

# LARGE PRINT GUIDE



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## RAF Stories: The First 100 Years 1918 – 2018

# Prepare

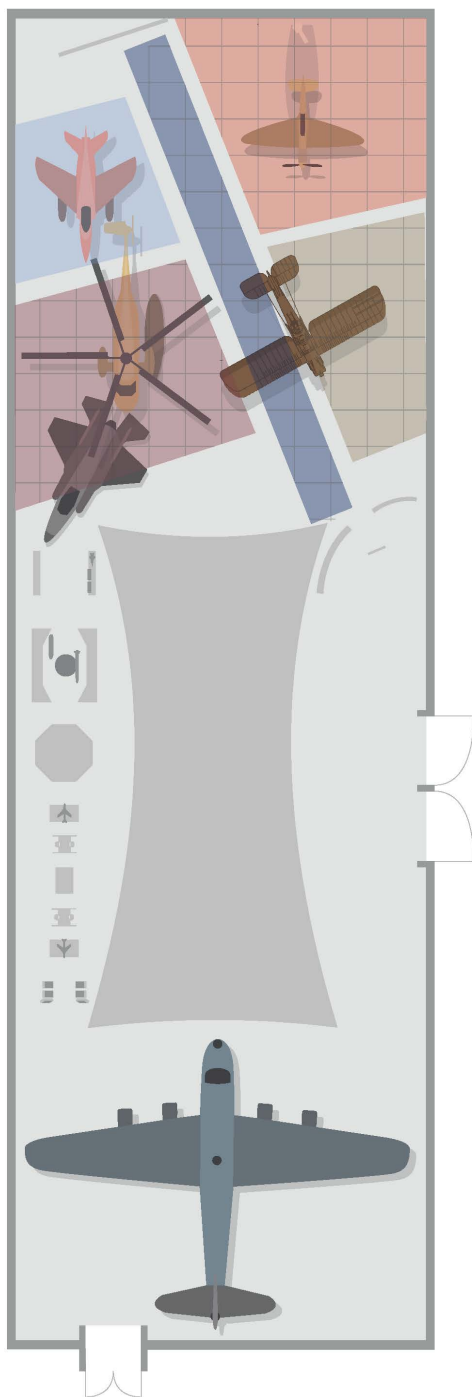
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# Location of the Prepare theme



 Prepare

## Prepare

**The Royal Air Force recruits people from all backgrounds. The service helps them find the role most suited to their talents and trains them in world-class facilities, enabling anyone to go anywhere. RAF personnel are encouraged to develop their knowledge and skills to bring out the best in themselves and others, both while in service and when they return to civilian life.**

**The RAF works with partners in science and industry to harness both new technologies and diverse skillsets, creating an effective Whole Force. Its strong global partnerships continue to be vital to ensuring the RAF delivers its mission.**

## Recruitment and Training

**Recruits have been drawn to the RAF for many reasons. It might be the opportunity to fly or to see the world.**

**Selection is demanding and requires applicants to demonstrate intelligence, aptitude and determination.**

**When the RAF was formed, Lord Trenchard prioritised training, providing the RAF with a core of expertly trained personnel from a diverse range of backgrounds.**

**Excellence in flying training was ensured through the Central Flying School.**

**A hundred years later, the RAF employs cutting-edge training techniques, both physical and synthetic, to ensure its personnel are well-prepared for duty.**

**[Cut out figure]**

**Marshal of the Royal Air Force**

**Viscount Trenchard of Wolfeton GCB, OM, GCVO, DSO**

**Transferred to the RAF in 1918**

**Lord Trenchard is often known as the 'Father of the RAF'.**

**After joining the army in 1893, he rose to command the Royal Flying Corps in France during the First World War.**

**Lord Trenchard was the first Chief of the Air Staff, appointed shortly before the formation of the RAF. He became convinced of the need for an independent air force and a core of personnel who could operate the RAF's increasingly complex technology. His belief in 'the extreme importance of training' resulted in the three training institutions: RAF College Cranwell, RAF Halton and the Staff College, which delivered apprentice and officer training.**

**'I have laid the foundations for a castle: if nobody builds anything bigger than a cottage on them, it will at least be a very good cottage.**

**Obituary, 'The Aeroplane', 17 February 1956**

**[Image caption]**

**Lord Trenchard inspects the first intake of Halton apprentices. The Boy Apprentices were known as Trenchard's Brats.**

**© RAF Museum P015256**

**Reverse image: © RAF Museum AC76/17/13**

**[rafm.tours/Trenchard](http://rafm.tours/Trenchard)**

[Cut out figure]

**Corporal Sarah Branch**

**Joined the RAF in 2001**

**Sarah Branch joined as a Logistics Driver before transferring to the role of Air Cartographer, completing operational tours in Afghanistan, Iraq and the Falkland Islands.**

**She began her role as a recruiter in 2016 and, while based at the Armed Forces Careers' Office in Swansea, she works across the UK. Branch delivers careers presentations, offering advice about RAF opportunities to potential recruits and also visits Air Training Corps Squadrons to engage with Air Cadets.**

**,**

**The most rewarding aspect of my current posting is engagement with the public at career fairs, schools, colleges and universities, as well as helping young people to find their ideal career in the service.'**

**Sarah Branch, 2017**



**[Image caption]**

**Recruitment poster from the 1960s.**

**© Crown Copyright, Air Historical Branch**

**Reverse image: © Crown Copyright, MOD**

**[rafm.tours/branch](http://rafm.tours/branch)**

**[Cut out figure]**

**Group Captain Brian Richard Hoskins**

**Joined the RAF in 1964**

**In 1970 Brian Hoskins joined the Macaws aerobatic team who were based at RAF Manby as part of the College of Air Warfare. He later joined the Red Arrows in 1975 and became Red 1 in 1979.**

**Hoskins had the distinction of leading the team when it transferred from the Gnat to the BAE Hawk in 1980, a significant change which required conversion training for the team and led to the display routine being updated.**

**On leaving the Red Arrows, Hoskins moved to the Tactical Weapons Unit at RAF Brawdy, where one of his pupils included HRH The Prince of Wales.**

**'We had no fears about the versatility of the Hawk ... the power/weight ratio was very similar to the Gnat's and the handling characteristics were superb. However, the handling of the controls during formation aerobatics, particularly the throttle and airbrake, were quite different.'**

**Brian Hoskins, 'The Red Arrows: 25 Years' by Ken Ellis and David Oliver, 1989**

**[Image caption]**

**Hoskins with HRH The Prince of Wales, about 1981.**

**© RAFM X003-2603/0158**

**Reverse image: RAF Museum X007-6984**

## **[Recruitment and Training showcase labels]**

**Flight Lieutenant Andy Claesens**

**Joined the RAF in 1983**

**Andy Claesens entered the RAF Reserves eventually becoming an intelligence specialist. In the 1990s, he served overseas with the Jaguar Force – fulfilling his dream of flying in a fast jet – before joining the Defence Intelligence Staff. In 2003, he went to Iraq as an Arms Controller.**

**Andy moved into recruitment in 2009, and for eight years visited schools, colleges, cadets and youth organisations. In 2018 he was based at the Permanent Joint Headquarters at Northwood.**

**‘Recruiting and Selection gave me the huge honour of advising and encouraging youngsters who wished to serve their country.’**

**Andy Claesens**

**[Image caption]**

**At the age of 17, Andy Claesens was recruited by the Royal Auxiliary Air Force Regiment and 'did all the 'Boy's Own' things that Gunners get to do'**

**© Crown Copyright**

**There's a Job for Everyone**

**'There's a job for everyone' was the recruiting slogan for the RAF in the 1970s. The objects in this case are connected to the many and varied trades which have been undertaken by RAF personnel during its first 100 years.**

<b>Recruiting Sign 1920s</b>	<b>1</b>
<b>Butcher's Meat Cleaver 1941</b>	<b>2</b>
<b>Fabric Worker's Fabric-cutting Shears 1949</b>	<b>3</b>
<b>Barber's Scissors 1920s</b>	<b>4</b>
<b>Armourer's Ammunition Linking Tool About 1945</b>	<b>5</b>
<b>Motor Transport Fitter's Valve Spring Holder 1950s</b>	<b>6</b>
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Steward's Tea Cup and Saucer 1918–1939	8
Padre's Communion Set 1938–1939	9
Coppersmith's Soldering Iron and Stand 1951	10
Instrument Repairer's Bar and Callipers 1935	11
Airframe Rigger's Turnbuckle 1914–1918	12
Physical Training Instructor's Punch Ball 1928	13
Balloon Handler's Mooring Strop 1940s	14
Painter Finisher's Varnish Brush 1963	15
Batman's Clothes Brush 1938	16
Surgeon's Surgical Roll 1940	17
Air Traffic Controller 's Head Set 1980s	18
Dentist's Impression Plate 1940s	19
RAF Police Officer's Handcuffs 1950s	20
Shoemaker's Last 1939–1945	21
Musician's Trumpet 1967	22
Blacksmith's Tongs 1966	23
Air Mover's Quick Release Coupling 1970s to today	24
Carpenter's Glue Pot 1963	25

Cook's Rolling Pin 1939	26
Firefighter's Fire hose nozzle 1965	27
Motor Transport Driver's Pennant 1950s	28
Meteorologist's Barometer 1950s	29
Hydrogen Worker's Purity Indicator 1930s	30
Electrician's Test Meter 1942	31

**[Sensory display next to the There's a Job for Everyone showcase]**

**[Model of shoe last, object 21 in the nearby showcase]**

**This shoe last is one of the tools used by shoemakers. Leather is stretched over the last and then a sole is sewn on or glued into place.**

**[Smell]**

**The smell of Kiwi boot polish is familiar to everyone who has served in the RAF. Boots have to be highly polished with no smears to pass inspection.**

**[Sound]**

**Marching drill is an essential part of RAF basic training. It is led by a drill sergeant who is not afraid to shout!**



## Hawker Siddeley Gnat T1 1962–1978

Best known for its use by the Red Arrows aerobatic team, the Gnat T1 entered service in 1962, taking over from Vampire T11s as the RAF's standard advanced training aircraft. This small and agile aircraft was developed from the Gnat lightweight fighter. Gnat T1s formed the initial equipment of the Red Arrows until replaced by Hawk T1s in 1980.

This Gnat T1 was built in 1963 and flew as Red 3 between 1976 and 1980.

### Dimensions

Span: 8.8m / 24ft

Length: 9.7m /  
31ft 9in.

### Use

Two-seat  
advanced trainer

### Engine

4,230lb thrust Bristol Siddeley Orpheus 100

Top Speed 695mph at 20,000ft / 1,118 km/h at 6,096m

## **Maximum Altitude**

**Service Ceiling 14,630m / 48,000ft**

## **Armament None**

## **Where Used**

**UK**

## **[Touch]**

**The Gnat's compact shape and swept wings made it ideal for training fast-jet pilots.**

## Aptitude Testing Machine 1950s–1980s

**Do you have the skills to join the RAF? Applicants had to undergo a number of tests to challenge their co-ordination, multitasking skills and ability to work as a team.**

**This is one of the machines used at aircrew selection centres to test the hand-eye co-ordination of applicants, who had to steer a pointer over a line of dots on a revolving cylinder.**

**There was a slight delay between the movement of the wheel and the pointer, making the task even harder. A low score on this test could see any dreams of becoming a pilot come to an end.**

## Innovation

**The RAF has always needed technological innovation. This is vital for the service to deliver its mission of providing air power and protecting the UK's air space. The RAF works in partnership with industry to develop and supply the equipment and training it needs.**

**Throughout its history the RAF has been able to call upon people of vision, talent and intellect, both from within its ranks and in the wider world. In 2018 the RAF uses a combination of full-time military personnel, reservists, civil servants and contractors known as the Whole Force.**

**Supported by**



[Cut out figure]

Air Commodore Sir Frank Whittle OM, KBE, CB, FRS, FRAeS

Joined the RAF in 1923

Sir Frank Whittle is famous for his pioneering development of the jet engine. He joined the RAF as an apprentice at RAF Cranwell before moving to RAF Halton. He later earned a place on Cranwell's prestigious officer and flying training course. Whittle was known for dangerous aerobatics and low-flying, including wrecking two aircraft while rehearsing for an air display at RAF Hendon – now the RAF Museum.

He went on to develop his theory of jet propulsion – a fine example of Trenchard's vision for the service. Although interest from the Air Ministry in the early jet concept was lukewarm, Whittle persevered and the first aircraft to use his engine, the Gloster E28/39, eventually flew in 1941. The jet engine revolutionised aviation and Whittle was knighted for his work in 1948.

**'It was very hard for anybody to evaluate him, because he was a many-sided person who had a charming naiveté. He trusted people, and believed that everybody was motivated by common good.'**

**Leslie Cheshire, 'Whittle – The True Story', John Golley, 1987**

**[Image caption]**

**Whittle outlined his idea for a jet engine while studying at RAF College Cranwell. Although development was slow, the first British jet-powered aircraft flew in 1941.**

**© RAF Museum P024086**

**Reverse image: Keystone/Hulton Archive/Getty Images**

**[Frank Whittle showcase labels]**

**Air Commodore Sir Frank Whittle OM KBE CB FRS FRAeS**

**Joined the RAF in 1923**

**Sir Frank Whittle invented the jet engine. This example of his uniform is from the time when he held the RAF rank of Air Commodore.**

**The tunic bears pilot's wings in gold wire and medal ribbons including those of a Knight of the British Empire and Commander of the Order of the Bath.**

**This tunic is of the Air Ministry 1947 pattern which only had a short life. The disappearance of the large, useful pockets on the lower skirts of the tunic proved deeply unpopular with officers. Pockets were subsequently reinstated in the 1951 pattern uniform.**

**'A nation's ability to fight a modern war is only as good as its technological ability.'**

**Sir Frank Whittle**

Sir Frank Whittle's Service Dress Uniform:

Cap, Jacket, Trousers, Shirt, Tie, 1947

Power Jets W2/500 Engine 1918–1939

**Following Sir Frank Whittle's original jet engine design, the W2/500 on display in front of you contributed valuable lessons in the development of the first production jet engines in the UK.**

**Whittle's invention of the turbojet became a technological milestone. His initial engine, the WU, appeared in 1937 produced by the Power Jets Company. The improved W1 was first flown in the Gloster E28/39 in May 1941. Experience with the more advanced W2 and W2B resulted in the Rolls-Royce Welland used in the RAF's first jet fighter, the Gloster Meteor.**

**It is believed that this W2/500 development engine was tested in a Vickers.**



**'I do not remember it, but I am told that shortly after take-off, someone slapped me on the back and said 'Frank, it flies!' and that my curt response in the tension of the moment was: that was what it was bloody-well designed to do, wasn't it?'**

**The first flight of the Gloster E28/39, 'JET – the story of a Pioneer', Frank Whittle, 1953**

**[Image caption]**

**The Gloster E28/39 became the first British aircraft powered by a jet engine.**

**© RAF Museum X003-2674-0448 [Tactile objects lectern]**

## **Beatrice 'Tilly' Shilling**

**Beatrice Shilling joined the Royal Aircraft Establishment at Farnborough and served as an aero-engineer for 43 years. During the Second World War, she saved pilots' lives with her brilliant idea of introducing a metal washer into the Merlin engines of early Spitfires and Hurricanes to stop them cutting out in combat.**

**Fearless in the face of discrimination, Tilly was respected by her colleagues for her outstanding intellect, practical skills and personal integrity. She strongly believed in women's equality in the fields of science and technology. Tilly was an expert motorcycle racer and relaxed by driving fast cars at full throttle.**

**'Tilly [was] a flaming pathfinder of women's lib.'**

**Anonymous Royal Aircraft Establishment Scientist, 'The Daily Telegraph Book of Airmen's Obituaries', Edward Bishop, 2002**

**[Image caption]**

**Rolls-Royce Merlin engines being installed in  
Supermarine Spitfires.**

**© RAF Museum 212-222**

## Rolls-Royce Merlin III Engine

**The Spitfire, Hurricane, Lancaster, Mosquito and Mustang are some of the most famous aircraft of the Second World War– and all of them were powered by the Rolls-Royce Merlin engine.**

**Rolls-Royce designed a new engine called the PV12 (Private Venture 12) in 1933, building on the experience gained with the Type R. This became the world-famous Merlin which powered bomber, fighter, and transport aircraft into the 1950s. Built under licence in the USA as well as in the UK, the Merlin proved an adaptable design appearing in many versions which would see its power double over its lifetime from 1,030hp in the Merlin II to 2,060hp in the Merlin 130.**

**This Merlin III on display in front of you was the type of engine used by Spitfires and Hurricanes in the Battle of Britain.**

**[Image caption]**

**Supermarine Spitfires of No. 610 Squadron, 1940.**

**© Crown Copyright**

## **Dame Fanny Lucy Houston**

**The eccentric Lady Houston personally intervened to ensure British participation in the 1931 Schneider Trophy seaplane race. Outraged by the lack of government funding, she used the considerable wealth she had inherited from her three husbands to present £100,000, enabling the Rolls-Royce Type R powered Supermarine S6b to win the race and keep the trophy for Britain.**

**Lady Houston would later fund the first flight over Mount Everest and was always keen to promote British interests. In 1936, the Abdication crisis upset her so much that she stopped eating. This may have led to her subsequent fatal heart attack.**

**'Every true Briton would rather sell his last shirt than admit that England could not afford to defend herself.'**

**Lady Houston on her reasons for funding the Schneider Trophy, 1931**

**Lady Houston with the Schneider Trophy Team, 1931.**

**© RAF Museum PC71/62/001**

## The Schneider Trophy

After winning the 1927 Schneider Trophy race with the Napier Lion powered S5 seaplane, Supermarine turned to Rolls-Royce to supply the engines for the improved S6 aircraft. With only six months to develop the engine, work proceeded 24 hours a day enabling flight testing to commence one month before the race began.

The resulting Rolls Royce Type R engine powered the Supermarine S6 and S6b aircraft to victory in the 1929 and 1931 Schneider Trophy races.

The research and development Rolls Royce put into the Type R, on display here, would feed into the development of the Merlin engine, while the experience gained on the S6 would inform one of Supermarine's later designs – called the Spitfire.

'It is not too much to say that research for the Schneider Trophy contest over the past two years is what our aero-engine department would otherwise have taken six to ten years to learn.'

Sir Arthur Sidgreaves, Managing Director, Rolls-Royce,  
1931

**[Image caption]**

**A Supermarine S6b is manoeuvred on to a slipway.**

**© RAF Museum 65/E/1139**

## Sir Stanley Hooker

Sir Stanley Hooker was a legendary figure in the aero engine industry and one of Britain's greatest engineers. His many achievements include the development of the Rolls-Royce Merlin's two-stage supercharger, enabling the Spitfire Mk IX to counter the Luftwaffe's Focke-Wulf 190. He played a key role in the progression of jet propulsion in Britain, contributing to development of the Rolls-Royce Nene, the Pegasus vectored thrust turbofan – power plant of the Harrier vertical take-off aircraft – and the RB-211.

'One of our great fighter pilots told me of his first operational flight in a (Spitfire) Mk IX, and of the look of astonishment on a German pilot's face as he climbed up past him with a much greater performance.'

Sir Stanley Hooker, 'Not Much of an Engineer', 1984

[Image caption]

Sir Stanley –the force behind many technological achievements.

© RAF Museum AC75-21-35-A



## Pegasus Engine

In 1958 the Bristol Siddeley Company began work on a vectored-thrust engine for vertical take-off. Initially tested in 1959, it produced 40.0Kn (9,000lb) thrust and an improved version, now named Pegasus, powered the Hawker P1127 vertical take-off aircraft on its maiden flight in September 1960.

Further developed by Rolls-Royce and American partner Pratt and Whitney, the Pegasus engine powered the Hawker Siddeley Kestrel as well as all variants of the famous Harrier vertical take-off and landing aircraft.

### Pegasus Engine 1970s–1990s

The Pegasus engine's revolutionary thrust vectoring is obtained by four rotating nozzles, two on either side. It features two main rotating systems, turning in opposite directions, thus minimising gyroscopic forces. This example, the Pegasus 11, powered the Harrier GR3.

[Image caption]

The Pegasus engine that powered the Harrier.

© RAF Museum PC93-36-1

## TIALD

The Thermal Imaging Airborne Laser Designator (TIALD) provided the RAF with a day and night precision targeting system for laser-guided bombs.

TIALD was only in prototype form when called into action during the Gulf War 1991. Engineers from Ferranti and the RAF worked relentlessly to prepare two pods and four Tornados for deployment. The pods, named Sandra and Tracy (Tracy is on display here) after characters from the adult comic Viz, guided over 200 bombs during the final 18 days of the war.

Production versions of TIALD equipped the Tornado, Jaguar and Harrier fleets and were used in Bosnia, Kosovo and Iraq. They were later replaced in service by the more capable Litening III pod.

**'We worked seven days a week– the engineers working 24 hours a day. We did, effectively, two years' work in a month.'**

**Greg Morgan, No. 13 Squadron, on the TIALD development, 'Thunder & Lightning' by Charles Allen, HMSO, 1991.**

**[Image caption]**

**A TIALD panel is inspected underneath a Harrier during the Balkans Conflict.**

**© RAF Museum GDC/074/25/9**

Wing Commander Andrew Walters

Andy Walters and his Navigator had already flown a number of low level attacks against Iraqi airfields during the opening phase of Desert Storm when they were selected to be trained on TIALD.

As the two prototype TIALD pods had been rushed into service, few RAF Tornado crews had been trained in their use. To supplement the small number of crews trained in the UK, the three crews of Andy's flight were reassigned to use TIALD.

They had one morning of ground school followed by an afternoon flying and practising with the pod. The next day they were flying missions over Iraq.

'My Nav was great. He'd never touched this pod before and he ended up getting an award from Ferranti for the biggest percentage of hits. Every one of his targets he correctly identified and designated.'

Andy Walters, RAF Museum interview, August 2017

**[Image caption]**

**A Sepecat Jaguar carrying a TIALD pod.**

**© RAF Museum X007-6980**

**[RAF in the World showcase]**

## **The RAF in the World**

**Some of the RAF's most important partnerships are with allied nations, many of which have endured throughout its first 100 years.**

**The RAF went to the aid of Kuwait in 1920 during a border dispute – support which continued, as required, through to 1930. In 1940 the people of Kuwait contributed to the Gulf fighter fund which raised £50,000 to pay for 10 RAF Spitfires, replacing those lost during the Battle of Britain. The RAF continued to provide air support for Kuwait, helping to protect its borders following independence in 1961.**

**The RAF has also assisted in training the Kuwaiti Air Force and played a leading role in the liberation of Kuwait after the Iraqi invasion of 1990.**

**The partnership continues today.**

**Sergeant Graeme Holt Fenton in the cockpit of W3360**

**© RAF Museum PO15036**

**Background image: © RAF Museum X008-4002/005**

Framed Badge No. 79 Squadron (RAF) 1939

1

**Good will visits, squadron exchanges and participation in military displays help to bond allied nations together. This badge commemorates the participation of No. 79 Squadron in the Bastille Day fly past in Paris.**

The NATO Tiger Association 1961–2018 and beyond

**The Tiger Meet was an idea promoted initially by No. 74 Squadron. Squadrons with tigers in their heraldic badges are invited to annual NATO Tiger meets to develop camaraderie between allies and exchange ideas.**

**Participating aircraft and accessories are often painted with tiger stripes**

Aircrew Protective Helmet, No. 74 Squadron 1980s

2

**No. 74 Squadron was a founding member of the Tiger Association.**

Tiger Meet Patch 1982

3

## Shoulder Titles

Trinidad, Rhodesia and New Zealand Belgium, Czechoslovakia,

Luxembourg and Channel Islands

Argentina and Brazil 1982 4

**During the Second World War, foreign personnel serving with the Royal Air Force could be identified by badges carried on their shoulders which displayed their country of origin.**

Hugh the Bear 2018 5

**Hugh was named after 1st Viscount Hugh Montague Trenchard, Father of the Royal Air Force, to mark the RAF's centenary.**

**Hugh is travelling the world in 2018, meeting people from the RAF and other air forces. He is recording all his flights in his log book and collecting squadron badges for his kit bag.**

**You can follow his adventures on Facebook at: Hugh the Flying Bear. Hugh will be landing at the Museum later this year for a well-earned rest.**



## Tri-National Tornado Training Establishment

**The Panavia Tornado was built jointly by the UK, Germany and Italy to share the huge costs of developing new airframes. The Tri-national Tornado Training Establishment was formed at RAF Cottesmore in 1981 and continued to train pupils from the three nations until 1999.**

## Tri-National Tornado Training Establishment Badges

1980s and 1990s 6

Tri-National Tornado Training Establishment Beer Tankard 7

Exchange Officer US Air Force P-4 Helmet 1957 8

**Officers can serve tours and even fight in units of another NATO country. This helmet was worn by Squadron Leader Morley, an RAF pilot who flew F-102 Delta Daggers with United States Air Force.**

**Letter and Polish Air Force eagle badge sent by Corporal Wladyslaw Ciesielski to Sheila Tremaine, the young daughter of an English friend, 30 January 1944.**

**Ciesielski's letter explains why Polish airmen are in Britain fighting alongside their RAF comrades.**