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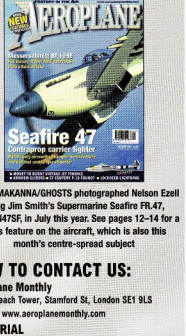
- ARNHEM GLIDERS
- ST-EXUPERY P-38 FOUND?
- LOCKHEED LIGHTNING



PHILIP MAKANNA/GHOSTS photographed Nelson Ezell flying Jim Smith's Supermarine Seafire FR.47, VP441/N47SF, in July this year. See pages 12–14 for a news feature on the aircraft, which is also this month's centre-spread subject

HOW TO CONTACT US:

Aeroplane Monthly
King's Reach Tower, Stamford St, London SE1 9LS
Internet: www.aeroplanemonthly.com

EDITORIAL

Editor Michael Oakey	**(020) 7261 5846**
Assistant Editor Tony Harmsworth	**(020) 7261 5551**
Design Editor Tanya Caffrey	**(020) 7261 5668**
Sections Editor Nick Stroud	**(020) 7261 6401**

General enquiries & back issues
Lydia Matharu **(020) 7261 5849 • Fax (020) 7261 5269**
e-mail: aeroplane_monthly@ipcmedia.com

Editorial assistance
Philip Jarrett, Mike Hooks, John Donaldson

Webmaster David Siddall
e-mail webmaster@aeroplanemonthly.com

ADVERTISING

Advertising Manager Lee Morris	**(020) 7261 6459**
Advertising Executive Dave Stone	**(020) 7261 6292**
Advertising Executive Gareth Richards	**(020) 7261 7299**
Classified Ads	**(020) 7261 2739**
For all insert sales – Innovator	**(020) 7261 7710**
List Management	**(020) 7261 7098**

PUBLISHING AND MARKETING

Publishing Director Hamish Dawson	
Assistant Publisher Belinda Cooper	**(020) 7261 7261**
Marketing Executive Fiona Allen	**(020) 7261 6551**
Marketing & Promotions Assistant Thomas Borthen	**(020) 7261 7656**
Marketing Assistant Dylan Byrne	**(020) 7261 6639**
International Editions Sirilya Nawalkar	**+44 (0)20 7261 7082**

e-mail sirilya_nawalkar@ipcmedia.com

READER SERVICES

Back issues	**(020) 7261 5849**
Subscription enquiries	**+44 (0) 845676 7778/**

e-mail ipcsubs@qss-uk.com

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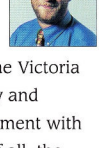
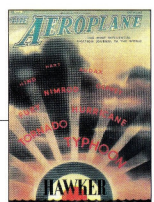
From the Editor



WITH THIS YEAR'S Battle of Britain Sunday coming up, we are delighted to be focusing, in our new *The Art of Aviation* feature this month, on the Battle of Britain London Monument which is set to be unveiled on the Victoria Embankment next year. Fizzing with energy and passion, it reflects the intensity and commitment with which Britain was defended in 1940. Best of all, the monument will appeal not just to aviation enthusaists and art devotees, but to the public at large. It will be a powerful and permanent reminder — in a prominent location in the capital — of the sacrifices made by The Few, and by the many who backed them up.

Funded solely by donation, the monument is well on the way to meeting its roughly £1·6 million costs — but it's not there yet. So, if you like what you see on pages 38–41 of this issue, join me in sending what you can afford, and let's see if *Aeroplane* readers can make a significant dent in the £500,000 sum still to be raised. Every little helps.

Michael Oakey – EDITOR



RIGHT THE AEROPLANE, **JUNE 20, 1941**
This issue carried a Hawker advert on its front cover (note the mention of the Typhoon; the first production Tiffies had just been completed)
■ Launched as a monthly magazine in 1973 by Richard T. Riding (Editor for 25 years until 1998), *Aeroplane* traces its lineage back to the weekly *The Aeroplane*, founded by the legendary C.G. Grey in 1911 and published until 1968

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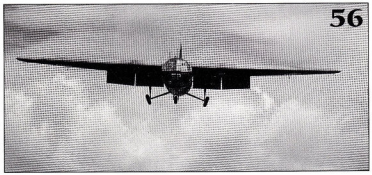

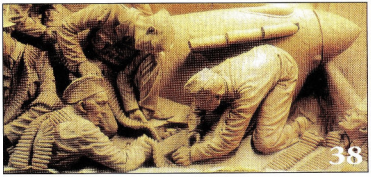

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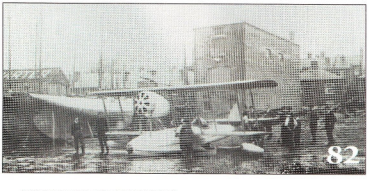

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Navigator

Our *Navigator* section at the back of the magazine tells you all you need to know about what to buy and where to go:

MAIN PICTURE ABOVE **The Lockheed P-38 Lightning, or "Fork-tailed Devil" as it became known by the Japanese, has always been one of the most unmistakable shapes in the sky, with its twin booms and central cockpit nacelle making it instantly recognisable. P-38J *Porky II* of The Air Museum "Planes of Fame" was photographed by MICHAEL O'LEARY in March 2003**

News compiled by: Tony Harmsworth
Tel: 020 7261 5551 **Fax:** 020 7261 5269
E-mail: anthony_harmsworth@ipcmedia.com
OR Write to our usual address

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FLUG WERK 190 AIRBORNE

■ New-build Focke-Wulf makes succesful test hop in Bavaria

PHOTOGRAPH: FLUG WERK

ON JULY 22 AT MANCHING military test airfield in Bavaria, the first of the new-build Flug Werk Focke-Wulf FW 190A-8Ns, D-FWWC/WNr 990001, made its initial test-hop with EADS test pilot Horst Philipp at the controls.

The successful flight came eight years after Flug Werk was set up at Gammelsdorf by airline pilot Claus Colling and engineer Hans-Günther Wildmoser — the latter sadly died in September 2003. The machine is now due to fly a thorough test programme.

Flug Werk customer "kit" FW 190s have already been supplied to several operators, including the Wings of Dream museum at São Carlos in Brazil and collector Rudy Frasca in Illinois, USA, but it is currently unclear whether the British CAA will allow the Flug Werk '190s to appear at shows in the UK.

It is hoped that Flug Werk will relocate to a new hangar at Manching during 2005, where a "flying museum" will be established. A pair of genuine Messerschmitt Bf 109s are scheduled to be rebuilt in the new hangar, to be followed by a production line of new-build '109s powered by Daimler-Benz DB601 engines.

ABOVE New-build FW 190A-8N D-FWWC has its ASh-82T engine fired up by test pilot Horst Philipp on July 22 before BELOW the test hop down the Manching runway.

Combat vet Cat flies again in the Netherlands

CONSOLIDATED PBY-5A Catalina PH-PBY flew again on August 4 at Valkenburg in Holland, following a five-year rebuild with the Stichting Neptune Association (SNA). The amphibian arrived at Schiphol airport on August 11 to be painted in a post-war silver Dutch Navy scheme, and was due for official unveiling on August 30. The SNA Catalina is the oldest airworthy PBY in the world, having originally gone to the US Navy as Bu2459 on November 15, 1941. Assigned to VP-73 at Reykjavik, Iceland, it saw plenty of action against submarines, sinking U-582 and U-200. Post-war it was a fire-bomber in Canada and Chile, and in 1995 arrived in Holland to be flown by Cat Air on the airshow circuit. Following Cat Air's demise it was acquired by the SNA and flown to Valkenburg for overhaul in May 1999. It will be based at the Aviodrome at Lelystad; a new hangar will house it alongside L-749A Constellation N749NL, which arrived at Lelystad from Schiphol on July 5 to a rapturous welcome from a 6,000-strong crowd.

ROGER SMEATH

ABOVE Consolidated Catalina PH-PBY leaving Valkenburg on August 11, heading for the paint shop at Schiphol Airport.

OSHKOSH DEBUT FOR TP-51C

New-build high-back two-seater wins Best Mustang trophy at 52nd EAA AirVenture

ANTHONY HARMSWORTH

MAX CHAPMAN'S North American TP-51C, NL251MX, built by John Muszala's Pacific Fighters Company at Idaho Falls, made its first flight early in July, and was one of the stars of the Experimental Aircraft Association's AirVenture 2004 event, held at Oshkosh, Wisconsin, on July 27—August 2. It is appropriate that the aircraft flew just after the 60th anniversary of D-Day: the most famous of the small number of "high-back" Mustangs converted in the field was used to fly General Eisenhower over the beaches soon after the landings. Unlike the Eisenhower aeroplane, the new-build machine is fitted with a full set of controls in the rear cockpit, and is the first of several high-back P-51s expected to emerge from the Pacific Fighters workshops. It was flown to Oshkosh by Muszala, and picked up the award for Best North American P-51.

Among the other trophy winners were Curtiss JN-4H N3223, which took Antique Grand Champion award for owner Frank Schelling of Pleasant Hill, California; Stinson 108-2 N949D, winner of the Classic Grand Champion award for Boyd Walsh from Virginia; and Grumman TBM Avenger N86280 from the Cavanaugh Flight Museum at Addison, Texas, which won the Best Bomber award. The Fighter Factory at Suffolk, Virginia, won Best Fighter with Curtiss P-40E N1941P; Grand Champion World War Two went to Bob Baker's Oklahoma-based P-51D Mustang N451D, and Grand Champion Post World War Two was bagged by Vought F4U-5NL Corsair N45NL from the Stow, Massachusetts-based Collings Foundation.

ABOVE John Muszala taxies out in Max Chapman's North American TP-51C NL251MX at Oshkosh on July 28 . The fighter was scratchbuilt in Muszala's Pacific Fighters workshops at Idaho Falls.

Fokker's first and last

A REPRODUCTION of Fokker's first airliner, the F.II, was unveiled at the Aviodrome at Lelystad, Holland on August 3. The last genuine F.II, PH-RSL, was destroyed by German bombing at Schiphol during 1940; construction of the Aviodrome's "H-NABC" began in 1994. Work on the fuselage was initiated by a team of volunteers from the Fokker factory, and the 50ft wooden wing was built in Austria CraftLab in Vienna. The correct BMW V engine was found in Australia.

The first F.II flew at Schwerin, Germany, in October 1919; some 30 were built, seeing service with several airlines including KLM, Sabena and Luft Hansa. Having been the last aeroplane to be worked on by Fokker employees before the company folded in 1996, "H-NABC" can lay claim to being the last true Fokker.

ABOVE The Fokker F.II on show at the Aviodrome on August 3.

RICHARD WORLAND

GLADIATOR TAKES SHAPE

THE RESTORATION of Gloster Gladiator Mk II N5719/G-CBHO is progressing well with Retro Track and Air at Cam in Gloucestershire. Recovered during 1999 from Norway, where it had been operated by 263 Sqn during May 1940, N5719 has had its primary structure completed along with the tailplane and fin, and the original undercarriage has been refurbished. Patterns for new mainwheel castings have been completed and work on manufacturing the new wing ribs is progressing. Some parts of the Bristol Mercury engine have been recovered and an additional core engine has been acquired,the overhaul of which is under way. Retro is keen that the project should continue at a good pace and that N5719 should fly in the UK, preferably in Gloucestershire, its birthplace. The company, lauded for fine rebuilds of Rolls-Royce Merlin and Griffon aero-engines, would like to hear from anyone interested in becoming involved in this project. For details e-mail retrotrackandair@aol.com.

Write to: Aeroplane, King's Reach Tower, Stamford Street London SE1 9LS **Web:** www.aeroplanemonthly.com

Tri-Motor becomes oldest flying US airliner

FORD 4-AT TRI-MOTOR N1077 flew for the first time in 64 years at Kalamazoo, Michigan, on July 21, following a 40,000hr, near four-year restoration by Hov-Air at Vicksburg, Michigan for owner Greg Herrick. The oldest flying American airliner, and the oldest flying multi-engined airliner in the world, the Tri-Motor was flown to Herrick's Golden Wings Museum at Blaine, Minnesota, the following day. On July 24 N1077 was flown to Oshkosh, Wisconsin, for the EAA convention, where it proved very popular with visitors, although Greg chose not to enter the airliner in the judging this year because some detail work has yet to be completed.

XAVIER MORAL

ABOVE Ford Tri-Motor N1077, seen near Oshkosh in August, in the paint scheme it wore for the Lindbergh Mexico trip in 1929.

Greg Herrick's N1077 was the tenth Ford Tri-Motor built. Following roll-out in September 1927 it was retained by Ford for company use and demonstration flights. On December 19, 1927, N1077 was used to fly Evangeline Lindbergh to Mexico City to spend Christmas with her son Charles, who was on a goodwill tour of Latin America following his solo New York—Paris flight seven months earlier. Charles took his future wife, Anne Morrow, for her first aeroplane ride in N1077 during its stay in Mexico.

On April 20, 1928, Floyd Bennett, the first man to fly over the North Pole, accompanied by Bernt Balchen, the first man over the South Pole, set out from Dearborn in N1077, flying supplies to Greenly Island, Quebec, where the crew of Junkers-W 33 *Bremen* were stranded following their 36hr first east—west crossing of the Atlantic. Tragically, Bennett was taken ill on the trip, and died on April 25.

In March 1929 Amelia Earhart flew N1077, and from May 1929 until a landing accident in November 1936 it flew in Canada as G-CARC. Recovered from the Yukon in 1956 by former barnstormer Frank Caldwell and taken by truck back to his base in Idaho, the historic aircraft was acquired by Herrick in 1996.

MESSERSCHMITT ON SHOW AT KRAKOW

MESSERCHMITT Bf 109G-6 Werknr 163306, which has been under restoration to taxiable condition by the Polish Eagles Association Foundation at Goraszde near Warsaw for the past five years, left its workshop by road in June to spend the summer on display at the Muzeum Lotnictwa Polskiego in Krakow, *reports Chris McKay*. The Regensburg-built, early-style Bf 109G-6 was recovered from Lake Trzebun near Gdansk in June 1999, where it had ditched on May 25, 1944. The fighter's DB605 engine is free-moving, and the ancillary systems are currently being overhauled at Goraszde, ready for installation when the machine returns from Krakow in the autumn. The original canopy frames and Perspex have been refitted, and the Revi gunsight, control column, rudder pedals, throttle quadrant and oxygen system have all been overhauled. The original wooden-backed instrument panel had succumbed to nature, and a search continues for an original to replace it.

ABOVE Messerschmitt Bf 109G-6 Werknr 163306 during assembly in Krakow in early July.

RIGHT The '109 has been repainted in the markings it wore when Feldwebel Ernst Pleines of the 2nd Staffel, Erganzungs-Jagdgruppe West, ditched it in 1944.

News in Brief

■ The Vulcan to the Sky campaign, which in December 2003 was awarded a Stage One Pass in its bid for lottery funding to get Vulcan XH558 back in the air, has received word from the Heritage Lottery Fund that £2,738,000 will be awarded to the project. The award means that once partnership funding to make up the £3,970,000 required for the completion of the project is in place, Vulcan to the Sky can give the go-ahead for a flying restoration to begin.

■ Douglas DC-6B N996DM was undergoing taxy-trials at Salzburg Airport on August 15, and was expected to have made its first flight after a four-year overhaul by the end of the month. Owned by Flying Bulls, it is destined for the air display circuit in Europe.

Tel: 020 7261 5551 **Fax:** 020 7261 5269 **E-mail:** anthony_harmsworth@ipcmedia.com

SEA HARRIER FOR NEWARK

New exhibit to form part of new VTOL display with Meteor RB.108 engine testbed

BAE SEA HARRIER FA.2 ZA176 left RNAS Yeovilton by road on July 20 and arrived at the Newark Air Museum at Winthorpe, Nottinghamshire, the following day to become the 69th aircraft in the museum's collection.

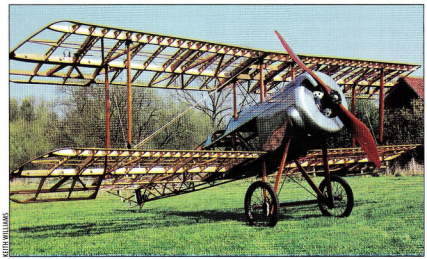
Newark's latest acquisition first went operational in December 1981 as a Sea Harrier FRS.1, and is thought to have seen service on *HMS Hermes* during the Falklands War the following year. On June 7, 1983, flying from *HMS Illustrious*, it was involved in an international incident, when pilot Lt I. "Soapy" Watson had to land it on the deck of a Spanish freighter after an avionics malfunction left him unable to locate or contact the carrier. The freighter, *Alraigo*, was transporting a dismantled telescope to the La Palma Observatory in the Canaries, and Lt Watson landed ZA176 on the telescope's huge baseplate.

The Harrier will form part of a VTOL display with Newark's Gloster Meteor FR.9 VZ608, which in the 1950s was used as the flying testbed for the Rolls-Royce RB.108 vertical lift engine which later powered the VTOL Short SC.1.

NEWARK AIR MUSEUM

ABOVE Sea Harrier ZA176 after unloading at Newark on July 21. The aircraft will go on show in Newark's new hangar, built with assistance from the Heritage Lottery Fund.

Scout breaks cover in Solihull


KEITH WILLIAMS

A BRISTOL SCOUT REPLICA, originally built by RAF apprentices in 1960, is currently being restored in Solihull, West Midlands, by Mike Thorn for owner Keith Williams, who intends to loan the machine to the Bristol Aero Collection at Kemble airfield in Gloucestershire when it is completed.

The Scout replica was used as a recruiting tool by the RAF for several years, and in order to make the machine more robust for its hard life as a travelling exhibit a steel-legged undercarriage was fitted in place of the original Scout's wooden unit. Mike Thorn has now replaced the metal undercarriage with more traditional materials. After disposal by the RAF the Scout seemed to have disappeared, until it was found stored in a barn. After several different owners, and a period of storage at Duxford, it was bought by a private collector in Norfolk, from whom Keith Williams purchased it.

The replica Scout was originally marked as A1742, the first machine of the third batch of Scout Ds built, which was delivered to the Royal Flying Corps on July 22, 1916. Keith Williams is currently considering which identity and paint scheme to give the revived fighter, and would welcome any ideas on the matter.

Keith also needs a Type 5/17 compass, an airspeed indicator, altimeter and pitot head. If anyone has suitable items for sale, please call Keith on 0121 745 6205 or e-mail him at keith@kwaltd.com.

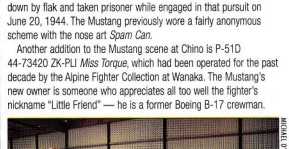
ABOVE The restored Bristol Scout replica, seen recently in Solihull awaiting re-covering. The final paint scheme for the aircraft has yet to be decided.


MICHAEL O'LEARY

P-51 PAINTED IN ACE MARKINGS

AT CHINO, THE AIR MUSEUM Planes of Fame P-51D N5441V has been painted in the personal markings of Captain James Goodson, a 14-kill 336th Fighter Squadron ace who settled in England and now lives in East Kent. Goodson joined the Royal Canadian Air Force in 1940, flew Hurricanes with 133 Sqn, was transferred to the USAAF in September 1942 and took command of the unit on October 5, 1942. He became known as "King of the Strafers", and was shot down by flak and taken prisoner while engaged in that pursuit on June 20, 1944. The Mustang previously wore a fairly anonymous scheme with the nose art *Spam Can*.

Another addition to the Mustang scene at Chino is P-51D 44-73420 ZK-PLI *Miss Torque*, which had been operated for the past decade by the Alpine Fighter Collection at Wanaka. The Mustang's new owner is someone who appreciates all too well the fighter's nickname "Little Friend" — he is a former Boeing B-17 crewman.



MICHAEL O'LEARY

TOP P-51D N5441V, now in the markings of James Goodson.
ABOVE ZK-PLI, recently exported from New Zealand to Chino.

Write to: Aeroplane, King's Reach Tower, Stamford Street London SE1 9LS **Web:** www.aeroplanemonthly.com

Jets fly on at Castle AFB

CASTLE AIR FORCE BASE near Atwater in California, vacated by the US Air Force in 1995, is now home to several privately-owned Cold War-era jets, two resident operators being the Golden Gate Wing of the Commemorative Air Force (CAF), and MiG specialist Sal Rubino. During June Rubino donated his Mikoyan-Gurevich MiG-17, N1VC, to the CAF, which will operate the Vietnam-era fighter alongside their polished Lockheed T-33 from the airfield.

Rubino also owns two flyable examples of the MiG-21, which he will continue to base at Castle. Another Cold War fighter, Convair F-106 Delta Dart c/n 0-72456, has recently gone on show at the adjacent Castle Air Museum following a detailed restoration.

A further Convair F-106 arrived at Chino, California, for the Yanks Air Museum in July. Previously stored at Davis-Monthan AFB, Arizona, the two-seat F-106B was last used as a chase aircraft on the Rockwell B-1B bomber programme.

ABOVE The Commemorative Air Force's MiG-17, N1VC, seen at the former Castle Air Force base while still owned by Sal Rubino.

ALAN KEY

LEFT Convair F-106 Delta Dart 0-72456 has recently gone on show at Castle Air Museum, adjacent to the California base. The type was developed from the F-102 Delta Dagger in the mid-1950s.

FRENCH C-47 COMPLETED

RESTORATION OF THE Musée de l'Air's former USAAF and French Air Force Douglas C-47 Dakota 42-92449 has recently been completed at Le Bourget in Paris. The machine now wears the markings of the famous *Buzz Buggy*, and was completed just in time for the D-Day 60th anniversary celebrations in June.

Dakota 42-92449 was assigned to the US Army Air Force in Europe in March 1944, and served in both the Netherlands and Belgium before being handed over to the Foreign Liquidation Commission in July 1947. From January 1948 it was registered F-BEFB, but 12 years later it was recruited for a second spell in the military, joining the French Air Force in May 1960. Assigned to the French colony in the Antilles during 1961, it then went to ELA-56, a special missions unit at Evreux, in 1966. In 1970 the C-47 was donated to the Musée de l'Air, and spent the next 30 years either on display or in storage.

ADRIAN BALCH

ABOVE Out on the apron at Le Bourget in July, Douglas C-47 USAAF 42-92449 has been restored with the nose art and markings of D-Day veteran *Buzz Buggy*. It was assigned to Europe in May 1944 and served in Holland and Belgium.

WALRUS TO GO DOWN UNDER?

VIA THE WALRUS PROJECT

IF NEGOTIATIONS prove successful, Dick Melton's Supermarine Walrus W2718/ G-RNLJ may move to New Zealand where a new group, The Walrus Project (TWP), will complete its restoration to flying condition and operate the rare biplane amphibian. One of only four survivors and the only example that will ever fly again, the aircraft is currently stored near Great Yarmouth in Norfolk.

Heading TWP are two former Royal New Zealand Air Force (RNZAF) pilots, Ross Ewing and Shane Glassey, who will offer shares in W2718, with individual shareholdings expected to start as low as NZ$5,000. When TWP receive sufficient expressions of interest they plan to issue a more comprehensive prospectus. If the endeavour proves successful, the Walrus will be transported to Christchurch, and may be restored in a workshop at Wigram, the home of the RNZAF Museum.

ABOVE Supermarine Walrus W2718 in Dick Melton's workshop a couple of years ago. It is now in storage.

A total of 11 Walri were operated by The Royal New Zealand Navy at Hobsonville, West Auckland, the surviving machines being passed on to the RNZAF at the end of the war to train future Consolidated PBY pilots.

Walrus W2718, which was operated by Nos 751 and 764 Sqns of the Fleet Air Arm, only survived after being acquired by one Norman Grogan from the Isle of Wight in the early 1950s and turned into a caravan. In 1986 it was donated to the Southampton Hall of Aviation, and Dick Melton, a former Chief Engineer on the Battle of Britain Memorial Flight who had always wanted to get hold of a Walrus, took it on in 1989.

■ **For more information contact The Walrus Project, Box 20-170, Christchurch, NZ**

Register Review

Compiled by Mike Hooks

NEW UK REGISTER ADDITIONS continue to be made up mainly of light and ultralight aircraft with a few airliners. Older types featured are **Aero L-39ZA Albatros** G-CCWB ex N404ZA and Romanian Air Force 136, **Stearman** G-CCXA, also described as an N2S-4 Kaydet, was formerly N75TL/N5148N and originally US Navy 37869, while coming the farthest is former New Zealand **Pitts S-1S** ZK-ECO which becomes G-CCXK based at Shipdham. Probably the oldest newcomer is former floatplane **Cessna 180** G-CCYK, ex SE-KEA/LN-TSD/N6573A.

Atlantic Air Transport at Coventry has registered elderly **ATR-42-300** c/n 007 as G-DRFC, ex OY-CIB/A2-ALJ/OY-CIB/F-WWEC. A restoration is **Auster AOP Mk 9M** WZ711, also known as the Beagle E.3, cancelled by the CAA in 4.01.

Cancellations are **Bulldog** G-DDOG/XX524 with a C of A valid to 28.5.06, based at Malaga, Spain, and **Electra** G-LOFG, used by Air Atlantic for spares and moved to the fire dump at Coventry still in its Norwegian marks LN-FOL, never aspiring to a UK C of A. **Jet Provost** G-BWZZ/XM470 has gone to South Africa and **Shorts 360** G-OBLK is now EI-SMA. **Tiger Moth** G-APAM had a landing accident on 5.4.04 but will no doubt recover. **Piper Cub** F-BMHM is now UK-based and a candidate for G- registry.

An Irish addition is 1976 **Cherokee** EI-DDZ, ex PH-PDW/OO-HAT/N8882E; it visited the PFA Rally at Kemble this year in its new marks.

In France, an ex-military **Broussard** is now F-GIBN, and **MS.733 Alcyon** F-BDZV, whose C of A expired in 1.85, is current at Toussus-le-Noble, presumably on rebuild.

Three Dutch additions are elderly **Jodel DR.1050** PH-MGA ex OO-MGA/F-BMGA (not much repainting in its life!); Early Birds **Nieuport 28C-1** N6256 at Lelystad has become PH-NIE while much-travelled **Catalina** PH-PBY is ex N27311/C-FHHR/CF-HHR/N18446/RCAF 11022, which made its first flight on 4.8.04 after a three-year restoration programme. Departing was **Tiger Moth** PH-II to Germany.

German airliner cancellations include **Boeing 757s** D-ABNL, 'BNM, 'BNR and 'BNS, all exported to Russia, which should cause confusion among spotters with the 757's similarity with the Tu-204! Three **747s,** D-ABZB, 'BZF and ' BZI, have gone to Iceland as TF-ARP, 'ARR and 'ARV, **Friendships** withdrawn from use are D-AELC, 'ELD, 'ELF and 'ELI, while exports include **Super Cub** D-EFBU and **Dornier 27** D-EFYW, both to Hungary for conversion to Water turbroprop power. Other exports are **Airship 600** D-LCLA to America as N601SK and unairworthy **Hiller UH-12B** D-HAHA, destination not known.

In Sweden, **Broussard** SE-BMH is ex LN-WNA/F-GHUG/French Army, while **Safir 91B** LN-HHW has been reserved as SE-LBG since 4.94 — the recent death of its Norwegian owner will presumably release it.

New Swiss registrations are HB-CYV, **Cessna 170B** ex N2463D/N550PN/N2463D and CASA-built **Jungmann** HB-UVU ex D-EDWL/E3B-486. Cancelled are **Horizon** HB-DCM, **Jodel DR.105A** HB-EMS and the last Swiss **Meteor FL.55**, HB-EAE, imported ex I-FELW in 10.59. It followed two others, HB-EAC and 'EAD, ex I-FELH and 'ELL. The **Jodel**, formerly F-BIVN, arrived in Switzerland in 1971. Other Swiss cancellations are **Jodel D.9** HB-SAF, **Jodel D.112** HB-SUF, a frequent visitor to Croydon in the 1950s, and **Meta-Sokol** HB-TCA. Of later vintage are **Porters** HB-FMK and 'FMM, exported as D-FEJE and I-CAKE.

In Austria, **Stearman** OE-CTW is ex N5180N/42-17276, and **Porter** OE-BIA is cancelled.

Further afield, **Chipmunk** ZS-BTO is ex G-BCYJ/WG307, **Gnat** G-GNAT/8638M/XS101 is now VH-XSO, **Mustang** ZK-PLI has been exported and is now at Chino, and CASA **Jungmann** C-FLAE is ex N439DW/E3B-439.

■ **We are indebted to *Air-Britain News* for much of the above information**

ABOVE **Handsome Auster AOP Mk 9M (or Beagle E.3) WZ711, seen here in the summer of 1967, has recently been restored to the register.**

Historic Battle of France Hurricane Mk I under rebuild

IN A SMALL WORKSHOP in Cambridgeshire, Hurricane Mk I L1659, a Battle of France veteran, is slowly taking shape with the Cambridge Fighter and Bomber Society, *reports Mike Shreeve.* The fabric-winged L1659 was originally issued to 85 Sqn, part of the Air Component of the British Expeditionary Force in France. Nearly 60 years after being shot down near Abbeville, it was excavated in 1999. The crash site was pinpointed by Joe Rogers, father of Paul Rogers, the driving force behind the project. Joe served with Gp Capt Peter Townsend as groundcrew on Hurricanes, before himself undergoing pilot training, and the fighter is being recreated as a tribute to 85 Sqn and to Townsend in particular.

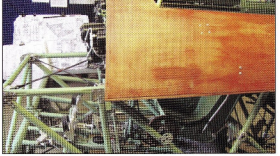
Under way for about two years with volunteer labour, the rebuild has re-used an estimated 80+ per cent original parts, with the woodwork being all-new. The main fuselage frame, firewall, centre-section and fin have been completed and mated, much woodwork installed, and fitting-out of the cockpit and fuselage has begun. Work should start on the wings next year.

The team is building up a runnable Merlin III engine, the plan being to taxy the aircraft as part of a multimedia centre for history and education in the Cambridge area.

■ Contact the project's support group at prr20@hermes.cam.ac.uk or via www.cbfs.org.uk

MIKE SHREEVE

BELOW LEFT **The near-complete fuselage of L1659.** RIGHT **A close-up of the cockpit area.**



Write to: Aeroplane, King's Reach Tower, Stamford Street London SE1 9LS **Web:** www.aeroplanemonthly.com

Chailey ALG comes back to life 60 years on

A CROWD OF MORE than 15,000 flocked to a sun-drenched Bower Farm at Chailey in Sussex over the weekend of August 7–8 for the only D-Day 60th anniversary airshow to take place on the site of a 1944 RAF Advanced Landing Ground (ALG).

Nine World War Two fighters graced the Bower Farm strip, cut on the axis of one of the old ALG runways a week before the show. Among the four Spitfires present were two with direct Chailey connections: Ray Hanna's MH434 and Carolyn Grace's ML407 both flew from Sussex ALGs, which came under the control of the No 18 Sector HQ in Westlands cottage on Bower Farm, which still stands today.

On the Sunday, three of Chailey's 131 "Polish" Wing pilots who flew from Chailey on D-Day were reunited at their old airfield: Fg Off Stanislaw Nawarski of 302 Sqn, who was on the first operational mission from Chailey on April 26, 1944, and 317 Sqn pilots Kazik Budzik and Ludvik Martel shared memories of their time in Sussex just over 60 years ago. More next month.

JIM SERVICE

ABOVE **As the Historic Aircraft Collection Piper L-4 (one of 60 light aircraft at the show) lands , Spitfire IX MH434 and a pair of P-51 Mustangs await departure for their display slots.**

JIM SERVICE

RIGHT **The three Polish D-Day veterans who were reunited at Chailey on August 8. Left to right: Flt Lt Kazik Budzik, Sqn Ldr Ludvik Martel CV VM, and Fg Off "Bob" Nawarski.**

News in Brief

■ Ross Anderson, the owner of Chino-based warbird restoration company Square One Aviation, was killed in the crash of his Harmon Rocket home-built shortly after departure from Torrance Airport on the morning of July 7. Square One has built an enviable reputation for its P-51 rebuilds.

■ The caption for the cover photograph on the July 2004 edition of *Aeroplane* incorrectly stated that Curtiss P-40ZK-RMH belongs to the Alpine Fighter Collection. It is, of course, owned by The Old Flying Machine Company.

■ Following the cancellation of heavy tanker contracts by the US Forest Service in May, Hawkins and Powers at Greybull, Wyoming, has put its fleet up for sale. The only large piston firebombers currently operating are Butler Aviation's Douglas DC-7s, contracted by the State of Oregon.

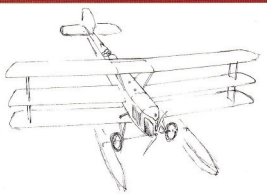
Lost & Found

Pemberton Billing's Poser

THE ECCENTRIC and ebullient aviation pioneer Noel Pemberton Billing is best known for learning to fly and winning his aviator's certificate before breakfast, founding the company that eventually became Supermarine, organising a raid on the Zeppelin sheds at Friedrichshafen, and making the accusation in parliament that Britain's airmen were being "murdered" by being sent into battle in inferior aircraft. He also conceived a whole range of aircraft designs, some of which were built, alhough many remained nothing more than dreams.

During the First World War these designs included the extraordinary Pemberton-Billing P.B.29 and P.B.31 Night Hawk anti-Zeppelin quadruplanes (see pages 82–84, this issue).

LEFT **The portrait of Noel Pemberton Billing, with the drawing in the background.**
RIGHT **Frank Munger's reconstruction of the mystery aircraft.**



Painstaking research has enabled a complete list of Pemberton Billing's aircraft designs to be assembled, and the whole range of type numbers are accounted for, including a few irregularities. There is, however, one enigma. The accompanying portrait of Billing was taken in 1916, about the time that he was standing for Parliament. Of more interest than the man in this study is the mysterious aeroplane featured in the drawing used as a backdrop. It is a large single-seat, single-bay triplane with a fully-cowled engine in the nose, fronted by a pair of radiators set at an angle to reduce frontal drag. The fuel tanks are located at the wing centre-section, and the pilot is seated alarmingly far back in the fuselage, with streamline fairings both in front of his cockpit and behind it. The lower wing is attached below the fuselage, to which it is attached by struts. It is unclear whether a wheel or float undercarriage was intended. Because of the camera angle, the wings appear to have sweepback, but this could simply be the result of the distortion that is plainly evident on the left side. The sketch is an attempt by aviation artist Frank Munger to produce a probable likeness from the vagaries of the original drawing.

The trouble is that this triplane does not conform to, or even resemble, any other known Pemberton Billing design. In his book *Air War: How to Wage It*, published in 1916, Billing included a fold-out artwork spread depicting all of the Pemberton Billing designs to date, and there is no trace of the mysterious triplane. At this late stage it seems unlikely that anything further will come to light; this is probably one puzzle that will never be solved.

PHILIP JARRETT

PETER ARNOLD

TOP OF THE PROPS

Invited to Northern Montana, USA, for the first air-to air photographic sortie with the world's only Supermarine Seafire FR.47 for Phil Makanna's **GHOSTS** calendar, Spitfire historian **PETER ARNOLD** lost no time in heading to the travel agent to book a transatlantic ticket

THE E-MAIL CAME IN from Ezell Aviation in Texas at 1000hr. "You would be welcome to join the photo shoot of the Seafire Mk 47 VP441 for Phil Makanna's 2006 'GHOSTS' calendar at the owner's private strip in Northern Montana." I looked at the date; less than two weeks' time, the start of the school holidays. Could I even get tickets? By 1600hr the flight was booked. One does not pass up such chances.

I had last seen VP441 at Booker some 30 years ago, dismantled in the back of the hangar at Doug Bianchi's Personal Plane Services. It looked pretty sorry for itself, having been vandalised at an Air Training Corps (ATC) unit in Plymouth and the subject of a messy ownership wrangle with a principal UK preservation society of the time.

In 1975 it was shipped to the USA for John Stokes of San Marcos, Texas. Stokes, a prominent member of the Confederate Air Force, as it then was, commissioned some initial airframe restoration, but this petered out as the scale and cost of the engineering task became apparent.

By 1995 the collection of parts and material was with aviation engineering magician Nelson Ezell at Breckenridge, Texas. Ezell Aviation has a very fine record for restoring large US Navy aircraft, and VP441 was one for the "back burner", awaiting a prospective customer, destined to be Jim Smith of Crystal Lakes, Montana, a very rare, self-made and supremely successful innovative engineer and businessman. The world sought, and still seeks, his ingenious design solutions, and this enabled him to retire in his forties, some 20 years ago, and indulge his passions for golf, classic aircraft and the mysteries of Stonehenge. Today, a mile-long hard runway blends seductively with a manicured 18-hole private golf course set in mountainous landscape, complete with a full-size replica of Stonehenge. This is the fabulous Crystal Lakes. The spotless "Toys" hangar houses a personal fleet of 20-plus classic and warbird aircraft ranging from a Curtiss Jenny to a Cessna A-37B Dragonfly, and, now, a Seafire FR Mk 47.

Restoring VP441 to flying condition was never going to be easy. Only 90 FR.47s were built, and this final Spitfire variant bears little resemblance to the first Spitfire prototype of 1936. The evolution from a two-bladed fixed-pitch propeller with about 1,000 h.p. on tap from a Rolls Royce Merlin to six-bladed variable-pitch contrarotating propellers turned by a mighty 2,300 h.p. Griffon testifies to the original design genius of R.J. Mitchell and the development skills of Joseph Smith at Supermarine over some eight years. It would difficult enough to restore the Seafire in the UK, let alone in Texas.

Solving complex technical problems has been the norm throughout Jim Smith's working life. Total authenticity to the n'th degree did not concern him too much in VP441's restoration. This "technical freedom" allowed Nelson Ezell to explore a range of solutions throughout the aircraft. Without this freedom, given the many unique features on the Mk 47, it is doubtful that a restoration to airworthiness could have been contemplated.

Griffon 60-series engines with two-stage superchargers, for the world's Spitfires Mk XIV, XVIII and XIX, are rare indeed. To locate an 80-series engine with a contrarotating output shaft would be impossible. Finding the Dowty-Rotol contra-rotating

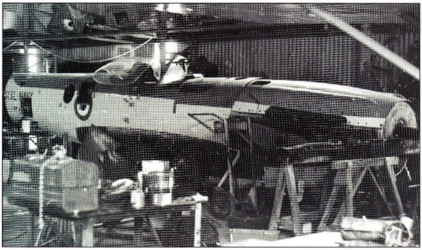
ABOVE LEFT Supermarine Seafire FR.47 VP441/N475F on Jim Smith's hardstanding at Crystal Lakes, Montana, with the White Fish mountains as a backdrop.

PHIL MAKANNA/GHOSTS

propeller and all the accoutrements; spinner nosecones, etc, is also impossible. Don't even think about manufacturing them. The Griffon 58, however, as fitted to the Avro Shackleton, offered a perfect solution. The lack of a section of supercharging would hardly be a problem. The engine could be married to a Griffon 65 blower and wheelhouse, and the fuel injection unit replaced by a carburettor from a Pratt & Whitney R-2800. The 58 would fit the mounting points, and the bonus would be the twin output shafts for the de Havilland contra-rotating propeller. Although of totally different design to the Dowty unit, this assembly could be trimmed and adjusted to replicate the original. A massive amount of work was required to produce a newly-designed carbonfibre spinner group, but this was achievable. A safety bonus was the ability to use the Shackleton feathering system, in the event of an engine failure, to extend the glide performance.

Americans traditionally dislike British Dunlop pneumatic brakes with their expanding airbag bladders and complex valving. Ezell's solution was to graft in hydraulic disc brakes using commercially-available pads with purpose-designed calipers and rotors. These fit perfectly within the envelope of the Dunlop components, and are only externally discernible to the most ardent Spitfire aficionado. A peek in the cockpit reveals beautifully engineered toe brakes and no traditional brake

ABOVE Nelson Ezell brings the snarling Seafire in close, showing the repositioned carburettor air-intake behind the spinner, a feature unique to the FR.47. BELOW During 1972 VP441 was stored in a hangar at Booker airfield. The machine had been rescued by the Historic Aircraft Preservation Society from an ATC unit in Plymouth during 1963, and was restored at RNAS Culdrose. After static display at Squires Gate, Blackpool, in the late 1960s, ownership of VP441 passed to Reflectaire Ltd. Auctioned off in April 1972, it was exported to Texas in 1975.



PETER ARNOLD

lever on the spade "D" grip.

For the fibreboard pilot's seat, a modified available American item was used, and instead of the unique trim-wheel assemblies fitted to the 20/40-series Spitfires and Seafires,a modern equivalent was substituted and adapted. The instrumentation is broadly to original specification, with additional instruments as appropriate to modern-day flying. There was a hint of pride when Jim Smith told me that they had retained the "pull-down blind" chassis indicator for the undercarriage; unique to Spitfires from late Mk I right up to Seafire 47.

Currently, VP441 is the only airworthy Spitfire variant with the later "torque box" wing introduced on the Mk 21. To this is added the complication of a wing-folding mechanism unique to the FR.47. Clearly the internal systems of this wing have been re-engineered to maximise the fuel capacity and incorporate modern systems for fuel transfer, wing folding and locks, flaps, undercarriage retraction and those little extra gear doors that fully seal the undercarriage bay.

It is not surprising that this project took considerably longer than originally planned. That Jim Smith was happy to let it "take what it takes" is a measure of his great faith in Ezell Aviation's engineering skills. That the aircraft made a flawless maiden flight on April 14, 2004 (see *Aeroplane*, June), completed its test programme in double-quick time and flew the 1,500-mile delivery flight all in the hands of Nelson Ezell and with barely a minor glitch is testimony to that faith.

Progress on the restoration had been followed keenly by a band of British enthusiasts. One in particular, Laurence Bean, nurtured a special interest, having been associated with VP441 back in its days with the Plymouth ATC in the 1950s–60s; this was "his" aircraft. Although he was based in Penang, Malaysia, he maintained a continuous dialogue with Ashley Ezell on its progress, providing much historical research detail, and had managed to locate ground- and aircrew associated with the Seafire when it served with 804 Sqn, Fleet Air Arm (FAA), on *HMS Ocean*.

As the first post-restoration flight began to approach, the inevitable questions arose in the UK. How will they paint it? Will they get it right? Could we perhaps "help" them? The response was positive. Yes, the owner wanted the later "Korean" scheme, and yes, they would appreciate assistance with it. Laurie Bean, Steve Atkins and I entered serious internet communication mode to research the scheme right down to the smallest of military instructional stencils. Surprisingly, assembled photographs, running into scores, revealed many slight variations from aircraft to aircraft. Paint chips were supplied and a spreadsheet approach was adopted, listing some 50-odd areas of detail application, with size and position all backed up with reference local images. The age-old dilemma as to whether it should be matt or gloss was not an issue; FAA post-war would be gloss. The principal markings were drawn up on Mylar film and applied to Mk 24 Spitfire VN485 at Duxford to confirm and photograph the final positions.

It was "painting by numbers" stuff, but it worked. The results and the application by Chad Ezell are stunning. The impact of the first flight revelation in the UK aviation web forums and press was immense, and certainly a major surprise to both the owner and the restorer. It was not a surprise to me.

Ah yes, GHOSTS! Blessed with wonderful backdrop scenery and balmy weather, a series of ground shots were taken from various angles as Nelson Ezell positioned ever lower over "Stonehenge". After 25-odd passes it was looking more like Reno Air Racing as the aircraft was knife-edged at low level between the trees and over the monoliths. To complete the photography, the rear canopy was removed from the Beech T-34 Mentor and Phil Makanna went off to do his air-to-air thing in the mountains.

By the time the pair returned I had positioned myself to photograph the landing. The aircraft circled in close formation overhead, clearly capturing "Stonehenge" as a backdrop. I lay on my back on the "number 1 green", more perfect than any carpet. Round and round they went, sometimes silhouetted against a single small puffy white cloud. That glorious Griffon growl; I had surely died and gone to Spitfire heaven.


PHIL MAKANNA/GHOSTS

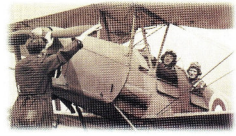

PETER ARNOLD


PETER ARNOLD

ABOVE Nelson Ezell, who restored VP441 at Breckenridge, Texas, banks the mighty machine away from the Beechcraft T-34 camera platform.
LEFT Nelson fills up VP441 before the photographic sortie. When fitted with a 90gal drop tank and two 23gal underwing blister tanks the Seafire FR.47 had a total capacity of 287gal, giving it an impressive range of 940 miles.
LEFT The Seafire makes a low pass over Jim Smith's full-size replica "Stonehenge".
BELOW RIGHT The "sting" tailhook, anchored to the fuselage stern at the base of the rudder. Operational Second World War Seafires had the less-efficient A-frame hook, replacement by the "sting" starting on early Seafire Mk XVs.

Contact!

Aircraft preservation comment and analysis, with PAUL COGGAN



This month Paul reports on the remains of no fewer than three classic Hawker Fury monoplanes found in Iraq, and ponders on some potential newcomers to the international jet warbird community

ONE OF MY FAVOURITE BOOKS is *War Prizes* by Phil Butler (Midland Publishing), a treasure trove of information and photographs concerning captured Axis aeroplanes. When I think of war prizes I generally visualise Focke-Wulf Fw 190s, Messerschmitt Me 262s or, more recently, the ugly Argentine Pucarás. However, the recent conflict in Iraq has presented us with another interesting "traditional" warbird type in the form of several major structures from Hawker "Baghdad" Furies and one almost complete example. I am most grateful to Jeff Bell, who sent me several images of a Fury T.20 looking in remarkably good condition following capture by British forces at Shaibah, and two derelict single-seaters nearby. The two-seater was apparently "preserved" whole near a roundabout inside Shaibah. Jeff tells me: "The two-seater was dismantled on to a trailer ready for shipment back to the UK. [This appears to be the only surviving ex-Iraqi Fury T.20.] I was told that, despite years of just sitting there, its prop actually still rotated! The plate on the tail was marked 'Mk 20 623329 29'. Two single-seaters were on the dump, essentially in natural metal, but the Iraqi markings were still visible. One was serialled 258 under the wing, but I never had a chance to inspect the other." Jeff noted the three aircraft during his tour of duty at Basrah from June to October last year.

I HAD EARLIER seen reports that at least one Baghdad Fury was destroyed in a USAF air attack. At least two others have been reported previously in Baghdad, and a story I heard two years ago said at least four airframes were "in circulation". I think the Fury is a much-underrated warbird, particularly in its pure Centaurus-powered form. (I am not a fan of the bastardised Wright-engined air racers which, thankfully, seem to be in decline.) The Iraqi government ordered 30 Furies, known within Hawker as "Baghdad Furies", in December 1946. Deliveries began in 1948. The following year two T.20 trainers were delivered. Eventually, another three two-seaters and 25 single-seaters were ordered and delivered to Iraq in 1953 (some sources say only four two-seaters in total were delivered). The Fury was, essentially, the first modern monoplane to enter service with the Iraqi Air Force. The initial eight Furies (231–237 and 239), and one two-seater (161) were taken on charge by 7 Sqn. Hurried pilot training took place at Moascar al-Raschid Air Base. This poor training probably led to a spate of accidents early in the type's service. One was lost almost immediately and, by the time the aircraft moved to Amman to participate in combat operations against the Israelis, eight had been lost. It is believed the first combat missions were flown out of Damascus al-Mezzeh in Syria. It is little known that the British Admiralty's interest in the two-seat trainer version was precipitated by the Iraqi request for the type.

DAVID TALLICHET and Ed Jurist rescued most of the Baghdad Furies when they acquired some 27 airframes in the 1970s. For some reason this gorgeous thoroughbred is undervalued. It has Grumman Bearcat performance and a fabulous pedigree, so why is it to some extent shunned? My guess is that the Centaurus is renowned for being somewhat "troublesome". At least one of the Tallichet/Iraqi projects is still available. Several are under restoration in the USA, and there are six airworthy examples there and single examples in Australia, South Africa and the UK.

THE INTERNATIONAL warbird jet movement continues to grow, several new types coming into the civil domain despite (unfair) constant negative press. When the Hunting Jet Provost became available as ex-RAF stock in the early 1990s, it attracted a massive following, largely owing to Richard Lake's enthusiasm and marketing skills. I wonder if the announcement by Lancaster Aviation in Canada that it will shortly have 45 Canadair CT-114 Tutors for sale will see this jet trainer similarly snapped up? On a more exotic note, the South African Air Force at Valhalla registered two Dassault Mirage IIIs at the end of July. Could this be the start of a more exciting jet historic flight?

RIGHT The Hawker Fury T.20 found in "remarkably good condition" at Shaibah, Iraq, during the recent conflict. It was being prepared for recovery to the UK.

PAUL COGGAN joined the RAF in 1973 in the trade of air traffic control. After various assignments, including postings to RAF Wittering, RAF Watton (Eastern Radar) and then 12 Sqn Operations at RAF Lossiemouth, he resigned from the RAF in 1986 to start his own publishing company. He has been researching and writing about warbirds for almost 30 years.

Hanna inquiry 1

SIR — The Spanish CAA accident investigation board report on Mark Hanna's accident on September 25, 1999 is published. According to *Aeroplane's* summary of the report (July 04 issue), these are the points listed as the possible causes for the accident:

1 The final turn was too tight.
2 The aircraft had overshot the runway threshold.
3 The pilot looked back.
4 Pilot distraction.
5 Miscalculating the height of the slope at the end of the runway resulting in a greater bank owing to the effect of the slipstream over the rudder and engine torque.
6 Crossing a vortex from an earlier fast pass causing a stall.

It is obvious to anyone who knew Mark and is competent at flying World War Two propeller fighters that the Spanish investigation board is far from describing the cause of the accident.

It is therefore extremely unfortunate that *Aeroplane* has published a summary of the Spanish report. It leaves the uninformed reader with the impression that Mark died as a result of a series of pilot mistakes. He did not.

These Spanish assumptions are not what Mark's family and friends wish for your readers or anyone else to remember him by.

No-one is more qualified to judge what caused his son's tragic death than the legendary aviator Ray Hanna.

To publish a summary of the Spanish report without consulting Mr Hanna first shows great disrespect for Mark's family as well as inability or disinterest to make sure *Aeroplane* does not contribute to spreading utter nonsense.

By consulting Mr Hanna, you would have learnt that the Spanish report lists a series of wrong assumptions:

1 Mark had more experience on World War Two propeller fighters and on the Messerschmitt Bf 109 than anyone in Europe. He would never unintentionally fly a turn too tight (stall) as the limit of speed and bank was embedded in his spine. Several competent pilots of World War Two fighters can confirm his approach normal for the type.
2 One does not "overshoot a threshold". One flies over the threshold prior to touchdown. (Mark did not overshoot the centreline.)
3 No experienced pilot looks back in a tight final turn. Your sight is fixed on the spot where you want to land.
4 Mark's distinguished RAF career flying F-4 Phantoms and his vast experience on World War Two propeller fighters made him an extremely focused pilot. He would never be distracted during a landing, particularly not in the Bf 109 which he described as demanding.
5 Misjudging the height (gradient) of the slope in front of RW 13 could cause an incorrect height impression relative to the runway. It would not however, result in a greater bank or be related to slipstream or engine torque.
6 Crossing the vortex from the previous pass did not cause a stall. If an aircraft stalls in landing configuration, the nose drops down. It did not.

Mark was led in over RW 31 at Sabadell airfield by a business twin. After a solo low approach and a pull-up at the end of RW 31, he saw the very steep slope right at the end of RW 31 and the 200m grass over-run at the end of RW 13.

For obvious reasons he then decided to switch runways and land on RW 13. After a crossover and a tight circuit, he returned to where he had made a 5g pull-up a minute before. There was virtually no wind and the vortex funnels were there waiting for him.

Who would think of vortex funnels when there was not another aircraft in sight?

His left wing hit the vortex. The leading edge slat on the left wing almost certainly closed, creating asymmetric lift slip. The recovery manœuvre was instant and by the book. He applied full right rudder and power. He brought the nose up, wings almost level, and managed to initiate a climb. However, too much altitude was lost for him to climb above the level of the runway in the distance available to him. The time from upset to impact was 2⅓sec.

Scientific time and aerodynamic private studies have been made of the accident. Every calculation points to the theory that Mark's own vortex brought him down.

I suggest you consult with your editorial team as to how best to restore the wrong impressions left with your readers in publishing a summary of the Spanish report. Publishing this letter would be a start.

ANDERS K. SAETHER
Scandinavian Historic Flight
via e-mail

Mark Hanna crash report published

AN INVESTIGATION INTO THE accident in which eminent display pilot Mark Hanna was fatally injured in Spain on September 25, 1999, reached no firm conclusion on the cause, according to an English translation of the report which is now available on the Spanish civil air accident investigation commission's website, *reports Michael Oakey*. It does, however, shed light on the sequence of events immediately leading up to the crash.

The accident happened as Old Flying Machine Company director Hanna arrived at an airshow at Sabadell Airport near Barcelona in Hispano Buchón G-BOML, accompanied by a Piper Aztec camera aircraft, having flown from Gerona.

The translation of the report states: "when both aircraft were performing a pass at a low height and speed over runway 31/13, [the Buchón] abandoned the formation to the left, making part of the left approach pattern and performed a pass at a low altitude (estimated at 10–20m) and high speed (estimated at 260–270 knots) that ended approximately 200m from the end of the runway in a climb (estimated at a 5g "pull") with a barrel roll in the direction of Tarrasa, returning to carry out the left approach pattern to enter on runway threshold 31.

"During the pattern, the pilot requested authorisation to land on runway threshold 13. The controller authorised him to use any one of the thresholds, at his choice. In order to proceed with this manœuvre through runway threshold 13, the aircraft had to cross the field and carry out two steep turns to the left, the last one of which, at least, was [made] at a very low speed and very low height, in landing configuration, with the landing gear down."

The Buchón was observed to bank to 35–60° in the turn (witness estimates differ), but then the port wing dropped, increasing the bank to some 80°.

"All the available data" says the report, "... lead to conclude that the final turn of the manœuvre to face runway end 13 was too tight, possibly because the aircraft had overshot the runway threshold and the pilot, wanting to be positioned for the landing, had to look back."

"The result was that the aircraft suffered a left wing-drop during the manœuvre, losing height quickly. Although the pilot tried to recover it by increasing power and stepping on the right rudder to the maximum, he was able to climb a little, but not enough to avoid the accident."

Examination of the wreckage gave no indication of engine failure. The wing slats were still in place, the starboard unit still movable while the port unit was bent with the wing during impact. There was no evidence of pilot incapacitation; he was conscious when rescued, but died the next day in a specialist burns unit in Barcelona. The report includes a transcript of the radio conversation between the aircraft and Sabadell tower in the minutes leading up to the accident.

Hypotheses about what caused the wing drop include pilot distraction; miscalculating the height of the slope at the runway end, resulting in a greater bank owing to the effect of the slipstream over the rudder and engine torque; and crossing a vortex from the earlier fast pass, causing a stall.

A research fellowship to help burns victims was established in memory of Mark Hanna. Donations may be sent to: Mark Hanna Surgical Research Fellowship, The Appeals Director, Blond McIndoe Centre, Queen Victoria Hospital, East Grinstead, West Sussex RH19 3DZ

ABOVE A diagram of the final flightpath of Buchón G-BOML, from the official report in Spanish. "Tonel" means "barrel roll". LEFT Mark Hanna shortly before his death at the age of 40.

4

ABOVE How the Spanish accident investigation was reported in July's *Aeroplane*.

The Editor replies:

First and foremost, I regret any distress we inadvertently caused to the Hanna family in the course of our reporting. All of us who admired Mark's airshow performances still miss him, and our purpose in reporting the official accident inquiry was to address, at long last, almost five years after the event, the legitimate and often-asked question of what happened to bring his life to a tragically premature end.

That said, the above letter raises an important issue about how we cover accident investigations in *Aeroplane*. Our fundamental policy when dealing with official accident investigation findings has always been a simple one: to provide an accurate summary of the report (space considerations usually make it impossible to reproduce the report in full).

We also try to publish our story as soon as possible after we become aware that the report is available, first because the whole point of our news section is to give readers fresh information likely to be of interest, and secondly because an investigation may contain lessons of immediate use to other pilots and operators.

We deliberately try never to seek opinions at that stage from anywhere else, and specifically not from those involved in or connected to the incident in question. An official report is an official report,

Write to: Aeroplane, King's Reach Tower, Stamford Street, London SE1 9LS or e-mail us at aeroplane_monthly@ipcmedia.com

Letter of the Month

The Hastings and the Paratechnicon

SIR — Many thanks for the Hastings *Database* in August's *Aeroplane*, which brought back memories of flights in the "Bullfrog" both as a civilian flight test observer at RAE Farnborough and later in the RAF on Casevac [Casualty Evacuation] duties.

To expand on the section relating to the Hastings Paratechnicon, this abortive development followed successful trials with the Universal Freight Container carried by Halifax PP350. I heard that one proposed use of the latter was to land a body of airborne troops "en bloc" rather than scatter them in sticks via a conventional paratroop drop, with the consequent problem of their having to find one another and regroup before going into action. On measuring the g forces on the container as it fell away from the aircraft, these were found to be more than a human cargo could endure.

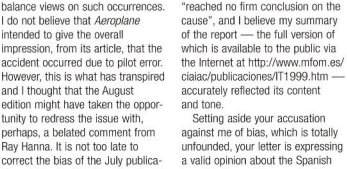
Whereas the earlier container fitted neatly into the Halifax bomb bay (with bomb doors removed) the Paratechnicon was a huge excrescence on the belly of the Hastings. On August 15, 1949, as an observer with Supply Dropping Section, Mechanical Engineeering Department,RAE, I was fortunate to fly on (and survive) the first air drop of the Paratechnicon. Hastings TG499 was flown on that occasion by then Sqn Ldr Dickie Martin, seconded to Mech Eng Flight from the RAF, who later went on to test the Javelin at Glosters. The statement in your article that there was not much deterioration in the aircraft's handling is contrary to his comments at the time and to my own observation. The aircraft yawed excessively and in Dickie's view was unsuitable in that configuration to be flown by inexperienced pilots or at night. Standing behind the pilots, it was possible to see the horizon sliding from side to side despite their highly skilled handling of the aircraft.

On releasing the Paratechnicon over Odstone, near Lasham, there was quite a bang followed by the Flight Engineer (Lefty) whipping up the trapdoor in the flight deck floor to check for internal underside damage to the Hastings. Nothing was found and, when the Paratechnicon landed then turned over on its back, the flight crew were noticeably amused!

After landing back at Farnborough I had to await a lift back to the section and whilst chatting with a groundcrew member noticed unusual scratches on the No 2 propeller. These did not seem the result of contact with debris thrown up when taxying. Their cause became apparent after the Paratechnicon was returned by road to Farnborough. The (fortunately) lightly-constructed nose of the container was deeply gashed and it was apparent that the Paratechnicon had rolled into No 2 propeller on release.

The news of the loss of the RAF crew from Boscombe Down in Hastings TG499 a little over five weeks later was received with sadness in the Section. So ended an apparently ill-conceived plan to transplant a workable idea from an obsolete aircraft to what was then a modern transport. Perhaps it would have worked on the Shackleton!

FRANK GREEN *Baldock, Hertfordshire*



ABOVE **Hastings TG499 with underslung "Paratechnicon" pannier.**

and should in turn be reported "unfiltered" and uninfluenced by third parties, whether or not they are connected to the case. This does not preclude subsequent discussion, however, and our *Skywriters* pages provide a forum for this.

Hanna inquiry 2

SIR — I have read *Aeroplane* for years and have always been impressed by its sensible and careful commentary on the warbird scene. However, I was most disappointed by your news story *Mark Hanna crash report published* in the July issue. While you were careful to maintain that you were quoting directly from the Spanish CAAIC report, your selected précis leaves the reader with a picture of Mark flying a poorly executed approach. Such quotes as "very slow speed and very low height" . . . and "All the available data lead to conclude that the final turn to face runway end 13 was too tight . . ." etc could hardly do otherwise.

I believe the Spanish report to be flawed; a glance at the pictorial flightpath *(reconstruccion de la trayectoria)* and such wild hypotheses as "the pilot had to look back at the position for landing . . . " indicate that any investigation of the facts were not going to interfere with a conclusion that had already been made. I have learned subsequently that comments by our own AAIB and the report of vortex generation by Oslo University were ignored, thus confirming my reservations. The "Board" may look for a balance of probabilities if the cause of accident is unknown, but it cannot ignore such strong contribution from other professional bodies and certainly not from two expert observers (Ray Hanna and Keith Skilling) who deny that the circuit looked other than normal for this type of aircraft.

Many *Aeroplane* readers are not pilots but have huge interest and affection for vintage aviation. Without their support, airshows would not exist. They rely on magazines, such as yours, to translate and balance views on such occurrences. I do not believe that *Aeroplane* intended to give the overall impression, from its article, that the accident occurred due to pilot error. However, this is what has transpired and I thought that the August edition might have taken the opportunity to redress the issue with, perhaps, a belated comment from Ray Hanna. It is not too late to correct the bias of the July publication, which should not be *Aeroplane's* final word on Mark's death.

PETE JOHN
Market Lavington
Devizes
Wiltshire

The Editor replies:
I totally disagree with you that I gave an unfair impression that "the accident occurred due to pilot error" — the official report does not say that, and I did not insert any such message. Indeed, I specifically stated in the first sentence of my report that the investigation "reached no firm conclusion on the cause", and I believe my summary of the report — the full version of which is available to the public via the Internet at http://www.mfom.es/ciaiac/publicaciones/IT1999.htm — accurately reflected its content and tone.

Setting aside your accusation against me of bias, which is totally unfounded, your letter is expressing a valid opinion about the Spanish investigation and I am content to publish it; both of the above letters are printed with the approval of the Hanna family. Clearly there is dissatisfaction in some quarters with the findings of the Spanish official report — just as there will no doubt be views on accident investigations and the correct reporting of them — and I would like to invite further informed comment on this subject for a future issue.

Skywriters

Brackla's dump

SIR — Further to Mr K. McLaren's letter and picture, July *Aeroplane*, I can tell him and your readers that not all the aircraft at Brackla were turned into ingots.

In the top right hand corner of the field where the scrap is, a road can be seen heading off the page. Between 1992 and 1994 I lived in a house at the end of that road. Also up to 2002 my elder son and I used to fly radio-controlled aircraft from Brackla.

When I moved to my present house I got to know one of the neighbours reasonably well: a Mr Charles Hay, a former air gunner, who completed his only tour at East Kirkby. More importantly, he worked at Brackla helping to chop up the aircraft stored there.

My point to all this is that he told me when the chopped-up aircraft could not be removed by normal means they were dumped into holes along the riverbank (bottom right-hand corner) or transported across to the other side of Nairn and dumped into a disused quarry. Then soil was heaped on top to hide it all. The last area is possibly about to be built on, as a housing estate encroaches ever nearer. Apparently it is not just the local people who know of this dump but preservation groups all over as well. The one item that I didn't get from Charlie was to what amount of the complete aircraft was dumped.

DAVID DARNLEY
via e-mail

Wolverhampton gliders

SIR — I read Alec Brew's article *A New Kind of Museum* (March *Aeroplane*) with interest. I hope some additional information will be of interest to your readers.

The T-31 and T-21 are owned jointly by Peter Alcock and myself, the T-21B Sedbergh being XN188 (BGA 1588). The second T-38 Grasshopper is XK822 and can be seen under restoration in the museum. Bob Arnold's very genuine Göppingen-Hirth Gö-III Gövier is c/n 378 (BGA 1639). I am currently returning this Second World War glider to "Hitler Youth" colours.

For the record the Slingsby T-8 Tutor is BGA 1759, c/n or military serial is not known. Can anyone help?

The aim of The Air Cadet Heritage Collection is to collect, restore and preserve an example of every type operated by the RAF in support of the Air Training Corps and RAF section of the Combined Cadet Force. If anyone has any leads to a statically restored Chipmunk we would love to hear from them.

VAUGHAN K. MEERS
Streetly
West Midlands

New Zealand Rapides

SIR — Congratulations on a very good article on the D.H. Dragon Rapide (*Database*, April) — my favourite aeroplane. I thought that mention may have been made of Cook Strait Airways, which operated Rapides from December 26, 1935 until the outbreak of war in 1939. They had five D.H.89As, ZK-AED, 'AED, 'AEE, 'AEW, and 'AGT. They were named after the planets, e.g. Mars. Jupiter. Only one survives today and that is now ZK-AHS, which is at MoTAT in Auckland. All five saw service with the RNZAF and four were wrecked in the islands. During the war nine D.H.89Bs were released from RAF stocks in 1943 and saw service with RNZAF until the arrival of the 30 D.H.104 Devons in the 1950s. The D.H.89Bs were to see service in the National Airways fleet as ZK-AKS, 'AKT, 'AKU, 'AKY, 'ALB and 'ALC. Today only 'AKU and 'AKY survive in New Zealand and are airworthy.

I thought this may be of interest and help complete the D.H.89 Dragon Rapide picture.

IAN G. GRANGER QSM
Chair
Vintage Aviation Hawke's Bay Charitable Trust Inc
Napier
New Zealand

Swinging Typhoons

SIR — I read with interest Chris Thomas's excellent article *Taming the Tiffie* in *Database* in the June edition of *Aeroplane*. However, I have a question concerning the penultimate paragraph, concerning Hugh Bergel's theory that "what caused the swing was not the engine torque but the depression of the elevators into the swirling slipstream as the pilot pushed forward" to raise the nose during the take-off roll. In fact, isn't the effect he describes much more likely to be the gyroscopic effect that one expects to feel on raising the tail?

HENRY FAJEMIROKUN
via e-mail
[Who can provide us with chapter and verse on this? — Ed]

Wrong gear

SIR — I expect you'll have had dozens of corrections to the caption to the photograph of "a crew member checking a C-47's glider-towing attachment . . ." on page 47 of the June issue.

ABOVE **Slingsby Grasshopper WZ755 at the Boulton Paul Aircraft Heritage project in Wolverhampton— see Vaughan Meers's letter on this page.**

It is, of course, the glider-snatching apparatus, as shown in the picture in your website's *Aero Archive*, from June 15, 1945, of a Dakota hooking the Hadrian's cable.

Incidentally, I remember seeing this demonstrated at the *Daily Express* Air Pageant at Gatwick, on July 23, 1949.

JOHN BOLT
via e-mail

Hastings fitter . . .

SIR — Three comments on the Handley Page Hastings (August *Aeroplane*):

1 Hastings TG493 *Picture of the Month* — Oh dear! not Bristol Centaurus engines but Hercules.

2 As a one-time engine fitter at RAF Manby Flying College, I was disappointed that we didn't get a mention in your excellent history of the Hastings. I was very impressed with our TG617 when doing its acceptance checks; it then had very little use for at least six months after which the engines didn't run properly. This was only fixed by fitting all new carburettors as the RAE injector carbs tended to stick if not fully inhibited.

Oil gulping was experienced on our Herc 230s on the Valettas, but our Hastings had another problem. I was on a flight to Alaska to fit a Merlin in Avro Lincoln *Aries II*. At Goose Bay one engine was well down on oil; we ran on 34A/33 I think, a straight mineral-based oil of which Goose had none, only Aero Shell. Very reluctantly I put in the minimum after they showed me on their paperwork it to be its equivalent. Over Hudson Bay the engine began misfiring so we returned to Goose and found one sleeve not moving. The sludge had been freed by the detergent oil such as to block the sleeve-valve crank small oilway causing it to seize and shear — a known problem on the Korea run, I understand.

3 At Manby we had the Handling Squadron, writing the pilot's notes. They had a new Met version Hastings; on an overshoot test at our sister airfield Strubby, it went up steeply, stalled and crashed, killing a pilot standing between the seats. I always suspected that it must have

Lost & Found — Your Replies

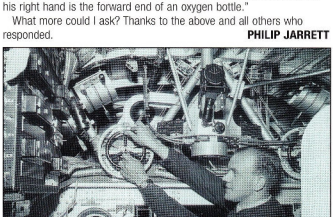
Stirling response

Aeroplane readers again responded promptly to one of my appeals, identifying the large aircraft whose innards were featured in *Lost & Found* on page 14 of the March 2004 issue.

Jeff Jefford was first off the mark, saying that it depicted the forward face of the mainspar of a Short Stirling bomber. The picture appears in his book on Observers and Navigators. Jack Clarke said that the picture was also used in the Pilot's Notes for the Stirling. Peter Howell of The Stirling Project writes: "You are looking aft down the fuselage, and the upper section of the front spar is immediately behind the corporal, who is operating the fuel tank control valves. Fuse boxes at the flight engineer's station are on the left, and the DF loop assembly is suspended from the roof. You can just see the ladder to the mid-upper turret directly beneath the corporal's wristwatch, and the round thing above his right hand is the forward end of an oxygen bottle."

What more could I ask? Thanks to the above and all others who responded.

PHILIP JARRETT



ABOVE **It's a Stirling: the mystery interior from March's *Lost & Found*.**

been trimmed up and the nose couldn't be held down; from your information now I am almost certain that is what happened.

Thanks for the excellent articles.

JACK FRENCH
via e-mail

. . . and navigator

SIR — Being an ex-Hastings navigator, I wonder if you could possibly see your way clear in future articles about ancient long-range transports to mention the poor bloody navigator from time to time? On those long, mainly over-water, flights on the Far East run we had to respond instantly to frequent cries of "Where are we, Nav?" from up front when we had only the most primitive equipment to do it with. No *Gee*, frequently no Loran, certainly no H_2S, Doppler, INS or GPS. Just ADF (if it was working), DR, and astro (not much good in daylight). Once, when the 10kW MF beacon at Car Nicobar was off the air, I navigated across most of the Bay of Bengal by seeing where the cloud-tops were blowing and assuming that was the wind at our altitude — it worked!

The RAF almost completely ignored navigation before World War Two — hence only 5 per cent of bombs even near their targets in 1940/41 — please don't emulate them again.

WALTER BLANCHARD FRIN
(former Transport Command "Trapper"; also once President of the Royal Institute of Navigation
via e-mail

Flying Visit

Former Rothmans aerobatic display team pilot and *Battle of Britain* film pilot **TIM MILLS** talks to **MELVYN HISCOCK** about his flying career

What is your first aviation memory?
My father was in the RAF, so aeroplanes were second nature to me. The first real memory is of Vickers Virginia bombers at Andover, when I was about six. One crashed; great excitement! I feel ashamed now at having been excited.

When was your first flight?
1937/38. Father hired an Aeronca C-3, and took my brother and me for rides from West Malling.

What prompted you to learn to fly? It was bound to happen. I was called up for National Service in 1948, applied for pilot training, and was lucky enough to be accepted.

When was your first solo?
On a Prentice at RAF Digby on January 20, 1950.

What do you consider your best aviation achievement?
To be in the right place at the right time to be chosen as one of the RAF pilots to fly in the *Battle of Britain* film.

Do you have any unfulfilled ambitions? Not any longer, but I did want to fly the Falcon 50.

Who, or what, has most influenced your career?
First, a charming wing commander at the MoD, at a career interview, who told me I would never reach dizzy heights in the RAF and would not fly anything other than a desk again. So I retired at 43 and looked for flying jobs. I had a great year with Rothmans, but it was hardly a career move; Neil Williams suggested I should convert my CPL to an ATPL as the executive charter company he part-timed with needed a pilot. So my last 12 or so years of flying were on Falcon 20s and H.S.125s. Very enjoyable; but on a sad note, I inherited his Jeppesen Airways Manuals.

What do you see as the greatest aviation invention?
It must be the turbojet; and the development of high bypass ratios for far greater fuel efficiency than the simple turbojet.

Do you hold any aviation records? No.

Can you think of a time when you looked out of the cockpit and thought, "This is what aviation is all about"?
Several, but one stands out: first or second display with Rothmans, flying No 3, so Manx Kelly's true slow roll left has me doing a sort of very tight negative-g barrel roll to maintain position. Old Warden fence line looks very close, concentrate on Manx, and wonder if this is really what it is all about! Got used to it, and actually enjoyed it as the season progressed.

What was your favourite aviation moment? Flying a Spitfire in company with about nine others, breaking towards the two Heinkel He 111s led by the B-25 camera aircraft, with a similar number of Bf 109s (well Buchóns really) turning in from the other side, and the ensuing excitement. Then being told to resume our positions and do it all over again!

What was your least favourite moment?
My last-ever flight in a Spitfire, delivering the Mk II to RAF Coltishall for the BofB Memorial Flight. Went to put on a trickle of power round finals only to find no trickle of power, only a large three-bladed prop coming to a standstill. Luckily I made the runway without trouble, and had no time to think about it until afterwards.

What is your favourite aeroplane? I have always had a soft spot for the Hurricane since seeing someone doing an airtest in one at RAF Watton in the early 1940s and doing the best beat-up of an airfield I have ever seen! So it has to be Hawker's *Last of the Many* Hurricane; I was lucky enough to get about 20 hours on it in the film.

And your least-favourite?
Easy. A thing called a Volmer amphibian that Vivian Bellamy had — it looked rather like a Walrus without the top wing! Pretty unpleasant to fly, worse on the ground! Never tried it on water.

Which aircraft from history would you most like to have flown? My father was on 12 Sqn, flying the Fairey Fox. A classic in its time; I would love to have a go in one — the Curtiss-engined version, of course.

An Emil's Story Emerges

In the months since the rescue of a Messerschmitt Bf 109E-7 from a Russian lakebed on behalf of UK recovery specialist Jim Pearce, **MARK SHEPPARD** has been examining the airframe in detail and piecing together the aircraft's history

ERIC WINTER

ABOVE Messerschmitt Bf 109E-7 6274 *Rote 19* with Fw Josef Wirtz. Note the armoured windscreen, faintly painted number and polar bear emblem of 5./JG5. The high number corresponds to an influx of "Emils" to 5./JG5 from 6./JG5, which had just been re-equipped, in late April/May 1942, with new Bf 109F-4s.

MESSERSCHMITT BF 109 *Werknummer* (WNr) 3523 was built by Arado GmbH at Warnemünde, Germany, as an E-1. Arado built some 500 Bf 109E-1s under licence, including some 50 E-1/B fighter-bombers, and 3523 was probably from construction block 3380–3664, manufactured between June 1939 and April 1940. Completed in September 1939, 3523 had a 1,100 h.p. Daimler-Benz DB601A inverted V-12 engine. Its armament consisted of four MG 17 7·62mm machine-guns, two over the engine and one in each wing. Its camouflage would have comprised the standard 1939 colours of RLM70 *Schwarzgrün* (black-green) and RLM71 *Dunkelgrün* (dark green) on the upper surfaces of the wings, tailplane and fuselage sides, and RLM65 *Hellblau* (light blue) on the undersurfaces. The *Stammkennzeichen* or *Stkz* (factory codes) CS+AJ were applied to the fuselage and under the wings. Following testing at Warnemünde, it was taken on charge by the Luftwaffe on September 27, 1939.

Whether 3523 suffered any damage between September 1939 and mid-1940 is not known. According to *Reichsluftministerium* (RLM) records, by August 1940 all undamaged Bf 109E-1s were to have been sent to a repair/upgrade centre to be upgraded. Many E-1s from the same block as 3523 were upgraded to E-4s and E-7s, some after being damaged.

The Quartermaster's returns up to this period record damage/losses by aircraft's tactical numbers. Only later did they start to make reference to the WNr, so any reference to 3523 being damaged cannot be found in this source.

An E-7 upgrade entailed the replacement of the MG 17 wings by a pair reworked to take a single 20mm MG-FF cannon in each wing. Additional rewiring facilitated the fitting of an ETC fuselage-centreline rack to carry a 300-litre drop tank or a 250kg bomb. The distinctive E-type flat propeller spinner was often covered over to become pointed, one of the distinctive indicators of an E-7 upgrade. The last change in many cases was the inclusion of a heavier canopy frame with an armoured head support.

By mid-1941 3523 had already flown for two years and had hundreds of hours on its airframe. Aircraft were overhauled after two years/1,500hr, this service including a full stripping of the metal surfaces to remove all paint.

By this stage 3523 might have had three or four different colour/demarcation schemes applied over its initial factory finish. This strip-down is thought to be the reason why 3523 carried no evidence of previous camouflage or markings.

Once overhauled, 3523 was completed as an E-7 "Trop" and finished in North Africa colours, with RLM79 *Sandgelb* (sand yellow) upper surfaces and RLM78 *Hellblau* lower surfaces. It is thought that the aircraft also had both its upper and lower engine cowlings painted RLM04 *Gelb* (yellow) over the RLM78/79. The top cowling was evidently painted while on the airframe, as yellow overspray had entered the apertures and coated the engine. After completion, the fighter was again marked up with its *Stkz*, CS+AJ, and despatched to a *Feldluftpark* (aircraft storage park), to await issue to a unit. There seems to be no trace of the white fuselage band usually applied to "Trop" variants for the North Africa theatre. These were often applied en route to North Africa, often in Italy. In late 1941/early 1942 Bf 109E "Trops" were being assigned to other duties, because the F models were being sent to North Africa.

In 1942 *Jagdgeschwader 5* (JG5) in *Luftflotte 5* in the north became the main recipient of the Bf 109Es, and it was May 1942 before some of the units in the Arctic Circle began receiving Bf 109Fs. No longer required for North Africa, 3523 went to a Luftwaffe repair/conversion depot, where it was repainted in the standard European fighter camouflage of the period, the same as that applied to production Bf 109Fs. It is unclear whether the crosses were reapplied or simply masked off, though the WNr on the fin and a couple of stencils on the gun cowling were masked before repainting. The demarcation lines were very crisp, with no overspray,

ABOVE The Bf 109E on the shoreline immediately after lifting from the lakebed. The complete canopy was a worry, as it could have indicated that the pilot was still on board. Luckily the research was correct; he had escaped uninjured. The white smudges on the picture are falling snow. The recovery was first reported in our March 2004 issue.

LEFT The complete fuselage in Jim Pearce's Sussex hangar after the fighter was transported back to the UK. The RLM79 camouflage may be seen as a pink colour most clearly around the cockpit.

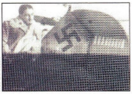
RIGHT **Captains V.P. Pokrovskiy and P.I. Orlov of 2 GIAP in the summer of 1942 with a lend-lease Curtiss P-40E behind. Pokrovskiy was the victor over Lt Widowitz in the combat of April 3, 1942. During April 1942 2 GIAP were flying P-40Es, Hurricanes and MiG-1s .**

CARL-FREDRIK GEUST

indicating that 3523 was properly masked off before repainting. It was completed in RLM74 *Grauviolet* (gray-violet), RLM75 *Graugrün* (gray-green) and RLM76 *Lichtblau* (light blue). The blue was also applied to the fuselage sides, which were then mottled with two or three standard colours. The demarcation lines were the same as those for Bf 109s of 1940, but in the 1942 European colours, a combination thought to be quite unusual on E-model Bf 109s.

In early 1942 3523 was flown through Germany, up through East Prussia, Riga and Tallinn and across the Gulf of Finland to Malmi airfield, Helsinki. On February 27, 1942, two Bf 109E-7s, 3523 and 3183, took off from Malmi and landied at Pori, on Finland's west coast, at 1715hr. Pori was the main Feldflugpark for Luftflotte 5, storing spares and replacement aircraft. It seems likely that RLM04 *Gelb* was added to 3523's lower wingtips and rudder while it was stored at Pori awaiting allocation.

On March 20, 1942, two pilots of 5 Staffel, Jadgeschwader 5 (5./JG5) were tasked with picking up two replacement Bf 109Es. At Pori, Uffz Arthur Mendl and Uffz Ernst Koch strapped into their aircraft. With Mendl flying 3523 and Koch flying SF+BC, they left Pori at 1355hr and landed at Kemi at 1532hr. After a day's break the two left Kemi at 0945hr on March 22 to fly to Petsamo, which they reached at 1123hr.



ERIC MOMBEEK

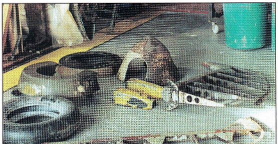
ABOVE **Bf 109E-7 1187 *Rote 4*. The nine victories relate to Lt Widowitz, whose aircraft this was before March 20, 1942. It then became Uffz Mendl's mount when 3523 arrived. Could that yellow-nosed Bf 109 in the background be 3523?**

Both Mendl's *flugbuch* and the Pori airfield diary identify his Bf 109E-7 as 3523. Koch's Bf 109E-7 was recorded by its four-letter *Stkz* identity. This signifies that 3523 was flown to Petsamo with no visible *Stkz*. This supports the analysis of the recovered airframe, indicating that the *Stkz* had been overpainted. Had its codes been visible, 3523 should have been recorded as CS+AJ in both documents.

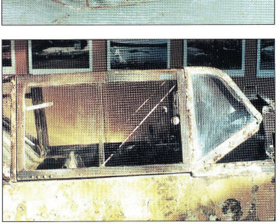
It seems probable that, on March 23, 3523 became the new aircraft of Lt Wulf-Dietrich Widowitz. His previous aircraft, Bf 109E-7 1187 *Rote 4* (with nine victory bars on the rudder; thought to comprise three RAF and six Russian), was apparently handed over to his wingman, Mendl. Mendl then flew 1187 until April 4, when he was injured in combat. The aircraft was lost on April 9, while being flown by Fw Anton Kandziora, who became a prisoner of war.

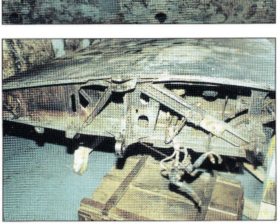
A study of Mendl's logbook and loss lists enabled seven tactical numbers to be discounted with some certainty. The identity that seems most probable for 3523 is *Rote* 6, which seems to fit where the paint specks remain. The previous *Rote 6* was lost on the day 3523 arrived at Petsamo. (On March 22, 1942, Oblt Rudolf Grobe, flying Bf 109E-7 3183 *Rote 6* of 5./JG5, was killed in an emergency landing at Titowka after the aircraft suffered flak damage.)

On April 4, 1942, at 0905hr four Bf 109s of 5./JG5 escorted a Bf 110 over the Front. At the same time, four Hawker Hurricanes of 2 GIAP V-VS SF, flown by Soviet pilots S/Lts Pokrovskiy, Mozerov, Orlov and Leshenko, were patrolling



MICHAEL OAKEY PHOTOGRAPHS

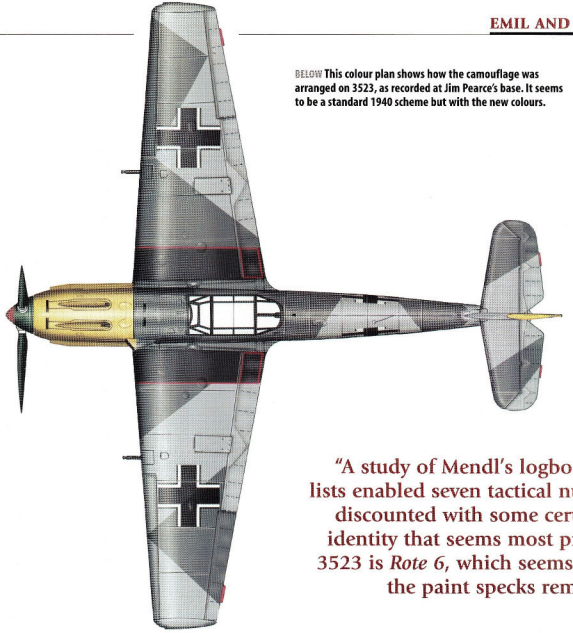




RIGHT **Detail photographs of 3523 taken by the Editor at Jim Pearce's Sussex base in January 2004. The first shows the state of preservation of one of the mainwheel tyres, the coolant tank, spinner backplate and spinner, rudder and exhaust fairings.**
FAR RIGHT **The fuselage data plate showing place of manufacture (Arado Warnemünde), type (originally Bf 109E-1), Werke Nr (109-3523), year of manufacture (1939) and handover date (September 27).**
BELOW RIGHT **It is rare to see a recovery with all its original glazing. The "red" line on the canopy was the dive-bombing angle indicator.**
FAR RIGHT **This view of the port wing root shows how well the airframe has survived its immersion.**

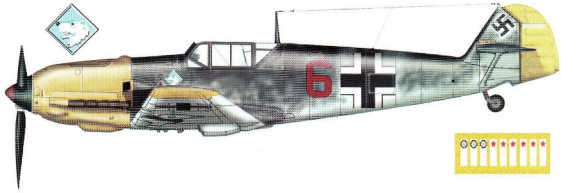
An Emil's Story Emerges

BELOW **This colour plan shows how the camouflage was arranged on 3523, as recorded at Jim Pearce's base. It seems to be a standard 1940 scheme but with the new colours.**

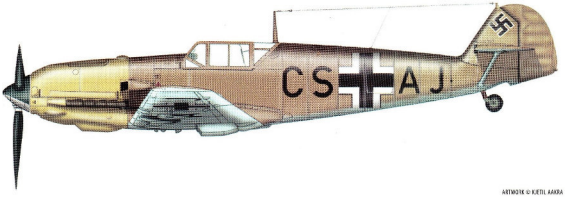


"A study of Mendl's logbook and loss lists enabled seven tactical numbers to be discounted with some certainty. The identity that seems most probable for 3523 is *Rote 6*, which seems to fit where the paint specks remain"

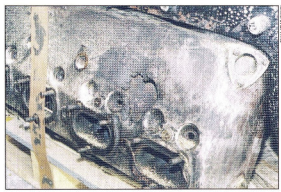
RIGHT **A colour profile of how 3523 looked when shot down in April 1942. The two exceptions are the emblem of 5./JG5 (which had not been applied in time, but was regularly applied) and the possible transfer of Widowitz's victories.**



RIGHT **Bf 109E-7 WNr 3523 having been completed as a tropical variant. This colour scheme using RLM78/79 was evident under the European camouflage of RLM74/75/76.**



ABOVE Another picture of the Bf 109 on the lakeshore. Notice the armoured windscreen and the missing fuselage access hatch. The yellow cowling was located next to the airframe and propped in place for the photograph.
RIGHT The impact of the 20mm cannon round on the starboard cylinder bank that had nothing to do with the loss of 3523. The general condition of the engine seems good.



SU-Quadrant 5880-5882 when they observed four Bf 109s and a Bf 110. In the ensuing combat Pokrovskiy attacked a Bf 109E and observed hits to its engine. He recorded that the Bf 109 made a forced landing in SU-Qu 4276.

Messerschmitt 3523 was hit by a number of small-calibre bullets, and also took a single 20mm cannon hit in the starboard wing root, which just missed the starboard radiator, exploded and sent hot shards through the side of the fuselage under the cockpit. This damage fractured the coolant pipes, the aircraft immediately emitting a stream of glycol. Widowitz had only a few minutes before his engine seized. The rocky terrain was not ideal for a belly landing, but he found frozen Lake Shonlgul-javr, 12 miles south-east of Luostari on the Murmansk Front. Bringing 3523 down with the engine still turning, he made an almost flawless belly landing on the ice without jettisoning his canopy.

The remaining three Bf 109s of 5./JG5 returned to Petsamo at 1015hr, and the pilots reported Widowitz's crash landing. Although not behind Russian lines, it was 20km from Luostari, the nearest Luftwaffe airfield, and even in late winter/spring could still be bitterly cold. At 1603hr a number of Bf 109Es took off to escort the Fieseler Storch of JG5 which was often used to rescue downed airmen.

Here is another Jim Pearce connection. On March 12, 1942, Widowitz flew the Fieseler Storch (with Mendl as observer) to rescue a pilot and *Bordfunk* of a crashed Bf 110. The pilot was Uffz Emil Gross and the Bordfunk Uffz Gerhard Sarodnik. They were the crew of Bf 110E-2 WNr 4502/M8+ZE of 6.(Z)/JG5, which Jim brought back to the UK in 1992 (see *In From The Cold*, April 1994 *Aeroplane*).

Widowitz was picked up, and by 1620hr the Bf 109s of 5./JG5 had landed at Petsamo. Messerschmitt 3523 sat on the ice for a while. A partial salvage seems to have been undertaken, as, when 3523 was recovered, several items were missing. Apparently a salvage team removed important items including the radio, compass, gunsight, machine-guns, ammunition and instruments. It is known that the top engine cover and MG 17 gun cowling were removed to permit access to the guns. It seems unlikely that the engine was to be salvaged because of its weight, even though it was undamaged. Some Russian reconnaissance aircraft spotted 3523 on the ice and shot at it. This explains some of the other bullet holes, and is the only explanation for the 20mm cannon hole in the engine. This shell hit the starboard cylinder block without putting a hole in the cowling, so the damage could only have been done while the fighter was on the ice with its top cowling removed. Luckily the top cowling was found on the lakebed alongside 3523.

In the spring of 1942 3523 sank. It is now dismantled (with its smaller components inhibited and wrapped in oilskins) at Jim Pearce's base in Sussex. This remarkably complete, 65-year-old Bf 109E-1/E-7 is for sale, and the means to restore it exist in the UK.

Wulf-Dietrich Widowitz was born in Graz, Austria, on June 22, 1918. He returned to 5./JG5 and later rose to the rank of Oberleutnant and Staffelkapitän of 9./JG5. He died in an accident on July 28, 1943, while flying a Gotha Go 145 of III/JG5. At that time he had 36 victories, mostly in the East. He is buried at Petsamo.

Thanks are due to those who helped with this account. Jim Pearce allowed the author to look over the airframe, and Kjetil Aakra, Carl-Fredrik Geust, Kari Lumppio, Dave McDonald, Ken Merrick, Eric Mombeek and Rune Rautio helped in compiling the story

An Emil's Story Emerges

The Office...

The Gloster Meteor F Mk 8

THE RAF'S FIRST jet aircraft, the Gloster Meteor first flew — as the F.9/40 with de Havilland H.1 turbojets — on March 5, 1943. The Meteor F.8 was the result of an effort to improve the type's performance, which, by 1947, was inferior to that of the latest jet fighters. The first prototype F.8, a modified F.4 powered by Rolls-Royce Derwents, flew on October 12, 1948, and the mark entered service with the RAF in December 1950.

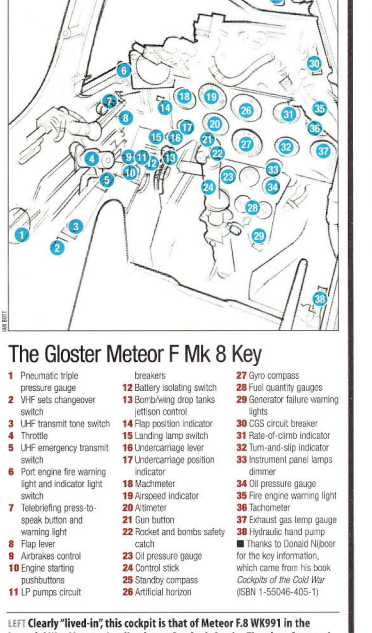
Pilots coming on to the Meteor from piston-engined trainers such as the North American Harvard had to accustom themselves to a changed state of affairs in the cockpit. While some instruments were familiar, the airspeed was indicated in knots rather than miles per hour, the altimeter had additional needles, the engine instruments were different and there was a Mach meter, an exhaust gas temperature gauge, and relight buttons. Navigational equipment was minimal.

Engine starting and handling required new techniques. Pressing an engine start button initiated a low moaning sound, and then after 5sec the high-pressure (HP) cock was moved to half-open. As revolutions rose the cock was eased to fully open. Opening it too fast resulted in airframe-shaking resonance, and rapid throttle movement in flight could cause a flame-out, especially undesirable above 15,000ft, where the engines were reluctant to restart.

Moreover, relighting required the skills of a contortionist, for while the relight buttons were on the instrument panel, the HP cocks were located low on either side of the seat. The pilot therefore had to grip the control column with his knees while pressing the relight button for 5sec and then opening the appropriate HP cock slowly with the button still depressed, and wait for the engine to respond.

On the plus side, the bubble canopy provided an excellent view, and when everything was working well the Meteor was a delight to fly.

The first of another of our new series, planned to alternate with *Aeroplane Explains*, features a close look at a famous British jet fighter cockpit, thanks to the photographic skills of aviation photographer **DAN PATTERSON**



The Gloster Meteor F Mk 8 Key

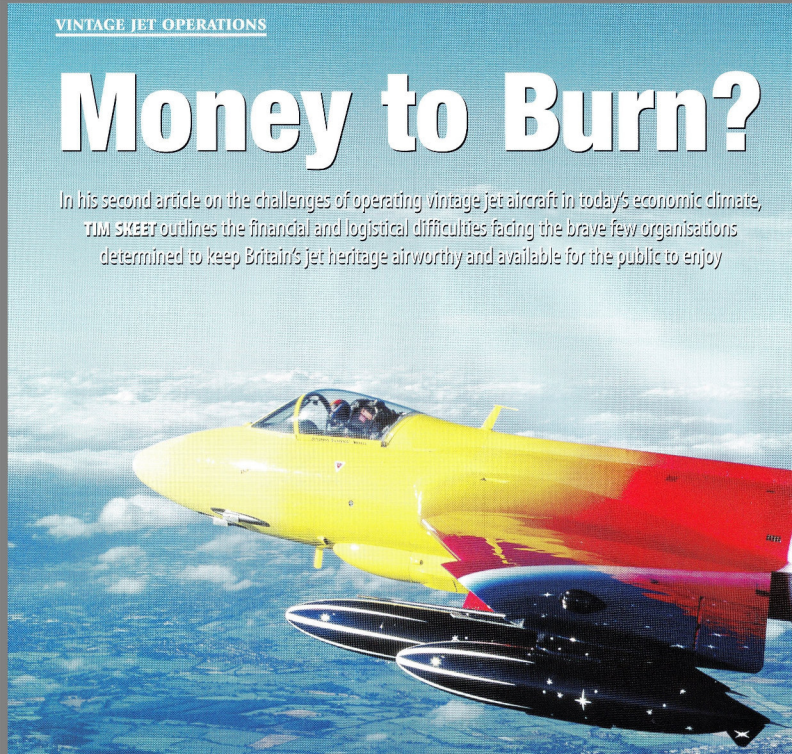
1 Pneumatic triple pressure gauge
2 VHF sets changeover switch
3 UHF transmit tone switch
4 Throttle
5 UHF emergency transmit switch
6 Port engine fire warning light and indicator light switch
7 Telebriefing press-to-speak button and warning light
8 Flap lever
9 Airbrakes control
10 Engine starting pushbuttons
11 LP pumps circuit breakers
12 Battery isolating switch
13 Bomb/wing drop tanks jettison control
14 Flap position indicator
15 Landing lamp switch
16 Undercarriage lever
17 Undercarriage position indicator
18 Machmeter
19 Airspeed indicator
20 Altimeter
21 Gun button
22 Rocket and bombs safety catch
23 Oil pressure gauge
24 Control stick
25 Standby compass
26 Artificial horizon
27 Gyro compass
28 Fuel quantity gauges
29 Generator failure warning lights
30 GGS circuit breaker
31 Rate-of-climb indicator
32 Turn-and-slip indicator
33 Instrument panel lamps dimmer
34 Oil pressure gauge
35 Fire engine warning light
36 Tachometer
37 Exhaust gas temp gauge
38 Hydraulic hand pump

■ Thanks to Donald Nijboer for the key information, which came from his book *Cockpits of the Cold War* (ISBN 1-55046-405-1)

LEFT **Clearly 'lived-in', this cockpit is that of Meteor F.8 WK991 in the Imperial War Museum's collection at Duxford, Cambs. The aircraft served with 13 Gp Communications Flight and Nos 46 and 56 Sqns.**

Money to Burn?

In his second article on the challenges of operating vintage jet aircraft in today's economic climate, TIM SKEET outlines the financial and logistical difficulties facing the brave few organisations determined to keep Britain's jet heritage airworthy and available for the public to enjoy



ABOVE Jonathon Whaley's stunning Hawker Hunter F Mk 58A, G-PSST, over the Cotswolds in its highly distinctive, personalised colour scheme. Based at Kemble since 1999, the aircraft is a regular performer at airshows around the UK. Photograph © JOHN DIBBS/aviation-images.com.

THE PREVIOUS ARTICLE on this subject (*Juggling Jet Heritage*, September 2004 *Aeroplane*) looked at the four main areas of difficulty facing enthusiasts who would like to fly old jets. Of the four "f-words" — filing, fixing, flying and financing — the biggest hurdle by far is the last, financing. Obtaining regulatory approval from the UK's Civil Aviation Authority (CAA), maintaining the machines and identifying competent, qualified and available pilots are all challenges in their own right, but finding the money is the single greatest obstacle to the future of the jet warbird movement, especially at a time of soaring fuel and insurance costs. Various accidents and mishaps bring further pressure to bear on key elements of the costs of operating these powerful vintage "stovepipes".

Unfortunately the outlook for the jet warbird sector is not bright. The vintage-jet movement relies heavily on the enthusiasm of a small number of dedicated — and sufficiently wealthy — individuals. Rising costs and technical hurdles are placing increasing strains on their willingness to continue to shoulder the financial burden.

The British take great satisfaction in achieving much with little, and shoestring budgets, volunteer work and knife-edge economics are all part of the tradition of the country's preservation scene. However, the complexity of jets, the scale of the costs and the need for safety demand absolute professionalism and a commercial approach.

The UK has already lost some important items of its aviation jet heritage. In recent years the last airworthy Gloster Meteor F.8

migrated to Australia, and several airworthy English Electric Lightnings and Blackburn Buccaneers have departed for South Africa. There are no big historic jets flying. The last de Havilland Comet remains grounded, as are the few remaining Handley Page Victors, not to mention a whole generation of large civilian jets. The potentially airworthy Supermarine Swift F.7 XF114 was last reported heading for the Southampton Hall of Aviation (now renamed Solent Sky).

In recent years there have been some positive developments in the UK. English Electric Canberra B.2/6 WK163 and de Havilland Sea Vixen XP924 were cleared for civilian operation, and there is now the potential for an Avro Vulcan to join the flying community. The availability of ex-Swiss de Havilland Vampires, Venoms and Hunters, and some ex-RAF Hunting Jet Provosts, Folland Gnats and more Hunters, all at reasonable prices, has created the possibility of a jet warbird movement in the UK. A shrinking population of these types continues to operate from various centres around the UK. Recently, moreover, Mike Collett's Air Atlantique operation has established the Classic Flight at Coventry, securing the future of a number of rare aircraft including the only flying Meteor NF.11.

To keep any machinery in good working order, it is essential to get it out and run it regularly. This is especially true of old jet aircraft. Prolonged inactivity is damaging. It is therefore encouraging that there is a fleet of almost airworthy types that allows options to be kept open for the future. These include the various aircraft maintained "live"

Money to Burn?

CLIFF ROSE

RIGHT **The sublime English Electric Canberra B.2/6 WK163 of Classic Aviation Projects is now based with Air Atlantique at Coventry, and is always a welcome sight at UK airshows.**

"The first obvious source of income for jet operators is the airshow circuit, which attracted some 6½ million visitors in 2003, making it second only to football as a paying leisure activity"

TIM MITT

ABOVE **Mat Potulski of Hawker Hunter Aviation, which operates a sizeable fleet of vintage jets from its base at Scampton in Lincolnshire.**

BELOW **De Havilland Venom FB.50 G-VENM is an ex-Swiss Air Force example painted as WK436 of 11 Sqn while based in West Germany during the mid-1950s.**

at Bruntingthorpe (Lightnings and Comet) and Elvington (the Victor). There are also various military maintenance units and technical schools that keep airframes well maintained beyond their Service flying lives, potentially preserving a stock for the future.

Interest versus economics

The fact remains that flying old jets remains essentially a leisure activity, and therefore, by definition, uncommercial. The jet community has been forced to move away from a hobby culture based on volunteer labour, and to introduce commercial discipline. Owners are unlikely to recoup their investment in classic jets, and cannot expect a positive capital gain on resale to offset operating expenses. Air-show revenues, sponsorship, military support functions, other commercial activities or film and promotional work are all possible ways of earning money to cover costs. Currently barely viable, the jet warbird movement finds itself relying increasingly on the generosity of a small group of private benefactors.

Mat Potulski of Hawker Hunter Aviation (HHA) argues: "Flying jets is a passion, but it has to be put on a semi-commercial footing, as the costs are so horrendous".

"The costs relative to income are the killer. There is almost no income from airshows now," confirms Ronan Harvey of Delta Jets, operator of popular display Hunter WV318. "We keep our overheads as low as possible," he adds, "but it's near-impossible to cover costs."

The first obvious source of income is the airshow circuit, which attracted some 6½ million visitors in 2003, making it second only to football as a paying leisure activity. This figure might suggest that there is a lot of money available somewhere, but the number of shows is diminishing and the amount available to pay for the flying display often does not go very far. In real terms, airshow organisers are now paying less for the same acts than a decade ago. In part, this is because they are being squeezed by the rising costs of insurance, catering, policing etc. Glenn Moreman, who organises Kemble's popular Classic Jets show, says: "Our fuel bill is horrendous. The first- and second-generation jets are not very economical."

Stewart Ross of Classic Aviation Projects, the Canberra operator now based with Air Atlantique at Coventry, claims that show appearances just about covered that aircraft's operating costs during the 2003 season, although the Canberra is a unique performer. In contrast, the similarly unique Sea Vixen made 28 display appearances but still failed to cover its costs, which, including fuel, amounted to more than £100,000. For less charismatic types there will probably be fewer bookings per aircraft, and some operators may be willing or able to provide an aircraft at cost or less. Ronan Harvey is blunt: "Airshows don't pay. In the first

CLIFF ROSE

year we did 35 airshows with [Hunter] '318. This year we will be lucky to do three."

De Havilland Aviation (DHA) at Bournemouth and Delta Jets at Kemble do their best to attract business by offering maintenance and pilot training in an effort to cover costs and spread the financial load. However, turnover depends on a small number of private individuals who are willing to own and fly a jet, which has to be maintained and hangared somewhere. But once again, even when an aircraft is owned by a syndicate, rising costs and little opportunity to earn income from shows have meant that some syndicates are suffering from waning interest. The fun flying and pilot training is just getting too expensive. Overall, today, there is probably insufficient work to keep all the various A8-20 maintenance operations commercially viable and maintain the safety standards.

As Ronan Harvey points out, there is no industry body speaking for the operators, and still little more than informal contact between the key people: "The people are so diverse, and there is no organisation that represents us".

Running a maintenance operation requires an operating base, which can also be complicated and costly. DHA operated from Swansea Airport, but the runway was too short for the Sea Vixen. Having reviewed a limited number of options, Gwyn Jones was able to take over the defunct Jet Heritage facilities alongside the Bournemouth Aviation Museum at Hurn. Here the local authorities and the airport management maintain a helpful attitude towards the museum and facilities. Delta Jets occupies a site at Kemble, a former RAF maintenance base. Ronan Harvey spent a lot of time and energy securing the future of the airfield by buying it from the Ministry of Defence. Kemble's future will ultimately depend on its ability to generate a broad spread of business revenues, and this in turn is crucial to the future of Delta. As a further illustration, redevelopment of its previous home site at Cranfield forced Kennet Aviation to seek a new home at North Weald. Now the future of North Weald is uncertain, creating yet more doubt and worry for the collection.

The sponsorship lottery

If owner-operators cannot earn enough from airshows or engineering operations there is the possibility of sponsorship, although there are few sponsors available. Soft-drinks company Red Bull, a company already identified with extreme sports and aviation in other European countries, made a high-profile arrival on the UK scene in 2003 with its support for the Sea Vixen. Repainting and branding the Sea Vixen caused some initial consternation in some quarters of the aviation fraternity, although this was one of the key requirements of Red Bull in return for the sponsorship cash.

Approaching Red Bull and negotiating an agreement took some six months of tentative discussions, which included the delicate matter of the paint scheme. Taking the bull by the horns, a quick decision was made in a local coffee shop. The deal soon settled down into a successful partnership, which was renewed for the 2004 season.

On the thorny question of the colour scheme, there are those who believe that historic aircraft should appear in historic colours. On the other hand, the bright and exciting colours appear to have gone down well with the general, non-specialist public that comprises the majority of show-goers. "Airshows are theatre", points out Brian Lewis of Airshow Enterprises, and the Vixen plays to the crowd.

Beyond the high-profile deals, some sponsorship comes in a more discreet fashion, through the provision of parts or services from a variety of specialist companies in the aviation field that are pleased to make their contribution to the nation's heritage in return for a more modest logo or publicity. The Coventry Canberra, for instance, has enjoyed support from a number of

ABOVE **A glorious photograph of Delta Jets' Folland Gnat G-RORI/XR538 climbing into a loop over Gloucestershire in 2002. Photograph by IAN FRIMSTON/FUJI LAB.**

IAN HAM

BELOW **De Havilland Aviation's Sea Vixen takes off for another thrilling — but expensive — display at a UK airshow, wearing its Red Bull paint scheme.**

CLIFF HOYE

"All enthusiasts must play their part, including those who sit on the airfield fence to avoid paying the entrance fee. Everyone must get off the fence and face up to the realities of the business"

PHILIP MEWS

ABOVE Always a dynamic display item at airshows, the Golden Apple Trust's North American F-86A-5 Sabre, G-SABR/FU-178, is resident at Duxford and is the oldest flying jet in the world.
ABOVE RIGHT One of the most numerous vintage jet types in Britain is the Hunting Jet Provost and its ground-attack counterpart, the BAC Strikemaster, with more than 40 examples on the UK register in 2004.

companies such as CFS, Spies Hecker and Kidde Graviner, which have supplied various services including paint or fire protection systems. Such support is invaluable.

However, a new player is now entering the sponsorship arena to lend a hand with the preservation of the nation's jet heritage. It is too early to estimate the effect this might have and how widely the money will be allocated, but the announcement earlier this year that the Heritage Lottery Fund (HLF) is willing to support the Vulcan to the Sky (VTS) appeal is a significant development.

The Vulcan enterprise: the final frontier

The VTS Vulcan is the most ambitious vintage jet project in the UK, if not the world. Heroic or mad depending on your point of view, the ambition to put the great Avro delta back in the air surely remains a source of hope and inspiration.

Vulcan B.2 XH558, Cold War warrior and iconic example of British design and engineering, was rolled into a hangar upon retirement from RAF service in an essentially airworthy state. The CAA decided that the type was, for the purposes of civilian operation, a Complex Category type, and would therefore require manufacturers to support the aircraft and its critical components. With this in mind, the project team, led by Dr Robert Pleming, planned the approach to civilian regulatory clearance as a military operation. The Vulcan costs were of Olympian proportions, but, after a long period of determination winning over disappointments and near failure, there is the prospect of sufficient funding to see the project through to fruition. With the commitment of £2·7 million of HLF money the project, kicked off by the Walton family in 1997, looks as if it might succeed. Heritage Lottery Fund involvement means that the aircraft will be acquired by a charitable trust, the Vulcan to the Sky Trust, and will return thus to public ownership. In addition, a supporting programme of education based around XH558 will tell the story of the Cold War.

Since fund raising started in earnest in 1999, some £650,000 has been raised from a variety of sources, including the public. An impressive 17,000 people and companies have made donations. With the promise of £2½ million from the HLF, the team must raise a further £500,000 to finalise the deal. However, even when the funds are secured and the aircraft is certificated there will be the question of the annual running costs, which are likely to run into several hundred thousand pounds per year. Further sponsorship will be needed for this, but sponsorship consultants retained by the trust are confident that this support will be found.

The question arises as to whether, in an industry starved of sponsorship and money, pouring this amount into one great project is justified. Robert Pleming responds with the observation: "If we can't get the Vulcan, that tremendous example of British heritage, to fly, then it is highly unlikely that any other Complex Category type will ever fly in future privately". This, then, is the challenge. To set a precedent and save one of the big complex aircraft, not just the small, simpler fighter types.

When considering the crisis potentially afflicting the jet movement, the absence of large public companies lending a generous hand is very apparent. "It's a shame that the likes of British Airways, British Midland International or Virgin don't have more heart and soul. Big aviation companies should help," comments Air Atlantique's Mike Collett. Air Atlantique, a small, privately-owned company, offers significant cross-subsidies to maintain its growing fleet of revenue-depleting Classic Flight aircraft.

Besides Air Atlantique, Rolls-Royce still operates a Spitfire, and Martin-Baker (a private company) flies two working Meteors, but other examples of big companies becoming involved are rare. Air Atlantique, with its combination of commercial patrol, pollution control, passenger carrying and other tasks on the one hand, and the costly Classic Jet aviation operation on the other, is a unique business model that is able to bring down the costs of maintaining a jet fleet.

On the other hand, big public companies today require tough return-on-equity targets, making it all but impossible for public limited

ALEX MOW

companies to sustain heritage operations if there is not a clear "bottom line" benefit. As anyone following the active debate over the fate of the Concordes will know, the cost of maintaining one for display could not be justified, whatever Richard Branson said publicly.

Away from the private sector, the military are willing to be supportive, but the enormous pressure on the defence budget, and the growing operational needs of the armed forces, mean that there is little in the kitty for heritage projects. During the 1970s the RAF operated the Vintage Pair, consisting of a Vampire T.11 and Meteor T.7, and indeed the Vulcan was kept flying for an extra season or two beyond retirement for display purposes. But that is now history, and the Royal Navy Historic Flight has struggled to get Hawker Sea Hawk FGA.6 WV908 back in the air.

If the military cannot afford heritage projects, there may still be contracting work for ex-military jets. However, one of the problems of operating private civilian aircraft is that current UK CAA A8-20 Permit to Fly rules actually prevent these machines from generating an income from any source other than display work, and the training associated with this. There are, however, some jurisdictions where these restrictions do not apply. Nowadays, outsourcing by the armed forces is very much on the agenda, so perhaps this is the time to review the Permit to Fly rules and grant a limited number of company-specific exemptions enabling civilian operators to undertake military training contracts while the jets remain on the UK civil register.

A good example of a type that could benefit from an easing of the rules is the Hunter, which is still capable of providing useful service, as has been demonstrated by their recent adoption by the Canadian Navy in the fleet requirements role. Potulski's HHA, which owns a fleet of Hunters, a Buccaneer and a Sukhoi Su-22 "Fitter" at Scampton, sees a possible commercial use for the retired military machines in the form of threat-simulation work. "We are set up and structured to pitch for a different market than other operators," he says, "and are actively examining the potential for defence outsourcing, both in the UK and abroad."

As a final source of commercial income there is film work. For example, the James Bond film *Tomorrow Never Dies* required almost 90hr of Aero L-39 Albatros flying for only 3min of finished screen footage. This is nice work if you can get it, but the big screen does not often need vintage jets, and computer-generated imagery has replaced much of the demand.

A hard cash landing

Britain has a strong record of preserving its national heritage, and this applies to the country's rich aviation tradition. Certainly, compared with its European partners, Britain has been successful and has shown the way both in terms of static and airworthy preservation. The tradition of keeping old aircraft flying dates back before the Second World War, and there is plenty of enthusiasm or technical expertise available today to sustain a healthy airworthy heritage industry. Moreover, the regulatory authorities in the shape of the CAA have been broadly constructive, although maybe there is scope for modification of some of the rules, as discussed above.

The jet warbird community is at a crossroads, facing difficult choices. Without adequate support, organisation, money and vision the future of jet preservation is in jeopardy, and a significant element of aviation heritage could be irretrievably lost. There are no easy solutions, but if the various interested parties, including enthusiasts, owner/operators, airshow organisers, the authorities and potential sponsors, do not act, the outlook will be bleak. All enthusiasts must play their part, including those who sit on the airfield fence to avoid paying the entrance fee. Everyone must get off the fence and face up to the realities of the business. Come forward, sponsors, and let us see if we cannot keep the current fleet of vintage jets flying a bit longer, and find the will and resources to enable further, more-modern types to operate privately.

TIM ALLEN

ABOVE **Ronan Harvey of Kemble-based Delta Jets, one of the most important centres in the UK for vintage jet maintenance.**

ABOVE LEFT **The magnificent Avro Vulcan XH558 during its airworthy days. If the Vulcan to the Sky campaign can raise £500,000, the Heritage Lottery Fund will release £2·7 million to return the aircraft to the air. See panel below for details of how you can help.**

TIM ALLEN

ABOVE **Mike Collett of Air Atlantique. The company operates a number of classic jets including the last flying Meteor NF.11 and the immaculate Canberra B.2 WK163.**

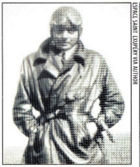
Vulcan to the Sky

Donations to help return majestic Avro Vulcan XH558 to the sky may be made at www.tvoc.-co.uk, or by post to VTS, PO Box 3240, Dorset BH21 4YP, making cheques payable to the Vulcan to the Sky Trust

VIA MICHAEL O'LEARY

Saint-Ex found?

In May 2000 the remains of a twin-boomed aircraft were discovered 200ft beneath the surface of the Mediterranean. More than 55 years previously, Antoine de Saint-Exupéry, "poet of the skies", disappeared while flying a USAAF Lockheed Lightning over the same area. Could these remains be Saint-Ex's aircraft? **XAVIER MÉAL** looks at the evidence and concludes that it's possible — but by no means certain

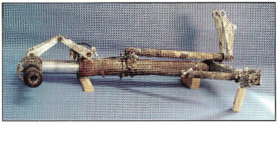


ESPACE SAINT EXUPÉRY VIA AUTHOR

ABOVE Arguably the greatest aviation writer of them all; Antoine de Saint-Exupéry in Buenos Aires in 1930.
TOP In the days before his disappearance, Saint-Ex was photographed extensively by American photographer John Phillips; the French aviator is seen here taxying out in an F-5 Lightning.
RIGHT The Lightning main undercarriage assembly found by Luc Vanrell during a dive off Cap Croisette, near Marseilles, in May 2000.

ON JUNE 23, 2004, during a short official ceremony at Le Bourget, near Paris, the supposed wreck of the Lockheed F-5B Lightning in which famous French aviator and author Antoine de Saint-Exupéry died on July 30, 1944, have been handed over to the Musée de l'Air et de l'Espace. These relics will be put on display later in the year, after receiving a specialised electro-chemical treatment to ensure their long-term preservation.

On May 23, 2000, well-known French wreck-diver Luc Vanrell identified scattered, heavily damaged debris of what appeared to be a twin-boomed aircraft during a dive east of Ile du Riou. The debris lay on a sandy bottom, about 150–200ft deep. Entangled in fishing nets was a 6ft-long part of a port boom, including a turbocharger. A little deeper, a complete main undercarriage assembly was found. In the same area was other small debris, and what was later



identified as a Daimler-Benz engine. Vanrell contacted Aéro-Re.L.I.C. (Re.L.I.C. — **Re**search, **L**ocate and **I**dentify **C**rashes), an association which specialises in crash sites of World War Two aircraft in southern France. After obtaining authorisation from the authorities, the remains were then recovered at the end of 2003. The first investigations of the remains were undertaken by Philippe Castellano, president of Aéro-Re.L.I.C. According to Castellano, the upper part of the undercarriage showed a modification introduced on post-serial No 42-66802 P-38s, limiting the possibilities to the P-38J, P-38L, two-seat P-38M, F-5B, F-5E, F-5F and F-5G. After a long and detailed analysis, Aéro-Re.L.I.C. concluded that no P-38H-5-LO, P-38J, nor any of the subsequent models, had ever been officially recorded as lost in the Mediterranean area during or after the war.

Just above the the corner joining the inboard web (part number 230085L) and the diagonal shear web (part number 230109) of the stainless-steel structure assembly, in front of the supercharger inboard support, the reference "2734L" — manually punched — was found. According to Aéro-Re.L.I.C., this number is the Lockheed Aircraft Corporation Manufacturer Serial Number (LAC MSN) number, and the "L" (an inverted 7 in this case) stands for left. Thus,

on the report published on their website, Aéro-Re.L.I.C. concludes that "the presence of LAC MSN 2734 number on the left forward boom of the aircraft has enabled its formal identification. The 2734 MSN corresponds to Lockheed Model 422-81-21, USAAF type F-5B-1-LO Lightning 42-68223, which went missing on Monday July 31, 1944, during an aerial reconnaisance mission in the area of Annecy, Lyon and Châlon-sur-Saône, with Commandant Antoine-Marie de Saint-Exupéry as the pilot ".

But is it really St-Exupéry's aeroplane?

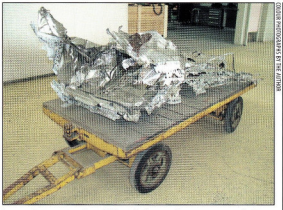
Several aviation specialists have expressed concern about the way the pieces were identified, and offer some significant points.

Firstly, the stamped LAC MSN (if indeed that is what it is) is rather thin to be hailed as definitive proof. During the Flying Legends airshow at Duxford in July, the author spoke to Steve Hinton of California-based Fighter Rebuilders, who has worked on five P-38s, and Bob Cardin, project manager for the recovery and restoration of P-38 *Glacier Girl*. Both confirmed they found such stamped LAC MSNs on the P-38s they worked on, but none looked exactly like the one found on the wreck, and none were found in the same specific location. These were machine-stamped, whereas the one on the wreck was stamped by hand. Moreover, wherever the LAC MSN was stamped on *Glacier Girl*, there was also a USAAF serial number. Significantly, *Glacier Girl's* USAAF serial number was wrong by one unit — it read 41-7629 where it should be 41-7630. Somebody had made a mistake when stamping the parts while the P-38 was being built. Conclusion: this number alone cannot be considered irrefutable proof.

So far, no counter-research has been undertaken by any recognised or official specialists, not even the simple tasks that would verify that those four digits and one letter have not been stamped recently; this could be checked using, for example, an electronic microscope. The French Air Force recently declared that it concurred with the report written by the Aéro-Re.L.I.C members.

In the first Aéro-Re.L.I.C. report given to the local authorities (which has not been made public) the conclusion was cautious, stating that the company had concluded that they had found a piece of St-Exupéry's aircraft by pure deduction, using the LAC MSN. The first report also called for further research to discover other significant pieces, such as parts of the engine, cockpit or radio, that could be identified with no doubt. The second report, dated April 12, 2004 (which may be read on www.aero-relic.org), is much shorter, and rather boldly concludes that St-Exupéry's aircraft has been found (even though the pieces of the wreck only represents a mere ten per cent of a P-38) and that the mystery of where the author of *The Little Prince* died has been unveiled.

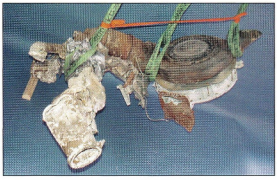
The first report stated that the discovery in September 1998 of a chain bracelet in a fisherman's net, on which was inscribed "Antoine de Saint-Exupéry (Consuelo), c/o Reynal and Hitchcock Inc, 386 Fourth Avenue, New York City, USA" was the first evidence that led Aéro-Re.L.I.C. to research the area. Since then, the heirs of the famous author have kept the



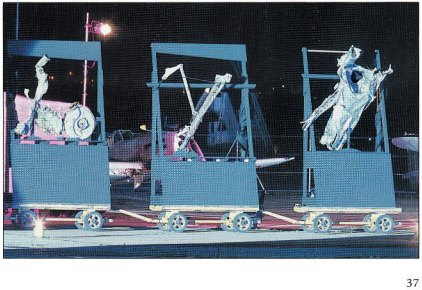
ABOVE **The number found stamped — by hand — inside the turbosupercharger casing, alleged to be the aircraft's Manufacturer Serial Number (MSN).**
ABOVE LEFT **The remains of the boom after its recovery from the Mediterranean, with the turbosupercharger casing at the front of the trolley.**

bracelet out of public sight and no research has been undertaken on it. However, a newly published book reports that research undertaken in an FBI laboratory in the USA concluded that the bracelet had not been artificially aged, but that it could not determine how old it was.

So, are these pieces of wreckage really that of the French author's P-38 ? At the end of July, the wreckage was still at Le Bourget where it was being examined by the French Air Force's air accident investigation branch and a specialist from the French National Museum's Laboratory of Le Louvre. The first task was to determine the appropriate treatment for the preservation of the pieces, but the Musée de l'Air has also expressed an interest in doing its own research and does not intend to take the Aéro-Re.L.I.C report at face value — probably a wise decision considering its goal to have the wreckage and the chain bracelet made into a special Antoine de Saint-Exupéry exhibit in the future. Watch this space for updates on the controversy over the final resting place of one of aviation's greatest writers. A



LEFT **The unmistakable turbosupercharger of the Lockheed P-38, which fitted into the booms of the Lightning aft of the wings.**
BELOW **On June 23, 2004, the recovered undercarriage leg, boom part and turbosupercharger were displayed at Le Bourget as a backdrop during an audio-visual show celebrating the history of aviation, before being handed over officially to the Musée de l'Air et l'Espace.**



The Art of Aviation

Aircraft and flyers are an exciting subject for aviation art, be it painting, sculpture or other media. In the first of a new occasional series by a variety of authors, **MICHAEL OAKEY** spotlights a stunning memorial to be unveiled next year

BELOW Sculptor Paul Day (no relation to the recently-retired CO of the Battle of Britain Memorial Flight!) created this vigorous bronze maquette or trial piece of the centrepiece of the Battle of Britain London Monument.

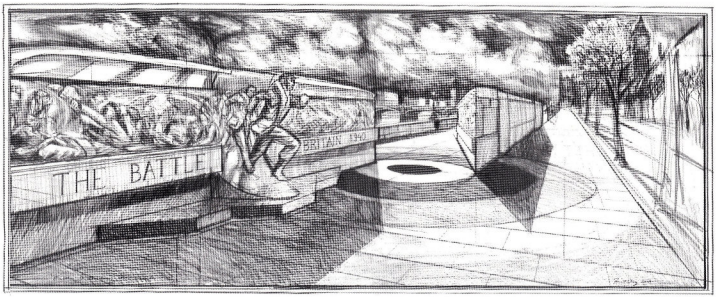
AVIATION IS VERY RARELY CHOSEN as the theme for a new piece of public sculpture these days — and when it *has* been, in the last few years, the results have often been disappointing. With a few honourable exceptions such as the Battle of Britain Memorial on the clifftop at Capel-le-Ferne in Kent, far too many aeronautical sculptures have ended up looking like rollercoasters or bits of bent wire, lacking in elegance, wit and emotion. All that, however, is about to change in spectacular fashion.

Regular readers of *Aeroplane* will already know a bit about the Battle of Britain London Monument, a project officially launched by the Battle of Britain Historical Society at the Royal Air Force Club in Piccadilly last year, and on which we reported in our May 2003 issue. Most readers, though, will not be aware of the dramatic progress that has been made in recent months in producing the monument and in raising the necessary funds for its completion — both aspects of which are forging ahead.

This progress was brought home to me on two occasions in June and July this year, when I saw photographs of the sculptor's maquettes and clay masters for the bronze monument; they are breathtaking, as I hope you will agree when you have studied the illustrations on these pages and overleaf.

Due for unveiling on London's Victoria Embankment in late May next year, the monument will have at its heart two 26ft-long bronze friezes being created by sculptor Paul Day. They depict a wide variety of Battle of Britain scenes, including not just The Few — the fighter pilots who took part — but groundcrew, factory workers, Air Raid Precautions (ARP) Wardens, control-room plotters and others whose contribution made victory possible. The centrepiece of the frieze facing the road will be a group of pilots emerging powerfully out of their background, "scrambling" to their aircraft in readiness for take-off.

The friezes are to be mounted on a walkway



cut diagonally into a granite plinth-like structure built in the late 1860s. It is situated most appropriately between the RAF Memorial and Westminster Bridge, over the road from the Ministry of Defence, and the imaginative re-use of the structure has been designed by architect Tony Dyson of Donald Insall Associates.

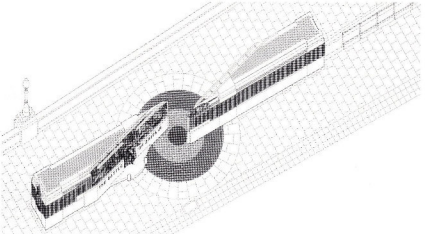
On the outer walls of the monument will be bronze plaques bearing the names of the airmen who flew in the Battle, and their squadron badges and other illustrations.

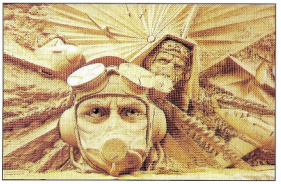
The bronzes are being cast by the Morris Singer foundry, which is based in a suitably aeronautical location on the edge of Lasham Airfield in Hampshire; moulds have recently been taken from the clay master of the first frieze and delivered there ready for casting.

So what is this ambitious project costing? In April this year the cost was put at £1,450,000, of which £950,000 had already been raised in mid-July, just as this issue was going to press, the project's Chairman of Trustees, Ted McManus, told *Aeroplane* "We have now raised £1·1 million, but the costs are inevitably creeping up and so we still need £½ million in round figures". Unfortunately no money has been made available by the Heritage Lottery Fund (see *Crosswind*, this issue, for columnist John Maynard's view about that), but high-profile sponsors include *The Daily Mail*, Edinburgh University, Eurotunnel, Imperial Tobacco Group, Jaguar Cars, Rolls-Royce PLC, Spink (Medallists), Vauxhall Motors, Vickers PLC and Shepherd Neame.

Donations are also *very* welcome, of course, from aviation enthusiasts and members of the public — see overleaf for details of how we can all support this outstanding project.

TOP **A pencil sketch by the sculptor showing a pedestrian's-eye view of the monument as it will look when completed on London's Victoria Embankment.**
ABOVE **Another of Paul's sketches, showing initial ideas for the composition of the bronze relief facing the Embankment road.**

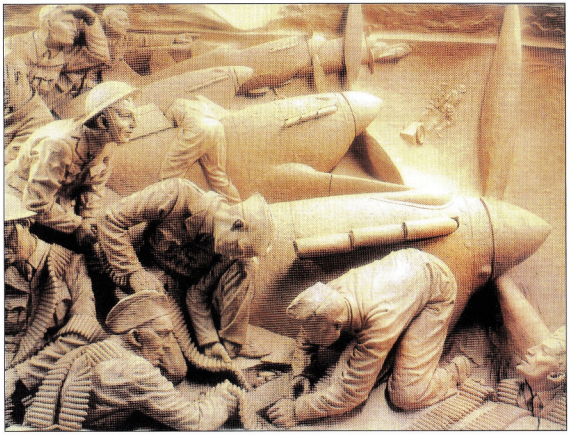




ABOVE **This aerial impression shows the layout of the monument, and the coloured granite paving making up an RAF roundel.**
LEFT **Under attack: an arresting detail from Paul Day's original clay sculptures for the friezes, showing Messerschmitt Bf 109 pilots being pursued by Spitfires.**
■ **See overleaf for more pictures of the sculptures** ▶

The Art of Aviation

Battle of Britain London Monument



RIGHT **Armourers at work replenishing the ammunition of a Hurricane between sorties.**
BELOW **They also served: an ARP warden encounters a harrowing sight in a bombed-out church. The depth of both detail and emotion in these high-relief sculptures should strike a chord with everyone who visits the completed monument.**

To make a donation to the Battle of Britain London Monument

The cost of the Battle of Britain London Monument is being met entirely by donations. UK taxpayers may complete a Gift Aid declaration which will increase their contribution by 28 per cent (April 2004 figure) — ask for a Gift Aid form when sending your donation.

Please send all donations (Sterling cheques or money orders made payable to "Battle of Britain London Monument" to: Battle of Britain London Monument Ltd, 11 Greenland Rd, Barnet, Herts EN5 2AL (tel 020 8440 5422; fax 020 8440 3676; e-mail info@bbm.org.uk; website www.bbm.org.uk).

■ Registered Charity No 1067987

TOP **Sheer determination: a larger-than-life Spitfire pilot sets his jaw against the task to be faced.**

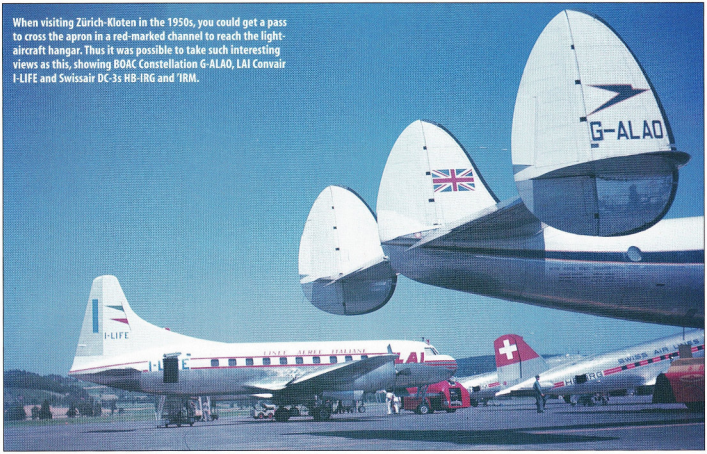
LEFT **Wartime humour is deftly captured too: while women work in an aircraft-factory assembly shed, an anti-aircraft gunner from a neighbouring scene leans in to steal a kiss.**

Personal Album

Post-Second World War piston-engined airliners form the theme of this month's *Personal Album*, **MIKE HOOKS** having provided this selection from his archives. In the days before growing concern over hijacking and terrorism it was often possible to get much closer to aircraft at major airports

ABOVE **Douglas DC-6B HB-IBA was delivered to Swissair in the summer of 1951, and is seen at Zürich-Kloten Airport in the mid-1950s amid various items of ground equipment. In the background is the old light aircraft hangar containing a mass of Piper Cubs; it was demolished in an expansion programme in the 1980s. The DC-6B was sold to Sterling Airways as OY-EAO in 1963, and in 1972 returned to the USA as N515AO.**

ABOVE **Globe Air, Switzerland, operated three Airspeed Ambassadors. Here HB-IEK undergoes maintenance at the company's Basle base on May 30, 1962. It was restored to the British register in January 1964 as G-ALZS, but was damaged beyond repair in an overshoot while landing at Luton on September 14, 1967.**
RIGHT **A short-lived third-level operator was Severn Airways, based at Bristol-Lulsgate. De Havilland Dove G-APZU, seen at Biggin Hill in May 1975, was one of two operated. The company only lasted until July that year, when it went into voluntary liquidation. The Dove was withdrawn from use at Exeter.**



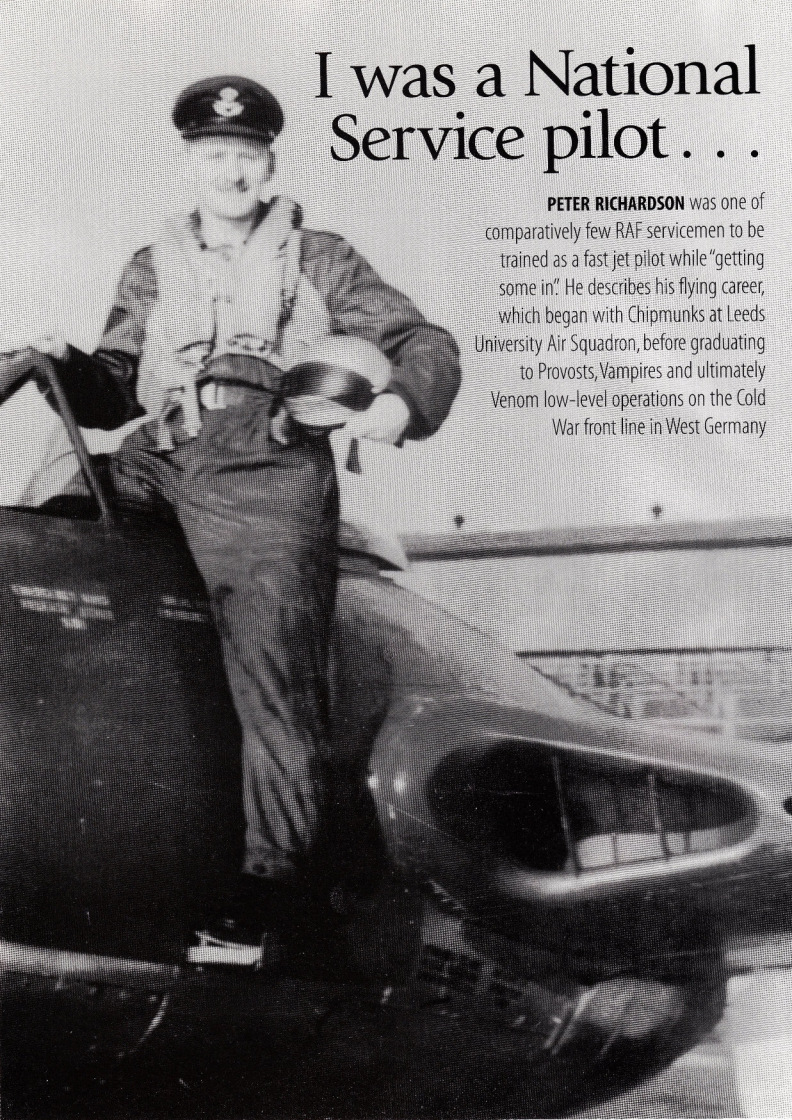
When visiting Zürich-Kloten in the 1950s, you could get a pass to cross the apron in a red-marked channel to reach the light-aircraft hangar. Thus it was possible to take such interesting views as this, showing BOAC Constellation G-ALAO, LAI Convair I-LIFE and Swissair DC-3s HB-IRG and 'IRM.

RIGHT **Eagle Airways' Vickers Viking G-AMGG *Sir Robert Calder* was delivered in April 1955, one of 38 eventually operated by the airline from its Blackbushe base, where it is seen here. It was written off at Agadir in December 1959.**

BELOW **Formed at Southend, Essex, in January 1946, Channel Airways used a wide variety of aircraft until it closed in February 1972. The fleet included two Bristol Freighter 21s; G-AIFO, seen clearing the fence at Southend, had served for some years in Africa before its purchase in April 1957. It was withdrawn from use in 1960.**

ABOVE **Douglas C-47B Dakota G-ALXL was delivered to Cambrian Airways at Cardiff-Rhoose in February 1960, one of ten Dakotas used. It was cancelled in July 1969 to become 5B-CBB but may not have taken up these marks or N94717 before being burned on the Bahrein fire dump.**

LEFT **The double-deck Breguet Br 763 could carry 59 passengers on the upper deck and 48 on the lower. Air France operated 12 as the Universal, introducing them on routes between France and Africa in March 1953. Here, put out to grass, is F-BASX in the summer of 1973.**



I was a National Service pilot . . .

PETER RICHARDSON was one of comparatively few RAF servicemen to be trained as a fast jet pilot while "getting some in". He describes his flying career, which began with Chipmunks at Leeds University Air Squadron, before graduating to Provosts, Vampires and ultimately Venom low-level operations on the Cold War front line in West Germany

I WAS PROUD OF MY PFB. It was the nearest thing to a full "wings" we could get as University Air Squadron (UAS) pilots. The Preliminary Flying Badge, to give it its full title, was awarded on completion of a number of examination papers in airmanship, engines, meteorology etc, and a flying test.

Leeds University Air Squadron had just been equipped with de Havilland Canada DHC-1 Chipmunks when I became a member in 1950, so I never had a chance to fly the venerable Tiger Moth. None of the intake in my year had any flying experience at all, not even in civil aircraft. The magazines of the time were full of Avro Vulcans and Hawker Hunters, and the huge Bristol Brabazon was flying, soon to be followed by the Britannia and the Viscount. What promise and excitement the future seemed to hold at that time. We were keen, young and desperate to learn all we could about the world of aeroplanes.

Certain memories never fade, and that of my first flight is one that is still crystal clear. The calm patter of my instructor, Plt Off Draper, the gradually increasing push in my back as we accelerated down the runway, and that powerful-sounding noise coming from the Gipsy Major. I was hooked!

Summer camps were glorious holidays where we learned to partake of the life of an RAF station. We were privileged, too, to be able to live in the officers' mess and even get a ride in other kinds of aircraft. Our CO was a man we all greatly admired. He had been a prisoner of war in Germany, and I can remember one occasion when we all stood outside dispersal and watched him take to the skies in a Spitfire and wished we could do that too. There were other "incidents" too, as when I nearly stood a Chipmunk on its nose trying to taxy across the grass in a 30kt crosswind, or when a fellow Cadet Pilot was given three days' "jankers" for low flying over the beach.

In 1953, while at summer camp, I was chosen to represent the squadron in the inter-UAS competition for the Hack Trophy, presented by Wg Cdr Hack to the squadron gaining the highest number of marks at junior, intermediate and senior levels in a test of flying ability. That year, the name of Leeds University Air Squadron was engraved on it for the first time in the squadron's history.

I lived in Doncaster, and vacations presented an opportunity to fly with the local RAF Volunteer Reserve at No 9 Reserve Flying School. On that first Christmas vacation, flying conditions were atrocious. There seemed to be a prolonged succession of sleet or rain, accompanied by low cloud; not the best weather for a first solo in a Percival Prentice. That would have to wait a little longer. The performance of the Prentice in general fell a good deal short of that of the Chipmunk, but it was nevertheless admirably suitable for "Pattern A" practice. (Does anybody remember Pattern A? I never came across it again, but it was then the basis for obtaining a White Card.)

So, after I had logged some 270hr on Chipmunks and 50hr on Prentices, National Service beckoned and I reported for duty at Kirton-in-Lindsey, Lincolnshire, in September 1954, with the rank of pilot officer. There were ten of us in all, five of us doing our National Service and the remainder on short-service commissions.

All of us were ex-UAS types with PFBs, and desperately keen to start flying. We were very unfit, and the day after our first session in the gym we certainly knew it! However, a month of physical training, square-bashing and sport changed all that, and we were off to No 2 Flying Training School (FTS), RAF Hullavington, Wiltshire, as Course No 2B to start our flying training on Hunting Provosts.

I liked the Provost, and I see from my logbook that I went solo in 2½hr. The aircraft was totally without vices, and conversion on to type presented no difficulty. In no time at all the course was completed. Next stop, No 4 FTS at RAF Middleton St George in County Durham.

Here we were joined by the Number 2 course from Hullavington, and we amalgamated to

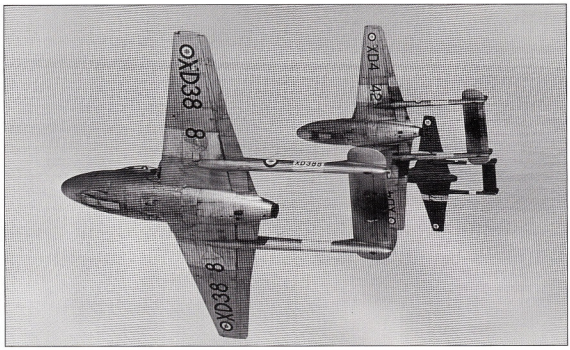
PETER RICHARDSON

ABOVE **Cadet Pilot Peter Richardson beside a Chipmunk T.10 during summer camp at RAF Silloth in Cumbria in August 1953.** TOP **The Percival Prentice, which entered service in November 1947, was the RAF's first basic trainer with side-by-side seating, and taught thousands of RAF aircrew the basics of flying until its replacement by the Hunting Percival Provost in 1953.**

PETER ROBERTSON

FAR LEFT **The author as a Flying Officer astride a de Havilland Vampire FB.5 of 233 OCU at RAF Pembrey in December 1955.** LEFT **The Alvis Leonides-powered Provost was the last of the RAF's piston-engined basic trainers, with a total of 387 being built between February 1951 and April 1956. The author took this photograph of Provost T.1s at Hullavington in 1955.**

RIGHT **Three Vampire T.11s of 5 FTS at Oakington peel away during a training flight. The author flew the T.11 while with 4 FTS at Middleton St George in the spring of 1955.**



DEREK RICHARDSON

"On March 4, 1955, I had my first introduction to the Vampire T.11. Having only flown aeroplanes with a noisy clattering windmill in front, I found the smoothness and quietness of a jet aircraft unbelievable"

ABOVE **The author as a Cadet Pilot while at Leeds University Air Squadron Easter Camp at Sherburn-in-Elmet in 1953.**

become No 102 course. The weather was bitterly cold that February, with about a foot of snow covering the airfield. Despite taxying de Havilland Vampires up and down the runway, the conditions made flying (or at least ground handling) nigh impossible. So it was not until March 4, 1955, that I had my first introduction to the Vampire T.11. Having only flown aeroplanes with a noisy clattering windmill in front, I found the smoothness and quietness of a jet aircraft (at least from the cockpit) unbelievable. Again, it handled beautifully and was a real pleasure to fly; even spinning proved to be a relatively gentle exercise.

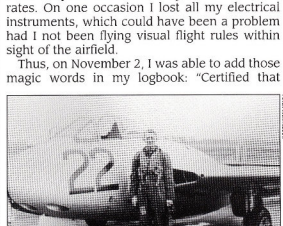
I was also able to fly the Vampire FB.5, which I recall had no fewer than nine fuel gauges, one for each tank, grouped together on a low panel almost hidden by the control column. The problem was exacerbated by the fact that the tanks emptied simultaneously, but at different rates. On one occasion I lost all my electrical instruments, which could have been a problem had I not been flying visual flight rules within sight of the airfield.

Thus, on November 2, I was able to add those magic words in my logbook: "Certified that Flying Officer P. Richardson has successfully completed the course in accordance with the current authorised syllabus, and that he is awarded the flying badge in accordance with Queen's Regulations and Air Council Instructions". We parted company with those who were making the RAF their career, as they went off to fly Hunters at the Operational Conversion Unit (OCU) at RAF Chivenor. We NS types went to No 233 OCU at RAF Pembrey, West Glamorgan, to fly Vampire FB.5s.

We began learning how to use the aeroplane as a weapon, with exercises in formation flying and air-to-air gunnery. Somehow the flag proved an elusive target for me, and it was only after several sorties that I managed to achieve any hits. Not surprisingly, therefore, my Summary of Flying and Assessments for air gunnery records "Below Average". This did not deter the powers that be from sending me to RAF Celle, north-east of Hannover, to join 94 Sqn and fly de Havilland Venom Mk 1s. The Venom was a good deal more potent than the Vampire, and extremely manœuvrable. It admirably suited the role in which the squadron was cast, as part of the 2nd Tactical Air Force.

When we carried out high-altitude sorties at 45,000ft we were just too slow compared with other contemporary aircraft to maintain the initiative, despite being able to outmanœuvre them. On one occasion we were scrambled to intercept an unidentified aircraft heading in a westerly direction, conspicuous by its contrails. It was still unidentified by the time we had (almost) caught up with it, but we were getting low on fuel. Later we discovered that it was a Russian civil aircraft, not previously seen, carrying the Bolshoi Ballet for their first visit to London since the Second World War. As Celle was only about ten miles from the Russian zone

RIGHT **Pilot Officer Richardson beside a Vampire FB.5 at RAF Middleton St George in 1955. Early production Vampires, such as this example, were not fitted with ejection seats.**



REBEL RICHARDSON

we had to be extra careful, when letting down in bad weather, not to cross the borderline.

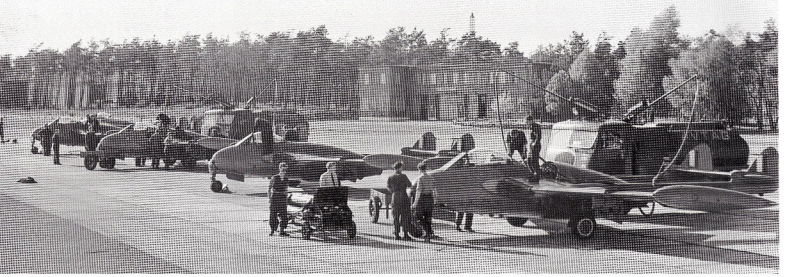
Firing rockets with dummy warheads at scrap lorries or tanks was great fun. The former barely lasted a day and the latter no more than a week, and that was with concrete warheads! The target for cannon practice was a white sheet about 6ft x 10ft, and a good effort was to hit it with 30 out of the 100 rounds fired. The Venom was an excellent gun platform and in those days, before the advent of g-suits, it was usual to pull 5–5½g at the end of the dive, which meant one blacked out for a few seconds.

While with 94 Sqn I was made Navigation Officer. My predecessor had started to cover the whole of one wall of the briefing room with a large-scale map of the British Sector, which I completed. The maps were "borrowed" from the RAF Regiment, which was also stationed at Celle, and on them I marked the low-flying areas and interlinking routes. These maps were ideal for selecting simulated ground-attack targets such as windmills or small bridges. The strike sorties were the most exacting exercises, and were usually flown in pairs or fours. They involved a fairly circuitous route to the target, with a correspondingly direct route back to base, most of the way at zero feet (almost!). Not only did this require considerable navigational skills, but at speeds of up to 550kt one had to keep a very sharp eye open for power lines, radio masts, trees and the like, not to mention watching the fuel gauge.

I enjoyed my National Service, but I consider myself to have been very lucky. I did contemplate a career in the RAF, but in the end engineering won by a short head. Looking back, I have no regrets. I still get a tingle in the pit of my stomach, however, when I see the vintage Vampires, Meteors, Canberras (regretfully rarely a Venom) that sometimes pass over my house. They were a part of my life that I will always remember.

The final words in my logbook give me immense satisfaction: "Assessment of ability: In Rocket Projectiles — above average; In Air Gunnery — above average." I had achieved something.

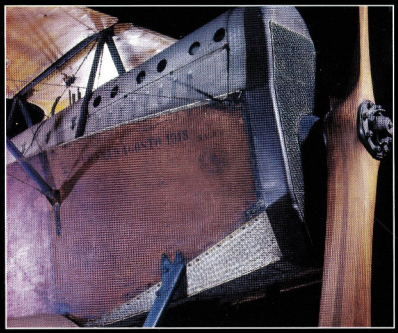
ABOVE **Venom FB.1s of 11 Sqn over West Germany in the mid-1950s. The author flew Venoms with 94 Sqn as part of the 2nd Tactical Air Force, which was tasked with the protection of the territories of the West, reaching its peak operational strength in late 1955.**



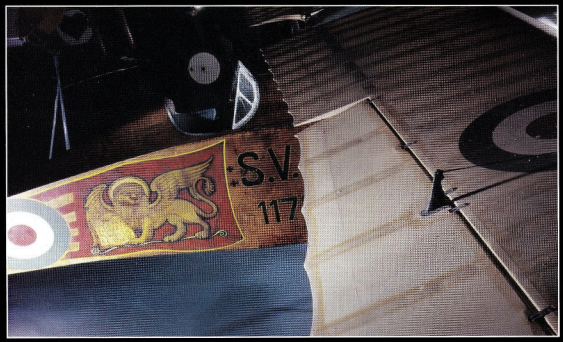
BELOW **A typical scene at a 2nd TAF base in West Germany in 1954, as Venoms are refuelled and prepared for a sortie from Wunstorf, west of Hannover.**

An Eye For Detail

In his second picture feature, American aviation photographer **DAN PATTERSON** presents intimate images of the Italian Air Force Museum's preserved but unrestored Ansaldo SVA 5 at Vigna de Valle, Italy, a veteran of a raid on Vienna led by poet Gabriele d'Annunzio

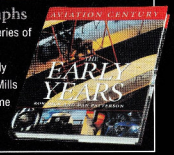


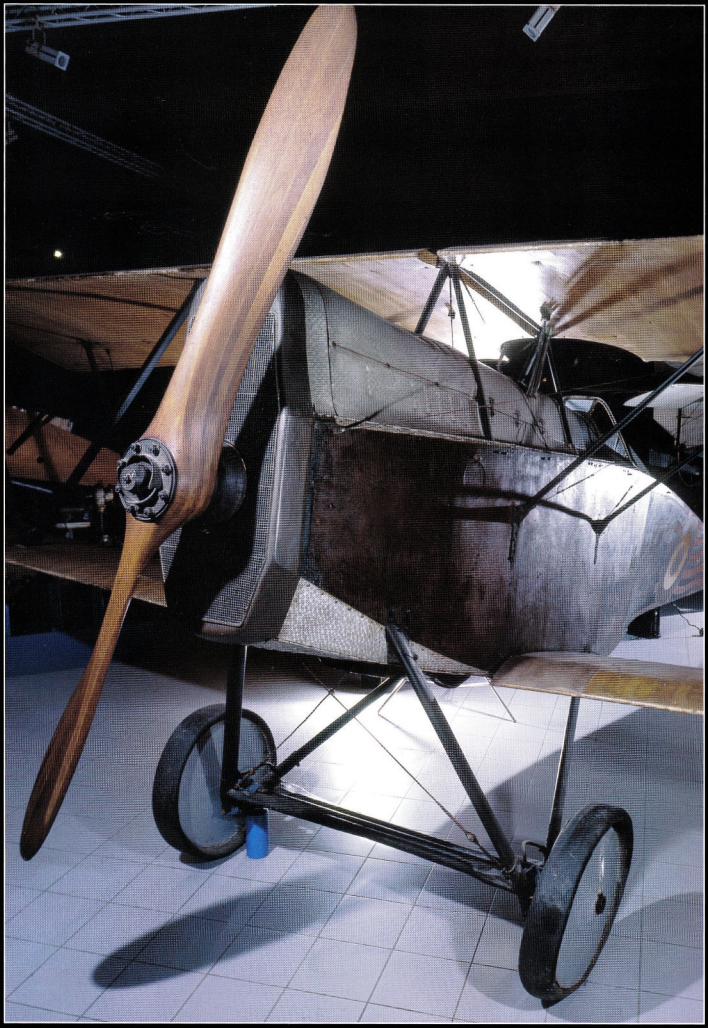
LEFT The radiator for the watercooled 220 h.p. SPA 6A vertical inline engine fronts the angular cowling with its unpainted, "engine-turned" metal panels above and below the side panels of the ply-covered fuselage. BELOW A distinctive feature of the SVA 5 fighter's wing structure was the use of Warren girder strut bracing, which eliminated the need for lateral wire bracing, although cross-bracing between the fore and aft struts was still required. A faired headrest was provided.



RIGHT The propeller, typical of the era, is of laminated tropical hardwoods. The perished tyres are clearly original! LEFT A close-up of the clear-doped, fabric-covered upper wing and starboard aileron. The ornate fuselage markings of 87ª Squadriglia "La Serenissima" and alloy-framed windscreen are also shown. Note the small German crosses marking patched hits from enemy fire. This SVA 5 was flown by Gino Allegri on the Vienna raid of August 9, 1918. BELOW LEFT The fuselage markings on the port side, showing the ageing of the original varnish.

Dan Patterson's photographs . . . feature in the "Aviation Century" series of books, produced by Dan with Air Vice-Marshal Ron Dick. Volume 1, "The Early Years" (ISBN 1-55046-407-8; Boston Mills Press), is available now; the next volume is due out soon. See Dan's website at www.flyinghistory.com for more info





Club Imperial

Club Imperial

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THAT MOST ICONIC OF British inter-war airliners, the Handley Page H.P.42, has been extinct since the last example built, G-AAXF *Helena*, was dismantled at Donibristle during 1941. Many people have long dreamed of seeing a replica of this pioneering machine in the air, and in the late 1980s a "very-long-long-term" project to bring the H.P.42 back to life was initiated by "Team Merlin".

In July 1994 another legendary British biplane took to the air again when Peter McMillan's Vickers Vimy replica NX71MY/"G-EAOU" made its first flight in San Francisco. After recreating Ross and Keith Smith's prizewinning 1919 England—Australia flight in 1994, the Vimy came to Britain, and was operated in the mid-1990s by Team Merlin for airshow and promotonal work. The operation of the Vimy, the largest flying biplane in the world, was seen as a stepping-stone towards the Imperial 42 project and the ultimate plan to put a totally authentic H.P. 42 back into the air.

The major stumbling block for potential H.P.42 builders has been locating original plans from which to build the giant, 130ft-span airliner. Many leads were followed, but they were all either dead ends or led to the same source. Through the Imperial Airways website Team Merlin was contacted by a former member of Imperial Airways staff with a lead to some original documents in Canada, and several boxes of these were acquired. For those parts not included in the plans, factory photographs were sourced, and together with other documentation it was possible to reverse-engineer the missing drawings.

Club Imperial was set up during 2003 to cover all aspects of Imperial Airways history, and in early 2004 the Club became the official supporters' group for this Handley Page H.P.42 project. The club will keep members up to date with the latest developments on the project, and provide historical information and reminiscences on the H.P.42.

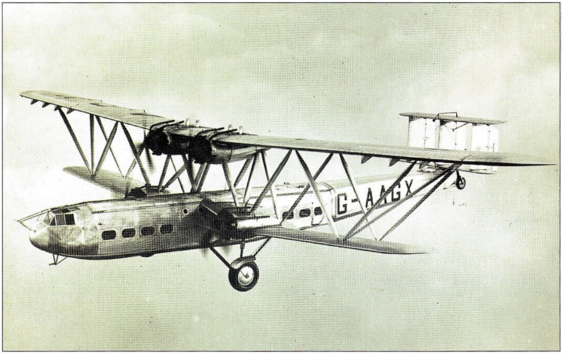
The aircraft is only part of the project. There are plans for a museum, an educational programme and a new mobile exhibition, and a documentary on the project is in production. The club is tracking down items for its archive, and has helped to reunite people interested in Handley Page who have not met for more than half a century.

HANDLEY PAGE ASSOCIATION

ABOVE The crowd-pulling potential of the H.P.42 has never been in question. Here a group of admirers marvel at Sir Frederick's leviathan at the Empire Air Day at Croydon on May 25, 1935.

Society aims

1 To keep alive the history of the pioneering days
2 To help save and share information
3 To support the Imperial 42 project



HANDLEY PAGE ASSOCIATION

RIGHT The majestic sight of Handley Page H.P.42 G-AAGX in flight. If you want to help make this sight a reality again, join Club Imperial.

Nelson Ezell flew Jim Smith's recently-restored Supermarine Seafire Mk 47 VP441/N47SF in July 2004 for the benefit of reno
air in April 2004, VP441 is based at Jim's property in Crystal Lakes, Montana. Powered by a Rolls-Royce Griffon 58 engine driv

wned air-to-air photographer PHILIP MAKANNA, on a shoot for his GHOSTS 2006 calendar. Restored by Ezell Aviation at Breckenridge, Texas, and returned to the
ing a six-bladed contra-rotating propeller, it is painted in its original 804 Sqn FAA/*HMS Ocean* colours and is currently the only airworthy Seafire in the world

Transonic Trainer

CURRENTLY UNDERGOING EVALUATION by North American's flight test section, the TF-86F two-seater advanced trainer is the company's second experimental aircraft of the type, the first one having been written off in a fatal crash some months ago. Local news reports at the time said the aircraft failed to recover from a roll near the ground. The latest version has a modified vertical tail, clearly aimed at improved directional stability.

The Canberra as a Transport?

MARTIN AIRCRAFT HAVE BEEN BUSY in recent weeks demonstrating to USAF officers a proposed transport version of the B-57B Canberra intruder. A mock-up was exhibited at Washington National Airport showing how eight passengers could be accommodated in the portion of the fuselage usually occupied by the bomb-bay.

Martin are trying to sell to the Strategic and Tactical Air Commands the idea that a fast jet transport of this type would be valuable for the transportation, under combat conditions, of top-ranking officers.

Codenames for Russian Aircraft

A SYSTEM OF CODENAMES for various current Russian aircraft types has been introduced by the United States Services to supplement the type numbers which have been allocated to each new type as it appeared, for purposes of identification. The codename system was used by the Allies during the 1939-45 war for Japanese aircraft, which, like the Russian types, had obscure designations.

Codenames for Russian aircraft are in three classes, beginning with B for bombers, F for fighters and C for transports. Names which have so far been used in the three classes are:

Bombers: *Bison*, the four-jet swept-wing bomber displayed publicly at the 1954 May Day flypast over Red Square; *Badger*, a twin-jet swept-wing bomber; *Butcher*, the Ilyushin Il-28, in large-scale service [later changed to *Beagle* — Ed]; *Bosun*, a Soviet Navy twin-jet straight-winged bomber; *Bull*, the Tupolev Tu-4, a copy of the Boeing B-29; *Bob*, the Ilyushin Il-4 (DB-3F), an obsolete piston-engined bomber; *Buck*, the Petlyakov Pe-2 light bomber; *Beast*, the Ilyushin Il-10 "Shturmovik".

Fighters: *Fang*, the Lavochkin La-11; *Frank*, the Yakovlev Yak-9, both piston-engined fighters.

Transports: *Coach*, the Ilyushin Il-12 twin-engined civil and military transport.

ABOVE North American test pilot Ray Morris takes the second prototype TF-86F trainer variant of the Sabre aloft for its maiden flight on August 17, 1954. Two prototypes were built, serials 52-5016 and 53-1228, but the type was never put into production.

ABOVE An advertisement for the Lockheed Super Constellation from the October 15, 1954, issue of *The Aeroplane* — "You will enjoy its spaciousness, unsurpassed passenger comfort, luxury, décor and appointments".

Bad Type

PRINTERS SHARE WITH WRITERS the onerous knowledge that their slips that pass in the type may mislead thousands of readers. For instance, a recent *Air Charter Bulletin* states that BEA's Waterloo—London Airport helicopter service "would reduce the journey time to 18 months". Fortunately, the error will be clear to anybody who has done the same journey by coach — "to" should have been "by". [From Chris Wren's *Wroundabout* column]

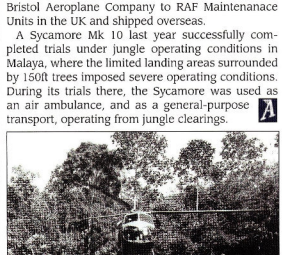
Gloster's Loss

A GLOSTER JAVELIN on a test flight from Moreton Valence crashed into the Bristol Channel on October 21, between Cardiff and Weston-super-Mare. The aircraft, a production model, was on a routine test flight and was being flown solo by Flt Lt R.J. Ross, on detachment from Farnborough. No trace has been found of the pilot, although early reports suggested he might have baled out. Pieces of wreckage of the Javelin have been recovered, and Royal Navy salvage vessels are seeking the main wreckage.

Sycamores in Malaya

THE FIRST OF A NUMBER of Bristol Sycamore helicopters intended for use in the jungle campaign in Malaya arrived in Singapore at the beginning of October. The Sycamores were delivered by the Bristol Aeroplane Company to RAF Maintenanace Units in the UK and shipped overseas.

A Sycamore Mk 10 last year successfully completed trials under jungle operating conditions in Malaya, where the limited landing areas surrounded by 150ft trees imposed severe operating conditions. During its trials there, the Sycamore was used as an air ambulance, and as a general-purpose transport, operating from jungle clearings.



RIGHT Bristol Sycamore HR.14 XE311 of 194 Sqn drops into the smallest of jungle strips in Malaya. The unit received its Sycamores in October 1954, operating the type until June 1959.

A Tragedy of Errors

After his experiences as a glider pilot in the spearhead of the D-Day operations, Peter Boyle was back in England and ready for the next push into occupied territory — but the bid to take the bridges over the Lower Rhine did not quite go according to plan, as **TIM O'BRIEN** explains

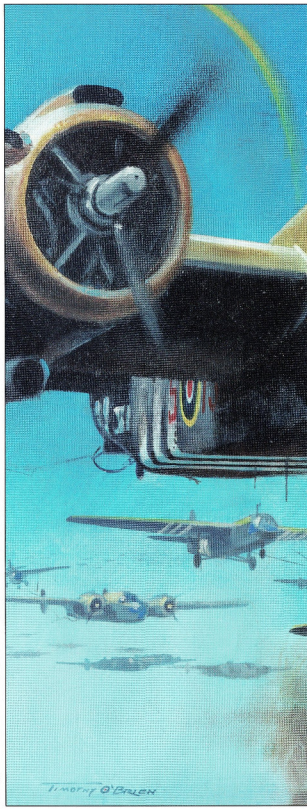
ABOVE **Formed in 1942, the Glider Pilot Regiment undertook some of the most daring and hazardous operations of the Second World War.**

ABOVE **Sgt Peter Boyle proudly poses for the camera in his Glider Pilot Regiment uniform, while on leave back home in Radcliffe-on-Trent, near Nottingham.**

HAVING RECEIVED HIS "baptism of fire" in June 1944 with Operation *Coup de Main* in Normandy (see *Nothing is Impossible*, June 2004 *Aeroplane*), transport-glider pilot Peter Boyle returned to England. After visiting his family in Nottingham he travelled to Dover to see his girlfriend, Aileen, who was stationed there with the Auxiliary Territorial Service (ATS). His leave over, Peter returned to his unit, B Squadron of the Glider Pilot Regiment (GPR), based at RAF Brize Norton in Oxfordshire. After the intense activity of *Coup de Main*, Peter, now promoted to staff sergeant, resumed the more mundane tasks of cross-country flights or circuits in Airspeed Horsa gliders towed by the Armstrong Whitworth Albemarle IIs of 296 and 297 Sqns. He was also getting used to flying as first pilot, as his friend S/Sgt Geoff Barkway, who had been first pilot on the D-Day operation, was recuperating from his injuries in hospital. The highly-trained glider pilots were now ready to fly more fighting men into battle and to fight with them, so they just kept waiting and training for that next sortie.

Meanwhile, in France, the Battle of Normandy raged until the stalemate of the bridgehead was broken at the end of July 1944 by Gen George Patton's US Third Army. The 12th US Army Group, commanded by Gen Omar Bradley, then forged its way towards the German frontier, while Field Marshal Montgomery's British 21st Army Group advanced through northern France and Belgium towards Holland.

Back at Brize Norton, B Squadron was put on standby several times to fly troops to a specific target, which at least relieved the monotony of the training flights and gave the crews something to focus on. Peter recalls: "During July and August there didn't seem to be much activity, just these training flights, military training and



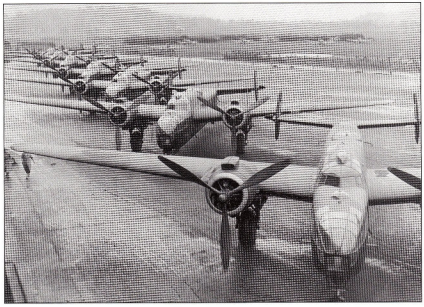
around 12–13 briefings for the next operation. One day they would say 'You're going to the north of Paris', then it would be cancelled as the Allies had reached that objective. Then we would be told about another target, only for it to be cancelled at the last minute, and so it went on." In the end 15 operations in a row were cancelled owing to the Allies' swift advance, and the airborne forces were keen to get back into the war at almost any cost.

Then B Squadron and the Albemarle squadrons were relocated to RAF Manston in Kent, where they arrived on September 15. "At last

we knew something was finally happening," says Peter. "If we were going to Manston, then we must be going to the Continent. Once we had landed at Manston and marshalled ourselves, that was it until the operation, as we didn't fly any exercises from the airfield. It was here that I first encountered the Gloster Meteor jet. We weren't allowed near them, but could see them when they took off."

The move to Manston was made in readiness for Operation *Market Garden*, Montgomery's plan for a swift advance through Holland by securing all the major rivers and canals along the route. Reluctantly approved by Gen Dwight Eisenhower, the Supreme Allied Commander, on September 10, 1944, its main purpose was to capture the bridge over the Neder Rijn at Arnhem, 64 miles behind enemy lines, in the biggest airborne operation in history. The Allied armies south of the Rhine would then reinforce the airborne troops at the bridges. If successful, it would allow an Allied thrust into the Ruhr, Germany's industrial heartland, and end the war by Christmas. However, it had taken six months to plan D-Day — this time there were only seven days in which to plan the attack.

ABOVE **A 296 Sqn Albemarle and the glider train en route to the landing fields near Arnhem in September 1944, as part of Operation *Market II*. Original painting and illustrations by TIMOTHY O'BRIEN GAvA.**



ABOVE The Albemarle was originally designed for the reconnaissance-bomber role, but was made obsolete by the four-engined "heavies", and went on to play its part as a Special Transport and glider tug.

Although the *Coup de Main* landing in Normandy had proved successful, this time the RAF had chosen a landing site eight miles west of Arnhem, considering it to be less heavily defended than the bridge site. Losing the advantage of surprise, the troops would have to march some 5–8 miles to their objective. Also, unknown to the Allies, the 9th *Hohenstaufen* and 10th *Frundesberg* SS Panzer Divisions were in the area, refitting after their defeat in Normandy. Peter recalls: "We started our briefings for Arnhem three days beforehand, and everyone appeared to know what was going to happen, a total contrast to the tight security around D-Day! Then we were let out on leave, which wouldn't have happened before the Invasion. Anyway, along with another glider pilot, I hitch-hiked into Dover before heading off to meet Aileen, who had been given a couple of hours off from her ATS unit."

During the night of September 16–17 Allied bombers carried out raids on flak defences, troop positions and barracks on the outskirts of Arnhem. Hundreds of aircraft then took off from airfields across England during the morning of Sunday September 17. Meanwhile, says Peter: "Back at Manston we had our final briefing. We all accepted it just like any other 'op', except that the target was another bridge, so it must be special. But they said that the area around the bridge was too boggy for us to land there; it couldn't have been worse than what I had encountered on D-Day. We could have got 20 gliders in close to the bridge and held it until relieved. There would have been casualties, but we could have held the bridge until reinforcements arrived." As well as carrying heavy equipment, gliders were to carry more than a third of the 35,000-man force over to Holland; the rest would be dropped by parachute.

On the second day of the operation, Monday September 18, Peter's Horsa received its load of a 75mm pack howitzer, a Jeep and a trailer, which was loaded by four members of the 1st Airlanding Light Regiment, Royal Artillery, who were taking it over to Arnhem. Peter and his copilot checked that everything was on the right loading station and fastened down correctly. After a delay of nearly five hours owing to foggy weather, the operation was finally on. Peter took off from Manston in perfect conditions during the afternoon, towed by an Albemarle. "I flew as first pilot, and we just bounced along in our plywood glider in high tow as we crossed the North Sea in clear weather."

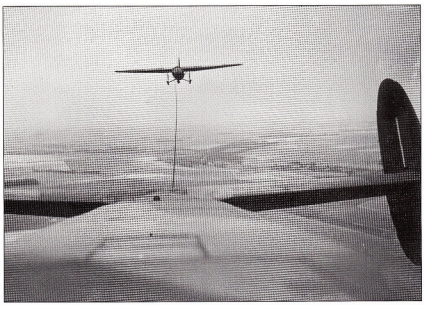
Above the stepped layers of aircraft forming the glider train was the air cover, provided by Supermarine Spitfires, Hawker Tempests and de Havilland Mosquitoes. "Compared with the landing in Normandy," says Peter, "the flying during the Arnhem operation was easy. It was in daylight, and you just sat there, looking out for the usual risks of tug aircraft failure, broken tow-rope and collisions. I think that this second lift was heavier than the first. I remember catching a glimpse of the RAF rescue boats down below in case a rope broke. Meanwhile, above us were Stirlings and Halifaxes towing gliders. Even higher up must have been the air cover, but we were too busy to see them. While flying behind our tug we always had to have total concentration on following him all the while, and if you drifted out of line you were in danger of pulling the tug's nose down."

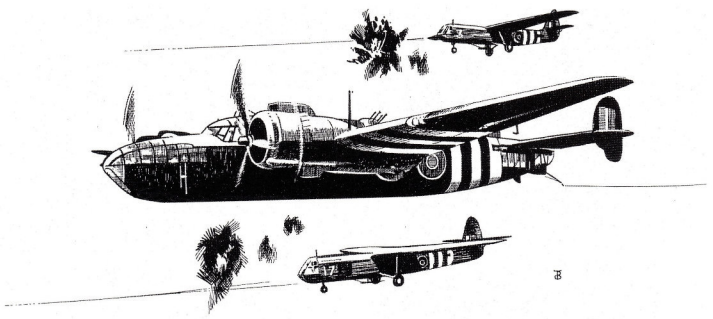
After the 30min trip across the North Sea they crossed the Dutch coast, where the aerial armada encountered light flak before flying over the flooded countryside towards the target. At this stage in the flight Peter remembers seeing a fighter aircraft shooting past him at high speed, weaving in and out of the Allied aircraft as it disappeared into the blue. To this day he cannot say whether it was friend or foe, as it all happened so quickly.

On the approach to the drop zone they met more light flak. "When we were about 1½ miles away from the landing zone we released ourselves from the tug at an altitude of 1,500–2,000ft." The Albemarle then disappeared, with the towrope flapping behind it.

"We had to keep our wits about us with all the congestion of tugs, gliders and ropes. However, we had a perfect landing in a good open field near Wolfheze. I remember hearing some rifle and machine-gun fire in the distance. Then we unbolted the pins to take the tail unit off and unload the equipment. My copilot and I then stayed with the gun crew as we departed the

BELOW The view from a Horsa-towing Albemarle. A total of 2,238 troop-carrying Airspeed Horsa Mk Is and 1,561 gun- and vehicle-carrying Horsa Mk IIs was built.





"After the 30min trip across the North Sea they crossed the Dutch coast, where the aerial armada encountered light flak before flying over the flooded countryside towards the target"

landing site; later that night we helped them dig in. The next day I remember sitting on the gun with some others as we made our way along the road into Oosterbeek, to be greeted by the Dutch, who were cheering and handing out coffee. It must have been here that I briefly saw the river for the one and only time."

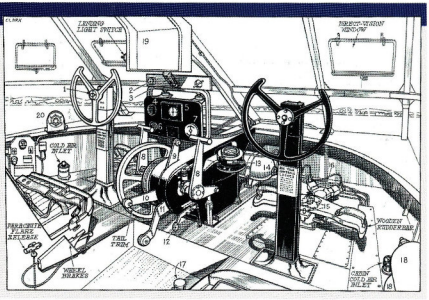
Most of the glider pilots then joined together to fight as an infantry unit. Peter recalls leaving the artillery gun crew and meeting up with some other glider pilots in Oosterbeek on his second night. "I think that there were about 12 in our group. Here I found a new pal in Sgt Burgoyne, another glider pilot, along with my old mate S/Sgt Briggs, from the Sherwood Foresters, who had joined the glider regiment with me. I gathered that S/Sgt Geary, another pal from the Sherwood Foresters, was also out there somewhere, but never saw him again until after the war. While we were on patrol I remember a pilot called Shepherd stopped a bullet in the thigh. Burgoyne and I took him to a Regimental Aid Post crammed full of wounded, somewhere near the Hartenstein Hotel."

Over the next few days, as the battle grew progressively worse, Peter's group was whittled down as they split up or suffered casualties. "As our patrol neared a road by the railway there was a commotion going on up ahead, and we started to get a pounding as German tanks, infantry, the whole lot seemed to be trying to push us back. It all started to happen then, and we began to be driven back along between houses and streets in the town. It was here that we lost Briggs. We were on a patrol and he insisted on poking his head around a wall, only to get shot by a sniper. Then 'Paddy', the quartermaster sergeant, who shouldn't really have been on the operation, went out to see if Briggs had survived. Unfortunately the sniper

ABOVE **An Albemarle of 296 Sqn and Horsas of B Sqn encounter flak as they near the landing zone on September 18, 1944. The attempt to gain the bridges over the Neder Rijn was made up of two operations — *Market*, the airborne element, and *Garden*, the groundforces' advance.**

The Airspeed Horsa cockpit

THE TWO-SEAT "OFFICE" of the Horsa gave particularly good vision in all directions, and was fitted with rudder bars which could be adjusted to the length of the pilot's leg, and which, with the control column wheels, were quickly detachable. This sketch by J.H. Clark appeared in the May 26, 1944, issue of "The Aeroplane"



1 Nut for wheel removal
2 Air-pressure bottle
3 Dash lamp
4 Airspeed Indicator
5 Towing-cable angle indicator
6 Altimeter
7 Turn and bank indicator
8 Airbrake control levers
9 Towing-cable release
10 Flap control
11 Undercarriage jettison
12 Landing lamps
13 Compass
14 Compressed air storage brakes
15 Wing nut for rudder bar removal and alternative spindle for pilot's leg adjustment
16 Brake regulator valve
17 Very pistol tube
18 Compressed air storage, flaps
19 Beam approach holder
20 Dimmer switch for cockpit lights

A Tragedy of Errors

ABOVE RIGHT **The Horsa was built to be rugged enough to land in fields directly adjacent to the target, providing a swift and silent mode of delivering troops to strategically important locations.**

got him, too." Following a tragedy of errors, the operation had now turned into a disaster. Major-General Urquhart's British 1st Airborne Division in Oosterbeek was now surrounded and short of food, medicine and ammunition.

While Peter was busy evading the enemy, he was aware that RAF Stirlings and Dakotas were overhead, continuing their resupply operations.

"I remember one going over with its engine on fire. By now there was just Burgoyne and myself. Having then made our way up to a house where we knew our troops were, an officer directed us towards some crossroads, where we found a slit trench and decided to have a bit of kip, as we had hardly slept for several days. One thing that I do remember about Arnhem is the lack of sleep. On another occasion I remember kipping under a mattress near a bombed-out house. While in this trench we heard some tanks, which turned out to be German. They must have circled around and come back. They almost drove straight over our trench, so we kept our heads down, and when their troops had passed we popped our heads out. Seeing no British troops, we clambered out and ran off."

By now it was the evening of Monday September 25, and that night the evacuation of the remnants of the British 1st Airborne Division took place across the Lower Rhine in bad weather. Now stranded on the wrong side of the river, Boyle and Burgoyne were well and truly alone in their fight for survival. They found a cellar in a deserted house in which to hide, where they found jars of fruit to eat. Then, one morning, possibly the 28th, Burgoyne crept upstairs to go to the lavatory, only to rush down half-dressed. "What's the matter Burgy?", I said, to which he replied: 'You are not going to believe this, but there's a tank in the garden!'" The tank crew had slipped in during the night, while Peter and Burgoyne were asleep. They were cleaning up their tank when an immaculately-dressed SS officer spotted Burgoyne and cried out in perfect English: "Come out English, or you are going to die". The glider pilots thought "Get knotted!" Peter then recalls hearing the engine start and the tank reversing before letting loose a few machine-gun rounds along the roof, by which time Burgoyne had pulled up his trousers!

"We dared not move, as we thought we would

"Now stranded on the wrong side of the river, Boyle and Burgoyne were well and truly alone in their fight for survival. They found a cellar in a deserted house in which to hide, where they found jars of fruit to eat"

BELOW **Troops land at Zone Z near Wolfheze, while the Horsas of B Sqn are unloaded.**

be safe in the cellar. Then came a loud noise and a crash as the tank fired a shell into the house. As I came to, dazed and bruised, we were taken out of the rubble and put up against a wall and searched. Ten days after leaving England, the two of us were taken off in a lorry with other prisoners to the town's prison, and en route we nearly came a cropper as three RAF Mitchells or Bostons dropped bombs nearby. I never got to see the bridge in the end, as we were all put on a train with other airborne troops and taken to Stalag 12a, a filthy tented place where I met up with another glider pilot, S/Sgt Shorter, who had landed at the wrong bridge on D-Day."

Operation *Market Garden* was to become one of the most heroic defeats in British military history. The GPR was decimated, with 90 per cent of its pilots killed, wounded or taken prisoner. To make up the numbers for further operations, such as the crossing of the Rhine, aircrews were seconded from the RAF.

Peter was transferred to Stalag 4b, and got out when the Germans left as the Russians advanced in April 1945. "We were on the loose for several days before the Russians caught up with us one day, as we were burning the hair off a pig that some German women had given us to cook. Seeing the Russians arrive on their horses and carts, the women naturally ran off. We were searched for anything valuable like watches that they could pinch before escorting us off, eventually reaching American troops and tanks near a canal. But they didn't release us immediately. In a way, that incident seemed to be more frightening than the battle at Arnhem. Eventually the Yanks came over the bridge for us after three days, and transported us to Halle, then to Reims, from where I flew home in an Avro Lancaster."

Looking back at his wartime career, Peter Boyle modestly explains that he feels his war was only a short one compared with the experiences of others. However, he certainly packed a lot into those two operations by participating

LEFT **The glider pilot patrol fights its way through the streets of Oosterbeek as the enemy advances, forcing them to retreat. Of the 1,262 glider pilots which took part in Operation *Market Garden*, 219 were killed, 511 were made prisoners-of-war or evaded capture, and 532 were evacuated safely.**

in both the air and ground wars in Normandy and Arnhem. Since the war Peter has attended the ceremonies at Arnhem only twice. As for revisiting the site of the *Coup de Main* operation at Pegasus Bridge, Peter and his wife Aileen have been back several times.

Peter also lost contact with his D-Day pilot, S/Sgt Geoff Barkway DFM. They eventually met again by chance at a midnight toast to absent friends during the 40th anniversary reunion in Normandy, also attended by several other pilots. Thinking that their days of flying together with the army were over, Peter and Geoff were reunited again in the cockpit on June 6, 1994. The Army Air Corps made the poignant gesture of flying them in a Gazelle helicopter over the exact route they had flown during *Coup de Main*. Even though it was not a glider, the flight still lived up to the GPR's motto of "Nothing is impossible".

BELOW **Peter Boyle at his home in December 2003.**

Captured — Peter Boyle and Sgt Burgoyne are taken prisoner by the German tank crew who escort them from the ruins of the house they were hiding in.

Acknowledgements
The author would like to thank Peter Boyle for his help and patience in the preparation of this article

To buy any original paintings and drawings by Tim O'Brien that have appeared in "Aeroplane", please contact him on 01949 877590, or email at tobrienart@hotmail.com

Database

Lockheed P-38 Lightning

Nothing else looks like it or handles like it — Clarence "Kelly" Johnson's unmistakable twin-tailed design for a fast, manœuvrable high-altitude fighter had a difficult birth but went on to become one of the deadliest and most distinctive multi-role aircraft of the Second World War. **MICHAEL O'LEARY** recounts the genesis of the Lockheed P-38 Lightning

DURING THE 1930s the US Army Air Corps (USAAC) had a motley collection of combat aircraft — the fighters of the day were little more than glorified sport aircraft, built for a war that may never happen. Strategic bombing rested on the broad fabric wings of aircraft that would not have seemed out of place in the First World War.

A few far-sighted USAAC officers made appeals for new, dynamic aircraft that would inject life into the Service, but the government, still struggling with the disastrous effects of the Great Depression, was reluctant to finance new aircraft.

From 1935 to 1937 the growing menace of Nazi Germany began to register among even the most isolationist American politicians, and some money began to reach the military for limited research and development on advanced aircraft projects. One of these projects was a twin-engined interceptor capable of carrying a heavy armament to high altitudes, which would be attained with newly-developed turbo-superchargers. The new design would have long range and be able to climb quickly to intercept high-flying bombers. A tricycle undercarriage was specified to simplify ground handling. Entitled Specification X-608, the requirement was circulated among interested aircraft manufacturers. The specification was spearheaded

ABOVE Max Millar's cutaway drawing of the P-38L. See the full illustration on page 73. OPPOSITE TOP The ace maker — the versatile P-38 was used on every front to which the USAAF was committed. The top P-38 ace, Richard Bong, scored a staggering 40 victories while flying the type in the Pacific. OPPOSITE BOTTOM A freshly-completed P-38F with taped-over guns awaits delivery at Lockheed's Burbank factory.

by Lt Benjamin Kelsey, a Massachusetts Institute of Technology graduate who, in 1934, had been appointed officer in charge of the Fighter Projects Office at Wright Field, Ohio.

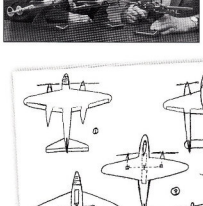
The Lockheed Aircraft Corporation of Burbank, California, had developed a reputation for producing high-performance aircraft with advanced aerodynamics and an ability to grab records and headlines, but lucrative government contracts were needed to assure stability and growth.

An earlier USAAC specification had put Kelsey in contact with Lockheed chief designer Hall Hibbard and his young assistant, Clarence "Kelly" Johnson. Kelsey was impressed by the aircraft the men designed for the proposal (it was Johnson's first crack at a military design), but Bell won the contract by the narrowest of margins with the hopeless FM-1 Airacuda.

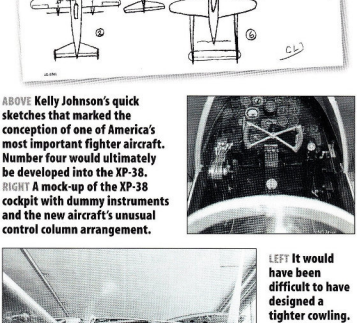
Lockheed had been considering a high-performance military aircraft before the specification was issued, and had come up with a working proposal for the new aircraft, designated the Model 22 (also identified in period documents as Project M-12-36). The design inception date was March 1936.

Johnson looked at Specification X-608 and realised that the biggest handicap would be the lack of a suitable powerplant. The USAAC required the new aircraft to climb to 20,000ft in 6min and have a top speed of at least 360 m.p.h. at altitude. Long range was also required, with all fuel carried internally. Working with Hibbard, Kelly immediately began making sketches of proposed aircraft. All of these early designs had two engines. One engine would simply not provide the performance required by the military. Johnson chose the V-12 Allison V-1710 engine, which could develop at least 1,000 h.p. (with good growth potential) while its low frontal area offered good streamlining. It was also the only American high-horsepower inline engine in series production.

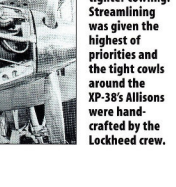
Hibbard and Johnson settled on a design that had elegant twin booms with a nacelle mounted on the wing between the booms. Power was to come from twin 1,150 h.p. Allison V-1710-Cs, and high-altitude performance would be greatly enhanced by twin General Electric turbosuperchargers in the booms, connected to the engines by complex tubing. A tricycle undercarriage, with the noseleg in the fuselage pod and the main legs in the spacious booms, was provided as required. The armament was housed in the nose of the nacelle.

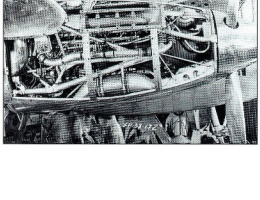


ABOVE The XP-38 at March Field, where it was taken by road for flight testing in December 1938.
LEFT Decades after the birth of the P-38, its designer, Clarence "Kelly" Johnson (left), and Lockheed test pilot Tony LeVier discuss its unique qualities.



ABOVE Kelly Johnson's quick sketches that marked the conception of one of America's most important fighter aircraft. Number four would ultimately be developed into the XP-38.
RIGHT A mock-up of the XP-38 cockpit with dummy instruments and the new aircraft's unusual control column arrangement.





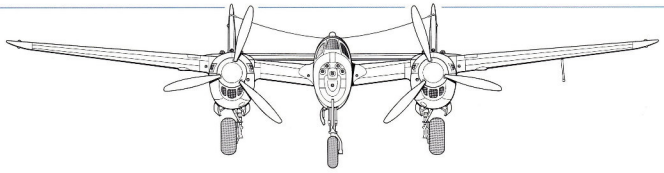
LEFT It would have been difficult to have designed a tighter cowling. Streamlining was given the highest of priorities and the tight cowls around the XP-38's Allisons were hand-crafted by the Lockheed crew.

Another advanced feature was the use of a butt-jointed, flush-surface skin to give maximum streamlining. The Model 22 would also be the first production aircraft to have all of its control surfaces covered in aluminium rather than fabric. Johnson had almost completed the design of a thin-section wing when the concept had to be dropped because it was impossible to accommodate the required quantity of fuel in the wing, and the Service refused to consider external tanks. Consequently the Model 22 was given a thicker wing, reducing its performance. In a report on the new design Johnson devoted six pages to "compressibility effects", since he knew the aircraft would be entering unexplored aerodynamic territory.

Kelsey studied the tendered proposals. Impressed by the sheer power offered by the Model 22, he recommended that the USAAC issue a prototype contract to the Burbank firm. Bell also won a prototype contract for its single-engined design that would become the XP-39.

The government issued Air Corps Contract No 9974 to Lockheed on June 23, 1937, for the construction of one XP-38, allotted USAAC serial 37-457. The cost of the aircraft was $163,000. The company team was pleased with this, although they realised that the new XP-38 was radical and one aircraft might not lead to production if the design did not perform as required.

In July 1938 the company began XP-38 subassembly construction in a partitioned area of a Burbank hangar. Workers had to overcome problems fitting and flush-riveting the aluminium skin; this was truly a state-of-the-art machine, with an attendant learning curve. As Johnson moved up the company ladder, Jim Gerschler took over as project engineer, and quickly made some changes, including the addition of Allison V-1710-C7 and C9 engines with counter-rotating propellers. The



Lockheed P-38 Lightning

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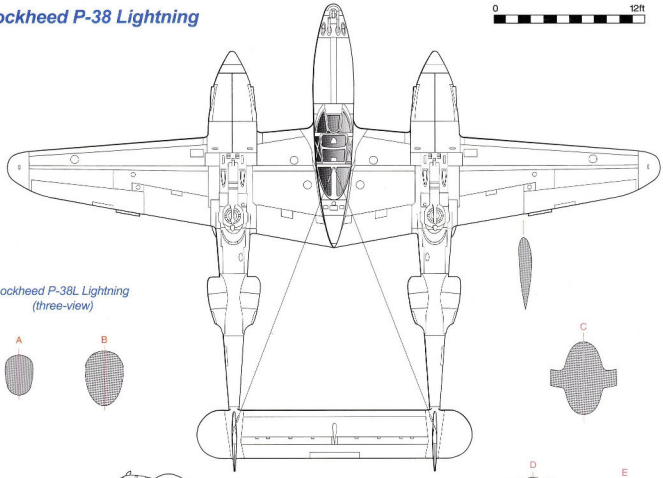
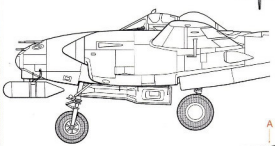
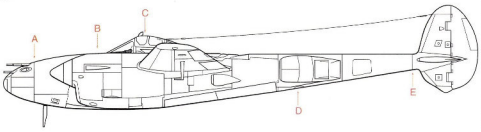
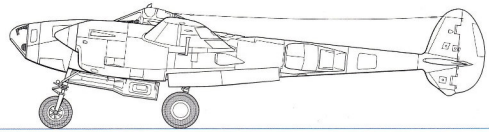


Lockheed P-38L Lightning (three-view)



Scrapview of nose of Lockheed P-38M Lightning nightfighter





Lockheed F-5 "Droop Snoot" Lightning

starboard engine would rotate in a clockwise direction to counter the torque forces of the anticlockwise-turning port propeller, eliminating the tremendous torque of two engines turning in the same direction.

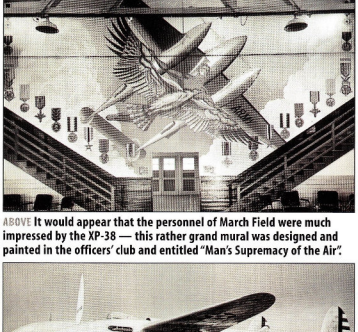
The XP-38 was like no other fighter that had flown in the USA. First of all, it was huge. Weighing in at more than 15,000lb, and with a wingspan of 52ft, it looked more like a bomber. Lockheed had given the twin Allisons extremely snug cowlings. The flush riveting was first-rate, the polished metal unmarred by protrusions to impair streamlining.

Large Fowler flaps, used with great success on Lockheed's transport aircraft, were added to both of the XP-38's wing sections to improve low-speed handling. The long, slim booms that replaced a "normal" fuselage housed General Electric Type F turbosuperchargers and the main undercarriage, and supported the graceful twin fins that had become a Lockheed trademark. The nacelle for the pilot was mounted on the wing centre-section between the two engines. The design team liked the idea of centring the armament package (at this point, still undecided) for several reasons. It simplified maintenance, a more concentrated cone of firepower could be achieved by a battery of guns, and the c.g. could be more accurately maintained. As construction neared completion the XP-38's armament was standardised as one 23mm Madsen cannon and four Browning 0·50in M2 air-cooled machine-guns with 200 rounds per gun, although armament was never fitted to the prototype.

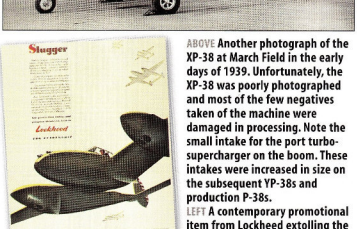
Lockheed, Allison, and General Electric worked closely to ensure that the operation of the engines at high altitude would be as efficient as possible. A complex network of tubing connected each engine to its individual turbosupercharger in the boom. The turbine wheel was located in a semi-flush housing atop each boom over the trailing edge of the wing. As the aircraft gained altitude, the turbosupercharger would begin to function, taking exhaust gases from the engine to the turbine via the tubing. Spinning at tens of thousands of r.p.m., the turbine would compress the exhaust gases and pass them through an intercooler in the wing leading edge The compressed and cooled gas was then channelled back down the engine's throat to maintain manifold pressure at altitude.

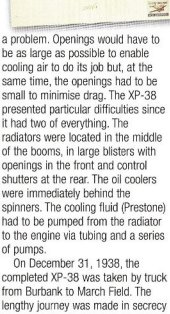
The designers knew the engines would have to be closely cowled for maximum streamlining, but location of the radiators and oil coolers posed a problem. Openings would have to be as large as possible to enable cooling air to do its job but, at the same time, the openings had to be small to minimise drag. The XP-38 presented particular difficulties since it had two of everything. The radiators were located in the middle of the booms, in large blisters with openings in the front and control shutters at the rear. The oil coolers were immediately behind the spinners. The cooling fluid (Prestone) had to be pumped from the radiator to the engine via tubing and a series of pumps.

On December 31, 1938, the completed XP-38 was taken by truck from Burbank to March Field. The lengthy journey was made in secrecy and the partly dismantled aircraft was shrouded to prevent prying eyes from getting a close view. It took several days to assemble the machine, service it, and make sure all systems were operational.



ABOVE It would appear that the personnel of March Field were much impressed by the XP-38 — this rather grand mural was designed and painted in the officers' club and entitled "Man's Supremacy of the Air".





ABOVE Another photograph of the XP-38 at March Field in the early days of 1939. Unfortunately, the XP-38 was poorly photographed and most of the few negatives taken of the machine were damaged in processing. Note the small intake for the port turbo-supercharger on the boom. These intakes were increased in size on the subsequent YP-38s and production P-38s.

LEFT A contemporary promotional item from Lockheed extolling the virtues of its new "slugger".

During the first series of taxy tests, Kelsey found a number of problems, one of which almost resulted in the loss of the prototype before it had flown. As speed was increased it became apparent that the XP-38 lacked sufficient braking power. The brakes became extremely hot on one high-speed run, and the XP-38 shot off the end of the paved area, bounced through the grass, hit a ditch and stopped. By the time Kelsey had clambered from the cockpit, Lockheed engineers had already arrived. The frightened team inspected their creation, feeling the polished skin for any deformation. After a quick walk around they were delighted to find no damage.

Engineers scavenged the spares bin for useful items, and attached a cylinder from a Northrop A-17 dive bomber and an extra small tank to contain additional hydraulic fluid inside the XP-38 so that, when the brakes began to fail, the pilot could pump additional fluid into the brake reservoir to provide increased brake pressure and cooling.

Kelsey and Lockheed realised that the brakes would be good for only one or two landings with this emergency lash-up. Kelsey decided that the best way of getting the XP-38 back to its parking space would be to bring the big fighter in over the fence at the slowest possible speed, right on the edge of the stall, allowing the aeroplane to use the entire runway to stop with minimal braking. Kelsey and the Air Corps, both entering a new phase of high-performance aerodynamics, were to learn that dragging an aircraft in over the threshold at very low speed was unwise and unsafe.

Work was finally completed on January 27, 1939, and the XP-38 was brought out for final checks. Kelsey boarded the prototype, went through a brief engine check and began to taxy toward the runway, using the rudders for directional control and staying off the brakes as much as possible. Slowly advancing the large throttles with his left hand, Kelsey decided to go after rolling a short distance. Speed quickly built up. A tug on the yoke lifted the nosewheel and the XP-38 lifted smoothly from the runway, the roar of its twin Allisons a muted rumble as the exhaust gases passed through the turbosuperchargers. It was not to be a smooth flight.

Just after the mainwheels left the runway, flutter set in, the instrument panel disappearing in a violent blur. Kelsey fought to maintain control with the yoke that was trying to shake itself out of his hands. A quick glance out of the cockpit showed the wingtips shaking so violently that they were travelling 3ft up and down!

Kelsey yanked the flaps up. The large Fowler flaps had been half down, a take-off procedure recommended by Lockheed engineers. As they came up into the wing, the intense flutter stopped.

Reducing speed and keeping the nose raised, Kelsey flew the XP-38 for 34min, making the gentlest of manœuvres while trying to figure out why the fighter had nearly shaken itself to pieces. During the intense flutter the pilot had noticed a portion of flap shaking particularly violently. The fact that the flutter disappeared when the flaps were retracted led him to attempt a landing with the

flaps fully up. Since they had to stay up, Kelsey was forced to keep the fighter's nose up 18° during the approach, and the twin fins contacted the runway before the mainwheels.

The XP-38 was examined, and the cause of the flutter was immediately discovered. Several soft aluminum control rods for the flaps had broken due to the intense flutter, which had come about from lack of gap sealing and poor flap installation. The matter was quickly rectified by fitting steel control rods, cutting away some parts of the wing skin and providing adequate gap sealing for the flaps.

By February 10 the XP-38 had made five more flights, accruing nearly 5hr of flying time. Kelsey found the XP-38 a dynamic aircraft which handled well. Lockheed and the Air Corps felt they had a winner.

Official USAAC testing of new aircraft was carried out at Wright Field. Lockheed reasoned that it would take too long to take the prototype apart and transport it by rail, so Kelsey decided to fly the machine there. The Air Corps decided that Kelsey should attempt to set a speed record between Los Angeles and Dayton (Wright Field). A fuel stop at Amarillo, Texas, was planned.

The XP-38 departed March Field on February 11, with Kelsey intending to rely on the cruise performance, and not push the machine. He reached Amarillo in just 2hr 48min. Rapidly refuelling, it was on to Dayton in 2hr 45min. Chief of the USAAC, Gen Henry "Hap" Arnold, was on hand to discuss the flight. He had been under pressure to put the Air Corps in a positive light. The cross-country speed record was held at that time by millionaire pilot Howard Hughes. Since a cross-country speed dash was not considered from the start of the XP-38 flight, the time spent on the ground at Amarillo meant that Hughes's overall record could not be beaten, but his flying time could be beaten if the USAAC acted quickly. After a brief discussion Arnold sent the aircraft on its way to Mitchel Field, Long Island, New York.

After averaging 360 m.p.h., Kelsey began his descent into Mitchel Field when the carburettors began to ice up. The XP-38 did not have carb heating, and Kelsey was unaware that deadly ice had started to form in the carb throats. He lowered the flaps, reduced power and raised the nose to bring the XP-38 in as slowly as possible, since the braking system was still less than adequate.

As he approached the threshold, Kelsey saw that he was low and eased the throttles forward, but was faced with the heartstopping realisation that there was no power. The XP-38 slammed into the ground short of the runway threshold, and Kelsey was lucky to escape with cuts and bruises.

The USAAC reconsidered the aircraft and, on April 27, 1939, contracted Lockheed for 13 service test YP-38s. The speedy issuing of the contract was largely due to "Hap" Arnold's persuasive arguments in favour of the aircraft. The XP-38 flights had not established any performance data for the Air Corps to study, and it was essentially taking the word of one man that Lockheed could produce what the Air Corps needed.

The demise of the XP-38 — the pilot's statement

"DEPARTED FROM WRIGHT FIELD AT 1525hr; accident occurred while attempting landing at Mitchel Field at 1650hr. Arriving over New York at 14,000ft, the engines were throttled to lower power, about 15in manifold pressure (MP). The engines were running at this partial power for about 3min and then throttled down and the plane slowed to get the gear down. After lowering the gear, partial power — about 20in MP — and about 2,000 r.p.m. was used in the turn for approach. The engines were throttled back completely and the aircraft slowed to about 120 m.p.h. to lower the flaps. After the flaps were down, the throttles were opened. The left engine started up partially, but the right continued to idle. The fuel capacity was checked, fuel pressure was steady at 4lb on both engines. Mixture controls were rich; the left engine was running at about 15in and 1,900 r.p.m. The prop pitch was checked to be sure it was in low pitch. When it became obvious that with gear and flaps both down the aircraft would not glide into Mitchel Field, the flaps and gear handle were put in the UP position in the hope that with less drag it might coast in. When the speed got below 120 m.p.h., further efforts to get one engine to go were abandoned since with the low speed and high drag the aircraft obviously could not be held if one engine came on full. The glide was slowed to about 100 m.p.h. It appeared that it might glide to a golf course across the road from Mitchel Field. As the trees were approached, the speed was kept at 90–95 m.p.h. and after passing through the tops of the trees, it was pulled up sharply just before hitting. It landed in a normal altitude in the bottom of a gully and slid up the bank. There was an impression that the main gear hit while partially extended. All items on the check list were checked on approach. The flaps were intentionally lowered so as to undershoot a little, figuring on pulling in with the engines so as to make the shortest possible landing due to the long ground run of the aircraft. The engines have to be completely throttled back to get the flaps down without vibrating through the middle range.

"Of the possible causes, the most likely seems to be the possibility of icing in the carburettors due to excessive intercooling at high speed and partial power. As far as could be ascertained in the time available, there was no apparent reason either in the operation of the controls or in the instrument indications of any mechanical failure or engine failure as such. The fact that both engines were partially out indicates that some general condition must have affected both. There is no control for carburettor heat since these engines have never given indication of icing, and with turbo installations there is normally sufficient heat or compression. However, in this case, the high speed, lower power condition may have cooled the air below normal conditions"

Benjamin S. Kelsey, 1st Lieutenant, US Army Air Corps

"As he approached the runway threshold, Kelsey saw that he was low and eased the throttles forward, but was faced with the heartstopping realisation that there was no power"

After his cross-country speed dash, Ben Kelsey's broken XP-38, or "mystery plane" as it was described in the press, was photographed on a golf course adjacent to Mitchel Field, New York

Trials & Compressibility

When the gleaming YP-38s first flew, some unpleasant surprises awaited the test pilots when new and deadly problems were uncovered in the basic design, as **MICHAEL O'LEARY** reveals

A CLOUDLESS BLUE SKY hung over Burbank on November 5, 1941, as more than 25,000 Lockheed workers gathered during their lunch break to hear "Hap" Arnold give one of his pep talks. As they filed back into the hangars, test pilot Ralph Virden strapped into a gleaming YP-38 to begin a typical day's work.

Virden taxied out, took off, and was soon climbing out to the west for a series of power dives, which he completed successfully. Some 15min later the YP was back over the Burbank area. It was seen in a dive, making an unearthly shriek, followed by its fluttering tail assembly which had separated from the airframe. The YP crashed into a house at 1147 Elm Street in neighbouring Glendale, literally blowing the dwelling in half and killing the pilot on impact. Owner Jack Jensen was found asleep in his bed, blithely unaware that the USAAC's latest fighter had destroyed his house.

Why did the YP crash? First, we must return to the accident that had destroyed the XP-38. Arnold and other influential officers lobbied long and hard for the new design, and Contract No 12523, for 13 YP-38s, was issued on April 27, 1939, spelling out the terms for the production of the YPs. They were to be vastly different from the XP, and problems developed accordingly. Lockheed gave the YP-38 the new designation Model 122, and the engineering team began refining and developing the basic design.

Lockheed assumed that the USAAC would order no more than 80 P-38s, and this reasoning led to problems in adapting the design for mass production. The company made plans for rapid expansion, nearby buildings being purchased as construction of a new plant began. An intensive drive was also made to increase the workforce, up to 500 a day being hired during 1941.

ABOVE One of the 13 YP-38s on a test flight out of Burbank, with trails of fog drifting into the San Gabriel Mountains. The "Y" in the designation denoted that the new aircraft were for Service test and evaluation.

ABOVE Casually dressed Lockheed test pilot Marshall Headle prepares to take the spotless first YP-38 aloft on its first flight.

RIGHT Headle doses a test pilot with oxygen before a high altitude YP-38 flight. During a later high-altitude pressure chamber test Headle suffered a stroke, and never recovered.

A distillery was converted for the production of P-38 subassemblies and the building of the YPs, but the expansion was so rapid that work began to flag. Although initial drawings had been approved and released by mid-1939, fabrication did not begin until early 1940. Work dragged as changes were made to the drawings and to partly-completed airframes.

American officials watched events in Europe with concern. The USAAC attempted to spur production of the new fighter, but the first YP did not fly until September 17, 1940, when Marshall Headle took it up for a short proving flight.

Although the YP looked like the XP, it was very much a new aircraft, and the USAAC knew that intensive testing would be needed to prove the design for operational use. It wanted the XP's weight reduced by 1,500lb for the YP, but the weight was not reduced enough. The 13th and final YP was not delivered until May 1942, but test pilots had begun amassing time on the earlier aircraft. Alarming new problems soon came to light.

As an aircraft's speed increases, airflow begins to compress around certain points of the airframe. If the compression occurs around vital control surfaces, the aircraft's flying qualities can be drastically affected. Major Signa Gilke, an experienced USAAC test pilot, took a YP up to 35,000ft for a planned dive at more

than 400 m.p.h. As the aircraft accelerated, Gilke found the yoke rocking wildly as he attempted to retain control. As the YP exceeded 400 m.p.h. it seemed that its elevator had developed extreme flutter, and that the nose was starting to tuck under.

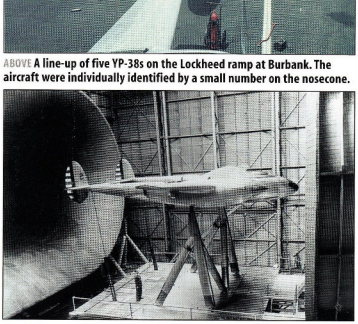
This violent behaviour was caused by the compression of airflow over the YP's centre section, which, in turn, created very turbulent airflow and a venturi effect, producing the extreme tail buffeting. Gilke closed the throttle and used the elevator trim tab to fight the YP out of a near-fatal situation. Compressibility had been encountered, but few knew what to do about it.

The same problems were found by Lockheed test pilots who replicated Gilke's dive. External mass balances were fitted to the elevator, which was also reskinned with thicker-gauge aluminium, but the trouble persisted. Wright Field told Lockheed to give the compressibility and tail buffeting its immediate attention, but Johnson and his team knew that a quick solution would be difficult.

It was quite possible that P-38 production might be curtailed by September 1941 if a solution was not found, so YP-38 c/n 2202, USAAC 39-689 (the first of its type) was assigned for test work. Milo Burcham, Jimmy Mattern and Ralph Virden were concerned when engineers wanted them to take the YP past 300 m.p.h. at 30,000ft, which, when the altitude was factored in, was beyond the YP's limiting Mach number of 0·68. By this time the YP had been subjected to numerous modifications, including large elevator servo tabs that came into operation to aid recovery from the dive once forces on the yoke exceeded 30lb. Despite the tabs, Burcham and Mattern remained reluctant to carry out the high-altitude/high-speed tests, but the highly-experienced Virden agreed.

This brings us back to the accident of November 5, 1941. Fifty years later, Lockheed test pilot Tony LeVier explained his view of the accident:

ABOVE A line-up of five YP-38s on the Lockheed ramp at Burbank. The aircraft were individually identified by a small number on the nosecone.



ABOVE The second YP-38 was tested in NACA's full-size windtunnel. Note the man next to the struts to give an idea of the sheer size of the tunnel.

ABOVE Nightmare on Elm Street — the aftermath of Ralph Virden's fatal dive in a YP-38 on November 5, 1941, in which the tail broke off in flight.

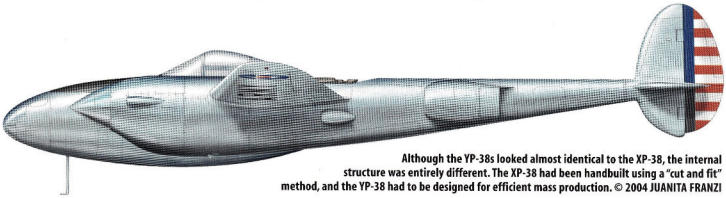
"I believe Virden was in a deliberate high-speed dive for a buzz job, but the P-38 was probably right on the edge of critical Mach and, when he started his pull-out, things didn't go as planned, so Virden pulled harder and the spring tab helped and the excessive buffet and tail loads broke the tail off. It was Ward Beman who discovered what was going on, and he came up with the dive flap."

After hundreds of hours of hard work, Johnson found the most logical answer to Virden's crash when, after examining the wreckage and data, he concluded that linkages to the larger elevator tabs failed, causing them to go into extreme deflection, which probably resulted in a sudden and catastrophic force travelling through the tail boom. This caused an immediate structural failure.

As P-38 production built up, the problems continued. A YP was flown to NACA's windtunnel at Langley Field, Virginia, where it was subjected to numerous tests and modifications, including a lengthening of the fuselage pod in hope of smoothing out the airflow (it did not work). Johnson also continued working on the problem and, using his own data and that gathered from NACA Langley, issued a report, *Study of Diving Characteristics of the P-38*, in early 1942.

Johnson found that the P-38's drag factor rapidly increased as the airframe hit Mach 0·65. A shock-wave formed around the wing centre section and this, in turn, led to the tail buffeting. Lockheed was worried that modifications to the basic design would cause massive production delays and again place the aircraft's future in doubt. A fairly minor modification cured the shockwave problem. A small fillet was added at the junction of the wing leading edge and the canopy. This had to be carefully installed to ensure a tight fit, but did eliminate the tail buffeting.

Newer production P-38s were allocated to the test role, and the YPs were relegated to the training role until they were scrapped before the war's end.



Although the YP-38s looked almost identical to the XP-38, the internal structure was entirely different. The XP-38 had been handbuilt using a "cut and fit" method, and the YP-38 had to be designed for efficient mass production. © 2004 JUANITA FRANZI

The Search for Perfection

Before the P-38 was ready to enter service, numerous variants were built in an attempt to create the perfect fighter. **MICHAEL O'LEARY** explains the type's constant design modifications

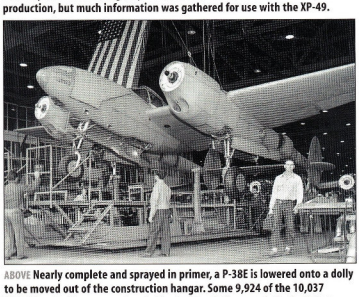
FLIGHT TESTING OF THE YP-38s continued as the first production P-38s started coming together on the line. The contract was for 66 aircraft, close to Robert Gross's original prediction that no more than 80 would be ordered by the USAAC. The contract was issued on September 20, 1939, before the YP's first flight, the new aircraft to be a mixture of P-38s, the sole XP-38A and P-38Ds.

Gone was the glowing silver of polished aluminum and, in its place was Dark Olive Drab (Shade 41) and Neutral Gray (Shade 43) camouflage applied according to Technical Order No 07-1-1. The division between the two standard camouflage colours followed a wavy line from just under the nosecone to a point below the wing, where it moved up to meet the wing root. On the booms, the Olive Drab did not extend under the wings or tail, although it was brought down the trailing edge of the rudder almost to the join with the fin.

The YPs and the first P-38s were identical except for a few minor changes, armament initially being standardised on one 37mm cannon and four 0·50in machine-guns. From combat reports from Europe (Ben Kelsey was sent to Britain and France) it became obvious that the aircraft would need armour protection and self-sealing fuel tanks.

The USAAC issued a directive that

TOP Factory-fresh P-38J 42-104155 receives servicing before being delivered to a USAAF depot. The P-38J introduced "beard" radiators in the nacelles. ABOVE The sole XP-38A was fitted with a pressurised cockpit and was test-flown by Joe Towle during May–December 1942. The idea was never put into production, but much information was gathered for use with the XP-49.



ABOVE Nearly complete and sprayed in primer, a P-38E is lowered onto a dolly to be moved out of the construction hangar. Some 9,924 of the 10,037 Lightnings built were constructed by Lockheed, the remainder by Vultee.

P-38s on the production line would receive this additional equipment, designating them P-38D (36 built). The "D" suffix denoted US fighters brought up to the latest European combat standard. They also had the less-dangerous low-pressure oxygen system installed, plus a retractable landing light. In an effort to keep the fighter's weight down, maximum fuel capacity was reduced from 410 US gal to 300 US gal. Some P-38s and P-38Ds were set aside for research and development, and some had odd configurations. For example, P-38 s/n 40-744 (the first built) had a cockpit installed in the port boom (the turbo-superchargers were removed) to assess the effects of an asymmetric layout on the pilot.

One production airframe was designated XP-38A and given a pressurised cockpit, not a bad idea considering the P-38's altitude capabilities. To offset the additional weight, production XP-38As were to have had the 37mm gun replaced by a 20mm cannon. Carl Haddon was the project engineer, and data from this experiment was applied to the XP-49, about which more later.

The USAAC was not pleased with the slow delivery rate, but Lockheed was experiencing delays with turbosuperchargers (General Electric), engines (Allison), and propellers (Curtiss). The construction of other subassemblies, such as under-

carriages, was also behind schedule, and the rapid expansion of Lockheed was causing problems.

With P-38Ds at last being delivered, the USAAC sent them to the 1st Pursuit Group (PG) at Selfridge Field, Michigan. Many of the unit's pilots had flown YPs, and it was thought that experience thus gained would help smooth the P-38's introduction into service.

When the 1st PG received its new mounts in spring 1941, the nose cannon were not yet fitted and the aeroplane was still some way from being combat ready. However, the 1st tested its new fighters in a realistic combat environment, the P-38s going to Louisiana and the Carolinas for "war games" during September and November 1941. Pilots tested them against Seversky P-35s and Curtiss P-36s and P-40s, finding them superior, especially at altitude.

Meanwhile, Lockheed was receiving further massive orders for the Lightning (the name applied by the British and adopted by the press), and as 1941 drew to a close more variants began to appear on the production line. On August 30, 1940, a follow-on contract for 410 aircraft had been placed (to be delivered as P-38Es, P-38Fs, F-4s, F-4As, F-5s, and F-5As). Lockheed, in turn, placed massive subcontracts with suppliers which stretched their output capacity.

The P-38E (Model 222-62-09), the first major production version , was considered an interim step towards the combat-ready P-38G.

LEFT Tony LeVier (left) and Kelly Johnson inspect a P-38J dive flap. The dive flaps were a crucial addition to the fighter's airframe, and went a long way to curing many of the fighter's problems with compressibility.

ABOVE A single RP-38, 40-744, was modified with an additional cockpit in the port boom in order to study the effects of piloting off the centre line.

ABOVE RIGHT "Pay-off for Pearl Harbor!" screams a colourful 1940s advert for Cadillac, which built precision parts for the Lightning's Allison engines.

ABOVE Several different tail configurations were tested on early P-38s for a variety of reasons, including a raised tail for a possible floatplane variant, and a swept-up tail to remedy high-speed tail buffeting, as seen here.

On the E the 37mm cannon was replaced by a licence-built 20mm Hispano with 150 rounds of ammunition. Once again, many of the P-38Es went to training units, but the USAAC and Lockheed retained some for modification and testing. Those assigned to training units usually carried the "R" prefix, indicating a non-combat role. Thus the USAAC operated RP-38s, RP-38Ds, and RP-322s as of 1942, when the designation came into effect.

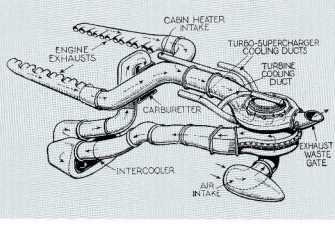
Some RP-38Es were put to extremely esoteric uses. A few were converted to "piggy-backs" with a small second seat behind the pilot, and were used for training. One was given an upswept tail in anticipation of being fitted with huge floats, enabling the fighter to be flown to Pacific bases, where the floats would be removed on arrival. However, the US Navy proved more than capable at shipping fighters to combat bases,

> "The 1st Pursuit Group tested its new fighters in a realistic combat environment, the P-38s going to Louisiana and the Carolinas for 'war games' during September and November 1941"

The Lightning's turbosupercharger system

ON THE P-38L GENERAL ELECTRIC B-33 TURBOSUPERCHARGERS were mounted in the top of each forward boom at station 207, and were attached to the centre-section rear shear beam. Air entering the system through scoops mounted on the outboard side of each boom below the wing was rammed into the impeller section of the turbosupercharger, where it was compressed. The compressed air then passed through a duct to the intercooler, and then to the carburettor. The air induction system controlled the intake, flow and temperature of the air from the intake scoops to the carburettors. A closed system of cuts, starting with the boom-mounted intake scoops, controlled and routed the airflow. From the scoops, the air went through the air filter (if in operation) through the compressor of the supercharger, and through pressure-tight ducts to the intercooler. The intercooler was of the core type, equipped with electrically-operated flaps. Compressed hot air from the turbosupercharger passed around the tubes of the cooling element and was cooled sufficiently to make it suitable for engine operation. From the intercooler, the air passed by pressure-tight ducts to the carburettor. An auxiliary system of scoops and ducts was provided to conduct cooling air to various sections of the engine. Air was directed to the spark plugs, magnetoes, distributors and to the cap baffles of the turbosupercharger. This cooling air remained in a free state, escaping to the outside atmosphere after use.

Exhaust manifolds from the cylinder banks converged in a "Y" aft of each engine, and a shrouded tailpipe carried exhaust gases from that point to the supercharger nozzle box. Gases passed through the supercharger and out via the wastegate after driving the turbine bucket wheel. The latter was mounted at opposite ends to the compressor impeller on the same shaft.



Lockheed P-38 Lightning data

	XP-38	YP-38	P-38E	P-38G	P-38J	XP-49
Powerplant	Two 1,150 h.p. Allison V-1710C-9/ -11 engines	Two 1,150 h.p. Allison V-1710-27/ -29 engines	Two 1,150 h.p. Allison V-1710-27/ -29 engines	Two 1,325 h.p. Allison V-1710-51/ -55 engines	Two 1,425 h.p. Allison V-1710-89/ -91 engines	Two 1,600 h.p. Continental XI-1430-1 engines
Dimensions						
Wingspan	52ft 0in	52ft 0in	52ft 0in	52ft 0in	52ft 0in	52ft 0in
Length	37ft 10in	37ft 10in	37ft 10in	37ft 10in	37ft 10in	40ft 1in
Height	—	9ft 10in	9ft 10in	9ft 10in	9ft 10in	9ft 9¼in
Wing area	327·5ft²	327·5ft²	327·5ft²	327·5ft²	327·5ft²	327·5ft²
Weights						
Empty	11,507lb	11,171lb	11,880lb	12,200lb	12,780lb	15,400lb
Loaded	15,416lb	14,348lb	15,482lb	19,800lb	21,600lb	18,825lb
Performance						
Maximum speed	413 m.p.h.	405 m.p.h.	395 m.p.h.	400 m.p.h.	414 m.p.h.	405 m.p.h.
Cruising speed	—	330 m.p.h.	—	340 m.p.h.	290 m.p.h.	315 m.p.h.
Ceiling	38,000ft	38,000ft	—	—	—	—
Rate of climb	20,000ft in 6min 30sec	3,330ft/min	—	20,000ft in 8min 30sec	20,000ft in 7min	3,500ft/min
Range	—	650 miles	500 miles	275–2,400 miles	450–2,600 miles	680 miles

and the idea was dropped. Others served as glider tugs, and some P-38Es tested new drop tanks.

Along with the 377 USAAC machines, the P-38F series included 150 Lightning Mk IIs intended for the RAF (see page 75 for the RAF Lightning saga). Retaining the same armament as the P-38E, the Fs had 1,325 h.p. Allison V-1710-49/-53s. They were produced in five batches, each having its own set of updates and modifications. The F-series included the first Lightnings to carry drop tanks (P-38F-5-LO), two 155/165 US gal tanks being carried on pylons between the fuselage pod and engines that could alternatively carry two 1,000lb bombs.

Built with 1,325 h.p. Allison V-1710-51/-55 engines, some 708 P-38Gs (Model 222-68-12) were ordered in six blocks. Generally similar to the F-series these had numerous refinements including winterisation equipment, which would prove useful in the Aleutians and the European Theatre. The P-38G-13-LO and -15-LO (374 aircraft, designated Model 322-68-10) came from the cancelled British order for Lightning Mk IIs. The Lightning, in its many variants, was finally ready to go into frontline service.

ABOVE **Appearing at first glance to be a Lightning, the XP-49 incorporated P-38 parts and structure (modified fuselage pod and outer wing panels) but was otherwise a new design. Note also the darkly tinted windscreen.**

BELOW **While a P-38 glider tug is still firmly on the ground, its load, a Waco CG-4A, has become airborne. Plans were made to have a Lightning tug as many as three of the Waco gliders but the idea was dropped when it was decided to standardise on transports such as the C-47 and C-46.**

The XP-49

Back in March 1939, the USAAC issued Circular Proposal 39-775 in the hope of finding an even better aircraft than the P-38 at an even lower price. To meet the new proposal Lockheed designed the Model 522, similar to the Model 222 (P-38), Lockheed having decided to capitalise on a winner.

Work on the XP-49, as it was designated, slowed as momentum built up on the P-38, and the USAAC and Lockheed realised that it would be overpowered with the proposed Pratt & Whitney XH-2600 or Wright R-2160. During March 1940 it was decided to power the new aircraft with the new 1,540 h.p. Continental XIV-1430-9/-11 liquid-cooled 12-cylinder inverted-vee engine. As the other engines had been rated at 2,300–2,500 h.p., this meant that estimated top speed dropped from 475 m.p.h. to around 400 m.p.h., the same as that of the P-38.

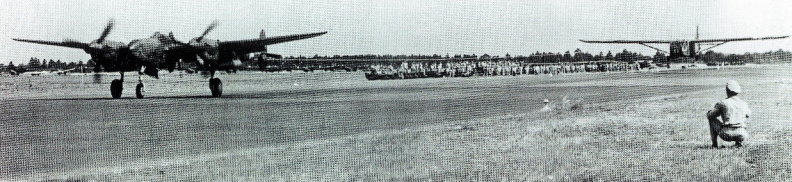
By the end of 1940 Lockheed was able to put enough staff on the aircraft to get it moving. Under the leadership of Carl Haddon a mock-up was completed, being inspected by the USAAC on August 28, 1940.

On November 11, 1940, Joe Towle took the XP-49 on its 35min maiden flight over Burbank, reporting that it handled well. In late November the aircraft was back in the experimental shop for the fitting of new XIV-1430-13/-15s and the Royalin fuel tanks were replaced by self-sealing units.

By late December Towle was flying the XP-49 again, but the aircraft had developed hydraulic problems. On January 1, 1943, he skilfully made a forced-landing at Muroc Air Force Base following hydraulic and electrical problems. One engine was shut down in flight, and the port main undercarriage folded on touchdown.

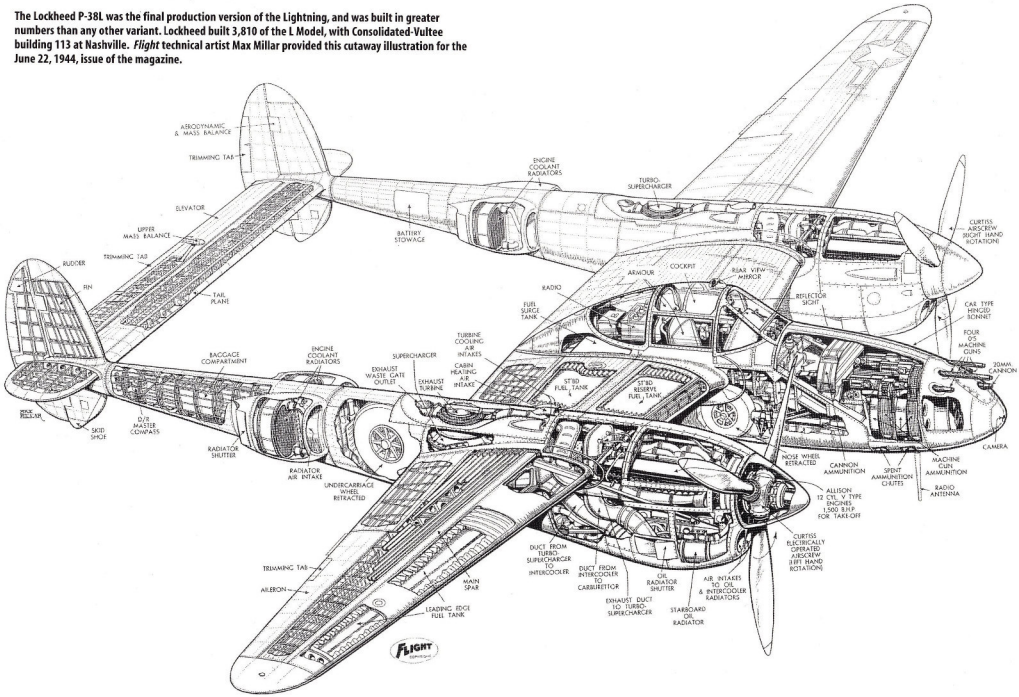
Repairs were made, and the fins were enlarged by 8in. The XP-49 was finally delivered to Wright Field on June 26, 1943, more than two years behind schedule. Only a few flights were made before the Continental engine programme died. The XP-49 sat out the rest of the war at Wright Field. Tests showed that the XP-49's performance was inferior to that of the P-38J then in service.

Although it survived a later test programme which involved dropping it from various heights, it was scrapped in 1946.



Lockheed P-38L Lightning

The Lockheed P-38L was the final production version of the Lightning, and was built in greater numbers than any other variant. Lockheed built 3,810 of the L Model, with Consolidated-Vultee building 113 at Nashville. *Flight* technical artist Max Millar provided this cutaway illustration for the June 22, 1944, issue of the magazine.



The Fork-tailed Devil Goes to War

The versatile P-38 was operated on every front by the Allies, and was adapted for use as an "eye in the sky" and stopgap nightfighter, as **MICHAEL O'LEARY** explains

WITH THE USA THRUST into the war after the Japanese attack on Pearl Harbor, military planners scrambled to allot their rather meagre resources effectively. At the start of the war, the P-38, available in limited numbers, was the fastest American fighter and also had excellent range. The threat of the Japanese invading Alaska and creating another combat front was so real that the 55th Fighter Group (FG) despatched its 54th Fighter Squadron (FS) to Elmendorf Field. Quickly "winterised", 25 P-38s were fitted with long-range tanks, arriving at the remote location on May 29, 1942. The first Lightning victories were scored by 54th FS Lightnings when they downed two Japanese flying-boats near Umnak. Soon joined by P-38s from the 343rd FG, the two units remained in action until July 1943 when the Japanese retreated from the two Aleutian Islands they had occupied. The two units remained in the far north until the end of the war.

TOP A USAAF Lightning pilot uses the type's ingenious retractable steps to climb aboard his 500lb-bomb-equipped P-38 in May 1944.
ABOVE A line-up of Lightnings and a navigation B-17 on their way to Britain as part of Operation *Bolero*. The fastest way to get the much-needed fighters to the European battlefront was by air, which also avoided the U-boat threat.

In order to get desperately needed P-38s to Britain, Operation *Bolero* saw Lightnings flown in groups across the Atlantic with navigation B-17s paving the way. Between July and August 1942, 164 Lightnings made it to Britain. Six didn't and belly-landed with their guide B-17s in Greenland. Decades later one of the P-38s was raised from its icy tomb to be restored to flying condition as *Glacier Girl*. One of the P-38s transiting through Greenland became the first P-38 to shoot down a Luftwaffe aircraft when a long-range Focke-Wulf Fw 200 was knocked down on August 15, 1942.

These early P-38F arrivals of the 1st and 14th FGs flew sorties against the enemy but with little success and were soon transferred to North Africa for Operation *Torch*, the invasion of North Africa. The P-38s started flying to their new area of operation on November 14, 1942, and shot down a Messerschmitt Bf 109 on November 21 for the first P-38 African victory. The P-38s of the 82nd FG joined the action on Christmas Day 1942. These three units would serve with distinction in the Mediterranean theatre of operations (MTO) for the duration of the war, operating at first with the Twelfth Air Force and then with the Fifteenth Air Force.

For operations from Britain, the USAAF still needed P-38s for range and the 20th and 55th FGs left Washington for the long mission to Britain, their P-38Hs arriving during August and September 1943. They

were in action on October 15 after the losses on unescorted bombing missions were proving unacceptable.

The 364th and 479th FGs soon reinforced the Eighth Air Force while the 367th, 370th, and 374th FGs arrived for the 9th Tactical Air Force. All seven of these P-38 units were used as aerial cover for the D-Day landings since their unique shape would make them easily identifiable to Allied gunners. However, all but one P-38 group in Britain was re-equipped with P-51s while another group received P-47s. The 374th FG retained their P-38s until VE-Day.

The early Pacific War saw America trying to send any form of fighter aircraft to counter the Japanese. These were usually single squadron, not group, deployments and the 39th FS, 35th FG, had its Bell P-39 Airacobras replaced with Lightnings. The first victories for these P-38s took place on December 27, 1942 — more than a year after Pearl Harbor, illustrating the early problems of production and supply. The P-38 force then began to build rapidly with the 9th FS, 49th FG, and 80th FS, 8th FG ("The Headhunters") receiving their Lightnings in early 1943. The long supply train was a problem and it was not until September 1944 that these groups had complete squadrons of P-38s.

The Lightning excelled in the south-west Pacific, with one fighter group, the 475th, scoring 545 victories in two years. The 49th FG, mostly using P-38s, accounted for 678 aircraft.

The Thirteenth Air Force operated two groups of P-38s, the 8th FG and 347th FG, while the Seventh Air Force had the Lightning-equipped 531st FS, 21st FG. The Tenth Air Force had the P-38s of the 459th FS, 80th FG; the Eleventh Air Force had the 54th FS, 343rd FG, and the Fourteenth Air Force flew P-38s with the 449th FS, 51st FG. As the invasion of Japan loomed, hundreds of new Lightnings were shipped to the Philippines and other USAAF depots and new squadrons probably would have been formed for the invasion. Following the surrender of the Japanese forces, however, the new aircraft were simply destroyed on site.

Sky Spies

With its compartmentalised nacelle, it is hardly surprising that the P-38 was soon altered to carry cameras in its nose. After Pearl Harbor the USAAF realised the importance of strategic reconnaissance, and consequently more than one in eight Lightnings was provided with cameras instead of weapons, providing the USAAF with one of its most effective reconnaissance tools of the war.

As the war evolved in Europe and the USA was drawn into the conflict, the British and French knew that the speed at which the German war machine moved made real-time intelligence extremely important. The best method of intelligence gathering was, of course, by aircraft. However, most reconnaissance (or observation, as the mission was usually classified at that time) aircraft were slow, lumbering types that offered stable platforms for cameras. To send such machines into areas where Messerschmitts had air superiority was suicide, but commanders often had little choice.

Specialised photo-reconnaissance aircraft were badly needed. After France was overrun and the British Expeditionary Force driven from Dunkirk, it became essential to obtain photographs of events in occupied Europe. Since the USA and its Allies had such a great need for new aircraft, orders were being placed even before the YP-38 service test aircraft flew. On August 30, 1940, the USAAC placed a contract for 410 P-38s, a significant order, as it specified that some of the aircraft would be built as F-4, F-4A, F-5 and F-5A photo-reconnaissance (PR) variants.

The Lightning F-4/F-5 embodied a relatively simple airframe modification. The guns and accessories were removed and camera mounts and clear-vision windows installed, along with the requisite wiring and controls for the pilot. The first photographic Lightnings had their nose profile changed only slightly to accommodate the cameras, but later variants sported noses that were complete departures from the fighter's original proboscis.

Lockheed and the military felt that the PR aircraft could dispense with armament and rely on high speed and high altitude for protection. The idea had merit, but as the enemy began developing advanced fighters the life of a PR pilot became fraught with danger. Moreover, as the war progressed, commanders wanted the PR aircraft to fly lower to obtain more detail on enemy movements.

Much of the modification work was done at depots such as the one in Dallas, where Lightnings were flown from Burbank to have the armament removed and the photographic modifications made. This way, the main production lines were not slowed down by having to build different variants simultaneously.

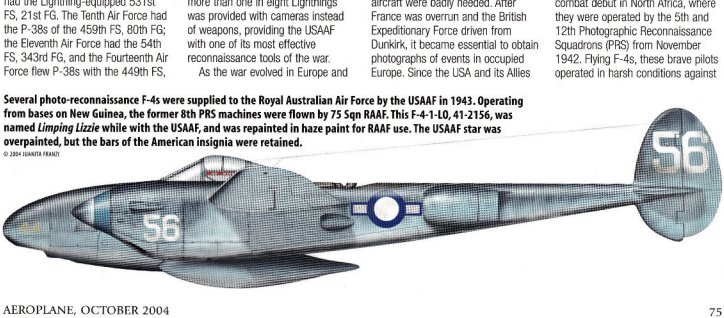
The PR Lightnings made their combat debut in North Africa, where they were operated by the 5th and 12th Photographic Reconnaissance Squadrons (PRS) from November 1942. Flying F-4s, these brave pilots operated in harsh conditions against

The RAF Lightning — it could have worked...

IN MAY 1940 THE FRENCH ORDERED 417 P-38s (designated Model 322-Fs), while the British requested 250 Model 322-Bs. Inexplicably, both commissions requested that the Allisons be fitted without turbosuperchargers and counter-rotating propellers. By the end of June France had capitulated, and the Model 322-Fs were added to the British order. British pilots went to Burbank to fly the new fighter, and were unanimous in their dislike of the British variant, deeming it useless as a fighter. The Ministry of Supply announced that it would accept just three Lightning Is for testing in Britain (AF105–107), refusing to accept any more. Arriving in March 1942, these did not enter RAF service and were returned to the US Army Air Forces. Had the British persevered with the Lightning Mk II (with the standard powerplant equipment) it would have provided the RAF with another outstanding and much-needed fighter

"The Lightning excelled in the south-west Pacific, with one fighter group, the 475th, scoring 545 victories in two years. The 49th FG, mostly using P-38s, accounted for 678 aircraft"

Several photo-reconnaissance F-4s were supplied to the Royal Australian Air Force by the USAAF in 1943. Operating from bases on New Guinea, the former 8th PRS machines were flown by 75 Sqn RAAF. This F-4-1-LO, 41-2156, was named *Limping Lizzie* while with the USAAF, and was repainted in haze paint for RAAF use. The USAAF star was overpainted, but the bars of the American insignia were retained.



an enemy who had yet to suffer defeat. The units eventually received F-5s, and were joined by two squadrons of the 3rd Photographic Reconnaissance Group (PRG).

Such was the importance of these "sky spies" that some fighters were converted to the PR role in the field. Some retained a modicum of armament, usually two or three 0·50in guns that would prove a nasty surprise to an enemy who thought he was attacking an unarmed aircraft.

The 28th Composite Group flew F-4s in Alaska from 1942, operating over the freezing Aleutians where enemy floatplane fighters were attempting to control the skies over the two islands they occupied — the only American territory occupied by the Axis forces during the war. It was a difficult operating environment, neither the enemy nor nature giving any quarter, and losses were high.

The 8th PRS, with its distinctive "8-Ball" insignia, started operating in New Guinea, where the powerful Lightnings often outran Japanese fighters, bringing home photographs that enabled the bombers to destroy the enemy's bases.

The 9th PRS took its Lightnings to war over India, another rugged combat zone where a downed pilot often remained permanently missing.

Operating from the UK, the Ninth Air Force flew four squadrons of PR Lightnings, the 30th, 31st, 33rd, and 34th PRS operating daily over Fortress Europe and bringing back essential intelligence for bombing missions and the coming invasion. After D-Day in June 1945 these units moved directly into France, often operating from improvised airstrips to provide the latest intelligence for the fast-moving armies.

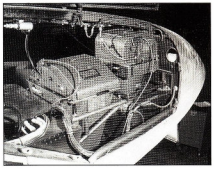
The USA supplied PR Lightnings to some of its Allies. The Royal Australian Air Force briefly operated a few, but it was the Free French Air Force that achieved the greatest success with them, operating far and wide over Nazi-occupied territory. French F-5s flew alongside the Lightnings of the 3rd PRG, Twelfth Air Force, and famed French author and record-setting aviator Antoine de Saint-Exupéry disappeared during one of these missions (see page 36 for more information). The PR Lightnings greatly contributed to ending the war but, with the coming of peace, most of them were ignominiously blown up at their bases.

Lightning Nightfighter

By early 1943 the USAAF had pinned its nightfighting hopes on the newly-developed Northrop P-61 Black Widow, but delays in its acceptance

ABOVE **Allisons on a haze-camouflaged F-5B receive some final work at the factory. The haze finish gave the upper surfaces a very dark blue colour and lightened to a very pale blue, almost white colour on the aircraft's underside.**

RIGHT **The nose of a P-38 modified to F-4 configuration showing two vertical cameras. The F-4 could carry four cameras, the pilot operating their controls via switch boxes.**
BELOW **Roaring in at 50ft, a USAAF F-5B pilot snapped this photograph of a captured German airfield on July 9, 1945.**



ABOVE **With the longer, squared-off nose of the F-5G, the PR Lightnings lost some of their elegance, but it markedly improved their efficiency.**

meant that a stopgap had to be found. Trainee nightfighter pilots gathered at Williams Field, Arizona, were to form the central core of the 418th and 419th Night Fighter Squadrons (NFS), but there was a long way to go before they became effective units. The aircraft awaiting the trainee night warriors were a mixed bag of RP-322 Lightnings and sluggish Douglas P-70s (nightfighter version of the A-20).

Training in RP-322s and P-70s gave valuable twin-engine experience, but an effective method of dealing with enemy aircraft had yet to evolve. The key to the whole operation lay in an effective radar system and the speed to intercept and destroy night intruders.

By the end of training the new nightfighter pilots realised that the Black Widow would not be forthcoming, and resigned themselves to the fact that they would be going overseas with P-70s. The pilots were shipped to Guadalcanal, where they arrived towards the end of 1943.

The 418th NFS had been activated on March 17, 1943, and its first overseas base was Milne Bay, New Guinea, which it occupied on November 2, 1943. In operation, the P-70 proved to be a failure in most respects, and some enemy bombers could actually outrun the modified Douglas light bomber. The 419th NFS arrived at Guadalcanal on November 15, 1943, and immediately began experiencing the same problems as the 418th. There were insufficient P-70s to bring the units up to full strength, so each squadron was assigned a small number of P-38H Lightnings, which were a great

A Study in Scarlet — Milo Burcham and *Yippee*, the 5,000th Lightning

LOCKHEED TEST PILOT MILO BURCHAM was something of a cowboy. Burcham would often drive his battered old Ford to his stables and saddle up his favorite horse, Smokey, for the 2½-mile ride to Lockheed. Arriving at the old Spanish-style house taken over by Lockheed for use by the test pilots, he would then jump on a bicycle and pedal to the flightline. Hired by Lockheed as a ferry pilot in 1937, two years later he was sent to Britain and put in charge of flight testing at the company's Liverpool division. On his recall to Burbank, his skill as a pilot brought about his assignment to flight testing, where he began flying YP-38s.

Burcham did not leave the hazardous flying to others, and often undertook the most risky test flights himself. He was eager to help young USAAF pilots master the P-38, and during the summer of 1945 undertook a tour of Fourth Air Force training bases in the USA to show the students P-38 manoeuvres they thought impossible — especially manoeuvres at slow speeds and low altitude with one engine out. When the time came to celebrate the production of the 5,000th Lightning, a fire-engine-red colour scheme was chosen along with the name *Yippee*, an old cowboy term that Milo thought most appropriate, which was emblazoned on the nose and under the wings. Milo took the spectacularly-painted P-38J-20-LO up on May 17, 1944, for a flying display over Lockheed and Burbank. Sadly, Burcham was killed less than six months later while testing the new Lockheed XP-80 jet fighter

ABOVE **Milo Burcham displays *Yippee* over Burbank. The bright red paint was set off by highly polished propeller blades. After being used for publicity purposes, *Yippee* returned to normal military configuration.**

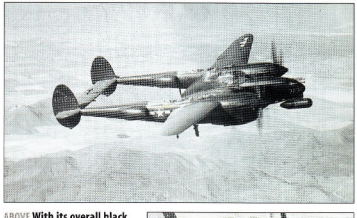
improvement over the P-70s in terms of performance.

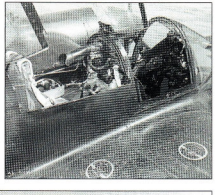
The P-38Hs were stock day-fighters with no radar or any other equipment for finding the enemy at night. The Lightning pilots would wait until the enemy were over target and, hopefully, illuminated by searchlights, would then try to pick out the outline of enemy aircraft and intercept them. This method had its dangers, as the P-38 was vulnerable to anti-aircraft fire from defenders as well as to the Japanese bombers' gunners.

Lieutenant Donald Dessert of the 419th checked out in the first P-38H assigned to the unit and flew the first searchlight patrols between 1945hr and 2145hr on December 10, 1943. The patrol proved fruitless, and other pilots were equally baffled in trying to find the enemy by searchlight. The method had been used in Britain during the early days of the war with some success, but it was far from ideal. Ground control interception (GCI) radar was later installed to help vector the P-38H pilots on to their targets, but did little good.

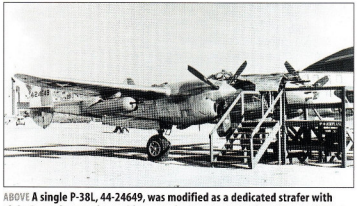
Although nearly 400 night missions were flown by the end of 1944, the 419th's pilots claimed only three enemy aircraft. One pilot, Henry Meigs, nailed two Mitsubishi G4M "Betty" bombers over Guadalcanal and was personally awarded the Distinguished Flying Cross by Admiral "Bull" Halsey, who was probably just happy to see some victories from the nightfighter units.

The American talent for improvising in the face of adversity came to the fore in the quest for an efficient nightfighter. Pilots and mechanics of the 6th Fighter Squadron (FS), the ancestry of





ABOVE **With its overall black camouflage, flash muzzles for the weapons, and radar pod, the P-38M nightfighter had a somewhat pugnacious appearance. Note the radar aerials mounted beneath the starboard wing.**
RIGHT **A tight squeeze — even with the bulged canopy, space was at a premium for the P-38M's radar operator.**



ABOVE **A single P-38L, 44-24649, was modified as a dedicated strafer with eight Browning 0·50in machine-guns in the nose and wingracks capable of carrying another two weapons per side, offering a potent combination of 12 forward-firing guns. The strafing role, however, was well covered by B-25s.**

which could be traced directly back to the First World War 6th Aero Sqn, fitted out at least two P-38Gs with a second seat and an SCR-540 radar unit mounted in a drop tank. The radar gave the two-man crew the "night eyes" they needed, but the New Guinea detachment of the 6th was disbanded before the ingenious invention could be used in combat. Other modifications were carried out, the 547th Night Fighter Squadron (NFS) in the Philippines modifying at least two P-38Js with AN/APS-4 radar pods.

The thought of converting the Lightning into a dedicated night-fighter seems to have occurred to several people at the same time. The P-38 was a good choice for the nightfighter role. It had excellent visibility, long range, heavy armament and the added reliability of a second engine. Back in the USA, at least one P-38J had been reworked to carry AN/APS-4 radar in a large glassfibre pod. During initial tests the pod was carried under the rear fuselage, but it was quickly damaged by the hail of expended cartridges when the machine-guns and cannon were fired. The pod was then moved to an outboard wing panel, and the installation worked fairly well.

A few P-38s had been converted in the field to two-seaters. These were often used as squadron hacks, and to give the groundcrews a taste of flying. Others were modified to carry high-ranking officers on fast (and heavily escorted) trips over battlefields to observe the situation from the air. The P-38 was fully capable of carrying a second seat, but the installation, usually in the space directly behind the pilot,

ABOVE **The business end of the P-38M nightfighter, with its distinctive AN/APS-6 radar and pod. Although intended as a P-61 Black Widow stopgap, the P-38M proved superior in performance to the Northrop machine.**

offered little room and extremely little in the way of comfort.

All of these factors were eventually combined and, during the last few months of 1944, the USAAF contracted Lockheed for the conversion of a P-38L into the new role of nightfighter. In the meantime, deliveries of Black Widows to combat units had started, and the P-61, while it had its problems, was infinitely better than any other attempt at a nightfighter. The 418th NFS quickly dumped all but two of its P-38s. This duo continued night operations and, on February 22, 1944, Lt Dorval Brown made the first nocturnal bombing raid on Rabaul, in company with Capt Emerson Baker in the other Lightning. These non-radar P-38s still had no success in tracking enemy fighters, but they did participate in night harassment missions against the Japanese.

The first P-38M was 44-26865 (there were no XP or YP M models, the series assuming immediate operational production). Modifications included the installation of the radar in a large glassfibre pod under the nose, blast muzzles on the weapons to prevent the compromising of the pilot's night vision, and a second seat behind the pilot for the radar operator (RO). The RO sat perched higher than the pilot, with the viewing port for the radar set projecting into his face.

To give the RO some room, his position was fitted with a blown bubble canopy but, even so, it was a very tight fit and the ROs were chosen with a regard to their height (or lack of it). The first flight of the P-38M took place on February 5, 1945, by which time the P-61 was firmly established in service and setting an impressive record against rapidly dwindling enemy air forces. Although the USAAF ordered 75 P-38Ms, this seemed almost a token gesture, since the war was approaching a victorious conclusion.

Flight testing of the P-38M started in July 1945 at Hammer Field, the large nightfighter base just east of Fresno, California. Testing revealed that the aircraft had a better performance envelope than the P-61, but that the P-61 was better suited to the role. Records of P-38M deployment are not entirely clear, but it appears that only four reached the Philippines before the war's end. However, P-38Ms were stationed in Japan with occupation forces (the 418th NFS, which became part of the 421st NFS), though they did nothing for the war effort since, by today's standards, the force was absolutely minuscule. Most P-38Ms remaining in the USA were scrapped or put up for sale as surplus.

Lockheed P-38 Lightning Variants

XP-38 (Lockheed Model 022-64-01) Advanced long-range interceptor with two Allison V-12s, propellers rotating inwards and provision for four 0·50in guns plus one 23mm gun in nose (not installed).
YP-38 (Model 122-62-02) Thirteen pre-production Service test examples. Polished natural metal and sprayed aluminium finish. Allison engines with outward-rotating propellers. Armament, often not installed, two 0·50in guns, two 0·30in and one 37mm cannon
P-38 (Model 222-62-08) First production variant, 30 built. Limited armour and four 0·50in guns and one 37mm cannon. Delivered in Olive Drab and Neutral Grey camouflage. Most used for training
XP-38A (Model 622-62-10) Experimental conversion of P-38 serial 40-762 to test pressurised cockpit
P-38D (Model 222-62-08D) Same as P-38 but with more military equipment, including self-sealing tanks and extra armour. Flares added, plus low-pressure oxygen system. 36 built
P-38E (Model 222-62-09) Same as P-38D, but with reworked hydraulic system. The 37mm cannon replaced by more reliable 20mm Hispano. Some had Curtiss Electric propellers and most had SCR274N radio. 210 built, some converted to P-38F-4-1-LO
P-38F (Model 222-60-09) Variants of the F received new model numbers: P-38F-1 was **Model 222-60-15**, P-38F-5 **Model 222-60-12**; other models became **322-60-19**. P-38F had pylons inboard of the engines for 2,000lb of bombs or fuel tanks. The P-38F-15 introduced modified Fowler flaps
P-38G (Model 222-68-12) Essentially same as P-38F except for new engines (V-1710-51/55) and revised radio equipment. P-38G-13 and P-38G-15 were **Model 322-68-12**; these machines were RAF Lightning Mk IIs not delivered
P-38H (Model 422-81-20) Two Allison V-1710-89/91s with automatic oil radiator gills for improved cooling. Carriage of bombs or fuel increased to 3,200lb. 601 built; 128 finished as F-5Cs
P-38J Distinctive large chin radiators for improved cooling. Greater fuel capacity. With the J-10 a flat, optically perfect bulletproof windshield was introduced. P-38J-15 had new dive brakes and power-assisted ailerons. Most delivered in natural-metal finish. Total of 2,970 built, including F-5B/F-5E/F-5F PR variants. **Model 422-81-14** covered the P-38J-1 and P-38J-5, **422-81-22** the P-38J-10, **522-81-22** the P-38J-15 and -20, and **522-87-23** the P-38J-25
P-38K (Model 422-85-22) One aircraft only. Same as P-38J, but Allison V-1710-75/77s were equipped with paddle-bladed propellers
P-38L (Model 422-87-23) Same as P-38J but with V-1710-111/112 engines. Landing light in port wing. Connections for ten 5in rockets under the wings
P-38M (Model 522-87-23) Conversion of basic P-38L airframe into two-seat nightfighter (75 built) with radar in nose pod. Most delivered in overall black finish
XFO-1 Five P-38F-5B-LOs assigned to US Navy in North Africa with BuNos 01209–01212.
F-4-1 (Model 222-62-12) Unarmed PR version of P-38E with four K17 cameras and autopilot; 99 aircraft built. F-4A-1 used the P-38F basic airframe; 20 built. Most delivered in haze camouflage
F-5A (Model 222-68-16) P-38G modified for PR. F-5A was **Model 222-62-16** ; F-5A-3 was **Model 222-68-16** as was F-5A-10. Most delivered in haze camouflage
F-5B (Model 422-81-21) Adaptation of P-38J-10 for PR; 200 built
F-5C (Model 222-68-16) Modification of P-38H for PR; 123 built
XF-5D (Model 222-68-16) Rebuild of F-5A-10 with Plexiglas nosecone and prone observer's position. Two 0·50in guns and vertical camera
F-5E PR modification of the P-38J-15, P-38J-25 and P-38L-1. F-5E-2 was **Model 422-81-22** (P-38J-15), 100 built; F-5E-3 **Model 522-87-23** was conversion of 105 J-25s; F-5E-4 **Model 422-87-23** was conversion of 500 P-38L-1s
F-5F-3 (Model 422-87-23) PR conversion of the P-38L-5
F-5G-6 (Model 422-87-23) F-5F-3 with different camera equipment
Model 322 Lightning 243 Lightning Mk Is ordered for RAF (AE978–999, AF100–220), majority taken over by USAAF as P-322 and flown as advanced trainers. Order for 524 Mk IIs (AF221–744) cancelled

Lockheed Production	9,924
Vultee Production	113
Total built	**10,037**

PAINTING BY MICHAEL O'LEARY

A Force of Nature

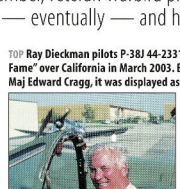
Ever since he could remember, veteran warbird pilot **RAY DIECKMAN** longed to fly the Lightning. He got what he wanted — eventually — and here describes a typical flight in the twin-boomer

AS A YOUNG MAN growing up with the desire to go aloft in any and all kinds of aircraft, I never dreamed that I would be able to fly something as beautiful as a P-38. However, looking back from my early flying days in a Piper Cub to my current "ride", the Boeing 777, the chips always seem to have fallen into place. After decades of flying I had the background to accomplish my youthful goal. Since I could not afford to buy a P-38, who was going to let me fly theirs?

In 1990 my friend and flying buddy, Gen Bill Lyon, bought a P-38 at The Museum of Flying Auction. I called him the next day to offer my services. Bill's response was: "Sure, no problem. You can fly it right after me!" Well, he never flew the P-38 and the aircraft kept eluding me, and was then sold. However, I was put in touch with Ed Maloney and Steve Hinton at The Air Museum "Planes of Fame" in Chino, California. After successfully restoring a North American T-6 and campaigning the thing around for a few years, I was given the opportunity by Ed and Steve to check out in the P-51. Then the Grumman F6F Hellcat, Curtiss P-40, Vought F4U Corsair, Douglas SBD and Skyraider, Grumman F8F Bearcat and a few others.

Every time I saw a P-38 fly I could not take my eyes off it. When I flew in formation with one, the desire to get at the controls became even greater. Maintaining my ever-present optimism and trying to preserve my untarnished safety record of always returning from a mission, I secretly hoped that everyone at the museum who was checked out in the P-38 would be taken sick simultaneously; then my dream could come true!

TOP **Ray Dieckman pilots P-38J 44-23314 *Porky II* of the Air Museum "Planes of Fame" over California in March 2003. Before it was painted in the colours of Maj Edward Cragg, it was displayed as 42-3314 *Joltin' Josie*.**



ABOVE LEFT **American Airlines Boeing 777 pilot by day, Ray Dieckman finally got the chance to realise one of his dreams in 2003, when the Air Museum asked him to manage the museum's Midwest tour, which meant being current on all the types on the tour — including *Porky II*.**

ABOVE RIGHT **The immaculate and spacious cockpit of *Porky II*.**

In 2003 the chase was over and the P-38 finally came within my grasp. Steve Hinton and I struck a deal. I would manage the museum's Midwest warbird tour with the Corsair, Hellcat, Warhawk and Lightning. Of course, being the chief pilot of this collaboration meant I had to be checked out in all of the assets. As I had already flown the other three, it was time for my first checkout in the P-38.

The checkout ran thus:

1. Do not forget to latch the canopy properly or it will blow off
2. Roll up the side windows; they are part of the flight structure
3. As with all twins, get above minimum control speed (V_{mc}) after take-off. Get the gear up
4. If you lose one, reduce power on the good engine immediately, otherwise the aircraft could torque-roll
5. After take-off, check the temperatures, get the coolant doors in auto (not too hot, not too cool)
6. Reduce power. Be nice to the engines and they will be nice to you. Know your powerplant settings and keep them harmonised

Now for the flight. As with most checkouts, you prepare for all anomalies and things that never happen — but might. So what could go wrong with a 60-year-old aircraft, even if it is well maintained?

1. You could lose an engine. Feather the prop, get the speed above V_{mc} (160 m.p.h.). Plan your approach and landing, keep the aeroplane clean until you are set up for landing. The P-38 does not like to stay level on one engine with gear and flaps down. Carefully coach the beast back to base.

2 Coolant overtemp: open coolant doors, open oil doors, think about the set-up and landing at the nearest suitable field
3 Catastrophic engine failure with fire: Get reasonable altitude and bale out
4 Undercarriage emergencies: know your systems

The P-38 does not leap into the air like a lot of aircraft I have flown. You have to get the nosewheel off the ground and really coax it into the air. The original flight test report discusses this procedure and explains it as an anomaly due to having a nosewheel instead of a tailwheel, and the negative camber in the wing.

Meanwhile, back in the cockpit:

1 We are on the power at 45–54in manifold pressure (MP)
2 Check the propellers at 3,000 r.p.m.
3 Scan the engine instruments
4 Check flight instruments
5 Start rotation at 90–100 m.p.h.
6 With a positive rate of climb, undercarriage up
7 Look for 125–140 m.p.h., above V_{mc}
8 METO (maximum except take-off) power is 42in MP, 2,600 r.p.m.
9 Climb power is 35in MP, 2,500 r.p.m.
10 Maximum cruise power is 35in MP, 2,300 r.p.m.
11 Normal cruise is 30in MP, 2,000 r.p.m.

At first the aircraft feels a bit stiff and is not nimble. I wanted the P-38 to feel more like a fighter; it just did not.

Climbing out — more tasks:

1 Check hydraulic pressure
2 Undercarriage up and locked, pressure is up
3 Boost fuel pumps off, check PSI
4 Coolant temps; a little cool, get them into auto to be regulated
5 Check oil temps; close the doors a little more and get them in the middle of the green

You are doing all these chores while communicating with air traffic control and your wingmen, watching out for other traffic, and flying the aeroplane on the desired track. In the P-38 you are very busy during your first few hops, and there is no time for navel-gazing. After completing all the cockpit management stuff you finally get to sit back, take a deep breath, look around and smell the roses.

Now the P-38 is in its element. It has quit growling and you have coaxed it into its sweet spot. It is a cruiser. The aeroplane feels good and comfortable. With the external tanks it has long legs and is built for comfort — if there is such a thing in a single-seat fighter.

Now you are sitting in the cruise mode, with all that trepidation behind you, you feel good but it is time to land. Can we not just stay here a little longer? No, your fighter pilot's sore backside replies.

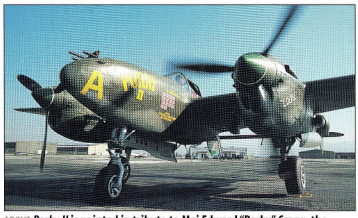
For descent and landing, you need to do the following:

1 Fuel on fullest tanks. Mixture to auto rich
2 Check temps and PSI
3 Flaps for approach. Check hydraulic PSI
4 Undercarriage down, three green, check PSI
5 Full flaps
6 120 m.p.h. approach speed
7 100 m.p.h. over the fence
8 Bleed off to 80 m.p.h. in the flare and land

After turning off the runway:

1 Open coolant doors
2 Flaps up
3 Open oil doors
4 Trim reset
5 Roll down windows

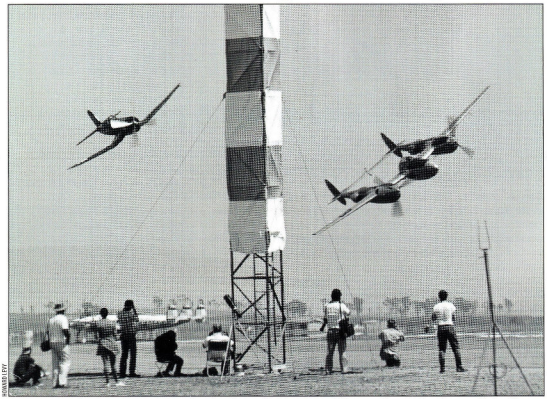
As a comparison, I have always said a Corsair lands like a butterfly with sore feet. The P-38 lands Archie Bunker-style, just plopping down after a hard day at work. A



ABOVE ***Porky II*** **is painted in tribute to Maj Edward "Porky" Cragg, the inspirational commander of the 80th FS, shot down in the original *Porky II* on December 26, 1943, after downing his 15th Japanese fighter.**

Greased Lightnings

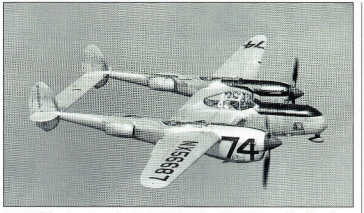
After the end of the war, a Lightning could be picked up for next to nothing — a fact exploited by ambitious but inexperienced air racers, as **MICHAEL O'LEARY** explains



ABOVE **Gary Levitz streaks round the pylons in his P-38 in the 1970s with Gene Akers's FG-1D hot on his heels.**

"WHEN I GOT TO KINGMAN, I was like a kid in a candy store," recalls William P. Lear Jr. "There were more than 5,000 ex-military aircraft parked on the desert floor. I was after a Lockheed Lightning. I went through rows of virtually new aircraft, picked one out, paid $1,250 my dad had given me, and was then the owner of a gleaming F-5G. I was 17 years old and I wanted to go racing. Only trouble was, I had never flown a Lightning or any other high-performance aircraft."

Lear had built up a few hundred hours of twin-engine flight time, and climbing into the Lightning he realised he had no idea how to start



ABOVE **William Lear Jr posing his F-5G Lightning, NX56687, over San Francisco Bay for photographer Bill Larkins in the late 1940s. Famed aerobatic pilot Betty Skelton is crammed behind the young pilot.**

the thing! He motioned over a mechanic who showed him how to get the Allisons going and he was soon taxying to the active. Pushing the throttles forward, he was on his way. However, he had the side windows rolled down. The Lightning does not like to fly with the windows down, as Lear discovered as he roared down the runway.

"While trying to control the aircraft to get it airborne, I was desperately trying to wind the windows up, but they wouldn't stay. The buffeting started again. I was now indicating about 120 m.p.h., and the damned aircraft had still not flown itself off the ground, as my erstwhile mechanic had promised. I finally saw the window ratchet latches, locked them and madly cranked them up while I grabbed a handful of wheel and yanked the bird into the air. I had already burned up a lot of runway. That mechanic may have known how to start up a P-38, but he sure didn't know anything about flying one. Nor did I. But I was about to learn."

The date was May 20, 1946, and Lear had bought the Lightning to enter the aircraft in the cross-country Bendix Trophy race from Van Nuys, California, to Cleveland, Ohio. The popular National Air Races had started up again with the end of the war but instead of the unique, wildly advanced racing aeroplanes of the 1930s, the field was now dominated by surplus military aircraft. Lear had purchased the PR Lightning because it had an advanced ADF (automatic direction finder) which was ideal for a cross-country event.

After flying the P-38 to his home airport at Compton, California, Lear made a few preparations but it was an essentially stock machine that left Van Nuys on the morning of August 30, 1946 (his dad made him replace the ADF with Lear avionics which, the young pilot later commented, "were crap"). With one fuel stop, the young pilot was outclassed by other machines and aviators such as Paul Mantz in his P-51. However, he did manage to come in 14th in a field of 16, averaging only 327 m.p.h. with a total elapsed time of 6hr 15min 45sec. "But I was there. And I had finished! I may not have been the smartest, or the fastest, but, by God, I had given it my best shot — and I had done it. And I still hold the record for being the youngest to have ever flown the Bendix."

Since new Lightnings were so cheap, many were snapped up by pilots who wanted to race the cross-country Bendix and the Thompson pylon event. Some were raced virtually stock, others saw wild modifications. However, the Lightning could not compete with souped-up Mustangs like Mantz's.

The re-started Cleveland National Air Races lasted only four glorious years. At the end, there was little market for P-38s but some were sold to mapping companies, a couple smuggled to foreign air forces, while others were left to rot. However, some of the machines survived to form the basis of the few flying Lightnings that we have today.

Lightning Survivors (flyers listed in red)

P-38F

41-7630 Registered N5757, *Glacier Girl*, based at Middlesboro, Kentucky, USA. Airworthy
42-12647 National Museum, Port Moresby, Papua New Guinea. Wreck for possible restoration
42-13084 National Museum, Port Moresby, Papua New Guinea. Wreck for possible restoration

P-38G

42-13400 Elmendorf AFB, Alaska, USA. Gate guardian

P-38H

42-66841 Classic Jets Fighter Museum, Adelaide, South Australia. Currently under restoration
42-66905 National Museum, Port Moresby, Papua New Guinea. Wreck for possible restoration

P-38J

42-67638 Hill AFB, Utah, USA. On display
42-67762 National Air and Space Museum, Washington DC, USA. Currently on display
42-104088 Registered N38LL. Ex-Commemorative Air Force (CAF) wreck. Currently being rebuilt for private owner in southern California
44-23314 Registered N138AM, *Porky II*. The Air Museum "Planes of Fame", Chino, California, USA. Airworthy

P-38L

44-25786 Yugoslav Aeronautical Museum, Belgrade, Serbia. Stored incomplete
44-26761 Registered N2897S, Fantasy of Flight, Polk City, Florida, USA. Damaged airframe for restoration
44-26996 Registered N5596V. CAF, Camarillo, California, USA. Airworthy but currently under legal dispute
44-27083 Registered N2114L. Erickson Air Museum, Tillamook, Oregon, USA. Airworthy
44-27097 Registered N577JB. War Eagles Air Museum, Santa Teresa, New Mexico, USA. Airworthy
44-27183 Registered N718. Yanks Air Museum, Chino, California, USA. Airworthy
44-27231 Registered N79123. Ron Fagen, Minnesota, USA. Airworthy
44-53015 Ex-N9957F. McGuire AFB, New Jersey, USA. Outside display
44-53087 Registered N3800L. EAA Aviation Foundation, Oshkosh, Wisconsin, USA. On display
44-53095 Registered N9005R. Lone Star Flight Museum, Galveston, Texas, USA. Airworthy
44-53097 Ex-N3JB. Museum of Flight, Seattle, Washington, USA. On display
44-53186 Registered N38EV. Evergreen Heritage Collection, Medford, Oregon, USA. Airworthy
44-53193 Kissimmee, Florida, USA. Wreck for rebuild
44-53232 Ex-NX66678. USAF Museum, Dayton, Ohio, USA. On display
44-53236 Bong WWII Heritage Center, Superior, Wisconsin, USA. On display
44-53242 Tom Reilly, Kissimmee, Florida, USA. Ex-N57496 wreck for rebuild
44-53254 Registered N25Y. Lefty Gardner, Texas, USA. Currently under rebuild after forced landing

Several wrecked airframes remain in Alaska and on Pacific islands. Two Lightnings recovered from the Pacific are currently in southern California with at least one being rebuilt to flying condition

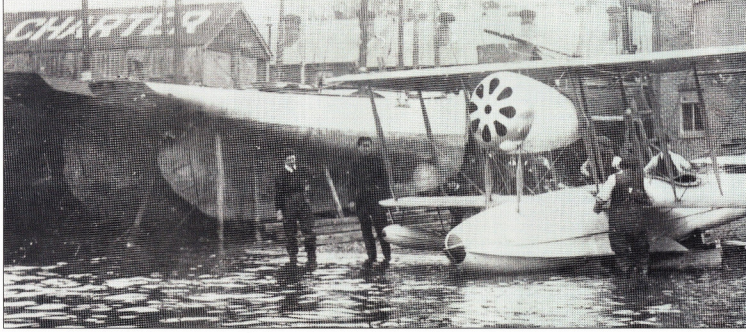
Next Month Database Examines…

The de Havilland Sea Vixen

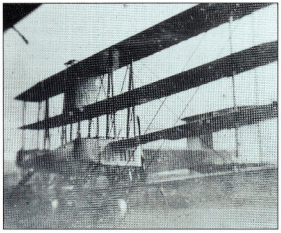
Tony Buttler tells the story of the mighty Sea Vixen — Britain's first aircraft to be designed as an integrated weapons system and the Fleet Air Arm's first swept-wing jet fighter

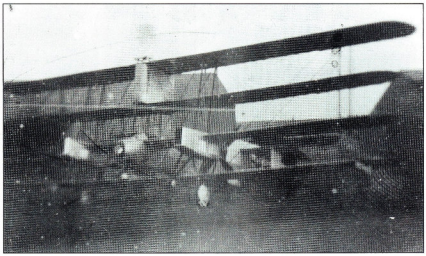
The First Supermarines

This selection of pictures was provided by **MR IAN RICHARDSON** of Andover, Hampshire, whose father, Cecil G.H. Richardson, joined Pemberton-Billing Ltd at Southampton on October 5, 1915, and took over complete charge of the drawing office until he left in June 1918, by which time the company had become the Supermarine Aviation Works



ABOVE The first Supermarine aeroplane, the Pemberton-Billing P.B.1 flying-boat, is brought to the edge of Southampton Water for flotation tests in the early months of 1914. Noel Pemberton Billing (no hyphen), founder of the company that later became the Supermarine Aviation Works, is the tall figure at the starboard wingtip, wearing a cap. At this stage the newly completed aircraft has no engine in the pear-shaped nacelle beneath the upper wing centre section. Later, an old 50 h.p. Gnome rotary was installed. The P.B.1 was destined never to fly. Visible here are the elegantly streamlined one-step hull with a spring-ejected mooring grapnel in its nose, the cockpit aft of the wing cellule, and the stabilising floats beneath the lower wingtips.

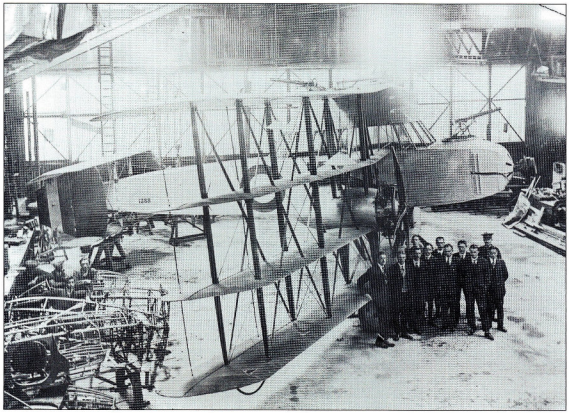


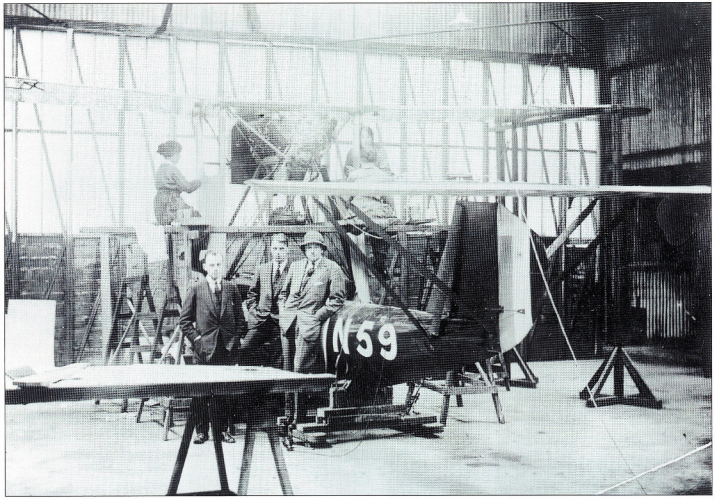


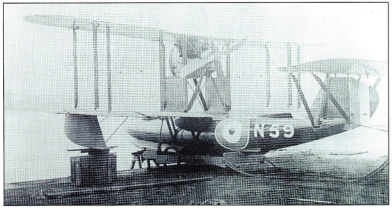
ABOVE & LEFT The extraordinary Pemberton-Billing P.B.29E (E for experimental) anti-airship quadruplane of late 1915/early 1916 was allegedly designed and built in seven weeks. The optimistic idea was that the quadruplanes would climb to 10,000ft and patrol the night skies over Britiain at low cruising speed until a German airship was sighted, whereupon the defending aircraft would pursue it at top speed and endeavour to engage it using its nose-mounted searchlight and machine guns in the nacelle fitted between the centre sections of the upper two wings. Power was provided by a pair of 90 h.p. Austro-Daimler six-cylinder watercooled engines driving four-bladed pusher propellers. Although the P.B.29E was never allotted a military serial number, it was tested at the RNAS aerodrome at Chingford, Essex, early in 1916, but was destroyed in a crash later that year. Photographs of the aircraft are scarce, so we make no apologies for the poor quality of these hitherto unpublished views, in which the nose-mounted searchlight and the gun mounting on the nacelle are clearly visible.

ABOVE The first Pemberton-Billing aeroplane to fly was the P.B.9 single-seat scout biplane, which Billing called the "Seven-day 'Bus" because he claimed that it was designed, built and flown in seven days. This was a slight exaggeration, as the process took nine days, and the wing cellule was a complete ready-made unit which Billing had purchased from E.C. Gordon England, who had built it for an uncompleted pusher biplane. Billing's designer at the time, a young Romanian named Carol Vasilesco, therefore only had to design the fuselage (see *The Seven-Day 'Bus*, October 1981 *Aeroplane*). The engine was the same old 50 h.p. Gnome that had been fitted in the P.B.1 flying-boat, and was by now producing substantially less than its rated power. The P.B.9 made its maiden flight from a field in the Netley area on August 12, 1914, and was still being flown in mid-1915, having been impressed into service as a training machine with the Royal Naval Air Service (RNAS).

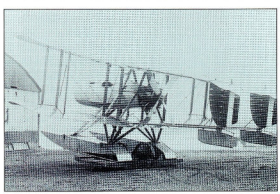
BELOW The P.B.29E's successor was the P.B.31E Night Hawk, of which two were ordered by the RNAS, serialled 1388 and 1389. Some of the company drawings of this machine bear the signature of a young draughtsman named R.J. Mitchell, who was under Richardson. Only the first was completed before the order was cancelled (ostensibly it was the rebuilt P.B.29E), and it is seen here in the Supermarine works, with a group of personnel posing beneath its starboard 100 h.p. Anzani nine-cylinder air-cooled radial engine. Although Lewis guns are in the nose and nacelle positions here, the upper position was subsequently fitted with a 1½-pounder recoilless Davis gun. The beam from the nose-mounted searchlight could be directed by the front gunner. After delivery to the Design Flight at RNAS Eastchurch in Kent during the week ending December 1, 1916, test pilot Clifford Prodger took it for its first flight in February 1917, but it was not up to the task and could never have caught a German airship. It was deleted on March 3 and scrapped on July 23. The group under the nose comprises, left to right, Victor Scott-Paine, five unknown men, Hargreaves, Mitchell (?), Richardson and two more unknowns.

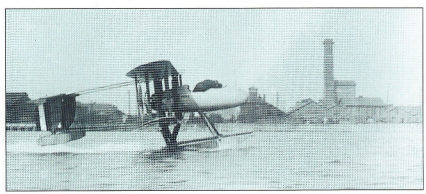




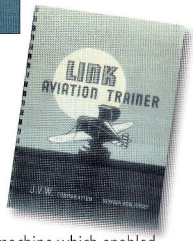


ABOVE & LEFT The elegant Supermarine N.1B Baby, which Richardson designed, was Britain's first fighter flying-boat. A single-seater powered by a 200 h.p. Hispano-Suiza engine driving a geared four-bladed pusher propeller, it first flew in February 1918. Three were ordered, serialled N59 to N61, but only N59 was completed; N60 was delivered to RNAS Grain as spares, and N61 was cancelled. Significant features were the elegantly streamlined 24ft mahogany hull, built on the Linton-Hope principle, and the inverted-camber tailplane mounted on top of the fin and rudder. The wings could be folded backwards. Despite its good performance and manœuvrability, the Baby did not go into production, but it was the forebear of the Supermarine Sea King fighter flying-boats and the racing Sea Lions, one of which won the 1922 Schneider Trophy contest. In the picture above, Richardson, Hargreaves and Hubert Scott-Paine pose with the N.1B Baby as it nears completion in the workshop (note the women working on the side curtains between the innermost interplane struts on either side of the yet-to-be-cowled engine).





ABOVE & ABOVE RIGHT Sponsored by the Air Department (AD) of the Admiralty in 1916, the two-seat AD Navyplane was designed by Harold Bolas of the AD in collaboration with Richardson and Mitchell of Supermarine, which built the sole example to be completed, 9095. First flown in August 1916, the Navyplane was intended for reconnaissance and bombing, and was initially powered by an American-designed 150 h.p. Smith Static ten-cylinder radial engine, as seen in the left-hand picture. The Smith Static engine proved troublesome and was replaced by a 150 h.p. A.R.1 rotary engine, and this was probably the installed unit when the right-hand picture was taken, depicting the machine taxying. Richardson is the man in the rear cockpit, leaning forward to impart advice to the pilot. When officially tested at Grain in May 1917 the Navyplane had a poor performance even without an observer and a military load, and it was deleted on August 27.



Finding the missing Link

In the late 1920s Edwin A. Link, an American aviator and inventor, devised a machine which enabled the student pilot to practice "blind flying" while remaining safely on the ground. **ROSINA BROWN** relates the history of the first flight simulator, and meets a husband-and-wife team who restore them

THE LINK SYNTHETIC INSTRUMENT Flying Trainer, invented more than 75 years ago, was the brainchild of Edwin A. Link, a self-educated aviator and inventor born in Huntingdon, Indiana, USA, in 1904.

Link's company, Link Aviation Devices of New York, devised the first truly effective flight simulator in 1929, although it did not arrive in Britain until 1936. Overtaken by the wonders of electronic computers and virtual-reality simulation, it is testimony to the soundness of Link's original design that his trainers still have a place in the training of amateur pilots who do not have the latest technology at their disposal.

Link constructed a model of an aircraft cockpit and, so that the movements of an aircraft could be realistically simulated, equipped it with an instrument panel and controls. The device could be used for instrument training by manipulating the controls on the basis of instrument readings. The artificial horizon on the instrument panel enabled the pilot to maintain straight and level flight or control climbs and descents with no visual outside reference.

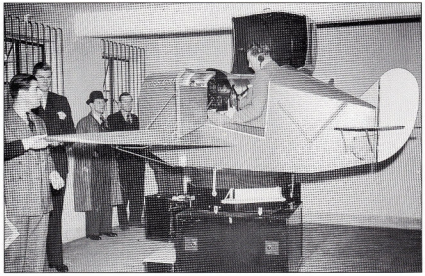
Before the advent of the Link, an aircraft would be flown with a hood over the pupil's cockpit, making it necessary for the tyro to fly relying solely on his instrument readings, or "flying blind". This practice could, of course, be extremely dangerous, not to mention expensive should the lesson not go according to plan.

Link training would usually follow the basic training of a pilot in an aircraft, and was used to teach him how to fly on his instruments alone, which often took longer to teach than the actual flying of an aircraft.

Link Trainers were produced in the 1930s and purchased by the US Government from 1934. Production increased rapidly with the approach of the Second World War, and this first successful flight simulator was used to teach basic instrument flying, instrument landing and radio navigation to more than 500,000 military pilots. As aircraft technology advanced, the trainer

TOP **Ken and Audrey Whiffin with the RAF Manston History Museum's Link D-4 in 1999. Photograph by IAN FRIMSTON/FUJI LAB.**
ABOVE **The cover of an original 1939 brochure for the Link Trainer.**

BELOW **A British Airways student in a Link at Gatwick in November 1937.**



RIGHT **An ATC cadet puts his flying skills to the test in the D-2 at Manston, with Ken Whiffin standing by as instructor.**

Finding the missing Link

was modified and commercial airlines began to use it to train their pilots.

The Link Trainer did not arrive in Britain until 1936, when Air Cdre Fellowes, following his meeting with Ed Link during a lecture in the USA, successfully demonstrated it to the RAF. This meeting also led to Fellowes becoming the sole agent for the Link in Britain.

A British company, JVW Ltd, was set up in Aylesbury, Buckinghamshire, and was responsible for all sales, installation, part servicing and maintenance. In 1946 JVW Ltd was taken over by a new company, Air Trainers Ltd, but the existing management and staff were retained, and took on research and development, leading to the eventual manufacture of the new D-4 Instrument Flying Trainer, the first model to be built entirely in England. With its bulging order-books, the company was producing up to 15 machines a month to satisfy home and overseas demand. More than 10,000 Links were built.

BELOW **The Link Trainer found favour all over the world, and was sold to 35 nations, including Germany, Italy, Russia, Japan and, as seen here in 1950, France.**

The advance of electronic technology in the early 1950s allowed the introduction of further improvements that made the simulators more realistic. Analogue computers led to more innovations, but also heralded the end of the Link Trainer era, allowing aircraft cockpits, controls and instrument displays to become more individualised. The Link Trainer could now be used only to prepare pilots for basic blind flying.

By the end of the 1950s pilots in America were being trained in simulators that precisely duplicated the cockpits of the aeroplanes they would be flying. Any modifications were easily incorporated and, with added virtual-reality simulation, highly complex real-life conditions could be reproduced.

Today flight simulation is essential for familiarising pilots with any new modifications to an existing aircraft, or for training them to fly a new model. Simulators are used widely by the military and by commercial companies.

Good as it would be for the Air Training Corps (ATC) in Margate, Kent, to have these state-of-the-art facilities available, they are beyond the corps' financial reach. However, Ken Whiffin and the RAF Manston History Museum have been doing their bit to provide the next best thing, in the form of Link Trainers, lovingly restored and in perfect working order.

An ex-RAF man, Ken has spent many hours restoring these forerunners of the sophisticated flight simulator. His pedigree is surprisingly similar to that of Mr Link. When not elbow-deep inside a D-4 Trainer, Ken, who is visually impaired, tunes pianos in his local area. Edwin Link once worked in a player-piano factory in the USA, and although the Link is part electrical, part mechanical and part electronic in operation, it is based on the common wood-and-fabric bellows. The vacuum-operated turn motor used in a Link is the same as that used to drive a Pianola; the only difference being size.

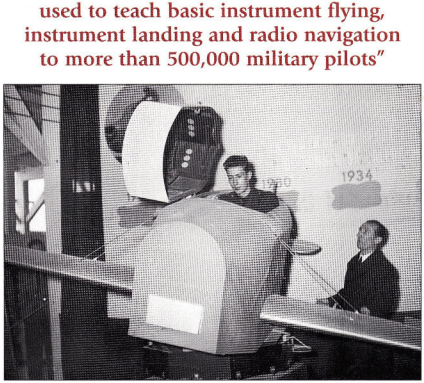
Ken's romance with the Link Trainer was rekindled when he was asked to go to ATC Squadron Headquarters in Margate to repair a radio. Ken served as a radio technician in the RAF. He was based at Finningley and in the Middle East, and on leaving the Service in 1959 as a flight lieutenant he worked for Phillips in Wandsworth, south London, also as a radio technician. Ken has been a dedicated radio amateur for many years, so there is little he does not know about the inside of a radio.

On his arrival at the headquarters Ken could not help noticing the wreck of a D-2, its component parts scattered around the room. It was explained to Ken that since the working Link had been moved from the ATC's previous Headquarters it had been gradually stripped down by various people, resulting in some parts being lost and some taken away.

Ken explains: "Because I couldn't keep my mouth shut about being involved with the Link during my time in the RAF, that day I got myself involved in the Link restoration business; a task which took me 2½ years to complete, starting from the floor up. When I took on this labour of love I didn't know what was missing, but with the help of a colleague who did the intricate manual work, owing to my failing eyesight, we gradually rebuilt the D-2 to its former glory. The biggest job was to make new bellows and re-cover them."

The Link's movements are caused by the main pitching and banking bellows and by the turning motor. Three main valves control the

"This first successful flight simulator was used to teach basic instrument flying, instrument landing and radio navigation to more than 500,000 military pilots"

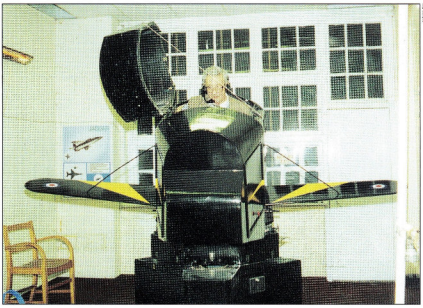


application of vacuum to the bellows and motor. These valves are secured to a common manifold connected to the main vacuum manifold to the Trainer, and are located beneath the cockpit floor. They are the nerve centre of all the Trainer's movements.

Four main components make up the D-class Trainer: the base, the revolving octagon, the fuselage and the desk. The base, which supports the octagon and fuselage, houses the base terminal box, the wind-drift mechanism and base teletorque assembly, as well as mechanical and electrical linkages to the fuselage and instructor's desk. The base terminal box also serves as a terminus for most of the wiring of the electrical equipment.

The octagon supports the fuselage. It is mounted on a main spindle and is free to rotate in either direction. A universal joint allows the fuselage to pitch and bank, and incorporates "take-offs" which transmit the pitching and banking movement of instruments and mechanisms in the fuselage. The most important contents of the octagon are the four main bellows providing the pitching and banking movements. Also attached to the octagon is the turning motor. Two pneumatic shock-absorbers stabilise the fuselage and manual and automatic locking devices. The fuselage houses the numerous pieces of equipment which transmit signals to the teletorque motors related to the various cockpit instruments, causing the instruments to give appropriate readings. The instructor's desk includes the automatic recorder, the radio control units, the remote instrument case and various remote controls.

Once Ken had successfully restored the D-2, it was only a matter of time before his next project cropped up. On a spur-of-the-moment visit to the RAF Manston History Club Museum, situated on Manston airfield, Ken happened

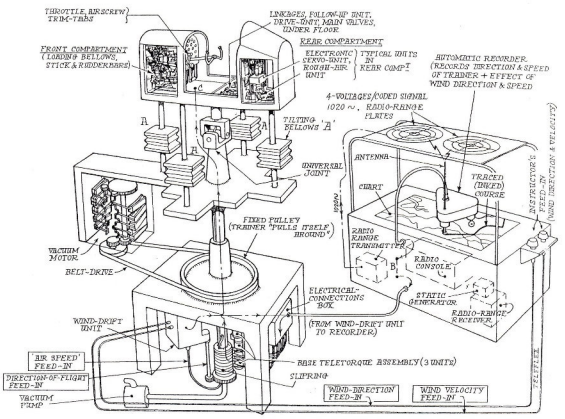


to notice a D-4 hidden away in the corner of the old hangar. This time it was his wife, Audrey, who could not keep quiet. "Oh look, a Link Trainer! He knows all about them, he's just done a D-2 for the ATC."

Peter Smith, the museum's Aircraft Restoration Officer, was delighted to explain to Ken the history of their D-4. The Trainer had been used for many years by the combined cadet force at Dulwich College in south London. When it began to emit smoke they stopped using it and decided to donate it to the History Section at Manston. It was complete.

The cockpit of the D-4 resembles that of any modern single-engined aircraft. Instruments on the D-4 include an airspeed indicator, altimeter vertical speed indicator, gyro-magnetic compass, artificial horizon, turn-and-bank indicator, magnetic compass, wheel and flap position

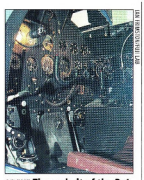
ABOVE **Ken Whiffin gives the D-2 at Manston a test flight. The D-2 was introduced in 1942, chiefly for British use, and was an improvement over the D-1 in having a wind-drift mechanism fitted.**



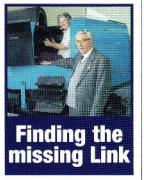
ABOVE **A Link Trainer before restoration at Manston. The fuselage was stored elsewhere at the museum.**

LEFT **A 1950 diagram of the layout of the Link D-4 by *The Aeroplane's* J.H. Clark. The radio system works as follows: voltages are impressed on radio range plates from the transmitter at "B"; picked up by antenna and passed to pre-amplifier and receiving amplifier, then through cable to base terminal box and up to fuselage control box at "C".**

RIGHT **The Link Trainer appeals to students of all ages, even the younger "computer generation", as this potential future pilot demonstrates in the D-4 at Manston.**



ABOVE **The cockpit of the D-4, with all the instruments needed to replicate a single-engined modern aircraft.**



Finding the missing Link

BELOW **Westland Whirlwind HAS.7 XN380 is one of two examples at the RAF Manston History Museum.**
BELOW RIGHT **The museum is housed in buildings formerly occupied by RAF Manston's Motor Transport Section.**

indicator, vacuum gauge, clock, automatic radio compass and instrument landing system (ILS) indicator. Although they were made for the Trainer, most are identical in appearance with standard units. The engine instruments comprise a tachometer, boost gauge, fuel and oil pressure gauges, fuel quantity gauge, carburettor, oil, engine and air temperature gauges. There are normal rudder pedals and a standard push-pull type wheel control. A standard engine control quadrant, flap and undercarriage operations, and control surface trim tabs complete the controls. There is a map-case in the door. A sliding translucent covering over the cockpit simulates cloud flying, and a further opaque cover cuts out all light for "night flying".

Ken's first task was to find out if the D-4 still worked. By using a domestic vacuum cleaner he found some signs of life, and, as luck would have it, he found a proper vacuum pump under a pile of junk in the hangar. He stuck it on and the Trainer "flew"! The main problem with any project like this is the lack of circuit diagrams, and as 4,500 new drawings were required for the original production of the D-4, the size of the task can be appreciated. Ken explains: "With nothing on paper you are literally 'flying blind'. We knew how it should work, but were afraid of blowing it up."

The present state of play is that the D-4 is at the point where it will "fly", but without the benefit of three of the instruments, the altimeter, air speed indicator and climb/dive meter. But as a determined Ken says: "The unit that drives those units is the one emitting smoke. The breakdown is in the oscillator that drives the units. We also have a fault in the wiring that I can't trace. But I will!"

Finding parts and drawings for the Link is a matter of contacting other collectors and enthusiasts around the country. Ken happens to know from previous conversations that Solent Sky (formerly the Southampton Hall of Aviation) at Eastleigh desperately wants a "crab". Manston has four, but they need manuals on the Link if they are to complete their restoration. Eastleigh can oblige. And so it goes on.

Other exhibits at the museum are in various stages of restoration. They include Gloster Meteor TT.20 WD646/"WD615", de Havilland Canada Chipmunk T.10 WP772, Westland Wessex HU.5 XS482 and two Westland Whirlwinds, HAR.10 XJ727 and HAS.7 XN380. There are also two training gliders on show, Slingsby Cadet TX.3 "VM791" and Slingsby Grasshopper TX.1 XA231. In addition several cockpit and nose sections are on display — Canberra B(I).6 WT205, Buccaneers S.1 XN928 and S.2B XV352, Victor K.2 XL190 and Valiant BK.1 XD857.

The RAF Manston History Society and Museum all started in the late 1980s, when an airshow was being staged at RAF Manston for the first time since the 1950s. Service people, interested in the history of aviation, thought it would be an added attraction for the public if some "bits and pieces" from bygone days could be put on show. A small collection of personal mementoes of aviation's past was assembled. Manston's Commanding Officer at the time, Tom Hindmarsh, gave the enthusiasts his blessing to initiate the Club and Museum. The rest, as they say, is history.

On March 31, 1999, the RAF left Manston, but the museum subsequently moved into the station's old MT section. It is now open daily in summer and at weekends in winter — see panel below for details — and exhibits record the military and civilian aviation history of the site since it was first opened as a Royal Naval Air Station in 1916.

Ever since Ken Whiffin's first involvement with Link Trainers, Audrey — a fully trained Link pilot herself — has given him tremendous support, so much so that she is now recognised as his "chief test pilot". Ken, of course, is known affectionately as her "blind flying instructor". What else?

RAF Manston History Museum

Located in the old RAF Manston MT Section building beside the A253 west of Ramsgate, adjacent to the Hurricane and Spitfire Memorial Building, the museum is open 1000–1600hr daily April—October, and 1000–1600hr at weekends November—March. Admission costs £1 (accompanied children free); for more details of the museum and of Manston's history call 01843 825224 or visit the website at www.rafmanston.co.uk

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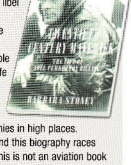
Book of the Month

TWENTIETH CENTURY MAVERICK: THE LIFE OF NOEL PEMBERTON BILLING (by Barbara Stoney; ISBN 1-904408-09-5; Bank House Books, PO Box 3, New Romney, Kent TN29 9WJ; 9¼in x 6¼in hardback; approx 290 pages, illustrated; £15.00).

IN AVIATION ALONE, the achievements of Noel Pemberton Billing are legion. He established one of Britain's first flying grounds; learnt to fly and gained his aviator's certificate all before breakfast one morning in 1913; used the £500 he thus won in a wager with Handley Page to found the company that later became Supermarine (the name was coined by him); and masterminded a bombing raid on the Zeppelin sheds at Friedrichshafen in 1914. He also campaigned for air defence as an independent MP, and conceived numerous aircraft (some of which were built and flown).

But that is merely the aeronautical aspect of this extraordinary eccentric. Barbara Stoney, whose biographies of Enid Blyton and the Dame of Sark were much acclaimed, took on a formidable challenge when she chose Billing as her next subject. As she soon discovered, and reveals in this absorbing book, he was a charismatic man with an active interest in many spheres, often working on many entirely different projects simultaneously. He is known for his gramophone records, miniature Compass Camera and motorised caravan, but less so as a yacht dealer, magazine publisher, author and playwright. Others will have heard of his doings in the House of Commons, where in 1916 he outrageously alleged that airmen were being "murdered" by being forced to fly inferior and faulty aeroplanes, and in the Law Courts, where he successfully defended himself against a charge of obscene libel brought by the dancer Maud Allan.



Given this plethora of material, one has to congratulate the author on managing to marshal it into a readable and entertaining book. Billing lived life in the fast lane, and while he was often admired and loved by many who worked for him or enjoyed his friendship, he also made many enemies in high places. Nonetheless, he enjoyed a full life, and this biography races along with appropriate pace. While this is not an aviation book *per se*, there is a good deal of aviation in it, and a good percentage of the illustrations relate to Billing's aeronautical activities. This reasonably priced biography is a worthy addition to any library. **PHILIP JARRETT**

■ **Copies of this book are available to *Aeroplane* readers, direct from the publisher at the above address, at the special price of £12.50 including UK postage (add £5.75 for mainland Europe postage), and $22 post paid to the USA. For rest of world, please e-mail BankHouseBooks@aol.com**

WW2 RUSSIAN

RED STAR VOLUME 13 — MIKOYAN'S PISTON-ENGINED FIGHTERS (by Yefim Gordon and Keith Dexter; ISBN 1-85780-160-1; Midland Counties Publishing, 4 Watling Drive, Hinckley, LE10 3EY, UK; 11in x 8¼in; 128 pages, illustrated; £18.99). Midland Counties' Red Star series deals with modern and historic Soviet subjects, *Mikoyan's Piston-Engined Fighters* covering the early designs of the MiG design bureau. The types covered are the MiG-1, MiG-3 and experimental versions (including the original MiG-9), the I-230 and I-220 series, the MiG-13 and the twin-engined DIS-200. The genesis and development of each is covered in detail, while the MiG-3's combat history has its own chapter. Given that more than 3,000 were produced, the text in this section could have been expanded, as 14 of the 18 pages are completely taken up with photographs. The start of the Mikoyan & Gurevich partnership provides the introduction to the volume. General-arrangement drawings of MiG-3 variants occupy ten pages, while 24 colour profiles depict all of the types covered.

This volume contains a lot of new information and many previously unpublished photographs. The one fact that comes from reading this book is the way the fortunes of the designs covered were linked to the engine developments of the Mikulin bureau, their failure to meet specifications resulting in the lowering of expectations for many of OKB-155's (the Mikoyan bureau) designs. The unwillingness of Soviet authorities to interrupt production to introduce newer types during the Great Patriotic War was also a factor in Mikoyan's late-war developments remaining prototypes only.

Overall, as a developmental history of the types covered, this volume is to be recommended for anyone with an interest in Soviet aviation and is "must have" for those wanting to investigate in detail what MiG did before it turned its attention so successfully to jet fighters. **DAVID WILLIS**

NAVY DVD

FLY NAVY DVD (Colour; 70min; £14.95 available direct from www.eavb.co.uk or from the Fleet Air Arm Museum and specialist shops; Editions Audiovisuel Beulah, 66 Rochester Way, Crowborough, TN6 2DU, tel 01892 652413). Featuring three Royal Navy recruitment and promotional films from the archives of the Imperial War Museum, this no-frills DVD offers an entertaining and informative look at carrier operations in the late 1960s and early 1970s. The first, *Hands to Flying Stations*, was made in 1975 and illustrates the launch and recovery of fixed- and rotary-wing aircraft from *HMS Ark Royal*. The sheer complexity of operating big jet aircraft from the narrow confines of a carrier is well-captured, with plenty of up-close-and-personal

camerawork of Phantoms, Buccaneers and Sea Vixens being prepared for their brutally swift departure from their floating home via steam catapult. The sight of various deck crew scurrying about beneath the monstrous aircraft, often just inches from red-hot tailpipes or hungry jet intakes, engendered in this reviewer a distinct "rather them than me" feeling. There is some terrific footage of 849 Sqn Gannet AEW.3s waddling up to the catapult, and good views of launches from the recovery Wessex hovering nearby.

The second film, narrated by Bob Holness, is entitled *The Buccaneers*, and details a typical sortie as undertaken by the eponymous Fleet Air Arm strike aircraft in 1966. Filmed on board *HMS Eagle*, this *Boys' Own*-style recruitment short features highly enjoyable material from the deck and the cockpit, including some excellent footage of an air-to-air rendezvous between a Buccaneer and a Scimitar tanker, as seen from the former's point of view. Great stuff.

The last is arguably the least interesting of the three films, detailing the vital duties of the ship-board Aircraft Controller, but does include some fascinating film of a Hunter GA.11 being vectored for an intercept during a training sortie.

Fly Navy is not only of interest for those who served on board one of the Royal Navy's carriers during the 1960s and 1970s, although they will certainly love it, but also to anybody with an abiding interest in the golden era of British naval jet fighters — or extreme beards (some humdingers here).

NICK STROUD

LOCAL HISTORY

SUN, SAND AND SILVER WINGS; THE STORY OF AVIATION ON THE SOUTHPORT AND SOUTH WEST LANCASHIRE COAST

FROM 1910 TO 2003 (by John Mulliner; ISBN 1-872839-09-6; GDP Marketing and Communications, Space Solutions Business Centre, Sefton Lane, Maghull, Liverpool L31 8BX; 8¼in x 6in softback; 75 pages, illustrated; £9.99).

I must confess an unaccountable attraction to small, locally-published histories relating to aviation activities in specific parts of Britain. Although their narrow perspective can often distort the subject area's true significance, their authors often uncover hitherto undiscovered documentary and pictorial gems from local newspapers and collections that add to our general knowledge of British aviation's development. This is a very typical example. There has been continuous aviation activity along the coast of Southport and south-west Lancashire since 1910, when Compton Paterson, H.G. Melly and John Gaunt began to experiment with their aeroplanes.

The author takes us through from those early days to operations at RAF Woodvale today and the Southport Air Show. On the way, we learn of the joyriding enterprises of the inter-war years, promoted by the Avro 504s of Avro Aviation (of which, sadly, there are no pictures), the Airco D.H.6s of Golden Eagle Aviation and the D.H.6s, Avro 548s and Avians and de Havilland Fox Moth operated by Norman Giroux's Giro Aviation Co. (Incidentally, the 504 was not "known in civilian service as the 548" as the author states. The 548 was a 504 converted to a three-seater and powered by a watercooled inline engine instead of the original aircooled rotary.) The Second World War saw the construction of RAF Woodvale, and the history of the station is woven in among the succeeding aeronautical events in the area, such as the post-war resumption of pleasure flights and the advent of the Southport Aero Club, which moved to Woodvale in 1961. Flying from the beach continued until 1990.

There are plenty of illustrations, both monochrome and colour, although many are far too small to be of use. Some basic research would have revealed that the "Farman-type biplane" "of unknown design" is the distinctive Planes Ltd Biplane, built by Handley Page and flown by Fenwick.

Despite the factual errors and a sprinkling of literals, this is an entertaining little book, and hardly expensive by today's standards.

PHILIP JARRETT

Flight Simulation

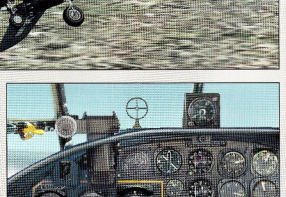
"BRIEFING TIME" B-25J MITCHELL* — AN ADD-ON FOR *FLIGHT SIMULATOR 2002* AND *FS 2004

THE NORTH AMERICAN B-25 MITCHELL was one of the most versatile and widely-used aircraft of World War Two, and was also considered the best medium bomber of that conflict. The subject of this simulation is *Briefing Time* — a B-25J that flew with the USAAF's 489th Bomb Squadron, Twelfth Air Force, which served in the North African and Italian campaigns.

This simulation has been designed by MAAM-SIM, an official arm of the Mid Atlantic Air Museum (MAAM) in Pennsylvania, whose aim is to raise money for the museum's projects by creating high-quality aircraft for Microsoft's *Flight Simulator*, featuring MAAM's own aircraft.

Briefing Time — the sim — comes on two CDs. The first contains the software, while the second is a multimedia CD to help you become aquainted with the aircraft itself, and includes five scanned vintage B-25 training manuals as used by the real pilots, and the 489th Bombardment Squadron Handbook. There is also 48min of video footage of the real *Briefing Time*. Rounding off this CD is the inclusion of 500 high-quality digital photographs taken over a two-year period.

However, the real gem is the simulation itself. This is flawlessly detailed in both visual and operational terms. The interior and exterior rendition is photographic in appearance, and the cockpit is awash with dials and interactive levers and switches, each of which is accurately reproduced. You can sit in the pilot's or copilot's position — nothing unusual there — but you can also move to the other aircraft stations such as the upper turret or the waist-gunner's or bomb-aimer's position, all of which are photographically rendered.



ABOVE **The colours and markings accurately portray B-25J 43-27638 *Briefing Time* of the Mid Atlantic Air Museum.**
RIGHT **The remarkable level of detail in the cockpit and internal renderings is second to none, and is the next best thing to actually taking the left-hand seat of one of World War Two's most successful aircraft.**

Address: Aeroplane, Kings Reach Tower, Stamford Street London SE1 9LS

WW2 GERMAN TRUTH ABOUT THE WUNDERWAFFE (by Igor Witkowski; ISBN 83-88259-16-4; European History Press, Warsaw; distributed by Books International, 101 Lynchford Street, Farnborough, Hants GU14 6ET; 11¾in x 8¼in hardback; 300 pages, illustrated; £34.95).

Originally published in Poland in 2002, this book was rapidly translated by Bruce Wenham and the English edition followed at the end of last year.

The author has specialised in research on German military technology, spending five years in the collection and analysis of materials, working in archives in three countries, and the result is a fascinating account not only of what was achieved but what could have been if some of the futuristic weapons had reached production.

The book is wide-ranging: it covers vengeance and electromagnetic weapons, jet fighters and bombers, new concepts for conventional weapons such as "invisible" aircraft and vessels, concrete ships, recoilless weapons, infrared and many other things.

The turbulent development of guided weapons covers everything from rocketry to the Bachem Natter — there was quite a variety in this area. Rocket-propelled fighters are described along with biological, chemical and nuclear weapons.

The final part deals with the author's research into other projects, details of which have probably not been previously published. A bibliography lists more than 260 sources, and 12 pages of colour photographs complete a very interesting study. A mention of the so-called "Foo Fighters" seen by Allied aircrews over Europe is accompanied by a photo (page 274) purporting to be over Germany in the 1940s. In fact it shows a Tachikawa Ki-36! **MIKE HOOKS**

Having a detailed cockpit interior means that the designers can provide an interactive engine start-up procedure, which is accompanied by an interactive checklist. The sense of satisfaction at successfully completing an engine start-up, culminating in the equally authentic-sounding roar of the engines as they burst into life, is immense. The exterior rendering is equally fine, the aircraft's metallic skin being faithfully reproduced in a range of liveries. Animations include moving and operable cowl flaps, opening and closing hatches, engine start-up smoke, flashes from the engines' 28 exhaust stacks and even touchdown marks and smoke from the tyres.

The flying experience is just as memorable. The B-25 is graceful, forgiving, and at the same time fairly agile. Take-off is essentially straightforward, but landing needs some care — you need to make sure that you are correctly lined up on final approach and do not allow the speed to fall off too much as you cross the runway threshold.

Briefing Time is without doubt one of the finest add-ons ever produced for *Flight Simulator* and is available in the UK from R.C. Simulations (www.rcsimulations.com, tel 0117 971 5000) or from MAAM's own website (www.maam.org).

All of these companies provide an online purchasing service, generally a quick and safe way of buying software. A few tips for buying through "payware" — pay with a credit card and, if possible, make sure that the website has some form of secure sign at the bottom of the transaction page, and always make a note of any code or reference numbers given to you. Finally, when the bill appears on your next monthly statement, make sure that the value is the same as you were expecting and quoted online. **DEREK "BARON" DAVIS – *COMPUTER PILOT***

Internet

Compiled by Jim Winchester

THIS MONTH'S THEME, WOMEN IN AVIATION, looks particularly at the various organisations that promote flying as a career for women today and recall the past history of female aviators.

Women in Aviation International has more than 7,000 members and an active conference and events programme. Headquartered in the USA, its site at **http://www.wai.org/** includes the Women in Aviation Hall of Fame with biographies of the inductees since foundation in 1992. The Online Resources section of the site gives a longer list of famous women aviators and a bibliography of books by and about women in flight and related topics.

The British Women Pilots' Association has a fairly simple site at **http://www.bwpa.demon.co.uk/**. It offers an aviation careers guide (sold by mail order) and a range of scholarships. There is a link to long-distance flyer Polly Vacher's site at **http://www.worldwings.org**.

The Ninety-Nines organisation was founded in 1929 by 99 licensed women pilots for the mutual support and advancement of women in aviation. Its site **http://www.-ninety-nines.org/** includes a two-part history of the organisation and its achievements. Also included are details of an oral history project, its small museum in Oklahoma City and the annual cross-country air race.

Another famous group is the Women's Airforce Service Pilots, who ferried aircraft, towed targets and trained male pilots up to 1944. Its site **http://www.wasp-wwii.org/** is called WASP on the Web (WASP not WASPs) and is a very enthusiastic creation, incorporating contemporary posters, articles and newsletters as well as modern reunion information and details of the programme to interview surviving WASP members. There is also a project to establish a WASP museum at Avenger Field, Sweetwater, Texas.

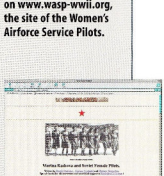
On this side of the Atlantic, the Air Transport Auxiliary comprised men and women who mainly ferried aircraft from factories to squadrons. There is a history of the ATA, complete with some typically sexist comments by C.G. Grey, editor of *The Aeroplane*, at **http://www.airtransportaux.org/**, a site dedicated to American women pilots who flew with the RAF. The RAF website also gives the history of the ATA at **http://www.raf.mod.uk/history/ata.html**.

For some famous women aviators there are a number of biographical and "tribute" sites, particularly for Amelia Earhart. Billing itself as "the official Amelia Earhart site" is **http://www.ameliaearhart.com**. The Ninety-Nines' site includes a biography of Amy Johnson at **http://www.ninety-nines.org/johnson.html**. There is a quite lengthy biography of Jean Batten at **http://www.nzedge.com/heroes/batten.html** and the life of record-breaking French aviator Jacqueline Auriol is outlined at **http://www.ctie.monash.edu.au/hargrave/-auriol.html**. One of a number of sites retelling the story of the Soviet Air Force's "Night Witches" and ace Lilya Litvak is **http://www.elknet.pl/ancestory/raskov/raskov.htm**.

As for today's military pilots, an article from the USAF Air University entitled *Equality in the Cockpit* at **http://www.-airpower.maxwell.af.mil/airchronicles/aureview/1984/may-jun/samuelson.html** outlines the history of women pilots up to the mid-1980s.

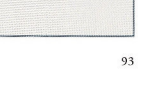
http://www.womenmilitaryaviators.org/ is the site of a group promoting the interests of female aircrew. There is not a great deal of content on the site for non-members, which is true to some degree of most of the group sites mentioned, who all encourage interested and qualified women to join.

ABOVE **Polly Vacher's site is linked with that of the British Women Pilot's Association.**



ABOVE **Much of interest is on www.wasp-wwii.org, the site of the Women's Airforce Service Pilots.**

ABOVE **Second World War Soviet women pilots are the subject of www.-elknet.pl/ancestory/.**



ABOVE **Female military aircrew are catered for at www.womenmilitary-aviators.org.**

AEROPLANE READER OFFER

Three popular items to buy this month, at exceptionally favourable prices for *Aeroplane* readers

Red Arrows Video/DVD

NOW IN ITS 40th airshow season, the Royal Air Force's incomparable Red Arrows aerobatic display team is the subject of a new official video/DVD. Features include: 3D graphics showing how some of the team's signature manoeuvres are flown; in-the-cockpit footage from a 20min sortie; the team's history, back to the Black Arrows and the Yellowjacks; a detailed look at the BAe Hawk; and more.
VHS video: £12.99 plus £1 p&p in UK Mainland (Europe please add £2.50, rest of world £4). **DVD:** £15.99 plus £1 p&p in UK Mainland (Europe please add £2.50, rest of world £4).

From £12.99 (plus p&p)

■ **To order yours, call 0870 727 4156 or complete the coupon on page 100**

Brass Pocket Telescope

THIS ATTRACTIVE brass telescope closes to a length of just over 6in to fit in your pocket or bag, and has powerful 15x magnification. Precision 15 x 30 optics give superb clarity. Finished in protective lacquer with leather-look cover and free storage pouch, it is ideal for aircraft identification and other outdoor uses. It costs just £19.99 post free in UK Mainland (*please add £2.50 for orders from Europe, £5 for rest of world).

Only £19.99*

■ **To order, see coupon on page 100 or call 0870 727 4156**

Pocket Airband Radio

THIS COMPACT and stylish airband radio is ideal for aviation enthusiasts to use at airshows and airports. The unit receives civilian airband (108–136MHz). Features include an easy-to-use tuning dial, volume control, belt clip and earphone jack (earphones are included) all for the amazingly low price of just £9.95 (p&p free in UK Mainland; for Europe add £2.50, for ROW add £5) — and in time for the summer show season. The radio is powered by 2 x AAA batteries (not supplied).

Just £9.95

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■ To order any of the items shown in the panel above, just **call 0870 727 4156 or see coupon on page 100**

Information Exchange

Are you trying to find the answer to a thorny aviation question? Or trace an old aviation friend? Then this page may help

COMPILED BY MIKE HOOKS

■ After National Service in the RAF in 1946–48, Mike Hooks maintained a strong interest in aviation and became Editor of *Airports International* during 1967–75. He then joined the SBAC, where his duties included managing the Press Centre at the Farnborough Air Shows; he retired in 1993. Mike is an Honorary Life Member of Air-Britain and a member of the Croydon Airport Society

WRITE TO: Mike Hooks, Information Exchange, *Aeroplane*, King's Reach Tower, Stamford St, London SE1 9LS

■ Geoff Pell, 11 Tebourba Drive, Alverstoke, Gosport, Hants PO12 2NT, on behalf of the Gosport Aviation Society, is researching local **disposal of aircraft** from RAF Gosport/*HMS Siskin* and *HMS Daedalus* at the end of hostilities in 1945. Anecdotal or documentary evidence would be most welcome.

■ Alan D. Bennett, 22 Ridge Road East, Grimsby, Ontario, Canada L3M 4E7, is working on a biography of Capt Roy Brown and asks why the pilot of a **rotary-engined aircraft** was obliged to lean the air/fuel mixture during climb away after take-off. If he did not, the engine would progressively (or suddenly?) receive an excessively rich mixture and the cylinders would cease firing — a phenomenon to which the Camel seemed particularly prone. The "rich cut" seems to have occurred shortly after the wind-driven Rotherham fuel tank pressurising pump began to rotate. Mr Bennett has checked with a pilot who flies a Camel replica who assures him that this is so but cannot give a scientific reason — can anyone?

■ John French has a sticker for the **Free Northumbrian Air Force** (July) which appeared to originate with a detachment of 202 Sqn operating search and rescue Sea Kings from RAF Boulmer. It seems such levity was not appreciated by higher authority, and the stickers soon disappeared!

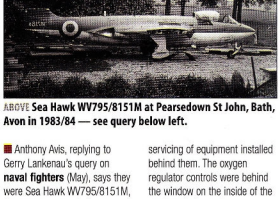
■ Keith Wigglesworth, 5 Mead Way, Highburton, Huddersfield HD8 0TG, believes he saw the fuselage of a **Heinkel He 177** on the dump at RAF Bicester in 1956 — can anyone confirm?

■ Charles Shepherd, 15 Thorngrove Avenue, Hillfield, Solihull, West Midlands B91 3XJ, is writing a biography of his late father, **LAC Desmond Charles Shepherd**, who joined the RAF in Birmingham in 1941 and served with 61 OTU at Hemswell, various Polish squadrons, 137 Sqn with whom he was wounded at Eindhoven during the Battle of the Airfields, and at 100 MU Bircham Newton in 1945–46. Mr Shepherd would like to hear from anyone who knew his father or has information on him.

Address: Aeroplane, Kings Reach Tower, Stamford Street London SE1 9LS

■ For more questions and answers, see *Aeroplane's* website **www.aeroplanemonthly.com**

■ **Internet users** — Please include a postal address with your e-mail query as we often have to include hard copy (e.g. photocopies) with a reply



ABOVE **Sea Hawk WV795/8151M at Pearsedown St John, Bath, Avon in 1983/84 — see query below left.**

ABOVE **Can anyone identify this motor glider conversion, photographed at Southampton/Eastleigh in September 1955?**

■ Colin Green has been in touch with the Igor I. Sikorsky Historical Archives regarding the **Cirrus-powered Sikorsky S-39** (June). They have photographs, so perhaps Gary Shilling can take it from there.

■ Richard H. Hitchins, 2 Idola Street, Shailer Park, Queensland 4128, Australia, has sent us a photograph of an unmanned **target drone** aircraft belonging to the Queensland Air Museum which has been identified as an International Model Aircraft 30ft TG Mk 2 manufactured by Frog. He would like confirmation of this, and asks how the target reached Australia? Were any used by the RAAF? And, if so, how many and where? Presumably it was air-towed, but by which aircraft?

■ Joe Edis, commenting on the July issue, wonders why the uncrewed and unchocked **Siskin** (page 79) did not run away — we have another distant view of it taking off — and is curious to know the reason why some of the **Audaxes** (page 53) have perforated top cowlings. No other Audax in our files has these, so was it a local mod at Heliopolis, presumably to prevent engine overheating?

■ T. Greene, 24 Mill House Gardens, Mill Road, Worthing, West Sussex, refers to Capt Eric Brown's book *Wings on my Sleeve* in which the author mentions **two-seat Mustangs and Thunderbolts** as bomber escorts over Germany, and asks if there were such versions used operationally?

ABOVE **A target aircraft in the Queensland Air Museum hangar — see adjacent query.**

■ Arthur Ord-Hume and Dave Welch are intrigued by a photograph taken by the latter at Eastleigh Airport, Southampton, on September 3, 1955. It shows an apparently unregistered motorised adaption of a **Slingsby Cadet** with its original Offur towhook still in the nose. A very wide-track undercarriage, a fuel tank or radiator in front of the engine and a large flat windscreen complete the evidence — can anyone identify it and say whether it ever flew?

■ Michael Clarke, 18 Church Avenue, Holywood, Co Down, Northern Ireland BT18 9BJ, is researching **Joseph Cordner**, an Irish aviation pioneer who designed, built and test-flew several aircraft between 1908 and 1912. There is a problem in dating Cordner's first aircraft which might be solved by establishing when the propeller, almost certainly by English manufacturer T.W.K. Clarke, was first available. It was also used by Harry Ferguson, another Irish pioneer, in early 1910, but was the prop available in 1909?

■ Nicole A. Mooney, 13894 Forsythe Road, Sykesville, MD21784, USA, seeks information on her uncle, R123239 **Edward Gerard Frezell RCAF**, and his crew, F.K. Thorogood, navigator, C.G. Bennett, bomb-aimer, G.N. Rafferty, wireless operator/gunner and B. Towler, gunner. Flying in Wellington HE466 of 30 OTU, Hixon, on a night training flight on February 13, 1943, all died when, owing to radio malfunction, the aircraft flew into high ground in bad visibility in Snowdonia.

■ Anthony Avis, replying to Gerry Lankenau's query on **naval fighters** (May), says they were Sea Hawk WV795/8151M, the spares source to keep WV908 flying, and Swift XF113 in sections. Rob Finch sends a photograph of the Sea Hawk and says that Bob Poulter, who acquired these aircraft, later had Sea Hawk WM993.

■ Guido Corten, Komeetlaan 36, 6133VA Sittard, The Netherlands, is researching the crash of 21 Squadron **Mosquito FB.6 PZ314** near Sittard on 2.2.45 in which the CO, Wg Cdr Ivor Dale, and navigator Fg Off Kenneth Hackett were killed; both are buried in the British Military Cemetery, Sittard. Mr Corten seeks more information about the cause and location of the crash, plus background information about the crew and squadron.

■ Don Moore-Searson replies to the **Barracuda query** (June), saying that the apparent inlets were windows providing daylight to the insides of the wing roots to facilitate operation and servicing of equipment installed behind them. The oxygen regulator controls were behind the window on the inside of the starboard wing root.

■ A monument is being built at ***HMS Ringtail*** (Burscough) Fleet Air Arm aerodrome to honour all those who served there, with a high-profile dedication ceremony planned for Sunday October 10, to which everyone is invited. Lawrence Critchley, 5 Douglas Drive, Ormskirk, Lancashire L39 1LJ, would like to hear from anyone who served there or has connections. Please send him an SAE and information; lists of accommodation etc were despatched around June.

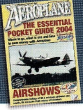
■ P.J. Hudson, following up the **stolen Meteor** story (April), reports that a night-fighter version was stolen from storage at Shawbury in the 1950s. It was to be issued as a replacement to a squadron, but despite a thorough search all that was found was a drop tank, so investigators surmised that it had been dismantled over a period and sold as scrap! Which one was it?

Where are they now?

■ John Underwood, 2054 W. Mountain Street, Glendale, CA 91201, USA, is trying to trace **Helmut Schilling** who flew Arado Ar 234s and was in the air when the war ended, so had about 30 minutes of peacetime flying when he landed! Helmut became an American citizen and worked at Palmdale, but may have returned to Germany for the F-104 programme. Does anyone know his whereabouts?

■ R.M. Forder, 211 Dobcroft Road, Sheffield S11 9LF, is trying to trace **Sgt E.G. Friend**, the sole survivor from Flt Sgt A.N. Levy's crew in 50 Squadron Lancaster ME441/W which failed to return from an attack on the synthetic oil plant at Bohlen on March 20/21, 1945. Does anyone know the circumstances of the loss — can friends or family help?

Airshows & Events



Aeroplane's calendar of events is published monthly. All information is correct, to the best of our knowledge, at time of press. Details can change, so check before setting out.

NOTICE TO SHOW ORGANISERS: is your event listed here? If not, contact Nick Stroud on 020 7261 6401 or fax 020 7261 5269 for free inclusion

FREE SPARE COPIES of our 2004 Airshows & Museums Guide (left) are available from the Editorial Office

SEPTEMBER

1 Dorset Police Air Support Unit Operations A Christchurch Aviation Society lecture by Sgt Mark Taylor. Druitt Hall, Christchurch, Dorset; tel John Brown 01202 765981

3–5 Goodwood Revival Goodwood, Chichester, Sussex; tel 01243 755000, website www.goodwood.co.uk/diary

4 PFA Devon Strut Fly-in Belle Vue, Devon; tel 01805 623113, website www.pfa.org.uk

4–5 Duxford 2004 Airshow Duxford, Cambs; tel 01223 835000, website www.iwm.org.uk

4–5 Combined Services Memorial Weekend Yorkshire Air Museum, Elvington Airfield, Yorks; tel 01904 608595 website www.yorkshire-airmuseum.co.uk

5 Breighton At Home Day A Real Aeroplane Club event. Breighton, Yorkshire; tel 01757 289065 or 01302 890633

5 Hooton Park Open Day The Hooton Park Trust opens the historic airfield site to the public. Includes guided tours and aviation exhibits. Hooton Park Airfield, Ellesmere Port, Cheshire; tel 0151 327 3565

DAMIEN BURKE

LEFT **The Real Aeroplane Company's "At-Home" at Breighton on September 5 will almost certainly include the beautifully-restored Percival Mew Gull, G-AEXF, the machine Alex Henshaw flew on his record-setting flight to Cape Town in 1939. For more information about Breighton, visit www.realaero.com.**

5 Jets Plus 2004 Flying display, parachutists, pleasure flights and celebrity appearances. Bruntingthorpe Airfield, Leicester; tel 08444 770747

5 Shuttleworth Pageant Air Display Old Warden Aerodrome, Beds; tel 01767 627288 or 24hr hotline 090 68 323310, website www.shuttleworth.org

8 The Restoration of "Peter Townsend's" Hurricane A London Society of Air-Britain talk. Paul Rogers of the Cambridge Bomber and Fighter Society describes the recovery of remains from France and the UK to recreate an 85 per cent original aircraft. The Victory Services Club, London W2; tel 01444 811317 (1000hr–1800hr)

9 Jersey International Air Display Jersey, Channel Islands; website www.jerseyair-display.org.uk

10–13 Science Museum Heritage Open Days The Science Museum opens its doors throughout the site. Wroughton, Wilts; tel 01793 846200 website www.science-museum.org.uk/wroughton

11 Aeromodelling & Twilight Sunset Air Display Old Warden Aerodrome, Beds; tel 01767 627288 or 24hr hotline 090 68 323310, website www.-shuttleworth.org

11 Leuchars International Airshow RAF Leuchars, Fife, Scotland; tel 01334 839000, website www.airshow.co.uk

11–12 National Championship Air Race Leicester, Leics; tel 01476 860606 website www.royal-aeroclub.org

11–12 Southport Airshow 2004 Southport, Lancs; tel 01519 342418, website www.visitsouthport.org.uk

12 PFA Devon Strut Fly-in Watchford, near Honiton, Devon; tel 01805 623113, website www.pfa.org.uk

12 Kemble Open Day Kemble Airfield, Kemble, Cirencester, Glos; tel 01285 771076, website www.kemble.com

12 Aero Model Day Old Warden, Beds; tel 01767 627288, website www.shuttleworth.org

12 Auster Fly-in Popham

Overseas airshows and events

SEPTEMBER

4 Airshow Lelystad If all goes according to plan, this year's show at Lelystad will see the long-awaited debut of the Aviodrome's Lockheed Constellation — worth waiting for. Lelystad, The Netherlands; tel 00 31 320 289 840, website www.aviodrome.nl

4 The RAF In Action The Air Museum "Planes of Fame", Chino, CA, USA; tel 001 909 597 3722

4–5 Air 04 Payerne Swiss International Air Display, Payerne, Switzerland; tel 00 41 31 323 2258, website www.air04.ch

4–5 International Air Fest Brno, Czech Republic; tel 00 420 26 603 4683, website www.airshow.cz

4–6 Canadian International Air Show Lake Ontario, Toronto, Ontario, Canada; tel 001 416 263 3650, website www.cias.org

5 Fundación Infante de Orleans Flying Day Cuatro Vientos, Madrid, Spain; tel 00 34 91 508 0842, www.fio.es

11 "What Are They Like To Fly?" A Commemorative Air Force seminar with CAF pilots describing warbird flying. Midland Airport, Texas; tel 001 432 563 1000 x2259, www.-commemorativeairforce.org

16–19 41st National Championship Air Races & Air Show The fastest racetrack in the world. Reno, Nevada; tel 001 775 972 6663, website www.airrace.org

18–19 EAA East Coast Fly-in Toughkenamon, Pennsylvania, USA; website www.eaa.org

21–25 Africa Aerospace & Defence 2004 Waterkloof AFB, Centurion, South Africa; website www.aadexpo.co.za

25 Lee Bottom Wood, Fabric & Tailwheels Fly-in The eighth gathering of classic and vintage aircraft at the friendliest airfield in the Midwest. Hanover, Indiana; tel 00 812 866 3211, website www.leebottom.com

OCTOBER

1 The Honorees Speak A chance to meet World War Two aviators inducted into the CAF Hall of Fame. Midland Airport, Texas; tel 001 432 563 1000 x2259, website www.-commemorativeairforce.org

1–3 EAA South East Regional Fly-In Evergreen, Alabama, USA; tel 001 251 578 1707, website www.eaa.org/avlinks/flyins.html

2 Naval Air Warfare The Air Museum "Planes of Fame", Chino, CA, USA; tel 001 909 597 3722, website www.planes-offame.org

2–3 Fina-CAF AIRSHO 2004 Midland International Airport, Texas, USA; tel 001 432 563 1000, website www.-commemorativeairforce.org

2–3 California International Airshow Salinas, California, USA; tel 001 831 754 1983, website www.salinas-airshow.com

2–3 2004 Tennessee Skyfest McKellar-Sipes Airport, Jackson, Tennessee, USA; website www.skyfest.us

3 Fundación Infante de Orleans Flying Day Cuatro Vientos, Madrid, Spain; tel 00 34 91 508 0842, website www.fio.es

5–7 International Helitrade Geneva, Switzerland; website www.internationalhelitrade.com

6–10 Japan Aerospace 2004 Pacific Exhibition Centre, Yokohama, Japan; website www.aerospace.jp

7–10 EAA Copperstate Regional Fly-In Phoenix, Arizona, USA; tel 001 520 400 8887; website www.eaa.org

12–14 NBAA Business Jet Convention 2004 Las Vegas, Nevada, USA; tel 001 202 783 9000, website www.nbaa.org

15–17 Miramar Air Show MCAS Miramar, San Diego, California, USA; tel 001 858 577 6240, website www.-miramarairshow.com

16–17 Wings over Houston Airshow 2004 Ellington Field, Houston, Texas, USA; tel 001 713 644 1018, website www.wingsoverhouston.com

21–23 AOPA Expo 2004 Long Beach, California, USA; website www.aopa.org

23–24 Amigo Airshow El Paso, Texas, USA; tel 001 915 545 2864, website www.amigoairsho.org

Write to: Aeroplane, Kings Reach Tower, Stamford Street London SE1 9LS **Web:** www.aeroplanemonthly.com

Airfield, Hants; tel 01256 397733, website www.popham-airfield.co.uk

12 Open Cockpit Day The Helicopter Museum, Weston-super-Mare, Somerset; tel 01934 635227, website www.helicoptermuseum.co.uk

14 Eurofighter Typhoon A Milton Keynes Aviation Society lecture by the society's president Steve Bond, who spent four years working on the Typhoon's development programme. Kents Hill Community Centre, Milton Keynes; tel 01908 607349

17 Cobham Hall Open Day A rare chance to see inside the Fleet Air Arm Museum's storage hangar. 1400hr–2000hr, RNAS Yeovilton, Somerset; tel 01935 840565, website www.fleet-airarm.com

17 Aeronca Club Fly-In The Aeronca Club of Great Britain flies in to Thruxton, Hants. Strictly PPR; tel 01264 772352, website www.aeronca.co.uk

18 Fleet Air Arm International Air Day 2004 RNAS Yeovilton, Ilchester, Somerset; tel 01935 456752, website www.yeovilton-airday.co.uk

18–19 Battle of Britain Airshow With the possibility of two Constellations and a DC-6 in formation — piston heaven! Biggin Hill, Kent; tel 01959 572277, website www.air-displaysint.co.uk

19 Solent Aviation Society Fly-In Popham Airfield, Hants; tel 01256 397733, website www.popham-airfield.co.uk

19 Vintage and Classic Day The Vintage Aircraft Club, Turweston, Bucks. Strictly PPR; tel 01908 503691

20 The *Tirpitz* Raid A lecture by Sqn Ldr Tony Iveson DFC. Royal Air Force Museum, Hendon; tel 020 8205 2266, website www.rafmuseum.org.uk

21 Vickers Aircraft A Gosport Aviation Society talk by Dave Cotterell. Snooker Club, Stubbington Green, Hants; tel 0239 242 1903

25 Shuttleworth Gala Dinner & Hangar Dance Get in the mood at Old Warden Aerodrome, Beds; tel 01767 627288 or 24hr hotline 090 68 323310, website www.shuttleworth.org

25 Shoreham Aerojumble Shoreham Airport, West Sussex; tel 01424 440644

25–26 Autumn Fly-in A North Coates Flying Club event. North Coates, Grimsby, Lincs; tel 01472 388850, website www.northcoatesflying-club.co.uk

25–26 National Championship Air Race Alderney Flying Club, Alderney, Channel Islands; tel 01476 860606, website www.royal-aeroclub.org

26 D-Day Sunday A National Trust event with stalls, military vehicles and D-Day battle re-enactments. Ashridge Park, Berkhamsted, Herts; tel 07789 174013

OCTOBER

1 The Sinking of the *Tirpitz* An illustrated talk on 617 Sqn's involvement with the sinking of the mighty German battleship, by Jim Shortland. Tempest Anderson Hall, Museum Gardens, York; tel 01904 639543

3 Breighton At Home Day & Pre-Hibernation fly-in The Real Aeroplane Club's last get-together of the year. Breighton, Yorkshire; tel 01757 289065 or 01302 890633

2–3 Ploughs to Propellers — 1940s Weekend Rougham Airfield, West Suffolk; tel 01359 270238, website www.-roughamairfield.org

10 Duxford Autumn Air Show Duxford, Cambs; tel 01223 835000, website www.iwm.org.uk

10 Fly-In Popham Airfield, Hants; tel 01256 397733, website www.popham-airfield.co.uk

10 Open Cockpit Day The Helicopter Museum, Weston-super-Mare, Somerset; tel 01934 635227, website www.helicoptermuseum.co.uk

16–17 End of Season Fly-In Northrepps (Cromer), Norfolk; tel 01263 513015, e-mail northrepps@hotmail.com

17 All Hallows Fly-In The Vintage Aircraft Club's final fly-in of the year. Turweston, Bucks. Strictly PPR; tel 01280 705400

19 BAC One-Eleven Part 2 A Gosport Aviation Society talk by Nick Read on one of Britain's most successful small airliners. Snooker Club, Stubbington Green, Hants; tel 0239 242 1903

Auctions Compiled by Phil Ellis

TRANSATLANTIC AVIATION PIONEER CHARLES LINDBERGH WAS remembered at a Bonhams sale at the RAF Museum in Hendon on April 26, when a painting of his record-setting solo transatlantic flight of May 1927 went under the hammer. The painting, by Fred Groves, which measures 23in x 19in and shows the Ryan NYP *Spirit of St Louis* flying low across a stormy Atlantic, sold for £345. It was the highlight of an aviation section which also included various aircraft instruments, among them a lot comprising two instruments from a Spitfire and a Hurricane. They were an Artificial Horizon Mk IB and a Directional Gyro Mk IA respectively, and sold for £81. Three aircraft instruments, comprising a Marconi bearing dial, a compass and a navigator's periscope with calculators, sold for £46.

An interesting mixed lot including *Jane's All the World's Aircraft* in two volumes, 1943–44 and 1948, a Bristol Engines sales leaflet from the 1950s and an assortment of Concorde-related items including writing paper, playing cards, pens and a headscarf, went for £150.

Collectors looking for books on aviation subjects found a good selection at Dominic Winter Book Auctions in Swindon on June 23. A lot comprising 25 volumes, including *Spitfire — The Story of a Famous Fighter* (first edition, 1960) a 1959 edition of *Air Aces of The 1914–1918 War* and *Von Richthofen and The Flying Circus* (1964), all by Bruce Robertson and published by Harleyford, sold for £200. On the following day, the auctioneers offered a private collection of works by Captain W.E. Johns, including a first edition of *The Camels are Coming*, the book which introduced the famous fictional aviator Biggles to the world. It is a collection of short stories and Biggles — who must surely have inspired generations of flyers — first appears in a tale called *The White Fokker*. This edition had been restored, but professionally, and came complete with its dustjacket, making it especially rare. It sold for £3,000, towards the lower end of the pre-auction estimate.

Sales of toy and model aircraft at Vectis Auctions at Stockton-on-Tees included an interesting pre-war Interceptor fighter rubber-powered flying model by Frog Model Aircraft of London (Frog, incidentally, was an acronym for Flies Right Off the Ground). This attractive early ready-to-fly model, said to have been inspired by the Supermarine racers of the day, had a tinplate fuselage and fin, printed paper wings with rubber motor and accessories. It was in standard silver RAF colours, contained in its original box, which was in fair condition, and came with instructions. This helped it to a final bid of £70 in a sale on July 6. It is worth remembering that items in their original boxes and with instructions are always worth more. If you are buying kits that are made to be built, they will always be worth more if they have not been assembled. If they *have* been assembled, then much depends on the competence of the modeller. An old model that is really well made can still be desirable.

An assortment of RAF and RFC items appeared at Buckinghamshire auctioneers Bosley's on June 9, including an RFC pilot's tunic and cap, which sold for £800; and an RAF 1918 khaki pattern officer's cap and uniform, which realised £700. Also under the hammer was a World War Two RAF parachute bag which sold for £45 and original Pilot's Notes for the Avro Lancaster and Short Sunderland V, which sold together for £70.

Autograph hunters at the same sale could have picked up a signed photograph of outstanding World War Two RAF fighter ace Johnnie Johnson for £35. Johnson, who was initially rejected by the RAF, went on to fly more than a thousand missions during the war. In his illustrious career he had 38 confirmed kills and was never shot down.

ABOVE **Fred Groves's painting of Charles Lindbergh's *Spirit of St Louis* sold at Bonham's Hendon auction for £345.**

ABOVE **Check your bookshelves — this copy of *The Camels are Coming*, Biggles's debut, sold for £3,000 at Swindon.**

ABOVE **The Frog Interceptor's box ingeniously doubles as a winding-jig for the flying model's rubber motor.**

ABOVE **RFC and RAF uniforms realised £700–800 at Bosley's auction in Buckinghamshire on June 9.**

Crosswind

Asides — and broadsides — from the wings, with JOHN MAYNARD

This month John asks why Heritage Lottery Fund money has not been provided for the Battle of Britain London Monument, and proposes another memorial — this time to test-flight aircrew

FAR BE IT FROM ME to criticize the Heritage Lottery Fund for awarding a conditional £2·7m to the Vulcan to the Sky project. The balance of the £3·9m needed is being secured by donation, corporate support, and fund-raising. Nothing wrong with that, but how come the Lottery Fund has now twice declined support for the London Battle of Britain Memorial, which still needs to find another £500,000 to reach its target? It is also of interest to note that only one of the other nations, whose citizens actually fought with us as aircrew in the Battle, has found it possible to contribute any money! As many will know, the names of all aircrew who participated in the Battle will be carried, country by country, on 28 bronze panels within the memorial. If ever a cause deserved the financial support of us all, it is surely this one. Had the Battle been lost, so too would have been life, liberty and happiness in this land and throughout the world.

I BELIEVE THAT it was during Lord Palmerston's vigorous tenure of the office of Foreign Secretary in the 1830s and 1840s that his command "Send a Gunboat!" had those foreign fellows scampering about to conform with Britain's interests. Somehow I cannot imagine that Spain's irritating sensitivities over Gibraltar will similarly be stilled by the PM's instructions to "Send Geoff Hoon" to bolster the Rock's recent celebrations of British rule.

A COUPLE OF Canadian Navy ships have recently spent three days trying to locate ¼th-scale models of the Avro Arrow supersonic all-weather fighter on the bed of Lake Ontario. The instrumented models had been launched over the water attached to missiles capable of boosting them to Mach 2 as part of the Arrow research programme in the late 1950s. Apart from satisfying the memorabilia movement by trying to retrieve a model or two, the Navy felt the exercise to be a worthwhile salvage exercise. On return to port, Captain Paul Doucette archly revealed, "We found lots of things, but not what we had hoped to find". I would only add that, when Prime Minister Diefenbaker cancelled the Arrow in 1959, there was a spirited debate centred on the possibility of banging him off on a rocket to some far distant shore where he might do rather less damage!

PERHAPS AS A RESULT of the celebration of aviation's centenary year in 2003 and the commemorations that it inspired, a few readers have written regretting the absence of any sort of memorial to those who lost their lives in the course of the advancement of the science of flight. In particular test pilots, flight test observers, and other technical flight crew members are at the forefront of readers' minds and names may extend from the Honourable Charles Rolls and S.F. Cody through a host of brave men and women up to the present day and beyond in an unending roll of honour.

It is suggested that the objective would be to erect a memorial, perhaps at Farnborough, and that this should ideally be accompanied by a commemorative roll of honour housed nearby with public access to its pages. The most daunting aspect of this appealing proposition is of course the definition of eligibility for inclusion in such a roll. For instance, should it cover production flight test crews as well as experimental, and what type of mission or sortie should be deemed "in pursuit of the science of flight"?

It seems right that Service as well as Civilian test pilots and crews be included, especially when one considers the huge contribution made by them at Farnborough, Boscombe Down and Bedford. However, what about the casualties that have occurred in the course of sales demonstrations or public displays involving not only the likes of John Derry and Tony Richards, but also Service pilots flying development aircraft? Finally, and there will be many more definitions to be explored, does a single flight by an instrument fitter to adjust a piece of equipment which ends in an unrelated fatal accident constitute a test flight in the context of the proposed memorial?

RIGHT Another glimpse of sculptor Paul Day's clay original for the Battle of Britain London Monument, referred to above and featured on pages 38–41. Here we see WAAF plotters at work in a sector operations room, while fighter pilots discuss tactics in the background.

JOHN MAYNARD
After training at the de Havilland Aeronautical Technical School in 1949–53, John Maynard served as a Pilot Officer in the RAF during his National Service. He returned to de Havilland in 1955, and in 1969 he joined BAC. He left the aircraft industry in 1973, but has continued to nourish his enthusiasm for British aviation ever since.