi Aviation Holding and Italy's Finmeccanica Group signed a general agreement in June 2007, establishing a strategic partnership which resulted in SuperJet International (SJI) being formed. SuperJet International is 51% owned by Alenia Aermacchi and 49% by Sukhoi Aviation Holding and is based in Venice at Marco Polo International Airport. It



Below: Superjet RA-89010 was one of ten examples delivered to Aeroflot in 'light' configuration to bridge the gap before aircraft meeting the airline's full specification were handed over. SCAC

is responsible for marketing, sales and aircraft delivery in Europe, North and South America, Africa, Japan and Oceania.

Evgeniy Andrachnikov, SCAC's Sales Senior Vice President, told *Aviation News*: "We were looking for an international partner to inject expertise and knowledge and to also serve as our 'window' to the international market. The Italians were selected and by all means they are the right partners for us."

SuperJet International also provides worldwide logistical support for the Sukhoi Superjet 100 including training of pilots, technicians and cabin crew. It has facilities at Venice and Moscow with state-of-the-art simulators, a Cabin Emergency Evacuation Trainer and classrooms. Prospective pilots are put through 11 four-hour sessions on the simulator with a 90-minute pre-flight briefing and 30-minute debrief.

Once these sessions have been completed they undergo a check-ride in the simulator to gain their type rating.

DESIGN

During initial development, SCAC held regular meetings with airlines to discuss their requirements.

Two airliner variants of the Superjet are currently offered, the SSJ100-95B (Basic) and SSJ100-95LR (Long Range). The Basic model has a range of 1,645nm (3,048km)

at maximum passenger payload while the Long Range variant is capable of 2,470nm (4,578km). Both have a maximum cruise speed of Mach 0.81 and a maximum payload of 26,995lb (12,245kg).

Deputy Chief Designer Alexander Dolotovskiy told *Aviation News*: "The key feature of our aircraft is the combination of an unbeatable level of comfort and a high level of fuel efficiency. From the point of view of fuel efficiency, our aircraft is the best in the world for a 100-seater. That is thanks to the advanced aerodynamic design we applied to our aircraft and a good engine."

At the heart of the Superjet's design is a highly efficient wing boasting an aspect ratio of ten. While most regional jets feature winglets the Superjet doesn't – at least not yet.

"Winglets are usually installed on aircraft with lower aspect ratio wings," explained Dolotovskiy. "So if you already have a high aspect ratio wing you don't need to use them."

Despite this, SCAC has developed a winglet for the aircraft and Irish regional carrier CityJet has taken an option to retrofit them to its aircraft from 2017.

"We have that card in our pocket," explained the designer. "We can simply release it in the coming years to improve fuel efficiency."

The Superjet is the first 100-seat regional jet with a full fly-by-wire (FBW) system that has been designed to prevent the aircraft from exceeding its flight envelope. The manufacturer says the FBW system optimises handling, reduces flight crew workload, and maximises fuel efficiency.

The most obvious design feature in the cockpit is SCAC's decision to use sidesticks instead of the conventional control column. Dolotovskiy said the decision to use sidesticks was taken after consultation with airlines. Five large switchable LCD screens provide the pilots with data and an interface to the Thales avionics system and the aircraft is fitted with a centralised maintenance system (CMS) that records and analyses maintenance data and diagnoses any faults.

Cabin seating is five-abreast with 98 seats in a single class at a spacious 32in (81cm) pitch. Mexican low-cost carrier Interjet has opted for 93 seats with a larger 34in (86cm) pitch while the jet is capable of accommodating 103 seats with a 31in (79cm) pitch. At 7ft (2.12m) tall and 10ft 7in (3.24m) wide, the passenger cabin is one of the largest in its class. Spacious overhead luggage bins, which SCAC claims are the best in class, have also been incorporated, while the combination of low-maintenance LED lighting and large windows bring a bright and airy feel to the cabin.

Two toilets are provided as standard; one at the front and one at the rear with the latter tailored to the needs of passengers ▶

Left: **Gazpromavia was the launch customer of the Long Range variant.** SCAC/Alexander Popov





Above: **Five large LCD screens provide the pilot with data as well as an interface with the Thales avionics system and the aircraft is flown using sidesticks.** SCAC

Below left: **Interjet's fleet of Superjets are fitted with a high-end cabin designed by Italian firm Pininfarina. They feature 93 leather seats with a 34in pitch.** SJJ

Below right: **The spacious cabin of the Sukhoi Business Jet enables a variety of configurations to be installed.** SJJ



with reduced mobility and incorporating a baby-changing table. There is also a galley at each end of the cabin.

A host of changes including aerodynamic enhancements and weight reductions are being explored to improve efficiency. Last year SCAC revealed it was investigating a stretched version of the Superjet, seating up to 120 passengers for the 2020 timeframe.

POWERPLANT

PowerJet produces the SaM146 engine used by the Superjet. The company is a collaboration between French engine manufacturer Snecma and NPO Saturn of Russia.

PowerJet has produced the SaM146 with a 20% reduction in components compared

with similar engines, resulting in reduced operating and maintenance costs. It has also been designed with common right and left parts to reduce the spares requirement and allow engine interchangeability.

SCAC says the latest third-generation Full Authority Digital Engine Control (FADEC) optimises performance and reduces fuel consumption.

The SSJ100-95B is fitted with the SaM146-1S17 engine offering 15,400lbf take-off thrust while the SSJ100-95LR is powered by the SaM146-1S18 offering 5% more take-off thrust at 16,100lbf.

PRODUCTION

Assembly of the Superjet takes place at SCAC's Komsomolsk-on-Amur facility

in the extreme far east of Russia. Once assembled, the aircraft is flown to Ulyanovsk to have the interior fitted and for painting before heading to Zhukovsky where it undergoes ground- and flight-testing prior to delivery. The exception to this is some aircraft that are destined for select Western customers. These airframes are flown from Komsomolsk-on-Amur to Zhukovsky for flight-testing before heading south to Venice where they are fitted out, painted and tested by SJJ.

Six prototypes were produced between 2007 and 2010 with five serial aircraft built in 2011. Since then Komsomolsk-on-Amur has produced 25 aircraft in 2013 and 37 in 2014 with production capacity at the plant currently standing at 60 aircraft a year. That



SuperJet International carries out cabin-fitting and painting of the aircraft destined for Interjet and select other Western customers at its facility at Venice Marco Polo Airport. Key-James Ronayne

rate is set to rise as SCAC invests in labour and the facilities as well as increasing productivity and optimising its processes.

SUKHOI BUSINESS JET

The business aviation market is another area being targeted by SCAC. One Sukhoi Business Jet (SBJ) is already in operation in Russia and a sub-completion line is being introduced in Venice for the international market.

Andrachnikov explained: "In the business jet market you always look at the range, size and the price. In those terms we are a unique product. The size of the fuselage provides significant room for creativity. You can fit a full-size bedroom in the aft section and a shower with a glass door.

"At the same time, it is quite affordable for a business jet compared with our close competitors."

OPERATORS

Aeroflot signed a contract for 30 SSJ100s in 2005 but, after further consultation, decided it wanted to improve the specifications of its order. To avoid delivery delays, the carrier and SCAC agreed the first ten aircraft would be delivered in 'light' specification before being replaced by jets meeting the new, 'full' requirements.

The latter includes an upgraded Flight Management System (FMS) and weather radar equipped with a wind direction detection function. It also features additional video control cameras, separate lighting controls for both Economy and Business Class and another galley. There is also space to fit a baby cot.

Aeroflot received its first 'light' SSJ100 on June 6, 2011. The first jet meeting 'full' specification was handed over on May 31, 2013 and all ten of the 'light' jets originally

delivered had been replaced by the end of June the following year. Aeroflot currently operates a fleet of 22 SSJ100s on domestic and European routes.

One of the type's biggest success stories has come in Mexico with Interjet. The airline signed a deal for 15 aircraft plus five options in 2011. The options were converted at the 2012 edition of the Farnborough International Airshow with another ten options taken during the ALTA Airline Leaders Forum in Panama in November that year.

The first two aircraft performed their first revenue flights on September 18, 2013. Interjet uses the SSJ100s on its domestic network from Mexico City to Torreón, Aguascalientes, Campeche, Minatitlán, Zacatecas, Mazatlán, Acapulco, Puerto Escondido, Bajío and other local destinations. As of October 23, 2014 the Superjet has also been used between Monterrey and Houston, Texas.

Interjet's aircraft are configured with a high-end cabin fit designed by Pininfarina. The airline has achieved a maximum daily utilisation of more than 11 flight hours and had recorded in excess of 37,000 flights by last October.

In November Interjet received its 17th and 18th examples, XA-NGO (c/n 95071), and XA-VER (c/n 95072). Last March, the airline executed the ten options it had taken out in 2012, growing the carrier's eventual fleet of SSJ100s to 30.

José Luis Garza, Chief Executive Officer of Interjet, said: "The Sukhoi Superjet 100 is a really good product; we are very satisfied with its superior performance and reduced operating costs. The SSJ100 was the right choice for the Interjet fleet development; it is perfectly suitable for domestic mid-density routes as well as several short-haul international ones."

Andrachnikov is very proud of the aircraft's performance in Mexico. "It flies ►



Above: Final assembly takes place in SCAC's Komsomolsk-on-Amur facility in the extreme far east of Russia. Current production capacity at the plant is 60 aircraft per year. SCAC

Yakutia SSJ100-95B RA-89011 fires up the engines on a snow-covered ramp. The airline operates the Superjet on domestic services as well as international routes to China, Japan and South Korea. SCAC/Alexey Petrov



Above: Sukhoi Superjet 100 RA-89039 has been acquired by SFD Rossiya and features a three-cabin interior. AirTeamImages.com/Alexander Mishin

Below: Interjet Sukhoi Superjet 100 XA-NGO on the ramp outside SuperJet International's Venice facility prior to delivery to the Mexican carrier. Key-James Ronayne



up to 300 flight hours a month per aircraft and has reliability somewhere in the region of 99%+," he revealed.

Gazpromavia, the airline arm of the giant Russian energy firm Gazprom, was the launch customer of the Long Range variant, performing the first commercial service with the type in March 2014 between Moscow and Sovetsky City in northern Russia. The airline operates a fleet of ten SSJ100-95LRs on domestic and international routes.

Another Russian carrier, Yakutia Airlines, operates two Superjets and ordered a further three SSJ100-95LRs at this year's

Paris Air Show. They are used on flights to the Far East, Siberia, the Urals, southern Russia and also to China, Japan and South Korea.

Red Wings Airlines became the newest operator of the type when it received its first SSJ100-95B on January 19 last year.

The aircraft, RA-89021 (c/n 95021), was the first of three delivered to the Moscow Domodedovo-based carrier under an October 2014 lease agreement with SCAC. Configured with a 93-seat two-class cabin, eight in Business Class and 85 in Economy, they have been leased for an initial five-year

period and are used on services between Moscow and Makhachkala and Grozny in the south as well as Ufa, Sochi and Mineralnye Vody among others. Now with a fleet of five aircraft, the carrier is busily expanding its network for the SSJ100.

Other airlines that have operated the Superjet include launch customer Armavia, Moskovia Airlines, Center South Airlines and Indonesia's Sky Aviation, all of which have since ceased operations. A single example, RDPL-34195 (c/n 95026), was delivered to Lao Central Airlines in February 2013, shortly before it too suspended operations. The aircraft has been in storage at Vientiane ever since, but early last year local media reports suggested the carrier was looking to resume flights.

UTair-Express agreed to acquire six SSJ100-95LRs from VEB-Leasing, fitted with 103 seats in a single-class layout, however the carrier's financial problems resulted in deliveries being cancelled.

The type has also won orders from government agencies and VIP customers. Russia's Ministry of Emergency Situations has two Long Range variants on order while the Ministry of Internal Affairs has acquired one of the former Aeroflot 'light' examples. SFD Rossiya has also agreed a deal to acquire two SSJ100s originally destined for Lao Central.

RusJet operates an SBJ to ferry executives around and Comlux has acquired an airframe originally intended for UTair-Express for VIP use in and around Kazakhstan. The aircraft has been reregistered 9H-SBJ (c/n 95060) and was flown from Venice to Indianapolis for cabin fitting in August. An undisclosed customer from Asia has also ordered two examples for VIP duties.

ORDERS

While Andrachnikov declined to disclose how many orders SCAC had on its books, he did say: "We have a firm guideline given from the government that we must sell at least 30 a year over the length of the entire programme."



Above: **Russia's Ministry of Internal Affairs uses SSJ100-95B RF-89151 to transport department officials.** SCAC/Nikolay Krasnov

Bottom: **Red Wings received its first SSJ100-95B on January 19 last year. The airline now has a fleet of five.** SCAC/Alexey Petrov

Kazakhstani carrier Bek Air signed an agreement with SCAC at the Farnborough International Airshow in 2014 for seven SSJ100s with a 103-seat all-economy configuration.

In October 2014, Belgium's VLM signed a tentative agreement with Ilyushin Finance to become the European launch operator of the Long Range variant. The deal covered two SSJ100-95LRs plus two options and ten purchase rights with the first aircraft scheduled for delivery in April this year. However, delays with EASA certification of the Long Range variant has forced the Antwerp-based carrier to postpone the type's introduction until the latter part of 2016.

At February 2015's Aero India in Bangalore, Nepalese airline Bishwo Airways signed a letter of intent (LOI) with SCAC. It is expected an order will be placed for five SSJ100s in a two-class 93-seat configuration with the first aircraft to be delivered in 2017.

Three months later the Russia-China Investment Fund (RCIF), SCAC, Xixian New Area Administrative Committee and New Century International Leasing from China signed a deal to form a leasing company. Over the next three years, it will purchase up to 100 Superjets from SCAC in a deal worth approximately \$3bn.

Further orders followed at MAKS-2015 in August, with SCAC and State Transport Leasing Company (GTLK) agreeing a contract for 32 SSJ100s. The first aircraft under the contract will be delivered to Russian carrier Yamal Airlines. Kazakhstani operator SCAT Airlines has also agreed a deal for 15 SSJ100s plus five options through GTLK, with the agreement signed at MAKS-2015.

Continuing what has been a good year for the project, Greenland Express and CityJet have both selected the SSJ100 for their fleet renewal programmes. Greenland Express signed a LOI for five 98-seat

examples on September 29, with deliveries expected between 2016 and 2018.

The CityJet order covers 15 aircraft and ten options, all fitted with a 98-seat single-class layout. The aircraft will replace the carrier's Avro RJ85 fleet, with the first aircraft arriving in March. Four aircraft are expected to have joined CityJet by the end of 2016 with the additional 11 following in 2017.

CityJet Executive Chairman Pat Byrne says the carrier will introduce the type on charter work before launching it on scheduled services from the carrier's London City hub in 2017. SuperJet International says the necessary certification for London City operations should be obtained by the end of the year.

DUBAI AIRSHOW 2015

With those deals behind them, SCAC and SJL presented SSJ100-95B I-PDVY (c/n 95065) at the 2015 Dubai Airshow as they work towards securing their first orders in the Middle East and North Africa (MENA) region.

Among those who toured the jet at Dubai was Sudan Airways, while SCAC officials spoke of potential sales in Egypt, Iran, Oman, Qatar and Saudi Arabia.

Sales forecasts produced by SCAC's parent company, United Aircraft Corporation (UAC) show that aircraft orders in the MENA region in the 60- to 200-seat market will exceed 700 airframes between now and 2034. Having achieved a raft of new orders and with airframe improvements in the pipeline, SCAC and SJL are no doubt confident of securing some of that business.

With new customers materialising all over the globe, the Sukhoi Superjet 100 is really starting to spread its wings. **AN**





A-7 CORSAIR

LTV'S BOMB TR



This US Navy A-7E Corsair II sports sand camouflage having taken part in Desert Storm. US Navy

The A-7 Corsair II was not a hotrod in the conventional sense. Its speed, or seeming lack of it, initially caused concerns. Capt Henry Suerstedt, VAX (Heavier than Air) programme manager at the time defended the aircraft by saying: "You don't carry coal in a Cadillac nor race a pickup truck at Indianapolis."

The A-7 was a subsonic light attack aircraft, originally conceived by the Ling-Temco-Vought (LTV) consortium as a direct replacement for the Douglas A-4 Skyhawk in naval service and the Douglas Skyraider, North American F-100 Super Sabre and Republic F-105 Thunderchief in the USAF.

In 1962 the office of the Chief of Naval Operations (CNO) launched the Sea-Based Air Strike Study project to re-evaluate priorities in light of the war in South East Asia. The United States Navy naval air arm at the time was built around the A-4 Skyhawk. A more versatile aircraft was needed in the 1965-1972 timeframe.

The CNO study looked at 27 existing and future projects. By the end of the exercise this number had risen dramatically to 144. Once the dust had settled, the requirements for the VAL (Heavier than Air Attack Light) design had been selected.

The US Navy had instructed that the VAL should be 25% heavier and about 17% costlier than the A-4E Skyhawk, but this was offset by twice the range and double the payload. This cost increase was, however, still acceptable when compared with the cost of the General Dynamics/Grumman F-111B, which the service had been ordered to purchase; in fact three A-7s could be purchased for each F-111B.

Vought became aware that the US Navy wanted the VAL to be based on a modified F-8 Crusader and quickly established a design team drawn from those behind the F-8. The A-7 was declared the winner on February 11, 1964. A \$24,119,698 contract for three initial A-7A aircraft followed. A further contract valued at \$105.8m for four Lot II aircraft was soon added. The US Navy would go on to buy a total of 199 of the A-7A model.

Due to a contract term, Vought was obligated to work hard to maintain standards and delivery times or suffer heavy financial penalties if they failed to do so. Failure could have cost the company as much as \$65,000 per late day.

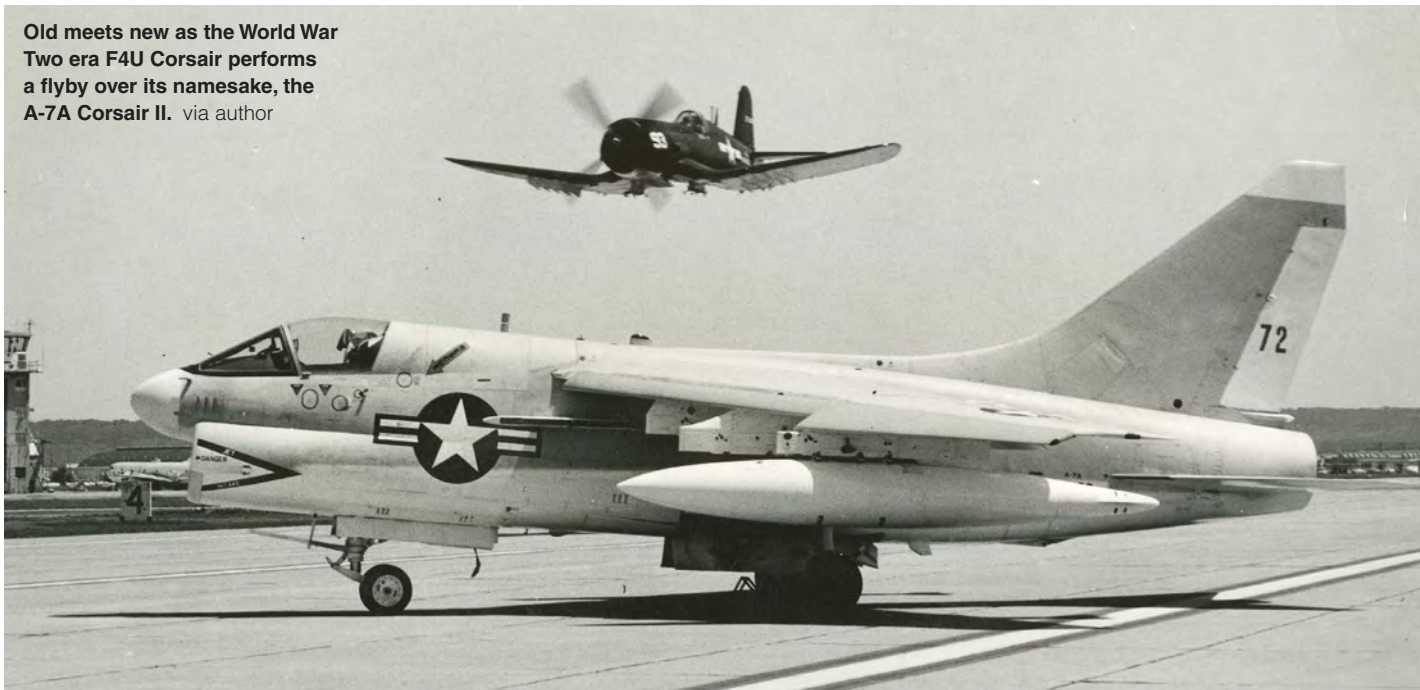
DESIGN

The A-7 Corsair II shows its heritage from the earlier F-8 Crusader with its swept wing and outboard leading edge extensions. The 375sq ft (34.84m²) area of the wing is swept back at an angle of 35° at the quarter chord line. Wing thickness was set at a constant 7% and a NACA 65A007 section aerofoil was selected. The wing has a span of 38.73ft (11.8m) when fully extended reducing to 23.77ft (7.24m) when folded for use on board aircraft carriers. It also features a single ▶

IR II UCK

A veteran of both the Vietnam conflict and the first Gulf War, the Ling-Temco-Vought A-7 Corsair II packed a punch, as **Patrick Boniface** describes.

Old meets new as the World War Two era F4U Corsair performs a flyby over its namesake, the A-7A Corsair II. via author



slotted trailing edge flap with a 9.2ft (2.8m) span, deflecting down to 40° for landing. Conventional ailerons, spoilers and slot deflectors are also fitted on the wing forward of the flaps.

A 25.4sq ft (2.4m²) speed brake is mounted on the fuselage belly and, when fully deployed, deflects through to a maximum angle of 60°.

Main landing gear is of tripod design with two different high-energy braking systems for the USAF's A-7Ds and US Navy versions. The cockpit layout on all versions of the Corsair II is generally similar with only slight differences between Air Force and Navy variants. The A-7 was the first military aircraft to have a head-up display (HUD), it used the Marconi-Elliott Automation AN/AVQ-7(V) unit slaved to a Computer Devices of Canada

AN/ASU-99 projected map display and the Texas Instruments APQ-126 radar system. A Douglas ESCAPAC I-C2 ejection seat was provided for the pilot.

The Corsair II could carry up to 15,000lb (6,804kg) of mixed ordnance including missiles, bombs and other stores on six wing pylons and two fuselage side mounts. On internal fuel alone the A-7 had an unrefuelled range of 2,920nm (5,408km), with external tanks this could be raised to 3,560nm (6,593km). A less noticeable enhancement was the fitting of polyurethane foam-lined fuel tanks, self-sealing fuel lines and extensive steel and boron carbide armour plating. The pilot was provided with steel armour plate against frontal fire and aluminium armour from below.

The first flight took place when an A-7A took to the air on September 27, 1965 at Hensley Field, Dallas, Texas.

Naval Air Test Center Patuxent River, Maryland, served as the base for initial US Navy evaluations with the first fleet squadron VA-174 standing up at NAS Cecil Field, Florida on October 14, 1966. After a year of preparation VA-147 was declared combat ready on November 4, 1967 and embarked on board USS *Ranger* for a cruise in South East Asia.

The A-7B was fitted with upgraded Pratt & Whitney TF30-P-8 engine offering 12,200lb of thrust as well as improved, yet lighter, flaps. The first of 196 A-7Bs for the US Navy flew on February 6, 1968.

The 67 A-7Cs produced were fitted with the TF30-P-408 engine with 13,400lb of

This US Navy A-7A is carrying a mix of 250lb and 500lb inert bombs. via author



thrust. The first trainer version evolved as the TA-7C featuring a tandem cockpit for student and instructor. These aircraft were made up of 24 existing A-7Bs and 36 new build airframes. Two-seaters of the A-7H and A-7P followed and were known as the TA-7H and TA-7P respectively, however 30 two-seaters for the Air National Guard (ANG) had the designation A-7K.

The D/E series were a significant enhancement on previous versions. The D featured the M61A1 Vulcan Gatling rotary cannon (other versions had two 20mm Colt Mk12 cannons). The D model also had a new anti-skid braking system plus could be in-flight refuelled (all subsequent versions were capable of this).

Two YA-7D prototypes were built and used the TF30-P-6 engine, the first flight of this type taking place on April 6, 1968. Both these aircraft were later retrofitted with the Allison TF41-A-1 engine which were licence built copies of the Rolls-Royce RB162-256 Spey with 14,250lb of thrust.

The Navy's E-variants were generally similar, but with the notable difference of a more powerful Allison TF41-2 with a thrust of 15,000lb. Internal fuel capacity was greater than on the D version, but at the expense of the D's greater foam protection of the main fuel tanks.

At the heart of both D/E versions was the IBM Corporation AN/ASN-91 (V) tactical computer, which calculated bomb aiming based on inputs from the aircraft's various sensors including the Doppler radar, Garrett Corp CP-953A/AJQ air data computer and AN/APQ-126(V) forward-looking radar.

In 1985 following USAF requests for proposals for an aircraft to take over the Fairchild Republic A-10 Thunderbolt II's interdiction role the concept of a supersonic A-7 materialised powered by a single Pratt & Whitney F100-PW 220 engine developing 26,000lb of thrust. To accommodate this powerplant the aircraft was lengthened by 4ft (1.2m). The vertical stabiliser also gained 10in (25cm) in height. Two aircraft A-7Ds 71-0344 and 70-1039 were modified (designated YA-7Fs) and subsequently operated by 445th Flight Test Squadron at Edwards AFB in California. The role they had been designed for was, however, filled by F-16 Fighting Falcons.

In 1982 eight TA-7Cs were modified to serve as EA-7L electronic aggressor aircraft and were operated by VAQ-34 at NAS Point Mugu in California from 1983 until as late as November 1994 when the last aircraft was sent for storage at Davis-Monthan AFB.

VIETNAM

The A-7 Corsair II set records almost from the off. On its first combat deployment with the US Navy in South East Asia, the aircraft had a daily availability rate of ten-12 out of 14 available aircraft in each squadron. Furthermore, in the type's first 4,000 hours of missions not a single aircraft was lost. The USAF bettered that statistic with only three accidents in 50,000 flight hours.



LTV A-7B 154363 taxis at the manufacturer's Dallas, Texas facility. The main difference between the A and B variants was the more powerful TF-30-P-8 engine which replaced the P-6. via author

In the lead-up to these impressive figures, the A-7A first entered combat in Vietnam on December 4, 1967 with VA-147 performing attacks against bridges and highways around Vinh. In the coming months USS *Ranger* made four regular line periods on Yankee Station in the Gulf of Tonkin. The aircraft made strikes against the Nui Long Lau tunnels in December 1967, sealing the entrances with 500lb, 1,000lb and 2,000lb bombs. Other targets included railways, coastal shipping, vehicles and roads and bridges between Vinh and Haiphong and VA-147 also flew air support for the US Marines during the siege of Khe Sanh.

The destruction of the Thanh Hóa Bridge by aircraft of VA-82 from USS *America* proved the wisdom of the targeting systems on board the A-7. The bridge had until this time remained resolutely intact despite repeated attacks, but it finally succumbed to the combined efforts of four A-7Cs and 8,000lb of Walleye and Mk84 General Purpose bombs.

The free flow of ideas and experience with the US Navy and USAF led to the

formation of a joint project called Coronet Stallion. The USAF embarked three pilots, one maintenance officer and 20 specialists onboard USS *Ranger* to assess the A-7. The USAF's chief officer, Maj Charles McClaren made a formal summary of his findings. "We found the A-7A very rugged, stable and long-legged aircraft," he said. "Performance was not impressive with the small engine (TF30), but fuel economy was astounding...our maintenance people thought the A-7A one of the most easily maintained aircraft that they had encountered."

The hot and humid air of Vietnam robbed the engine of much of its power. Such was the effect that fully armed aircraft sometimes struggled to reach 432kts (800km/h). For the earliest A-7A models, high density altitude and maximum weight runway take-offs often necessitated a 'low transition' where the plane was intentionally held in ground effect during wheel retraction and also as much as ten miles at treetop level before the aircraft had achieved a satisfactory speed for safe flap retraction. Launches from carriers were



A US Navy A-7 performs a catapult launch from a carrier. Key Collection

PILOT'S VIEW

Capt Paul Austin, US Navy (Ret) tells *Aviation News* about his experiences with the A-7.

I transitioned into the A-7B from the A-4E and immediately noticed how much larger the cockpit was. The visibility allowed much better views when conducting air-to-air manoeuvring or looking for and defeating surface-to-air missiles (SAMs).

I was in Vietnam flying off USS *Kitty Hawk* and USS *Oriskany* [and] flew 310 combat missions. I learned in combat that it could not out climb AAA [anti aircraft artillery] gun fire. Shells would burst all around us as we pulled off targets day or night. We learned not to try to climb so fast, but to keep our speed up while staying lower and turning to give the AAA a harder target.

We flew different types of missions. One was called Alpha strikes; 30 or more aircraft going against one well-defined target such as a bridge, railway or airfield. The bombs were free fall and a large number of them were needed to get the desired destruction. Another mission was smaller in scope, only four aircraft from a single squadron targeting roads, intersections and some smaller pontoon bridges.

The enemy put much of their high-value equipment, such as SAM sites, near towns or populated areas. We were not permitted to plan our attacks [to] reduce

our exposure to defensive fire. We were required to make our runs to preclude any long or short hits landing in populated areas. The enemy knew this and placed their aim points in what was called Barge Sector Fire, meaning they would point all of their guns on the bearing they knew we would have to use and just fire any time they thought we were there, causing us to fly right through the flak.

The missions we considered the highest priority was 'A Troops in Contact' mission, which meant our guys on the ground needed air support. We would stay as long as we could, dropping one weapon at a time or none just to keep the enemy off guard by flying low over their heads. We would leave only when we were Winchester (out of weapons) or bingo (out of fuel).

One event I am particularly proud of is the last combat mission we flew off USS *Oriskany* on February 22, 1972 as the war was drawing to a close. The senior officers got together and decided the flight would be made up of only senior officers... no junior officers. No one wanted to have to write a letter home explaining why a son, husband, or brother was lost on the last mission."

Two VA-72 Corsair IIs fly over Saudi Arabia during Operation Desert Shield. US Navy





This A-7D was photographed in 1974 and was assigned to the USAF's 354th Tactical Fighter Squadron/355th Tactical Fighter Wing at Davis-Monthan AFB, Arizona. Peter Foster



The Corsair II was conceived by the Ling-Temco-Vought consortium as a direct replacement for the Douglas A-4 Skyhawk in US Navy service. This is a A-7E of VA-146. Peter Foster



The folded wings of this Puerto Rico ANG A-7D reveal the aircraft's naval lineage. Key Collection

little better with airspeeds decelerating by as much as 20kts (37km/h) immediately after getting airborne. When the A-7E entered service the decision was taken to operate it 4,000lb (1,814kg) below the variant's maximum take-off weight.

The USAF's A-7Ds were widely used in Vietnam and Cambodia by the 354th Tactical Fighter Wing (TFW) and the 388th FW both stationed at Korat RTAFB in Thailand, entering combat in October 1972. The A-7Ds were also assigned the 'Sandy mission', providing air cover for helicopter combat search and rescue. The USAF Corsair IIs stationed at Korat were

engaged in operations over Vietnam until mid-January 1973; in Laos until February 22, 1973 and in Cambodia until July 15, 1973 when A-7Ds of the deployed 353rd Tactical Fighter Squadron/354th TFW flew their last air support mission of the war in support of Khmer National Armed Forces.

On May 15, 1975 Khmer Rouge gunboats seized the SS *Mayaguez* and A-7Es from the aircraft carrier USS *Coral Sea* provided air cover for the recovery operation. At the end of the battle three USAF CH-53 helicopters had been destroyed with the loss of two airmen, 11 Marines and two Navy corpsmen and a further three Marines were reported missing.

By the end of the Vietnam War the US Navy had lost 19 A-7s in combat whereas the figure for USAF was four.

When US forces pulled out of bases in Vietnam and neighbouring Thailand in late 1975, the USAF's A-7Ds previously stationed at Korat flew to Clark AFB in the Philippines. They later returned to the USA and were taken on charge by several ANG squadrons.

The next combat that the Corsair II saw was supporting Operation Urgent Fury, the US-led invasion of Grenada in October 1983. The A-7Es from VA-15 and VA-87 flew from the USS *Independence* and carried out their role with great success.

Following a suicide attack on a US Marines billet at Beirut airport, Lebanon on October 23, 1983, President Ronald Reagan ordered retaliatory strikes against Hezbollah bases in Syria and Lebanon. The strikes took place on December 4 and involved six A-7Es from VA-15 and six from VA-87 flying from the USS *Independence* as well as six A-6E Intruders. The USS *John F Kennedy* launched a further nine Intruders. The force was fired upon by SAMs bringing down two A-7Es, both pilots ejecting and being recovered. Another A-7E was also hit but made it back to the carrier.

On March 24, 1986 what became known as the 'Gulf of Sidra incident' occurred following simmering tension with Libya. Two F-14 Tomcats had been engaged by a pair of Libyan MiG-23s which were then shot down. Part of the response the same day was USS *Saratoga* launching A-7s from VA-83 armed with AGM-88 High-speed Anti-Radiation Missiles (HARMs) which destroyed SA-5 missile sites near Sirte.

This was the first time the HARM had been used in combat. The next day, A-7s repeated the assault on Libyan SAM sites as Intruders attacked key Libyan Navy warships and assets. Further strikes against Libya were launched on the night of April 15 which included A-7Es from VA-72 and VA-46 aboard the USS *America* as part of Operation El Dorado Canyon. This was a retaliation after the US blamed Libya for bombing a West Berlin nightclub where two US servicemen and a civilian were killed and a further 229 people were injured including 79 Americans.

OPERATIONS PRAYING MANTIS

The Iran-Iraq War led to the creation of Operation Earnest Will led by the US to ensure freedom of navigation for shipping in the Persian Gulf. Vessels were being protected by warships from foreign navies, but the crippling of the frigate USS *Samuel B Roberts* on April 14, 1988 by an Iranian mine led to a strike by the US Navy. A-7Es from USS *Enterprise* alongside Intruders prosecuted Operation Praying Mantis against Iranian targets.

Corsair IIs flown by the Ohio Air National Guard's 180th Tactical Fighter Group were deployed to Panama in late December 1989 to take part in Operation Just Cause, the US invasion of the Central American nation ▶



Oklahoma ANG A-7D 70-0976 at RAF Coningsby in June 1988. Cliff Knox

that resulted in dictator Manuel Noriega being deposed. They were one of a number of ANG units that went to Panama over the next few years as part of Coronet Cove exercises.

The last American combat service for the A-7 Corsair II was during Operation Desert Storm in 1991 when US Navy A-7Es flew from the carrier USS *John F Kennedy*. By this

time most of the other carriers in the US Navy inventory had replaced the A-7Es with the McDonnell Douglas F/A-18 Hornet. During the short conflict A-7s were used in both day and night missions deep inside Iraqi territory and for targets in Kuwait; squadrons VA-46 and VA-72 having the distinction of carrying out the last combat missions with the A-7E.

The USAF started to dispose of its

The YA-7F never made it into production with its intended role filled by the F-16 Fighting Falcon. Two A-7Ds were converted into YA-7Fs during development, including 71-0344.

LTV Aircraft

inventory of A-7Ds in 1974, passing the aircraft to various ANG units across America. However, the regular Air Force had another somewhat special mission for the A-7. The 4450th Tactical Group headquartered at Nellis AFB, Nevada, holds the distinction of being the last active duty USAF unit to operate the A-7 Corsair II. Its role was to assist in the development of the Lockheed F-117 Nighthawk particularly for pilot training at Tonopah Test Range about 30 miles (48km) southeast of the town of Tonopah in Nevada.

Technicians and engineers in charge of the stealth planes would use 20 A-7Ds in place of the F-117s on the apron for orbiting Soviet satellites to detect, while the precious and highly classified F-117s were safely inside the hangars during daylight hours. The ruse was to convince the Soviets that Tonopah operated nothing more exciting than old



Royal Thai Navy A-7E 160859 makes its approach to U-Tapao International Airport. The Thai A-7s were operated by the 104th White Shark Squadron, 1st Wing before being placed in reserve in July 2007.

Marc van Zon

Corsair IIs, but in January 1989 the last A-7s were transferred to Aircraft Maintenance and Regeneration Center (AMARC) at Davis-Monthan AFB in Arizona for storage.

On January 12, 1981 ten A-7Ds were destroyed in a terrorist attack on Luis Muñoz Marín International Airport in Puerto Rico. The aircraft were part of the 198th TFS and formed part of the Puerto Rico ANG. While the attack was the largest against an American military station since the Vietnam War, it went largely unreported because it was overshadowed by the Iran hostage crisis, when 52 Americans were held for 444 days.

The last USAF active duty squadron to operate the A-7 was the 23rd TFW at England AFB in Louisiana which retired its last example in June 1981.

The ANG started to replace its A-7s with F-16s in the late 1980s and the last such unit to retire the Corsair II was the 125th Tactical Fighter Squadron of the Oklahoma ANG at Tulsa in October 1993.

OVERSEAS OPERATORS

Many of the surplus aircraft were sold to Greece, Thailand and Portugal. Greece continued to operate the A-7s in frontline service until October 17, 2014 when the Hellenic Air Force (HAF) retired its final A-7Hs and TA-7Hs at Araxos Air Base, having served there with the 116th Combat Wing. Fifteen A-7E and two TA-7C aircraft were decommissioned during the ceremony, the remainders of a force that was once comprised 60 A-7Hs and five TA-7Hs plus a further 50 A-7Es and 18 TA-7Cs. In Greek



Portugal received the first of its Corsair IIs in December 1981. Key Collection

service the aircraft flew in five HAF squadrons and during its career in Greek service 13 aircraft were lost.

The Portuguese Air Force (PoAF) received 20 refurbished former US Navy A-7As, which were designated as A-7P and TA-7Ps in service. Each was powered by a TF30-P408 engine and was equipped with avionics from D and E variants.. The first of the initial batch of nine aircraft was handed over on December 24, 1981 and in 1983 an additional 24 A-7Ps and six TA-7Ps were authorised with deliveries made between October 8, 1984 and April 30, 1986. Sadly, one of the aircraft was lost on a test flight prior to delivery when it suffered a bird strike and crashed in Oklahoma, killing the pilot. Between 1981 and 1996 the type was operated by Attack Squadron 302 Águias Reais based at Air Base No 5 at Monte Real and between 1984 and 1999 by

Attack Squadron 304 Magníficos at the same location. The last flight of a Portuguese A-7 Corsair was on June 10, 1999

The Thai Government bought 14 A-7Es and four TA-7Cs primarily for coastal defence and these were delivered in the summer of 1995 to the 104th White Shark Squadron, 1st Wing at U-Tapao International Airport. The A-7s were placed in reserve on July 20, 2007, but the Royal Thai Navy has maintained them in excellent condition with the aim of possibly reintegrating them.

Total production of the A-7 Corsair II reached 1,569 aircraft. It defined a generation and became something of an iconic warplane; its role in Vietnam bringing the type to the attention of the general public. Following retirement many Corsair IIs have found their way into private collections and museums. **AN**



Hellenic Air Force TA-7H 155774 performs a formation take-off from Kleine Brogel AB in Belgium with A-7H 160560. AirTeamImages.com/Jan Severijns

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NORWEGIAN AMBITIONS

Aviation News Editor Dino Carrara examines the rapid expansion of low-cost carrier Norwegian and its growing long-haul network.



Norwegian, one of Europe's largest low-cost carriers, has taken the leap to operate long-haul services. It currently has a fleet of eight Boeing 787-8 Dreamliners and 91 737-800s and flies from 17 bases. And, as it continues to expand, it's picking up numerous awards along the way.

The airline, headquartered at Fornebu near Oslo, is very different today from its early years. It was founded in 1993 when Bjørn Kjos, the current CEO, and some of his pilot friends took control of bankrupt Norwegian carrier Busy Bee, which had flown Fokker 50s as a subsidiary of Braathens SAFE.

The new company, named Norwegian Air Shuttle (NAS), took over the leases of three Fokker 50s (adding a fourth in 1995)



and started flying services on behalf of Braathens on the west coast of Norway. By 2001 the fleet had grown to seven aircraft.

In 2000 in a bid to diversify and reduce reliance on Braathens, Norwegian Air Shuttle bought two helicopter firms, Luftransport of Norway and Ostermann in Sweden. But it became apparent these operators were not a good fit for NAS and both were sold in 2005.

In January 2001, Braathens announced it would stop a number of routes NAS was flying and reduce services on others. This led to one of the Fokker 50s being put into storage, but freed up aircraft for NAS to start its own flights – which began in 2002 with the launch of a Stavanger to Newcastle service.



Above: **The Silver pension company of Norway used Boeing 737-300 LN-KKZ for advertising.** AirTeamImages.com/Keith Blincow

Main photo: **Norwegian currently has eight Boeing 787-8 Dreamliners for long-haul flights.** AirTeamImages.com/Danish Aviation Photo

Below left: **Norwegian's CEO, Bjørn Kjos, a former Royal Norwegian Air Force F-104 Starfighter pilot, qualified lawyer and novelist.** Norwegian

Below: **The airline has 91 Boeing 737-800s in its current fleet.** Norwegian

The agreement with Braathens ended the same year, after it merged with SAS – which in turn decided to use its subsidiaries, SAS Commuter and Widerøe, on routes NAS had been flying.

NAS launched its own domestic services in 2002 as a low-cost carrier – on condition that Norway's authorities did not allow frequent flyer programmes to apply to these routes; and that SAS be prevented from cross-subsidising its own internal Norwegian services so as not to undercut NAS. The Norwegian Competition Authority supported the requests and brought in appropriate legislation.

On September 1, NAS was rebranded as Norwegian and took on its first jet, Boeing 737-500 LN-BRU. Two 737-300s were added by the end of the year.

The Fokker 50s were dispensed with in 2004, a year when Norwegian agreed a codeshare arrangement with FlyNordic and Sterling Airlines. The airline continued to grow but the challenges it faced were such that it was not until 2005 that it achieved its first profitable year.

In 2006 Norwegian took the bold step to branch out from its homeland to establish a Polish subsidiary based at Warsaw, with flights to five European cities. But, despite the operation being profitable, it was later decided to concentrate on Scandinavian services and the base shut in 2010.

During 2007 Norwegian set up a base at Stockholm/Arlanda and placed an order for 42 Boeing 737-800s, the first of which arrived in 2008. Meanwhile the collapse that year of Sterling Airlines opened up opportunities in Denmark and Norwegian established a base at Copenhagen. Another was set up at Oslo Rygge Airport (in addition to one that already existed at Oslo/Gardermoen).

Norwegian's first services outside Europe began in 2008 with flights to Dubai from Oslo and Stockholm. In 2009 the it expanded rapidly with 39 new routes emanating from Denmark alone, while passenger numbers rose by 18% to 10.8m.

The carrier placed an order for another 15 737-800s in 2010, a year when it started painting notable Nordic figures on aircraft tails.

Fifteen more 737-800s, plus three 787-8 Dreamliners, were ordered in 2011 – which also saw Norwegian open a new base in Helsinki and become the first carrier to offer free Wi-Fi on flights.

In 2012, it set up its first Spanish bases at Malaga and Las Palmas in the Canary Islands. It also ordered two more 787-8s and, as a sign of its ambitions, announced the largest-ever agreement in European aviation history for new aircraft – with deals for 22 737-800s, 100 737 MAX 8s and 100 Airbus A320neo jets.

Norwegian's first A320neo will arrive this year, and it will be the launch carrier ►





A Dreamliner lifts off from Gatwick. Norwegian uses the type for services from the London airport to Fort Lauderdale, Los Angeles, New York, Orlando and Puerto Rico. Services to Boston and Oakland International Airport, for San Francisco, will be added this year. David Dyson/Norwegian

in Europe for the MAX 8 when the first is delivered in 2017. Asked why the company opted for a split buy of 737 MAXs and A320neos, CEO Bjørn Kjos told *Aviation News*: "Although the first 737 MAX 8 will arrive in 2017 we'll get a huge number of MAXs in 2018, 2019 and 2020, so they're a little bit delayed compared to the neo. We'll need more aircraft in 2016 and 2017. We couldn't get enough MAXs or neos."

With neither Boeing nor Airbus able to deliver the number of aircraft in the years Norwegian wanted, it opted for products from both companies to meet its demand.

The airline established a base at London/Gatwick in 2013 along with a subsidiary, Arctic Aviation Assets, based in Dublin, to manage Norwegian's fleet of aircraft. Part of its remit is to lease aircraft out, such as a deal announced on December 18 for HK Express of Hong Kong to take 12 A320neos.

Norwegian was named 'Best European Low-Cost Carrier' in 2013 at the Skytrax World Airline Awards and more accolades have followed since.

LONG-HAUL

Norwegian launched long-haul services on May 30, 2013 from Stockholm and Oslo to Bangkok and New York's John F Kennedy International Airport – with Fort Lauderdale connected from Stockholm and Copenhagen. Delays to delivery of its first Dreamliners required the carrier to begin the services with two leased Hi Fly Airbus A340-300s. The first Dreamliner arrived a few weeks later on June 28.

Norwegian's 787-8s have two classes – with 32 seats in Premium with a seat pitch of 46in (117cm) and 259 in Economy with a pitch varying from 31in (79cm) to 32in (81cm). The 737s have just Economy Class, with a pitch of 30in (76cm).

While a number of airlines have tried to crack low-cost long-haul in the past, it seems that aircraft like the Airbus A350 and Dreamliner have the capabilities to make this type of operation successful. In Norwegian's case, the 787's faster speed, reduced fuel consumption and lower maintenance costs compared to older airliners made long-haul financially feasible.

For its Bangkok services, Norwegian hired Asian cabin crew. Kjos explained: "The reason is that's where the [majority of] traffic will originate in the future. Eighty percent of the traffic in the long-haul operation will come from Asia." The cockpit crew remain European to comply with European Aviation Safety Agency (EASA) requirements.

The long-haul network has grown with flights from Gatwick to Fort Lauderdale, Los Angeles, New York, Orlando and Puerto Rico. This year will see new services from Gatwick to Boston (March 27) followed by Oakland International Airport (May 12) for San Francisco.

The Copenhagen long-haul network has also grown to include Bangkok, Orlando, Las Vegas, Los Angeles, New York, Puerto Rico and St Croix in the US Virgin Islands; and destinations from Oslo/Gardermoen now include Fort Lauderdale, Orlando, New York and Puerto Rico. There are also flights from Stockholm/Arlanda to Oakland and Puerto Rico.



Economy class (above) and Premium (right) on Norwegian's Dreamliners. Norwegian



In May 2014, Norwegian opted for another variant of the Dreamliner when it signed lease deals for three 787-9s. Two will enter service in 2016 and the third in 2017.

On November 11, flight DY631 from Bergen to Oslo became Norwegian's first service to use a mixture of biofuel and conventional fuel. It led to a reduction in emissions of more than 40% compared with a similar flight using regular fuel. A spokesperson for the airline said: "Norwegian currently don't use biofuel as it is not commercially available at a competitive price but the flight in November 2014 demonstrates the future capabilities and the industry's shared commitment to make sustainable biofuel more easily available for airlines."

Norwegian achieved the self-imposed goal of a 30% reduction in CO2 from 2008 to 2015. The biggest contribution to that success came from new aircraft to its fleet, which produce fewer emissions. An airline press release stated: "Through the development of new technologies and frameworks, Norwegian wants to help make aviation carbon neutral by 2050."

The last full-year financial results available are for 2014, when Norwegian posted a net loss of NOK 1,050m (£80.6m) on revenues of NOK 19.5bn (£1.5bn), compared with a net profit of NOK 322m (£24.7m) the previous year.

In the seven years up to 2014, the company had made a profit – so why the downturn? Major investments for future expansion and the significant cost of NOK 459m (£35.2m) of fuel hedging for 2015 had a big impact on the figures, though Norwegian says it had strong revenue and capacity growth. The average load factor in 2014 was 81% (up 3% on the previous 12 months) and the airline carried 24m people, up 16%.

Last year was another busy period of expansion for the airline, though it also faced a major problem. On February 28 an 11-day strike began, involving Norwegian's Scandinavian pilots, which led to the



A close-up of the tail on Boeing 737-800, LN-DYC. Since 2010 Norwegian has been painting notable Nordic figures on the tails of its aircraft. AirTeamImages.com/Danish Aviation Photo

cancellation of almost 2,000 flights.

The dispute was over concerns that employment terms in Norway, Denmark and Sweden would be amended in a bid to cut costs and bring conditions more into line with what the airline was offering elsewhere in Europe. The pilots wanted terms agreed with the parent group rather than their employers, the subsidiary Norwegian Air Norway. Eventually a deal was hammered out, still with the subsidiary, but with some concessions to the pilots.

Norwegian said in a press release on March 10: "With the new collective agreement, the company has established a contributory pension (innskuddspensjon) for the pilots, a reduced Loss of Licence insurance, as well as a more flexible work schedule.

"The Scandinavian pilots' collective agreement has some of the best terms in the industry. The agreement has been signed with the Scandinavian pilot companies in which they are hired.

"In addition, the Norwegian Group has given an extraordinary guarantee of employment for all the pilots employed in Scandinavia. Such a guarantee is unique in Scandinavia, especially in a competitive industry like aviation. This guarantee is valid until October 2017."

After this temporary setback the carrier pushed on with its growth. Last October it started domestic Spanish services with flights from Madrid to Gran Canaria and Tenerife North; and from Barcelona, flights to the same two airports in the Canary Islands plus Fuerteventura. Malaga has a link to Gran Canaria and Tenerife South.

Speaking in Madrid on July 9, Kjos emphasised the importance of Spain to the company: "Figures speak volumes – Norwegian offers 133 routes in and out of 15 Spanish airports, of which six are operating bases, and employs almost 900 people in the country.

"One-fifth of our entire fleet is based here. The launch of this first batch of seven domestic routes makes our commitment to Spain all the more evident."

On October 22, Norwegian announced an order for 19 more 787-9s (plus ten options), which will bring its total of 787-8s and -9s to 38.

In November the airline was granted a UK Air Operator Certificate (AOC), which, it says, opens up "bilateral traffic rights to a series of potential new routes including Asia, South America and South Africa." This British arm of the company will operate under the name Norwegian UK from the first quarter of this year.

As well as Gatwick (where the carrier has ten aircraft based), the airline also flies from Birmingham, Edinburgh and Manchester, and in 2014 flew 3.9m UK passengers to 34 destinations. ▶

Norwegian supports the United Nations Children's Fund (UNICEF) – sending, for example, a Boeing 737-800 loaded with school supplies and emergency aid from Copenhagen to Amman on November 2 to help Syrian refugee children. Its backing is illustrated by the extra titles on this Boeing 737-300. Norwegian





Three of Norwegian's 737-800s. Norwegian

It also announced that it would be flying for tour operators Nielson Travel, Balkan Holidays and Skiworld in the winter of 2015/16 from Gatwick to ski destinations in France, Spain and Bulgaria. The airline also flies for other tour operators, such as Thomas Cook and TUI, for sunshine holidays. Norwegian has been flying inclusive tour passengers since 2010.

The company had earlier established subsidiaries with their own AOCs to secure international growth and additional traffic rights: Norwegian Air International is based in Dublin while Norwegian Air Norway is based at Fornebu near Oslo. The former looks after Helsinki, Madrid, Barcelona, Malaga, Alicante, Las Palmas, Tenerife South, Bangkok, New York and Fort Lauderdale. The latter operates routes from the Scandinavian bases.

From November 23, Norwegian became

the first in Europe to offer passengers live in-flight TV. They can watch Norway's TV 2 News and Bloomberg Television via their personal devices connected to the free Wi-Fi currently on 87 of the carrier's aircraft.

Norwegian started flights on December 4 from the US east coast to the French-controlled Caribbean islands of Guadeloupe and Martinique. The 737-800 services are from JFK, Boston and Baltimore/Washington.

Six days later, the airline retired its last 737-300, LN-KKW. The jet has been donated to the Norwegian Aviation Museum in Bodø in the far north of the country.

Today, Norwegian is Europe's third-largest low-cost carrier, operating more than 400 routes to 130-plus destinations in Europe, North Africa, the Middle East, Thailand, the Caribbean and the US. Its biggest base is Oslo/Gardermoen where it currently

has more than 20 aircraft and flies to 100 destinations.

Looking ahead, Kjos told Bloomberg that the next step for the airline is linking smaller cities along the Atlantic coasts of Europe to destinations on the US east coast, mainly using the 737 MAX, which will have the range to cover such distances. As this would enable passengers to avoid using hubs, he feels there's a large market for such services.

Discussions have also taken place with Ryanair about the Irish carrier feeding passengers into Norwegian's long-haul network.

Norwegian has come a long way from solely flying domestic flights in Norway on behalf of another carrier to becoming a leading low-cost carrier with a long-haul network. **AN**

Norwegian has more 787-8s (pictured) on order as well as the longer 787-9. Norwegian





230 SQUADRON SUNDERLANDS

David Nicholas recounts the exploits of 230 Squadron with the Sunderland over almost 20 years of operations with the flying boat.

The elegant Short Sunderland was not only the last flying boat to be operated by the RAF, but also the longest serving. Its career straddled the age of the biplane with that of the jet airliner. Developed in parallel with the S 23 'C-Class' for Imperial Airways, the prototype of the S 25, soon named 'Sunderland', flew for the first time on October 16, 1937 and after further development production began at Rochester, Kent.

No.230 Sqn received its first Sunderland on June 22, 1938 when L2159 arrived at the unit's base at RAF Seletar in Singapore. The Squadron was assigned to Far East Command and under the command of Wg Cdr W H Dunn. It was the first unit to be fully equipped with the type and by late September eight Sunderlands had been delivered and the unit worked to an operational pitch.

Artwork depicting the attack on submarine U-577 on January 9, 1942 by Sunderland Mk II W3987/DX-X. David Ails/www.ailsaviationart.com

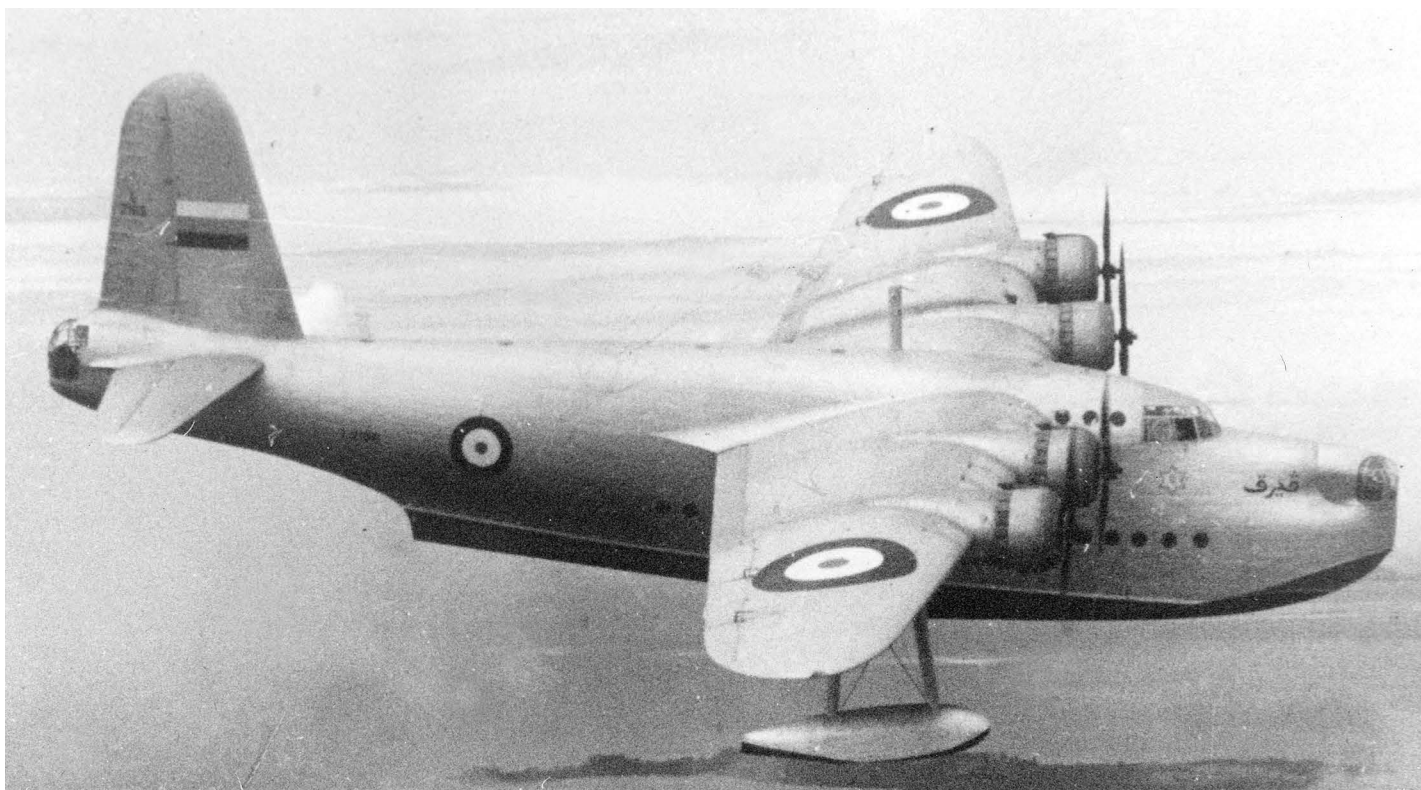
Four leaders of the Malay States donated funds to purchase Sunderlands. To formally record this generosity and to establish links, four aircraft were named after the donor state at a ceremony and wore their name in Malay on the nose. They also wore the flag of the state on the fin and these remained until the aircraft were camouflaged at the start of World War Two. The aircraft in question were L2160 Selangore, L2161 Negri Sembilan, L2164 Pahang and L2166 Perak.

The silver-coloured Sunderlands flew regular patrols among the many Malay islands, monitoring shipping, looking for pirates and providing a visible and impressive presence in many remote areas. However,

all this changed the following year when war broke out and a large detachment was ordered to Ceylon for Indian Ocean shipping patrols and meteorological reconnaissance flights. The reported presence of the pocket battleship *Admiral Scheer* (the intelligence was incorrect and it wasn't in the area) resulted in a flurry of activity and then in February 1940 the whole Squadron concentrated at Koggala, Ceylon. It was a brief stay, as in May – with rising tensions in the Mediterranean – the Squadron was ordered to move to Alexandria in Egypt.

SUBMARINE SUCCESSES

There Wg Cdr Geoffrey Francis assumed command and when Italy declared war on June 10, 230's Sunderlands began patrols monitoring Italian naval movements. Action soon came, as off the Libyan port of



On delivery to 230 Sqn in 1938, Sunderland Mk I L2166 was named *Perak* and wore the state's black, yellow and white flag on the tail and name in Arabic script on the nose. T Thewlis

Tobruk at dawn on June 21 Francis' aircraft was intercepted by a Fiat CR 42 of the 90^a Squadriglia flown by Tenente Franco Luccini, later one of the leading Italian aces. His gunfire blew a large hole in the hull and damaged the fuel tanks that the enterprising crew plugged with Plasticine. Soon after they alighted at Alexandria at 0830hrs, the Sunderland was hauled onto the slipway for repairs. The gunners claimed one of the attacking fighters destroyed.

A week later on June 28, 230 returned the 'compliment' – and with interest. Flying L5804/S off western Greece after departing from Malta, Flt Lt Bill Campbell's crew spotted a narrow white track of a periscope 'feather'. The submarine was attacked, the bombs straddling it, with the vessel believed sunk.

It turned out to be the Italian Navy submarine *Argonauta* that had been sunk. To attack a submarine was a rare occurrence, but Campbell's crew did it again the following

afternoon. Once more flying to the west of Zante they spotted the Italian submarine *Rubino* on the surface. The vessel was unable to dive having been previously damaged. Attacking from 1,000ft Campbell's Sunderland dropped two bombs that fell either side of the stern, following which the submarine immediately broke up and sank leaving four survivors struggling amidst the debris. Seeing them, Campbell alighted in the choppy waters to rescue them. The day's adventures were not over as en route back to Malta they spotted another submarine that they strafed, having used all their depth bombs. Campbell subsequently received the DFC for these exploits.

Patrols and convoy escorts continued with L5803/T flown by Flt Lt P R Woodward bombing an Italian destroyer on July 1, narrowly missing the stern, whilst on the 23rd a merchant ship was attacked and damaged.

It was certainly not one-sided, however, as a few days later Sqn Ldr Charles Ryley's crew in L5804/S were attacked by four Macchi 200 fighters for almost an hour. They managed to shoot one down, however the Sunderland was badly damaged and only saved by the courage of LAC Campbell who crawled inside the wing to plug holes in the fuel tanks.

More success came for 230 Sqn Sunderlands on September 30. Aircraft L2166/U flown by Flt Lt Pat Alington's crew sank the Italian submarine *Gondar* that was carrying three 'chariot' human torpedoes in concert with the Royal Australian Navy destroyer HMAS *Stuart*. At the time, 230 Sqn was the RAF's most successful anti-submarine squadron by some margin.

ROYAL EVACUATION

Following the Italian invasion of Greece, 230 Sqn was ordered to move some of its Sunderlands to Scaramanga near Athens. This started on December 12, 1940 while aircraft were also sent on detachment as required to Souda Bay in Crete. Operations were conducted from these locations into 1941. Flying from the latter location on March 27, Flt Lt Ian McCall's crew located part of the Italian battle fleet off the coast of Sicily.

Sunderlands continued to shadow the Fleet and although the Italian battleships withdrew, in a night action off Cape Matapan the Royal Navy sank the cruisers *Fiume*, *Zara* and *Pola* and two destroyers, *Alfieri* and *Carducci*. However, within days the Germans invaded Yugoslavia and Greece, which immediately changed the situation and Allied forces were soon retreating.

An evacuation of Greece and later Crete began, with the Sunderlands of 228 and 230



Sunderland Mk III EJ143/S shown on a take-off run in the Indian Ocean. EN-Archive

Sqns picking up men from the coasts. The roomy flying boats were often packed to overflowing, such as on one flight that brought out 83 passengers. It was a 230 Sunderland that evacuated King Peter of Yugoslavia on April 17, whilst a few days later, Flt Lt Alan Lywood flew out the Greek monarch King George II, his family and the Prime Minister Emmanouil Tsouderos. The evacuation was not without loss though, as Stukas later destroyed L2161/Y Negri Sembilan which was at anchor at Scaramanga on the 23rd.

The Squadron then re-established itself back in Egypt, settling at Aboukir in June and soon after the move 230 helped gain another scalp. On the 15th, during the Allied invasion of Syria, Fg Off R S Bohm's crew located the Vichy French destroyer *Chevalier Paul* off the coast and its sighting report enabled Swordfish from 815 Sqn to sink it with torpedoes.

Six weeks later when Flt Lt E Brand's crew in Sunderland L2166/NM-U attacked the Italian submarine *Delfino* in the Gulf of Sollum they were shot down by its fire, though the four survivors were picked up. They had damaged the submarine sufficiently for it to be unable to dive.

However, Convoy patrols remained the staple diet, though on October 22 Sqn Ldr Ken Garside in 230's sole Mk II Sunderland (W3987/NM-X) attacked a surfaced submarine but it crash-dived. Marauding Luftwaffe fighters were a constant threat, as proved a few days before Christmas when Flt Lt S W R Hughes' crew in T9071/M were en route to Malta. About 50 miles (80km) northeast of Benghazi two Bf 110s of III/ZG 26, one of which was flown by Ofw Helmut Haugh attacked the flying boat, wounding two of the crew. However, Sgt Jacques Dupont is believed to have shot down one of the attackers. The Sunderland was badly damaged and force landed off the coast where it struck a reef. The 20 crew and passengers struggled ashore and the survivors made it back to British lines, having captured 130 Italians en route. Dupont was later awarded a DFM.

There was a successful start to 1942



Sunderland Mk V SZ581/B-Y in Greenland supporting the British North Greenland expedition in 1952. 230 Squadron records

when on January 9 Sqn Ldr Ken Garside, once again in W3987 – now coded DX-X, attacked a surfaced submarine that went down followed by a maelstrom of huge bubbles, oil and debris. His crew was credited with sinking the U-577 that went down with all hands.

Maritime patrols continued through the year, with Garside attacking another surfaced submarine on June 27 but without result. Two days later it was different, their bombs straddling the conning tower of a submarine before the stern rose vertically and it slid out of sight followed by a huge oil patch measuring over 400 yards wide; they claimed another sub destroyed. Then on the 31st Garside's crew once more in W3987/DX-X located a fourth submarine on its air-to-surface vessel (ASV) radar and approaching they again dropped a pattern of eight 250lb bombs, though four failed to release. The front gunner strafed the vessel that returned fire; Garside was later awarded a DFC for this action. Although 230 carried out a lot more patrols, particularly in support of Malta convoys, this was its last success in the Med.

INDIAN OCEAN

In January 1943, now fully equipped with Sunderland Mk IIIs, 230 Sqn moved to Dar es Salaam in Tanzania for shipping protection in the Indian Ocean against any threat from

Japanese or German submarines. Around this time it was decided that an all-white scheme for the Sunderlands would be more effective during maritime operations than having the underside sky blue and the brown/green camouflage for the rest of the aircraft.

There was little chance of finding a submarine over these vast areas but the monotonous work protecting convoys off the coast of East Africa was vital – such was the Axis threat in the Mediterranean Sea that all shipping from India and Australasia had to use the Cape of Good Hope route. Detachments were soon established on islands in the area to extend the patrol coverage. Also during the summer, 230 returned to its Mediterranean haunts to support the invasion of Sicily, six aircraft were detached to Bizerte in Tunisia. At this time Wg Cdr Dundas Bednall, a 230 'old boy', returned as OC, and in February 1944 he led the Squadron back to Koggala for convoy and anti-submarine ops in the eastern Indian Ocean and off Burma to counter the Japanese. Sorties were also flown from island bases, but no action came their way.

In the hope of masking the white Sunderlands better for night anti-shiping work Bednall had 'his' aircraft, JM673/P painted black overall. It was the only example painted in this colour by the squadron as a trial.

Sunderland Mk III JM673/P was dubbed *Black Peter* and painted this colour for night anti-shiping work. Pete West



Wg Cdr Bednall, 230 Sqn's OC had his Sunderland Mk III JM673/P painted black to reduce its visibility for night anti-shipping work. It was christened **Black Peter** but was the only one to be repainted. D K Bednall via Arthur Banks



Left: Flt Lt Stan Bowater in Sunderland Mk V DP200/B-Z escorts the Royal Yacht Britannia on May 15, 1954 as the Queen returns from her tour of the Commonwealth. 230 Squadron records

However, a more active part in the Burma campaign soon came in support of the Chindit force that had been operating in North Burma, deep behind Japanese lines.

As they began to withdraw, over 500 sick and wounded men were unable to march out and needed evacuation. At the end of May, 230 Sqn sent two aircraft, JM659/Q and DP180/O, flown by Flt Lt Jack Rand and Fg Off Ted Garside to Dibrugarh on the Brahmaputra River in eastern Assam. From there they flew to evacuate the casualties from Lake Indawgyi that lay 100 miles (161km) west of the Burmese city of Myitkyna.

A Sunderland at Kalamaki Bay in Greece awaits its next load of evacuees in May 1941. 230 Squadron records



Sunderland Is N9029 'V', L2161 'Y', L2160 'X' of 230 Sqn over the Arabian Sea en route from Galle in Ceylon to Alexandria on May 2, 1940. 230 Squadron records



As well as facing the Japanese, the Sunderland crews had to cross the jungle-covered heights of the Chin Hills that were usually shrouded in thick mist and cloud. The first sortie was flown on June 2 and over the next month during 13 sorties, 537 men were evacuated from under the noses of the enemy and resulted in a number of well-earned decorations to the crews.

Thereafter 230 Sqn resumed its patrol activities, beginning re-equipment with Sunderland Mk Vs in January 1945. During that period it flew some transport sorties into central Burma and supported the campaign, latterly from Akyab and then Rangoon. Armed recce and anti-shipping patrols into the Gulf of Siam and to the Andaman Islands were mounted with Flt Lt E Holstein's crew locating the tanker Tohu Maru (subsequently sunk by RAF Liberators) as well as damaging another ship and sinking a launch on June 15. Similar attacks then followed until the end of the war.

BERLIN AIRLIFT

On conclusion of hostilities 230 Sqn spent a few months on transport work from Singapore and then returned to the UK, and eventually settled at RAF Calshot, Hampshire as a part

"...gunfire blew a large hole in the hull and damaged the fuel tanks that the enterprising crew plugged with Plasticine."

of Coastal Command's only flying boat wing. When the Soviet blockade of Berlin began in June 1948 it resulted in the famous airlift. The Sunderland was a useful addition due to its spacious hold and 230 Sqn sent four aircraft – VB887/4X-X, SZ582/4X-O, SZ581/4X-Y and SZ573/4X-W – to Hamburg. Flying from the River Elbe they flew into Havel Lake in

Berlin carrying a variety of loads. As the Sunderland was designed to operate from the sea, and so had more protection from salt, it was regularly chosen to carry salt to de-ice the Berlin runways.

The detachment was withdrawn in December when ice on the rivers made conditions too hazardous, by that time 230 had flown 1,000 sorties. Soon afterwards the Squadron moved west to RAF Pembroke Dock, Pembrokeshire from where life continued supporting the Fleet.

One unusual task during the summer of 1952 was a detachment to Greenland in support of the British North Greenland expedition. This operation was repeated during the brief Arctic summer of 1954, the task requiring high degrees of flying and navigational skill, fully testing 230's crews.

By the mid-1950s, with most maritime tasks being achieved by landplanes, the days of the flying boat were numbered, and 230 Sqn was disbanded at Pembroke Dock on February 28, 1957. Thus its 'boat' era ended but in its almost 20 years of successfully flying the Sunderland the Squadron had certainly lived up to its Malay motto 'Kita chari jaur' – 'We search far'. **AN**

Sunderland Mk V SZ567/230-P was serving with 230 Sqn when the unit was disbanded in February 1957. It is shown here at RAF Wig Bay, Dumfries and Galloway on March 1, 1957. J D R Rawlings



AIRPORT MOVEMENTS

A round-up of notable aircraft visiting UK airports.



ABERDEEN

3/11 N504AC Gulfstream G550. **4/11** D-IBJJ CitationJet 525A CJ2. **5/11** D-IOHL CitationJet 525A CJ2. **7/11** G-OAGC EC225LP CHC Scotia dep to Baku via Southampton. **10/11** N795CP Gulfstream G550. **14/11** UR-MDA An-26-100 Meridian Aviation Enterprise.

BIGGIN HILL

2/8 PH-SVT Robin DR.400/140B; 9H-COL Global Express n/s. **3/8** F-GLPK Beech C.90B. **4/8** C-GPUV TBM 850 dep 17th. **5/8** 9H-BSA Hawker 750. **7/8** N431HM Douglas C-47A; OO-TMQ PA-28-161; PH-BEH Cessna 182P. **9/8** D-CAWX Citation 680 Sovereign dep 11th; HB-LTI PA-31T Cheyenne II dep 12th. **10/8** HB-PKG PA-28-181 n/s. **14/8** PH-TGL PA-28-181. **15/8** OO-FDG Falcon 2000EX dep 17th; PH-TTC Cessna 172R dep 17th. **17/8** G-BUAR/PP972/11-5 Seafire LF.III dep 19th; **OK-OKD PA-34-220T**. **19/8** R91/61-ZI Transall ET00.061, French AF. **20/8** **PR-VCO Gulfstream G450 n/s; 7T-VNC Citation 560XLS+**. **21/8** OE-EKZ Cessna 208; OO-LCL SOCAT TB-20 Trinidad dep 23rd. **27/8** SP-RPW King Air Beech 200 dep 30th. **28/8** OY-JJD Beech 400A n/s. **30/8** D-EFKG Beech V-35B n/s; OK-PMI Beech 400A. **31/8** OO-WGW AS350B3.

BIRMINGHAM

1/11 OK-RDA LET L-410UVP-5 Citywing; YL-BBL 737-33V airBaltic; VT-ALU 777-337ER Air India; HZ-A2 A320-214X; A7-CEV Global 5000 Qatar Executive; C-FFIJ Global 5000; F-GNVK Falcon 900EX EASy; T-785 Falcon 900EX EASy LTDB, Swiss AF. **2/11** F-HCIE 757-204 La Compagnie Luton diversion, f/v. **4/11** **SP-SPA ATR 72-202 SprintAir f/v**; OY-TLP Avanti also 9th. **5/11** D-ILCE PA-31T1. **6/11** SE-RHD Citation 560XLS+. **7/11** F-RAJB A340-212 ET03.060 French AF. **9/11** OE-GXL Citation 560XL also 15th.



Etihad Cargo Boeing 747-47UF N476MC visited East Midlands Airport on December 4, returning Formula 1 cars to the UK following the final Grand Prix of the season in Abu Dhabi. Karl Nixon

Global 5000 VT-IBG makes a graceful landing on Runway 26 at Luton on December 2.

AirTeamImages.com/Alex Peake

10/11 D-AKAT Legacy 600; D-CEFE CitationJet 525C CJ4; OE-IPW Falcon 7X. **15/11** D-EKEU PA46-350P. **16/11** RA-26142 An-26B Pskovavia f/v; VP-BGS Global 5000. **17/11** VP-CGD Falcon 900EX. **18/11** VP-CVH Gulfstream G280. **19/11** 258 Learjet 45 102 Sqn, Irish Air Corps; F-GLPT Merlin IIIB Airlec Air Espace; F-GOPM Falcon 20E. **21/11** TC-MCA A300C4-605RF MNG Airlines; EI-FBL 717-2BL Volotea Airlines f/v. **24/11** HA-LXA A321-231(SL) Wizz Air f/v; N500LS BBJ1. **25/11** D-ILAP Phenom 100; OK-ESC Nextant 400XT. **26/11** HB-LTN Avanti. **27/11** SE-RFS 767-304ER TUIfly Nordic f/v; **407 & 603 An-26s MH59, Hungarian AF**; PH-FHB PA-46-500TP. **28/11** SP-KPV SAAB 340AF SprintAir. **29/11** LY-SPF A320-214 Small Planet Airlines f/v; LZ-AWA A330-223 BH Air f/v; TC-JTA A321-231(SL) Turkish Airlines Manchester diversion f/v. **30/11** UR-CNT An-12BK Ukraine Air Alliance f/v; SE-RIL Citation 560XLS.

BLACKPOOL

1/9 PH-ACE Beech 300. **2/9** **A9C-HA Bell 430 Bahrain Royal Flight**. **5/9** D-ECIM PA-28-140; EI-FEJ Pipistrel Virus 912. **6/9** F-GHUV Beech E.90 n/s. **18/9** ZZ380 Wildcat HMA2 825 NAS, RN. **19/9** N104CJ MiG-15UTI Norwegian AF Historical Squadron. **22/9** D-CDOC Learjet 45. **24/9** D-CFTG Learjet 35A; DU-142 AW139 Dubai Government Air Wing; PH-WDL PA-34-220T. **26/9** F-HTCR Beech C.90GTi. **30/9** D-CRIS Astra SPX.

BRISTOL INTERNATIONAL

5/10 EC-JFT Citation 560 Ultra. **10/10** EC-LPM 717-2BL Volotea Airlines dep 12th; F-HTCH & OO-INN Beech 200s; F-GSGL CitationJet 525B CJ3 n/s.

11/10 D-AOLG Fokker 100 Avanti Air; EI-LIM AW139;

F-GOPM Falcon 20E; F-GRGK ERJ 145EU HOPI; F-GRYL Beech 1900D Twin Jet; F-HMML Phenom 300; F-HPCD Diamond DA42NG; F-HSAS Falcon 7X also 17th n/s; I-ADJT E195LR Air Dolomiti. **13/10** MM62201 Avanti 14° St, 71° Gr, Italian AF. **15/10** D-CLUZ Learjet 60. **17/10** F-GGGA Citation 550 II n/s; F-GXRK CitationJet 525 CJ1; F-HOIE Avanti; F-HRCA CitationJet 525 CJ1+ n/s; OO-EFC Cirrus SR22. **18/10** F-HOUR Citation 510 Mustang. **19/10** OE-GBD Astra SPX. **20/10** HB-PJC PA-46-500TP n/s. **22/10** S5-FUN Challenger 300. **25/10** YU-SVL Citation 560XLS. **28/10** T7-SCR CitationJet 525 CJ1 dep 2/11.

1/11 VQ-BTV Falcon 7X. **4/11** D-BMAD Do 328JET Sun-Air; F-GPYV Beech 1900C-1 Atlantique Air Assistance; SP-DLV CitationJet 525A CJ2 dep 18th. **5/11** VP-BJD Gulfstream G550 also 15th. **14/11** D-CEFD Learjet 55. **19/11** F-HALM Falcon 50. **25/11** D-CHRC CitationJet 525C CJ4. **28/11** OE-FNP Citation 510 Mustang also 29th n/s.

CAMBRIDGE

4/10 LX-LAB PC-12; OK-PPP Hawker 400XP; 2-FIFI PA-46-500TP; **ZS-TLC Beech 350**. **4/10** 156/ABT TBM 700B EAAT, French Army. **12/10** F-GXTM Falcon 50. **19/10** EI-RUL & EI-RUM 737-7K9s ex Transaero for storage; VQ-BJB 747-446F AirBridgeCargo arrived for painting; rolled out 2/11 as G-CLAA in CargoLogicAir colours, dep 3/11; G-EZIF A319-111 rolled out in Allegiant Air colours, to become N308NV. **21/10** SE-DJL Falcon 7X.

2/11 **A9C-ISA 737-86J Bahrain Royal Flight dep**; YU-HWF SA341G Gazelle. **4/11** G-SMAN A330-243 ex Monarch Airlines arrived for painting, dep 16th in flynas colours. **6/11** F-GSMG CitationJet 525B CJ3; OK-MAR CitationJet 525A CJ2+. **14/11** PH-DON Cessna 172P. **16/11** G-CLAA 747-446F CargoLogicAir colours, to Marshall; PH-AMI Cirrus SR20. **18/11** M-GSIX Gulfstream G650. **22/11** **3A-MGA Falcon 7X**. **23/11** 2-LOVE Beech A.36; F-GRET Citation 510 Mustang.

DONCASTER SHEFFIELD

1/10 107/YV Xingu EAT00.319, French AF. **3/10** 144614 CC-144B 412 TS, RCAF n/s. **5/10** 099/YP Xingu EAT00.319, French AF also 8th. **9/10** 144617 CC-144B 412 TS, RCAF n/s. **10/10** UR-CAL An-12BK Ukraine Air Alliance. **12/10** T7-TAN Citation 750 X; OE-KGC PA-46-350P n/s. **13/10** UR-CAK An-12BP



Two former Slovenian Air Force Pilatus PC-9s, N69LW (pictured) and N69XC, transited via Peterborough Business Airport en route to the US. They arrived on December 11 and the aircraft in this photo is shown the following day. Dino Carrara

Ukraine Air Alliance. 14/10 LN-IDC Citation 560 Encore. 15/10 5N-PZE Gulfstream IV. 16/10 OO-GMJ Beech 350 n/s. 18/10 OE-GBD Astra SPX; **EW-455TQ 747-281BF Transavia** export Airlines n/s. 19/10 PH-DND ERJ 145MP FlyDenim. 25/10 **5N-DSN Beech 350**. 27/10 F-GULY Beech C.90B.

DURHAM TEES VALLEY

2/10 50+36 Transall LTG63, German AF. 3/10 SP-ENZ 737-85F Enter Air. 4/10 I-AVND Learjet 45 dep 6th. **10/10** 2-BOYS Commander 114B. 14/10 CS-TRI A330-322 HiFly n/s; D-CAAM Do 228-212 Arcus Air. 15/10 LZ-FLL An-26B Bright Flight also 22nd; UR-KDM An-12BK Cavok Air dep 19th. 16/10 PH-MJP Fokker 100 FlyDenim. 19/10 9H-MDJ Cessna U.206G n/s. 23/10 C-GZCZ Gulfstream G150; OH-RBX Citation 560XL n/s; SP-KPK SAAB 340A Sprint Air. 28/10 OO-IDE CitationJet 525 CJ1; D-CSLT Learjet 60 n/s. 29/10 HA-TAG SAAB 340A Fleet Air International.

EAST MIDLANDS

3/11 UR-CEZ An-12BP Cavok Air also 4th. 4/11 EW-328TG An-26B Genex. 5/11 D-CARO Citation 680 Sovereign; HB-JSG Challenger 605. 9/11 C-GSLU Falcon 2000EX. 11/11 9H-FAM Phenom 100. 16/11 RA-26142 An-26B Pskovavia. 17/11 **4K-AZ100 II-76TD-90VD Silk Way Airlines**; SE-RIZ Citation 560XLS. 18/11 RA-26086 An-26 Pskovavia. **19/11** 2-RTKD ATR 42-512 for painting for Azul. **20/11** F-HBIR Citation 510 Mustang. 26/11 OO-PAR CitationJet 525B CJ3. 29/11 N778LA 777-F16 Southern Air/LAN Cargo.

GLASGOW

1/10 TC-AFF Challenger 300; D-CJPG Learjet 35A. **2/10 C-FARA Skyvan Summit Air to be based at RAF Brize Norton**. 3/10 D-ABUE 767-330ER Condor, diversion Los Angeles-Frankfurt; OO-LET Beech 200; OE-GBD Astra SPX. 4/10 OK-PPP Hawker 400XP. **5/10** D-CGEP Gulfstream G150; N900CU TBM 900 c/n 1090 on delivery. 7/10 OO-PAR CitationJet 525B CJ3; SP-ENZ 737-85F Enter Air & SP-LNB E195LR LOT both football charters. 8/10 OY-PHD PA-46-500TP. 10/10 N979MB TBM 900 c/n 1092 on delivery. **11/10** CS-DTQ Phenom 300. 12/10 SP-ENQ 737-85F Enter Air football charter. 13/10 09-0540 C-40C 73rd AS, 932rd AW, USAF. 14/10 OO-PRM Citation 510 Mustang; **19201 Lynx Mk.95 EHM, Portuguese Navy**; TC-FHY A320-214 Freebird Airlines. 16/10 168573/BR-34 MH-60S HSC-28, USN. 18/10 910502 C-26D AOD Naples, USN. 20/10 900531 C-26D AOD Naples, USN; V-11 Gulfstream IV 334 Sqn, Royal Netherlands AF. 22/10 T7-ASH PA-46-500TP. 23/11 N434MA TBM 900 c/n 1094 on delivery. 24/10 OE-GMG Citation 650 VII. 27/10 96-0108 UC-35A 6-52nd

Avn, US Army. 29/10 C-GTQX 737-8FH Air Transat on delivery for winter lease; A6-EPB 777-31HER Emirates f/v. 30/10 TC-FHC A320-214 Freebird Airlines.

INVERNESS

1/10 HB-JUF Gulfstream G650 also 2nd-12th. 2/10 OK-UGJ Citation 680 Sovereign also 6th. 4/10 D-CCCF Citation 550 II; 139/ABS TBM 700A EAAT, French Army also 14th; OY-JPJ Citation 650 III also 8th. 7/10 LN-TWL Beech 200 also 21st. 8/10 LX-ZED Challenger 605. 13/10 166324/HW-71 MH-60S HSC-26, USN. 15/10 TC-KHB Gulfstream G450 dep 18th. 19/10 D-CMDH Citation 680 Sovereign dep 21st. **20/10** N8833 Gulfstream G650. 24/10 C-GHQZ Dash 8-314 United Nations. 28/10 D-ILAC Eclipse EA500. **29/10** OE-IEL Global Express n/s. 30/10 D-CEFE Citation 525C CJ4. 31/10 A7-CEV Global 5000 n/s.

3/11 OY-PBI LET 410 n/s. 4/11 D-IOHL CitationJet 525A CJ2. 12/11 LX-ZED Challenger 605. 12/11 OY-EVO Citation 550 Bravo. 16/11 OO-PCI PC-12 dep 18th. 18/11 OO-CIV CitationJet 525C CJ4. 19/11 D-IAKN CitationJet 525A CJ2+. 20/11 OE-FKO CitationJet 525A CJ2+ n/s. 21/11 OY-CLP Citation 650 VII. 23/11 PH-MYX Citation 650 VII; D-CRON Citation 560XLS. 26/11 D-CAWX Citation 680 Sovereign+.

LEEDS BRADFORD

1/9 F-GRNT Merlin IIIB Airlec Air Espace. 2/9 OY-JPJ Citation 650 III. 7/9 D-IEKU & D-IPVD CitationJet 525A CJ2s. 10/9 ZZ178 C-17A 99 Sqn, RAF. 11/9 CS-DTC Phenom 100. 12/9 LZ-AWA A330-223 BH Air. 14/9 D-IDAK Beech C.90. 16/9 OE-FID Citation 510 Mustang. 19/9 YU-BTM Citation 650 VII. 22/9 HB-VPG Phenom 300. 23/9 9H-FAM Phenom 100. **26/9** C-FKCI Challenger 300.

5/10 D-IPVD Citation 525A CJ2. 6/10 HB-JSN Falcon 7X. 11/10 D-CHLR Phenom 300. 13/10 N280C

Gulfstream G280. 14/10 D-CHER Learjet 60; D-CFAI Learjet 55. 15/10 ZS-TDF Global 6000. 16/10 **T7-ASH PA-46 JetPROP DLX**. 19/10 D-CNOC Citation 560XLS. 23/10 ZZ504 Shadow R1 14 Sqn, RAF crew training.

LIVERPOOL

1/10 D-ISJM CitationJet 525 CJ1+. 2/10 OY-NBS PC-12 dep 4th; OE-LID ATR 72-600 InterSky; OE-LIA Dash 8-314 InterSky; D-CRIS Astra SPX. 7/10 OE-GIE CitationJet 525C CJ4. 10/10 D-AFAM Challenger 604; F-GIXE 737-3B3 Europe Airpost n/s; OK-RDA LET L410-UPV Van Air. 12/10 D-AOLG Fokker 100 Avanti Air. 14/10 D-CGGG Learjet 31A n/s. 15/10 F-HJD CitationJet 525A CJ2+; F-GPKL PA-46 JetPROP DLX. 16/10 PH-JUR PA-32RT-301 n/s. 18/10 ZK561 Chinook HC6 arrived from docks, on delivery to RAF Odiham; EC-KKD Beech 400XP. **20/10** D-EAWW PA-28R-201; **RA-67221 Challenger 300 Tatarstan Airlines dep 23rd**. 21/10 **VP-BHZ A320-214 Yamal Airlines**. 22/10 ZZ416 Shadow R1 14 Sqn, RAF also 23rd. 23/10 LN-WDH Dash 8-Q402 Widerøe. 24/10 9H-MTF 737-329 Multiflight n/s. 26/10 OE-HCZ Challenger 300 n/s. 27/10 EI-GJL AS365N3.

LONDON GATWICK

1/11 9H-LDV Challenger 605; T-785 Falcon 900EX EASY LTDB, Swiss AF. 2/11 EI-RNE E190STD Alitalia London City Diversion. 3/11 OM-GTA 737-4Q8 Go2Sky f/v op for Windrose Airlines; UR-WRK A320-211 Windrose Airlines f/v football charter; 103/XI TBM-700A EAT00.0319, French AF. 5/11 A6-EPC Boeing 777-31HER Emirates f/v. 6/11 A6-EPD 777-31HER Emirates f/v. 7/11 A6-EPA 777-31HER Emirates f/v. 10/11 A6-EPB 777-31HER Emirates f/v; OE-FCZ CitationJet 525A CJ2+. 11/11 D-ASTP A321-211 Germania f/v; C-GLNL Learjet 35A. 12/11 TC-JTD A321-231 Turkish Airlines f/v. 13/11 OM-HEX 737-81Q Air Explore op for Iraqi Airways. 17/11 A7-HBJ Boeing 747-8KB BBJ Qatar Amiri Flight f/v. 20/11 **5N-BQN 767-352ER Med-View Airlines new service from Lagos**. 21/11 OO-FTS Citation 560XL. 23/11 TC-DCF A320-216 Pegasus Airlines f/v. 26/11 SP-TVZ Boeing 737-8BK Enter Air f/v. 28/11 PH-TFF 737-86N TUI Airlines Netherlands f/v; D-BAVB Challenger 300.

LONDON HEATHROW

1/11 ET-ASK 777-360ER Ethiopian Airlines f/v; HS-TKN 777-3ALER Thai Airways International f/v; TC-JIY A330-223 Turkish Airlines f/v; VQ-BQE 777-3M0ER Aeroflot f/v. 2/11 N782AM 787-8 Dreamliner Aeromexico f/v; TC-JTD A321-231(SL) Turkish Airlines f/v. 3/11 A7-CEV Global 5000; N734AR 777-323ER American Airlines f/v. 5/11 HL8010 777-3B5ER Korean



Jordan Aviation Airbus A320-211 JY-JAC on its first visit to Manchester on December 9. It had arrived from Beirut, Lebanon. Nik French



United States Coast Guard Gulfstream V 02 touches down at Luton on December 9. Apron
Media courtesy of Paul Ferry

Air f/v. 6/11 A7-BEC 777-3DZER Qatar Airways f/v.
7/11 5Y-KZH 787-8 Dreamliner Kenya Airways f/v;
A6-EON A380-861 Emirates f/v; HS-TKV 777-3D7ER
Thai Airways International f/v; VP-CTS Gulfstream
G650. **8/11** HS-TKZ 777-3D7ER Thai Airways
International f/v. 11/11 B-8231 A330-243 China
Eastern Airlines f/v; D-ABDQ A320-214 airberlin op for
Lufthansa; HS-TKU Boeing 777-3D7ER Thai Airways
International f/v. 12/11 5Y-KZJ 787-8 Dreamliner
Kenya Airways f/v; D-AEBN E195LR Lufthansa
Regional f/v. 13/11 HS-TKX 777-3D7ER Thai Airways
International f/v. 15/11 9V-SNB 777-312ER Singapore
Airlines f/v; M-YSIX Gulfstream G650. 16/11 HS-TKL
777-3ALER Thai Airways International f/v. 17/11
4R-ALP A330-343 Sri Lankan Airlines f/v; HZ-
AK28 777-368ER Saudia f/v. 18/11 VN-A864 787-9
Dreamliner Vietnam Airlines f/v. 19/11 A7-BCS 787-8
Dreamliner Qatar Airways f/v. 21/11 HS-TKY 777-
3D7ER Thai Airways International f/v. 23/11 C-FNOH
787-9 Dreamliner Air Canada f/v.

LONDON LUTON

1/10 N333BH Legacy 650; B-8158 Gulfstream G450.
2/10 TC-ABN Challenger 605. 3/10 I-PFLY & S5-SAD
Global 6000s. 4/10 VP-BNW Hawker 850XP. 5/10
I-NEOZ 737-86N Neos; F-GPGK Falcon 900B. 6/10
OE-LEY A320-214 Niki. 7/10 N916CG Astra. 8/10
N288WR Gulfstream G650. 9/10 P4-AMR Challenger
300. 10/10 SX-GRC Falcon 7X; N745AX 767-232F on
delivery to West Atlantic ex ABX Air. 11/10 **3B-PGT**
Global 5000. 12/10 OE-LET A321-211 Niki; OE-GES
Citation 560XLS+. 14/10 D-AYSM Gulfstream G650.

LONDON SOUTHEAST

2/11 OO-GHE Falcon 2000EX n/s; HB-IZP SAAB
2000 Ethad Regional. 3/11 VP-COM Citation 500 1,
N788DP BBJ1. 4/11 N958MD Cessna 340A sold in
USA, dep to Wick en route to Florida. 11/11 G-ISLH
ATR 42-320 Blue Islands to Inflight Aviation dep 16th.
16/11 G-ISLI ATR 72-212A Blue Islands to Inflight
Aviation. 17/11 D-IAHT Mu-2P. **20/11** D-CULT Do
228-212 Businesswings. 29/11 SP-KPV SAAB 340AF
SprintAir f/v.

MANCHESTER

1/11 SX-BDT A320-232 Hermes Airlines f/v, op for
Iraqi Airways; VQ-BIU A320-214 Aeroflot f/v, CSA
Moscow team to play Manchester Utd. 3/11 EC-JPU
A340-642 Iberia f/v, for painting at Air Livery; LX-
TQJ Falcon 7X f/v; 9H-BVJ Challenger 850 f/v. 4/11
TC-JTD A321-231(SL) Turkish Airlines f/v; S5-SAD
Global 6000 f/v; N113CS Gulfstream G650ER f/v,
Leeds Bradford diversion. 6/11 A6-EOI A380-861

Emirates f/v; LZ-FLL An-26B Bright Flight f/v. 7/11
A7-BCJ 787-8 Dreamliner Qatar Airways f/v; B-HNR
777-367ER Cathay Pacific f/v; D-ITRA CitationJet 525
CJ1 f/v. 8/11 A7-BCM 787-8 Dreamliner Qatar Airways
f/v; OE-LFQ Fokker 70 Austrian Airlines f/v; N247WE
Global 5000 f/v. 9/11 A7-BCR 787-8 Dreamliner Qatar
Airways f/v; D-AOLG Fokker 100 Avanti Air f/v. 10/11
A7-BCE 787-8 Dreamliner Qatar Airways f/v; LZ-CGR
737-448F Cargo Air f/v, op for DHL; N800KS 737-7BC
BBJ1 f/v; OE-GHF Learjet 40 f/v; OH-SWI CitationJet
525A CJ2+ f/v. 11/11 A7-BCX 787-8 Dreamliner
Qatar Airways f/v; LZ-CGQ 737-3Y5F Cargo Air f/v;
UR-CNT An-12BK Ukraine Air Alliance f/v. 12/11
A7-BCF 787-8 Dreamliner Qatar Airways f/v. 13/11
A7-BCT 787-8 Dreamliner Qatar Airways f/v; SE-RHD
Citation 560XLS+ f/v; I-XPR Gulfstream G450 f/v.
15/11 A7-BCU 787-8 Dreamliner Qatar Airways f/v.
16/11 A7-BCS 787-8 Dreamliner Qatar Airways f/v.
17/11 A7-BCW 787-8 Dreamliner Qatar Airways f/v;
EC-JBA A340-642 Iberia f/v, for painting at Air Livery;
F-GSTF A300B4-608ST Airbus Hawarden diversion.
19/11 A7-BCY 787-8 Dreamliner Qatar Airways f/v.
20/11 SP-ENX 737-8Q8 Enter Air f/v; OK-PPP Beech
400XP f/v. 21/11 A7-BCV 787-8 Dreamliner Qatar
Airways f/v. 22/11 9V-SNB 777-312ER Singapore
Airlines f/v. 23/11 I-GURU Learjet 40 f/v. 24/11 A7-
BCQ 787-8 Dreamliner Qatar Airways f/v; A6-EOP
A380-861 Emirates f/v. 25/11 PH-HWM Challenger
605 f/v; F-HBGE TBM 850 f/v. 26/11 A7-BCA 787-8
Dreamliner Qatar Airways f/v; **5Y-CYE 737-86N Kenya**
Airways f/v, on delivery flight, dep 27th; HZ-MS4A
Gulfstream G450 f/v. 27/11 MAB C-17A Qatar Emiri
Air Force; N280GD Gulfstream G280 type f/v. 28/11
TC-JTE A321-231(SL) Turkish Airlines f/v.

PRESTWICK

1/10 N817GA Gulfstream G150 on delivery; **HR-AUX**
ATR 42-320QC ex TACA, ferry flight; 168980 C-40A

VR-61, USN also 9th, 15th & 17th. 2/10 N92KQ
Kodiak 100 floatplane. 7/10 HB-FSO PC-12 c/n 1570
on delivery; 166324/HW-71 MH-60S HSC-26, USN
also 8th, 11th, 13th, 20th & 22nd. 8/10 167852/HW-
60 MH-60S HSC-26, USN. 12/10 92-1451, 94-6701 &
94-6703 C-130Hs 182nd AW, II ANG. 15/10 **N83KE &**
N40GZ Beech 350s US Army. 19/10 85-0010 C-5M
60th/349th AMW, USAF; 08-0293 MC-12W 322nd
AEW, USAF. 20/10 HB-FSS c/n 1574 & HB-FST c/n
1575 PC-12s on delivery; 08-0309 MC-12W 322nd
AEW, USAF. 22/10 **168760/LC-760 P-8A VP-30**
USN also 23rd. 24/10 PR-PFH Phenom 100. 25/10
165379/BD C-130T VR-64, USN n/s. 26/10 168206
UC-12W SP-MAGTF, USN; 081F-RAJB A340-212
ET03.060, French AF; N268GA Gulfstream G280.
27/10 N856BW Beech 350 US Army; 87 Xingu 24F,
French Navy. 28/10 HB-FSV PC-12 c/n 1577 on
delivery. **30/10** G-MOGG S-92A HMCG to be based.

2/11 99-0004 C-32A 1st AS, 89th AW, USAF; HB-
FSW PC-12 c/n 1578 on delivery; N636AR Dash
8-103 EP Aviation. 3/11 N1TF & N650JH Gulfstream
G650s. **5/11** N567AF PC-12 c/n 1567 on delivery.
6/11 92-1451, 94-6701 & 94-6703 C-130Hs 155th AS,
II ANG all n/s. 7/11 N543JN MD-11F Western Global
Airlines; 165378 C-130T VR-55, USN. 9/11 08-0353
& 08-0462 MC-12Ws 489th RS, 9th RW, USAF. 10/11
HB-FSX (c/n 1579) & HB-FSY (c/n 1580) PC-12s on
delivery; EC-406 A400M Airbus for crosswind trials.
11/11 N276A & N288A Gulfstream G550s; 09-0525
C-37B 99th AS, 89th AW, USAF. 17/11 HB-FSZ PC-
12 c/n 1581 on delivery. 18/11 UR-82008 An-124-
100M-150 Antonov Airlines; A7-MBN S-92A & A7-GHO
AW139 both Gulf Helicopters. These were off-loaded
from UR-82008, then reloaded on UR-82029, due to
an aborted hunting trip. 22/11 UR-82029 AN-124-100
Antonov Airlines. 23/11 HB-FQA c/n 1582 & HB-
FWD c/n 1576 PC-12s on delivery. 24/11 PH-BHC
787-9 Dreamliner KLM crew training.

SOUTHAMPTON

1/11 D-AFUN Legacy 650 Air Hamburg. 2/11 N862MT
Citation 525 M2. 9/11 N885B Falcon 900EX. 13/11
EC-KKD Beech 400XP; G-SAYE Do 228-201 Aurigny
Air Services f/v. 17/11 C-215 Challenger 604 Esk.721,
Royal Danish AF. 18/11 ZJ-THC CitationJet 525C CJ4
first Jersey-registered aircraft to visit; N789RR Global
XRS.

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



Royal Wings Airbus A320-212 JY-AYI visited Birmingham on December 14. AirTeamImages.com/
Dave Sturges

With thanks to: D Apps, D Banks, D Bougourd, S Boyd, J Brazier, N Burch, P Claridge, A Clarke, I Cockerton, KW Ede, M Farley, N French, P Gibson, D Graham,
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RJ Sayer, M Shepherd, A Smith, D Turner, JA White, G Williams, Blackpool Aviation Society, Manston Movements, Solent Aviation Society/Osprey,
South Wales Aviation Group, CIAN, GSAE, The Aviation Society, EGPE ATC, www.dtmovements.co.uk, Aerodata Quantum Plus and RHADS.

AIR BASE MOVEMENTS

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



Boeing C-32A 09-0017 departs RAF Mildenhall on December 1. The aircraft, from the 1st AS/89th AW at Joint Base Andrews, was visiting in support of President Barack Obama's trip to Paris for the COP21 climate change summit. Ryan Dorling

RAF BRIZE NORTON

12/11 A4M016 A400M Airbus Military dep 23rd. **19/11 KAF326 KC-130J-30 Kuwait AF n/s.** **20/11** 144614 CC-144B RCAF 412 TS, RCAF; R214 Transall NG ET00.064, French AF. **23/11** ZB692/Y Gazelle AH1 671 Sqn, AAC. **24/11** **TK.10-11/31-53 KC-130H Ala 31, Spanish AF.** **29/11** 50+66 Transall LTG61, German AF dep 1/12.

RAF CONINGSBY

18/11 A4M016 A400M Airbus Military o/s. **23/11** ZJ211 Apache AH1 3 Regt, AAC; 68 Xingu EPV/28F French Navy. **26/11** 105/YU Xingu EAT00.319, French AF.

RNAS CULDROSE

23/11 ZJ647 Alpha Jet QinetiQ; **N-316, N-319 & N-326 NH-90-NFHs DHC/860 Sqn, Royal Netherlands Naval Air Service.** **24/11** ZR322 A109E 32(TR) Sqn, RAF. **25/11** ZF562/404-IR Lynx HMA8SRU 815 NAS, RN.

RAF FAIRFORD

9/11 84-0126 C-21A 76th AS, 86th AW, USAF.

RAF LAKENHEATH

5/11 84-0126 C-21A 86 AW 76th AS, 86th AW, USAF; 06-6163 C-17A 60th/349th AMW, USAF dep 11th. **7/11** 11-5738 C-130J-30 19th AW, USAF, also 8th, 10th & 11th. **8/11** 83-1285 & 87-0035 C-5Ms 436th/512nd AW, USAF both n/s, both also 10th, 12th & 13th; 11-5752 C-130J-30 19th AW, USAF. **9/11** 85-0008 C-5M 436th/512nd AW, USAF; 11-5752 C-130J-30 19th AW, USAF n/s. **10/11** 03-3119 C-17A 183rd AS, Ms ANG. **18/11** 61-2663/OF RC-135S 55th Wg, USAF dep **22nd.** **19/11** 493rd FS received new F-15D 84-0046/LN as replacement for 86-0182 w/o 08/10/14.

RAF LEEMING

23/11 ZE376, ZF537 & ZG918 Lynx AH.9As 657 Sqn, AAC all dep 26th.

RAF LOSSIEMOUTH

5/11 165379/BD C-130T VR-64, USN. **9/11** 162775/PD P-3C VP-9, USN, dep 11th. **10/11** 14 Atlantique NG 21F French Navy, dep 23rd. **11/11** 166695 C-40A VR-56, USN; **0014/F-RBAF A.400M ET01.061, French AF.** **12/11** 166695 C-40A VR-56, USN also 13th. **13/11** 4 Atlantique NG 21F, French Navy. **15/11** 77 Xingu 28F, French Navy. **16/11** 67 Xingu 28F, French Navy. **19/11** 133 Falcon 10MER 57S, French Navy. **20/11** 92-0375 C-20H 76th AS, 86th AW, USAF; 140114 CP-14014 Wg, RCAF dep 26th. **21/11** 4 Atlantique NG 21F, French Navy dep 26th. **22/11** 130615 CC-130J-30 RCAF 8 Wg, RCAF dep 24th; 85 Xingu 28F, French Navy. **27/11** 177705 CC-177 RCAF 429 Sqn, RCAF; 165378 C-130T VR-55, USN n/s. **30/11** **0008/F-RBAB A400M ET01.061, French AF.**

RAF MILDENHALL

2/11 80-0321 C-130H 158th AS, Ga ANG dep 6th; 79-0479 C-130H 192nd AS Nv ANG n/s. **4/11** 80-0326 C-130H 158th AS, Ga ANG n/s; **75-0557/OK E-3B 552nd ACW, USAF dep 8th.** **5/11** 165736/QB KC-130J VMGR-352, USMC dep, present since 29/10. **6/11** 85-0008 C-5B 436th/512nd AW, USAF; 80-0322 C-130H 158th AS, Ga ANG n/s; 79-0475 (n/s) & 79-0476 (dep 10th) C-130Hs 192nd AS, Nv ANG. **9/11** 165738/BH KC-130J VMGR-252, USMC dep 11th, also 16th n/s. **12/11** ZZ665 Airseeker R1 51 Sqn, RAF dep, arrived 3/9. **17/11** 165392/NY KC-130T VMGR-452, USMC n/s. **20/11** 85-0002 C-5M 436th/512nd AW, USAF; AT-17 (dep 30th), AT-27 (dep 1/12), AT-22 & AT-28 (both dep 23rd); Alpha Jets AJeTS, Belgian

Defence – Air Component. **30/11** **0008/F-RBAB & 0014/F-RBAF A400Ms FrAF ET01.061, French AF.**

RAF NORTHOLT

2/11 102004 Tp-102C TSFE, Royal Swedish AF; T-785 Falcon 900 LTDB, Swiss AF. **3/11** 045/62-IB CN-235-200M ET01.062, French AF; 2/FP (F-RAFP) Falcon 900 ET00.060, French AF. **8/11** 258 Learjet 45 102 Sqn, Irish Air Corps, also 27th. **9/11** 09-0525 C-37B 99th AS, 89th AW, USAF n/s; **102005 Tp-102C TSFE, Royal Swedish AF.** **14/11** XW199 (also 26th) & ZA935 Puma HC2s 33/230 Sqn, RAF. **16/11** C-215 Challenger 604 Esk 721, Royal Danish AF; **MM62167 P-180E 28 Gr, Italian Army n/s.** **17/11** 67 Xingu EPV/28F, French Navy. **18/11** 166376 C-37A VR-1, USN; 185 Falcon 10MER 57S, French Navy; L1-01 Falcon 2000EX Slovenian Govt n/s. **19/11** ZJ694 Sentinel R1 5 Sqn, RAF dep 23rd. **20/11** ZK304/FM Typhoon FGR4 1(F) Sqn, RAF dep 23rd; ZD575/DC Chinook HC4 Odiham Wg, RAF. **22/11** ZG995 Defender AL1 651 Sqn, AAC; ZZ518 Wildcat HMA2 825 NAS, RN n/s. **23/11** ZH845 Merlin HM2 824 NAS, RN. **25/11** ZH004 Defender T3 651 Sqn, AAC n/s. **26/11** XW209 Puma HC2 33/230 Sqn, RAF. **27/11** G-ZIOO A109SP delivered to 32(TR) Sqn, will become GZ100. **30/11** 14+01 Global 5000 FBS, German AF.

RAF SHAWBURY

11/11 XZ320 Gazelle AH1 651 Sqn, AAC; ZB692 Gazelle AH1 671 Sqn, AAC also 26th. **16/11** ZB691/S Gazelle AH1 671 Sqn, AAC. **25/11** ZJ190 & ZJ195 Apache AH1s 4 Regt, AAC; ZG993 Defender AL1 departed by road to the Museum of Army Flying, Middle Wallop where it will initially be placed into storage until the new the museum extension is completed. **30/11** ZJ118/B Merlin HC3i 846 NAS, RN.

RAF WADDINGTON

24/11 QQ100 A109E ETPS.

RNAS YEOVILTON

12/11 A4M016 A400M Airbus Military. **18/11** ZJ647 Alpha Jet QinetiQ o/s also 24th o/s. **19/11** ZB692/Y Gazelle AH1 671 Sqn, AAC also 25th. **23/11** ZJ210 Apache AH1 3 Regt, AAC; **N-316, N-319 & N-328 NH-90-NFHs DHC/860 Sqn, Royal Netherlands Naval Air Service.**

Key: n/s night stop; o/s overshoot

US Navy P-3C Orion 161012 taxis out at RAF Lossiemouth, Moray, on December 14. Niall Paterson



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THE GRUMMAN AMPHIBIANS



THE GRUMMAN AMPHIBIANS
- Goose, Widgeon & Mallard
Fred J Knight with Colin R Smith

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REGISTER REVIEW

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



Fly Vectra's newly acquired Cessna 560XL Citation XLS+ G-RSXP visited Edinburgh Airport on December 11. Mark Piacentini

RESTORATIONS

REG'N	MODE(S)	TYPE	C/N	OWNER
G-BIKX	400589	Boeing 757-236	23493	DHL Air Ltd, Leipzig/Halle, Germany (NB)
G-CCNG	404A93	Flight Design CT2K (assembled by Mainair Sports Ltd)	8004	ND Dykes, City Airport (Barton), Greater Manchester
G-CJNE	405655	Schempp-Hirth Discus 2a	18	R Priest, Wycombe Air Park, Buckinghamshire
G-EZMK	400BD7	Airbus A319-111	2370	easyJet Airline Company Ltd, Luton, Bedfordshire (NB)
G-HAVI	406259	Airbus Helicopters EC130B4	3903	Skargardsgruppen i Stockholm AB, Stockholm Bromma, Sweden
G-MVSL	406FAA	Aerial Arts Chaser S	CH807	RJ Turner, (Spalding, Lincolnshire)
G-MYYL	403B33	Cyclone AX3/503	7110	R Ferguson, Priory Farm, Tibenham, Norfolk
G-STNR	403B0B	IAV-Bacau Yak-52	833810	DJ Hopkinson, Henstridge, Somerset
G-WILD	40264E	Pitts S-1T	1017	SL Goldspink, Shuttleworth (Old Warden), Bedfordshire
EI-CJX	TBA	Boeing 757-2Y0	26160	ASL Airlines (Ireland) Ltd, Dublin (for operation on behalf of Aer Lingus)
EI-RMC	Not allocated	Bell 206B JetRanger	488	D Ganley, (Tuam, Co Galway)

NEW REGISTRATIONS

REG'N	MODE(S)	TYPE	C/N	OWNER
G-CIOC	406E03	Boeing N2S-4 Kaydet (officially registered as an A75N1)	75-4961	Skymax (Aviation) Ltd, Damyns Hall, Upminster, Greater London
G-CIOP	406E3B	Airbus Helicopters AS355F1 Ecureuil II	5216	RCR Aviation Ltd, Thrupton, Hampshire
G-CITP	406F03	Grumman American AA-1B Trainer	AA1B-0466	Have A Look, Grimbergen, Belgium
G-CIUC	406F3E	Airbus Helicopters AS365N3+ Dauphin II	6379	Airbus Helicopters UK Ltd, Oxford, Oxfordshire
G-CIUM	406F61	Piper PA-12 Super Cruiser	12-1272	S James and J Havers, North Weald, Essex
G-CIUT	406FA0	DAR Solo 120	120-230-003	Conair Sports Ltd, Poplars Farm, Deppers Bridge, Warwickshire
G-CIUU	406F85	Reims Cessna F152	1770	C Bennewith, Rochester, Kent
G-CIUW	406FA4	Cameron Z-90	11934	MG Howard, (Dubai, United Arab Emirates)
G-CIUX	406FA6	Auster AOP.9	AUS.B5-020 (officially registered as AUS/180)	R Warner, Westside Farm, Whittlesford, Cambridgeshire
G-CIUZ	406FB3	P & M Quik GTR	8726	S Spyrou, (London N12)

G-CIWD	406FC1	TLAC Sherwood Ranger ST	PFA 237B-15221	AR Pitcher, (Udimore, East Sussex)
G-CIWF	406FC9	Airbus Helicopters EC225LP	2955	Wilmington Trust SP Services (Dublin) Ltd, (stored Fleetlands, Hampshire)
G-CIWN	406FBB	Such Special Shape	002	DG Such, (Barkway, Hertfordshire)
G-CIXH	406F8E	Schempp-Hirth Ventus 2a	20	O Walters, Bicester, Oxfordshire
G-CIZR	406FC6	Van's RV-9	PFA 320-14506	ML Martin, (Cuckfield, West Sussex)
G-CLRD	406F31	PZL-Bielsko SZD-51-1 Junior	B-2149	Devon and Somerset Gliding Club Ltd, North Hill, Devon
G-CLRJ	406FCA	Schempp-Hirth Discus bT	28	MS Smith, Kingston Deverill, Wiltshire
G-DAGN	406F38	Comco Ikarus C42 FB80 Bravo (assembled by Red Aviation)	1509-7419	NJ James, Welshpool, Powys
G-EMPP	406661	Diamond DA42M Twin Star	42.M011	Diamond Executive Aviation Ltd, Gamston, Nottinghamshire
G-EXCC	406FAD	CubCrafters Carbon Cub EX-2	LAA 395-15363	MS Colebrook, (Tilford, Surrey)
G-EZOW	406E68	Airbus A320-214	6834	easyJet Airline Company Ltd, Luton, Bedfordshire (NB)
G-EZOX	406E69	Airbus A320-214	6837	easyJet Airline Company Ltd, Luton, Bedfordshire (NB)
G-FEGN	406F34	Piper PA-28-236 Dakota	28-8411030	PJ Vacher, Melhuish Farm, North Moreton, Oxfordshire
G-FLLY	406F3F	Dassault Falcon 2000LXS (officially registered as a 2000EX)	301	TAG Aviation (UK) Ltd, Geneva Cointrin, Switzerland
G-FLOE	406FA1	Robinson R66	0631	Heli Air Ltd, Wellesbourne Mountford, Warwickshire
G-FOXU	406F22	Aeropro EuroFOX 912(1)	BMAA/HB/673	CD Waldron, Redlands, Wiltshire
G-FSBW	406FB1	Aeropro EuroFOX 912S(1)	BMAA/HB/678	SB and LS Williams, Headcorn, Kent
G-HARL	406FAC	Comco Ikarus C42 FB100 Bravo (assembled by Red Aviation)	1509-7418	PJ Harle, Morgansfield, Fishburn, Co Durham
G-HPIN	406F52	Bell 429	57187	Harpin Ltd, Bagby, North Yorkshire
G-IMBO	406F48	Jodel DR250/160 Capitaine (built by Centre Est Aeronautique)	73	Training and Leisure Consultants Ltd, Headcorn, Kent
G-KMIR	406FC5	Schleicher ASH-31Mi	31026	M Woodcock, Sleaf, Shropshire
G-MADA	406F57	Boeing 737-548	24919	Opel Investments Ltd, (stored Bacau George Enescu International, Romania)
G-MCGL	406F8B	Sikorsky S-92A	920254	Bristow Helicopters Ltd, Aberdeen, Aberdeenshire (NB)
G-NRWY	406F26	Boeing 737-8JP	39024	Norwegian Air UK Ltd, London Gatwick
G-OFES	406F36	Alisport Silent 2 Electro	2076	NDA Graham, Oban, Argyll and Bute
G-OLEG	406D52	Yakovlev Yak-3M (built by Strela Proizvodstvennoye Obedinenie)	0470202	WH Greenwood, Swanborough Farm, Lewes, East Sussex

PREVIOUS IDENTITIES				
REG'N	P.I.	REG'N	P.I.	
G-BIKX	ex D-ALEI	G-RVTB	ex G-CIWM	
G-CIOC	ex N9548H	G-SAAR	ex I-RAIQ	
G-CIOP	ex ZS-HMI	G-SANT	ex G-JPIP	
G-CITP	ex OO-PTC	G-SGFE	ex G-OLAR	
G-CIUM	ex D-EFHH	G-TREB	ex N7156J	
G-CIUU	ex OO-PNP	G-TUKU	ex D-KUKU	
G-CIUX	ex WZ679	G-VWET	ex D-EARS	
G-CIWF	ex D-HTIN	G-XLEJ	ex F-WWAE	
G-CIXH	ex D-1645	EI-CJX	ex N135CA	
G-CLRD	ex SP-3891	EI-FHP	ex LN-DYH	
G-CLRJ	ex PH-1359	EI-FHR	ex LN-DYJ	
G-EMPP	ex G-DSPY	EI-FHT	ex LN-DYL	
G-EZMK	ex HB-JZM	EI-FHY	ex LN-NGI	
G-EZOW	ex D-AXAU	EI-FKH	ex B-2211	
G-EZOX	ex D-AXAV	EI-FLJ	ex PK-GPI	
G-FEGN	ex HB-POJ	EI-FMD	ex N204FR	
G-FLLY	ex F-WWJX	EI-FME	ex 9V-SLH	
G-HAVI	ex (SE-)	EI-FMG	ex G-MNUX	
G-HPIN	ex M-HRPN	EI-FMH	ex F-WWYM	
G-IMBO	ex D-ENVM	EI-FMJ	ex F-WWEZ	
G-KMIR	ex D-KMIR	EI-FML	ex N929FR	
G-MADA	ex UR-GBF	EI-FMO	ex I-8035	
G-MCGL	ex N254J	EI-SLR	ex HB-AFG	
G-NRWY	ex EI-FHI	M-ABIX	ex LY-VEK	
G-OLEG	ex D-FLAK	M-ABIY	ex LY-VEJ	
G-PNGB	ex VH-DBF	M-YSIX	ex N656GD	
G-PRPD	ex N332NG	2-IDBU	ex EI-DBU	
G-REEV	ex D-HIAG	2-MMRJ	ex 9M-MRJ	
G-RMAR	ex G-NSEV	2-RLAF	ex EI-FGZ	
G-RSXP	ex N52457	2-RTKD	ex PR-TKD	

G-PNGB	406E9D	Partenavia P68B	37	P Morton, (Cowes, Isle of Wight)
G-PRPD	406D9A	Bombardier Dash 8-Q402	4332	Flybe Ltd, Exeter International, Devon
G-PTEK	406FB2	Van's RV-9A	PFA 320-13934	PK Eckersley, (Thornton-Cleveleys, Lancashire)
G-REEV	406F25	Robinson R44 Clipper II	12448	SNG Aviation Ltd, (Wolverton, Buckinghamshire)
G-RFLO	406FA8	UltraMagic M-105	105/213	IJ Martin and DJ Groombridge trading as Flying Enterprises (Alveston, Gloucestershire)
G-RMAR	406C27	Robinson R66	0154	Marfleet Civil Engineering Ltd, Earls Colne, Essex
G-RSXP	406EEC	Cessna 560XL Citation XLS+ (built by Textron Aviation Inc)	560-6198	Fly Vectra Ltd, Biggin Hill, Kent
G-RVTB	406EAD	Van's RV-7 (built by V Millard)	LAA 323-14932	TM Bootyman, (Heath, Derbyshire)
G-SAAR	406F4E	AgustaWestland AW189	89003	British International Helicopter Services Ltd, RAF Mount Pleasant, Falkland Islands
G-SANT	40611C	Schempp-Hirth Discus bT	12	S Cervantes, Portmoak, Perth and Kinross
G-SGFE	406C91	Liberty XL-2	0050	SGF Enterprises Ltd, (Calne, Wiltshire)
G-TGLG	406F4C	AutoGyro Calidus (assembled by Rotorsport UK Ltd)	RSYK/CALS/028	TR Galloway, Shobdon, Herefordshire
G-TREB	406F44	Cessna 182T Skylane (built by Textron Aviation Inc)	18282376	Camel Aviation Ltd, Wycombe Air Park, Buckinghamshire
G-TUKU	406F45	Stemme S10-VT	11-126	Stemme UK Ltd, Gamston, Nottinghamshire
G-VWET	406F3D	Lake LA-4-200 Buccaneer (built by Consolidated Aeronautics Inc)	1106	JM Charlton, Lezignan-Corbieres, France
G-XLEJ	406D1A	Airbus A380-841	192	British Airways PLC, London Heathrow
G-YROG	406F66	Magni M.24C Orion	24-15-9384	AJ Brent and AD Mann, Fairoaks, Surrey
G-ZBKD	406D7A	Boeing 787-9 Dreamliner	38618	British Airways PLC, London Heathrow
G-ZBKE	406D7B	Boeing 787-9 Dreamliner	38620	British Airways PLC, London Heathrow
EI-FHP	4CA546	Boeing 737-8JP	40865	Norwegian Air International Ltd, Oslo/Gardermoen, Norway
EI-FHR	4CA547	Boeing 737-8JP	39045	Norwegian Air International Ltd, Oslo/Gardermoen, Norway



Although registered to Comhthorbairt (Gaillimh), ATR 72-600 EI-FMJ operates for Stobart Air. Phil Woods

EI-FHT	4CA548	Boeing 737-8JP	40867	Norwegian Air International Ltd, Oslo/Gardermoen, Norway
EI-FHY	4CA549	Boeing 737-8JP	39020	Norwegian Air International Ltd, Oslo/Gardermoen, Norway
EI-FIZ	4CA511	Boeing 737-8AS	44709	Ryanair Ltd, Dublin (NB)
EI-FKH	TBA	Airbus A320-214	1041	Emer Aircraft Leasing (Ireland) Ltd (for Small Planet Airlines as LY-SPG)
EI-FLJ	TBA	Airbus A330-243	1052	Streamline Aircraft Leasing Ltd (for Beijing Capital Airlines as B-8221)
EI-FMD	TBA	Airbus A320-214	2325	Bellevue Aircraft Leasing Ltd (for SATA International, Portugal as CS-TKQ)
EI-FME	TBA	Airbus A320-233	2517	Fly Aircraft Holdings Five Ltd, TBA
EI-FMG	Not Allocated	Solar Wings Pegasus XL-R	SW-WA-1076	T Noonan, (Dromcollogher, Co Limerick)
EI-FMH	TBA	Airbus A330-343	1635	Panamera Aviation Leasing XI Ltd (stored at Tarbes-Lourdes-Pyrenees, France)
EI-FMJ	4CA58D	ATR 72-600	1295	Comhthorbairt (Gaillimh), Dublin (operated by Stobart Air)
EI-FML	TBA	Airbus A319-111	2240	Celestial Aviation Trading 34 Ltd, (stored at Shannon)
EI-FMO	Not Allocated	BRM Land Africa	06-00014	Laois Flying Club Company Ltd, Portarlington Limetree, Co Laois
EI-FOA	4CA512	Boeing 737-8AS	44708	Ryanair Ltd, Dublin (NB)
EI-FOB	4CA513	Boeing 737-8AS	44710	Ryanair Ltd, Dublin (NB)
EI-SLR	TBA	ATR 72-201(F)	108	ASL Airlines (Ireland) Ltd, Dublin (NB)
M-ABIX	43EA3D	Airbus A320-232	2108	CIT Aerospace International (stored at Shannon)
M-ABIY	43EA3F	Airbus A320-232	2275	CIT Aerospace International (for Indigo as VT-IDO)
M-YSIX	43EA73	Gulfstream G650	6156	AC Executive Aircraft (2016) Ltd, Dublin
2-IDBU	TBA	Boeing 767-37EER	25077	Pegasus Aviation VI Inc (stored Teruel, Spain)
2-MMRJ	TBA	Boeing 777-2H6ER	28417	Muzon Leasing Four Ltd, (stored Châteauroux, France)
2-RLAF	TBA	Airbus A321-211	677	African Holding Company of America (stored Montpellier, France)
2-RTKD	43EB50	ATR 42-500	604	Wells Fargo Bank Northwest NA (for First Air, Canada)

CANCELLATIONS

REG'N	TYPE	C/N	REASON
G-ANNB	de Havilland DH.82A Tiger Moth	84233	Cancelled as Permanently WFU (CofA expired 12.6.58, proposed rebuild abandoned?)
G-ARXW	Morane Saulnier MS.885 Super Rallye	100	Cancelled as Permanently WFU (CofA expired 4.5.04. Was based in France)
G-BAZT	Reims Cessna F172M	0996	To Turkey
G-BMVU	Monnett Moni	PFA 142-10948	Cancelled by CAA (Permit to Fly expired 8.6.12)
G-BNGN	Cameron V-77	817	Cancelled as Permanently WFU (CofA expired 27.4.09)
G-BNWW	Boeing 767-336	27140	Cancelled as Permanently WFU (flown to Orlando/Sanford International, Florida 28.10.15 for parting out)
G-BPWB	Sikorsky S-61N	61822	To Denmark as OY-HUF
G-BSGP	Cameron N-65	2293	Cancelled as Permanently WFU (CofA expired 17.6.09)
G-BSHD	Colt 69A	1736	Cancelled as Permanently WFU (CofA expired 29.9.12)
G-BTPG	BAe ATP	2014	To Sweden as SE-MBG

G-BWWJ	Hughes 269C	1130256	Cancelled as Permanently WFU (CoFA expired 28.10.96 (last noted as stripped hulk at Ashley Farm, Bracknell 8.12)
G-BYKW	Lindstrand LBL 77B	620	Cancelled as Permanently WFU (CoFA expired 2.5.12)
G-BZNX	SOCATA MS.880B Rallye Club	2113	Cancelled as Permanently WFU (CoFA expired 29.6.11)
G-CBTL	Monnett Moni	PFA 142-11558	Cancelled by CAA (no Permit to Fly issued, believed not completed)
G-CCEB	Thruster T600N 450	0035-T600N-085	Cancelled by CAA (Permit to Fly expired 28.6.15. Last reported at Dunkeswell, Devon 8.14)
G-CCJD	Mainair Pegasus Quantum 15	7974	Cancelled by CAA (Permit to Fly expired 3.6.14)
G-CCSO	Raj Hamsa X'Air Falcon 133(1)	BMAA/HB/364	Cancelled by CAA (substantially damaged in a forced landing near Owston Ferry, North Lincolnshire 5.7.15)
G-CDUH	P & M Quik GT450	8167	Cancelled as Destroyed (ditched in Cromarty Firth, Highland 11.10.15)
G-CFSI	Aerola Alatus-M	AS 01-020	Cancelled by CAA (SSDR motorglider, no Permit to Fly required)
G-CGCV	Centrair 101A Pegase	101A0392	Cancelled as destroyed (extensively damaged when it hit a wall during a field landing near Upper Swell, Gloucestershire 24.6.13)
G-CGGJ	Schweizer 269C-1	0350	To Poland
G-CGOO	Sorrell SNS-8 Hiperlight	99-008	Cancelled as Permanently WFU (believed not completed)
G-CJJC	Sikorsky S-92A	920240	To Nigeria
G-CIWM	Van's RV-7	LAA 323-14932	Re-registered as G-RVTB
G-CJCA	Schleicher ASW-15B	15202	Cancelled as Permanently WFU (badly damaged in field landing near Skirwith, Cumbria 12.5.12)
G-CJNE	Schempp-Hirth Discus 2a	18	Cancelled as Permanently WFU (but restored again later in the month)
G-CJOC	Schempp-Hirth Duscus bT	127	Cancelled as Destroyed
G-CUIK	QAC Quickie Q200	PFA 094A-11204	Cancelled by CAA (Permit to Fly expired 8.7.14)
G-CYLS	Cessna T303	T303-00005	To USA as N285AT
G-DABS	Robinson R22 Beta II	3083	To France
G-DBVY	LET L-13 Blanik	173121	Cancelled as Permanently WFU (CoFA expired 28.9.10)
G-DCRT	Schleicher ASK-13	13396	Cancelled as Destroyed (crashed during failed winch launch, Chipping, Lancashire 20.9.15)
G-DDEA	Slingsby T.59D Kestrel 19	1865	Cancelled by CAA (no CoFA issued since registration)
G-DDOB	Grob G.102 Astir CS77	1653	Cancelled by CAA (CoFA expired 27.10.09)
G-DHZZ	Rolladen-Schneider LS8-18	8117	To Germany
G-DSPY	Diamond DA42M Twin Star	42.M011	Re-registered as G-EMPP
G-EDGJ	Zivko Edge 360	MCK002	Cancelled by CAA (crashed at Old Buckenham, Norfolk 22.4.15 after failing to recover from a flat spin)
G-EZGK	Airbus A319-111	4717	To Switzerland as HB-JYJ
G-EZWO	Airbus A320-214	5785	To Switzerland as HB-JXE
G-FDZY	Boeing 737-8K5	37261	To Canada as C-GHZY
G-FDZZ	Boeing 737-8K5	37262	To Canada as C-FHZZ
G-GFRO	Robin ATL	04	Cancelled as Destroyed (crashed on take-off at Nympsfield, Gloucestershire 11.4.15)
G-GILI	Robinson R44 Raven I	1436	To USA as N303SP
G-HAVI	Airbus Helicopters EC130B4	3903	To Sweden (but restored again 3 days later)
G-JPIP	Schempp-Hirth Discus bT	12	Re-registered as G-SANT
G-JWEB	Robinson R44 Raven I	1334	To USA
G-MANH	BAe ATP	2017	To Sweden as SE-MHI
G-MGAG	Aviasud Mistral	BMAA/HB/009	Cancelled as Permanently WFU (Permit to Fly expired 27.6.00)
G-MJHC	Southdown Lightning Mk.II/ Ultraspots Tri-Pacer	82-00044	Cancelled by CAA (Exemption to Fly expired 12.12.89)
G-MNWO	Mainair Gemini Flash II	490-1086-4-W287	To Bangladesh
G-MNZP	CFM Shadow Series BD	K039	Cancelled as Permanently WFU (Permit to Fly expired 20.6.06)
G-MOFZ	Cameron O-90	3350	Cancelled as Permanently WFU (CoFA expired 8.8.11)
G-MVBT	Thruster TST Mk.1	8068-TST-083	Cancelled as Permanently WFU (Permit to Fly expired 10.12.07)
G-MVBZ	Solar Wings Pegasus XL-R	SW-WA-1345	Cancelled as Permanently WFU (Permit to Fly expired 17.9.05)
G-MWOJ	Mainair Gemini Flash IIA	814-1290-7-W608	Cancelled as Permanently WFU (Permit to Fly expired 8.7.12)
G-MYSX	Pegasus Quantum 15	6832	Cancelled as Permanently WFU (Permit to Fly expired 12.11.12)
G-MYYL	Cyclone AX3/503	7110	Cancelled by CAA (but restored again later in the month)



Diamond Executive Aviation's DA42MP G-DSPY has been re-registered G-EMPP. AirTeamImages.com/Chris Procter

G-MYZE	TEAM Mini-Max 91	PFA 186-12570	Cancelled by CAA (Permit to Fly expired 28.9.12)
G-MZGB	Cyclone AX2000	7302	Cancelled by CAA (Permit to Fly expired 19.5.08, last noted stored at Blackhill, Draperstown, Co Londonderry 5.12)
G-MZGK	Pegasus Quantum 15	7331	Cancelled as Permanently WFU (Permit to Fly current to 25.5.16, last noted at Trenchard Farm, Eggesford, Devon 8.15)
G-MZIF	Pegasus Quantum 15	7355	Cancelled as Permanently WFU (Permit to Fly expired 10.6.10)
G-MZJR	Cyclone AX2000	7385	Cancelled as Permanently WFU (extensively damaged when it ran into a fence during a forced landing near Shoreham, Kent 24.7.09)
G-NSEV	Robinson R66	0154	Re-registered as G-RMAR
G-OBYE	Boeing 767-304	28979	To Germany as D-ATYE
G-OBYG	Boeing 767-304	29137	To Germany as D-ATYG
G-ODXB	Lindstrand LBL 120A	1250	To USA
G-OLAR	Liberty XL-2	0050	Re-registered as G-SGFE
G-OLAS	Vierwerk Aerolite 120	186D	Cancelled as Destroyed (crashed at Darley Moor, Derbyshire 13.9.15)
G-OSJN	Europa Aviation Europa XS	PFA 247-13687	To Czech Republic
G-PIPY	Cameron Pipe-105	3815	Cancelled as Permanently WFU (CoFA expired 30.8.12)
G-PURS	Rotorway Executive	3827	To Republic of Ireland
G-REDF	Airbus Helicopters AS365N3 Dauphin II	6884	To Germany
G-RSXL	Cessna 560XL Citation XLS	560-5699	To USA as N699XL
G-RYAK	Yakovlev Yak-18T	08-34	To Germany
G-SMAN	Airbus A330-243	261	To Malaysia as 9M-AZL
G-STNR	IAv-Bacau Yak-52	833810	Cancelled as Permanently WFU (but restored again later in the month)
G-TAGR	Europa Aviation Europa XS	PFA 247-13061	Cancelled as Destroyed (crashed on landing at Bolt Head, Devon 1.7.15)
G-VWOW	Boeing 747-41R	32745	To USA as N744VG
G-WACO	Waco UPF-7	5400	To Belgium
El-BHI	Bell 206B JetRanger	906	Cancelled at Owner's Request - Permanently WFU
El-CVM	Schweizer 269C	S-1328	To USA as N269LA
El-DBU	Boeing 767-37EER	25077	To Guernsey as 2-IDBU
El-DDI	Schweizer 269C-1	0156	To Netherlands
El-DMC	Schweizer 269C-1	0205	To Netherlands
El-DYH	Boeing 737-8AS	36570	To South Korea as HL8049
El-DYI	Boeing 737-8AS	36571	To South Korea as HL8050
El-EPS	Airbus A319-111	3377	To Spain as EC-MIR
El-ETX	Boeing 737-7Q8	29359	To USA as N7877H
El-EUX	Boeing 737-7Q8	29352	To USA as N7874B
El-EUY	Boeing 737-7Q8	29354	To USA as N7875A
El-FDL	Airbus A320-232	2029	To Turkey as TC-AGO
El-FGZ	Airbus A321-211	677	To Guernsey as 2-RLAF
El-FHI	Boeing 737-8JP	29024	To United Kingdom as G-NRWY
El-FKH	Airbus A320-214	1041	To Lithuania as LY-SPG
El-FKL	Embraer 195	19000067	To Turkey as TC-YAT
El-FLJ	Airbus A330-243	1052	To Peoples Republic of China as B-8221
El-FLV	Boeing 767-36NER	30854	To Portugal as CS-TKR
El-RMC	Bell 206B JetRanger	488	To Hungary
El-RUB	Boeing 737-85P	33982	To USA as N280EA
El-RUS	Boeing 737-8MC	44437	To Mexican Air Force as 3526
El-STH	Boeing 737-429F	25729	To Hungary as HA-FAY
M-HRPN	Bell 429	57187	To United Kingdom as G-HPIN
M-KARI	Bombardier Challenger 605	5838	To USA as N583TA
M-SAPL	Bombardier Challenger 605	5883	To USA as N955PM
M-SPEQ	Beech 300 King Air 350	FL-241	To USA as N350DP
M-SPEX	Beech 300 King Air 350	FL-274	To USA as N352JP

Key: NB – Nominal Base

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

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TALES FROM THE LOGBOOK...



US EAST COAST MAY 1989 PART 2

Gerry Manning concludes his account of a 1989 trip to the US East Coast.

An open day and air show at the US Naval Air Test Center (NATC) at Patuxent River on Saturday, May 27 was not to be missed as many of the aircraft in the static display were one-offs in special colour schemes – and there were aircraft from the US Navy's Test Pilot School (TPS) which flew an assortment of types, including some not in Navy service.

All air shows usually have some civil participation, and this one was no exception. We noted North American P-51D Mustang NL51JB, Grumman FM-2 Wildcat N315E and Canadian-built T-6 Harvard N98474, which had been converted to look like the NA-50/P-64 single-seat fighter variant.

The oldest aircraft on show was Douglas Dolphin NC14205, which dated back to the early 1930s. It was a twin-engine, amphibious flying boat and served as a private flying yacht, airliner, military transport and in the air-sea rescue role. One was ordered for Franklin D Roosevelt, the first aircraft purchased for a US President, but he never used it.

Performing formation aerobatics were four Pitts S2Ss from the Holiday Inn display team. Meanwhile, aircraft from the NATC included

Above: **Miami has always been a great place to see exotic airliners from South and Central America, like Surinam Airways Douglas DC-8-62 N1809E.** All photos author

Below: **US Navy Test Pilot School North American T-39D Sabreliner 150987 among the static display at the NAS Patuxent River open day. The aircraft had an F/A-18 radome and APG-65 radar system fitted and was used for test purposes by the Navy and the radar's manufacturer.**



Kaman SH-2F Seasprite 149021, Lockheed S-3B Viking 159770, McDonnell Douglas T-45A Goshawk 162788, Lockheed P-3C Orion 162770, Grumman E-2C Hawkeye 163029, LTV A-7E Corsair II 156874 and Grumman C-2A Greyhound 162140.

The TPS operated a wide spectrum of aircraft – at one end was U-6A Beaver 150191 and at the other, in a wonderful white and red colour scheme, McDonnell Douglas Hornet F/A-18B 161249. Others seen were McDonnell Douglas TA-4J Skyhawk 152868,



Left: In the days of drab grey military aircraft it was great to see McDonnell Douglas F/A-18B Hornet 161249 in the bright colours of the USNTPS.



Below left: US Navy Test Pilots School U-6A 150191 was among the interesting aircraft on display at NAS Patuxent River. This might seem an unlikely type for test pilots to fly but few fast jet pilots would have experience in a tailwheel, radial piston-powered aircraft, so it was an ideal to teach new skills.

Rockwell T-2C Buckeye 158605 and North American T-39D Sabreliner 150987, which had an extended nose.

Types serving with TPS, but not in regular Navy service, that we saw included Bell OH-58A Kiowa 71-20554, Northrop T-38B 60-0582 and Beech U-21 Ute 67-18096. Perhaps the oddest aircraft in the fleet was Schweizer X-26A 76-0086, a glider used to teach students about yaw/roll coupling.

Other aircraft of interest present included UP-3A Orion 150528 of VXN-8 in a full colour scheme. Used for oceanographic research, it was based at 'Pax' River. Lockheed EC-130Q of VQ-4 162312 also featured, and was used for the TACAMO (Take Charge and Move Out) role. It would trail a very long wire antenna and transmit messages using very low frequency (VLF) to communicate with ballistic-missile submarines under the surface.

There were also three Grumman F-14A Tomcats from NAS Oceana-based VF-101 'Grim Reapers' in an all-over grey scheme, while the billed highlight of the show was a performance by the Blue Angels flying F/A-18s.

On the way out we made a quick stop, as the traffic went past stored Convair 880-22M N48063, acquired as a spares source for the sole UC-880 operated by the US Navy.

It was then a 70-mile (113km) drive south to Fredericksburg, Virginia, to stay the night.

MUSEUM DAYS

The next couple of days were spent at a relaxed pace visiting museums in Virginia. First was the Marine Corps Air-Ground Museum at Quantico. The indoor exhibits, housed in 1920s-vintage hangars, included Boeing FB.5 A7114, Thomas-Morse S4B/C Scout NR66Y, Grumman F4F-4 Wildcat 12114 and Vought F4U-4 Corsair 97369. Outside, exhibits included Douglas C-117 50834, Beech C-45F 90536, Douglas EF-10B Skyknight 124618 (this design was the first tactical jet to be converted to the role of electronic warfare) and F-6A Skyray 139177. ►

Above left: Republic F-84F Thunderstreak 51-1786 on display at the Air Power Park and Museum at Hampton, Virginia, in the markings of the Thunderbirds USAF display team.

Left: Operated by Guatemala City-based Lineas Aereas Mayas, Douglas DC-6A TG-SAS was one of the many proliners at Fort Lauderdale, Florida. The sole aircraft in the company fleet, it was configured for cargo operations.





Left: The largest user of the post-1945 tail-tail version of the DC-3 was the US Navy. Many found their way on to the civil market after storage at Davis-Monthan AFB. Douglas C-117D N456WL was at Fort Lauderdale during the author's visit, still in its basic USN livery.

Below left: **Viasa McDonnell Douglas DC-10-30 YV-135C** taxis at Miami. Following mounting losses the government-owned carrier was closed down in 1997.



It was an 80-mile (129km) drive to our next location, the Virginia Aviation Museum at Richmond, where the collection comprised mainly vintage light aircraft, including Bucker Bu-133C Jungmeister N133BU, Aeronca C-2A N11417, Fairchild 24 Model G NC19123 and Bellanca CH-400 NX237.

Star exhibit was Vultee V1-A NC16099, dating back to 1936. This was a single-engine airliner powered by a 1,000hp Wright R-1850 radial. It had once been owned by newspaper tycoon Randolph Hearst and is the only example in the world. Its last commercial role was flying monkeys from Central America to California.

The museum was located at Richmond International Airport, and a drive past the cargo area revealed Convair CV.600 N94246 of SMB Stage Line and 727-25C N126FE of Federal Express.

It was then an early finish after a 50-mile (80km) drive to a motel in Lightfoot, enabling us to relax in the sunshine by the pool.

The next day was Memorial Day (Monday, May 29) in the US – a public holiday, which meant it wasn't possible to visit NASA at Langley. But other locations were open.

The day started with a 20-mile (32km) drive to the US Army Transportation Museum at Fort Eustis, which covered all aspects of transport including boats. Fixed-wing exhibits included de Havilland Canada C-7 Caribou 57-3079, in the colours of US Army parachute team 'The Golden Knights', U-1A Otter 55-3270 and U-6A Beaver 58-1997.

Helicopters on display were Sikorsky VH-34C 57-1725, CH-21C Shawnee 56-2077 and YCH-54A Tarhe 64-14203, the second pre-production machine. From Lockheed was the AH-56 Cheyenne 66-8832. This was a fast-attack helicopter but it suffered development problems and political pressure which saw the project cancelled.

Just five miles (8km) away at Patrick Henry International Airport, we found NASA Cessna 310 N505NA and Beech Queen Air B80 N506NA on the ramp. Presidential Airways Jetstream 31 N131CA was also noted, operating a commuter flight, and we saw three US Army Beechcraft – U-21As 66-18020, 67-18122 and C-12A 76-22250.

Above left: **British Airways' Concorde G-BOAF** turns onto the runway at Miami.

Left: A US Army Sikorsky CH-54 Skycrane departs Miami with a Curtiss C-46 Commando under-slung. The journey was aborted when one of the harnesses worked loose and the C-46 was dropped in the sea.





Douglas DC-8-51F HK-2587X of ARCA Aerovias Colombianas glistens in the sunshine at Miami. ARCA was a Colombian freight carrier based in the capital, Bogota. It suspended operations at the start of 1997.



That most elegant of propliners, the Lockheed Constellation, was in its last few years of commercial freight operations when L-1049F Super Constellation HI-548CT was photographed landing at Miami. It was owned by Santo Domingo-based Aerochago. The Dominican Republic was the base of a number of these classic aircraft.



Lloyd Aereo Boliviano's sole cargo aircraft, Boeing 707-323C CP-1365, makes its approach to Miami. The 707 was the only cargo type operated by the Cochabamba-based carrier.



Trans-Air-Link Douglas DC-6A N779TA in the final seconds before touchdown at Miami. Few of the Miami-based propliner cargo carriers spent much on the livery of their aircraft.

Five miles (8km) further on was the Air Power Park and Museum at Hampton, its seven exhibited aircraft all jets from the 1950s and '60s. The oldest was Republic F-84F Thunderstreak 51-1786 (in the colours of the USAF's Thunderbirds display team) and the newest, Hawker P.1127 Kestrel (XV-6A) NASA 520. – which had

served with the RAF West Raynham-based Tripartite Evaluation Squadron, funded and manned by the UK, US and West Germany. Following the 1960s trial, six aircraft were sent to the US.

That night's accommodation was at Norfolk Airport, but before arriving we drove past the cargo area which revealed 727s

N102FE of Federal Express and N415EX of Emery Worldwide together with NAMC YS-11A N918AX of Airborne Express.

TO THE SUNSHINE STATE

The following morning we handed the car back to Avis, having travelled 1,089 miles (1,753km), and checked ourselves in for Piedmont flight PI1280 to Charlotte, North Carolina. Boeing 737-400 N412US had us there in just 44 minutes.

We then had nearly two hours before 737-300 N346US took us to Fort Lauderdale, Florida, in a little less than 90 minutes, on flight PI1218, giving us the opportunity for some airside photography. It was exclusively Piedmont 727s N748US and N741US and 737s N212US (-200), N342US (-300) and N409US (-400). Five Piedmont Commuter System Short 360s were also noted, including N690PC and N722PC.

Arriving in Florida we picked up another rental car – driving off in a Buick Regal having regrettably turned down the offer of a five-litre Mustang convertible because we needed the closed top for the air conditioning in the heat.

The only call was the propliner ramp and permission to wander around was granted. Aircraft pictured included Douglas DC-6s N906MA, TG-SAS of Lineas Aereas Mayas, N99TB of South East Air Express and N43867 of Caicos Caribbean Airways. Also present were Douglas C-54A N74183 and C-117 N456WL, Convair 440s N4808C and N4826C, Curtiss C-46A Commando N74173 and Lockheed SP-2E Neptune N88487.

When hiring the car we had been given a voucher for a Guest Quarters hotel offering a discounted rate of \$79 for a room per night instead of \$208 so we stayed in Fort Lauderdale for the rest of the trip.

The next morning we began a circuit of local airfields. First was Fort Lauderdale Executive Airport where, among all the new and shiny bizjets locked in their hangars, were three standout items – DC-3 N92578, CV-440 N912AL and Grumman G.44 Widgeon N37DF.

A short drive then took us to Opa Locka Airport, where ramp access was granted and an assortment of types photographed. Highlights included DC-8s N8974U of Air Transport International, N821F of Transoceanic Airways (an airline that never actually took to the air) and Boeing 727 5N-AWX of Kabo Air of Nigeria.

Added to the logbook were three Grumman HU-16 Albatross airframes: N8497T, N8523H and N7026H; Fairchild C-123K N689SM; Douglas DC-7B N1097; and no fewer than three DC-3s, N87664, N8099 and N225GB.

MIAMI

The last couple of days of the tour were spent at Miami International Airport. I had first been here eight years earlier, and although there were fewer propliner movements there did seem to be more classic jets, operating ►



Cargo Aereas Dominicana Curtiss C-46A Commando HI-495SP at Kendall-Tamiami Executive Airport.



One of the aircraft seen at Kendall-Tamiami airport was N896JB – built as a Lockheed Lodestar it was converted to a Howard 500 configuration in 1961 and used by a number of owners as a luxury executive transport.

both passenger and cargo services.

Twenty-eight Boeing 727s from 19 different operators were seen over the course of our stay in Miami. Highlights included CP-1276 of Lloyd Aero Boliviano, 6Y-JMP of Air Jamaica and OB-1301 of Haiti Trans Air.

Tar Air Cargo Boeing 707 LV-MZE was one of 22 different examples of the type seen. Other interesting 707s logged were Tampa Colombia's HK-3333X, Avianca's HK-1402, Lan Chile's CC-CEB and HC-BHY of Ecuadoriana. We also noted 62-4130, a US Air Force VC-135B. Several DC-8s hit the logbooks, including OB-1222 of Aeronaves del Perú, HK3490X from Tampa Cargo and N1809E of Surinam Airways.

Widebody airliners included DC-10s from Aeromexico (XA-DUG), Scanair (SE-DHT), Viasa (YV-135C) and Lufthansa (D-ADFO).

EI Al and Virgin Atlantic Airways both operated 747s (4X-AXF and G-VIRG) into Miami – and we also saw Delta, United and TACA International Airlines 767s.

Other widebodies noted were Eastern Air Lines Lockheed L-1011 TriStar N330EA and Airbus A300s from American Airlines (N70054), Viasa (YV-161V), Continental Airlines (N212EA) and Air Jamaica (F-BVGP) – plus it was great to see British Airways Concorde G-BOAF.

Propliner highlights were a pair of Super Constellations, HI-548CT of Aerochago

Airlines and HI-515CT of AMSA (Aerolineas Mundo SA), which landed within an hour of each other. We also noted DC-6s N95BL of APA International Air of the Dominican Republic, N98BL of Aerial Transit and N841TA of Trans-Air-Link – which also operated the sole DC-7C seen, N869TA.

One of the oddest events we observed during the trip involved a C-46. We'd noticed a wingless and engineless airframe was being worked on when a US Army CH-54 Skycrane arrived, picked it up and took it away. Confusion has always remained over the correct identity of the aircraft.

It was supposed to go to the Museum of Aviation at Robins AFB in Georgia but, while flying along the coast of Florida, one of the ropes securing it under the helicopter worked loose and it had to be dropped in the sea.

Honduran Air Force Lockheed L-188 Electra 555 and C-130A Hercules 559 also visited during our stay, as did Venezuelan Air Force Hercules 5320 and USAF C-20A 86-0201.

HOMEWARD-BOUND

First call on our final day was Kendall-Tamiami Executive Airport to see the Weeks Air Museum, where we found Mosquito NX35MK, Avro 504J N3182G, Dewoitine D.26 N282DW and Grumman J2F-6 Duck N1214N. Out on the airfield were C-46s N625CL and HI-495SP, DC-7C HI-524CT and Lockheed Lodestar N896JB.

Then it was back to Miami to return the car and book in for Pan Am flight PA2048 to New York. Airbus A300 N212PA had us back in the 'Big Apple' in around two hours and, following a change of terminal, we boarded Boeing 747-136 G-BBPU for flight BA172 to Manchester, arriving back in the UK after a flight time of 5hr 58m.

Then it was time to post off the rolls of slide film and review what had been an excellent trip. **AN**

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To counter the threat, Coastal Command established a ring of bases stretching from Scotland and Northern Ireland to Iceland, and from south Wales and south-western Britain to Gibraltar and the Azores, all 53 of these stations are covered in this book.

A variety of aircraft were employed, some land-based and others water-based like the Sunderland and Catalina, in the endeavour to extend the range of protection given to the convoys. And, as the war progressed, Beaufighters and Mosquitos were brought to play to reverse the role and carry out attacks on German supply ships along the European coastline. Specifically for this purpose, strike wings were established at Banff, Dallachy, Langham and North Coates.

Coastal Command also had the overall responsibility for carrying out all photographic reconnaissance; for collecting the data required to produce daily meteorological reports, and providing air-sea rescue cover.

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