

# FLIGHT PLAN '66 BY RAY MALMSTRÖM

**F**LIGHT PLAN 66 has been devised to really help you successfully to build and fly a model aircraft. This month we present the plan, building instructions and sketches for THE MAGNUM—an attractive, easy-to-build semi-scale model. Next month we shall describe in detail with photos and sketches, the trimming and flying of this perky full-of-go model. If you are an absolute beginner to the thrilling hobby of aeromodeling then Flight Plan 66 is for you. Even if you are an aeromodeller already, we feel sure that you will find some useful tips in these articles—and anyway, you'll want to build and fly MAGNUM. So if you feel ready, let's roll out on to the runway and take off for a lot of building and flying fun.

## Building the fuselage

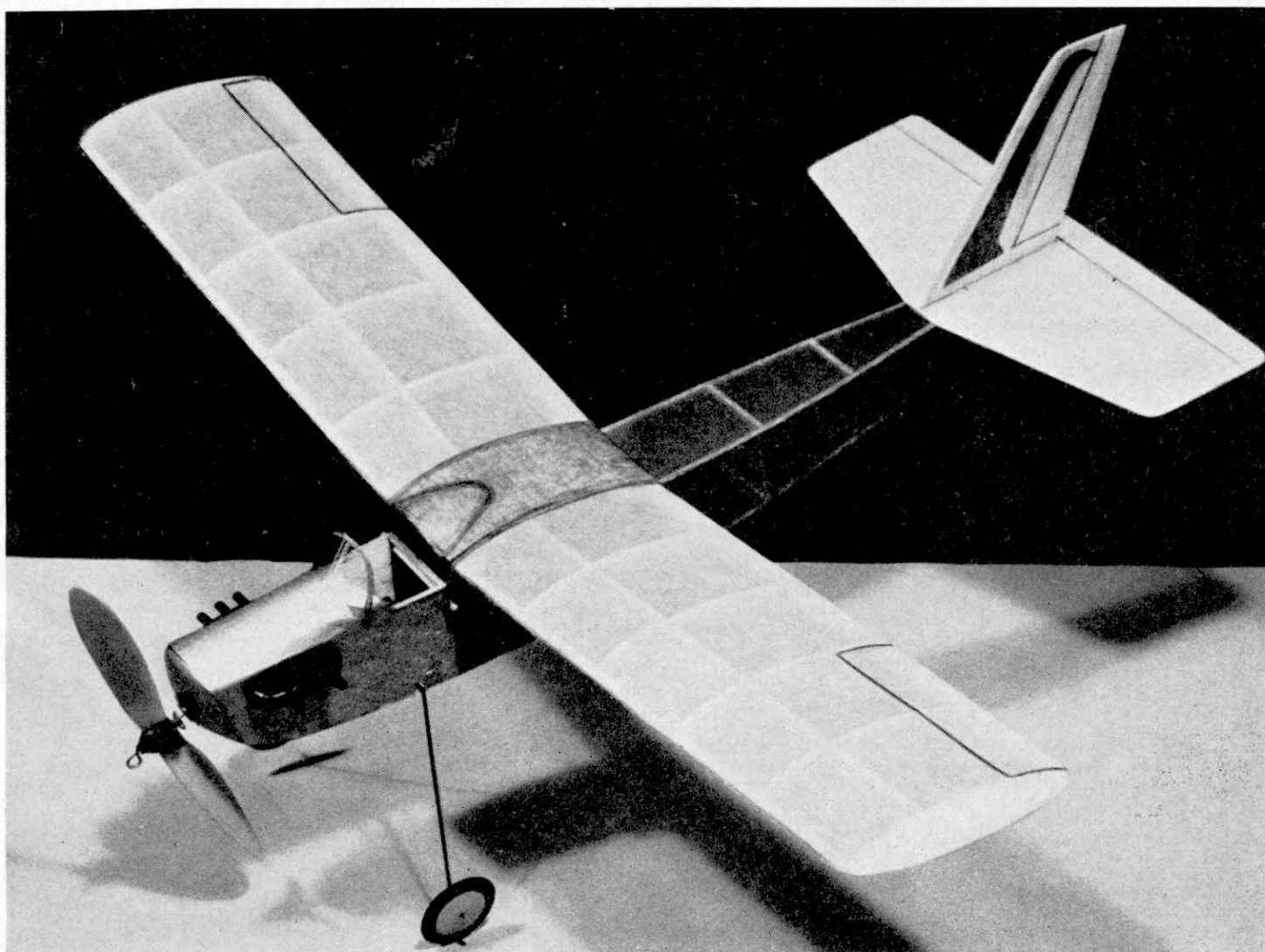
Before starting, check the materials list and have a flat board, pencil, tracing paper (or greaseproof), a couple of new single-edge razor blades, a steel rule, some modelling pins, fine sandpaper and a couple of soft brushes ready to hand. Trace the fuselage nose pieces from the plan, turn the tracing over and transfer it to  $\frac{1}{16}$  sheet medium grade balsa. Use medium grade balsa (often marked by having the ends of the sheet and

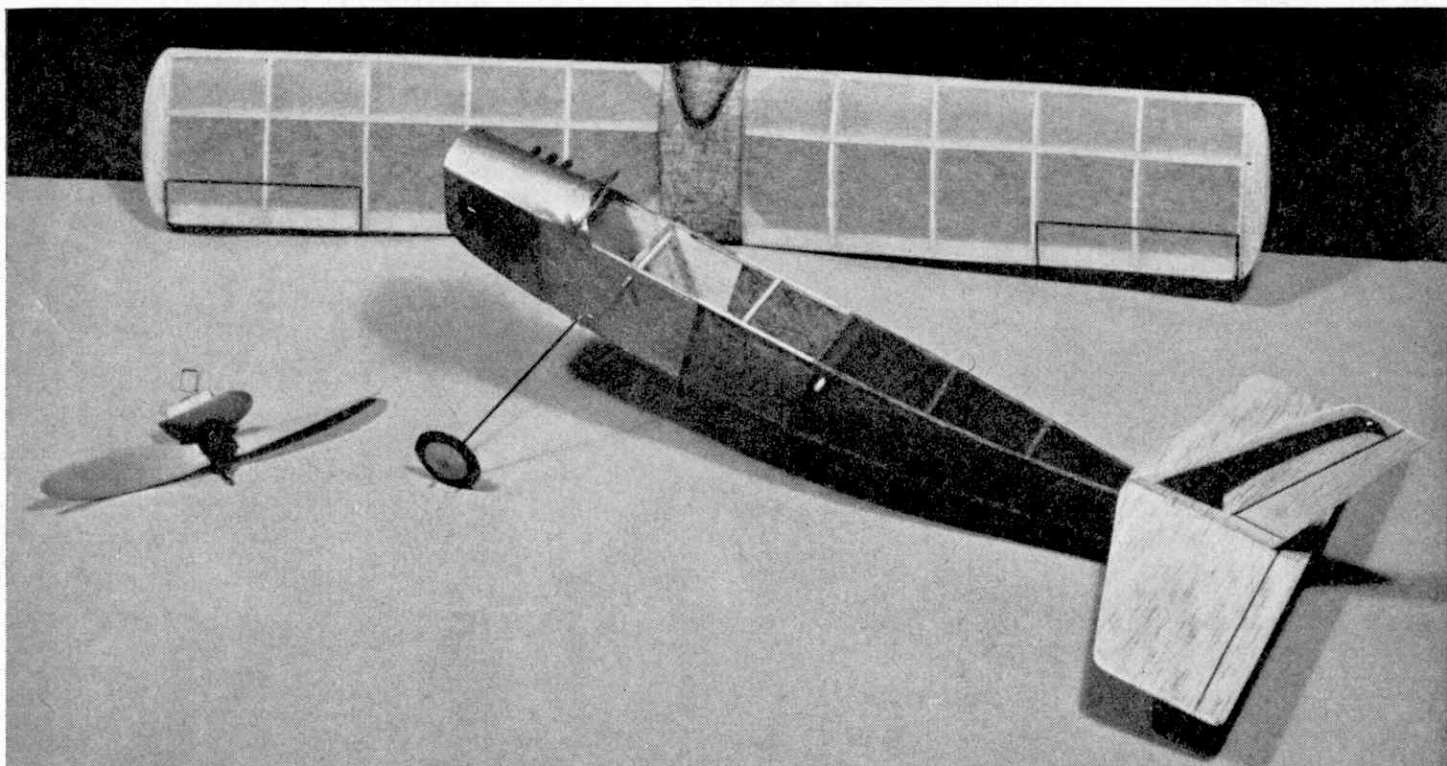
strip coloured green) for the entire structure of MAGNUM. Put two pieces of  $\frac{1}{16}$  sheet together, hold at the corners with a spot of cement, and cut out two nose pieces together—you get two identical shapes this way. Remove the plan from your M.M. and pin to the board. Rub some candlewax over the outlines of fuselage and wings. This stops the cemented frameworks from sticking to the plan. Build one of the fuselage sides over the plan, using a nose piece and  $\frac{1}{16}$  sq. balsa strip. Hold in place with modelling pins. (Packets from your hobby shop 6d. approx.) When dry lay a piece of tracing or greaseproof paper over the framework, having removed the pins. Over this framework build a second. The greaseproof paper will prevent the two sides sticking together. Cut the  $\frac{1}{16}$  sq. cross pieces from the plan top view

of fuselage. Start joining the fuselage with the six pieces marked Z on the constructional sketches. With a set square check that your fuselage sides really are square. This is important. Cut out former F1 ( $\frac{3}{16}$  sheet) and the rear dowel peg pieces ( $\frac{1}{16}$  sheet). When cross pieces Z are dry, pull the fuselage together, cement firmly and pin, until cement is dry. Then cement former F1 into the nose, holding with pins. Cement the rear dowel peg pieces in, and add the remaining cross pieces and formers Fla, F2. Add the triangular shaped gussets and drill a small ( $\frac{1}{16}$  diameter) hole in the gussets and the sheet nose pieces to take the  $\frac{1}{16}$  diameter wing retaining dowels. Bend the wire tail skid (20 gauge wire) and bind and cement to rear fuselage upright. Bend the undercarriage to shape from 20 gauge wire. Bind the under-

# PART I 'THE MAGNUM'

A semi-scale rubber powered shoulder wing monoplane





carriage wire to the undercarriage former ( $\frac{1}{8}$  sheet) and smear cement over the thread, binding as for the skid. Then cement the undercarriage former into the slot in the fuselage nose pieces. Sheet-in under the nose with a piece of  $\frac{1}{8}$  sheet tightly, rub down the entire fuselage framework with a piece of very fine sandpaper. Take care over this as it will help to ensure a good tissue covering. Cut the fin and tailplane from  $\frac{1}{8}$  sheet. Round-off the edges and give one coat of clear dope. Remember to dope only one side at a time, pinning the fin and tailplane to the building board while dope is drying. This is important to avoid warps. Warps are often the cause of a model failing to fly well or, indeed, at all! Cut the cowling from a piece of thin notepaper, curve and cement to nose pieces, over F1a and F2. Cut the dashboard from the plan and cement to F2.

## Covering and Finishing

Now cut four pieces of lightweight Modelspan tissue paper, making each piece about  $\frac{1}{2}$  in. bigger all round than the fuselage sides, top and bottom. Smear tissue paste on the framework and then lay on the first piece of tissue paper, smoothing out the wrinkles towards the edges. Allow tissue paste to dry and then with a sharp razor blade carefully trim off the excess tissue paper. Repeat this procedure for the other three sides. Leave the last section of the underneath of the fuselage open for access to the rubber motor. With a very soft brush paint water all over the covering and allow to dry. Finally, again using a soft brush, put on a thin coat of clear dope (small bottle of dope 9d. from hobby shop), give the sheet nose pieces a coat of clear dope as well. The nose and cowling can then be painted silver or bronze using a small tin (9d.) of Humbrol paint. You can now add the wheels (streamlined plastic 1 in. diameter 2d. or 3d. a pair). A quick and neat way of retaining the wheels is to get a piece of plastic electrical tubing, remove the centre wire, and then push a  $\frac{1}{4}$  in. length on to the axle. It must be a tight fit. When the dope and paint are dry you can cement the tailplane and fin in position. Make sure they are at right angles to fuselage and each other. They can be accurately pinned while the cement dries. Make the cylinder blocks from

$\frac{1}{4}$  in. sheet balsa, and the cylinders are pieces cut from an old biro refill tube. Make holes in the cylinder pieces and push in the tubes. The cylinders and pipes can be painted black before assembling to the fuselage nose. Cut the windscreen from thin acetate sheet (obtainable from your model shop) and cement firmly in place. Cut a length of dowel ( $\frac{1}{4}$  in. diameter) and insert through dowel pieces in end of fuselage. Add the  $\frac{1}{8}$  in. diameter wing dowels, cementing in place.

## The Noseblock

Build up the noseblock from  $\frac{1}{4}$  in. sheet. Please remember the noseblock is a very important part of your model, so do make it accurately. It is not difficult if you take your time. Cement the spigot to the rear of the noseblock, and use a drill to accurately drill the hole for the 20 gauge brass bush. The two small discs of  $\frac{3}{32}$  plywood hold this brass bush firmly in place. You can obtain a small piece of scrap  $\frac{1}{8}$  ply from your hobby shop. See the spigot of the noseblock fits firmly into the opening in F1. Bend a winding loop (use a pair of sharp-nosed pliers) in a length of 20 gauge wire. Insert the wire through the 5 in. diameter K.K. plastic propeller (obtainable from your model dealer), slip a couple of cup washers on the shaft through the brass bush. Finally, bend a hook for the rubber motor on the end of the shaft. A spot of thin oil on the shaft will ensure the propeller revolves freely. Give the noseblock two coats of clear dope.

## The Wing

And now to the wing. The wing is built in two halves, and then cemented together at the centre ribs to complete. Pin the leading edge, lower mainspar, and trailing edge over the plan. Cut out 14 ribs from  $\frac{1}{8}$  sheet, slot them into position over the centre spar, cementing each firmly to it, and to the leading and trailing edges. Add the top centre spar last. When dry remove from plan. Make a left and right hand wing panel. Now very carefully make 'V' cuts (see building sketches) in the spars. Do not cut right through. Pin the centre section half to the board and raise the wing tip upwards (to give dihedral angle to the wing). Place under the

wing tip dihedral block piece Y. Pin piece Y to board, and tip rib to piece Y. Put cement into and around the 'V' cuts and allow to dry. Add the gusset pieces (see sketches and plan). Both wing panels are then joined together to form the completed wing frame. Sandpaper the leading edge to a rounded shape. Lightly sandpaper the whole frame and cover with four pieces of tissue, water shrinkage and doping as for the fuselage, but remembering to pin the wing panels to the building board, using little balsa blocks as shown in the construction sketches. Cement the two incidence pieces X under the ribs as the wing centre section. These are very important. Cover the top of the centre section with  $\frac{1}{8}$  sheet. Add former F3 and the fairing block. Give the centre section one coat of clear dope. The building of your MAGNUM is now complete. Hold the wing in place with two 2 in. rubber bands, and install the rubber motor as shown in the last construction sketch. The second article in Flight Plan 66 will deal with balancing, trimming and flying your MAGNUM—so, see you in a month's time!

## Materials List

- 2 lengths  $\frac{3}{8}$  in. by  $\frac{3}{8}$  in. by 36 in. balsa strip
- 2 lengths  $\frac{1}{4}$  in. by  $\frac{1}{4}$  in. by 36 in. balsa strip
- 1 sheet  $\frac{1}{8}$  in. by 3 in. by 36 in. balsa
- 1 piece  $\frac{3}{8}$  in. by 3 in. by 3 in. balsa sheet
- 1 piece  $\frac{1}{2}$  in. by 3 in. by 6 in. balsa sheet
- 1 piece  $\frac{3}{8}$  in. by 3 in. by 4 in. balsa sheet
- 36 in. length 20 gauge piano wire
- 1 20 gauge brass bearing bush
- 2 20 gauge cup washers
- 1 small piece of  $\frac{1}{8}$  in. plywood
- 1 KeilKraft (KK) 5 in. diameter two blade plastic propeller
- 1 biro refill tube (used)
- 1 (or 2 if a two-colour model is desired) sheets lightweight Modelspan tissue
- Small piece of notepaper
- Small piece of thin acetate sheet
- 6 in. length  $\frac{1}{8}$  in. diameter dowel rod
- 1 in. length  $\frac{1}{4}$  in. diameter dowel rod
- Linen thread
- 1 pair 1 in. diameter streamlined plastic wheels
- Length of electrical tubing
- 1 tube Balsa cement
- 1 tube tissue paste
- 1 tube rubber lubricant
- 1 36 in. length of  $\frac{1}{8}$  in. wide rubber strip
- 2 2 in. rubber bands
- 1 small bottle of clear dope



