

50 
Display Seasons

 **ROYAL
AIR FORCE RED
ARROWS™**



2014
www.raf.mod.uk/reds
#reds50



It is a huge privilege to lead the Royal Air Force Aerobatic Team, the Red Arrows, in 2014 – our 50th display season. This is a milestone moment for a Team that represents the United Kingdom, the values of the Royal Air Force and helps promote British industry. Each performance by the Team showcases the speed, agility and precision of the Royal Air Force. It is also a reminder of the exceptionally talented and motivated pilots, engineers and support staff that are the Red Arrows. With more than 4,500 displays completed in 55 countries, countless audiences will have seen these qualities demonstrated for themselves over the years.

In our 50th display season, the Team remains an important public face of the Royal Air Force. The very nature of the work undertaken by the Service often goes on out of sight of everyday gaze. That is why it is crucial we continue to highlight how the Royal Air Force is a modern, adaptable and capable force.

All members of the Team are very proud to be a part of this 50th display season and are honoured to have the opportunity to entertain audiences at home and around the world. To celebrate the 50th, you will notice the Red Arrows' aircraft have a new Union flag tailfin design.

My Team and I thank you for your unstinting support and hope you enjoy our displays in 2014

I wanted a design created that reflected the very British soul of the Red Arrows while keeping it simple and achievable in terms of both time and cost. We are extremely proud of our heritage and hope this new look brings with it a sense of pride for both past members of the Team and for members of the public to share in.

Previous Teams, in whose distinguished footsteps we follow, have captured the spirit of British excellence, the quality of its engineering and also inspired people of all ages and backgrounds. In my third year as Team Leader, I aim to continue this wonderful legacy. My Team and I thank you for your unstinting support and hope you enjoy our displays in 2014.

Squadron Leader Jim Turner

Team Leader of the Royal Air Force Aerobatic Team - the Red Arrows

50th
Display Seasons

BAE SYSTEMS
INSPIRED WORK



**Air Chief Marshal Sir Andrew Pulford KCB CBE ADC RAF
Chief of the Air Staff, The Royal Air Force**



**Group Captain Jamie Hunter
Commandant, Central Flying School**



**Wing Commander Neil Fraser
Officer Commanding, Royal Air Force Aerobatic Team (RAFAT)**

The Royal Air Force protects our Nation's interests 24 hours a day, seven days a week, 365 days a year and gives our Government real choice in times of crisis. This year marks the 50th display season of the Royal Air Force Aerobatic Team, the Red Arrows. Since the first display season in 1965 millions of people have been thrilled and delighted by the Red Arrows; today the team continues to demonstrate a commitment to excellence that is a hallmark of the Royal Air Force.

The Red Arrows' pilots and supporting personnel are operationally experienced, and have completed frontline tours on fast jet units flying aircraft such as the Tornado and Typhoon. Some members of the Team will be detached to serve overseas on operations during their time with the Red Arrows. As a team, they showcase the excellence found throughout your Royal Air Force, and I hope you take great pride in this when you watch them display this season.

For five decades, the Royal Air Force Aerobatic Team, the Red Arrows, has demonstrated the highest standards of fast-jet flying to audiences across the world. Such precision comes from hard work and a career's worth of training.

Equipping those who deliver flying training with the correct skills and knowledge is the responsibility of the Central Flying School, of which the Red Arrows forms a significant part. Based at RAF College Cranwell in Lincolnshire, the Central Flying School trains all flying instructors for the Royal Air Force, the Royal Navy and the Army, and is responsible for military pure flying standards. It has been in the business of the pursuit of excellence in all flying related matters for over one hundred years, is the world's oldest flying school and pre-dates even the Royal Air Force itself, which was formed in 1918. The Central Flying School and Royal Air Force Aerobatic Team collectively sit within No 22 (Training) Group, with its own Headquarters providing essential support to the Team throughout the year.

While the piloting skill you see every time the Red Arrows take to the sky is impressive, what you are actually witnessing is the efforts of an integrated team, formed by pilots, support staff and highly-skilled engineers. The dedication to their mission is fundamental to this Squadron's success and epitomises today's Royal Air Force.

Ever since the final display of last year was completed, the Royal Air Force Aerobatic Team has been busy preparing, training and focussing on producing an exciting show for its 50th season in 2014. A huge amount of hard work goes into putting together this performance – whether it's the precision flying of the pilots, the skilled engineering of the technicians or the expertise of the support staff. They are a tangible demonstration of the commitment and dedication seen across the Royal Air Force.

The Team all work together to create a display which is safe and well-managed but without losing the thrilling appeal that will typify the Red Arrows this year, just as it has done in each of the previous 49 seasons. Thank you for your continued support and please enjoy the display.

50 seasons of excellence

It was in 1964 when the Royal Air Force amalgamated its display teams into one, premier unit – the Red Arrows. The name was taken from the Black Arrows team and the colour scheme as a tribute to the Red Pelicans, while the aircraft chosen to be flown, the Gnat, had been used by the Yellowjacks.

In the first season of 1965, the Team – flying seven aircraft in a display and based at RAF Fairford – performed 65 shows. A media event at RAF Little Rissington on May 6 was the Team's first official display, with the first public performance in the UK on May 15 at Biggin Hill Air Fair. The Team permanently increased to nine display aircraft in 1968 and the Diamond Nine became the Red Arrows' trademark formation.

The Gnat, which had flown 1,292 displays, was replaced by the BAE Systems Hawk, a modified version of the RAF's fast jet and weapons trainer, for the 1980 season. Also that year, permission was given for the Team to have the motto *Eclat* – meaning excellence.

RAF Scampton – the station famous for its role in the 1943 Dambusters raid – became the Team's new home in 1983, moving from RAF Kemble – its base since 1966. Apart from a period at RAF College Cranwell between 1995 and 2000, the Lincolnshire station has been the Red Arrows' permanent home ever since.

During the Team's world tour of October 1995 to February 1996, the Red Arrows performed to nearly a million people in Sydney on Australia Day.

In 2002, the Red Arrows flew with a British Airways Concorde over London to mark Her Majesty The Queen's Golden Jubilee.

A decade later, the Red Arrows performed another series of flypasts over the capital, for the Queen's Diamond Jubilee, the 2012 Olympic Games Opening Ceremony – seen by a global television audience in excess of one billion people – and the Athlete's Parade.

The 4,500th Red Arrows display took place at the RAF Waddington International Air Show in July 2013 – in the Team's 49th season.



The public face of the Royal Air Force



With more than 4,500 displays in 55 countries, the Red Arrows represent the best of British

With a trademark combination of close formations and precision flying, the Royal Air Force Aerobatic Team, the Red Arrows, has been displaying since 1965. One of the premier aerobatic teams in the world, they are the public face of the Royal Air Force and are ambassadors for the United Kingdom.

The Team is made up of 120 people, including pilots, engineers and essential support staff. Together, they demonstrate the excellence and capabilities of the Royal Air Force and the Service's skilled, talented people.

This year's display will feature a first half of synchronised formation aerobatics followed by a more dynamic second half.

Based at RAF Scampton in Lincolnshire, the Team, which has flown more than 4,500 displays and is celebrating its 50th season in 2014, has a number of important roles:

Representing and showcasing the skills and values of the Royal Air Force

The Red Arrows are part of the wider Royal Air Force and the Team is a great reminder of the dedication and talented people found across the Service.

Representing and showcasing the skills and values of the RAF

Detailed preparation goes into creating the Team's displays, with the jets flying several times a day, for six or seven months, before a season begins.

Indeed, members of the Squadron have served on operational units, whether they be fast jet or helicopters, strategic transport or intelligence-gathering aircraft. Their backgrounds hint at the wide range of tasks the Royal Air Force performs today and is prepared for. As an example, the pilots have completed operational tours in Afghanistan and Libya, or been part of the Quick Reaction Alert in the UK and Falkland Islands, protecting our skies.

Assisting in defence diplomacy

Displays by the Red Arrows are one of the ways the UK strengthens its relationships abroad, benefiting defence and prosperity. The Team provides the UK, as the Royal Air Force does, with a great ability and option to promote and support the country's interests – diplomatically, industrially and militarily. The Red Arrows have, up

Supporting British industry

Being renowned both at home and overseas, the Team and the excellence

to the start of the 2014 season, displayed in 55 countries worldwide. The 2013 Middle East tour, which saw 15 displays and transited through 10 countries, was a great example of how the Red Arrows represent the UK far away from home.

Aiding recruitment for the UK Armed Forces

Being members of the Armed Forces, the Red Arrows are proud to represent the UK. As children, many of the current pilots and other members of the Squadron were first inspired to pursue a career in the military and join the Royal Air Force after watching the team in the sky.

How to become a Red Arrows pilot

It takes years of dedication and service in the Royal Air Force before a pilot can even apply to join the Red Arrows. All are fast jet pilots from Royal Air Force squadrons, with huge experience of flying operations around the world.

To apply for selection to the Red Arrows, pilots must:

- Have at least 1,500 fast jet flying hours
- Have completed a frontline tour
- Be assessed as above average in their flying role

A shortlist of nine applicants is examined during a thorough selection week each year. They are put through a gruelling flying test, formal interview and are chosen to replace those who will finish their tour at the end of the season. The Team Leader must have completed a three-year tour as a Team Pilot earlier in his career and is appointed in a separate selection process. Once they have finished their three-year tour with the Team, the pilots return to frontline, instructional or staff duties.



Circus engineers

Each of the Red Arrows' aircraft is looked after by its own, designated engineer for the whole display season. These Royal Air Force engineers are specially selected from the Squadron, on an annual basis, to accompany the Team's pilots.

They fly on transits – but not in displays – and ensure the aircraft are serviced efficiently at each location when operating away from the Red Arrows' home of RAF Scampton. As the pilots are known as Red 1 through 10, these engineers are known as Circus 1 to 10 – denoting which pilot they fly with and which jet they look after.

Red 1

Team Leader
Squadron Leader
Jim Turner



As the Team Leader, Jim is primarily responsible for all aspects of the display, from running the training programme, creating the routines and leading the Team on the ground and in the air.

Jim, 41, was educated at the Kings School, Canterbury, where he was a member of the Combined Cadet Force. He joined the Royal Air Force aged 18.

After flying training, Jim was posted to No 41(F) Squadron flying the Jaguar GR3A. In 2000, Jim completed the Qualified Weapons Instructor course and returned to the frontline with No 54(F) Squadron. He flew exercises in Europe, the Middle East, Canada and North America and operational sorties over Iraq, enforcing the no-fly zones.

His first period with the Red Arrows was 2005-2007 – his final year spent as Synchro Leader. Following this tour he was official advisor to the Royal Saudi Air Force Aerobatic Team and was then deployed to the Combined Air and Space Operations Centre in Qatar. Jim, who is married to Karen and has two sons, Aidan and Finlay, rejoined the Red Arrows as Team Leader in 2012.



Jim flew the Jaguar GR3A before joining the Royal Air Force Aerobatic Team.

Circus 1

Junior Engineering Officer

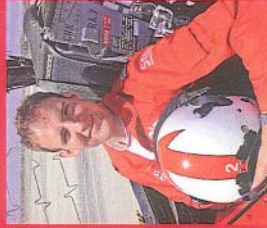
Flight Lieutenant
Mark Noye



As an Engineering Officer, Mark, 30, is responsible for all engineering issues. Mark attended BETHS Grammar School before studying Aeronautical Engineering at university. Mark's RAF postings include 29(R), 1435 Fln in the Falkland Islands and Trials Officer on the Test and Evaluation Squadron. Mark and his wife Beverley are expecting their first baby.

Red 2

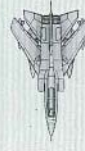
Flight Lieutenant
Stew Campbell



Stew, 34, was educated at Peebles High School in the Scottish Borders. His desire to fly jets came from watching military aircraft conducting low flying from his classroom windows. After completing his Highers, Stew studied physical education at the University of Edinburgh. He was sponsored by the RAF and completed his Elementary Flying Training with East Lowlands University Air Squadron.

He joined the RAF in 2003 and, after graduating from Advanced Flying Training on the Hawk, was selected to return to the Tucano at RAF Linton-on-Ouse to become a Qualified Flying Instructor. Stew then joined Central Flying School (Tucano) Squadron to teach new instructors and was also the 2008 Tucano display pilot.

After Tactical Weapons training, Stew was due to fly the Harrier but, with the dawn-down of the jet, was re-streamed to the Tornado GR4. Posted to 617 Squadron (The Dambusters), he completed two operational tours in Afghanistan. Stew is married to Clare and 2014 will be his first year with the Red Arrows.



Stew flew the Tornado GR4 before joining the Royal Air Force Aerobatic Team.

Circus 2

Senior Aircraftman
Tom Lowe

Aircraft Maintenance Mechanic (Mechanical)



Tom, 21, is originally from Derby and in the process of completing a Modern Apprenticeship in Aeronautical Engineering. Following basic training at RAF Halton, Tom went to RAF Cosford to complete trade training. He was then posted to RAF Scampton to work on the Red Arrows' Hawk aircraft.

Red 3

Flight Lieutenant
Joe Hourston

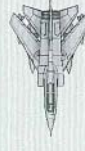


Joe, 35, who is in his first season with the Red Arrows, was born in Inverness and grew up in the Black Isle village of Cromarty, Scotland. He went to Fortrose Academy. Joe then studied Aerospace Engineering at Glasgow University and received sponsorship from the RAF – completing Elementary Flying Training with the Universities of Glasgow and Strathclyde Air Squadron.

Joe started his Initial Officer Training with the RAF in 2001 and undertook fast jet training on the Tucano at RAF Linton-on-Ouse and then the Hawk T1 at RAF Valley. After Advanced Jet Training, he was a Qualified Flying Instructor on 208 Squadron.

Joe completed his Tactical Weapons Training on the Hawk 115 at the Nato Flying Training School at Cold Lake, Canada. After this, Joe was posted to the Tornado GR4 and 617 Squadron (The Dambusters), RAF Lossiemouth, during which time he served in Afghanistan. Recently, Joe has been back at RAF Valley instructing on the RAF's new jet trainer, the Hawk T2.

Joe lives with his wife Sarah and young son Hamish.



Joe flew the Tornado GR4 before joining the Royal Air Force Aerobatic Team.

Circus 3

Corporal
Ben Laking
Aircraft Technician (Mechanical)



Ben, 29, was born and raised in Lincolnshire. He completed basic and trade training and was posted to 1st Line servicing on II(AC) Squadron. He then worked on the Tornado Propulsion Flight before being posted to the Red Arrows. Ben lives with his wife Susie and their dog Alfie.

Red 4

Flight Lieutenant
Ollly Parr



Ollly was born into a family serving with the Armed Forces. As such he grew up experiencing homes in Germany, Northern Ireland, Hong Kong, England and South Korea.

He was educated at Kingswood School in Bath and went on to study at Kingston University in London, where he spent time on the Officer Training Corps. Upon graduation he attended Royal Military Academy Sandhurst, although upon completion of the course in 1999 he chose to switch his Commission to the RAF with a view to pilot training.

He joined the RAF in 1999 and, after completing Elementary Flying Training, was streamed to fly fast jets – graduating from the Tactical Weapons Course, RAF Valley, in 2003. He was then assigned to 31 Squadron, RAF Marham, operating the Tornado GR4, and flying two tours of Iraq. After this, Ollly was posted to become an instructor at RAF Valley. In 2009 he was posted back to 31 Squadron and a second time to the frontline, completing a four month tour of Afghanistan.

Ollly, 38, is in his second year in the Red Arrows.



Ollly flew the Tornado GR4 before joining the Royal Air Force Aerobatic Team.

Red 5

Flight Lieutenant
Steve Morris



Steve, who grew up in Sheffield, was educated at Westfield Comprehensive School in the city and was a member of the Air Training Corps. He took A-Levels at The Sheffield College before studying Aerospace Engineering at the University of Sheffield. He was sponsored by the RAF and flew Tutor aircraft at the Yorkshire Universities Air Squadron, RAF Church Fenton.

He joined the RAF in 2002 and after Advanced Flying Training at RAF Valley, was selected to remain with 208 Squadron, to become a Qualified Flying Instructor. After his Creamie tour, Steve completed Tactical Weapons Training and was selected to fly the Harrier GR9. Steve was the last pilot to complete the Harrier Operational Conversion Unit and was posted to 1(F) Squadron at RAF Cottesmore where he became Combat Ready shortly before the Harrier was disbanded in 2010. He then went on to fly the Tornado GR4 and was posted to IX(B) Squadron at RAF Marham. Steve was involved in Operation Ellamy over Libya. This is his second year with the Red Arrows.

The 33-year-old lives in Cranwell with his wife Hannah, also an officer in the RAF.



Steve flew the Tornado GR4 before joining the Royal Air Force Aerobatic Team.

Red 6

Synchro Leader
Flight Lieutenant
James McMillan



James was born and raised in the UK but lived in New Zealand from the age of 10. Educated at Kerikeri High School in the Bay of Islands, James achieved the equivalent of A-Levels in physics, chemistry, economics and mathematics.

James was accepted for pilot training in the Royal New Zealand Air Force during his last year at school. After his basic flying course, James was selected for fast jets – becoming the youngest qualified fast jet pilot in the RNZAF.

After New Zealand disbanded its fast jets, James transferred to the RAF in 2002. Following training on the Hawk, he was selected as a Qualified Flying Instructor, at RAF Valley.

Completing his instructional tour and Tactical Weapons course in 2006, he was posted to the Harrier GR9 where he served with 1(F) Squadron based at RAF Cottesmore. During his time on the frontline, James served in Afghanistan.

James, 34, is in his third year with the Team and his partner Jennie also serves in the RAF as an air traffic controller.



James flew the Harrier GR9 before joining the Royal Air Force Aerobatic Team.

Red 7

Synchro Two
Flight Lieutenant
Mark Lawson



Mark was born in Utrecht, Holland before his family returned to the UK when he was aged one. He grew up in Harpenden and was a member of 795 (Harpenden) Squadron Air Training Corps during his time at Sir John Lawes secondary school. He read Aeronautical Engineering at Loughborough University, graduating in 1999.

He joined the RAF in 2000 and undertook Elementary Flying Training at RAF Wyton before being streamed to fly fast jet aircraft. On completion of basic and advanced fast jet training on the Tucano and Hawk aircraft respectively, Mark was posted to RAF Lossiemouth. There he flew Tornado GR4 on the role of squadron QWI pilot on IX(B) Squadron at RAF Marham. He flew the Tornado GR4 and supported operations in Iraq, Afghanistan and Libya.

Mark is in second season with the Team and the 35-year-old lives with his wife Katie and young son James.



Mark flew the Tornado GR4 before joining the Royal Air Force Aerobatic Team.

Circus 4

Corporal
Nicky Cunningham
Aircraft Technician
(Avionics)



Nicky, 32, grew up in Nairn. After completing his NVQ Level 3 and Modern Apprenticeship in Aeronautical Engineering, Nicky was posted to XV(R) Squadron working on the Tornado GR4 OCU. Nicky worked on both Tornado GR4 Display and Tornado Role Demonstration teams before being deployed overseas. He joined the Red Arrows in 2011.

Circus 5

Corporal
Victoria White
Aircraft Technician
(Mechanical)



Victoria, 29, is originally from Suffolk and has completed a Modern Apprenticeship in Aeronautical Engineering. She was posted to work on the Tornado GR4 at XIII Squadron and later to IX(B) Squadron. Victoria has completed many overseas frontline tours as well as overseas detachments. Victoria lives with her fiancé, Chris.

Circus 6

Sergeant
Kevin Healey
Aircraft Technician
(Mechanical)



Kevin, 34, is originally from Worcestershire. On completion of his trade training he was posted to XIII Squadron working on Tornado GR4/AA. Kevin completed several overseas operational tours and took part in detachments to the United States. He also worked on the VC10 tanker-transport aircraft. Kevin and his partner Natalie have three children, Neve, Gemma and Joel.

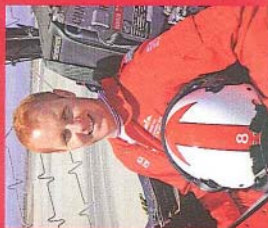
Circus 7

Corporal
Jonathan Wilcox
Aircraft Technician
(Avionics)



Jonathan, 35, was born in Germany and raised in Norfolk. He is currently studying for his HND in Aeronautical Engineering. After training, Jonathan was posted to RAF Marham before completing several overseas operational tours and detachments. Jonathan lives with his wife Victoria and their daughters Evelyn and Annabelle.

Red 8



Flight Lieutenant
Martin Pert

Born in Paisley, just outside Glasgow, Martin was raised in Abbots Langley, Hertfordshire. He commenced his schooling in Scotland before the move south, completing his A-Levels at Parmer's School, Gaoston. He was a member of 2(F) (Watford) Squadron Air Training Corps. Martin was awarded a RAF Sixth Form scholarship and also completed the RAF Flying Scholarship, gaining his Private Pilot's Licence aged 17.

He joined the RAF in 2000 and completed Joint Elementary Flying Training at RAF Church Fenton. Selected for fast jet duties, Martin flew the Tucano and Hawk before becoming a Creamie Qualified Flying Instructor on the jet at RAF Valley. In 2006, Martin was the Hawk solo display pilot. Martin then completed the Harrier Operational Conversion Unit and was posted to 1(F) Squadron, RAF Cottesmore, flying the Harrier GR7/9. He served on operations over Afghanistan. Martin was proud to conduct the last sortie to honour the Harrier GR9 bow out of service. In Feb 2011, Martin was posted to 100 Squadron, RAF Leeming. This is Martin's third year on the Team.

Martin, 33, lives with his wife Susie and son Fraser.



Martin flew the Harrier GR7/9 before joining the Royal Air Force Aerobatic Team.

Red 9



Executive Officer
Flight Lieutenant
Mike Child

Mike, 34, grew up in Chichester, West Sussex and was interested in flying from a young age. He was educated at Chichester High School for Boys, where he was a member of the Combined Cadet Force and undertook his flying scholarship at TG Aviation, Manston. He then studied at the University of Birmingham, where he was sponsored by the RAF and spent much of his time flying the Tutor aircraft at the University of Birmingham Air Squadron.

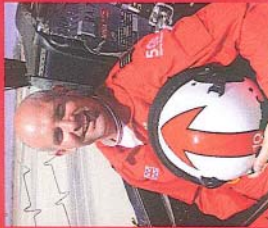
He joined the RAF in 2001 and, after Advanced Flying Training, was selected to remain with 208 Squadron, to become a Qualified Flying Instructor. Mike was the Hawk Display Pilot in 2007. Having completed his Tactical Weapons Training in Canada, he was posted to the Typhoon at Coningsby serving on 3 (F) Squadron. Mike was declared Combat Ready in December 2009 and went on to serve on Quick Reaction Alert in the UK and Falkland Islands.

Mike, who is in his third year with the Team, lives in Woodhall Spa with his wife Christina and their daughter Elsie and their dogs Charlie and Rufus.



Mike flew the Typhoon before joining the Royal Air Force Aerobatic Team.

Red 10



Supervisor
Squadron Leader
Mike Ling

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.

Mike attended St Olave's Grammar School, Orpington, Kent, and was a member of 2427 (Biggin Hill) Squadron Air Training Corps. After flying training, Mike was posted to 72 (R) Squadron as a Qualified Flying Instructor on the Tucano. Operationally he flew the Tornado F3, with 111 (F) Squadron, at RAF Leuchars. Here he played an active part in the air defence of the UK and Falkland Islands on Quick Reaction Alert duties.

Mike joined the Red Arrows for 2008, flying for three years as a display pilot, including in the Synchro Pair. Promoted to Squadron Leader on leaving the Team, he became the Subject Matter Expert for the future UK Military Flying Training System. 2014 is his third year as Red 10 and his sixth overall with the Team. Mike, 35, lives with his partner Nicola and enjoys hill walking, skiing, private flying and watching Formula One and rugby.



Mike flew the Tornado F3 before joining the Royal Air Force Aerobatic Team.

Officer Commanding RAFAT



Wing Commander
Neil Fraser

Neil has overall responsibility for the Royal Air Force Aerobatic Team (RAFAT) and ensures procedures followed by the Team allow for safe and efficient flying.

Neil, 42, was educated at John Hampden Grammar School, High Wycombe, and was a member of 332 Squadron Air Training Corps. Awarded a flying scholarship, he was sponsored by the RAF and studied at the University of Birmingham.

Following Initial Officer Training in 1993, Neil completed military flying training at the Euro-NATO Joint Jet Pilot Training School, Texas. After further training on the Hawk T1, he was posted to the Harrier GR7 on 1(F) Squadron and flew operational tours over Kosovo. After becoming a weapons instructor, he flew operations over Iraq while with 3(F) Squadron. Promoted to Squadron Leader, he had a tour as a Harrier Staff Officer. As Officer Commanding Harrier Standards and Evaluation he flew missions over Afghanistan. In 2008 he joined IV(AC) Squadron and did two more Afghanistan tours before promotion and a posting to Air Command. Neil is married to Debbie and has two sons, Matthew and Oliver.



Neil flew the Harrier GR9 before joining the Royal Air Force Aerobatic Team.

Circus 8



Corporal
Ross Harrison
Engineering Technician (Weapons)

Ross, 32, is originally from Norwich. After completing basic and trade training he was posted to Tactical Armament Squadron at RAF Marham. Working on 6 Squadron Jaguar GR3s at RAF Coltishall, Ross spent several years completing many operational tours overseas. Ross joined the Red Arrows in July 2012.

Circus 9



Sergeant
Kevin Smith
Aircraft Technician (Avionics)

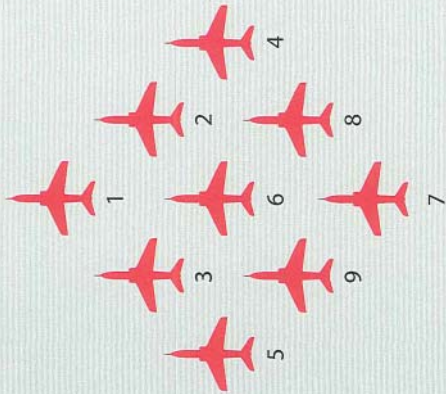
Kevin, 44, is originally from London. On completion of training he was posted to Harrier Maintenance Flight based at RAF Wittering working on the Harrier GR7 and T10 aircraft. Kevin has worked on Tornado F3s with 111(F) Squadron and has completed several overseas tours and detachments. Kevin lives with his partner Lisa and four children Billy, Pam, Owen and Hetty.

Circus 10



Sergeant
Stu Burrow
Aircraft Technician (Mechanical)

Stu, 42, is currently studying an Engineering Management Degree through the University of Lincoln. After trade training Stu worked on various units with VC10, Sentry AWACS and Harrier aircraft. He has served on various overseas detachments to North America and across Europe. He has also spent time working with RAF Careers.



Flying a display

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 'first half of the Red Arrows' display consists of synchronised, formation aerobatics, followed by a more dynamic second half. The Synchro Pair, Reds 6 and 7, perform the highly popular manoeuvres during this 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. 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.

Anyone can request a display or flypast by the Team. The decision on where the Red Arrows perform is controlled by the Royal Air Force Events Team. The section receives more than 800 requests each year, with between 75 and 85 displays able to be fitted into the Red Arrows' summer season. Many flypasts are also conducted by the Team as they transit to and from these displays. For more information on requesting a display or flypast, visit the Red Arrows website.



Hawk T1

The Hawk T1, flown by the Red Arrows, was designed as a fast jet and weapons trainer and has been with the Royal Air Force since 1976.

Top speed: Mach 1.2

Maximum altitude: 48,000ft

Range: 1,000nm

Engine: Rolls-Royce Adour, producing 5,200lbs of thrust

BAE Systems' dual control Hawk T1 replaced the Folland Gnat as the aircraft used by the Red Arrows – appearing for the first time in the 1980 season. The Team's jets are essentially the same as those flown by Advanced Flying Training students at RAF Valley, with the exception of their trademark smoke-generation modifications and a slightly up-rated engine which gives a faster response time.

Smoke on, go!

The Red Arrows are famous for their red, white and blue smoke trails. Smoke is a crucial element of the Team's displays and the trails have an important flight safety role. 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 vivid smoke also enhances the display's visual impact.

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 fitted to the aircraft. At the precise time, the pilot releases the

liquid by pushing one of three buttons on the control column. There is one minute's worth of blue smoke, a minute of red and five minutes of white.

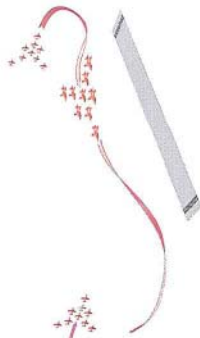
Responsible for replenishing the pods are two dedicated dye teams, led by Corporal Michael Knight and Corporal Dave Trimby. Due to the diverse range of locations the Team operate from, these engineers travel thousands of miles a year by road. Wherever the jets land, there's a dye team waiting. Working to tight timescales, they ensure the red, white and blue trails look the part when Red 1 calls "Smoke on, go!"



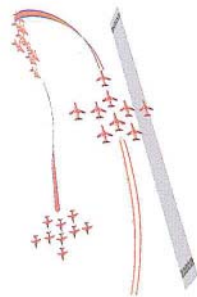
Royal Air Force Aerobatic Team 2014 Full Display



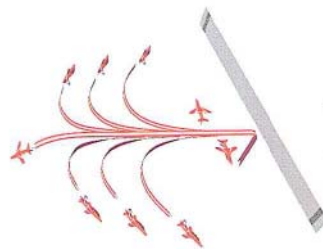
1-2 Big Battle to Short Diamond Arrival Loop



3 Eagle Roll



4 Flanker Bend



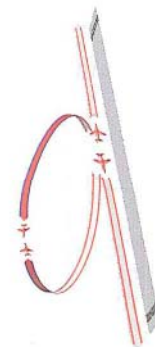
9 Palm Split



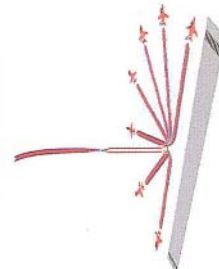
10 Gypo Pass



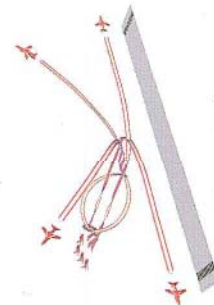
11 Cyclone/Slingshot



16 Carousel



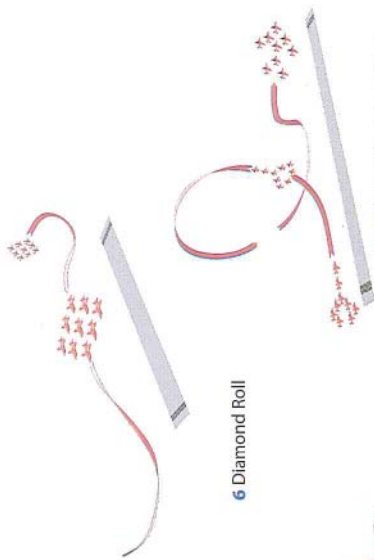
15 Vertical Break



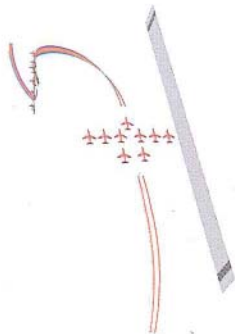
22 Gypo Break



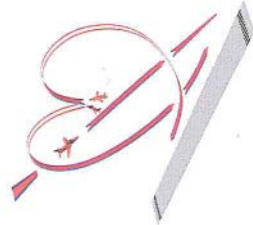
21 Twister



6 Diamond Roll



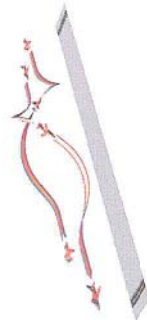
5 Phoenix Bend



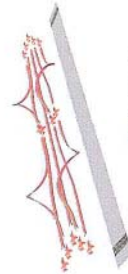
7-8 Concorde to Fred Loop



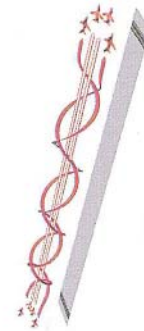
12 Goose



14 Opposition Barrel Roll



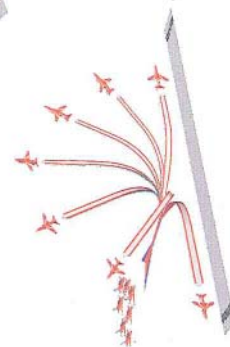
19 Rollbacks



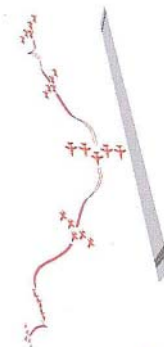
18 Corkscrew



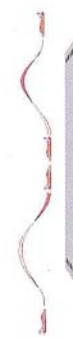
20 Mirror Pass



24 Vixen Break



17 Python



23 Double Rolls

Behind the scenes

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

Behind-the-scenes, dozens of people plan and coordinate the Team's every move and make sure – whatever the time of the year – that each of the Squadron's 120 individuals and aircraft is in the right place, at the right time, in a safe and efficient manner.

This team is drawn from the various roles, trades and branches of the Royal Air Force and also Civil Service. Like every other member of the Team, they represent how the Royal Air Force has people with vast experience, skills and dedication.

Administration

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 Sergeant Buzz Matthews and Senior Aircraftman Matty Henson, they act as a focal point for the entire Team. The department works to coordinate everything from the booking of accommodation to organising leave passes. The Team Manager is also responsible for publishing a schedule known as WHAM, which stands for What's Happening. According to the Manager, it's distributed to everyone on the Team and the document contains details of where everyone has to be and very precise timings, often down to the minute. Nothing is left to chance.



Team

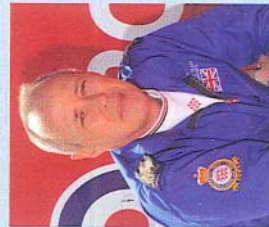
Manager



Squadron Leader
Ruth Shackleton

Ruth joined the RAF in 1999 as an Officer Cadet. Intent on becoming a Flight Operations Officer, she has enjoyed a varied career to include: Duty Operations Officer at RAF Northolt arranging VIP flights, 18 Squadron Operations Officer with Chinook Helicopters, Task Coordinator for the Air Transport fleet at RAF Brize Norton and DTMA Andover, NATO HQ Operations Officer, Naples Italy, Aide de Camp to Air Officer Commanding 22 Training Group, Officer Commanding Operations Squadron RAF Coningsby, home of the Eurofighter Typhoon. Operational experience has included detachments to BFFI (Falkland Islands 2001), Operation Telic (Iraq 2003), Operation Herrick (Afghanistan 2008), Operation Enduring Freedom (Afghanistan 2010) and Operation Ellamy (Libya 2011). Ruth enjoys travelling and she is a Fellow of the Royal Geographic Society. She is a mezzo soprano and continues to perform when the display schedule permits!

Adjutant



Warrant Officer
Alan Irons

Alan attended Kent School in Hoster, Germany, and White House Grammar School in Cumbria. He joined the Royal Air Force in 1980. He joined 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. He served at eight UK and three German units before promotion to Warrant Officer. His final tour as a member of the regular Royal Air Force was MOD Corsham as Unit Chief Clerk responsible for all aspects of Tri-service personnel support. He left in 2012 after 32 years of service. Alan returned to the RAF as a Full Time Reservist with the Red Arrows in 2013. Alan's partner is Lynne-Marie.

Flight Operations

Flight Operations (Ops) is responsible for all aviation planning and coordination during the year. During the winter months, the Ops 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 Ops corporals, Sue Rettie and Craig Oxford, ensure all the low flying bookings, flight plans and diversions are booked, while the Ops Officer books the jets into the airfields, ensuring there is fuel and support on the ground for the Team. Before heading overseas, Ops ensure all diplomatic clearances are granted and host nation facilities meet the Team's requirements.

Aircrew Planning Officer



Squadron Leader
Dave Platt

Dave, 52, originally from Lancashire, 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 carried out software development work on the Typhoon. He returned to the RAF as a Full Time Reservist with the Red Arrows in June 2013. Dave lives with his wife Sally, and two children, Oliver and Bethany.

Flight Operations Officer



Flight Lieutenant
Jennifer Lavender

Jennifer, 31, originally from Twickenham, is a graduate of Exeter University. After completing Officer Training, she was posted to RAF Akrotiri as Officer Commanding Accounts and took part in a fast jet Training Exercise in Abu Dhabi. She was then posted to RAF Marham before training at RAF Shawbury to become a Flight Operations Officer. Afterwards, she was posted to RAF Kinloss as the Operations Officer for 201 Squadron (Nimrod). In 2010 Jennifer deployed to Al-Udeid as the UK Afghanistan Watch Keeper. She was then posted to RAF Odiham, Chinook Helicopter Force Headquarters, where she attended Exercises in Jordan, Morocco and California. In 2012, she deployed with 12 (Mechanised) Brigade to Afghanistan as the British Army Headquarters Aviation Liaison Officer. Jennifer lives with her husband, Thomas.

Busy 365

October-December

The Red Arrows are not just busy during the summer season. The Squadron is hard at work throughout the year. Training begins at the Team's base, RAF Scampton, almost as soon as the last summer display is completed. To mark the transition, all Squadron members revert to wearing green flying suits and coveralls. Each pilot flies three sorties a day, five days a week to train. The process starts with small formations of three or four aircraft as the new 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. Before Christmas, the Team takes part in a number of public relations activities such as visiting hospitals, schools, and delivering talks and presentations.

January-March

The Circus engineers selected to fly with the Team are subjected to medical tests and emergency simulations. The display sequence is designed by the pilots and the Team will aim to fly its first nine-ship formation in March. All of the equipment required for the Team's annual spring training detachment to Cyprus is packed and sent ahead. The display programme is agreed, accommodation is booked and travel arrangements made.

April-May

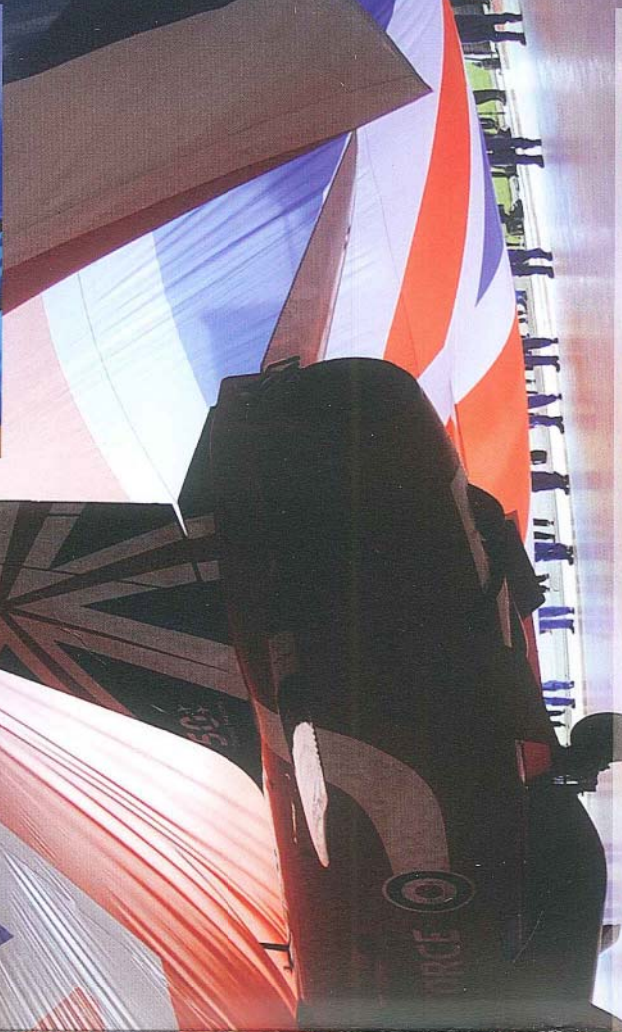
The Team move to RAF Akrotiri, to perfect their display in the better weather of Cyprus. This is known as Exercise Springhawk. Shortlist week also takes place here – where pilots hoping to get a place on the Team are assessed. The training season ends in May when the Red Arrows' Air Officer Commanding 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 blue flying suits.

May-October

During the display season, the Red Arrows will perform between 75-85 displays and more than 100 flypasts at a variety of events. Often the Team will appear at two events a day, sometimes in different parts of the country. The engineers work hard to ensure all the jets are ready for each display and transit. And the dye teams, public relations team, drivers and suppliers need to be in the right place, at the right time. Planning by the Team Manager and Administration team is vital. Finally, after the last display of the season, there is a formal dinner to say goodbye to members who are leaving. Preparations for next year then begin, all over again.

Flying the flag

To mark the 50th display season, the jets are carrying a new tailfin design. The Union flag design reflects the best of British and the Team's role as ambassadors for the UK. The new tailfin was unveiled at RAF Scampton. A giant Union flag was draped over the first of the Hawks to receive the new look – to keep the design a secret until the big moment. Then, when the time arrived, the engineers and support staff – known as the Blues – removed the flag to reveal the new design.



PR Manager

Mr Andrew Morton

Andrew is responsible for the publicity and engagement strategy for the Red Arrows. The 32-year-old, from East Yorkshire, graduated from the University of Lincoln with a First Class Honours degree in Journalism. He worked as a daily newspaper reporter, news editor and video journalist for more than 10 years before moving to PR.

PR Officer

Mrs Jo Pearson

Jo, originally from Scotland, worked for the Royal Navy before transferring to work for the RAF. She has worked on various RAF units including her previous position in Marketing and Public Relations for RAF Careers at RAF College Cranwell. Jo lives in Lincoln with her husband Dave.

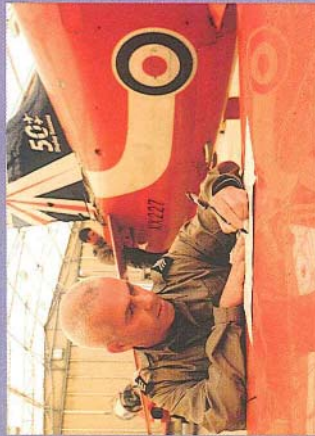
Public Relations (PR)

The department organises the Team's many public functions, visits and high-profile meetings, together with coordinating the ground presence at airshows and other events in the UK and overseas. The PR team also respond to all press queries. All of the Red Arrows' marketing and promotion materials, from brochures to the website, are looked after by the PR department. It is the only Red Arrows section led by a civilian manager – an experienced media specialist – who is assisted by two other people, including a Senior Aircraftman.

The support team

There are 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 coversalls.

They represent the many, varied roles in the Service and demonstrate the team work required on the ground to ensure the jets can display safely in the air.



Mechanical Engineering

Mechanical technicians make up two thirds of the Red Arrows' engineering team and are responsible for the maintenance and certification of the Team's BAE Systems Hawk T1 aircraft.

The mechanics 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 – everything from the smallest nut and bolt, to the wings.



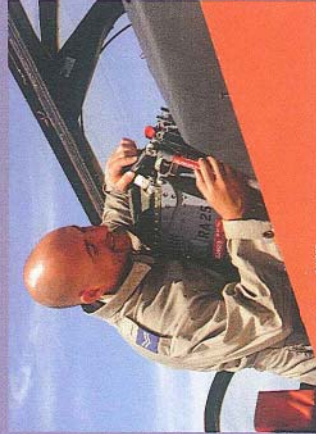
Avionics

The Red Arrows have 14 avionics technicians who are responsible for all the electrical and avionics systems on the aircraft. They maintain equipment ranging from emergency compasses to complex engine control circuits, as well as introducing upgrades such as new radio systems and engine performance monitoring equipment.



Engineering Support Flight

Engineering Support Flight (ESF) is responsible for maintaining quality assurance, standards, support, records and training. The section is led by a Flight Lieutenant and has a mixture of regular and reserve personnel of various ranks. Support and training is paramount within the Red Arrows to ensure compliance in the air and on the ground, regardless of trade or rank.



Weapons Technicians

The smallest of the Red Arrows' three engineering trades, the weapons technicians are responsible for the maintenance and control of the explosive components and survival equipment fitted to the Hawk aircraft.

The team work on the aircraft's ejection seats, explosive canopies and fire suppression and emergency systems.



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.

All of the thousands of pieces of equipment that help the Red Arrows work smoothly – everything from nuts and bolts to aircraft engines – are purchased, stored, managed and distributed by the suppliers.



Mechanical Transport

The Red Arrows have six drivers who are responsible for a fleet of 18 vehicles, from 38-tonne trucks to Land Rovers. A vital part of the Team, they ensure all the equipment and personnel get to the right place as well as ensuring the aircraft are refuelled and replenished with the diesel needed for the smoke systems.



Photographers

Without one of the Team's photographers, the Red Arrows would not be able to display. There are three in the Team – Corporal Steve Buckley, Senior Aircrewman Adam Fletcher and Senior Aircrewman Craig Marshall. Their role is crucial for safety and training purposes, 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 on the ground.



Survival Equipment Fitters

The Team has three Survival Equipment Fitters who maintain all elements of the pilots' safety kit.

This specialist equipment includes helmets, anti-G trousers, life rafts, oxygen masks and parachutes.

1. Mk10 Flying Helmet

This is for maximum protection and also houses the communications equipment.

2. Red Display Flying Suit

The Red Arrows' famous flying suit is worn for the display season but not during the Team's training period, when a green coverall is used.

3. Oxygen Mask

There is also a microphone within the mask to enable the pilots to communicate.

4. Aircrew Life Preserver

This contains vital survival aids including locator beacon, mini flares and a first aid kit.

5. Personal Equipment Connector

This connects to the aircraft to supply communications for the helmet and mask, oxygen for the pilot and to inflate their 'G' trousers.

6. Aircrew Flying Gloves

7. Aircrew Cutter

Used for cutting rigging lines and harness.

8. Anti-G Trousers

Prevents blood rushing to the legs when pilots pull 'G' during manoeuvres.

9. Aircrew Flying Boots

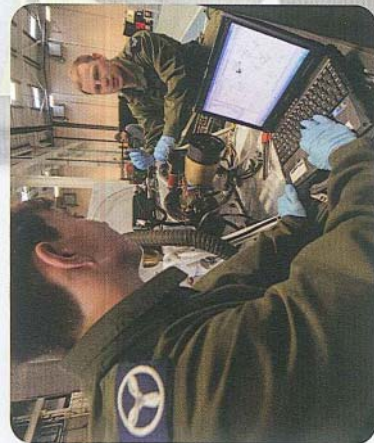
Flame retardant.



The Royal Air Force is recruiting now...

The Royal Air Force Aerobatic Team, the Red Arrows, is made up of the most exceptional pilots, engineers and support staff that the RAF has to offer. All of these roles are vital in ensuring the team's 50th display season is a success.

If you're longing to experience a new and dynamic way of life, the RAF could be the career choice for you.



ROYAL AIR FORCE CAREERS

To find out more about our careers, visit www.raf.mod.uk/careers or find us on www.facebook.com/rafcareers

The Red Arrows and Hawk – the perfect partnership

For more than 30 years of their historic half-century, the RAF's Red Arrows have been wowing the crowds from the cockpit of the BAE Systems Hawk.

As the Reds prepare to put on yet another world-class display, it is fitting that the next generation of fast-jet pilots are being trained on the next generation of Hawk.

On the outside, Hawk T2 may look similar to its older sibling, the T1, which is flown by the Reds, but under the skin it is a completely different aircraft, providing a quantum leap in how air forces train their pilots.

The really clever part about the T2 is in its cockpit, which is packed with the latest state-of-the-art simulation and emulation technology in its all-digital glass cockpit displays.

Hawk has simulated radar, defence aids and weapons capability, but to the student pilot it's like they are stepping into one of the world's leading fighter aircraft, such as Typhoon or F-35.

The focus is on learning and the freeze frame nature of debriefing sessions means that every element of a training sortie can be examined in detail.

Stepping into a Hawk today is like stepping into a flying classroom.

Students are receiving realistic training - they are being trained not only to fly but also to fight and win. 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.

With this cutting-edge technology it is easy to see why nearly 1,000 Hawks have been bought by air forces across the globe during the years the Reds have been lighting up the skies with their displays.

The future of Hawk is continuing its evolution to meet the demands of the frontline pilots and making sure they are better prepared than ever before.

BAE SYSTEMS

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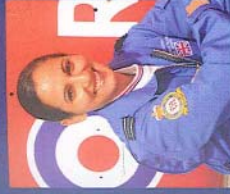


Senior Engineering Officer

Squadron Leader
Josh Fortune

Josh, 42, originally from Weston-Super-Mare, has responsibility for all engineering and logistical matters for the Red Arrows. He joined the RAF as a weapons mechanic working at RAF Waddington and RAF Warham. During his tour on Tactical Armaments Squadron he was detached overseas in support of Air Ops. He commissioned into the Engineer branch and oversaw the armament support to Tornado F3 at RAF Leeming before qualifying as an EOD Officer. As a Tornado GR4 Junior Engineer Officer he supported Air Ops Iraq in Al Udeid (Qatar) and as the Tornado Capabilities Officer he supervised the GR4 modification programme. He undertook an air accident investigation in Afghanistan prior to assuming a HQ Air Command post as an Explosives Safety Officer. Prior to joining the Red Arrows he was the Tornado GR4 Senior Engineer Officer on 41(R) Test & Evaluation Squadron at RAF Coningsby. During his RAF career, Josh achieved a first class BSc (Hons) Degree in Engineering Management.

Josh is married to Vanessa and has three children – Luke, Stephanie and Christian.



OC ESF

Officer Commanding Engineering Support Flight

Flight Lieutenant Nosheen Chaudry

Nosheen was a member of 2187 (Canvey Island) Squadron ATC. Her role involves working to combine, and add to, existing logistic and support elements. After Initial Officer Training and Engineer Specialist Training Nosheen was posted to RNAS Yeovilton to work with the Tri-Service Rotary Wing project teams. She then moved to RAF Odiham as Officer Commanding Armament Engineering Flight.



WO Eng

Warrant Officer Engineering

Warrant Officer David Lloyd

David lives in Rutland, he is responsible for the management, discipline and welfare of the Blues. He has worked at various units in the UK and overseas and held a previous posting with the Red Arrows before being promoted to WO. Before returning to the Squadron, David served as the last WO on 4(R) Squadron prior to the retirement of the Harrier aircraft.



FS Eng

Flight Sergeant Engineering

Flight Sergeant Barrie Ramsden

Barrie, 50, lives in Lincolnshire, he is responsible for coordinating engineering detachments and manpower requirements for the Blues. He trained as a Flight Line Mechanic and has worked on nearly all of the current and retired aircraft within the RAF including a tour on 617 Squadron (The Dambusters). Barrie has completed numerous overseas tours and detachments.



The Blues

50 Display Seasons
ROYAL RED™
AIR FORCE
ARROWS



This brochure is supported by

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