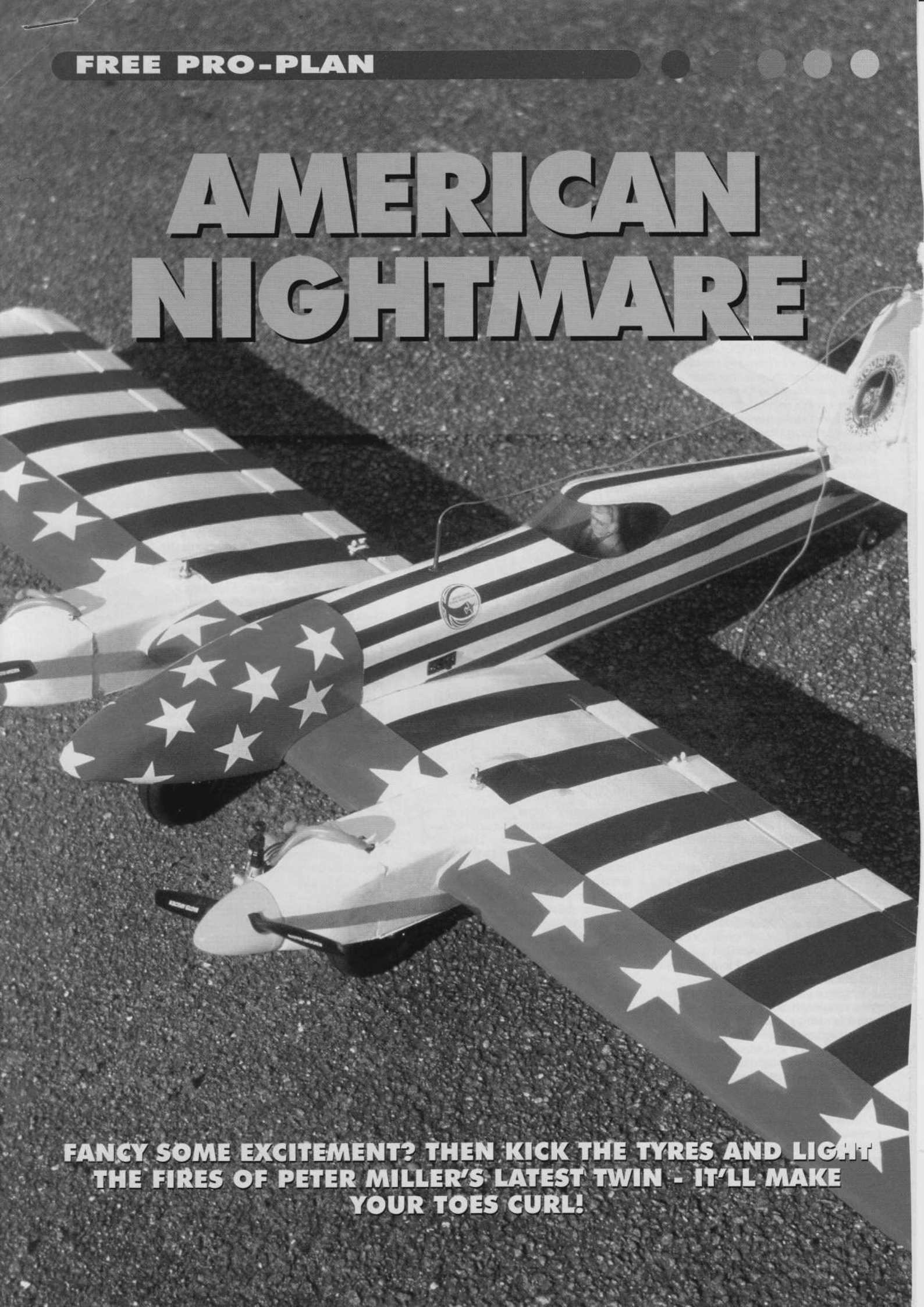
FREE PRO-PLAN

AMERICAN NIGHTMARE

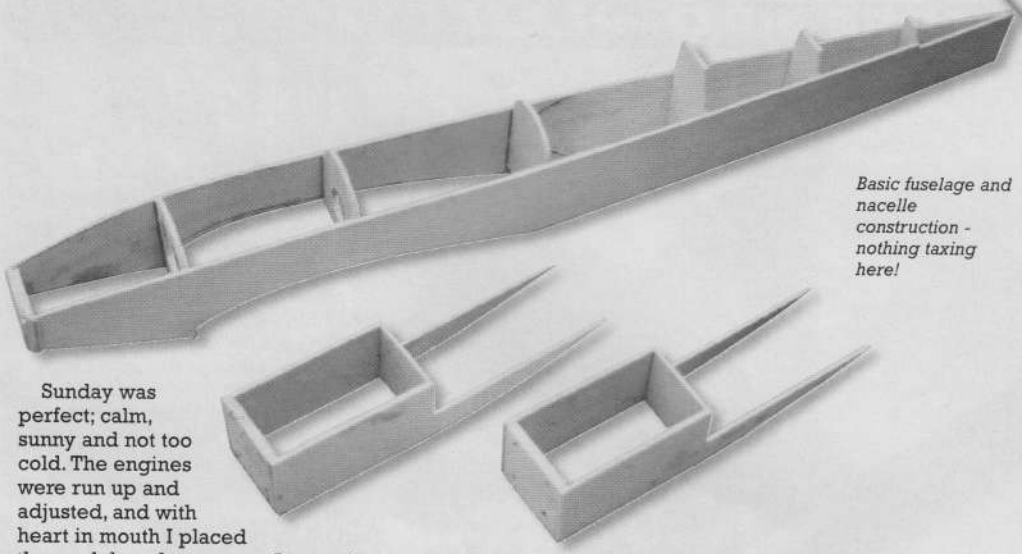


FANCY SOME EXCITEMENT? THEN KICK THE TYRES AND LIGHT THE FIRES OF PETER MILLER'S LATEST TWIN - IT'LL MAKE YOUR TOES CURL!

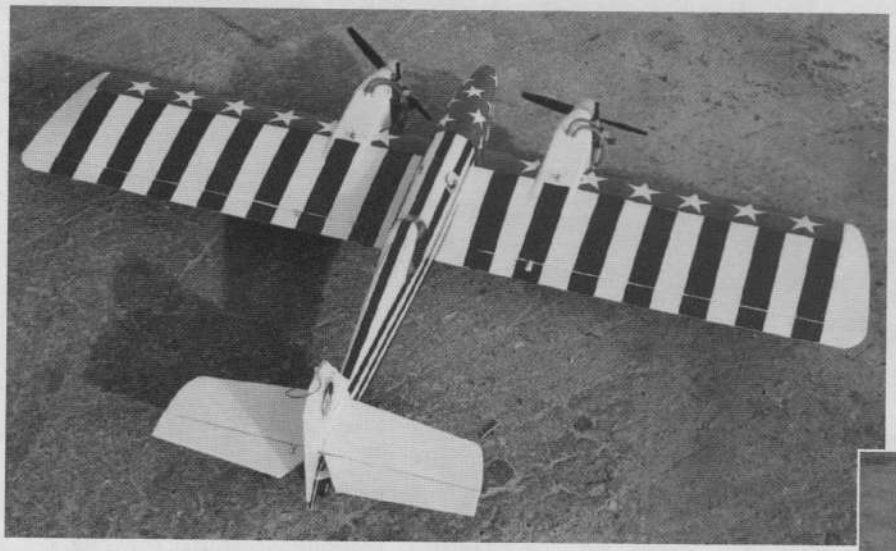
I'd been hankering to design a twin for quite some time and had measured countless 3-views and worn out at least one calculator, all without finding a model that met my criteria. It's not that I haven't dabbled in twin design before. Several years ago a couple of small models powered by Cox TD .020s sprang from the drawing board, and I quickly discovered that lots of power resulted in a model that flew relatively fast, even on one engine. Handy, as this made them safer to fly in that condition.

Having ditched the idea of a scale model but with a practical working scale specification in mind, I promptly used the criteria in the designed of American Nightmare (I'll tell you how I arrived at the name a little later). On my 'wish list' was a wing area of 450 sq. in., plus minimum drag and low weight. I also wanted the model to fly well on one engine. A Clark Y section was chosen and set at zero degrees incidence, as this provides lots of lift if you pull the nose, is very fast, and acts almost like a symmetrical section when inverted.

Horse power is courtesy of a pair of well run Super Custom .15s, each having performed very reliably in a variety of $^{1}/_{12}$ scale fighters where they proved easy to start, displayed good reliable throttle response and provided plenty of power.



Basic fuselage and nacelle construction - nothing taxing here!



American Nightmare is small, light, fast and very, very aerobatic.

ON ITS HEAD

If I didn't put this bit first you'd only go to the end to find out how the model flies, so I'll save you the bother!

We fly from the remains of an old wartime airfield once every three weeks and I had nearly got the model finished when the club secretary advised me that the coming weekend was 'our' time. I had the model complete and ready to go by Saturday, albeit in an all-white finish as I hadn't had time to complete the trim.

Sunday was perfect; calm, sunny and not too cold. The engines were run up and adjusted, and with heart in mouth I placed the model on the runway. At a nod from me my assistant released her and I was treated to a rapidly vanishing rear view of American Nightmare. I soon discovered that the model is very, very fast and on that first flight even low rates were a bit too much. The Nightmare went like a rocket; aerobatics were great - big, smooth and fast - at times I was as near as only ten seconds reaction time behind the model! Of course, you can throttle back... It doesn't make a lot of difference to the speed but it makes you feel as if you're in control. The starboard engine was a fraction rich, and after a period of running at reduced throttle it stopped... I could now find out what she was like under asymmetric power.

In practice the rudder keeps the model straight, and it can be safely turned away from the dead engine. Turning towards the dead engine produces an instant spin - throttle back and it stops at once, allowing you to pull out safely. Try this high up, though! The landing was fast and flat, it can be slowed down more but she likes to come in smoking the tyres. I walked back from that flight feeling just as if I'd had my first run on the biggest roller coaster in the world... I think 'stunned' would be an understatement!

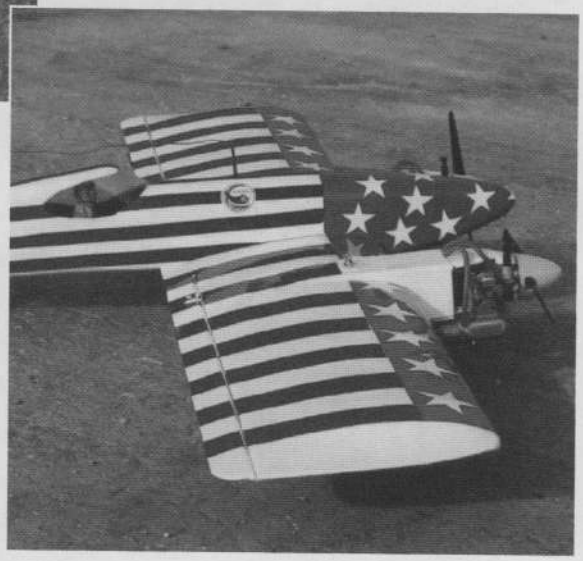
My camera pilot Stuart Pickett was to make the second flight with reduced throws. He soon got used to the model and made several runs at half throttle. My Canon lens with predictive autofocus just couldn't keep up with it, in fact, I took just three 'useable' photos when I usually expect at least 20 out of a 24 exposure film. Once the photos had been taken Stuart proceeded to fly a full range of aerobatics, all at half throttle, before landing the model with both engines still running.

On the third flight I flew all the aerobatics; loops and bunts are easy, smooth, and track dead straight. Rolls are fast and axial in both directions. Flicks are not too fast due to the weight out on the wings. Inverted is easy and needs almost no down trim at all. The model is very forgiving, at no time did it try and bite except on one engine, but that's to be expected.

And the best part? The sound of those two engines on song at full power in a long, low fly-past. Boy! It really makes your toes curl.

CLEAR THE BOARD!

Anyone building this model will have quite a lot of experience (no beginners allowed!) so I'm not going to give detailed instructions except where they are really needed. The fuselage is exceptionally simple, the only



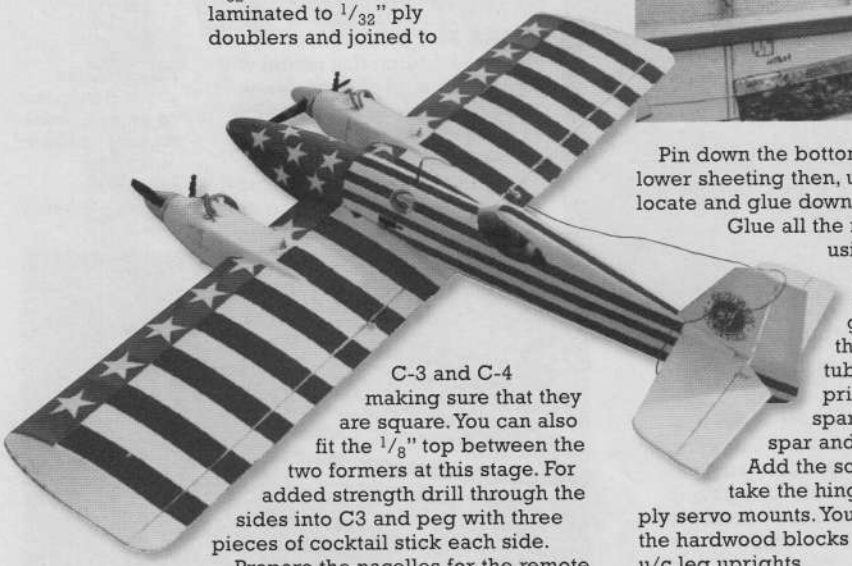
Ease of engine access is important on a twin; American Nightmare's motors can be fully exposed for maximum attention.

Some 1/4" sheet, a ply nose ring, stick 'em together, shape / sand, and before you know it, you've got a quick, easy and durable cowl.

slightly unusual feature is that the top is planked. Planking can be a little tedious but it doesn't take very long, honest! The main thing is to chamfer and taper each plank to fit; this saves quite a lot of gap filling later. I work from each side up and the top centre down alternately, meeting half way between those points. The rest of the fuselage build is 'conventional'.

As for the tail, this is a simple sheet unit, mostly from soft balsa with the exception of the tailplane which is quite hard. You could also use hard balsa for the fin if you wanted.

The engine nacelles are designed to fit around the tank and engines used. They also house two micro servos, one for the throttle and the other for the aileron, both of which you'll need before building the wing. 3/32" balsa sides are laminated to 1/32" ply doublers and joined to C-3 and C-4 making sure that they are square. You can also fit the 1/8" top between the two formers at this stage. For added strength drill through the sides into C3 and peg with three pieces of cocktail stick each side.



Maximum fun with minimum outlay, American Nightmare doesn't take long to build and is sure to put a smile on your face...

Prepare the nacelles for the remote glow connectors and the slanted front SLEC type tanks, the pipes of which come out at the top of C-3.

The bottom hatch is made from 1/32" ply with the grain across the fuselage and a stiffener in the tank bay area, whilst the rear portion curves round and covers the servos. Temporarily fit the engine mount and engine, spot glue C-2 in place and build the cowl as shown. The cowl has small pieces of ply inset to take the fixing screws which fix directly to the engine mount. It's design is such that it can be removed without taking anything else off. You'll note that the nacelle and engine installation is designed for maximum accessibility - remember there are two engines, twice the potential for problems!

WING

Start off by laminating the rock hard 1/4" sq. balsa spars and 1/8" x 1/4" spruce laminations. Fabricate the R1a and R1b unit and the R1 - R1b centre-section assembly, which spans to the nacelle. The undercarriage mount is made from a strip of 1/4" thick x 3/4" wide ply; two strips of 1/8" liteply form a channel for the 8 swg torsion bar legs.

The wing centre-section ready for top sheet, note the nacelles being used as gauges. Oh, and if your bench isn't cluttered you're not working fast enough!

Pin down the bottom spar and lower sheeting then, using the ribs, locate and glue down the u/c mount. Glue all the ribs in place using the nacelles to set the exact spacing. It's a good idea to fit the paper conduit tubes at this stage, prior to the top spar, trailing edge spar and leading edge. Add the scrap blocks to take the hinges and the 1/16" ply servo mounts. You can also glue the hardwood blocks which take the u/c leg uprights.

Now sheet the top of the wing and finish off the tips, trailing edge, ailerons etc. I suggest that you don't glue the nacelles into place until you've covered both them and the wing. I did it the hard way!

Built in the above manner the wing will be completely flat; however I wanted some washout, which can be put in during covering. The washout starts where the sheeted section ends.

FITTING OUT

In terms of positioning, the Rx NiCad pack is fixed behind F-2, the Rx behind that and the two fuselage servos as far back as possible, leaving just enough room to get a screwdriver to the servo retaining screws, past the 1/4" ply nut plate.

Four Supertec Naro Max BB servos from J. Perkins found their way into the nacelles. This allows you to mix ailerons for differential and play with the throttle mixing. Take a tip from me... don't try this until you're familiar with the model! I used ordinary 'Y' leads to pair the servos up.

Control throws are: Ailerons 1/4" each way, elevators 9/16" each way, rudder, as much as you can get. The elevators might be more sensitive if the C of G is a bit further back, so set them a bit less at low rates.

In this configuration the C of G came out just about on the spot and the total weight was 59oz giving a wing loading of 18.3 oz / sq.ft. - very civilised.

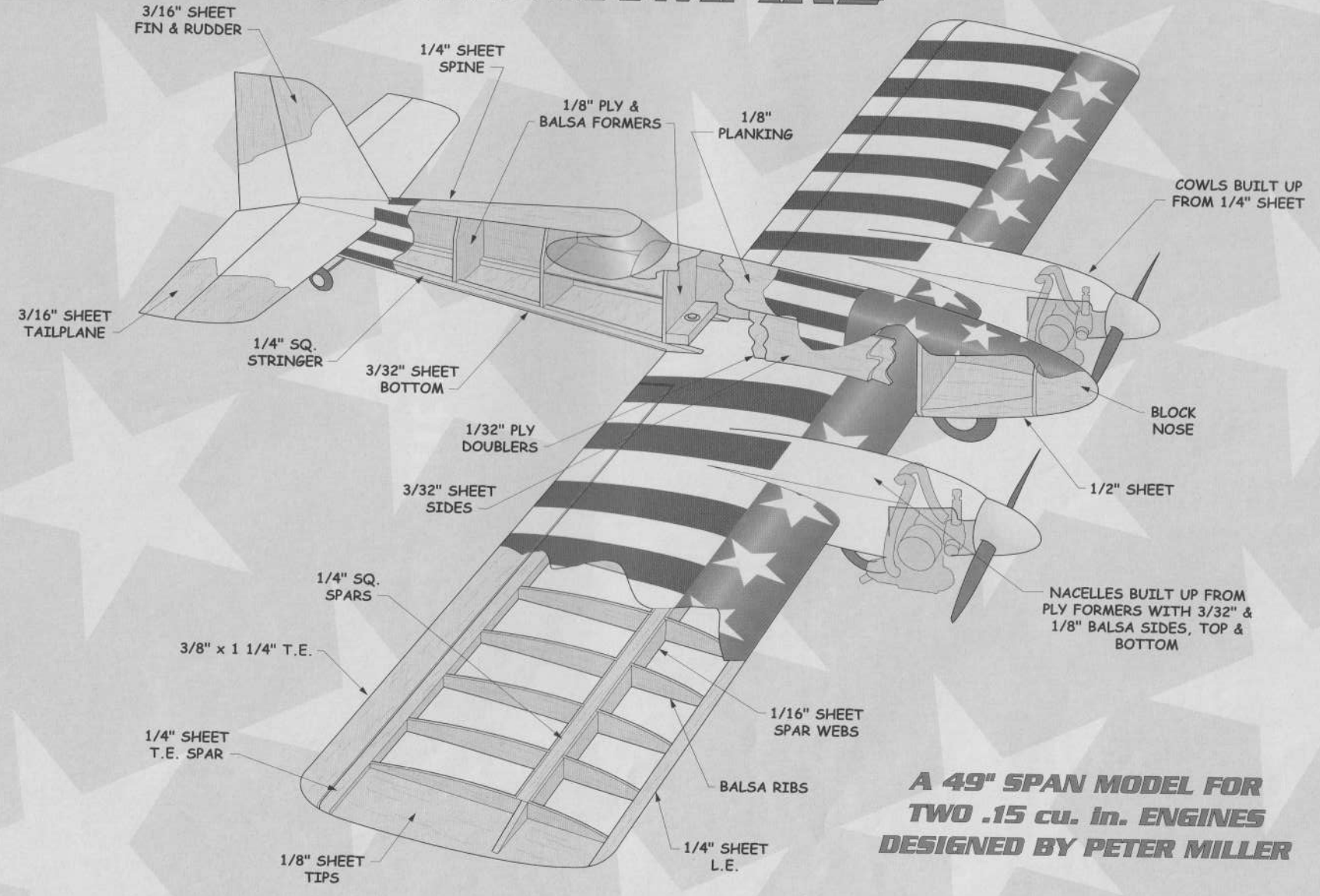
COVERING AND COLOUR

I covered the entire model with Solarfilm Supershrink Polyester, a wonderful new material which shrinks well, pulls up tight... I could go on, but just try it for yourself and you'll find out. Be careful when shrinking as the wing panels can warp. I put in about 3/16" washout under the trailing edge spar at the tip.

As I said earlier, there I was on Saturday morning with an all-white model, and I had to photograph and fly it the following day. Something had to be done! I covered the nose and leading edge of the wing with blue Supershrink, using Solartrim for the stripes.

A single star pattern was drawn on some thin card and cut out... then came the clever bit.

AMERICAN NIGHTMARE



A 49" SPAN MODEL FOR TWO .15 cu. in. ENGINES DESIGNED BY PETER MILLER

DATAFILE

Name:	American Nightmare
Designed by:	Peter Miller
Aircraft type:	Sports aerobatic twin
Wingspan:	50"
Wing area:	460 sq. in.
Weight:	59oz
Wing loading:	18.3 oz / sq. ft.
Fuselage length:	33.5"
Power:	2 x .10 - .15 cu. in two-strokes
Rec'd no. of channels:	4
Control functions:	Rudder, elevator, throttle, aileron

Having first cut the correct number of square shaped pieces of Solartrim, from which to produce the stars, I duly stapled them together, with the card pattern on top, then cut through the lot in one go with a sharp scalpel. A few minutes sticking them in place, a couple of BMFA stickers and club badges for good measure and two hours later the model was finished.

OPERATION

I use a starter mounted in my flight box which is much safer than a hand-held unit. Start each engine and get it set at high and low throttle settings. Using identical servos and a 'Y' lead means that providing you've set the engine connections correctly all should work properly.

With the assistance of a remote glow connector start each engine, check them together, cycle the throttles a few times, then go fly it!

CHEAP THRILL

American Nightmare is cheap to build, the engines are very reasonably priced and even the micro servos won't break the bank. Not only that, this is one aeroplane that won't take you months to build.

When it comes to flying, anything that claims to give you a bigger thrill is likely to be either illegal, immoral, or guaranteed to make you sick. One final piece of advice before you fly it... put some bicycle clips on!

Up and away at a rate of knots... she'll keep you on your toes but will behave herself on one engine.