



What chance another wet summer? Be prepared with John Rutter's unorthodox 44" span amphibian for .20 to .25 engines!

Bertie

This particular model arose from the need to have a second model for a September Kielder event – it's a long way to go only to have something go wrong with your one and only model. As usual the model had to be simple to make and fairly viceless in the air as it was likely to make its maiden flight on the day. (I drew the model up only 7 days before the event, you see.)

As it happened, although I built the prototype in only five days, I decided the weather for that weekend looked pretty awful and didn't go. This gave more time to finish



the model with some flashy colour scheme and the results are in the photos. Now that colour scheme looked nice with the wings and hull separate but once joined the whole thing was a bit over the top. This led naturally to the name, Bertie Bassett being the Liquorice Allsort man!

Due to the need for speedy construction I decided to use the wing section I used on 'Zack', a previous model. This was intended originally for a trainer and gave good flying characteristics but its main advantage was that it had no separate leading edge and could be flown with simple sheet ailerons, all of which meant that it could be assembled very quickly indeed. Anyway, I still had the jig.

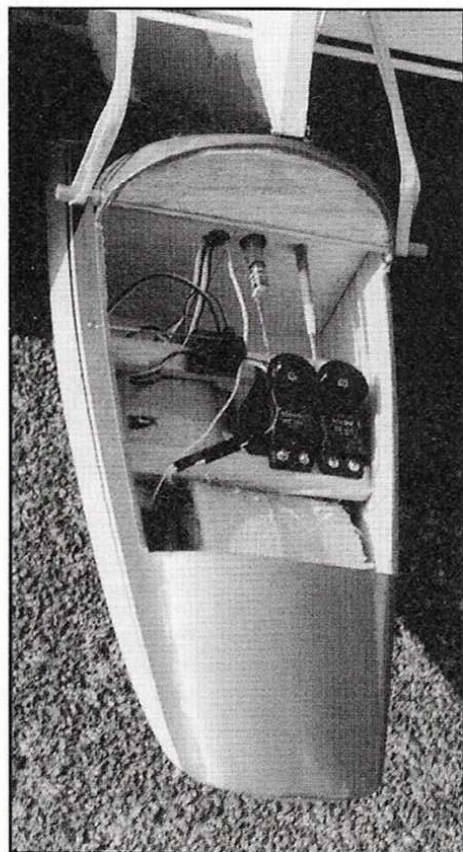
Let's start!

The flying surfaces are the easiest place to start. Once the wing has been veneered the tip and root are squared off and the trailing edges cut to allow a piece of balsa about 5/16in x 1/4in to be glued to it. When stuck in place and trimmed up with razor plane and glasspaper this forms the trailing

Bertie is as much at home on the water as on dry land; pylon-mounted pusher engine is easy to access and start.

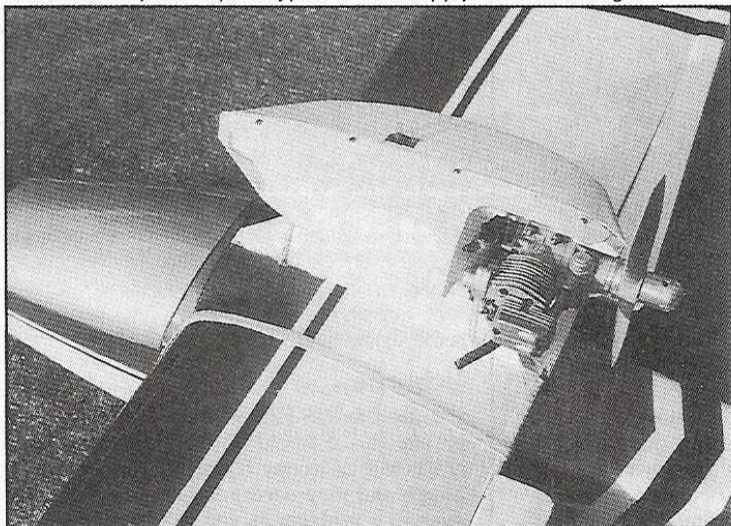
edge. I cut the ply motor mount/pylon from 1/2in marine ply which is nice and strong but hardly lightweight. The throttle servo could be screwed to rails that are formed from this ply as it's cut out but this would make joining the wings difficult. Instead I chose to put cutouts into the pylon ready for servo rails to be added later.

When the trailing edge has been trimmed to match the wing, mark a centre line on the tips and cut a strip of scrap balsa at least as long as the chord, preferably a bit longer, and just sufficient in width so that it touches the building board when pinned along the centre line you've just marked out. These strips should ensure that when you epoxy the pylon in place the wings are joined at the same incidence. Make sure that you put epoxy on the ends of the veneer rather than on the foam; this will give a much stronger joint than relying on a foam-to-foam joint. Blocks of scrap under the TE of the pylon



Avionics bay; we can supply a moulding for the hull front.

O.S. F26 Surpass in prototype; we can supply cowl mouldings.



should hold it in the correct place while the epoxy sets.

While this little lot is setting you can cut out and join the parts that make up the tail surfaces. Try not to use rock hard wood for this or you will need a lot of lead in the nose – the original needed about 6oz as it is. Once cut out and shaped, the tail surfaces can be painted with a coat of Clearcoat (essential for water use and the use of diesel motors, it stops the film unpeeling) and then covered, I used Solarfilm as usual. I joined the elevator halves with 14G piano wire to which I had silver soldered a brass horn in order to have a hidden linkage. An external linkage, as for the rudder, could be used.

One thought I did have was that a 'V' tail at 90° (elevator control only) would keep out of the water better than the more usual form and then only a small water rudder/tailwheel would be needed for ground steering. The full rudder is worse than useless in the air

causing the model to roll in the opposite direction to that required, hence its abbreviated form on the plan. Finding this out caused some interesting moments on the initial flights! The cause of this peculiarity may be that the tip floats act like anhedral. What the heck, the ailerons are effective right down to the stall so who needs rudder except for ground/water steering?

Back to the wing

The tip floats are formed by cutting off the last 2.1/5in at 30° on a circular saw, inverting the wing and then cutting out a section at the same angle. Before you glue them on again it helps if you form what will be the bottom to the shape shown on the plan. I did this on a big disc sander, followed by veneering the float bottom. When epoxied back in place the tips then point down at 60° and form very solid tip floats. The U/C mounting on my model (which will spend only a short part of its life operating from water) is a piece of shaped beech let into the bottom of the wing. I held this in place neatly by taking some of that expanding urethane foam from a DIY store and squiring it into the slot before clamping the whole lot solid. This produces a very strong join but don't forget

the clamps as the pressure exerted by the foam is considerable.

The ailerons are simply cut from 3/16in sheet, 'V' shaped at the front and tapered at the rear. The torque rods are 14G piano wire, drilled and bent brass tube horns soldered in place. The bearing is another piece of brass tube stitched and epoxied to the TE. The ailerons themselves are held to the wing with mylar strip hinges. The servo rails can now be added. I cut a hole out of one wing panel near the pylon to take the aileron servo, before reinforcing all veneer joints with narrow strips of nylon/lightweight glass cloth either doped or preferably epoxied in place. Warming the epoxy up with a heat gun helps it to flow better and set quicker.

The aileron linkages are short lengths of threaded rod with metal clevises. The throttle linkage is a bit more complicated but is basically two lengths of threaded rod

joined by a bellcrank which is screwed to the pylon. Lengths used and exact positioning of the bellcrank will depend on your motor. As can be seen from the photos I side mounted the motor and glued the fuel tank on the opposite side of the pylon with silicone to keep it out of the way and at the same time as close as possible to the motor. The pylon needs only a very little shaping of the balsa front end to allow the vacuum formed cowlings to fit, though the cowlings themselves will obviously need trimming to miss the fuel tank outlet pipes, cylinder, carb, etc.

I was in a hurry when trimming to cowl the motor so I made no attempt to fit the cowling closely. I can recommend cutting out the intake on the motor side of the cowling (to aid motor cooling), the other side is stronger without it. I glued the tank side cowling in place but held the motor side

and glue this lot together. Carefully pull in the nose as you add the rest of the formers, note that F4 is in two halves so that it can be glued in with the rest. This should give a nice straight hull.

Add the keel strips, sand them and the hull sides level and sheet the underside of the hull. The forward portion should be 1/16in ply, the rear should be light 1/16in balsa, cross grain. Remove from the board. Add the wing fairing pieces and doublers, glue the servo rails in place, preferably with the servos already installed. Make up and fit the pushrod and snake, pin the tail in place and check for the correct movements. When you're happy, the top triangular strip and sheeting can be glued in place. The top sheet has its grain running the length of the hull and it extends to the trailing edge of the wing – it DOES NOT stop at F6. Add the top part of F4 to the rest of the former, glue

alternative to this is to use either a vacuum moulding or to make a GRP version of the nose from a vacuum moulding. The latter is the strongest method of all but of course takes a little longer to do.

If you use the vacuum moulding supplied by RM then you need to coat the inside of the moulding with release agent before using the gel coat and GRP. With either moulding an extra former on the nose will locate the moulding that bit more accurately. Hopefully the nose contours of my original and your replica will not be too disparate and this moulding will blend in nicely. I used the best part of a sheet of 1/2in balsa to make the nose of the original, that's over £2, which makes a replaceable moulding look more attractive.

Trim the top rear of the canopy to match the wing fairing and F4 and then carefully cut away the canopy with a razor saw to make the access hatch for the R/C gear. Glue the 1/4in wing retaining dowels in place and add scrap balsa to F4 for reinforcement. Strap the wing on with a couple of bands and make up the top fairing block (under the wing TE) and the canopy/wing fairing. I made the latter by laminating soft 1/8in sheet with EVO impact. Do any remaining shaping on the fairing blocks and rear hull, give the hull a coat of Clearcoat and cover with film. Install the Rx and switch; I used a wire rod in tubing to activate the switch. Install the motor if it's not already on the wing and check for balance. I melted lead and poured this into the back of my balsa noseblock; with a GRP or vacuum formed nose it might be better to glue the weight to the front of F4. Perhaps the locating former could be made from ply to allow the weight to be screwed in position.

That should be about it. Put the wheels back on if you are to test it from the ground, don't forget to use silicone bath sealant on the wing join (grease the underside of the wing, stick the sealant to the hull and band the wing in place overnight) if you're using it on water, check that the motor works as it should and that everything else moves the right way and in the right amounts and off to the flying field.

Airborne

I used an OS F26 Surpass on my model but any .20-.25 would do the job. A glow two-stroke will be thirsty compared to the .26 though and may need a larger tank, not too much of a problem as you will have to make your own tank anyway if you use my motor fairings. My Irvine .20 diesel swings a given prop a bit faster than the OS, is lighter, picks up better, used just as little fuel and is half the price. It doesn't sound as nice



with small screws, the latter method could be used on both sides if desired. When you're happy with the fit, movement of surfaces, etc., remove the servos, give the whole wing a coat of Clearcoat and cover with film. The pylon is easier to paint.

Fuselage/hull

The fuselage/hull is simple to look at but is not quite conventional to make; a jig would be very useful in its construction but I built mine over a straight line on the plan. The reason for this is simply that there is no parallel section to pin down to the board as is usual in model aircraft.

Start by cutting out the sides and formers; the holes marked in the latter are accurate for the linkages, etc, as drawn looking from the front. It's important to mark the centres on the top edge of the formers because the hull is built inverted over a centre line marked on your board or over your plan. Cover the plan with a piece of scrap polythene such as the backing off a piece of Solarfilm before gluing anything. Pin formers F6 and F7 to the plan inverted, hold the sides to the formers and run a bit of cyano along the join. Glue a bit of shaped scrap into the meeting point of the hull ends

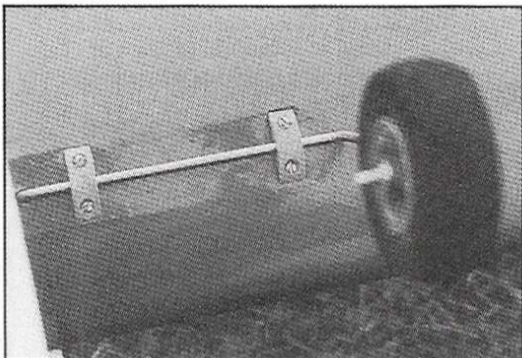
Striking trim is courtesy of Solarfilm; tail surfaces are cut from sheet.

the remaining fixed formers into position but only pin in place those formers that will eventually be a part of the canopy.

Tedium for some looms at this point! Blank the canopy area (I actually like planking, I find it quick, easy and cheap as well as light and strong). Smooth off the front end and glue the nose block pieces together noting that the centre portion is left hollow for nose weight. This block is then tack-glued in place and shaped along with the planking to give the nose contours. An



And away she goes! Bertie climbs up onto the step for another water take-off.



Most will operate Bertie from dry land; that's where the simple bolt-on u/c comes in...

though! On the ground the rudder is very sensitive and my first few takeoffs were very 'swinging'. The model was also very prone to trying to nose over. It reminded me of a dog I used to have; he would go running along with his nose to the floor and tail in the air. He even managed to do a forward roll once when he got his nose caught in a rut!

My model also had this tail high and happy attitude until the airspeed pushed the tail down. I've moved the wheels forward a touch on the plan. Immediately after takeoff my model needed a little 'up' trim to climb away, throttled right back I would have to reduce this. I assume I got the thrust line wrong and yours should not do this. This

Model is certainly different and, with an increasing number of 'Splash-in' events these days, could be one inexpensive answer...

small matter apart, the model handles very well in the air. I already mentioned the rudder problem. The model rolls and loops quite nicely but with a tendency to stabilise itself when inverted. All that high weight becomes pendulum stability when upside down!

The model isn't exactly fast but it's no slouch and it has a very good glide. Mine has a slight tendency to drop the right wing in the stall but this happens at a very low airspeed. From the water trials I've run the model seems to behave perfectly well. The water rudder is very effective despite a strong 'weathercock' effect in a strong wind and allows the model to be positioned nicely at slow speed. Opening the throttle in calm conditions results in a huge bow wave until you give it 'up' elevator. At this point it

creams along very nicely with the tail buried in the water and will rise onto the step easily at around half throttle; the water rudder loses effectiveness as the ailerons take over.

Once on the step the model rises easily into the air with very little elevator movement. On landing the model is reluctant to come off the step and slides along in spectacular style. There is no tendency to 'ground loop' when set up as shown, probably because it settles onto one or the other tip float, not both, when chugging around on taxi. I should point out that I held the canopy in place with tape on my model to seal the gaps and make sure that it didn't go anywhere. I have a remote charging socket under the wing along with throttle and aileron extension leads so I hardly ever see the gear.

