

2017



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RAF Red Arrows



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 **ROYAL
AIR FORCE REDTM
ARROWS**

A photograph of two young boys in profile, looking towards the right. They are wearing blue polo shirts with 'Blue Skies' and 'Jon Egging Trust' logos. In the background, a red RAF flight suit is visible, hanging on a wall. The setting appears to be a museum or exhibition space.

BAE SYSTEMS

INSPIRED WORK

Each season, the Royal Air Force Aerobatic Team, the Red Arrows, is fortunate to perform in front of millions of people. As Red 1, I feel enormously privileged when, during one of our show's looping manoeuvres, I look up through the top of the jet's cockpit canopy and see the thousands of spectators that come to each event. We hope that by watching our display and being able to meet the personnel that work on the team, that people from all backgrounds are inspired to think, feel and – importantly – do something differently, perhaps in a creative or innovative way.

Indeed, every week, the team's pilots, engineers and support staff travel to many schools, universities and businesses. Particularly rewarding is our involvement with good causes, such as one of the RAF's family of charities or the Jon Egging Trust, which works with young people. Through these activities, we aim to encourage individuals to look above the norm, understand their potential and see what teamwork, dedication and self-belief can achieve.

The Red Arrows demonstrate the qualities and capabilities of the RAF and we cherish

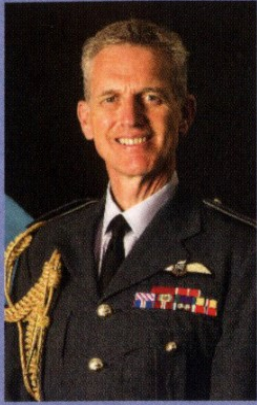


the responsibility of representing the Armed Forces and United Kingdom across the world. The Red Arrows, as a brand, is one that has enormous reach overseas. Aviation is a truly global language and the Red Arrows support UK interests in an unrivalled manner, forging 21st century partnerships across defence, industry and education. This was seen during our 60-day Asia-Pacific and Middle East tour last year, when the team made history by displaying in China for the first time.

Our focus is now on delivering the very best aerobatic show during 2017 – the Red Arrows' 53rd display season. As a Squadron, we're incredibly

proud of our heritage and are always looking to advance our preparation and performance in the constant pursuit of excellence. On behalf of the entire Red Arrows team, thank you for your support and I hope you enjoy the display.

Squadron Leader **David Montenegro**
Red 1 and Team Leader of the Royal Air Force
Aerobatic Team, the Red Arrows



The Royal Air Force Aerobatic Team, the Red Arrows, has been impressing crowds across the United Kingdom and around the world for over 50 years. 2016 was a particularly exciting year for the team, including displaying in China for the first time and

visiting 16 other countries on the way there and back – a visible demonstration of Britain's place in the world, and the global reach of the Royal Air Force.

For many people, seeing the Red Arrows' red, white and blue smoke trails over a summer sky at an air display is the only contact they will have with the Royal Air Force. But it's important to recognise that the skill, dedication and professionalism of the nine pilots who will fly the display today are in fact demonstrated every day by every member of the whole Force that makes up the Service, whether that be the team of well over 100 who constitute the Red Arrows, or every regular, reservist, civilian and contractor who works in all areas of the Royal Air Force. Each and every one of them has a vital part to play in defending our Nation and its interests whether at home or overseas.

And of course the RAF remains as busy as it has been in a generation, defending the skies of the United Kingdom, and participating in Counter-Daesh operations in Iraq and Syria, whilst remaining on standby to conduct humanitarian and other operations wherever in the world we might be needed.

I hope you enjoy the display today: it is with great pleasure that I present the 2017 Royal Air Force Aerobatic Team – the Red Arrows.

Air Chief Marshal

**Sir Stephen Hillier KCB CBE DFC ADC MA RAF
Chief of the Air Staff, The Royal Air Force**



Whether enjoying a display by the Royal Air Force Aerobatic Team in the United Kingdom or overseas, you're watching a tangible result of detailed preparation. Indeed, the Red Arrows' dynamic show is perfected over six months before a busy season

begins, with talented, skilled pilots, engineers and support staff working closely together to deliver a demonstration of innovation and precision – both in the air and on the ground.

This type of world-class training is a hallmark of the Royal Air Force. The Red Arrows form part of the Central Flying School which is responsible for inspiring instructional and flying excellence across the three services. Based at RAF College Cranwell in Lincolnshire, the Central Flying School, parented by No 22 (Training) Group, trains flying instructors for the Royal Air Force, the Royal Navy and Army and conducts research and development into instructing techniques. It has an important role in maintaining military flying standards. Established in 1912, the Central Flying School is the world's oldest flying school – and has a global reputation in its field, with strong international partnerships and influence.

Just as the Central Flying School continues to deliver the very best training, the Red Arrows remain focussed on showcasing the best of British – displaying the unique capabilities of the Royal Air Force and its people on new stages in 2017.

Group Captain

Fin Monahan

OBE DFC MA MSc RAF

Commandant,

Central Flying School



Look carefully on the side of the Red Arrows' aircraft or sleeve of any of our personnel and you will see the Royal Air Force Aerobatic Team's crest with its motto, Éclat. It's proudly worn by the team and symbolises both our privilege to represent the Royal Air Force as a whole and also a common goal – the constant pursuit of excellence.



Detailed preparation goes into each and every aspect of the Red Arrows' year, which involves a continuous, high-tempo cycle of training, displays and engagement activities. Whether it's a performance at a home venue in the United Kingdom or a show overseas, the Red Arrows help to project vital influence, promote prosperity and support important national interests using the team's convening power. Each member of the Red Arrows, including support staff, technicians or pilots, understands these responsibilities and aims to inspire those we are honoured to meet and display for.

Thank you for your unwavering support of the team and we hope you enjoy the Red Arrows' 53rd season.

**Wing Commander
Martin Higgins MSc BEng RAF
Officer Commanding, Royal Air Force Aerobatic Team**



Showcasing UK excellence across the globe

In 2017, the Royal Air Force Aerobatic Team will perform to millions of people, with the same guiding direction as the very first Red Arrows season more than 50 years ago: Impress the knowledgeable, thrill the ignorant and scare no one.

Combining teamwork, precision and flair, the Red Arrows will display across the United Kingdom and overseas, promoting the best of British to new audiences and stages.

But that only tells half the story. The Squadron is busy all year, on the ground and in the air – preparing and training to ensure the show seen by people in the summer is polished and perfected.

Just like those personnel at other units of the Royal Air Force, the 120 people who make up the entire Red Arrows team are highly-skilled individuals who are motivated in the pursuit of excellence.

Flying British-built Hawk fast-jets, the team, which is based at RAF Scampton, Lincolnshire, aims to perform a world-leading and inspirational aerobatic display in its 53rd season and add to the more than 4,800 shows completed since the opening 1965 campaign.



Those watching in 2017 will see a new display featuring colourful changes, including to the wide arrival formation – known as the Wall – and the popular Tornado move, where Reds 8 and 9 roll around the rest of the team's aircraft. There is also another new manoeuvre to enjoy in the second half of the show, called Hurricane, and a big change to the show's finale which sees Red 1 fly a very dynamic pattern, before a stunning break by seven of the jets.

In this brochure, you can find out more about the pilots, engineers and essential support staff who form the Royal Air Force Aerobatic Team and the important roles of the Red Arrows.

Representing the Royal Air Force

The Red Arrows are a reminder of the dedicated, talented people found across the Royal Air Force. Members of the Squadron have served on operational units, including fast-jets, helicopters, strategic transport and intelligence-gathering aircraft. Their experience reflects the wide range of tasks the Service performs each and every day to help secure the skies and protect and promote national interests.

Supporting UK growth and prosperity

Being renowned for excellence, the Red Arrows showcase and reinforce the reputation of the UK, its industry and skills – supporting the country's growth and prosperity. The Squadron demonstrates teamwork in a high-performance setting and is often used as a positive case study by organisations around the world. The Red Arrows also support national initiatives to encourage interest in Science, Technology, Engineering and Maths subjects, known as STEM.

Aiding recruitment to the Armed Forces

Being members of the Armed Forces, the Red Arrows are proud to represent the UK. As children, many of the current Squadron were first inspired to pursue a military career after watching the team perform.

Projecting influence as national ambassadors

Displays, flypasts and engagement events staged by the Red Arrows overseas help to develop and strengthen partnerships for the UK. The team's conveying power provides the country with unique abilities and opportunities to support important interests on a global scale.



What it takes to be a Red Arrows pilot

Two or three new pilots join the Red Arrows each year, succeeding those who finish their tour at the end of the season. Typically, they will spend three years with the team before returning to the frontline, instructional or staff duties. To apply for selection to the Red Arrows, pilots must have these key attributes:

Serving RAF pilot

It takes years of dedication, training and service as a Royal Air Force officer before a pilot can even apply for consideration to join the Red Arrows.



Make the shortlist



A shortlist of usually nine applicants is examined during a thorough week-long selection each year, which comprises a formal interview, peer assessment and a flying test.

Operationally experienced

Each pilot must have completed a frontline, operational tour. This can include on Quick Reaction Alert – helping to secure our skies, everyday of the year.



Above average

A candidate must be an exceptional pilot. They have to be assessed during their career as above average in their flying role.



1,500 fast-jet flying hours

All are fast-jet pilots with huge experience of flying frontline aircraft, such as the Tornado or Typhoon.



Be an ambassador

Flying is only one aspect of a Red Arrows pilot's duties – they must also be excellent communicators, being prepared to act as national ambassadors, carry out media work and represent the Royal Air Force at important occasions.





Meet the pilots

RED

1

Team Leader

Squadron Leader David Montenegro

As Team Leader, David, 40, is primarily responsible for all aspects of the display, from running the training programme to choreographing the show. He leads the nine-aircraft aerobatic display.

David was educated at Alleyn's School, Dulwich, where he was a member of the Combined Cadet Force and awarded an RAF Flying Scholarship in his final year. David went on to gain a BA (Hons) in politics and theology at the University of Manchester. Keen on all aspects of aviation from an early age, it was his experience on Manchester and Salford University Air Squadron that firmly set his sights on a career in the RAF, which he joined in 1999.

After tours as a fighter pilot on the Tornado F3 and qualified flying instructor on the Hawk T1, David was selected to join the Red Arrows in 2009, with his three years in the team culminating in the role of Synchro Leader. Returning to the team as Red 1 in 2015, this is David's third, and final, year as Team Leader.





RED **2** Flight Lieutenant Toby Keeley

Toby, 35, a former member of the Hailsham Air Training Corps, studied business management at Solent University. He completed elementary flying training as a member of Southampton University Air Squadron.

After his basic fast-jet training, he graduated from advanced flying training at RAF Valley and completed his tactical weapons training on the Hawk 115 at the NATO Flying Training School in Cold Lake, Canada.

Selected to fly the Tornado GR4, Toby completed a frontline tour and was posted to IV(R) Squadron, RAF Valley, as a qualified flying instructor on the Hawk T2.

In 2015 Toby managed and flew in the first Hawk T2 Pair Role Demonstration. This is his first year with the Red Arrows.



RED **3** Flight Lieutenant Dan Lowes

Dan, 32, attended St. George's College, Weybridge, and was a member of 11(F) Squadron of the Air Training Corps.

Joining the Royal Air Force in 2004, he was selected to be part of the Typhoon Operational Conversion Unit in 2008. He gained his multi-role combat-ready status on 3(F) Squadron before serving on both 6 and 1(F) Squadrons. On completion of the qualified weapons instructor (QWI) course, he joined 41(R) Test and Evaluation Squadron where he was the QWI in charge of air-air and air-ground weapons on Typhoon. Dan has conducted Quick Reaction Alert in the UK and the Falkland Islands, flown in the UAE, Malaysia and the US, as well as participating in numerous training and testing deployments overseas. This is Dan's first year on the Red Arrows.



RED **4** Flight Lieutenant
Matt Masters

Matt, 40, who joined the RAF in November 1998, was brought up in Southampton and was awarded an RAF Sixth Form and Flying Scholarship at King Edward VI School. He obtained his private pilot's licence in 1993 and went on to complete elementary flying training while a member of Bristol University Air Squadron.

On completion of fast-jet training, Matt was selected to be a qualified flying instructor on the Tucano at RAF Linton-on-Ouse for his first tour. Subsequently, Matt flew the Tornado F3 at RAF Leuchars conducting Quick Reaction Alert for UK airspace and completed several multi-national exercises in the US, Denmark and in the Middle East.

Before joining the team, Matt flew the Hawk T1 on 100 Squadron at RAF Leeming. This is his second year on the team.



RED **5** Flight Lieutenant
Chris Lyndon-Smith

Chris, 37, was awarded a Royal Air Force Flying Scholarship when he was 16 and went on to complete his private pilot's licence the year after. He then joined the Royal Air Force in 1998.

Selected to fly fast-jets, Chris was posted to the frontline for three years. He was then posted to 208 Squadron as a qualified flying instructor (QFI), after which he returned to the frontline. He was selected as a Red Arrows pilot in 2011 and flew as Red 2, 7 and 6 in subsequent seasons. After this tour, he joined 100 Squadron where he flew as one of the aggressor pilots in air combat, close air support and low level evasion roles. He also served as a Deputy Flight Commander and was an instructor on the Squadron. Chris re-joined the Red Arrows in August 2016.

RED 6

**Synchro Leader
Flight Lieutenant
Tom Bould**

Tom, 35, who joined the RAF in 2005, was educated at Woodhouse Grove School in West Yorkshire. While studying for his degree in aerospace engineering at Manchester University, he completed his elementary flying training as a member of Manchester and Salford University Air Squadron.

After being streamed to fly fast-jets, Tom was selected to be a 'Creamie qualified flying instructor' – a term given to pilots who are traditionally selected to become flying instructors due to above average, exceptional skills shown throughout their advanced flying training. He was subsequently chosen to be the Tucano display pilot in 2010.

Tom then completed tactical weapons training and was selected to fly the Typhoon.

During his frontline tour, Tom had several deployments to the Falkland Islands as well as flying in exercises in Malaysia and the UAE. This is Tom's third year on the Red Arrows.

RED 7

**Synchro Two
Flight Lieutenant
Si Taylor**

Si, 36, who joined the RAF in 2003, was born and brought up in Leeds where he attended Allerton High School.

He then went on to study ergonomics at Loughborough University, graduating in 2002.

Si completed his elementary flying training at RAF Woodvale and went on to fast-jet training at RAF Linton-on-Ouse and RAF Valley. He was selected to fly the Tornado GR4.

He deployed operationally on frontline missions and took part in several overseas exercises before being selected to cross over to the Typhoon FGR4 in 2012.

During his time on 3(F) Squadron he deployed to the Falkland Islands and took part in exercises in Oman, the UAE and Poland.

This is Si's second year on the team.





RED 8

**Executive Officer
Flight Lieutenant
Mike Bowden**

Mike, 35, who joined the RAF in 2002, was educated at St Joseph's High School in Newport, South Wales. While in sixth form education he completed an RAF and Air League Flying Scholarship and went on to gain his private pilot's licence aged 17. On completion of his A-levels he progressed to Cardiff University, sponsored by the RAF, to study joint computing and mathematics.

During his RAF career, Mike was a Creamie instructor on the Hawk.

He went on to fly the Harrier GR9, Tornado GR4 and complete two operational tours of duty on the frontline. This is Mike's third year with the Red Arrows.

RED 9

**Flight Lieutenant
Emmet Cox**

Emmet, 38, was born and raised on the North Shore of Auckland, New Zealand, and emigrated to the UK in 2001, after graduating from the University of Auckland with a BSc, majoring in computer science.

He joined the RAF in 2002. His basic and advanced fast-jet training was carried out on the Tucano at 72(R) Squadron, RAF Linton-on-Ouse, and the Hawk T1 at 208(R) Squadron, RAF Valley.

He undertook tactical weapons training on the Hawk 115, based at NATO Flying Training in Canada, and was subsequently posted to RAF Lossiemouth to fly the Tornado GR4. He was a member of 617 Squadron (The Dambusters), flying operational missions overseas and exercises in Europe and North America.

This is Emmet's third, and final, year on the Red Arrows.



RED 10

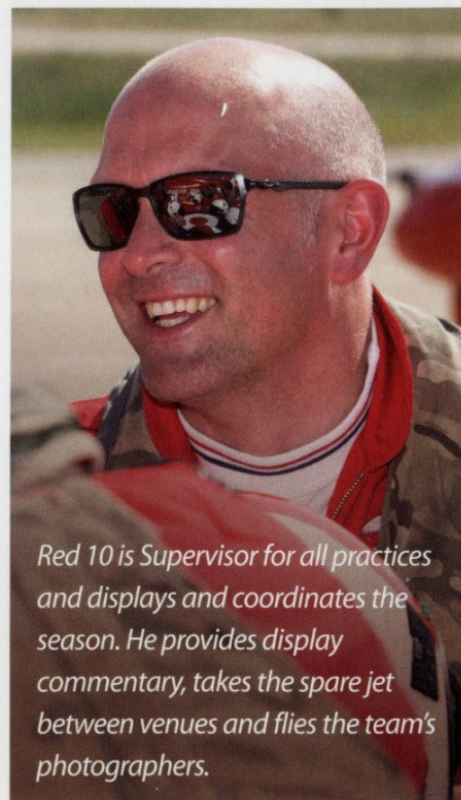
**Supervisor
Squadron Leader
Mike Ling MBE**

Mike, 38, was a member of 2427 (Biggin Hill) Squadron Air Training Corps, reaching the rank of Cadet Warrant Officer and receiving a Royal Air Force Flying Scholarship.

Mike's first tour was with 72 (R) Squadron at RAF Linton-on-Ouse as a qualified flying instructor on the Tucano TMk1 aircraft, teaching basic fast-jet flying. He then completed NATO Flying Training in Canada on the Hawk 115 aircraft before being posted to the Tornado F3 with 111 (F) Squadron based at RAF Leuchars in Scotland. Here he played an active part in the air defence of the United Kingdom and the Falkland Islands on Quick Reaction Alert duties.

Mike joined the Red Arrows for the 2008 season before being selected for the Synchro Pair for the 2009 and 2010 seasons. Promoted to Squadron Leader on leaving the team, he became a Subject Matter Expert for the UK Military Flying Training System while being a part-time pilot with No 1 Air Experience Flight, flying air cadets in the Grob 115E Tutor.

Mike rejoined the Red Arrows in 2011 and is now in his sixth year as Red 10, taking him to a total of nine years with the team.



Red 10 is Supervisor for all practices and displays and coordinates the season. He provides display commentary, takes the spare jet between venues and flies the team's photographers.

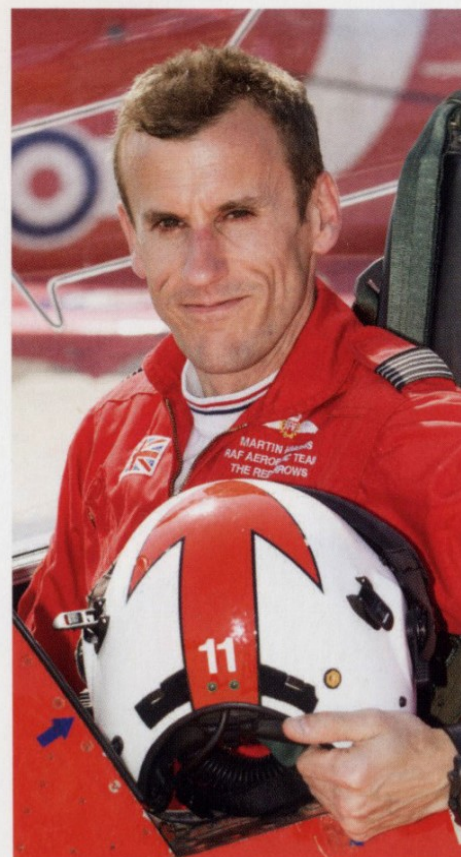
Officer Commanding RAFAT

Wing Commander Martin Higgins

Martin, who joined the RAF in 1993, attended Colston's School, Bristol, and was a member of the University Air Squadron during his undergraduate degree in aeronautics and astronautics at Southampton University.

A former Tornado F3 pilot, Martin flew two operational tours in Iraq. He was selected to be a Red Arrows pilot from 2004 to 2007, initially as Red 3 and then as Red 9 for his remaining time on the team. Subsequently, he was posted to 111(F) Squadron, culminating in a four-month tour in the Falkland Islands as Officer Commanding 1435 Flight. After a staff tour at Air Command on the Lightning II desk, he rejoined the Red Arrows as Red 5 for the 2012 season and was subsequently promoted into another staff tour in January 2013. He rejoined the Red Arrows as Officer Commanding in December 2014.

Martin has overall responsibility for the Red Arrows and he ensures procedures followed by the team allow for safe and efficient flying.



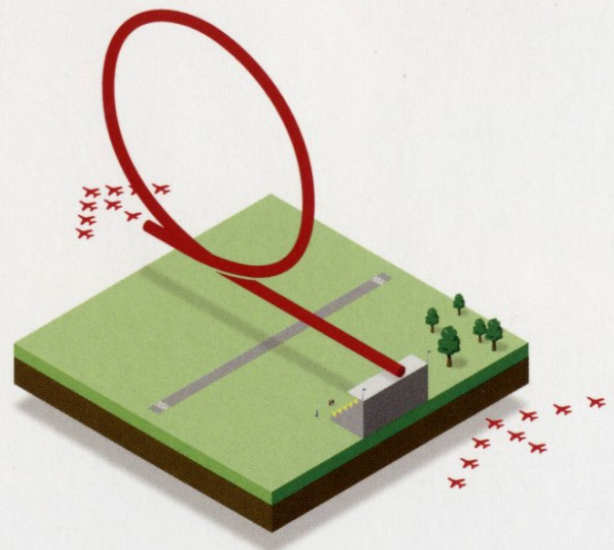
Full display 2017

The Red Arrows' aerobatic display changes each year. Over the next four pages, you can see the individual manoeuvres featuring in the 2017 season's full show. The first half of the Red Arrows' display consists of synchronised, formation aerobatics, followed by a more dynamic second half.

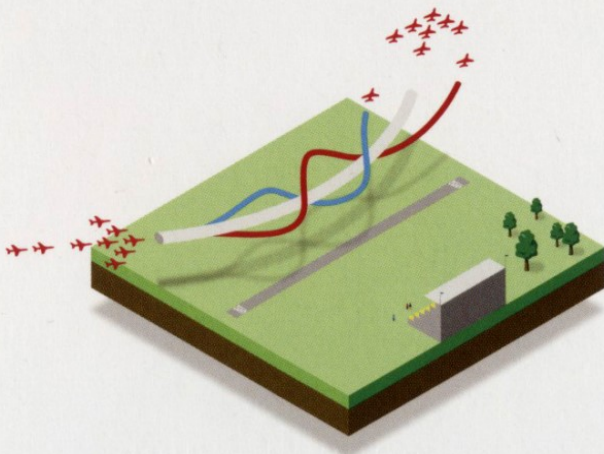
Reds 1 to 5 form the front section of the team's formation, known as Enid, and Reds 6 to 9 make up the rear part, called Gypo. The Synchro Pair, Reds 6 and 7, perform the highly-popular opposition manoeuvres during the latter section of the show.

During a display, Red 10 acts as the team's Supervisor, who maintains two-way radio contact with the Team Leader. He also provides the commentary.

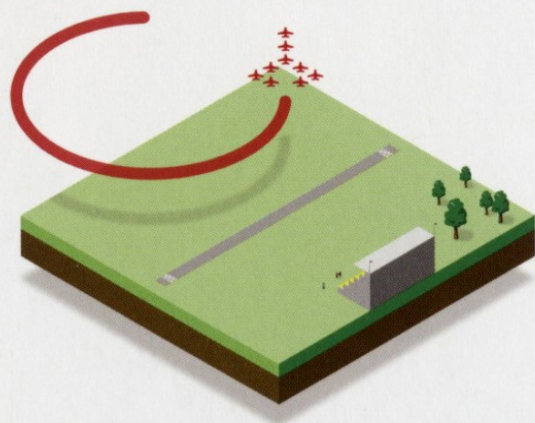
There are three types of display the Team Leader can elect to fly - full, rolling or flat. To carry out a full, looping display the base of the cloud must be above 5,500ft to avoid the aircraft entering the cloud at the top of the loop. If the cloud base is less than 5,500ft, but more than 2,500ft, the team will perform the rolling display - substituting wing-overs and rolls for the loops.



1. Wall to Nine Arrow

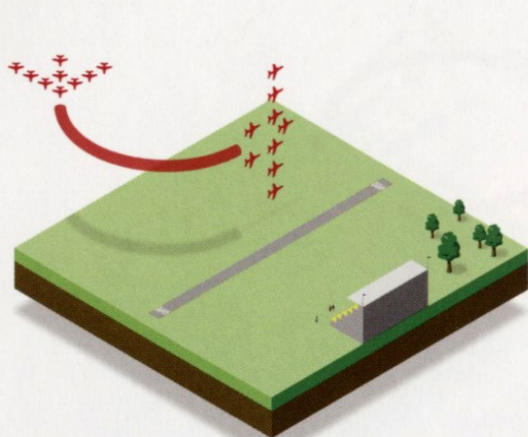
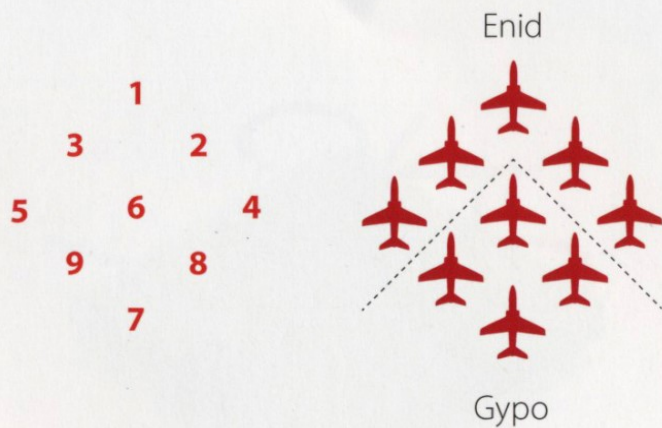


4. Tornado

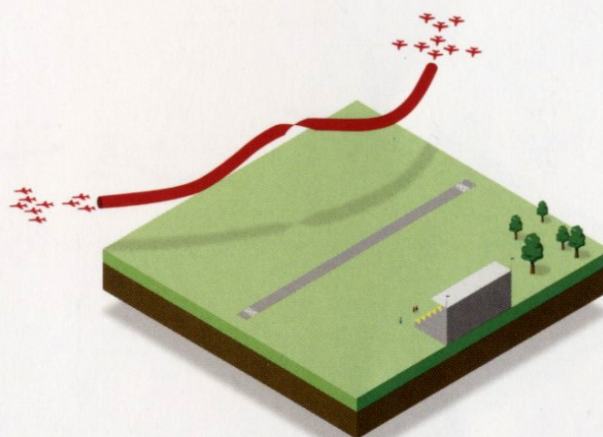


5. Concorde Bend

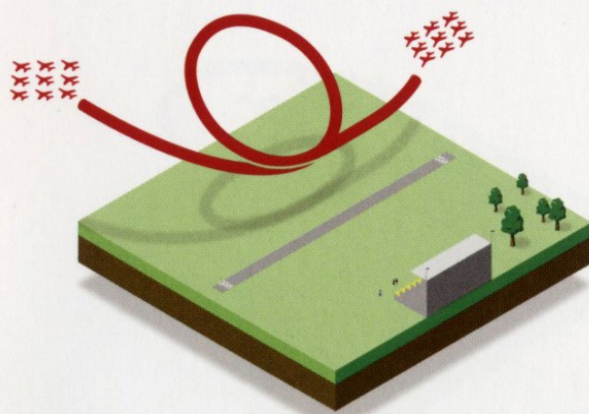
And when the cloud base is below 2,500ft, the team will fly the flat display, consisting of a series of flypasts and steep turns.



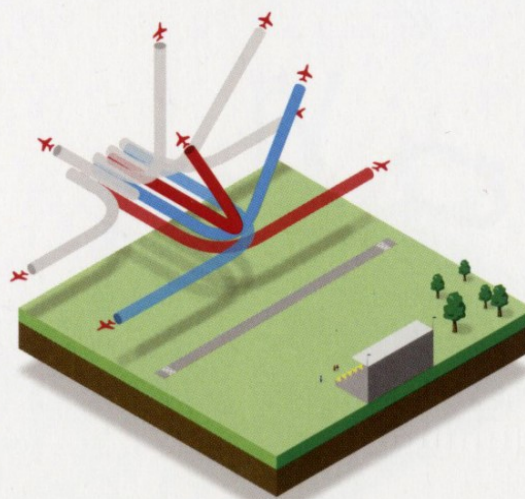
2. Nine Arrow to Phoenix



3. Spitfire Roll

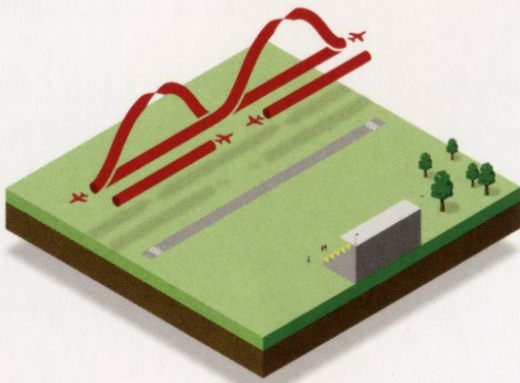


6. Diamond Quarter-Clover

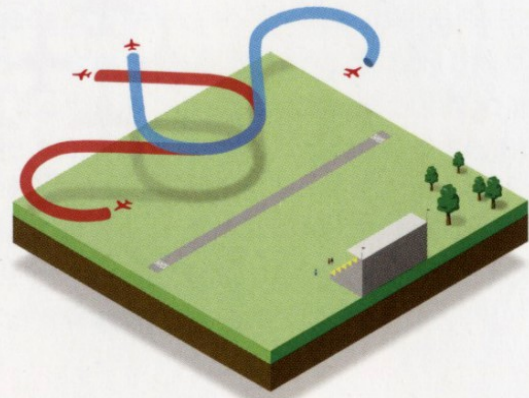


7. Detonator

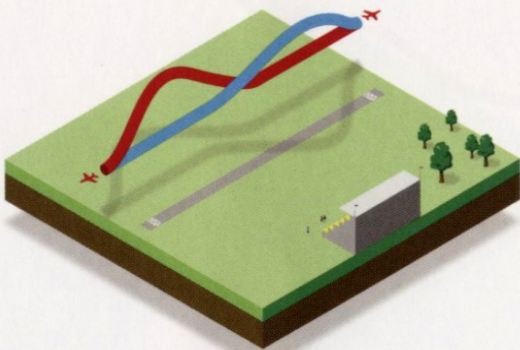
Full display 2017 (second half)



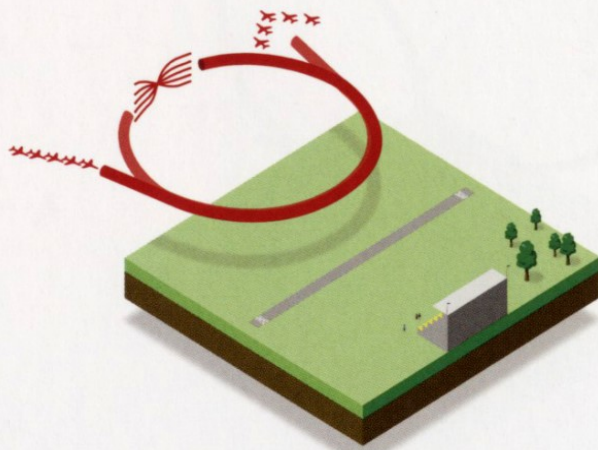
8. Gypo Pass



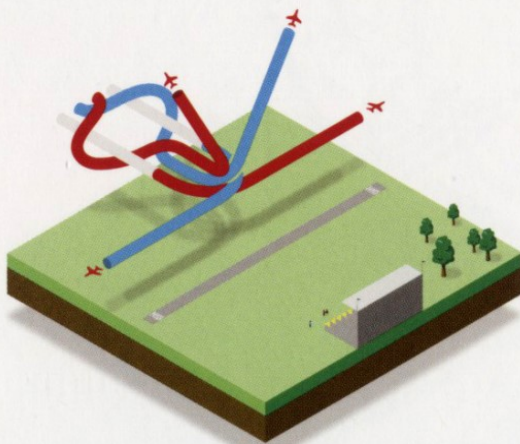
9. Cyclone to Slingshot



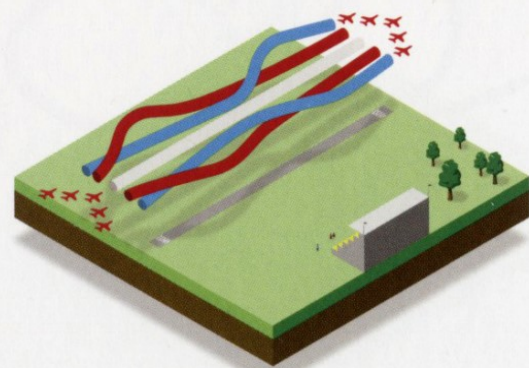
12. Opposition Barrel



13. Slalom



16. Gypo Break



17. Rollbacks

The Hawk

BAE Systems' dual control Hawk T1 replaced the Folland Gnat as the aircraft used by the Red Arrows from the 1980 season. The team's jets are essentially the same as those flown in advanced flying training, with the exception of their trademark smoke-generation modifications and a slightly uprated engine which gives a faster response time. Whereas the two seats in the trainer version of the jet are occupied by an instructor and student, a pilot sits in the front of a Red Arrows' cockpit and, on transit flights, an engineer or photographer from the Circus team is in the rear seat. The flowing Union flag tailfin design emphasises the Red Arrows' role as national ambassadors for the United Kingdom.



Smoke on, go!

Smoke is a well-known element of the team's displays and the trails have an important flight safety role too. They allow the pilots to judge wind speed and direction – enabling them to locate other aircraft when different sections of the team's formation are several miles apart.

The smoke is created by injecting diesel into the aircraft's hot exhaust, vaporising it at 400 degrees centigrade. The basic vapour colour is white. The red and blue trails are made by mixing the diesel with a dye stored in a pod on the aircraft. At the precise time, the pilot releases the liquid by pushing one of three buttons on the control column. There is capacity for a minute of blue smoke, a minute of red and five minutes of white.



Length

11.9 metres (39ft 3in)

Wingspan

9.4 metres (30ft 10in)

Height

4 metres (13ft 2in)

Range 1,000 nm

Maximum speed

Mach 1.2

Thrust

5,200lbs

Maximum
take off weight

5,700kg

Powerplant

Rolls-Royce Adour

Engine type

Twin shaft turbofan

Wing area 16.70 m²
(179.64 ft²)

Maximum altitude

48,000ft



January



February



March



July



August



September

Busy all year

The Red Arrows are not just busy during the summer season. The Squadron is hard at work year-round.

January-March

Through the winter months, training for the forthcoming season takes place at the team's home base, RAF Scampton. It's also during this period, in February, the Circus engineers selected to fly with the team are subjected to medical tests and emergency simulations, including pool drills. Gradually, the various parts of the display sequence, designed by the Team Leader, are brought together in the training programme and the Red Arrows will aim to fly the first nine-ship formation of the year by March. Behind-the-scenes, all of the equipment required for the team's spring training detachment is packed and sent overseas. The administration section is also busy, working on detailed plans for

the team's display calendar, such as booking accommodation. Meanwhile, the public relations team arrange high-profile media facilities at RAF Scampton, set up Press interviews and host charity groups and other visitors to the Squadron.

April-June

The team moves overseas, usually to Greece, to perfect the display in the finer Mediterranean weather. Known as Exercise Springhawk, it allows the Red Arrows to fly up to 15 nine-ship display practices every seven days. Shortlist week also takes place here, where pilots hoping to get a place on the Squadron are assessed. The training ends when the Red Arrows' Air Officer



April



May



June



October



November



December

Commanding makes an assessment of their safety and professionalism. If he is content, Public Display Authority is awarded – permission to display in front of the public. The pilots, engineers and support staff are now allowed to wear their red and royal blue display coveralls. The first display of the season is flown in May or June and the period also sees the Red Arrows perform at major occasions – such as Her Majesty The Queen's Birthday Flypast in London.

July-September

More than 60 displays are flown during a typical season and July and August are months when the Red Arrows take part in some of the biggest airshows. These events provide an excellent opportunity for members of the Squadron, including the pilots, to meet the public and represent the Royal Air Force. As well as the displays, many flypasts are carried out by the Red Arrows as they transit to and from shows. The engineers work tirelessly to ensure all the jets are ready for each display and transit. Often the team will appear at two events in one day, sometimes in different parts of the country or overseas, and careful planning is required to ensure the various

dye teams, technical support, public relations sections and other staff are in the right place, at the right time. The final displays of the season take place in September.

October-December

After the domestic season has come to a close, the Red Arrows can be deployed overseas in the autumn – representing the UK, promoting industry and supporting other national interests. On return, that year's team will disband and a formal dinner is held to say goodbye to Squadron members who are leaving. Preparations for next year then begin, all over again. To mark the transition from the display season to training, all Squadron members revert to wearing green flying suits and coveralls. New pilots, selected during the shortlist process, begin their work with the rest of the team. Practice begins at RAF Scampton, with each pilot flying three sorties a day, five days a week to train. The process starts with small formations of three or four aircraft as the pilots learn flying references and formations. During the winter, the aircraft also get an extensive overhaul by the engineers. Each jet takes between four and 16 weeks to complete.





Ensuring the Red Arrows perform a great display in the air involves a lot of teamwork on the ground.

Behind-the-scenes, dozens of people plan and coordinate the Squadron's every move. The team is drawn from the various roles, trades and branches of the Royal Air Force and Civil Service.

Flight operations

Flight operations is responsible for all aviation planning and coordination during the year. During the winter training months, the operations staff liaise with the engineers, air traffic control and the aircrew to ensure the daily flying programme runs smoothly. For the busy summer season, the Aircrew Planning Officer maps all the routes between displays and flypasts. The department's corporals, Sue Rettie and Rachael Trimble, ensure all the low flying bookings, flight plans and diversions are arranged, while the Flight Operations Officer books the jets into airfields, ensuring there is fuel and support on the ground.



**Aircrew
Planning Officer**

**Squadron Leader
Dave Platt**

Dave joined the RAF in 1985 and was posted to Tornado F3 after navigator training. Following tactical weapons training he joined XI(F) Squadron, taking part in Operation Desert Shield. He also took part in Operation Deny Flight over Bosnia and several detachments to the Falkland Islands. Dave, a graduate of the GD Aerosystems Course, commanded the Tornado F3 software team during the second Gulf War, then crossed to the Professional Aviator Spine in 2004.

After a final flying tour on 25(F) Squadron, Dave did trials and development work on the Typhoon. He returned to the RAF as a full time reservist with the Red Arrows in June 2013.



**Flight
Operations Officer**

**Flight Lieutenant
Adam Youle**

Adam, from East Yorkshire, is a flight operations officer who has primarily worked in fast-jet operations and flight safety.

He joined the RAF in 2007 and has completed roles at RAF Waddington, RAF Leuchars, RAF High Wycombe and RAF Valley. His military career has also sent him to Abu Dhabi, Dubai, Qatar, China and the Falkland Islands.

Adam is a former Air Cadet with 1260 (Newark-on-Trent) Air Training Corps Squadron and is still involved with the organisation. He joined the Red Arrows in May 2016.

What it takes to be a Red Arrows pilot

Two or three new pilots join the Red Arrows each year, succeeding those who finish their tour at the end of the season. Typically, they will spend three years with the team before returning to the frontline, instructional or staff duties. To apply for selection to the Red Arrows, pilots must have these key attributes:

Serving RAF pilot

It takes years of dedication, training and service as a Royal Air Force officer before a pilot can even apply for consideration to join the Red Arrows.



Make the shortlist



A shortlist of usually nine applicants is examined during a thorough week-long selection each year, which comprises a formal interview, peer assessment and a flying test.

Operationally experienced

Each pilot must have completed a frontline, operational tour. This can include on Quick Reaction Alert – helping to secure our skies, everyday of the year.



Above average

A candidate must be an exceptional pilot. They have to be assessed during their career as above average in their flying role.



1,500 fast-jet flying hours

All are fast-jet pilots with huge experience of flying frontline aircraft, such as the Tornado or Typhoon.



Be an ambassador

Flying is only one aspect of a Red Arrows pilot's duties – they must also be excellent communicators, being prepared to act as national ambassadors, carry out media work and represent the Royal Air Force at important occasions.



Administration and Team Manager

The administration team work tirelessly to ensure plans run smoothly so the team can display. Headed by the Team Manager and Adjutant, and supported by a Sergeant and Senior Aircraftman, they act as a focal point for the entire Squadron. The department coordinates everything from booking accommodation to organising leave passes. The Adjutant works closely with display organisers so that every aspect of the team's requirements is in place. The Team Manager coordinates the Squadron's sponsorships, corporate arrangements and liaises closely with Foreign & Commonwealth Office and Embassy colleagues whenever the team goes overseas.



Team Manager

**Squadron Leader
Cate Driscoll**

Cate returned to the Royal Air Force at the beginning of 2015 as a full time reservist with the Red Arrows, becoming Team Manager. Joining the RAF in 1996 as a logistics officer, Cate has had a varied career, predominantly in air logistics and exercise and operational planning. She had operational tours in Sarajevo and Kuwait. Cate left the Service to work for London 2012, before becoming programme manager at Heathrow airport in the procurement department.



Adjutant

**Warrant Officer
Alan Irons**

Alan joined the Royal Air Force in 1980 in what is now known as the personnel support trade and was posted to HQ Strike Command. In the mid to late-1980s he experienced the Cold War in Germany with tours at RAF Gutersloh and RAF Bruggen. His final Regular service tour was at MoD Corsham as Unit Chief Clerk. He left the RAF in 2012 after 32 years of service and returned as a full time reservist with the Red Arrows.



The support team

There are more than 120 people in the Royal Air Force Aerobatic Team. This includes the Red Arrows' support team, who are known as the Blues, because of their distinctive display coveralls. They represent the many, varied roles in the Service and demonstrate the teamwork required on the ground to ensure the jets can display safely in the air.

Avionics

The Red Arrows have 20 avionics technicians who are responsible for all of the electrical and avionics systems on the aircraft. They maintain equipment ranging from emergency compasses to complex engine control circuits.



Weapons Technicians

The technicians are responsible for the maintenance and control of the explosive components and survival equipment fitted to the Hawk. The team work on the aircraft's ejection seats, explosive canopies and fire suppression and emergency systems.



Dye Team

Responsible for replenishing the pods are two dedicated dye teams. Due to the diverse range of locations the Red

Arrows operate from, these engineers travel thousands of miles a year by road. Wherever the aircraft land, there's a dye team waiting. Working to tight timescales, they ensure the red, white and blue trails look the part when Red 1 calls "Smoke on, go!"

Logistics

Responsibility for ensuring spare parts get to the Red Arrows wherever they are operating throughout the world falls upon the supply team. They also ensure that the team's transport, whether it is an RAF Hercules C130 aircraft or an articulated lorry, are correctly loaded.



Photographers

Without one of the team's three photographers, the Red Arrows would not be able to display. Their role is crucial for safety, videoing every display from the ground – both during winter training and the summer season. They also take still images for the team, capturing pictures of the jets in action around the world, in the air and from the ground.



Survival Equipment Fitters

The Squadron has three Survival Equipment Fitters. They are responsible for maintaining all of the pilots' safety equipment. This includes everything from the helmets and oxygen masks to the anti-G trousers worn by the aircrew in the cockpit.



Mechanical Engineering

Mechanical technicians make up two thirds of the Red Arrows' engineering team and are responsible for the maintenance and rectification of the team's aircraft. They look after the complete range of mechanical components and structure of the aircraft including the engines, gearboxes, flying controls, landing gear, hydraulics, air conditioning, anti-icing and fuel systems.

Mechanical Transport

The Red Arrows have eight drivers who are responsible for a fleet of 20 vehicles, from 38-tonne trucks to Land Rovers. They ensure all the equipment and personnel get to the right place as well as refuelling the aircraft.



The Circus



Circus 1 Flight Lieutenant Alicia Mason. Age 35
Junior Engineering Officer. Alicia's Circus duties include being a resource manager, military commander and professional engineer.



Circus 2 Corporal Shaun Kelly. Age 35
Weapons Tradesman. Shaun, who is from Mansfield and joined the RAF in 2001, became a member of the Red Arrows team in 2014.



Circus 3 Corporal Jay Cawston. Age 30
Mechanical Tradesman. Jay joined the RAF in 2004 and is originally from Doncaster. He came to the Red Arrows in 2012 and led the Red Arrows' dye team in 2016.



Circus 4 Corporal Louis Jelley. Age 28
Avionic Tradesman. Louis was born in Kingston upon Hull and completed an apprenticeship in aeronautical engineering at RAF Cosford. He joined the Squadron in 2014.



Circus 5 SAC(T) Mark Pittaway. Age 26
Avionic Tradesman. Mark joined the RAF in 2009 and did a previous tour on the Red Arrows after completing his basic training. He re-joined the team in 2016.



Circus 6 SAC(T) Mike Fleming. Age 33
Mechanical Tradesman. Mike, from South Shields, attained a mechanical engineering degree at Leeds University before joining the RAF in 2010 and the Red Arrows in 2014.



Circus 7 Corporal Michael Knight. Age 35
Mechanical Tradesman. Michael was born in Northampton and was a member of 222 (Broadlands) Squadron Air Training Corps while at school. He joined the RAF in 1998.



Circus 8 Sergeant Scott Mackie. Age 38. Circus Leader.
Mechanical Tradesman. Scott, originally from Manchester, grew up on the Isle of Man. He joined the RAF in 1996. He coordinates Circus training and administration.



Circus 9 SAC(T) Jordan Thorburn. Age 27
Mechanical Tradesman. Jordan grew up in Dunbar, Scotland, and joined the RAF at the age of 21. He has been with the Red Arrows since 2014.



Circus 10 SAC Hannah Smoker. Age 27
Photographer. Hannah, from Scarborough, graduated with a degree in media production from the University of Lincoln in 2010. She joined the Red Arrows in 2017.



Circus 11 Squadron Leader Rich Bland. Age 36
Senior Engineering Officer. In his role, Rich joins the Circus team when 11 aircraft are deployed.



The Circus is a team of support crew who fly in the rear seats of the jets during the season. Just as the pilots are known as Red 1 through 11, the team members are known as Circus 1 to 11 – denoting which pilot they fly with. The Circus comprises the Junior Engineering Officer (Circus 1), the Circus Leader (Circus 8), together with mechanical, avionic and weapon tradesmen and a photographer. Each is specially selected from the Squadron, on an annual basis, for that particular season. They accompany the aircraft on transit flights – but not in displays – and ensure the jets are serviced at each location when operating away from the Red Arrows' home of RAF Scampton. Each also has a secondary Circus duty, from sorting documents to administration.



Three pilots: 22 seasons



Three of the team's most experienced pilots will enjoy their final season with the Red Arrows in 2017.

Between them, Wing Commander Martin Higgins, Officer Commanding, Royal Air Force Aerobatic Team (**OC RAFAT**), Squadron Leader Mike Ling (**Red 10**) and Squadron Leader David Montenegro (**Red 1**) have flown an amazing 22 seasons with the Red Arrows. Here is an insight to their favourite moments and what has inspired them.



Thousands of images are taken of the team every week. If you were to pick one, what would it be and why?

Red 10: There are iconic/viral images for each of my most memorial moments from my time with the team – the formation flypast of the Statue of Liberty, over the Olympic Park and a fabulous shot of my aircraft over Lewis Hamilton's F1 car on the runway at RAF Scampton. There is also a famous 'inverted selfie' taken by Katsu Tokunaga from the back of my jet in Cyprus in 2014 – it's brilliant and one of my favourite ever photos.

Who has been your greatest inspiration and why?

Red 1: I have been inspired by many people during my younger years and throughout my career. But, notably, two teachers at my school – Mr Grant and Mr Reed – who steered me on to the right path during a time when I was underperforming in my academic studies. They encouraged me to choose academic subjects that I enjoyed, rather than ones that I felt expected to do.

What will you miss most when you leave the Squadron?

OC RAFAT: The chance to meet extraordinary people – from Heads of State to incredibly brave children in Great Ormond Street Hospital.

Out of all of the displays you have seen or taken part in, what would you say your favourite manoeuvre was?

OC RAFAT: The Corkscrew – I flew it for both of my years as Red 9.



What have been your most memorable moments with the team?

Red 10: Four that particularly stand out are displaying in New York Harbour as Red 3 in 2008, achieving my boyhood dream of flying as one of the Synchro Pair (as Red 7) at my home town airshow at Biggin Hill in 2009, flying over the opening ceremony of the 2012 London Olympics as Red 9 and racing Lewis Hamilton in his F1 car while flying David Coulthard in a Hawk in 2013.

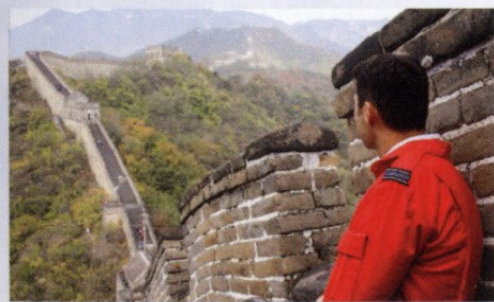
When did you know you wanted to be a Royal Air Force pilot?

OC RAFAT: Since I was 10-years-old. I saw Concorde at Filton Airport and the Red Arrows at Weston-super-Mare. Both inspired me to join the RAF and to become a Red Arrows pilot.



If you could fly anyone in the backseat of the Hawk, past or present, who would it be?

Red 10: It would have to be Wing Commander Guy Gibson VC, DSO & Bar, DFC & Bar. Those post-nominals say it all! I would like to talk to him about his experiences in Bomber Command during the Second World War and the challenges he faced in setting up 617 Squadron at RAF Scampton in March 1943 then launching for the famous Dambusters raid only two months later – an incredible feat! He would have been based at RAF Syerston around the same time as my late grandfather who also flew Lancasters and I would ask him about their time there.



What has been the greatest highlight of your time with the Red Arrows?

Red 1: The 2016 tour of the Asia-Pacific and Middle East regions was an incredible experience and a highlight of my time in the team so far. I was extremely proud to represent the UK across 17 countries over nine weeks – including the first Red Arrows display in China.

What advice would you give to anyone aspiring to be a Red Arrows pilot?

Red 1: 1. Never be afraid to admit your own weaknesses as it takes strength to be able to do that. 2. Try to understand what teamwork really means in all that you do, including your family life. 3. Being a Red Arrows pilot is only possible if you are a serving RAF pilot with operational experience, so read as much as you can about what it takes to be an RAF officer first and foremost.

Global ambassadors



Sydney/Australia. 1996



Giza, Egypt. 2003



New York, USA. 2008

One of the key roles of the Red Arrows is being global ambassadors - promoting the best of British overseas. By the beginning of 2017, the team had performed in 57 countries, equivalent to a quarter of the world.

In the inaugural 1965 season, the Red Arrows displayed in France, Belgium, Germany, Italy and the Netherlands, in addition to a busy schedule across the United Kingdom.

Since then, the Red Arrows have flown far beyond mainland Europe. The Squadron has represented the UK's Armed Forces, conducted defence diplomacy and supported important interests in an unrivalled way - whether it's with displays, flypasts or ground events.

These deployments have ranged from the United States to Australia. The team's 1996 display in Sydney, on Australia Day, was watched by one million people, who lined the city's harbour.

China became the latest location during a hugely successful nine-week global tour in late 2016. This 20,000 mile exercise to Asia and the Middle East, which featured more than 20 displays and flypasts in places such as Singapore, India and Abu Dhabi, supported UK excellence across business, trade and education.

The 57 countries visited by the Red Arrows since 1965



Pushing the boundaries of engineering

To the hundreds of thousands of aviation enthusiasts who enjoy the RAF's Red Arrows every year, the BAE Systems Hawk is a jet with guaranteed wow factor.

With the pilots of the world's most famous aerobatics team at the controls, the agility of the jet is ideally suited to their spectacular display.

But, for more than 20,000 pilots – including all those flying fast-jets in frontline action for the RAF – it is a flying classroom which gave them the edge.

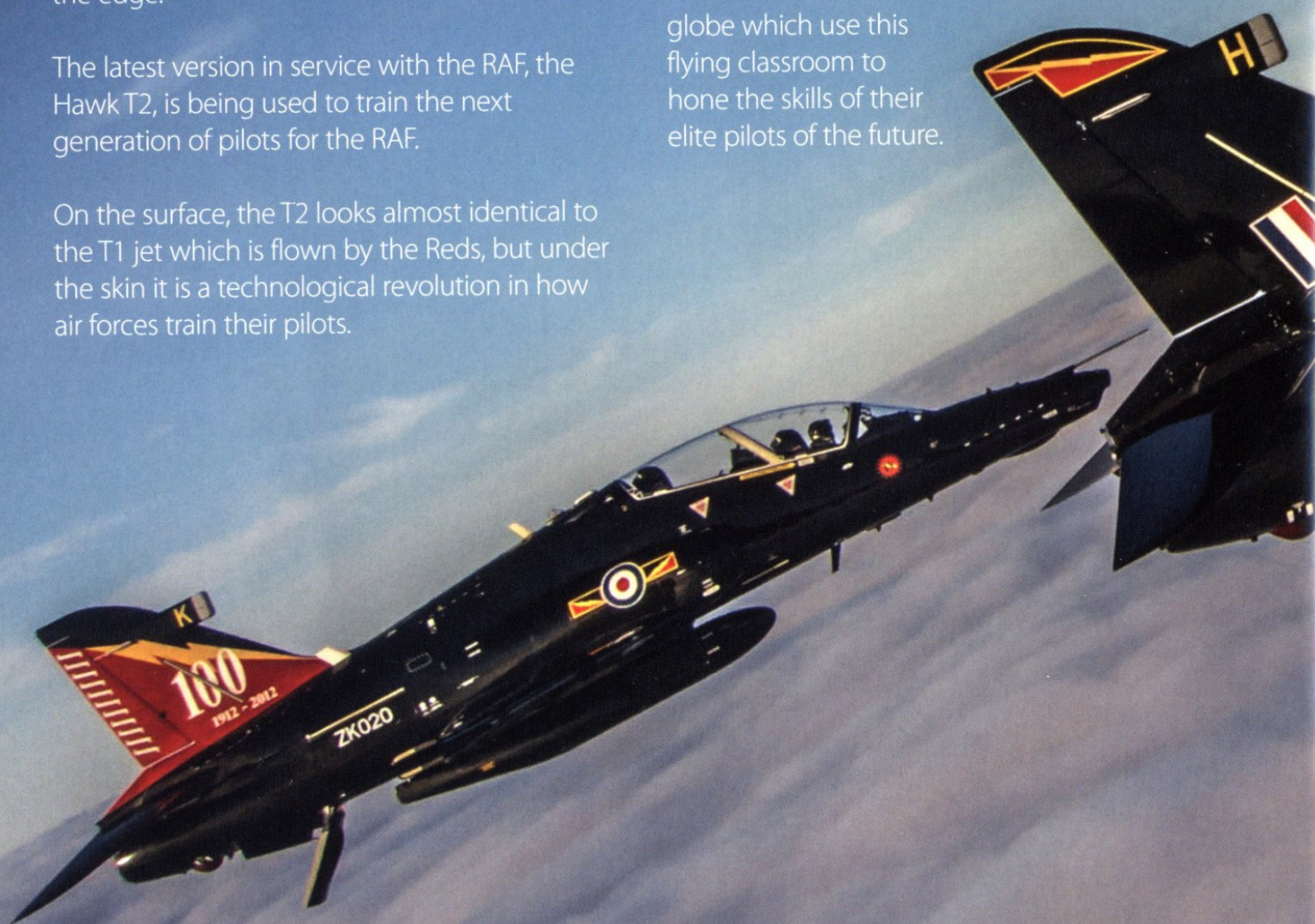
The latest version in service with the RAF, the Hawk T2, is being used to train the next generation of pilots for the RAF.

On the surface, the T2 looks almost identical to the T1 jet which is flown by the Reds, but under the skin it is a technological revolution in how air forces train their pilots.

To start with, its all-digital glass cockpit is packed with the latest state-of-the-art simulation and emulation technology.

It has simulated radar, defensive aids and weapons capabilities which replicates the experience of stepping into one of the world's leading fighter aircraft such as Typhoon or F-35 Lightning II, which will be the cornerstone of the RAF's combat force for years to come.

This best of British engineering has not only benefited the RAF but air forces across the globe which use this flying classroom to hone the skills of their elite pilots of the future.





Indeed, the air forces of Saudi Arabia and Oman are the latest to add the newest standard of Hawk to their fleet, meaning more than 1,000 of the advanced jet trainers are now either in service or on order – making it the world's most proven and successful military training aircraft.

A desire to push the boundaries of engineering has evolved in to an aircraft which gives these students realistic training which equips them with the skills to ensure they are ready for the frontline.

In scenarios, they are faced with synthetic threats and they must respond with synthetic defensive aids such as chaff, flares and missiles.

Students will also 'drop' simulated smart bombs and are taught evasive manoeuvres and electronic warfare techniques. This technology development continues today as our engineering teams keep Hawk at the forefront.

This includes the integration of large area display technology in the cockpit, new wing configurations to improve performance and upgrades to the man-machine interface.

The Hawk technology has served the Red Arrows for almost 40 years of their half-century of wowing the crowds.

Once again, in 2017 the Hawk will allow the team to light up the skies while its latest variant, the T2, continues to evolve and ensure frontline pilots are better prepared than ever before

Roll of honour



D A Smith, 4 Flt Lt R B Duckett, 5 Flt Lt R Perreux, 6 Flt Lt J T Kingsley, 7 Flt Lt I C H Dick, 8 Flt Lt J D Rust, 9 Sqn Ldr R P Dunn, Manager Flt Lt P Mackintosh, Engineer Fg Off G E White, Adjutant Flt Lt R Dench **1970** Leader Sqn Ldr D Hazell, 2 Flt Lt R Perreux, 3 Flt Lt D A Smith, 4 Flt Lt J D Rust, 5 Flt Lt J Haddock, 6 Flt Lt I C H Dick, 7 Flt Lt R B Duckett, 8 Flt Lt D S B Marr, 9 Flt Lt R E W Loverseed, Manager Flt Lt P Mackintosh, Engineer Flt Lt G E White, Adjutant WO L Ludlow **1971** Leader Sqn Ldr R E W Loverseed, 2 Sqn Ldr D S B Marr, 3 Flt Lt A C East, 4 Flt Lt W B Aspinall, 5 Flt Lt P J J Day, 6 Flt Lt C F Roberts, 7 Flt Lt R E Somerville, Manager Flt Lt K J Tait, Engineer Flt Lt G E White, Adjutant WO L Ludlow **1972** Leader Sqn Ldr I C H Dick, 2 Flt Lt W B Aspinall, 3 Flt Lt A C East, 4 Flt Lt R E Somerville, 5 Flt Lt K J Tait, 6 Flt Lt P J J Day, 7 Flt Lt D Binnie, 8 Flt Lt E E G Girdler, 9 Flt Lt C F Roberts, Manager Flt Lt B Donnelly, Engineer Flt Lt I Brackenbury, Adjutant WO S Wild **1973** Leader Sqn Ldr I C H Dick, 2 Sqn Ldr W B Aspinall, 3 Flt Lt B Donnelly, 4 Flt Lt E E G Girdler, 5 Flt Lt K J Tait, 6 Flt Lt D Binnie, 7 Sqn Ldr R E Somerville, 8 Flt Lt D J Sheen, 9 Flt Lt P J J Day, Manager Flt Lt R M Joy, Engineer Flt Lt I Brackenbury, Adjutant WO H E D Rundsstrom **1974** Leader Sqn Ldr I C H Dick, 2 Flt Lt K J Tait, 3 Flt Lt B Donnelly, 4 Flt Lt E E G Girdler, 5 Flt Lt C M Phillips, 6 Flt Lt D Binnie, 7 Sqn Ldr R E Somerville, 8 Flt Lt D J Sheen, 9 Flt Lt R Eccles, Manager Flt Lt R M Joy, Engineer Flt Lt I Brackenbury, Adjutant WO H E D Rundsstrom **1975** Leader Sqn Ldr R B Duckett, 2 Flt Lt M J Phillips, 3 Flt Lt B Donnelly, 4 Flt Lt R Eccles, 5 Flt Lt J Blackwell, 6 Flt Lt D Sheen, 7 Sqn Ldr B R Hoskins, 8 Flt Lt M Cornwell, 9 Flt Lt R Barber, Manager Sqn Ldr A L Wall, Engineer Flt Lt A Hunt, Adjutant WO H E D Rundsstrom **1976** Leader Sqn Ldr R B Duckett, 2 Flt Lt M J Phillips, 3 Flt Lt R Eccles, 4 Flt Lt D R Carvell, 5 Flt Lt R S Barber, 6 Sqn Ldr B R Hoskins, 7 Flt Lt M Cornwell, 8 Flt Lt M T Curley, 9 Flt Lt N S Champness, Manager Sqn Ldr A L Wall, Engineer Flt Lt A Hunt, Adjutant WO H G Thorne **1977** Leader Sqn Ldr F J Hoare, 2 Flt Lt D R Carvell, 3 Flt Lt R S Barber, 4 Flt Lt M J Phillips, 5 Flt Lt N S Champness, 6 Flt Lt M Cornwell, 7 Flt Lt M T Curley, 8 Flt Lt R M Thomas, 9 Flt Lt M B Stoner, Manager Flt Lt M B Whitehouse, Engineer Flt Lt A Hunt, Adjutant WO H G Thorne **1978** Leader Sqn Ldr F J Hoare, 2 Flt Lt D R Carvell, 3 Flt Lt M B Stoner, 4 Flt Lt M J Phillips, 5 Flt Lt L A Grose, 6 Flt Lt M T Curley, 7 Flt Lt S R Johnson, 8 Flt Lt B C Scott, Manager Flt Lt M B Whitehouse, Engineer Flt Lt R A Lewis, Adjutant WO H G Thorne **1979** Leader Sqn Ldr B R Hoskins, 2 Flt Lt M T Curley, 3 Flt Lt B C Scott, 4 Flt Lt M D Howell, 5 Flt Lt M B Stoner, 6 Flt Lt R M Thomas, 7 Sqn Ldr S R Johnson, 8 Flt Lt N J Wharton, 9 Flt Lt W Ward, Manager Sqn Ldr R Thilthorpe, Engineer Flt Lt R A Lewis, Adjutant WO H G Thorne **1980** Leader Sqn Ldr B R Hoskins, 2 Flt Lt M D Howell, 3 Flt Lt W Ward, 4 Flt Lt N J Wharton, 5 Flt Lt B C Scott, 6 Flt Lt R M Thomas, 7 Sqn Ldr S R Johnson, 8 Flt Lt B S Walters, 9 Flt Lt T R Watts, Manager Sqn Ldr R Thilthorpe, Engineer Flt Lt R A Lewis, Adjutant WO H G Thorne **1981** Leader Sqn Ldr B R Hoskins, 2 Flt Lt B F Walters, 3 Flt Lt W Ward, 4 Flt Lt M H de Courcier, 5 Flt Lt N J Wharton, 6 Sqn Ldr S R Johnson, 7 Flt Lt T R Watts, 8 Flt Lt I J Huzzard, 9 Flt Lt J R Myers, Manager Sqn Ldr R Thilthorpe, Engineer Flt Lt G M Nisbet, Adjutant WO H G Thorne **1982** Leader Sqn Ldr J Blackwell, 2 Flt Lt B S Walters, 3 Flt Lt J R Myers, 4 Flt Lt I J Huzzard, 5 Flt Lt W Ward, 6 Flt Lt T R Watts, 7 Flt Lt M H de Courcier, 8 Flt Lt T W L Miller, 9 Flt Lt P A Tolman, Manager Sqn Ldr R Thilthorpe, Engineer Flt Lt G M Nisbet, Adjutant WO H G Thorne **1983** Leader Sqn Ldr J Blackwell, 2 Sqn Ldr I J Huzzard, 3 Flt Lt J R Myers, 4 Flt Lt T W L Miller, 5 Flt Lt E H Ball, 6 Flt Lt M H de Courcier, 7 Flt Lt P A Tolman, 8 Flt Lt S H Bedford, 9 Flt Lt C A R Hirst, Manager Sqn Ldr J E Steenson, Engineer Flt Lt M E J Render, Adjutant WO H G Thorne **1984** Leader

1965 Leader Flt Lt L Jones, 2 Flt Lt B A Nice, 3 Flt Lt R G Hanna, 4 Flt Lt G L Ranscombe, 5 Fg Off P G Hay, 6 Flt Lt R E W Loverseed, 7 Flt Lt H J D Prince, 8 Flt Lt E C F Tilsley, Manager Sqn Ldr R A E Storer, Engineer Fg Off D Green, Engineer Fg Off C T Harrow, Engineer Fg Off D Whitby **1966** Leader Sqn Ldr R G Hanna, 2 Flt Lt D A Bell, 3 Flt Lt R W Langworthy, 4 Flt Lt P R Evans, 5 Flt Lt R Booth, 6 Flt Lt H J D Prince, 7 Flt Lt T J G Nelson, 8 Flt Lt F J Hoare, 9 Flt Lt D McGregor, Manager Sqn Ldr R A E Storer, Engineer Fg Off C T Harrow, Engineer Fg Off D Whitby **1967** Leader Sqn Ldr R G Hanna, 2 Flt Lt D A Bell, 3 Flt Lt F J Hoare, 4 Flt Lt P R Evans, 5 Flt Lt R Booth, 6 Flt Lt H J D Prince, 7 Flt Lt E E Jones, Manager Flt Lt L G Wilcox, Engineer Fg Off D Whitby, Adjutant Flt Lt R Dench **1968** Leader Sqn Ldr R G Hanna, 2 Flt Lt D A Bell, 3 Flt Lt D A Smith, 4 Flt Lt P R Evans, 5 Flt Lt F J Hoare 6 Flt Lt R Booth 7 Flt Lt J T Kingsley 8 Flt Lt I C H Dick 9 Flt Lt R B Duckett Manager Flt Lt L G Wilcox Engineer Fg Off D Whitby Adjutant Flt Lt R Dench **1969** Leader Sqn Ldr R G Hanna, 2 Flt Lt P R Evans, 3 Flt Lt



Sqn Ldr J Blackwell, 2 Flt Lt S H Bedford, 3 Flt Lt G I Hannam, 4 Sqn Ldr T W L Miller, 5 Sqn Ldr E H Ball, 6 Flt Lt P A Tolman, 7 Flt Lt A R Boyens, 7 Flt Lt A K Lunnon-Wood 8 Flt Lt C D R Mclroy 9 Sqn Ldr A B Chubb Manager Sqn Ldr H R Ploszek Engineer Flt Lt M E J Render Adjutant WO D H A Chubb **1985** Leader Sqn Ldr R M Thomas 2 Flt Lt P D Lees, 3 Sqn Ldr A B Chubb, 4 Flt Lt P J Collins, 5 Sqn Ldr G I Hannam, 6 Flt Lt A K Lunnon-Wood, 7 Flt Lt C D R Mclroy, 8 Flt Lt D W Findlay, 9 Flt Lt A P Thurley, Manager Sqn Ldr H R Ploszek, Engineer Flt Lt J S Chantry, Adjutant WO D H A Chubb **1987** Leader Sqn Ldr R M Thomas, 2 Sqn Ldr P J Collins, 3 Flt Lt M A Carter, 4 Flt Lt M J Newbery, 5 Sqn Ldr A B Chubb, 6 Flt Lt C D R Mclroy, 7 Flt Lt A P Thurley, 8 Flt Lt J E Rands, 9 Flt Lt G M Bancroft-Wilson, Manager Sqn Ldr H R Ploszek, Engineer Flt Lt J S Chantry, Adjutant WO M R J Fleckney **1988** Leader Sqn Ldr T W L Miller, 2 Flt Lt G M Bancroft-Wilson, 3 Flt Lt D C Riley, 4 Sqn Ldr P J Collins, 5 Flt Lt S W M Johnson, 6 Sqn Ldr A P Thurley, 7 Flt Lt J E Rands, 8 Sqn Ldr J W Glover, 9 Flt Lt M A Carter, Manager Sqn Ldr H R Ploszek, Engineer Flt Lt J D Williams, Adjutant WO M R J Fleckney **1989** Leader Sqn Ldr T W L Miller, 2 Flt Lt A W Hoy, 3 Flt Lt M J H Cliff, 4 Flt Lt G M Bancroft-Wilson, 5 Sqn Ldr D C Riley, 6 Flt Lt J E Rands, 7 Flt Lt S W M Johnson, 8 Flt Lt J W Glover, 9 Flt Lt M J M Newton, Manager Sqn Ldr A J Stewart, Engineer Flt Lt J D Williams, Adjutant WO M R J Fleckney **1990** Leader Sqn Ldr T W L Miller, 2 Flt Lt A Smith, 3 Flt Lt P C H Rogers, 4 Flt Lt A W Hoy, 5 Sqn Ldr D C Riley, 6 Flt Lt S W M Johnson, 7 Flt Lt J M Newton, 8 Flt Lt D A Wyatt, 9 Flt Lt M J H Cliff, Manager Sqn Ldr A J Stewart, Engineer Flt Lt C R Bushell, Adjutant WO M R J Fleckney **1991** Leader Sqn Ldr A P Thurley, 2 Flt Lt G P Howes, 3 Flt Lt N C Rogers, 4 Flt Lt A Smith, 5 Flt Lt S C Meade, 6 Flt Lt J M Newton, 7 Flt Lt D A Wyatt, 8 Flt Lt A W Hoy, 9 Flt Lt M J H Cliff, Manager Sqn Ldr A J Stewart, Engineer Flt Lt C R Bushell, Adjutant WO M R J Fleckney **1992** Leader Sqn Ldr A P Thurley, 2 Flt Lt R W Last, 3 Flt Lt B J Cross, 4 Sqn Ldr G P Howes, 5 Flt Lt J C Bird, 6 Sqn Ldr D A Wyatt, 7 Flt Lt S C Meade, 8 Flt Lt A Smith, 9 Flt Lt N C Rogers, Manager Sqn Ldr L Garside-Beattie, Engineer Flt Lt R L Miller, Adjutant WO M R J Fleckney **1993** Leader Sqn Ldr A P Thurley, 2 Flt Lt S Chiddention, 3 Flt Lt M G Ball, 4 Flt Lt B J Cross, 5 Flt Lt J C Bird, 6 Sqn Ldr S C Meade, 7 Flt Lt R W Last, 8 Sqn Ldr G P Howes, 9 Flt Lt N C Rogers, Manager Sqn Ldr L Garside-Beattie, Engineer Flt Lt R L Miller, Adjutant WO J Howard **1994** Leader Sqn Ldr J E Rands, 2 Flt Lt C D Jepson, 3 Flt Lt M W Zanker, 4 Flt Lt K P Truss, 5 Flt Lt M G Ball, 6 Flt Lt R W Last, 7 Flt Lt S Chiddention, 8 Flt Lt B J Cross, 9 Flt Lt J C Bird, Manager Sqn Ldr L Garside-Beattie, Engineer Flt Lt M J Northover, Adjutant WO J Howard **1995** Leader Sqn Ldr J E Rands, 2 Flt Lt R Matthews, 3 Flt Lt S D Perrett, 4 Flt Lt T Couston, 5 Flt Lt M W Zanker, 6 Flt Lt S Chiddention, 7 Sqn Ldr K P Truss, 8 Flt Lt C D Jepson, 9 Sqn Ldr M G Ball, Manager Sqn Ldr H M Williams, Engineer Flt Lt M J Northover, Adjutant WO J Howard **1996** Leader Sqn Ldr J E Rands, 2 Sqn Ldr A C Offer, 3 Flt Lt D N Stobie, 4 Flt Lt R Matthews, 5 Flt Lt S D Perrett, 6 Sqn Ldr K P Truss, 7 Flt Lt T Couston, 8 Flt Lt C D Jepson, 9 Flt Lt M W Zanker, Manager Sqn Ldr H M Williams, Engineer Flt Lt M J Northover, Adjutant WO J Howard **1997** Leader Sqn Ldr S C Meade, 2 Flt Lt I S Smith, 3 Flt Lt G M Waterfall, 4 Sqn Ldr A C Offer, 5 Flt Lt A Cubin, 6 Flt Lt T

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A D E Evans, 9 Sqn Ldr K A Lewis, 10 Flt Lt R R Jones, Manager Sqn Ldr J M Paige, SEngO Sqn Ldr M J Northover, JEngO Flt Lt A D McNeill, Adjutant WO J H May **2001** Leader Wg Cdr A C Offer, 2 Flt Lt A F Parkinson, 3 Flt Lt C Gleave, 4 Sqn Ldr M M Garland, 5 Flt Lt J P Hughes, 6 Sqn Ldr J D Provost, 7 Flt Lt J R Hawker, 8 Sqn Ldr C D Carder, 9 Flt Lt M R Cutmore, 10 Sqn Ldr A D E Evans, Manager Sqn Ldr J M Paige, SEngO Sqn Ldr M J Northover, JEngO Flt Lt T Beagle, Adjutant WO J H May **2002** Leader Sqn Ldr C D Jepson, 2 Flt Lt D Thomas, 3 Sqn Ldr J H Green, 4 Flt Lt A F Parkinson, 5 Sqn Ldr C Gleave, 6 Sqn Ldr J R Hawker, 7 Sqn Ldr M M Garland, 8 Sqn Ldr C D Carder, 9 Flt Lt J P Hughes, 10 Flt Lt S C Underwood, Manager Sqn Ldr L C Johnson, SEngO Sqn Ldr M J Northover, JEngO Flt Lt T Beagle, Adjutant WO J H May **2003** Leader Sqn Ldr C D Jepson, 2 Flt Lt J P Griggs, 3 Flt Lt D C Mason, 4 Flt Lt D J Simmons, 5 Sqn Ldr J H Green, 6 Sqn Ldr M M Garland, 7 Sqn Ldr D Thomas, 8 Flt Lt A F Parkinson, 9 Sqn Ldr C Gleave, 10 Flt Lt S C Underwood, Manager Sqn Ldr S E Varley, PRO Miss R L Huxford, SEngO Sqn Ldr R K Carleton, JEngO Flt Lt T Beagle, Adjutant WO J H May **2004** Leader Sqn Ldr C D Jepson, 2 Flt Lt A F Parkinson, 3 Flt Lt S D Stevens, 4 Flt Lt D J Slow, 5 Sqn Ldr D C Mason, 6 Sqn Ldr D Thomas, 7 Flt Lt D J Simmons, 8 Flt Lt J P Griggs, 9 Sqn Ldr J H Green, 10 Flt Lt S C Underwood, Manager Sqn Ldr S E Varley, PRO Miss R L Huxford, SEngO Sqn Ldr R K Carleton, JEngO Flt Lt S C Race, Adjutant WO J H May **2005** Leader Sqn Ldr R P G Patounas, 2 Flt Lt S Morley, 3 Flt Lt M J Higgins, 4 Flt Lt D J Slow, 5 Flt Lt J H Turner, 6 Sqn Ldr D J Simmons, 7 Flt Lt S D Stevens, 8 Flt Lt J P Griggs, 9 Sqn Ldr D C Mason, 10 Flt Lt S C Underwood, Manager Sqn Ldr S E Varley, PRO Miss R L Huxford, SEngO Sqn Ldr S R Davies, JEngO Flt Lt S C Race, Adjutant WO J H May **2006** Leader Wg Cdr R P G Patounas, 2 Flt Lt G B J Perilleux, 3 Flt Lt D R Ellacott, 4 Sqn Ldr S Morley, 5 Flt Lt P O'Grady, 6 Flt Lt S D Stevens, 7 Flt Lt J H Turner, 8 Flt Lt D J Slow, 9 Sqn Ldr M J Higgins, 10 Flt Lt A C R Robins, Manager Sqn Ldr P J Hunt, PRO Miss R L Huxford, SEngO Sqn Ldr S R Davies, JEngO Flt Lt R D J Gates, Adjutant WO J H May **2007** Leader Wg Cdr J R Hawker, 2 Sqn Ldr B D Murphy, 3 Flt Lt A R Keith, 4 Flt Lt G B J Perilleux, 5 Flt Lt D R Ellacott, 6 Sqn Ldr J H Turner, 7 Flt Lt P O'Grady, 8 Sqn Ldr S Morley, 9 Sqn Ldr M J Higgins, 10 Flt Lt A C R Robins, Manager Sqn Ldr P J Hunt, PRM Miss R L Huxford, SEngO Sqn Ldr E D Williams, JEngO Flt Lt A Scott, Adjutant WO J H May **2008** Leader Wg Cdr J R Hawker, 2 Flt Lt S P Rea, 3 Flt Lt M R Ling, 4 Sqn Ldr G Duff, 5 Flt Lt A R Keith, 6 Flt Lt P O'Grady, 7 Sqn Ldr B D Murphy, 8 Flt Lt G B J Perilleux, 9 Flt Lt D R Ellacott, 10 Flt Lt A C R Robins, Manager Sqn Ldr J S Trott, PRM Miss R L Huxford, PRO Miss E J Thomas, SEngO Sqn Ldr E D Williams, JEngO Flt Lt C R Fenn, Adjutant WO J H May **2009** Leader Wg Cdr J R Hawker, 2 Flt Lt 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Thomas, S Eng O Sqn Ldr R Priday, J Eng O Flt Lt A B Littler, Adjutant WO A Murray BEM **2012** Leader Sqn Ldr J Turner, 2 Flt Lt M Pert, 3 Flt Lt M Child, 4 Flt Lt J McMillan, 5 Sqn Ldr M Higgins, 6 Flt Lt B M Plank, 7 Flt Lt C Lyndon-Smith, 8 Flt Lt D B Davies, 10 Sqn Ldr M Ling, Manager Sqn Ldr E J Parker, PRM Mrs J Cross, S Eng O Sqn Ldr R Priday, J Eng O Flt Lt A B Littler, Adjutant WO A Murray BEM **2013** Leader Sqn Ldr J Turner, 2 Flt Lt O Parr, 3 Flt Lt M Lawson, 4 Flt Lt M Pert, 5 Flt Lt S Morris, 6 Flt Lt C Lyndon-Smith, 7 Flt Lt J McMillan, 8 Flt Lt B M Plank, 9 Flt Lt M Child, 10 Sqn Ldr M Ling, Manager Sqn Ldr R Shackleton, PRM Mr A Morton, PRO Mrs J Pearson, S Eng O Sqn Ldr J Fortune, J Eng O Flt Lt A B Littler, Adjutant WO A Irons **2014** Leader Sqn Ldr J Turner, 2 Flt Lt S Campbell, 3 Flt Lt J Hourston, 4 Flt Lt O Parr, 5 Flt Lt S Morris, 6 Flt Lt J McMillan, 7 Flt Lt M Lawson, 8 Flt Lt M Pert, 9 Flt Lt M Child, 10 Sqn Ldr M Ling, Manager Sqn Ldr R Shackleton, PRM Mr A Morton, PRO Mrs J Pearson, S Eng O Sqn Ldr J Fortune/ Sqn Ldr H Raja, J Eng O Flt Lt M Noye, Adjutant WO A Irons **2015** OC RAFAT Wg Cdr M Higgins, Leader Sqn Ldr D Montenegro, 2 Flt Lt M Bowden, 3 Flt Lt E Cox, 4 Flt Lt S Campbell, 5 Flt Lt T Bould, 6 Flt Lt M Lawson, 7 Flt Lt S Morris, 8 Flt Lt O Parr, 9 Flt Lt J Hourston, 10 Sqn Ldr M Ling, Manager Sqn Ldr C Driscoll, PRM Mr A Morton, PRO Mrs J Pearson, S Eng O Sqn Ldr P Searle, J Eng O Flt Lt M Ramsden, Adjutant WO A Irons **2016** OC RAFAT Wg Cdr M Higgins, Leader Sqn Ldr D Montenegro, 2 Flt Lt M Masters, 3 Flt Lt S Taylor, 4 Flt Lt M Bowden, 5 Flt Lt E Cox, 6 Flt Lt S Morris, 7 Flt Lt T Bould, 8 Flt Lt S Campbell, 9 Flt Lt J Hourston, 10 Sqn Ldr M Ling, Manager Sqn Ldr C Driscoll, PRM Mr A Morton, PRO Mrs J Pearson, APO Sqn Ldr D Platt, S Eng O Sqn Ldr Pete Searle, J Eng O Flt Lt M Ramsden, Adjutant WO A Irons



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**Senior Engineering Officer
Squadron Leader Rich Bland**

Rich, 36, has responsibility for all engineering and logistical matters for the team. He studied aerospace engineering at the University of Southampton before joining the Royal Air Force in 2003 and graduating from engineer specialist training in 2005. Rich has been responsible for numerous teams working on Tornado F3 and Typhoon. He joined the Red Arrows in 2017.



**Junior Engineering Officer
Flight Lieutenant Alicia Mason**

Lissy, 35, has responsibility for engineering issues and the Circus team. She was an active member of the Air Training Corps (1924 (Shirley) Squadron), where she reached the rank of Cadet Warrant Officer. Lissy went on to gain a BEng (Hons) in mechanical engineering with power/aerospace from the University of Surrey. Lissy joined the RAF and graduated from engineer specialist training in 2005.



The Blues



**Officer Commanding ESF
Flying Officer Chloe Sainsbury**

Chloe, 23, leads the Squadron's Engineering Support Flight (ESF). Born in Kings Lynn, she went to Springwood High School and Welbeck Defence Sixth Form College before studying at Newcastle University. 2017 is Chloe's first year with the Red Arrows.



**Warrant Officer Engineering
Warrant Officer Gary Smith**

Gary is responsible for the management, discipline and welfare of the team and is a mentor for the junior officers. He is an aircraft engineering technician, whose legacy trade is avionics. Gary joined the RAF in 1983 as a flight systems mechanic.



**Flight Sergeant Engineering
Flight Sergeant Laurence Pack**

Laurence coordinates the engineering aspects of the support team. He joined the RAF in 1984 as an airframes mechanic and has maintained most variants of Phantom, Tornado, Harrier, Puma and Typhoon aircraft whilst serving on a number of frontline squadrons.



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