International Air Tattoo 83

RAF Greenham Common – July 23 & 24

In aid of THE ROYAL AIR FORCE BENEVOLENT FUND
and in association with **Nationwide Building Society**

£1

Introduction by:

The Rt. Hon. Lord Shackleton
KG PC OBE MA LLD(Hon) DSc(Hon)
President of International Air Tattoo

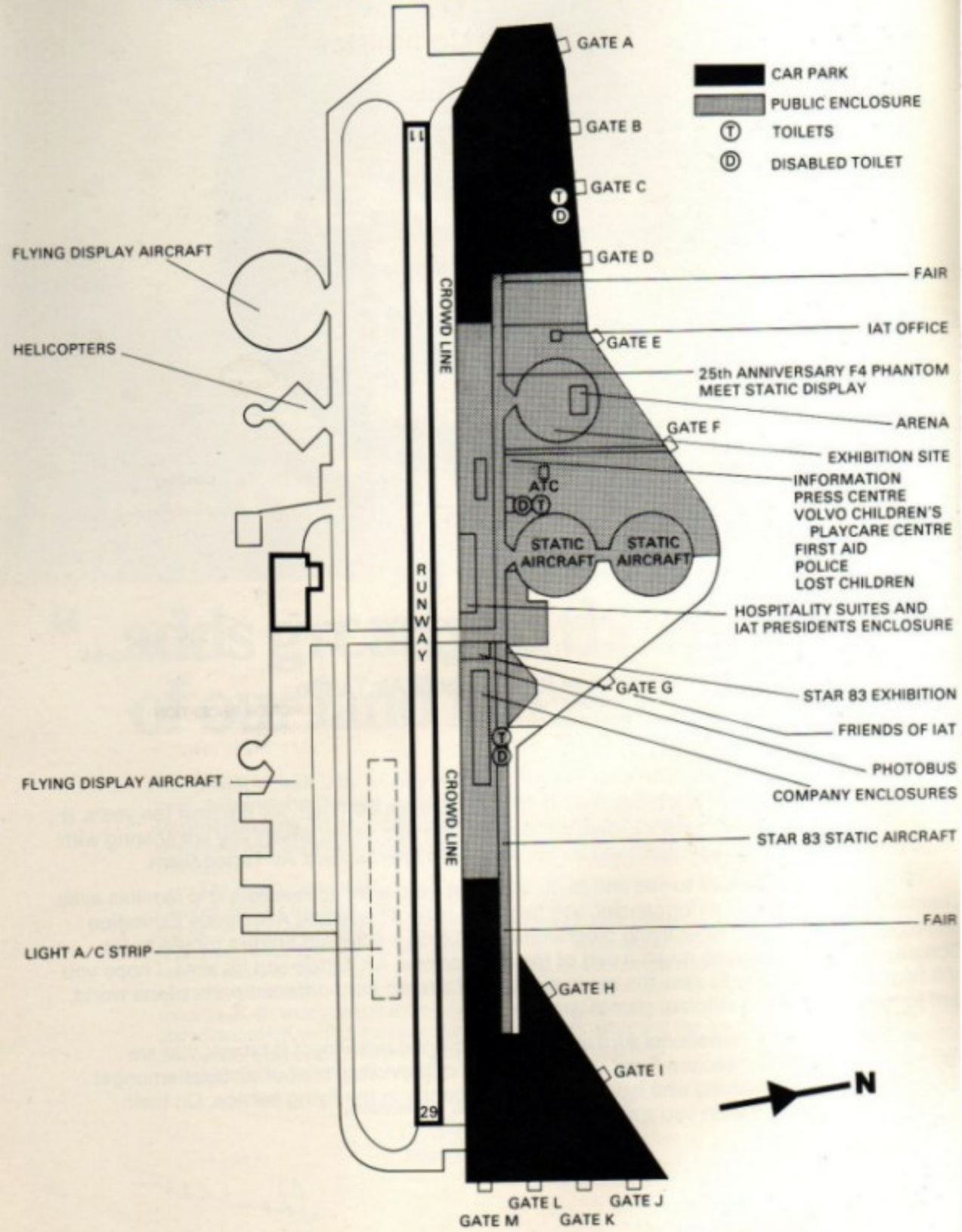
The International Air Tattoo has been held at Greenham Common for the past ten years. It stands in the forefront of military shows world wide, and this event, which you are sharing with us, is probably the finest yet organised by the dedicated International Air Tattoo team.

This year there is more to see and to do than ever before for enthusiasts and families alike. There are exciting arena performances, two large fun fairs, a trade and Aerospace Exhibition and a really superb eight hour flying programme, including a splendid Spitfire tribute to Sir Douglas Bader, who was so much a part of the International Air Tattoo and its aims. I hope you will take the opportunity to view the many displays of aircraft from different parts of the world, and to meet their crews who are glad to greet you.

In attending the International Air Tattoo, apart from the enjoyment it brings, you are supporting the RAF Benevolent Fund in its vital work of providing relief of distress amongst those (and their dependants) who have served their country in the flying service. On their behalf, I thank you and wish you a memorable day.

Shackleton

International Air Tattoo 83



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Welcome to Greenham Common

On behalf of the United States Air Forces in Europe and the 501st Tactical Missile Wing, welcome to International Air Tattoo '83—the finest military air display in the world.
The American communities of RAF Greenham Common and RAF Welford are proud to be a part of this magnificent effort in support of the Royal Air Force Benevolent Fund.
We wish the sponsors, organizers and participants continued success in the future.

Robert M. Thompson

ROBERT M THOMPSON, Colonel, USAF Commander

Royal Air Force Greenham Common

RAF Greenham Common was a glider base during World War II in the lead up to the Normandy landings, but operational use of the airfield ceased with the end of hostilities. The United States Air Force first began to build up the base in February 1951 and on 18 June 1951 the RAF handed over operational control.

Construction was completed in 1953, providing a runway 200ft wide and 10,000ft in length with an additional 1,000ft overrun at either end. The airfield became operational in March 1954 with B-47E aircraft of the 303rd Bomber Wing, Strategic Air Command.

The base was again deactivated in June 1964 and handed back to RAF control. When US Forces withdrew from France, however, it was reallocated to the USAF in January 1967 as a storage site and subsequently selected as a NATO standby base, operated by the 7551st Combat Support Group under the control of HQ 3rd Air Force, USAF. Several Reforger exercises involved Greenham Common in their activities and in March 1976 F-111Es of the 20th TFW moved in from Upper Heyford while repairs to their home runway were completed. They remained throughout the summer and after their departure the base continued to be operated by a detachment from the 20th TFW.

In 1978 Greenham Common was once again downgraded to a US Army storage unit as an annex to RAF Welford. In the meantime a major programme had been put in hand to re-surface much of the airfield and modernise the facilities for operational use during the 1980s. On 1 January 1979 Greenham Common was redesignated the 7273rd Air Base Group. It was announced in 1980 that the airfield would be the UK base for the 501st Tactical Missile Wing. From 1981 extensive redevelopment work has taken place at the base, the airfield reopening for operational use in June 1983.

Although fully aware of how much the International Air Tattoo has done for the Royal Air Force Benevolent Fund, I have had no previous direct contact with the organisation. Having seen just some of the preparatory work for this year's show, I now well appreciate how the IAT success and reputation has been earned.
It is with very great pleasure that I say "Welcome to Royal Air Force Greenham Common for the 1983 Air Tattoo". I hope that you will enjoy all aspects of your visit.

M J Marsh

M J MARSH, Wg Cdr, RAF Commander

Who will Benefit from IAT '83?
The Royal Air Force Benevolent Fund

The Royal Air Force Benevolent Fund was founded by the late Viscount Trenchard in October 1919 for the relief of distress or need, amongst past and present members of all ranks of the Royal Air Force, including the Women's Services, the Royal Auxiliary Air Force, the Royal Air Force Reserves, and their widows, children and other dependants. The Fund provides help for casualties arising in peacetime as well as in time of war.

There are no hard and fast rules about who may be helped or how much help may be given; each person's needs are considered in the light of their particular circumstances, the object being to provide relief in the many cases where assistance from the State is either not forthcoming or is inadequate.

The Fund aims to enable dependants to maintain some semblance of the life to which they have been accustomed, and to help children into careers which their fathers might reasonably have expected them to follow.

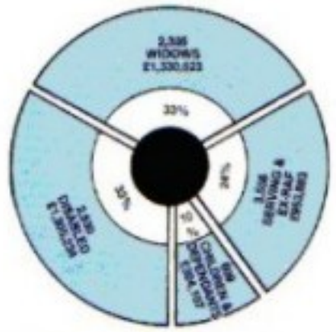
Boys from the Duke of Kent School at cross country practice

The Duke of Kent School

The Duke of Kent School, Woolpit, is an Independent Preparatory Boarding School administered by the Fund for the sons and daughters of Royal Air Force personnel of all ranks. Preference for admission is given to children (Foundationers) whose fathers died or were seriously disabled whilst serving. Exceptionally, children of retired Royal Air Force personnel are also accepted particularly if the father died through illness or disablement attributable to his service.

The Fund will also help pupils leaving the Duke of Kent School and assists with fees for their later education where necessary. Also, it helps with the fees for children of Royal Air Force personnel at boarding schools.

The Fund's Work 1982



9,480 Beneficiaries £3,973,847

The Royal Air Force Benevolent Fund's convalescent home, Princess Marina House

Princess Marina House

Princess Marina House, Rustington, Sussex, provides convalescence for serving personnel of all ranks of the Royal Air Force; and convalescent and residential accommodation for partially disabled and elderly past members of the Service, their adult dependants and the adult dependants of those still serving.

The Fund recognises an increasing need for this service and has recently doubled the capacity of Princess Marina House at a cost of over £1m.

In 1982, expenditure on the relief of distress amounted to almost £4m. The greater part of this went to help widows and the disabled. The survivors of the Second World War and their dependants are increasingly vulnerable to ill health and financial hardship as they grow older and in 1982 expenditure has risen by some 30% over 1981.

The Fund obtains its income from subscriptions from serving RAF Officers, Airmen and Women; from investment income, legacies, donations and various fund-raising activities. We must continue our efforts to increase our income if we are to meet the demands of the coming years and you can help us by supporting IAT '83.

Information on donations, legacies, bequests and covenants will gladly be supplied by:

Secretary Appeals,
Royal Air Force Benevolent Fund,
67 Portland Place,
London
W1N 4AR

A Lifetime of Service

Sixty-five Years of the Royal Air Force, 1918-1983

On April 1st, 1983, the Royal Air Force completed its first 65 years—for some, a lifetime of service. The R.A.F. Benevolent Fund has marked this anniversary with a handsome book, lavishly illustrated with more than 125 colour plates.

In a Foreword, Marshal of the Royal Air Force the Right Hon. Lord Elworthy, K.G., G.C.B., C.B.E., D.S.O., M.V.O., D.F.C., A. F.C., M.A., writes:

"Flying is such an integral part of our lives today it seems suprising that the first powered, manned flight took place less than 80 years ago. The Royal Air Force itself is only 65 years old, yet its lifetime has been one of momentous change and achievement.

"Flying is fun and exciting and, in Service flying, very much a matter of teamwork. The pictures in this book underline both the professionalism which characterises the fascination of the medium in which it operates.

"I commend it to you. The choice of pictures is excellent and the captions informative."

A short résumé by Air Commodore H. A. Probert, head of the Air Historical Branch (R.A.F.), traces the development of the Royal Air Force to the present day.

A Lifetime of service is published by Seagull Press and is £12.50, including packing and postage, from the R.A.F. Benevolent Fund, 67 Portland Place, London, W1N 4AR, (Tel. 01-580 8343).

Publication of the book has been aided by the sponsorship of many firms and organisations and the entire profit from its sale will go to the R.A.F. Benevolent Fund.

In the words of Air Chief Marshal Sir Keith Williamson, G.C.B., A.F.C., *A.D.C.*, Chief of the Air Staff:

"The men of the Royal Air Force have had to work and train hard over the years to keep abreast of these precocious machines. To the traditional military virtues of courage, loyalty and determination they have added an unsurpassed reputation for technical and professional excellence. Without these qualities the R.A.F. could not have made the critical contribution which it did to the Nation's fortunes in military operations from the First World War to the Falklands Campaign."

The first day—April 1st 1918. The airmen in this historic photograph are typical of those who laid down the traditions of their great Service. The aircraft is a Bristol Fighter, examples of which flew with the R.A.F. until 1931.

'A Legend in His Own Life Time'

A Tribute to Sir Douglas Bader
by
Air Marshal Sir Denis Crowley-Milling

His favourite aircraft—the Hawker Hurricane

As a colleague and close friend it is my great privilege to write about Douglas Bader whose memory we honour and pay tribute to in staging this year's biennial International Air Tattoo.

Looking back through my wartime flying log book I see a highly significant entry on 25th June 1940: "Douglas Bader took command of 242 (Canadian) Squadron at RAF Coltishall". At that time I was one of the few Englishmen on this Canadian squadron and I amongst others had been posted in to replace the casualties suffered at Dunkirk. The squadron was then sent to France to help cover the retreating land forces only to return a few weeks later following the French capitulation. In those few weeks things had not gone well and, as a result, the Squadron Commander had been removed so morale was far from high and we now awaited the arrival of the new Commander. None of us had heard of Douglas Bader and we now learnt that he had two 'tin' legs and he was thirty which of course seemed old to most of us who were around twenty. There was also some speculation as to his ability to fly without legs but this was very soon dispelled. After a somewhat cool reception by the pilots in the crewroom he climbed into a Hurricane, took off and showed us just how well he could fly, 'tin' legs and all. By the end of his display everyone to a man was watching in admiration as he put the aircraft through its paces. From then on we never looked back and speaking for myself there has never been a leader to match him. As young, relatively inexperienced pilots, we were completely won over by him and his indomitable fighting spirit. He never ceased to encourage us and most of all he helped us to conquer our fears. In the air over the radio he kept up a constant flow of talk, cracked jokes and made us all feel twice the men we were. I have always thought how lucky I was to have been under his guidance throughout the Battle of Britain and later when he led the Tangmere Wing; I gained vital operational experience under him early in the war and this stood me in good stead later in the war when I was fortunate enough to lead my own squadron and wing.

He never touched alcohol but was always the life and soul of the party. He took an energetic part in the squadron party games and 'tin' legs are hard to fall on. I remember he used to joke about the possibility of getting a bullet through one of his legs just so he could have a good laugh at the expense of the Germans if he did. With Douglas Bader any sign of 'red tape' or pompous authority was an immediate challenge, almost always effectively dealt with usually with a certain amount of relish. Such people considered him quite insufferable and high handed well beyond his rank but his direct approach had the desired effect as was amply demonstrated when we were short of vital spares for our aircraft in the build up to the Battle of Britain.

A demonstration in 1976 by Sir Douglas—how to get in and out of a Hurricane's cockpit with tin legs

Talking Spitfire tactics: Sir Douglas with the author and Sqn. Ldr. Pete Thorn formerly of the Battle of Britain Flight.

He kept on flying for business and pleasure until the late 1970s.

When he collided with an enemy aircraft in August 1941 leading the Tangmere Wing over Northern France the sudden and utter silence on the radio was devastating and had an eerie effect upon us all. We feared the worst but could not bring ourselves to believe it was true. Happily the next day we heard that he was safe, a prisoner. I am sure I need not recall what a nuisance he made of himself to the Germans as a POW and the times he tried to escape. As a consequence he finished up in the notorious Colditz Camp.

Sir Douglas signing a painting depicting the scene over Northern France on the fateful day in August 1941

When he returned home at the end of the war he was immediately offered a safe parliamentary seat and was pressed hard to accept: his answer was typical of the man, he would accept nothing on a plate; if he were to become an MP he would go out and fight for it. From then on he led a very full life working for Shell, as he had pre-war, and later for the Civil Aviation Authority. All that time he never ceased encouraging and helping innumerable disabled people in many parts of the world and in many different ways. Also, in more recent years, we have been very fortunate in having him as President of the International Air Tattoo. With him as the figurehead it has blossomed into the premier air display and the largest of its kind. So, as we enjoy the display at RAF Greenham Common today, we also pay tribute to a man who triumphed over his disability. His singleness of purpose has seldom if ever been equalled. He was a born leader who served his country with great distinction and became a legend in his own life time.

Lady Bader, along with his colleagues and friends, all wish to keep alive the memory of his indomitable spirit and his deep concern for the disabled. With this in mind the 'Douglas Bader Foundation' has recently been formed and details of this and how you can help are given within this programme.

Sir Douglas with Sir Denis in characteristic pose being interviewed by a television reporter at IAT

We visit No. 56(F) Squadron at Wattisham, one of the RAF's famous fighter squadrons in the F-4's 25th anniversary year, to look at the task, the men and the machines that make up this . . .

RAF Phantom Squadron

No. 56(F) Squadron is one of seven UK air defence fighter squadrons within No. 11 Group. Two squadrons (Nos 43 and 111) are based at Leuchars with Phantom FG1s; two at Coningsby (Nos 29 and 64, the latter being the shadow designation for 228 Operational Conversion Unit) with Phantom FGR2s; two at Binbrook (Nos 5 and 11 Squadrons) with Lightning F3/F6s and No. 56 Squadron at Wattisham with Phantom FGR2s. As well as UK air defence 56 Squadron is tasked with air defence of the Fleet and has an overseas reinforcement role. Inevitably this involves a great deal of training not only for the squadron crews but also working in conjunction with other units in such areas as electronic countermeasures and fighter direction.

The Wattisham Phantom squadron plays its part in the round-the-clock quick reaction alert (QRA), which provides two aircraft on constant 10-minutes readiness day and night in the UK air defence region (UKADR). The area is divided into two sectors, the northern part being covered by the Leuchars Phantoms and the southern sector by the Binbrook, Coningsby and Wattisham units. When a squadron is allocated to QRA it maintains two aircraft, fully armed and 'ready to go', with air and ground crews at the 'Q-sheds' for three-week periods. The aircrew spend 24-hours living in the Q-shed and the ground crews stay for a week at a time. The Phantom is armed with the British developed Skyflash air to air missile, which linked to the aircraft's radar can be locked on to a target at a range of 8—12 miles plus, from any aspect, head on being preferred. It has an enhanced multi-direction kill probability over the Sparrow missile which it has replaced. For close combat the improved AIM9L version of the heat-seeking Sidewinder is also carried. Although the aircraft are on standby with a declared 10-minutes to take-off allowance, actual times normally achieved are but a fraction of this time. Every second is crucial in reacting to an alert and getting the Phantoms to a position where they can identify the intruder before it reaches the point at which it could, if an enemy, launch a missile against a ground target. In peace-time most targets prove to be Russian long-range aircraft probing NATO defences, coming down through the Iceland-Faroes gap. These are primarily an interception task for the northern sector at Leuchars. The Southern based squadrons provide a backup to the north and for aircraft coming out of the Baltic area or central Europe. They are also concerned with the western and south-west approaches.

QRA—Scramble!

Start-up

Taxi from Q-shed

Take-off

The F-4 weighs in at 52,000lb on take-off

With a typical take-off weight of 52,000 lb, of which 19,000 lb is fuel, the Phantom has a range of about 500 miles or endurance of about 1½ hours, without in-flight refuelling. The provision of tanker support is essential if combat air patrol is to be maintained at a time of tension or war, at the sort of distances from the UK that would be required. A pair of Phantoms can reach the Iceland-Faroes gap, 650 miles north of Scotland, mount patrol for 1½ hours and return to base, with the support of a single Victor tanker.

Inevitably a great deal of 56 Squadron's time is taken up with training flights, detachments and exercises, from the home to other UK bases as well as overseas. The air defence scenario runs very much as follows in an exercise situation. Information concerning possible enemy aircraft comes from the air defence radars airborne in the RAF's Shackleton AEW2s (soon to be replaced by the Nimrod AEW3s, NATO's Boeing E-3 AWACS and ground radar stations and our own east coast ground radars. The Phantoms are launched to intercept and identify the target as early as possible, under the direction of the Sector Operations Centre (SOC), which in the case of 56 Squadron operating from Wattisham is located at RAF Neatishead. The Southern SOC is under the command of Group Captain Joan Hopkins, currently the RAF's only female station commander. With its Westinghouse AWG-12A nose radar in the pulse-doppler mode the F-4 has an excellent look-down moving target capability for low flying targets as well as normal forward scanning. Once identified as an 'enemy' target the crew press forward their attack using the Skyflash at range and Sidewinder close in. The Phantom can also be fitted with an SUU 23 gun pod in place of the centre-line fuel tank, housing a 20mm Vulcan gun which delivers 6000 rounds per minute, providing a useful back-up to the missiles.

Skyflash and Sidewinder missiles are carried

Obviously the Phantoms are not the only line of defence, but operate with the back-up of surface-to-air missiles. The second line of defence is provided by a string of Bloodhound II SAMs strategically spread along the the east coast, operating as detached flights of No. 85 Squadron, each allocated a missile engagement zone and under the direction of the same sector operations centres as the Phantoms. The third and ultimate line is the Rapier airfield point defence system. These RAF Regiment units are equipped with Blindfire radar to control the fast and effective missiles against incoming, close-range targets.

Peacetime training permits very realistic exercises involving all the necessary elements of fighter control and direction, electronic countermeasures from both the defenders and attackers, in-flight refuelling and air combat. During the last year 56 Squadron has worked with USAF KC-135 and KC-10 tankers as well as the new Vulcan K2s which have supplemented the Victors since the Falklands conflict. NATO forces provide the squadron with varied 'enemy' targets for home-based exercises and the USAF gives experience against the F-5E Aggressors from Alconbury. But for the crews the training highlights of the year are when they go into a 'live' situation—the missile practice camp (MPC) held at RAF Valley, the armament practice camp (APC) held at Akrotiri, Cyprus and the dissimilar air combat training programme (DACT) staged at the NATO range at Decimomannu, Sardinia. The periodic overseas squadron exchanges and detachments are also very welcome.

56 Sqn. Phantom alongside a KC-10 Extender for a refuelling exercise

The Phantom would of course be quite useless without a highly trained crew to transform it into an effective fighting weapon. In real cost terms this takes several million pounds to transform the ab initio pilots and navigators into an operational ready crew. We met one of 56 Squadron's busy aircrew, Flight Lieutenants Ray Crowley and Vernon Harrod and asked them how they had reached their present position at the front-line of Britain's air defence.

Pilot Ray Crowley from Ashford had wanted to fly with the RAF from his early school days. A member of the Air Training Corps, he had been awarded a Flying Scholarship and first soloed on a Cherokee at Goodwood ten years ago. With an RAF Cadetship he went on to Southampton University where, as a member of the Air Squadron he was back in the air flying Bulldogs at Hamble. After getting his degree he progressed to RAF College Cranwell for officer training and on to the flying course. He enjoyed flying the Jet Provost, particularly the low-level exercises and landing away from base. On then to Valley and the Hawk which he found a big step. The flying course was now much more demanding as the aircraft's performance was so good and a lot of skills had to be refined. Ray enjoyed the tactical weapons course at Brawdy and labelled it 'licensed hooliganism' the best course in the RAF. Although opting for the air defence Lightning he was allocated to the Phantom and arrived at Coningsby to join the OCU. Here he was introduced to the aeroplane and the second crew member, a navigator, both of

Pilot Flt.Lt. Ray Crowley and navigator Flt.Lt. Vernon Harrod

which came as a bit of a shock. The sheer size, weight, speed and complexity of the Phantom was awe-inspiring after the Hawk, "Once you had got used to the handling characteristics then you had to move on to using the radar; this was the difference in skill required to drive a Rolls-Royce along a motorway and driving a formula one racing car in a Grand Prix motor race", was Ray's view. He saw the navigator at first as "an intruder into the pilot's cockpit" but quickly learnt that his survival as a fighter pilot depended as much on the skill of the navigator as his own ability to fly the aircraft.

"The size, weight, speed and complexity of the F-4 was awe-inspiring"

Pilots and navigators are normally paired as a regular crew with 56 Squadron. This is not only preferred by both but according to 56 Squadron's CO Wing Commander Geoff Brindle it improves the effectiveness of the team in operational flying. Vernon Harrod usually partners Ray Crowley in the back seat of the F-4. Vernon, who comes from Sussex, also wanted to be a pilot at school, but did not make up his mind to join the RAF until he had graduated from Exeter University with an economics degree. He was turned down for pilot training at the Officer and Aircrew Selection Centre, Biggin Hill but was offered a place as a navigator, which he gladly accepted.

Initial officer training commenced at Henlow late in 1977, Vernon found this tough going, having had little in the way of preparation. But with the OTU behind him he found the course at the Navigation School, Finningley much more to his liking. He enjoyed the systematic approach to learning with clear objectives and step-by-step assessment. Flying commenced with air experience on Bulldogs, followed by regular Dominie trips practicing what he had learnt in the classroom. Later the Jet Provost came onto the scene for low-level navigation, requiring split-second accuracy, a skill which identified the navigators for the fast-jets. Selected for Phantoms, although he would have liked PR Canberras, Vernon moved on to Brawdy to be introduced to the complexities of air combat, tactical flying and the new sensations of high speed and pulling up to 7G. The memory of his first trip in a Phantom at 228 OCU Coningsby remains vivid—"I was stunned by the fantastic acceleration and sheer power of it". He went on to learn that the F-4 had even more qualities than just speed when it came to interception and air combat. In August 1980 he was posted to 56 Squadron where his training was to come to fruition in the

"I was stunned by the fantastic acceleration and sheer power"

operational sense. Here he had to learn to apply his knowledge to the real-life situation, coming face-to-face with ECM, target identification of both aircraft and ships, CAP management, briefing and debriefing, multi-target intercepts and much more. In March 1981 he was declared 'operational' and could then take his turn on QRA with pilot Ray Crowley as a front-line crew.

We joined No. 56 Squadron at RAF Wattisham, Suffolk for a few days to see how the Phantom was being used some 15 years after it had been introduced into RAF service. And what better way than to take part in a squadron air defence exercise with the Squadron CO Wing Commander Geoff Brindle at the controls of the aircraft, talking through and demonstrating some of the features of the F-4 and the squadron's tasks.

250 kt and just 100 ft above the cold uninviting North Sea the Phantom seemed docile enough. We had come off CAP (combat air patrol) having successfully intercepted and 'destroyed' a Jaguar and Hercules and dropped down out of the grey winter cloud to take a look at the shipping. With nothing in view the casual suggestion from the pilot that we might see what life there is in the 25 year old fighter seemed innocent enough. I was certainly not prepared for what followed. A muffled rumble and I was pushed back in my seat as the aircraft surged forward. Full military power from the two reheat Rolls-Royce Spey engines, together producing over 40,000 lb thrust, was providing rocket-like acceleration. The air speed indicator was revolving too fast to

Wg.Cdr. Geoff Brindle 56 Sqn. Commander

read but after a 15 sec count the pilot declared 550 kt and he pointed the nose skyward. Then it was the turn of the altimeter to make the same wild gyrations before we rolled off the top, throttled back and levelled at 10,000 ft with the speed still at a healthy 350 kt. "There are few aircraft that can out-accelerate the Phantom at low-level even today" was the nonchalant observation from the front seat. "It might have been designed in the fifties but it still has an awful lot to offer to air defence in the eighties. The rugged and reliable airframe, well proven in Viet Nam and a pair of powerful albeit thirsty engines provide the vehicle for a weapons control system which has been developed and enhanced over the last two decades".

Hercules interception

Mission briefing for 56 Sqn. crews

After briefly posing alongside in tight formation for some photographs the lead Phantom suddenly opened up its twin Speys and pulled away. The urgent tone of the Sector Controller soon identified the reason as we accelerated to maintain battle formation, multi-targets had been picked up heading West into Wainfleet. While I tried to remember what to do with the radar to bring it into the correct mode the calm voice of the pilot instructed me perfectly until the tell-tale blips appeared on the screen. "Its a pair of Jags on their way home, we should soon zap them". And so we might have done but I soon lost them from the screen as we manoeuvred hard to get the best attack angle. Before I had sorted things out and got orientated again we had 'locked on, fired and claimed a kill', blue leader had done the same and we were heading back for our CAP position.

After our low level dash it was time to head back for Wattisham. We chose to make a low-level visual recovery, cruising round the Norfolk coast until we were abeam the airfield, then a run across the airfield and break for landing. The final approach with full flap, in a nose high attitude at what seemed to be a very high speed, soon had us delivered firmly onto the runway with the breaking parachute streaming behind.

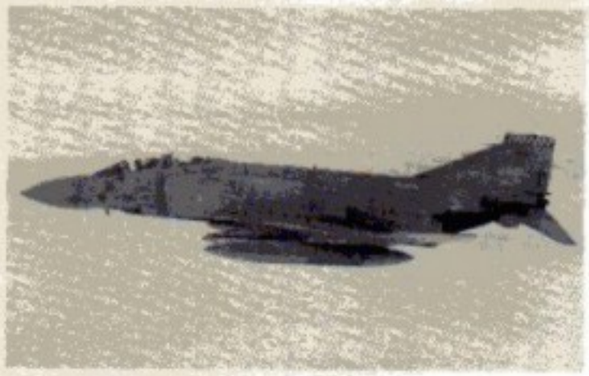
Back in 56 Squadron's operations room the crews were excitedly swapping experiences from the afternoon's missions; a pair of Jaguars and a Hercules could

Full reheat produces over 40,000lb thrust from the RR Speys

now be added to the Jaguars, Canberra, Phantom and a Bolkow 105 helicopter already on the tally. While this sounded like a game to the casual observer I knew that it was deadly serious business on the part of the participating crews. They were training for the real thing and while mistakes could be made and learned from today, tomorrow they might have to put their hard won skills to the ultimate test. This was reinforced at the post-flight debriefing when every facet of the 80-minute exercise was carefully analysed and commented upon by the participants. What came over very clearly also was that the Phantom might be 25 years old in design, but in function it remains an impressive and effective fighting machine, in the hands of well trained crews. My visit to No. 56(F) Squadron really did confirm that the Phantom is the *phantastic* fighter that will go into the annals as one of the great classic aircraft.

We would like to thank Wing Commander Brindle and the many members of No.56(F) Squadron for the considerable help that they so freely gave in the preparation of this report.

The F-4 remains a *Phantastic* fighter



Ballooning—The 200th Anniversary

1983 is an important year for ballooning—it is the 200th anniversary of man's first flight, which took place in France in 1783—in a balloon. This great achievement is being commemorated at airshows and balloon rallies all over the world, culminating in the World Ballooning Championships in France in September. In Britain the event is being marked by The International Balloon Fiesta in Bristol on August 12/13/14th and The Bicentennial Meet at Longleat House, in Wiltshire, on August 21/22/23rd.

The first balloon was constructed by the Montgolfier brothers in 1783. This was a paper balloon, 122ft in circumference and inflated with hot-air. It rose to 1,000 ft but quickly slid back to earth as the hot air escaped.

Replica of the 1783 Montgolfier balloon

Soon after, Professor Charles, a physicist, used hydrogen to inflate a rubber coated balloon. This rose speedily into the clouds but fell outside Paris, whereupon, according to reports, it was 'attacked by peasants believing it to be the devil'.

Later in 1783 the Montgolfier brothers developed a waterproof linen balloon of 52,000 cu.ft which ascended at Versailles in the presence of Louis XVI. The first human ascent was on 15th October 1783 by Pilatre de Rozier. A month later, on 21st November, Rozier and the Marquis D'Arlandes ascended in a Montgolfier balloon for the first free flight and travelled five miles across Paris at a height of 300 ft.

It was not until the 1960's that hot-air ballooning became safe enough to attract followers. With the introduction of strong flame resistant sheeting, and propane gas, two of the biggest hazzards of early ballooning were overcome.

Ballooning is now a sport which attracts great interest throughout the world, particularly in Western Europe and America. Balloon prices vary from £3,000 to £15,000 depending on shape, size and extras. Recent commercial

The tiny Colt 'Cloudhopper'

'Champion Spark Plug'

balloons have been built in the shape of bottles, light bulbs, a replica of the original Montgolfier baloon and even a Chateau—these balloons require a great deal of experience and nerve, to fly! Balloon sponsorship has become an accepted side of the sport, and the limits of balloon 'record breaking' flights are being pushed further and further with the successful crossing of the Atlantic by balloon, the planned Round the World Flight, and the *To the Edge of Space* project.

Amongst the balloons on display here at IAT 83 (if weather permits) are: British Gas, J&B Whisky, Newbury Data, Ashford Fiesta, Famous Grouse, Bandag Tyres, Fokker Aircraft, Champion Spark Plug, Smirnoff Cloudhopper and Alka Seltzer.

The Smirnoff Cloudship manufactured by Colt Balloons

'British Gas'

Ashford's 'Fiesta'

Goodyear's Aerial Ambassador

She gets plenty of exercise, but it doesn't make one bit of difference in her mammoth measurements, which are a disproportionate 192-59-50 feet that is! This rotund lady is, of course, the Goodyear Airship *Europa*.

To explain her dimensions, the *Europa* is 192 feet long, 59 feet high, and 50 feet wide. Her sausage shape is maintained by 202,700 cubic feet of helium inside the rubber-coated polyester fabric envelope. Power is supplied by twin, six cylinder, 210 hp engines giving the airship a cruising speed of 35 mph and a maximum speed of 50 mph. Flight altitude is normally between 1,000 and 3,000 feet with a maximum ceiling of 8,500 feet.

For six months of the year *Europa* is based at its winter headquarters in Capena, Italy a few miles north of Rome. The other six months she 'barnstorms' throughout Europe. Her North American sister ships, the *America* based in Houston; the *Columbia* based in Los Angeles, and the *Mayflower* in Miami, have similar schedules.

The *Europa* was built in 1972 as part of a more than £2-million expansion and improvement programme for Goodyear's airship operations. She became the fourth airship in the company's current lighter-than-air fleet.

Early in 1978 *Europa* was completely rebuilt as part of a planned maintenance schedule to ensure that Goodyear's aerial ambassador is in top flight condition to conduct its annual public relations and public service tours of Western Europe. A new envelope was fitted and the airship also received new engines, instruments and other components.

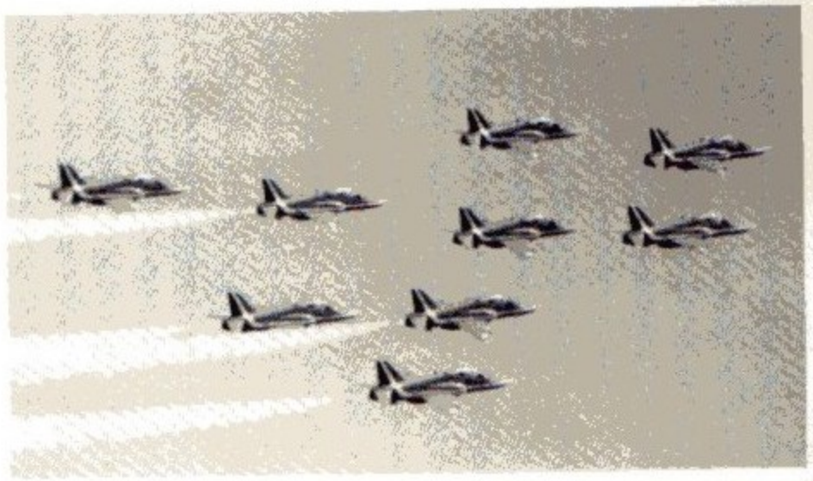
All four airships have identical cars, or gondolas. Each is 23 feet long and 8 feet high. Passenger capacity is six, plus the pilot, and each of the airships carries several thousand passengers annually. Goodyear airships, past and present, have operated for more that five decades without a single passenger fatality. In addition to serving Goodyear's own public relations programmes, the airship is also in great demand by Europe's news media, particularly television networks, for use as an aerial camera platform for special events. The Goodyear airship has carried cameramen over many cities in Europe. Exciting and unusual aerial pictures obtained have appeared in newspapers and magazines across the world.

The *Europa* is staffed with a crew of 23—five pilots, a public relations representative and 17 crewmen, some of whom are engine, radio, electronics and structural experts. With seven specially-equipped ground support vehicles, the *Europa* crew is almost self-sustaining in the field, as far as operation and maintenance of the airship is concerned. A bus, specifically designed for the operation, serves as a flight centre and communications headquarters on tour. It is equipped with all administrative aids necessary for the operation.

A large tractor-trailer truck serves as a mobile maintenance facility. The tractor unit includes a machine shop, spare parts and supplementary equipment. A radio and T.V. electronics van and a mast van also travel along. A mini-bus and two cars round out the rolling stock and are used for ground liaison work and crew transportation.
All special vehicles are equipped with two-way radios for contact with each other or the airship. Safety is the primary factor in the overall airship operation. Although it is possible to fly in some types of adverse weather, since the comfort and enjoyment of passengers is of prime concern, the *Europa* remains moored to her mast when there is excessive rain and/or wind.

On display—The Royal Air Force

The Royal Air Force is making a major contribution to the huge static aircraft display here at IAT 83. In the air you can see front-line aircraft such as the Tornado, trainers, historic machines, helicopters and the world famous *Red Arrows* flying their scarlet Hawk advanced jet trainers.



Red Arrows—Hawk T1

Chinook HC1

Buccaneer S2

Hercules C1

Vulcan B2

Jaguar GR1

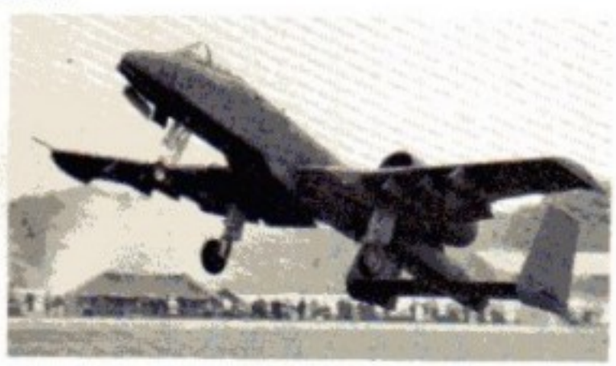
Tornado GRI

On display—The United States Air Force

The United States Air Force is participating in all aspects of International Air Tattoo 83; in the air you can see the new Lockheed TR-1 reconnaissance aircraft, the A-10 Thunderbolt tank-buster, F-15 Eagle fighter and the MC-130 Hercules 'Sky-hook'. Many more types are lined up in the static display including the record-breaking SR-71 and giant C-5 Galaxy. USAF Phantoms are in the 25th Anniversary line-up and yet more aircraft in the STAR display.

Lockheed TR-1

F-15 Eagle



A-10 Thunderbolt

C-5 Galaxy

F-16 Fighting Falcon

F-111 Aardvark

B-52 Stratofortress

CH-53 Jolly Green Giant

Lockheed Aids UK Defence

In 1931 British aviator Glen Kidston flew his Lockheed Vega from London to Paris in 72 minutes—a record for that time. Today a Lockheed-built SR-71 from RAF Mildenhall can zoom the same distance, about 340 km, in approximately 6.5 minutes. Records and fast speeds are Lockheed traditions, but a more important tradition is providing for the Free World's defence. In that respect, the Royal Air Force gave Lockheed a critical boost toward becoming a major defence contractor.

Nearly fifteen months before Hitler's sweep into Eastern Europe, the British Purchasing Commission ordered a military version of Lockheed's Super Electra for the RAF. Dubbed the 'Hudson', this plane made its maiden flight in December 1938. During the war years Lockheed delivered 1,150 RAF Hudsons; one of them being a free aircraft donated by the company's employees. Hudsons tracked the *Bismark* and the *Prince Eugen* and one RAF Hudson was the first plane to capture a submarine when it bombed and strafed a U-boat into submission.

The Hudson was the predecessor of a series of Lockheed-built anti-submarine warfare (ASW) aircraft: the PV-1 Ventura, the PV-2 Harpoon, the P-2 Neptune, the P-3 Orion, the S-3 Viking and the CP-140 Aurora. Several of the world's armed forces still fly the Neptune and the P-3 Orion is the U.S. Navy's current land-based, fixed-wing ASW patroller. Seven other nations, including Australia and New Zealand, also fly the P-3. The CP-140, a P-3 derivative, is deployed by the Canadian Forces. Lockheed's sea-based anti-submarine S-3A Vikings protect U.S. Navy carrier task forces around the globe. All of the ASW aircraft emerged from the assembly lines of the Lockheed-California Company in Burbank. The company also built the famous P-38 Lightning fighter aircraft, which served with the USAAF in Europe, making an important contribution to the Allied success.

RECONNAISANCE DUO—Lockheed-built SR-71s and TR-1s are top intelligence collectors for the U.S. Air Force.

Lockheed's airlift heritage also has been extended across the seas to serve the RAF. Lockheed-Georgia Company's C-130 Hercules aircraft have been the mainstay of the United Kingdom's Strike Command tactical transport capacity for nearly two decades and have carried out a variety of missions including heavy service during the Falkland Islands conflict both for long-range transport and specially modified as an air-to-air tanker. In 1965 Lockheed-Georgia Company signed a contract with the Royal Air Force for 66 C-130K Hercules aircraft, the largest single sale of the aeroplane to an overseas customer. The first RAF Hercules flew on October 19th, 1966, and the entire fleet was delivered by mid-1968.

The Lockheed-Georgia Company, known as the airlift centre of the world, has built or modified more than 7,500 jet and propjet aircraft since beginning operations in 1951. In addition to the C-130 Hercules, Lockheed-Georgia Company has built the world's largest military cargo transport, the C-5A Galaxy, the C-141 StarLifter, the L-100 Hercules commercial air freighter and the JetStar executive transport. The company has begun production of the updated C-5B aircraft, the first of which is scheduled for delivery in December 1985.

Another long-standing field of Lockheed pre-eminence is reconaissance aircraft. In the 1950s Lockheed-California's secretive *Skunk Works* began assembly of the U-2, an aircraft that has performed yeoman service in the gathering of vital intelligence for both the United States and its allies. Production of the U-2 ended in the late 1960s: in the late 1970s the production line was revived by a U.S. Air Force order for TR-1 aircraft, a 40 per cent larger version of the original U-2. Lockheed already had delivered seven aircraft in the TR-1 series by May 1983 and with them the U.S. Air Force's Stategic Air Command has established its first TR-1 squadron at RAF Alconbury.

Joining the U-2/TR-1 family in reconnaissance work is another Lockheed-California product: the SR-71 Blackbird. The world's fastest and highest-flying aircraft, SR-71s can zip along at Mach 3 (2,000 mph or 3,200 km/h) at altitudes above 85,000 feet (26,000 m).

From the Hudson to the TR-1 and SR-71, Lockheed planes have protected and defended the United States and the United Kingdom. The latest addition to Her Majesty's forces is another Lockheed aircraft, the L-1011 TriStar. Six TriStars formerly flown by British Airways as commercial passenger jets are now being modified as aerial tankers for the RAF by Marshall of Cambridge.

Participating as members of Lockheed's STAR '83 team here at this year's International Air Tattoo are Lockheed-California Company, Advanced Development Projects; Lockheed-Georgia Company; Guidance and Control Systems, a division of Litton Industries; Hughes Aircraft Company, Radar Systems Group; Itek Optical Systems, a division of Litton Industries; Lockheed Dataplan, Inc.; Pratt & Whitney Aircraft Group, Government Products Division; and Sperry Computer Systems, Microwave Data Transmission Systems.

Lockheed Hudsons were delivered to the RAF in 1939

Arena Programme

SATURDAY 23 JULY

1100 Royal Air Force Police Dog Demonstration Team
1130 Junior Leaders Regiment Royal Corps of Transport Gymnastics Display Team
1145 Band of Her Majesty's Royal Marines, Commando Training Centre
1205 Royal Marine Commando Display Team
1235 Royal Signals White Helmets Motor Cycle Demonstration Team

Performance ends at approximately 1305

1700 It's A Knockout Competition—Semi Finals
1730 Band of Her Majesty's Royal Marines, Commando Training Centre
1750 Junior Leaders Regiment Royal Artillery Gymnastics Display Team
1805 Royal Signals White Helmets Motor Cycle Demonstration Team
1830 Royal Marine Commando Display Team
1900 Royal Air Force Police Dog Demonstration Team

Performance ends at approximately 1930

SUNDAY 24 JULY

1100 Royal Air Force Police Dog Demonstration Team
1130 Junior Leaders Regiment Royal Corps of Transport Gymnastics Display Team
1145 Band of Her Majesty's Royal Marines, Commando Training Centre
1205 Royal Marine Commando Display Team
1235 Royal Signals White Helmets Motor Cycle Demonstration Team

Performance ends at approximately 1305

1700 It's A Knockout Competition—Final and Presentation of Prizes
1730 Royal Signals White Helmets Motor Cycle Demonstration Team
1755 Junior Leaders Regiment Royal Artillery Gymnastics Display Team
1810 Royal Air Force Police Dog Demonstration Team
1840 Royal Marine Commando Display Team
1910 Band of Her Majesty's Royal Marines, Commando Training Centre—"Beat the Retreat"

Performance ends at approximately 1935

RAF Police Dog Demonstration Team

STRONG, robust, intelligent, adaptable to training and to climatic conditions, loyal, faithful and dependable—in a word, the Alsatian. The enthusiast will tell you no other dog is so flexible in employment. Basically a German sheep-dog, an Alsatian can be used as tracker, hunter, guard, guide for a blind person, or be trained to the gun. But his most famous role in this country is that of police-dog, especially with the Royal Air Force Police.

The appearance of the RAF Police Dog Demonstration teams at International Air Tattoo and at various shows throughout Britain are well known, but the precision of obedience work and the amusing tricks they perform do belie the immense contribution they make to the security of the Royal Air Force.

Night after night, in all weathers, the lone handler and his dog patrol airfields and important installations. In the heat of the tropics, too, they keep silent vigil. The dog is trained to scent the intruder on the wind. However much we might resent the suggestion that we smell, if the dog could speak he would tell us that we all smell differently; to him that scent is as good as a fingerprint is to a detective. The handler is trained to 'read' his dog so that he can tell instantly when the animal has made a 'Pick-up'. Thereafter he will set the dog to follow the scent and will 'run-in' with his dog.

Once he reaches his quarry the dog will attack the intruder, until the handler calls the dog to heel. The dog will then lie 'couchant' while the handler identifies and searches the intruder and afterwards assists his handler to escort the trespasser.

To carry out these various operations requires careful training and this is done at the RAF Police School, Newton, Nottinghamshire. All the dogs received into the Royal Air Force are gifts from the public, and since dogs were first introduced into the Service in 1941 many thousands of Alsatians have been accepted and trained.

The Junior Leaders Regiment Royal Artillery Gymnastics Display Team

The Junior Leaders Regiment Royal Artillery is stationed at Bramcote near Nuneaton in Warwickshire. It is tasked with training the future Senior Non-Commissioned Officers and Warrant Officers of the Royal Regiment.

Young men between the ages of 16½ and 17½ come to the Regiment for one year of training prior to joining an adult unit in the United Kingdom or within the British Army of the Rhine.

The year spent at Bramcote is broken into three terms of fourteen weeks and three periods of leave. On arrival a recruit will undergo six weeks of rigorous training before continuing onto a syllabus of trade training, education, military orientation, field exercises, adventure and leadership training. Great emphasis is placed on sport, with all major and minor games being catered for, and to occupy leisure time, a wide range of activities including skiing, motor bike scrambling, horse riding and many others.

The Troop was formed in September last year and began training in January, approximately four times a week, to provide the high standard of team work required for this demonstration. As this is in addition to their normal military and education training, their enthusiasm for these displays is vital. A high degree of fitness and strength, combined with courage, daring and determination are the qualities that the young Gunner of the 1980's needs.

Band of HM Royal Marines Commando Training Centre (by permission of the Commandant)

Under the direction of Lieutenant R. A. Waterer, LRAM, RM, the band of the Commando Training Centre was formed in 1972 and is based at Lympstone, Devon at the premier training establishment of the Royal Marines.

Since its formation the Band has participated in many engagements both at home and abroad, for National and International events.

During Her Majesty the Queen's Silver Jubilee Year the band took part in such events as; The River Thames Pageant, the Tri-Service Guard at Buckingham Palace and the Military Music Pageant at Wembley Stadium.

In early 1980 the band visited the Mediterranean with engagements in Turkey, Cyprus and Gibraltar while embarked in *HMS Intrepid* and later in 1980 the band flew to Washington DC to undertake concerts and marching displays. On 29th July 1981 the band appeared outside St. Paul's Cathedral, London on the occasion of the Royal Wedding between HRH Prince Charles and Lady Diana Spencer.

These engagements are in addition to the domestic commitments the band has at the Commando Training Centre, at other service establishments and for civilian events within the United Kingdom.

Royal Marines Bands are renowned throughout the world for their versatility in various musical combinations. These include: Salon Orchestras for background music during dinners, Dance Bands for all occasions, concert Military Band and Ceremonial Marching Displays, both indoors and outdoors, Corps of Drums and Herald Trumpeters for sounding fanfares at dignified occasions.

Royal Marines Commando Display Team

The Commando Display Team is a mobile display that travels the country during the summer months presenting the Royal Navy, the Royal Marines and the Wrens to the public. It provides a unique opportunity for the general public to see some of the versatile skills taught to today's modern servicemen and women.

The Team consists of 3 Officers, 8 Senior NCO's, 6 Junior NCO's, 4 Wrens, 10 Freefall Parachutists and 21 Marines, a total of 50 men and women, commanded by Lieutenant Mark Bibby, RM. All Team Members are part of 'R' Commando Company based at Royal Marines, Poole in Dorset.

Helicopter Display

This breathtaking display of flying skill by Lieutenant Ralph Miles, RN, is aimed at showing the versatility of the Wessex Mk 5 helicopter and some of the ways in which it is used by the Royal Marines Commandos. The Wessex is a twin engined

short range helicopter flown mostly by Royal Naval pilots and used primarily in the Commando role but is also used for search and rescue operations. In the Commando role, the helicopter is used for rapid assault by the Royal Marines. Operating from Commando Carriers and assault ships, these Wessex helicopters can carry up to 12 fully armed Royal Marines and their associated equipment. They can also carry artillery and landrovers slung beneath the fuselage. It can be armed with machine guns, rockets and guided missiles, providing close support for ground troops.

Terrorist Attack

The scene is set with a Royal Navy Mobile Radar Station entering the area. You are asked to imagine the setting as a remote cliff top which is heavily wooded. Armed Naval ratings are seen guarding and operating the radar station when the roar of motorcycles is heard. A desperate group of hardened terrorists enter the scene, attack and take over the station overpowering the armed guards.

What follows is an example of a typical Royal Marines Assault. The Wessex helicopter flies over and hovers at 200ft above the arena. A rope is lowered and a group of Commandos abseil into a covering position. At the same time, a further group move in by vehicle and during a short, but action filled assault, the Radar Station is recaptured from the terrorists. The battle scene comes to an end with a wounded terrorist being airlifted out of the arena.

Unarmed Combat

The Royal Marines Unarmed Combat Team enter the arena and take-up positions to allow maximum viewing. Unarmed combat is an important Commando skill taught to all Royal Marines during their training. The demonstration provides an exciting display in this military art and includes defences against attackers with and without weapons.

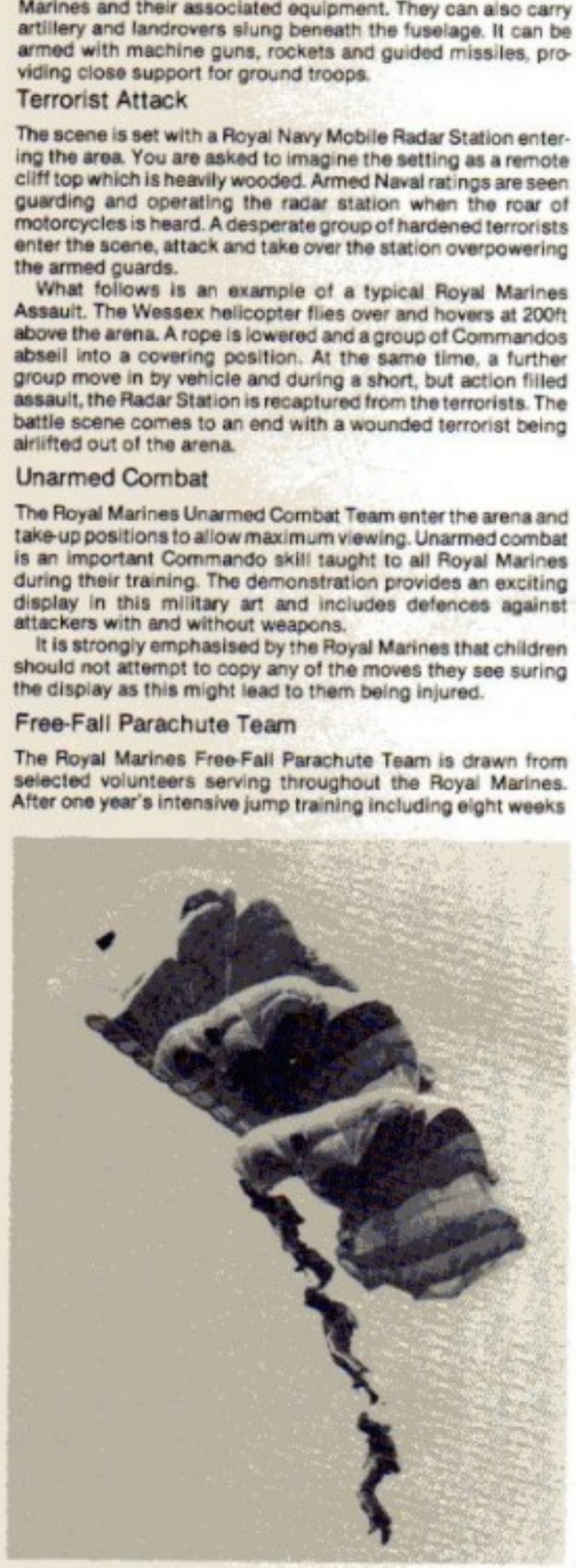
It is strongly emphasised by the Royal Marines that children should not attempt to copy any of the moves they see suring the display as this might lead to them being injured.

Free-Fall Parachute Team

The Royal Marines Free-Fall Parachute Team is drawn from selected volunteers serving throughout the Royal Marines. After one year's intensive jump training including eight weeks winter training in the United States the newly trained jumpers are ready to join the team for a minimum of two years display and competition work.

The Team usually jump from 10,000 feet depending upon air clearance and cloud level. They will be in a free-fall position before opening their main parachutes and as they fall you will be able to follow them by the coloured smoke trails made by cannisters attached to their ankles. Once the parachutes are open, the team members will attempt to link-up with each other in the air using 'Canopy Relative Work' which is extremely difficult but makes it a really exciting display of parachuting skills.

The parachute that the teams use are the latest high performance GQ Unit Canopies. These require expert handling skills in order to accurately steer the parachutist into the small landing areas likely to be encountered at the various displays. The Team is led by Lieutenant Mike Wills from Farnham, Surrey.



The Royal Signals White Helmets

The Royal Signals White Helmets, the world record breaking and original motor cycle display team are in their fifty sixth season this year. They specialise in providing a unique and thrilling arena performance of skill, high speed precision and spectacular feats of balance on motorcycles. Originally formed from despatch riders of the the Royal Corps of Signals, the team is now made up from a wide range of Royal Signals tradesmen. Royal Signals have always produced a display team which demonstrates not only the qualities of skill and courage required of despatch riders in two world wars but also the versatility of the Signalman today in Cyprus, Hong Kong or the United Kingdom.

All team members have undergone a tough two weeks and highly competitive selection course carried out in Catterick and the surrounding Yorkshire Moors. The few selected then undergo six months show training before their first public performance. All the soldiers are Royal Signals tradesmen who have volunteered to spend three years with the team. After a tour with the White Helmets they return to their units to continue soldiering at home or abroad. For many of the soldiers it is their first experience of motorcycling.

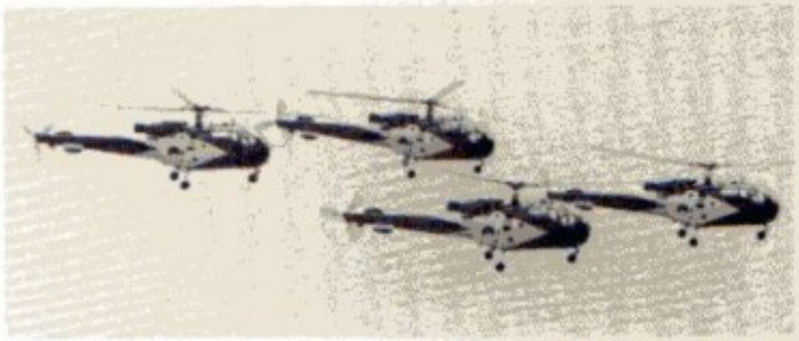
After a winter of hard training in all weathers the team produces a display of high-speed cross over rides with split second timing, feats of balance, with as many as twenty two men on six machines and ten men on a single motorcycle and breathtaking spectaculars such as the Fire Jump and famous Car Jump.

The team is proud to use all British equipment, ranging from the Austin Ambassador 2000, the Triumph Tiger 750, with its Lucas Rita electronic ignition and Girling gas oil shock absorbers to the CCM 250 Moto-Cross machine, equipped with Champion spark plugs, Renold chain and Dunlop tyres.

International Air Tattoo Awards 1983

Four magnificent trophies will be awarded at IAT 83. Three of them will be for performances in the flying display on Sunday 24 July. The panel of international judges will announce their decision after the close of flying on Sunday evening.

THE **'SIR DOUGLAS BADER TROPHY'** presented by SHELL (UK) OIL in memory of Sir Douglas Bader, will be awarded to the pilot or team leader who gives the best overall flying demonstration on Sunday 24 July. Solo jet demonstrations and aerobatic teams of more than 6 aircraft will be excluded from this competition.

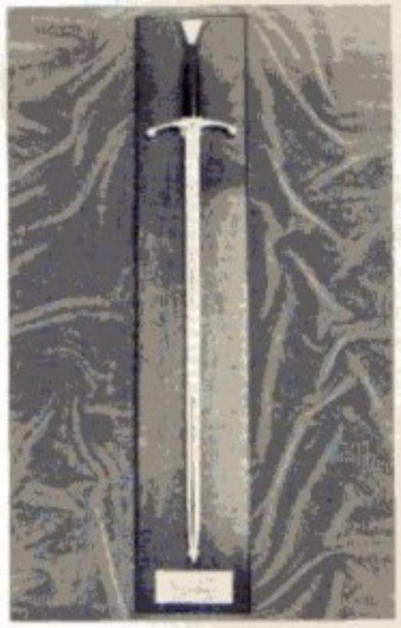


SHELL UK OIL TROPHY WINNER AT IAT 81 The *Grasshoppers* Helicopter Display Team—Royal Netherlands Air Force.

The **'EMBASSY TROPHY'**, presented by WD & HO Wills, will be awarded to the pilot who gives the best solo jet demonstration on Sunday 24 July.

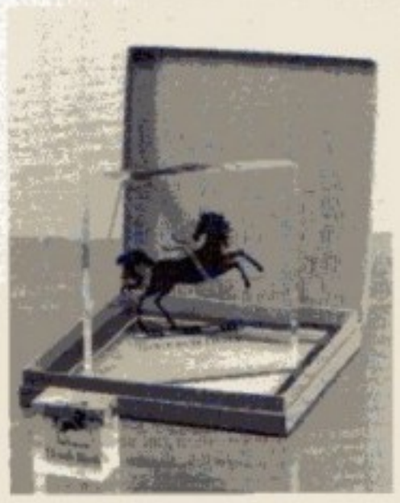
EMBASSY TROPHY WINNER AT IAT 81
Captain Hans Hemmelder—Royal Netherlands Air Force, flying a Northrop NF5A.

The **'INTERNATIONAL DISPLAY SWORD'** presented by NATIONWIDE BUILDING SOCIETY will be awarded to the pilot or team leader who in the opinion of the judges gives the best flying demonstration by an overseas participant on Sunday 24th July.



The **'SPIRIT OF THE TATTOO AWARD'**, presented by Lloyds Bank plc, will be presented to the participant, detached unit or member of the IAT/USAF/RAF staff who has made the most outstanding contribution to the success of International Air Tattoo 83.

SPIRIT OF THE TATTOO AWARD WINNER AT IAT 81
Lieutenant Jack Rivers—217 Field Squadron RE (V).



INTERNATIONAL DISPLAY SWORD WINNER AT IAT 81
Major 'Boy' Soons—Royal Netherlands Air Force, flying a F27 Troopship.

Lockheed C-130 Hercules

In its many versions the Hercules refuels helicopters and fighter planes, surveys and photo-maps large areas of the world, hunts icebergs and hurricanes, fights forest fires, serves as an airborne command post and is used extensively for humanitarian and transport missions around the World. This montage shows just a few of the hundreds of missions flown by the *HERK*

STAR 83

Earlier International Air Tattoos have featured a theme commemorating a milestone in aviation history such as the 25th Anniversary of the Lockheed C130 Hercules in 1979. In 1981, the theme developed into a major event to demonstrate a specific aspect of the employment of air power. Sea Search 81 involved thirty-five military and civilian fixed and rotary wing aircraft from many countries and was widely acclaimed as the world's first international meet of maritime patrol and search and rescue aircraft.

STAR 83 is the first ever truly international meet of Strike, Attack and Reconnaissance aircraft. The aim of this Meet is to promote the exchange of views, ideas, information and techniques between front line air crews and industry as well as creating an atmosphere of international friendship, goodwill and understanding.

The main feature of STAR 83 has been a full day Symposium at which operational crews and representatives of the aerospace and avionics industries have discussed topics and have exchanged information and ideas of mutual interest and concern.

Participants have also taken part in challenging competitions which have demanded initiative, stamina and determination in the application of some of the knowledge and skills of their profession. Now, they eagerly await the announcement of the results of these competitions and the presentation of the Trophies at the President's Reception which is the closing event of the Meet on Sunday 24th July.

Since arriving for STAR 83 on Wednesday 20th July, the participants have had many opportunities for informal social exchanges at Reading University where the campus provided an ideal environment for the exchange of information and knowledge. The climax of the social activities was a STAR 83 reception followed by a buffet supper and cabaret—"An Evening with the Stars"—at The Hexagon, Reading, where the friendly atmosphere and colourful setting was enhanced with entertainment by the international star—Iris Williams.

Associated with STAR 83 is the McDonnell Douglas F4 Phantom Meet to commemorate the 25th Anniversary of this remarkable aircraft. Crews of the F4 Phantoms attending this Meet have participated in all the events of STAR 83.

To assist in mounting STAR 83, the support and backing of the aerospace and avionics industries has been sought in the form of a STAR Industries Team. Special facilities have been provided for members of the Team in return for their support and financial contribution to the various events included in STAR 83. Other companies are supporting specific STAR 83 activities.

The aircraft which have assembled for STAR 83 and the F4 Phantom Meet are now on display in two special lines on the taxiway to the east and west respectively of the Air Traffic Control Tower. The STAR 83 Co-Ordinator and Organising Team hope that you will enjoy this special feature of International Air Tattoo 83 which includes some of the most modern, complex and exciting military aircraft in the world today.

The ARMY at IAT 83

In addition to its contribution to the Arena Entertainment, described elsewhere in this Programme, the Army is well represented by a number of static displays. These displays give a clear idea of the role and equipment of several of the combat arms, supporting arms, and logistic services.

The Combat arms are well represented by Regiments of the Royal Armoured Corps and the Infantry.

155mm Self-propelled gun

The Royal Armoured Corps is represented by the County Armoured Regiment The Royal Hussars (The Prince of Wales's Own). The Regiment was formed in 1969 by the amalgamation of the 10th Royal Hussars and the 11th Hussars. The Regiment's nickname 'The Cherry Pickers' was gained as the result of an action in an orchard during the peninsular campaign when serving under the Duke of Wellington.

The Infantry is well represented by display teams from the **Prince of Wales's Division** and visitors will have the opportunity to talk to men from such famous Regiments as the Duke of Edinburgh's Regiment (an amalgamation of the Royal Berkshire Regiment and the Wiltshire Regiment), the **Royal Hampshire Regiment** and the **Gloucestershire Regiment.** In addition to a wide range of equipment and weapons the display includes a climbing tower on which the public is invited to test its nerve and skill.

Also taking part in the Infantry display is a small team from the **Coldstream Guards.**

Army Air Corps Historic Aircraft Flight

The Army Air Corps is responsible for flying Army helicopters, providing aerial reconnaissance, control of artillery fire and air to ground fire support.

The Medical Services This display covers all aspects of the work of the **Royal Army Medical Corps,** the **Royal Army Dental Corps** and **Queen Alexandra's Royal Army Nursing Corps.**

The Royal Electrical and Mechanical Engineers are responsible for keeping operational and, when necessary, repairing the Army's immense range of equipment. This range includes tanks, vehicles, guns, guided weapons, radar, radio and aircraft—all in large numbers and of many different types.

Scout AH1 Utility helicopter

In the field with the TA

Lynx AH1 anti-tank helicopter

On display—Air arms around the world

Nearly 30 of the world's air arms from five continents are taking part in the flying and static displays at International Air Tattoo 83, here at Greenham Common. Illustrated are just a handful of the colourful and varied aircraft types to be seen.

Saab 105s—Austrian Air Force

Lockheed T-33—Canadian Forces

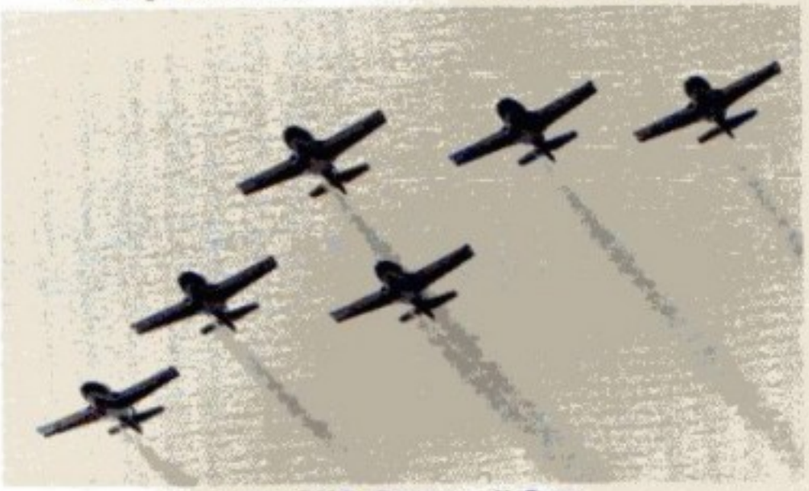
RF35 Draken—Royal Danish Air Force

Super Etendard—French Navy

Sea King—German Navy

Alphajets—French Air Force

Macchi MB339—Italian Air Force



Cessna T-37C—Portuguese Air Force

Sea Harrier—Indian Navy

F-5E Tiger—Royal Jordanian Air Force

Falcon 20—Royal Norwegian Air Force

ETPS Celebrates its 40th Anniversary

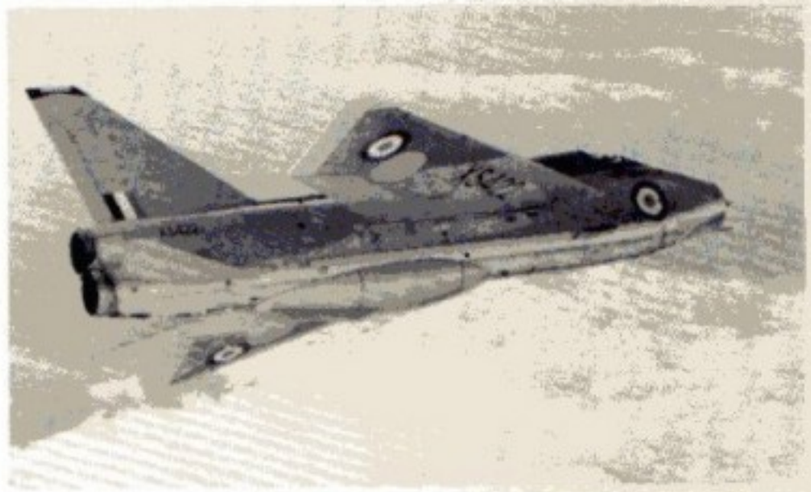
The Empire Test Pilots' School trains pilots and engineers for exacting roles in flight test teams concerned with the research, development and acceptance of Service aircraft and weapons systems.

The increasing complexity and expense of modern multi-mission aircraft and their associated equipment places increasing responsibility on those tasked with their safe and efficient development for the Armed Services. The extent and importance of the tasks demand the highest possible professional standards from test pilots and flight test engineers and the greatest possible understanding and co-operation between these key members of trials teams. The Empire Test Pilots' School aims to meet these requirements by teaching high-calibre operational pilots the demanding skills of the test pilot and by providing pilot and flight test engineer students with the opportunity of working closely together on challenging flight test exercises. They have here, today, at Greenham Common a static display of 6 of their aircraft, distinctive in the School's livery. This year they celebrate their 40th Anniversary and look forward to many more to come.

The Empire Test Pilots' School was formed at Boscombe Down, Wiltshire, in 1943 with terms of reference 'to provide suitably trained pilots for test flying duties in aeronautical research and development establishments within the Service and the Industry'. For several years the School was the only institution of its kind in the world. Shortage of space as Boscombe Down caused a move to Cranfield in 1945. A further move in 1947 to Farnborough started a long and fruitful association with the Royal Aircraft Establishment. During twenty years at Farnborough the School syllabus evolved progressively without major innovation until the setting up in 1963 of the Rotary Wing Course to meet the growing need for trained helicopter test pilots. In 1968 the School returned to the more open skies of Boscombe Down, where it renewed a close and valuable association with the Aeroplane and Armament Experimental Establishment. The Flight Test Engineer Course was added in 1974, and to date some 929 pilots and engineers have graduated from the School, including 368 from overseas.

With Empire Test Pilots' School graduates having circled the moon, served in Skylab and played major roles in the development of Concorde and the Tornado, the School looks to the future with confidence. As always, moves are afoot to update the School fleet; long term plans include the Chinook, the Tornado and an advanced replacement for the Varistab Basset, in the form of the Varistab Hawk. Planned syllabus improvements include increased emphasis on airborne systems assessment as more suitable hardware becomes available.

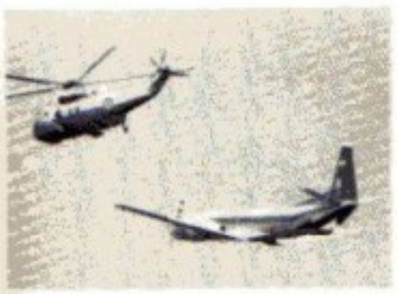
The course of the future is unlikely to become less demanding; its successful completion will always require hard work and dedication. But the rewards are great, the graduates can rightfully expect to continue to be involved in the world's most stimulating and absorbing aerospace projects.



Lightning T5 two seat, high speed trainer

Varistab Basset landing at Boscombe Down

Hawks are replacing Hunters at ETPS



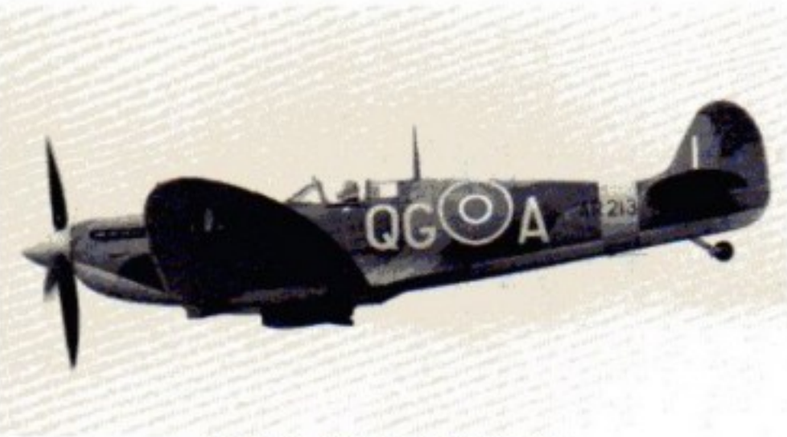
ETPS Sea King and Andover over Salisbury Plain

Helicopter line-up at Boscombe Down

Spitfire Parade

There is a special display in the flying programme at 2.00 pm when the largest number of Spitfires seen in modern times will make their tribute to International Air Tattoo's former President, Sir Douglas Bader.

The Supermarine Spitfire was designed by R. J. Mitchell following his success with the S6B racing seaplane which won the Schneider Trophy in 1931. The prototype Spitfire, powered by the new Rolls-Royce Merlin engine, was first flown on 5 March 1936. It was put into production later that year and by the outbreak of war 310 had been built. First deliveries to the RAF went to No. 19 Squadron at Duxford in July 1938. On 16 October 1939 a Spitfire of No. 603 Squadron shot down the first Luftwaffe aircraft, a Heinkel He III.



Spitfire IA—The Hon. Patrick Lindsay

Spitfire VB—Battle of Britain Memorial Flight

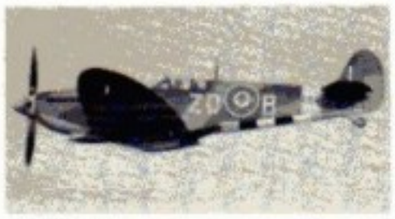
By July 1940 nearly 1,000 Spitfires were on the strength of 19 RAF squadrons, at the start of the Battle of Britain.

Developments of the basic airframe and engine quickly followed to meet specific Fighter Command requirements: Mk's I, II were fighters; V, VIII, IX and XVI were fighters or fighter-bombers; Mk's VI, VII were high altitude fighters while the IV, X and XI were unarmed photo-reconnaissance versions with the Mk XIII being an armed variant. A total of over 18,300 Merlin-engined Spitfires was built.

Spitfire XIV—Spencer Flack

In 1943 the RR Griffon-engined Spitfire XII entered service with Nos. 41 and 91 Squadrons at Hawkinge. The new powerplant increased the power, speed and rate of climb, particularly at low level. Of the 2,036 Griffon-engined Spitfires built the main versions were the Mk's XII, XIV, 21, 22 and 24 fighters/fighter-bombers and the Mk XIX unarmed photo-reconnaissance aircraft. The PR19 had a top speed of 460 mph and a ceiling of 43,000ft. The last Spitfire was built in October 1947 at Eastleigh and the famous fighter remained in RAF service with Royal Auxiliary Air Force squadrons until 1951.

Today there are over 70 Spitfires remaining in the UK of which about 18 are potentially air-worthy, although at present only half that number can be flown. Amongst the Spitfires in the flypast it is hoped that the following marks will be represented: Mk's IA, IIA, VB, VC, IX, XIV and XIX.



Spitfire IX—Ray Hanna

Spitfire VC—Shuttleworth Collection

Spitfire XIX—Battle of Britain Memorial Flight