

Royal Air Force


The **Royal Air Force** (RAF) is the United Kingdom's aerial warfare force. Formed towards the end of the First World War on 1 April 1918,^[4] it is the oldest independent air force in the world.^[5] Following victory over the Central Powers in 1918 the RAF emerged as, at the time, the largest air force in the world.^[6] Since its formation, the RAF has taken a significant role in British military history. In particular, it played a large part in the Second World War where it fought its most famous campaign, the Battle of Britain.^[7]

The RAF's mission is to support the objectives of the British Ministry of Defence (MoD), which are to "provide the capabilities needed to ensure the security and defence of the United Kingdom and overseas territories, including against terrorism; to support the Government's foreign policy objectives particularly in promoting international peace and security".^[3] The RAF describes its mission statement as "... [to provide] an *agile, adaptable* and *capable* Air Force that, person for person, is second to none, and that makes a decisive air power contribution in support of the UK Defence Mission".^[8] The mission statement is supported by the RAF's definition of air power, which guides its strategy. Air power is defined as "the ability to project power from the air and space to influence the behaviour of people or the course of events".^[9]

Today the Royal Air Force maintains an operational fleet of various types of aircraft,^[10] described by the RAF as being "leading-edge" in terms of technology.^[11] This largely consists of fixed-wing aircraft, including: fighter and strike aircraft, airborne early warning and control aircraft, ISTAR and SIGINT aircraft, aerial refueling aircraft and strategic and tactical transport aircraft. The majority of the RAF's rotary-wing aircraft form part of the tri-service Joint Helicopter Command in support of ground forces. Most of the RAF's aircraft and personnel are based in the UK, with many others serving on operations (principally over Iraq and Syria) or at long-established overseas bases (Ascension Island, Cyprus, Gibraltar, and the Falkland Islands). Although the RAF is the principal British air power arm, the Royal Navy's Fleet Air Arm and the British Army's Army Air Corps also deliver air power which is integrated into the maritime, littoral and land environments.

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<div><div><div></div></div></div> <div>Badge of the Royal Air Force</div>	
Founded	1 April 1918
Country	United Kingdom
Type	Air force
Role	Aerial warfare
Size	33,840 active personnel ^[1] <div>832 operational aircraft^[2]</div> <div>1,940 RAuxAF</div> <div>2,220 reserve personnel^[a]</div>
Part of	British Armed Forces
Air Staff Offices	Whitehall, London
Motto(s)	Latin: <i>Per Ardua ad Astra</i> <div>"Through Adversity to the Stars"^[3]</div>
March	Royal Air Force March Past
Website	www.raf.mod.uk (http://www.raf.mod.uk/)
Commanders	
Chief of the Air Staff	Air Chief Marshal Mike Wigston
Notable commanders	Lord Trenchard <div>Lord Portal</div>
Insignia	

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History

Origins

While the British were not the first to make use of heavier-than-air military aircraft, the RAF is the world's oldest independent air force: that is, the first air force to become independent of army or navy control.^[5] Following publication of the "Smuts report" prepared by Jan

Ensign



Logo



Roundels



Fin flashes



Pilot's brevet



Aircraft flown

Attack

- Typhoon FGR.4
- General Atomics MQ-9A Reaper
- General Atomics MQ-9B Protector RG.1
- Lockheed Martin F-35B Lightning

Fighter

- Typhoon FGR.4
- Lockheed Martin F-35B Lightning

Trainer helicopter

- Airbus Helicopters Jupiter HT.1
- Airbus Helicopters Juno HT.1

Utility helicopter

- Aérospatiale SA 330 Puma HC.2
- Leonardo AW109SP GrandNew
- Bell Griffin HAR.2
- Boeing Chinook HC.4/5/6/6A

Reconnaissance

- Beechcraft Shadow R.1

Smuts^[12] the RAF was founded on 1 April 1918, with headquarters located in the former Hotel Cecil, during the First World War, by the amalgamation of the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS). At that time it was the largest air force in the world. After the war, the service was drastically cut and its inter-war years were relatively quiet, with the RAF taking responsibility for the control of Iraq and executing a number of minor actions in other parts of the British Empire. The RAF's naval aviation branch, the Fleet Air Arm, was founded in 1924 but handed over to Admiralty control on 24 May 1939.^[13]

The RAF developed the doctrine of strategic bombing which led to the construction of long-range bombers and became its main bombing strategy in the Second World War.^[14]

Second World War



A late-war version of the Spitfire, which played a major role in the Battle of Britain

The RAF underwent rapid expansion prior to and during the Second World War. Under the British Commonwealth Air Training Plan of December 1939, the air forces of British Commonwealth countries trained and formed "Article XV squadrons" for service with RAF formations. Many individual personnel from these countries, and exiles from occupied Europe, also served with RAF squadrons. By the end of the war the Royal Canadian Air Force had contributed more than 30 squadrons to serve in RAF formations, similarly, approximately a quarter of Bomber Command's personnel were Canadian.^[15] Additionally, the Royal Australian Air Force represented around nine percent of all RAF personnel who served in the European and Mediterranean theatres.^[16]

In the Battle of Britain in 1940, the RAF (supplemented by 2 Fleet Air Arm Squadrons, Czechoslovak, Polish and other multinational pilots and ground personnel) defended the skies over Britain against the numerically superior German Luftwaffe. In what is perhaps the most prolonged and complicated air campaign in history, the Battle of Britain contributed significantly to the delay and subsequent indefinite postponement of Hitler's plans for an invasion of the United Kingdom (Operation Sea Lion). In the House of Commons on 20 August, prompted by the ongoing efforts of the RAF, Prime Minister Winston Churchill eloquently made a speech to the nation, where he said "Never in the field of human conflict was so much owed by so many to so few".^[17]

	<ul style="list-style-type: none">Boeing E-3D Sentry AEW.1Boeing RC-135W Airseeker R.1General Atomics MQ-9A ReaperRaytheon Sentinel R.1
Trainer	<ul style="list-style-type: none">BAE Hawk T.1/T.2Beechcraft Super King AirBeechcraft T-6 Texan IIGrob Viking T.1Typhoon T.3Grob Prefect T.1Grob Tutor T.1Short Tucano T.1
Transport	<ul style="list-style-type: none">Airbus Voyager KC.2/KC.3Airbus A400M Atlas C.1Boeing C-17 Globemaster IIIBAe 146 CC.2/C.3Lockheed Martin C-130J Hercules C.4/C.5

The largest RAF effort during the war was the strategic bombing campaign against Germany by Bomber Command. While RAF bombing of Germany began almost immediately upon the outbreak of war, under the leadership of Air Chief Marshal Harris, these attacks became increasingly devastating from 1942 onward as new technology and greater numbers of superior aircraft became available. The RAF adopted night-time area bombing on German cities such as Hamburg and Dresden, and developed precision bombing techniques for specific operations, such as the "Dambusters" raid by No. 617 Squadron,^[18] or the Amiens prison raid known as Operation Jericho.^[19]



The Avro Lancaster heavy bomber was extensively used during the strategic bombing of Germany.

Cold War era

Following victory in the Second World War, the RAF underwent significant re-organisation, as technological advances in air warfare saw the arrival of jet fighters and bombers. During the early stages of the Cold War, one of the first major operations undertaken by the Royal Air Force was in 1948 and the Berlin Airlift, codenamed Operation Plainfire. Between 26 June and the lifting of the Russian blockade of the city on 2 May, the RAF provided 17% of the total supplies delivered during the event, using Avro Yorks, Douglas Dakotas flying to Gatow Airport and Short Sunderlands flying to Lake Havel.^[20]



The Handley Page Victor bomber was a strategic bomber of the RAF's V bomber force used to carry both conventional and nuclear bombs.

Before Britain developed its own nuclear weapons the RAF was provided with American nuclear weapons under Project E. However following the development of its own arsenal, the British Government elected on 16 February 1960 to share the country's nuclear deterrent between the RAF and submarines of the Royal Navy, first deciding on 13 April to concentrate solely on the air force's V bomber fleet. These were initially armed with nuclear gravity bombs, later being equipped with the Blue Steel missile. Following the development of the Royal Navy's Polaris submarines, the strategic nuclear deterrent passed to the navy's submarines on 30 June 1969.^[21] With the introduction of Polaris, the RAF's strategic nuclear role was reduced to a tactical one, using WE.177 gravity bombs. This tactical role was continued by the V bombers into the 1980s and until 1998 by Tornado GR1s.^{[22][23]}

For much of the Cold War the primary role of the RAF was the defence of Western Europe against potential attack by the Soviet Union, with many squadrons based in West Germany. The main RAF bases in RAF(G) were RAF Bruggen, RAF Gutersloh, RAF Laarbruch and RAF Wildenrath – the only air defence base in RAF(G). With the decline of the British Empire, global operations were scaled back, and RAF Far East Air Force was disbanded on 31 October 1971.^[24] Despite this, the RAF fought in many battles in the Cold War period. In June 1948 the RAF commenced Operation Firedog against Malayan terrorists during the Malayan Emergency.^[25] Operations continued for the next 12 years until 1960 with aircraft flying out of RAF Tengah and RAF Butterworth. The RAF played a minor role in the Korean War, with flying boats taking part.^[26] From 1953 to 1956 the RAF Avro Lincoln squadrons carried out anti-Mau Mau operations in Kenya using its base at RAF Eastleigh.^[27] The Suez Crisis in 1956 saw a large RAF role, with aircraft operating from RAF Akrotiri and RAF Nicosia on Cyprus and RAF Luqa and RAF Hal Far on Malta as part of Operation Musketeer.^[28]



The Avro Vulcan was a strategic bomber used during the Cold War to carry conventional and nuclear bombs.



RAF Shackleton flying in formation in 1957 during Jebel Akhdar War in Oman

In 1957, the RAF participated heavily during Jebel Akhdar War in Oman with both Venom and Shackleton jet aircraft. The RAF made 1,635 raids, dropping 1,094 tons and firing 900 rockets at the interior of Oman between July and December 1958 targeting insurgents, mountain top villages and water channels in a war that remained under low profile.^{[29][30]} The Konfrontasi against Indonesia in the early 1960s did see use of RAF aircraft, but due to a combination of deft diplomacy and selective ignoring of certain events by both sides, it never developed into a full-scale war.^[31]

One of the largest actions undertaken by the RAF during the cold war was the air campaign during the 1982 Falklands War, in which the RAF operated alongside the Fleet Air Arm. During the war, RAF aircraft were deployed in the mid-Atlantic at RAF Ascension Island and a detachment from No. 1 Squadron was deployed with the Royal Navy, operating from the aircraft carrier HMS Hermes.^{[32][33]} RAF pilots also flew missions using the Royal Navy's Sea Harriers in the air-to-air combat role, in particular Flt Lt Dave Morgan the highest scoring pilot of the war.^[34] Following a British victory, the RAF remained in the South Atlantic to provide air defence to the Falkland Islands, based at RAF Mount Pleasant (built 1984).^[35]

Recent history

With the end of the Cold War and the collapse of the Soviet Union, the RAF's focus has returned to delivering expeditionary air power.^[36] Since 1990 the RAF has been involved in several large-scale operations, including: the 1991 Gulf War,^[37] the 1999 Kosovo War,^[38] the 2001 War in Afghanistan,^[39] the 2003 invasion and war in Iraq^[40] and the 2011 intervention in Libya.^[41]

The RAF's 90th anniversary was commemorated on 1 April 2008 by a flypast of 9 Red Arrows and four Typhoons along the Thames, in a straight line from just south of London City Airport Tower Bridge, the London Eye, the RAF Memorial and (at 13.00) the Ministry of Defence building.^{[42][43][44]}

Four major defence reviews have been conducted since the end of the Cold War: the 1990 Options for Change, the 1998 Strategic Defence Review, the 2003 Delivering Security in a Changing World and the 2010 Strategic Defence and Security Review. All four defence reviews have resulted in steady reductions in manpower and numbers of aircraft, especially combat aircraft such as fast-jets. As part of the latest 2010 Strategic Defence and Security Review, the BAE Systems Nimrod MRA4 maritime patrol aircraft was cancelled due to over spending and missing deadlines.^[45] Other reductions saw total RAF manpower reduced by 5,000 personnel to a trained strength of 33,000 and the early retirement of the Joint Force Harrier aircraft, the Harrier GR7/GR9.^[46]



Typhoons and Red Arrows flypast for the 90th Anniversary of the RAF, 2008

In recent years fighter aircraft on Quick Reaction Alert (QRA) have been increasingly required to scramble in response to efforts made by the Russian Air Force to approach British airspace.^[48] On 24 January 2014 in the Houses of Parliament, Conservative MP and Minister of State for the Armed Forces, Andrew Robathan, announced that the RAF's QRA force had been scrambled almost thirty times in the last three years: eleven times during 2010, ten times during 2011 and eight times during 2012.^[49]

RAF Coningsby in Lincolnshire and RAF Lossiemouth in Moray both provide Quick Reaction Alert, or QRA, and scramble their fighter jets within minutes to meet or intercept aircraft which give cause for concern. Lossiemouth generally covers the northern sector, while Coningsby provides QRA in the south. Typhoon pilot Flight Lieutenant Noel Rees describes how QRA duty works. "At the start of the scaled QRA response, civilian air traffic controllers might see on their screens an aircraft behaving erratically, not responding to their radio calls, or note that it's transmitting a distress signal through its transponder. Rather than scramble



A Typhoon on QRA intercepts a Russian Tupolev Tu-95 bomber approaching UK airspace^[47]

Typhoons at the first hint of something abnormal, a controller has the option to put them on a higher level of alert, 'a call to cockpit'. In this scenario the pilot races to the hardened aircraft shelter and does everything short of starting his engines".^[50]

On 4 October 2015, a final stand-down saw the end of more than 70 years of RAF Search and Rescue provision in the UK. The RAF and Royal Navy's Westland Sea King fleets, after over 30 years of service, were retired. A civilian contractor, Bristow Helicopters, took over responsibility for UK Search and Rescue, under a Private Finance Initiative with newly purchased Sikorsky S-92 and AgustaWestland AW189 aircraft. The new contract means that all UK SAR coverage is now provided by Bristow aircraft.^[51]

In 2018 the RAF's vision of a future constellation of imagery satellites was initiated through the launch of the Carbonite-2 technology demonstrator. The 100 kg Carbonite-2 uses commercial off-the-shelf (COTS) components to deliver high-quality imagery and 3D video footage from space.^{[52][53]}

Structure

The professional head of the RAF is the Chief of the Air Staff (CAS).^[54] The CAS heads the Air Force Board, which is a committee of the Defence Council. The Air Force Board is the management board of the RAF and consists of several high-ranking officers.^[55]

Authority is delegated from the Air Force Board to the RAF's commands. While there were once individual commands responsible for bombers, fighters, training, etc., now only the Air Command exists, headquartered at RAF High Wycombe.^[56] As this command is headed by the Chief of the Air Staff himself, it does not operate in way previous commands did with their own separate Air Officers Commanding and staff remote from Whitehall.^[57]

Groups

Groups are the subdivisions of operational commands; these are responsible for certain types of operation or for operations in limited geographical areas:

- No. 1 Group (Air Combat): controls the fast-jet force and the RAF's intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) capabilities, as well as the following stations: RAF Coningsby, RAF Lossiemouth, RAF Marham, and RAF Waddington.^[58]
- No. 2 Group (Air Combat Support): controls the Air Mobility aircraft and the RAF's Force Protection assets as well as the following stations: RAF Benson, RAF Brize Norton, RAF Odiham and RAF Northolt.^[59]
- No. 11 Group (Multi-domain operations group): will lead air and space operations and command of the following air stations: RAF Boulmer, RAF Fylingdales, RAF Scampton, RAF Spadeadam.^[60]
- No. 22 Group (Training): responsible for the supply of qualified and skilled personnel, as well as the following stations: RAF College Cranwell, RAF Cosford, RAF Halton, RAF Linton-on-Ouse, RAF Shawbury, MOD St Athan, RAF St Mawgan and RAF Valley.^[61]
- No. 38 Group (Air Combat Service Support): responsible for engineering and logistics, communications and medical operations, as well as the following stations: RAF High Wycombe and RAF Wittering.^[62]
- No. 83 Group (Expeditionary Air): the RAF's operational headquarters in the Middle East, responsible for UK air operations in the Operations KIPION and SHADER Joint Operating Areas (JOAs) of some eight million square miles.^[63]

Stations

An RAF station is ordinarily subordinate to a group; it is commanded by a group captain and it is sub-divided into administrative wings, each under a wing commander, as follows:^[64]

- Operations wing
- Forward support wing
- Depth support wing
- Tactical imagery support wing
- Base support wing

Wings

As well as administrative wings, the RAF has formed Expeditionary Air Wings (EAWs), each under a wing commander, to support operations; wings currently active are as follows:

- No. 34 Expeditionary Air Wing, based at RAF Waddington: delivers ISTAR operations^[65]
- No. 38 Expeditionary Air Wing, based at RAF Brize Norton: delivers air transport operations^[66]
- No. 121 Expeditionary Air Wing based at RAF Coningsby: delivers multi role operations^[67]
- No. 135 Expeditionary Air Wing based at RAF Leeming: delivers fighter operations^[67]
- No. 138 Expeditionary Air Wing based at RAF Marham: delivers fighter operations^[67]
- No. 140 Expeditionary Air Wing based at RAF Lossiemouth: delivers fighter operations^[67]
- No. 901 Expeditionary Air Wing based in the middle east: delivers voice and data systems^[68]
- No. 902 Expeditionary Air Wing based in the middle east: delivers helicopter services^[69]
- No. 903 Expeditionary Air Wing based at RAF Akrotiri: delivers operations against ISIL^[70]
- No. 906 Expeditionary Air Wing based in the Middle East: delivers transport services^[71]



Main bases of the Royal Air Force 2018:

● Typhoon ● Lightning ● Hawk T1A ● Hawk T2 ● Tucano T1
● ISTAR ● Transport ● Helicopters ● Basic Trainers ● VIP

Squadrons



Phased Array Ballistic Missile Early Warning System at RAF Fylingdales

A flying squadron is an aircraft unit which carries out the primary tasks of the RAF. RAF squadrons are somewhat analogous to the regiments of the British Army in that they have histories and traditions going back to their formation, regardless of where they are based, which aircraft they are operating, etc. They can be awarded standards and battle honours for meritorious service. Whilst every squadron is different, most flying squadrons are commanded by a wing commander and, for a fast-jet squadron, have an establishment of around 12 aircraft.^[64]

Training Schools

The RAF Schools consist of the squadrons and support apparatus that train new aircrew to join front-line squadrons. The schools separate individual streams, but group together units with similar responsibility or that operate the same aircraft type. Some schools operate with only one Squadron, and have an overall training throughput which is relatively small; some, like 3 FTS, have responsibility for all Elementary Flying Training (EFT) in the RAF, and all RAF aircrew will pass through its squadrons when they start their flying careers. 2 FTS and 6 FTS do not have a front-line training responsibility – their job is to group the University Air Squadrons and the Volunteer Gliding Squadrons together. 2 FTS's commanding officer holds the only full-time flying appointment for a Group Captain in the RAF, although he is a reservist.

- Central Flying School – CFS standardises flying training across the air force and ensures standards and safety are maintained.^[72]
- No. 1 Flying Training School – Basic Fast Jet Training (BFJT), based at RAF Linton-on-Ouse^[73]
- No. 2 Flying Training School – Gliding training, based at RAF Syerston^[74]
- No. 3 Flying Training School – Elementary Flying Training, based at RAF Cranwell with a squadron at RAF Wittering.^[75]
- No. 4 Flying Training School – Advanced Fast Jet Training (AFJT), based at RAF Valley^[76]
- No. 6 Flying Training School – Flight training for the University Air Squadrons, based at RAF stations throughout the UK^[77]

The British military operate a number of joint training organisations based at RAF Stations:

- Defence Elementary Flying Training School – Elementary Flying Training for Royal Navy and Army Air Corps students, based at RAF Barkston Heath^[78]
- Defence Helicopter Flying School – Basic helicopter training, based at RAF Shawbury.^[79]
- Defence College of Technical Training^[80] – Several different specialist areas: aeronautical engineering, electro and mechanical engineering, and communication and information systems.^[81]
 - Defence College of Aeronautical Engineering.^[82] Comprising:
 - Royal Naval Air Engineering and Survival Equipment School.
 - DCAE (Lyneham)
 - No 1 School of Technical Training, Royal Air Force
 - Defence College of Electro-Mechanical Engineering.^[83] Comprising:
 - Royal Naval School of Marine Engineering
 - 8 Battalion Royal Electrical and Mechanical Engineers
 - No 4 School of Technical Training, Royal Air Force
 - Defence School of Communications and Information Systems.^[84] Comprising:
 - 11th (Royal School of Signals) Signal Regiment
 - No 1 Radio School, Royal Air Force
 - Defence School of Marine Engineering.

Flights

A flight is a sub-division of a squadron. Flying squadrons are often divided into two flights, e.g., "A" and "B", each under the command of a squadron leader. Administrative squadrons on a station are also divided into flights and these flights are commanded by a junior officer, often a flight lieutenant. Because of their small size, there are several flying units formed as flights rather than squadrons. For example, No. 1435 Flight is based at RAF Mount Pleasant in the Falkland Islands, maintaining air defence cover with four Eurofighter Typhoon aircraft.^[85]



RAF Mount Pleasant, home to No. 1435 Flight providing air defence for the Falkland Islands

Personnel

At its height in 1944 during the Second World War, more than 1,100,000 personnel were serving in the RAF. The longest-lived founding member of the RAF was Henry Allingham, who died on 18 July 2009 aged 113.^[86]

As of 1 January 2015, the Royal Air Force numbered some 34,200 Regular^[87] and 1,940 Royal Auxiliary Air Force^[88] personnel, giving a combined component strength of 36,140 personnel. In addition to the active elements of the Royal Air Force, (Regular and Royal Auxiliary Air Force), all ex-Regular personnel remain liable to be recalled for duty in a time of need, this is known as the Regular Reserve. In 2007 there were 33,980 Regular Reserves of the Royal Air Force, of which 7,950 served under a fixed-term reserve contract.^[89] Publications since April 2013 no-longer report the entire strength of the Regular Reserve, instead they only give a figure for Regular Reserves who serve under a fixed-term reserve contract.^[90] They had a strength of 7,120 personnel in 2014.^[91]



Members of the RAF Regiment on parade, 2013

Figures provided by the International Institute for Strategic Studies from 2012 showed that Royal Air Force pilots achieve a relatively high number of flying hours per year when compared with other major NATO allies such as France and Germany. RAF pilots achieve 210 to 290 flying hours per year.^[92] French and German Air Force pilots achieved only 180 and 150 flying hours across their fleets respectively.^[93]

Officers

Officers hold a commission from the Sovereign, which provides the legal authority for them to issue orders to subordinates. The commission of a regular officer is granted after successfully completing the 24-week-long Initial Officer Training course at the RAF College, Cranwell, Lincolnshire.^[94]

To emphasize the merger of both military and naval aviation when the RAF was formed, many of the titles of officers were deliberately chosen to be of a naval character, such as flight lieutenant, wing commander, group captain, and air commodore.^[95]

Other ranks

Other ranks attend the Recruit Training Squadron at RAF Halton for basic training.^[96] The titles and insignia of other ranks in the RAF were based on that of the Army, with some alterations in terminology. Over the years, this structure has seen significant changes: for example, there was once a separate system for those in technical trades, and the ranks of chief technician and junior

technician continue to be held only by personnel in technical trades. RAF other ranks fall into four categories: Warrant Officers, Senior Non-Commissioned Officers, Junior Non-Commissioned Officers and Airmen. All Warrant Officers in the RAF are equal in terms of rank, but the most senior Non-Commissioned appointment is known as the Chief of the Air Staff's Warrant Officer.^[97]

Specialist training and education

The Royal Air Force operates several units and centres for the provision of non-generic training and education. These include the Royal Air Force Leadership Centre and the Royal Air Force Centre for Air Power Studies, both based at RAF Cranwell,^[98] and the Air Warfare Centre, based at RAF Waddington and RAF Cranwell.^[99] NCO training and developmental courses occur at RAF Halton and officer courses occur at the Joint Services Command and Staff College at Shrivenham.^[100]

Aircraft

Combat Air

Typhoon

The Eurofighter Typhoon FGR4 is the RAF's primary multi role air defence and ground attack fighter aircraft, with a total of six squadrons based across RAF Coningsby and RAF Lossiemouth,^{[101][102]} following the retirement of the Panavia Tornado F3 in late March 2011.^[103] Their task is to defend UK airspace. In October 2007 it was announced that MoD Boscombe Down, RNAS Culdrose and RAF Marham would also be used as Quick Reaction Alert bases from early 2008, offering around-the-clock fighter coverage for the South and South West of UK airspace when a direct threat has been identified.^[104] With the retirement of the Panavia Tornado GR4 on 1 April 2019, the Typhoon FGR4 took over the Tornados' duties after undergoing the 'Project Centurion' upgrades.^{[105][106][107]}



Typhoon FGR4

The RAF has nine front-line Typhoon units; No. 3 (Fighter) Squadron, No. XI (F) Squadron, No. 12 (Bomber) Squadron (joint RAF/Qatar Air Force squadron), No. 29 Squadron (Operational Conversion Unit) and No. 41 Test and Evaluation Squadron based at RAF Coningsby, with No. 1 (F) Squadron, No. II (Army Cooperation) Squadron, No. 6 Squadron and No. IX (B) Squadron based at RAF Lossiemouth. On 23 November 2015, it was announced that two additional front-line Typhoon squadrons will be formed consisting of Tranche 1 versions.^{[101][108]}

Lightning

On 23 November 2015, it was announced that a total of 138 Lockheed Martin F-35B Lightning IIs will be ordered.^{[109][110][111]} Known only as the **Lightning** in British service,^[112] the first RAF squadron to operate the F-35 was No. 17 Test and Evaluation Squadron at Edwards AFB, California, accepting its first F-35B in 2014.^[113] No. 617 (The Dambusters) Squadron officially reformed on 18 April 2018 as an RAF Lightning Squadron.^[114] The first four aircraft arrived at RAF Marham in June 2018,^[115] with a further five arriving in August 2018.^[116] The planes were declared combat ready in January 2019.^[117] The second UK based F-35 squadron to be formed will be No. 207 Squadron on 1 July 2019 as the OCU for both RAF and Royal Navy pilots.^[118]

Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR)

The Sentry AEW1, based at RAF Waddington, provides airborne early warning to detect incoming enemy aircraft and to co-ordinate the aerial battlefield.^[119] The UK Government's announcement of the procurement of five E-7 Wedgetails in March 2019 led to the withdrawal of two Sentry AEW1s in preparation for the future transition to the new type, bringing the fleet down to four aircraft.^[120]



F-35B Lightning

The Sentinel R1 (formally known as ASTOR – Airborne STand-Off Radar) provides a ground radar-surveillance platform based on the Bombardier Global Express long range business jet. These were supplemented in 2009 by four (a fifth was added later) Beechcraft Shadow R1 aircraft equipped for the ISTAR role over Afghanistan.^[121] Three more Shadow aircraft will be procured as per the 2015 Defence Review. The Tornado GR4A is fitted with cameras and sensors in the visual, infra-red and radar ranges of the spectrum.^[122]

Ten MQ-9A Reaper Unmanned aerial vehicles have been purchased to support operations in Iraq and Afghanistan. They are operated by No. 39 Squadron based at Creech Air Force Base and No. XIII Squadron at RAF Waddington.^[123]

Three RC-135W Rivet Joint replaced the Nimrod R1 fleet in the signals intelligence role under the AIRSEEKER Programme. The Nimrod fleet was retired in 2011, the RAF co-manned aircraft of the US Air Force until the three RC-135s entered service between 2014 and 2017.^[124] The aircraft will be Boeing KC-135 Stratotanker tankers converted to RC-135W standard in the most complex combined Foreign Military Sales case and co-operative support arrangement that the UK has undertaken with the United States Air Force since the Second World War.^[125] Airseeker received its first operational deployment in August 2014, when it was deployed to the Middle East to fly missions over Iraq and Syria as part of Operation Shader.^[126]



Sentry AEW1



Sentinel R1



Airseeker R1



Shadow R1



MQ-9A Reaper

Helicopters

An important part of the work of the RAF is to support the British Army by ferrying troops and equipment at the battlefield. However, RAF helicopters are also used in a variety of other roles, including support of RAF ground units and heavy-lift support for the Royal Marines. The support helicopters are organised into the tri-service Joint Helicopter Command (JHC), along with helicopters of the British Army and Royal Navy.^[127]

The large twin-rotor Boeing Chinook, based at RAF Odiham provides heavy-lift support^[128] and is supported by the Westland Puma HC2 medium-lift helicopter based at RAF Benson.^[129] The Bell Griffin HAR.2s based at RAF Akrotiri in the Cyprus Sovereign Base Areas, the only remaining dedicated helicopter Search and Rescue force in the RAF.^[130] However, all UK military helicopter aircrew routinely train and practice the skills necessary for Search and Rescue, and the support helicopters based in the UK are available to the Government under Military Aid to the Civil Authorities in case they are needed. The AgustaWestland AW109 Grand New aircraft of No. 32 (the Royal) Squadron also provide VIP transport and military helicopter capabilities.^[131]



Chinook HC2



Puma HC2



Griffin HAR2



AW109 Grand New

Air Mobility

The RAF operate the Boeing C-17 Globemaster III in the heavy strategic airlift role, originally leasing four from Boeing. These were purchased, followed by a fifth delivered on 7 April 2008 and a sixth delivered on 8 June 2008. The new aircraft entered frontline use within days rather than weeks. The MoD said there was "a stated departmental requirement for eight" C-17s and a seventh was subsequently ordered, to be delivered in December 2010.^[132] In February 2012 the purchase of an eighth C-17 was confirmed,^[133] the aircraft arrived at RAF Brize Norton in May 2012.^[134]

More routine strategic airlift transport tasks are carried out by the Airbus A330 MRTT, known as the Voyager in RAF service. The first Voyager arrived in the UK for testing at MoD Boscombe Down in April 2011,^[135] and entered service in April 2012.^[136] The Voyager received approval from the MoD on 16 May 2013 to begin air-to-air refuelling flights and made its first operational tanker flight on 20 May 2013 as part of a training sortie with Tornado GR4s. By 21 May 2013, the Voyager fleet had carried over 50,000 passengers and carried over 3,000 tons of cargo.^[137] A total of 14 Voyagers are due to form the fleet, with 9 allocated to sole RAF use. As the Voyagers lack a refueling boom, the RAF has requested a memorandum of understanding (MoU) with the USAF allowing the UK access to tankers equipped with refueling booms for its Boeing RC-135W Airseeker SIGINT aircraft.^[138]

Shorter range, tactical-airlift transport is provided by the Lockheed Martin C-130J Hercules, known as Hercules C4 and C5 in RAF service and based at RAF Brize Norton in Oxfordshire. The draw-down of the Hercules C5 fleet has begun with the final aircraft planned to retire in 2019. The fourteen C4 extended variants are scheduled to retire on 31 March 2035. The Airbus A400M Atlas replaced the RAF's fleet of Hercules C1/C3 (C-130K) transport aircraft which were withdrawn from service on 31 December 2012 and will also replace the C4/C5 variants. Originally, 25 aircraft were ordered, although the total is now 22.^{[139][140]}

No. 32 (The Royal) Squadron replaced the Queen's Flight in 1995 and operate the Agusta A109 and BAe 146 CC2 in the general air transport and VIP transport roles. The squadron is based at RAF Northolt in west London. Aircraft operate with a priority for military needs over VIP transport. Two additional BAe 146s were purchased in March 2012 from TNT Airways and were refitted by Hawker Beechcraft on behalf of BAE Systems for tactical freight and personnel transport use.^{[141][142]} The aircraft, designated as the BAe 146 C Mk 3, arrived in Afghanistan in April 2013.^[143]



C-17A Globemaster III



Atlas C1 (A400M)



Hercules C5 (C-130J)



Voyager KC3 (A330 MRTT)



BAe 146 CC2



BAe 146 C3

Training aircraft

Elementary Flying Training, as well as Multi-Engine Lead-In training, is conducted on the Grob Tutor T1. Basic fast jet training is provided on the Short Tucano T1 and initial helicopter training on the Squirrel HT1, at which stage aircrew gain their 'wings'. Multi-Engine aircrew, weapon systems officer (WSO) and weapon systems operator (WSOp) students are trained on the King Air to gain their wings before a posting to an Operational Conversion Unit. Advanced jet flying training is now provided on BAe Hawk T2 for fast jet aircrew and helicopter pilots complete a course on the Bell Griffin HT1, before they are sent to their OCU, which trains them on a specific aircraft type in preparation for service with a front-line squadron. The OCUs use modified operational aircraft, such as the Typhoon T3, as well as sophisticated simulators and ground training.^[144]

The Tutor equips the fourteen University Air Squadrons, which provide University students an opportunity to undertake an RAF training syllabus based loosely on EFT to get them to and beyond solo standard. These units are co-located with Air Experience Flights, which share the same aircraft and facilities and provide air experience flying to the Air Training Corps and CCF. The Volunteer Gliding Squadrons also provide air experience flying to cadets using the Grob Viking T1 conventional glider. Due to an airworthiness issue in April 2014, the Viking fleet and the Grob Vigilant T1 aircraft were grounded for a two-year period, although Viking operations have subsequently resumed.^[145] The Vigilant was unexpectedly withdrawn from service in May 2018, a year earlier than planned. A contract tender was initiated in February 2018 to replace this capability starting in 2022.^[146]

Two of the ten T-6 Texan II trainers due as part of the UK Military Flight Training System were delivered in February 2018, forming the nucleus of the unit to be operated at RAF Valley. The aircraft are jointly operated by the Royal Air Force and Ascent Flight Training to provide lead-in training for RAF and Royal Navy fighter pilots prior to advanced training on the Hawk.^[147]

No. 100 Squadron operates the BAe Hawk T1 to support other fast jets and in support of ground unit training, as an aggressor aircraft. The Squadron fulfils the role of enemy aircraft in air combat training or to provide more assets in joint exercises.^[148]



Tutor T1



Tucano T1



Hawk T1



King Air T1



Viking T1

Future aircraft

The F-35B Lightning II is intended to enter service around 2020 under the Joint Combat Aircraft programme.^[149] On 19 July 2012 the Defence Secretary, Philip Hammond, in a speech in the US, indicated that the UK would initially receive 48 F-35B to equip the Navy's carrier fleet and would announce at a later date what the final numbers would be. Jon Thompson, MOD Permanent Secretary, told the House of Commons Defence Select Committee, in late 2012: "Our commitment over the first 10 years is for 48 F-35B". An order for the first 14 aircraft on top of the four already procured for operational test and evaluation is expected later in 2013. The first four of 14 production aircraft were ordered in November 2014.^[150] Six further aircraft were ordered on 3 November 2015,^[150] with expected delivery in 2016. In November 2015, the government commitment to order 48 F-35B aircraft by 2023,^[151] 24 of which will be available for carrier duties.^[152] The 2015 Strategic Defence and Security Review stated the intent for the UK to purchase 138 F-35 aircraft over the life of the programme.^[152] The first F-35 aircraft arrived at RAF Fairford in Gloucestershire on 29 June 2016 after a Transatlantic crossing involving air to air refuelling.^[153]

On 5 October 2015, it was announced that the Scavenger programme had been replaced by "**Protector**", a new requirement for at least 20 systems.^[154] On 7 October 2015, it was revealed that Protector will be a Certifiable derivative of the MQ-9B SkyGuardian with enhanced range and endurance.^[155] In July 2018, a General Atomics US Civil registered MQ-9B SkyGuardian was flown from North Dakota to RAF Fairford for the Royal International Air Tattoo where it was given RAF markings. It was formally announced by the Chief of Air Staff that No. 31 Squadron would become the first squadron to operate the Protector RG1.^{[156][157][158]}

In July 2014 the House of Common Defence Select Committee released a report on the RAF future force structure that envisaged a mixture of unmanned and manned platforms, including further F-35, Protector RG1, a service life extension for the Typhoon (which would otherwise end its service in 2030) or a possible new manned aircraft.^[159]

In November 2015, the Government confirmed in its Strategic Defence and Security Review that nine Boeing P-8 Poseidon aircraft will be purchased for surveillance, anti-submarine and anti-surface ship warfare, filling a capability gap in maritime patrol that had been left since the cancellation of the Nimrod MRA4 programme in the 2010 SDSR.^[160] It was announced on 20 August 2018 that the Boeing P-8A will be known as the **Poseidon MRA1** in RAF service.^[161] The first production Poseidon MRA1 *ZP801* made its initial flight on 13 July 2019.^[162]

In July 2018 at the Farnborough Airshow, the Defence Secretary announced a £2bn investment for BAe Systems, MBDA and Leonardo to develop a new British 6th Generation Fighter to replace Typhoon in 2035 under Project TEMPEST.^[163]

On 22 March 2019, the Defence Secretary announced the United Kingdom had signed a \$1.98 billion deal to procure five Boeing E-7 Wedgetails to replace the ageing E-3D Sentry AEW1 fleet in the Airborne Early Warning and Control (AEW&C) role, with deliveries expected to take place in the early 2020s.^[120]



Boeing Poseidon MRA1



F-35 Lightning



Boeing E-7 Wedgetail

UK Military Flying Training System

The UK's military flying training has been civilianised through a public-private partnership, which puts training output in the hands of a civilian contractor, known as Ascent Flight Training, a consortium of Lockheed Martin and Babcock International. The main elements of the system are fixed- and rotary-wing training from ab-initio all the way to Operational Conversion Units, which prepare aircrew for a specific frontline platform.^[164]

Fixed wing

The new process uses three new fixed wing aircraft, the Grob 'Prefect' elementary trainer, the Beechcraft T-6 Texan II basic fast jet trainer, and the Embraer Phenom 100 multi-engine trainer. The aircraft have been procured to reduce the training gap between the older generation Tutor T1, Tucano T1 and King Air T1 aircraft, and the RAF's modern frontline aircraft, including advanced systems and glass cockpits. MFTS also relies far more on synthetic training to deliver aircrew to the front line, where advanced synthetic training is commonplace. Basic Fast Jet training is undertaken on the Texan, and advanced training is done on the BAE Systems Hawk T2, the contract for which had been separated from the rest of the UK MFTS contract, under the auspices of the Advanced Fast Jet Trainer programme.^[165]



Prefect T1



Texan T1



BAE Hawk T2



Phenom T1

Rotary

In May 2016, it was announced that the RAF would see delivery of 29 Airbus H135 and 3 Airbus H145 helicopters for use as training aircraft. It was announced by Air Marshal Sean Reynolds, the Senior Responsible Owner for UKMFTS, that "Aircrew across the three Services will continue to conduct their basic and advanced rotary training at RAF Shawbury and Army Air Corps Middle Wallop. Aircrew selected for training in mountain and maritime helicopter operations will receive instruction at RAF Valley".^[166]

Symbols, flags, emblems and uniform



Royal Air Force Ensign

Following the tradition of the other British fighting services, the RAF has adopted symbols to represent it, use as rallying devices for members and promote esprit de corps. British aircraft in the early stages of the First World War carried the Union Flag as an identifying feature; however, this was easily confused with Germany's Iron Cross motif. In October 1914, therefore, the French system of three concentric rings was adopted, with the colours reversed to a red disc surrounded by a white ring and an outer blue ring.^[167] The relative sizes of the rings have changed over the years and during World War II an outer yellow ring was added to the fuselage roundel. Aircraft serving in the Far East during World War II had the red disc removed to prevent confusion with Japanese aircraft.^[168] Since the 1970s, camouflaged aircraft carry low-visibility roundels, either red and blue on dark camouflage, or washed-out pink and light blue on light colours. Most uncamouflaged training and transport aircraft retain the traditional red-white-blue roundel.^[168]



Queen's Colour

The Latin motto of the RAF, "Per ardua ad astra", is usually translated as "Through Adversity to the Stars",^[169] but the RAF's official translation is "Through Struggle to the Stars".^[3] The choice of motto is attributed to a junior officer named J S Yule, in response to a request from a commander of the RFC, Colonel Sykes, for suggestions.^[170]

The Badge of the Royal Air Force was first used in August 1918. In heraldic terms it is: "In front of a circle inscribed with the motto Per Ardua Ad Astra and ensigned by the Imperial Crown an eagle volant and affronte Head lowered and to the sinister".^[169] Although there have been debates among airmen over the years whether the bird was originally meant to be an albatross or an eagle, the consensus is that it was always an eagle.^[171]

Ceremonial functions and display

Red Arrows

The Red Arrows, officially known as the Royal Air Force Aerobatic Team, is the aerobatics display team of the Royal Air Force based at RAF Scampton, with under-review plans to move to RAF Waddington. The team was formed in late 1964 as an all-RAF team, replacing a number of unofficial teams that had been sponsored by RAF commands.^[172] The Red Arrows badge shows the aircraft in their trademark *Diamond Nine* formation, with the motto *Éclat*, a French word meaning "brilliance" or "excellence".^[172]

Initially, they were equipped with seven Folland Gnat trainers inherited from the RAF Yellowjacks display team. This aircraft was chosen because it was less expensive to operate than front-line fighters. In their first season, they flew at 65 shows across Europe. In 1966, the team was increased to nine members, enabling them to develop their *Diamond Nine* formation. In late 1979, they switched to the BAE Hawk trainer. The Red Arrows have performed over 4,700 displays in 56 countries worldwide.^[173]



The Red Arrows in formation with an F-35B and a pair of Typhoons at the Royal International Air Tattoo in 2016

Royal Air Force Music

Headquarters Royal Air Force Music Services, located at RAF Northolt, supports professional musicians who attend events around the globe in support of the RAF. The Central Band of the Royal Air Force was established in 1920.^[174] Other bands include the Band of the Royal Air Force College, the Band of the Royal Air Force Regiment and the Band of the Royal Auxiliary Air Force.^[175]

Current deployments

Country	Dates	Deployment	Details
<u>Gibraltar</u>	1940s–present	<u>RAF Gibraltar</u>	Although there are no permanently stationed aircraft, RAF aircraft (e.g. transports) make regular visits. ^[176]
<u>Cyprus</u>	1940–present	<u>RAF Akrotiri</u>	As part of <u>British Forces Cyprus</u> , the RAF have aircraft which can be deployed from Cyprus as part of the <u>intervention against ISIL</u> . ^[177]
<u>Qatar</u>	2005–present	<u>RAF Al Udeid</u>	An RAF <u>RC-135 Rivet Joint</u> aircraft is based at Al Udeid which is currently in use as a Middle Eastern base for the RAF as well as being the headquarters for the RAF contribution to <u>Operation Shader</u> . ^[178]
<u>Afghanistan</u>	2001–present	<u>Operation Toral</u>	The UK continues to contribute to NATO's <u>Resolute Support Mission</u> with the RAF providing <u>Puma HC2s</u> . ^[179]
<u>Norway</u>	1960s–present	<u>Bardufoss Air Station</u>	RAF fighter and/or helicopter squadrons undergo winter-training in Norway. ^[180]
<u>Ascension Island</u>	1982–present	<u>RAF Ascension Island</u>	The island is used as an air bridge between the UK and the <u>Falkland Islands</u> . ^[181]
<u>Falkland Islands</u>	1982–present	<u>RAF Mount Pleasant</u>	As part of <u>British Forces South Atlantic Islands</u> , the RAF has two Chinook helicopters based at Mount Pleasant, ^[182] and four Typhoon aircraft in an air defence role. ^[183]

See also

- Royal Air Force Museum
- Royal Auxiliary Air Force
- Royal Air Force Air Cadets
- List of military aircraft operational during World War II
- List of Royal Air Force stations
- RAF News

Footnotes

- Since April 2013, MoD publications no longer report the entire strength of the **Regular Reserve**, instead, only Regular Reserves serving under a fixed-term reserve contract are counted. These contracts are similar in nature to the RAuxAF.

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