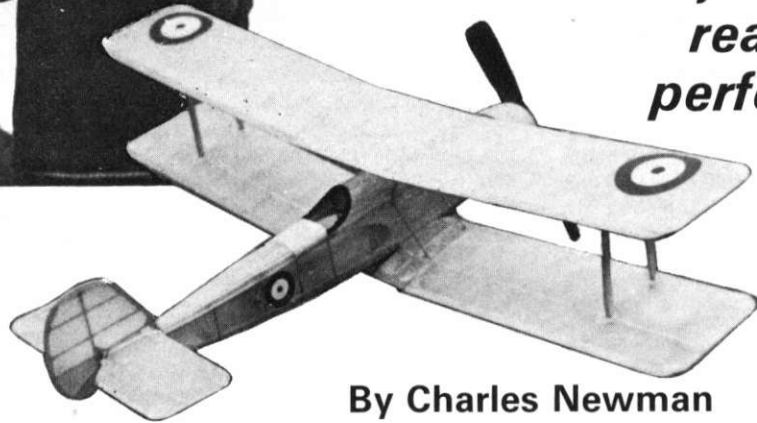


# VICKERS VILDEBEEST

*For rubber power scale  
enthusiasts, here's an  
unusual subject with a  
really good  
performance*



**By Charles Newman**

IN 1928 Rex Pierson thoughtfully designed the Vildebeest at Vickers in Weybridge. Thoughtfully because he did not like curves and streamlines as they were difficult and costly to manufacture. The result of his labours was a large, angular biplane which is a very suitable subject for a beginner's rubber scale model. The preponderance of straight lines, whilst not exactly the last word in beauty, makes for easy construction just like the Ajax, Competitor, Sentinel et alia. Anyone who has tackled one of these with reasonable success should have no trouble with the Vildebeest. There are relatively few 'tricky bits' and the model is sufficiently large to be easy to handle in the air, whilst utilising a standard 12in Keil Kraft plastic propeller, so do not bother to carve a wooden one unless you wish to. Thanks to Pierson's angular design philosophy, there are none of these curly formers with masses of notches to cut either. All in all, a very straightforward model.

You will notice from the photographs that the model has been left in its natural tissue finish in order to keep it light. The original weighed in at 6oz all up, with rubber and  $\frac{1}{2}$ oz nose ballast. There is no point whatever in building something this size if it is too heavy to perform properly – you are far more likely to get complimented about your models because they fly well rather than for a good but heavy finish. The same goes for detail so forget the Lewis gun and bombs! The Vildebeest flies very slowly with a majestic air and a gentle stall which is really what it is all about.

The prototype was constructed without much trouble by Adrian Flowers, a sixteen year old who has built other models but nothing like this before. His model flew straight off the board, so you see, it can be done.

Before launching into the construction of the model, there are a few points worth mentioning. Firstly, though intended as a beginner's rubber scale model, there have been only a couple of minor deviations from scale, thus it is quite accurate. So, please enter competitions with it if you wish. You may do better than you think and you certainly will come away with more confidence and know-how. Secondly, for those who really must go to town on colours and details, here are a few references.

*Aeromodeller*, November 1943 – 1/72 drawing plus photos.

*Vickers Aircraft* since 1908 (Putnam) – drawings, photos plus text.

*Aeroplane Monthly*, May 1979 – article called 'Vincent Valedictory' which has some excellent photos of Vincents, the sister ship of the Vildebeest.

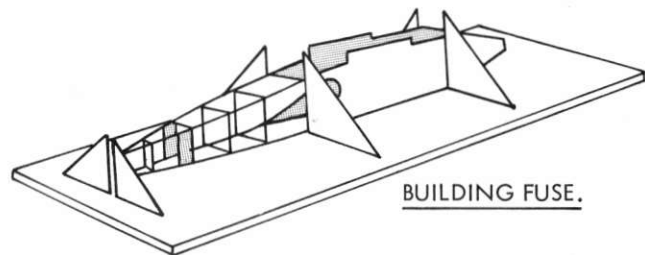
Finally, if this is your first scale model, build it as carefully as you can but when it comes to the big day, be even more patient. The first few flights should be made over long grass or similar and in calm winds. Whilst this is true of most models, it is most true of the free flight scale model. The designer has been known to keep models for ages before that first flight so that conditions are good.

As this design was aimed principally at people with little or no experience in this field, there are fairly full constructional notes. Before attempting any construction, study the plans carefully and become acquainted with it. If necessary, look at details of the full-size aircraft. Make sure that you know what tools will be required and arrange to either buy or borrow anything that you do not have. Use which adhesive you know best: balsa cement or PVA are equally suitable. Cover the plan with a thin, large plastic bag – the best are those used to cover clothes returned from dry cleaners.

## Construction

1. Make templates for ribs R1/2, R3, and T2 from thin (1mm ply) ply or card. Omit the spar notches but include those for the leading edge (LE). Cut out all the rib blanks and notch the spars. In the case of the riblets (R3), include the notches in the template and cut them out with every riblet as you go.
2. Pin down wing TEs plus lower reach spars packed  $\frac{1}{16}$ in for outer wing panels and upper centre section. Pin down the spars (both) for the lower centre section. Pin down the lower spar for the tailplane. Add *all* ribs except root ribs of the outer panels and the riblets. Add root ribs with the use of the dihedral template. Make four of these and leave them pinned to the board next to the ribs.
3. Cut the front fuselage sides and mark the former positions. Now build one fuselage side over the other to ensure symmetry. Use hard balsa for the longerons and medium hard for the verticals and cross members.
4. Return to the wing to add all LEs and upper spars (front and rear) and all gussets.
5. Insert all the riblets (R3) using a pair of tweezers. These may be omitted if required but will improve both appearance and performance if put in.
6. Prepare the wheels by cutting eight 3in squares from  $\frac{1}{16}$ in sheet balsa and divide them into two piles of four, with each layer with the grain at 90° to the one before (like plywood). Glue them together, using clamps.
7. Cut some strips of  $\frac{1}{16}$ in sheet the same width as the interplane struts. Also some  $\frac{1}{16}$ in x  $\frac{1}{16}$ in and  $\frac{1}{16}$ in x  $\frac{1}{8}$ in strips. Glue a length of each strip to the wide one with a gap in

Below: *basic fuselage assembly. Sides are joined inverted over plan, using squares to ensure that the sides stand vertically.*



between (see section on plane). Scrape any excess glue away with a piece of scrap wood. A second piece of the wide strip will be added later to form a tube, but for the moment set these aside to dry.

**8.** Now assemble the basic fuselage inverted over the plan. Use set squares cut from balsa or cord to keep the fuselage square to the drawings.

**9.** Study all the wire parts except the propeller assembly and fully understand their shape, position and function. Use long nosed pliers to shape these parts over the plan. Mark them where necessary with permanent white (Typex fluid) or matt white paint. It is *very important* that the wire bending is accurate and symmetrical. Cut the tubes for the undercarriage (U/C) at this stage.

**10.** The wings and tailplane may now be lifted from the board and the front lower spars be added to the outer panels and upper centre section. Tailplane will be complete and simply require all excess glue to be removed. Do the same when spars have dried in the wing panels and the wing tips have been added.

**11.** Lift fuselage from board and check fit snugly between the ribs and spars of the lower centre section. Trace from plan the *inner* outline of the laminated section of the fin onto a piece of  $\frac{1}{16}$ in sheet, extending the lines a little each end. Cut some lengths of  $\frac{1}{32}$ in x  $\frac{1}{32}$ in from  $\frac{1}{16}$ in sheet and soak them in a bowl of water for at least an hour. In the

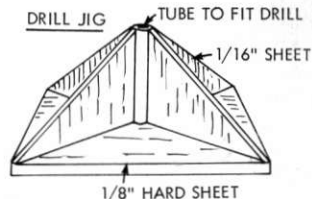
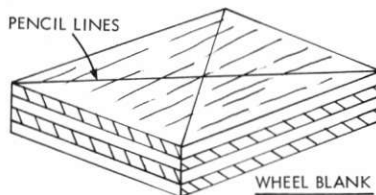
meantime, grease the edge of the fin template with Vaseline and pin down over the plan. Cut some scrap  $\frac{1}{16}$ in sheet into small pieces and grease one side of each. When the strips have soaked, dry them gently with some tissue. Using PVA glue and *not* balsa cement, glue all four pieces together and whilst they are still wet, place one end at one end of the template. Anchor it with one of the pieces of scrap and pin, greased side against the strips. Continue in the same manner, and work your way round until the shape is formed and leave to set.

**12.** Take a length of  $\frac{1}{32}$ in square and cut two pieces to fit between the U1s where the cabane struts meet the fuselage. Now attach the cabane struts using thread and cement. The front and rear bracing struts must now be added. Bind and cement the front struts to the forward ends of the strips and the rear struts to the rear. Glue each unit on the inside of the fuselage side, the top of the strip level with the top of the fuselage side, the struts emerging through their slots. The ends of the braces should fit against the spars – check that they do.

**13.** Remove laminated fin outline from plan, clean up and replace to set.

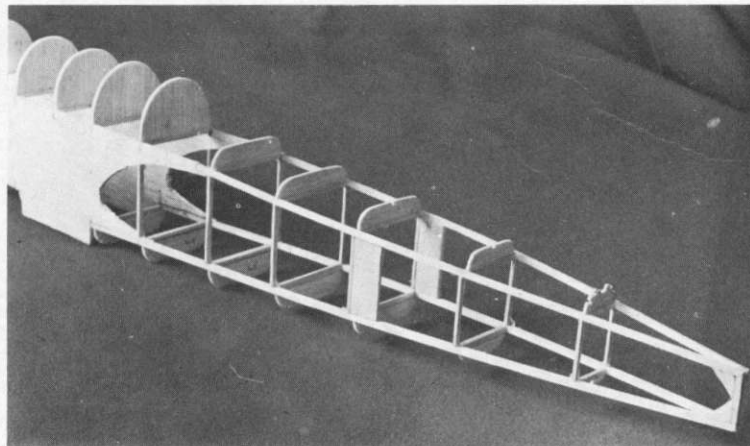
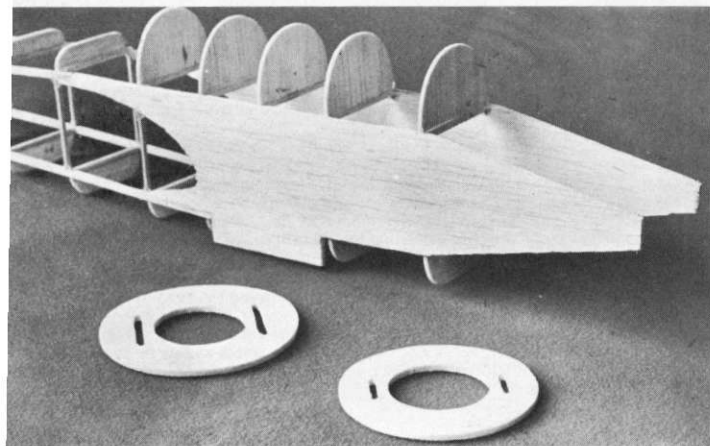
**14.** Add fuselage formers U1-3 and L1-2, checking to keep them vertical. Then add C1-2. Set aside to dry.

**15.** Take the wheel blanks and drill a  $\frac{1}{16}$ in diameter hole in the centres. The jig shown in sketch shows how; draw the wheel outline on both sides of the wood, and scribe on the inner line of the tyres, again both sides. Shape the wheels, truing up by running wire through the centre of both together.



*Lightweight wheels are made from cross grained laminations of balsa. In the absence of vertical drill, true axle holes can be achieved using this drilling jig.*

**16.** Sheet upper front fuselage, also the bay between L1 and L2. When dry, cut out the two cockpits. Cut some spacing pieces (four) from  $\frac{1}{32}$ in square and glue them between C1



Above: *two views of the basic fuselage assembly after joining the fuselage sides. Formers have been added top and bottom of basic frame. Note formers C1 and C2, ready to slot over the fuselage sides.*

and C2. Add all the remaining formers, noting the angle of the lower ones. Add upper and lower fuselage stringers. Sheet the cowling with  $\frac{1}{16}$ in. Leave to dry.

**17.** Finish the fin and shape the TE of the tailplane.

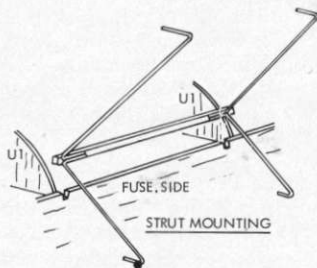
**18.** Shape the fuselage blocks to leave the rear end slightly proud so as to allow sanding down to achieve an even finish when stuck to U1/L1. Then hollow out.

**19.** Form cowling ring and stick to C1. Add C3 with 1mm ply facing and blending it into the sheeting. Open out the centre of the ply facing to accept nose plug.

**20.** Sew U/C axle wire to rear face of lower centre section front spar. Sew upper U/C legs to the outer ends of the same spar, again to the rear. Solder on the brass tubes, inserting the legs as shown. Sew the upper ends of the rear legs to rear face of rear spar. Insert the other ends into the tubes and solder the axle to the bend as shown in the sketch on the plan. This rear leg should be a sliding fit and is sprung by the axle. Attach lower centre section to fuselage and sew lower bracing struts to rear faces of spars. Run cement over all thread joints.

**21.** Pin upper centre section down to the board and stick on the outer panels, chocking up the tips to ensure similar dihedral.

**22.** Sew all cabane struts, to the rear faces of the upper centre section lower spars, checking that the incidence remains correct and that the wing is true viewed from the front.



**23.** Cut four pieces of aluminium or plastic tube (from a Biro inner) and stick them to the ribs at the positions shown with Evostick or a cyano adhesive. Now add the gussets.

**24.** After a final check to see that everything is ready and smooth, proceed to cover the model with the lightweight Modelspar or Jap tissue, taking care to stick it to the ribs on the underneath. Cover the lower outer wings as separate units but do not dope. With that exception, give the whole model a coat of 50/50 dope and thinners, followed by two more on the fuselage. Leave the model for several days to settle.

**25.** Cut two lengths of shirring elastic (available from a haberdashers) about 15in long. Cut a piece of 22g wire 2in longer than the interplane struts and bend a small hook in the end of it. Tie a match to one end of each piece of thread. Starting with the front tube in the upper wing, using the wire as a needle, pass the thread down through the wing, the front interplane strut and out through the lower wing. Now insert the thread in the rear tube in the lower wing and pass it up through the wing, the rear interplane strut and up through the upper wing, pulling tight as you go. Tie the two ends together. Repeat for other pair of wings. Now stick the lower wing panels to lower centre section, the struts setting the dihedral angle automatically. Allow to set thoroughly.

**26.** Snip through the thread and remove the struts. Now dope the lower wing panels with one coat of 50/50 dope and thinners.

**27.** Make up the noseplug. Insert the brass bush. Give it several coats of full strength dope mixed with talcum powder. Apply this also to the wheels but rub some balsa cement into the tyres first, sanding smooth when dry. Finish with one coat of clear dope.

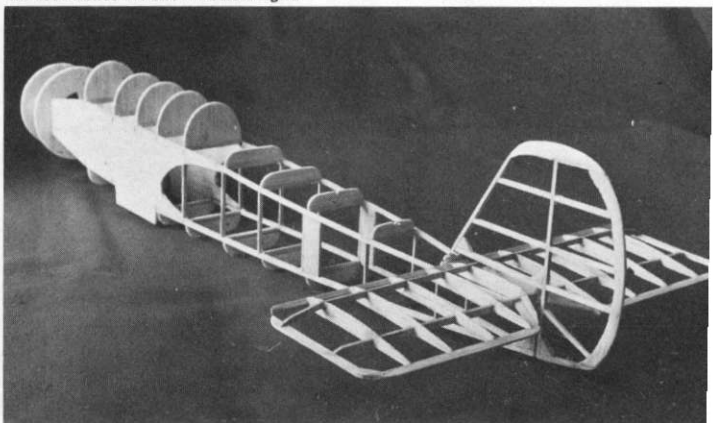
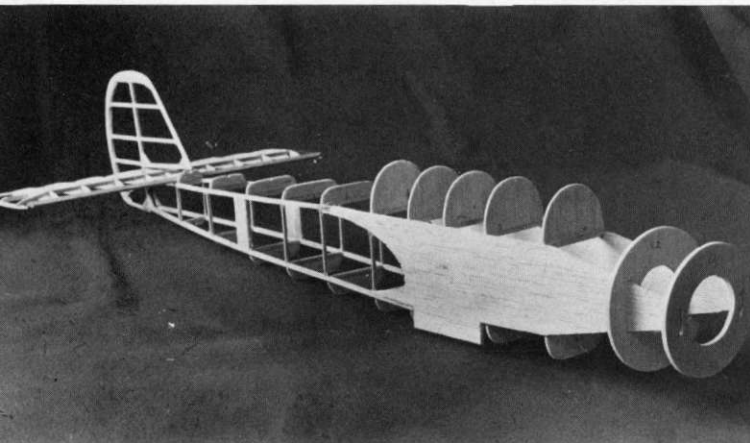
**28.** Take a Keil Kraft 12in plastic propeller and remove the spiral on the hub. Trim the blades to the line shown on the plan and balance the propeller, spinning it on a piece of wire to test it. Make up the little free wheel clutch, drill a fine hole and attach it with a  $\frac{1}{16}$ in woodscrew. The clutch should move freely.

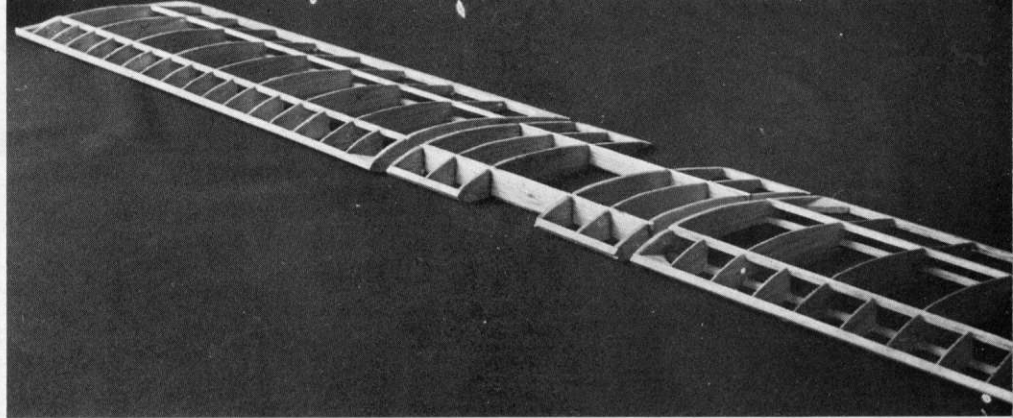
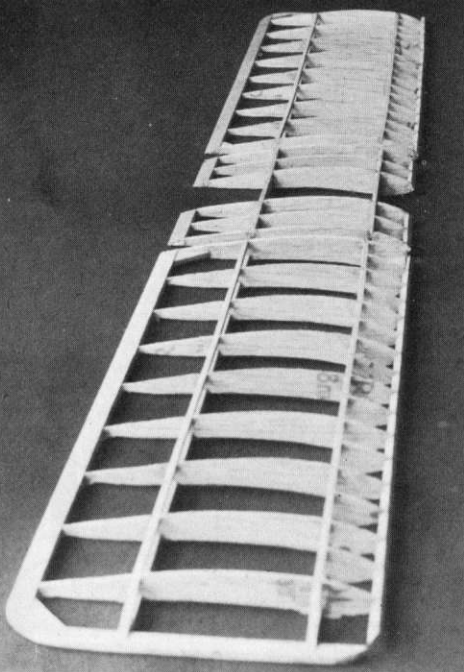
**29.** Bend up the propeller shaft from 16g wire. This is easier if you soften the wire first in a blow lamp or gas flame. Heat until the wire glows red and bend whilst still glowing. Do not forget the cup washers when assembling the unit. Check that it revolves freely in the bush and that the propeller revolves freely on the shaft. A drop of light oil is a good idea.

**30.** If it is intended to paint the model, it should be done so at this stage, but only using a spray gun to give a very thin finish. Paint tailplane and fin as separate units.

**31. Assembly.** Simply place and not stick the tailplane in position. Stick the fin over it. Tailplane is now trapped but loose and is temporarily held in place by rubber bands whilst trimming is carried out. When the correct position is found, stick down permanently and remove bands. Interplane struts are put back as described in step (32). Wheels are simply slipped over the axles and held by washers soldered to the axle. Trim the axle and cover hub with a shallow paper cone. Treat tailwheel the same way but without the cone. Drill out hole for rear motor peg and insert peg.

Below: *further views of the fuselage frame, here with tailplane and fin units added. It is worth working over the airframe at this stage to clean up glue joints, corner pieces and the like, but do avoid disturbing any of the glue joints. The finished tailplane and fin assemblies are shown below right.*





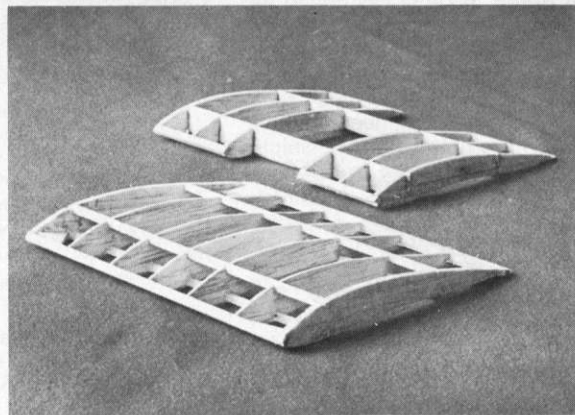
*Structural details of the two complete wing assemblies, here ready for cleaning up and covering. The two wing centre section units are shown right.*

### Flying instructions and conclusion

Power for your model will depend on how heavy it is, but either 8 strands of  $\frac{3}{16}$ in rubber, or 6 strands of  $\frac{1}{2}$ in rubber 18in long should be about right. Lubricate it well before use. The designer mixes a brew of 50/50 green washing up liquid and glycerine (no, not the nitro type! The type that comes in bottles in Boots for cake icing). Make up the motor with a bobbin for the rear dowel, using a small band to retain it. Force some fuel tubing over the prop hook to protect the rubber. Load the motor with the aid of the stick shown on the plan.

With the model now complete, balance it and add weight in order to get the CG about  $1\frac{1}{2}$ in from the LE of the upper wing. You are now ready for that first glide—into long grass please. Assuming that you have not too many errors, she should float down some way in front of you. If not, check the incidences of all flying surfaces. Provided they look alright, pack the tail in order to achieve a flat glide. This model will glide so do not let anyone tell you that biplanes do not!

Now for the first powered flips. Again over long grass, wind on about 75-100 turns and launch gently into wind. Gently! She does not weigh very much, remember. The original model that Adrian built needed no change to the thrust line. You will note that downthrust is built in. We are indebted again to Mr Pierson of Vickers for so thoughtfully doing so with the full-size aeroplane! Continue to work up the turns and trim if necessary should a stall develop. Unless the turn is tight, do not correct it. This model is somewhat unusual for a biplane inasmuch as it will fly quite happily to the left or right. After each flying session, remove the motor, wash and dry it, dust it down with French chalk or talc and store it in a cool, dry, dark place.



The Vildebeest is an extremely forgiving model which again makes a good candidate for a beginners scale job. To illustrate this, the designer's wife Helen, who is not an aeromod, had not the slightest problem flying it despite the fact that it had only had its first flight some hour and a half before. Should you have a few spills during trimming and general flying (and Helen did not!), do not worry as the Vildebeest is a very 'floppy' model with a sprung U/C, so you are unlikely to do too much damage. Although a one-piece model, the wings are arranged with flexibly mounted interplane struts and butt joints between the panels so that in the event of a really nasty return to terra firma, the wings will merely fail at the joints. It is, of course, a simple matter to put the model back together again and this system avoids any complicated assembly methods which can be difficult to produce and will not necessarily reduce damage in a crash.

It is to be hoped that the above will encourage some of you to build this model. It is simple to build and fly and will give a great return of fun for the effort put in. Although the Vildebeest was chosen for this project, because the designer felt that it would make a good beginners model, he has frequently talked to other experienced modellers in other spheres of the game, who say that they often thought about rubber scale but shied away. Gentlemen (and ladies) now is the time to act. Have fun!

