

The 'Amazing'



Ron Rees' basic all purpose hull made from Depron



easily using templates and that didn't need specialist modelling tools and equipment.

Two or more model boat club members who were prepared to get the thing going, this perhaps being the most important.

ABOVE: A US Swift PCF boat. Note the state of it and the lifejackets etc. hung on its railings.

So what now?

This article is not just aimed at people who would like to get a school or junior club model boating section going, but is for anyone who would like to have a go at building an incredibly simple, fast and cheap fun model, and perhaps something that their grandchildren could have a go at. The main thing in its favour is the design, as we know from experience that this shape is stable, strong and simple to build, yet fast, indeed very fast, which of course is paramount when you design a model for younger people. The overall shape can be easily modified to cover most of the full-size profiles that interest people, particularly youngsters, which is part of its appeal.

One key thing that we do not want, is to expect youngsters to stay enthusiastic when faced with month's of work! It seems to be true nowadays that they want quick results, but when I think back,

FROM LEFT BELOW: Conventionally built wooden American style leisure boat; Torpedo boat built from a Glynn Guest plan; Traditionally built wooden hulled Norfolk Broad's style of leisure craft; The first foam hulled model, a Fairey Huntress; Targa, the foam hulled police launch (MB September to November 2014); RAF ST207 (MB July 2014).

ABOVE: The completed Swift PCF boat based on the Amazing Hull, on the water at Fishers Green SC.

If you look at the pictures, you will see an array of some of the models I have been 'messaging about with' over the last few of years. Whilst they represent various types of craft, they all have one major thing in common and that is that they are all of the hard chine type. This, from experience, has resulted in models that which may appear to be totally different, can handle all kinds of water conditions, are very stable and are all capable of considerable speed (if you wish it!) and are generally really good fun to operate.

I don't know what started off the train of thought leading to this article, but I think it was when I was engrossed in bemoaning the fate of model boating and the vagaries of the 'young generation' and their apparent disinterest in anything constructive and a couple of jovial members of the Luton & District MBC and myself expounded on possible ways of righting these wrongs in the Victorian splendour of a show at Alexandra Palace. In the chaos of the North Circular Road on my way home, I reasoned that most of us old and slightly wrinkled boat modellers had started the hobby later in life, when we had some money to spare, a bit more time and a wife who was glad to see the back of us so she could get her hands on the TV control for a change!

There are young and enthusiastic boat modellers out there, but are often in a family of keen model boaters' in a home where the spare bedroom is

furnished like the Swan Hunter Shipyard. Having spent most of my adult life teaching young people how to design and make things, using tools and solving problems, I know that there is a need in most of them to explore how things work. Model clubs in schools have always been enthusiastically attended, whether they be for round-the-pole electric aircraft, rockets, free-flight aircraft, indoor foam r/c model aeroplanes and even small electric powered model boats made from recycled materials. Despite all of this, it seems that only a small number then continue with such a hobby.

Most teachers in Design and Technology Departments would jump at the chance to have a model boat club after school once a week, and when you couple that to having a model boating lake not too far away to test and run models, it is a reasonable assumption that if not now, then one day in the future one of the students will come back to the hobby when there is not so much going on in their lives. To this end I mentally explored what you would need to make a club like this succeed and my thoughts revolved around:

A local secondary school who were interested in having a club and allowing it to take place in their workshops.

A technology teacher in that school who is prepared to stay behind to support and supply the necessary qualified, safety and police clearances

and who can lock-up afterwards.

A nearby club pond where youngsters could meet the adult club members and run their models and bear in mind that some schools have their own swimming pool, which could be utilised.

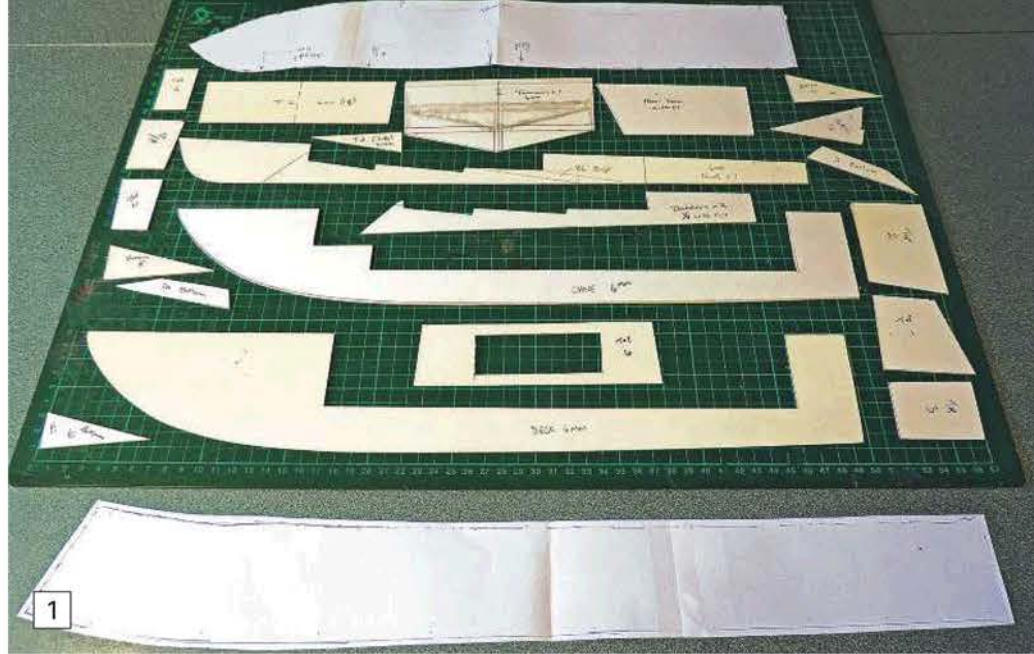
A simple and easy to build cheap and reliable design of model boat that gave scope to be built in many different guises.

A model where the parts could be batch-produced

“Most teachers in Design and Technology Departments would jump at the chance to have a model boat club after school once a week”



RIGHT: All the template parts for the model. One of the plan copies has been cut up and the pieces of paper stuck onto the card, with the exception of the side and bottom skins.



ABOVE: This photo shows the decking piece being drawn so that you have a one piece deck. Check that the complete piece will clear the edge of the sheet of Depron when flipped over, then draw a centre line.

so did I when I was their age. Whatever we build must be achievable and even if the build quality and paint finish is a total mess, it should still work well. Because of this we can't expect youngsters to doggedly wade through a full set of complicated formers, longitudinal strips, strip planking (or double diagonal!) and all the rubbing down, lining and glass-fibre over the insides and/or the outside, etc. etc. We could always go for a vac-formed or GRP hull, but these aren't cheap and defeat the whole object.

Designing the basic hull

As regular readers of this magazine know, I enjoy 'messaging around' with new materials and ideas.

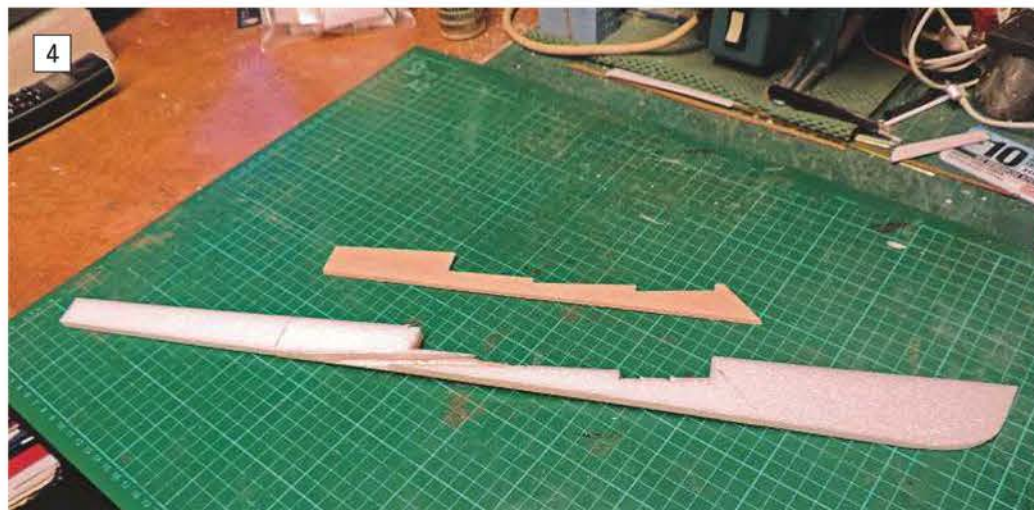
Most of my recent models have been based on a carved solid (or laminated) block of blue (builder's) polystyrene foam. This system works really well, but then I know that careful shaping, checking and re-checking what you have carved, is the only way to ensure a true, accurate and scale hull. Unfortunately you can't guarantee that beginners or school students will do this and if you want to guarantee success, you end up doing it for them, which is not the idea. So what was needed, was an almost foolproof method that was quick and easy where a few minor mistakes were not the end of the world.

My first model boat was a Keil Kraft EeZeBilt Triton cabin cruiser. Triton was one of a set of seven



LEFT: The adhesive used was Deluxe Materials R/C Modellers Glue for most of the building. This adhesive can be used on one side only and has to be pinned and left for an hour, after which it dries clear. It is very strong on foam, fills gaps and can be used on clear acetate windscreens with confidence as it doesn't fog the plastic. UHU POR is a very good alternative for joining the bulk of the foam work. It should be spread thinly on both mating surfaces, left for 5 to 10 minutes then brought together, which is a faster method but more fiddly. ZAP Foam Safe CA is very expensive for the quantity you get and must be used with its own Foam Safe 'Kicker' otherwise it can remain wet for ages on foam. I thought it was pricey, being nearly £13 for both and a tiny 20 gram (0.7 ounce) bottle of glue at that! Despite this it is very useful on high stressed areas or where you don't have enough hands, clamps or pins to hold two difficult 'springy' parts together. Two part epoxy? I used Z-Poxy five minute, but only for the motor, propeller and rudder mountings. It is great on foam and other materials like wood or metal to foam, but relatively speaking it is heavy. We do understand its gap filling properties and in small quantities it has its place in a lightweight model.

“Whatever we build must be achievable and even if the build quality and paint finish is a total mess”



RIGHT: Glue one plywood side support to the keel, weight down flat and leave to dry. When set, trim away propshaft slot before adding second plywood side.

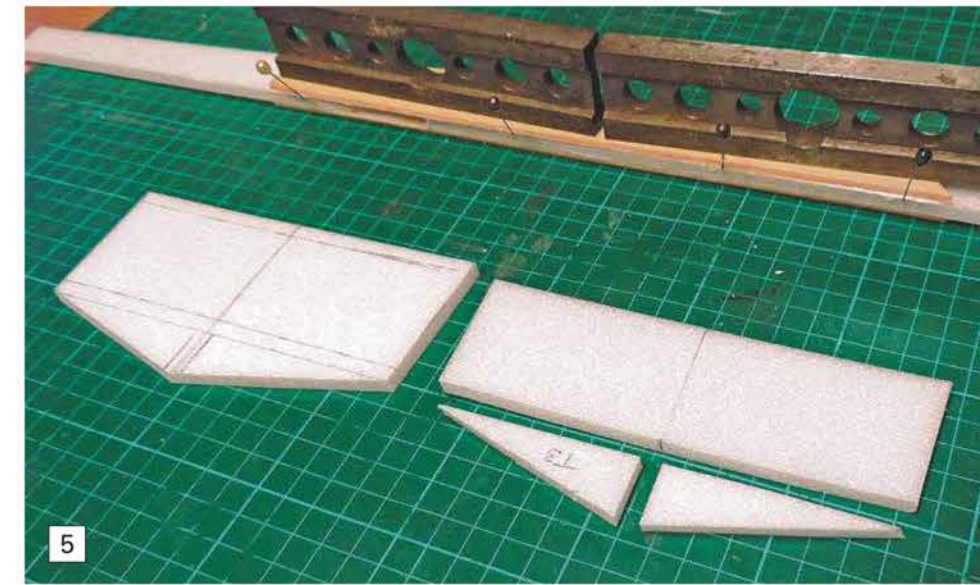
beginner's models, aimed specifically at the young newcomer to model boating and Ernie Webster, Eddie Keils' young designer, came up with a simple slot together hard chine hull design in die-cut balsawood. Other talented model designers took the hard chine hull design and applied it in various ways to create foolproof kits. Les Rowell, another model boat designer, took 'Egg Box' construction as it was called and applied it to his boat kit designs, just like Ernie Webster. The late Vic Smeed, another prolific and talented designer, modified and improved many designs to keep in line with the fast growing technology of that period. Today, Glynn Guest regularly applies the lessons learned from these pioneers and often uses similar methods in his Free Plan models.

The fact is that this slot-together concept allows us to build a simple yet strong hull that almost self-aligns as it goes together. The only fiddly bits being sanding the open structure at right angles once dry and pinning down the outer skins at the bow. Compared to the plank-on-frame method, this is a massive and practical step forward.

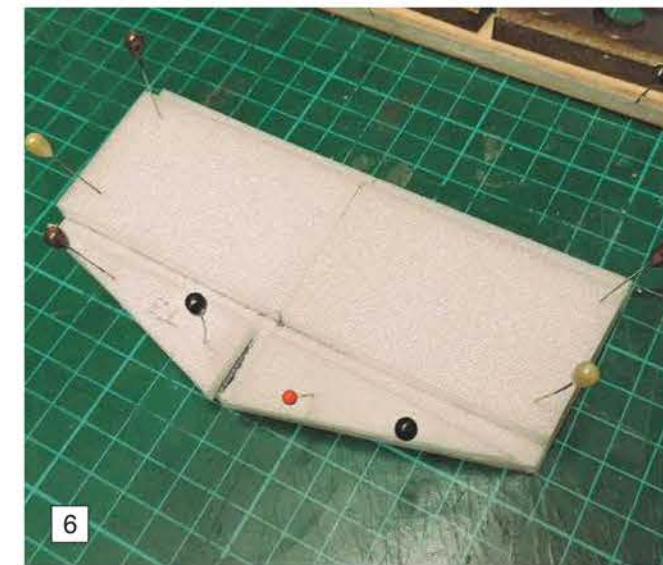
In reality we don't need all the framework to make a basic hull shape - just take a look at a welded aluminium dinghy of today or a vac-formed moulding, as we only need to make joints where the skins meet. The 1960's Mirror Dinghy used a 'stitch and glue method' and the internal supports were only there to support the seats, deck, the mast step and rowlocks, keeping the hull shape intact.

In the plan design shown here, the framework enables the self-alignment of the constituent parts to ensure accuracy without complicated jigs, giving a firm base for the motor, propshaft and rudder assemblies and supporting the transom and deck. So, in the interests of simplicity, the whole model relies on a straight centre line.

As a result, I started with a simple keel that was strengthened each side by adding 3mm Lite Ply doublers and this is the only part that really needs to be 100% straight. This 'Motor Stick' principle, as we used to call it when building free flight rubber aeroplanes, is a rigid base on which to fix all the propulsive hardware and the other frames. It ensures that the motor, coupling and propshaft align



ABOVE: While the keel is drying, prepare the parts for the transom. Use an offset of 6mm to make sure the gaps are nice and snug.

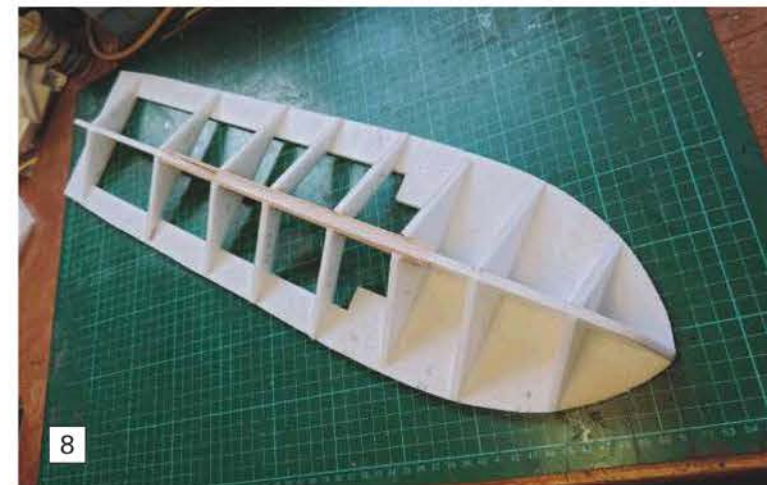


LEFT: Transom parts glued and pinned together and in the background the keel parts are weighted down on a flat surface to dry properly. This is quite important as everything is built on the keel.

BELOW: Using pins and some 90 degree weights, glue the assembled keel on the centre line of the chine deck and leave to dry.



BELOW: Glue the triangular formers, in pairs as shown on the plan, into position between the keel and the edge of the chine to create the bottom of the hull.





LEFT: I had envisaged building a freelance torpedo boat and that is why I increased the length of the hull. However, I came across this Revell 1:48 scale US Navy PCF (Patrol Craft Fast) plastic kit on eBay and once assembled it fitted the bill exactly, so from now on all the future building work had this type of craft in mind. That is the beauty of this type of hull which can be easily altered to suit the craft of your choice.



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ABOVE: Glue the transom assembly and the front deck support on the centre line. Ensure they are at 90 degrees, although the side formers, if they are cut accurately, will ensure the correct angles.

properly and if carefully built and weighted down flat when drying, forms the centre line piece of a model, which is so critical to its accuracy. It was decided to dispense with cutting the slots and tabs so beloved by the early designers. The model builder now relying on a set square or similar to ensure 90 degree joints. This makes cutting out the parts so much quicker and if a part doesn't exactly line up, it will be sanded flat anyway and covered by the main hull skins, as remember that this truly is a quick build and/or beginner's model. Consequently, a set of plans were drawn AFTER making a prototype hull. If it didn't look right I changed it, but doing it this way I knew for certain that the drawings worked.

The drawings supplied here can be enlarged to A2 on the photocopier (x 2) to give a finished basic hull 20 inches long by 6.5 inches beam and a depth at the bow of 4.25 inches (510 x 170 x 105mm). Two copies should be made so one of them can be cut up to make the templates. A standard 400 brushed motor would be adequate for sport use, but a 2820 size 1000kv brushless motor was eventually fitted which makes for a very spritely fun model! You can of course enlarge, or even reduce the size, as you think best.

Getting started

After cutting out a set of paper patterns, stick these on to card, or if you are planning to supply a model club of any sort, thin aluminium or good quality birch plywood would last much longer. There is also the option of cutting several kits at once using a hot wire cutter and this method benefits from an aluminium pattern for the larger quantities. Gather together the basic tools needed to build one of these Depron boats, namely:



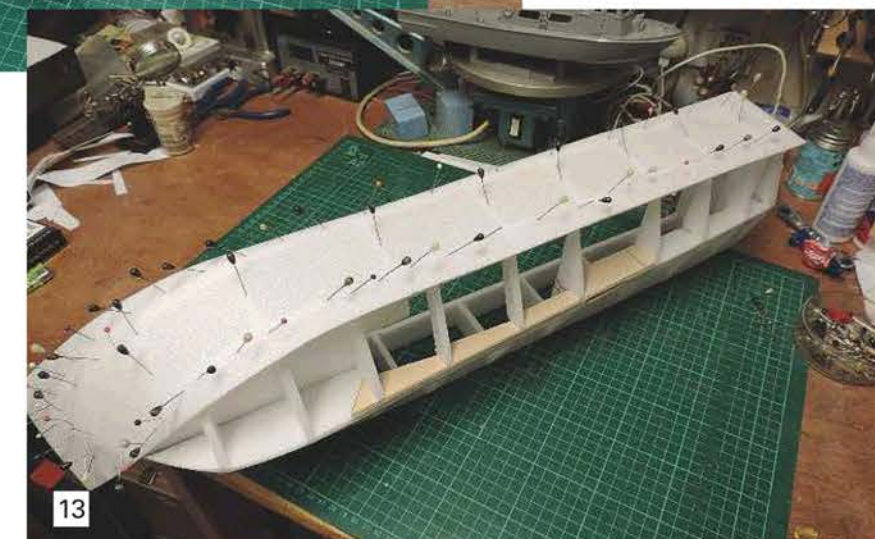
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- A good quality model knife with a sharp blade.
- A steel ruler and fine marker.
- A supply of model pins, cutting mat and a sanding block.

I am a believer in keeping models as light as possible and strong, as you can always add weight, but it is nearly impossible to remove it if a model does not perform very well. There is also the need to make a beginner's or fun model like this as simple and cheap as possible, so the materials need to be easy to cut and shape. There is also the fact that there is virtually no dust when rubbing-down and this is a big plus when building models in a domestic environment.

Having designed some indoor flyers for kids at one of my school clubs, I am well versed in the use of Depron. This white polystyrene sheet is incredibly light and much stronger than people think. It is very easy to cut with just a sharp modelling knife and sands easily, plus it has no grain direction so can be cut in any way from the sheet to get the best out of the raw material. The 2 and 3mm thick sheets will bend quite easily, so are ideal for one piece hull skins while the 6mm thick sheet makes for a very rigid structure. (Recently that there was a lovely little Depron Fairey Swordsman kit available on eBay. The performance photos looked great and our hull should do the same)

Costs are a consideration. A one square metre sheet of 6mm Depron cost £5, and a similar size sheet of 3mm thick was £3, both together nearly enough for five models, which equates to less than one sixth of the cost of balsawood! Suppliers? Colin Bliss Models at Maldon and Active Scale Models of Hockley in Essex both stock sheet Depron and a quick search online will find other stockists around the UK.



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Glues?

PVA adhesives will not dry if sandwiched between two pieces of foam although it can be used painted on outside surfaces as an exterior finish for strengthening. Most solvent based adhesives will melt the foam, so five minute epoxy, Deluxe Materials R/C Modellers glue, UHU POR and possibly Foam Safe Zap and Activator are really the only adhesives that should be used.

For those that cannot tear themselves away from wood for everything, all the 6mm (1/4 inch) parts on the plan can be made using soft and light balsawood and I would use either medium 1/8 or 3/32 inch for the skins, but applied with the grain vertical, cut into small sections. The assembly sequence is exactly the same no matter what material you use.

In the early days of EeZeBilt kits, the build sequence was illustrated using a step by step set

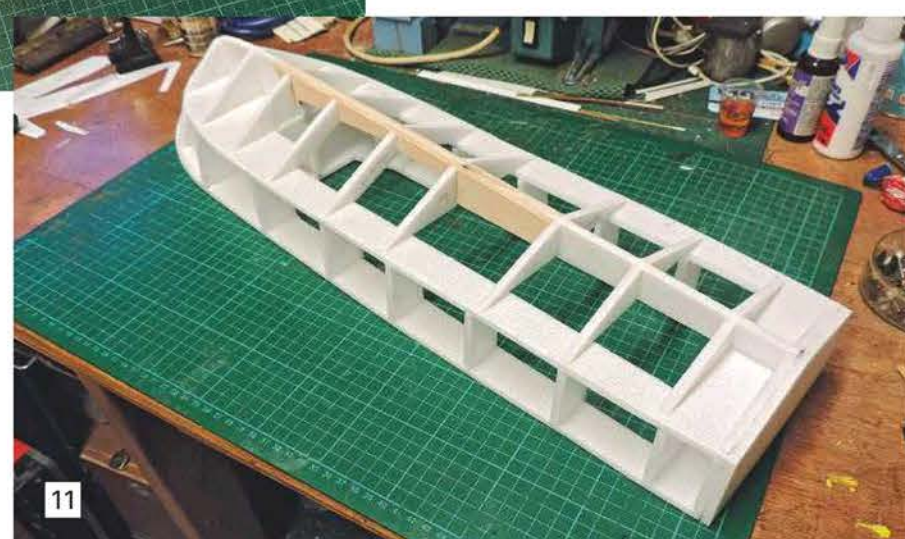
ABOVE: After rubbing the sides level and in line with the shape made by the sanding block, the first side skin was stuck in place. R/C Modeller's glue gives plenty of time to position and pin the 3mm thick sheet to the frames. Once dry, its ends were first trimmed with a sharp knife and then sanded to shape. The other side was then added in the same way. Leaving the hull now to fully dry overnight, the other side skin piece was also then trimmed and sanded to shape.



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ABOVE: Pin and glue the top deck into the recess in the transom piece and ensuring it is central, the forward part to the front deck support.

RIGHT: Add the deck and side supports between the deck sheet and the chine sheet in pairs. Try to line them up with each other to maintain equal stresses, and if you opted to extend the hull's length, add more of these as needed. Ensure the edges protrude just a little over the edge so they can be sanded to give the exact angle of the side skins. The sanding block you make must easily span the distance and only light forwards and backwards action is needed. The foam can be damaged if you slip off the frames and dig the corner in, so take it slowly as Depron sands much more easily than wood and it only takes a short while. Just make sure the formers follow the angle and the edges of those preceding are feathered nicely.

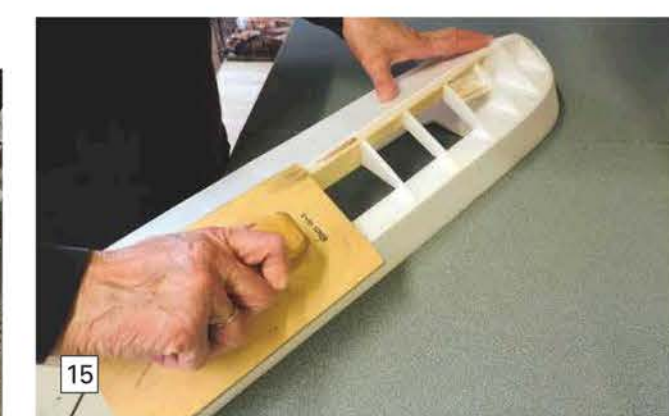


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BELOW: Once happy with the side skins trimmed and sanded to size, coat the relevant edges with glue, position and pin on the first bottom skin, and allow to dry.



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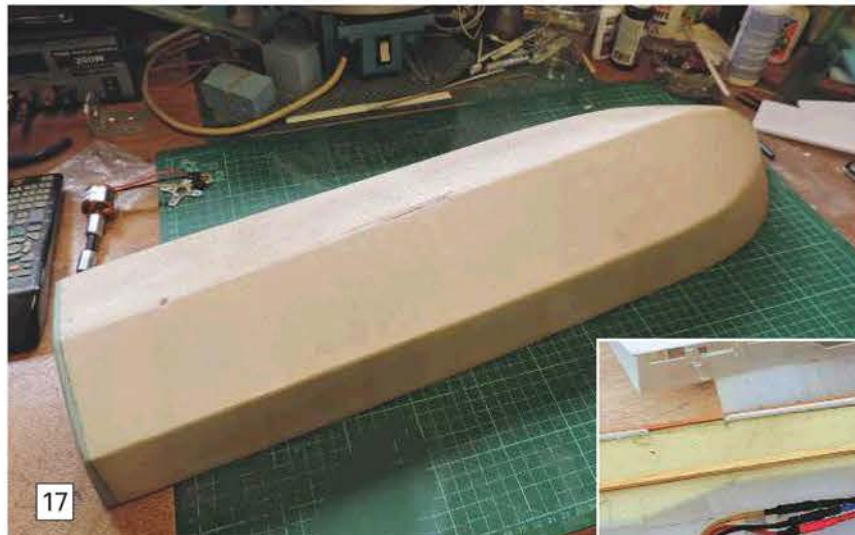
ABOVE: Trim and sand back the first bottom skin then pin and glue on the second one. This picture shows the style of sanding block used for all the major smoothing work. Here it is creating a nice bevel on the edge of the first bottom piece. You can, with the R/C Modellers Glue and a finger, make a fillet of glue along any seams that are suspect.



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ABOVE: Here is the basic Depron hull. I like to use a leg from a pair of tights to skin over the hull as the foam, once treated with a coat of resin, whether epoxy or acrylic, does need the added strength that the nylon gives it. Do not be tempted to use polyester or fiberglass resin as this melts these plastics! Lightweight tissue, glass cloth, brown paper and aircraft nylon have all been tried in the past, but the problem of joins and overlaps always makes the edges fiddly and awkward to get a good totally uniform smooth finish.

A leg of a pair of ladies tights, being a tube of nylon, will cover a hull up to 36 inches in length with no joins or overlaps and is surprisingly strong once finished. If it is easier for you, or you want more strength and knock resistance, then after the first layer of nylon and resin has had the sharpness (it dries hard, but a little rough to the touch) sanded off, a second nylon skin can be added if desired. In the picture, the toe and heel part of the tights are stretched together and tied over the gap in the deck to get rid of any wrinkles. This also creates a handle to hang it up to dry for manhandling, without touching the wet surface.



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ABOVE: This is the hull after finishing with the 15 denier (thin) tights and applying one coat of SP113 Finishing Epoxy Resin, although any make of solvent free finishing resin will do. Some of the Acrylic (water based) coatings are nice and easy to use, but will take three to four coats to match the strength of one coat of epoxy resin. They are of course quick to dry between coats, 20 minutes on average, and easier to sand. I have also experimented with thinned PVA adhesive, Cascamite powdered glue and Ronseal clear acrylic gloss varnish will work equally as well as a purchased, branded, acrylic product. Note: I needed a curved transom for the Swift PCF boat, so added a piece of blue foam, glued with R/C Modellers Glue, sanding it to shape once dry before covering with nylon.



RIGHT: The 'guts' of the Depron hulled boat.



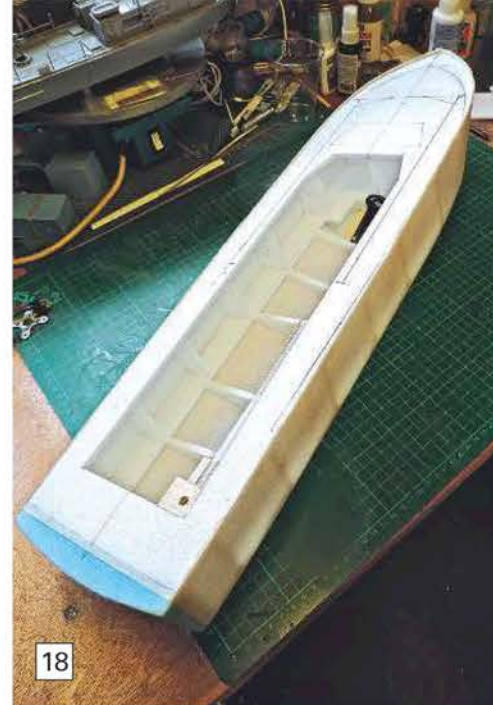
RIGHT: The Depron Swift PCF boat - almost finished in mid-2014.

of hand drawn black and white pictures as printing technology was not as advanced as it is today. I'm glad to say that we have moved on since then and the photo sequence shows how to put the basic hull together. The prototype was built exactly as per the plan and the second hull built from it is the one used in the photo sequence, but was extended by adding 1.5 inches in front of, and the same distance behind, the wooden supported keel pieces. I also extended the top deck plan by another inch at the bow/deck level and consequently the rake of the deck support piece. This gave me a hull more suitable for torpedo boats and similar and was done to show the flexibility of the basic plan.

Conclusion

Well, that is the build of our basic 'Amazing' all-purpose Depron hull. The long one became a Swift PCF from the Vietnam War and details of the upper parts were all taken by doubling up all the measurements of the 1:48 scale Revell kit to make a handy 1:24 scale replica. The little black hull will probably become a Fairey Swordsman or a sports fishing boat in due course or just a freelance fun run model. It doesn't matter what you choose, because as long as you watch the weight of the cabin and so on, you know for a fact that it will be a good runner.

In the final analysis, the Swift PCF model has performed extremely well and even though I have



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ABOVE: And here is the hull the right way up! It may be best to coat the deck separately, using the same principle, but the other way up, if you can't get the creases out of the stretched 'tights leg' when pulled over the top of the hull.

a few more bits and pieces to finish off, I am more than pleased with its performance. It took about two days to make and cover the hull, and in terms of cost, the materials for the hull including Depron, adhesive, a pair of tights (yes, I did buy new ones!) and resin came to a little over £7. Not bad for a beginners model!

Have fun and keep on model boating, Ron Rees. ●

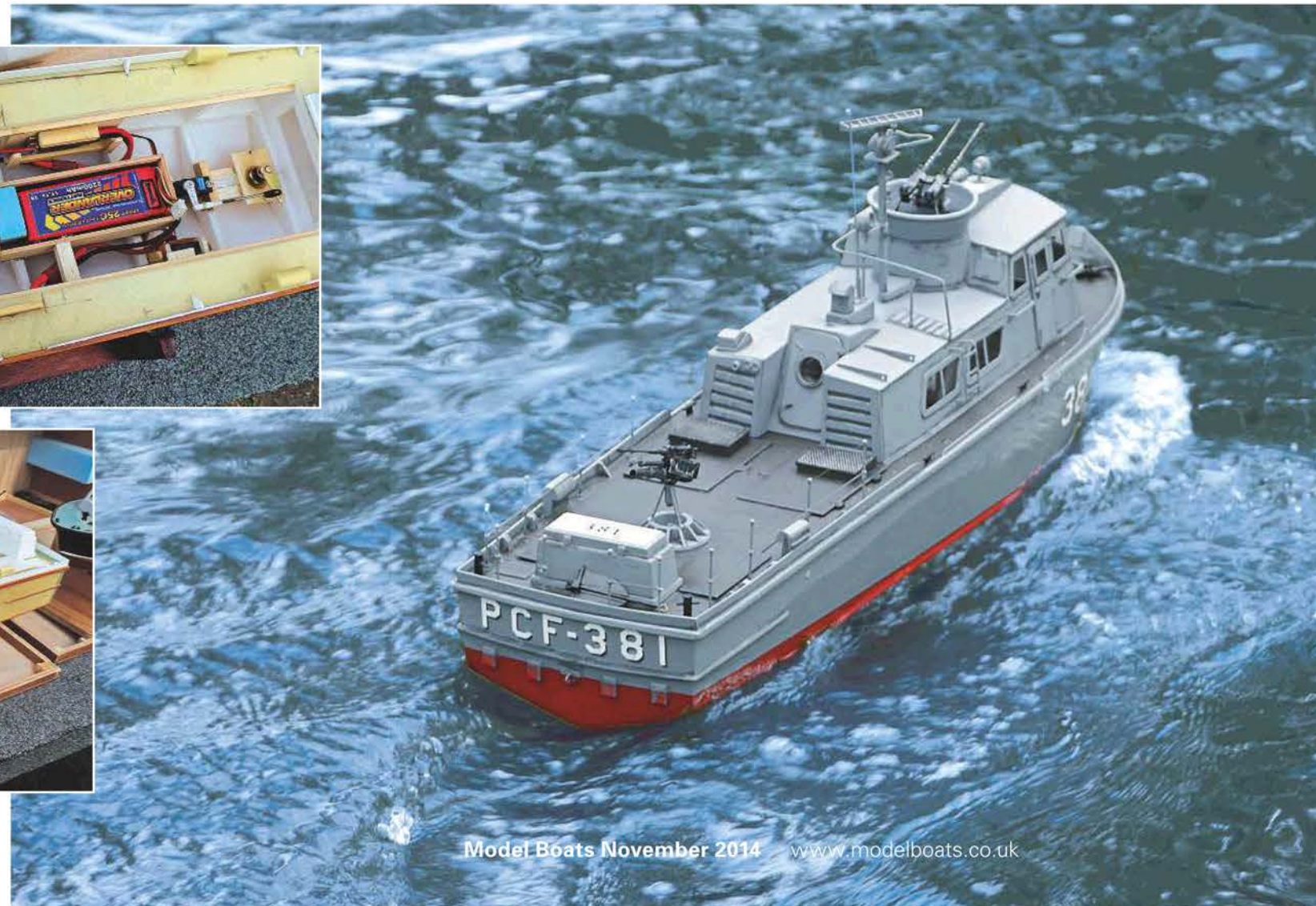


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ABOVE AND LEFT: Here are the two hulls, the black 30 Denier coated original that the plans were drawn from and the slightly longer tan coloured 15 denier covered hull for the Swift PCF model. At this point they have no chine, running strips or deck edgings, but these are easy to fit. I tend to use 1.5mm and 3mm spruce stripwood or similar, glued on with medium superglue before the final coats of finishing resin are applied. Now your hull is ready for its superstructure, so start searching the world wide web for images of various boats as there are thousands of them out there.



“I am more than pleased with its performance.”