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36" Thames River Police Launch

by robbob



8th Nov 2018

36" Thames River Police Launch

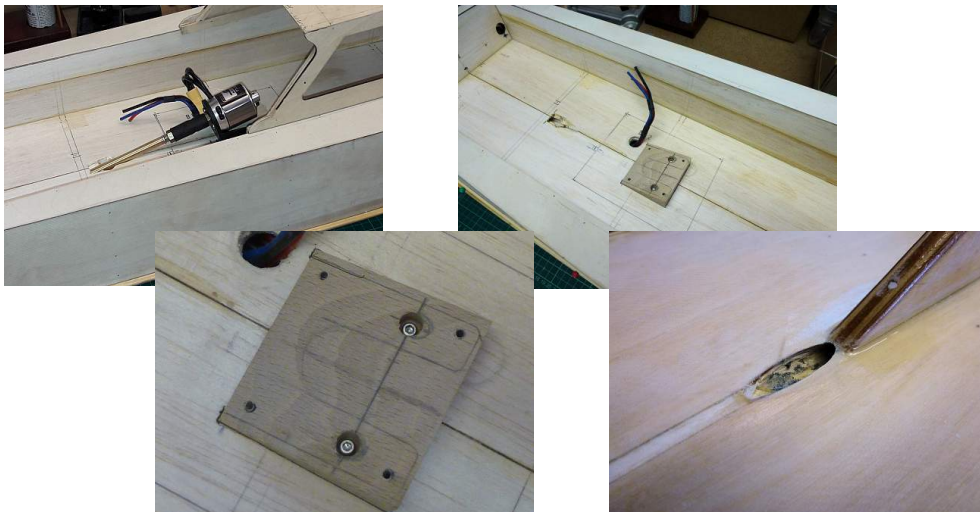
After the successful build of the 'Vintage Model Works' RAF Crash Rescue Tender I was asked by Mike Cummings of VMW if I would undertake to build a prototype of their new model with the aim of checking the construction method and the assembly instructions for accuracy before the kit is put into production. The model is a 'Thames River Police Launch' and is based on the original design by Phil Smith for the Veron company, this was a very popular model kit in the late 50's and 60's and sold for the princely sum of 43 shillings and tuppence, approximately £2.15 in today's money but an equivalent cost of £48.50 in 1960. This design has been updated to accommodate electric propulsion and radio control by Colin Smith, the son of the original designer and it has been re-scaled to be 36" in length where the original was 24" which gives much more scope for detailing and provides more 'hiding room' for the drive, control systems and all the associated wiring. The kit produced by VMW uses the same construction techniques as the original and the materials are a combination of balsa and plywood both of which a laser and CNC cut for precision. The ply and balsa materials supplied are of very high quality as one would expect from VMW and all the stripwood for the chines, rubbing strakes and deck detailing is included, even the dowel required for the mast is in the box, very comprehensive! The kit also includes white metal fittings such as the fairleads and stanchions, and the searchlight and horns. The glazing for the windows comes in the kit too. The instruction sheet supplied is in need of revision as it is largely taken directly from the original as written by Phil Smith and some of the terminology needs updating, for instance the ply bottom and side skins are referred to as 'strakes' but I understand that a re-write of the instructions is in hand along with an updated plan showing the best positioning for the motor, prop-shaft, battery, ESC, receiver, rudder and servo. During construction I have added a few additional pieces of ply or balsa as reinforcement or supports and substituted some balsa parts for ply where I thought a stronger material would be better. I also added some hatches to give access to the wiring at the bow and the rudder & servo at the stern but largely I have not gone 'off plan' to any extent. The pictures show the model in it's present state (Nov 2018) and is ready for painting and finishing.



15th Jan 2019

Motor, mount & prop-shaft.

The prop-shaft, coupling and motor mount that I ordered from ModelBoatBits has arrived so it seems a good time to make up a supporting wedge for the mount to fix to. I do have a rigid brass motor alignment aid that I used when building the Crash Tender but do you think I can find it in the workshop?....nope! ? I expect it will turn up when I need it least! ?Not wanting to waste time I used a length of heat shrink tubing over the motor coupling to make it as rigid as possible, a trick I had seen done elsewhere, and this enabled me to position the motor on its mount in the desired position and measure the angle that the mounting wedge needs to be made to. I used an offcut of beech that I had in the workshop which I cut to size and then shaped it on the rotary sander that I bought in Lidl, fantastic piece of kit !!. The wedge was then drilled to take the nylon motor mount and also the fixing screws that pass through the beech block, through the balsa base of the box and into the ply reinforcing plate that I put in during early construction of the hull. After cleaning up the hole through the keel the prop-shaft was keyed with some abrasive, smeared with some epoxy and then pushed through to mate with the motor coupling. I used the excess epoxy resin around the shaft inside the hull and used some packing tape to stop it running out when I inverted the hull to seal the lower end. A quick spin on the motor confirmed that the alignment was spot-on and the hull set aside while the epoxy set. The next step will be to plank the deck.



21st Nov 2018

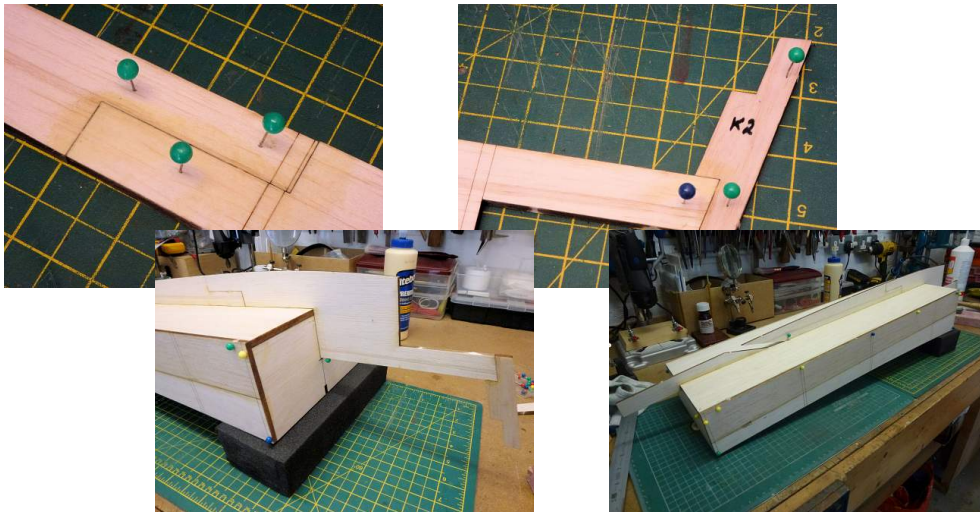
Constructing 'The Box'

Phil Smith, the original designer of the Thames River Police Launch, based the construction on a rigid box structure around which bulkhead formers are fixed to give the hull it's shape, a design feature of many of the Veron kits. In the Vintage Model Works kit all the components of this box are laser cut and require no additional trimming before assembly, I have used Titebond 2 aliphatic glue throughout the construction as it bonds wood very firmly and dries quickly too. I started by joining the edges of the two sheets of balsa that form the base of the box, these were held firmly together with some scrap wood and weighted down on the cutting mat and left to dry. Meanwhile the box sides were similarly glued together taking care that the two pieces that form each box side are in perfect alignment using the laser etched vertical lines that mark the bulkhead former positions, these were also wedged together and weighted while the glue set. Once the bottom and sides are dry the ends can be added to complete the box construction, a try-square was used to check the box for accuracy and everything was held together with some 'push pins' while the glue set. As this box forms the foundation of the hull it's essential that there's no twist or anything out of square. This was all done in one evening, clearly the assembly of this kit could be completed quite rapidly if you really wanted too!

29th Nov 2018

Assembling the keel & adding bulkhead formers.

With the box assembled and the glue fully cured the next stage is to glue the inner keel parts together and fix it to the underside of the box. The keel consists of four pieces that need to be jointed whilst on a flat surface, the instructions suggest that the parts are best assembled whilst laid over the plan with a transparent protective sheet between to ensure accurate alignment. A gap is left in the keel for the prop shaft and this gap is laminated over by some additional keel pieces on either side. I chose to deviate from the instructions here and fit these pieces after the prop shaft was in place to ensure a snug fit, I have it on order from Model Boat Bits along with the prop and rudder. The assembled keel is glued in place along the centre line of the inverted box and when dry the bulkhead formers can be added. The positions of all the formers are clearly marked on the box and the underside formers are added first followed by the side formers and lastly the bow formers, and the assembly set aside to dry. I'd almost forgotten how easy it is to work with balsa, it takes glue and pins readily and assembling this model is a joy, however, shaping the solid balsa bow blocks to the correct profiles will be an interesting challenge. But I don't need to do that for a while yet.



11th Jan 2019

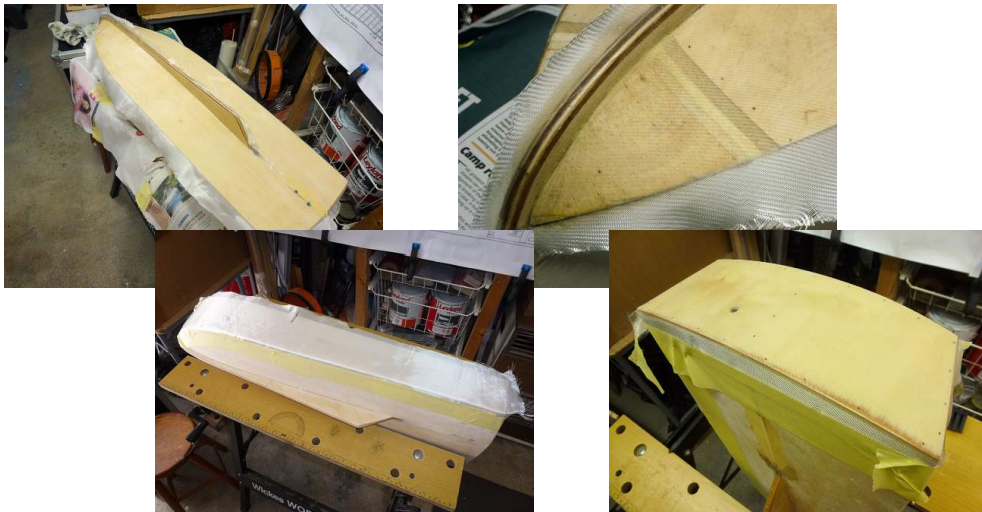
Fitting the rubbing strakes.

Before I can apply the final coats of epoxy on the hull I need to fit the two rubbing strakes. I started with the bottom rubbing strake which runs along the chine where the side skins and bottom skins meet. The strakes meet the external keel at the bow and also extend across the stern. I used a length of square section of obeche which needed a gentle curve towards the bow, rather than steam the wood I soaked it in water for a few minutes to soften it and then used a heat gun while bending the strip gently to the required curve. When the wood had cooled and dried the bend was set I did a test fit and drilled very fine holes through the strip so that the modelling pins I use to hold the piece in place would not split the wood. A 30 minute epoxy was used to fit the strakes on both sides of the hull and stern. Above this bottom strake is a second rubbing strake and this also meets the keel at the bow and runs across the stern, I used a broader and thinner obeche strip for this and it was prepared and fixed in the same way. The final pieces to fit will be the gunwales which run around the hull where the sides meet the deck but I will not fit them until I have planked the deck.

9th Jan 2019

Glassfibre cloth & epoxy resin

I used glassfibre cloth and epoxy resin successfully when building my 46" RAF Crash Tender and I chose to do the same with the Police Boat. See: <https://model-boats.com/builds/view/23951> for the Crash Tender blog. The application of the cloth and resin serves to strengthen the hull enormously and produces a completely watertight hull, and after additional coats of resin are applied and sanded between coats resulting in a surface that is absolutely smooth and the perfect substrate for the subsequent paint process. With the benefit of my previous experience and greater confidence working with these materials I used a 'fast' hardener with the resin which gives a working time of 30 minutes and a much shorter curing time where previously I had used a 90 minute 'slow' hardener. The basic process is to cut the cloth roughly to shape with a good margin of overlap and then use masking tape along one edge so that after the resin has been brushed onto the hull the cloth can just be lifted over onto the resin. I then lightly brush the cloth into the resin and push the cloth into any tight angles, without any further resin on the brush, until the weave of the cloth is filled and there are no air pockets and the cloth is completely flat. At this point DO NO MORE as the resin will start to harden and any more fiddling with it will cause the cloth to lift and bubble, less is definitely more in this instance. The resin should cure completely overnight and can be trimmed with a sharp blade. I tend to cover a hull in five stages, as there are five 'faces' to the hull and thus it's a five day process for me, this may be time consuming but I think the results are worth the effort. I will brush on two further coats of resin when the rubbing strakes and gunwales have been added, this will completely fill the weave of the cloth to create a nice flat surface but it's essential to rub down each coat after curing. All the materials were bought from 'Easy Composites' <https://www.easycomposites.co.uk>



9th Dec 2018

Upper & Lower Chines

The next stage is to assemble and fit the upper and lower chines to the bulkhead formers.

Each chine is made from three parts that are step jointed together, the instructions recommend using the plan to ensure correct alignment with a protective transparent paper between, however the cutting accuracy of the parts is such that having checked the alignment over the plan I was confident that assembling and gluing them together on the cutting mat would be OK. The upper chines were assembled first and when set were glued and pinned to the tops of the bulkhead formers with the fronts butting against the K1 keel former at the prow.

The lower chines were assembled in the same fashion and when dry are glued and set into the slots in the bulkhead formers.

Finally the stern former F7 is added and the whole assembly set aside to dry.

The hull is quickly taking shape now and even at this stage is very rigid and yet remarkably light.

15th Dec 2018

Stern & keel formers

Various small pieces, S8 & S9, are added to bulkhead former F7 that create the curvature of the stern which in turn support the outer skin, in addition there are some pieces that are fixed either side of the keel as laminations to add strength and to support the bottom skins where they meet the keel. The prop shaft has yet to be delivered so I used a length of 8mm plastic rod temporarily in its place so that I could fit the keel laminations K5 around the shaft. I chose to fit additional pieces on either side of the keel between the bulkhead formers to support the bottom skins and some extra pieces of balsa were fitted at the stern to support the outer skin, and in a similar fashion some extra pieces fitted either side of the keel formers at the prow. Once all these pieces were firmly set they need to be sanded to the profile of the hull, and this is best done with abrasive paper around a sanding block. I made a sanding 'plate' from some 6mm MDF with a sheet of 120 grit aluminium oxide abrasive paper glued to it to form a perfectly flat sanding surface and this was used to chamfer and flatten the bulkhead, keel and chine formers so that the outer skins would lay as flat as possible across them. I also fitted some pieces of ply under the centre section of the box around the keel to reinforce the area under where the motor mount will be as I don't think the balsa base of the 'box' will take screws firmly. The next step will be to fit the side skins and then the hull will really take shape.



6th Jan 2019

The bow blocks & outer keel

The bow of the boat has a compound curve and to create the shape a single block of hard balsa is supplied in the kit, although in my pre-production prototype this had to be formed by laminating some pieces of thick balsa together to the required size. Rather than laminating up a single block separately I did the laminating and glueing in situ on the hull to ensure a solid tight block, and after the glue had cured I set about shaping it. Initially I used a razor saw to roughly remove the surplus at the sides and bottom and then began the process of shaping it to the final form. My sanding plate proved invaluable for the final stages of making the block flush with the hull sides. The underside of the blocks were very carefully shaped with a combination of the sanding plate and abrasive paper around a series large round formers. I was careful not to just use abrasive paper over fingers as this can create grooves and unevenness in the soft balsa. I had already created a concave shape in the bulkhead former F1 and with the ply bottom skins in place it was relatively easy to extend the contour into the bow blocks being very careful to ensure symmetry on both sides. A line was drawn on the blocks that extended the curve of the hull strakes to define the shape. I also used the outer keel as a template throughout the shaping process to make sure that I was not removing too much material. It would be very easy to remove too much material so it pays to do this slowly and carefully, checking all the time for symmetry. Finally when I was happy with the shape I formed a slight flat on the blocks for the outer keel to sit on, using a back light helped greatly with this, and the whole hull was given a light sanding with a detail sander. The prototype kit was supplied with keel components made from thick balsa which would easily be damaged in use so I recreated this in thick ply laminations to the required thickness and shaped it so that it was completely flat and square on the inner edges and with a curved profile on its outer edges. The keel was checked for fit on the hull throughout so that only a minimum amount of filler would be required to blend it to the hull. It was fixed in place with epoxy adhesive and firmly pinned until it fully set and very little filler used to finish it. The kit, which is available now from VMW, includes a single piece bow block and ply keel parts as standard, which makes construction much quicker and easier. I'm glad that bit is over and I'm very pleased with the result. Next stage will be glass fibre cloth and epoxy resin....

4th Jan 2019

Decks & hatches.

Because I need access to the wiring at both ends of the boat I formed the framework of an opening at the bow to make the dummy hatch into a real hatch. In a similar way a hatch was formed in the rear deck which will give me access to the wiring, rudder servo and the ESC cooling. It's going to be quite tight to get all that into the cavity under the rear deck but I've done a test fit and it will all go in but will involve some 'keyhole surgery' through the rear hatch opening when I get to the stage of installing all of the running gear...?. Both of these decks were glued and pinned in place and some packing tape used to pull the decks firmly onto the frames. The side decks were also trimmed for best fit and secured in the same way and when all was dry and set a small hand plane was used to trim them flush to the hull sides. The next stage will be to fit the balsawood blocks at the bow and shape them to the hull.....it's the tricky bit I've not been looking forward to...?



18th Dec 2018

Fitting the side skins.

The side skins are made from 1.5mm ply and require a slight curve towards the bow and I found that this is best achieved by gently warming with a heat gun, which seems to relax the glue between the laminations, so that when bent to a gentle curve and allowed to cool will set the shape very easily. The skins are supplied are slightly oversize and when the skins have been bent they can be roughly clamped to the hull and then marked for trimming, also while the skin is clamped in place the positions of the bulkhead formers can be marked on the skin. Back on the bench the skins were trimmed with a craft knife (with a fresh blade) and then drilled with a 1mm bit to allow pinning through into the formers and strakes. Aliphatic glue was applied to the hull formers and strakes and the skin positioned so that the drilled holes were in correct alignment with the formers and then clamped and pinned in place. Because the skin was pre-formed to the hull shape the clamps and pins are not under much tension and the hull was set aside while the glue set. When the port skin had fully set overnight, the pins and clamps were removed and the skin was finished with a plane to remove the excess down to the strakes and the F1 former at the bow and the sanding 'plate' used to finish it all off. Where the side skins meet at the prow there needs to be a wide flat area for the external keel to butt to and so the trimming and sanding there will be done at a later stage before the bow blocks are fitted and carved. The process was repeated for the starboard side skin and while the glue was setting I gave some thought to a means of concealing some of the wiring that needs to run the length of the hull ?.

21st Dec 2018

Internal wiring & bottom skins

Because I am keen to conceal as much of the wiring as possible I have decided to place the battery at the bow and the operational equipment at the stern, the engine on the original boat was central and covered with a soundproof box and this is convenient as the motor can be positioned and concealed in the same way. This means that some of the wires will have to run the full length of the boat and the easiest way to conceal them is to run them beneath the 'box' around which the hull is formed, and this needs to be done before the bottom skins are fitted. Holes were bored through the bulkhead formers under the port side of the hull and battery cables were run to the stern where the ESC will be and three motor wires from the ESC run to the centre, emerging near the motor position. For good measure I put in a servo cable and a separate draw wire just in case I needed to put more cabling in for any additional features, perhaps working navigation lights? Satisfied that I had all the cabling in place I was able to fit the bottom skins starting with the starboard side first. Before doing so I put a very slight 'hollow' in former F1 which should help blend the shape of the hull where the ply skins meet the balsa blocks that will be carved and shaped to form the bow. This can be seen in the last picture. The process of forming and fixing the skins is the same as for the side skins but in addition to the pins holding the skins in place I used some brown polythene 'packing tape' to pull the skins tightly against the bulkhead formers and strakes. The packing tape has a very high tensile strength and is ideal for this, and of course cheap and easy to remove. Once the aliphatic glue had set thoroughly overnight I removed the excess from the skins with a small block plane and finished them with my sanding plate. Before I fit the skin at the stern I will have to arrange the water cooling for the ESC, with the pickup just behind the prop and the outlet on the stern. I'll cover that aspect in the next update.



29th Dec 2018

Plumbing the water-cooling for the ESC

The HobbyKing ESC I'm using has the facility for water cooling and as it will be in an enclosed location without any free ventilation it seems sensible to utilise this feature. To keep the water circuit as short as possible I will put the pickup just behind the propeller and the exhaust on the stern but as the boat has a bulkhead just in front of the stern skin I need to make an access hole through it to allow me to secure the nut on the stern skin. I made a hole through the bulkhead large enough to get a socket on the nut and reinforced the hole with a ply plate, similarly I reinforced the inside of the stern skin where the outlet passes through it. When I was happy that the arrangement worked and I could attach the hoses and securing clips easily I glued and pinned the stern skin to the hull. The water pickup is a standard one that is readily available but it's supplied with overly large and ugly fixing nuts, the inside one is of no consequence but I thought that the outer one needed smartening up so I put it on a threaded rod and locked it in place with another nut and put that into the chuck of a drill and used a file to re-shape the nut to a pleasing taper....who needs a lathe.....? I had to reduce the height of the inner keel former as the pickup tube is not long enough to get a good fixing with the internal nut, as the inner keel is balsa I fitted a ply reinforcing plate to spread the load. The last 'photo shows the location of the ESC, main battery fuse and receiver. The hoses will be secured to the ESC with spring clips throughout. I found that the silicone tube I use tends to kink rather easily if the radius of a bend is too small and I found it necessary to form a tight spring coil around the piece that loops the water back through the ESC to prevent this happening.