

# FROG PENGUIN CERTIFICATE

## THE BACKGROUND TO THIS KIT:

Some twenty years ago I purchased a box of odds and ends of kits and models. To my amazement and delight I found amongst the items a very warped Frog Penguin Battle and badly battered Hawker Demon. I was instantly transferred back to my childhood and the excitement those glorious Silver and Green Penguin Boxes used to evoke. I decided there and then to try to obtain a complete collection of all the Penguins and restore them as best as I could to their former pristine glory. Since then, with the aid of two dedicated fellow enthusiasts I have chased this dream. Earlier this year I had a visit from Mr. Richard Lines of the Lines Family, who introduced the whole concept of Injection Moulded kits to the Model World, and changed it for evermore. Having enthused over the, by now, almost completed collection of Penguins, Mr. Lines went on to admire our kit for the Grebe. Suddenly he turned to me and asked if it would be possible to reproduce a Penguin kit using one of the original kits as a Master. With this marvellous and generous suggestion was born the Penguin Replicas of the Hart and Hind. I think that I can say in all honesty that even today they would not look out of place in any collection of contemporary kits. On some of the items we have "cheated" and cast them in White Metal, but apart from this you have now in front of you a kit identical to that produced some FIFTY YEARS AGO! It makes one think, does it not? One point: in those glorious far off days before the advent of the pernicious reviewer to pick up every little error; it was the habit of Messrs Lines Bros. to choose some half-dozen current RAF serial numbers and distribute ~~them amongst their kits!~~ This is why both the Hart and Hind share the same serial number! We decided to produce the kits "warts and all" so please don't point out this "Error" to us.

It has been suggested to us that for such "Collectors" items as these kits, we could easily charge twice our normal prices. This was never the point of the exercise. Our prices have always been competitive and on the low side. Indeed we have campaigned against the "Silly Prices" some firms have now seen fit to charge, six or seven pounds for a simple injection kit, and up to ten pounds for a couple of sheets of vac-forms that can be produced at a rate of 30 sheets an hour and for the cost of pence. In this case especially, we wanted to share our love for a very fine range of kits with fellow modellers and enthusiasts. In conclusion I would like to thank Richard Lines for his kindness and generosity in letting us produce these replicas, and a heart-felt "Thank you" to all the Lines Family for starting something that has given so much pleasure to so many.

The Registered Trade Mark FROG is reproduced by agreement with the proprietors of Hornby Hobbies Ltd. These kits are produced entirely by Merlin Models and there is no connection with Hornby Hobbies.

NOTE! We are still trying to complete the collection of Penguins. If anyone out there has (and would be prepared to part with), we badly need a Penguin Fury, Scimitar, Monespar, Dianah, Osprey, Envoy and Sectioned Empire Flying Boat. We would pay a more than generous price for any of these, whether in kit form, made up, or even in warped bits and pieces! Dare we mention it, we might even part with a beautifully restored Penguin SINGAPORE in exchange for some of them!

**Hawker Hart No: 0335**



The

# FROG



# 'Penguin' Series

MINIATURE NON-FLYING SCALE MODEL AEROPLANES

## THE HAWKER "HART" Mk. II.

Two-seat Fighting-Bomber Biplane.

(535 h.p. Rolls Royce "Kestrel" 11B 12-cyl. water-cooled vee engine).

When, in 1929, the Hart was put into production for the Royal Air Force, it set a unique standard which it has maintained against all comers ever since. It is safe to say that no other single aeroplane has been flown for so long and in such large quantities by the Royal Air Force before; nor any which has been used for such a complicated variety of purposes. There is nothing outwardly remarkable about the machine; but it represents the high-water mark of biplane design. One of its most outstanding features is the ease with which it can be built, the manufacturing method having been likened to the principle made famous by "Meccano" toys—in fact, all the separate parts fit together in the same way. It is built up on a "basic girder" structure—that is to say, a rigid framework bearing little or no resemblance to the final shape of the machine but to which is attached a light wooden framework, covered with fabric, forming the actual surfaces. The fabric covering is so arranged as to be easily removed in sections, and the main structure thereby exposed, so that repairs in the field may be carried out with a minimum of trouble. It is possible, for example, completely to rebuild a Hart fuselage on a Service aerodrome if the necessary material is available—the only tool required being a spanner.

The chief beauty of the Hart, however, is its adaptability. During the nine years it has been in commission no less than seven different varieties of Hart have been developed, each for entirely separate and distinct purposes and each valuably fulfilled its particular function that even to-day there appears little likelihood of their being replaced. The different types range from the standard Hart Day Bomber through Army Co-operation machines, trainers, fighters and reconnaissance types to Fleet Air Arm deck-fighters and twin-float seaplanes. The basic structure of all these machines is nearly identical; but each is fitted with the special equipment required for its job and nearly all of them have different engines.

The policy adopted by many foreign Powers of equipping their Air Services with the best available aeroplanes used by the Royal Air Force naturally resulted in hundreds of the various Hart types being sold abroad; and they have long formed the essential part of the aerial armament of Sweden, Estonia, Yugoslavia, Japan, Greece, Portugal, Iraq and Egypt—quite apart of course, from the British Dominion Air Forces. And many of these countries have laid out factories for the purpose of building Harts under licence, generally fitting them with any engine which takes their fancy.

Well known variants of the Hart are the Hind, Demon, Osprey (seaplane and deck-fighter), Hind Trainer, Audax, Hardy and Hartebeeste; and models of the first four are obtainable in the "Penguin" range in addition to the Hart itself.

### INSTRUCTIONS FOR ASSEMBLY.

First carefully study the photograph on the box lid and the General Arrangement Drawings, checking over the various items until you are sure of where each part goes.

It may then be necessary to "clean-up" these parts with a penknife or sandpaper until their shape exactly conforms with the drawings. This is because, in manufacture, occasionally "flash" and roughness at the corners are liable to occur.

1. **The Fuselage.** The two halves of this are first firmly cemented together, care being taken to see that they register exactly with each other. When absolutely dry the seams may be cleaned up with sandpaper or a file; taking particular care over the large recess in the deck. The cockpit-block may then be cemented in place and cleaned up when dry, any cracks being filled with cement.

2. **The Main Planes.** The only "re-touching" these will require may be a little sanding of the trailing edges in order that they may present a perfect "knife-edge" all the way along, but as little as possible should be done as the rib markings will be obliterated.

The lower plane is now cemented firmly into the opening

hand) and a centre-section, or centre-plane. Thus a biplane, such as the Hind, has, as its designation implies, two planes. There are four wings and one centre-section, the place of the lower centre-section being filled by the fuselage. A monoplane has one plane, comprising two wings; a triplane three planes with a total of six wings, and so on.

Incidentally, the word aeroplane is derived from two Greek words, *aeros* and *planos* (*aeros* and *planos* which together mean "a wanderer in the air." The word plane is the Latin one for a flat surface and implies the level surfaces presented by the aerofoils. Mono, bi and tri, are, of course, the Greek words for one, two and three.)

3. **The Tail Surfaces.** The tailplane is supported at two points—at the rectangular "cutaway" in its leading edge which fits round the "step" in the tail-end of the fuselage; and on top of the projection at the extreme rear called the stern-post. It is thus nearly parallel to the line of flight and has a triangular gap beneath it. This is to permit the trailing-edge of the tailplane on the full-size model, to be moved up and down by the pilot in order to compensate for variations in load.



be moved up and down by the pilot in order to compensate for variations in load.

Cement the tailplane at these points, squaring it up to the fuselage in plan by holding the model over the drawing. The rudder is then cemented in place, taking care to see that it lies on the centre-line of the fuselage in plan. Finally the four tailplane-struts are cemented in exactly the position shown on the drawings.

4. The Undercarriage. The two undercarriage vees are fitted as shown in the sketch; but it may be necessary to clip off a small piece of the spigots on the rear legs so that they will go right into the holes in the lower centre-section. While the cement is drying the two "vees" must be "played out" to their correct angle against the front view drawing.

The steel wire axle is next passed through the holes in the splices of the "vees" and very carefully cemented in place over the front view drawing—that is, leaving the correct amount projecting each side and seeing that the whole undercarriage is perfectly "square" to the machine. Then the wheels are slipped on and held there by a "blob" of cement on the ends of the wire just sufficiently far away to allow the wheels to revolve.

The disc forming the "nose" of the fuselage is circular; just a fraction larger than the airscrew spinner; and quite flat.

5. This aeroplane is moulded in the correct yellow colour adopted by all Service trainers in the Royal Air Force. The only part that it is necessary to paint is, therefore, the engine cowling—that is, the "nose" of the fuselage from the "plating line" which is moulded just behind the rear centre-section struts up to the airscrew. All this, including the radiator should be painted silver.

NOTE: To obtain a really good finish, the first coat when thoroughly dry, may be sandpapered all over with 00 Grade sand paper and this process may be repeated over three or four coats if very great care be taken.

6. Transfers. The transfers of the Identification discs and Service numbers may next be placed for a minute or so in a saucer of clean water. Lift them out and slide them straight off the paper containing them approximately into their positions on the aeroplane. They will take about twenty minutes to dry but, during this time may be moved about with a finger to get them in their exact position.

7. Airscrew, etc. A hole must now be pierced in the precise centre of the circular disc forming the "nose" of the fuselage. The airscrew is then threaded on to the pin provided for it and the latter cemented into its hole sufficiently far just to allow the airscrew to revolve.

The "trumpet" exhaust pipes are cemented in the grooves provided on each side of the cowling, with the "trumpets" sloping forward.

The pilot's seat is then made up, painted and cemented to its balsawood block which in turn is cemented to the floor of the fuselage.

The instrument board is painted, cut out and cemented to the front edge of the pilot's cockpit.

Finally, details should be touched-up with Indian ink or black paint—the front and rear faces of the radiator, for example, should be black, as should the wheel-tyres, exhaust ports, engine louvres, tail wheel, outlines of the foot-steps, machine-gun cartridge shutters, etc. These and other details can be obtained from the drawings.

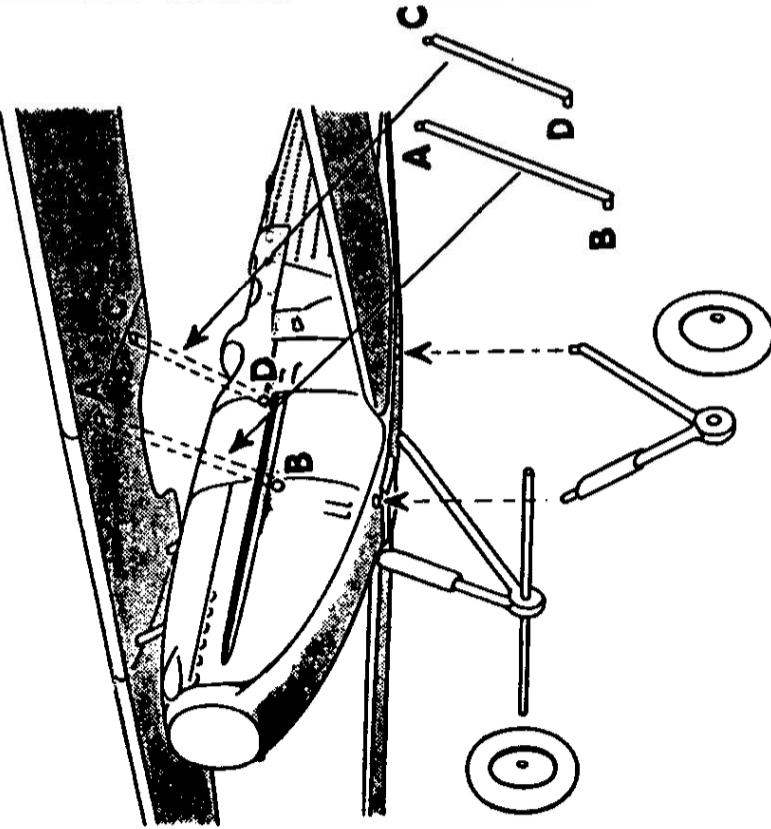
way wrong, but as little as possible should be done, or the rib markings will be obliterated.

The lower plane is now cemented firmly into the opening cut for it in the base of the fuselage. During this operation careful checks on the drawing should be made to see that the plane is "square" to the fuselage both in plan and when viewed from the front or rear. This latter is most important.

The two "N" interplane struts are next fitted to their sockets on top of the lower plane. Note that the upper extremities of these struts are further apart than the lower; otherwise port and starboard are identical. Cement them well home in the wing sockets and, while drying, adjust to the approximate outward rake over the drawing. Also check that, when viewed from the end of the plane, both sets of struts slope forward the same amount.

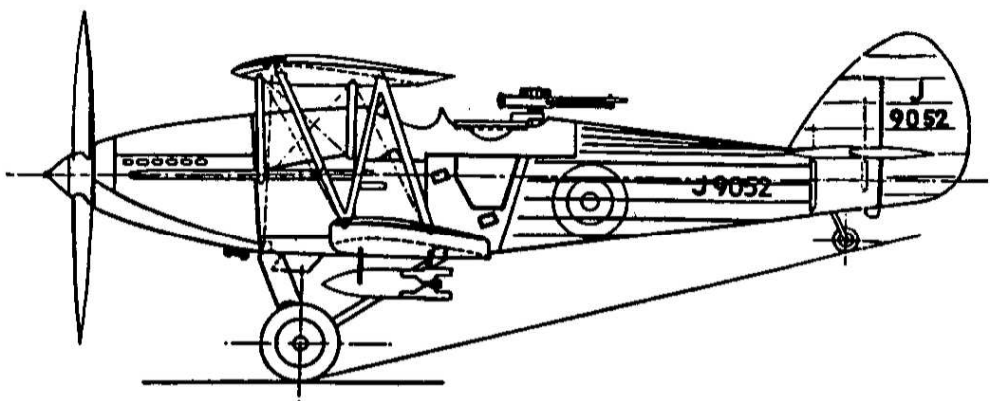
When the lower sockets are quite dry the upper plane should be laid upside-down on the table, the rest of the model, also upside-down, lowered on to it and the upper ends of the struts cemented into their sockets, the whole being held firmly in position until dry. But at the same time, the upper plane must be squared up with the fuselage in plan and care taken to see that it is parallel to the lower plane—i.e., has the same angle of incidence—when viewed from the end.

Finally, the four centre-section struts are fitted, their position and arrangement being clear from the drawings.

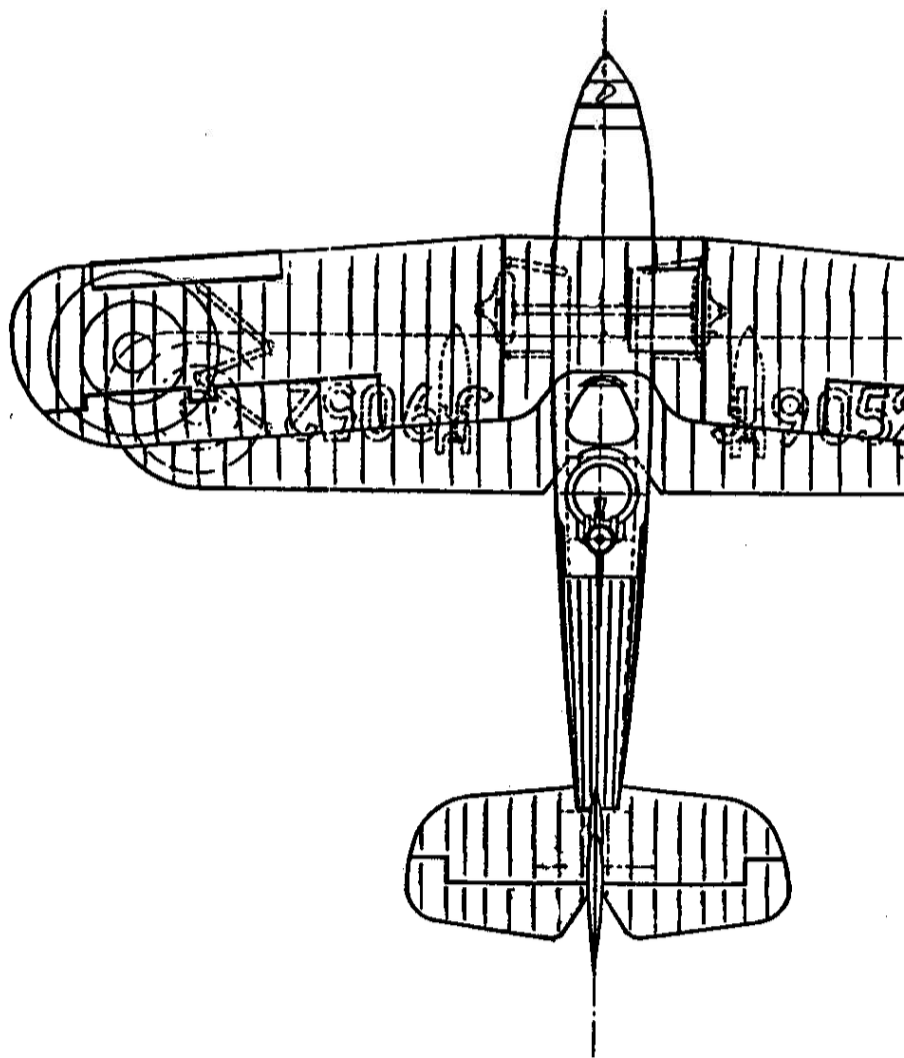


How to fit the Centre Section Struts and Undercarriage.

[N.B. Many people unconnected with aviation often wrongly refer to an aeroplane as a "plane," just as landmen frequently call a ship a "boat," and this leads to confusion when enumerating components. The supporting surfaces of an aeroplane are correctly called "planes," each of which is usually divided into two wings (right- and left-



**SIDE ELEVATION.**



**PLAN.**

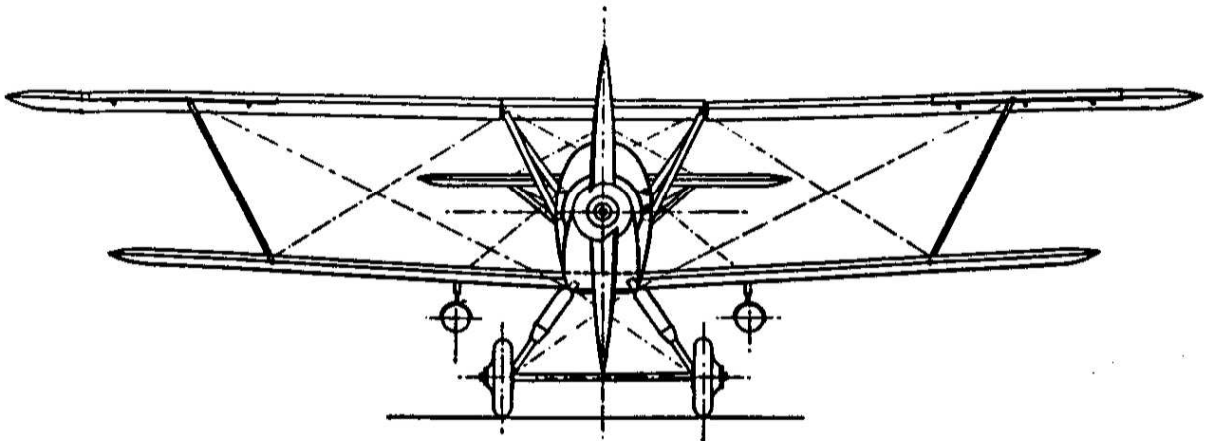
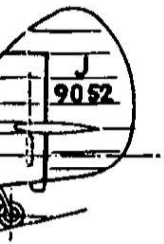
Viewed from above.

THE  
**FROG**  
 SOLID SCALE MODEL  
 OF THE  
**Hawker 'Hart' Mk. II**

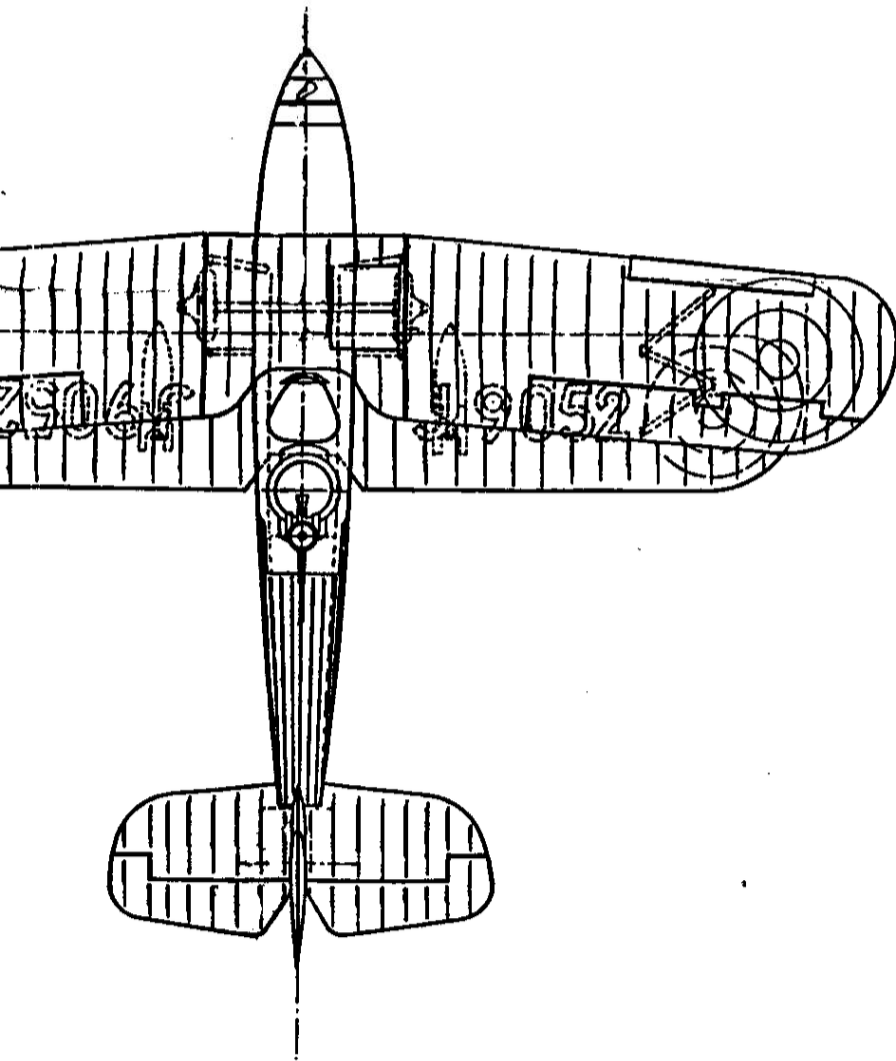
2-seat day bomber biplane  
 (525-h.p. Rolls-Royce "Kestrel" II B 12-cyl.  
 water-cooled vee engine).

Reproduced on a scale of 72:1 (6ft. to the  
 inch) from drawings supplied by Hawker  
 Aircraft, Ltd., Kingston-on-Thames, Surrey.

Designed and made by  
**INTERNATIONAL MODEL AIRCRAFT LTD.**  
 MERTON, SURREY.



**FRONT ELEVATION.**



**PLAN.**

Viewed from above.

**Specification of the full size  
aeroplane.**

Span	-	-	-	-	37ft. 4½in.
Length o/a	-	-	-	-	29ft. 4in.
Height	-	-	-	-	10ft. 4in.
Area	-	-	-	-	350 sq. ft.
Weight, empty	-	-	-	-	2,530 lbs.
Weight, loaded	-	-	-	-	4,554 lbs.
Bomb load	-	-	-	-	342 lbs.
Fuel	-	-	-	-	693 lbs.
Speed at 3,280 ft.	-	-	-	-	184 m.p.h.
Speed at 10,000 ft.	-	-	-	-	172 m.p.h.
Climb to 13,000 ft.	-	-	-	-	12-6 mins.
Service ceiling	-	-	-	-	21,300 ft.
Landing Speed	-	-	-	-	61 m.p.h.
Range at cruising speed at 3,000 ft.	-	-	-	-	455 miles