Aircraft In Miniature Limited

Rug Rat Resins

1:72 Resin Kit of the

de Havilland DH 84 Dragon 1 & 2

History, Notes and Instructions

History

The success of the Fox Moth air services prompted Edward Hillman to ask de Havilland for a twin-engined version with which to operate his Paris service. The resulting DH84 Dragon was a 6-8 seat aircraft powered by two Gypsy Major engines. It used the Moth outer wings, slightly modified, and first flew on 24 November 1932. Mr Hillman operated six aircraft of this type. Over the next three years, 115 aircraft were sold in all parts of the world, and the Dragon 2 was introduced form constructors number 63 onwards. This variant had faired in undercarriage struts and individually framed windows. Among the users of this variant were Railway Air Services, who operated 9 of the type.

Two examples, G-ACCV 'Seafarer'* and G-ACMJ 'Seafarer II' were used by Jim and Amy Mollison in attempts on the world distance records with limited success. Other operators included Aberdeen Airways Ltd., African Air Transport Ltd., Canadian Airways Ltd., Iraq Petroleum Transport Co Ltd., Jersey Airways *, Highland Airways Ltd., Indian Airways Ltd., Midland & Scottish Air Ferries, Northern & Scottish Airways Ltd., Petroleum Transport Ltd., Rhodesia And Nyasaland Airways * and Wilson Airways Ltd. The Prince of Wales used G-ACGG as a royal transport.

Military operators were the Danish Army Air Force, Eirann Army Air Corp., Iraqi Air Force (fitted with guns and an extended dorsal fin), Portuguese Air Force, Southern Rhodesia Staff Corp. Air Unit/Southern Rhodesian Air Force and the Turkish Air Force. A further 87 aircraft were built by de Havilland Australia. These aircraft were all used initially by the RAAF and were essentially similar to the Dragon Is, but had enlarged side windows and the top of the cockpit was solid, not glazed.

Known surviving aircraft at the time that this kit was researched are listed below (this list will obviously change with time):

Australia
VH-BDS, ex-RAAF A34-92, currently airworthy.

Ireland
EI-ABI 'Iolar', operated by Aer Lingus, currently airworthy.

New Zealand
ZK-AXI, East Coast Airways.

United Kingdom
G-ACET, Russavia Collection, for restoration.
G-ACIT, Science Museum, Wroughton.
VH-SNB, ex-VH-ASK, ex-RRAF A34-13, East Fortune Museum,

USA
N34BH, ex-G-ADDI, currently airworthy.

Introduction

The Rug Rat Resins kit of the Dragon is cast in urethane resin using one- and two-piece moulds. Because of the limitations of the moulding techniques, there may be a few small air bubbles in the components, but these can be filled using any of the proprietary fillers (Green Stuff, Milliput, etc.). Another deficiency of resin is that the moulds eventually show some pitting, which may need some skim-filling here and there. This 'pitting' is not a symptom of extraneous bubbles in the resin; it is caused by pimples appearing in the mould, sometimes very early in the life of that mould. We normally only produce 40 sets from each mould.

Resin parts can be shaped with a scalpel fitted with a stout blade, or a modelling knife, and can be cut with a razor saw. It is glued using superglue (cyanoacrylate) or 5 minute epoxy. We favour the use of superglue, but be warned: if your mating surfaces are well prepared, the superglue bond will be immediate and permanent. Any attempt to reposition the parts may result in breakage. Resin is a relatively brittle material and rough treatment of thin components will lead to breakage. Resin can be filed, sanded, wet-and-dried, and polished, just like polystyrene, but remember that the dust is an irritant (similar to sawdust). Wear a mask, or sand it wet. For filling, we generally recommend Milliput, because it sets thoroughly, even in thick layers. The down-side is that it takes about 3 hours to cure. Green stuff and similar fillers that rely on evaporation are only suitable for 'skimming' and minor filling operations that need to be sanded with a minimum of delay.

Before starting assembly, wash the resin parts in warm soapy water or a good benign solvent such as isopropanol. This will remove the mould release agent from the parts. Do not use hot water because the parts may soften and distort. You can turn this to advantage however, because if you have a warped component, or want to 'tweak' something, you can heat up the component with hot water or a fan heater and gently adjust it. When it cools it will keep its modified shape. If you are unhappy with any of the parts, send them back to us for free replacement.

In addition to the resin parts, the kit also contains cast metal parts and vacuum-formed transparencies. Use superglue for the cast metal, and read the detailed instructions for advice on gluing the transparencies.

The kit contains parts and markings for the Dragon 1 and 2. The differences between the two were minor, but the most obvious difference is the more refined window framing of the Dragon 2, (provided on the decal sheet), slightly different wheel spat shape and louvers on the engines of the Dragon 1. A unique feature of the decals is the provision of the windscreen and window frames. These can be used with any Dragon with a silver fuselage. There are complete sets of markings for aircraft of Jersey Airways, RANA and Seafarer.

Parts List

Cast Metal

Tailwheel
Propellers (2)
Exhausts (2)
Control column

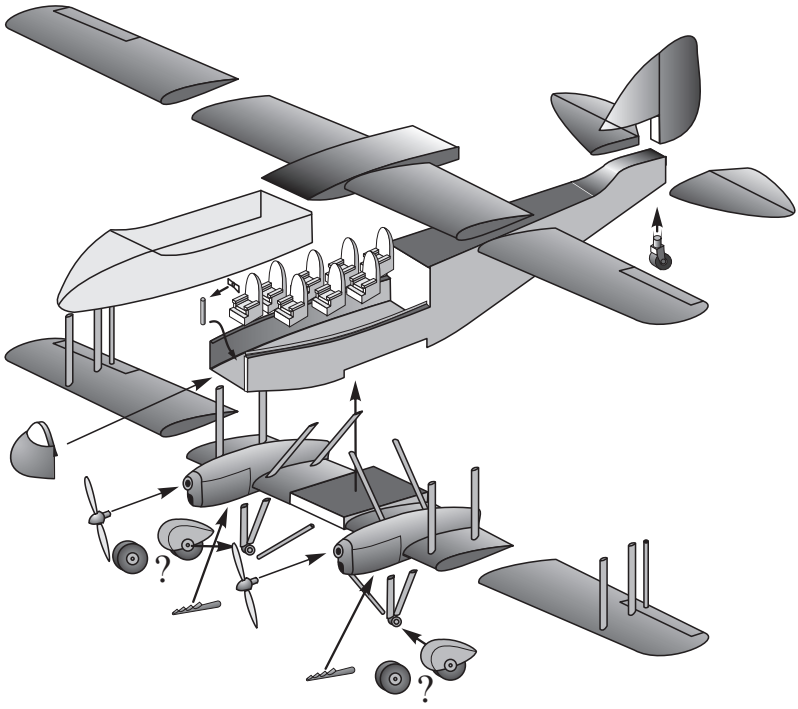
Inner interplane struts (8)
Undercarriage V struts (2)
Undercarriage struts (fuselage to wheels) (2)
Venturi
Generator
Aileron tie rods (2)
Nose cone/instrument panel
Pilot/Cabin seats
Wheels with spats (2)

Resin

Fuselage
Fin
Tailplane halves (2)
Upper wings (2)
Lower Wings (2)
Upper centre section
Lower centre section

Other

Vacform canopy (2)
Decals
Instructions



1. Preparation

Wash all the resin parts in warm, soapy water or isopropanol, then remove the excess resin with a craft knife or razor saw. Sand the rough edge to a flat surface and use the line that marks the border between the resin part and the 'flash' as a guide. We find that a sanding block with medium wet-and-dry paper is ideal. As resin sands very easily, be careful not off take off too much material!

The vacuum formed canopy can be cut from its surround with a stout blade, alternatively use un-serrated scissors.

2. Assembly

Step 1 - Glue the cabin seats in position. Add the pilot's seat and control wheel. There are some prominent internal struts shown on the drawing (not provided in the kit), which you can make from stretched sprue and add if desired. There should be a bulkhead behind the pilot's seat, with cut-outs for the pilot's access. Paint the interior to your choice. Paint the instrument panel to the base colour. DH aircraft were frequently black, silver, or light grey.

Step 2 - Trim the canopy so that it fits precisely against the ledges provided. We recommend that the canopy is glued using 5-minute epoxy. The canopy will take a lot of abuse, white glue is not strong enough, and superglue will cloud it. Place a bead of 5-minute epoxy around the front and rear bulkheads, and on the sills, using a piece of stretched sprue. Watch out for 'stringing'. Glue the canopy in position, ensuring that you have good continuity of fuselage lines.

Step 3 - When the canopy has set, glue the upper and lower wing centre-sections to the fuselage. Trim the underside of the upper centre-section where the wings will join onto the top of the clear transparency. Make sure that there is a good flush joint. This will minimise the filing later. It is easier to get the joints straight at this stage.

Step 4 - Carefully fill the joint around the transparency/resin intersection with Milliput. Work it into the joint with a wet finger. Make sure that you remove the Milliput from the areas which will be windows. This is easily done when the Milliput is still uncured. When the Milliput is dry, lightly sand, if necessary. When sanding the joints, make sure that you do not scratch the areas of canopies that will form the windows. You cannot polish vacform canopies. Note that the window decals will cover part of the joint.

Step 5 - At this stage, we recommend spraying the model with a mid-grey acrylic paint to show up any imperfections in the filler. Spray the whole model, including the transparency. This paint can be removed later by using isopropanol.

Step 6 - Trim and glue into position the struts that run from the engines to the fuselage and the interplane struts that join the outer ends of the centre-sections. Struts are provided, but can be replaced with other material if required. The details are:

LOCATION	LENGTH	QUANTITY
Interplane	20 mm	8
Aileron tie rods	20 mm	2
Fuselage to engine	16 mm	4
Fuselage to wheel	19 mm	2

Step 7 - Glue the wing outer panels (upper and lower) to the centre-sections, making sure that dihedral and sweepback are correct. If necessary, trim the joining faces. Do this by placing the model over the drawing, then check it 'by eye'. The sweepback of the upper and lower wings must be the same and if one wing is slightly out of alignment it will look very obvious on the finished model.

Step 8 - Fill any remaining joints between the components with Milliput, and sand to shape. Make sure that the filled surfaces are really to your satisfaction, because the expanse of silver will show up every defect in the surface.

Step 9 - Glue the tailplane halves and fin to the rear fuselage.

Step 10 - Add the remaining interplane struts and aileron tie rods to the outer wings. Check whether the example you are modelling had the strut-mounted generator. Fill the strut-to-wing joints as necessary.

Step 11 - Add the undercarriage parts; wheels, V-struts and side braces. Note that the spat shape and undercarriage legs of the Dragon 1 and 2 were slightly different. Modify the shape of the spats with a file to suit the variant you are modelling. The spats provided are for the Dragon 2. Bare wheels are also provided, as many aircraft were operated without the spats.

Step 12 - After rectifying any deficiencies in the surface, remove the primer and apply the chosen paint scheme. Mask the transparency. The cockpit canopy can be masked completely and the canopy frames provided as decals can be used after the masking is removed. Note that the Dragon 2 was usually fitted with an extra window. The design of the model makes it difficult to have a transparency at that position on the model and we recommend that you paint the area where the window will be dark grey before applying the decal.

After painting the model and applying the decals, attach the propellers, tailwheel and exhaust. Rig the model using the drawing as a reference. We suggest that you use stretched sprue attached with superglue.

Finishing and Decorating the Model

Varnish the transparency first because decals do not stick well to unpainted plastic, then mask the cockpit transparency and cabin windows.
Paint the aircraft overall. The three options give very different markings as follows:
SEAFARER - was gloss black overall, with silver cockpit window frames and no cabin windows.
JERSEY AIRWAYS LTD - was a Dragon 1, with aluminium dope overall and the shorter cabin windows.
RANA (Rhodesia And Nyasaland Airways) - was a Dragon 2, with an extra window. The fuselage was a sky blue below the waist line, otherwise it was aluminium dope overall.
When the paint is thoroughly dry, remove the masking and touch up any areas as necessary.
Apply the window frame decals - CAUTION - THEY ARE VERY DELICATE AND SHOULD BE APPLIED USING A PAINT BRUSH AS DESCRIBED BELOW:
Cut each decal from the sheet and soak it in warm water until it is released from the backing sheet. While the decal is soaking, apply a coat of Johnsons Klear to the area where the decal will go. When the decal has released, slide it on to the transparency and put it into position with a paint brush. Dry the bristles of the brush and then absorb the surplus liquid into the bristles of the brush.
Let the first decal dry, then do the same procedure for each of the other window decals.
Let all the window decals dry thoroughly, then apply all the colour scheme decals.
Finally paint any exposed areas of transparency and blend it into the overall paint finish.

References:
DeHavilland Aircraft Since 1909, A J Jackson, Putnams
De Havilland - thre golden years 1919 - 1939, R J Riding, IPC Transport Press (Flight)
Wingspan, June 1994.

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