

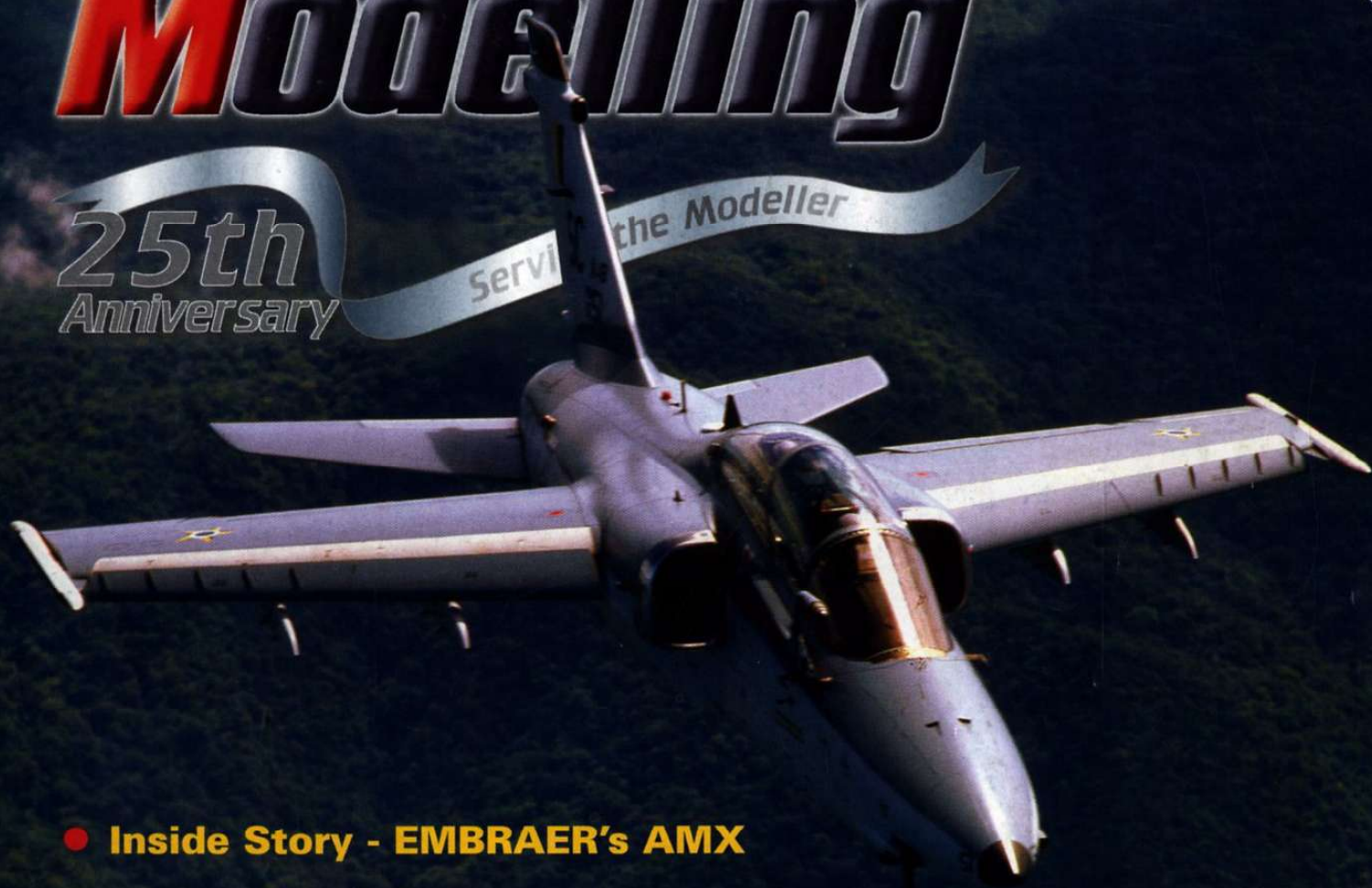
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Aircraft in Profile
Vickers Valiant
last of the V-bombers



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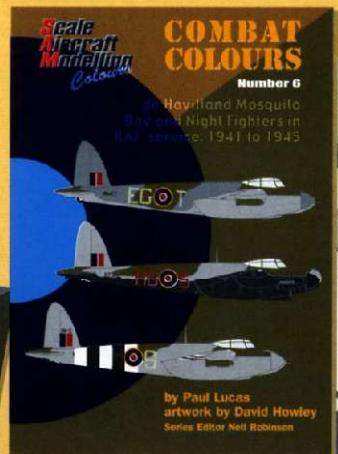
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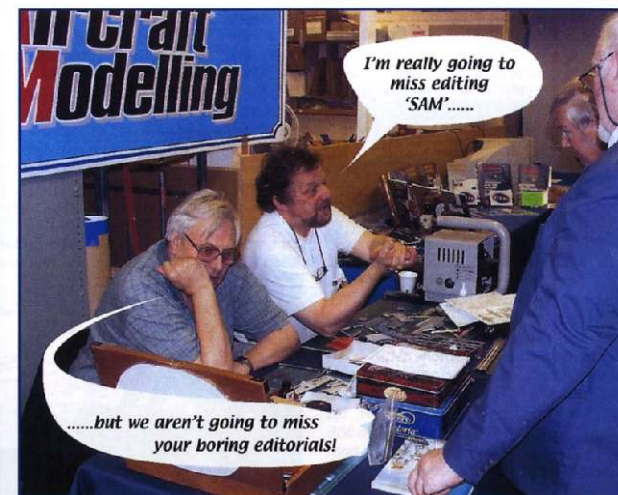
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On the front cover: A Brazilian Air Force AMX-T (EMBRAER via Paul E Eden)
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Due to circumstances beyond our control, the FREE AIRFIX decal sheet, announced in the last issue, has been temporarily delayed and will now be available in time for the August issue (Vol 25/6)

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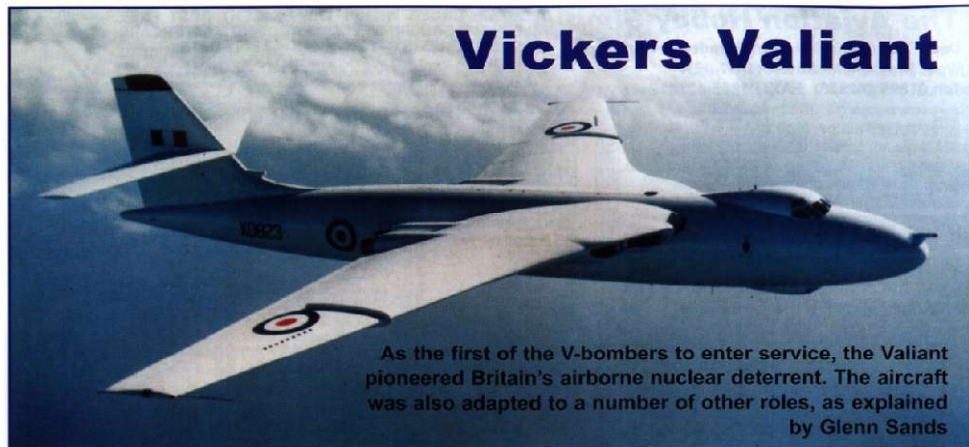
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Vickers Valiant



As the first of the V-bombers to enter service, the Valiant pioneered Britain's airborne nuclear deterrent. The aircraft was also adapted to a number of other roles, as explained by Glenn Sands

The development of the turbojet engine and the nuclear bomb completely altered the structure of Royal Air Force Bomber Command. At a senior level it was seen that a single aircraft would now be able to perform a mission which might have required 1,000 bombers during World War II. Thus, there was an urgent need for new, 'modern' bombers to fill the ranks of a smaller Bomber Command. The Command would have a reduced number of aircraft, but these aircraft would offer higher performance and be able to deliver any of the nuclear bombs then being developed – including Britain's nuclear deterrent. The new aircraft were to be able to operate at a specified altitude of not less than 50,000 ft and at speeds around Mach 0.9–1.0. The prospect of such performance was not only of appeal to those who would fly the bombers; it was also of immense political appeal, since the high cost of a single bomber meant that only a limited number could be built owing to the state of Britain's economy following the end of the war. Indeed, there was a need to totally re-equip the whole of the RAF, but most notably Bomber Command. At the time many people believed in the policy of rebuilding Britain's military strength through a massive re-armament drive at all cost – this thinking ultimately leading to the development of the RAF's V-Bomber force as a strategic deterrent.

As a result of this new defence planning, the Air Staff issued a 1947 requirement for new jet bombers. The aircraft were to utilise a wing sweep of some 35°, which was assumed to be the optimum angle for large aircraft, based on British data and captured German research. Such an angle delayed compressibility effects over the wing when approaching the speed of sound. At the time these effects were relatively unknown, a further bomber, the Short Sperrin, being designed with straight wings as an 'insurance bomber' against the failure of the more radical designs then being proposed.



Above: WB210, the first Valiant prototype, was rolled out in a highly-polished natural metal finish. Its 'letter-box' air intakes are clearly visible in this view. Although the Valiant was the most conventional of the operational V-bombers, it represented the cutting-edge of bomber technology when it first flew in 1951. (Aerospace Publishing Ltd)

Top: One of a batch of 30 Valiant B(K).Mk 1 aircraft, XD823 was one of the Operation Grapple aircraft. These machines were specially modified, being the first Valiants painted overall in anti-flash white and the only examples with white nose radomes. (Arthur Gibson Photographic Collection)

Vickers submitted a tender for the bomber competition, but was unsuccessful. However, later study of its design revealed that the Vickers' bomber would be able to meet all of the specified requirements, apart from that of range. Though less advanced than the other two designs that later emerged as the Vulcan and Victor, Vickers' submission could be made ready much sooner than those from Handley Page and Avro, this time advantage proving very attractive to Bomber Command.

Vickers Type 660

As a result of Vickers' proposal, Air Ministry Specification B.9/48 was drawn up around the design, which was allocated the number 660 in the Vickers type list. Two prototypes were ordered on 2 February 1950, the first was to be powered by four Rolls-Royce Avon RA.3 turbojets rated at 6,500 lb st, and the second, designated Type 667, was to be powered by four Armstrong Siddeley Sapphire turbojets.

Initial design work commenced in 1949 and within a year components were being made into complete assemblies at the Foxwarren experimental shop. It is interesting to note that such was the rapid pace of developments in aviation at the time, that two prototypes were required because the concept of the project was largely experimental. Two aircraft would allow for on-going modifications on one, while the other was being tested. By now the Vickers B.9/48 bomber had been christened Valiant.

Final assembly of the bomber commenced in 1951 at Vickers' company airfield at Wisley. From the grass airfield the prototype Valiant, Vickers Type 660, WB210, took to the air on 18 May 1951. The crew for the flight comprised the pilot, J. 'Mutt' Summers, who had previously flown the prototype Spitfire, and G. R. 'Jock' Bryce. The flight was short, lasting barely five minutes, and only four more flights were made from Wisley's grass strip before trials were relocated to Hum airfield, Bournemouth,

Shown here on display during an RAF open day at the height of its operational career, this Valiant B.Mk 1 wears the standard anti-flash white colour scheme with pale national markings and serials. (Via Glenn Sands)

while a concrete runway was constructed at Wisley. Although already known as the Valiant, the prototype was not officially named until June 1951. It was so called in recognition of an earlier Vickers aircraft, the Type 131 of 1931, a single-engined military tractor biplane.

WB210 was subjected to seven months of flight testing during which an RAF officer, Squadron Leader Brian Foster, was attached to the test team. Foster was flying as co-pilot on 12 January 1952, when, during engine shutdown and re-light trials over Hampshire, a fire broke out in an engine bay after a wet start. No fire detection equipment had been installed in the bay, and by the time the blaze was detected the flames were so advanced that the wing was on the point of collapse. The pilot gave the order to abandon the aircraft and the three rear crew members went out first, followed by the two pilots. All the crew survived, except Squadron Leader Foster, who died when his ejection seat struck the Valiant's fin while the aircraft was in an uncontrolled, descending left-hand turn. Following this accident, modifications were made to the atmospheric balance in the fuel system, curing the fault which had led to the wet start and fire.

Valiant B.Mk 2

Although tragic, the loss of the first Valiant did not affect flight testing to the extent that many believed. The second prototype, WB215, was almost complete at the time and made its first flight at Wisley on 11 April 1952. WB215 differed from its predecessor in introducing enlarged intakes to feed the 7,500-lb st

Right: Some industry pundits called for all Valiants to be completed to the B.Mk 2 standard illustrated here. Had they been, the type's premature retirement with fatigue problems might have been avoided. (Aerospace Publishing Ltd)

Below: By comparison with the photograph of WB210 on the previous page, this image nicely demonstrates the production-standard intake configuration. It also shows the Valiant's earliest service finish to advantage. (Aerospace Publishing Ltd)



Avon RA.7 engines that had been used to power it in place of the proposed Saphires. The aircraft remained with the test programme for more than a year and was flown by a second RAF officer, Squadron Leader Rupert G. W. Oakley.

Following the success of WB215, Vickers received an initial order for 25 Valiant B.Mk 1s in April 1951. Five of these aircraft were to be powered by 9,000-lb st Avon RA.14 engines, while the remaining 20 were to have 10,500-lb st Avon RA.28s, with longer jet pipes. At the same time, Vickers received specifications from the Ministry of Supply for a prototype target-marking version of the Valiant, which was to be strengthened for high-speed, low-level flight and to have increased fuel tankage. Designated Type 673 and named Valiant B.Mk 2, the aircraft was known unofficially by Vickers as the 'Pathfinder'. It first flew on 4 September 1953, just days before that year's SBAC Farnborough airshow. The B.Mk 2 was finished in overall gloss black, and its fuselage was 4 ft 6 in longer than that of the B.Mk 1. Other structural changes saw the undercarriage housed in two long

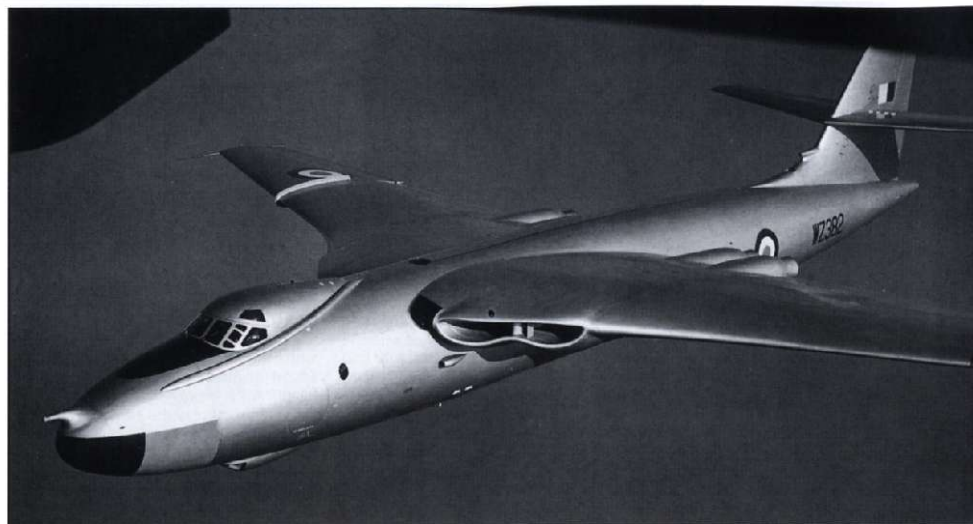
nacelles projecting behind the trailing edge of the redesigned wing.

The airframe changes were coupled with the introduction of Rolls-Royce RA.14 engines, which gave the B.Mk 2 significantly improved handling over the B.Mk 1. Flight tests showed that the B.Mk 2 was able to achieve 552 mph at sea level, whereas the B.Mk 1 struggled to reach 414 mph. Production of the 'Pathfinder' would have allowed for even greater performance, since Rolls-Royce RB.80 by-pass engines, the forerunners of the Conway turbofan, were to be installed. However, the Air Staff decided that there was no longer a requirement for the Valiant B.Mk 2 and the sole example, WJ954, was eventually scrapped. In a twist of fate, ten years later the whole of the V-Force adopted a low-level role. The airframes of the Valiants then in service proved incapable of withstanding the stresses imposed by prolonged flight at low level.

Building the Valiant

With Valiant B.Mk 1 production certain, a number of revolutionary manufacturing methods had to be adopted by Vickers.





Powered stretching and forming tools were used for the leading edges and fuselage panels, fuselage frames and spar sections. Sculpture milling was introduced for the first time, to manufacture the centre-section spar web plates. Synthetic bonding was applied to doubling plates on the control surfaces. A special glass-bonding shop was started to produce various dielectric components, such as the nose radome and suppressed aeriels, as well as ducting for the air system.

The four Avons were buried in the inner wing, a location which was in keeping with British practice at the time. Their intakes were long rectangular slots in the wing root leading edge. Before the first flight vertical airflow straighteners were added in the mouths of the intakes, but in subsequent Valiants the familiar 'spectacle' intakes were adopted to provide a greater mass flow to the higher rated RA.7, RA.14 and RA.28 Avons.

The Valiant's fuselage followed the general pattern of tensile alloy, stressed-skin construction and embodied Vickers' traditional system of construction, with a flush-riveted skin attached to the longitudinal stringers only, the circular fuselage frames being inside the stringers to which they were cleated. The pressure 'egg' which housed the crew had a concave diaphragm bulkhead forward, with radial stiffening beams and the aft bulkhead was an unstiffened convex shell. The 'neutral hole' theory as developed in the first Viscounts was applied to the canopy, oval side windows and oval door, starboard emergency exit hatch, roof sextant dome and floor bomb-aimer's compartment. The door was

provided with a wind shield to assist the crew in bailing out – only the two pilots had ejection seats. Extensive use of electrical systems was made, the only hydraulic systems being for the brakes and steering gear, but even then their pumps were powered by electric motors. The main control surfaces were power operated, but were capable of being selected for manual control. The outward-retracting undercarriage consisted of dual legs and wheels, arranged in tandem and operated by an electrical actuator through worm gearing. The undercarriage stowed into wells in the wing between the engine nacelles and the underwing hardpoints and, when retracted, was covered by two large doors.

Production Valiant B.Mk 1

The first production Valiant, WP199, first flew on 21 December 1953. At the controls were 'Jock' Bryce and Brian Trubshaw. The first five production aircraft (all RA.14 powered) were allocated the Vickers designation Type 674, and carried full radar equipment. One of these aircraft was involved in an incident where both of its ailerons broke away during a high-speed run at medium altitude but, remarkably, test pilot Bill Aston brought the aircraft back safely to Boscombe Down.



Above: WZ405 was a Valiant B(PR)K.Mk 1. These aircraft were outwardly generally similar to the standard B(K).Mk 1, except in the area of the bomb bay, where a number of windows allowed palletised cameras to 'look out'. (Via Glenn Sands)

This classic study shows a number of Valiant details to advantage, including the prominent cockpit canopy, outer-wing fences and undernose bomb-aimer's position. (Via Glenn Sands)

With testing underway, the definitive RA.28-powered Valiant B.Mk 1 was entering production, the first of these Type 706 aircraft being WP204. The aircraft went for handling trials at Boscombe Down and acceptance trials were performed on 4 April 1955. A change in specification was issued during 1954, requesting eleven Valiants to be fitted with removable equipment for high-altitude photographic-reconnaissance sorties by day and night and for aerial survey work. These were slotted into the production line at intervals, the first of the machines being designated Vickers Type 710, or Valiant B(PR).Mk 1 in service. The first PR aircraft, WP205, flew for the first time on 8 October 1954.

Two other Valiant variants were developed the first being the Type 758, which carried the RAF designation B(K).Mk 1. It served in a dual bomber/tanker role and 45 were issued to the RAF, beginning with WP214. The latter proved to be one of the most interesting Valiants, operating with No. 138 Squadron, before serving within Bomber Command's 'special units' carrying large



amounts of ECM gear and other electronic eavesdropping equipment. By this stage, WP214 was operated on a joint basis by personnel from Bomber Command's Development Unit and Vickers. The other variant was the Type 733 B(PR)K.Mk 1, which served in bomber, photographic-reconnaissance or tanker roles. Fourteen examples were delivered to RAF squadrons. In addition, a number of B.Mk 1s was modified for test and programme support roles.

In January 1955, the Valiant received its release for operational service within the UK and overseas and in June that year RAF Gaydon, a formerly disused World War II training airfield, was established as home for the first Valiant operator, No. 232 Operational Conversion Unit (OCU). The unit was tasked with carrying out intensive flying trials and training potential Valiant aircrew. Many of the OCU's officers included pilots who had been involved in the Valiant's development programme at Vickers' Weybridge factory, among them was Rupert Oakley, now a Wing Commander, who was keen to see the aircraft in front-line operational service as soon as possible.

The first front-line squadron to receive Valiants was No. 138 at Gaydon, Warwickshire, commanded by Wing Commander Oakley DSO, DFC, AFC, DFM. The unit's first B.Mk 1, WP206, was taken over from the OCU in February. The Squadron later moved to RAF Wittering with an additional six Valiants.

Valiants abroad

It was only to be expected that with such a sophisticated new bomber in service, the RAF was keen to demonstrate the aircraft's capabilities and to conduct a number of 'flag-waving' exercises. One such exercise took place on 5 September 1955, when two Valiants, under the command of Squadron Leader R. G. Wilson, left RAF Wittering on proving trials. Operation Too Right, as it was called, took Britain's first V-Bomber to

Right: The first generation of V-Bomber crews was some of the most experienced in the RAF. Aircraft Captains were required to have an 'above average' assessment and to have previously served at least 1,750 hours as captain. At least one tour on Canberras and four-piston-engined experience were also requirements. (Via Glenn Sands)

Singapore, Australia and New Zealand. No major unserviceability was encountered throughout a tour in which the two aircraft flew almost 146 hours. Simultaneously, at the SBAC Farnborough airshow, there was a fly-past of six pairs of Valiants from units based at RAF Wittering and RAF Gaydon. The final test of the capabilities of the aircraft, apart from air exercises and the detailed assessment of specialised equipment, was carried out in the spring of 1956, when No. 138 Squadron flew four Valiants for 1,000 hours, without any major problems.

Vickers Valiant

With its undercarriage and flaps retracted, the clean lines of the Valiant become clear. This example also has the extended jet pipes. (Via Glenn Sands)

Once initial deliveries had been made to No. 138 Squadron, the introduction of Valiants to other units quickly followed. The second squadron operator was No. 543 Squadron at RAF Wyton, which received its first aircraft after forming at Gaydon on 1 June 1955. These were B(PR).Mk 1s. During daylight operations a fan of up to eight main cameras and a tri-installation of three cameras to provide wide-angle cover, were mounted in a 'camera crate' in the bomb bay. Behind this, in a fairing, was a survey camera, with two wide-angle oblique cameras mounted above it. During night operations, the B(PR).Mk 1 carried five or six cameras in the 'camera crate' with an equal number of photo-cell units. Photo-flashes were housed in a flash crate at the rear of the bomb bay.

By 1956 RAF Marham and RAF Honington were also operational with Valiants, both of them within Bomber Command's No. 3 Group, and five more Valiant squadrons were formed. The first of these was No. 214 Squadron, a former Lincoln operator which re-formed at Marham in March 1956. In May, No. 207



Squadron, which had previously operated leased Washingtons, was formed with eight Valiants. A further Valiant squadron also formed in May 1956, alongside No. 138 Squadron at Wittering. This was No. 49 Squadron, which had previously distinguished itself when engaged in bombing operations against the Mau-Mau in Kenya in August 1955. In July, the formation of No. 148 Squadron completed the establishment of the Marham Wing, while the first of the Honnington Valiant units, No. 7 Squadron, formed on 1 November 1957, to be followed by No. 90 Squadron in January 1957.

As the squadrons accustomed themselves to operating their new bomber, a series of trials was undertaken to improve the efficiency of the RAF's medium bomber force, as the V-Force was alternatively known (the medium referring to the range, rather than size and weight of the aircraft). To improve the Valiant's performance on short runways at maximum weight, particularly under hot conditions, tests were carried out with Scarab rockets clipped to the rear fuselage; these were later replaced by de Havilland Super Sprites, fuelled by a highly volatile mixture of high-test peroxide and kerosene and delivering a thrust of 4,200 lb for 40 seconds. However, because of a variety of problems, including scorching along the fuselage, the rockets were relocated under the main engines, packaged in nacelles which – in theory at least – were reusable. A trial installation was tested on WB215 and was demonstrated by Brian Trubshaw at the 1956 Farnborough airshow. Further trials were carried out between 23 August and 7 October 1958 by the Bomber Command Development Unit at Wittering, using three Valiants: WZ402, XD871 and XD872. Some eight rocket-assisted take offs were performed, but the procedure was never adopted as standard.

Valiants became regular overseas visitors during the 1950s, one aircraft each from Nos 214 and 543 Squadrons, for example, flew to Idris, Libya to participate in Exercise Thunderhead, testing the defences of NATO countries in



southern Europe and the Mediterranean area. These overseas detachments soon became routine and the squadrons attained several firsts with their aircraft.

The Valiant was the first V-Bomber to drop a British nuclear weapon. In August 1956, two aircraft from No. 49 Squadron were detached to RAAF Edinburgh Field,

Above: V-Bomber formations were a common sight at the Farnborough airshow. Here two Valiants fly in formation with two early model Avro Vulcans. (Via Glenn Sands)

Below: Another view of XD823. XD818, XD822-825, XD827, XD829 and XD857 were similarly modified for Operation Grapple. (Via Glenn Sands)



Maralinga, South Australia, the detachment being commanded by Squadron Leader E. J. G. Flavell. On 11 October, Valiant WZ366, flown by Flavell, released a 10,000-lb weapon from 35,000 ft, at Mach 0.8 over the test range in Southern Australia. Also participating in the trials was a modified Canberra from No. 76 Squadron, tasked with collecting atomic cloud samples at all altitudes.

Operation Musketeer

Although it had always been intended for the nuclear bombing role, events saw the Valiant called into action in a more conventional role during the Suez Crisis, as part of Operation Musketeer. In October 1956 Valiants from Nos 138, 148, 207, and 214 Squadrons were detached to Luqa, Malta, and on 31 October their crews were briefed to attack Egyptian airfields, as part of the air offensive prior to the Anglo-French landings in the Suez Canal zone. The initial attacks were carried out by Canberras of Nos 12 and 109 Squadrons and Valiants of Nos 148 and 214 Squadrons, against airfields at Almaza, Cairo West and Inchas in the Nile Delta and Abu Sueir, Fayid, Kabrit and Kasfareet in the Canal Zone. As they headed for their objectives, the bomber crews knew that the Egyptian air defences would be on alert. This was because hours of intercepted radio traffic had forewarned the Egyptian population that a series of attacks on airfields around Cairo and in the Canal Zone would begin, following the expiry of an Anglo-French ceasefire ultimatum to Israel and Egypt, which Egypt had rejected.

In the event, the Egyptian defence failed to materialise and locating the airfields proved no problem for the bomber crews, since every town in the Nile Delta region was fully illuminated. A typical attack was flown by Valiant XD815 from No. 148 Squadron. Operations from Malta involved a 1,800-mile round trip of some five hours, with just 15 minutes was spent over Almaza airfield. This proved to be the standard type of Valiant mission throughout the crisis, with single aircraft bombing from 40,000 ft. Some bombers made two passes over the airfields to ensure that their attack did not damage civilian

property. It was stressed to all Valiant crews that Egyptian casualties should be kept to a minimum. In the event the airfields had been marked with flares by 'Pathfinder' Canberras prior to the raids. Only one Egyptian attack was reported, by Valiant pilot Squadron Leader E. T. Ware of No. 148 Squadron. During a night raid, his aircraft was intercepted by an Egyptian Meteor NFMk 13 which made two inaccurate firing passes, Squadron Leader Ware was easily able to avoid the attacker by climbing to altitude. The airfields suffered a further two nights of attacks by Valiants, during which raids were brought down to medium level to increase accuracy.

Cairo West was struck on the night of 1/2 November, with Valiants from No. 138 Squadron attacking for the first time, led by Wing Commander Oakley. There was no enemy opposition and the raid proved a great success. Photographic intelligence collected by Canberra PR.Mk 7s after the raid, showed that bombs had landed across both runways.

Combat lessons

Following the Anglo-French landing, the Valiants returned immediately to the UK, their task of attacking Egyptian airfields completed. Following the debrief held by Bomber Command after the Valiant's combat debut, a number of recommendations were proposed and modifications were made to the bombers. It was clear to the crews that the Valiant could not climb any extant night fighter, but on the downside there was a tendency for the aircraft's bombs not to separate cleanly. It was discovered that at high speed the bombs tended to stay with the Valiant immediately after release, suspended in the airflow just a few feet below the bomb bay. Pilots also reported considerable buffeting when the bomb doors were opened.

To reduce buffeting a deflector was fitted to the rear of the bomb bay, the bomb doors being unable to open until this was raised. A spoiler consisting of four vertical slats was mounted in front of the bay and was extended prior to bomb release to break up the airflow under the bomb bay. The break up of the airflow under the Valiant during weapons release was critical if the bomber was to be able to deliver the 10,000-lb MC Mk 1 Blue

Huge underwing auxiliary tanks were a feature of tanker Valiants in particular. In tanker configuration, the aircraft carried a Fight Refuelling Ltd Mk 16 Hose Drum Unit (HDSU) in the rear of its bomb bay. (Via Glenn Sands)

Danube nuclear bomb. The aerodynamic characteristics of the weapon required a smooth release and separation from the Valiant. Suez also had an adverse effect on Britain's nuclear programme, with the recall of No. 49 Squadron's detachment from weapons trials in Australia as a precautionary measure.

By 1957 all of the RAF's Valiant squadrons were back at their home bases. In July, No. 199 Squadron at Honington, which had previously flown Canberras in the ECM role, received its first Valiant. By 16 December 1958, the squadron had moved to RAF Finningley, renumbered as No. 18 Squadron, becoming responsible for ECM for the whole of the V-Force. The role saw a change in No. 18 Squadron's Valiant crew make-ups, with the addition of two Airborne Electronic Officers (AEOs), one of whom was responsible for operating the newly introduced ECM equipment.

Valiant production ended in 1957, with the last example, XD875, being delivered on 24 September. By this time Vickers had built 108 production Valiants, two prototypes and one B.Mk 2. Of this total 14 were B(PR).Mk 1s, many of which went to No. 543 Squadron, equipped to receive fuel in flight, and 45 were B(K).Mk 1s, many of which were able to receive as well as deliver fuel.

Inflight-refuelling and nuclear trials

The first inflight-refuelling trials had taken place at Boscombe Down in November 1955 using two modified aircraft, WX390 serving as the tanker and WZ376 acting as the receiver. Despite the successful conclusion of the tests, it was not until March 1958 that operational trials were initiated by No. 214 Squadron. The Marham-based squadron soon became the RAF's first tanker squadron.

In 1957, perhaps the most significant event in the development of the V-Force deterrent took place – the testing of Britain's first thermonuclear device. In early 1955, a defence statement had announced that 'the British Government has decided to proceed with the development and production of



With its upper surfaces wearing a very glossy Dark Green/Medium Sea Grey camouflage, this Valiant is demonstrating its Mk 16 HBU for the camera. Note the hard demarcation between the upper surface camouflage and underside white and the outward-retracting main undercarriage units. (Aerospace Publishing Ltd)

through 90° to get clear of the target area. Such a bomb release procedure would see that the Valiant was being flown to its limits. The weapon was barometrically fused to detonate at 15,000 ft over Malden Island, 350 miles south of Christmas Island.

On the morning of 15 May 1957, Valiant XD818, flown by Wing Commander K. G. Hubbard, Commanding Officer of No. 49 Squadron, took off with a prototype megaton-range weapon in its bomb bay. At 11.38, local time, the device detonated on schedule over Malden Island producing a yield of approximately one megaton.

Britain carried out a three more thermonuclear weapon drops from Christmas Island in 1957, the last two being made on 19 June and 8 November, respectively. All of the warheads involved were in the megaton range. Worthy of note is that Britain applied code names only to the warheads of its thermonuclear devices, not to the complete weapon. This practice continued until such weapons were finally retired from RAF service.

With the RAF keen to demonstrate the capabilities of its 'new' bomber, in October 1957 one Valiant each from Nos 138 and 214 Squadrons, together with

thermonuclear weapons, following the American H-Bomb tests of 1954 and with the knowledge that Russia was pursuing a similar policy.

In 1955 discussions had been opened with the US on nuclear co-operation for defence purposes, covering training and joint operations. These talks were the first significant breakthrough since the McMahon Act of 1946 had ended Anglo-American nuclear collaboration, and seem to have been influenced by the fact that

That the Valiant entered RAF service in the same year that the last of the Mosquitos was retired, is a testimony not only to the longevity of the Mosquito, but also to the pace of change in contemporary aerospace technology. For a time, the Valiant and Canberra were the RAF's primary strike assets. (Via Glenn Sands)

Britain had since developed an independent nuclear capability.

Thus, with 'some information' released by the Americans, the British thermonuclear weapons programme went ahead, and by May 1957 an experimental megaton-range device was ready for testing. Pre-warned of the tests, No. 49 Squadron was detailed to carry out the air drop, and in March 1957 four Valiants were detached to Christmas Island, in the southwest Pacific, as part of Operation Grapple. Prior to the detachment, No. 49 Squadron crews went through two months of intensive training – there could be no room for error. Weapon release was from 39,000 ft at a speed of Mach 0.82, and was to be followed by a steep turn



two Vulcans, represented Bomber Command in the USAF's Strategic Air Command Bombing Competition, held at Pinecastle AFB, Florida. It was the first time that V-Bombers had taken part in the competition, which took place over six nights and involved 45 SAC bomber wings. Despite some initial difficulty with one of the Valiant's nav/attack systems, the No. 138 Squadron aircraft was placed 27th out of 45. The crew from No. 214 Squadron was placed 11th out of 90 in the individual crew part of the contest.

The following year's competition at March AFB, California, saw the Valiants placed seventh in a combined bombing and navigation event, out of 41 teams. One No. 148 Squadron Valiant crew, led by Squadron Leader R. W. Richardson, achieved the highly respectable position of ninth out of 164 crews.

Other operations performed by Valiants included Snow Trip, a survey of the Distant Early Warning (DEW) radar chain across the Canadian Arctic border and the regular Lone Ranger flights. These latter involved a single aircraft deploying to an overseas RAF base as part of a long-range navigational exercise and usually took place over a weekend.

Vulcans and Victors

By 1957 the introduction of Vulcans and Victors was beginning, but for the time being it was the Valiant that formed the backbone of the strategic deterrent – for another three years at least. By 1961 nine squadrons and an OCU were equipped with Valiants as part of the medium bomber force. Nos 7 and 18 Squadrons were still serving in the ECM role; Nos 49, 90, 138, 148, 207 and 543 Squadrons included strategic reconnaissance in their roles; while No. 214 Squadron fulfilled the tanker role, in which it was joined by No. 90 Squadron at Marham from October 1961.

Right: Dwarfing the Tiger Moth parked next to it, this Valiant B.Mk 1 shows off the 'neutral hole' oval crew access door. Also noteworthy is the cap on the end of the IFR probe. (Via Glenn Sands)

Below: In order to increase its chances of surviving a low-level penetration into enemy airspace, the Valiant was given a Dark Green/Medium Sea Grey upper surface camouflage. Even so, it was tacitly understood by some members of the Valiant community that any aircraft launched for real, was unlikely to return from the mission. (Via Glenn Sands)



Vickers Valiant

For a number of years, three Valiant units, Nos 207, 49 and 148 Squadrons, were assigned to NATO in the tactical bombing role under the control of the Supreme Allied Commander, Europe. For this role the aircraft carried either conventional bombs, comprising 21 1,000-lb weapons in three clutches of five and two of three, or tactical nuclear weapons of a US design. Thus, the Valiant not only formed part of Britain's VForce, but also augmented the striking power of NATO, at least until 1961.

Perhaps the most visible change to the Valiants occurred in 1963, with the introduction of camouflage for the low-level role. The overall gloss anti-flash white scheme gave way to green and grey uppersurfaces over white. Although the Valiant had never been designed to withstand the stresses of low-level flying, Bomber Command estimated that the aircraft would remain in service for another five years. After a detailed re-assessment of potential enemy defences had shown that high-level subsonic operations had become too dangerous, the change to low-level tactics was imposed across the V-Bomber fleet following a statement by the Air Minister in February 1964 at Wittering.

Cracking up

Perhaps inevitably, in 1964, a fracture occurred in the rear spar of a Valiant, and when other aircraft were inspected, indications of metal fatigue were found. The final Valiant sorties were flown in December and the force was withdrawn from service in January 1965. Repairing the Valiants was never an option, since with the introduction of the Avro Vulcan and Handley Page Victor bombers, no budget was available.

One of the last Valiants to fly operationally was XD818 of Operation Grapple fame. It took off from Marham on its last training sortie on 9 December 1964. Within a month, large-scale scrapping of the fleet commenced. Only XD818 and four other examples were saved, the latter being employed on test duties. The last Valiant to fly was XD816, which had been on loan to the British Aircraft Corporation since September 1964. This final airworthy example took part in a flypast on 29 April 1968 to mark the disbandment of Bomber Command and the inauguration of its successor – Strike Command.

While the Victor and Vulcan, have overshadowed the achievements of the Valiant, it is perhaps worth noting that the Vickers' bomber was successfully adapted to all of the roles given to it by Bomber Command. At the time the Valiant entered service it was described by Sir George Edwards, Vickers' chief designer, as an 'unfunny' aircraft that was produced in the shortest possible time. In fact the prototypes had been ordered in February 1950, the first of them completing its maiden flight in May 1951, and the first production aircraft flying in December 1953. RAF Bomber Command had its first Valiant squadrons by late 1955. The Valiant proved extremely easy to service and no major 'snags' were discovered that could not be fixed. Throughout the early dawn of Britain's deterrent force, Vickers Valiants stood dispersed at constant readiness at sites throughout Britain, while their crews trained and learned the methods that would be passed to the RAF's next generation of crews, who were destined to fly more deadly nuclear bombers.

Glenn Sands

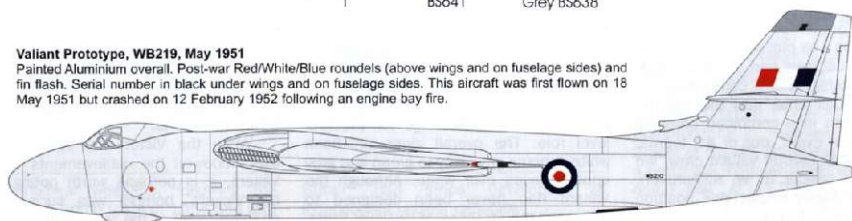


Valiant drawings by David Howley



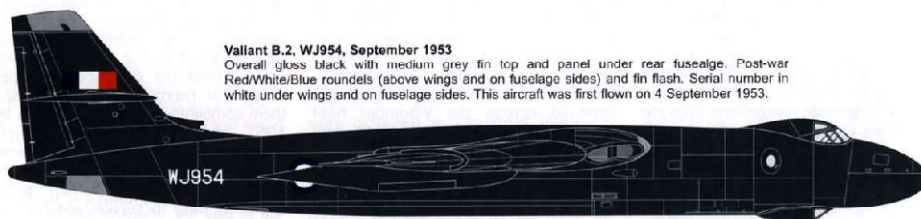
Valiant Prototype, WB219, May 1951

Painted Aluminium overall. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings and on fuselage sides. This aircraft was first flown on 18 May 1951 but crashed on 12 February 1952 following an engine bay fire.



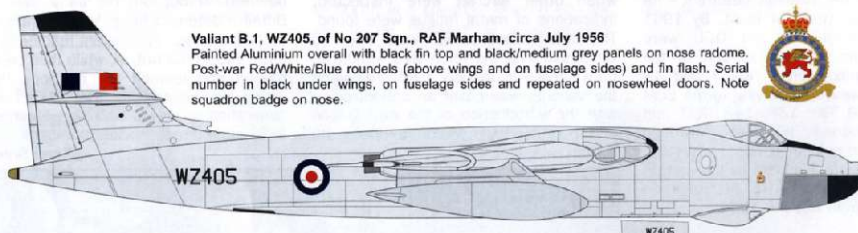
Valiant B.2, WJ954, September 1953

Overall gloss black with medium grey fin top and panel under rear fuselage. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in white under wings and on fuselage sides. This aircraft was first flown on 4 September 1953.



Valiant B.1, WZ405, of No 207 Sqn., RAF Marham, circa July 1956

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and repeated on nosewheel doors. Note squadron badge on nose.



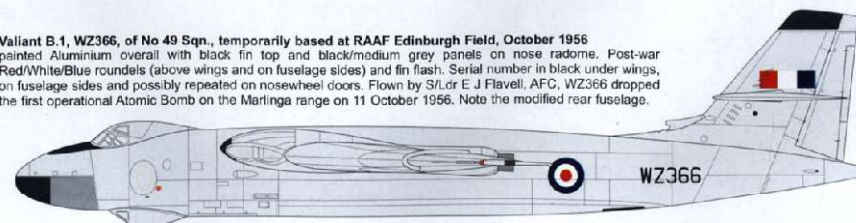
Valiant B.1, WZ395, of No 214 Sqn., RAF Marham, circa September 1956

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose.



Valiant B.1, WZ366, of No 49 Sqn., temporarily based at RAAF Edinburgh Field, October 1956

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Flown by S/Ldr E J Flavell, AFC. WZ366 dropped the first operational Atomic Bomb on the Marlinga range on 11 October 1956. Note the modified rear fuselage.



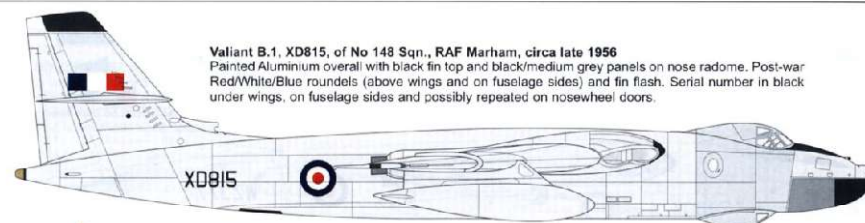
Valiant Camouflage notes

Initial production aircraft were painted Aluminium with Post War Bright Red/White/Bright Blue roundels and fin flashes, with black under wing, fuselage side and nosewheel door serials. Matt Anti Flash White scheme was introduced circa July 1956, so late production aircraft would have carried this finish. The original painted Aluminium finish would have been replaced either to a set modification programme or during 3rd line servicing.

Gloss Anti Flash White was introduced circa December 1959. Under wing and nosewheel door serials were deleted. Pale Red/White/Pale Blue national markings.

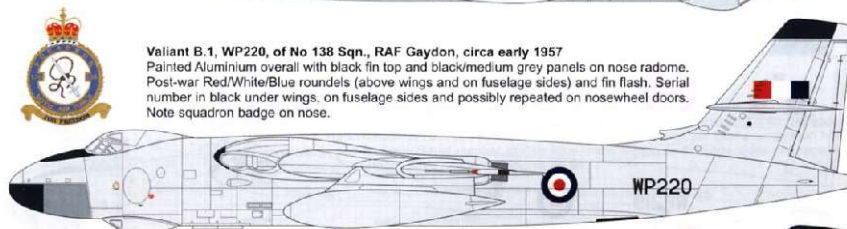
Valiant B.1, XD815, of No 148 Sqn., RAF Marham, circa late 1956

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors.



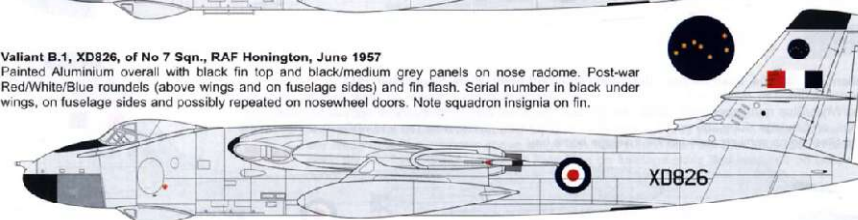
Valiant B.1, WP220, of No 138 Sqn., RAF Gaydon, circa early 1957

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose.



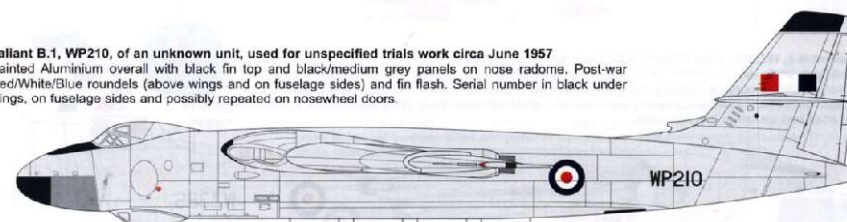
Valiant B.1, XD826, of No 7 Sqn., RAF Honington, June 1957

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin.



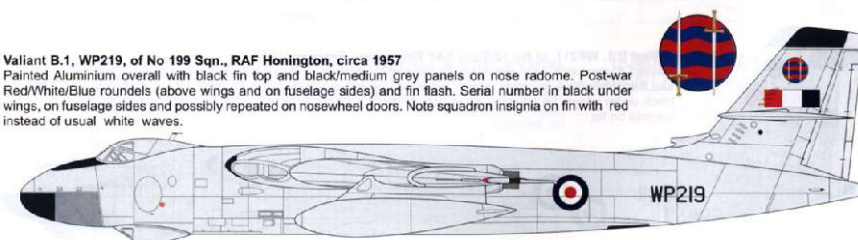
Valiant B.1, WP210, of an unknown unit, used for unspecified trials work circa June 1957

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors.



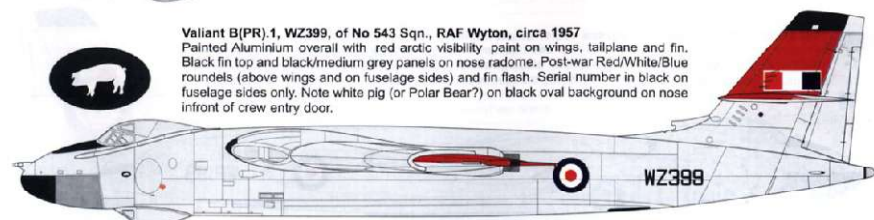
Valiant B.1, WP219, of No 199 Sqn., RAF Honington, circa 1957

Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin with red instead of usual white waves.



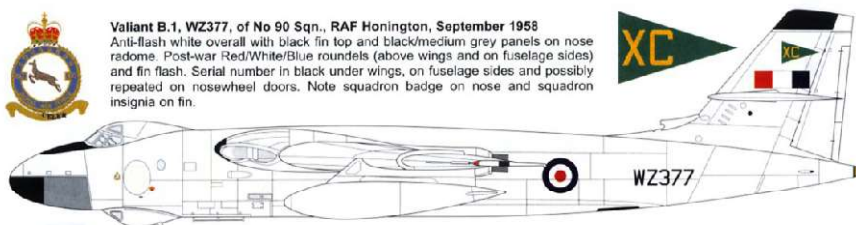
Valiant B(PR).1, WZ399, of No 543 Sqn., RAF Wyton, circa 1957

Painted Aluminium overall with red arctic visibility paint on wings, tailplane and fin. Black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black on fuselage sides only. Note white pig (or Polar Bear?) on black oval background on nose in front of crew entry door.

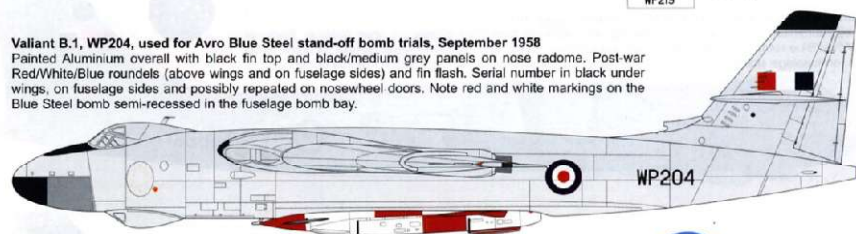




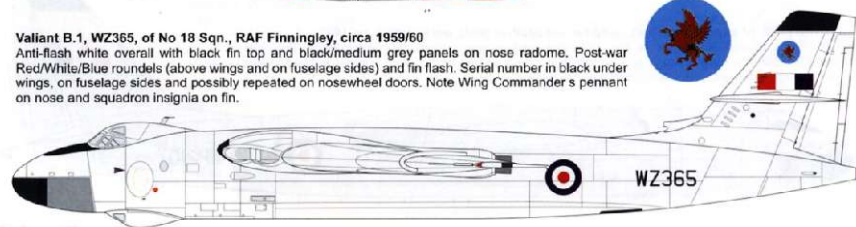
Valiant B.1, WZ377, of No 90 Sqn., RAF Honington, September 1958
 Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose and squadron insignia on fin.



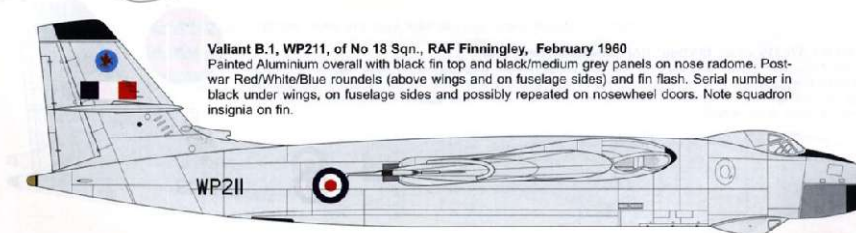
Valiant B.1, WP219, of No 207 Sqn., RAF Marham, September 1958
 Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose and squadron insignia on fin.



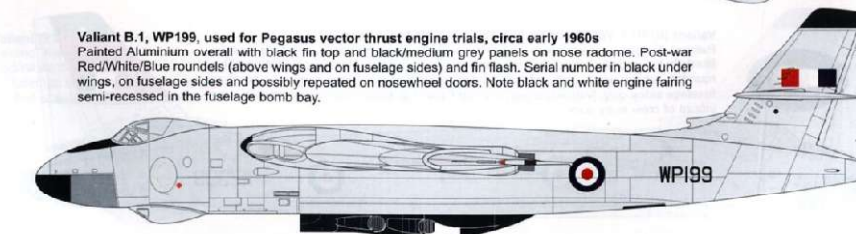
Valiant B.1, WP204, used for Avro Blue Steel stand-off bomb trials, September 1958
 Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note red and white markings on the Blue Steel bomb semi-recessed in the fuselage bomb bay.



Valiant B.1, WZ365, of No 18 Sqn., RAF Finningley, circa 1959/60
 Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note Wing Commander's pennant on nose and squadron insignia on fin.



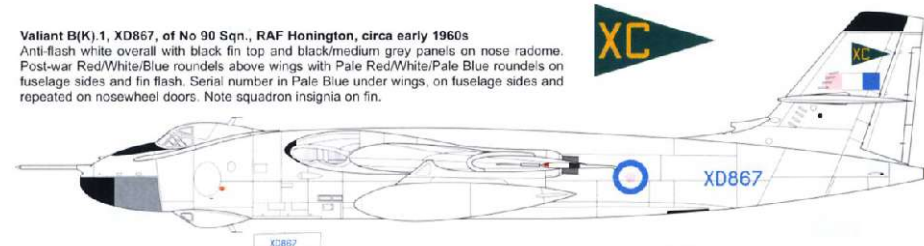
Valiant B.1, WP211, of No 18 Sqn., RAF Finningley, February 1960
 Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin.



Valiant B.1, WP199, used for Pegasus vector thrust engine trials, circa early 1960s
 Painted Aluminium overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note black and white engine fairing semi-recessed in the fuselage bomb bay.

Valiant B(K).1, XD867, of No 90 Sqn., RAF Honington, circa early 1960s

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings, on fuselage sides and repeated on nosewheel doors. Note squadron insignia on fin.



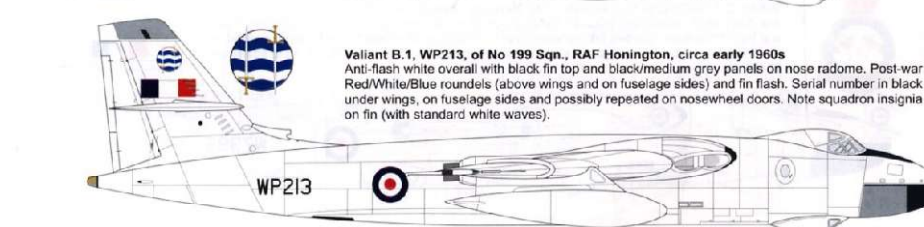
Valiant B(PR).1, WZ380, of No 543 Sqn., RAF Wyton, circa early 1960s

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings, on fuselage sides and repeated on nosewheel doors. Note squadron insignia on fin.



Valiant B(PR).1, WZ392, of No 543 Sqn., RAF Wyton, circa early 1960s

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue on fuselage sides and repeated on nosewheel doors. Note squadron insignia on fin.



Valiant B.1, WP213, of No 199 Sqn., RAF Honington, circa early 1960s

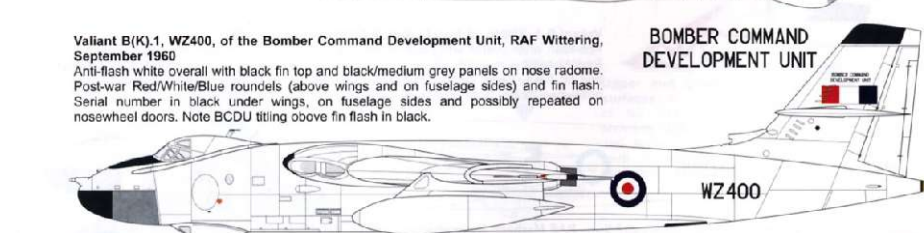
Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin (with standard white waves).



Valiant B(K).1, WZ400, of the Bomber Command Development Unit, RAF Wittering, September 1960

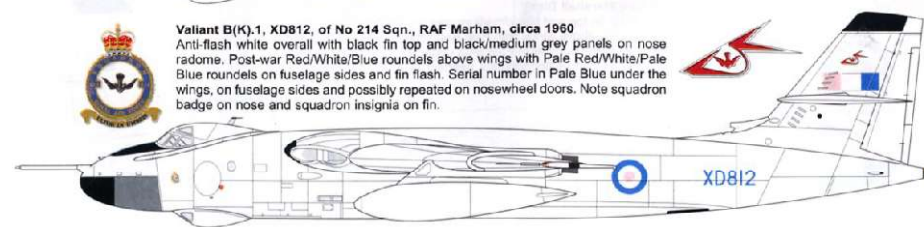
Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note BCDU titling above fin flash in black.

**BOMBER COMMAND
 DEVELOPMENT UNIT**



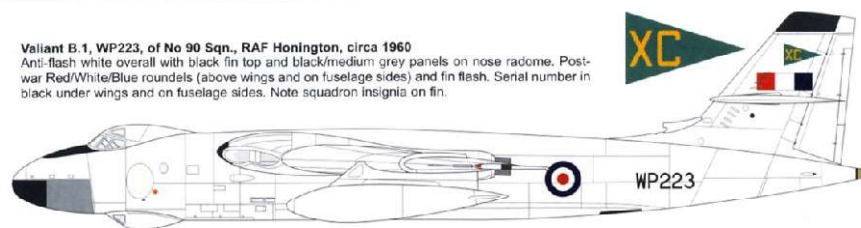
Valiant B(K).1, XD812, of No 214 Sqn., RAF Marham, circa 1960

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose and squadron insignia on fin.



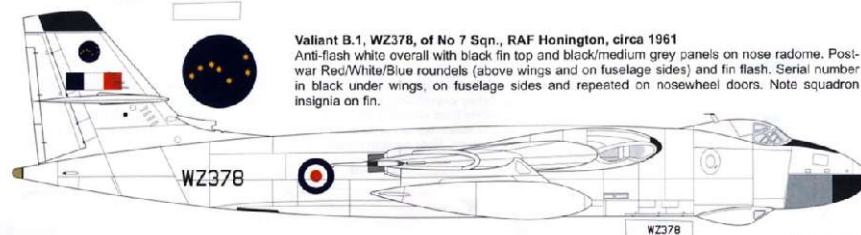
Valiant B.1, WP223, of No 90 Sqn., RAF Honington, circa 1960

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings and on fuselage sides. Note squadron insignia on fin.



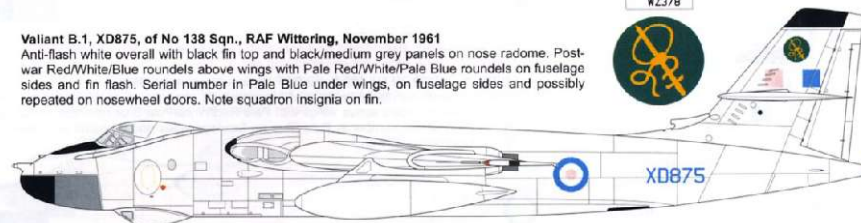
Valiant B.1, WZ378, of No 7 Sqn., RAF Honington, circa 1961

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and repeated on nosewheel doors. Note squadron insignia on fin.



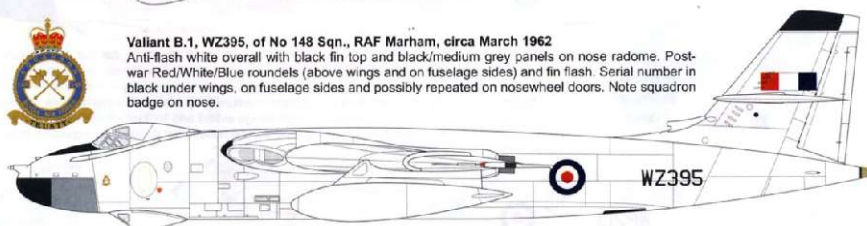
Valiant B.1, XD875, of No 138 Sqn., RAF Wittering, November 1961

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin.



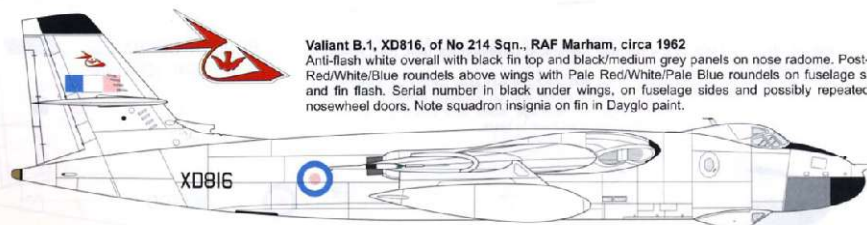
Valiant B.1, WZ395, of No 148 Sqn., RAF Marham, circa March 1962

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron badge on nose.



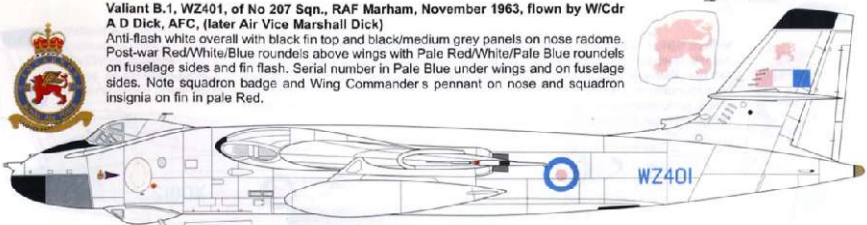
Valiant B.1, XD816, of No 214 Sqn., RAF Marham, circa 1962

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in black under wings, on fuselage sides and possibly repeated on nosewheel doors. Note squadron insignia on fin in Dayglo paint.



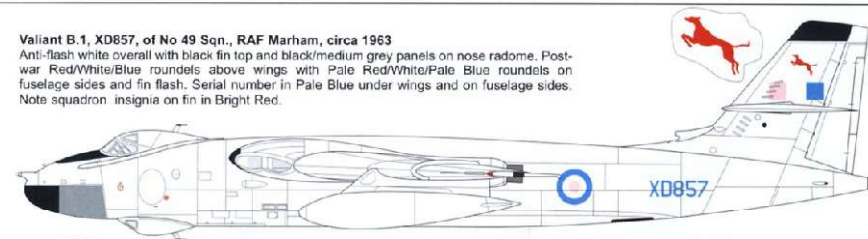
Valiant B.1, WZ401, of No 207 Sqn., RAF Marham, November 1963, flown by W/Cdr A D Dick, AFC, (later Air Vice Marshall Dick)

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings and on fuselage sides. Note squadron badge and Wing Commander's pennant on nose and squadron insignia on fin in pale Red.



Valiant B.1, XD857, of No 49 Sqn., RAF Marham, circa 1963

Anti-flash white overall with black fin top and black/medium grey panels on nose radome. Post-war Red/White/Blue roundels above wings with Pale Red/White/Pale Blue roundels on fuselage sides and fin flash. Serial number in Pale Blue under wings and on fuselage sides. Note squadron insignia on fin in Bright Red.



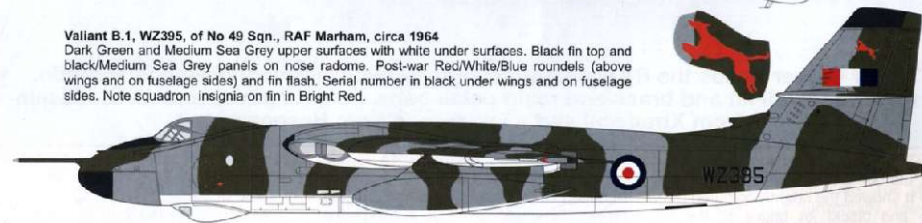
Valiant B.1, WZ404, of No 207 Sqn., RAF Marham, circa 1964

Dark Green and Medium Sea Grey upper surfaces with white under surfaces. Black fin top and black/Dark Green panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings and on fuselage sides. Note squadron insignia on fin in Bright Red.

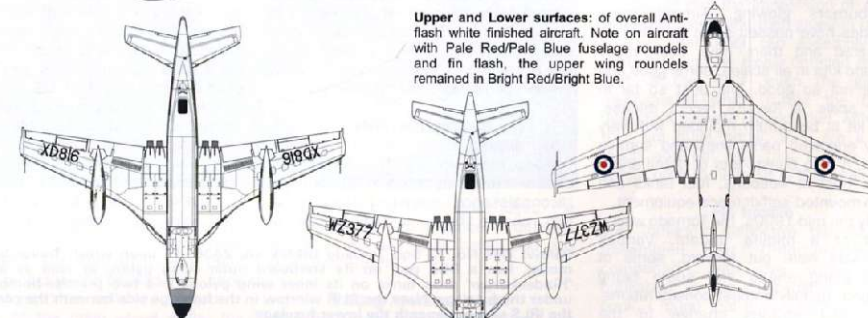


Valiant B.1, WZ395, of No 49 Sqn., RAF Marham, circa 1964

Dark Green and Medium Sea Grey upper surfaces with white under surfaces. Black fin top and black/Dark Green panels on nose radome. Post-war Red/White/Blue roundels (above wings and on fuselage sides) and fin flash. Serial number in black under wings and on fuselage sides. Note squadron insignia on fin in Bright Red.



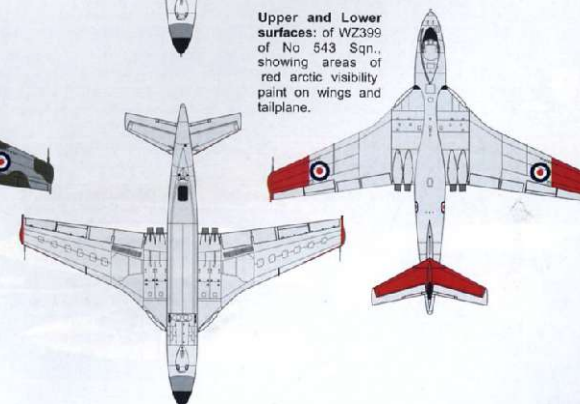
Upper and Lower surfaces: of overall Anti-flash white finished aircraft. Note on aircraft with Pale Red/Pale Blue fuselage roundels and fin flash, the upper wing roundels remained in Bright Red/Bright Blue.



Camouflage finish: upper surface pattern with white under surfaces.



Upper and Lower surfaces: of WZ399 of No 543 Sqn., showing areas of red arctic visibility paint on wings and tailplane.





Trevor Glover builds the RAF's high-technology tactical-reconnaissance Tornado, using the Revell kit and brass and resin detail parts from Airwaves and Aires, decals from Xtradecal and a few pieces from Hasegawa.

In 1975 Airfix released the MRCA in kit form, the box art being most memorable, since it showed the brightly coloured (red, white and black) jet taking to the air, afterburners glowing. Almost three decades have passed since that first kit appeared and there have been many Tornado kits in all scales, some good and some not so good. The best so far in 1:72 scale is Revell's recent release. This kit is beautifully moulded with very finely engraved panel lines and surface detail. It also boasts lots of detail and a whole host of weapons, fuel tanks and pylon-mounted self-defence equipment.

By the mid-1990s, the Tornado was in need of a midlife update. Various proposals were put forward, some of them going ahead and some being dropped, usually on cost considerations. The most obvious change to the

upgraded Tornado GR.Mk 4/4A is the addition of a FLIR unit in a fairing mounted to port on the underside of the forward fuselage. This system allows the aircraft to make low-level approaches to targets, and to attack them without using radar. Since the FLIR is passive, there are no tell-tale emissions to give away the Tornado's position to the enemy.

Building the model

I had decided that I wanted to build a Tornado that was slightly different, and chose the updated GR.Mk 4A reconnaissance machine. Since there has always been a wide range of

aftermarket accessories available for the Tornado, I also decided to take advantage of some of these.

Assembly started with the cockpit. I had decided to use the Airwaves GR.Mk 4 brass conversion set, which also includes a resin FLIR fairing. All the kit parts were painted a light grey, in this case Humbrol No. 127 US Ghost Grey. The raised detail depicting the various consoles in the cockpit tub had to be removed, as did the similar detail on the front and rear instrument panels. The appropriate brass parts were also painted with Humbrol No. 127, and when they were dry I coated them with an

Below: This No. 13 Sqn Tornado GR.Mk 4A, ZA369/U, upon which Trevor based his model, has a BOZ pod on its starboard outer wing pylon, as well as a pair of 'Hindenberg' drop tanks on its inner wing pylons and two practice-bomb carriers under the fuselage. Note the SLIR window in the fuselage side beneath the cockpit and the IRLS sensor beneath the lower fuselage.

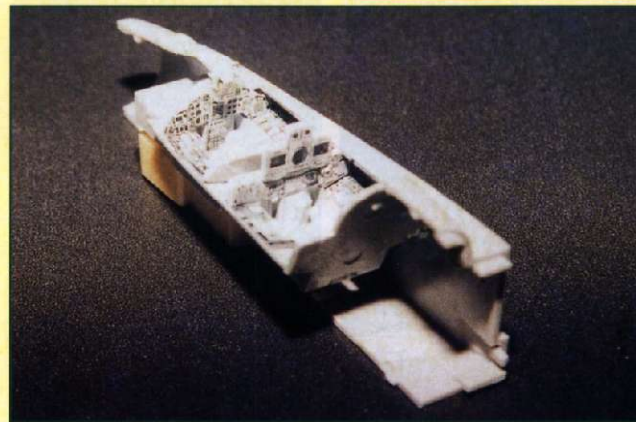


Right: Revell provide a comprehensive set of grey and clear plastic parts for the Tornado GR.Mk 1, along with a large decal sheet. Trevor chose to use the accessories illustrated both to add detail to the already fine kit, and to facilitate the conversion to upgraded Tornado GR.Mk 4A standard.

Below: A brass cockpit detail set from Airwaves added greatly to the kit parts. The Aires' resin nosewheel bay is just visible below the cockpit tub.

acrylic varnish. Next I painted them with black oil paint, leaving the paint only in the recessed lines. I always use water-based varnish, since oil paint will not react with it.

Appropriate colours were then used to paint the various switches and displays. The brass fret includes a new throttle assembly which is made up of eight very small parts. This was too much for me, so I made a simple one out of some plastic rod. The brass HUD was not



a great fit when folded, so I cut it into three pieces and glued them separately.

I had decided to use the Aires resin wheel wells. The front wheel well fitted exactly as if the Revell part had been used and all three wells are superb. In order to fit the main wheel wells, the guides for the Revell wells have to be removed, the Aires parts then fit very nicely – you do not even have to remove their moulding blocks. They result in the undercarriage bays looking very busy.

Items 4 and 5 on the brass fret were left until later and were fitted to the front cockpit coaming once the fuselage sides had been glued together. Also at this stage, I added a very thin piece of clear plastic to the HUD, finishing off this assembly by adding kit part number 15, which is the centre section containing the boxes for the three very prominent rear cockpit displays.

When the Hasegawa Tornado was first released some years ago, there was some disappointment that the wing slats and flaps could not be assembled in the lowered position, as was the fashion with a number of new kits at that time. Airwaves came to the rescue, however, with a very nice resin set for the

Hasegawa kit. I have since used the Airwaves wings with a number of different Tornado kits and have never had any problems with fit.

Fitting Airwave's wings

With the Revell kit, however, fitting the new wings proved a little different. I first fitted the kit parts 37 and 38 to the fuselage. These are the seals which cover the opening where the sweeping wings slide into the fuselage. Parts 29 and 30 were also fitted at this stage. Part 29 fitted in position for the resin wings perfectly, and Part 30 helped to support them when the whole wing structure was assembled. A pair of resin prongs, which on some other kits would fill the fuselage opening aft of the wing in its forward position, had to be removed. On the Revell kit the prongs stuck out at the trailing edge, inboard of the flaps. I cut it off as close as I could to the wing. The wings were then put in place and secured with superglue. The tailplanes are designed to move, but I decided to stick them, although I still used the internal bar, part 73, since this made sure I got the tailplane alignment right. After leaving the tailplane assembly overnight to cure,

the top and bottom fuselage halves were glued together. The fit was very good and after a slight rub down with a fine grade wet & dry, no filler was needed. To finish off, I cut two pieces of thin plastic card 11 mm x 5 mm to fit over the rubber seals in the fuselage behind the wings. On the kit the wings are designed to swing, but with the resin wings fixed in the forward position, there is a gap right through to the other side. The plastic card was scribed horizontally down the middle, to give the impression of where the seals meet, and then glued in place.

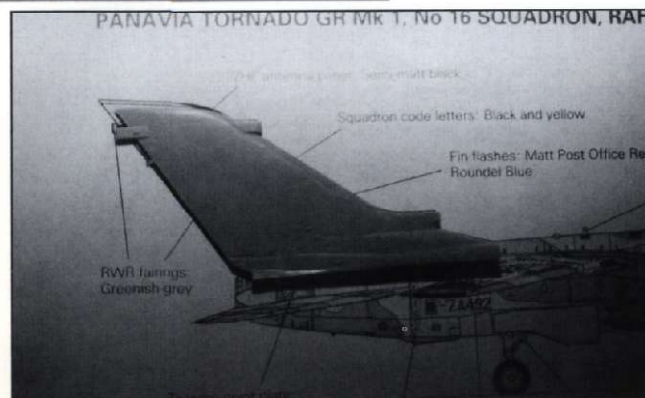
The afterburner can assembly was next. It is just as nicely detailed as the rest of the kit – even the geared mechanisms which rotate the thrust deflection buckets are included. Although they are quite small, they are a nice touch and not one that I have seen before on a Tornado kit in this scale.

Fin trouble

The Tornado's distinctive tail fin was assembled next. Unfortunately, by comparison with the scale plans published in the Linewrights Tornado book, I found that it was slightly on the



Above: Revell's lower fuselage and tailplanes are shown here combined with Aires' resin main wheel wells and Airwaves' resin wings.



small side, being about 1.5 mm too short and having 2 mm too little sweep at its trailing edge.

The plans I used had been enlarged from the original 1:96 scale, so there was room for error, but the rest of the kit checked out very well. I knew I could not enlarge the tail without destroying the

very nice surface detail and so I decided that I could live with the discrepancy.

The nose radome, afterburners and fin were then attached to the fuselage. They proved to be a superb fit, only requiring a little filler around where the fin meets the fuselage spine.

However, the air intakes did cause a



Left: Laying the fin on to a set of suitably enlarged Aeroguide Tornado book scale plans showed the slight deficiency in its size.

small problem. The plastic on the upper part of the intake is very thin. In one way this is very good because it certainly makes the intakes look the part when fitted to the fuselage, but it was very easy – as I found out that when I removed some flesh and scrap plastic – to damage. I cracked the plastic slightly, and also discovered that the intake/fuselage fit was not perfect, so I left the intakes to dry overnight and applied a little putty before attaching them to the fuselage. Once the putty had been sanded, I had to remove the two locating pins provided, since I could not get a good fit with them – even then, a little filler was required.

To finish off the main fuselage, the windscreens were fitted, along with the airbrakes. The latter were fixed in the closed position and a gentle sanding was needed to leave them flush with the surrounding fuselage.

The undercarriage also caused a few problems. The Aires resin set includes four parts for the main undercarriage and two retraction jacks, however, I still needed to use the front and main undercarriage from the kit. This was very good, but a bit on the fiddly side. Leaving the wheels aside, the main kit undercarriage assembly still consists of four parts for each leg and even the instructions recommend that the parts be left for five hours to dry. This is where I had some hassle, since I just could not get the leg assemblies to fit into the new wheel bays. I had to remove the locating tabs from parts 65 and 73 of the kit legs and then cut a tab of resin from each wheel bay. I call these resin pieces tabs because I have no idea what they were, but that is not to say that the resin bays were inaccurate. Once these items had been removed there was no problem.

The nose undercarriage fitted as if the kit wheel well had been used. Once everything was secure, I left it overnight to dry and only then fitted the undercarriage doors. I finished off with the resin retraction jacks. The Aires instructions have these placed too far to the rear, they should be in front of the wheel unit. The Revell kit instructions show the correct position. The resin wheel bays may have caused me some grief, (other modellers may find a better way of using them), but they do add to the kit and look superb when finished.

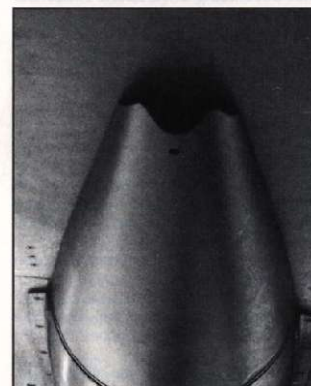
From GR.Mk 1 to GR.Mk 4A

To convert the Tornado from a standard GR.Mk 1 to a Mk 4A, there are several things to be done. First of all, the GR.Mk 4A, like its predecessor, the GR.Mk 1A, does not have 27-mm Mauser cannon, since these were removed to make room for reconnaissance equipment. Representing this on the model is simply a matter of filling in the

Left: These two views show the fairing associated with the FLIR system added as a result of the GR.Mk 4/4A upgrade.



Left, above and below left: Here a good impression of the shape of the Tornado GR.Mk 4A's underfuselage IRLS installation is given. Note that the sensor's panoramic window is covered in the photograph above.



cannon ports with putty and sanding smooth. Next I fitted the forward-looking infrared (FLIR) sensor fairing included in the Airwaves GR.Mk 4 cockpit conversion set. This was not a great fit and needed a little putty to blend it into the fuselage. Then I used the infra-red linescan sensor (IRLS) from the GR.Mk 1A/GR.Mk 4A reconnaissance set and placed it directly behind the front undercarriage. With the standard laser rangefinder and marked target seeker (LRMTS) also in place, the undersurface of the Tornado nose is now a very crowded place.

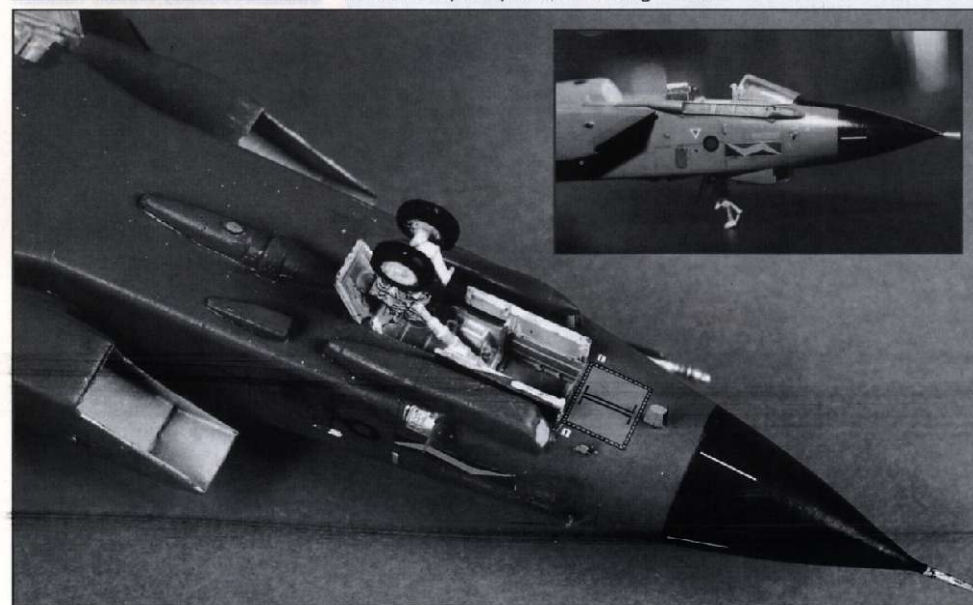
The final parts to fit are two brass camera windows on the forward fuselage. On the real machine side-looking infra-red sensors (SLIRs) are mounted behind these. Lastly, a brass part representing an electrical ground supply socket is fitted. This part takes the form of two connected square pieces, one being

glued to the lower edge of the fuselage directly alongside the FLIR sensor. The second piece then hangs down as if it was an open flap. This part had to be gently bent to fit the curve of the fuselage and so it was best to separate the parts and fit them individually.

The inflight-refuelling probe was fitted next. It was not a great fit and needed filler to cover some quite large gaps. The hinged arm which pushes the probe into the open position has a couple of holes that needed to be carefully drilled, since the kit part represents these holes as

Below: An underside shot of the forward fuselage shows just how complicated this area is on the Tornado GR.Mk 4A.

Inset: The forward fuselage illustrated during construction. The fairing for the inflight-refuelling probe, as well as the colourful No. 13 Sqn markings, are worthy of note.





Top: Another view of the real ZA369/U, this time carrying inert 1,000lb bombs under the fuselage. The FLIR fairing, (common to the Tornado GR.Mk 4 and the Mk 4A), is visible beneath the forward fuselage.

Above: Close-up of the cockpit area comprising parts from the Airwaves GR.Mk 4 brass conversion set.

raised dots. With drilling complete, the arm and the probe itself were put away to be fitted at a later stage.

The Revell kit includes a very wide range of stores, including two types of fuel tank, BOZ 101/107 and Sky Shadow countermeasures pods, Sidewinder air-to-air missiles, laser-guided bombs, 1000-lb bombs and ALARM anti-radar missiles. I had no reference showing what a standard GR.Mk 4A load would be. During the Gulf War of 1991, GR.Mk 1As regularly flew with four 330-lmp gal tanks or even two 495-lmp gal 'Hindenburg' tanks borrowed from the Tornado FMk 3, but the photograph I had showed a GR.Mk 4A flying with two of the smaller tanks, two Sidewinders, a Sky Shadow pod and a BOZ 107, so this is the configuration I chose.

I used the 495-lmp gal tanks from the kit along with the Sidewinders, but for the BOZ 107 and Sky Shadow pods I used the Airwaves resin items, since the kit parts looked a little on the long and narrow side. Both the resin items needed

careful cleaning to remove flash and a seam line, but once this was done, they looked superior to the kit parts.

Over the last few years, RAF Tornado bombers have changed from their original grey/green camouflage scheme to a two-tone grey (although an overall solid grey scheme was applied for Iraqi Freedom). However, the nose cone, which apparently cannot be painted, has remained black. I used Humbrol paint throughout, No. 156 Dark Grey and No. 164 Dark Sea Grey being the quoted numbers in one of my reference books.

I have never been a great fan of Revell instructions, or decals for that matter, and Revell painting instructions are usually far from simple. Shades frequently need to be mixed, usually with figures like 57 per cent of this, 32 per cent of that and 11 per cent of the other. I know every model company wants the modeller to use its products, but it would be useful to have other paint references as an alternative.

After applying a light coat of No. 65 Aircraft Blue as an undercoat and to prime the resin parts, I then sprayed the complete model with No. 156 Dark Grey and left it to dry completely. The Tornado two-tone scheme is not difficult, but care is needed when masking the rear fuselage. Once this was done, the top surfaces were sprayed with No. 164 Dark

Sea Grey. I then coated the entire model with three coats of Johnsons Klear. The Klear enables the model to be handled without risk of damage to the paint and it is also a very good gloss varnish over which to apply the decals. All detail painting was also done at this stage.

One of the great reasons for going to model shows is to talk with other modellers and learn new techniques, such as painting navigation lights silver and then painting over them with Humbrol acrylic Clear Red or Clear Green. This simple technique really makes them look like lights with covers.

Before the decals were applied, I ran some thinned-down black oil paint into some of the panel lines on the fuselage and wings. Unfortunately, this was not a great success, since the panel lines are just too fine.

The decals I chose were from Xtradecal X051-72, which includes Tornado GR.Mk 4, GR.Mk 4A, FMk 3 and Harrier GR.Mk 7 markings. I decided to make GR.Mk 4A ZA369/U of No. 13 Squadron, which was based at RAF Marham during July 1998. The decal's instruction sheet can be confusing, since its drawings show the GR.Mk 4A with cannon fitted and no FLIR fairing.

The sheet only includes a small amount of stencil markings, so the rest will have to come from the kit decal sheet. This latter is very good and very comprehensive, with masses of stencil markings. It is well printed with no white edge, like that found on some other decal sheets, surrounding the roundels.

Final details

Now to put the small and fiddly parts in place. First I replaced the kit ejection seats with a pair of resin items from Airwaves. The kit seats were not bad, but the resin seats offered more detail, including seat belts, and certainly looked better. I have a feeling that I may have painted the belts the wrong colour, showing just how important good reference material is.

I put the refuelling probe in the extended position, to show off the very nice detail in that area. The aircraft's various antenna blades were a mix of kit

and brass parts. It was at this stage that I realised I had a problem. The very small clear sprue which contains the clear lense of the LRMTS was missing. This may not have been Revell's fault, since before I started the kit, the box had been opened on several occasions. As I did not have time to wait for a replacement, I used the equivalent part from the Hasegawa kit, which meant taking the body of the LRMTS off the fuselage and cleaning up the entire area before I could use the new part.

One last departure from the standard kit parts was the landing lights. The lights on the main undercarriage doors are especially prominent and for these I used MV lenses which are far superior to the clear parts in the kit. When all these small pieces had been painted, all that was left to do was to finish off with a couple of light coats of Xtracolor matt varnish to dull everything down.

Conclusion

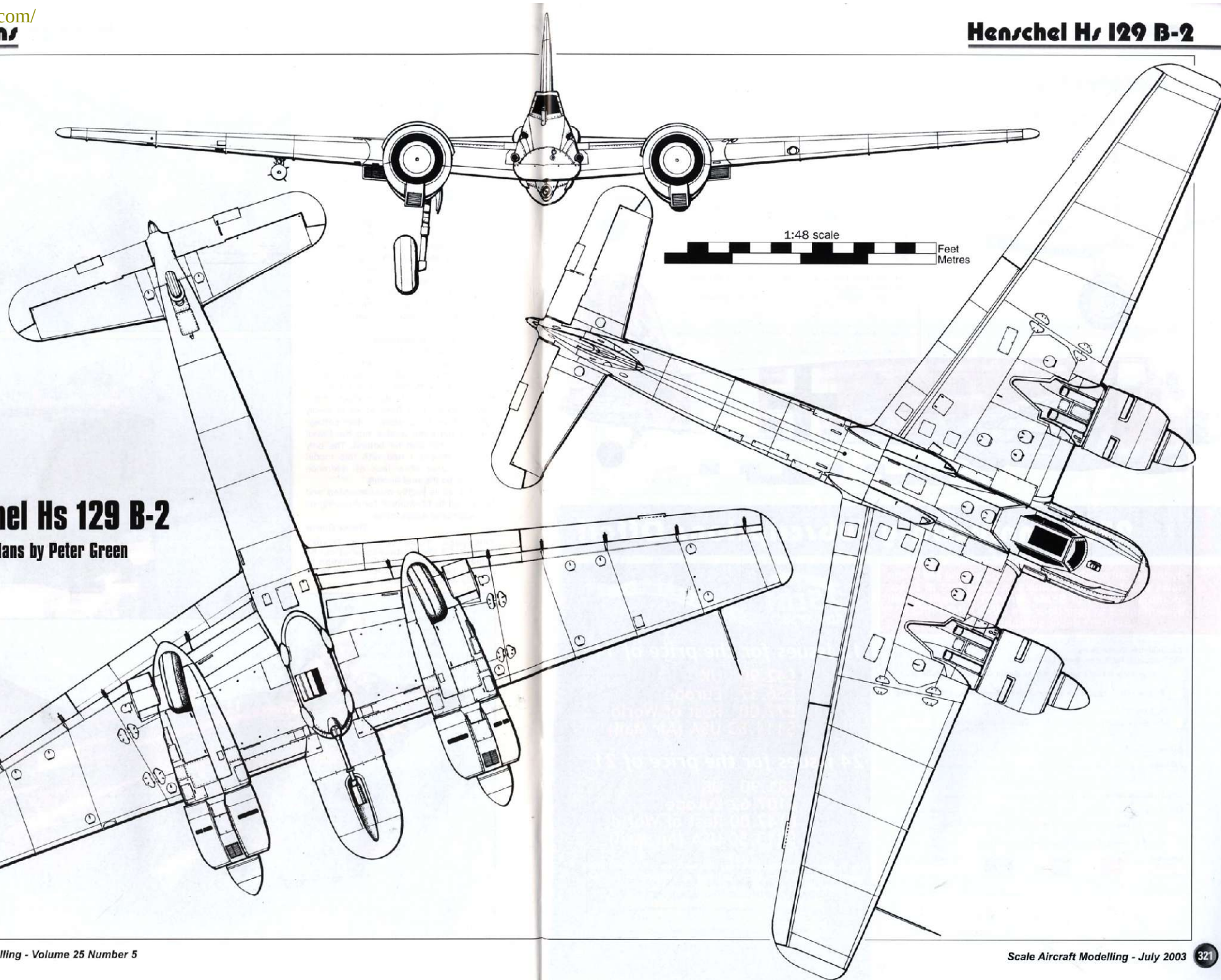
Over the last 30 years or so, I have only made a few Revell kits. However, over the last few years Revell have been making kits on a par with 'the best' and some of their recent 1:48 scale products have been superb. This Tornado kit is easily the best in 1:72 scale – the cottage industry parts are a *plus*, but the Revell items are not that far behind. The only real frustrations I had with this model were because of a lack of reference material on the real aircraft.

This kit is highly recommended and thanks go to ED Models for providing all the additional accessories.

Trevor Glover

This page: Three views of Trevor's Tornado GR.Mk 4A showing what can be achieved with the careful application of aftermarket accessories and decals to an already well-produced kit.





BOEING'S 'SHORT' 737

Nils Mathisrud converts
Revell's 1:144 Boeing 737-800
in to the shorter 737-600

Having built some time-consuming conversions lately, I next wanted an easily-built model that could be assembled more or less straight from the box and finished in a relatively short time. Airliner models are generally easy to build I mused, being straightforward constructions without any interior and with no weapons 'hanging off' them.

Thus I acquired Revell's 1:144 scale Boeing 737-800, which I had been told was one of the best airliner kits available. I also had Liveries Unlimited decals for the new Scandinavian Airlines paint scheme, a simple, but at the same time a very attractive livery. Surely it would be a simple task to finish this one?

At this time, I had occasion to fly to

Troms, located north of the Arctic circle. When I boarded my Scandinavian Airlines Boeing 737 flight at Enevnes Airport in Norway, I discovered that the markings for the aircraft I was due to fly in, LN-RPE, were amongst those included on the Liveries Unlimited decal sheet. There was one challenge though, this particular aircraft, (LN-RPE), was a 737-600, the shortest version of the Boeing 737 Next Generation 'babies'. Despite this, I decided to model this particular aircraft, although it would no longer be an 'out-of-the-box' project.

The 737NG and 737-600

According to the crew, the Next Generation series is not a popular

workplace. The aircraft generate a lot of noise, both in the cockpit and in the cabin, and from an ergonomic point of view, the cockpit layout is a disaster. On top of this, the -600 with its short fuselage and long wings has very poor directional stability.

Generally the latest aircraft type of an airliner is the most popular to fly. Not so for SAS with their 737s. These aircraft are flown by rookies, whilst the experienced pilots choose the DC-9, MD-80 and -90!

The Revell kit

The kit is available in two versions; the only difference being the decal sheet. The kits are No 4238 with decals for



Right: Liveries Unlimited excellent conversion notes for the 737-600.

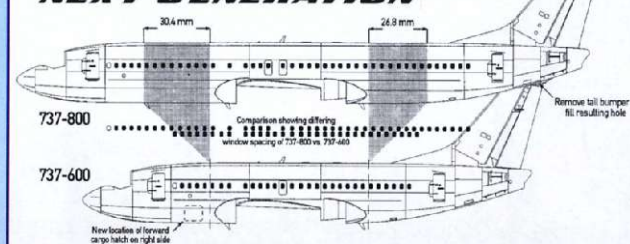
Below: Three under construction views of the model during the conversion process. Note the cuts for the fuselage shortening and the re-shaped engine nacelles.

Hapag-Lloyd, and 4245 with KLM decals included.

I started construction by filling the fuselage windows, using Milliput rolled out to a long cord and placed along the length of the windows on the inside of the fuselage. I then pressed the Milliput through the windows and let it dry before I sanded everything flush from the outside.

It has been reported that the windows row is a bit too low on the fuselage side

Converting Revell's BOEING 737 NEXT GENERATION



and that this can make problems for aligning cheatlines with the cockpit windows and the tail. This was no longer a problem now. The next step was to shorten the fuselage.

The Liveries Unlimited instructions give detailed description on where to cut: 30.4 millimetres were removed in front of the wings and 26.8mm aft. (see their instructions, reproduced above, with their kind permission). I had good help from a mitre box that I had recently acquired. The 737-800's tail bumper was removed at this stage.

Gluing together the fuselage halves is





Above and right: Close-ups of the original Revell kit, and modified, engine nacelles.

a stage that should not be rushed. I joined two sections at a time, carefully ensuring that everything was aligned, and then allowed them to dry before attaching the next section. I also made sure that the left and right fuselage halves matched when joining the sections.

With the six fuselage sections joined together, I added some weight to the nose before I attached the cockpit transparency. I did not bother to protect the window glazing, since I would be using the decals to represent all the windows.

I removed the antennas on the fuselage top and bottom as they are too wide in scale and would easily break off when handling the model anyway. New scale size antennas were added later.

Wings

The construction of the wings was very simple. The one piece for the lower wing half and fuselage section ensures the correct dihedral. The upper wing halves were then glued to the lower wing half. A main undercarriage well is also provided. This is attached to the centre section between the wings, from the inside. Care must be taken when the wings are attached to the fuselage. A blade antenna on the underside prevents the wing section to be snapped right in. I removed the blade antenna and replaced with with plastic card later on.

Engines

Moving on to the engines. These are the only parts on the kit that really need improvement. From various kit reviews I

had read, the engines lack a proper intake duct and the 'fan' is just moulded to a bulkhead. This seems to be a common problem with many airliner kits. I decided to fix 'the problem'. My way of solving this was to cut out a strip of aluminium from a beer can, about 3mm wide, and fold this around the fan disk. The engine was then assembled, and when dry, I filled the inside walls between the aluminium ring and the intake lip with Milliput. This was smoothed whilst still wet and finally sanded when dry. The small strakes on the nacelles were replaced with new items cut out from thin plastic card.

After cementing the engines to the wings and the wings to the fuselage I noticed that the shape of the engines is wrong! The NG series nacelles are both longer and wider than the 300-500 series of nacelles. Revell has managed to capture the increased length, but has failed to capture the higher intake opening. Whilst the 300-500 series has a flattened lower lip, the NGs intake openings are rounder. Thus the undersides of the nacelles are almost parallel to the aircraft's centreline and to the ground, but the kit engines have a distinctive 'nose-up' angle.

First I had to prepare for a new lower lip. With a pair of scissors I cut out another short strip of aluminium from a beer can. I superglued this part on the outside of the original flattened lip, thus giving the opening a rounder appearance. The space between the new lip section and the kit part was then built up with Milliput, as well as the underside of the

nacelle. When this was dry, I filed the intake duct to make it deeper in height and sanded the underside to shape.

Now that I know the problems with the engines, I would do the stages in a slightly different order, by first attaching the strip to the fan disk and then assembling the engine. Then I would fix the intake opening and the nacelle underside. Finally, I would build up the intake duct before attaching the engines to the wings.

Finishing details

All the work on the fuselage and engines had removed many of the panel lines. On a model in this scale, not much should be visible anyway, but with panel lines on some areas whilst other areas were devoid of any lines, it would not look so good, so I carefully rescribed most of the lines, trying to get them as delicate as possible.

The undercarriage on this model is very nice and is more detailed than on many larger scale kits. One thing should be noticed though, on the kit instruction sheet for the Hapag-Lloyd decals option - the right and left undercarriage legs have been switched and show the torque link scissors incorrectly. This has been corrected on the KLM kit instructions.

To make it clear, part 42 is the starboard leg, whilst part 49 is the port, and the torque link scissors should be on the front of the legs. I basically used the parts from the kit, except from thinning down the torque links and replacing the nose wheel doors with thin plastic card. The various antennas were replaced with

Right and below: The much modified finished model in the striking SAS livery.

items also made of plastic card. I added a few antennas missing in the kit as well, using photos as reference.

Painting and decalling

Now I was coming to the stage where I would bring life to the model. Studying photos of Scandinavian 737s on the *Airliners.net* web site, disclosed a few inaccuracies on the Liveries Unlimited painting instructions. This is, according to the manufacturer, because the decal sheets were designed before many SAS 737s had entered service and SAS painting instructions had been used as reference. I would recommend the *Airliners.net* web site to anyone who builds civilian aircraft models. It contains thousands of photos. (A search on Boeing 737 300-500 series from any airline resulted in more than 15000 photos!)

First I gave the model a coat of light grey to reveal any scratches and/or blemishes. I found a few areas that needed extra filling and sanding. I then started applying the actual colours. Xtracolor produce paint for two of the colours for the new SAS livery. The fuselage grey (X338) and the engine red-orange (X339). Unfortunately, no paint for the blue fin is provided, but RAF Roundel Blue (X30) is nearly spot-on. Xtracolor also have other general colours such as BAC 707, also known as Boeing Grey (X301).

I started with the wings, painting these BAC 707. The undercarriage and the wheel well bays were also painted in this colour. Leading edges of the wings, tailplanes and fin and the fuselage rear end were then painted with Humbrol Polished Aluminium and polished with SnJ polishing powder.

I painted the intake lips with Xtracolor X331 Corrugard, a darker and duller metal finish than the wing leading edges. The insides should be the same colour, but to achieve a shadow effect I used a darker shade here, Xtracolor Natural Steel.



The engine fans were painted Humbrol Gun Metal. The 'hot end' of the engines were painted Corrugard and Xtracolor Oily Steel. With the wings and metal finishes masked, I painted the fuselage and the engine nacelles in SAS grey.

Next came the red-orange sections on the nacelles. The strakes are described as red-orange on the instruction sheet, but they were SAS grey on the aircraft I modelled. This seems to vary between the aircraft, grey on some red-orange on others. Engine nacelles are frequently hit by baggage trucks and other vehicles, making repairs necessary. The metal leading edges and the demarcation between the Boeing grey and SAS grey on the nacelles is not quite accurately described on the instructions.

Liveries Unlimited provides the complete fin as a decal, which is why Xtracolor has not produced this paint. However, the demarcation between the blue fin decal and the metal and grey leading edge is not correct for many aircraft, including LN-RPE. I have mixed experience with decals covering a complete surface like this and since the SAS logos are also included as separate decals on the sheet I decided to paint the fin.

Before I could start applying the decals I had to touch up a few places and overshot a few places with the airbrush. In addition to the painted door outlines, the sheet also provides separate decals with panel lines for the doors and hinges as well as for the baggage hatches. I chose to not use these, since these lines are not visible on the real aircraft from a distance. The sheet also includes a large number of small stencils which made the decalling job a rather lengthy one. It took me two evenings to apply all the *little devils* to the model. It prevented me from spending money at the local pub though!

What I thought would be a fast build model took me over a month to finish. However, much of the work was done the first week and I wasn't as effective as I could have been over the following weeks. Now that I know the few faults with the kit and how to deal with them, I will certainly build another one. But the next one will be built as a straight -800 with no modifications to the fuselage length.

Thanks to Jennings Heilig for producing this set of Liveries Unlimited decals, thus making it possible for me to build this model.

Nils Mathisrud

Polish Pony



Randy Lutz builds Tamiya's 1:48 scale NA P-51B Mustang Mk III in the markings of Polish 'ace' S/Ldr Eugeniusz Horbaczewski, CO of No 315 'Deblinski' Squadron, early 1944

Squadron Leader Eugeniusz Horbaczewski: At the close of hostilities in Europe, the Polish manned fighter squadrons within the RAF had accounted 922 'Confirmed' and 188 'Probable' victories. In addition they claimed 258 'Damaged' enemy aircraft and produced forty-one aces, six of which had shot down ten or more aircraft. Amongst the most legendary of all the Polish aces was S/Ldr Eugeniusz Horbaczewski. Polish pilots were noted for their bravery and Horbaczewski was no exception. For instance, on 22 June 1944, while No 315 *Deblinski* Squadron was on a strafing mission, W/O T Tamowicz was shot down by flak and crashed in a marsh. Horbaczewski landed on an uncompleted Normandy landing strip and rescued his comrade and flew back to base sitting on his lap. On 18 August, twelve Mustangs from No 315 Sqn engaged sixty Fw 190s. During the ensuing battle which lasted some fifteen minutes, they claimed sixteen enemy aircraft shot down for loss of only one Mustang. This single loss was that of S/Ldr Eugeniusz Horbaczewski, but not before he had downed three Fw 190s. Horbaczewski's final tally was sixteen aircraft and four V1 flying bombs destroyed.

In all my 30 years of model building, this is the first model I have encountered that did not require filler of any kind! (Mind you I have built many models without filler which in retrospect, could have benefited from it). This model is exceptional. Moulded in medium grey plastic with a good assortment of canopy

options - closed Malcolm hood; closed 'clam-shell' canopy or open 'clam-shell'. The canopies are a touch on the thick side but have amazing clarity.

When the kit was first released the main complaint was about the curved cockpit floor and how it should be the flat wooden variety. I admit that Tamiya got

that bit wrong but it is something I can live with - especially as it comes with a kit that assembles so well. Once the closed Malcolm hood is installed, the floor is really not that visible. One major plus is the option of building it with the flaps down.

As this kit was to be built out-of-the-box, using the kit decals, any modifications were limited to what would pass at an IPMS Competition.

Construction started with the interior, which was airbrushed with Testors Model Master Interior Green (FS34151). The seat was finished in Model Master Chromate Green, while the radio gear and instrument panel were painted with Black Chrome. A dark wash was applied to all the green components and when dry, was followed by three applications of green dry-brushing. Each subsequent dry-brushing was slightly lighter than the previous one until I had created a nice contrast between the dark areas and the high-lights. A multi-step, grey dry-brushing process was also used for the black chrome areas to break up the mono-chromatic look. Afterwards, small traces of red were applied to selected

Above and left: Randy's finished Tamiya model of S/Ldr Eugeniusz Horbaczewski's Mustang Mk III, FB387, PK-G of No 315 (Deblinski) Sqn, as she looked when based at Brenzett, in the spring of 1944.

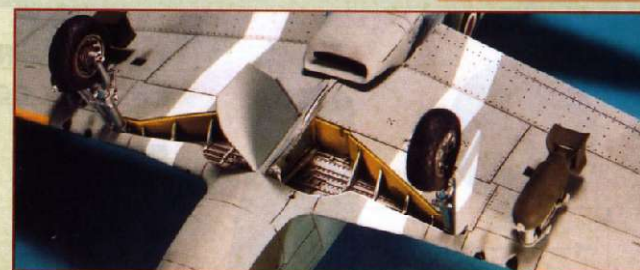


Right: Close-up detail of the mainwheel undercarriage bay showing the various colours involved - see main text.

Below: Close-up of the nose area and undercarriage legs.

areas of the instrument panel, side consoles, and control stick.

Micro Scale Kristal Kleer was applied to the instrument faces, and the kit supplied seat belt decal was finally added to the seat. Tamiya also supply a decal for the instrument panel, but I find these are a little too vibrant in comparison with the rest of the interior.



Part numbers A13 and B15 are the radiator and oil cooler and they were airbrushed with Testors Metalizer Aluminium and then given a black wash to pick out the details. The tail wheel opening was airbrushed with Testors Zinc Chromate Yellow and then the fuselage halves were assembled, trapping all the previously finished interior components.

Step three of the instruction relates to the installation of the exhaust pipes. Tamiya suggests installing them at this stage but this would lead to unnecessary masking. I found it best to leave them off until after painting the main airframe. You should however, verify with photographs of the subject being modelled, as both shrouded and unshrouded exhausts are included with the kit. Horbaczewski's Mustang had the unshrouded style. These two parts were airbrushed with Metalizer Burnt Iron - after the pipes were drilled out.

The upper and lower halves of the wing were assembled and the mainwheel wells were finished in three different

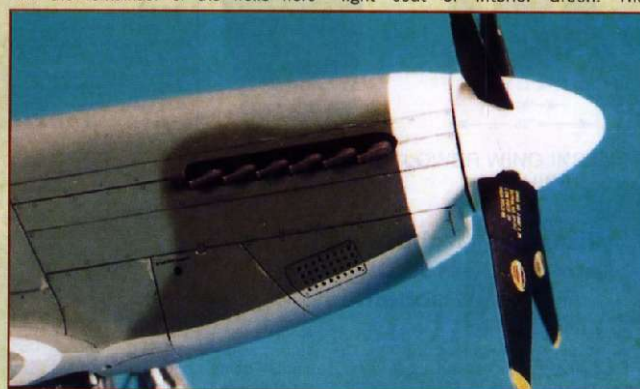
colours. The main spar at the back of the mainwheel well was painted Chromate Yellow; Interior Green was applied to the main spar that separates the two wells; and the remainder of the wells were

finished in Metalizer Aluminium. Tamiya's instructions indicate a wheel well colour of Interior Green overall, but based on my references, ('Camouflage and Markings, NA Mustang, RAF Northern Europe 1936-45', and 'P-51 Mustang in Color') this is incorrect.

A dark wash was next applied to the details and then the gear doors were tacked in place, in the closed position using Kristal Kleer. This prevents any underside colour over-spray from getting in the wells. The main wing and both tailplanes were attached at this time. The fit of these parts is superb. *No filler of any kind was necessary.* At this point, the engine cowl breather vents, gun barrels and any other miscellaneous openings were drilled out.

Painting

Next, the canopy was attached, the framing masked off and then given a light coat of Interior Green. The



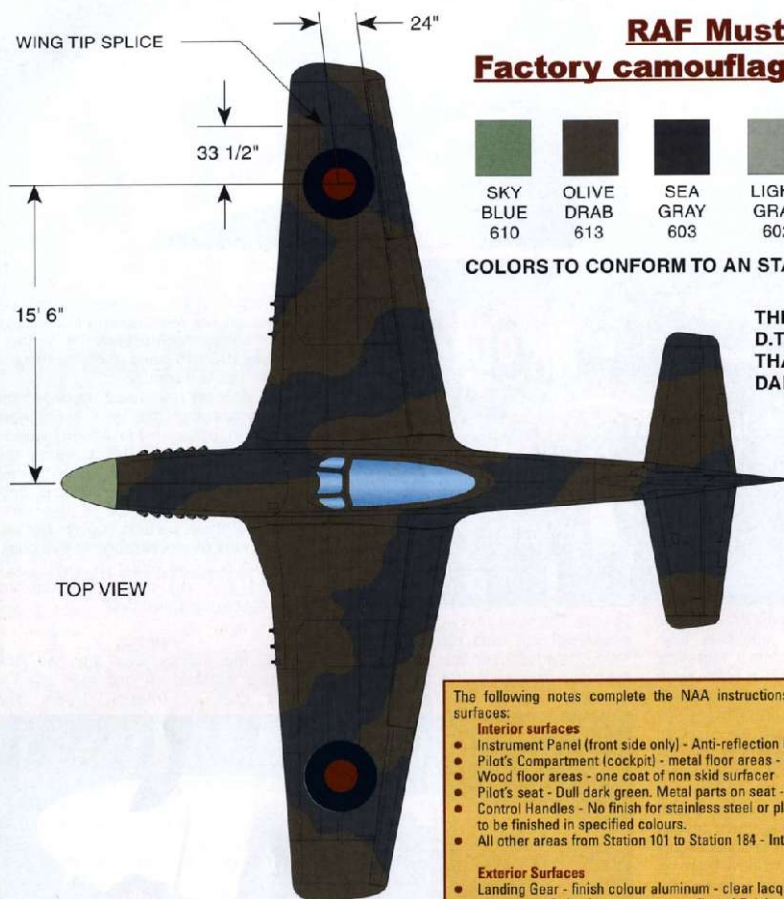
instructions show an external rear view mirror on Horbaczewski's aircraft, but this is incorrect. He did have a mirror, but it was the internal type - so I left off part A3.

I was now ready to start painting the model, and it was at this point some of the errors in the instruction sheet came to my attention. Tamiya's painting guide does not indicate the white band around the nose, immediately behind the spinner and the bands around the wings. These,

Above: Close-up of the exhaust manifolds and engine cowl breather vents - all suitably drilled out.

Left: Close-up of the canopy area - note the correct absence of a rear view mirror.





Victor G. Archer describes and illustrates the official paint schemes

The RAF received some 900 Mustang Mk III and Mk IV fighters in 1944. Of these all of the Mk IIIs and about half of the Mk IVs were finished at North American Aviation's plant in camouflage and markings to RAF requirements. The later Mk IV aircraft were left in their natural metal finish, like the USAAF P-51Ds and Ks. The accompanying artwork shows the exact pattern and colours for the Mustang Mk IVs, (the Mk IIIs were similar).

By the spring of 1944, the USAAF had dropped the use of camouflage for the majority of its aircraft in the European Theatre of war, so the RAF Mustangs were unique in being painted with colours to ANA Bulletin 157. However, note from the colour drawings that the Sky rear fuselage band and the

Yellow wing leading edge identification stripes were not painted on at the NAA plant, being added later by RAF Maintenance Units in the UK.

The colours and camouflage pattern followed the existing RAF requirements exactly, except that the RAF Dark Green colour was replaced by USAAF ANA Bulletin 157 Olive Drab 613. Note that this shade of Olive Drab was not the same as the earlier USAAF Bulletin 41 Dark Olive Drab No 41, being somewhat lighter and greener.

All of the ANA colours had been agreed on at joint RAF/USAAF meetings in 1942 and early 1943, with many RAF and USAAF colours being dropped in favour of jointly used colours. (Full details of these colours can be found in Chapter 7 of the Schiffer Publishing book, 'USAAF Aircraft

RAF Mustang IV Factory camouflage and markings



COLORS TO CONFORM TO AN STANDARDS AS PER ANA BULLETIN NO.157

THIS CAMOUFLAGE SCHEME IS IN ACCORDANCE WITH D.T.D. - BRITISH TECHNICAL CIRCULAR #360 EXCEPT THAT OLIVE DRAB HAS BEEN SUBSTITUTED FOR A DARK GREEN.

The following notes complete the NAA instructions for interior and exterior surfaces:

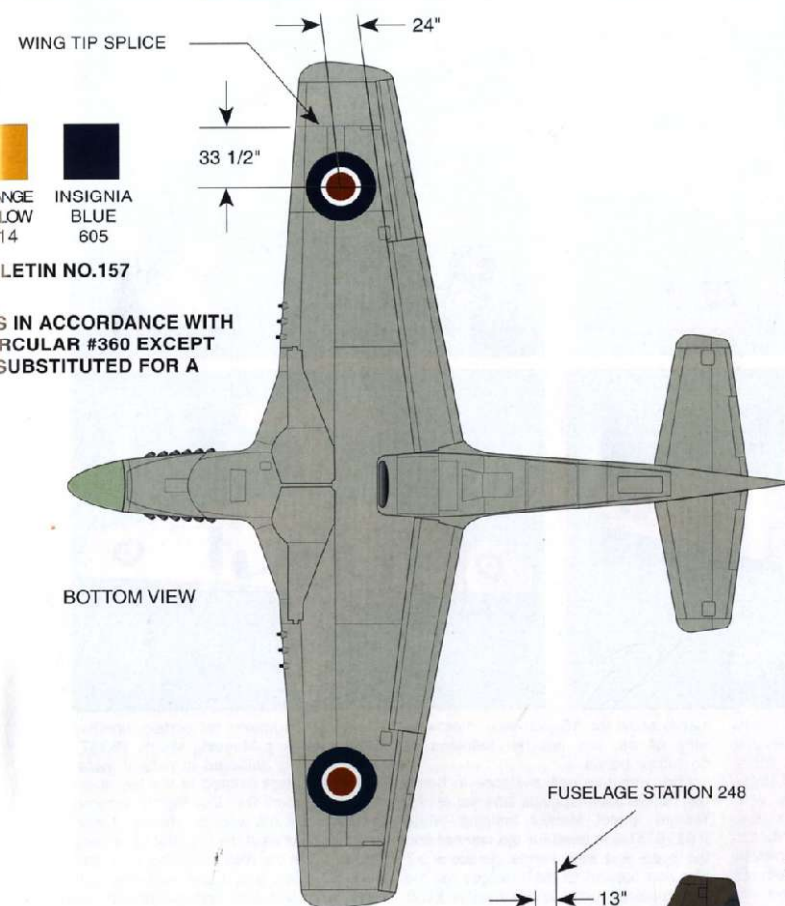
- Interior surfaces**
 - Instrument Panel (front side only) - Anti-reflection Flat Black/Instrument Black
 - Pilot's Compartment (cockpit) - metal floor areas - no finish
 - Wood floor areas - one coat of non skid surfacer
 - Pilot's seat - Dull dark green. Metal parts on seat - no finish
 - Control Handles - No finish for stainless steel or plated handles, except knobs to be finished in specified colours.
 - All other areas from Station 101 to Station 184 - Interior Green
- Exterior Surfaces**
 - Landing Gear - finish colour aluminum - clear lacquer or varnish with 12 ounces of aluminum paste per gallon of finish.
 - Note: corrosion resistant parts or parts that are cadmium, zinc or chromium plated require no finish.
 - Propeller Blades - Instrument Black, to be primed and given one finish coat.
 - Propeller Blade tips - Identification Yellow, one coat 4 inches from tip.
 - All fabric control surfaces - Aluminum, two coats of aluminum dope.

Markings and Camouflage, 1941-1947, by Robert D and Victor Archer).

The RAF Dark Green colour was very close to the ANA 157 Olive Drab 613. All of the colours referenced on the drawing were very close to their RAF equivalents. It should be noted that as all of these ANA colours were manufactured in the USA using USA pigments, that they would fade differently to their RAF manufactured colours.

All the data is from the USAAF/NAA document AN 01-60JE-2, section VII, dated 1944. The drawings follow Figure 468, showing the British colour scheme. The colours were checked from the original ANA Bulletin 157 colour chips and Ministry of Aircraft Production RAF colour chips - all from the Robert D Archer Aviation Archives.

Victor G Archer



LEFT VIEW

UPPER LONGERON
 (Splice between upper deck and side panel)

FUSELAGE REFERENCE LINE



RIGHT VIEW



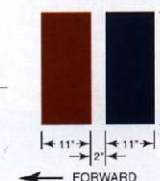
**UPPER WING INSIGNIA
 2 REQUIRED**



**FUSELAGE INSIGNIA
 2 REQUIRED**



**LOWER WING INSIGNIA
 2 REQUIRED**



**FIN FLASH
 2 REQUIRED**

1/72 Scale
 © Victor Archer '03



together with white tailplane and fin/rudder bands were a standard identification feature applied to many RAF-operated, UK-based, Fighter Command Mustangs, to comply with USAAF 8th and 9th Air Force practice, although the tailplane and fin/rudder bands were either not applied or removed at an early stage on many RAF Mustangs - which is evident in photos of Horbaczewski's Mustang.

The nose band should be a scale 12 inches in width, starting from the front of the cowl and terminating at the forward edge of the exhaust manifolds opening. Photographs of Horbaczewski's machine

clearly show the 15 inch wide chordwise wing bands, but not the tailplane or fin/rudder bands.

So, with this new evidence in hand, the Tamiya painting guide was set aside. Testors Model Master Insignia White (FS17875) was used for the spinner and the nose and wing bands. Xtracolor X7 Sky was applied to the fuselage for the rear fuselage band and Xtracolor X106 Insignia Yellow (FS13538) was airbrushed along the leading edge of the wings instead of using the decals supplied in the kit. All of these areas were masked off prior to the remainder of the model being painted.

It is not known for certain whether Horbaczewski's Mustang Mk III, FB387, was originally delivered in natural metal finish and then painted in the UK at an MU in standard RAF Day Fighter scheme as many Mk IIIs were or whether it was actually painted in the US prior to delivery to the UK in the ANA 613 Olive Drab and ANA 603 Sea Gray upper surfaces with ANA 602 Light Gray undersides scheme as featured in Victor Archer's accompanying drawings.

In the event, I opted for a UK-finished machine and used Xtracolor X1 Dark Green and X6 Ocean Gray upper surfaces with Xtracolor X3 Medium Sea Gray under surfaces. A 'soft', but tight demarcation was used between the two upper surface colours which I personally find is best accomplished freehand, as opposed to trying 'raised edged' masks. I find the masks tend to produce uneven results, with some areas featuring soft over-spray while other areas are almost hard edged. A hard edge demarcation line was used however to separate the upper and under surface colours.

Decals

The decals were next. Tamiya's decals are produced by Scalemaster using the Invisaclear process. In terms of colour density and adhesion they are excellent.

Above: Around-the-clock views, of the position of the white i/d markings.

Left: Close-up S/Ldr Horbaczewski's out of register 'kills' scoreboard.



Right: Close-up of the rear fuselage showing how the individual aircraft letter overlaps the fuselage roundel.

Below left: The starboard underwing identification lights.

Below right: Profile of a thoroughbred.

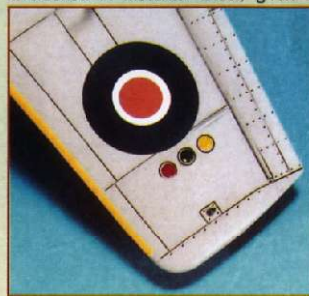
but the registration can sometimes be variable! The focal point of any Aces' aircraft is 'the scoreboard', and on mine the victory crosses were printed well out of register. In fact they were so far off, I prefer to look at the side without the scoreboard. Another problem with the decals is the size of the personal markings. Based on photographs of Horbaczewski's Mustang, it appears that the row of bomb mission markers and the victory crosses are printed slightly oversize. Also, the row of bombs on the nose could be yellow instead of the white as given. I have based this assessment on a detail photo I found in the Aircam Aviation Series No 3 'Mustang in Foreign Service' book. By comparing the tonal values of the Polish chessboard which is known to be white, and the bombs, you can see a difference in shades.

When applying the fuselage national insignia and squadron codes, make sure the individual aircraft letter 'G' is slightly overlapping the fuselage roundel. It is not shown this way in the instructions, but is clearly shown on pages 122 and 123 of the Ian Allan 'Mustang at War' book. Solvaset was used as a setting solution, and if applied sparingly, will not damage the decals.

On the underside of the starboard wing are three identification lights. In the past I have tried painting these freehand and have never been happy with the results, but I have since come up with a new method. I airbrush three pieces of clear decal film with Gunze-Sangyo Transparent Red, Transparent Green and Testors Turn Signal Amber. Then, using a Waldron punch, I am able to produce small discs of coloured decal film which are applied like regular decals. Once the model is finished, they were covered with Johnsons/Future Floor Wax to give them a high gloss appearance.

Landing gear

Prior to painting the wheels and undercarriage, both halves of the wheel hubs were drilled out, as well as the landing gear oleo scissors and tie down rings. Then the struts and hubs were airbrushed in Metalizer Steel, given a



dark wash and small strips of aluminium foil, shiny side out, were glued to the shock portion of the gear leg. Testors Rubber was sprayed on the tyres and then they were dry brushed with dark, medium and then light, grey, to add depth and define the tread detail.

Weathering

All the all panel lines were treated to a dark grey wash and a black wash was flowed into all the control surfaces. Minor chipping and scuffing was accomplished with a mixture of silver enamel and Winsor and Newton Raw Umber oil paint, which was thinned slightly with turpentine and applied with 000 brush. The model was then airbrushed with Testors Dulcoat. At this time, the gear doors that were previously tacked in place, were removed and the inside surfaces were sprayed with Testors Metalizer Buffing Aluminium. On the inboard gear cover, there is a reinforcing plate which was polished to a higher shine than the remainder of the door using 'SnI' polishing powder. With the undercarriage glued in place, the model was ready for the application of chalk pastels.

Starting on the underside, the wheel wells were given a dusting of dark grey pastels in the corners and immediately behind the oil cooler and radiator outlet. A medium grey was applied along all the panel lines and then gently streaked back using a large sable brush. Various shades of green and grey were applied to the topsides. To accentuate the ribbed framework on the fabric control surfaces, dark grey pastels were brushed in to all the low areas between the actual ribs.

Then, lighter shades of green and grey were applied to the high points of the ribs. The undercarriage was dusted with a light tan, while the propeller blades were streaked with light grey. The last details involved the addition of the whip radio antenna which was made from fine surgical wire, and the painting of the navigation lights.

This model was a breeze to assemble. Tamiya has engineered the fit of components as if it were a Swiss watch and it ranks as one of the finest aircraft models I have ever built. Sometimes model building can be a frustrating pastime, but this model was nothing but pleasure. I give it two thumbs up!

Randy Lutz

References

- Aircam Aviation Series No 3, 'Mustang in Foreign Service' - Osprey Publishing, UK. This publication has some of the best photos of Horbaczewski's personal markings.
- Camouflage and Markings, 'NA Mustang, RAF Northern Europe 1936-45' - Ducimus Books Limited, UK.
- P-51 Mustang in Color, Squadron/Signal Publications, USA
- 'Mustang at War', Roger A Freeman, Ian Allen Ltd, UK. (Pages 122 and 123 provided the only photos in my collection that showed the correct placement of the squadron codes in relation to the fuselage roundel).
- 'P-51 Mustang' Detail and Scale by Bert Kinzey, Squadron/Signal Publications, USA



AMX International AMX

Andy Evans briefly describes the development of the multi-national AMX advanced attack/reconnaissance aircraft with detailed photographs of an AMI-operated example.



In service, the Brazilian air force refers to its single-seat AMX warplanes as A-1 machines, while the two-seaters, as illustrated, are A-1B aircraft. (EMBRAER via Paul E Eden)

Development of the AMX started formally in April 1978, when Aeritalia and Aermacchi combined their resources to meet an Aeronautica Militare Italiana (AMI, or Italian air force) requirement for an advanced multi-role attack/reconnaissance aircraft. The project received extra impetus in 1980, when Brazil joined the programme. A common specification, including good short-field performance, high subsonic operating speeds and advanced nav/attack systems, allowed an initial agreement in July 1981 for the joint procurement of 266 aircraft. These comprised 79 AMXs for Brazil and 187 for Italy, plus six prototypes, from the Aeritalia, Aermacchi and EMBRAER production lines, as well as licensed construction of the AMX's powerplant, the 11,030-lb thrust Rolls-Royce Spey Mk 807 turbofan.

The first Italian aircraft served with the AMI's test and trials unit at Pratica di Mare. During April 1991, the aircraft was fitted with a Spey Mk 807A engine, uprated to 13,500 lb, while Rolls-Royce was also offering a new version of the Spey, with a demonstrated 30 per cent thrust increase over the Mk 807 engine.

AMX-A01 (MMX594) first flew at Aeritalia's Turin-Caselle factory flight-test centre in May 1984; the first of two Brazilian-assembled prototypes (A04/YA-1 and A06) flew in October 1985. Although the first Italian prototype crashed fatally on only its fifth take-off, following an engine problem on 1 June 1984, AMX development was successfully concluded by the remaining prototypes in Italy and Brazil.



The AMX has now matured into a highly effective attack aircraft for battlefield interdiction, close air support and reconnaissance missions. The aircraft is capable of operating at high subsonic speed and low altitude, by day or night and, if necessary, from bases with poorly finished or damaged runways. Design features include HOTAS, Litton Italia INS, head-up and head-down digital data displays, digital databus, active and passive ECM, a Martin Baker Mk 10L ejection seat, internal cannon and provision for inflight refuelling.

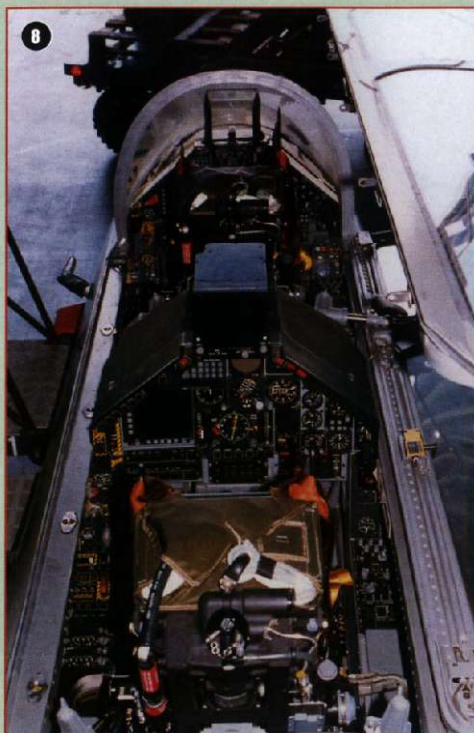


Fifty-one two-seat AMX-Ts were procured by Italy to replace the Fiat G.91Ts of the AMI's 201/204 Gruppo with the advanced training wing at Amendola, later re-designated as 32 Stormo in September 1992. Retaining the same dimensions and full combat capabilities of the single-seater, the trainer version displaces one of the fuel tanks behind the cockpit with a second Martin Baker Mk 10L ejection seat. The first of three AMX-T prototypes (MM55024) flew in Italy on 14 March 1990, with Brazil flying its first two-seater, TA-1 (5650) on 14 August 1991. Radar-equipped versions of the AMX have also been proposed in Brazil and Italy for enhanced all-weather, ECR and maritime attack roles. SMA/Tecnasa's SCP-01 Scipio radar installation has been favoured for Brazilian AMXs, while FIAR's Grifo-F has been proposed to replace the standard Elta/FIAR range-only



AMX International AMX





radar in some Italian aircraft. Trials have also been completed in Italy with a version with Aérospatiale's AM39 Exocet radar-guided anti-ship missile. In the reconnaissance role the AMX can either carry external recon pods, or can be equipped with any one of three pallets developed by Aeroelectronica for internal mounting in the forward fuselage.

The first operational Squadron to receive the AMX was the AMI's 103 Gruppo di 51 Stormo at Treviso-Istria in north eastern Italy in 1989. It was followed by 132 Gruppo/3 Stormo at Villafranca and 14 Gruppo/2 Stormo also based at Istria. In Brazil, the 1st Squadron of the 16th Aviation Group, 1/16 GAv, flies the AMX (locally designated as the A-1) attack aircraft from Santa Cruz, Rio de Janeiro, with the first operational example having been delivered on 17 October 1989.

Italy has upgraded its AMXs to carry 1,000-lb GBU-16 Paveway II laser-guided bombs and their associated designator pods. Initial operational capability for the AMX/GBU-16 was



achieved in 1996, allowing delivery of the weapons against targets that were designated by the CDLP pods carried by AMI Tornados. The AMX received its own CDLP designator pods during early 1998. Italian AMXs have operated in support of United Nations and NATO operations over the Balkans.

In Brazil, plans for a radical AMX upgrade have been abandoned on cost grounds, but EMBRAER has achieved limited export success, initially with a 1998 order for eight aircraft based on AMX-T for the Venezuelan air force. These machines, initially designated AMX-ATA, may well have been completed with Elbit avionics and replaced T-2A Buckeyes in service. A later Venezuelan order for 12 more AMX-T aircraft will see the type replacing T-2Ds from 2005.

AMX In Detail

1. The nose code and the cat-and-mouse intake badge identify this aircraft as belonging to 103 Gruppo/51 Stormo at Istria. Previously equipped with the G.91R, the unit had been based at Treviso. All operational AMX aircraft wear an overall medium grey colour scheme, with reduced-size roundels and lo-vis codes and squadron markings.

2. Wing-tip rails carry the AIM-9L version of the ubiquitous Sidewinder AAM in Italian service, and the indigenous MAA-1 Piranha in Brazilian service.



3. The main landing gear is built by Messier-Hispano-Bugatti and is hydraulically retracted into the sides of the lower fuselage beneath the air intakes.

4. Internal armament consists of a single 20-mm, six-barrelled M61A1 Vulcan cannon with 350 rounds in the Italian AMXs and twin 30-mm DEFA cannon in the Brazilian aircraft.

5. A pilot exits his aircraft. Note the integral steps, the open access panel and the coaming behind the ejection seat that is normally covered by the canopy. Also of interest are the 'bomb silhouettes' just below the windshield.

6. The tailfin, showing squadron markings and the forward- and rearward-looking tip-mounted RWR antennae. Note also the runway arrestor hook and tailplane incidence markers.

7. The rear fuselage, showing the arrestor hook, the aircraft serial number hidden by the tailplane, and one of the chaff/flare units.

8. Looking forward into the cockpits of an AMX-T.

9. The extended wing flaps are shown here in detail. Also of interest are the two antennae on the spine.

10. The forward fuselage is shown in detail as the pilot shuts down the aircraft and the ground crew prepare to 'turn' the jet. Of note is the corrugated material behind the ejection seat and the 'cover' that it is designed to allow for a second seat in the AMX-T.

11. The mechanism of the sideways-hinging canopy is shown

Brazil has yet to complete its order for 79 AMXs and 15 AMX-Ts (as here), while Italy has received its full total of 110 single seaters and 26 trainers. (EMBRAER via Paul E Eden)

here, along with the root of the IFR probe, complete with red positioning light.

12. This AMX was photographed just after it had taxied in. Note the wheel chocks and the open chaff/flare dispenser bays. Also of interest are the four-finned wing tanks.

(All photographs by Andy Evans unless otherwise credited)



Scale Aircraft Modelling - July 2003 339

Walther Dahl's Focke Wulf

Dear Neil,
Whilst I was very impressed with Jamie Leggo's modelling ability in his Fw 190 article, 'Walter Dahl's Stummböcke' in the March 2003 issue, (Vol 25/1), can I offer a correction to the actual identity of the pilot of 'black 13'? He appears not to have read my *Stummgruppen* feature that appeared in the March 2001 issue, (Vol 23/1), as part of his research.

One of the captions to the accompanying photos of Jamie's superb model offers, "...possibly finished in the markings of Major Walther Dahl". Well I am afraid it was definitely not Walther Dahl's aircraft! Dahl was the Kommodore of JG 300.

'Black 13', which Jamie modelled, was an aircraft of strength of IV./JG 3, a *Sturmgruppe* that was operationally subordinated to Dahl's *Geschwader* during the early summer of 1944 and with whom it briefly shared a base, (Ansbach), with Dahl's *Stabschwarm* - and hence the confusion that has arisen over the years regarding this aircraft.

My own research, (as stated in my March 2001 'Aircraft in Detail' feature on *Sturmjäger* operations in 1944), suggests that 'black 13' was in fact assigned to the *Staffelkapitän* of 11./JG 3, a *Hptm* Werner Gerth and being an 11 *Staffel* aircraft it would mean that the spinner and *Adlerflügel* (Eagle wing) exhaust trim would have been white not yellow! Note here that TriMaster also suggested a totally fictitious red-cowled scheme in their decal options which thankfully Jamie didn't fall for.

Jamie also refers to the R8 *Rüstsatz* as chiefly concerning



the Mk 108 30mm cannon. It did not. The R8 variant primarily involved the fitting of upper cowl fairings and the deletion of the MG 131/13 machine guns. The outer wing cannon was part of the R2 modification. Incidentally, the word *Stummböcke* is a plural form of the word *Stummböck*.

Finally, still keeping with Fw 190s and specifically Albert Tureczek's 'Wilde Sau Nachtjäger' article in the April 2003 issue (Vol 25/2), please find attached a photo from my collection of a close-up of an *Eberskopf* boar's head emblem on the cowling of an NGr 10 Fw 190 which may be of interest to readers

Neil Page,
Folkestone
Kent



This month, IPMS(UK) Liaison Officer, Paul Smith, explains how he first came in to contact with the IPMS and eventually ended up on the IPMS(UK) Committee....

All change, ...well almost! In April 2003, the IPMS(UK) held its AGM and the Committee experienced a limited change of personnel. One of these changes was my taking over the position of Liaison Officer. Another change of staff, was that of Membership Secretary. Ian Crawford has at last escaped off the Committee and has been replaced by Alan Carr. If you need to contact him, his address is 5 Roslyn Gardens, Gidea Park, Romford, Essex RM2 5RH, United Kingdom. He is also contactable by e-mail: Membership@ipms-uk.co.uk

IPMS(UK) Liaison Officer. A grand title, but what does it mean? I now have the wonderful task of keeping all the Branches and Special Interest Groups in contact with the Committee. This also covers answering letters from the public and writing this column in SAM, which was so ably re-started in Vol 25/1 by Andy Scott. My thanks to Andy for this; I hope I can keep up the good work!

It is unfortunate that we had a number of *gremlins* sneak into the SIG Leaders' list we published in Vol 25/2. No sooner had that issue 'hit the streets' than we were informed by several IPMS Members that it had one or two errors in it, so apologies to those SIG Leaders who had incorrect details published, we hope to correct this in a future issue. This may sound strange not having a correct list to publish, but contact names and addresses do change. For some reason an out-of-date contact list was still in circulation, and unfortunately we did not get to hear of it until too late.

The list of Branches/Branch Secretaries will follow in a later issue, after we have made very sure there are no incorrect addresses in it! However I can virtually guarantee that the day after it's published, we will get a notification of a change of contact name for one of the Branches....

So please read the lists published with the following proviso, 'Correct at date of publication'. If you have tried to contact an address and got no luck, please write to me at the address below, or e-mail me at: liaison@ipms-uk.co.uk and I will get the right one to you.

Tempest Fugit

While it is unfortunate just how quickly things get out of date, it is sometimes harder to believe just how long things have been around. It's only when you look at the dates of published books or magazines in your collection that you really believe things have been going for as long as they have.

This may seem like a strange comment, but in 1978 when this illustrious magazine was first published, I was a mere 20 year old but had been dabbling in model making since the late 1960s. I really started to build kits *properly* in the mid 1970s, after leaving school and starting work, and was getting interested in US Naval Aviation. I read over and over again, the Aircraft in Detail article on the F-14 Tomcat in that first issue of 'SAM', looking at the detail and colour schemes. I did not know about IPMS at that time - I was a happy modeller, making my kits in blissful isolation.

In fact I did not hear about the IPMS until 1982, when my local IPMS Branch was being advertised on a local radio station. So, off I went to the meeting place, a room above a pub on the outskirts of Bristol. The only problem was, although I had the correct pub name, I was just at the wrong pub! But with a few helpful directions from the Landlord I eventually made it to the right place, and so began my introduction to the IPMS.

By then, IPMS had been going for some nineteen years since its creation back in 1963, and had some thirty or so Branches. Having never previously attended a UK National Championships, I had not really met that many other IPMS members from other Branches, nor any of the members of the hallowed and immortal IPMS(UK) Committee whose names were to be revered. It was at this and other shows that I met those mythical names that I had read in 'SAM' and often wondered what they looked like. To my surprise they looked just like me - ordinary guys with an interest in model making!

Like Andy Scott, I too became a SIG Leader. My interest in Naval Aviation, and in Aircraft

Carriers led, in 1984, to my becoming the co-ordinator for the Aircraft Carrier SIG. By 1995 the SIGs had grown to some twenty strong and I was still co-ordinator for the Aircraft Carriers SIG, and oddly enough I still am!

So, here we are, 25 years after 1978, and the Society is now celebrating its 40th Anniversary. Like 'SAM', it is still going strong and still has so much to offer as it continues to grow, even in this stressed out, high-tech life style and Computer Game era.

The hobby has changed, like so many other things. It is no longer just a hobby to fill in the spare time that we once had, it now helps us to unwind and reduce the stress and tension of living and working in an ever demanding world - and it gives you something to show off at the end of it. And who knows, in 20 years time it may be you writing this column, about the hobby you enjoy.

* * *

If you want to know more about IPMS, please write to me:

Paul Smith, IPMS(UK) Liaison Officer
26 Sherbourne Avenue,
Bradley Stoke, Bristol BS32 8BB.

Don't forget to enclose an A5 self-addressed envelope and some First Class stamps, or you can E-mail me at: Liaison@ipms-uk.co.uk

Paul Smith
IPMS(UK) Liaison Officer



International Plastic
Modellers' Society (UK)
'By Modellers, for Modellers'

For details of IPMS(UK) Branches in your local area, or indeed IPMS(UK) Membership details, contact:-

IPMS(UK) Membership Secretary
Alan Carr, 5 Roslyn Gardens,
Gidea Park, Romford, Essex,
RM2 5RH, United Kingdom
E-mail: membership@ipms-uk.co.uk

Adrian Warburton's Maryland

Dear Neil

The day the June issue of 'SAM' was published with the letter from Ian Coleman on Adrian Warburton's Maryland, which was itself a response to something I had put in the 'In Tray', I was given these two photos of 'his' AR733 in a rather sorry state on Hal Far after some Bf 109s had tried to shred its tail. The photos came from Jack Vowles, who was Warburton's Flight Engineer, via Tim Callaway, who is responsible for the implementation of the RAF website. With them came the information that this particular Maryland was covered with a coat of clear lacquer and then polished; this, together with some very fine adjustment to the electrically variable pitch of the propellers, gave this aircraft a 15 mph advantage over other Marylands in the cruise, and no less than 32 mph extra when 'flat out'. The smaller photo of the tail unit would seem to show that it had been patched and repainted before.

Information on the commemoration that followed the recent discovery of the Lockheed Lightning F-5 in which Warburton lost his life can be found on www.raf.mod.uk/, which has further photos and direct testimony from Jack Vowles.

Mike McEvoy

Adrian Warburton

He was described as the most valuable pilot in the RAF during the Second World War, one of the most decorated British servicemen of all time. Yesterday, 59 years after his disappearance during a reconnaissance flight over southern Germany, Adrian Warburton was finally accorded the funeral he deserved.

During a brief ceremony conducted in driving rain and hail in the shadow of the Bavarian Alps, the remains of the man once compared to T E Lawrence for his daring, were interred beside those of Commonwealth airmen laid in their graves decades before. A piper's lament played as members of the Queen's Colour Squadron of the RAF lowered his coffin into the ground at the British Military Cemetery at Durnbach, 20 miles south of Munich. The body of Warburton, whose exploits have been immortalised in books and film, had lain undiscovered in a German field since the day in April 1944 when the luck that had carried him through more than 400 missions ran out.

He was 26, a Wing Commander and the holder of the DSO and bar and DFC and two bars. Serving on attachment to an American squadron, he should not have been flying at the time of his death, having been grounded following a road accident. It was only last September that his remains were recovered after an investigation by aviation historians from Britain, Germany and America. The discovery of the crash site, 30 miles north of Munich, ended the mystery of his fate.

That mystery had endured since 12 April 1944, when he took off from a base in Britain in a Lockheed Lightning F-5 reconnaissance aircraft of the US Eighth Air Force. Research suggested that he was shot down at low level by a German

anti-aircraft battery.

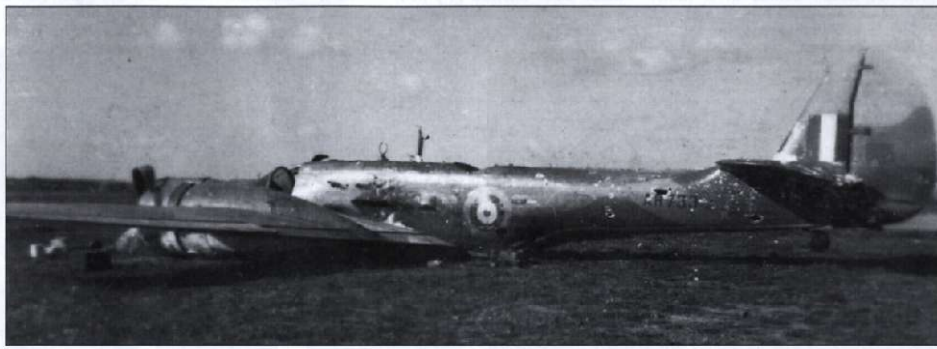
The life that ended that day was as remarkable as it was brief. Born in Middlesbrough, the son of a Naval Officer, Adrian Warburton attended St Edward's School in Oxford, where Guy Gibson and Douglas Bader were also educated. He was commissioned into the RAF in 1939, initially showing little promise as a pilot, and posted to Malta the following year. It was there that he recorded his greatest exploits, flying Martin Maryland reconnaissance aircraft. The highlight came in November 1940 when he and his two crewmen carried out a near suicidal low-level sweep over the main Italian naval base at Taranto in preparation for a torpedo attack by Swordfish aircraft based on the carrier *HMS Illustrious*.

Warburton insisted on repeated passes at about 50 feet, so low that the Italians were unable to train their guns. Proof of the risk he had taken was provided by part of a radio aerial from an Italian ship found lodged in the Maryland's tail wheel! The information he gathered ensured the success of the attack, which crippled a large part of Mussolini's fleet.

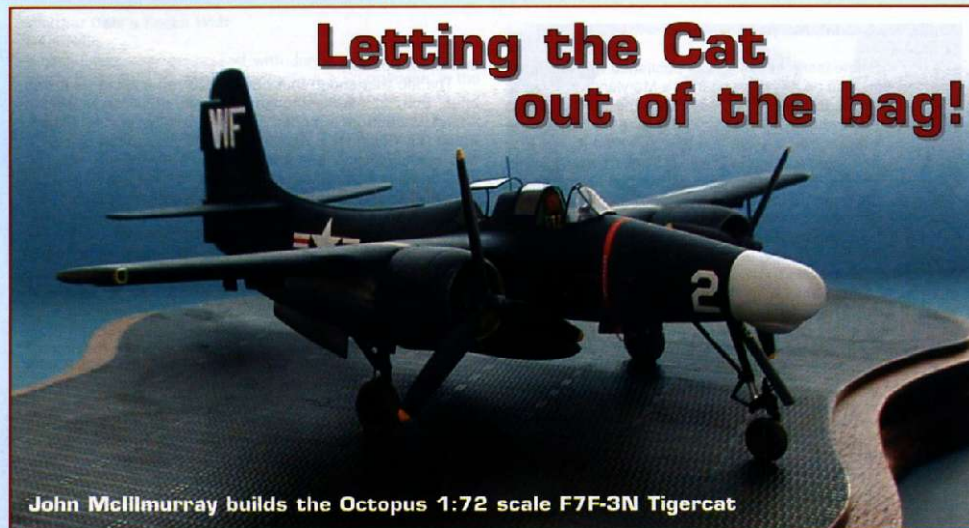
The burial was preceded by a church service attended by British, American and German officers. One of those present was Jack Vowles, a wartime NCO who serviced Warburton's aircraft in Malta. The two men became friends.

Mr Vowles, 81, said, "Warby was never a swaggler. There was some jealousy about his awards, but he never cared about medals. He was driven by an absolute determination to get the job done. If he did a job badly - and that was extremely rare - he would refuel and go back straight away to do it again."

Adrian Warburton was credited with seven enemy aircraft shot down, one Probable, six Damaged and three destroyed on the ground, not bad for a Recce pilot! Furthermore most of his claims came whilst flying a Maryland!



Letting the Cat out of the bag!



John McIlmurray builds the Octopus 1:72 scale F7F-3N Tigercat

The F7F-3N was the most numerous of all the Tigercat family, 106 being passed on to Naval and Marine units between May 1945 and June 1946, differing from its forebear, the F7F-2N, only in regard to the incorporation of the SCR-720 radar in a re-designed nose. The first 'kill' credited to the Tigercat came on 1 July 1951, when Capt E B Long and radar intercept operator (RIO) W/O R C Buckingham, of VMF(N)-513, in their F7F-3N 'red 14' successfully intercepted and despatched a North Korean Po-2 'Bedcheck Charlie'. The F7F-3N soldiered on with its night air defence, interdiction and ground support missions, providing sterling service until 1952 when it was replaced by such aircraft types as the Douglas F3D-2.

The Octopus kit

I was first alerted to Octopus kits after visiting my local model shop and ended up walking away £13.99 the poorer, but in possession of what looked like a very nice Tigercat kit! Octopus hail from the Czech Republic and their tooling is very similar to that found in MPM and Sword kits.

The kit itself comes in a rather flimsy envelope style box. **Photo 1** Contents include a very nice, well drawn,

twenty-three step construction guide, plus painting/decals plan, throughout which, on all but one occasion, Octopus point out where the modeller will have to add scratchbuilt items or purchase other Pavla offerings if they so wish. Two items that are not noted are the 'T' antennas and pylons located on the inboard portions of the wings. Also included are two decal options, one vacform canopy set, (front and rear), some sixty-three grey plastic parts and eighteen resin items of Pavla origin. **Photo 2**

Quality of these parts varies. The plastic parts need cleaning up, whilst the resin detail parts, (with the exception of all the blowholes in the rocker covers of my engines), are very nice.

Construction Internal structure

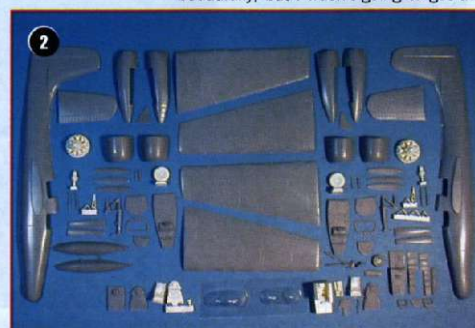
Steps 1 to 5 in the instructions deal with the construction of the various resin and plastic parts that make up the cockpit and nose bay. The cockpit/nose bay are not however sandwiched between the fuselage halves until Step 8. Dry fitting these parts showed very poor fit and it was obvious that a slower approach was going to be needed.

Other than removing the rudder for a more animated position later on, preparing the cockpit parts involved trying to get the basic fit of the resin cockpit structure. **Photo 3** shows how the rear of the resin part, as well as the sides of the fuselage halves need reducing, (shown in black). The length difficulty is due to the rear cockpit wall forcing the resin part forward, which interferes with the fit of the instrument panel.

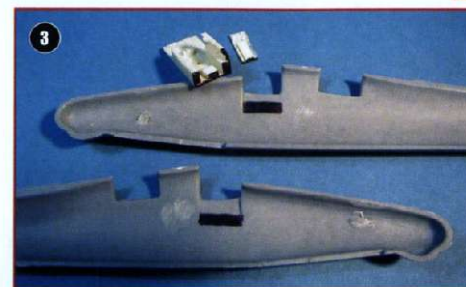
Even this measure proved futile and it boiled down to needing to remove a good 2mm off the front of the dashboard coaming in order for the instrument panel to fit in line with the resin part. All this was unfortunately 'just the beginning'!

Photos 4 and 5 show how the internal structure has been built up slowly to try and get the best fit all around. This required, amongst other things, reducing the thickness of the cockpit floor to clear the nose bay structure and cutting a 'shelf' in to the nose halves for the nose bay side walls to sit on.

Life Colour paints were used for the internal colours. This was my first experience with them and I didn't do too well brush painting them on. They spray beautifully, but I wasn't going to get the



Letting the Cat out of the bag



compressor out to do areas I would hardly ever see again!

Note: a good 3mm is missing off the bottom of the dashboard. The starboard resin detail has been removed for clarity and in Step 8, the drawing shows rudder pedals that are neither referred to as kit parts or scratch built items.

Propellers

Step 6 deals with the fit of the plastic prop blades to the resin hub. Check your references to decide whether or not your machine had 'clipped' blades. **Photos 6 and 7** show both the preparation of these parts, using brass fuse wire for extra strength, and the finished item respectively.

Engines

Step 7 deals with the painting of the engines. **Photo 8** These paint up very nicely and apart from the blowholes, are very nice items - as are the seats.

Fuselage

Step 8 brings the two halves of the fuselage together - after whatever method you have used to construct the internal detail. However, before the two halves come together, the modeller is instructed to pack the remaining space in

the nose with an undisclosed amount of weight!

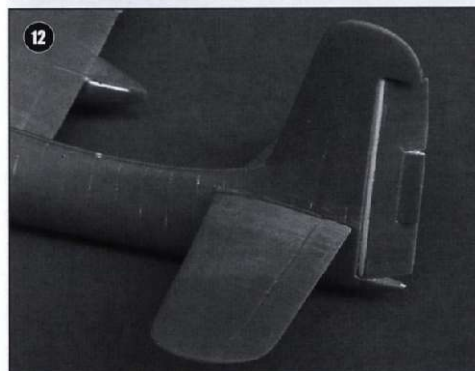
Again the fit is poor - **Photo 9** showing the amount of filling required. It was sometime after this, whilst looking down the length of the fuselage that I noticed that the pilot's headrest is not moulded squarely on the rear wall! Some filler was applied to make it look a little wider on

the offending side - (seen before and after in **Photos 10 and 11**).

Tail

Before leaving Step 8 and the fuselage parts, let me just say that I was glad that





I had removed the rudder, as the *break* in this otherwise dark aircraft's colour scheme by the Zinc Chromate rudder leading edge is very welcome. **Photos 12 and 13**

Main Gear Bays

Steps 9 to 11 deal with the construction of the main gear bay parts. As with cockpit and fuselage, the fit of the parts is very poor. **Photo 14**

The instructions advocate the reducing in thickness of the gear bay roofs but this proves insufficient when it comes to trying to get them to fit to the

wings in the following Step. Either cut away the appropriate area of the lower wing or reduce the height of the frames that the roof rests on inside the gear bay walls. I chose to do the latter.

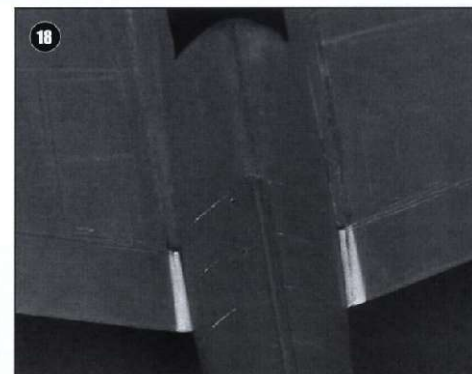
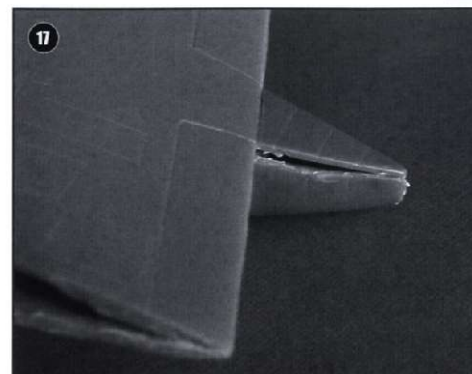
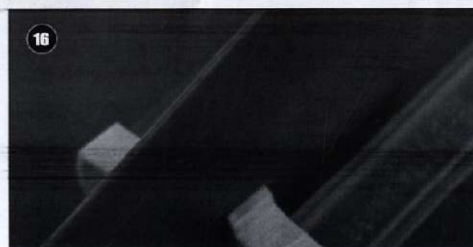
Wings

Steps 12 and 13 cover the joining of the wing halves and location of the gear bays and the 'power eggs'. It is regrettable that no detail is given for inside the oil cooler and carburettor intakes. I had no clear photos of these features and so chose not to represent them but I now wish that I had.

One other thing to look out for is the trailing edges, which are rather thick and warrant reducing. **Photos 15 and 16**

Mentioned in a later Step is the locating of the triangular fairings that jut out at the back of the wings and form the top of the nacelles. The fit of these parts is also poor. **Photo 17**

Steps 12 and 13 instruct the modeller to increase the inboard length of the landing flaps with a triangular wedge 1mm thick. It is however best to wait until you are confident you have the correct 6 degrees of dihedral before you measure the amount of extra flap you



need. **Photo 18**

It is also well worth taking the time to replace the navigation lights and even gun camera, with clear Perspex - you will not be disappointed. **Photo 19**

The completed wings, (with lots of filler around the gear bay joins), are then, together with the tailplanes, attached to the fuselage in Step 14.

Engines

As mentioned, Steps 12 and 13 cover the sandwiching of the resin engine parts inside their plastic cowlings and the joining of these *power eggs* to the wing/gear bay. Two things must be

considered at this point. The crank case detail on the engine is straight up and down and does not follow the 6 degree dihedral; and, the exhausts really need representing, as they will be seen! The tubing from low amp electrical wire is ideal. **Photo 20**

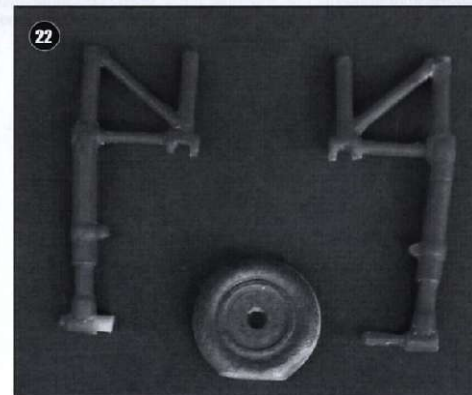
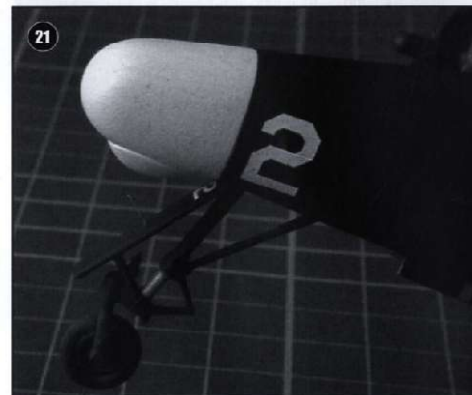
Nose Gear

Steps 15 and 16 concern the construction and fit, (including scratchbuilt nose door supports), of the tricycle undercarriage. Two things are of note here. The oleo leg is of insufficient length to give a proper 'tail down/nose up' attitude - to prevent 'prop strike';

and, with all the weight in the nose, the nosewheel rear support strut would be better off replaced by a length of brass rod. Both these above two points have been incorporated into my nose gear.

Photo 21

Also seen is a length of rod, or a 'spike', protruding from the bottom of the nose wheel; even with the nose packed with lead, as well as the rear of the engines, such is the weight of the thick plastic used for this tooling that the model still ended up being a tail sitter! The only thing to do was drill a hole in the base I was to display the model on and secure the nose down by the above method!





Main Gear

Steps 17 to 20 concern the construction of eighteen individual undercarriage parts plus doors. It is here that some good photos of the real aeroplane would have come in handy as it is unclear where the ends of a number of hydraulic arms exactly end up!

As far as preparation goes however, the main concern is in regard to the oleo leg wheel shafts. They are simply too fragile and do not even conform to the diameter of the wheel's location hole! These features are best replaced by stronger components. **Photo 22**

Photos 23 and **24** show various aspects of the completed undercarriage set up. (Note: Lowering the gear bay roof to clear the aerofill of the lower wing has had the knock-on effect of 'lowering' the undercarriage. As a result a slightly



Final Detail

Steps 21 to 23 concern the addition of any kit parts that are left and the locating of scratchbuilt or after-market items.

Photo 25 shows the resin Mk 8 Gun sight and also a rear view mirror that I chose to add. Apart from the rear hood having the 'bulged' head clearance feature, the canopy parts are otherwise fine. (The rear hood also needed reducing in length by 1mm to fit).

Photo 26 shows the location of the Mk 9 Rocket Launchers. Grooves in the plastic indicated their position. Similar grooves are also present to the rear as used on some types; these location grooves were smoothed over. Octopus

advocate the purchase of a Pavla set but I was content to scratch build my own zero length rails.

I know the F7F-3N was armed with 20mm cannon but I couldn't help using the Aires exquisitely detailed .50 cal resin barrels to represent the Tigercat's armament which should really have smooth barrels. **Photo 27**

In **Photo 28** the drilled-out ejector chutes can be seen, as well as the 'T' antennas. This area could also be home to a pylon for drop tanks/ordnance, but I didn't fit any to my model.

Finally **Photos 29** and **30** show a simple 'breather' tube on the drop tank and an even simpler rendering of the tail hook respectively. Going back to the drop tank, the sway brace should have been modelled a lot better - but I was getting rather tired by this stage in the project.



Painting and Decaling

Octopus wisely provides a decal option for both a Non-Specular Black aircraft and a Gloss Sea Blue machine. It was this latter aircraft that I wanted to model as I already had a black F4U-5N Corsair. The model was therefore given a few coats of Xtracolor X121 Gloss Sea Blue over the Halfords grey primer and set to one side for a few days.

However, just when I thought I was nearing the finish line I had a major setback. The Octopus decals were far too thin; brittle; unable to be moved over the surface of the model to their correct position, and simply did not react at all to setting solutions!

I had very few appropriate alternative markings for the F7F Tigercat in my spares box and the only option my limited spares allowed was for an overall black machine after all - which is greatly thanks to the Italeri F4U-5N Corsair kit! So my

completed model ended up in the matt black livery and markings of 'white 2', tail code WF, of VMF 513(N). How appropriate that VMF 513(N) was called 'The Flying Nightmares'!

Weathering

Having first sprayed my model in Xtracolor X121 Gloss Sea Blue, the opportunity now presented itself to gently rub down the overall Matt Black acrylic paint in certain places, with micromesh, to reveal the former colour. Exhaust staining was also applied using Humbrol 71 Linen and pastels. I am not a great fan of taking photos in direct sunlight but such conditions proved advantageous to showing off more clearly the weathering effects mentioned. **Photos 32** to **34** and **Photos 35** to **39** overleaf.

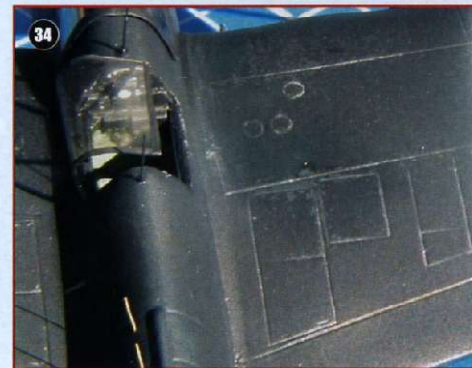
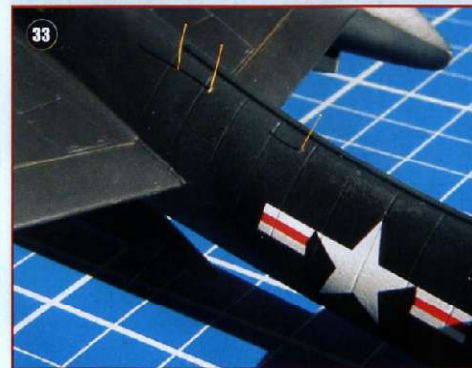
Conclusion

The kit is a little rough in places and a

little annoying but why moan? It's good old fashion modelling and after all where are the alternatives? A friend has a RVHP conversion set which includes a F7F-3N nose for the Monogram kit. I think it is up to the modeller how the model ends up looking and if you are blessed with detail photos from one of the surviving warbirds then I am sure you could do a much better job than I have. I must admit that I am very surprised at the lack of references available on this machine. I would have thought a Walk Around, InTech or Detail in Scale volume would have been available a long time ago?

As for the cost - okay for the same price you could get a very crisp Hasegawa tooled model, but you don't want a Dinah - you want a Tigercat Night Fighter, so you go and buy this kit and work hard to get your monies worth.

John McIlmurray



Sagittario Rising



Tony O'Toole takes a loving look at the Flying Machines' 1:48 scale Reggiane Re 2005 Sagittario (Archer) - the last of the Italian 5 Series fighters

As a last ditch effort to bring the technical standard of Italian fighters up to the same levels as their German allies as well as the opposing Allied forces, the Italian Air Ministry issued a requirement which resulted in three different aircraft, (all modifications of current designs), from Fiat, Macchi and Reggiane being tendered - the Fiat G 55, the Macchi C 205 and the Reggiane Re 2005. These aircraft, all powered by variants of the German Daimler Benz DB 605, were to become known as the '5 Series' fighters.

The Reggiane Re 2005 *Sagittario* was the last of the line of well known Reggiane fighters that started with the Re 2000 back in 1937, itself based very closely upon the Seversky P-35. The original Re 2000s were powered by a Piaggio 870hp radial engine and after rejection by the *Regia Aeronautica*, were operated by Sweden, Hungary and eventually the Italian Navy. Although manoeuvrable, the aircraft had a structurally weak airframe and also lacked power. To help compensate for this, the next version, the Re 2001 *Falco* was strengthened and re-engined with a license produced version of the German Daimler Benz DB 601A-1 inline engine, the Alfa Romeo RA 1000 RC41-1a *Monsonie*. As most of these engines

were allocated to production of the Macchi MC 202, only 252 of this version were produced.

The next version was the Re 2002 *Ariete*, which was a fighter bomber powered by a Piaggio P XIX RC45 radial of 1,175hp. This version had a longer nose and a strengthened fuselage and was very effective in its designed role.

The last of the line, and arguably the best fighter produced by Italy during the war, was the Re 2005 *Sagittario* (Archer). This fighter reverted to the inline engine again and was powered by a license produced version of the excellent German Daimler Benz DB 605A-1, the Fiat RA 1050 RC 58 *Tifone*.

Whilst retaining the overall configuration of its forebears, the new aircraft incorporated considerable structural redesign and a new undercarriage. Deliveries of the Re 2005 commenced in 1943, but it was rushed in to service. The prototype and ten pre-production aircraft were operated by 362a *Squadriglia* of 22 *Gruppo* and their main task was to protect Rome and Naples, although some operated from Sicily during the Allied landings there. By the time of the Armistice, only forty-eight aircraft had been built and most appear to have been destroyed due to bombing or air combat.

The survivors continued to be operated by the *Aeronautica Nazionale Repubblicana* Italian Nationalist Air Force and the German *Luftwaffe*, but mostly in a high speed liaison role. It is said that in 1945, the few remaining survivors were withdrawn to Berlin and operated in the fighter role until that city fell.

Left: The Flying Machines' box top and spread of injection-moulded plastic and resin parts, decal sheet and instructions.

Flying Machines' Re 2005

This new kit by Flying Machines is, as far as I am aware, the very first release by them and is a very professionally produced kit, very reminiscent of Classic Airframes. The plastic parts, which include the main airframe and undercarriage, are very nicely detailed and the resin parts for the cockpit and wheel bays are likewise very good.

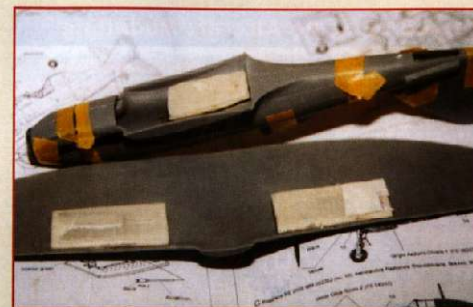
My first job was to pre-paint all the interior parts. The instructions suggest using Interior Green with black details. The wheel bays are really nice and are also to be painted Interior Green. When all of the paint was dry, I washed black watercolour paint into the recesses to show off the detail and dry brushed them with matt silver. There are four lugs on the resin pieces and although the side walls and other smaller pieces are easy to remove, I managed to cut through the roof of the wheel bay, so be careful! I covered the cut with a thin plastic card 'plaster'. The four lugs on the bottom of the cockpit floor can be left in place as there is enough space below it. Once all the pieces are painted and separated from their pour lugs, assembly of the model can commence.

The resin side walls were attached to the insides of the cockpit, making sure that the grooves at the rear line up with the end of the fuselage hump, as the head rest sits in them later on. The resin rear wheel bay bulkhead was fitted as was the propeller backplate and the instrument panel, before the fuselage halves were joined. Whilst the halves are held together with tape, the cockpit floor had the rudder pedals and the control column fitted and these were then fitted in to place from the 'hole' in the bottom of the fuselage where the wings would go later. Also at this stage, the upper cowl machine gun section was fitted, but this was too big and required sanding down later on.

The wheel bays were added to the lower wing sections and then the upper wings were added over these. If you don't remove enough resin from the wheel bays the wings will not fit. You will know when enough resin has been removed as the top surface of the wheel bays become rather 'see through'.

The completed wings were then added to the fuselage. Part of the lower rear fuselage required removing to enable the wings to fit and once in place there were gaps between the wings and fuselage on both sides. Once the correct dihedral was set and a bit of filler run in to the gaps however, they disappeared. Lots of tape was used to maintain the wings in place whilst they dried and whilst trussed up like this I fitted the tailplanes which also only needed a little filler applying to fair them into the fuselage.

After being left overnight to dry, all of the tape was removed and all the joints were sanded down ready for painting. Before this was done however the air filter was added to the side of the nose and the vac formed canopy was cut out and dry-fitted. There was a problem with the canopy as although I cut it along the



Above: The resin cockpit interior and the mainwheel wells in place - (note the patching-up of the port bay roof!) - and.....

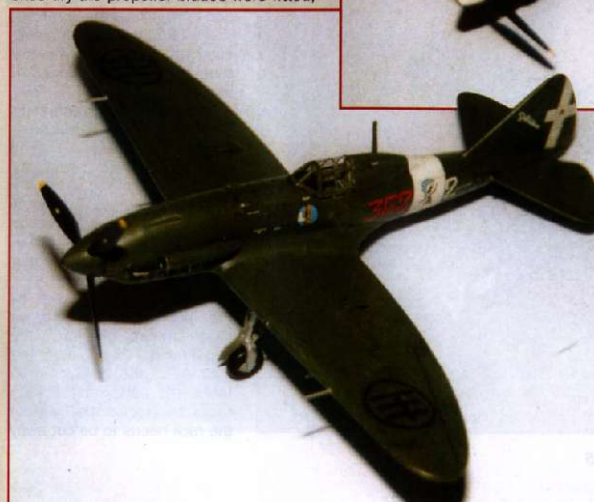
Right:.....putting it all together with plenty of Tamiya tape to make sure everything stays together and the wing dihedral is correct.

lines that were in the clear acetate, when I dry fitted it to the fuselage it was far too small! Luckily a spare is provided and this was cut bigger and fitted okay, phew!

Painting

Now onto painting, the instructions state to use *Verde Oliva Scuro* (Dark Green) on the upper surfaces and *Grigio Azzurro Chiaro* 1 (Light Grey) on the undersides. No model paint manufacturer's equivalents are mentioned, but luckily FS numbers are provided. FS 34052 is for the Dark Green, which is X109 Marine Corps Green in the Xtracolor range and FS 36307 is provided for the Light Grey. Unfortunately I could not find a manufacturer's paint reference to match this and being on a deadline to complete the kit/review, I did not have time to order the paints. Instead I tried matching what I had to colour pictures of Italian aircraft and I came up with AeroMaster *Grigio Mimetico* 1 for the undersides. I believe Polyscale do a range of Italian colours and given time I would have liked to have given these a try.

The paint was brushed on a usual and went on well with no problems, with a white fuselage band being applied using Humbrol Gloss White. The propeller spinner was painted green and white and once dry the propeller blades were fitted,



applied - not too much though as these aircraft were literally 'factory fresh'.

I really enjoyed building this kit. I have always been fascinated by Italian World War Two fighters - they resemble the lines of classic racing cars to me. I have never built an Italian fighter in 1:48 scale before, but I think I am now hooked!

This new kit, despite having its problems, was relatively easy to build, the problems were very minor and easy to correct and at the end of the day it is a beautiful model of a beautiful aircraft. What more can we ask as modellers.

Thanks to Flying Machines for providing such enjoyment with this kit

Tony O'Toole

Reviews of some of the latest kits received by Scale Aircraft Modelling



P-47D Thunderbolt 1:48 scale UK price £28.99

This latest release from Tamiya consists of 162 parts spread over five grey and one transparent sprue, with ten of these parts being unused and presumably included in anticipation of later releases of this popular subject, the most obvious being a 'Bubbletop'.

Decal options are limited to two subjects, both from the 58th FG based at Halesworth in March 1944 and finished in Olive Drab over Neutral Gray. Lt Frank Kibbe of the 61st FS and Capt Walker Mahurin of the 63rd FS. Kibbe's is the boxtop version with the Red Indian Chief marking to complement the red cowling and rudder, while Mahurin's is more sedate with a white cowling ring and white bands around the tail surfaces and a 'War Savings Bond' legend. Both subjects feature the star-and-bar markings under both wings.

The optional parts are many and various. Three propellers are provided, tapered and paddle-bladed Curtiss and a Hamilton, four rear view mirrors, solid or 'spoked' wheel hubs, three gunsights, a pair of 500lb bombs, one 150 gallon and two 108 gallon drop tanks and a pair of triple 4.5in 'bazooka' tube launchers, plus odd parts like



a D/F 'tower' and rings and a larger instrument panel glare shield. There is also the choice of open or closed cowling flaps, open or closed inter-cooler outlets, raised or lowered flaps and two different types of distributor on the engine housing.

Construction starts with the cockpit interior and were it not for the absence of a 'proper' seat harness I would say this was the equal of many resin upgrade sets. Tamiya do provide a decal harness but such things are a bit too 'flat' for my own taste, so I added a seat harness from a generic Re-Heat set. A decal is also supplied for the instrument panel dials, something I have been wary of in the past hav-

ing found them ill-fitting and/or crudely presented. No such fears here; this Tamiya offering is beautifully presented and settles into place perfectly, each dial in to the correct recess, even over the bold raised detail on the part.

The fuselage halves are closed around the cockpit interior and a substantial wing spar, for unlike the current 'norm', the wing is constructed in two separate pieces rather than a one-piece lower wing part with two upper wing panels. However, the engineering throughout this kit is truly spectacular and the complex construction is made easy. I was also impressed by the scope of the detail included, Tamiya even providing the almost complete-

ly hidden turbo outlet in the fuselage underside!

The engine is most impressive and rewards time spent making up an ignition harness with fine wire. It is not essential as the engine lurks deep within the cowling, but like a seat harness I regard the addition of a wiring harness as *de rigueur*.

Making up the wings reveals some unusual panel inserts in the undersides, which might indicate what we may see in the future from Tamiya. Perhaps a dive-brake equipped 'hot-rod' P-47M?

A cautionary note. Make sure all the parts are properly cleaned-up before assembly. The tiniest of sprue tag remnants will throw the parts out one way or another, but when cleaned-up their fit is fantastic. I really liked the gun blast tubes with all eight being substantial enough to rescue from the 'carpet monster' if carelessly dropped!

The flap hinge/actuators have to be trapped between the flap halves as they are assembled. Time should be taken here as the orientation of the hinge/actuators isn't immediately obvious and it is best to remove and fit each one in turn after identifying it from the part number on the sprue.

I was also impressed by the provision of separate sway braces on the wing bomb racks. One point for the purists - if the 108 gal drop tanks are used on the wing racks the rod at the rear of the rack needs to be cut away

and replaced with fine plastic rod between the rack and the rear of the tank. This was a spring-loaded strut which held the tank clear of the flap and aileron when it was dropped.

I also really appreciated the thought that went into the attachment points for the bombs and drop tanks. Tamiya provide for the creation of a finely detailed sub-assembly that can be carefully painted before it is attached with a very large tab that is completely hidden within the bomb rack.

Throughout construction the kit just fell together. Most of the join lines run along panel lines and those that did-

n't were easily polished out. Impressive stuff. One exception were the sway braces for the centre line bomb rack, parts E2 and E3. These were a little shallow, so I laid a strip of 10thou plastic card into the recesses in the fuselage and polished the ends to suit before fitting the brace parts.

I also chose to replace the kit's sliding canopy section with one from a Falcon vac-formed set, as the kit's is a little too thick for scale and doesn't sit properly on the model's spine. No discredit to Tamiya here, the kit item is admirably thin and wonderfully clear - it just isn't possible to mould the trans-

parency to scale thickness and I really wanted to show the 'lid' open to reveal that super cockpit interior.

AeroMaster and Polly Scale acrylics were used to finish the model, followed by a coat of AeroMaster clear gloss varnish, then the kit decals were applied. In the past some Tamiya kits have suffered from sub-standard decals. Those in the P-47D kit are stunning, easily up to the standards of the best after-market offerings, wonderfully flexible with really solid colours and dozens of tiny stencils that can be read with the help of a magnifying

glass. A coat of AeroMaster matt varnish finished the paintwork, then a little weathering and final assembly completed the project.

This kit is the finest aircraft kit of Tamiya's I've built to date and re-sets the benchmark for their future releases. I am not going to waste time debating overall accuracy in terms of shape and dimension - it looks spot-on to me.

Alas, the price is sure to cause a sharp intake of breath to many potential purchasers and individual modellers will have to make up their own minds on the kit's value.

David Batt



Boeing 135 ARIA 1:72 scale UK price £34.99

Based on the AMT/ERTL KC-135A you can actually construct one of three variants from this new AMTech kit - namely the EC 135N ARIA/ALOTS; the C-135B T/RIA; or the EC 135E ARIA.

There have been a large number of different variants of this aircraft but this must rank as one of the most bizarre with its huge nose extension to house an 85" steerable dish antenna. As far as I am aware this is the first kit of this sub-type to be produced in 1:72 although some years ago master pattern maker Dave Buttress produced a resin nose conversion under the name of DB Productions.

The kit is cleanly moulded in light grey with engraved panel lines and the first task is to construct the interior assembly. This consists of a full-length deck, the front end of which has the cockpit area. This section contains the crew seats, instrument panel, con-

trol columns and a number of bulkheads plus the crew entrance detail. At the far end of the deck is another bulkhead, the oxygen tanks and the auxiliary power unit. It is a pity that most of this is completely hidden when the fuselage halves are joined. Also to be assembled at this stage is the mainwheel bay interior, which is cemented to the underside of the deck.

It is now time to remove the fuselage halves from the sprue. It is split vertically and each half is a one-piece mould-

ing - including the extended nose. The inside of the fuselage was painted and the previously pre-painted interior cemented in position. You have to be careful here. The exact position of the deck is not marked on the inside of the fuselage and it is important that you get it right so that when you fit the under wing centre-section the wheel wells line up correctly with the cutouts in this section. I achieved this by temporarily fixing the under wing section to the deck with masking tape and, by positioning it in the fuselage slot in one half, it automatically located the deck. I added lots of weight in the nose before the fuselage was joined and then added the ventral housing at the tail end. The alternative pieces for this version are supplied as resin and a little carving is required to get them to fit.

Regarding the fuselage, you may experience a little trouble here as it is warped at the tail end. This problem is endemic to the AMT/ERTL KC-135 series so it is not just

this kit. Most of the warp seems to be corrected when the fuselage halves are glued together but a little judicious bending is needed afterwards!

The next steps are the wings. There is a bottom center section with two outer panels and single piece upper outer panels. The instructions state that the joint for the outer panels can be a problem and so there are instructions on how to strengthen this area. They also suggest that you fit a metal spar as part of this process.

With the wings in place I fitted the tailplanes and the fin tip. You now have to decide which sub-type to construct - either J 57 or TF 33 engine - both are supplied in the kit. There are other differences, all of which are noted in the instructions.

The engines, complete with pylons, are split vertically and enclose the compressor and turbine fans. The pylons are located onto the wings by means of pegs but I found that they inhibited the correct fit and found it easier to



remove them. A little filler was needed around the front end of the pylons to help blend them into the leading edge.

At this stage you will need to fit the cockpit windows. Normally you would expect them to be slotted into a gap but not in this case. The transparency comes complete with a top section into which is moulded some instrument detail. Painting this is a waste of time as it is completely hidden when the assembly is finished. After fixing the canopy, the fuselage roof is cemented in place and this needs blending-in. The variant various 'lumps and bumps' need cementing onto the fuselage at this stage. This is as far as I went before painting.

That complete, the main undercarriage was fixed in place and the doors fitted. At this stage I had a little trouble

as the outer doors fouled the wheels and although I have dozens of photographs of the -135 series, all undercarriage detail was masked by the inner engine pod. I did manage to find a few front views and although in shadow I could

just discern that the bottom of the door hinged outwards. When I examined the door itself the inside detail included the hinge line, so this enabled me to modify the doors accordingly.

Applying the decals takes some time - there is a lot of black lining. In fact I seemed to be a bit short in that area,



but this was easily rectified with after-market stripes. After a coat of semi-gloss varnish the transparency masking was removed, the wheels added and the job was done.

In your display cabinet this model has 'wow' factor, there is nothing like it anywhere. It is not a kit to be rushed and my problems I found arose from

the original AMT/ERTL kit, not this conversion. If you are into modern American aircraft then you must have this one.

Ernie Lee

Suggested references: 'KC-135 In Action' - Squadron/Signal 'KC-135 Stratotanker' - Aerofax Thanks to AMTech for the review kit.



Loire-Nieuport LN.411
1:48 scale

The LN.411 was another of those rather ungainly, unattractive, and largely unwanted machines that the French aviation industry seemed to specialise in during the late 1930s. Designed as a dive-bomber and intended for use by both services, it proved to be an under-performing beast and the Armée de l'Air were only too happy to hand their quota over to the Aeronavale.

Only two units ever operated the LN.411 in Anger, Escadrilles AB2 and AB4, and their history is notable mainly for one famous operation on 19 May 1940 when they combined for an attack at Berlaumont in northern France in a valiant attempt to stem the German advance. Half the

force of twenty machines was lost in the attempt and most of the survivors were destroyed in the days afterwards. With their bases overrun, the two units withdrew to the south of France and ultimately to North Africa after the Armistice.

Undistinguished aircraft it may be, but this model, in the usual Azur style of this prolific Czech Republic kit producer, comprises a set of basically accurate injection moulded parts providing the main airframe, with neat resin castings for the cockpit and other small details. Vacuumformed canopies and an excellent decal sheet complete the package.

Any modeller who has built this type of kit before will have no problems as it is one of the easier of the breed. With the possible exception of the



undercarriage, of which more anon.....

Having blanked out the inside of the exhaust holes with plastic card, the fuselage halves were glued together straightaway and left to set. The assembled and completed cockpit can be inserted from underneath through the wing opening which is a neater way of doing this than the conventional method suggested in the instructions.

All the panel lines are very faint, so I carefully went over them with an Olfa P.Cutter to give them a bit more definition. This is particularly necessary for the engine cowling panels and the various control surfaces. The wings needed a

bit more work, especially the usual problem of ensuring that the resin undercarriage bays fit correctly. The air intake parts were less of a problem, thankfully!

Once these were all in place, I glued the lower wing to the fuselage and left it to set before adding the upper wing halves. I found this sequence better than the kit instructions because it meant that I could attend to the upper wing-to-fuselage joints individually to get as neat a join as possible. The port wing was fine, but the starboard still required a little filler.

The tailplane assembly was simplicity itself, the only point to remember was to put the endplates on correctly - even though they do look as if they are on backwards! All the joints were plain butt joints, and you could if you wish reinforce them with brass rod.

The three air intakes under the nose were fitted

next and, not surprisingly, needed a little filler to blend them in smoothly. In fact, the main chin intake fitted better than expected and, with the 'mesh' front to the inner piece, looks quite neat.

With the main airframe complete, I then turned my attention to completing the cockpit and fitting the canopy. To my relief, this was quite an easy task with careful and steady trimming and I didn't need to resort to the spare canopy for once! I glued it in place with epoxy resin glue which made for a neat and strong joint. Too late I realised that there is no gunsight supplied in the kit.....

The resin canopy rails needed to be fitted very carefully, 'slot' side inwards of course. By the way, the odd angle of these is explained by the fact that the canopy is pulled down towards the fuselage as it opens rearwards, an unusual arrangement, to say the least. This should be borne in mind if an open canopy is required on your model.

At this stage the model was prepared for painting; all other detail parts being left until later. After a coat of primer - and having masked the canopy, of course - the camouflage colours were applied by airbrush. This is

never an easy task with French camouflage patterns of the period and particularly so with the 'blotchy' pattern on these machines.

The decals went on easily, the only tricky part being that the rudder stripes are made up of three separate colours that need to be cut to size from the panels supplied on the sheet - fiddly, but not difficult.

With a grand total of twenty-two parts, the undercarriage assembly is probably the worst part of the kit and is tricky to get right. As a piece of design it reflects the full-size in being somewhat over-complicated and quite a challenge to make sense of. The main rearwards-folding undercarriage legs are no problem and these were glued into place and left to set thoroughly - and correctly aligned - before proceeding further.

Now the fun starts! Each rear strut comprises four parts, one plastic and three resin, and these were assembled on a simple jig to ensure that all four completed struts were alike. The central horizontal T-bars were glued to their support blocks within the bays, (medium viscosity superglue is essential for all this work), and then the pairs of struts were glued either side. When aligned correctly

with each other, their lower ends were glued to the bottom of the main legs. There are no proper locations for any of this so a lot of care is required, but if done properly you do end up with a strong assembly - it just dips into your reserves of patience to get there!

The undercarriage doors are the worst bit of all, simply because there is absolutely no provision in the kit for fixing them. So, with careful reference to the instruction sheet drawings, each door was offered up to their approximate locations and the protruding T-bar rods trimmed to their correct length. This is all a bit trial-and-error, but the doors could then be glued to the ends of the rods so that they hang more-or-less where they should be in relationship to both the wheels and the leading edge of the wing.

The geometry of the undercarriage would suggest that the bottom of the doors should be connected in some way to the bottom of the legs, so I cut short lengths of rod to do this in a way that may not be prototypical but does at least make for a fairly strong assembly on the model.

After all this, the final details were simplicity itself and the model was soon complete.

The propeller, as is usual in this style of kit, needs to be assembled from separate blades, hub and spinner. When gluing the blades to the hub, I find a useful tip is to place it on a watch face so that you can easily align the blades with the 4, 8 and 12 o'clock positions. At least it is a simple paint job on French machines - matt black overall.

The rudder and aileron control horns are resin castings that need careful handling but look good once glued into place; likewise the tiny grab rails on the fuselage sides. The box art shows an aerial wire running from the radio mast to the fin and for the sake of this review I've replicated this, but I'm not sure if this is correct, such wires were not normally seen on French aircraft of the period, just masts only. Having checked all my reference photos, I certainly cannot see evidence of wires, but then they don't normally show anyway especially when seen against a sky background.

This may not exactly be an exciting subject, but nevertheless this is a nice kit of one of aviation's more unusual aircraft and can be recommended if you like something a bit out of the ordinary.

David Jane



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Sikorsky MH-60L

1:48 scale UK price £TBA

Revell's latest foray into rotary wings is in fact a re-boxing of an Italeri offering. Indeed all the parts remain on the sprues to make an MH-60K (albeit this is not mentioned on the packaging nor in the instructions - the parts are simply listed as 'not for use').

As such it carries most of the mods applicable to the fully upgraded 'L' variant - the most prominent omission being the sat-comm 'hump' aft of the rotor - you have however sufficient parts to enable a model anywhere between the full 'L' and the interim 'Velcro Hawks'.

To be fair to Revell not all the features are necessarily flown at any one time; you can for instance see Ls without the refuelling probe or the stub wings, and antennae fit varies widely.

The kit features the standard down-turned 'wings' (ESSS) associated with the '60 and provides four very nice drop tanks. (As two are more routinely flown, you thus retain a spare pair - ideal for an Apache!). Again provided but not mentioned, are the up-turned stubs typical of the MH-60K or the US Air Force's HH-60Pave Hawks.

Armament is restricted to two cabin-mounted M-60s, which all my references indicate are not typical, (Ks and Ls are more commonly seen with the more effective miniguns or even .50s).

Markings are provided for two machines of the 160th SOAR and include extensive stencilling of which more later. Finally, and possibly uniquely, the kit provides for blade folding, (which is used when packing the aircraft into a C-5), sadly whilst the correct 'folding' style horizontal stabiliser is also provided, you would have to do your own surgery to fully replicate a 'folded' machine.

The main blades have subtle 'droop' moulded-in which is a nice touch - albeit you may have to reverse it if you fold the blades!!

The kit is typical Italeri, cleanly moulded in dark olive plastic, it appears quite good on the sprue; assembly however is another matter. The extensive use of add-on parts mir-

rors the original, but their location on the airframe is not marked in any way and the whole process becomes somewhat hit-and-miss. This is not aided by instructions that vaguely resemble the items they represent. In fact I was left with the distinct impression



that whoever had drawn the instructions had (a) not seen the production sprues and (b) never checked if building the thing was actually possible! Lots of dry runs and frequent referral to references then!

Assembly, as you would expect, commences with the cabin interior. A full set of seats is provided although I left off the rearmost row, which appears to be a common practice. Pilot seats and a full set of controls are also provided along with instrument panels that have decals to represent the main panel and centre console. There is no representation of the overhead console.

The detailing on all these items is adequate with a bit of cleaning up and careful painting, but those building for competition would want to turn to the brass or resin folks for a more accurate job on what is a very busy interior if modelled in its entirety.

The two fuselage shells have to be prepared next. There are various holes to be opened up, (not all of them marked - so plan ahead), and some filled, (the VOR 'towel rails' are not used on the L as far as I can tell), plus of course the undercarriage legs have to be 'insinuated' and fixed inside the cabin.

A change to the instruction sequence I chose to make, was not fitting the tail rotor as this would ease both painting and transport/stor-



age. Conversely, on reflection, I also think it might have been better to fit the overhead glazing, (which appears not to be tinted on these aircraft), and the lower glass panels in the nose at this stage. This would have enabled easier alignment and the improvement of what turned out to be a rather approximate fit.

Finally there are some decals for the insides of the doors, which I chose to ignore. Bringing the fuselage together around the interior requires some care to get everything lined up correctly, as again there is no really positive keying of components. Once assembled however the basic carcass is quite strong and you can think about adding the cockpit glazing. This is not a good fit and some fettling is called for to line the various bits up.

I then tackled the exhaust suppressors. This required a number of dry runs as the instructions appear to have reversed some of the part numbers - a problem further compounded by ambiguous drawings. Once together and sanded I added a support stay using brass wire. You have to look for this on photographs as it is often 'lost' in the shadows, but it is quite prominent and as in the prototype helps steady a potentially fragile assembly.

The stub wings come next. Again fit is very vague, a locating pin has no corresponding hole and parts, (which need to be banded), are not easily differentiated. The twin supporting struts - which locate into the inboard stores pylon - have no corresponding location points on the fuselage and also appear to have their part numbers reversed. Furthermore if you weren't paying attention earlier in the instructions you will have fitted the covers, (only used when ESSS is not fitted), over said unmarked location points! (No, I hadn't, but only because I didn't follow the instructions!).

With the model substantially complete fitting all the 'warts and protrusions' can commence. This is a long and tortuous process due to the aforementioned lack of location guidance. The kit provides everything appropriate - nose radar, FLIR ball, RWR antennae, etc., with the exception of the previously mentioned 'hump' associated with sat-comm. I can only counsel great care and attention to references throughout this part of the construction.

Painting as ever with US Army aircraft is not as straightforward as it would appear. Some references suggest that these particular aircraft are overall matt black; a possibility reinforced by the provision of light sand/yellow titles in the decals rather than the standard black.

References are not conclusive however as the standard Helo Drab colour is meant to change colour in different lights! Photography is therefore ambiguous, showing a colour range from olive drab to almost black depending on the time of day.

The actual colour is a dark greyish green, Xtracolor do a good version, or you can use Humbrol 66 Matt Olive Drab - either makes a good starting point. I used Humbrol followed by a couple of coats of Kleer to prep it for the decals.

A comprehensive set is provided with masses of stencilling as well as the primary titling and serials etc. They went on extremely well and settled down nicely with a touch of Micro Sol.

As the final finish needs to be very matt indeed, a coat of Xtracolor matt varnish was used to seal everything in. This left the yellow decals looking a little bright so for the final coat I added some Olive Drab to the varnish and misted it on, effectively toning down the colour. Adding some black to this mix then allowed me to also sug-

gest exhaust staining on the aft fuselage and fin.

Whilst the model was drying I got on with the rotors. As earlier stated they are designed to fold and as the feature doesn't detract from the appearance I left it in. Providing the retaining pieces are clamped firmly whilst they set, operation is quite positive with no flopping about when the blades are spread. I added some minor plumbing to the top of the rotor head, and changed the kits' rather thick pitch links for brass rod, but otherwise built it 'as kit'.

The tail rotor was made removable by inserting some tube in to the fin to give a decent 'push fit' whilst still retaining the angle required.

The finished model certainly looks like a 'Hawk', but it is a shame that just a little more attention wasn't paid to the mods and how to get them on the airframe. The decals are superb on the other hand, albeit they include a number of items the location of which remains a mystery to me!

The kit nevertheless has the benefit of accurate outline, and includes most of the

essentials so it does represent good value for money. Those of you wishing to go further and involve the resin and brass aftermarket, will find they have an excellent basis from which to work.

Best references are 'International Air Power Review' Vol 4 (which covers the 160th SOAR in detail), 'World Air Power Journal' Vols 12 and 13, and of course the Squadron 'In Action' on the MH-60.

Mike Verier
Thanks to Revell for the review sample.



Sukhoi Su-6AM-42

1:72 scale UK price TBA

This is the first product from yet another talented group from the Czech Republic. The real aircraft was produced to a tender to replace the Il-2. It was unsuccessful and only six were produced, making it another rare subject to add to our collection of Russian aircraft.

It is moulded in light grey with engraved panel lines and minimal flash. The fuselage, complete with fin and rudder, is split vertically in to which is fitted quite a bit of cockpit detail.



The first task was to build the cockpit interior; this consists of a floor, (with moulded-in side consoles), seat, bulkhead, instrument panel and control column. Behind the bulkhead is the gunner's position with a further bulkhead at the rear. The gunner himself had no seat just a wide strap slung across the fuselage to sit on! This is supplied as etched metal, as are the seat belts, instrument detail and gunsight.

After completing and painting the interior, I originally cemented it to one fuselage half. I then taped the halves together to check interior fit and hit a problem. The floor was cemented between the indicator marks on one side of the fuselage but when I joined the halves I found that it was too far to one side and was not at right angles to the vertical owing to the restrictions of the instrument panel and bulkhead.

After removing the assembly, I found an easy way to correct it. I again taped the fuselage halves together but then fitted the assembly through the wing aperture, centering and then cementing one side to the fuselage half. Any gap can then be filled with

that is an etched metal grille. But before I could fit this assembly a little attention was needed around the slot, as it is too large for the intake lip. I corrected this by trimming the slot and inserting a piece of plastic card on the forward surface and trimmed it to conform to the fuselage.

The wings come as a single lower surface with port and starboard upper sections and the main undercarriage legs are fitted into the lower section before the upper ones are cemented in place. I do not like this method of fixing undercarriage legs, much preferring to fit them after painting. Luckily I found that they could be slotted into place after the wings are assembled

so these and the rest of the wing detail I left until after painting.

After cementing the single-moulding horizontal tailplanes and an air scoop to the upper fuselage, I test fitted the vacuum canopy and then painted the

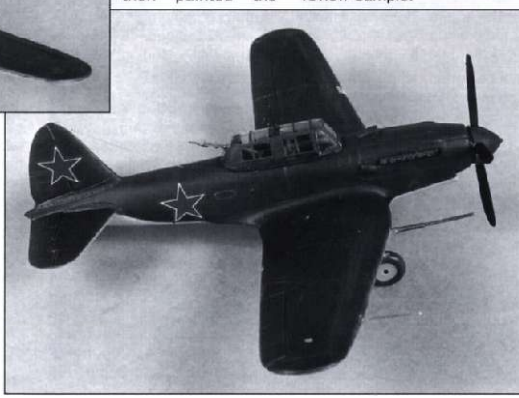
assembled model. It was then time to fit the 'delicate bits' eg the cannons, pitot and undercarriage, plus the etched brass wheel doors.

Decals came next. These are simply three sets of red stars but they went on perfectly. The canopy was fitted and blended-in to the fuselage with Crystal Clear and touched in, the propeller added and the last job was the underwing bombs on tiny etched brass shackles. I found the easiest way to fix those was to cement them to the bombs and then fix the whole assembly to the wings. A couple of stretched sprue aerial wires and the project was complete.

I found this kit no more difficult than any other short run project and I am sure that it will cause a few puzzled faces when placed on the model table at your local model meeting.

Ernie Lee

Suggested reference:-
'OKB Sukhoi' by Midland Counties
Thanks to Valom for the review sample.

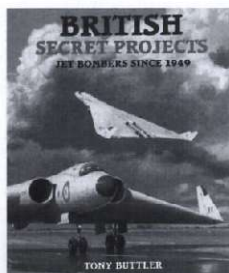


Title: Secret British Projects: Jet Bombers since 1949
Author: Tony Buttler
Publisher: Midland Publishing
Price: £24.95

Those of you who know Tony Buttler's first book in this series, devoted to British fighter projects, may well have laid your money down even before seeing this review.

Although the title takes as its starting point 1949, coinciding with the flight of the English Electric A.1, the projects featured in fact cover all the post-WWII bomber and strike aircraft, epitomised by Keith Woodcock's splendid dust-cover artwork of an early Avro 698 design with wing tip fins and two stacked pairs of Olympus.

While some of the projects have seen the light of day in various magazine articles in the last few years, it is all



gathered here together with much that is new, grouped in to fifteen chapters.

One of these is devoted to the TSR.2 and its competitors, and the author gives a clear-eyed assessment of the aircraft which is perhaps only now possible. Where relevant throughout the book, the politics, in a non-partisan sense, are lucidly explained.

The text is accompanied

by a positive plethora of three-views and artists' impressions of the proposed aircraft, and some are illustrated by photos of models. There is a 'colour section' of both photos and colour artwork by Pete West, who was equally prominent in the fighter volume.

Modellers who share my taste for this interest will consider which kits, (or parts from the spares box), they can cannibalise to reproduce some of these designs, or who they might try to persuade to cast some of them in resin, (one of the smaller BAE designs is already on its way).

Some of the more fanciful German designs from the closing period of WWII can be characterised as *science fiction*, but a considerable amount of effort was devoted to many of the projects covered here, which could be

characterised by 'Maybe' rather than 'What If?'

The author has become a one-man 'centre of excellence' in this area, and I found his work published here absolutely fascinating; not least perhaps because much of the work was going on in the background when I was a regular visitor to the Farnborough shows.

The book, especially when taken together with the fighter volume, gives a vivid impression of the British aviation industry at a time when the only constant was change. This is a first-class book and if it is for a niche readership then I am that niche! With fighters and bombers covered - and this book includes maritime reconnaissance - I hope that there is enough remaining material for a third volume, (support aircraft, perhaps?), please!

Mike McEvoy

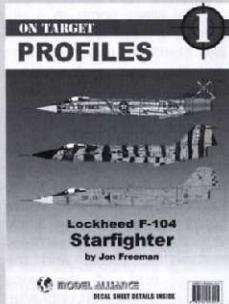
The Aviation Workshop Publications Ltd
On Target Profiles
'No 1: Lockheed F-104 Starfighter'

Artwork by Jon Freeman
UK Price £9.99

No 2: RAF & Commonwealth P-51 Mustangs
Artwork by Jon Freeman
UK price £9.99

These two are the 'launch pair' of a planned series of ongoing soft-backed booklets, aimed squarely at the modeller - crammed full of inspirational full colour illustrations, comprising a mix of fifteen pages of 1:72 scale profiles with sixteen pages of four-views including the inside front and inside back covers.

The text consists solely of comprehensive captions to each aircraft illustrated, and both books have a colour chart inside the flap of the fold-out back cover, with



numerical identification of the shades where possible.

Each book within this new and growing series, will be accompanied by an order form for a decal sheet of selected aircraft of the chosen type in either 1:72 or 1:48 scales - depending on the modellers' preferred scale.

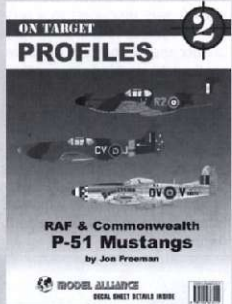
It was good to see so many of the 'special'

schemes in the Starfighter book included, although the decal sheet illustrated covers eight 'standard' service aircraft from various countries; maybe the noble art of hand-painting will be revived, but I think I would agitate for a second set of decals!

The Mustang decals include three Allison-engined P-51s and four with Merlins, including the celebrated 'Doolybird' and the 613 Sqn. Mk I with the Panda Bear nose marking. The decal sheets are printed by Fantasy Print Shop, which should be an indication of their quality.

Jon Freeman's excellent illustrations should be well known to 'SAM' readers, and I particularly liked his distinction between bare natural metal and painted silver on the later Mustangs.

Whilst some of the subjects may appear familiar, not



least to those who have the 'Ducimus RAF Mustang' booklet, many are not, but all are very useful compilations in colour, and the tie-in with relevant decals should prove to be popular.

I look forward to future 'On Target Profiles' to follow these, and their accompanying decal sheets!

Mike McEvoy

Malta Aviation Museum Foundation
Malta Fly Past Issue 5
Charles Stafrace

This A4 softback is a *pot pourri* of aviation information; whatever the period of your interest there is something in for you.

The first article deals with Royal Naval Aviation in Malta 1924-1927, covering some useful aircraft and also some real 'oddballs' such as the Avro Bison. For

the researcher this article also contains some useful tables such as a run-down of the aircraft on board contemporary aircraft carriers with specimen serial numbers.

The next subject is the fighters that defended Malta during World War Two, with no less than seventeen colour profiles - enough to keep any modeller happy - and we are only up to page 22 of this 96 page book.

Other articles cover such

subjects as the restoration of a Hurricane; the aircraft and story of *Sergente Maggiore* Teresio, an Italian fighter ace; a synopsis of Maltese air shows; the odd story of Malta's Sound Location Anti-Aircraft Defense and many other bits and pieces.

If you are interested in aviation associated with Malta, or indeed 'interesting' aviation in general then this could be for you.

Ernie Lee

Midland Counties
Tupolev Tu-4
Yefrim Gordon & Vladimir Rigmant
Red Star volume 7
UK price £19.99

Commonly known as the 'Soviet Superfortress', the airframe of this aircraft was a direct copy of the B-29. This 127-page softback is the most comprehensive study of this aircraft I have yet come across. Not only does it cover the original machine but the various subtypes and different versions

derived from it. Although I was aware of the 'B-29 copy', I did not realise the amount of development that took place after the original construction.

There are 26 pages just devoted to variants. These include missile carriers and transport/troops ships complete with underlying cargo pods. There was also an aircraft adapted to tow MiG-15 fighters to the combat zone. The idea was that these aircraft be launched to protect the bomber and then re-attach



for the homeward flight!

It was also put to many other uses; testing new engines and even as test beds for AWAC's. Another development was the Transport, designated the Tu-70 with a drastically altered fuselage shape, changing even more so with the development of the Tu-85 bomber. This is an excellent reference and one that many modellers and aviation enthusiasts with an interest in Soviet aircraft will want.

Ernie Lee

Osprey Publishing
Jagdgeschwader 27 'Afrika', by John Weal
Price: £ 13.99/ \$19.95



Latest in the Elite Units series, this *Geschwader* will always be associated with the North African campaign and 'Star of Africa' Hans-Joachim Marseille; the introduction to this book points out that this period accounts for only a quarter of the unit's service, so while many of the colour illustrations show Bf 109s in 'desert' schemes, early greens and late greys also

feature heavily.

The first of these side views is of an Arado Ar 68, the type on which the unit was formed as I./JG 133, and the last three of John Weal's profiles are of a Gotha Go 145A, a Bf 108B and a *Storch*; in between are thirty-six 109s, and they are followed by two pages of unit badges in colour.

The photos, which as so often in this series look as though most have come from personal albums or collections, are always worth study,

and I particularly like that on the top of page 77 - any ex-fighter pilot will relate to that! - and those on page 80 merit more than a passing glance, and could form the basis of a splendid diorama, in as large a scale as practicable.

The accounts of the *Geschwader*'s operations are, as always in this series, engrossing, and with the popularity of the Bf 109 as a modelling subject this book should find a ready market among 'SAM' readers.

Mike McEvoy



Ian Alan Publishing - Air War Classics
Fokker Dr.I Triplane
Paul Leaman
UK price £35

I suppose there was almost a thousand different types including sub-variants that were used, or intended to be used, in World War One, yet only a few remain in the mind of most air enthusiasts - and this is one of them. This is born out by the number of replicas that are around.

Perhaps it is because some well-known airman flew this little aircraft. As well as

Manfred and Lothar von Richthofen, other famous names that spring to mind include Ernst Udet, Werner Voss, Herman Göring and Rudolf Hess to name a few.

If this is 'your aircraft' then you are in for a treat - a large 224-page hardback packed with photographs and artwork. For the aviation enthusiast and modeller alike it is a gold-mine of information.

An early chapter covers Fokker's early attempts to produce aircraft but the meat of the book is about the Dr.1.

Photographically speaking it must be the largest collection inside one cover. Add to that nine colour two-views and four colour profiles plus scale drawing of the Dr.1. and its development aircraft.

And for the real enthusiast, there is a cutaway, structural drawings, a list of serial numbers, details of aircraft shot down and even details of captured aeroplanes.

I have only skimmed the surface of this excellent tome, if you are a fan of this aircraft then you have to have it.

Ernie Lee

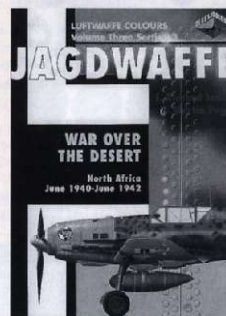
Ian Alan Publishing
Jagdwaaffe
War Over the Desert
North Africa
June 1940-June 1942
Richard Smith & Martin Pegg
UK price £14.95

This series of books have, I am afraid over-long titles - necessary, but they do play havoc with captions! In fact there is even more of it as the primary title is 'Luftwaaffe Colours volume 3, section 3'!

All this makes a long

name for this 94 page soft-back book, but as many of you will know this is a 'must have' series for the Luftwaaffe enthusiast. As it intends to cover German fighter camouflage from 1935 to the end of hostilities, as a single book with such in-depth detail it would need a forklift stuck to move it. Thus we get edible chunks such as this.

For those not familiar with these books they are a mixture of photographs, many of which have interpretations reproduced as colour profiles,



(there are 26 of them); added to that there is a potted history of events and pilots. Each profile has an informative caption giving RLM colours, and in many cases the pilots name.

This book covers Bf 109 activity over the Western Desert and Malta in this period. This is only the 11th volume so I should reserve a large space on your bookshelf as no self-respecting enthusiast of this subject can do without them.

Ernie Lee



Reviewed by Neil Robinson

AEROMASTER 72-199/48-618 Abe's Super Stars

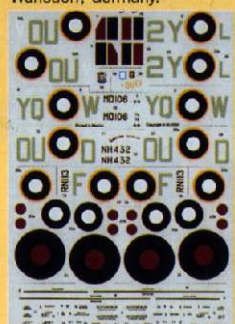
There is the choice of either 1:72 or 1:48 scale in the first of this latest AeroMaster package, which cover an F/A-18E Hornet CAG bird from VFA-115 and an F-14D Tomcat from VF-31 - both flying off USS Abraham Lincoln, (CVN-72), in December 2002.



craft with fuselage side 'artwork' and both from No 485 Sqn; a standard canopy Mk XVI with broad chord pointed rudder and again fuselage 'artwork' from No 451 Sqn circa May 1945; and a Mk Vc, flown by W/Cdr John Checketts, circa June 1944, with Polish and Canadian 'markings' on the nose.

AeroMaster 48-581 'Post D-Day Spitfires 1944/45 Pt II'

Another selection of late-war Spits, this time comprising a Mk IXe of No 340 (Free French) Sqn., April 1944; a Day Fighter Scheme camouflaged HF Mk VII of No 616 Sqn with narrow D-Day stripes, June 1944; a IXe from No 485 Sqn., circa December 1944 and the 485 Sqn Mk IXe from the first 'Post D-Day Spitfire' sheet but this time with full D-Day stripes; and finally a post-war, 'bubble-topped' No 2 Sqn Spitfire Mk XIVe of 2 TAF based at Wunsdorf, Germany.



AeroMaster 48-595 'Aircorbas at War Pt III'

AeroMaster 48-580 'Post D-Day Spitfires 1944/45 Pt I'

Four late-war Spitfires - a 'bubble-top' Mk XVI circa April 1945 and a standard Mk IXe with D-Day stripes only on the lower surfaces, both these air-

Theatre' of Port Moresby and Guadalcanal, circa 1942/43, and a Soviet AF P-39N flown by Major Mikhail Rents, 30 GIAP, 1945.



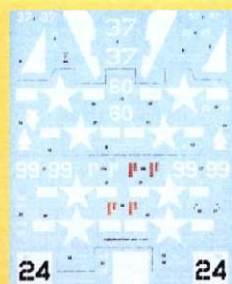
AeroMaster 48-596 and 48-615 'Marauding Invaders Pts I and II'

A selection of six B-26s - three per sheet - featuring a mix of 'glass-nosed' A-26Cs and solid 'gun-nosed' B-26Bs, all but one of which are from the Korean War - but all feature some kind of 'nose art'. Two of the gun-nosed Bs have an overall Olive Drab scheme, one B-26C is in overall matt black and the remaining three are in overall natural metal with coloured 'trim'.



AeroMaster 48-601 'Hellicats Pt III'

Four, late-war, Pacific Theatre, overall Sea Blue Gloss F6F5 Hellicats, enlivened only by their white geometric parent 'carrier markings', from USS Yorktown, USS Bennington, USS Lexington and USS San Jacinto.



AeroMaster 48-613 and 48-614 'American Trojans Pts I and II'

With the old Monogram kit back on the stockists shelves again, these two sheets give us the opportunity to add some fresh markings to the 'old timer'. Seven T-28s, (two Bs, three Cs and a pair of Ds), are featured - six in US Navy colours ranging from the overall yellow through overall white with red trim and on to grey fuselage with yellow wings/tailplane. The only camouflaged version is a DT-28D of the Air Commandos in the TO-1-4 'South East Asia' scheme.



Model Alliance UK/ The Aviation Workshop MA-72102/MA-48102 BAe Harrier GR.7

No less than thirteen Harrier GR.7s are featured on both the 1:72 and 1:48 versions of this very welcome sheet - nice to see the current RAF types getting a 'look in' at last. Markings and schemes cover the initial two-tone green camouflage pattern from the 1993/94 period up to the current 2003 two-

tone grey scheme and also includes an overall light grey ARTIF finished machine based at Incirlik in Turkey in 1995. Aircraft from Nos 3, 4 and 20 Squadrons are featured, plus the SAOEU and Boscombe Down's Air Warfare Centre. One set of standard Red/Blue and one set of lo-viz Pale Red/Pale Blue roundels is included plus a smaller additional sheet containing most of the stencilling variations. Excellent value - all we need now is a decent 1:48 scale GR.7 to put them all on!!



Model Alliance UK/ The Aviation Workshop MA-72103/MA-48103 RN and RAF Sea Kings

Another scale-optional offering, with both the 1:72 and the 1:48 sheets featuring the same subjects, which in this instance offers seven Royal Navy machines, (an AEW.2; four HC.4s; a HU.5 and a HAS.6), and a pair of RAF HAR Mk 3s. Again a variety of schemes and markings to choose from - all beautifully illustrated in colour on the instruction sheets.



25th Anniversary
Serving the Modeller

? 5 year subscription to Scale Aircraft Modelling Celebration Competition

Over the twelve issues of this 25th Anniversary Volume, we will be featuring a monthly, ongoing 'running competition' asking one question in each issue. All you have to do is to answer each of the twelve questions, (the first of which was in the March 2003 issue, last month), and then send all twelve answers, by 1 June 2004, to:-
SAM's 25th Anniversary Celebration Competition,
352 Selbourne Road, Luton, Bedfordshire
LU4 8NU United Kingdom

Question No 5:-
What did the initials MRCA stand for with respect to the Panavia Tornado prototype?

Events Calendar

SAM's Monthly diary of modelling related events worldwide.

SAM = Events at which SAM will have a trade stand or presence.

Saturday 21/Sunday 22 June 2003: Gatwick Aviation Museum in conjunction with Southern Counties Historic Vehicles Preservation Trust. Vallance By-Ways, Lowfield Heath Road, Charlwood, nr Gatwick. Adults £4.00, children/OAPs £2.00. Vintage and classic vehicles; Trade stalls; Craft stalls; Model Aircraft display; Aviation jumble; Fairground Rides. For more information Peter Vallance 01293 862915

Sunday 6 July 2003: Ford Full of Models at Newhaven Fort, Newhaven, East Sussex. For more information tel IPMS Sussex on 01444 457 382

Saturday 26/Sunday 27 July 2003: Townsville Model Expo at the Hotel Room, Thuringowa Council Chambers, Townsville, North Qld, Australia. For further information contact Peter Johnstone - E-mail <peter@pjdesign.com.au>

Sunday 20 July 2003: Model Mania at Chelsey School, Chelsey, nr Wallingford, Oxon. More models, more fun, more to see, more to do. More information from: 01491 652 295 or 01491 652 536

Saturday 9 August 2003: Salem VA - 2003 Virginia Shoot-Out Model Contest and Convention, sponsored by Roanoke Valley IPMS, at the Salem Civic Centre, Salem VA. 9am to 5pm. Contact: Tommy Carr 540-725-4102. E-mail: <tcarr83700@aol.com> or Tim Ward 540-977-6205. E-mail: <tward86@aol.com> Website: <www.rvips.com>

Sunday 17 August 2003: IPMS Avon present their 14th Annual Model Show at Yate Leisure Centre, Kennedy Way, Probably 'The Best One Day Show in the UK!'. Many Clubs and Traders. Open Competition. Plenty of FREE car parking. Restaurant, Bar etc. Easy access from the M4 and M5. All enquiries (from Clubs and Traders) to Phil - Tel/Fax 01454 850119. E-mail <ipmsavon@aol.com>

Sunday 17 August 2003: Redhill Airport Fly-In & Aeronautical Collectors Fair at Redhill Airport, Surrey. 10am Joy rides, historical aircraft, books, kits, models etc. Short display by RAF aircraft. Proceeds to local charities. For info Tel/Fax: 01737 822 200 Aceball Aviation

Sunday 31 August 2003: IPMS Bampton present their 2003 Annual Show at The Priory Centre, St Neots, Cambridgeshire. 10am to 4pm. Admission: Adults £1 Children, Students & Senior Citizens Free. For further info contact: Sam Bratby on 01487 830 689 or sambratby@supanet.com

Saturday 13 September 2003: 'CapCon 2003' organised by IPMS Canada at the Nepean Sportsplex Salons, Woodroffe Avenue, Ottawa, Canada. Competition open to all modellers - 60+ categories; 15+ themes and special awards. Contact - e-mail <capcon2003@hotmail.com> or write to Paul Eastwood, IPMS Ottawa, Box 7142, Ottawa (Vanier), Ontario, K1L 8E3, Canada

Sunday 14 September 2003: Sutton Coldfield Model Makers Society Show at the Town Hall, Sutton Coldfield. Open 10am. Admission: £2.50 adults, £1.50 children and concessions. Club stands & traders. Open competition for senior and juniors. For further details contact: Peter Haywood - 01899 578 074 Or e-mail: <p.haywood@madassfish.com>

Sunday 21 September 2003: Modelfest 2003 Model Show, organised by IPMS Farnborough. Frogmore Community Campus, Yately, Hants. (Off the A30 - 2 miles from J4 M3). Contact Pete Readman, tel 0118 978 2910 or e-mail <preadman@compuserve.com>

Sunday 28 September 2003: St Edmundsbury Scale Modellers Club Show at the Moreton Hall Community Association and Club, Moreton Hall, Bury St Edmunds. Signposted from A14. Club & Trade stands. New bigger, better venue. Bar & bar food, big FREE car park. 10am to 5pm. Contact: Dominic Stevenson, 7 Silverdale Close, Ipswich, IP1 4JF. Tel: 01473 743 189.

Saturday 22/Sunday 23 November 2003 IPMS/UK Scale Modelworld 2003 - THE BIG ONE!! at the Telford International Centre, Telford, Shropshire. IPMS/UK's 40th Anniversary Show. Bigger and Better than ever before!!! Make a date in your diary NOW!!! Watch this space for further details.

Publish your event
If your modelling group, club, branch, chapter or society would like their event (or even regular meetings) publicised in 'SAM' simply drop us a line with all the relevant information - date, venue, opening times, entrance fee(s), who's displaying, how to get there, and who to contact for further information. We'll leave all the details in right up to the date of the event, so the earlier you send it in, the longer it will be publicised. Don't miss out on FREE PUBLICITY, send your details today to: SAM's Events Calendar, Guideline Publications, 352 Selbourne Road, Luton, Bedfordshire LU4 8NU.



A while back, I wrote in this column about the problems of the traffic involved with going to the Mildenhall Air Display, and got a letter from an Antipodean reader - who missed my point by an Australian mile - saying that East Anglian congestion was of no consequence to him. I did say that if the opportunity came my way to comment equally on the ease of getting in and out of the Avalon Show in Oz, I'd take it to redress the balance. But why go to see real aeroplanes anyway, when the variety of possible subjects is much greater at your local model shop?

This magazine has, throughout its 25 years been about real aeroplanes as modelling subjects, although those whose lips curl at the 'What if' school of modelling might want to debate the nature of reality.

One of those unanswerable

questions that gets batted around the editorial table, in whichever questionable place of entertainment it happens to be at the time, is the proportions of the preferences of our readers and their primary interests. My feeling - and this does not necessarily reflect 'Official Policy', or indeed 'Opinion' - is that there is at each end of the spectrum about 20 to 25 percent whose chief enthusiasm is clearly either for the modelling of the aircraft, and in between them is a somewhat amorphous group of those with, shall we say, flexible allegiance!

Given that my interest in aeroplanes started, if family legend is to be believed, around the age of two and a half, it's a reasonable supposition that the modelling followed a little later. I do recall that from seven or eight onwards, Christmas or birthday presents - apart from the current volume of 'Aircraft of the Fighting Powers', accounting no doubt for my library obsession, and perhaps for my devotion to the 1:72 scale of its drawings - were models, usually in wood but with the occasional black recognition model acquired

through one or other of my family in the RAF at the time. And I also remember quite clearly that comments were made on my habit of *modifying* these, usually with plasticene, rather than leaving them as their designers intended.

Apart from watching that Spitfire IX chasing a *Jabo* Fw 190 over the Boumemouth rooftops one memorable Sunday morning, seeing real aircraft close to was something of a problem until well after VE day, but it must have been in 1947 or '48 that I was taken to an Open Day of sorts at Beaulieu where my principal memory is of my first flight, in the back seat of an Auster; this faced sideways, and I remember a degree at least of discomfort.

Beaulieu was at the time the seat of the Airborne Forces establishment, and an early helicopter base, so there must have been Hoverflys of both Marks there, but I don't know (at this distance) whether my mental pictures of them are genuine or a form of 'Recovered Memory Syndrome'.

But in the 1950s it was possible to see aircraft in their natural habitat, at least on their perches, and I recall

clearly going to Hurn - where I later spent some time with Sea Hornets - for the start of the 'Daily Express'-sponsored South Coast air race in 1950.

What I don't know is how much this contact with real aircraft spread over in to my modelling in the days of my youth; but nowadays there's a positive, if not always direct, link for me between seeing metal and fettling plastic.

Between the late 1970s and early 1990s when there was a new Mark of aircraft or a new squadron marking to be seen at every other air display, there's no doubt in my, admittedly selective, memory that when I got my photos developed a few days after a show one of their functions was to give me a reference for the inevitable - thank goodness - Modeldecals set that would surely follow, at least from the 1977 Air Tattoo onwards. (Those listening to the ground movement talking-brick frequency that year finally asked me by mid-Friday not to broadcast, "Wouldn't that make a splendid decal sheet?", whenever an attractive colour scheme turned off the runway on arrival).



In the years that followed the regular formation, or conversion, of Tornado squadrons in particular, either bomber or fighter, gave instant novelty to the benefit of Kodak and, I hope, Dick Ward - (although I believe that the rumour that Dick was involved in the design of some of these markings is not necessarily accurate).

With the decline of fresh subjects to photograph, my attendance at displays gradually transferred from those featuring contemporary hardware to those reflecting the preservation scene, notably Warbirds, Duxford in particular became increasingly attractive, and I am lucky that both before and after my move of a few years back, I was within an hour and a half's drive of the Imperial War Museum's 'country branch'. And in the year following my retirement from 'the day job', the fulfilment of my long-held ambition to go to Oshkosh also enabled me to visit several museums in the Northern United States and

Southern California.

In spite of a familiarity with both Yeovilton and Hendon, I became seriously wide-eyed at Dayton and San Diego, and at Pensacola the following year.

The US Naval Aviation collection was an add-on to Sun'n'Fun, and on the same trip I found the Joy of Joy-Riding, notably in ancient aircraft. That particular trip included a twin Seabee and a Waco YMF, and I've been able to add a few since then in Australia and the US of A, where the wallet is somewhat less dented by all this fun; but the odd thing is, with the exception of the Mustang 'Strawboss 2', (thanks to an Eagle Strike decal sheet), I've not been really tempted to model something I've flown in.

Museums and static displays are of course very useful for photographing details, of cockpits if you're lucky and persuasive, but otherwise of such important little places as undercarriage bays or aerial fits, although there is always the risk that a

preserved aircraft, flying or static, may differ both in finish and equipment from the time when it was operational. I'm pleased to see this distinction carefully noted in Squadron/Signal's 'Walk Around' series.

Writing this I have gradually come to a conclusion that while the aircraft I see and photograph in museums sometimes read across fairly directly to my modelling, those at displays can have a rather more tenuous link. The picture I originally chose to illustrate, or at least accompany, this Tailpiece is that of an RAAF F-111C doing its 'dum and burn' act at Avalon earlier this year, and while it was very impressive it's not easy to reproduce that effect in a diorama, even though the sight and sound will stay in my memory for many years (and I did take care to get the appropriate decal sheet to go with the Hasegawa kit in my garage - just in case).

But the other is of an aircraft I DO want to model; the

No 76 Squadron Hawk 127 with the specially applied - and unfinished, there being no time to paint the striping under the wings - colour scheme for the display season.

I have the Italeri kit and the Mastercraft resin tail correction really close to the workbench, and all I need now is the decal sheet, which I was assured, by this amiable moustachioed English chap I met by chance at Avalon, is in the pipeline.

That nice Spencer Pollard of 'Military in Scale' wrote a piece a couple of years back on discovering the virtues of visiting air shows, not least to look at wear and tear on the subjects of your modelling. I think there's more to it than that. One of the drawbacks of our branch of the hobby is that the fruits of our labours don't actually do anything, and it's good when possible - and I know that I'm lucky to be able to visit quite a selection of these events - to see some of the objects of our labours in full flight.

There's no Mildenhall this year, so I'm spared the decision of whether the traffic queues are worth facing; and for the benefit of our Australian reader, getting in to Avalon was easy, but getting out following the *Son et Lumiere* reminded us forcibly of trying to leave the RIATs of my younger days. But I wouldn't have missed it for the world. For me the metal and the plastic are two sides of the same coin, if perhaps of differing and variable value. If I had to choose to give up one or the other, I'd probably go in to my traditional 'Management by procrastination' mode, until the decision was made for me!

Mike McEvoy



BACK ISSUES

AIRFIX magazine

The following is the list of SAM back issues currently available:

Vol 6 No 12	F-111	Vol 22 No 1	Israeli Air Force Pt 3
Vol 12 No 10	Equatorial Air Force	2	EE (BAC) Lightning
Vol 16 No 3	Raiders in Germany	3	MIG 25 Foxbat
4	SEAC Special	4	Rockwell S-1B Lancer
5	Anson T1-22	5	Aircraft of the B of B
6	He 111	6	Tokin Gulf Yacht Club
7	Reversal Lord Leao	7	RAF 2000 & 190
8	Mosquito bombers	8	MIG-23/27 Flogger
9	RF-4 Phantoms	9	B-26 over Japan
10	Valetta & Varsity	10	RAF AF 1918-1939
11	Water Bombers	11	Stumgruppe 1944
12	Fairey Barracuda	12	Bomber Destroyers
Vol 18 No 9	C-127 Super King Air	1	Reo 2000 Air Race
Vol 18 No 10	Police Air Support	2	Fairchild C-122 Provider
Vol 19 No 3	Australian Defence Forces	3	CH-46 Sea Knight
4	Albacore/Firebrand	4	Lockheed's second generation Dragon Lady
5	Tornado	5	First generation RAF Hawks
6	USAF at 50	6	North American F-86D
7	Bell AH-1 Cobra	7	F8K & F-95L sub-types
8	Bell P-39 Abaco	8	First Generation Export Hawks
9	DHC-4 Caribou	9	Aero L-39 Albatros family
10	C-130 Transports	10	Hamier GRS, 7 & T10 in RAF service
11	A-3 Skywarrior	11	International Festival of the Sea 2001
12	SE-5a	12	Morlin Engine Seafires
Vol 20 No 5	F-100 Mustang	1	2nd & 3rd Generation BAE Hawks
6	Airfix to Berlin	2	RAF Bostons in the Pacific
7	P-51B & C Mustang	3	Auro Vulcan
8	DH.104 Dove/Devon	4	Falklands Air War
9	Antonov An-2 Colt	5	BAC Sea Harrier
10	Boeing F4B/P-12	6	FRS.1 & P.2
11	Sukhoi Su-27 Family	7	The RAAF's Sub Hunters
12	Aero Lancaster	8	Westland Lynx - all variants
Vol 21 No 1	Military Boeing 707s	9	Focke Wulf Fw 190A
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The Mig 29 was always seen as the Cold War competitor to the F-15 and F-16, but since German reunification it now operates along side its old rivals.

The red, black and yellow livery shown here was chosen following an international competition run by 2nd Squadron of the 'General Steinhoff' Fighter Group.

The Mig 21 was the first Eastern Block jet to operate at Mach 2.

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04706 F-4F PHANTOM 'WILD HORSE' 1:32



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