

# LARGE PRINT GUIDE



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

# Support

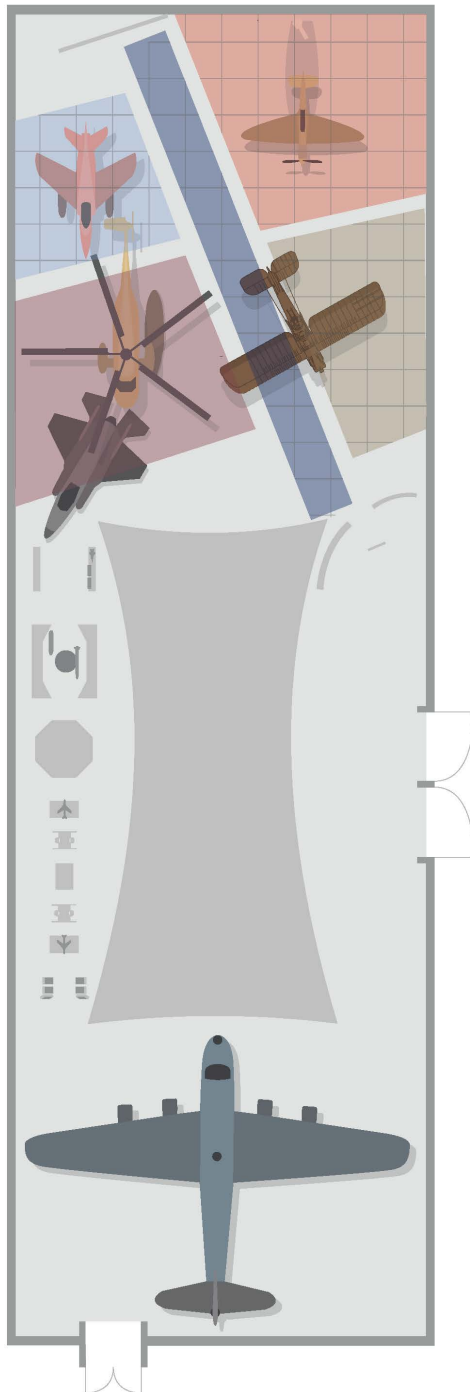
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# Location of the Support theme



 Support

## Support

Since its formation in 1918, the Royal Air Force has supported its people, the nation and those in need around the world. It delivers disaster relief and humanitarian aid. It ensures that people, supplies and equipment are transported quickly to wherever they are needed.

The RAF relies on highly-skilled personnel on the ground as well as in the air. The service can be called upon to support civil and military operations worldwide, using the global reach of the RAF transport fleet.

## Saving Lives

**The RAF provides medical services, safety and survival equipment, and escape and evasion aids to its personnel. Its services and resources have also been called upon to help civilians across the world – including Search and Rescue and Mountain Rescue. The RAF's transport fleet has often delivered vital global humanitarian relief following natural and man-made disasters.**

**[Support showcase labels]**

**Corporal Joan Daphne Mary Pearson GC**

**Joined the Women's Auxiliary Air Force in 1939**

**In the early hours of 31 May 1940, Daphne Pearson rescued the injured pilot of a burning aircraft loaded with bombs after it had crashed near Detling airfield.**

**She went back to look for another member of the crew in the burning wreckage, whom she found dead. Daphne then returned to the base to help the doctor and was on duty as usual a few hours later.**

**She was awarded the Empire Gallantry Medal, later the George Cross, for her bravery, the first woman to receive the award during the Second World War.**

**'Corporal Pearson threw herself on top of the pilot to protect him from the blast and splinters ... Her prompt and courageous action undoubtedly helped to save the pilot's life.'**

**From the citation for the awarding of the Empire Gallantry Medal, 'London Gazette', 19 July 1940**

## Keeping Alive and Safe

**Flying at height can be dangerous. The RAF have to equip their aircrews to work in an environment where severe cold, lack of oxygen and low pressure can prove fatal. They also have to be protected from physical threats, high g-forces and the potential risk from fire.**

Aircrew Equipment Assembly: 1

Mk 4B Aircrew Helmet

Type V9 Oxygen Mask

Type 317A Oxygen Regulator Mk 20 Life Jacket

Personal Equipment Connector Mk 2A Anti-G External Trousers

1980s–1990s

**This equipment is designed to keep aircrew alive both in flight and in the event of having to leave the aircraft. This kit was used by a member of a Phantom aircrew during the early 1990s.**

**Partial Pressure Helmet 1960s** 2

**As height is gained, air pressure decreases. However, the human body needs pressure to prevent it from swelling. This helmet is worn with a suit that puts pressure onto the lungs. Aircrew also inhale pressurised oxygen to help them cope with differences in pressure internally.**

**Heated Clothing:** 3

**Type H Electrically-heated Sock Electrically-heated Waistcoat**  
**1939 –1945**

**Flying at height is very cold and heated clothing was first used in the First World War. The examples here were used in the Second World War.**

**First Aid Pouch 1940s** 4

**This first aid pack includes pain relief and treatments for burns and large wounds.**

**Aircraft-Stowed Crash Axe 1930s–1980s** 5

**This equipment is used by aircrew to exit the aircraft in an emergency.**



## Capture and Escape

Many RAF personnel have had to endure long periods of imprisonment in sometimes challenging conditions.

Some have used locally-sourced materials or items smuggled to them by military intelligence to help them escape, evade capture and return to safety.

### Prisoner of War Clog 1918

6

This clog was issued to an RAF prisoner of war in Germany during the First World War. The many scraps of leather used in its construction hint at the shortages in raw materials in Germany at this time.

### Safe Conduct Pass 1930s

7

Used from 1920s to the present day, the safe conduct pass promises to reward the bearer if they help a downed airman evade capture. They became known as goolie chits as local tribes in the region where they were first used were rumoured to castrate prisoners.

Wanted Poster 1942

8

**This leaflet was issued by the German police for Squadron Leader Douglas Bader and Flight Lieutenant John Palmer. Although Bader had lost both legs in a flying accident, he became a celebrated fighter ace and, when shot down and captured, made several attempts to escape.**

Radio 1944

9

**There is a concealed radio in this water canteen. In order to keep up to date with how the war was going, prisoners of war devised ingenious ways of concealing from the Germans the means to obtain unfiltered/unbiased news.**

Wooden Camera 1940s

10

**This camera was constructed by a prisoner of war to take photographs for forged documents to be used to avoid capture after an escape.**

## **Billy Can 1941–1945**

11

**Corporal Thomas Fisher was captured by the Japanese in 1942 and endured over three years of imprisonment in a number of POW camps in the Far East. The engravings on this billy can summarise his movements across the region. The bear represents his home county of Warwickshire.**

## **Braces and Playing Cards About 1943**

12

**Maps were hidden in everyday items like braces and playing cards to enable them to be smuggled in to prisoner of war camps.**

## **Artwork of an MI9 Escape Aid 1943**

13

**British Intelligence department MI9 produced escape aids to help Allied airmen shot down over Europe return to Britain. This artwork shows how a compass can be hidden inside an RAF tunic button.**

## Survival and Evasion

**In the event that they were compelled to leave their aircraft, RAF aircrew have to be able to survive in environments which can range from the sea to desert. They also have to be prepared to evade hostile forces and win the trust of local populations.**

Flying Ration

14

Water Cannister

Edible Candle

Aircrew Whistle

Aircrew Escape Pack

1943–about 1980

**These objects were standard RAF issue to support aircrew who had to survive outside their aircraft.**

Join the Club

15

Caterpillar Club Badge

Goldfish Club Cloth Badge

Late Arrivals Club Certificate

Martin-Baker Tie

1943–1945

**These badges are awards for surviving a range of escapes and near misses.**

**The Caterpillar Club is for those who escaped from an aircraft using a parachute.**

**You can gain a Goldfish Club badge if you escape in a life raft.**

**The Late Arrivals Club certificate is presented to those who have evaded capture and returned.**

**The Martin-Baker tie can be worn by those who have successfully used a Martin-Baker ejection seat.**

**[Sensory display at the end of Saving Lives showcase]**

**[Model of the oxygen mask]**

**Oxygen masks are standard issue for aircrew who fly at high altitudes. A microphone enables easy communication.**

**[Smell]**

**All engineers have a handy rag to hand to mop up the oil spills that inevitably happen when aircraft and engines are in for repair.**

**[Sound]**

**The sound of the rotors of Chinook helicopters are very distinctive. Chinook crews describe it as 'wokka wokka'.**

## Airlift

While they are often overshadowed by the exploits of more agile combat aircraft, the rapid deployment of troops and supplies by transport aircraft and helicopters can be just as crucial to the successful outcome of a mission.

Transport aircraft can be used to sustain life and as a declaration of intent. During the Berlin Airlift, the aircraft of RAF Transport Command and the United States Air Force kept the population of West Berlin from starvation. In June 1948 Soviet forces blockaded the divided former German capital. An airlift was the only way of supplying food and fuel to the population of West Berlin. During the 11-month blockade, aircraft delivered 1.5 million tons of supplies ensuring the survival of the Western occupied zones.

**'Tension was high ... one plane arrived every minute ...  
They brought everything Repair and Maintenance  
to Berlin. Not only bread, meat, milk but even coal and  
wood; and they saved the situation.'**

**Mikhail Semiryaga, Soviet Military Administration, Berlin,  
1948/1949, 'Berlin Airlift', Jonathan Sutherland and Diane  
Canwell**

**[Image caption]**

**Supplies are offloaded from a Handley Page Hastings  
during the Berlin Airlift.**

**© RAF Museum PC98/173/6338**



## SOS

The RAF provides a pool of personnel, equipment and expertise that can be called upon during times of national and international crisis.

The main role of services like Search and Rescue and Mountain Rescue may originally have been to recover RAF aircrew but they have spent most of their time rescuing civilians. At home, RAF personnel have found themselves helping emergency services during floods, security alerts and serving as firefighters during industrial disputes. Abroad, aircraft and helicopters have been used to deliver aid to remote areas cut off by natural disasters.

**'You're in the forces, but you're saving lives, not taking them.'**

**Sergeant Paul Hunter, 'The Daily Telegraph', 2015**

**[Image credit]**

**A crew transfer from their dinghy to an airborne lifeboat.**

**© RAF Museum P029402**

## **Airborne Lifeboat Mk 1A 1943**

**This mahogany hulled parachute-dropped lifeboat was originally built for use with the RAF Coastal Command Vickers Warwick ASR Mk 1 air-sea rescue aircraft from October 1943.**

**Later versions were used also by Lancaster and Shackleton aircraft. It had auxiliary engines (not now fitted), oars and a mast – all these were stowed on deck together with the rudder.**

**After the Second World War, this example was used for sail training until struck off RAF charge in February 1950.**

## Eject

Things can go wrong very suddenly in a combat aircraft so it is essential to be able to exit the cockpit as quickly as possible.

By the 1940s the steady rise in operating speeds made it increasingly difficult for aircrew to abandon their aircraft if required. The Martin-Baker Company designed an ejection seat which used a series of explosions to propel it, and its occupant, clear of the cockpit. Early seats relied on the aircrew to unstrap themselves and then deploy their parachute but this was soon replaced by an automatic system. Later, rocket seats also enabled aircrew to escape from static aircraft on the ground.

Anyone whose life has been saved by using a Martin-Baker seat is offered membership of the Ejection Tie Club. By 2018 the club had over 6,000 members.

**[Image credit]**

**A Mk16 seat from a Typhoon receives a thorough check.**

**© RAF Museum 051079**

## **Ejection Seat, Martin-Baker Mk 2 1950s–1960s**

**1**

**The cartridge powered Mk 2 was the first Martin Baker seat to offer automatic release. After the seat had left the aircraft, a drogue would fire, deploying the parachute and separating the occupant from the seat even if they were unconscious. The Mk 2 seat was fitted to a number of RAF aircraft in the 1950s. This Mk 2E was fitted to a Gloster Meteor.**

## **Ejection Seat, Martin-Baker Mk 7A 1978–2018**

**2**

**Fitted to the Phantom in RAF service, the rocket-powered Mk 7 family of seats has proved one of the most successful ejection seats ever produced, having saved the lives of over 2,400 aircrew throughout the world.**

## Ejection Seat, Folland, Type 4GT/2 Mk 4 1960s–1970s<sup>3</sup>

**The only other British company to have produced an ejection seat was Folland Aircraft Ltd. This lightweight seat, based on a Swedish design, was fitted to the Hawker Siddeley Gnat T1. It featured an unusual arming handle which would poke the occupant in the back of the head if left in the safe position.**

## Transport and Maintenance

**Whether they are serving in arctic snowfields or arid deserts, it is the personnel on the ground who ensure that the RAF continues to operate in the air.**

**Cutting-edge technology needs specialists to repair and maintain it. Today, major repair work is undertaken by industry partners. However, it is RAF personnel who carry out the daily servicing, maintenance and repair of equipment, sometimes with basic tools and under fire.**

**[Cut out figure]**

**Flight Lieutenant Julie Ann Gibson**

**Joined the RAF in 1984**

**The RAF began recruiting female pilots in 1989. RAF engineering officer Julie Ann Gibson sent in her application on the very first day it became possible and, in 1991, was the first female regular officer to graduate as an RAF pilot.**

**She specialised in flying multi-engine aircraft and became a Captain on Lockheed Hercules aircraft, based at RAF Lyneham in Wiltshire. She delivered personnel and equipment to locations around the world.**

**'If you have a dream or passion don't let anybody put you off it and don't let anybody say you can't do something because you are a girl.'**

**Julie Gibson, The Kingsley School News**

**[Image caption]**

**Gibson sits at the controls of a Lockheed Hercules of No. 24 Squadron, RAF Lyneham, 2001.**

**© RAF Museum X003-2647/002**

**Reverse image: © RAF Museum X003-2646/001**



## **Servicing Under Fire**

**In 1942 the RAF Servicing Commandos were established to support air operations from forward operating bases close to the battlefield. Through North Africa, Italy, Northern Europe and Burma this small band of specialists had to re-arm, refuel and maintain aircraft on makeshift or recently occupied airfields.**

**With the enemy nearby, they had to be on alert. During March 1945 the Servicing Commandos found themselves fighting alongside the RAF Regiment during a month long siege of the Burmese airfield of Meiktila.**

**The modern successors to the Servicing Commandos are the RAF Tactical Supply Wing who support and refuel helicopters in the field.**

**'Most of the time the men lived liked nomads, sleeping under tents moving often at short notice. All the Units were involved in the major invasion landings ... to keep the aircraft flying.'**

**'A History of the RAF Servicing Commandos' by JP Kellett & J Davies, 1989**

**[Image credit]**

**A member of the Tactical Supply Wing advances to refuel a Puma helicopter.**

**© RAF Museum X003-2688-7SW4**

**Trojan 5cwt Tender 1927**

**1**

**Introduced in 1924, the Trojan van was based on the cheap, and mechanically simple, Trojan motorcar. The low price and cheap running costs were irresistible to an RAF desperate to replace its wartime vintage Ford vehicles, but suffering under a tight budget. The Trojan entered service in 1927 with both a solid van body and the canvas covered utility body seen here.**

**David Brown Light Aircraft Tractor Mk 2, Diesel 1953      2**

**After the Second World War the RAF sought to replace its aging fleet of agricultural tractors that had been used to move aircraft around their airfields. Based on the successful Taskmaster industrial tractor, the Light Aircraft Tractor entered service in 1953 and was able to pull aircraft weighing up to 60,000 lb (27,216 kg). The last examples in service were sold off by 1976.**

**Trolley Accumulator 1940s      3**

**Trolley Accumulator contains a series of batteries providing a ground-based source of electric power for an aircraft. This example has been fitted with a small petrol engine to provide power for recharging the batteries.**

## Global Reach

**The movement of equipment and troops is a vital military task. With its global reach and speed of deployment, the RAF's transport fleet is an essential part of the UK's armed forces.**

**After the First World War, overseas deployment of RAF personnel was common and could involve a long and uncomfortable journey by ship, rail and finally truck. In the 21st century, deploying troops by helicopter or aircraft can have an immediate effect on the battlefield but, often, it is the longer-term logistical support of the transport, tanker and motor transport fleets that is vital to success.**

## Westland Sea King HAR3 1962–1978

Originally designed for anti-submarine warfare, the Westland Sea King was adapted for RAF search and rescue duties as the Sea King HAR3. Deliveries began in 1978, replacing the Whirlwind HAR10 and Wessex HAR2 in providing search and rescue cover for both military and civilian personnel across the UK. Sea Kings were fitted with highly advanced search and navigation equipment and operated in all weathers both day and night.

This Sea King was the very first in RAF service, and was only retired in 2015. It was flown in 2011 by HRH The Duke of Cambridge while he was serving as a Search and Rescue pilot at RAF Valley.

### Dimensions

Rotor diameter: 18.8m / 62ft

Length: 16.9m / 55ft 9.75in.

### Use

Long range,  
all-weather search and rescue helicopter

## **Engine**

**Two 1,795 shp Rolls-Royce Gnome gas turbines**

## **Top Speed**

**131mph / 210km/h**

## **Maximum Altitude**

**Service Ceiling 4,267m / 14,000ft**

## **Armament None**

## **Where Used**

**UK**

**Falkland Islands**

## **[Touch]**

**The Sea King's large fuselage enables it to provide enough equipment and space for major rescue missions.**

**[Cut out figure]**

**Flight Lieutenant Ayla Holdom**

**Joined the RAF in 2003**

**Ayla Holdom was a Search and Rescue (SAR) Sea King pilot based at RAF Chivenor. In 2011, she became the first openly transgender pilot in the British Armed Forces.**

**Holdom found the RAF judged her solely on her professional skills and her colleagues were strongly supportive. One of those colleagues was HRH The Duke of Cambridge who invited her and others from their unit to his wedding in June 2012. Holdom retired from the RAF in 2015 after a 13-year career to fly police helicopters.**

**'The legacy of the RAF is written and upheld by its people. It was my absolute privilege to serve where diversity made us stronger.'**

**Flight Lieutenant Ayla Holdom, 2017**

**Holdom completes paperwork at RMB Chivenor.**

**© Ayla Holdom /Reverse image: © Ayla Holdom**

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

**[Cut out figure]**

**Lara Small**

**Joined Rolls-Royce in 2011**

**Lara Small is the Manufacturing Engineer Manager for Engine Assembly at Rolls-Royce. She leads 20 manufacturing engineers who specialise in different engines including the EJ200 (Typhoon) and the RB 199 (Tornado). Small spent a large part of her childhood taking things apart, not only to fix them, but also for the pleasure of finding out how things are made.**

**Her hobbies of attending air shows and riding motorbikes led her to study Aerospace Manufacturing Engineering at University before joining Rolls-Royce in 2011. Small was one of The Daily Telegraph's top 50 women in engineering in 2014.**

**[Image caption]**

**Lara Small at Rolls-Royce in front of a Rolls-Royce Trent engine at the Bristol branch.**

**© Rolls-Royce/Reverse image: © Rolls-Royce**



# Lockheed Martin F-35B Lightning II

## Joint Strike Fighter From 2018

The F-35 has been in development since 1997. It is the result of a partnership between over 1,500 companies from nine countries. There are three different variants in use by twelve nations. Each variant has slightly different capabilities. The A variant takes off and lands conventionally, the B variant is designed for short takeoff and vertical landing, and the C variant is designed specifically to fly from aircraft carriers.

To discover more about the F-35 please visit the RAF – First to the Future exhibition.

### Dimensions

Span: 10.7m / 35ft

Length: 15.6m / 51ft 2in.

### Use

Short Takeoff and Vertical Landing (STOVL) supersonic stealth aircraft, capable of both strike operations and intelligence gathering

## **Engine**

**Two 4,000lb thrust Pratt and Whitney F-135-600  
turbofans**

## **Top Speed**

**1,200 mph / 1,930km/h**

## **Maximum Altitude**

**Service Ceiling 15,240m / 50,000ft**

## **Armament**

**Paveway IV AMRAAM ASRAAM**

**Other missiles and bombs are currently in development**

## **Where Used**

**USA, trials and training**

**UK**