

TRIXIE

MIKE KEAY WIPES A TEAR THEN, WITH A LICK OF HIS PENCIL AND THE BACK OF AN ENVELOPE, GETS TO GRIPS WITH HIS LATEST DESIGN, A 40" WING SPAN SPORTS MODEL WITH VINTAGE APPEAL

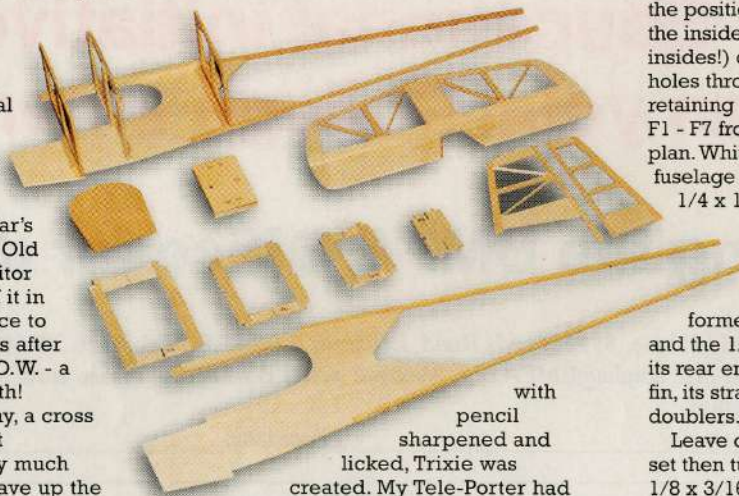


Early days in construction. Mike's no-nonsense design approach makes for a pleasurable build.

It was a wonderful model, one of those which was completely reliable, was enjoyable to fly, and in which you had total faith. It clocked up over 2500 flights, around 500 hours... then it happened. At last year's Vintage Weekend at Old Warden a certain editor captioned a photo of it in RCM&E with reference to wood worm - and this after 10 years or more at O.W. - a veritable kiss of death!

One flight too many, a cross wind, a touch of pilot complacency and my much loved Black Magic gave up the fight.

My wife Bobbie said, "Build another" but however well another was built, it could never replace the 'family pet' with its 'used' and oil soaked look. So out with the traditional back of the envelope and



with pencil sharpened and licked, Trixie was created. My Tele-Porter had proved to be a stable flyer and had many characteristics I liked, so a mini version was planned, 3 channel, 40" wing span, easy to construct and cheap to build with a .10 size engine up front. It was built and test flown before the Nexus 1999 New Model

Design extravaganza at Old Warden where it received third place, so some people must have liked it!

SITTING PRETTY

The model, as can be seen from the photos, turned out to be quite pretty and sits tidily in the sky as it potters around on idle throttle. It's capable of modest, positive aerobatics with the rates out and will loop, roll, Cuban 8 and stall turn with the best of 'em. It's too early in its evaluation to have tried much more but its responsiveness shows promise. Construction is very straightforward and should give little cause for concern to even the newcomer to plan building - so here goes...

FUSELAGE

Start by making up the fuselage sides from medium grade 1/8" sheet balsa, joining at the datum; when dry, add the top and bottom 3/16 x 3/16" obechi, spruce or hard balsa longerons. Mark the positions of the seven formers on the insides (check that they ARE the insides!) of each assembly, and drill holes through both sides for the wing retaining dowels. Make up the formers F1 - F7 from materials shown on the plan. White glue F2, 3 and 4 to one fuselage side reinforcing the join with 1/4 x 1/4" triangular section. When dry, glue on the second side, preferably using a jig, making sure all is square. Next add the remaining formers, the wing retaining dowels and the 1/8 x 1/2" top spine slotted at its rear end to accept the bottom of the fin, its strake and the wing seat doublers.

Leave overnight for all the joints to set then turn the fuselage over and add 1/8 x 3/16" Warren bracing between F4 and F7 on both sides and 1/8 x 1/8" to the bottom between the formers. Make up and fit the 1/8" sheet infills above and below the stabiliser leaving a 3/16" slot for later fitting. Note that the stern post is part of the fin construction and will be fitted later.

Measure and cut the rear undercarriage plate from 1/8" birch ply and, before epoxy gluing it to the fuselage, drill 6BA clearance holes for the saddle strap bolts and their blind T-nuts. When in place the adjacent 1/8" sheet balsa floor between formers 3 and 4 can be added.

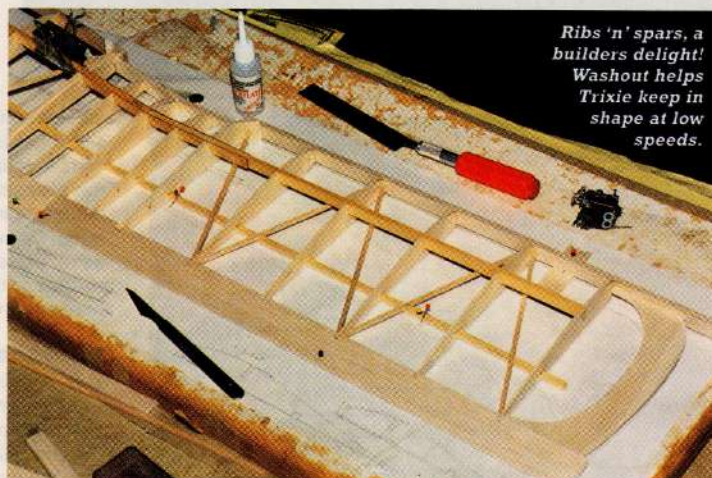
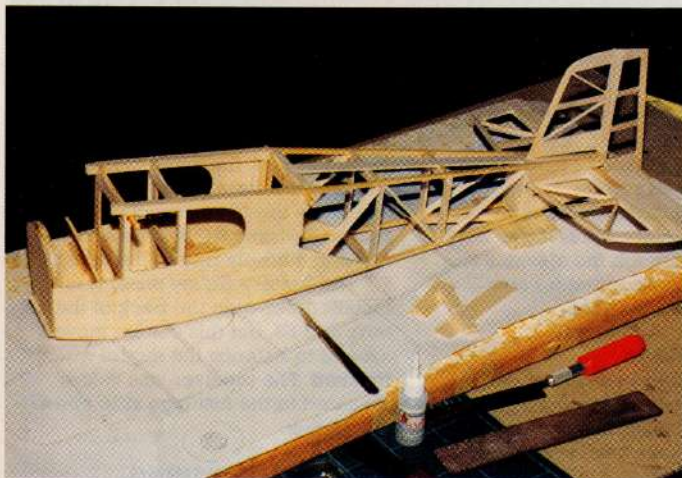
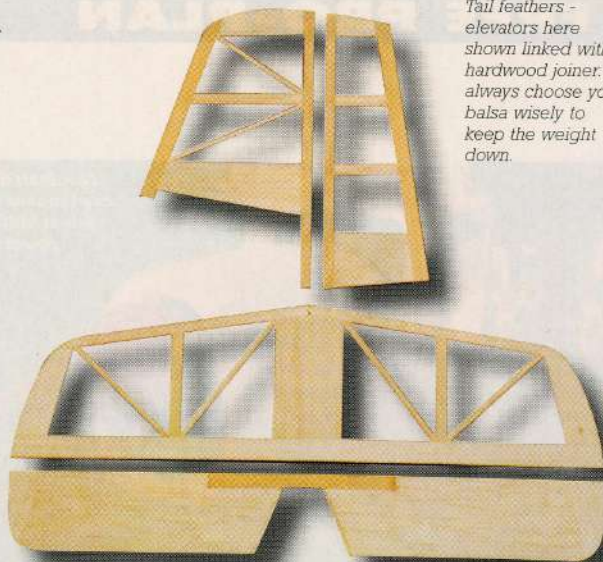
By now the fuselage rear end should be strong enough to allow us to tackle the front. We need to build in a couple of degrees of right thrust to F1 so the starboard balsa side sheet should be shortened by 1/8". The sides between F1 and F2 should be pinched together slightly to meet up with F1. This didn't prove difficult on the prototype but, if necessary, soak the outer surfaces with warm water to which a drop or two of washing up liquid has been added, holding the pinch in with wing bands, masking tape or similar, until dry.

Consider the tank location next. I used a home-made tinplate one of

the engine used. The prototype one was located to F1 with four 3/16" birch dowel pegs. To prevent wear and tear on the cowl rear face, I prefer to make a 1/32" or 1/16" birch ply rear former slightly oversize to fit the front face of F1. Dowel holes can then be drilled through this and F1 to give perfect alignment. The centre can be whittled away to allow the cowl to fit from the front, over the engine and associated bits and pieces; apertures shaped in the front and bottom allow cooling air in and out.

I chose to fit the engine muffler through the cowl side after the cowl was fitted to the fuselage, a very tidy arrangement. Two holes were therefore drilled through the starboard side of the cowl so the muffler screws could be accessed. The roughly shaped cowl and its rear glued-on former can now be white taped into position and the cowl, its former, fuselage sides and

Tail feathers - elevators here shown linked with a hardwood joiner. As always choose your balsa wisely to keep the weight down.



Ribs 'n' spars, a builders delight! Washout helps Trixie keep in shape at low speeds.

about 3oz capacity but 4oz would be better with hindsight. The tank lies comfortably between F1 and F2 and under the dashboard former. Remember to position the top about 10mm above the carburettor spray bar line to prevent unnecessary engine flooding.

Whilst the 'Fairy' is doing its stuff you can concentrate on a few calculations and measurements to work out where the engine mount will fit on F1 so the muffler will lie neatly alongside the fuselage. I had to cant my engine slightly for this to work. Holes also need to be positioned for the fuel tank plumbing and the undercarriage saddle clamps. When you're satisfied that all is O.K., F1 can be epoxied between the sides. Behind F1, 3/8" x 3/8" triangular section gives additional strength to the front end as does the 1/4" flooring. The front is completed with the positioning of the dashboard former, such that there is slight upward slope towards the cockpit. Test for shape before gluing on the 1/8" soft balsa front decking. This can be planked or sheeted.

COWL

This is made up from laminations of 3/8" and 1/4" soft balsa sheet to suit

top/bottom decking can be shaped to a pleasing outline. Tack the cowl hardwood mounting blocks in place on F1 with cyano then position them finally with small screws and epoxy. Strengthen the holes in the cowl with thin



cyano and / or sleeve them with plastic tube. A sliver of snake outer works well here.

WINGS

These are of conventional construction using medium grade balsa for the leading/trailing edges and rear spar with a 1/8 x 1/2" obechi or spruce main spar.

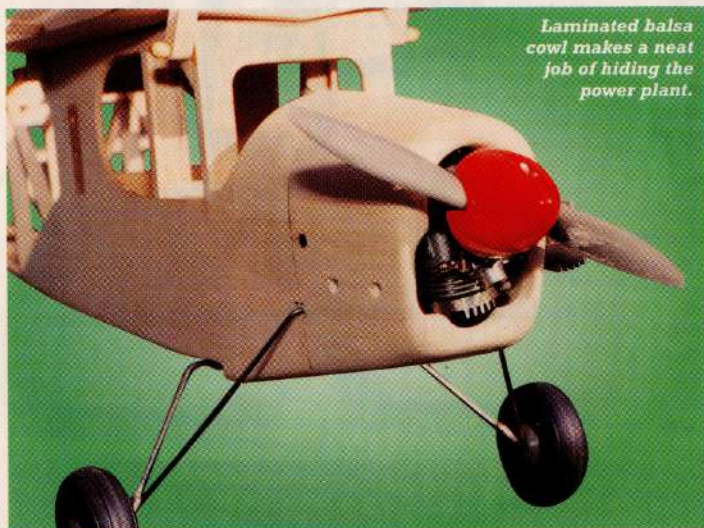
The sheeted centre section lies back about 1/2" which gives some character to the overall design and a tidier hold for the rubber bands.

Medium density 3/32" and 1/8" sheet is used for the ribs although 1/16" could be substituted for the outer ones. Whatever's used, the ribs are best shaped using the sandwich technique. The centre section ones can then be reshaped as shown on the plan. Some washout is incorporated into the wing so that the incidence reduces towards the tips and this helps to control any tendency to tip stall at low speeds. A block is shown on the plan and is used under the trailing edge during construction to build in the 'warp'.

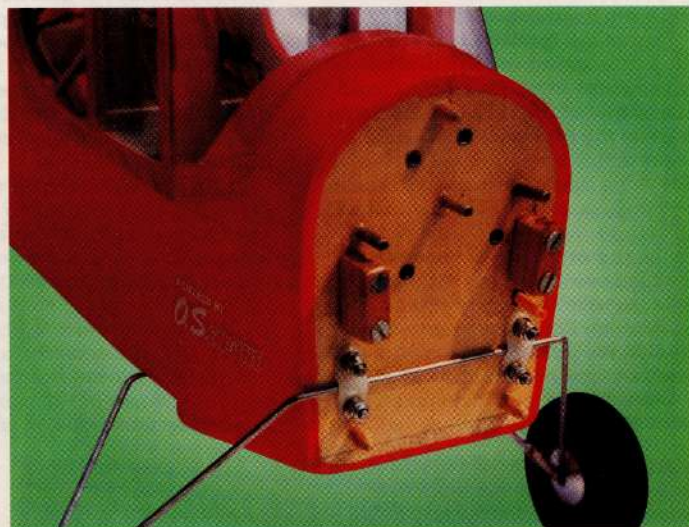
The wings go together quite quickly. Tackle the trailing edge first by cutting slots to accept the rear end of the ribs, then pin this down on the plan using the washout block mentioned above. Cut out the dihedral braces from 1/16" birch ply and epoxy to one of the spars. You'll need to enlarge the rib spar slots in the centre section to accommodate these. Lay out the leading edge and both spars, then fit the ribs including

Fuselage well under way, unmistakable vintage lines already evident.

Raw deal - Trixie gets an airing without her finery... no way to treat a lady!



Laminated balsa cowl makes a neat job of hiding the power plant.



Plumbed in and ready for engine trials. Remote needle is a sensible safety precaution and helps keep a clean profile.

(TOP RIGHT) Bulkhead ready to accept the motor. Note the offset mount position, in order to put the exhaust in the right place.

the reshaped centre section ones. Remember that the root rib needs to be canted to allow for the dihedral, there's a template on the plan to make this easier. The Warren cross braces between the ribs ensure that the built in warp stays where put. The other wing can now be constructed in the same way and offered up to the first, epoxy joining at the main spar, leading and trailing edges.

The wing tips are made from a white-glued laminate of three 1/16" sheets; two of diagonally grained soft balsa, opposed either side of a 1/16" birch ply core. A good 'ding resistant' formula; the tip fillets are from 1/8" sheet. The 3/32" balsa centre section sheeting is next, over the ribs on the top and flush with ribs on the bottom. The leading edge centre section fillets are made from 1/2" x 1/2" triangular section balsa. These make covering much easier. Sand the leading edges to shape, lightly sand over the completed wing and it's finished. Easy wasn't it?

WAGGLY END

The tailplane construction is very basic with built up stabiliser, fin and rudder, using 1/8" sheet elevators joined with 14swg piano wire. The fin slots into the fuselage top spine and its trailing edge also forms the

fuselage sternpost. It's fitted after the stabiliser is slotted into place. Use your favourite method of hinging for the elevators and rudder. I used centre sewn Solartex (M&M type) for mine. Commercial control horns were used, bolted through the elevator and rudder with the surrounding area hardened with thin cyano.

UNDERCARRIAGE

This is a simplified version of that used on previous designs of mine featured in RCM&E, Tele-Porter and Chunkie 92. These have proved highly durable and easy to remove, repair or replace. The 12swg main leg is saddle clamped to the fuselage ply bottom plate and the 14swg strut to the front of F1. Note that the front leg is bent almost back on itself at the bottom end before wire binding and soft soldering to the main leg. This is easily accomplished by heating the last inch or so in a gas flame or blow torch until red hot then allowing it to cool slowly. This softens the metal and makes the bending easier. But before doing so, clean the softened area back to bright metal, it won't solder otherwise. The retaining saddle clamps are bolted into secure blind "T" nuts that make for easy removal if necessary. A ground clearance of about 3" gives rigidity and good tracking. 2.1/4" wheels were used on the prototype but if your patch is a bit rough, lightweight 3" might be better.

The 16swg steerable tail wheel bracket, glued into the leading edge of the rudder, terminates at a 3/4" wheel which gives excellent ground handling.

RADIO TIMES

The prototype used a Jeti Rex 4 micro receiver driving Topaz 1000 mini servos and powered by a 250 mAh battery which gives about 1 hour of flying with my set up; occasional 'top ups' from an SM Services field charger offers more confidence. The complete flight pack was range tested for compatibility with my

Futaba computer tranny before installation, and all worked well. Pushrods from the servos to the flying surfaces are from 16swg piano wire, whilst the throttle connection is made by small plastic snake. The servos are fitted to a liteply tray to the rear of F3. The battery (in my case) was installed between the back of the tank and F3, but this can be moved around to balance the model when finished. The receiver was Velcro mounted to the fuselage side above the servos.

COVERING, FINISHING...

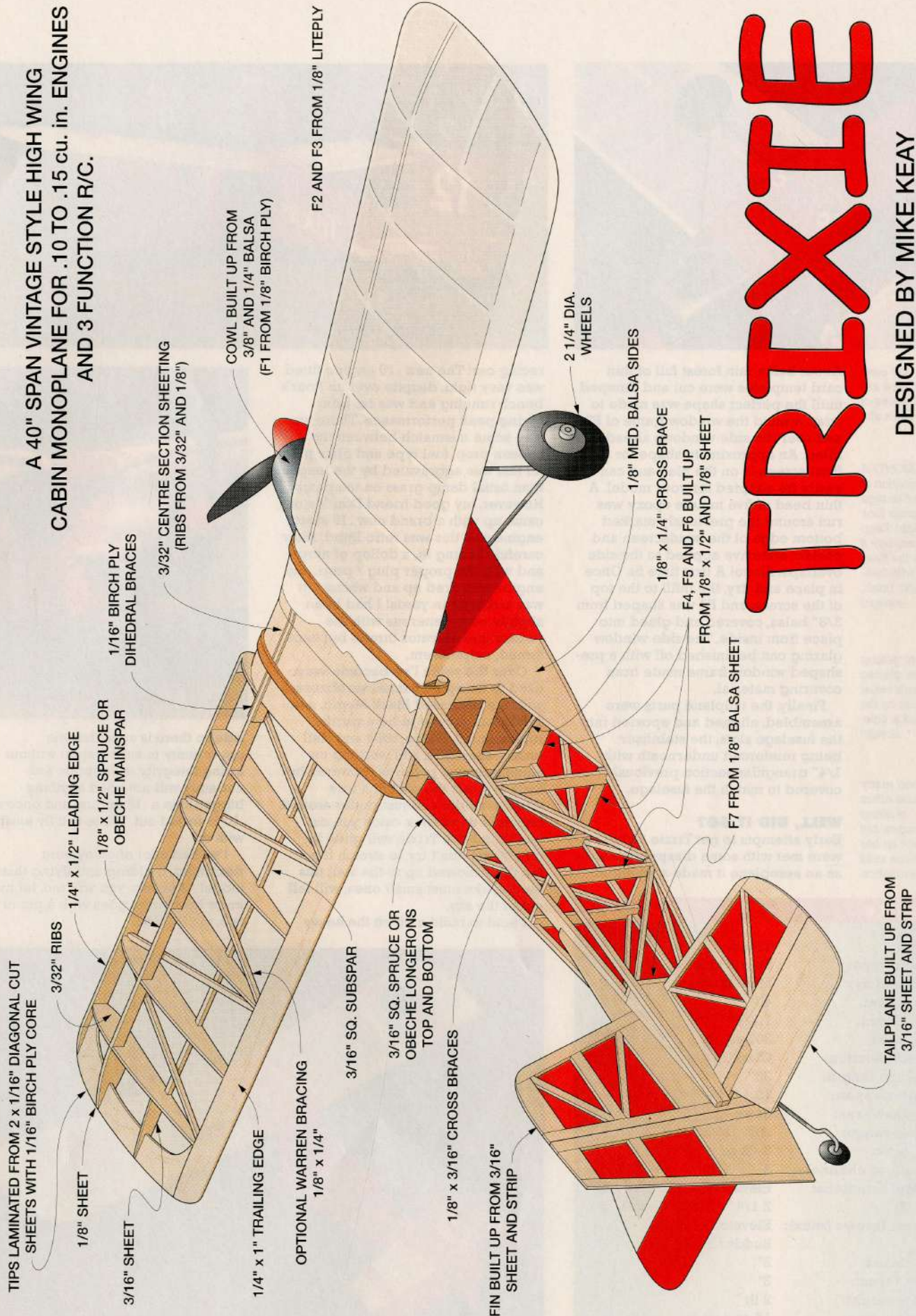
I thought long and hard about the covering material - Litespan, Solarfilm, Fibafilm, in the end I opted for Solartex in natural and vintage red. Yes, I know it's heavier than all the others but it looks right and very 'vintagey'. Those who are on a weight watcher programme will probably go for something lighter - 'sup to you!

I used a water-based clear acrylic fuel proofer from those nice people at FMK. This is the first time I've used this comparatively new product. Thinned slightly with water, the coating went on a dream with no brush marks. Although it looks milky when applied, it dries to a super clear finish and FMK tell me they've tested it using up to 60% nitro without it breaking down.

Now, I have to admit, I love designing, building and covering but I really hate glazing. I know how to do it and can empathise with Gerard Feeny's article in a recent RCM&E, but there's still the fear of making a b***s of it and spoiling a beautiful model. You have to do it right first time and that's the worry.

I chose to make up the wretched clear bits in three pieces. Acetate sheet was cut to suit the two side panels with a 1/4" overlap to the fuselage sides along the bottom and rear. These were carefully glued in place with contact adhesive. The front screen proved (as expected) rather more difficult.

A 40" SPAN VINTAGE STYLE HIGH WING
CABIN MONOPLANE FOR .10 TO .15 cu. in. ENGINES
AND 3 FUNCTION R/C.



TIPS LAMINATED FROM 2 x 1/16" DIAGONAL CUT SHEETS WITH 1/16" BIRCH PLY CORE

1/8" SHEET

3/16" SHEET

3/32" RIBS

1/4" x 1/2" LEADING EDGE

1/8" x 1/2" SPRUCE OR OBECHE MAINSPAR

1/16" BIRCH PLY DIHEDRAL BRACES

3/32" CENTRE SECTION SHEETING (RIBS FROM 3/32" AND 1/8")

COWL BUILT UP FROM 3/8" AND 1/4" Balsa (F1 FROM 1/8" BIRCH PLY)

F2 AND F3 FROM 1/8" LITEPLY

2 1/4" DIA. WHEELS

1/8" MED. Balsa SIDES

1/8" x 1/4" CROSS BRACE

F4, F5 AND F6 BUILT UP FROM 1/8" x 1/2" AND 1/8" SHEET

F7 FROM 1/8" Balsa SHEET

1/4" x 1" TRAILING EDGE

OPTIONAL WARREN BRACING 1/8" x 1/4"

3/16" SQ. SUBSPAR

3/16" SQ. SPRUCE OR OBECHE LONGERONS TOP AND BOTTOM

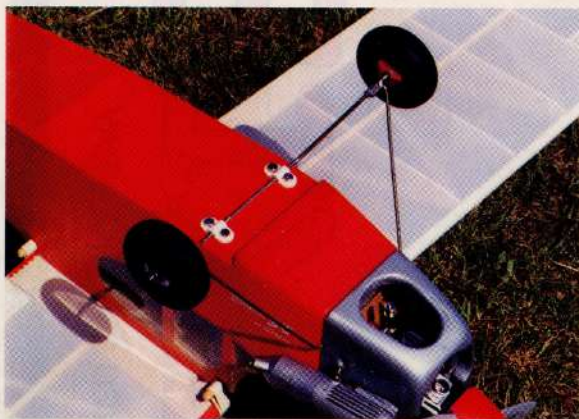
1/8" x 3/16" CROSS BRACES

FIN BUILT UP FROM 3/16" SHEET AND STRIP

TAILPLANE BUILT UP FROM 3/16" SHEET AND STRIP

TRIXIE

DESIGNED BY MIKE KEAY



Durability and ease of maintenance are key features of Trixie's ulc.

(TOP RIGHT) A combination of natural and vintage red Solartex look oh-so-right. Keep your joints tidy if you go the Keay way with 'see-through' finish, though!

Time spent getting the acetate glazing right pays visual dividends on the finished article. Lovely!

Fuelled and ready to go, Trixie offers relaxing performance but will pick up her skirts for some mild aerobatics.

About half a rain forest full of thin card templates were cut and dumped until the perfect shape was made to wrap around the window frame of F2 and over the side windows already fitted. An approximate shape for the front screen is on the plan and can easily be adapted for your model. A thin bead of five minute epoxy was run around the previously marked bottom edge of the windscreen and contact adhesive applied to the side overlaps. Bingo! A first time fit. Once in place and dry, the infill to the top of the screen and F2 was shaped from 3/8" balsa, covered and glued into place from inside. The side window glazing can be finished off with a pre-shaped window frame made from covering material.

Finally, the tailplane parts were assembled, aligned and epoxied into the fuselage slots, the stabiliser being reinforced underneath with 1/4" triangular section previously covered to match the fuselage.

WELL, DID IT GO?

Early attempts to get Trixie airborne were met with some disappointment - as an aeroplane it made a splendid



racing car! The new .10 engine fitted was very tight, despite over an hour's bench running and was far from giving peak performance. There was also some mismatch between the chosen prop, fuel type and glow plug; all this was aggravated by the longer than usual damp grass on the patch. However, my good friend Don Major came up with a brand new .15 sized engine and this was retro fitted. After careful running in, a dollop of nitro and with the proper plug / prop., the engine was fired up and whizz... it was airborne in yards! I had been slightly over generous with the rudder and elevator throws but once tamed, no problem.

Over the years I've become very used to doing 3-channel aerobatics with the deceased Black Magic, and Trixie has proved to be a worthy replacement. Loops, rolls and stall turns - easy! (I'm still working on some negative patterns) however her forte is to act the part of a true vintage model and just potter around. Should a dead stick catch you out you'll find that Trixie will glide in nicely, but don't try to stretch it out too far. If slowed up to the stall this model, like most small ones, will fall out of the sky.

I tend to build a bit on the heavy



side so there is considerable opportunity to save weight without losing integrity in strength. You certainly will not need anything bigger than a .15 engine and once my .10 is sorted out, Trixie will fly easily with it.

I've had a lot of enjoyment designing, building and flying this model - I'm sure you will too, let me know how yours goes with a pic or two, via RCM&E.

DATAFILE

Name:	Trixie
Aircraft type:	Sports vintage
Designed by:	Mike Keay
Wing span:	40"
Wing chord:	7.3/4"
Wing area:	307 sq. in.
Aerofoil section:	Clark Y
Fuselage length:	32"
Tailplane span:	12.1/2"
Tailplane area:	54 sq. in.
Engine range:	.10 - .15 cu. in.
Fuel tank:	3 - 4 oz
Rec. no. of channels:	3
Control functions:	Elevator, rudder, throttle
C of G:	2.1/4" - 2.1/2" behind l.e.
Control throws (max):	Elevator ±1/2" Rudder ±3/4"
Side thrust:	2°
Down thrust:	3°
All-up weight:	2 lb
Wing loading:	15 oz / sq. ft.

