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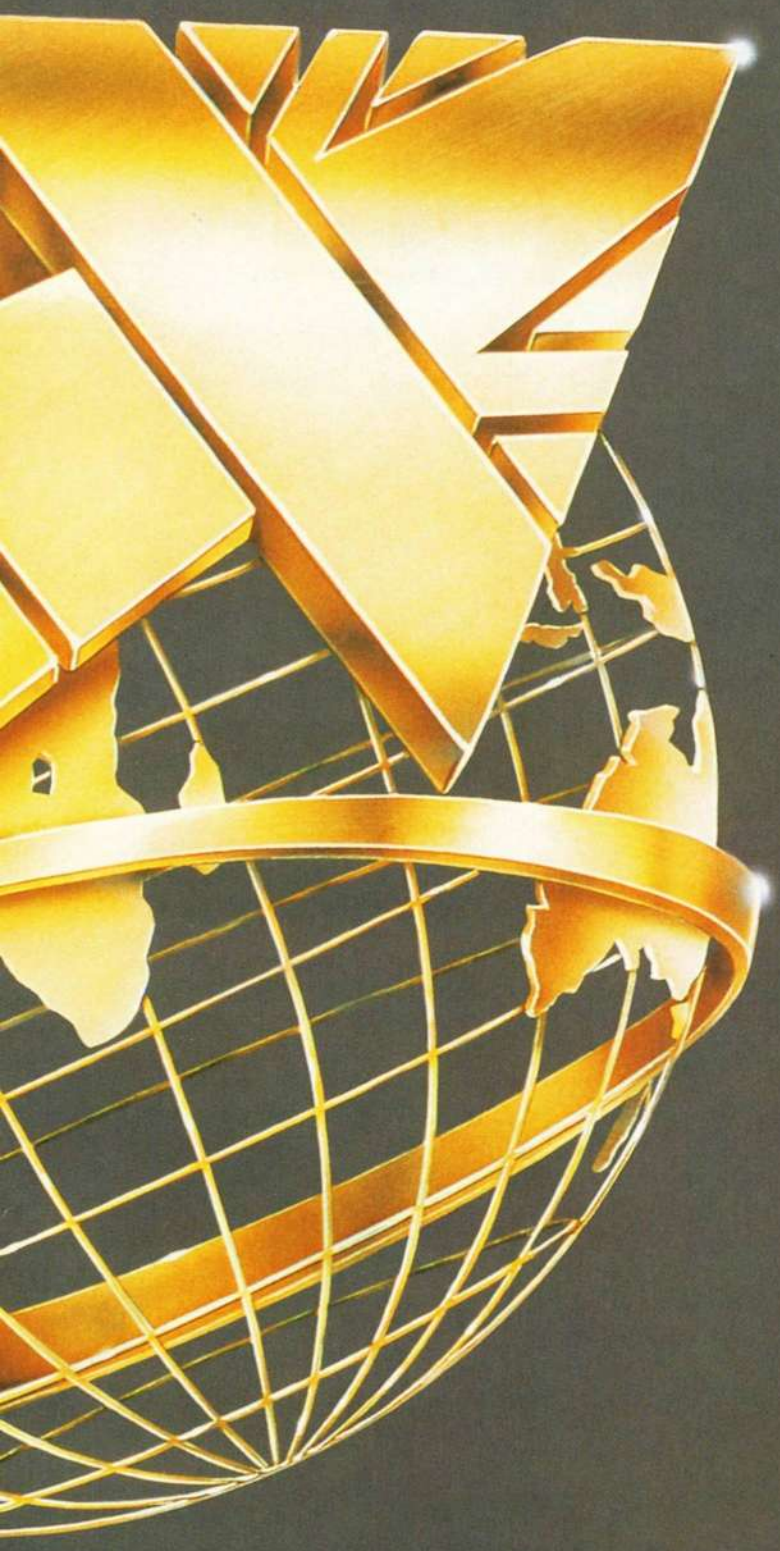
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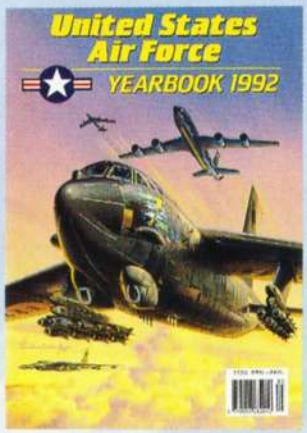
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Managing Editor: **Peter R March**
Publishing Director: **Paul A Bowen**
Editorial Assistant: **Brian Strickland**
Production Manager: **Claire Lock**
Advertising Manager: **Nicholas Gordon**
Production Assistant: **Katy Selby-Rickards**

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INTRODUCTION

Air Chief Marshal Sir Peter Harding
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Chief of the Air Staff

In my foreword to the 1991 Yearbook, I suggested that the events of the previous year might be regarded as a watershed in the history of man and the development of world affairs. Since then we have seen an attempted coup in the then Soviet Union and witnessed the demise of the Union, something that many had considered extremely unlikely until only very recently. The end of the Soviet Empire will bring about a reduction in the tension between East and West but as we have already seen from events in some of the former Soviet Republics and in the Gulf and Yugoslavia the 1990s will be marked by a growth in world instability and a period of greater uncertainty for us all.

The Gulf War served to highlight the challenges our Service must be prepared to face in the coming years. It also provided a graphic illustration of the key role of air power in modern warfare, with its high degree of sophistication and technological development, establishing beyond doubt the pivotal position of air power in the nation's defence requirements. There are many lessons to be drawn from the conflict and this we shall do, but it is clear that one of the key ingredients of our success was the quality of our people: the ability and courage of our air and ground crews in theatre, the sustained support provided by our personnel away from the front-line and, just as importantly, the strength and magnificent support of our families, particularly those with members serving in the Gulf.

During 1992 many of the major changes agreed under 'Options for Change' will begin to take effect. This will be a difficult and challenging period for everyone, not only for those involved in squadron disbandment and unit closures, but also for the stations receiving the redeployed units and for the many staffs who have to effect and coordinate the programme. It is essential we manage this process effectively to ensure that the impact on our people is minimal and that, once complete, the Royal Air Force has the right structure for the nation's defence needs in the 90s and beyond. I believe we are on the right track.

We will need to be highly responsive, flexible and mobile to ensure that we retain the ability to deploy at short notice anywhere in the world. The Royal Air Force will be a smaller service, but will retain its breadth of capability and a well trained and well equipped front line capable of supporting our existing roles. How will this be done? First, by retaining our most modern and capable aircraft and accentuating the multi-role nature of our equipment. Secondly, by bringing in new Command Structures and rationalised Support facilities which are in balance with the new frontline and thirdly, by obtaining for the first time in many years adequate manning.

The process of change will take time and will not be fully complete until 1995, although the bulk of the reorganisation will be in place before then. Throughout this period, the Royal Air Force will need to be alert to changes on the international stage and aware of events closer to home so that, if called to do so again, we can meet the kind of challenges we faced in the Gulf with the same high degree of success and professionalism. I am sure that it will be able to do so.



Enter the SENTRY

Paul Jackson visits RAF Waddington to see the RAF's new airborne early warning Sentry and to meet *Wing Commander Rod Thompson,* the Commanding Officer of No 8 Squadron, which has made the leap from veteran Shackleton to modern E-3D.

It was supposed to be a five-year stop-gap, but when its four Rolls-Royce Griffons finally ceased to reverberate down the Scottish valleys, the venerable Shackleton AEW2 had been in service for no less than 19.5 years. NATO's last piston-engined, front-line aircraft stood down on 30 June 1991, terminating a branch of the Avro family tree which can be traced back through the Lincoln and immortal Lancaster to the Manchester – a response to a 1936 RAF specification.

Inheritor of these proud traditions, No 8 Squadron made the transition from the Shackleton to the Boeing E-3D Sentry AEW1 on 1 July 1991, simultaneously moving from RAF Lossiemouth to RAF Waddington, south of Lincoln.

Ordered in 1986 to replace the Mk 3 version of Nimrod, which was beset by development problems, the Sentry is a Boeing 707 airframe modified by the addition of a 30ft diameter rotodome housing a radar scanner. In US Air Force and NATO service the E-3 is known by the acronym of AWACS – Airborne Warning And Control System – whilst its RAF designation (AEW) omits the control function in favour of the abbreviated Airborne Early Warning.

From their lofty vantage points, these flying radar stations can see far more than a ground-based antenna, thus greatly increasing the time available to fighters to respond to an incoming threat. The 17-person crew includes four on the flight deck, but it is the Tactical Director and his staff in the subdued lighting of the windowless fuselage who are the key link with surface-based units co-ordinating Britain's defence. Reflecting this primacy of the 'back office', No 8's CO, Wing Commander Rod Thompson, wears the single-winged brevet of a navigator, having gained his AEW experience in the somewhat less comfortable Shackleton.

Wg Cdr Thompson's knowledge of both aircraft prompts the obvious question of comparisons, but the answer is far from simple. "To compare the Shackleton with the E-3 is almost impossible, for what we have done is missed a generation of AEW aircraft in between," he explains. "Essentially, however, a significant feature of AEW is the height of the radar above the earth's surface, determining the distance you can see – and there is the biggest difference between the Shackleton and the E-3. Whereas the Shackleton operated at between 5,000 and 8,000 feet, the E-3D typically flies at 30,000 feet."

"By modern standards, the 1940-1950s vintage radar in the Shackleton was not very sophisticated and hence was vulnerable to jamming, weather clutter and sea movement. E-3D radar has jamming resistance, clutter rejection and all the other built-in features you would expect of a modern military radar. The E-3 is a much larger aircraft, and so can carry more powerful transmitters; everything is up a scale or two on the Shackleton. We can fit more radios, more crew and while there were only three radar consoles in a Shackleton, there are nine in the E-3."

Waddington's neighbours who remember the days of the Vulcan find the Sentry's four GE-SNECMA CFM-56 turbofan engines incredibly quiet. It is difficult to believe, but a Sentry with four 24,000 lb st engines makes less noise than the single-turboprop Tucano trainers which often make use of the Waddington circuit.







Above: *The 30-foot diameter rotodome is the Sentry's main sensor, but the RAF's E-3D version also has 'Yellow Gate' wingtip ESM pods and rearward-facing HF aerials just inboard.*

Left: *Co-pilot Flt Lt Mike Barton adjusts the throttles for the four CFM-56 engines.* Paul Jackson

Top: *CFM-56 turbofans are more fuel-efficient and more powerful than the P&W TF33s of USAF and NATO E-3s. RAF (and French) Sentries can stay aloft one hour more on the same amount of fuel.* John Dunnell Above: *Wherever possible, RAF Sentries are flown with the same crew members. Shown here is the Tactical Director (foreground) and two of the six-person Surveillance Team.* Paul Jackson

"There's not a lot to choose between the Shackleton and E-3D in terms of unrefuelled endurance," says Wg Cdr Thompson. "In round terms about 12 hours. In the E-3 we have air-to-air refuelling – in fact, twin systems. We can take fuel from hose fitted tankers (as used by the RAF) or boom-fitted tankers (of the USAF), and remain airborne for 20-24 hours with no problem." Training has so far been only with RAF tankers, however.

Following the installation of equipment by a BAe detachment co-located at Waddington, Sentry ZH102 was accepted by the RAF on 24 March 1991, and formally handed-over in a ceremony two days later. Five days after that, the Warsaw Pact was formally dissolved, although No 8 Squadron is not rash enough to claim a connection between the two events! Was the £1 billion RAF AEW programme therefore redundant before it flew its first mission?

Thompson is emphatic, "With no shadow of doubt there is still a use for an aircraft like the E-3D. In fact, an argument could be made that there is *more* use for it now. However, the 'where and how' has probably changed. There is, nevertheless a threat, albeit much-diminished, from the East and so there is still an application for this aircraft in the traditional air defence/AEW role, patrolling the borders between NATO and what was the Soviet Union."

"Where I see the E-3 coming into its own is as part of the new openness and freedom in Europe. Whilst I don't see it being used in the area of verification, clearly because it's a good surveillance platform it does allow us to reassure ourselves that there isn't a build-up taking place on the other side of the border."

Even before the last Shackleton flight, No 8 Squadron (Designate) was operating the Sentry as an extension of the UK air defence network. On 8 May 1991, ZH102 made the first operational sortie, captained by Flt Lt Dave Buchanan and with Sqn Ldr Peter Haworth as Tactical Director, spending 8 hours 50 minutes co-operating with the Sector Operations Centre at Neatishead, Norfolk. As No 8 gained more knowledge of the immense potential of its new equipment (it is perhaps no coincidence that the radio call-signs of RAF and NATO E-3s is 'Magic') Tornado and Jaguar crews newly returned from the Gulf War were evaluating their experience of working with USAF E-3B/Cs.

"These orchestrated the air battle," explained Rod Thompson. "They ran

The veteran Shackleton AEW2 was finally phased out of RAF service on 30 June 1991. PRM



offensive forces into Iraq, controlled the tanking, got aircraft back to their home bases. Since our offensive support and interdictor crews came back from the Gulf we are getting a lot of approaches to see if we can start to develop similar ways of operating." If Europe evolves its own unified defence policy and needs to operate militarily outside the Western Union boundaries, RAF and French E-3s could provide a similar service. "I am sure that the command and control aspect of AWACS is something we are going to have a very close look at," remarks Thompson.

Indeed, No 8's first sortie after re-formation was flown by ZH101 on 4 July 1991 and involved control of Jaguars, Harriers and Tornado GR1s as attacking forces in an offensive support exercise (OSEX). Schizophrenically, the same aircraft was directing the defending Tornado F3 and Hawk fighters – a role more in keeping with its day-to-day missions during work-up. Though responsible for disseminating information it has gathered to ground stations and ships, the Sentry may also act as a self-contained air defence platform.

"A sector station may give us two or four fighters and possibly even a tanker and send us down threat to look after a particular area," explains Wg Cdr Thompson. "The Navy does that quite a lot. It's not an autonomous function as our information would go back to the ground and theirs would come up to us."

Such is the amount of data flowing to and from the Sentry that two personnel – a Communications Operator and Communications Technician – work at a double console in the forward part of the aircraft. Currently using a data link called IJMS (Interim JTIDS Message Standard – pronounced eye-jims) the Sentry will, in the next year or two, be fitted with the American-developed Link 16 standard of JTIDS (Joint Tactical Information Distribution System). There are plenty of other datalink networks through which the Sentry can co-operate with other forces, such as the Link 11. It can even transfer data to another Sentry in the next patrol area or the relief aircraft arriving to replace it in the defensive line.

With a radar range of over 300 nautical miles, the Sentry can pick up a mass of aircraft, the most significant of which have to be assigned identities and tracked. A constant flow of information between ground control centres and the nine mission consoles (each with a video screen) aboard the Sentry is essential for harmonious operation. If a new plot appears on the E-3's radar, one of the tactical team will mark it for investigation. Moments later, counterparts on the ground have received the picture via IJMS and begin comparing the plot with known flight-plan information and ground radar returns. Within two minutes they will have decided whether the aircraft is of interest. IJMS then updates the picture on the E-3's screens, announcing that the plot is (for example) British Airways Flight 123 inbound from New York.

Often forgotten, but equally useful, is the identification provided by transponders (IFF) in military parlance) and from the Loral *Yellow Gate* ESM pods on the Sentry's wingtips. Radar data appears on the Sentry's screens as orange dots and IFF returns as green. An aircraft within radar range and 'squawking' is marked by a dot of each colour.

Under an agreement signed in May 1982, RAF Sentries are integrated with the NATO force of 18 similar E-3A aircraft based at Geilenkirchen, Germany. Patrol tasks are assigned on a day-to-day basis by the US or German general commanding the NATO AEW Force (NAEWF) at SHAPE. RAF Sentries therefore take turns with provision of detachments to forward stations at Ørland (Norway), Trapani (Sicily), Prevaza (Greece) and Konya (Turkey), the first such taking place between 17 and 21 June 1991 when ZH102 was at Ørland, working with Norwegian air defence agencies. "Our area of operations will be exactly the same as the E-3A component, once the Squadron is declared to NATO on an interim basis in mid-1992," says Rod Thompson. "The only difference is that the E-3D component is manned by wholly RAF crews, while the E-3A has a mixed international crew. To the user – the man in his ship who has an AEW aircraft on the end of a radio – there will be no difference."

Within the constraints of leave entitlement and sickness, RAF Sentry crews will fly together regularly, whereas NATO has a 'soft crew' system under which the same group of people may never board an aircraft twice. A requirement for three Airborne Technicians to monitor the Sentry's complex equipment has meant

Main picture: *Early starts and late finishes are usual when a typical sortie lasts nine hours. A Sentry awaits its crew on the security-tight ramp at Waddington.* Paul Jackson Inset: *Ursa primus. The E-3D's first Tupolev Tu-95 was encountered on 10 June 1991 when ZH102 was diverted to direct the interception of two 'Bear-Ds' maritime reconnaissance aircraft by Tornado F3s of No 25 Squadron (who took this picture).*



the creation of a new NCO aircrew brevet specific to the E-3 force: the single wing and letters AT. "They look after the radar system, communications and the computers," explains Wg Cdr Thompson, "but they are not technicians in the sense that they only mend things when they break. They are just as important to the mission as the pilot or flight engineer. The radar technician, for example, activates the radar, tests and configures it, selects the various operating modes, switches-in redundancy and then hands over the working radar system for the operational crew to use it."

Female aircrew are another new feature of Sentry operations. Says Wg Cdr Thompson, "Currently we have two at Waddington, both of them fighter controllers. They do exactly the same as their commissioned and NCO male counterparts within the surveillance area – operating radar, detection, managing data links and so on. We do not have any female pilots and navigators yet, but this is one of the aircraft that is open to them, so I am sure that we will eventually see one or two ladies on the flight-deck."

Building up the squadron to its planned 11 crews is a long process and will not be completed until well after the seven Sentries have been received. Three crews were trained at Geilenkirchen in the late-1980s, one of which became the basis of the Sentry Training Squadron when it formed at Waddington on 1 June 1990. The first STS course took place between 8 May and 11 October 1991, increasing No 8's strength to three crews, and the last of the 11 crews will be trained by February 1994. STS 'belongs' to Waddington's Operations & Training Wing and will remain in being after 1994 to train replacements. By then, No 8 will have formed its third flying component, 'C' Flight, to join the current 'A' and 'B'. Additionally, the squadron's ground-based tasks are assigned to the Flight Commander Training (combat-readiness, captain's courses, upgrade training, etc) and the Flight Commander Operations, responsible for daily organisation.

The final Sentry, ZH107 – incidentally also the 1,000th and almost last of the Boeing 707 family – arrived at Waddington on 22 August 1991 for fitting-out by BAe and is due to be handed-over in late-March 1992. Aircraft are 'owned' and maintained by Waddington's Engineering Wing and assigned to No 8 Squadron or the STS as required. As a result, Wg Cdr Thompson will have the largest RAF squadron in terms of flying personnel – over 200 – but No 8 ranks far lower in size if total air and ground staff are taken into account. Engineers are trained at the Sentry Ground Maintenance School, also at Waddington.





Top: *NATO maintains a fleet of 18 E-3As based at Geilenkirchen, Germany. USAF aircraft, (E-3C illustrated above) in common with those of NATO, are known as 'AWACS'.* PRM

The UK and France collaborated with purchasing and testing of their respective Sentry forces, one result of which is that the powerful and fuel-efficient CFM-56 turbofans selected by both air forces for their E-3s will all be overhauled in France. Conversely, the *Armée de l'Air* sends its flight deck crew to fly in Waddington's simulator, although both have mission simulators to train tactical operators. Rod Thompson predicts that an aircrew exchange programme between the RAF and FAF will be established soon to complement that already operating between Waddington and Geilenkirchen.

Recent reductions in defence expenditure have caused uncertainty over the future of some RAF units, but have not affected Waddington. "Here, we are in a growth industry," observes Wg Cdr Thompson. "Not only do we have a brand new piece of kit, but it is also one which really does the job – and because of that, people are enthusiastic about it. They enjoy flying it; they want to fly it; and it more than does the job they expect it to do. It's a joy to command a squadron in which you do not have to motivate people – the kit motivates them itself."

A service career of 25-30 years is ahead of the E-3D. As it celebrates its 77th anniversary this year, No 8 Squadron can look forward to marking its 100th birthday still flying the aircraft it has today (a 'century with the Sentry'). That is something to which few, if any, squadrons can anticipate with certainty. It took the RAF a long time to acquire a viable AEW platform and it is only now discovering its true potential; once again, No 8 Squadron is indispensable.



INNOVATION AND COMMITMENT

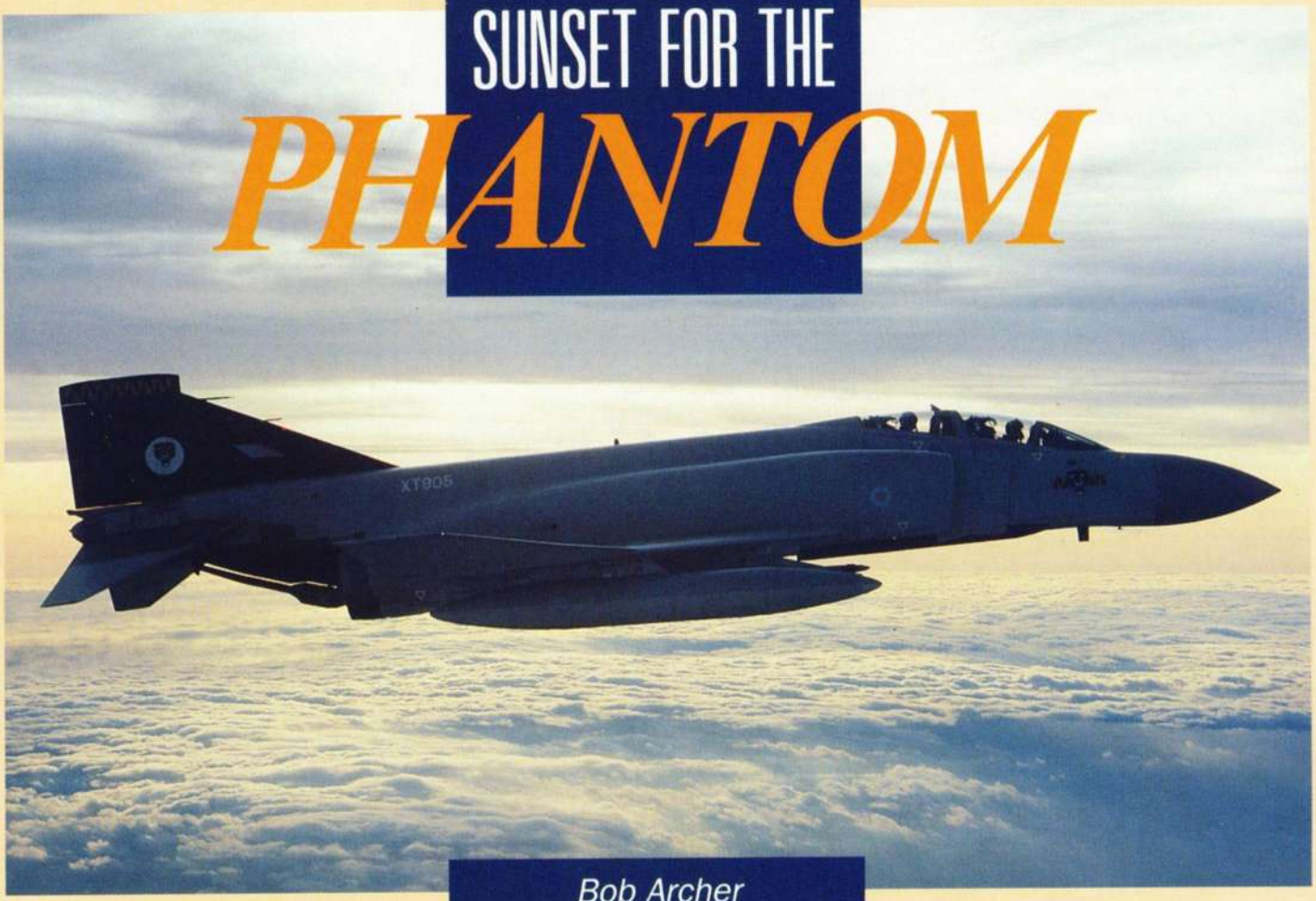


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SUNSET FOR THE PHANTOM



Bob Archer

After several hours of preparation involving briefings and suiting up, the pilot and navigator strolled the short distance from the squadron complex along the path towards the slightly open doors of the hardened aircraft shelter. Once inside both went to the office, known affectionately as the 'Wendy House', to check for the maintenance status and sign for the grey Phantom parked inside. With both crew satisfied as to the airworthy condition of the aircraft, the navigator climbed the access ladder and settled into the rear cockpit as the pilot performed his customary pre-flight walk round and inspection. The navigator then repositioned himself temporarily into the front seat to evaluate the weapons control switches while the pilot checked the weapons themselves.

Once satisfied that everything was in order the pilot climbed into the cockpit and began the lengthy pre-flight routine. With a flick of the switch the external generator immediately started the starboard engine which initially burst into life with a gently rising note. Within seconds this was reverberating within the confines of the shelter. The cockpit instrumentation signified all was well with the engine temperature at normal and the rpm indicating 50%, thus enabling the port engine to be set in motion. As the navigator aligned the inertial navigation system (INS), the pilot monitored the engine performance before indicating to the groundcrew to disconnect the external power supply. There followed a full functional check to ensure all flight controls were serviceable and the INS was working satisfactorily.

An audible alarm sounded as the two shelter doors opened fully, and with clearance from the control tower received, the pilot released the park brake and eased the throttle forward. The Phantom emerged into the cold late autumn afternoon at the same time as three other aircraft in the flight appeared from their reinforced hides. As number four the aircraft was last onto the taxiway. The four aircraft proceeded to the end of runway 23 when each of the eight crew members confirmed they were ready to commence the sortie. One behind the other the four aircraft taxied into position onto the runway before the engines were run up to 82% full power. Once permission for take-off was obtained from air traffic control the first pair commenced their run with a short roll forward followed by a loud roar as the pilots advanced the throttle through the 'gate' to engage the afterburner. The sudden increase in power accelerated the heavily laden aircraft forward with the pace quickening at an exhilarating rate until both became airborne halfway along the runway. With the roar from the first two Phantoms subsiding the second pair followed, entering the wake created by the previous two aircraft. Within seconds these too were airborne with four pencil thin arcs indicating the Phantoms were climbing into a left-hand turn at the start of their journey to conduct air refuelling practice with a Hercules C1K tanker somewhere off the North Sea coastline near Lowestoft.....

This simplified glimpse of No 74 Squadron at work is re-enacted several times during the course of a normal flying day at RAF Wattisham, which as the sign at the main gate proudly announces is 'Home of the Phantom'. However, it would be more appropriate if the sign was to read 'Last Home of the Phantom' as after 24 years of front-line service the type has been concentrated at Wattisham to perform its final few months of operations before withdrawal at the end of 1992. A total of 170 FG1 and FGR2 versions were received by the RAF and Fleet Air Arm during 1968 and 1969, with an additional 15 F-4J(UK)s being delivered in 1984. Of these fewer than three dozen remain operational with No 56(F) Firebird *and No 74(F)* Tiger *Squadrons at Wattisham since Germany-based Nos 19 and 92 Squadrons at RAF Wildenrath both disbanded during 1991. The Phantoms of No 1435 Flight at RAF Mount Pleasant in the Falklands are also due to be withdrawn with the Tornado F3 likely to assume responsibility for air defence within the Falkland Islands Protection Zone (FIPZ) if a continuing presence is required.*

The two current squadrons have operated the type for many years, with a Phantom element formed on 22 March 1976 at RAF Coningsby to enable No 56 Squadron to commence transition from the Lightning, which was completed on 29 June with the squadron officially reforming on the new type at Wattisham on 9 July. The squadron flew alongside the Phantoms of No 23 Squadron until 30 March 1983 when the latter unit relocated

to the Falklands, where it remained until replaced by No 1435 Flight on 1 November 1988. The transfer of No 23 Squadron for duty in the South Atlantic left a gap in the southern portion of the United Kingdom Air Defence Region (UKADR) which was filled by the purchase of the 15 refurbished US Navy F-4J(UK)s. No 74 Squadron was selected to operate these 'new' jets, reforming on 19 October 1984. It flew the F-4J(UK) until January 1991 when the unit switched to the FGR2 with a Phantom Training Flight (PTF) being activated at the same time. The assignment of the PTF at Wattisham followed the withdrawal of the OCU from Leuchars. The former was established to conduct refresher courses, although with no additional aircrew being transferred to the Phantom the Flight was wound up 12 months later.

As squadrons have disbanded and aircraft flown for storage, the two Wattisham based units have had the pick of Phantoms with the highest modification status or which have had a major overhaul recently. Retirement from service was based upon several factors, including those due for major service as the Phantom maintenance unit at RAF St Athan ceased at the end of 1991. A number of surplus Phantoms with limited flying hours remaining have been held in contingency store as an immediate readiness reserve enabling them to be returned to service quickly if required.

Despite the type remaining an effective deterrent, it was inevitable that it would be outmoded simply by advancing age. Sentiment aside the decision to retire the Phantom from the last two operational units was finally taken, with No 56 Squadron due to stand down on 1 July 1992 followed by No 74 Squadron six months later. Ironically, No 74 Squadron was the last squadron to convert to the Phantom and will be its final operator. The Phantom will never be remembered for its good looks, although the combination of its upturned wing tips, down-turned nose and anhedral tailplane ensure that, from certain angles, it embodies the appearance of a formidable adversary.

Many F-4 aircrew love it and will mourn the passing of the type. Although it has never been an easy aircraft to fly, and frequently unforgiving in certain situations, it is a pilot's aircraft which was produced prior to the advent of fly-by-wire and all-singing, all-dancing computers! At present the Phantom fits neatly into the air defence chain between the long-range Tornado F3 and the nimble single point defence Hawk T1A. No replacement for the Phantom is on order at present, although the European Fighter Aircraft (EFA) has been designed to conduct medium-range air defence duties amongst other roles.

Both squadrons will remain operational until they officially stand down from their commitment to the defence of the United Kingdom. Indeed, to remain an effective part of the overall deterrent both will continue as if their future was assured with exercises planned and a visit to RAF Akrotiri, Cyprus for armament practice camp being scheduled for Spring 1992. This final Phantom APC will see old hands, and comparative newcomers, firing at banners towed by No 100 Squadron Hawk T1s over the Mediterranean. The only difference between this and previous visits to Cyprus for APC will be that everyone will be trying that little bit harder to be the best! In addition No 74 Squadron will participate in the annual Tiger Meet due to be hosted by the Spanish Air Force during summer 1992.

The Phantom has been universally popular with spectators at air shows and RAF personnel alike as it bridged the gap between first generation jets such as the Canberra and the Tornado, currently performing both air defence and the fighter-bomber role. Surprisingly the Phantom did not see combat during its RAF career, although it looked after the interests at home during the Falklands campaign and during Operation Granby. *In addition, the Phantom participated in the latter operation, with aircraft from RAF Germany conducting air defence of Cyprus while based at Akrotiri.*



.....Meanwhile, back in the air the four-ship has completed its simulated air combat training (ACT) sortie and with daylight fading rapidly has begun preparing to recover to Wattisham. Control of the entire sortie was under the watchful eye of the radar site at RAF Neatishead, Norfolk although it is Eastern Radar who have vectored the Phantoms from the airspace

Four Phantom FGR2s of No 74 (Tiger) Squadron prepare for take-off (left top). PRM *Undercarriage up* (left), *the lead Phantoms climb out, heading for a rendezvous high over the North Sea.* Graham Finch *The last aircraft* (below) *rolls forward, engages afterburners and accelerates down the runway.* Graham Finch





Each Phantom in turn plugs into the refuelling drogue trailed by descending Hercules C1K tanker XV203. Bob Archer

above the cold North Sea 'feet dry' over an area between Lowestoft and Great Yarmouth on a south-westerly heading towards Wattisham. With recovery initiated both crew members are fully occupied completing their routine checks including returning weapons switches to their safety positions. Contact with the station is established to enable a status report to be passed to the aircrew, including details of the local weather and runway state. The changeable climate frequently results in aircrew departing the returning in different weather conditions, particularly during late autumn, winter and early spring months. Therefore pilots can choose between the type of recovery available with radar, instrument or vectors for a visual return if conditions permit.

Once in the circuit, the aircraft perform a number of overshoots before landing with the final gradual descent halted as the wheels touch down close to the 'piano keys' at the end of runway 23. The brake chute billows in the slipstream assisting the pilot with his braking as the aircraft slows to taxi speed. The Phantom is manoeuvred to the end of the runway where, with the flick of a switch, the chute is disconnected for recovery by ground personnel. As the aircraft turns onto the taxiway both canopies are opened to allow cool air to enter the cockpits, for although there is a limited air conditioning system, the Phantom was never designed with crew comfort in mind!

As the aircraft taxies back to the No 74 Squadron area, one engine is shut down as a safety and economy measure. Squadron operations has provided the shelter number for the aircraft with groundcrew awaiting to assist with parking. The second engine is shut down as the aircraft enters the shelter.

The ever-present groundcrew set to work replacing engine covers, wheel chocks and performing post-flight maintenance while the aircrew replace safety pins in the appropriate positions in the cockpit and return all operable switches to the 'off' position. Once satisfied that the aircraft is safely parked the Phantom is officially 'returned' to the squadron during a second visit to the 'Wendy House'. Any faults requiring maintenance which have appeared during the sortie are notified to enable repairs to be carried out before the next flight. Although the sortie has been completed there follows a debriefing involving all eight crew members who evaluate the performance of themselves and their colleagues.

The doors of the four hardened aircraft shelters close as darkness descends on RAF Wattisham. The Quick Reaction Alert or Q barns at Wattisham are empty as they have been for many months, as 'trade' in the shape of Soviet reconnaissance flights probing UK air defence has all but ceased. What little trade exists is normally handled by the Tornado squadrons at Leuchars and Leeming. The current vogue is *Glasnost* rather than the Cold War and the establishment of friendly links between the West and the former Warsaw Pact nations has been a contributory factor in the retirement of the Phantom from RAF service. It would be fair to say the success of the deterrent, in which the Phantom was a significant player, brought about the reduction of the need. Simply put the Phantom was a victim of its own success!

Touchdown close to the piano keys with a puff of smoke from the tyres. PRM



PHANTOM IN UK SERVICE

F-4K Phantom FG1 – Purchased for the Royal Navy to replace the Sea Vixen as an all-weather, long-range, carrier-borne fighter for Fleet defence, the Phantom FG1 was essentially an F-4J with Rolls-Royce Spey engines in place of General Electric J79s. The different powerplants necessitated changes to the inlets and a re-faired lower rear fuselage. The radome and aerial dish were modified to swing 180deg enabling the Phantom to be accommodated below deck on British aircraft carriers with their limited elevator clearance. Internally there were numerous equipment changes including a different autopilot, avionics, instruments, while the nose wheel leg was extended to enable safe launches from the smaller catapults on British carriers.

A pair of development YF-4K models, together with two F-4K versions, were initially constructed, with the first of these (XT595) remaining in the USA with the manufacturer until June 1970, despite performing its maiden flight four years earlier. The first three remained as development aircraft, with only the fourth Phantom XT598 being brought up to operational configuration. A total of 48 production FG1s were ordered although a Government policy change resulted in only 24 being delivered to the Fleet Air Arm with the remainder joining the RAF instead. The phasing out of *HMS Ark Royal* saw the survivors transferred from the Navy to the Air Force at the end of 1978. The FAA's Phantom FG1s were shore based at RNAS Yeovilton and at Leuchars after transfer to the RAF.

F-4M Phantom FGR2 – Following cancellation of the RAF's TSR2, F-111K and P1154, the YF-4M Phantom FGR2 was selected as the replacement for the Hunter and Canberra which were operating in the ground attack and photo reconnaissance roles in the UK and with RAF Germany. The version differed from the FG1 as it lacked the extended nose wheel leg and provision for catapult launch, but featured anti-skid brakes, strike camera equipment, a new Ferranti inertial nav/attack system and different radios from those fitted to US models. A new fire control system was installed, along with revised weapons fitment and release, plus a more extensive electronic warfare package. The version could also carry a centreline mounted SUU-23 gun pod or EMI multi-sensor reconnaissance pod.

A pair of YF-4Ms were constructed in 1967, both joining the test programme where they remained. The first RAF Phantom FGR2 (XT891) was delivered to No 23 Maintenance Unit (MU) at RAF Aldergrove on 20 July 1968 for a short period of evaluation before being issued to No 228 OCU at RAF Coningsby on 23 August 1968. The two YF-4Ms were followed by 116 FGR2 models which included a number of 'twin-stick' versions for training within the first batch of 24 aircraft.

F-4J Phantom F4J(UK) – The need for air defence of the Falkland Islands Protection Zone in 1982 was met by deploying Phantom FGR2s to RAF Stanley, although this created a gap in available resources for the southern part of the UK as the Tornado ADV was not available. The solution was to obtain 15 surplus US Navy F-4J Phantoms. The J79 engines were retained with the result that designation F4J(UK) was applied rather than Phantom FGR3. As their employment was considered to be temporary, while the Tornado F3 continued to be delivered to UK air defence squadrons, few equipment changes were made.

Following a complete overhaul at NAS North Island, California the first three F-4J(UK)s were delivered direct to RAF Wattisham for service with No 74 Squadron on 30 August 1984, with the remaining dozen arriving by 13 December. These served until early 1991 when they were replaced by the FGR2s released by RAF Leuchars.

ROYAL AIR FORCE PHANTOM SQUADRONS



Phantom FGR2 – No 2 Sqn. PRM

Phantom FGR2 – No 6 Sqn. Ian MacFarlane



Phantom FGR2 – No 14 Sqn. PRM



Phantom FGR2 – No 17 Sqn. PRM



Phantom FGR2 – No 23 Sqn. PRM



Phantom FGR2 – No 19 Sqn. Graham Finch

NO 2 SQUADRON

The squadron has been dedicated to the photo reconnaissance role for several decades employing FR versions of the Spitfire, Meteor, Swift and Hunter before receiving the Phantom FGR2 beginning on 7 December 1970. Initially No 2 (Phantom) Sqn at RAF Bruggen operated alongside No 2 (Hunter) Sqn at RAF Gutersloh until the end of March 1971. No 2 Sqn was declared operational with the Phantom at RAF Laarbruch on 1 April 1971, although the type was only assigned for five years as conversion to the Jaguar GR1 began in June 1976 with completion by 1 October.

NO 6 SQUADRON

No 6 Sqn was formed at RAF Coningsby on 7 May 1969 as the first front-line RAF Phantom FGR2 squadron. The introduction of the Jaguar GR1 in the ground attack role resulted in No 6 Sqn losing its Phantoms during the summer of 1974, officially reforming with the Jaguar at RAF Lossiemouth on 1 October before moving south to Coltishall one month later.

NO 14 SQUADRON

No 14 Sqn was the first Phantom FGR2 squadron in RAF Germany, converting from the Canberra B(I)8 for the ground attack/ reconnaissance role. Conversion began during early 1970 with the squadron officially moving from RAF Wildenrath to RAF Bruggen on 30 June 1970. Jaguar GR1s began arriving in April 1975 with re-equipment completed by November as the Phantom was transferred from ground attack to air defence.

NO 17 SQUADRON

The second RAF Germany Phantom unit, No 17 Sqn reformed on 1 September 1970. The squadron was located at RAF Bruggen for ground attack duties with the Phantom FGR2. They remained until September 1975, when the squadron re-equipped with Jaguar GR1s.

NO 19 SQUADRON

No 19 Sqn was the longest serving Phantom unit in RAF Germany with more than 15 years of air defence operations with the type. The squadron was located at RAF Gutersloh flying the Lightning F2A when it began conversion in July 1976 with a Phantom element formed at RAF Coningsby. Upon completion the squadron reformed at RAF Wildenrath on 1 October 1976. The squadron finally disbanded at the end of 1991 with its aircraft being flown to Wattisham for storage.



Phantom FGR2 – No 29 Sqn. PRM



Phantom FGR2 – No 31 Sqn. PRM

NO 23 SQUADRON

No 23 Sqn commenced conversion to the Phantom FGR2 at RAF Coningsby during mid-1975 before reforming at RAF Wattisham on 1 November. The squadron transferred its aircraft to No 29 Sqn on 30 March 1983 when it disbanded at Wattisham, reforming the same day at RAF Stanley, Falkland Islands to replace the detachment provided by No 29 Sqn. With the reduction of the threat in the South Atlantic the squadron was redesignated No 1435 Flight on 1 November 1988, enabling No 23 to return to the UK and reform with Tornado F3s at RAF Leeming.

NO 29 SQUADRON

Reformed with the Phantom FGR2 in the air defence role No 29 Sqn was based at RAF Coningsby from 1 January 1975. A detachment of Phantoms was sent to RAF Stanley for air defence of the Falkland Islands commencing 17 October 1982 as soon as the airfield was suitably upgraded to operate the type. The detachment ceased when No 23 Sqn was assigned to RAF Stanley on 30 March 1983. The squadron continued to operate the Phantom at RAF Coningsby until receiving the Tornado F3 in May 1987 and being declared operational on the new type on 1 November.

NO 31 SQUADRON

The squadron converted from the Canberra PR7 at RAF Laarbruch to the Phantom FGR2, performing the ground attack and photo reconnaissance role from 20 July 1971 and moving to RAF Bruggen at the same time. In keeping with other RAF Germany ground attack units, the squadron converted to the Jaguar GR1 on 1 July 1976.

NO 41 SQUADRON

The only Phantom unit to have formerly operated the Bloodhound missile, No 41 Sqn reformed with the FGR2 at RAF Coningsby on 1 April 1972 conducting for reconnaissance and ground attack duties. The squadron began conversion to the Jaguar GR1 during August 1976 before officially reforming on the type at RAF Coltishall on 1 April 1977.

NO 43 SQUADRON

No 43 Sqn reformed on 1 September 1969 with the Phantom FG1 at RAF Leuchars for operations over the northern part of the UK Air Defence Region. The squadron operated a mix of Phantom marks when the FGR2 version was added in May 1988, although this was short lived as conversion to the Tornado F3 commenced in September 1989.

NO 54 SQUADRON

No 54 Sqn operated Hunters until 1 September 1969 when the unit was established at RAF Coningsby with the Phantom FGR2. Another unit dedicated to the ground attack role, the squadron moved to RAF Lossiemouth on 29 March 1974 where it converted to the Jaguar GR1 before relocating to RAF Coltishall five months later.

NO 56 SQUADRON

The penultimate Phantom operator, No 56 Sqn flew the Lightning for 15 years before converting to the Phantom FGR2 on 29 June 1976. Although stationed at RAF Wattisham the squadron worked up on the Phantom at RAF Coningsby. Almost 16 years to the day after being declared operational with the Phantom, No 56 Sqn is due to be disbanded on 1 July 1992.

NO 64 SQUADRON/228 OCU

No 228 OCU received its first Phantom FGR2 at RAF Coningsby on 23 August 1968 with No 64 Sqn being allocated as its 'shadow' squadron in July 1970. The OCU remained at Coningsby until 22 April 1987 when it relocated to RAF Leuchars to make way for the increasing number of Tornado F3s. However, with the wind down of Phantom operations the OCU was disbanded on



Phantom FG1 – No 43 Sqn. PRM



Phantom FGR2 – No 56 Sqn. PRM



Phantom FGR2 – No 64 Sqn. Bob Archer

31 January 1991 and replaced by the Phantom Training Flight at Wattisham.

NO 74 SQUADRON

After remaining inactive for 13 years, No 74 Sqn reformed at RAF Wattisham on 19 October 1984 although its first F-4J(UK) versions of the Phantom were delivered two months earlier. The former US Navy aircraft, with their different engines and sub-systems, was withdrawn from service during early 1991 with the squadron switching to the FGR2 version on 17 January. No 74 Sqn is due to disband on 1 January 1993, thereby having the honour of being the RAF's last Phantom unit.

NO 92 SQUADRON

Sister to No 19 Sqn at RAF Wildenrath, No 92 Sqn also exchanged the Lightning F2A for the Phantom FGR2 beginning in January 1977, although the move from RAF Gutersloh was not completed until 1 April 1977. The squadron disbanded on 5 July 1991 with the majority of its aircraft being flown to RAF Wattisham for storage.

NO 111 SQUADRON

No 111 Sqn began conversion to the Phantom FGR2 at RAF Coningsby during mid-1974, being declared operational on 1 October. The squadron moved to RAF Leuchars on 3 November 1975 where it moved to RAF Leuchars. The FGR2 was replaced by surplus Fleet Air Arm FG1s beginning in April 1978, although it was March 1980 before conversion was complete. The squadron officially ceased flying the Phantom on 31 January 1990 having re-equipped with the Tornado F3.

NO 1435 FLIGHT

The reduction in the number of Phantom FGR2s at RAF Mount Pleasant, Falkland Islands to four aircraft permitted No 23 Sqn to return to the UK and the creation of No 1435 Flight at the end of March 1988, although the official announcement of the re-designation was not made until 1 November 1988. The Phantom will be withdrawn during 1992.

PHANTOM TRAINING FLIGHT

The Phantom Training Flight (PTF) was created at RAF Leuchars in August 1972 to train aircrew flying the FG1 following the disbanding of the FAA's No 767 Naval Air Squadron which had conducted this duty for both services. The PTF remained in this role until 1978 when No 228 OCU assumed the responsibility of training crews for both versions. The demise of the OCU at the end of 1990 resulted in the formation of a Phantom Training Flight to perform refresher courses with the FGR2 at RAF Wattisham under control of No 74 Sqn. The PTF was established on 1 January 1991 for just 12 months.

Phantom F4J(UK) – No 74 Sqn. PRM



Phantom FGR2 – No 92 Sqn. PRM



Phantom FGR2 – No 1435 Flight. John Dunnell



Phantom FG1 – No 111 Sqn.
Graham Finch



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HERCULES UNIVERSITY

Lindsay T Peacock visits No 242 Operational Conversion Unit at RAF Lyneham



Talk to anyone who flies fast jets as a matter of routine and the chances are that he (or, increasingly, she) will be rather condescending and, perhaps, dismissive of those whose flying duty is accomplished as part of the air transport world. That attitude is also often echoed by members of the general public whose perception of the airlift task focuses firmly on hauling cargo from place to place, a job that is neither terribly glamorous nor, if one is honest, the most exciting way of spending one's time. Even those who are collectively referred to as 'truckies' would probably agree that droning along in a Hercules at medium-altitude for hour after hour after hour isn't the most stressful of occupations. There may well be some who, if pressed, would also agree that it could become tedious.

As is often the case, such sweeping generalisations are unwise, for there is much more to airlift than simply lugging freight from point 'A' to point 'B' in much the same way as a commercial cargo agency does. This very soon becomes apparent if one examines the tasks that are undertaken by the RAF's Lockheed C-130 Hercules, for one will quickly be forced to acknowledge that comparisons with a company like Federal Express are way off target.

Hauling cargo is, of course, an important mission and could accurately be described as the 'bread and butter' portion of the work undertaken by the RAF Lyneham-based Hercules fleet. There are other jobs though and, while they may be performed with less frequency, they are none the less important in the overall application of air power as practised by the Royal Air Force.

Air dropping is one and this is in fact a many-faceted discipline for it can encompass the delivery of men or supplies. In the former instance, it may typically involve the insertion of a substantial number of paratroops by groups of aircraft flying in fairly close formation, often at low altitude. In the latter, it can involve the delivery of foodstuffs and other supplies or heavy equipment by parachute and there are a number of techniques which may be used, depending on load and terrain. Again, skill in low flying is often a feature of these sorties and while routine training is based mainly on the delivery of military equipment, air drop techniques are perhaps best known to the public at large for their application to humanitarian operations.

In that context, there are probably few who have not seen some film coverage of these activities at one time or another, for in recent years, the Herks from

Main picture: *Hercules XV302 on the ramp at Lyneham.* PRM Inset top: *XV217 pictured during a training exercise over Wales.* Lindsay Peacock

Lyneham have been called upon with increasing frequency for relief work overseas. In so doing, they and their aircrews have compiled a splendid record in helping to combat natural and man-inspired disasters around the world, most recently assisting the Kurds in Northern Iraq.

Air-to-air refuelling is another mission that falls to the RAF's Hercules fleet. However, since only a few aircraft are tanker-configured, it follows that this is a relatively minor activity. Be that as it may, a good proportion of RAF Hercules aircrew are expected to maintain currency in air refuelling techniques and this again is an aspect which lies far outside the capabilities of commercial freight organisations.

So, clearly, Lyneham's Hercules community has a fairly wide-ranging brief, in terms of both ground covered and the type of flying that is performed by the four squadrons (Nos 24, 30, 47 and 70) that operate from here. One other flying unit also in residence at this Wiltshire base is No 242 Operational Conversion Unit (OCU). A long-serving element of the RAF transport force (it has been active since 1951), the OCU took up permanent residence at Lyneham in 1975 but remains little known beyond the immediate confines of the Hercules community, even though it could quite reasonably claim to be the most important of all Lyneham's residents.

Such a claim might possibly sound fanciful but would be legitimised by the simple fact that it is No 242 OCU which is responsible for the training of aircrew to man the 60-strong Hercules fleet. In reality, though, its formal designation as an OCU is in many ways a misnomer for it has a number of other important tasks to perform besides simply churning our newly-qualified personnel. Among these are the accomplishment of post-graduate training and the monitoring and maintaining of standards across the force, both of which are essential if the squadrons that it supports are to continue to operate effectively.

Presently headed by Wg Cdr Angus Morris, No 242 OCU has somewhere in the region of 130 personnel, of which all but about 10 are aircrew. OCU organisation naturally embraces a Headquarters section and five subordinate squadrons. The latter comprising the Ground Training Squadron, better known as 'ground school'; the Hercules Conversion Squadron; the Hercules Training Squadron; the Simulator Squadron and the Support Training Squadron.



HAULING CARGO BY HERCULES

Following a thorough check by the loadmaster, a Medium Stressed Platform (MSP) is loaded aboard a Hercules at Lyneham.

Currently these elements are fairly well scattered around Lyneham but work on new quarters is due to begin in the summer of 1992. On completion, this will allow the ground, conversion and training squadrons to be brought together in a single building with effect from late 1993, heralding an important and long overdue new chapter in the history of the OCU, as well as some organisational change since the ground and conversion squadrons are then expected to amalgamate.

For those who are new to the Hercules (and for co-pilots in the process of being upgraded to captain), training inevitably begins at the Ground Training Squadron (GTS) and one of the first actions is to establish constituted crews, each crew comprising a pilot, co-pilot, navigator, flight engineer and air loadmaster. In a typical year, the eight officer and senior NCO instructors assigned to GTS will deal with just under five courses of six crews each.

Each of these courses lasts for seven weeks, with instruction being targeted towards the *ab initio* student in so far as technical, operational and professional aspects are concerned. At some stage, course members are despatched to RAF Mount Batten, Plymouth for specialist tuition in survival techniques (including dinghy drill) and they also go to the Aviation Medicine Training Centre at North Luffenham. GTS ends with a written examination, after which students move on to the next stage.

It is at this point that they come under the wing of the Hercules Conversion Squadron (HCS), with whom they will complete an 11-week course. Due to differing levels of skill, flying requirements vary slightly in so far as 'hands-on' time is concerned and this is accomplished by adjusting sortie duration. Captains, who will already be quite familiar with the Hercules, typically fly 90-minute sorties and log just over 52 hours of actual flying time while co-pilots get two-hour sorties and accumulate 76 hours, as do all other crew members.

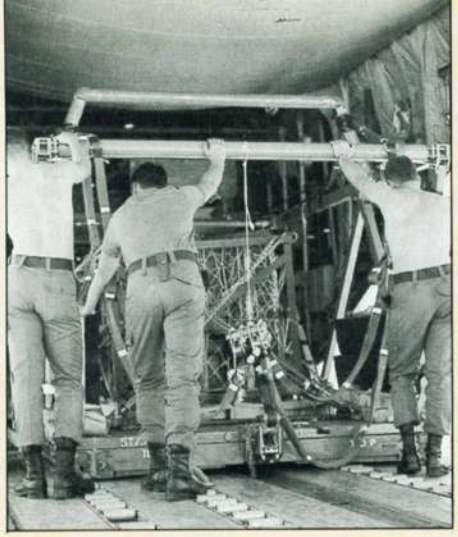
It should come as no surprise to learn that the freshly constituted crews are not let loose on the Hercules right away and their initial experience of 'flying' is actually accomplished in a



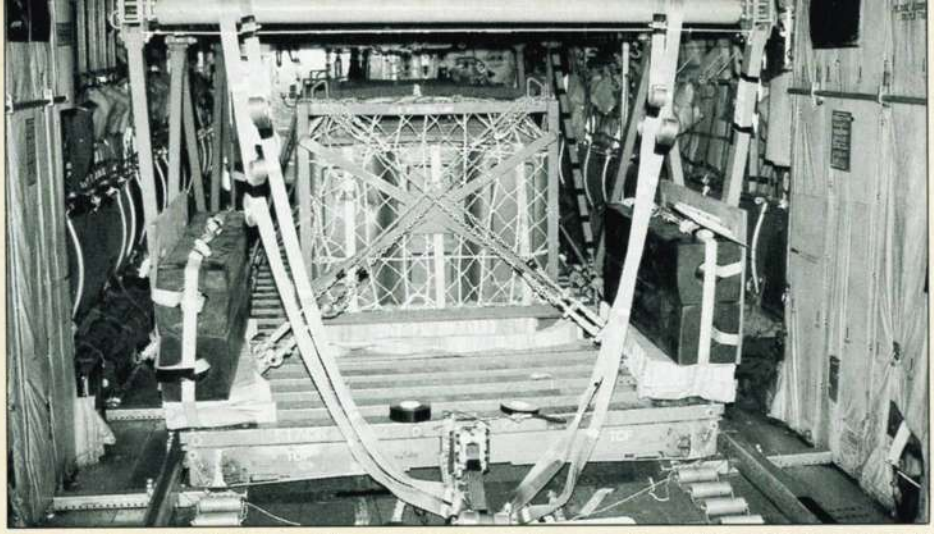


Above: *242 OCU aircrew using Station Keeping Equipment (SKE) during a sortie from Lyneham. Displays and controls for SKE are visible on the top of the cockpit coaming.* Lindsay Peacock

Left: *Low-level training proved invaluable during the Gulf crisis.* Dave Fry



Although extensive use is made of the loading equipment, there is still a requirement for some muscle-power.



Once in place, the MSP doesn't leave a lot of room to move about. This particular example is loaded with ballast and is to be dropped by personnel who are undergoing training with No 242 OCU. Photographs Lindsay Peacock

simulator, where the basic operating procedures are absorbed. Only when those have been mastered will they encounter the real thing and begin the flying syllabus, key aspects of which include general handling both by day and night, instrument flying and navigation and route operations. During the latter phase, they will also practice airways flying procedures and complete at least one trans-Atlantic crossing.

Extensive use is made of the simulator throughout the HCS syllabus, each crew logging a total of 38 hours in this device, which has the added advantage of being able to replicate emergency situations without any of the attendant hazards that would be present in the air. As already noted, it is first used to impart knowledge of basic procedures but it also has a valid part to play in later stages of the course and is a most valuable teaching aid, as well as a useful tool in allowing instructor staff to assess student performance.

The final stage of the course comprises a series of checks on ability in aircraft handling, instrument flying and route operations. Written examinations form part of this assessment process, as also does a simulator check and this is a particularly important time for student and instructor alike, since it is now that categorisation occurs.

In the case of newly graduated but still inexperienced *ab initio* crew members, that category is always 'D'. This is sufficient to allow assignment to one of Lyneham's four operational squadrons, although higher gradings can be achieved by 'retreads' who will already have some Hercules experience. In both instances, as their degree of expertise develops, they can be regraded, other categories being 'C' (average ability), 'B' (above average) and the highly exclusive 'A' (exceptional).

Successful completion of the course does not mark the end of their association with the OCU, as their ability and proficiency continues to be monitored. Part of the responsibility for this rests with the squadron to which they are assigned but it is primarily a concern of another department within No 242 OCU, the Hercules Training Squadron (HTS). In addition, there is Lyneham's Standardisation Evaluation (StanEval) unit, an independent agency that is tasked with continually monitoring flying standards at Lyneham and which reports directly on its findings to No 1 Group at Upavon.

HTS tasks embrace further training and checking of standards across the Hercules force. Periodic Refresher Training (PRT) is one facet of the HTS workload and is, perhaps, viewed by many squadron aircrew as a 'necessary evil'. Basically, it requires them to undergo a two-week period of very intensive training with HTS instructor staff during which they will complete five flying sorties, three simulator missions and some ground training, leading up to categorisation, either in the existing grade or, ideally, in an improved grade.

Instances of failure can occur, resulting in downgrading to 'E' category but such occurrences are usually concerned with rare violations of safety procedures. This is illustrated by the fact that the failure rate is less than one per cent, with about 20 'E' categories being 'awarded' in a typical year during which about 2,100 aircrew checks will be conducted. A period of further training with emphasis on the shortcoming invariably follows, this usually entailing three or four extra training sorties before recategorisation in one of the grades mentioned earlier.

At present, HTS normally accomplishes more than 100 PRT courses annually. The frequency of PRT varies according to the category held by the individual concerned. Thus, 'D' categories face this ordeal at six-monthly intervals, 'C' categories are examined annually, 'B' categories come in to HTS every 18 months and those who merit an exceptional 'A' grading are only required to attend every two years. On negotiating the PRT hurdle crews return to their squadrons and resume operational flying activity.

At first glance, it might appear that aircrew who hold 'B' and 'A' categories are pretty much left to their own devices for

Aerial view of the Lyneham apron and hangar facilities. Lindsay Peacock



A Hercules begins a 'Khe Sanh' descent from 1,000ft. Lindsay Peacock



lengthy interludes. In theory, that could result in them developing bad habits as a result of their performance going unmonitored but it isn't quite as simple as that and checks and balances do exist to ensure standardisation is maintained throughout the Hercules community.

One way in which this objective is satisfied is by means of 'intermediate checks'. These are accomplished by HTS personnel at six-monthly intervals and entail a flying check together with a simulator trip for all squadron pilots and engineers who hold 'C' or above ('D' categories are exempted since they routinely face PRT at an identical interval). Thus, while an individual with an 'A' category is only subjected to PRT every two years, his performance will be assessed by means of three intermediate checks during the intervening period.

Other checks are also undertaken, at both squadron and OCU level. HTS staff perform route checking of all members of aircrew at the same frequencies as PRT while squadron training captains conduct flying training with all captains and co-pilots at monthly intervals. Instrument Rating Tests (IRTs) also feature in the on-going training programme, with pilots and co-pilots having to pass this hurdle on an annual basis. All crews (except for loadmasters) are also required to 'log' two hours in the simulator every month.

The Simulator Squadron currently has three Link Miles 'full-mission' devices, which in the course of a typical year will accumulate in the region of 8,500 'flying hours', just over 80% of which (7,000 hours) is devoted to 'operational' requirements. By far the majority of that quantity is accomplished in support of HCS, HTS and squadron objectives but other agencies – like the Joint Air Transport Establishment, the Aeroplane and Armament Experimental Establishment and the Meteorological Research Flight – also take advantage of No 242 OCU's facilities, as from time to time do foreign air forces such as Israel, Oman and Singapore.

The remaining element within the No 242 OCU framework is STS which is primarily concerned with imparting knowledge of and inculcating expertise in rather more demanding types of flying. It is here that aircrew learn how to take the Hercules to war, aspects of STS instruction imparting knowledge of tactical flying; assault landings; use of camouflage, cloud and terrain to achieve their objectives and lectures on weapons systems that might be encountered in wartime operations.

To perform that task, STS actually consists of two distinct components, each active in very different areas. Developing low flying and airdrop skills provides the lion's share of the work that is entrusted to STS, which normally offers five Transport Support (TS) courses per annum, each course spanning five weeks of demanding study on the part of the typical intake of three crews. STS is also 'parent' to the Tanker Training Flight (TTF) which, as its title implies, specialises in aerial refuelling.

The TS course is particularly hard on Air Loadmasters who are required to spend three weeks at ground school learning about such subjects as load preparation, delivery methods and aircraft trimming. Once they have completed that phase, they rejoin their colleagues for five weeks of flying activity, during which low flying is extensively practised, along with air dropping of a variety of types of load.

Careful planning is essential if the TS course is to progress smoothly, since it is dependent upon the support of numerous external agencies. Instances of this are provided by air drop operations, for it is the Army which actually furnishes the loads (whether they be men or equipment) and the drop zones, while low flying can only be undertaken with prior clearance along clearly defined routes.

With many training sorties including low-level navigation exercises and air drops, it follows that preparation can be a complicated and, one suspects, nightmarish business. Even assuming that the planning phase works well, one is ever at the mercy of the British climate and it is by no means certain that good planning will clear the way for good execution since our weather can be notoriously unpredictable. In view of that, it should come as no surprise to learn that the course includes a few 'spare' days in the event of it being necessary to re-fly a particular sortie.

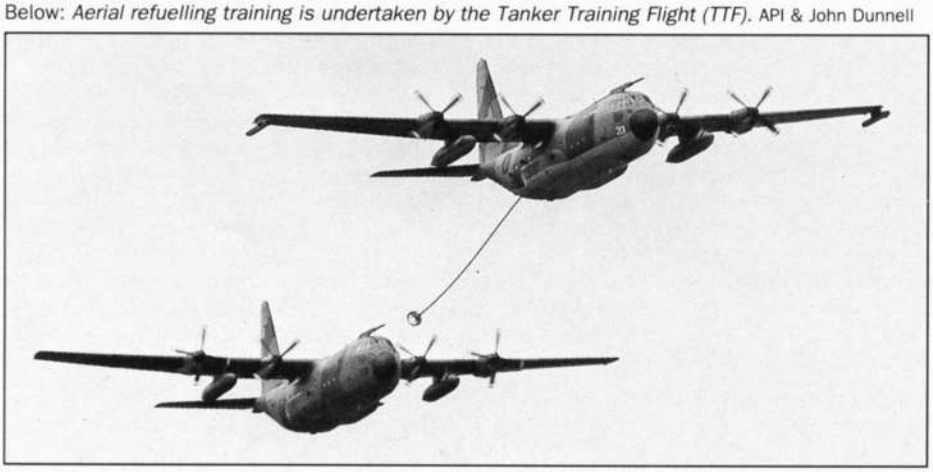
Having successfully completed the TS course, graduate crews will be required to return to STS six months later for reinforcement training as a matter of routine and STS personnel are also tasked with categorisation checks of all TS-qualified crews on an ongoing basis. It should, however, be noted that some of the TS checks are undertaken by StanEval staff in the execution of their duties, which may include all types of categorisation check.

Turning to air-to-air refuelling (AAR) two basic types of course are provided by the TTF and intakes are in large part driven by the need for Lyneham to have tanker crews (qualified in both dispensing and receiving fuel and distributed amongst Nos 24 and 30 Squadrons) and receiver-only crews (spread fleet-wide) available for duty at any time. To meet this need, the TTF usually runs four tanker courses (of five weeks duration) and five receiver courses (of two weeks duration) annually. Again, planning is all important, for aerial refuelling is very much dependent upon outside agencies, with tanker courses requiring 'customers' while receiver course require tankers.

Additional work stems from the requirement for all AAR-capable aircrew to re-qualify within 12 months of attaining initial capability. This is a TTF responsibility, but thereafter, annual currency is monitored by an operational squadron's own AAR training personnel, who themselves will have completed one of the periodic AAR Instructor courses that are run by the TTF.

Little known it might be, but there is no doubt that No 242 OCU's influence is far-reaching, for its activities affect the lives and careers of everyone who serves as aircrew with the tightly-knit transport community at RAF Lyneham. Looking ahead, computer-based training is to be introduced by the GTS element during 1992 and this will be accompanied by some reorganisation so as to permit the ground, air and simulator conversion training phases to be more closely integrated. Implementing this new concept seems certain to allow the OCU instructors to turn out an even better product and will ensure that they continue to function as Britain's 'Hercules University'.

Below: *Aerial refuelling training is undertaken by the Tanker Training Flight (TTF).* API & John Dunnell





THE BELIZE EXPERIENCE



Heading picture: *Flt Lt Gavin Davey guides 'Charlie Lima' along the Atlantic coastline, a vital navigational tool for the radarless Puma.* Above: *Harrier GR3 XZ987, with Wg Cdr Haward at the helm, makes a fast pass over the Cays off the Belizean coast.* All photographs Tony Holmes

Tony Holmes

Thirty years ago, an overseas posting in the RAF meant the chance to spend some time in a far flung corner of the former Empire. Tengah, Butterworth, Kai Tak, Muharraq and Akrotiri were just some of the possibilities on offer, breaking up the drudgery of a service career spent shuffling between some of the less than exotic locations on offer back home.

Flying a fighter sweep over the lush jungle or arid desert plain was an everyday occurrence for Hunter pilots in half-a-dozen squadrons. Bombing exercises that would involve overflying hundreds of miles of cool, blue ocean were handled in a matter-of-fact way by Canberra units, whilst Beverley groundcrews had ample time to perfect their tans in the broiling equatorial sun as they toiled away on rectifying minor faults on the aircraft's hard-worked Bristol Centaurus powerplants.

Returning to the stark reality of 1992, the average serviceman (or woman) is unlikely to endure the rigours of an out-of-theatre deployment, let alone a permanent period of time stationed outside of Europe. With bases being rationalised in Germany, and Hong Kong's return to Chinese control in 1997, the prospects of an adventurous young RAF recruit securing an overseas assignment are minimal. However, in amongst all this doom and gloom shines one small ray of hope, emanating from an obscure Central American country known as Belize.

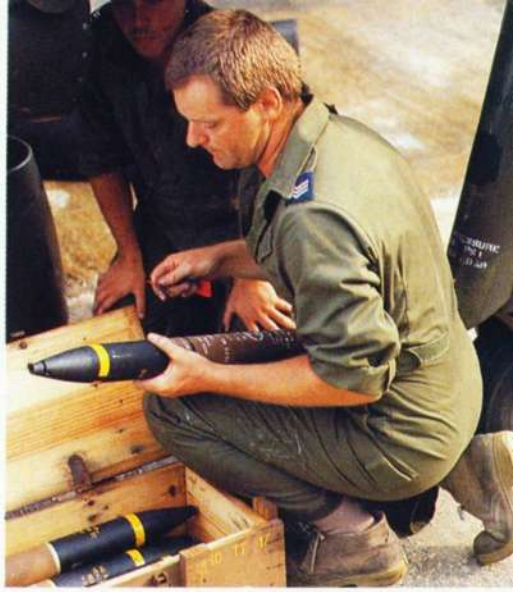
For many years little more than a tropical outpost of the Commonwealth, Belize (or British Honduras as it was then known) was conspicuous by its absence on the RAF posting rosters, the lush tropical rainforests never reverberating to the crackling whine of a jet engine. However, this all changed on 5 November 1975 when six Harrier GR1As from No 1 Squadron (assisted by Victor K2s) deployed to Belize International Airport in a show of force triggered by neighbouring Guatemala's expansionistic overtures. From that day RAF Strike Command has maintained a presence within the borders of the fledgling nation, thus ensuring its sovereignty.

Today, the threat posed by Guatemala is thought to be minimal. Indeed, Harrier GR3s and Puma HC1s performed at an official Guatemalan Air Force air show in 1990 after being invited across the border by their former protagonists. Nevertheless, the Government of Belize has requested that British armed forces remain based in-theatre, the Harrier GR3s of No 1417 Flight and the Puma HC1s of No 1563 Flight continuing to operate in support of the resident Army battalion.

All but retired from frontline service back in Europe, the venerable GR3 still maintains a toe-hold in Central America, four aircraft wearing the Flight's traditional sailfish emblem. Tasked in the main with the low-level CAS (Close Air Support) missions, the quartet of Harrier pilots in Belize thoroughly enjoy the freedom associated with flying a fast jet in this part of the world.

"Compared to Europe, we are not penned in all over the place by prohibited areas. The country is the size of Wales, but only has a population the size of Swansea spread across it. It numbers about 170,000, of which roughly one-third live in Belize City. Therefore, the majority





Above right: *Landing light ablaze and canopy cranked back, Sqn Ldr 'Fin' Finlayson slowly tracks down the short taxiway that links 'Foxy Golf's' hide with the runway.* Above left: *Just as the GR3 is unique to Belize, so too is the ordnance that it carries. The SNEB rocket pods feature prominantly during a typical week's flying for No 1417 Flight.*

of the country is empty, and we as pilots do not have to worry about major airports, mink farms or annoying villagers, because they are just not there. In their place is jungle, mountains, marsh and swamp land. As a result, we can get on with our job in a much more open and free fashion than we would be able to in Europe", explained Sqn Ldr John 'Fin' Finlayson, seasoned veteran of low-level flying in Belize.

All four pilots on strength with the Flight are senior Harrier operators, having amassed over 5,500 flying hours on-type between them. Selection for a tour in Belize rests almost solely on the prospective pilot's experience on the GR3. Up until two years ago, all members of the Harrier community were qualified on this type. However, with the progressive introduction of the GR5/7 into frontline service, proficiency rating and accumulated hours on the rapidly disappearing GR3 are becoming hard to achieve.

Therefore, pilots chosen for service with No 1417 Flight are now spending a minimum of 18 months with the unit, as opposed to a three-month stay in the past. Although GR3s no longer dominate the ramps at Wittering or Gütersloh, the Harrier T4 still serves as the primary trainer with No 233 OCU, this venerable jet allowing pilots to remain current on the GR3 through their similar handling characteristics and cockpit layouts.



The current boss of No 1417 Flight, Wg Cdr David Haward, believes this commonality will ensure that sufficient numbers of GR3-qualified pilots will remain in the system to operate the Harriers in Belize for the rest of the jet's frontline life. "All the pilots going through on the OCU for the GR5/7 have all flown the T4, and the odd trip in a GR3, so it is not so much of a back conversion as it would be if they had not operated the T4", he said.

Because of their paucity in numbers, the pilots usually amass plenty of flying hours in the course of a typical month. From Monday to Friday, six sorties are flown each morning before midday, two waves of three aircraft being launched, usually on low-level support missions. The morning push allows the Flight to avoid the worst of the civilian traffic, which shuttles in and out of the International Airport with increasing regularity. This routine also allows the groundcrews to work exclusively on unserviceable jets without having to pre-flight aircraft for afternoon sorties. As a result, the availability of Harriers on-line in Belize is appreciably better than that achieved by frontline units back in Europe.

The four Harriers are split between two autonomous hides ('Charlie Delta' and 'Foxy Golf') situated on either side of the airport's solitary runway. Here, the aircraft are worked on by 12-man teams who live permanently within the barbed-wire compounds. Each serviceable jet is maintained on a 20min state of readiness, fuelled up, primed and ready to roll should Belizean airspace be violated.

In RAF service the Harrier has been predominantly used as a 'mud mover', but in Belize, the GR3 also doubles as a fighter. Pilots regularly perform practice air intercepts and combat manoeuvring during their stint with the Flight, the curriculum consisting of 40 minutes two-v-one sorties out over the coast at medium altitude. Crews take it in turns to be 'bounced', the defending Harriers being vectored onto the 'intruder' by fighter controllers operating the elderly SPY1 'Butcher Radar' back at Airport Camp (APC).

Aside from the twin 30mm Aden cannon affixed to the GR3's belly, two Harriers have been modified to allow the carriage of AIM-9G Sidewinders on the outer wing hardpoints. Known as the Operation *Corporate* Phase Six update, these airframes have received wiring mods to facilitate the mounting and firing of air-to-air missiles.

Returning to their primary task of close air support, the pilots in Belize utilise three weapons ranges; New River Lagoon, Baldy Beacon and Seven Hills. Each presents a different challenge to both aircrew and the Primary Forward Air Controller (PFAC), guiding the jets in from ground level. The Harriers are usually armed with SNEB rockets, practice bombs, 30mm cannon and, occasionally, cluster bomb units. With the help of the PFAC, the pilots enjoy laser designation on the targets, drastically improving the accurate delivery of ordnance.

Although the Harrier can transit across the thick jungle of Belize quicker than any other aircraft in-theatre, it cannot carry upwards of ten fully-equipped soldiers from the APC barracks to a jungle clearing on the Guatemalan border, land, and off-load its human cargo, then extract another squad of troops and haul them back to Belize City.

This vital task is left to No 1563 Flight, and its four Puma HC1s. Part of the RAF contingent in Belize for almost as long as the Harriers, the Pumas work closely with the Army, and its various squads on patrol

out in the jungle near the country's western border. As with the Harrier Flight, there are only enough aircrew present in-theatre to man each helicopter, four pilots and four crewmen sharing the tasking between them. Unlike the fast jet pilots, the Puma crews only spend three months at APC before being rotated back to their parent units at Odiham (No 33 Sqn) or Gütersloh (No 230 Sqn). Typically, at any one time, 75% of both the air and groundcrew on strength with No 1563 Flight will have come from the former unit. This split is also reflected in the hardware they operate: three of the four Pumas in Belize wear the 'C' prefixed codes of No 33 Sqn.

Everyday missions undertaken by the crews include the supply 'milk-run' down to the border outposts at Union Camp, Cadenas Op and No Name Rebro, the Puma being loaded up with mail, foodstuffs, communications equipment and replacement troops from the APC garrison. The landing sites at these jungle bases often consist of a small square of PSP (pierced steel planking) just large enough to set a Puma down on. Making full use of the mountainous topography, the outposts are invariably perched at the summit of the rocky outcrops, thus further eroding the Puma's performance in the hover due to their operational height above sea level. Paired with the sapping heat of the Belizean jungle, the incredible hovering heights encountered by the crews reduce the helicopter's throttle response appreciably, cutting into its load-carrying capacity.

Because of these unique operational requirements, the Flight only receives combat ready aircrew to fill the flying slots in Belize. As a result, the flying standards maintained are consistently high, with crews learning to cope with jungle operations very quickly.

Belize is a big country for four Pumas to cover from a base not entirely central to the operational theatre, so in an effort to increase the helicopters' range, several of the larger landing sites have stockpiles of Avtur. These usually consist of several Air-Portable Fuel Cells (APFC), which, when exhausted, are flown back to APC and replenished.

Aside from flying the 'milk-run', the Puma crews also participate in regimental exercises out over the jungle training school range in the deep south-west of Belize. Occasionally, the Royal Artillery requests the movement of one of its 105mm Light Guns, the Puma being able to carry the weapon to any of the 150-plus landing sites scattered across the country in less than an hour – a trip that could take up to 20 hours by road. The PFAC, and his squad, also regularly utilise the Flight when operating out on the weapons ranges, loading his laser designating unit and associated kit aboard the helicopter for the short flight out to New River Lagoon or Seven Hills.

The Flight also maintains a permanent standby element for disaster relief and search and rescue (SAR) in the region, regularly conducting hurricane deployment exercises to the Caribbean Islands. In 1986, the Puma crews were heavily involved in earthquake relief in Mexico and Colombia, and today the bulk of the unit's SAR work involves transporting traffic accident victims from the scene of the smash to Belize City hospital.

Should a Harrier or Puma go down in the jungle the third major RAF unit at APC would come into play. The flight safety team of No 16 Sqn RAF Regiment would be tasked with retrieving any casualties from the crash site, this small band of men being fully trained in jungle SAR techniques. Although this is an important task for the unit, SAR work is not the squadron's primary role in Belize. Two Field Standard B1(M) Rapier missile sites are located on either side of the airport's runway, these systems providing APC with short-range air defence cover. Fully autonomous, these sites are home for two six-man crews from the Wildenrath-based unit.

The Rapiers provide an overt deterrent which effectively convinces any passers through Belize of the Regiment's ability to defend APC. The crews regularly practice intercepts by acquiring aircraft in the pattern over the airport and tracking them in until they land. Besides the SAR and air defence roles, the squadron also participates in border patrol work, the regiment regularly relieving Army squads and heading into the jungle on eight-day sorties.

If it's variety you want, and you don't mind the sweaty humidity, then Belize is the place to be. Although the threat from neighbouring Guatemala has receded somewhat, the personnel stationed at APC still go about their daily tasks with a professional resolve that is undiminished.



Below: *Union Camp consists of little more than a stone-walled enclave for the resident patrol and a small square of PSP (pierced-steel planking) large enough to set a Puma down on. Immediately behind the Puma is Guatemala.* Right: *As with operations in Europe, the Puma crews in Belize consist of only two men; pilot and aircrewman. The crewman in this case is Sgt Alan Swan.*



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This illustration is taken from a poster displayed on Shell lorries before the outbreak of the Second World War, in 1939.

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Shell Aviation Service

A year after the successful conclusion of Operations Granby and Desert Storm, *Group Captain Neil Taylor* reviews the effectiveness of the Gulf Air War and outlines its implications for the Royal Air Force



JP233 airfield denial weapons were carried by Tornado GR1s on early missions. Andy Glover

GULF RETROSPECT

The Iraqi invasion of Kuwait was a salutary reminder that, while the direct threats which we have faced for the last 40 and more years are now receding, significant risks of conflict elsewhere in the World remain. Within 24 hours Kuwait was occupied and large numbers of Iraqi forces began to mass on the Northern Saudi border. The grave and apparently immediate threat to Saudi Arabia demanded an immediate response from the international community. The air power build-up was particularly rapid and proved decisive in deterring further Iraqi aggression and containing the crisis in its early critical stages. By Day 5 of the crisis, 301 Allied aircraft were 'in-theatre'; by Day 35 this had increased to 1220 and by the start of the Allied air campaign it stood at 2430. The numbers continued to increase, and by the start of the Allied land attack, some 2790 Allied aircraft were either deployed in the theatre or were capable of projecting military power directly into it.

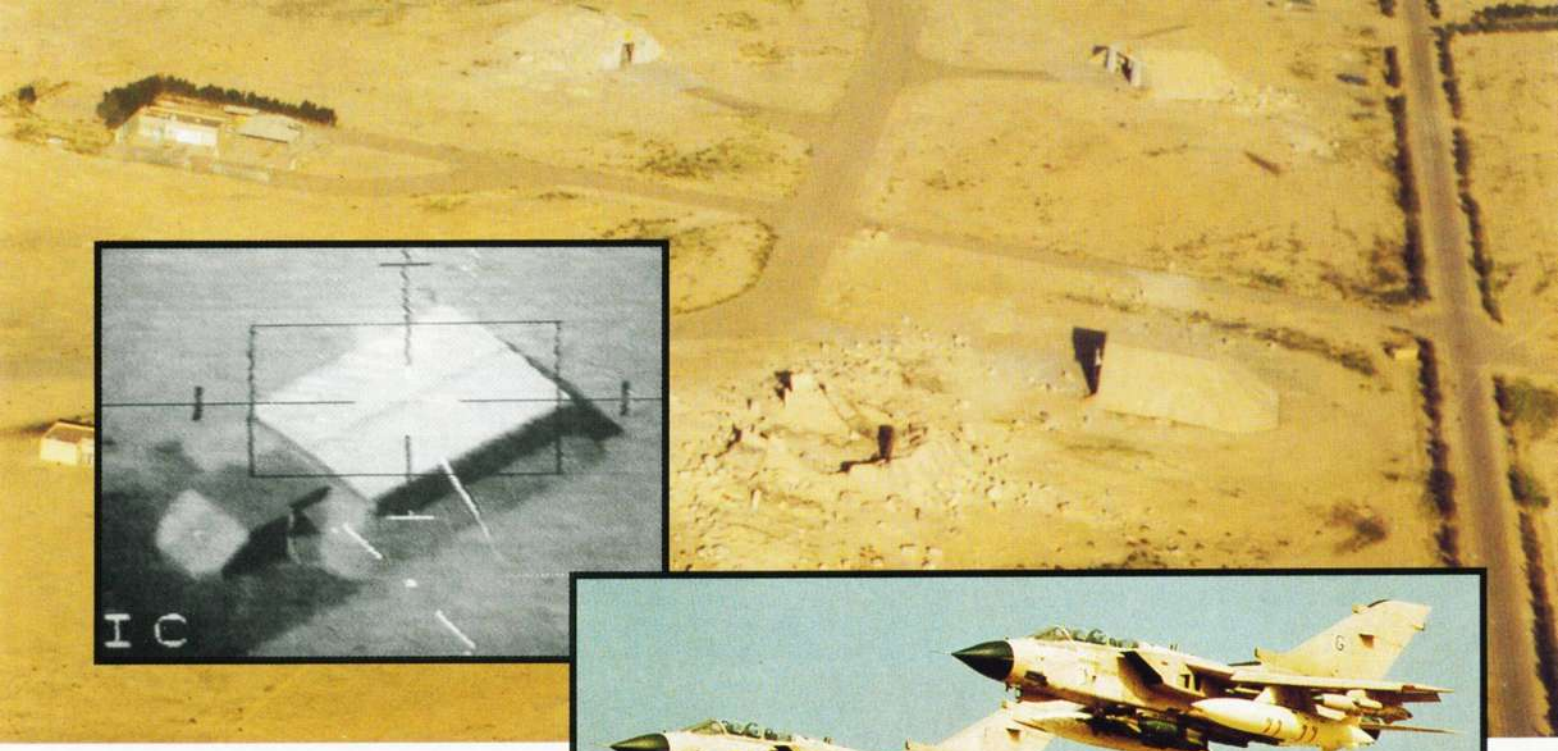
While the build-up continued, Allied air crew already in-theatre carried out intensive operational flying training. Ultra-low flying skills were honed and intercept training under AWACS control became the norm for air defence crews. Perhaps inevitably, the Allied air forces sustained some losses during this period as crews pushed themselves and their aircraft to the very limits. Overall, some 21 Allied aircraft were lost in accidents during this phase; the RAF lost one Jaguar and one Tornado.

Throughout the build-up the Allies were conscious of the danger of an Iraqi pre-emptive attack against the growing concentrations of high-value assets, equipment and personnel within Saudi Arabia and the Northern Gulf. To protect against this threat, coalition forces maintained up to 20 fighters flying combat air patrols (CAPs) for 24 hours per day, continuously. Airspace control was achieved by dividing the Gulf and adjacent areas into a number of zones: the Red Sea, South, West, Central East and Gulf. AWACS aircraft were airborne constantly and – like the fighter CAPs – were supported by a stream of tankers. A layered air defence system was created using Patriot and Hawk surface-to-air missiles (SAMs) to provide area defence while SHORAD was deployed for point defence of key facilities. The management of this very crowded and potentially deadly airspace was one of the many triumphs of the war. Throughout seven months of crisis and conflict during which several hundred thousand sorties were flown, not one 'blue-on-blue' air engagement rook place; this was a fine tribute to the high standards of training and discipline of all concerned.

While military preparations continued, diplomatic efforts were intensified. On 29 November 1990, the United Nations Security Council applied further diplomatic pressure on Iraq by passing Resolution 678 which authorised the multi-national forces in the Gulf to take appropriate action if Iraq failed to withdraw its forces from Kuwait by midnight Eastern Standard Time on 15 January 1991. However, as December gave way to January, it became increasingly clear that Saddam Hussein would not withdraw from Kuwait. But by this time Allied air power was ready. Training skills had reached a peak, stocks of spares and weapons were at wartime levels and personnel, aircraft and ground equipment were fully prepared and protected. Thus, 19 hours after the expiry of the Resolution 678 deadline – and with no sign in sight of an Iraqi withdrawal or any prospect of a peaceful resolution to the crisis – the Allied forces began a major offensive under the code name Operation *Desert Storm.*

The operational problem that faced the multi-national forces in the Gulf was quite severe. In numerical terms, Iraq had the world's fourth biggest army and the tenth largest Air Force. On the ground the balance of advantage lay firmly with the Iraqis. The number of troops and tanks deployed by each side within the Kuwait theatre of operations was broadly equal, but the Iraqis enjoyed important advantages. They held strong field defences, had a marked superiority in artillery and their troops and commanders were highly experienced in fighting defensive battles. In terms of a ground versus ground fight the Allies faced the prospect of a potentially costly struggle to liberate Kuwait.

The Iraqis also enjoyed some important advantages in the air. They had a very



Hardened aircraft shelters were succesfully targeted (main picture and inset) *by precision attacks with laser guided bombs (LGBs).* Mark Robinson Above: *A pair of Tornado GR1s equipped with LGBs take off for a mission over Iraq.* N.Risdale

strong, integrated surface-to-air defence system employing some 7000 SAMs and 10,000 anti-aircraft artillery (AAA) pieces. They also operated substantial numbers of advanced aircraft, most notably the Mirage F1, MiG-29 and Su-24. But perhaps their greatest strength lay in the survivability of their bases. The Iraqis possessed some 24 very large and heavily fortified main operating bases and a further 30 major dispersal airfields. Most had runways of 10,000 ft in length with parallel taxiways, and many covered huge acreages. For example, Talill Air Base in South East Iraq covered 9000 acres – over twice the area of Heathrow Airport. The Iraqi air bases were also well-provided with hardened aircraft shelters connected to the operating surfaces by multiple access lanes, and all were protected by multiple SAMs and AAA. All this meant that these bases were formidable targets and virtually impossible to close for an extended period even with advanced weapons and large numbers of aircraft.

But despite these significant Iraqi advantages, the overall balance in the air was heavily weighted in favour of the Allies. Partly this was a function of numbers. At the start of the crisis the Iraqi Air Force possessed over 600 fixed-wing combat aircraft, augmented by a further 160 armed helicopters under Army control. In contrast, by 15 January the Allies had over 2400 aircraft based either within the theatre of operations or close enough to be capable of projecting power into it. These latter included not only the carrier-based air power from six US Navy carrier battlegroups, but also US air forces based in Turkey and B-52 bombers based in Diego Garcia and Moron in Spain (and subsequently at RAF Fairford).

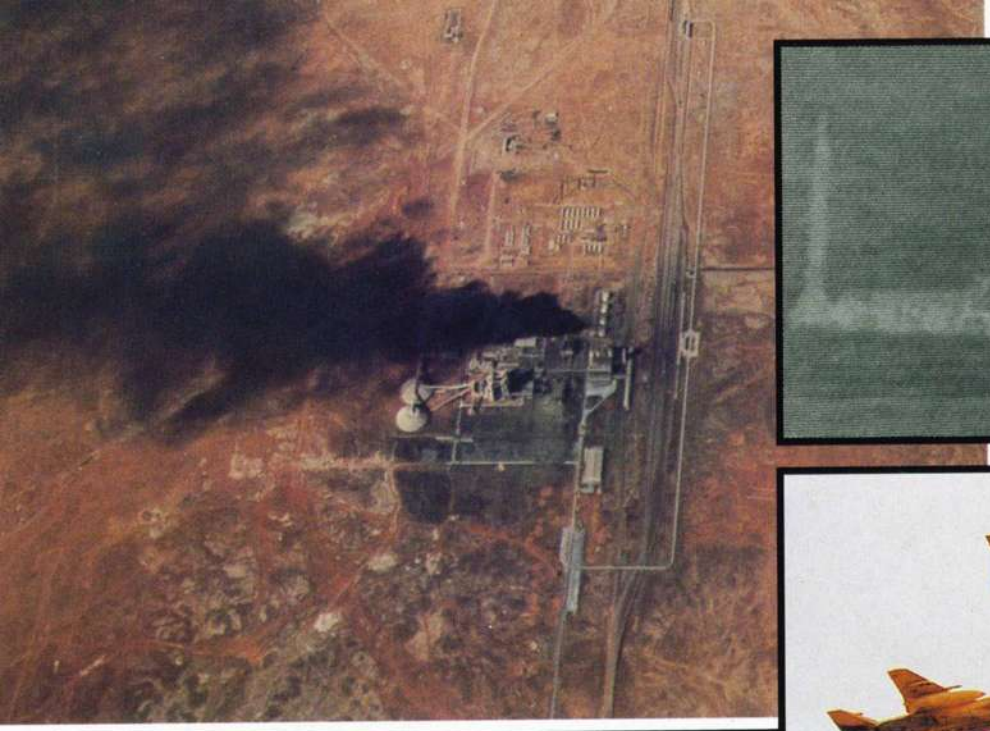
If the Allied numerical superiority over the Iraqi air forces was very great, their technological superiority in terms both of platforms and weapons was even more marked. At the outbreak of hostilities, the technological level of the Iraqi order of battle was variable. Although the Iraqis possessed advanced aircraft, perhaps half of their Air Force's front line consisted of variants of obsolescent MiG and Sukhoi designs. In contrast, many of the combat aircraft and weapons of the Allied air forces were at the cutting edge of technology and a generation in advance of those of the Iraqis. Virtually every type of current-generation United States and British combat aircraft was deployed in the Gulf. The Allied superiority in air-delivered weapons was no less marked than its superiority in platforms. The Allies deployed a wide range of 'smart' weapons such as TV, infra-red, radar, and laser-guided bombs and missiles, as well as conventional cruise missiles. The Allied air armoury also included a number of special conventional weapons. Some were designed to penetrate deep concrete bunkers, while others such as the 15,000 lb BLU-82 blast bomb were designed for minefield clearance.

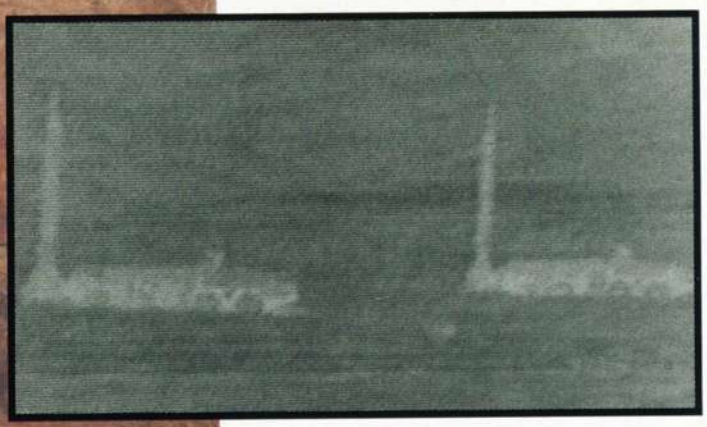
Moreover, to make the most of their formidable combat air power, the Allies had also deployed a wide range of combat-support air forces, notably air-to-air refuelling tankers, reconnaissance and surveillance aircraft and electronic warfare aircraft. These so called 'force-multipliers' added substantially to the technological lead already enjoyed by the Allied air forces, and they were crucial in helping the Allies to develop to the full their combat air potential.

But perhaps of greatest importance was the difference in training, doctrine and organisation between the opposing forces. The Iraqi Air Force was built essentially on the Soviet model; organised on a regional basis and with an ethos which discouraged individual air crew initiative, it had an undistinguished history. During the Iran/Iraq War, despite the virtual absence of effective opposition, the Iraqi Air Force remained primarily on the defensive. It tended to operate in 'penny packets', and because of poor airmanship and lack of target intelligence, it proved to be generally ineffective. Although some successful attacks were launched against oil and shipping targets, the majority of Iraqi Air Force operations took the form of close-in, single-pass hit-and-run missions using small numbers of aircraft. At no time were more than six aircraft used, and follow-on attacks were very rare. All this meant that the Iraqi Air Force had little impact on the course of operations in that war.

Combat air patrols (CAPs) were flown by Tornado F3s of Nos 29(F) and 43(F) Squadrons. Dave Edwards











Designated targets included Iraqi oil installations (top left) *and mobile Scud missile launchers* (above top), *the latter proving difficult to locate.*

Jaguars deployed to the Gulf (above) *were reliant on air-to-air refeulling provided by a mix of TriStars, Victors and VC10s.* John Dunnell Left: *A No 101 Sqn VC10 K3 provides air-to-air replenishment for two JP233-equipped Tornado GR1s.* Mike Lumb

By the time of the invasion of Kuwait, the Iraqi Air Force appeared to have changed little from the days of the Iran/Iraq War. Iraqi Air Force leaders apparently believed that the Iraqi Army's surface-to-air defence capabilities were as lethal to friend as they were to foe. As a result, the Iraqi Air Force had put little effort into developing the joint doctrines so critical to modern land/air warfare, a situation made worse by the lack of initiative and innovation bestowed on the Force by its rigid and stereotyped Soviet-style training regime. Moreover, compared with their opposite numbers in the Allied Air Forces, Iraqi air crew flew far less, followed a relatively undemanding training profile and – as a result – possessed far less tactical skill.

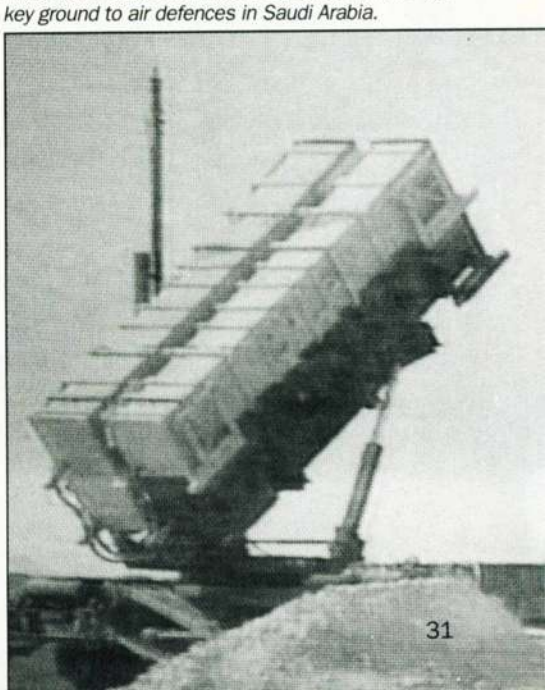
The net effect of all this gave the Allies a potentially decisive edge upon which they sought to capitalise through their campaign plan. For the Allies, air power was the principal force element and the primary means of achieving success with the least possible casualties. Air power had to be used to win the battle of air superiority, to destroy the Iraqi nation's ability to sustain the war and to cripple the Iraqi Army as a cohesive fighting force; and it had to be used to spearhead the physical liberation of Kuwait. For the Allies, the Gulf War had to be primarily an air power war.

Consequently, the initial Allied action took the form of an air campaign, and this was itself divided into four distinct phases. Phase 1 – planned to last for seven to ten days – was designed primarily to achieve overall air supremacy and damage Iraqi strategic capabilities. Phase 2 – the suppression of the Iraq surface-to-air defences within the Kuwait theatre of operations (KTO) – was planned to be brief and lead directly into Phase 3. In this phase the Allies intended to concentrate their attacks against the Iraqi Army in the KTO with the aim of destroying (in just over three weeks) half of its tanks, armoured personnel carriers and artillery. The prime aim of the fourth and final phase was to provide direct support for the Allied land force offensive.

It has been said that 'no plan survives contact with the enemy' and the Gulf War proved no exception to this well-established piece of military wisdom. The weather – the worst ever recorded for the region – obscured many targets from visual and laser-guided attacks, and the air effort diverted into what became known as 'the great Scud chase' was three times that anticipated by the planners. As a result, *G Day* – the date set for the Allied land forces to attack – slipped from Day 30 to Day 39 of the war. Moreover, as operations developed, the various phases of the campaign began to merge and overlap. Yet despite these and other inevitable problems, the success achieved by the air campaign was unprecedented in the history of warfare. The Allies launched between 2000-3000 sorties a day throughout the conflict and, on average, one Allied bombing sortie took place every minute of every day. By *G Day*, the Allied Air Forces had mounted nearly 100,000 sorties and achieved outstanding results.

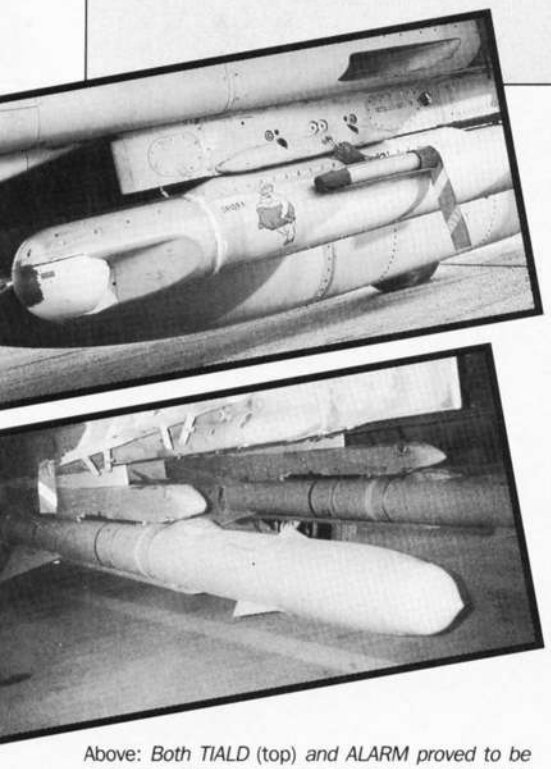
The counter-air element of the campaign had effectively killed the Iraqi Air Force as a fighting force by Day 10 of the conflict. Allied bombing attacks on key command nodes and radars, had in a matter of hours crippled the highly centralised Iraqi surface-to-air defence system. At the same time, Allied offensive counter-air attacks on Iraqi airfields severely dislocated Iraqi air operations. Before the war, the Iraqi Air

American Patriot anti-missile batteries formed the key ground to air defences in Saudi Arabia.





Above: *Pave Spike-equipped Buccaneers, providing laser designation for accompanying Tornados, subsequently carried LGBs on bombing sorties themselves.* Bob Archer



Above: *Both TIALD* (top) *and ALARM proved to be extremely effective weapons even though trials had not been concluded.* Norman Robeson

Force was managing to fly about 100 sorties per day. But during Days 1 to 3 of the Allied air campaign – when the Iraqi Air Force could have been expected to increase their sortie rates in response to Allied attacks – it flew only 50 sorties per day; only a handful of these were offensive missions. On Day 7 of the war the Allies shifted their offensive counter-air effort to targeting Iraqi hardened aircraft shelters, and by Day 9 the Iraqi Air Force threw in the towel and dispersed its surviving aircraft either to Iran or to the woods and villages around its bases. In the last two weeks of the war it launched hardly a single sortie, and Allied aircraft operated over Iraq virtually unchallenged.

The strategic bombing element of the Campaign enjoyed even greater success than the counter-air element. By *G Day* much of Iraq's strategic installations lay in ruins. Iraq's nuclear research and production had been almost totally destroyed, while chemical and biological warfare facilities had been severely damaged. Half of Iraq's oil-refining capacity had been destroyed, the national electricity grid had been 'broken' and transport feeder routes to Kuwait cut by half. In effect, Iraq's ability to sustain its war machine had been crippled. The great precision of Allied air attacks meant that – despite some tragic instances – Iraqi civilian casualties and collateral damage were very low indeed in relation to the enormous and wide-ranging damage inflicted upon Iraq's strategic and military installations.

Nearer the battlefront, Allied air power had effectively sunk Iraq's Navy and grievously wounded its Army. According to recently published figures in the United States, physical losses by the Iraqis included over 1500 tanks, 1500 artillery pieces and 1200 armoured personnel carriers, representing nearly half of these equipment categories deployed by them within the Kuwait Theatre of Operations. But of equal importance, were the consequential effects of dislocation and demoralisation. Battered day and night from the air, cut off from much of its supplies and with its command and control in shreds, the Iraqi Army had – by *G Day* – been reduced to a collection of isolated and dispirited units which in many cases were eager to surrender. It was the combination of all these effects that wrecked the Iraqi army as an effective and cohesive fighting force and paved the way for the rapid – and for the Allies relatively bloodless – liberation of Kuwait. The so-called 100-hour 'Ground War' was in reality a highly integrated land-air operation in which the air and land forces operated together as equal partners providing each other with mutual support and mutual opportunities.

When the ceasefire came into effect on 3 March, the Allied Air Forces had flown 110,000 sorties and dropped 88,500 tons of bombs (of which some 7,400 tons were precision-guided). The effects were quite literally devastating. Nearly 350 of Iraq's combat aircraft (50% of its total) had been either destroyed or driven into exile. Half of Iraq's airfields needed major repairs to their operating surfaces, while a further number were damaged to lesser degrees. And 64% of the Iraqi hardened aircraft shelters had been destroyed or suffered major damage. Iraq's nuclear, biological and chemical weapon production plants and the country's electrical generation capacity had been badly damaged, and a wide range of other strategic facilities had suffered varying degrees of destruction. Within Kuwait, Iraqi losses finally totalled 43 divisions, 3700 tanks, 2400 armoured personnel carriers, 2600 artillery pieces, 14 warships and 11 auxiliary vessels.

By any standards it was a decisive victory, and it was a victory in which air power played the dominant part. As the US Air Force Chief of Staff General McPeak pointed out, the Gulf War was "the first time in history that a field army had been defeated by air power". For that reason alone it will inevitably become an important case study for the future. A full and authoritative assessment of the implications of the War for British forces is yet to be finalised, but what was clearly demonstrated above all else during the Campaign, was the vital need to attain air superiority in any conflict. Gaining and maintaining the required degree of control of the air should always be a commander's first priority when faced with an opponent who is equipped with an air force. Coalition forces were faced with an integrated, Soviet-style air defence system twice as dense as any in Europe at the height of the Cold War and yet the system was broken in a matter of hours. It may not always be as easy in any future conflict to achieve such spectacular results so quickly, but it should now be clear what will happen if any air force allows the level of air supremacy attained over Iraq to be achieved again: final, crushing and irredeemable defeat.

The Gulf War also illustrated that the precision of modern air attack has revolutionised warfare. In WW2, bomb accuracies were measured in terms of miles but in the Gulf War, 70% of the precision guided bombs dropped by the Allies struck within two metres of their aiming point. Such accuracy reduces the number of sorties that need to be flown, reduces the time taken to achieve the desired results and reduces the risk to the aircrew flying the sorties. Importantly, too, such improved accuracy reduces the risk of unwanted collateral damage and unintended civilian casualties.

Next the Gulf War demonstrated the need to be able to supply and reinforce forces quickly over great distances. US forces were able to draw heavily on pre-positioned stockpiles of equipment but British forces had to be supplied from UK and German bases. Up to 500 tonnes of essential equipment was flown out in a variety of aircraft daily but the majority was transported by sea; fortunately, on this occasion there was a lengthy build-up period available. It is worthy of note though that the number of air transport movements generated by Operation *Granby* was equivalent to 10 years worth at the normal peacetime rate.

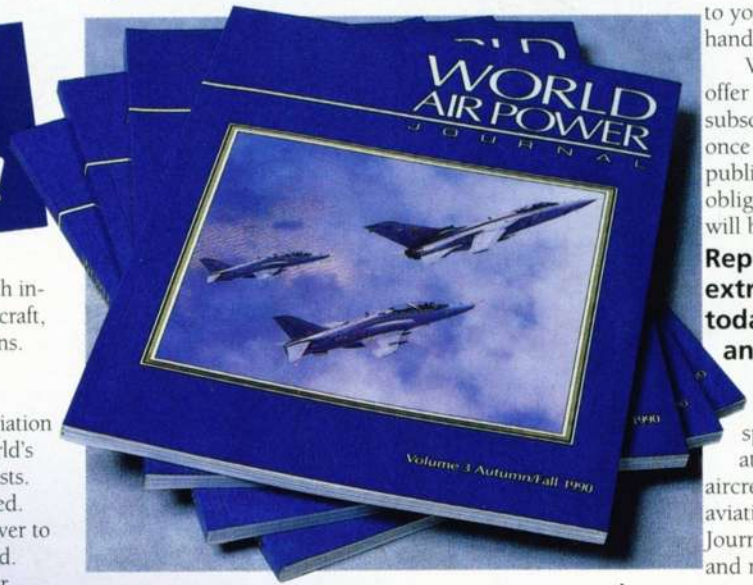
Finally, it showed that quality, above all else, was the dominant factor in air power effectiveness. It was not so much in quantitative but rather in qualitative terms that the Iraqi Air Force was critically weak. Air power quality has many functions: quality of technology, quality of training, quality of organisation, quality of thought and doctrine, and, arguably the most important of all, the quality of our people. In all these areas coalition forces were much better prepared. The challenge we face in the aftermath of the War is to ensure that the importance of these qualities is never forgotten.

Group Captain Neil Taylor BSc, RAF, is Director of Defence Studies (RAF).

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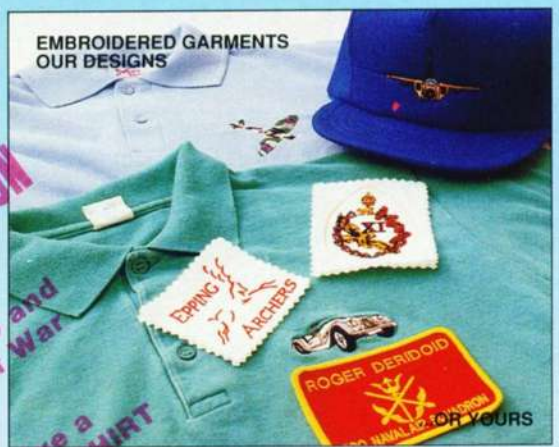
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All in a day's airlifting for the Tristar, reports *Paul Jackson*

Main picture: *Tanker in transport's clothing. One of the two Tristar K1s awaits the arrival of its passengers on the ramp at Akrotiri.* Paul Jackson





Right: *No 216 Sqn's Tristar tankers played an important part in deploying RAF aircraft to and from the Gulf for 12 months from August 1990.* Mike Rondot

The next-best alternative to being everywhere at once is to be able to go anywhere at a moment's notice. In strategic terms, omnipresence is highly desirable but financially prohibitive, so major air forces have opted for maximisation of their assets by equipping some units to respond rapidly over great distances. One example of this force-multiplication is the tanker/transport which is able to accompany and air-refuel combat aircraft during a long transit flight whilst carrying in its cabin the men and ground equipment to service the machines immediately on arrival in the war zone. It was the aftermath of the Falklands War ten years ago which prompted the RAF to obtain its first true tanker/transports, and although other duties have diluted the original concept of a pure refueller, the aircraft are perhaps even busier than envisaged in their roles of freighting and passenger carrying.

Six Lockheed TriStar Srs 500 wide-bodied airliners were originally bought from British Airways in 1982 to replace hard-pressed Victors in refuelling RAF Hercules transports operating between Ascension Island and the small airport at Port Stanley. However, before the first tanker conversion was complete, the decision was made to build a major air base on the Falkland Islands which would allow aircraft of TriStar size to bring troops and combat aircraft directly to the South Atlantic outpost if it were again threatened.

Some 14 months were to elapse between the start of RAF passenger-carrying TriStar flights (with help from British Airways flight crews) and formation of No 216 Squadron at Brize Norton, Oxfordshire on 1 November 1984. Today, 'two-sixteen' squadron – say 'two-one-six' at your peril – has an establishment of eight aircraft in no less than three configurations and is fully occupied flying scheduled and unscheduled sorties to all corners of the Globe.

It took until December 1990 for the original six aircraft to complete modification to the planned standards at Marshall of Cambridge (Engineering) Ltd, although all had served in interim capacities since delivery. Four, serialled ZD948, '950, '952 and '953, are Tristar KC1s (note the small 's' in RAF nomenclature) with a 104in by 140in cargo door added to the port side of the forward fuselage and a reinforced floor. The others, ZD949 and '951, are Tristar K1s with normal floors and doors.

All six have been fitted with two Flight Refuelling Ltd Mk 17 tanker hose-drum units (HDUs) in the lower rear fuselage and additionalfuel tanks in the under-floor cargo bay to increase their fuel capacity to 313,300lb, or a little over 142 tonnes. This should be regarded as a theoretical figure, as with all tanks full the Tristar KC1 would exceed its 245 tonne maximum take-off weight by 16 tonnes. Mounted virtually side-by-side, the two HDUs cannot refuel a pair of aircraft simultaneously, but are to give redundancy in the event that one should fail during a mission.

Cabin capacity of the KC1 is 20 standard-size freight pallets, on which are mounted seats, cargo or even a galley. Technically, the maximum for seating is 266, but this is normally restricted to 196 to allow for refreshment facilities and





Top: *The two K1s were given desert pink camouflage for service during the air war in the Gulf, being known as Pinky and Perky.* PRM Above: *Tristar C2 ZE704, one of a pair of passenger transports that entered service in 1985.* PRM

reservation of some pallets for luggage, the usual space for which is occupied by the extra fuel. The less versatile K1s now take up to 187 seats, having previously been outfitted for a maximum of 202.

In September 1985 No 216 took delivery of two ex-Pan Am TriStar 500s (N508PA and N509PA) whilst a third (N503PA) was put in long-term storage at Cambridge. With slightly different avionics, the new aircraft were designated Tristar C2 and placed in passenger-carrying service (as ZE704 and ZE705) pending conversion to K2 tankers. In this guise, their lack of a rear freight door would have posed problems for installation of extra tankage and thus slightly reduced maximum capacity. Following a re-think of requirements, it was decided to fit the K2s with only a pair of under-wing FRL Mk 32B refuelling pods (as then also planned for the K1s and KC1s) and leave them with just the standard airliner fuel capacity of 213,240lb. As such, they would have been known as C2(K)s.

This plan also floundered on the practicalities of refuelling drogue stability and proximity of receiving aircraft to the tailplane. Having proved themselves valuable on the twice-weekly Falkland Islands run, the C2s are now likely to be left as passenger-carriers. If funding permits, they will be brought to Mk 1 standards of military avionics as C2As – no UHF radios are currently fitted, for example – and joined by ZE706 from Cambridge acting as the first C2A. Seating arrangements were for 250 plus a small medevac area with stretcher supports, but have been increased since January 1992 to 267 without detriment to the latter. C2s fly three-quarters of the twice-weekly Falklands services and used to provide half the weekly Cyprus schedules until these went totally K1 in December 1991.

Taxpayers feeling aggrieved at the thought of service personnel lounging in club class whilst quaffing champagne on their way to an overseas posting may be pleased to learn that the Tristar C2 is (in the writer's experience) insufferably hot; was totally lacking in alcoholic refreshment until December 1991; devoid of all forms of entertainment, including earphones; bereft of duty-free facilities; 'non-smoking' on even the longest flights; and able to offer only tourist-class meals to be eaten with plastic cutlery. There may be less comfortable airlines operating somewhere in Latin America, but they do not have the benefit of RAF flight-deck and cabin crew who labour longer and harder than most civilian counterparts would tolerate.

No 216 Squadron has an establishment of 22 crews for its eight aircraft, comprising 44 stewards, 24 loadmasters, 24 engineers, 24 captains, 21 co-pilots and five administration staff. The working day for all can be up to 16 hours, followed by a minimum of 14 hours rest prior to the next duty. Typically, on the Falklands run, one crew flies the eight-hour leg from Brize Norton to Ascension Island, where a second joins to complete the service in a further seven hours, then brings back the aircraft to Ascension the following day. Cyprus-and-back can be covered by one crew in one day, but only on military working schedules.

Some 35% of the Squadron's flying is on scheduled flights to the Falklands and Cyprus. A further 55% is taken up with exercises and special or 'one off' tasks and the remaining 10% with regular tanking missions within the UK Air Defence Region. Despite the low last-mentioned figure, No 216 is officially classified as a tanker unit and so falls due for TACEVALS (tactical evaluations) just like any fighter or strike squadron.

Flying a typical support mission, perhaps to resupply an overseas detachment, a Tristar KC1 would be carrying 82 passengers and their luggage, plus eight freight pallets with up to 2 tonnes on each. One incongruity related to the immense capabilities of the aircraft is that even at its home base, the Tristar is unable to take off at the maximum permissible weight of 245 tonnes due to runway length limitations. Between 235 and 237 tonnes is the norm, but even at the 'other end' there can be problems with such a large aircraft.

The average military airfield – perhaps one overseas to which RAF combat aircraft have been detached – is not equipped with cargo-handling equipment big enough to reach the 15ft high sill of the freight deck, so alternative arrangements must be made well in advance. It also has to be borne in mind that the Tristar's wheel loading is high for some military bases: a vital consideration if 'that sinking feeling' is to be avoided. Putting this giant of the RAF into proportion, one Tristar load is theoretically equivalent to three VC10s or four Hercules. Alternatively, as a 'combi' the aircraft will carry the same number of passengers as a VC10, *plus* two VC10s-worth of freight.

Demands for Tristar transport are persistent, but varied. On behalf of the RAF, a normal 'trail' might be made to Nellis AFB in Nevada, taking strike/attack aircraft and support equipment for a *Red Flag* exercise. Normally, the route is via desolate Goose Bay, Canada, but for reasons unnecessary to elaborate, the winter transit through Bermuda is more popular with crews. Taking the army from Germany to its exercise ground near Calgary, Canada, involves short, sharp bursts of activity – five flights in seven days with 700 men and equipment – at regular intervals between April and October. In winter, less frequent training is conducted in Kenya, for which No 216 again obliges.

Non-standard exercises and deployments can take a Tristar tanker and its 'chicks' to exotic destinations in the Far East, the most memorable mission being the 'Golden Eagle' World circumnavigation by four Tornado F3s in 1988. Earlier that year, *Operation Fire Focus* practised a rapid reinforcement of the Falkland Islands resulting, incidentally, in the unprecedented sight of no less than four Tristars on the ground simultaneously at Mount Pleasant.

Eight crews – one third of the squadron – are kept current in tanking procedures, for which they fly regular missions in the tanker 'towlines' off UK shores. Their role here is no different to that of the VC10Ks or Victors which daily replenish any Strike Command aircraft which has booked an appointment, except that they are not usually scrambled to support fighters investigating Russian aircraft transiting the UK Air Defence Region. Although able to carry more fuel than other RAF tankers, the Tristar has to give it away more slowly: 4,000lb per minute, compared with twice 2,800lb/min from a VC10's two wing-mounted Mk 32 pods *(FRL figures)*. No 216's tanking hours may be reduced soon, when the new VC10 K4 refuelling conversions are delivered.

Servicing the Tristar involves an unusual compromise between the worlds of civil and military aviation. The squadron's engineering staff undertake Primary,





Above: *Seating is ten abreast in the wide cabin of a Tristar. Unlike other RAF transports, the aircraft retains the civilian style of forward-facing seats. Forward of the wing, the Tristar K1 has cargo space.* Photographs Paul Jackson

Inset: *Unloading a Tristar C2. In tanker versions the freight hold is occupied by additional fuel tanks.* Paul Jackson

Primary* and Primary** overhauls on a calendar basis (3, 6 and 12 months) instead of by hours flown. There is an hours 'back stop' (450, 950 and 1,800 respectively), but the first time that was triggered was by the exertions associated with supporting the liberation of Kuwait in *Operation Granby*. Minor (24 months or 3,600 hours) and Major servicing (twice those intervals) is sub-contracted to Marshall of Cambridge. Practices will change shortly when No 216 adopts the civilian method of Zonal Checking with multi-skilled personnel, replacing the fixed trades traditional in the RAF.

Keeping the Tristar flying when away from base can be a headache, because the RAF is not part of the airlines' worldwide system of pooled spares. Parts have to be obtained through the manufacturer's agents – and that can be galling, at an airport on the other side of the Globe when the same component is in a foreign company's storage shed a few hundred yards away. In Europe, at least, British Airways is contracted to provide spares and was especially helpful during *Operation Granby*.

In that connection, it is worth remarking that whilst many regard the Gulf War as a six-week operation in January/February 1991, it lasted a year for the Tristars of Brize Norton. Both the Tristar K1s – hastily daubed a hideous shade of pink – were involved during hostilities, tanking combat missions and bringing out reinforcement aircraft, but No 216 mounted the first sortie to reinforce Saudi Arabia on 12 August 1990 and flew the last homeward mission of *Granby* on 5 August 1991.

There is no clearer illustration than this of the value to the RAF of its largest aircraft, or proof that it is the unsung support units which are first in and last our. Those who fired the missiles and dropped the bombs in the Gulf conflict justly gained credit, but they would have had a quiet war if their weapons were still on a boat in the Mediterranean when the shooting started. Targets deeper into Iraq would have gone unscathed if airborne filling stations had not been on hand, and the ground troops' morale would have slumped without the knowledge that they would be swiftly restored to their families as soon as no longer needed. In the United Kingdom, only the Tristar combines these functions of strategic transport and tanker – jointly or separately – contributing to the effectiveness of the British armed services out of all proportion even to its considerable size. Quite appropriate then that its operating squadron's translated motto should read '*216 – Bearing Gifts*'.

Main picture: *Welcome to the Falkland Islands. Tristar C2s are often escorted into Mount Pleasant by patrolling Phantom FGR2s of No 1435 Flight.* Inset: *Less like an airport and more of an obstacle course is Wideawake airfield on Ascension Island, half-way staging-post on the twice-weekly route to the Falkland Islands.* Photographs Paul Jackson



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SPITFIRES CIRCUSES RHUBARBS AND A JUBILEE

James D.Oughton looks back at Fighter Command in 1942

To most of us, the term 'Spitfire pilot' conjures up an image of a 'happy-go-lucky character', at one with his world – taking on the enemy with great panache in a day fighter aircraft second to none. Nothing could have been farther from the truth in 1942; the day fighter squadrons, of whose equipment the Spitfire formed the cutting edge, were fighting a long, hard and merciless battle of attrition over enemy-held territory against a foe with better equipment and greater combat experience. This was, in effect, a *Battle of Britain* in reverse, with a defensive fighter force locked in to offensive operations under new commanders.

Against a background of unparalleled disaster – the Japanese onslaught in the Far East, the set-backs in the Western Desert, and the apparently unstoppable German advance into Russia – the RAF in the UK formed the only direct offensive force against the enemy until joined by the United States Army Air Force (USAAF) half-way through the year. Bomber Command was in the process of change and not until May, with the launch of the first thousand bomber raids, did the character of its new commander make itself apparent. Fighter Command, despite heavy casualties during



Left: *Longer legs: Range was always a problem with the Spitfire which, as an interceptor fighter, had internal tankage for a meagre 85 gallons of petrol. The fighter versions, such as this Mk IX, were fitted with drop tanks which ranged from 30 to 170 gallons capacity.*

the previous year, resumed the offensive in March.

At the beginning of the year there were some 60 squadrons of Spitfires in Fighter Command, with a total strength of more than 1,100 aircraft. With these were 13 squadrons of obsolete Hurricanes, mostly employed on night fighter duties or in the ground attack role, the total on hand being 265 aircraft. The only other fighter of significance was the Typhoon of which there was only one squadron available, with a nominal strength of 14 aircraft.

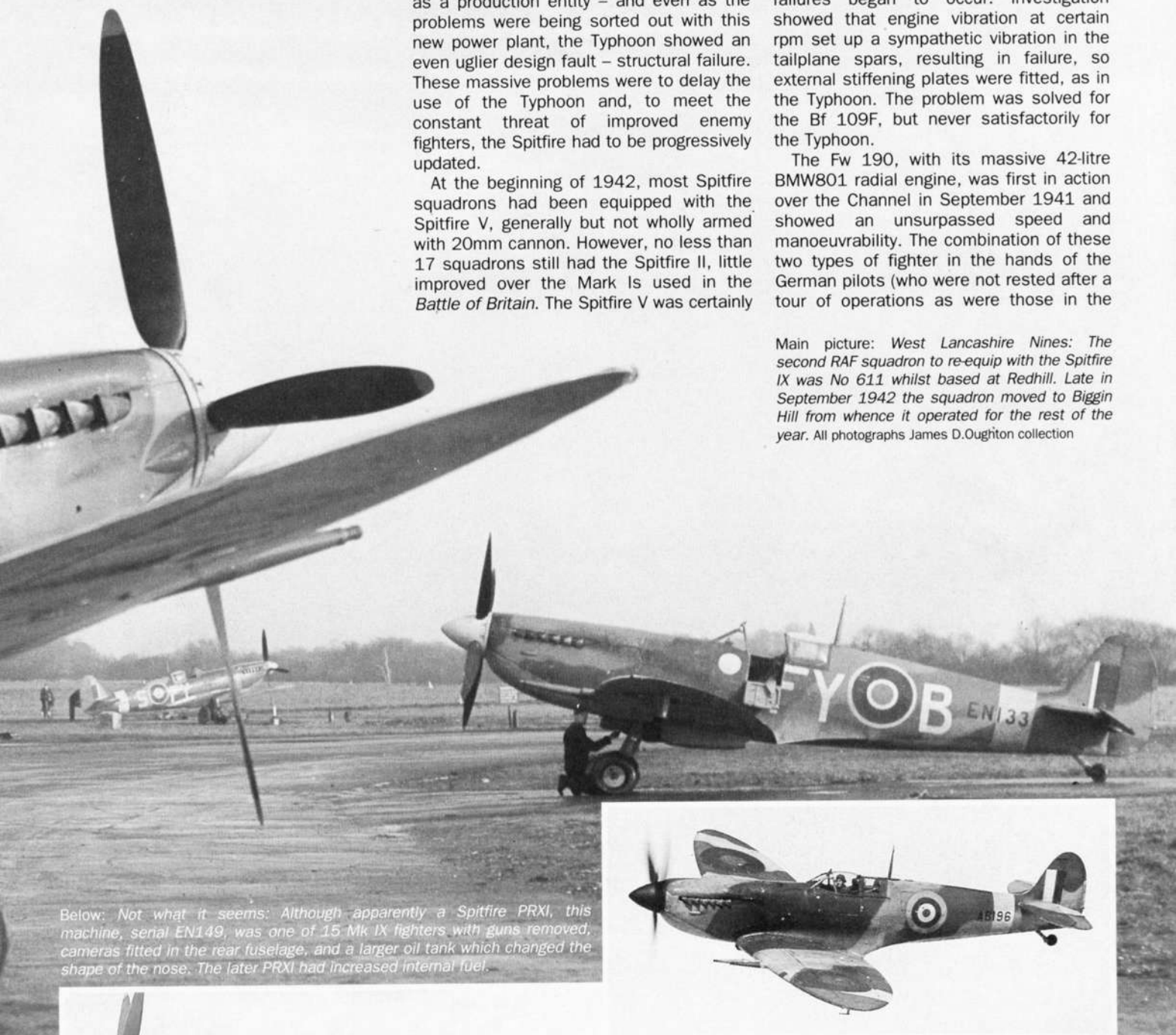
Herein lay the basic problem. Back in December 1937, the Air Staff had issued Specification F.18/37, which opened with the statement "The Air Staff require a high speed single seater fighter . . . as a replacement for the Spitfire and Hurricane . . ." Contracts for this new fighter were placed with Hawker Aircraft in 1938 and the design emerged in two forms – the Tornado with a Vulture engine, and the Typhoon with the Sabre powerplant. The Vulture was subsequently withdrawn, leaving the Typhoon as the 'white hope'. But the Sabre engine was far from ready as a production entity – and even as the problems were being sorted out with this new power plant, the Typhoon showed an even uglier design fault – structural failure. These massive problems were to delay the use of the Typhoon and, to meet the constant threat of improved enemy fighters, the Spitfire had to be progressively updated.

At the beginning of 1942, most Spitfire squadrons had been equipped with the Spitfire V, generally but not wholly armed with 20mm cannon. However, no less than 17 squadrons still had the Spitfire II, little improved over the Mark Is used in the *Battle of Britain*. The Spitfire V was certainly a match for the Bf 109E, but outclassed by the Bf 109F. There were only two Luftwaffe fighter *Geschwader* in occupied France – JG2 and JG26. Both units were equipped with the Bf 109F and the new and menacing Fw 190; JG26 was fully converted to the latter by the end of March.

The Messerschmitt Bf 109F had entered service with the two units in March and April 1941, and it is of interest to note that in its early days it suffered from the structural failure ailment which beset the Typhoon – the tail design had been changed from that of the Bf 109E, and failures began to occur. Investigation showed that engine vibration at certain rpm set up a sympathetic vibration in the tailplane spars, resulting in failure, so external stiffening plates were fitted, as in the Typhoon. The problem was solved for the Bf 109F, but never satisfactorily for the Typhoon.

The Fw 190, with its massive 42-litre BMW801 radial engine, was first in action over the Channel in September 1941 and showed an unsurpassed speed and manoeuvrability. The combination of these two types of fighter in the hands of the German pilots (who were not rested after a tour of operations as were those in the

Main picture: *West Lancashire Nines: The second RAF squadron to re-equip with the Spitfire IX was No 611 whilst based at Redhill. Late in September 1942 the squadron moved to Biggin Hill from whence it operated for the rest of the year.* All photographs James D.Oughton collection



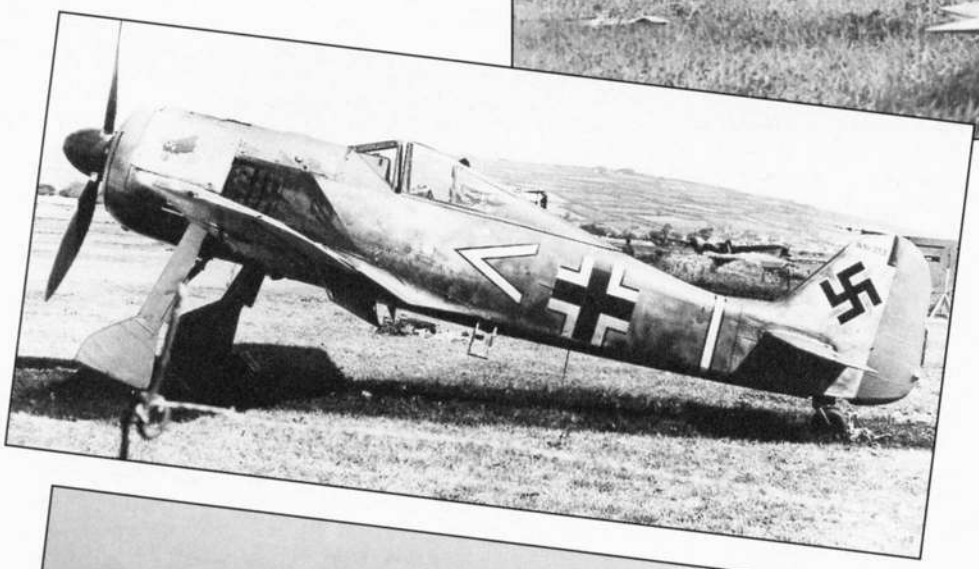
Below: *Not what it seems: Although apparently a Spitfire PRXI, this machine, serial EN149, was one of 15 Mk IX fighters with guns removed, cameras fitted in the rear fuselage, and a larger oil tank which changed the shape of the nose. The later PRXI had increased internal fuel.*



Above: *Four cannon nine: The first Spitfire VC to be fitted with a Merlin 61 engine by Rolls-Royce, and thus probably the Mk IX prototype, serialled AB196 made its first flight in this form on 27 March 1942. It was one of the few Mk IXs to carry four 20mm Hispano cannon.*

The Messerschmitt Bf 109F was a redoubtable foe. One of the JABO (fighter-bombers) of JG26 (right) *made a forced landing at Beachy Head on 20 May 1942 after being hit by gunfire whilst attacking Channel shipping. It was carefully rebuilt at the RAE and later flown by No 1426 (Enemy Aircraft) Flight. It was repainted in RAF markings with serial NN644* (far right) *but retained the white '11' and bomb marking of its original owners.*





Left: *The critical one: The Focke Wulf Fw 190 was described by Fighter Command's chief as the best fighter in the world in 1942. On 23 June of that year, the adjutant of III/JG2 mistook the Bristol Channel for the English Channel and touched down after an aerobatic display at RAF Pembrey. He soon learned the error of his ways and the RAF at last had an Fw 190 of its own.*



Below left: *A wolf in wolf's clothing: The captured Fw 190 was taken to the RAE and, repainted in RAF markings (the cock's head emblem on the cowling was retained) began flight trials on 3 July 1942. It proved to be all that had been claimed for it.*

Below: *Quart in a pint pot: The Spitfire with the Griffon engine – 36.7 litres in place of the Merlin's 27 litres. This aircraft. DP845, was first flown as the Mk IV prototype on 27 November 1941. Later, the Mk VC with a Griffon IIB was ordered into production as the Spitfire XII – the first of which flew in October 1942. Squadrons began equipping early the following year.*







RAF) led to heavy casualties among the Spitfires of Fighter Command. Intelligence had provided some indications of what Fighter Command was up against as a Bf 109F had been forced down near Dover in July 1941 and carefully rebuilt. It began flying at the RAE in September, but unfortunately was lost in an accident a month later.

Another Bf 109F was crash-landed near Beachy Head on 20 May 1942, and although it was not flown for some time it gave further insight into the capabilities of this version of the Luftwaffe's standard fighter. But even as this event took place, the newest development of the 109 – the 109G or '*Gustav*' was taking its place in the Luftwaffe's armoury, and this meant that the Spitfire V was completely outclassed. Powered by the DB605 engine which was some two litres bigger than the DB601 in the 109F, the Bf 109G had a top speed of more than 380 mph and impressive armament, including the new 30mm cannon.

But the Fw 190 was the biggest threat, and it lead to a remarkable series of events in June and July 1942. On 23 June, a captain in 12 Commando set out a plan to capture an Fw 190 from the station at Abbeville – provisionally named *Operation Airthief*. The scheme called for a night raid to enable a British pilot (Jeffrey Quill, Supermarine's Chief Test Pilot was nominated) to get to a parked Fw 190, start it up and fly it out. Thankfully, this hazardous enterprise was made unnecessary by the equally unusual, if not bizarre, arrival of an Fw 190 at RAF Pembrey on the same day. This machine, flown by a pilot from JG2, had been landed by mistake and was captured without damage. It went to the RAE, and test flying began on 3 July.

The results of these test flights were passed to Fighter Command, and on 17 July the AOC-in-C (Air Chief Marshal Sholto Douglas) addressed a Most Secret letter to the Under-Secretary of State for Air, in which he stated ". . . At the beginning of the war our fighters possessed technical superiority over those of the enemy. We have gradually lost this lead and we are now in a position of inferiority . . . There is . . . no doubt in my mind, nor in the minds of my fighter pilots, that the Fw 190 is the best all-round fighter in the world today. It is no answer to say that the position will be reversed when the Spitfire IX comes into general use . . ." Harsh words indeed, and matched by those used by the Australians who, faced with possible invasion by the Japanese, needed their land forces withdrawn from the Middle East and interceptor fighter squadrons to be based in Australia. They were adamant that they wanted Spitfires . . . "We should not be fobbed off with offers of the obsolete Hurricane, a retrograde design from the outset using 1920s design principles not far removed from those of the Demon biplane . . . it marked the need for quantity over quality in the approach to war and was alone among Allied and enemy fighters of the period in its girder/fabric structure and unsophisticated thick wing . . . designed for mass production by the low-grade labour available in the Expansion days . . . the Typhoon is a poor successor with a hybrid structure and an undeveloped engine . . . we must have the latest Spitfires with two-stage superchargers . . ."

The Spitfires of Fighter Command, having eased their level of operations over the 1941-42 winter period, began offensive action again in March 1942, either flying escort to the bombers of No 2 Group or engaged in purely fighter sweeps. These various operations were carried out under different code names:

Circus: Short-range bombing attacks escorted by fighters with the aim of bringing the Luftwaffe fighters to combat.

Rhubarb: Small-scale fighter or fighter-bomber attacks on various ground targets on an opportunity basis.

Ramrod: Similar operation to *Circus* but with the aim of destroying the target.

Rodeo: Fighter sweeps over enemy territory.

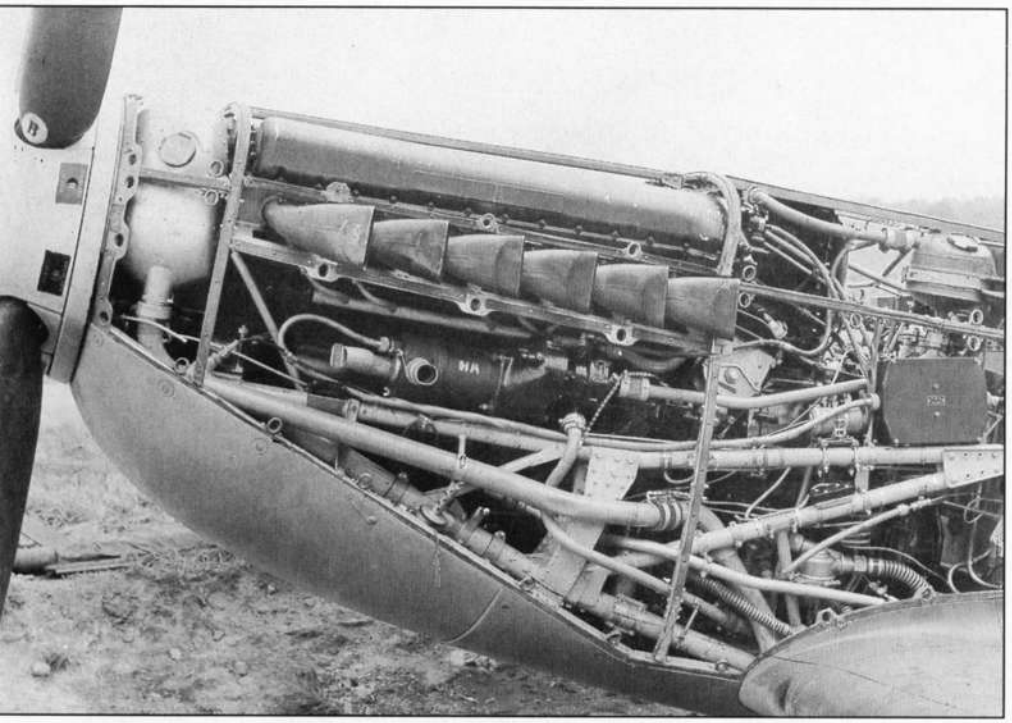
Roadstead: Attacks on shipping by fighters and/or fighter-bombers.

In addition to these sorties, the Command Spitfires had, of course, the task of 'scrambling' to intercept German raiders; among the most troublesome of these were the JABOs (fighter bombers) – Bf 109s or Fw 190s carrying a single bomb and used to attack Channel shipping or coastal towns. The Typhoon, with its high low-altitude speed would, it was hoped, help in this area but hardly had they begun operations when yet another snag arose. The Typhoon, with its snub nose and straight-taper wing, closely resembled the Fw 190; of eight aircraft lost on operations towards the end of the year, no fewer than five were shot down by our own fighters or anti-aircraft fire. Sadly, 62 Typhoons were also lost in non-operational accidents in 1942. The prototype of the Typhoon II, redesigned with a new structure and thin wing and later renamed Tempest, began flying on 2 September.

But the Tempest would not appear in sufficient quantities to equip a squadron for many months and in the meantime the Spitfire had to carry the burden. To meet the many and varied demands, the aircraft was modified again and again. The loss of aileron effectiveness in high speed manoeuvres was met by fitting new metal ailerons in place of the fabric-covered

Jubilee stripes: During the preparation for the Dieppe raid, there were areas of confusion. Some fighter squadrons, for instance, were told to paint distinguishing stripes on their aircraft. One which carried them was Spitfire VB AA853, coded 'WX-C' of No 302 Sqn. It was in fact the personal mount of Wg Cdr Stephan Witozenc, leader of No 2 Polish Wing.





The business end: This photograph, taken at Hucknall on 29 September 1942, shows a Merlin 63 engine installed in a Spitfire IX. In effect, this new powerplant comprised the basic engine plus two individual superchargers separated by an intercooler.

originals, which ballooned at speed. The menace of high-flying Junkers Ju 86P reconnaissance bombers was met by the pressurised Spitfire VI with a pressure cabin and extended wing-tips, and also by the Spitfire IX, sometimes stripped to basics and with limited armament. One of the latter aircraft, from the High Altitude Flight at Northolt, climbed to intercept a Ju 86R (a developed version of the 86P) on 12 September 1942, and reached an altitude of 44,000ft whilst making attacks. The Ju 86R was damaged and made off, and there were no further 'stratospheric' attacks.

Other actions by Spitfires included the unexpected call to readiness by the Biggin Hill Wing at 0825hr on 28 February 1942. The Spitfires of Nos 124 and 401 Squadrons took off at 0855hr to cover warships coming up the Channel, returning from the raid on Bruneval where the previous night Whitleys of No 51 Squadron had dropped paratroops and a radar specialist to examine and take 'samples' from a German *'Wurzburg'* radar. In company with the *'Freya'* radars these had been tracking many of the No 2 Group and Fighter Command sorties.

Before this, on 12-13 February, however, the Channel had been plunged into the chaos caused by the breakout of the German warships *Scharnhorst, Gneisenau* and *Prinz Eugen*, which sailed up the Channel from Brest to Kiel. The ships were first spotted by two Kenley Wing Spitfires carrying out an impromptu *Rhubarb* operation, but the pilots left it until their return to notify Command. By a remarkable co-incidence, two other Spitfires from No 91 Squadron flew over the scene at the same time and saw both Spitfires and warships. They broke radio silence, but it was a long time before attacks were mounted. In the event, the enemy ships were attacked in bad weather by six Swordfish of 825 Sqn FAA, led by Lt Cdr Esmonde, who was awarded a posthumous Victoria Cross for leading the attack. All six Swordfish were shot down, the only Fighter Command Spitfires to cover them being 10 aircraft from No 72 Sqn at Manston.

The most radical change in the Spitfire, so far as the general offensive was concerned, came about in June 1942 with the delivery of the Spitfire IX to No 64 Sqn, who took them into action for the first time the following month. The Mark IX was basically the Spitfire V airframe in which was mounted a new Merlin, the Mark 60 series, featuring a completely new supercharger system, two-speed and two-stage. The air being compressed in the first stage of supercharging meant that there was a need for an inter-cooler before it could be forced into the second stage and thence into the engine. All this was contained within the limits of the small Spitfire airframe and a 'crash' programme was started to produce Mark IXs as fast as possible. And, as if this was not too much to ask, yet another engine development was under way, this time to install the Griffon (which was nearly 10 litres bigger than the Merlin) in the Spitfire. Although too late for 1942, the first Griffon Spitfire, the Mark XII, began reaching the squadrons early in 1943.

Another Spitfire development had been initiated by the Air Fighter Development Unit (AFDU). In October the unit began flying the 'clipped-wing' version of the Mark V in which they had sought to improve aileron efficiency at low and medium altitudes by removing the wing-tips. It worked, but AFDU got no medals from on high. The Director of Technical Development tore them off a strip for carrying out unauthorised modifications; but in the long run all was well and the Spitfire LF V went into operation.

The new Mark IXs in squadron hands began to restore confidence, but there were lessons to be learnt. On 17 August 1942 the American VIII Air Force Bomber Command began its offensive with B-17 Flying Fortresses, for which Fighter Command supplied Spitfire escorts. It was on one of these operations that No 133 (Eagle) Sqn despatched a dozen Spitfire IXs on 26 September. Unfortunately they stayed with the bomber force too long and finally broke off for home running low on fuel. Only one made it back to the UK, the others either making forced landings or being shot down. Once again the Spitfire's achilles heel had shown up – lack of range, accentuated by the more powerful, and hence more thirsty, engine.

But 1942 was marked by a great air battle in which more squadrons were deployed by Fighter Command than in the *Battle of Britain*. This was *Operation Jubilee*, the Combined Operations raid on the Channel port of Dieppe. The main ground assault was carried out by Canadian soldiers, among whom the casualties were horrendous. From the air, there had been no heavy bomber support, only that available from the light bombers of No 2 Group. Fighter Command activities, placed under No 11 Group and controlled by Air Vice-Marshal Leigh-Mallory, included fighter-bomber assaults with Hurricanes. But the main 'umbrella' over the Dieppe beaches fell to the lot of the Spitfires. There were some misdirections – the higher performance Spitfire IXs, in short supply, were used to escort B-17s on diversionary targets. Nonetheless, the Spitfires managed to ward off the Luftwaffe's bombing attacks, only one ship being lost. The cost was exceptionally high – 106 British aircraft were lost that day, of which 88 were Spitfires.

In addition to the casualties incurred by operations such as have been described, Fighter Command was further weakened by the need for the Spitfire in other areas of the world – Malta, in March; North Africa for *Operation Torch* in November; for El Alamein in October; for Australia – and, quite separately, the need to release more aircraft for conversion to Seafires for the Royal Navy.

So we return to the fighter pilot in his Spitfire. No aluminium foxhole this, but the centre of action all the way. No short hard war like the Falklands or the Gulf, but a long slogging match, day after day, month on month, year after year. It was to be some time before the situation began to improve; some signs of ultimate victory came with the success of the El Alamein offensive, the North African landings and the German stalemate at Stalingrad.

1942 had been a hard year for Fighter Command. Over 43,000 offensive sorties were flown in which no less than 915 aircraft were lost, 626 of these being Spitfires. The effect of German superiority can best be demonstrated, simply, by their losses in the same area over the same period – 168 aircraft. In the long run, the war of attrition would turn in the Allies' favour. The German fighter defence in the west would be damaged beyond repair by the combined bomber offensive against the factories and the unceasing fighter combat.



Above: *One of the first. Described as the second production Spitfire IX, BR592 was basically a Mk V in which a Merlin 61 engine had been fitted by Supermarine. It was delivered to No 64 Squadron on 8 July 1942.* Top: *Spitfire VB BL479 was delivered to No 316 (City of Warsaw) Sqn in October 1942, then based at Hutton Cranswick, Yorkshire. No 316 moved south to Northolt early in March 1943.*

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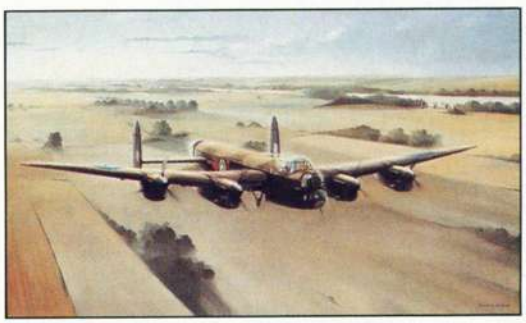


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SOUTHERN SENTINELS

Ten years after the Falklands War *Paul Jackson* visits the RAF units providing the first line of defence for this remote outpost.

No sooner has the Tristar begun its descent towards RAF Mount Pleasant than the reception committee appears – one on each wingtip. The pair of Phantoms shepherd the airliner on the final stages of its flight to the Falkland Islands, but their presence is no mere ceremonial for personnel arriving on a tour of duty in the South Atlantic. Each fighter carries six missiles and a loaded Vulcan cannon, to be used without hesitation if its home base should be threatened. Ten years ago, Argentine forces walked into the Falklands before the tiny garrison could be strengthened; the RAF is there to make sure that it cannot happen again.

In Europe, similar air patrols are no longer required between what used to be East and West Germany, whilst Russian aircraft in need of a mandatory escort are now infrequent visitors to the northern regions of the UK Air Defence Region. However, 7,865 miles from London over 1,000 British servicemen maintain a state of military vigilance over the 778 islands of the Falklands, backed by fighter aircraft ready to scramble at a few moments' notice, day or night. Just 350 miles away, Argentina has made no aggressive moves in recent years, but faced with the volatile world of Latin American politics, defenders can leave nothing to chance.

Opened in May 1985 after a prodigious construction effort in a rapidly changeable and sometimes hostile climate, Mount Pleasant Airport (MPA) is the major UK base on the Falklands, with over 1,000 personnel drawn from all three Services, excluding those assigned to co-located HQ British Forces Falkland Islands (BFFI – pronounced 'biffy'). Commander BFFI is a tri-service appointment alternating yearly between an Air Vice Marshal, Major General and Rear Admiral, but the station commander Mount Pleasant is an exclusively RAF post, currently held by Gp Capt D.A. 'Andy' Williams AFC.

Whereas most personnel serve up to four months on the islands on rotation from their units (and families), Williams and a few other key executives are on a one-year accompanied posting. Living in small, well-insulated Swedish-style houses, these few senior officers ensure continuity of command and prevent the rapid staff turnover from throwing up too many re-inventions of the wheel. Other men and women are billeted in the sprawling, two-storey wooden domestic complex which, though warm and dry, is officially recognised as being only one step away from 'active service'. As a consequence, personnel are excused the normal accommodation and messing charges whilst serving in the spartan environment of Mount Pleasant and associated sites.

The role of MPA, says Gp Capt Williams, is to 'Deter Argentine aggression and, if that fails, to protect the airhead to await reinforcements'. Consequently a minimal force of four fighters, two Hercules tanker/maritime surveillance aircraft, four helicopters, Rapier surface-to-air missiles and radar sites is based on the islands. Whilst that is clearly insufficient to withstand the entire *Fuerza Aerea Argentina*, accurate intelligence should ensure a reinforcement

Heading picture: *A pair of Phantoms from the resident No 1435 Flight based at RAF Stanley on patrol over typical Falkland Islands terrain.* Paul Jackson



Prime task of No 1312 Flight Hercules is to extend the patrols of the Phantoms by refuelling. Falkland Sound provides the backdrop in this instance. Paul Jackson



Viewed from the rear of the Hercules, a Phantom displays its four Sidewinders. Two Sky Flash missiles are also carried, plus a podded 20mm cannon. Paul Jackson

of the defences if conflict appears to be likely. MPA has two runways and ample protected accommodation for aircraft which can be flown out from the UK in under a day. To meet a sea-borne threat, Nimrod MR2s and Buccaneer S2Bs would be deployed with the assistance of Tristar tanker/transports, whilst Tornado F3 interceptors could bolster the air defences. Troops and their equipment can arrive from Europe with equal rapidity, so greatly reducing the size (and cost) of the permanent garrison on the Falklands. Should the runways or taxiways be damaged by air attack, Royal Engineer specialists from the FI Field Squadron will rapidly patch the surface to allow flying to continue.

Despite its small size, the air element of MPA has a formidable list of regular tasks: air defence, air-to-air refuelling, maritime reconnaissance, logistic air support, search and rescue, air transport support and reinforcement reception. The last-mentioned would be partly the responsibility of Port & Movements Squadron, a unit deriving its non-standard title from the fact that seaborne deliveries to Mare Harbour at nearby East Cove are included in its responsibilities, handled by attached Royal Corps of Transport personnel.

MPA deals with 2,500 international passenger movements monthly and a similar number on the frequent helicopter flights (including two Sikorsky S-61Ns of Bristow Helicopters) which are sometimes the only link with remote outposts. There are nine Tristar services per month, comprising six all-passenger C2s – 'Timmys' in the military vernacular of Fi-Speak – two pax/freighter KC1s ('Tommys') and one of the latter carrying only cargo. Though large, a Tristar is lost on the immense main hardstanding of MPA, which can easily take nine widebodied transports. Covered accommodation is available for one Tristar – in, inevitably, the 'Timmy Hangar'.

Central to defence of the islands, and maintaining a constant watch over the sea to the shores of Argentina, is the Falkland Islands Air Defence Ground Environment. FIADGE consists of three mountain-top radar sites, of which No 303 Surveillance Unit, atop 1,504ft Mount Kent, a few miles west of Port Stanley, is equipped with a Marconi Series 600 (RAF Type 97). On West Falkland, No 7 SU on Byron Heights and No 751 SU on Mount Alice both have Plessey AR-3Ds (RAF Type 94s). A further Type 97 is installed near MPA. All sites can pool their information and control fighter interceptions, but Mount Kent normally acts as the Control and Reporting Centre for direction of intercepts.

The austere living conditions at MPA seem like The Ritz compared with life at a

Main Picture: *Additional equipment carried by No 1435 Flight Phantoms includes a flare dispenser to decoy heat-seeking missiles.* Paul Jackson





Left: *Spoils of war. A Sea King hovers over one of the many war trophies displayed at Mount Pleasant.* Above: *Painted yellow in the UK, Falkland Island Sea Kings fly in a grey tactical colour scheme and are fitted with radar warning receivers.* Paul Jackson/Patrick Allen

radar site. No 7 SU returned to service in December after repair to damage caused by 150mph winds, whilst 100mph gales are normal at all sites and the contrary Falkland Islands weather can present aspects of all four seasons in a single day. Radars are protected by fibreglass 'golfballs' but operators have to work in converted ISO containers and live in Portacabins securely chained to the ground. Four months on a remote mountain connected to civilisation only by the thin thread of an 'Eric' (Bristow's S-61N) is one of the RAF's least attractive postings.

Radar plays a leading role in management of the air traffic Terminal Control Zone, established around the Falklands on 9 October 1991. Entirely contained within the area administered by Argentina's Comodoro Rivadavia Flight Information Region, the Zone extends some 50 miles from the shores of the main Falklands group and applies to all aircraft in transit or visiting the islands. It must be admitted that the South Atlantic is an air traffic backwater which sees only the occasional chartered civil aircraft plying between Chile and the Falklands. However, establishment of the Zone was an important point of political recognition on a par with the FI Conservation Zone which brings the islands a tidy income in commercial fishing licences.

First line of defence for the islands is No 1435 Flight and its four MPA-based Phantom FGR2s. Air and ground crew personnel are seconded from Phantom units at RAF Wattisham to keep the unit operational 365 days per year. During daylight hours, crews are at immediate readiness in the Quick Reaction Alert headquarters close to the individual Phantom hangarettes. Wearing flying clothing at all times – including the uncomfortable waterproof Immersion Suit – they eat and sleep in the QRA 'hut' for 24 hours at a time.

Phantoms are equipped with the normal four short-range BGT AIM-9L Sidewinder air-to-air missiles (of which the devastating use by Sea Harriers must be ingrained on the collective memory of the Argentine Air Force), and two of the possible four BAe Sky Flash medium-range radar-guided missiles. Replacing the rear pair of Sky Flashes beneath the aircraft's belly is an SUU-23/A pod containing an M61 Vulcan fast-firing 20mm cannon. This is useful for a 'shot across the bows' of an uncooperative intruder as well as being deadly in close combat. Additional equipment for the South Atlantic includes chaff (MJU-15/A) and flare (AN/ALE-40) dispensers on the inboard wing pylons and night vision goggles for the navigator.

Crews must be night-current, but as a

minimum of night training flights are undertaken, they spend only a month at MPA before returning to the UK. During that time, each crew completes a series of training sorties, including practice missions versus other Phantoms and against the Hercules tankers which routinely extend missions to two or more hours. At home, combat training is undertaken with unarmed aircraft and culminates with the pilot pressing the missile launch button. With Falklands-based Phantoms fully armed at all times, it is necessary to call 'switches safe' at 10 miles from the planned point of interception to avoid accidents.

With retirement looming early in 1993, the Phantom has little time left in its current role of Falklands' protector. The decision to re-equip No 1435 Flight with Tornado F3s, the only logical replacement, had not been made by the beginning of 1992. As it is uneconomical to fly the Phantoms home merely for scrapping, they are expected to be disposed of locally. One may go to a local museum together with an Argentine Pucara and UH-1H Iroquois which MPA is looking after pending construction of accommodation in Port Stanley.

The locally-based Hercules act as the enemy in a scenario far more realistic than initially might be thought. Transport aircraft could be used to infiltrate special forces in advance of an attack on the Falklands and are therefore a potential target. In a variation of the exercise, one Phantom will act as escort to the Hercules, and hence two of the four fighters have white tails for easier recognition of 'good guys' and the 'bad'. In addition to the arms of the Falkland Islands on the nose, Phantoms carry a Cross of Malta in red on the fin as a link with No 1435 Flight's defence of the Mediterranean island in World War 2. Aircraft are named after the three Sea Gladiators (not of No 1435) renowned for protecting Malta: *Faith*, *Hope* and *Charity*. The fourth Phantom? – *Desperation*.

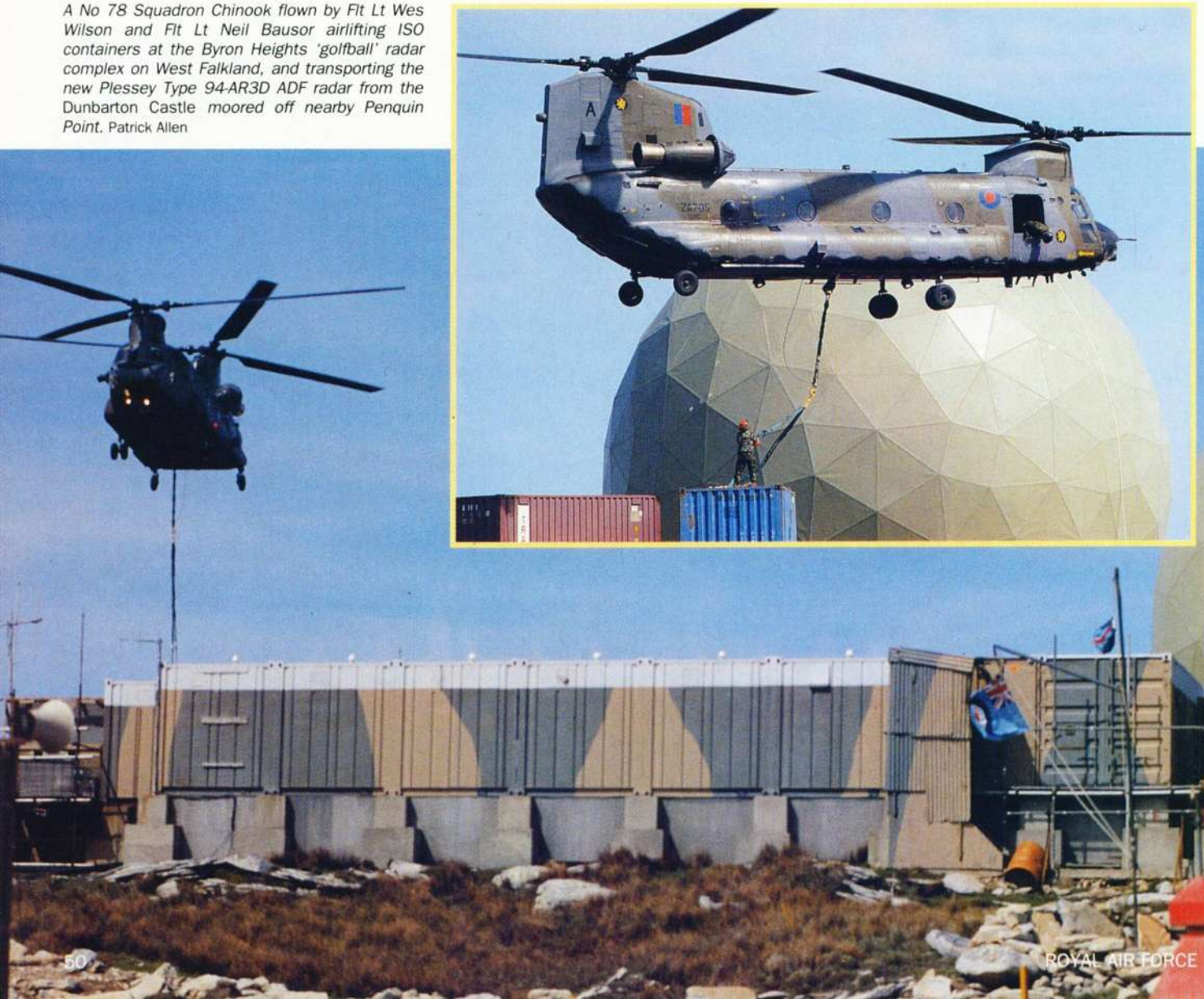
Launching a Phantom QRA usually activates the missile defences of MPA and Mare Harbour provided by the Resident Rapier Squadron. Seconded from Europe, personnel are unique at MPA in being drawn from a single squadron which concurrently provides a detachment to Belize. Primary Rapier sites are manned round the clock, their personnel working 24 hours on, 24 hours stand-by and then 24 hours off for their four-month tour of duty. Additional sites would be manned by reinforcements.

Keeping the Rapier's radar and visual directors on their toes, Phantoms make several passes of a missile site after each take-off – a mission appropriately known as 'Fiery Cross'. MATS-B target drones the size of a model aircraft simulate enemy aircraft in training detachments to nearby Bertha's Beach and are additionally used to test machine-gunners based both alongside the Rapier missile launchers and in defence of the mountain-top radar sites. In time of conflict, both would also benefit from the addition of Shorts Javelin shoulder-launched SAMs and availability of BAe Sea Wolf aboard the RN frigate permanently detached as Falklands guard-ship.

The same process of inventive street-naming at MPA which placed the RAF Police HQ down Letsby Avenue has seen the operators of 'Fat Albert' (alias the Lockheed Hercules) resident on Albert Square. No 1312 Flight has two Hercules C1K tanker conversions of the standard transport, for the primary task of refuelling the Phantom force and providing targets for fighter affiliation. One of the three crews and one aircraft are on constant short notice standby in the event of a QRA scramble. Duty tours in the South Atlantic come round quickly; of the four Lyneham based Hercules squadrons, only Nos 24 and 30 provide tanker-trained personnel for No 1312.

About half the 150 hours per month generated by the two Hercules are on patrol of the Falkland Islands Conservation Zone, the inner portion of which (75 miles in radius) is covered regularly. Fisheries protection is left to the Falkland Islands government aircraft and ships, the RAF role being to locate and identify all types of

A No 78 Squadron Chinook flown by Flt Lt Wes Wilson and Flt Lt Neil Bausor airlifting ISO containers at the Byron Heights 'golfball' radar complex on West Falkland, and transporting the new Plessey Type 94-AR3D ADF radar from the Dunbarton Castle *moored off nearby Penquin Point.* Patrick Allen



vessel of any nationality within 15 miles of the coast and any Argentine and Soviet ships sailing farther out. During four-hour patrols, ships are picked-up on the aircraft's standard Ekco E290 nose radar or by specially installed wingtip pods containing electronic support measures (ESM) equipment which homes onto naval radar. Code named *Orange Blossom*, this is a repackaged Racal MIP-2 *Orange Crop*, as installed on Royal Navy Lynx and Sea Kings.

With four additional tanks in the hold for an extra 28,000lb of fuel, and a hose-drum unit on the rear ramp, the Hercules has very little room left for cargo. Only mail and light stores are therefore dropped by parachute on the normally twice-monthly reconnaissance and re-supply flight to the garrison on South Georgia, 1,000 miles to the east. A further 300 miles distant, the South Sandwich Islands see their 'Albert' only three times per year. Evacuation is another Hercules role: the seriously ill to hospital in Montevideo, Uruguay or compassionate cases to Santiago, Chile, to catch a scheduled airliner.

The only nominally resident flying *squadron* at MPA is No 78 which, in spite of its permanent-sounding title, is manned by personnel on short-term secondment from European-based helicopter squadrons, Nos 7, 18 and 202: two months for the aircrew or four months for the engineers. 'A' Flight has a pair of Chinook HC1Bs which are invaluable for heavy lifting in a country the size of Wales possessing only a single, quarter-decent road (between MPA and Stanley). Loads of up to eight tonnes are routinely lifted underslung, such as 'Snow Cat'-like Hagglunds BV206 tracked vehicles and ISO containers.



Flown by Flt Lt Jim Anderson and Flt Lt Chris Bodiam, a No 78 Sqn Sea King on a low level sortie. Patrick Allen

Two Sea King HAR3s constitute 'B' Flight of No 78 Squadron. These are the familiar yellow helicopters taken from their bases around the British coast and painted dark grey. Their roles still include search and rescue, but the tactical colour scheme results from the fact that their missions are not always humanitarian. Up to 12 troops or small underslung loads can be carried in the army support role. In its more traditional role, however, one Sea King is maintained on SAR stand-by and has been scrambled on many occasions to give assistance to foreign fishing boats in difficulty or with sick crewmen. Winching onto the cluttered deck of (say) a Korean boat, none of whose crew speaks English, is a difficult enterprise without the not infrequent accompaniment of a gale blowing directly from the Antarctic.

In fairer weather, helicopters provide a pleasant and leisurely way to view the islands. A haven for walkers and ornithologists, the land of small settlements trimmed with the yellow of imported gorse reminds many visitors of northern Scotland. The odd pile of twisted wreckage is left of aircraft lost during the 1982 conflict. More poignant are the carefully tended war cemeteries: a neat circle near the Task Force landings at San Carlos remembering the 255 British personnel; a simpler collection of crosses bearing Argentine names close to the site of the bloody battle for Goose Green.

Back at MPA, the Public Information Officer takes a telephoned complaint from a remote settler regarding low flying aircraft – or rather the absence of them. The sheep farmer wishes to know why his settlement has *not* seen an RAF aircraft for over a fortnight and drops a strong hint that two Phantoms would be a reassuring sight (and sound) if they would be kind enough to put in an appearance. The people of the Falkland Islands remember with gratitude and affection the members of all three armed services who liberated them ten years ago.

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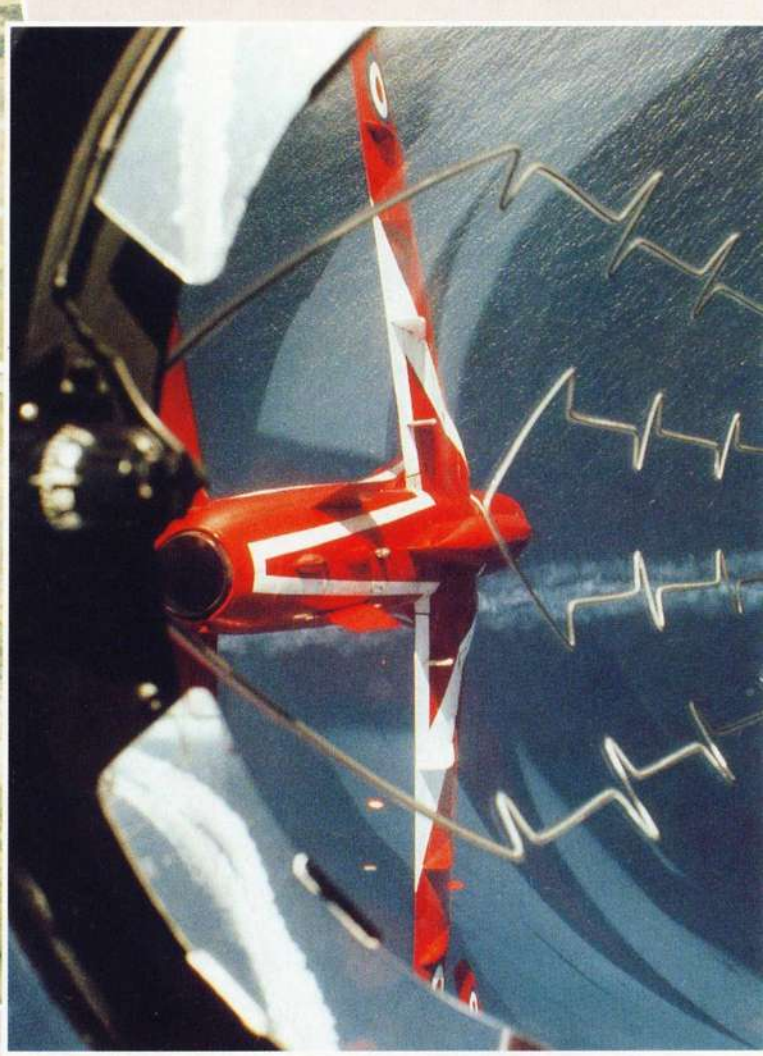
TOUR OF DUTY

Squadron Leader Andy Stewart

Squadron Leader Andy Stewart, Team Manager of the RAF *Red Arrows* (1989-1991) presents some photographic highlights of a memorable third year with the team. The annual detachment to Cyprus, just prior to the start of the new display season gives the *Red Arrows* the opportunity to train in near ideal weather conditions. The following photographs were taken by Andy Stewart from the rear seat of a Hawk during a practice sortie in April 1991.



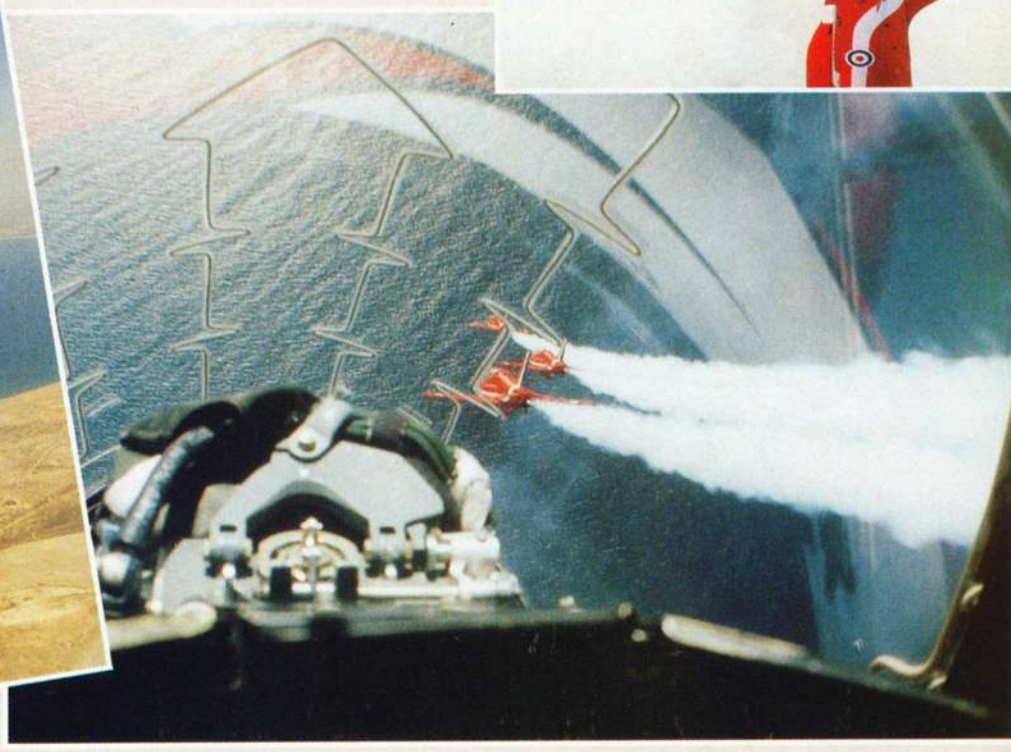












Squadron Leader A J Stewart RAF

Squadron Leader Andy Stewart, aged 37, was born in Salisbury, Wiltshire and educated at Worth School in Sussex. He joined the RAF in 1972 and, after training on the Gnat and the Hunter, first flew the Phantom air defence fighter with No 56(F) Squadron. In 1980 Andy started a four year tour as a Hawk flying instructor at RAF Valley before returning to air defence duties, this time in Germany with No 19(F) Squadron. He subsequently rejoined No 56(F) Squadron at RAF Wattisham as a Flight Commander in 1985.

Andy joined the *Red Arrows* as *Red 10* for their 25th anniversary season in 1989 and completed three years as Team Manager before being posted to the RAF Staff College at the beginning of 1992. In support of the Team he used to fly either the spare Hawk, a Bulldog trainer or a Gazelle helicopter to reach airshow venues, where he gave the display commentaries. Highlights of the tour included arranging the first visit by a western aerobatic team to the (then) Soviet Union in 1990, followed by flying with the *Russian Knights* when they displayed in the UK in 1991.

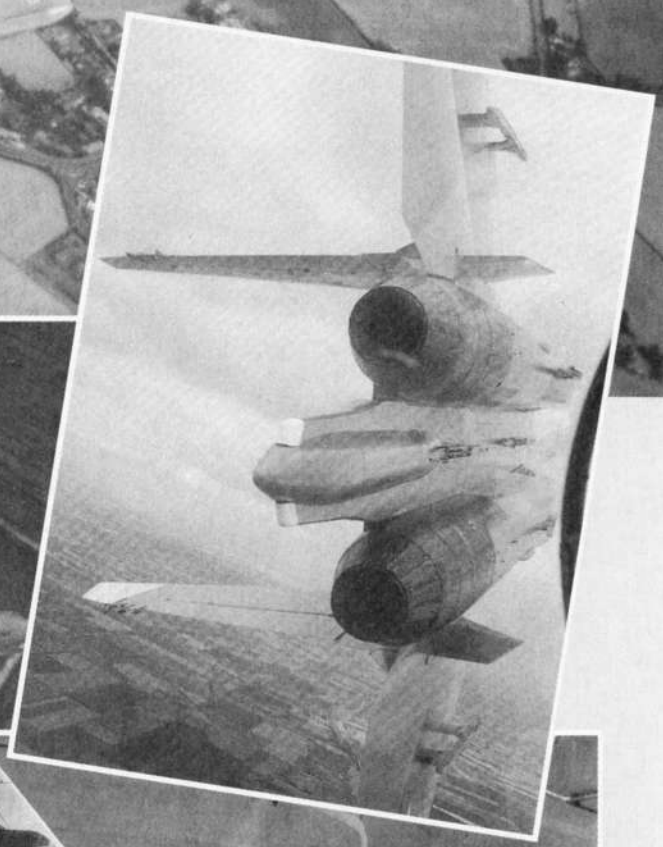
Married and with two sons aged 11 and 9, Andy has over 3,500 flying hours. After photography other interests include cooking, gardening and still learning to play golf!

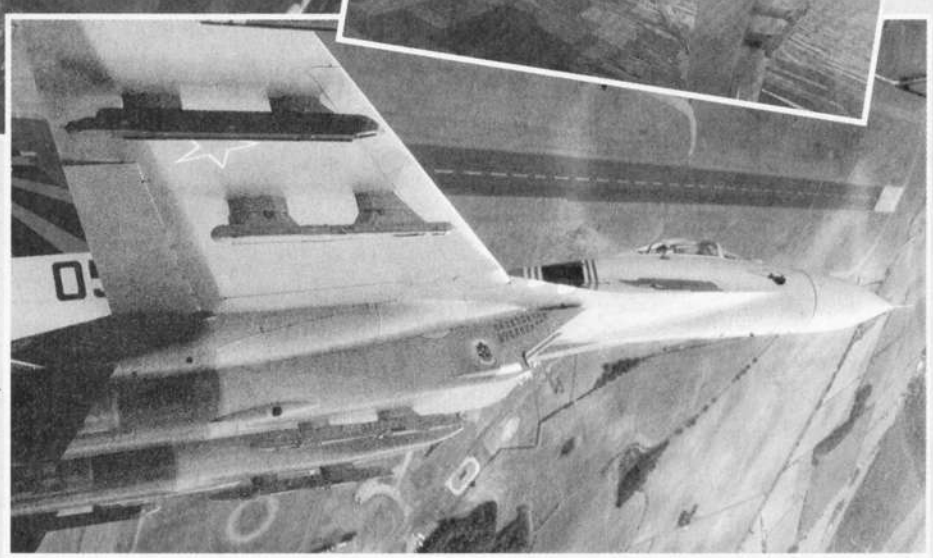
A book of colour photographs of the Red Arrows in action by Katsuhiko Tokunaga and Andy Stewart has recently been published by W H Smith, price £8.99. A donation from the sale of every book is being made to the RAF Benevolent Fund by W H Smith.



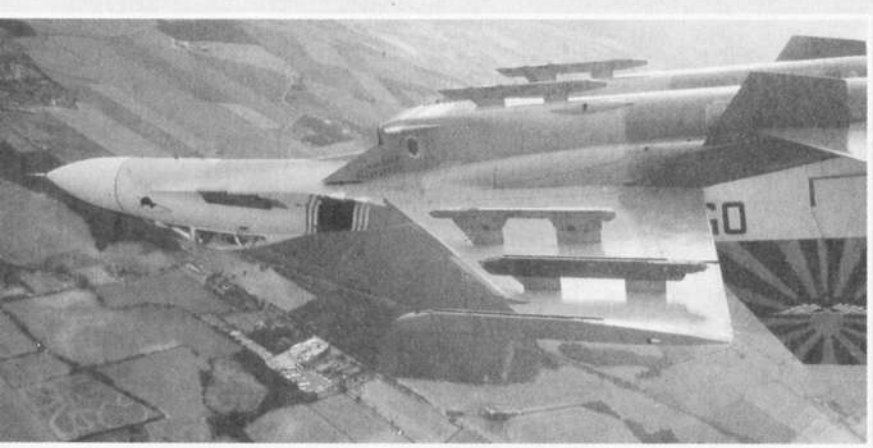


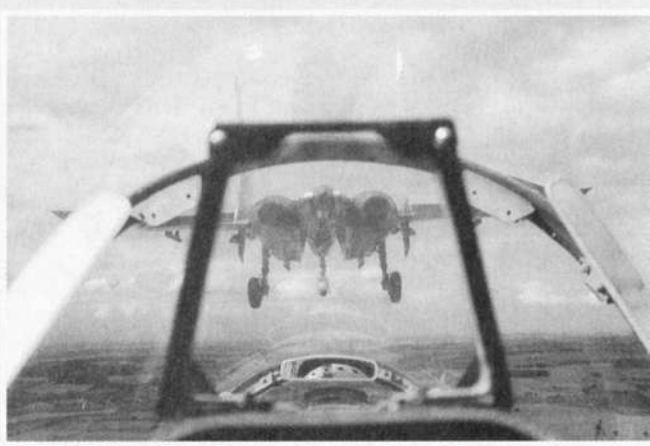






In September 1991 the Soviet Air Force aerobatic team, the *Russian Knights*, visited the UK with their Sukhoi Su-27 *Flankers*. This first visit of a Soviet jet display team to the UK included public displays at RAF Leuchars and RAF Finningley on 21 September. Andy Stewart was lucky enough to fly in the back seat of the leader's Su-27UB for a practice display at Finningley on 19 September, during which he took this set of unique photographs.





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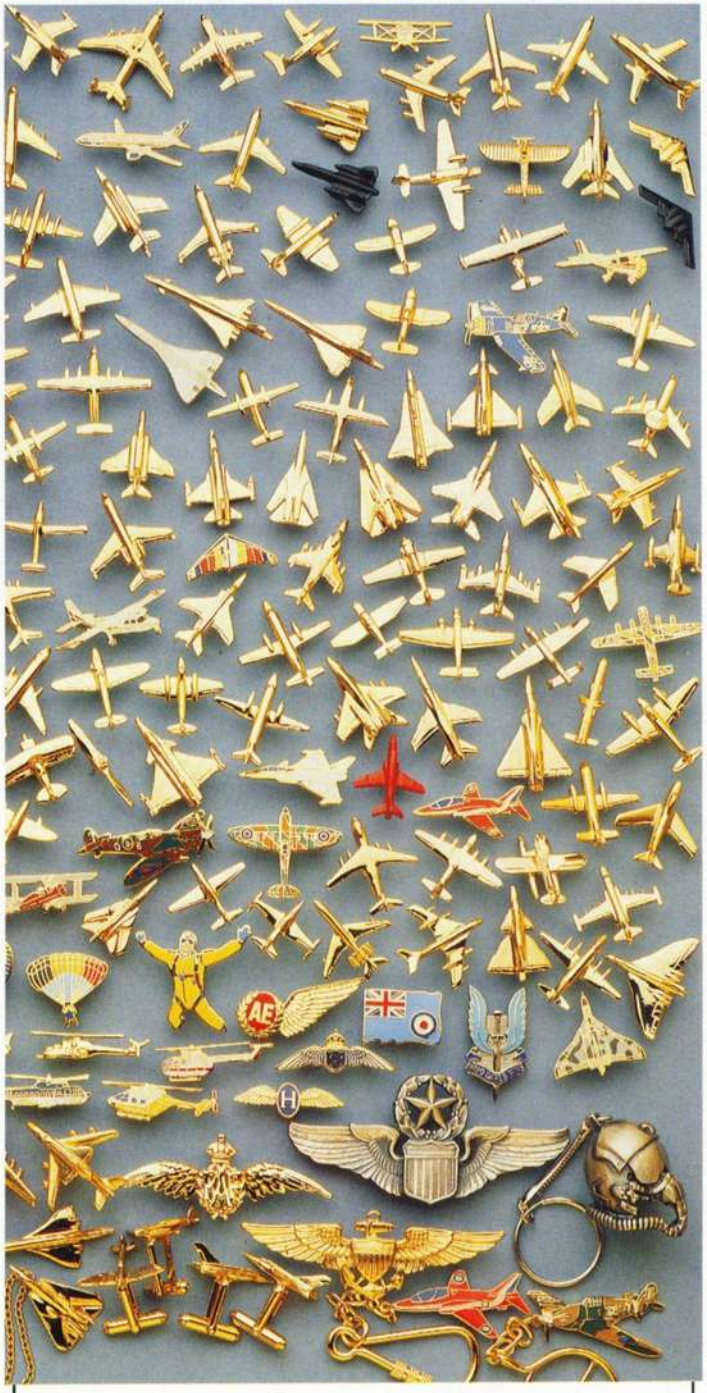
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In 1987 Frank Wootton was commissioned to paint the Tornado F3 taking off from RAF Coningsby. A limited edition of prints was produced from that painting – proceeds being donated to the RAF Benevolent Fund and the Lord Dowding Sheltered Housing Project. Prints cost £45 each and are available from Sqn Ldr P1/Org, HQ 11 Group, RAF Bentley Priory, Stanmore Middlesex HA7 3HH. Cheques made payable to NONPAS Stanmore Park should accompany orders.





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AIRMOBILITY FOR 'CERTAIN SHIELD'

Patrick Allen

"Okay forward six and left . . . Dead ahead five . . . Forward four descending . . . Forward three descending . . . Two . . . One . . . Steady down, height is good. Hookers working with the load . . . Height is good . . . Load attached . . . Up gently . . . Up gently and back . . . Up gently, prepare to take the strain . . . Up gently, taking the strain . . . Up gently, load is clear of the ground . . . Good load."

The Chinook crewman lying face down on the floor watches the Command Landrover swing gently below him as the Westphalia countryside begins to accelerate by. The second crewman watching from the forward door gives the pilot information on a second Chinook also picking up its load of 36 troops, an internal vehicle and an underslung Command Landrover and trailer. Once clear of the Battalion pick-up point the two Chinooks fly along the designated heliroute to the drop-off point south east of Paderborn. Ahead and behind are more RAF Chinooks and Pumas busy moving troops from NATO's new Airmobile Division during Exercise *Certain Shield.*

Having moved German, Belgian and British troops forward, the Chinooks and Pumas then started to move logistic supplies including food, ammunition and fuel. The aim of Exercise *Certain Shield* was:– "To evaluate a Multi-national Airmobile Division as an operational reserve in order to develop future NATO force structures and concepts."

With support helicopters provided by the RAF and German Army, the Airmobile Division must be capable of rapid reaction and deployment covering distances over 120km, regardless of any ground obstacles or ground damage, and be capable of sustaining itself in battle for 48 hours. Once extracted from a battle it must be capable of being re-committed after a further 48 hours.

The future for helicopters and heli-borne troops looks bright as British and other NATO Forces are reduced and restructured. The emphasis is now being placed on smaller, flexible and more mobile forces. Helicopters and the use of airmobile troops is seen as one of the options to provide a more flexible, mobile force. Exercise *Certain Shield*, which took place in Germany from 10-20 September 1991 was the first trial of a newly created NATO multi-national Northag Airmobile Division.

Destined to become an element in NATO's new Rapid Reaction Corps (RRC) the Multi-national Airmobile Division comprises the UK's 24 Airmobile Brigade together with helicopters and troops from Germany, Holland and Belgium. The helicopter lift for the British 24 Airmobile Brigade is provided by RAF Chinook and Puma helicopters.

Two Chinooks full of troops lift a pair of LSVs.



24 Airmobile Brigade airmobility is provided by RAF helicopters, usually comprising up to 12 Chinook HC1s from Nos 7 and 18 Squadrons, and 12 Puma HC1s from Nos 33 and 230 Squadrons. During Exercise *Certain Shield* Chinooks and Pumas from No 240 Operational Conversion Unit (OCU) and Chinooks from No 7 Sqn, plus Pumas from No 33 Sqn deployed to RAF Gütersloh in early September to join Nos 18 and 230 Sqns at their home base. In their support of the Airmobile Brigade the RAF and Army have made good use of their considerable experience with the Puma and exploiting the Chinook's substantial lift capability.

The British 24 Airmobile Brigade comprises three Infantry Battalions, an Army Air Corps Regiment, an Air Defence Troop, a Field Engineer Squadron, plus supporting arms. The Brigade was formed to provide a fast moving, flexible and versatile force which would be capable of reinforcing the British Army of the Rhine (BAOR). Acting as a heli-borne fast reaction force, the brigade can also be used as flank protection or for support offensive ground operations, including rear area security, airmobile or airborne counter-operations, target seizure and acting in a reinforcement role. With the original British Airmobile Brigade now



Above: *A Puma arrives at an RV west of Korbecke to fly forward the first wave of German troops.* Inset left: *Pumas of the Aviation Battle Group prepare to move their ambush teams.* Inset right: *A waiting Puma at 9 Regiment's Forward Operating Base.* Right: *Troops are flown in by 33 and 230 Sqn Pumas to the confinement area south of Munster.* All photographs Patrick Allen

merged to form part of a NATO Airmobile Division the flexibility of heli-borne operations is increased even further.

The concept of UK airmobile operations was developed in close co-operation between the RAF and the Army. No 18 Squadron, prior to equipping with the Chinook in the period 1978-1980, worked closely with 5 Field Force in Germany, helping to formulate many of the doctrines used in today's airmobile operations. In 1980 as the RAF Chinook entered service, airmobile development continued. During four years of extensive trials with the British Army's 6 Brigade in the 1980s, today's airmobile concepts were finally established. On 1 April 1988, 24 Infantry Brigade was retitled 24 Airmobile Brigade and based at Catterick in Yorkshire. The role of the Brigade during hostilities was defined as reinforcement of the British Army of the Rhine.

Over the past three years the Brigade has conducted numerous airmobile exercises supported by RAF helicopters. During this time the Brigade has continued to expand and adapt its airmobile operations. This has led to several new concepts including the forming of Aviation Battle Groups (ABG), Airmobile Battle Groups and Aggressive Delay Tactics. The last of these exercises, named *Eagles Flight*, took place on Salisbury Plain in July 1991. This was the major work-up for the Brigade prior to deploying to Germany as part of the Multi-national Airmobile Division. Also joining the Brigade on Salisbury Plain were a number of German Army CH-53G helicopters from Army Aviation Regiment 15, and UH-1D Iroquois from Army Aviation Regiment 10. This allowed the RAF Chinooks and Pumas an opportunity of working with the German helicopters prior to exercise *Certain Shield*. As part of a Multi-national Airmobile Division RAF Pumas and Chinooks, plus German Army CH-53s and UH-1Ds would work together as part of an Airmobile Battle Group and deploy to a Forward Operation Base (FOB) to support the Airmobile Division troops.

In support of 24 Airmobile Brigade, RAF helicopters carry forward the airmobile infantry battalions in a two-wave lift. Each serial in a battalion airmove is designed to maximise the Chinook's lifting capabilities. Pumas are used to deploy up to 12 troops each for reconnaissance screens and deploy Mortar teams prior to the arrival of the main force. Standard Chinook loads are usually 36 troops equipped with Milan anti-tank weapons plus motorcycle and

Troops from the Duke of Edinburgh Royal Regiment boarding RAF Chinooks during a Battalion airmove.









Top left: *Chinooks are an essential element of Airmobile exercises.* Top right: *Light Strike Vehicles (LSVs) are under trials for recce missions.* Above: *Chinook about to lift a netted ATMP (All Terrain MultiPurpose vehicle).*

underslung command vehicle with trailer. Alternatively they can lift 16 troops plus an internal Supercat all terrain multi-purpose vehicle (ATMP) or a Light Strike Vehicle (LSV) plus an underslung vehicle. The Chinook can easily accommodate up to 56 Milan equipped troops. During wartime with seats removed this number can be dramatically increased. Over 80 troops have been carried in a Chinook and during Operation *Provide Comfort* some 116 Kurdish refugees were flown down from the mountains in a single lift. Having completed the main battalion airmoves Chinooks are then assigned to the logistics lift *(Log Ripple)* resupplying ammunition, food, equipment and fuel. A number of Pumas and Chinooks are assigned other tasks within the forward area.

During the *Log Ripple*, Chinooks fly forward eight-ton netted pallets which are pre-netted into eight Puma size loads. The Pumas then supply forward positions with ammunition and supplies. The air-portable ATMPs and LSVs are used by recce teams, battlefield casualty evacuation and transport of the battalion's Milan reserves and mortar ammunition. Motor cycles are used by the airmobile battalions for liaison tasks until landlines are laid.

The entire airmove is undertaken in complete radio silence with each helicopter working to a strict Standard Operating Procedure (SOP). Flying around a safe and defined heli-route, helicopters pass through Aircraft Control Points (ACPs) and over a Forward and Rear Zone Indication Point Officer known as 'ZIPO'. By reading the hull letter or coded number on the side of each helicopter as they pass, the 'Zipo' can cross each serial off his list. By holding up a code letter on a large board he can inform a helicopter of its next task or redirect the helicopter to another serial should it be changed. Using a series of colour codes and numbers each pick up point in the Brigade's confinement area is recorded on the SOPs. As each helicopter arrives at a pick up point they are directed to their 'chalk' by a beachmaster. The troop leader of each section known as the Stick Leader holds up a red card for the pilot to see. A Chinook will then line its tail ramp at the head of that stick and wait for the troop to emplane. The Stick Leader will have his drop-off grid written on the reverse of his red card. Another marshaller will direct the Chinook to the correct load for that particular serial. If loads are being moved without troops, the load's serial number and drop-off grid is then written in chalk on the top of the load. The helicopter crewman can then simply read off the grid from inside the helicopter. The simplicity of the whole operation is popular with both the troops and the RAF crews. Also placed along the heli-route is the Main Refuel Area (MRA) operated by the RAF's Tactical Support Wing (TSW).

The latest concept in airmobile operations has led to the formation of the Aviation Battle Group (ABG). This is formed by combining the Lynx AH7 anti-tank helicopters of 9 Regiment, Army Air Corps with six RAF Pumas plus an Infantry Company armed with Milan anti-tank missiles, and an Air Defence Troop armed with Javelin surface-to-air missiles. The ABG can be used to act as a fast reaction force and be deployed to block any enemy armoured concentration threatening the Brigade. Ideal for ambushing enemy armour, the RAF Pumas fly ahead of the Army anti-tank Lynx helicopters and 'insert' their Milan and Javelin armed troops. Once the troops have been deployed the Pumas head back to a holding area, while the Lynx move up to their fire positions. The deployed ground troops give the Army Lynx additional protection from land and air threats, and help to increase firepower during an engagement. After the attack, the Pumas return to extract their fire teams. Using their RAF Pumas to move them around the battlefield the ABG troops are also used to guard the Army helicopters while they are deployed in the field. RAF Chinooks are also used, helping to move the ABG Forward Arming and Refuel Points (FARPS) and by bringing forward fuel and weapons.

During Exercise *Certain Shield* British and German airmobile concepts were used to formulate a standard operating procedure which could be used by any future multi-national force. On the first day the new Division tried the British system of helicopters flying in tactical pairs, picking up troops with rotors running, then flying forward in a stream. The German system involves flying forward in blocks of up to ten helicopters at a time. Having arrived at their troop pick-up point rotors are stopped while the troops emplane. Once loaded, the helicopters fly forward in formations or 'swarms'. Pathfinder helicopters will have flown in several hours prior to the main wave to secure suitable landing sites. Both systems were used during the exercise. During one lift RAF Pumas were used to fly forward German paratroopers from the 27 Luftlanderbrigade to act as a covering force prior to the arrival of the main wave. This comprised British 24 Airmobile troops, Belgian troops from the Para-Commando Regiment, and German Luftlander troops who were all flown forward by RAF Chinooks and German Army CH-53s. Once deployed into their forward positions a number of RAF Pumas and Chinooks then deployed to a forward operating base along with two German CH-53Gs and two UH-1Ds to provide instant tasking for the troops.

The success of the British 24 Airmobile Brigade has proved that helicopters can provide the flexibility and mobility needed in tomorrow's army. The Airmobile Brigade has validated all those in the RAF and Army who, over the years, have supported the Airmobile concept. Exercise *Certain Shield* was the first of many multi-national partnerships combining national expertise to the benefit of the NATO alliance. Over the years there has been a great sense of enthusiasm within the British 24 Airmobile Brigade by all ranks both in the RAF and Army. This enthusiasm for airmobility was evident during Exercise *Certain Shield.*

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While Stocks Last

Tedder

The centenary of the birth of one of the great military leaders of this century, Arthur William Tedder GCB, DCL, LLD, BA, Marshal of the Royal Air Force, 1st Baron Glenguin was marked in 1990 as was the 50th anniversary of his arrival in the deserts of the Middle East as Deputy AOC.

There can be no doubt that both Tedder and his exploits were great but his story is that of a complete man, great in the most human and humble of ways and sadly an important story often lost in the palimpsest that is history. His active Service career of over 30 years saw him rise from a Western Front pilot to become Britain's first post-war Chief of the Air Staff. He came to the RFC, as it then was, by the 'blessing' of an injured knee which rendered him unfit for infantry duty with the Dorsetshire Regiment, to whom he was commissioned.

Much has been written, not all of it complimentary, of his time in the deserts of the Middle East and North Africa and of his command of the world's first truly 'allied' air force in Sicily, Italy and from Normandy to Berlin.

But what of the man behind the facade? There is wide and consistent opinion, even among those who did not always see eye to eye with him, that Tedder was a "warm hearted person with a puckish sense of humour". From his Cambridge days and the adornment of rooftops to his 'conversation with Kesselring' in 1942, Tedder endeared himself to many with displays of an obvious and deep rooted sense of proportion, warmth and humour.

He was a humble and considerate man who, by his very nature of fairness and left of centre political beliefs, inspired those who served under him to see their respective roles as forming part of the greater team that military service is. But it was this perception of the team that brought some of the sharpest criticism. Invariably such views are unbalanced for he never allowed personal or service prejudice to override the pre-eminent consideration of the greater effort. As an example he had no doubts in strongly criticising Coningham over an incident involving that renowned anglophobe George Patton.

Tedder alone among the British 'field' commanders saw the desperate need to ensure the success of an 'Allied' force. Supported by his great friend Sir Charles Portal, the legendary war-time Chief of the Air Staff, Tedder fought tooth and nail from the first involvement of the Americans in North Africa right to the end of the war to see it succeed.



Michael Ulyatt

SHAEF (Supreme Headquarters Allied Expeditionary Force) he perceived far more important than any individual interest. To the truly great and perceptive among the leaders he was seen as a powerful and great leader. To others, blinkered by personal pride and prejudice, he was seen as 'scheming' and to some weak and a 'sop' for the Americans. Nothing could be further from the truth for he possessed the highest degree of personal and moral courage.

Like Portal, Tedder was too concerned with the future to worry about the past and when he finally gave us the last of the great WW2 memoirs *With Prejudice*, less than two years before his death, he told his story, as he saw it, caring neither to change or launder his views. Like Churchill he gave us his book, warts and all. His memoirs rekindled some of the controversies and showed Tedder to be the honest, upright and determined man he was and bore out the words of Thomas: "Rage, rage against the dying of the light".

Retirement saw the departure from post-war service life of some of our greatest figures, most notably Brooke and Portal and it was left to the next wave to take up the reins. Tedder was clearly the most adept and successful of these. Montgomery's dislike for Whitehall and his intellectual conflict with bureaucracy have unfortunately reflected poorly on the great Field Marshal's post-war career. As CIGS his opposite number as head of the air force was Tedder and their mutual animosity, doubtless tempered somewhere along the line with a grudging respect, carried on in the corridors of power.

This produced the ridiculous situation in which, if at all avoidable, they would not attend meetings together, delegating their deputies the task. Though it takes two-to-tango, Tedder's contribution to the argument was based upon his own perceptions of modesty and an intolerance of conceit, veneration and 'colossal ego'. The origins of the animosity between them remains authoritatively undefined but it doubtless began in the desert after the 2nd Battle of Alamein when it was all perceived as 'bloody Monty's war', with little attempt being made to give due credit to the many people involved in the effort across the sands.

Tedder retired as Chief of Air Staff at the end of 1949 having served with great distinction during four years, the greater part as Chairman of the Chiefs of Staff Committee and having transformed the RAF from a vast fighting machine into one more attuned to the trials of peace. After a brief sojourn he went to Washington as Britain's representative on the Military Council of the North Atlantic Treaty Alliance, finally retiring in 1951.

But what of the man outside of his service life? He was a homely man, enjoying nothing more than the times among his family and friends. To him they were all that were really important. Without detracting from the tremendous commitment he gave to the RAF and his country, he had a comfortable set of values, sadly amiss in many then and now. He suffered great loss twice in the war, firstly in July 1940 when his eldest son





Left: *Tedder in North Africa, 1942.* Above: *'Mary' Coningham, Harry Broadhurst and Tedder – 'A great triumvirate'– Europe 1945.* Below: *Tedder in later life.*

Dick went missing in action over Cherbourg and in January 1943 Rosalinde, his wife of 28 years, was tragically killed in an air crash while visiting Egypt.

As chairman of the Malcolm Clubs, which he helped found and President of the RAFA, he did much to help his fellow airmen, for this was how he saw them. Civilian 'postings' on the boards of The Distillers Company, Standard Motor Company and the Governors of the BBC, ensured that his time was fully occupied. He was a gifted artist, producing many coloured pencil sketches which remain as vivid and evocative as the day they were made. The latter part of his life was dogged by ill health and further personal sadness when his second wife died in 1965.

In so complete a person it is almost impossible to summarise his achievements and acknowledge, fully, his service. He was the third giant of the RAF, standing shoulder to shoulder with Trenchard and Portal, both great friends. He did most to ensure the effective use of air power and was the first leader to be called upon to exercise such power. His contribution as the 'diplomat' among the allied leaders cannot be overstated. But perhaps we need to step outside to see him in a true light.

He inspired and motivated, he cajoled and comforted, he led with tenacity and by example, not by conceit and arrogance, he carried his rank and did not let it carry him and he remained strangely above the greatness of his achievements. He was an 'air commander of genius' and yet so modest as to belie his own abilities. In the end and above everything he achieved professionally he was an honourable, great and gifted man, who made his mark on history and people and then stood back, unconcerned with adulation and let the superfluous pageant go by, with a wry smile and warmth in his heart.

Michael Ulyatt is currently working on a major biography of Lord Tedder.



PHANTOMS



OVER THE SOUTH ATLANTIC

Air Vice-Marshal Ian Macfadyen CB OBE FRAeS RAF describes his unexpected task, as Officer Commanding No 29 Squadron, to provide Phantoms for air defence of the Falkland Islands

On 31 March 1982 I stepped into my Phantom FGR2 early in the morning to fly back to my home base, RAF Coningsby, after a month of delightful gunnery practise in sunny Cyprus. When I got home I first heard stories of 'a spot of bother' in the South Atlantic. Although I did not know it then, the next 18 months of my life were to change dramatically.

Like many others, after the invasion of the Falkland Islands on 1 April, I listened intently to the drama unfolding in the House of Commons in the debate the next morning – a Saturday. There were rapid deployments of ships and some bigger aircraft, but I did not expect much involvement personally as the runway at Port Stanley – at 4,100ft – was far too short for Phantom operations. It was therefore with some surprise that my Station Commander, Group Captain Wratten (now Air Marshal Sir William Wratten of Gulf fame), told me in his office some two weeks later that if Phantoms were to be involved, it would be my Squadron to go. This was naturally an exciting prospect and we immediately set about planning what should be done by way of operational training, together with the necessary logistic and personnel aspects. The next few months were to be intensive indeed.

Plans were already in hand to re-take the islands, and to enlarge Port Stanley's runway using the US-manufactured AM-2 matting system to enable Phantoms to operate. This was to be a very high priority because of the FGR2's look-down/shoot-down capability which was in 1982 still advanced for its day – and a capability not possessed by the Royal Navy's Sea Harriers; such was the priority for the aircraft's capability that we even considered using the existing runway at Port Stanley as a war measure. However, arrester cables (RHAGs) would clearly be necessary to stop the aircraft from either running off the end of the runway or into the hazardous ditches alongside. Part of our early training therefore included arrested landings and flying approaches into the only available 4000ft runway – at the British Aerospace airfield at Brough. That runway looked alarmingly short!

We also set about an intensive period of bringing crews up to a high operational readiness, practising dissimilar air combat training (DACT) with a variety of aircraft including the Mirage, a type in extensive service with the Argentine Air Force. Besides this we considered options for using the full capabilities of the multi-role Phantom, but opted eventually for air-ground strafe as the only practical additional role to our specialised air defence primary task. For old hands like myself, who had only been involved in air-air training previously, the prospect of some 'mud-moving' was exciting.

Whilst all this was going on, work was set in hand to make improvements to our aircraft. First, the AWG-12 radar got a much needed 'reliability package', but others quickly followed, including the fitment of chaff and flare dispensers. These were very new indeed to the RAF (I recall the first trial fit when the armourer concerned had to don the full fireman's protective clothing!). Next came supplies of the AIM-9L Sidewinder, far more capable than our old AIM-9Gs.

It was around mid-May, at yet another conference at HQ 11 Group, that we learnt of a likely deployment to Ascension Island. This soon became a reality and Squadron markings had to be removed from the aircraft to be deployed. Although the Squadron had some aircraft in the then new grey paint scheme, two more had to be repainted over the weekend before the planned deployment to Ascension Island – quite a task for RAF St Athan, where the aircraft had to be sent.

On Monday 24 May 1982, the first two No 29 Squadron aircraft made one of the longest non-stop fighter transit flights in the RAF's history on the 4,000 mile flight to Ascension Island. It was to become more of a routine over the next few months. Diversion airfields en route were few and far between, and there was no prospect of one at the other end. 10½hr later, the first Phantoms were in the South Atlantic. The detachment immediately set up on Quick Reaction Alert (QRA) in case of an Argentine attack and was under the command of Sqn Ldr Roy Trotter (now OC No 29 Squadron at Coningsby). The detachment was to remain there, uncertain of its future, for the next five weeks before it returned to the UK once the war was over.

Events, however, were far from over for the rest of the Squadron, since the next problem was to protect the Falklands in peace from possible further aggression. But first the runway at Port Stanley had to be prepared for safe peacetime operations. There was nevertheless an urgency about matters, not least because aircraft carriers, with their Sea Harrier and Harrier complements, could only remain in theatre for a limited period. It was, however, not to prove easy to extend the runway and airfield for our use.

First, the task of clearing the airfield of unexploded ordnance proved formidable and took much longer than anticipated. Secondly, the runway was holed in one place by a 1,000lb bomb dropped on the first Vulcan raid; this was to become a permanent problem due to subsidence of the temporary filling. Thirdly, the runway



A pair of Phantoms ready to deploy to Ascension Island in May 1982. Note the obliterated squadron markings on the rear aircraft. Ian Macfadyen







Above: *Victor tankers provided essential AAR during the deployment to Ascension Island.* Laurie Hilditch. Right: *A 29 Sqn Phantom overhead Wideawake airfield.* Ian Macfadyen Below right: *Take-off from Wideawake.* Ian Macfadyen

could only be extended one way – to the West – and this entailed moving a huge tonnage of rock and subsoil in order to make it reasonably level. Lastly, the planned dispersal area for Phantoms at the end of Runway 27 proved to be such difficult ground that a new site well down the runway had to be found.

In anticipation of a move early in September, the Squadron once again deployed an element to Ascension Island towards the end of the month; during the month the groundcrew and equipment set sail for the Falkland Islands, under the leadership of Warrant Officer Geoff Bland. It was soon evident that plans had been optimistic. The advantage, however, was that it allowed those at Ascension Island to concentrate on some excellent operational flying in perfect conditions. With tanker support, sorties rarely lasted less than four hours, and it was not long before six aircraft were clocking up more flying hours than a whole Squadron would normally do in a month.

The difficulties at RAF Stanley, as it was by now known, kept delaying the deployment further South, not helped by some fierce winter weather. Thus it was not until 1 October that I flew down to RAF Stanley in a Hercules to view the airfield and to meet my people before I was to take the first Phantom south. This proved most valuable because the whole scene had to be seen to be believed. RAF Stanley was totally unlike any airfield I had ever seen. Besides the bleak setting, facilities were crude, but above all the impression was of a tiny airfield; not for us the space we were used to back home. For example, the Harrier dispersal was 10yds from the edge of the runway and my new Phantom dispersal not much more.

About 5,000ft of the 6,000ft of AM-2 matting had been laid at the time of my visit, but the squadron dispersal was anything but complete with no hangars, a few tents and nowhere to park the aircraft. Two weeks later it was to be transformed thanks to the remarkable work both of the Royal Engineers who worked round the clock, backed up by the enthusiasm of the Squadron's advance party who had already been in the South Atlantic for a month. In the interim, it was back to Ascension Island, where the weather, balmy breezes and wonderful flying seemed a far cry from our future location.

Sunday 17 October 1982 dawned bright and clear on Ascension and the forecast,





Right: *Catching the arrester wire at RAF Stanley, with brake parachute deployed in case of wire failure.* Ian Macfadyen



Relaxation at RAF Stanley – note the use of the Argentinian drop tank for additional seating area! Ian Macfadyen



Royal Engineers laying a section of the 6,000ft AM-2 matted runway at RAF Stanley. Ian Macfadyen

after a couple of problem days, was good for the Falklands. Six serviceable Phantoms had been prepared for my trip. The aircraft had shown unusually good serviceability in such a benign climate – but today was to be different! Two aircraft went u/s on the pre-flight, the next went u/s on crew acceptance and the fourth, my intended aircraft, had a complete radio failure. With 17 Victor tankers to support me, all ready to go, these setbacks were becoming increasingly embarrassing, especially with not a little interest from on high.

Eventually I climbed into the sixth aircraft and got started with a back-up aircraft ready with me. The story did not stop there because just after take-off the radar in my aircraft failed totally; to complete the saga the inertial navigation system (INAS) motored to 180° South of its own accord at the top of the climb – and we had no TACAN! This might have been a prudent moment to return to Ascension Island, but we had Victors as escort all the way down to the last 1000 miles and my navigator, Sqn Ldr Pete Simpson, was a highly experienced Nav Instructor, and mental D/R was no problem for him! The sortie subsequently was remarkably uneventful, with nine refuellings.

After 1½hr in cloud, having left the last Victor, we heard the first sound on the radio of our welcoming Sea Harriers, who approached to escort us in. It was an unforgettable sight to pop out of cloud in the descent at 18,000ft into a clear sky with RAF Stanley just below us. Twenty minutes later, after 9¾hr, we were safely on the ground having made the first arrested landing on the new runway. The welcoming party was huge by Falklands standards with people all around the airfield as far as minefields and the like would allow. One hour later, after a magnificent operational turn-round by the 'boys', Flt Lt Andy Maddox took the aircraft on its first sortie over the islands. During the next three days further aircraft gradually began arriving and we took over QRA duties from the Royal Navy just four days after we had arrived.

Flying in the Falklands was certainly difficult. First, there was nowhere else to go, so the weather dominated all we did, as safety was clearly paramount. No more than two Phantoms were allowed to be airborne except in the case of operational need. We nearly always flew with a Hercules tanker airborne to both prolong flight time and to keep us airborne in an

Below: *No 29 Squadron dispersal – to the rear is a minefield.* Bottom: *Aerial view of RAF Stanley.* Below right: *A Phantom on patrol along the coastline of West Falkland.* Photographs Ian Macfadyen







Left: *Two Harrier GR3s equipped with sidewinders over Goose Green.* Ian Macfadyen

emergency; if it was not airborne it was on immediate standby. We invariably intended to land back into one of the five arrester wires straddled across various points of the AM-2 covered runway. Occasionally, if there was a sudden weather deterioration we had to opt for a conventional landing as it took a few minutes to get one aircraft into a cable, clear the runway and then reset it. In such an eventuality, with large ditches either side of the runway, use of braking had to be done carefully despite the much shorter than normal runway as a burst tyre could have catastrophic consequences. Fortunately, there was usually plenty of wind. It was, however, not always down the runway. I am one of a few who have experienced 50kt cross wind landings (into the cable I may add) but looking through the side of the cockpit to land was certainly a novel experience.

Training flying took us out over to the West of the Falkland Islands where we would work with the Royal Navy whose air defence ships were on constant alert. All flying was done with live armament, and special rules had to be developed to ensure adequate safety. We found (to our surprise) there was a hole for a safety pin in the trigger which added still further to the safety – and to the need to be fully alert if a real threat emerged. It never did. The Hercules normally operated at medium level but it was not uncommon for AAR operations to be at low level. Refuelling amongst the numerous islands around West Falkland provided views of some superb unspoilt scenery and, when the sun shone, bright sandy beaches.

Besides operating the Phantom we worked with our Harrier colleagues who had recently converted to the air defence role. This, along with affiliation training with the Hercules, provided plenty of training variety. Crews were able to fly about 20hr per month, roughly at UK levels, but the number of sorties was relatively few because they often lasted over three hours. The adverse weather ensured frequent no flying days, but there was always the constant QRA requirement. Half of the detachment was on some kind of alert, and a minimum of four aircraft were on QRA at any one time. This placed great demands on the engineers and those on the Station who supported us, but there was little else to do, and at least the work prevented boredom.

The working week was seven days with the occasional rest day (always different). Those on QRA were in comparative comfort, with Portakabins provided; these were the only ones on the site initially apart from the Ops Room. My office was a tent, complete with strip lighting, a purpose built wooden entrance, with corrugated iron door – and cardboard boxes as In/Out trays (the only thing we had fortunately omitted from our deployment pack!).

Night flying was always testing. I have rarely experienced total darkness, and then only really in the South Atlantic where there was not even a light to be seen. One evening Peter Simpson and I were recalled to the circuit via a GCA approach; we were a little disconcerted to see the airfield lights disappear at about 12 miles range and were somewhat alarmed when we went into cloud at 400ft! Being forced to overshoot because we were still in cloud at 200ft we were highly relieved to find that half-way down the runway we were back into clear air. This meant we were forced to land in the other direction. We had not been briefed, however, that a 30kt crosswind had suddenly brewed up, so on my first circuit I found I could not line up on the runway. It was good to be back on the ground safely a few minutes later. Many of us had similar experiences.

We had only one incident in the air of note, and that was on the day the Secretary of State for Defence, John Knott, visited RAF Stanley. This was a week after our initial deployment. Andy Maddox was sent airborne, in marginal weather, to demonstrate an arrested landing. Having failed to see the runway on his first approach there was already a certain tension when he made the second, but it was with some relief that we saw the Phantom emerging out of the mist. What followed was fairly dramatic. The aircraft arrester hook engaged the wire, but the latter promptly severed under the strain, slicing bits off the tailplane in the process. Fortunately, Maddox managed to stop the aircraft on the runway having wisely decided whatever happened he was going to stay on the ground.

In the early days off-duty accommodation was a ship in the middle of Port Stanley harbour. The *Rangatira* was a former New Zealand ferry ship which had been hastily converted for operations, complete with a helideck. If you were lucky, you might get a lift from a passing helicopter refuelling in a dispersal immediately next to ours; there were plenty around in those early months. Otherwise it was a long drive to town, along a road which could only passably be called that, to catch the LSL to the *Rangatira* – one of five ships in the harbour. Such a process could take well over an hour, so helicopter lift procedures had to be developed in case of an alert. I always admired our Harrier cousins because they firmly slept on site – in accommodation that had been honed to perfection over years of field operations!

During my seven months on those islands I saw many changes to the airfield and its surrounds. The *Rangatira* was not long used by No 29 Squadron (which with a turnover of people became 'Phandet', and later No 23 Squadron) before a Swedish 'Coastel' accommodation vessel arrived from the Gulf of Mexico to provide not only much improved comfort for all, but a short land link to the Squadron. The airfield was gradually transformed, roads were constructed, and life became more normal.

I look back on those months leading up to and in the South Atlantic with satisfaction and pride. It was one of the most challenging periods of my life, with certainly the most demanding flying. I got deep fulfilment from not only the work, but also from commanding people who were in every way outstanding. The British seem to thrive in adversity, providing ingenuity and good humour just when needed. But that all seems a long time ago now.

Air Vice Marshal I.D. Macfadyen CB OBE FRAES RAF is Assistant Chief of Defence Staff – Operational Requirements (Air) at the Ministry of Defence. In 1982 he was Officer Commanding No 29 Squadron, flying Phantom FGR2s from RAF Coningsby.

A Hercules tanker takes off from RAF Stanley to provide support for the Phantoms. Ian Macfadyen



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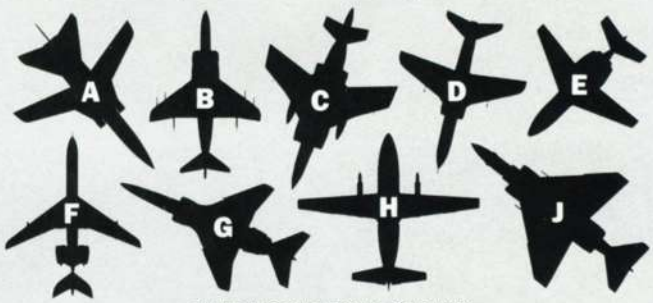
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AIR TOURNAMENT INTERNATIONAL 92
AT A&AEE BOSCOMBE DOWN SALISBURY, WILTS ON 13 OR 14 JUNE 1992.

HOW TO ENTER

Study the silhouettes below (not to scale) of nine RAF aircraft, then put the appropriate letter by the correct names of the nine in the entry coupon.

Complete your name and address on the entry form and send to Royal Air Force Aircraft Competition at the Promoter's address below.

The first 150 all-correct entries received before 1st June will win a free admission ticket to Air Tournament International 92 at A&AEE Boscombe Down on 13 or 14 June. All correct entries received by 30 September 1992 will be entered in the Concorde Flight draw to win a 1hr 40min champagne flight from London Airport on a British Airways Concorde.



RULES & CONDITIONS OF ENTRY

1. You may send as many entries as you like, but each entry must be made on the official ROYAL AIR FORCE AIRCRAFT Competition coupon.
2. Photocopies of the coupon and handwritten entries will NOT be accepted.
3. No responsibility can be accepted for loss of entries or damage to them however caused.
4. The judges decisions will be final. No correspondence will be entered into.
5. Closing date for the receipt of entries is 30 September 1992 and the prize winner will be notified by post.
6. The prize winner's name together with the solution will be available from the Promoter's office at the address below, on receipt of an SAE.

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☐ Hawk T1	☐ VC10 K3	☐ Dominie T1

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AVIATOR II

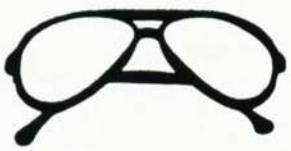


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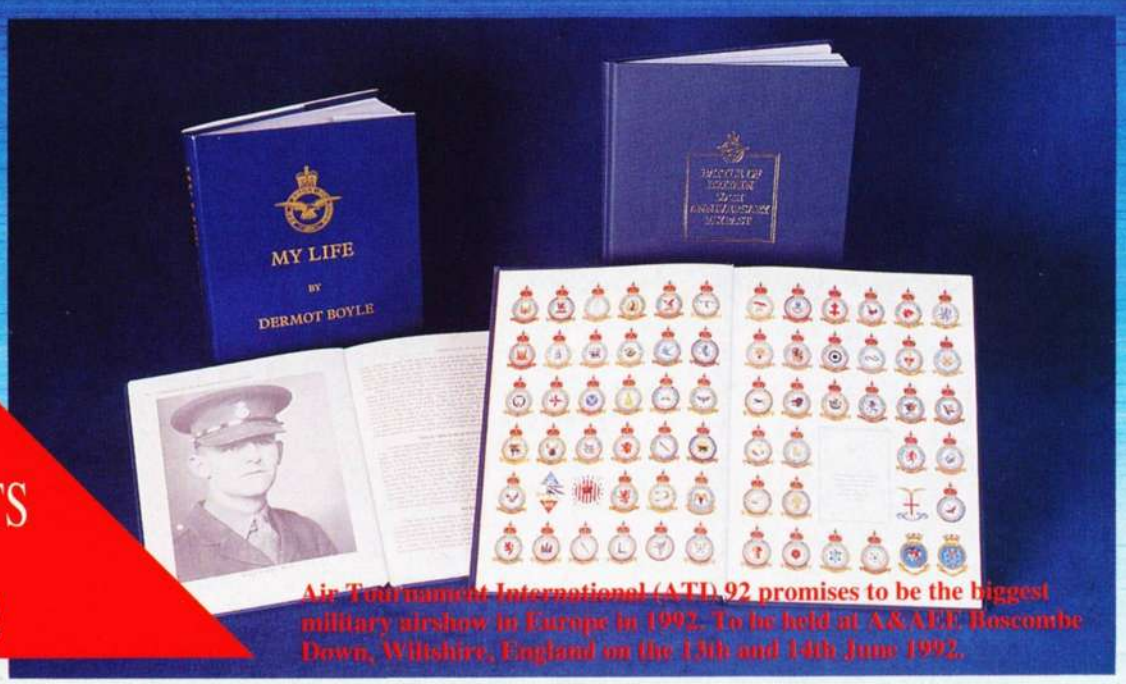
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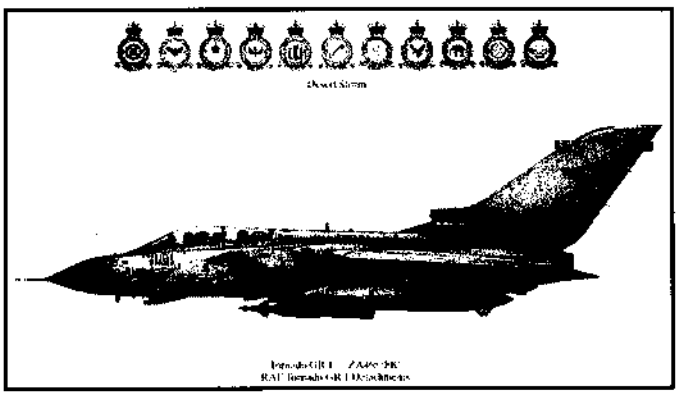
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No.	Subject	Unit
30	Wasp HAR.2	22 Sqn, RAF
31	§ Gazelle AH.1	3 CBAS, RM
34	§ Wessex HAS.3	737 Sqn, RN
36	VC10 C.1	10 Sqn, RAF
38	Hunter FGA.9	1 TWU, RAF
40	Hurricane IIc	111 Sqn BBMF, RAF
41	Spitfire IIa	19 Sqn/ BBMF, RAF
43	Jet Provost T.3A	1 FTS, RAF
44	Dominie T.1	6 FTS, RAF
45	Jetstream T.1	MCBS, 6 FTS, RAF
48	Snowdon 3	Royal Navy Historic Flight
52	F-4E Tiger II	527 TFTAS, USAF
53	CF-101B Voodoo	416 Sqn, CAF
55	Harrier GR.3	4 Sqn, RAF
57	Hunter FGA.9	79 Sqn/ TWU, RAF
60	Tornado GR.1	TTTE, RAF
62	§ Sea Harrier FRS.1	899 Sqn, RN
65	Phantom FG.1	43 Sqn, RAF
66	Phantom FGR.2	29 Sqn, RAF
67	Jaguar T.2	226 OCU, RAF
68	Chinook HC.1	240 OCU, RAF
69	F-15C Eagle	32 TFS, USAF
70	F-4E Phantom II	526 TFS, USAF
72	§ Wessex HU.5	845 Sqn, RN
74	§ Chipmunk T.10	F533, RAF
75	Jaguar GR.1	54 Sqn, RAF
76	A-10A Thunderbolt II	79 TFS, USAF
78	Hawk T.1	63 Sqn/ 3 TWU, RAF
81	§ F-14A Fighting Falcon	322 Sqn, RNLAF
82	Tiger Meet T.2	RAF Command
85	Lightning F.6 (camo)	11 Sqn, RAF
86	Tornado GR.1	9 Sqn, RAF
87	§ Nimrod MR.2P	120, 201, 206 Sqns, RAF
89	Hercules C.1P	Lyneham Wing, RAF
90	Vulcan K.2	50 Sqn, RAF
91	Sea Harrier FRS.1	801 Sqn, RN
92	Vulcan B.2	Op.Black Buck, RAF
93	Sea Harrier FRS.1	800 Sqn, RN
95	Tornado GR.1	617 Sqn, RAF
96	A-6E Intruder	VA-34, USN
97	§ Phantom FGR.2	56 Sqn, RAF
98	F-16A Fighting Falcon	The Thunderbirds, USAF
99	Phantom FGR.2	64 Sqn/ 228 OCU, RAF
100	Buccaneer S.2B	208 Sqn, RAF
101	§ Phantom FGR.2	23 Sqn, RAF
102	RF-4C Phantom II	16 TRS, USAF
103	F-111F	48 TFW, USAF
105	CT-114 Tutor	2 CFFTS, CAF
106	Hunter T.8	229 OCU, RAF
107	T-37B Tweet	85 FTS, USAF
109	T-37B Tweet	85 FTS, USAF
111	F-4E Phantom II	335 TFS, USAF
112	Wessex HC.2	72 Sqn, RAF
113	T-37B Tweet	37 FTS, USAF
114	T-38A Talon	80 FTS, USAF
116	Lightning F.6 (dark grey)	5 Sqn, RAF
117	Phantom FGR.2 (camo)	92 Sqn, RAF
118	§ XC-135A Stratolifter	SAC, USAF
119	Sea King HAS.2	819 Sqn, RN
120	T-37B Tweet	85 FTS, USAF
122	C-141B Starlifter (grey)	63 or 445 MAW, USAF
123	Jet Provost T.5A	FTS/ Cranwell, RAF
124	§ Sea King HAS.5	814 Sqn, RN
125	Lynx HAS.2	702/ 815 Sqns, RN
126	F-111E	79 TFS, USAF
127	Gazelle HT.2	705 Sqn, RN
128	Tornado GR.1	15 Sqn, RAF
129	Phantom FGR.2	29 Sqn, RAF
130	SR-71A Blackbird	9 SRW, USAF
131	Hercules C.1K	1312 Flight, RAF
132	§ C-141B Starlifter (grey)	60 or 349 MAW, USAF
133	Spitfire IIa	41 Sqn/ BBMF, RAF
134	Lynx AH.1	Army Air Corps
135	Sea King HAS.5	820 Sqn, RN
136	Sea King HAS.5	826 Sqn, RN
137	Spitfire Ia	602 Sqn, RAF
138	Spitfire F.22	602 Sqn, RAF
140	VC10 K.2	101 Sqn, RAF
142	Vampire FB.5	805 Sqn, RAuxAF
144	§ EF-111A Raven	42 ECS, USAF
145	Tornado GR.1	45 Sqn/ TWCU, RAF
146	Vampire FB.5	612 Sqn, RAuxAF
148	F-4E Phantom II	480 TFS, USAF
149	Sea King AEW.2	849 Sqn, RN
154	Hawk T.1A (camo)	151 Sqn/ 2 TWU, RAF
153	Jet Provost T.3A	7 FTS, RAF
154	Vampire FB.5	682 Sqn, RAuxAF
155	Vixen K.2	56 Sqn, RAF
156	Sea King HAS.5	706 Sqn, RN
157	Victor K.2	57 Sqn, RAF
158	P-38J Lightning	77 FS, 20 FG, USAAF
159	Sea King HC.4	846 Sqn, RN
160	C-5A Galaxy (grey)	60 or 349 MAW, USAF
161	§ Shackleton AEW.2	8 Sqn, RAF
162	Sea Fury FB.11	807 Sqn, RNHF
167	Tornado GR.1	16 Sqn, RAF
168	C-141B Starlifter (grey)	438 / 314 MAW, USAF
169	Tornado F.2	229 OCU, RAF
171	P-51D Mustang	84 FS, 78 FG, USAAF
172	B-17F Flying Fortress	'Memphis Belle', USAAF
173	Jaguar 'S'	6 & 20 Sqns, 'RAF
174	Phantom F-4J	74 Sqn, RAF
175	Jetstream T.2	750 Sqn, RN
176	§ F-16A Fighting Falcon	406 TFS, USAF
177	Meteor T.7	Vintage Pair, RAF
178	Vampire T.11	Vintage Pair, RAF
179	§ Hawk T.1A (grey)	79 Sqn/ 1 TWU, RAF
180	§ Chinook HC.1	18 Sqn, RAF
181	Tornado GR.1	31 Sqn, RAF
182	F-4GS Tomcat/hawk	3rd Sqn, AVG
183	P-47D Thunderbolt	61 FS, 56 FG, USAAF
184	B-24H Liberator	700 BS, 467 BG, USAAF
185	Sea King HAS.5 '012'	824 Sqn, RN
186	Sea King HAS.5 '235'	824 Sqn, RN
187	Tornado GR.1	20 Sqn, RAF
188	Gazelle HT.3	2 FTS/ CFSHQ, RAF
189	§ Tornado GR.1	17 Sqn, RAF
190	Phantom FGR.2	19 Sqn, RAF
191	CF-104 Starfighter (other)	CSPE, RCAF
192	CF-104 Starfighter (camo)	1 CAWG, CAF
193	F-16A Fighting Falcon	612 TFS, USAF
194	F-16A Fighting Falcon	613 TFS, USAF
195	F-16A Fighting Falcon	614 TFS, USAF
197	Jet Provost T.5A	7 FTS, RAF
198	Sea Harrier FRS.1	800 Sqn, RN
199	Spitfire Vc	310 Sqn, RAF
200	Firefly AS.6	1830/ 1843 Sqn, RNVR
201	F-111E	20 TFW, USAF
202	Sea King HAR.3	202 Sqn, RAF
203	Harrier GR.3	3 Sqn, RAF
204	Halifax B.III	158 Sqn, RAF
205	Wellington IV	300(Polish) Sqn, RAF
206	Lancaster B.III(Special)	617 Sqn, RAF
207	Firefly AS.5	812 Sqn, RNRF
208	Sea Hawk FGA.6	806 Sqn, RNRF
209	Spitfire LF.IXe	43 Sqn, RAF
210	Sea King HAS.5	819 Sqn, RN
211	Phantom FG.1 (special c/s)	111 Sqn, RAF
212	Jet Provost T.3A	1 FTS, RAF
213	Spitfire F.21	602 Sqn, RNunAF
214	F-14A Tomcat (low viz)	VF-84, USN
215	§ Andover E.3	115 Sqn, RAF
217	Sea King HC.4	845 Sqn, RN
218	Fin-18A Hornet	VMFA-115, USMC
219	Comet C.2	216 Sqn, RAF
220	F-15C Eagle	53 TFS, USAF
221	Lancaster B.III	61 Sqn, RAF
222	CF-18A Hornet	1 Can Air Div, CAF
223	Phantom FGR.2	23 Sqn, RAF
224	Sea Harrier FRS.1	801 Sqn, RN
225	Sea King HC.4	707 Sqn, RN
226	Sea Harrier FRS.1	899 Sqn, RN

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No. SP19 – Puma HC.1, XW216 'F', RAF Puma (ME) Sqn – £7.00. Signed by commanders (100 only) – £16.00
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each print with badges appropriate to the aircraft/unit depicted. Price includes a donation to the RAF Benevolent Fund.

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	as above but signed by aircrew members on the day of ceremony	£10.60
		£9.60

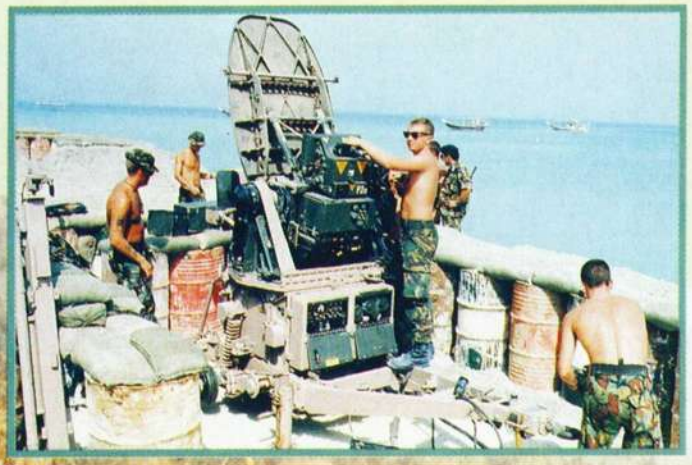
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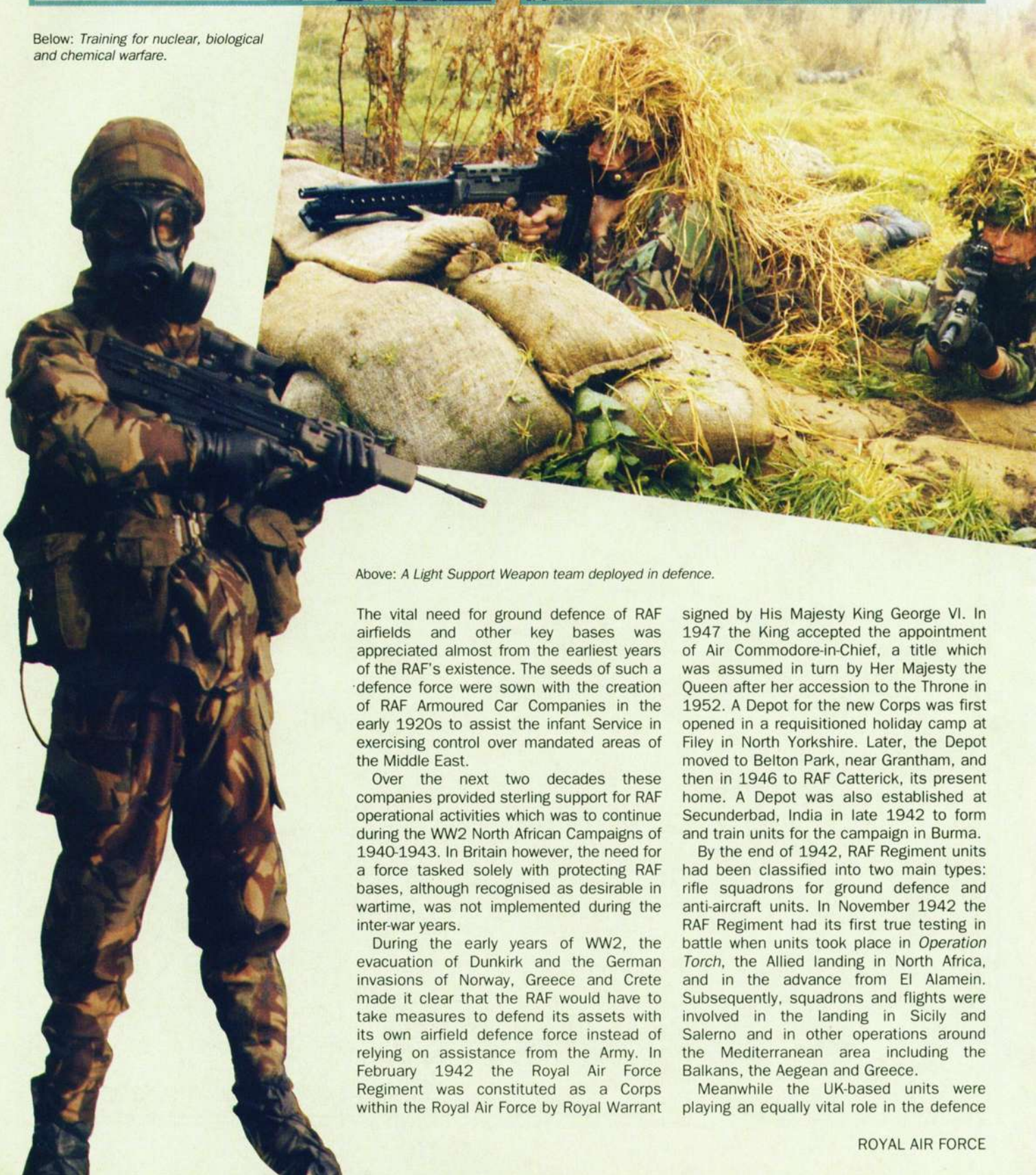
No.	Subject	Unit
227	Chinook HC.1	78 Sqn, RAF
228	Sea King HAR.3 (grey)	78 Sqn, RAF
229	Tornado F.3	43 Sqn/ 229 OCU, RAF
230	Jetstream T.1	750 Sqn, RN
237	F-4G Phantom II	21 TFS, USAF
232	Jaguar GR.1A	2 Sqn, RAF
233	Puma HC.1	33 Sqn, RAF
234	§ Hawk T.1A (grey)	234 Sqn/ 1 TWU, RAF
235	Canberra B.2	100 Sqn, RAF
236	Aermacchi MB.326H	CFS Roulettes, RAAF
237	Hunter T.7	237 OCU, RAF
238	Tornado GR.1	9 Sqn, RAF
239	Tornado F.3	29 Sqn, RAF
240	Spitfire LF.IXE	604 Sqn, RAuxAF
241	F/A-18A Hornet	VMFA-251, USMC
242	Wessex HU.5	771 Sqn, RN
243	Harrier GR.3	4 Sqn, RAF
245	CF-18A Hornet	425 Sqn, CAF
246	Spitfire LF.IXE	610 Sqn, RAuxAF
247	RF-4C Phantom II	38 TRS, USAF
248	Sea King HAS.5	819 Sqn, RN
249	Phantom FGR.2	92 Sqn, RAF
250	Phantom FG.1 (camo)	43 Sqn, RAF
251	Nimrod R.1	51 Sqn, RAF
252	F-16C Fighting Falcon	512 TFS, USAF
253	F/A-18A Hornet	VMFA-122, USMC
254	Bloodhound MR.II	25 & 85 Sqns, RAF
255	Harrier GR.5	233 OCU, RAF
256	Nimrod MR.2P	120 Sqn, RAF
257	F-15C Eagle	57 FIS, USAF
258	Wessex HC.2C	84 Sqn, RAF
259	Wasp HAS.1	829 Sqn, RN
260	Hawk T.1A	The Red Arrows, RAF
261	CF-5A Freedom Fighter	419 Sqn, CAF
262	F-16C Fighting Falcon	18 TFS, USAF
264	Phantom FGR.2	64 Sqn/ 228 OCU, RAF
263	F-16C Fighting Falcon	526 TFS, USAF
266	Sea King HAS.5	814 Sqn, RN
267	Nimrod MR.2P	206 Sqn, RAF
268	Buccaneer S.2B	12 Sqn, RAF
269	Nimrod MR.2P	MASU, RAF
270	B-52G Stratofortress	2 BMW, USAF
271	KC-135R Stratotanker	384 ARS, USAF
272	B-1B Lancer	28 BMS, USAF
274	Swordfish II	836 Sqn, RNHF
275	Vulcan B.2	Vulcan Disp.Flt, RAF
276	Hercules C.3P	Lyneham Wing, RAF
277	F-16A Fighting Falcon	157 TFS, SCANG
278	F-4C Phantom II	123 FIS, OANG
279	Lancaster BI	100 Sqn/ BBMF, RAF
280	Buccaneer S.2B	208 Sqn, RAF
281	F-111G	1 Sqn, RAAF
282	F-111G	6 Sqn, RAAF
283	F/A-18A Hornet	77 Sqn, RAAF
284	Boeing E-767-358C	33 Sqn, RAAF
285	Mirage IIIO	75 Sqn, RAAF
286	F/A-18A Hornet	2 OCU, RAAF
287	F/A-18A Hornet	2 Sqn, RAAF
288	C-130H Hercules	36 Sqn, RAAF
289	Sea King HAS.6	824 Sqn, RN
290	Beaufort I	22 Sqn, RAF
291	Tornado F.3	11 Sqn, RAF
292	F-14A Tomcat	VF-154, USN
293	Lightning F.6 (red rib)	5 Sqn, RAF
294	F/A-18A Hornet	Blue Angels, USN
295	Tornado F.3	5 Sqn, RAF
296	Aermacchi MB.326H	Roulettes, RAAF
297	C-130H Hercules	164TAG, OANG
298	P-3C Orion	11 Sqn, RAAF
299	E-3A Sentry	Sqn.2, NATO AEWF
300	BAe.146 QC.2	The Queen's Flt, RAF
301	Harrier GR.5	1 Sqn, RAF
302	Tornado GR.1A	2 Sqn, RAF
304	Harrier GR.7	4 Sqn, RAF
307	Chinook HC.1	7 Sqn, RAF
308	F-4G Phantom II	194 TFG, ksANG, USAF
309	F-16A Fighting Falcon	184 TFG, KsANG, USAF
310	Jet Provost T.5A	LLAADTS, 6 FTS, RAF
312	Sunderland MR.5	201 Sqn, RAF
313	Tornado GR.1A	13 Sqn, RAF
314	Tornado GR.1	14 Sqn, RAF
315	F-16A Fighting Falcon	Thunderbirds, USAF
316	146Sat RC.1	216 Sqn, RAF
317	Tucano T.1	7 FTS, RAF
318	Phantom FGR.2	1435 Flight, RAF
319	B-1B Lancer	46 BMS, USAF
320	Nimrod MR.2P	120, 201, 206 Sqs, RAF
321	Bulldog T.1	Univ C & S Air Sq, RAF
322	P-3K Orion	5 Sqn, RNZAF
325	Tornado F.3	27 Sqn, RAF
324	F-4E Phantom II	110 TFS, kANG
325	Tornado F.3	25 Sqn, RAF
326	F-16C Fighting Falcon	62 TFTS, USAF
328	Sea King HAS.6	814 Sqn, RN
329	C-130E Hercules	314 TAW, USAF
331	Sea King HAR.3	771 Sqn, RN
332	BAe.125 CC.3	32 Sqn, RAF
336	F-15E Strike Eagle	336 TFS, USAF
337	F-16A Fighting Falcon	2 Sqn, RAB
338	F/A-18C Hornet	VFA-85, USN
339	Mirage F.1B	140 Sqn, RAF
340	Sea King HAS.6	820 Sqn, RN
341	Jaguar GR.1A	41 Sqn, RAF
342	Nimrod MR.2P	42 Sqn, RAF
343	Tornado F.3	43 Sqn, RAF
344	PA-200 Tornado	JAG-31, GAF
345	F/A-18A Hornet	VFA-305, USN
346	A-10A Thunderbolt II	706 TFS, AFRes, USAF
347	F-15A Eagle	7 TFS, USAF
348	CF-18A Hornet	410, 416, 441 Sqs, CAF
349	Alpha Jet	JAG-41, GAF
352	Sea King HAS.6	819 Sqn, RN
353	F-4E Phantom II	457 TFS AFRes, USAF
354	Sea King HAS.1	824 Sqn, RN
355	F-15A Eagle	555 TFTS, USAF
356	Phantom FGR.2	56 Sqn, RAF
357	F-111E	55 TFS, USAF
358	CH-136 Kiowa	444 Sqn, CAF
359	Chipmunk T.10	12 AEF, RAF
360	A-7D Corsair II	120 TFS, ANANG, USAF
361	F-111C	1 Sqn, RAAF
362	Viking TK.1	662 VGS, RAF
363	Hawk T.1A	63 Sqn/ 2 TWU, RAF
364	RF-4E Phantom II	AKG-51, GAF
365	Tornado F.3 (special c/s)	65(R) Sqn, RAF
366	C-130H Hercules	40 Sqn, RNZAF
367	Viglant T.1	983 VGS, RAF
368	Phantom FGR.2	56 Sqn, RAF
369	F-16C Fighting Falcon	69 TFS, USAF
370	Canberra T.17A (navig)	360 Sqn, RAF
371	Tornado F.3	111 Sqn, RAF
372	Hawk T.1	4 FTS, RAF
373	P-3C UIII Orion	333 Sqn, RNAF
374	Phantom FGR.2	74 Sqn, RAF
375	Tornado F.3 (75th anniv c/s)	65(R) Sqn, RAF
377	Sea King Mk.43	330 Sqn, RNoAF
378	Sentry AEW.1	8 Sqn, RAF
379	Jaguar GR.1A (Gulf c/s)	Jag Gulf Det, RAF
380	Tornado GR.1 (Gulf c/s)	27 Sqn, RAF
381	Tornado GR.1 (Gulf c/s)	31 Sqn, RAF
382	Tornado F.3	"Desert Eagles", RAF
386	F-16A Fighting Falcon	331 Sqn, RNAF
387	F-4G Phantom II	81 TFS, USAF
388	Tornado GR.1 (Gulf c/s)	617 Sqn, RAF
389	Tucano T.1	3 FTS, RAF
391	Phantom FGR.2 (Spl blue c/s)	19 Sqn, RAF
392	Phantom FGR.2 (Spl blue c/s)	92 Sqn, RAF
394	F/A-18A Hornet	The Blue Angels, USN
397	Tornado GR.1 (Gulf c/s)	17 Sqn, RAF
400	Tornado F.3	43 Sqn, RAF
415	F-117A Nighthawk	37 TFW, USAF

§ – Low stock





Below: *Training for nuclear, biological and chemical warfare.*



Above: *A Light Support Weapon team deployed in defence.*

The vital need for ground defence of RAF airfields and other key bases was appreciated almost from the earliest years of the RAF's existence. The seeds of such a defence force were sown with the creation of RAF Armoured Car Companies in the early 1920s to assist the infant Service in exercising control over mandated areas of the Middle East.

Over the next two decades these companies provided sterling support for RAF operational activities which was to continue during the WW2 North African Campaigns of 1940-1943. In Britain however, the need for a force tasked solely with protecting RAF bases, although recognised as desirable in wartime, was not implemented during the inter-war years.

During the early years of WW2, the evacuation of Dunkirk and the German invasions of Norway, Greece and Crete made it clear that the RAF would have to take measures to defend its assets with its own airfield defence force instead of relying on assistance from the Army. In February 1942 the Royal Air Force Regiment was constituted as a Corps within the Royal Air Force by Royal Warrant signed by His Majesty King George VI. In 1947 the King accepted the appointment of Air Commodore-in-Chief, a title which was assumed in turn by Her Majesty the Queen after her accession to the Throne in 1952. A Depot for the new Corps was first opened in a requisitioned holiday camp at Filey in North Yorkshire. Later, the Depot moved to Belton Park, near Grantham, and then in 1946 to RAF Catterick, its present home. A Depot was also established at Secunderbad, India in late 1942 to form and train units for the campaign in Burma.

By the end of 1942, RAF Regiment units had been classified into two main types: rifle squadrons for ground defence and anti-aircraft units. In November 1942 the RAF Regiment had its first true testing in battle when units took place in *Operation Torch*, the Allied landing in North Africa, and in the advance from El Alamein. Subsequently, squadrons and flights were involved in the landing in Sicily and Salerno and in other operations around the Mediterranean area including the Balkans, the Aegean and Greece.

Meanwhile the UK-based units were playing an equally vital role in the defence

The Regiment's current equipment includes Rapier missile units (right), *Scorpion light tanks and Spartan light armoured vehicles* (both on exercise, below right). Sue Bushell

Overseas deployments: Keypoint defence in Oman during the 1960s (far left) *and gunners working on a Blindfire Tracker of their Rapier unit during the recent Gulf crisis* (left).



RAF Regiment GOLDEN JUBILEE

Wing Commander Ian McPhee

of Britain by combatting not only Luftwaffe raids but also, from mid-1944, the V1 flying bomb menace. During that same year the initial landing forces for *Operation Overlord,* the Allied invasion of France, included some 38 RAF Regiment squadrons. These units remained in the vanguard of the advancing Allied armies throughout subsequent campaigns in France, the Low Countries and Germany. Indeed, many units were employed to advance ahead of the Army to seize key airfields.

Whilst RAF Regiment units battled their way across Europe, their counterparts in India and Burma were maintaining the same high standards of dedication and courage. By early 1944 most units were concentrated in the Imphal Plain and the Surma Valley fighting zones to protect the RAF's forward operating locations. When, in March 1944, the Japanese breakout into the Plain threatened the security of these airstrips, Regiment units fought doggedly against great odds. By August the Japanese had begun their retreat from Burma and RAF Regiment units were to the fore during the Allied advance adding numerous laurels to their reputation. The following example reflects the nature of these operations.

In early March 1945 the invaluable Meiktila airfield complex was captured by four RAF Regiment squadrons. Japanese opposition was near-fanatical and continued over the next ten days forcing the Regiment to evacuate the airstrip each night and then reoccupy it the following morning with heavy casualties on both sides. A number of gallantry awards were earned by RAF Regiment personnel during this action.

The post-war period saw a significant reduction in the size of the Regiment from its wartime peak of 85,000 men. Nevertheless the Corps continued to

Armoured cars of 1 Armoured Car Company in the Middle East circa 1920.



THE ROYAL AIR FORCE REGIMENT

The Royal Air Force Regiment is responsible for the defence of RAF stations throughout the world and employs a variety of equipment, including Skyguard and Rapier missile batteries to perform this task.

Regular Wing Headquarters:

3 Wing	RAF Catterick	Light Armour C
6 Wing	RAF West Raynham	Rapier C (USAF bases)
33 Wing	RAF Gutersloh	Light Armour C

Regular Squadrons:

1 Sqn	RAF Laarbruch	Rapier
2 Sqn	RAF Catterick	Light Armour
3 Sqn	RAF Aldergrove	Field/Internal Security
15 Sqn	RAF Leeming	Rapier
19 Sqn	RAF Brize Norton	Rapier (USAF bases)
20 Sqn	RAF Honington	Rapier (USAF bases)
26 Sqn	RAF Laarbruch	Rapier
27 Sqn	RAF Leuchars	Rapier
34 Sqn	RAF Akrotiri	Light Armour
37 Sqn	RAF Bruggen	Rapier
48 Sqn	RAF Lossiemouth	Rapier
51 Sqn	RAF Catterick	Light Armour
63 Sqn	RAF Gutersloh (to move to Marham in 1992)	Rapier
66 Sqn	RAF West Raynham	Rapier (USAF bases)

Queens Colour Sqn RAF Uxbridge — Ceremonial/Field

Auxiliary Wing Headquarters:

1310 Wing	RAF Catterick	Field
1339 Wing	RAF Waddington	Skyguard/Oerlikon

Auxiliary Squadrons:

2503 Sqn	RAF Waddington	Field
2620 Sqn	RAF Marham	Field
2622 Sqn	RAF Lossiemouth	Field
2623 Sqn	RAF Honington	Field
2624 Sqn	RAF Brize Norton	Field
2625 Sqn	RAF St Mawgan	Field
2729 Sqn	RAF Waddington	Skyguard/Oerlikon
2890 Sqn	RAF Waddington	Skyguard/Oerlikon





Top: *The Queens Colour Squadron.* Above: *Bayonet training for Basic Gunners during training at RAF Catterick, the Regiment's Depot.*

support the RAF in numerous campaigns and in emergency operations in such trouble spots as Palestine, Aden, Oman, Cyprus, Borneo and Malaya. There has been a continuous RAF Regiment presence in Northern Ireland since the start of the present emergency in 1969.

The RAF Regiment also assumed responsibility for the command of three Associated Overseas Forces: The RAF Regiment (Malaya), the Iraq Levies and the Aden Protectorate Levies, until these countries' special relationships with Great Britain terminated in the 1950s and 1960s.

More recently, in the Falklands War an RAF Regiment squadron provided integral air defence for 5th Infantry Brigade. During the Gulf War the RAF Regiment provided both ground and air defence units to protect RAF assets at air bases in Saudi Arabia and Bahrain and with the Support Helicopter Force.

The RAF Regiment undertook ground defence and airfield security duties during the Gulf crisis.



The present-day RAF Regiment comprises short-range air defence squadrons equipped with Rapier missiles and ground defence squadrons equipped with light armoured vehicles. One squadron has a parachute capability. There are also a number of Royal Auxiliary Air Force Regiment squadrons in the ground and air defence roles. At most RAF stations there is a small RAF Regiment staff which is responsible for formulating station defence plans and for training RAF personnel in defence duties.

RAF Regiment personnel man the Queen's Colour Squadron of the Royal Air Force which represents the RAF at State and other major ceremonial occasions, and which is the custodian of the Queen's Colour for the Royal Air Force in the United Kingdom. Her Majesty the Queen presented the RAF Regiment with its own Queen's Colour at Buckingham Palace in 1953 and presented a new Colour at RAF Catterick when Her Majesty reviewed the RAF Regiment on its 25th anniversary in 1967. A replacement Colour will be presented at a 50th Anniversary Review at RAF Catterick later this year.

As a result of 'Options for Change' the RAF Regiment will take its share of reductions. However, there are a number of equipment improvements planned for the near future which will ensure that the RAF Regiment continues to be a flexible, cost effective and highly professional force which is capable of responding rapidly to events in all parts of the world.

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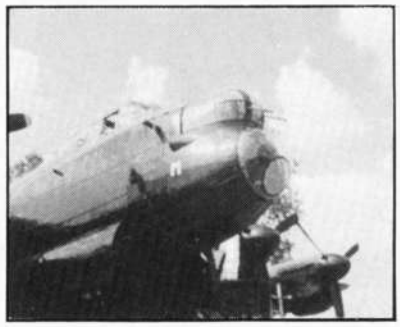
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COMRADES 1942-92

THE RAF's 1991 YEAR



Brian Strickland reviews some of the RAF's highlights of 1991

JANUARY

On 8 January the crew of a Phantom from **No 19 Squadron**, Wildenrath ejected south of Limassol, Cyprus and were picked up within half an hour by a No 84 Squadron Wessex from RAF Akrotiri.

No 3FTS at the RAF College Cranwell took delivery of its first Shorts Tucano to commence replacement of its Jet Provosts.



The Queen made her last journey in the only remaining propeller-driven aircraft in her Flight, an Andover CC2, which over the past 26 years had made nearly 1,500 royal journeys.

Sir Michael Quinlan, Permanent Under Secretary of State, MoD, opened the new **Aircraft Paint Facility** at No 1 Engineering Sqn, RAF St Athan.

FEBRUARY

The **Radio Engineering Unit** at Henlow celebrated its 40th anniversary.

The Queen visited **RAF Marham** to give support to families of men involved with Operation *Granby*. The Prince of Wales visited **Brüggen** to meet wives.

Following a re-assessment of the cost-effectiveness of the **RAF Bloodhound** air defence missile system, it was decided to withdraw the force from the two remaining sites – Wattisham and West Raynham – from 1 July.

MARCH

Flying Officer Anne-Marie Dawe, aged 22, from Hornchurch became the RAF's first female navigator when she graduated from No 6 FTS Finningley. Anne was posted to Hercules aircraft based at Lyneham.

26th ZH101, the first of the RAF's seven **Sentry AEW1** airborne early warning aircraft, was handed over by Boeing at Waddington. Flying to date had been under the auspices of the Boeing Company on test and evaluation sorties.

Phantom F4J ZE353 made its final flight from No 74 Squadron at Wattisham to Manston, where it was destined for the **RAF Fire Training School**. An ex-US Navy example, obtained from America in 1983 to replace aircraft operating in the Falkland Islands, ZE353 had carried out 580 missions over Vietnam.

RAF crews from **No 84 Squadron**, working with the Royal Navy, Cyprus Police, National Guard and customs, helped to recover drugs with a UK street market value of £650,000 from the sea off Cyprus.

From 1 March there was a reduction in the number of airfields open 24hr a day, 365 days a year to be available for the emergency recovery of military and civilian aircraft. **Kinloss**, **Leeming**, **Valley**, **Waddington** and **Wattisham** ceased to be MEDA. The MEDA commitment currently undertaken by Lyneham was transferred to Brize Norton. Manston, Leuchars and St Mawgan all retain their MEDA role.

GULF ACTION

JANUARY

17th **OPERATION *DESERT STORM* COMMENCED** **Tornado GR1s** took part in Allied air strikes, concentrating on anti-airfield operations with **Hunting JP233** cratering weapons. A Bahrain-based GR1 was shot down - Flt Lts Adrian Nichol and John Peters from No XV Squadron were taken prisoner.

Jaguar GR1As from **Muharraq** made day raids on targets in Kuwait. Used newly-received CRV-7 rocket pods for the first time in combat.



Defence Minister Tom King announced call-up of **No 4624 Squadron, R Aux AF**, to assist air transport movements in the UK, Cyprus and the Gulf.

18th/19th In first mission by a reconnaissance - equipped Tornado GR1A, two aircraft of **No 2 Squadron** detached at **Dhahran** attacked a mobile Scud launcher.

21st Announced that Tornados had revised tactics to reduce losses. Missions flown at higher level for immunity from flak.

23rd Revealed that RAF **Tornados** had used precision weapons against Iraqi aircraft shelters.



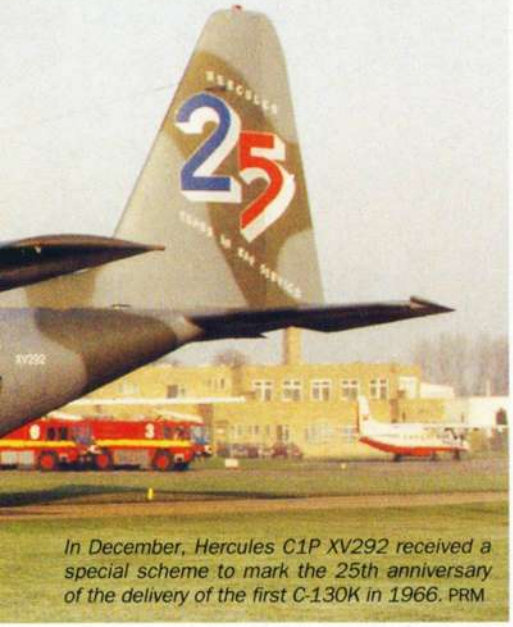
Tanker force of **VC10s** – augmented since December by Victors, and from outbreak of war by Tristars – flew 700th Gulf sortie since August 1990 claiming 100% reliability for launching tasked missions.



24th Plans announced for half-squadron of **Buccaneers** from **No 12 Squadron**, Lossiemouth to operate in target-designation role, assisting Tornados.

26th First three Buccaneers of No 12 Squadron arrived at **Muharraq**, led by Wg Cdr Bill Cope.

26th/27th In a typical night's activity, **Tornado GR1As** made two raids of eight aircraft each



In December, Hercules C1P XV292 received a special scheme to mark the 25th anniversary of the delivery of the first C-130K in 1966. PRM

APRIL

1st **Valley** celebrated the 70th Anniversary of the formation of **No 4 FTS** with a numeric '70' flypast. The school was formed in 1921 at Abu Sueir, Egypt.

In a four-month expedition, under the leadership of **Sqn Ldr Michael Cole**, an RAF team used two hovercraft to reach the source of the **River Yangtze** in China. They took vital medical help to remote communities.

8th Tom King, Secretary of State for Defence, launched the first **RAF Defence Support Agency**. The DSA has been created from the former Maintenance Group with headquarters at Brampton.

The **Seed Trophy** for the 1989/90 season was presented to **No 5 Squadron**. The trophy is awarded within No 11 Group to the squadron achieving the best results in air-to-air gunnery.

17th **Avro Shackleton MR2 WL757**, named 'Brian' made its farewell flight from Lossiemouth to Finningley – its 40th anniversary of operational service.

MAY

The Irish Airline Pilots Association presented the 1991 **Colonel James Fitzmaurice Award** to **B Flight, No 202 Squadron** at Brawdy for search and rescue duties over the Irish Sea. Inaugurated in 1966, the award is presented to mark outstanding contributions to Irish aviation.

Phantom XT906 took off from **Leuchars**, ending a 20-year plus era at the base and becoming the last Leuchars Phantom to fly.

The Foreign Secretary announced in Parliament that the UK was to send RAF Chinook and Puma helicopters to **Turkey** to help distribute relief supplies.

It was announced that **RAF Abingdon** is to close in 1992, with its maintenance work transferred to St Athan and flying units to Benson.

Tons of food, clothing and other supplies were delivered by air to Kurdish refugees by RAF units based in Turkey. A **Hercules** detachment was based at **Incirlik** and **Chinooks** were operating out of **Diyarbakir**.

The **Tri-national Tornado Training Establishment** (TTTE) at Cottesmore completed 100,000 hours of GR1 flying in 10 years of training aircrews for the RAF, the German AF, the German Navy and the Italian AF.

The roll-out of restored **Messerschmitt Bf 109G-2** Gustav G-USTV took place at **RAF Benson** after a 19-year restoration. This is the only flying Bf 109 with a Daimler-Benz engine.



Measures to restructure the RAF's front line in **Germany** were announced. These included withdrawing the two Phantom air defence squadrons, reducing the number of bases to two with the closure of Wildenrath and Gütersloh and reducing Tornado GR1 squadrons in Germany to four.

JUNE

Flt Lt Julie Ann Gibson, aged 29, made RAF history when she became the first woman in the service to receive her pilot's wings. She has subsequently joined **No 32 Sqn** flying Andovers.



A memorial was unveiled in **Crete** to men of the RAF who were killed in action there during WW2. Two squadrons were involved – No 30 with Blenheims, which now flies Hercules from Lyneham, and No 33 flying Hurricanes which now operates Pumas from Odiham.

Sgt Sue Rosie, aged 29, the RAF's first female Air Signaller, received her brevet. Sue and her husband now work on **No 51 Squadron**, which flies Nimrods from Wyton.

JULY

1st The **Shackleton AEW2** was finally retired, being replaced by the Sentry AEW1. Wg Cdr Chris Booth handed over command of No 8 Squadron to Wg Cdr Rod Thompson and operations transferred from Lossiemouth to Waddington.

No 92 Squadron disbanded at Wildenrath. Formed in 1917, No 92 had been serving in Germany since 1975. The squadron's Phantoms overflew the base in 'Diamond Nine' formation on their way to the UK.

against a radar and command facility and two of six each against an ammunition storage site in Western Iraq. GR1As launched a short-notice reconnaissance mission to assess damage to bridges.

27th/28th Night operations included Tornado GR1As using **ALARM** missiles in direct support of Saudi Tornado IDS bombing raids.



29th **Jaguars** continued to attack Silkworm sites, in conjunction with Allied naval forces' attacks on Iraqi navy. Used American CBU-87 cluster bombs for the first time.

30th Two **Jaguars** sank Polnochney C-class landing craft with CRV-7 rockets and 30mm guns.

FEBRUARY

1st/2nd Combat debut for the **Buccaneer S2B**. Using the Westinghouse AN/AVQ-23E **Pave Spike** laser designator pod, a bridge over the River Euphrates was successfully marked for six Pave Way guided bombs dropped by two Tornado GR1s.



2nd One of three **Nimrod MR2Ps** from the Kinloss MR Wing operating from **Seeb** directed US attack aircraft to destroy an Iraqi patrol boat.

3rd Tornados began daylight missions; eight Dahran-based aircraft carrying eight 1,000lb bombs each.

6th Arrival of the first of four Tornados, each fitted with GEC-Ferranti **TIALD** (Thermal Imager and Laser Designation) pods.

10th Service debut of Tornados with TIALD. Four bridges (two of them pontoon replacements for an earlier attack) were destroyed, together with an aircraft inside a hardened shelter.

14th Sixth, and final Tornado GR1 was lost while on a medium level bombing raid over Iraq.

24th Allied coalition ground offensive launched; all British air, land and sea forces involved.

26th Iraq withdrew from Kuwait.

28th Allied offensive military operations ended. **OPERATION *DESERT STORM* CONCLUDED.**

MARCH

3rd **Iraq** agreed to Allied conditions for ceasefire.

15th The last of the **Odiham** contingent of helicopters and crew sent to help Kurdish refugees on the Turkey-Iraq border returned home.

Four **Hunters** were painted black in the livery of the famous 1950s *Black Arrows* aerobatic team to celebrate the 40th anniversary of the first flight of the Hunter by Neville Duke on 20 July 1951 from Boscombe Down.



31st **No 85 Squadron**, which operated the Bloodhound surface-to-air missile at West Raynham since 1975, was disbanded.

AUGUST

Retired **Shackletons WL747** and **WL757** were bought by a Cypriot businessman to form the first exhibits at a Cypriot aviation museum to be built at Paphos. Two other Shackletons (WL790 and WR963) were flown to Coventry Airport for the Shackleton Preservation Society.

Wattisham became the first RAF base in the UK to be inspected by a former Warsaw Pact member when a Hungarian team visited the station in a bilateral exercise pending ratification of the Conventional Forces Europe Treaty.

The Queen visited **Bentley Priory HQ** to pay tribute to the service of the **Royal Observer Corps** over its 66-year life. The ROC had been stood down following a Home Office review of Civil Defence in the light of developments in East-West relations

After 17 years in RAF Germany, **HQ 4 Wing RAF Regiment** has disbanded for the second time in its history. The Wing was originally formed in 1944. It was disbanded in the late 1950s and reformed in 1974.

8th **John McCarthy** was flown by an RAF VC10 of No 10 Squadron from Damascus to RAF Lyneham after more than five years as a hostage in Beirut.

Harrier GR5s from **No 3 Squadron** based at Gütersloh visited a Czechoslovakian MiG-29 base at Zatec, near Prague. They deployed at Roundnice to commemorate the 50th anniversary of No 311 (Spitfire) Czech Squadron which participated in the Battle of Britain.

26th The RAF's last **Vulcan** (XH558) flew in formation with the Red Arrows at the Great Warbirds Airshow at West Malling.

Two RAF Wessex from **No 28 Squadron**, based in the New Territories, Hong Kong, went to the aid of a sinking barge with nearly 200 men aboard 65 miles south-east of the Colony in the South China Sea. The Wessex crews flew five sorties in appalling conditions and brought back 24 survivors.

The RAF provided RAF Tristar KC1 ZD953 of **No 216 Squadron** to convey relief supplies for Aijtofasta in Chile which has been devastated by a freak rainstorm.

The **School of Fighter Control** finally vacated West Drayton, where it had been in residence since moving from Bawdsey in 1974, for a new purpose-built home at Boulmer.

SEPTEMBER

6th The first BAe Hawk T1A was delivered to **No 100 Squadron** at Wyton. The squadron, which provides aerial targets, commenced re-equipment, having flown Canberras since 1972.

11th The first of the RAF's Tornado squadrons, **No 16**, was disbanded at **RAF Laarbruch**, ending a contribution to RAF history that dates back to 10 February 1915. No 226 OCU at Lossiemouth became No 16 (Reserve) Squadron.

12th **BBMF Hurricane LF363** crashed at Wittering while attempting to land while en route from Coningsby to a display in Jersey. LF363 was the last Hurricane to enter the RAF and joined the BBMF in 1957. The pilot, Sqn Ldr Allan Martin, escaped with minor injuries.

20th The **RAF Red Arrows** Hawks and the visiting **Soviet AF Russian Knights** team with their Sukhoi Su-27 *Floggers* flew past the Queen Mother at her residence near Balmoral. The Sukhoi team subsequently displayed at Leuchars and Finningley.



25th **Cadet Pilot Kate Saunders**, aged 22, became the first female to eject from an RAF aircraft, a Harrier T4A of No 233 OCU, while on a familiarisation flight over Driffield, North Yorkshire. She sustained serious injuries.

The final **Hawk** (XX162) to undergo major maintenance work at **Abingdon** flew back to No 4 FTS at Valley. 161 Hawks had received major overhauls at Abingdon since the Hawk Major Maintenance Flight was formed there in January 1982. Hawk maintenance is now undertaken at St Athan.

Exercise *Certain Shield* was held in Germany as the first full trial of the British-commanded Multi-National Airmobile Division. The RAF and German helicopters provided the vital airlift capability to the soldiers of five nations.

A VC10 flew home the freed hostage and ex-Battle of Britain pilot **Jackie Mann** to Lyneham. A Spitfire tribute was flown in welcome.

OCTOBER

On the 27th **Air Marshal Sir William Wratten** unveiled the **Croydon Airport Battle of Britain memorial** at the Old Croydon Airport. The dedication was conducted by the Rev P R Turner, Assistant in Chief HQ Strike Command. The 23ft high granite faced memorial, surmounted by a bronzed eagle and depicting, on four sides, the badges of Fighter Command Squadrons which flew from Croydon is a tribute to the fighter pilots and the people on the ground at Croydon who were killed in WW2.

A flypast of **Jet Provosts**, in diamond nine formation, took place over Cranwell on 11 October to mark the retirement of the JP from **No 3FTS**.

2nd The **Quick Reaction Alert** (QRA) by RAF Germany was discontinued. The changed security situation in Europe has meant that this precaution, mounted since April 1945, was no longer necessary. Since 1977 Phantoms of Nos 19 and 92 Squadrons maintained an aircraft on QRA at **Wildenrath** around the clock. Over the last 25 years Lightnings and Phantoms carried out 250 operational and 1,500 training scrambles without loss or damage to an aircraft.



RAF veterans who served in the Murmansk, Russia theatre of war in 1941 met each other for the first time in half a century at the **RAF Museum**, Hendon to celebrate the arrival of the first Hurricanes in Russia during WW2.

The last ex-operational **Bloodhound Mk 2** surface-to-air missiles left West Raynham for the scrapyard. Some 300 missiles went this way after the disbandment of No 85 Squadron in July.

NOVEMBER

Four student pilots training on the **Tucano** went solo for the first time at **Wildenrath**. It is thought that this was the first time any such pilot has done so at Wildenrath. The students, accompanied by four QFIs were on a visit from Cranwell.

The **Red Arrows** named the new pilots who will join the team for the next three years. They are Flt Lts Jerry Bird (31), Rob Last (32) and Barry Cross (27).

DECEMBER

3rd The command of **No II (Army Co-operation) Squadron** passed from RAF Germany to Strike Command when the squadron, equipped with Tornado GR1As, moved from RAF Laarbruch to RAF Marham.

10th A further round of changes affecting the RAF was announced by the **Minister of State for the Armed Forces**. These include the disbanding of No 42 Squadron (Nimrods), No 60 Squadron (Andovers), No 55 Squadron (Victors), No 208 Squadron (Buccaneers) and the redeployment of Nos 27 and 617 Squadrons (Tornado GR1s) from Marham to Lossiemouth, the TWCU (Tornado GR1s) from Honington to Lossiemouth and No 236 OCU (Nimrods) from St Mawgan to Kinloss, over the next 18 months.

19th 25th anniversary of the delivery of the first C-130K Hercules to Marshall of Cambridge on 19 December 1966 for the RAF, was marked with a special paint scheme applied to **Hercules C1P XV292** and a ceremony at Teversham.

Eight Jaguar GR1s from **RAF Coltishall** on detachment to Incirlik, Turkey clocked up 1,000hr on sorties to give reassurance and protection to the Kurds in northern Iraq.

The crew of a Hercules based in the **Falklands** sighted one of the largest icebergs ever seen. It took the aircraft two hours to fly round the 200ft iceberg, which was estimated as 55 miles square.

BLACK HAWK



Flight Lieutenant Ian Wood, based at RAF Chivenor in Devon, is this year's Solo Aerobatic display pilot, flying an all black Hawk T1A of No 63 Squadron, No 2 Tactical Weapons Unit. Ian will be displaying the aircraft at about 36 airshows around the country between May and September.

In the past the Hawk has been displayed in its usual Air Defence Grey livery; but this extremely effective camouflage, allied with the relatively small size of the aircraft often makes it very difficult to see on a hazy summer's day. The idea of using a black scheme for the display aircraft came from a conspicuity trial which No 63 Squadron carried out last year. The trial was aimed at finding a paint scheme which would highlight the aircraft and thereby help reduce the possibility of a mid-air collision. The display aircraft will be identical to the trial aircraft (XX255, illustrated on the contents page) except it will be painted gloss black for greater durability.

Ian has been practising his routine since February, and like all display pilots faces a rigorous work-up period. All practices are videotaped to try and highlight any mistakes and improve on previous sorties. The display lasts six minutes and demonstrates the excellent manoeuvrability of the Hawk.

Educated at Christ's Hospital before studying politics at The University of Hull on a university cadetship, Ian joined the Royal Air Force in 1981 and after four years flying training joined No IX Squadron at Honington. Flying the Tornado GR1 in the strike/attack role, he moved to Brüggen in 1987. After four years flying the GR1, in 1989 he took up his current post as a Weapons Instructor on No 63 Squadron at RAF Chivenor, one of two squadrons which form the Tactical Weapons Unit. He has currently flown 2300 hours, 1200 of them on the Hawk.

PHANTOM PHINALE

The awesome sight of a Phantom FGR2 displaying in full reheat will be seen for the last time this summer. A Phantom from No 74 (Fighter) Squadron, will be displaying at all the major airshows this season to mark the end of over 20 years of frontline service.

Two special colour schemes have been designed for the static and flying display aircraft, which will be seen from April onwards. The crew selected to display the Phantom for the last time are pictured opposite – Flt Lt Archie Liggat, pilot (left), and Flt Lt Mark Manwaring, navigator (right).





Group Captain Neil Taylor looks at the effect that the changes in Europe are having on the role and structure of the Royal Air Force



TOWARDS 2000

The dramatic events in eastern Europe and the Soviet Union over the last three years have heralded a sudden end to the Cold War. The Warsaw Pact has disappeared as a cohesive military force and unilateral and negotiated reductions of forces through arms control treaties have reduced the newly formed Commonwealth of Independent States' ability to mount a short-notice offensive. The risk of conflict in central Europe has therefore reduced significantly.

The Cold War brought unwelcome tensions but from the West's point-of-view it bonded nations together and saw the development of a strong defensive alliance which gave Europe an unprecedented period of peace and stability. Alliance doctrine was therefore based on the twin goals of forward defence linked to a strategy of flexible response. Circumstances have now changed and change has brought with it uncertainty.

While the Soviet Union was committed to arms reduction (and, hopefully, the Commonwealth of Independent States will remain so) Russia is still the largest European power; it possesses over 30,000 nuclear weapons. In 1989 (the latest year for which full figures are available) Soviet factories produced ten submarines, 50 bomber aircraft, 600 fighter aircraft, 1700 main battle tanks and 450 ballistic missiles; their tank production alone was more than double that of the whole of NATO. And now the emerging independent states must be taken into account. The Ukraine, for example, which occupies a pivotal position in Europe, has 1.5 million armed forces personnel (albeit it has announced that it will gradually reduce these numbers down to 420,000 and cut its defence expenditure from 30% of GNP down to 8.9%) which cannot be ignored. Like its other east European and former Soviet republican counterparts, it has yet to commit itself to the Arms Control Negotiation process.

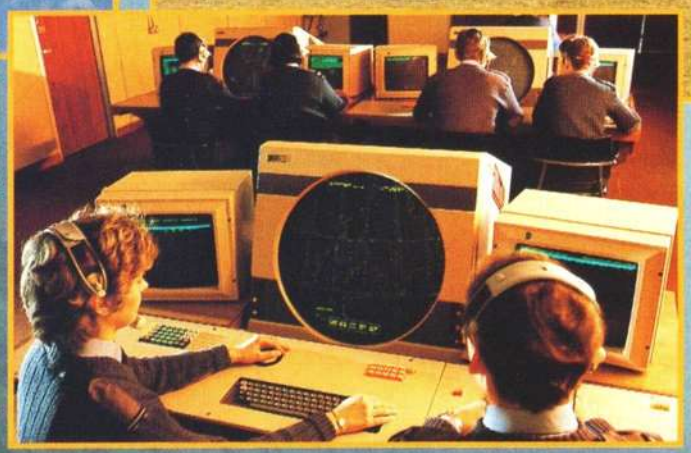
Acknowledging all these changes, NATO ministers are agreed that the risks to our security in the future are less likely to result from calculated aggression against Allied territory but rather from spillage caused by the serious economic, social and political difficulties which face many countries in central and eastern Europe. The new military guidelines drawn up by them in November 1991 declared that a forward defence strategy and flexible response were no longer appropriate. They have called for more mobile, flexible and better equipped multi-national forces to replace the 'layer cake' disposition of single nationcorps across the Central Region. A key component of Alliance forces will be new rapid reaction forces capable of deploying anywhere from the Arctic to the Mediterranean.

The British Government's response to NATO's new strategy has been to undertake a restructuring of our forces to reflect changing international circumstances. For the RAF the 'Options' process will result in some changes with reductions in the number of operating squadrons, closure of some stations, withdrawal from squadron service of some aircraft and redeployment of others, and a cut in the manpower requirement. It will involve the most significant changes to the RAF's front line and support areas since the early 1970s. Although our personnel will be smaller in number (a reduction from 89,000 to



Below: *Siemens Plessey AR320 'Type 93' mobile radar.* Cliff Bolton





Above: *The appearance of Russian Tupolev Bear 'C's over the North Sea, providing regular 'trade' for RAF Phantom squadrons, has virtually ceased with the end of the Cold War.*

Right: *The Marconi universal console for the Integrated Command and Control System (ICCS) at the heart of the Improved UK Air Defence Ground Environment (IUKADGE).*

Main picture: *The Harrier GR3 has been replaced by the second generation GR5 and night-attack GR7 versions.* BAe

75,000), they will be well trained, professional and are highly motivated. Importantly, they will be very well equipped to meet their commitments.

A wide ranging re-equipment and re-building programme continues to improve the quality of our equipment and infrastructure. The emphasis placed on survivability of our operational units has been a key concern over recent years. A hardened Primary War Headquarters for Strike Command has been completed and given state-of-the-art communications and command and control facilities; the system was put to its first test (which it passed with flying colours) during Operation *Granby*. In addition, the alternate facilities and the hardened air defence control centres have been fully refurbished and new radars (including transportable 3D radars) have been introduced throughout the whole of the ground environment.

In terms of aircraft, six squadrons of very potent, battle-proven Tornado GR1s will be retained for deep penetration strike/attack missions in the defensive counter air roles. Additionally, two of these squadrons will be earmarked for the anti-surface vessel warfare role from 1995 and these aircraft will be equipped with Sea Eagle missiles. All of the aircraft have an excellent terrain-following capability, a good defensive aids suite and a fixed 27mm cannon. They can carry a wide range of ordnance including free fall, laser guided and cluster bombs and JP233 – the runway denial weapon which proved so successful in the Gulf War – or, for self-defence, the Sidewinder heat-seeking missile. The aircraft has excellent handling characteristics, an outstanding navigation system and an extremely reliable automatic terrain following system. Some of the Tornado GR1s will be given an enhanced capability with the introduction of an anti-radiation missile (ALARM) and the fitting of a thermal imaging and laser designation (TIALD) pod. In addition, two squadrons of the reconnaissance variant, the Tornado GR1A (which also retain the full offensive capability of the GR1s), have entered service; the aircraft has an advanced infra-red linescan system and a sideways looking infra-red system which together give horizon-to-horizon cover at low level. The imagery from its sensors is recorded on video tape which can be reviewed in flight. Optimised for low-level operations, it was used very effectively operationally over Iraq. The Tornado is proving to be one of the most successful aircraft ever built and with the enhancement

programme incorporated into some aircraft it will be with us well into the next Century.

The programme to replace the Harrier GR3 with the new Harrier GR5/7 aircraft is well under way. It is a much more capable aircraft and has a considerably greater range than its predecessors. In the case of the GR7, the aircraft will have a full night attack capability. With its unique ability to operate from almost any site, the aircraft presents a most difficult targeting challenge to any opponent. One UK-based squadron is earmarked for assignment to SACEUR's Strategic Reserve (Air) component and a further two squadrons will continue to be based in Germany. In the offensive support role the Harrier will be complemented by retaining the Jaguar in full operational service. With its improved navigation system, night attack capability and defensive aids suite, the Jaguar too performed extremely well in the Gulf War.

To equip these offensive support aircraft a range of new weapons will be developed. An improved laser guided bomb together with a stand-off conventional capability is being sought. For strike missions, the acquisition of a new stand-off tactical air-launched air-to-surface missile to replace the free-fall WE 177 bomb currently in service is being considered. A range of options is being studied for the delivery vehicle and the warhead will be of British design. For all weapons procurement in the future much greater emphasis will be placed on the acquisition of multi-role systems to enhance the capability of all aircraft platforms.

On the air defence side, the majority of the UK air defence organisation has been upgraded and modernised and there now exists a layered system of considerable strength. The outer layers are provided by the Tornado and the Phantom (until the latter is withdrawn from service). These all-weather fighters operate either on their own or together with Sidewinder-equipped Hawks.

The introduction of all seven Sentry Airborne Early Warning (AEW) aircraft, which will be completed by mid-1992, will greatly improve the early warning capability of the whole system. The build-up of the Tornado F3 force from six to seven squadrons has been completed on schedule and some of the significant improvements in capability introduced into a number of aircraft during Operation *Granby* will now be fitted to all Tornado F3s. Further enhancing the whole is a mix of Tristar, VC10K and Victor tanker aircraft. Plans to replace the Bloodhound (which was retired from service in 1991) with a new medium range surface-to-air missile (MSAM) are progressing and MSAM is due into service in 1995.

Finally, the European Fighter Aircraft (EFA) is planned to enter service towards the end of the decade. Principally required for the air-to-air role, it has nevertheless been designed from the outset as a multi-role fighter. The basic design philosophy pitted the aircraft against the MiG-29 Fulcrum and Su-27 Flanker and their best possible upgrades for the year 2000 and beyond. The design philosophy remains valid and the aircraft will satisfy the RAF's







Left top: *There will be two squadrons (Nos 2 and 13) of Tornado GR1A reconnaissance variants in front-line service.* Daniel March

Left middle: *All Tornado F3s are receiving the improvements introduced for aircraft deployed to the Gulf.* PRM

Left: *Sidewinder-equipped Hawk T1As will continue to provide point defence.* BAe

Below: *The European Fighter Aircraft (EFA) is due to enter service later this decade.* PRM



need for an agile, flexible combat aircraft; it will have the capability to operate both defensively and offensively once in service.

Because of the new strategic situation in Europe and the Services' commitments beyond NATO, the fixed and rotary wing transport force has remained unchanged after the review. Inter-theatre transport will continue to be provided by the Tristar and VC10 and intra-theatre transport will be provided principally by the Hercules. Tristar, VC10 and Hercules are also capable of providing an air-to-air refuelling capability and, as the Victor is retired from service, more aircraft will be converted to compensate. Half of the Hercules fleet has been 'stretched' to increase the aircraft's capacity by some 30% and the fleet has been enhanced with the fitting of improved ECM equipment and updated electronics. For the rotary wing element, the Chinook is being upgraded to CH-47D standard and two squadrons of Pumas will be retained. The Wessex will be phased out of service and, on present plans, it will be replaced in the support helicopter role by the Puma and in the search and rescue role by the Sea King. A new light support helicopter will therefore be required to replace the Puma in its current role.

The RAF provides all the United Kingdom's shore-based fixed wing aircraft for anti-submarine, anti-ship and maritime air defence tasks; these are complemented by the Royal Navy's ship-borne helicopters and Sea Harriers. For maritime reconnaissance and anti-submarine warfare we currently operate four squadrons of Nimrod aircraft; these aircraft are equipped with the Stingray torpedo and the Harpoon anti-ship missile. In the future the numbers of aircraft will reduce (leading to the loss of one squadron) but the Nimrod remains a very capable system with a self-contained ability to detect, localize, track, prosecute and destroy both submarine and surface targets at great distances given its air refuelling ability.

Finally, on the flying training side the Service's pattern of basic training has been improved with the introduction of the new tandem seated, turboprop Tucano aircraft. The Tucano has made the transition to the advanced Hawk trainer much simpler, given the similarity of cockpit layout and it has reduced the requirement for basic flying training bases from three to two while maintaining the same pilot output. The Hawk is an excellent advanced training aircraft and it is used to develop the pilot's tactical flying and weapons skills before he progresses to his operational conversion unit.

Facing us until the end of the decade is an increasingly diffuse and fluid strategic situation which may demand changes in operating conditions. The balance of capabilities that we will need in the future might be different from those that we have fielded in the past. But the changes in the strategic situation will mean that four characteristics will become even more important in our future joint operational posture; they are: reach, mobility, flexibility and responsiveness.

Of these, the characteristic of reach is the most obvious. For NATO strategic depth is growing as the former Warsaw Pact states align themselves more with the West and operational space is therefore expanding. The likelihood of NATO members being involved in Out of Area (OOA) crises is proportionally higher and the threat from long-range weapons is growing as more states deploy long-range missiles. The West will need to be able to deter or respond to such events which therefore implies the need for greater reach in our operational posture.

Next there is the need for mobility. In Europe, the combination of expanding space and declining force levels will reduce the value of fixed defences and therefore increase the importance of mobility. In future, NATO must be capable of deploying its forces forward rapidly and possibly at short notice to protect Alliance boundaries and of concentrating appropriate force anywhere within its area. Increased mobility will be essential if this is to be achieved.

Thirdly, there is the vitally important need for flexibility. The days of shaping our forces to meet relatively fixed scenarios are gone and in the future we must be capable of dealing with a wide spectrum of operational situations – some of which will be impossible to foresee. The watchword tomorrow, even more so than today, has to be flexibility.

Finally, there is responsiveness. The risk of conflict in increasing but specific threats are difficult to define with any degree of precision. Aggression could occur with little warning and from an unexpected source. We must therefore not only be capable of managing crises as and when they occur but we must be capable of doing this quickly and effectively.

Even after all the changes to be implemented over the next three years, the RAF will remain one of the largest Western European air forces in terms of the number of combat aircraft it can field. Operating regularly on a World-wide basis, its capabilities span virtually the whole spectrum of air power. These capabilities include nuclear and conventional, offensive and defensive counter-air, maritime, transport, air-to-air refuelling and helicopter support. While the number of regular squadrons will reduce from 67 to 55, qualitatively they will be significantly better equipped than ever before and will be well prepared to carry us forward into the next Century.

Group Captain Neil Taylor BSc, RAF is Director of Defence Studies (RAF).

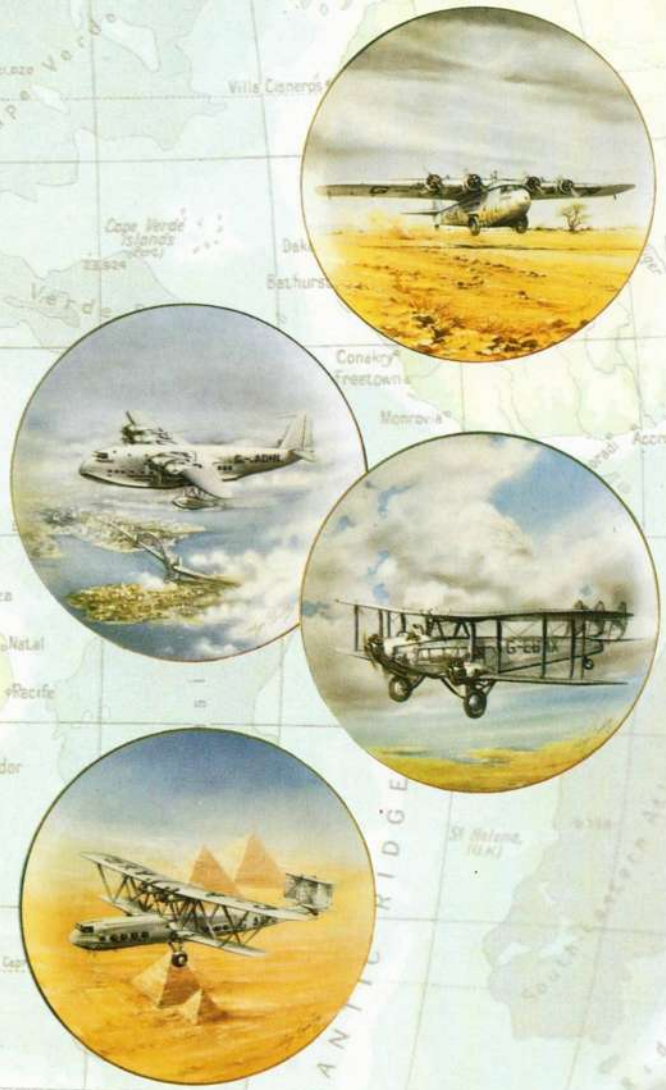






Top: *Further VC10 tankers will be delivered from 1993 to replace Victor K2s.* Mike Rondot Middle: *Nimrods will be based solely at Kinloss after No 42 Squadron disbands at St Mawgan later this year.* John Dunnell Above: *Replacement of Jet Provosts by Tucanos will be completed this year.* PRM

WINGS ACROSS THE EMPIRE



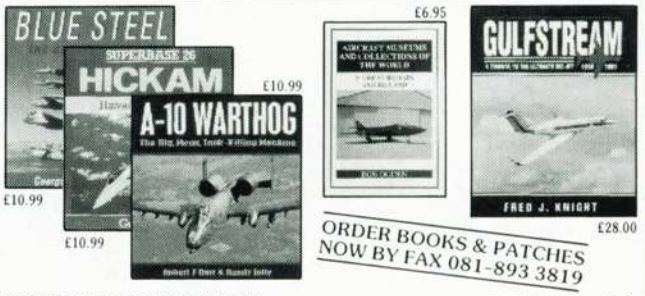
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THE ROYAL AIR FORCE 1992

SQUADRONS AND UNITS OF RAF GERMANY AND STRIKE COMMAND



HS Buccaneer S2B – No 208 Sqn, Lossiemouth. William Jesse

Sue J Bushell

1992 sees the Royal Air Force much leaner than in recent years. The '*Options for Change*' programme which has been implemented over the last two years has seen a restructuring of RAF Germany and the retirement of some older aircraft - these changes are discussed in the article on the subject elsewhere in this Yearbook.

Since the last survey of RAF Squadrons in the Royal Air Force Yearbook 1988, the service has become much leaner. The new understanding reached with former Warsaw Pact adversaries has resulted in the *Options for Change* process being enacted with the restructuring of RAF Germany and the retirement of some older aircraft gathering pace. The two Phantom squadrons and some of the Tornado units based in Germany have been disbanded and the closure of two bases – Wildenrath and Gütersloh – is imminent. In the United Kingdom Church Fenton is to become a relief landing ground this year and No 7 FTS is transferring its aircraft to No 1 FTS at Linton-on-Ouse; the Jet Provost is now all but retired, having been replaced by the Shorts Tucano. Another closure will be Abingdon, which is passing its maintenance duties to St Athan and the resident flying units are transferring to nearby Benson.

Apart from the Jet Provost, the past few years have seen the passing from RAF service of the Pembroke, Phantom F-4J(UK) and Venture powered glider, whilst other types scheduled to be retired in the next two years or so will include the Buccaneer S2, Phantom FGR2 and Victor K2, the former two to be replaced by the Tornado, including some released from service in Germany and the latter by VC10 C1K/K4s.

BAe Hawk T1A – No 100 Sqn, Wyton. Graham Finch

No 1 Squadron

(1 Group, Strike Command)
BAe Harrier GR5 – Wittering, Cambs

When formed on 13 May 1912 the unit also had a vertical take-off capability, as it was equipped with balloons, airships and man-carrying kites. By the start of WW1, No 1 Squadron had progressed to aeroplanes, ending the war with the SE5a. It spent the early 1920s in India before returning home as a fighter squadron in 1927. No 1 participated in the Battles for both France and Britain with Hurricanes. Later equipped with fighter-bomber Typhoons and Spitfires, it finished the war on bomber escort duties before converting to Meteors in 1946. History was made at Wittering in 1969 when it became the first unit in the world to fly an operational STOVL combat aircraft. It converted to the GR5 version of the Harrier in 1989.

No 2 Squadron

(1 Group/Strike Command)
Panavia Tornado GR1A – Marham, Norfolk

Also established on 13 May 1912, No 2 Squadron claims to be the oldest RAF squadron to fly aeroplanes. It was deployed to France in 1914 and undertook reconnaissance and bombing tasks with two of its pilots, Lt W.B. Rhodes-Moorhouse and 2nd Lt A.A. McLeod, being awarded VCs for acts of gallantry. The unit takes the style 'No II (AC) Squadron' which stems from its reconnaissance and support operations with Army Co-operation Command during WW2. It was equipped with Lysanders from 1938 and was the first RAF unit to fly Tomahawk (1941) and Mustang (1942). No 2 accompanied the invading Allied armies on to the Continent in 1944, and so became a component of the British Air Forces of



Occupation, later RAF Germany. The basic role of reconnaissance and support is retained to this day, with specially equipped Tornado GR1As replacing the SEPECAT Jaguar in 1989. Aircraft carry the badge of a Wake Knot, but are more readily identified by a white triangle on the fin. No 2 Squadron moved to Marham in December 1991.

No 3 Squadron (RAFG)
BAe Harrier GR5/7 – Gütersloh, Germany
Formed on 13 May 1912 with various training types, fighter, reconnaissance and ground attack missions occupied No 3 Squadron during WW1 and after a brief period in India during 1920, it became a home-based Fleet co-operation squadron before transferring to air fighting in 1924. In 1929 it became the first squadron in the RAF to fly the Bristol Bulldog. Temporarily deployed to Abyssinia for the 1935-36 crisis, it subsequently flew Hurricanes during the Battle of France and eventually became resident in Germany in 1945 with Tempests, which were replaced by Vampires in 1948. Sabres, Hunters and Javelins followed in turn until 1961, when Canberra interdictors arrived. Since 1972 No 3 Squadron has operated Harriers in close support of the Army. Its aircraft are marked with a cockatrice (dragon) upon a green bar. The first improved Harrier GR5 arrived on 12 September 1990. No 3 Squadron will transfer to Laarbruch during 1992.

No 4 Squadron (RAFG)
BAe Harrier GR7 – Gütersloh, Germany
No 4 Squadron was formed in August 1912 from part of No 2 Squadron and has spent much of its life overseas with service in France in WW1, Turkey in 1921-22, France again during 1939-40 and continually on the Continent since 1944. Its role has almost always been close support or reconnaissance. Its Harrier GR1s were RAFG's first when they arrived at Wildenrath in 1970. The Squadron moved to Gutersloh in 1977 and will transfer to Laarbruch during 1992. Today it operates the night/attack Harrier GR7. No 4 Squadron's nose marking comprises a figure '4' upon a lightning flash, flanked by black and red diagonally-divided bars.

No 5 Squadron
(11 Group/Strike Command)
Panavia Tornado F3 – Coningsby, Lincs
A reconnaissance squadron during WW1, No 5 flew types such as the BE2, BE8 and Bristol Fighter on the Western Front, before being transferred to the North-West Frontier as part of the British garrison in India. Biplanes were flown until late in 1941 when it became the first RAF squadron with Mohawks, which were operated against the Japanese from India and Burma. No 5 disbanded as a Tempest squadron when Indian independence was achieved in 1947. After a brief flirtation with target-towing at Chivenor, No 5 was reformed at Wunstorf with Vampires, later flying Venom, Meteor and Javelin all-weather fighters until re-equipped with Lightnings at Binbrook in 1965. The squadron stood down in October 1987 to begin conversion to the Tornado, simultaneously moving to Coningsby where it was officially reformed on 1 May 1988 as an air defence squadron. No 5's aircraft are distinguished by their tail insignia of two gold swords in the shape of a 'V' upon a green maple leaf.

No 6 Squadron
(1 Group/Strike Command)
SEPECAT Jaguar GR1A/T2A
Coltishall, Norfolk
Formed on 31 January 1914, after operating in France with BE and RE types in 1914-18, No 6 Sqn spent the inter-war years in the Middle East in army co-operation and light bomber duties with Gordons, Harts, Demons, Hardys and Gauntlets. During WW2 it flew Hurricanes in the 'tank-busting' role in the Western Desert. Whilst in Egypt in 1949, No 6 received Vampires as its first jets. Canberra light bombers served between 1957 and 1969, when the unit returned home to become the first to fly Phantoms. The present Jaguars have been operated since 1974. The unofficial badge of a flying tin-opener underlines No 6's 'tank-busting' role.

No 7 Squadron
(1 Group/Strike Command)
BV Chinook HC1 – Odiham, Hants
Formed on 1 May 1914, No 7 Squadron was assigned to reconnaissance and artillery spotting in WW1 using BEs and REs before it became a heavy bomber unit in 1923, successively flying Vimy, Virginia and Heyford biplanes. The lighter Wellesley monoplane, Whitleys, Ansons and Hampdens followed. Stirlings were received in August 1940, with No 7 being the first RAF squadron with the earliest of the four-engined 'heavies'. Lancasters and Lincolns were followed in 1956 by the Valiant jet V-bomber, although its career was abruptly terminated by fatigue problems in 1962. In 1970, No 7 was back, this time with Canberras in the target facilities role, but 1982 witnessed a major change when it was reformed as the home-based squadron of Chinook twin-rotor helicopters. Assigned to Army support, these heavylift machines carry the squadron badge of the constellation Ursa Minor (the Great Bear) on a dark blue disc.

No 8 Squadron
(11 Group/Strike Command)
Boeing Sentry AEW1 – Waddington, Lincs
An Arabian dagger motif provides a clue to No 8's early service. After serving in France, following its formation on 1 January 1915, No 8 Squadron operated in Egypt, Iraq and Aden between 1920 and 1945. During WW2 its light bombing role included operations against Italian forces with Blenheims, Marylands and Hudsons, and it finished the war by converting from Wellingtons to Liberators. Remaining in the Near East post war, No 8 became a fighter-bomber unit and was the RAF's last front-line Hunter squadron when disbanded at Sharjah in 1971. No 8 has spent the last 20 years in the airborne early warning role operating the venerable Shackleton AEW2, the RAF's last front-line propeller-driven aircraft. It gave way to the E-3D Sentry in July 1991, when No 8 moved from Lossiemouth to Waddington.

No 9 Squadron (RAFG)
Panavia Tornado GR1 – Bruggen, Germany
Formed on 8 December 1914 as the first operational squadron equipped with radio. Training and coastal defence duties occupied No 9 Squadron during its early days in France, but it also undertook reconnaissance and light bomber missions in 1915. Since 1924 it has been a bomber squadron, and on 4 September 1939 its Wellingtons joined those of No 149 Squadron on the first bombing raid of WW2. Distinction was gained during the latter part of the war for its precision attacks with Lancasters using Barnes Wallis' super-heavy bombs, some of which were used in the successful attack on the *Tirpitz* in 1944. The Lancasters gave way to Lincolns in the post-war period and No 9 converted to the Canberra in 1952. Vulcans were flown from 1962 until 1982, when No 9 was reformed on 1 June at Honington, Suffolk as the first operational Tornado squadron. On 1 October 1986 No 9 Squadron transferred to Bruggen where it has remained in the strike/attack role. Insignia is a bat marking carried on the Tornado's fin.

No 10 Squadron
(1 Group/Strike Command)
BAC VC10 C1/C1K – Brize Norton, Oxon
Formed on 1 January 1915, No 10 Squadron flew observation, reconnaissance and light bombing missions in France and Belgium during WW1. It then became a bomber unit, operating

BAe Harrier GR7 – No 4 Sqn, Gütersloh. Iain Logan





BAC VC10 C1 – No 10 Sqn, Brize Norton. Iain Logan

types such as the Hyderabad, Virginia and Heyford between the wars, followed by the RAF's first Whitleys in 1937 and the Halifax in 1941. After WW2 No 10 changed its role to transport with the Dakota. In January 1953 No 10 Squadron returned to its bombing role and flew Canberras before becoming the first squadron to receive Victors in April 1958, which it flew until 1964. Two years later it re-formed with VC10 C1 transport aircraft, which it continues to operate today. Eight of its 13 aircraft are undergoing conversion to allow their dual use as tankers.

Panavia Tornado GR1A – No 13 Sqn, Honington. John Dunnell



No 11 Squadron
(11 Group/Strike Command)
Panavia Tornado F3 – Leeming, North Yorks
Formed in 1915 as a fighter unit, No 11 undertook army co-operation tasks in India between the wars. It was transferred to the Middle East in 1940, and then to the Burma front with Blenheims and Hurricanes from 1943. In 1948 No 11 Squadron moved to Germany, where it flew Mosquitos in a fighter bomber role before converting to all-weather intercepters – Meteors and Javelins. No 11 received Lightnings at Leuchars in 1967 and moved to Binbrook in 1972, its aircraft wearing the markings of two eagles in flight, flanked by black and yellow bars. On 1 May 1988, the RAF's last Lightning squadron was stood-down for Tornado conversion and the new No 11 became operational on the type at Leeming on 1 November 1988.

No 12 Squadron
(18 Group/Strike Command)
Hawker-Siddeley Buccaneer S2A/B
Lossiemouth, Moray
Formed on 14 February 1915, No 12 Squadron was involved in reconnaissance on the Western Front in WW1. In 1926 it became the sole recipient of the Fairey Fox, which is recalled by the squadron's use of a fox's mask unit badge. It had progressed to Battles when sent to France in 1939, and sustained serious losses in the German advance of May 1940. Flg Off D.E. Garland and observer Sgt T. Grey won a posthumous double VC during the historic attack on the Albert Canal bridges on 12 May. Heavier equipment in the form of the Wellington, Lancaster and Lincoln followed until the unit became an early operator of the Canberra jet in 1952. Between 1962 and 1967 No 12 flew Vulcans in the strategic role before reforming at Honington, Suffolk in October 1969 as the RAF's first Buccaneer squadron. It moved to Lossiemouth in 1980 and is scheduled to convert to the Tornado GR1 when the Buccaneers are retired in 1993.

No 13 Squadron
(1 Group/Strike Command)
Panavia Tornado GR1A – Honington, Suffolk
Formed on 10 January 1915 with BE2s, No 13 Squadron flew reconnaissance duties throughout WW1. It was reformed with Bristol Fighters as an army co-operation squadron in 1924 and later used Atlases, Audaxes and Hectors. Lysanders were taken to France with the British Expeditionary Force. Blenheims were flown in Bomber Command's first 'Thousand Bomber Raid'. Later, No 13 Squadron and its Blenheims were transferred to North Africa – Venturas, Baltimores and Bostons followed. No 13 Squadron was reformed as a photographic reconnaissance unit with Mosquitos in Palestine. From January 1952 Meteor PR10s were operated in Egypt. A further move came in January 1956 to Cyprus, where it received Canberras, which were flown until returning to the UK in October 1978. No 13 Squadron was reformed on 10 January 1990 as the RAF's second Tornado GR1A squadron, being based at Honington but scheduled to move to Marham during 1992.

No 14 Squadron (RAFG)
Panavia Tornado GR1 – Bruggen, Germany
Formed in 1915, No 14 Squadron was one of the first deployed to the Middle East, where it flew such aircraft as the Martinsyde S1, BE2, DH2, Bristol Scout and RE8. A flight of the squadron at one time operated with the local guerilla forces led by Lawrence of Arabia. Remaining there after 1918, it was a garrison squadron in what are now Israel and Jordan and was involved in the Western Desert campaign of WW2, operating Blenheims and, in August 1942, some of the RAF's first Marauders. Briefly a home-based maritime patrol squadron, No 14 moved to Germany in 1946, where it flew fighter-bomber Mosquitos, Vampires and Hunters, followed by tactical strike/attack Canberras, Phantoms and Jaguars. At Bruggen since 1970, No 14 re-equipped with the Tornado GR1 on 1 October 1985. It was the first Tornado squadron to be deployed to the Gulf in August 1990, being based at Bahrain. The squadron markings are a blue cross on a winged white disc, flanked by blue diamonds.

No 15 (Reserve) Squadron
Tornado Weapons Conversion Unit
Panavia Tornado GR1 – Honington,Suffolk
No 15 Squadron was a Tornado GR1 unit at Laarbruch between 1983 and December 1991, when it was disbanded as part of the RAF's reductions in Germany. It has subsequently replaced No 45 Squadron as the TWCU's shadow designation.

No 16 (Reserve) Squadron
226 Operational Conversion Unit
SEPECAT Jaguar GR1A/T2A
Lossiemouth, Moray
No 16 Squadron was until September 1991 a Tornado GR1 unit at Laarbruch, being disbanded as part of the 'Options for Change' reductions. It is now allocated as the Reserve Squadron for the Jaguar OCU.

No 17 Squadron (RAFG)
Panavia Tornado GR1 – Bruggen, Germany
Formed on 1 December 1915, No 17 Squadron spent its early days in Egypt, mainly on tactical recconnaissance duties. From 1924 it was a home defence fighter squadron, flying Hurricanes in the Battle of Britain. Deployed to Burma in November 1941, No 17 undertook offensive sweeps and finished the war equipped with Spitfires. It then became one of the few RAF squadrons in the Commonwealth occupation force in Japan before disbanding in 1948. Back in the UK during 1949-51, No 17 was assigned to target-towing before reforming in Germany during 1956 with photo-reconnaissance Canberras. Strike/attack became No 17 Squadron's role from 1970 when it received Phantoms, which gave way to Jaguars in 1975 and Tornados ten years later. Its markings are a black and white arrowhead on the nose and a red gauntlet on the fin.

No 18 Squadron (RAFG)
BV Chinook HC1 – Gutersloh, Germany
Formed on 11 May 1915, No 18 Squadron was a bomber unit during WW1 and following disbandment in 1919, was not reformed until 1931 when it emerged with Harts. A series of light bombers followed until the outbreak of WW2 when No 18 took its Blenheims to France as part of the BEF. Moved to the Mediterranean in 1941, the squadron saw active service in the Western Desert with Blenheims and Bostons. No 18 received Dakotas in 1947 employing them in the Berlin Airlift of 1948. Canberras were flown from 1953 until 1957, and Valiants from 1958 until 1963, the latter in the ECM role. Wessex helicopters were operated from 27 January 1964 and No 18 Squadron moved to Germany the following year. The first RAF squadron with the Wessex HC2, it became the first with the Chinook in 1982 and operates the type today from Gutersloh in the tactical air transport role for the Army. It will move to Laarbruch during 1992. No 18's aircraft are identified by a red pegasus badge.

No 20 Squadron (RAFG)
Panavia Tornado GR1 – Laarbruch, Germany
Employed in the fighter-reconnaissance and army co-operation roles in France and India up to 1947, No 20 Squadron's tasks in WW2 included support of Wingate's Chindits. Between 1949 and 1951 it was based at Llanbedr and provided target facilities with miscellaneous types, but took on an operational role in 1952 when posted to Germany for fighter duties with Vampires, Sabres and Hunters. In Singapore from 1961 to 1970 with ground-attack Hunters a forward air control flight of Pioneers was added in 1969. Back in Germany, the squadron reformed with Harriers late in 1970, but these were replaced by Jaguars at Bruggen in 1977. On 29 June 1984, No 20 was re-assigned to Laarbruch with Tornado GR1s. However it will disband in 1992 as part of the reductions in RAF Germany and its badge of an eagle with outstretched wings will reappear on the Harriers of No 233 Operational Conversion Unit as its shadow designation.

No 22 Squadron
(18 Group/Strike Command)
Westland Wessex HC2
Finningley, S Yorks and detachments
After service in France in WW1, No 22 was an experimental squadron of the A&AEE at Martlesham Heath for 11 years from 1923, gaining a maritime flavour to its operations when re-equipped with Vildebeest torpedo-bombers in 1934. The RAF's first Beauforts arrived late in 1939, and with these No 22 made Coastal Command's initial minelaying sortie on 7 May 1940. Flg Off K Campbell won his posthumous VC flying such an aircraft in June 1941. Beaufighters continued with this work, adding rockets to their armoury after No 22 was transferred to the Far East in 1942.



Westland Wessex HC2 – No 22 Sqn, Finningley. PRM



Panavia Tornado F3 – No 25 Sqn, Leeming. PRM

Disbanded in 1946, the unit was reformed in 1955 as the first Whirlwind SAR (Search and Rescue) squadron, gradually converting to the Wessex between 1976 and 1981. The SAR HQ at Finningley supports operational components at Chivenor ('A' Flight), Leuchars ('B' Flight), Valley ('C' Flight) and Coltishall ('E' Flight). A major change will occur when the Wessex is retired and the SAR HQ moves to St Mawgan.

No 23 Squadron

(11 Group/Strike Command)
Panavia Tornado F3 – Leeming, North Yorks

No 23 Squadron has been in the fighter role since formed on 1 September 1915. After WW1 service in France, No 25 was reformed in July 1925 with Snipes, replacing these with Gamecocks in 1926. At this time it formed a two-aircraft aerobatic team, one of its pilots being Flg Off Douglas S. Bader. During WW2 No 23 Squadron specialised in radar-equipped night intruder missions over enemy airfields, making the RAF's first such operation with a Blenheim on 21-22 December 1940, and after 1945 continued as a night fighter squadron with Mosquitos, Vampires and Venoms. All-weather Javelins and Lightnings were used until replaced by Phantoms in 1975. No 23 Squadron was deployed from Wattisham, Suffolk to Port Stanley, Falkland Islands on 1 April 1983 moved to the new Mount Pleasant airport on 1 May 1986. No 23's current role is UK air defence, being based at Leeming since November 1988.

No 24 Squadron

(1 Group/Strike Command)
Lockheed Hercules C1P/C1K/C3P
Lyneham, Wilts

Alhough it was a fighter unit in WW1 and was the first squadron in France with the highly-effective DH2, No 24 is traditionally associated with the communications and transport. Operating in the London area from 1920 to 1946, it was a VIP unit for which task it had a remarkable diversity of equipment including wartime Prime Minister Winston Churchill's personal York, No 24 being the first to operate the type. After WW2, No 24 Squadron standardised on Lancastrians, then re-equipped with the Hastings in 1950. Since 1968 it has operated C-130K Hercules as part of the Lyneham Transport Wing. The squadron tends to specalise in route flying and aerial refuelling.

No 25 Squadron

(11 Group/Strike Command)
Panavia Tornado F3 – Leeming, North Yorks

Formed in September 1915, No 25 Squadron spent WW1 in France. When reformed in 1920 as a fighter squadron it was initially equipped with Snipes but later flew Grebes, Siskins, Furies, Demons and Gladiators before Blenheims arrived in 1938 for use in night patrols. Beaufighters were flown from 1941 and later Mosquitos for intruder missions. No 25 Squadron was retained after the war as a night fighter squadron, flying Vampires from 1951 and Meteors from 1954. Javelin all-weather fighters arrived in 1959 but the unit was disbanded on 30 November 1962. No 25 Squadron was reformed as a Bloodhound surface to air missile unit on 1 October 1963 and remained so for a quarter of a century until passing its SAMs to No 85 Squadron and beginning a new operational period flying the Tornado F3 from Leeming.

No 27 Squadron

(1 Group/Strike Command)
Panavia Tornado GR1 – Marham, Norfolk

The badge of a green elephant on No 27's aircraft recalls the fact that its first equipment when formed in November 1915 was the Martinsyde G100 Elephant, later replaced by the DH4. In India, the squadron flew the famous DH9 for a decade before gaining Wapitis in 1930 and Harts on the eve of WW2, these being retained for a year. A brief tour of duty in Malaya ended with the Japanese invasion, but No 27 returned to harrass the invaders with the RAF's first Beaufighters and later operated the first Mosquitos to be deployed in the Far East theatre. After flying Dakotas in 1947-50, it turned to Canberra bombers in 1953-56, then Vulcans from 1961 to 1982, including nine years in the maritime radar reconnaissance role. It became the third RAF Tornado GR1 strike unit on 12 August 1983 but has been earmarked to disband in 1993 as part of the current reductions.

No 28 Squadron

(Strike Command – direct)
Westland Wessex HC2
Sek Kong, Hong Kong

Currently charged with supporting the Army garrison in Hong Kong and providing SAR cover No 28 Squadron has spent only three years in the UK since it was formed in November 1915. No 28 flew in France and Italy with FE2s and Sopwith Camels during WW1, then in India from 1920 with Bristol Fighters and Wapitis. Hurricanes and Spitfires were used in Burma and Malaya in WW2, then No 28 Squadron took up residence in Hong Kong during 1949, receiving Vampires two years later. Ground attack Venoms and Hunters followed. These gave way to Whirlwind helicopters in 1968 with conversion to the Wessex being undertaken in 1972.

No 29 Squadron

(11 Group/Strike Command)
Panavia Tornado F3 – Coningsby, Lincs

This fighter unit operated in France during WW1 with the DH2, Nieuport Scout and SE5a and was prominent in home defence during the inter-war years. By 1940 No 29 Squadron was flying Blenheims equipped with some of the first airborne radars, and progressed through Beaufighters – with which it flew the RAF's first patrol on the type on 17-18 September 1940 –



Westland Gazelle HT3 – No 32 Sqn, Northolt. Brian Strickland



BAe 125 CC3 – No 32 Sqn, Northolt. APM

to Mosquitos before the end of WW2. Jets in the shape of the Meteor night fighter arrived in 1951, followed by Javelins and Lightnings. Phantom FGR2s took over at Coningsby in 1974, and as well as UK air defence these were committed to maritime air superiority and overseas deployment. No 29 Squadron became the RAF's first operational Tornado F3 air defence squadron when it returned to the front line on 1 November 1987. Fin markings depict an eagle preying on a buzzard.

No 30 Squadron
(1 Group/Strike Command)
Lockheed Hercules C1P/C1K/C3P
Lyneham, Wilts
No 30 Squadron was formed in the UK in 1914 for service in Egypt during WW1 and was retained in the protectorate of Iraq after the war. Alongside No 47 Squadron it was a pioneer of the Cairo to Baghdad mail service in the days when every such sortie was a potentially hazardous venture. Back in Egypt at the outbreak of WW2, the unit flew its Blenheims as fighters against Italian forces. From 1942 to 1946 it operated in Ceylon, Burma and India with Hurricanes, Thunderbolts and Tempests, but became a transport squadron with Dakotas in 1947 and remains in the role today. The Dakotas and subsequent Valettas gave way to Beverleys in 1957 and the Hercules in 1968. Operating as part of the Lyneham Transport Wing No 30 Squadron is engaged particularly in route flying and air refuelling.

No 31 Squadron (RAFG)
Panavia Tornado GR1 – Bruggen, Germany
No 31 Squadron has the distinction of being the first RAF squadron in India (December 1915), where it operated with only short breaks until that country's independence in 1947. Bristol Fighters, Wapitis and Vincents were used in the inter-war years although transport became the primary role from 1939 onwards and remained so when the squadron was reformed at Hendon in 1948 from the Metropolitan Communications Squadron. No 31 moved to Laarbruch in Germany in 1955 to fly photo-reconnaissance Canberras, which were exchanged for strike/attack Phantoms at Bruggen in 1971. It became a Tornado GR1 squadron on 1 November 1984, its aircraft being identified by a yellow star on the fin plus a green and yellow arrowhead nose marking.

No 32 Squadron
(1 Group/Strike Command)
HS Andover C1/CC2, BAe 125 CC1/2/3, Westland Gazelle HT3/HCC4
Northolt, Middx
DH2s, DH5s and SE5as equipped No 32 Squadron during its early years in France in WW1. It remained as a fighter squadron for home defence duties between the wars with a variety of classic fighter biplanes. In November 1937, a No 32 Squadron Gauntlet became the first aircraft to intercept a target under ground radar control during trials of Britain's new and highly secret defensive screen. After flying Hurricanes in the Battle of Britain, No 32 moved to North Africa in 1942, where it supported the *Torch* landings. Later years were spent in the Middle East and Near East with Vampires (from 1949) and Canberras, which arrived in Cyprus in 1957. In 1969 No 32 Squadron was transferred to what had been the Metropolitan Communications Squadron. Three types of aircraft are today employed on the squadron's VIP transport task.

No 33 Squadron
(1 Group/Strike Command)
Westland Puma HC1 – Odiham, Hants
No 33 Squadron was formed as a fighter unit in January 1916, initially with BE2s for fighter defence against airship raids. Day-bomber Horsleys were used when No 33 was reformed in 1929 and these were followed by the popular Hart – with which No 33 Squadron was the first, in 1930. Stationed in the Middle East from 1935, No 33 flew in the Western Desert, Greece and Crete campaigns, but returned with its Spitfires to the UK for D-Day. It formed part of the German occupation force until transferred to Malaya in 1949 for anti-guerilla operations with Tempests and Hornets. From 1955, night fighter Venoms, Meteors and Javelins were employed in defending the UK before No 33 Squadron became a Bloodhound SAM squadron in Malaysia from 1965 to 1970. Since June 1971, Puma helicopters have equipped No 33 Squadron for tactical support of the Army based at Odiham.

No 38 (Reserve) Squadron
No 236 Operational Conversion Unit
HS Nimrod MR2/2P
Previously a Shackleton MR2 unit in Malta from 1953 until 1967 No 38 Squadron is the 'shadow' unit for the Nimrod OCU at St Mawgan that is moving to Kinloss in June 1992.

No 41 Squadron
(1 Group/Strike Command)
SEPECAT Jaguar GR1A/T2A
Coltishall, Norfolk
No 41 Squadron was operational in France during WW1, then became a UK air defence squadron from 1923. Its first monoplane, received in 1939, was the Spitfire and various marks were flown until 1947 including a period operating on the Continent in 1944-46. Jet-powered Meteors replaced Hornets in 1951 and these were successively followed by Hunters, Javelins and Bloodhound SAMs. Phantoms were employed in the reconnaissance role at Coningsby until the present No 41 Squadron was formed at Coltishall on 1 April 1977 as a Jaguar unit. Assigned to tactical reconnaissance, with a secondary attack capability, the unit partners Nos 6 and 54 Squadrons in the Coltishall wing, its aircraft wearing a double-armed cross flanked by red bars.

No 42 Squadron
(18 Group/Strike Command)
BAe Nimrod MR2/2P – St Mawgan, Cornwall
Formed in April 1916, No 42 Squadron served in France and Italy during 1916-19 in the tactical reconnaissance role before its long history of maritime operations began with its reformation as a Vildebeest torpedo-bombing squadron in 1936, In the Mediterranean from 1942, its Beauforts flew anti-ship missions, but No 42 became a Blenheim bomber and Hurricane ground-attack unit in Burma from early 1943. It ended the war flying Thunderbolts, then returned to the UK as a Beaufighter attack unit of Coastal Command until 1947. In 1952 Shackletons were issued to a re-formed No 42 Squadron for maritime reconnaissance. The Shackleton was replaced by the Nimrod MR1 in 1971 and the more capable MR2 in 1983. No 42 Squadron is disbanding in October 1992.



Lockheed Hercules C1P – Lyneham Transport Wing. PRM


BAe Nimrod MR2P – No 42 Sqn,St Mawgan. APM



SEPECAT Jaguar GR1A – No 41 Sqn, Coltishall. APM



McDonnell Douglas Phantom FGR2 – No 56 Sqn, Wattisham. John Dunnell

No 43 Squadron

(11 Group/Strike Command)
Panavia Tornado F3 – Leuchars, Fife

No 43 Squadron formed in Scotland during 1916 for service in France in WW1, then spent 1926-39 as a fighter unit on the South Coast. It was the first to have Gamecocks, in 1926, then flew Siskins and the Fury before receiving Hurricanes in 1938, which it flew in the Battle of Britain. After the occasional rest period in Scotland, it left for North Africa in 1942, ending the war whilst flying from Italy, where it remained until 1947. No 43 arrived at Leuchars in 1950, a year after being reformed with Meteors which it flew until July 1954, when No 43 became the RAF's first Hunter squadron. These were taken to Cyprus and Aden from 1961 to 1967. A new No 43 formed at Leuchars on 1 September 1969, equipped with the former RN Phantom FG1s. Re-equipment with the Tornado F3 came in 1989. Known as the 'Fighting Cocks' after its badge, No 43 Squadron is partnered by No 111 in its key role in the northern half of the UK Air Defence Region, although it has an additional role of defence of the Fleet.

No 47 Squadron

(1 Group/Strike Command)
Lockheed Hercules C1P/C1K/C3P
Lyneham, Wilts

No 47 was deployed in Greece and Iraq during WW1 before becoming part of the British force aiding White Russians against the Bolsheviks in 1919. It was reconstituted in Egypt in 1920 with DH9s, then operated in Sudan with Fairey IIIF floatplanes on the Nile for a time. Vincents and Wellesleys bombed Italian positions in what has become Ethiopia during 1940. No 47 Squadron turned to anti-shipping attack with Beauforts, Beaufighters and Mosquitos from 1942, and operated in the Far East in 1942-46. Halifax A7/9s were the equipment when No 47 converted to the transport role in the UK during 1946, these giving way to Hastings and Beverleys (of which the squadron was the first operator) before the present Hercules arrived in 1968. The squadron flies its aircraft mainly in the tactical and short-range transport roles as part of the Lyneham Transport Wing.

No 51 Squadron

(18 Group/Strike Command)
BAe Nimrod R1P – Wyton, Cambs

Formed in May 1916, No 51 Squadron flew various types of fighter on anti-Zeppelin patrols during WW1, but did not reappear in the Order of Battle until reformed as a light bomber squadron with Virginias and Ansons in 1937. It operated Whitleys and Halifaxes during WW2, then became a transport squadron with Stirlings and Yorks until it was disbanded in 1950. In 1958 No 192 Squadron, an intelligence-gathering unit flying Comets and Canberras, was renumbered No 51. Equipped with a reconnaissance model of the Nimrod since 1972, the squadron is officially assigned to long-range calibration. No 51 Squadron applies the badge of a flying goose to its three Nimrod R1Ps.

No 54 Squadron

(1 Group/Strike Command)
SEPECAT Jaguar GR1A/T2
Coltishall, Norfolk

No 54 Squadron was formed in May 1916 and flew Pups and Camels in France during WW1, but was not reformed until 1930 for home air defence. It received Spitfires in 1939 and with these took part in the Dunkirk evacuation and the Battle of Britain. As the threat of invasion receded, it performed fighter sweeps over France from 1941, but was moved to Australia for air defence from 1942 until 1945. Reformed in the UK with Tempests, No 54 Squadron specialised in ground attack, later flying Vampires, Meteors, Hunters and Phantoms, until the present Jaguars arrived in 1974. Re-formed at Lossiemouth on 29 March 1974, No 54 relocated to Coltishall on 8 August 1974, and like Nos 6 and 41 Squadrons is available for rapid redeployment to the NATO flanks in an emergency. Its aircraft are marked with a rampant lion, with a blue and yellow checkerboard.

No 55 Squadron

(1 Group/Strike Command)
Handley Page Victor K2 – Marham, Norfolk

No 55 Squadron formed in 1916 and became the first DH4 operator early the following year. In October 1917 it became (with Nos 100 and 216 Squadrons) a founder member of Trenchard's Independent Force of strategic bombers. Between the wars No 55 operated in Iraq, and then took part in the Western Desert campaign and invasion of Italy, flying Baltimore and Boston light bombers before being disbanded in 1946. No 55 Squadron did not reform until 1 September 1960 when it was equipped with Victor strategic bombers. Tanker models of the Victor took over in 1965, in which year the squadron moved from Honington to Marham. The squadron, which absorbed No 232 OCU on 4 April 1986, became the sole Victor tanker operator on 30 June 1986. It will disband in 1993 when the Victor is retired.

No 56 Squadron

(11 Group/Strike Command)
McDonnell Douglas Phantom FGR2
Wattisham, Suffolk

No 56 was one of WW1's most notable fighting squadrons, its success beginning in March 1917 when it became the first RFC unit to be equipped with the SE5. Squadron pilots included two high-scoring VCs: Captain Albert Ball (40 victories) and Major J.T.B. McCudden (57 victories). Between the wars No 56 was in the home defence business and, after flying Hurricanes in the Battle of Britain, 56 was the initial recipient of Typhoons in September 1941. These aircraft proved the best counter then available to the Fw190, despite earlier problems. The squadron introduced the ill-fated Swift interceptor in 1954. The more successful Hunter and Lightning followed and in March 1976 the present Phantoms were received for UK air defence duties. The fighter will be retired in mid-1992.

No 60 Squadron (RAFG)

HS Andover C1(PR)/CC2
Laarbruch, Germany

Lt Col W.A. 'Billy' Bishop VC (72 aerial victories) was an early Commanding Officer whilst No 60 Squadron was operating in France during WW1. From 1920 onwards No 60 was stationed in India and participated in the Burma campaign with Blenheims and Hurricanes before taking up station in Singapore in 1945 for local air defence. It was a major force in the Indonesian confrontation of the 1960s, and has more 'lasts' than 'firsts' to its credit: it flew the final RAF front-line Meteors (September 1961) and Javelins (April 1968). The RAF Germany Communications Squadron was given the vacant No 60 'number plate' in February 1969 and began receiving Andovers in March 1987 as replacements for its ageing Pembroke C1s for light transport and communications roles, with the last Pembroke leaving in April 1990. The squadron is disbanding on 1 April 1992.



Handley Page Victor K2 – No 55 Sqn, Marham. PRM

BAe Nimrod R1P – No 51 Sqn, Wyton. Graham Finch



No 63 (Reserve) Squadron
No 2 Tactical Weapons Unit
BAe Hawk T1A – Chivenor, Devon
No 63 Squadron was a Hunter squadron between 1956 and 1958, its number plate has subsequently been allocated to a section of No 2 TWU at Chivenor. Aircraft markings are a black and yellow checkerboard.

No 65 (Reserve) Squadron
229 Operational Conversion Unit
Panavia Tornado F3 – Coningsby, Lincs
A Bloodhound SAM squadron in Singapore from 1964 to 1970 and before that operating Hunters, No 65 Squadron's markings (a lion upon white arrowhead containing eight red chevrons) is now carried by the Tornado F3s of No 229 OCU at Coningsby.

No 70 Squadron
(1 Group/Strike Command)
Lockheed Hercules C1P/C1K/C3P
Lyneham, Wilts
A fighter and ground attack unit in France between 1916 and 1918 and the first with the well-known Sopwith Camel in July 1917, No 70 Squadron was reformed in Egypt during 1920 to fly the classic large biplanes: Vimy, O/400, Vernon, Victoria and Valentia. For most of WW2 it flew Wellington bombers against Italian and German targets in North Africa, but turned to transport in 1948 with Dakotas. Hastings and Argosies were flown from Cyprus from 1956, to be followed by the Hercules from November 1970. In February 1975, No 70 returned to the UK from Cyprus to join the transport wing at Lyneham. Its principal duties now include low-level cargo dropping and Army support.

No 72 Squadron
(1 Group/Strike Command)
Westland Wessex HC2 – Aldergrove, NI
Formed in July 1917 for fighter and reconnaissance duties No 70 Squadron served in Iraq during 1918 but was disbanded the following year. In February 1937 it reformed for home defence as the first Gladiator unit. These gave way to Spitfires in April 1939, which the squadron flew from Biggin Hill and Croydon in defence of London during the height of the Battle of Britain. A later transfer resulted in No 72 fighting on the North African and Italian fronts from 1942. After the war it was equipped successively with Vampires, Meteors and Javelins. In November 1961, No 72 Squadron received Belvedere twin-rotor helicopters at Odiham, these giving way to the Wessex HC2 in August 1964. The squadron moved to Aldergrove, NI in 1981. No 72 Squadron's helicopters are identified by the insignia of a swift flanked by blue bars.

No 74 Squadron
(11 Group/Strike Command)
McDonnell Douglas Phantom FGR2
Wattisham, Suffolk
No 74 Squadron 'The Tigers' is one of the RAF's best-known fighter squadrons, its past members including Major Edward Mannock VC, the top-scoring fighter pilot of WW1 with 73 victories. Disbanded in 1919, the squadron re-emerged in 1935 with Demon fighters on Malta during the Abyssinian crisis. Returned to the UK the following year, it flew Spitfires over the Dunkirk beaches and in the early stages of the Battle of Britain before mounting offensive sweeps over occupied France in 1941. Following a mid-war interlude in the Near East, No 74 supported the invasion of Europe as a unit of the 2nd Tactical Air Force and ended WW2 based in the Netherlands. In June 1945, the 'Tigers' became the third Meteor jet fighter squadron, operating from Colerne and later Horsham St Faith (now Norwich Airport). At nearby Coltishall No 74 became RAF's first Lightning fighter squadron in 1960. After a spell in Singapore between 1967 and 1971, the squadron was dormant until reformed on 1 July 1984 to fly 15 newly-purchased ex USN Phantom F-4J(UK)s, appropriately decorated with a tiger's head and black/yellow bars. The arrival of the Tornado F3 in the late eighties enabled other Phantom units to release their aircraft and the F-4J(UK) gave way to the FGR2, the last F-4J(UK) flight taking place on 17 January 1991. The squadron will be stood down at the end of 1992.

No 78 Squadron
(Falkland Islands/Strike Command)
BV Chinook HC1, Westland Sea King HAR3
Mount Pleasant, Falkland Islands
Formed in November 1916 to intercept Zeppelins and later Gotha aeroplanes raiding London, No 78 disbanded in 1919 and was not reformed until 1936 when it was equipped with the Heyford and subsequently progressed through various marks of Whitley to the Halifax. After the war No 78 operated Dakotas with Transport Command, based in the Middle East. Valettas, used from 1950, gave way to Pioneers in 1956, then Twin Pioneers in 1958, before Wessex helicopters were adopted in 1965. The squadron disbanded in Oman during 1971 as Britain pulled-out of the Middle East, and did not reappear until 22 May 1986 when it was formed from the Chinooks of No 1310 Flight and Sea Kings of No 1564 Flight in the Falkland Islands. Transport support of the Army is the squadron's main role, although the Sea Kings also perform SAR tasks.

No 79 (Reserve) Squadron
No 1 Tactical Weapons Unit
BAe Hawk T1A – Brawdy, Dyfed
No 79 Squadron was formerly a Swift and Hunter squadron in Germany until disbanded in 1961. Today it is allocated to an element of No 1 TWU based at Brawdy. Aircraft markings are a red arrow on a white bar each side of the fuselage roundel.

No 84 Squadron
(AHQ Cyprus/Strike Command)
Westland Wessex HU5C – Akrotiri, Cyprus
Formed in January 1917, after flying SE5s on fighter duties in France No 84 Squadron took up station in Iraq during 1920 and remained there for the next 20 years. Its Blenheims took part in the Greek campaign of 1940-41 and were subsequently transferred to the Far East to combat the Japanese invasion. In December 1942 it became one of only four units to fly the Vultee Vengeance dive-bomber operationally, although they were quickly replaced by Mosquitos. After a brief return to Iraq post-war, No 84 again redeployed eastwards to fly the RAF's first Brigands against Malayan guerilla forces. No 84 Squadron converted to the transport role in February 1953 with Valettas, followed by Beverleys and Andovers, and moved to Akrotiri in January 1972. Initially equipped with Whirlwind helicopters, conversion to Wessex HC2s followed in March 1982, with ex-Navy Wessex HU5s replacing them in 1985. 'A' Flight is assigned to search and rescue for the local RAF armament training base, whilst 'B' Flight provides light transport support for the UN peacekeeping forces in Cyprus. The squadron insignia is a scorpion, but each helicopter wears a different 'ace' or 'joker' playing card motif.

No 100 Squadron
(18 Group/Strike Command)
BAe Hawk T1/T1A – Wyton, Cambs
No 100 Squadron was formed in February 1917 as the RFC's first specalised night bomber squadron, and operated giant Handley Page O/400s in the closing stages of WW1. It was later a day-bomber and then a torpedo-bomber squadron, operating the RAF's first Vildebeests in Singapore. It was overrun by the Japanese in February 1942, still operating the elderly biplane. When reformed in December 1942, No 100 flew the Lancaster, with which it participated in the bomber offensive against Germany. Retained after WW2, No 100 Squadron's Lincolns arrived in 1946 and gave way to Canberras in 1954, whilst Victors were employed from 1962 to 1968. When reformed in 1972, No 100 had returned to Canberras, this time for the provision of target facilities. The unit moved from St Mawgan to Wyton in January 1982. The arrival of the first BAe Hawk on 6 September 1991 marked the beginning of the end for the venerable Canberra.

No 101 Squadron
(1 Group/Strike Command)
BAC VC10 K2/3 – Brize Norton, Oxon
No 101 Squadron, formed in July 1917 for night bombing with FE2s in France, was disbanded in 1919 and did not reform until March 1928. It became the RAF's only Sidestrand squadron in 1929 and traded these in for Overstrands in 1935. By the outbreak of WW2 No 101 had Blenheims which were used in bombing missions until Wellingtons arrived in April 1941. During the second half of WW2 No 101 was also involved in electronic counter-measures with Lancasters. Lincolns arrived in August 1946 and in May 1951 it became the first Canberra jet bomber squadron. Vulcans arrived in January 1958 and were flown for the next 25 years, launching the bombing assault on invading Argentine forces in the Falkland Islands in 1982. Conversion to the VC10 tanker came on 1 May 1984 at Brize Norton.

No 111 Squadron
(11 Group/Strike Command)
Panavia Tornado F3 – Leuchars, Fife
After WW1 service in the Near East, No 111 disbanded in Palestine with Brisfits in 1920, but was reformed for home duties four years later. Hurricanes arrived in January 1938 and gave No 111 Squadron its place in history as the RAF's first unit to operate the fighter. These were flown in the Battles of France and Britain, before Spitfires were taken out to North Africa in 1942. Disbanded as an occupation squadron in Austria during 1947, No 111 Squadron emerged as part of Fighter Command in 1953, gaining renown for providing the spectacular Hunter mass formation aerobatic team the *Black Arrows*. After flying Lightnings, the squadron converted to Phantom FGR2s in 1974 and moved to its present base on 3 November 1975. Ex-Navy Phantom FG1s gradually took over from 1977 onwards, but No 111 Squadron re-equipped with the Tornado F3 in 1989. Universally known as 'Treble One', this squadron partners No 43 in the northern air defence region. Its aircraft carry a black lightning flash marking.

BAC VC10 K2 – No 101 Sqn, Brize Norton. Graham Finch



No 115 Squadron
(1 Group/Strike Command)
HS Andover E3/3A – Benson, Oxon
Beginning in December 1917, No 115 Squadron was a night bomber unit equipped with Handley Page O/400s during WW1. Reformed in June 1937 with the Harrow, it re-equipped with Wellingtons which were used in attacks against shipping and later began raids against German targets. Lancasters arrived in 1943 and were in turn supplanted by Lincolns. No 115 Squadron received Washingtons in 1950 and converted to the Canberra in 1954 but was disbanded in 1957. No 116 Squadron at Watton took over No 115's 'number plate' in August 1958. Flying Varsities as part of Signals Command, No 115 later received Argosies. Since November 1976 it has flown the distinctive red and white Andovers on calibration duties and moved to its present home on 7 January 1983.

No 120 Squadron
(18 Group/Strike Command)
BAe Nimrod MR2P – Kinloss, Moray
Formed in January 1918 with DH9s but cheated out of combat in WW1 by the Armistice, No 120 Squadron was not reformed until June 1941, when it received Liberators for long-range maritime reconnaissance duties and became the first in the RAF to operate the type. Today, it continues to perform the same role, having progressed through the Lancaster GR3 and Shackleton to the Nimrod today. No 120 arrived at Kinloss on 1 April 1959 and received its Nimrod MR1s from February 1971 onwards. Its aircraft are pooled with Nos 201 and 206 Squadrons of the Kinloss Wing.

No 151 (Reserve) Squadron
No 2 Tactical Weapons Unit
BAe Hawk T1A – Chivenor, Devon
No 151 Squadron last operated Lincolns, Hastings, Varsities and Canberras on radar development work in 1962-63. Today it is allocated to a section of No 2 TWU at Chivenor. Markings are a St Andrew's Cross (white on blue background) on each side of the fuselage roundel.

No 201 Squadron
(18 Group/Strike Command)
BAe Nimrod MR2 – Kinloss, Moray
No 201 Squadron was formed from No 1 Squadron, Royal Naval Air Service at Fienvillers in France on 1 April 1918. It was re-established after a decade of inactivity in 1929 to fly Southampton and London flying boats, which gave way to the Sunderland in 1940. No 201 Squadron was heavily involved in Coastal Command's battle against the German U-Boats playing a vital role in keeping Britain's essential supply lines open. The Sunderland was not traded-in for land-based Shackletons until 1957, which were also operated in the maritime reconnaissance role. No 201 moved to Kinloss in March 1965 and became the RAF's first Nimrod squadron there in October 1970. Its aircraft are pooled with those of Nos 120 and 206 Squadrons.



Westland Puma HC1 – No 230 Sqn, Gütersloh. PRM


BAe Hawk T1A – No 151 Sqn/2 TWU, Chivenor. PRM

No 202 Squadron
(18 Group/Strike Command)
Westland Sea King HAR3
Finningley, S Yorks and detachments
No 202 Squadron reformed at Kalafrana, Malta in 1929 after brief WW1 service and flew Fairey IIIF seaplanes until the arrival of Scapa flying boats in 1935. These were followed by Londons, Catalinas and Sunderlands, the two last-mentioned types operating with No 202 from Gibraltar against Axis submarines in the Atlantic and Mediterranean. The squadron was reformed in October 1946 for meteorological reconnaissance, at first flying Halifaxes, then Hastings. In September 1964 it became a helicopter rescue squadron with Whirlwinds, which were supplanted by the long-range Sea King from May 1978 onwards. 'A' Flight at Boulmer officially re-equipped with the new type on the first day of 1979, followed by 'B' Flight at Brawdy, 'C' Flight at Manston, 'D' Flight at Lossiemouth,'E' Flight at Leconfield and the Sea King Training Unit at Culdrose. The HQ and SKTU move to St Mawgan early in 1993.

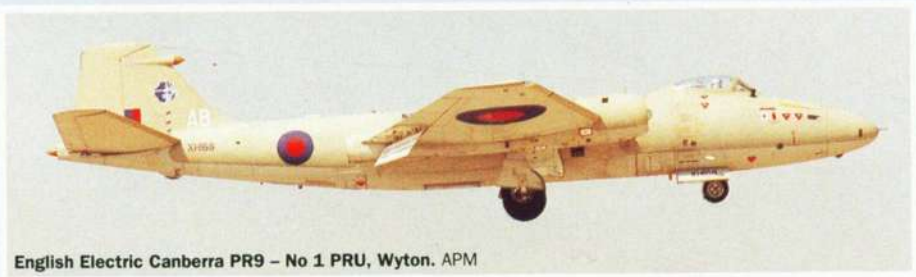
No 206 Squadron
(18 Group/Strike Command)
BAe Nimrod MR2P – Kinloss, Moray
Formed on 1 April 1918 from No 6 Squadron, RNAS with DH9s for bombing, No 206 Squadron was disbanded on 1 February 1920 by renumbering it as No 47 Squadron. No 206 Squadron was reformed in 1936 with the Anson. with which it entered WW2. Its anti-submarine patrols and attacks on enemy shipping were continued with Hudsons from March 1940, followed by the Fortress and Liberator. Between 1947 and 1950 No 206 changed to a transport role and flew Yorks in the Berlin Airlift. When reformed in 1952, it reverted to its former role of maritime reconnaissance, at first with Shackletons, then Nimrods from November 1970. The squadron has been at Kinloss since July 1965, and with Nos 120 and 201 Squadrons it shares a pool of aircraft.

No 208 Squadron
(18 Group/Strike Command)
HS Buccaneer S2B – Lossiemouth, Moray
After WW1 fighter service, No 208 became was an army co-operation squadron in Egypt between the wars, and undertook the same role in the Western Desert campaign with Lysanders and Hurricanes. After a period in Italy with ground-attack Spitfires, No 208 Squadrom moved to the Middle East with the coming of peace and remained there, apart from short periods, until disbanded with Hunters at Bahrain in 1971. Reformed with Buccaneers at Honington on 1 March 1974, No 208 moved to its present base in July 1983, partnering No 12 Squadron in the maritime strike/attack role. Under the current proposals No 208 Squadron will disband in 1993.

No 216 Squadron
(1 Group, Strike Command)
Lockheed Tristar K1/KC1/C2
Brize Norton, Oxon
After service as a bomber unit in WW1, No 216 Squadron spent the interwar years in the bomber-transport role in Egypt, flying types such as the DH10 until re-equipped with Bombays in 1939. By 1942-43, transport had become No 216's only duty, remaining so until recently. In 1956, the squadron became the world's first jet transport squadron when the Comet was taken on strength, the last of which was withdrawn in 1975. Briefly equipped with Buccaneers in 1979-80, it reformed on 1 November 1984 to

English Electric Canberra T17A – No 360 Sqn, Wyton. APM




English Electric Canberra PR9 – No 1 PRU, Wyton. APM

operate Tristars bought to expand the RAF's tanker/transport fleet. The first K1 tanker was handed over to the RAF on 24 March 1986. Today it operates a mixed fleet of cargo, tanker and dual-role aircraft.

No 230 Squadron (RAFG)
Westland Puma HC1 – Gütersloh, Germany
No 230 Squadron was formed in the closing months of WW1 for coastal defence, but disbanded in 1922. After reforming in 1934, it operated the maritime reconnaissance Singapore biplane flying boat before changing to Sunderlands in 1938. Its Sunderlands evacuated troops from Crete and 537 wounded members of Wingate's Chindit force from behind Japanese lines. Later, No 230 carried 5,000 tons of food to Berlin in the 1948 Airlift. After it was transferred to army support, No 230 flew Pioneers from 1958 and added a few Twin Pioneers during 1960-61, but converted to helicopters during 1962 with the arrival of the Whirlwind. Flying Pumas since 1971, No 230 Squadron moved to Germany in October 1980 and is scheduled to move to Laarbruch during 1992.

No 234 (Reserve) Squadron
No 1 Tactical Weapons Unit
BAe Hawk T1A – Brawdy, Dyfed
No 234 Squadron was last operational with Hunters in Germany in 1956-57. It is currently allocated to one of No 1 TWU's squadrons at Brawdy. Aircraft markings are red diamonds on a black background.

No 360 Squadron
(18 Group/Strike Command)
English Electric Canberra PR7/E15/T17A
Wyton, Cambs
The RAF's youngest squadron was formed on 1 April 1966 to fly Canberras equipped with jamming equipment to test the skills of air defence radar operators on land, sea and in the air. A new number was allocated because No 360 has a 25% Royal Navy personnel content, and every fourth CO is a naval officer. This unique squadron has been at Wyton since June 1974, its aircraft marked with the insignia of a moth upon a trident, plus red bars and a yellow lightning flash on each side of the fuselage roundel. With the recent re-equipment of No 100 Squadron with the Hawk, No 360 has gained some PR7 and E15 variants of the Canberra to add to its T17As.

No 617 Squadron
(1 Group/Strike Command)
Panavia Tornado GR1 – Marham, Norfolk
Famous as the squadron which undertook the May 1943 raid on the Ruhr dams under the command of Wg Cdr Guy Gibson, No 617 Squadron is now an element in Britain's home-based strike force. Post-war No 617 flew Lincolns, Canberras and Vulcans, spending 1958-81 at its original base of Scampton. It re-formed on 16 May 1983 with Tornado GR1s, 40 years to the day after its first operation from Marham. The squadron marks the fins and noses of its aircraft with a red lightning flash on a black background. During 1993 No 617 Squadron is scheduled to move to Lossiemouth to take over the maritime role from No 208 Squadron.

FLIGHTS

The following smaller flights were operational early in 1992:

No 1312 Flight (Strike Command)
Lockheed Hercules C1K
Mount Pleasant, Falkland Islands
Aerial refuelling and maritime surveillance from Mount Pleasant, Falkland Islands.

No 1417 Flight (Strike Command)
BAe Harrier GR3 – Belize City Airport, Belize
Responsible for close support and reconnaissance for the British element defending Belize (formerly British Honduras).

No 1435 Flight (Strike Command)
McDonnell Douglas Phantom FGR2
Mount Pleasant, Falkland Islands
Took over the duties of No 23 Squadron in the Falkland Islands and has named its four aircraft *Faith, Hope, Charity* and *Desperation*. The Phantoms are due to be replaced by Tornado F3s in mid-1992.

No 1563 Flight (Strike Command)
Westland Puma HC1 – Belize City Airport, Belize
Responsible for helicopter support for UK troops in this Central American protectorate.

OPERATIONAL CONVERSION UNITS

OCUs convert pilots and other aircrew to their particular type of front-line aircraft. In times of conflict OCU equipment and personnel would have a role to play, either through adoption of their 'shadow' squadron numbers or assignment as reinforcements to other squadrons operating the same type. Units marked with an asterisk (*) use aircraft from other squadrons or a pool as required.

No 226 OCU (1 Group/Strike Command)
SEPECAT Jaguar GR1A/T2A – Lossiemouth, Moray
Allocated No 16 (Reserve) Squadron designation.

No 229 OCU (11 Group/Strike Command)
BAe Tornado F3 – Coningsby, Lincs
Allocated No 65 (Reserve) Squadron designation.

No 233 OCU (1 Group/Strike Command)
BAe Harrier GR3/GR5/T4 – Wittering, Cambs
Allocated No 20 (Reserve) Squadron designation.

No 236 OCU (18 Group/Strike Command)
BAe Nimrod MR2/MR2P – *Kinloss, Moray (from June 1992) Allocated No 38 (Reserve) Squadron designation.

No 240 OCU (1 Group/Strike Command)
BV Chinook HC1, Westland Puma HC1 – Odiham, Hants

No 241 OCU (1 Group/Strike Command)
Lockheed Tristar K1/KC1/C2, BAC VC10 C1/K2/K3 – *Brize Norton, Oxon

No 242 OCU (1 Group/Strike Command)
Lockheed Hercules C1P/C1K/C3P – *Lyneham, Wilts

TACTICAL WEAPONS UNITS

Two Tactical Weapons Units (TWUs) provide newly-qualified pilots with experience of weapons usage before they join their first squadron. The Hawks also have an emergency air defence function.

No 1 TWU (11 Group/Strike Command)
BAe Hawk T1A – Brawdy, Dyfed
Aircraft wear Nos 79 or 234 (Reserve) Squadron markings. The Unit is to close by 31 August 1992.

No 2 TWU (11 Group/Strike Command)
BAe Hawk T1A – Chivenor, Devon
The Unit transferred to Support Command on 1 April 1992

TRAINING UNITS

There are three further training flights for specific aircraft together with the TTTE and TWCU for Tornado operational training.

Andover Training Flight
(1 Group/Strike Command)
HS Andover E3/E3A – *Benson, Oxon

SAR Training Unit (18 Group/Strike Command)
Westland Wessex HC2 – *Valley, Anglesey

Tri-National Tornado Training Establishment
(1 Group/Strike Command)
Panavia Tornado GR1 – Cottesmore, Leics
Also operates German and Italian aircraft and trains personnel from those countries.

Tornado Weapons Conversion Unit
(1 Group/Strike Command)
Panavia Tornado GR1 – Honington, Suffolk
Aircraft wear No 15 (Reserve) Squadron markings.

SPECIAL UNITS

Electronic Warfare and Avionic Unit
(18 Group/Strike Command)
HS Andover C1 – Wyton, Cambs

No 1 Photographic Reconnaissance Unit
(18 Group/Strike Command)
English Electric Canberra PR9 – Wyton, Cambs

The Queen's Flight (1 Group/Strike Command)
BAe 146 CC2, Westland Wessex HCC4
Benson, Oxon

Strike/Attack Operational Evaluation Unit
(Strike Command)
Panavia Tornado GR1/GR1A, Harrier T4/GR7, Jaguar T2A – Boscombe Down, Wilts

Tornado Operational Evaluation Unit
(Strike Command)
Panavia Tornado F3 – Coningsby, Lincs

Battle of Britain Memorial Flight
Avro Lancaster, Hawker Hurricane, Supermarine Spitfire, DHC Chipmunk T10,
DH Devon C2 – Coningsby, Lincs

Vulcan Display Flight
Avro Vulcan B2 – Waddington, Lincs



Westland Sea King HAR3 – No 202 Sqn, Finningley. APM


Panavia Tornado GR1 – No 617 Sqn, Marham. APM



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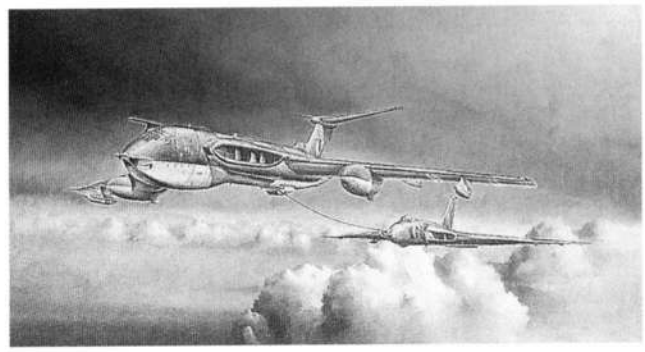
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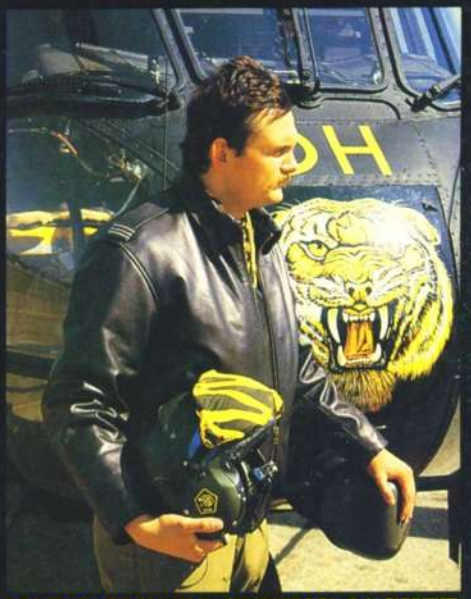
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