



**AIRCRAFT IN DETAIL**

A Spanish Navy EAV-8B seen refuelling from a USAF KC-10A during delivery. (McDonnell Douglas via Gary Madgwick)

## **BRITISH AEROSPACE / MCDONNELL DOUGLAS HARRIER / AV-8**

ONE aircraft almost guaranteed to capture the full attention of the crowd at an air show is the Harrier. The sheer output of noise as it hovers and flies sideways and backwards as well as forwards demands that it be noticed, whilst in the hands of British pilots at least, a bow to the audience at the conclusion of its display is a final gesture to demonstrate the agility of an aircraft which remains almost

unique in the fixed-wing flying world.

It is perhaps remarkable to realise that the Harrier started life almost 40 years ago, and that like a few other legendary designs in the annals of British aviation, it was initially a private venture. On 21 October 1960, years of research and experimentation into Vertical Take-Off and Landing (VTOL) aircraft culminated in the first - tethered - flight of the

Hawker P.1127, designed around the Bristol-Siddeley Pegasus engine which had four rotating exhaust nozzles to provide vertical and horizontal thrust. The P.1127 went on to become the Kestrel, which was originally envisaged as a concept aircraft for future designs, such as the P.1154, but instead was further developed into the world's first true operational VTOL aircraft, the Harrier.



The first Sea Harrier Mk.51 for the Indian Navy, seen landing at Farnborough in 1982. (Andy Sheppard)



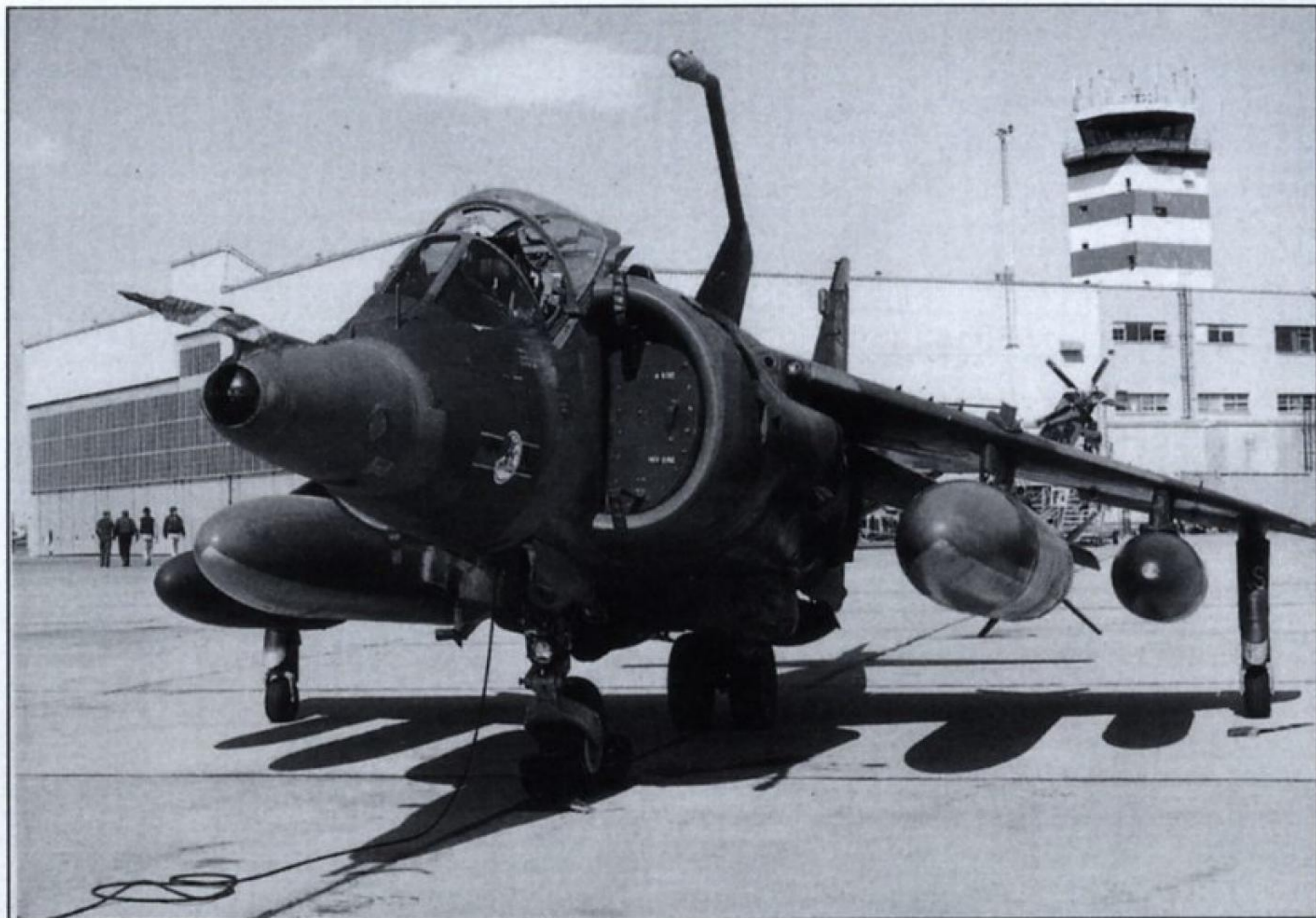
A pair of US Marine Corps AV-8B Harrier II Plus aircraft of VMA-542. (McDonnell Douglas via Gary Madgwick)



A Harrier GR.5 of No. 1 Squadron, RAF, firing a Sidewinder missile. (British Aerospace)



Two Sea Harrier FA.2s of 899 Squadron, Royal Navy. (British Aerospace via Gary Madgwick)



**Left: A Harrier GR.3 of No. 3 Squadron at Cold Lake CFB, Canada, fitted with refuelling probe and external tanks ready for its return flight across the Atlantic. (MoD) Below left: A Harrier T.4 of No. 233 Operational Conversion Unit at RAF Wittering. (MAP)**

#### THE EARLY 1980s

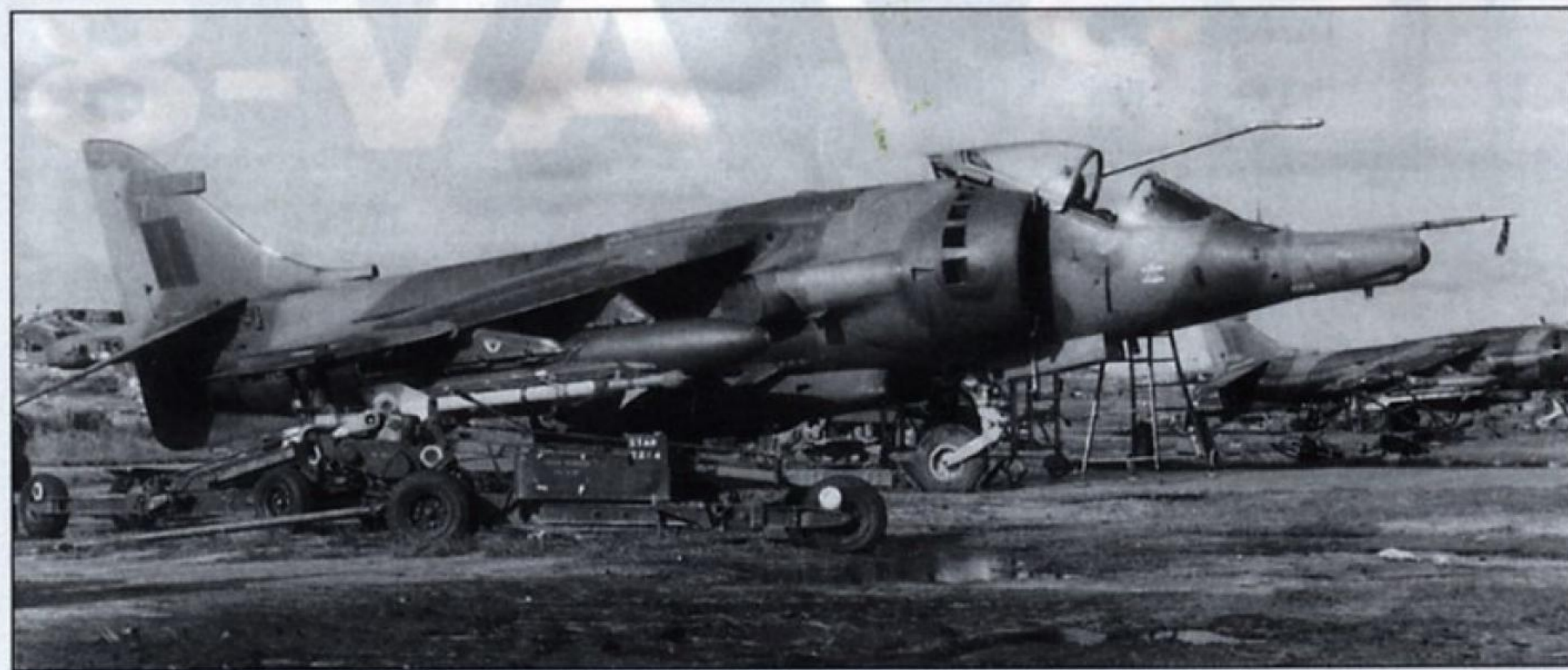
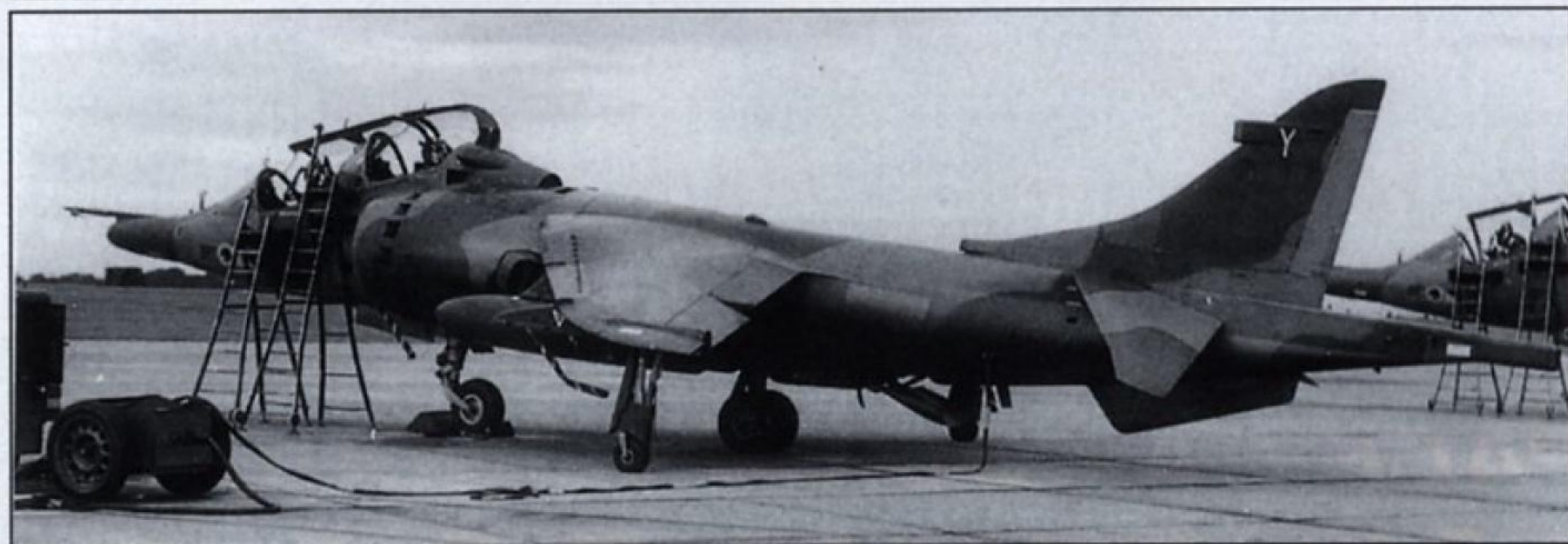
When the Harrier was first covered as an Aircraft in Detail subject in *Scale Aircraft Modelling* in September 1981, the design was at a critical stage in its history, the development of a second generation. In addition, within eight months of publication Royal Air Force and Royal Navy aircraft had proved the type's operational capabilities in the Falklands campaign, and more recently US Marine Corps machines saw first combat use in the 1991 Gulf War. This article picks up where the earlier one left off.

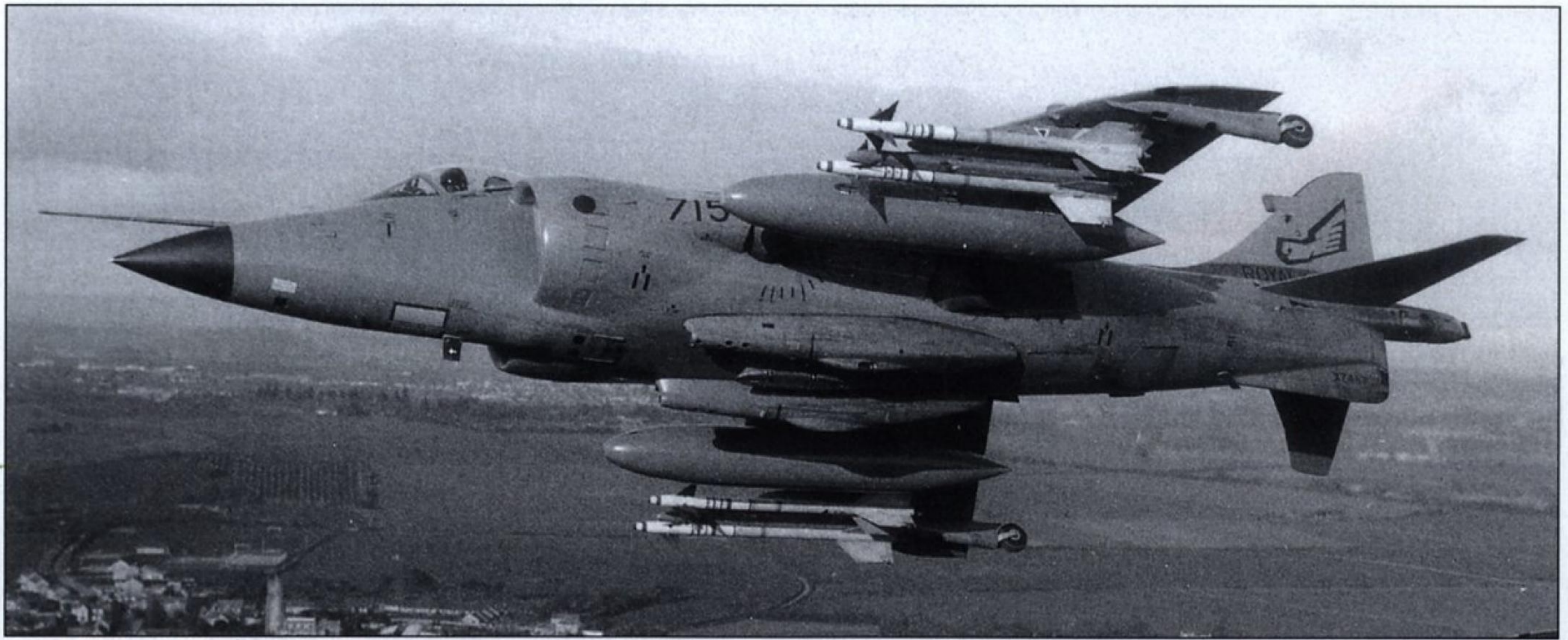
In late 1981, the Harrier was in service with four air arms in five main versions - the RAF GR.3 and T.4, the RN Sea Harrier FRS.1 and T.4, the USMC AV-8A/C and TAV-8A, and Spanish Navy VA.1 and VAE.1 Matador (equivalent to the AV-8A and TAV-8A respectively).

The RAF aircraft served with No. 233 Operational Conversion Unit and No. 1 Squadron at RAF Wittering, Nos. 3 and 4 Squadrons at RAF Gutersloh in Germany, and No. 1417 Flight in Belize, the latter operating a small number of the single-seat GR.3 only. Royal Navy units consisted of Nos. 800, 801 and 899 Squadrons at RNAS Yeovilton, the latter acting as the training unit with two-seat T.4s as well as FRS.1s.

USMC aircraft were assigned to three operational squadrons, VMAs-231 and -542 at MCAS Cherry Point, North Carolina, and VMA-513 at MCAS Yuma, Arizona, all with a mix of AV-8As and Cs, the latter an upgraded A model with some of the systems improvements of the AV-8B then under

**Left: Seen at Port Stanley Airport, this pair of Harrier GR.3s armed with Sidewinders were part of the Harrier Detachment (HarDet) providing air defence for the Falkland Islands after the 1982 conflict. (Alan W. Hall) Below: Three Harrier GR.3s of No. 1417 Flight based in Belize. (MoD)**





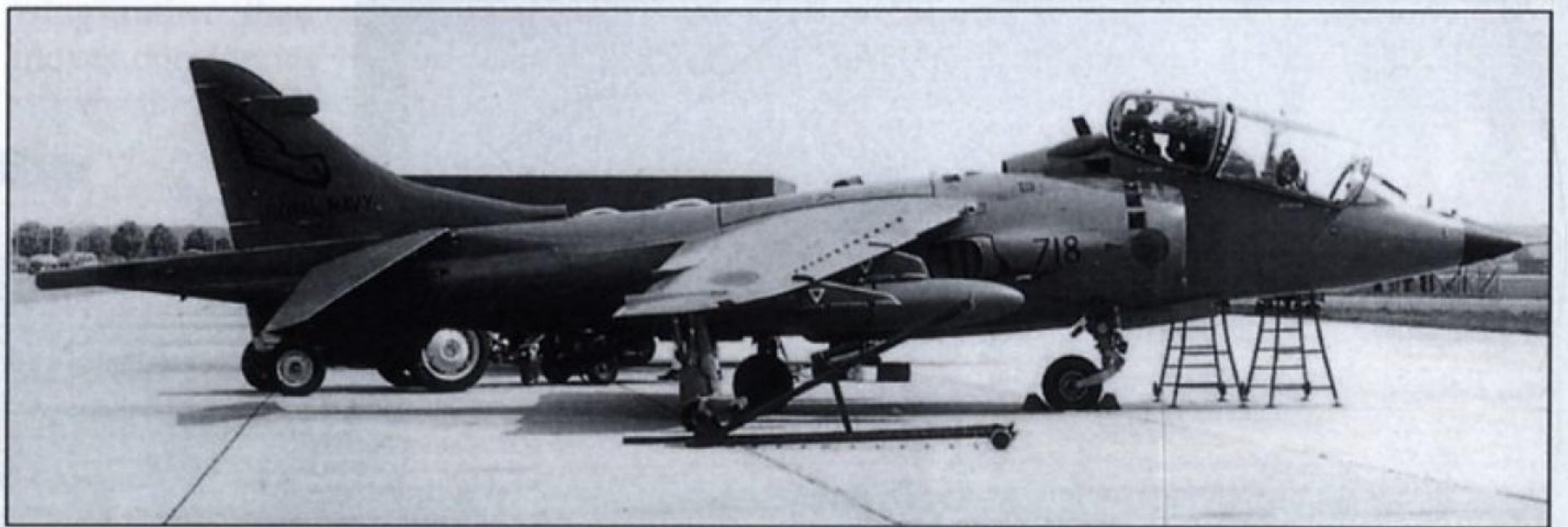
**Above: This Sea Harrier FRS.1 of 899 Squadron is fitted with the twin AIM-9L Sidewinder missile rails adopted during the Falklands campaign. (British Aerospace) Right: A Sea Harrier FRS.1 of 801 Squadron seen at RNAS Yeovilton. (MAP) Below right: A 899 Squadron Harrier T Mk.4N, which despite its black-painted nose, was not fitted with the Blue Fox radar, that training being conducted in specially-equipped Hunter T.8Ms (MAP)**



development. Training was conducted by VMAT-203, also based at MCAS Cherry Point, which operated the two-seat TAV-8As alongside the single-seat AV-8As and Cs.

The Spanish aircraft, 11 VA.1 and two VAE.1 Matadors, were flown by Escuadrilla 008, shore-based at Rota, and deployed at sea aboard the aircraft carrier *Dedalo*.

In addition, the Indian Navy had ordered the Sea Harrier, originally planning to take up to 48 examples, eventually reduced to just 23 acquired in three batches. The first of six single-seat Mk. 51s and a pair of two-seat Mk.60 trainers were delivered to RNAS Yeovilton in late 1982, where they remained



**Below: This Sea Harrier FRS.1 ZD580, one of three post-Falklands attrition replacement aircraft, is seen undergoing fitting of equipment at Dunsfold prior to delivery, and reveals some very useful detail of its access panel locations and their internal features. (MoD)**

for a year undergoing training before half departed for India, followed by the rest some six months later.

Six months before the Indian aircraft came off the Dunsfold production line, the Harrier underwent the ultimate test - actual combat operations.

#### INTO ACTION

On 2 April 1982, Argentine forces landed in the Falkland Islands. The British Task Force despatched to retake possession included Harriers, in both RN FRS.1 and RAF GR.3





Above: One of a handful of AV-8Bs assigned to the Naval Air Test Center at Patuxent River for development work, this brightly-coloured example was one of the four pre-series Full-scale Development aircraft. (Scott Van Aken)



Seen back on the ramp at MCAS Cherry Point, North Carolina, this AV-8B of VMA-231 wears the two-tone grey scheme applied to Harrier IIs deployed for Operation Desert Storm. (Scott Van Aken)



An AV-8B Harrier II of VMAT-203, the USMC Harrier training squadron based at MCAS Cherry Point. (Scott Van Aken)



A Night Attack AV-8B of VMA-214 in one of a number of variations to the low-visibility grey scheme. (Scott Van Aken)



This AV-8B of VMA-311 is finished in a low-visibility grey scheme adopted by the Harrier force after the Gulf War. (Scott Van Aken)



A Harrier GR.5 of No. 233 OCU in the overall green finish applied to all the RAF second-generation aircraft. (Scott Van Aken)



Above: One of a number of No. 4 Squadron Harrier GR.7s to display the squadron flash across the entire fin. (Scott Van Aken)  
Below: This Harrier GR.7 wears the overall grey scheme progressively being applied to RAF front-line aircraft. (Scott Van Aken)





**Above: Two AV-8As of VMA-231, seen during one of the unit's frequent deployments to Europe for NATO exercises between 1978 and 1984. (MAP) Right: Quite familiar on RAF aircraft, this VMA-231 AV-8A wears snow camouflage applied for an exercise in Norway. (Gary Madgwick)**

guises - the only fixed-wing aircraft able to operate from the available ships, the first of the new class of 'through-deck cruisers' *HMS Invincible*, and the commando carrier *HMS Hermes*. 800 Squadron embarked on the latter whilst 801 Squadron boarded *Invincible*, both squadrons having their own Sea Harrier complements increased by the addition of aircraft from 899 Squadron and storage. As they sailed south, gloss grey and white finishes were replaced with overall semi-matt Extra Dark Sea Grey, national insignia were 'toned-down', and all unit markings removed.

Back in the UK, a hastily-formed 809 Squadron received almost all the other Sea Harriers in the inventory, these aircraft being repainted in a two-tone Medium Sea Grey and Mixed (Barley) Grey finish with low-visibility markings. Meanwhile, at RAF Wittering, No. 1 Squadron prepared 14 GR.3s for deployment, and at the end of April aircraft of both units began the long ferry flight to Ascension Island where they boarded the ill-fated *Atlantic Conveyor* for the rest of the journey south.

New paint finishes were not the only changes made, there being a considerable number of modifications to machines of both services. Not least of these was enabling the **Right: A VA.1 Matador, also known as the AV-8A(S), of the Spanish Navy's Escuadrilla 008. These aircraft remain in service alongside the EAV-8Bs acquired in 1987. (MAP) Below: One of Escuadrilla 008's two VAE.1 two-seat trainers. (British Aerospace via Gary Madgwick)**



Sea Harriers to use the then latest version of the Sidewinder missile, the AIM-9L, and also to carry the weapon in pairs under each wing rather than singly, both significant moves considering the air defence role with which the type was primarily tasked. In addition, Navy machines were cleared to carry some RAF ground-attack munitions, and RAF aircraft were adapted to carry RN rocket pods, equipped to carry Paveway laser-guided bombs, and received an self-defence capability with fittings for AIM-9G Sidewinders.

The exploits of the Harriers during Operation Corporate are well documented, and it is widely recognised that, particularly without the Navy aircraft to protect the Task Force from Argentinian air attack, success of the entire venture would have been doubtful. Sea Harriers destroyed no less than 27 Argentinian aircraft in the air, and also flew a large number of ground-attack sorties. The Harrier GR.3s concentrated on ground-attack missions, including close air support for advancing troops, their involvement in the battle at Goose Green being a classic





**One of the two YAV-8B prototypes, clearly showing both the retention of the original cockpit position and the double set of inlet suction relief doors. (via Gary Madgwick)**

case of the latter which was specifically mentioned in a Government White Paper issued some months later. The success of the Harrier in combat was not without casualties though, with six Sea Harriers being lost, two to Surface-to-Air missiles, two in a mid-air collision, and two in accidents, along with four GR.3s, three to ground fire and one in an accident.

### NEXT GENERATION

Both Hawker-Siddeley and McDonnell Douglas, who had become the American associate contractor, had plans to improve the Harrier. As early as 1973 a joint Advanced Harrier programme had been undertaken, but the costs of both airframe and engine development led to the proposed AV-16A being abandoned.

However, following up on the technical achievements of the joint venture, McDonnell Douglas evolved a new design configuration, which incorporated a wing constructed from composite materials and promised most of the AV-16's capabilities without the need to develop a new engine. After full-scale wind-tunnel, structural and flight tests using two prototypes under the

designation YAV-8B, the design went into full scale production as the AV-8B Harrier II.

The most obvious change to the aircraft was the new wing, with approximately a 20 per cent increase in span, 14½ per cent more area and Leading-Edge Root Extensions (LERX). The outrigger wheels were repositioned from the wingtips to a point almost at mid-span, whilst the internal fuel capacity was increased by 50 per cent over the earlier version to more than 7,750lbs. The number of wing stores stations was increased to six, capable of carrying more than 9,000lbs of ordnance in the form of air-to-ground weapons including up to 16 MK-82 bombs, six MK-83 bombs, four AGM-65 Maverick missiles, 12 rocket pods, or six AIM-9 Sidewinder air-to-air missiles for combat air patrol or armed escort missions, as well as for self-defence. To increase operational range, two 300-gallon external fuel tanks could be carried (four for ferry purposes), and provision for inflight-refuelling was retained using a redesigned bolt-on probe fitted to the top of the port air intake.

The fuselage retained much greater commonality, particularly on the two prototype YAV-8Bs, though on production aircraft the cockpit was raised for improved vision. The

tip of the nose housed a Hughes AN/ASB-19 Angle Rate Bombing Set (ARBS) for target acquisition and tracking, linking a dual TV/laser target seeker to the cockpit Head-Up Display (HUD) via computer, ensuring extremely accurate weapons delivery. Though they looked similar to the first generation type, the engine intakes were redesigned, the first 16 aircraft having two sets of inlet suction relief doors for the Pegasus F402-RR-404 engine. Introduction of the improved F402-RR-406 saw this arrangement revert back to one row of eight.

Under the fuselage, a pair of pods housed a single General Electric GAU-12/A 25mm cannon on the port side, with 300 rounds of ammunition contained in the starboard unit, with a connecting fairing carrying the rounds to the gun. The AV-8B entered service with VMAT-203, the Harrier training squadron, in 1984, with the first operational unit, VMA-331, receiving its aircraft to replace its A-4 Skyhawks in 1985. A further seven squadrons eventually received the Harrier II, three having previously flown the AV-8A and C, and the others the Skyhawk.

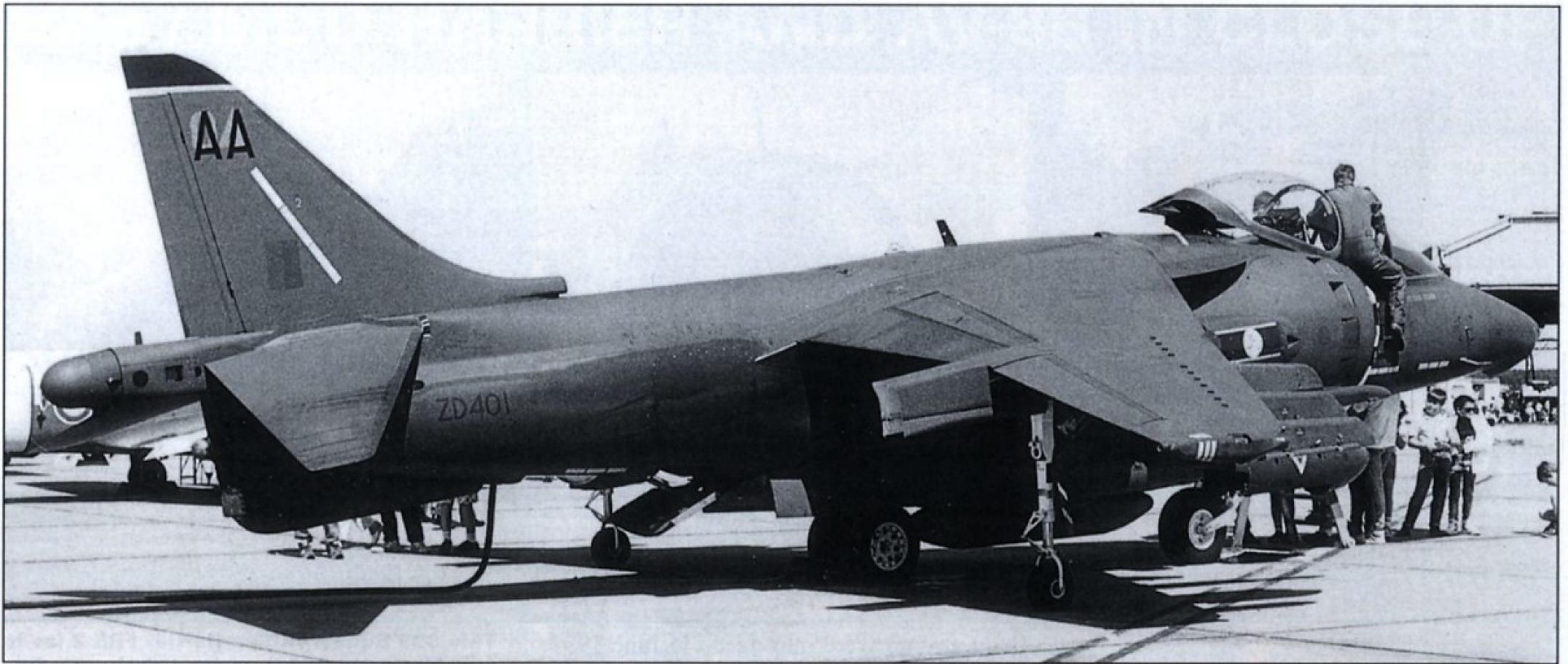
### BIG WINGS FOR THE RAF

British Aerospace at Kingston had also been working on a 'Big Wing' version of the Harrier, for the RAF, but funding and other considerations presented difficulties, the project eventually focussing on a proposed rebuilding of existing GR.3 airframes as the GR.5 with a larger wing and revised forward fuselage. In 1982, however, an agreement between BAe and McDonnell Douglas to share in production of future Harriers led to the idea being dropped in favour of entirely new aircraft based on the AV-8B.

Still known as the GR.5, the new RAF version differed from USMC machines mainly in only minor aspects, such as the substitution of the Stencel ejection seat by

**Left: An AV-8B Harrier II of VMA-331, the first operational squadron to receive the type, in 1985, and the only USMC Harrier unit to have since been dis-established, in 1992. (McDonnell Douglas) Below: One of VMAT-203's TAV-8B two-seat trainers. (via Gary Madgwick)**





Seen here in at RAF Kinloss 1989 is the first Harrier GR.5 supplied to No. 3 Squadron, showing the traces of its former No. 1 Squadron codes under the newly-applied AA codes on the fin. (MAP)

the Martin-Baker Mk.12, replacement of some American avionics, and fitting of an extra wing pylon forward of each outrigger fairing for carriage of self-defence AIM-9 Sidewinder missiles. The powerplant was essentially identical to that of the AV-8B, though designated as the Pegasus 105 instead, and it had a digital control system from the outset, a feature which was retrofitted to US aircraft. Other modifications to the aircraft included a higher bird-strike resistance by the use of a thicker windscreen and reinforced leading edges, features which, along with British internal systems and the extra wing pylons, contributed to an increase in the aircraft's weight over its American counterpart.

The first of 60 GR.5s were delivered in 1987 to RAF Wittering and the Harrier Conversion Team, an establishment set up for engineering evaluation and familiarisation, the first aircraft assigned for flying duties not being issued to No. 233 OCU until the following year. No. 1 Squadron became the first operational user of the type in late 1989, followed by No. 3 Squadron some six months later, in April 1990. The type's service life was to be much shorter than anticipated, however, following the decision that all RAF Harriers would be to the later, more capable GR.7 standard. The final 18 production aircraft were accordingly built as GR.5As with provision for GR.7 avionics and placed straight into storage to await full conversion, the GR.5s already in service being upgraded to GR.7 standard by 1994.

#### NIGHT ATTACK AND DESERT STORM

The first 162 AV-8B Harrier IIs delivered to the US Marine Corps were all solely day-

**Above right: Seen in 1995, this Harrier GR.7 of No. 1 Squadron carries the unit fin-tip marking applied in similar fashion to those worn by aircraft of other squadrons. (Gary Madgwick) Right: This Harrier T.10 flown by No. 233 OCU wears the markings of No. 20 Squadron, its 'shadow' identity, on the intake sides. (Gary Madgwick)**

attack aircraft, but the following 66 were built with night-attack capability, through the incorporation of a GEC Forward-Looking Infra-Red (FLIR) system mounted on the nose ahead of the windscreen. A number of cockpit equipment changes were also made in conjunction with the installation of the FLIR, including Head-Down Display (HDD) and digital colour moving map, an improved HUD, and provision for the use of GEC Cat's Eyes Night Vision Goggles (NVGs). The first of these new aircraft known, unofficially, as both the Night Attack AV-8B and Night Attack Harrier II, went to VMA-214 in September 1989.

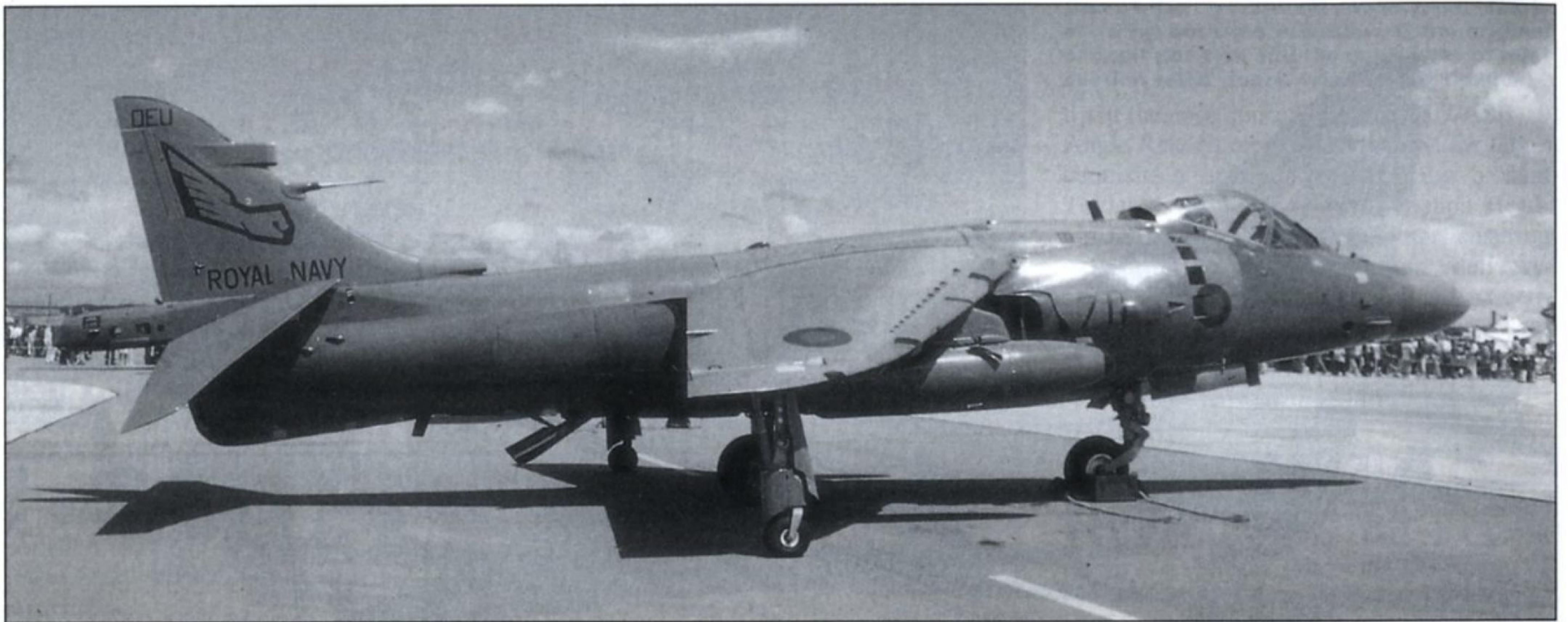
The RAF equivalent to the Night Attack AV-8B was the GR.7, which has an identical night/bad weather attack capability using the same FLIR equipment, but attached to Ferranti Night-Owl NVGs in place of the American items. The first production versions were delivered for operational testing and evaluation in mid-1990, followed by the first service aircraft in September of that year, going to No. 4 Squadron in Germany to replace its GR.3s. No. 3 Squadron took

delivery of its first GR.7s two months later, but it was to be almost another two years before No. 1 Squadron was finally re-equipped with what is almost certainly the definitive RAF version of the aircraft it has flown since 1969.

Though RAF Harriers were not involved in the 1991 Gulf War, Operation Desert Storm saw expeditionary air operations performed by US Marine Corps AV-8Bs. The Harrier II was the first USMC tactical strike aircraft to arrive in the region, with three squadrons, totalling 60 aircraft, and one six-aircraft detachment operating ashore from an expeditionary airfield, while one squadron of 20 aircraft operated from a sea platform. During the ground war, the Harriers were based only 40 miles from the Kuwait border, making them the most forward deployed tactical strike aircraft in theatre. They flew 3,380 sorties for a total of more than 4,000 flight hours, maintained a mission capable rate in excess of 90 percent, and achieved an average turnaround time during surge rate flight operations of 23 minutes, an impressive combat debut for the type.







### FURTHER DEVELOPMENT

During Desert Storm, the Marine Corps found its overall night/all-weather capability to be deficient, and took appropriate steps to rectify the situation through the introduction of a new variant, the AV-8B Harrier II Plus, along with a long-range remanufacturing programme of a considerable number of early AV-8B airframes over the next several years to the same standard.

Featuring the Hughes APG-65 radar as fitted to the F/A-18, along with all previous systems and features common to the Night Attack AV-8B, the Harrier II Plus is powered by the latest version of the Pegasus engine, F402-RR-408, which provides up to 15 per cent more thrust at high ambient temperatures, plus benefits of reduced maintenance and twice the hot-end life of earlier versions. The APG-65 gives the aircraft compatibility with the AIM-7 Sparrow and AIM-120 AMRAAM for beyond-visual-range (BVR) air-to-air engagements, and it also permits anti-shipping operations using the AGM-84 Harpoon missile. A 300-round capacity GAU-12 25mm six-barrel gun pod can be mounted on the fuselage centreline station, with a Lead Computing Optical Sight System (LCOSS) gunsight for both air-to-air and air-to-surface use. The first of 27 new-

build aircraft were introduced in June 1993.

The ongoing re-manufacture programme for selected early Harrier IIs in the inventory mates a new fuselage and night-attack cockpit with a used day-attack wing and tailplane set, whilst the Pegasus F402-RR-406 engine is replaced with the -408, providing increased thrust and reliability, and the ARBS is replaced with the APG-65 radar and a navigation FLIR, along with a moving map and NVGs, giving the same day and night/bad weather attack capability of the Night Attack Harrier II. The programme will extend the service life of the aircraft into the next century as well as greatly improving their combat capability.

### HARRIERS AT SEA

Installation of a new radar system was the main feature of a totally separate rebuild programme in 1985, when British Aerospace began the mid-life upgrade of the Royal Navy's Sea Harrier FRS.1s to FRS.2 standard. Two aircraft were used as prototypes, with the first flight taking place in September 1988, and a contract was soon awarded for the conversion of 31 FRS.1 airframes to the new standard.

Changes included were a larger nose radome to house a GEC-Marconi Blue Vixen radar, replacing the previous Blue Fox unit.

**This 899 Squadron Sea Harrier FRS.2 (as it was known in 1993) wears a dark grey finish with black titling and darker shade roundels, in direct contrast to the scheme seen on page 524. (Gary Madgwick)**

Blue Vixen allows engagement of multiple targets at longer ranges, as well as improved surface target acquisition. Up to four AIM-120 AMRAAMs can be carried on the outboard launch rails, with the provision for two more in place of the removable ventral gun pods. The cockpit has been redesigned with the relocation of major weapon system controls to the Hands-On Throttle and Stick (HOTAS) control column, and new visual displays include dual multi-purpose HDDs to complement the existing HUD.

The Sea Harrier FRS.2 was redesignated as the FA.2 in 1994, by which time two orders had been placed for a total of 28 new-build aircraft, the second order also covering five final FRS.1 conversions. The FA.2 first saw duty in 1995 over Bosnia as part of the British commitment to Operations Deny Flight and Sharp Guard, operating from Royal Navy carriers in the Adriatic.

By 1989 and the entry into service of the aircraft carrier *Principe de Asturias*, the Spanish Navy had already enlarged its Harrier force by the addition of 12 EAV-8Bs, deliveries of which took place in 1987, and during 1992 a further 14 aircraft were ordered, one a two-seat TAV-8B and the rest the Harrier II Plus, the existing EAV-8Bs to be brought up to the same standard.

In 1989, the Italian Navy became the fifth customer of the Harrier, when it ordered two TAV-8Bs which were delivered in 1991, followed by orders and delivery of 16 AV-8B Harrier II Plus aircraft for operations from the carrier *Giuseppe Garibaldi*.

A potential sixth operator is the Thai Navy, reported to be considering the AV-8B for use from its new helicopter carrier.

With over a quarter century of operational service and successful use in two conflicts behind them, two generations of Harriers have proved their abilities - and the story isn't over yet.

**Above left: This Spanish Navy EAV-8B heads a line of older VA.1 Matadors shortly after delivery. (Rolls-Royce) Left: This TAV-8B is one of two acquired by the Italian Navy for training pilots assigned to fly the single-seat AV-8B Harrier II Plus (McDonnell Douglas via Gary Madgwick)**



# BAe / MDD HARRIER AND AV-8B IN CLOSE-UP



Access to the Harrier GR.7 is by way of a wheeled boarding ladder. (Gary Madgwick)



Front cockpit of the China Lake TAV-8B seen on the front cover. (Neville Dawson)



Detail of the Martin-Baker Mk. 12 ejection seat in British aircraft. (Gary Madgwick)



The outer wing pylons with an inert bomb and Sidewinder missile and launch rail on a No. 4 Squadron GR.7. (Gary Madgwick)



Nose of the China Lake TAV-8B, showing to good effect the side-ways-opening canopies of the two-seat aircraft. (Neville Dawson)



Port air intake area of a No. 4 Squadron GR.7, showing clearly the optional inflight-refuelling probe. (Gary Madgwick)



Starboard rear fuselage of a GR.7. Visible are the airbrake, ventral strake and the aft exhaust nozzle. (Gary Madgwick)



Close-up of the tail of an AV-8B Harrier II. Visible at the extreme right is part of the starboard chaff dispenser. (Scott Van Aken)



Nose area of an AV-8B, showing the ARBS seeker in the tip, and the FLIR unit fitted to the Night Attack aircraft. (Scott Van Aken)

# British Aerospace / McDonnell Douglas Harrier / AV-8 camouflage and markings

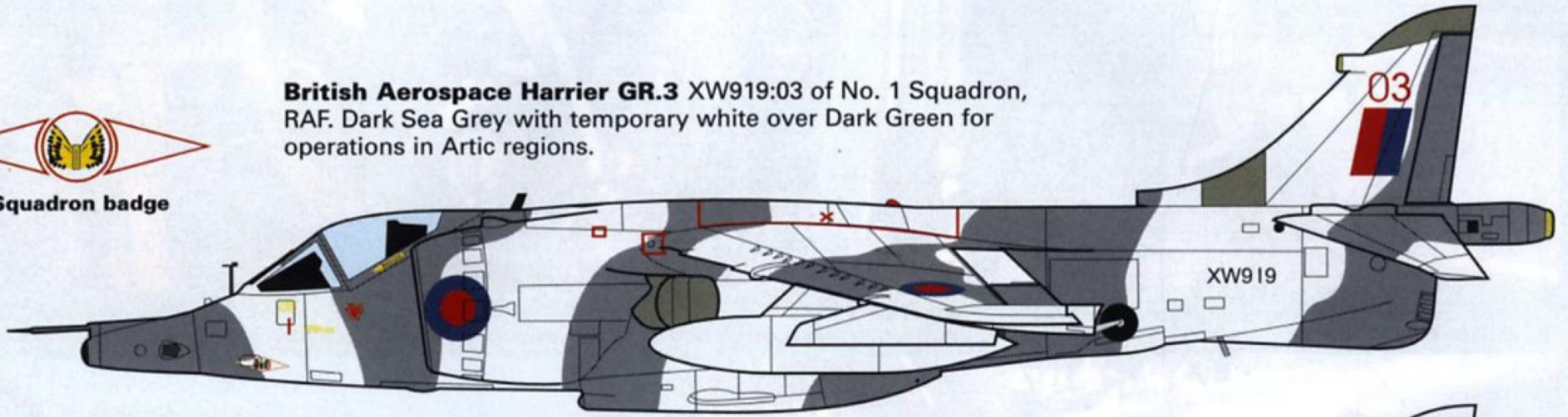
Artwork by Iain Ogilvie

## HARRIER / AV-8 COLOUR KEY



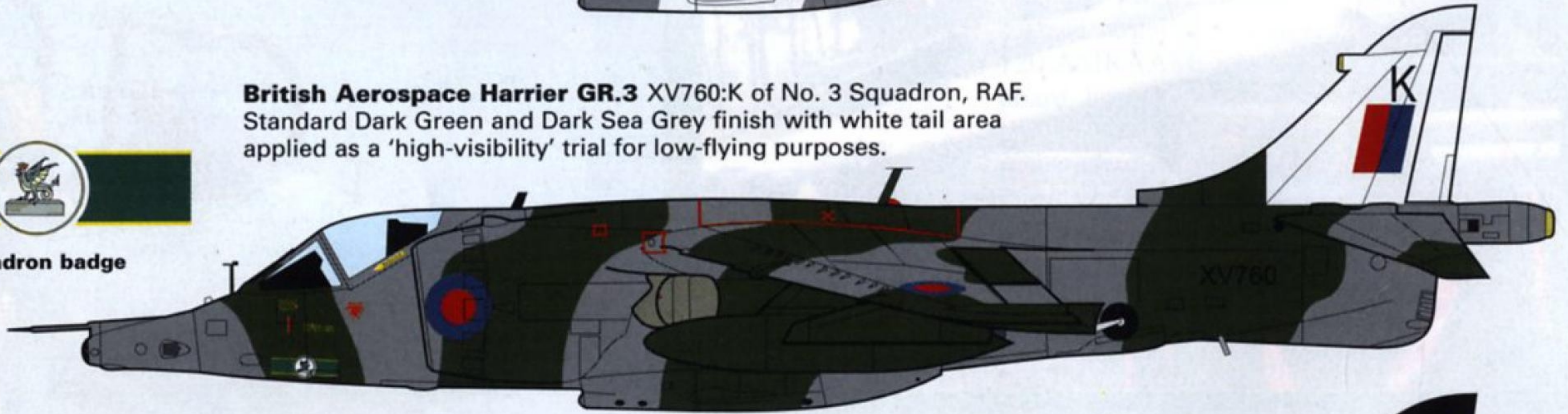

No.1 Squadron badge

**British Aerospace Harrier GR.3** XW919:03 of No. 1 Squadron, RAF. Dark Sea Grey with temporary white over Dark Green for operations in Arctic regions.



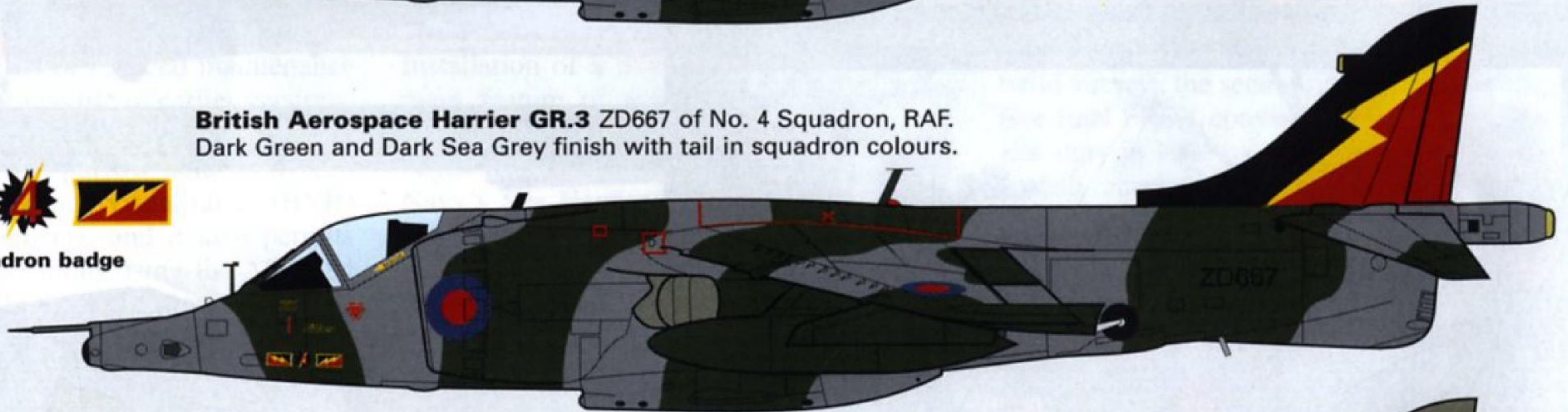
No.3 Squadron badge

**British Aerospace Harrier GR.3** XV760:K of No. 3 Squadron, RAF. Standard Dark Green and Dark Sea Grey finish with white tail area applied as a 'high-visibility' trial for low-flying purposes.



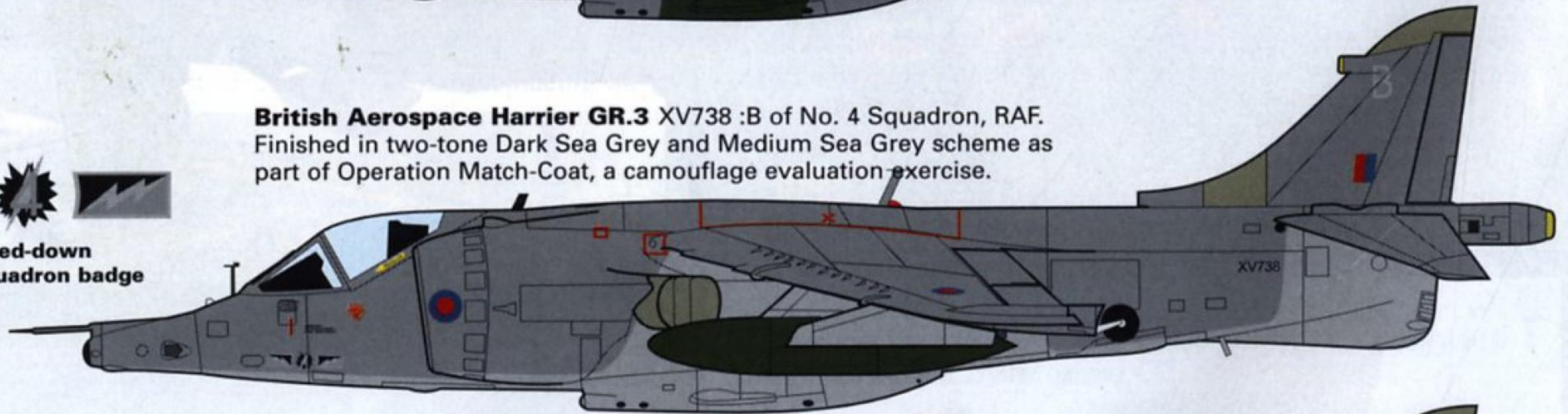
No.4 Squadron badge

**British Aerospace Harrier GR.3** ZD667 of No. 4 Squadron, RAF. Dark Green and Dark Sea Grey finish with tail in squadron colours.



Toned-down No.4 Squadron badge

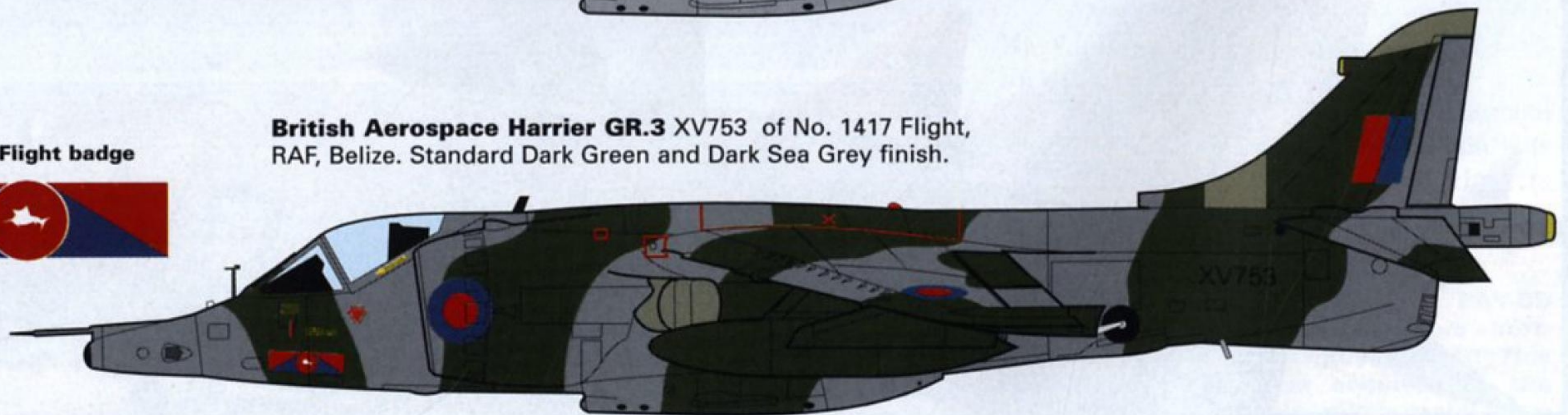
**British Aerospace Harrier GR.3** XV738 :B of No. 4 Squadron, RAF. Finished in two-tone Dark Sea Grey and Medium Sea Grey scheme as part of Operation Match-Coat, a camouflage evaluation exercise.



No.1417 Flight badge



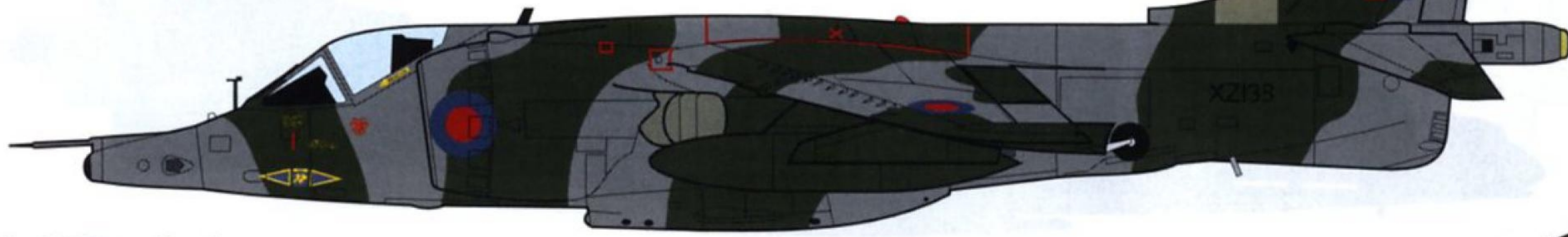
**British Aerospace Harrier GR.3** XV753 of No. 1417 Flight, RAF, Belize. Standard Dark Green and Dark Sea Grey finish.



No.1453 Flight badge



**British Aerospace Harrier GR.3** XZ138 of No. 1453 Flight, RAF, Falkland Islands. Standard Dark Green and Dark Sea Grey finish.



No.233 Operational Conversion Unit badge



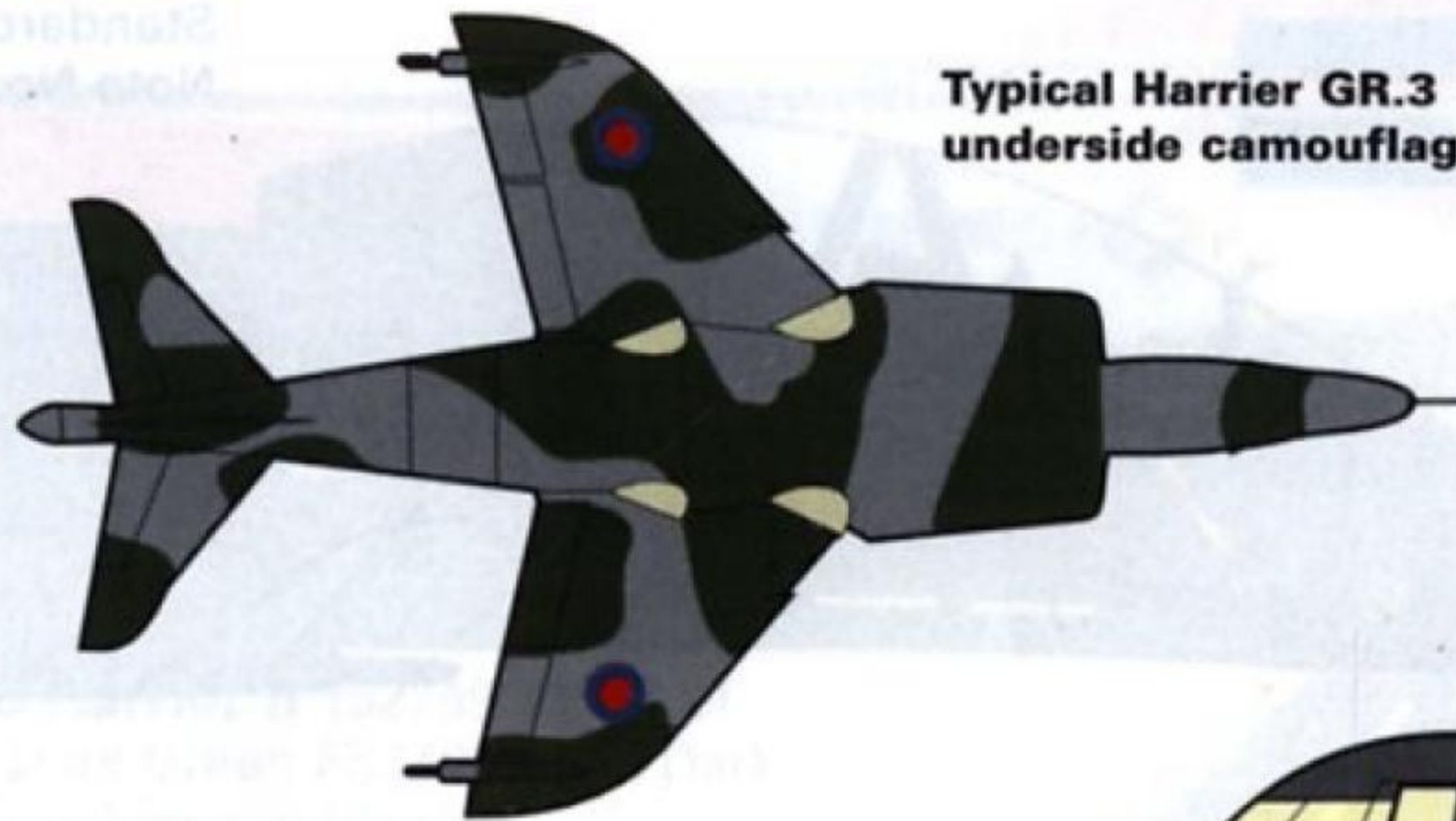
**British Aerospace Harrier T.4** XW934:W of No. 233 Operational Conversion Unit, RAF. Dark Green and Dark Sea Grey finish.



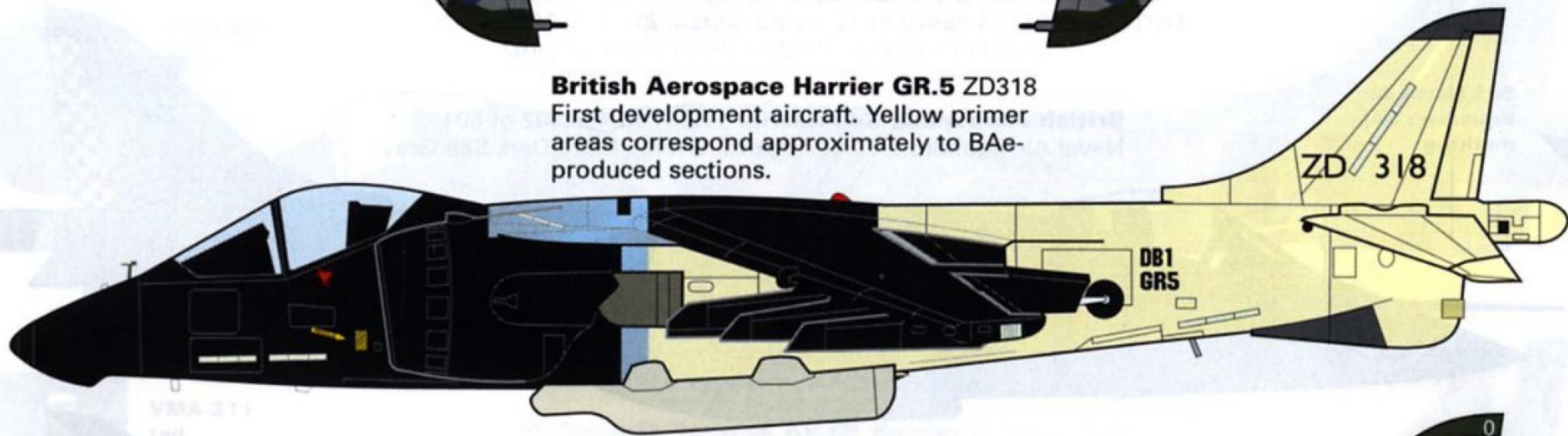
Typical Harrier GR.3  
uppersurface  
camouflage



Typical Harrier GR.3  
underside camouflage

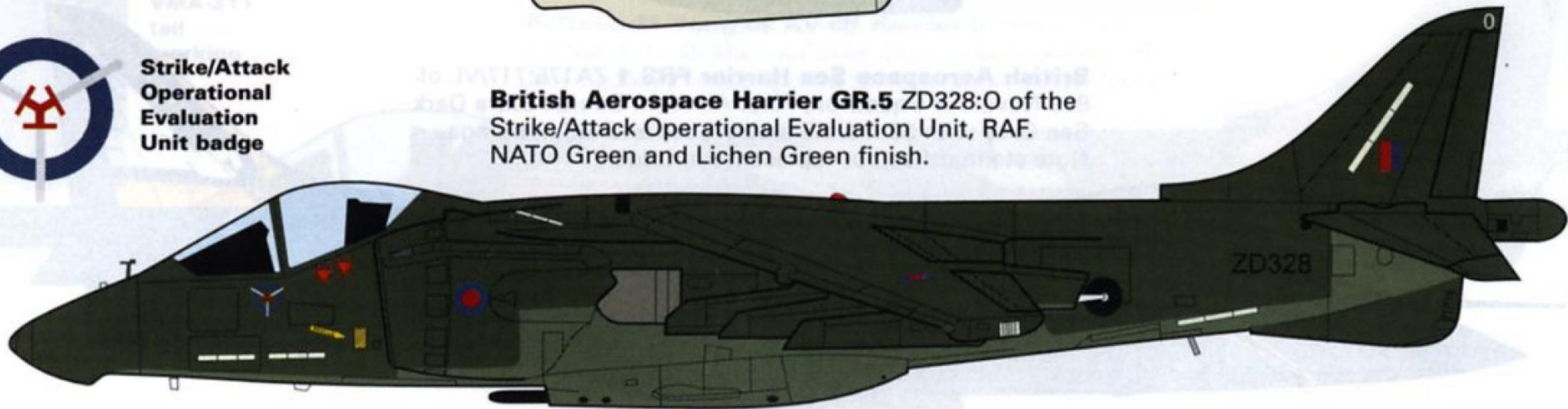


**British Aerospace Harrier GR.5** ZD318  
First development aircraft. Yellow primer  
areas correspond approximately to BAe-  
produced sections.



Strike/Attack  
Operational  
Evaluation  
Unit badge

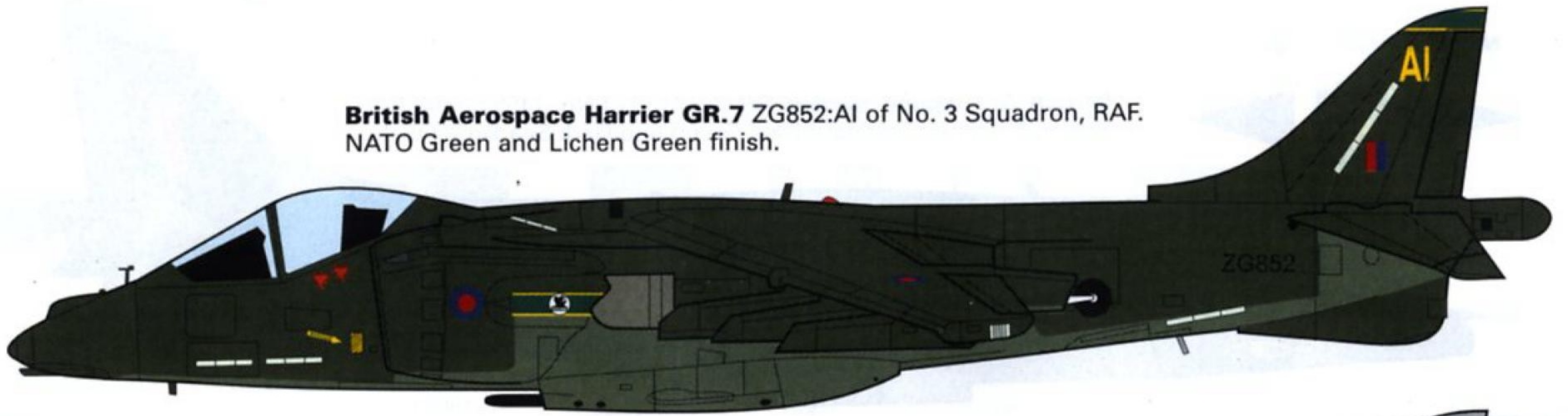
**British Aerospace Harrier GR.5** ZD328:O of the  
Strike/Attack Operational Evaluation Unit, RAF.  
NATO Green and Lichen Green finish.



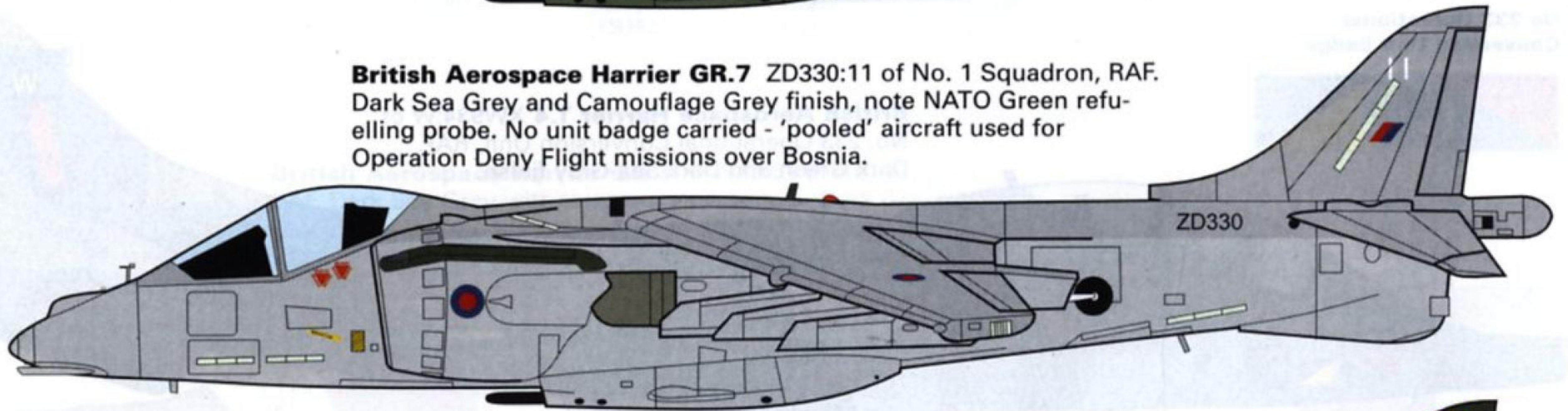
**British Aerospace Harrier GR.5** ZD355:01 of No. 1 Squadron,  
RAF. NATO Green and Lichen Green finish with temporary white  
areas for operations in Arctic regions.



**British Aerospace Harrier GR.7** ZG852:AI of No. 3 Squadron, RAF.  
NATO Green and Lichen Green finish.



**British Aerospace Harrier GR.7** ZD330:11 of No. 1 Squadron, RAF.  
Dark Sea Grey and Camouflage Grey finish, note NATO Green refuelling probe. No unit badge carried - 'pooled' aircraft used for Operation Deny Flight missions over Bosnia.



**No.20 Squadron badge**

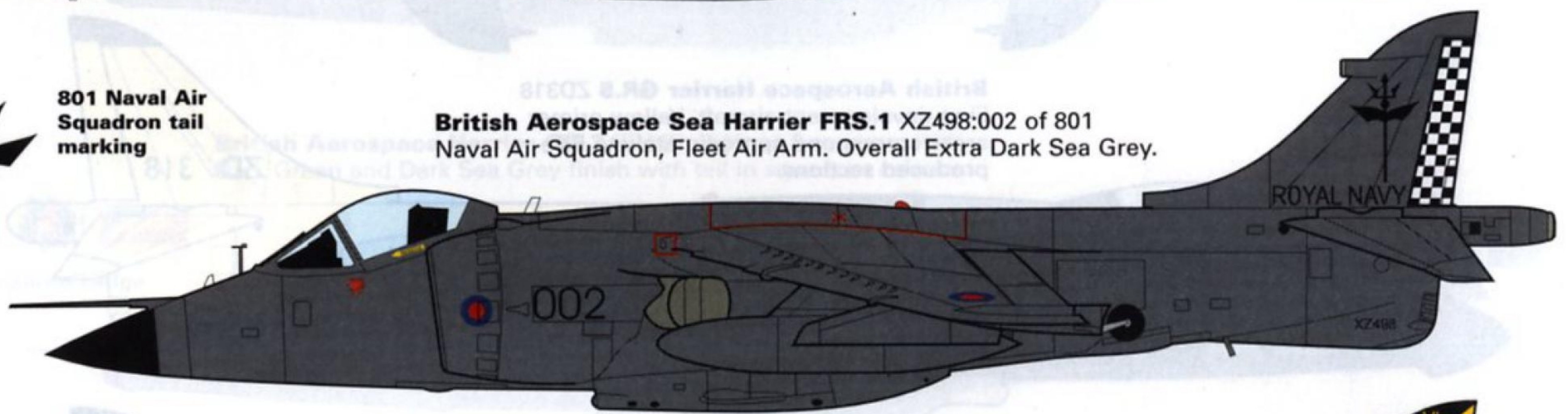


**British Aerospace Harrier T.10** ZH660:P of No. 233 Operational Conversion Unit, RAF.  
Standard NATO Green and Lichen Green finish. Note No.20 (Shadow) Squadron badge.

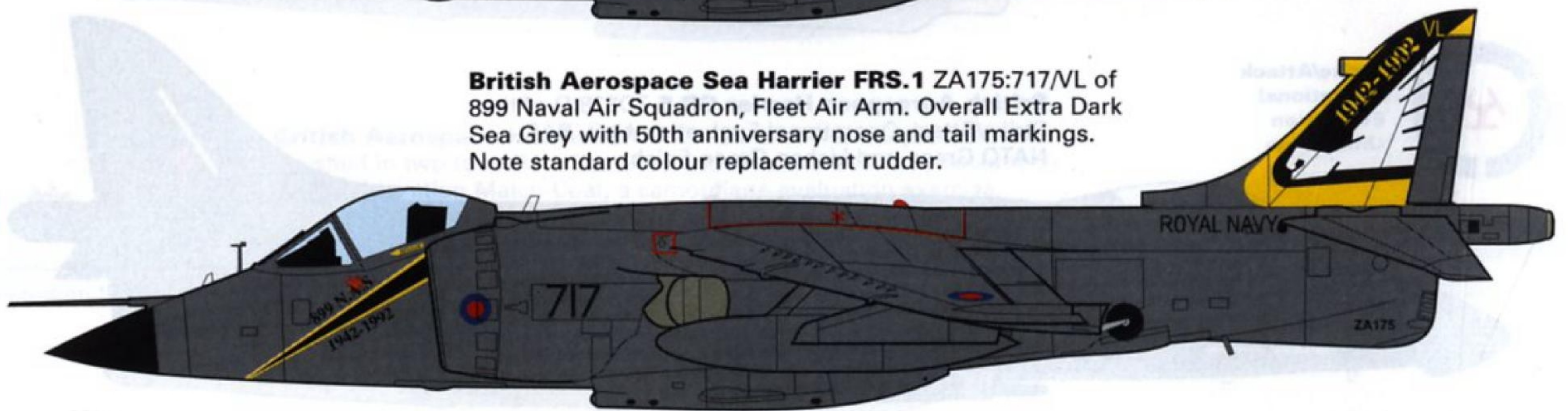


**801 Naval Air Squadron tail marking**

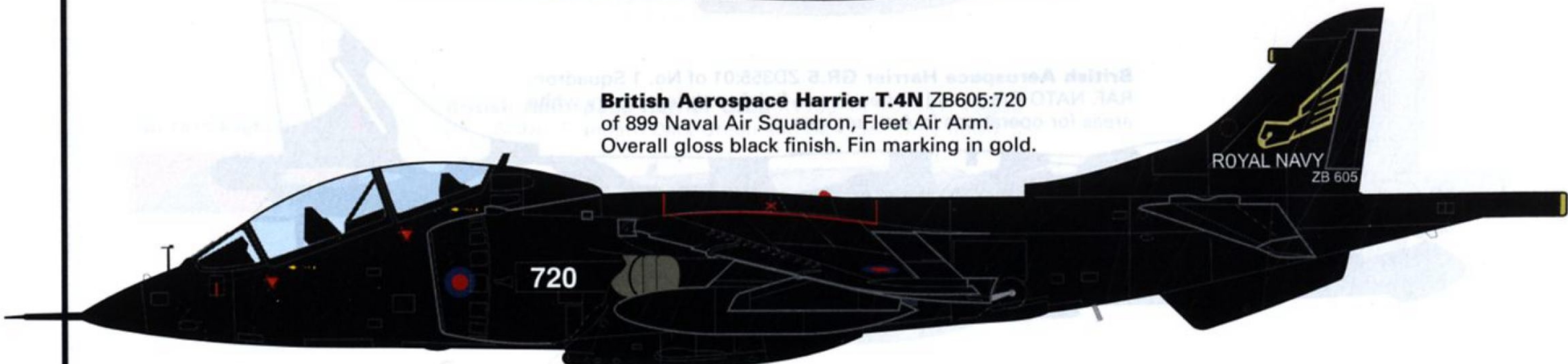
**British Aerospace Sea Harrier FRS.1** XZ498:002 of 801 Naval Air Squadron, Fleet Air Arm. Overall Extra Dark Sea Grey.



**British Aerospace Sea Harrier FRS.1** ZA175:717/VL of 899 Naval Air Squadron, Fleet Air Arm. Overall Extra Dark Sea Grey with 50th anniversary nose and tail markings. Note standard colour replacement rudder.



**British Aerospace Harrier T.4N** ZB605:720 of 899 Naval Air Squadron, Fleet Air Arm. Overall gloss black finish. Fin marking in gold.



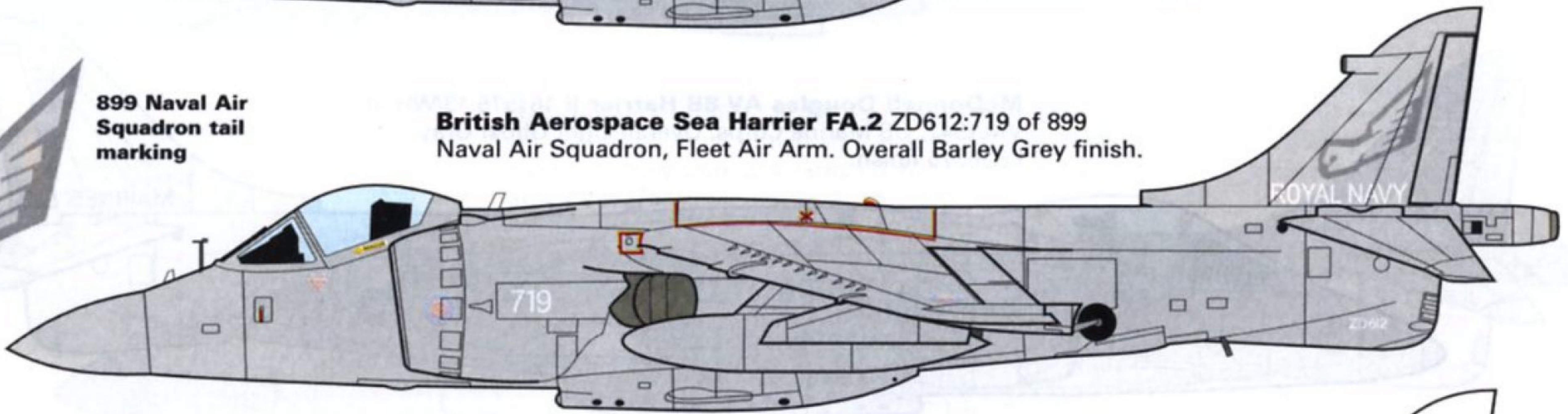
**British Aerospace Sea Harrier FA.2** ZD608:128 of 800 Naval Air Squadron, Fleet Air Arm. Overall Barley Grey finish. No unit markings carried - aircraft participating in Operation Deny Flight.



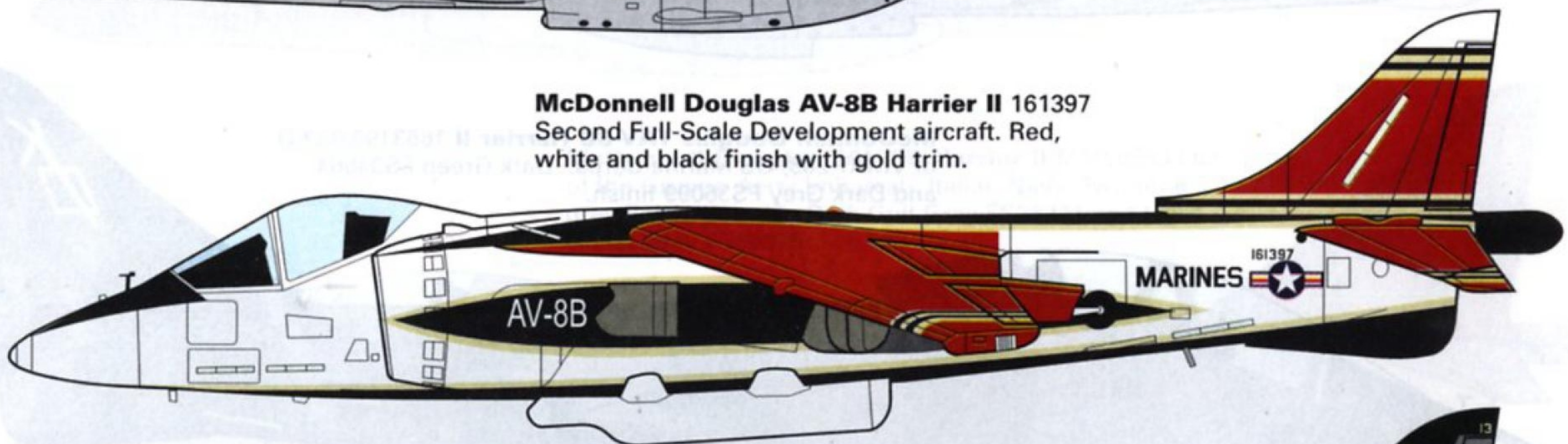
**899 Naval Air Squadron tail marking**



**British Aerospace Sea Harrier FA.2** ZD612:719 of 899 Naval Air Squadron, Fleet Air Arm. Overall Barley Grey finish.



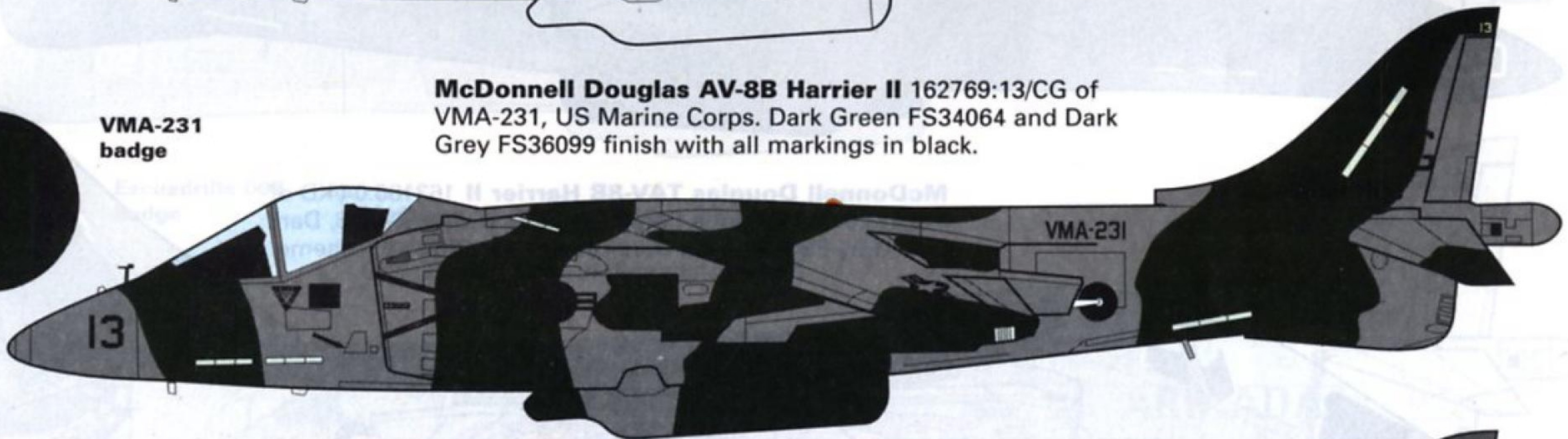
**McDonnell Douglas AV-8B Harrier II** 161397 Second Full-Scale Development aircraft. Red, white and black finish with gold trim.



**VMA-231 badge**



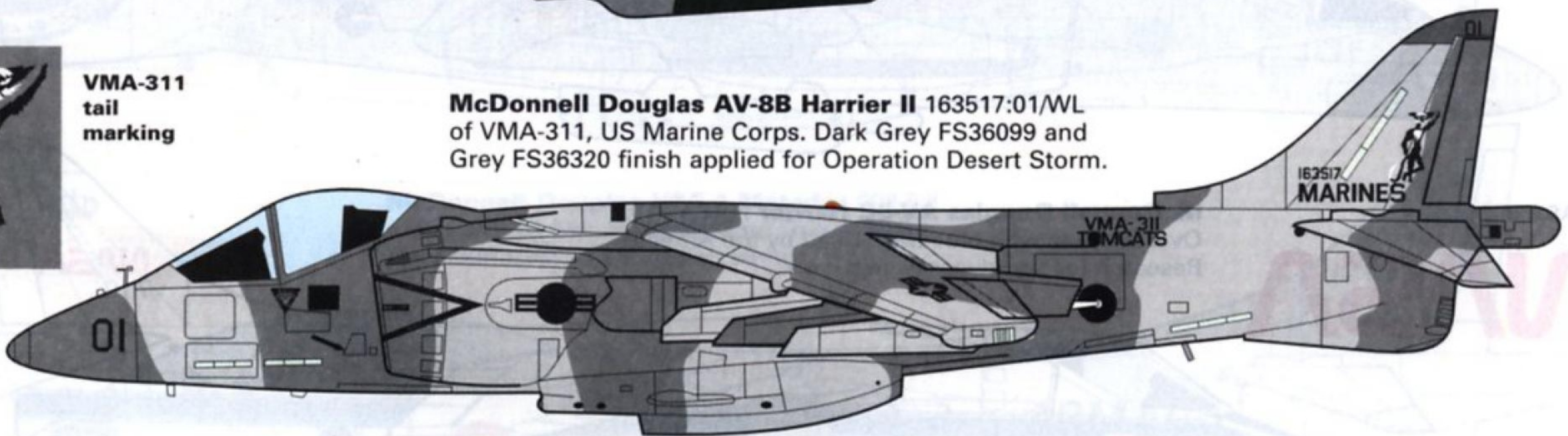
**McDonnell Douglas AV-8B Harrier II** 162769:13/CG of VMA-231, US Marine Corps. Dark Green FS34064 and Dark Grey FS36099 finish with all markings in black.



**VMA-311 tail marking**



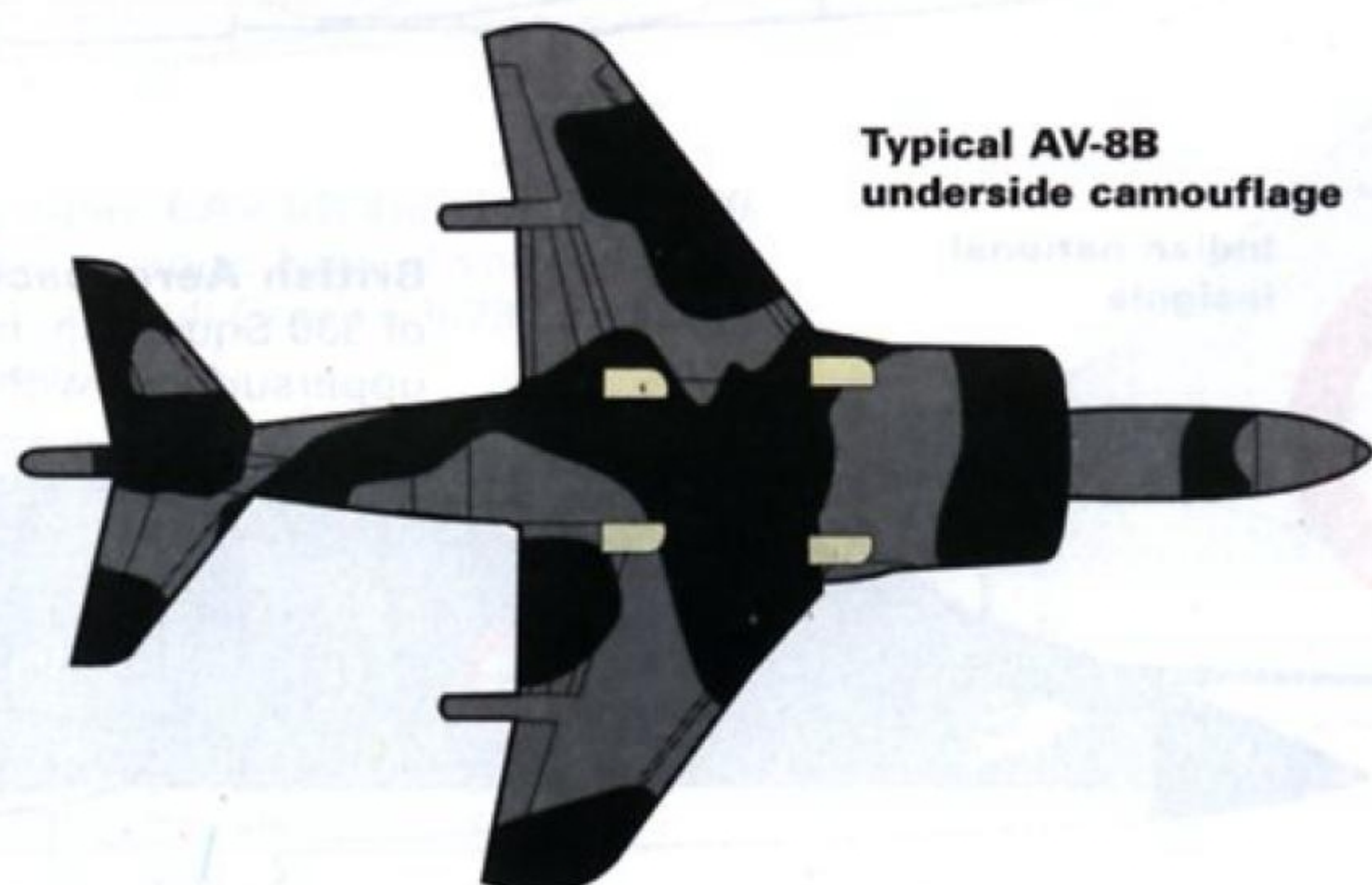
**McDonnell Douglas AV-8B Harrier II** 163517:01/WL of VMA-311, US Marine Corps. Dark Grey FS36099 and Grey FS36320 finish applied for Operation Desert Storm.



**Typical AV-8B uppersurface camouflage**



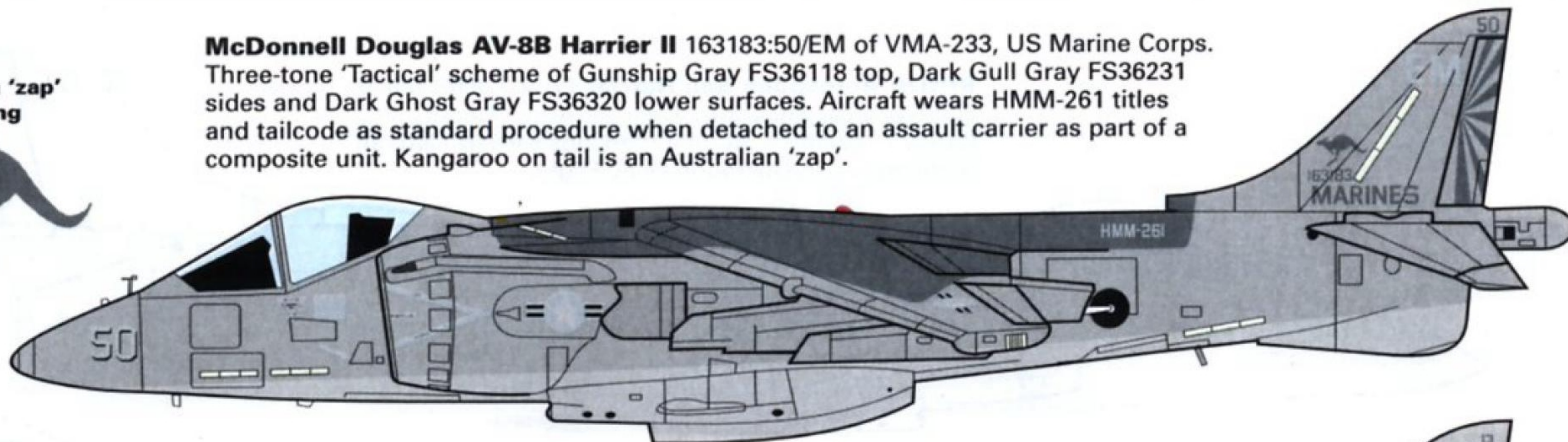
**Typical AV-8B underside camouflage**



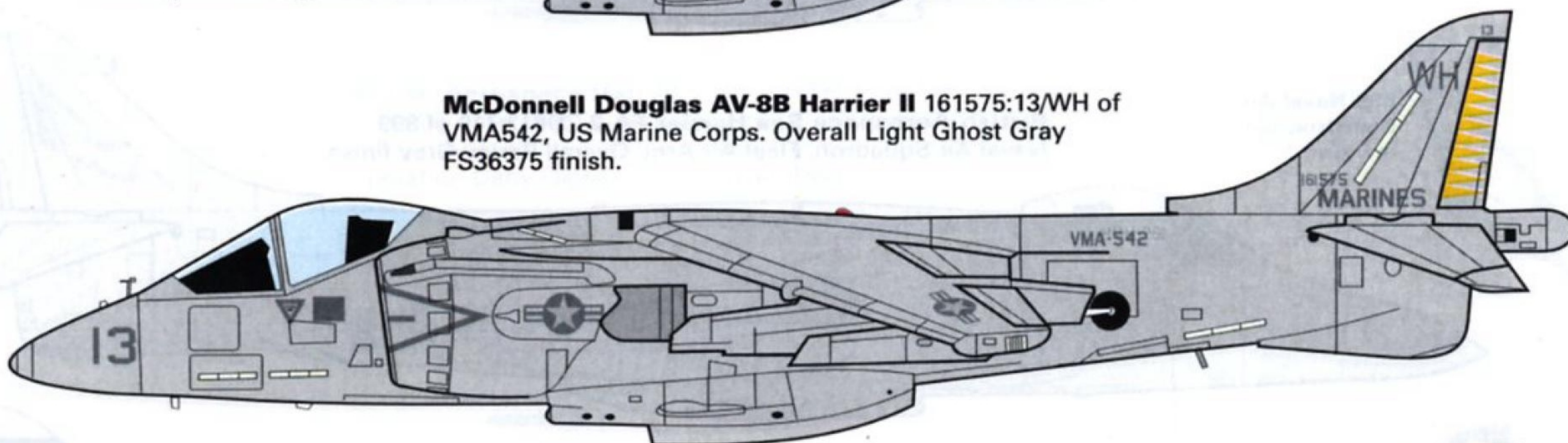
Australian 'zap'  
tail marking



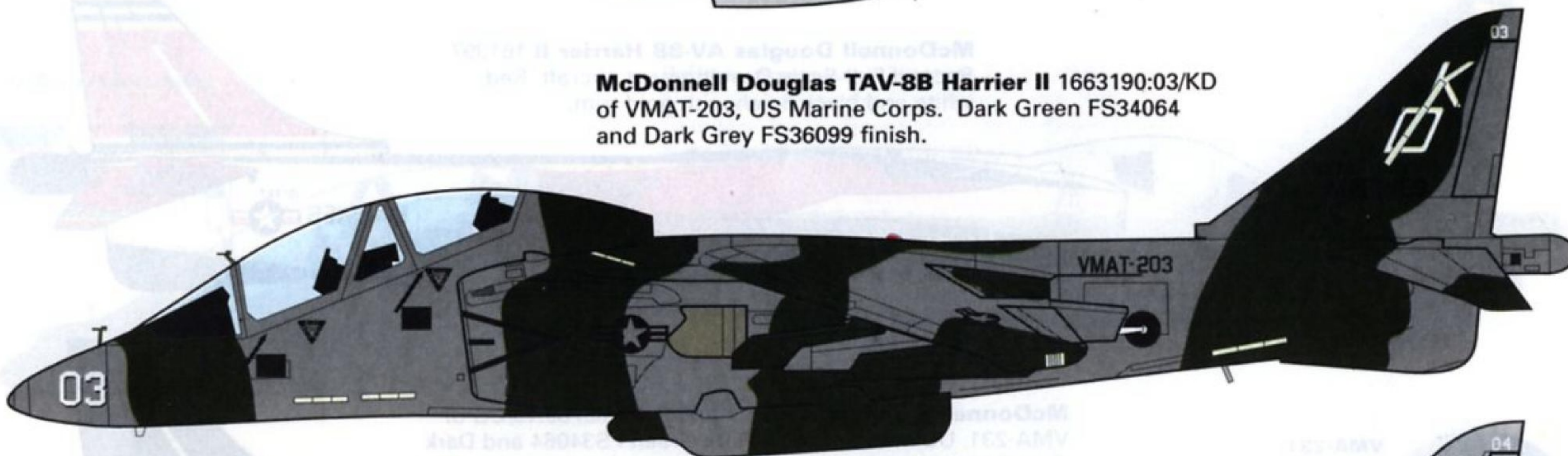
**McDonnell Douglas AV-8B Harrier II** 163183:50/EM of VMA-233, US Marine Corps. Three-tone 'Tactical' scheme of Gunship Gray FS36118 top, Dark Gull Gray FS36231 sides and Dark Ghost Gray FS36320 lower surfaces. Aircraft wears HMM-261 titles and tailcode as standard procedure when detached to an assault carrier as part of a composite unit. Kangaroo on tail is an Australian 'zap'.



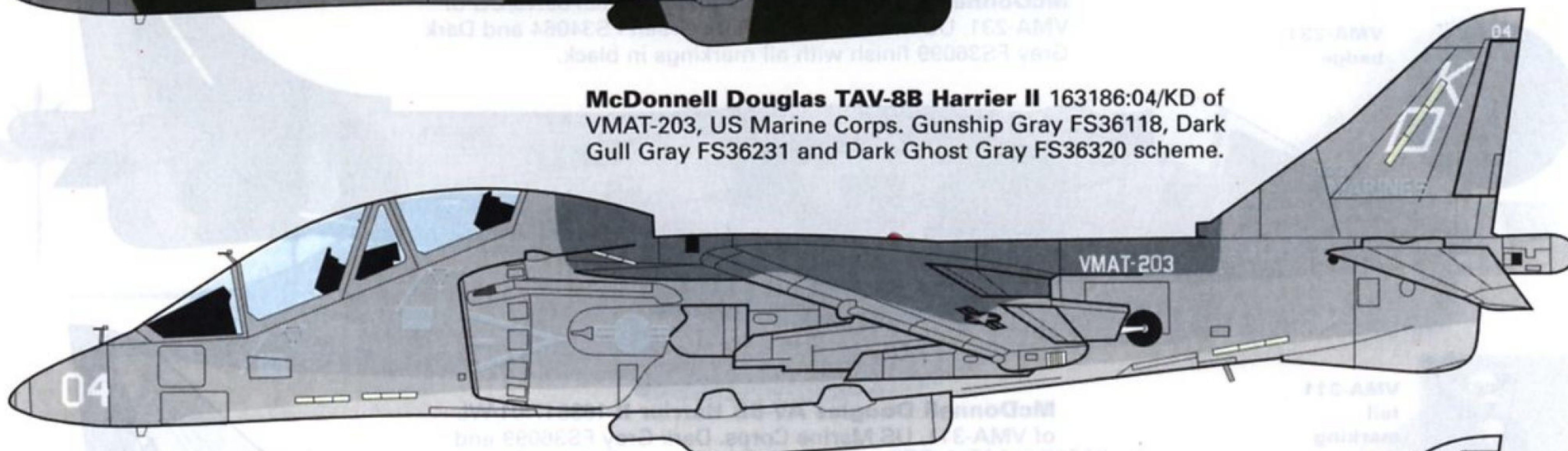
**McDonnell Douglas AV-8B Harrier II** 161575:13/WH of VMA542, US Marine Corps. Overall Light Ghost Gray FS36375 finish.



**McDonnell Douglas TAV-8B Harrier II** 1663190:03/KD of VMAT-203, US Marine Corps. Dark Green FS34064 and Dark Grey FS36099 finish.



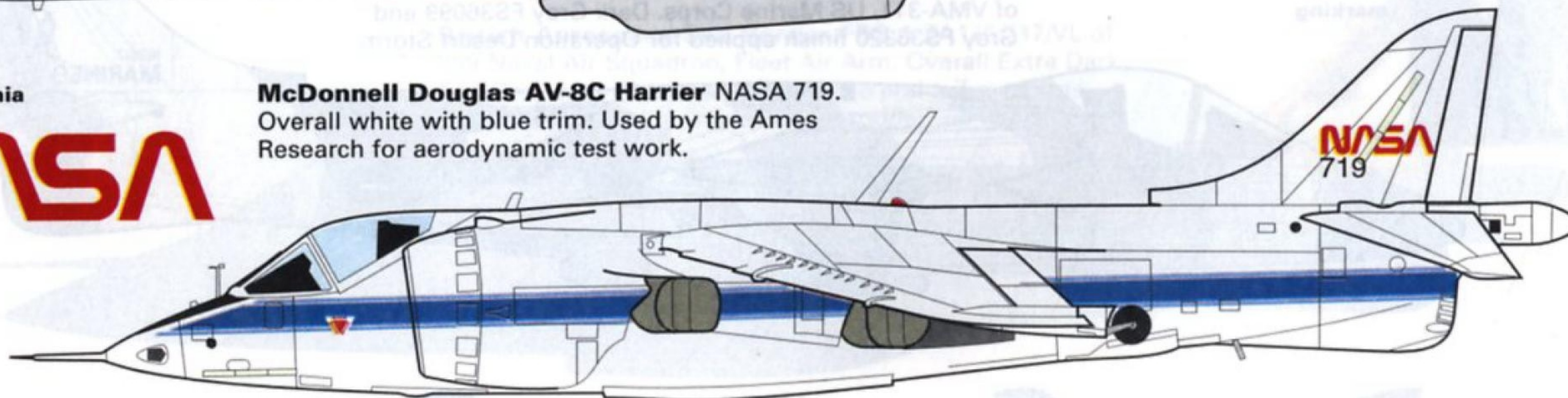
**McDonnell Douglas TAV-8B Harrier II** 163186:04/KD of VMAT-203, US Marine Corps. Gunship Gray FS36118, Dark Gull Gray FS36231 and Dark Ghost Gray FS36320 scheme.



NASA insignia



**McDonnell Douglas AV-8C Harrier** NASA 719. Overall white with blue trim. Used by the Ames Research for aerodynamic test work.



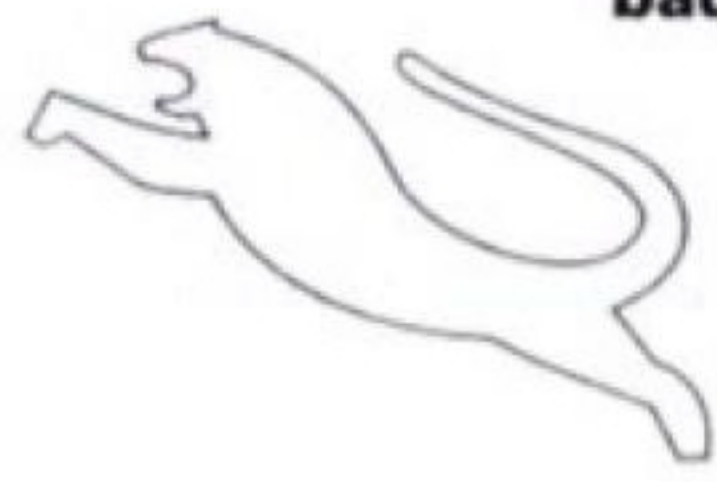
Indian national  
insignia



**British Aerospace Sea Harrier Mk.51** IN610:10 of 300 Squadron, Indian Navy. Extra Dark Sea Grey uppersurfaces with white undersides.



300 Squadron badge



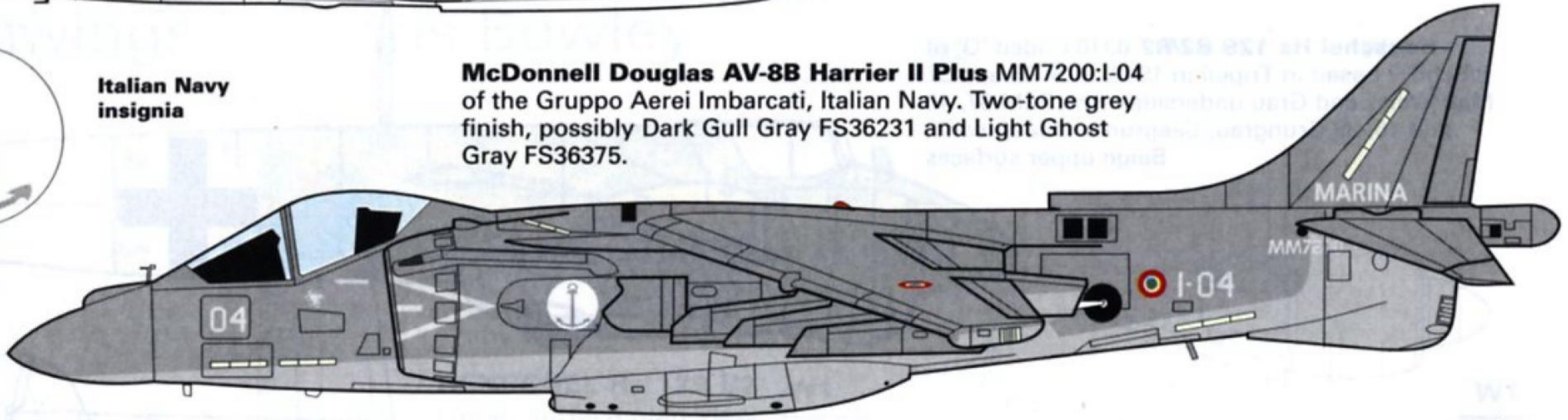
**British Aerospace Harrier Mk.60** IN651:651 of 300 Squadron, Indian Navy. Uppersurfaces in Extra Dark Sea Grey, undersides white.



Italian Navy insignia



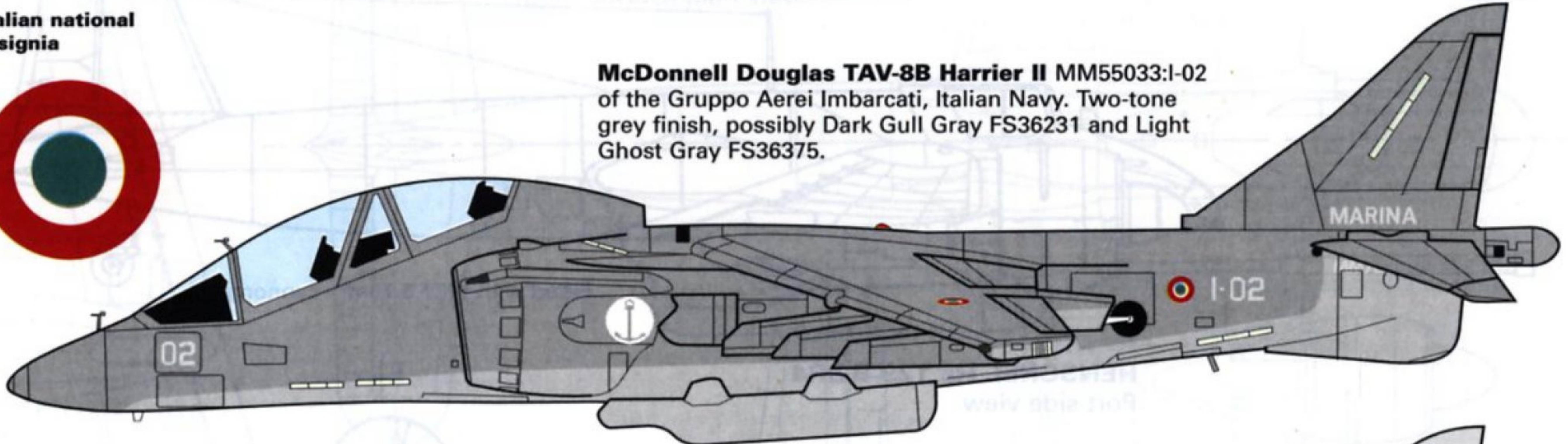
**McDonnell Douglas AV-8B Harrier II Plus** MM7200:I-04 of the Gruppo Aerei Imbarcati, Italian Navy. Two-tone grey finish, possibly Dark Gull Gray FS36231 and Light Ghost Gray FS36375.



Italian national insignia



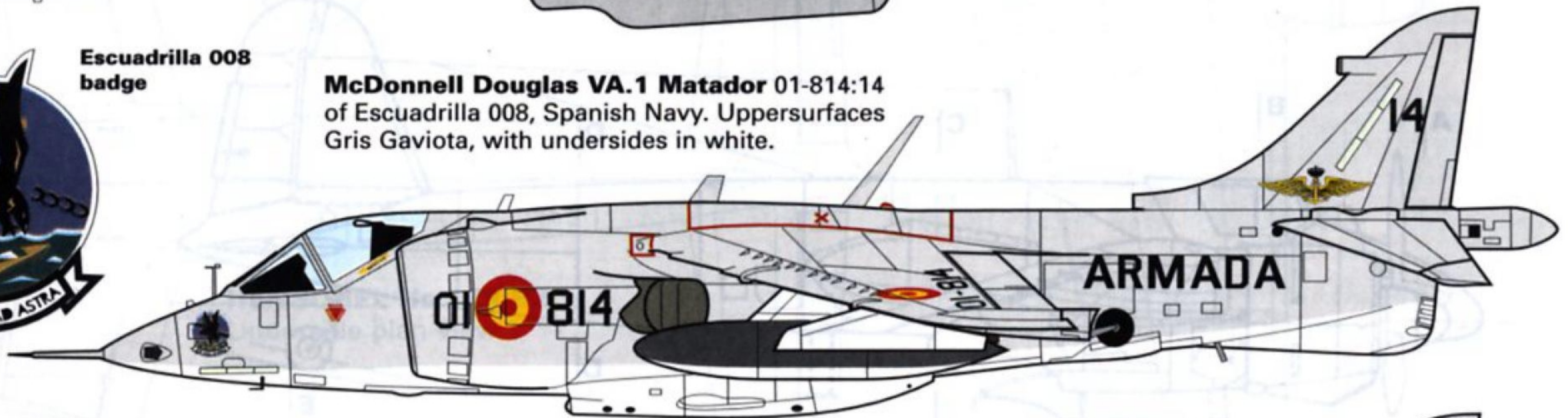
**McDonnell Douglas TAV-8B Harrier II** MM55033:I-02 of the Gruppo Aerei Imbarcati, Italian Navy. Two-tone grey finish, possibly Dark Gull Gray FS36231 and Light Ghost Gray FS36375.



Escuadrilla 008 badge



**McDonnell Douglas VA.1 Matador** 01-814:14 of Escuadrilla 008, Spanish Navy. Uppersurfaces Gris Gaviota, with undersides in white.



Spanish Navy insignia



**McDonnell Douglas VAE.1 Matador** 008-8:8 of Escuadrilla 008, Spanish Navy. Gris Gaviota uppersurfaces, undersides in white.



Spanish national insignia



**McDonnell Douglas EAV-8B Harrier II** 01-909 of Escuadrilla 008, Spanish Navy. Two-tone grey finish, possibly Dark Gull Gray FS36231 and Light Ghost Gray FS36375.

