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October 2025
Vol. 75 No. 899

model Boats

HMS *Lightning* TB-1

A hands-on review of the new 3D-printed kit from Deans Marine



Fairey Huntsman 31

SLEC's large scale cabin cruiser kit tackled



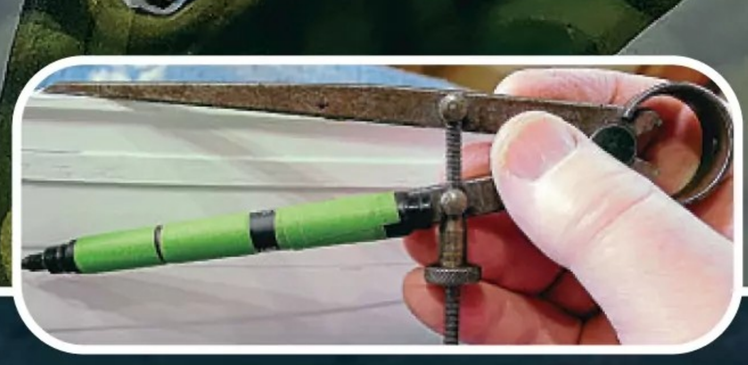
The *Duchess of Cornwall*

Modelling the St Mawes ferry in 1:18 scale



Jennifer

A Orion Mouldings hull-based West Country Trading Ketch



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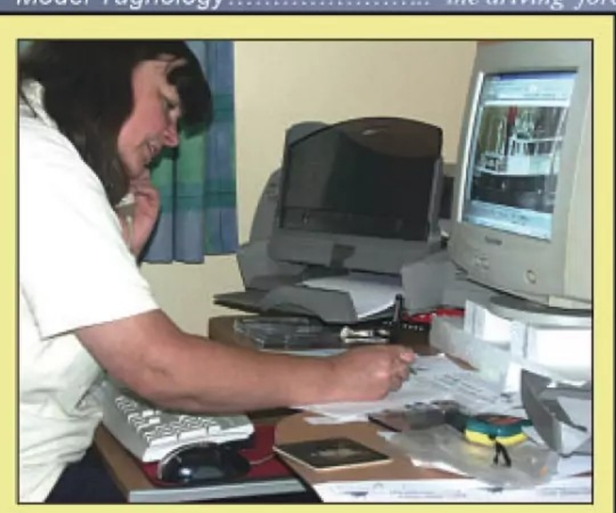
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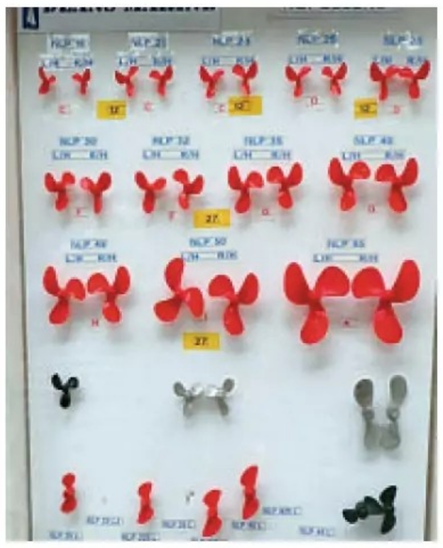
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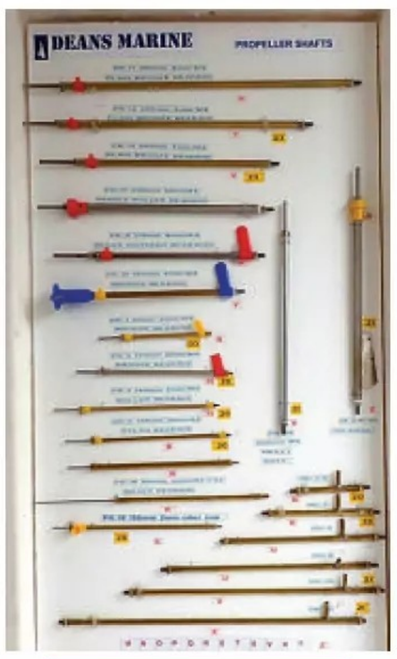




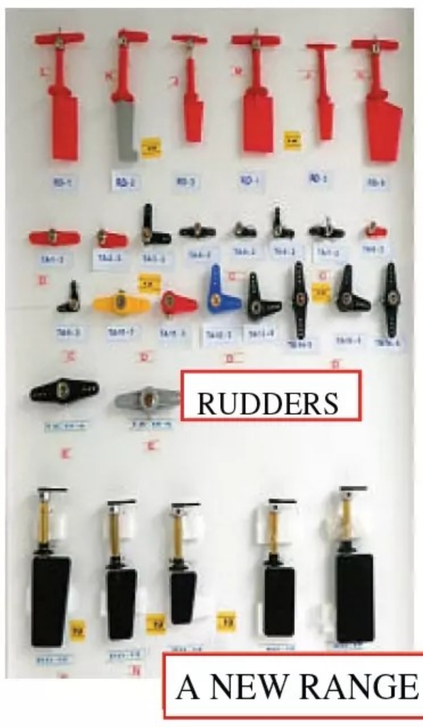
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By post: Model Boats, Kelsey Media, Media Centre, Morton Way, Horncastle, Lincs LN9 6JR
Tel: 01507 529529 Fax: 01507 371066
Email: editor@modelboats.co.uk

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Answerphone 24hr
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Archive enquiries: Jane Skayman
01507 529423 jskayman@mortons.co.uk

ADVERTISING
Advertising Sales Executive:
Fiona Leak
fleak@Mortons.co.uk
Tel: 01507 529573

Sue Keily
skeily@mortons.co.uk
01507 529 361

By post: Model Boats Advertising, Kelsey Media Limited, Media Centre, Morton Way, Horncastle, Lincs, LNP 6JR

PUBLISHING
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Head of Customer Marketing (Subscriptions): Claire Aspinall
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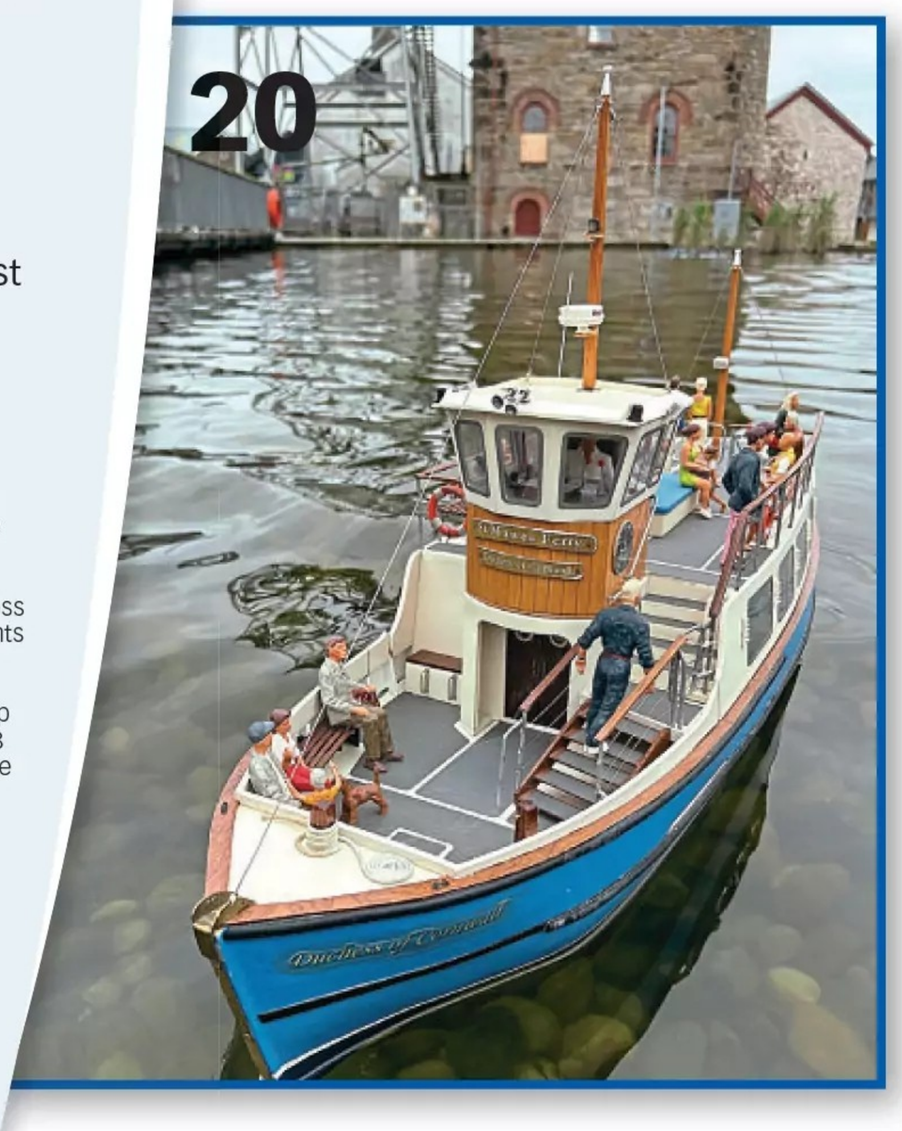
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WELCOME TO THE OCTOBER 2025 ISSUE OF MODEL BOATS

Before investing in, and starting work on, a new kit, it's always helpful to get the take of another respected modeller who's already tackled the build. So, in this month's issue, Nick Brown and John Mileson share first-hand accounts of their experiences, thoughts and opinions on the Deans Marine HMS *Lightning* and SLEC Fairey Huntsman 31 kits – two very different propositions but, as you will see, ultimately both very rewarding projects.

Further inspiration can be found in Peter Binn's article, which chronicles the construction of his fabulous 1:18 scale scratch build of the *Duchess of Cornwall*, the popular with locals and tourists alike ferry that operates year-round between St Mawes and Falmouth.

Hailing from the same region but representing a boat that served a very different purpose, in a very different era, is Martin Crapper's Orion Mouldings hull-based build of a working 1:32 scale West Country Trading Ketch – the very pretty appearance of *Jennifer* totally belying the hard and gritty historic reality of what life would have been like for the crews that worked aboard such vessels.

For those of you still honing your own skills – although, let's face it, none of us ever stop learning – there are also some helpful 'how to' articles in the pages ahead. Eric Belshaw shows us the ropes – quite literally – when it comes to building and coupling barges for tugs to tow, while Richard Simpson not only offers an easy-to-follow guide to painting waterlines but some informative info on how the qualities of the different oil types used to lubricate steam plants should influence the product choices we make.

And if all this leaves you in awe of other abilities, then you're not alone. I've long been an admirer of Nev Wade's beautifully crafted tall ships, but it turns out even he sometimes curses the fact that he's not one of those 'technical gods' – as explained in his ~~Zen~~ Despair & the Art of Model Maintenance feature.

As the icing on the cake, we're able to bring you a really exciting and exclusive prize draw, courtesy of The Airbrush Company, with an Iwata High Performance C-PLUS airbrush, which retails at £295, up for grabs!

Plus, there's our Compass 360 news-round up, which includes some not to be missed forthcoming event dates for your diary, and, of course, my personal favourite pages to work on, the Your Models/Your Letters section.

Enjoy your read,

Lindsey

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OUT AND ABOUT

Illuminated regattas – a sparkling start to autumn!



Between 4pm and 9pm on Saturday, October 4, 2025, Bournville Radio Sailing and Model Boat Club will be hosting an illuminated regatta on its lake at Valley Parkway, Bournville Lane, Birmingham B30 1QS. What's more, between 4pm and 6pm visitors will be welcome, under the supervision and guidance of BRSMBC members, to try out the club's 'have a go' yachts and model boats for themselves. There will be no admission fee, but anyone wishing to sail a model boat of their own will need to sign in – this can be done in advance online by visiting the club's website at https://www.bournvillebrsmbc.com/

Likewise, and also on October 4, the Crowborough Model Club will be holding an open to all illuminated event on the Centenary Boating Lake, Crowborough Leisure Centre, Eridge Road, Crowborough, East Sussex TN6 2TN, starting at 6.30pm. For further details/enquiries visit the club's website at http://www.crowboroughmodelboatclub.org.uk/ and click on the 'Contact us' icon.

2025 Midlands Model Engineering Show



Meridienne Exhibitions' Midlands Model Engineering Show will be returning to the Warwickshire Event Centre, near Leamington Spa (program your SatNav to CV31), from Thursday, October 16 through to Sunday, October 19. The show will be open to visitors from 10am to 4.30pn from Thursday to Saturday, and from 10am to 4pm on the Sunday.

The 35 clubs and societies who have already comfirmed their attendance will be displaying hundreds of exhibits covering a wide range of modelling skills. The Society of Model & Experimental Engineers will this year be putting a special focus on offering practical advice to newcomers by providing an introduction to, and demonstrations of, lathe work, milling, simple CNC machining, CAD (Computer Aided Design) and 3D-printing. Also, Neil Wyatt, editor of the combined magazine *Model Engineer & Workshop*, will once again be hosting a series of expert talks on a variety of different topics.

Entry forms for those of you wishing to have work displayed or submitted into one competition categories can now be downloaded at https://www.meridienneexhibitions.co.uk/events/midlands-model-engineering-exhibition. In either case, entry is free of charge (although look sharp as cut-off date is Monday, September 22) and accepted entrants will be granted two days of without charge admission to the show. Judging of competition entries will be undertaken on the Thursday, with the awards/prize ceremony taking place on the Sunday.

Discounts are offered on tickets purchased in advance (as opposed to on the day/s) and full details can be found at https://www.meridienneexhibitions.co.uk/events/midlands-model-engineering-exhibition/visit

2025 Yeovil Model Show



This year's Yeovil Model Show is scheduled to take place from 10am to 4pm on October 26 at the Westfield Academy, Stiby Road, Yeovil BA21 3EP. Visitors will be able to view thousands of models, along with modelling and painting technique demonstrations. There will also be a wide selection of trade stands to browse. The venue boasts free parking and disabled access. Hot and cold refreshments will be available to purchase throughout the day.

Admission will be charged at £6 for adults, with concessions.

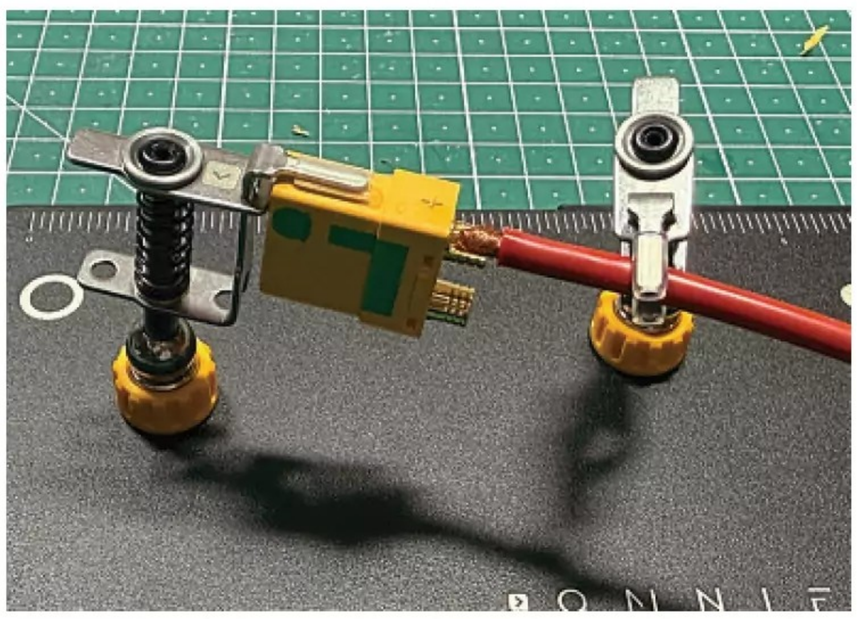
For further information, email yeovilmodelshow@gmail.com or call/text Ken on 07759 137000.

Omnifixo clever clamps

The founder and CEO of the Swedish brand Omnifixo (dedicated to the design and manufacture of innovative hand tools) has just introduced a nifty new generation of 'helping hands for the modeller' gadgets, the Omnifixo M4 and Omnifixio S2. Ideal for use when gluing, soldering, painting, *etc*, these clamps are equipped with magnetic feet and a spring mechanism. Thanks to the incorporation of a magnetic ball joint, the holders can be positioned easily and flexibly and will remain nice and stable once in position. You can also, if you remove the silicone clamp protection, use these clamps as electronic conductors for test circuits. Yet further ideas for their usage can be found both in the accompanying operating manual and on the manufacturer's website.

Both sets work in the same way, although the M4 (priced at £52) comes with four clamps (as opposed the two offered by the S2, priced at £29) and a larger baseplate.

To order, or to check on ROW (Rest of World) prices, please refer to the manufacturer's website at https://omnifixo.com.





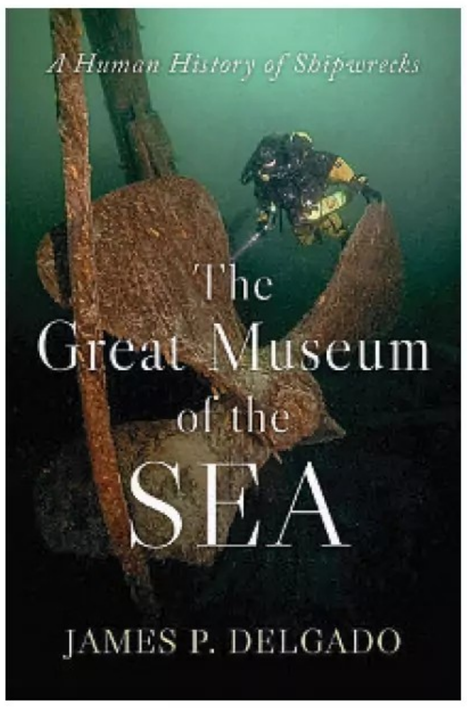




Ideal for use when gluing, soldering, painting, etc, these clamps can also be used, once you've removed the silicone clamp protection, as electronic conductors for test circuits.

BUY THE BOOK

The Great Museum of the Sea – A Human History of Shipwrecks

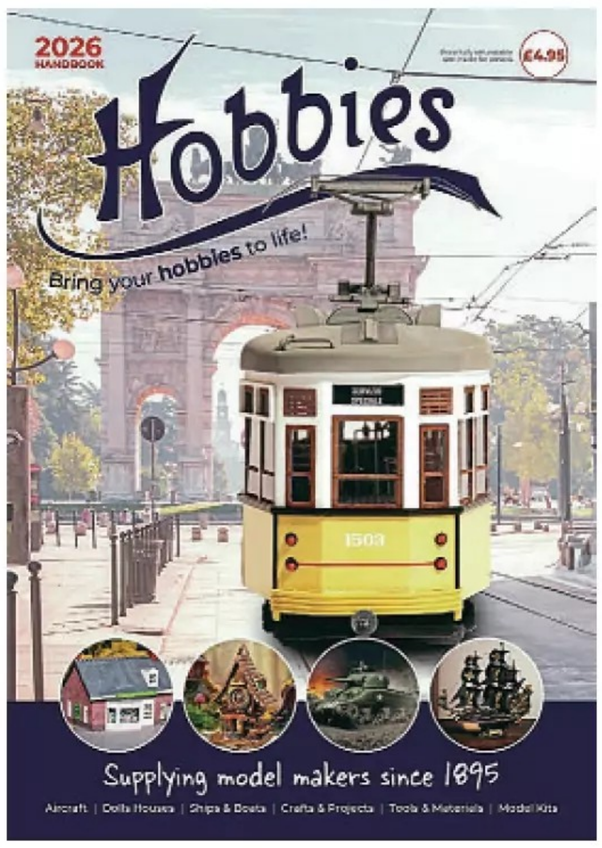


In this new title, archaeologist and host of *National Geographic*'s '*The Sea Hunters*' James P. Delgado takes us on a tour of world wrecks, both ancient and modern. These include many of the 100 plus lost ships he has personally discovered and investigated, such as *Titanic*, USS *Arizona* and the last ship to have brought slaves to the US, *Clotilda*. Authoritative and informed by decades of shipwreck expeditions, Delgado's accounts offer an insider's perspective, taking the reader both into the deep and behind the scenes.

Due for release on October 1, 2025, pre-orders for this hardback format book, published by the Oxford University Press and carrying an RRP (Recommended Retail Price) of £20, are now being taken at https://uk.bookshop.org/p/books/the-great-museum-of-the-sea-a-human-history-of-shipwrecks-james-p-delgado/7866057?ean=9780197780756. Alternatively, an order can be placed at your local bookstore (quote ISBN 78019 7780756).

2026 Hobbies Handbook

Priced at £4.95 and now available to order online at https://hobbies.co.uk is the latest *Hobbies* Handbook annual. Please note that while there will be no charge for the postage of this packed with product catalogue to addresses in the UK, those residing in Europe and the ROW (Rest of World) will be required to cover p&p costs of £7.95/£8.95 respectively.



Boating lake bungalow up for sale

Imagine being able to able to sail your model boats in the back garden; that's the USP (Unique Selling Point) of a new to the market 3-bed detached bungalow in Middleton-on-Sea, West Sussex (https://www.rightmove.co.uk/properties/154166051#/?channel=RES_BUY) as the southerly facing rear garden boasts its very own boating lake!



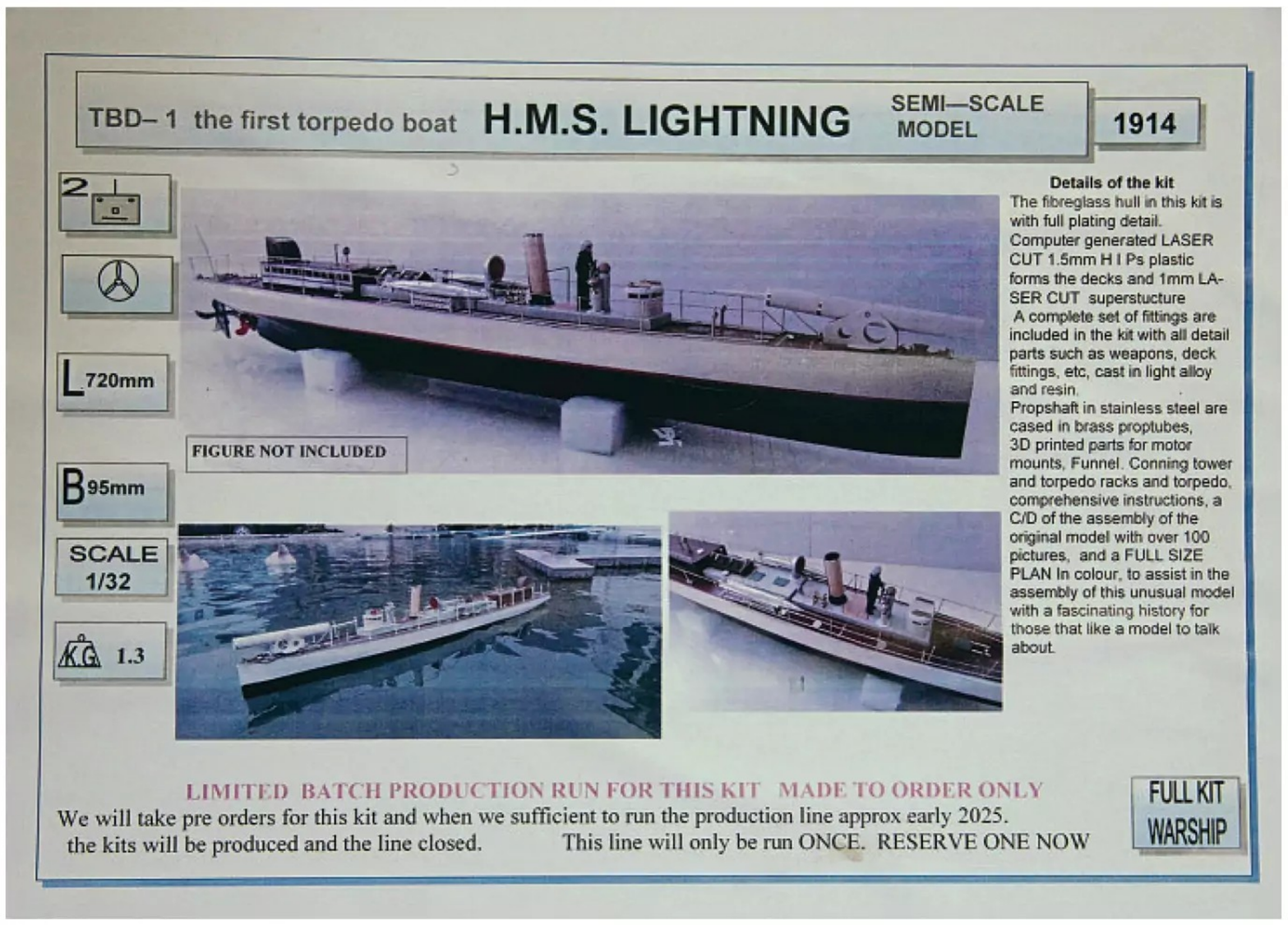
HMS *Lightning* TB-1

Nick Brown reports back on Deans Marine's new 3D-printed resin kit, with a hands-on build review and performance evaluation…

In the late 19th Century, the potential effectiveness of the Whitehead torpedo paved way for the future of a new type of vessel which combined the qualities of great speed and small size with a weapon that could destroy a battleship. The famous Thornycroft company was renowned for producing fast boats such as the launches *Miranda* and *Gitana*, and in 1876 it persuaded the British Admiralty to place an order for its first torpedo boat; this vessel would be called HMS *Lightning*. Later in life it would be designated *TB-1* (*Torpedo Boat 1*). It was armed with a singular torpedo tube mounted on the bow of the boat, with two reloads sitting on cradles located amidships on deck rails. The vessel, 87.5ft long with a beam of 10.75ft, was powered by a steam engine allowing speeds of 20 knots, which at the time was high speed for a warship. Queen Victoria was reportedly impressed by the two prototype torpedo boats in attendance at the Naval Review at Spithead in 1878, one of which was HMS *Lightning*. HMS *Lightning* spent most of her life as a tender to the Royal Navy Torpedo School HMS Vernon at Portsmouth being utilised in various experiments and trials, until she was broken up in 1896.

Fast forward by more than a century!

Ever since I first started model boat building, I've been in regular contact with Ron Dean of Dean's Marine. This is the first 3D-printed resin kit produced by Deans Marine, and the new tech replaces 90% of the conventional cast resin and cast white metal fittings we'd usually expect to see. Ron initially

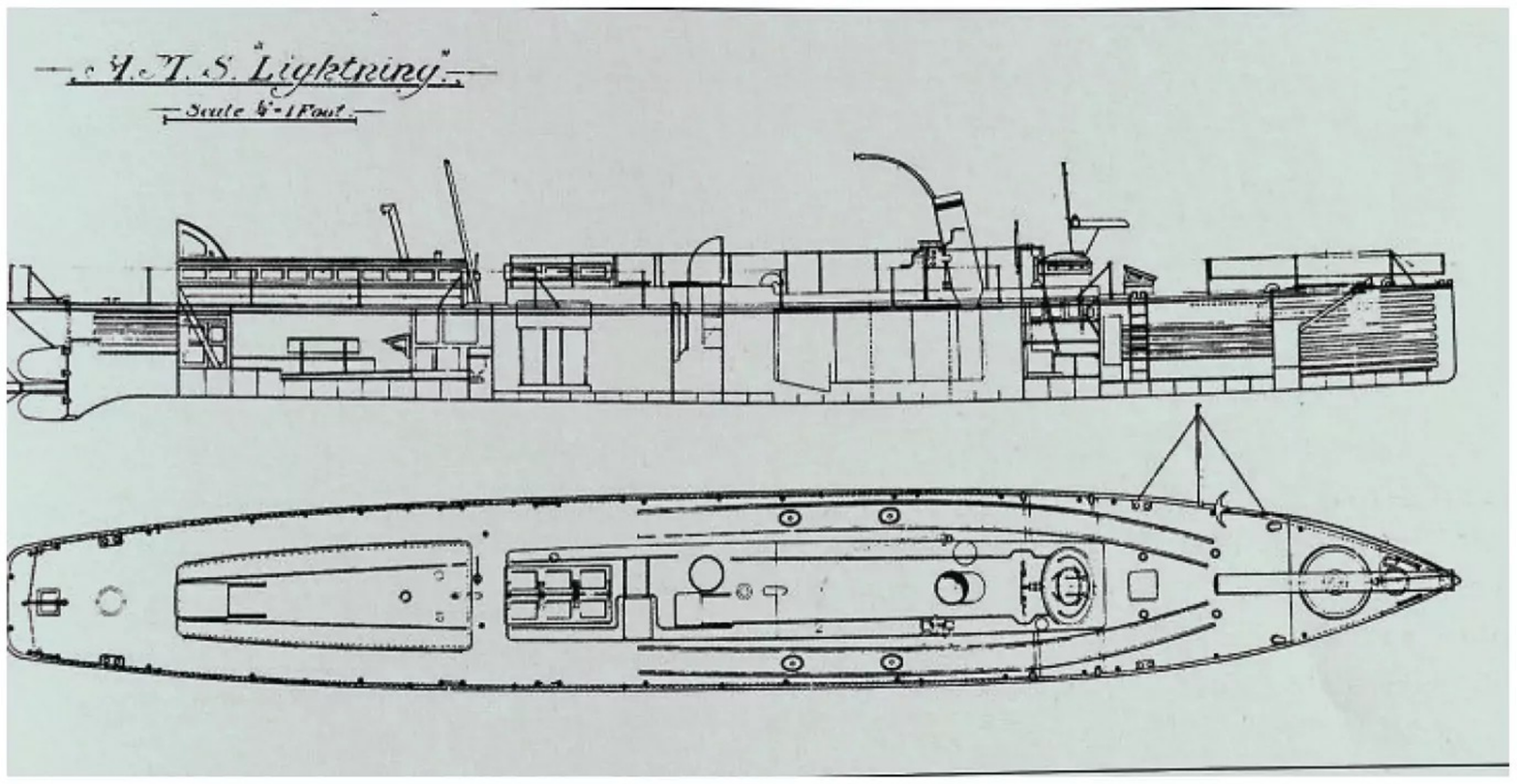


The box of this new type of model kit.





HMS Lightning, the first torpedo boat of the Royal Navy, photographed at the Thornycroft yard at Chiswick before fitting out with armament, circa 1877.



The general arrangements of the TB-1 showing the unusual propulsion and rudder system not recreated in the kit.

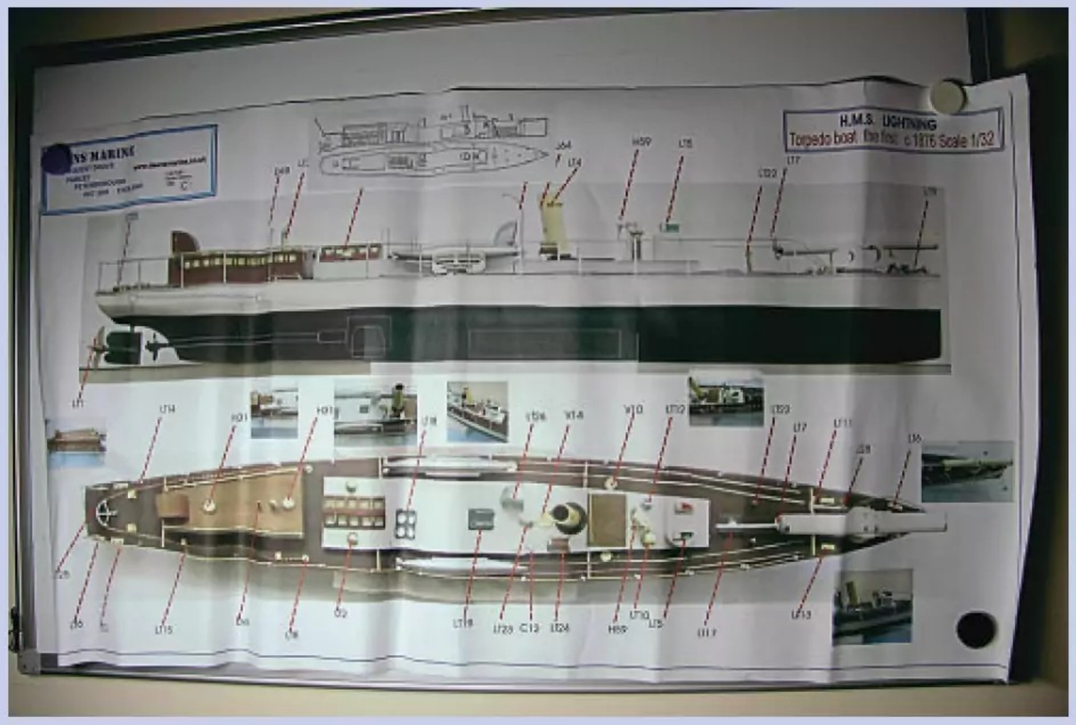
"This is the first 3D-printed resin kit produced by Deans Marine, and the new tech replaces 90% of the conventional cast resin and cast white metal fittings we'd usually expect to see"

revealed it to the public at the Deans Marine's annual Open Day in 2024, and then later that year, at the Blackpool Model Show, he started to take orders for the initial limited batch of the HMS *Lightning TB-1* kit. Deliveries started to take place in January of this year. I was one of the first to receive my kit as I collected it from Farcet (Dean's Marine's home base), where I got to see the next generation of 3D-printed kits being worked on – they look amazing, too, but I will leave the announcements to Ron!

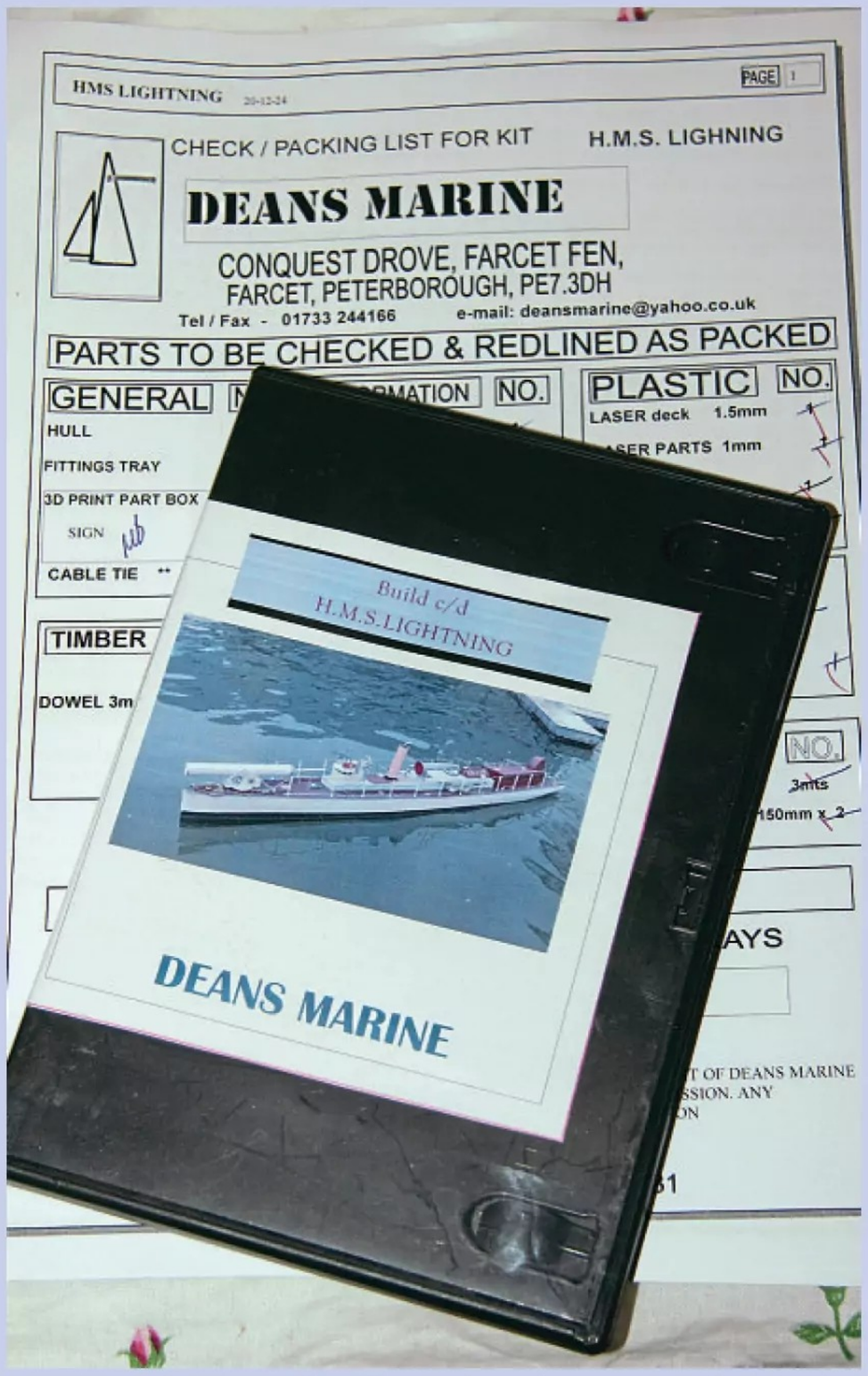
Lifting the lid on Lightning

So, what do we get in our kit? Well, contained in a decent sized box with pictures of the completed model decorating the lid, we have a smart looking GRP hull with moulded metal plating, two sheets of laser cut plasticard containing the deck and superstructure sections, a conventional fittings tray housing the hand rails, propeller shaft, propeller, some white metal fittings, a full-size plan, a CD with constructional photos, an instruction booklet, and an interesting smaller

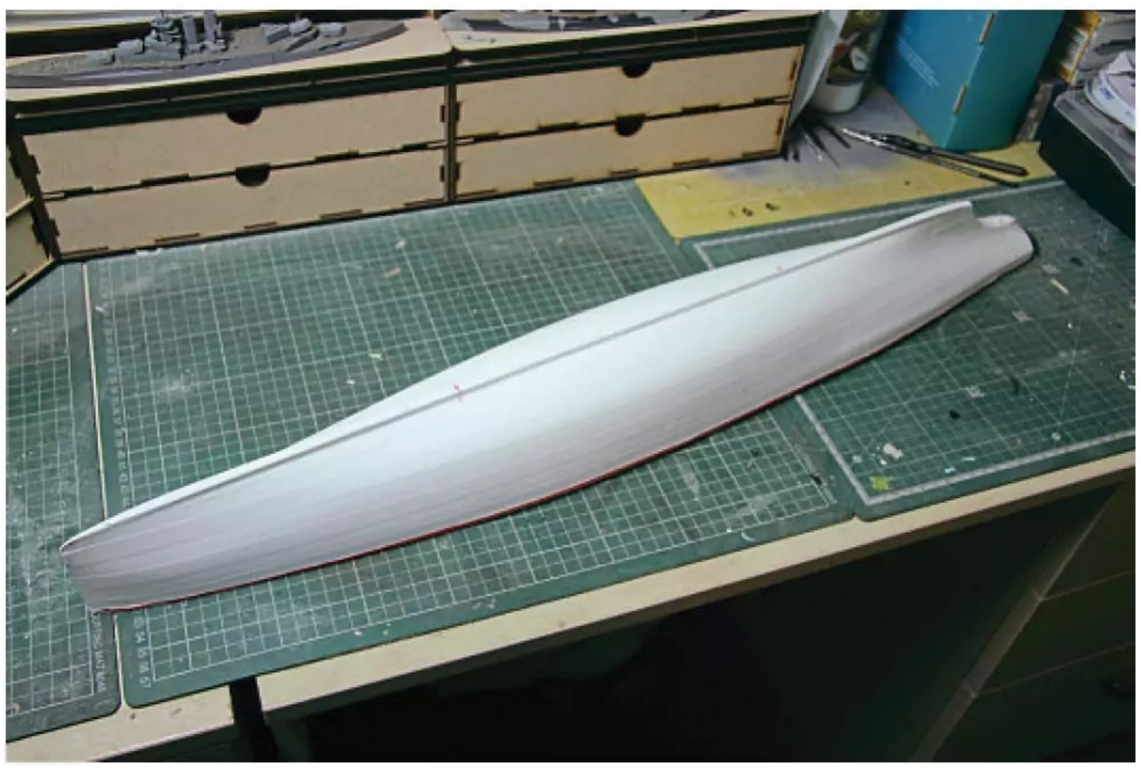


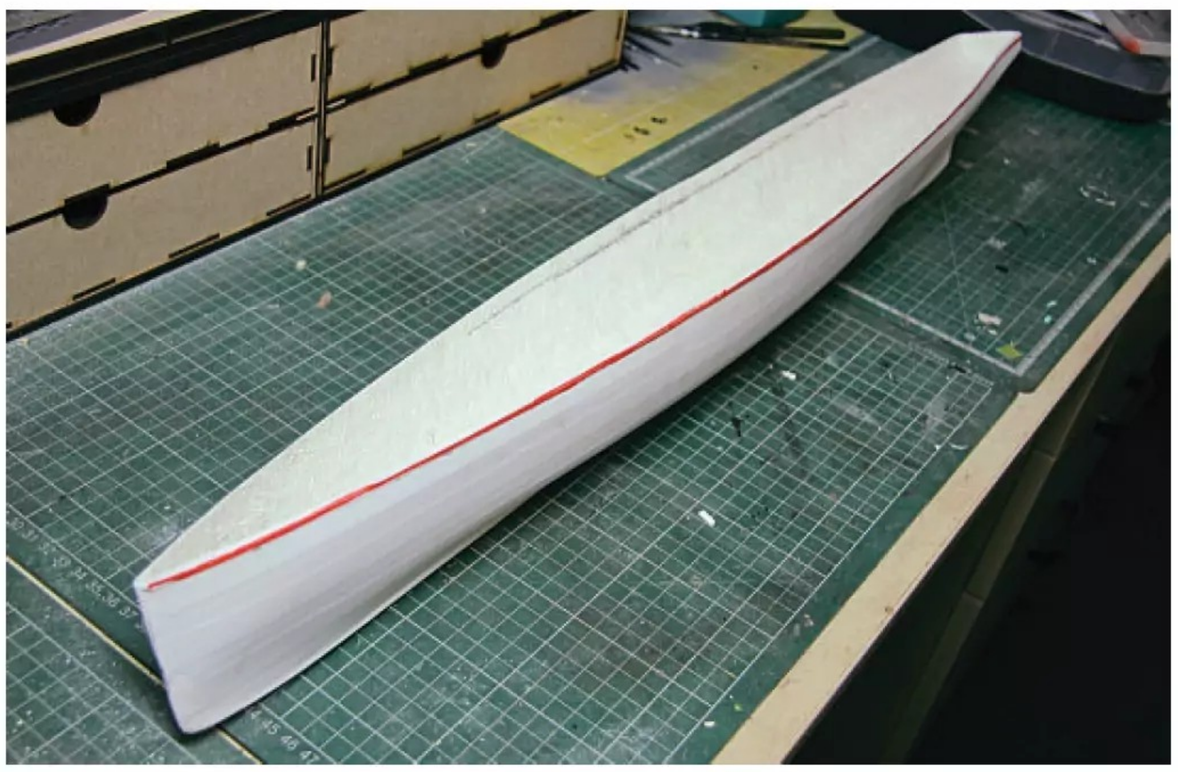






The kit contents including the GRP hull, plans, fittings tray and the intriguing fittings box.





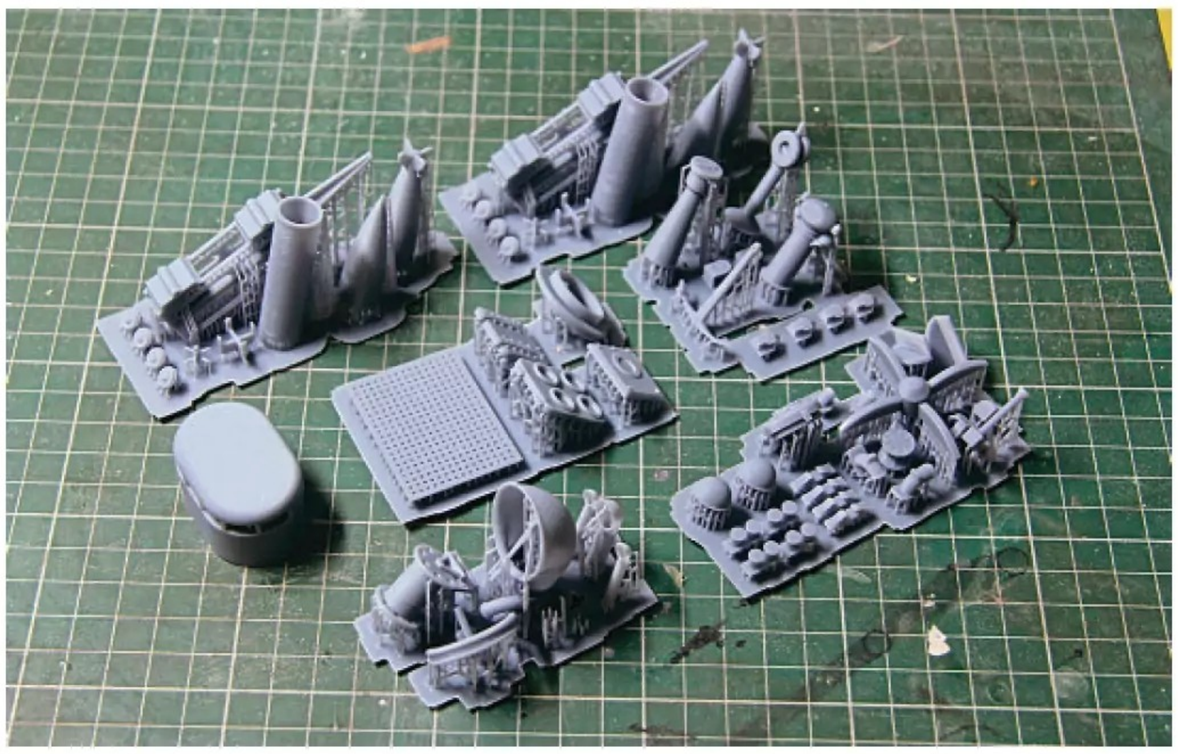
The hull up close with the moulded-in plating detail. Note the red line indicating where to remove the excess fibreglass for the deck.

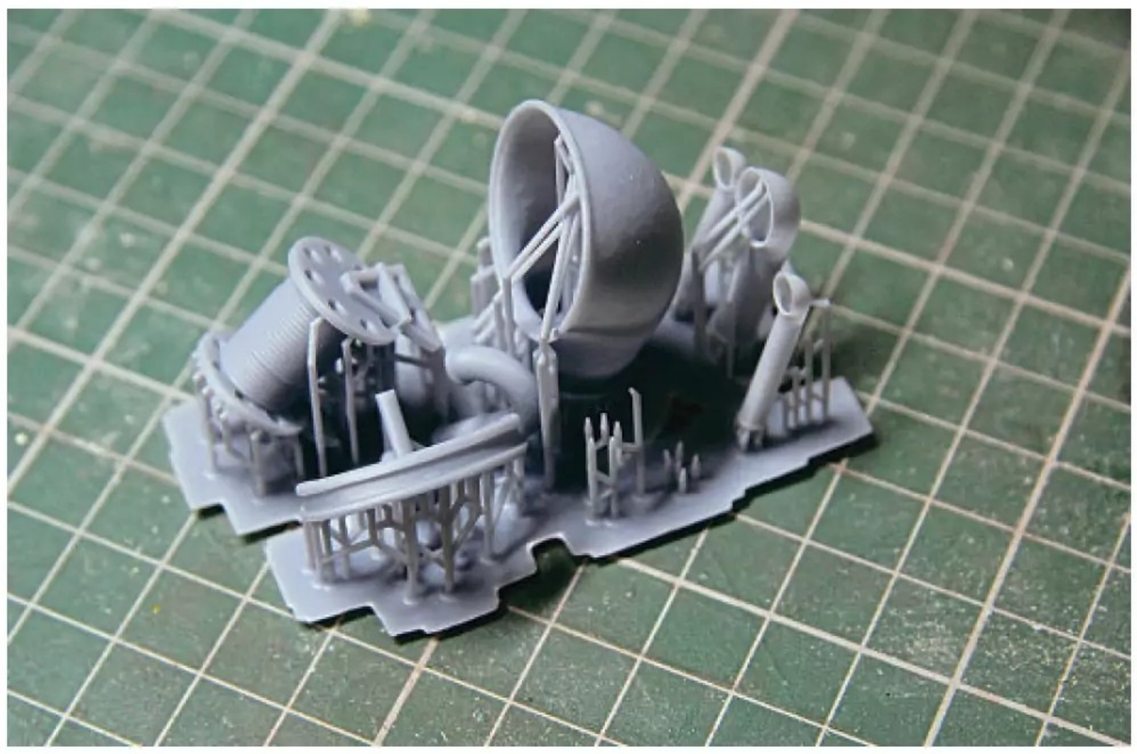
sturdy box containing six rafts of 3D-printed resin fittings.

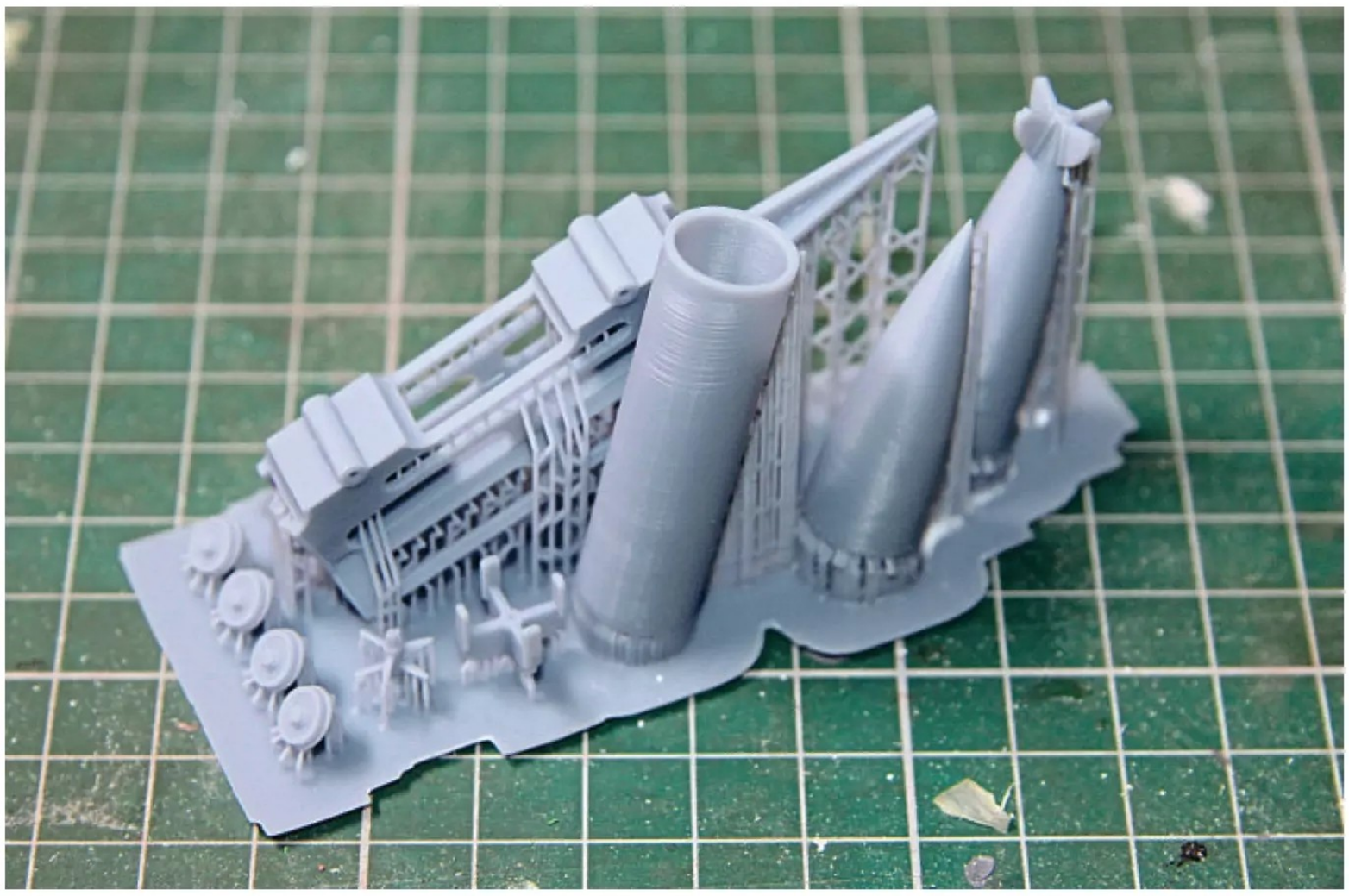
The kit is advertised as a semi-scale kit; this is due to the aft underside hull and drive system and *not* the overall look of the above water appearance, which is 1:32 scale. The reason for this is that the actual HMS *Lightning* had a strange propeller/rudder system which is just not possible to make work 100% efficiently in a radio-control model. Consequently, Ron has produced a conventional propulsion system and rudder but has added a resin propeller to give the sense of scale when viewed in the water. Having piloted the prototype model, I can confirm that this methodology works well and results in a model that cuts through the water beautifully.

Hull, deck & superstructure

The first step of the build is to mark out the hull deck line, which is highlighted in the instruction manual and CD photo gallery. To ensure this is all level use a sanding file – and don't forget to wear a protective mask when dealing with fibreglass. I drilled out the prop shaft hole on the keel and the rudder post allowing me to trial fit the shafts and post, carefully checking everything lined up with the motor smoothly via a 2.3mm/M4 Nycrome coupling. The motor I fitted was the recommended Dean's Marine







The new technology in all its glory: the six 'rafts' of 3D-printed fittings, with the torpedoes and a multitude of other fittings.



The hull primed, with the rudder, propshaft and deck fitted, ready for the final colours.

"The kit is advertised as a semi-scale kit; this is due to the aft underside hull and drive system and not the overall look of the above water appearance, which is 1:32 scale"

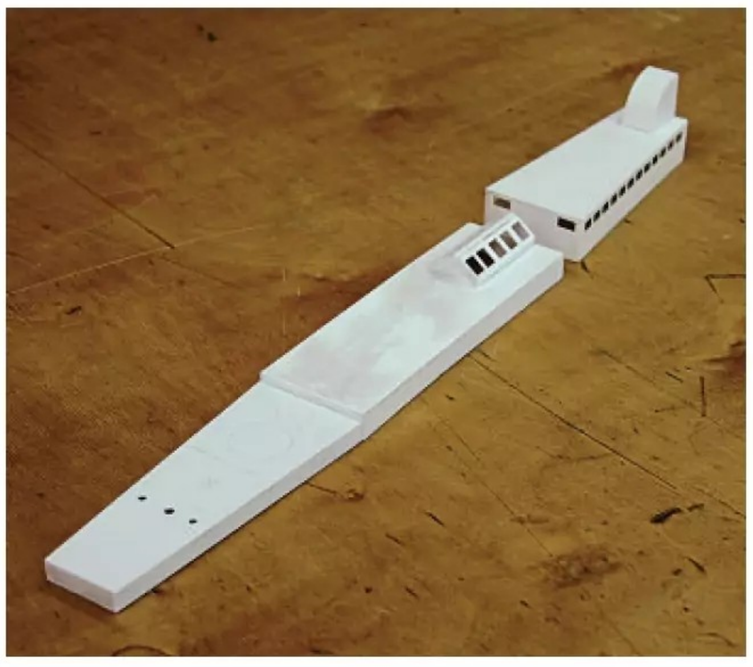
Kyte 6-7.2v motor, which would be controlled by a 10amp Electronic Speed Controller (ESC), and I dug out my spare 7.2v NiMH power pack to act as battery and ballast. Once I was happy with the layout, I glued and then fibreglassed the prop shaft tube and rudder post into their final positions.

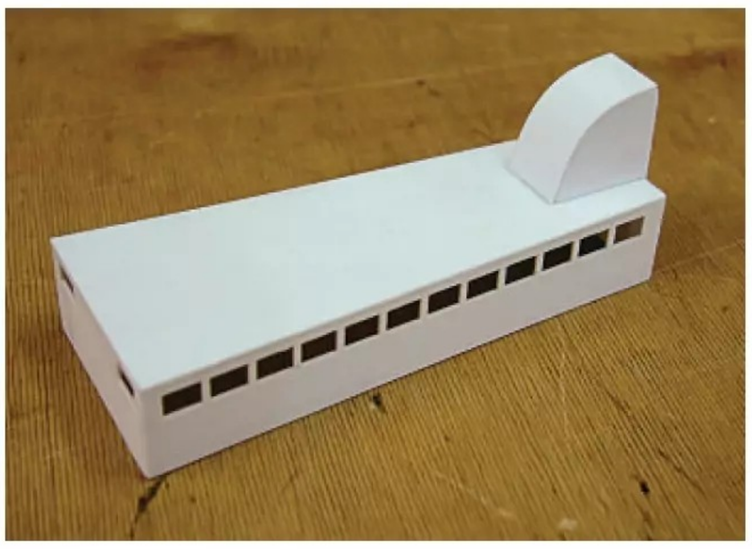
I then took the hull to my local lake (Wicksteed Park) for a trial float and was pleased to find that all was good for the suggested waterline.

I added a mini-servo and glued the main deck on to the deck beams created by the laser cut strips provided in the kit. After having smoothed the joint between the hull and deck with some car body filler and sanded flush, I decided that this would the perfect stage to paint the hull; this was during some down time before the RAF Cosford Airshow (which I was dutifully bound to attend by my work!)

I first sprayed the hull with my favourite standard acrylic grey primer from Halfords, which highlighted very little in the way of imperfections. So, after a few swipes from a sanding stick, I was ready to apply the bright white, which I chose from Halfords range of UV resistant car paint as white paint tends to yellow over time.

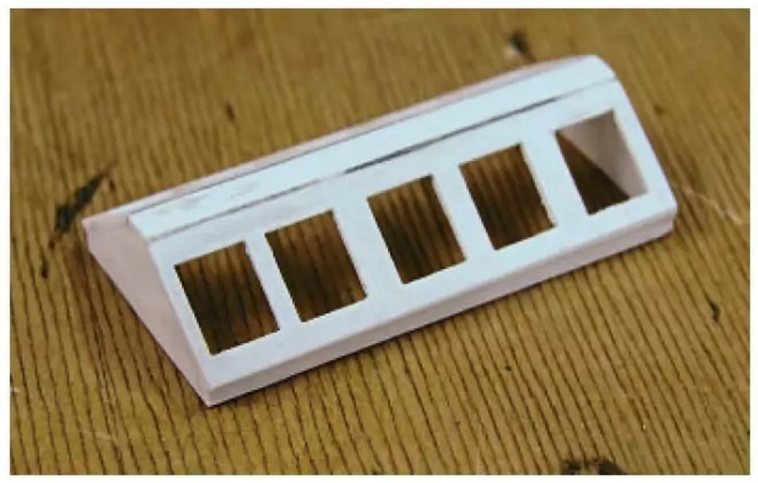
Knowing where the waterline was from my previous test float, I then masked off the white with 18mm wide Tamiya tape to get a nice sharp edge before applying my favourite colour from the Humbrol acrylic spray can range, Brunswick Green. This isn't an accurate colour for the anti-fouling paint, but I wanted the underside







The minimalist superstructure made up from the laser cut plastic sheet parts.



The engine room hatch, also made up from plastic card, ready for its mahogany paint.

to look different, and the prototype model is painted with a metallic bronze green which draws the eye. The deck was hand painted with thinned Sovereign Hobbies Cortecene Brown (I believe that Resolution Hobbies is now the stockist of this range of paints), and it took three coats to get the coverage I was looking for.

Shifting to the minimal superstructure that is so iconic of this type of early torpedo boat, I followed the instructional manual, removing the plastic parts from the laser cut sheet and gluing them together using Tamiya Cement (White Cap) and Extra



The hull painted in its bright white and Brunswick green colour scheme.



The mini servo observed through the aft access point on its purpose-built mount.



The recommended Deans Marine Kyte motor on its mount seen though the centre hatch.



The corticene brown deck, with the brass strips represented by the gold vinyl supplied in the kit.



The stanchions and torpedo cradle rails fitted, with the deck now starting to look busy.

Thin (Green Cap), carefully making sure they were all square and lined up with each other. I then did a quick tidy up with a sanding sponge and prepared for painting.

Once again, I primed with Halfords grey and then over sprayed with the UV resistant white. The aft cabin and engine hatch was hand painted with Mr Hobby acrylic Mahogany Brown, its slightly streaky appearance giving an impression of wood panelling.

The kit also provides some gold/brass vinyl sheet to represent the brass strips which on the real HMS *Lightning* secured the corticene mats to the deck. Once cut into thin strips with a scalpel blade, I stuck these lengths on the deck, their correct locations achieved by referencing the plan supplied. These were then sealed over with a lacquer varnish.

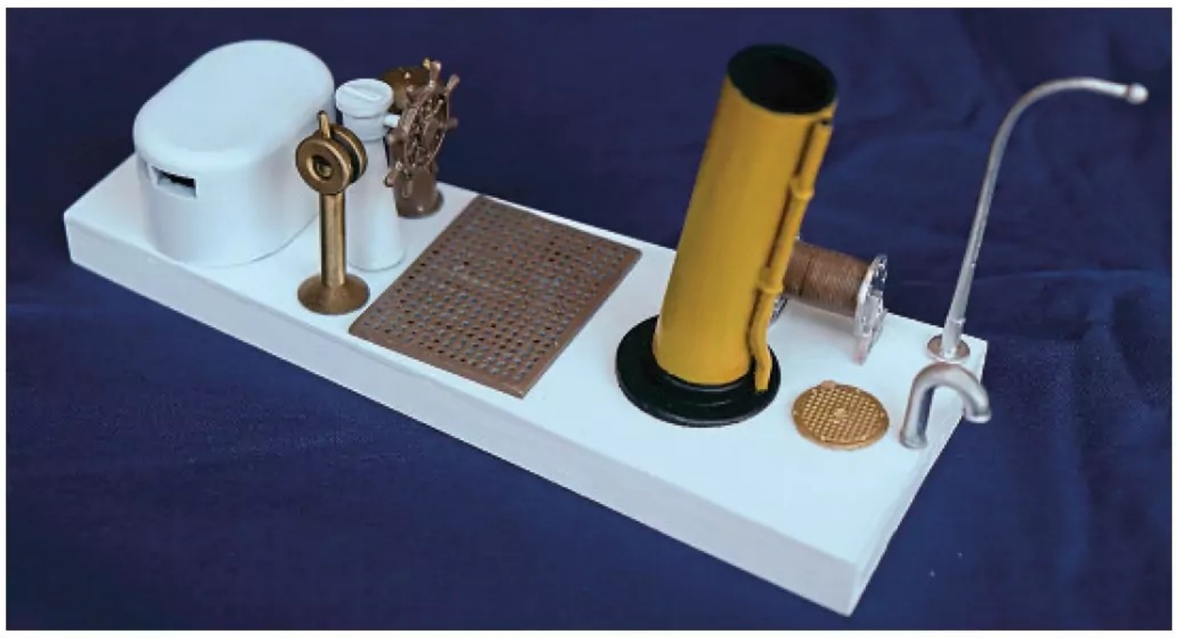
"The bright white I chose from Halfords range of UV resistant car paint as white paint tends to yellow over time"

Fittings

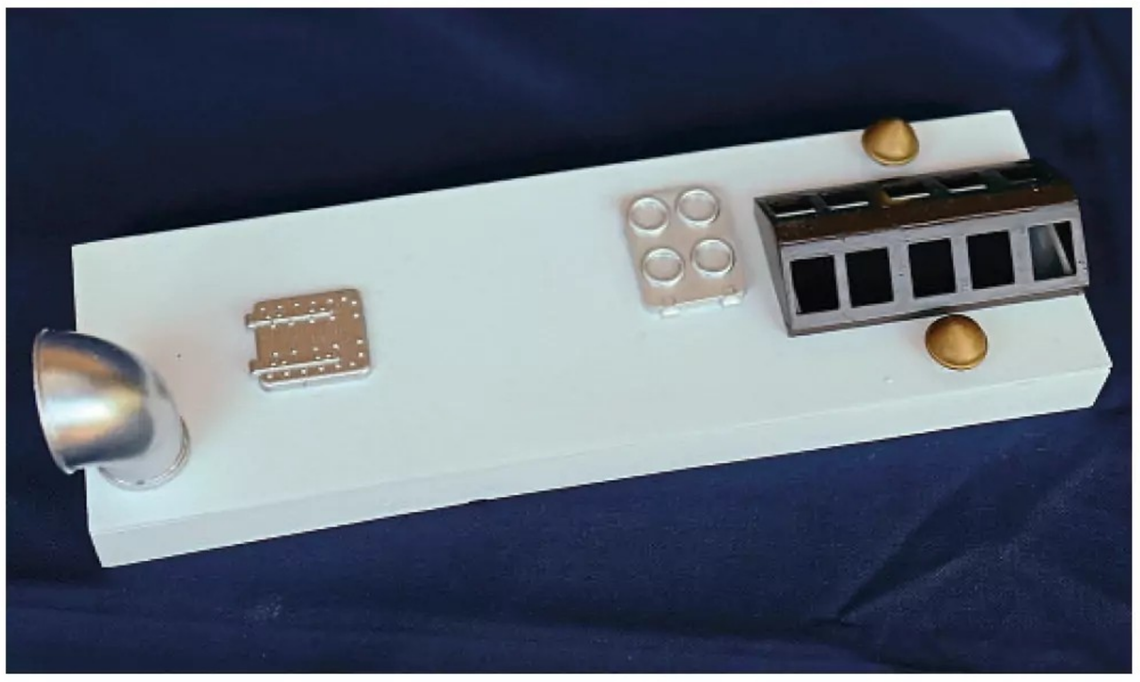
The fittings are probably the most enjoyable phase of a build, and I was particularly looking forward to working with 3D-printed components included. For anyone not familiar with the use of this relatively new to the modelling world tech, the fittings are all first drawn up using Computer Aided Design (CAD). The digital files are then transferred to a 'splicing programme', which allows a printer to physically produce the parts in a resin vat, with each layer of resin being subjected to UV light to cure it. These fittings are produced on 'rafts' and have build supports to assist the printing process, so certain fittings are printed fully in one piece and can be easily removed ready for immediate use on the model as opposed to being supplied as multi-part assemblies of various small fittings.

Watching Ron skilfully transfer some of his CAD fittings to the splicing programme and selecting print on his printer made me appreciate that the process isn't as easy as some would have you believe. So, if you're considering venturing into printing out your own 3D parts, I would suggest you prepare yourself for numerous failures until you've mastered the art. Ron explained to me that it took him six months of trial-and-error practice to achieve the fantastic results now being obtained. He now intends to replace his entire resin and white metal range of fittings with a rolling production line of standard fitting common to his kits in a variety of scales. So, expect to see new fittings in future kit releases.

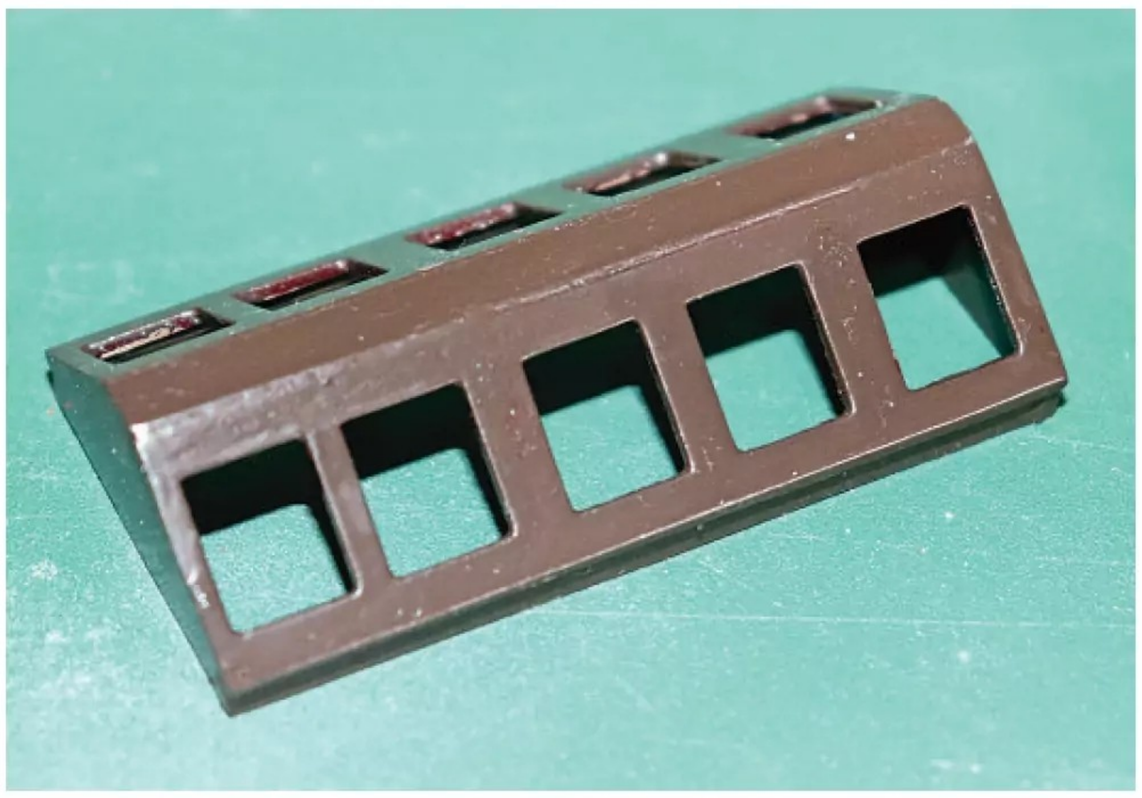
You will still need to be careful when removing the fittings from the print rafts and supports, but the kit instructions explain the various methods for safely doing so. While you can twist the parts off, this is *not*



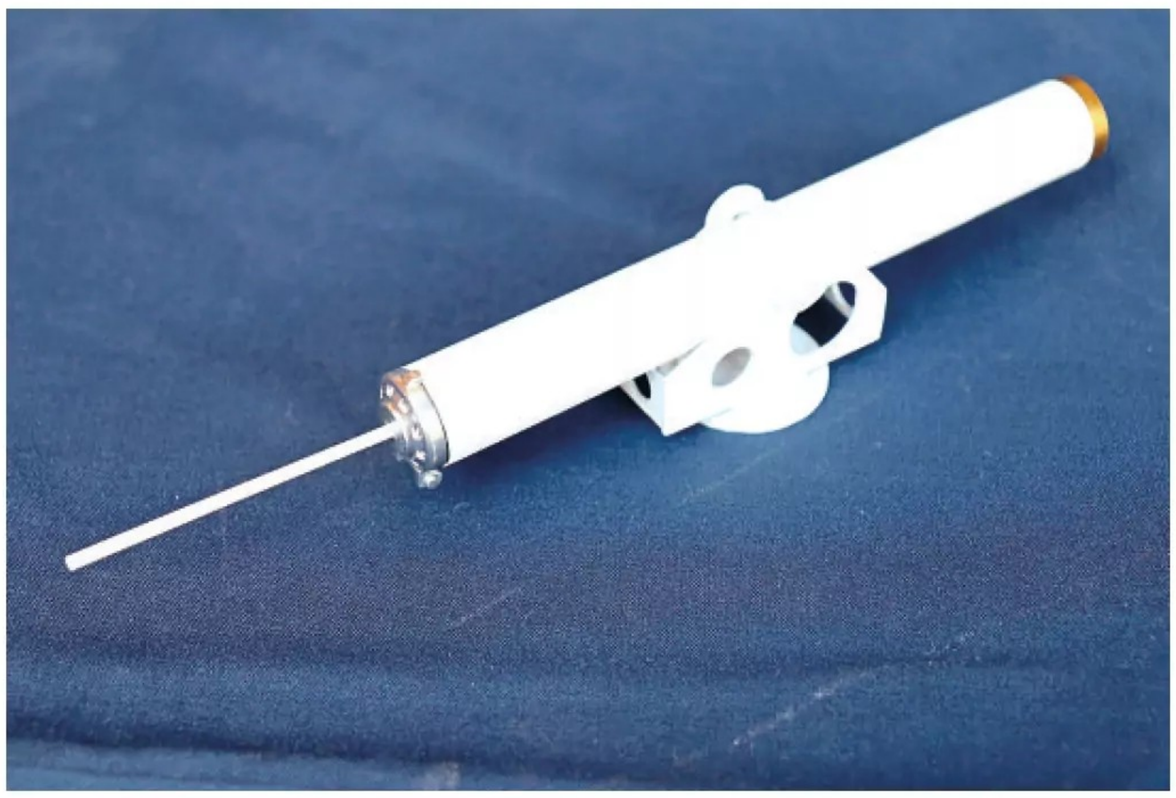
The forward superstructure with its armoured conning position and normal conning area with a buff funnel so iconic of the Victorian era.



The centre access hatch or engine room casing, detailed with many 3D-printed hatches.

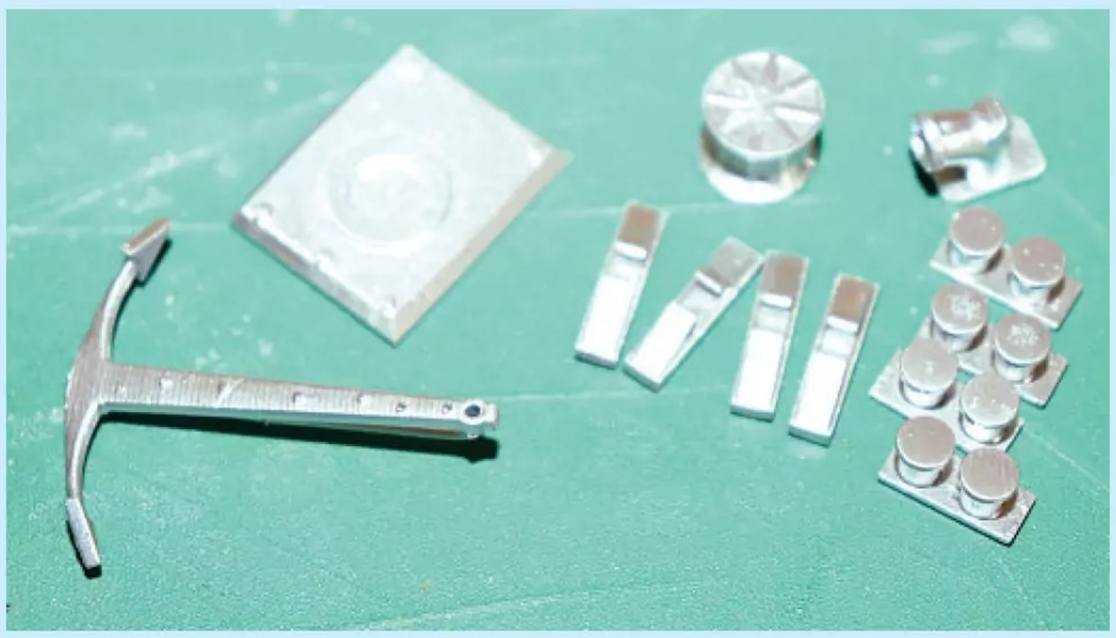


The engine room hatch/vent painted in mahogany.



The business end of the torpedo boat – the torpedo tube on its rotating mount.









The smaller 3D-printed fittings painted in metallic colours to produce a 'builder's model' effect. Note the 'extra prop' on the rudder to allow the model work conventionally.

"You will still need to be careful when removing the fittings from the print rafts and supports… While you can twist the parts off, this is not recommended"

recommended; a pair of snips or a scalpel will greatly benefit you when it comes to damage free removal.

Remember that the material you're working with will be resin and so when sanding you will still require a mask to prevent any dust inhaled affecting your lungs.

My favourite fittings are the torpedo cradles, which look very industrial as per the originals on the real HMS *Lightning*. Being produced from 3D printed resin, however, they are surprisingly lightweight and have a sublime layer of detail on them. Other notably good 3D printed fittings include the single piece armoured conning position, large cowl vent and tiller arm, all of which add significant interest to the model.

Before you commit to the final location of your fittings, several other parts must first be installed on the deck of *TB-1*. The first of these are the torpedo cradle rails; these were the only parts I replaced with some 1mm square plastic strut as I wasn't 100% convinced the laser-cut versions on the plastic sheet could, once removed, be easily cleaned up. These rails facilitated the torpedo cradle being moved along the deck for reloading of the torpedo tube on the bow. I painted mine with aluminium silver pen, which highlights them against the brown corticene deck, creating the look of a 'builder's model'. Other items are the stanchions; these come supplied as white metal items (32 of them), along with a length of thin brass wire to pass through them to create the handrail around the deck edge.

Returning to major fittings, the main feature of this model is the large single torpedo tube situated on the bow area on a rotating mount. The is made up from a single length of plastic tube, with a 3D printed tube cap (that features some superb hinge and bolt detail), sitting on a laser cut plastic

















Final construction pictures.





"The model was taken to my local lake at Wicksteed Park in Kettering for its first trial run, where the single propeller and NiMH 7.2V 5000 battery pack was more than enough to zoom the lightweight hull across the lake, recreating the famous 1878 Spithead Review!"

mount. Staying with the builder's model theme, I painted my torpedo cap chrome silver and wrapped some of the brass/gold vinyl strip to the front end of the tube.

The bridge equipment, such as compass, engine room telegraph and ship's wheel, all need to be located between the conning position and the funnel, with a 3D-printed grating area for the coxswain to stand on.

A multitude of small hatches are scattered over the engine room casing, which I painted in gold and silver to contrast with the white painted deck areas. Smaller cowl vents and mushroom vents detail the aft cabin area, with a grab rail to allow a crew member to walk around the next feature on the deck… The *TB-1* has an exposed steering gear system located on the stern decking area. Produced in 3D-printed resin, fittings include rollers and a tiller arm, plus a length of chain to create the illusion of a working steering system on the model.

The fIttings pack includes a complete 3D-printed mooring system too, in the form of an anchor, capstan, hawser, and four bollards and fairleads; as per other fittings, I painted these in metallic colours, chrome silver on this occasion.

The final item to be fitted to the model is the large four-bladed propeller; this is for show only, to give a fair representation of the original version, although in model from its fitted to the rudder. You will hopefully be able to understand from the pictures of this area why the model form is different to the designed original – the location of the prototype rudder sits in front of the propeller and in scale form this will not work effectively. I painted it metallic gold and used some strong/thick superglue to attach the fake propeller to the rudder.

I prefer to fit a figure to my models to give a sense of scale. A figure isn't included with this kit, so I acquired a 1:32 scale sailor from a well-known auction site. This resin figure was added to the coxswain position next the ship's wheel.

Lightning hits the water

The model was taken to my local lake at Wicksteed Park in Kettering for its first trial run, where the single propeller and NiMH 7.2V 5000 battery pack was more than enough to zoom the lightweight hull across the lake, recreating the famous 1878 Spithead Review! Having tested the Dean's Marine prototype model at Farcet earlier this year, I felt my version matched the performance and manoeuvrability of Ron's model perfectly. I can foresee having much fun with this model on beautiful calm summer's day, as the sunshine would reflect all the chrome and brass work on the model's upperworks.

A new dimension for the hobby

Many thanks to Ron Dean of Dean's Marine for allowing me to follow his progress with the TB-1 model and for his advice on the fittings. I now look forward to seeing what the future holds for model boating as it embraces this new 3D technology. Highly recommended to all!



On water shots of the model at Wicksteed Park.



Incredibly popular with locals and tourists alike, the stylish Duchess of Cornwall. Image courtesy of Fal River / Cornwall Ferries Ltd.

The *Duchess of Cornwall*

Peter Binns chronicles the construction of his 1:18 scale tribute to the much-loved passenger ferry linking St Mawes with Falmouth

I like building vessels with character, historical significance and/or local interest here in Cornwall, and I'm back with another obscure but, I hope, interesting scale boat project from the pandemic years.

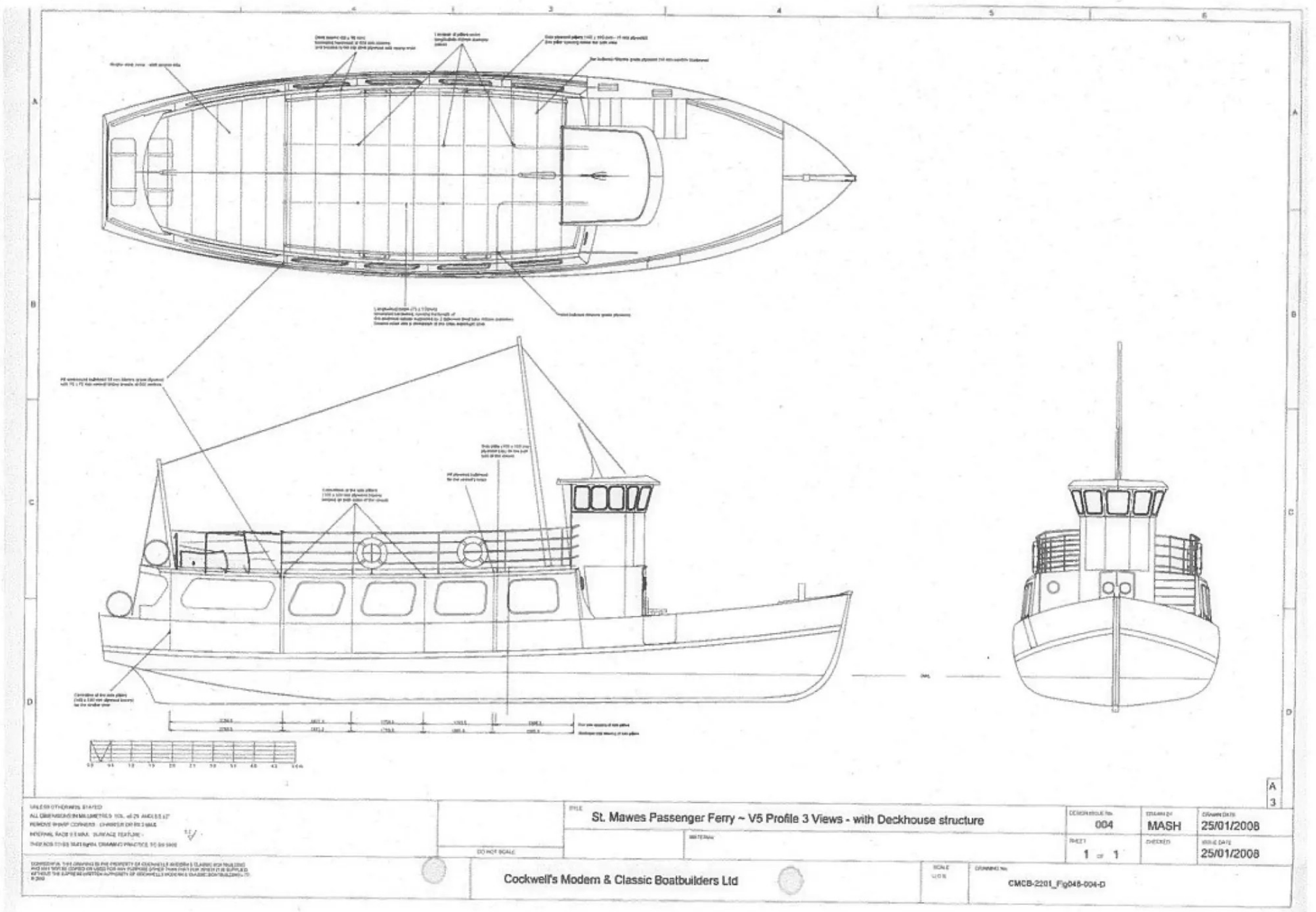
In Falmouth there is a long history of passenger ferries which ply many times a day throughout the year across the Carrick Roads to the now rather exclusive village of St Mawes on the Roseland Peninsula. Most, over the years, were locally built in wood, and the '*Duchess*', the last addition to the fleet, was no exception. She was launched in 2008 by her namesake, Camilla, the then Duchess of Cornwall, and the then Duke of Cornwall, HRH Prince Charles, now our Queen and King. I am told, however, that there are no plans to re-name the vessel.

The Duchess of Cornwall is an attractive but purposeful looking 60ft craft, with her tall, traditional varnished wooden wheelhouse, contrasting contemporary superstructure and shallow draft necessary for working at all tides. Having travelled on her many times and knowing her so well, I decided this would be a good project to start during the Coronavirus lockdown.

Plans... What plans?

Unlike most of my previous scale boat projects, there are no published model plans for this vessel, so I started with nothing but a handful of photos. However, unable to determine the ship's lines to any degree of accuracy from photographs, I managed to get hold of some small size, low-resolution scans from the owners of what I thought would be the original plans of the boat. Although very helpful, the plans were not sufficiently detailed to build from, and on closer inspection there were some fundamental and some detail differences between them and the actual vessel as built.

My first job was therefore to create a set of 1:18 scale plans based on the model drawings and as many photographs as I could find on the internet. However, it soon became apparent that these would still be insufficient to draw accurate plans with the correct detail. In early March of 2020, the boat had been taken out of the water for her annual pre-season repair and refurbishment and, through the contact who provided the plans, I was able to spend a couple of hours onboard in the boatshed just before



The small size, low-res scans Peter managed to obtain from the owners of the vessel were helpful but not sufficiently detailed to build a model from, and closer inspection revealed some fundamental difference between the line drawings and the actual boat as built.



The Duchess undergoing her pre-season overhaul in Penryn.



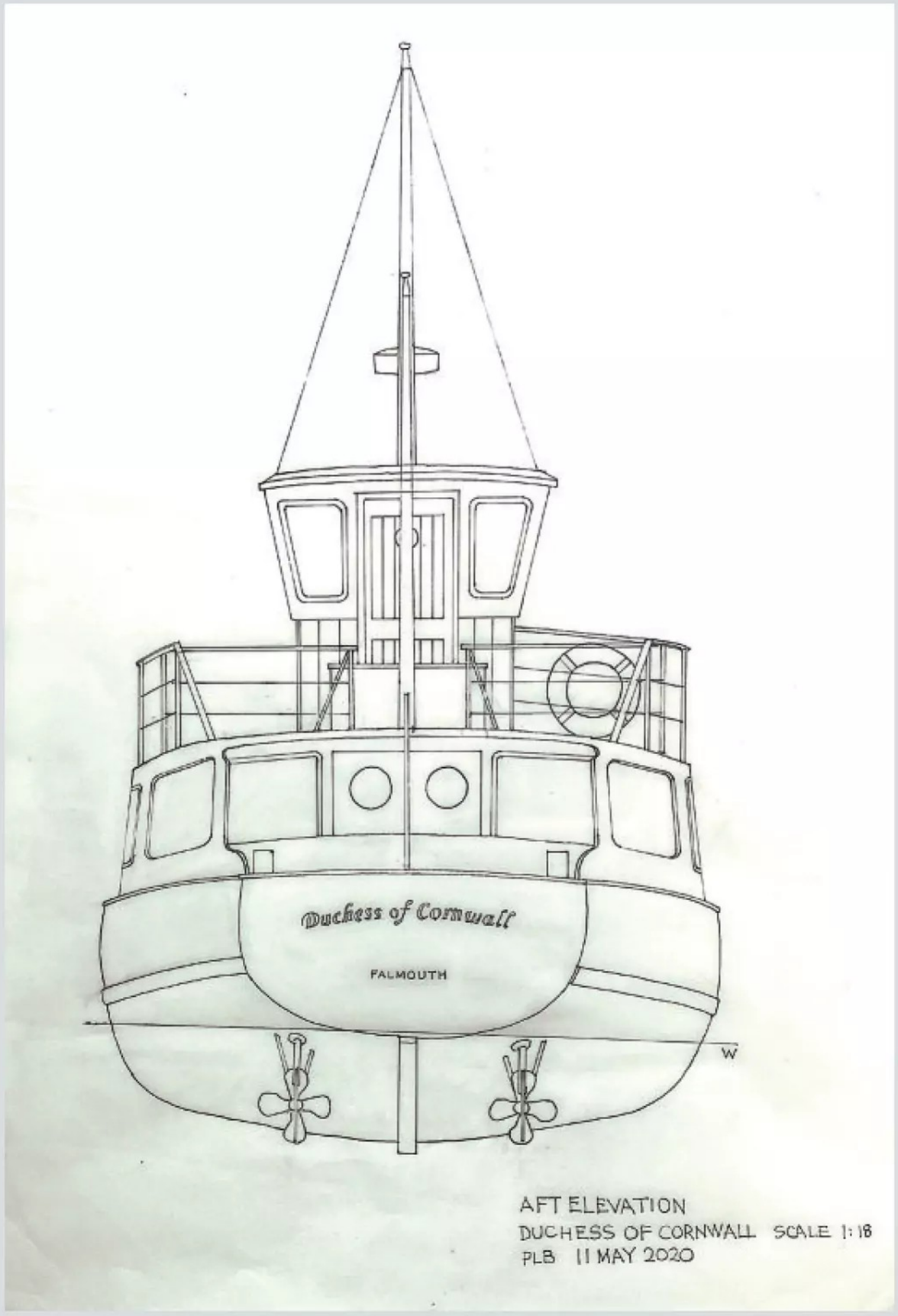
Peter is most grateful to the vessel's owners for allowing him the opportunity to get up close and personal with the Duchess, as the measurements and photos he was able to take proved invaluable to his build.

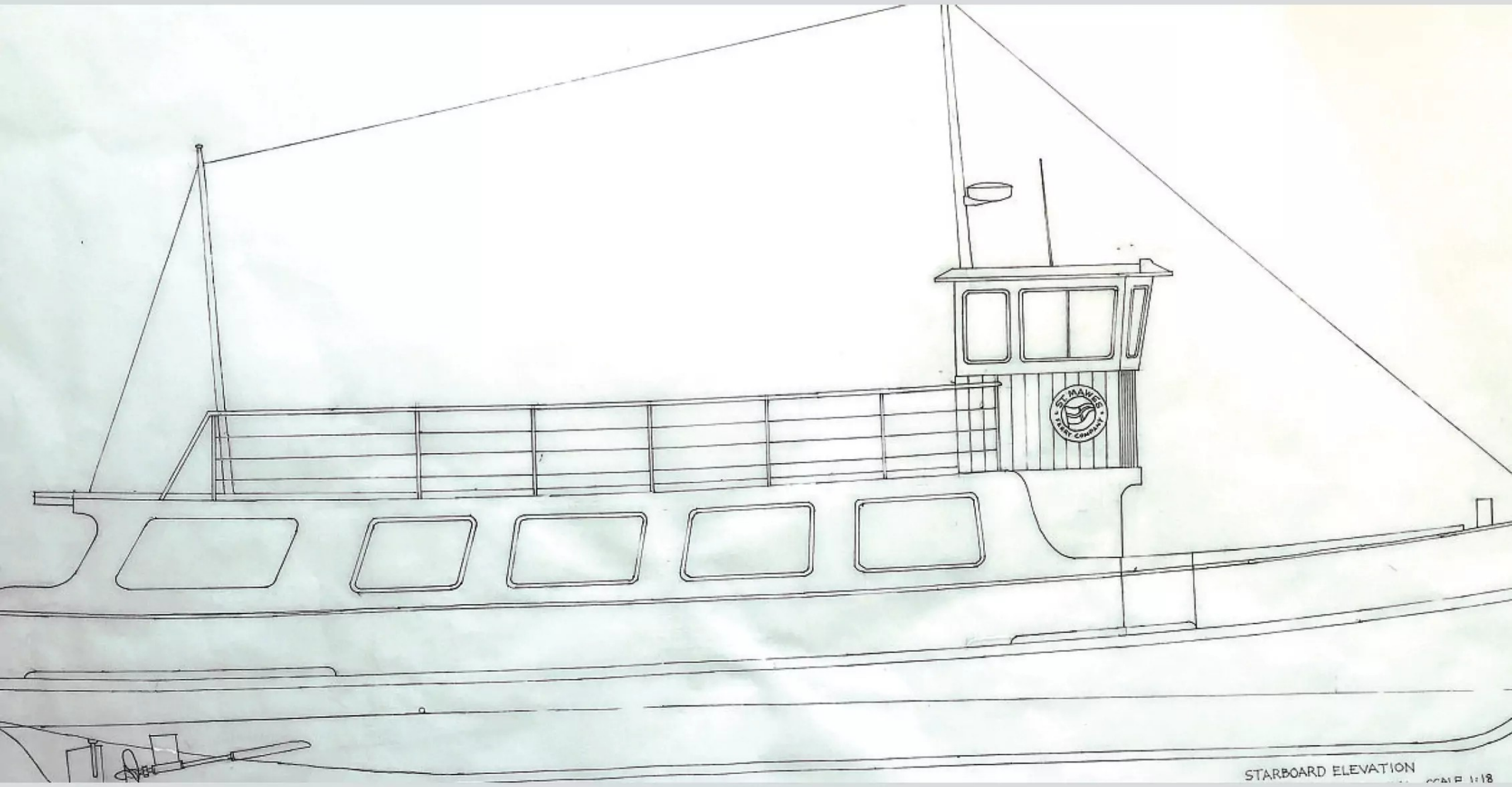
lockdown started, photographing everything and taking measurements. This proved invaluable.

With time on my hands during lockdown, I then set about drawing the 1:18 scale plans in ink on translucent detail paper from a 1-metre-wide roll I had ordered previously. The plans included a side elevation from the starboard side, a main deck plan, an upper deck plan, an elevation from the bow, an elevation from the stern, the 13 templates for the bulkheads, and a keel plan.

Only a few of the bulkhead shapes were included in the plans I obtained from the boat's owners, so I had to fill in the gaps using dimensions taken from my completed plans, adapting known neighbouring bulkhead shapes on computer, and by reference to some work-in-progress build photos kindly provided by my contact at the boat's owners. This was easy going back towards the stern, but there were several bulkhead shapes missing towards the bow where the hull shape changes



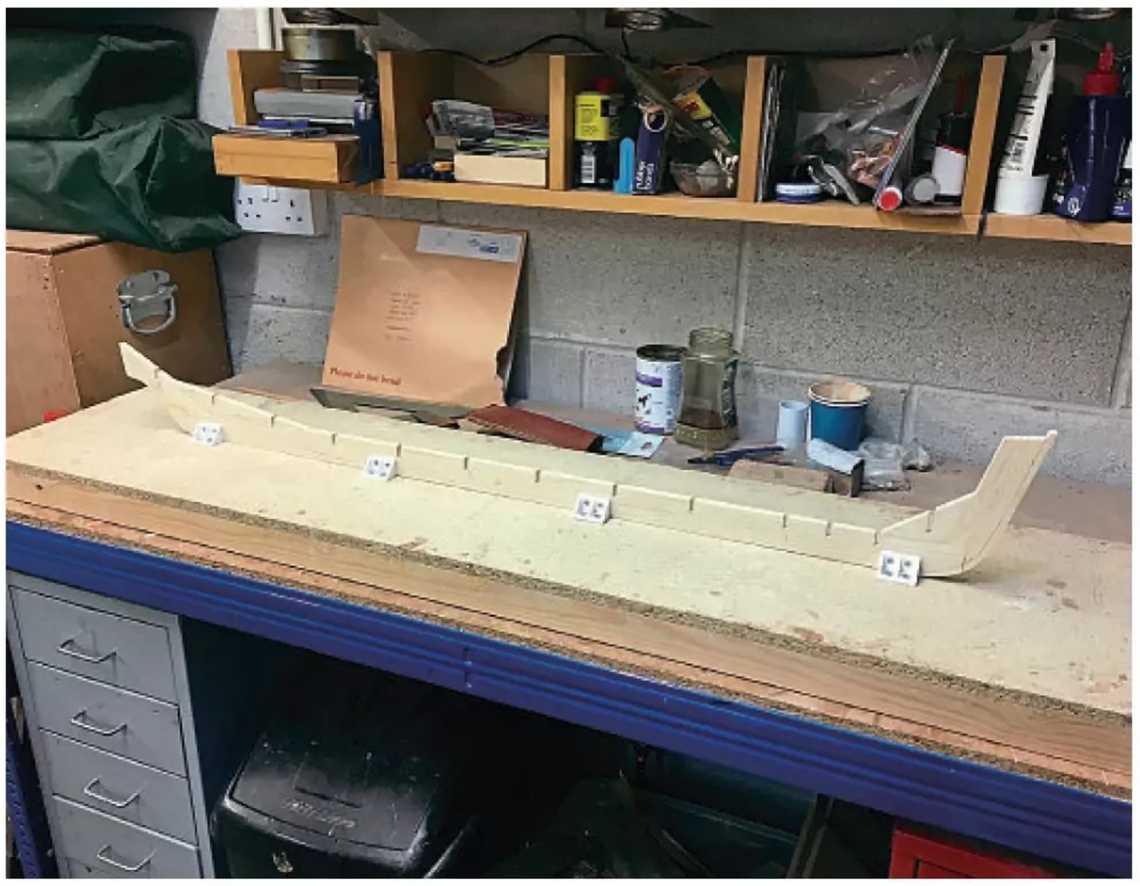




Peter's 1:18 scale drawings based on the plans and his own observations following inspection of the actual vessel.



Using pine to laminate the keel.



The keel notched, ready for the frames.



Peter's dry test assembly of the keel and frames.

significantly. Unable to guess at the right shapes to achieve the correct lines, I adapted three or four bulkhead shapes from templates I had kept from a previous build of a vessel with a similar shaped hull.

Commencing construction

Building started with cutting, laminating, shaping and notching the keel using some good quality seasoned 8mm thick pine, 33mm deep.

The next job was to print out card templates for each frame from the drawings I had adapted from the basic plans provided by the boat's owners. After carefully cutting out each one, I drew round the templates onto 4mm birch plywood and manually scored all the lines with a craft knife – hard work! This helped to keep the blade of my delicate Shapercraft table fretsaw on track. The fine-toothed blade only vibrates in order to cut material so it's all too easy to stray off the line, especially when it hits a particularly hard bit of plywood. (I have since graduated to a scroll saw -– much easier!)





Once the glue on the assembly had dried and the bulkheads had been secured, each was notched, both the top of the gunwales and approximately half-way between them and the keel, to receive stem to stern 3mm square spruce stringers, ensuring rigidity during the hull planking process.

After cutting out and sanding the 13 frames and the transom, I was able to partly dry-assemble the hull frame in order to check alignment, *etc*. By and large it all went together quite well, so I was confident enough to set about glueing the bulkhead frames in place on the keel section.

Once the assembly had dried and the bulkheads were secured, I notched each one at the top of the gunwales and approximately half-way between the gunwales and the keel to receive stem to stern 3mm square spruce stringers to ensure rigidity during the hull planking process.

At the same time, I worked out where the 12v lead/acid battery would lie at the boat's centre of gravity, cut out sections of some of the frames, and made a tray to hold the battery at the lowest point in the boat. I also worked out the position of the twin motors aft of the battery compartment and incorporated mounting platforms and cutouts in the frame to accommodate the universal joints and shafts.

Planking the frame and fitting the hardware

Having constructed the hull frame, I was ready to start carvel planking with 2mm x 10mm limewood planks. This went without too much bother and the relative evenness of the laid planking meant that filling and sanding was also relatively painless. As with all my plank-on-frame hulls, a skin of fine glass mat and two layers of Z-Poxy finishing resin ensured a smooth and watertight end result.

Next up was the installation of the twin prop shaft tubes, their A-frame supports, and the twin rudder tubes – always a delicate operation to avoid excess damage to the lovely smooth hull just completed! However, all six items were fixed in position without undue drama and sealed with more resin, inside and outside. Because, after this point, it would not be easy to work on the model upside-down, I decided to paint the hull before going any further.

Keeping everything down below

The *Duchess* has a necessarily very shallow draft so that she can still operate at low tide when only inches of water remain at the end of St Mawes quay. This means there is very limited headroom beneath the main deck and I didn't want any hardware or electrics visible in the main saloon. Consequently, everything needed to fit neatly under the main deck – the two MFA Torpedo 500 motors, the Mtroniks Viper Marine 20 speed controller, the Planet receiver, a proportionate engine sound generator module and speaker, a water pump and piping to simulate the exhausts at the waterline, and, not least, the 12v lead/acid battery. The space was there; it was just a case of shoe-horning.

Weight could have been an issue so I was careful to check the maximum I could add in addition to the already



Planking the frame with limewood.

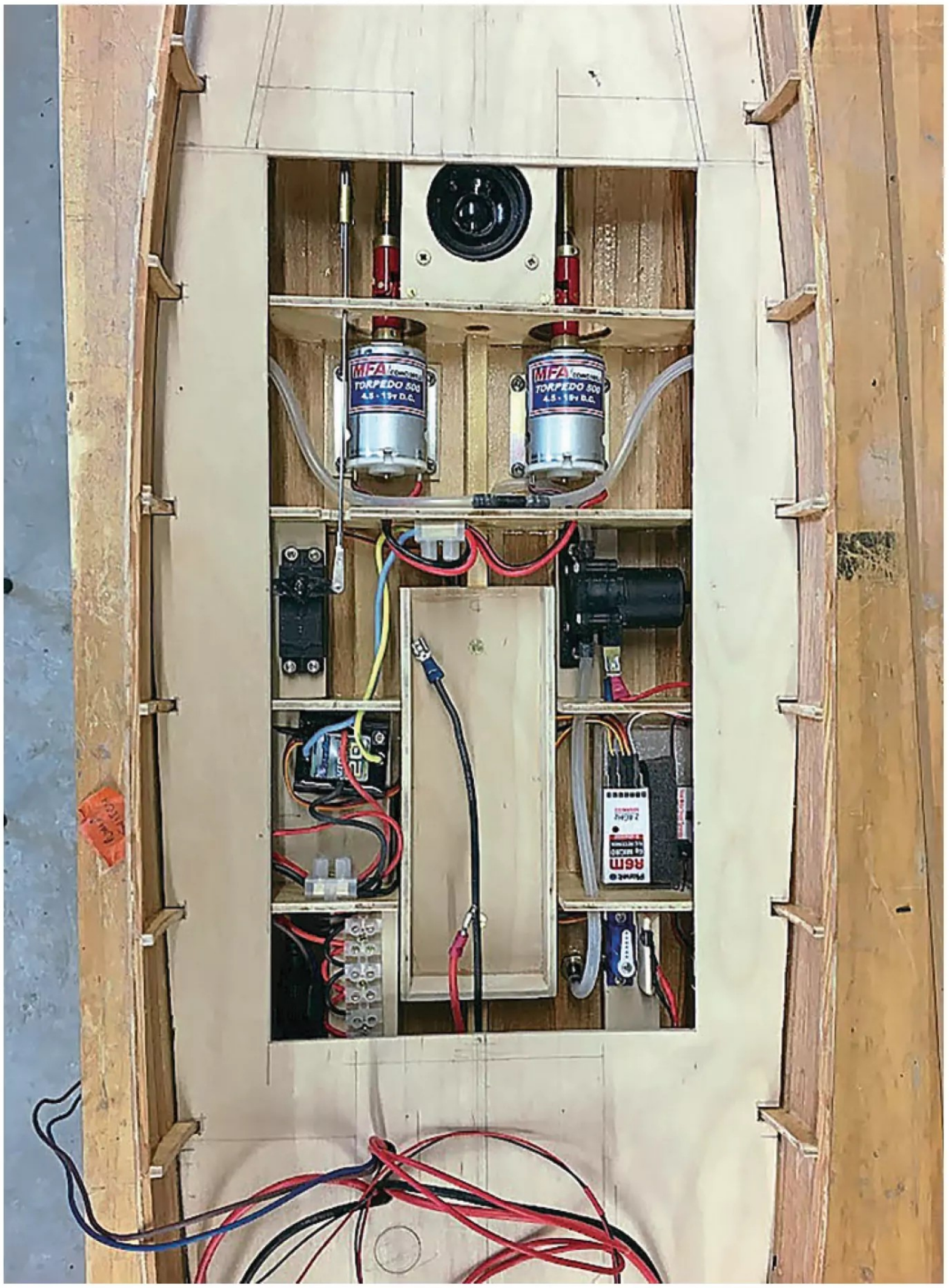


The hull skinned with two layers of Z-Poxy finishing resin over fine glass cloth.





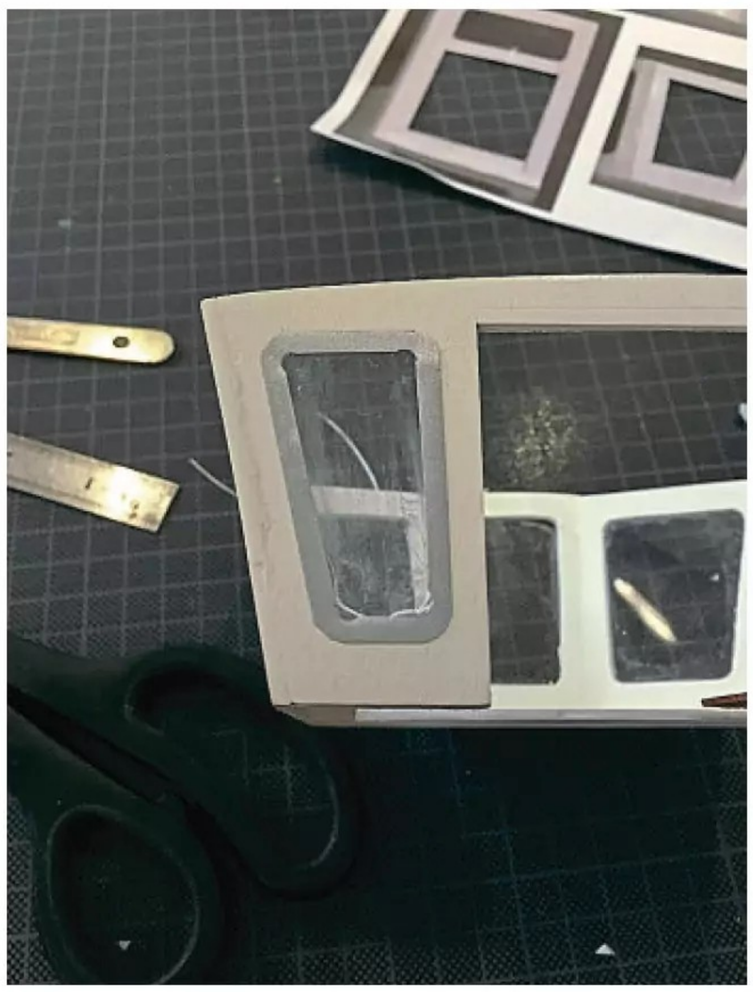
The painted hull. Note the Installed props, shafts and rudders.



The two MFA Torpedo 500 motors, the Mtroniks Viper Marine 20 speed controller, the Planet receiver, a proportionate engine sound generator module and speaker, a water pump and piping to simulate the exhausts at the waterline, and, not least, the 12v lead/acid battery, all neatly shoe-horned in place under the main deck.



The hull with the main deck laid and the wheelhouse turret built.



Peter used self-adhesive metallic vinyl to simulate the aluminium window frames.

installed hardware and battery, *etc*. This I did by floating the hull in my test tank and measuring how much additional weight it could take before the water hit the vessel's waterline using lead shot, a plastic bottle and some kitchen scales.

Building the wheelhouse 'tower'

With a large removable section for access, and smaller hatches for the rudder linkages, *etc*, the main deck was cut and fitted. This then permitted the building and permanent mounting of the forward wheelhouse 'tower', a distinguishing feature of the *Duchess* in these parts. This comprises a bottom section with an arched recess forward, behind which there are double doors leading through to the saloon, a timber-clad centre section, and the glazed top section with angled windows to three sides. The trickiest section was the latter, where all the outward-leaning frames had to butt up accurately and the round-cornered windows given aluminium frames cut from self-adhesive brushed aluminium foil (which, even if I say so myself, now looks quite effective).

The wheelhouse also serves as the model's control centre (as it should!), with the main power on/off switch, ESC switch and water pump switch all wired in and accessible through the opening wheelhouse door – just about manageable with my stubby fingers!

Sound investment

Also housed in the wheelhouse below the console is a neat little PCB and speaker which permits the playing of sound samples, recorded voice or music, all uploadable via a mini-USB port on the board. The volume is not massive but, with the lower section of the wheelhouse 'tower' acting as a sound box, and by increasing the volume of the sound clips as much as possible before uploading them, the sound is audible from quite a few yards away on the water, sometimes further if the wind is favourable. I uploaded a ship's hooter giving three blasts, a skipper's safety announcement and two pieces of music, each which plays in rotation in response to the left-hand lateral stick on my transmitter.

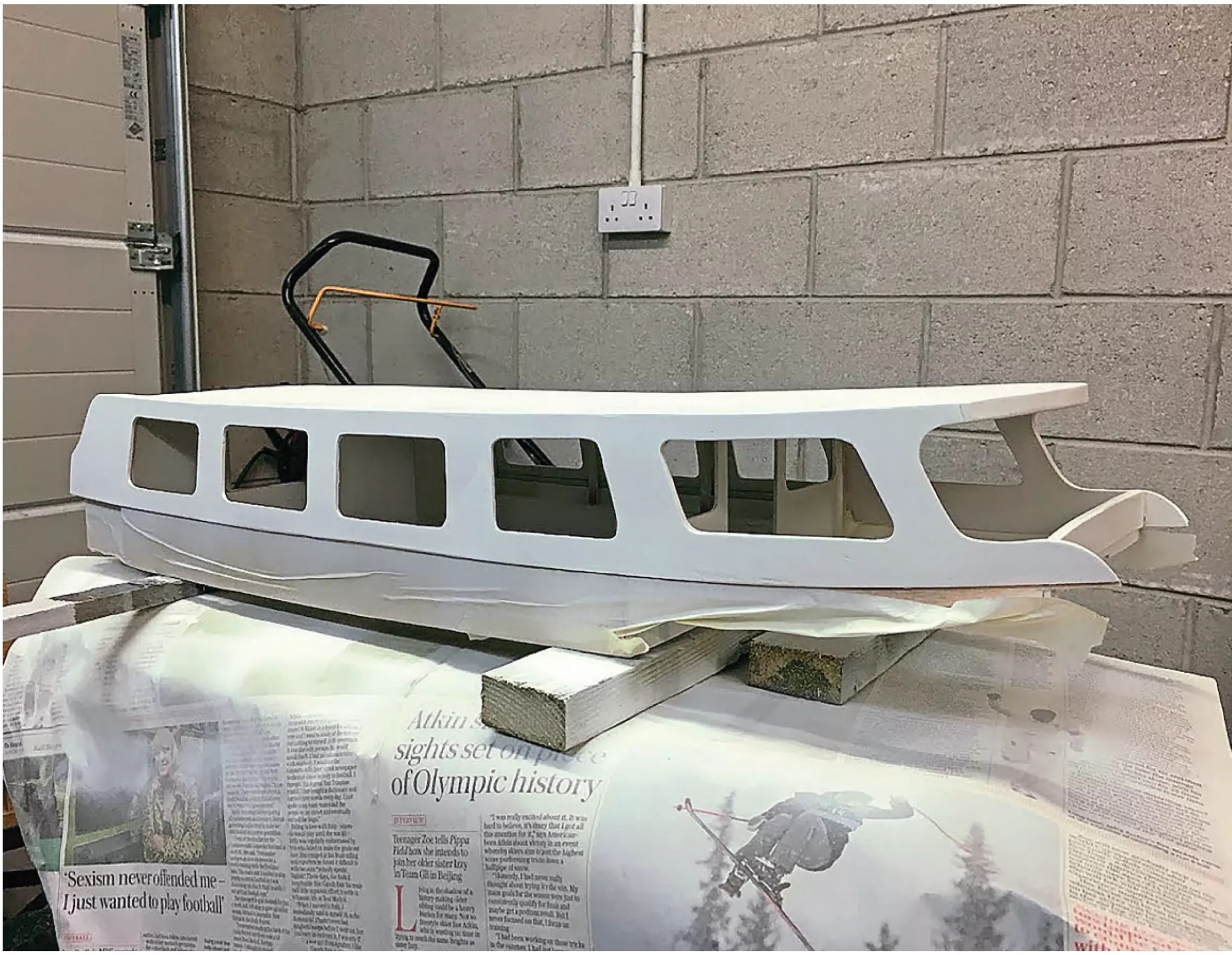
Fabulous ferryboat build



The wheelhouse taking shape. Note the PCB for sound effects.



Beginning in situ construction of the removable superstructure.



Basic construction of the removable superstructure completed.





The basic superstructure fitted in place and painted.



Establishing how much further weight can be added in Peter's test tank.



Testing the 6v incandescent lighting, installed to achieve a more realistic look than be obtained with the use of LEDs.



The non-slip deck areas created with self-adhesive textured vinyl.



The railings and various other details added to the superstructure.

Fabulous ferryboat build



Peter's Duchess of Cornwall name decals were printed on his PC, applied to the hull and then given a couple of coats of clear varnish.



Tickets, please! The painted scale figures that really bring Peter's 1:18 scale Duchess to life.

Removable superstructure

With the wheelhouse and electrical connections made, I could proceed with building the removable main part of the superstructure and upper deck. I built this in situ to ensure an 'invisible' fit. Like the wheelhouse, the windows were glazed with acrylic sheet and framed with cut brushed aluminium self-adhesive foil. The seats under the windows inside were also attached to this assembly. At the same time, I also added detail to the foredeck area so that I could ensure the neatest possible joint between the fixed and removable sections of the boat.

It was then time for a float test again and another weight check to see how much more I would be able to add.

Let there be light…

I should also mention that the boat was to be fully lit with navigation, outside deck floodlamps and interior lighting. I chickened-out (yet again) from going LED and stuck to a 6v incandescent system, powered from the main 12v battery via an inexpensive voltage reducer. The end result is, I think, more realistic than the super-bright effect of LED, although I can already hear LED-heads saying you can get 'warm white' effect LEDs!

The devil in the detail

That left a lot of detailing still to be done – most of which I hope is self-evident in the photos. The grey non-slip surfaces I made from textured self-adhesive vinyl for kitchen furniture upgrading, the railing and seating were made from brass tube, rod and mahogany strip, and the two life raft cases made from balsa and scrap.

Unable to find anyone able to cut vinyl lettering at the sizes I needed for the *Duchess*'s name on the bow and stern, and as DIY computer-printer transfers (decals) don't work on darker backgrounds, I came up with a compromise. I created the wording in the style, colour and size required using Microsoft Word Art, took photos of the background colour of the actual hull, superimposed one on the other and printed them out on medium weight photo paper. I then cut round the lettering area (not the individual letters), removing any sharp points, and then glued these in position on the hull. I then applied two coats of clear lacquer to seal them and prevent any water ingress. OK, they're a bit raised, and the background part has darkened a bit since being lacquered, but I'm fairly happy in the absence of any other solution (or a steadier hand to paint with!).



David's beautifully finished build

Life onboard

Finally, I came to one of my model boat 'must haves' – figures. A boat out on the water with no figures is like fish without chips, Laurel without Hardy, *Marie* without the *Celeste*. But as we all know, obtaining the figures you want at the right scale is often very difficult. So it was in my case, having chosen to build at 1:18 scale. I have built up quite a large collection of suitable figures at 1:24 scale, but obviously these would not do, so I ventured into the realms of 3D scanning and printing. With the help of a local company (and some disproportionately high investment) I created 22 men, women, children and dogs in 1:18 scale which, to justify the expenditure, I have saved as masters for

silicon rubber moulding and repeated resin casting. Just means I have to build everything at 1:18 scale in the future!

To cut a long story short, with advice from a skilled fellow-model boat club member, I taught myself how to make 2-part silicon rubber moulds from each master and resin-cast figures from them. Early attempts were not 100% successful, but in time I learned to get it right. After priming, I spent many happy hours painting. The results can be seen in my photos. Not perfect by any means, but overall they create the desired effect.

Launch and conclusion

Well, when launch day came the *Duchess* didn't sink, but I did have some problems with the electronics. Firstly, I started losing throttle and, worse, control, spasmodically. But what I found was that if I by-passed the in-line engine sound generator module (*i.e.*, in-line between the ESC and the receiver), it all worked fine. It turned out that the ESC didn't have enough output to power both the receiver and the sound module, so I had no option but to change it for another type with more oomph, a 40A Hobbywings Quikrun, which worked fine. Secondly, the lead acid battery was too heavy, especially when fully charged (joke!) so I replaced it with a much lighter 12v NiMh pack which allows the boat to sit better in the water at the bow.

Finally on the water!

In the five years since I built her, the *Duchess* has never failed to attract attention due to her familiarity to local people and a good number of holidaymakers, and because of the cheap little sound system I installed. Currently this plays a rather comical but authentically based skipper's "*Welcome aboard*"' announcement and safety instructions, a snatch of the Desert Island Discs theme tune *By the Sleepy Lagoon* by Eric Coates, and, to please true Cornish folk, a rendition of the local anthem *My Cornwall* sung by The Oggymen. ●



Peter's delightful Duchess captures the eye of BBC Radio Cornwall presenter James Dundon (left).

Acknowledgement

The author of this feature, Peter Binns, would like to thank Garrick Royle, Managing Director, King Harry Ferry, Cornwall Ferries Ltd for providing drawings, access to the *Duchess of Cornwall* while undergoing annual maintenance, information, and his kind support during the construction of the model.







The beautiful lines of SLEC's Huntsman 31.

SLEC's Fairey Huntsman 31

John Mileson doubles down on this go large kit building challenge

Fairey Marine Ltd was a boat building company set up in the late 1940s by Sir Charles Richard Fairey and Fairey Aviation's MD, Chichester-Smith. It was based on the River Hamble, Southampton. At this time Sir Charles clearly had a few bob, as he acquired *Shamrock V,* a J Class yacht that had been built in 1930 for Sir Thomas Lipton, the tea magnate. Both Fairey and Chichester-Smith were keen sailors and between them hatched a plan to produce 'affordable' sailing dinghies using techniques employed in the aircraft industry, which both were well acquainted with. They gathered around them experts from the two relevant industries, aviation and sailing. Peter Twiss, a hero of mine, joined in 1960. You may recall he held the world air speed record at the time. Roger Clark, the motor rally champion, another of my heroes, was also enlisted. Probably, the most important member of the team, though, was the designer of most of the Fairey boats, Alan Burnard.

The dinghies they designed that are most familiar to those of us keen on sailing include Firefly, Swordfish, Jollyboat and, the most famous of all, the 505, International 14s and the Flying 15. The latter a favourite of the Duke of Edinburgh and his mentor, Uffa Fox.

In the 1960s, Fairey designed and built a range of wooden hulled speed boats. These were known for their speed, stability and good rough water handling.

Like so many innovative British businesses, in 1975 the Fairey Group went into receivership, and Fairey Marine Ltd was absorbed into the marine division of the Babcock International Group. Since then, the company has produced, amongst others, the Waveney class lifeboat for the RNLI and the Attacker class patrol boat.

In this article, however, we will be focusing on the Fairey Huntsman 31, which has quite a pedigree going back to the 1960s.



Excitement as the lid is lifted. John chose to purchase all the additional equipment suggested by SLEC, which included the propellor and shaft, speed controller, universal joint, etc. This proved a good move.



The parcel arrived in good condition from SLEC. Nobody warned John to enrol on a body building course prior to delivery, though! So, at this point he had to work out the 'little' problem of how to manhandle the package across the garden and into the shed (a.k.a. as his model boat building workshop).

Fairey magic casts its spell

Up until a couple of years ago I'd had no real interest in cabin cruisers and certainly had no intention of buying a kit for one. Until, that is, while browsing the trade stands at the 2024 Blackpool Model Show the stand-out attraction for me became the prominently displayed Huntsman 31 kit build on SLEC's stand. I was sorely tempted to purchase a kit for the 4ft version there and then. Sense (or perhaps I should say, self-preservation), however, prevailed. How could I possibly sneak that huge box past my wife and into the house? And more to the point, if I were to be successful, how would I live with the fear of our credit card statement arriving and the subsequent grilling I would receive? So, reluctantly, I took the safe option and returned home 'kit-less'.

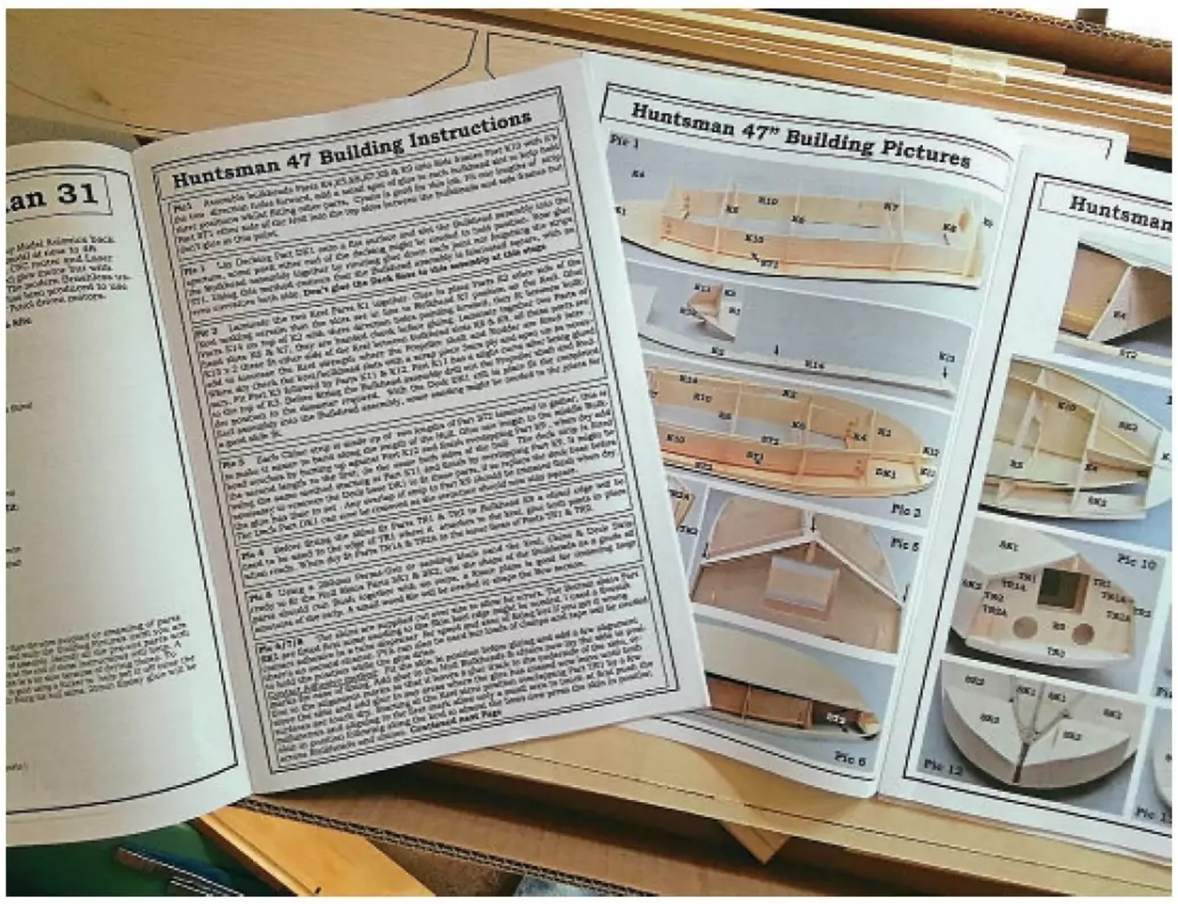
But I couldn't get the Huntsman out of my mind. Other projects helped to dampen my ardour somewhat, but the desire remained.

Double trouble

Then came the fateful day, when I found myself just standing around the pond with my fellow Wicksteed Park Model Boat Club members admiring what appeared to be a Huntsman, or similar, being put through its paces. Suddenly, one of my few chums sidled up to me. Normally, I'm always a bit suspicious of 'sidlers', but Mark had always come across as harmless enough. How wrong I could be? I don›t know quite how it happened but within a matter of minutes, and obviously some erudite smooth talking, he had convinced me that I ought to have one of these cabin cruisers. "*Yes*", I thought, "*Why not?*" – all fear of reprisals at home instantly forgotten.

Unbeknown to me, however, I was about to get myself into even deeper water still, because it was then that Mark turned to face me, and I noticed a tear in his eye. In a hesitant, almost whimpering voice he confessed that he, too, would love to have one, but that his demanding full-time job would preclude him from ever constructing the kit himself. It was, he lamented, a lifelong dream shattered.

I really don't know what came over me, as despite thinking he was overdoing the dramatics a bit, I then found myself offering to build one for him alongside my own.



The manual consists of two separate booklets: one featuring a clear and concise set of written instructions and other the numerous illustrations that act as visual reference points, this avoiding the irritation of having to flicking back and forth between the pages of a single manual trying to make sense of things.



The point at which it dawned on John just how crowded his shed was becoming, before he'd even opened the second box (in case you haven't read the entire article yet, John agreed to build a second model for a fellow club member alongside construction of his own Huntsman).

Big on charm!



Note the clever use of the 'sub deck'. The ribs are glued together within the sub deck, but not to it. This ensures the assembly is kept nice and square.



Both keels are shown here being laminated with 6mm ply. The side cheeks give additional strength to the propellor shaft slot.



Each component is precisely cut, making assembly quick and easy.



With the still loose skeleton fitted to the sub deck, the stringers were glued in.

Funnily enough, after that he made a rapid recovery, and before I knew it, I was on the phone to SLEC ordering two kits and all the other bits and pieces required to finish the boats.

Why don›t I keep my big mouth shut?

Trouble and strife

I didn't say anything about this development to my wife when I returned home. Better ponder on it! I imagined it would be several days before the kits arrived anyway, which would give me some breathing space in which to concoct a good cover story.

Now, having previously purchased plywood, *etc*, from SLEC, I knew its order handling system to be efficient, but on this occasion the sheer speed of turn around took me by complete surprise. The very next day, while, I was out shopping for humble provisions, the goods arrived. Fortunately/unfortunately, my wife *was* on hand to take delivery of what turned out to be a huge parcel. Apparently, the courier asked if there was anyone who could give him a hand to lift this from his van.

"The plywood components are all beautifully cut using a router – meaning no cleaning up of heavily burnt laser cut parts"

Obviously not. I can well believe he struggled, for on my return not only was I confronted with the logistics of moving this enormous package to my shed but also with a series of very awkward to dodge questions.

Third degree over (for the time being), I managed to manoeuvre the massive parcel onto a sack barrow, before then very gingerly wheeling this, a couple of feet at a time, towards the



The propshaft slot in the keel. The manual instructs you to "open the hole out to suit the shaft", meaning it needs to be drilled out to 8mm in diameter. The dilemma here was that the shaft hole is considerably longer than John's drill bit, regardless of which side he approached it from. An unsuccessful attempt was made at using an 8mm diameter file.



John therefore came up with the following solution – don't try this at home, children! The tapered end of his 8mm round file was precariously gripped in an electric drill chuck. Then, running the electric drill very slowly, the violently wobbly file was fed into the shaft hole. This, he explained, was one of those occasions when he knew you shouldn't be doing what he was attempting, fearing the whole lot was going to seize up and completely wreck the keel! Gradually, however, the slots were opened out to suit the shafts.



The two bottom skins of the hull fitted. There's not a lot of excess plywood, so precision location is vital. John found plenty of map pins and clamps made this operation fairly easy.



Once the adhesive attaching the skins to the frames was dry, the skins were faired into the bulkheads, etc, to allow the top side skins to overlap the lower ones. This is a very hit and miss task. While not in the instructions, John did add additional blocks of wood to the bulkheads (as indicated by the red arrow) to increase the surface area for glueing. A good idea in theory, but not actually successful in practice.



The plywood upper skins are very tough to manipulate to the required shape of the hull. Even with the strongest of clamps, John could not achieve contact with all the sculpted bulkheads.



Using plenty of map pins and adhesive, the transom fitted well.



The bow was a different matter: John found cutting and shaping lumps of balsa wood very difficult, and that there was great scope for plenty of filler.



A start being made on the two cockpits (bear in mind that John was working on the build of two models simultaneously). The parts slotted together well, but those originally received were twisted (later to be replaced by SLEC) due, in his opinion, to the use of an inferior plywood (as opposed to the much better birch faced wood used elsewhere in the kit).



As can be seen, great gaping gaps were present between the bulkheads and skin.

garden steps on route to the shed. I hadn't planned how to negotiate those steps, though, and the barrow and parcel already had other ideas. Before I knew it the three of us were sprawled out in a flower bed set to one side of bottom of said steps. Fortunately, this incident wasn't witnessed, but I knew big trouble was coming my way. My wife is an exceptionally keen all-year-round gardener and when she discovered the desecration of a prize flower bed… Well, need I say more?

Moving swiftly on… Having dusted myself off and summoned up the almost Herculean strength required to lift and precariously rebalance the box on the barrow, on we went. My safe haven/

"The instructions recommend using contact adhesive. Well now, this struck me as being fraught with problems"

shed is not very big and is filled with part finished boats and a considerable amount of 'it might come in handy' rubbish. Consequently, on arrival there was some grubbing about on the floor in order to get the outer packaging of the parcel removed, this revealing two large cardboard boxes, both thankfully intact following their eventful journey across the garden.

Setting two work…

Having removed the lid of one of the boxes, my first impressions of the contents were very favourable. The plywood components are all beautifully cut using a router – meaning no cleaning up of heavily burnt laser cut parts.

The introduction to the two accompanying manuals, one featuring photographic instructions and the other written, followed the usual mantra: read well and inwardly digest. That's a bit like asking a kid to look at the ingredients of an ice-cream before eating it, don't you think? That said, the instructions appeared to be superbly comprehensive.

At that point, though, the bigger picture for me was just how large these boats were. To turn them around was going to involve opening the shed door, stepping carefully through it, rotating them and returning from whence I came!

Even so, for the sake of speed, I decided to build both boats in tandem.

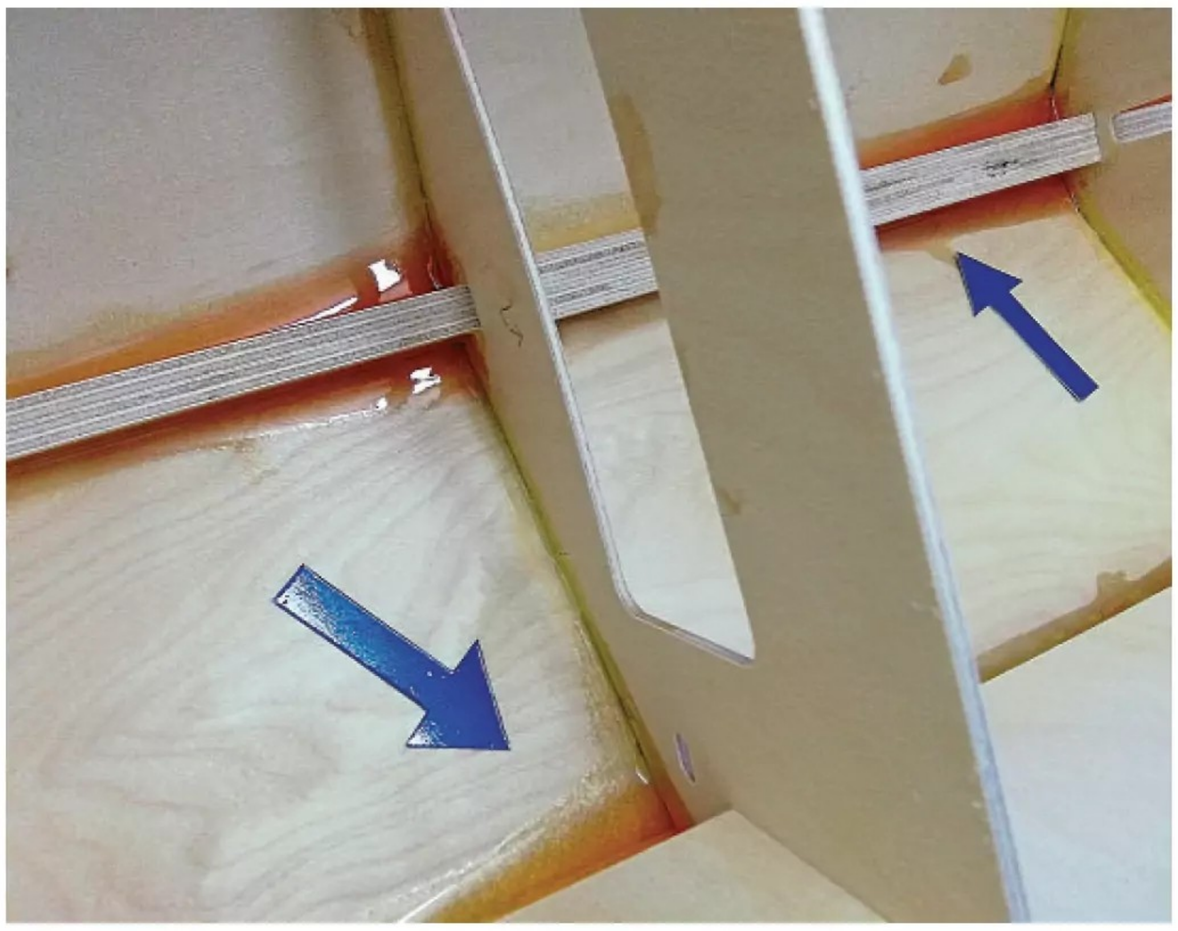
I won›t bore you with all the construction details, but needless to say, coming from SLEC, all the parts fitted exceptionally well.

The basic construction of the 'skeleton' proved easy. I was then, however, pulled up with a jolt when time came to fit the 'bones' to the four outer skins. I would be a liar if I didn't say I had some serious concerns regarding the method of attaching these skins to the frames, as this involves wrapping fairly thick plywood around compound curves.

The instructions recommend using contact adhesive. Well now, this struck me as being fraught with problems. While a dry run to start with is suggested, there's only a few millimetres around the edges of these skins to play with. It would, therefore, be imperative to locate each 4ft skin exactly – bearing in mind the frame is coated in contact adhesive. Faced with such a precise task, I began to imagine myself mislocating one by just a fraction and then panicking and trying to rip the whole thing off – and there were four to do.

Consequently, I resorted to traditional PVA adhesive. At least this would give me a fighting chance of getting each of the skins correctly located, although admittedly it did mean using all my stock of clamps, yards of masking tape, dozens of map pins, and some extremely bad language. Tools fell on floor, plywood popped up where it was supposed to be stuck down, masking tape would not take the strain, PVA attached itself to everything, including my hands and clothes and hands – which, incidentally, were getting stiffer and stiffer as the adhesive dried on, forming PVA gloves! It was a nightmare!

Ideally, assistance is really required for these operations. I am sure PVA is easier than using contact adhesive,



The application of resin within the hull is not specified in the instructions. This does, however, ensure a watertight hull and strengthens the joints



Blending in the panels and balsa wood blocks proved a tedious job and filler (P38) had to be used.



The completed bow profile. More sanding will be required before Eze-Cote and matt are applied to the hull.



The real fun begins! These strips, (chine rails) are, according to the instructions, vital if the boat is to plane. Each strip has to be twisted to the contours of the hull. Not the easiest of jobs, and John frequently found his fingers rather than the strips themselves getting stuck to the hull!



The vac-formed components must be carefully cut from the sheet. Initially, John used scissors, but found they wandered off the line, spoiling one of the seat backs. He therefore resorted to a craft knife.



John usually brush paints his models and tells us that in retrospect he wished he had opted to do so here. As you will see, the roof of the cabin has been masked off (masking being a task he particularly dislikes having to tackle, explaining that try as he might, there's always a small gap somewhere!).



John was not looking forward to bending up the pulpit rail, but he found that using the template supplied for this made the job surprisingly easy. The instructions suggest ordinary solder for the joints, but John opted to silver solder his and points out that this is just as easy and achieves far stronger results.



The cockpit complete. Please note, the wood panelling is not included in SLEC's kit.



The sub deck finally fitted.



With the cabin/cockpit area complete, the roof panels, both in two halves, were bonded on.

"Fitting the 'chine rails' did cause me grief…"

but tempers are likely to be frayed whichever option is chosen. You probably need several sets of hands and a nurse standing by to mop your brow! For me, it certainly didn't help that I was undertaking this task on one of the hottest days on record.

I did advise Mark that a considerable amount of resin and P38 filler may be required as the project progressed. He appeared less than enthusiastic.

With the hull construction complete, it was time to sand the plywood and balsa to shape – not a job I relish. Once satisfied with the contours being approximately right, I became concerned my over-zealous sanding had made some of the plywood very thin. Worryingly so!

But, adopting a 'never mind' philosophy, I pressed on, covering the hull with Eze-Cote and fibreglass cloth. This was a job I was able to take real joy in, as it's a pleasure to use, making surfaces exceptionally smooth and, fingers crossed, waterproof.

The next step was to work on the superstructure, which in the case of the Huntsman is one long cabin/cockpit. It was the cockpit 'box' where things started to go a bit wrong. What should have been a simple box turned out to be a somewhat twisted structure. This, I must point out was not due to my shoddy workmanship, the parts being misshapen on arrival. For some inexplicable reason, SLEC chose to manufacture these from, in my opinion, inferior plywood – as opposed to the excellent birch faced ply used for the rest of the kit. I initially forged on, hoping that with the use of heavy weights I would be able to counteract the distortion. No such luck. So, I contacted Chris at SLEC, and the offending ply parts were promptly replaced. However, while the replacements were nice and flat, they were still cut from the same type of ply, so I can't help wondering why the quality of these particular parts could not have been matched to same high standards evidenced in the rest of the materials supplied.

After this minor hiccup everything started to go well. Well, almost everything…

Fitting the 'chine rails' did cause me grief – in fact, had the instructions not pointed out that these rails are vital if the boat is to plane, I would've been tempted to omit them altogether. This was yet another occasion where an additional pair of hands would have been most useful. I did, momentarily, consider asking my wife, but almost immediately thought better of this idea and simply struggled on. The problem centred around twisting strips of wood around a complex hull form, therefore making it impossible to use clamps. It also required the use of superglue and the loss of more skin!

Eventually, however, once these rails had been fitted, it was time to consider painting what were two quite large boats.

I tend to prefer to brush paint models using the superb Phoenix Precision enamel paints, but occasionally, as was the case here, I opt to work with Halford's rattle cans. To be honest, I'm not a fan of spray painting. I don't like all the preparation of masking off and relying on clement weather conditions outside for the actual spraying. This experience only served to remind me of why, more often than not, I give this method the swerve. Eleven cans later and with a

wallet about £150 lighter, the finish was somewhat disappointing. Another "never mind' moment.

Finally, it was time to add all the fittings. These can be supplied by SLEC as an additional pack, and I have to say are well worth the money.

All in all, it took me about three weeks to build and finish both models simultaneously.

While this article was not commissioned as a kit review, it is probably worth assessing just how good, in my opinion, it has turned out to be.

Time for the school report

While this article was not commissioned as a kit review as such, I think it's worth adding my tuppence ha'penny worth…

The finished boat is superb!

I'd initially been apprehensive about how heavy the finished boat would be. It *is* large, but, actually, it's surprisingly light and should present no problems in terms of lifting when getting it to the pond.

"This is a great kit, which makes up into one of the most stunning 'cruisers' on the market"

While the overall construction is pretty simple, except where an additional pair of hands might prove useful, it's probably not a kit I would recommend to the complete beginner.

The quality of the machining of the wooden parts is excellent. Similarly, the quality of the majority of the plywood and additional strips of wood, *etc*, is very good. But, for me the kit was slightly let down by the seven pieces of inferior ply that make up the cockpit and brought to mind that old adage 'Spoiling the ship for a ha'porth of tar'!

The instructions are well thought through and clear guidance is given at every stage. My only concern would be the recommendation of contact adhesive for fitting the hull skins – although that's probably just my own prejudice against 'instant bonding'.

Huntsman 31 kit marks out of 10

Delivery time and packaging	10
Instructions	10
Quality of components	9
Overall design	9
Ease of construction	9
SLEC customer service	10
Customer satisfaction	10

A handsome Huntsman

This is a great kit, which makes up into one of the most stunning 'cruisers' on the market. The resulting model, like the original prototype, is a real 'head turner' and will I'm sure be the envy of many.

I am absolutely delighted and proud of my finished model (and I hope Mark is of his). So proud in fact, I don't want to get it wet! ●



An overall view of the cruiser from above

Jennifer's maiden voyage.

Jennifer

Martin Crapper talks us through the design and build of this West Country Trading Ketch

40 years ago, my father and I built a three-masted schooner, the *Sophie Williams*, based on a then commercially available fibreglass hull for the Porthmadog Schooner *M.A. James* and corresponding drawings by David MacGregor. This took to the water in 1987, was written up in *Marine Modelling (Marine Modelling 59, February 1992 pp46-48)*, and was then sailed at various locations over the intervening years, with a few modifications made along the way. In late 2023/early 2024, she was completely refurbished, and it was this that gave me the boat building bug again.

Eschewing building my own hull, I settled on the West Country Trading Ketch hull from Orion Mouldings.

> ***"Eschewing building my own hull, I settled on the West Country Trading Ketch hull from Orion Mouldings"***

This appealed as it appears to be the same scale as the *Sophie Williams*, 1:32, and would allow me to create another example of a British small sailing ship from around the turn of the 20th century.

As with the schooner, I first needed to carry out some research, and the book *Westcountry Trading Ketches* by Captain W.J. Slade and Basil Greenhill was therefore my first port of call, along with Greenhill's *The Merchant Schooners* and as many internet photos of surviving examples, notably *Bessie Ellen* and *Garlandstone*, as I could find.

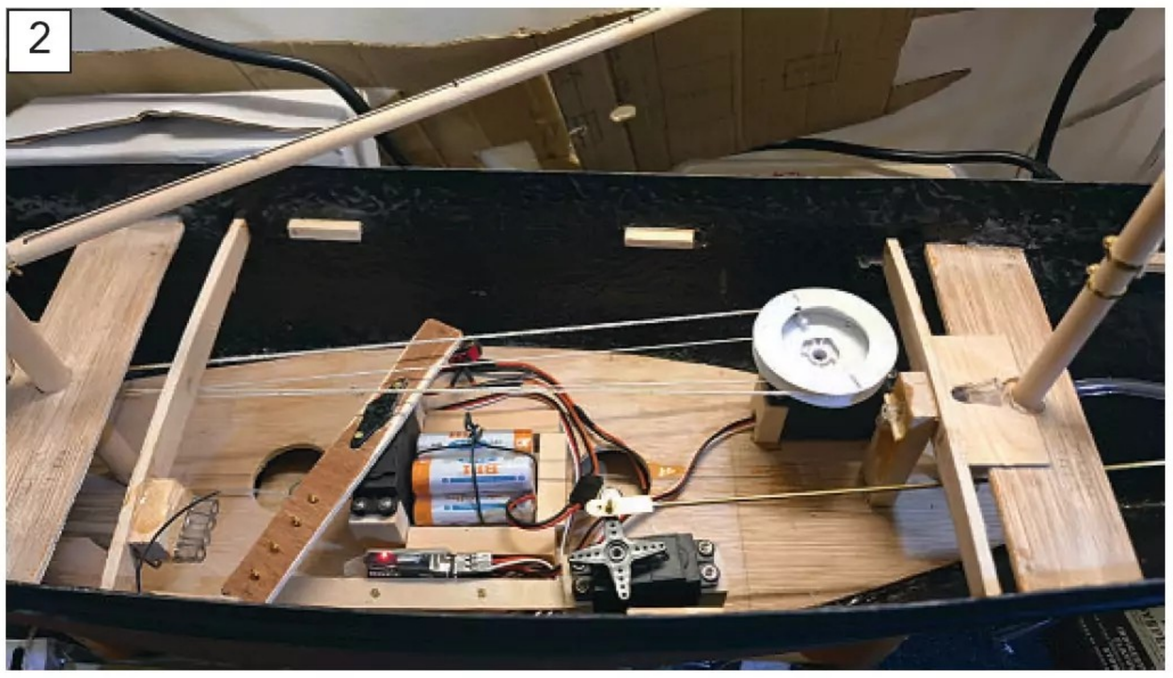
Ballast calculations

Because I was working with a fibreglass hull – a very nice one, with moulded yellow metal sheathing detail – which was already watertight, the easiest method of establishing the ballast required was to fill the hull to its waterline using a measuring jug.

The 4.5 litres of water this took indicated a ballast of 4.5 kg, so a 4kg false keel was made, the shortfall allowing some spare weight for all the fittings and some internal trimming.

The keel was the same design as on the schooner, cast from a roll of lead flashing from the builder's merchant melted in an old saucepan over a





camping stove. This was supported with plywood, attached to long bolts epoxied through the keel of the hull, with a wooden reinforcing piece on the inside (**Photo 1**). No attempt was made to shape this false keel. There really was no point, as small trading vessels did not sail particularly fast and scale speeds on the water tend to be too high, even with the drag of a big rectangular keel.

With the false keel removed for display, the bolts do protrude from the bottom of the hull but are not very noticeable when the model is on her stand.

Genre typical

There then followed another period of research. The hull comes with drawings for the *Irene* of Bridgewater, another survivor, but in modified form, with a cut-down rig, an engine fitted, and the mizzen mast moved forrard to accommodate it. I wanted an original sail-only ketch as she might have appeared in 1910, so there was some thinking to do.

The radio equipment had to be made to work, which required a clear understanding of where the masts were to be stepped and the length of the booms, and that meant the location of everything else on the deck, not to mention the access arrangements for servicing the radio equipment, had to be considered.

I made a cardboard template for the deck and then started sketching, my eyes constantly darting back and forth between what I was putting down on paper and my gathered reference photos. As I wanted a version with a galley on deck, the layout was substantially based on the *Clara May* in her more original form, not as recorded in detailed photos in the Slade-Greenhill book at the end of her life in 1953. The mast and sail plan, however, is a cross between the *Uleila* and the *H.F. Bolt*, for which there are drawings in the latter part of the book.

The result is not a model of a specific prototype but one intended to be scale-typical for the genre, and she is named *Jennifer* after my wife. Her registration port is Fowey, in tribute to Daphne du Maurier – and in particular, her debut novel *The Loving Spirit*, which has a strong sea faring theme and is based partly on the story of the woman shipbuilder Jane Slade.

The main boom is very long – too long to get enough adjustment with a servo arm – so a sail winch was needed. Despite being a reasonably bulky model, the hull didn't leave that much space for this. It was just possible to fit a sail winch in on the starboard side, under the extreme after end of a removable section of deck. I decided both main and mizzen sheets would work off the one sail winch, making a drum with two different diameters to allow for the differing length of sheets for the two big sails. These drums wound cords which run to pulleys fitted directly beneath the small fore hatch, passing just to the side of the main mast and so back to the drums; the actual sheets hook to these loops and lead up through silicone tube to the deck and thence to the sails (**Photo 2**).

This left the port side of the hold area for a servo for the steering, connected by a long rod, with access to the top of the rudder under the whaleback wheelhouse. The rudder is a two-part arrangement – a painted, scale rudder with a transparent celluloid extension, thereby affording enough control for model sailing. A servo for the jibs is mounted centrally. Unlike on the schooner, where the jibs just fly free on a sheet running from side to side, those on the *Jennifer* overlap each other and could not be trusted to change tack themselves in a light wind. The ends of the jib sheets were therefore led through more silicone tubes to the ends of a long arm attached to a servo. This flips the jibs from one tack to the other when going about.

The batteries, a 6 V pack made up for me by Strikealite, were fitted amidships, below the jib servo arm (again, see **Photo 2**), and I also allowed for wiring to a switch under the small after hatch and for working navigation and stern lights (made using LEDs).

There was a certain amount of adjusting the radio to get the travel of the servos correct, but once that was sorted, I could move on to the deck and superstructure.

This was an enjoyable build, mostly using 1.5 mm ply and various sorts of strip wood, with old Meccano and other gears I had lying around and some plasticard being used for details such as the cargo winch and anchor windlass (see **Photo 3**). The deck is a sheet of ply, with the planks just drawn



on using a soft pencil, which looks fine from the pond side. The anchors, ventilators, dinghy, crew and various other details are commercial fittings. The figurehead – an attractive redhead like the ketch's namesake – is made from a 1:24 scale, but rather small, German lady that Dad had spare from his large-scale tram layout, suitably carved and painted (**Photo 4**).

It turns out that the run in at the bow of the moulded hull is a little too sharp compared with most of the drawings and imagery I can find, so the windlass is rather crammed in width-ways. This, however, isn't really evident when the model is out on the water.

Mast, spars, sails and rigging

Masts and spars came next. The Slade/Greenhill book includes dimensions for the spars on the ketch *Uleila*, including all the tapering, which was useful. So, I obtained dowels as closely matching the largest diameter of each as I could and set to work tapering. I do not own a lathe, and I am not sure it would have helped much if I did. My cheap pillar drill, though, swings sideways on its stand, so I was able to dangle this over the side of the workbench, clamp long spars in it, set it going, and taper away with hand-held sheets of sandpaper (see **Photo 5**). This was not the most interesting of jobs but fortunately achieved acceptable results far more quickly than anticipated. Following this, the spars were all varnished, and I set about making ironwork out of sheet brass, not so much aiming for prototype detail but for a robustness that would withstand sailing. There were no commercially available mast hoops of the correct diameter that I could find, so I made my own by sawing thin strips off brass tube, with about a 67% success rate! The Appledore roller reefing gear is representative, and was made from some old gears I found, probably from a Tamiya tank kit built and then damaged/destroyed back in the 1970s (see **Photo 6**).

"The model was designed first and foremost to sail, but she had to look right on the water, so there was a fair amount of ropework to contend with…"

The sails were made from an old cotton sheet cut to my paper templates by a friend who is a whizz with her sewing machine, in return for a donation to a charity of her choice.

The rigging is, of course, a compromise – the model was designed first and foremost to sail, but she had to look right on the water, so there was a fair amount of ropework to contend with. The only working lines are the jib, main and mizzen sail sheets. The main and mizzen sails would have also had vangs – lines to the peak end of the gaff – which would have aided the trim of the sails, but as there was no way to make these work, and 'dummies' would interfere with the handling, they were left off. I did however attach a great deal of 'decorative' rigging such as the downhauls on the jibs, and all the standing rigging – shrouds, stays and the like – I tried to get as correct as possible. I opted for the older style of square-headed topsail on the mizzen, as per the sail plan of the *Uleila*, and both topsails can be removed completely, if necessary, in higher winds. I used practical but not prototypical small screw eyes to attach lines to spars (see **Photo 7**).

On the water

Having finished all the superstructure and rigging, the next step was to place the model, with sailing keel attached, in the garden pond to check the final trim. She floated exactly level and to the waterline without any further adjustment whatsoever, which was a happy surprise. It was time, therefore, to head to the club for *Jennifer's* maiden voyage.

In a light wind, she handled fairly well, but could not be persuaded to tack, *i.e.*, turn through the wind – changing direction required her to wear ship, turning away from the wind.

A second outing on a somewhat breezier day was a better experience, and she sailed with topsails both on and off, tacking effectively once she had a bit of speed up. She was never as good 'in stays' (tacking) as the topsail schooner, but this was apparently also the case with the real ketches, as reported by Captain Slade. More significantly, the sail winch didn't work all that effectively, or rather it did, up until the point where the cords managed to unwind themselves from the drums and get tangled up inside the hold – a problem eventually solved by replacing the cords with a continuous loop of elastic, tight on the drums. This can slip in a strong wind but is easy enough to pull back into place through the main hatch without the need to remove the full access panel in the deck.

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"I am hoping that this article may encourage others to give it a try. It's really not that difficult"

The finished model is now very pleasant to sail (see **Photos 8 and 9**), though finding a club day with enough, but not too much wind and no rain can be a challenge! Slight variations in the speed and direction of the wind will affect model in ways you simply wouldn't notice on a full-size vessel and, of course, at pond/lake side you may be quite a long way from your boat as well, so the feel of the breeze on your face doesn't necessarily represent surface conditions out on the water. Nevertheless, it is great to watch your creation cruise majestically along on a reach. I am constantly surprised that more people do not build working scale sailing ships, so I am hoping that this article may encourage others to give it a try. It's really not that difficult.

Homage to a harsh historic reality

Jennifer certainly looks the part when sailing. I think of her as a homage to the hard, hard men that worked these little ships before the First World War, hauling cargoes of coal and other materials to harbours and beaches round the West Country with a crew of only three, occasionally taking one extra man on journeys across the Atlantic for the Newfoundland trade in salt fish. In contrast to the aesthetics of the vessels themselves, it was a way of life that had no beauty or romance to it whatsoever and which was finally finished off for good by the war. While I would never want to bring those gruelling working conditions back, I'd would be fascinated to travel back in time simply to observe them first-hand, but the model is as close as I am going to get!

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- Nozzle type: Threaded
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EXCLUSIVE PRIZE DRAW

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Good luck, everyone!

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The Airbrush Company Prize Draw

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Most boot toppings vary in width, unless they go around a hull with almost all vertical sides such as with that of this cruise ship fitted with a duck tail around the stern. You could almost certainly get away with an adhesive tape if you were building a model of this vessel.

Waterline painting workshop

Richard Simpson offers an easy-to-follow guide

One thing that seems to catch newcomers out, and which can end up being very frustrating, is the process of painting the lower hull of a model to the correct waterline. This might involve simply the demarcation between two colours, or it might involve the inclusion of what is known as a boot topping. The boot topping is the stripe down the side that separates the upper hull colour and the lower hull colour and, itself is worthy of a little consideration.

One of the most basic concepts to get your head around in the first place is the fact that the separation between the two hull colours nearly always follows the waterline. This is because the paint applied below the waterline has to have significantly different properties to the paint applied to the upper hull, which is not normally submerged. Traditionally below the waterline could have been an anti-fouling paint that was designed to deteriorate from the surface, thereby not enabling marine growth to attach itself to the lower hull. Unfortunately, these paints also tended to contain chemicals designed to kill marine growth, so their use is no longer acceptable.

The fact still remains, though, that a different type of paint is used below the waterline than above it, so we have a join line between the two, usually at the waterline.

Firstly, let's just be clear about what this waterline is. Any ship, boat or model has been designed to sit in the water in a specific way. Full scale ships vary quite significantly depending on loading, but our models tend to float at the same level all the time. If the ship, boat or model was sat in perfectly placid water and you were to draw a line around the hull at the precise point where the water surface met the hull, you would have drawn the waterline. Most kits and plans will have the waterline marked on the instructions, plans or drawings, although sometimes only at the stem and the stern.

This brief article, then, is intended to provide some understanding of just what we're looking for when we want to paint the hull and produce the join between the two paints correctly. While I am not suggesting the methods outlined below are best or indeed the only way to do things, they work for me.

"A different paint type of paint is used below the waterline than above it, so we have a join line between the two, usually at t he waterline"

Boot topping

Boot topping is one of those subjects destined to create many differences of opinion, most of which seem to be generated by a modeller's ability to A) understand what is going on, and B) apply that to their model. We all have different levels of understanding and ability, so it's important to be aware of this and build our models accordingly. Consequently, some people are happy to apply boot topping as an adhesive tape. This saves a huge amount of time and is significantly easier than masking in two stages and applying three different paints, as well as the fact that the adhesive tape can hide a multitude



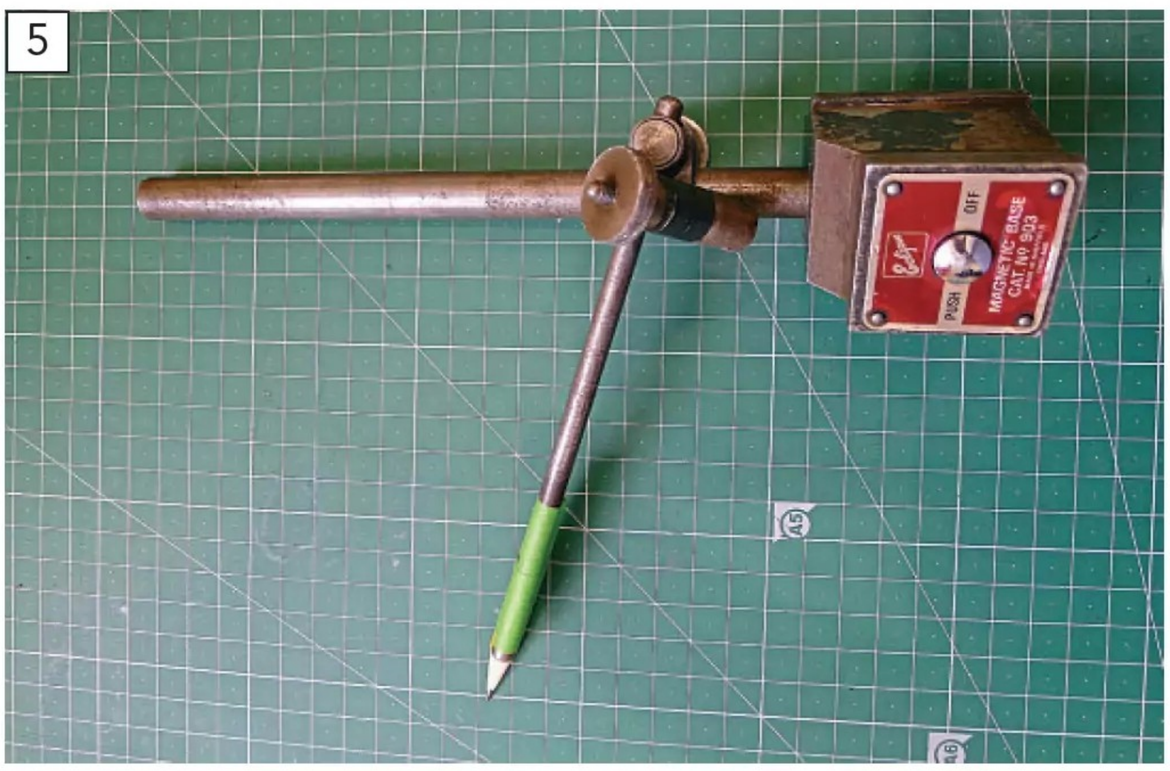
For this model, the upper hull was sprayed, the upper edge of the boot topping was marked and masked, the boot topping was sprayed before the lower edge was marked and masked, and then finally the lower hull was sprayed.



Richard finds an all-over couple of coats of primer sets the hull up for all subsequent painting. Rattle cans make this quick and easy and are the simplest way to obtain a good finish.



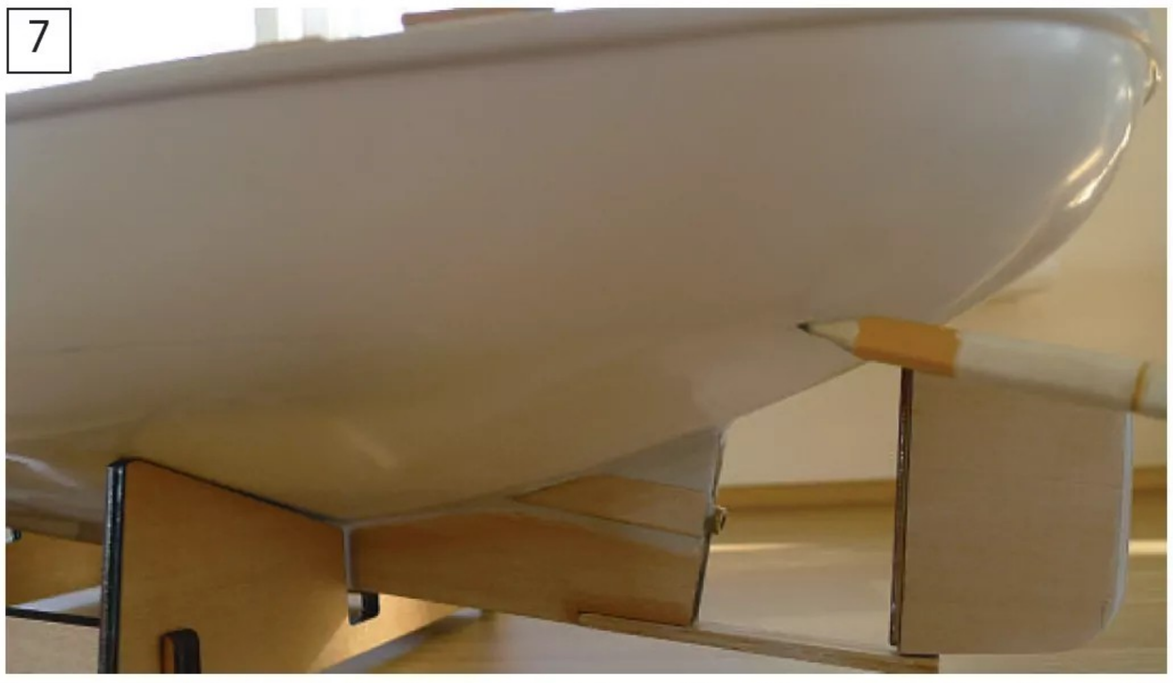
For this model, the upper hull was painted white – again, with a rattle can. Overlapping the lower colour ensures a neat demarcation.



Richard's own weapon of choice is an engineer's dial gauge stand. The pencil is then infinitely adjustable but can also be locked in place – so a perfect tool for this job.



The waterline needs to be marked on the stem post, the position of which is taken from either the plan or the kit instructions. You can even use reference photographs if they are suitable.



The next step is to move to the stern and check the position of the waterline there. You might find that you now need to adjust the angle of the model with packing to get the pencil to meet up with both marks perfectly.

of sins when we didn't quite get the waterline correct. The thing to be aware of though is that the boot topping is usually not a parallel sided stripe. The way to envisage it is as follows… Sit your model boat in the bath and imagine the waterline created. Then apply a small amount of force downwards such that the hull moves down perfectly parallel by a few millimeters and note the new waterline. If the hull has perfectly vertical sides at any point, the most likely being the midship section, then the two waterlines will be parallel at that point. Some ships have an almost entirely vertical hull at the waterline, so the boot topping is very nearly parallel (see **Photo 1**). If you consider the stern however, which may have a significant angle to it at that point, the two water planes are not going to be parallel. So, while applying boot topping with adhesive tape might be quick and convenient, it often won't be accurate.

"While applying boot topping with adhesive tape might be quick and convenient, it often won't be accurate"

I have found over the years that the best way to approach boot topping painting is to first paint the upper hull. Then, draw the upper edge of the boot topping, mask to the line and apply the



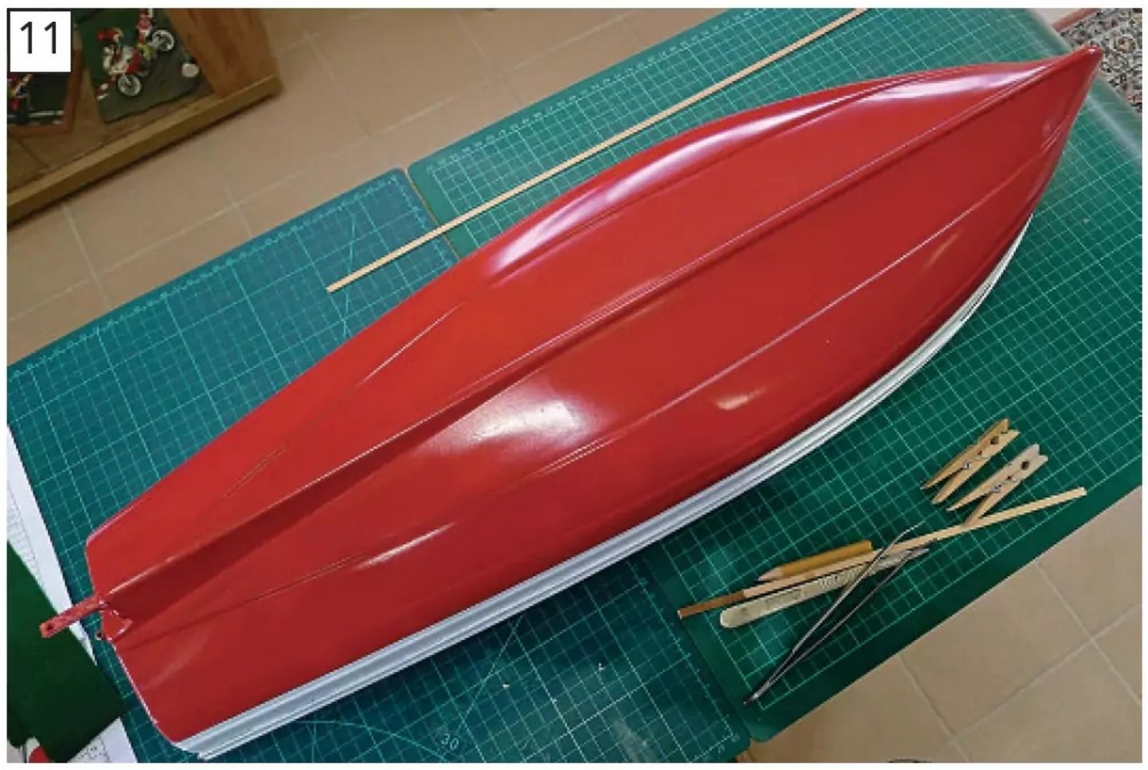
For a fairly straightforward hull a thicker masking tape might do the job perfectly well. Ensure it sits down completely and follows the pencil line perfectly.



If the shape is a little more rounded or there is detail such as planking to deal with, the use of a thinner masking tape might be easier for the first run, followed by thicker types.



Overspray can get everywhere if you're not careful. It is always better to be safe than sorry, so ensure all areas not being painted are well protected.



A couple of dusting coats and then a final heavier one should give you a nice smooth finish. Again, a simple rattle can afforded quick, easy and convenient application here.

"This can be brush painted or sprayed on using either an airbrush or rattle can, but we want the upper hull paint applied with a slight overlap into the lower hull area"

boot topping paint. Finally, draw the lower edge of the boot topping and mask up to it before applying the final lower hull colour. By doing so you will achieve a perfectly shaped boot topping around the hull and neat demarcations at the top and the bottom edge (see **Photo 2**).

Drawing the waterline

Enough preamble, the main point of the article is to describe a method of drawing a waterline that we can then apply masking tape to, so we can apply paint.

After a complete coat of primer (see **Photo 3**), my own preference is then to paint the upper hull. This can be brush painted or sprayed on using either an airbrush or rattle can, but we want the upper hull paint applied with a slight overlap into the lower hull area (see **Photo 4**).

Once the upper hull is painted, the model needs to be set up on the workbench in such a way as it sits with the waterline perfectly parallel to the worktop. It doesn't matter what height, but it must be parallel. It is usually easiest to sit the model in its building stand for this. Attention must then turn to the 'tool' that will be used. I use an engineers' dial gauge stand (see **Photo 5**), simply because I have one, but any means of holding a pencil or pen at a set height will suffice. Some sort of block of wood or metal with a vertical protrusion that a pen or pencil can be taped to works well, but having the height of the pencil or pen tip adjustable makes life a lot simpler. The height of the pencil then needs to be set at the waterline at the bow. The position of this is taken from the plan, instructions or any other reference source you have. Make a mark on the stem post with the pencil (see **Photo 6**) and then move your tool to the stern. Again, find the waterline at the stern from your reference and check that the pencil is still at the same level (see **Photo 7**). It frequently isn't. This simply shows that the model might not necessarily be sitting in its stand at the same attitude as it floats. You may need to adjust the height of the stand at one end or the other to lift whichever may be the lower mark. Frequently you'll find doing this will affect the other end, so this adjusting of the packing under the stand can take some time. You may also need to adjust the height of the pencil during this process. At the end of the day, with the model sat in its stand, you need to be able to slide the tool to both ends, so that the pencil point touches the model exactly at the waterline mark at both ends. During this process, you may also find that you have to adjust the height of the pencil so the angle it touches the hull at is closer to perpendicular. Usually, it's low and pointing upwards to accommodate the angled stern. Once you have that, congratulations, that's the hardest part! The tool is then dragged around the model, gently drawing the pencil over the hull to generate a feint line between the fore and the aft waterline marks. You don't want to apply too much pressure and

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As Richard didn't have a suitable rattle can in the appropriate colour for this one, he used an airbrush. Everything else in the process, however, was approached in exactly the same way.

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Get everything right and you should end up with not only a nice finish but a demarcation between the hull colours that sits perfectly at the water line.

14



There are a couple of ways of drawing a line parallel to the deck, but Richard finds using a pair of dividers with a pencil attached to one arm quick and easy.

15



The result is possibly a little more unusual than the normal waterline paint joins, but it still looks smart.

"Adding too many coats of paint to a masked edge runs the risk of building up a noticeable edge to the paint when the masking is removed"

move anything, such as the pencil height or the model, but you do need to generate a clearly visible line. If the upper hull paint is a high gloss and a pencil will not draw over this, you could instead use a fine marker pen. With one side of the hull suitably marked out, it's time to do the other side. If you can access the other side without moving the model, fine, but if you need to rotate the model do it without disturbing any of the packing that's maintaining the correct attitude.

I hope it is now becoming obvious that this must be done on a clean, clear, flat work surface. If you don't have the luxury of such a surface, then an offcut of a kitchen worktop can usually be picked up fairly cheaply and does the job well.

Masking

You now need to apply masking tape above the pencil line all the way around the hull (see **Photo 8**). If the hull is a complex shape or if it's of clinker construction then a thin masking tape may be required up to the pencil line, with thicker tape and paper attached to that (see **Photo 9).** Great care must obviously be taken to follow the pencil line smoothly while still maintaining a seal over detail. Clinker hulls can, around the stern, prove very tricky and it may take a number of attempts to get the tape to perfectly follow the pencil line. Be careful you don't remove the pencil or pen marking while you are applying the tape, otherwise you'll be back to stage one! Ensure the entire model is protected from overspray with either paper or spare bin bags (see **Photo 10**).

Painting

Finally, you can apply the paint with either brush or spray up to the masking tape. If this is the top edge of a boot topping then it only needs to be painted by an amount just wider than the boot topping, but, if it's the lower hull colour then the entire lower surface needs to be painted, either with a rattle can (see **Photo 11**) or with an airbrush (see **Photo 12**). Some might prefer to apply another coat of primer, but I tend to simply rely on the one all over coat of primer. Adding too many coats of paint to a masked edge runs the risk of building up a noticeable edge to the paint when the masking is removed (see **Photo 13**).

The exceptions

The process described above will work for a good many models and will help you achieve a neat waterline in exactly the right place. There are, however, exceptions. These will be models of boats that do not have a demarcation between the upper and lower hull paints at the waterline.

One such model that I came across was Billing Boats' *African Queen*. Once built, I set this up to paint the lower hull as described but simply couldn't get it to look like the photographs of the model. Then I realised the paint joint wasn't on the waterline, it actually followed a line that was parallel to the deck. This required a different approach. To get this paint line I used a set of dividers with a pencil taped to one arm and dragged it around the hull at the appropriate height to give the required line to apply the masking tape (see **Photo 14**). It was tricky to maintain a consistent height, but I got a suitable line that looked OK when masked and painted (see **Photo 15**).

16



Not uncommon is either the paint join curving up at the bow or, as in this case, the upper line of the boot topping. Apart from the curve in this line, all other aspects of the marking out can follow exactly the same procedure as described.

17



Frequently with older vessels the paint demarcation goes across the rudder and stern frame. This can all be marked out with a pencil before masking and painting to give a perfect representation of the real vessel.

18



Probably one of the biggest challenges you are likely to come across will be a shallow sterned clinker-built hull. The method Richard has described in this article enables you to still get that perfect line on both sides of the hull and a paint line that sits perfectly at the water level when the model is afloat.

19



Some ships nowadays may even have more than one colour of paint below the boot topping. In this case the red is for visible show but the light grey is a resin-based paint that is extremely tough and resistant for underwater protection.

Another exception you may come across is where either the line between the two paints or the boot topping curves up steeply at the stem. This is because, of course, the stem is effectively under water when the ship is underway as a result of the bow wave, as with the fishing vessel shown in **Photo 16**. In such cases, the majority of the waterline can be created using the method described earlier but the rise at the stem must be tackled freehand. When doing this I produce a card template with a datum edge, either on the existing part drawn waterline or even at the deck level, to ensure that the same curve is produced on both sides of the hull.

The bottom line

Painting the waterline is one of those things that can be approached in many different ways but there will always be those who'll tell you that their way is the best. I've come to realise over the years that, invariably, the best way is your own way. Do what you feel comfortable with; do what you feel you can achieve successfully; follow any advice you choose and make decisions that you feel will give you the results you are after.

"It's one of the best methods of dealing with the most complex waterlines… which would be very difficult to accurately achieve in any other way"

There will still be those who prefer to apply boot topping with adhesive tape and there's nothing wrong with that. Being from a seafaring background, though, I tend towards trying to achieve the levels of realism that I've experienced at work. The process above also allows an easy marking out and masking of such complex areas as around the stern of traditional vessels where the paint demarcation goes through the rudder (see **Photo 17**), so it's very versatile. I also tend to think it's one of the best methods of dealing with the most complex waterlines – for example, where there's a shallow stern on a clinker built model (see **Photo 18**) or in cases such as the large cruise ship shown in **Photo 19** where there are two separate and distinctly different paints used below the boot topping) – which would be very difficult to accurately achieve in any other way. ●

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Barges being towed by a tugboat on the River Thames. Photo by David Iliff under Creative Commons license (https://creativecommons.org/licenses/by-sa/3.0/).

Waterways workhorses

Fancy building some barges for your tug to tow? **Eric Belshaw** shows us the ropes…

The definition of 'barges' in the English Dictionary is "*to hurry and push through rudely, or a flat-bottomed boat – from the French 'Baris'*". So, let's push on rudely with this article…

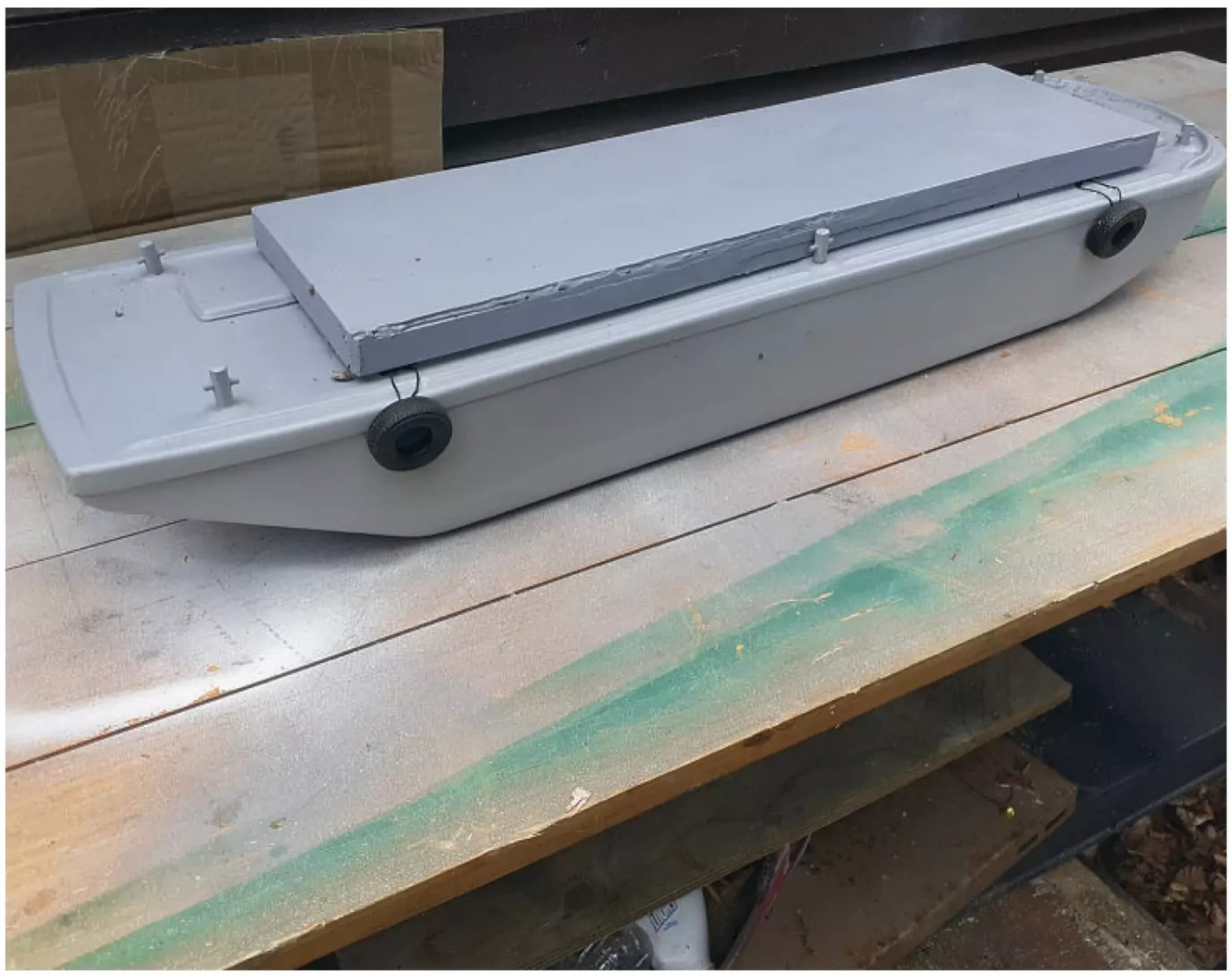
In the May 2025 issue of Model Boats, a reader's letter expressed the desire for a barge, or barges, that his model tug could pull. Well, barge kits are out there. I know of at least two manufacturers, Mobile Marine and Deans Marine, offering these.

But, when it comes to towing barges in multiples, there are some factors to consider…

At a recent boating event I watched a tug towing a string of three barges – with difficulty, the model looking like a duck being followed by its wayward, oversized chicks, or perhaps a loosely segmented dragon. Not exactly seamanlike. So, what was wrong? Well…

1. Individual barges rarely have steering, and certainly no crew.

2. Movement and direction control come from the tug or tugs, so the barge/s must be firmly tied to the tug and each other.



Deans Marine offer barge kits based on vac-formed hulls for fast, easy assembly.



Typical barge to barge lashings.



Alongside tow. Note the fore and back springs and the head and stern ropes with fenders to prevent structural damage.

From as far back as 1820, when steam paddle tugs worked on the major waterways, sailing barges, such as the famous Thames barges and Norfolk Wherries, would be lashed together to form a floating mass that could be pulled against wind and tide by a tug. Indeed, today estuary tugs and water tractors use the same techniques to handle large tankers and bulk carriers that can't manoeuvre easily on their own.

The question is, though, how do we hold barges together when they are not all the same. There are no locking clamps or twist locks like there are on shipping containers and barges have been around far longer than ISO containers anyway. The answer is, we use ropes.

The ropes that go from front to back prevent to longitudinal movement of one barge to the next are called 'springs', and the ones that go side to side are called 'breast' ropes. Within the barge structure these ropes hook onto either single or multiple bollards in a set, which are called 'bits', while the packing between the barges we refer to as 'fenders'.

"If you haven't got a saw, you can use a bread knife but wash it afterwards otherwise your sandwiches will taste peculiar!"

There are, of course, more ropes to contend with when two or more rows of barges are assembled. If you're going down that road, I would strongly recommend further YouTube and Google research.

I found the US Navy 'Guidance for Maritime Towing' Document No SL740-AA-MAN-010 very useful, and this can be found on the Library of Congress site online.

Pulling or pushing

No, we are not dealing with "*hurriedly moving rudely*" here, we're talking about the position of the tug…

The tow rope and bridle allow a tug to steer and change the tension on the individual bridle lines. This means that as the tug moves to the left, the right-hand bridle line will tighten, and consequently the barge/s will also move to the left (to equalise the bridle line tension).

Just as can be seen in Fraser Gray's LV21 lightship article featured in the July issue of Model Boats, in real life, the professionals do it with towing bridles and tugs ahead and astern for manoeuvring in tight spaces.

Now for the 'makey' bit…

I had been given one barge (the Deans' one), so I decided to make some more for myself out of spare material I had laying around (dry wall lining and builders corrugated plastic).

My simple barge design measured 26 inches long by 6 inches wide by 3 inches deep (that would be 65 cm by 15 cm by 7.5cm for the younger generations).

The bow and stern blocks were laminated from the dry wall foam and sanded to shape. If you haven't got a saw to cut the foam, you can use a bread knife, which is just as good, but wash it thoroughly afterwards otherwise your sandwiches will taste peculiar!

The material to make the hull bottom, sides and main deck is 3 mm thick, so the bow and stern blocks both got an undercut 1¼ inches wide on the top, sides and bottom. This made the hull material flush with the finished



Towing with a 'bridle'.



Pushing from astern. Note the two fenders where the tug bow meets the stern of the barge.



Eric's DIY barge under construction.

block shapes while maintaining the 6in x 3in cross section.

Four ½in square wooden spars measuring 15¾ inches long were set into the two (bow and stern) end blocks at 13½ inches apart, one spar at each corner.

A corrugated plastic wrapper (cut to 15¾ inches by 16 inches) was folded around the block and spar assembly to form the outer skin of the barge and complete the hull. 6 inches across the bottom, 3 inches up each side and 2 inches were folded across the top at each side, to form the deck. The wrapper overlapped each end block by 1 1/8 inches and filled the undercut resulting flush sides and bottom.

When sanding the bow and stern blocks, I copied the shape of the Deans' kit-built barge for uniformity, with the sloping bow being slightly tapered and the less sloping stern partly rounded. I used Urethane glue for this assembly, not quick, definitely messy, but the end result is superbly stiff and strong.

I added a 6mm combing measuring 4 inches wide and 15½ inches long, with mitred corners, to each barge as a hatch seat. The excess wrapper inside the combing was cut away to provide access for the necessary weights. I added a cross piece on the inside at the bottom roughly halfway between the block ends to provide extra stiffness

A waterproof skin is necessary to protect the soft foam, so I copied a scenery making process I use when model railroading. I covered the hulls with matt emulsion paint, and then, while the paint was still wet, introduced a layer of newspaper kindly provided by our free local rag.

I had to work quickly as the heatwave we were experiencing was drying the paint before I could get the paper on and wetted.

This method is close to papier-mâché but using emulsion paint instead of wood glue. It creates a tough shell, and it's very durable when two or more layers of paper are used. I was going to use fibreglass cloth, but I didn't have enough to do both barges.

I should point out, putting the paper on the hull is a very 'hands on' process, so if you use this technique don't expect to remain clean!

With the two hulls papered, emulsioned and finally varnished, they were hung out to dry on our redundant bird feeder.

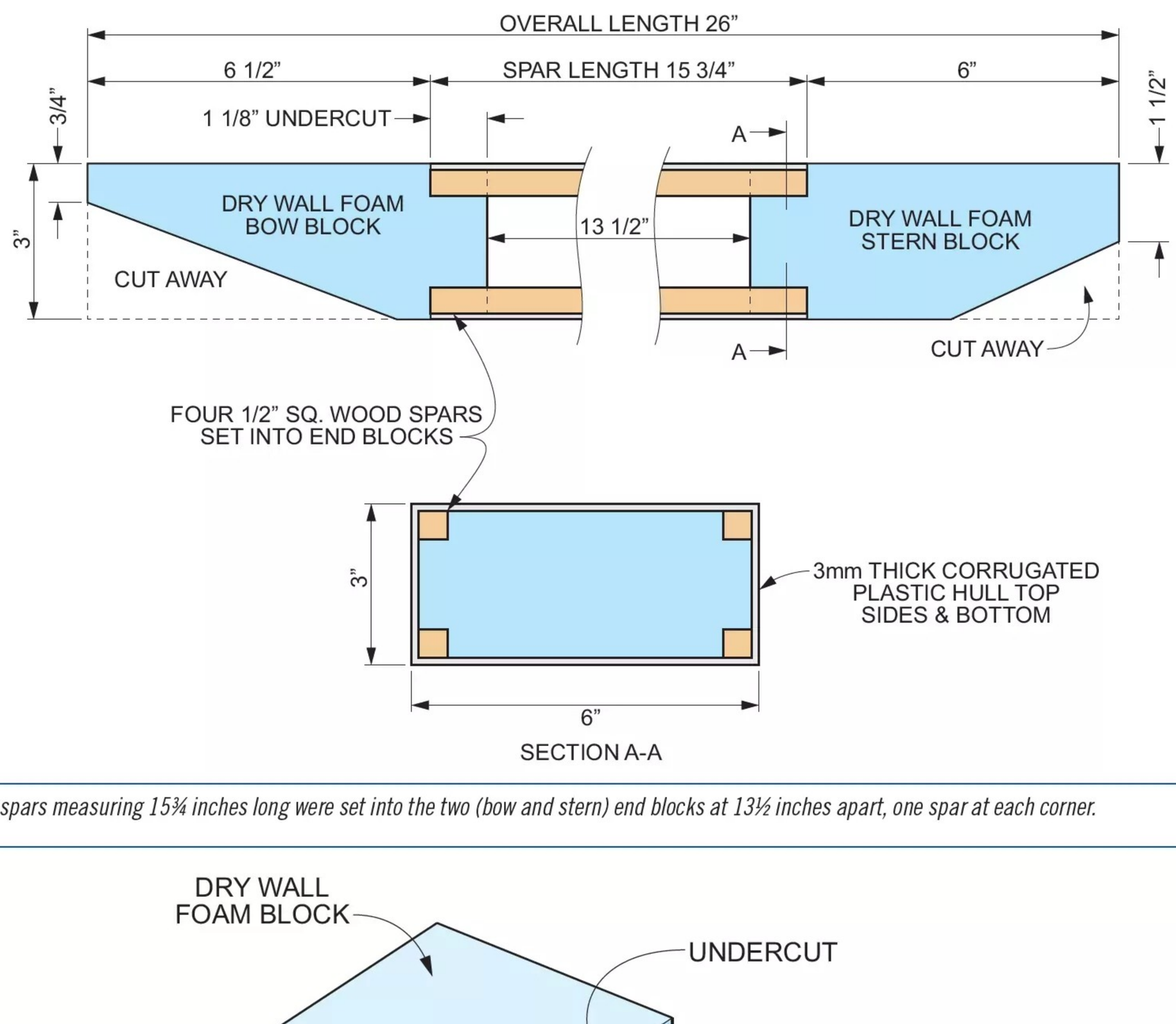
After a few days, once all was dry, the bollards (8mm dowel, with a 3mm skewer cross tee fitted to a hole 5mm from the top of the dowel) could be



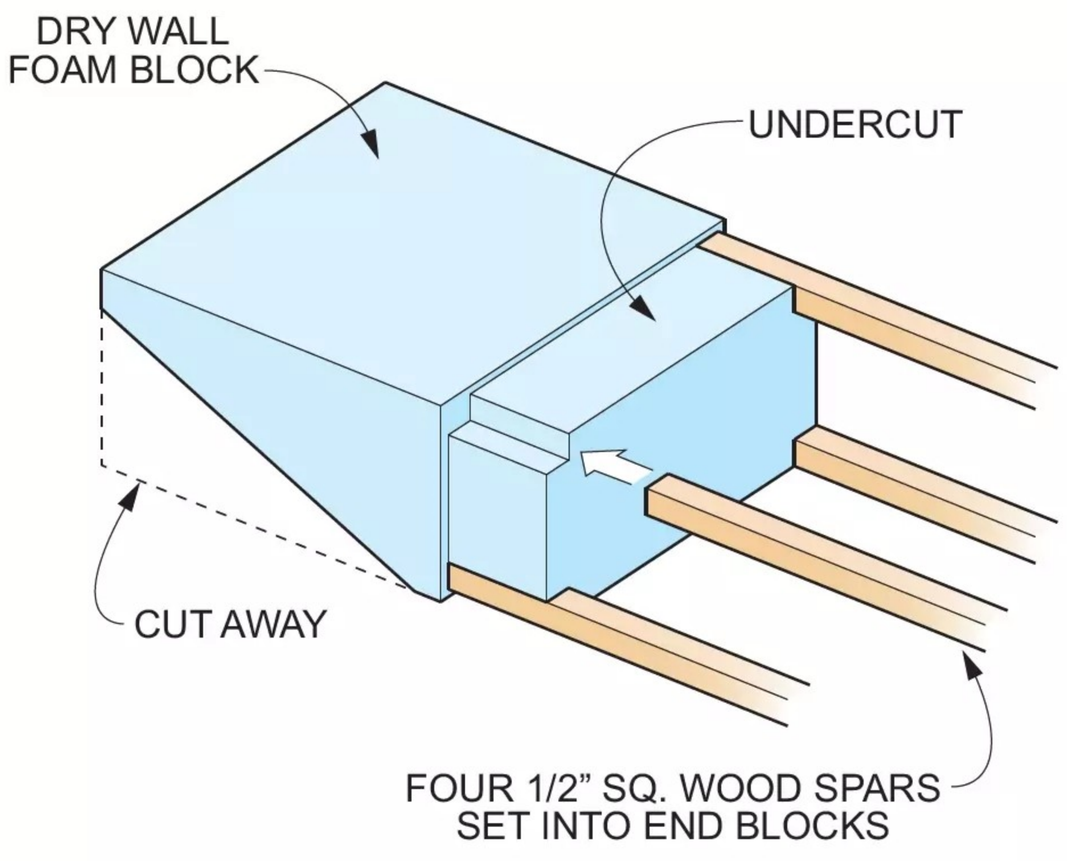
Bow block (6.5 inches long).



Stern block (6 inches long).



Four ½in square wooden spars measuring 15¾ inches long were set into the two (bow and stern) end blocks at 13½ inches apart, one spar at each corner.



The bow block with undercuts and spars.



Odd looking water birds on the feeder!



Paper and paint being applied.

added. I used 35 mm long pieces, six pieces in all for each barge, glued into 8mm holes drilled in the deck. Positioning the bollards was done by rule of thumb, with the first put in situ acting as a guide for all the others.

Painted

On completion, these barges sat *on* the water, not in it, so some ballast was required. All I had to hand were some broken house bricks, so these I cut into 200 to 500 gram weights for the barges.

When these ran out, I grabbed some empty ½ litre water bottles to insert in the empty space in the barge hull. I had to dig some of the foam out of the bow and stern blocks so that they would fit easily and securely.

String and scale

For the barge lashings I used common cotton string so that the line paths could be easily followed in the photos taken for this article. But, of course, if this is a project you're intending to undertake, the tow rope you'll need will depend on the fitting sizes on your tug and barges.

My barge dimensions are good for model boats from 1:50 to 1:20 scale, but it should be easy enough to ratio these dimensions if you want something smaller or larger.

Operational considerations

When you lash your barges together, they will be heavy and unwieldy. I conscripted a mesh type garden tray



Awaiting paint.



Painted.



Brick and water bottle ballast.



The tug Oncor with tow rope, bridle and barge quartet.



Pusher tug No.3 roped to the barge quartet.

to launch my barge and pusher tug configuration. Getting it out of the water meant unlashing the tug and lifting it out separately, then releasing each barge and lifting them out individually too.

Towing is easier, as fitting the bridle can be done while your tug and barges are in the water by hand tying the tow rope to the King post or by dropping the towing eye over the deck hook.

Follow up

There's a club called Jersey Model Tugs that specialises in model tug towing and the photos and video footage posted by them on Facebook are always worth a watch.

I, too, have posted some pictures and videos on the Alvaston Pirates Facebook page showing the two configurations working on our lake to support this article. If you're already operating such a set up, it would be great to see some photos in the 'Your Models' section of this magazine. ●

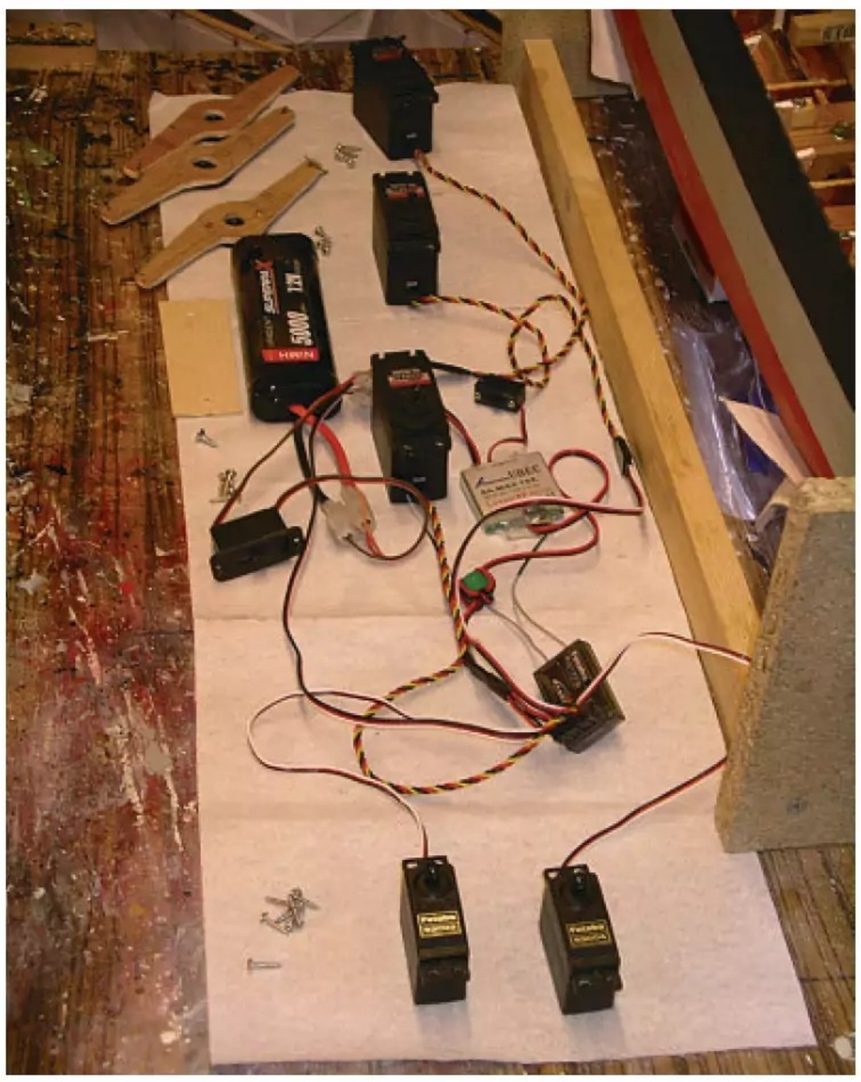
~~Zen~~ Despair & the Art of Model Boat Maintenance

Are you a technical god? If not, **Nev Wade's** analysis of the fault finding/problem resolving trials and tribulations faced by the rest of us mere mortals may well strike a chord!

Some people are just technical gods; up to date on all the latest devices, fazed by nothing, and any type of failure seems to be grist to their mills. They aren't in the least vindictive, nor do they exhibit any pleasure in others' problems – on the contrary, they will move heaven and earth to help the technically challenged, like me. They revel in all the glitches that come up at the side of the pond; clearly finding joy in rolling up their sleeves, opening cavernous toolboxes, and setting to work to get the show back on the road (or perhaps that should read water). I'm not in envy of them, but I do marvel at their abilities. Long ago, one such local practitioner had me offering to send him to the other side of the pond while I sabotaged the inner workings of his boat, just so he could then have the pleasure of fault finding (oh, the fear that that small expression generates in one such as me!) and fixing the damage! But this piece isn't about such gods, it's about what the rest of us face when *we* set out on a quest for technical enlightenment.

The moment of truth

It's a bright, sunny day, with a lovely, constant breeze. Your pride and joy is sailing itself, beating across the pond, while you contemplate the infinite. You charged up the battery overnight, checked that all was well before you launched, and so have settled down for a pleasant morning. As your boat approaches the side of the pond, you put the helm over and prepare to return on the other tack. **NOTHING ... NOTHING!!!** Your fingers frantically operate all the sticks in disbelief; you must be imagining it! **STILL NOTHING!** And then, with all control lost, the boat ploughs straight into the bank. Obviously, it has to come out of the water. You know you will have to take the hatches off but, even if you built the boat yourself, you fear the confrontation with technicalities that is to come. And, sure enough, once the hatches have been removed, it's all there, grinning at you, daring you to pit your flimsy knowledge against the physics 'under the bonnet'. Somehow, you just know that it won't be an obvious wire off, repairable in a moment, job; it will be a 'Blighty



These are the typical innards of one of Nev's boats, no great complexity when compared to some, but quite enough when seen through small hatches.



Like all the little components in a watch just after you let go your grip on a spring, here are the innards that escaped onto the deck. In those days Nev used an ESC in the circuit – he can no longer remember why!



The deck of Potosi, built to 1:116 scale, while she was being converted from 40MHz to 2.4GHz control. This turned out to be even more 'fun' than usual, as trying to gain access while negotiating the shrouds in such a small space proved especially fiddly! The size of the 40MHz receiver will give you an idea of the space available.



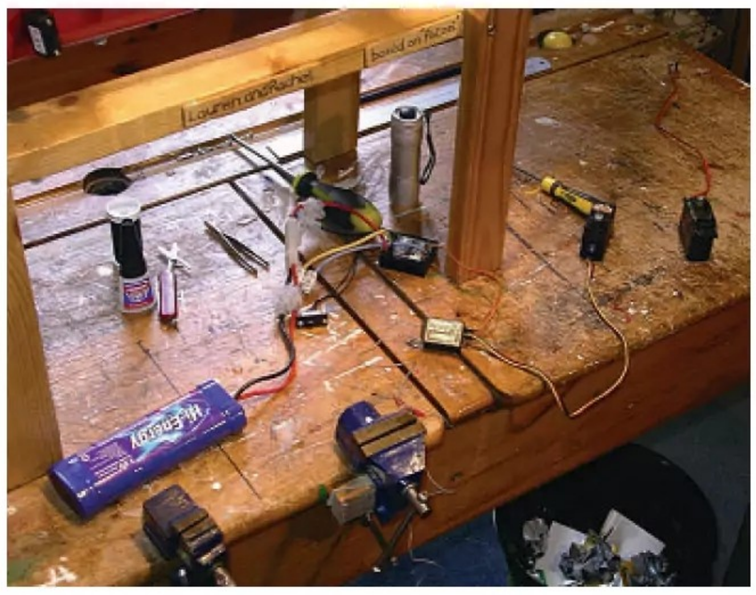
The same model, after Nev had fought to take out the receiver, and the leads to it that Nev had to, albeit belatedly, identify. A servo is lurking below.

wound' that will have all comers proffering advice before it finally leads you to wend your weary way home in the search for solutions.

Tears before, during & after bedtime!

It's not so much the actual electrical theory that bothers you. You probably know that V = IR; it's just that it never seems to be that easy. Connections will be tested for tightness, batteries will be re-charged 'just in case', but it still won't work. It's at this point you know that your worst fears have been realised: you're going to have to 'fault find' (that dreadful expression again).

A technical god would have a meter, a light on a wire, or something, that he could connect to a pre-installed point, conveniently situated in the wiring near the surface of the boat's innards. Some gods can even perform the mysterious rites of telemetry. These gods know what's broken down before it actually happens and they have digital readouts to direct them to the source of the problem.



Nev's test circuit, simply cobbled together from what he had to hand. This was where some of his tension laden 'trials' would take place

You, on the other hand, will have to work things out by a process of elimination, this involving taking out one component at a time so that you can try replacing it with a spare until you find the offending part. You'll end up with the wiring of the boat laid, like the innards of a butchered chicken, all over what you laughingly call your workbench. You'll be aware, of course, that before you start you should identify all of the individual wire ends so that you'll know what needs connecting back to what, but infernal optimism will intervene, and you'll not do that until you're in a complete mess! Almost the worst part is that you probably won't have the spare bits required without cannibalising one of your other boats, meaning, inevitably, that this will quickly turn into a 'two chickens gutted' game.

If you've been very fast, you'll have reached this point on Day 1. That is progress, but it comes at a price. It means you'll have to sleep on it. That sounds like a good thing, and, almost invariably, it is.



This tranquil close-up of Penang was taken before battle, due to a fault that shut down the power to the whole boat after sailing for ten minutes or so, commenced.



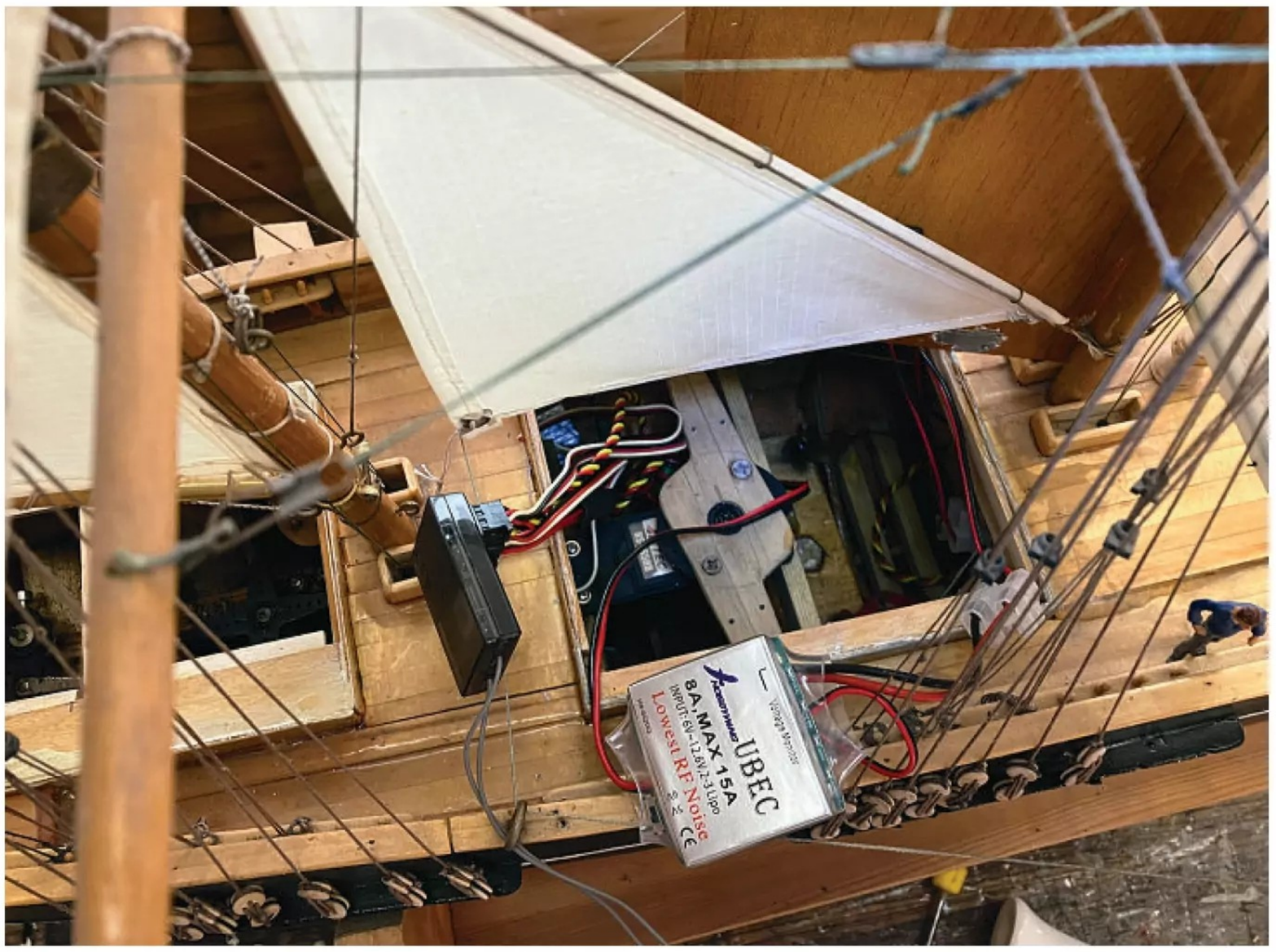
The carnage strewn battlefield. If you can bear to, look carefully; you'll see the whole sorry business, from deck furniture (such as ships' boats) to wiring and tools. A depressing sight if you're not a technical god.



Below decks of Penang before an investigation was started; as you will see, at this point everything is still crammed in (fairly) neatly.



The entrails: anticlockwise, from the bottom left, UBEC, receiver and battery, unearthed and ready for one-by-one substitution. A trial sail was required after each change, which took two weeks. It turned out to be the UBEC, in case you're wondering.



Joseph Conrad, with what turned out to be receiver trouble.



Nev's five masted barque, Potosi – the model shown undergoing surgery to convert it from 40MHz to 2.4GHz in Photo 3.

The trouble is, sleeping on it entails your sub-conscious getting involved, and that's when you'll realise that what you may previously have considered 'only model boat building' has become so much more than that. Just like paying the mortgage, dealing with your rebellious teenage children or changing jobs, it's become something else to worry about. You'll be thinking of it as you try to go to sleep. After you've gone to sleep, it'll wake you up again. If you're lucky, a solution will occur to you, but, unless you're prepared to get up at three o'clock in the morning and see if your idea works, you'll have to contain yourself into Day 2, and that'll cost you more sleep!

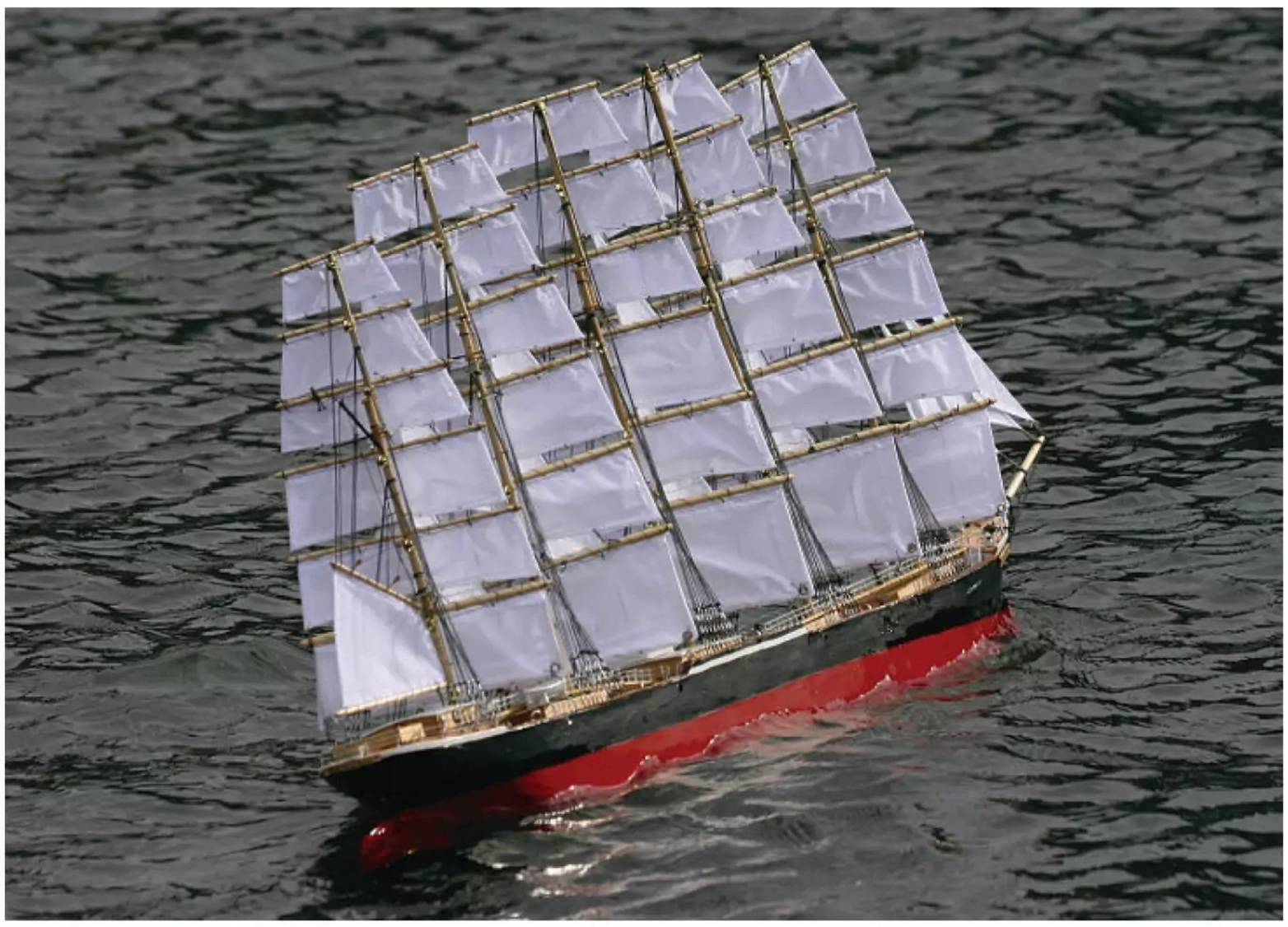
During Day 2, you'll apply the inspiration that came in the night. If it works, you can return to normal life, if not then it becomes like a video game, you 'go to the next level' of difficulty. You start to imagine the future laid out in front of you, endlessly chasing the solution to the problems of your failed boat. If nightfall on Day 2 arrives with you in this position, you may be in for a worse night than the last one, as this time you won't even have made the start that you did yesterday.

Sometimes the night will pass philosophically, and you'll sleep. Sometimes you'll have that *eureka* moment. More often, however, the possibilities swimming around your head will make it impossible to mentally switch off. Having already carried out lots of uncomfortable fiddling around inside the boat, trying different bits, all to no effect, you may decide your next move will be to set up a test circuit on your workbench/table so you can alter things more easily. That kind of conclusion can offer some comfort, finally permitting you to succumb to exhaustion in the full of hope of success tomorrow.

In the worst-case scenario, you'll find you have some kind of issue that



Potosi, now doing well under 2.4GHz control.



The five masted full rigger, Preussen.

that isn't going to reveal itself on the bench, only on the water. If you've been there, you'll know this just prolongs the agony, because, however much time and effort you spend on theorised solution/s, it might be days before you can return to the pond to test out whether you *have* actually resolved things – think of all the potential for lost sleep now!

In and amongst all this will be the work on the boat itself, trying to stuff your fingers down through open hatches to reach connections and screws. This is the moment when you'll remember all those powered models you've seen, where the superstructure can be removed to reveal beautiful, easily accessible, wiring looms. It's not like that on my boats. Access is via small hatches and wires have to be lassoed and recovered from behind all the other components that are down there in the stygian gloom. (You can end up holding small metal torches in your teeth to help with this, but I don't recommend it). As with wires and string the world over, if they can fall one way or another, they'll pick the difficult way, where you'll have to dismantle half the boat in order to reach them. The screwdriver access that you so carefully built in, now turns out to need your wrist to be double jointed! During a lull in your growing frustration, you'll gaze at the wall and contemplate throwing the whole lot into next door's skip.

So, the days will pass… If you're lucky you'll find someone who actually knows what they're talking about, and who is able to offer some guidance on what to buy/throw out/turn the other way round/change.

Hopefully, one day you'll get there and be able to return to the pond to



Preussen romping along, just the kind of moment when it all goes wrong!



The boat that had the faulty UBEC, Nev's barque, Penang.



Penang, enjoying good wind on a sunny day.

resume your meditations. Scarred by the experience, you'll be a sadder yet wiser man – perhaps even a seer, able to help others as if you, too, have evolved into a technical god.

The role of the manufacturer

Manufacturers of radio and associated equipment are *the* technical gods of the technical gods. It is they who have enabled our hobby to reach the heights of ingenuity that it has, but (there's always a but, isn't there?) don't they make life difficult sometimes?

You and I build boats, but all the radio equipment I installed (ten years plus ago) appeared to have been designed for aeroplanes. When the time came to change from 40MHz to 2.4GHz, which I thought I really ought to do on all my boats, I found this, too, seemed to have been developed with 'planes in mind. A typical example is the 2.4GHz receiver, which has a kind of 'failsafe' that automatically puts the throttle channel on a 'plane to idle at certain times. When used for my sailing ships it put the main mast yard control into all kinds of confusion, until I fitted a UBEC (Ultimate Battery Eliminator Circuit) after being advised to do so by a technical god. Nobody tells you about this kind of thing, you simply have to wrestle with it after you've bought £150 worth of stuff!

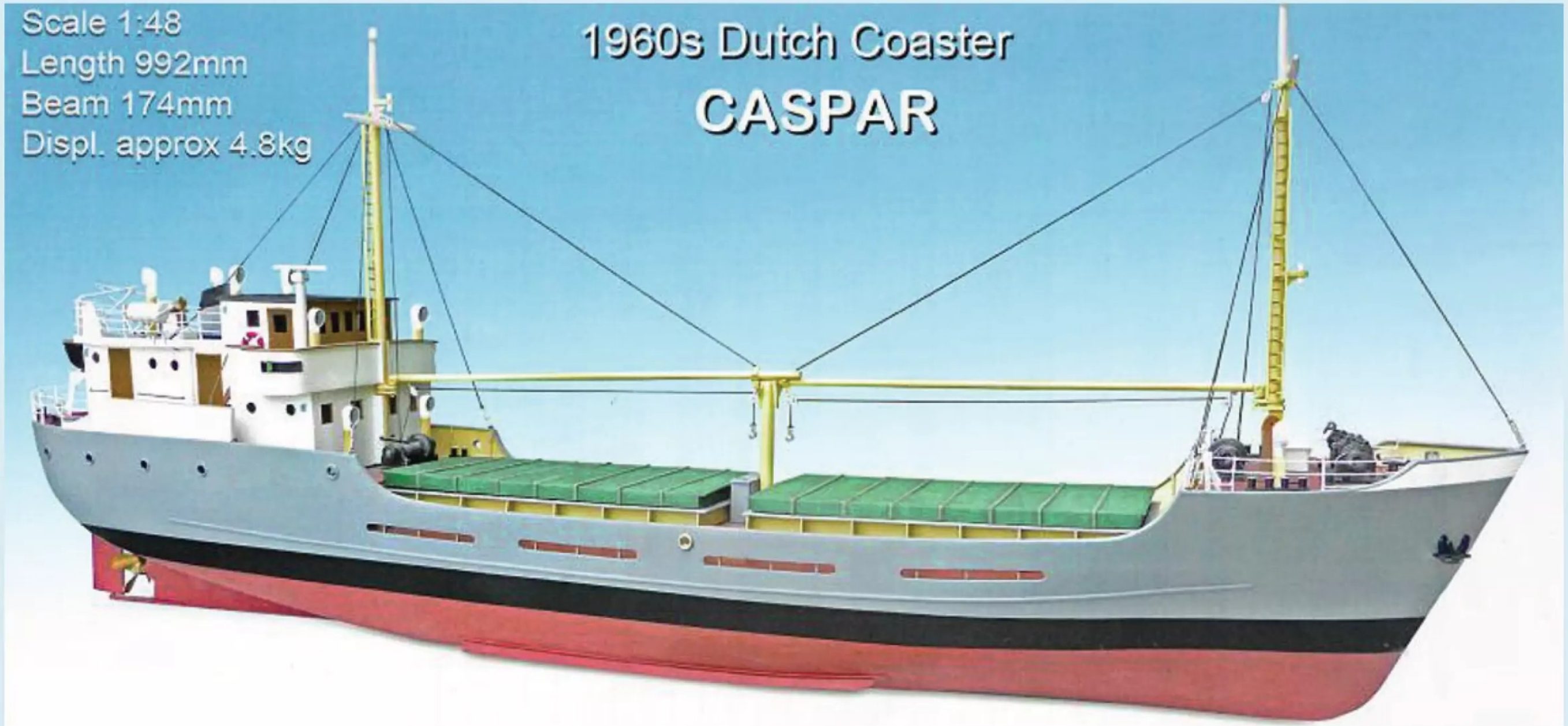
If you take the line that 'you'll stick with the equipment you know', you'll find it's out of production, so you'll have to buy the latest offerings on the market, whether you like it or not! In my case, that's recently resulted in the purchase of radio gear that required its transmitter set-up to be tackled via an app on my iPhone! Why?!

In the lap of the gods

So, what advice can I offer? Take heart. Just do it. Jump in at the deep end. You've nothing to fear but fear itself – except, of course, the nights of tossing and turning, wishing you were a technical god! ●



This is what makes it all worthwhile, the four masted full rigger, Peter Rickmers.



This attractive model is a representation of a 512ton general cargo motor vessel built in the Netherlands in the early 1960s.
There have been many vessels built to this basic design so you can invent your own colour scheme.







The kit is to the usual high standards and includes building manual, GRP hull, lifeboat, other materials; CNC cut styrene decks and superstructure, full size plan, resin and white metal fittings.

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BOILER ROOM

Richard Simpson revisits the subject of oils and lubrication, and flags up a potential game-changer…

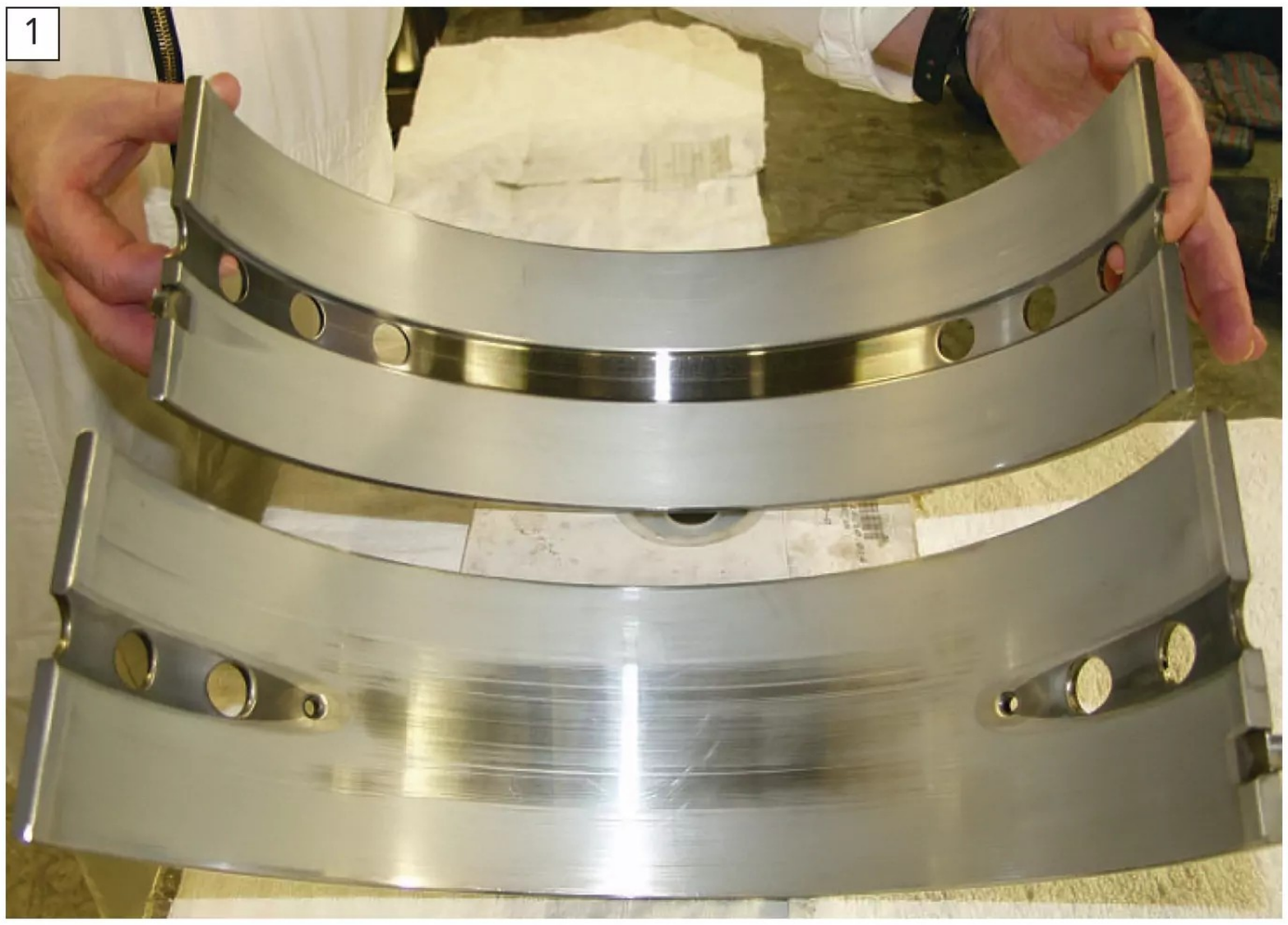
While I try to ensure that the subject matter of the Boiler Room articles remains fresh and interesting, there always seems to be one or two topics that recur quite frequently during pondside conversations and so perhaps merit revisiting occasionally. The obvious one is 'The Rules', but rest assured we're not going there again this month.

I consider myself very lucky to have gone through a marine engineering training system in the days when the course content really was superb, and we enjoyed the luxury of looking at many and varied associated subjects. One of these was tribology. The name immediately commanded our interest! While there are many definitions of tribology out there, a fairly accurate one is '*the science and engineering of understanding friction, lubrication and wear phenomena for interacting surfaces in relative motion*'. As this includes lubricants, obviously in our own specific area of interest this is oil. As with most things, I am still learning and discovering new things about oils all the time, so I hope some of you might find what follows interesting.

A little theory

As the different types of lubrication don't really play much of a part in our model steam plant, for us the bottom line is that there are two basic categories. These are 1) Hydrodynamic, where an oil wedge is created between two rotating parts such as rotating shafts in bearings (see **Photo 1**) and 2) Boundary, where the parts move together slowly and so rely on the properties of the oil to keep the components separated, such as a screw thread, gears or a lathe slide (see **Photo 2**). There are also many applications that use a combination of the two, such as oscillating shafts, oscillating cylinders and engine cross heads, which all move quickly as well as being completely stopped during normal operation. So already we are

1



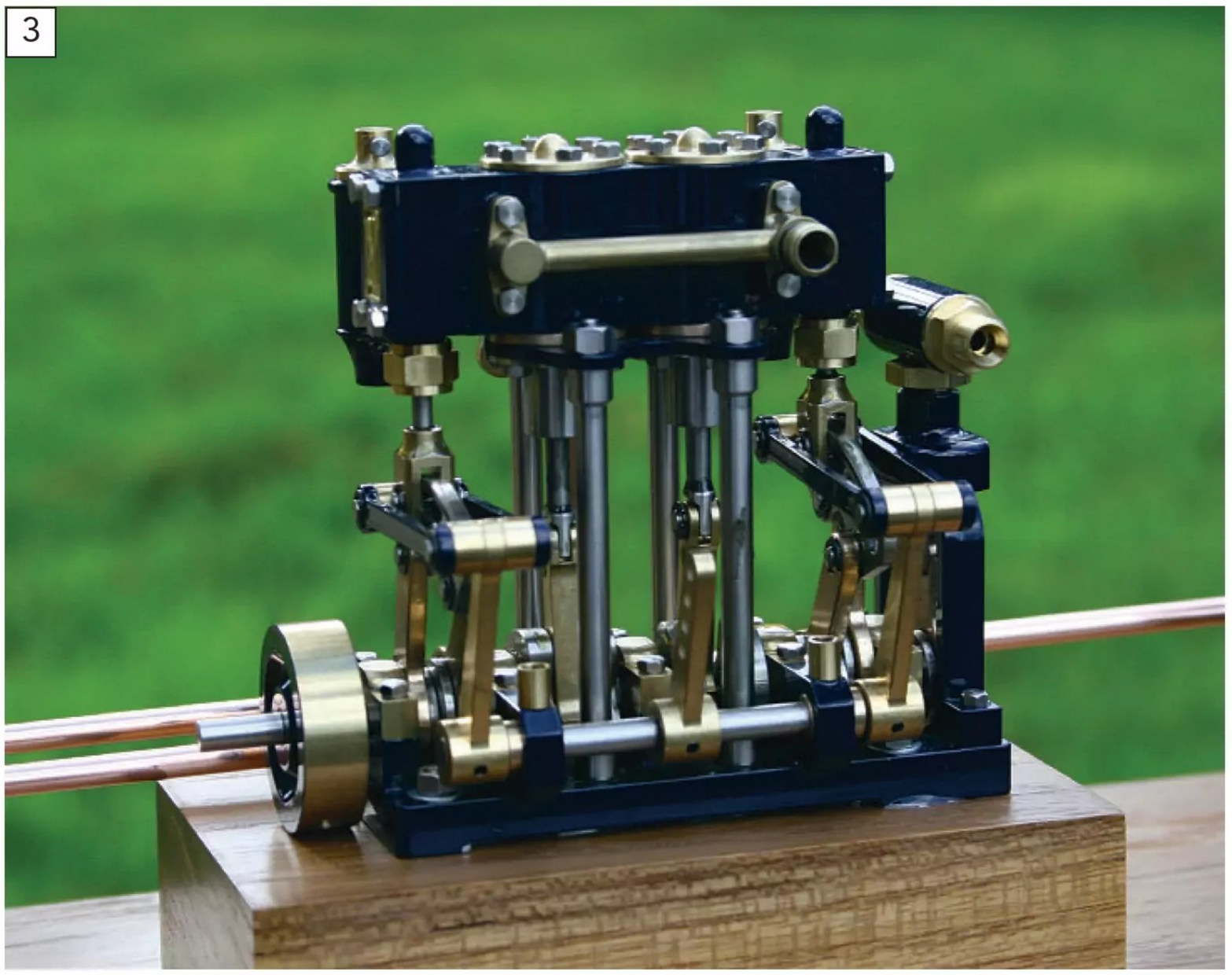
Large size white metal bearings only have a very thin coating of the white metal. The shaft and bearing are kept separate by hydrodynamic lubrication to ensure long service life. These full-size marine engine bearings have done 12,000 running hours.

2



Boundary lubrication is where there is little movement between the parts, so the separation is directly related to the physical properties of the oil. Examples would be screw threads, the slide faces and even the gears in the gearbox on this lathe.

3



On a single marine engine there are various requirements for different types of oil and even for both boundary and hydrodynamic lubrication, usually requiring two quite different oils.

4



A typical 10-40 motor oil is a fairly safe option for external lubrication, but a slightly lower viscosity would be just as good while giving slightly less resistance.

seeing that an oil has to meet more than one operating criteria. When you start to look at the other possible properties that we find in, say, an average vehicle engine oil, such as detergents, dispersants, anti-oxidants, anti-wear agents, anti-foaming compounds, friction modifiers, *etc*, it is easy to see how confusing it can all become. This is where the misinformation starts to creep in, as details often get inaccurately passed on verbally, to the point where wrong/bad advice is given. I'm not going to dwell on the dangers of listening to those who advocate, "*Don't worry, it's all the same stuff*", but, for many reasons, invariably it isn't. I have even heard stories of people recommending the use of chain saw oil for steam engines, which is about as far away from "*the same stuff*" as you could possibly get!

Our requirements

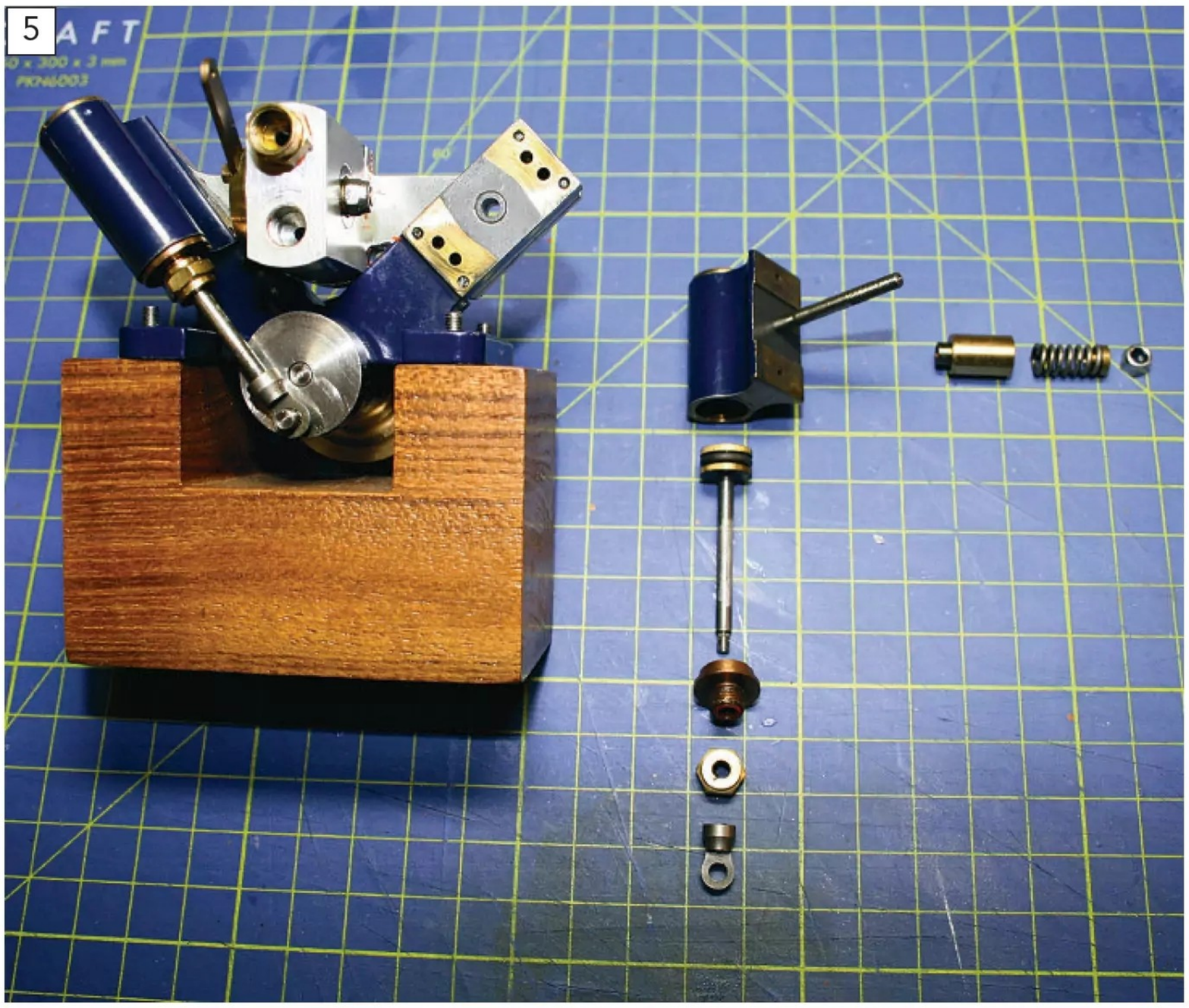
When it comes to steam modelling, we need to consider two different types of oil, mainly because these two oils work under totally different conditions. The first is the oil that lubricates the piston in the cylinders, commonly known as Steam Cylinder Oil, or SCO. This has to work under conditions of high temperatures as well as having to resist the scouring effects of high pressure wet steam trying to remove it from the cylinder. Don't forget wet steam is a very effective cleaning medium! The oil will therefore be of a higher viscosity at normal temperature so

"When it comes to steam modelling, we need to consider two different types of oil, mainly because these two oils work under totally different conditions"

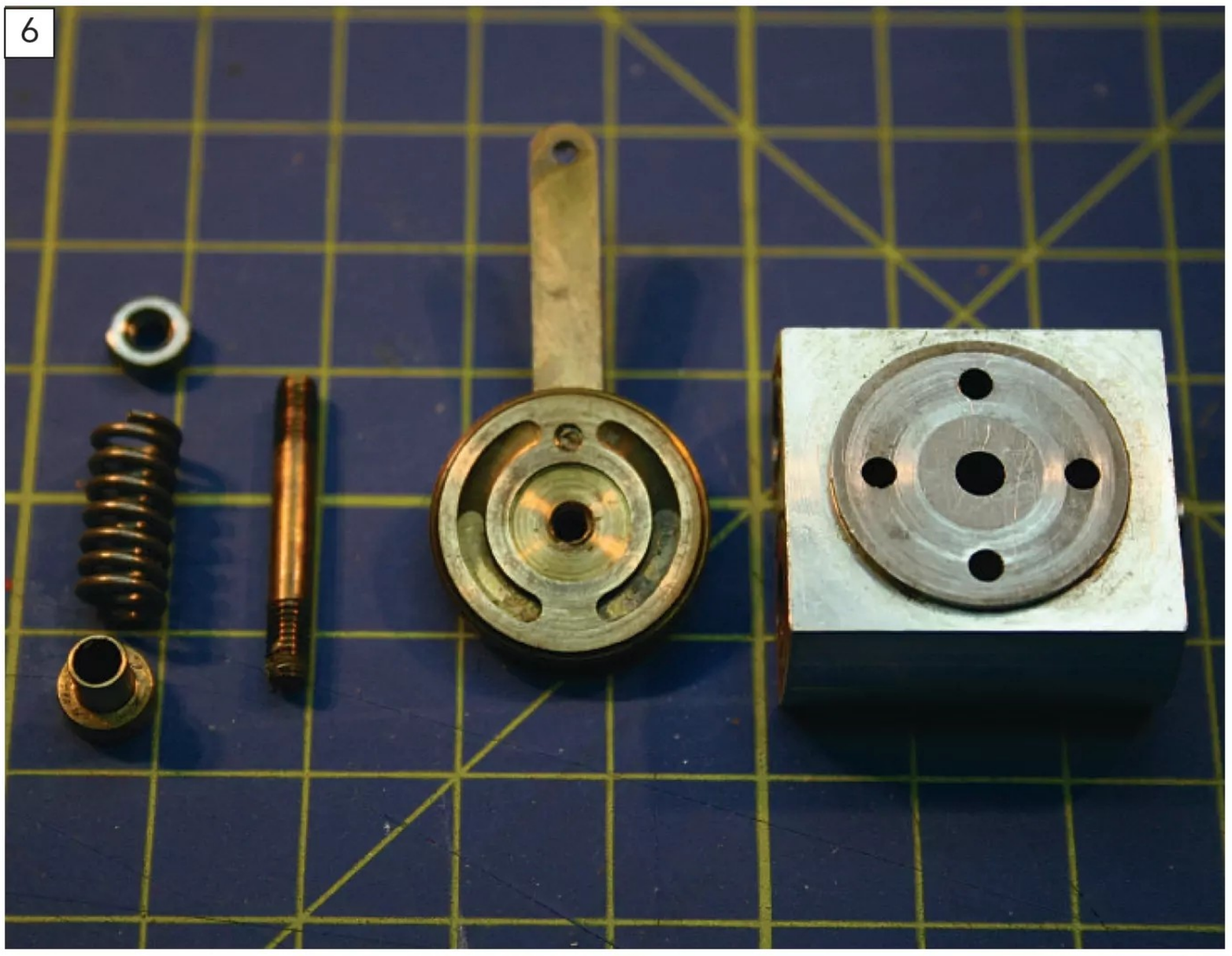
that it's of a more acceptable viscosity when at operating temperature. This oil will be administered to the cylinder, do its job, then be removed in the separator afterwards. It will be required to meet a combination of lubricating categories, as we're looking at boundary lubrication at the top and bottom of the piston stroke and hydrodynamic lubrication in the middle of the piston stroke. The second oil we need to consider is for the external surfaces of the engine, such as bearings, crosshead slides, glands, sliding linkages, *etc*. These operate under much lower temperature conditions and oil is usually applied to the parts that required lubricating externally using an oil can, syringe or oil pen. This oil will be of a much lower viscosity at room temperature, as its temperature will be increased by a far lesser degree. So, on any single steam engine (see **Photo 3)** there will be a distinctly different requirements for the two types of oil.

External oil

Let's first of all then look at the possibilities for the external oil. For many years I have been happy to use common or garden motor oil to lubricate the external surfaces of my engines (see **Photo 4**). I still don't think there's much of a problem with this; however, a recent conversation with a model marine engine manufacturer led me to think that perhaps the viscosity is a little on the high side. Care, however, must be taken when considering a lower viscosity oil, as this must have the lubricating properties necessary to protect an engine. Balanced against this is the consideration that a higher viscosity oil will actually create a greater resistance to movement, so will potentially increase your steam consumption for a given output. Consequently, I would be cautious about using a very light lubricating oil such as that used for a sewing machine, pushbike or OO gauge model railway lubrication, but perhaps a lower viscosity motor oil would be suitable. While any average motor oil you have laying around would be a reasonably safe bet, a more freely rotating engine might be achieved with an oil of slightly lower viscosity. It's worth remembering as well that while the external temperatures of the engine are significantly less than the cylinder temperatures, they're still elevated, and most motor oils are designed to accommodate this. Such an oil can easily be decanted into a small syringe or an oiling pen and kept in the tool box. As regards frequency of application, this tends to be determined more by experience/trial and error. I tend to oil everything thoroughly the night before a sail and that seems to keep things suitably lubricated without too much mess.



Internal surfaces for the SCO to lubricate would be the cylinder and the port faces on this typical 'V' twin oscillating engine.



Frequently though, the steam control valve might also have rubbing faces that the SCO is required to lubricate on its path through the engine.

Internal oil, steam cylinder oil, SCO

We now come to a point where most of the confusion arises, often resulting in misleading, if not actually incorrect, information being given. The bottom line for me has always been that my engines are valuable and precious, so why on earth would I want to skimp on the cost of the oil? SCO is designed and made for the job and meets all the criteria for its operation. I have even heard that as steam dies out as a mainstream engineering power we will not be able to buy SCO anymore. That couldn't be further from the truth as steam still is, and always will be, used in laundries, breweries, kitchens and many manufacturing processes, so a steam resistant lubricant is always going to be needed. In fact, many oil manufacturers still have specific SCOs in their catalogues in a selection of different viscosities.

"Just a word of caution here…"

I think the biggest challenge for us is to consider which SCO will be the best fit for our models, bearing in mind here that internal lubrication involves the piston, cylinder and, in the case of an oscillator, the port faces (see **Photo 5**) and, with many engines, the running faces of the steam control valve (see **Photo 6**). Part of the problem is that there tends to be far more advice out there for model engineering/model locomotive users, and so the model boat users can become influenced by them. When it comes to SCO, this tends to be available in viscosities quoted as ISO grades at 40 deg C of either 1000, 680 or 460. I have even seen an example of ISO 220 available.

ISO 1000 (see **Photo 7**) is a very thick oil at normal temperatures and while capable of maintaining its properties at the high temperatures found in larger superheated steam engines may not be the best for our model boats. When I first started playing with steam engines, many years ago, I initially used an ISO 1000 oil, and I know there are a number of steamboat modellers out there who still use it. But, while the 1000 oil offers a high level of protection, it also has a high level of resistance and will slow an engine down as it cools and increase steam consumption. It's very difficult to remove from the separator, too. Being so thick at room temperature, it takes an age to get it into a displacement lubricator; its viscosity makes it almost impossible to decant into a syringe and, believe me, you'll lose the will to live trying to get it out again!

A bit of research many years ago led me to consider trying an ISO 460 grade SCO in my boat engines (see **Photo 8**). At the relatively lower temperatures my engines operate at, this has proven to be a much more effective oil. For a start, it can easily be handled and decanted into a syringe for easy filling of the lubricator. It is also significantly easier to get out of the separator after a run, and it does a perfectly good job of lubricating the cylinders.

Just a word of caution here: it is not uncommon for a marine plant to be fitted with what may be misleadingly referred to as a superheater. This is nothing more than a loop or a coil in the steam outlet pipe from the boiler that is passed through the exhaust of the boiler. These should not be

7



Richard initially used an ISO 1000 SCO, before realising that this was best suited to high temperature and high-pressure engines powered by superheated steam. This is too high a specification for most lower pressure and temperature engines.

8



For many years now Richard has used an ISO 460 oil, such as this example supplied by Miniature Steam. This little bottle came as a sample supplied with an engine but it can also be purchased separately in larger quantities.

considered as a superheater as the temperature of the boiler exhaust is not high enough to take the steam up to the dryness fraction that would be considered as superheated. It can at best be described as a drier. Consequently, model marine plant would very rarely be considered as using superheated steam, so the temperature requirement for the SCO is nowhere near superheated temperatures. An ISO 460 oil is actually pourable, so it can be easily decanted into a syringe; it can also be easily removed from the separator after a run by sucking it out with a syringe.

Recommendations

Up until recently I would nornally have used a lighter grade of standard motor oil for external lubrication and an ISO 460 grade of SCO for internal lubrication. The one I have been using recently is supplied by Miniature Steam Models, although, of course, many of the UK based model steam suppliers will happily sell you an equivalent. These oils would all be kept in my

9



Typically, in Richard's toolbox there will be a syringe of engine oil, a syringe of SCO and a syringe of grease, affording him just the right quantity of easy to carry and apply at pondside supplies.



The lubricator invariably has a steam pipe going across the top of the chamber, making getting SCO past it and into the body of the lubricator a bit of a challenge. ISO 1000 oil makes this even more difficult, especially if using a syringe.



A syringe with a blunt nozzle fitted makes for very easy and precise external oiling. Oil cups can be filled and external bearing surfaces accurately oiled with no difficulty, thereby minimising waste and mess.



Morris Lubricants Golden Film Universal Steam Oil is supposed to do the job of both oil types, so a review in the future is a must. If it works it will simplify the oiling process for us all.

"Described as an oil that's designed for both internal and external lubrication, it's a blend produced exclusively for Heritage Steam Supplies"

toolbox in syringes (see **Photo 9**) ready for use as required. This makes topping up the lubricator with SCO as straightforward as possible (see **Photo 10**), as well as easy external lubrication (see **Photo 11**).

However, as can frequently happen when I start to do a little research and dig into the subject I am writing about at the time, I came across a very interesting UK based steam supplier by the name of Heritage Steam Supplies. This company tends to concentrate on boiler supplies, mainly full size, and specialises in the restoration of locomotives, agricultural equipment and many other heritage steam powered machinery, but one product that particularly caught my eye was Morris Lubricants' Golden Film Universal Steam Oil (see **Photo 12**). As it's described as an oil that's designed for both internal and external lubrication, I decided to have a look at the specification for it on the manufacturer's own website, but, curiously, failed to find any mention of the product. A phone call led to an extremely interesting conversation with a very knowledgeable chap, who informed me that the oil is indeed designed to meet the requirements of both internal and external small scale steam engine lubrication, and that the only reason it's not listed on the Morris Lubricants' website is that it's a blend produced *exclusively* for Heritage Steam Supplies. He also explained that the oil is suitable for operating pressures of up to 180 psi and 400 deg f, which the majority of model boat plant work falls well below. It is designed to have the tenacity to resist steam scouring and washing in the cylinder as well as having excellent metal wetting and adhesion properties. It should not stain paintwork as some oils which use rape as a viscosity modifier can, while being of a viscosity that still enables wicking on engine bearings.

Conclusions

Although this has been just a very condensed look at the oils we might want to use for our steam engines, I hope that, by clearing away a bit of the confusion and helping to put the less than useful advice out there into context, this instalment of Boiler Room may help when making your selection. I do believe there's credibility in the philosophy of "*you get what you pay for*" here. Using some sort of cheap alternative oil could well prove a false economy; one that could perhaps cost you a damaged engine at some point in the future. If you do a little bit of research into SCOs from any of the big oil manufacturers you will see just how well refined they are, and just how much thought goes into their blending with various modifiers, such as tallow, to achieve the appropriate properties. Interestingly, before mineral oils became the norm, steam engines were actually lubricated with animal tallow, so it's no surprise that nowadays a synthetic equivalent is still used in modern SCOs.

I will be obtaining a bottle of the Morris Lubricants Universal Steam Oil in the near future, and I'll let you know how it goes. Only using one oil for all the needs of the steam engine would certainly simplify the contents of the toolbox. ●

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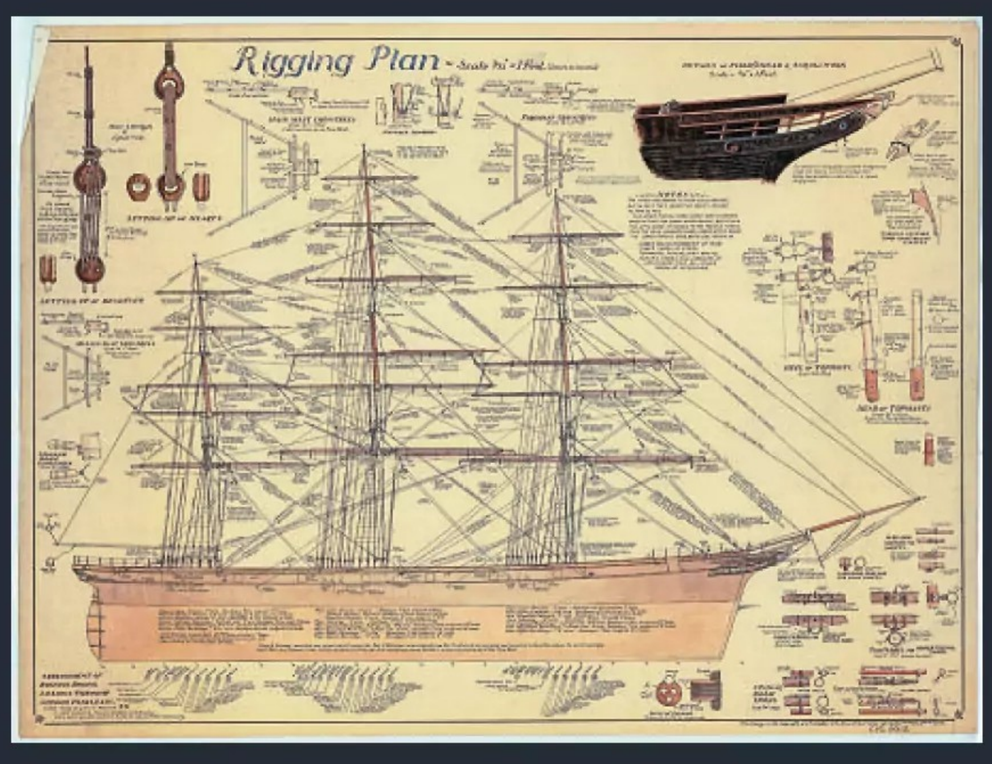
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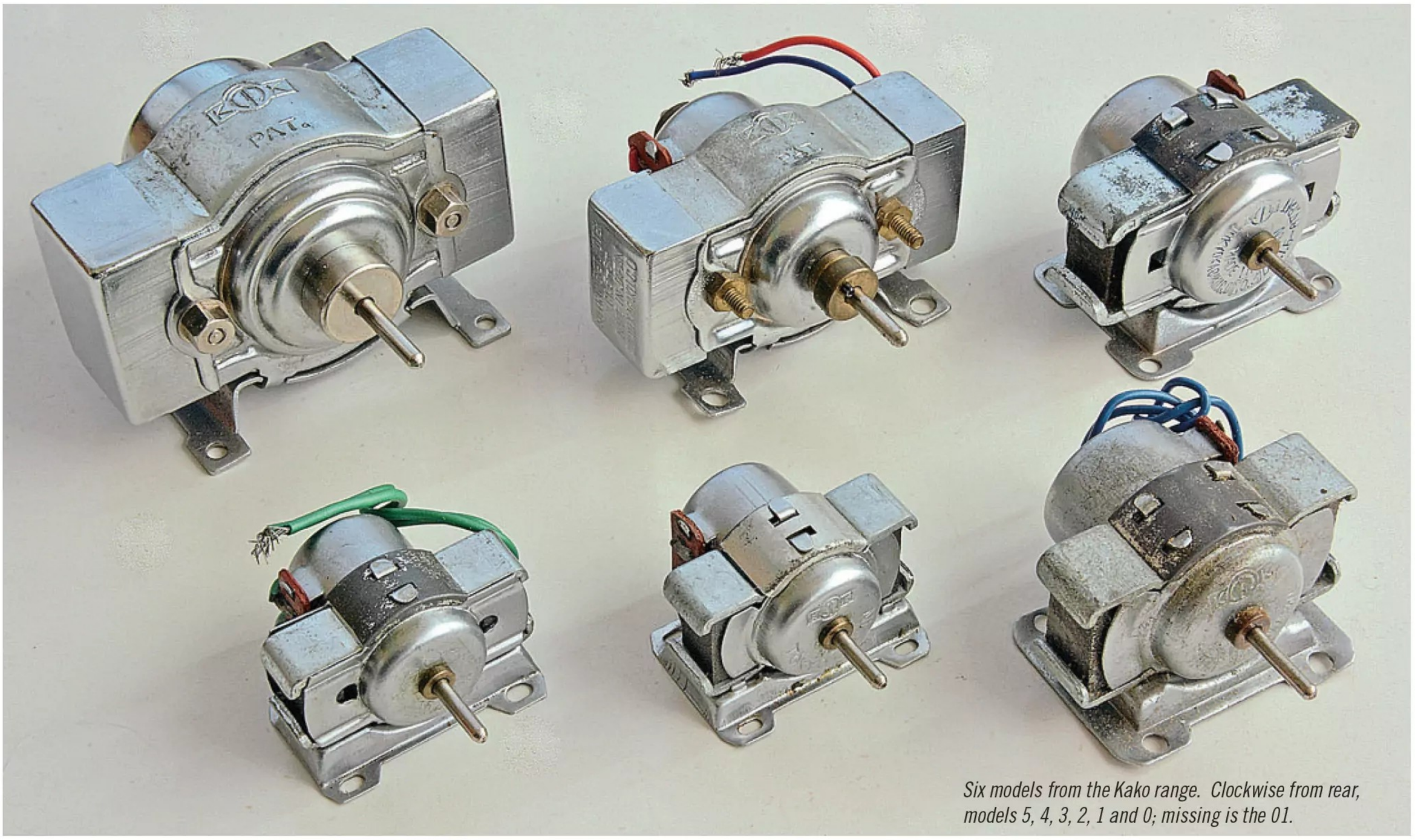
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Rigging plan for *Cutty Sark* (1869), ID reference. M1860

Collectables catch-up

John Parker shares more of his vintage model motor collection



Six models from the Kako range. Clockwise from rear, models 5, 4, 3, 2, 1 and 0; missing is the 01.

Calling all Kakos

The Kako family of small electric motors arrived on British shores in 1958 from Japan and immediately became popular as a low-cost alternative to traditional British-made motors, such as the Taycol range. Seven motors made up the range, from the '01' at 3s 11d (three shillings and eleven pence pre-decimal currency) through to the hefty '5' at 31s 6d (thirty-one shillings and six pence). All had a similar arrangement of two Alnico V permanent magnets carried either side of a cylindrical tinplate centre body enclosing a three-pole armature, but in the case of the '4' and '5' the bent-tab construction gave way to a much more serviceable nut and bolt arrangement, with the '5' even able to boast replaceable carbon brushes.

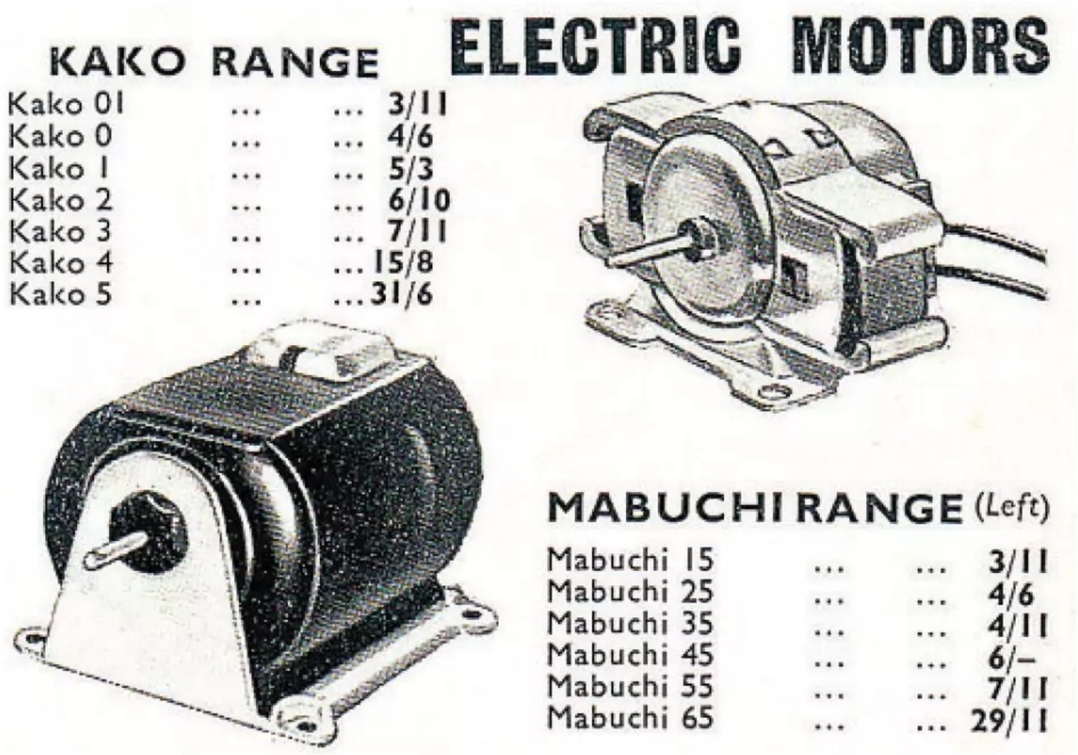
Although clumsy and cheap looking, these motors proved to be quite willing and long-lasting performers, falling short mainly in the efficiency department. Many are the Model Maker plans of the '60s that called for a Kako or two; a pair of '4's or '5's in a scale destroyer running off a 6v accumulator could provide a very creditable performance for the time. Mostly, though, it was the smaller pocket-money priced ones that made up the bulk of sales, many powering Ee-Ze-Bilt kits on their first tentative voyages across the local pond. Their time was the '60s and by the dawning of the '70s they were already giving way to something better.

Blue-cased Mabuchis

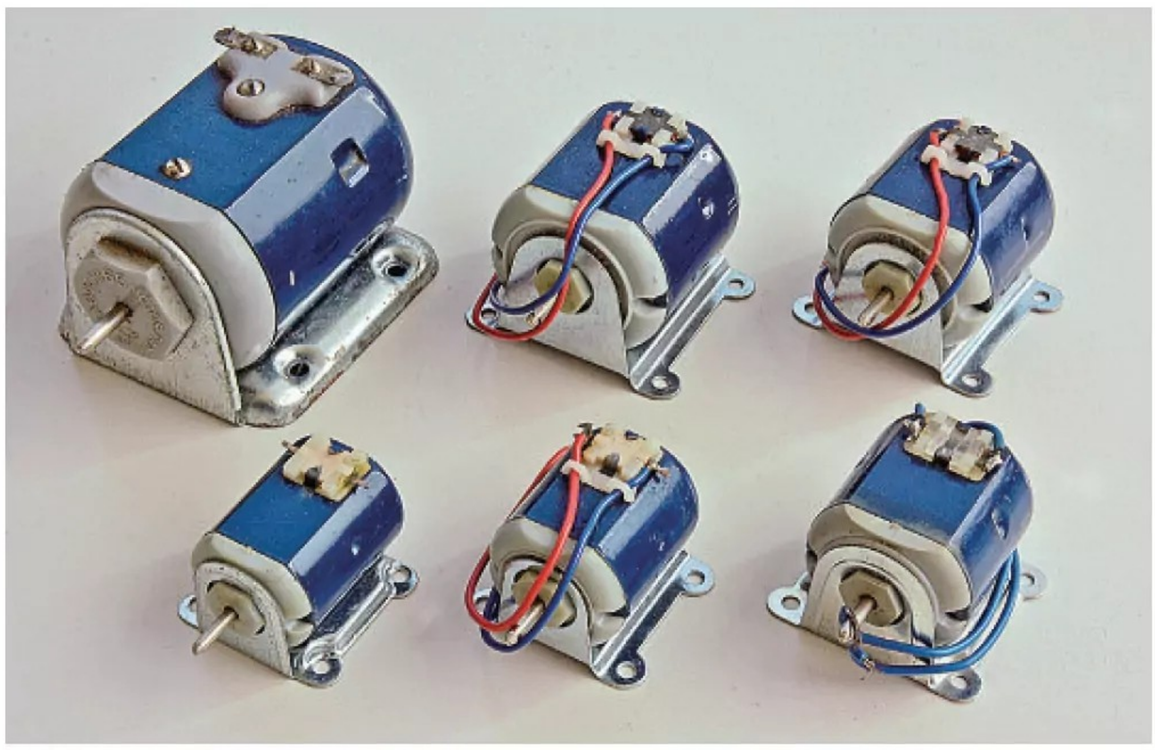
The well-known blue-cased Mabuchi motors were actually made by the same company as the Kakos, TKK Mabuchi, and had existed for some time side-by-side with them. They were an altogether neater design, featuring a deep-drawn metal case with an injection-moulded end cap at the output end. The six models in the range covered much the same range of sizes and applications as the Kakos. They were known as the 15, 25, 35, 45, 55 and 65, and were slightly cheaper than their equivalent Kako. Once again, the largest model, the 65, came with screw-fixed replaceable brushes and more rugged construction, but it cost four times as much as the 55 model and the scarcity of it today suggests that it only made up a small percentage of sales.

It was in their use of sintered ferrite magnets that the blue Mabuchis really scored over the Kakos and other motors – a Mabuchi patent, I believe, as was their automatic armature winding machine, which made high rates of production possible. The ferrite magnets made them far lighter, opening up new applications such as early electric flight. They were located in the case by a spring fixing that held them against indentations in the sides, and I think Mabuchi must have been very glad to adopt this simpler form of construction in place of the many tinplate parts needed to be held together in a Kako. Surviving examples suggest they were also more resistant to corrosion than the thinly plated Kakos.

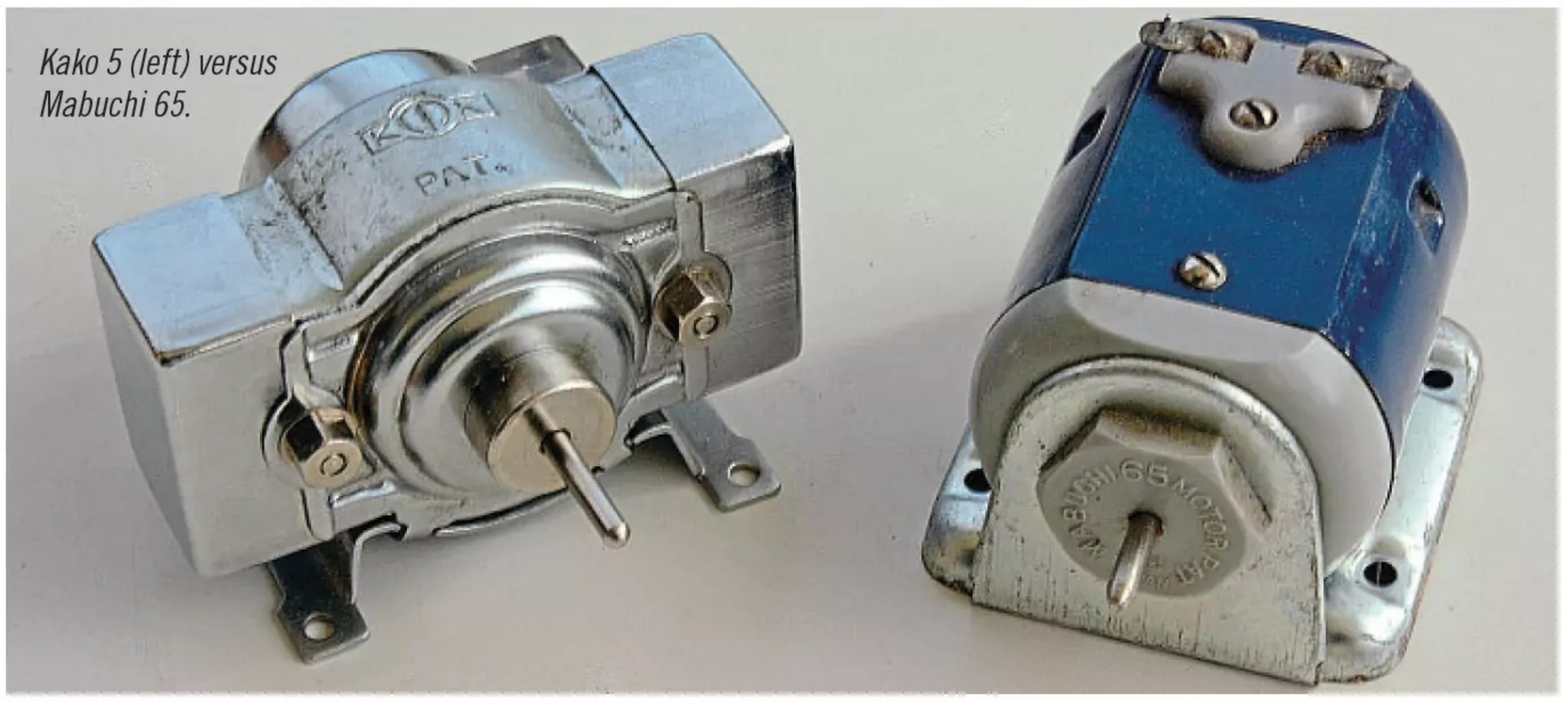
One of my photos shows the two largest models of Mabuchi and Kako side-by-side for comparison. On the right we have the welterweight Mabuchi 65 at 167 grams facing off against the heavyweight Kako 5 on the left at 295 grams. The better torque of the low-revving (3800 rpm) Kako 5 could drive a larger propeller and may perhaps have given it the edge in a model boat. Also shown is a peculiar Kako encased in red plastic and held together by screws, identified by its box as a Kako De Luxe No. 4.5 with replaceable carbon brushes. It was sold under the Aristo-craft label on the American market, but I have never seen it mentioned in print anywhere. As its designation suggests, it lies roughly intermediate in size between the Kako 4 and 5 models.



A 1959 advertisement showing pricing.



The Mabuchi blue-case range: clockwise from rear, models 65, 55, 45, 35, 25 and 15.



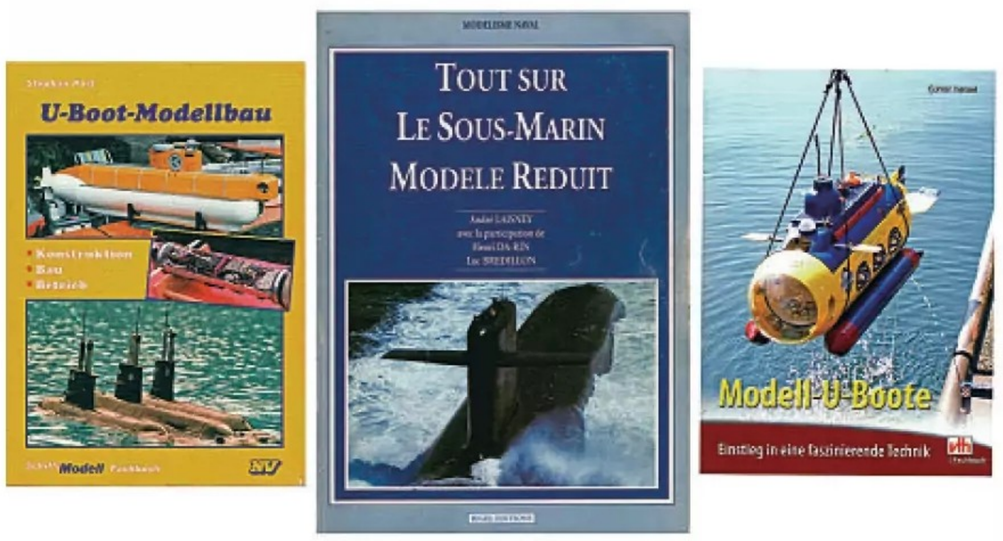
Kako 5 (left) versus Mabuchi 65.



Kako De Luxe 4.5



MRB covers, 1970s to date.



Specialist books on model submarines from magazine publishers.

Modèle Réduit de Bateau

This long-running magazine, the French equivalent of Model Boats in both name and content, first appeared in 1942. It seems to have undergone something of a re-organisation in recent years, with the current publishing schedule six issues a year, and a growing selection of plans available from its website https://boutique.mrb-magazine.com/gb/. I was recently able to borrow a big box of back issues from a friend, and found it a good read, or should I say browse, considering the language barrier. Plans, photographs and sketches are after all multi-lingual, and these days all you need is a mobile phone for Google to offer you a quick translation of any page of particular interest.

It was interesting also to note the change in cover presentation over the decades: simple single-colour graphic design gave way to black and white photographs, then colour photographs of bikini-clad models clutching the latest creation (plans inside), then a return to more sober covers with bar codes and an explosion of straplines highlighting what would be found within.

If you're looking for more information on a particular modelling subject then it can be worth trying the publishers of foreign magazines for any specialist publications they might offer. I was very glad, for example, to have been able to add the three volumes shown on the building of model submarines to my library; two from the publishers of the German magazines *Schiffs Modell* and *Modell Werft*, as well as one (alas no longer available) from the publishers of *Modèle Réduit de Bateau*.

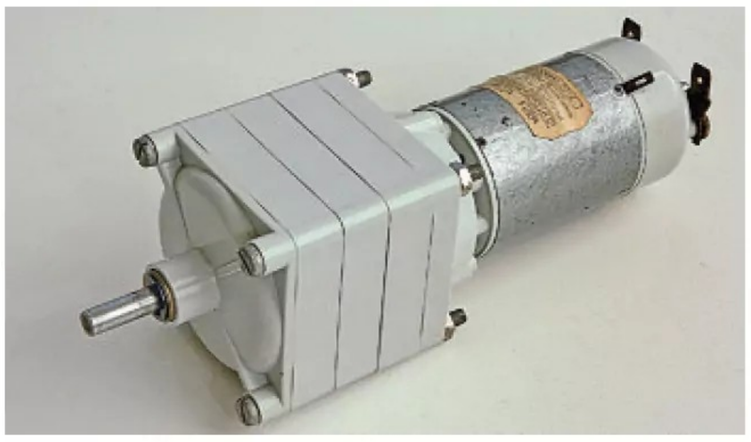
Flotsam & Jetsam



Early Decaperm (left) and Hectoperm.



Later geared Hectoperm (left) and Decaperm.



Decaperm Maxi-Pile.

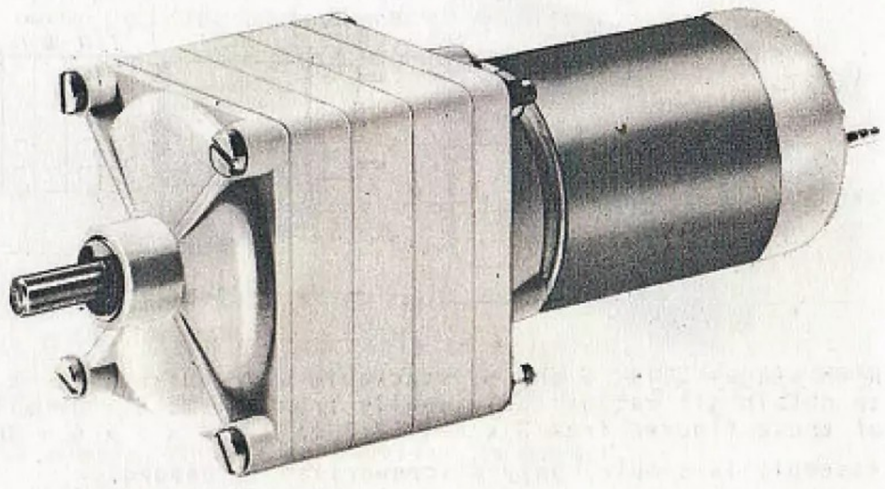
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MAXI-PILE
with Decaperm 5-Pol

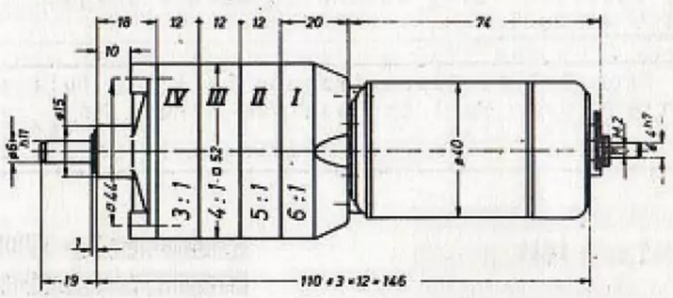
Type 6V Ref.No. 6301
Type 12V Ref.No. 6302

MARX

The universal gear 3:1 to 360:1
(See page 11 for motor data)



stages



Weight: 425 g

With stages 3, 4, 5 and 6, stackable as required, it is possible to obtain all ratios individually from 3:1 to 6:1 or all products of these figures from 3 x 4 = 12:1 to 3 x 4 x 5 x 6 = 360:1

Assembly is simple. Only a screwdriver is needed.

The gear is supplied fully assembled with 4 stages:
3, 4, 5 and 6 = 360:1.

Important: From 3:1 to approximately 30:1 the full motor torque is transmitted. Over 30:1 the maximum torque Md_{max} = 10.000 cmp may not be exceeded. Excessive loading will damage the gear.

Data sheet for the Maxi-Pile Decaperm, circa 1977.

11

DECAPERM 5-Pol
with single-stage gearbox 2,75:1

Type 6V Ref.No. 6801
Type 12V Ref.No. 6802

MARX



Model boats: To fit screws of Ø 40-50 mm

Motor Specification:

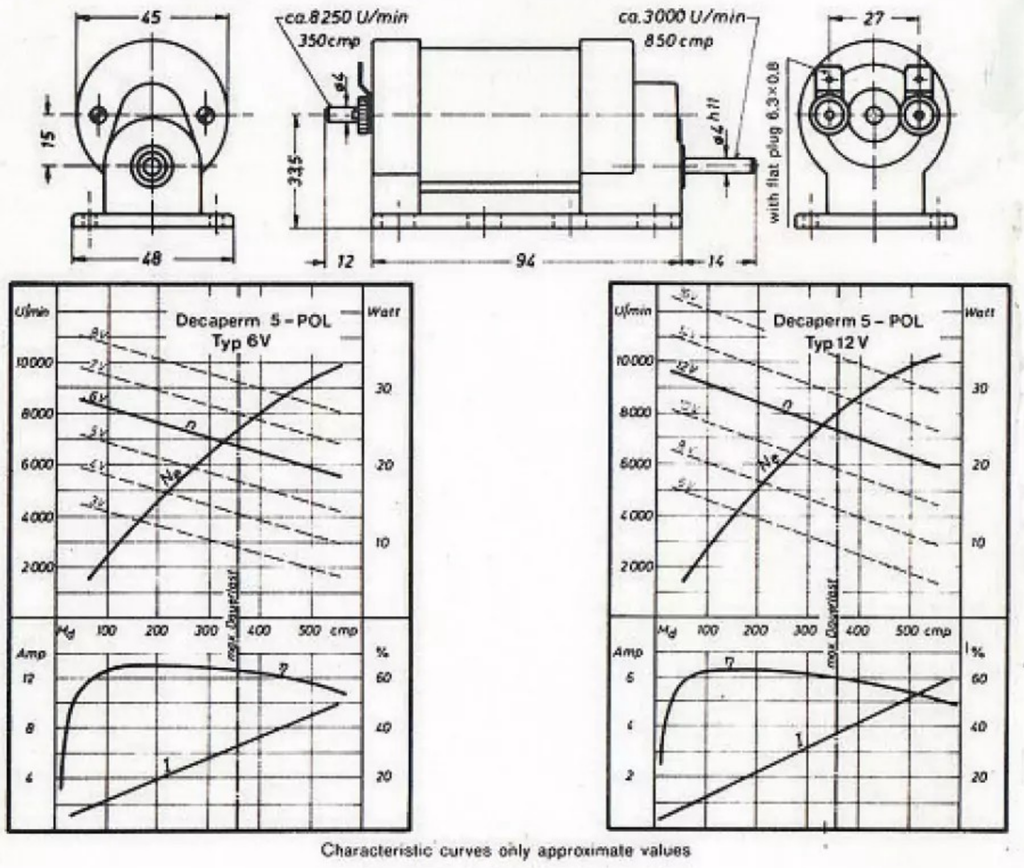
Dimensions: Dia. 40, shaft dia. 4, 72 long
Weight:..... 250 g
Rated torque:..... 350 cmp
Pull-out torque:..... 700 cmp
Max. housing temperature:..... 90° C
Speed:..... 9,000 - 7,000 rpm
(according to load)

Total weight:..... 322 g

	Type 6V	Type 12V
Rated voltage.....	6 Volt	12 Volt
No-load current approx	0.6 Amp	0.3 Amp
Max. permanent current	7.0 Amp	3.5 Amp
Rated power.....	20 Watt	20 Watt
Efficiency.....	63 %	65 %

Accessories

Suppression Filter 3 new version No. 8122 (page 22), **Switch 10 A** No. 8413 (page 21), **Cable 10A , 50 cm lg** No. 8411 (page 21),**Cardan joint 4** No. 8011 (page 20), **Cable 10 A, 10 cm lg** No. 8412 (page 21), **Flat sleeves 6,3 x 0,8** No. 8313 (page 21), **Pulley 4mm** No. 8203 (page 20),



Characteristic curves only approximate values

Data sheet for the Decaperm, circa 1977.

Getting a Perm

Also new in the 1960s was a range of permanent ring magnet motors from Marx Luder of Germany. The largest of these, the 40mm diameter Decaperm and 50mm diameter Hectoperm, were to become the motors of choice for large scale model boats. Like the smaller 30mm diameter Monoperm (see Flotsam and Jetsam October 2024 edition), these underwent evolutionary change to their construction and characteristics over the years of their production. Starting with a bright orange plastic case in a black metal wrap-around that incorporated the mounting foot, by the end of the decade these came with an extended plastic housing that incorporated the mounting base and a gearbox of 2.75:1 ratio (Decaperm) or 2:1 (Hectoperm).

Both geared and non-geared output shafts were initially provided at the same end, but this was later changed, in around 1975, to them being at opposite ends. From this point the motors were only sold in geared form, but were easily removable from the gearbox/mounting to use as a standalone unit if desired. They came in 6-volt and 12-volt versions, with a power output of 20 Watts in the case of the Decaperm and 30 Watts for the Hectoperm, with efficiency reaching as high as 75% in the case of the latter. By comparison most model motors of the time were hard pressed to achieve 50% efficiency.

In the unlikely case that a standard geared Decaperm or Hectoperm didn't suit your application, there was, from 1973, the option of a Maxi-Pile unit with either motor. This came with four epicyclic gear cassettes, or 'piles', of 3:1, 4:1, 5:1 and 6:1 ratio which could be mounted singularly onto the end of the motor or stacked in different combinations to provide no less than 15 different ratios, from 3:1 to 360:1. It was a truly versatile motor system that held the high ground for quite some time, until its ever escalating cost and increasing competition caused it to fade from the market in the 1990s. ●

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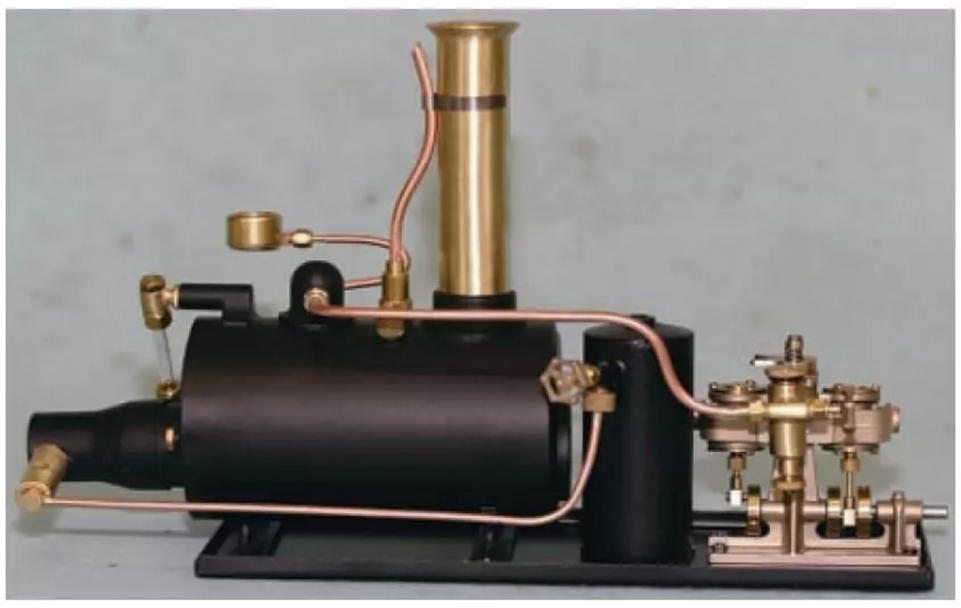
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Your Models

Whether you're highly skilled and experienced or completely new to the hobby, you're definitely invited to this launch party! So please keep the contributions coming by emailing your stories and photos to **editor@modelboats.co.uk**

Vanguard

Well done on another great edition. I've just renewed my subscription! I'm enclosing photos of my recently completed model - the Steel and Bennie tug, *Vanguard*. She operated on the Clyde from 1946-1961. The model is based on the Mobile Marine Models' Empire Tug hull and plan (*Lady Jan*). Most fittings are also from MMM. The *Ingleby Cross* tug is in the background, which featured in Model Boats a few years ago.

The *Vanguard* will be sailing off to a safe harbour at the Scottish Maritime Museum, Irvine, shortly.

ELAINE McFARLAND
EMAIL

Another sensational build, Elaine, and yet another great reason for anyone within striking distance to pay a visit the Scottish Maritime Museum in Irving. Thank you! Ed.







Vanguard, the latest build from talented model maker Elaine McFarland, is shortly to be put on display at the Scottish Maritime Museum in Irvine.

Vigilant

I can't really claim a lot of credit for building the tugboat Vigilant. This must go to my fellow Wicksteed Park Model Boat Club member, Les Pace. It came into my possession really quite by chance. I was not looking to increase my boat stock; in fact, I should be reducing it.

I've always been an admirer of Les's modelling skills. He has the ability to create model boats that look 'lived in', even before weathering takes place.

He had mentioned he was planning to dispose of this boat and donate to the club the proceeds of the sale. This was an opportunity for me to intercept the transaction and own one of his boats. We agreed the price, and I paid the money into the club's fund. I was 'right chuffed'.

The scratch-built boat wasn't quite finished (I think Les had become a bit bored with it), as the weathering was



The Vigilant as purchased by John Mileson from Les Pace not quite finished.







Vigilant after some rigorous weathering from John.

yet to be completed. So, as I had just purchased from Mounfleet Models a kit for a Clyde Puffer, which I intended to fully weather, the *Vigilant* gave me the opportunity to practice my skills.

Have I improved the look of the tugboat? No, I don't think so. What I have created is a vessel on its way to the breaker's yard. It's a bit overdone, but when 6ft offshore looks alright.

As to my weathering skills? Could do better – 4/10.

JOHN MILESON
EMAIL

LOL! You are aways so self-depreciating considering you're such a fabulous modeller, John. In my eyes, *Vigilant* now looks like a tug that's had a typically hard-working life! Ed

Zeeland

I thought you might like to see a few photographs of my Billings Boat kit build Zeeland, now complete and water.

TOMASZ KLYSZYNSKI
EMAIL

It's always lovely to be able to share the beautifully shot images of your kit builds, Tomasz. Thanks so much! Ed.



Tomasz Klyszynski's beautifully built (from the Billing Boats' kit) and finished Zeeland patrols his picturesque local lake. See next page for more of Thomasz's gorgeous photos.

All hands on deck!









James Stevens 3

I was very interested in John Mileson's article in the August edition about steam lifeboats, as I have one. It was built several years ago by Tony Woodford, a member of our club (Phoenix Marine Model Club) who has sadly passed away. I bought it from his widow as I didn't want it to go out of the club. Tony's/my boat is of *James Stevens 3* and was built using much the same amount of information that John has access to. It is some 36ins long and is also steam powered; however, the steam plant is rather elderly and past its best, so a new one from Martin Baylis is on order. The photo I've sent you is of the model under steam on our sailing lake in Byfleet, Surrey, and was taken by friend Martin Lighten.

Thanks for a great read.

DAVID WILDE
EMAIL

I love that you've adopted this super steam lifeboat model and are keeping it, well maintained, 'in house'. I am sure that's just what Tony would have wanted. Enjoy! Ed.



Steam lifeboat James Stevens 3, built by the late Tony Woodford and now being maintained and sailed by fellow club member David Wilde.

Laurentian Hill

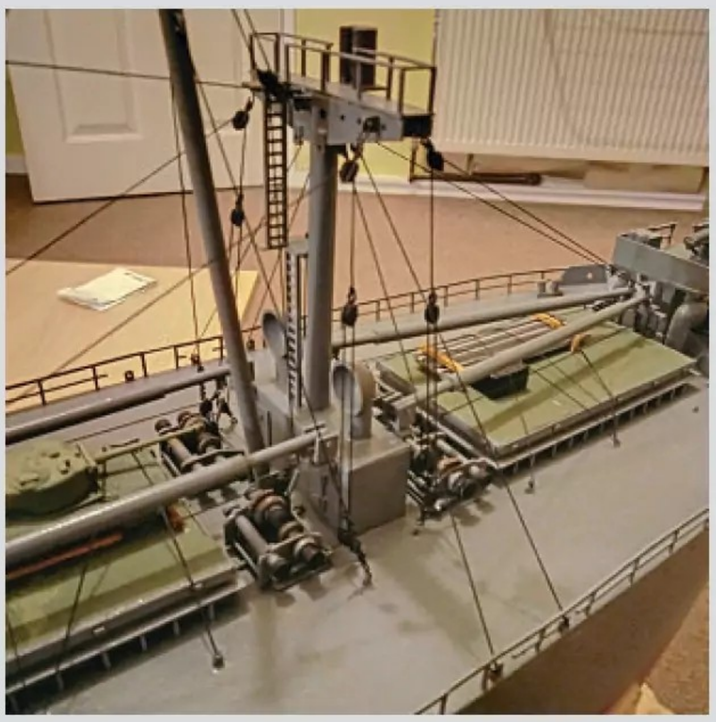
I have recently completed a 1:100 scale model of the Laurentian Hill, a North Sands standard cargo ship built in 1943 (originally named *Fort Brandon* – the ship being renamed in 1948). This was scratch built from plans, the hull being a combination of balsa, plywood bulkheads and frames, and coated inside with glass fibre resin. A lot of the fittings had to be handmade, including all of the cargo winches. For a first attempt at a radio-controlled scale merchant ship, I don't think it looks too bad.

My next build, the cargo ship *Port Chalmers* (one of convey of vessels that took part in Operation Pedestal, a British operation to resupply the besieged island of Malta in 1942) is now underway.

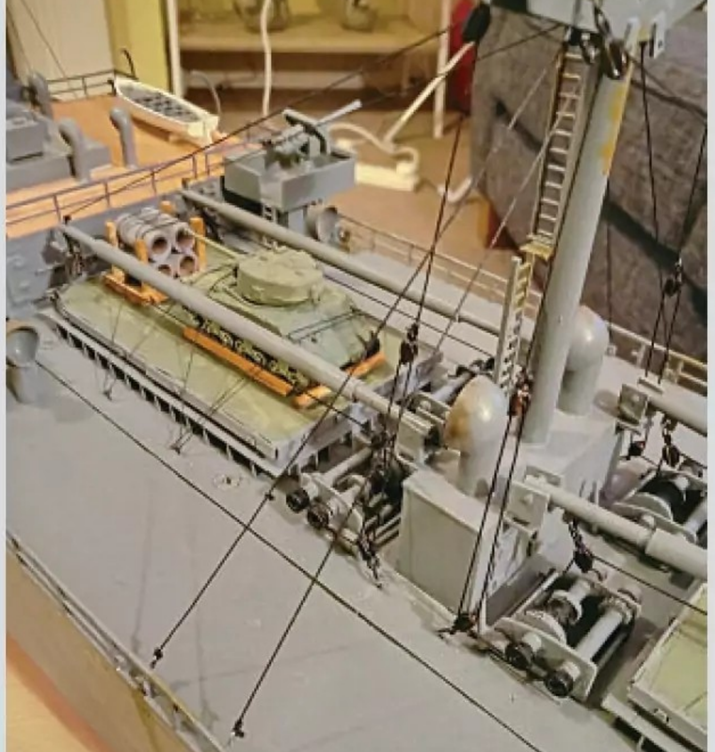
ALUN CASTLE
EMAIL

There's some marvellous detailing, not least all those handmade cable winches, to be seen in these shots, Alun. You've done a really fantastic job.

Please do send in some pics of Port Chalmers on completion. Ed.







Detail shots of Alun Castle's splendid scratch built from plans 1:100 scale working model of the cargo ship Laurentian Hill.

Your Letters

Got views to air or information to share? Then we want to hear from you!

Letters can either be forwarded via email to **editor@modelboats.co.uk** or via post to **Readers' Letters, Mortons Media Group, Media Centre, Morton Way, Horncastle, Lincs LN9 6JR**

A clear improvement & an open invitation

I'm delighted to report that, having been cleared of lots and lots of weed, my fellow Blackburn & District Model Club members and I are once again able to enjoy the whole expanse of our lovely park lake in Blackburn. Our thanks go out to our friends at Blackburn with Darwen Borough Council for carrying out this work.

We sail every Wednesday and Sunday morning throughout the year (we sit undercover when it rains!), with models out on the water including everything from yachts to battleships and vintage cabin cruisers (unfortunately no IC - diesel or petrol - engines are permitted) and we're always looking to swell our ranks.

So, if anyone reading is a model boater living in the East Lancashire area and is interested in joining us, do please get in touch, Either send us an email to hmmwavemaster@btinternet.com or give Les Pollard a ring on 07445 879256. We will be delighted to hear from you.

CHRIS TAYLOR
BLACKBURN & DISTRICT MBC CLUB CHAIRMAN

Great news, Chris! And bravo to your local council. Ed.



Following some serious dredging courtesy of the local council, the Blackburn & District MBC's lovely lake is now nice clear for both members and visitors to enjoy.

Maltese Falcon

I thought you might like to see our luxury visitor to Paxos at the moment, the *Maltese Falcon* sailing yacht.

Apparently, the boat cost somewhere between $150 & $300 million to build and is now owned by Elena Ambrosiadou, a Greek-British hedge fund manager. The boat is 88m long and uses the 'DynaRig' sail system, rigging the sails in around seven minutes under the control of just one person; then the computer controlled masts pivot to suit the ideal sail angles. It's also fitted with two 1700hp Deutz V12 engines, has space for 12 guests and 18 crew, along with suites, reading room, full gym, jacuzzi, & cinema projected onto one of the sails. There's a full complement of water toys as well as two tenders. Charters start at €590,000 per week, plus expenses, of course. What a bargain!

GRAHAME CHAMBERS
EMAIL

Thanks, Grahame. To quote Sam Spade (the character played by Humphrey Bogart in the 1941 film *The Maltese Falcon*), "the stuff that dreams are made of"! Well, maybe for some. She's gorgeous and would make a wonderful modelling subject, but, to be honest, I'm a simple girl and would feel more at home on a little, old Trehantiri. Ed.



The multi-million-pound super yacht, the Maltese Falcon, spotted by our talented draughtsman, Grahame Chambers, off the coast of Paxos recently.

Mystery model





Pete Bonney is hoping someone reading can tell him more about his mystery model.

I've recently subscribed to your publication and I thought I'd enclose a picture of one of the 16 boats currently in my collection, I'd be interested to hear from anyone who may recognise it and be able to share some info, such as when it was made and by whom? I am sending a picture of it I spotted in a publication no longer in print which dates from 1986, so I know it harks from a date prior to that. It's a large model, measuring 2.4 meters long, and it's been very well made and is extremely detailed. It's also still in full working order; I've only had to update the electronics, as those fitted didn't work. The motors though are original, as is everything else.

PETE BONNEY
EMAIL

Firstly, glad to have you onboard, Pete. Secondly, over to you, chaps!

HMVAS *Bounty* appeal

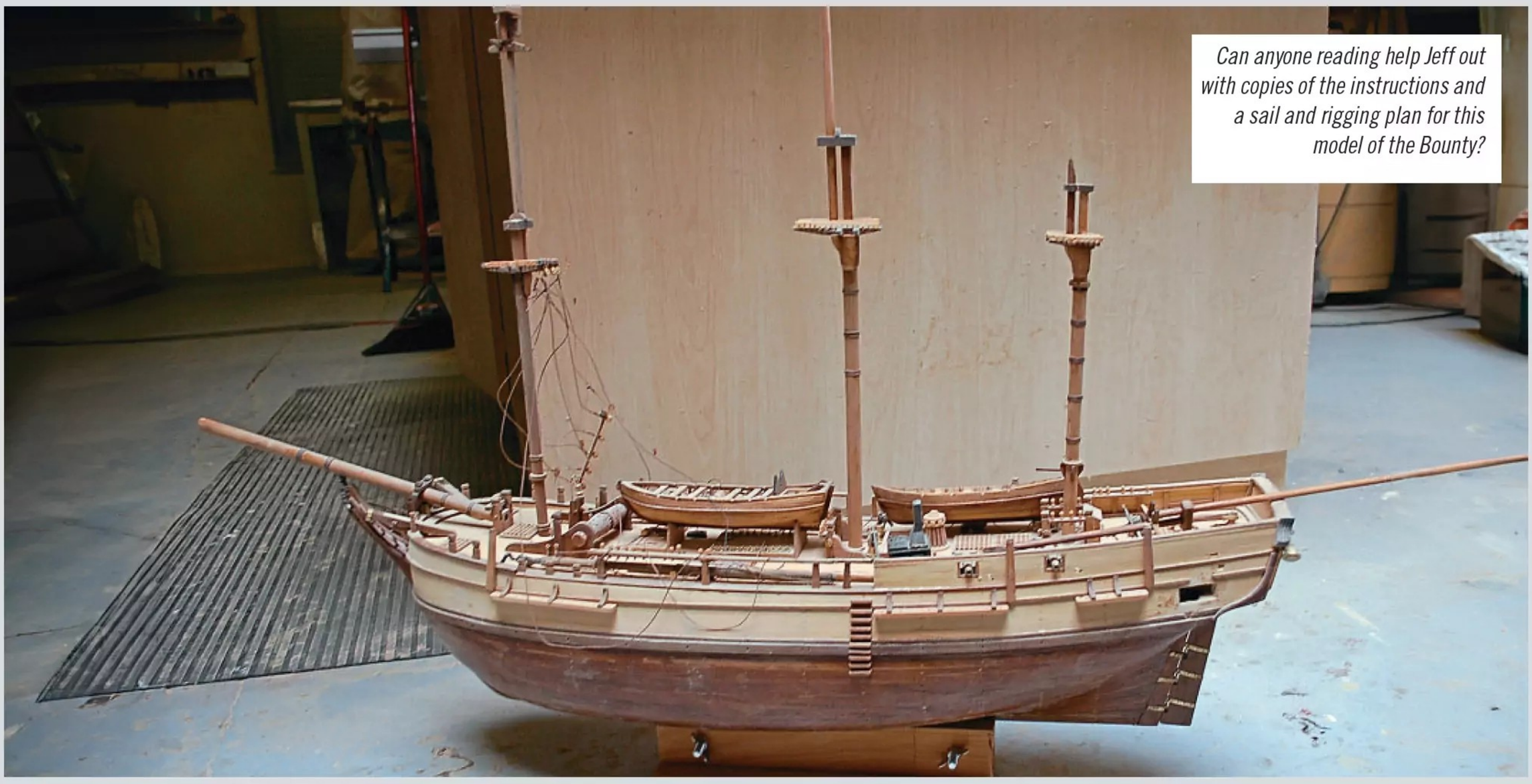


I am asking for your assistance again. I have just found a partly finished beautiful model of HMS *Bounty* of mutiny fame. I have discovered that the builder has died and the man he gave the model to has now given it to me. Unfortunately, there are no sails on the model, the rigging is incomplete and there are spars missing; otherwise, the hull is complete and very well made, with, I think, most of the accessories. The model is 24 inches long at deck level with a six-inch beam. If any of your readers have made this model and would be willing to send me a copy of all instructions and a sail and rigging plan, I will happily cover all expenses and postage costs.

Many thanks.

JEFF WARE
EMAIL

Fingers crossed here, Jeff. I will, of course, pass any correspondence/offers of assistance on to you. Ed.



Can anyone reading help Jeff out with copies of the instructions and a sail and rigging plan for this model of the Bounty?





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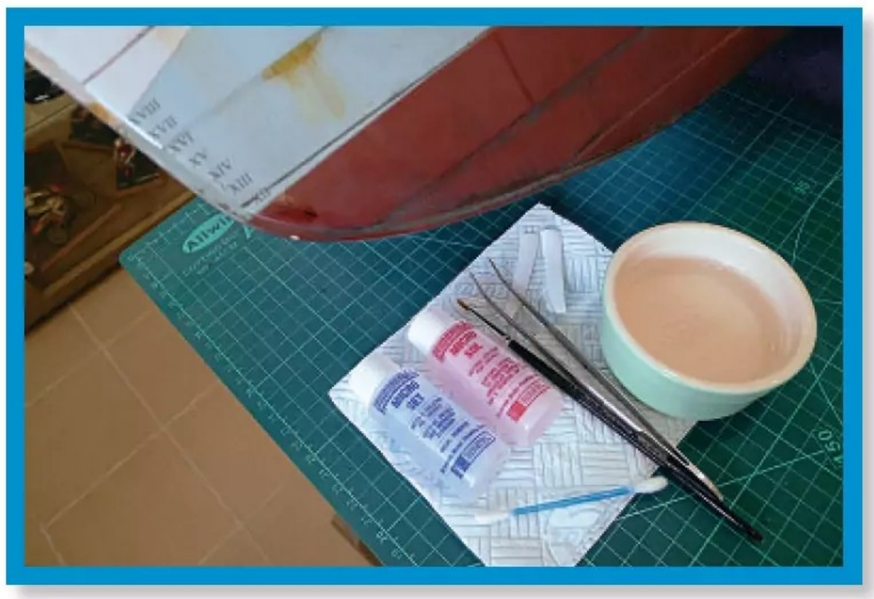
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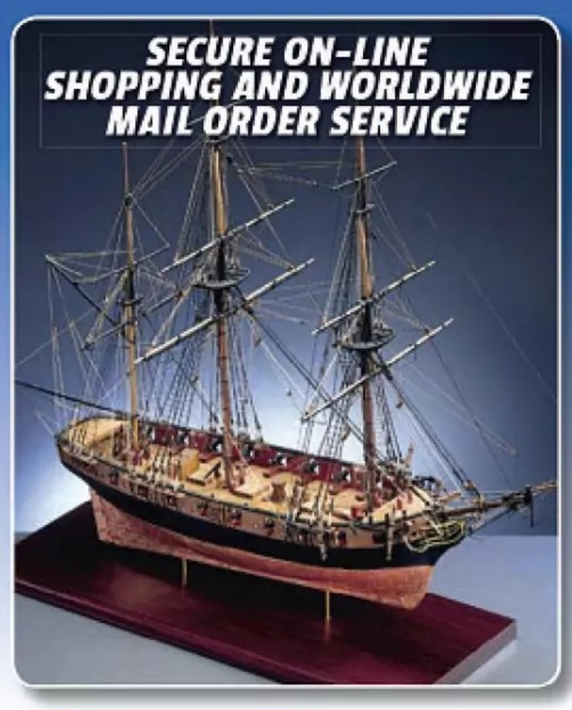
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