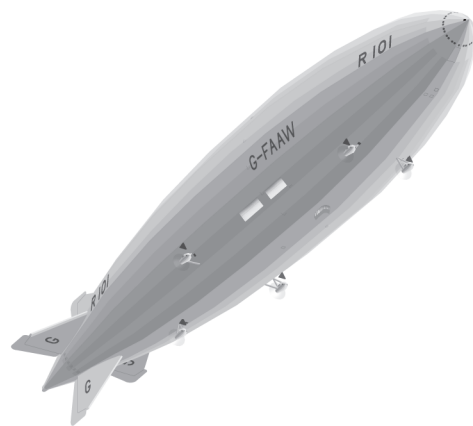


Assembly Instructions for R101

History of the R101

The government of Great Britain in the early 1920s began plans for an international travel service known as the Imperial Airship Scheme. Aeroplanes of the time were considered unsuitable for travelling long distances, and it was felt that a fleet of passenger-carrying airships would be an ideal way to connect more closely the vast British Empire. Originally it was proposed the airships be built by a subsidiary of the Vickers company, but in 1924 the new Air Minister, Lord Christopher Thomson, decided to initiate a government-owned airship company. The result was the simultaneous construction of two rival airships, the Vickers Airship Guarantee Company R100 and the government's Royal Airship Works R101.



R101's creators faced formidable challenges, the ship being twice the size of anything that had been previously built. The design team, supervised by Lt.Col. Vincent Richmond, developed a large number of innovative and advanced features, such as electric servo-motors for the control surfaces and automatic gasbag venting valves. R101 was constructed of a framework of steel rings and longitudinal girders. Lift was provided by huge balloon-like cells filled with hydrogen gas, and the entire structure was covered with doped fabric. Quarters for the crew and passengers were located in the lower part of the hull, with the control car directly underneath. Passenger accommodation was comparable to that on an ocean liner; meals were prepared by the chef in an electric galley, and even a smoking room was provided. The ship was powered by five diesel engines giving a maximum speed of 62 miles per hour.

Problems arose during construction. The originally specified engines were delayed, and an older and much heavier type was substituted. This, along with the steel frame which was perhaps stronger than necessary, made the ship overweight. Her first flight took place in October 1929, and it was soon found that the payload was far below what had been anticipated. Drastic measures were taken to increase lift: the internal gas cells were 'let out' to increase their volume, and the ship itself was cut in half and lengthened to add an additional gas cell, increasing the overall length to 777 feet. In addition, the outer cover was found to be defective and had to be replaced.

Even with these modifications, R101's performance was less than satisfactory, but there was great political pressure to send the ship on her maiden voyage to bring Lord Thomson to an Imperial conference in India. With many misgivings on the part of designers and crew, R101 set off in poor weather on 4 October 1930 from her base at Cardington. In the early hours of the next morning she was over France, struggling to maintain altitude against high winds and turbulence. As she crossed a wooded ridge near the town of Beauvais the nose dipped toward the ground, possibly due to a leak in the forward gas cell. The ship struck at low speed, and immediately the hydrogen gas burst into flames. Only eight men (two of whom died later) managed to fight their way to safety; the remaining 46 passengers and crew, including the ship's officers and Lord Thomson, perished in the inferno.

The disaster stunned the British nation, and with the death of the principal backer of the airship scheme and many of the country's most experienced airshipmen there was little enthusiasm for continuing with lighter-than-air development. The rival ship R100, though it had flown successfully on a transatlantic journey to Canada, was soon scrapped, and only the huge sheds at Cardington were left as reminders of Britain's great passenger airship dreams.

The Model

This model builds into a 1:700 scale replica of R101 as she appeared during her final voyage. A word of caution: this model is not suitable for assembly by young children, due to the use of sharp tools and the complexity of some assembly steps. Previous experience with card modeling is recommended. If you have any comments or suggestions regarding this kit, I can be reached by e-mail at models@currell.net

Model parts are contained in the document **r101_parts.pdf**. Print out the parts document on 8.5"x11" or A4 size white card stock suitable to your printer. 67 lb. cover stock (approximately 8.5 thousandths of an inch or 0,2 mm thick) is recommended.

Tools

Before beginning, you will need the following tools and materials:

- a) white glue
- b) a glue applicator such as wooden toothpicks or a small paintbrush
- c) scissors (optional)
- d) a sharp knife for cutting
- e) a flat cutting surface
- f) a ruler or straight edge
- g) a scoring tool or blunt knife for creasing the fold lines

Hints

- a) Select a well-lit, comfortable work area that will remain undisturbed when you are not there.
- b) Keep your hands and tools clean when working, to avoid getting glue on visible parts of the model.
- c) It's easier to stay organized if you only cut out those parts you need for each step.
- d) Make sure your knife is sharp. When cutting straight lines, use a straight-edge. Scissors, if used carefully, can be used for large curved parts.
- e) Study the diagrams carefully, and always test-fit the parts before applying glue.
- f) You may wish to colour the edges of the parts to make seams less visible. Pencil crayon or paint applied with a fine brush can be used (experiment on scrap pieces to see what works best).

Assembly

In these instructions, the directional terms are given assuming the model is horizontal (fins at back). 'Port' and 'starboard' refer to left and right sides respectively. Scoring of parts is indicated by thin black lines outside the part's outline or by dashed lines on the part's surface. Score parts *before* cutting them out. In the diagrams, subassemblies are identified by a number within a circle (e.g. ②), corresponding to the step in which it was assembled.

Assemble the body segments (**steps 1–5**). Typical body segment assemblies comprise an outer surface segment (the 'skin' of the airship), a connecting strip and an internal former to provide strength and maintain the segment's shape. Note that the cross-section of the airship is a multi-sided polygon, and the outer surface part must be scored before cutting out. To construct an assembly, carefully cut out the parts and glue the connecting strip to the inside of the surface segment. This strip must be lined up so that the shaded areas protrude beyond the edge of the surface part (see the diagrams). The segment is then folded along the scored lines so the edges butt together and are held by the connecting strip. The internal former is made of two pieces which are glued back-to-back. Because the former shape is not symmetrical, blue locating arrows are printed on the pieces; the arrow tips must line up. Glue the former ring inside the section connecting strip so that the printed arrow tip lines up with the outer surface seam, and ensuring the former does not protrude into the notched part of the strip. When joining the completed sections to each other, ensure the longitudinal seams line up.

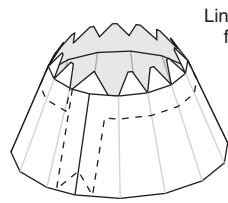
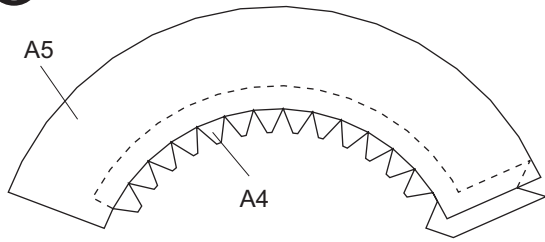
(**Step 6**) assemble the fin segment in the same manner as the body segments. Insert the fin spars C8 into the slots cut into the outer surface, so that they protrude equally from each side. The tail segment (**step 7**) is roughly circular in cross-section at the wide end, but forms a 7-sided polygon at the narrow end. Assemble and attach the lookout platform to the narrow end, then join the tail and fin segments to the main body (**step 8**).

Assemble the display stand (**step 9**). This will allow you to set the airship down while adding the smaller assemblies in the following steps.

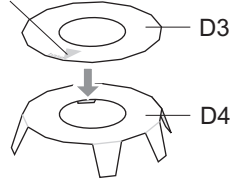
Assemble the stabilizer fins (**step 10**). The orientation of the printed letter 'G' is identical for the side and top fins, but differs on the bottom fin. Attach to the tail of the airship, using the blue printed shapes and protruding spars for alignment. Assemble and attach the control surfaces (**step 11**) to the rear edge of the stabilizer fins. Assemble the control car (**step 12**) and attach to the blue printed shape on the bottom of the airship body.

Assemble the engine cars (**step 13**). Note that the three versions of this car (for the rear, port and starboard engines) differ only in their printed markings. To avoid confusion, you may wish to assemble one car, then proceed through the remaining steps before beginning the next car. Attach the struts to the cars (**step 14**), using the diagrams to ensure they are at the correct angles. Port and starboard cars are mirror images of each other. Fold and cut out the radiators (**step 15**) and attach to the airship body as shown. Then attach the engine assemblies, taking care that they are aligned parallel to the long axis of the airship. Finally, attach the propellers (**step 16**) to the blue circles printed on the rear of the engine cars.

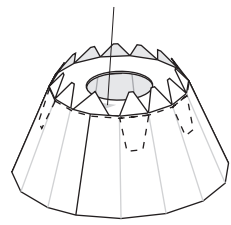
1 Typical body segment



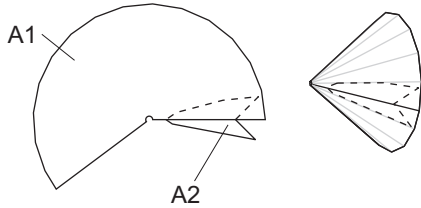
Line up blue arrows front and back.



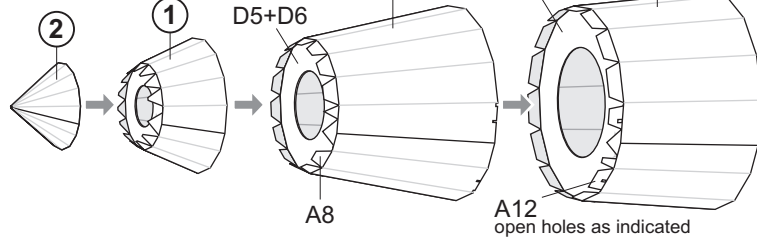
Line up blue arrow on former with body seam.



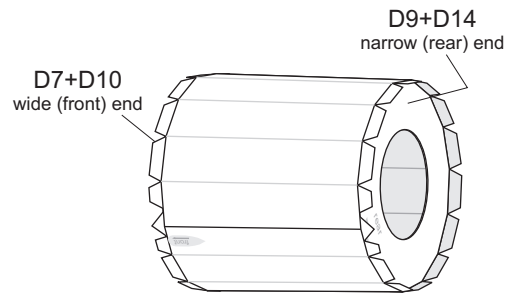
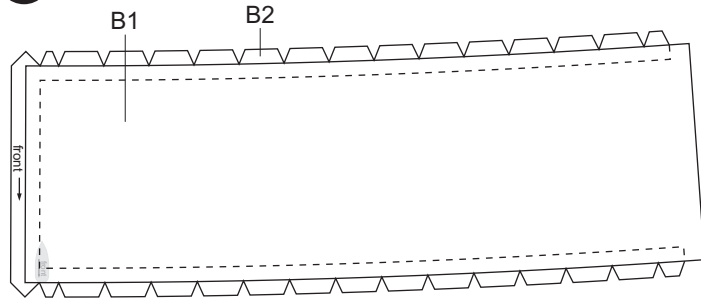
2 Nose segment



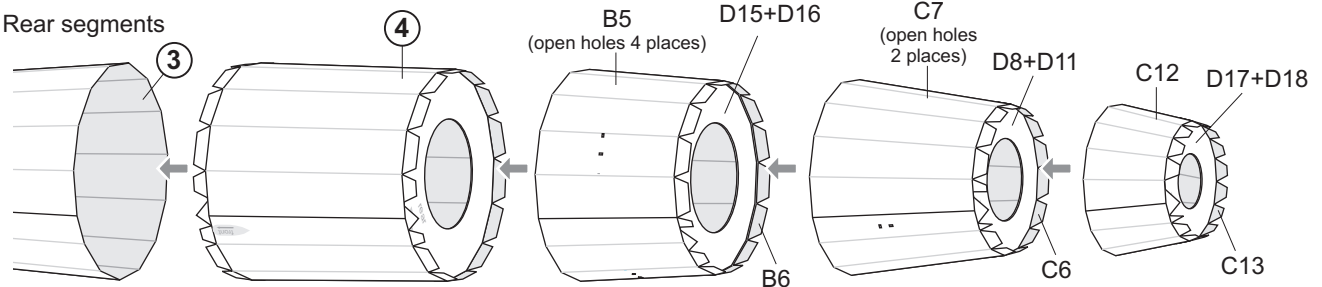
3 Forward segments



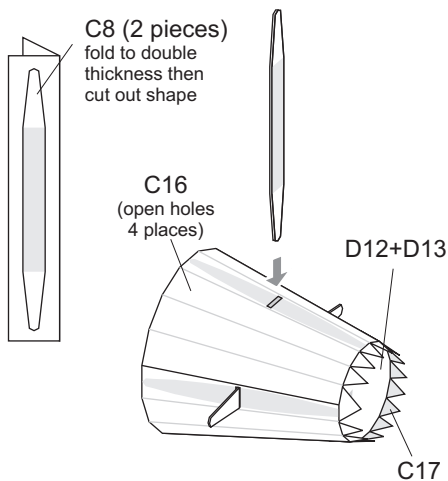
4 Centre segment



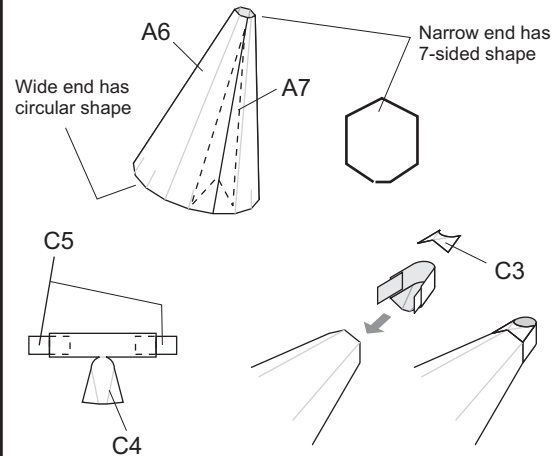
5 Rear segments



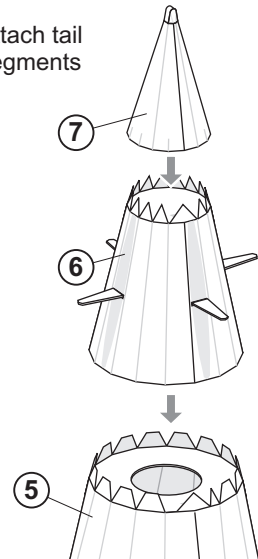
6 Fin segment



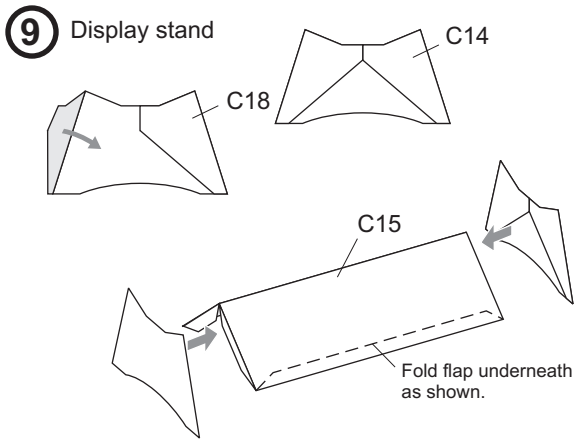
7 Tail segment and lookout platform



8 Attach tail segments



9 Display stand



C14

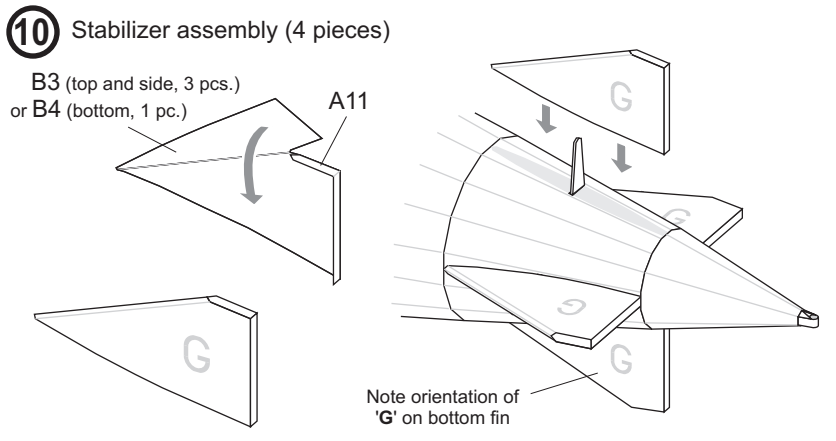
C18

C15

Fold flap underneath as shown.

10 Stabilizer assembly (4 pieces)

B3 (top and side, 3 pcs.)
or B4 (bottom, 1 pc.)

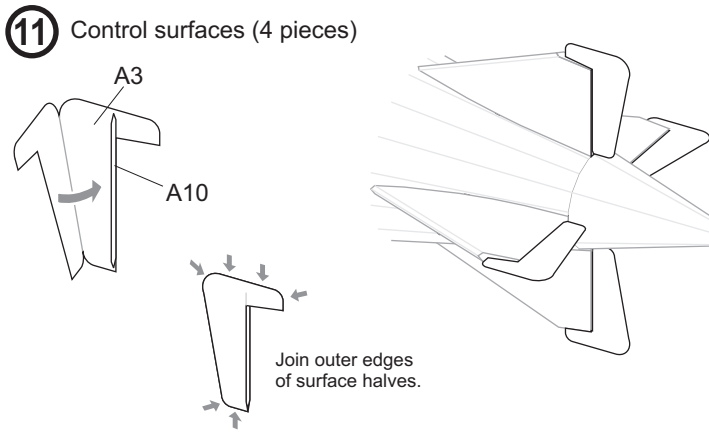


A11

G

Note orientation of 'G' on bottom fin

11 Control surfaces (4 pieces)

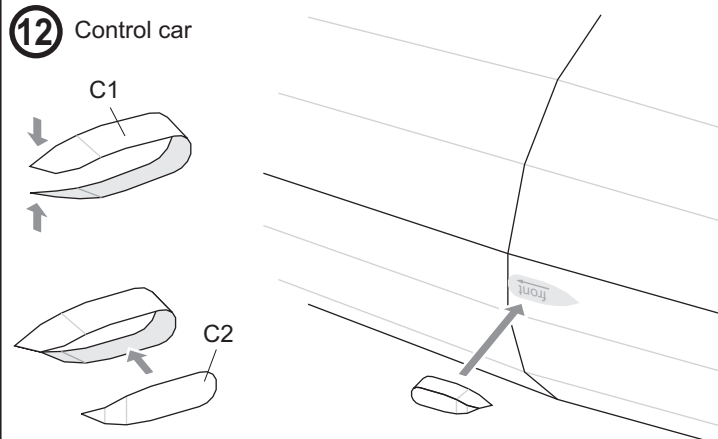


A3

A10

Join outer edges of surface halves.

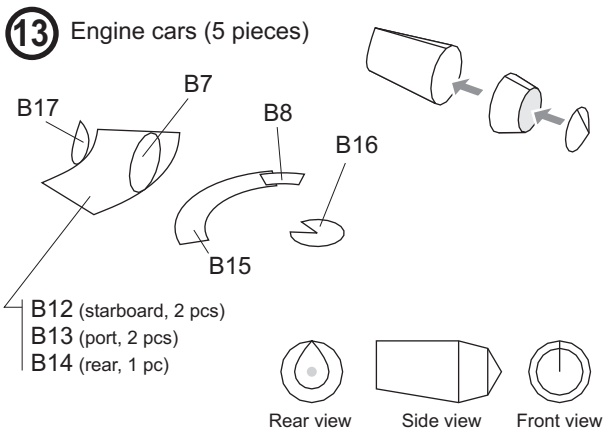
12 Control car



C1

C2

13 Engine cars (5 pieces)



B17

B7

B8

B16

B15

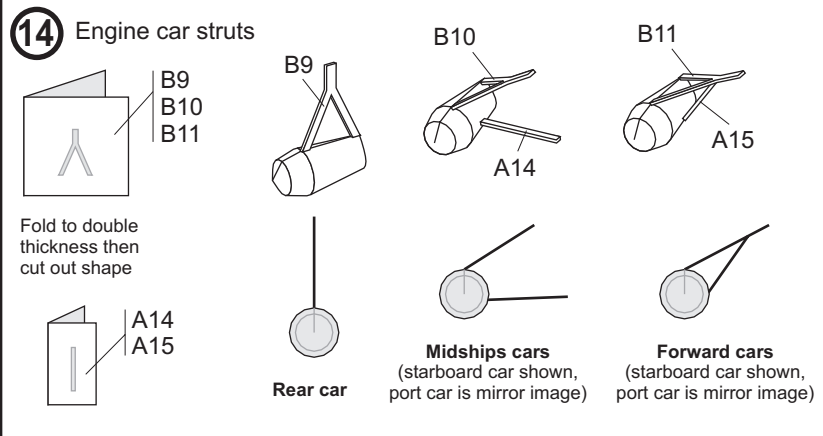
B12 (starboard, 2 pcs)
B13 (port, 2 pcs)
B14 (rear, 1 pc)

Rear view

Side view

Front view

14 Engine car struts



B9

B10

B11

A14

A15

Rear car

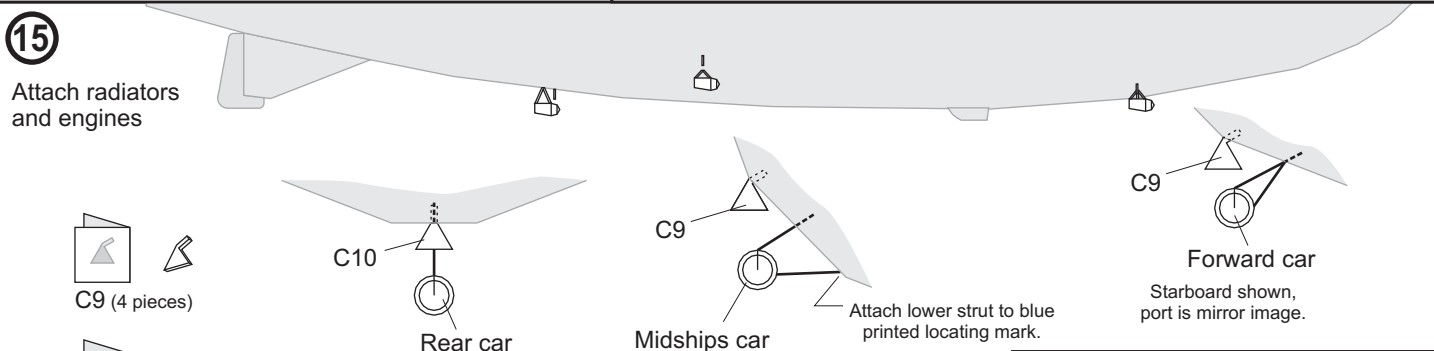
Midships cars
(starboard car shown, port car is mirror image)

Forward cars
(starboard car shown, port car is mirror image)

Fold to double thickness then cut out shape

A14
A15

15 Attach radiators and engines



C9

C10

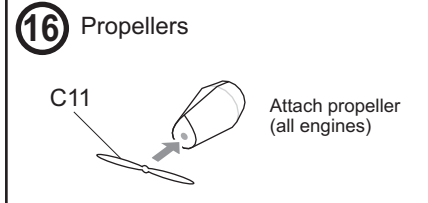
Rear car

Midships car
Starboard shown, port is mirror image.

Forward car
Starboard shown, port is mirror image.

Attach lower strut to blue printed locating mark.

16 Propellers



C11

Attach propeller (all engines)