LEPRECHAUN TWO

MASTER PLAN

50 years on - 67in span version of Dic Twomey's classic glider design.

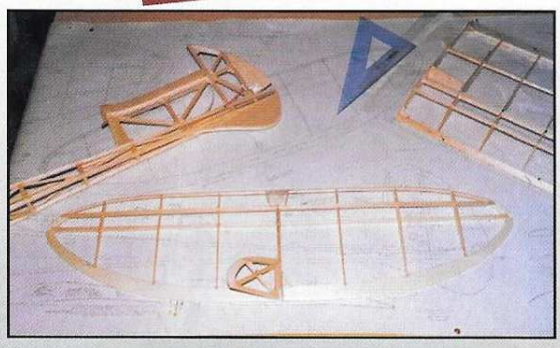
When AeroModeller published the plans for the mighty 103in. span *Leprechaun* in March 1950, they began the birth of a legend: for the next couple of decades its sheer size was inspirational to many, and it was indeed a dream to fly. Nothing else, it seemed, came close – for not only was the span greater than almost anything else in the then-revered Plans Handbook, the low aspect ratio and l-o-n-g fuselage meant that it dwarfed lesser designs.

And yet, this was NOT the original Leprechaun: that honour fell to a model just one third the size of the published design, while *Leprechaun Two* as presented here, was designed in 1949 as a twice-sized version of the original, giving a much more manageable size. After all, at the time the big *Leprechaun* was built, Dick Twomey was an 18-year old schoolboy, and his transport was simply a bicycle, though he did later graduate to a Fiat 2-seater. Still not the best way to transport the big `un!

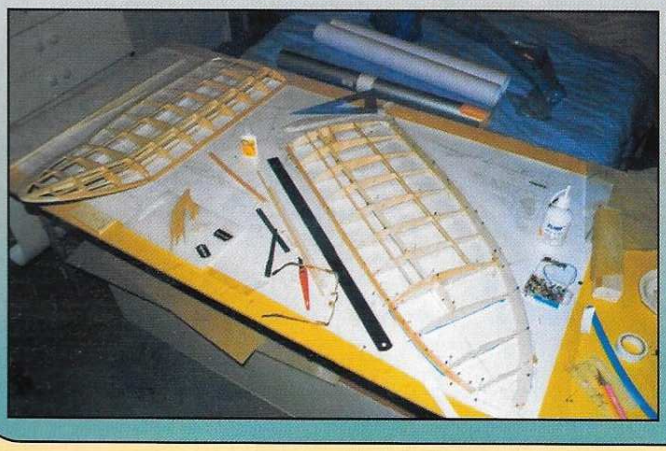
Incidentally, there were five different 'Leps' in total: in addition to those already mentioned, there was a one-and-a-half and a two-and-a-half times version designed between June and September `49. *Leprechaun Two* has a similar wingspan to an A/2 glider of that period, but with its 6:1 aspect ratio, a lot more wing area!

Events like National Service in the RAF conspired to pigeon-hole large model aeroplane flying, though Dick continued to fly smaller models. While a fifty year wait between design and publication may seem a little excessive (!) at least you can build one safe in the knowledge that it is well proven. And that the *Society of Antique Modellers* 'SAM 1066' confirm

The lad `imself: Dick Twomey on one of his many visits to the UK from his home in Mauritius. With an aspect ratio of just 6:1, there's plenty of wing area - so make sure you fit the D/T, even though they weren't used 50 years ago. This version is covered with heavyweight tissue.

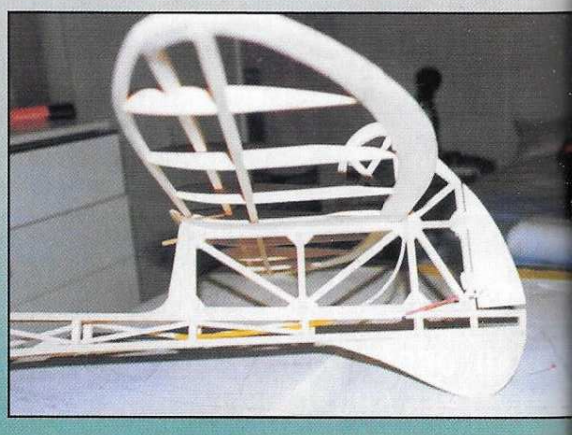


Far left: construction under way by mak first fuselage side. progress! Fuselage has geodetic spacer fin. Note angled ro on wing and foldin



Left: scrap balsa supports are placed under the front of the ribs and front of trailing edge to keep profile correct. Split and re-cement leading edge at tips to curve.

Right: R/C 'snakes' and horns make life easy! White tube guides the D/T line, yellow tube the rudder operating line.



that it is eligible to compete in their Vintage flying events. There's even a *Leprechaun Trophy* to be competed for at their European Championships, which take place at Middle Wallop in Hampshire over the 20-22 August `99.

You'll find it well-sized, the longest part is the 57in. long fuselage which fits in the boot or across the back seat of most cars. The two-piece low aspect-ratio wings are even less of a problem to stow.

Now based in Mauritius, Dick is a frequent visitor to the UK, and built the example illustrated here during January this year in his Southsea flat, without the benefits of a modeller's workshop at his disposal. It's a simple design, and only basic tools are required. Dick takes over the story…

Although this aircraft takes a fair amount of balsa, the cost is not excessive even at today's prices. Visiting *Flitehook*, I parted with around $25 for the Lep's balsa and ply, and perhaps another $7 for wire and heavyweight tissue. Add a D/T timer (please!) and you've some idea of the material costs, up to the doping and finishing stage.

Having bought the goods, the next requirement was a large-ish, flat, building surface -and I don't recommend the floor! I laid a 6x3ft. sheet of 3/8in. softboard on top of a wall papering table, supporting the table's sagging middle with model boxes, etc. You do need to spend some time levelling the whole thing, as you don't want a long bent fuselage, and the wings once built will not twist. I aimed to build flat, but found a little washout in one wingtip, which made the decision as to which way it would circle!

Fuselage, fin and tailplane

The basic fuselage is simple to build, although it is of course necessary to splice some 1/4in. strips together to form the longerons. Where there is a tight curvature e.g. at the nose, split the strip longitudinally and re-cement in position. Add the geodetic strips before lifting the sides from the board, they help to keep the decolage (wing/tail incidence difference) correct, and will also help later to resist any tail-twist. Put the two sides together, inserting the spacers, square-up and then cement the top and bottom geodetics in position.

Adding the pylon, which is laminated above the fuselage top, is straightforward. Check carefully that the incidence is correct.

When making the fin and rudder, keep checking that everything in the 'vertical' is aligned. The forward top fin is attached to the tailplane, and for ease of transport I hinged mine to fold sideways when out of the flight regime. The folding fin is kept lined up with the rear fin by gluing a tiny piece of celluloid on the hinge-side of the fixed fin.

The tailplane is easy and of symmetrical section, as on all Leprechauns. Nick the trailing edge slightly off-centre to allow the D/T line to pass beside the tailplane-attached top fin.

Wings

There are only 24 ribs, so cutting them out is not laborious. Start the construction by fixing one main panel's leading and trailing edge to the board, supporting the ribs and trailing edge as indicated on the plan. This will maintain the profile of the Isacson (mod. Twomey) wing section. When inserting the top spars, allow for the leading edge sheeting, which will be put on later. Angle Rib 1 and Rib 8 to match the dihedral. When the glue for the top spars is fully set, lift the wing panel from the board and add the lower spars, again allowing for the later sheeting.

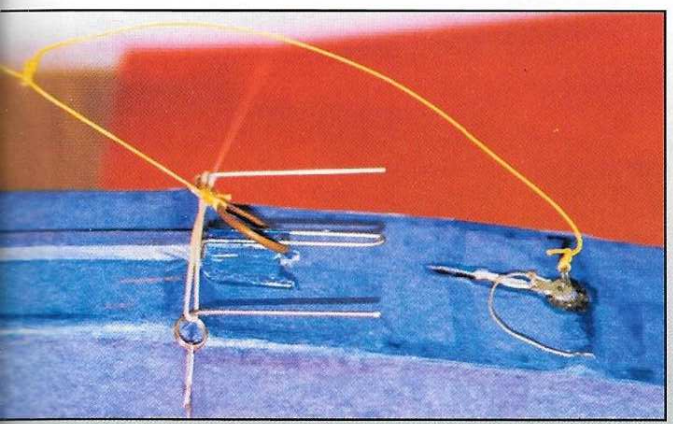
Now build the matching tip panel, splitting and re-cementing the L.E. to achieve the curvature. When complete (top and bottom) mate the tip panel to the main panel at the tip dihedral angle, and strengthen the joint with the rib fillets and ply dihedral keepers.

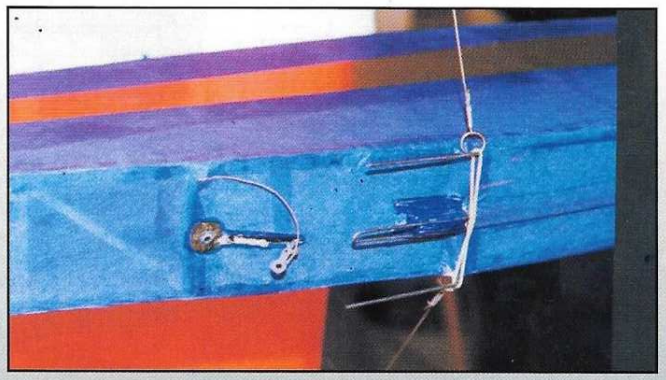
After bringing the other wing to the same stage, and again before adding the sheeting which forms the leading-edge box, it's time to place the port and starboard together and fit the wing joiner wires brass tubes. Do this with the joining wires inside, or my cousin Murphy will ensure that the two halves do not mate!

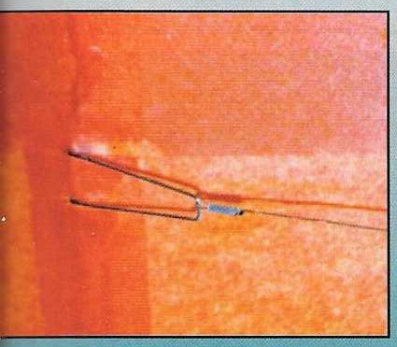
With main panels again flat on the board, add the leading edge sheeting to the top surface. When set, lift - but before sheeting the undersurface it is advisable to form, bind and cement the wire attachments for the bracing wire at the Rib 8 (tip dihedral break) position. It is difficult to do the binding (I use a strong thread/light towline) when all the sheeting is already in position. Then fix the lower sheeting last, then polish-up the aerofoil profile by sanding the leading edge as necessary.

D/T and Autorudder

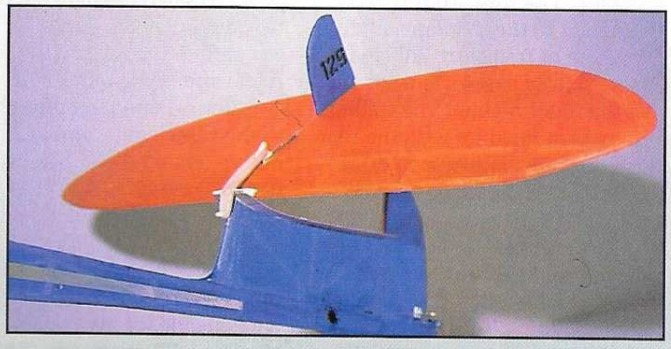
My system is only one of a series of options, so by all means use your own preferred methods for timer release, and operation of rudder and dethermaliser. None of these were fitted to the original

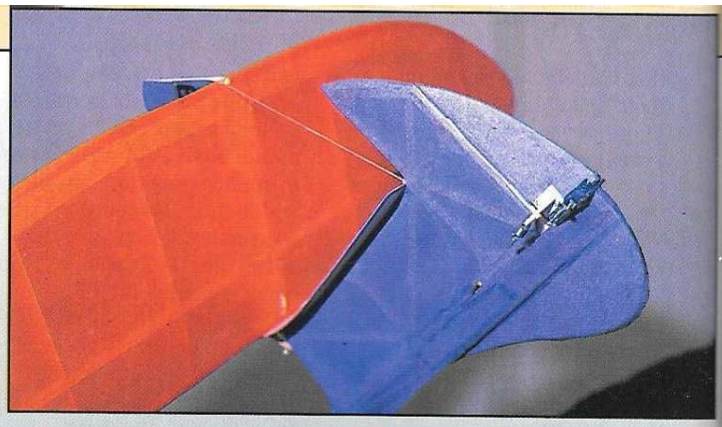


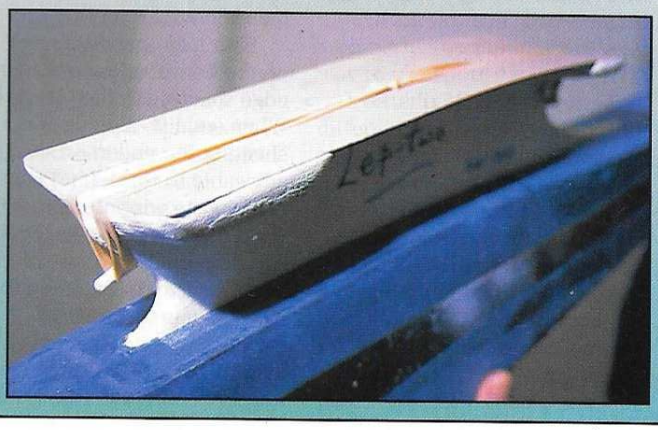




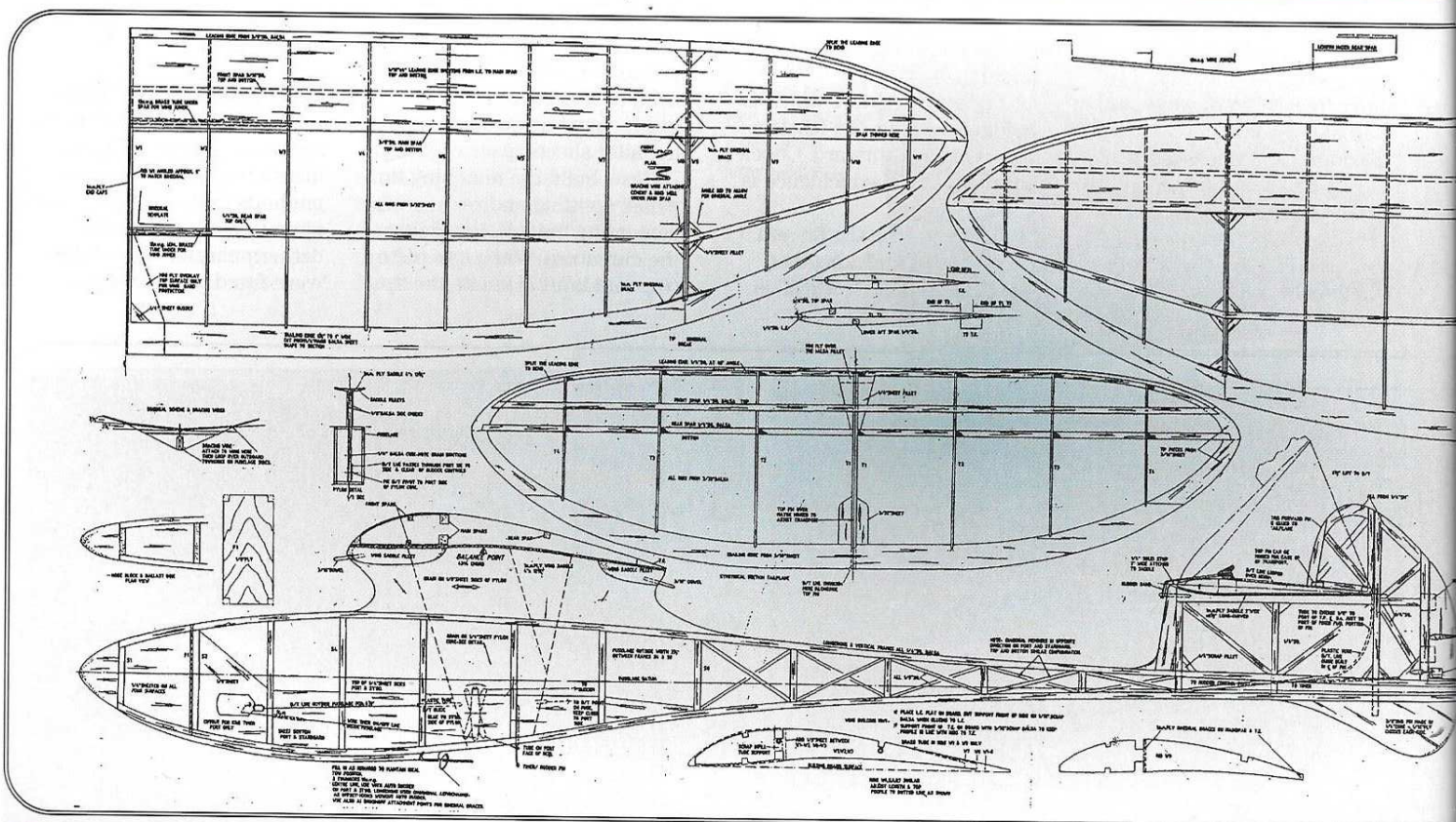
Above left: note wing bracing wires secured to outer tow hooks with rubber bands. Tow ring is shown on central hook, with yellow loop from towline connected to pin in tube, to operate timer and autorudder on release. Above right: with towline released, pin has been pulled from its tube to operate timer/rudder via internal control pivot. Line from timer/rudder release is to prevent it from dropping inside fuselage. Left: wing bracing wire hook attachment - cover with foam during transport or suffer tissue rips! Right: Top of fin is hinged to tailplane to ease packing/transport problems.

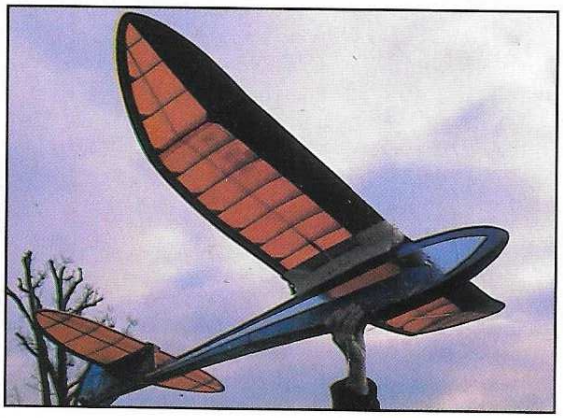


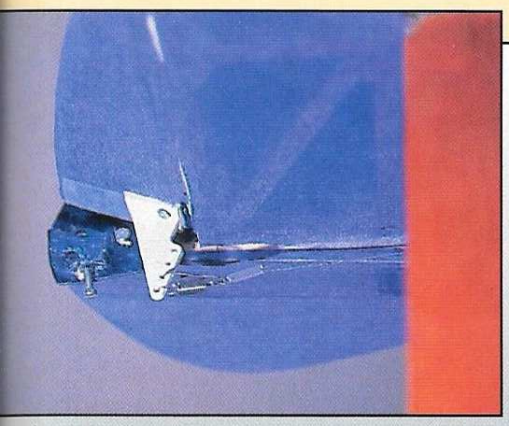




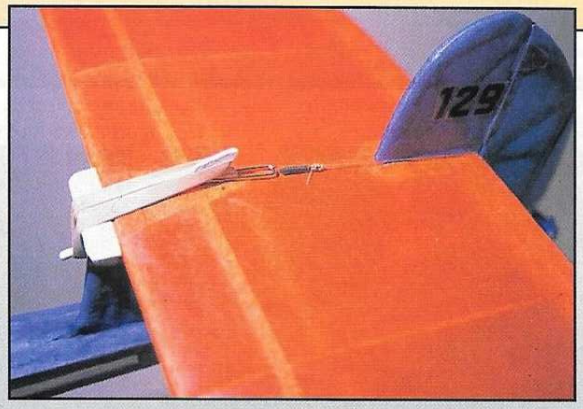
Above: tip-up tailplane dethermaliser may not be original - but it is essential in today's environment. Left: notches in the trailing edge just outside the wing join point prevents rubber bands slipping between the wing halves. Right: balsa block under wing platform gives added strength.



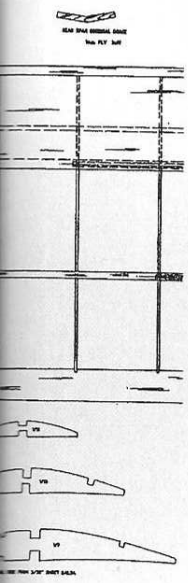




Left: autorudder is simple and effective. Right: tailplane is tensioned by the rubber band, and held in the normal (down) position by the dethermaliser line leading back to the timer.



Left: dethermaliser line ring to fuselage sets the limit to tailplane tip-up for D/T action. The KSB 'off' line goes into the fuselage to the control pivot inside. Note the two cocktail-stick pins at the wing leading edge to prevent the retaining rubber bands slipping into the gap between the wing halves.



Full size copies of this plan are available from AMI Plans & Parts Service, Model Activity Press Ltd, 5 George Street, St Albans, Herts AL3 4ER, England. Price £10.00 including p&p.

Leprechauns anyway, but are of course permitted under Vintage rules now. To guide the control lines at fuselage entry and exit points, I've found R/C plastic tubing ideal, and on this size of model R/C rudder horns are also not out of place.

Finishing

I used the modern equivalent of Heavy Modelspan. and needed five sheets (30 x 20in.) for the wings, one for the tailplane and two for the fuselage and fin.

Approximately two and a half ounces of nose-weight will bring the balance point to the planned position and the total weight to approximately 2 lbs, then you can get trimming. If you want to 'go back a bit in time' try a model like this on the 250ft. towline permitted by the BMFA, or the even longer 328ft. used by SAM 1066. It's another world!

Materials List

Balsa sheet (36 x 4in.)

1/16in.	- 4 off
1/8in.	- 1 off
3/32in.	- 3 off
3/16in.	- 1 off
1/4in.	- 3 off

Balsa Strip (36in.)

1/8x1/8in.	- 3 off
3/16x3/16in.	- 4 off
1/4x1/4in.	- 18 off
3/8x3/8in.	- 2 off

Miscellaneous:

Small amounts of 1/32in.,1/8in and 1mm ply. 12swg (or equivalent) piano wire and brass tubing. Small amounts 18 and 20swg piano wire. Four feet of bracing wire.