

THE ROYAL AIR FORCE BENEVOLENT FUND'S

International Air Tattoo 93

RAF FAIRFORD 24-25 JULY

THE OFFICIAL
PUBLIC CELEBRATION
OF 75 YEARS OF THE
ROYAL AIR FORCE



£5

FRIENDS OF INTERNATIONAL AIR TATTOO



Did you know that next time you visit an airshow promoted by International Air Tattoo (IAT), you could attend for four days, have your own reserved grandstand seat in a members' enclosure, complete with its own exclusive catering and toilet facilities. No, this is not first prize in an aircraft competition, it is part of the benefits of joining Friends of International Air Tattoo (FIAT).

Membership of FIAT is open to anyone. It entitles you to visit the airfield on the aircraft arrival day (Friday), the two public days (Saturday and Sunday) and the aircraft departure day (Monday).

Other benefits include a free ride on the open-top photo-bus to the operational area, where you can view and photograph the aircraft taking part in the flying display. There is also a free souvenir programme and three newsletters during the year.

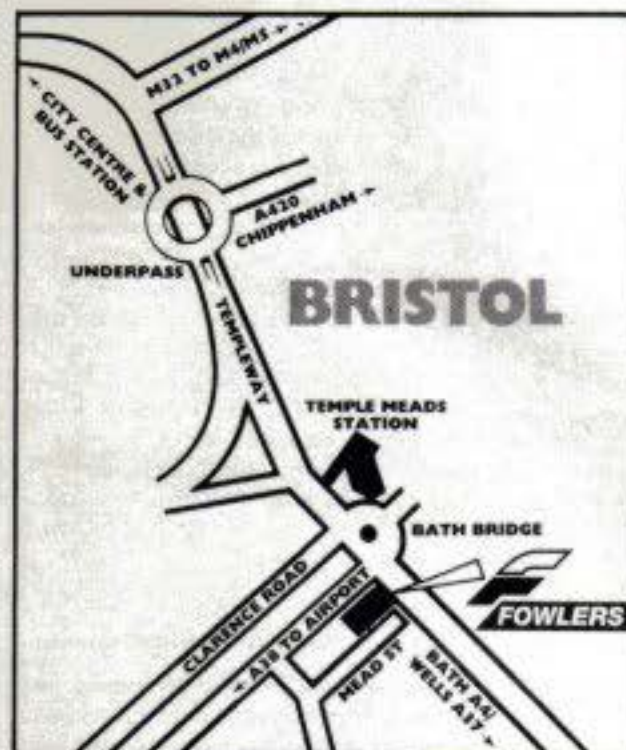
Like the airshow, FIAT is truly international

with Friends coming from all over the world including the USA, New Zealand and Japan, giving you the opportunity to meet others with a similar interest. Many Friends keep in contact with each other throughout the year, exchanging news and views and photographs.

The enclosure, which is always situated centrally on the crowd line, is also visited by members of participating Air Forces. This enables you to meet and converse with personnel from other Air Arms.

The fact that many Friends rejoin FIAT every year indicates the level of enjoyment our members receive. You can become a Friend by contacting:

Membership Secretary
Friends of International Air Tattoo
PO Box 1940
RAF Fairford
Glos GL7 4NA



Only 5 minutes walk from Bristol's main Temple Meads Railway Station or a 10-minute bus or taxi ride from the Centre Coach/Bus Station. Bristol Airport is also only a 30-minute journey away by taxi. Motorway connections to London, South Wales, the West Country and the Midlands are conveniently close via the M32.



COME AND SEE FOR YOURSELF OR GIVE US A CALL

2/12 Bath Road BRISTOL | 207 Rodbourne Road SWINDON

TEL: 0272 770466 | TEL: 0793 534985
FAX: 0272 774121 | FAX: 0793 538279



Our rates include:-

- Insurance cover in the U.K.
- AA membership for the duration of the hire
- Unlimited mileage

We also offer for hire:-

- Waterproof clothing
- Helmets
- Gloves
- Krauser luggage

ROYAL AIR FORCE FAIRFORD

Peter R March



Peter R March



Fairford has hosted several deployments of USAF B-52 Stratofortresses, the latest in June this year when three aircraft from Griffiss AFB arrived on a fourteen day detachment.

3919th Air Base Squadron was redesignated the 3919th Combat Support Group, a Strategic Air Command unit. The 68th Bomb Wing continued to deploy six B-47s to Fairford until July 1961.

Reflex alert aircraft strength was doubled at RAF Fairford in July 1961 when the 68th Bomb Wing increased its deployment to nine B-47s, while the 96th Bomb Wing from Dyess AFB, Texas, began deploying three B-47s to RAF Fairford.

The reflex posture at the base changed on 1 August 1962, when the 68th and 97th Bomb Wings were replaced by the 340th Bomb Wing from Whiteman AFB, Missouri.

On 1 December 1962, a SAC reflex alert

posture was again implemented at Fairford. This was supported by one KC-97 aircraft from the 19th Refueling Squadron, Otis AFB, Massachusetts, and was on rotating alert for 28 days at a time.

The base continued to be used by the US Air Force until 26 June 1964, when it was transferred back to RAF control. Later in 1964, the Central Flying School moved to Fairford with Gnat T1 aircraft. The Red Arrows team was based at Fairford from the beginning of 1965 until September 1966. The base was then used by the growing Belfast and VC10 fleets of the Royal Air Force until 23 May 1967, while the runway at nearby RAF Brize Norton was out of use.

KC-135 Stratotankers were resident from 1979 until the base was reduced to standby status in 1990.



Peter R March

The station lay dormant as a satellite of Brize Norton until September 1977 when it reopened as an RAF Air Support Command Base with two squadrons of C-130 Hercules. In April 1969, Fairford became the British Aircraft Corporation test centre and home of Concorde 002. The two Hercules squadrons moved to RAF Lyneham in the summer of 1971, while Concorde test flying continued until 31 January 1977.

The US Air Force returned to Fairford in early 1979 when the 7020th Air Base Group, a USAFE unit, was designated and activated on 1 February 1979. Preparation was made and in September 1979 KC-135 Stratotankers arrived at RAF Fairford. The tankers were the first USAF aircraft to be stationed at the base since 1964 and these remained until Fairford was reduced to standby status in August 1990.

Fairford also hosted deployments of B-52 Stratofortresses from the United States during this period. The airfield was reactivated for Operation Desert Storm in early 1991 and received a number of B-52s that were used for bombing raids on the Iraqi Army in Kuwait. The most recent USAF visitors were three B-52s from Griffiss AFB, New York on a two-week detachment during early June 1993. At the same time Fairford became the first UK airfield to receive a deployment of B-1B Lancers when three aircraft made a short visit. RAF Fairford currently comes under the control of the 7020th Air Base Squadron, USAF.

RAF Fairford was opened by the Royal Air Force in January 1944. No 620 Squadron arrived on 18 March 1944, with Stirling bombers and Horsa gliders. It was joined a week later by No 190 Squadron.

Shortly before midnight on 5 June 1944, 45 Stirlings towing Horsa gliders set out from the base with nearly 900 paratroopers. During the early hours of D-day the paratroopers were dropped near Caen, France, to secure and hold bridges over the River Orne and establish a firm base east of the river in support of D-day operations.

That evening, after returning for service and repairs, 36 Stirling and Horsa combinations took off from RAF Fairford in less than an hour. In their bellies, 33 jeeps, 29 trailers, 11 motorcycles, eight 7mm guns and 254 troops were waiting to reinforce the

troops dropped the previous night.

Throughout the following weeks both Fairford squadrons carried huge quantities of supplies to the Normandy beachhead. In addition, they made nightly drops of supplies to resistance groups behind enemy lines.

On 17 September 1944, the first day of the Arnhem operation, 50 aircraft flew from the base, 38 of them towing gliders and 12 more acting as pathfinders for the main force. During the following week of intensive fighting they flew daily resupply operations in the face of heavy enemy opposition until the action was brought to an end.

In October 1944, two squadrons towed some 30 gliders from Fairford to Rome, returning with repatriated servicemen from Italy. Glider experimental work and training took place at the base after the war until it

was closed in December 1948.

In June 1950 RAF Fairford was re-opened and began preparing to receive units of the US Air Force. The airfield was enlarged, extended and, for a while, was jointly occupied by the US Air Force and the RAF. It was handed over to the US Air Force in July 1951, and the 7507th Air Base Squadron, a 3rd Air Force unit, was the first Air Force organisation assigned to the base.

In October 1952, the organisation was converted into the 3919th Air Base Group under Strategic Air Command. In 1955 the group was changed to a squadron.

On 6 January 1958 the first B-47 Stratojets were deployed to the base from the 68th Bomb Wing at Chennault AFB, Louisiana, to initiate the continuing alert force concept. On 1 January 1959 the

Below: USAF B-47 Stratojets were first deployed to RAF Fairford in 1958.



Below: Boeing KC-97 tankers operated from Fairford on 28 day rotation.



With best wishes for a
successful 75th
Anniversary Air Tattoo.

Sun Alliance is pleased to
support The Royal Air
Force Benevolent Fund.



SUNALLIANCE
GROUP

Registered Office: Sun Alliance Group plc, 1 Bartholomew Lane, London EC2N 2AB
Telephone: 071 588 2345

BRITISH AEROSPACE

1918-1993

Arthur Reed



Ever since 1 April 1918, the day on which the Royal Air Force was born out of the Royal Flying Corps and the Royal Naval Air Service, British Aerospace and its many predecessor companies have been the most important suppliers of aircraft of all types to the Service as it has grown over 75 years from a fledgling to one of the strongest and most comprehensive air arms in the world.

Those predecessors are a roll call of famous names, companies which form the vital threads in the fabric of the British aviation story; Supermarine and Hawker; Gloster and English Electric; Avro and Armstrong Whitworth; Airspeed and de Havilland; Blackburn and Bristol; Folland

Spanning 75 years of aviation technology – the Sopwith Camel of 1918 (inset) and the new Eurofighter 2000.

and Hawker Siddeley; Percival and Scottish Aviation; Sopwith and Vickers.

Space does not permit the mention of more than a handful of the aircraft which such manufacturers developed for the RAF – a rough count indicates there have been approaching 200 different types so far – while the brief does not cover well-known aircraft which served with the RAF, such as the Handley Page Victor and the McDonnell Douglas F-4 Phantom which although produced by companies outside British Aerospace, were serviced by BAe.

Choosing which aircraft to mention from World War 1 is an invidious task, but probably the name that lives on in most minds is that of the Sopwith Camel single-

seat biplane fighter. Its top speed was given – with precision – as 118.51 mph and it boasted a climb of 1000 ft/min.

At the end of that war, the RAF was run down to such an extent that within 18 months of the Armistice its strength had gone from 291,170 men and women to 29,730 and its operational squadrons from 383 to 25. At the same time, it had to make due with wartime designs such as the Vickers Vimy, although it was that lumbering bomber, with its two 360hp Rolls-Royce Eagle VIII engines giving it a maximum speed of 100 mph, which hinted at the possibilities of today's wodd-girdling aviation industry by being first to fly the Atlantic.

Specifications for a few new aircraft, such as the Gloster Grebe, the Armstrong Whitworth Siskin, the Vickers Virginia and Vernon, were issued under a tight budget during the 1920s as Major General (later Lord) Trenchard, the 'father' of the RAF, established the foundations of the Service. But it was not until 1934, with the threat of

another world war looming, that the Service began take off once more. Under the RAF Expansion Scheme of that year, an increase in first-line strength from 52 to 126 squadrons within five years was ordered.

The winning outright of the Schneider Trophy at a speed of 340mph by the RAF in 1931 with the Supermarine S6B seaplane (powered by the Rolls-Royce 'F' engine, which was developed into the Merlin) led directly to R.J. Mitchell's superb Spitfire and a revolution in the design of RAF fighters. At the Hawker works at Kingston at much the same time, Camm and his team were perfecting the Hurricane.

The Hurricane, with a top speed of 316mph, entered service with No 111 Squadron at RAF Northolt in December, 1937. The 355mph Spitfire began its Service life with No 19 Squadron, at RAF Duxford, the following June. It was just in time. At the Royal Review of the RAF by King George V on 6 July 1935, all 350 aircraft were biplanes; the RAF's first

operational monoplanes, the Avro Anson, did not enter service until 6 March 1936!

So the eight-gun Hurricane and Spitfire marked the end of an era. Beautiful aeroplanes as they were, the Demon, the Fury and the Gladiator, would have stood little chance against the 3,500 modern fighters and bombers which the Luftwaffe threat against this country in the Battle of Britain. By 1940 however, thanks to the immense exertions of the British aircraft industry, Fighter Command mustered just over 1000 aircraft, most of them the latest types.

From the rapidly-expanded factories came a host of other classic designs for the RAF – the Typhoon and Tempest, from Hawker; the Lancaster and York, from Avro; the Wellington, from Vickers; the Blenheim, Beaufort and Beaufighter, from Bristol; the Walrus and Sea Otter from Supermarine; the wooden-construction Mosquito, from de Havilland; and, in July 1944, when No 616 became the RAF's first jet squadron, the Meteor from Gloster.

The fierce demands of wartime produced, in a relatively short time, a quantum leap in aircraft/engine/equipment design and development, so that by 1945, with Germany and Japan defeated, the RAF, which only ten years earlier, had been in the era of the biplane, had moved into the era of the jet. The Vampire jet fighter joined the Meteor with the squadrons in 1946, and Petter, with English Electric at Preston, was well along the road towards designing the Service's first jet bomber – the Canberra.

The outbreak of the 'Cold War' in which the Soviet Union and the West faced each other with nuclear weapons poised, hastened the entry into service with the RAF of the V-bombers. The Valiant, from Vickers – the first to go operational, in January 1955 – was soon followed by the Vulcan, from Avro, and the Victor, from Handley Page. The arrival of this potent force wrote the final chapter for the era of the World War 2 heavy bombers, notably the Avro Lincoln, developed from the Lancaster – although the Shackleton, the original Lancaster design developed as Britain's front-line early warning system, soldiered on until replaced by the Boeing Sentry AEW1 in the early 1990s.

Another long-lived design is the Hawker Siddeley Nimrod maritime reconnaissance aircraft which traces its lineage back to the de Havilland Comet, the world's first jet





Hawker Hunter



English Electric Lightning



Armstrong Whitworth Argosy



SEPECAT Jaguar



Hawker Siddeley Nimrod



BAe 146 - The Queen's Flight



Red Arrows Hawks

Peter H March

Peter H March

airliner - which made its maiden flight in the hands of John Cunningham as long ago as 1949. The RAF became the first air force in the world to form a jet transport force in 1956 when No 216 Squadron took delivery of Comet 2s. Nimrods entered RAF service in 1969 and will remain on duty for quite a few years yet to come.

In 1959, eight years after the Canberra, the RAF received its first Mach 2 interceptor, the Pterter-designed English Electric Lightning, a fitting companion for the Hawker Hunter, another classic design from the Camm stable at Kingston. The Hunter, the Service's first swept wing transonic fighter, had gone to the squadrons five years earlier to take over from the first-generation jets. The delta-wing Gloster Javelin, designed for all-weather operations, followed the Hunter into service and was equipped with the Firestreak air-to-air missile, as was the Lightning. Lightnings were later armed with the infra-red Red Top missile. Another of BAe's missiles operated by the RAF is the Rapier ground-to-air system, which proved itself in battle in the Falklands in 1982.

The RAF's transport responsibility can be traced back to the 1920s. In 1928, Vickers Victorias evacuated 586 refugees during riots in Kabul, and in 1948-49 the Service played a vital part in the airlift which kept Berlin alive. By the 1960s, the RAF transport fleet included the Comet, the Bristol Britannia and the Armstrong Whitworth Argosy, the 'Whistling Wheelbarrow', so called because of its twin-boom configuration and the typical whine of its four Rolls-Royce Dart turboprops. VC10s, products of the historic Weybridge site, now closed, joined the RAF fleet from 1966.

Today, The Queen's Flight, RAF, operates three BAe 146 airliners and No 32 Squadron, based at Northolt, a fleet of BAe 125 corporate jets as VIP transports. These are in addition to earlier Hawker Siddeley 125s, known in the Service as Dominies, used as navigation/systems trainers.

By the late 1960s, the design team at Hawker Siddeley had solved the considerable problems of vertical take-off and the Harrier GR1 gave the RAF the distinction of being the first air force in the world to operate a VSTOVL aircraft in squadron service. The Harrier has since been extensively developed into the Harrier GR7, capable of night/low-level/poor-weather operations, by BAe in association with McDonnell Douglas.

British Aerospace has also worked closely with McDonnell Douglas to develop its Hawk jet trainer for the United States Navy. The Hawk, the RAF's transition aircraft to fast jets, has sold to many other air forces throughout the world, and is best-known to the public as the mount of the brilliant RAF aerobatic team, the Red Arrows. Hawks replaced the Hunter and the Folland Gnat in the advanced trainer role, while the Blackburn Buccaneer S2, originally designed for the Royal Navy, was

adopted as a Canberra replacement.

The 1960s and 1970s saw the start of international aircraft projects and two of the notable products of this policy in front-line service with the RAF today, are the SEPECAT Jaguar GR1, developed with France, and the Anglo-German-Italian Panavia Tornado, the latter in service in two versions, bomber and interceptor.

The Tornado GR1 has now become the Service's major weapon platform in the strike, attack and reconnaissance roles, replacing the Vulcan, Canberra, Buccaneer and some Jaguars. Total production of this version is scheduled to exceed 1000, other users being the German Air Force and Navy, the Italian Air Force, and the Royal Saudi Air Force. Capable of twice the speed of sound at altitude, the interdicator/strike version of the Tornado can fly at 1480km/hr



at low level, using its terrain-following radar. It can carry a wide range of weapons, and two 27mm cannons are fitted in the lower forward fuselage.

The air defence variant (ADV) version of the Tornado, known in Service as the F3, was developed by BAe for the RAF, and has a longer nose section, containing the Foxhunter airborne interception radar. It is equipped with a single 27mm cannon and can carry four Sky Flash air-to-air missiles under the fuselage and two Sidewinders and long-range fuel tanks beneath the wings. The F3 is a Mach 2 aircraft with long endurance. Like the GR1 version, it is equipped for in-flight refuelling. The ADV has been bought by the air forces of Saudi Arabia and Oman.

Traceable back over three-quarters of a century through the companies now within the British Aerospace family, the manufacturing line by no means stops here. The Royal Air Force pins high hopes for the future on weapons such as the Advanced Short Range Air-to-Air Missile (ASRAAM), the anti-radar missile ALARM, and S225X, with 'fire-and-forget' performance and electronic counter-measures, and on Eurofighter 2000, the advanced interceptor which is being developed jointly with Germany, Italy and Spain.



British Aerospace today - the latest in the Hawk line, the single seat 200 (above); the night-attack Harrier GR7 (top); Tornado GR1 equipped with ALARM missiles (right) and the first of three Tornado GR4 development aircraft (below).

Eurofighter 2000 is due to enter service at the turn of the century with the RAF, the German, Italian and Spanish Air Forces. The design is radically advanced - a single-seat, twin-engine, foreplane-delta wing with 13 store-carriage stations, a low radar cross-section to reduce detection, and high agility, achieved by controlling a deliberately unstable aircraft with a quadruplex digital active fly-by-wire system.

Flight safety and operational capability are enhanced by an intelligent ground proximity warning system and by a facility that, with the press of a button, establishes the aircraft in a wings-level, nose-up attitude with the throttles in an intermediate position. Direct voice control on some systems will further ease the pilot's workload.

Eurofighter 2000 may be light years away from the World War 1 Sopwith Camel. But the remarkable fact is that the gigantic technological advances which separate the two aircraft types have been achieved by British Aerospace and its predecessor companies within the space of a single lifetime.





SEVENTY FIVE BUSY YEARS

The Royal Air Force was formed on 1 April 1918 by the amalgamation of the Royal Flying Corps and the Royal Naval Air Service. Despite early reservations that flying machines would never have a role in warfare, by the end of World War I it was clear that these were misplaced. In June 1918, the Independent Air Force was formed with one fighter squadron and nine bomber squadrons to operate by day and night against German industrial targets and airfields. It was the first time that an air force had been created to operate without reference or subordination to Army or Navy commands.

By the end of World War I, the new Service comprised 22,647 aircraft and 103 airships in 383 squadrons and 15 flights. Personnel amounted to over 300,000, of whom some 25,000 were WRAF. Yet, in less than 18 months, the RAF had dwindled to 25 operational squadrons and fewer than 30,000 personnel. Under Major General Trenchard, Chief of the Air Staff, the RAF fought for survival. Its position was strengthened in 1919 with the introduction of the titles Secretary of State and Under Secretary of State for Air and by the

creation of its own rank titles.

Trenchard, who gained the title of 'Father of the RAF', foresaw that its foundations had to be secured on the grounds of quality and on a framework which could be rapidly expanded when necessary. This far-sighted approach saw the creations of the RAF College Cranwell in 1920, the RAF Aircraft Apprentice School of Technical Training at Halton in 1922 and the RAF Staff College for senior officers at Andover the same year.

The majority of the RAF's few flying squadrons were then based in the Near and Middle East. Trenchard contended that the vast areas of desert and mountains within the British Empire could be controlled far more easily and economically from the air than by the traditional methods of garrisons on the ground. This theory was first put into practice in early 1920, when a force of 12 DH9 bombers and 219 officers and men was sent to Somaliland to deal with a significant rebel force. After several bombing raids, the remnants of the rebels surrendered to the Somaliland Camel Corps. There were no RAF casualties and the action demonstrated how air power could be used to police large tracts of land.

Following that success, the military control of the whole of Iraq was subsequently handed over to the RAF.

Despite its small size, the RAF was at the forefront of progress throughout the 1920s and 1930s. Records were set over distances which may seem short by modern-day standards but, in the days of single-engined, open cockpit biplanes flying over uncharted lands, were no mean achievement. In 1927, the RAF received its first all-metal fighter when the Armstrong Whitworth Siskin IIIA entered service with No 41 Squadron. In the same year, the RAF won the Schneider Trophy race for seaplanes with a Supermarine S5, the same aircraft setting up a new 100-km closed circuit speed record of 283.67 mph. Supermarine seaplanes won the Schneider Trophy twice more, thus ensuring its permanent retention by Britain. In 1937, a Bristol 138 established a new height record of 53,937 feet.

It was not until 1934 that events in Europe gave rise to the RAF Expansion Scheme which called for the number of Home Defence squadrons to be increased to 75. Modernisation was badly needed: at the

Royal Review of 1935, over 350 aircraft were present, all of them biplanes. In December 1937, the RAF's first single-seat low-wing monoplane fighter, the Hurricane, entered service with No 111 Squadron, followed in June 1938 by the 355 mph Spitfire. These fighters, together with more modern bomber types such as the Blenheim, Wellington and the American Hudson, ensured that the RAF had a nucleus of effective aircraft at the outbreak of World War II.

During World War II, air power played a vital part in achieving victory. In 1940, victory in the Battle of Britain ensured the survival of the United Kingdom and co-operation in the Western Desert between the RAF and the Army provided the framework for all future tactical air operations. Yet the primary role of the RAF was that envisaged in 1918 - strategic bombing. The price was high: of a total of 70,253 RAF personnel killed in action, 55,573 were Bomber Command aircrew.

With the advent of the nuclear age in the 1950s, the RAF's V-force of four-engined jet bombers became responsible for the UK's nuclear deterrent. Between 1956 and 1963,



Bristol Blenheim (above), Gloster Meteors (left) and Vickers Valiant (below left).

the V-force was supplemented by 60 Thor ICBMs. The Ballistic Missile Early Warning Station at RAF Fylingdales was capable of giving four minutes warning of any attack. Well within this time, the RAF's bombers on Quick Reaction Alert would have been airborne in retaliation, some carrying the Blue Steel stand-off bomb.

From 1968 onwards, the Commands were restructured as a result of the Government's decision to withdraw British forces from east of Suez with the exception of Hong Kong. In 1969, the maintenance of the nuclear deterrent passed to the Royal Navy's Polaris submarine force. The RAF continued to be responsible for tactical nuclear operations and the defence of the home base, as well as the rapid reinforcement of remaining overseas bases.

Twice within the last eleven years the RAF has been called upon to exercise the flexibility of air power in the face of aggression. During the recapture of the Falkland Islands in 1982, the RAF deployed

Representative types from the RAF's 75 year history: Avro 504K (top), Hawker Hind (middle), De Havilland Tiger Moth (above), Bristol Beaufighter (top right) and Avro Lancaster (right).

WORLDWIDE SALUTE

Air arms from around the world have accepted the invitation to come to International Air Tattoo 93 to celebrate the 75th Anniversary of the Royal Air Force. Many of these air services can trace their origins back to the earliest years of military aviation, while others are the result of very recent events. Over the following pages we survey the background and outline the present organisation and aircraft that equip the air forces that you see participating in the flying and static aircraft displays.

ROYAL AUSTRALIAN AIR FORCE

The RAAF originated in 1912 as the Army Aviation Corps and became the Australian Air Force on 31 March 1921, gaining the Royal prefix three months later. Currently it operates from ten major bases in Australia and one in Malaysia, but the service is suffering significant reductions in its size over the next decade. Currently the RAAF has over 70 F-18 Hornets for ground attack and air defence roles and 22 F-111s (14 F-111C and four F-111A) in the strike/reconnaissance roles; there are five Boeing 707-320Cs for tanker/transport duties and 19 P-3C Orions for maritime reconnaissance/ASW work. For tactical and medium range transport the RAAF has 24 C-130EH Hercules.

General Dynamics F-111C - Royal Australian Air Force



Peter R March

BELGIAN AIR FORCE (FORCE AÉRIENNE BELGE/BELGISCHE LUCHTMACHT)

The Aviation Militaire was formed on 20 March 1915 and in 1925 the air service was renamed the Aéronautique Militaire, taking on its present name on 1 October 1946. Today it is organised in two commands: The Tactical Air Force Command (TAF) and Air Force Training and Logistics Command (AFT & LG). The former is responsible for all flying and non-flying combat units, plus operational support. The TAF units form part of NATO's 2nd Allied Tactical Air Force and controls 15 Wing, with Nos 20 and 21 transport squadrons and No 40 helicopter squadron, which includes the Navy's Alouette III flight. Belgium was one of four European countries that selected the F-16 Fighting Falcon to replace its F-104 Starfighters, with 116 F-16 A/Bs delivered by 1985. The C-130H Hercules is the principal transport aircraft all of which are to undergo a major life extension programme.

Alpha Jet - Belgian Air Force



Daniel March

BRAZILIAN AIR FORCE (FORÇA AEREA BRASILEIRA)

The FAB was formed in 1918, taking its present name on 20 January 1940 and became independent from the Army in 1941. It is one of the best-equipped air forces in South America and supplies most of its own equipment. Being a vast country the Air Force became responsible for the nation's air mail service - a role it continues to perform. Currently there are 22 major bases. The first of 65 AMX (A1) attack aircraft were delivered in November 1989 and the first of 14 AMX-Ts in 1992. It is currently upgrading its substantial fleet of Northrop F-5s and Mirage IIIs. In the tanker role the FAB operates four Boeing KC-137s (ex airline 707-300Cs) and two KC-130H Hercules; for transport tasks there are eight C-130EH Hercules, three RC-130E Hercules, 20 DHC-6A Buffalo and 12 HS748s.

CANADIAN FORCES

The Canadian Air Force was established in November 1918 and received the prefix 'Royal' in 1924. The Canadian Forces was formed in 1966 by the amalgamation of the three Services. The air component is organised into five Operational Air Groups and has 20 major bases across Canada. The Fighter Group is now tasked with sovereignty surveillance, tactical air support of Land Forces Command, fighter training and operations in the national interest. Restructuring of the fighter force will result in four operational squadrons after 1993, all with multi-role tasking. Two of the four squadrons will remain available for rapid deployment anywhere in the world, should the need arise.

Currently the service has 87 CF-18A and 39 C-18B Hornets. There are approximately 160 helicopters for maritime transport, surveillance and search and rescue roles - together with 18 CP-140 Aurora long-range patrol aircraft and three CP-140A Arcturus surveillance aircraft for Arctic operations. Five CC-137 (Boeing 707), three CC-150 (Airbus A-310) and 31 CC-130EH Hercules are employed in the transport/tanker roles.

CHILEAN AIR FORCE (FUERZA AREA DE CHILE)

Founded in February 1913 the original Escuela de Aeronáutica Militar became the Chilean Army Aviation Co in 1918. It took its present name on 21 March 1930 when the former Army Aviation Co and Navy Air Service were amalgamated. The Air Force is divided into four brigades with ten major bases. Chile still operates over 30 Hawker Hunters of differing marks and currently some are being upgraded so that they will remain in service, along with two Canberra PR9s until the end of the decade. In 1992 the US agreed to sell Chile surplus F-5 Tiger II fighters, A-4 Skyhawk attack aircraft and P-3 Orion patrol aircraft. Enser is currently upgrading the CAF's 16 Mirage 50 fleet and has delivered 80 new built T-35 A/B Pilan basic trainers. The Chilean Air Force aerobatic team Los Halcones was re-equipped with Extra 300s in 1991 and is making its European debut with this aircraft.

CZECH AIR FORCE

The Czechoslovak Republic was founded as an independent nation in October 1918 after centuries of Austrian rule. Under Communist rule from 1948 the Air Force was reorganised into air divisions, comprising air regiments with particular emphasis on air defence and providing support to the army in the field. With the indigenous aircraft industry producing trainers and transports, the Czech Air Force received a full complement of Soviet combat aircraft.

When the Czech and Slovak Federal Republic was divided into two independent states on 1 January 1993, the Czech Air Force received two-thirds of the aircraft that were held prior to the division. It is now organised along similar lines to the RAF with Groups, Wings, Squadrons and Flights rather than its previous Soviet structure. The CAF operates the MiG-21 Fishbed, MiG-23 Flogger and MiG-29 Fulcrum for air defence; while the Su-22 Fitter and Su-25 Frogfoot is used in the fighter/attack role. The transport fleet comprises An-2s, An-12s, An-24s, An-26s, L-410s and Tu-134 aircraft. A substantial fleet of helicopters is operated which includes Mi-24 Hind gunships, Mi-8/17 Hips and Mi-2 Hoplites. A quartet of L-410 Turbolets provides a unique formation display team.

Sukhoi Su-22 Fitters - Czech Air Force



Peter R March

ROYAL DANISH AIR FORCE (KONGELIGE DANSKE FLYVEVÅBEN)

Denmark has one of the oldest traditions of military flying, its original Army Flying School having been founded in July 1912. This became the Army Flying Corps in 1923. The present title was assumed in October 1950. Today the ROAF operates from seven major bases. It is the smallest air force within NATO, sharing with Norway assigned roles within Allied Forces Northern Europe, with particular emphasis on the Baltic. It has two main elements, the Tactical Air Command and the Air Material Command - operating a total of 116 aircraft. Tactical Air Command Denmark (TACDEN) with five squadrons controls 49 F-16A and 14 F-16B together with 18 RF-35 Drakens. A decision on the replacement of the Draken is expected this year. TACDEN has two transport squadrons with three C-130H Hercules and three Gulfstream III aircraft. Some 30 Saab T-17 Supporters remain in the training/ liaison role. Eight Sikorsky S-61As are used for SAR work.

Saab Draken - Royal Danish Air Force



John Dunnett

Lockheed CP-140 Aurora - Canadian Forces



Peter R March



Avro Shackleton (top), Gloster Javelin (middle left), BAC VC10 (middle right), Handley Page Victor tanker with Panavia Tornado GR1 (above) and British Aerospace Harrier GR7 (right).



offensive, defensive and support forces over 8,000 miles from the home base. RAF Harriers provided offensive firepower alongside their Royal Navy counterparts operating from ships and temporary shore bases. After the loss of the Atlantic Conveyor, the sole surviving Chinook helicopter played a major role in the support of the land forces; and Vulcans flew strategic bombing missions from Ascension Island, at that time the longest raids ever carried out. Major factors in the success of the operation were the massive efforts of both the air transport and the air-to-air refuelling forces in maintaining the logistic chain from the UK to Ascension Island and on down to the South Atlantic.

In August 1990, Iraq invaded Kuwait. Within 48 hours of the British Government's decision to send forces to the Gulf, a squadron of Tornado F3s arrived in Saudi Arabia and flew their first operational patrol only two

hours later. They were joined after two days by a squadron of Jaguar ground-attack aircraft together with Nimrods for maritime patrol and VC10 tankers. There is little doubt that such prompt reaction by the Coalition forces deterred further aggression by Iraq.

At peak strength, the RAF had 158 aircraft and some 5,500 regular and reserve personnel in theatre, supported by the Air Transport Force. Air supremacy was achieved by the end of the first week of the campaign to enforce the UN resolutions. The Iraqi Air Force had either fled or been

trapped on its damaged airfields. The 1,000-hour air war enabled the ground forces to complete their campaign in 100 hours without fear of opposition from the air.

Air power can be used in peacekeeping and in crisis. It can be used offensively and defensively. In this 75th Anniversary year, the RAF is reorganising to face the challenges of a changing world in which air power will play an ever more prominent part in global security. Justifiably proud of its past, the Royal Air Force looks forward to the future.

ROYAL DANISH NAVY (SOVAERNETS FLYVETJENESTE)

The present Sovaernets Flyvetjeneste, established in 1971, is equipped with eight Westland Lynx helicopters, which are maintained by the Air Force. They are based at Vesterås and are mainly used on fishery protection and survey work, operating from frigates. The Lynx are receiving upgraded Gem 42 engines and Kestrel ESM tactical data systems.



Westland Lynx - Royal Danish Navy

FRENCH AIR FORCE (L'ARMÉE DE L'AIR)

In April 1910 France established a military flying service as the Service Aéronautique which became the L'Armée de l'Air in August 1933. France is divided into four Metropolitan Air Regions and operates from 44 major bases. 318 Mirage 2000s have been delivered, or are on order. Eighteen Mirage IVPs will remain in service until the mid-90s. Up to 230 Rafale Ds are in prospect and the Embraer EMB-312 Tucano has been ordered to meet the turboprop trainer requirement. A substantial number of Mirage F1, IIB/Es and VF, together with 150 Jaguar Av/Es are also on strength. Some 180 Alpha Jets are used for advanced tactical training and 76 Transalts and 12 C-130H Hercules for transport tasks. The air force also operates four E-3F Sentry AEW aircraft and 11 KC-135FR tankers.



Dassault Mirage 2000 - French Air Force

FRENCH ARMY AVIATION (AVIATION LÉGÈRE DE L'ARMÉE DE TERRE)

There are three Corps d'Armée, each allocated a Regiment d'Helicopters de Combat (RHIC) operating some 70 helicopters, comprising AS330 Pumas, AS332 Super Pumas and AS342M Gazelles, AS632 Cougars and a Group d'Helicopteres Legeres (GHL) with Alouette IIIIs. Future equipment in the late 90s will include the Franco-German Eurocopter HAP/HAC-30.



Eurocopter Gazelle - French Army Aviation

FRENCH NAVAL AVIATION (AÉRONAUTIQUE NAVALE)

Replacement of the aircraft carriers Clemenceau and Foch has been delayed and the two ships will continue in service until later in the decade. Some 70 Super Etendards are serving with three squadrons. A small number of F-6E(FN) Crusaders remain and some are being refurbished pending the delivery of the Rafale M, of which 86 are on order. The Alouette has been modernised to extend its ASW capabilities. Maritime patrol squadrons operate the Atlantic 1 and the improved ATL2. The Nord 262 Freighter continues in service along with the EMB-121 Kingu, Falcon 10/10MER, Falcon 20H Gardian for communications, training and special roles. A fleet of 27 Lynx HAS2(FN)/HAS4(FN) are used for anti-submarine (ASW) and search and rescue (SAR) tasks along with 18 SA321 Super Frelons for SAR/transport.



Dassault Super Etendard - French Naval Aviation

GERMAN AIR FORCE (LUFTWAFFE)

Following the re-unification in October 1990 the Luftwaffe, now organised into three commands, has grown considerably through the addition of the East German Air Force's fleet of Soviet supplied aircraft. Of these a number of MiG-29s, transports and helicopters remain in service. Five Jagdbombergeschwader are equipped with Tomado GR1s and 175 Alpha Jets are used in the attack and training roles. Some 80 C-160 Transalts are operated by four transport wings and seven HFB 320 Hansa Jets are used for ECM duties. Over 100 UH-10 Iroquois are deployed for SAR/utility roles.



McDonnell Douglas F-4F Phantom - German Air Force

GERMAN ARMY AVIATION (HEERESFLIEGER)

Divided into three corps, some 800 helicopters provide support to the German army in the field. Over 100 Sikorsky CH-53Gs are used in the medium transport role and more than 300 MBB Bo105/PM helicopters are equipped for anti-tank/AOP/insertion duties. In addition nearly 200 UH-10 Iroquois and 106 Alouette IIs are used for communications, observation and utility tasks.



Sikorsky CH-53G - German Army Aviation

GERMAN NAVAL AVIATION (MARINEFLIEGER)

The first German Navy Tomado squadrons were declared operational ten years ago and a total of 112 are now on strength with two wings - though one of the wings is to be transferred to the Luftwaffe as part of the navy's planned reduction. Nineteen Atlantic IIs are used for ASW/ELINT work, 22 Westland Sea King 41s for SAR duties and 19 Westland Sea Lynx 88 for ASW. Fourteen M-14BT/PL Haze were acquired from the former East Germany, together with eight Mi-8 Hips for SAR/ASW duties.

HUNGARIAN AIR FORCE (MAGYAR LÉGIERŐ) (see Page 38)

ISRAELI AIR FORCE (HEYLA HA'AVIR)

The state of Israel dates from 14 May 1948 and is today one of the Middle East's major air arms. Currently it has 19 combat squadrons deployed at ten air bases which have some 560 front-line jet aircraft. Two F-15 Eagle squadrons are used for the fighter intercepter role together with three squadrons of F-16 Fighting Falcons and three with Kfir (an indigenous design based on the Mirage III). Attack squadrons comprise five Phantom units, three with A-4 Skyhawks and one with Kfir. Since the Gulf War the US has supplied Israel with 15 F-15A/B Eagles, ten Sikorsky CH-53A, 24 McDonnell Douglas AH-64A Apache anti-tank helicopters and ten UH-60 Black Hawk helicopters. In the transport/tanker/communications role the air force operates 17 Boeing 707-320, 23 C-130 E/H/KC-130H Hercules, 12 C-47 Dakota and four Westwind 1124/1124N.

ITALIAN AIR FORCE (AERONAUTICA MILITARE ITALIANA)

Italian military aviation began in June 1912 with the founding of the Battaglione Aviatori. The air arm changed titles many times before taking its present name on 13 October 1943. Nearly 100 Tomado GR1s have been delivered but nevertheless the F-104 Starfighter remains in service - 140 having been upgraded with new radar and avionics. The multi-role AMX is gradually replacing RF-104Gs and Fiat G-91s and some 70 have been supplied to three squadrons. Deliveries of 110 single-seat and 26 two-seat AMX/AMX(T) are expected to be completed next year. Over 30 Aeritalia G-222 and 12 C-130H Hercules are used for transport duties. The Italian AF aerobatic team the Frecce Tricolori flies 10 Aeritalia MB339 advanced trainers.



Aeritalia AMX - Italian Air Force

ROYAL JORDANIAN AIR FORCE (AL QUWAT AL-JAWWIYA ALMALAKIYA AL URDUNIYA)

The RJAF was formed with British assistance as the Arab Legion Air Force in 1949. Most of its aircraft were destroyed during the 1967 war with Israel but replacements were obtained from Britain and the US. Currently it operates from eight major bases with eight front-line squadrons of Mirage F1Es, Northrop F-5E/Fs and Mirage F1Cs. The operational units are supported by five training and transport squadrons flying F-5A/Bs, Bulldozers, Aviatiks, C-130BH Hercules and C212 Aviocars. The RJAF also operates 24 AH-1F Cobras, two S-70A Black Hawks, eleven AS332M-1 Super Pumas, 14 Sikorsky S-76, eight Hughes 500D, two MBB Bo105 and eight SA342 Gazelles. For VIP use it has two Gulfstream IIs and a Sabreliner 75A. The Royal Flight at Amman uses a variety of aircraft and helicopters including a Lockheed Triton 500.



Lockheed C-130 Hercules - Royal Jordanian Air Force

KUWAIT AIR FORCE (AL QUWWAT AL JAWWIYA AL KUWAITIYA)

Situated in one of the most volatile regions of the world, the Kuwait Air Force was established, with the help of Britain, in 1960. During the 1990 Iraqi invasion of Kuwait, many of its aircraft and helicopters were destroyed. Delivery of 32 F-18C and eight F-18D Hornets is under way, with procurement of further Hornets expected. Fifteen Mirage F1CR/BK and 19 A-4KU/TA-4KU are in service. Six BAe Hawk 64s have been delivered and 18 Shorts Tucanos are in process of delivery. Two L-100-30 Hercules are used in the transport role and the helicopter force comprises four AS332AF Super Pumas, six SA330H Puma and 20 SA342K Gazelles.

ROYAL NETHERLANDS AIR FORCE (KONINKLIJKE LUCHTMACHT)

An Air Force (the Luchtwafafdeling) was created by the army in July 1913 and in 1936 became known as the Wapen der Militaire Luchtmacht. The present Air Force was established on 27 March 1953 as an autonomous air service. It currently operates from seven major bases, forming part of NATO's 2nd Allied Tactical Air Force. The first F-16 unit was formed in May 1981 and there are now 191 F-16A/Bs on strength. Two years ago two second-hand DC-10-30s were obtained for conversion to a combined passenger/tanker/freighter configuration in support of the F-16 fleet - these are yet to enter service. Twelve F-27-100 and -300 tactical transports are on strength. Ten Pilatus PC-7 Turbo Trainers have recently been purchased. Helicopter squadrons are equipped with 28 MBB Bo105Cs, 62 Alouette IIs, three Alouette III SAR and four AB-412SPs are on order. The R Neth AF deploy team, the Grasshoppers, flies four Alouette III helicopters.



General Dynamics F-16 - Royal Netherlands Air Force

ROYAL NETHERLANDS NAVY (MARINE LUCHTVAART DIENST)

The MLD, formed in August 1918, is the air arm of the Koninklijke Marine (Royal Netherlands Navy). It is equipped with 13 P-3C update II Orion aircraft based at Valkenburg for maritime reconnaissance/SAR tasks. One Super King Air 200 is used for training purposes. Twenty-two Westland Lynx SH-14D (recently upgraded) are used in the ASW role from frigates and with a land-based SAR/utility role at DeKooy.



Lockheed Orion - Royal Netherlands Navy

ROYAL NEW ZEALAND AIR FORCE

The original New Zealand Permanent Air Force was founded in June 1923. The RNZAF was formed from this in February 1934 and became an autonomous service in April 1937. For the past 25 years it has relied on A-4 Skyhawk attack aircraft to provide its front-line combat strength. The entire Skyhawk fleet has recently been upgraded under Project Kahu. The RNZAF comprises seven operational squadrons in the fighter attack, maritime strike, anti-submarine and transport roles operating from seven major home bases and at Tengah in Singapore. Four Aircoasters and 14 CT48 Airtrainers remain on strength for basic training purposes, with new build MB339Cs for advanced flying instruction. Six P-3K Orions are employed on MPASW duties while transport squadrons are equipped with nine Andover C1s, two Boeing 727-100Cs and five C-130H Hercules. Five Bell 47G, 14 UH-1H Iroquois and seven Westland Wasps are operated by helicopter squadrons.



Aeritalia MB-339 - Royal New Zealand Air Force

ROYAL NORWEGIAN AIR FORCE (KONGELIGE NORSKE LUFTFORSVARET)

Air and Naval Air Arm Forces were formed in 1915 as the Hærens Flyvevæsen and Marinen Flyvevæsen respectively, being integrated into the present Air Force in 1945. Today it operates from 13 major bases, and operates within the NATO structure of Allied Forces Northern Europe, being assigned to both Northern and Southern Commands. The 59 F-16 Fighting Falcons, are primarily tasked for air defence with a secondary anti-shipping role. The remaining 28 Northrop F-5A/Bs, which are undergoing an avionics update, are used for fighter lead-in, aggressor, air defence and electronic warfare training. Four P-3C Orions, obtained in the late 1980s, are being upgraded to P-3N standard for coastguard duties. Three Falcon 20Cs are operated in the ECM/VIP role and six C-130H Hercules and two DHC-6 Twin Otter for transport purposes. A Twin Otter 200 is used for SAR and 17 MF1-15 Safaris for training. Two helicopter squadrons operate 18 Bell 412SPs and five Westland Lynx 88s, while Sea Kings are used for SAR tasks.



Northrop F-5A - Royal Norwegian Air Force

ROYAL AIR FORCE OF OMAN (AL QUWAT AL-JAWWIYA AL-SULTANAT OMAN)

The original Air Force of Muscat and Oman was founded with British assistance in March 1959, but it was not until a decade later that the first combat aircraft were received. Britain remains a major supplier of equipment to the Oman forces, and has signed a defence co-operation agreement. In mid-1990 Oman signed a contract for BAe Hawks, ordering a mixed fleet of single-seat 200 series and two-seat 100 series. These will eventually replace the 15 Hawker Hunters currently operated. A total of 22 Jaguars are used in the attack/training role. Six armed BAe BA Defenders fly coastal patrols and seven Skyvan 2Ms are fitted with surveillance radars for maritime patrol and SAR duties. In the transport role three BAC One-Eleven 475s are operated and the Royal Flight has a Boeing 747SP, a DC-8-73, two Gulfstream IIs and two AS332 Super Pumas. Ten Bell 214B/214STs, 22 AS-305A/B-212s and three AB-206A Jettiflangers equip helicopter squadrons.



BAC 111 - Royal Air Force of Oman

PORTUGUESE AIR FORCE (FORÇA AÉREA PORTUGUESA)

Portugal has a long tradition of military flying through the Arma de Aeronáutica and Aviação Marítima. A unified Air Force was created from these land and naval air elements on 1 July 1952. The Portuguese Air Force is being reorganised and 20 F-16A/B Fighting Falcons are to be delivered commencing next year. It is expected that Germany will transfer 40 Alpha Jets to Portugal in return for its use of the Berna range - these would replace the 12 T-38 Talons and 54 Fiat G-91s still in service. Six refurbished Lockheed P-3P Orions were supplied in the late 1980s for maritime patrol/ASW duties. Basic training is provided by 17 Epilons. Three Falcon 20 and three Falcon 50s are used in the VIP role. The transport fleet comprises six C-130H/H-30 Hercules and 22 C212/C212A Aviocars, together with ten SA330C Puma and 21 Alouette III helicopters.



Fiat G-91 - Portuguese Air Force

RUSSIAN AIR FORCE

(VOENNO-VOZDUSHNIYE SILY ROSSIIKI FEDERATSII (VVS-RF))

The air forces of the former Soviet Union have been divided between the nine independent republics. Five CIS states, including Russia, signed a collective security treaty, centralising ultimate control. Belarus and Kazakhstan have each signed bilateral agreements with Russia. The VVS-RF inherited from the Soviet air force some 5,000 combat aircraft and more than 14,000 pilots. It has four commands - Long-range (strategic) Aviation (DA), Military Transport Aviation (VTA), Frontal Aviation (FA) and the Reserve and Training Command. The Russian AF operates its fleet of Tupolev Tu-160 Blackjack and Tu-95 Bear strategic bombers from Engels AB in the Saratov region, Mozdok in the Northern Caucasus and Ukrainka in the Far East. Over 220 Tu-26 Backfires, 136 Tu-22 Blenders and some 300 Tu-16 Badgers are also in the Long-range Aviation Command. The air defence forces have retained approximately 200 MiG-31 Foxhounds, 200 Su-27 Flanker Bs, 300 MiG-25PD Foxbat-Es, 400 MiG-23 Flogger B/Gs and 16 Il-76 Mainstay AWACS aircraft. In the Frontal Aviation Command there are some 750 Su-24 Fencers, 250 Su-25 Frogfoots, 1,000 Su-17 Flitters, 400 MiG 29 Fulcrums, 100 MiG-25 Foxbat B/Ds, 1700 MiG-23 Flogger Bs. Military Transport Aviation includes over 500 An-2 Colts, 500 Il-75 Canids, 100 An-24/26 Curis, 55 An-22 Cocks, 15 An-24 Condors, three Tu-154 Careless and three Tu-134 Crusties. Over 3,000 helicopters - Ka-50 Havocs, Mi-24 Hindis, Mi-17 Hip-Hs and Mi-8 Hip C/Es are operated by the Army.



Tupolev Tu-95 Bear - Russian Air Force



Mikoyan MiG-29UB - Russian Air Force

SLOVAK AIR FORCE (see Page 35)

SPANISH AIR FORCE (EJÉRCITO DEL AIRE ESPAÑOL)

The Aeronáutica Militar Española was established in March 1911, becoming the Servicio de Aeronáutica Militar Española in February 1913 and the Ejército de Aire Español on 9 November 1939. The Spanish Air Force now operates from 21 major bases. It has 72 EF-18 Hornets, the last being delivered in 1990, equipping three Wings, 58 Mirage F1C/EBs, and 23 Mirage IIIE/Ds, for air defence and ground attack. Eleven RF-4C Phantoms continue to be operated in the reconnaissance role. A fleet of eleven P-3A/B Orions are used for MR/ASW together with three F-27 Maritime 400MPAs. Three Boeing 707-320 B/Cs are configured as tanker/transports. In the transport role the air force has 12 C-130H/H-30 and KC-130H Hercules together with 78 C212 Aviocars. The latter are being replaced by larger CN-235s. A total of 64 C-101EB Aviocats are in service and eight of these form the Patrulla Águila national aerobatic team based at San Xavier. Over 35 Dornier Do27As remain in service in the liaison/SAR role. A variety of helicopters are operated including the AS332 Super Puma, SA330C/HJ Puma, UH-1H Iroquois, Sikorsky S-76C, Alouette III, AS350B Ecureuil, Hughes TH-55 and Bell 47G/CH-13H.

SWEDISH AIR FORCE (SVENSKA FLYGVÄPNET)

Although officially founded in July 1926, the Swedish Air Force can trace its origins back to 1912 when the Army and Navy received their first aircraft. A separate Swedish Army Aviation Corps was re-established in 1954 and Naval Aviation in 1957. Today the Air Force operates under six regional commands and the Första Flygeskadern attack command from 16 main air bases and is equipped with 137 air defence JA 37 Viggens and 130 attack/reconnaissance Viggens. Nearly 70 of the older generation J/Sk 35 Drakens also remain operational. The new JAS 39 Gripen lightweight, multi-role fighter will be in service in the mid-90s, eventually equipping 16 squadrons. Over 130 Sik 60 (Saab 105) are used for attack/training, while the transport force has eight C-130E/H Hercules and ten Saab 340s, some of which are modified for AEW duties. The SAR helicopter fleet comprises ten AS332M Super Pumas.



Saab Viggen - Swedish Air Force

SWISS AIR FORCE (KOMMANDO DE FLIEGER-UND FLIEGERABWEHRTRUPPEN)

The Militär-Flugwesen was founded in 1919 and Schweizerische Flugwaffe on 19 October 1936. In keeping with Switzerland's neutral status, which it has upheld since 1815, the Swiss Air Force, operating from 23 major bases maintains an impressive fighter and attack force, but keeps more than a half the number in reserve. The BAe Hawk has recently been purchased to replace the Vampire T55 trainers. Air defence is undertaken by seven squadrons of F-5E/F Tiger IIs and two squadrons of Mirage III/5s. A total of 128 Hawk Hunters are still on the inventory equipping five squadrons. In the training role a mixture of Pilatus P-3, PC-7 Turbo Trainer and PC-9 are used. For helicopter operations there are 15 AS 332M-1 Super Puma and 92 Alouette II/III. Six Hunter F58s are flown by the Swiss AF Aerobatic Team, the Patrouille Suisse.



Hawk Hunter - Swiss Air Force

TURKISH AIR FORCE (TÜRK HAVA KUVVETLERİ)

The Turkish Flying Corps was formed in 1914, becoming the Turkish Army Air Service in 1917. It finally adopted the present title in 1928. As a key member of the eastern flank of NATO Turkey receives a considerable amount of aid from the USA. Since Operation Desert Storm RAF and US detachments have remained in Turkey because of continuing problems with Iraq. The large and varied fleet of front-line aircraft is composed of many aircraft which have been passed on from other NATO air arms. Recent arrivals have been surplus USAF F-4Es from Germany. The F-16C/D is being manufactured in Turkey, under the US-backed Oryx programme and a production run of 150 is envisaged. Over 200 examples of the F-104 Starfighter are still operational. The transport fleet comprises some 20 C-160 Transalls, nine C-130B/E Hercules, a considerable number of C-47 Dakotas, while delivery of 50 CN-235s has commenced. Three Viscount 700s are still in use for VIP transport and over 50 UH1H Iroquois together with five Sikorsky UH-19 are used for SAR work.



Lockheed Starfighter - Turkish Air Force



CASA CN-235 - Spanish Air Force



Rockwell B-1B Lancer - United States Air Force

UNITED STATES AIR FORCE

The US Army operated its first aircraft in August 1912 and the 1st Aero Squadron was formed in March 1913. Various titles were used for operating units during World War I. On 24 May 1918 the autonomous US Army Air Service (USAAS) was formed, although it was brought back under Army control in June 1920. In July 1926 it was renamed the US Army Air Corps and in June 1941 changed again to US Army Air Force. The US Air Force was finally re-established as a fully autonomous service on 18 September 1947.

The USAF's organisation underwent fundamental changes in 1992 resulting in the establishment of two major front-line commands - Air Combat Command (ACC) and Air Mobility Command (AMC). There are now 'composite' air wings combining multiple aircraft types under a single commander, with responsibility for a variety of missions. The B-52 Stratofortress fleet has been reduced to approximately 100 aircraft and is being converted to conventional operations together with a similar number of B-1 Lancers. The creation of the AMC and ACC was mainly designed to ensure the rapid response needed for operations such as the Gulf War. In the air superiority role over 335 F-15A/B Eagles, and 420 F-15C/D Eagles are on strength together with 175 F-15E Strike Eagles in the attack role. A large number of F-16 Fighting Falcons and F-4 Phantoms together with over 600 A-10A Thunderbolt IIs remain in service. Fifty-six F-117A Nighthawks have been delivered. Air Mobility Command operates KC-135s and KC-10s for tanker/transport duties, C-5 Galaxies and C-141 Starlifters and a fleet of C-130 Hercules for long, medium and tactical transportation.

UNITED STATES AIR NATIONAL GUARD

The US Air National Guard operates some 1800 aircraft at military bases and civil airports throughout the USA. This fleet includes over 350 transport aircraft ranging from the big C-5A Galaxy down to the Beech C-12 communications aircraft. Of nearly 800 combat fighters there is just a handful of F-4 Phantoms, with the majority comprising early model F-15 Eagles and F-16 Fighting Falcons. Attack aircraft mainly consist of A-7 Corsair IIs and A/OA-10 Thunderbolt IIs. There are also training aircraft and helicopters operated by ANG units.



Grumman F-14A Tomcat - United States Navy

UNITED STATES ARMY

With more than 8,000 helicopters and 450 fixed-wing aircraft, the US Army is the West's largest operator of rotary-winged aircraft. UH-60 Black Hawks have been delivered in considerable numbers and AH-64 Apache deliveries are continuing. The upgrading of AH-64s to the Longbow standard has now commenced.

The CH-47 Chinook fleet is being upgraded to the 'D' model. Most AH-1 Cobras are now -F or -S models with TOW missiles. The veteran UH-1 Huey is due for replacement in the training role.

UNITED STATES MARINE CORPS

The active-duty Marine aviation arm is divided into three Marine Air Wings (MAW) - each with some 160 fixed-wing and 155 helicopters. It maintains routine deployments of two Marine Expeditionary Units (MEU) which are special operations capable (SOC). The inventory includes nearly 300 F/A-18 Hornets, 28 A-4 Skyhawks, 20 A-6E Intruders and 20 EA-6B Prowlers. Nearly 200 AV-8B/TAV-8B Harrier IIs have now been received. A total of 62 Hercules are used for transport/tanker duties. The Marine helicopter element consists of heavy (HMH) medium (HMM) and light attack (HMLA) squadrons.

UNITED STATES NAVY

The Navy's 16 aircraft carriers are currently supported by 13 active and two reserve air wings. Each Carrier Air Wing (CAW) has a total of 80 aircraft which includes two squadrons of F-14 Tomcats or F-18 Hornets as interceptors.

There are also three attack squadrons of F-18s and one of A-6Es on each carrier. In addition there are 37 helicopter squadrons with UH-1s, SH-2s, SH-3s, CH-46s and SH-60Bs, together with three mine counter-measures squadrons operating the RH-53D Sea Dragon. Five transport squadrons provide worldwide fleet support, including carrier onboard delivery (COD). A total of 22 active and 13 reserve squadrons of P-3 Orions in the ASW role are operated from shore stations.

AIR TATTOO VIDEOS

RAF BENEVOLENT FUND INTERNATIONAL AIR TATTOO 93

RAF Fairford

ARTVideo, who so expertly filmed ATI 92 (Boscombe Down) and IAT 91 (Fairford) also have the exclusive rights to film this year's airshow. Available from 1 October. You are welcome to order in advance - your payment will not, of course, be banked until the video is sent to you.

THE PERFECT AIRSHOW MEMENTO!

AIR TOURNAMENT INTERNATIONAL 92
Boscombe Down

INTERNATIONAL AIR TATTOO 91
RAF Fairford

ALL VIDEOS IN THIS AD ARE £14.95 plus £1 p&p UK (First Class), £2.80 overseas (Airmail). Running time each video approx 60 mins. VHS PAL, IAT93 will also be available in VHS NTSC, the American/Japanese format.

Some of the other videos produced by ARTVideo are available by mail/telephone order from Avid as their UK distributor.

NEW! MIRAGE 2000
The full story from the Mirage 3 to the Mirage 2000-5. Superb air-to-air, exercise, missile firing, in the cockpit, construction, in-flight refuelling, speed record, test and display flight footage. Gulf War role inc Jaguar footage.

HAWKER HUNTER AIRBUS THE SAINT BERNARDS OF THE AIR - Helicopter search and rescue AVIATION VIDEO NEWS - A Magazine on Video - Vol 5 - 2 hours NATO AIR FORCES - Vol 1 The Portuguese Air Force

Send cheques/postal orders, payable to Avid, to:
Avid, Dept IAT93, West House, 5A Park Avenue,
BEDFORD, ENGLAND MK40 2JY
or 'phone with credit card details: 0234 327518
or Fax: 0767 600882

Immediate despatch by First Class post

FREE CATALOGUE AVAILABLE

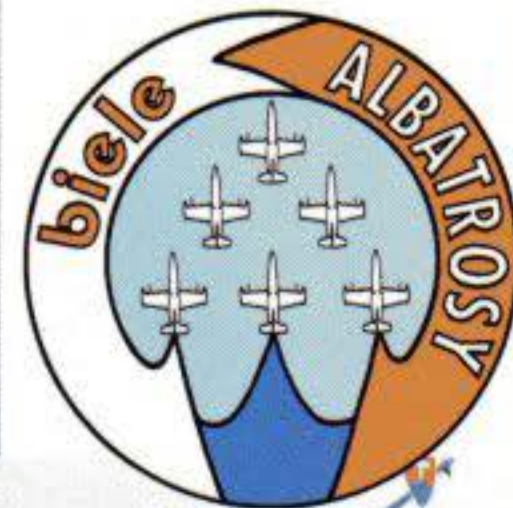
GRANDSTAND SEATING

Our grandstand seating systems are designed with both spectator and organiser in mind. They have clean and comfortable tip-up seats giving ample legroom and maximum vision while installation is possible indoors or outdoors on the most difficult, uneven or varied surfaces.

Audiences of 3 to 30,000 can be catered for with structures which conform to British Safety Regulations. All systems can be rapidly installed and dismantled.

AUSTEN-LEWIS LTD

TELEPHONE: 0793 750599 FAX 0793 752072
CHELWORTH PARK · CRICKLADE · SWINDON · WILTSHIRE SN6 6HE



THE SLOVAK AIR FORCE AND AIR DEFENCE

Introduced by its Commander, *Major General Stefan Gombik*

Having been formed on 1 January 1993 the Slovak Air Force and Air Defence is only seven months old, and in its present form is the world's newest air arm. An air force in Slovakia actually dates from 1918 when the independent Czechoslovak Republic was established – but there was only a short period from 1938-1945 when a distinct Slovak Air Force existed.

Establishment of the present Slovak Air Force and Air Defence commenced in the last quarter of 1992 after it had been formally decided that the Czech and Slovak Federal Republic would be divided into two independent states. In the process of division the Czech and Slovak Armed Forces were divided in the ratio of two-to-one. This included the Czechoslovak Air Force and Air Defence.

As a result of this division the new Slovak Air Force and Air Defence received 162 aircraft and helicopters from the former air arm, including ground support material and

several air defence missile complexes. It now operates from five air force bases and has a total of 229 aircraft and helicopters of various types and categories. These include MiG-21 and MiG-29 fighters; Su-22 and Su-25 fighter-bombers; L-29 and L-39 trainers; Mi-8, Mi-17 and Mi-24 helicopters; L-410, An-24, An-26, An-12 and Tu-154 transports.

The new Air Force has worked hard to improve the infrastructure at its bases and to improve the working conditions for pilots and technicians. The principal outstanding problem to solve is the provision of accommodation for officers who came from the Czech Republic and where their families still reside. As a result of all the changes the Slovak Air Force has been involved in extensive flying training and conversion of pilots to new types. Training over Slovakia presents a new problem as few pilots have experience of flying over the unfamiliar and much more mountainous terrain of Slovakia.

At present the Air Force's only aerobatic



Above: Maj General Stefan Gombik, Commander of the Slovak Air Force and Air Defence. Top: Slovak Air Force MiG-21, L-39 and MiG-29 at Silac Air Base, Central Slovakia.

display team is the *White Albatroses*, flying L-39 Albatros trainers, whose pilots are instructors from the Air Force Academy. Commencing in May individual pilots are now preparing to display the MiG-21, MiG-29, Su-22 and Su-25, to enable them to participate at the Slovak Air Force Air Show next year. This special event is being held to celebrate the 50th anniversary of the Slovak national uprising and the 75th anniversary of the tragic death of Slovak national hero, pilot General M R Stefanik.

THE WHITE ALBATROSES



The *White Albatroses* jet aerobatic team was first formed by the Czech and Slovak Air Force towards the end of 1991, equipped with the L-39C Albatros. The new team's members are instructors at the Slovak Air Force Academy and are based at Kosice. The team's display debut was at the Czech and Slovak International Air Fest at Bratislava last year.

After the division of Czechoslovakia only three of the *White Albatroses'* aircraft stayed with the Slovak Air Force and a huge effort was needed to acquire further L-39s to meet the requirement for nine aircraft (six to display plus three spares). All of the Albatroses are normal production

Left: The *White Albatroses* made their public debut at Bratislava in September 1992.

BRANDON MARQUEE HIRE

BRANDON CATERING & FURNITURE HIRE



A CLASSIC MODERN PAVILION AVAILABLE ANY LENGTH IN A VARIETY OF WIDTHS FROM 6-20 METRES.



NAT WEST LIFE DINNER & DANCE HELD AT THE EXHIBITION CENTRE IN BRISTOL, 1993.

BRANDON HIRE PLC, 72-75 FEEDER ROAD, ST. PHILIPS, BRISTOL BS2 0TQ. TEL: 0272 772400 FAX: 0272 7106



Lindsay Peacock

HUNGARY'S AIR DEFENCE GROUP

Barely five years ago, the idea of watching a demonstration team flying MiG-21s at the International Air Tattoo would have been greeted with incredulity, but the democratisation of several Eastern European nations has resulted in unfamiliar warplanes from unfamiliar air arms appearing at a number of events in Western Europe. Hungary is one of those nations that has been keen to venture far from its own borders and making its debut at a British event when it contributed an Antonov An-26 transport to ATI 92 at Boscombe Down in a visit that could be likened to 'testing the water'.

Evidently the Hungarian authorities found the 'temperature' to their liking and this has prompted them to make a significant contribution to this year's Tattoo, with an aerial display team known as Magyar Kapos. However, whereas most teams now

utilise suitably modified trainers, Magyar Kapos is equipped with a type that constitutes the backbone of the Magyar Honvedseg Repulo Csapatal (Hungarian Air Defence Group), namely the MiG-21bis 'Fishbed-L'. Since this classic delta-winged warplane has never before been demonstrated at a British air display, the team's appearance at Fairford has been eagerly awaited – and is sure to be keenly watched, for it is undoubtedly one of the star items in a programme that isn't lacking in highlights.

Although Hungary has enthusiastically embraced democracy, past membership of the Warsaw Pact alliance is evident in the armed forces, which continue to operate equipment obtained from the former Soviet Union. This is certainly true of the Hungarian Air Defence Group which is basically organised into two separate

command agencies: the Orszagos Legvedelmi Parancsnoksag (National Air Defence Command) and the Csapatrepuo Parancsnoksag (Troop Command).

As its title suggests, the National Air Defence Command is primarily concerned with ensuring sovereignty of Hungarian airspace. This task is accomplished from air bases at Kecskemet, Papa and Taszar, each of which is home for a regiment-sized unit with two subordinate squadrons. Although these squadrons are referred to by numerical designations, they are also identified by colourful names and it is the latter that are used here in describing the operational elements.

The top-of-the-line interceptor is the MiG-23MF 'Flogger-B' which operates from Papa with one of the pair of squadrons assigned to the Stromfeld Aurel Regiment. Just a dozen examples of this variable-geometry fighter were received but only nine remain airworthy with the Saman 'Witch Doctor' Fighter Squadron, which also has three MiG-23UB 'Flogger-C' two-seat trainers. Also part of the same regiment at Papa is the Griff 'Griffon' Fighter Squadron, but this flies the less potent MiG-21bis.

The 'Fishbed' is by far the most numerous combat type, and two basic interceptor versions are currently used by operational elements, the older MiG-21F-13s and MiG-21PFs having been retired from service some time ago. In consequence, only the



Mikoyan MiG-21MF

Lindsay Peacock

MiG-21MF 'Fishbed-J' and MiG-21bis 'Fishbed-L' currently serve with front-line forces. Regardless of sub-type, squadron strength is normally about 16 single-seaters plus a quartet of MiG-21UM 'Mongul-B' two-seaters for operational training and pilot conversion tasks. However, there appears to be at least one variation from this rule.

Looking more closely at the other 'Fishbed'-equipped units, the parent organisation at Kecskemet is the Szentgyorgyi Dazso Regiment which controls the activities of the Puma 'Puma' and Darazs 'Bee' Fighter Squadrons. The basic single-seat version is the MiG-21MF 'Fishbed-J', whereas the Taszar-based Kapos Regiment operates the MiG-21bis, assigning these to the Boszorkany 'Witch' Fighter Squadron. Even though the Kapos Regiment has only one named interceptor squadron at Taszar, there are sufficient

aircraft stationed there to equip two full-strength squadrons.

One other fast jet type figures in the inventory, namely the Sukhoi Su-22M-3 'Fitter-H'. Its primary air-to-ground attack role has resulted in the limited number of 'Fitters' being placed under the operational control of the Troop Air Command, even though the aircraft and the unit that operates them are actually part of the Kapos Regiment at Taszar.

Twelve 'Fitter-H' single-seaters were delivered to Hungary and eleven of these are still active, along with three Su-22U-3 'Fitter-G' trainers. All are currently assigned to the Solyom 'Falcon' Fighter-Bomber Squadron, which is primarily tasked with close air support of ground forces.

Other Troop Air Command resources are principally composed of helicopters, although a limited number of transport

aircraft also fall within this establishment's domain. By far the greatest concentration of rotary-winged hardware is to be found at Szentkiralyzsabadja, which is home for at least three helicopter squadrons that collectively constitute the Bakony Regiment. The most formidable type on charge is the Mil Mi-24 'Hind' attack helicopter. Most of the 40 examples are of the 'Hind-D' sub-type, but this total includes eleven 'Hind-Es'. Differences between the two mainly relate to missile armament options. Irrespective of this, all are assigned to the Kerecsen Solyom 'Kerecsen Falcon' Helicopter Squadron.

Marginally less warlike, but still capable of packing a fairly powerful punch, the Mil 'Hig' operates with the other two elements of the Bakony Regiment. Mi-8TB 'Hip-Cx' equip the Borz 'Badger' Squadron while the 'Phoenix' Squadron has a most diverse fleet

Antonov An-26



Peter D. March

Sukhoi Su-22M



Lindsay Peacock

Mikoyan MiG-23MF



Lindsay Peacock

THUNDERBOLT FROM THE NORTH

Major Lennart Berns,
Swedish Air Force

Since 1984, the SAAB JA 37 Viggen fighter has been the mainstay of the Swedish air defence system and will continue to be so well into the next century when it will be replaced by the multi-role JAS 39 Gripen.

More than 30 years ago, attempts were made to design a true multi-role, all-weather combat aircraft. The first was the American General Dynamics F-111, which was followed by the Swedish Saab-Scania AJ 37 Viggen and the joint British/German/Italian Panavia MRCA, later to be named the Tornado. These early attempts to combine the fighter, attack and reconnaissance roles into one single airframe eventually failed. The main reason was the state-of-the-art electronics of the day; it would have been much too heavy to fulfil all its tasks and not sophisticated enough to be operated by a one- or two-man crew. As a result these aircraft were subsequently developed into different versions; the Viggen was no exception, and five different versions were eventually built.

The first design studies for the Viggen were made during the early 1950s, in order to find a successor to the Saab J 35 Draken. The early specifications outlined an aircraft with supersonic performance but which was able to take-off and land within 500m and also have a multi-role capability, in order to combine high speed and short-field performance, the Viggen was designed as a canard aircraft in which the main delta wing and the canard wing produce lift. The aircraft also incorporated reverse thrust, the first single-engined aircraft in the world to feature this. Another unique aspect of the Viggen is that all versions are designed to be serviced and maintained by ordinary conscript airmen.

The first Viggen was the AJ 37 attack version which first flew on 8 February 1967. Deliveries to the Flygvapnet (Swedish Air Force) began in 1972, including a two-seat trainer version with reduced attack capability. Next came the two reconnaissance versions – the SH 37 (radar recce) and SF 37 (photographic recce), delivered in 1974 and 1975. A later modification has enabled the reconnaissance versions to be used for air-to-sea attack missions.

The JA 37 fighter version of the Viggen was first flown on 4 November 1977 and introduced into service in 1980 (JA stands for 'Jakt' and 'Attack', meaning fighter in the primary role and with limited capacity as an attack aircraft). It differs externally from the earlier versions by being slightly longer, due to an extra compressor stage, and most



Above: The Viggen's large canard wing enables it to take off and land on very short runways. Below: A line-up of JA 37 Viggens from F17 at Kallinge in southern Sweden, some of them with the unique camouflage pattern chosen for most Swedish military aircraft. Lennart Berns.



Top: JA 37 Viggen from F4 Wing at Östersund/Frösön in northern Sweden. Inset: Display pilot Jan Fröjd is a front-line fighter pilot from the Flygvapnet's F4 Wing. Photographs Peter Modigh.

notably, carries a small antenna behind the vertical fin. The engine is basically a commercial Pratt & Whitney JT8D-22/7300, modified by Volvo-Flygmotor into the RM8B military engine, delivering 16,220 lb st without afterburner. With full afterburner the thrust of 28,110 lb st is comparable to one of the large passenger ferries travelling between Sweden and the UK!

The JA 37 is an easy aircraft to fly, allowing the pilot to concentrate on reading the glass screens and delivering the munitions. Helping him is a digital automatic flight control system which provides 'steering assistance' for the mission even when the aircraft is flown manually. It also provides the pilot with the necessary visual information for sighting, formation flying and landing. For navigation the aircraft is equipped with an inertial navigation system. Six air-to-air missiles can be carried in a mixed configuration of BAe Rb 24 Sky Flash and AIM-9J and AIM-9L Sidewinders. Mounted beneath the fuselage is a 30 mm Oerlikon KCA cannon with outstanding precision, even during a head-on attack.

The eye of the Viggen fighter is the Ericsson PS-46 pulse-doppler radar in the nose, designed to detect targets at long ranges and low altitude. The radar is

capable of tracking two targets at the same time. A unique feature is the fighter-link by which radar information can be directly transmitted from one aircraft to other Viggen fighters operating at the same time.

Despite the aircraft's rather clumsy looks, it is capable of Mach 2+ at higher altitudes and has been flown at up to Mach 1.3 at treetop level. Thanks to its canard the Viggen fighter can be flown as slowly as 220 kmh (137 mph), still retaining good control in all axes. All flights are recorded on tape and by synchronised replaying of tapes from up to four aircraft in a special three-dimensional analysis device, the pilots are able, for example, to evaluate their previous dog-fight! The last of 149 JA 37 Viggen aircraft was delivered to the Flygvapnet in 1990 and eight squadrons are equipped with the type.

The Swedish pilot displaying the Viggen is 39-year-old Captain Jan Fröjd, who has 2,300 hours flying experience, 1,200 of them in the Viggen fighter. Captain Fröjd, who has been a display pilot since 1989, is married with two children. He was born in Järvsö, but lives in Östersund in northern Sweden, close to F4 Jämtland Wing, which is responsible for this year's Flygvapnet participation at RAF Fairford.

Due to the short display slots at Fairford, Captain Fröjd has revised his normal programme, concentrating on demonstrating the low speed manoeuvrability and short-field performance of the Viggen.

THE ROYAL AIR FORCE BENEVOLENT FUND'S

INTERNATIONAL AIR TATTOO 93

THE WORLD'S LARGEST MILITARY AIRSHOW IN FULL COLOUR

£10.95

THE IAT 93 BOOK £10.95
A colour record of the world's largest military airshow. Over 200 full colour pictures and a complete checklist of participating aircraft.

THE IAT 93 VIDEO £14.95
Featuring the highlights of one of the most exciting airshows of 1993.

EXCLUSIVE SKYHIGH OFFER
Buy both the book and video and save £2! Book and video £23.90.

Post to: SKY075, The Royal Air Force Benevolent Fund Enterprises, PO Box 1940, Fairford, Glos. GL7 4NA. Telephone: (0285) 713456 · Fax: (0285) 713268

COMPLETE IN BLOCK CAPITALS PLEASE MR/MRS/MISS/MS

NAME _____

ADDRESS _____

POSTCODE _____

I AM OVER 18 YEARS OF AGE

United Kingdom Post and Packing Charges: (For overseas rates please ring 0285 713456) £1 per item, £1.50 for the set.

Please enclose a Postal Order/International Money Order/Cheque (drawn on a UK Bank) made payable to 'RAFBF ENTERPRISES' or fill in your VISA/MASTERCARD details below.

CARD NO. _____

EXPIRY DATE _____ SIGNATURE _____

From time to time the RAF Benevolent Fund may wish to send you details of other services which they feel may be of interest to you. Please tick the box if you do not wish to receive this information.

REF. NO.	DESCRIPTION	QTY.	COST	TOTAL
250303	IAT 93 VIDEO			
710011	IAT 93 BOOK			
250353	VIDEO AND BOOK			
TOTAL GOODS				
P&P				
TOTAL AMOUNT				

AVAILABLE EARLY
OCTOBER

International Air Tattoo 93

STATIC AIRCRAFT DISPLAY

It is hoped that many of the following aircraft will be on view in the static displays on the south side of the airfield. Aircraft parked on the northern aprons can be viewed from the Photobus.



Peter R Merritt

ROYAL AIR FORCE
Andover E3
BAe 125 CC3
Buccaneer S2B
Bulldog T1
Canberra PR9/T17
Dominie T1
Gazelle HT3
Harrier GR7
Hawk T1/T1A
Hercules C1/C3
Jaguar GR1A
Jet Provost T5B
Jetstream T1
Nimrod MR2P
Puma HC1
Sea King HAR3
Sentry AEW1
Tomado GR1/GR1A
Tornado F3
Tristar KC1
Tucano T1
VC10 C1K
VC10 K2/3
Victor K2
Wessex HC2

ROYAL NAVY
Harrier T4
Jetstream T2
Sea King AEW2

DEFENCE RESEARCH AGENCY
Hercules W2
Canberra

MOD(PE) A&AEE
Comet 4C
Harvard
Hunter F6

ROYAL AUSTRALIAN AIR FORCE
C-130E Hercules
GD F-111C

BELGIAN AIR FORCE
Alpha Jet
Mirage V
Sea King Mk48
SF260MB

BRAZILIAN AIR FORCE
Boeing KC-137

CANADIAN FORCES
CC-130 Hercules
CP-140 Aurora

CZECH AIR FORCE
Antonov An-12 Cub
Sukhoi Su-22 Fitter
Sukhoi Su-25 Frogfoot

ROYAL DANISH AIR FORCE
AS550 Fennec
C-130H Hercules
F-16A Fighting Falcon
F-16B Fighting Falcon
Hughes 500M
RF-35 Drakan
Sikorsky S-61
T-17 Supporter

ROYAL DANISH NAVY
Lynx HAS90

FRENCH AIR FORCE
Mirage F1

FRENCH ARMY
SA342 Gazelle
AS532 Cougar

FRENCH NAVY
Atlantique
Falcon 10MER
Lynx HAS4(FN)
N262E Frigate
Super Frelon
Xingu II

GERMAN AIR FORCE
Alpha Jet
Canberra B2
F-4F Phantom
HFB320 Hansa
RF-4E Phantom
C-160D Transall
UH-1D Huey

GERMAN ARMY
MBB Bo 105
Sikorsky CH-53G

GERMAN NAVY
Mi-8 Hip
Sea Lynx Mk88
Tomado IDS

HUNGARIAN AIR FORCE
An-26 Curl

ISRAELI AIR FORCE
Westwind 1124

ITALIAN AIR FORCE
Atlantic
AMX

ROYAL JORDANIAN AIR FORCE
C-130H Hercules

KUWAIT AIR FORCE
L-100-30 Hercules
F-18 Hornet

ROYAL NETHERLANDS AIR FORCE
Alouette III
F-16A Fighting Falcon
F-16B Fighting Falcon
MBB Bo 105CB
Pilatus PC-7

ROYAL NETHERLANDS NAVY
P-3C Orion
SH-14 Lynx

ROYAL NEW ZEALAND AIR FORCE
Boeing 727
MB339CB

ROYAL NORWEGIAN AIR FORCE
Falcon 20C
F-5A Freedom Fighter
F-5B Freedom Fighter
F-16B Fighting Falcon

ROYAL AIR FORCE OF OMAN
BAC 1-11/485GD

PORTUGUESE AIR FORCE
C-130H Hercules
Fiat G91R-3

RUSSIAN AIR FORCE
Il-76 Midas
Tu-95 Bear

SLOVAK AIR FORCE
An-26 Curl

SWEDISH AIR FORCE
JA37 Viggen
Tp84 Hercules

TURKISH AIR FORCE
F-104 Starfighter
TF-104 Starfighter

USAF - EUROPE
A-10A Thunderbolt II
C-21A Learjet
C-9A Nightingale
C-130E Hercules
MC-130H Hercules
KC-135R Stratotanker
F-4G Phantom
F-15E Strike Eagle
F-16C Fighting Falcon
F-111E Aardvark

USAF - AIR COMBAT COMMAND
B-1B Lancer
B-52H Stratofortress
RC-135U Stratotanker

USAF - AIR MOBILITY COMMAND
C-5A Galaxy
KC-10 Extender
KC-135E Stratotanker
WC-135B Stratotanker
C-141B Starlifter

USAF - AIR FORCES ICELAND
HH-60G Pavehawk
F-15C Eagle

USAF - AIR NATIONAL GUARD
EC-130E Hercules
KC-135E Stratotanker
KC-135R Stratotanker

US ARMY
RC-12D Huron
CH-47D Chinook
OH-58D Kiowa
UH-60A Blackhawk
AH-64A Apache

US MARINE CORPS
KC-130T Hercules

US NAVY
P-3C Orion

USAF - HQ USEUCOM
Beech C-12
C-21 Learjet

CIVILIAN
BAe 125-800
(Federal Aviation Administration)
Blackburn B2 (BAe)
Cessna 340
Cessna Citation II (NLR)
Consolidated Catalina
(Plane Sailing Air Displays)
Dassault Falcon 20
(FR Aviation)
DH104 Devon
(955 Preservation Grp)
DH104 Devon
(DH 104 Association)
DH104 Dove (Club Mistral)
DH104 Sea Devon
DH82A Tiger Moth
DH82B Queen Bee
DH83 Hornet Moth
DH89A Dragon Rapide
Fouga Magister
(Royal Air Services)
HS Gnat (Sylmar Aviation)
MBB Bo 105
(Police Aviation Services)
Miles Magister
North American Harvard
Percival Pembroke
Percival Prentice
Percival Proctor
Percival Provost
(Sylmar Aviation)
RAF SE5A

HOT AIR BALLOONS
B&Q Stores
Donor Card
Mafesers
Motorola



PHOTOBUS TOURS OF THE OPERATIONAL AREA

Aircraft taking part in the flying display are parked on the operational aprons on the opposite side of the airfield. Take a £4.50 trip on an open top bus to photograph the display aircraft. The Boarding Point is at the eastern end of the runway. Proceeds in aid of The Royal Air Force Benevolent Fund.



For the enthusiast... AIRCRAFT CHECKLISTS

The IAT's official listing of serials, codes and squadrons for all the aircraft - Northside and Southside - here at the world's largest military airshow up to the evening of Friday 23 July. Priced at £1.50, they are easily available from special sales points marked with a © on the site plan. A complete list of all aircraft movements from the first arrival to the last departure can be obtained by mailing £4.00 to: Participation Manager, IAT, PO Box 1940, Fairford, Glos., GL7 4NA. Please make cheques payable to RAFBF Enterprises. All proceeds to The Royal Air Force Benevolent Fund.

THE ORGANISING COMMITTEE GRATEFULLY ACKNOWLEDGE THE PROVISION OF SAFES BY SECURICOR FOR INTERNATIONAL AIR TATTOO 93.

Securicor Safes, No 8 The Argent Centre, Silverdale Road, Hayes, Middlesex. Tel 081 813 5225

International Air Tattoo 93

FLYING DISPLAY PROGRAMME

The organisers of International Air Tattoo 93 cannot be held responsible for any alterations to this programme through circumstances beyond their control. Any such alterations will be notified via the Public Address System.

SATURDAY 24 JULY

0920

Emergency Services Drive-Past

The Falcons
Royal Air Force Parachute Team, RAF Brize Norton
Kiwi Blue
Royal New Zealand Air Force Parachute Team
Lockheed Hercules C3
RAF Lyneham
Transport Wing

4 **Boeing Stearmans**
Cadbury's Crunchie Flying Circus
Rendcomb Aerodrome, Glos

1000

4 **Westland Gazelle AH1s & Westland Lynx AH7**
The Silver Eagles
Army Air Corps Display Team, Middle Wallop

5 **Extra 300s**
Los Halcones
Chilean Air Force Display Team

GD F-16A Fighting Falcon
349/350 Sqn - 1 Wing
Belgian Air Force

McDD AH-64A Apache
US Army Aviation, Hanau

6 **Aero L-39 Albatroses**
The White Albatroses
Slovak Air Force Aerobatic Team

1100

McD F-4F Phantom
JG-71
German Air Force

Saab JA37 Viggen
F4 Wing
Swedish Air Force

4 **Mikoyan MiG-21bis**
The Hungarian Sky Hussars
Hungarian Air Force Display Team

2 **Fairey Swordfish and Fairey Firefly**
Royal Navy Historic Flight
RNAS Yeovilton

2 **Westland Gazelle HT2s**
705 Naval Air Squadron
RNAS Culdrose

Sukhoi Su-27 Flanker-B
Sukhoi Su-27 UB Flanker-C
The Test Pilots
Gromov Flight Research Institute Display Team, Moscow

1200

8 **Dassault Alpha Jets**
The Patrouille de France
French Air Force Aerobatic Team

Panavia Tornado IDS
JbG-34
German Air Force

Dassault Alpha Jet
7/11 Squadron - 9 Wing
Belgian Air Force

3 **Extra 300s**
Royal Jordanian Falcons
Jordanian Aerobatic Display Team

Sukhoi Su-22 Fitter
Czech Air Force

1300

4 **Sud Alouette IIIs**
The Grasshoppers
Royal Netherlands Air Force Helicopter Display Team

Mikoyan MiG-29 Fulcrum
Czech Air Force

4 **Let L-410M Turbolets**
Czech Air Force Display Team

7 **CASA C-101EB Aviojets**
Patrulla Aguila
Spanish Air Force Display Team

1400

Dassault Mirage 2000B
EC 2/2, Dijon
French Air Force

2 **McD F-18C Hornets**
The Red Hats
Kuwait Air Force Display Team

General Dynamics F-111C
No 6 Sqn
Royal Australian Air Force

Aeritalia G222
Reparto Sperimentale Volo
Italian Air Force

10 **Aermacchi MB339PANAs**
The Frece Tricolori
Italian Air Force Aerobatic Team

1500

GD F-16A Fighting Falcon
311 Sqn
Royal Netherlands Air Force

Grumman F-14 Tomcat
US Navy

2 **Mikoyan MiG-29 Fulcrums**
The Russian MiGs
Flight Research Institute Display Team

6 **Hawker Hunter F58s**
The Patrouille Suisse
Swiss Air Force Display Team

1600

ROYAL AIR FORCE 75TH ANNIVERSARY PAGEANT

Salute to 75 Years
20 **HS Hawk T1/T1As**
No 4 FTS/CFS
RAF Valley

Those Early Days
Royal Aircraft Factory SE5A, Avro 504K, Hawker Hind, Gloster Gladiator and Miles Magister
The Shuttleworth Collection Old Warden

Wings of War
DH Mosquito and Bristol Blenheim
BAe and The Aircraft Restoration Co
Chester and Duxford

Battle of Britain Memorial Flight
Supermarine Spitfire, Hawker Hurricane and Avro Lancaster
RAF Coningsby

The RAF Today
Panavia Tornado F3
No 56(R) Squadron
RAF Coningsby

BAe Harrier GR7
No 20(R) Squadron
RAF Wittering

1700

Westland Puma HC1
No 33 Squadron
RAF Odiham

HS Nimrod MR2P
No 206 Squadron
RAF Kinloss

HS Buccaneer S2B
No 12 Squadron
RAF Lossiemouth

HS Hawk T1A
No 7 Flying Training School
RAF Chivenor

Lockheed Tristar KC1, BAC VC10 C1 and BAC VC10 K2/3
Nos 216, 10 and 101 Squadrons
RAF Brize Norton

5 **Lockheed Hercules C1/C1K/C3**
RAF Lyneham
Transport Wing

Tactical Demonstration
Lockheed Hercules C1
RAF Lyneham
Transport Wing

9 **HS Hawk T1As**
The Red Arrows
Royal Air Force Aerobatic Team
RAF Scampton

1815

FORMATION FINALE

Battle of Britain Memorial Flight
DH Mosquito
Red Arrows
Panavia Tornado F3
Panavia Tornado GR1A
BAe Harrier GR7



Photo: R. Marshall



Photo: R. Marshall



Photo: R. Marshall

SUNDAY 25 JULY

0920

Emergency Services Drive-Past

The Falcons
Royal Air Force Parachute Team, RAF Brize Norton
Kiwi Blue
Royal New Zealand Air Force Parachute Team
Lockheed Hercules C3
RAF Lyneham
Transport Wing

4 **Boeing Stearmans**
Cadbury's Crunchie Flying Circus
Rendcomb Aerodrome, Glos

1000

4 **Westland Gazelle AH1s & Westland Lynx AH7**
The Silver Eagles
Army Air Corps Display Team, Middle Wallop

5 **Extra 300s**
Los Halcones
Chilean Air Force Display Team

Aeritalia/Aermacchi/Embraer AMX
Reparto Sperimentale Volo
Italian Air Force

McDD AH-64A Apache
US Army Aviation, Hanau

6 **Aero L-39 Albatroses**
The White Albatroses
Slovak Air Force Aerobatic Team

1100

Panavia Tornado MFG-2
German Navy

Saab JA37 Viggen
F4 Wing
Swedish Air Force

4 **Mikoyan MiG-21bis**
The Hungarian Sky Hussars
Hungarian Air Force Display Team

2 **Fairey Swordfish and Fairey Firefly**
Royal Navy Historic Flight
RNAS Yeovilton

2 **Westland Gazelle HT2s**
705 Naval Air Squadron
RNAS Culdrose

Sukhoi Su-27 Flanker-B
Sukhoi Su-27 UB Flanker-C
The Test Pilots
Gromov Flight Research Institute Display Team, Moscow

1200

8 **Dassault Alpha Jets**
The Patrouille de France
French Air Force Aerobatic Team

Dassault Super Etendard
59S Hyeres
French Naval Aviation

Dassault Alpha Jet
JbG 49
German Air Force

3 **Extra 300s**
Royal Jordanian Falcons
Jordanian Aerobatic Display Team

Let L-59 Albatros
Czech Air Force

1300

4 **Sud Alouette IIIs**
The Grasshoppers
Royal Netherlands Air Force Helicopter Display Team

Mikoyan MiG-29 Fulcrum
Czech Air Force

4 **Let L-410M Turbolets**
Czech Air Force Display Team

7 **CASA C-101EB Aviojets**
Patrulla Aguila
Spanish Air Force Display Team

1400

Dassault Mirage 2000B
EC 2/2, Dijon
French Air Force

2 **McD F-18C Hornets**
The Red Hats
Kuwait Air Force Display Team

General Dynamics F-111C
No 6 Sqn
Royal Australian Air Force

Aeritalia G222
Reparto Sperimentale Volo
Italian Air Force

10 **Aermacchi MB339PANAs**
The Frece Tricolori
Italian Air Force Aerobatic Team

1500

GD F-16A Fighting Falcon
331/332 Squadron
Royal Norwegian Air Force

Grumman F-14 Tomcat
US Navy

2 **Mikoyan MiG-29 Fulcrums**
The Russian MiGs
Flight Research Institute Display Team

6 **Hawker Hunter F58s**
The Patrouille Suisse
Swiss Air Force Display Team

1600

ROYAL AIR FORCE 75TH ANNIVERSARY PAGEANT

Salute to 75 Years
20 **HS Hawk T1/T1As**
No 4 FTS/CFS
RAF Valley

Those Early Days
Royal Aircraft Factory SE5A, Avro 504K, Hawker Hind, Gloster Gladiator and Miles Magister
The Shuttleworth Collection Old Warden

Wings of War
DH Mosquito and Bristol Blenheim
BAe and The Aircraft Restoration Co
Chester and Duxford

Battle of Britain Memorial Flight
Supermarine Spitfire, Hawker Hurricane and Avro Lancaster
RAF Coningsby

The RAF Today
Panavia Tornado GR1A
No 11(AC) Squadron
RAF Marham

BAe Harrier GR7
No 20(R) Squadron
RAF Wittering

1700

Westland Wessex HC2
'A' Flight, No 22 Squadron
RAF Chivenor

HS Nimrod MR2P
No 206 Squadron
RAF Kinloss

HS Buccaneer S2B
No 12 Squadron
RAF Lossiemouth

Shorts Tucano T1
Central Flying School
RAF Scampton

Lockheed Tristar KC1, BAC VC10 C1 and BAC VC10 K2/3
Nos 216, 10 and 101 Squadrons
RAF Brize Norton

5 **Lockheed Hercules C1/C1K/C3**
RAF Lyneham
Transport Wing

Tactical Demonstration
Lockheed Hercules C1
RAF Lyneham
Transport Wing

9 **HS Hawk T1As**
The Red Arrows
Royal Air Force Aerobatic Team
RAF Scampton

1815

FORMATION FINALE

Battle of Britain Memorial Flight
DH Mosquito
Red Arrows
Panavia Tornado F3
Panavia Tornado GR1A
BAe Harrier GR7



Mi-8

Lynchey Presscock

that consists of five Mi-17 'Hip-H' assault transports, two Mi-17P 'Hip-K' electronic countermeasures platforms and one Mi-9 'Hip-G' command post.

Yet more 'Hip-Cs' are to be found at Szolnok, with the Szolnok Mixed Air Carrier Regiment's Sarkany 'Dragon' Mi-8 Training Squadron. As implied by the unit designation, this is mainly concerned with training duties but there is little doubt that it could (and would) fulfil a combat role if needed.

Also part of the same regiment are nine Antonov An-26 'Curl' tactical transports that operate alongside a handful of Mi-8S 'Hip-Cs' configured for VIP duties.

The only other fixed-wing transport types consist of two Antonov An-24V 'Cokes' and three LET L410UVPs. These serve with the Vitez Hari Laszlo Transport Squadron at Tokol near Budapest for liaison and communications duties.



Mi-2

Lynchey Presscock

Similar tasks are also likely to be undertaken by the Asboth Oszkar Regiment which flies about 30 examples of the Mi-2 'Hoplite', although these also appear to have a combat role and would probably work in concert with the 'Hinds', as scout helicopters. Until quite recently, this regiment was resident at Borgond but it has now moved to Szolnok.

The only other type known to carry the red, white and green arrowhead national insignia is the Zlin 43, four examples of which are stationed at Budaors on the outskirts of Budapest. These are under the control of the Magyar Honvedelmi Szovetseg which is a paramilitary agency that is concerned with pre-service training.

Looking to the future, economic factors will determine what happens to the Air Defence Group. Reductions in force size have been recommended. A 1990 government plan intimated that the

interceptor fleet would fall from 99 to 61 aircraft, something that could most easily be accomplished by withdrawing the remaining MiG-21MF 'Fishbed-Js' and closing the base at Kecskemet. The same planning document recommended that the number of attack helicopters should be reduced from 79 to 66. There is no plan to retire the limited number of 'Fitters' and these are expected to remain in the active inventory for the immediate future at least.

In terms of new equipment it comes as no surprise that at operational level there is an understandable wish to acquire Western hardware. How this will be satisfied is another matter entirely and will depend in large part on Hungary's success in coming to terms with capitalism. However, if as anticipated it fares well in adopting a market economy, then the day that we see Hungarian national insignia on Western-built aircraft may not be too long delayed.

INTERNATIONAL AIR TATTOO FLYING DISPLAY AWARDS 1993

All participants in the IAT 93 flying display on Saturday 24 or Sunday 25 July will be eligible for one of the following awards:

THE UK DISPLAY SWORD

Presented by the ALLIANCE AND LEICESTER BUILDING SOCIETY for the best flying display by a UK participant. All UK participants, excluding aerobatic teams of more than six aircraft will be eligible for the award. This is the first year that the UK Display Sword has been awarded.



SUPERKINGS SOLO JET AEROBATIC TROPHY

Presented by IMPERIAL TOBACCO PLC for the best solo jet demonstration. All single/two seat jet demonstrations will be considered for the award. At IAT 91 the Superkings Solo Jet Aerobatic Trophy was awarded to Squadron Leader Ian MacDonald flying a Harrier GR5 from No 233 OCU, RAF Wittering.



SIR DOUGLAS BADER TROPHY

Presented by SHELL UK OIL for the best overall flying demonstration. All participants, excluding aerobatic teams of more than six aircraft and solo jet demonstrations that qualify for the Superkings Trophy will be eligible for the award. The Sir Douglas Bader Trophy was awarded to Captain Fournier flying a Mirage 2000 from 2/2 Escuadron, Dijon Air Base, France at IAT 91.



IN CELEBRATION OF 75 YEARS

A SELECTION OF GIFTS TO CELEBRATE THE 75TH ANNIVERSARY OF THE ROYAL AIR FORCE



POLO SHIRT (330200) M-L-XL £15.99	RUGBY SHIRT (340200) L-XL £21.99	SWEAT SHIRT (350200) L-XL £17.99	SHERWOOD ORGANISER (1150220) £49.55	75 th TANKARD (440205) £25.00	THE OFFICIAL ROYAL AIR FORCE 75 th ANNIVERSARY LOGO EXCLUSIVE TO SKYHIGH

STEALTH T-SHIRT (360610) M-L-XL £8.00	MIGHTY 8 th T-SHIRT (360400) M-L £3.50 (471 92 T-SHIRT)	GRIM REAPER T-SHIRT (360605) M-L £5.00	BLACK WIDOW T-SHIRT (360600) M-L-XL £8.00	SPITFIRE TIE (370410) £8.95 - 75 th TIE (370200) £8.95 - FIGHTER TIE (370440) £6.50 - LANCASTER TIE (370400) £8.95	

ORDER BY PHONE OR VISIT WWW.SKYHIGH.CO.UK. FREE DELIVERY TO THE MAINLAND. ORDER BY PHONE CALL 0285 713456. ACCESS OR VISA ORDERS TELEPHONE 0285-713456. SKYHIGH DEPARTMENT SKY075 - PO BOX 1940 - FAIRFORD - GLOUCESTERSHIRE GL7 4NA

THE INTERNATIONAL DISPLAY SWORD

Presented by B&Q STORES PLC to the pilot or team leader who gives the best flying demonstration by an overseas participant. All overseas participants, excluding aerobatic teams of more than six aircraft will be eligible for this award. The International Display Sword was awarded at IAT 91 to Captain Reinder Zwaart from No 322/323 Squadron, Leeuwarden Air Base, Royal Netherlands Air Force, for his display in an F-16A.



INTERNATIONAL DISPLAY TEAMS

A record number of aerobatic and parachute display teams from around the world will be taking part in the flying display at International Air Tattoo 93. Over the following pages a number of these teams are introduced. Details of other national teams appear elsewhere in this programme.

Frecce Tricolori



Peter R March

CHILE

Los Halcones (Escuadrilla de Alta Acrobacia)

Chilean Air Force aerobatic teams have a long tradition going back to 1948 when Group 11's team of P-47 Thunderbolts was formed. The Halcones 'High Performance Aerobatic Squadron' was established in 1981. Team pilots are selected from various Chilean Air Force units and receive intensive training prior to performing in public. The Halcones have previously given displays on two occasions at IAT when equipped with Pitts S2A and S2S biplanes. In 1991 the team relinquished its Pitts for the new Walter Extra 300 high performance aerobatic monoplane. Painted in Chilean national colours of white, blue and red, the Extras will be appearing for the first time in Europe.



Royal Jordanian Falcons

ITALY

Frecce Tricolori

The Italian National Aerobatic Team, the Frecce Tricolori, was first established by the Italian Air Force at Rivolto on 1 March 1961. Prior to this Italy was represented at national and international air shows by teams formed in relation from selected squadrons of the Air Force. The pilots of today's team are recruited from across all squadrons of the Italian Air Force after a selective screening. The team flies ten blue painted Aermacchi MB-339A/PANs for a 20 minute colourful display making use of smoke in the national colours of red, white and green.



The Red Hats

JORDAN

Royal Jordanian Falcons

The Royal Jordanian Falcons aerobatic display team was formed in 1978 to represent Jordan and its national airline at major aviation events around the world. The civilian Falcons operates as a special section of the Royal Jordanian Airline and 'Falcon Flight' has its team headquarters at Amman International Airport. The Royal Jordanian Falcons has previously displayed at the International Air Tattoo flying a trio of Pitts S-2As. In 1992 these aerobatic biplanes were replaced by Walter Extra 300 high performance monoplanes, with which they are making their debut in the UK.

KUWAIT

The Red Hats

Flying McDonnell Douglas FA-18C Hornets this Kuwait Air Force display duo comes from No 25 Squadron based at Ahmed Aljaber Air Base. The leader is 38 years old Lt Col Hussain Al-Qattan, a former A-4 Skyhawk pilot and veteran of the Desert Storm campaign. It is his call sign Red Hat that gives the duo its name for their debut at IAT 93. The wingman is Capt Aymen Almudhaf. Aged 33 he flew Mirage F-1s and also participated in the Gulf War, during which the Kuwait Air Force flew more than 900 missions.

RUSSIA Russian MiGs

The two test pilots flying the Mikoyan MiG-29 Fulcrums are based at the Russian Flight Research Institute at Zhukovsky near Moscow. The display leader is test pilot/cosmonaut Sergey Tresvyatsky, aged 39, who has over 3,000 flying hours experience in 45 types of aircraft. Currently he is involved in testing experimental control systems and the investigation of automatic landing systems. He is one of the pilots of the 'Buran' spaceplane team. His wingman is test pilot Alexander Beschastnov, Deputy Commander of the fighter pilots' detachment. Aged 36, he has flown more than 2,500 hours on 36 types. His current flying activity is the investigation of the problems of modern aircraft protection from stalling and spinning, advanced control systems and air combat problems.



Kiwi Blue

NEW ZEALAND Kiwi Blue

Kiwi Blue is the Royal New Zealand Air Force's parachute display team and is formed from the staff of the Parachute Training and Support Unit. The team was first formed in 1990 as part of the RNZAF's contribution to the sesquicentennial celebrations. Although Kiwi Blue is only a part-time team as the members are all full time parachute jump instructors, they perform regularly throughout New Zealand and Australia.

The team of eight will exit an RAF Hercules at 6,500ft and move to form a star or ring formation. They will then freefall down to 5,000ft prior to commencing a bomb burst. The parachutists will deploy their parachutes at 3,000ft and manoeuvre to form an eight man 'follow the leader' canopy stack to touchdown.



Russian MiGs

Patrulla Aguila



Peter R March

SPAIN Patrulla Aguila

The Patrulla Acrobática de España is a section of the Spanish Air Force Academy at San Javier, Murcia and the pilots, previously flying front-line fighter aircraft, are now instructors at the Academy. Formed in July 1985 the Patrulla Aguila has performed at each IAT since that date. The six CASA C-101 Aviojets flown by the team is the basic/advanced trainer used by the Spanish Air Force. Powered by a Garrett TFE 731-2-2J turbofan engine the Aviojet has a maximum speed of mach 0.8 and can withstand load factors of between +7.5G and -3.7G.



Hungarian Sky Hussars

Lindsay Pearson

UK
Silver Eagles

This year the Army Air Corps helicopter display team, the Silver Eagles is celebrating 25 years of display flying. The Blue Eagles was first formed in 1966 from volunteer instructors at the Army Air Corps Centre Middle Wallop. Although the display routine has undergone many changes over the years, the skills have not - the team and its organisation today are very much the same as that originally conceived in 1966.

They are very experienced personnel from a wide variety of backgrounds including veterans from the Falklands, the Gulf and Northern Ireland. These aircrew willingly give their spare time in order to rehearse, travel and display to as wide an audience as possible. 1993 sees a change of helicopter for the team with the introduction of a quartet of Westland Gazelles whilst retaining a single Westland Lynx.

The Team Leader, for the second successive season, is Captain Colin Dunscombe, who pilots the Lynx. He is an A2 instructor and is on his third instructional tour at Middle Wallop. Colin had the unfortunate distinction of being part of Saddam Hussein's human shield, having been taken prisoner during the invasion of Kuwait where he was attached to the Kuwait Air Force as a Tactical Helicopter Instructor.



RAF ON DISPLAY



Top: Tornado F3 of No 56 (R) Sqn, RAF Coningsby piloted by Flt Lt Jerry Gotham. Top left: Wessex HC2 from No 22 Sqn 'A' Flight, RAF Chivenor, flown by Flt Lt Paul Lees. Top right: Harrier GR7 from No 20(R) Sqn, RAF Wittering, flown by Flt Lt Robert Lee. Middle: Buccaneer S2B of No 12 Sqn, RAF Lossiemouth piloted by Flt Lt Glenn Mason. Above left: Tornado GR1A piloted by Sqn Ldr S.H.Cockram, No 11(R) Sqn, RAF Marham. Above right: Hercules C1P flown by Sqn Ldr Nigel Watson from RAF Lyneham.

UK
Royal Navy Historic Flight

The establishment of the Royal Navy's Historic Flight was not planned but rather evolved over a period of more than 10 years. When Westlands at Yeovil took over the interests of Fairey Aviation in 1960 they presented the airworthy Swordfish LS326 to the Royal Navy at Yeovilton where it was kept flying. This was followed by a Sea Fury presented by Hawkers in 1971.

In February 1972 Fairey Firefly AS5 WB271 was transported back to RNAS Yeovilton from Australia by the officers of HMS Victorious and it flew again in September 1972. In 1973 the Royal Navy Historic Flight was in commission and displaying regularly at airshows around the UK.

After major setbacks in 1989/90 when the Flight's Sea Furies were lost in accidents, a step forward has been made in 1993 when a second Swordfish (W5856) was handed over to the Flight on 22 May. W5856 is the oldest surviving Swordfish, having been built by Blackburn at Sherburn-in-Elmet in 1941 (and like LS326 is really therefore a 'Blackfish'). After many years in Canada it was acquired by the Strathairn Collection. It was purchased by British Aerospace and was rebuilt to flying condition by the company at Brough, with the Bristol Pegasus engine restored by Rolls-Royce at Filton.

With three aircraft on display this season the RN Historic Flight presents a co-ordinated routine. The pilot of the Firefly is Lieutenant Dave Mackay and the Swordfish pilots are Lieutenant Commanders Alan Davison and Dave Knight.



Royal Navy Historic Flight

UK
Crunchie Flying Circus

The Cadbury's Crunchie Flying Circus, now in its fourth year, is a unique formation team with its smoke-generating Boeing Stearman biplanes, each with a wing-walker flying on the top wing. The Stearman pilots are among the top display fliers in the country with nearly 50 years of flying experience between them.

Vic Norman, who formed the barnstorming team, also flies one of the aircraft and manages Aerosuperbatics Ltd, the company that owns the aircraft and trains the wingwalkers. Mike Dentith, team leader, was previously a member of the Skyhawks Aerobatic Team and Matthew Hill, who has flown everything from gliders to commercial aircraft, is now in his fifth season on the display circuit. The wing walkers, who bring glamour to this unique act, are Helen Tempest, aged 27 who has been wingwalking for twelve years and Sara Cubitt, aged 22 who is now in her third season 'on the wing'.



Crunchie Flying Circus

ROYAL AIR FORCE AEROBATIC TEAM THE RED ARROWS



Aerobatics have always played a prominent part in Royal Air Force pilot training and allow a new pilot to develop confidence in himself and his aircraft. Formation flying is an essential part of the tactical operations of any front-line squadron. Formation aerobatics not only encourages the growth of confidence in a leader and other members of the formation but also develops team spirit. The RAF has long recognised the value of display flying in pilot training as well as for the Service's prestige and for recruiting purposes. Since the earliest days of the Air Force, there have been aerobatic display teams.

The Red Arrows, now in its 29th season, was formed in 1965 with seven pilots and gave 65 displays in the team's HS Gnat trainers that year, winning the Royal Aero Club's Britannia Trophy in recognition of their outstanding contribution in the field of aviation. The Team expanded to nine pilots in 1968 and since then the classical Diamond Nine formation has become their hallmark and is recognised throughout the world as the peak of precision flying.

The diminutive HS Gnat was flown by the Arrows until the winter of 1979/1980 when it was replaced by the new British Aerospace Hawk advanced jet trainer which the team continues to fly today. By the end of

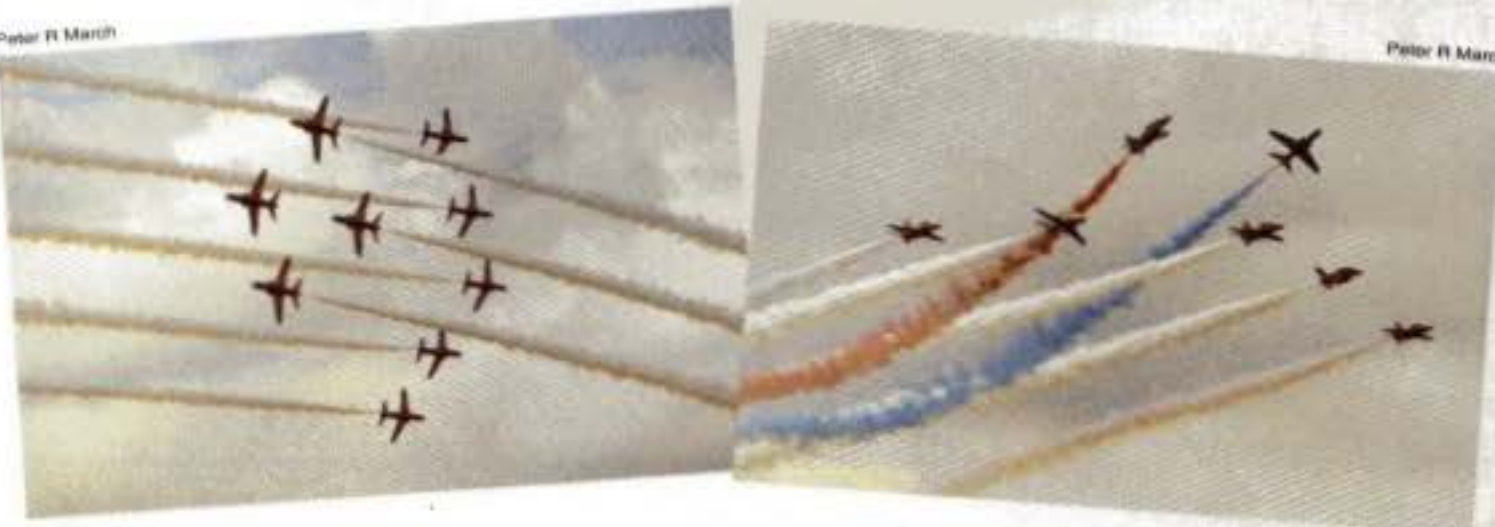


September 1992 the total number of public displays given by the Red Arrows reached a staggering 2,702 since being formed, having added 93 during that 28th season. This was slightly lower than the planned 99,

as six performances were cancelled, primarily due to bad weather at display locations at home and on the Continent. The Red Arrows is a full squadron of the historic RAF Central Flying School based at RAF Scampton in Lincolnshire. It is commanded by Squadron Leader Adrian Thurley, who is in his third and final year as Red One. During the 1993 season the Team has over 100 displays programmed throughout the British Isles and NW Europe concluding with the Battle of Britain At Home displays at Finningley and Leuchars in mid-September. The Arrows then make a visit to the USA, the first for ten years.

A tour on the Red Arrows normally lasts for three years and each year new pilots will join the Team. Newcomers for the 1993 season are Flt Lt Sean Chiddenton - Red 2 and Flt Lt Benny Ball - Red 3. The Team Manager Sqn Ldr Les Garside-Beattie, who is also a qualified Hawk pilot, flies Red 10, the 'spare' aircraft to the display base in case one of the Hawks becomes unserviceable.

The Manager is also the team's public voice, giving the commentary at air displays during Red Arrows' performances. The nine display pilots have previously flown a cross-section of the RAF's fast-jet aircraft and have amassed in excess of 24,000 flying hours between them.



THE RAF FALCONS PARACHUTE DISPLAY TEAM



The RAF Falcons are the only parachute team sponsored by the Ministry of Defence and established on a full time basis. With ten parachutists in the air and a support team of three on the ground, the Falcons are one of the largest and most spectacular parachute teams to be seen anywhere in the world.

The Team are all serving officers and senior non-commissioned officers from the Administrative (Physical Education) Branch of the Royal Air Force. As Military Parachute Jumping Instructors they are based at No 1 Parachute Training School at RAF Brize Norton in Oxfordshire.

The display they give, in all but the worst weather conditions, combines freefall parachuting and canopy handling and culminates in a 300ft high spiralling stack which involves a high degree of discipline, team work and individual skill. This is further demonstrated by the Team's ability to land in quick succession on to two crosses in arenas as small as 50 metres square.

The Falcons are fortunate to have either an Andover from No 32 Sqn (RAF Northolt)

or a Hercules from Nos 47 or 70 Squadrons (RAF Lyneham) as their jump platforms. The low level flypast and salute provide a fitting climax to Falcons' displays.

During the 1993 display season the Falcons will give approximately 100 displays at venues throughout Great Britain and Europe, with the aim of portraying the spirit of adventure and the mastery of the air that is symbolic of the Royal Air Force.

Although the Falcons have mastered the skills required for their displays, they are constantly practising to ensure that they perform as well as is possible in the prevailing weather conditions. Additionally, the Team are always working to improve their individual skills in freefall as well as practising new skills such as Canopy Relative Work, where the parachutists fly their canopies in contact with each other.

The final result is the product of many years' skill, experience and of course team work. The apparent ease with which the Falcons perform is proof of their dedication and professional approach to their task as instructors at the Parachute Training School.





PATROUILLE SUISSE

The *Patrouille Suisse*, with its six Hawker Hunter F58s represents the finest tradition of Swiss military aviation and its display gives the pilots an opportunity to demonstrate their flying skills. It also emphasises the team work, discipline and determination which this kind of flying requires in order to give the five or six public air displays each year.

Founded in 1964, the *Patrouille Suisse* is based at Dübendorf. The team consists of six pilots, two reserve pilots and a ground supervisor, a former pilot of the team. The pilots all come from the Surveillance Wing, who also serve as flying instructors in their respective squadrons. The display sequence, one of three different programmes to suit varying weather conditions, lasts about 15

minutes and is the product of a once-weekly training flight, over an eight month period. The 1993 team is:

- | | |
|------------------------------|------------|
| (1) Leader - Hptm F Ramseier | (3,100 hr) |
| (2) Obilt M Thöni | (1,400 hr) |
| (3) Lt R Schlatter | (1,300 hr) |
| (4) Hptm W Hoffman | (1,700 hr) |
| (5) Capt S Rapaz | (2,700hr) |
| (6) Hptm D Höll | (2,600 hr) |

THE GRASSHOPPERS

In the spring of 1973 four pilots of No 299 Squadron of the Royal Netherlands Air Force trained in formation flying more often than usual in the area around their Deelen air base. This was done in preparation for a demonstration to celebrate the 60th anniversary of the Royal Netherlands Air Force in June of that year, and led to the foundation of a new helicopter display team. As the 'grasshopper' features in the emblem of No 299 Squadron the call sign *Grasshoppers* was chosen.

But it was another six years before the existence of 'the *Grasshoppers*' team was formalised by the Air Staff. So as to be better recognisable as the official representatives of the Royal Netherlands Air Force their Alouette III helicopters were painted in the national colours of red, white and blue. This colour scheme has been maintained to the present day.

The 1993 display consists of two parts - close formation flying by the four Alouette III helicopters and some specific helicopter manoeuvres such as flying sideways, backwards and hovering.

The number 1 position (leader) is flown by Captain Peter Hardenbal, aged 32. This is his first season with the *Grasshoppers*. To date, he has flown 2,400 hours, 2,200 of which are on the Alouette III. Outside the display season he is an instructor pilot at No 300 Squadron and flight commander of the 2nd flight of No 298 Squadron at Soesterberg Air Base.

Number 2 position (right wing) is flown by Lieutenant René van Riet, aged 28. René is an operational pilot with No 298 Squadron at Soesterberg and has flown 1,800 hours. He is in his second season with the *Grasshoppers*.

Number 3 position (left wing) is flown by First Lieutenant Robert de Lange, aged 28. Before joining the team Robert was an operational pilot with No 298 Squadron at

Soesterberg. He has flown 1,800 hours, 1,600 of which are on the Alouette III, and this is his third season with the team.

Number 4 position (slot) is flown by First Lieutenant Job van Roden, aged 32. So far he has flown 2,000 hours, 1,700 of which are on the Alouette III. It is also Job's third season with the team. Outside the display season he flies as an operational pilot with the 4th flight of No 300 Squadron.

The number 5 position is flown by First

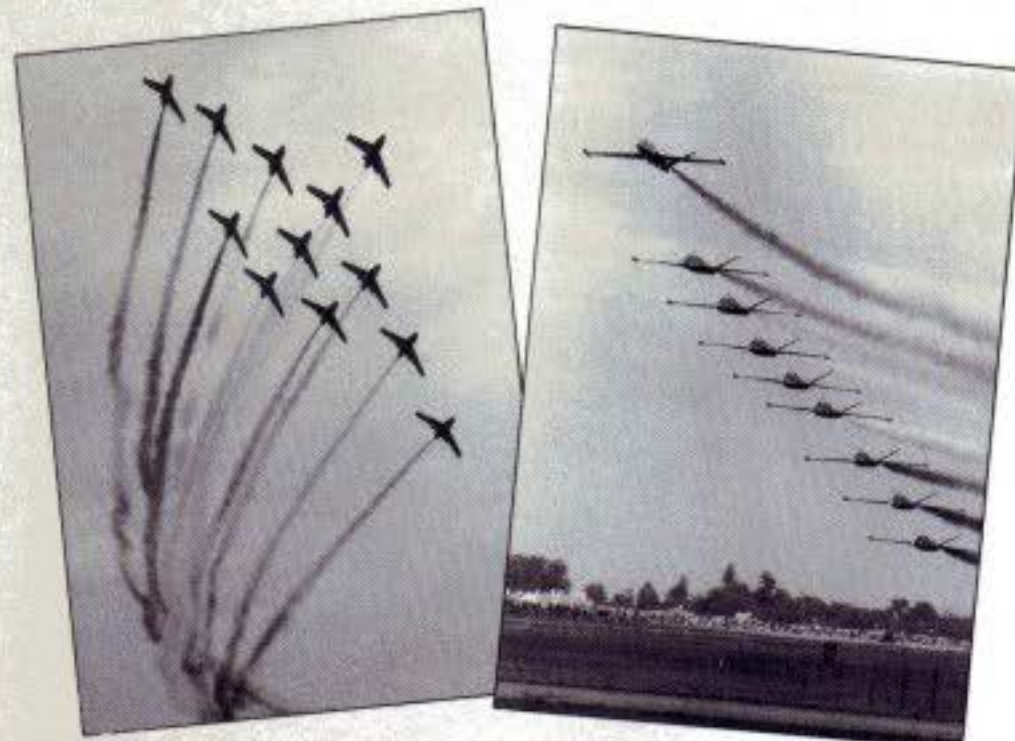
Lieutenant Roger Hilbers, aged 25. It is Roger's first year with the team and he is the manager of the team and narrator during the show.

Major Jan Kes, aged 40, is the coach of the team and commander of No 300 Squadron stationed at Deelen Air Base.

The *Grasshoppers* are scheduled to display, in what is likely to be their last season, at 19 venues in 1993, of which four are in the UK.



THE PATROUILLE DE FRANCE



Above: Aircraft types flown by the Patrouille de France include Dassault Mystere IVs (left), superseded by Fouga Magisters (right) in 1964. Photographs Peter R March

Since 1953 the *Patrouille de France* has represented to the general public the dynamism of the French Air Force as a whole. The imaginative performance of its eight Alphajets demonstrates the quality of aircraft that equip the French Air Force and the dedicated professionalism of the finest French fighter pilots.

Now, in its 40th year, the *Patrouille de France* is one of the world's great aerial demonstration teams. Based at Salon de Provence, the *Patrouille* is a detachment of the French Air Force Academy. Selected for a three-year term of duty, the pilots – all officers and volunteers, have more than 1,500 flying hours.

Low altitude, tight formation flying demands concentration, discipline and practice – so the team flies up to two sorties a day, initially with small numbers of aircraft and gradually building up to the full formation by Christmas. Each year a new display is prepared, based on a succession of various tight formations gracefully interconnected throughout the demonstration. Through this long and hard process of constant practice the *Patrouille de France* is able to present an exciting and spectacular display each year.

Aerobatic flying in France dates from 21 September 1913 when Adolphe Pegoud, then a pilot with the French aircraft manufacturer Bleriot, performed the first aerial loop in public during a demonstration at Buc, near Versailles. This was the start of a new adventure in which some of the most famous pilots were involved – aerobatics was born.



The first team aerobatic demonstration in France was performed in 1931 by a group of instructors at the French Flying Training Academy. Based at Etampes, the *Patrouille d'Etampes* consisted of three Morane-Saulnier MS230s and a Morane-Saulnier MS225. It was very successful and subsequently participated at many air shows across France and abroad. Another aerobatic demonstration team performed in 1934 at Dijon. Formed from 1/7 Fighter

Squadron, and equipped with the MS225, the *Patrouille Weises* numbered 18 aircraft. One of its most famous manoeuvres was to fly all 18 aircraft in formation, linked together by a cable.

In 1937, the *Patrouille d'Etampes* moved to Salon-de-Provence and became the *Patrouille de l'Ecole de l'Air*. But with the outbreak of World War 2 in September 1939 the activities of these aerobatic teams ceased. After the war a new team called the *Patrouille de Tours* was formed. In 1947 the team, flying a dozen Stampe SV4s, returned to Etampes and was officially activated as the French Air Force Demonstration Flight, tasked with officially representing the French Air Force at national and international air shows.

In 1950, with the introduction of jet-powered aircraft such as the de Havilland Vampire and Republic F-84G Thunderjet, a new chapter in French aerobatic history started. The 3rd Fighter Wing's aerobatic team was the first to be granted permission to use the official title *Patrouille de France*. In 1954 the team upgraded to the new jet-powered Dassault Ouragan and was assigned to the 2nd Fighter Wing at Dijon. Between 1955 and 1963 four different wings were allowed to use the name *Patrouille de France*, progressing from the Ouragan to the Dassault Mystere IV. These teams continued the tradition of the *Patrouille de France* and brought France's latest aerospace technology to the attention of the world.

In 1964 the Air Force Academy's Team became the *Patrouille de France*, and for more than 13 years the twin-tailed distinctive Fouga Magister thrilled crowds around the world. The number of aircraft used by the team grew successively from six to eleven before finally being limited to nine. In 1981 the team switched to the then new Dassault Alphajet. By the end of 1992 the team had logged nearly 113,000 flying

hours, with participation from 136 pilots in 1,550 performances. Today the *Patrouille de France* continues in the best tradition of precision flying, living up to its reputation as one of the world's best aerobatic teams and serving as Ambassadors of France.

For 1993 the team members are:
Team Director: Commandant Yvan Gremillet, aged 47, joined the French Air Force in 1967 and has over 5,300 flying hours – including 4,500 on fighter jets.

Assistant Manager: Commandant Michel Lebouvier, aged 46, with more than 6,000 flying hours.

Athos 1 – Leader: Commandant Philippe Connan, aged 35, second year with the team, 3,100 flying hours.

Athos 2 – Inner Right Wingman: Lieutenant Jacques Perret, aged 32, first year with the team, 2,500 flying hours.

Athos 3 – Inner Left Wingman: Capitaine Philippe Laloix, aged 35, first year with the team, 3,700 flying hours.

Athos 4 – Slot pilot: Capitaine William Kurtz, aged 33, first year with the team, 2,000 flying hours.

Athos 5 – Outer Left Wingman: Capitaine Daniel Manzo, aged 37, seventh year with the team, 4,300 flying hours.

Athos 6 – Outer Right Wingman: Capitaine Regis Huillier, aged 34, second year with the team, 2,800 flying hours.

Athos 7 – Leader solo: Capitaine Fabrice Gourhan, aged 34, third year with the team, 3,000 flying hours.

Athos 8 – Second solo: Capitaine Pierre Chicha, aged 31, second year with the team, 2,500 flying hours.

Maintaining the top notch condition of the twelve Alphajets assigned to the *Patrouille de France* are some 30 technicians who devote countless hours to the support of the aircraft. They are recruited from the various flying units of the French AF, and each is a specialist in a specific field. The maintenance officer is Capitaine Charlier. In the course of the season the personnel and equipment necessary to support the air shows are carried by either a Transall C160 or Lockheed C-130H Hercules of the French Military Transport Command (COTAM).

The Alphajet, a tandem two-seat aircraft, is the result of a Franco-German co-operation (Avions Marcel Dassault Breguet Aviation and Dornier GmbH). It was designed to provide a versatile aircraft for advanced flying training and tactical support missions. The Alphajet's excellent flight characteristics make it a natural choice as the *Patrouille de France's* mount. It is powered by two 2,965 lb st Turbomeca Larzac O4 engines which give it a maximum speed of Mach 0.85 at high altitude. First flown in 1973, over 500 Alphajets have since been produced.

Today, the *Patrouille de France* continues in the best traditions of the Armee de l'Air as a respected ambassador of its country. In October this year the team celebrates its 40th birthday – yet another memorable event in the *Patrouille's* fine history.



LOCKHEED AND THE RAF

An Enduring Relationship



Royal Air Force Hercules CMk3, a familiar sight in British skies.

C-130J Hercules

One aircraft in particular, the C-130 Hercules, has served as the backbone to the RAF's multi-purpose air transport force, delivering supplies, men, fuel and humanitarian assistance under hostile and peaceful conditions for more than 25 years.

Now, Lockheed and a strong team of UK industrial partners are launching a new, privately-developed state-of-the-art Hercules, the C-130J. It will be offered to customers worldwide as an affordable replacement for their ageing Hercules fleets. Designed to reduce ownership costs, the off-the-shelf, C-130J features:-

- Modern rugged airframe
 - New propulsion system
 - Advanced, integrated two-man flight station
 - Numerous system enhancements
- It will enable the RAF to perform its diverse multi-role tasks well into the next century with reduced manpower, and lower operating and support costs. C-130J operators also will benefit from enhanced performance - shorter take-offs, better climb rates, higher cruise altitudes, increased range and faster speeds. Production is underway. First flight occurs in September 1995 with deliveries in 1996.

Below: The new C-130J will greatly enhance the RAF's ability to meet commitments worldwide.



C-130J two-man flight deck.



Below: Lockheed P-3 on patrol.

P-3 Maritime Patrol Aircraft (MPA)

Into each P-3 manufactured at Lockheed's Marietta facility goes experience gained from fifty years of leadership in MPA production. A highly capable, multi-role platform with an advanced avionics suite, today's P-3 offers an affordable, world-class solution for replacement of ageing maritime patrol fleets. In co-operation with a formidable array of UK-based companies, an improved version of Lockheed's P-3 exceeds mission requirements for the RAF's own replacement MPA program.

Enduring Lockheed/UP Relationship

The Lockheed/UK industrial partnership for the C-130J Hercules, and the broad involvement of UK-based companies for the P-3 replacement MPA program, reinforces the UK's position as a world leader in key aerospace technologies.

Furthermore, it brings significant economic and employment benefits to the UK now and for many years to come.

Together, we salute the Royal Air Force on the grand occasion of its 75th anniversary.



BOEING'S LOFTY SENTRY

Each day since October 1992 Boeing E-3 airborne warning and control system (AWACS) aircraft belonging to the NATO Airborne Early Warning Force and the Royal Air Force have been in the air over strife torn Bosnia-Herzegovina. Under code name Operation Sky Monitor this involves two sorties being flown daily to provide constant surveillance during daylight hours, and occasionally at night, to monitor compliance with UN Security Council Resolution 781 over the designated 'no-fly' zone. An RAF Sentry AEW1 of No 8 Squadron usually flies the first of these, which are operated mainly in Hungarian airspace.

No 8 Squadron made the transition from the veteran Avro Shackleton AEW2, that had served in the AEW role for 19½ years, to the Boeing E-3D/ Sentry AEW1 on 1 July 1991, moving from RAF Lossiemouth to RAF Waddington, Lincolnshire at the same time.

Ordered by the Ministry of Defence in 1986 in place of the ill-fated HS Nimrod AEW3, which was beset by development problems, the Sentry is a modified Boeing 707 airliner airframe, with the addition of a 30ft diameter 'rotodome' housing a radar scanner. It is a large aircraft with powerful transmitters and radar with jamming resistance, clutter rejection and other built-in high technology features. Powered by four 24,000lb st GE-SNECMA CFM-56 turbofan engines, that are both more fuel efficient and more powerful than the Pratt & Whitney



Top: Boeing E-3D Sentry on an early test flight. Above: An RAF Sentry AEW1 escorted by an air defence Tornado F3.

TF33s in the older E-3s flown by the USAF and NATO, the RAF's quieter Sentries are a good deal more environmentally friendly. For air-to-air refuelling it has the use of twin hose fitted tankers (as used by the RAF) or boom-fitted tankers of the USAF. Remaining airborne for 20-24 hours on patrol presents no problem for the E-3D.

From their lofty vantage point at 30,000ft 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 working at the nine consoles in the subdued lighting of the windowless fuselage who are the key link with surface-based units co-ordinating the responding air defence.

Because of the amount of data flowing to and from the Sentry 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

JIMS (Interim JTIDS Message Standard - pronounced 'eye-jims') the Sentry will, in the near future, be fitted with the American-developed Link 16 standard of JTIDS (Joint Tactical Information Distribution System). 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. Equally useful, but often forgotten, is the identification provided by transponders (IFF - in military parlance) and from the Loral Yellow Gate ESM pods on the wing tips.

Under an agreement signed in May 1982, RAF Sentries are integrated with the NATO force of 18 E-3A aircraft based at Geilenkirchen, Germany. Patrol tasks (such as to forward stations at Orland, Norway; Trapani, Sicily; Preveza (Greece) and Konya, Turkey) are assigned on a day-to-day basis by the US or German general commanding the NATO AEW Force (NAEWF) at SHAPE.

All seven of the RAF's E-3D Sentries (ZH101-ZH107) are in service with No 8 Squadron at RAF Waddington. A total of eleven crews are in the process of being trained by the Sentry Training Squadron, with the final crew scheduled to graduate by February 1994. The last of the RAF's E-3Ds (ZH107), that was received in March 1992, was the 1,000th of the Boeing 707 family of aircraft to be built. A service career of 25-30 years is ahead of the Sentry AEW1. As it reaches its 78th birthday this year, No 8 Squadron can look forward to marking its 100th birthday flying the aircraft - a 'Century with a Sentry'.



Below: One of NATO's fleet of 18 E-3 AWACS surveillance aircraft based at Geilenkirchen, Germany.