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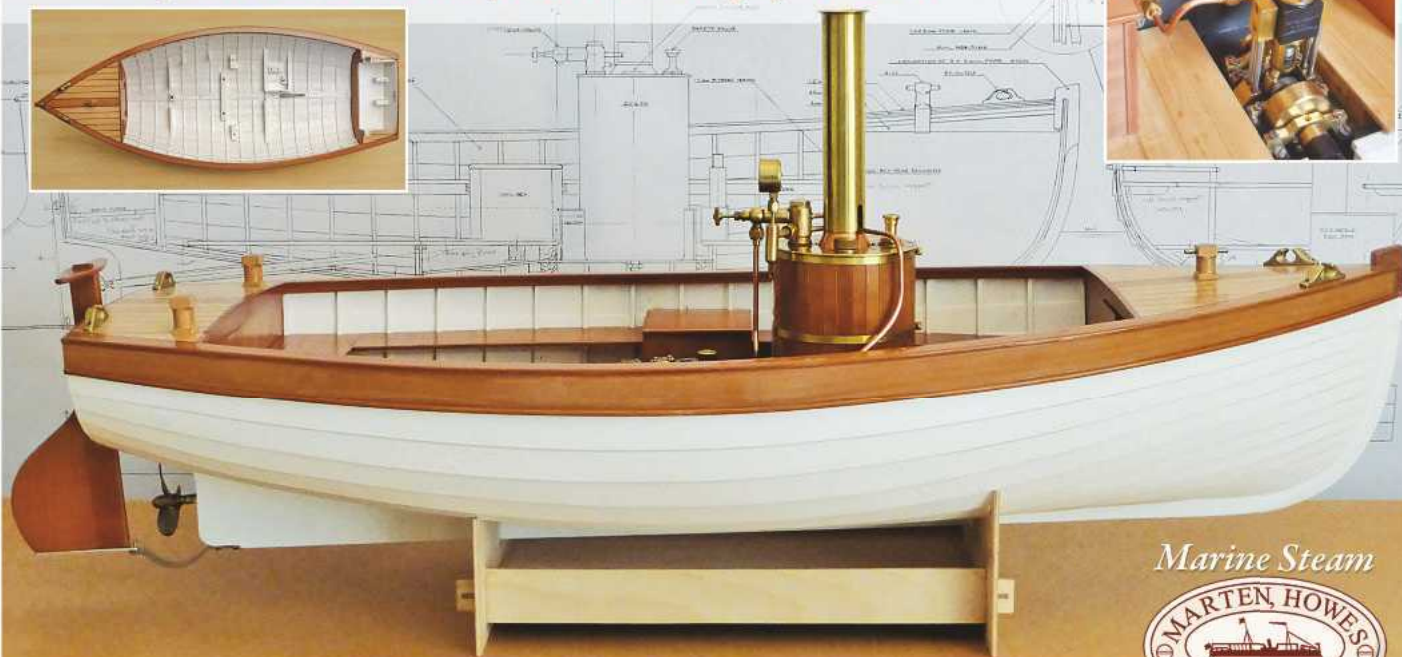
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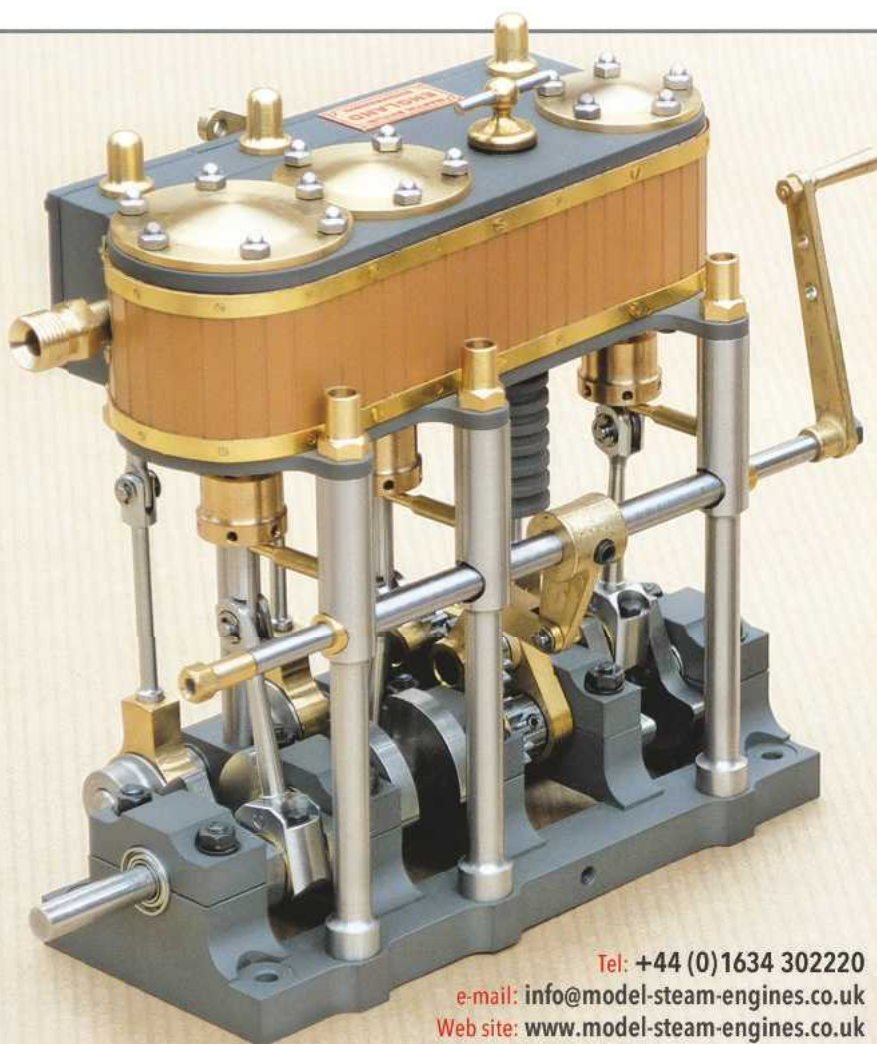
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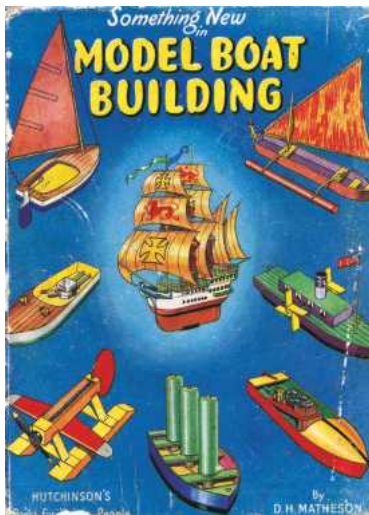
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Bow piece

This 84 page issue is on sale just before Christmas 2015 and is packed with articles of interest to model boat enthusiasts and builders. The main feature in this issue is Part One (of two) for a new plan being introduced into our MyHobbyStore Plans Service for the classic Fairey Huntsman 31. The plan is CAD drawn by the well-known model boating enthusiast Dave Milbourn, who has built two prototypes to prove the model can be built and it will work and perform just as he intended. He has been active in the model boating scene for many years in both a private and commercial capacity, and we are pleased to welcome him back to these pages.

In addition, Phil Button has another fine piece on his work with steam models, this one entitled 'Shutting the Stable Door' where he relates how he overcame an unexpected problem with one of his boats, and all in a practical fashion. This is something we all do as rarely do we get it right first time, but are often not quite so keen to admit, and therefore Phil's 'warts and all' article is refreshing.

We also have a fine easy to understand article on 3D printing and what it means for us modellers by Ron Rees, and in 'Not for the Purist', Douglas McGhee shows how it is practical to motorise and radio control waterline model boats.

We have reports from the October 2015 Blackpool Model Boat Show and the September Essex Country Show where Southend MB, together with other clubs, aimed to promote the hobby to a wide general public audience.

There are the usual regular columns including Range Finder and its ongoing HMS Skirmisher project; Flotsam and Jetsam which looks at early literature to encourage youngsters to become involved in this hobby; Boiler Room discusses 'pickling' and BMPRS News visits Kingsbury Water Park for more exciting power boat racing and spills.

This issue is on sale in December 2015 just before Christmas. On behalf of Steve Stoner who designs and lays out the articles in the magazine, Colin Bishop who looks after our website and its forum plus provides the essential editorial cover for me when I am on holiday and myself, I wish you all a very Happy Christmas and Prosperous New Year and thank you for your support for this magazine, now entering its 66th year of publication with continuing excellent worldwide sales.

Paul Freshney - Editor



Compass 360

Model Boats notice board for your news

Editorial Contact - Paul Freshney

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Ostend Ospreys' Summer 2016 Race Programme

This fast electric racing group are pleased to announce their programme for the 2016 season. These fast electric race meetings will be on:

Sunday 22nd May 2016

Sunday 12th June 2016

Sunday 24th July 2016

Sunday 21st August 2016

All events will be held at Althorne Lake in Essex and both mono hull and hydroplane classes will

be catered for. Please note that Althorne Lake is a privately owned venue so, for further details, those interested in competing are invited to contact the organiser who is: Paul Heath, via Heaths RC Model Shop in Hadleigh, Essex
Tel: 01702 553700 (10am-5pm Tuesday-Saturday inc.)

London Model Engineering Exhibition 2016

A final reminder that this is being held at Alexandra Palace, North

London from **Friday 15th to Sunday 17th January 2016** with the full spectrum of modelling from traditional model engineering, steam locomotives and traction engines through to the more modern gadgets and boys toys, plus trucks, boats, aeroplanes, helicopters and robots all being featured. Over 50 clubs and societies will be present. Although primarily an engineering show, there is much to interest model boating enthusiasts. Further information from the show's website:
www.londonmodelengineering.co.uk or tel: 01926 614101

Ellesmere Port Model Boat Show

It is confirmed that this will be held once again on **Saturday & Sunday 5th/6th March 2016** at the Waterways Museum with a strong club and trade presence. More detailed information to follow.

Lifeboat Enthusiast Society's Midland Open Day

This Society will be holding its 2016 Midland Open Day on **Saturday 14th May** in conjunction with Knightcote Model Boat Club at their usual sailing water; Sat. Nav. location CV47 2EQ. This is five miles from J12 of the M40. There will be two guest speakers, lifeboat memorabilia, hot food, tea and coffee etc. with on site parking

and toilet facilities. The 2015 event was a huge success with over 30 lifeboats both on display and on the water, so please go along to support this Open Day. For more information please contact either of:

Adrian Clutterbuck (LBES),
tel: 01604 846461
Derek Nelson (KMBC), tel: 01926 640045

Model Hovercraft Association

Richard Bristow wrote in with regard to Andy Cope's hovercraft article in the 2015 MB Winter Special and wished to draw reader's attention to his association and its website: www.modelhover.org

On this, there is currently a free plan of an easy to build hovercraft that readers might find useful.

Navies in Miniature Conference - 2016

Being held in Amsterdam on **4/5th February 2016** at the Rijksmuseum, this will be a two-day international conference about naval model collections and the research, conservation and presentation of historic ship models. Registration is now open and a draft programme and registration details in the form of a PDF document can be found on the conference website: www.rijksmuseum.nl/en/whats-on/symposiums/symposium-navies-in-miniature.

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- A Gallery which features photo albums of models, including some under construction by Model Boats readers and being updated as they progress.
- A Forum that has sections for: Beginners, General, R/C and Accessories, Static, Kits, Scratch build, Steam, Vintage, Events and Chat.
- A Features area that has sections for: Build Features, Kit and Product Reviews, Hints, Tips and Technical, Show and Regatta Reports and General Interest Articles on Model Boating.
- A Link to www.myhobbystore.com which has over 3000 plans available and numerous modelling items, books and kits. These can all be purchased online.

M&S District Footy Championship

Roger Stollery reports on this event for the Cadenhead Trophy, 27th September

The Clapham Model Yacht Club ran its first Open Meeting for many years on its water at the Long Pond on Clapham Common. The Footy class was the beneficiary of this enthusiasm and it proved to be an ideal venue for this event with good access around the lake and plenty of public interest. Competitors travelled from as far away as Derby in the North and the Cotswold's in the West, as it was one of the annual series of open events for Footy r/c yachts, which is keenly contested.

Morning session

Initially all boats were in their biggest rigs in the light breeze and Footy class captain, Peter Jackson, sailing a simple balsawood chine boat to his new design F-Plan, set down the challenge to the rest by winning Race 1, whilst Roger Stollery's hard chine Correx Supabug' took the next two races before local skipper Jim Vice won Race 4 sailing an Ice. Peter Shepherd sailing a balsawood Fat Boy Slim won Races 5 and 7, his winning streak interrupted by David Wilkinson who now had borrowed an Ice because of servo difficulties with his lambus. Peter Jackson came back with another win and this put him at the top

BELOW: The winner Peter Jackson receiving the trophy from PRO Rob Vice.



of the leaderboard at lunchtime with 21 points in front of Peter Shepherd and Roger on 23.

Afternoon session

Strong gusts were hitting the water more across the lake after lunch, so smaller sails were favoured by some competitors. Local member Weslie Philip joined the racing and created an unusual problem, because his deafness required more than just the countdown machine, so PRO Rob did some basic signing with his fingers to indicate the countdown to the start. Weslie thoroughly enjoyed being involved in the racing and always finished in the top half of the fleet and his beaming smile increased in size whenever he finished in third place. Keith Parrott was quite delighted to win Race 11, as he had never won a race at this level of competition. However the afternoon's racing was dominated by David Wilkinson with three wins and two seconds, but this was not sufficient to catch Peter Jackson because of his high score

BELOW: Some of the skippers at Clapham Common on this day.



in races when he was in the clubhouse doing repairs.

Conclusion

Clapham Common is a great cosmopolitan gathering place and there was a great deal of interest taken by the spectators, who were amazed by the exciting competition and performance of these little boats that are made very easily and cheaply using simple modelling materials. There are a great number of free plans for making simple balsawood hulls

BELOW: Clapham Common is a great model boating venue.



and effective sails from plastic bags on the Footy class website: www.sailfooty.uk.com
Rob was thanked by the prizewinners for running another good Footy event, which everyone enjoyed and wanted to repeat in 2016. As is the Footy custom, a Novice Prize was presented to the skipper who has not appeared in the podium places during the year's league events and this was presented to Jim Vice who finished fifth.

Results (Top 10 only)

- 1st:** Peter Jackson, Abington Park
- 2nd:** David Wilkinson, Cotswold
- 3rd:** Peter Shepherd
- 4th:** Roger Stollery, Guildford
- 5th:** Jim Vice, Clapham
- 6th:** Keith Parrott, Frensham Pond
- 7th:** John Dacey, Clapham
- 8th:** Trevor Thomas, Abington Park
- 9th:** Weslie Philip, Clapham
- 10th:** Grant Harris, Clapham

Huntsman

PART 2

Model Boats
February 2016
issue is on
sale on the
15th January
2016

**FREE
PLAN**

Earnshaw

Next month in *model* Boats

This issue has **Part Two** of the **Fairey Huntsman Feature Plan** article by **Dave Milbourn** and it includes a new **Free Plan** for **Earnshaw**, a freelance model based on a coastal steamer, presented by **Glynn Guest**. In addition apart from end of 2105 show reports, included will be **Pirana**, a model started in the 1980's and built to a **Vic Smeed** design first published in **Model Maker**

See more about what's in **Model Boats** magazine month-to-month in forthcoming issues and see some of the articles you may have missed from past issues and subscription offers on our website: www.modelboats.co.uk

We have a great range of subscription packages that you can choose from, including **our new Print + Digital package** which give subscribers 13 issues a year with 6 free plans, 13 digital editions to download and keep PLUS access to an Online Archive dating all the way back to January 2007.

Don't forget! The February 2016 issue will be published on

Pirana



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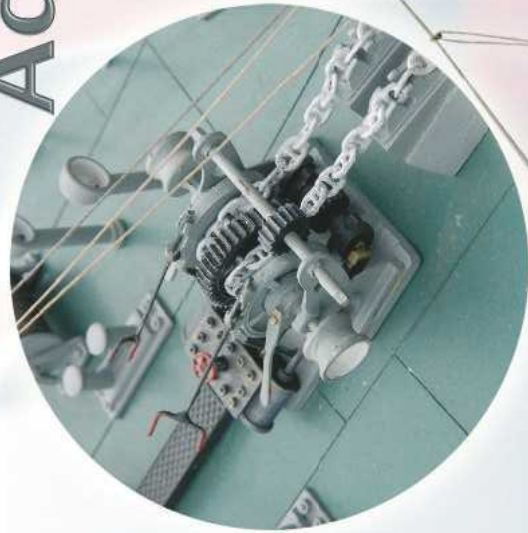


Contents may be subject to change.

Admiralty Coaster C.642

Scale 1:32

Length O.A. 49.5" (1257mm) Beam 9.5" (241mm)
Displacement 35lbs (16.5 kg)



Kit Price
£495
Inc. U.K. Carriage

Typical of many such craft built for servicing fleet vessels. One of a group built by Yarwoods of Northwich, C.642 was launched in 1946 and served until being placed for disposal in 1956. Purchased by F.T. Everard & Sons Ltd of Greenwich, Kent, C.642 was renamed the "Clarity" and used for a short period as a dry cargo carrier before being lengthened and widened in a conversion to a tanker. Steam propulsion was retained until she ended her days in a scrap yard in Antwerp in 1969.

Colour schemes are included for both vessels as shown on the leaflet, plus full size drawings, instruction booklet, numerous diagrams and colour photos in the instruction booklet.

The kit contains a GRP Hull, all woodwork, rod, wire, dowel etc, plus of course hundreds of our legendary white metal fittings including crew figures.



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HUNTSMAN

Fairey **PART 1** Huntsman

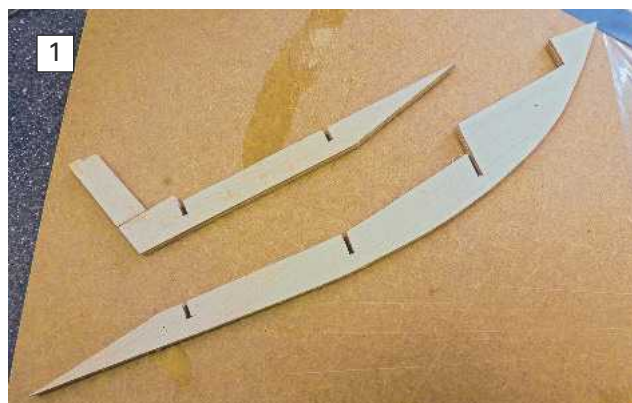


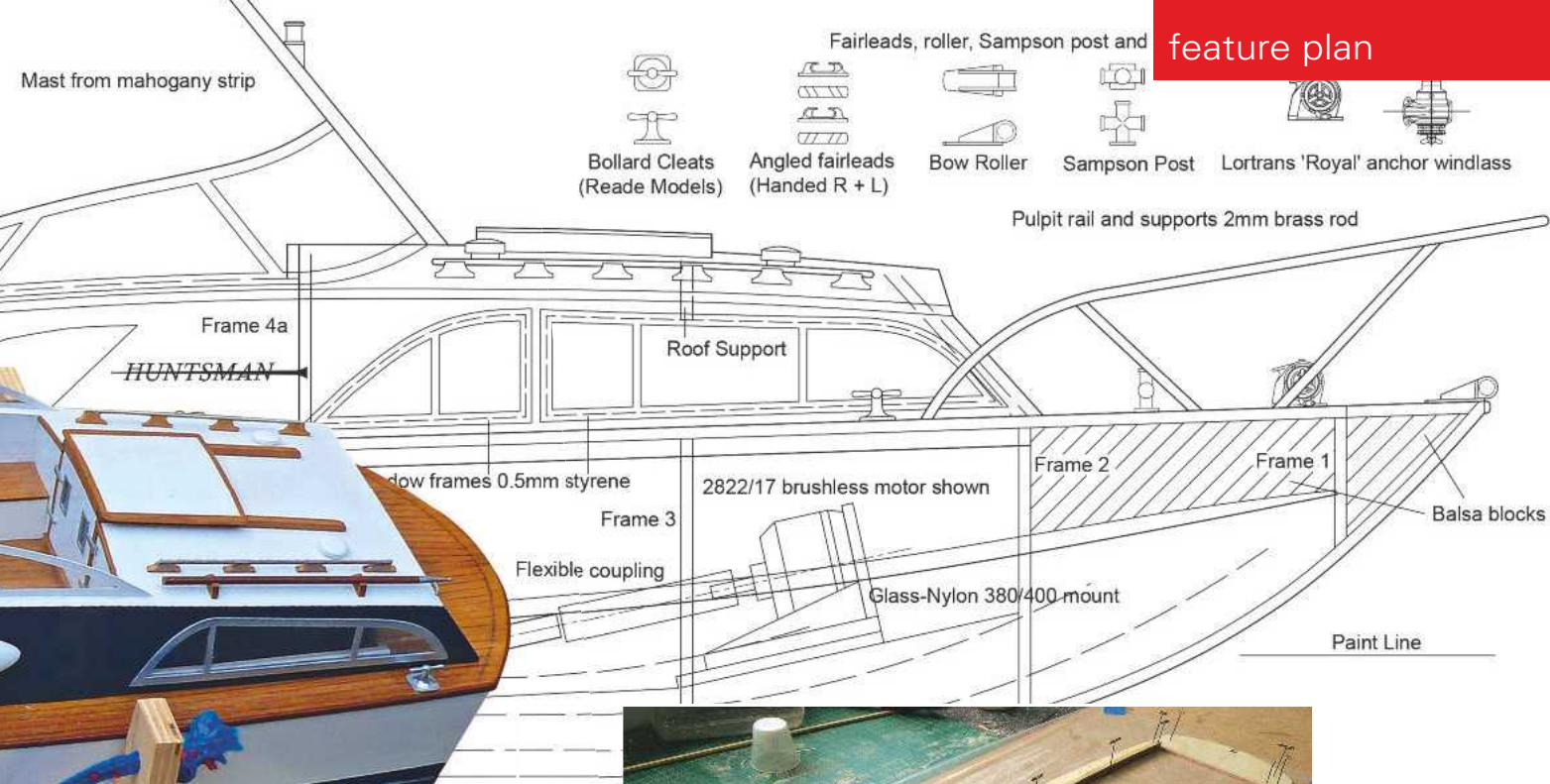
Dave Milbourn presents a new Feature Plan

This model of the classic Fairey 1960's powerboat has its origins in the Precedent kits which I designed for Model Avionics (Modav) in 1972. Those were made to 1:8 and 1:11 scales to produce models as near to 4ft and 3ft long as possible. Back then, practical powerful electric motors and NiCd battery packs for models were just beginning to come into the market, but were just not suitable for these particular model boats. Two channel digital proportional radio sets however were available, even though the servos were large and slow, and the sets were expensive. For example, the two channel Futaba Digimax was over £80 and that's £1000 in today's money. The boats were usually fitted with Hirtenberger HP61 and Webra Speed 40 Schneurleported glow (nitro fuelled) i.c. motors and noise pollution wasn't the issue that it is today.

Modav then morphed into Balsacraft International Ltd (aka Precedent Kits) and the company had other projects requiring my time, such as model aircraft kits. Largely for that reason I didn't build another Huntsman after the two prototypes, despite having pangs of nostalgia every time I saw one on a lake somewhere. The closest I came, was a little Fairey Swordsman design, which I scaled-up for a 540 motor from a Phil Connolly free plan and that was published in Model Boats in 1999.

During 2014 I decided to investigate the use of brushless motors, largely to gain some expertise in this new technology. Our Editor Paul Freshney had built a few models using them and he suggested I might begin with the same combination of motor and speed controller that he had found successful, so I ordered these and set about looking for a suitable model to put them in. I don't know when the thought hit me, but it suddenly became blindingly obvious that a smaller Huntsman 31 would make the ideal model boat. I already had a copy of the original plans as a CAD file, so it was easy to rescale that to obtain the size and shapes for





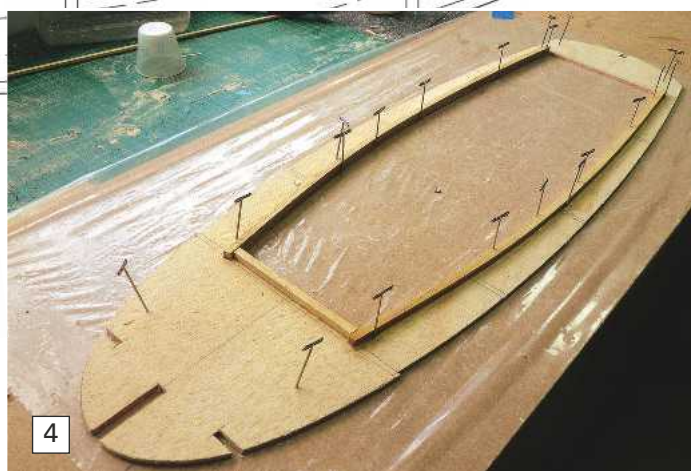
a 1:16 scale model, which works out at a fraction less than 24 inches (590mm) long.

The model isn't true scale as it has been simplified in several areas and notably it has a flat deck to allow the basic framework to be built upside-down on a board. The construction mirrors that of the earlier *Swordsman*, using Liteply sheet as the main material. A combination of Slo-Zap cyanoacrylate (superglue) and Deluxe Materials' Aliphatic Resin have been used as glues for the main construction. Details of other materials used are either mentioned in the text or on the plans. The sharp-eyed amongst you will notice that two models have been built, fundamentally identical except for their drivetrains and external detail.

The following text explains the construction in a logical order. It's by no means the only way of doing it, but please bear in mind that I've already built two more of these craft than you have, so let's go.

Deck and basic frames

The keel is made from six parts and there are two identical parts each of three shapes. Glue the two rear parts together, then the two front parts and allow to set, **Photo 1**. These front and rear keel assemblies are then joined with a pair of ply doublers, forming a 6mm wide gap between them for the propshaft tube. Lay the two parts over the plan, making sure that the slots for the frames

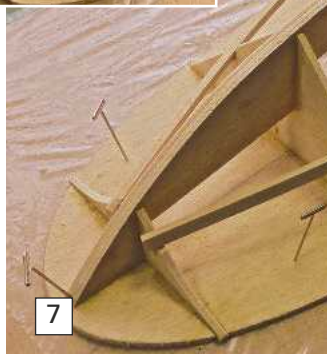


correspond to the plan and that the lower edges are dead straight and in line. Weight or pin down, then epoxy one of the rectangular doublers over the joint, **Photo 2**, with its ends lining up with Frames 4 and 5. When set, turn the assembly over and glue the other doubler in place. Check that the propshaft tube will fit loosely in the slot formed and use a rat-tail file to ease this slot if necessary, **Photo 3**.

At this stage you should check with the plan that the motor and mount which you intend to fit will line up correctly with the propshaft tube. I used a 28mm diameter brushless motor (in both hulls) with a 380 to 400 size moulded glass-nylon mount mounted on a 1/8 inch thick Birch plywood plate, and the plan allows for this set-up. If your motor and mount are a different size, then you will need to adjust the top edge of the keel between Frames 2 and 3 until the centre-lines of the motor shaft and the propshaft are in alignment. If you leave this until later you will have a nightmare of a job.

Cut out the deck; mark the positions of the frames and pin it down flat on the building board. Cut and glue the three lengths of 3/16 x 3/16 inch (approx. 5 x 5mm) Obechi strip which fit along the sides and front of the cut-out, **Photo 4**. Now slot each of the frames into the keel; position this assembly on the deck and glue each of the frames in turn to the deck and keel, **Photo 5**, also adding





“The most complicated feature of the Huntsman 31 (H31) hull is the shape at the bow”

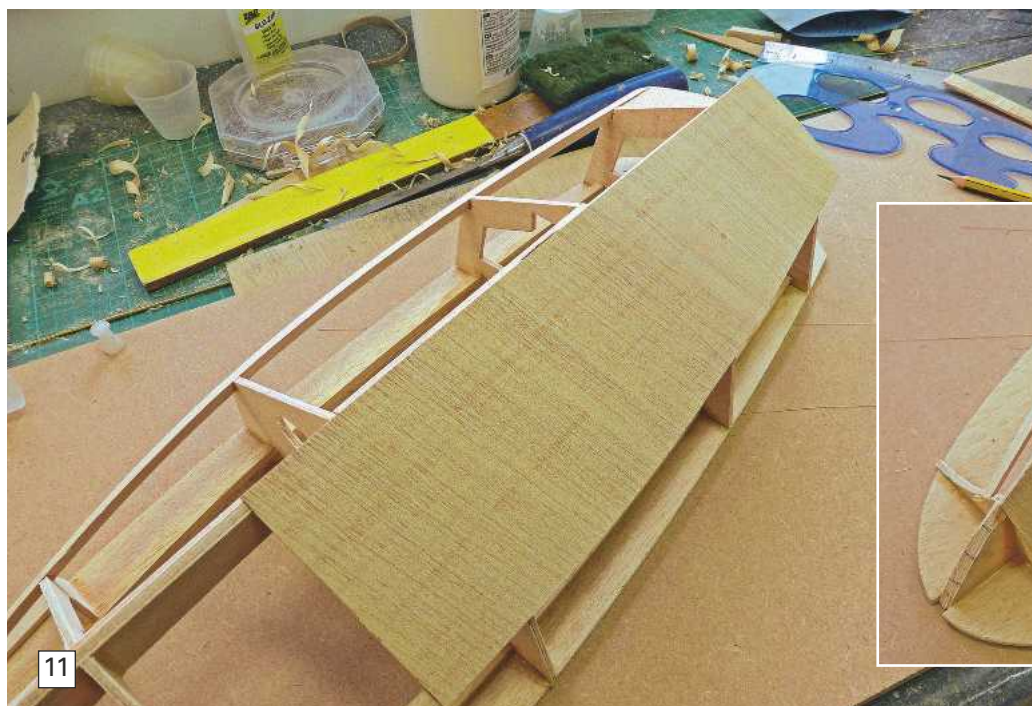
the transom former across the back of Frame 6, **Photo 6**.

The chine stringers are made up of two laminations of 1/8 x 1/4 (3 x 6mm) inch Bass strip. This can be obtained from specialist model timber suppliers, the stock for this model coming from SLEC, who supplied all of the wood. Spruce or Obechi would do at a pinch as a substitute. Check the cut-outs in the corners of the frames for accurate fit then glue the first stringers in place, port and starboard, **Photo 7**. When completely set, add the second laminations and use plenty of spring clamps to hold in place while the glue dries, **Photo 8**.

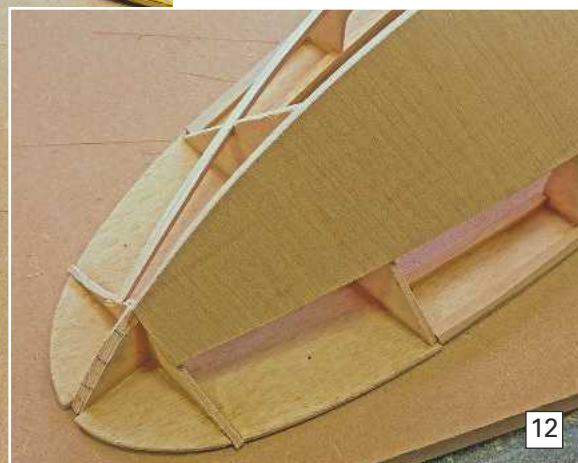
Fitting the hull skins

You will now need to shape the keel and the chine stringers to accept the bottom skins for which a razor-plane and a flat Permagrafit sanding block are ideal. A good tip here is to mark the edges of the parts you need to shape with a pencil at intervals of 25 to 50mm, **Photo 9**, then plane and sand the wood away until the marks just disappear, **Photo 10**.

The bottom skinning is cut from pieces of 2mm Liteply, fitted with the grain running across the hull from keel to chine, **Photo 11**. Make sure that the butt-joints between adjoining sheets are level and tight. The bottom skinning at the bow terminates flush with the front face of Frame 1. There is a 1/8 x 1/2 inch (3 x 12mm) strip doubler on each side along the lower edges of the deck in this bay. Glue these in place then trim flush with the deck edge and chine stringers, **Photo 12**. The angle between the side and bottom skins becomes almost 180 degrees near the bow, so the join of the side and bottom sheets at the chine has to change from being an overlap rearwards of Frame 3 to a butt-joint (edge-to-edge) forward between Frames 2 and 3. Carefully trim the edges of the bottom skins straight between Frames 2 and 3 to allow for the butt joint and fit the piece of side-skin in this bay first, with the grain running from chine to deck, **Photos 13 and 14**. Rearward of Frame 3 you should plane and sand the edges of the bottom skins and deck flush with each other and add the rest of the side skin from 2mm Liteply.



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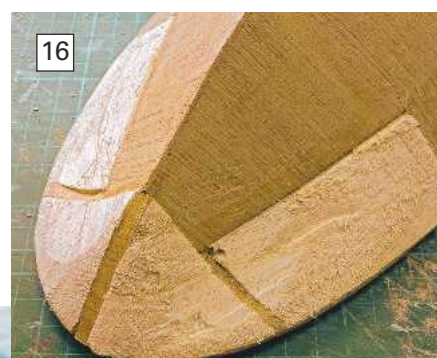
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That beautiful bow - take your time

The most complicated feature of the Huntsman 31 (H31) hull is the shape at the bow, where there is a marked concave flare ahead of Frame 2 which straightens again at the stem. The designer of the real boat, Alan Burnard, incorporated this flare to make the boat much more dry-running in rough water than the Huntsman 28 (H28). That's the reason why the H31 has a very rounded bow shape when viewed from the top, the H28 being quite pointed. The original kits used sheet plywood for the whole length of the side skins, but this didn't take up the double curve very well at all and resulted in a marked bulge in the sides. This 1:16 scale version is small enough to permit the use of block balsawood ahead of this frame instead, carefully carving and sanding it until the required curve is achieved. It's not half as difficult as you might think, as long as you take your time and use the right tools.

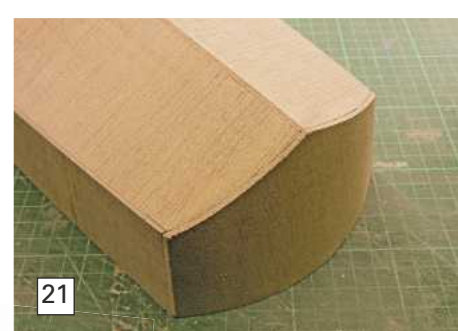
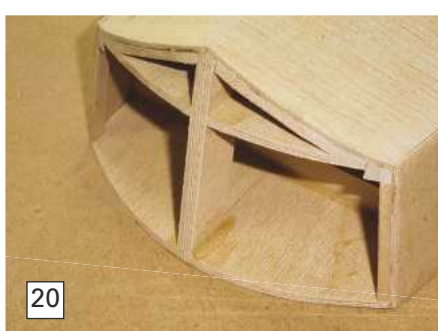
First you should glue blocks of balsawood into the void between the chine stringers and the deck, with the grain running parallel to the keel. Make sure that they go far enough under the chine stringers to prevent them becoming too thin when you carve the concave shape into them, **Photo 15**. When set, use a razor plane and sharp chisel to roughly remove the excess material outward of the frames and deck-edge and then you can use 120 grit abrasive paper to begin the shaping of the convex area around the front of the keel, **Photo 16**. The concave shape is achieved by wrapping some 120 grit abrasive paper around a suitable cylindrical former, for which an

empty aerosol can proved ideal, and gently sanding with a wrist-rolling motion around and along the balsawood to form the double-curve. It is best to sand away a little on one side and then repeating the number of sanding strokes on the other side. Keep checking each side by eye and take care not to sand away any of the ply deck or the edge of Frame 1. Change to a finer 240 grit of sandpaper and continue until you're happy with the shape, then use a folded piece of 320 grit sandpaper in your



16





22



hand to remove any remaining 'hairs' and smooth the balsawood, **Photo 17**.

At this stage there will be a few gaps around the edges of the balsawood blocks which should be filled with a proprietary filler, **Photo 18**. Allow to dry then smooth with 320 and finally 400 grit sandpaper, **Photo 19**. Hold the hull up to the light and view the bow from several different angles to make sure that you have achieved that lovely double-curved shape and that it is even on both sides of the hull. Make any final adjustments with 240 through to 400 grit sandpaper, then pat yourself on the back and treat yourself to a glass of something nice - I did!

Transom and coaming strips

The rear edges of the hull skins are reinforced with 1/8 x 1/2 inch (3 x 12mm) strip Obechi or Bass wood, then sanded round for the transom, **Photo 20**. This can be steamed to a curve over a kettle then held while it cools. Glue and tape in position while drying, then sand the edges flush with the skins and deck, **Photo 21**, and the completed hull with all the skinning and transom in place and shaped

is shown in **Photo 22**. Sorry about this photo appearing out of sequence with the text as the propshaft tube was actually fitted later.

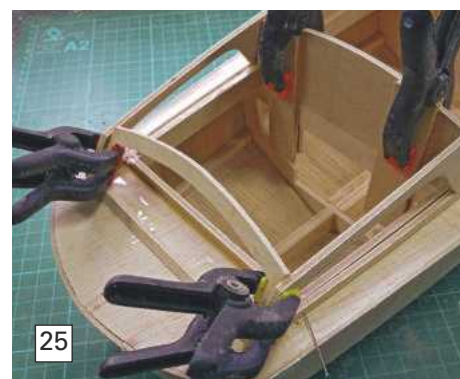
The coaming strips are cut from 3mm Liteply and glued around the edge of the deck cut-out, up against the Obechi strip which you fitted way back when you first laid down the deck. Use lengths of scrap stripwood wedged across the cut-out to hold the coamings in place while the glue sets,

Photo 23. The edges of the coamings should be 1/4 inch (6mm) above the deck all round.

Superstructure framework

The whole of the superstructure is removable for access to the motor, radio and battery etc. and it should be built over the coamings so that it will fit snugly when finished. Note that the bottom edges of the cabin sides are NOT dead straight, but curve very slightly to allow for both the inward slope of the cabin and the curve of the coamings. Cut the parts out first, if possible using a band-saw or scroll-saw to cut the two sides as one so they are identical. Clamp or tack-glue the two Frames 4a and 5a on top of Frames 4 and 5. Check the fit of the cabin sides, adjusting the curve of the bottom edge if necessary, and mark the position of Frames 4a and 5a accurately on them from the plan. Glue and pin them to the edges of the two frames, making sure that no glue is allowed to get between the coaming and cabin sides. Chamfer the lower edges of the cabin front and rear frames and glue these in place. Use spring clamps and pins to hold the whole assembly to the hull while drying, **Photo 24** being of the forward end of the cabin, and **Photo 25**, which is the stern end. Note the Sellotape on the deck preventing excess glue doing what is meant to.

Glue strips of 1/8 x 1/8 inch (3 x 3mm) Obechi or Basswood along the top edges of the cabin sides above the windows, then sand them to match

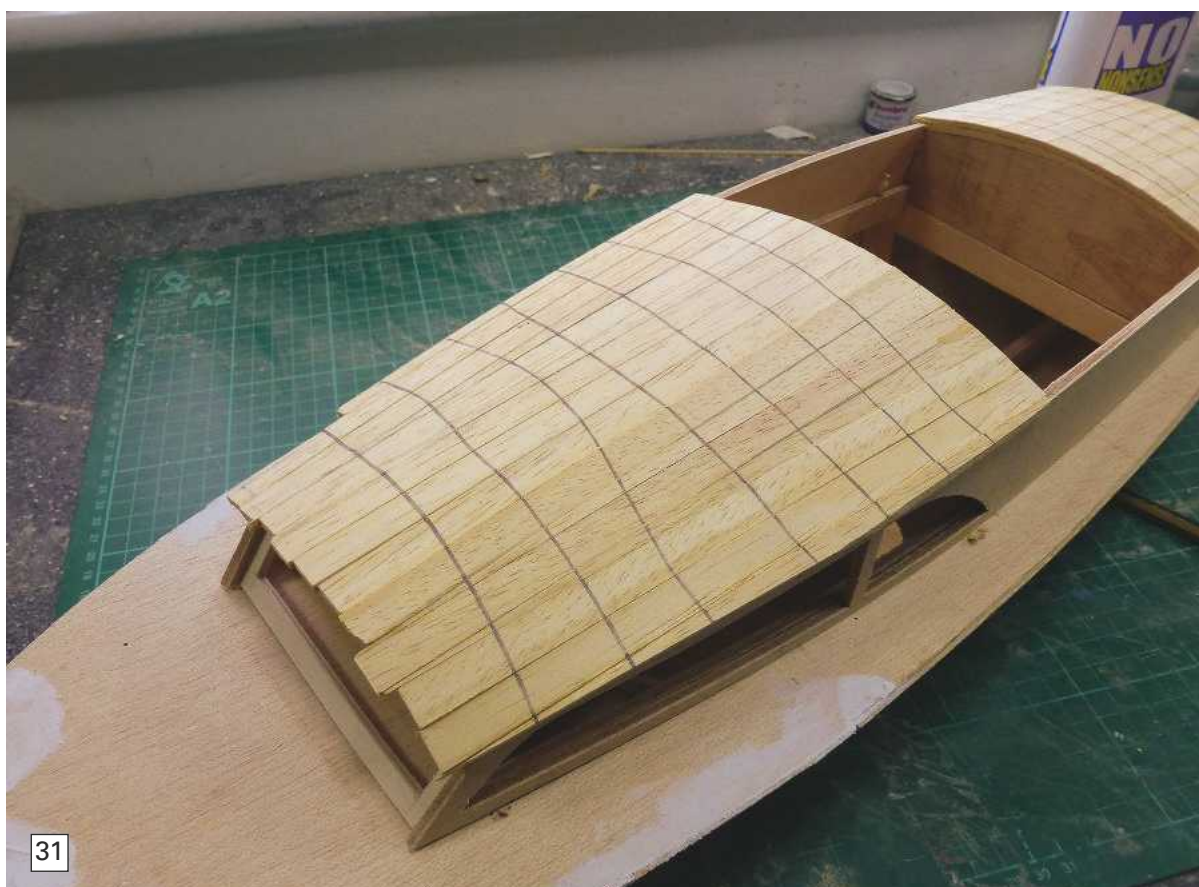


the curve of Frames 4a and 5a. Add the two roof support parts to the front cabin, **Photo 26**, and likewise the rear cabin, **Photo 27**.

Planking

The cabin roofs are planked with $\frac{3}{32} \times \frac{3}{8}$ inch (2 x 10mm) Obechi strips. If you prefer to use balsawood for this, then make the planks $\frac{1}{8}$ inch (3mm) thick. The curve from front to back isn't very pronounced, but you can steam each plank to a curve if you prefer to make gluing it in place easier. Slow Zap superglue was used as an adhesive to glue the planks to the frames with a bead of Aliphatic glue along the edge of each plank where it fitted against the next one. Wipe off any excess glue with a damp cloth as you proceed. Begin with the two planks each side of the centre line, **Photo 28**, then add planks one at a time to alternate sides. Fit a couple of wedge-shaped planks as shown to allow for the

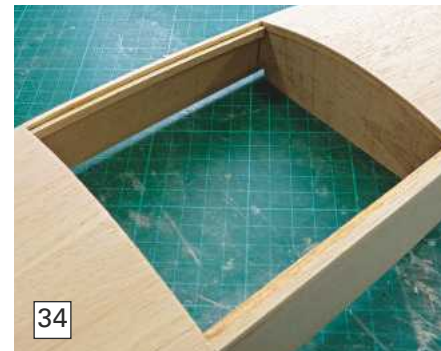




taper of each cabin, **Photo 29** being of the part planked roof of the forward cabin and **Photo 30** of it fully planked. When set, draw pencil lines across the planking from one side to the other at about 2cm intervals, **Photo 31**, sand with 120 through to 400 grit paper on a flat block, using a circular motion, until these marks disappear and you have a nice smooth curve to the roof. Fill any gaps with balsawood filler, sand smooth and trim the ends with a razor saw or sanding block, **Photo 32**, and repeat this for the rear cabin.

Cockpit

Two 3/16 x 3/16 inch (5 x 5mm) strips run along the top inner edges of the cabin sides between Frames 4a and 5a. They are glued in place very slightly



higher than the sides and sanded to match the curve of the roof, **Photo 33**. The very top of each cockpit side is made up of two strips of 3/32 inch (2mm) Obechi which will be glued 0.5mm apart to form a slot for the windscreen, which is fitted after painting. **Photo 34** is of the outer of these strips in place. Use a scrap piece of 0.5mm styrene or acetate to act as a spacer, **Photo 35**, while you fit the second strips, then sand them all flush with the cabin roof when done, **Photo 36**.

The cockpit inner sides are cut from 2mm Liteply and glued in place flush with the top of the cockpit sides. You might be well advised to sand and seal them prior to fitting; this makes painting them easier than leaving it for later. At the same time sand and seal the cockpit front and rear formers and the three pieces of 3mm Liteply which make

up the cockpit floor. Cut and trim these all to fit and then glue in place, **Photos 37 and 38**. The two upright formers are sanded flush with the top of the cabin roof.

Surface preparation

You're getting very close to applying the finish now. If you have used Liteply, it's a good idea to fill the grain. I used Deluxe Materials' Model Lite, **Photo 39**, but I've also used ordinary interior-grade Fine Surface Polyfilla in the past. Just apply it thinly with a plastic card or squeegee; allow to dry then sand back to the wood with 320 grit abrasive, **Photo 40**. Brush off all of the dust and then go over the whole model again with the dusting brush on the household vacuum-cleaner, just to be sure.



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Covering with cloth and epoxy resin

Lightweight glassfibre cloth and epoxy finishing resin is the favourite for most of my wooden models. It's easy these days to obtain good-quality materials, which makes sanding the resin no longer the chore it used to be and here's how this model was tackled.

One ounce per square metre cloth is one grade heavier than the very lightest available. Cut the cloth a few inches larger all round than the model, taking care not to stretch the cloth or you'll open up big gaps in the weave which will be difficult to fill. Apply a very light coat of 3M's Spray Mount all over the surface to be covered, a light dusting allowed to settle from about a foot away is all that's required to make the model slightly tacky to the touch. Now lay the cloth gently on to the model, starting along the keel and gently smoothing it out towards the edge. When you're happy with this, mix up some Z-Poxy Finishing Resin, adding about 10% Ethanol to thin it. This is also known as 'rubbing alcohol' and can be obtainable from various sources on the Internet. Apply a coat of resin all over the cloth, again

starting along the keel and brushing outwards. Take special care along the edges. You can use an old plastic bankcard to squeegee out any excess resin if you wish, **Photo 41**. Allow this to set thoroughly for about three hours at room temperature, then 'feather' off the excess cloth around the edges with some 320 grit sandpaper and then cover the transom in the same way, **Photo 42**. Apply another thin coat of resin all over the hull, leave it to set and then rub down the finished hull.

Silicon-carbide finishing paper is an excellent abrasive for this and it comes in grades from 180 to 400 grit and is a pale grey in colour. Rolls can easily be obtained by mail order via Internet websites. Finish sanding the hull with 320 and then 400 grit paper. The inside of the hull must be waterproofed to prevent the joints from coming apart etc. and for this, a couple of coats of finishing resin, thinned down as before is applied. There's no need to be fussy here, so just slosh it around until everything is thoroughly soaked then leave to set hard.

Chine rails and spray strips

Now is the time to fit the two chine rails along the edges of the chine. These are vital to the proper

Plan for Fairey Huntsman

The highly detailed full size plan No. MM2111 is available from MyHobbyStore Ltd and is priced at £12.50 + p/p as of December 2015. MyHobbyStore plans may be purchased online at www.Myhobbystore.com.



planing performance of the boat and must not under any circumstances be left off - you have been warned! Round off one corner only of a length of 1/8 x 1/8 inch (3 x 3mm) Bass stripwood and taper it towards the front end. This is the upper outside edge of the rail as the lower outside corner is left uncompromisingly sharp – please see the sections on the plan. Mark a line along the corner of the chine with a soft pencil and continue it smoothly up towards the bow, **Photo 43**. The bottom edge of the rail goes along this line. Fit the rail with slow-setting superglue (Slo-Zap is ideal), gluing about 100mm at a time and holding it against the hull until it has set. You might want to speed things up by using an accelerator spray, but beware that some cyano' adhesives don't work with this stuff (e.g. Slo-Zap). Check as you go that you don't build a kink or a wave into this rail as it should be a continuous smooth curve, **Photo 44**. The six spray rails on the bottom of the hull are fitted parallel with the keel and equally spaced out from it – please see the reduced-scale sketch on the plan and **Photo 45**. Make them from hardwood strips around 3/32 x 3/32 inch (4 x 4mm) then sand them to a half-round section. Seal and gently sand the chine and spray rails prior to painting.

(To be continued in February 2016 Model Boats, and if all this doesn't convince you to clear the building board straightaway, then nothing will! Enjoy your hobby - Dave Milbourn)

Acknowledgements

On-the-water photos are by Steve Dean and Martin (Mayhem) Davis, other photos by the author and my heartfelt thanks to Steve, Martin and to Scott Pett for their other invaluable help. Acknowledgments also to Bill Honeyball for sending me his copy of the original Huntsman 31 plan from Australia, and to Mike Allen for laboriously re-tracing and converting my crummy scan of it into a useable AutoCAD file.

Martin Davis has kindly taken a video of some of the 2015 Wicksteed Park session and it's on YouTube: <https://youtu.be/uw1C8SfZPS4>.

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Fairey Huntsman with a Leopard brushless motor. This version has some additional external detail compared to the Turnigy motor version.

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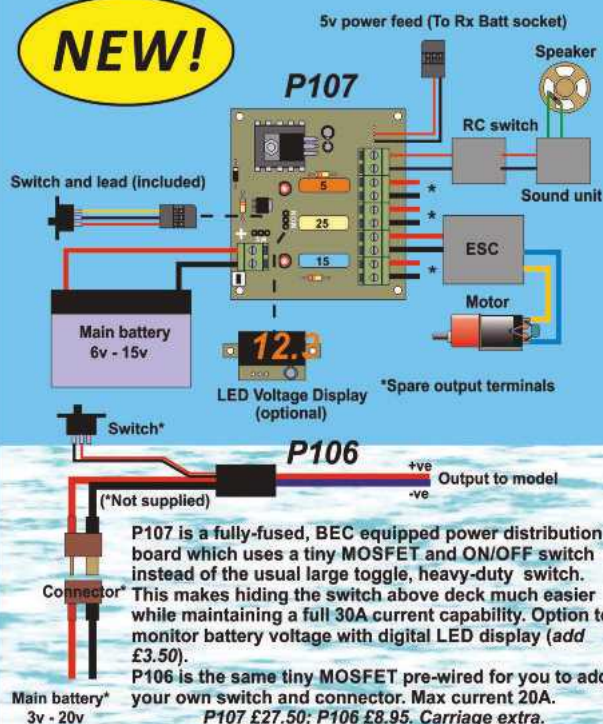


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The 21st Century aircraft carrier HMS Queen Elizabeth (back) and the F35B Lightning 2 aircraft.

Range Finder



Dave Wooley with his *Worldwide Review of Warships and Warship Modelling*

Welcome once again to our regular sortie into the world of fighting ships and this month we visit the FAA Museum at Yeovilton and in our regular build feature, are making the 3pdr guns for the Deans Marine 1:96 scale HMS Skirmisher.

Fleet Air Arm Museum

There are some new Galleries which made this 2015 visit memorable and they are for the recent launched (floated-out) aircraft carrier HMS Queen Elizabeth, showing they are keeping ahead of the

game. It is impressive, not just in the arrangement of the interactive displays and informative illustrations, but explaining effectively how this new class of aircraft carrier is constructed and will be operated, all with accompanying timelines. Part of the display makes imaginative use of models which include the Augusta Westland Merlin HM2 which is a much improved version of the original HM1, now with upgraded mission computers, cockpit, operational and acoustic displays. Add to this some models of the new F35B Lightning 2 which is to be the aircraft of the fixed wing squadrons for the new aircraft carriers and to meet this requirement, 809 Naval Air Squadron (NAS) is being reformed to fly them.

1:144 scale model of HMS Queen Elizabeth

As a modeller I was very much interested in this model which has pride of place in the centre of the 21st Century Aircraft Carrier Exhibition,

Photo 1. At present there are no models commercially available, either in injection plastic moulded form, polyurethane resin or as a GRP hull. Therefore seeing this official model makes it all the more interesting, as this is the actual current configuration of HMS Queen Elizabeth. Displacement of the full-size vessel will be approximately 70600 tons, her 280m length and 39m beam dwarfing the old Invincible class and even at 1:144 scale, a truly impressive model.

The F35B Lightning 2 will, as already mentioned, fly with 809 NAS and the soon to be reformed RAF 617 Squadron (The Dambusters), this having being disbanded after its tour of duty in the Afghanistan

Photo 1. Demonstrating in 1:144 scale (hopefully!) how the HMS Queen Elizabeth will look when the aircraft carrier enters service with its air group by the close of this decade.



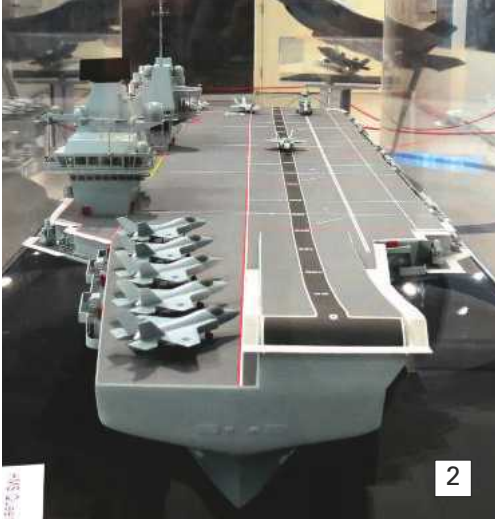


Photo 2. The new aircraft carriers retain a ski jump to assist the STOL capability of the F35B Lightning 2.



Photo 3. A view of the starboard stern quarter. Note the Goalkeeper CIWS on the lower sponson.

Photo 4. Following US Navy practice, HMS Queen Elizabeth has large deck edge lifts.

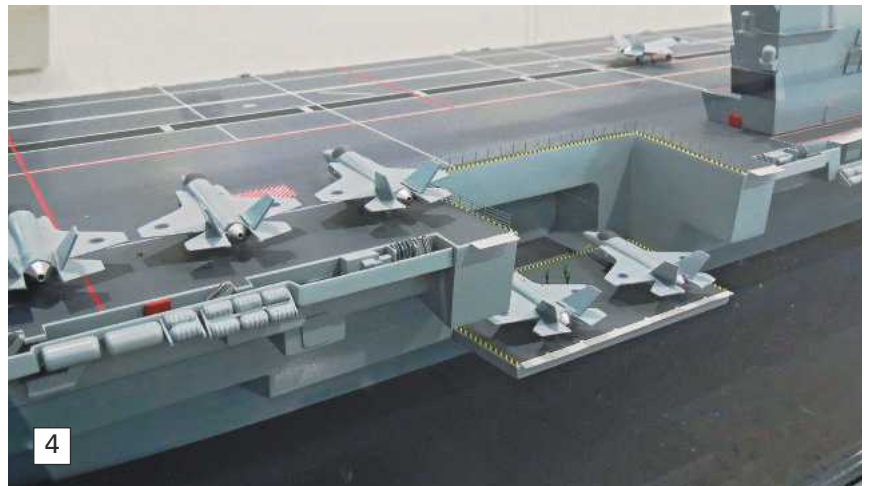


Photo 5. The second (aft) island is primarily for flying control.

Photo 6. The forward Island supports a spacious bridge and the Smartello early warning radar on top of the pyramid type of foremast.

Photo 7. Each island structure is shaped to minimize its radar cross section.

campaign. The Lightning 2 is classed as a STOL (Short Take Off and Landing) aircraft and will launch from this new aircraft carrier with the aid of a Ski Jump seen here on the model,

Photo 2. There are two other variants of this aircraft, the F35A which operates in a conventional take off and landing mode and the F35C which is designed for catapult launches and as such has a strengthened undercarriage, folding wing tips, greater range and payload capacity than the F35B.

Forty aircraft can be accommodated, although now it is understood only twelve F35B will normally be embarked operationally because of cost constraints, but the two deck edge lifts will each be capable of lifting two aircraft at once, **Photo 3** being of the starboard stern quarter and **Photo 4** of a lift. Both HMS Queen Elizabeth and her sister ship HMS Prince of Wales have an unusual arrangement of two island superstructures with the after unit devoted to flight operations. Clearly visible on top of island and abaft of the communications mast is the Artisan Type 997 3D radar which is reputed to have a range of 200km and be capable of tracking 900 targets at the same time, **Photo 5**, and you can see the forward lift between the islands. It's worth noting that the two 'islands' have an exaggerated shape designed to minimise the radar cross-section (RCS) of this warship. The forward island has a pyramid mast similar to that on the Type 45 Daring class destroyer and it supports the large Smartello early warning radar. The shapes of the islands when viewed closely are even more exaggerated than those of the Type 45 destroyers, **Photo 6**. The forward island also incorporates the navigating bridge as seen in **Photo 7**.

Our final two pictures from this new gallery show





Photo 8. A model of the F35B Lightning 2 designed for Short Take Off and Landing (STOL).

Photo 9. A view looking directly forward and note the boarding platform on the transom.

Photo 10. HMS Glorious between WW1 and WW2.

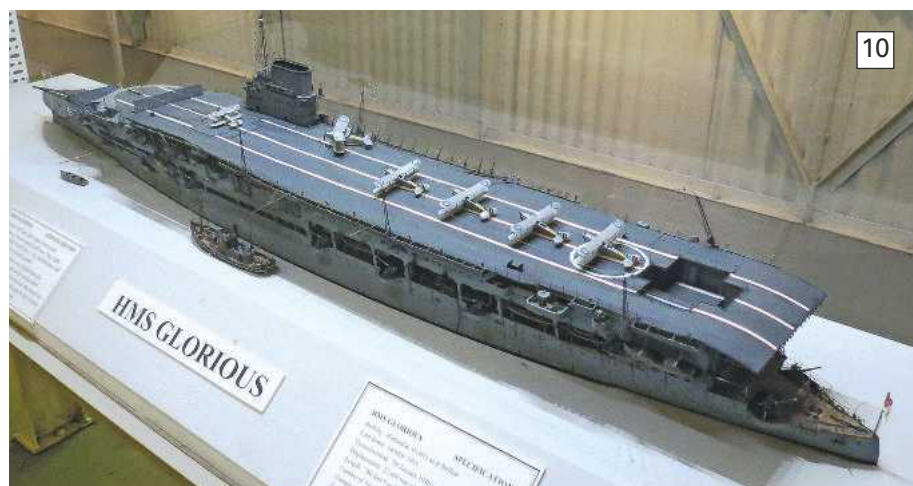


Photo 11. On the flight deck on HMS Glorious are four Fairy Flycatchers.

Photo 12. As there was a lack of purpose built escort carriers to protect the convoys during the early part of the Battle of the Atlantic in WW2, the solution was to convert merchant ships with a flight deck running the length of their hulls, as seen on this model.



a larger scale model of the F35B Lightning 2, **Photo 8**. Note the forward lift fan is in some ways similar to that of the old Soviet Yak 38 aircraft which were embarked aboard the Kiev class carriers during the Cold War. The big difference of course though is in performance and capability, because the Harrier and Yak 38 were sub-sonic, whereas the F35 has a top speed of Mach 1.4 and a low radar cross section. It is known officially as a 'fifth generation' fighter. The last picture in this sequence, **Photo 9**, is looking forward along the length of the flight deck, a view that would have been familiar to many Fleet Air Arm pilots landing a Buccaneer, Scimitar, Sea Vixen or Phantom in the 1960's and 1970's.

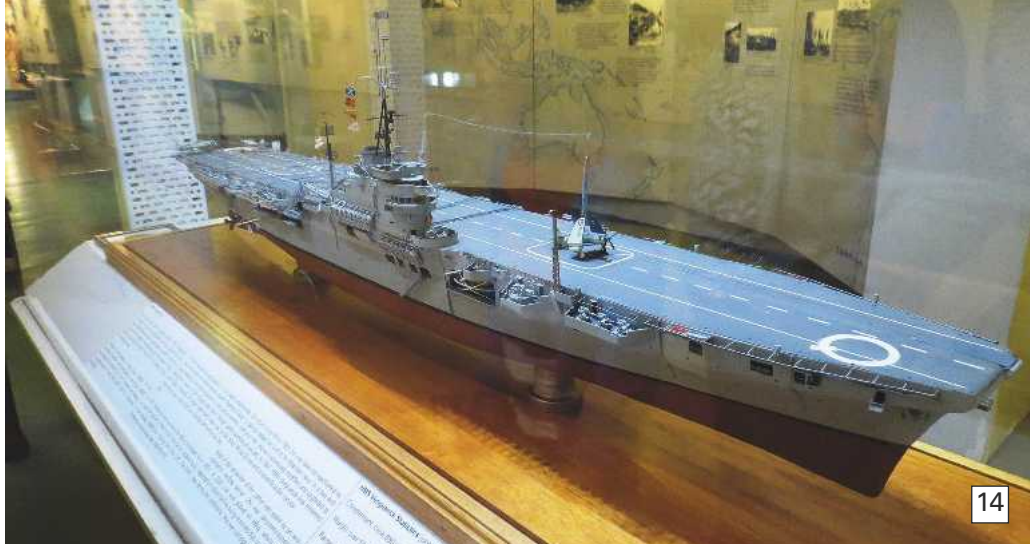
HMS Glorious c1920

There are other new exhibits at the FAA Museum such as that devoted to the salvaging of a Skua fighter bomber that was shot down during the Norwegian campaign of 1940, but more on that later, however for now a look at some of the other aircraft carrier models on display. Model Boats September 2015 had an excellent article by Alistair Roach on the work of model maker Norman Ough. In that article, reference was made to a waterline model of the HMS Glorious which can be seen in the approach to The Carrier Experience. The historical value of this model cannot be understated, as by any definition it is a model masterpiece, but what it also reveals is how far we have come in the intervening years in terms of ship and aircraft development. Mind you, we talk nowadays about STOL aircraft, yet in the 1920's (90 years ago) aircraft carriers such as HMS Glorious with their diminutive Fairy Flycatcher planes were in many ways STOL capable, catapults not having been invented, so it's perhaps a little simplistic to try and compare naval aviation from the past to the 21st Century, but there is actually a direct and unbroken link, **Photos 10 and 11**.

Battle of the Atlantic

Also part of the museum's redevelopment is an enhanced Battle of the Atlantic exhibition which includes such features as the inside of a U-boat as an interactive display and on the mezzanine floor is a full-size Fairy Swordfish with a truly excellent section devoted to the role of the FAA in anti-submarine warfare. Part of this display includes a Focke-Achgelis FA 330 Bachstelze (Rotor Kite), a free rotating form of auto-gyro which was launched from Type IX U-boats to a height of 120 metres to observe beyond the horizon.

Included in the same gallery is a 1:96 scale model of MV Empire MacAlpine, the first of the MAC (Merchant Aircraft Carrier) vessels entering service on 14th April 1943. At 434ft in length, the ship could



only accommodate four fairy Swordfish, but on the 7th May 1943 a Swordfish from 836 Squadron NAS was the first aircraft to land on what was essentially a functioning merchant ship, **Photos 12 and 13.**

HMS Vengeance

Another aircraft carrier model caught my eye that I hadn't seen on a previous visit and this was the light fleet carrier HMS Vengeance. This particular model represented one of the late-WW2 ten ship Light Fleet Aircraft Carrier program which were designed and constructed to merchant ship standards. The model shows HMS Vengeance as built with a single Hawker Sea Fury. In 1950, HMS Vengeance was transferred to the Royal Australian Navy, returned in 1955, and then sold to Brazil in 1956 serving as the NAeL Minas Gerais A11, before being finally decommissioned on 16th October 2001, **Photos 14 and 15.**

Recovery of a Skua

This superb exhibition is unique since it depicts the recovery of a Blackburn Skua from the bottom of Lake Breidal in Norway. The Skua, piloted by Captain RT Partridge RM of 800 Squadron NAS, had engaged and downed a German HE111 during the campaign in Norway on 27th April 1940, but in so doing was itself damaged and lost. The whole story and plane's recovery is well worth the time spent in this gallery, **Photo 16.**

HMS Eagle

This model has been relocated within the museum for better viewing. Together with HMS Ark Royal, HMS Eagle at 37389 tons was the last of the conventional big RN fleet aircraft carriers and was



laid down on the 24th October 1942, completing in October 1951. The model shows HMS Eagle after her 1966 to 1967 refit when operating Sea Vixen and Buccaneer S2 aircraft, **Photo 17.**

Conclusion

The FAA Museum is always endeavouring to improve its exhibits and displays and although this is only the briefest of reviews I hope it will wet your appetite to see more of what is on offer if you are near Yeovil. If you have an interest in naval aviation and warships, then you really can't find a better place to combine both.

Photo 13. Swordfish aircraft aboard the Empire MacAlpine.

Photo 14. A superb 1:96 scale model of HMS Vengeance, one of ten light fleet carriers of the RN Colossus class planned during WW2.

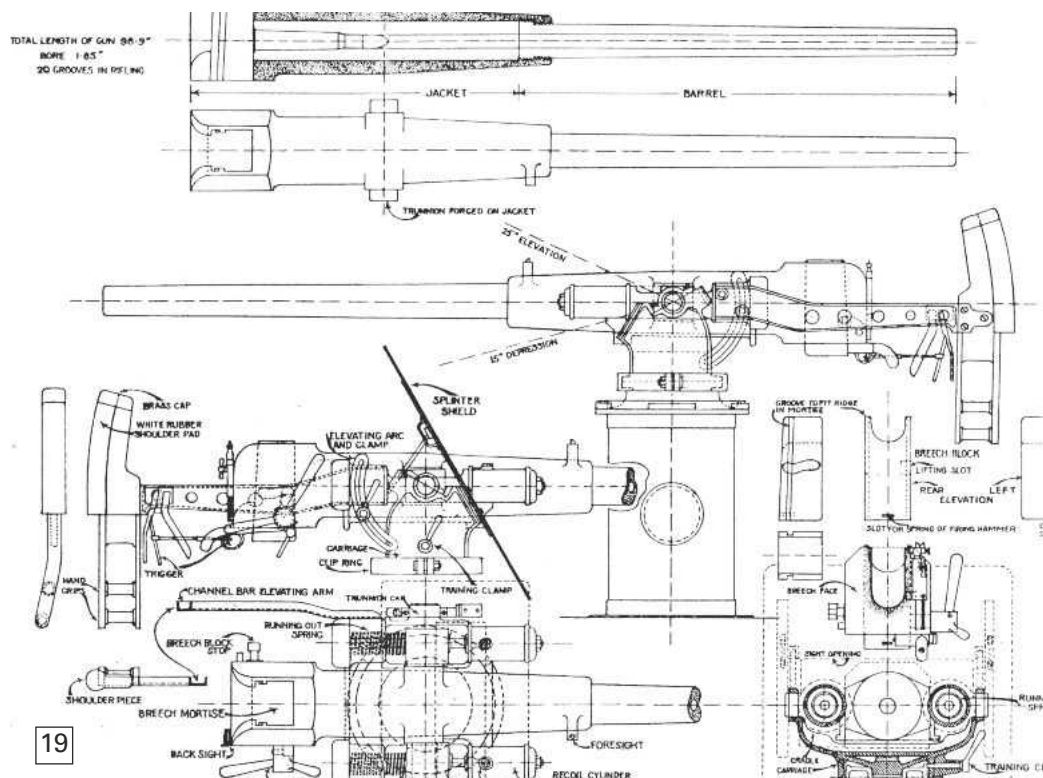
Photo 15. HMS Vengeance was designed to embark up to 48 piston engine powered aircraft.

Photo 16. A unique exhibition showing the salvaging of the remains of a Blackburn Skua, originally from HMS Ark Royal (WW2).

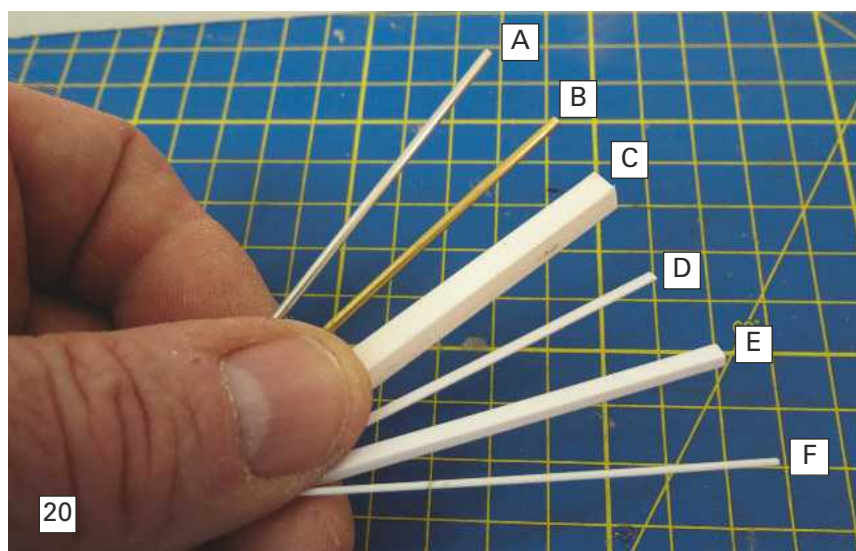
Photo 17. HMS Eagle, together with HMS Ark Royal (RO9) were the last of the post-WW2 big RN fleet aircraft carriers.



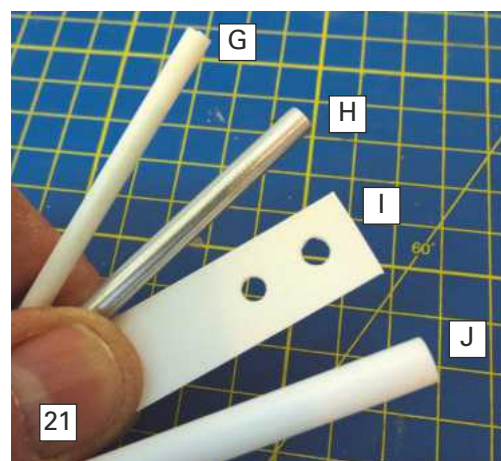
18



19



20



21

Making a 3pdr gun

When looking at the method used to make all eight of the required 3pdrs, a legitimate question to be asked is: 'Why not in polyurethane resin or be 3D printed?' The answer is simple, in that I like a challenge!

Mind you with resin castings, photo-etched detail can be added to refine the more delicate parts such as the shoulder support and as will be seen in a forthcoming issue, a 3D printed version of the 3pdr has now been produced. Anyway, as a model maker I'll attempt to show the materials used and how to make each and every part of the guns, which were actually all assembled in less than four hours. Drawings? Back in the 1950's a series of plans and drawings of naval fittings and guns were produced by Norman Ough, first in the Percival Marshal publication *Ships and Ship Models*, then *Model Maker* and finally reprinted in *Model Boats* in the late 1960's and early 1970's. It is from the 1970 March edition of *Model Boats* that I have sourced a superb Norman Ough drawing of the Mk. 1 3pdr, **Photo 19**. Using this drawing and several pictures, work could commence on selecting the materials that would form all the necessary parts to construct these guns.

Each gun has a number of basic parts and for

Photo 18. Two 3pdrs mounted on tracks within the after spotting top of a 1:48 scale model of the late-Victorian Battleship HMS Vengeance.

Photo 19. A superb drawing of the 3pdr gun by Norman Ough (*Model Boats*, March 1970).

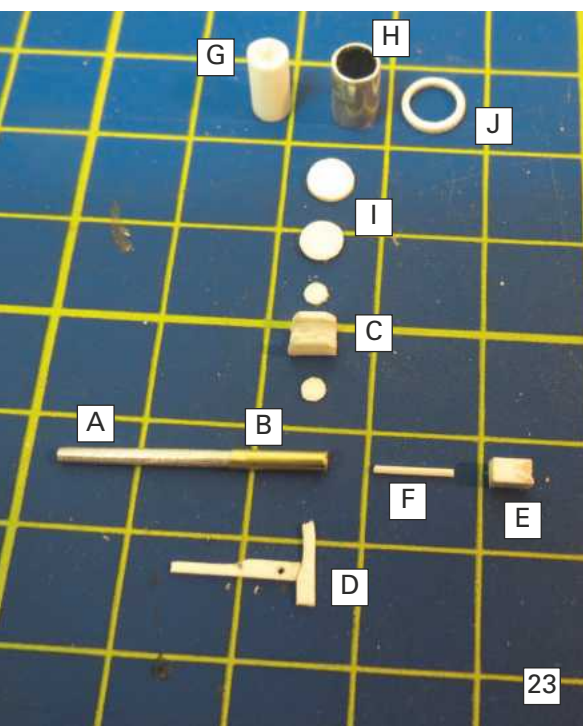
Photo 20. The basic materials used for the 3pdr gun model.

Photo 21. The basic materials used for the gun mounting.

HMS Skirmisher - Part Fifteen

In this issue we are looking at the 3pdr Hotchkiss guns as carried by this warship. Originally of a French design, the 3pdr Hotchkiss was adopted for RN service in the mid-1880's as a relatively easy to install and operate quick-firing naval gun that was subsequently manufactured in the UK by the Elswick Ordnance Company. Weighing 240kgs with a length of only 2.048 metres, it could be installed on both small and large warships as in **Photo 18**. The maximum elevation of the Mk. 1 version was from minus 5 to plus 25 degrees, with a rate of fire of 20 rounds per minute.

The original purpose of the gun was for opposing torpedo boat attacks, which in the late-Victorian period were seen as a real threat to much larger warships and by implication, the worldwide dominance of the Royal Navy. However, by the time HMS Skirmisher entered service in 1905, the 3pdr was considered ineffective for frontline service, but 2950 of the guns in various marks were manufactured for naval service and a small number are still retained to this day and used for ceremonial duties.



ease of identification each piece of material has been given a letter.

Gun itself - Photo 20 - 6 pieces

- A)** The barrel is from 1.7mm o.d. aluminium tube
- B)** The brass jacket is of 1.8mm brass tube
- C)** The trunnion support carriage is of Evergreen No. 253, 4.8 x 4.8mm styrene box section.
- D)** The shoulder support is of Evergreen No. 123, 0.5 x 1.5mm section.
- E)** The breech block is Evergreen No. 165, 2 x 2.5mm hollow box section.
- F)** The recoil cylinders are Evergreen No. 220, 0.88mm diameter rod.

Gun mounting - Photo 21 - 4 pieces

- G)** The mounting insert is Evergreen No. 225, 4.8mm o.d. tube.
- H)** The mounting is aluminium tube, 5mm o.d.
- I)** The clip ring and top mounting plate are styrene 0.75mm sheet punched to size.
- J)** The circular base ring is Evergreen No. 229, 5.1mm o.d. styrene tube.

Additional items

- K)** The cradle is from styrene channel section.
- L)** Trunnion caps are from 0.75mm styrene.
- M)** The shoulder support is 0.75mm styrene sheet

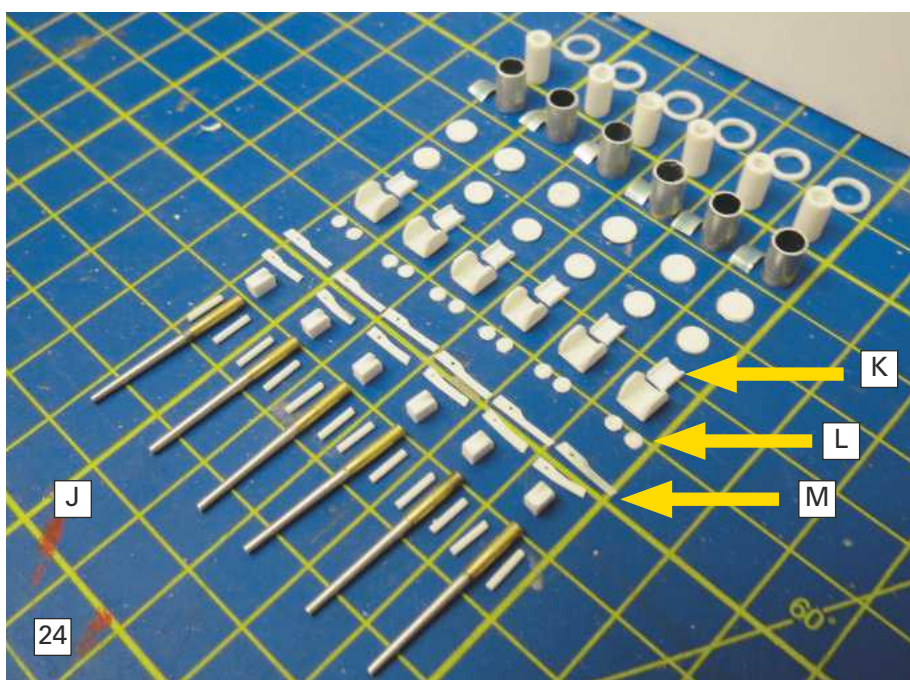


Photo 22. A simple method has been used to taper the aluminium barrels.

Photo 23. Most of the parts for assembling a single 3pdr gun.

Photo 24. This shows some of the additional parts for the 3pdr assembly line.

Photo 25. The 3pdr mountings (see text).

Photo 26. Fitting the clip ring styrene disc to the top of the mounting.

Creating the parts

The first step is to create a tapered gun barrel, from aluminium tube A. For this a Unimat lathe was used, but the same result can be achieved using a Proxxon drill. A fine file is gently moved along the rotating barrel until the desired taper is achieved, **Photo 22.**

Each part needs to be cut to size with the aluminium barrel inserted into a brass jacket piece (B) with the Mortise (groove) formed in the breech block, **Photo 23.**

Additional parts are the cradle (K) that supports the barrel, trunnions caps (L) and shoulder support (M), **Photo 24.**

With all the parts duly prepared, mounting assembly can commence with the styrene tube (G) fitted into (H), the aluminium tube, to which can be added the circular base ring (J), **Photo 25.**

This is followed by fixing the circular punched out styrene clip ring which in turn supports the U-section cradle and carriage for the gun's barrel, **Photo 26.**

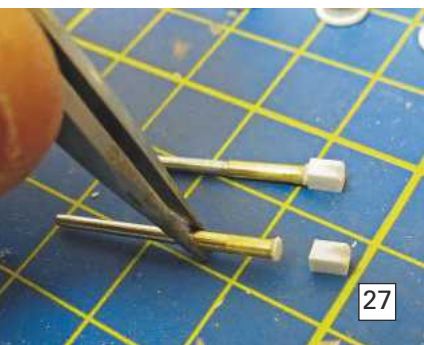


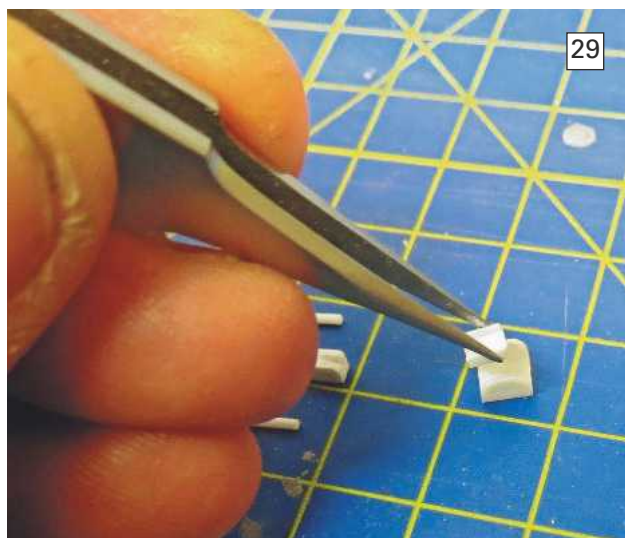
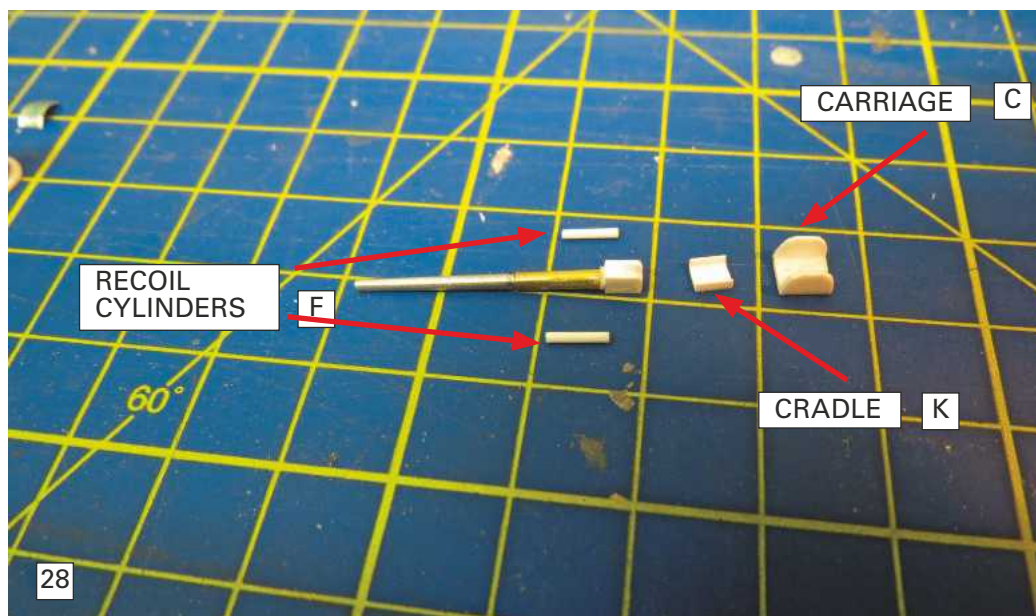
Photo 27. A gun barrel and its jacket being attached to its breech block.

Photo 28. The parts of the 3pdr gun ready for assembly.

Photo 29. The recoil cradle is fitted into its carriage.

Photo 30. The brass jacket part of the gun is fitted into the cradle between its two recoil cylinders.

Photo 31. Fixing a styrene disc trunnion cap.



Fixing the barrel parts

With the gun barrel prepared, its breech end can be sealed with a small punched styrene disc which provides a fixing to which to attach the breech block, **Photo 27**. With the barrel and breech block joined, the cradle, carriage and recoil cylinders were made ready to be assembled as in **Photo 28**. As the cradle supports both the barrel and recoil cylinders as on the full-size gun, the cradle is seated into the carriage first, **Photo 29**. Each recoil cylinder is seated on to the edge of the cradle with the jacket (brass tube) end of the barrel including the breech block placed in position between each recoil cylinder as in **Photo 30**.

With the gun barrel secure in the cradle, the next step is to fix to each side of the cradle the trunnion caps. These are formed by the simple expedient of punching them out of styrene sheet, **Photo 31**, with a leather punch as appropriately sized discs. This leather punch has over the years proved to be one of the most useful tools in my armoury.

With the gun fixed into the cradle and the



32

Photo 32. Nearly there! The guns and their remaining parts ready to be fitted to the mountings.

Photo 33. One 3pdr gun temporarily in place by the deck edge of HMS Skirmisher.

trunnion caps fitted, the shoulder support can be added. It is in two parts; a horizontal arm which is fixed to the left hand side of the cradle and the actual vertical shoulder support, all glued together as one and then fixed to the cradle. With the shoulder support in place all that remains is to fix the trigger arrangement, access panel and handgrip extension. The shoulder pad is a strip of 0.5 brass wire fixed to the back of the vertical shoulder support as you can see on the fully assembled gun in **Photo 32**.

There are some additional parts yet to be fitted, including a breech lever, breech block stop, elevation clamp, and fore and back sights. After all this, it has to be said that these 3 pdr guns are relatively simple to make and once fitted on the model do add greatly to its overall appearance as in **Photo 33**.

Next month we will build a 12pdr gun.



33

This month's Mystery Picture The clue is: Lost at the Second Battle of the Solomon Sea.



Answer to the December 2015 Mystery Picture

The clue was: Operation Anvil and look to the stern.

This was not one of those easy ones, but the clue did have the answer. The stern had the French tricolor flag and Operation Anvil (later Operation Dragoon), was the Allied landing on the French Mediterranean Coast in July 1944. The mystery picture was the French 9245 ton light cruiser Montcalm which was built by Société Nouvelle des Forges et Chantiers de la Méditerranée from November 1933 to November 1937. She was 589ft long by 17ft 6ins beam and

propelled by two shafts with Parsons geared turbines and was capable of 32 knots in continuous steaming. Montcalm was originally fitted with nine 6 inch guns in a 3 x 3 arrangement and an eight 3.5inch secondary battery and twelve 13.2mm machine guns.

Montcalm was one of the La Galissonnière class of six light cruisers and was fitted aft of the mainmast with a spacious hangar capable of supporting three seaplanes. During the British attack on Dakar in September 1940, Montcalm acquitted herself well, damaging HMAS Australia and thwarting all the torpedo

attacks from the FAA Swordfish torpedo strike planes. Montcalm eventually joined the Free French forces and was refitted in Philadelphia USA between January and August 1943 with both the hangar and catapult being removed and radar installed. Further improvements included six quad 40mm Mk. 2 mountings and sixteen single 20mm guns. Refitted again in France in 1946, Montcalm was placed into reserve in May 1957 and then used as an accommodation ship at Toulon. In 1969, Montcalm passed out of French naval service for disposal.

References and acknowledgements

Queen Elizabeth class aircraft carriers ref: Combat Fleets 15th Edition, page 839

HMS Glorious, Empire MacAlpine, HMS Vengeance and HMS Eagle ref: Aircraft carriers of the World 1914 to the Present by Roger Chesneau, pages 97 to 99, 118, 129 to 133 and 134 to 139.

French light cruiser Montcalm ref: Cruisers of WW2 by M J Whitley, pages 43 to 46.

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Shutting the Stable



Phil Button and a cautionary tale

'Shutting the stable door after the horse has bolted' is a commonly used expression for fixing something after it has gone horribly wrong and that describes this article to the letter. This is a cautionary tale for all those of you who operate gas fired live steam models and I will describe what led to my decision to design, build and install an emergency gas shut-off valve in ALL of my steam ship models.

My newest scratch built steamship 'Mullogh' (pronounced 'Mulloy'), seen in **Photo 1** is pictured in the living room awaiting sea trials, having both



sails and a working steam plant. She was later out for a steam powered run on Alvaston Park Lake in Derby and fairly well out on the water when I rather rashly decided to try going astern. I say 'rashly' since the engine has a mind of its own sometimes and will refuse to go into reverse properly. Ninety five times out of a hundred it behaves perfectly, but this time it fell in that other five per cent band.

The engine is a twin cylinder compound with Stephenson link motion on each cylinder and I suspect that the reason for the occasional mishap when changing from ahead to astern, or vice versa, is caused by the two sets of valve gear getting slightly out of step with each other so that one cylinder changes direction fractionally before the other. This obviously 'locks up' the engine as each cylinder tries to go its own way, the net result being that you (me) need to give the propeller a flick to set the engine in motion once again. As you cannot be in the middle of the lake to give the said flick, the engine stays stopped until the model is recovered.

'No problem', I hear you say; 'The model has sails so she could easily be sailed back to the lakeside and matters put to rights'. However, Mullogh is a bit of a tub being 4 feet long by 1 foot beam and 4 inches draught, all weighing in at 20kg, so without the propeller wash over the rudder it is pretty much un-steerable under sail power alone, which is why there is a large clip-on rudder extension for use when under sail, **Photo 2**.

Also, the model is arranged such that it can be either sailed or steamed (but not both at once) as the sail servo and regulator (or throttle if you prefer) servo share the same receiver output and are switched in and out of use manually, depending on how it is being used at the time.

There was a good stiff breeze blowing on the day in question and Mullogh proceeded to sail around

Door!

all by herself, including docking in the floating dock and getting out of it again, something that I have difficulty with when it's actually under control.

All this time, the gas burner was on full and initially this was not a major problem as the safety valve lifted to vent the steam that was not now being used by the engine. The Spektrum DX6i transmitter that is used with most of my steam models has a timer facility (at least, it has if I remember to initiate it) so that I do not allow the boiler to run too low on water and it was showing that I had about 7 minutes left to go before I needed to have the model at the lakeside for a boiler refill. Hopefully, the wind would bring her within reach before that time was up as it was blowing directly towards me, but the model had different ideas and continued to 'sail' around all by itself, keeping well out of reach.

The transmitter timer started to 'ping' to let me know that the boiler needed refilling and still the boat sailed blithely on, and out of reach, safety valve blowing strongly, but eventually the safety valve stopped blowing as the boiler finally ran out of water.....

Recovery and restoration

At this point, one of the Alvaston Pirates MBC members (it's their home water) started trying to cast a rescue line across the model using a short fishing rod with a tennis ball on the end of the cord but it kept evading capture and a request was made for the club's electrically powered inflatable recovery boat to be launched to go and get the boat as it was now emitting rather a lot of smoke and giving off a strong smell of scorched wood, this being hopefully only from the wood lagging around the boiler and not the model itself.

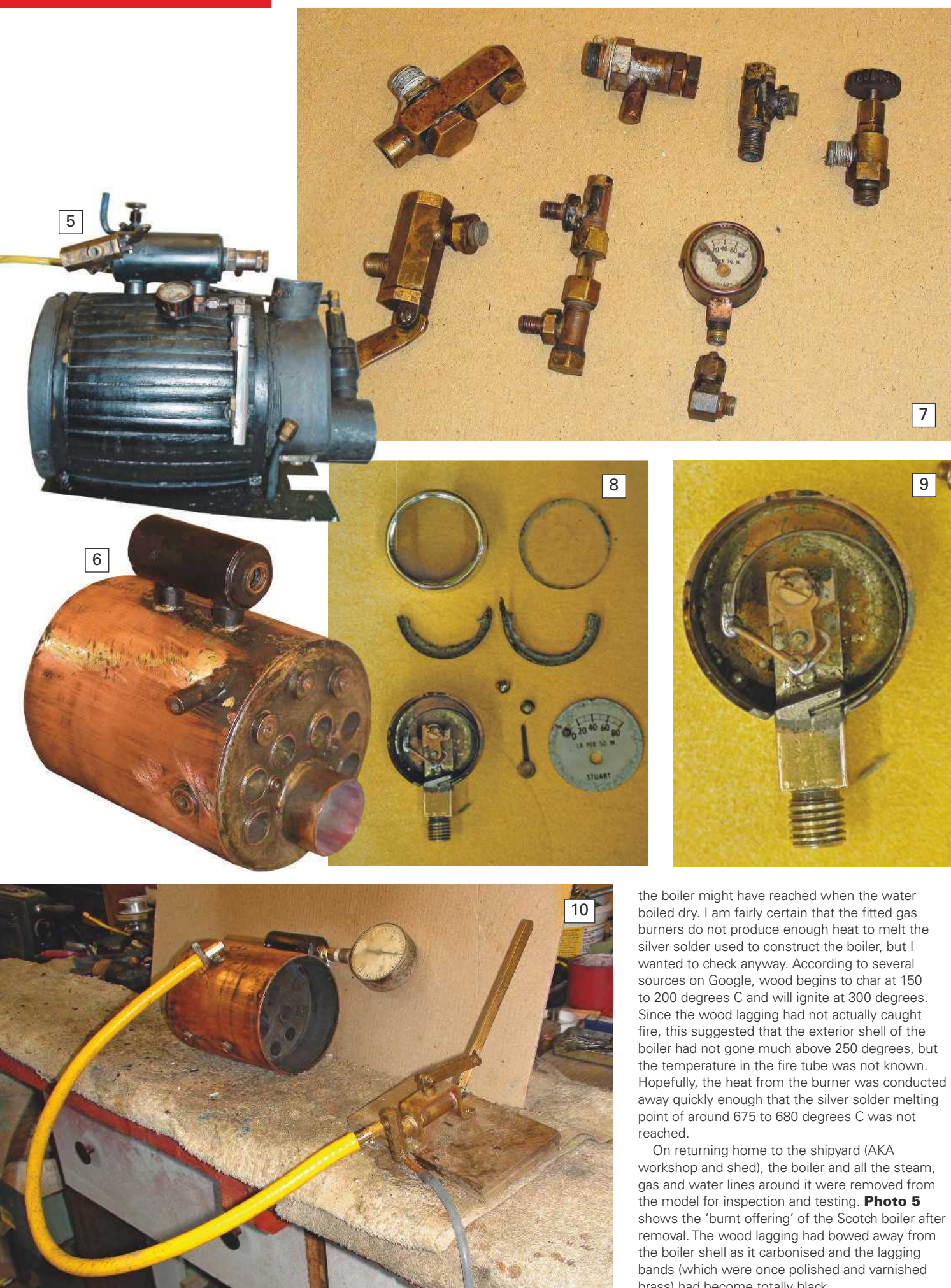


Just as the recovery boat was placed in the water, crewed-up and cast-off from the side of the lake, **Photo 3**, Mullogh decided to sail straight back to me. Is that Murphy's Law, or what? After removing hatch covers and thus letting out large volumes of smoke and turning off the gas to the burner, the hot gas bottle was removed for safety and dunked in the lake to cool it. Several handfuls of water were splashed on the smouldering wood lagging around the boiler and please note that there is no shortage of water in a boating lake. Fortunately there was no sign of an actual fire inside the hull, but the boiler looked like it was now lagged with charcoal and the inside of the model was liberally coated in wood and varnish tar as in **Photo 4**.

In response to questions from concerned club members (and members of the public) it was made clear that Mullogh was not going to be steamed any more for safety reasons until after the boiler had been removed and fully tested. However, after checking that the radio control gear, which is in a separate compartment from the boiler was still working properly, the temporary rudder extension was fitted and the model operated under sail for a while.

Before retuning home to Norfolk, I made a search on the Internet to try to find out what temperature





the boiler might have reached when the water boiled dry. I am fairly certain that the fitted gas burners do not produce enough heat to melt the silver solder used to construct the boiler, but I wanted to check anyway. According to several sources on Google, wood begins to char at 150 to 200 degrees C and will ignite at 300 degrees. Since the wood lagging had not actually caught fire, this suggested that the exterior shell of the boiler had not gone much above 250 degrees, but the temperature in the fire tube was not known. Hopefully, the heat from the burner was conducted away quickly enough that the silver solder melting point of around 675 to 680 degrees C was not reached.

On returning home to the shipyard (AKA workshop and shed), the boiler and all the steam, gas and water lines around it were removed from the model for inspection and testing. **Photo 5** shows the 'burnt offering' of the Scotch boiler after removal. The wood lagging had bowed away from the boiler shell as it carbonised and the lagging bands (which were once polished and varnished brass) had become totally black.



After removing all the 'charcoal' lagging and all of the pipework and fittings from the boiler and cleaning it with a wire brush to remove all of the burnt residue, I was left with the basic boiler as seen in **Photo 6**. Damage to the boiler fittings, **Photo 7**, was confined to smoke damage and could easily be cleaned off using a brass wire brush, so I thought at the time.

However, the exception to this simple cleaning was the pressure gauge, where a plastic spacer between the dial and the glass had melted. Not only that, but when the gauge was stripped, it was discovered that the manufacturer had used soft solder to assemble it and this had melted and run so as to jam the mechanism by soldering it all together. **Photo 8** shows the dismantled gauge and **Photo 9** shows the 'soldered' mechanism pivots and please note that I had cleaned and polished the gauge outer casing before discovering that it no longer worked.

The next job was to give the now cleaned boiler a full visual inspection for damage and this did not show any melted silver solder. However, to be totally sure that there was no damage that could not be seen, the boiler was given a full hydraulic test to ensure that it had no leaks and did not deform when under pressure. Safety dictates that this pressure test is carried out hydraulically using water, as a boiler failure is not catastrophic with water as it would be for testing with either air or steam.

To perform the hydraulic test, all except one of the boiler inlets were plugged and a non-return valve fitted to the open one. All except one of the boiler outlets were plugged, the boiler was filled completely with water and a pressure gauge fitted to the open outlet. A hand pump with its inlet connected to a water supply was piped to the non-return valve on the boiler and the pump operated until the pressure gauge showed twice the boiler working pressure, **Photo 10**. Any leaks would then become readily apparent and require the boiler to be drained and repaired, or even scrapped. As there were no leaks, the pressure gauge reading remaining steady, the pressure was left on for a time before the boiler was checked to ensure that



it had not deformed whilst under pressure, as any deformation also implies that the boiler is not safe to use. The boiler passed these tests, and so repairs could continue.

After the hydraulic pressure test, the boiler was refurbished by giving it a new coat of heat resisting black paint and re-fitting all the cleaned boiler fittings (water level gauge, safety valve, stop valve, etc.), burner and pipework, smoke box and flue uptake, ceramic boiler insulation with its wood strip cladding and a brand-new pressure gauge. **Photo 11** shows the boiler fitted with its ceramic sheet insulation temporarily held in place by rubber bands, whilst the high temperature adhesive dried. **Photo 12** shows the wood lagging strips (temporarily held in place with masking tape) awaiting the brass retaining bands and **Photo 13** shows the finished boiler, now ready for re-fitting into the model boat.

The silver material wrapped around and wired to



14



15



16

the water level gauge is a piece of Litho plate (a thin printer's aluminium sheet), painted with diagonal stripes on the inside to give a clear indication of the water level in the glass. When the water level reaches a stripe, refraction through the water changes the angle of the stripe, making the level obvious. On this particular model, the boiler is fairly well hidden in the machinery space and help with seeing the boiler water level is essential. To this end an LED has been fitted to light up the water gauge as it is almost impossible to see when there is bright sunshine outside. **Photo 14** shows the gauge with its stripes, showing a full boiler, and the LED.

Photo 15 is of the boiler re-installed in the model with most of its connecting pipework refitted. The water level sight glass is underneath the pressure gauge and hence the difficulty in seeing it.

Gas shut-off valve

So, after many days of work on stripping, testing, refurbishing and refitting of the complete steam plant installation, Mullogh had been returned to the condition that it was before the 'incident' albeit now smelling like the inside of a smoke house, something that would hopefully fade in time.

The next question to come to mind was how to avoid this problem in the first place. I can hear you saying; 'My model would not run out of water and the engine is totally reliable, so this will not happen to me', but what if your pride and joy gets a fouled propeller? Then it will stop just as effectively as Mullogh did and how would you then avoid repeating the problem that befell me?

One apparently simple answer to this is to

install some form of valve in the gas supply to the burner that can be operated via the radio control transmitter to shut off the gas, thereby giving much more time to organise the recovery of the model without the drama as described earlier.

The requirements for this valve were as follows:

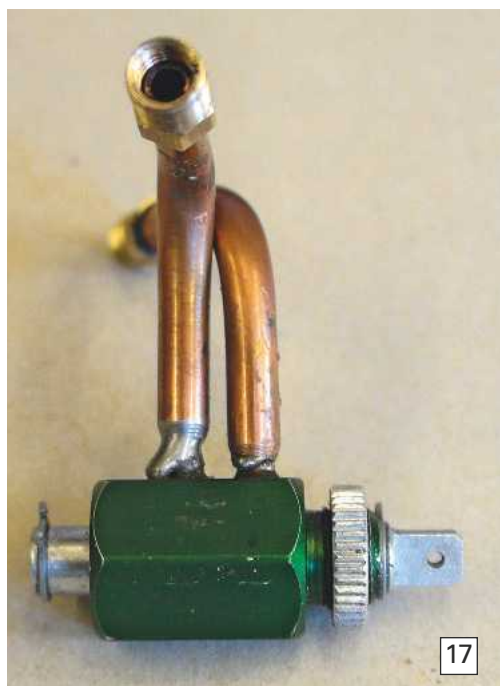
- 1)** To be easily operated from one of the radio control channels.
- 2)** Input and output connections to suit my standard 1/4 inch x 40TPI gas pipe nipples.
- 3)** Leak proof in both ON and OFF positions, since a model filling with the gas/air mixture becomes a bomb waiting to go off!
- 4)** Failsafe if at all possible - i.e. automatically closes on loss of radio signal and/or low voltage at the receiver pack.

The first thought was to look for an electric solenoid valve that would work at the receiver voltage of 4.8 to 6 volts. There are such animals (Chinese of course) but most of them have plastic connections to take push-fit flexible tubing, which does not appeal as a sound way to go with flammable gas in a hot space. Other solenoid valves can be found, but most of them come at what we would call 'silly money' and I did not want to go there, so abandoned the solenoid valve approach.

Next thinking was to use some form of linear On-Off valve, controlled by a servo. This led the thought processes into the field of model aircraft pneumatic undercarriage retract valves as these are small and light and need to be reasonably leak-proof so as not to drain the air from the on-board flight air cylinder.

This process started by ordering a Robart, Part No. 186, Retract Valve, **Photo 16**. The standard valve moves easily, but has nipples for push fit air tubing. These are made of brass and can be simply modified by soldering a piece of copper pipe over the nipple, after removing the valve internals to avoid cooking them, with an adapter at the end of the pipe for your chosen gas pipe fittings, **Photo 17**.

On testing with compressed air and immersing the valve in water to check for leaks, it became apparent that the way this commercial valve works, is that at one end of travel it connects the input port to the output port, which is fine and dandy, but at the other end of travel it vents the output port to



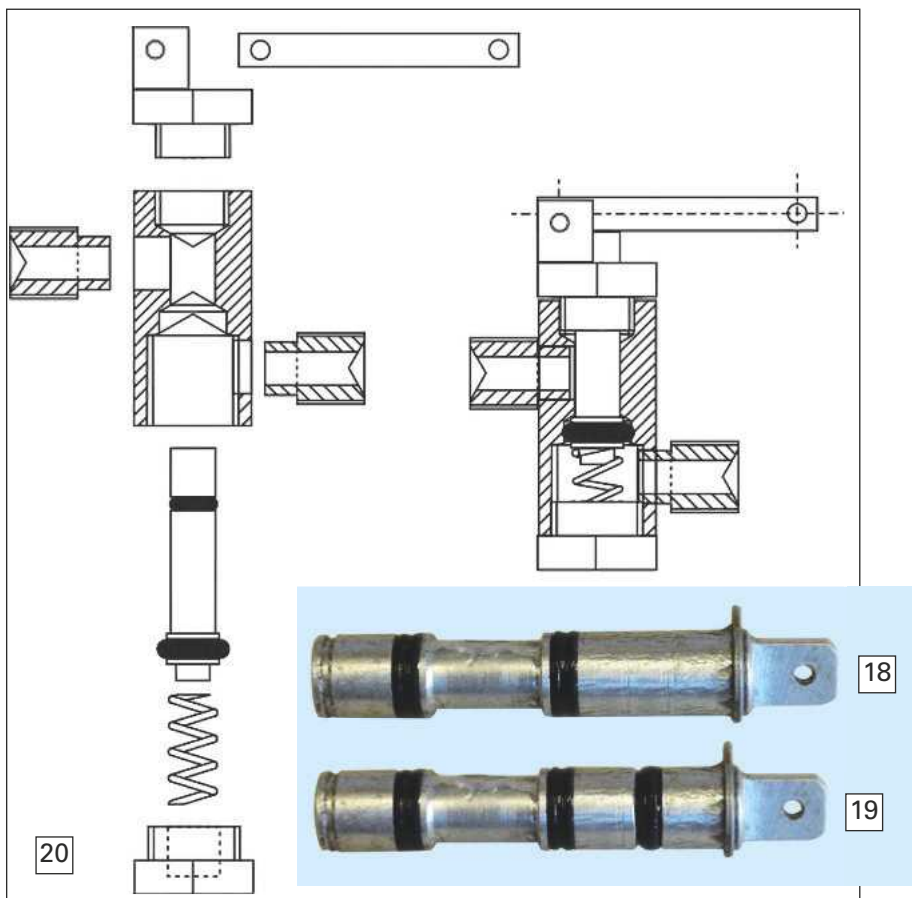
atmosphere, which is not so good. Silly me, as of course that is how it works in a model aircraft, Air ON gives undercarriage UP using air pressure, air vented to atmosphere gives landing gear DOWN under spring power as the air bleeds away.

Obviously, one could not have gas vented into the model, even if the burner had gone out, so this valve was dismantled again to find out how it worked. Inside was a spool with two O-ring seals and a machined cut-away, **Photo 18**. When in the ON position, the cut-away allowed gas to flow between the inlet and outlet ports and the O-rings prevented leakage. When in the OFF position, the O-ring at the output end of the spool is located between the two ports allowing venting to atmosphere towards the right hand end of the spool. This was easy enough to modify, as all that was needed was to machine a groove for another O-ring at the right hand end of the spool to prevent venting, **Photo 19**.

This appeared to work without leaks, at least on air, but before I had the 'brainwave' about the extra sealing O-ring, the home-design or a different type of valve to achieve the same end result had already been roughed-out on the domestic PC. This was based loosely on a design that I already had for a steam whistle valve, but with an additional O-ring to stop gas leaking out around the top of the stem. **Photo 20** shows that drawing of the valve parts and a part-sectioned assembly to show how they all fit together and **Photo 21** shows the machined and prepared parts, minus the O-rings, ready for assembly.

Connections to this valve have the gas inlet at the bottom so that both gas pressure and the spring act to keep the lower of the two O-rings closed against the valve seat. To open the valve, the operating lever is pulled towards the valve using a servo, thus pushing the lower O-ring off its seat and allowing gas to pass to the outlet connection at the top.

Once again, tests on this valve using compressed air and with the valve under water so that any leaks



become obvious, proved that it worked as required and did not leak.

So, now there were two valves, both of which would fulfill all the requirements listed earlier, with the exception of the 'fail-safe' facility. To achieve close to an ideal failsafe position, I planned to use a 'hidden' function of the generic Orange 6 channel receiver used in the model. Please note that the Orange receivers are DSM2 compatible, which means that they can be used with a Spektrum transmitter.

The latest DSM2 Orange receivers have a facility whereby they will revert all channels to 'bind' mode on either loss of radio signal or low battery voltage,





22



23

Transmitter Control	Aircraft Allocation	Phil's Allocation
Left hand stick	Throttle	Regulator (throttle)
Left hand stick	Rudder	Whistle valve
Right hand stick	Elevators	Ahead/Astern
Right hand stick	Ailerons	Rudder
Gear switch	Gear Up/Down	Compound/simple valve
Flap switch	Flaps Up/Down	Gas On/Off

meaning that all receiver outputs go back to how they were set during the binding process. Thus, if the gas shut-off valve servo was set to 'closed' during the bind process then it would automatically revert to closed as its fail-safe condition.

The gas shut-off valve was installed in the model, close to the gas bottle and piped to both the bottle and the burner. An additional micro-servo was fitted inside the radio control compartment and connected to the new valve using a bicycle-wheel spoke type of link. A micro-servo was used as there is not enough accessible space in the radio control compartment to fit a standard servo, yes, even in such a large model, and the micro-servo was more than adequate for what it had to do.

Photo 22 shows the home-designed gas valve installed in the boiler room and awaiting the gas piping.

Photo 23 shows the temporary installation now complete with pipework and the valve's servo just the other side of the bulkhead on the right of the picture. Once testing has been completed, the gas pipes would be removed from the model and painted bright yellow to identify them as gas lines.

'Programming' of the computer based Spektrum

DX6i transmitter proved rather a mind-twisting experience as it was necessary to work out which way the flap channel switch that I was using had to be set to obtain the required fail-safe function. I also had to refer to the Spektrum manual (don't you just hate doing that?) to figure out how to programme the switch correctly. The channel allocations on the transmitter are now as follows: See table left

Tests after installation to ensure that the valve worked as designed consisted of the following:

- 1) Check that the gas can be turned on and off via the radio control system using the flap switch with both transmitter and receiver powered up.
- 2) Switch off the transmitter (to simulate loss of signal) and check that the gas valve turns off.

I could not see any easy way to simulate a low receiver voltage, apart from waiting for it to happen, so have assumed that it will probably work, but we shall see in the fullness of time.

Conclusion

Following on the water tests at Woodbridge and Alvaston Park (Derby) lakes, **Photo 24**, the home designed shut-off valve works exactly as intended, and actually once again there was an engine problem in mid-lake, this time being when one of the engine control linkages decided to disconnect itself, but I was able to remotely switch the gas off. There have however been two subsequent problems with the installation, which are both down to me, so call them 'senior moments' if you will:

- 1) Twice I have forgotten to switch the gas ON via the transmitter before trying to light the burner.
- 2) Once, after turning off the gas by radio control, I forgot to turn off the gas valve at the canister so that when the transmitter was next turned on, the model filled with gas that was fortunately easy to clear by allowing the wind to 'ventilate ship'.

Having finally designed, built, installed and tested what seems to be an essential safety device for any live steam model, I wonder why I hadn't thought of it earlier as obviously it takes a 'disaster' to provide the wake-up call. Now, all that remains is to retrofit all the other live steam models in the Button Fleet with a similar installation, which shouldn't take too long as there are only five of them and they are all different.....



24



ABOVE: International One Metre (IOM) racing.



RIGHT: Best in Show was Keith Henley's THV Patricia.



ABOVE: Barry Brown's Riva Aquarama under construction.



RIGHT: James Goodall's Aerokits Crash Tender.



ABOVE: KM Bismarck built by Dave Lemaitre on the Southend stand.

RIGHT: Gerry Tovell's Director Class paddle tug - a very nice model.



LEFT: The MYA and Coalhouse Fort MBC stands.

Essex Country Show

Dave Brumstead reports

In mid-September, several local clubs were at Barleylands Farm near Billericay for the annual Essex Country Show, which is a showcase for model clubs and an opportunity to recruit new members, as this event is open to the general public, the organisers claiming 30000 visitors go through the turnstiles during its two days.

Host club was Southend MBC, who invite local clubs to support them, and a large marquee is supplied by the event organisers so we are undercover, should the weather take a turn for the worse. As it turned out, the weather wasn't too bad and there were a large number of visitors to see medieval jousting, motorbike displays, numerous traction engines (full size and model), vintage fairgrounds, classic cars and motorcycles, various farming activities and of course the model boats.

There is also a very large general trade area, but no specific model traders.

We had the use of a large lake which enabled International One Metre and Dragon Force yacht racing, as well as Club 500 races and the free sailing of r/c scale boats.

At the end of the weekend, prizes were awarded to the first three in the Club 500 racing and the 'Best in Show' award went to Keith Henley of Moorhen MBC for his model of the Trinity House Vessel Patricia. This event is a good opportunity to bring model boating to the general public and for local clubs to recruit new members and is highly recommended as an excellent day out, and of course you will see a range of model boats in action and on display. The Essex Country Show is celebrating its 30th anniversary on 10/11th September 2016.



ABOVE: A Dragon Force class yacht race. This relatively small r/c yachts are becoming increasingly popular.

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The Blackpool Sports Centre's main hall ticked all the boxes with plenty of space.

Blackpool Model Boat Show

Dave Wooley reports



Held on 17/18th October 2015 at the Blackpool Sports Centre, this event has always been known for its displays of excellent models, the number and diversity of vendors and a well-used small pool. For 2015, this was a new venue instead of the previously used Norbreck Castle Hotel. Mention has to be made regarding the effort put in by the organisers for this event, given the fact that this is a new venue and particular thanks must go to A Model World and Mark Williams who sponsored the event, and the local clubs and individuals who all made it happen.

Competition classes

This event has some properly judged competition classes for model boats and there were categories which covered just about any type of vessel from sail to pleasure boats. The Best in Show came from the Pleasure Boat class and it was Bluebird of Chelsea by Chris Blakelock. The Hull Model Boat Group has a well deserved reputation for superbly built models of fishing vessels, a notable example being the trawler St. Romanus, a previous show winner and here again on display. Sadly for 2015 there were no scratch built models entered into

the Fishing Vessel class, but Rodney Sanderson from Fleetwood more than made amends with his winner in the Semi-Kit class with his Onslow FD50.

In the Rescue and Life Saving classes, a model of the RNLB Helen Blake, the only Harbour class lifeboat to enter RNLI service had been scratch built by Graham Sleight and was the winner. In Semi-kit there was another outstanding lifeboat, the Arun class RNLB Keith Anderson and Kevin Brown achieved the well deserved first place with this model.

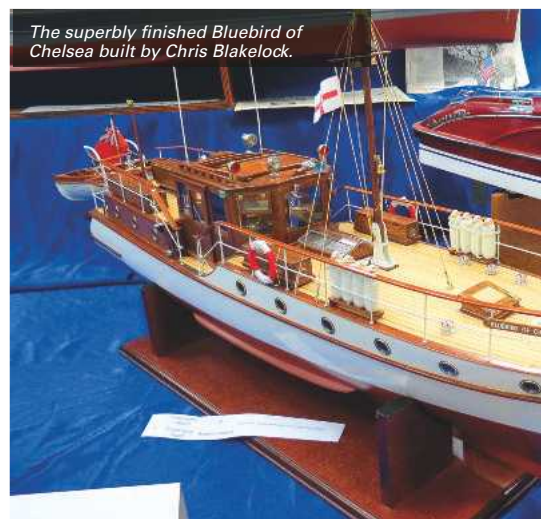
Interestingly, in 2006 the RNLB Keith Anderson was shipped to China and is now part of the China Rescue & Salvage Bureau for the port of Dalian and has been renamed Huaying 395.

Thanks to the preservation work of Jim Price of the Southport MBC, the winner in Naval Ships class was a model of the monitor HMS M17,



ABOVE: Show specials on the Component Shop stand.

LEFT: Some of the fine detail exhibited on Chris Blakelock's winning Bluebird of Chelsea.



The superbly finished Bluebird of Chelsea built by Chris Blakelock.



BELOW: The full-size trawler Onslow FD50 was from Fleetwood.



RIGHT: An exceptionally fine fully working model of the Arun class lifeboat RNLB Keith Anderson. Deploying the launching rack for the Y-class boat must have been difficult.



BELOW: On the Northwest Model Shipwrights stand was this under construction model of HMS Sovereign of the Seas, 1637.



BELOW: Best Club Stand for 2015 went to Blackpool and Fylde MBC.



ABOVE: What a cracking model is this TSS Lady of Mann.

BELOW: Chris Blakelock, left, receiving the Tower Trophy for the Best in Show Award at this event.



originally built by the late John Desborough, well known in the North for his superbly crafted models constructed mainly from scrap material. Remaining with Southport MBC, Peter Iddon was awarded First in the Workboats class with his super build of the IoM steamer TSS Lady of Mann.

Traders

These contribute so much to our hobby and it's always pleasant to visit each stand and see what's on offer and one is Mac's Mouldings from whom there are numerous accessories for our models, all in a range of scales. Model Timbers also have a huge range of fittings (as well as wood!), mainly in brass of a quality that is quite frankly second to none. There were the regular well known traders such as SHG Models, The Component Shop and

others. New to Blackpool though was Colin Graham with his 3D manufactured 12 volt smoke effect unit which is compact, efficient and only needs water to produce clouds of realistic smoke 'vapour' that is, perhaps most important for our models, totally non-oily.

The pool

This was in one of the adjacent rooms and although more than adequate for sailing model boats, this sort of detached arrangement was not as successful as having the pool within the same floor area as the rest of the show, so perhaps it was not as well utilised and viewed as it might have been if positioned elsewhere.

Clubs

Events such as this rely on model boat clubs to create a balanced event and as usual the local, and not so local clubs, all made the effort. Blackpool and Fylde MBC won Best Club Stand for 2015 with their well balanced display that was not overloaded, each and every model being easy to view including the miniatures. North West Model Shipwrights notably



ABOVE LEFT: A compact 3D printed 12v smoke generator unit by Colin Graham is available via eBay, and then search for 'Model Boat Smoke Effect Unit 12v-Uses Water (No Oil/Smoke Fluid)'. Price is £45 plus p/p at time of writing.

ABOVE RIGHT: HMS M17 was originally built ten years ago by John Desborough and has now been lovingly restored by Jim Price of Southport MBC.

RIGHT AND BELOW: Macs Mouldings has an ever expanding range of useful fittings.



also put on a good display including an under construction HMS Sovereign of the Seas of 1637.

Conclusion

This new site ticks all the right boxes including parking, refreshments, personal facilities etc. and is better than the old venue. Trying to establish an existing show at a new venue is not always easy and the organisers and volunteers had all done a good job, but I was disappointed to see some empty tables in the main hall, presumably because of 'no show' clubs or traders, and I think these should have been removed and replaced with seating or something else. This occurrence may be beyond the immediate control of the organisers but I think it is better that once it is known that spaces are not going to be taken prior to it opening to the public, to remove those empty tables and close the resulting gaps, one way or another. Visitors who have paid to come are otherwise left wondering what they are missing.

However, on a very positive note, the event raised and presented £431.84 to the RNLI, an excellent achievement and reflecting the ongoing generosity of our model boating fraternity.



LEFT: There is much about this model of the trawler St. Romanus that really does reflect life aboard a hardworking fishing vessel.



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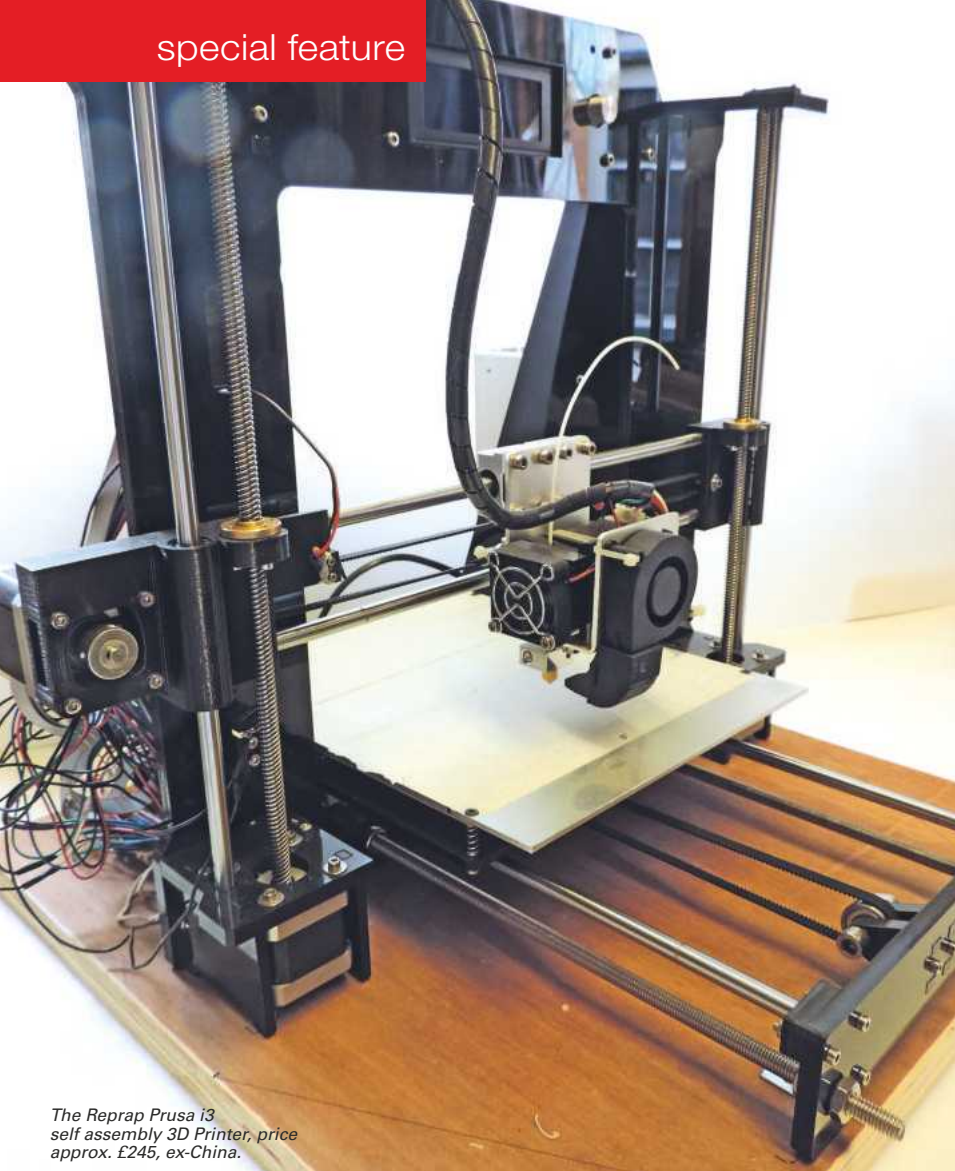
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The Reprap Prusa i3
self assembly 3D Printer, price
approx. £245, ex-China.

What can be made?

Well, probably virtually anything, as the pace of development is relentless. You could for example make a gearbox with all the internal gears inside of it, just by using 3D printing. This is possible because the printing process starts at the bottom and progressively lays down one shaped layer on top of another, moving slowly upwards until the whole object is complete and the technical term for this is 'Additive Manufacturing' or AM. It is also possible to print lettering on the side of a box or the inside of an object, and that's not been easily possible before now.

Different processes of 3D printing can be performed using metals, plastics, dental ceramics and even reconstituted bone cells for the surgical rebuilding of limbs and other bone structures. Of course these involve the use of top-end and very expensive technology that is, pricewise, far beyond the realms of us model boat builders. It is interesting though, when gauging the potential impact of this new technology that there are already fully functional 3D printed cars being tested and even full-size buildings. When a breakdown occurred recently on the International Space Station, which is fitted with a 3D printing facility, the instructions to print an essential part for the system on board were sent electronically from Earth and the exact replacement part was reproduced by the crew.

More practically for us, several parts, a bit like a kit of pieces for a complicated item such as a winch or a Bofors gun, can be printed at the same time, or you could even probably print the whole thing

3D Printing for the Model Boat Builder



Ron Rees explains this new technology

What's this 3D printing all about? Could it be a useful tool for the model boat builder?

For the first time (to my knowledge) some recent model engineering exhibitions have had some examples of this technology on display and for sale. Historically, if you wanted to make something, you had to carve, shape and cut away waste material to finish with the shape you needed, but all of a sudden everything now goes out of the window, because of the way 3D printers can 'print' solid items. As regular readers will recall, I love 'messing about' with new gadgets and it was fairly clear that here was another potential new toy to play with, but would it be any good?

I have also to say here at the outset, that there is a big THANK YOU to David Collins of the Romford Model Engineering Society who was immensely helpful in allowing me to use some of the pictures of the 3D printed parts he has made on his own self-designed machine.

as a complete item. Multiple identical items such as ten cowl vents can all be printed in one go, just by telling the G Code program (more about that later) to print them all. The scale of such items can be changed with just the click of a mouse once the first drawing is prepared, meaning that the need for several different scale masters and moulds will then be a thing of the past.

History

Much of the technology has been put together by American universities and its industry, together with help and ideas from Japan and others including the UK, creating the monster industrial 3D printers with all their different methods of operation, Lasers, powder deposition and photo-hardening polymers came about from the early 1980's and are the culmination of work from various countries. BAC Systems and the Rolls Royce Aerospace and Engine Divisions are already making turbine blades and similar using 3D printing technology in metal.



You could buy one of these printers if you won the Lottery and had a warehouse in which to install it, but what we need is a home desktop-sized printer for the average man in the street that can make 3D objects, usually in plastic, for lots of different applications and which does not require a mortgage to purchase, as well as being economical to operate.

Helpfully, along came Dr. Adrian Bowyer, senior lecturer in the Mechanical Engineering Department at the University of Bath, who had similar ideas and used his talents to invent the first small home desktop 3D printer in 2005. He then went on to offer his designs free to all and that were downloadable online, and so the REPRAP (Replicating Rapid Prototype) 3D printer was born. Those plans and instructions are still available, albeit now second and third generation. Just type 'Reprap' into the Google search engine and away you go. Not for nothing is Adrian called the Godfather of 3D printing and **Photo 1** (courtesy of the Internet) is of the second version of his initial machine design called Mendel, after the father of genetics. Well of course it didn't take long for loads of clever people who understood all this stuff to start making similar versions to his designs and marketing them under assorted names, a few even making radical changes to the layout, but the principles for them were, and still are, broadly the same.

How does it work?

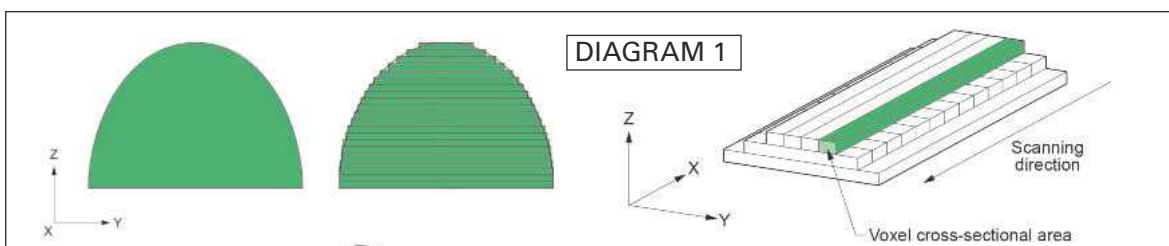
Any modeller who has hurled his domestic inkjet printer out of the window and jumped up and

down on it in frustration may have noticed the toothed belt drive that moves the print head and the motor that drives it. This moves from left to right in what we call the X-axis. The print head contains a heater that also pressurises the ink and in a series of digital pulses, squirts precise shapes on to the paper making lettering and so on. If the ink head was replaced by another motor and a small heated nozzle, hot plastic could be squirted out (extruded) instead, all this controlled by the same electronic control board.

Maybe Dr. Bowyer had jumped on a few printers in his time and had a collection of belt drives and motors, because he must have thought that if he made all the X-axis stuff move forwards and backwards as well, which we call the Y-axis, then he could print flat two-dimensional things such as coins, washers, name tags and door labels etc.

It didn't take long to make all of this move up and down as well on the Z-axis, which meant that after each 2D (Two Dimensional) layer of extruded plastic, the bed (the X and Y-axis machinery) rose or fell a little bit and it printed another layer of plastic on top of the last one so, lo and behold, the 3D printer came about and **Diagram 1** shows its principles.

The motors are controlled by a small PC board similar to that found in most Computer Numeric Control (CNC) devices such as laser cutters, lathes,





welders, automatic electronic assembly devices, car assembly robots and the such like. These boards are sometimes referred to as Arduino boards, or Project Boards, and are available from online electronic suppliers and retail shops such as Maplins in the UK. A 12 volt supply unit normally drives the whole thing, but if you buy a 3D printer, either readymade or as a kit, you will usually receive the machine supplied with this.

Most of the home 3D printers use a plastic filament similar to that found in a garden strimmer. Two main types of plastic are used, PLA and ABS, in a whole host of colours including metallics and wood-grains that are readily available from online suppliers for about £13 to £18 for a sizeable roll.

PLA (Poly-Lactic-Acid) melts at a lower temperature than ABS (Acrylonitrile-Butadiene-Styrene) which makes it more popular, but both are suitable for making robust plastic items for our models such as fittings, motor mounts, masters for any shape you could think of, including all the parts for say a winch or crane, as well as even figures to the right scale if you have the necessary scanning device.

What do I need to get going?

First, and without question, you need a computer with a reasonably current up to date setup. At the same time, an ability to get your head round the new software and processes is needed, or a very helpful computer whizz-kid living next door. On to your computer you can download for free the

program you need to draw and design objects in three dimensions, the favourite currently being 'SketchUp'. The basic free version is perfectly suitable for everything we are likely to want to do, so you don't need to purchase the more advanced 'SketchUp Pro'. Some of you may wish to download this software just to have a play with it as it is very user friendly and there is an Idiots Guide to SketchUp book available online for about £15.

The control board on the 3D printer does not recognise the format of most drawing programs which is usually in what is called STL (Standard Tessellation Language), which was invented by American students. So, you will need to export the three-dimensional drawings into another program which will allow you to set the printing parameters for the object you have drawn.

This program is sometimes called a 'Slicer' program, because it computes the layers of extrusion needed to make the object. So, another free download that you will need is a program such as 'Cura' which will convert the STL format to the final instructional data that the 3D printer needs which is called G Code, or Machine Code.

Helpfully, Cura is another free downloadable resource worth obtaining and having a look at, before spending money on the 3D printer. Most of the popular 3D printer names are listed in this program which makes setting it up for your own machine very easy. Most of these 3D printers will take a standard SD Card of 4GB or higher and will allow you to print without plugging the computer into your printer, although you can plug them in

First, and without question, you need a computer with a reasonably current up to date setup. At the same time, an ability to get your head round the new software and processes is needed



direct if you so wish. You just download from Cura on to the SD card and plug that into the printer so you can do drawings indoors and print outside in the workshop if you wish. Also, while we are talking about the computer side of things, there are loads of free to download 'things to make' and the most popular site for some of these is 'Thingiverse' where over 400000 topics are currently available. There are also hundreds of film clips with upgrades and 'how to use' items on YouTube, so that is also well worth a look.

You'll need a 3D printer.....

Rather obvious this, and there are lots of them advertised and sold on eBay, direct computer sales sites and at shows, but it can be a bit confusing choosing what you think you will need. I would recommend doing a bit of research, read blogs, talk to people who have already had a go and so on, but at the end of the day I think it will finally come down to how much money you want to spend.

For the beginner there are traps to watch out for, as many very posh looking 3D machines are really no more than a standard open frame Reprap Prusa i3, but sold in a pretty case of some sort. If you are a school or college, then perhaps that is relevant if you are worried about the chance of a child touching the 200 degrees Centigrade extruder head, but most of us should be aware of things like that and big clunky cases also take up a lot of desk and workshop space.

Dr. Bowyer's first design was a mass of threaded rods, nuts and bolts with wires everywhere, and it wasn't terribly stable or rigid, making for inaccurate printing unless constantly maintained. Most of the current versions are much better and a lot of people like and use the improved designs, the frames of which are now usually made from solid acrylic sheet or sometimes marine grade plywood. Various suppliers online will add something like 'RepRap, Mendel, Prusa, MakerBot' and so on to their advertisements and if they are robustly made then they should be okay and all perform in much the same way.

Prices for a built and ready to go commercial 3D printer with instructions (usually on a disc or SD card), start from about £450 and can reach £1000, but many come as a kit of parts and prices then range from £250 for a RepRap Prusa i3 upwards to the £400 mark or even more. Any model boat builder with a few kits under their belt should have no problems assembling such a machine in a couple of days and I had no difficulties, although to be honest, more comprehensive instructions would have helped. David Collins who has assisted with this article can build a machine that does much the same job, so please see his contact details at the end.

Two printers were purchased from China via eBay, one for myself and another that was assembled for a friend, **Photo 2** being of what's in the box and **Photo 3** is a close-up of some of the parts (please note that the clear frame pieces are protected by a brown paper film). The machine's acrylic frame can be clear or black, but are identical and as you will guess from the later pictures of these two machines, one is clear and one is black!

To avoid any confusion, these two 3D printers were listed on eBay at the time of writing in mid-2015 as:

3D Printer Kit LCD Screen Reprap Prusa i3 self-assembly, print size 270 x 200 x 170 and priced at £245 including delivery from China (but not UK taxes).

I have to say that their overall quality is superb, but the nuts and bolts are not the best, and a few were replaced, but that has been no big deal. The build instructions came in the form of a video and do leave a bit to the imagination. I prefer a printed booklet, but it seems that traditional writing and illustrating is beyond the abilities of some of these suppliers, but they are usually very helpful if you ask them questions online by email. Please bear in mind that when buying from the Far East to the UK, you will end up paying some sort of import or handling charge and for these two £245 printers, the charge was £17 each. One was ordered on a Monday morning, paid via PayPal and it arrived on the Thursday afternoon of the same week, a truly stunning service.

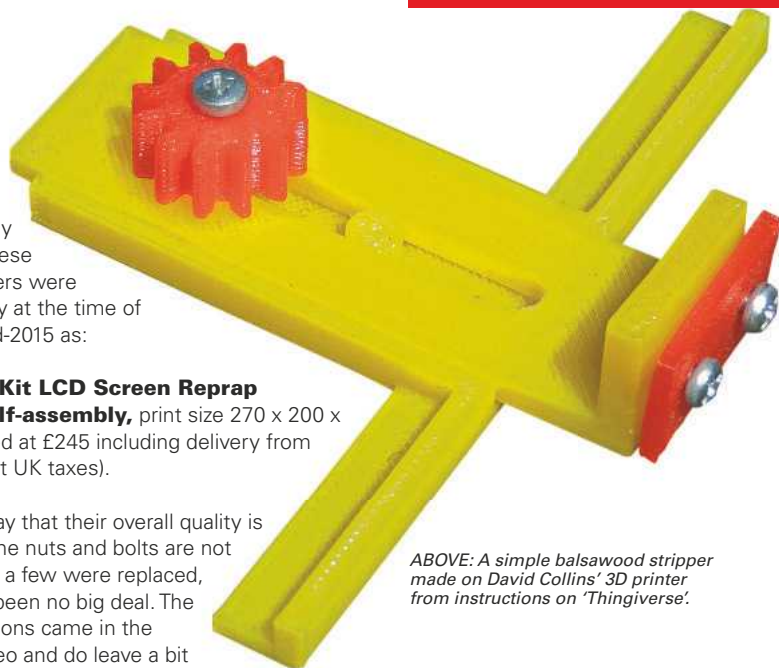
Assembling a printer

Anyone who can build a model boat kit has the skills to make a success of assembling a home build 3D printer kit. The kits mentioned have really good quality parts cut by laser from acrylic or top-quality plywood. These printers nearly all come with some basic tools such as Allen keys, small spanners, wire cutters and so on, but these are often of, dare I say it, 99p shop quality, and it can take ages to tighten the 100's of Allen screws these machines invariably have. Many of us have much better Allen drivers that look like screwdrivers with their long shafts and comfortable handles, and these are really so much better to use. It is worth getting 1mm, 1.5mm, 2mm and 3mm Allen drivers and some small nut driver sockets as well as long nosed pliers, if you don't already have these tools.

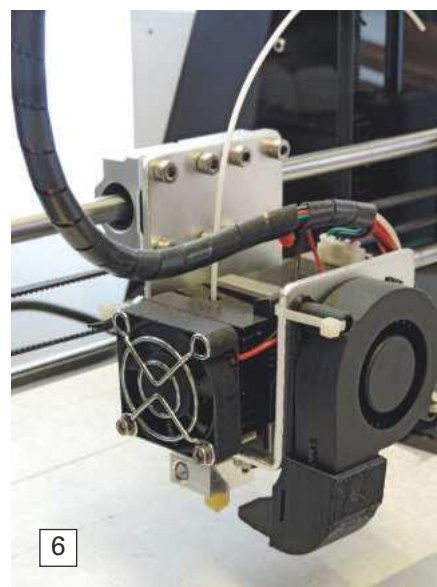
Photo 4 is looking at the front of the black framed complete machine. The small screen can just be seen centrally on the top cross member of the frame. **Photo 5** is of the rear of the machine and the printed circuit board behind the LCD screen can be clearly seen on the top cross member of its framework.

Photo 6 is a close-up of the print (extruder) head and you can clearly see the filament entering it at its upper face. The head moves left and right on the bars it is attached to, very much like a conventional ink jet printer and the whole thing moves up and down on bars at the sides of the machine. The table itself moves forwards and backwards, thus giving the three axis of movement required.

Actual assembly is fairly straightforward in most cases as it is like playing with Meccano. Be prepared to take items apart and turn them round the other way if they don't look right and bear in mind that some of the instructions are the typical



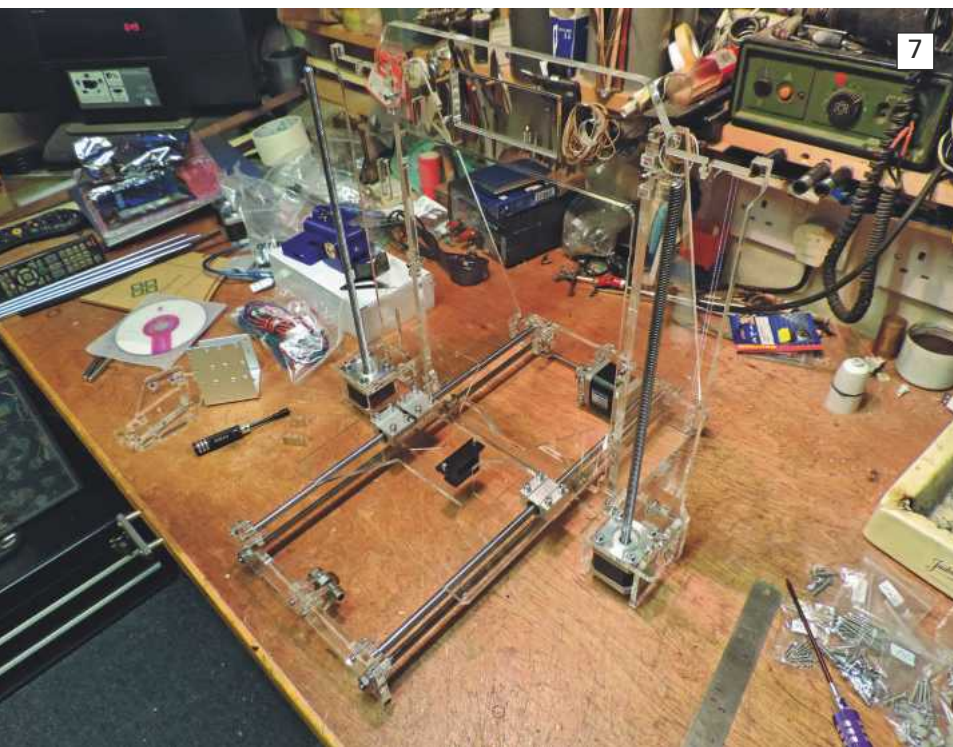
ABOVE: A simple balsawood stripper made on David Collins' 3D printer from instructions on 'Thingiverse'.





David Collins

I am indebted to him for his assistance and he has built, and can build, bespoke 3D printers for model makers and model engineers. **Photo 8** is of David with one of his machines and **Photo 9** is a close-up of it. He can be contacted via the email address printed at the end of this article.



Far Eastern attempt at the English language which can be hilariously funny if you are not upside down trying to get a 2mm screw into a part you can hardly see.

There are some areas of assembly that can cause a bit of head scratching in the process, so I hope these following tips will help anyone who decides to have a go:

Toothed belts

These are long lengths of belt material which you have to cut to length and pull tight to get into the locking ends, which can be tricky and a spare pair of hands here is a great help. If the belts are not tight enough you will get juddering and a lot of

zigzag lines on the printed parts. Fit and check these before cutting them to length as you rarely get more than three inches of spare belt and if a part is the wrong way round you may cut the belt off too long and leave none for the next part. You will probably, at the very least, have to fit two of these belts to your machine.

Limit switches

These stop the motors driving the axis mechanics too far and also register via a feedback system to the main control board and the computer program. Most of them are pre-wired, but do double-check how they should plug into the main board if they are not polarised. You shouldn't need to add shims or spacers, and if you do, then you've probably done something wrong.

The main wiring printed circuit board (pcb)

There should be a space for every wire and plug and most of them should only go in one way round. I advise builders to print a paper copy from the build sequence disc or place the board on a photocopier to make a full colour copy, so you can double check where each plug goes. Gradually the board gets covered with numerous wires and this results in it becoming easier and easier to push something into the wrong hole. Take time to study the various leads and printed circuit board, so you have a better understanding of where things need to go. There are at least four motors to install and each of these will have four or more wires running to it,



plus power leads to the two heaters and thermistor wires for temperature control, limit-switch wires for each axis and so on. Thus it all quickly builds into coloured spaghetti, so please check and double-check as you proceed.

As mentioned earlier, the second identical machine came with a clear frame (rather than black) and **Photo 7** is of that under construction, with it really being just a 21st Century glorified Meccano exercise with some wiring. I have to add here, that everything fitted, only tiny adjustments ever being needed, I guess the frame itself also being created on a 3D printer and/or laser cutter.

Tidying the cables?

Do not start tie-wrapping the cables to make it neater until you have switched the machine on and tested its movements in all directions as some slack will be needed in parts of the wiring loom. Drilling some extra small (3mm) holes here and there in the frame allows small tie wraps to be inserted to hold the cables and leads out of the way of the moving parts.

Printer Extruder Head

This is the part of the machine which causes the most problems as, when in use, it is squirting molten plastic out of a brass nozzle at a rather high rate of feet per minute, so it is important to be familiar with how the plastic filament drive works and which of the two fans does what. One is usually working all the time the machine is functioning and the other is temperature controlled

and so automatically switches on/ a needed.

The nozzle usually has a hole very accurately drilled through it of on average, 0.4mm diameter. This can sometimes get blocked and it should never be poked with a needle, so the need to sometimes clean the nozzle, remove and replace it is important. You can buy larger nozzles for a greater flow rate for large object printing or 'filling-in', if needed. The easiest way to clear a nozzle is to unscrew it and heat it to bright red in a blowtorch flame, then drop it into water as this usually does the trick for removing the blockage. The cheapest quality of filament can sometimes also get stuck in the drive roller, so this is another reason to build the extruder head yourself and be confident in its maintenance. Some machines offer two printer heads, so that two colours can be used and/or a higher print rate can be achieved when needed. The purchased machine had a single head so I have no experience of dual-head problems, but the additional head is an add-on option for many 3D printers.

Print Bed

This is very important and some time (and not just an evening), may need to be spent getting it level over the whole print area. Close tolerances are important and to give you an idea, several small print items were tested over three to four days before the height adjusters were just right. The normal gap test between the extruder nozzle and the table or bed is the; 'thickness of a piece of writing paper', so this process can be fiddly and time-consuming. Most printer kits will come with a heated aluminium plate to which some users

ABOVE: An 00/HO scale Stephenson's Rocket model's parts, all printed by Dave Collins on his bespoke 3D printer.

“Take time to study the various leads and printed circuit board, so you have a better understanding of where things need to go”



ABOVE: This is the 'boiler' for an electric smoke generator that runs on tap water. It used to be made from styrene sheet, cut to size and glued together, but can now be made in just three sections on a 3D printer. More to the point, it can pass as a dummy 'real' enclosed boiler in an open launch or perhaps inside a larger steam vessel.

will stick thin masking tape to help get the printed plastic object unstuck when it has cooled and the thickness of that tape has to be allowed for.

A better idea is to use a known flat surface like a glass or mirror tile and it's worth having three or four available. The tile should be coated with a 50/50 mixture of PVA glue and water, and then allowed to dry and be taped over, this being treated with PVA as well. This ensures that large flat printed objects stick to the plate properly as there can be a tendency for the plastic to contract as it cools and to lift at the corners during the hot-printing process.

The mirror or glass plate, and its now very well adhered 3D printed object, is then placed in the freezer for 30 minutes, after which the printed item should just cleanly snap away. The PVA mixture needs to be recoated afterwards, but this does resolve a very common problem. The glass plate is often held down on to the table by bulldog clips and these need to be allowed for when adjusting the height, but I have to say that once set-up, this system works very well in my limited experience.

Overall rigidity

I would recommend that you screw the 3D printer to a rigid flat baseboard such as a piece of 18mm plywood, making sure that none of the printer frame can move and small 90 degree metal mending plates from Screwfix (a UK DIY retailer) are handy for this. Once the printer is working, there are lots of bits moving around and some of the motors are quite heavy and these can change the critical settings of the table distance to the nozzle if it is all not properly secure. A mains on/off switch fitted to the baseboard will also be handy.

Control Panel (Heads-up Display)

All the computer generated inputs go through this little LCD panel on the top cross member which usually has just a screen and a single knob which twists to scroll through the menus and is pushed to engage the necessary instruction. It is simple to use, very much like the aforementioned computer transmitter panels, but it is a good idea to make a paper copy of all the menus as it will help you until you've got the hang of it all.

There is a given sequence for starting the machine which you should follow and if you are lucky you will get some instructions on your SD

card, disc or handbook, on how to do it all.

Clearly the thing won't work if the nozzle is not up to temperature (perhaps as much as 180 to 200 degrees) and the bed heater temperature is not set (usually 35 to 50 degrees). It won't print the object in the right place if you don't tell it to go to the start position and it won't print if the plastic filament feed motor is jammed or not correctly fed with filament. You will soon get the hang of all this, but please be prepared for some stop an' go attempts in the beginning.

The finest quality printing is truly unbelievable, but that means telling the printer to go slowly and if it is a large object, then you may end up setting it going just before you go to bed, because it can take 8 hours or so to make (print) the item. This is a learning curve, but well worth getting the hang of early on and the only way to do it right is to experiment and play with the machine.

What can you make with a model maker's 3D printer?

Well, within these pages are some captioned pictures of items made by David on his own self-built machine, including a fully functioning Voith Schneider drive unit, a balsa striper, the parts for a model of Stephenson's Rocket, and the boiler unit for a smoke unit made on the printer that is the subject of this article.

Conclusion

3D technology is evolving all the time and assembling your own printer allows you to add improvements and make changes as they come about, plus gives you a much better understanding of how it works. A multi-part magazine came out recently which supplies you with the parts to build a very pretty and compact printer, but over 18 months. At today's rate of progress it will probably be obsolete long before it is complete, but this will not detract from its overall usefulness and the cost? Well it is over £600 which is rather more than buying a kit-built machine in one go and being up and running 18 months earlier!

Some may disagree with the concept of using such a machine when building their models and say that there is then no skill in the construction process, but as far as that goes, there is definitely expertise needed to design and draw your ideas into a computer program, which is something I and others enjoy doing and this technology allows you to try and make things that may normally be virtually impossible. Much the same argument was aired when photo-etched parts started to appear on our models, but they are readily accepted nowadays.

As an addendum to all this what we need now, and to thoroughly understand, are inexpensive hand-held 3D scanners, so objects (even full-size) can be scanned to create the necessary computer file to then print a miniature copy. This is particularly useful if you wanted to make an exact miniature replica of something without the appropriate plan to hand, which brings us back neatly to the opening paragraphs describing the full capabilities of this technology.

Happy boating, and have fun.

Ron Rees - October 2015

Featured purchased machine

Obtained on eBay direct from China in mid-2015.

3D Printer kit. LCD Screen, Reprap Prusa i3 self assembly, print size 270 x 200 x 170mm.

Price: £245 with free p&p, but £17 tax and handling fee to pay before delivery in the UK as of June 2015.

David Collins

(David can build a bespoke machine at a reasonable price)

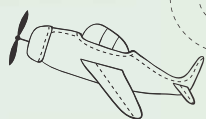
Email contact: dgcollins@ntlworld.com

Thingiverse

A fantastic resource for data and programs to make a huge range of items, including the 00/H0 scale Stephenson's Rocket pictured in this article.

Website: www.thingiverse.com

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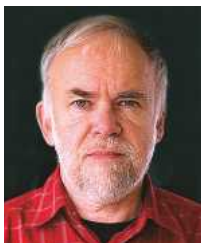
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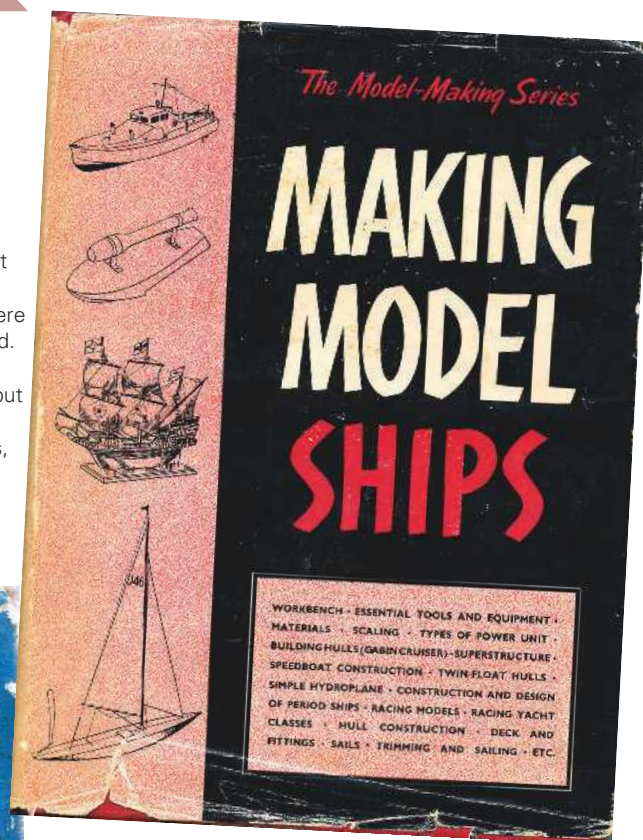
John Parker delves into the archives

34: Getting started

In the digital age, the building of a model boat is no longer one of the rites of passage for a young boy, as it once was. Consequently, there is a shortage of suitable designs being published. Certainly Model Boats does publish simpler designs for modellers with limited experience, but they are still intended for an adult audience. To find designs intended for building by youngsters, as you may want to do to encourage a young person expressing the wish to build his or her own model boat, requires a look through some of the literature of a past age.

RIGHT: *Making Model Ships* cover.

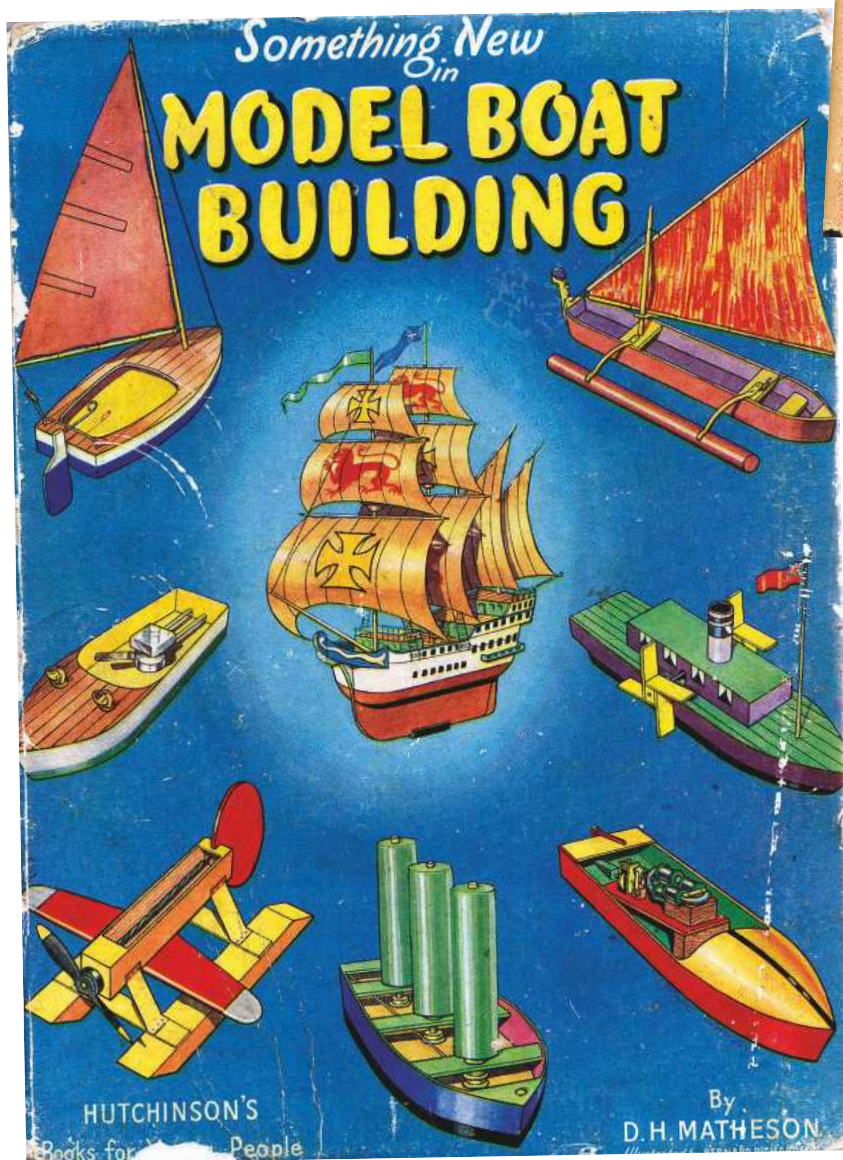
BELOW: *Something New in Model Boat Building* cover.



Something New in Model Boat Building

The earliest of the four books I have chosen to include here is *Something New in Model Boat Building* by D. H. Matheson, published by Hutchinson's in their Books for Young People series and illustrated by Bernard Richardson. The book carries no publication date, but began to be advertised in *Model Maker* magazine in 1952, so may be presumed to be from around that date. It is subtitled 'How to make Out-of-the-Ordinary Model Boats with Simple Tools and Materials', and this is an apt description for the book's contents.

Two brief introductory chapters cover tools, materials and basic hull design, followed by eighteen models, each with their own chapter; there are various sailing and rubber-powered designs of different vessel types, with a 'thermostatic' (pop-pop) boat, rotor ship, steam turbine boat, submarine and a launch powered by a home-built electric motor making up some of the 'out of the ordinary' models. Apart from simple bread-and-butter (laminated timber) construction used for one of the sailing ships, the hulls are simple flat-bottomed toy types made from timber, cardboard or tinfoil, using typical workshop tools and techniques rather than lightweight balsa wood, modelling knife and glue construction. The experimental types described, such as the steam turbine boat and rotor ship, could prove quite educational and a source of considerable interest. The operation of the rotor ship, with its spinning vertical cylinders, will be



baffling to many people and if the suggested rubber strand driving motor seems too limiting, it could readily be replaced with an electric motor.

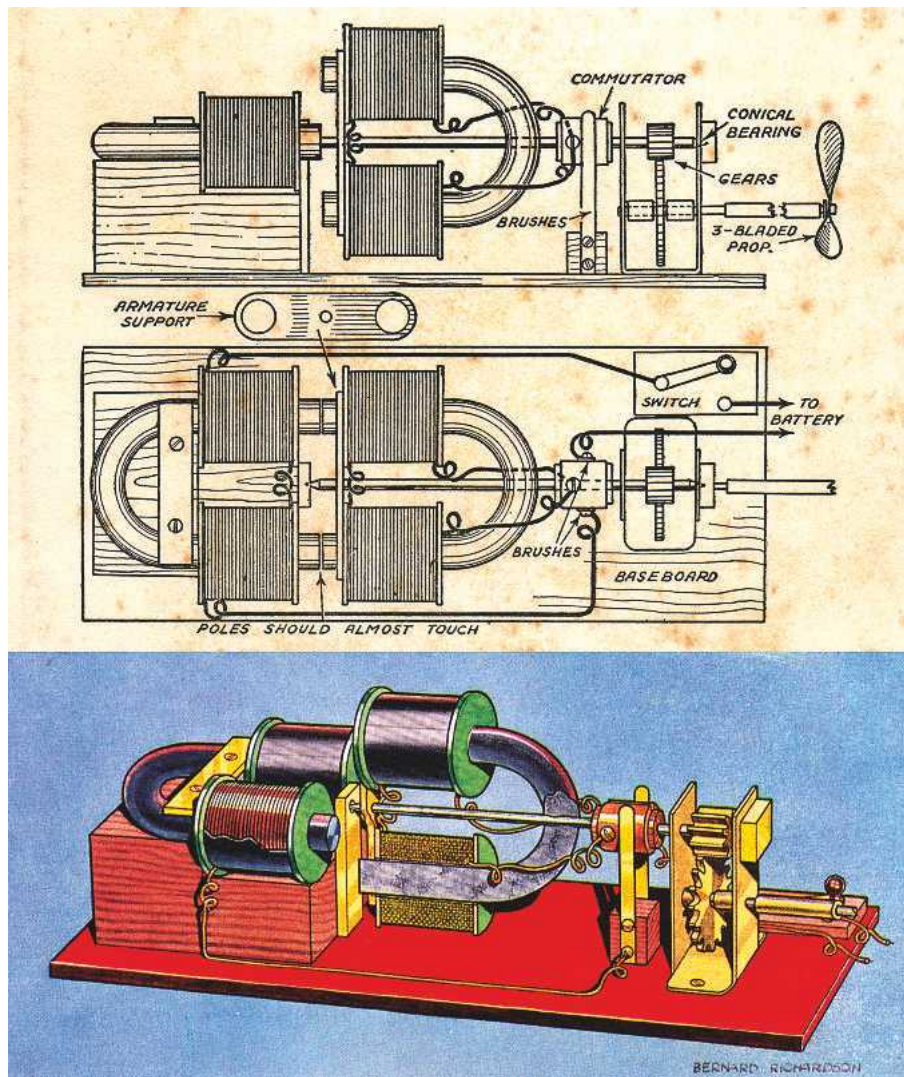
Only with the final chapter is electric power introduced, and it requires you to make your own motor. Here I think the author has been a little too ambitious, the winding of the two electromagnets needed for the rotor and stator, plus the provision of gearing to drive the propeller requires input from someone with engineering know-how. The cores of the electromagnets are of 3/8 inch diameter iron rod bent into a U-shape, with one, the rotor, having to be drilled exactly centrally and squarely in order to spin freely on its shaft. In case of difficulty, the suggestion is made to get your local blacksmith, machine shop or garage to supply these – it would be 'only a matter of a few pence inclusive'! They then must be left in the fire overnight, to become red hot and cool slowly, to soften the iron. More than anything else, these last two points show that the author was living in an era somewhat distant to our own. Within another ten years, the widespread availability of inexpensive sub-miniature motors removed the incentive for making your own, except as an educational exercise.

Making Model Ships

Published by Ward, Lock and Co Ltd in 1957, *Making Model Ships* again takes a traditional, workshop-style approach to the making of marine models, but is a more serious work intended to lead to the making of models rather than toys. It formed part of the publisher's Model-Making Series, and was written '...for every practical-minded young person with an interest in model making'. Five contributing writers provided the content, in five main sections that may be summarised as: Workshop - tools, materials, suppliers (and making a simple lathe); Model Ships and Power Boats – scale, power plants, ship drawings, methods of construction; Model Speedboats – configurations, construction, a simple hydroplane; Period Ship Models – details, fittings and methodology; Model Yachts – racing classes, construction, fittings, trimming and sailing.

The different styles, assumed skill level and emphases of the various writers tend to make this book seem a little disjointed. Illustration is by line drawings and a few photographs.

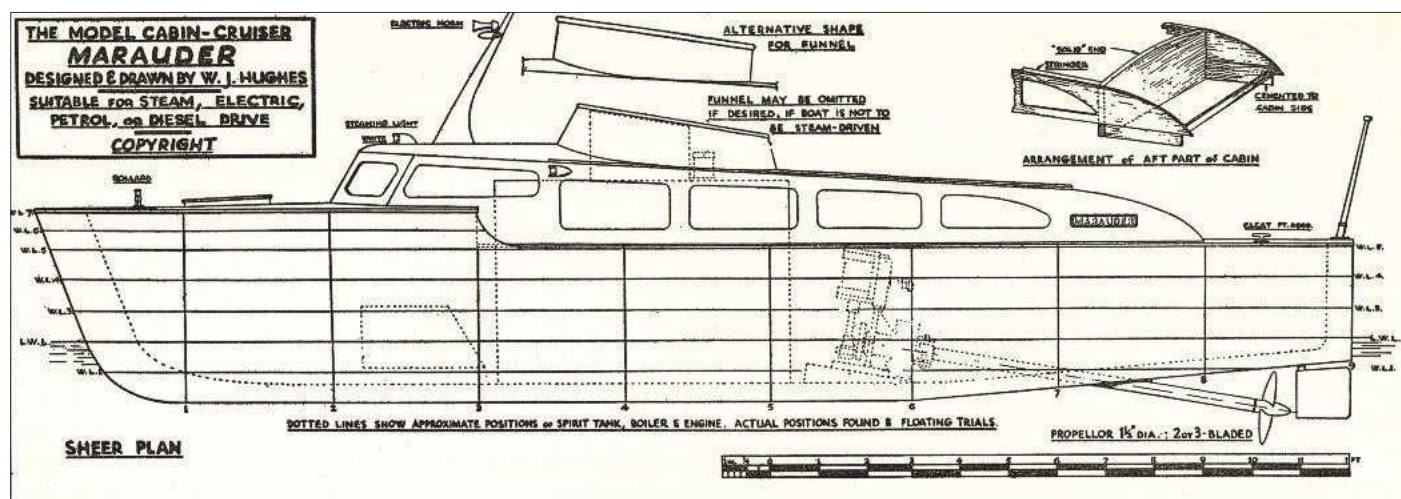
This book describes the traditional technique of 'bread and butter' construction from glued-up



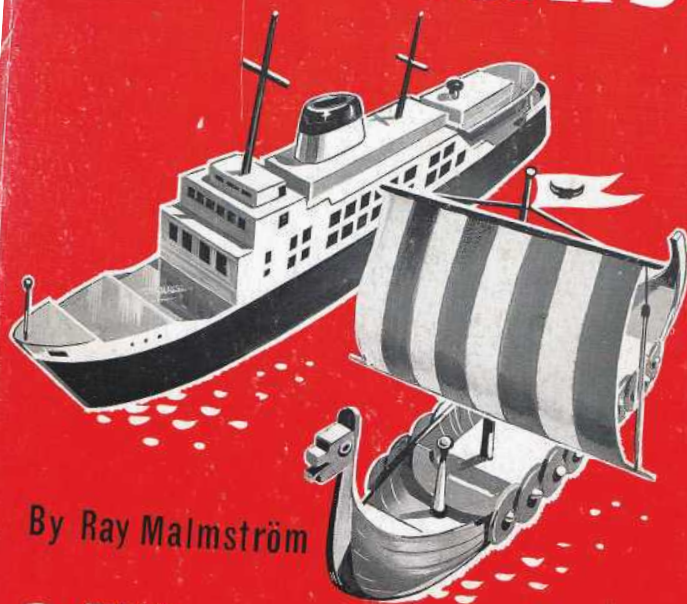
ABOVE: D.I.Y. electric motor.

timber pieces, carved to shape, using it to produce the quite fine looking cabin cruiser model called *Marauder*. This is one of four model boat designs for which constructional details are given, and is suitable for steam, internal combustion or electric power. A simple hydroplane is described next, for electric or diesel power, using built-up construction from balsa or plywood. An English Crusader ship of 1250AD forms the period ship display model and is based on a solid carved hull with planking over it. Finally, a 30 inch Restricted Class racing yacht using hard balsa bread-and-butter construction completes the quartet of models. Mention is made here of

BELOW: Extract from *Marauder* cabin cruiser plan.



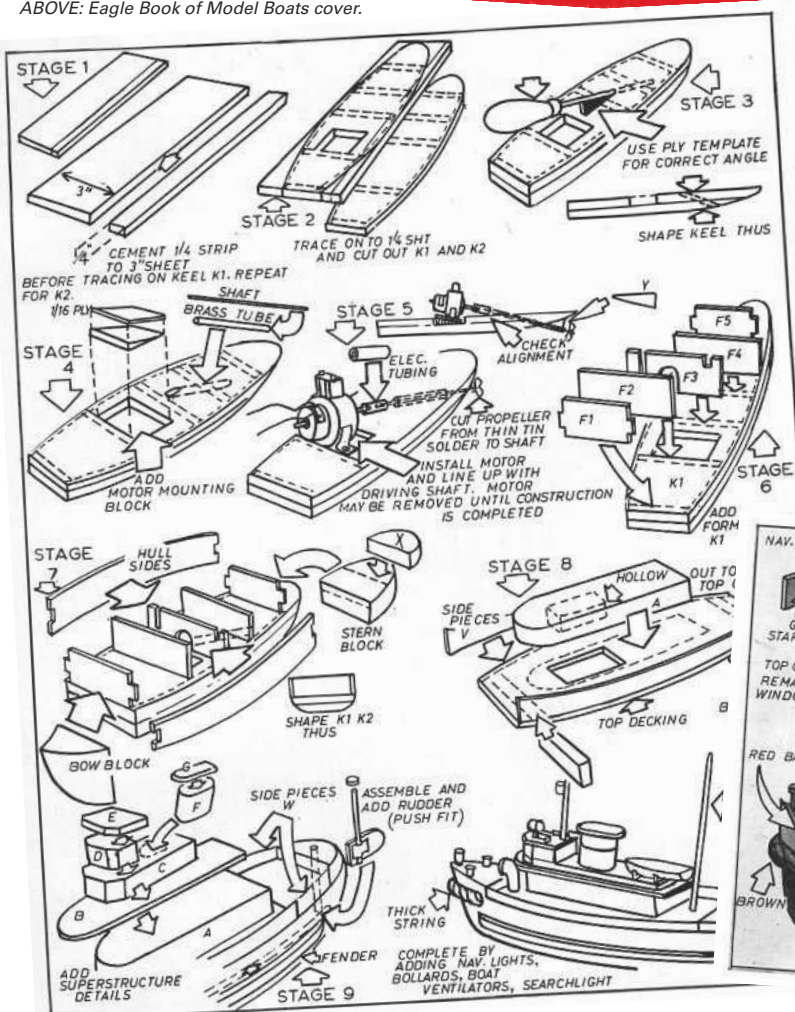
EAGLE BOOK OF MODEL BOATS



By Ray Malmström

8 EXCITING FULL SIZE MODEL BOAT PLANS INSIDE

ABOVE: Eagle Book of Model Boats cover.



plank-on-frame construction, with a warning as to its difficulty, so the model maker to left to graduate to a more advanced book if he wants to learn this technique.

Eagle Book of Model Boats

It's 1960 now, and the name of the respected comic Eagle has been invoked in the title of this 64 page book from Longacre Press by Ray Malmström. Ray's name was a familiar one to readers of hobby magazines in the 1960's, his characteristic line sketches and ink washes always appearing on a very crowded page to describe the stage-by-stage construction of simple balsawood models. This is very much the formula used in this book, along with several photographs of each of the completed models. A general chapter on the appeal of model boats is followed by the usual chapters on tools and materials; basic modelling tools and balsa, glue and paint in this case, and a chapter on power plants, before the book moves on to describe eight working models.

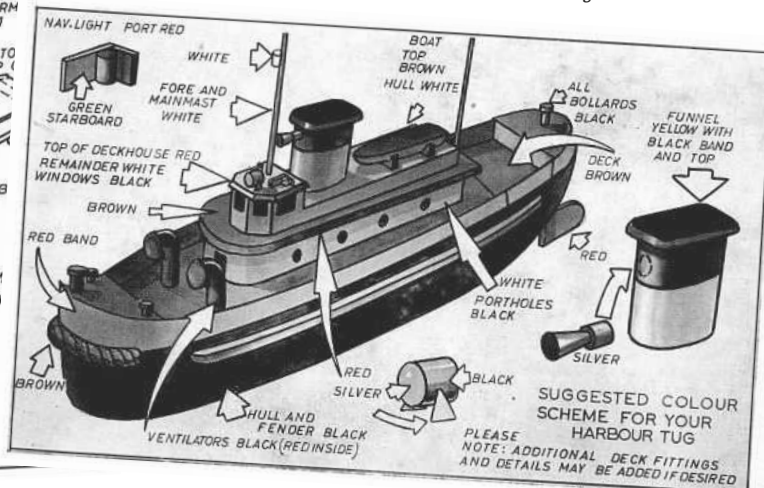
Grouping these by their means of propulsion, there is: A sail-powered Viking Warship; Jetex powered twin-hull Hydrojet; Jet-Ripple speedboat and Iceboat (for when your lake is frozen over); Electric-powered Foam Queen cabin cruiser; Harbour Tug and a Cross-Channel Steamer; The diesel powered Aquaskippa airboat.

Jetex motors, here in the form of the small Jetex 50B or 50C unit, were still enjoying popularity in 1960 and the book's author clearly considers them to be one of the standard means of powering a model boat. Full-size drawings and templates are included for all the models, which are thus necessarily small, shorter than a double-page spread except for the Cross-Channel Steamer, which measures some 455mm long and is the most complex model described, intended for a 4.5-volt Kako No. 3 motor or similar. For me, the prize pick is the Harbour Tug, only some 260mm long, but capturing the look of an American tug boat quite nicely.

Solarbo Book of Balsa Models

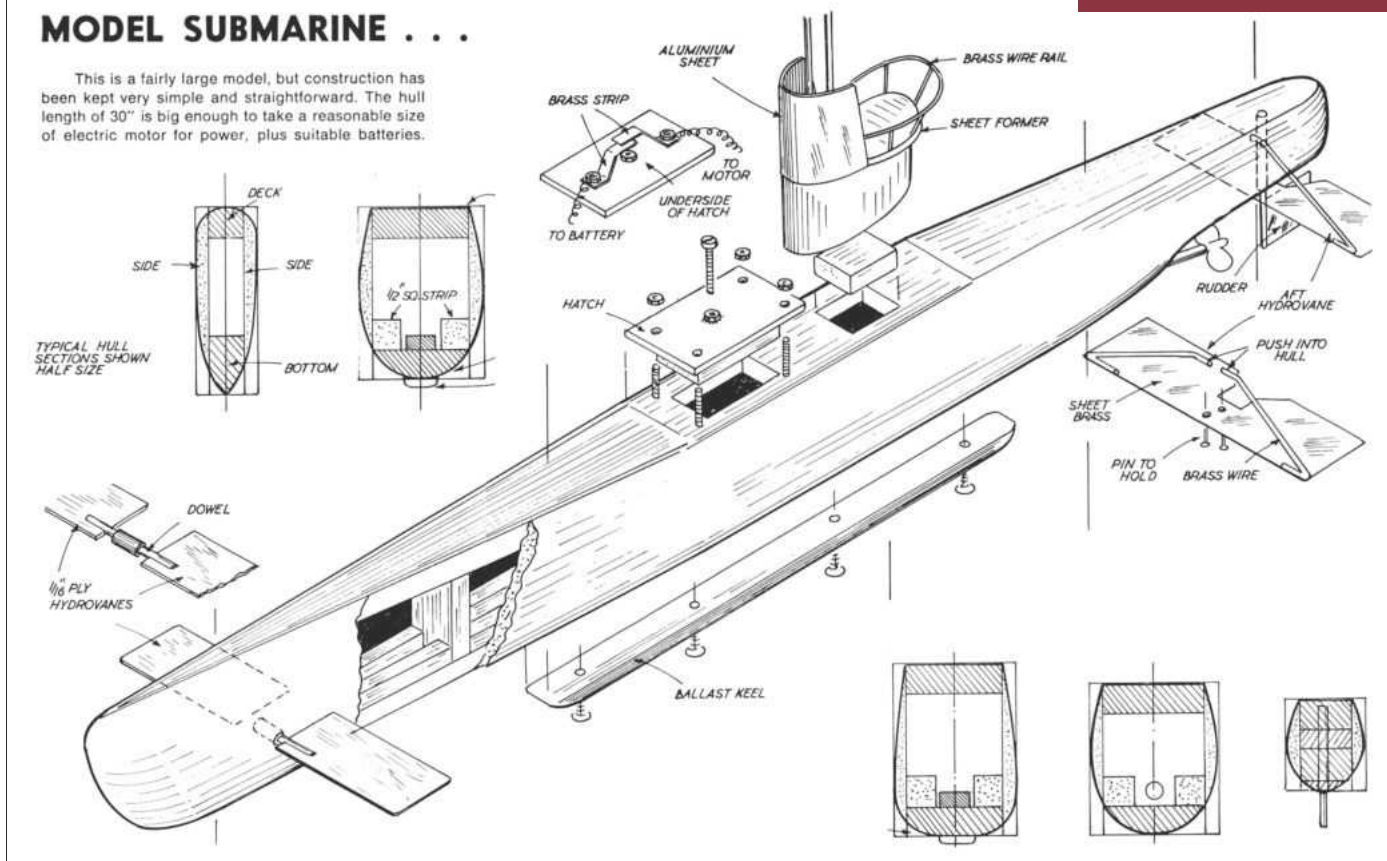
Published by Model and Allied Publishers in 1969, at that time publishers of this Model Boats magazine, the Solarbo Book of Balsa Models is a compilation of simple modelling projects penned by Ron Warring in association with the Solarbo balsa company. Quite a number of these projects

LEFT AND BELOW: How to build the Harbour Tug.



MODEL SUBMARINE . . .

This is a fairly large model, but construction has been kept very simple and straightforward. The hull length of 30" is big enough to take a reasonable size of electric motor for power, plus suitable batteries.



originally appeared in magazines of the time, such as Meccano Magazine and the Boy's Own Paper. Over fifty models are described, covering line-side buildings, model aircraft, boats and cars, helicopters, a hovercraft, electronics bread boarding, simple tools and machines and so on, along with some useful notes on working with balsa. All are depicted in Ron's signature style of multiple isometric views with full-size templates and plans as necessary, along with a photograph of the model in most cases.

The nautical subjects covered are the Kon Tiki raft of the explorer Thor Heyerdahl; a deep-vee speedboat for Jetex or electric power; a diesel powered aircrew hydroplane; a 14 inch cabin cruiser for inboard or outboard electric power; an electric dynamic diving submarine and a sailing catamaran. My favourite here is the cabin cruiser, an attractive built-up design with 3/32 inch sheeting on an interlocking framework of bulkheads and stringers. More so than other models of carved or bread-and-butter construction, this model serves as a stepping stone to the production of more complex, true to scale plank-on-frame models. The submarine could also make an interesting model, but without radio guidance or an automatic surfacing action, its operation must have been inseparable from fears of its imminent loss.

Conclusion

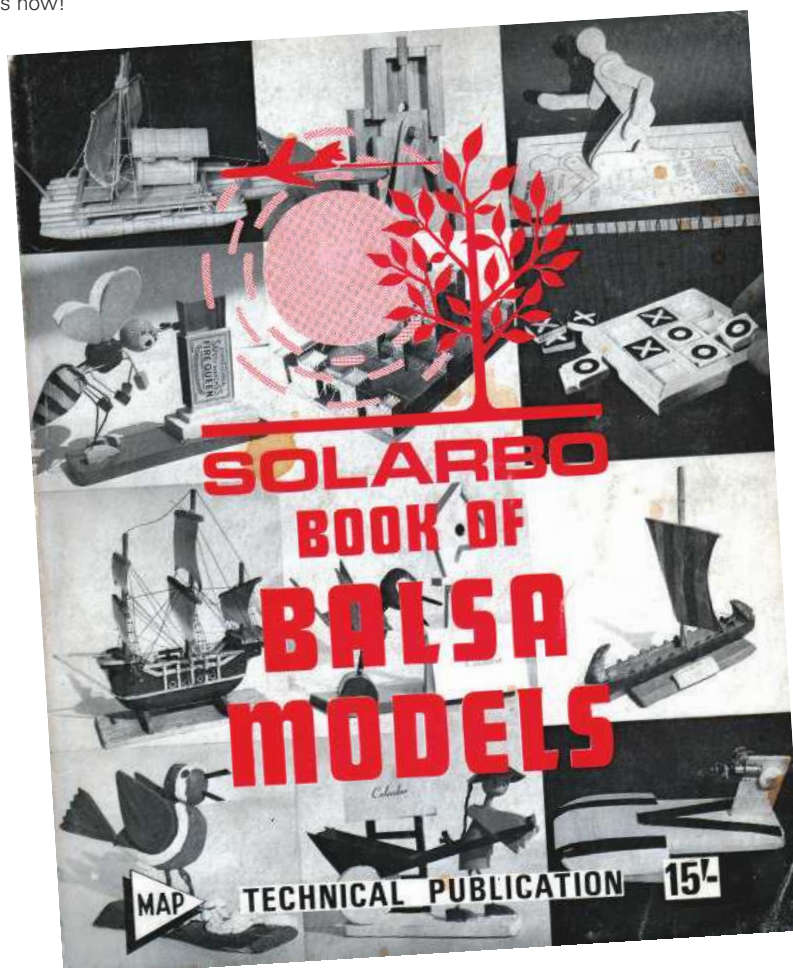
Old books such as these may provide the much needed practical information, otherwise difficult to find, to encourage a young model maker to take up the building of model boats. Some are tending to become expensive as they become collectable, but my examples were all quite inexpensively purchased online through auction sites or second hand book providers. Some may be available as reprinted or print-on-demand titles, but beware these may not be any cheaper than a good original, and often have poor typesetting. For taking the young model maker to a more advanced level, beyond the scope of the

books mentioned here, I would recommend Walter Musciano's Building and Operating Model Ships, covered in an earlier article (MB April 2015 issue).

One of my books is inscribed: 'To Graeme, wishing you a very Happy Christmas, with love from Auntie Sue and Uncle Errol'. I hope you stuck with the hobby Graeme, and are perhaps even reading this now!

ABOVE: A simple model submarine

BELOW: Solarbo Book of Balsa Models cover.





Glynn Guest with advice and tips for modellers

Lucky Find?

I'd just reached the point in my latest model where the addition of small items was needed to avoid a bare and unrealistic appearance. The usual lockers, hatches and cable reels helped to achieve this and the final touch would be a few lifebelts.

In the past, 'the mints with the hole' have been used to good effect. An alternative material has been some lengths of solder which could easily be bent around a suitable former and due to its softness, still retain a circular cross-section. On previous models such heavy lifebelts were never a problem, but I felt the new model had enough top weight already.

A search on the internet failed to locate any

suitable plastic items, not that I was too upset since it is always more satisfying to create something, even if it is not 100% accurate, rather than buying a perfect commercial item. Having said that, it is not unknown for a commercial item to require some work before it is acceptable for use, sometimes more work than scratch building the item would have taken.

So, the lifebelt problem was still simmering in the back of mind when my dear wife took me to look for a new refrigerator. As often happens we also had to visit a few more stores using the feminine logic that 'as we are passing, it's a shame not to' and thus I found myself in the haberdashery section of a large store.

Viewing all the kit available to the domestic sewer, knitter and dressmaker and it was not hard to find potential modelling uses for some items. Working my way through the large display and suddenly sets of different sized plastic rings were spotted. I'll confess to having no idea of their intended use, but one set was perfect for turning into lifebelts on the new model and only £1 for ten rings.

My first attempt to turn the rings into more realistic looking lifebelts, by wrapping string around them, was a total failure. It looked horrible and was a very messy job as well. A little thought and a pack of heat-shrink tubing, bought on a whim at a model show with the 'I'm bound to find a use for that' principle, was tried.

The ring was cut and four short pieces of tubing were slid on to it. A length of string was threaded through one piece of tubing which was then placed over the cut in the ring. Heating the tube, I used one of those handy gas lighters, caused the tubing to contract until it firmly held the string and closed the cut in the ring.

The string was then threaded through the next two pieces of tubing which were then shrunk onto the ring at 90 degrees to the first piece. The two ends of the string could then be run through the last piece of tubing and shrunk on to the ring opposite the first one. With the excess string cut away, a respectable lifebelt was the result.

If you use red coloured heat-shrink tubing on a white ring then it might be possible to use the lifebelt as it is, but these were destined for a military vessel and so were painted a drab colour.

I guess the modelling moral here is to not grumble when your spouse drags you around vast stores containing things you find difficult to get excited about. Just keep your eyes open and brain engaged and you might just find the answer to a modelling problem!



LEFT: Wilko plastic curtain rings. Okay, not perfect, but good enough for a stand-off scale r/c model and they could have other uses.

Recovering Models

One of the most heart stopping moments a modeller can possibly have, is when their pride and joy suddenly stops and refuses to acknowledge any wiggling of the transmitter sticks, no matter how vigorous or whatever words you chose to express your feelings with at that moment! If ramping up the stick wiggling or choice of words fails to get the model moving again, what can you do?

Well, if sailing in the company of other model boaters, there can be a stampede as they rush to push your model into safety. Whilst their enthusiasm is praiseworthy, their techniques might not be so welcome. If you are lucky your model can be recovered with no more than the odd scratch or maybe gouge from something sharp on one of the rescue boats. Less luck and someone knocks the superstructure off and then chews it up a little with their propeller as they sail over it. The ultimate in bad luck, although you might use other words to describe it, is when the combined efforts of this flock of Good Samaritans

manage to sink the stranded boat!

More experienced modellers will fix a line behind their model with a suitable float on the end and try to wrap the line around the stranded boat, then tow it back. This ought to be safer, especially with a little practice, but can still have its problems. Loosing awareness of just where the towing line is can result in getting it tangled around the recovery vessel's propeller and then you now have two models to recover!

I usually take two models with me when going for a sail. Ostensibly this is to double my sailing pleasure, especially if they are two quite different types of model, but in the back of my mind is always the thought that should one get stuck in the middle of the lake, I can push it back with the other. Recovering your own model means that you are likely to be very careful and thus minimise the chance of any damage.

Without a purpose built rescue boat, which can somehow grip the stranded model and positively sail it back, you are going to have to push it back. First, do not

try to fight any wind or waves unless they are taking the model into danger. It is better to recover the model from a less convenient (but still safe) place than struggle against the elements.

Second, when pushing the model from the side it is best to make contact with the middle and try to keep the recovery model perpendicular whilst pushing. This can be stable and with a gentle pushing action any deviations occur slow enough to give you a chance to correct them. With luck you might find the contact point on the hull sides which allows you to push it straight back to safety. If the stalled model starts to rotate when pushed, then back off a little and move the contact point to correct this rotation.

It might sound rather tricky but like most things, it gets better with practice. This neatly leads to the idea that with two of your models working perfectly on the water, you could still try pushing one back as a training exercise. In other words, a little practice before you need to do it for real!

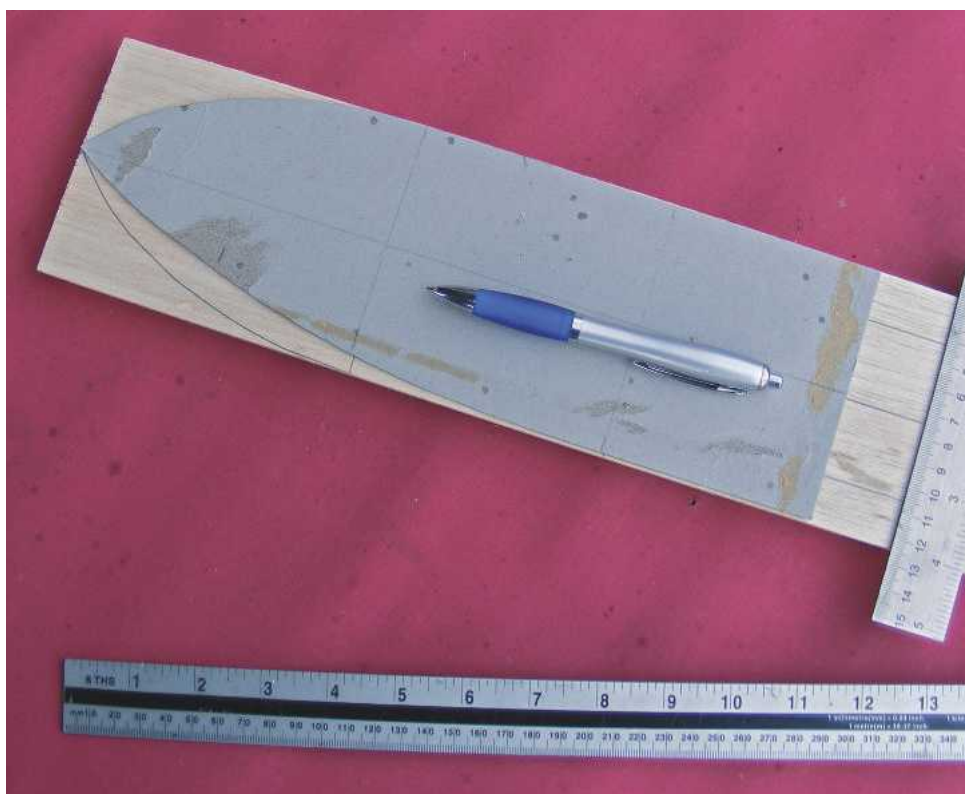
Card Templates

When scratch building a model, it often calls for symmetrical shapes, usually around the longitudinal axis, to be cut out. Failure to make these parts truly symmetrical will, at the very least, risk the model looking odd and may even produce weird sailing characteristics. A simple template to draw and maybe also to cut around, could be the answer. Making a template to match one side of the shape to be cut and then flipping it over (around the axis of symmetry) ought to ensure that both sides of the part are identical.

These templates could be made out of any suitable sheet material. If you planned to make several models, perhaps as part of a group or school project, then it might be worthwhile to use durable material for the templates such as plywood or possibly metal sheet? However, for a one-off model this does seem a lot of work and I tend to use cardboard, 1 to 1.5mm (1/16 inch) thick seems perfectly adequate. I often save suitable packaging or the backs of writing pads for this task.

The actual shape could be copied or traced from a plan. When working in the freelance or semi-scale zones I'll confess to being happy to sketch out the desired shape lightly with a pencil until something that looks okay appears. If the template shape is not quite right then it can be discarded and a second one made. This being both less frustrating and cheaper than ruining the material from which the model is being built.

BELOW: Templates help avoid wastage of wood, styrene or metal and ensure that repeated shapes are identical.



Boiler Room

PART
Sixty one:

Boiler Pickling



Richard Simpson's series on model steam plants

A recent outing with my Borkum, **Photo 1**, raised a concern as regards the validity of the sight glass level to the point where I didn't trust it. Luckily I had decided to get the boat out of the water just as the engine stopped due to lack of steam with the burner still going close enough to the bank to get to the gas tank and turn it off. I decided this was pushing my luck too far and, as I had already removed the sight glass and cleaned it out only a few months previously this was indicating to me that there was sediment in the boiler blocking the connections and it was time for a good internal clean. So, this boiler needed pickling!

What is Pickling?

Pickling is a very old process that has been used in engineering for many years and is basically a method of cleaning metal surfaces with acid. It is particularly useful in difficult, if not impossible to get at areas, such as inside tanks and boilers, but it is also very handy for complex and delicate parts that may be damaged by aggressive cleaning with abrasives or polishes, which may well themselves leave a residue. Pickling is regularly used to clean flux from soldered pipework, boiler shells after they have been silver soldered and many other applications where the complete cleaning and degreasing of the metal is required before moving on to further processes, such as painting. The process is basically nothing more complex than submerging the part in an acid, possibly heating it to increase the rate of reaction, before completely rinsing the acid away with clean fresh water to remove the loosened debris and any remaining acid.

Choose your poison!

Some modellers are more than happy to use good old-fashioned malt vinegar to pickle their metal components as it is readily available and cheap. The active component of the vinegar is acetic acid, which is also the base of some brown sauces and that is why if you dip a copper coin in brown sauce it will come out half bright and shiny, which may impress the grandchildren briefly before they return to the X-Box. My own concern with vinegar is that there is no control over it. The strength of the acid in the first place is unknown so just what you are applying to your metalwork will be of a hit and miss process when you try to pickle it using this medium. I much prefer to use tablets designed for the descaling of kettles and coffee machines, as they produce an acid of a known strength as well



as coming complete with a set of instructions for you to follow. The chances of first time success are therefore significantly elevated and the vinegar can be applied much more enjoyably to your fish and chips. Obviously descaling tablets are that bit more expensive than stealing the vinegar bottle from the kitchen cupboard, but anyway are still fairly cheap and **Photo 2** shows the two alternatives mentioned here.

The procedure

The first thing to do when handling something such as an acid is to be prepared in every way and plan what you intend doing. You are after all dealing with an acid and prolonged contact with your skin, and of course possibly your eyes, could lead to serious medical issues so first on the 'needed' list are rubber gloves and a pair of goggles. I know you don't do this every time you put vinegar on your chips, all of which just goes to show that vinegar is probably not that strong when used as a pickling agent. Also prepare your work area as you need to be slick and well organised to prevent spills and have items handy to deal with them should you have one. Make sure everything is to hand, so you don't have to go running around trying to find the kitchen roll at an inopportune moment, which your wife has hidden because she has seen what you are up to and knows she may well be just about to lose her last one because you didn't replace the one you used yesterday when wiping all the oil out of the bottom of your steam powered model! Also read through the instructions of the descaling tablets, **Photo 3**, to completely familiarise yourself with them, which will help you to have everything

Photo 2. The two likely candidates for the pickling liquid. Vinegar is of an unknown strength, but the descaling tablets are designed for the job and worth that little bit of extra expense.





you need to hand. Remember that we are dealing with acid, which might also discolour ceramics and other metals, so it should be treated with care and disposed of thoughtfully. If as here, you are using the over the counter descaling tablets intended for domestic use, their instructions will tell you how to dispose of the reconstituted acid safely and properly and the cautions to be exercised.

At a push you could probably do this procedure with the steam plant in the model boat, but I would far rather remove it (or at least the boiler), to have the best possible access to it. Also, remove the safety valve and the filling plug so you are not going to damage the former with acid as well as providing

Photo 1. The starting point, a model with any suspicion of scale or sludge in the boiler needs an internal cleaning and a blocked sight glass is just that.

Photo 4. Using a syringe makes the task of transferring the acid from the measuring jug to the boiler both easy and safe. Removing a fitting to give you a vent ensures there are no splashes and bubbling at the inlet hole.

Photo 5. A little bit of care will ensure that you do not splash a single drop and you can fill the boiler right up to its brim, ensuring every internal part gets cleaned.



Photo 3. It is worth considering descaling tablets for the fact that they come with instructions and you know that they are designed specifically for the task.

yourself with a vent to allow a smooth inlet flow for filling it. I also removed the plug on top of the sight glass to allow better venting and for another very specific purpose which I will mention later.

In the case of the descaling tablets, the two tablets were mixed in 500ml of hot water and thoroughly stirred until they dissolved, creating half a litre of hot acid. Rather than trying to pour this into the boiler through a funnel, there was a much greater chance of success if a syringe was used and a 50ml version was to hand, ready for the purpose,

Photo 4. I simply put the tip of the syringe into the acid, drew up a syringe-full and pushed this into the filling bush. This was repeated until the sight glass was full and then the top plug was replaced on the sight glass and the remaining space in the boiler was also filled. If you do this carefully, you should be able to avoid spilling a single drop and you should be able to see acid at the vent and the filling bush, ensuring the boiler is completely full, **Photo 5** being of the filled boiler.

Again, follow the instructions for the descaling tablets, but they will usually quote a length of time to leave the acid to work and so I went for lunch. Some tablets may well require you to use heat to improve the effect, but I prefer to use hot water in the first place and rely on the residual heat to assist the reaction. After lunch I went back to the boiler and carefully lifted it over to the sink. With





Photo 6. After a thorough flushing, the final process is to also give the sight glass a good flushing through as well, with as much pressure as you can generate at the syringe. This should ensure that the connections are nice and clear and you are going to get a reliable reading from the sight glass.

Photo 7. Finish off with a test steam to ensure everything is working perfectly. You don't have to wait for the annual steam test to check the safety valve and after such a process as a pickling, it is worth checking it all works okay.



water running into the sink to dilute the acid that was carefully being poured out of the boiler, I was very pleased to see that it was now quite a strong yellow colour, indicating that there was quite a bit of dissolved scale in it and then the rinsing process began. Again, using the 50ml syringe to fill the boiler to around half-full, it was then picked up, two fingers placed over the filling and vent holes and shaken vigorously to wash the insides. This water was then poured away and the process repeated four to five times. Finally, the cap from the sight glass fitting was removed once again and fresh water pushed through it via the syringe, **Photo 6**, to thoroughly flush it through and the connections, which was the reason of course for starting the whole process in the first place. After finally pouring out the fresh water, the connections were all replaced, the boiler refilled with normal feedwater, and it was now reassuring to see the sight glass working perfectly.

As a further simple test and precaution, the pressure gauge was removed and checked for calibration, the plant was fired-up to raise steam and its safety valve lifted to confirm normal operation, **Photo 7**. The boiler and engine were then replaced in the model.

Conclusion

No matter how careful you are in maintaining the quality of your boiler feedwater over the years there will inevitably be a build-up of deposits inside the shell. It may manifest itself as sludge at the bottom, or a scale build-up, or a combination of both, but ultimately it will need cleaning to ensure the reliability of the boiler. Blockages of such items as the sight glass could be potentially very damaging so it is well worth remembering and possibly even paying a bit more attention to the maintenance schedule I described in Boiler Room No. 55 (July 2015 MB). Above all, such processes as a boiler clean if well prepared and planned should be a relatively straightforward and an easy task, involving very little cost and minimum time and effort, but the benefits are immediately obvious and **Photo 8** is of Borkum again, but now with a new lease of life.

I would certainly recommend you perform the pickling process if you have picked up a secondhand boiler from somewhere and you have no guarantee of what the quality of its feedwater has been over its life. Finally, the pickling process can equally be applied to complex items such as soldered lattice masts and other intricate parts of our models.



Photo 8. What it is all about: Keeping your plant reliable and safe and on the water as much as possible. Simple maintenance tasks such as internal boiler cleaning go a long way to helping you achieve this.



SWA News

From the Autumn 2015 issue of Quarter Deck Ramblings

This is the newsletter of the Surface Warship Association that arrived recently in the Editorial Office. This association is a national organisation, its members all having an interest in warships and as a group they support many model boating and general interest events in the UK and Europe. One such recent event, where they were promoting the hobby to the general public, was the Mill Rythe Military Heroes Weekend and the following is from a short article by David McNair-Taylor first printed in the newsletter.

Mill Rythe Military Heroes Weekend

Held on 19/20th September 2015, Area 4 of the SWA was invited to put on a large model warship display for the second year running at the Mill Rythe

BELOW: Dave Reith's HMS Clyde.



Holiday Village on Hayling Island, Hampshire as part of their Military Heroes Weekend, which was attended by members of the Algerine Association, Royal British Legion and RNA.

In addition to a static display of 45 models, the SWA also put on demonstrations of the models on the outdoor swimming pool. There was ideal weather for these pool displays with nice sunshine and very little wind, the models sailing being well received by the event visitors.

The static display was located at the rear of the main dining room and although this area was large, its visibility and awareness were more limited than previously which resulted in a lower footfall than anticipated and several SWA members visited other parts of the complex to improve awareness of the display to the visitors. Having said that, the SWA had an excellent weekend and our thanks go to the management and staff of Mill Rythe Holiday Village for their help and support. Members attending were: Dave and Andrea Reith, Bob Jenner, Joe Jackson, Geoff Young, Alan Gamblin, David McNair-Taylor, Ken Winter, Charles Davis and Alan Hall.

Contact information

The SWA Membership Secretary is Mr. Hilary Breeze, 38 Birch Crescent, Holtwood, Aylesford, Kent, ME20 7QE. Tel : 01622 710528, email: hbreeze@ecgroup.co.uk.



ABOVE: Geoff Young's HMS Royal Oak.

BELOW: Charles Davis' Display.



ABOVE: Bob Jenner's HMS Illustrious.

Not for the Purist!

Douglas McGhee presents a novel means of propelling and controlling waterline models

This project first came to mind after pondside frustrations with inadequate deck openings which did not permit sufficient access to radio, couplings, etc., particularly with the smaller model. All this, together with the transfer of r/c gear from one model to another made me think something had to be done.

In my years as a technical teacher, I have looked after many model clubs. I remember a little single cell submarine power unit which could be fixed to the underside of a small plastic ship. If only this could be controlled by radio? After several prototypes fitted to a redundant model, the underwater controlled module was developed which seemed to satisfy the following criteria:

1. Easy transfer of gear from model to model.
2. One motor, radio, etc., to serve all models (would probably suit a school model club).
3. No more restricted access through tiny deck openings.
4. The models need only be waterline, which helps storage, display and transport.

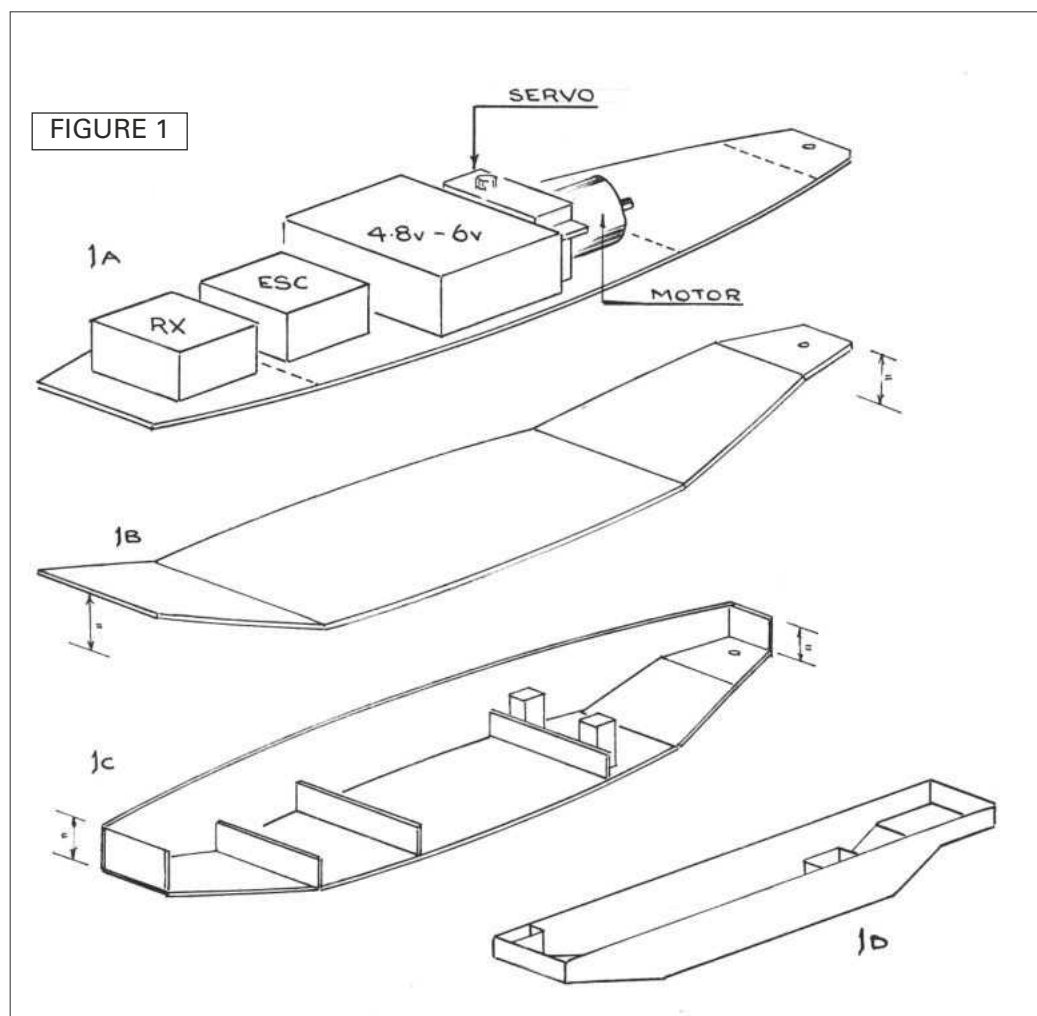
Figure 1 - The Module

The dimensions of the module will depend on the size of the components you wish to fit. In the beginning, make a card mockup and modify it until you are satisfied that everything will fit easily into the space and **Figure 1** shows the basic concept. Within it:

1a) shows a suitable arrangement; the motor,



ABOVE: 28 inch (70cm) destroyer on the water.



coupling and stern tube may take up more space than you think. The module is constructed of Liteply available from your model shop. This is a lightweight 3mm plywood which is easily cut with a craft knife and tacked together with cyano (superglue). Use your card mockup for the shape of the base.

1b) Score and crack along the broken lines so that the base is cranked as shown here. A spot of superglue at each bend should be sufficient. Cling film on your bench top will take care of any unwanted adhesion. Note the equal height fore and aft.

1c) The bulkheads are now glued in place and it would be useful at this stage to again test fit the radio etc. This test will also determine the height of the sides, transom and bow. Finally the interior is given a liberal coat of resin to seal it.

1d) This shows a slightly simpler construction with straight sides which will bring about a small increase in water resistance. The extra space could be used to accommodate ballast in little plywood pockets, although a flat bottom model will generally sit level when afloat.

Figure 2 - Driveline Configuration

This **Figure 2** shows the motor/shaft configuration and the closed loop rudder control, using steel fishing wire with small bore aluminium tube as crimps. The K & S Metal Bar at your model shop has brass rod and tube which can telescope into each other very neatly, a boon to kitchen table modellers without a lathe and these can be used for the rudder tube and stock. The stern tube is bushed with slices of smaller tube soldered inside then packed with grease or Vaseline before the propshaft is pushed through.

A simple old fashioned coupling is used to save space and can prove quite satisfactory. Model aero wheel collets are suitable as they come complete with grub screws, but make sure the hole for the drive pin is a very easy fit.

Figures 3 & 4 - Module to Model

Now there must be provision to receive the module within the waterline hull and **Figure 3** shows the general concept from a side view. This takes the form of a 'box lid' and it must be a very easy

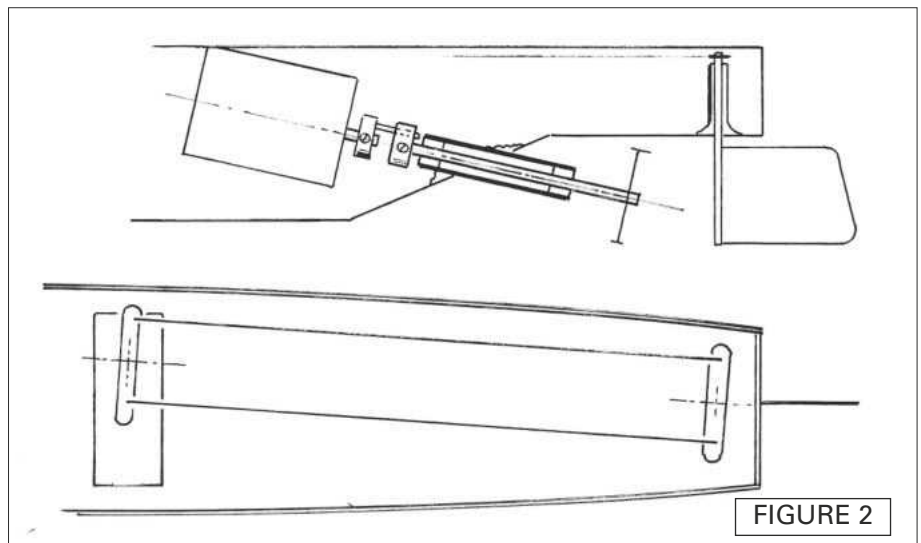


FIGURE 2

fit on the module to allow for expansion due to dampness and to avoid capillary action of the water. The easy fit can be arranged by wrapping five layers of masking tape around the module as shown in **Figure 4**. Build the lid around the module then remove the lid and tape when the glue has set.

At this stage we have a module with an easy fitting lid capable of containing all the working parts, so now is the time to test the complete set-up and make final adjustments.

BELOW: 36 inch (90cm) Vitalius Spartacus (schoolboy Latin for 'Vital Spark') a make-believe warship.

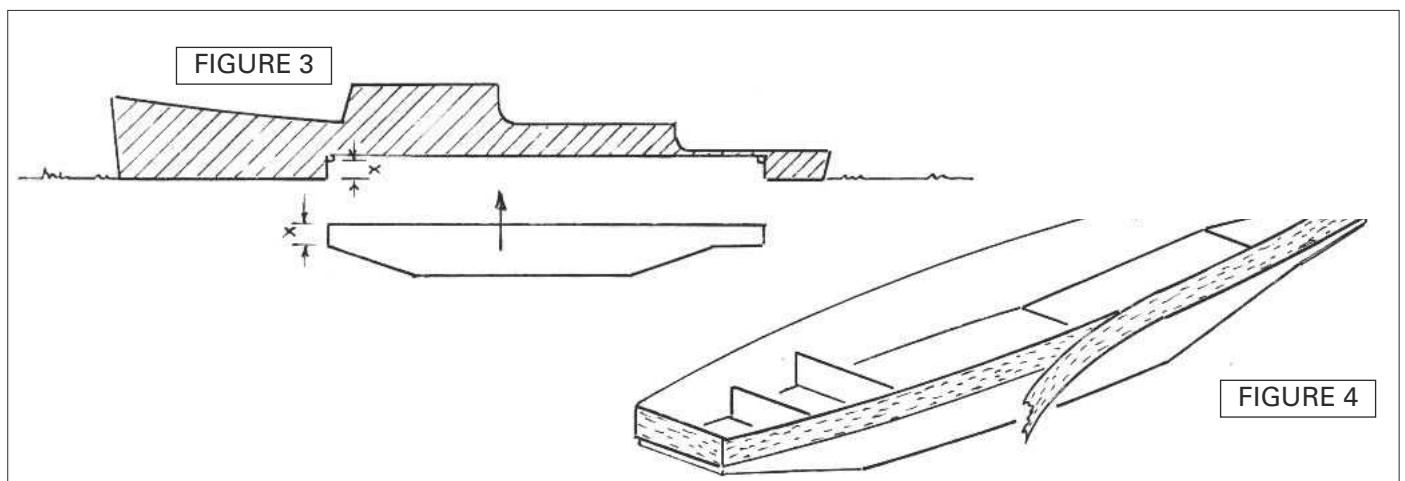
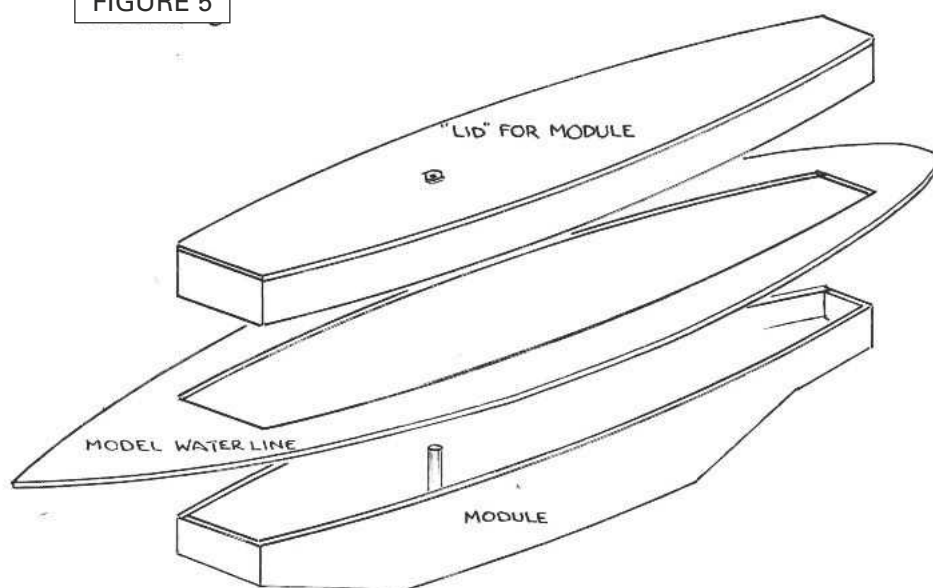
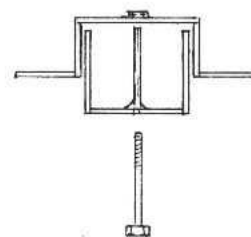


FIGURE 4

FIGURE 5



BELOW: A launch and destroyer drying out.



can be used as the lid for the next model.

The module is secured to the model by a bolt passing through a tube and captive nut (please note the two small stripwood stops at both ends, referring back to Figure 3). A shorter bolt will secure a waterline model to the display board. As you can see, the sides of the module are above the waterline when it is secured in place within the hull.

To make the sea for the display board, cover the hull of the model with cling film and bolt it to the board. Shape the sea effect with resin and filler, forming it as it cures. Paint the sea with enamels and when dry, a brush over with cellulose dope will produce a realistic crinkly effect. The cling film acts as a release agent and the resin sea is now a perfect register with the model when it is on display.

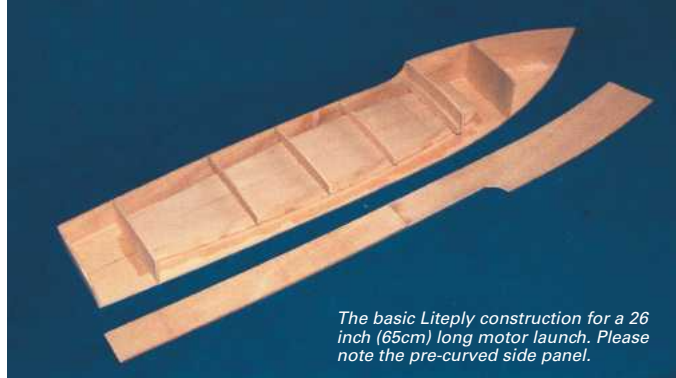
Figure 5 - The Models

None of these models are true scale, but the photographs hopefully show craft which could almost represent a full-size vessel. These models just seem to grow out of everyday materials, from denture tablet tubes (that shows my age) to a sixty year old collection of bits and pieces, however back to **Figure 5**. Cut a panel of Liteply to the waterline and the opening to accept the lid. This cut out piece

BELOW LEFT: The paddle steamer Bluebell on display with module.

BELOW RIGHT: The module and Bluebell (Wot no working paddles!) showing the cavity on underside of the hull.





The basic Liteply construction for a 26 inch (65cm) long motor launch. Please note the pre-curved side panel.

Conclusion

Although a purist may not be 100% happy with this concept, it does enable the builder to construct a model free from the usual access hatches in the decks, use the same drive module for different models if he or she wishes, and as the on the water pictures show, you cannot tell that a model has no bottom in the true sense, when afloat. Of course this concept could be extended to installing such a module into the bottom of a normal full-hull model if you so wished.

General information

1. The module shown in the photographs has a standard two channel receiver, an old Sea Rover esc, four D-cell NiCd's, a 280 sized motor and a 25mm three bladed propeller.
2. GRP resin from an auto shop (e.g. Halfords) is used for sealing the module and making the sea.

3. The filler used with the GRP resin is talcum powder.
4. To get a sharp curve in Liteply, make several light knife cuts across its grain.
5. Secure the receiver, esc and battery cells within the module using sticky-back Velcro tape.



ABOVE: A Steam launch afloat.

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Test Bench

Model Boats looks at new products

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Two New 'Ocean Liner' Books by William H. Miller

Both these books are published by Fonthill Media Limited. Millview, Toadsmoor Road, Stroud, GL5 2TB, website: www.fonthillmedia.com. Available direct from the publisher or through the usual retail outlets. Having written over 80 books on passenger liners, Bill Miller, aka 'Mr. Ocean Liner', has produced two new, superbly illustrated, maritime histories, which must be essential reading for anyone with an interest in those ships.

Conquest of the Atlantic – Cunard Liners of the 1950s and 1960s

Softback, 96 pages, 250 x 228mm, over 140 photographs in black & white and colour ISBN: 978-1-78155-350-3. Price (RRP) £19.99.

Cunard, the most famous name in shipping, began

175 years ago in 1840 with paddlewheel steamers, but grew, progressed and created some of the largest, fastest and most luxurious liners of their time. The final 'golden age' on the Atlantic run between Europe and North America was in the 1950s when the company slogan 'Getting there was half the fun' seemed so apt. Cunard had twelve liners on the transatlantic route in 1958, but the same year saw the introduction of the speedy and efficient passenger jet aircraft that immediately stole transatlantic travellers.

Cunard in the late 1950s had such celebrated ocean liners as the Queen Mary and the Queen Elizabeth as well as the Mauretania, Caronia, Britannic, Saxonia as well as smaller ships including the Media, Parthia, Sylvania and Franconia. In this new book, Bill Miller, takes the reader

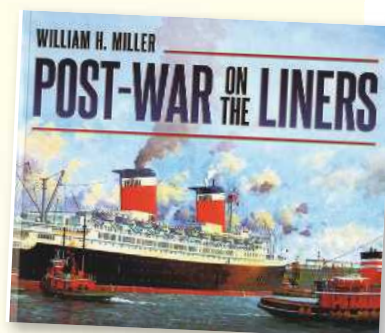
on a nostalgic journey, using original photographs, posters and memorabilia from his own personal collection to tell the story of these great ships that are all still remembered with much fondness by those who travelled on them. Cunard then faced furious competition from the airlines and by 1969 had only the QE2 on the route.

Post-War on the Liners

Softback, 96 pages, 250 x 228mm, over 130 photographs in black & white and colour ISBN: 978-1-78155-359-6. Price (RRP) £18.99.

The period from the end of WW2 to the late 1960s marked the golden era for the traditional port-to-port class-divided passenger ship business. It was an age of re-awakening, with the wealthy and adventurous seeking new experiences abroad and countless migrants wanting to leave Europe for new lives and opportunities overseas.

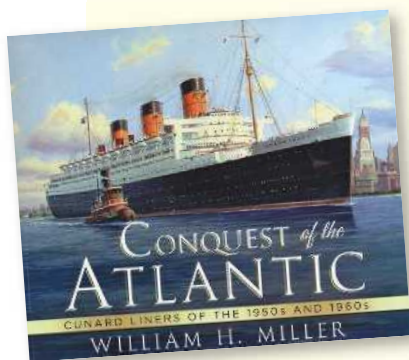
Atlantic crossings to the United States and Canada were popular, but there were also three and four class ships to South America, combination passenger and cargo



services carrying only a 100 or so travellers, fast mail ships to South Africa, colonial passenger vessels to East Africa, crowded migrant ship sailings to Sydney and Auckland, trans-Suez and trans-Pacific passages.

This book examines, through fascinating anecdotes and detailed research, the many passenger ship services of this bygone era, recapturing the charm, practicality and importance of post-WW2 sea travel, including the Queen Mary and Queen Elizabeth, Italian Line's Augustus, Union-Castle's Bloemfontein Castle, P&O's Oronsay and Shaw Savill's Southern Cross and lesser known vessels.

Book Reviews by
John Deamer



The British Carrier Strike Fleet – After 1945

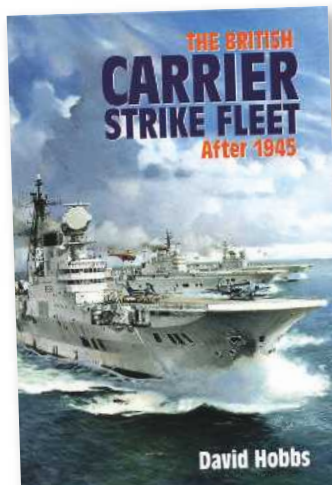
Written by David Hobbs. Hardback, 622 pages, 240 x 166mm, over 200 black & white photographs, line drawings, diagrams and maps. ISBN: 978-1-84832-171-7, price (RRP) £35.00 Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets.

In 1945 the most powerful fleet in the Royal Navy's history was centred on nine aircraft carriers. This book charts the post-war fortunes of this potent strike force and the changes in carrier design

and development with introduction of jets like the Phantom and the Sea Harrier; its decline in the face of diminished resources; the final fall at the hands of uncomprehending politicians and its recent resurrection in the form of the Queen Elizabeth class aircraft carriers, the largest ships ever built for the Royal Navy.

After 1945 'experts' prophesied that nuclear weapons would make conventional forces obsolete, but British carrier-borne aircraft were almost continuously employed in numerous conflicts very much across the world and giving successive British Governments options when no others were available. In the process, the Royal Navy invented many of the techniques and devices crucial to modern aircraft carrier operations

such as angled decks, steam catapults and deck-landing aids, while also pioneering novel forms of warfare such as helicopter-borne assault in the form of the



commando carriers HMS Albion and Bulwark and the tactics for countering insurgency and terrorism.

In this new book, the author, a retired Royal Navy pilot, combines narratives of these poorly understood operations with clear analysis of the structure and political background, benefiting from his personal experience of both carrier flying and the workings of Whitehall. It is an important but largely untold story of its renewed significance as Britain once again embraces carrier aviation. Whether you're a naval historian, enthusiast or ship modeller, if you're interested in aircraft carriers and British carriers in particular this is a useful and informative book.

Book Review by **John Deamer**

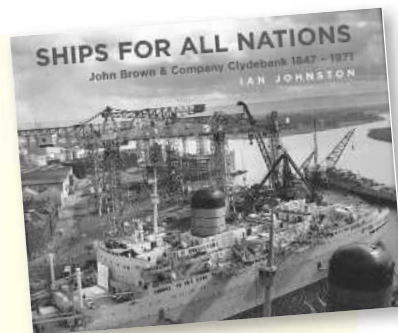
Ships for all Nations – John Brown & Company Clydebank 1847 - 1971

Written by Ian Johnston.
Hardback, 384 pages, 298 x 255mm, 400 black & white photographs, line drawings, diagrams, maps and plans, ISBN: 978-1-84832-267-7, Price (RRP) £40.00. Published by Seaforth Publishing, an imprint of Pen & Sword Books Ltd, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets.

This shipyard built some of the most famous vessels in maritime history including

great transatlantic liners like the Lusitania, Queen Mary and QE2, as well as iconic warships like HMS Hood and Britain's last battleship HMS Vanguard. Starting life as J & G Thomson in 1847, the business acquired its more famous persona when taken over in 1899 by the Sheffield based steelmaker John Brown & Company, which enhanced the yard's existing reputation for turning out first-class naval and mercantile products. This book charts the fortunes of the company in terms of its business development, its management and personnel, as well as the great variety of

ships it built during the century and a quarter of its existence. It also tells a wider story of the rise to world domination of the British shipbuilding industry and its eventual decline and collapse in the post-war decades. Ian Johnston is an acknowledged authority on The Clyde shipbuilding and this magnificently illustrated book was originally published as a limited edition in 2000, but this reprint is entirely revised although it retains all the original photographs from the yard's own unrivalled photographic archive which now forms part of the Clydebank Photographic Collection held by the National Records of Scotland in Edinburgh where they are being conserved,



re-catalogued and scanned for posterity.

This book will become a major reference work on the subject and as such is an essential 'must-have' for ship modellers, maritime historians and enthusiasts alike.

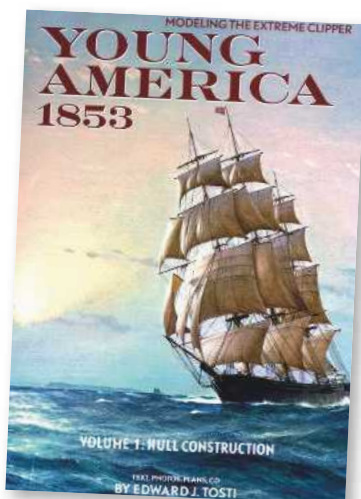
Book Review by
John Deamer

Modelling the Extreme Clipper – Young America 1853

Volume I: Hull Construction

Written by Edward J. Tosti.
Hardback, 267 pages, 312 x 238mm, over 700 black & white photographs. ISBN: 978-0-9904041-6-3, Published by SeaWatchBooks, LLC, 19 Sea Watch Place, Florence, OR 97439, USA. Website: www.seawatchbooks.com. Tel: (541) 997 4439. This book is only available direct from the publisher. Price: \$80 plus \$9 Shipping & Handling US, \$20 Canada, \$30 all other countries.

The extreme clipper Young America was one of a specific class of American merchant ships, built by William Webb at his shipyard on New York's East River in 1853. The design of these ships was largely



driven by extraordinary business opportunities created by the discovery of gold in California in 1849. Unlike the typical freight vessels of the day the clippers were designed largely for speed

and 'extreme clippers' almost exclusively so. Profits on the sale of goods in gold rush era San Francisco were so high that East Coast merchants gladly paid exorbitant freight rates for fast passages.

Following his successful two volume series on modelling the Royal Navy frigate Naiad* the author and ship model maker Edward Tosti, is in the process of modelling the extreme clipper Young America.

This first volume is a unique, 'step-by-step', pictorial guide describing in exquisite detail, the construction progress, tools and jigs etc. used to build the hull of this model, in fact it describes the construction of two hulls one in 1:72 scale 'plank-on-frame' and the other in 1:96 scale 'plank-on-bulkhead', using text and hundreds of photographs. There are also eight sheets of

four colour, 1:72 and 1:96 scale plans in an accompanying folder together with a CD containing frame templates and patterns.

Volume II, which will be published at a later date, will cover finishing the main deck together with her masts and rigging.

This is yet another superbly written and illustrated book from this master model maker, which I'm convinced, will not only be an essential reference work for anyone wishing to build this model, but will also serve as an extremely useful guide into the methods, tools and techniques employed in the construction of a ship model of this period.

*The Naiad Frigate Volumes I & II are available at \$80 each (plus shipping) from SeaWatch Books LLC, (details above) who regularly advertise in this magazine.

Book Review by **John Deamer**

Very Special Ships – Abdiel Class Minelayers of World War Two

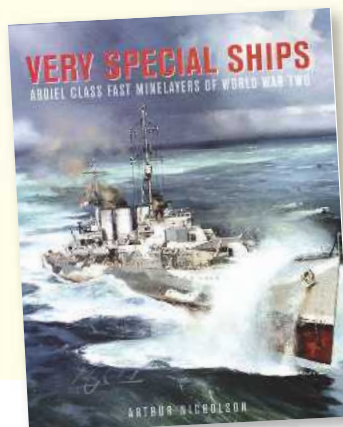
Written by Arthur Nicholson.
Hardback, 208 pages, 267 x 225mm, over 170 b & w photographs, line drawings, diagrams and maps (including 24 ship profiles in colour) ISBN: 978-1-84832-235-6, price (RRP) £30.00. Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222 website: www.seaforthpublishing.com. Available direct from the publisher or

through the usual retail outlets.

This is the first full-length book about the six Abdiel class of fast minelayer; HMS Abdiel, Welshman, Manxman, Latona, Ariadne and Apollo, the fastest and most versatile ships to serve in the Royal Navy during WW2. They operated not only as offensive minelayers dashing into enemy waters under cover of darkness, but in many other roles, most famously as blockade runners to Malta when in lieu of mines, they transported items as diverse as ammunition, condensed milk, gold, troops and even VIP's.

Distinguished by their three funnels, they were attractive well designed ships and they were also

unique as no other navy had such ships, so they were much sought-after commands. To give the broadest picture of this important class of ships, the book details the history of mines, minelayers



and minelaying; covers the origins and design of the class; describes the construction of each of the six ships and the modified design of the last two (HMS Ariadne and Apollo), together with the operational careers of the ships in WW2 when they played vital roles in the battle for Crete and the siege of Malta as well as other campaigns. The post-war careers of the surviving ships are also documented.

In this well written and superbly illustrated book, naval enthusiasts and potential model makers will find much to interest them.

Book Review by
John Deamer



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BMPRS News

Website: www.bmprs.co.uk

Tight racing in the B Class. (Photo courtesy of Judith Beesley)



Craig Dickson
reports from
Kingsbury Water
Park (2)

BELOW: The mangled top of Graham Stanley's F1 Catamaran.



After a short five week interlude since the previous event, it was time to return to Kingsbury Water Park for the eighth race of our calendar. Unlike previously, the weather on this occasion was fantastic throughout the day and it was nice to enjoy the heat of the sun instead of having to don wet weather gear again. For me the day started off with a bit of a panic. I took my camera out to discover to my horror that I had left the battery pack in the charger at home, so how would I get photos for the Model Boats Race Report? Thankfully Judith Beesley was on hand to capture her usual excellent photos and Garry also helped out - phew!

Malcolm Pratt (of the Kingsbury MBC), again kindly volunteered to act as OOD (Officer of the Day) taking and managing the individual bookings prior to the event, and overseeing its running on the actual day. Malcolm was helped at the race

control desk by Robin and Sue Butler along with Madelyn Reid and all did a great job. Tasks such as lap counting and generally monitoring each race can be very demanding. However it helps considerably when more than one person lends a hand to help and this occasion was a really good example of the friendly and helpful attitude of our membership.

Thirty one boats were entered across the various classes and except for the C Class which had only one entry, each of the others were sufficiently evenly supported for some excellent racing and great fun to be had as we shall see later. The usual format applied with an early driver's meeting called to remind us of the need to drive safely and have full consideration for others including the rescue boat crew and any wild life on the lake. Heat durations were set at 15 minutes each, one in the morning and one in the afternoon per class, with the exception of the C Class which with only one entry needing enough time for a single lap to secure the win!

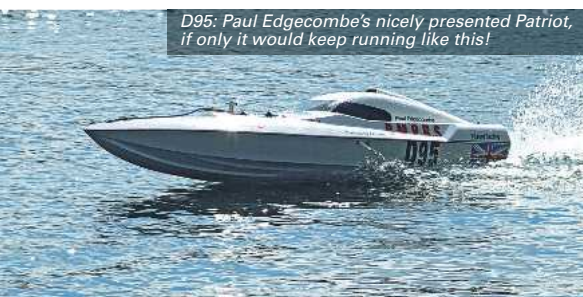
With everyone happy with the course layout, it was time to get first race underway starting with the smaller AA Class. What were the highlights of each class?

AA Class

This usually well supported class was a bit light on entries with only four boats entered. Two regular racers in this class, Mark Beesley and Graham Stanley, were both unable to enter this class due to awaiting delivery of essential spare parts for their engines. In the case of Mark for example, he had stripped down and serviced his OS outboard engine but had not yet received one of the essential bearing sets for the crankcase. Bob Cheshire had fully intended to race in this class also, but his



LEFT: Great weather ensured a good turnout, spectators included!



D95: Paul Edgecombe's nicely presented Patriot, if only it would keep running like this!

motor seized during warm-up before the race had even started. He suspected that a warped disk valve was the cause, but one for examination in his workshop.

With the four of us that did race, my West 28 powered Magnet achieved two non-stop runs and a total of 90 laps for first place. For me, this was the best that this boat (new for this season) had run so far. The tuned pipe length had been increased by 12mm and it made a substantial improvement to the way the engine throttled, enabling a larger prop' to be pulled, making all the difference.

Andy Rennie's CMB 21 powered Challenger achieved 77 laps in total for second place. Although Andy enjoyed consistent scores in both heats, his Challenger didn't seem quite as quick as it usually is. David Hough took third place with 72 laps in total racing his Go 28 powered Pursuit. This boat is remarkably quick for a relatively small hull, but his first heat lap lower score dented what could have been a potential winning result.

Junior member Kian Searle, had to settle for fourth place with 43 laps, his geared Picco engine suffered a loose gearwheel nut and an exhaust joint that was blowing which cost him a lot of laps.

A Class

Three of the five entries in this class were junior members, so would they give the two adults a run for their money?

Mike Barnes' ASP 46 Challenger clocked up consistent scores in both heats giving him first place with 94 laps in total making this his fourth consecutive win on the trot in this class. Junior member Luke Bramwell, had a great run with his Challenger (also ASP 46 powered), and achieved 86 laps in total for second place.



Though new to racing this year, Sally Dickson drove really consistently keeping out of trouble and scored a total of 82 laps for third place. It was good to see her feel more confident at keeping her boat going flat out, at least for most of the time!

Junior member Amelia Cheshire, came fourth with 35 laps in total. Heat One proved troublesome for her because the Crusader boat seemed to be weaving in and out all over the course. It wasn't her driving that was at fault, instead it was a sloppy rudder linkage which was fixed for the second heat making the boat much easier to drive. Junior member Kian Searle ended up in fourth place with only nine laps. His Crusader, after a slow start,



ABOVE: Andy Rennie's CMB 21 powered Challenger – note the large fuel tank amidships.

ABOVE LEFT: Andy Rennie, his smile confirms a great run with his winning X-Cat.

BELOW: Great end to a fantastic day – the winners at Kingsbury (2).





LEFT: Andy Rennie launching Andy Utley's D22 boat. (Photo courtesy of Judith Beesley)

BELOW: David Hough's third placed AA Class Pursuit. (Photo courtesy of Judith Beesley)



ABOVE: B44: Garry Dickson's winning B Class Challenger.



BELOW: Amelia Cheshire's Crusader 3 going much better in Heat Two. (Photo courtesy of Judith Beesley)



ran really fast until it clipped a buoy and flipped over. That resulted in the radio box taking on water and with non-functioning r/c as a consequence, retirement was the only option.

B Class

We had four of the regulars in this mid-sized nitro engine class, who always seem to enjoy some very close racing. My twin brother Garry had also made an identical change to his West powered Challenger, by increasing its tuned pipe length by about 0.5 inch. The boat now throttled much better, the engine pulling a bigger prop', running cooler and better all round. Garry's first heat got off to a bad start though because the glow plug connector snapped delaying

his start. Then, once on the water and going well, it clouted a buoy full on, leaving the boat missing its prop', a bent rudder and bent propshaft, but Garry wasn't deterred by this misfortune. The damage was fixed during the short lunch break and with a faultless second heat he managed to achieve 78 laps in total and first place!

Malcolm Pratt's CMB 67 powered Apache delivered a blistering first heat performance and was easily in the lead at the halfway point. However in the second heat, it was the turn of Malcolm's boat to hit a buoy hard when going flat out. The rudder damage sustained took some time to repair and Malcolm ended up with just 61 laps in total for second place. Andy Rennie's CMB 67 powered Warhawk reached 41 laps in total for third place, the engine suffering from stripped threads in the glow plug housing in the cylinder head leading to an early finish in the second heat. Had the glow plug been over tightened we ask? Mark Beesley started off well, but his boat flipped over in the first heat just past Buoy 4. He then noticed that the front bearing of the SC 61 engine had moved within its housing, and wisely decided to retire the boat for a proper engine inspection back in the workshop, 24 laps leaving him in fourth place.

C Class

This class featuring the largest nitro mono hull boats) disappointingly again had only one entry, that being our BMPRS Chairman Ian Searle. Now although only one lap needs to be scored to achieve the default first place and 15 championship points, you may recall that when this happened at the last Kingsbury event, Ian failed to get even the one lap



LEFT: D Class boats battling it out approaching Buoy 4. (Photo courtesy of Judith Beesley)

BELOW: AA11: Andy Rennie's Challenger on the way to second place in the AA Class. (Photo courtesy of Judith Beesley)



LEFT: A128: Quick recovery of Kian's Manta Ray boat. (Photo courtesy of Judith Beesley)

RIGHT: Garry Dickson fuelling his Mercury Cat' – note the battery operated electric fuel pump.



needed. So no pressure on him, but this time no problems and the one lap needed for first place easily achieved. I suspect that at our AGM, the C Class may need some discussion as to how we take it forward if it continues to gain so few entries.

D Class

In contrast to the C Class, these substantial spark ignition petrol engine powered mono hull boats saw the biggest entry of the day with eight entries and as always this guaranteed some fantastically exciting race action. The rooster tail propwash generated from these hulls is a spectacle to see, with the massive spray of water generated from the surface piercing prop's.

Mike Barnes' Zenoah powered Patriot clocked up a massive 104 laps in total giving him his second win of the day as yet again the combination of reliability, speed and great driving paid dividends, so well done Mike. Ian Searle's Tiger King powered Phantom was close on the tail of Mike's Patriot though and ran impressively quick achieving a substantial 101 laps for second place. Garry Dickson's Saturn took third place with 93 laps. His Saturn flipped-over towards the end of the first morning heat costing valuable laps. Also immediately upon launch in the second heat, the engine unexpectedly stalled needing a further rescue, Garry strongly suspecting that the water ingress from the morning 'flip', had not been sufficiently cleared from the engine and fuel system. Petrol engines are extremely sensitive to the slightest amount of water in their fuel systems, as we know from motor cars!

Kevin Alcock raced the latest new version of the

very popular Patriot hull, powered by an RCMK 30 engine. The strut support (which carries the rear section of the flexible driveshaft) on this new boat was handmade by Kevin, is adjustable by radio control and is impressively sturdy. Kevin scored 84 laps for fourth place, which was a good result for the boat's first race.

Although members usually extensively test and trim new boats before racing them, it is only in full race conditions that the true capabilities are revealed and fine adjustments become apparent, not unlike F1 GP racing I guess.

With zero total laps and bottom time, what happened to Paul Edgecombe's Patriot? In both of his heats, the Zenoah powerplant seemed to start okay, but following launch as soon as he throttled it up, the engine cut out and always at Buoy 1. This happened multiple times with no obvious reason all very frustrating and one to ponder prior to the next race.

Catamaran T1 Class

With only two entries in this race, both hulls were X-Cats and both powered by ASP Engines, but no two boats are never identical, so who would have the edge?

Andy Rennie had an easy win on this occasion with 78 laps in total, his cat' going very well without any issues or problems. Junior member Luke Bramwell though didn't have the best of races, gaining only 14 laps. Mechanical issues raised their head by way of the exhaust header (manifold) flaring badly at the point at which it connected to the tuned pipe. That caused issues with the gas flow (or lack of it) and the splitting of the silicone connector. Between the heats, Mike Barnes helped Luke using



ABOVE: Awaiting its race, the D Class winning Patriot of Mike Barnes.



BELOW: Help at hand for Luke who had issues with his T1 class X-Cat. (Photo courtesy of Judith Beesley)

ABOVE: D9: The impressive Patriot by Malcolm Pratt in the D Class. (Photo courtesy of Judith Beesley)

RIGHT: Tight racing in the B Class. (Photo courtesy of Judith Beesley)



a hacksaw to remove the damaged section of the header, although it wasn't the ideal solution as such jobs are if possible best left for the workshop.

Catamaran T2 Class

This larger class of catamarans (nitro or spark Ignition engines are allowed), had seven entries guaranteeing some spectacular racing with a few near misses and several collisions. Of the seven cat's, the only nitro engine powered boat was the CMB 91 powered Aeromarine of Malcolm Pratt. The others bring all petrol powered. Malcolm drove a fantastic race clocking up a massive 123 laps for the win and achieving the highest lap score of the day.

Garry Dickson's MPM 31 powered Mercury achieved 117 laps for second place and incidentally the second highest lap total of the day. This demonstrates how fast these catamarans are in the

right conditions, as calmer water allows their full potential to be achieved.

Kevin Alcock's Zenoah powered Conquest even though in third place, still scored a substantial total of 102 laps, enjoying some really tightly fought racing. Kevin would almost certainly have done even better if wasn't for his boat stopping prematurely in the second heat with a suspected engine failure.

Paul Edgecombe and Graham Stanley had some close neck and neck racing together, Paul gaining the edge over Graham by just one lap taking fourth place with 96 laps. Graham's F1 Cat had two substantial collisions first with Mark Beesley's Conquest, requiring Mark's cat' to be patched up with duct tape. Then second, right at the end of Heat Two, with Paul Edgecombe's X-Cat which all in all left Graham's cat once again needing major hull repairs. Graham is becoming an expert in his own right when it comes to hull repairs it has to be said.

BMPRS MEMBER PROFILE - Garry Dickson



Garry always with a smile

This month's member profile is that of my identical twin brother, Garry, who made me pleasantly realise that there are always new things to learn about people who you think you know inside out. His daytime occupation is that of Factory and Personnel Manager, but outside the pressure of work, his passion has always been that of model power boat racing. Garry wouldn't reveal his exact age to me but said he was born sometime in the year 1964, which I know is correct - no surprise there!

He joined the BMPRS about four years ago initially racing in the D Class with good success from the onset, gaining second place (amongst 18 competitors) in the 2012 D Class Championship. It was not long before his I.T. skills were recognised though and he took on the key role of Webmaster for us doing a fantastic job of maintaining our website and keeping it constantly updated with the latest exciting news and results. I put some questions to Garry to reveal a bit more about what makes him tick:

Does your family play any role in your hobby?

My loyal wife Carol is my rock and so supportive of my efforts and she is the one that deserves a medal. She is my 'spotter' and 'pitter' whose advice is so often correct but perhaps not often enough accepted by myself. At a recent Branstons race, Carol urged me to keep out of trouble in the D Class, but I drove 'Hell for Leather' much to Mike Barnes' delight, flipping the boat in the process and thus coming second to Mike who deservedly won by keeping calm.



Relaxing before a race!



Conclusion

The presentation of the certificates concluded what was another really enjoyable and exciting day's racing. Thanks were given to all those who helped out in the various roles, particularly to the Kingsbury members who provided the facilities, and to Stephen Merry who spent the entire day in the rescue boat, which was pure undiluted dedication by him for this vital, but usually wet, role.

As you may have noticed, a number of our members race boats in different classes. Contrary to what you might expect, several of them have commented that racing in the lower powered smaller engine classes, is in fact just as enjoyable as the furious raw power of the largest classes, so why should that be? It is they tell me, because in the smaller classes you can relax a little bit, but still enjoy the race just as much. For my part, for the time being though, I am sticking to the smaller classes!

BMPRS Kingsbury 2 results - 6th September 2015

Position	Name	Number	Hull	Engine	Heat 1	Heat 2	Total
AA Class							
1	Craig Dickson	55	Magnet	West 28	44	46	90
2	Andy Rennie	11	Challenger	CMB 21	37	40	77
3	David Hough	87	Pursuit	Go 28	27	45	72
4	Kian Searle	128	Challenger 43	Picco	28	15	43
A Class							
1	Mike Barnes	4	Challenger 43	ASP 46	48	46	94
2	Luke Bramwell	6	Challenger 43	ASP 46	42	44	86
3	Sally Dickson	77	Crusader 3	SC 46	40	42	82
4	Amelia Cheshire	98	Crusader 3	ASP 46	8	27	35
5	Kian Searle	128	Manta Ray	CMB 45	9	0	9
B Class							
1	Garry Dickson	44	Challenger 48	West 52	29	49	78
2	Malcolm Pratt	9	Apache	CMB 67	50	11	61
3	Andy Rennie	11	Warhawk	CMB 67	29	12	41
4	Mark Beesley	176	XXX 176	SC 61	24	0	24
C Class							
1	Ian Searle	127	Makara	CMB 90	1	0	1
D Class							
1	Mike Barnes	4	Patriot	Zen 28	59	45	104
2	Ian Searle	127	Phantom	Tiger King 27	50	51	101
3	Garry Dickson	44	Saturn	MPM 31	47	46	93
4	Kevin Alcock	75	Patriot	RCMK 30	37	47	84
5	Malcolm Pratt	9	Patriot	Tiger King 27	39	26	65
6	Andy Uttley	57	Arrow 57	CMB Alpha 27	25	37	62
7	Mark Beesley	176	Wave Rider	Zen 26	21	9	30
8	Paul Edgecombe	95	Patriot 95	Zen	0	0	0
Catamaran T1 Class							
1	Andy Rennie	11	X-Cat	ASP 46	37	41	78
2	Luke Bramwell	6	X-Cat	ASP	2	12	14
Catamaran T2 Class							
1	Malcolm Pratt	9	Aeromarine	CMB 91RS	62	61	123
2	Garry Dickson	44	Mercury	MPM 31	58	59	117
3	Kevin Alcock	75	Conquest	Zen	61	41	102
4	Paul Edgecombe	95	X-Cat 48	RCMK 30SX	50	46	96
5	Graham Stanley	29	F1 1320 GP	RCMK 30	52	43	95
6	Mike Proudman	85	Cyclone	Zen	38	46	84
7	Mark Beesley	176	Conquest	RCMK	36	0	36



Garry's B Class Challenger.

What are your other hobby interests?

Managing the BMPRS website. It is time consuming and can be a bit of a chore, but I absolutely love publishing the fun, action and everything that makes our hobby so very enjoyable!

How would your best friend describe you?

Direct, honest with a good sense of humour - a typical Northerner!

How did you first get into model boating?

Just out of primary school, I built my first electric powered 'ram rod' with lots of help and encouragement from my dear dad. Then I progressed to building a wooden crash tender

powered by an Enya 19 nitro fuelled engine, followed by a Huntsman 31 (the 46 inch wood version) powered by an HB 61 engine. I was 14 years old at this point, but already had the bug for i.c. powered model boats. Soon after this I was into racing multi-boats having built a Hunter from Prestwich Model Centre, then soon after an Omega 40 fitted with a geared OPS 40 engine. Technology was developing rapidly even back then..... Education priorities then kicked in with studying for University and model boating ceased.

So how come you got back into model boating after such a long absence?

The bug never left me, so when about five years ago I discovered that Bridlington Model Boat Society allowed i.c. model powerboats to be run on their water, I joined them and soon after the BMPRS on the advice of a friend who had also joined and have not looked back since, now attending all the BMPRS events and racing in three classes.

What types or classes of boat do you prefer to race and importantly why?

I love both small nitro and the big petrol classes as they have speed, adrenaline and cost the least to run!



Garry with his boats.

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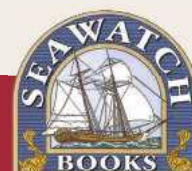
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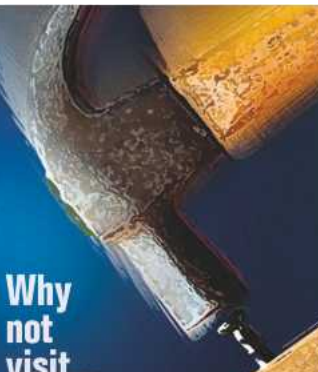
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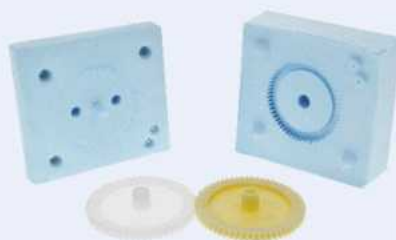


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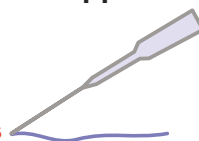
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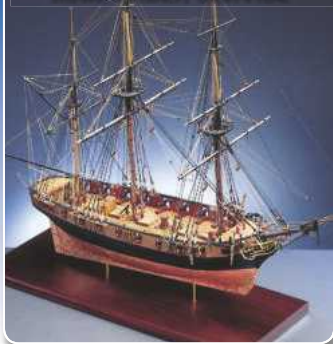
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Brushed speed controller

FROM £29.99

15A, 20A, 25A or 40A



No Relays or moving parts!

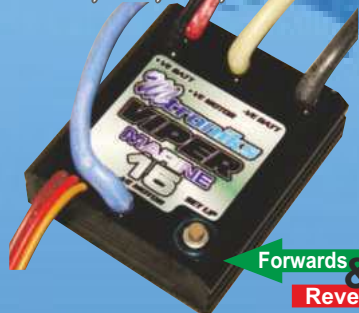
100% Waterproof, 24V, marine speed controller for traditional brushed motors. Easy to set up and use. Small size and weight. Ultra fine motor control with built in receiver power. Available for all size of motors, 15A, 20A, 25A and 40A. See website or contact your local dealer for more information.

VIPER Marine

Brushed speed controller

FROM £22.99

15A, 20A, 25A, 40A or 75A



100% Waterproof, 12V, marine speed controller for traditional brushed motors. Easy to set up and use. Small size and weight. Ultra fine motor control with built in receiver power. Available for all size of motors, 15A, 20A, 25A and 40A. See website or contact your local dealer for more information.

microVIPER

Brushed speed controller

£22.99



100% Waterproof, 12V, 10A marine speed controller for traditional brushed motors. Easy to set up and use. Incredible small size and weight. Ultra fine motor control with built in receiver power.

tio Marine

Brushed speed controller

FROM £26.99

15A, 30A or 50A



100% Waterproof, 12V, marine speed controller for traditional brushed motors. Easy to set up and use. Small size and weight. Ultra fine motor control with built in receiver power and now compatible with the new Lipo battery type. Available in 15A, 30A and 50A. See website or contact your local dealer for more information.

DIGISOUND

Realistic engine sound system

£59.99



--SOUNDS--

Small Diesel Tug

Large Multi Cylinder, Air Start

Napier Delta Diesel

Diesel Canal Boat

100% Waterproof, 12V, marine engine sound system. This is the worlds 1st, 100% waterproof, active, marine model sound system. It can be installed in minutes, giving you ultra realistic engine and horn sounds straight away. Everything is included in the system, wires, module and speaker! These systems come with adjustable volume and realistic engine speed change as standard. See website or contact your local dealer for more information.

100% Waterproof, 12V, marine speed controller for brushless motors. Easy to set up and use. Small size and weight. Ultra fine motor control with built in receiver power. Suitable for use with any battery type. Available in 15A, 30A and 50A. Also available as a complete system with motor included. See website or contact your local dealer for more information.

HYDRA Marine

Brushless speed controller

FROM £45.99

15A, 30A or 50A



24 Month Warranty on all Mtroniks electronic products



Mtroniks marine products are available from all good model shops, we are always available for advice direct

High quality speed controls designed and manufactured since 1987 in the UK

Mtroniks
electronics innovation

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