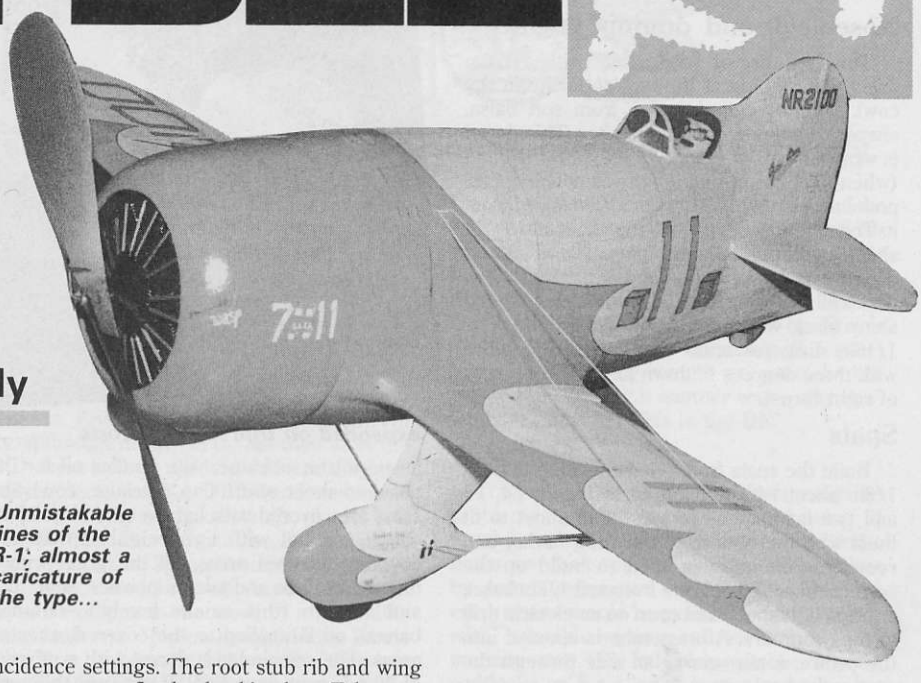
GEE BEE R-1

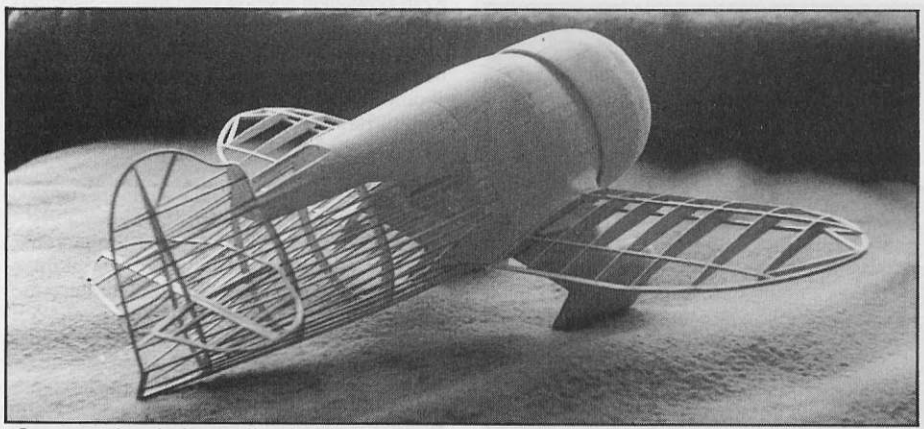
BUILD FROM OUR FULL SIZE PLANS!

Andrew Hewitt's roly-poly rubber powered 1/12 scale racer!



Unmistakable lines of the R-1; almost a caricature of the type...

I HAVE been designing, building and flying (not necessarily in that order) Scale rubber models for many years, always with a fresh challenge in mind. Many years ago I built a Peanut Gee Bee R-1 which flew very well indoors. Prompted by this success I progressed to this 1/12 version. The aim was to frighten the opposition at the Nationals. Flight trials proved the model's stability but a fast, downwind landing resulted in a damaged wing and removed all chances of qualifying.



Construction is basically simple. Take care with stringers!

The model is very accurate in outline and scores highly in Static, the only deviation from scale being the wing section. Flying qualities of the prototype are amazing. Though not a duration model it is very stable and flies safely even in brisk, windy conditions. You will find that your Gee Bee is built to withstand much fast flying (and punishment).

Build a barrel

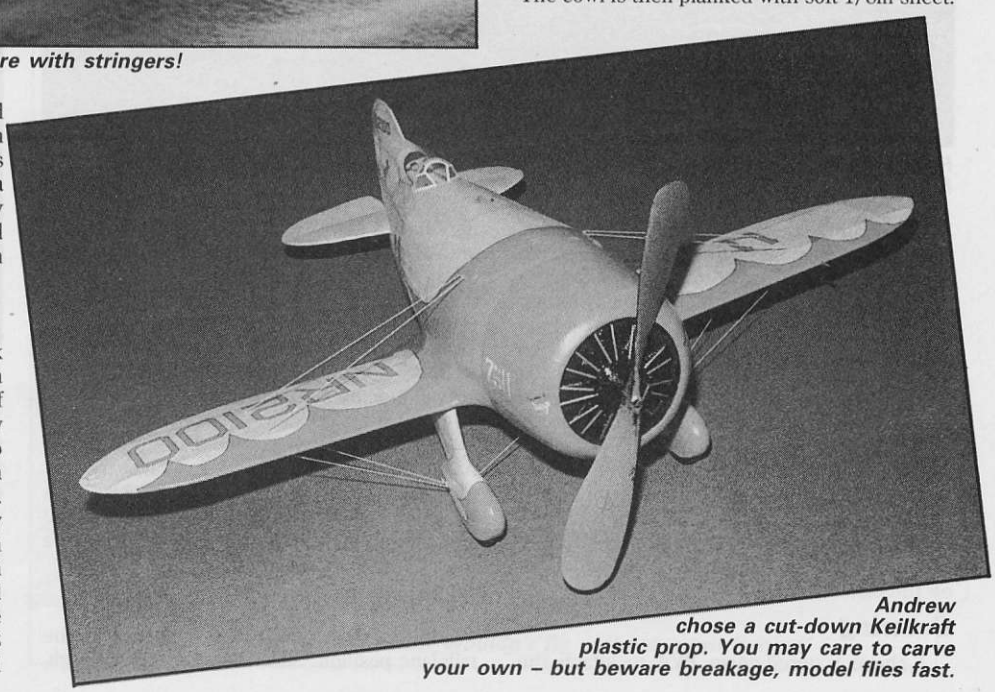
Cut out fuselage formers F3 to F8. Mark stringer positions and cut slots with a 1/16in file. Laminate tail outline from four strips of 1/32 x 1/8in sheet soaked in water for a few minutes. Pin round a card former and leave to dry for at least five hours. Cut top and bottom keels from hard 3/32in sheet and pin over plan. Locate half-formers F3 to F8, making sure they are perpendicular. When dry glue the 1/16in side keel in place. Carefully remove from plan and glue remaining half-formers in place. Add the second side keel. The fuselage will now be easy to handle. Fix the 1/32in ply braces to F3 and F4 (these ensure correct dihedral and incidence settings. The root stub rib and wing tongue are now firmly glued in place. Take care to align correctly on braces.

Now add all those stringers. Start adjacent to the side keels and work outwards, one side at a time to ensure the fuselage stays true. Now you really have a Gee Bee fuselage. Even though the stringers are only medium 1/16in sq, they add great strength.

Add the X formers between F3 and F4. Infill between them with soft 1/16in sheet, making sure the grain runs lengthwise for ease of bending. When sanded down this gives an excellent finish. Now begin the 1/32in sheeting. Start on the underside between F4 and F5, up to the root rib. Glue, with PVA, to the keels and formers only. Sheet the top decking back to F7 with light, straight-grained 1/32in sheet. Cut paper templates first. This saves lots of mistakes! The fairing at the rear of the wing is made from three pieces of soft 1/32in sheet.

Crack on with the cowling

Build up F1 from two laminations of 1/16in sheet, aligned cross-grain to give strength. Cut F2 from 3/32in sheet. A 1/16in box locates them in place, aided by the four formers Y. The cowl is then planked with soft 1/8in sheet.



Andrew chose a cut-down Keilkraft plastic prop. You may care to carve your own – but beware breakage, model flies fast.

Note that the planking extends beyond F2.

The front cowl is made from a series of 'polos' cut from soft 1/4 and hard 1/8in sheet. All are glued to the rear portion of the cowl and shaped as shown.

Noseblock and dummy engine

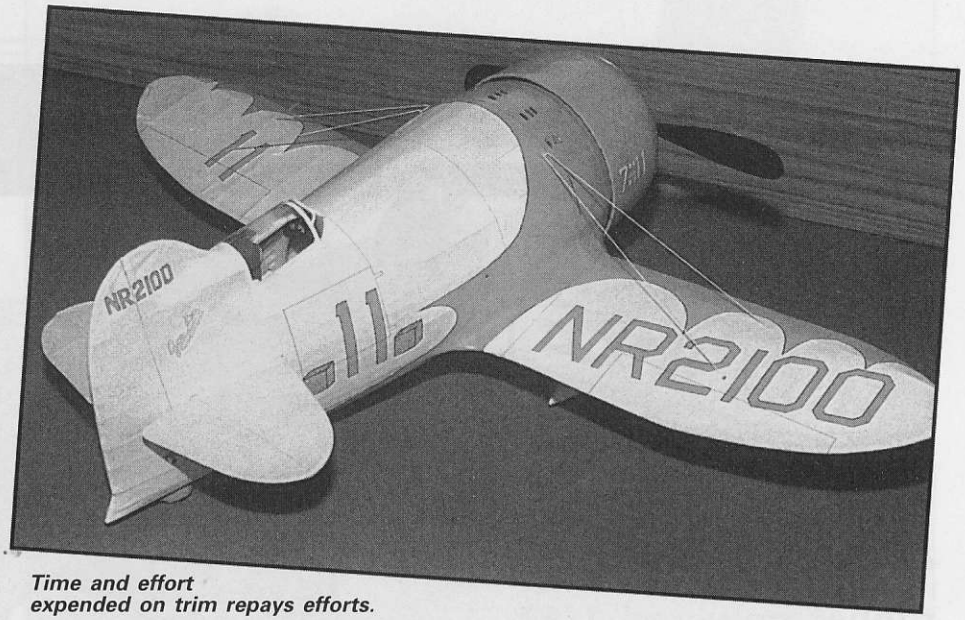
This is a disc of 1/8in sheet with a 1/8in sheet square plug at the rear to locate in the cowl. Dummy cylinders are from soft balsa, shaped to a dowel 15mm diameter. This dowel is wrapped with thread, covered with PVA and (when dry) cut in half lengthwise. The appropriate number of cylinders are then sliced from it. The crankcase is from 3/8in sheet and 1/2in sheet. Pushrods are from pins. The engine is doped with banana oil containing talcum powder to fill the grain, sanded smooth and painted shiny black with matt black background. The 1/16in diameter brass tube is fixed in place with three degrees of down and three degrees of right thrust.

Spats

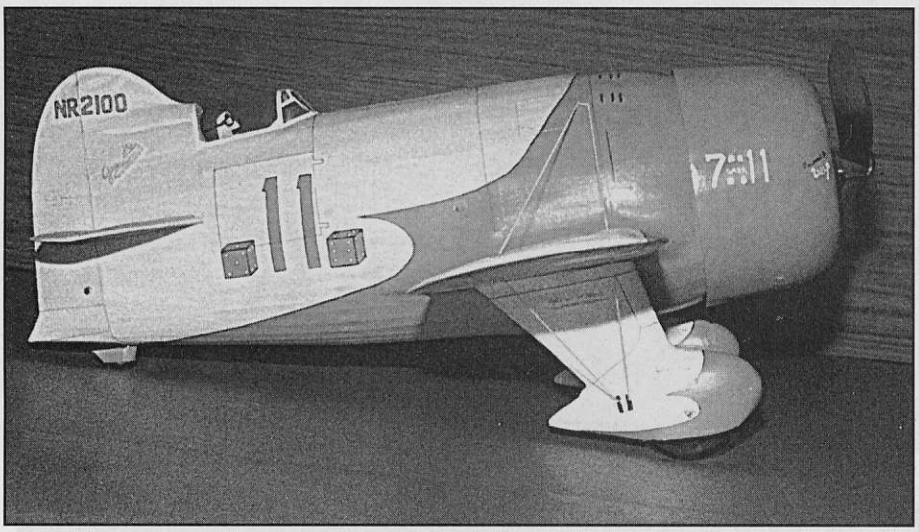
Build the spats from one lamination of hard 1/8in sheet with notches to locate on F4, F5 and two laminations of soft 1/8in sheet to fit flush with the bottom of the wing fairing and root rib. Soft balsa is used to build up the correct shape. Wheels are from soft 1/2in balsa, cut to rough shape and spun on an electric drill to final contours. A brass tube is epoxied into the centre; a pin acts as an axle through the spat and wheel.

Wing and tail

After all that work, the wing and tail are easy to build. Cut card formers to tail and wing tip shapes, then pin them to the building board.



Time and effort expended on trim repays efforts.



Rotund fuselage could easily accommodate Z-Model CA tank. Anyone care to try this form of power?

Soak 1/32in medium soft sheet pieces in lukewarm water, wipe off excess, glue together, pin round formers and leave to dry. This process is easy and produces light, enormously strong tips. When dry, separate from formers and pin down over the plan with trailing edges. Fit ribs and leading edges, followed by the 1/8in sq spars. Remove from plan when dry and glue bottom spar in position. Do not omit gussets.

Wing boxes are built from 1/32in sheet and 3/32in sq balsa. Pin in place and assemble onto wing tongues for correct alignment before going permanently in place. Roll a paper tube around a length of 16g wire and glue with PVA. Cut to correct length and glue in position as shown on the plan.

Covering

I chose watered-down PVA to attach the tissue to the airframe, with banana oil for the tissue-to-sheet stuff.. The fuselage, cowl and spats are covered with lightweight modelspan; wings and tail with lightweight Jap. Before covering sheeted areas, fill the grain with a mixture of dope and talcum powder. Sand nice and smooth (this smells lovely!). Thinned banana oil is applied to the covered, sheeted areas. The remainder is doped with a mixture of 30 per cent dope and 70 per cent thinners. Three coats should be enough for the wings and up to six on the fuselage will fill the tissue grain.

The model is now ready for painting. You could decorate just with plain tissue but nothing beats a good paint finish. Spray the white areas first with white enamel. Carefully mask off the red areas. A useful tip is always to spray away from the masking tape; this reduces the chances of the paint running beneath the tape. Matt red enamel is used.

Spray some Jap tissue matt red. Registration and racing numbers are cut from this with a very sharp knife and steel rule. Sandwich the required number of pieces of tissue between two pieces of stout paper. This reduces the risk of tearing the tissue. Glue trim in place with watered-down PVA and it will look sprayed on! The thin black separation line is applied with a fine, 'permanent' felt tip pen.

Assemble your racer

Make a fine cut in the covering at the tailplane position. Slide the elevators through, followed by the tailplane which may now be glued in place. Elevators are fixed to the tailplane with spots of PVA to allow adjustment. Tinplate hinges may be used if you prefer.

The spats are glued in place with plenty of PVA. Epoxy rigging hooks to the spats and upper fuselage. Rigging wires are from shirring elastic. This passes through the wing tubes but allows the wings to knock off if necessary. Lastly, the entire aircraft is given a fine coat of sprayed fuel proofer to give a shiny finish overall.

Prop and rubber

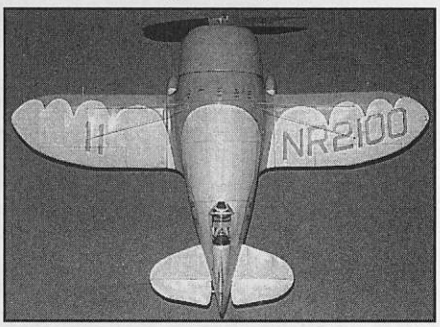
My choice was a cut-down 'large' plastic Keil Kraft propeller. A wood prop may be used but it might be vulnerable, for this model flies fast!

Two small washers fulfil the purpose of bearings. No freewheel is incorporated as you should not expect this type of aeroplane to glide... Power came from four strands of 1/4in flat FAI rubber, between 20-24in long and pretensioned.

Flying

Test gliding is pointless. Use low-powered flights to trim the model.

Check there are no warps, then balance the Gee Bee on the Centre of Gravity position. With the quoted thrustline settings the Racer should be docile in the air. If a strange tendency to fly on a 'left' knife edge occurs, trim this out with tip weight on the right wing. On low powered flights (about 100 turns) a very wide right turn should be achieved. Straight-line flight is quite possible!



Full-size R-1 (and R-2) had unhappy racing careers. Not so this 25in span scale replica so go ahead with yours!

My prototype was flown nose-heavy with plenty of 'up' elevator, making it easy to trim. All-up weight is 5.1/2oz. The Gee Bee flies fast and covers plenty of ground. It has ended in a tree, twice...

Now get racing!