

NIGHT FIGHTERS

This month, the Defiant, Bf 109 and Fw 190 modelled in 1:72 scale by Bryan Philpott

MOVING FORWARD in time to World War 2, we can find another day fighter that was pressed into service as a night fighter, but unlike the Camel this conversion features an aircraft that was not a success by any stretch of the imagination in its original designed role but by comparison had more luck in its nocturnal activities. This machine was the Boulton Paul Defiant.

With the benefit of hindsight it is easy to see that the Defiant was an anachronism that need never have happened. The practice of using a two-man crew in a single engine fighter, one to operate the guns, the other to fly the aircraft, proved successful in the early days of World War 1, but as progress was made even those early examples of aerial weapons had to give second place to the fast, manoeuvrable, single-seat scouts. It is odd therefore that as late as the 1930s the RAF was still pursuing the design of such a fighter.

The power-operated turret with its four-gun armament was to prove successful as defensive armament for bombers, but as an offensive weapon it was totally ineffective.

The Defiant was designed to Air Ministry

Specification F9/35 and can trace its ancestry back to the time Boulton Paul successfully married a power-operated turret to their Overstrand bomber. The use of a rudimentary turret on the Hawker Demon also influenced the Air Ministry who foresaw a devastating weapon in the two-seat fighter equipped with a power-operated turret.

The Defiant was similar in shape to the Hurricane, an asset that was to stand it well in its first encounter with the enemy, but it weighed over half a ton more than the Hawker fighter and its reduced wing area gave it a higher wing loading. The prototype, K8320, flew for the first time on August 11 1937 in the hands of Cecil Feather. Its 1,030 hp Merlin 1 engine gave it a top speed of over 300 mph which was more than comparable with contemporary single-seat fighters.

The second prototype flew in May 1939 and was powered with an updated Merlin 11; trials with both aircraft indicated that the basic design was sound, the only addition necessary being an increase in fin/rudder area, in which respect the pro-

totypes differed from the production versions.

A total of 87 Defiants were ordered in March 1937, these were to be powered by the Merlin 3 and the first of them flew on July 30 1939, being handed over to the AAEF in September the same year. By the end of 1939 over half of the initial batch had been constructed but by this time a further 363 has been ordered. One of the major problems associated with the first Defiants was caused by the Merlin 3 not having sufficient power. The wing area of 250 sq ft and the weight of 8,350 lb produced a wing loading of 30 lb per square foot and the 1,030 hp of the engine proved far from adequate. The technique required to fly the aircraft under simulated combat conditions resulted in the need for considerable concentration if the pilot was to stay out of trouble by confining his manoeuvres to those where a reduction in power would not cause too much embarrassment to him and his gunner.

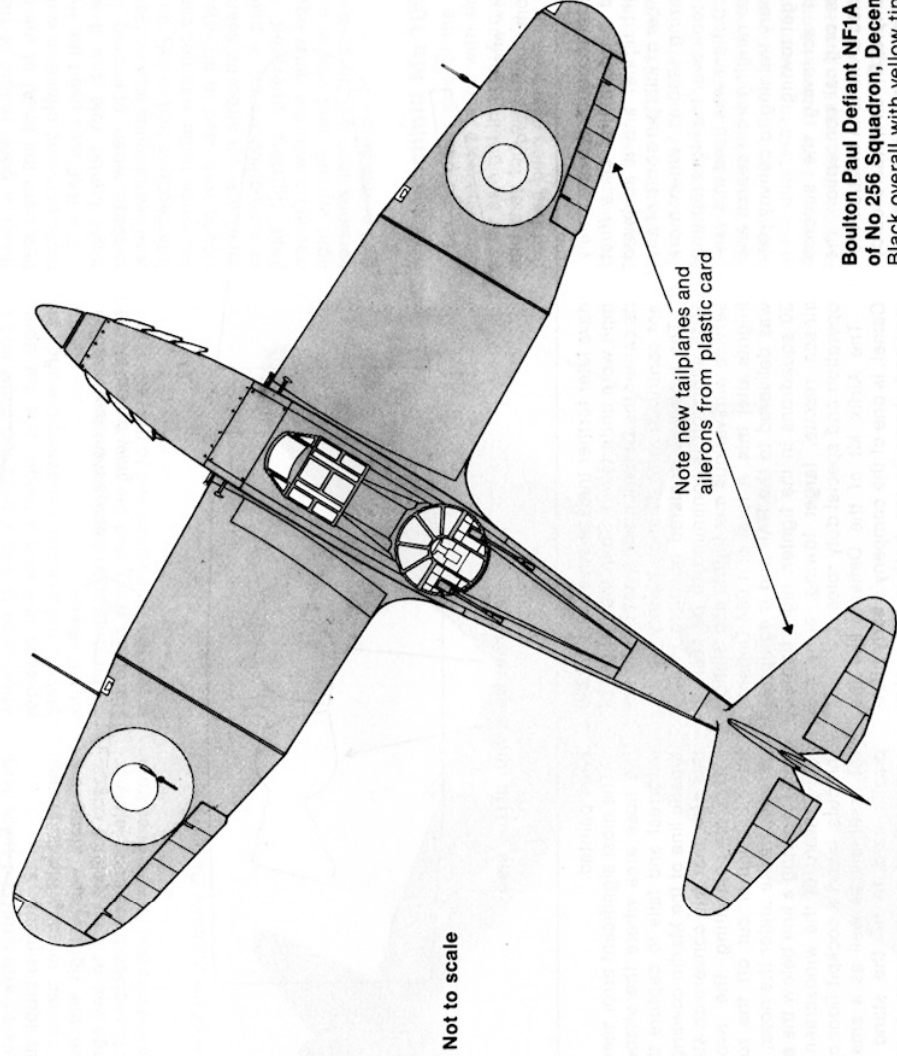
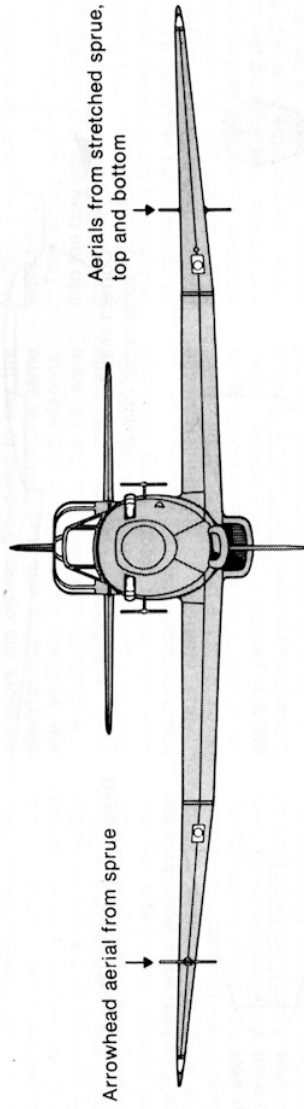
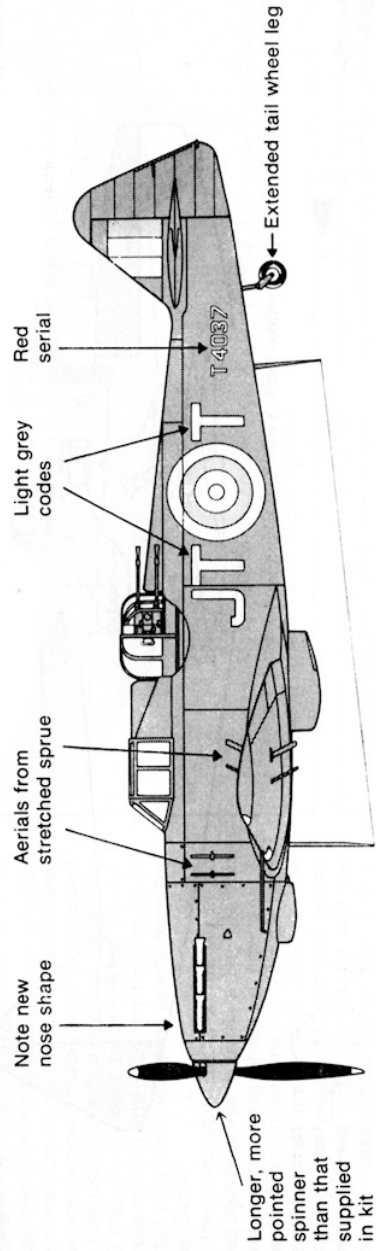
In December 1939 Defiants started to arrive at Martlesham to replace the Fairey Battles then being flown by No 264 (Madras Presidency) Squadron who had recently moved from Sutton Bridge. Trouble with engine failure and hydraulic systems led to a temporary grounding of the aircraft in January 1940, but this was lifted in February and the squadron was able to continue its working-up programme.

Dive bombing trials were carried out at Orfordness to test the aircraft's suitability for the ground attack role, but on February 15 1940 the Defiant embarked on a series of night flying tests that were eventually to lead to its successful role as a night fighter. No 2 Squadron became the second RAF unit to receive the Defiant but its intended use in army co-operation duties never materialised and the aircraft were withdrawn in August 1940.

One of the big problems encountered by pilots who flew the Defiant was the need to constantly think of his gunner's arc of fire, which was entirely opposite to the fighter pilot's philosophy of placing his aircraft with its forward-firing guns, behind his quarry. Despite initial operational success over Dunkirk, which led to a mistaken appraisal of the Defiant's ability, the aircraft was a complete failure as a day fighter and suffered very heavy losses in the Battle of Britain which led to its early withdrawal. The addition of AI radar plus the know-

Top of page Defiant 1 JT-T-74037 seen before her AI VI radar was fitted, one of the illustrations from Bill Gunston's new book *Night Fighters: A Development and combat history* (PSL, £4.50) (Christopher F. Foss). **Below** Author's model of the same aircraft as described here.



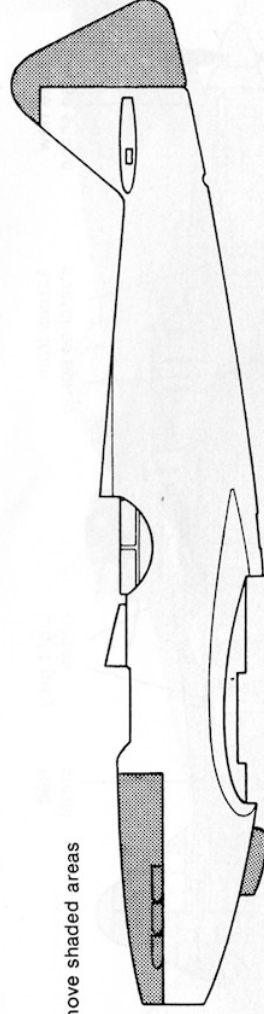


Boulton Paul Defiant NF1A
 of No 256 Squadron, December 1940
 Black overall with yellow tips
 to propeller blades

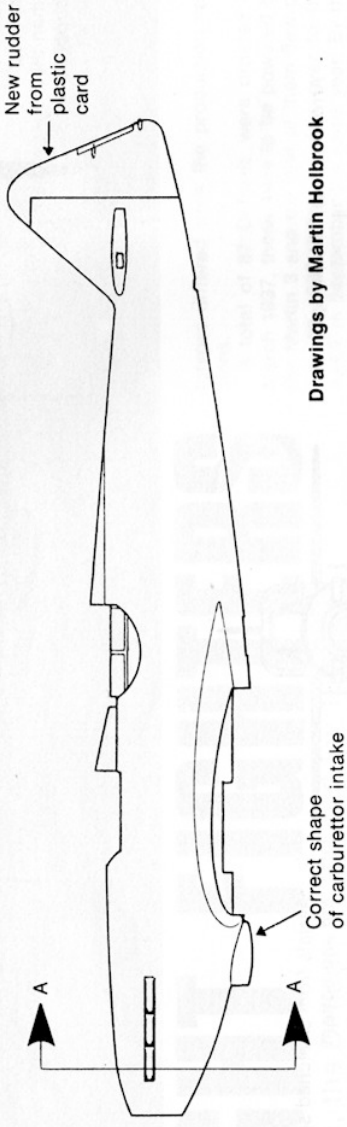
Defiant NF1

1:72 scale

Remove shaded areas



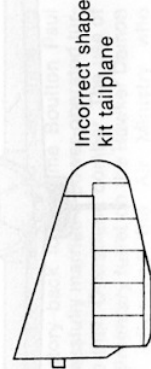
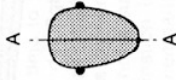
Move carburettor intake back 3 mm and reshape



New nose profile from balsa block (see text)

Exhausts from Airfix Spitfire kit

Drawings by Martin Holbrook

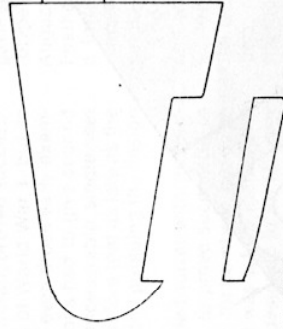


Incorrect shape kit tailplane

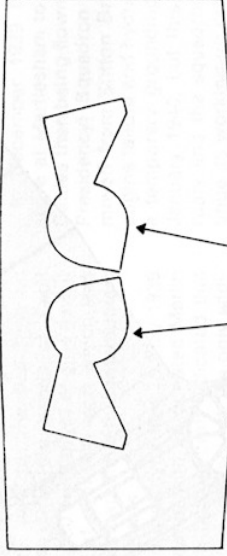
New tailplane from plastic card



Radar aerial from sprue on starboard wing



New ailerons from plastic card



Blank off wheel wells with plastic card

ledge that the aircraft could operate safely at night, turned it into a first class (first generation) night fighter and it achieved the highest number of kills per sortie of any night fighter during 1940-41. When more modern aircraft took over the night fighting role in 1942 the Defiant was used in a variety of other roles ranging from search and rescue, or gunnery training to convoy patrol duty and target towing.

Although not achieving the success hoped for in its original conception, the Defiant still earned a niche in aviation history for one example, DR 944, was used by Martin-Baker to carry out initial trials of their now famous ejector seat. On May 11 1945 the first successful dummy ejection was carried out from this aircraft and six

days later further trials at speeds up to 300 mph were undertaken. So in the twilight of its career the Defiant made a not insignificant contribution to aviation history.

The type was declared obsolete in July 1945 although it continued to be seen in service with various met flights and Station Flights after this. A total of 1,064 Defiants was delivered to the RAF and it equipped 30 squadrons in the fighter, night fighter, air-sea rescue, target towing, army co-operation and special duty roles.

The Airfix kit of the Defiant, like the Camel, is one of the company's early offerings and shows its age, both in the quality of the moulding and accuracy. The kit has been severely criticised in respect of the latter but it is not, in fact, as bad as it has

been painted.

The most significant error seems to be in the nose area where the shape is totally incorrect and fails to capture the characteristic line of the Merlin cowling, so it is in this area that this conversion starts.

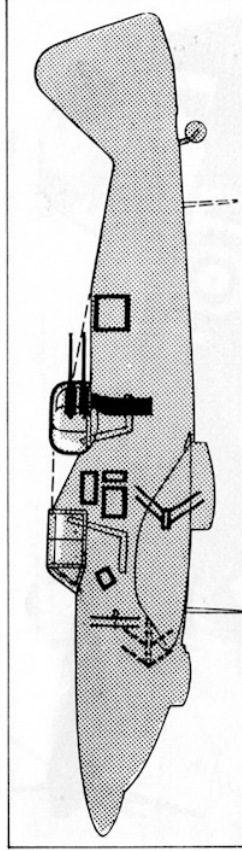
Before cementing the two fuselage halves together cut off the rudder, carburettor intake under the nose, and a section following a line below the exhausts to just forward of the windscreen. Clean up the cuts, insert a cockpit floor and the turret assembly as well as a small piece of plastic card to fill the stand slot, then cement the fuselage halves together.

A block of balsa is now cemented to the front fuselage and when this has set is carved to achieve the more rounded nose

and flattened top associated with the Defiant's top cowling. The rudder, which is moulded to the kit fuselage halves, is incorrect in shape, being too pointed at its base; this was removed during the first stage and is now replaced with a new one made from 30 thou plastic card sanded to the correct cross-section and with the ribbing simulated with stretched sprue as was done for the Camel.

The carburettor intake on the kit, which was also removed, is in the wrong position and is the wrong shape; a new one is carved from laminations of plastic card and cemented to the nose as shown on the drawings. Exhaust pipes on my model came from an Airfix Spitfire Vb with the fisttails modified but those from a Hurricane or scratch-built from plastic card will do just as well. The Spitfire kit also provided the spinner which is much more pointed and of greater diameter at its rear end than the assembly included in the original Defiant kit. The propeller blades were cut from plastic card and inserted into the cut-outs on the Spitfire spinner. Before leaving the fuselage, fill the hole under the centre section with a piece of 10 thou plastic card otherwise it will be possible to look right down through the cockpit and see daylight via the wheel wells. Apart from the ailerons the wings are accurate in shape and only need cleaning up around the trailing edges, the insertion of landing lights and walls to the wheel wells to make them acceptable. New ailerons are made from 30 thou plastic card and once again the ribbing is simulated with stretched sprue held in place with liquid cement.

Although correct in span the tailplanes do not have the right shape along the elevator hinge line or their trailing edges, so it is best to replace these completely or remove the elevators and fix new ones from



Diagrammatic representation showing the armament and AI VI radar installation in a Defiant 1A drawn by Art Bowbeer, one of the many such illustrations in Bill Gunston's new book on Night Fighters.

plastic card to the tailplane sections. Of the two methods the one I used was to completely replace the kit parts with plastic card components made from laminated 30 thou sanded to aerofoil section. I made these in two separate parts, the tailplanes forming one set of components and the elevators the others. Needless to say the elevator ribbing was produced in the same way as it was for the rudder and ailerons. The undercarriage doors in the kit were used as patterns for thinner ones made from 20 thou plastic card and the oleo legs were cleaned up before being cemented into their locations.

Final attention to the undercarriage assembly is the provision of larger diameter wheels to replace those in the kit which are also far too thin. The wheels I used came from my spares box and are 9 mm in diameter and just over 3 mm thick. The tail wheel oleo is also a trifle too short and I replaced this with a longer one cut from Slater's rod to which I attached the original kit tail wheel.

The twin arrowhead radar aerial on the starboard wing, and the two H aeriels just below the windscreen and to the rear of the

exhausts, were made from stretched sprue and cemented into position, while the two blade aeriels above and below the port wing were cut from 10 thou plastic card and cemented into position after the roundel was placed. The model was painted matt black and markings for a machine of No 256 Squadron, as supplied in the kit, were used.

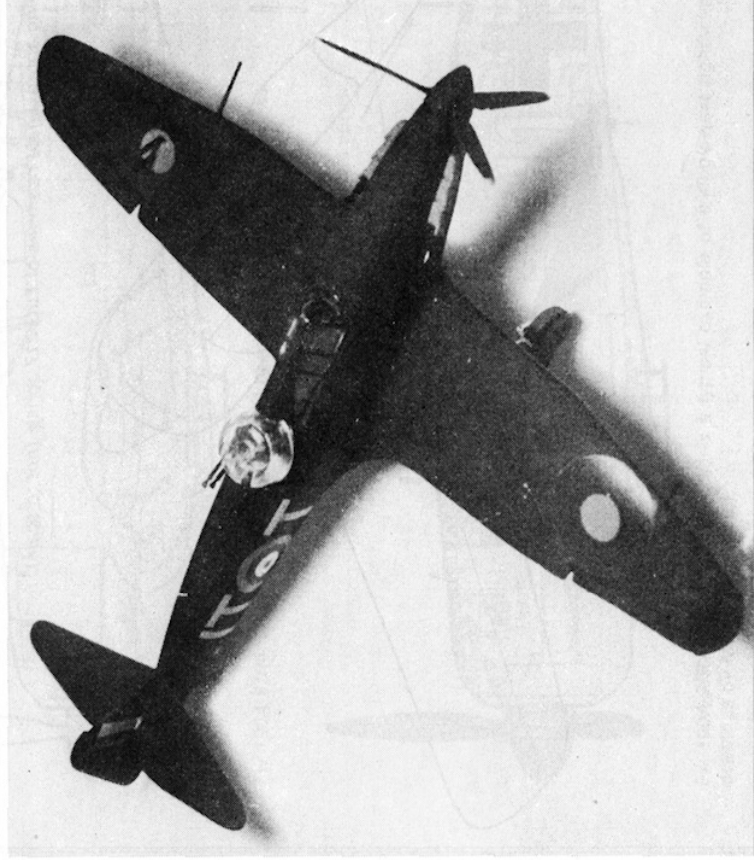
The fairing behind the turret retracted into the fuselage top decking to enable the guns to be traversed and it is not too difficult to make the aircraft in this condition by removing the moulded fairing from the kit fuselage and replacing it in the lowered position. This certainly changes the outline of the Defiant and the keen night fighter modeller might well be tempted to make two models; one showing the aircraft in its 'clean' state and the other with the decking retracted. Whichever is chosen, if care is taken, a good model of the night fighter that bore the brunt of the early Luftwaffe night bombing offensive will result.

The RAF also used the Hurricane in the night fighter role and it achieved some success when operating in conjunction with searchlights and on clear nights, as all interceptions had to rely on the pilot's vision since radar was not carried. The Hurricane was used in an interesting experiment with an airborne searchlight carried in a modified Havoc. A pair of the single seat fighters operated in close cooperation with the radar-equipped searchlight aircraft, and this is one of the versions that will be covered in the next part of this series.

Messerschmitt Me 109G-6

On the other side of the North Sea the Germans were faced with similar problems as far as night interception was concerned and they too pressed into service aircraft that had been designed for the day fighter role.

To combat the increasing activity of RAF Bomber Command, the Luftwaffe was forced to take a very serious look at the provision of an effective night fighter force. This had been somewhat neglected in the early days of World War 2 as the thought that Bomber Command could carry out effective raids over the German homeland, had not been given serious consideration in the quarters that mattered. As the threat developed the pattern of night fighting followed similar lines to those experienced by the RAF. The Bf 110 was developed into a most deadly night fighter and shared its vital role with various sub-types of the ubiquitous Ju 88 as well as other types specifically designed as night fighters. But in the early days, and indeed later in the war, the



Another view of the author's Defiant model.