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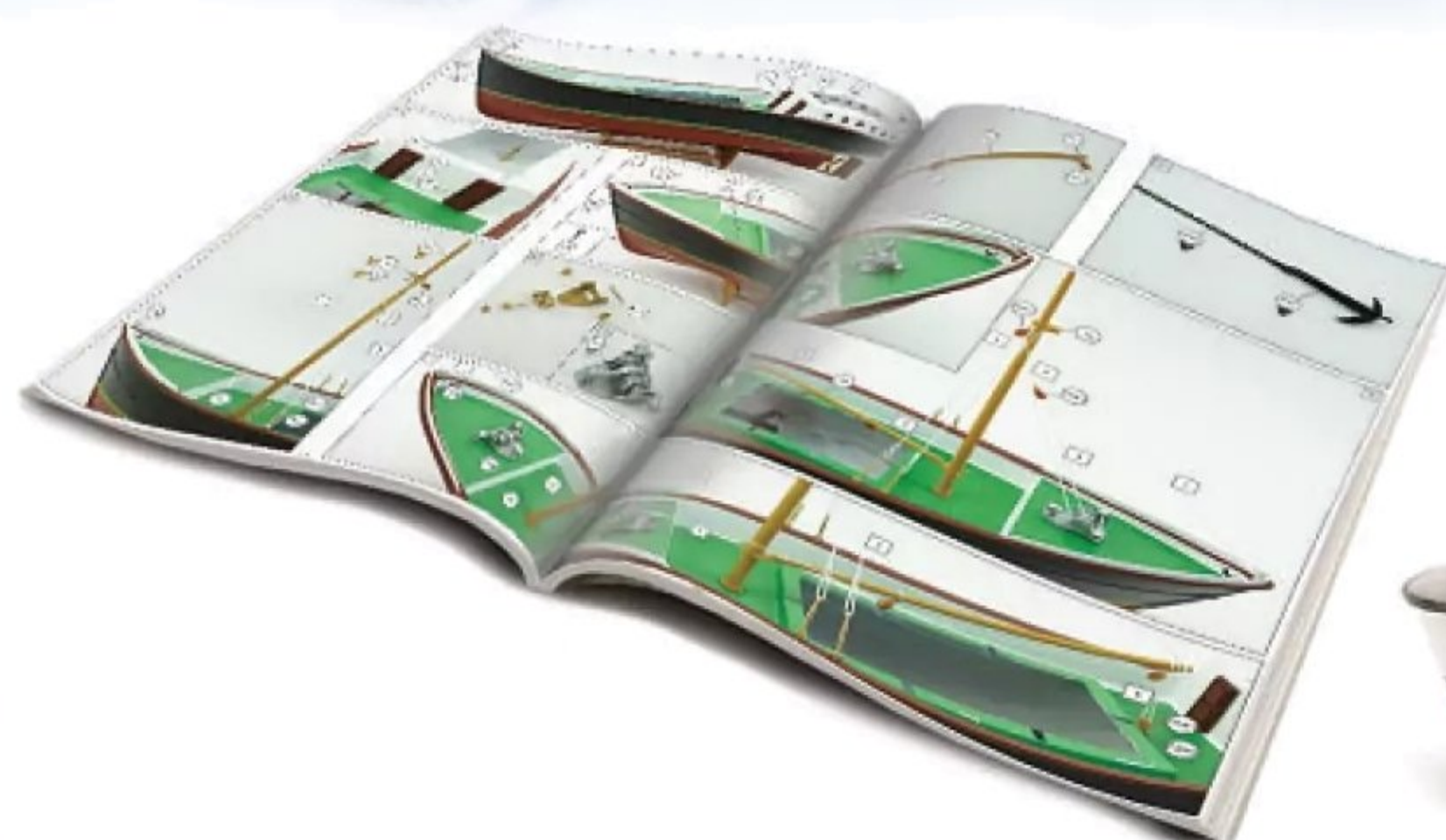


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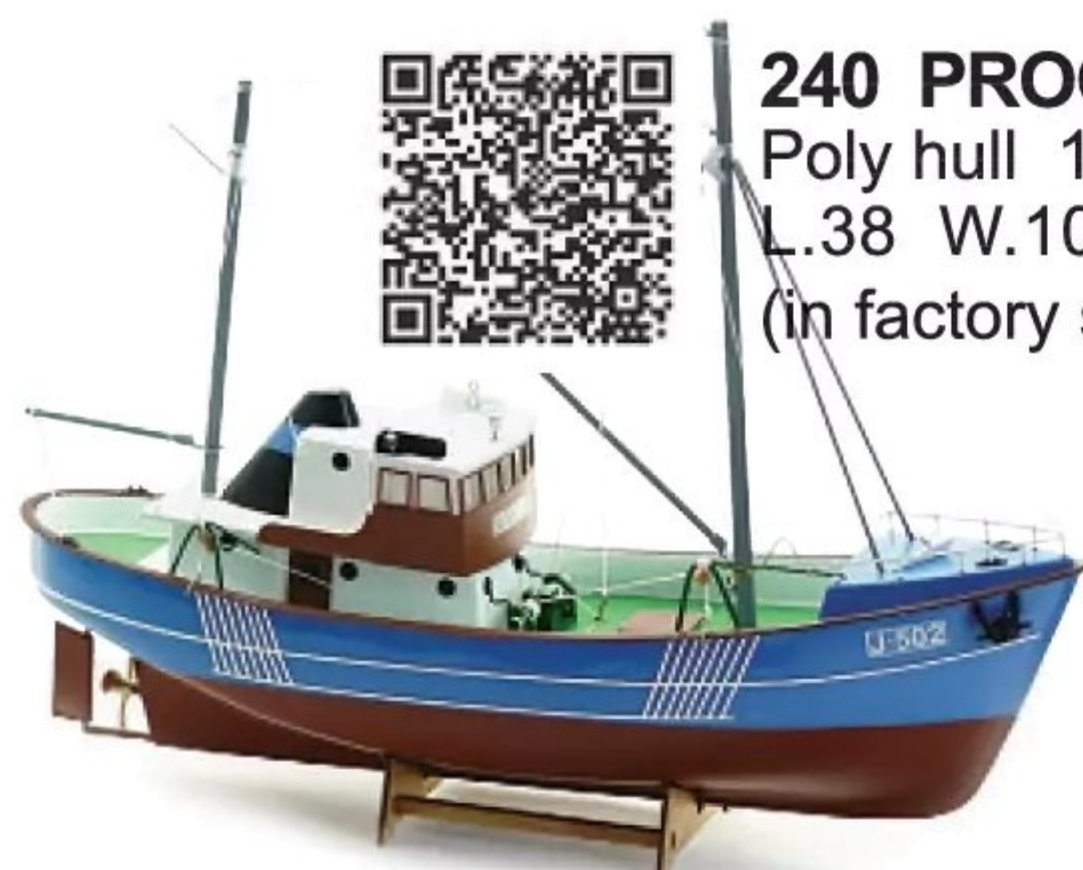
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Just three of the reasons you won't want to miss the September 2024 issue of Model Boats



I've mentioned my 'Model Boats playlist' in this column before, so I will begin this month with a Tracey Thorn lyric quote: "Tempting to think now it will all be plain sailing, old enough now to know there's no such thing". Why? Well, because while those wise words are so true of life in general, they often particularly resonate when it comes to model boat building projects. So, as I am sure that most of you will have your own tales of the unexpected, hopefully you will understand the need for an occasional change of tack content wise. The plan for this issue was, as flagged up on the Next Month page of the July edition, to bring you Part 1 of Nick Brown's review of Billing Boats' kit for the MS *Mercantile*. Unfortunately, however, having reached the finishing stage of the build in good time, a nasty reaction between paint and primer then left Nick no other choice but to strip this all back and start again. Hopefully, though, the model will be ready to show off in all its glory very shortly, possibly even as early as in the September issue. In the meantime, I am sure you find the article on HMS *Adamant*, a Royal Navy submarine tender Nick and his dad chose to scratch build as a companion for their 1:48 scale model of the HMS *X-1*, a more than worthy substitution. Thanks, Nick, for having been prepared for all eventualities!

Elsewhere in the mag, Phil Button also snatches success from the jaws of defeat in his *Blue Arrow* feature, ending up with a somewhat different model to the one he'd initially been aiming for but, as a result, enabling him to share some very useful pointers and tips. Likewise, John Parker dips into some of the factors you'll need to consider if pondering going for a paddle, while David Marks takes the grind out of grasping the basics when it comes to gears (OK, I am not going to lie, I'm still struggling a bit – but perhaps not a surprise as I did fail my Maths GCSE). Plus, if you're into tugs, you're in for a treat! Not only are we offering you the chance to win a pre-production factory sample for Billing Boats' soon to be re-released (following updates and improvements) 1:60 scale kit for *Ymer*, but you'll also find details of a great little Ready-To-Run bargain buy brought to our attention by Phil Parker (no relation to John).

Finally, because I am literally wincing as I type the name John, it's hold my hands up time (again!); some of you may have noticed that in last month's Welcome column I referred to contributor Tony Bird not just once but twice as John – I've no idea why but apologies for any confusion caused, and I'm so sorry, Tony. Permission to reciprocate by renaming me as you see fit (well, within reason!) – although to be quite honest over the years I've become pretty used to responding to Linda, Lesley, Cindy, etc, and even to, my personal favourite, 'Dear Sir' (understandable given my unisex name, and to be honest certainly no worse than 'Madam', which for some reason always feels like what follows is going to be a dressing down of some sort!).

Enjoy your read,
Lindsey

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Appledore & Instow Model Yacht Racing

Forming part of the annual Appledore & Instow Regatta, the long-established pond yacht races (no R/C entries are permitted) across the Taw and Torridge estuary in North Devon will this year take place on Saturday, August 3.

Starting at 11am, to coincide with low tide, these races will be open to all those wishing to compete, and cups and prizes will be awarded to the winners in each of the categories. Entry is free of charge (although all donations will be gratefully received) and there are usually plenty of loan yachts available for those without model boats of their own who want in on the action! Likewise, spectators are very welcome to watch the races from the lifeboat slipway at no cost.

Honorary Regatta Secretary Peter Reveley explains: "Racing across the Taw/Torridge

estuary started approximately 80 years ago. With Appledore having long been a ship and boat building community, historically, many of the shipwrights also took great pride in making models, and it quickly became very competitive in terms of who could build the fastest! And while industrial boat building has sadly diminished locally, many of us who were brought up in the village have continued the tradition of building new, as well as racing old, model boats.

We race yachts in various length categories, including 1ft 9in, 2ft 3in, 3ft, 3ft 6in and multi-hulls up to 3ft 7in, and there's also an open monohull race. There are also races specifically for children under the age of 14. We have just enough time to get all these races in between an hour before and an hour after low water. We only race in winds

up to Force 4, and always have a fallback date, as the event is a one off each year"

For further details, visit <https://www.appledore&instowregatta.org.uk>



August 3 promises (weather permitting) a fun day out for all in beautiful Appledore.

OUT AND ABOUT

RNLI Shannon Class decals

Airfix has announced a sheet of decals for use in conjunction with its A55015 1:72 scale RNLI Shannon Class Lifeboat Starter Set. With a fleet of 50 RNLI Shannon Class Lifeboats currently in active service, the sheet will feature all the different lifeboat names, identification numbers, and their respective stations, thereby allowing modellers to accurately represent a specific vessel/lifeboat station of their choice.

Carrying an RRP of £9.99, orders for the decal sheet can be placed directly with <https://uk.airfix.com> or purchased from all good Airfix stockists.



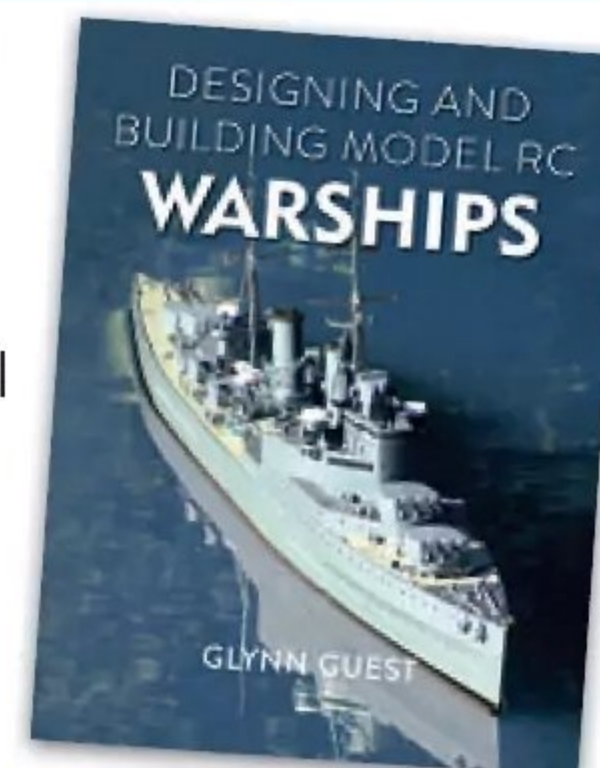
Thanks to a new sheet of decals, the Airfix 1:72 scale RNLI Shannon Class Lifeboat Starter kit can now be finished to represent any one of the 50 Shannon class lifeboats currently in service.

BUY THE BOOK

Designing and Building Model RC Warships

Just as the title of this new book by Glynn Guest suggests, within its 160 pages you will find all the information needed to design, outfit and operate your own 'Stand-Off Scale' model warships, along with plenty of trouble-shooting help and advice gleaned through years of modelling experience.

Published in paperback format by The Crowood Press with the ISBN 97807 19843914 and carrying an RRP (Recommended Retail Price) of £20, orders are now being taken at www.crowood.com. Copies can also be sourced via online retailers and local bookstores.



MBC image erratum

Last month's news story flagging up the Kirklees MBC Summer Open Day was, regretfully, illustrated with a photo of Rawdon Model Boat Club's lake. Our sincerest apologies, therefore, to both clubs, and for any confusion this may have caused.



Kirklees MBC lake.

Big savings on a day out

As part of its 40th anniversary celebrations this year, the Historic Dockyard Chatham (Kent) is offering those on Universal Credit or Pension Credit who reside in any of the following postcodes – ME1, ME2, ME3, ME4, ME5, ME7, ME8 and ME9 1-7 – reduced price admission. These £2 one day only tickets must be booked in advance online and proof of eligibility presented on arrival (visit <https://thedockyard.co.uk/plan-your-visit/buytickets/universal-credit-tickets/> for further details).

Currently running at the Historic Dockyard until September 1, 2024, and well worth a visit this summer is RNLI 200: The Exhibition.



Just one of the many reasons for a visit to the Historic Dockyard Chatham this summer is RNLI 200: The Exhibition, which will run through until September 1,

Last mast for the Golden Hinde

June 2024 saw the last of the three masts on the full-size reconstruction of the *Golden Hinde* located at London Bridge craned into position. The occasion was marked with a blessing by the Dean of Southwark, the Revd Dr Mark Oakley, who also, together with the winner of a children's art competition, placed two coins underneath the ship's mizzen mast (a halfpenny featuring *The Golden Hinde* and a 50p piece marking the 200th anniversary of the RNLI, donated by the Royal Mint), this being a long-established nautical tradition said to bring good luck.

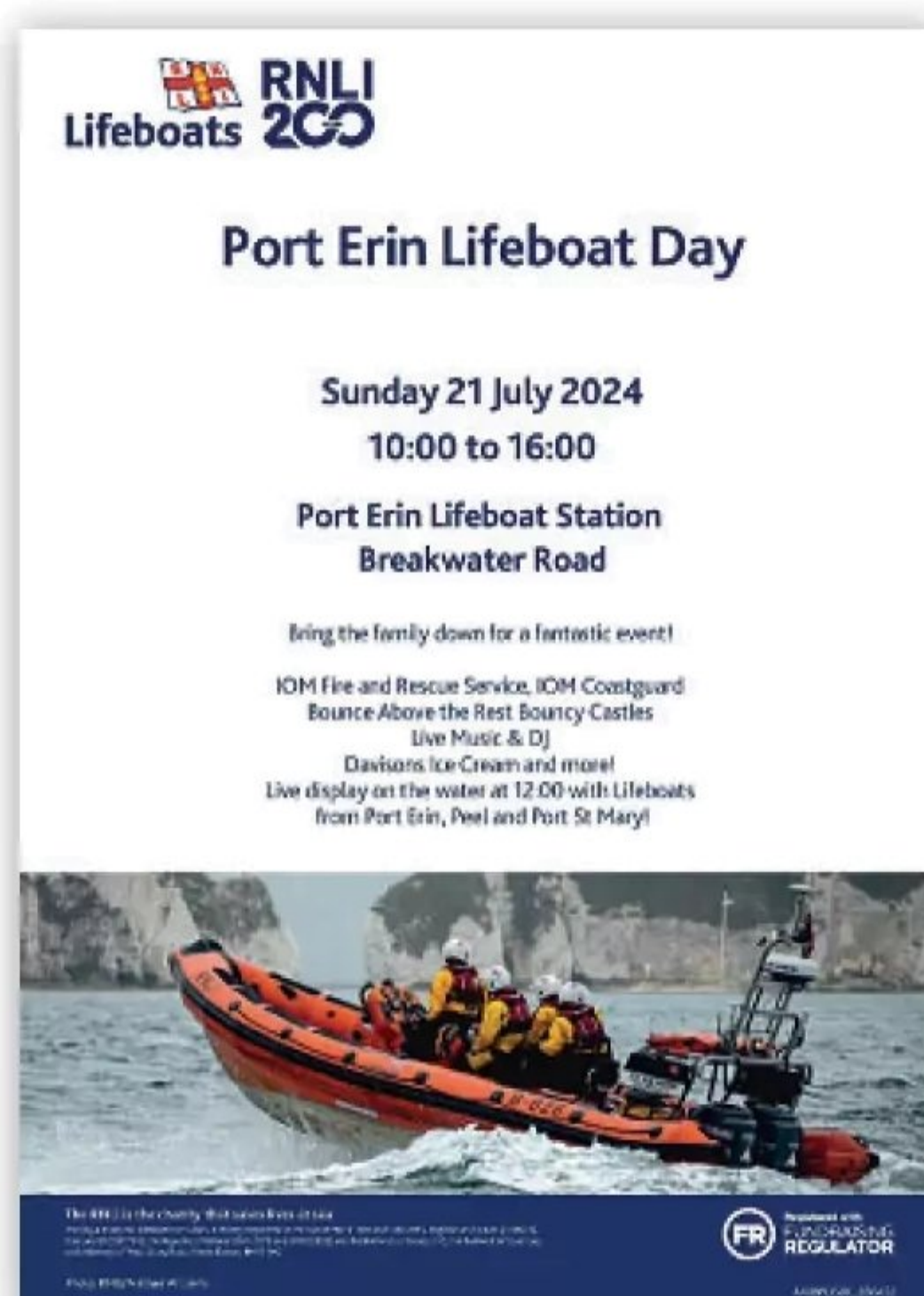
Hour long tours of *The Golden Hinde* are conducted between 10am to 6pm daily and can be booked in advance online at <https://goldenhinde.co.uk>.



The mizzen mast being craned into position on the *Golden Hinde*.

Port Erin Lifeboat Day

The RNLI be hosting a special family friendly day out for residents and visitors to the Isle of Man alike between 10am to 4pm on Sunday July 21 at the Port Erin Lifeboat Station (Breakwater Road). The event will be attended by representatives from both the IOM Coastguard and IOM Fire & Rescue Service, and there will be various stalls to browse, refreshments, live music and a DJ, and bouncy castles for the children. Plus, at 12 noon, lifeboats from Port Erin and Port St Mary will be putting on a live on the water display. For more information, visit <https://www.facebook.com/OfficialPortErinRNLI/>

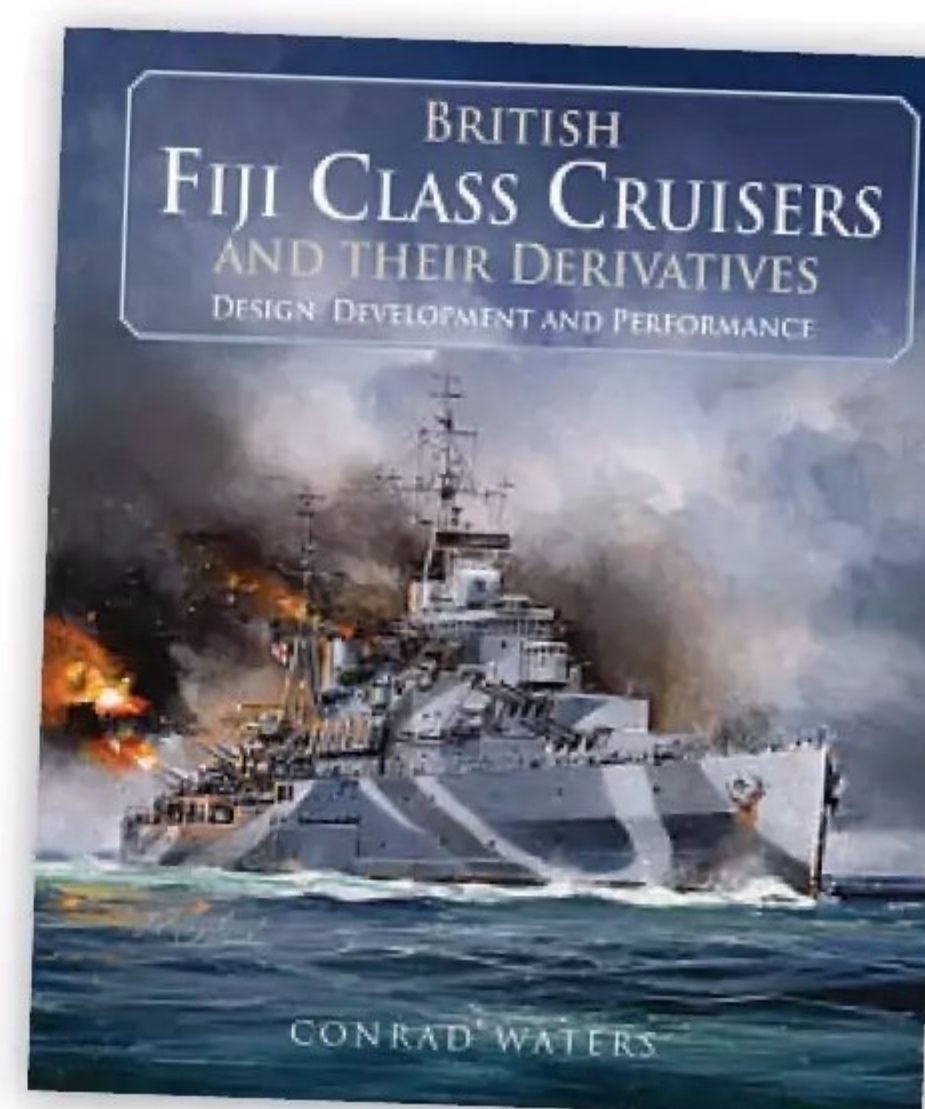


BUY THE BOOK

British Fiji Class Cruisers and their Derivatives – Design, Development and Performance

Based on original research in a wide variety of archives, and heavily illustrated with plans, photographs and colour camouflage drawings, author Conrad Waters' new book offers the first in-depth study of this innovative cruiser design and the modified classes that followed it.

Launched in hardback format by Seaforth Publications and carrying an RRP of £50, the title can be ordered from all good bookstores (quoting ISBN 9781526799838). However, worth pointing out is that the website <https://www.pen-and-sword.co.uk> is currently offering a generous 20% discount on this price.

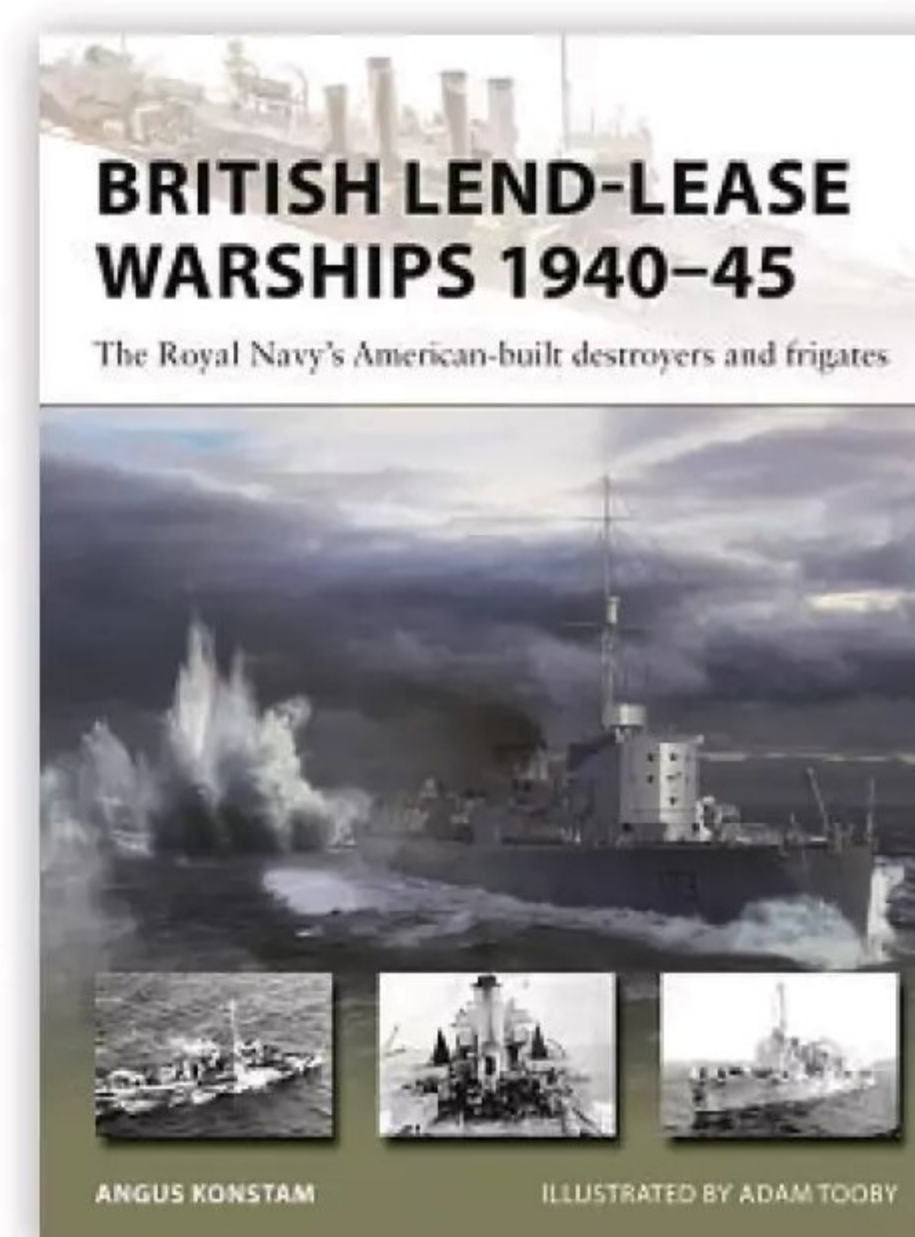


British Lend-Lease Warships 1940-45

Following the onset of World War II, U-boat attacks on Britain's vital sea lanes increased in ferocity, and the much-needed American-built destroyers and frigates supplied to the Royal Navy under Lend-Lease became crucial in the battle for the Atlantic.

In his latest book, naval historian Angus explains the role these essential to survival vessels served, alongside period photographs, detailed ship profiles of the major classes, and a cutaway illustration of HMS *Campbeltown* (of Saint-Nazaire raid fame).

Published in paperback format and carrying an RRP of £12.99 (please quote ISBN 9781472861283 if ordering from your local bookstore), the title is currently being offered at the promotional price of £11.69 when purchased via www.ospreypublishing.com, or for considerably less when opting for the downloadable eBook version.



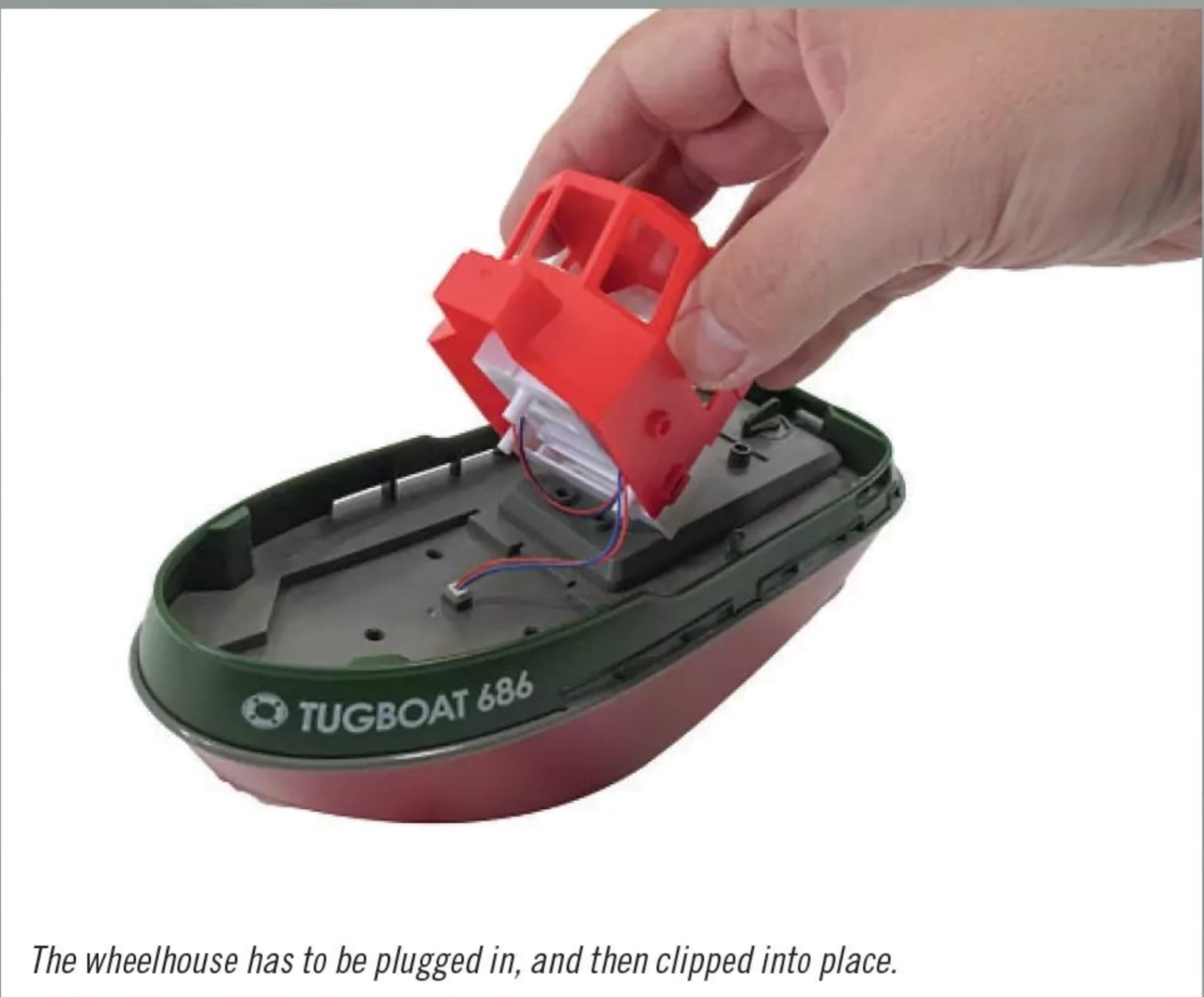
HENG LONG

Tugboat 686

Phil Parker draws a great little Ready-to-Run bargain buy to our attention



Opening the box, the model is neatly presented in a plastic tray.



The wheelhouse has to be plugged in, and then clipped into place.



Cheap ready-to-run radio control boats have been around for years. At some point, most of us will have been tempted, and found ourselves the owner of a pretty toy offering hopeless controls and the running of three-legged donkey. Some kid themselves that they will one day replace the mechanical parts, but generally these are shunted to the back of the workshop in disgrace.

All this changes with Heng Long's little tugboat. Complete with everything required to get on the water, apart from a couple of AA batteries, for under £40 this model

is far better than it deserves to be for the money.

Opening the box, the model obviously requires a little assembly. There are some details to be released from a sprue and clipped in place. The wheelhouse is ready to go but needs to be plugged in and pushed into position. Everything is made from plastic and seems pretty strong. The hull is ready painted, either green or blue, with the lower section in red-oxide.

Boat power comes from a single 14500/600mAh 3.7V Li-on battery, which is charged from a USB socket

"For under £40 this model is far better than it deserves to be for the money"

Tugboat 686 specification

Length: 230mm
Width: 94mm
Height: 154mm
(with all fittings in place)
Weigh: 271g
Power: One 14500/600mAh 3.7V
Li-on battery
Radio: 2.4GHz



At the back, there is a hollow for the battery, which is covered with a hatch.



The details are a bit chunky, but easy to fix in place.

using the supplied lead, taking about 90 minutes. The aforementioned pair of AAs fit in the bottom of the handset. You'll need a small cross-head screwdriver to open the hatch, and one is provided in the box.

The battery fits under an easily removable hatch at the back of the boat. There's no on/off switch, meaning the boat comes alive when plugged in, so switch the handset on before you do this.

Control is via a car-type handset with a steering wheel for direction and trigger for speed. A trim knob is found ahead of the steering wheel, as well as the power button. This is a 2.4GHz controller, and it will automatically pair with the receiver in the boat. Range is around 50m.

Impressively, the boat is powered by a pair of 17mm diameter, two-blade, propellers sitting in Kort nozzles. I'd expected that steering would be achieved by adjusting the power to each prop, but no, the nozzles swivel just as you would expect. As well as making the model more manoeuvrable, the nozzles should protect the props when it's put down on a table. The model isn't fitted with a water sensor, so the props and nozzles will move when held in the air for testing.

From box to water could take less time than it takes to charge the battery. The only problem is that once you've fitted the details the model won't fit back in the box! OK, it's pretty robust, but that's worth bearing in mind for the future.

Once launched, the boat heads off at a slightly un-tugboat-like speed. Even at about half-throttle it's a bit fast, the main complaint I have about it. Forward and reverse is available by pushing the trigger back and forth. Speed is proportional, and I found it happy at about half-throttle, but there's a bit more if you need to get out of the way of other sailors and their bigger boats.

Steering is also proportional, none of the hard left/hard right of other cheap boats. The turning circle is tiny, less than two feet as far as I can tell, but, with care, long sweeping turns are also possible. It would be unfair to enter this into a steering competition, but if you did, you'd stand a very good chance of winning! Obviously the boat steers in reverse, although it tends to pull to one side.

Although a generous, compared to the size of the model, bow wave is created, while I've been sailing the decks have stayed clear of water. Should you not find that to be the case, the battery hatch cover will keep the insides dry, probably even if the model turns submarine! Talking of which, the instructions point out it doesn't self-right and operators should take care not to flip it over. Glad they mentioned that!

You may feel the model is a little top-heavy. Mine certainly heels over in tight turns, but never shows any sign of capsizing. I've certainly enjoyed a few sessions pootling around our boat club lake.

Since this is a review, I'd suppose I better indulge in a little nit-picking. I've already said the speed is a little too high, but the biggest complaint concerns a claim on the box. Apparently, this model is 1:72nd scale. That's a mainstream plastic modelling scale, but don't stand a figure from your Airfix kit by the door as, at 42mm high, it will dwarf him! I'd say that the model is 1:40 scale, so you may be able to get away with a 1:42 scale person intended for O gauge railway modellers. Is this important? Well, the model offers an excellent starting point for modification and detailing, so these

and others the likelihood is you're going to want a crew. There are a couple of other boats in our club being worked on by my fellow club members as I write and I am sure the editor will be happy to feature these and others in the Readers Models section.

Overall, this is a fantastic little boat. It's perfect for a quick trip to the lake, or for youngsters to cut their sailing teeth on. Plus, its diminutive size makes it perfectly portable, and suitable for garden pools as well as larger bodies of water. Will there be any more in the range? I hope so. ●





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2024 BLACKPOOL MODEL SHOW

19/20 OCTOBER ● NORBRECK CASTLE HOTEL



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Please scan the QR code or visit BlackpoolModelShow.co.uk to purchase tickets and fill in Trade/Exhibitor/ Club form requests.



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Fanatic for Super'Phatic!

'It's so good ... I lent a bottle to a friend & he won't give it back!'

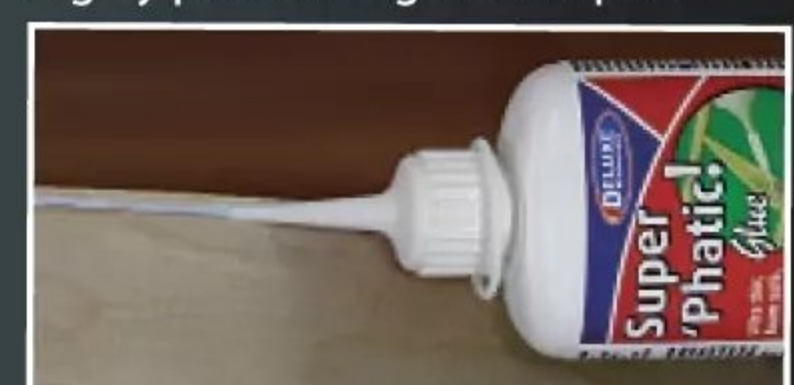
- No fumes, alternative to thin superglue
- Waterproof & allows working time
- Uniquely bonds wood to plastic & GRP





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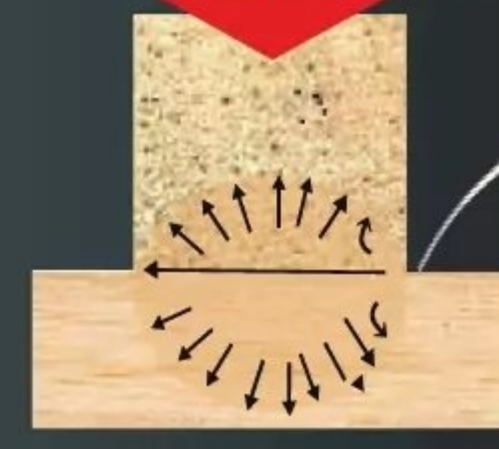
Highly penetrating & waterproof



Ideal for laminating decking



HOW SUPER'PHATIC! WORKS



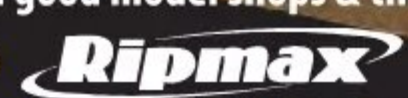
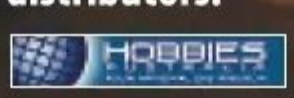
Unlike other glues Super'Phatic! wicks in to re-inforce joints

To find out more read the article on the next page

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Super'Phatic!

It's so easy to ignore progress and simply stick to the products we have, over the years, become comfortably familiar with. This month, however, John Bristow of DeLuxe Materials wants to introduce more of us to this 21st Century glue and its numerous advantages...

Super'Phatic! needs explaining, as it's a glue which has many benefits, and lots of applications, when model boat building. Whether you're a traditional scratch builder, kit builder, just like to assemble straight out of the box and sail, or perhaps have repairs you need to undertake, I hope you will be encouraged by this explanation of what Super'Phatic! can do for you.

Just like with superglue (CA), you can pre-assemble structures and then apply Super'Phatic! The difference is that, unlike CA, the bond isn't instant, so you can continue to manoeuvre and position a joint after application if necessary. You will, however, find porous materials such as wood bond more quickly than they do when using a conventional wood glue.

Testing penetration

When gluing porous materials, especially balsa, and items that will be subject to high stress, reinforcement around the joint is needed. The beauty of Super'Phatic! is that it will penetrate and toughen the material graduating away from the joint, thereby spreading the load into the surrounding material (see **Photo 1**).

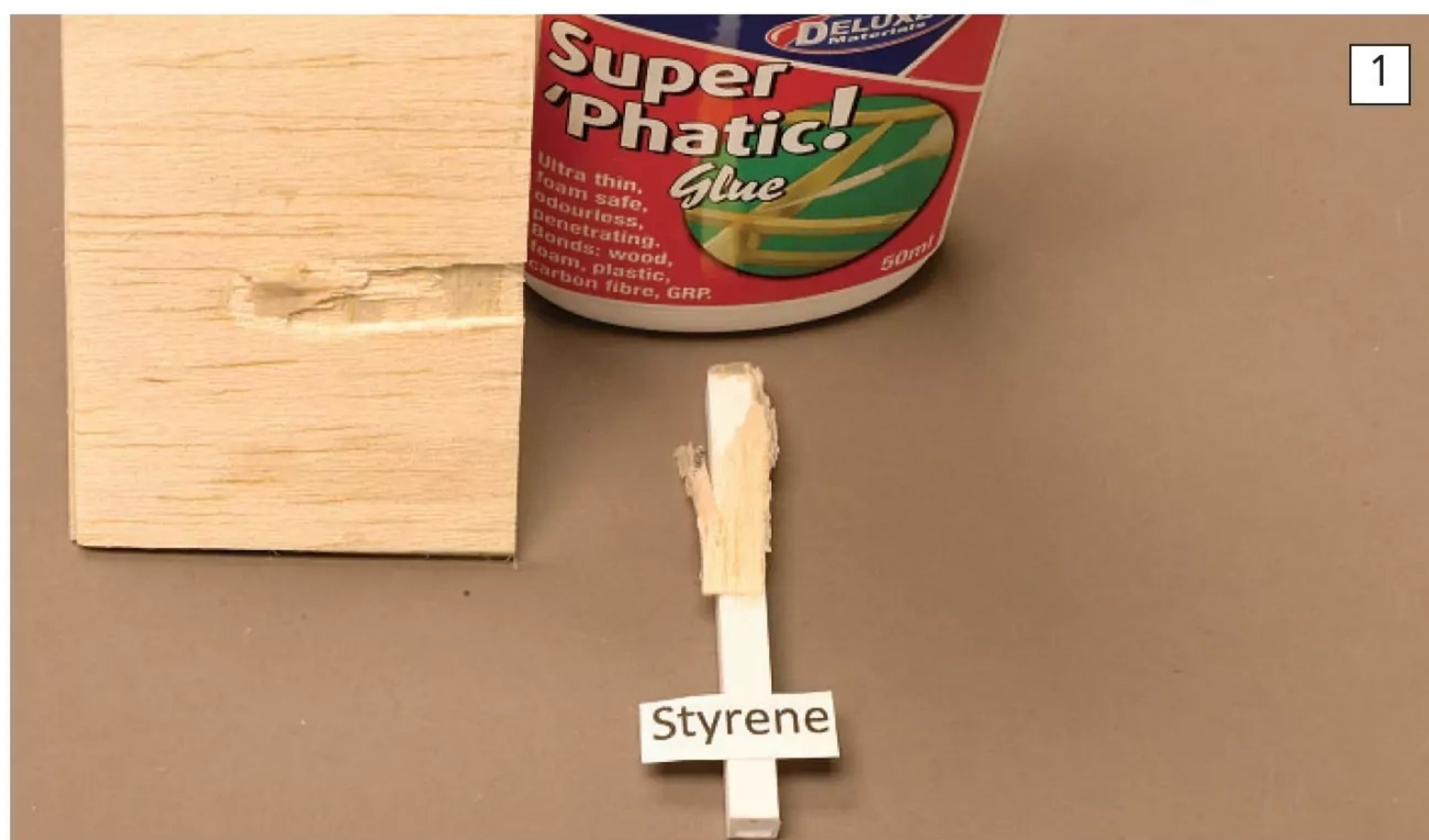
To demonstrate the effect for the purposes of this article we placed some balsa sticks on a balsa sheet and ran a tiny bead of Super'Phatic! along just one side of each of them (see **Photo 2**). For the first 30 seconds the glue remained visible, but within a minute it had been completely absorbed into the wood. A short time later, inspection revealed that rather than simply having bonding to the balsa sheet along the line where glue had been applied, the sticks were in fact firmly fixed at all points of contact (see **Photo 3**).

You will find many tasks, including everything from repairing cracked balsa to sealing the inside of a boat, will be made so much easier because Super'Phatic! will simply wick into a joint.

Multi-material adhesion

Super'Phatic! is an excellent glue for hybrid structures of wood, plastic, composites and metal, and model boats often incorporate a variety of these materials.

Photo 4 lists some of the porous to non-porous materials Super'Phatic! glue bonds brilliantly (e.g., balsa to metal, balsa to fibreglass, etc). This is because the



"You will find many tasks, including everything from repairing cracked balsa to sealing the inside of a boat, will be made so much easier because Super'Phatic! will simply wick into a joint"

penetration toughens the porous material and the glue filets around the joint to bond firmly to the harder material. Epoxy glue, by comparison, doesn't penetrate as well and so the toughening effect is too localised.

Resilience

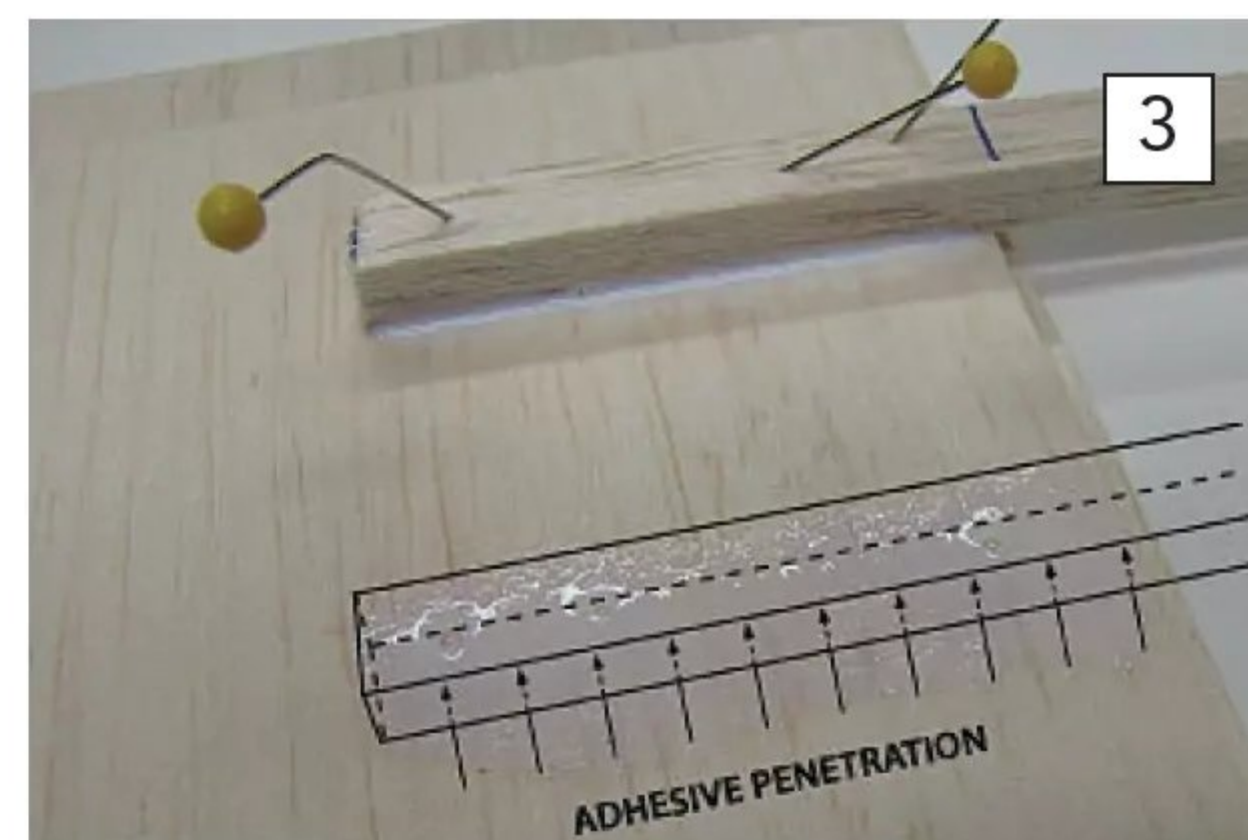
The bond is made with a strong but resilient film, which, unlike CA, won't shatter, which is especially reassuring when working with plywood joints.

Photo 5 illustrates the sheer strength of Super'Phatic!'s bond, as while the hardwood sticks glued to both plywood and balsa can be broken, Super'Phatic! joints will remain intact.

Likewise, when we bonded a plastic hinge (see **Photo 6**) and an aluminium strip (see **Photo 7**) to balsa with Super'Phatic! glue, after an over-night cure it proved stronger than both the wood and metal, clearly demonstrating that it's perfect for affixing metal ship fittings to ply.

No slide

As already mentioned, Super'Phatic!'s drying time is a good compromise between that of the instant bond created by CAs and the longer setting times of traditional glues. After it has been applied to a structure you have



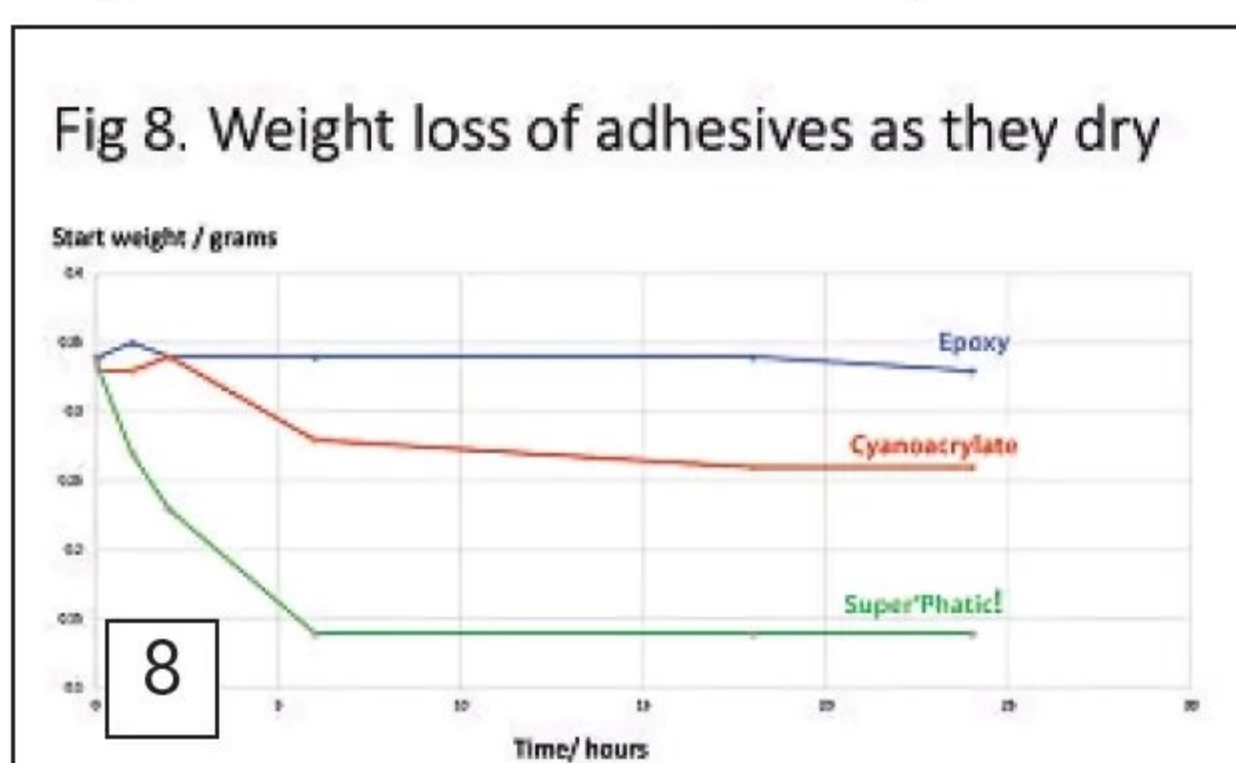
several minutes within which to reposition things, yet Super'Phatic! has a relatively short clamp or pin time.

When trying to clamp two flat surfaces together with PVA or Aliphatic between



them, the glue will act as a lubricant, and they will start to slide about. Clamping surfaces smeared with Super'Phatic! avoids this problem.

“When trying to clamp two flat surfaces together with PVA or Aliphatic between them, the glue will act as a lubricant, and they will start to slide about. Clamping surfaces smeared with Super'Phatic! avoids this problem”



Great for weight watchers!

Another benefit when choosing Super'Phatic! is that it dries losing half its weight in the process, thereby affording the lightest possible finished joints (see Photo 8).

Fume and mess free

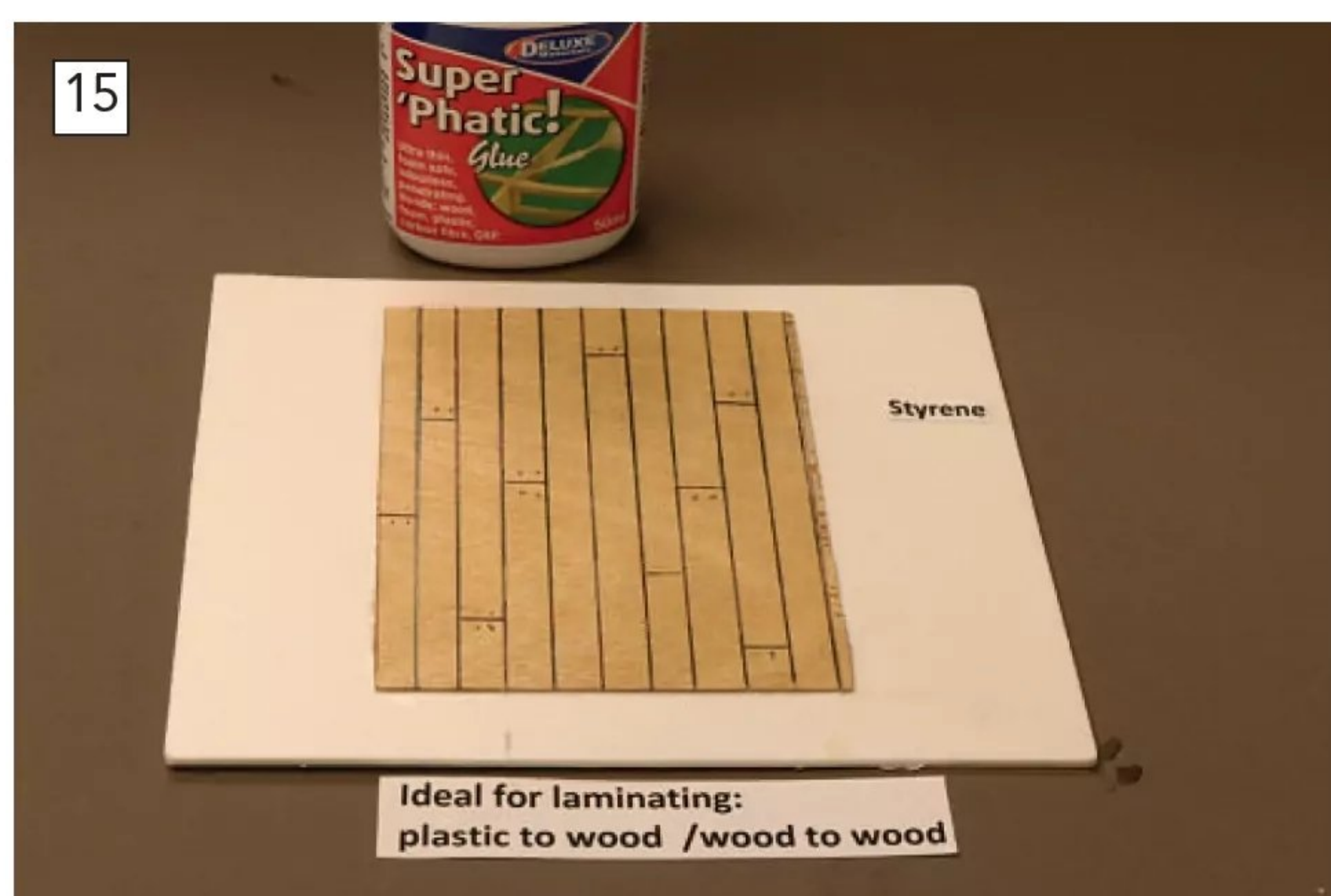
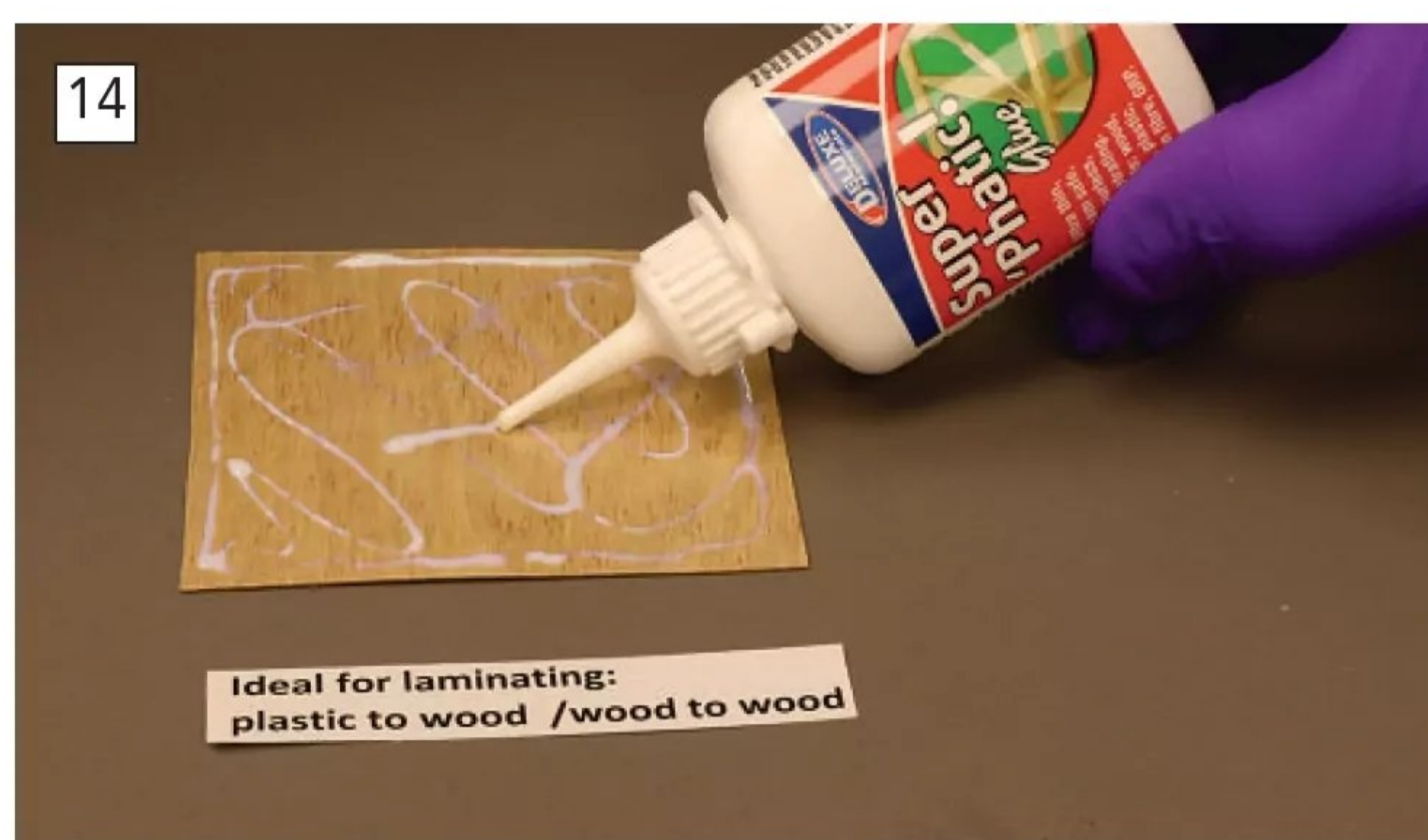
Super'Phatic! contains no solvents other than water. It is, therefore, fume free. This makes it an ideal alternative to CA glues when working in a confined space or, indeed, if you are sensitive to cyano and epoxies.



It is also very easy to clean up should there be any spills (see Photo 9).

Spills and excess application of product, however, are far less likely than with a lot of other adhesives out there. The nozzle on a bottle of Super'Phatic! dispenses just the right amount of product, with no dribbles (as demonstrated while being applied to a bulkhead in Photo 10), therefore leaving no excess glue to worry about.





Sandable joints

Photo 11 shows a hardwood side stringer that has been glued to a fibreglass hull side; any excess dry Super'Phatic! glue can be easily sanded away.

Significant uses

There are many uses for Super'Phatic! while model boat building, but here are a few of the more significant ones...

■ Bonding stringers

Having tacked the stringer onto a GRP with Roket CA glue to make sure it's in the right place, Super'Phatic! is added to create a

durable bond at the bow (see **Photo 12**) and the side (see **Photo 13**).

■ Bonding/laminating a plywood deck

Super'Phatic! can also be used for laminating. **Photo 14** shows it being spread onto a dummy marine ply sheet.

The deck is then placed, with plenty of adjustment time, onto a sheet of plastic styrene and weighted down. The glue dries through into the plywood, thereby achieving a cleaner and stronger result than you would get when using a simple contact glue (see **Photo 15**).

Photos 16 and **17/17a** show the plywood planks looking great on both the main deck

of our boats and also on that of customer Karl Kuttruff's steamer.

Putting Super'Phatic! to good use

On my own *Sea Hornet* (an enlarged version) I used plenty of Super'Phatic! for flooding the internal joints after the plywood skinning of the hull, reinforcing the bulkheads, and finally bonding the planked deck – using doll's house Parquet flooring panels – but don't tell anyone! (see **Photos 18 and 19**). This is still my favourite boat and at the lakeside everyone asks where did you get that mister?



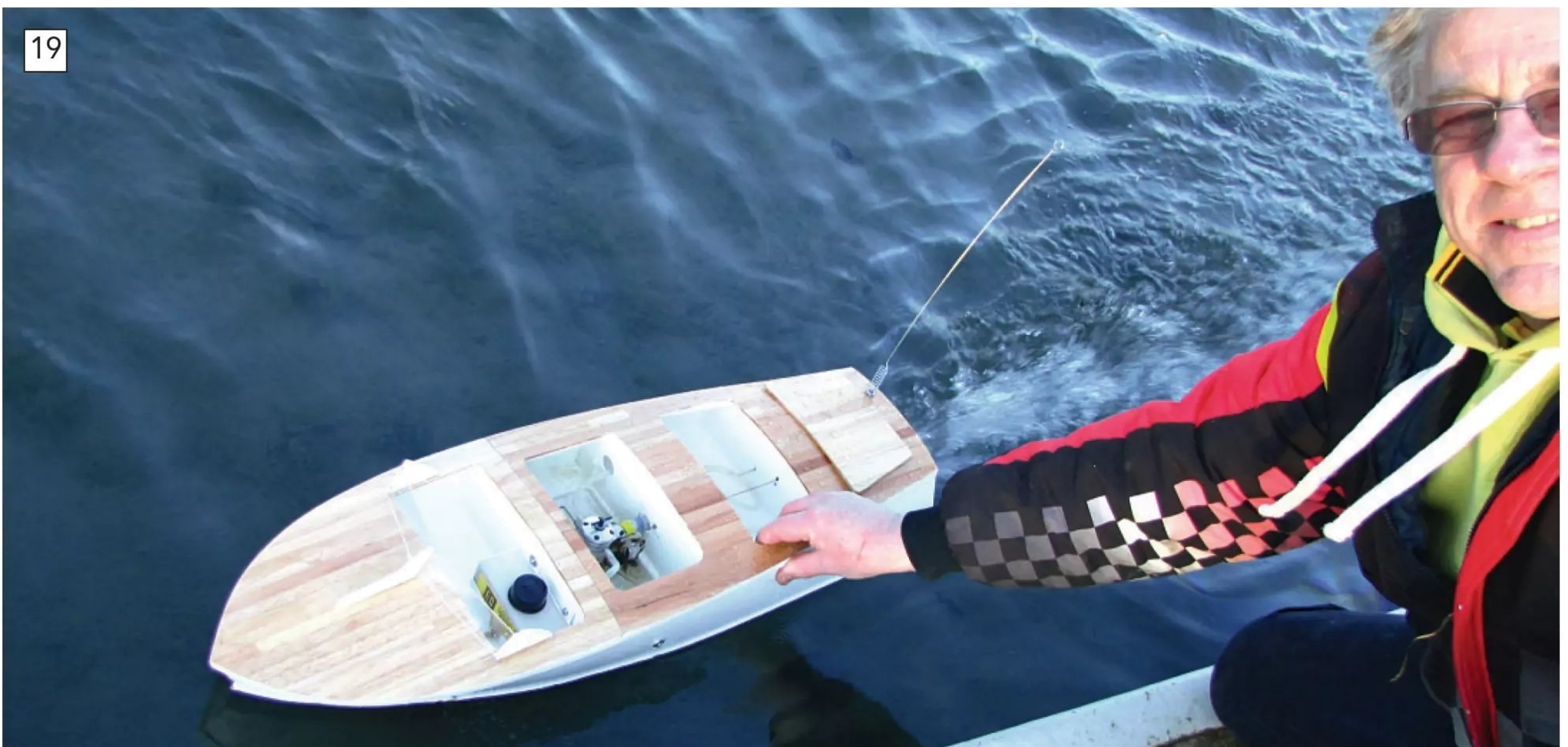
"If you've already discovered Super'Phatic! and have found a novel use for it, please send in details via the editor.... A surprise DeLuxe Materials prize package awaits the best three submissions received!"

Over to you!

If you've already discovered Super'Phatic! and have found a novel use for it, please send in details via the editor, including a good photo of yourself either working on a build in progress or with your finished model boat. A surprise DeLuxe Materials prize package awaits the best three submissions received! ●

Sourcing Super'Phatic!

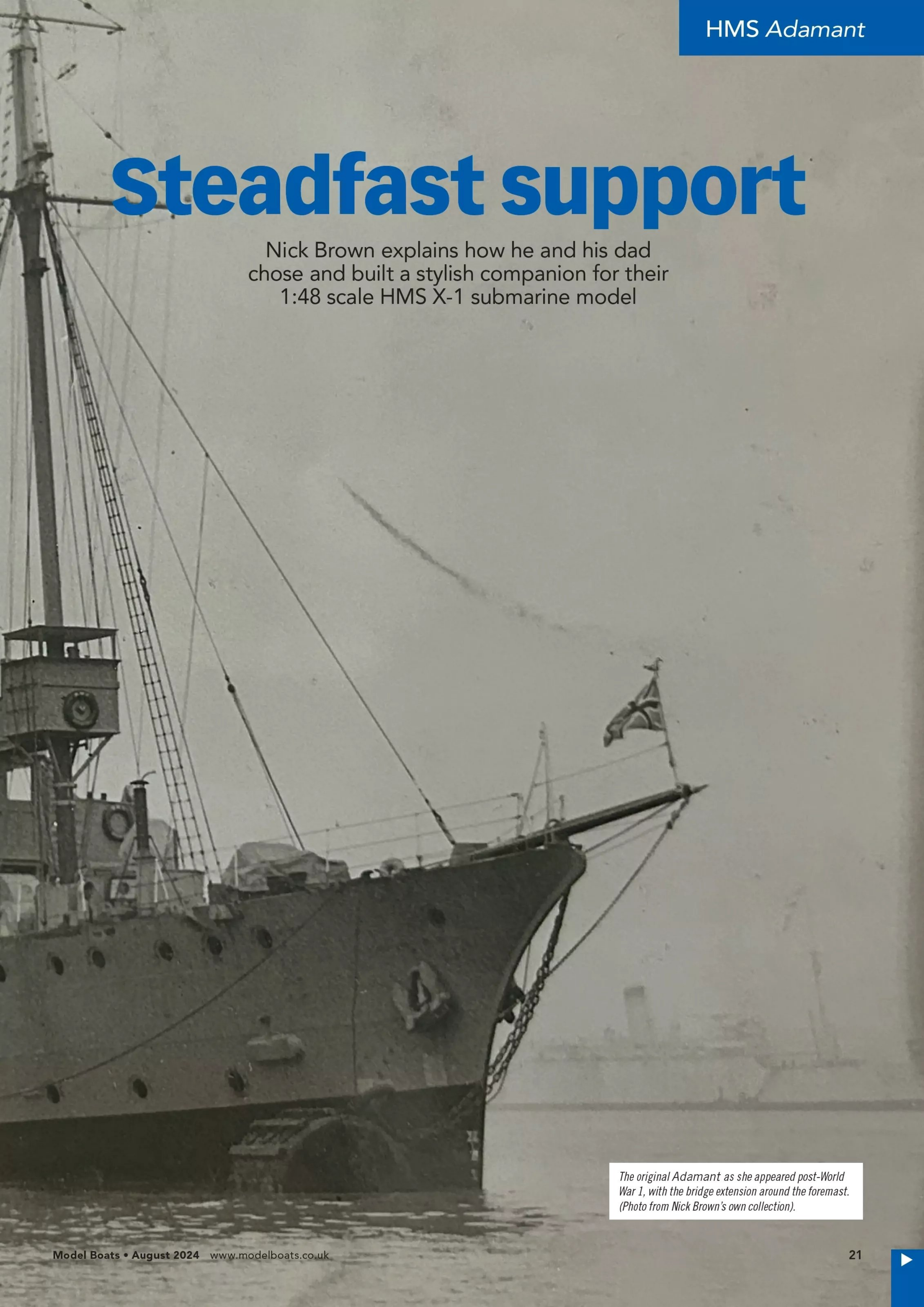
Super'Phatic! carries an RRP (Recommended Retail Price) of £7.99 and is distributed to all good hobby shops by Ripmax in the UK and Expo Tools. Should you encounter any difficulty finding the product, however, please visit the deluxematerials.com website or telephone 01529 455 034.





Steadfast support

Nick Brown explains how he and his dad chose and built a stylish companion for their 1:48 scale HMS X-1 submarine model



The original Adamant as she appeared post-World War 1, with the bridge extension around the foremast. (Photo from Nick Brown's own collection).





A fictional meeting, or was it? The Adamant tendering to the giant HMS X-1 submarine – both having been built to 1:48 scale.

After completing our 1:48 scale HMS X-1 submarine (see the February 2021 edition) my dad and I wanted to build a support vessel to sail with the submarine. In 1:48 scale the choice was rather restrictive unless we wanted a gigantic model of either HMS Medway or HMS Forth, both of which were out of the question as they wouldn't fit in the van! A smaller vessel needed to be sought.

During a visit to the CADMA show in Doncaster we were lucky to chance upon and buy a photo file of Royal Navy support vessels of the 1920s and 1930s, and this included the submarine tender HMS Adamant. Although finished in the grey hues of a warship, interestingly, she had the look of an Edwardian steam yacht! The idea of constructing something that appeared to incorporate two very different styles of vessel in one model appealed to both of us, so as usual a request was sent to Greenwich.

A tale of two sisters

Much like our requirement for a support vessel to accompany our submarine, the Royal Navy had the same problem.

Early submarines were small and cramped to allow continuous voyages at sea like

“In 1:48 scale the choice was rather restrictive unless we wanted a gigantic model of either HMS Medway or HMS Forth, both of which were out of the question as they wouldn't fit in the van!”

modern submarines. Crews often only stayed on-board for no more than three days, so accommodation, messing and maintenance were carried out on parent vessels.

HMS Adamant and her sister ship HMS Alecto were classified as submarine depot ship tenders, being built for the Royal Navy in 1911 to support the new D-class submarines. The tenders would allow a small part of the submarine flotilla to be deployed away from their main operating base. Adamant was launched on July 12, 1911, at Cammell Laird and was commissioned into service on April 27, 1912. Adamant was 212ft (65m) long and had a beam of 32.5ft (9.91m), displacing 935-tons. Unusually for this era they were unarmed, despite the famous Jane's recognition books saying otherwise!

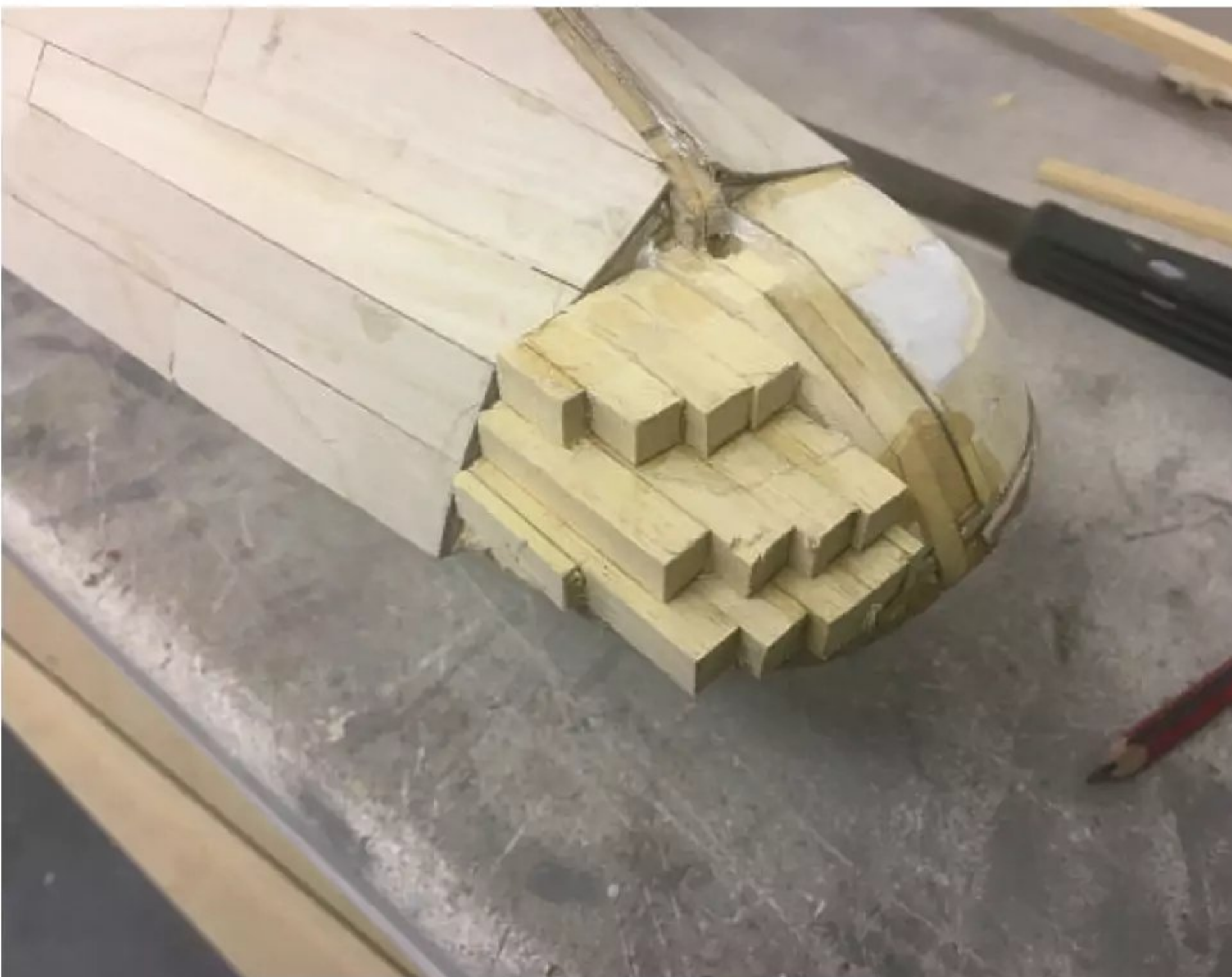
Adamant was attached to the 8th Submarine Flotilla and when World War 1 started she moved with the flotilla to its war station at Harwich. She was transferred to Eastern Mediterranean Squadron based

at Mudros in March 1915 to assist with the Dardanelles Campaign, now supporting the newer E-class submarines. In January 1916 she moved to Brindisi to act as depot ship for the Adriatic Squadron, before returning to Mudros in November of the same year. This flip-flopping between Mudros and Brindisi would continue until the armistice was declared in November 1918. Her sister, Alecto, had a similar experience but in Home Waters only, transferring up and down the east coast of England.

Post WW1 Adamant became parent ship of the 2nd Submarine Flotilla at Devonport, until 1922 when she moved to Portsmouth. Still looking after the 2nd Submarine Flotilla, she moved once again to the Mediterranean in 1925 and back again to Devonport in 1926. Eventually, after a few more years' service, she was sold to Rees, Llanelly, for scrapping in September 1932. Alecto differed from her sister and served in World War II before being disposed of in 1949.



The beginning of the Adamant; much like her full-size counterpart, she was built upright on stocks.



The stern was built up from ramin square strip wood, then filed to shape to create the rounded stern.



As far as we know X-1 and Adamant never actually served together, but they did co-exist in the Mediterranean for almost a year, so it's possible that they may have come across each other at one point but that no-one took the time to photograph them together. To a certain point, therefore, some artistic license has been taken!

Work gets underway

Our luck held, and the National Maritime Museum Plans Section sold us copies of the general arrangements of Adamant as built in 1911, with some very helpful hull sections and waterlines. The waterlines were very pleasing, but the bow shape was the most appealing feature, giving the ship her 'posh steam yacht look'.

“The waterlines were very pleasing, but the bow shape was the most appealing feature, giving the ship its ‘posh steam yacht look’”

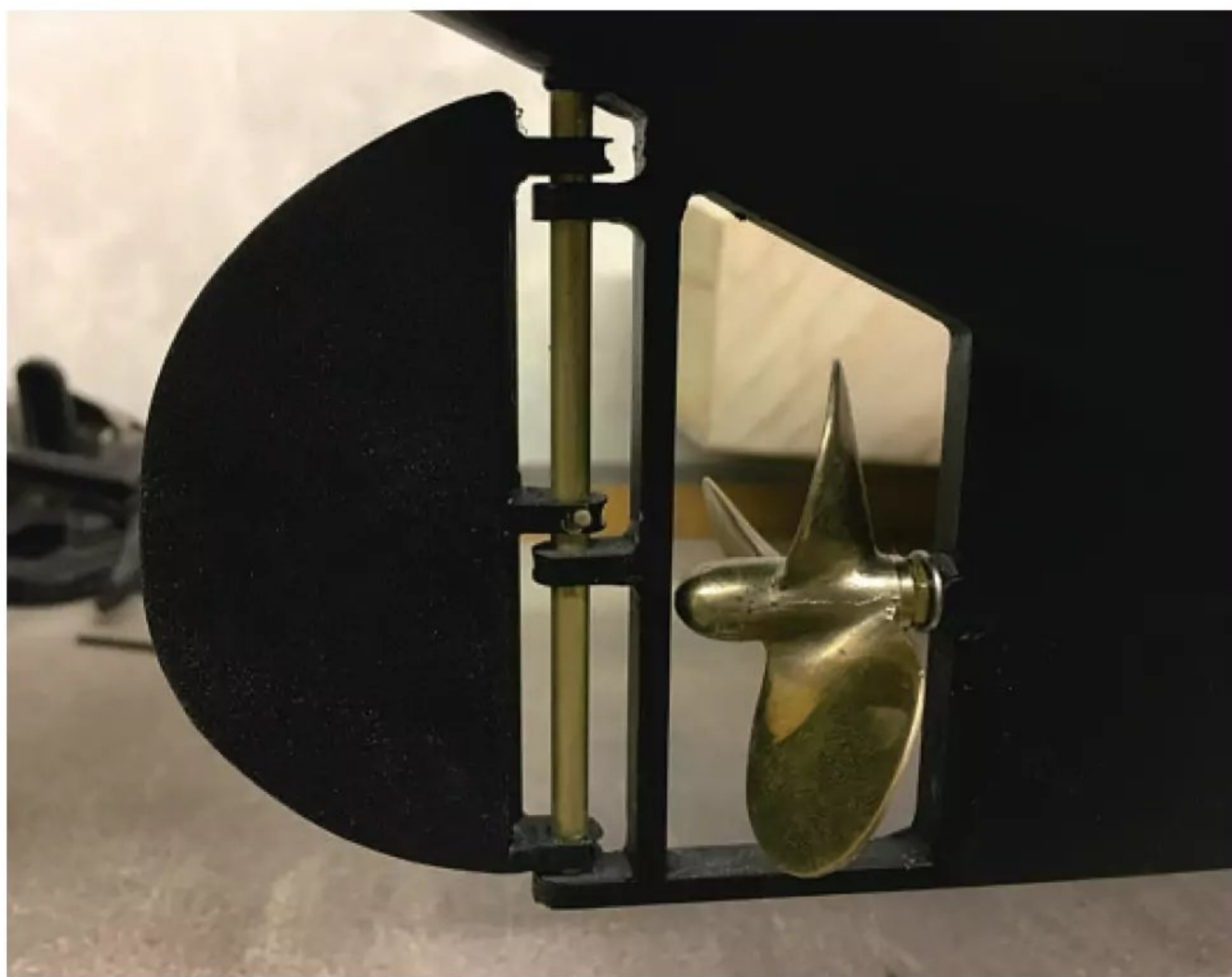
The hull of our model was constructed much like a real ship – upright and on stocks. Having a single screw (propeller) meant that the keel had to be built in two sections to allow the propeller shaft to pass through. The basic bow shape was added to the keel creating the backbone of the model. Transferring the hull sections from the plans, the frames were constructed from softwood; we prefer softwood, as it's easier to shape and glue than plywood. The deck beams were added, as were the upper longitudinal beams, creating the basic outline of the hull. The hull was skinned with 1/32" marine

plywood sheet (we have an excellent supply of birch faced ply for this task) and another layer of 1/32" plywood to create the plating effect. The stern posed an issue in terms of the plywood following the narrow shape, so it was filled with blocks of square ramin, filed to match the shape and blended into the hull plating.

The delicate framework that supported the rudder was carefully soldered together with square and rectangular brass section pieces. This entire brass framework is removable to a certain point, with hidden screws holding it to the hull. The rudder was



The application of the 1/32" plywood plating allows the shape of the hull to appear.



The rudder support framework is technically fully removable via hidden screws, but only in the most drastic of emergencies!

built up from brass sheet wrapped around a brass rod and filled with P38 car filler. The hinges had to be soldered to the rod using heat-soaks to prevent the pre-constructed rudder from falling apart. Like the supporting

framework, the rudder can be removed after some minor surgery, tapping a small locking pin from the hinge point – all just in case the rudder is damaged or a problem in the steering system occurs.

Self-induced problems

From the very start of this project, we wanted to utilise a smoke generator and I bought an off-the-shelf item, but this did present the problem of where to position it



The initial details being added on the hull and deck using lithoplate sheet, brass and aluminium tube. The off-set access to the internals of the model can just be seen.



The bridge being constructed, showing the extension around the foremast; all was modelled from 1/32" plywood.

inside the hull in order to keep it accessible. The 12v car heater motor used for main propulsion was located as low as possible, with the associated speed controller and receiver sitting against the hull sides to

allow the battery to sit in between them. Trying to fit the smoke generator in this limited space would mean having to make it removable to gain access to the battery for charging. The access hatch was also

complicated by being slightly offset to starboard to prevent interference created by the ship's boats – the bigger two of the four boats sit on the port side. To avoid having to gain access to this area continually, the main

power switch was located aft under the rear searchlight platform.

Hull details are a mix of lithoplate sheet to represent doors and hatches; strips of wood for what we presume are bumpers and climbing rungs, and brass portholes. The deck is something of an enigma, as to date no pictures of the actual deck could be found and the original ship's plans do not elaborate as to whether the deck was planked or not. We decided to make the model without planking on the decks and just added some anti-slip grips across the expanse of deck. It may not be 100% accurate but until further information comes to light it is close enough! The strips are 1/64" plywood cut into narrow lengths and laid across the decks and around skylights.

We intended to follow the ship's plans closely while constructing the superstructure, but a photo of a post World War 1 Adamant revealed a bridge extension wrapping around the forward mast. As we wanted to represent the Adamant in the 1920s to match the era

of the X-1 submarine, we strayed slightly in this detail.

We usually like to make the funnels on our models from downpipe or water pipe used in the building trade, as these are perfectly circular, strong, and come in standard diameter sizes. Unfortunately, however, none of the standard sizes matched the funnel on Adamant in 1:48 scale. Fortunately, a trawl through listings on a well-known auction site produced results in the form of some acrylic (Perspex) tube that came in the diameter required. The funnel is slightly tilted back at rakish angle; this was cut using an adjustable chop saw that ensured the top and bottom of it were at the identical angle and then detailed using bits and pieces from the spare's drawer. The steam vents and horns were also found in this drawer.

A choice of grey or grey!

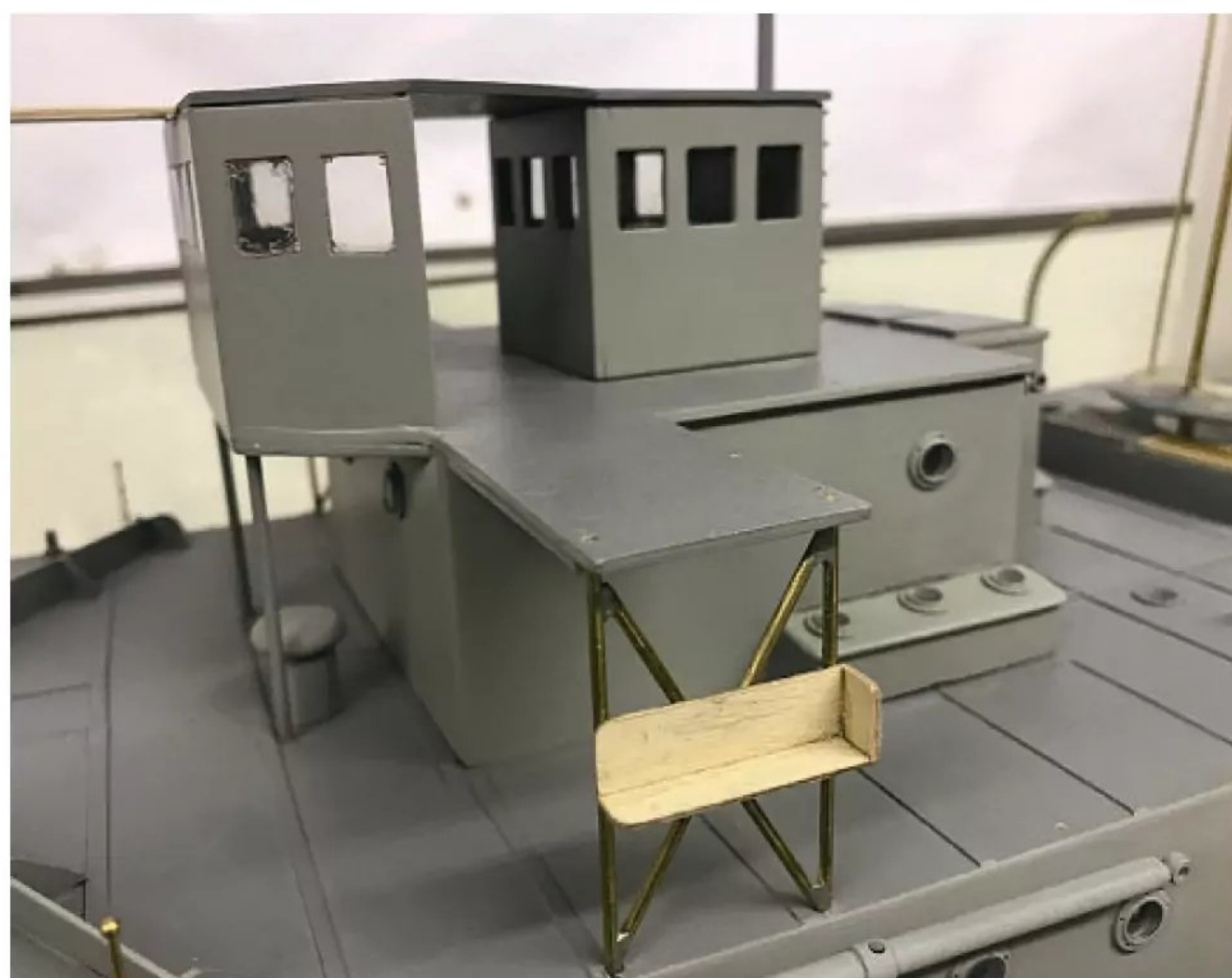
It was at this point we decided to paint the hull. After it had been given a rub down with some fine grade sandpaper and the



Acrylic tube, which, when detailed with fittings from the drawer that time forgot, was turned into a stylish funnel.



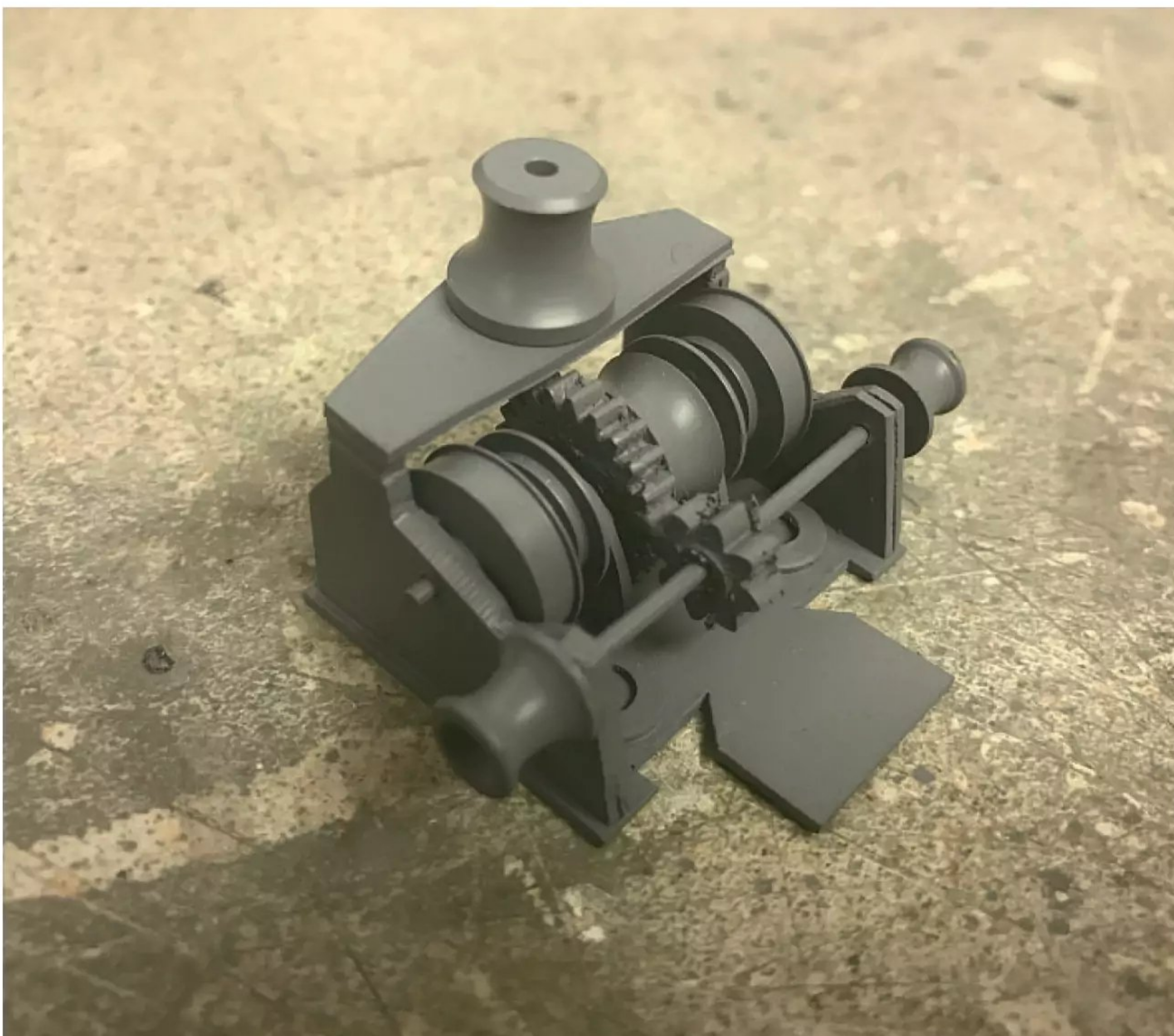
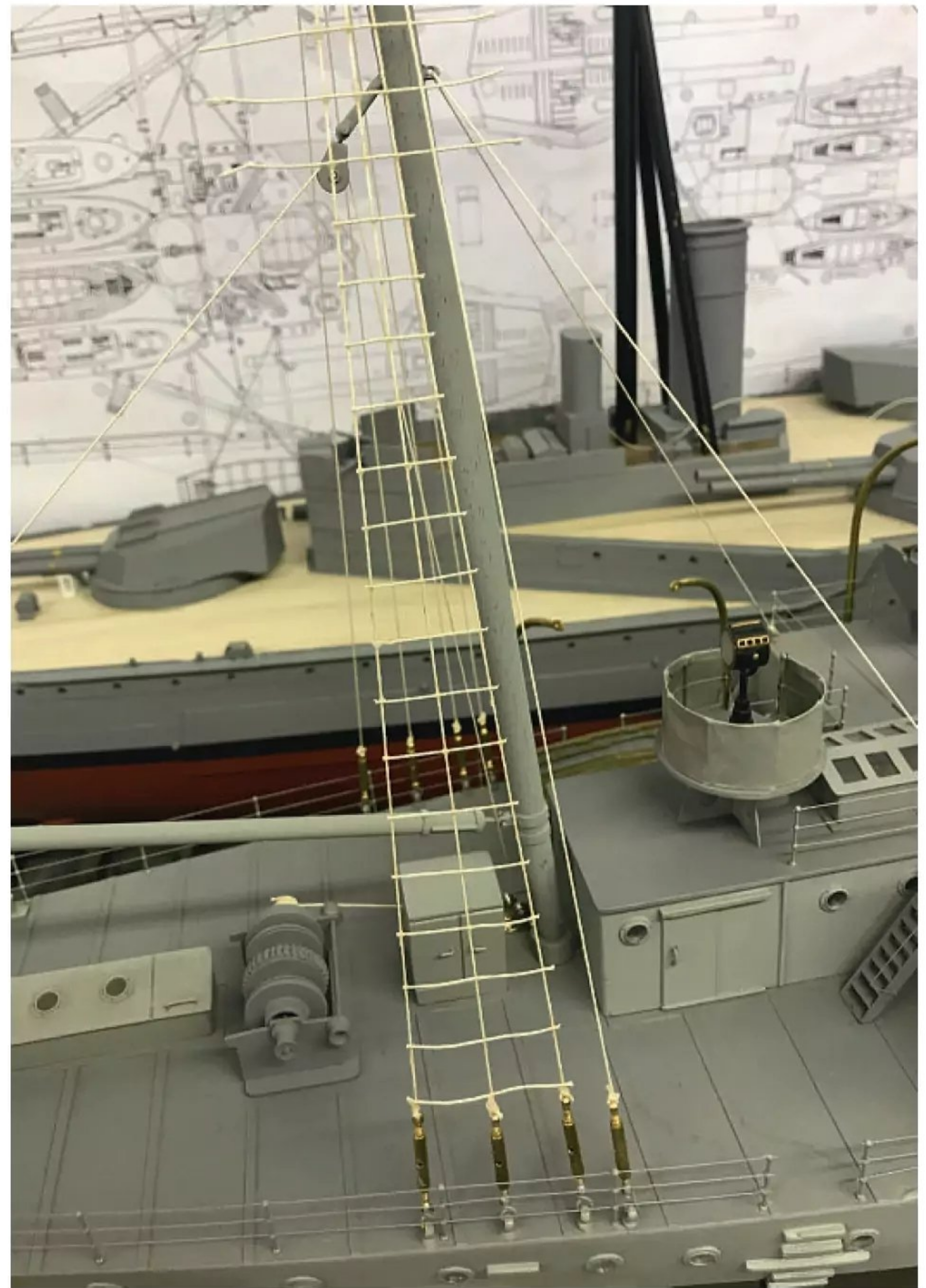
The hull spray painted in drab warship grey. Interestingly, the black waterline is not straight but actually tapers upwards at each end of the ship.



The bridge being painted and detailed with the navigation light boxes and their supports.



The beginning of the ratlines on the stern deck area.



The anchor windlass was built up using fittings from a Mountfleet Models' kit to create an approximation of the original.

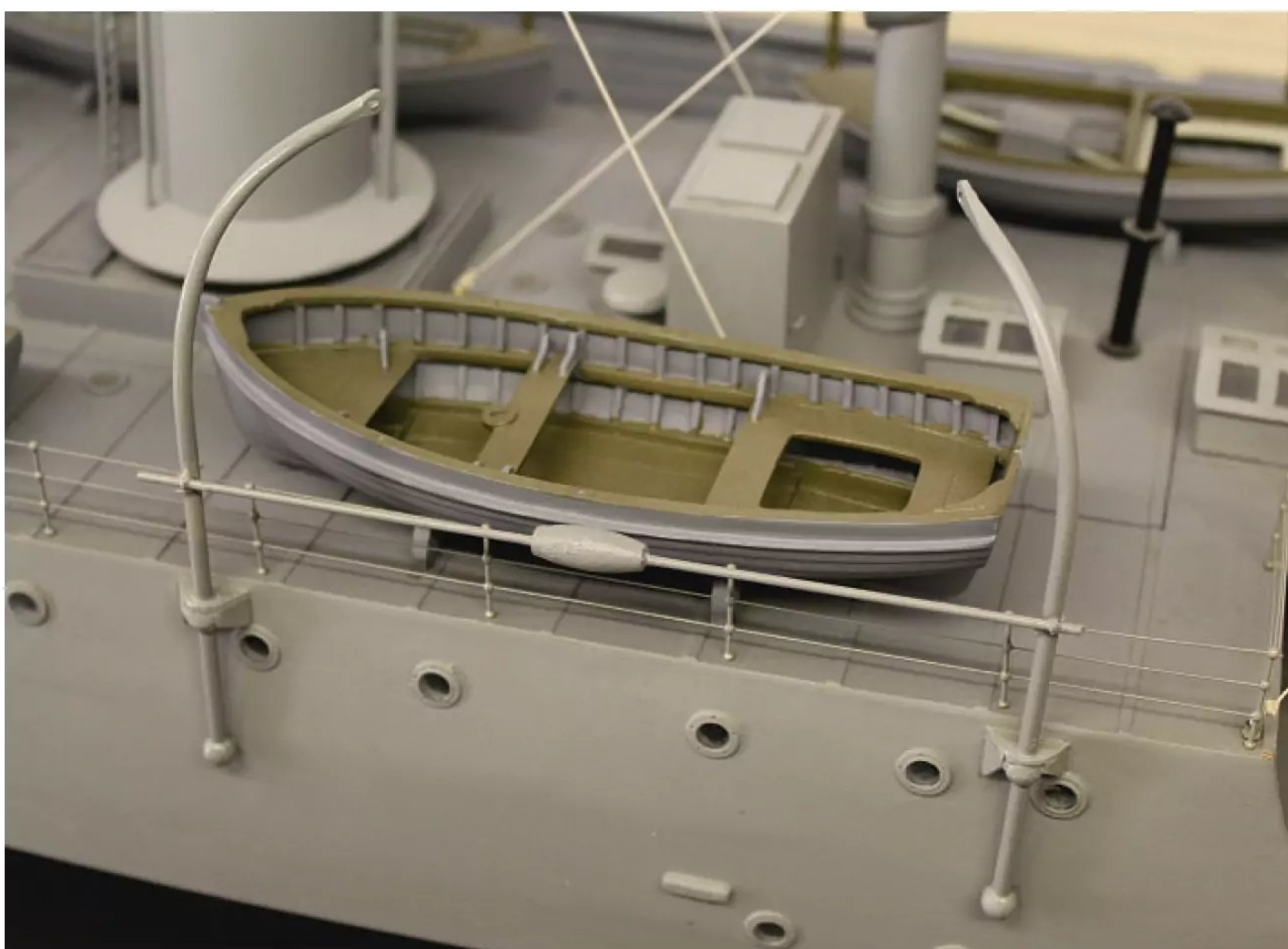
“I can’t praise these props highly enough, as they are cast bronze made from the lost wax process, and (in my opinion) are relatively inexpensive for such quality items”

odd gap filled, it was given a light coat of primer to check for any imperfections or gaps we’d missed earlier. It was then coated with a sealer to make it watertight and protect the wood before being painted with car primer grey as a base for the paintwork. The decks were left in the primer grey, as this looked about right for the type of finish required, while the hull sides were sprayed with Humbrol No. 64 Light Grey and the anti-fouling underside was given a coat of black car primer. Following this, the paintwork was sealed with a lacquer coat, adding a nice sheen to the finish and making it easy to wipe down after a sailing session.

With the painting complete on the hull, the three-bladed propeller was added, this being from our favourite manufacturer, the Prop Shop – I can’t praise these props highly enough, as they are cast bronze made from the lost wax process, and (in my opinion) are relatively inexpensive for such quality items.



Further deck details being modelled from 1/32" plywood sheet. The deck was festooned with many decklights and skylights. The 3D-printed searchlight was from the Shapeways Shop 3D Boats.



The ship's boats, sourced from Quaycraft, being fitted out, with the associated davits being made from brass tube bent to shape using a pipe bender.

The masts are standard lengths of dowel that matched up with the ship's drawings and were detailed with brass rod to represent the yardarms and mast tops. The upper mast tops are removable to allow the model to be easily transported and stored. The main mast also doubled-up as a derrick to lift items like torpedoes and other heavy equipment on- or off-board as desired. All the pulleys came, once again, from our spares drawer and were suitably modified to fit. The lifting winch

"Now came the task I had been particularly dreading..."

was a hard item to source, as was the steam anchor windless. Mountfleet Models now supply a couple of excellent winch kits and at a show we bought an example of each, but as they didn't exactly match the ones fitted to Adamant, we instead used the kit parts to make our own versions.

Training a spider!

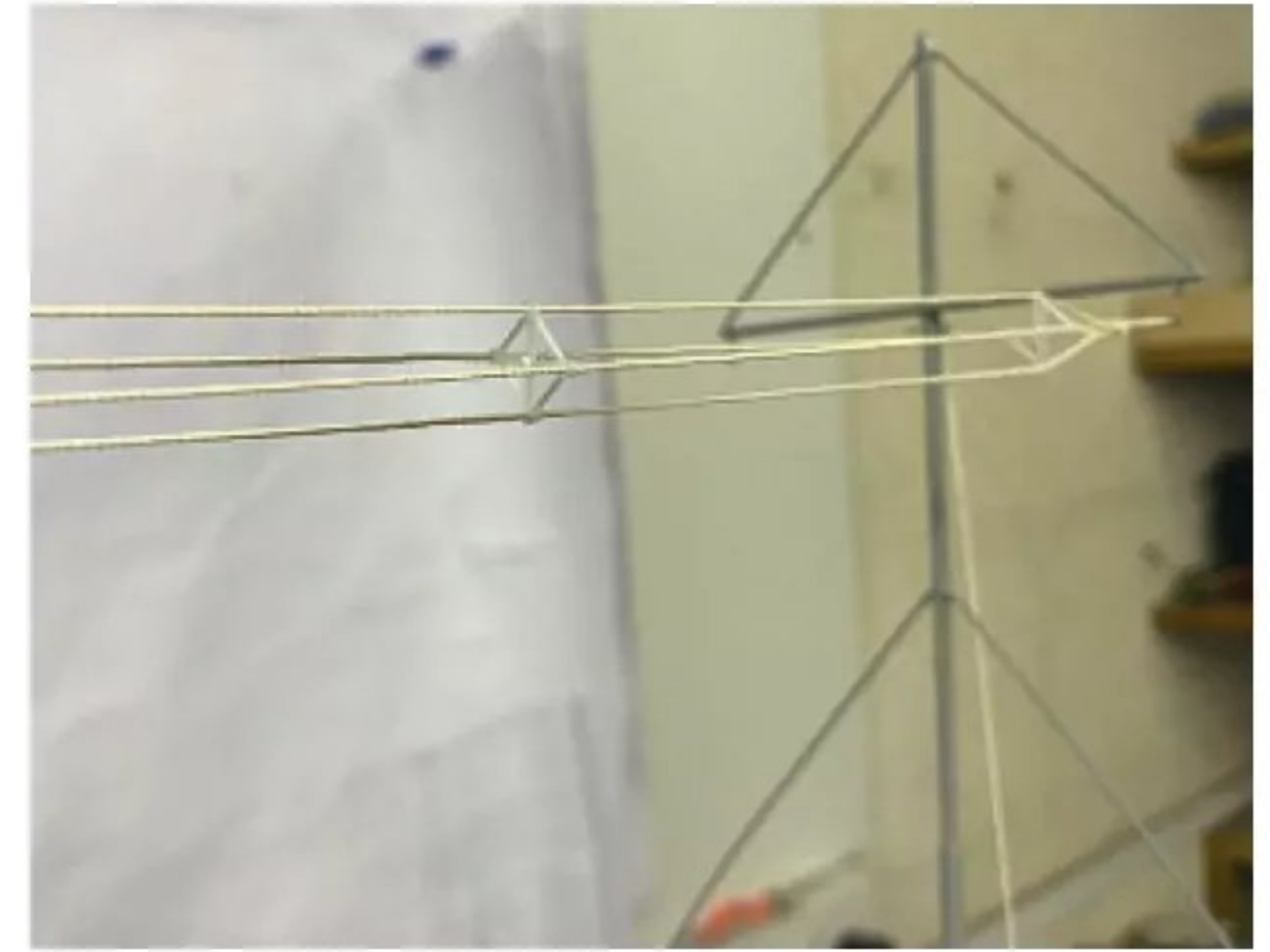
Now came the task I had been particularly dreading, as my last attempt at creating ratlines had been ten years earlier and it had been a bit daunting back then. This time I had to use turnbuckles to help rig the climbing ratlines, which helped to maintain the tautness of the cord during the process. The horizontal lines were placed approximately 1/2-inch apart and employing a spider might have been quicker! There are four of these



Perhaps the most pointless feature on the Adamant, but the most appealing when it comes to effecting the 'posh steam yacht look': the bow sprit.



To add a sense of scale to the model, crew figures from Mountfleet Models were hand painted to represent Royal Navy officers and sailors.



The 3D-printed aerial spreaders. The swear jar was duly filled trying to thread the cord through the tiny 0.3mm holes!



A final flourish: Adamant's silk White Ensign was raised thanks to the artistic skill of 'Flag Man'.



The completed model on the water; the incredibly tall masts so indicative of this era of warship.

"These flags and ensigns are absolutely beautiful and flutter very realistically"

'webs' to make and I thought my dad was 'pulling my leg' when he suggested that I make the aerial spreaders that hung between the masts! Alas no, so to save my sanity I splurged a bit of money on some 3D-printed parts, but my patience was still sorely tested while trying to thread a 0.2mm diameter cord through a 0.3mm diameter hole! Let's just say that Dad wisely left the shed while I carried out this task.

Ship's boats and other fittings

To save time we bought the ship's plethora of boats from Quaycraft, including a 27ft whaler, a 25ft motorboat, two 16ft dinghies and a 32ft launch. These brilliant cast resin kits represent the boats extremely well. To lift the ship's boats into the sea there are two davits per boat, each individually constructed from brass rod sitting on their own pivot point. Dad drew a template, so the subtle curve was the same on each davit using a mini pipe bender.

Other fittings included two searchlights sited fore and aft behind their own protective canvas screens. These were 3D-printed

items designed by a modeller called Mark Hawkins, who is building a similar era vessel with virtually identical features, including a Downton pump, searchlights and bridge equipment (ship's wheel and telegraphs). The canvas screens are remarkably simple affairs, created by using a technique I borrowed from Dave Wooley; masking tape cut into strips replicate canvas extremely well, especially when painted.

Standby to sail

I sourced the crew from Mountfleet Models current selection of 1:48 scale Royal Navy figures, which I painted myself. These figures not only give a sense of scale to the model but, by dotting enough of them around, create typical scenes of on-board activities. Other features that couldn't be purchased were scratch built; these were the stove chimneys, water tanks, skylights and mushroom vents, all made from either brass tube or 1/32" plywood. One of my favourite features is the bowsprit. While it

served no real purpose on the Adamant, it does enhance the ship's steam yacht-like appearance no end.

Finally, as always, we raised a silk White Ensign, courtesy of our favourite 'Flag Man', Mike Allsop; these flags and ensigns are absolutely beautiful and flutter very realistically.

Using a standard three-channel 2.4GHz radio on a model such as this (with limited internal access) has made life much easier at the lakeside. There is no need to worry about changing crystals if others are using the same frequency and it decreases the chance of snagging the rigging or other fragile fittings. With the smoke generator being replenished via the funnel, this, too, prevents potential damage.

Sailing the model at Wicksteed Park works best on a still, calm day or evening, allowing the plume of steam/smoke to stand out while Adamant sails serenely up and down the lake. To date, this has been one of our favourite models to build and sail. ●

Get into Gears!

David Marks takes the grind out of grasping the basics...



Recently, for the second time in about five years, I found myself purchasing some gears for a model boat project. As I come from an engineering background, finding my way around gear terminology is not a problem for me; indeed, for a long time I taught apprentices how to machine various types of gear, and how to measure/inspect the end results (see **Photo 1** – Image courtesy of Brett Lowery, one of my many former apprentices). I am hoping, therefore, that imparting some of this knowledge to others who may find themselves looking to make use of gears for a model boat project may prove helpful – nothing too heavy, just the very basics.

What are gears used for?

As far as model boat builders are concerned, gears have four main purposes:

- Providing 'Drive' between a power source (e.g. an electric motor) and an unpowered component (such as a propeller shaft). This is sometimes called 'Parallel Drive', as the axis of both the motor and the propeller shaft are parallel to each other.
- Increasing or decreasing 'the rate of movement'; normally this is the rotational speed between motor and prop shaft

- Changing the 'Axis of Movement'; usually this is taking the Drive through a right-angle but could be an angle other than 90°.
 - Converting a 'Rotational Movement' into a 'Reciprocating Movement'.
- One of my previous builds was a model of a Canadian Log Pusher (see **Photo 2**) from

Plan MAR 2330, which is still available from Sarik Hobbies. These little boats, as well as being powerful and robust, also need to be ultra manoeuvrable and able to turn through 360° within their own length. Mainly for the latter reason, they have a single combined propulsion/steering unit known as an Azimuth



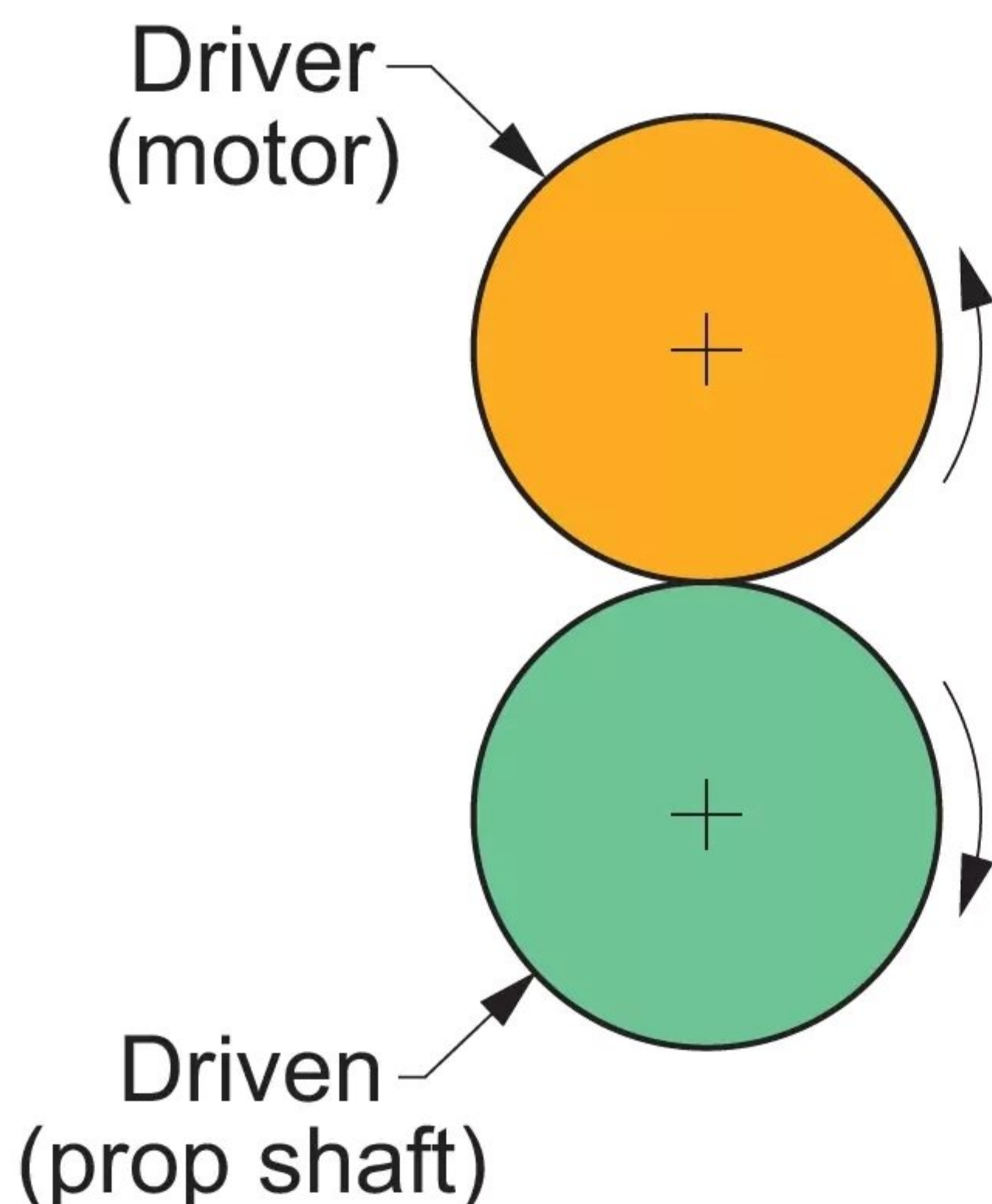


Diagram 1

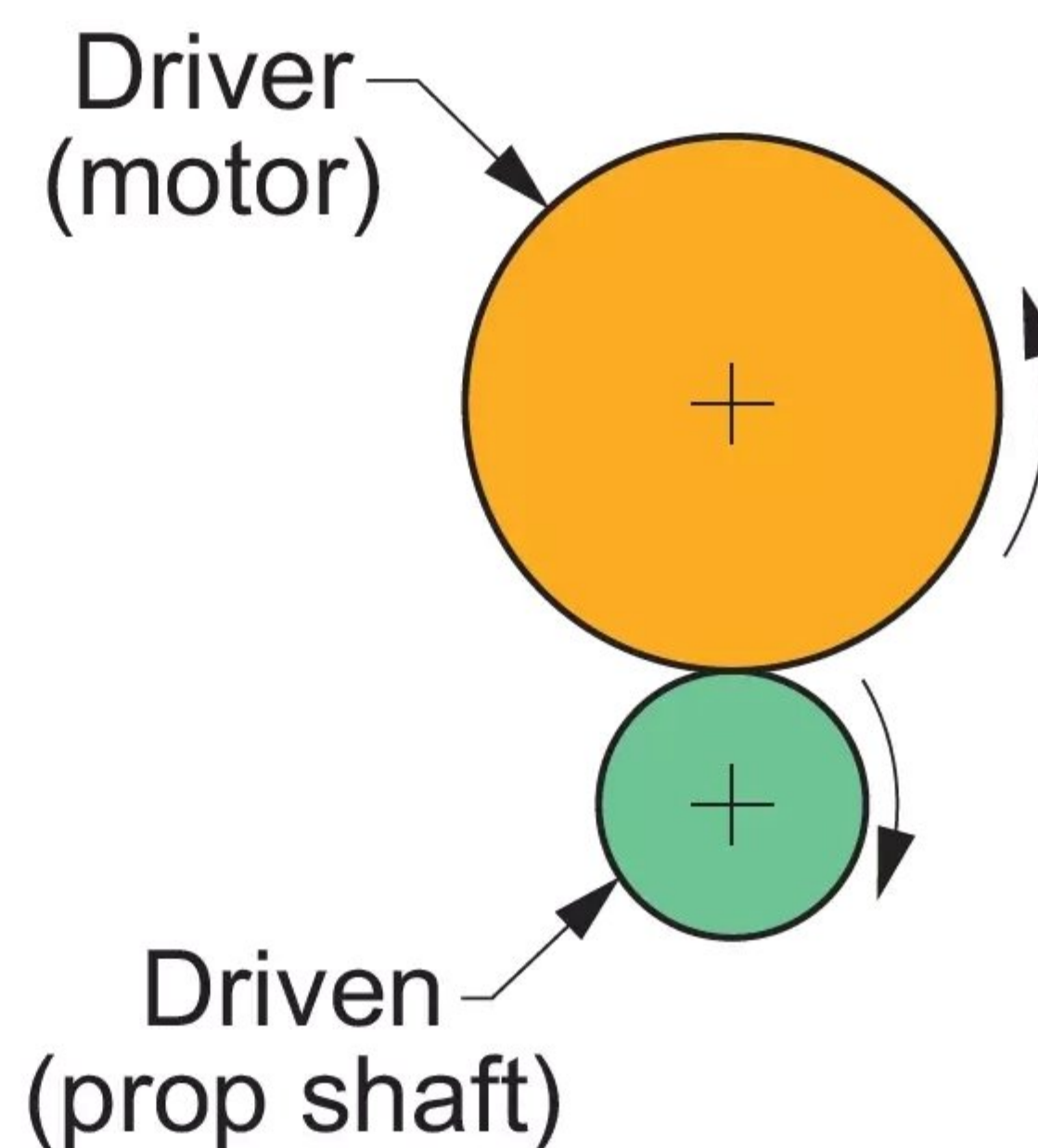


Diagram 2

Drive or Z Drive, which sits directly beneath the steerer. This was obviously a feature that I needed to replicate and the solution relied heavily on the use of gears.

What are gears?

We all know that a gear is a disc with teeth around its periphery which engage or mesh with the teeth on a mating gear. However, forget about gear teeth for a while and visualise two discs, in contact with each other at their periphery, one being the Driver, powered by an electric motor, and the other being the Driven, attached to a propeller shaft, where motion is achieved by friction alone (see **Diagram 1**). If the two discs both have the same diameter and therefore the same circumference, then the speed of the two discs will be the same, i.e., the RPM of the Driver (attached to the electric motor) will be matched by the RPM of the Driven (attached to the propeller shaft).

However, if utilising the same set-up but with a different pair of discs, where the Driver has a

diameter twice that of the Driven (see **Diagram 2**), then for the circumference of the smaller disc to keep pace with that of the bigger disc it will need to revolve twice for every one revolution of the bigger disc, i.e., the propeller shaft will rotate at twice the speed of the motor.

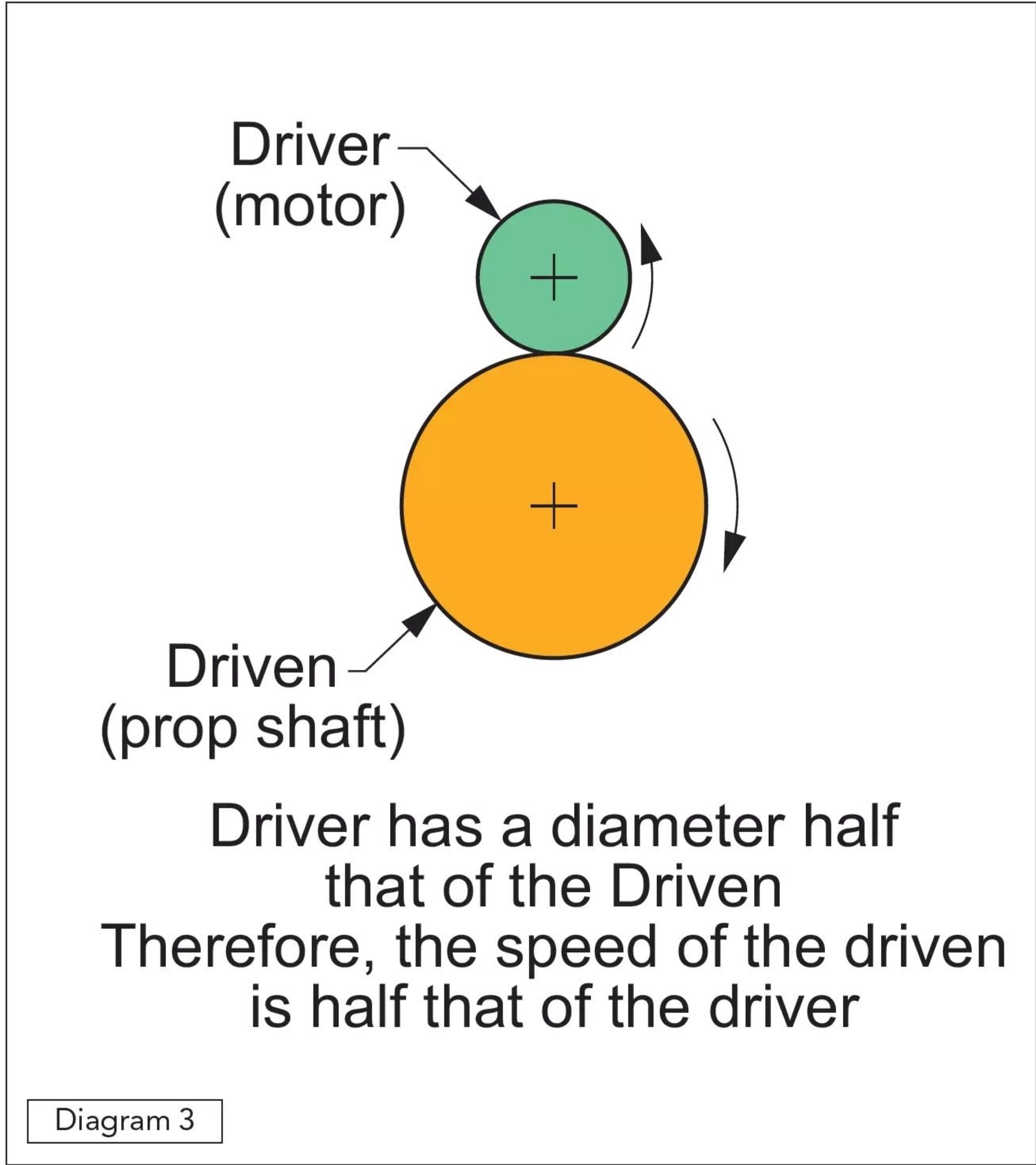
If you have a problem trying to visualise this set of circumstances, then think of the humble bicycle, which has a chain driven between two sprockets (a form of gear). A large sprocket attached to the pedals and a small sprocket attached to the spindle of the rear wheel means that the output from the rear wheel is much faster than the input provided by the person pedalling.

Conversely, going back to *Little & Large* (our two discs), fitting the smaller disc to the motor and the bigger disc to the shaft will cause the shaft to rotate at half the speed of the motor (see **Diagram 3**).

“If you have a problem trying to visualise this set of circumstances, then think of the humble bicycle...”

There are mechanisms that make use of two discs as a means of transferring motion from one to the other, where an element of slippage is not a problem, normally known as a ‘Friction Drive’. However, for most mechanisms, slippage cannot be tolerated, hence the use of discs with teeth around their periphery, giving us the most common type of gear, known as a Spur Gear. So, instead of a ‘disc’ of known diameter we have an imaginary circle called the Pitch Circle Diameter (PCD) upon which the teeth are spaced. Each gear tooth has two elements: the Addendum (above the PCD) and the Dedendum (below the PCD).

Two gears correctly ‘in mesh’ will roll about their invisible PCD, with the Addendum of one gear located within the Dedendum of the mating gear. The teeth of a gear are not straight sided but



have a slight curve, called an Involute Curve, and it is this curved surface where one gear meshes with its mating gear to produce drive. It should be noted that the Addendum is smaller than the Dedendum, thus providing an amount of clearance, sometimes referred to as Tip Relief (see **Diagram 4**).

How are gears specified?

We started by establishing that it is the relationship between the circumferences of two discs that determines if a motor (or some other *input* of power) turns the *output* (possibly a propeller shaft) at higher, lower or the same speed. Also, we use the term PCD to describe the discs upon which the gear teeth are spaced. This means that it is the number of teeth on the input gear and the number of teeth on the output gear that determine if there's an increase or decrease in speed or whether the two revolve at the same speed.

So, for example, if you have an electric motor with a nominal speed of 8000 RPM and you want that reduced to 4000 RPM, the calculation is, $8000 \div 4000 = 2:1$ ratio; therefore, you need two gears with the **same** tooth form but where the number of teeth

give the same end result of 2:1, e.g. $80T \div 40T$ or $60T \div 30T$, etc, with the smaller gear being the Driver fitted to the motor, and the bigger gear being the Driven fitted to the prop shaft.

How do I know when two gears have the same tooth form?

When purchasing gears, this will be defined within the data sheets available from the supplier, but the info is also available via the internet or alternatively easy enough to calculate yourself. The tooth form is defined as a ratio (so has no units of measurement) between the number of teeth and the size of the PCD. So, you are looking for the letters **M** or **DP**:

- **M** = Module and is the ratio between the No. of Teeth and the PCD measured in millimetres. So, ***M* = millimetres.**
- **DP** = Diametral Pitch and is the ratio between the No. of Teeth and the PCD measured in inches. So, ***DP* = inches.**

For two gears to mesh correctly, they need to have the same tooth form, and there is no direct conversion between M and DP. Here is an example where two gears look very similar, in both physical tooth size and diameter but one is M and the other is DP.

“If you wish to establish if a gear was manufactured to the Metric or the Imperial system, then it’s just a question of following a basic procedure and then carrying out a simple calculation...”

Tooth Size	PCD	No. of Teeth
3 M	*75.00 mm	25
8 DP	*3.00 inches	24

*1 inch = 25.4 mm

From the table above it can be seen that:

- $M = PCD \div T = 75 \div 25 = 3M$
- $DP = T \div PCD = 24 \div 3 = 8DP$

Note that:

- With M gears, the higher the number, the **bigger** the tooth size.
- With DP gears, the higher the number, the **smaller** the tooth size.

How can I identify an unmarked gear?

If you wish to establish if a gear was manufactured to the Metric system, making it a Module (M) gear, or to the Imperial system, making it a Diametral Pitch (DP) gear, then it’s just a question of following a basic procedure and then carrying out a simple calculation.

Measure the major diameter of the gear (measured over the tips of the teeth to see if it equates to a Metric or Imperial dimension and then making a simple calculation based on the No. of Teeth (T), as follows:

- $M = \text{Major dia} \div T + 2$, which for a gear with a Major dia of 81 mm and 25 teeth gives us $81 \div 25 + 2$ or $81 \div 27$, therefore a result of 3 M.
- $DP = T \div \text{Major dia} + 2$, which for a gear with a Major dia of 3.25 inches and 24 teeth gives us $24 \div 3.25 + 2$ or $26 \div 3.25$, therefore a result of 8 DP.

Take that result and see if it matches a standard Module (M) or standard Diametral Pitch (DP) and the internet will provide you with that information. I have purchased gears that were 0.5 and 0.7 M but the DP system uses just whole numbers 8, 10, 36 DP, etc. Should you end up with a strange result, it’s either your dodgy maths or you have gone down the wrong route. For example:

- * 8.466 DP equates to 3M
- * 1.588 M equates to 16 DP

How do I choose the correct gear for a particular application?

If you are undertaking a ‘build to print’ model, i.e., from a purchased plan or possibly a Model Boats free plan, then you just purchase the gears defined on the plan. However, as more people move towards using the Metric system you will get a far

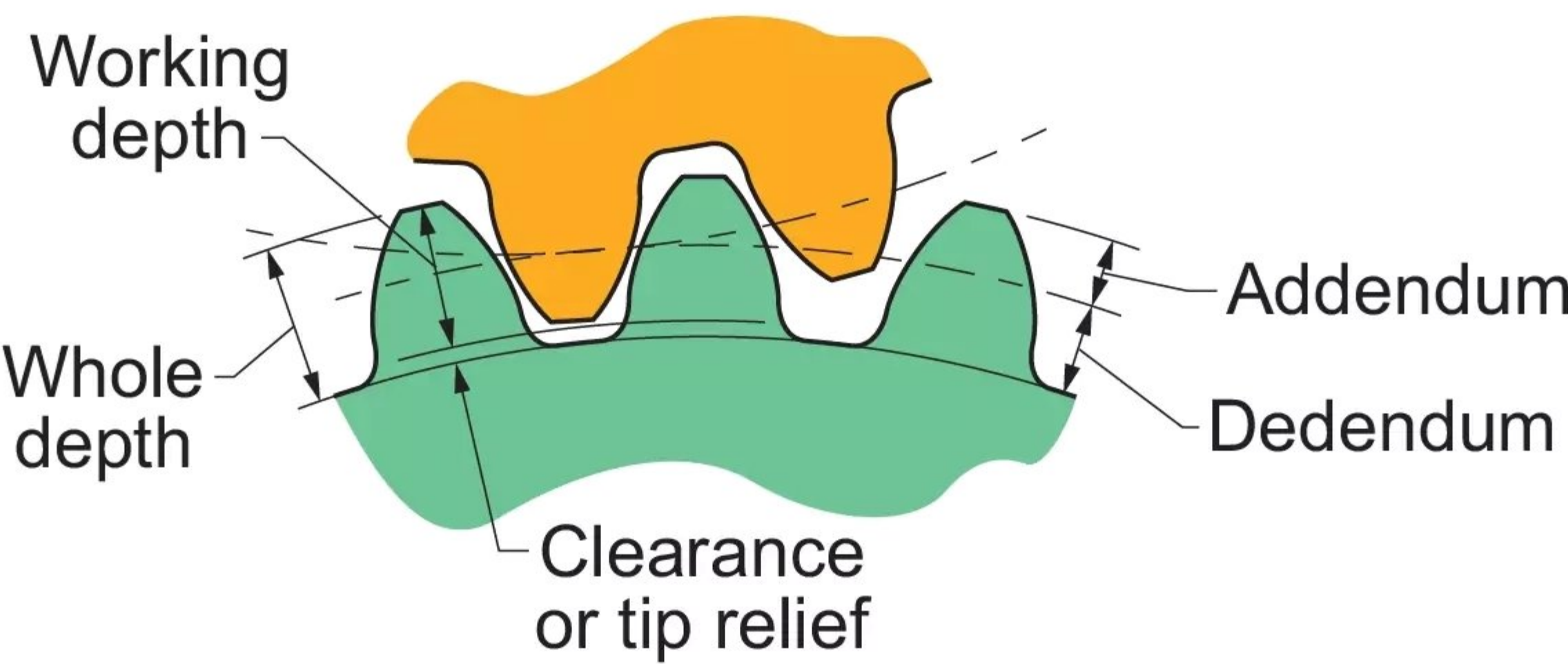
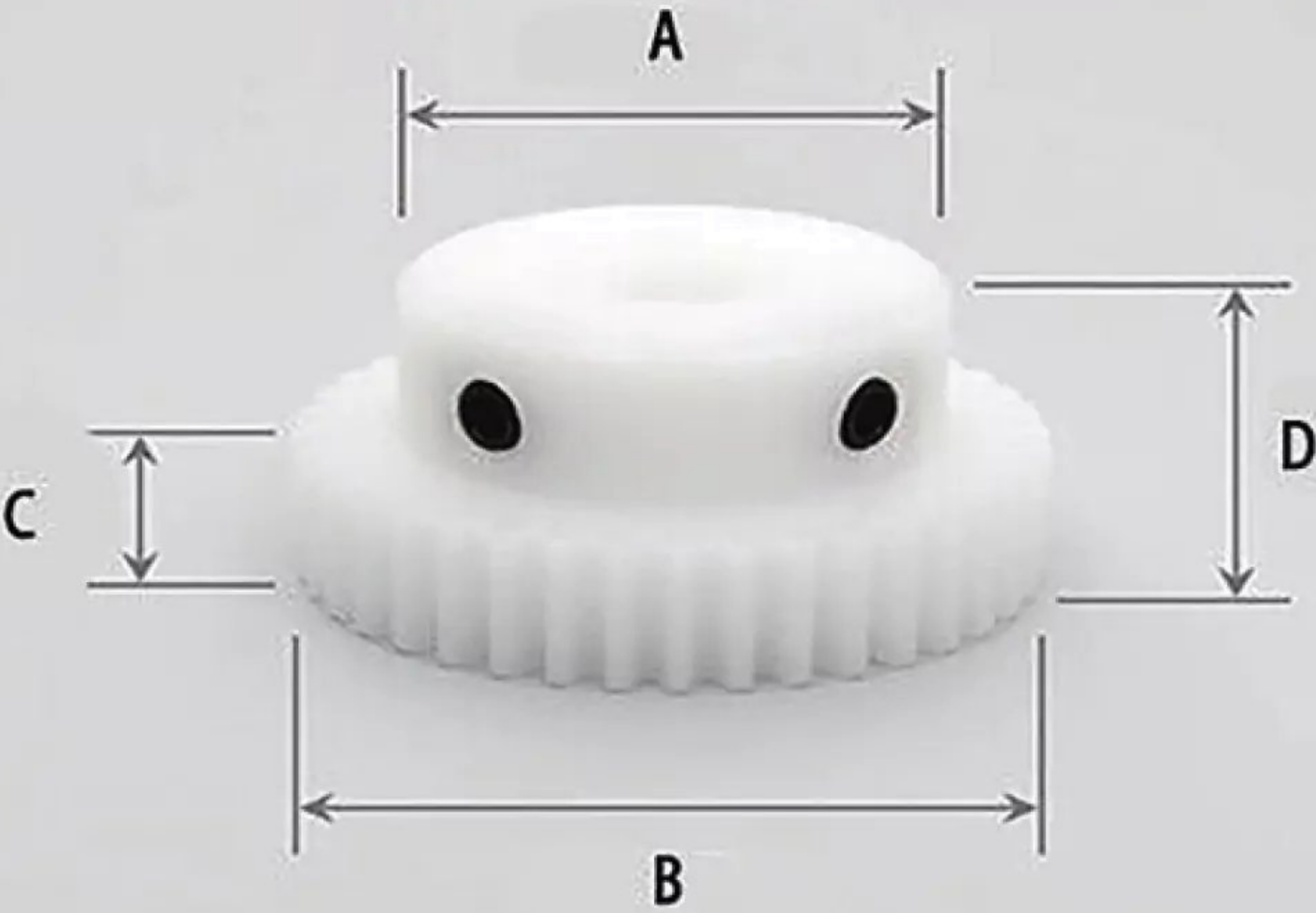


Diagram showing the principal parts of two spur gears 'in mesh' with each other, together with the PCD's of both gears

Diagram 4

Diagram 5



Model	Bore	B	A	C	D	top wire
15 teeth	3、 4、 5、 6、 8	17	12	10	20	M5
16 teeth	4、 5、 6、 8	18	12	10	20	M5
18 teeth	4、 5、 6、 8、 10	20	14	10	20	M5
20 teeth	4、 5、 6、 7、 8、 10、 12	22	16	10	20	M5
22 teeth	6、 8、 10、 12	24	18	10	20	M5
24 teeth	6、 8、 10、 12、 14	26	20	10	20	M5
25 teeth	6、 8、 10、 12、 14	27	20	10	20	M5

wider selection of M gears as opposed to DP gears. Although as previously stated there is no direct conversion between M and DP, you can get extremely close. So, if you have a problem purchasing DP gears try switching to nearest M size, but taking into consideration the number of teeth and the overall size of the gear if you need to accommodate the gears within a confined space. Also look at the bore size of the gear where it needs to interface with a shaft of a

particular diameter. For example, you may be looking for a gear to fit onto the output shaft of an electric motor, which are often made to Imperial sizes, such as 1/8-inch (3.15 mm). Faced with that situation, I would purchase a gear with a 4- or 5-mm diameter bore and make a brass reducer bush to take up the difference. Following this procedure, you will have a better chance maintaining the concentricity between the bore of the gear and the teeth (PCD).

Gear suppliers will provide the data needed regarding the physical dimensions of individual gears, bores sizes, etc, and also advise on the various material types available, which for the smaller gears needed for boat modelling will tend to be brass and various non-metallic material types such as Nylon and Delrin. Although brass gears are stronger, they are a bit noisy compared to Nylon or Delrin ones. **Diagram 5** shows part of a typical supplier's data sheet for 1 M Spur Gears in Nylon.



Should you want to get an idea of the size of a single tooth of a gear, the following calculations may be of use:
Module (M) Gears (therefore sizes are in millimetres):
■ Addendum = $1 \times M$
■ Dedendum = $1.25 \times M$
■ Tooth width = $3.142 \times \text{PCD} \div 2T$
Diametral Pitch (DP) Gears (therefore sizes

are in inches):
■ Addendum = $1 \div \text{DP}$
■ Dedendum = $1.157 \div \text{DP}$
■ Tooth width = $3.142 \times \text{PCD} \div 2T$
How do I change the axis of rotation?
So far, we have discussed Spur Gears, where the axis of the power source (electric

motor) is parallel to the axis of the driven element (propeller shaft). Most applications within model boat building use that system. Going back to my Canadian Log Pusher, this has the motor mounted vertically, driving (via two Spur Gears) a vertical shaft going down through the cabin floor and engaging with the propulsion unit. Here, by means of a pair of Bevel Gears, the drive



goes through 90° to the propeller. For this application the two Bevel Gears are equal (both 16T), but Bevel Gears can also be used to change speed, e.g. 12T driving 16T or 20T, etc, to give a further reduction in speed. **N.B.** 12T is normally the smallest number of teeth on a gear, although I have seen gears with 10T.

Photo 3 shows the arrangement at the 'dry end' of the set-up in my Canadian Log Pusher, with the two Spur Gears in the centre providing the drive to the prop shaft via the upper gear and steering via the lower gear. The upper gear is attached to the prop shaft which rotates within its brass case, the outer surface of which is attached to the lower gear which is driven via the gear attached to the steering servo. A standard prop shaft assembly of stainless-steel shaft and brass case therefore provides both drive and steering, with the brass case sitting inside a brass tube, just like a tiller rod inside a tiller tube. Note that both the motor and the servo are held in adjustable mounts to allow their respective gears to be meshed correctly. The gear affixed to the motor has already been correctly meshed, but the gear affixed to the servo is still to be brought into mesh.

Photo 4 shows the 'wet end' of the setup. The pair of Bevel Gears convert the vertical input from the motor to the horizontal output to the propeller. The circular housing is affixed to the brass case (mentioned in the previous paragraph) which rotates in a brass tube accommodated in the base of the hull, and this part of the set up provides the steering.

Another good use of Spur Gears was demonstrated by Ashley Needham in the April 2024 edition of Model Boats. Ashley presented an article covering the construction of *Moana's Canoe*. Here the method of propulsion was *Moana* operating a single paddle, so Ashley was seeking a very slow output to the paddle. He firstly used an electric motor with an integral 30:1 reduction gearbox, with the final drive to the paddle being via two Spur Gears, providing a further 50% reduction in speed (see **Photo 5** – Image courtesy of Ashley Needham).

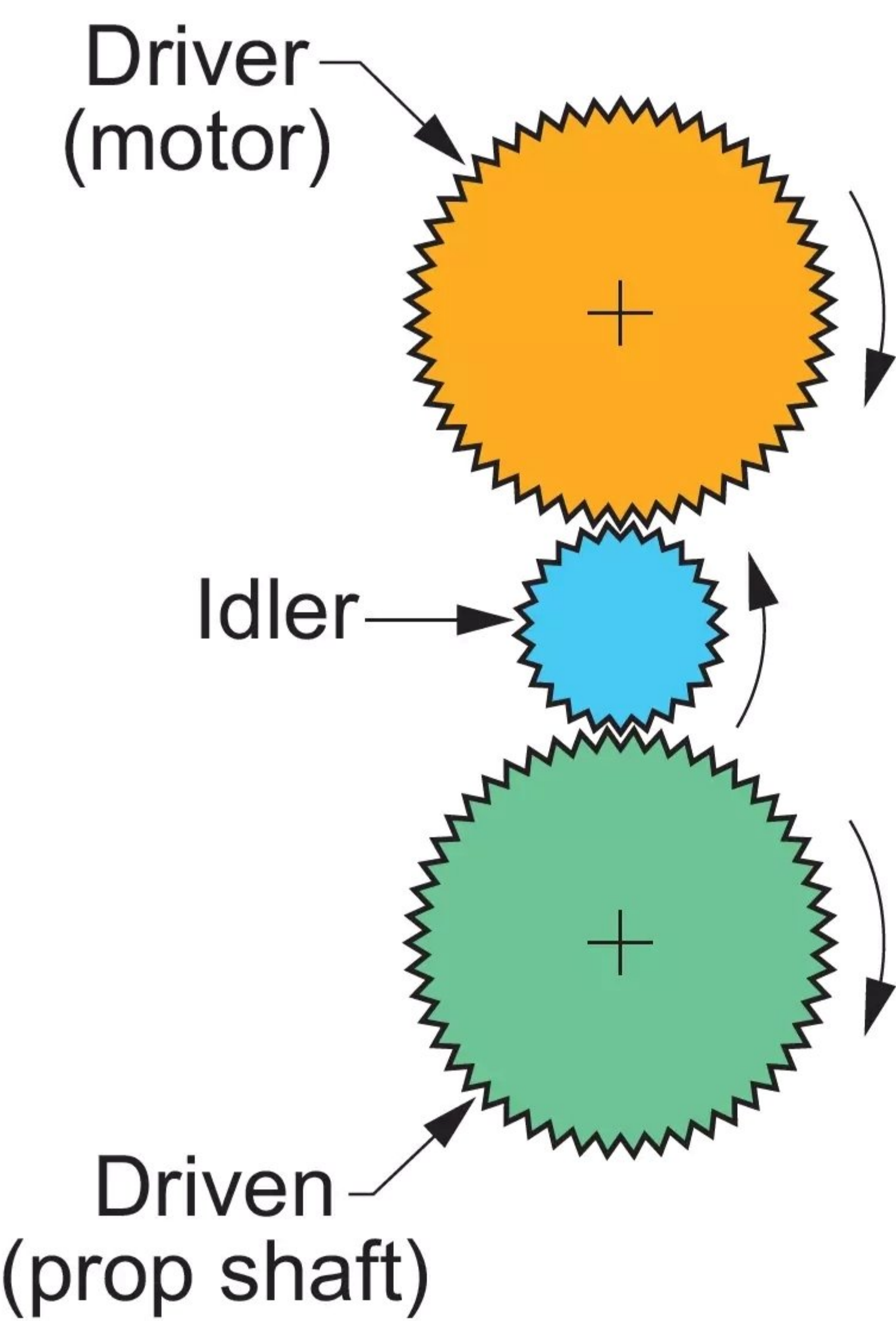
How do I change rotational movement into reciprocal movement?

This is achieved courtesy of a mechanism called a Rack and Pinion. The input of power is via a Pinion, which is just a Spur Gear, normally with a small number of teeth, which rotates to drive a strip of material with gear teeth machined along its length, called the 'Rack', in a reciprocal motion (see **Photo 6**).

What is an Idler Gear?

You will note that when two gears are in mesh, the Driven gear will rotate in the opposite direction to the Driver gear. Should you want the two to rotate in the same direction, then an Idler Gear needs to be





An Idler has been inserted
between Driver & Driven
Therefore, driver & driven both rotate
in the same direction

Diagram 6

introduced, sitting between the Driver and Driven Gears. The Idler is simply there to facilitate the change in direction and just rotates on its own spindle. It should be noted that the Idler Gear does not affect the 'gear ratio', irrespective of how many teeth it has (See **Diagram 6**). I very much doubt boat modellers would feel the need to install an Idler gear, as it's so easy to change a propellor shaft's direction of rotation by reversing the connections to the battery, but it's useful information to have.

What is a Worm and Worm Wheel?

Sometimes called a Worm Drive, this has two distinct and very different parts. Firstly, there's the Worm, which resembles a screw thread but, instead of having a V thread form, its form is that of an involute gear tooth. This engages with the Worm Wheel, which in essence is a Spur Gear but with the teeth set at an angle to match the helix angle of the Worm (see **Photo 7** – which shows a Worm and a Worm Wheel with 40:1 reduction). This mechanism is used where a reduction in speed is needed between the input (the Worm) and the output attached to the Worm



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“If you think you’ve never encountered a Worm and Worm Wheel before, then I must respectfully point out you are probably wrong...”

Wheel. The major advantage of utilising a Worm Drive is that it occupies much less physical space than that required if you were to use two Spur Gears to achieve the same reduction in speed.

If you think you’ve never encountered a Worm and Worm Wheel before, then I must respectfully point out you are probably wrong, as the humble Jubilee clip is (to use the correct terminology) a Worm Drive Hose Clip. As can be seen in **Photo 8**, the Worm is the adjusting screw, and the Worm Wheel is the clamping band.

Are there any alternatives to gears?

There certainly are! If space permits, a toothed drive belt (often called a Timing Belt) can be used. This is particularly useful where the Driver and Driven elements are remote to each other. For example, I have seen just such a system used to advantage for models of stern wheeler vessels, where instead of using Spur Gears, toothed pulleys are employed. This can be used to increase or decrease speeds and obviously also for a 1:1 ratio, dependent upon the number of teeth chosen for the two pulleys (see **Photo 9**).

Over to you!

So, there you have it. To be truthful, although I have used both Spur Gears and

9



“No doubt someone reading will be able to point out an example of their use!”

Bevel Gears, I have never used a Rack and Pinion or a Worm and Worm Wheel in a model boat. However, when SHG Model Supplies was in full flight (or the model boat equivalent), it included not only Spur and Bevel Gears in its range but also a Rack and

Pinion and a Worm Drive with a 34:1 ratio. There must, therefore, have been a call for them, and no doubt someone reading will be able to point out an example of their use! I know that mechanical winches often incorporate a Worm and Worm Wheel, and possibly anyone into modelling an aircraft carrier may want to incorporate a Rack and Pinion mechanism for operating the aircraft lift that moves aircraft to the below deck area for storage and maintenance. ●

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Following on from the *Progress* and *Carli* Prize Draws in the May and July 2024 issues, this month we’re offering you the opportunity to win a pre-production sample of another of the 1970s’ 1:60 scale kits that Billing Boats has been improving and updating ahead of releasing to the trade – this time around, for the tugboat *Ymer*.

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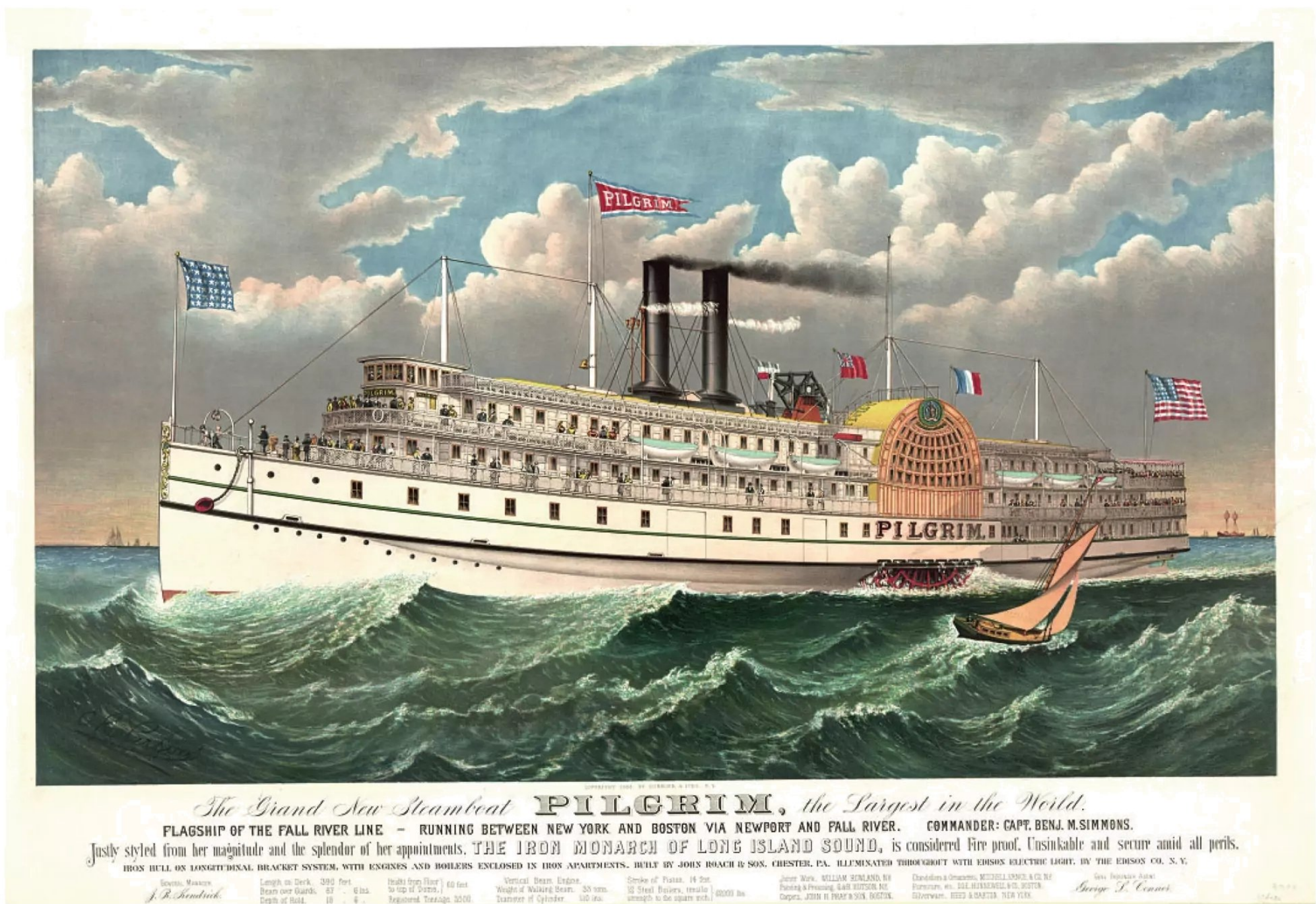
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A depiction of the American river paddle boat Pilgrim on a vintage travel poster (from author's own collection).

GOING FOR A PADDLE

Pondering a paddle boat project? Then read on, as **John Parker** is about to dip into some of the factors you'll need consider

In a well-known 1848 trial, carefully supervised by the British Admiralty, the paddle steamer *Alteco* engaged in a tug-of-war with the propeller driven vessel *Rattler*. Both vessels were of similar size and had the same type of steam engine. The *Rattler* soon began to show its superiority, and despite the best efforts of the *Alteco*, it found itself being towed backwards at some 2.8 knots. The results proved once and for all the superiority of the water screw, or propeller, over the paddle wheel as a means of marine propulsion. Except for a few applications

where it still clung on to some advantage, such as for shallow-draft river boats, the paddle wheel was, therefore, consigned to the history books.

As model boat builders, we need not be overly concerned with efficiency or the lessons of history. But, while the nostalgic appearance of a model paddle steamer as it makes its way across a lake by means of its highly visible and intuitively understandable method of propulsion, accompanied by the gentle slapping sound of the paddles as they churn the water, is undoubtedly attractive, there are pros and cons to a paddle boat and

various factors that need to be taken into account when building one.

Advantages

A major advantage of the paddle driven craft was that, unlike a propeller driven one, no submerged penetration of the hull was required. There was no need for a stuffing box or watertight gland that could allow a prop shaft to rotate while keeping the water out, in practice a constant source of leaks that required regular maintenance. The paddle wheels could be mounted on a shaft supported by simple bearings on the hull

“As model boat builders, we need not be overly concerned with efficiency or the lessons of history. But...”

well above the waterline, as a ‘side-wheeler’ with a paddle wheel each side amidships or a ‘stern-wheeler’ with a single wide paddle wheel at the stern. If only for the sake of completeness, I should mention that there is a third rarely seen arrangement which has the wheel(s) running in a recess within the hull and protruding below it. The reliance on simple engineering extended to the engine drive too: the high torque, low revving steam engines in use could easily drive the paddles directly.

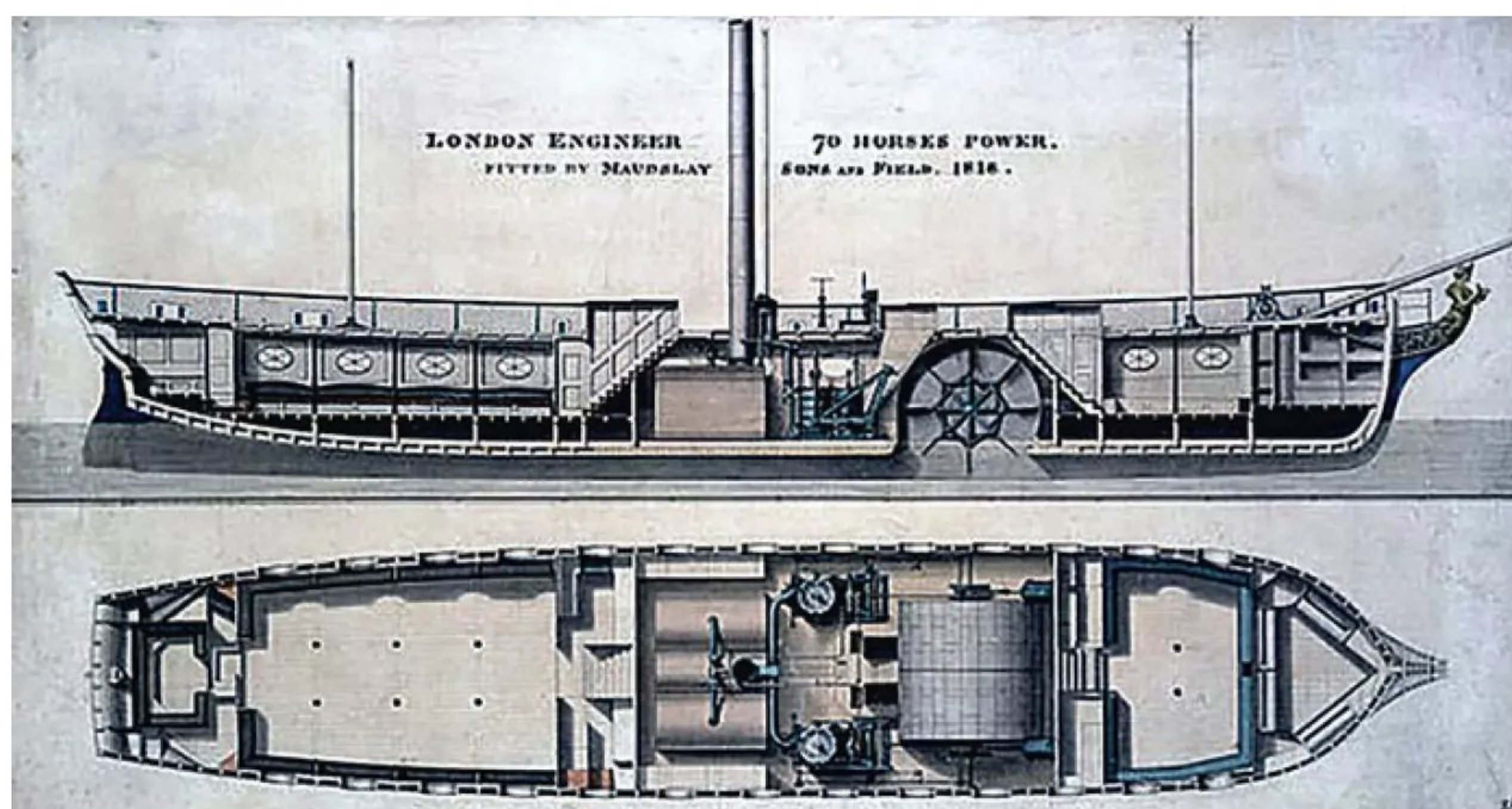
If the drive to the paddles of a side-wheeler is made independent, an astonishing level of manoeuvrability results, the craft even being able to rotate within its own length if one paddle can be driven in reverse. This is the reason the British Admiralty built Director Class paddle-wheel tugs as late as the 1950s, for manoeuvring aircraft carriers. Both paddle wheels of passenger carrying paddle steamers however were usually required to be locked to a common shaft, as independent operation could lead to safety concerns in some situations, such as when all the passengers moved to one side prior to disembarking.

The other main advantage of paddle-driven boats is their suitability for shallow water environments such as rivers. This is because nothing protrudes below the hull to get damaged by impact with rocks or the riverbed. The paddles can be made strong and, combined with their manoeuvrability and simple engineering, paddle steamers played an important role in the exploration of inland waterways and development of trade links.

Disadvantages

Apart from the lesser efficiency of its paddles compared to a propeller, the paddle powered craft suffers from the disadvantage of having a variable loading on its paddles. By this I mean that the depth of immersion of the paddle blades varies quite considerably with the loading of the ship and can end up far from the ideal value, increasing fuel consumption. The effect also manifests itself when the sea conditions are rough. Picture a wave as the length of the ship’s hull travels along it. From the crest of the wave to the trough, the paddle wheel can go from heavily immersed to running free in air, putting great strain on the engines. If a side-wheeler is travelling beam-on to the waves, each of the paddle wheels will be alternatively affected in turn, causing the ship’s heading to swing from side to side and make it hard to maintain a steady course.

Early warship crews were glad to see paddle wheels relinquished in favour of a



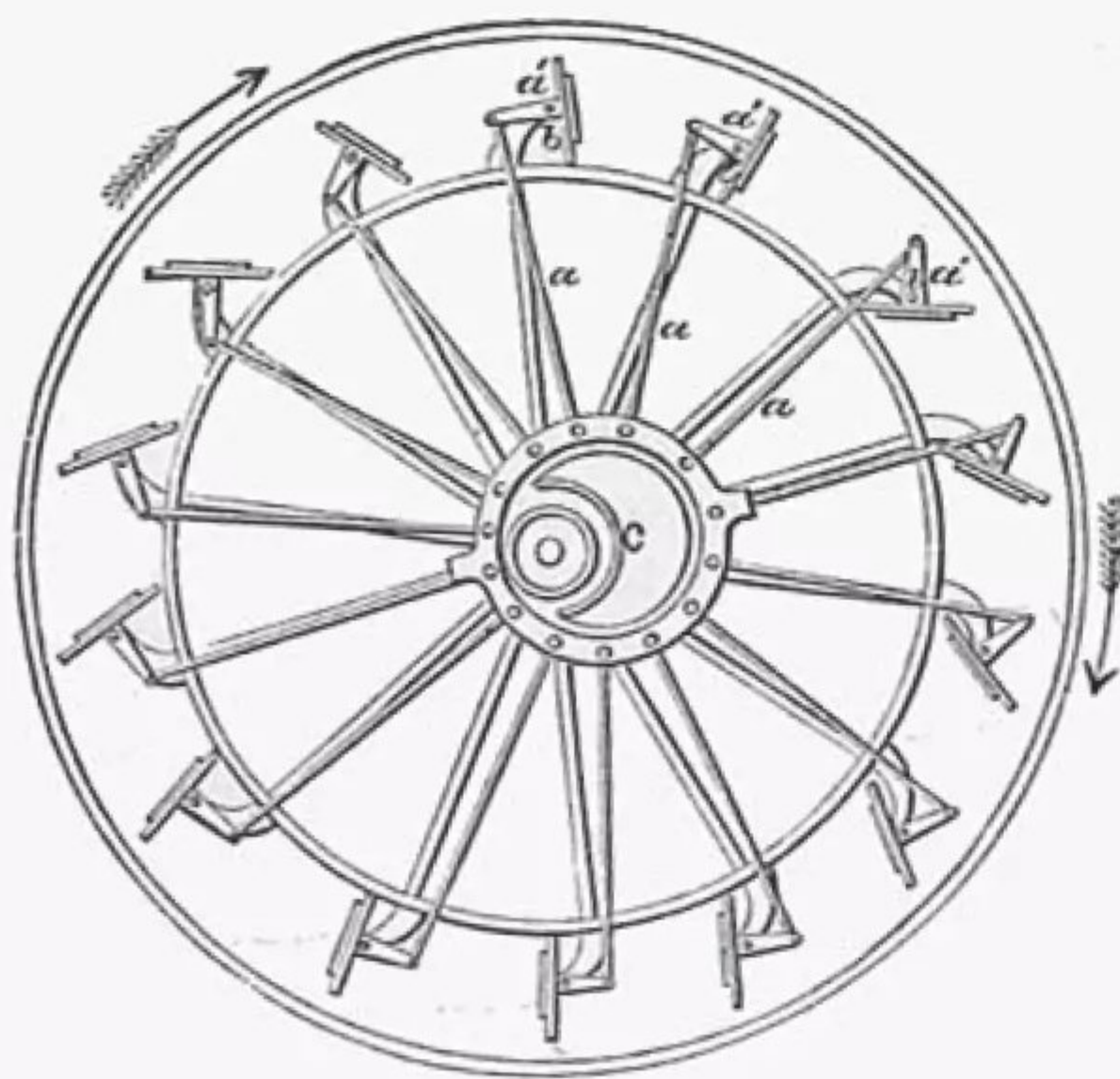
A paddle steamer with inboard paddle wheel, 1818 (Wikipedia).



This paddle steamer is experiencing variable paddle loading as it heads out into choppy water.



Paddle drive on a steam powered model by B. Russ.



Principle of the Morgan feathering paddle wheel (Wikipedia).

propeller, as they took up a lot of space at deck level, were prone to damage from enemy fire and restricted the firing arcs of guns.

Feathering paddles

The paddle wheel can be looked upon as a rotary engine-driven analogue of a canoeist's paddle. But this is only an approximation of the movement, for unlike the canoeist's paddle, the blades of a paddle wheel must travel in a circle and therefore do not enter or leave the water vertically; only at one point, that of maximum downward travel, are they at the correct perpendicular angle to motion. This is the cause of a loss of efficiency and increased noise as the down-going paddles 'slap' the water and the up-going blades lift it up, necessitating paddle boxes to contain the churned-up water.

The 'feathering' paddle wheel mechanism minimises this disadvantage by providing a system of paddle linkages and an eccentric to ensure the blades enter and leave the water close to vertical. This comes at a high price in terms of increased complication, wear and maintenance however, so the relatively small gains made need to be carefully weighed against the loss of simplicity. Most river boats and smaller vessels retained simple fixed floats.

Modelling considerations

The first important consideration when building a model paddle steamer is the need to gear down the drive from the motor (assuming it is electric) to achieve a paddle speed of perhaps 150-250 rpm. This can be done with the use of a geared motor or motor and separate gearbox but be aware of the noise these may produce. A low-revving, high-torque motor will make the job easier and may only require a single reduction stage, which can consist of a small, toothed pulley on the motor shaft driving a much larger one on the paddle shaft. An outrunner brushless motor



The simple river paddle boat Eva by T. Prior.

of 500KV or less may be a good choice, or, alternatively, a large, brushed motor running on less than its intended voltage to achieve the required torque at a low speed.

If independent paddle wheels are required, probably the easiest way to provide this is to simply duplicate the motor drive onto the two independent paddle

“Keep the construction of everything above the waterline, including the paddle wheels, as light as possible and mount the motor(s) and battery down low, as paddle steamers have a tendency to turn out top-heavy, resulting in a lack of stability”

shafts and either have a 'tank steering' set up on your transmitter using two sticks or mix the commands and assign them to a single two-axis stick. In either case, the rudder operation may be mixed or linked mechanically with the paddle wheel operation to achieve the desired result. A stern-wheeler riverboat often had the drive to the paddle by way of a 'scotch yoke' mechanism, which requires some model engineering expertise to duplicate. A simpler way might be to use a discreet belt drive with dummy connecting rods and cranks on the paddle shaft to emulate the characteristic motion.

Keep the construction of everything above the waterline, including the paddle wheels, as light as possible and mount the motor(s) and battery down low, as paddle steamers have a tendency to turn out top-heavy, resulting in a



Feathering paddle wheel of an old paddle steamer in Prague (Wikipedia).



Avalon, a Mississippi stern-wheeler by T. Prior.



Cyclops, a stern-wheeler by M. Gill and G. Ray.



An unusual sternwheel 'drogher' or basic cargo boat with independent paddle wheels by G. Ray.



The 1909 Australian fishing boat Ranger by C. and P. Averill.

lack of stability. As their correct ballasting is something of a black art, be prepared to try different locations for the ballast in the hull, both fore-and-aft and side-to-side.

If you are not constrained by scale accuracy, one rule of thumb asserts that there should be about one paddle or float per foot of full-size wheel diameter, with the width of each float 25% to 40% of its length. This is for non-feathering paddle wheels and best thought of only a starting point for experimentation, as the result will depend on the speed and purpose of the vessel. Driving the paddle wheel too fast or fitting too many floats to the paddle wheels will not result in higher speed as the water will not have time to fill the void left in it by the passage of the previous blade.

Plans and kits

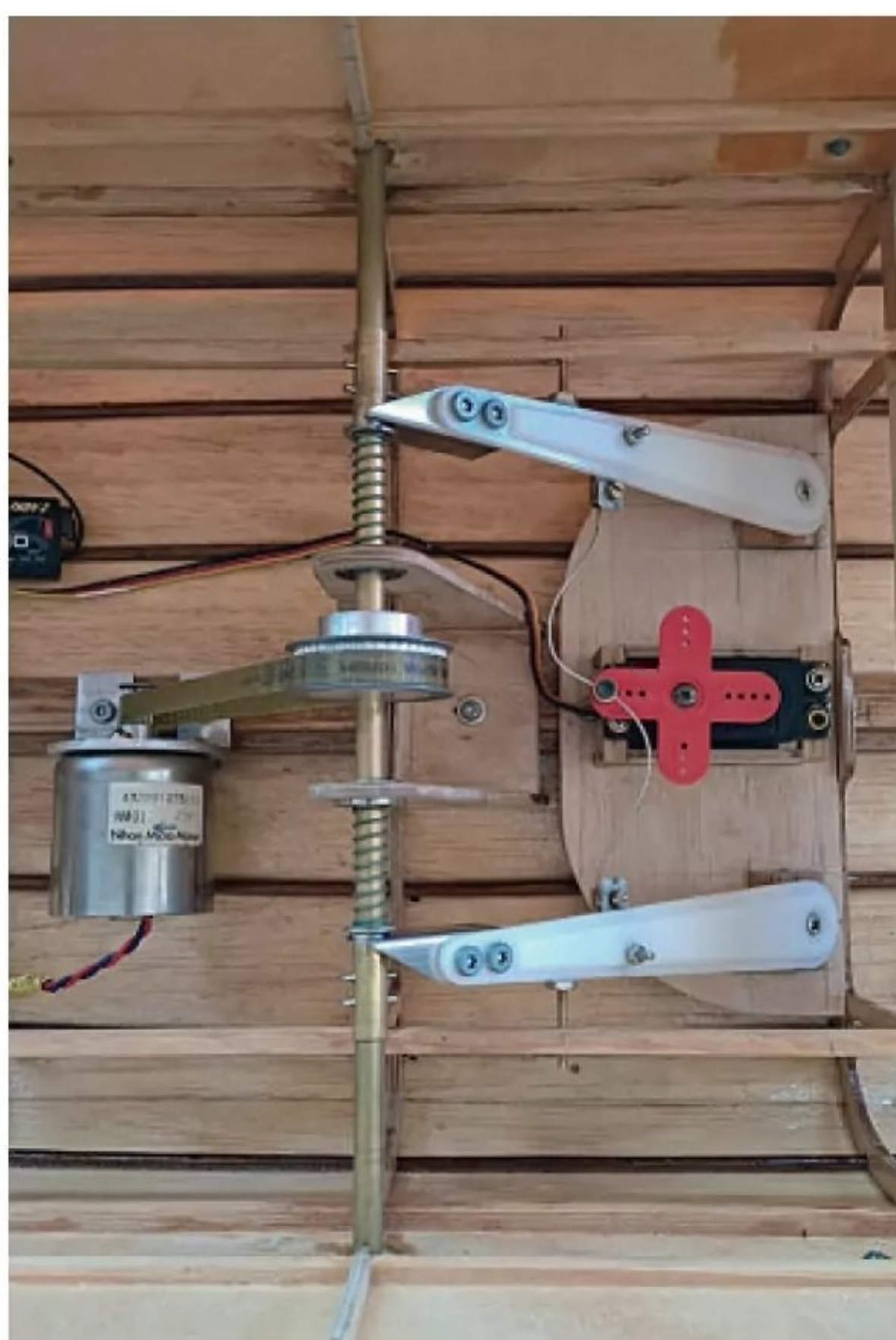
The various libraries of model boat plans contain a fair number of paddle boats, but they can be hard to pin down (no pun intended) as they are generally not categorised as such, being found amidst plans for other boats in the general listings. Sarik Hobbies (sarikhobbies.com) lists the Director class paddle tug mentioned earlier



This American paddle boat Iluka by G. Ray has a simulated 'walking beam' steam engine.



One method of paddle wheel construction from flattened and shaped copper wire, by M. Teese.



Toothed belt reduction and independent paddle drive via servo-driven clutches on a model by M. Teese.



Graupner feathering paddle wheel set.

(MM1292), the *St. Louis Belle* Mississippi paddle boat (MM826) and the sea-going passenger steamer *Waverley* (MM1457) amongst its offerings. Taubman Plans Service (taubmanonline.com) lists the *Clermont*, Fulton's historic river steamboat, and many other grand American passenger craft and river towboats. For something a little different, the historic river paddle steamers of Australia (see Flotsam and Jetsam, November 2022 issue) are simple rustic craft that can provide an easier model to make. Plans are available from specialist model boat supplier Float-A-



Phantom blockade runner with overweight superstructure.

“Be aware that some kits of paddle steamers, particularly the ornate Mississippi-style river boats, are intended for static display only, so do your research first if you want a working R/C model”

Boat (floataboat.com.au), along with an array of paddle wheel kits.

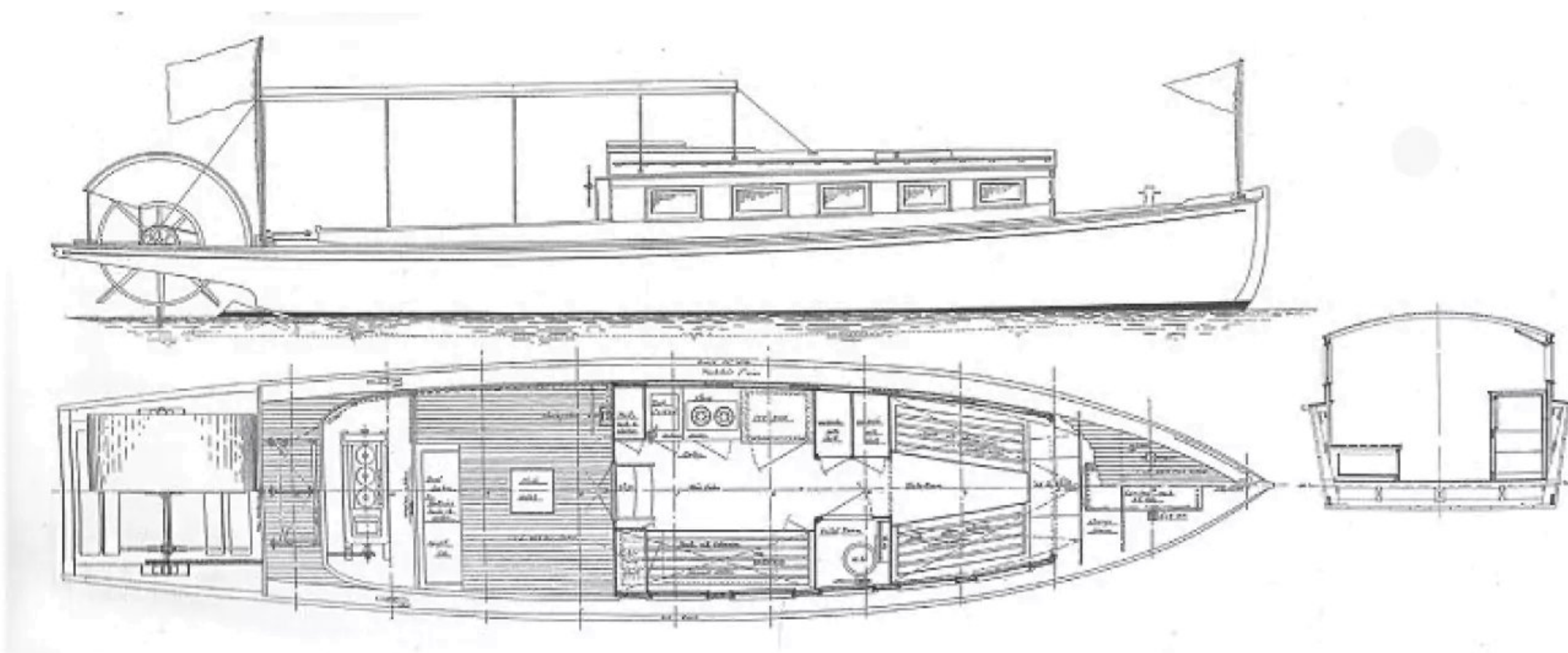
Simplified paddle boat plans have been offered by Model Boats from time to time, such as the *Phantom* blockade runner (MAGM2033) and split-sternwheel *Wrigley* (MM2076). An enlarged version of the former sometimes appears on our local boating pond. Its constructor really went to town with a detailed superstructure but alas did not keep its weight in check, consequently the model had to be fitted with an extended keel and lead bulb before it could be trusted to remain upright in open waters.

For a long time the go-to kit for the paddle modeller was Graupner's *Glasgow* paddle tug, which featured feathering paddle wheels. Unfortunately, this is no longer available following the demise of the company, putting a premium on any second-hand kits that may become available on auction sites. The same goes for the feathering paddles which were available

separately (Product No. 581). Feathering paddle wheels bring no real benefit to a model, but they do offer scale realism and technical interest.

Be aware that some kits of paddle steamers, particularly the ornate Mississippi-style river boats, are intended for static display only, so do your research first if you want a working R/C model. To this end, the website Paddleducks (paddleducks.co.uk) can be invaluable but it appears to be off-line at the time of writing – can anyone shed some light?

At the moment many of the model boating venues are weeded up here in Melbourne. It would certainly be good to have a paddle craft that could still operate without a propeller to get fouled. For inspiration, how about the simple, flat-bottomed 1911 design for a launch called the *Alligator*? The plans appeared in *The Rudder* magazine for that year and describe a craft that could be ideal for exploring the local everglades. ●



Alligator, a stern-wheeler launch by R. M. Haddock, 1911.

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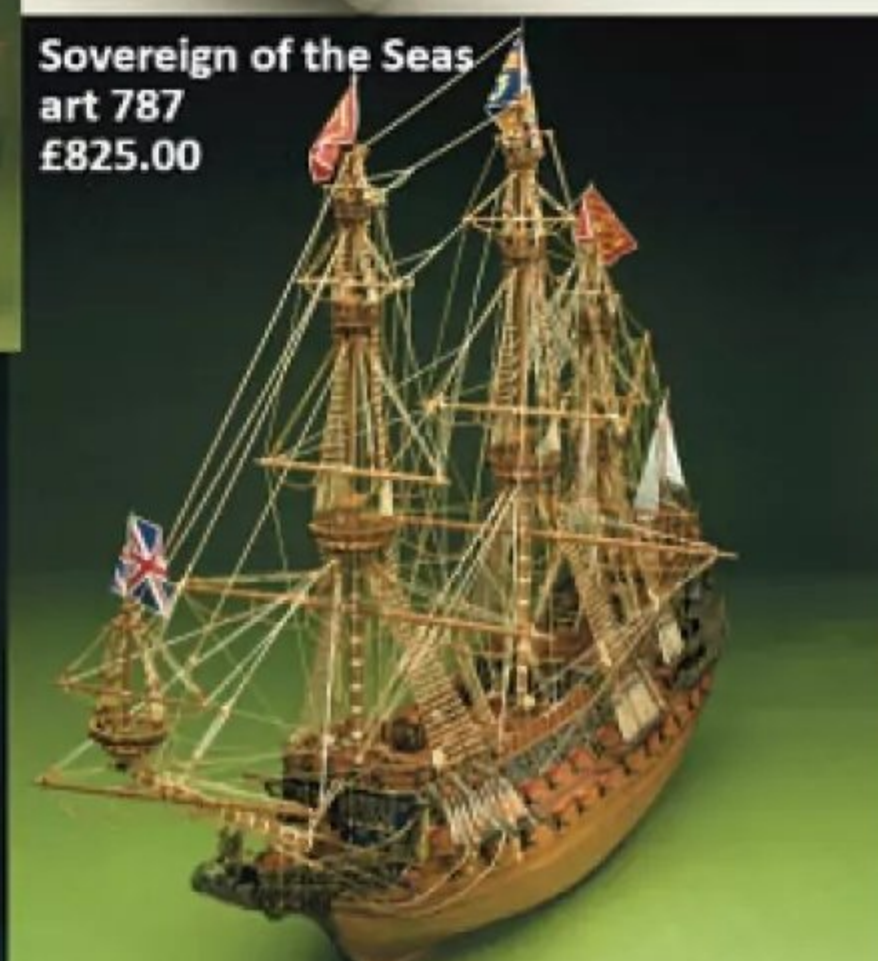
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BLUE ARROW

Drawing on lessons learnt during this experimental hydrofoil project, Phil Button shares some useful pointers and tips for those with similar aims



Way back in the mists of time (or to be more precise, the June 2004 issue of Model Boats) a Glynn Guest free plan was published for an all-balsa tunnel hull hydroplane called *Mosquito*.

With my help, one of my grandsons and his friend built one each. They found the performance 'a bit disappointing' (their words!). After much experimenting with their boats, we found that they would benefit from using SC batteries, rather than the AA batteries used up to that point. Space, however, was rather limited for installing SC cells, so I scanned the plans into my computer and scaled them up to 110%.

From these I built myself a sized-up example from balsa and the performance improved no end (see **Photo 1**). As I am not really a fan of balsa from a strength point of view, especially with the ever-present possibility of collisions, I built a second boat to the 110% plans but using ply as the medium. The new boat was finished in clear dope for waterproofing to allow for initial

"Some time after abandoning the ply model, I was looking at hydrofoil craft on the internet and idly began to wonder if I could add foils to my unused model hydroplane..."





sea trials. With the additional weight it didn't perform at all well though (no surprise there, then!) and was shelved for a while.

However, it seems I am straying from the point of this article, so let me continue and all will be revealed...

Struck by a potential solution

Sometime after abandoning the ply model, I was looking at hydrofoil craft on the internet and idly began to wonder if I could add foils to my unused model hydroplane. With a hydrofoil boat, foils are added below the hull of the boat or ship, and these provide lift (rather like aircraft wings) as speed increases.

The hull lifts out of the water, friction decreases, and the craft can go much faster.

Photo 2 (image courtesy of Wikipedia) shows a hydrofoil ferry at speed.

The foils provide lift in a similar manner to aircraft wings by having a curved top surface and a flat (or even concave) bottom. As the water flows over the curved upper surface, it is forced to increase speed and the pressure reduces. The pressure on the lower surface is unchanged, resulting in a lift force on the foil.

In addition to the hull, I had some aluminium edging with quite sharp edges and a curved surface that looked like it might be ideal for making the foils. **Photos 3, 4 and 5** show the plywood hull fitted with its foils

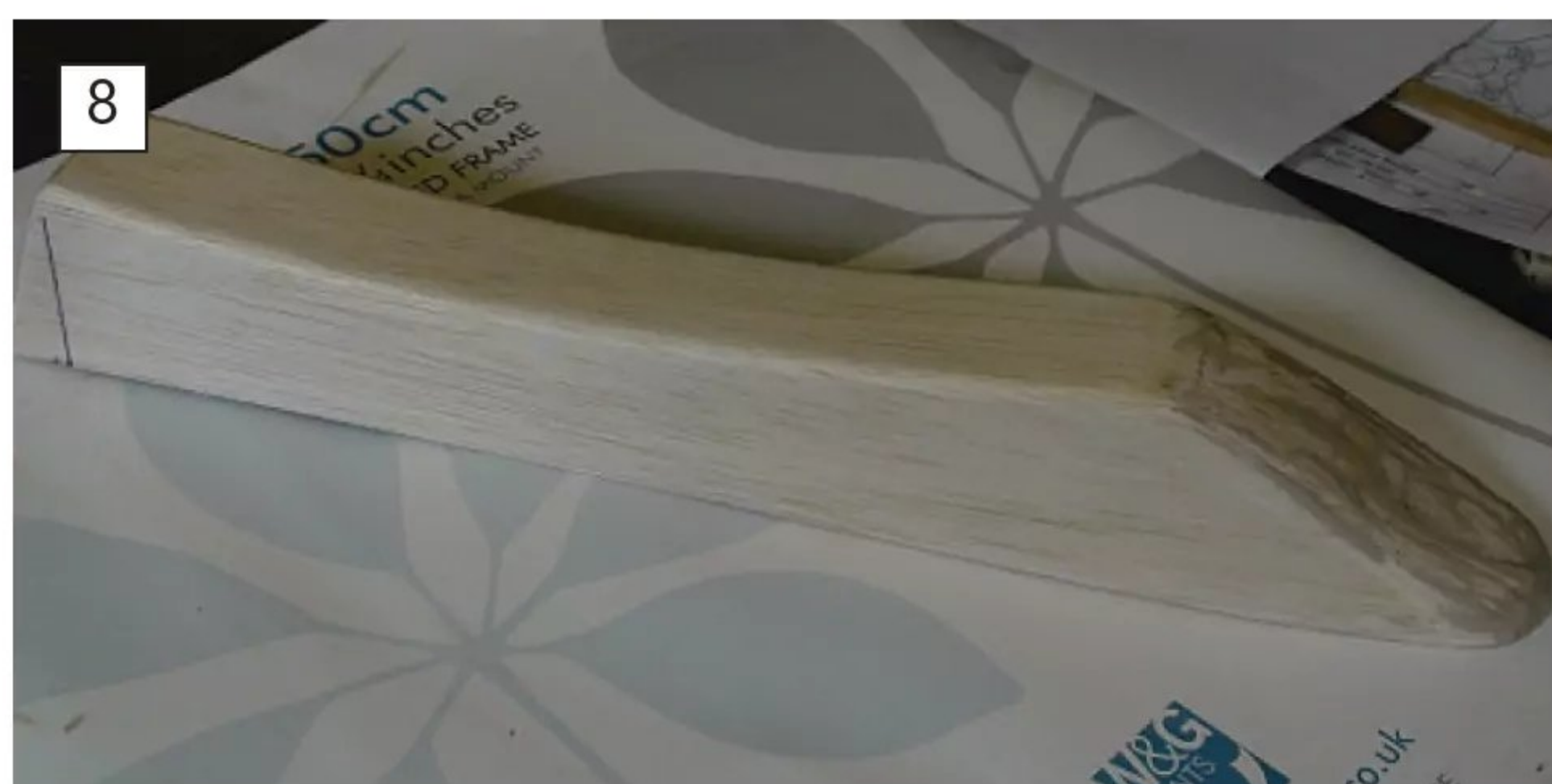
forward and aft. The foils were screwed to strengthening blocks underneath the 1.5mm decking.

Back on target

At this point, it was wintertime (not conducive to visiting the boating lake) so I decided to complete the hydrofoil craft in the hope that it might work. The foils were faired into the deck using car body filler to stop any potential moving about (see **Photo 6**) and the hull rubbed down and given several coats of cream gloss paint (see **Photo 7**).

Next came the long and narrow 'cabin' to hide the electrical bits and bobs. This was made from balsa, filled, coated in sanding





sealer, rubbed down as required (see **Photo 8**) and then finished in dark blue metallic gloss (see **Photo 9**).

After much playing around in the drawing package on my PC, a final colour scheme was arrived at (see **Photo 10**). The 'markings' were applied using computer generated water slide decals. These are printed out onto a product called Lazertran, soaked in water and the decal slid onto the surface. Any air bubbles under the decal along with any excess water must be carefully removed using kitchen towel. Once the transfers have dried, they turn white, but this can be hidden by giving them a coat of oil-based varnish. In any event, the transfers must be varnished otherwise they will come off in the water.

The electrical installation

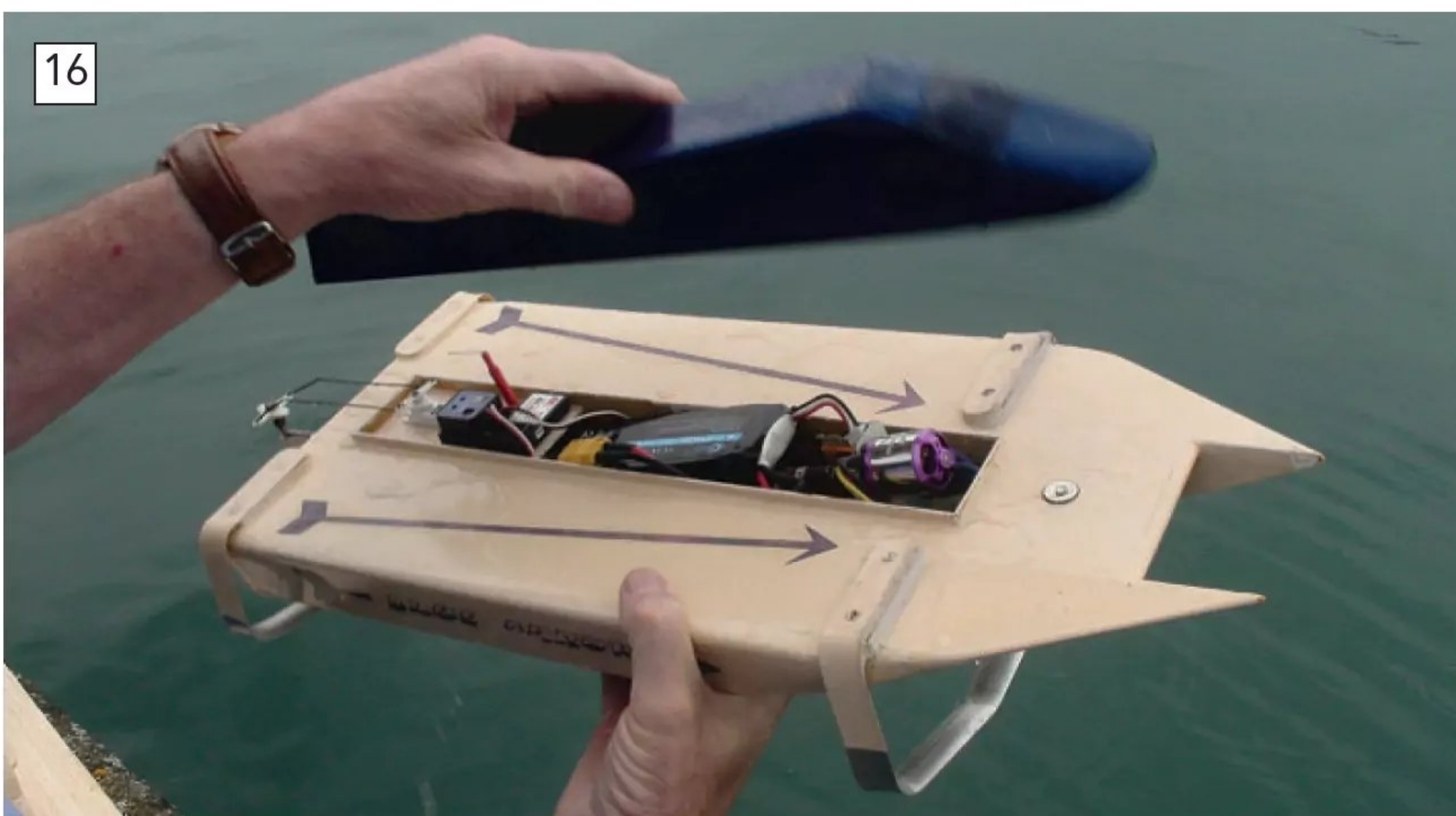
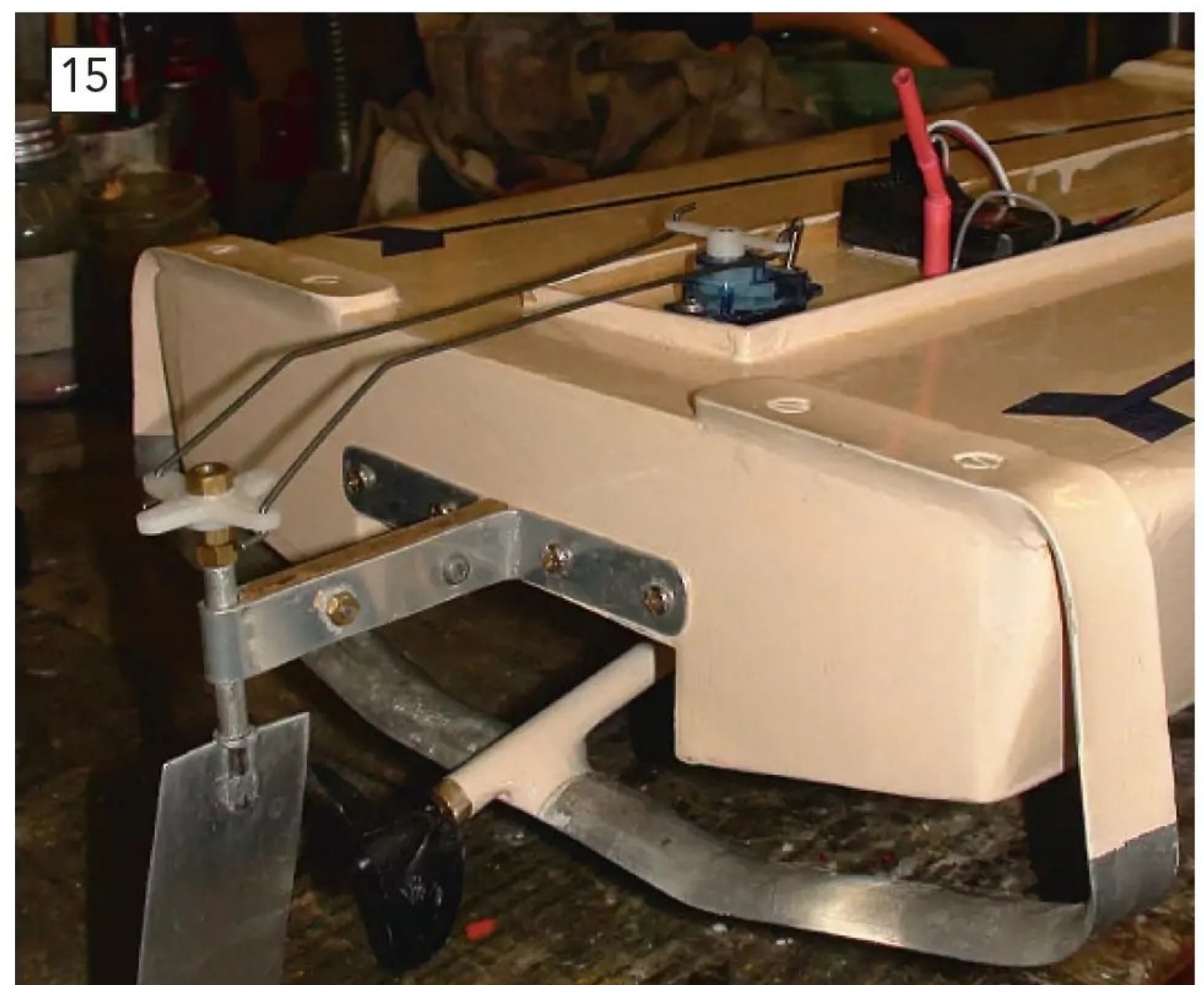
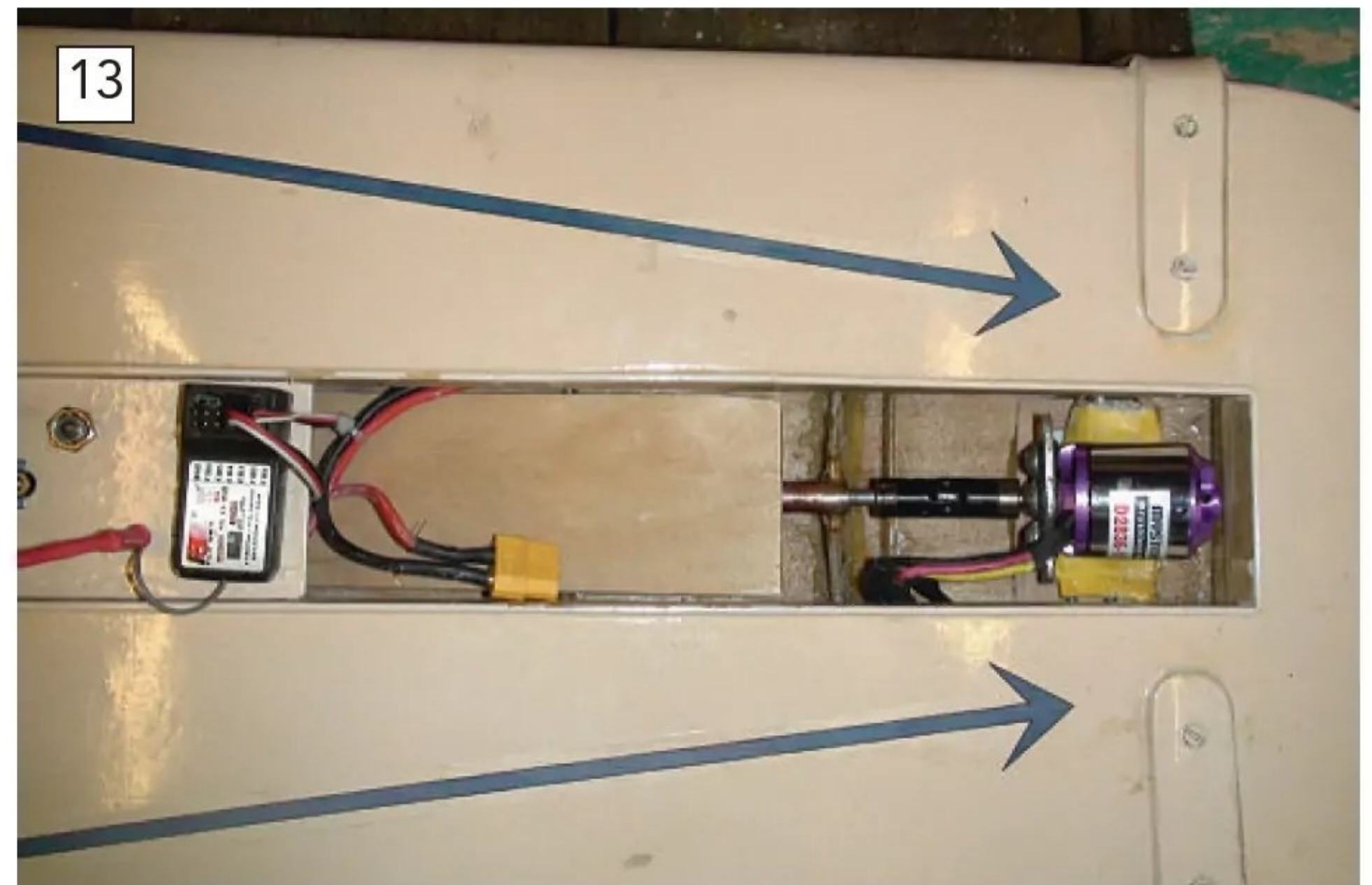
Now comes the electrical and control installation. This was to comprise a brushless electric motor and electronic speed controller (esc) with a two-channel radio control system (as we only need speed and rudder control).

Before this installation could go ahead, however, I realised that it would be necessary to remove the original propeller shaft and replace it with a longer one – otherwise the propeller would be out of the water when foiling! The new shaft (see **Photo 11**) was firmly fixed to the centre of the after foil using car body filler – and yes, it would have saved me a lot of time had I thought about the need to make this change before painting the model!

The motor chosen for this model was a brushless outrunner, where the magnets are in the outer shell and rotate with the propeller shaft, and the windings are fixed to the boat (similar to the rotary engines used in early aircraft). The motor (see **Photo 12**) is 28mm in diameter by 36mm long, giving 1700 rpm/volt, resulting in 18870 rpm at the propeller using an 11.1-volt LiPo battery. The plywood plate seen above the propeller shaft is to give a flat surface for the battery pack to rest on.

A motor mounting plate was made up from sheet steel and fixed to the hull using car body filler. Note that I used rubber grommets around the motor fixing screws as a crude form of anti-vibration mounting. A solid steel 'coupling' was used as a temporary fitment to keep the motor lined up while the filler holding the mounting plate sets – later





“The observant among you may have noticed something in Photo 16 that is not shown in any of the earlier pictures of the electrical installation...”

in the build this would be replaced with a conventional universal coupling. A small flat had to be filed on both motor and propeller shafts to give a surface for the coupling

screws to 'bite' on – otherwise the coupling can slip (been there, done that!).

Photo 13 gives a plan view of the 'engine room', showing the esc (installed

underneath the motor), the radio control receiver and the main battery connector.

Photo 14 shows the radio control receiver (6-channel, although only two are actually needed), the main on/off switch and a mini servo for rudder control.

After refitting the original boat's rudder as in **Photo 15** (but lower on the hull to keep it in the water) and making up new rudder control links, the build was completed and ready for sea trials (see **Photo 16**).

The observant among you may notice something in **Photo 16** that is not shown in any of the earlier pictures of the electrical installation – a small black box between the receiver and the rudder servo. I had in mind that at high speed (if the boat ever attained high speed!), the steering would be 'twitchy' to say the least. On a previous fast electric boat that was pretty much uncontrollable at speed I fixed the issue using a piece of tech from a model helicopter and fitted a heading hold gyro in the rudder circuit (see article entitled 'Transferable Tech' in the December 2020/January 2021 edition of Model Boats). This magic piece of electronics reacts to uncommanded heading changes much faster than I do and helps keep the model under control.



Sea trials

I test ran the model in the 'domestic test tank' (a.k.a. the bath) just to make sure that all worked as it should and that there were no leaks. However, the options with bath tests are somewhat limited, for obvious reasons, so next it was off to the lake.

Initial trials were carried out on a visit to the Woodbridge Model Boat Club in Suffolk, where I found that the modified hydroplane behaved pretty much the same as its non-foiling sibling. Steering was very good at low(ish) speeds but any 'twitchiness' at higher speed seemed to be taken care of by the gyro.

“The trick seemed to be to raise the speed fairly gently until the model started to plane and then apply full power, at which point she lifted out of the water on the foils and went like the proverbial rocket!”

However, no matter how I tried with different throttle settings and rate of applying the throttle, I couldn't get her up on the foils. At worst (just like her sibling, *Mosquito*) rapid throttle opening led to her behaving like a submarine and diving under the water. At best,

she tried to plane like her sibling but seemed to be inhibited by the foils (see **Photo 17**). So, it was back to the 'boatyard' for adjustments.

After minor adjustments to the angle of attack of both foils, it was time to get her back on the water again, this time in Sheringham, Norfolk. Having already found at Woodbridge that opening the throttle too quickly resulted in submarine impressions, I went at it somewhat more carefully. The trick seemed to be to raise the speed fairly gently until the model started to plane (see **Photo 18**) and then apply full power, at which point she lifted out of the water on the foils and went like the proverbial rocket (see **Photo 19**). ●



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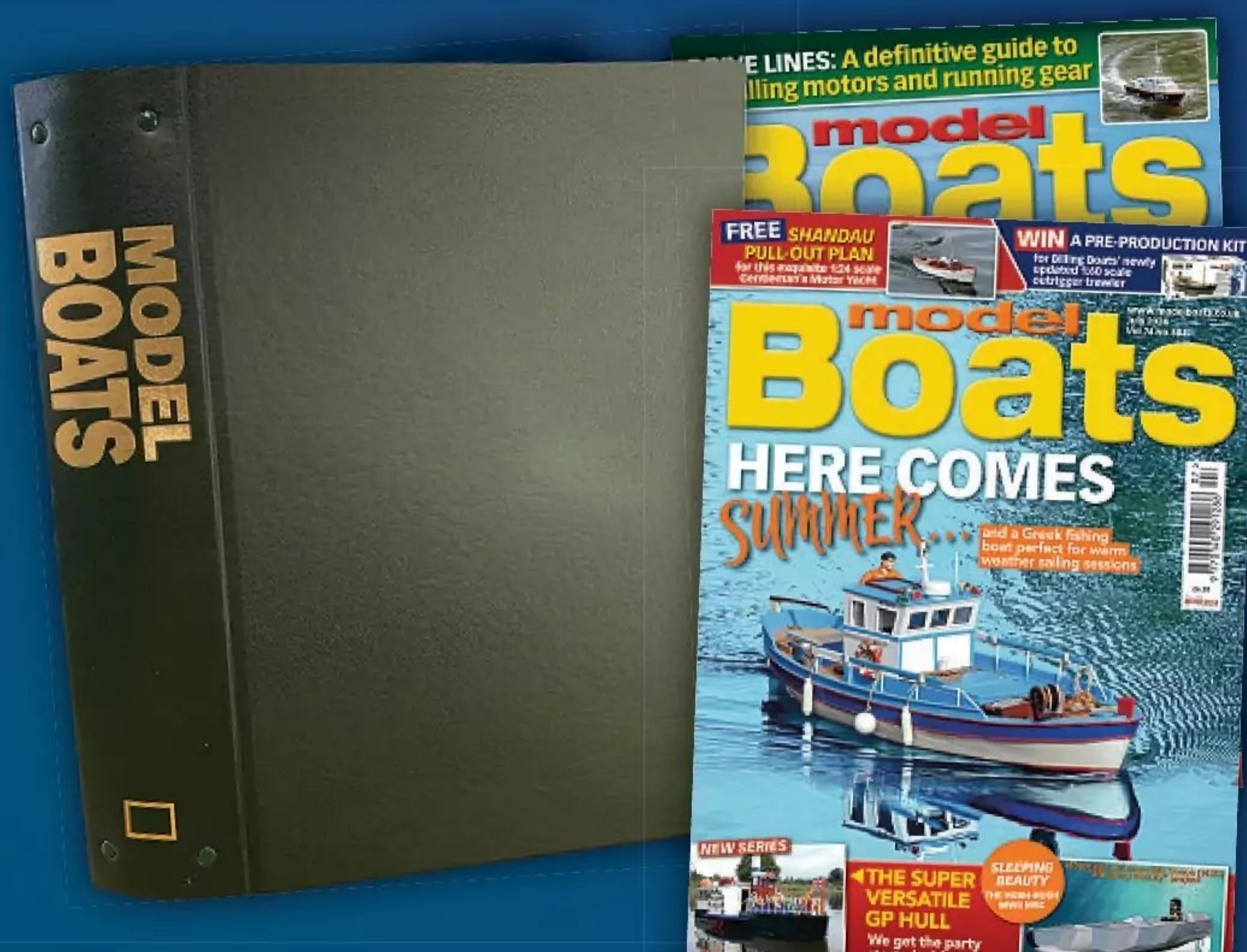
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THREEHMS *Warrior*

David Bray completes his build reviews
of Billing Boats' 1:100 scale kit

Warrior was rigged as a conventional three-masted ship – that is, square-rigged on all three. At the time there existed huge prejudice against steam power amongst senior officers in the Royal Navy. Sail had reigned supreme for hundreds of years, and steam was regarded with great suspicion. Apart from anything else, huge quantities of coal were required to be carried and handled, with the consequent coal dust and soot soiling the pristine paintwork and scrubbed teak decks. Coaling a ship was a perennial task, resulting in both the vessel and her

crew being saturated in coal dust. New skills were needed among the crew and officers. Engineers and stokers were a novel addition to a ship's complement. Early steamships suffered reliability problems, so a substantial sailing rig was retained in early steam warships. The sailing rig of *Warrior* was not as lofty as it would have been had she been a pure sailing vessel, but nevertheless she was capable of a decent sailing performance under sail alone. *Warrior* was one of the vessels in which the order "Up funnel, down screw!" could be heard. When under sail, the huge propeller could be hoisted into a trunk in the stern; the lower blade was still in the water but drag was reduced

substantially. The process to lift the propeller was totally hand-powered, and it was necessary that the whole crew were used to raise the 22-ton propeller.

Rigging the model

The Billings kit is configured to portray the vessel with full standing and running rigging. Sails are not included. This conforms to the convention I have always followed in the construction of static model period sailing vessels. If the vessel is portrayed as a full-hull model mounted upon a keel stand, then sails should not be included. On

Warrior complete and mounted on her stand.

“I did this on my lathe, but it can be done by careful sanding”

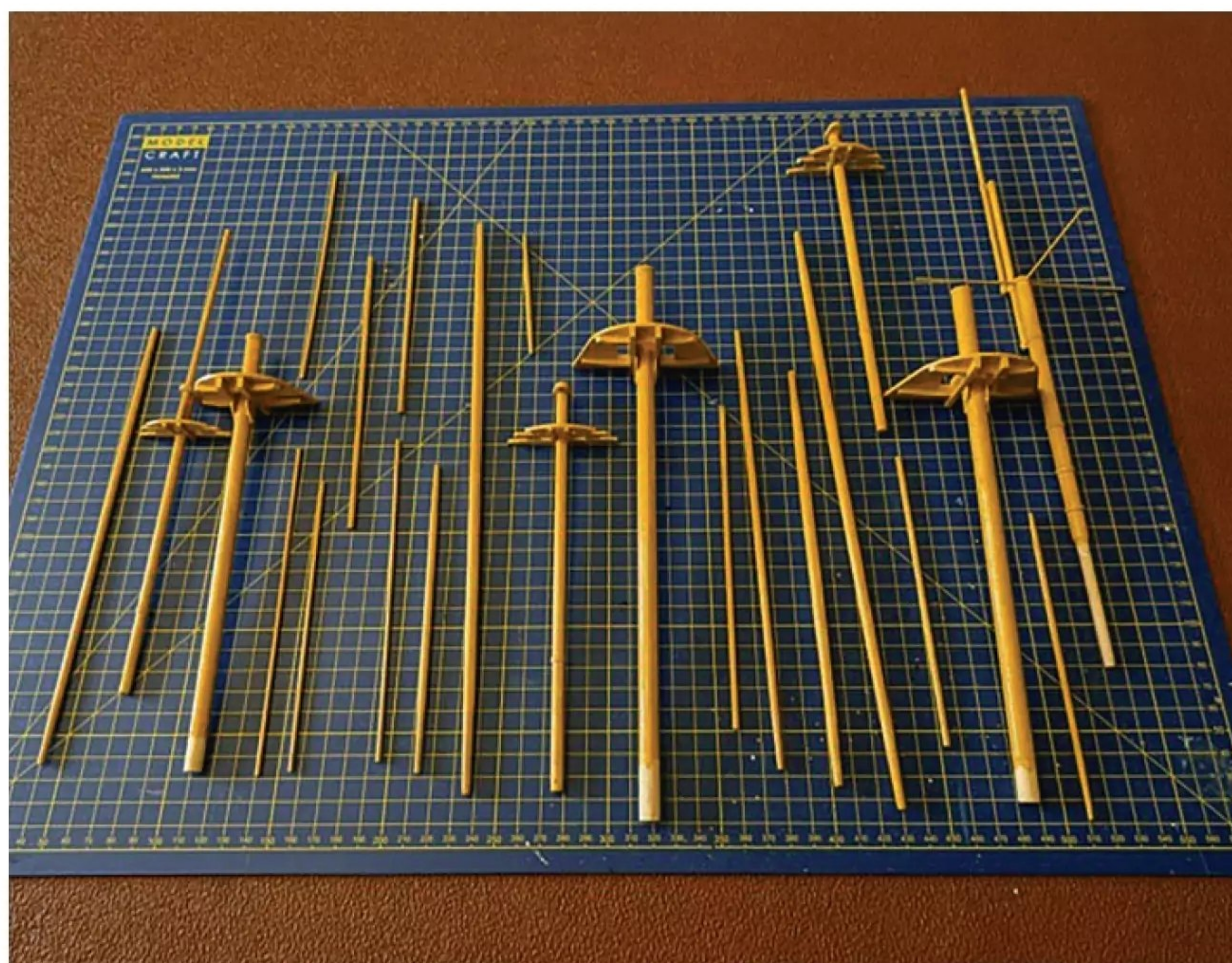
the other hand, if the vessel is shown as a waterline model, set in a realistic sea, then sails should be set and drawing, and the vessel heeling to the breeze.

In the model kit, masts and spars are provided in the form of a set of dowels of appropriate sizes. An instruction leaflet shows each mast as component parts, standing rigging, and running rigging. Each component needs to be identified, with dowels cut to length. The lower mast and topmast platforms (tops) are constructed from laser-cut wooden parts, as is the bowsprit. The latter is constructed as main bowsprit, jibboom and flying jibboom. Some spars need to be tapered. I did this on my lathe, but it can be done by careful sanding. Once all masts and spars are assembled, with construction of lower and topmasts complete, all spars can be painted yellow.

My breakfast-bar shipyard was converted into a rigging loft, and the job of making up all the stays comprising the standing rigging commenced. Standing rigging is the variety of stays and shrouds which provide permanent support to the masts and bowsprit.

I always rig a model in much the same sequence that would have been adopted for the real vessel. Lower masts first, then the standing rigging on those masts, before moving upwards to the topmasts. *Warrior* had her standing rigging tensioned and secured using deadeyes (at that time, bottlescrews would not be adopted for some years to come). Although *Warrior* was a technological revolution in many ways, many aspects of her design and construction reflected the earlier era of wooden hulls and sail.

Deadeyes need to be located onto the tops of the chainplates at the gunwale. I used fine (0.5mm) brass wire, circling each deadeye, twisted to secure, then fitted to



The masts and spars completed and painted.

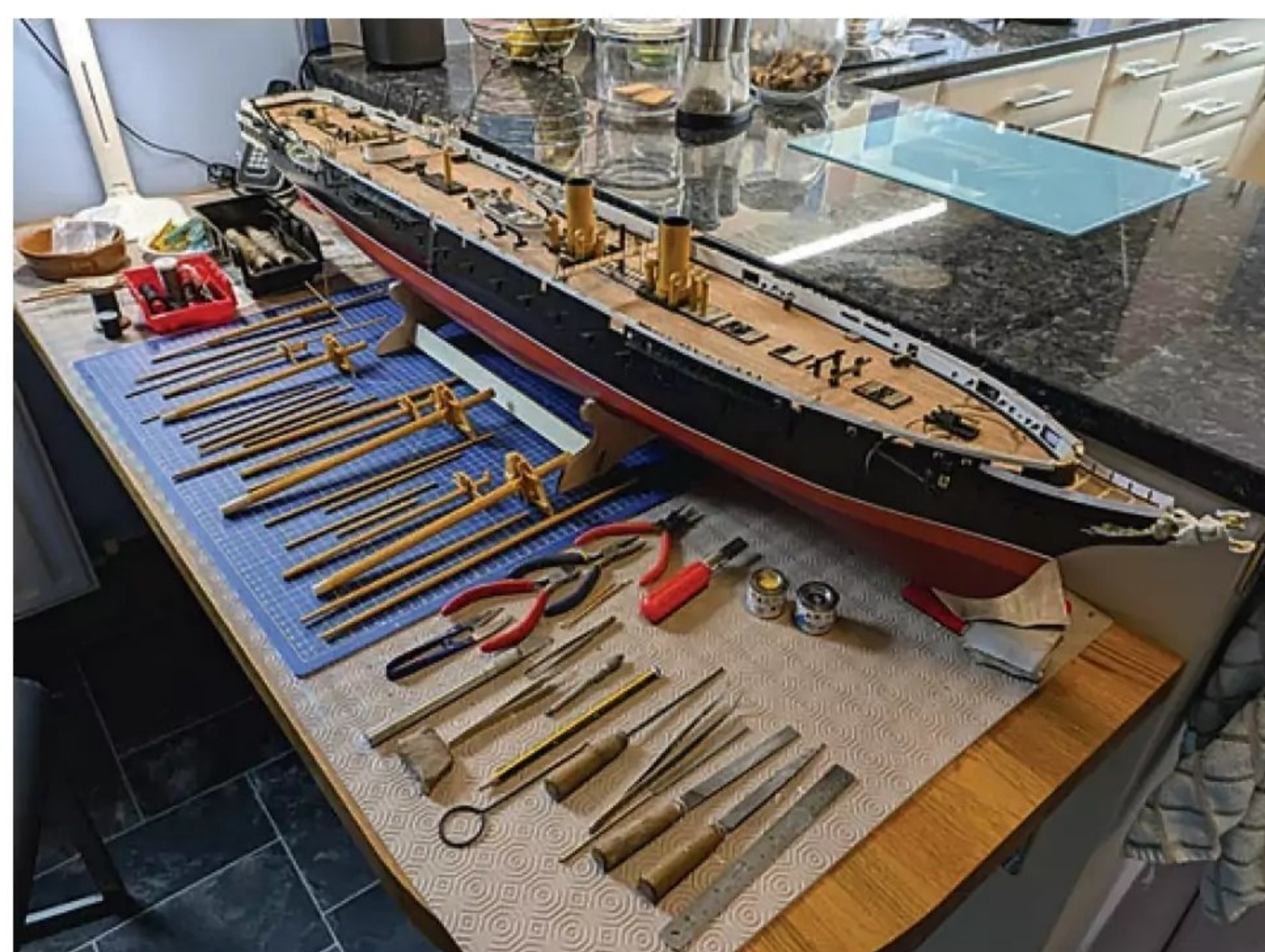
“Care must be taken to ensure that the correct sized deadeye is located onto each chainplate”

the chainplate with a further twist. Care must be taken to ensure that the correct sized deadeye is located onto each chainplate, large ones for the lower stays, smaller ones for the upper. Reference to the drawings is essential. While I was undertaking this task, I also fitted small deadeyes to the mast top platforms, together with their corresponding futtock shrouds.

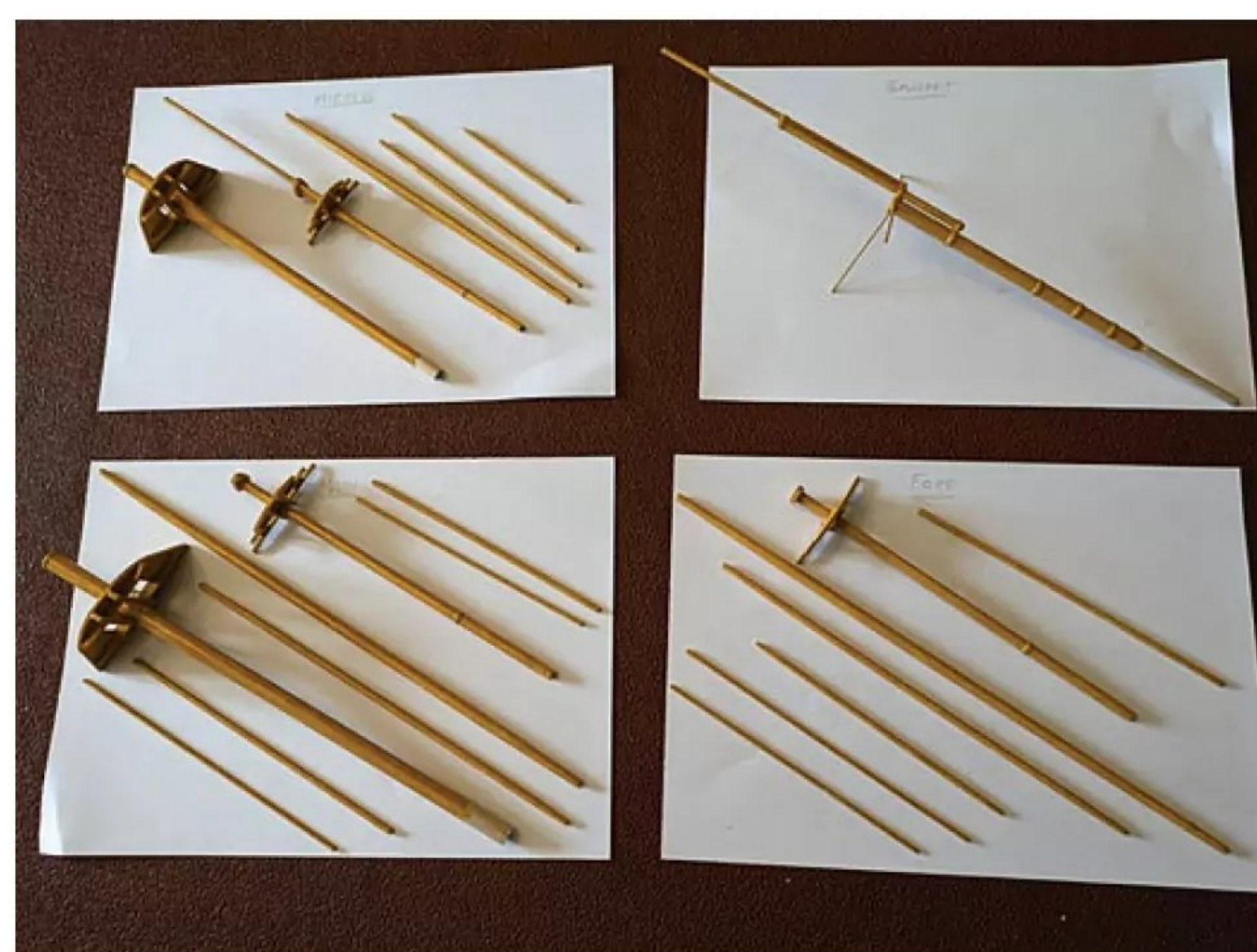
For help with rigging tasks, I have made a little jig on which individual elements of rigging can be made. Support hooks and crocodile clips allow a length of rigging cord to be held while I work on seizing eyesplices and deadeyes.

Warrior is heavily rigged, despite her sailing rig being auxiliary in nature. Both the fore and main lower masts have nine shrouds on each side, all eyespliced at the upper end. These splices are dropped over the masthead in order. This order is known as the ‘dressing order’, and normally starts with the forward starboard pair of shrouds, then the forward port shrouds, before working starboard/port aft. The final item is the double forestay.

Each shroud needs to have a deadeye seized onto the end. One of the most difficult jobs is to get all the deadeyes in line horizontally when rigged and set up. Starting with the forward pair each side, the

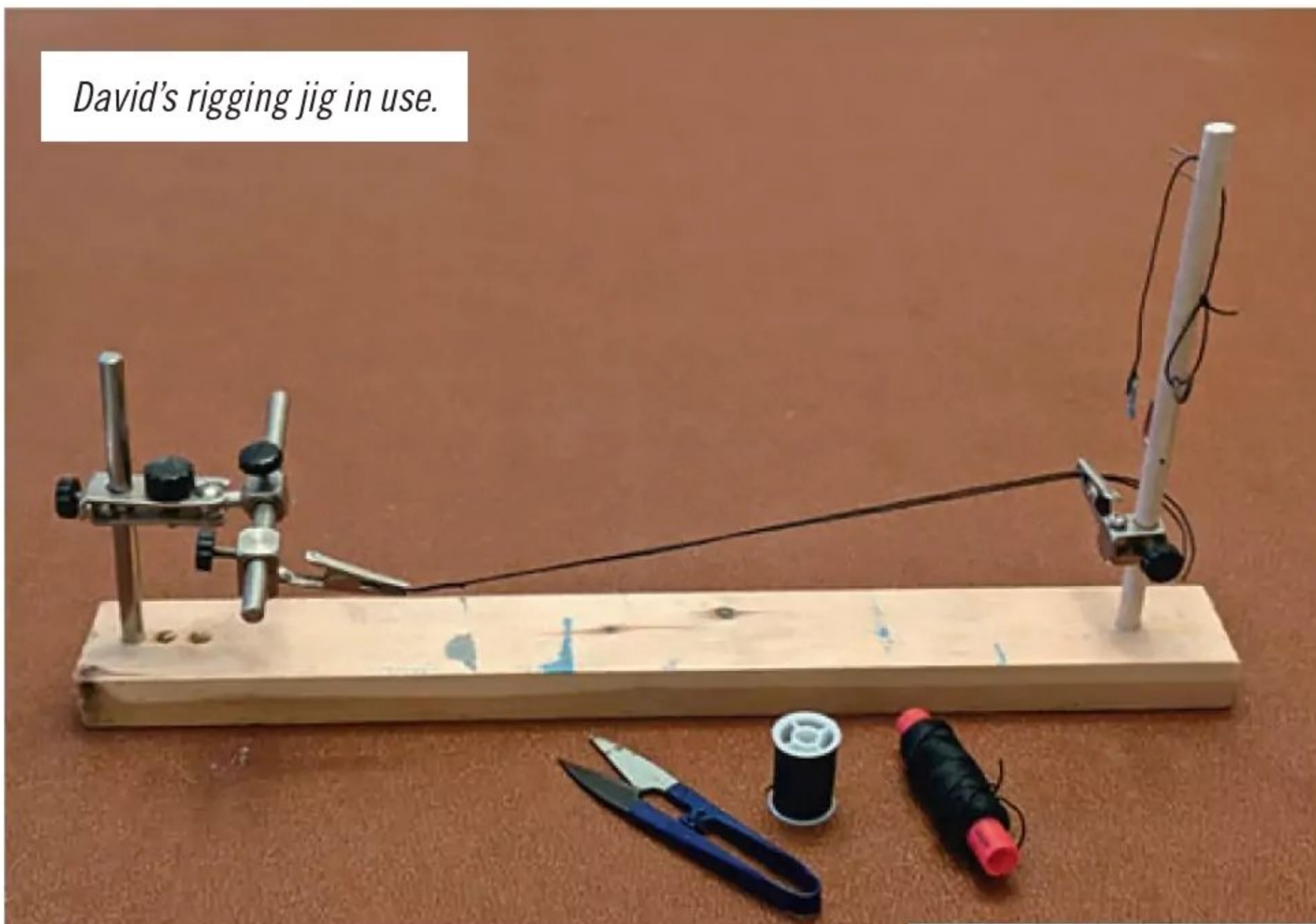


David's breakfast bar shipyard converted to a rigging loft!

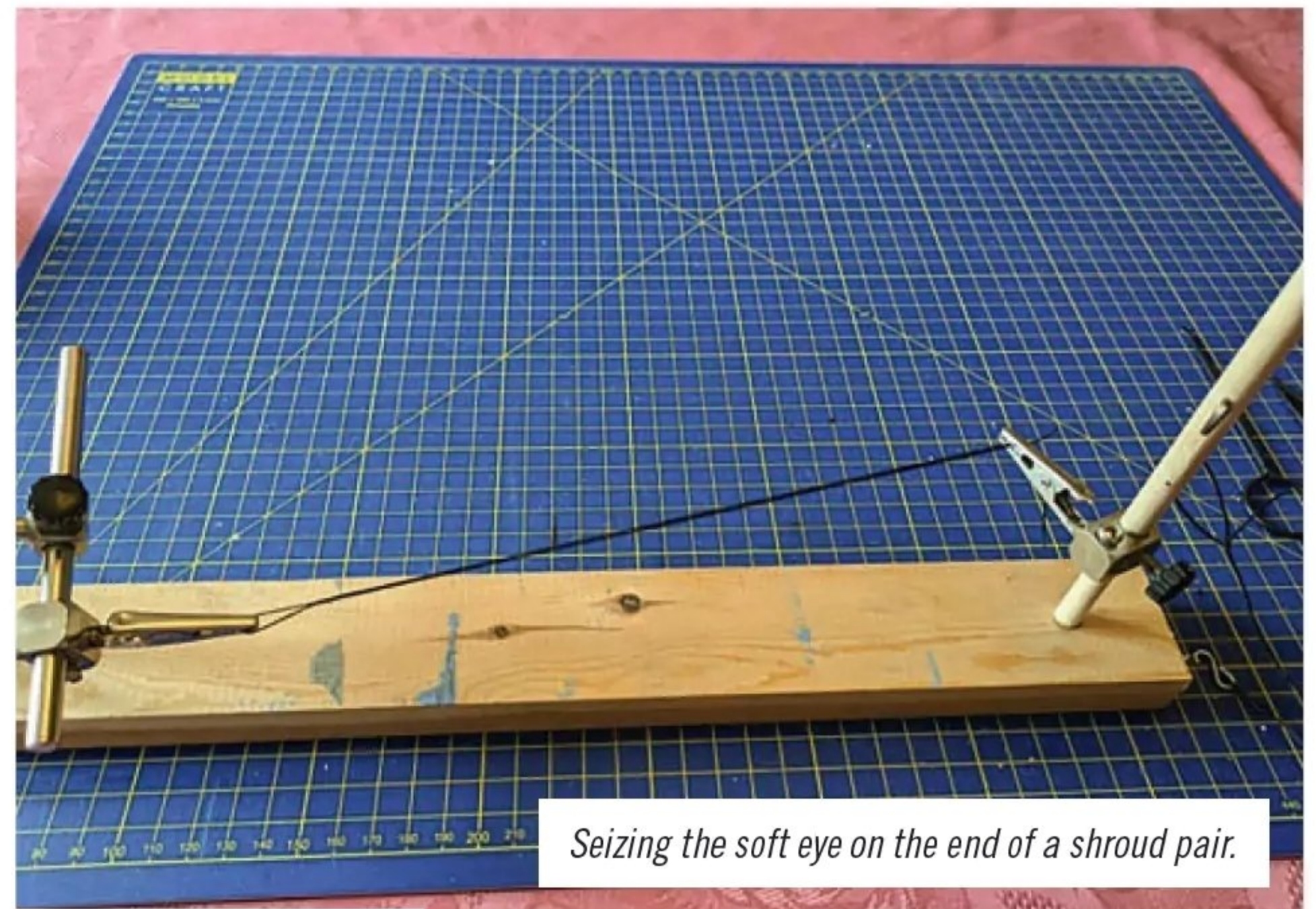


Masts and spars awaiting fitting.

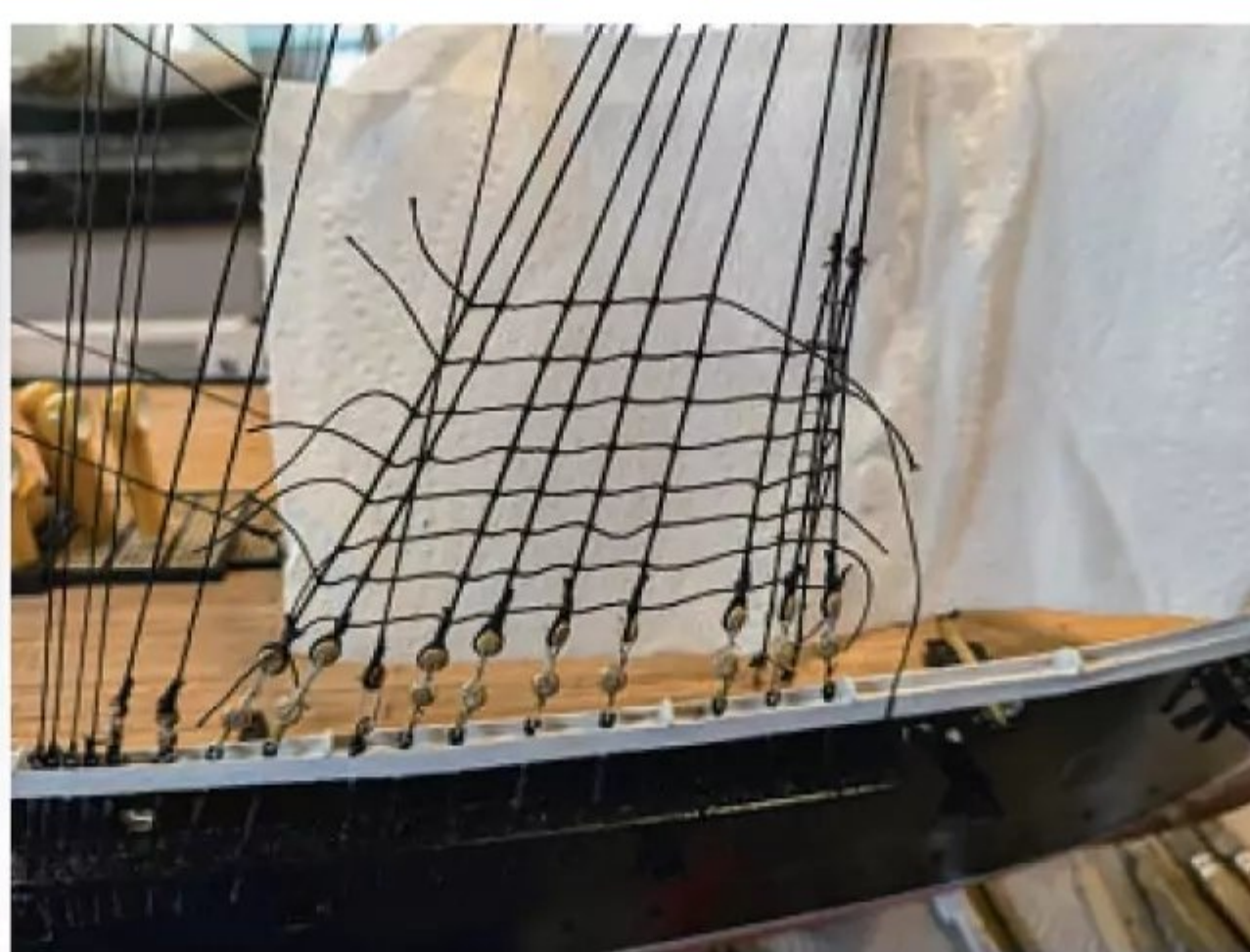
David's rigging jig in use.



Seizing the soft eye on the end of a shroud pair.



Seizing a deadeye onto the end of a shroud.



Ratlines being tied on the foremast, with the shrouds already in place and tensioned.



The foremast with its standing rigging.

shrouds are temporarily rigged and marked for length. Deadeyes are seized into the shroud pair at exactly the same length for each side. Lanyards are fitted, and the mast located. The deadeyes are rove onto their corresponding members on the gunwale. This should result in the two deadeyes each side being level with each other. Having rigged this pair, ensuring the mast is perfectly vertical, the remaining shrouds can be made and rigged. Each 'leg' needs to be a fraction longer than the last, as the lead becomes progressively further aft. Also, each pair has its 'splice' resting atop the previous one.

Patience is required. There are 54 shrouds and forestays to rig for the lower masts alone. These need to be set up and secured temporarily. Rigging will always slacken off with time, and during construction adjustments will be necessary.

I make up a small pot of dilute PVA wood glue (half-and-half PVA/water), which I use to 'paint' rigging knots so as to ensure that completed rigging doesn't inadvertently unravel.

Once the lower masts are set up and rigged, the bowsprit can be made and fitted. This is formed from three spars: bowsprit, jibboom and flying jibboom. To fit these components together I drilled 1mm cross-holes through adjacent spars and secured with 1mm wire rods. A chain bobstay is fitted beneath the bowsprit, leading to an eyebolt fitted into the stem at the waterline level. This

"Rigging will always slacken off with time, and during construction adjustments will be necessary"

bobstay will need adjustment and tightening at a later stage, so should only be secured temporarily. The remainder of the bowsprit rigging is straightforward.

Once all lower mast stays, including forestays, are fitted and rigged, topmasts can be stepped. Again, these are secured by cross-drilling and inserting 1mm wire pins. The topmasts have already been constructed, complete with their doubling and tops.

Starting from aft (the mizen mast), topmasts are rigged with shrouds leading to the lower mast platforms and backstays leading to the appropriate deadeyes on deck. All deadeyes are rove with their lanyards, but not at this

stage permanently secured. Topmast forestays need to be rigged according to the plans.

Finally, topgallant masts can be stepped and rigged; no deadeyes this time, and lighter thread should be used for the shrouds, forestays and backstays.

Once all stays are in place then the rig can be set up tight, adjusted and secured. Again, start from aft, continually checking for the correct rake and that all masts are transversely vertical. Often, tightening one stay pulls some slack in others. Considerable adjustment may be needed to achieve the required result. The final adjustment will be to tension the chain bobstay. A threaded purchase is formed at the



The standing rigging complete.





A close up of the standing rigging on foremast.



A close up of the standing rigging on main and mizzen masts.



The running rigging complete to the foremast

lower end, onto the stem eyebolt. This allows the bobstay to be tightened and secured. This act will take up the slack in every shroud and backstay on all three masts.

Once all this is complete, all rigging can be secured, and I recommend all rigging thread connections be 'painted' with the 50/50 solution of PVA glue with water mentioned earlier. This will prevent knots and hitches working loose. When dry, all loose ends of thread can be carefully trimmed off using snips. I say 'carefully' as it is essential that no 'accidents' occur, such as clipping the wrong line. A useful technique is to keep the snip blades closed right up until they are positioned at the line to be clipped. This prevents inadvertently cutting another piece of rigging.

The next job is to rig the ratlines. This is a long and tedious task but needs to be done with care. The finest thread is used, creating 'rungs' no more than 6 mm apart vertically, clove-hitched to each shroud. It is important that all ratlines are level and horizontal. I find it advantageous to prop up a piece of white card or paper behind the bank of shrouds being worked upon. This allows a much better view of the work.

In a real vessel, the job is known as 'rattling down', although considering you should always start at the deck and work upwards, I reckon it ought to be referred to as 'rattling up'! Leave about 20mm loose end at each end of each ratline. This allows you to hold the end with tweezers while trimming off the excess with the snips. Before trimming, apply PVA solution to all the ratline knots and allow to dry. It is worth spending an hour or two at this stage inspecting all of your completed

"This act will take up the slack in every shroud and backstay on all three masts"

"It is imperative you ensure this 'belay' is correct, as once the pin is glued in place it cannot be undone"

standing rigging. Invariably a few knots and fastenings will have worked loose and will require remedy. A cocktail stick with a dab of superglue comes in handy. Some rigging may have become slack, and a few deadeyes may need to be retightened and secured.

That is the standing rigging complete, and *Warrior* should now be beginning to really look the part! But there is still much to do. There are the yards and other spars to fit-out and locate in position, and then all the running rigging to tackle.

Before any running rigging can commence, the yards and gaffs will need to be 'fitted out'. So far, they have been cut to length and tapered where necessary, then painted yellow. Reference to the rigging drawings will indicate where blocks need to be secured and wire eyelets fitted. The fore and main lower yards carry stuns'l (studding sail) booms. Brass wire eyelets need to be made and fitted at the yard ends and quarters to take the booms.

The rigging plans provided with the kit omit a number of items. There are

no footropes beneath the yards, and no braces on the mizzen. I decided to add these features, as a square-rigger doesn't look right without them. In my time at sea, I have sailed in square-rigs and cannot contemplate working aloft without footropes on the yards. These are the ropes that the crew stand on when out on the yards furling or reefing sail. I made the footropes themselves from Trimits' craft stainless steel wire, plastic coated; this can be obtained from a craft shop and is normally used in jewelry making. It provides exactly the right stiffness to simulate a rope hanging below the yard. The footropes are attached to the yard at intervals by vertical



A close up of the standing rigging on the lower foremast.



The mainmast with running rigging complete.



The main and mizzen masts.

'stirrups'; short lengths of rope holding the footrope a fixed distance below the yard.

Commencing with the three lower yards, brass wire pins are fitted in their centres, facing aft, fitting into holes drilled into the mast at the correct height. The truss on which the yard pivots is simulated using black rigging thread. Braces and lifts need to be rove, taking care to ensure a fair 'lead' to the pinrail on deck. Yards must be carefully set up to be perfectly horizontal, and square to the centreline. Braces and lifts must be tightened and set up. Once satisfied that all three yards are square and level, the lifts and braces can be secured. I don't even attempt to belay the rope to the belaying pin in the normal manner. I pass the rope through the hole in the pinrail, then apply a smudge of glue to the belaying pin, pushing the pin into the hole and securing the rope in place. It is imperative you ensure this 'belay' is correct, as once the pin is glued in place it cannot be undone. The spare end of rope is cut off short. No attempt should be made to coil it up and hang the coil on the belaying pin as in full-size practice. I make separate coils of the same thread to hang on the pins once all rigging is complete. I will describe their making later.

Gaffs are fitted on all three masts. Each gaff is secured to the mast with a short length of brass wire; making a working gooseneck is not feasible at this scale. The gaffs are supported by a halyard using several blocks, and two vangs control the peak of the gaff. In hindsight, I would rig the three gaffs first, before fitting the three lower yards. I rigged the yards first, which made access difficult for the gaffs.

With any running rigging element, care must be taken when running the hauling part from its block aloft down to its belaying

"You may question why a Royal Navy ship should fly the red duster..."

pin on the appropriate pinrail. For upper yards, this is sometimes a tortuous route, ensuring that the lead doesn't foul any other rigging elements. Once in place, and before finally securing, I hang the spare end over the ship's side, and hang a clothes peg on it. This provides temporary tension on the line while other lines are rigged. Once all are rigged, adjustment can be made until all is fair, yards level and square. Then your halyards, lifts and braces can be secured permanently.

A red flag?

One of the final details is to hoist the red ensign at the spanker gaff. An alternative location is the taffrail staff, but this is very vulnerable, so I opted to show it on the spanker peak. You may question why a Royal Navy ship should fly the red duster; this flag being universally flown on merchant vessels. Not, however, in 1860. *Warrior* was the flagship of the 'Admiral of the Red'. The navy comprised three fleet divisions: Red, White and Blue. Vessels wore the ensign of the division to which they were attached.

Rope trick

Once all running rigging is complete, it is necessary to make several dozen tiny coils of rope to hang onto individual belaying pins. These simulate the lengths of spare line coiled up and stowed. I made a little jig with sets of three pins close together. Here, a length of rigging thread is wound around



The lower mizzen mast.

two of the pins, with one turn around the third pin. This forms a coil of rope with a single loop to hang onto the belaying pin. A smudge of glue helps the coil to 'hang' correctly.

Finishing touches

It is now necessary to go over the whole rig to check everything is correctly secured. Once satisfied that all is in order, I strongly recommend going over all knots, hitches and loops with dilute PVA glue (applied with a small artists' brush).

The stand can now be cleaned up and painted, then carefully attached to the hull.

The final task is to carefully examine every detail of the vessel. Inevitably there will be odd loose ends of rigging to be cut or secured, brass wire fittings to be painted, and/or the odd deck fitting that may have come loose will need re-securing. In hindsight, I would advise leaving the fitting of the lower deck gunport doors until all else is complete. I fitted mine much earlier on in the build and spent the next four months knocking them off; they are very vulnerable! One or two disappeared into the hull, lost forever, necessitating the making, painting and fitting of new ones.

Finally, the hull can be permanently secured onto the stand, and all is complete. And does she look impressive!

Behold a mighty Warrior!

This is a large model, constructed from a large kit. In my case, *Warrior* took nine months to complete, by far my biggest and longest build to date, but I enjoyed the process immensely. So, to sum up, I would say this well-presented Billing Boats' kit provides the more experienced modeller with a challenging but ultimately highly rewarding project.

So, what next for the breakfast-bar shipyard? Watch this space! ●

BOILER ROOM

Richard Simpson gets into the cut and thrust of another very important aspect of model engineering

Our models often share designs, concerns, behaviours and even the basic governing physics of their real-life counterparts. So, despite being miniature replicas we frequently have to consider just what goes in in real sea-going vessels to help us understand how to deal with various aspects – typical examples being ballasting, stability and propeller performance, to name but but a few. One that isn't always quite so obvious but is nevertheless a very important factor in all propulsion and drive systems is that of thrust. Consequently, this month I thought I would share some

of my own observations from my life at sea as regards how thrust is accommodated in full-sized ships, how this relates to our models, and how we should accommodate it there. Ignoring the effects of thrust has the

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potential to cause significant damage in our steam engines so, bearing in mind the cost of a steam engine, it’s definitely a subject to be taken seriously.

The real life set up

Of all the pieces of equipment I spent my career looking after in ship’s machinery spaces, it was always the thrust block (see **Photo 1**) that gave me most pause for thought. All ships have them. Without them serious damage would be caused to other pieces of vital machinery. Despite this, they frequently received the minimum



A modern main propulsion shaft showing clearly, from right to left, the shaft turning gear, an intermediate bearing and the main thrust block.



The two propellers on this vessel generate a significant amount of thrust to push a ship of this size through the water at speed. If this thrust wasn't transmitted directly into the ship's structure and isolated from the prime mover, it could cause significant damage.



In this arrangement the aft face of the external bracket is simply not designed to take propeller thrust, so there must always be a clearance between the propeller and the bracket.

of attention, apart from a survey every few years when it popped up on the Classification Society machinery list, which would involve taking the top cover off and removing one or two of the bearing pieces. Physically, there really wasn't a lot to it, but the job it did was fascinating.

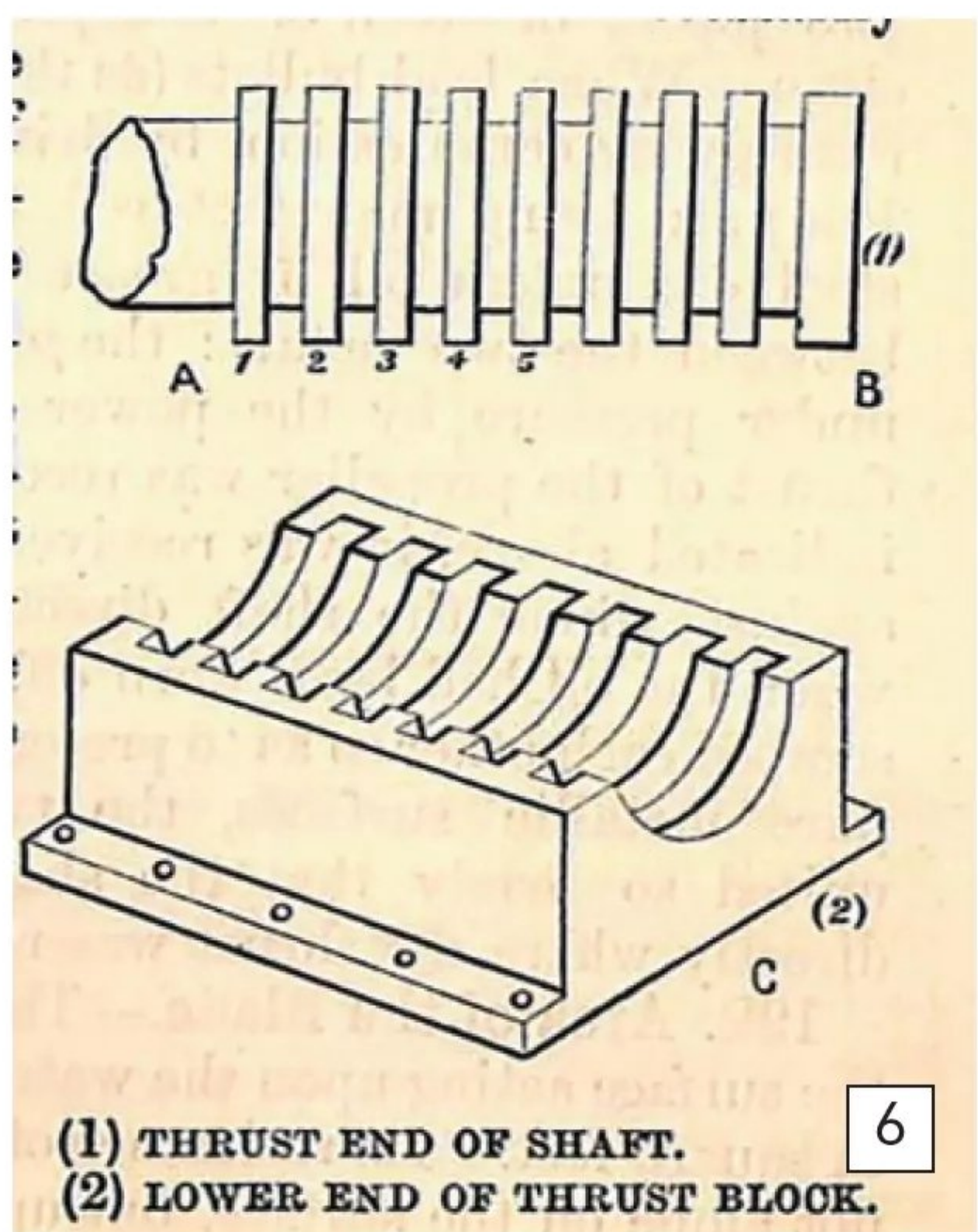
So, what does the thrust block do, and how? The thinking has to start with the propeller. As an example, a fairly small cruise ship propeller arrangement by today's standards can easily be in the region of two of them, each weighing 20 tons weight and being 20ft in diameter (see **Photo 2**). When these propellers are rotated at any speed, the propeller starts to generate thrust by the action of pushing the water it sits in rearwards. The equal and opposite force balanced by this is that the propeller is pushed forwards. To make the ship move forwards however, this thrust has to be transmitted into the hull. If there was no thrust block, the propeller would try to push the ship forwards by taking up all the clearances in the propulsion system and would push on what had the minimum clearance and therefore closed first. This might be the rear face of the aft 'A' frame (see **Photo 3**), the end of the stern tube, or, in a diesel electric plant, it might even start to push against the main propulsion motor rotor (see **Photo 4**). If it was a more traditional slow speed direct drive diesel engine propulsion system (see **Photo 5**) it might even push on the end of the main engine crankshaft. None of these components are designed to withstand or transmit thrust, so serious damage would result. What we do instead is install a device in the shaft line, called the thrust block, which transmits the thrust generated by the propeller into the ship's structure. Traditionally, when screw propellers were first used, the thrust block consisted of a row of maybe up to a dozen or so collars that ran against grooves cut in the casing that was mounted around them. The trouble with this arrangement was that there was quite a bit of resistance generated by the multiple



As with any electric powered model boat, a diesel electric ship has an electric motor connected directly to the propeller shaft. The rotor of this motor must be isolated from the thrust forces to prevent damage, or at least undue wear.



A traditional cargo ship could have the main diesel engine crankshaft connected directly to the propeller shaft. Again, significant damage would be caused if longitudinal forces were to be applied to the engine crankshaft. This slow speed diesel is directly connected.



Early attempts at a thrust block consisted of a row of collars pushing against matching thrust faces. The difficulty was getting exactly the same force on each one, so failures of the higher loaded faces were common.

collars and, at any one time, it was unlikely that all the collars were taking precisely the same load, so overloads of collars and failures were frequent (see **Photo 6**).

With the advent of advanced lubrication systems and white metal bearing technology nowadays we have seen the development of the commonly found Michell Type thrust block. This device basically consists of a large collar fitted to the shaft that rotates between two other large collars, known as the thrust collars, which are firmly attached to the casing and therefore the ship's structure. Between the rotating collar of the shaft and the fixed collars of the casing are 'floating' bearing segments, known as the thrust pads (see **Photo 7**). These segments float on a thin film of oil in exactly the same way in which a main bearing or a bottom end bearing work to create an oil film. On the forward side of the shaft collar we have the forward thrust pads, and on the rear side we have the astern thrust pads. These pads therefore transmit the thrust in the shaft into the thrust collars that are fixed to the hull and, via stiffeners and additional framework, into the ship's hull. So, when the propeller is rotating at full speed you can go and stand next to the thrust block and imagine that the entire weight of the ship is being pushed through the water via the brackets that the thrust block is sat on. I used to find it pretty cool anyway!

So, what does this have to do with model boats?

As I mentioned in the introduction, this is another area of marine engineering that must be considered when building model boats. In precisely the same way as thrust from the propeller has to be accommodated in a full-sized ship, it equally has to be accommodated in our models. If we simply



Nowadays a Michell type bearing arrangement is common. The bearing 'kidney' pieces are free to 'float' on a pivot, so form an oil wedge on the thrust face in exactly the same way as a rotating bearing does.

fitted a propeller to a shaft and assembled it into a model with either a motor or a steam engine on the end of it, there might be a possibility that the thrust could be transmitted into the hull through either the steam engine or the motor. Either way, you could be looking at the motor rotor or the steam engine crankshaft being pushed longitudinally until such point as rotating parts start to rub in areas where wear and subsequent damage could occur. You might get wear on the can end covers, or brush

gear wearing unevenly, if pushed lengthways in the motor, and you might get balance weights on the crankshaft rubbing against bottom end bearings or main bearings in the steam engine. Again, in either case the thrust from the propeller, transmitted through the shaft has to be isolated from the prime mover.

I have, in the past, heard conversations that indicate the modeller has not fully understood just what's going on and so has sometimes fallen into the trap of simply

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The basic components of an arrangement where a thrust face is incorporated into the aft bush. A thrust washer should not be required in this case.

fitting a washer behind the propeller thinking that was job done. Unfortunately, it isn't quite that simple.

Isolating the thrust from the prime mover means we must transmit the thrust force directly into the hull before it gets to the prime mover. We could use a thrust block, as in real life, but we don't really need that level of complexity. A brass or stainless-steel washer sat behind the propeller is frequently sufficient, but we must arrange for it to be actually doing the job. Another possibility is that the stern tube is fitted with a rubbing face by having the end bushes incorporating a thrust collar (see **Photo 8**). Whatever the arrangement, the propeller, or its lock nut, must actually be pushing the thrust washer or thrust face, so there must be no clearance there. We do all this by fitting the propeller to the shaft with its locknut (see **Photo 9**) and then the shaft into the tube (see **Photo 10**) before we attach anything to the motor or engine. The locknut behind the propeller must be tightened up, and then the washer, if being used, placed on the shaft before inserting it into the tube. On the front face of the tube, inside the model, we then put the astern brass washer (or, again, it might be a thrust face incorporated into the bush) before fitting either the lock nut and threaded coupling or the sliding coupling and tightening the grub screw (see **Photo 11**). The thrust washers, if used, should be as close a fit as possible on the shaft to help seal the end bushes of the stern tube. I always put a smear of waterproof grease or Vaseline on the rubbing faces. You will normally find that the thrust washer sits against the end of the stern tube and doesn't rotate, so the rubbing face is at the outside end between the propeller lock nut and the brass washer and, at the other end, between the brass washer and the coupling. The arrangement should give you complete, smooth, free rotation, without any binding, so you are looking for the minimum clearance you can create without feeling any resistance. This will probably be a very slight but just perceptible backwards and forwards movement of the shaft in the tube. For the thrust faces to do their job this backwards and forwards clearance must always be there, even when finally assembled in a model. So, basically, when the propeller is rotating ahead the thrust is transmitted into the hull by the rear face of the stern tube, and when the propeller is rotating astern the forward face of the stern tube is handling the thrust.

What we must then be careful of is how we go about connecting this to the coupling and then to the prime mover. If you imagine fitting the coupling and then fitting the prime mover and arranging it in such a manner that you are actually pulling on the shaft, you will prevent the correct movement of the shaft longitudinally and have longitudinal force on the prime mover. The shaft must be



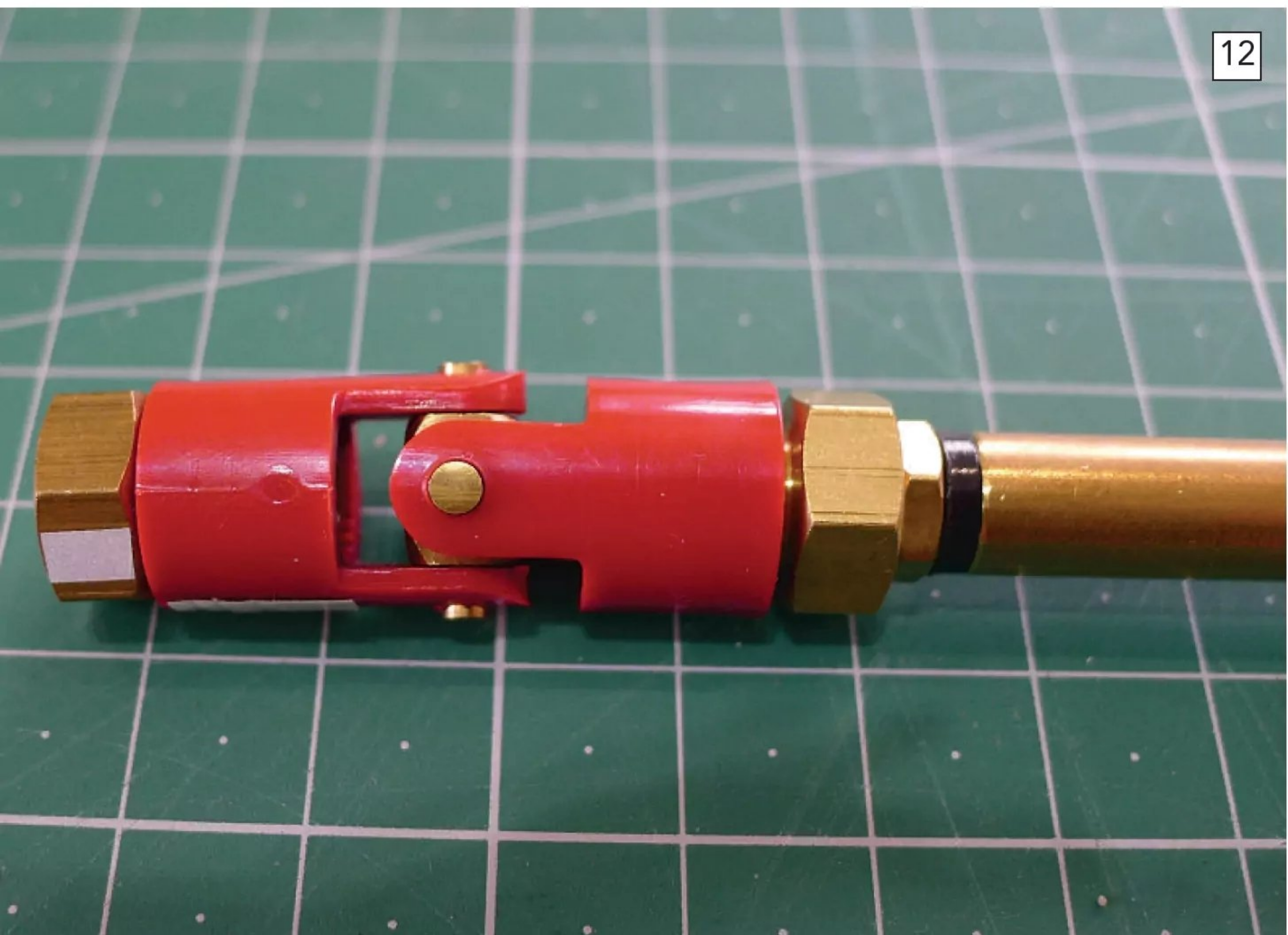
The propeller is locked against the lock nut with the thread as deep as possible into the propeller boss.



This then allows the lock nut to run on the aft thrust face of the shaft bearing, and hence transmit the thrust from the propeller into the stern tube, and therefore the model. If there is a clearance here when the propeller is pushed forwards, then something else is transmitting the thrust.



When the coupling is fitted, whether threaded with a locknut or simply a collar locked by a grub screw, the shaft should have a slight movement backwards and forwards to allow the ahead and astern thrust faces to do their job.



The most important aspect is that the coupling should allow free movement of the shaft backwards and forwards, while isolating this from the prime mover. Frequently, splines in this type of coupling are tight and so do not isolate the motor or engine from this movement.

free to play in the stern tube to enable the ahead thrust face and the astern thrust face to do their jobs. Traditionally, the Huco type of coupling consisted of two brass inserts that were splined into the central plastic bearing holders. These splines should allow movement backwards and forwards of the propeller shaft while isolating the prime mover from this movement. Unfortunately, nowadays I see this type of coupling invariably quite tight in the spline fit and so it doesn't allow longitudinal movement (see **Photo 12**). Ideally, the best coupling you can fit, whatever the arrangement may be, will allow the shaft to move backwards and forward to take up the clearance while ensuring that the moving parts of the prime mover remain free to rotate without any longitudinal load. So, you need to be able to get hold of the propeller, move it backwards and forwards so the two thrust faces come into contact with their relevant rubbing faces, while the prime mover doesn't move during this process. If you can achieve that, then you know the prime mover is isolated from any longitudinal force generated in the shaft. An excellent coupling configuration I use in some of my steam models is a simple interference pin arrangement (see **Photo**



A common coupling for a low load and low speed installation. The thrust face is incorporated into the plastic bush, and forwards and backwards movement of the shaft is accommodated while isolating the engine.

“Just being aware of what’s going on and thinking through the process of how to deal with it will help keep your model running for much longer and far more reliably”

13). This allows free movement of the shaft in the tube and isolates the engine from any movement of the shaft. The plastic sleeves prolong the life of the pins and cut down the noise. This wouldn’t be suitable in a high-speed application, where the out of balance pin in the shaft would vibrate significantly, but in low-speed installations it works well.

Conclusions

The idea of accommodating the thrust in our model boats doesn’t always get the attention it deserves. Invariably, any damage that occurs to the propulsion components can take some time to manifest and make itself known, and frequently exactly what has happened isn’t always understood. Wear in electric motors can simply result in them being exchanged for a new motor, and wear in steam engines tends to be put down to age and use, so the real root cause is often neglected. Accommodating the propeller thrust is not as important in smaller scale models, where things can be generally more over-engineered, but in performance models and in more highly loaded propulsion systems, such as used in tugs, the effects of a poorly set up shaft line will make itself felt far sooner, and the consequences of failure could be more of a concern.

Just being aware of what’s going on and thinking through the process of how to deal with it will help keep your model running for much longer and far more reliably. I still occasionally notice a model with a propeller and a locknut on the end of the shaft, with a washer sat behind it in a millimeter or two of free shaft, quite obviously doing nothing. As an example, when I put together my German steam workboat the shaft had a big clearance on the forward side of the stern tube. If that had been left, and if the coupling didn’t allow free movement of the splines, then the propeller would have been pulling on the engine crankshaft when going astern (see **Photo 14**). I decided to fit a spacer to the shaft and a thrust washer for it to push against, so the thrust is now taken by the washer running on the forward face of the stern tube bush (see **Photo 15**). The bottom line is always that you should be able to feel a very slight clearance in the shaft when moving it backwards and forwards with the propeller (see **Photo 16**) and, when you move it, you should not see any movement in the prime mover main shaft. If you do, there’s a possibility of undue wear taking place. ●



In this initial assembly it is easy to see that if the splines in the coupling are tight, forces will be transmitted into the engine. If the splines are slack, there’s too much movement of the shaft and you might get the propeller interfering with the rudder.



A simple spacer was made, and a thrust washer was fitted to accommodate the thrust in the shaft when going astern.



At the ‘business end’ you want to feel just the slightest amount of clearance when pushing the propeller backwards and forwards. When you do, you should see no movement at the motor or engine. Again, this set up uses a plastic bush with a built-in thrust face.

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

Noah's art

I build R/C model boats and I am delighted to say my 4-year-old son, Noah, has now built one of his own! He made this from balsa wood and a few bits and pieces we scavenged from around the house. He actually screwed and nailing everything together (under my supervision, of course), and then I simply helped out by adding the windows and painting the name and numbers of the side of the boat for him.

JAMES COXALL
EMAIL

Firstly, please congratulate Noah (love the name by the way!) on this totally awesome

build for me. He's achieved a much, much better result than when many years ago my then seven-year-old son was asked to make a boat that would float from scrap as a homework project. Unfortunately, he only had me to help (and I use the word 'help' in its very loosest sense), so it's lovely to see both what Noah has learnt from you and managed to achieve himself. He has also set the record, certainly within my time as editor anyway, for the youngest ever contributor to the Your Models section! Ed.



Noah and his brilliant little boat Elsa.

Eventide sets sail

You may possibly remember that I wrote to you in March '23, when you kindly put me in touch with Ray Wood as I had a couple of queries about the plan for his design *Eventide* (featured in the Jan '23 edition of *Model Boats*). Ray was very helpful, and I completed my own version a month or so ago.

She was an absolute pleasure to build. I

purchased her sails from Frank Parsons of Nylet and they are excellent. The varnished mahogany fore deck is not exactly 'scale', but I had some surplus strip wood and I just love varnishing mahogany!

When the weather finally became kind enough for a launch earlier this month, it was very satisfying to see my model finally on the water. After only a very brief outing, I was very pleased with her performance and am

now looking forward to sailing her again very soon.

BARRY WILLIAMS
EMAIL

Ooh, she looks very slick! Love how that sail perfectly complements the gorgeous mahogany deck and the stylish finish to her hull. You've got yourself a real beauty there, Barry. Ed.



Barry Williams' superbly built and finished version of Ray Wood's Eventide.



Welfreighter mini sub

I thought fellow readers might be interested to see this Welfreighter small submarine (which was used for clandestine operations during World War II) model my brother built. It is, as far as we know, the only model of its kind outside of the National Maritime Museum. It took him around six years in between frequent bouts of ill-health, to complete. He is now too old to use it, so I am trying to get it rehomed in a museum somewhere.

TREVOR BRUCE
EMAIL

Bravo to your brother, Trevor! I must admit I was amazed to learn that the files about this SOE (Special Operations Executive) developed vessel remained top secret for over 50 years before they were made available for historical research. I am sure



Our thanks to Trevor Bruce for sharing details about, and these images of, his brother's Welfreighter model, a really fascinating subject choice.

there will be a museum, especially one which perhaps has a special section dedicated to the fascinating role the SOE played during World War II, that will be delighted to accept this for display. Ed.



Aurora

I was interested to note Lachlan Maclean's model of Tyak-Mor in the February issue of Model Boats, and to note the hull was adapted from my earlier Aurora plan. Lachlan's workmanship is excellent, although I'm not sure the skipper is going to see much ahead from the wheelhouse front windows!

You may be interested in the photo I am sending you of an Aurora model built as per my plan. Regrettably, I cannot confirm the model maker.

JIM POTTINGER
EMAIL

Thanks, Jim. Whoever built this model has done a truly excellent job of executing your plan. Ed.



PS Glen Rosa

Since I was seven years old, my abiding passion has been paddle steamers, and (also since that time) I have always wanted to build a model paddler to sail on a pond. As ambitions go, this one seems pretty harmless, but it took me over 40 years to get round to realising it properly.

When I found out that Mountfleet Models would mould me a fibre-glass hull for PS Glen Rosa, however, I took up the challenge. The hull (which would, in fact, also do for the ship's two near-identical sisters Minerva and Albion) is 1:48 scale and proved just small enough to test in the bath.

The Glen Rosa herself carried holidaymakers and others on the Firth of Clyde from 1893 to 1939, a happy task interrupted only while she was requisitioned as HMS Glencross during World War I, when she served as a minesweeper out of Belfast and Swansea.

I managed to find back numbers of Model Boats Magazine from 2006 to 2007



A lifetime's ambition fulfilled: Alasdair Allan's gorgeous Glen Rosa paddle steamer.

which detailed a build from this same hull. This proved very helpful, as I had to create everything else (including decks, sponsons, paddle boxes, etc) from scratch, as well as wire up a motor, lights, smoke unit, etc. In the end, due to time constraints imposed by my job, the model took about 15 months to build.

I was keen to capture the *Glen Rosa* as she looked in her very first season for the Glasgow and South-Western Railway, so I ended up tracking down the original shipyard plans in Glasgow University Archives. I combined all this and other information with what I knew about paddlers from my time, some years ago, as one of the crew of *PS Waverley*.

In the end, I hope I have created a model which (while by no means the most skilled piece of work ever) aims at least to be pedantically accurate when it comes to historical detail! Photos here show the model on her maiden voyage recently, as well as



some details of the paddle-boxes and deck.

I realised that model paddlers are difficult to ballast in any way that overcomes their tendency to 'loll' with one wheel out of the water. The secret eventually proved to be lowering the centre of gravity by means of a home-made removable keel with lead weights. This seems to have overcome that problem, at least when she is going ahead.



I am pleased with the result and am looking forward to sailing her again soon!

ALASDAIR ALLAN
EMAIL

Wow – what a spectacular model. You’ve done an amazing job of fulfilling your dream, and I bet you are the envy of everyone pondside, Alasdair. Ed.

F.V. Surmount

The *Surmount*, BCK.98, was a seiner/ trawler built in 1974 by Campbeltown Shipyard Ltd, Argyll. One of several successful 80-foot-long steel boats produced by the yard, she was built for skipper George Slater of Portknockie. After being sold and renamed several times, she was eventually decommissioned and broken up in 2011.

My static scratch-built model of her has been built to a scale of 1:48 using the shipyard’s general arrangement drawings and reference to magazine articles from when *Surmount* was new, along with various photographs found in books and online.

The hull and whaleback I made from fibreglass, using moulds produced from wooden plugs. Rubbing strakes were added

to the hull using D section styrene strip. The propeller and skeg are brass, while the rudder was made from styrene. The deck is 1.5mm plywood on a 6mm square subframe. Styrene strip was used to make the tops of the frames inside the bulwarks and the capping rails.

The wheelhouse and casing were constructed from styrene sheet, and the various fittings were made from plastic. Copper and brass wire were used for ladders, railings and other appropriate parts. The main parts of the masts are thin dowel wood.

The fishing gear, comprising of the winch, rope coiler and powerblock crane, were mostly made from plastic and wire, with the winch barrels and powerblock sheave turned from brass. The two fishwashers in front of the wheelhouse are plastic, as are most of the other

deck fittings. A piece of dark green fine mesh vegetable bag was used for the net.

Standard enamels and acrylics were used to paint the model. Fly tying thread was used for the rigging and radio aerials. Vinyl self-adhesive lettering was used for the names, and I printed the fishing numbers and logos myself on thin paper and stuck them in place with cyano adhesive.

The model is mounted on a display stand made from veneered shelving, with two turned hull supports. I stained and varnished this before the completed model was attached.

JOHN ROBERTSON
EMAIL

Lovely work, John! Ed



John Robertson's beautifully finished, detailed and display mounted 1:48 scale static model of the seiner/trawler Surmount.



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**

Motor minesweepers

Further to Mr Jeff Ware's letter in the May edition about motor minesweepers, my brother and I made a scratch 1/4-inch scale model of a motor minesweeper many years ago. After this, Mr Paul Beckly of Sirmar model boat kits bought out a nice model construction kit for one. We both became friends with Paul, and my brother, being a draftsman, actually began to create the modellers' drawings for several more kits in the range until Paul sadly passed away at an early age.

My brother and I also worked on a surviving motor minesweeper that was moored at Cliff on the Isle of Grain in Kent. We did this to help out a group of gentlemen who were restoring the vessel so it could be preserved for future generations. Unfortunately, failure to raise sufficient funds and an ageing workforce meant the project never came to fruition, and, after an approach to Chatham Dockyard failed to find support, I believe the vessel was eventually broken up.

ANDREW BARNES
LONDON SE12

Thanks, Andrew. As you will no doubt now be aware, the Sirmar kit was mentioned by others in the Your Letters pages of last month's issue, but it was unclear whether or not this was still being produced/available. This additional information, albeit sad news, is therefore most appreciated.

It's also sad to learn the financial support needed for further work on the 1:1 motor minesweeper restoration project you, your brother and all the other volunteers put so much work into couldn't be secured. Ed.

Rawdon MBC's June Open Day

In the run up to June 8, several of our members worked tirelessly on repairing and refurbishing our showpiece harbour, located in the lee of the dockside, so that it would be ready for our first Open Day of 2024, while on the day itself other arrived before 8am to start setting up the tables, chairs, marquees, etc, in readiness of our first visitors at just after 10am.

The weather started off bright and breezy and, thankfully, despite some early morning showers, stayed that way for the duration.

Our Sail Secretary had organised a demonstration yacht race in the morning, while a committee member had arranged a 'Club 500' fast electric boat race in the afternoon, both of which proved very popular with competitors and spectators alike.

In this, the RNLI's 200th anniversary year, we had lots of lifeboat models on display,



Port Rawdon with one of its first visitors berthed alongside.



HMS Barham passing the new harbour.



HMS Nelson looking very menacing!



The ketch David Archer enjoys a spot of tranquil sailing on the Rawdon MBC's lovely lake in its scenic setting.



A Huntsman cabin cruiser enjoys some time out on the water.



RNLI rep Martin Chappellow poses with a full-size RIB.



These Mersey, Severn and Solent class lifeboats were just three of the RNLI models on display at the Rawdon MBC Open Day.

along with a full-sized RIB (Rigid Inflatable Boat) courtesy of the RNLI Bradford & Baildon Branch and accompanying volunteer Martin Chappellow.

Warship models were out in full force, too, with HMS Barham and HMS Nelson being sailed close to the dock.

We had also had tugs and cruisers, cutters and ketches, and all sorts of other craft, as you can see from the photos.

If you missed out this time around, fear not! We're going to be hosting another event in August 24. Entry will be free of charge, and we very much look forward to seeing as many as possible of you there. We're a very friendly and welcoming group, with members of all ages and backgrounds coming together to share our common enthusiasm for model boat building in all its many guises.

Rawdon MBC is open on Saturday and Sunday mornings from about 10am until 12 noon, or until the last keyholder calls it a day! So please feel free to pop in and have a chat about model boating. Please bear in mind,



Two tugs have a pushing match.

though, that while we encourage all kinds of model boats, we do not allow petrol or diesel engines of any sort; we don't want oil spoiling the water and harming the wildlife in and around our lake. Likewise, fishing is not permitted. I should also point out that we cannot entertain any kinds of flying models, drones, etc – our neighbours would not appreciate the noise or the possible invasion of their privacy.

We are easy to find. Set your Sat Nav with postcode LS19 6EQ and look for us at the top of Canada Road (where it joins Larkfield Road.) We're on Google Maps too! Alternatively, check out our Facebook page and/or website at <https://sites.google.com/view/rawdonmodelboatclub>.

MIKE CRITCHLOW
RAWDON MBC

The Marytown Model Ship Gallery

I recently travelled to Newfoundland, Canada, and had the opportunity to visit the largest model ship exhibition in Canada, the Marytown Model Ship Gallery in Marytown, Newfoundland. The museum features stunning detailed models of almost every type of vessel you can imagine, including tugs, schooners, dories, minesweepers, submarines, ferries, etc. Amongst the very



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impressive military vessels are large scale models of HMS Hood, HMS King George V and the German battleship Bismarck, while stunning sailing ships include the Bluenose, the Bounty and the Columbia.

What really makes this gallery particularly special, though, is how knowledgeable and passionate the individuals who give the tours are, each of them able to recount detailed information about the vessels modelled, their crews, their exploits and adventures, etc.

To provide a little taste of what I am talking about I am sending you a few pictures, but they show just the tip of the iceberg, so I would highly recommend a visit to anyone who happens to find themselves within easy striking distance of this museum. You will not be disappointed. For more info, email marystownmodelshipgallery@gmail.com.

For those unable to make the trip, the museum does have a website, www.modelshipgallery.com that's well worth a browse, and video footage of some of the exhibits can also be viewed on YouTube.

**RUSSELL BOWMASTER
NEW BRUNSWICK, CANADA**

Thanks for this recommendation, Russell, and for the fabulous photos. We do have lots of Canadian readers, and I am sure this will also be of interest to anyone planning to visit or holiday in Newfoundland in the near future. Ed.



HMS Kent

A wide variety of model ships are on display and the level of detail gone into these models is simply breathtaking with each one more impressive than the next. Which one will be your favorite? Some noteworthy models are HMS Hood, HMS King George V, the German Battleship Bismarck and sailing ships Bluenose, Bounty & Columbia.

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Mine Sweeper. Circa 1939

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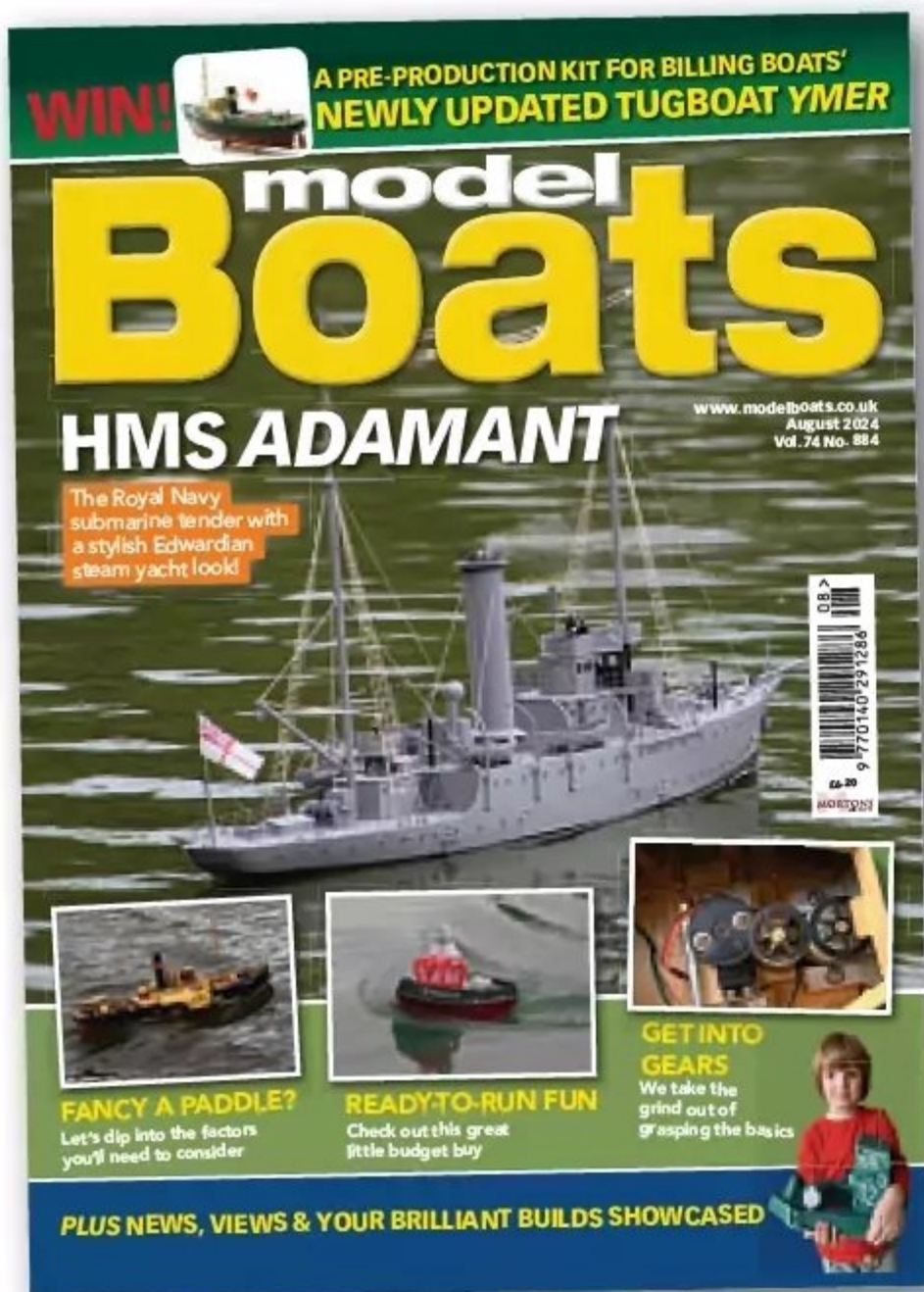
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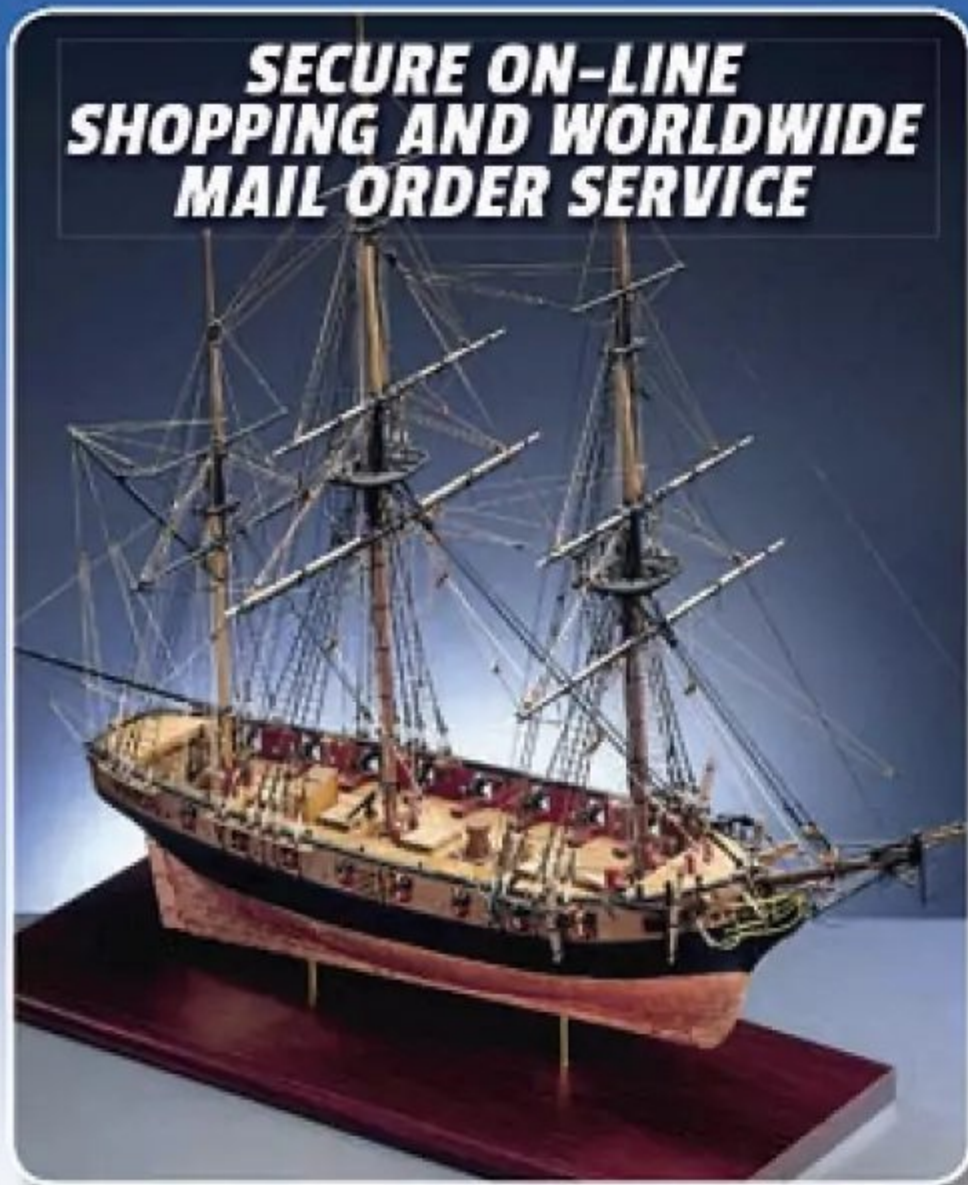
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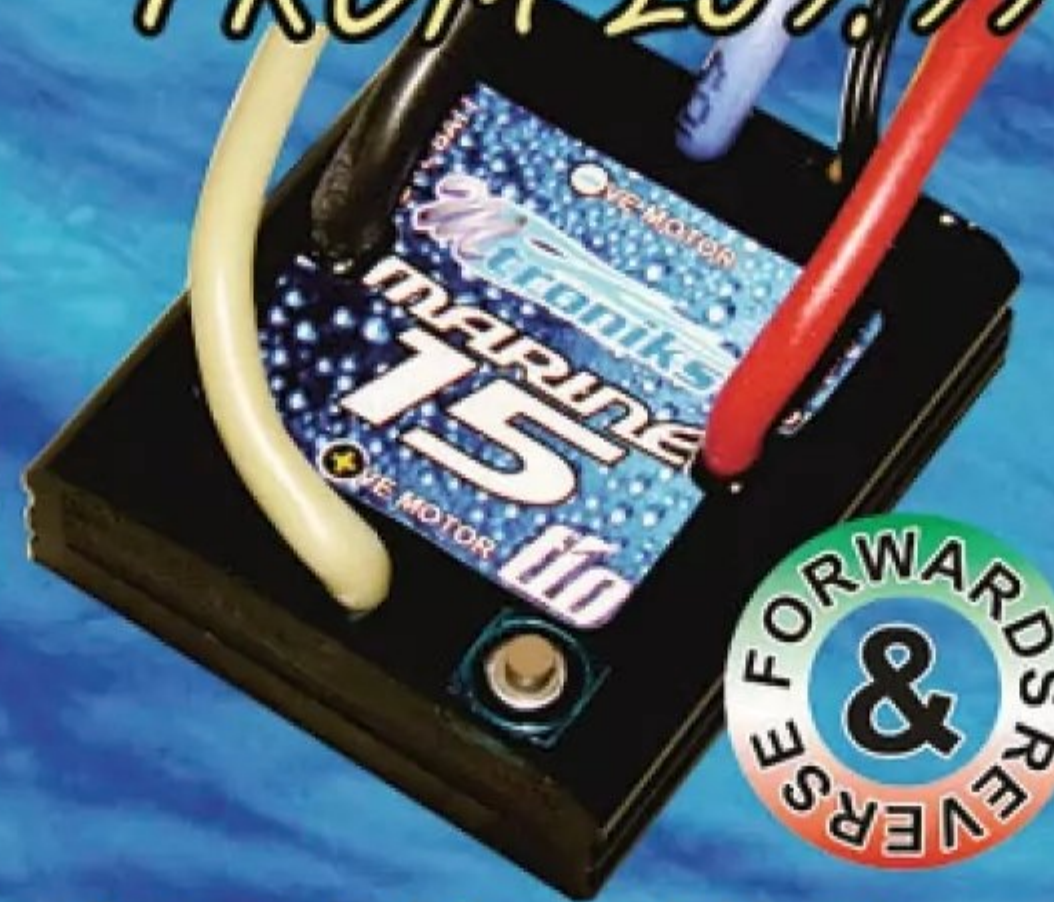
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