

Amelia

Dereck Woodward's 47"

span, 20-25 four-stroke

performer



Your Full-Size
SPORTSTER PLAN

Do you like aerobatics – but like to relax with a slow model? Prefer smaller models? Fancy a model that's all of these? Good! Meet 'Amelia'. A light, aerobatic and fun-packed 'vintage' structure around aerobatic dimensions, designed for the small OS or Vega four-strokers. A semi-scale fuselage, full cowling and a cockpit with stringered rear deck which says 'aircraft'.

Her 47in span, semi-symmetrical section wing and 2.3/4 lbs weight means she'll fly slow. Undercamber would make her fly slower at the expense of aerobatic performance. A symmetrical section would have improved her aerobatic ability, so I aimed to compromise.

Thinking long build times? Sixteen days' work from a blank sheet of paper lifted off on a test flight which ran to loops, rolls and Cuban eights. If you're ready to try a new

'Amelia' is fun to build and a delight to fly. Full-size plans in the centre of this issue!



The man and the model; Dereck with the prototype.



Short finals! 'Amelia' ticks in...

dimension in model flight, let's go. For inspiration, write "Light is Right when it comes to Flight" on a sheet of paper, pin it over your board. Now we build *your* 'Amelia', so how about the wing first?

Nostalgia is – cutting out ribs!

The NACA 23012 ribs were plotted by Chuck Anderson's Model Design program as sold by Argus Specialist Publications. The program also printed the wing panels and ellipses for the rear deck formers. I didn't realise the bug-eyed monster was that much use – check with ASP to see if *your* number cruncher is compatible

Make a ply template of R3, and cut out the ribs from quarter grain for the whole

wing. Ribs 1 and 2 then are trimmed by 1/16in as appropriate to allow for centre section sheeting. Easy so far. Yes, the spars are balsa – use wood with long straight grain here. The only departure from a 'vintage' structure is the leading edge top sheeting, to preserve the airfoil. The easy way is to build two panels, then jig in place over the drawing and build the centre section and its ply joiner between them.

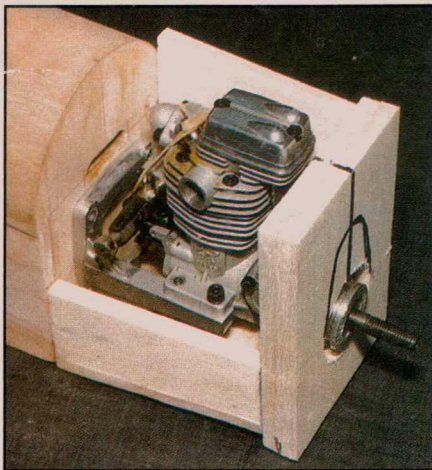
Fit the aileron torque rods, slot the trailing edge for hinges, then fit the aileron blanks in one piece, root to tip – glued to the fixed portions, held by the hinges along the moveable portions. Now blend into shape, part the ailerons off to remove and chamfer their l.e.s. They can't help but



Stringered rear deck says 'aircraft'...

match the wing now. As balsa tips are very prone to 'hangar rash', I used a sandwich of 1/16in balsa over 1/64in ply. This has proved durable - when a wing panel got wiped out (pilot error!) the tip was salvageable and went straight onto the new wing - why waste good wood?

The piano wire undercarriage mounts into channels made from 1/8in plywood built into the C/S and flexes to allow a little 'give'. With the wheels just ahead of the l.e. 'Amelia' will track straight on the take off roll. Long main legs and the sub fin-mounted skid give good prop clearance and a low ground angle to counter any swing as the tail comes up. Two nylon straps screwed into the rear



The cowling starts like this! O.S. 26 four-stroke used in prototype.



Note u/c fixing arrangement and cowling hatch in this shot; wing is simply banded on.

beams retain the aft leg, the wing bands hold the front.

The other big bit

Start with the fuselage rear frames by cutting or selecting your 3/16in square stock; fairly hard wood with long straight grain is called for. The open frames are built onto the front 3/16in sheet and the old trick of building the second frame atop the first is as valid as ever. For newcomers, this construction is not slow or complex. Just accurately cut a length of strip, check again

for fit, apply glue and place in position. With a little practice you'll progress so quickly you'll be disappointed that it's finished!

With two sides sitting on the bench, fit the 1/32in ply doublers. A valid old warning is to ensure you build a pair of sides - as opposed to two right handed ones! The fuselage is parallel sided from F1 to F5, so formers F1, 2 and 5 are glued vertically to one side. The opposite side is then added and left to set (or proceeded with if you're a cyano user).

The rear ends of the sides will need a little chamfering so that, when joined, the sternpost will be 1/4in thick to match the rudder. Make this a good snug fit before gluing up, the sides follow their natural

curve from F5 to the rear end. Now fit the fuselage cross braces, again mark off, cut, check, glue and fit.

Let's fit the radio

But radio fitting always comes at the back, just before 'flying' (which everyone reads first anyway!). There are two ways to fit radio. Build the model, cover it then poke around in the dark hoping it works - or trial fit everything into the basic open box sitting there now, while you can actually see what's what.



From somewhere straight out of the 'thirties, 'Amelia' awaits another trip.

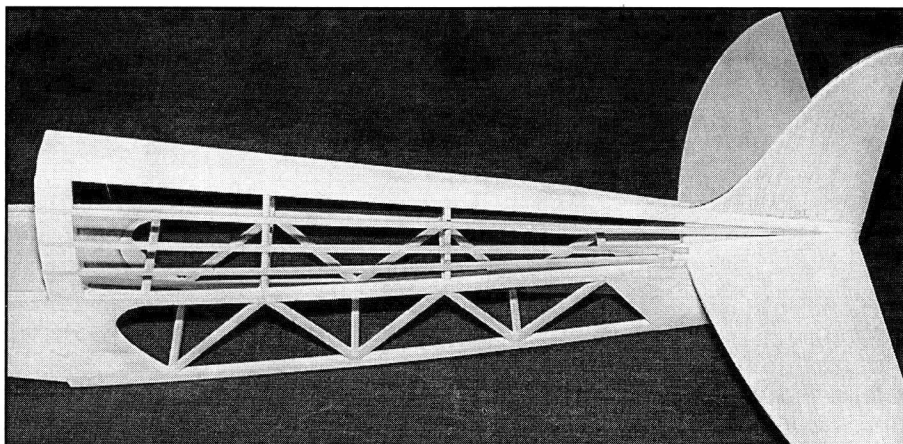
Typically, I'll pin the tailplane with elevators dry hinged and horn in place onto the fuselage, glue the servo rails into place and fit the control snakes - 'Goldenrods' on mine. Then check the ailerons for clearance. Like this I can visually check for clashes and fix the outers to eliminate slop. Fit a tube, made from drinking straws, to thread the aerial through to avoid it getting snapped, trodden on or even just looking dirty.

This is a good time to line up the engine, tank, and throttle snake. I always go for a removable tank hatch, having a slight mistrust of eternally buried 'plumbing'.

When you're happy...

Take all the gear out, label so you'll know where it goes and proceed. The rear deck is a good place to start; as I've hated fitting stringers from my first KeilKraft Spitfire onwards, here's the easy way!

Mark the stringer positions on F3, cut to length and hold each in place while you mark on F6 & 7 where to notch to about 1/16in deep to locate. As every model built will be slightly different, this way sees each stringer neat and straight. The front deck is 1/64in ply wrapped over the formers with a 3/16in overlap onto the sides. Light, far more resistant to handling and a better surface finish straight away.



Stringered rear end; spruce is better when it comes to crash resistance. The rest looks like it fell off a vintage model!

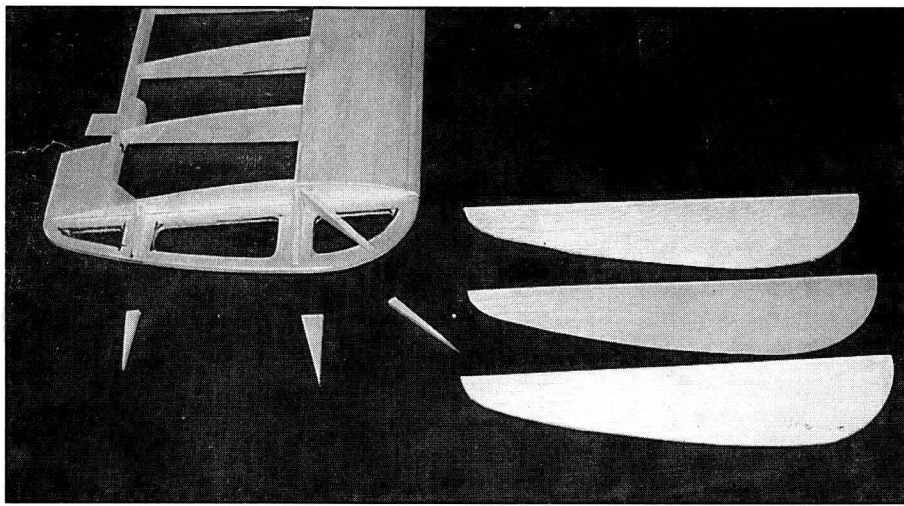
Any covering is fine for 'Amelia' - but bear lightness in mind and seal all the edges, especially if you're using a two stroke. With the OS 20 and 26, ten minutes flying leaves but a smear of oil on the tailplane leading edge.

Time to go fly

The elevator is powerful so don't exceed the 5/16in each way. Now for the aileron

smooth flying to preserve speed, stringing manoeuvres together in graceful sequence. If you think a low powered model is going to be a yawn - try this lot!

I've flown her through consecutive inside and outside loops, Cuban eights are no problem and she will do a small square loop. The roll is axial, three are a push on the OS 20 but easy on the OS 26 Surpass. The four-point looks good, it's easy to input rudder during the slow roll and she will just do a vertical roll. The rudder is fine for stall turns, remember straight up is limited but not too shabby on the 26 Surpass, 10% nitro and a 9 x 6 APC prop. Want to fly inverted? Roll her over and be surprised at the small amount of down trim needed.



Light, ding-proof wing tips before and after - worth the extra work for the gain in strength and loss in weight.

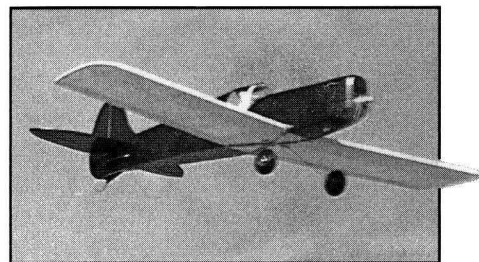
To finish off the front, the cowl is from 1/4in sheet and block. A great way to use up wood from the scrap box, use pieces that fit, cut down as needed, then carve the outer shape. The cowl 'top' is mostly hole, with another underneath to let out hot air and allow you to operate the OS carb. Choke by pushing it up from underneath. One less piece of wire sticking out the side!

To finish her off

There are a few around who'll be glad when I run out of purple and pink Monokote! A model like this cries out for either a 'vintage' type translucent doped finish or one that could have come from a lovingly restored 'Golden Era' aircraft. I can only plead that I was trying to get her airworthy for the First Small Model Association meeting last year!

differential. I wanted good slow speed handling from an aerobatic model without high lift and anti-stall devices. So there's a semi-symmetrical airfoil with a light loading and a broad tip chord. Ease back the power, add 'up' trim to put the wing at a higher angle of attack to increase lift for very slow flight. However, just above the stall, a down-going aileron can alter its wing's angle of attack to past the stall. Differential reduces down-going aileron movement, thus removing much of the chance of inducing a tip stall.

Taxying 'Amelia' is fun, rocking on her u/c as she taxis. Take off is straight, no fuss and the rudder is only needed to handle any crosswind, so we set off to 'three mistakes high' for checkout. Rudder action is neutral, I've already covered the aileron and elevator response. She responds best to



And thar she goes! Build one.

Now slow down. The engine, wing and tail are all 0° incidence, so to fly slow, increase the angle of attack for lift. Ease off the power, feed in up trim, she flies normally, but much slower. Cut price variable geometry! Practice just how slow she'll go and then check out circuits and landing. Watch the power, too high and she'll float along, refusing to come down. Three-pointers come easy once you accept the low speed, so avoid just driving her onto the ground.

It's a fun way to fly. If you've got noise problems an OS 20 or 26 or the new Vega 25 will hardly upset the most avid complainer. She's certainly slow enough for relaxation and the aerobatic performance will leave you wondering why you bothered with big, noisy models. So unbolt that little engine from the Flying Yawn you thought it doomed to and meet the challenge of slow, quiet aerobatics. See you down the site; fly safe now!