

Harrier GR.7/9

eduard

BRITISH FIGHTER

1/48 SCALE PLASTIC KIT

#1166



INTRO

The development of precision-attack missiles with a nuclear warhead during the 1950s changed strategic military doctrine dramatically. It became obvious that large military air bases would become easy targets that could be wiped out by a single, precise strike. This prompted French aircraft designer Michel Wibault to wonder, in 1955, if NATO might not be making a mistake by constructing some 100 new 'field' bases called Basic Operational Platforms (BOP) alongside the border of the Eastern Block. Instead, Wibault proposed the development of an aircraft with VTOL (Vertical Take-off and Landing) capability, eliminating the need for the proposed air bases.

First drawings

The VTOL (Vertical Take off and Landing) concept is not a new idea. Several VTOL aircraft were proposed during World War II, but it was the dawn of the jet era that brought new possibilities, first tested with Rolls-Royces' Bedstead flying device. A real aircraft followed in the form of the Short SC.1 prototype, using four RB.108 turbojets pointing downward with a fifth pointing to the rear for forward propulsion, but it was quite obvious such a layout was ineffective. Instead, Wibault proposed a single powerful gas turbine, driving four high-capacity movable blowers via shafts. There was not too much interest at Dassault, but it attracted the attention of USAF colonel Johnny Driscoll, who was then commander of the Paris based MWDP (Mutual Weapons Development Program). He presented Wibault's plans to Theodore von Karman and the famous engineer and physicist was impressed. Thanks to initiative from the MWDP, it was decided to build a testbed prototype. The Bristol Orpheus engine was selected for the purpose, but Bristol chief designer Stanley Hooker considered the design with all the shafts and blowers too heavy and complicated. As a result, and in cooperation with other designers, an alternative solution was proposed using a powerful turbojet engine with a large axial low pressure turbine as a source of pressure for vectored uplift nozzles. This proposal was finally adopted.

Road to the Harrier

The project was designated P.1127, and work began in 1957 as a close cooperation between Hawker Aircraft, with design offices still led by the memorable Sydney Camm, and the Bristol Engine Company, which shortly abandoned the idea of a modified Orpheus engine and started work on the completely new Pegasus unit. Both companies had to overcome many technical, political and financial hurdles in order to get the project through. The most important factor for success was the continuing support of the MWDP, as the British Ministry of Supply was still uninterested and, more to the point, Minister of Defence Duncan Sandys was writing his 'White paper on Defence' which left little room for manned aircraft in it. This was a contributing factor to the cancellation of the promising VTOL supersonic P.1154 project, developed alongside the P.1127. Incidentally, the name Harrier was originally reserved for the P.1154.

The first take off to test the hovering abilities occurred on the 21st of October, 1960, with test pilot Bill Bedford at the controls. It was quite an arduous job for him. After some enhancements to the control system, the program went on with more test flights to include the transition from hovering to forward flight and vice versa. Just a year later, significant changes and some relief for both Hawker and Bristol companies came in the form of a three sided agreement between the United States, United Kingdom and West Germany to finance nine prototypes built on the experiences with the P.1127 test program. These prototypes were named the Kestrel FGA.1 and ten pilots conducted 960 test flights and, in addition, also some 1,366 take offs and landings from the 7th of March 1964 to November, 1965. Four years after the successful ending of the Kestrel programme the first Harriers GR.1 arrived at RAF base Wittering. One year later, in 1970, two squadrons of Harriers were deployed to RAF base Wildernath in West Germany.

The Royal Navy Harrier FRS.1 (Fighter, Reconnaissance, Strike) differed from the RAF GR.3s from which they were developed, in many aspects. The main reason was the philosophy behind the use of the naval Harrier. Although only subsonic, it was intended as an interceptor for fleet air defence rather than in the ground attack role and installation of the Ferranti Blue Fox radar as well as ability to carry a range of air-to-air missiles were instrumental. There were more changes in order to make the Harrier suitable for service on the decks of Royal Navy carriers, such as, for example, a raised cockpit with a bubble canopy for better visibility.

The US Marine Corps AV-8A was similar to the RAF GR.1, but were able to carry AIM-9 Sidewinders on their outer pylons for self-defence purposes. Another area of changes was in the avionics.

The development of the first generation of Harrier went to the GR.3 with a more powerful Pegasus engine along with some other changes. The USMC upgraded their AV-8A to the AV-8C version and the Royal Navy bettered the FRS.1 with the FA.2. That marked the end of the development of the first generation of single seat Harriers.

The Search for Range and Payload

Shortly after the Harrier entered service, it became obvious there were some issues to solve. Primary concerns were short range and insufficient payload. To solve these shortcomings, a joint program called Advanced Harrier was started in the early seventies, but the British abandoned this in 1975 and McDonell Douglas refused to carry on the financially demanding project alone. The company came up with a less ambitious upgrade for the USMC Harriers, which fell under the five year funding plan of the US Ministry of Defence as the Harrier II project. Shortly thereafter, the British came back with their British Aerospace consortium. First flight of the Harrier II was conducted on the 5th of November, 1981. The core of the upgrade was the new Pegasus Mk. 105 with a thrust of 97 kN. The aircraft received a heavily reworked wing with some 14 % more area and with two underwing pods added. Also, the fuselage was changed to incorporate composite materials replacing the original aluminium alloy parts in order to save weight. All in all, payload capability rose by 6690 lb (3035 kg) with very short (VSTOL) take off and thanks to the new control system and improved stability the Harrier was now more forgiving than its predecessors. The USMC later equipped its Harrier II with radar during the upgrade program to the AV-8B+ spec, while the British Harriers II never received this. The only British Harriers with radar were Sea Harriers. The Royal Navy was not part of the Harrier II program, but after phasing out their FA.2s in 2006, they entered Joint Force Harrier operations with the RAF using marks GR.7 and GR.9. Former Sea Harrier unit No.800 Squadron received their GR.7s in April 2006, followed a year later by No. 801 Squadron. Both squadrons were enlarged and together they formed the Naval Strike Wing. Invincible Class carriers underwent several upgrades in order to accommodate the Harrier II. The main base of this JFH was RAF Base Cottesmore.

British Harrier IIs

First of the new Harrier IIs was the GR.5, of which 41 were built. The Harrier II had a much greater range and endurance than the first generation aircraft, promoting a greater emphasis on the interdicator role of the plane. For such a mission some more upgrades were necessary, leading to the GR.5A, of which 21 were built, 19 as new built aircraft and three upgraded from GR.5s. This was followed by the GR.7 with avionic improvements, including a nose-mounted forward-looking infrared (FLIR) system compatible with night vision goggles, new cockpit displays and also a new electronic countermeasures suite. The GR.7 took off for the first time in May 1990, entering service with RAF squadrons three months later. Existing GR.5s and GR.5As (53) were upgraded to the GR.7 standard, adding to the 34 new built examples. Twenty of them were later upgraded to the GR.7A standard with a new Rolls-Royce Pegasus Mk.107 engine offering 106 kN of thrust. Another development was carried out under the JUMP (Joint Upgrade and Maintenance Program) umbrella and led to the final GR.9 variant. This upgrade was conducted in several steps during scheduled periods of maintenance and significantly upgraded the Harrier avionics, communications systems and weapons capabilities. The Harrier now could fire AGM-65 Mavericks, drop Paveway LGBs and carry DJRP reconnaissance containers. In 1996, the last of the first generation Harriers were retired and Harrier IIs assumed all their RAF duties. They were deployed in several missions from Bosnia and Kosovo to the hostile and tough environment of Iraq and Afghanistan. It was expected that the GR.9 would carry on in service until at least to 2018, but on October 19th, 2010, it was announced that they would be retired in April of 2011. It was quite a controversial decision, leading to the loss of the only fixed wing aircraft with the ability to operate from the decks of Royal Navy carriers. During November 2011 all 72 remaining Harrier II aircraft together with all associated inventory were sold to the USMC for 108 million dollars, only to serve as a spare parts source.

ATTENTION



UPOZORNĚNÍ



ACHTUNG



ATTENTION



注意



Carefully read instruction sheet before assembling. When you use glue or paint, do not use near open flame and use in well ventilated room. Keep out of reach of small children. Children must not be allowed to suck any part, or pull vinyl bag over the head.



Před započítím stavby si pečlivě prostudujte stavební návod. Při používání barev a lepidel pracujte v dobře větrané místnosti. Lepidla ani barvy nepoužívejte v blízkosti otevřeného ohně. Model není určen malým dětem, mohlo by dojít k požití drobných dílů.

INSTRUCTION SIGNS * INSTR. SYMBOLS * INSTRUKTION SINNBILDEN * SYMBOLES * 記号の説明

OPTIONAL
VOLBABEND
OHNOUTOPEN HOLE
VYVRTAT OTVORSYMMETRICAL ASSEMBLY
SYMETRICKÁ MONTÁŽREMOVE
ODŘÍZNOUTREVERSE SIDE
OTOČITAPPLY EDUARD MASK
AND PAINT
POUŽÍT EDUARD MASK
NABARVIT

PARTS



DÍLY



TEILE

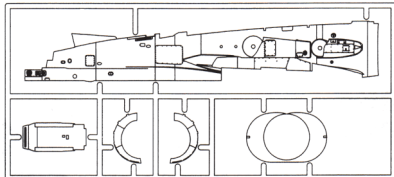


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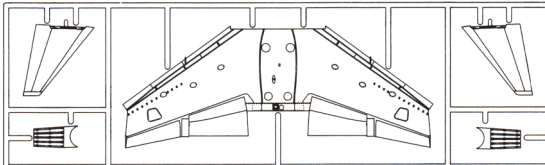
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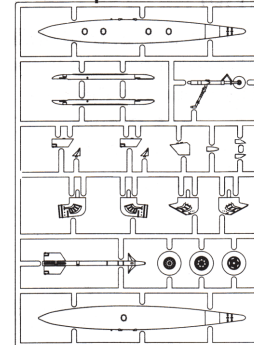


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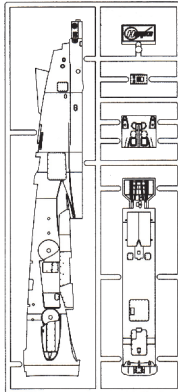
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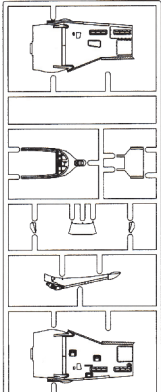
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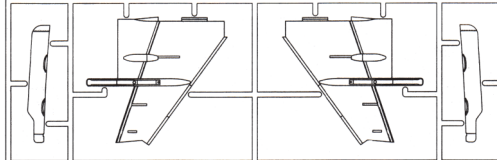
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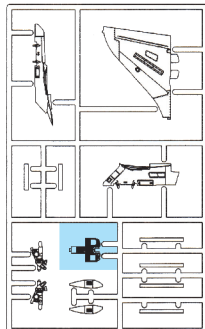
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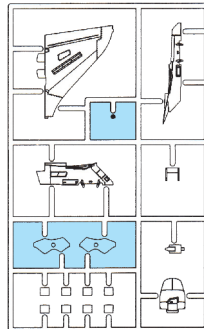
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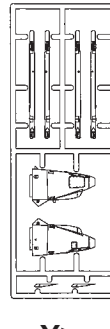
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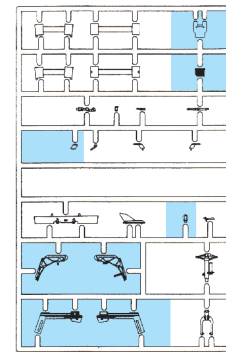
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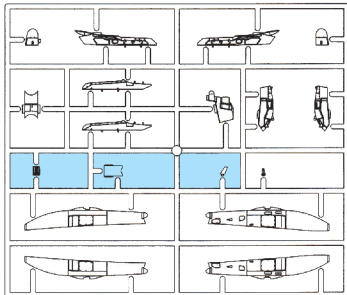
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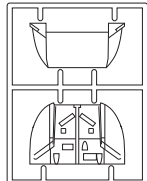
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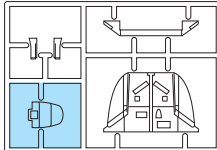
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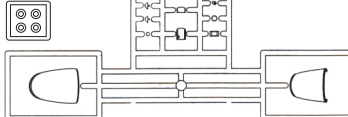
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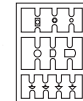
K>



P>



Z>

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BRASSIN RP - RESIN PARTS

R5



R6

2 pcs.



R7

2 pcs.



R10

2 pcs.



R14



R15



R17

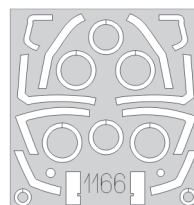
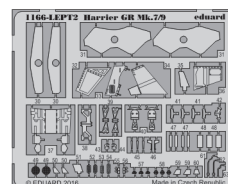


R16



R18

FILM

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MASKPE - PHOTO ETCHED
DETAIL PARTS

COLOURS



BARVY



FARBEN



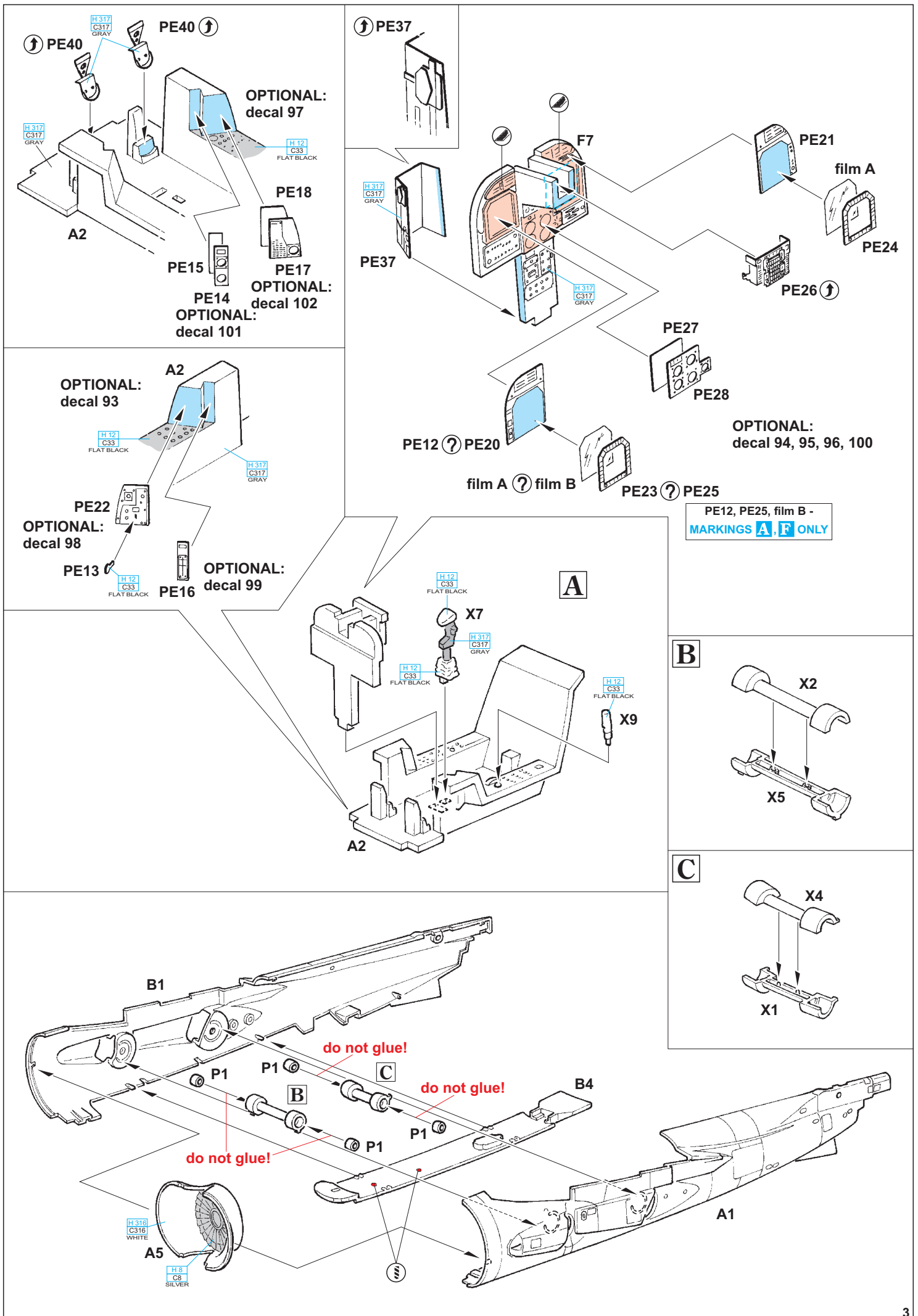
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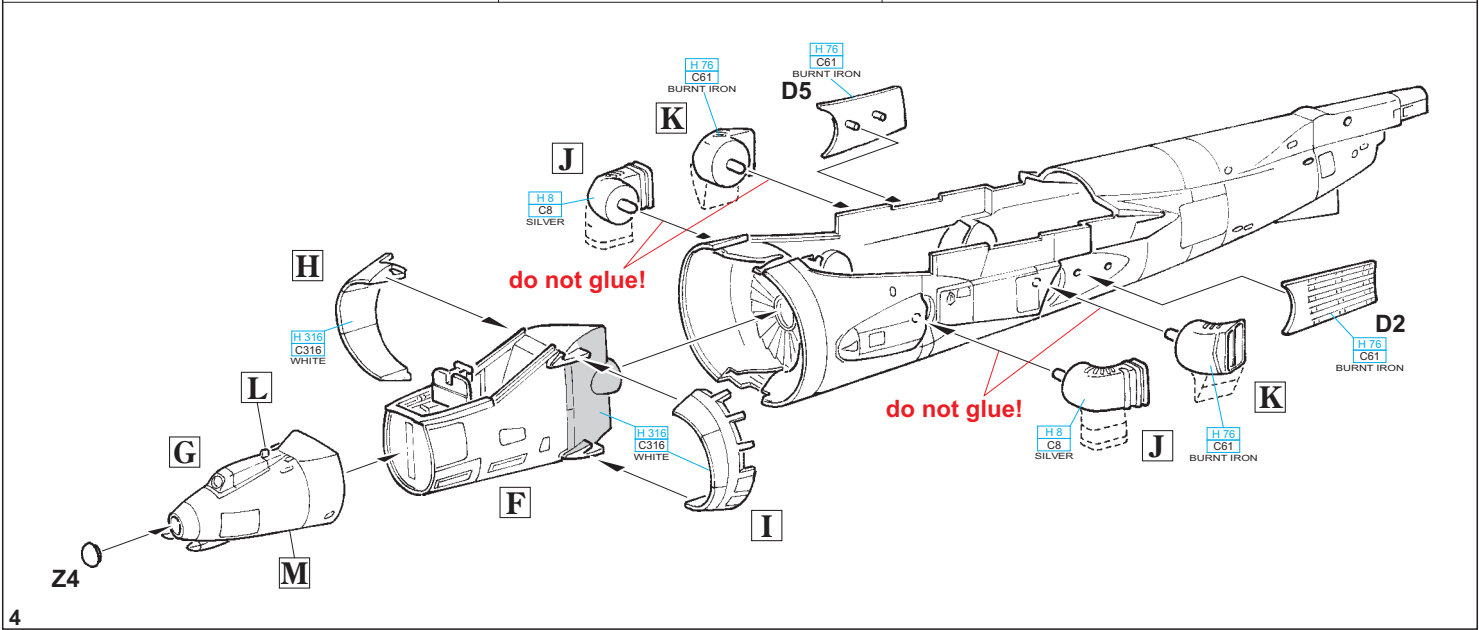
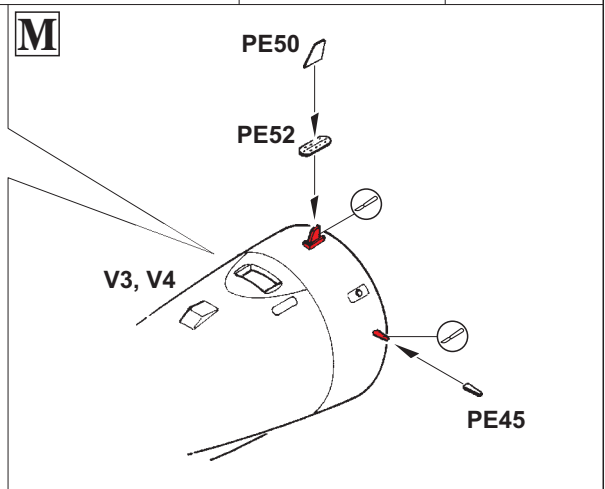
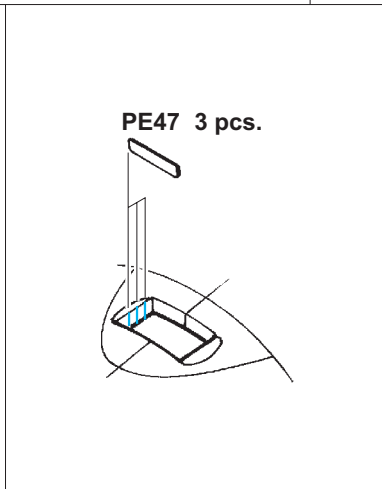
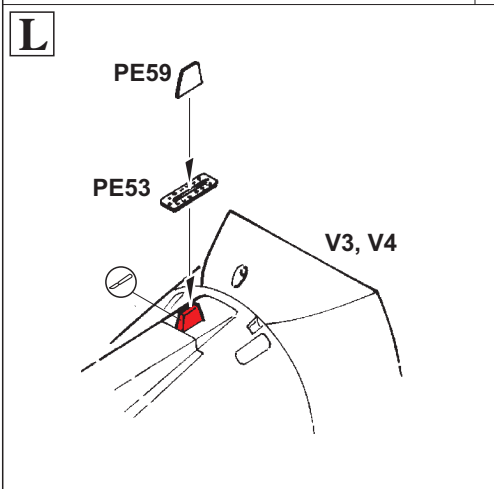
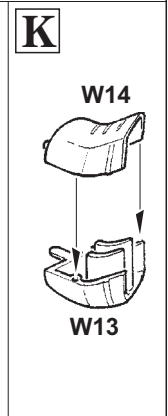
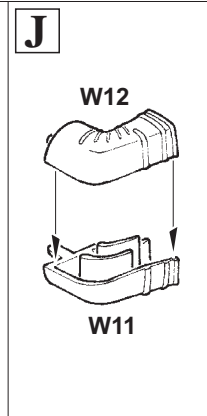
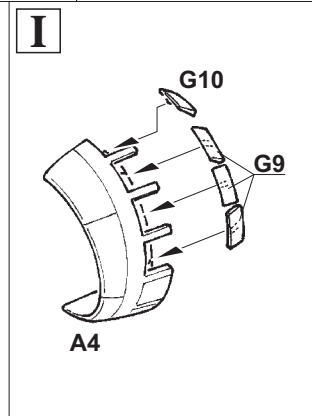
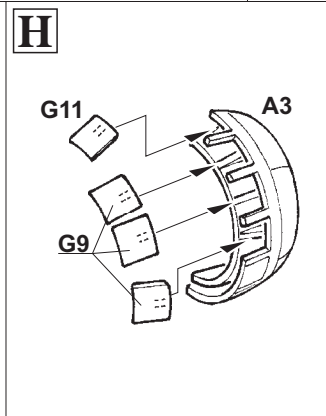
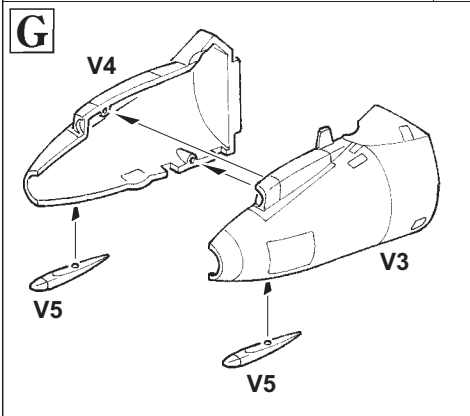
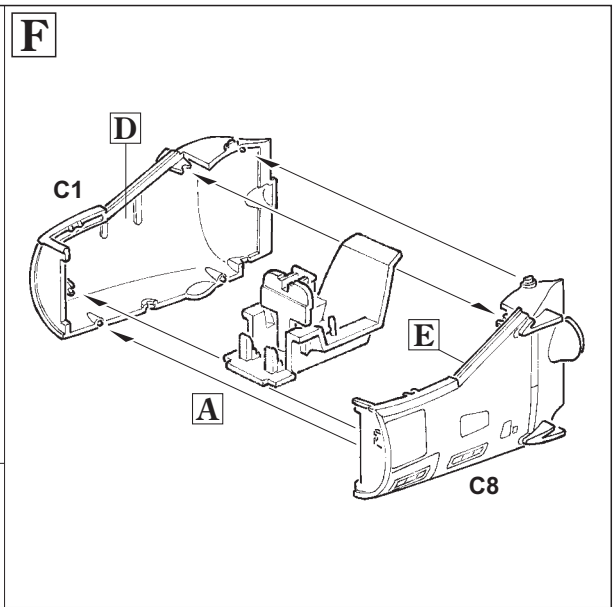
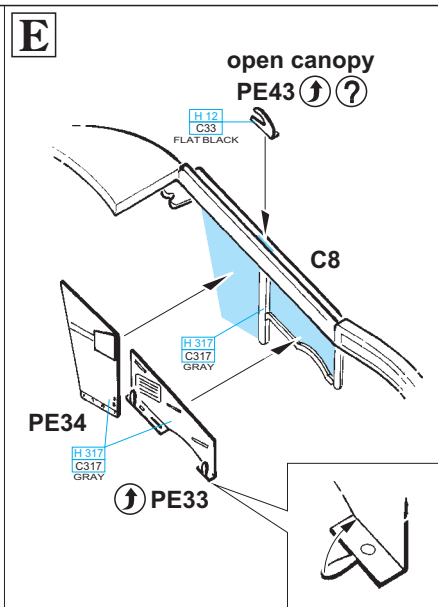
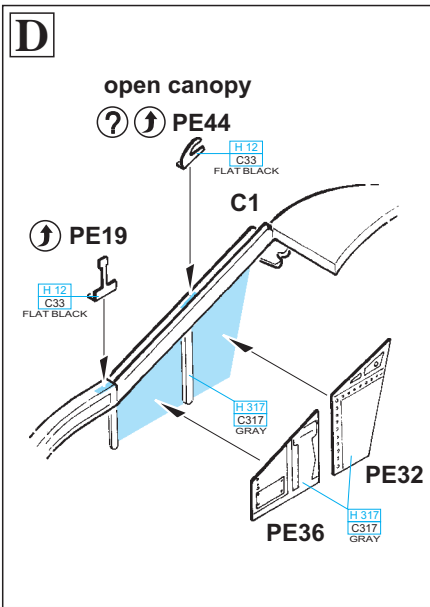


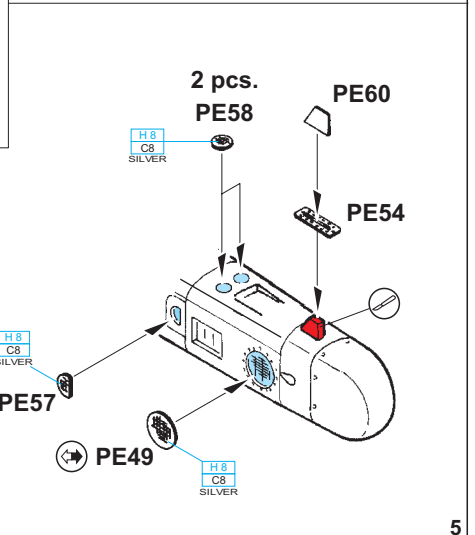
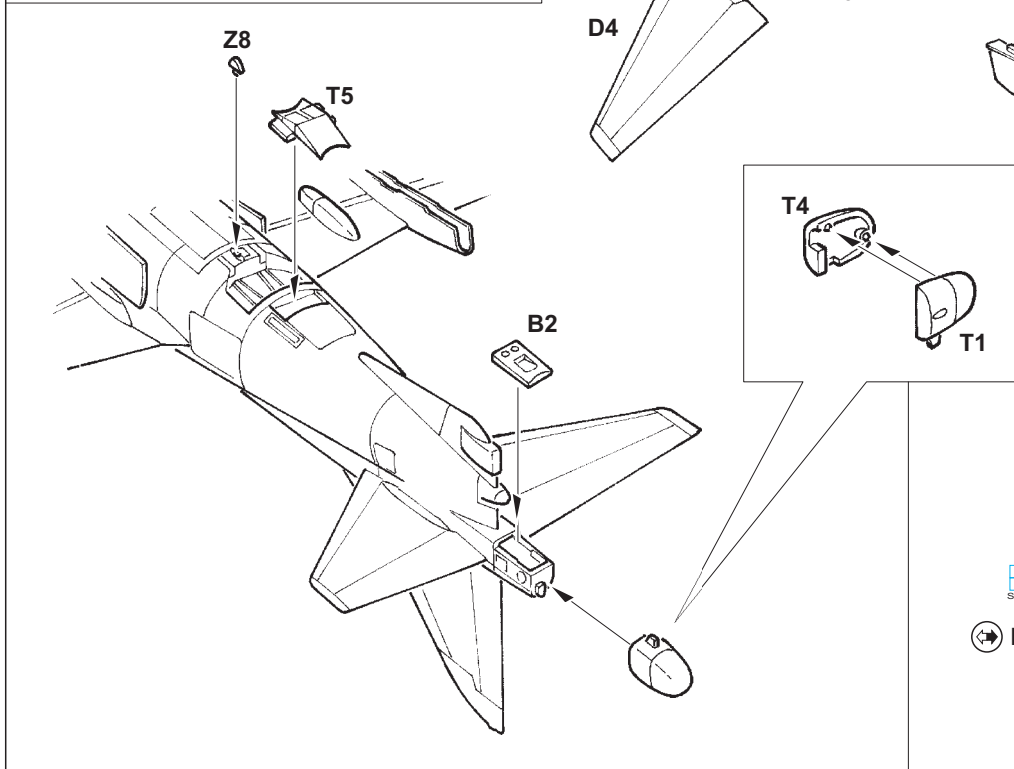
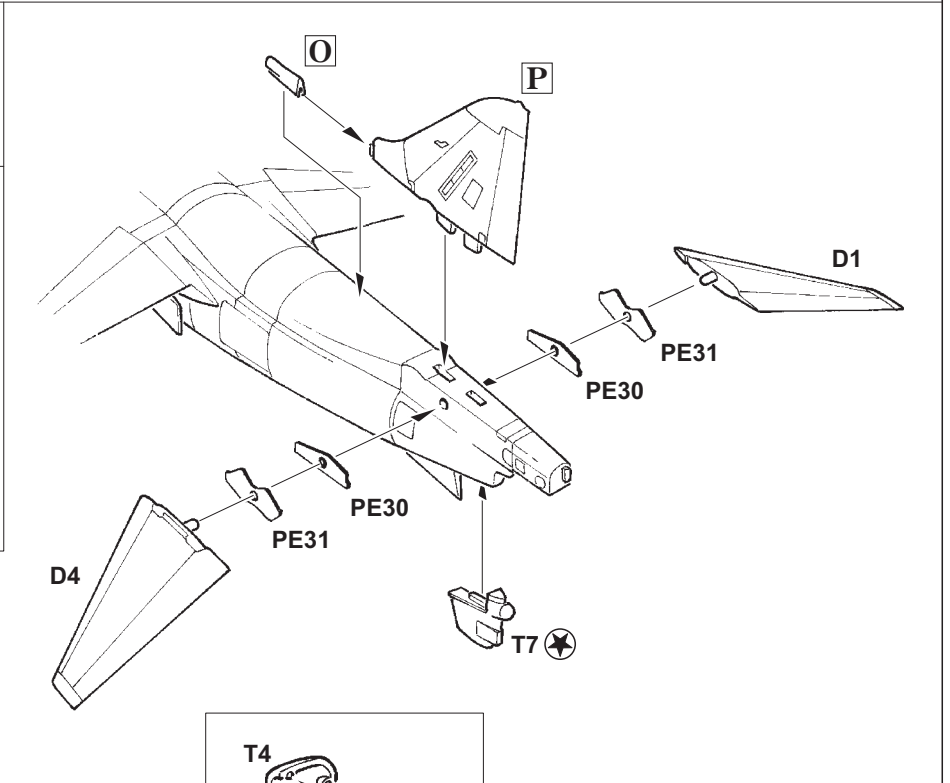
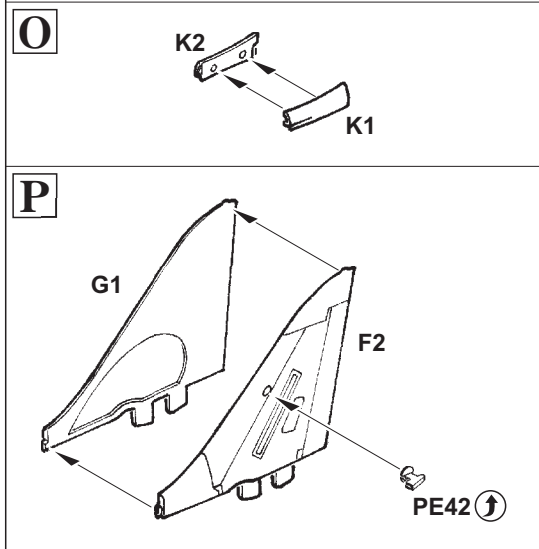
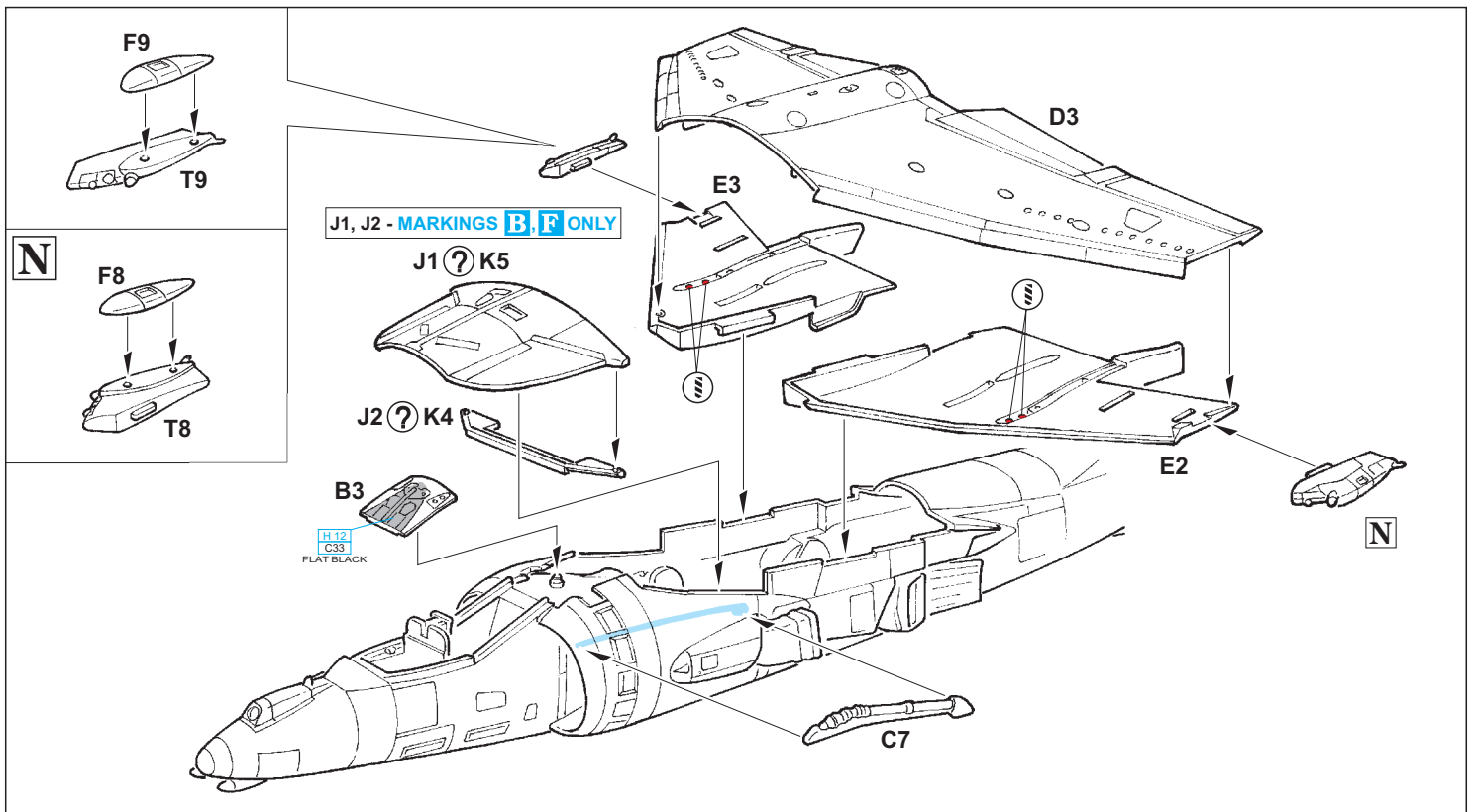
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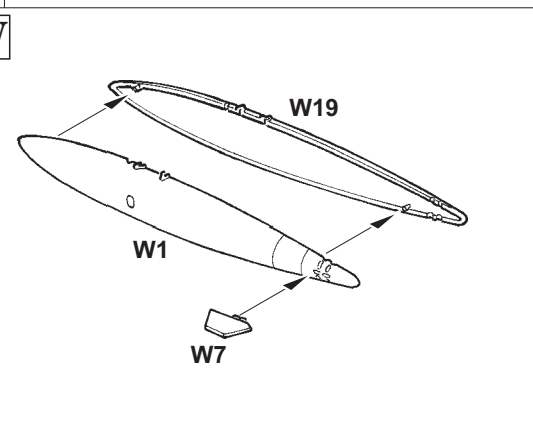
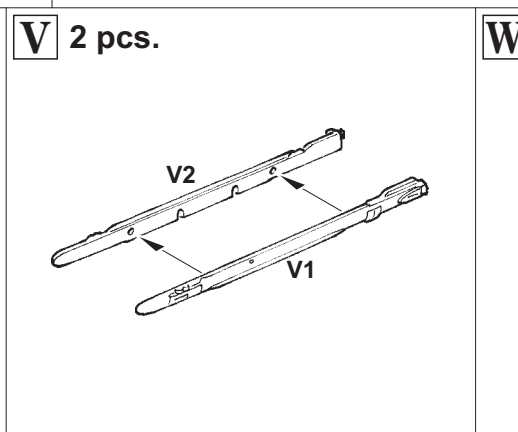
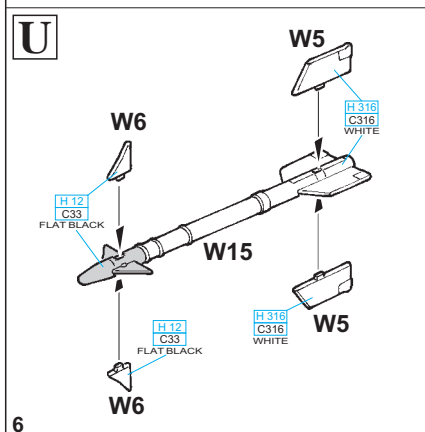
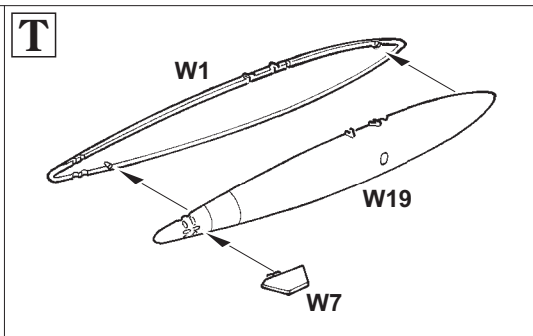
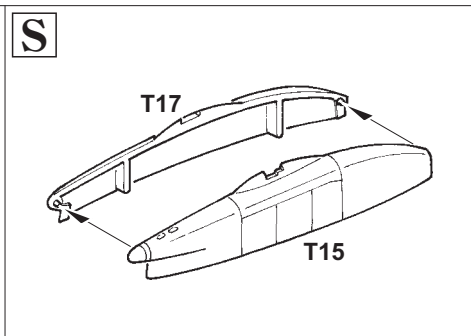
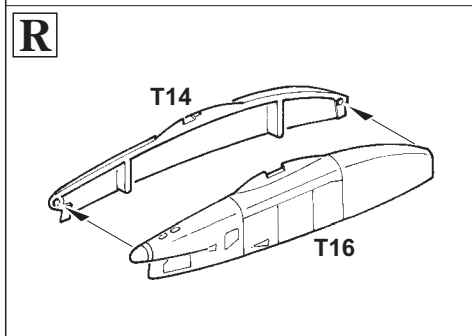
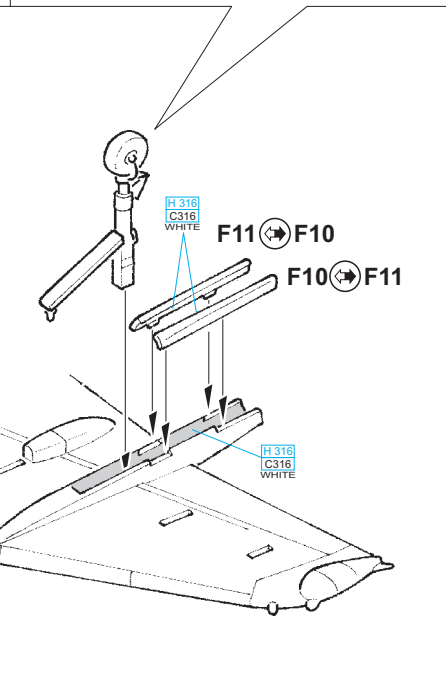
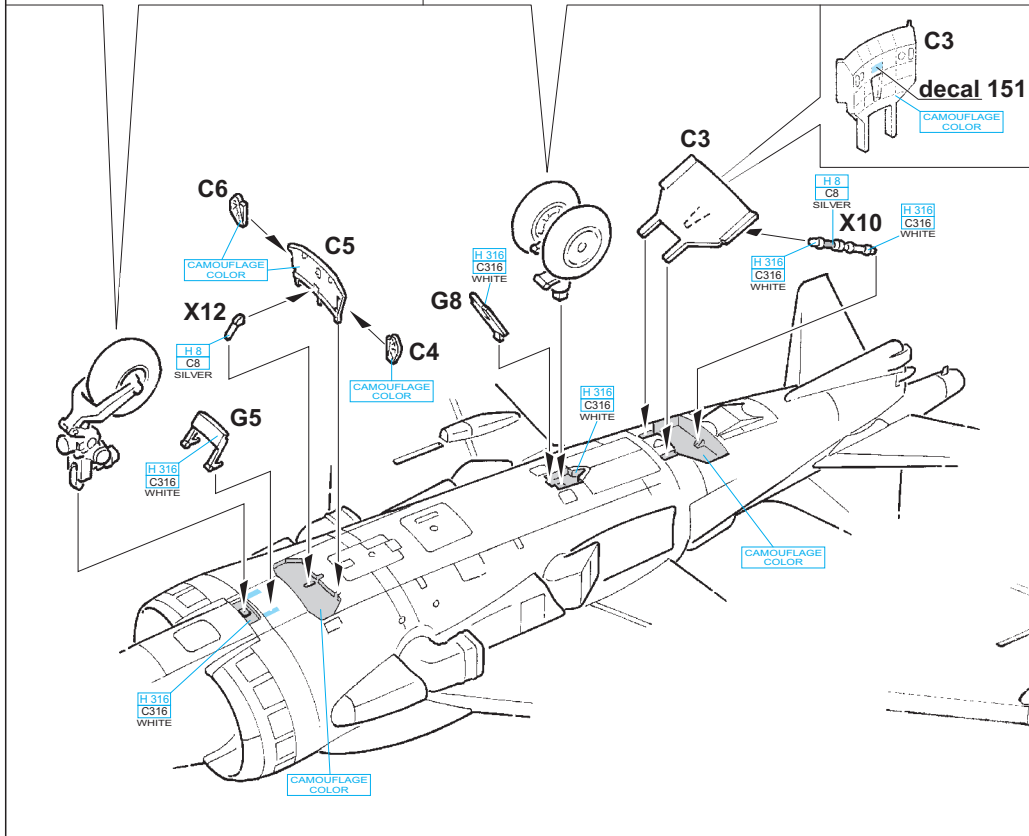
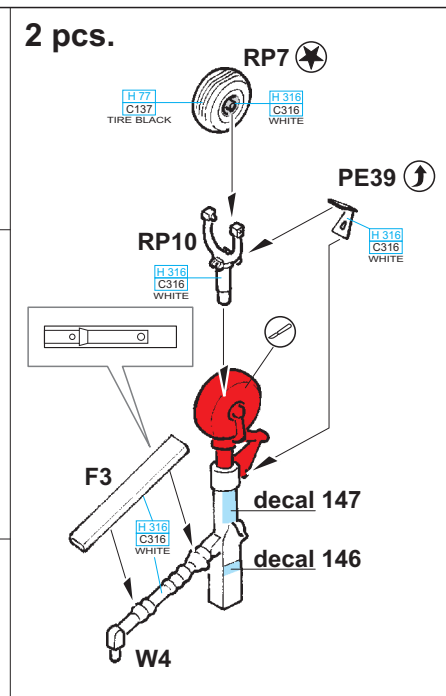
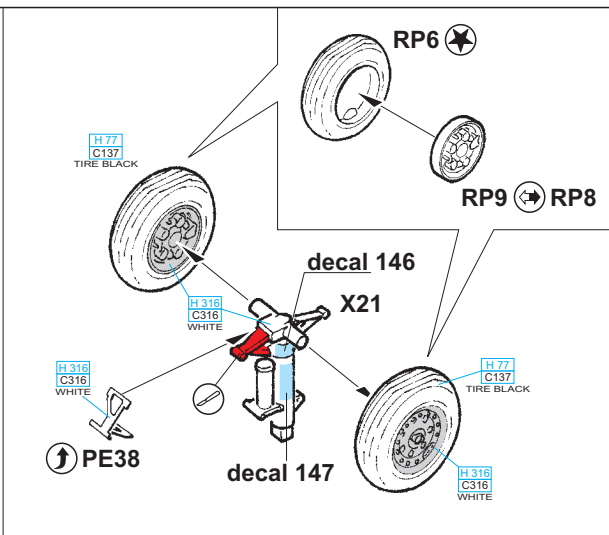
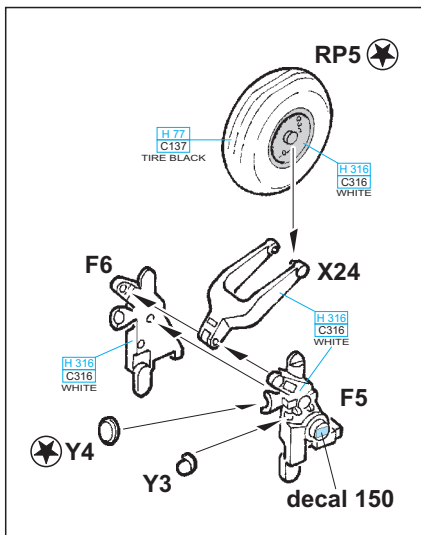
| GSI Creos (GUNZE) | | |
|-------------------|----------|--------------|
| AQUEOUS | Mr.COLOR | |
| H 8 | C8 | SILVER |
| H 12 | C33 | FLAT BLACK |
| H 25 | C34 | SKY BLUE |
| H 76 | C61 | BURNT IRON |
| H 77 | C137 | TIRE BLACK |
| H 79 | C39 | SANDY YELLOW |
| H 80 | C54 | KHAKI GREEN |
| H 82 | C31 | DARK GRAY |

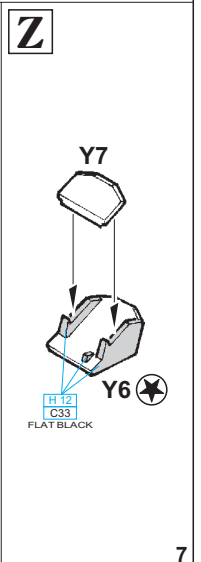
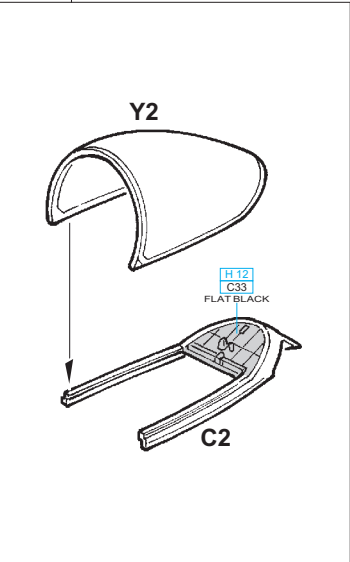
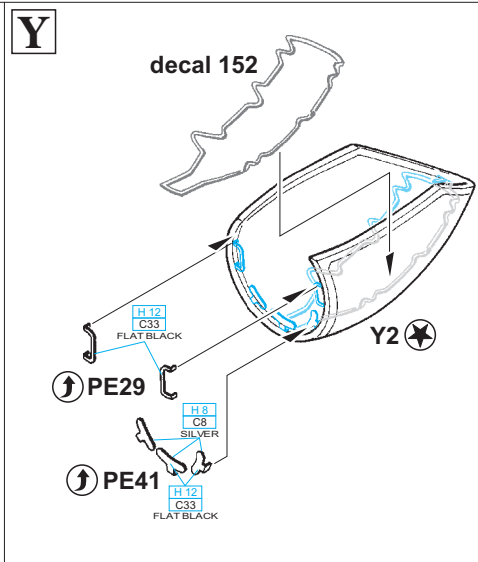
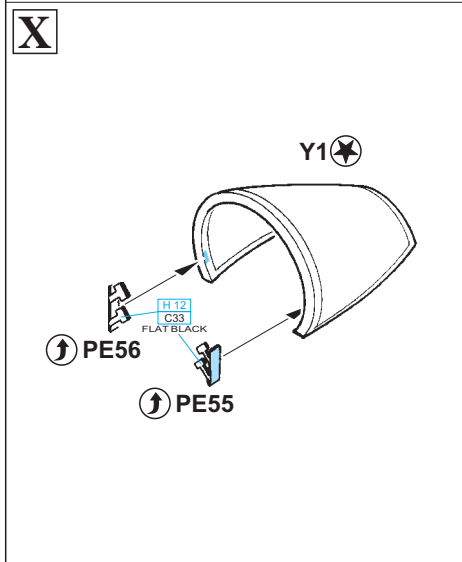
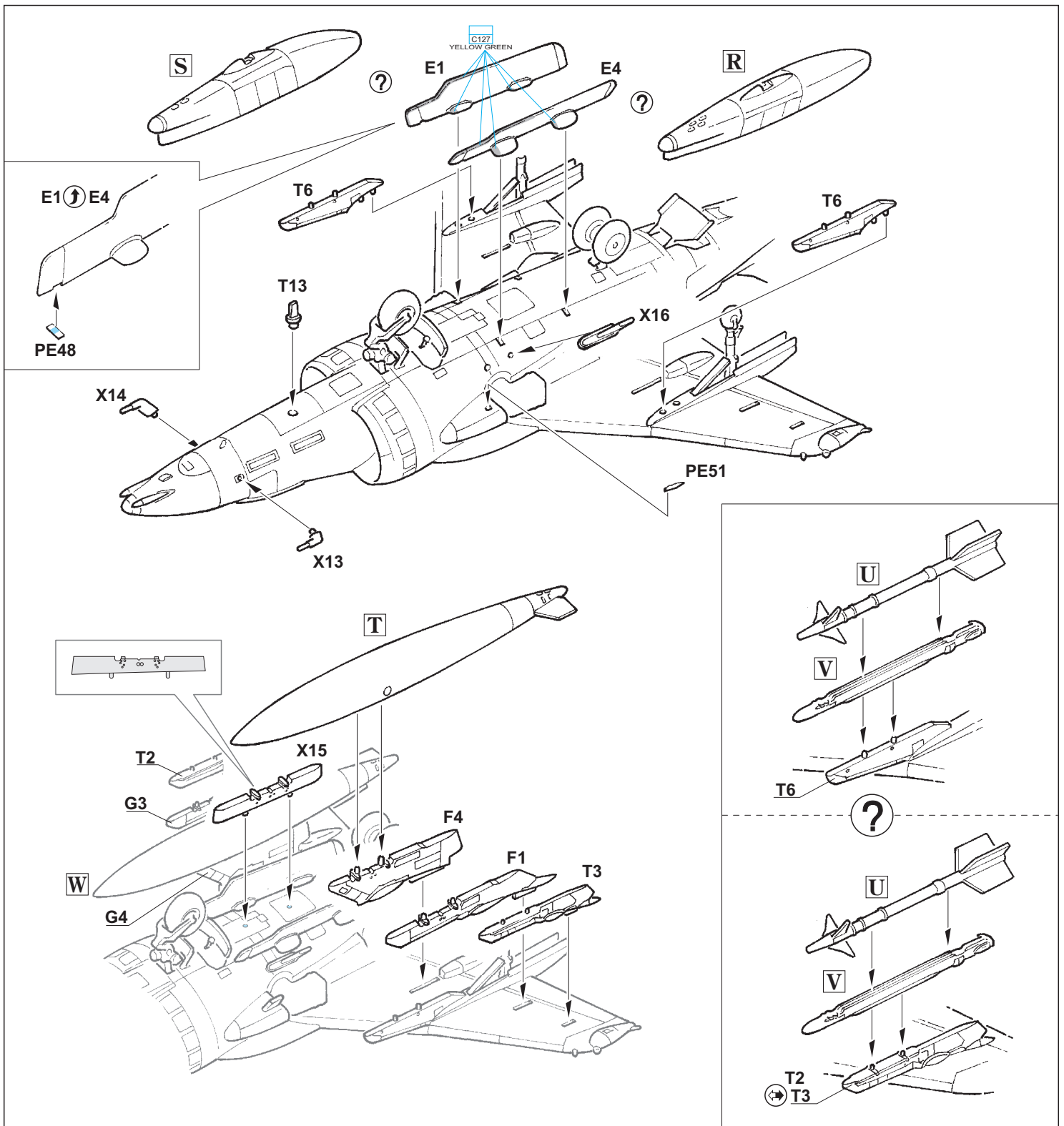
| AQUEOUS | Mr.COLOR | |
|---------|----------|----------------|
| H 86 | C68 | RED MADDER |
| H 309 | C309 | GREEN |
| H 312 | C312 | GREEN |
| H 316 | C316 | WHITE |
| H 317 | C317 | GRAY |
| H 320 | C320 | DARK GREEN |
| H 331 | C331 | DARK SEAGRAY |
| H 335 | C335 | MEDIUM SEAGRAY |
| | C127 | COCKPIT COLOR |

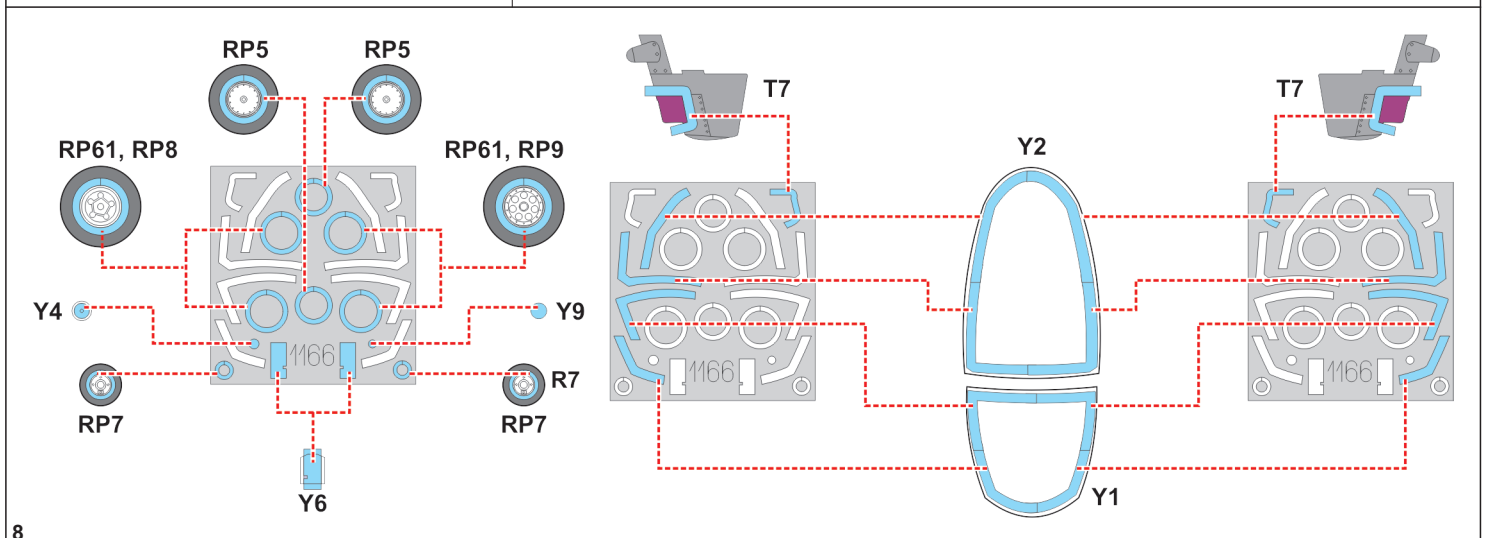
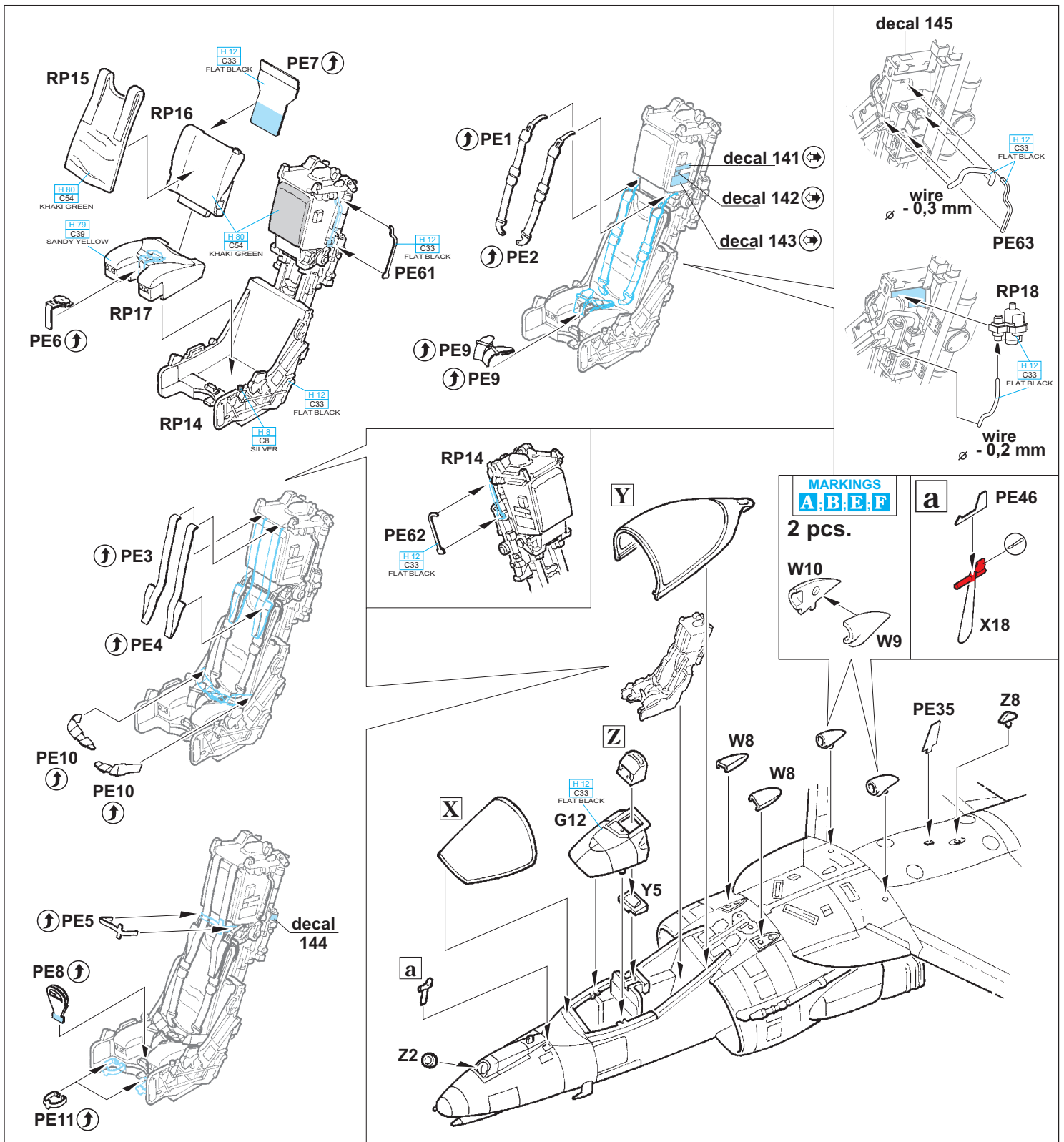






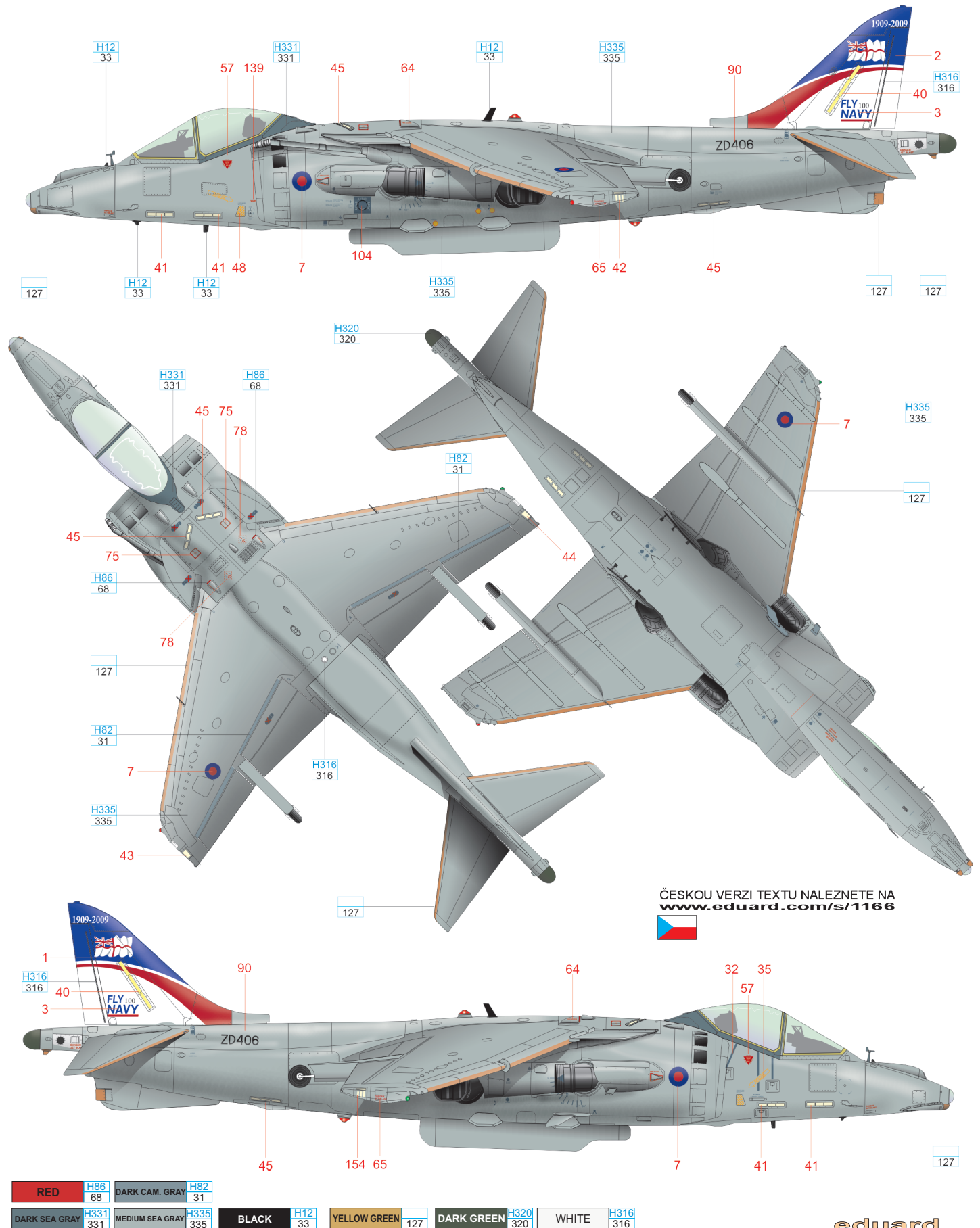






A Harrier GR.9, ZD 406, Royal Navy Naval Strike Wing, RAF Station Cottesmore, 2009

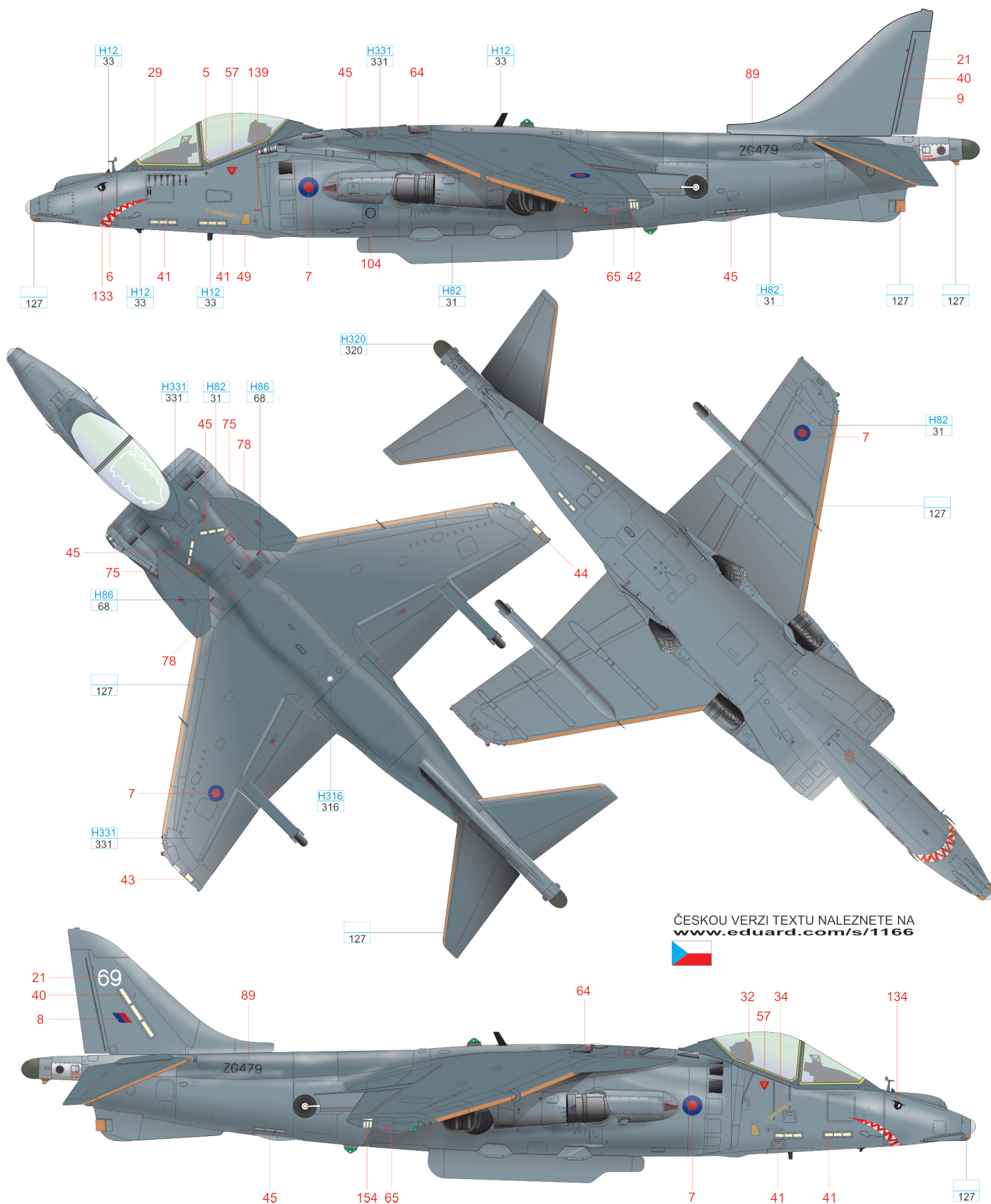
In 2009, the Royal Navy celebrated a century of UK Naval aviation. For that memorable anniversary, the fin of ZD 406 was painted in a striking three colour design with the inscription 'Fly Navy 100 1909 - 2009'. Apart from the fin, all surfaces were in Medium Sea Grey, except the canopy fairing, which was Dark Sea Grey. The aircraft ended up as a USMC spare parts source in the 'Boneyard'.



| | | | |
|---------------|-------------|-----------------|-------------|
| RED | H86 68 | DARK CAM. GRAY | H82 31 |
| DARK SEA GRAY | H331 331 | MEDIUM SEA GRAY | H335 335 |
| BLACK | H12 33 | YELLOW GREEN | 127 |
| | | DARK GREEN | H320 320 |
| | | WHITE | H316 316 |

B Harrier GR.7, ZG 479/69A, IV (AC) Squadron, Operation Telic, Ahmed al Jaber Air Base, Kuwait, spring 2003

With the small zig-zag style sharkmouth, this Harrier II served during Operation Telic, based at Jaber Air Base in Kuwait as a part of specially formed No. IV (AC) Squadron. The 30 Harriers were pooled from all four RAF Harrier squadrons (1st, 3rd, 4th and 20th). On the Port side there were black silhouettes of seven Paveway attacks plus two iron bombs attacks. Additionally, there was also a small silhouette of a MiG-29 painted just under the canopy (still unknown why). This Harrier II ended up at the 'Boneyard' as a spares donor for USMCAV-8Bs.



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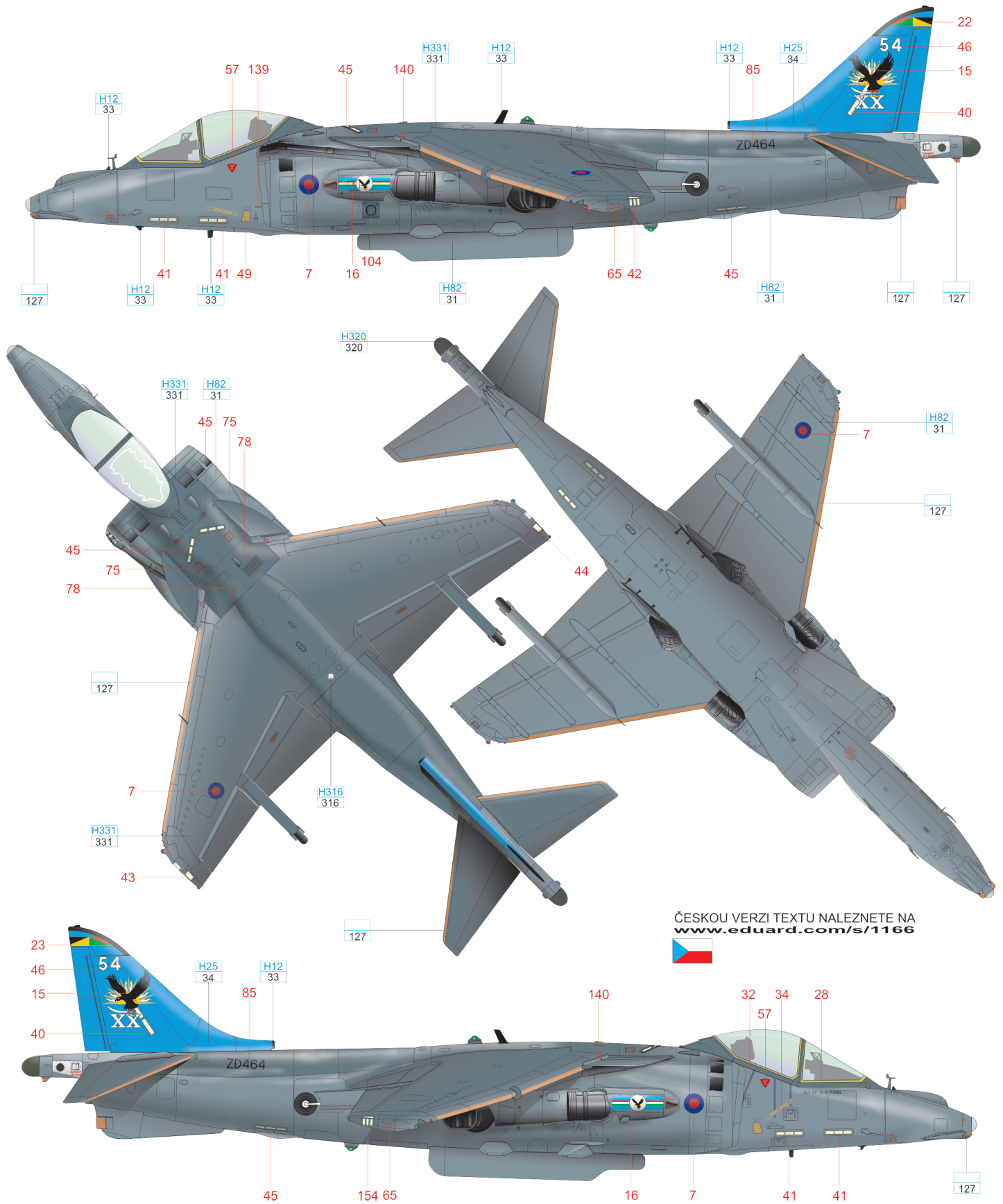


DARK SEA GRAY H331 331 DARK CAM. GRAY H82 31 BLACK H12 33 YELLOW GREEN 127 DARK GREEN H320 320 WHITE H316 316

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C Harrier GR.7, ZD 464/54, 20 (R) Squadron, RAF Wittering Air Base, 2002

This Harrier served with No. 20 Squadron RAF, which was from September 1992 until March 2010 the OCU (Operational Conversion Unit) for the BAE Harrier GR.9 and T.12. The aircraft selected for air shows had the vertical fin painted in light blue with a double X, the Roman numeral 20 and with the emblem of the squadron, a black eagle against a background of the rising sun. ZD 464 was lost during an airshow at Lowestoft on August 2nd, 2002. In front of spectators watching from the beach, the Harrier lost power while hovering some 90 ft above sea level and crashed into the water. The pilot managed to eject, but broke his ankle when landing on the debris of his aircraft.



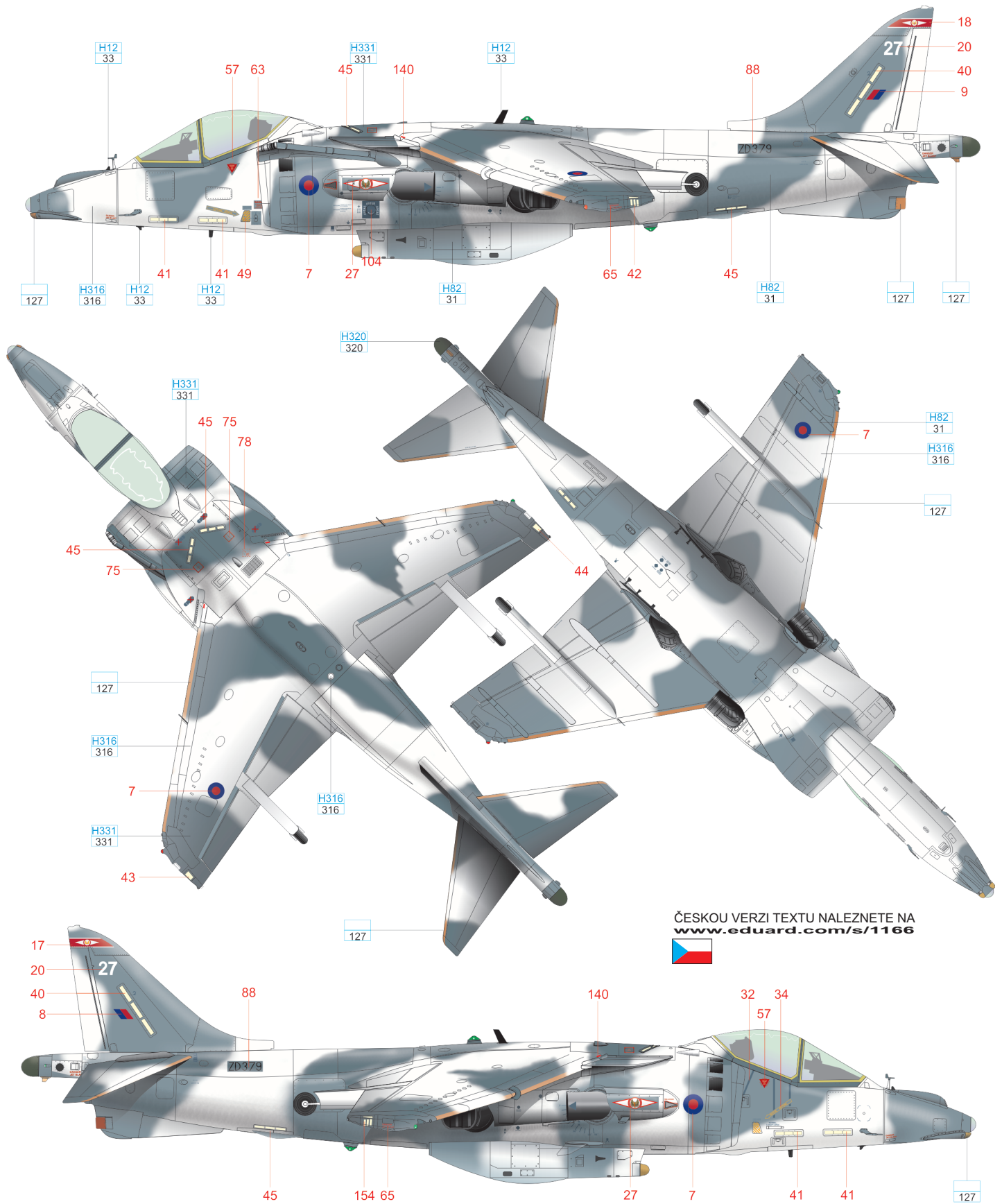
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| | | | |
|---------------|-------------|----------------|-------------|
| WHITE | H316 316 | SKY BLUE | H25 34 |
| DARK SEA GRAY | H331 331 | DARK CAM. GRAY | H82 31 |
| BLACK | H12 33 | YELLOW GREEN | 127 |
| | | DARK GREEN | H320 320 |

D Harrier GR.7, ZD 379/27, 1(F) Squadron, Barduffoss, Norway, January 2004

Painted in the so-called 'Arctic camouflage scheme' consisting of Dark Sea Gray and Dark Camouflage gray oversprayed white color, this Harrier took part in Snow Falcon military exercises in Norway during January 2004. The aircraft was later upgraded to GR.9 standard and is one of many sold to the USMC after being retired from service with the RAF and Royal Navy. As many others, ZD 379 ended up with the 39th Maintenance and Regeneration Group (AMARG) at the famous 'Boneyard' near Tucson, Arizona.



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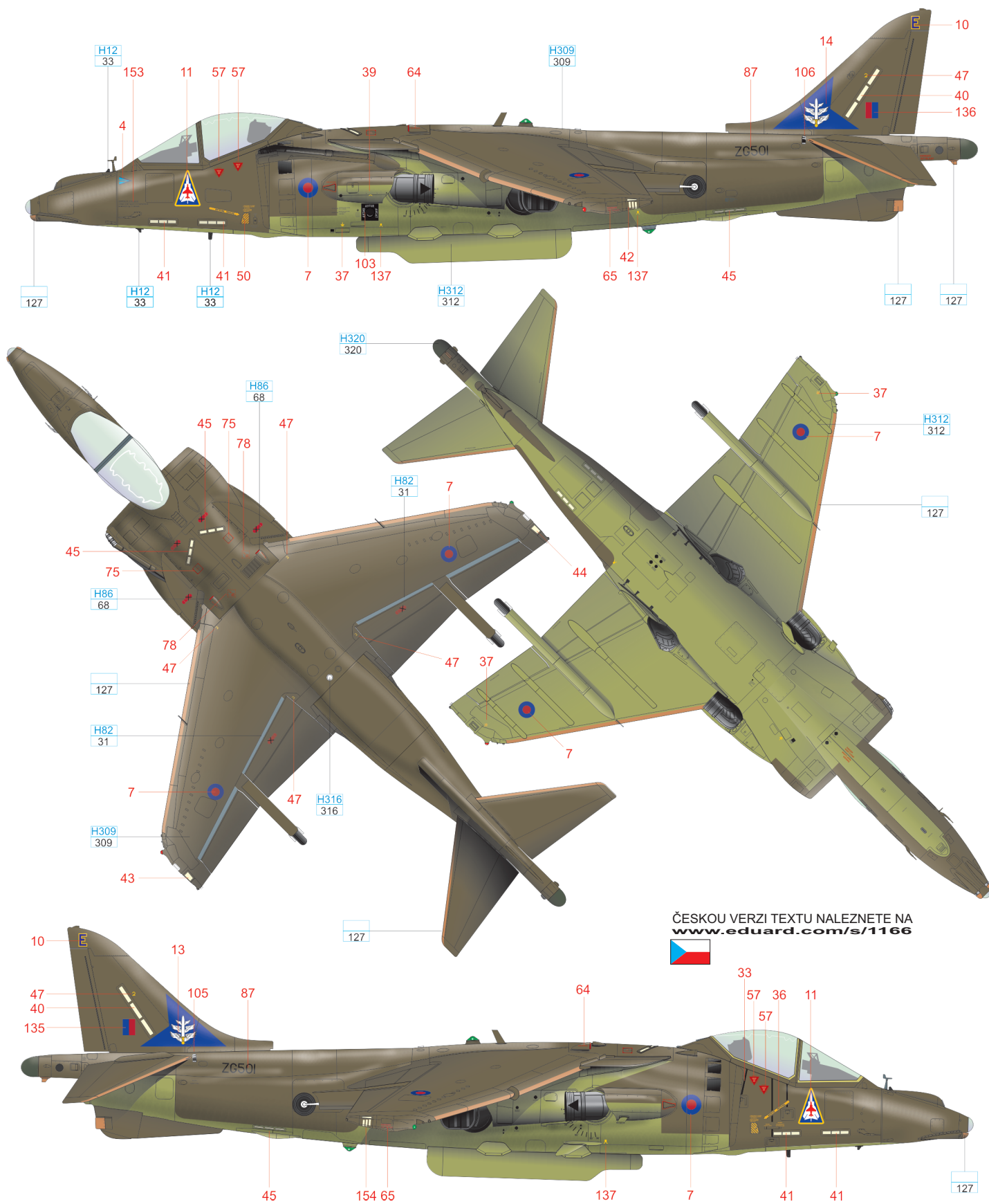


- DARK SEA GRAY H331
331
- DARK CAM. GRAY H82
31
- BLACK H12
33
- YELLOW GREEN 127
- DARK GREEN H320
320
- WHITE H316
316

E Harrier GR.7, ZG 501, SAOEU Boscombe Down, 1996

This was one of the Harriers serving during 1996 at Boscombe Down as part of Strike Attack Operation Evaluation Unit (SAOEU). The plane was camouflaged in NATO IRR Green and Medium (Lichen) Green during this period. On the vertical fin there was a unit badge (sword with three wings) on a blue wedge-shaped field. Originally, ZG 501 was part of No. 4 Squadron, but was transferred to No. 41 Squadron in 2010. There, it was repainted in Dark Sea Gray, obtaining the new code EB-Q. This Harrier was upgraded to GR.9 standard and later was sold as a spare parts source to USMC.

FOR THIS CAMOUFLAGE SCHEME USE STENCILS IN SECTION A ON DECAL SHEET



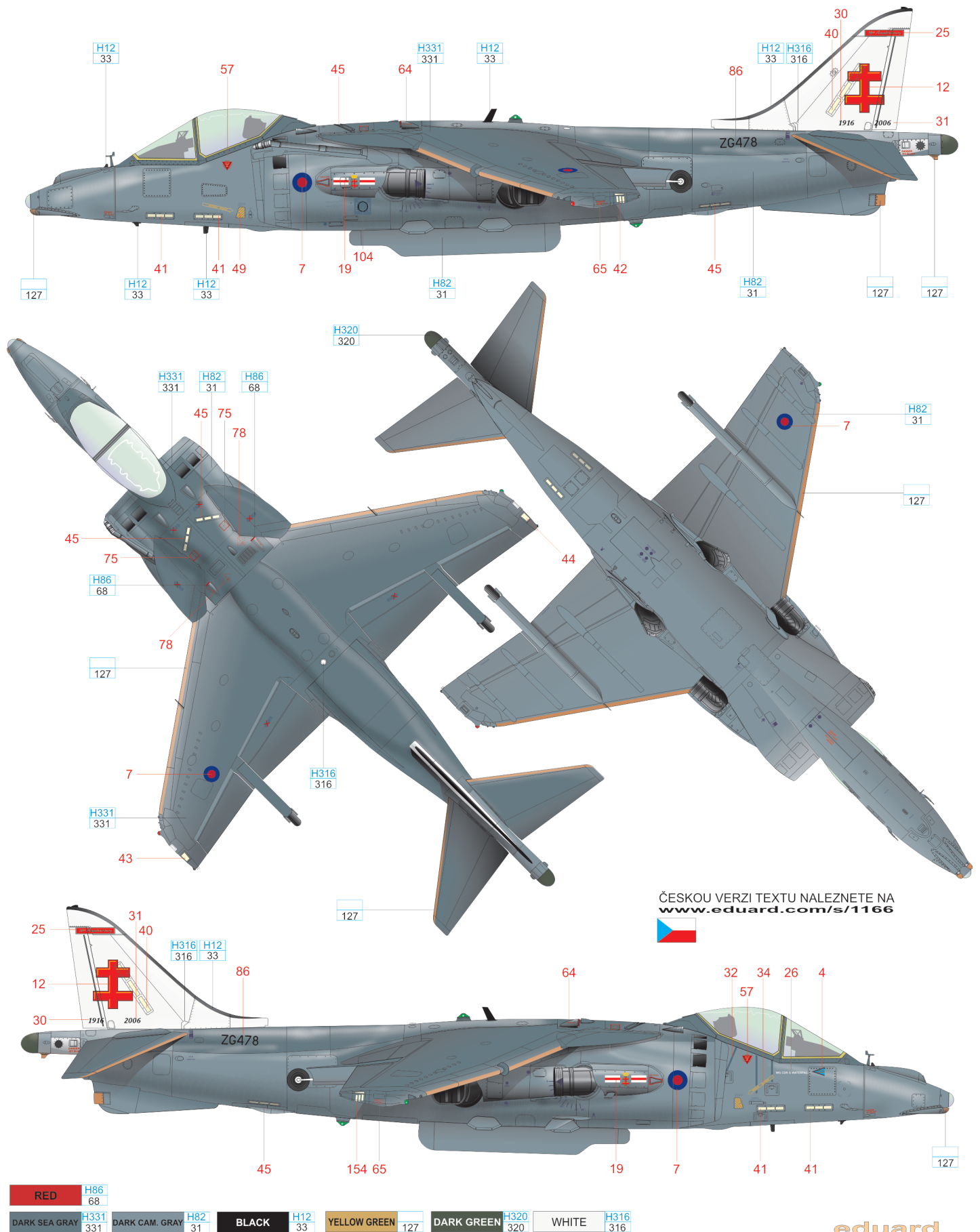
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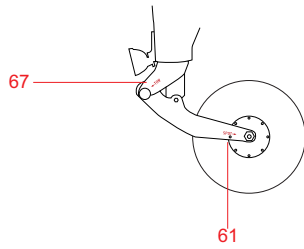
| | | | | | |
|------------|-------------|----------------|-------------|--------------|-------------|
| RED | H86 68 | DARK CAM. GRAY | H82 31 | WHITE | H316 316 |
| DARK GREEN | H309 309 | LICHEN GREEN | H312 312 | BLACK | H12 33 |
| | | | | YELLOW GREEN | 127 |
| | | | | DARK GREEN | H320 320 |

F Harrier GR.9A, ZG 478/68, No. 41 (R) Squadron, RAF Coningsby Air Base, March 2006

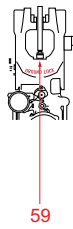
This Harrier II of No. 41 (R) Squadron based at Coningsby wore, during 2006, this anniversary scheme celebrating 90 years of the Squadron. On the probably white vertical fin (some sources insist on silver) with black leading edge there was a red Cross of Lorraine, the Squadron's symbol. This plane was heavily damaged in Afghanistan when attempting to land at Kandahar Air base on 14th May 2009. Throughout the approach, the rate of descent was too high and although Hover Stop was selected with full vertical thrust in the final stage, the plane struck the ground heavily, and the undercarriage collapsed. The aircraft caught fire and slid with all the underwing stores still attached along the runway for some 4,000 ft. During the trek down the runway the pilot turned the aircraft away from a formation of four aircraft waiting to take off, then ejected. The wreck ended in private hands and currently ZG 478 is undergoing restoration to static display condition.



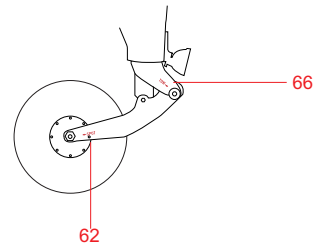
Left Side Nose Gear



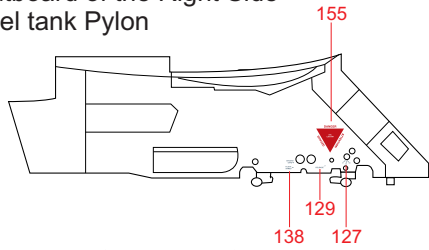
Front Nose Gear



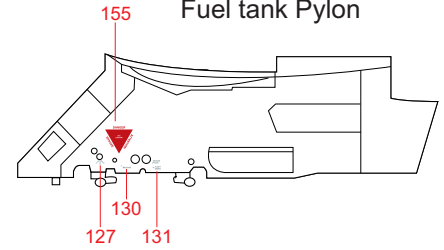
Right Side Nose Gear



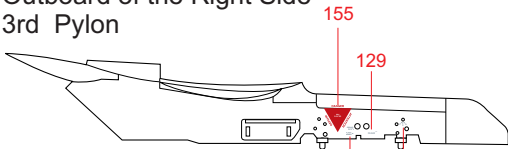
Outboard of the Right Side Fuel tank Pylon



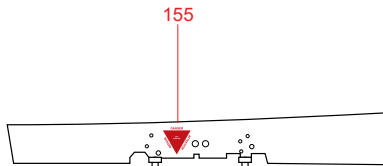
Outboard of the Left Side Fuel tank Pylon



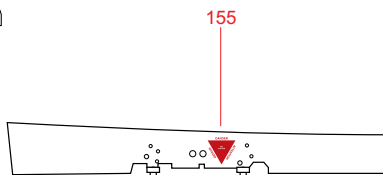
Outboard of the Right Side 3rd Pylon



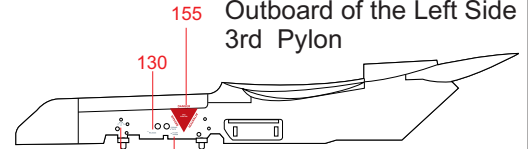
Central Pylon Right Side



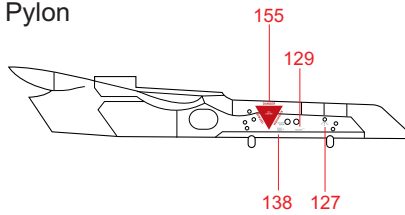
Central Pylon Left Side



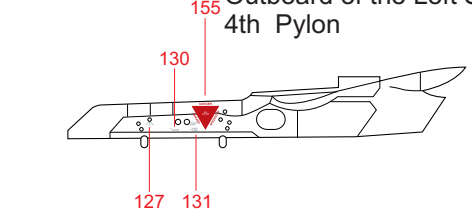
Outboard of the Left Side 3rd Pylon



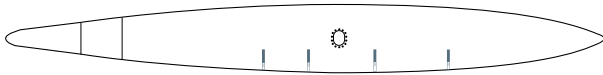
Outboard of the Right Side 4th Pylon



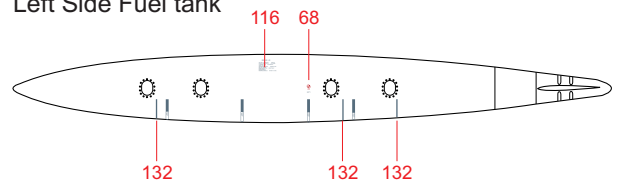
Outboard of the Left Side 4th Pylon



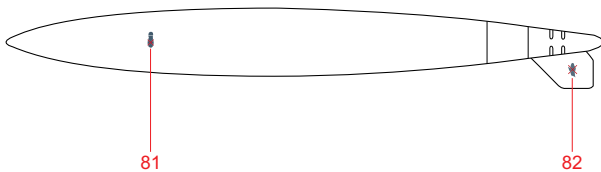
Right Side Fuel tank



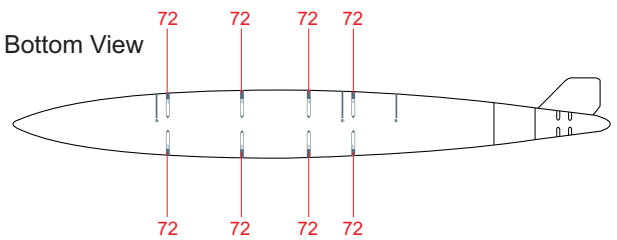
Left Side Fuel tank



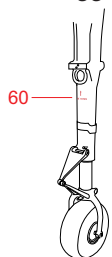
Fuel tank Top View



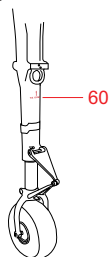
Fuel tank Bottom View



Left Side Outrigger



Right Side Outrigger



AIM-9L Sidewinder

