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December 2024
Vol. 74 No. 889

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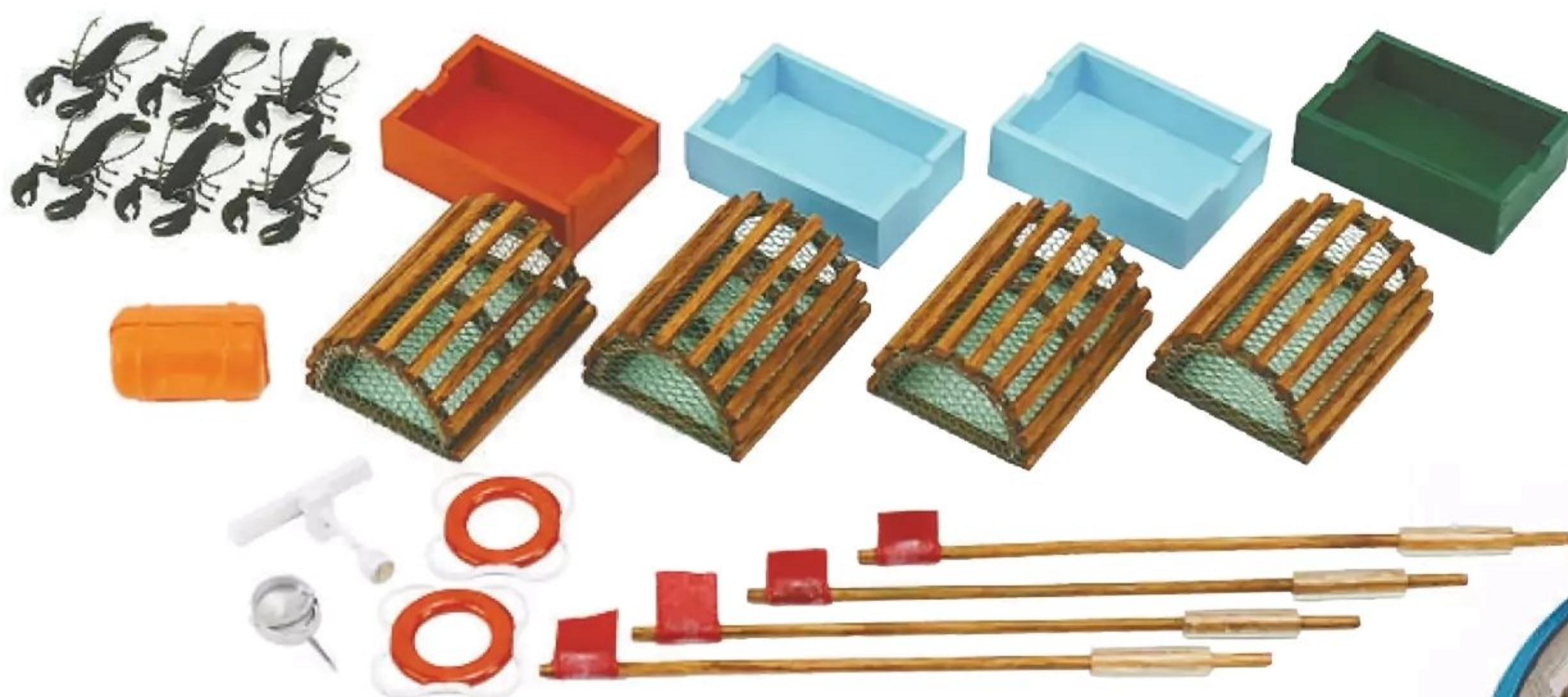
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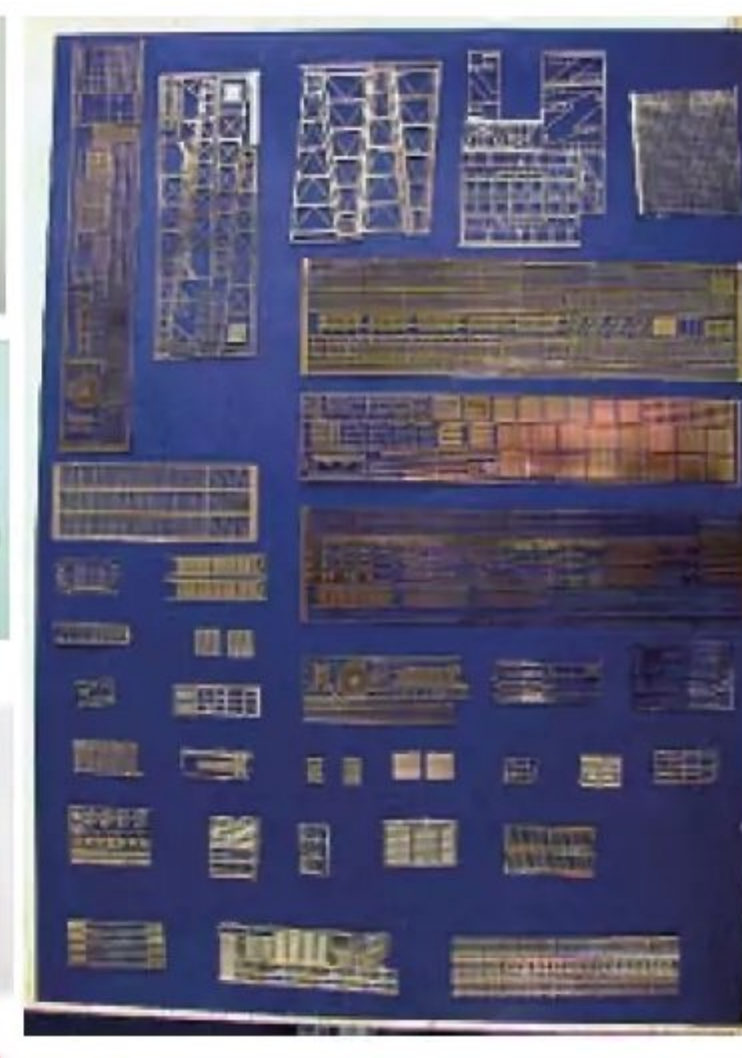
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EDITORIAL

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Publisher: Steve O'Hara

By post: Model Boats, Mortons Media Group,
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Email: editor@modelboats.co.uk

CUSTOMER SERVICES

General Queries & Back Issues
01507 529529 – Monday-Friday: 8.30am-5pm
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help@classicmagazines.co.uk
www.classicmagazines.co.uk

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

PUBLISHING

Sales and Distribution Manager: Carl Smith

Marketing Manager: Charlotte Park

Commercial Director: Nigel Hole

Publishing Director: Dan Savage

Published by: Mortons Media Group Ltd,
Media Centre, Morton Way, Horncastle,
Lincs LN9 6JR

SUBSCRIPTIONS

Tel: 01507 529529 – Mon-Fri: 8.30am-5pm
Enquiries: subscriptions@mortons.co.uk

PRINT AND DISTRIBUTIONS

Printed by: Acorn Web Offset Ltd,
Normanton, West Yorkshire.
Distribution by: Seymour Distribution Ltd, 2 East
Poultry Avenue, London, EC1A 9PT.

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Model Boats, ISSN 0140 - 2910, is published monthly by Mortons Media Group, Media Centre, Morton Way, Horncastle, Lincs LN9 6JR UK. The US annual subscription price is 89USD. Airfreight and mailing in the USA by agent named WN Shipping USA, 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA. Periodicals postage paid at Brooklyn, NY 11256. US Postmaster: Send address changes to Model Boats, WN Shipping USA, 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA. Subscription records are maintained at DSB.net Ltd, 3 Queensbridge, The Lakes, Northampton, NN4 5DT. Air Business Ltd is acting as our mailing agent.



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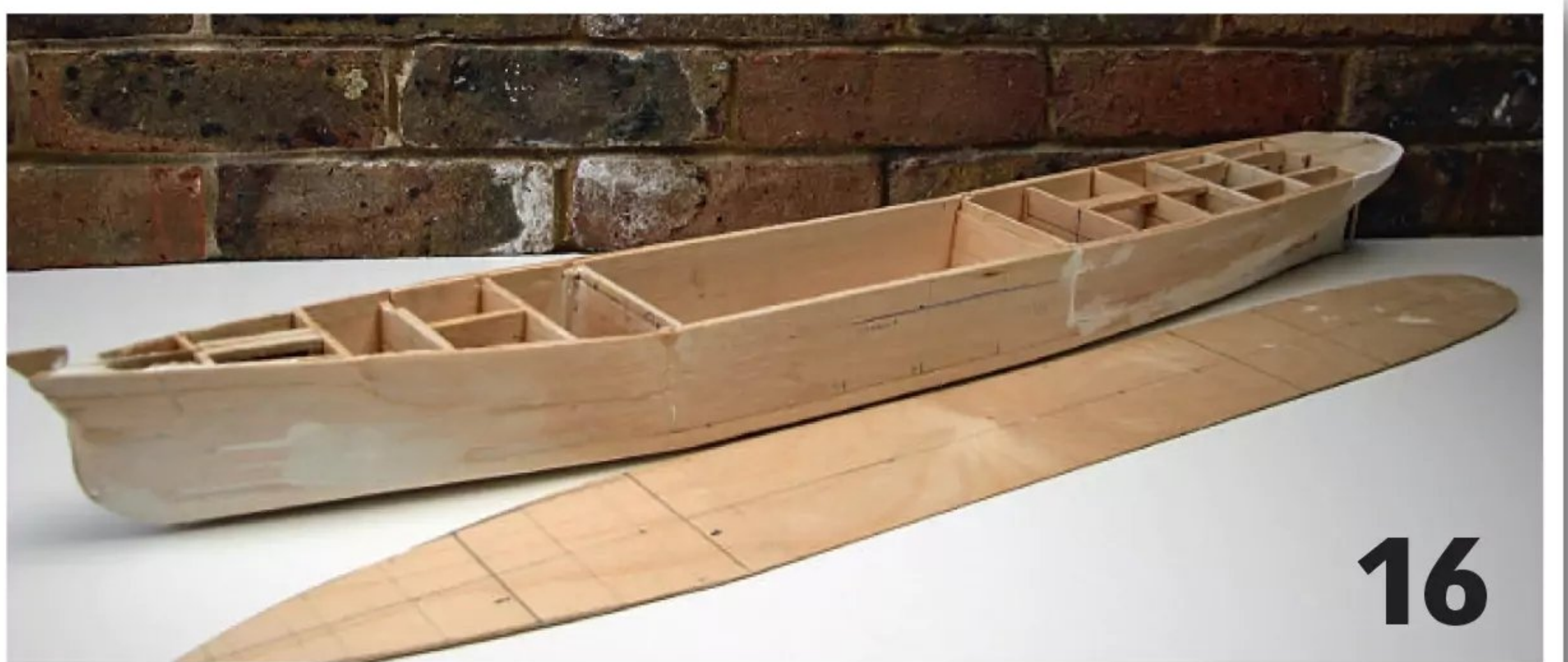
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There's no doubt allowing yourself to be present in the moment is a good and healthy mindset. That's easier said than done, though, when you work in publishing and are putting together an issue that's cover dated December yet goes on sale in November before October is even over! It's a situation further complicated by the fact that, depending on where you live in the world, some of you will receive the January 2025 (on sale from December 20, 2024) ahead of the holidays, while others may not. So, I should probably thank those of you living anywhere the mag takes a little longer to reach for all your support over the course of 2024 now, and take this as my opportunity to wish you a very Happy New Year. Equally, though, for those of you that buy at newsstand rather than subscribe, it's worth reiterating that Dec 20, 2024, on sale date for the Jan 2025 issue so that you don't forget to pick up your copy during what for many is likely to be a fairly chaotic week.

Trust me, you won't want to miss it, as the next issue is already shaping up to be a real cracker.

For a start, there will be a free plan and build guide for MS *Oldenburg*. Although the passenger ferry this model is based on was originally built in Germany, she now serves as transportation to and from Lundy Island (in the Bristol Channel), having replaced the Polar Bear in 1986. I've never been to Lundy (still on my bucket list), but I can remember as a small child living in North Devon standing on the beach staring out to sea at the mysterious island visible (if it was a clear day) on the horizon.

We'll also be bringing you another exciting and exclusive prize draw, a photo-led report from this year's Blackpool Model Show, and a fascinating, and beautifully illustrated, article on square-rigger sailing. I don't know about you, but I've often wondered how these models are sailed without the aid of a motor/propeller. All will be revealed!

I could go on and on, as there's so much to look forward to, but right here, right now, we've got a great line up of content for you on the pages ahead, so enjoy your read!

Lindsey

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Just three of the reasons you won't want to miss the January 2025 issue of Model Boats

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Compass 360

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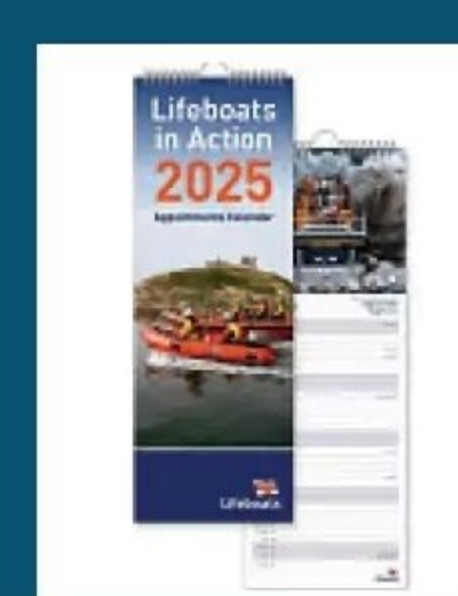
Whoever said socks are boring! Check out these perfect pondside Port and Starboard men's socks, priced at £4 a pair.



Who's doing the washing up? Learn while you earn (some brownie points) with this International Flag Code Tea Towel, priced at £7.50.



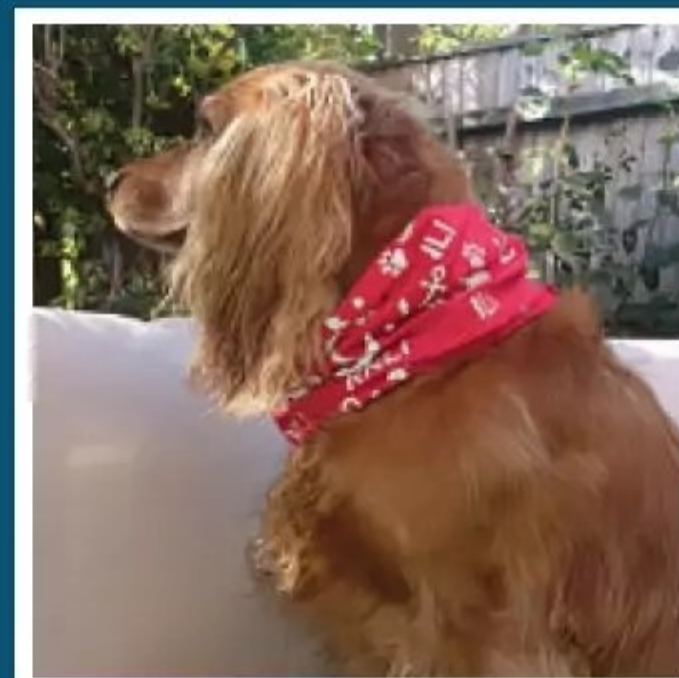
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Enjoy some piece and quiet with this 1,000-piece House of Puzzles Rescue Jigsaw, priced at £16.

OcCre's mighty Missouri

A 1:200 scale kit for the USS Missouri has been added OcCre's high spec range. The kit comprises 6,096 individual pieces (although glues and paints are not supplied and must be purchased separately), accompanied by plans, a comprehensive instruction manual, and step-by-step video tutorials. Aimed at the 'Advanced' modeller, carrying an RRP of £674.00, the approximate build time of 1,400 hours promises to result in an extremely detailed reproduction of this famous World War II battleship, measuring 1355 in length.

The USS Missouri BB-63, known as 'Mighty Mo', was the last battleship commissioned by the US Navy. Construction began in 1941, and

she was launched in 1944 during the most critical period of World War II. The Missouri played a key role in several Pacific battles, including Iwo Jima and Okinawa, before, on September 2, 1945, she served to host Japan's official surrender, marking the end of the conflict. She was also active during the Korean War, providing support with her powerful 16-inch guns. Although decommissioned in 1955, she was modernised in the 1980s as part of the Navy's strategy to reactivate its large battleships. During this period, the USS Missouri was deployed in the Persian Gulf War, showcasing her combat capabilities decades after her original launch. Finally, in 1992, she

was retired from active service. She is currently located in Pearl Harbor, Hawaii, where she is preserved as a museum ship.



OUT AND ABOUT

GAFFER – Impressions from a Loch Fyne Skiff

Image courtesy of Mhairi Law.



Now open and running through until February 2, 2025, at the Scottish Maritime Museum, The Linthouse, Harbour Road, Ayrshire KA12 8BT, is the *GAFFER Exhibition: A Century of Maritime Heritage Through Art. This exhibition, presented by the Law family, features a unique multimedia celebration of the

centenary of *Kirsty*, one of the last surviving Loch Fyne skiffs. *Kirsty*, built in 1921 and preserved for over 25 years by the Law family, is showcased through a captivating blend of art forms. *'GAFFER' comes from 'old gaffers', the traditional term for boats with a gaff sailing rig like *Kirsty*'s

Highlights of the exhibition include an opportunity to discover the rich maritime heritage of Scotland's West Coast, explore the artistry of traditional boatbuilding, experience the intersection of art and maritime history, and uncover the stories hidden in *Kirsty*'s timbers.

The museum is open from 10am to 5pm daily (although closed on Dec 25/26 and Jan 1/2, 2025), with admission charge at £9 for adults (with concessions). For further details, visit <https://www.scottishmaritimemuseum.org/irvine-museum/>

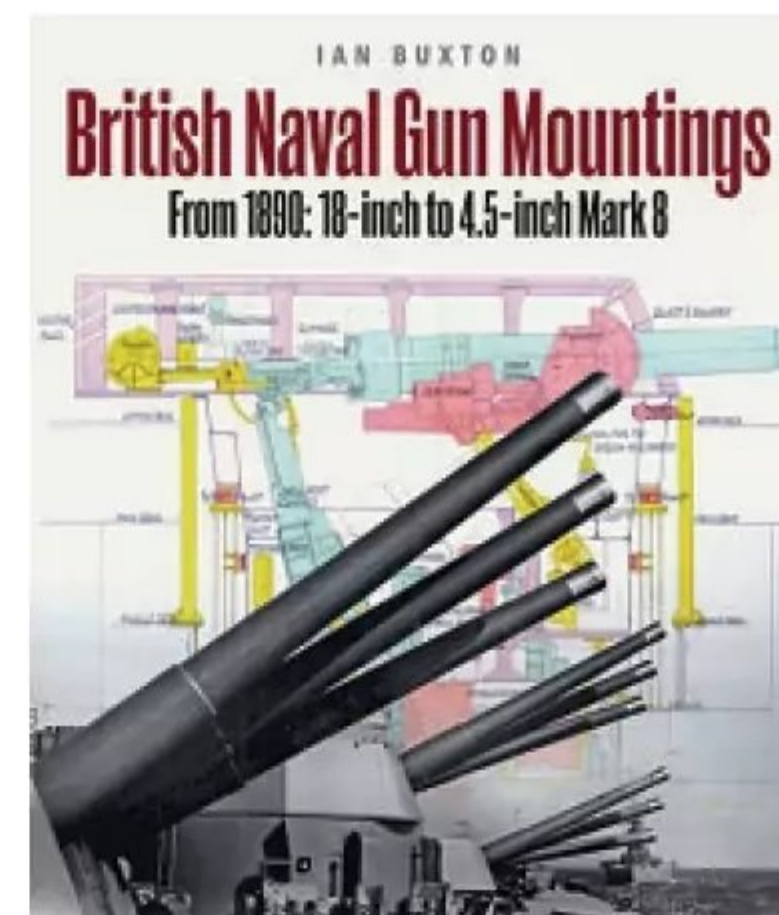
WHAT A SCOOP! Humbrol Prize Draw winner



In the October issue of *Model Boats*, we offered you the chance to win a bumper selection of Humbrol products valued at a massive £250. We are now delighted to announce the lucky winner as: Deryk Jackson of Bishopsteignton, Devon. Congratulations, Deryk!

BUY THE BOOK

British Naval Gun Mountings

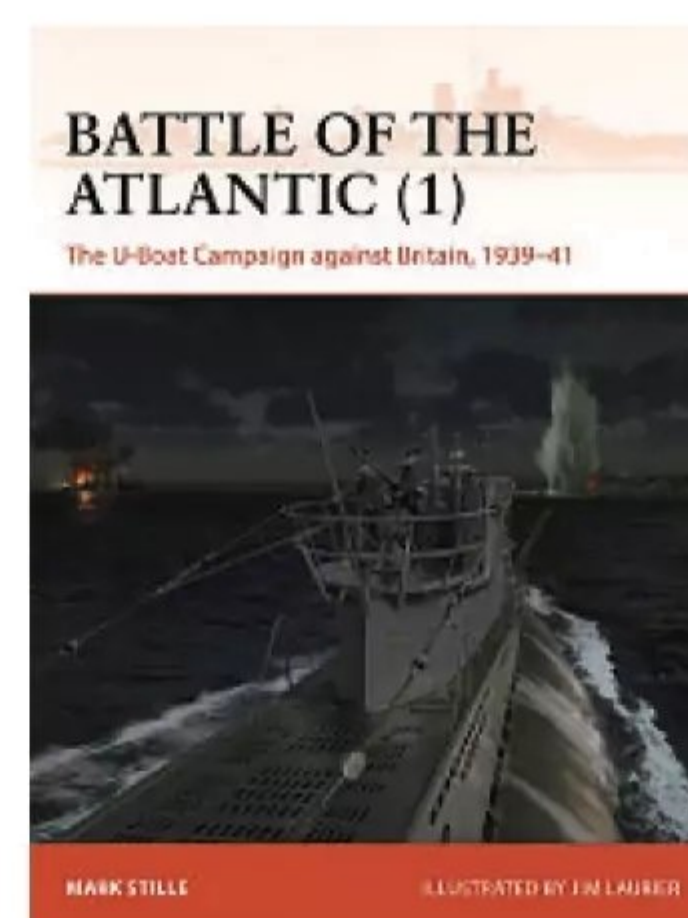


In his latest book, naval architect Ian Buxton documents the larger British naval gun mountings from 1890 through to the 1950s. Although these existed in many variants, there were only about 40 basic mountings, from 4.5in to 18in calibre, fitted to the majority of the Royal Navy's

larger ships. The massively engineered 'non-transferable' mountings, whose complexities and associated magazines took up a huge volume of the ship could weigh over 1000 tons, take two years to build and make up a quarter of the cost of a battleship. For each, well-illustrated official handbooks with coloured plates were produced, and about 50 of these highly detailed drawings are reproduced at large scale. In addition, the author provides an expert account of the design, construction and installation of such mountings, supported by a range of internal and close-up photographs, as well as comprehensive tables listing their individual characteristics.

Published in hardback format under ISBN 97813 9905 9961 and carrying an RRP (Recommended Retail Price) of £45, the website www.pen-and-sword.co.uk is currently offering a 20% introductory discount, reducing the cover price of this book down to £36.

Battle of the Atlantic (1): The U-Boat Campaign against Britain, 1939-41



This new title from naval historian Mark Stille is the first in what will be a series of illustrated books exploring the longest and best-known naval campaign of World War II. Volume 1 focuses on the struggle between Allied naval and air forces and the German U-boats during the first 15 months of the war, with the story

further brought to life by maps, diagrams, photographs and battle scene artwork.

Published in paperback format under ISBN 9781472861368, the book has been allocated an RRP of £16.99 but can currently be ordered at the discounted introductory price of £15.29 when purchased directly from www.ospreypublishing.co.uk, where electronically downloadable versions are also offered.



The review samples kindly provided by George Waller of Humbrol's Development Office.

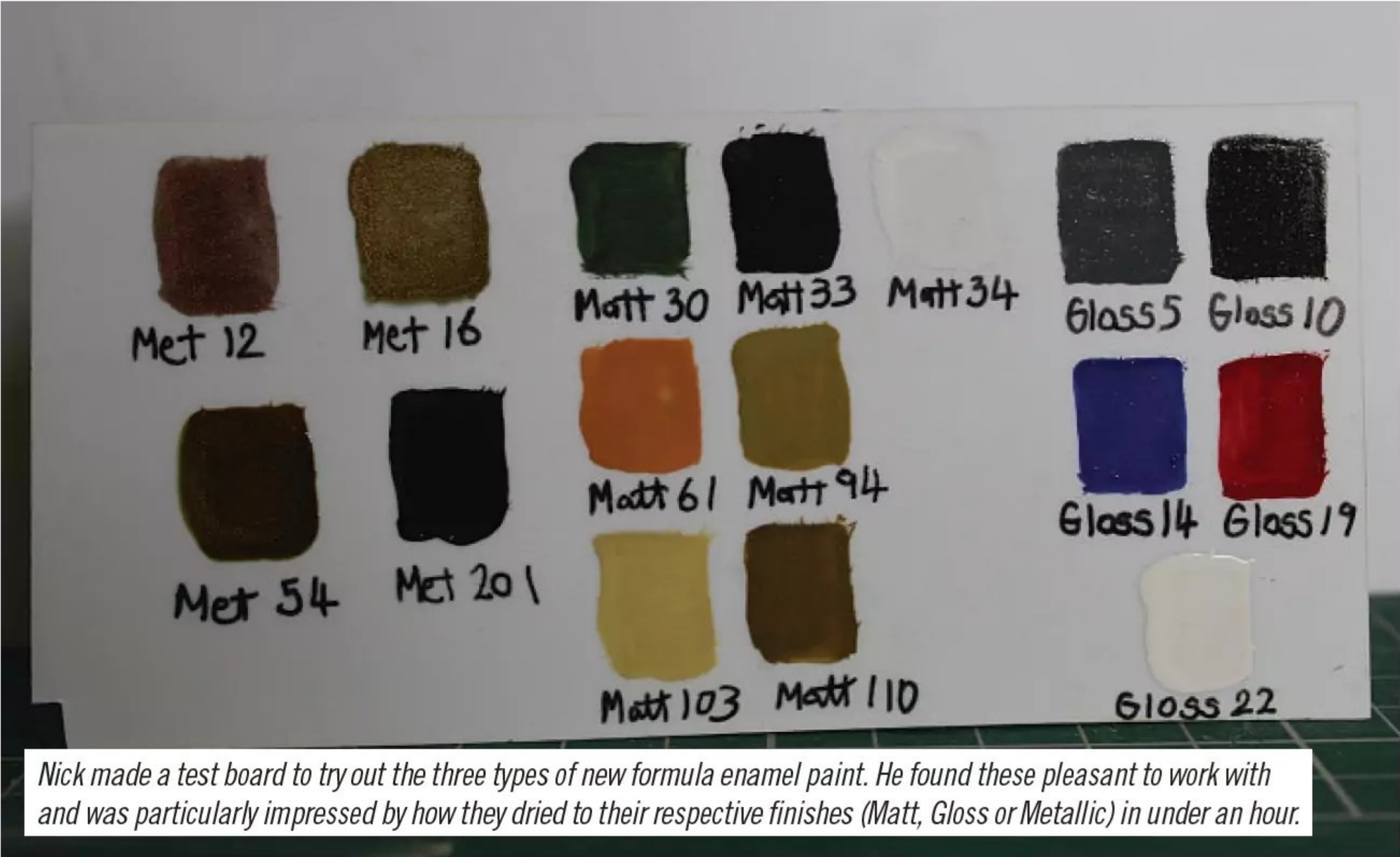
Humbrol™

WHAT'S NEW?

Nick Brown reviews the latest introductions to the range

I'm sure that most modellers based in the UK will have grown up using Humbrol paints and glues. In fact, I even tend to reference the Humbrol paint numbering system when talking to fellow modellers, as I know the majority of them, like me, are so familiar with the brand and its products that it's these numbers that immediately call specific colours to mind!

Humbrol has, traditionally, been most renowned for its enamel-based paint range, so closely associated with the iconic Airfix kits. Over the past decade, however, it has expanded into the acrylic (water-based) market too, with spray rattle cans and more recently the Gen 2 acrylic droppers. It has also reformulated its enamel range to



Nick made a test board to try out the three types of new formula enamel paint. He found these pleasant to work with and was particularly impressed by how they dried to their respective finishes (Matt, Gloss or Metallic) in under an hour.



The Aging Powders are pigments applied in a dry format; the excellent range of rust pigments make it possible to represent very realistic dark to light variations/stages of corrosion.



The new additions to Humbrol's product range: rust and oil washes, and 'Aging Powders' Pack 1.



The Duplex TID Tug, an old kit but a fair representation of vac-form and plasticard construction. Humbrol's acrylic spray cans were used to create the base layers ready for weathering.



Applying the rust wash coat: this is enamel-based and can be wiped off with thinners if you fail to achieve the desired 'look'.



The effect after wiping off without using thinners: the product sits in the joints and gaps highlighting possible detail.



The light-coloured rust aging pigment being applied with the stippling brush.



The rust aging pigment sitting on the bulwarks of the model; this requires 'working in' with the stippling brush to embed it on the paint finish.

bring it in line with new regulations. So, when I was sent some of the newly formulated paints, along with a variety of the other interesting new products now available, for the purpose of this review, I was very excited to give them a whirl...

Test card trials

I decided to first try the enamels on a test piece of plastic card to see how they behaved straight from the tinlet. These included the following:

- *Gloss 5- Admiralty Dark Grey
- *Gloss 10- Service Brown
- *Gloss 14 Blue
- *Gloss 19 Red
- *Gloss 22 White
- *Matt 30 Dark Green
- *Matt 33 Black
- *Matt 34 White
- *Matt 61 Flesh
- *Matt 94 Brown-yellow

"All of the enamels dried true to their respective finishes (Gloss, Metallic, and Matt) and were touch dry in under an hour of initial application, very impressive for enamel paint"

- *Matt 103 Cream
- *Matt 110 Wood
- *Metallic 12 Copper
- *Metallic 16 Gold
- *Metallic 54 Brass
- *Metallic 201 Black Metallic

When I opened the first tinlet (Gloss 5 Admiralty Dark Grey) I was hit by an aroma that immediately transported me right back to my childhood. Obviously, I don't endorse sniffing the fumes from any paint but, oh, that initial whiff was so very reminiscent!

In the past some severe shaking and stirring to mix the contents of a

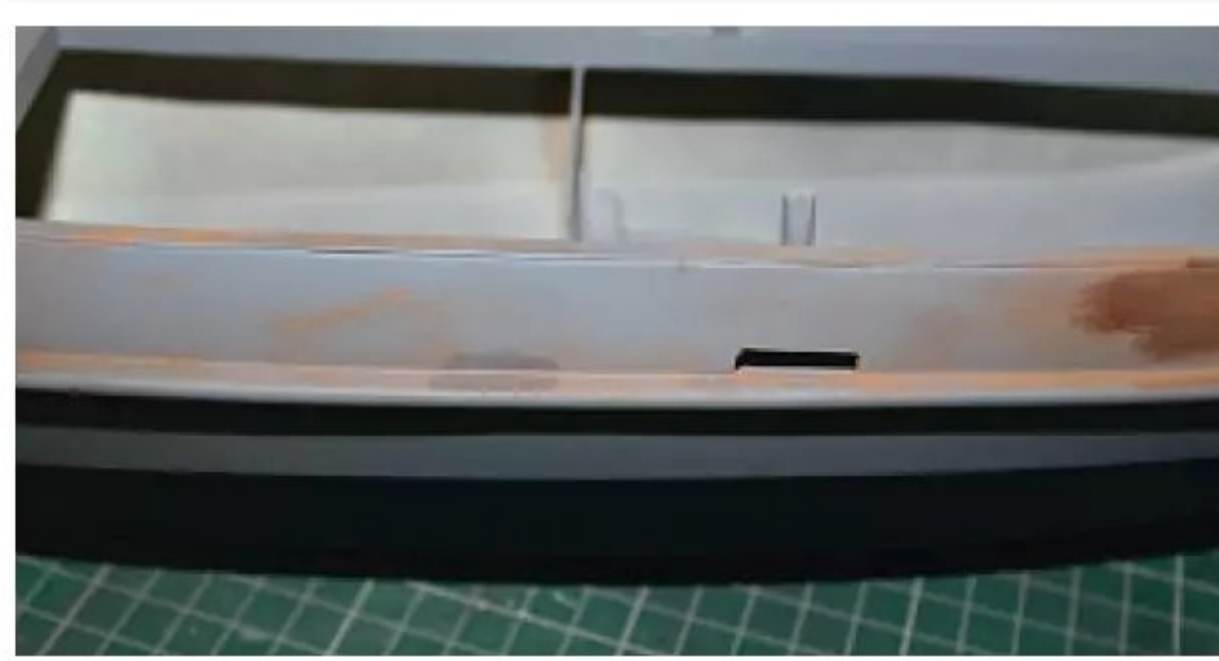
tinlet was always necessary, so I was pleasantly surprised to find that a few stirs of the new formula with my trusty paint stirrer was all that was required. I then test opened all the tinlets kindly supplied by Humbrol, and save for the 'Metallics', found them all a breeze to mix. The Metallics are different in that the pigments do



The effect after stippling into the paint work; this can be built up in layers and can easily be removed with water. Make sure, therefore, if working on an R/C boat or any kind of model you'll be putting on the water, that you seal it in with a varnish.



The effects of various layers and types of rust aging powder on the hull (damp, dry and built-up pigment layers); the darker pigment represents the oldest rust, while the lighter is reminiscent of fresh surface corrosion.



require the same old-style treatment to re-agitate the paint.

I applied each individual colour to my plastic card test pieces without first using a primer. Straight from the tinlet, the paint went on smoothly. Amazingly, despite being applied with one of the standard paint brushes supplied, there were no streak marks whatsoever. And while, yes, as you would expect, some of the lighter colours required a second coat, surprisingly, the density of pigment in Gloss 22 and Matt 34 (both white) meant a single coat was all it took. All of the enamels dried true to their respective finishes (Gloss, Metallic, and Matt) and were touch dry in under an hour of initial application, very impressive for enamel paint.

Weathering work

Naturally, however, I also wanted to see how the products performed on a test model, and I had plenty to choose from within my stash of kits (don't judge me!). I settled on a Duplex kit of the TID tug, which I'd made a start on a few years ago but had never quite got around to finishing. It's a small compact model built to 1:48 scale which, seeing as it represents a hard-working boat from the World War II era, has plenty of potential to be made more credible with a spot of 'weathering'.

I began with the acrylics, spraying the whole hull and superstructure with Primer Grey, which served as a close enough colour for the upperworks. I then masked off the upper hull and sprayed the Matt 33 Black onto the lower hull to represent the anti-fouling and waterline. The paint was applied in light coats, required very little reapplication and gave very satisfactory coverage.

I'd already decided I would try the new 'Aging Powders' to represent surface rust, but first I wanted to experiment with the enamel washes (Rust and Oil Stain). These are oil-based, so can be thinned with the Humbrol thinners if desired. I started at the bow section, liberally brushing the wash around the areas where, on the real vessel, grime and rust would

"The best thing about working with these washes is that if you're not happy with what you've achieved, you can simply apply some thinners to a cloth, wipe things off and start again. This is very reassuring, as it puts you in complete control"

have built up over time. The best thing about working with these washes is that if you're not happy with what you've achieved, you can simply apply some thinners to a cloth, wipe things off and start again. This is very reassuring, as it puts you in complete control.

I decided to let the rust wash to dry completely on the first run-through, before then applying the 'Aging Powders' on top. If you haven't used weathering type powders before, you may find there's a bit of trial and error involved in achieving the desired look. Having dipped into the pot with a stippling brush (which in my case also came courtesy of Humbrol), you then drop the collected powder onto the area you want to age and use the brush to stipple until the powder attaches to the paintwork. You can build up layers and apply other pigments on top too, thereby creating a natural-looking combination of old and more recently formed rust. To achieve this, I applied the darkest rust colour first and finished with the lightest.

It should, however, be pointed out that if working on any kind of model

intended to be put on the water, you'll need to seal the powders with a spray coat of varnish, otherwise they'll simply wash off.

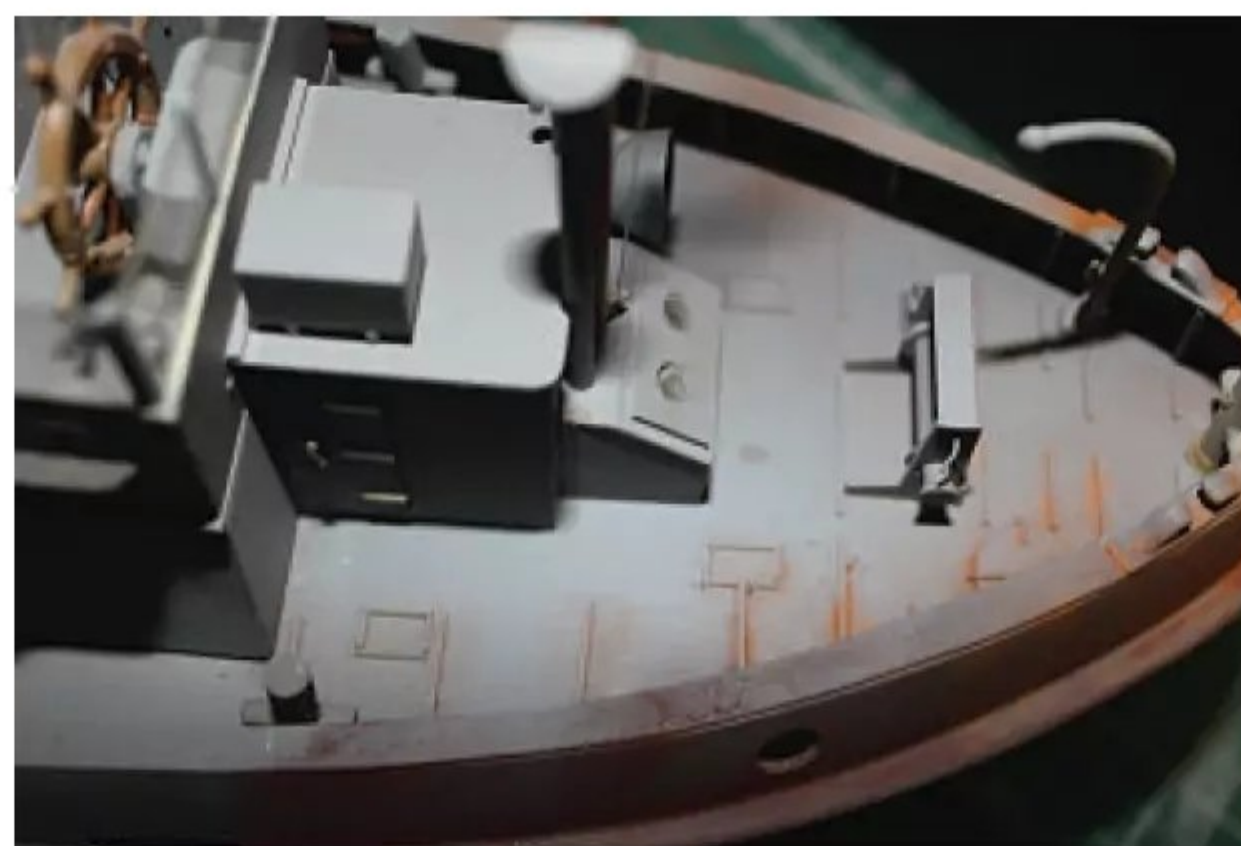
On my second attempt I applied a powder coat to a touch dry wash to see what the result would be; this gave a damp effect compared to applying to a dry surface.

The third application was directly to a painted hull finish, which gave a more minimalised rust effect, better representing the three types of rust that would commonly be seen on a well-used hull.

Another of the aging powders included in the pack was the suitably named 'Smoke', which I stippled around the funnel top to represent the dirty streak effects of burnt coal. I also stippled the final powder, just named 'Black', inside the funnel to portray a coal dust/smoke build up, and this nicely hides anything inside the tube.

Sold!

I would like to thank George Waller, Humbrol's Development Engineer, for supplying the test samples of paint, washes and new 'Aging Powders' for this review. I will definitely be purchasing the second 'Aging Powder' pack and replenishing my existing stock of Humbrol's old enamels with the newly formulated ones. In my opinion, they are excellent to work with, and I look forward to seeing what the future holds in terms of product development from this much-loved brand. ●



The Light Rust Aging Powder can also be used to highlight details around fittings and features on deck to give a well-worn look.



The 'Smoke' and 'Black' Aging Powders worked well to represent coal dust and soot around the tug's funnel.



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**PART
1**

A complex scale model, such as Colin's Fishery Cruiser Brenda, incorporates many of the materials described in this article.

MATERIAL MATTERS

Colin Bishop looks at model boat building materials and their uses (with a little help from Ashley Needham)

Once upon a time, working model boats were constructed with traditional materials, mostly wood with a bit of brass and string as needed, and maybe a lead keel and cotton sails for a yacht.

Simple methods of building were commonly used, featuring carving from a solid block of wood or the 'bread and butter' method whereby the hull is assembled from shaped planks, both methods being very wasteful of timber, with the bulk of it ending up as sawdust, shavings or firelighters. A more sophisticated method for more skilled modellers was plank on frame, which is still in wide use today, reflecting full-size practice. The 'skeleton' of the model would be constructed from hardwood or plywood to form the keel and the hull framing, and this would be planked over with, probably, obechi or balsa. This method was more efficient

and economical and formed the basis of many of the kits marketed from the 1950s onwards, but basically it was still all about using wood.

Plank on frame has an excellent full-size pedigree, in that it has been the basis of constructing ships for centuries, including the 'wooden walls' of Nelson's navy. The downside was that it deforested large parts of Britain's oak woods.

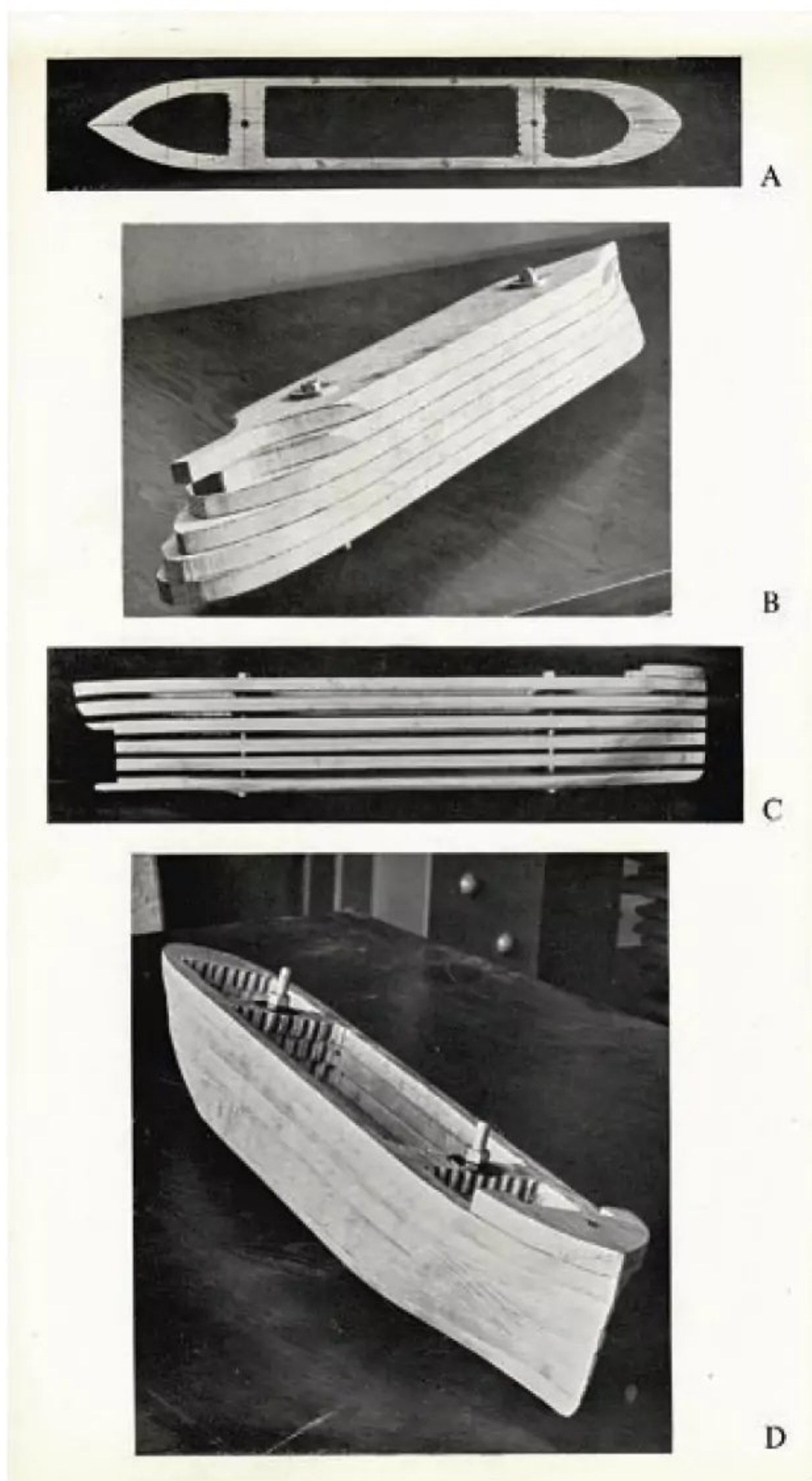
Model makers are unlikely to make the same impact on the environment, but today things are a lot different for us, with multiple options for constructing our models. It can, therefore, sometimes be difficult to decide on the best way forward. This article is intended to briefly describe the options for the average modeller and point out the pros and cons of various materials and methods. It's very much my own take on things and others may legitimately come to

different conclusions, but I hope it provides some food for thought when it comes to your own particular projects.

New materials

The wood-based modelling methods described above continued well into the 20th century but innovations in full-size construction following World War II were the basis of corresponding options for modellers, particularly with plywood and glass reinforced plastic (GRP). Since those early days, things have changed enormously, with models being constructed of GRP, various forms of plastic, styrene, ABS, etc, and even more exotic materials such as carbon fibre and Kevlar, although we will be leaving the latter two materials to the power boating and yachting experts.

The three main components of scale type model boats are the hull, superstructure and fittings. Some



Bread and butter construction, as illustrated in a 1949 book on boat modelling.

materials are suitable for all three, but fittings often require additional options and have a separate section here. There is also the need for running gear and electronics for working models, but these are beyond the scope of this article. In the following sections we will look at the main constructional materials and their uses.

Wood

Wood remains a mainstay of boat modelling and, despite the manmade alternatives for many applications, it still offers an unbeatable mix of variety and versatility.

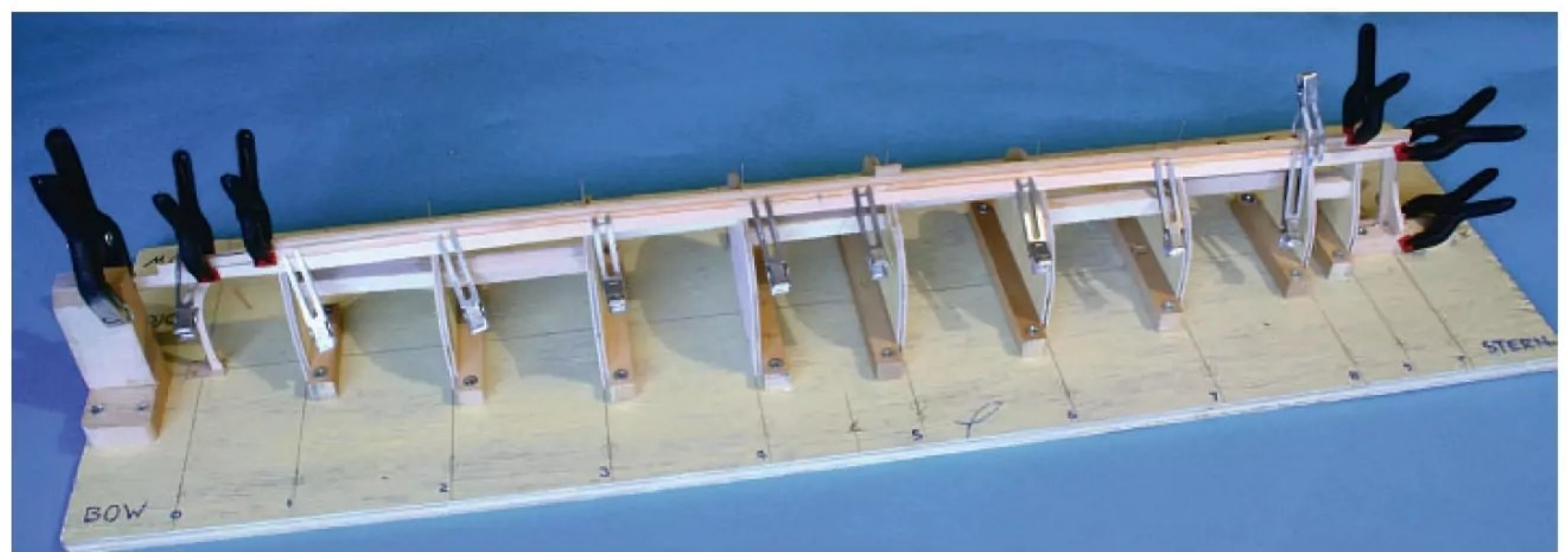
Balsa

The original modelling sheet and strip material has proved popular with aircraft modellers for decades, and rightly so due to its light weight and strength. It is equally suitable for boat modellers. It comes in soft, medium and hard grades and sheets are typically 3-inches (75mm) or 4-inches (100mm) wide and usually 36-inches (915mm) or 48-inches (1220mm) long.

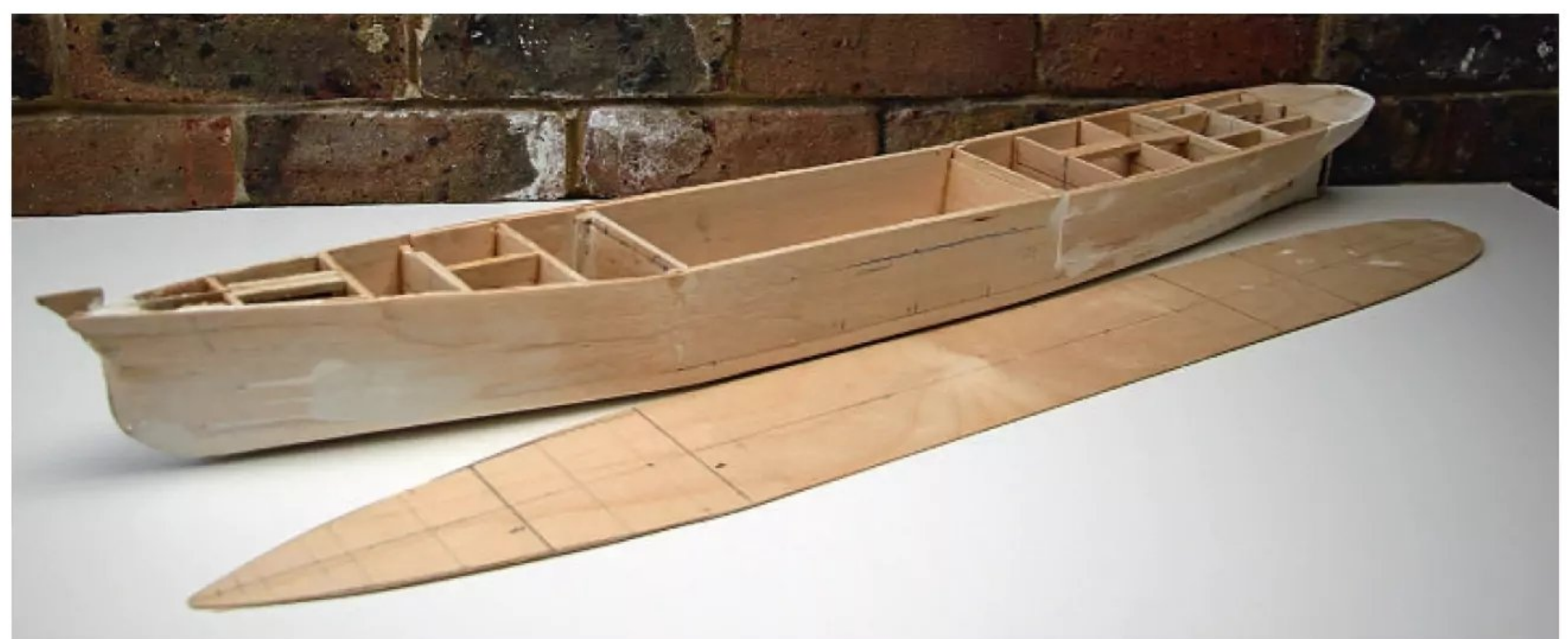
Sheets are commonly used for skinning hard chine or flat hulls, or for cutting into planks for plank on frame hulls. Thicker sheets can be used to build up the lower parts of hulls on the 'bread and butter' or carved block principle. Smaller models can



Plank on frame construction being demonstrated at the Warwick International Model Boat Show.



A plank on frame model under construction by the late master modeller Brian King.



Composite construction entails a combination of 'bread and butter' for the bottom sheet amidships and 'plank on frame' plus balsa blocks for the bow and stern on Colin's Edwardian liner model.

use it for framing. Balsa strip comes in a wide variety of standard and specialised profiles.

It is a favourite material used by long time contributor Glynn Guest for his many successful models. There's not much you can't do with balsa, as it lends itself to both hull and superstructure construction alike. Indeed, it's perfectly feasible to construct an entire small model from it. It does need to be properly sealed before painting though, and



Wood sheet, strip and plywood are mainstays of so many model boats.



SLEC's Fairey Swordsman kit designed by the late Dave Milbourn is a very successful example of the use of laser cut Lite Ply for lightweight accurate hull construction.



Matchsticks are another way of building model boats – if you have the patience!

hulls can benefit from being sheathed in lightweight glass cloth and resin to improve impact strength and watertightness.

“There’s not much you can’t do with balsa, as it lends itself to both hull and superstructure construction alike”

Balsa has become more expensive in recent years as it is used for the interior cores of wind turbine blades and the Chinese have bought up much of the global market.

Obeche

Obeche is another very popular wood for modelling in sheet and strip form. Like balsa, it is technically a hardwood but is stronger and thus more suitable for larger models, otherwise its applications are similar to those of balsa where weight may not be so much of an issue.

Lime/Basswood

Known as Lime in the UK and Basswood in the USA, this actually comes from the Linden tree. It is more expensive than balsa or Obeche but very close grained,

easily worked and takes an excellent finish. It is also one of the better woods for producing carvings. It’s ideal for planking hulls as well. Lime/Basswood is available in both sheet and strip form, the latter being particularly good for stringers and spray rails, etc.

Mahogany

Available in sheet and strip form, Mahogany tends to have a rather open grain at model making sizes so is not so suitable for smaller models. Its rich, attractive colour when varnished makes it popular for planking decks



A plug for a Royal Navy World War 1 monitor M15, built by former Editor Paul Freshney.



The two-part mould for HMS M15.



The hull of M15 extracted from the mould showing plating detail.



Paul's completed award winning M15 model.

and decorative trim, particularly on pleasure launches and the like.

“Mahogany tends to have a rather open grain at model making sizes so is not so suitable for smaller models”

Spruce

Spruce is flexible and obtainable in very thin thicknesses in sheet form down to 0.8mm. I used it to represent the deck planking on my Greek fishing boat build published in the July 2024 issue.

Dowel

This is another ‘old faithful’, although is perhaps used less than it used to be, with brass and aluminium tube now being favoured for mast construction. Dowel has the advantage that it can be tapered, with a bit of effort, where needed. Often, however, a viable alternative is to buy one of those cheap, long-handled artist’s brushes that come with a taper, which can simply be painted – an option that works for a lot of models.

The wood varieties above are the ones in most common use. There are many more which can be used but are less applicable to model boat builders, such as Beech, Walnut Apple, Pear, Cherry, etc, plus of course there are various veneers intended for marquetry and decoration that have specialist uses.

There are also two wooden sheet only materials which are widely used in model boat construction:

Plywood

Usually birch ply, this comes in a range of thicknesses from 12mm to 0.4mm and is the material of choice for many model makers. There are other varieties, but this is the best all-rounder, being waterproof and readily available in many sizes. It is very strong and tough. It is best to buy from a specialist model supplier such as SLEC, as the constructional ply found in DIY stores is often of inferior quality, with voids. Full-size boat building suppliers such as Robbins can also supply high quality marine plywood, but the birch ply from retailers such as SLEC is more than adequate for modelling purposes. The 0.4mm size is my favourite for facing superstructure on a balsa base as an alternative to plasticard, as it is a lovely material to work with, albeit not cheap.

Birch ply is flexible in either the



Application of glass cloth to the SLEC Fairey Huntsman kit to toughen the hull. Aerokote, finishing resin or Deluxe Materials Eze Kote can all be used.

horizontal or vertical direction and responds to steaming around tight curves. It is not, however, so effective in accommodating compound curves on a hull, where plank on frame or block carving is usually the better solution.

“This is something of a ‘marmite’ material”

Lite Ply

Lite Ply is a halfway house between balsa and Birch ply, with external facings sandwiching a softer core. This is something of a ‘marmite’ material and considered to be neither one nor the other by some modellers as it lacks the strength of birch ply and is rather soft, fragile and not waterproof, but it can be very useful in particular applications. If used as an external boat surface it needs to be properly sealed and hardened, ideally with a sheathing of thin glass cloth and resin or at the very least a sanding sealer. It does lend itself to laser cutting, as exemplified by the SLEC Fairey Power Boat kits.

It’s worth mentioning two other wood derived materials, card and paper, as they can often be useful. Card comes in a range of thicknesses and if sealed is excellent for facing superstructures. Prior to the availability of plasticard whole models were sometimes built from it. Glynn Guest frequently uses it in his popular designs, with dope as a sealant to strengthen and

waterproof it. Marcle Models and other suppliers market whole static kits out of printed card, which are incredibly detailed, realistic and attractively priced.

I use thin card and paper on my models, which are often small scale. While deck planking can be represented by drawing lines on plywood, this never really looks right as the grain patterns can still be seen under the varnish. But if you print the planking onto ivory coloured paper or thin card then this can be stuck and bonded to the deck with transparent varnish for a very neat effect. At near miniature scales, such as 1:150, (model railway N Gauge), features such as doors and windows can be printed out, stuck on with double sided tape and lacquered over.

A now neglected material is gummed paper strip, traditionally used as parcel tape, which has some useful qualities. In fact, whole hulls used to be made from it, and they were both tough and lightweight. I have often used it to represent plating on the hulls of my models, applying it using Deluxe Materials’ Eze Kote to ‘wet’ the adhesive. It shrinks very slightly as it dries, giving a very smooth surface for a finishing coat prior to painting, such as more Eze Kote, epoxy finishing resin or traditional shellac, all of which sand very easily.

Glass Reinforced Plastic

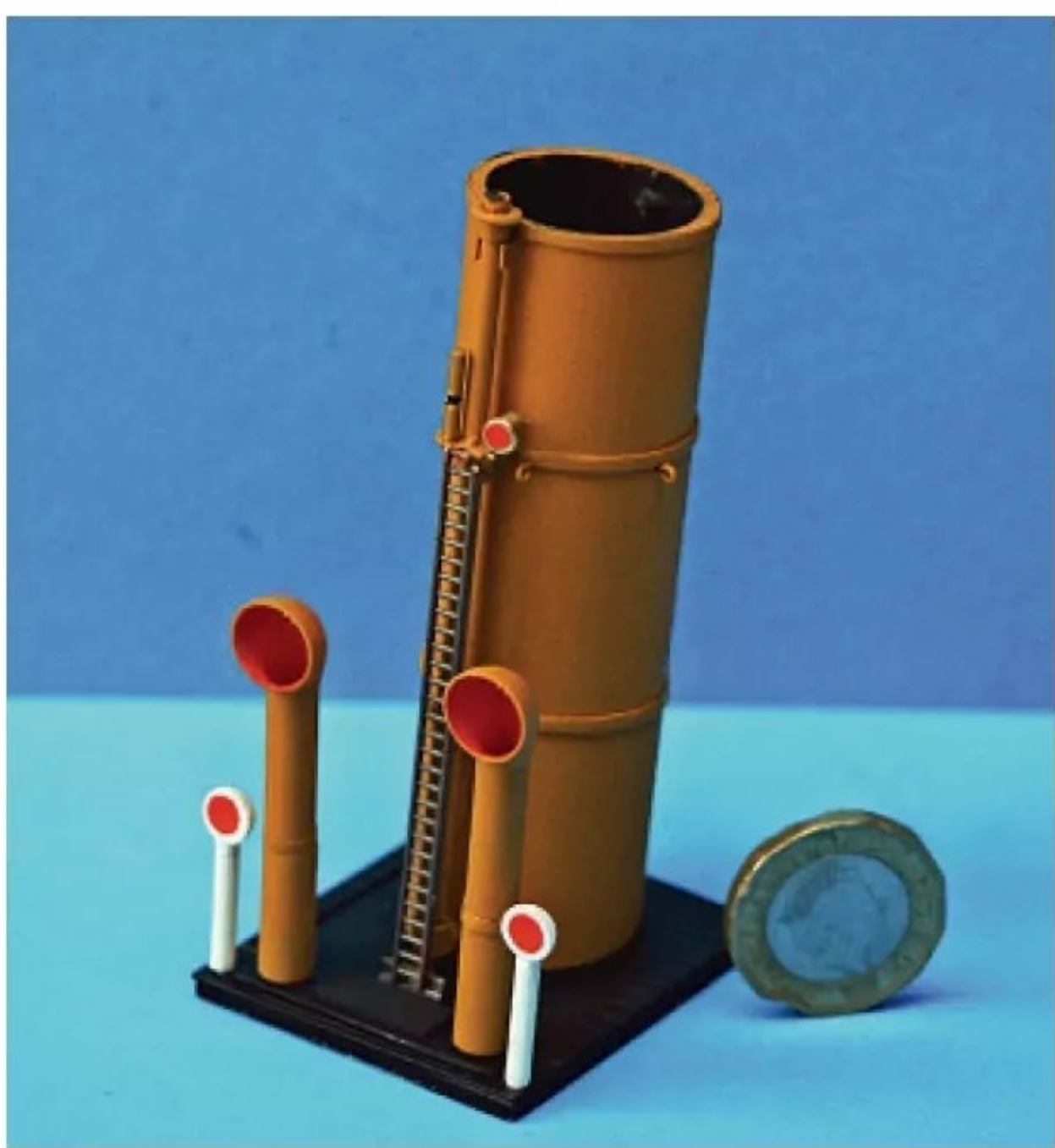
GRP, commonly referred to as fibreglass, was introduced into boat modelling as a logical progression



Plastic strip extrusions come in many profiles from different manufacturers, as does styrene sheet in different colours and embossed finishes.

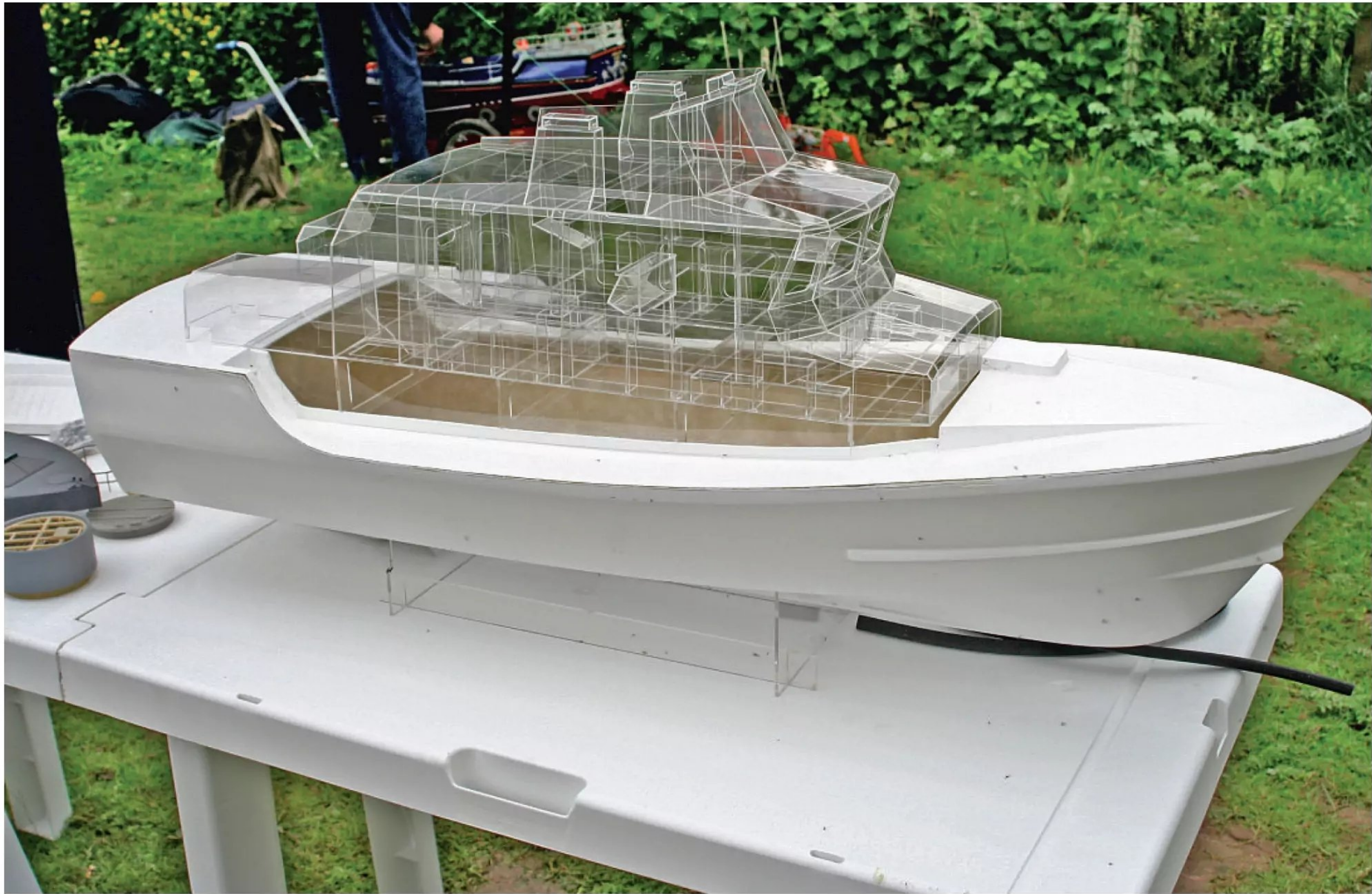
of its almost universal use in full-size leisure craft from the 1960s onwards. In many respects this is the ideal material for hulls, being incredibly tough, waterproof and needing little surface preparation for painting. It is, however, less suitable for superstructures due to its weight and

difficulty in reproducing some forms of fine detail. GRP was eagerly embraced by kit manufacturers as, once a mould had been made, they could run off as many copies as they wanted and there was no need to include hull construction components in their



Plasticard sheet and strip can be used to build up complex sub-components, such as this funnel for Colin's Edwardian liner.

products. The hulls were popular with builders too, not just for their strength but also there was now no need to construct the hull themselves, thus cutting down on building time. Plus, a lot of boat modellers dislike hull construction although enjoy making the above deck features of their models. This preference has been exploited ever since by manufacturers just providing GRP



A demonstration model of a lifeboat with a Perspex superstructure.



The Deans Marine Compact Kit of the tug tender Sir Francis Drake typically incorporates a GRP hull with plasticard decks, vacuum formed mouldings for the funnel and lifeboats, and a mixture of white metal and resin fittings.

hulls with a set of plans for finishing the model, sometimes accompanied by a selection of optional additional components and fittings – hence the term ‘semi kits’.

“In many respects this is the ideal material for hulls, being incredibly tough, waterproof and needing little surface preparation for painting”

While modellers do make their own GRP hulls, this is not all that common as you need to first make a mould, and to make that you need to construct a plug which has to be exactly the same on the outside as your intended GRP hull. This is quite a lot of extra work compared with conventional construction, especially if you only want to build one model.

GRP hulls are usually made from (smelly) polyester resin, glass mat and an external gel coat to give a smooth external finish. The gel coat goes in first and then the mat is laid up with

resin to the required hull thickness. It’s not an indoor job unless you live alone!

“It’s not an indoor job unless you live alone!”

There is, however, another very popular use for GRP in providing a protective sheathing for other materials using methods developed by the model aircraft community. If you have built a wooden hull it needs to be protected and waterproofed. This can be done conventionally using sealer and coats of paint and varnish, etc, which are water resistant but not so good for impact damage. Sometimes resin can be used on its own as a coating, but it is more effective to use it in combination with lightweight glass cloth which, after sanding down, produces a tough protective finish ready for paint application. An epoxy finishing resin is used for this as it is formulated to ‘wet out’ the glass cloth and provide a smooth, sandable finish. An alternative is to use one of the acrylic

resins on the market such as DeLuxe Eze-Kote, which is water-based and dries quickly, although more coats are needed. Epoxy resin does not smell strongly but is messier to use than the acrylic resin which only requires water clean-up. The epoxy gives a tougher finish, but the acrylic is sufficiently hard for most model boats, unless you are in the habit of bashing into the bank too often! It’s very much a matter of personal preference, but heavier or faster boats will benefit from the strength of epoxy.

Plastic

Even for older modellers, plastic in modelling seems to have been around for ever. We all built our Airfix Spitfires and other kits, or maybe briefly sailed a Tri-ang clockwork liner on the local pond before the innards rusted up. In the ‘60s you could also buy plastic fittings to embellish your Aerokits’ launch or your home-built pride and joy. But in truth these were all manufactured products, injection moulded in expensive machines. It wasn’t until the early ‘70s that plastic,



Foam lends itself to carving and other profiles that could be otherwise difficult to create. Here is the Terror Fish from the Stingray TV series. Image courtesy of Ashley Needham.

or styrene to be more accurate, became widely available in sheet form and a comprehensive range of extruded profiles. An early supplier was Slaters PlastiKard, established in 1972 and still going strong today. 'Plasticard' became the generic name when referring to styrene products.

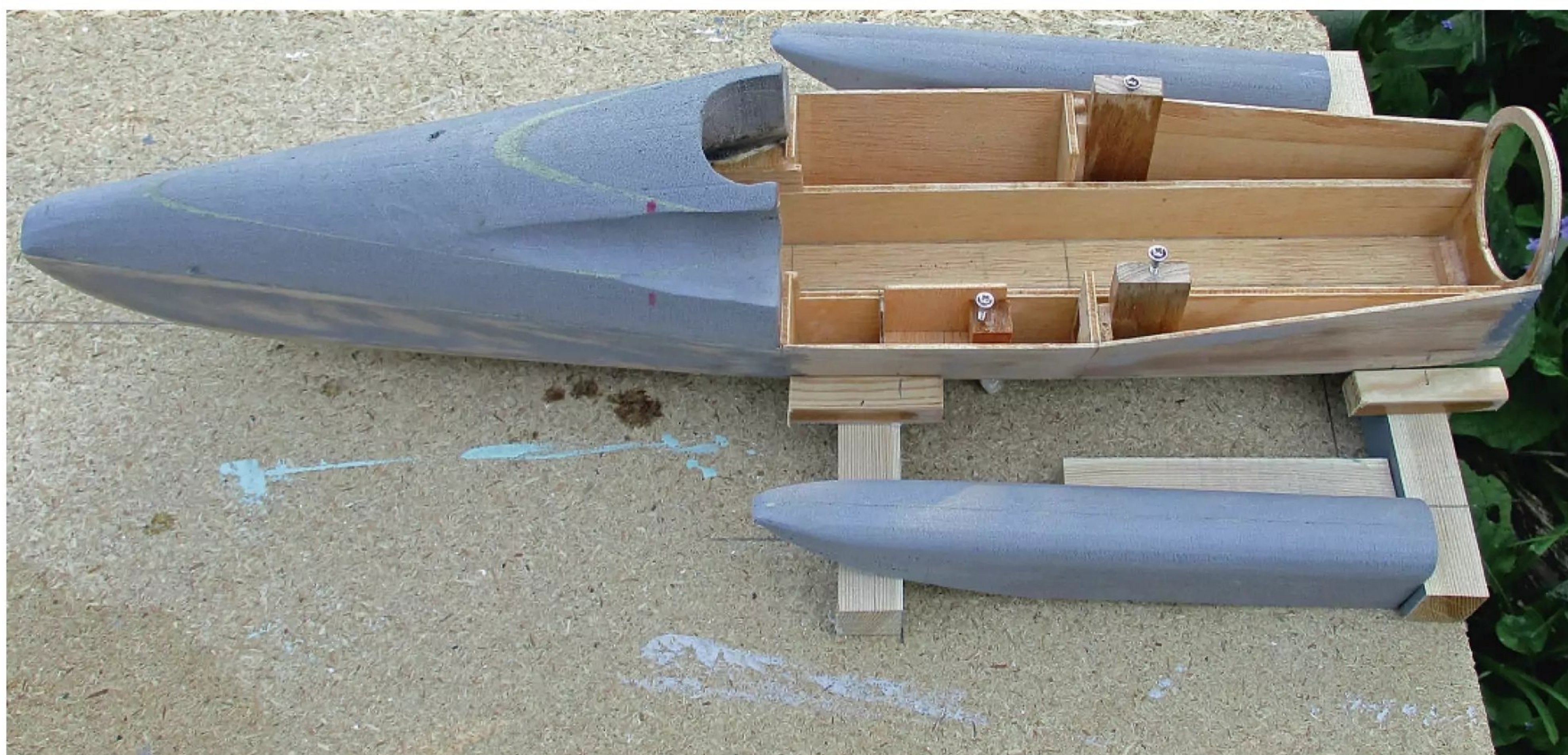
The introduction of plasticard was hailed as something of a revolution. This wonder material had a huge number of modelling applications,

which were embraced enthusiastically. Most of them were successful, but there were some initial drawbacks.

Scale modellers thought all their Christmases had come at once! Styrene made the construction of intricate detail, which had previously been time consuming and difficult, so much quicker and easier. Pieces could be literally welded together with a fine brush and a touch of liquid poly cement. The sheet cut easily,

and superstructures could be made up with clean edges, ready to take paint with no further preparation. The range of strip and extrusions including angles, channels and other shapes made it much easier to simulate the corresponding structures on full-size vessels. Cranes and complex masts could be put together without the need for complex soldering of brass and wire, albeit they were still quite delicate on a working model. Hulls and decks could be plated with the use of suitable adhesives, the list just went on.

But, and there is always a but, in the early days the quality of the styrene could vary. It's a petro-chemical product and so contains the seeds of its own destruction, in that chemical processes are still taking place to break it down. It is also very susceptible to UV light and needs to be protected by paint. You cannot leave that nice white surface exposed to the air. These days, the styrene you buy is pretty stable if protected, but that wasn't always the case. Back in the early days a friend of mine, Dave Sambrook, a superb medal winning warship modeller, built a model of the Royal Navy Tribal Class destroyer *Ashanti* and used styrene extensively for the upperworks and most of the fine detail. It was an amazing working model for its time but, sadly, within a few years it literally started to crumble. The conservation of plastic items in museums, etc, is the subject of many studies. Your model



Ashley's model of John Cobb's Crusader uses a combination of foam and balsa to reproduce the complex shape of the hydroplane. Image courtesy of Ashley Needham.



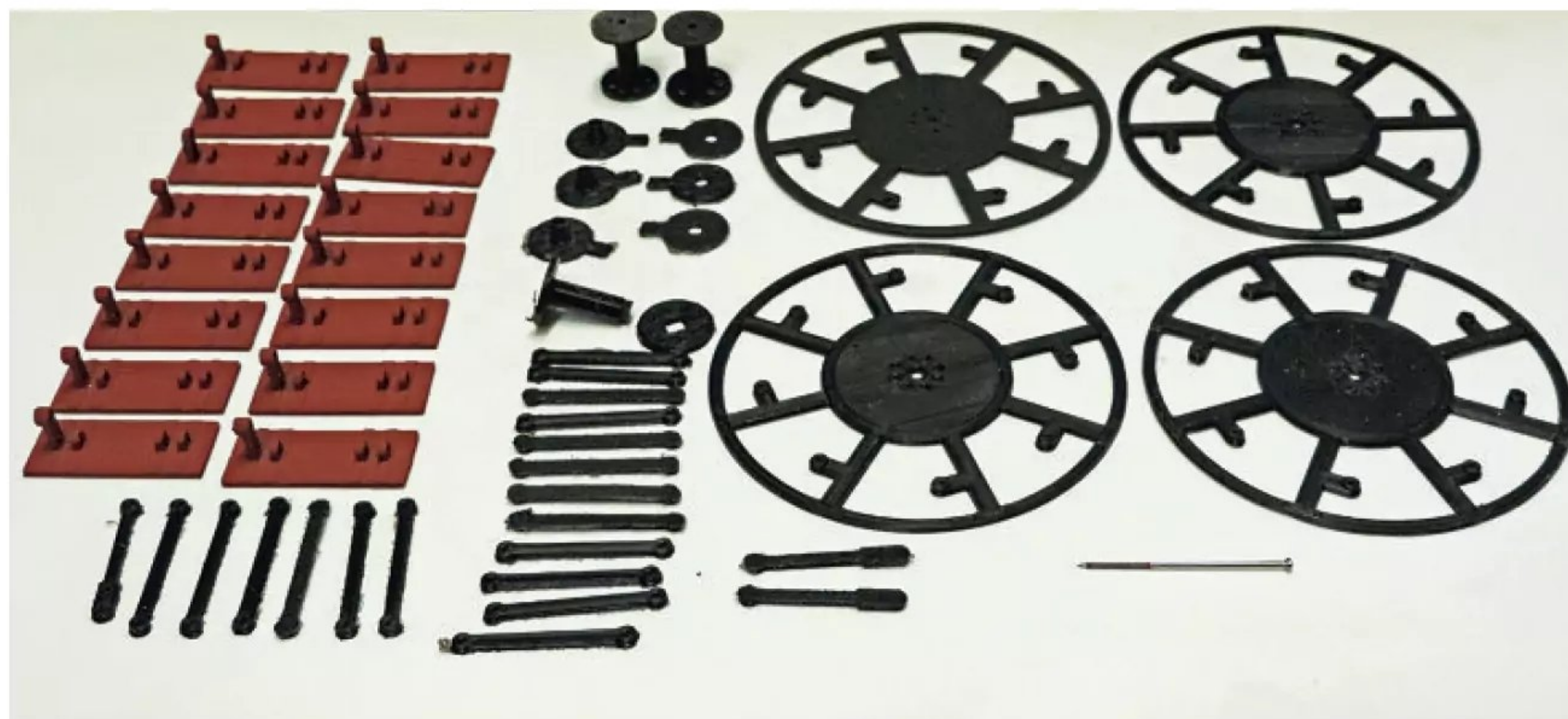
The 'wood' pontoon of Ashley's Farman Hydroglisseur is in fact veneered Styrofoam! Image courtesy of Ashley Needham.

might outlast you, but then again it might not!

"I used to leave the model in the shade under a tree at regattas to prevent this, but the birds..."

Plasticard tends to expand when it warms up, which can cause problems. My old Bardic Ferry had a plasticard aft deck. If I left it in the sun, it would expand and bow up quite alarmingly, returning to its normal dimensions as the temperature dropped. I used to leave the model in the shade under a tree at regattas to prevent this, but the birds...

'Plasticard' in all its forms is still a hugely popular modelling material, and rightly so. As long as you ensure it is protected from UV light and excessive



A set of feathering paddle wheels from a home printer, accurate but rather delicate for a working model.

heat changes it remains the first choice for many, although I personally prefer a nice bit of birch ply with a side dish of basswood for my models.

There are of course other types of plastic used in model boating. ABS/Styrene hulls are popular with a number of manufacturers for small to medium models as the material can be vacuum formed over a plug without the need for a mould to be made. This is a very economical process and also lends itself to lightweight superstructure mouldings. The type of plastic can vary however, and care must be taken to find the correct adhesive to join it to itself and to other materials. The vacuum forming process can also stretch the plastic very thin over corner sections in some instances. Hold the component up to the

light to check for this and reinforce internally if necessary.

"Hold the component up to the light to check for this and reinforce internally if necessary"

Foam (with thanks to Ashley Needham for this section)

Foam has become popular with a number of modellers, notably championed by Ashley Needham for his ingenious creations, as regularly featured in this magazine. The most useful type of foam is Styrofoam, which is the trademarked brand of a closed cell extruded polystyrene foam. This comes in blue, white and grey varieties, and in a number of densities; light density versions have a very open cell structure, while



Paul Freshney's HMS Aveley made extensive use of 3D-printed fittings commissioned from designer Mark Hawkins.



Linkspan Models, unfortunately suspended since Covid, developed some very sophisticated ferry models using CAD and incorporated laser-cut styrene superstructures, comprehensive etched nickel silver detail frets, resin cast and 3D-printed fittings, and vac-formed lifeboats and funnels. This is its Norland model.

dense ones have a close structure, being stiffer and slightly harder. It can be used in place of balsa or ply for bulkheads where weight is an issue, or it can be used in block form and sculpted to create difficult profile items. It can be glued with epoxy, PVA or expanding Gorilla glue, and there are several foam-safe specialist adhesives on the market.

“It can be used in place of balsa or ply for bulkheads where weight is an issue, or it can be used in block form and sculpted to create difficult profile items”

An overlooked form of foam is often seen in skips, in the form of silver foil-backed builders’ insulation. Its main advantage (other than it’s usually free!) is its availability in bulk, so it can be used to create larger structures. The drawback is that it’s very soft and has zero structural strength, so would have to be covered in an epoxy resin and fibreglass cloth.

All foams are naturally soft and have to be surfaced with a resin, such as Eze Kote or epoxy (not polyester, which melts most foams), and perhaps a thin layer of glass cloth. Hulls can

quite easily be produced by carving a hull shape, covering in fibreglass, and then scraping out the foam, leaving a fibreglass hull.

Depron is a brand of foam used by model aircraft bods and comes in thin sheets. It has limited uses for model boats due to its lack of structural strength, even when covered in Eze Kote/cloth.

Other materials

Worth mentioning is the very useful self-adhesive vinyl Trimline Tape from Model Technics. This comes on rolls, in a range of colours and in a number of different widths and can be incredibly useful for a variety of jobs. It is particularly beneficial for the thin boot topping line between the topsides and underwater bodies of models, but finds many other applications, such as funnel bands and anywhere when a thin tape can make a neat job on scratch-built structures.

“This comes on rolls, in a range of colours and in a number of different widths, and can be incredibly useful for a variety of jobs”

Perspex used to have a place for some applications before styrene became generally available, but is not much used now, being a rigid and heavy material and not easy to cut.

Plastic filament is, of course, used for 3D-printing and is covered in the following section.

3D-printing

The ready availability of reasonably priced 3D printers has opened up the possibilities for individual modellers wanting to make their own fittings.

With a 3D-printer there are two options. Firstly, you can download and print design files from the internet, either for free or at a cost, avoiding the need to design your own. It is often possible to easily scale up or down to match the scale for your model.

The more complex option is to download software to allow you to design your own fittings, and this is a rather different ball game despite some of the packages being advertised as easy to learn. Unless already familiar with CAD (Computer Aided Design), you will need to invest a lot of time and effort in learning to use these packages for complex shapes, which may not be worth it if you only want to design one or two items.



Some modellers still like to construct their models in metal. This is an example in aluminium seen at the Warwick show.



A selection of extruded brass and aluminium profiles. These are invaluable for scale models in a variety of applications.

There is also a choice of print filaments to use in your printer, some of which may be more suitable than others for the job in hand, so more research is needed there.

I have had items printed out for me by friends with hobby quality printers. In one instance the print was great quality but too fragile for a working mechanism. In the second, the surface quality of the print was simply not acceptable as it was ribbed and not smooth

enough. This suggests that a) you need a good quality printer, and b) you need to choose your filament for the job very carefully. It's never straightforward.

3D printers offer huge possibilities but need a lot of time and commitment to ensure you will be getting the results that you want.

Alternatively, a wide range of 3D fittings are now available for sale online, either at specific scales or with the option of specifying the

scale you want. The best ones are not cheap though.

Metal

The most common metals used for modelling, as opposed to model engineering, are brass, aluminium and copper.

Brass is the most common as it comes in sheet, tube, and various cross sections such as angle, strip rod and wire. It has numerous uses on a boat model and can be soldered or glued. It is relatively heavy compared with its plastic equivalents but much stronger and more rigid. While rod and wire may have similar diameters, the latter is more flexible. Both thin rod and wire are suitable for railings. Brass is also used to produce photo-etch fittings to represent fine detail, but this is an area for the more skilled modeller and is more commonly something to be purchased rather than made.

Aluminium and copper are generally available in sheet or tube. Aluminium tube is useful for masts and fittings where it is important to save weight, but it needs to be glued. Superglue is often the best choice.

Next month

In Part 2 we will be looking at fittings, adhesives, and painting and finishing. ●

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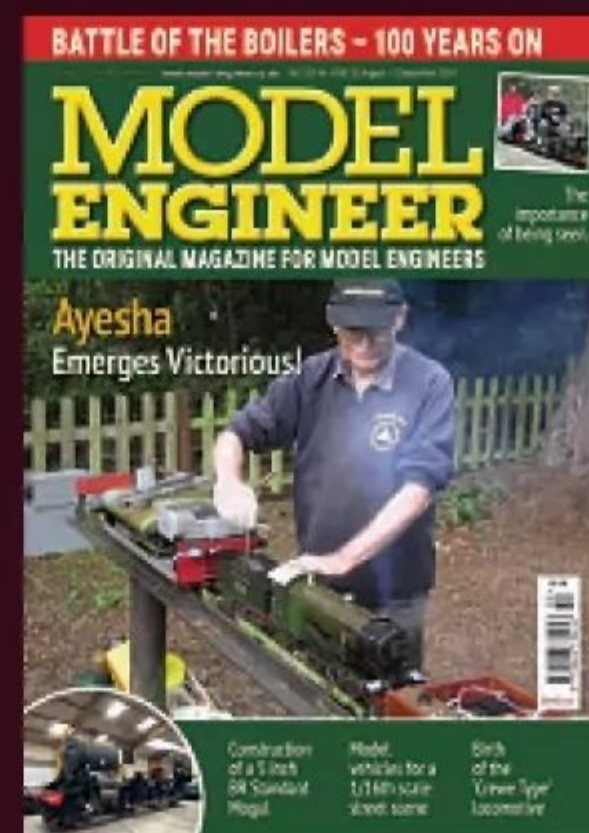
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MTB 74

Dave Wooley explains how he converted Italeri's 1:35 scale MTB 74 kit into a striking radio-controlled triumph

Converting injection-moulded kits has now become mainstream, championed in no small measure by Model Boats' columnist Dave Abbot and his Plastic Magic series of builds back in the late 1990s-2000s. In this article we will be looking at the conversion of a 1:35 scale Italeri MTB 74 kit. Before we venture any further, however, I should perhaps provide a potted history of this famous World War II Coastal Forces' Motor Torpedo Boat.

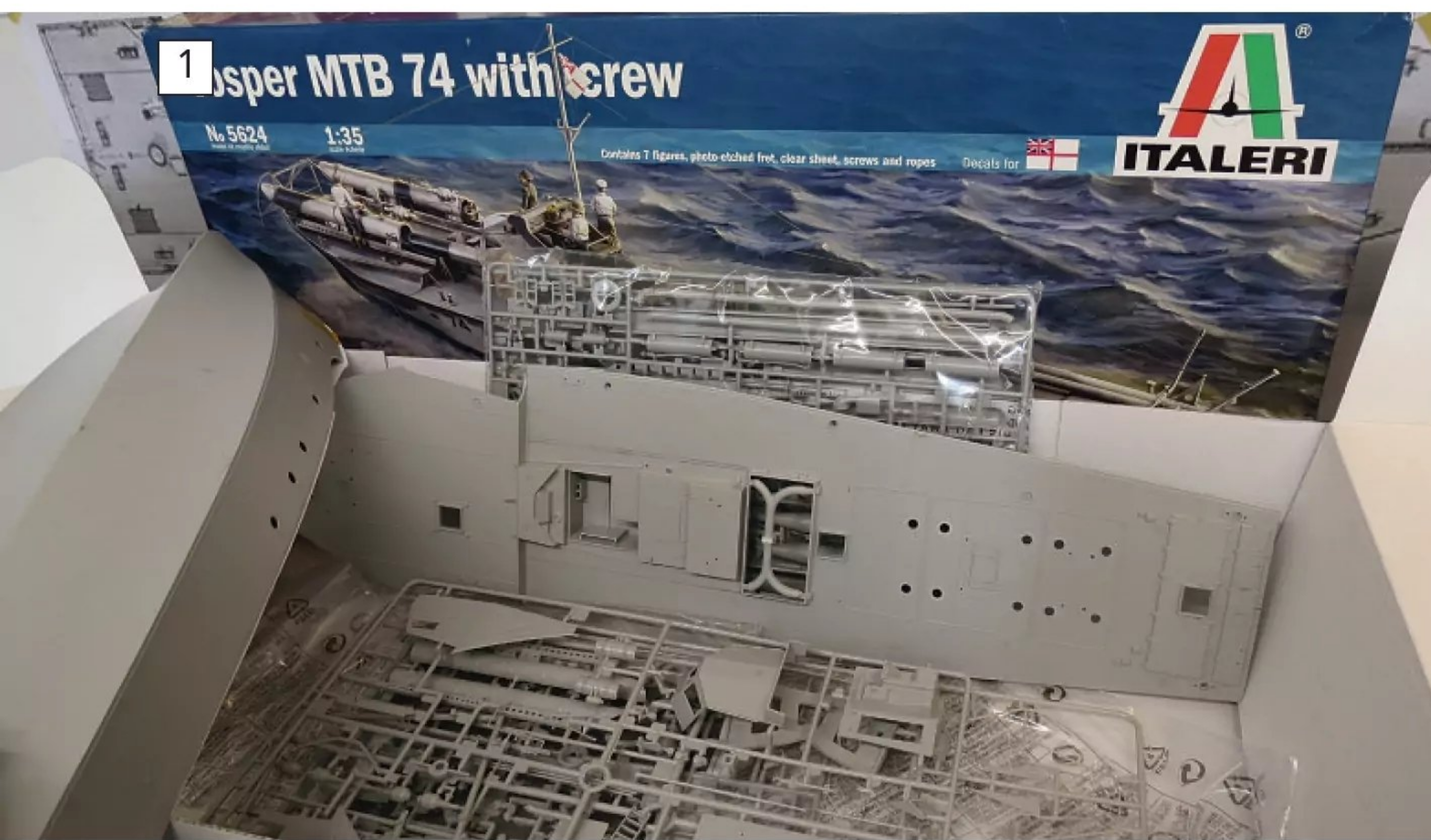
MTB 74, with its unusual forward torpedo tube arrangement, was originally built for the purpose of delivering time delayed torpedoes over the anti-torpedo nets at Brest harbour, in an attempt to inflict serious damage on the battle cruisers Scharnhorst and Gneisennau.

When that operation was abandoned, MTB 74 was then redirected to Operation Chariot, the destruction of the lock gates at St Nazaire. This daring raid involving destroyers, torpedo gun boats, MTBs, motor launches and the old former USN destroyer re-named HMS Campbeltown; the latter being crammed with high explosives and tasked with ramming the lock gate of the only dry dock on the French Atlantic coast large enough to support the battleship Tirpitz. MTB 74, commanded by Sub-Lieutenant Micheal (Micky) Wynn, was tasked with the primary objective of torpedoing the inner lock gates of the so called Normandie dock. Should the gates be closed, its secondary objective was the gates at the old

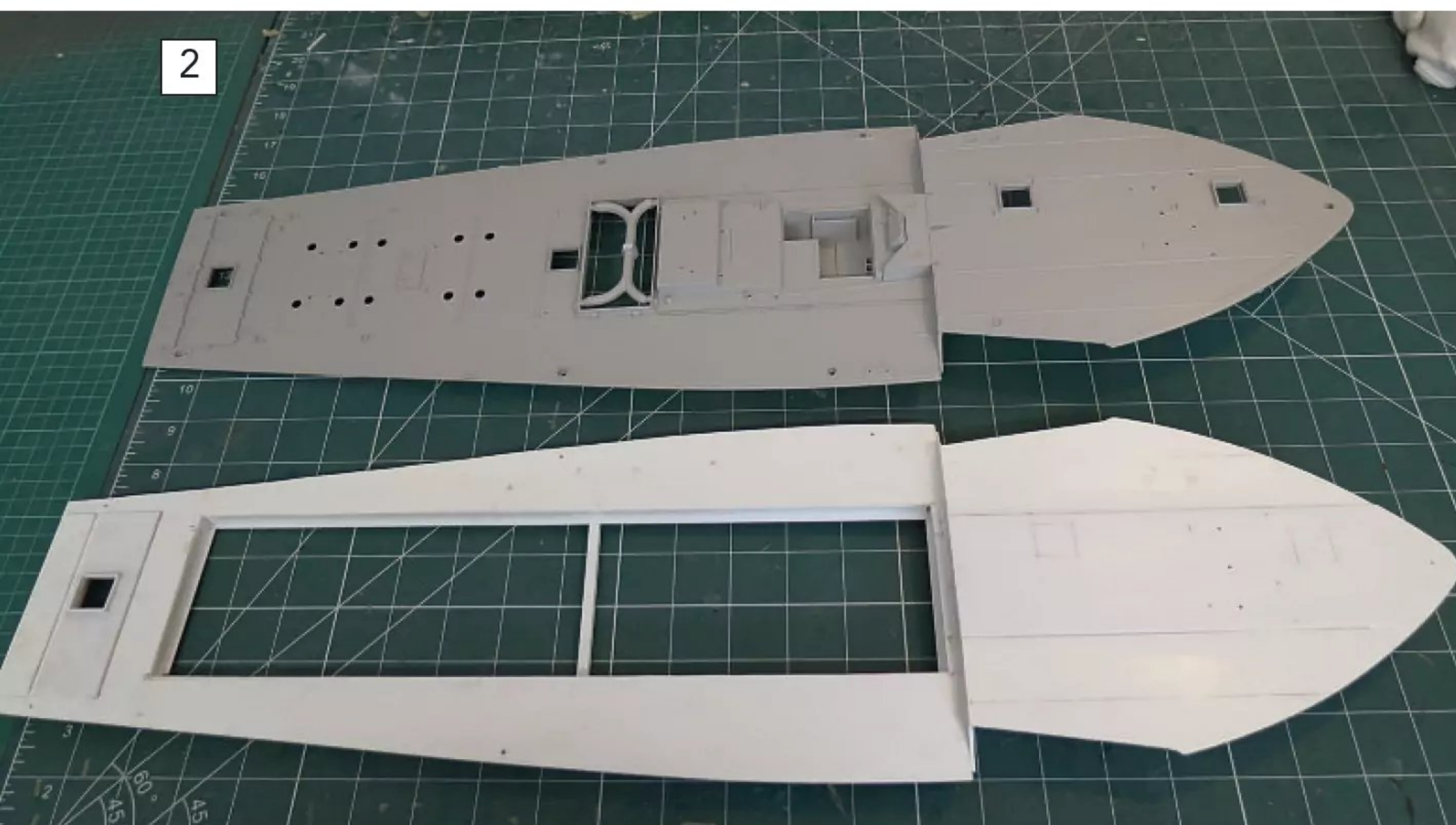
entrance into the St-Nazaire basin. It was at 06:30 on March 30, 1942, that the delayed fuses on the torpedoes fired by MTB 74 did indeed demolish the old entrance lock gates.

Sadly, however, MTB 74 was strafed and sunk by gunfire on its attempt to navigate out of the area, with all but two of the crew missing in action. Sub-Lieutenant Micky Wynn (now formerly known as Lord Newbrough) lost the sight of one eye and was saved from drowning only to endure several years as a POW in the notorious Colditz Castle.

Back in 1988 I had the privilege of meeting Lord Newbrough (who sadly passed away in 1998) on more than one occasion at his home of Rhug Hall in Corwen, North Wales, while sailing my 1:96 scale build of the battleship



Italeri's injection-moulded MTB 74 kit.



The deck included in the kit (top) and the compatible styrene replacement created by Dave.



Dave's styrene deck fitted onto the hull.

Tirpitz on the lake there. I am proud to say he showed a lot of interest in the model and later went on, in his role of benefactor to the Merseyside Maritime Museum, to prove instrumental in getting it placed permanently on display in the Battle of the Atlantic Gallery, where it remains to this day.

The kit

The kit, as we have come to expect from Italeri, is well boxed, and includes a hull (at 610mm x 168mm), separate deck, sprues supporting all the fittings, an etch fret, and a complement of naval figures, along with a very comprehensive assembly schedule (see **Photo 1**).

I now have a confession to make... This was to be my first ever attempt at converting an injection-moulded kit for a static display model into a radio-controlled, 'sea-going' version, and so, as such, was a bit of a learning curve for me.

The deck

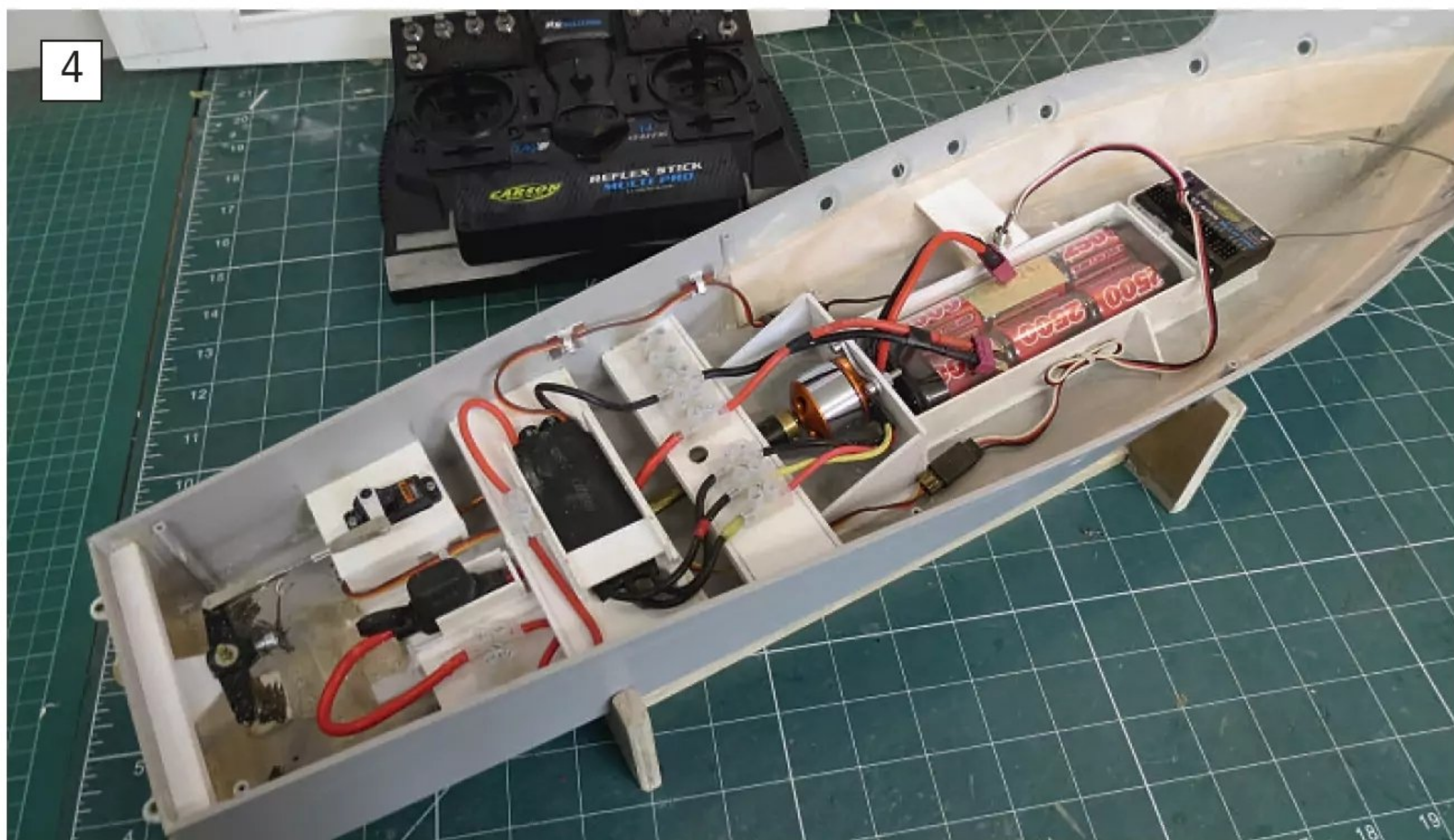
Italeri instructs the deck should be screwed into specified locations within the hull. Upon inspecting both the deck and the fittings to be located in and around it (such as the exhausts) though, it quickly became apparent that by permanently fixing the deck to the hull in this manner would result in extremely limited access to the interior. This required some lateral thinking, as the interior of my R/C MTB 74 would need to be kept easy to access while at the same time remaining watertight. Accurately cutting into the moulded deck supplied with the kit presented its own problems. The solution, therefore, was to discard this and create an exact copy in 2mm styrene, into which an aperture of the maximum size possible could cut (see **Photo 2**).

"This required some lateral thinking..."

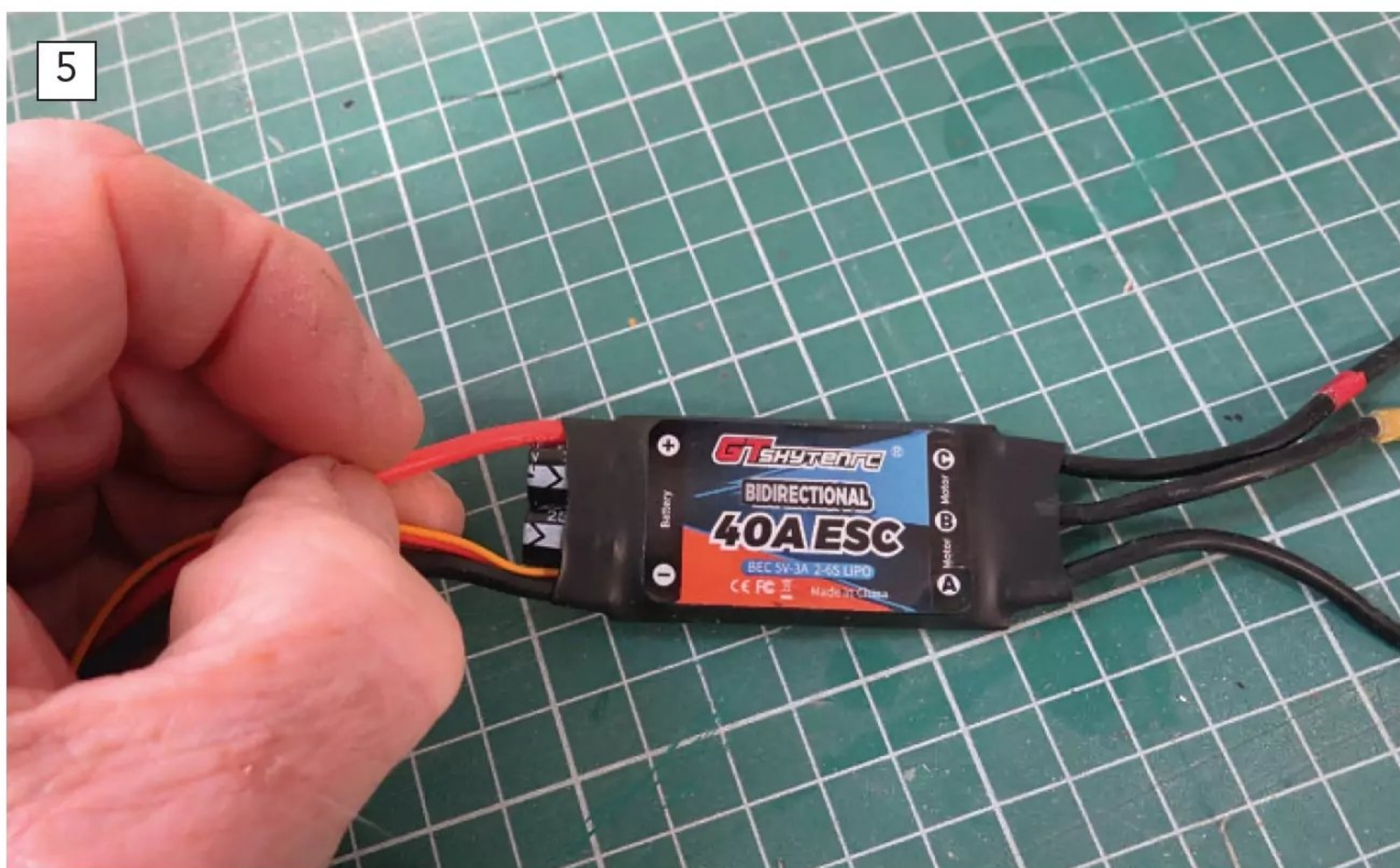
This was followed by marking out and fixing all the features pertaining to the original moulded deck, which included the rudder flat, the engine hatch covers with sky lights, the mushroom vents (which also double as screw head covers), and the internal well of the wheelhouse, plus hatch covers (see **Photo 3**).

Internal electrics and R/C

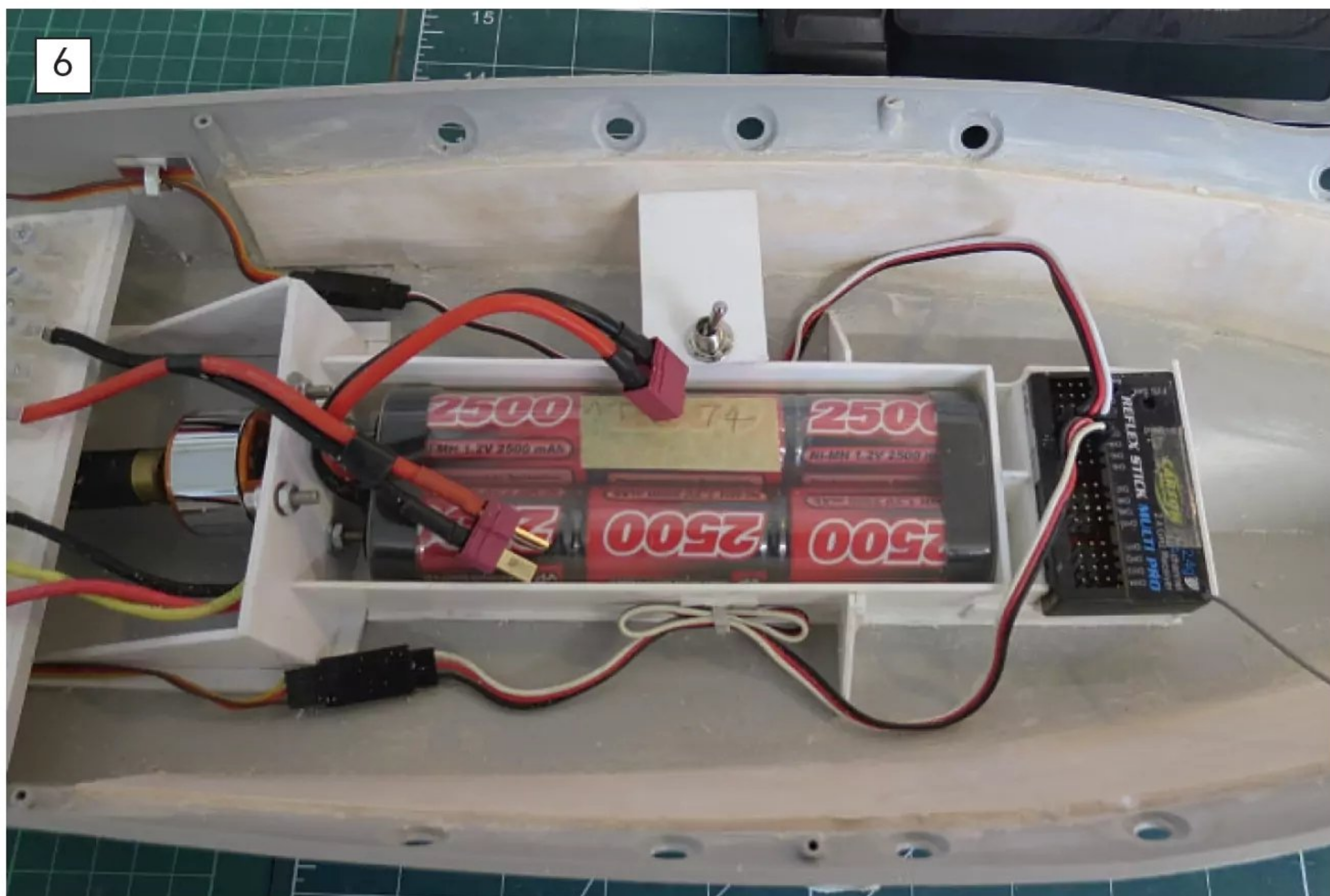
The next stage was to survey the internal space and assess where



Installing the electrics and R/C.



The wafer-thin plug and play bi-directional ESC used by Dave.



Balsa sheeting added to the inside of the hull and beneath the deck to reduce hull resonance.

the carefully selected power train and R/C could be comfortably, and accessibly, accommodated (see **Photo 4**). A brushless motor of 2200KV was installed amidships. Rather than the battery shown in **Photo 4**, the battery space forward now includes a 1600 AH NiMHs, as while the former boasted greater capacity, I found it to be overweight for this model.

The RX was located well forward of the motor, with a mini servo right aft proving to be of ideal size for rudder control. Usually, setting the parameters on a brushless ESC requires a program card. Here I took the plunge and went for a bio-directional 40A with BEC – essentially, a plug and play brushless ESC produced by GTshytenrc (see **Photo 5**). Unlike, for example, the Shark series, this unit is not water-cooled or waterproof.

Reducing resonance

To reduce the resonance that can be generated within an injection moulded hull, areas along the inside of the hull and under the deck were plated with sand-sealed balsa sheet (see **Photo 6**). This also helps keep a model afloat should it ever become filled with water.

Transom rudders and shafts (display only)

With the functioning single rudder and 3mm shaft installed (see **Photo 7**), attention shifted to the display only transom rudders and shafts; I use the word display as the model is to form part of the 2024 IPMS Scale Model World Movie and Film SIG (Special Interest Group) display. Here, again, the original injection moulded transom rudder arrangement supplied was discarded, this time on the grounds of durability, and a new set formed from brass (see **Photo 8**). A stand for static display was also built.

Fixing the deck

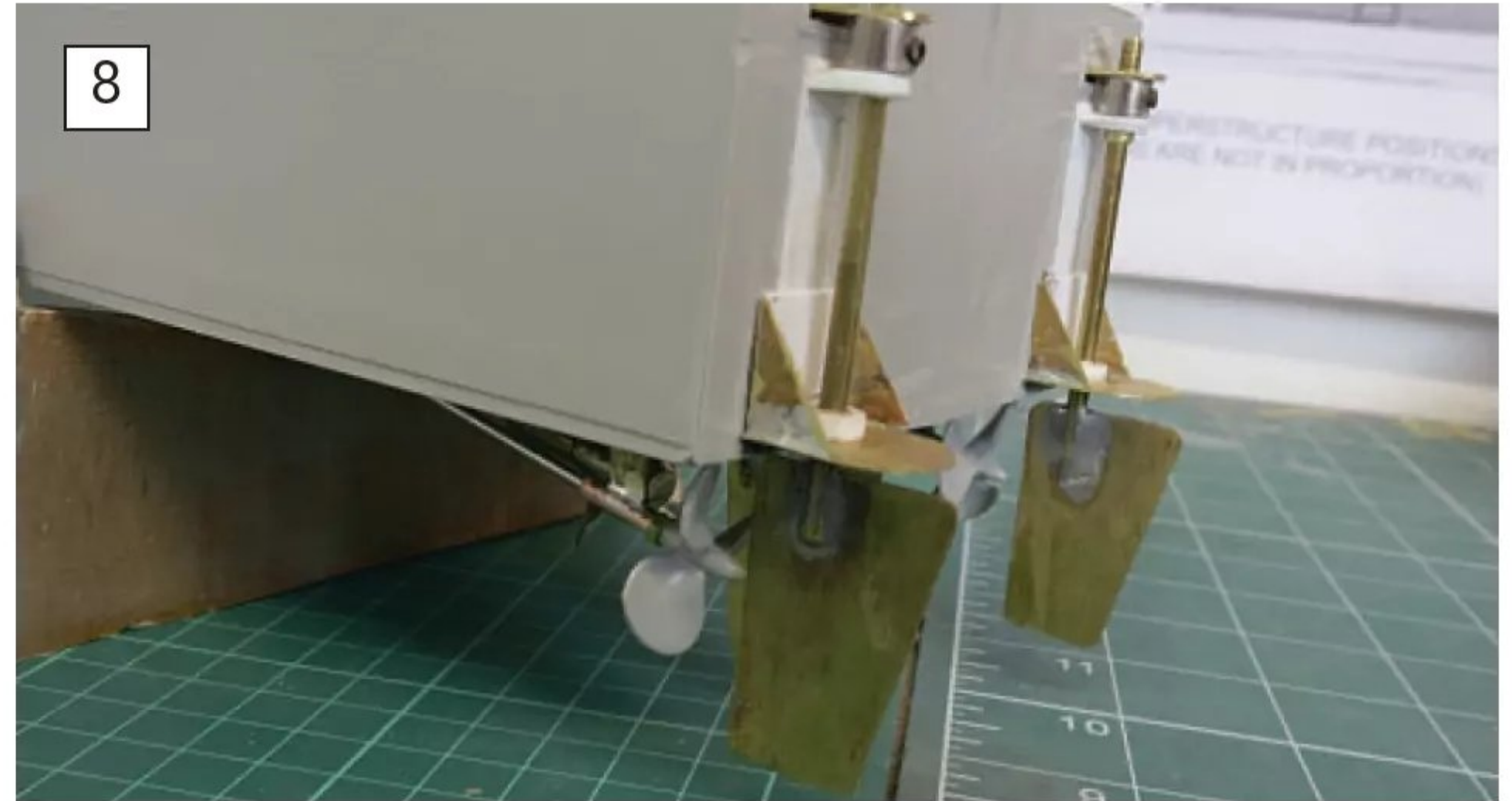
Referencing the assembly instructions, the deck needs to be screwed (using the screws being provided in the kit) to the gunwale through pillars inboard. Here, my alternative deck was located using the same positions but fixed permanently to the deck edge (see **Photos 9 and 10**).

Extra spray strips

The spray strips along the chine line would be inadequate in directing the water outward and downwards on an R/C model, and as such would make



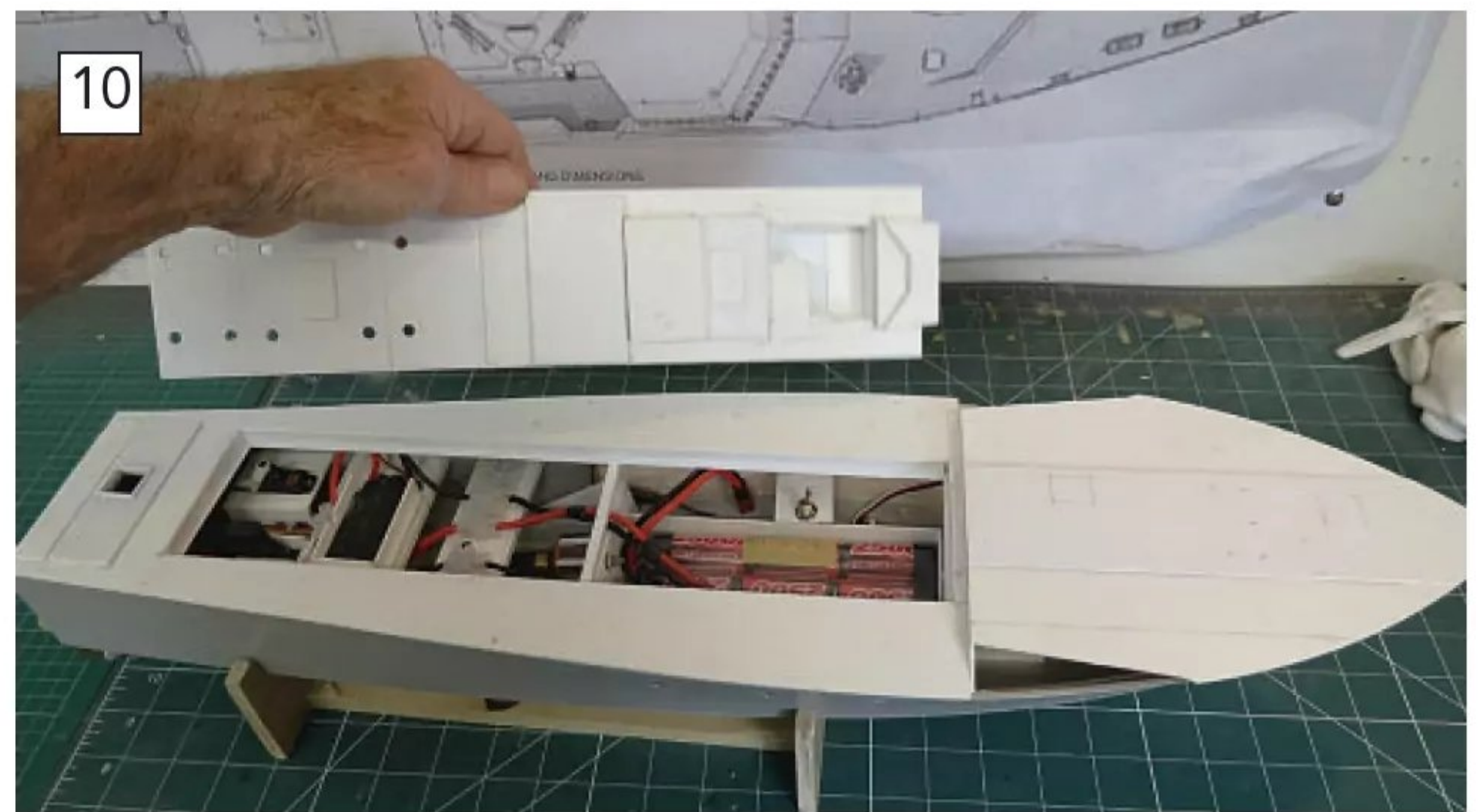
The centre drive shaft, functioning rudder and 25mm brass propeller.



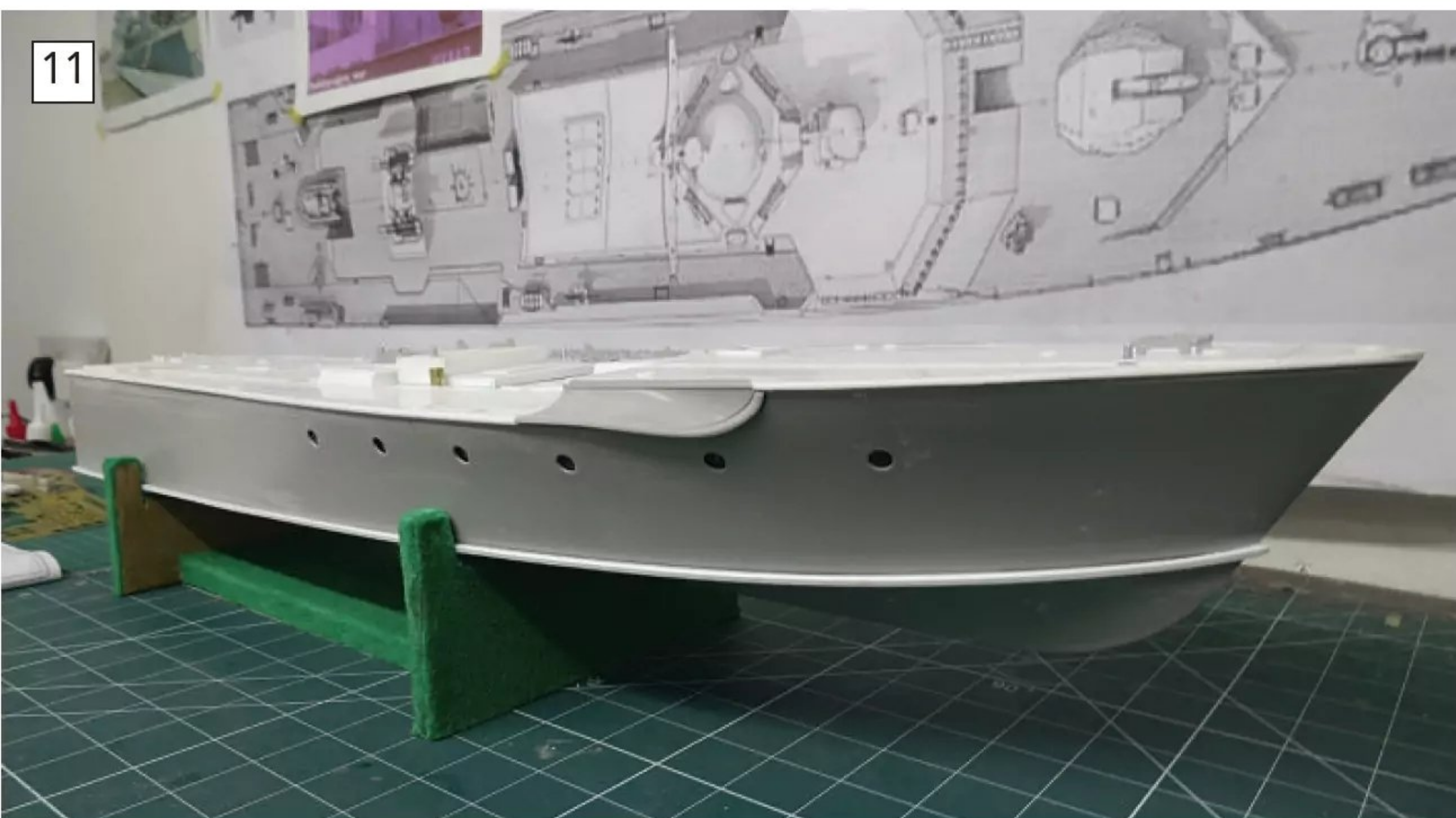
For display, provision was made for removal of the centre propeller and active rudder, so that it can be replaced by the non-functional transom rudders, shafts and propellers from the kit.



Fixing the replacement deck onto the prepared hull.



With the deck fixed, the removable centre is added.



Dave realised that for a working model the spray strip from the kit would be inadequate, thus a length of 2mm square Evergreen strip was added.

it difficult for the hull to get onto a stable planing attitude. So, to remedy this, I fixed a 2mm Evergreen box section onto the existing spray strip (see **Photo 11**).

Test run

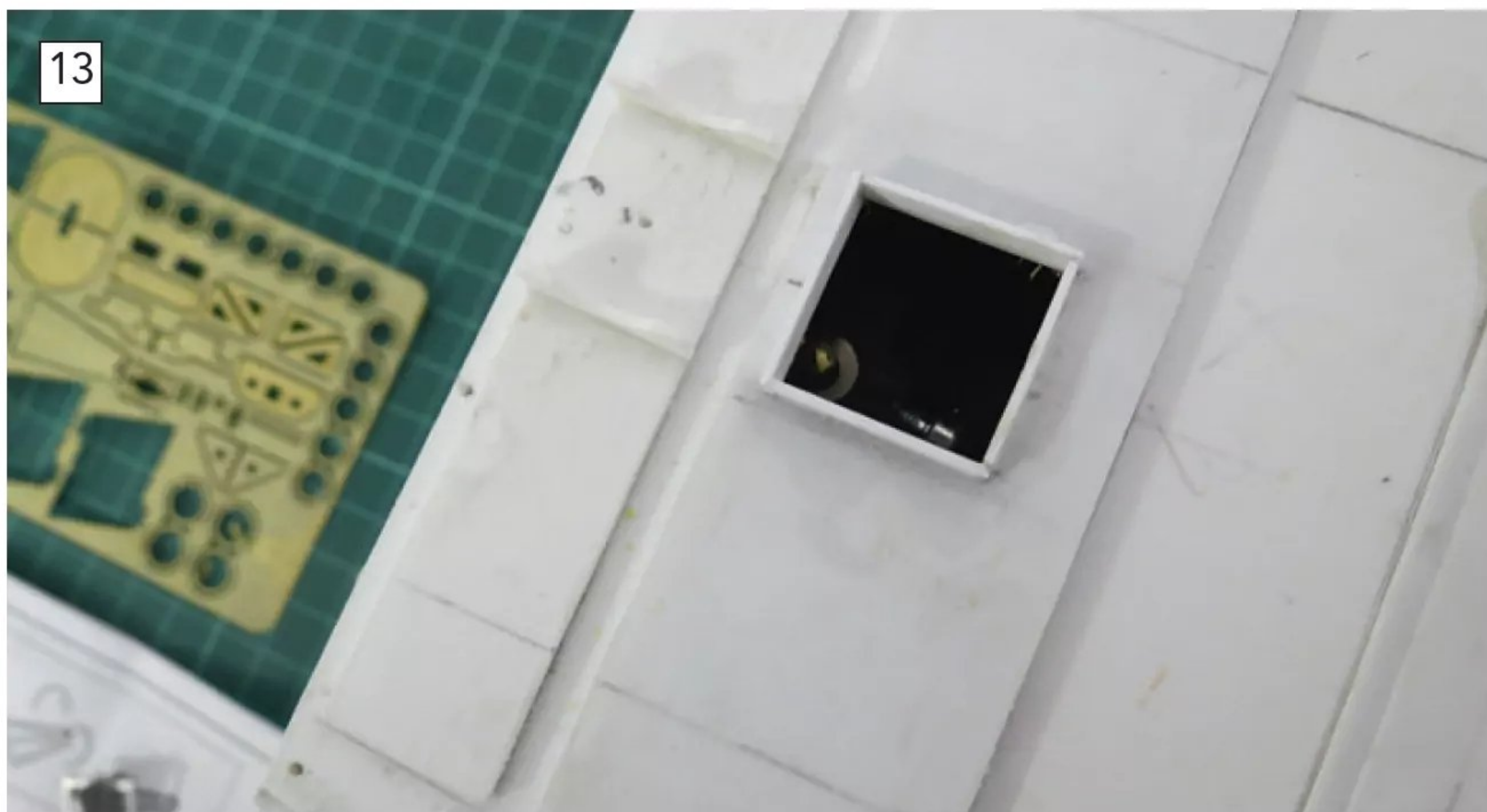
With all my builds I like to test out not just the internal installation but ballast, trim and performance. At this stage, therefore, it was off to my local boating pool, with the hull and deck all taped up. I was not disappointed; the performance from the brushless motor was excellent and the balance spot on. I was also pleasantly surprised by how well MTB 74 reacted to turns, thanks to the installation of a *dagger plate just forward of the point of balance. *A dagger plate is a small, flat, often curved sheet extending below the keel, which aids stability in high speeds turns (see **Photo 12**).

Fine adjustments

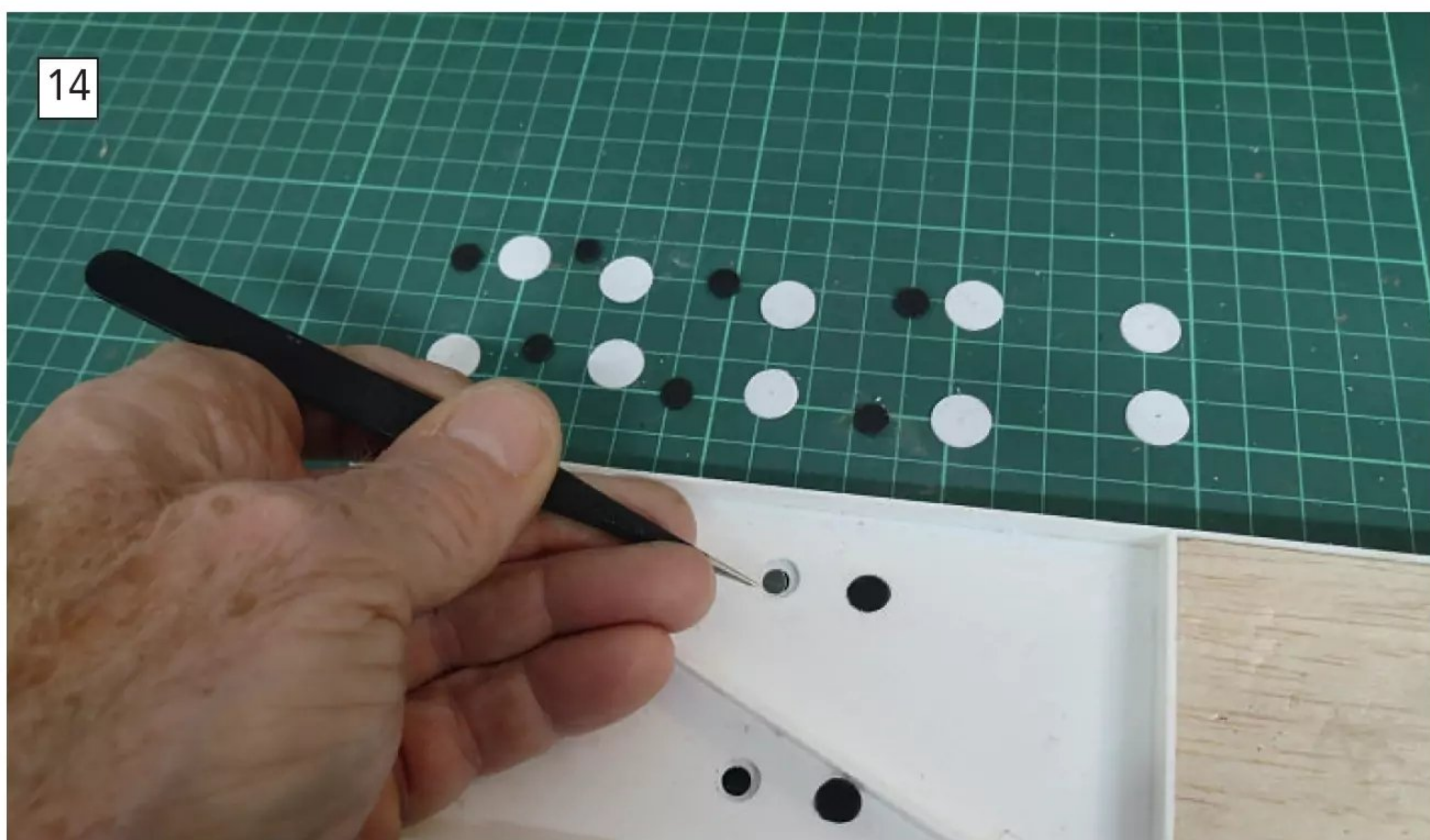
Even though access into the hull was good, the tiller arm was beneath the after deck and so difficult to reach. To offset this and allow for the easy removal of the rudder or fine adjustments, I created a hatch into which I could insert an Allen key (see **Photo 13**).



The first on-the-water, fully sealed up, test run.



Although it was easy to reach the tiller for adjustments with an Allan key, this rudder hatch was the only option available for sighting adjustment on the tiller arm.



Preparing the watertight covering of the skylights.

As mentioned earlier, there are sky lights on the deck aft of the wheelhouse. Although the kit supplies acetate that can be inserted into ports, I needed these to be watertight. To facilitate this, following insertion of the acetate, I first fitted a black styrene disc of a corresponding size, to which was added a larger disc that provided the watertight seal (see **Photo 14**).

Fitting out

Working from the stem aft, each of the fittings indicated in the assembly schedule were removed from the sprue, cleaned, and, where required, assembled as a single fitting, before being located on the deck. If undertaking the build yourself, beware of the carpet monster, as many of these fittings are both small and delicate (see **Photo 15**).

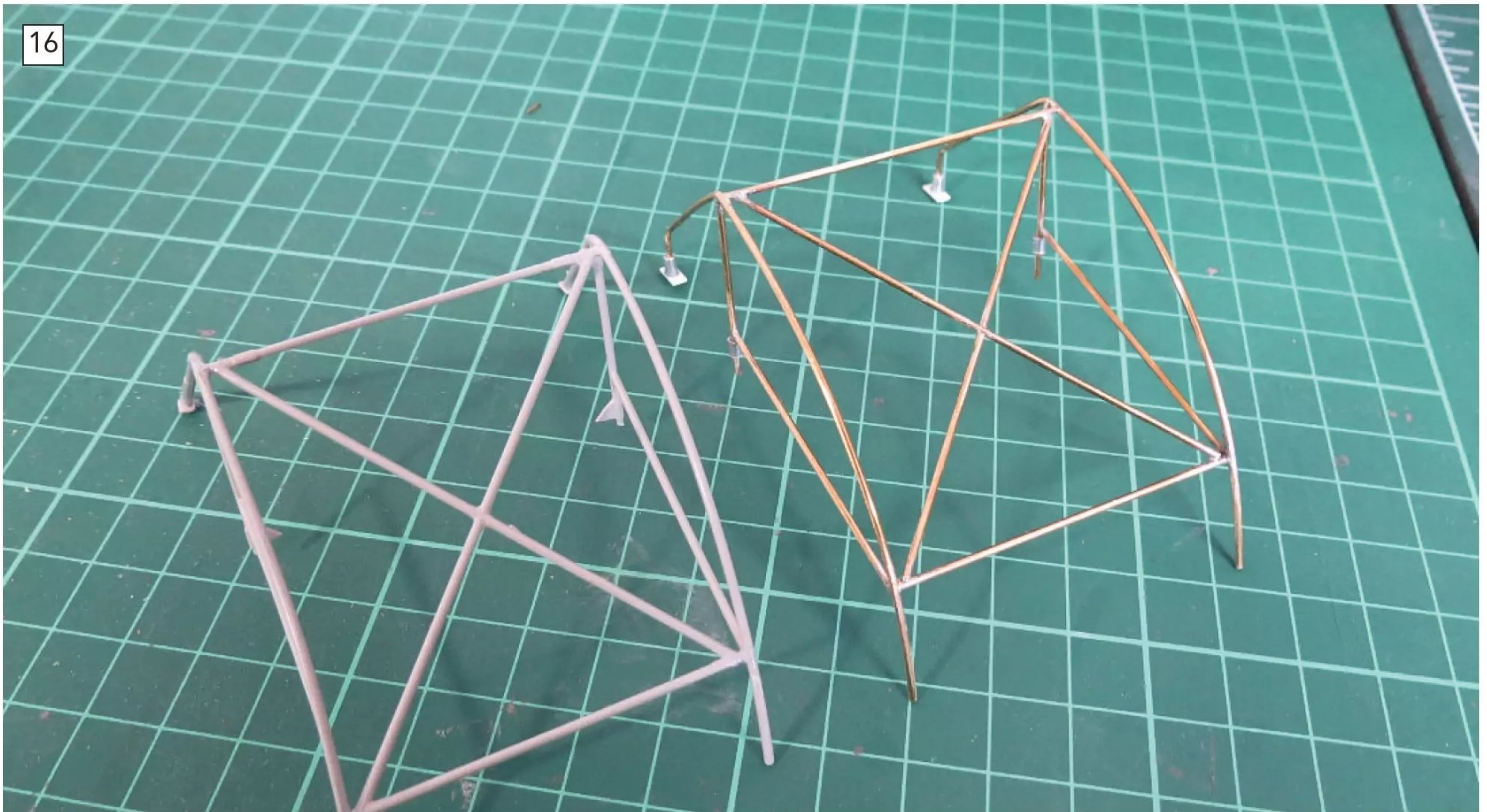
“I can’t find any clear references as to the exact purpose of the framework fitted to the bow – perhaps someone reading can enlighten me?”

Bow framework

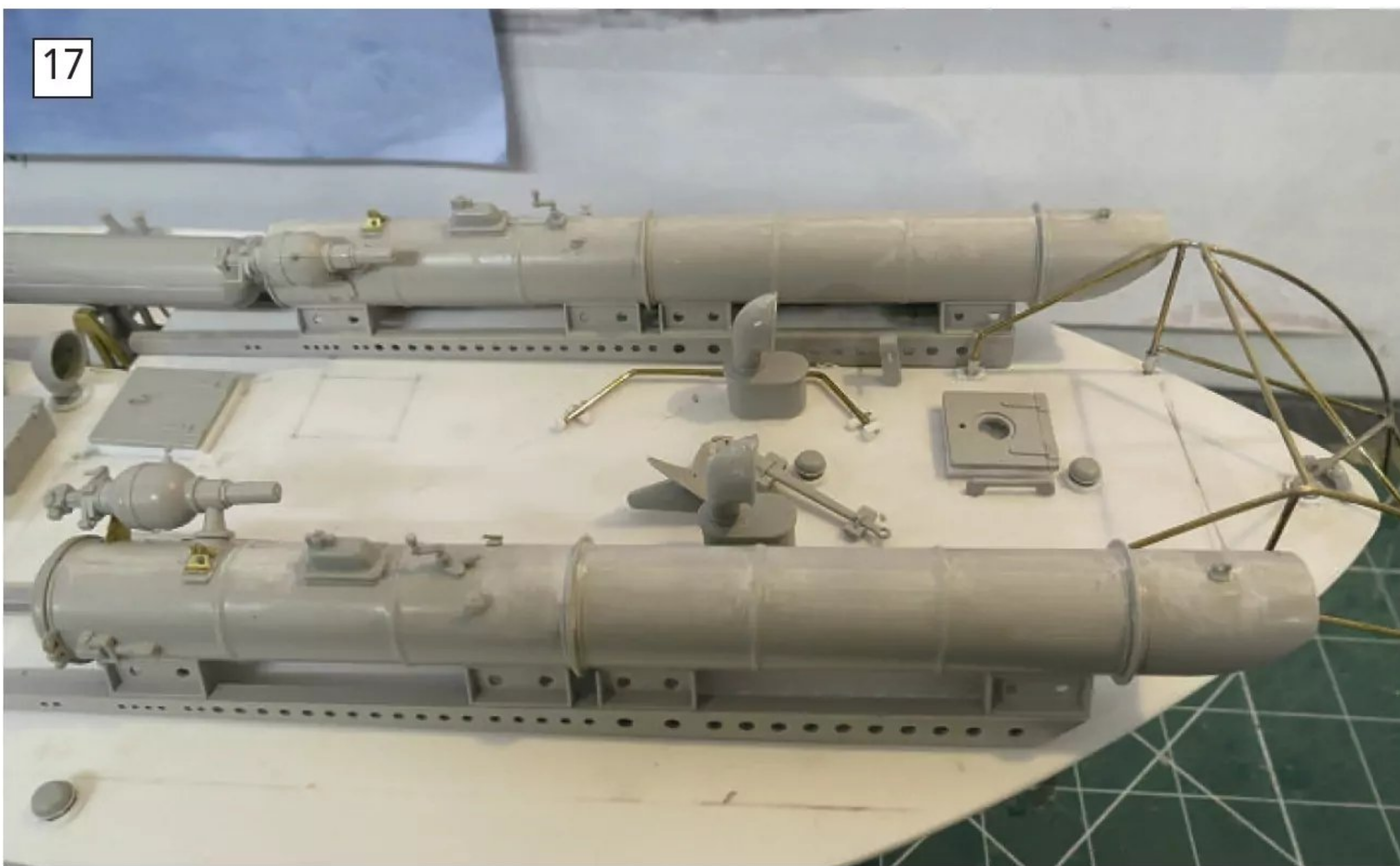
To be honest, I can’t find any clear references as to the exact purpose of the framework fitted to the bow – perhaps someone reading can



With the deck fixed, dry assembly of the fittings could begin.



A comparison between the original injection-moulded bow frame and Dave's jig formed brass replacement.



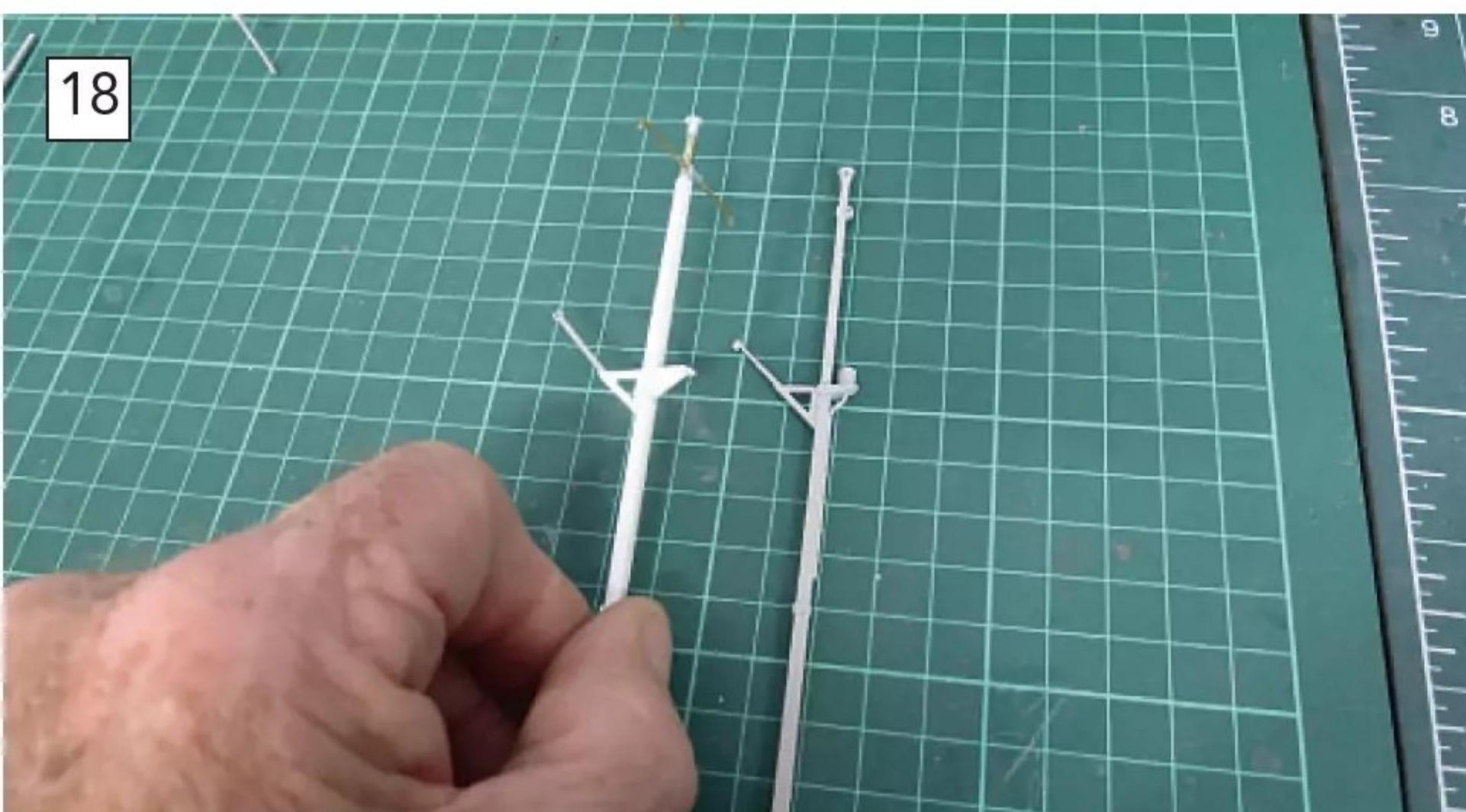
The brass bow frame fitted into place.

enlighten me, but, anyway, that provided in the kit is only suitable for display and too fragile for a working model. The solution was to form a brass equivalent. I, therefore, made a jig to support all the intersecting joints that required soldering (see **Photos 16 and 17**).

Replacement mast & safety line connectors

A closer look at the mast showed that, like the bow frame, it was too delicate for a working model and could be easily damaged. My replacement has a box section brass core cladded in styrene (see **Photo 18**).

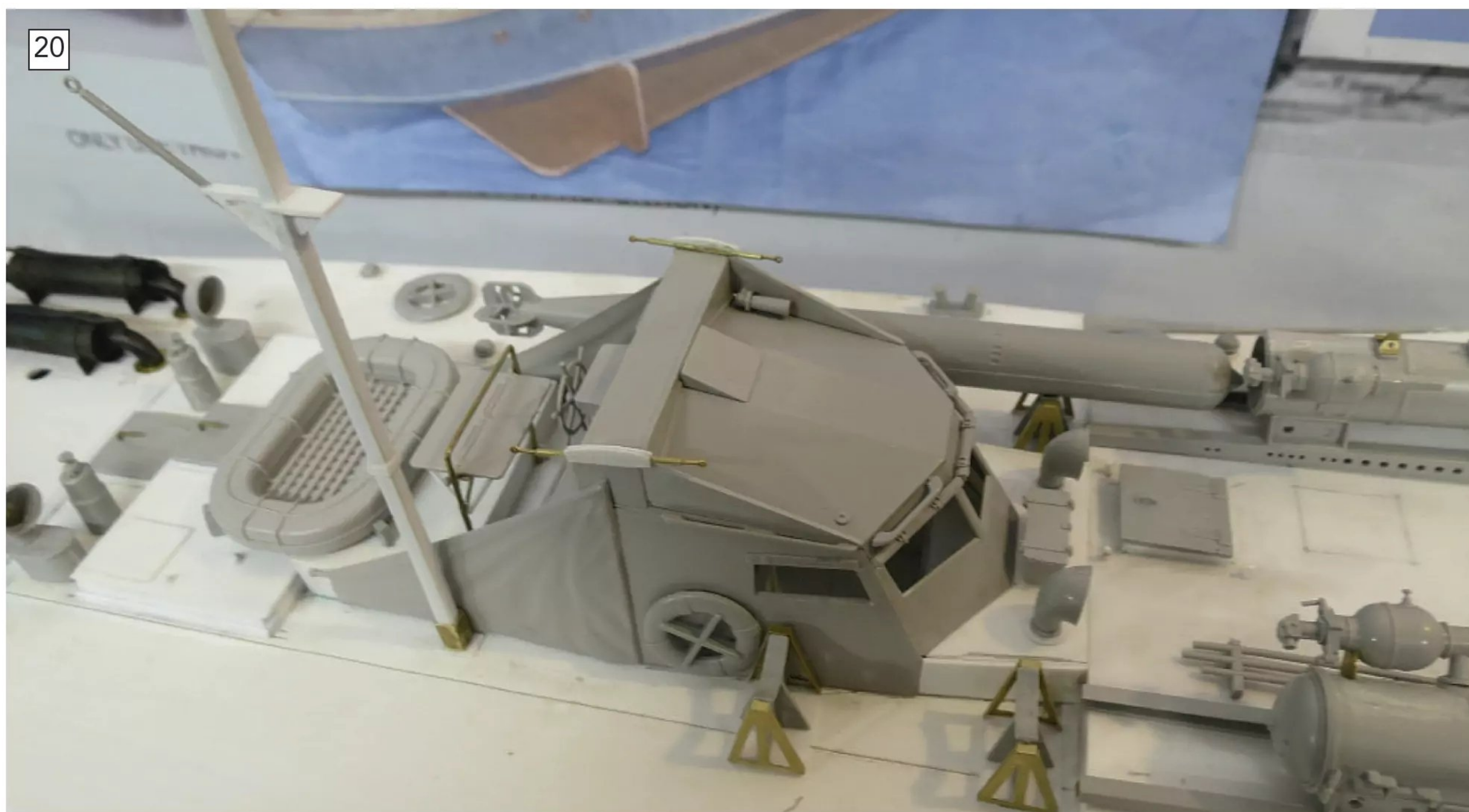
Either side of the wheelhouse are eyes for connecting the safety rail. These I also re-made from brass, for the simple reason that I wanted them to be removable via small hooks (see **Photos 19 and 20**).



Replacing the mast from the kit with a brass box section cladded in styrene.



To add strength, the safety rail connecting eyes are replaced by brass eyes.



During the dry assembly, the mast is secured into a brass box section base.



A full dry assembly.

Dry assembly

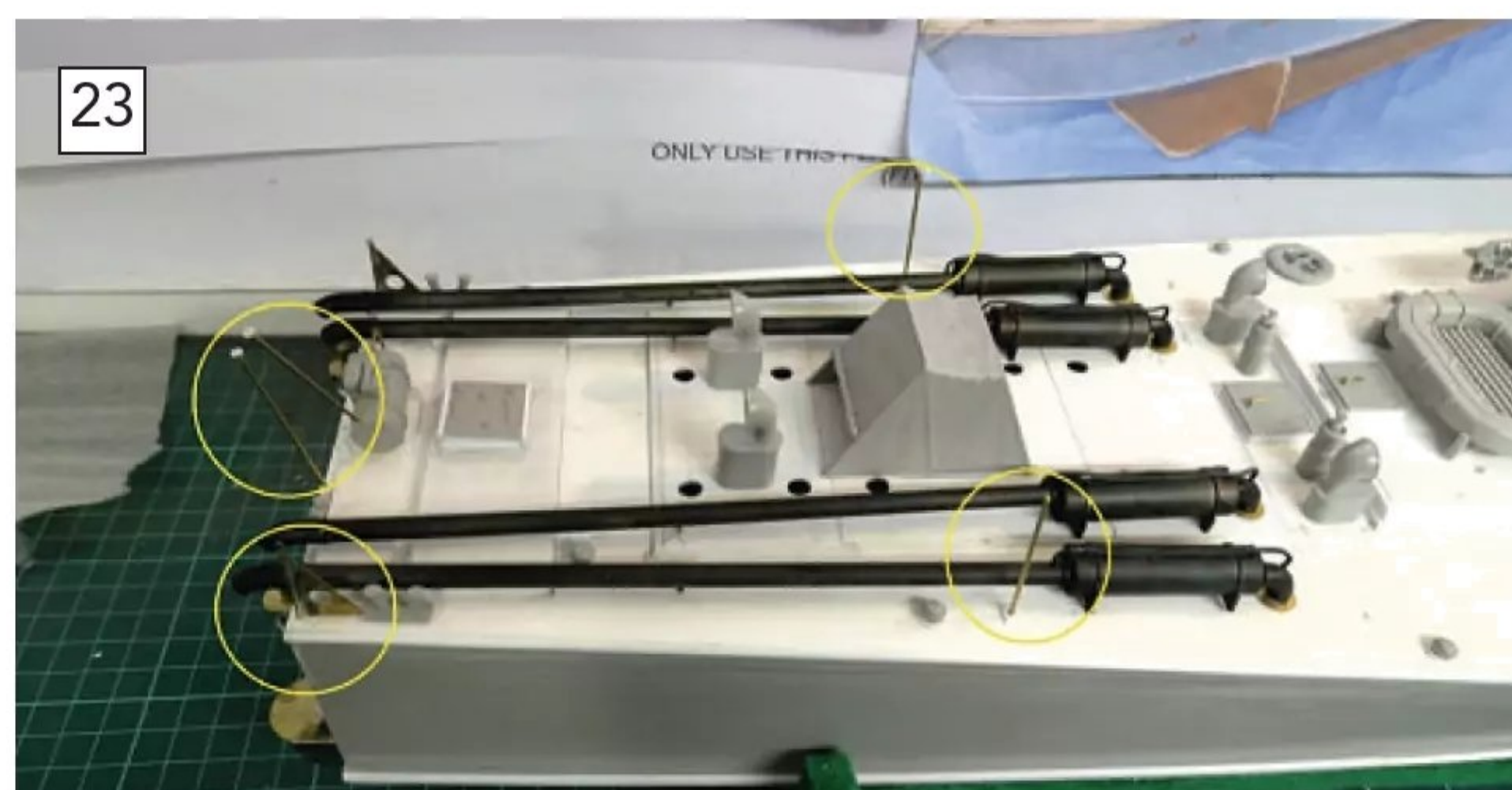
As always, I first ran a dry fit of all deck fittings, the results of which can be seen in **Photos 21 and 22**. I also fitted brass safety rail supports amidships and right aft on either side (ringed in yellow in **Photo 23**), as once again the originals weren't robust enough for an R/C model.

Airbrushing

An archive image of MTB 74 (see **Photo 24**) reveals the camouflage applied for Operation Chariot was Standard Scheme Home. To replicate this on my model, I used Mr Hobby's H 308 Grey overall, and then H311(a very light grey) and H305 for the underside and sides of the hull and some of the upperworks (for example, parts of the torpedo tubes).

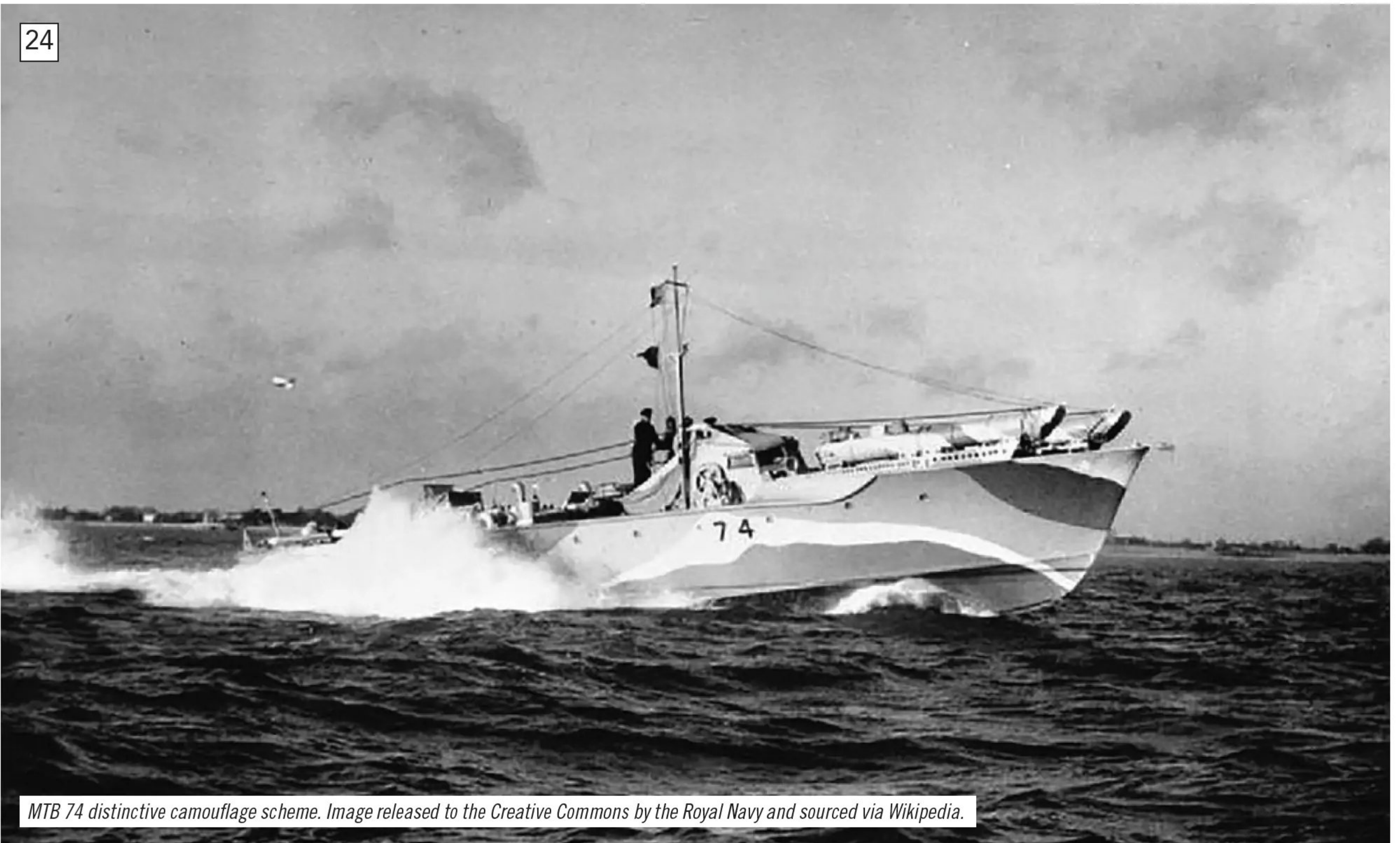


The amidships dry fixing.



Here Dave makes a slight departure from the assembly instructions for this kit, moving the outer exhausts further to port and starboard, and thereby facilitating access to the hull's interior.

24



MTB 74 distinctive camouflage scheme. Image released to the Creative Commons by the Royal Navy and sourced via Wikipedia.

25



Peeling back the Ultra Mask film after airbrushing the upper half of the hull.

To recreate this wave form-style camouflage, the same method used on my Finnish water jet-powered missile boat was employed. Once the basic patterns had been marked out on the hull and deck, I then covered these areas with Artool Ultra Mask Film, peeling it back as and where necessary as I airbrushed individual sections. This film could then be replaced, allowing adjacent areas requiring a different shade to be exposed (see **Photo 25**). Once I'd completed the camouflage scheme on the hull, this was then masked off so that the same method could be adopted on the deck (see **Photo 26**). This done, all masking was removed, revealing the results thus far (see **Photo 27**).

26



Preparing the deck and fittings for camouflage coatings.

27



The final fix of the prepared fittings.



Applying the Dark Dirt to give MTB 74 a more realistic appearance.



The Dark Dirt application was locked in by several coatings of Mr Hobby's Super Clear UV Cut Flat Matt Spray.



Still on sprue painting of the individual parts that will make up the kit supplied crew figures.



Various crew members looking busy. Each figure is secured to the deck via a .40mm brass wire pin inserted into his heel.

Weathering

There are numerous focal points on a deck that lend themselves to weathering, but it's the areas around the fittings on the sides of a hull where, due to lack of routine maintenance, rust/water marks/etc become most evident on real vessels, that particularly benefit from its application.

During wartime, of course, vessels were over-worked and often at sea for extended periods. MTB 74 had been allowed to become well-worn prior to Operation Chariot, having been converted for a particular mission from which she was not expected to return. For my model to credibly reflect this, it was, therefore, necessary to recreate

a more fatigued finish. To achieve this I followed the advice of paint aficionado Dave Howard, and on his recommendation applied Dark Dirt, a liquid-based clay which comes in various shades (see **Photo 28**).

It was then time to lock in these effects with several coats of Mr Hobby clear matt lacquer. This is a task best performed out in the open (see **Photo 29**), but I would still recommend using a spray booth and face mask.

Figures

In the past I had shunned the inclusion of figures on my builds, concerned they'd distract from the model itself. I have, however, since had a change of heart. Of course, painting figures is not every modeller's forte, and I still find it a challenge, but, when I do get it right, it's very rewarding. There seems to be two schools of thought on when and how to apply paint to small figures: while they're still on their sprues or only once they've been assembled. I've tried both methods and find painting on the sprue easier, but naturally this involves a bit of a touch up, firstly after the separate parts have been detached and then once they've been assembled (see **Photo 30**).

Locating the figures in meaningful positions and poses is essential; crew figures always look so much more convincing when portrayed fulfilling a

Acknowledgments

Dave would like to extend his thanks and appreciation to:

- Dave Abbott, for allowing Dave (Wooley) access to the photographs of his all scratch built model of MTB 74 for reference purposes
- Dave Howard, for his advice on weathering techniques.

32



The completed model on the water.

33



MTB 74 underway at speed.

particular task/duty. The illustrations on the boxes they come in often make helpful suggestions here, but most of us like to make those decisions for ourselves. As my MTB 74 was to be a working model, to avoid a 'man overboard' scenario, the figures needed to be firmly secured. I therefore inserted a pin into one of the heels of each figure, which I was then able to fix into the deck (see **Photos 31**).

On the water

How this relatively small 'plastic magic' model sailed on completion was always going to be the acid test. First, however, I removed the display transom rudders and propellers, as these would most certainly

34



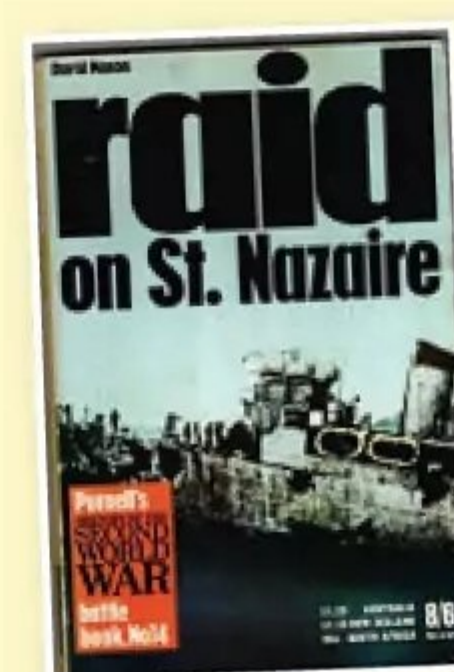
The MTB 74 with its full rig, all ready for display on the IPMS Scale Model World Film and TV SIG stand at the IPMS Scale Model World show this November.

“How this relatively small ‘plastic magic’ model sailed on completion was always going to be the acid test. First, however...”

have interfered with performance. I also inserted a small amount of lead right aft to aid trim. The trials went satisfying well, and I was not disappointed with performance. She was quick, and turns were tight, with no side slips or bouncing. I am, therefore, delighted to report that the project has been a resounding success (see **Photos 32-33**). ●

Recommended reading

Raid On St Nazaire, by David Mason
The Greatest Raid: St by Giles Whittell.





WATTSUN

Robert Yeowell shares a bright idea!

Several years ago, I acquired a 10-watt solar panel complete with a simple control unit. I think it was designed for charging 12-volt batteries in caravans, motor homes, etc. At the time I had no use for it, so I stashed it away. I rarely discard anything that may prove useful one day! Recently, however, while searching for some electrical bits in the garage, I came across it again. There it sat, in its box, still in as new/unused condition, along with the manufacturer's instructions. Cue one of those 'light bulb' moments/random project ideas... Could this unit be used to power a model boat?

Something old, sun-thing new?

I love models of tugs, over the years I have built six – four of these are still in regular use, including the oldest, built back in 1967. To get even more fun out of them, I have also made a number of barges, constructed at

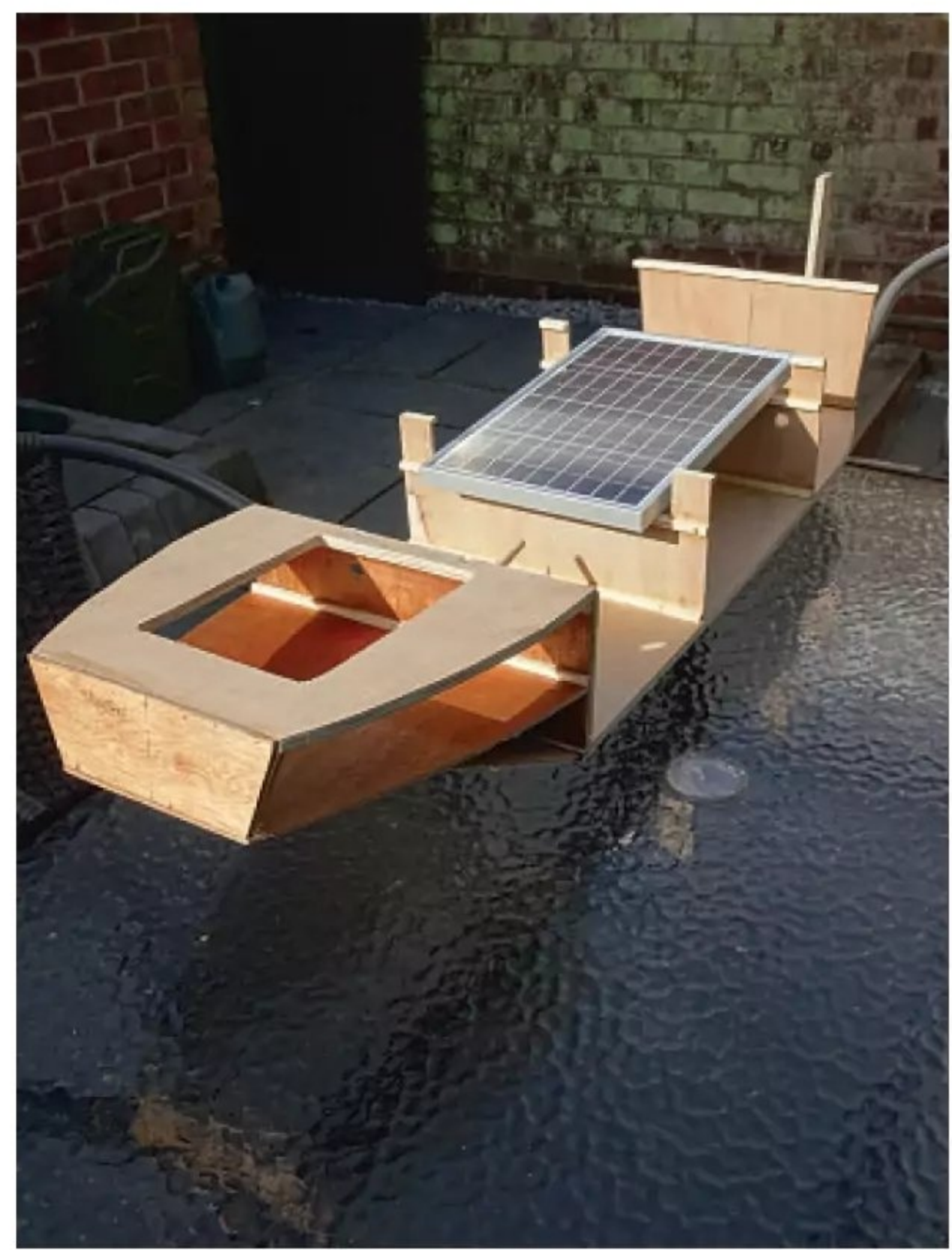
“Cue one of those ‘light bulb’ moments/random project ideas... Could this unit be used to power a model boat?”



The basic hull was formed from various thickness sheet plywood, while the hull bottom had been a shelf in its previous life! A bowed piece of wood gave the hull shape its natural 'rocker' effect and has also added some flair.



A piece of cavity wall insulation foam was used to add buoyancy and form the battery compartment.



A10-watt solar panel sits above battery compartment.



The final layout of electrical equipment: the solar panel sits on four wooden dowel pegs above the battery. The white cord/rope forms handles, which allow the solar panel to be lifted out to gain battery access.

low cost from various materials such as cardboard, blue wall insulation foam and scrap plywood. All of these are flat bottomed, have open hulls, and have been ballasted accordingly with two-kilogram bags of aquarium gravel.

My first idea, therefore, was to convert one of these barges by motorising it and simply fixing the solar panel into the hold on foam blocks so that it was at deck level. A mock-up tested in the garden pond, however, made it immediately apparent there was a stability problem with this set up. What's more, after

"I made no plan as such, just a few sketches and a very important wiring diagram"

a bit of reading up on solar power, I realised that this wasn't going to be a case of simply attaching an electric motor to the solar panel on a sunny day and off we go. A 12-volt battery and control unit would be required to smooth out and regulate everything.

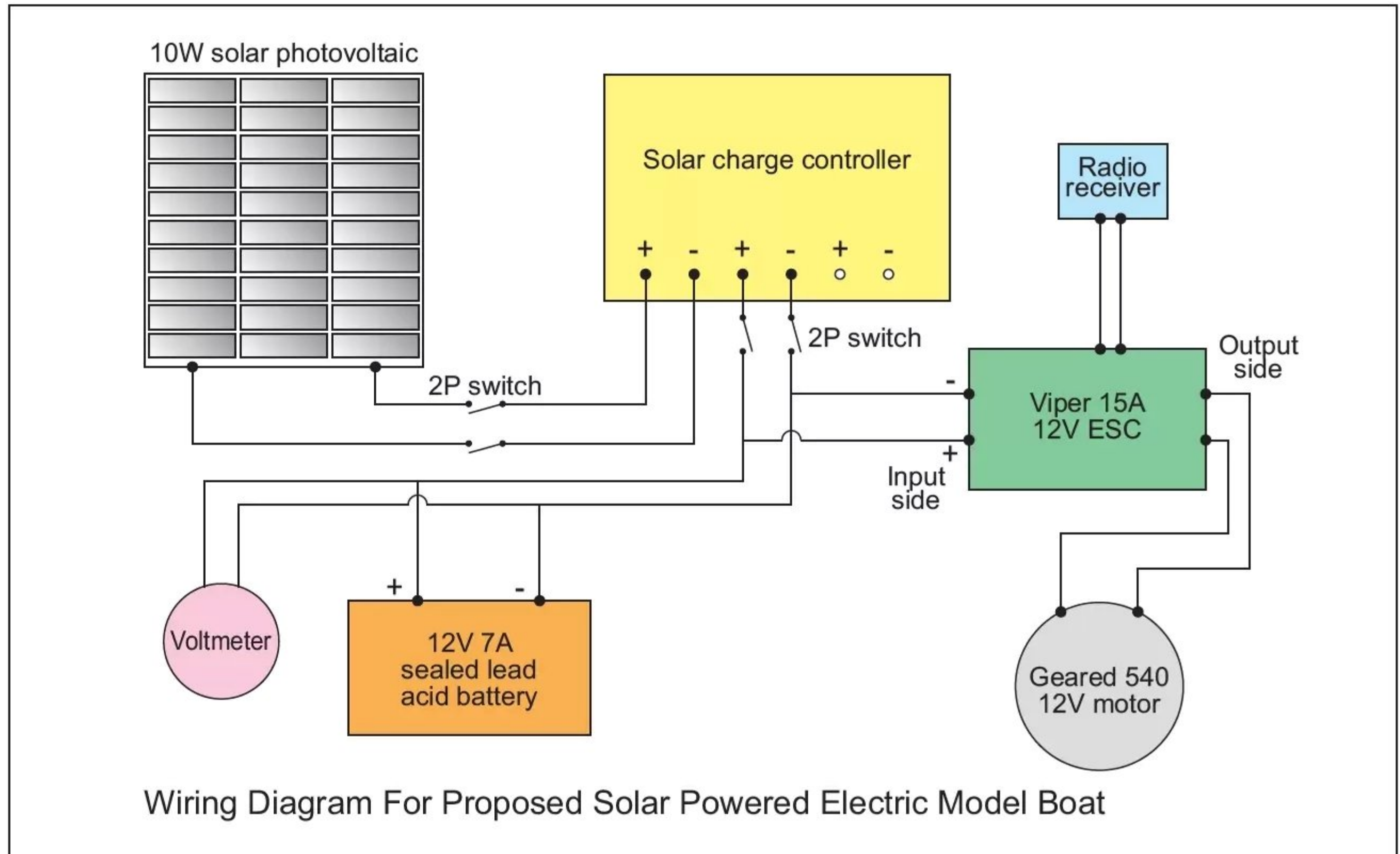
Plan/No Plan B

I keep a good stock of plywood off cuts, and I also had a spare MFA 540 motor with a 6-1 gearbox, a 15-amp Viper ESC, propellor shaft and a 60 mm propellor, plus most of my tugs use 7-amp an hour 12-volt lead acid batteries, so most of what was needed to build a new hull I already had to hand.

I made no plans as such, just a few sketches and a very important wiring diagram.

As evidenced in my photos, the finished vessel, which I've named *Wattsun* (what else!), looks rather barge-shaped. This was deliberate. Firstly, the design minimised build time. More importantly, though, it offered the reassurance that, should this experimental project result in failure, all the electrics could be removed with ease and used in a future model. *Wattsun* would then join the other unpowered barges to be towed by tugs.

A slightly bowed piece of 10mm plywood became the flat-bottomed



Robert's wiring diagram.

Wattsun in action on Coate Water Lake, with dinghy in tow.



piece of my barge-shaped hull (measuring 110cm in length overall, with a 28cm beam), the slight curve in the wood giving a nice sheer to the outline. The deck frames and transom were all crafted from 3mm plywood from the back of an old wardrobe I'd cannibalised. The superstructure I kept quite basic by constructing a wheelhouse from 'Liteply', onto which I grafted a cabin retrieved from a previous model.

Construction began in May 2024 and by the end of July 2024 the hull was finished to the point of water testing.

On the water

Fish pond trials showed that on a sunny day the solar panel was kicking out about 12.9-volts. The motor was taking approximately 800/900 milliamps with



Mixing it with the fast boys on the expanse of the Coate Water Lake!



Adding a few fittings transformed a basic plywood box into a reasonable looking model boat. The only purchased items were the anchor, life rings and the working hollow ventilators.

the boat being held static. The battery remained at a steady 12.6-volts. The first run lasted 20 minutes, followed by a further run of 40 minutes, at which point the battery was still giving 12.6-volts. Naturally, the solar panel output varied as clouds passed across the sun, at one point dropping to 12.2-volts.

The first proper test run was on a section of a local restored canal, but only two runs were made due to excessive weed. The sky was slightly

overcast, and at the end of the session the battery still showed a healthy 12.5-volts.

The next outing was to the Coate Water Lake, home of the Swindon Model Boat and Engineering Club. Again, there were sunny intervals that day. Two long runs were made, with a short rest period on the bank for checks to be done. With the switching in the charge position, the charge rate at the battery was showing an average of 12.87-volts.

Further tests will follow, and it will be interesting to see what happens as autumn and winter, with their darker skies, approach and, as a consequence, light levels fall. So far, though, the project appears to have been a resounding success and my fellow club members have expressed a lot of interest in my solar-powered tug. I am hoping, therefore, that Model Boats readers will also enjoy seeing and reading about Wattsun. ●



Alan's sympathetic restoration of the model donated to the Dover Transport Museum.

'Anglia' appeal

Having put much TLC into the restoration of a model of unknown origin, **Alan Poole** is now looking for answers...

This model was donated to the Dover Transport Museum recently and was readily accepted as it was believed to be a model of HMHS (His Majesty's Hospital Ship) *Anglia*. During World War I, this ship hit a mine and sank just off Folkestone with the loss of 134 lives, including both wounded soldiers being brought back from France and crew. This tragic event was obviously well recorded and, being very local, was of great interest to the Dover Transport Museum.

My involvement with the model and its story started when I was asked if I could restore it for the museum. The Model Boat Association Dover has close ties with the DTM (Dover Transport Museum), so, as a member of that club, and already having several models on display there, I readily accepted the challenge.

My brief was to sympathetically restore the model, maintaining its slightly naive charm. We didn't



Taken prior to work commencing, the stern section, showing the type of work necessary to get this fine model back to its original condition.



Nicely detailed considering its diminutive size of just 50mm in length overall, somewhat confusingly, considering what Alan's research would later reveal, the words 'Anglia London' have been hand painted on the stern of the portside motorboat.



Below deck, the original builder had gone to the trouble of crafting a little unit, measuring just 50mm x 55mm, containing fully detailed officers' cabins.

know who had originally built it, or when; all I can say is that the detail incorporated was very impressive, so whoever was responsible clearly knew his/her stuff. It had, however, been hand painted, and then over

the years repainted. As I didn't wish to disturb the patina, I knew I had to tread carefully here, by simply and subtly touching up some of the damaged paintwork areas with carefully matched paints.

Naturally research plays a very important part in the restoration of any model, and what I was to discover will be revealed later, but let's begin with the modelling aspects of the project...

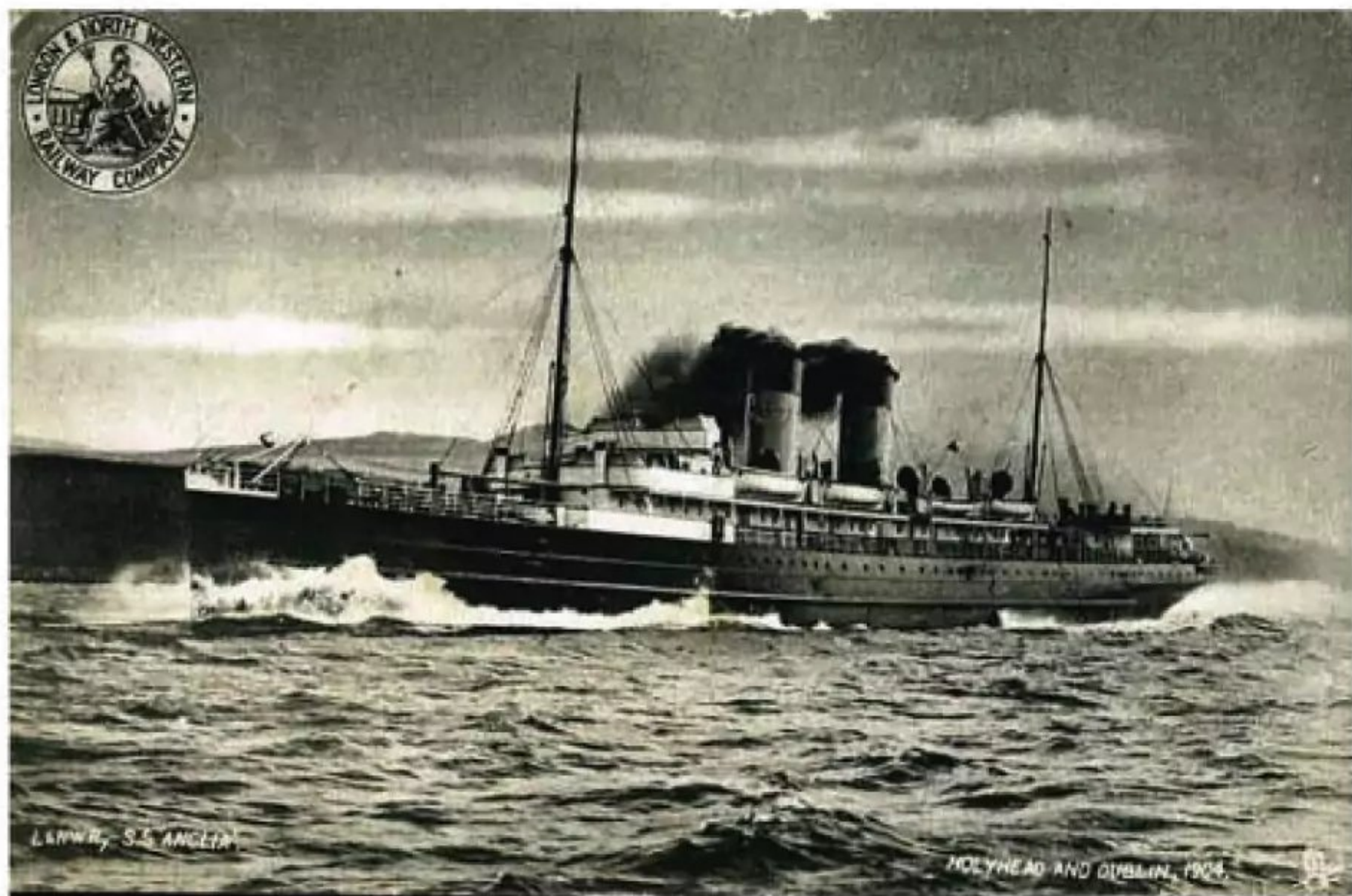


The steam plant had originally been squeezed into a very small space in the model.

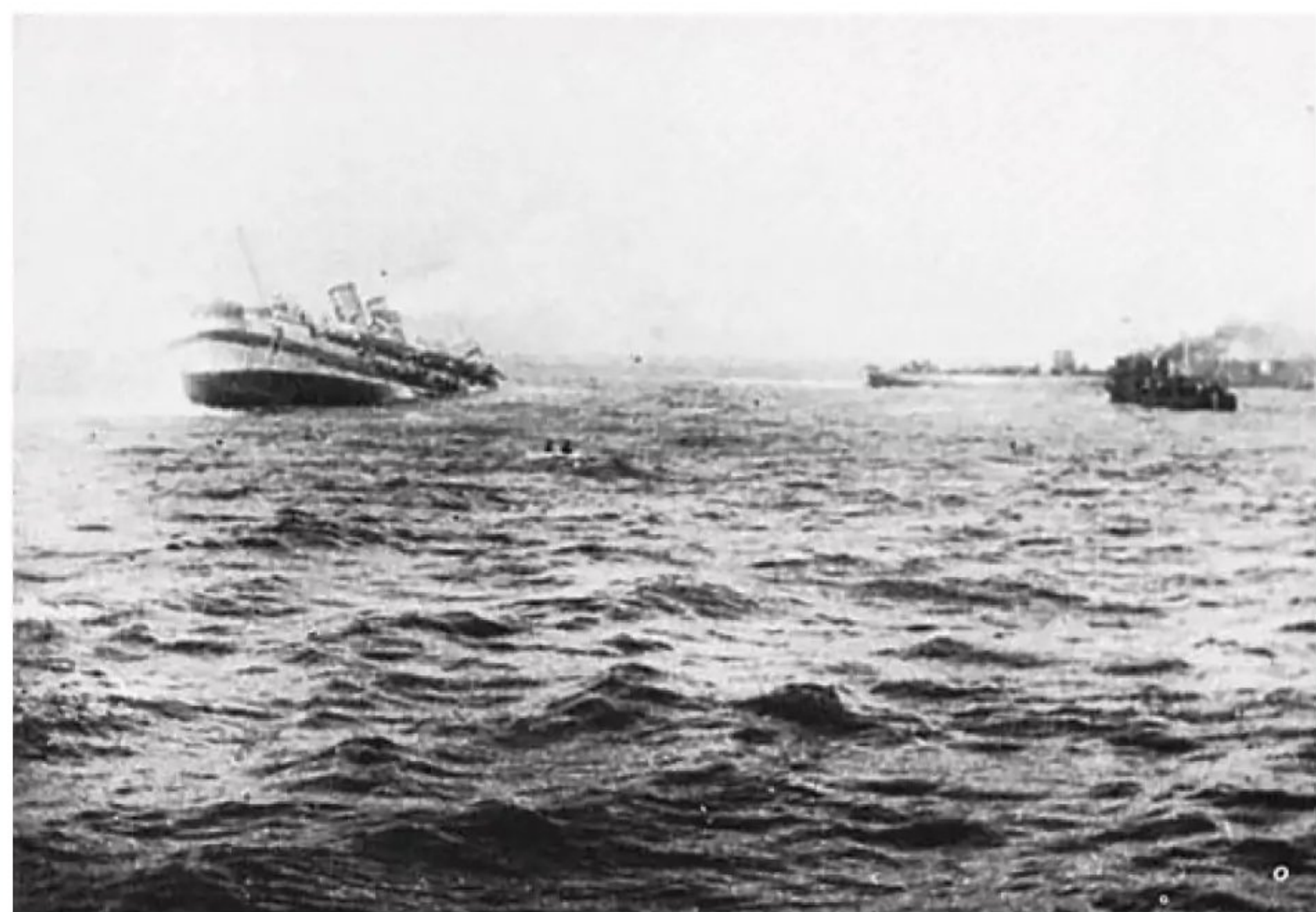


Alan decided to remove this and display it alongside the model in the museum.

SS ANGLIA



Anglia, built in 1900 by William Denny and Sons for the LNWR (London & North Western Railway), while still serving on the Irish Sea route as a fast steam packet ship.



Tragedy caught on camera: HMHS Anglia sinking off Folkestone in 1915 after hitting a mine while transporting wounded soldiers back from France.

“My brief was to sympathetically restore the model, maintaining its slightly naive charm”

Gently does it...

The type of work necessary to get this fine model back to its original condition can be seen in my close-up photo the stern section; this was taken before restoration began. The companionway/ boarding ladder has its rope hand holds covered in paint, the stanchions are bent, and the rigging for it just attached to any convenient point. The rear mast needed to be rerigged and the cargo derricks are laying at obscure angles. The paintwork damage is also evident. Looking closely, you can see the white paint has run over the black; all this needed cleaning off and the demarcation line tidied up. On the red painted section below the boot topping, the paint had crackled – my guess would be this had been, mainly, caused by UV over exposure, i.e., that the model had at some point been displayed near a window, as the starboard side was unaffected. As the museum didn't want a pristine finish and preferred to keep this model's aged look, the area where a previous stand had worn away the red paint (just visible in the photo) was simply matched in, then artistically weathered again to camouflage the repair.

Also just in shot is the after portside motorboat. The lifting block and tackle had come away and new rigging was needed. The boat was, therefore, removed and cleaned before being repositioned squarely in its cradle. It is very well detailed and considering its size,

being only 50mm in length, the detail is very good. The lettering 'Anglia London' is hand painted on the stern, the rudder pivots, and the little propeller rotates.

Another exciting find when restoring the model was the fully detailed officers' cabins. The actual size of this little unit is only 50mm x 55mm. When cleaning the bridge section, I noticed a bulkhead move and realised the lower bridge section could be lifted off to view three berths with bedding and wash basins in each, a central bathroom with all fittings faithfully reproduced, and a rest room with bookshelves and a table. All this detail is made mainly from wood. As such, the grain is evident in places and the very fine work shows signs of ageing. However, considering the materials that would have been available back when this old model was constructed, someone has done a remarkable job.

The bridge itself, above these cabins, is also highly detailed. The roof of the wheelhouse lifts off to reveal the two telegraphs inside, and the ship's wheel behind the binnacle turns as one would expect. On the deck, there are wooden gratings for the helmsman to stand on; these are very fine indeed, nicely made and varnished.

The raised forecastle area required some attention, and the deck when cleaned was patchy and needed revitalising – several coats of thinned satin clear varnish brought it back to life. This treatment was applied to all the decks on the model to give the same effect.

The front handrails were really bent and covered in thick paint, so a decision was taken to clean all the paint off and straighten them. Once the jackstaff was replaced and the anchor rehoused, this area was vastly improved.

An unusual detail in the well deck were the two large boxes of cargo; these had hand painted instructions on them, stating they should be "stowed away from boilers"!

A complete re-rigging of the model was undertaken, a replacement pilot flag was hoisted to the starboard outer halyard, the derricks were re-stowed over the forward hatch, many fittings were repaired, the whole ship thoroughly cleaned, and I handmade a red ensign from an old handkerchief, which now proudly flies from her stern.

When I'd lifted the tarpaulin-covered hatch to re-varnish the deck, I'd found a wooden grating underneath, which obviously served to allow air to reach the live steam boiler. I also discovered the large ventilator visible before the mast is also hollow and trunks down to admit air to the steam plant. I decided, however, to remove the live steam plant in its entirety and mount it on a board alongside the model as another interesting addition to the display.



Alan had hoped the house flag that was displayed on the after mast would provide further clues to the vessel/ model's true identity, but sadly a blank was drawn here.



Now restored to former glory, can anyone reading tell us any more about the provenance of this model?

Can you help?

Now exhibited at the Dover Transport Museum, located in Willington Road, Whitfield, Dover, though, the story is not quite over, as a mystery remains...

“As I pondered these differences, a couple of other what should have been glaringly obvious anomalies from the outset dawned on me...”

The hospital ship *Anglia* was built in 1900 by William Denny and Sons for the LNWR (London & North Western Railway) for use on the Irish

Sea route as a fast steam packet ship. She continued in this role until requisitioned during World War I as a hospital ship and was then lost in tragic circumstances in November 1915. During the course of my research, I examined photographs of the *Anglia* both in harbour and when she was sinking and noted that all show her with a counter stern, whereas the model has a cruiser stern. The model also has a prominent raised forecastle – whereas the HMHS *Anglia* had a flush deck forward, with a short-raised Jackstaff bulwark. As I pondered these differences, a couple of other what should have been glaringly obvious anomalies from the

outset dawned on me: the model has radar – a navigation aid not available when HMHS *Anglia* sank in 1915, and electric winches – not introduced until the middle of the 20th century.

There was another *Anglia* built to replace the original in 1920. This vessel, also a fast railway steam packet ship, was damaged when she hit the breakwater at Holyhead, and so was laid up, before eventually being broken up in 1935 – but, again, this was too early for the radar and winches fitted to the model.

Perplexed by these discrepancies, I decided to seek help. One possible clue was the house flag that was displayed on the after mast, so I posted photographs of it on a model boat forum asking if anyone recognised it. I had hoped if I could identify the company, that in turn would allow me to put a name to the ship. I had several responses, including one from a knowledgeable acquaintance in the North-East and one from Model Boats' contributor Colin Bishop. Colin consulted his extensive records and the William Denny archives but ultimately drew a blank. Living in the Dover area, I naturally know many mariners and crew on the ferries, some of whom are master mariners, so my next step was to consult them, and they all came to the same conclusion: the model must be a freelance design based on a ship that the builder obviously had an intimate knowledge of.

I would, however, really like to know if anyone recognises this model, or might be able to supply any more information about it. If I could identify the builder, that would be of great interest, both to myself and the Museum. ●



An Adamcraft dinghy afloat. Image courtesy of Roger Clements.



“It was a friend, Alan, who first alerted me to the program and we both saw its immediate potential for model making”

The Adamcraft Dinghy

Alan and I decided on the laser cutting of all the 3mm plywood parts needed to make an Adamcraft 18-inch sailing dinghy. I told the story of Adamcraft in the September 2023 edition of *Model Boats*; suffice here to say that the dinghy would make a very attractive model for static display, even if we didn’t want to sail it. Harvey Adam’s book *Model Boat Construction* would provide the necessary plans and construction notes. We would only be able to cut the 3mm (originally 1/8-inch) parts, but these constitute the bulk of the model and are the trickiest parts to cut. First however, the plans needed to be digitised by tracing them into a CAD (Computer Aided Drafting) package.

CAD tracing

Tracing begins with putting a scanned image of the printed plans, suitably adjusted for scale and orientation, into a CAD program as a backdrop image – here I used ProgeCAD, a clone of AutoCAD. The process is not just a matter of tracing over the plan lines, for these were originally hand drawn, so you have to allow for the potential for errors and the fact that they have been subjected to further distortion by the various processes that made possible their reproduction in a book. Consequently, much care and thought are required while tracing so that a part is not just slavishly copied but corrected for shape and position as you proceed.

“The process is not just a matter of tracing over the plan lines, for these were originally hand drawn, so you have to allow for the potential for errors and the fact that they have been subjected to further distortion by the various processes that made possible their reproduction in a book”

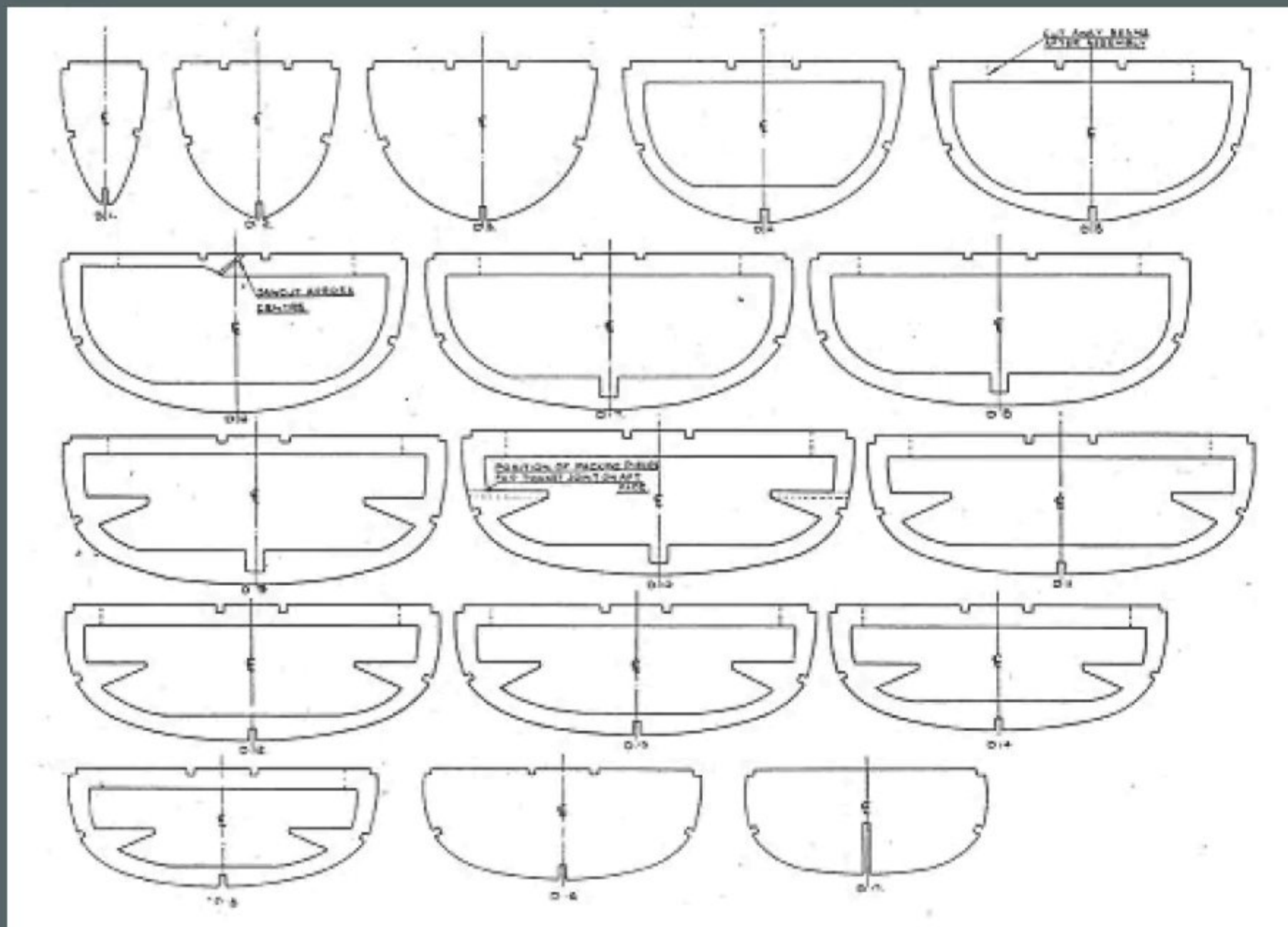
MAKERSPACE

Shh! **John Parker** is about to report back on a cutting-edge new initiative at his local library

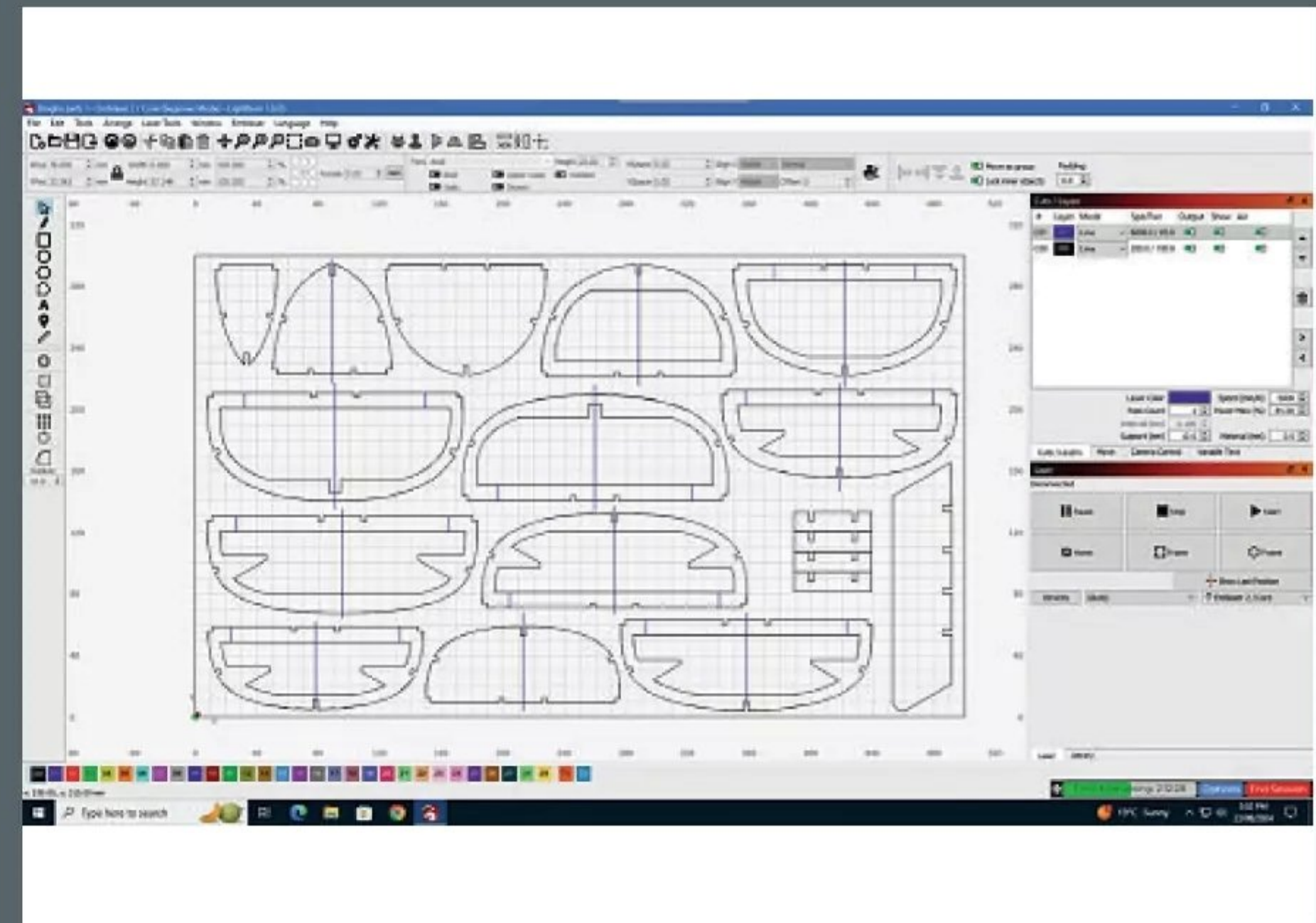


Recently a local library here in Melbourne instigated an initiative called Makerspace, where members are invited to sample creative technologies such as laser cutting and 3D printing using the library’s facilities set up in a special room. It

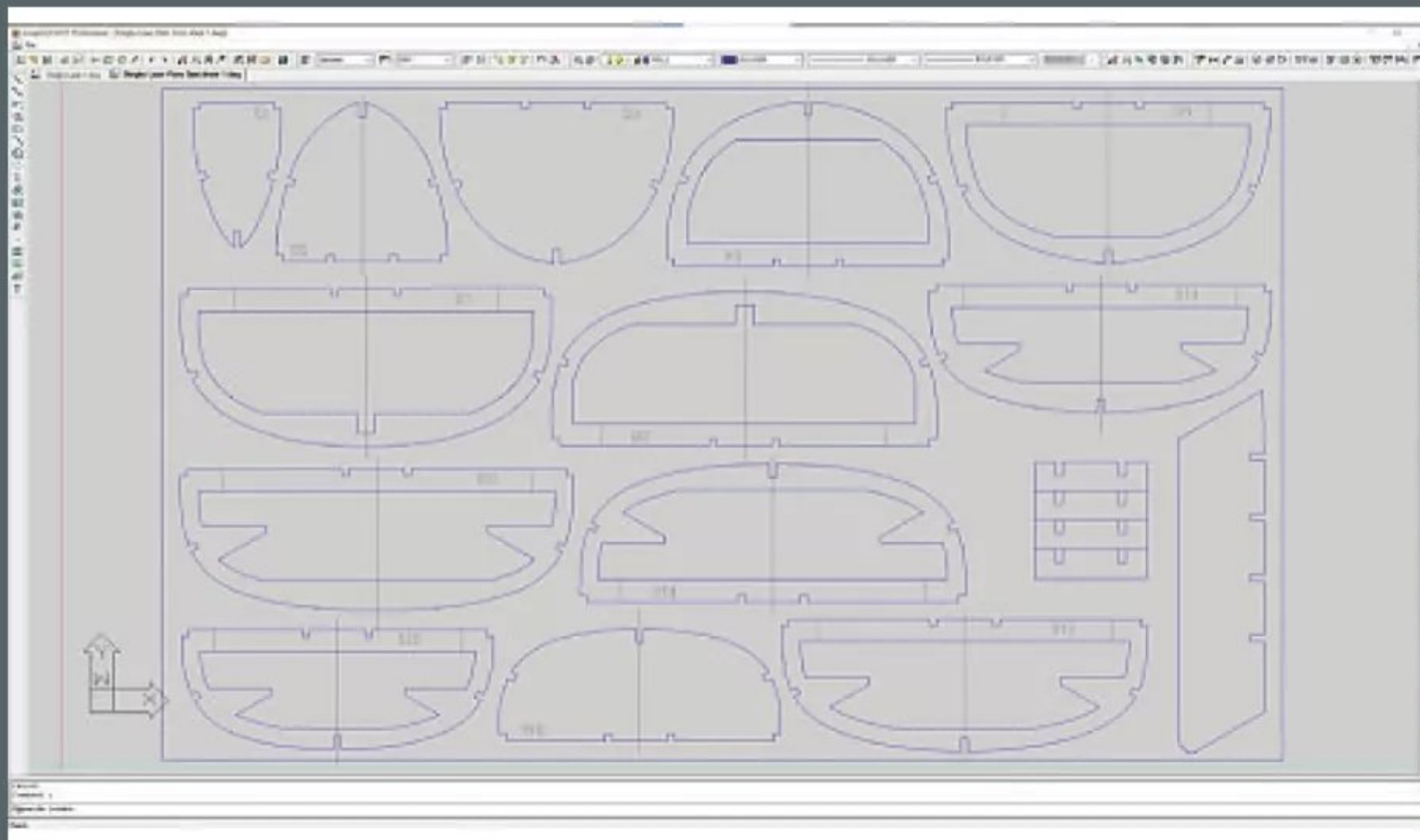
was a friend, Alan, who first alerted me to the program and we both saw its immediate potential for model making. Participants doing the course would be able to make their own designs, and we were shown some examples such as laser-cut plywood drinking coasters and miniature 3D-printed bunny rabbits, but we had altogether more ambitious goals...



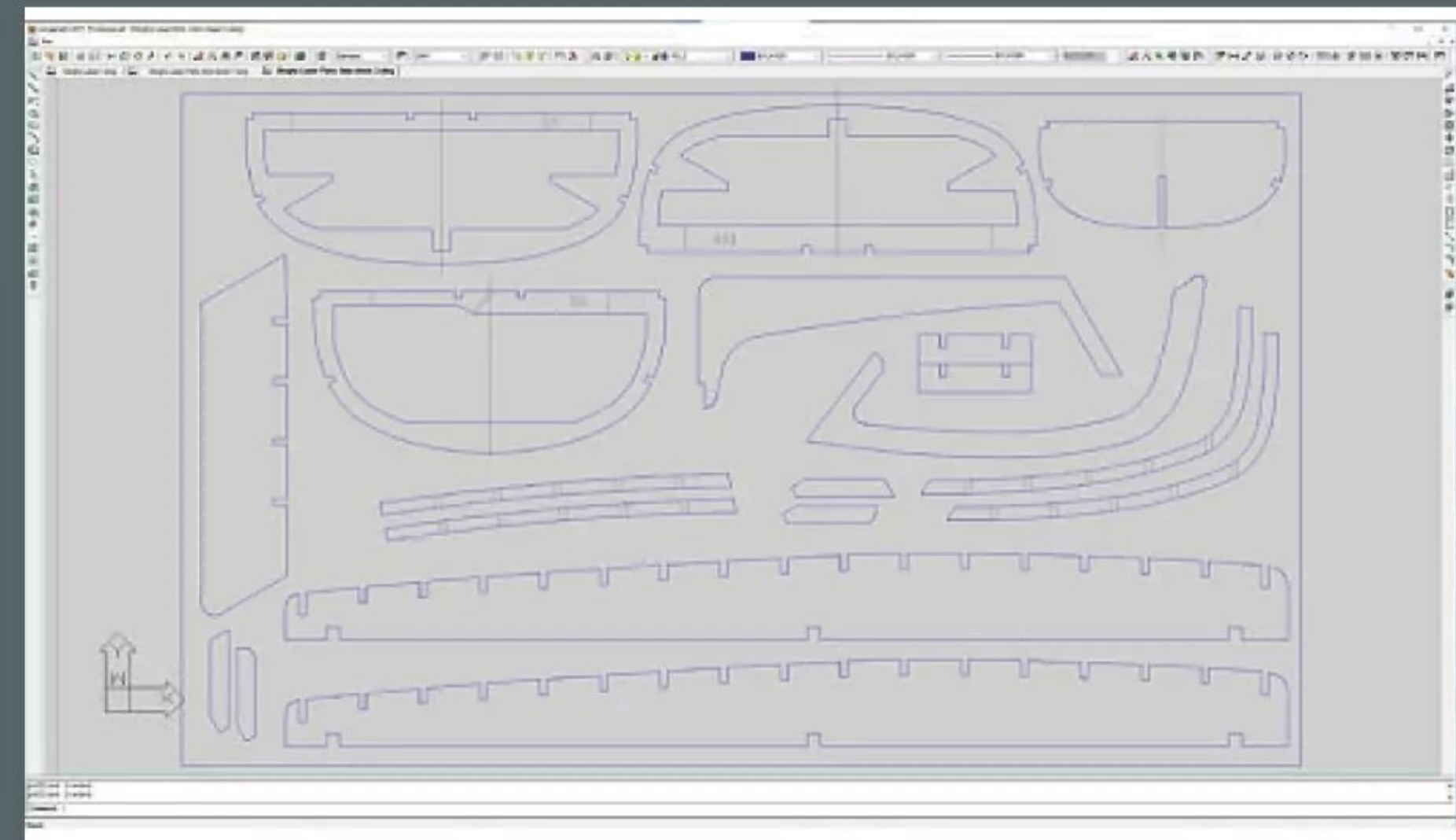
The dinghy's frames, as reproduced in Model Boat Construction.



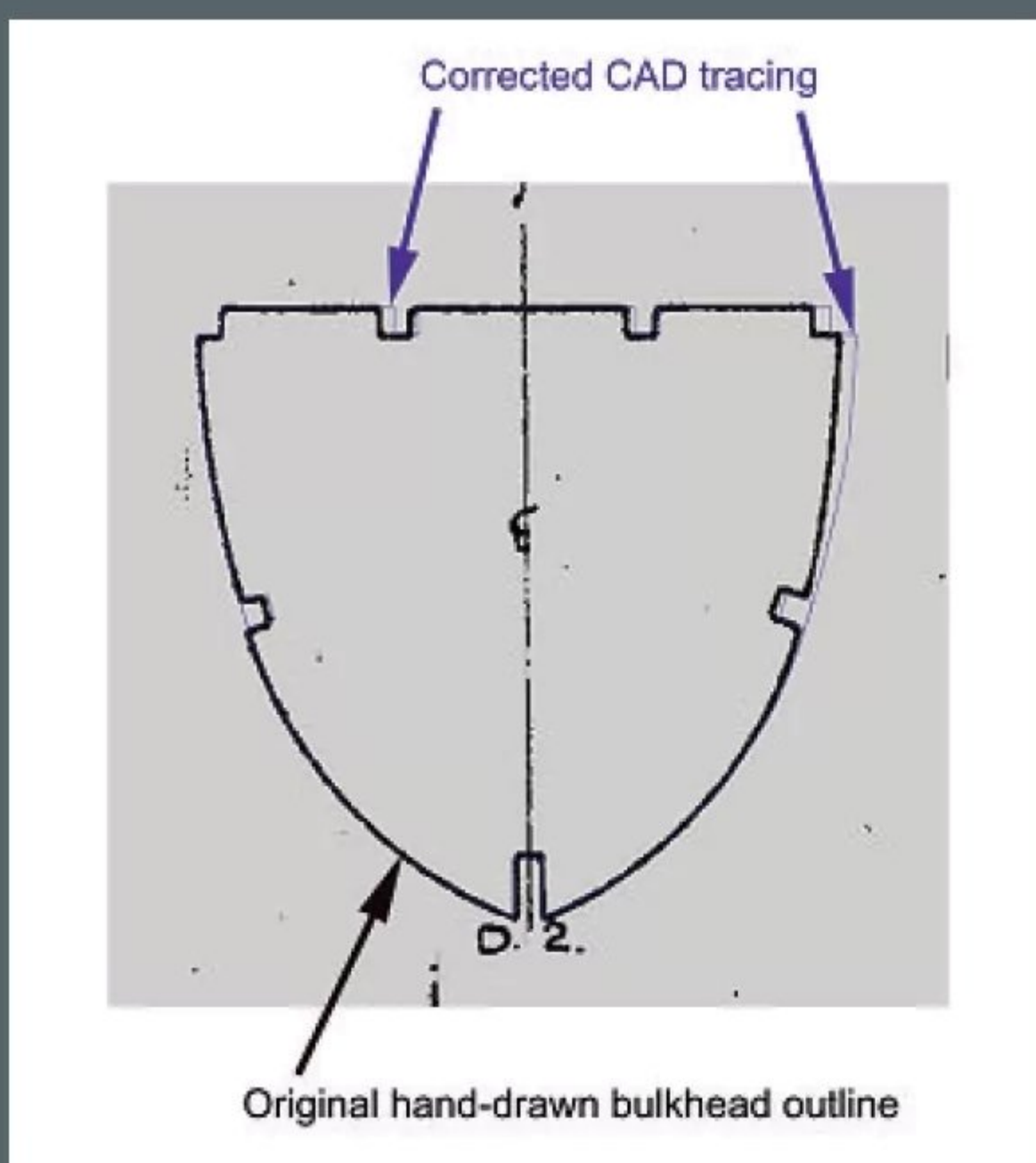
The Lightburn software interface.



The frames and other parts arrayed for cutting on Sheet 1.



The frames and other parts arrayed for cutting on Sheet 2.



Correcting a frame shape traced in CAD.

As an example, one of the pictures shows the scanned image of frame D2. It can be seen that the frame is not symmetrical; it appears the draftsman, having made a reasonable job of drawing the left-hand frame half, then got a little fed up and hastily sketched an undersized right-hand half. 'Mirroring' the traced

CAD outline of the left half over to the right half reveals the extent of the error. Determining which half is correct, and which isn't, may require measurements to be cross checked with the elevation view, as in the case here with the frame notches.

The ply material is supplied free of charge by the library as 500mm x 300mm x 3mm sheets so, once I had traced all the shapes, I had to mix them up and move them around so that they all could be fitted on two sheets with minimal waste. Here I greatly benefited from years of previous experience helping my mother cut tart cases and lids from a sheet of pastry!

Setting up

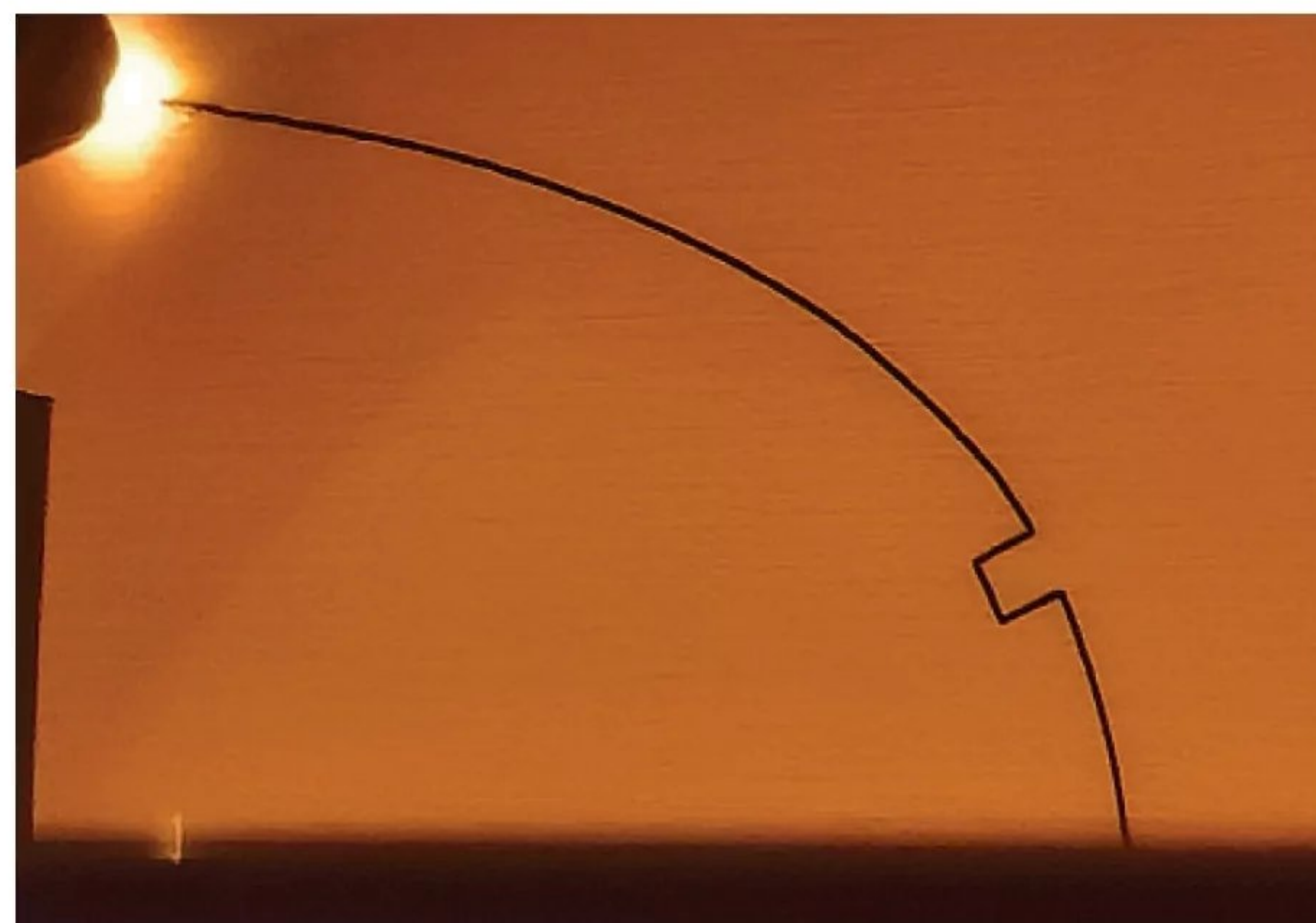
Armed with a memory stick that had the two sheet layouts saved to it, and having previously completed an introductory course on the safe operation of the equipment, Alan and I fronted up to the library to cut our first frames. Sessions are not supervised from this point on. The software used to interface with the

laser is called Lightburn, and we soon had the first sheet loaded and displayed on the screen. The preferred file format is Scalable Vector Graphics, indicated by the .svg suffix, but many other types of vector images can be loaded, including Drawing Exchange Format, .dxf, which is commonly used in CAD work.

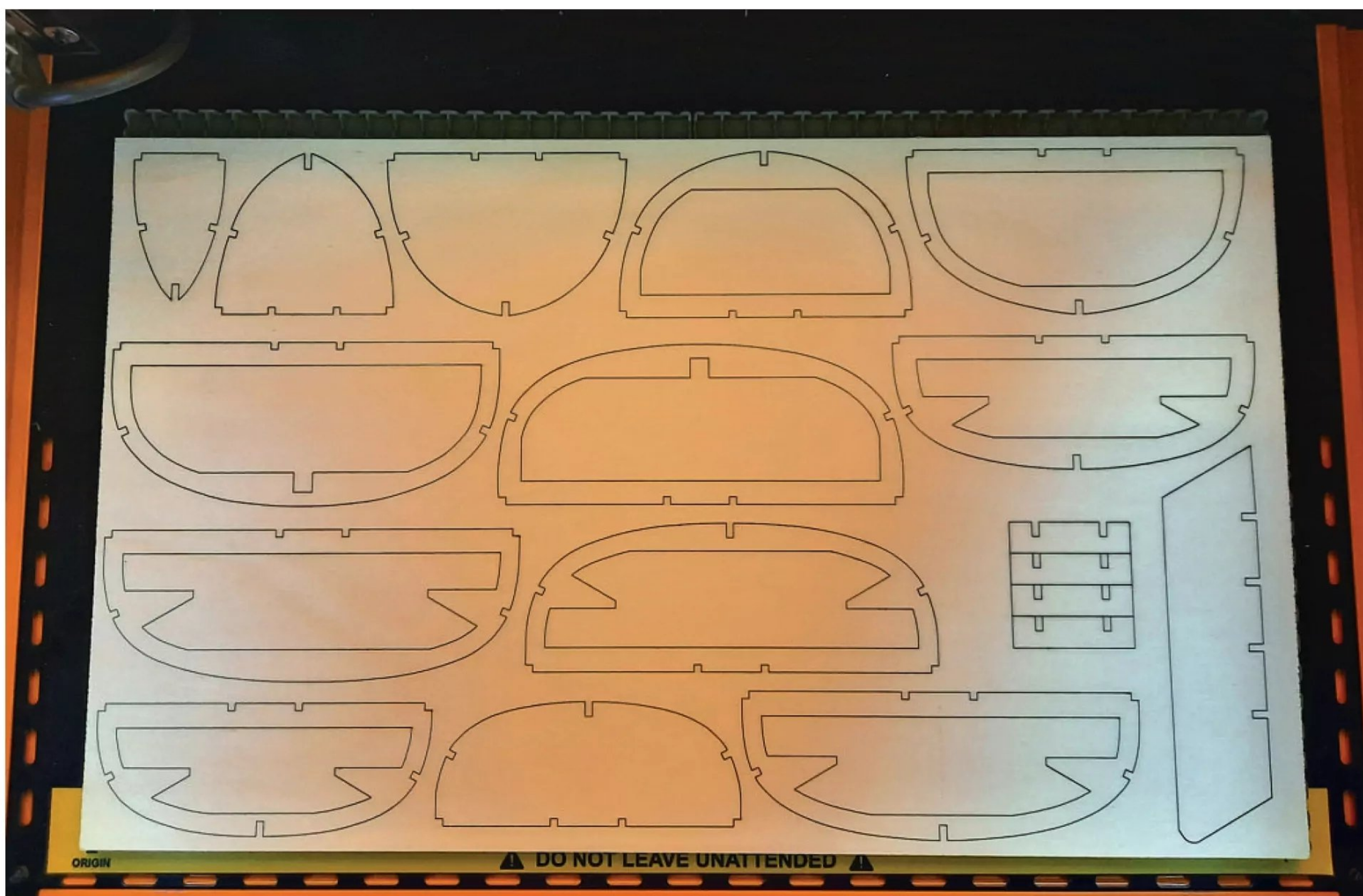
The laser machines used are known as Emblaser 2s, locally made in Melbourne by Darkly Labs (darklylabs.com). They measure 720mm x 540mm x 200mm and sit on a desktop resembling a large (A2) paper printer with an orange tinted lift-up lid. A fume extractor sits below the desk. They use a Class 1 semi-conductor diode laser operating at 445-455 nanometers wavelength, which is blue in colour and silent in operation. Most craft materials can be cut, such as cardboard, felt, paper, acrylic and wood. The library supplies these, as the use of unapproved materials such as PVC, vinyl, ABS or fibreglass results in the production of toxic



Emblaser 2 desk-top laser cutters.



The laser at work.



Finished cut sheet in the machine.

fumes. Although acrylic can be cut, it must be opaque, as the laser beam will pass unrestricted through clear acrylic – so alas it can't be used for the cutting of cabin windows.

Next it was necessary to set the parameters for the laser. Lines that had to be cut through were assigned to the black layer, with 100% power level and relatively slow 200 mm/minute speed set. Labelling of the frames, requiring only a light etching of the surface,

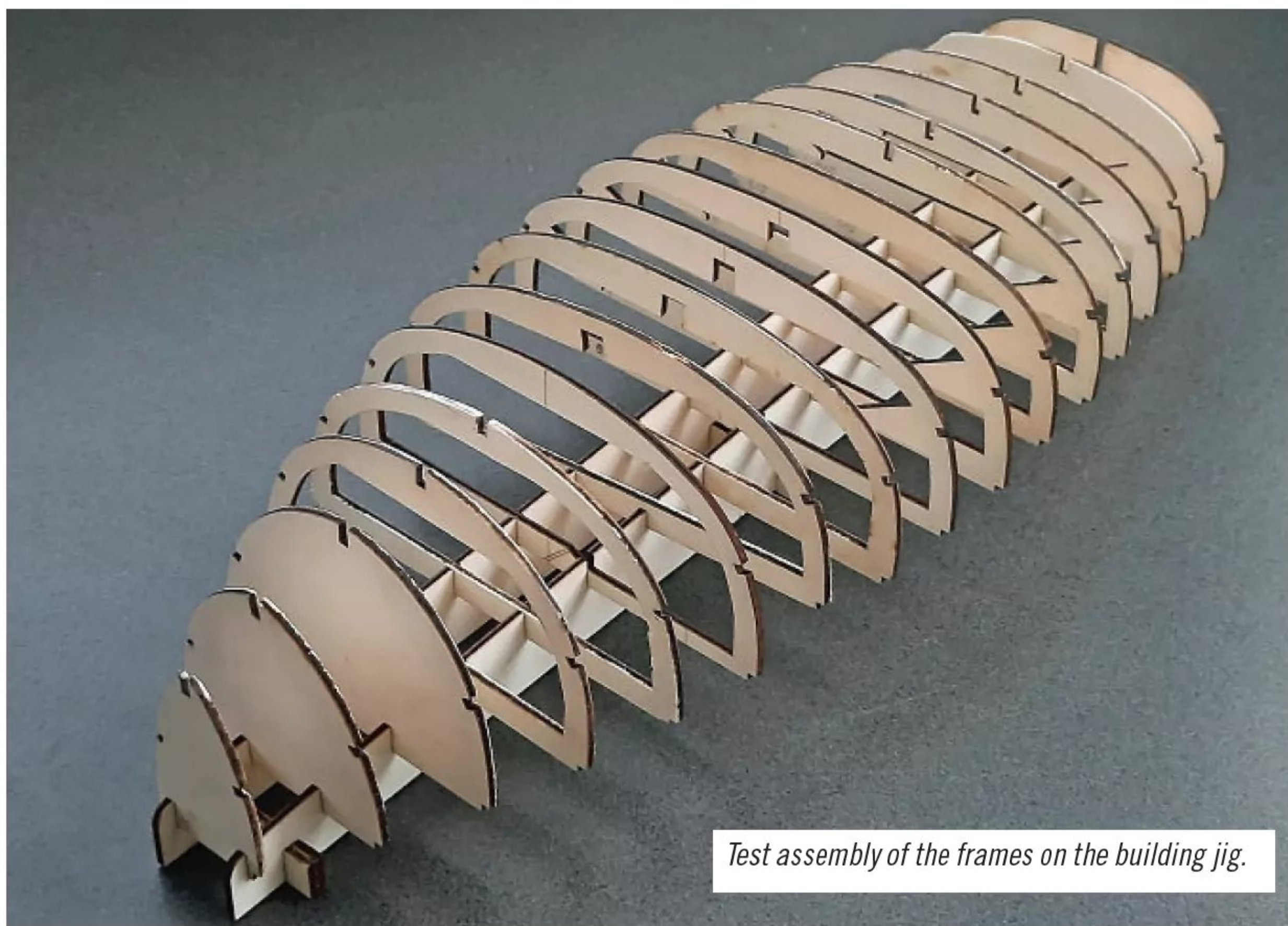
was assigned to the blue layer, and a high speed at a lower power level was set. A quick test was made with a scrap piece of plywood, then a fresh sheet was loaded, and we sat back to watch the results.

Operation

Like a pen plotter, the software decides what path the laser takes to cut all the parts, appearing to miss some lines at times, only to come back and do them later. It took about

45 minutes to cut the first of the two sheets required by our dinghy and, for some reason, considerably longer to cut the second. Removing the ply sheet from the machine, we found that all the parts were still held firmly within the sheet and required some careful light scoring with a hobby knife here and there to release them. Curves were smooth, with no signs of jaggedness, and notches were crisp and well defined. There were no signs of burning on

Close-up of a frame freed from the sheet.



Test assembly of the frames on the building jig.

imperfections were a result of the original tracing of the parts, rather than the laser cutting. These could be corrected on the drawing and replacement parts cut if really necessary. The fit of the notches was just about right; not too loose, yet not so tight that epoxy glue would be squeezed from the bonding surfaces. The assembled frame hinted at the decorative appeal of the completed dinghy. Of course, there is a lot more work to do to complete the model, but that will have to wait for another time.

“It may be worth your while to enquire if a similar program is available in your area”

Just the ticket

We enjoyed the experience of laser cutting in the Makerspace program, and it showed that even a simple, low-cost laser machine could produce perfectly satisfactory parts for the making of a model boat. The time taken was considerable, but of course you can be doing something else and just be on-hand to monitor operation from time to time. It may be worth your while to enquire if a similar program is available in your area.●

the face of the cut parts, though naturally the cut surface itself had a brown discolouration. This could be removed by sandpapering, if necessary, perhaps to make a stronger glued joint.

Some adjustment needed to be made to the recommended speed and power settings before we could achieve clear etching of the frame numbers and centre lines on the parts. Producing the parts for two dinghies (i.e., four sheets) took about four hours with set-up.

Assembly

We did a temporary assembly of one framework to check that all was well. First the laser-cut assembly jig was put together, which provided the correct location for all the frames. Because we had been only able to cut from 3mm ply, some of the keel box components will need to be re-cut manually from thinner ply using the 3mm parts as templates. For this reason, the keel components are not shown in the photograph of the assembled frames.

All generally went well; any slight

1



Manannan Propulsion Mk 2

Roy Cheers explains his latest design

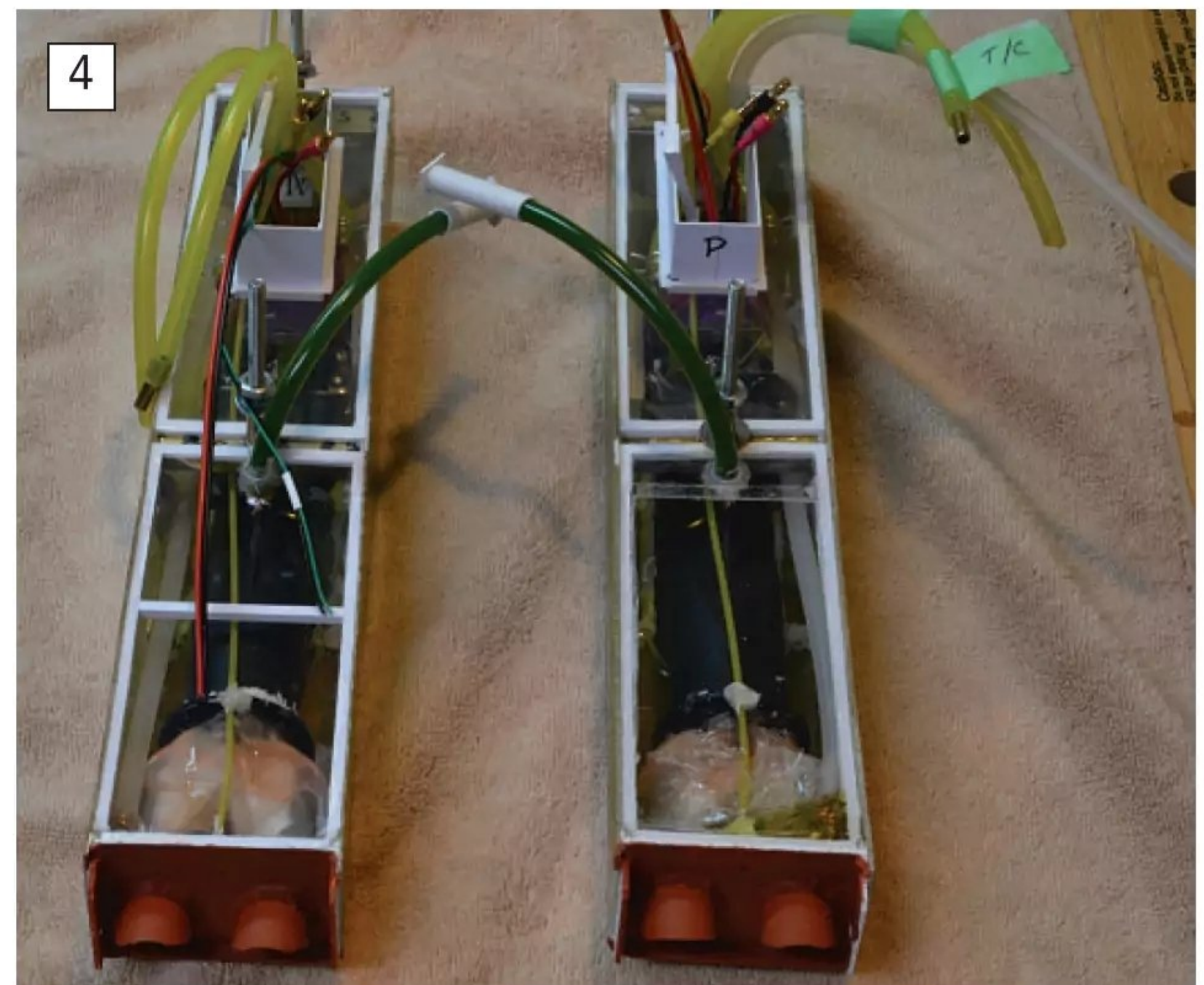
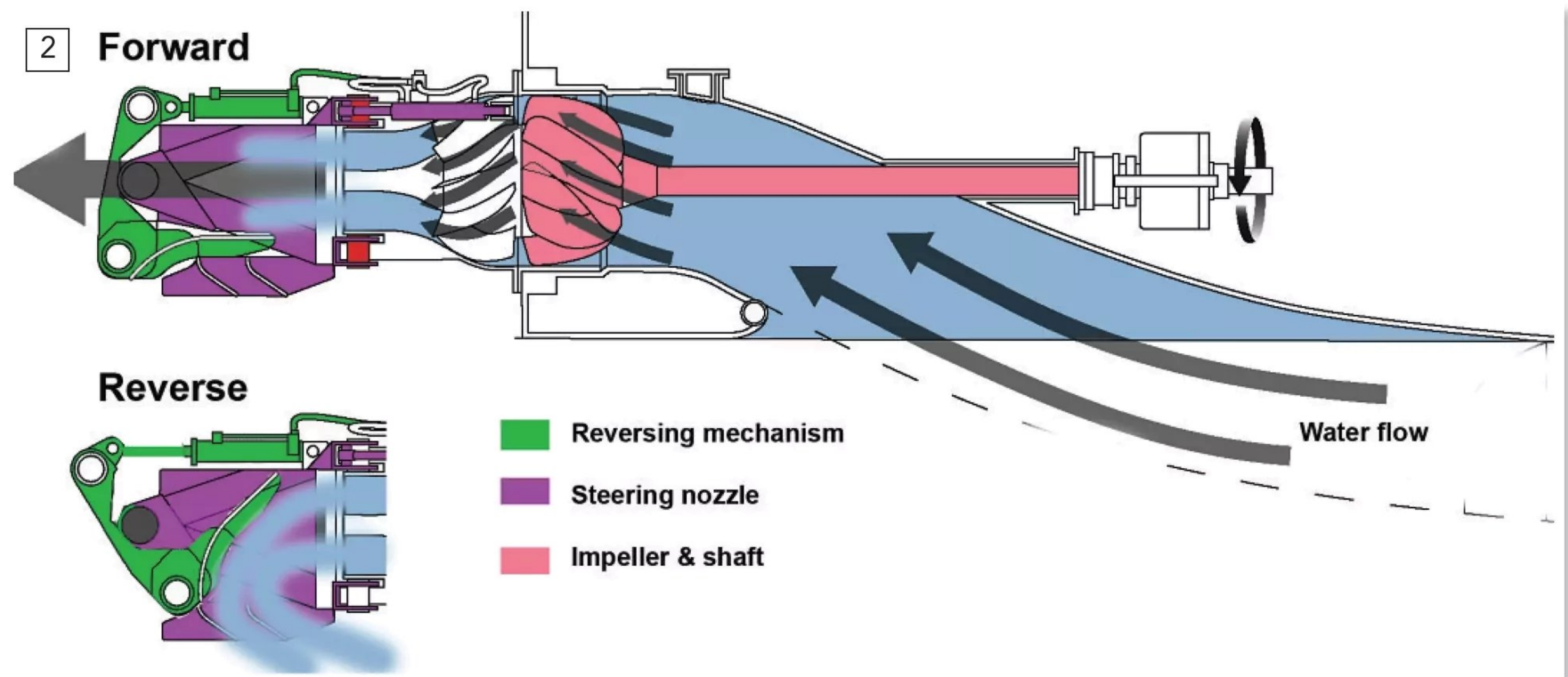
In an article featured in Model Boats December 2018 issue I described the build of my Isle of Man Steam Packet Co's catamaran ferry model, Manannan, (see **Photo 1**). Because there were no suitable ready-made steering nozzles for the waterjets, or kits from which to build some, I decided to make use of

simple 'tank steering', which meant slowing down on the inside of a turn, and vice versa. Going astern was achieved by lowering a curved shield over the jet discharge. After some running, however, I realised that tank steering was entirely inadequate, and the turning circle too large. Regular readers may recall me mentioning

steerable reversing nozzles were necessary, and that an etched metal design was being considered. Time, then, for an update...

Initial design decisions

What we will be looking at here is not a breakthrough in the design of waterjet steering, simply an



adaptation to a small scale. The basis for my design was an illustration found on the internet (see **Photo 2**) that I felt was a reasonably good match for the Manannan. I think the picture shows a design made by Rolls Royce/Kamewa, although the Wartsila design appears to be very similar. The purple part is the main steerable nozzle, and the green part the reversing flap. The picture shows a side view, as if the items were cut along the centreline. When the vessel is moving ahead, the water coming out of the waterjet goes straight through. Going astern, the reversing flap, shown in green, pivots anticlockwise to block off the discharge and forces the water to go through guides in the bottom which direct it forwards.

Steering is achieved by swinging the whole purple-and-green assembly to right or left, around the pivot, shown

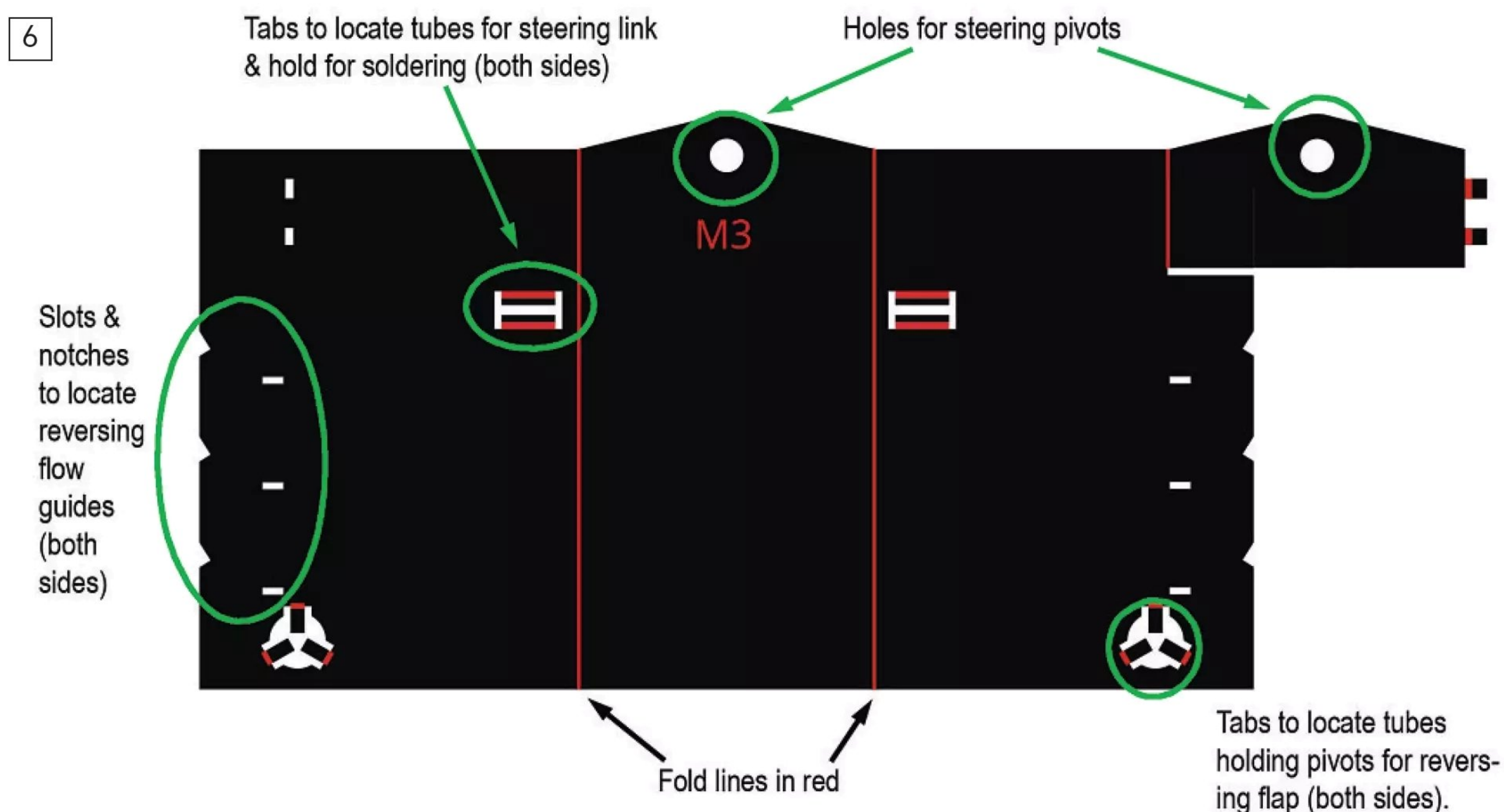
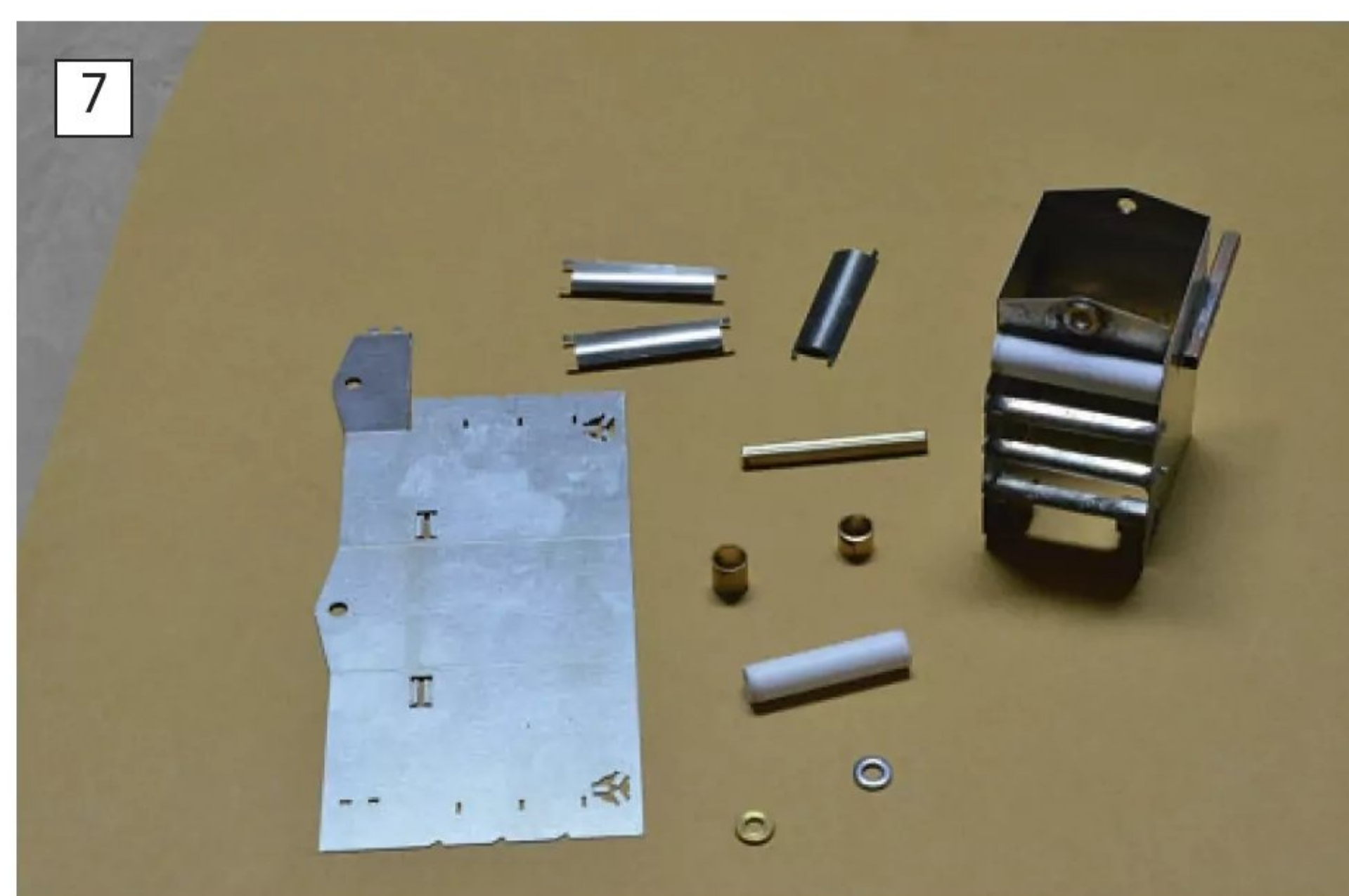
in red. On the real thing, the reversing flap and steering movement is done using hydraulic cylinders. **Photo 3** shows a view of the discharge end of Manannan's waterjets. **Photo 4** shows the propulsion boxes as fitted on the original build; the full-width reversing flaps (not shown) covered the two discharges.

"My workshop contains no more machine tools than a drill press and a small lathe, so this helped push the design decision to make the nozzle shell and reversing flap from etched metal, and other parts from readily available brass and aluminium tube"

My workshop contains no more machine tools than a drill press and a small lathe, so this helped push the design decision to make the nozzle shell and reversing flap from etched metal, and other parts from readily available brass and aluminum tube.

Having decided to link two nozzles together for steering, the length of the steering link between them and the nozzle spacing needed to match accurately to ensure that the two nozzles would always be aligned. This led to another decision to also make the steering link and a mounting frame for each pair of nozzles from etched metal. This had the further advantage that the assembly of two nozzles could be made removable.

Etched metal parts can be designed and made very accurately, and at worst need just a minor touch up with a file or broach. The pattern from



which my parts were made was a black and white picture, the design of which typically requires the use of vector graphics software (this stores the picture as mathematical formulae and uses simple shapes, circles, rectangles and triangles to build up a design). I used Inkscape, which is open-source and free to download. I started with a hand-drawn pencil and paper design for the parts at five times full size. Quite a lot of erasing and redrawing was involved before I concluded I had a workable design. The etched metal parts were then drawn at the correct size using Inkscape; on a computer it's possible to zoom in and out to check details, so I was easily able to expand the design on my screen to five times full size. Once happy, the main parts were printed out on paper at five

times full size so they could be trial 'assembled'. Finally, the computer file was emailed to PPD in Argyll, who did the etching for me.

A part-by-part explanation

It will be easiest to explain the design, and how photo-etched parts can be used, by describing the parts one-by-one. To put a size to them, the discharge tube from the waterjet has an outside diameter (OD) of 19mm, and the steering nozzle a width of 21mm and overall height of 27mm, not including the height of the steering pivot. The etched parts are made from nickel silver.

1. Reversing flap

Photo 5 shows a completed flap, which fits inside the nozzle, plus the

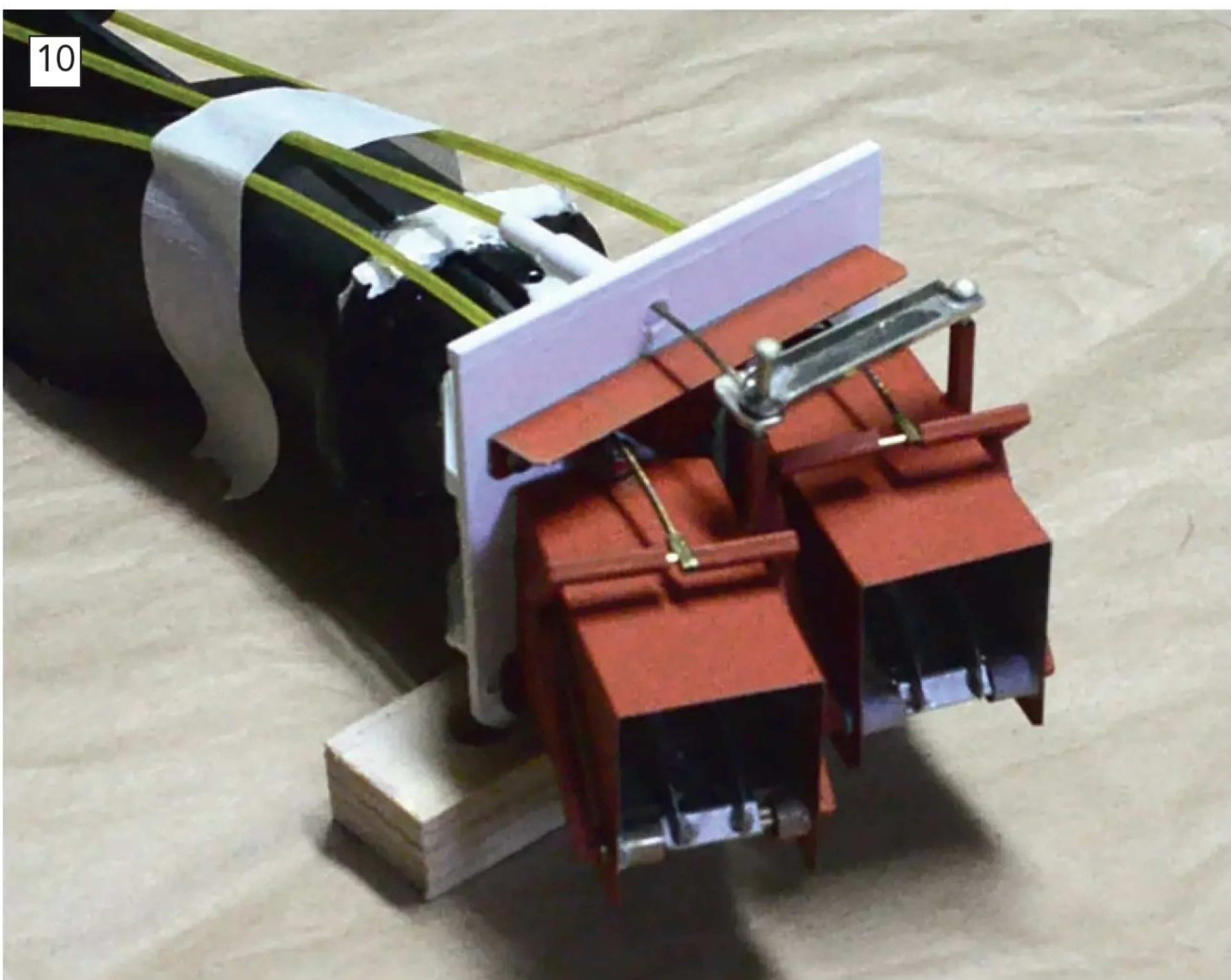
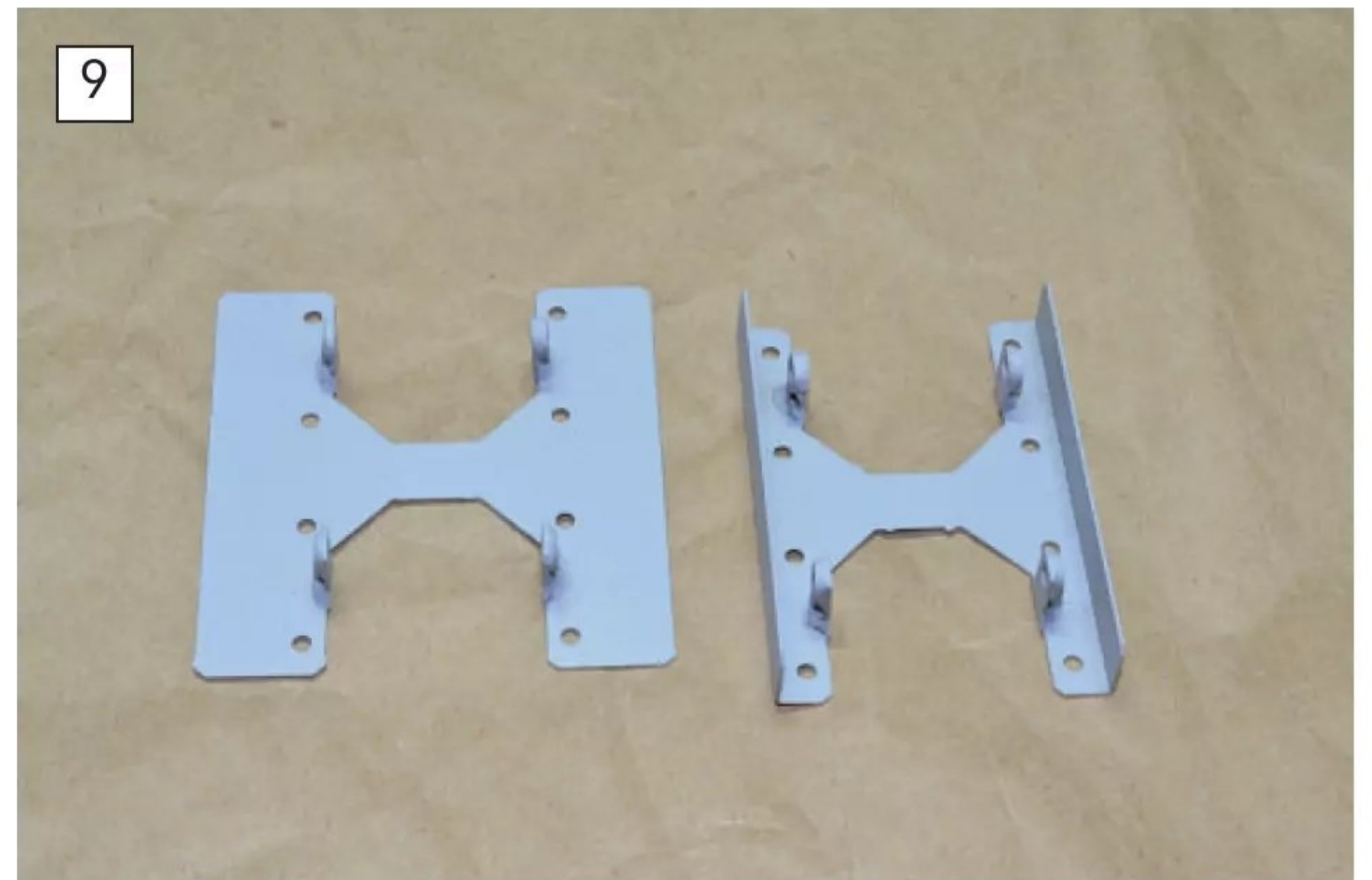
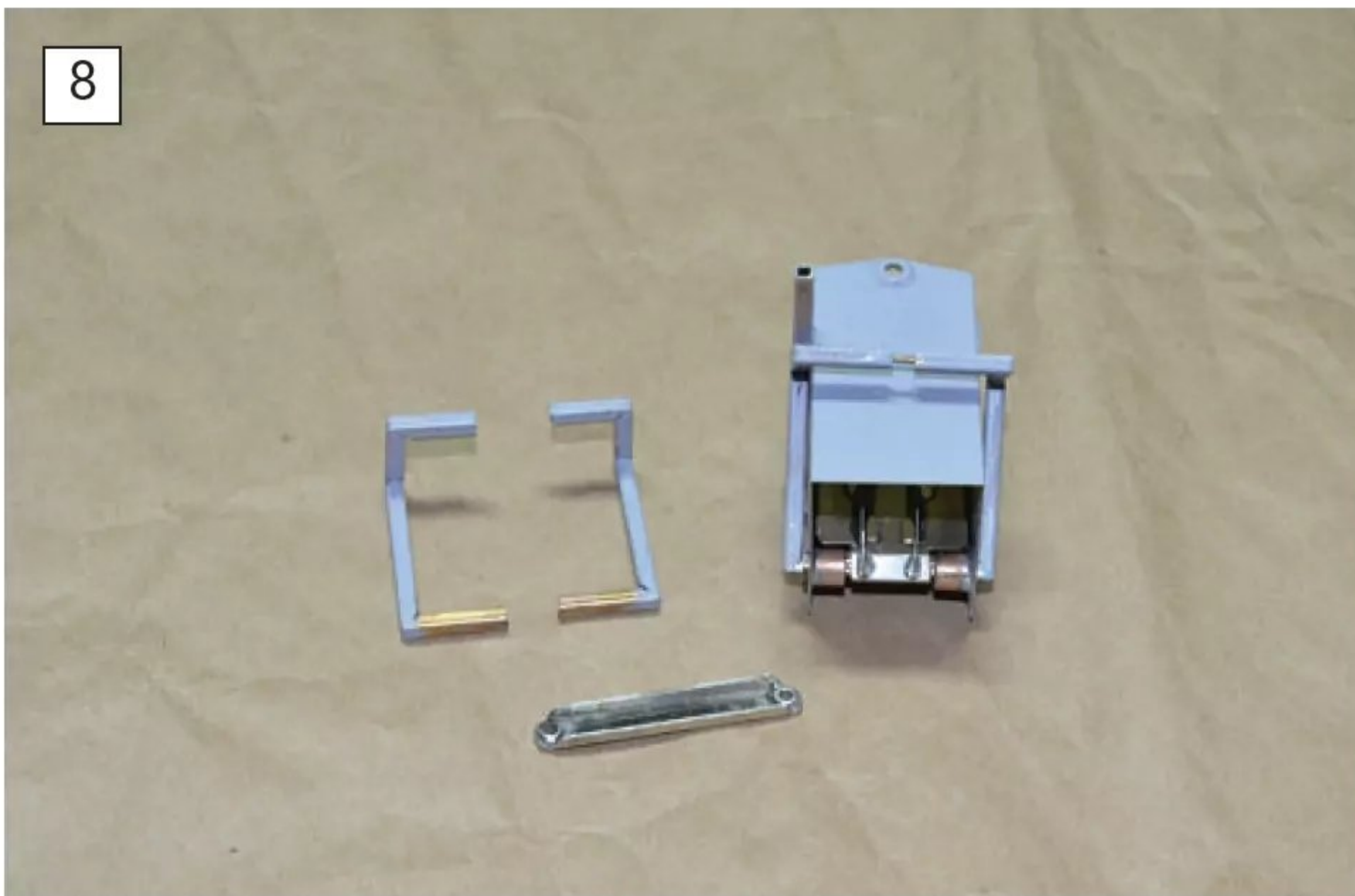
four parts that make one up.

There are two ribs which act as both stiffeners and guides and are glued or soldered to the main piece. The flap itself has a bottom extension which is folded along fold lines to form a recess that the 1/8-inch square tube is soldered into. The square tube will receive the 3/32-inch square tube of the operating lever.

The opposite top edge is shaped into a downwards curve. This restricts flow into the reversing guides when going ahead. The two sides have short extensions which can be folded down to change the overall width to provide a precise fit.

2. Nozzle body

Photos 6 and 7 show the body of the nozzle. The large piece folds up to



form the four walls of the shell, the small portion being the bottom front. Etched into it are tabs to locate the 3/16-inch OD brass bushings for the operating lever and the steering pivot.

At the bottom edge of the side pieces are slots which locate the tabs on the reversing guides, these being curved into a quarter circle.

The two brass tubes are soldered inside the side pieces, using a piece of aluminum tube through both as a mandrel to ensure they are aligned for soldering. I used uncured solder with flux that wasn't compatible with aluminum, so the latter did not become soldered in.

The washers are soldered onto the outside of the top and bottom pivot holes, again using aluminum tube as a mandrel. The washers provided additional thickness and bearing surface at the pivot point.

The white 3/16" OD styrene tube helps smooth the flow past the reversing guides when running ahead.

3. Operating levers and steering link

Photo 8 shows a pair of the operating levers, beside a nozzle with the levers and reversing flap installed. The levers are handmade from 3/32-inch square brass tube, so I couldn't achieve the same precision as etching. Right angle bends are formed by filing a 'V' at the location of each corner, leaving the outside face intact. That remaining face is bent inwards to form the angle. A short piece of 1/16-inch square tube is inserted and soldered at the corner to provide reinforcement. The steering link also has washers soldered at the pivot points to provide extra bearing surface. These photos show the parts after priming.

4. Mounting frame

Photo 9 shows two frames in work. The frames also have washers soldered at the pivot points, as well as 1/4-inch lengths of 1/16-inch diameter brass wire soldered into the inside of the corners of the angles to add strength.

Photo 10 shows a pair of assembled nozzles mounted to the end wall, and with the operating cables trial fitted. A piece of brass rod is inserted between each pair of operating levers; this fits through a small length of brass tube soldered to the end of the operating cable.

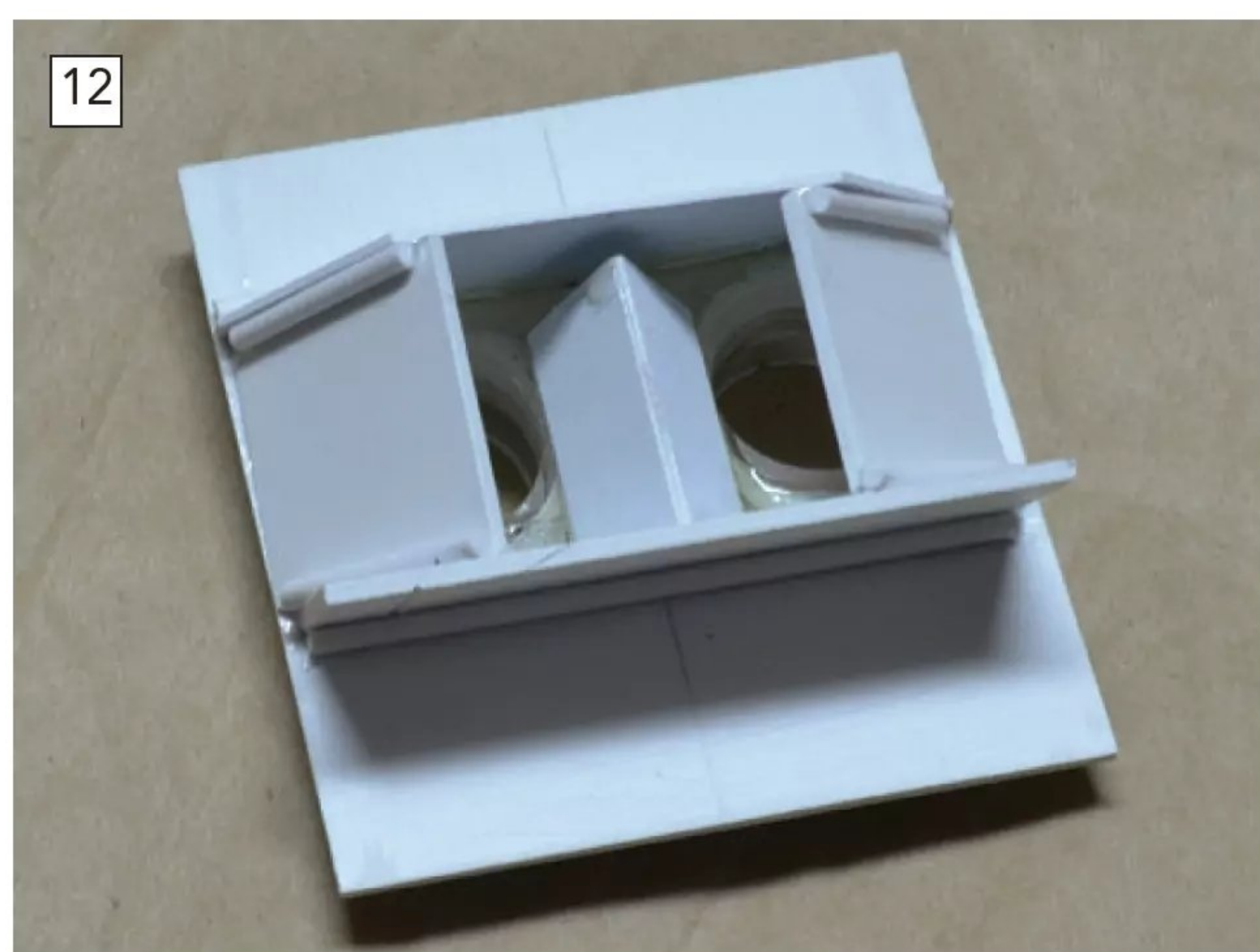
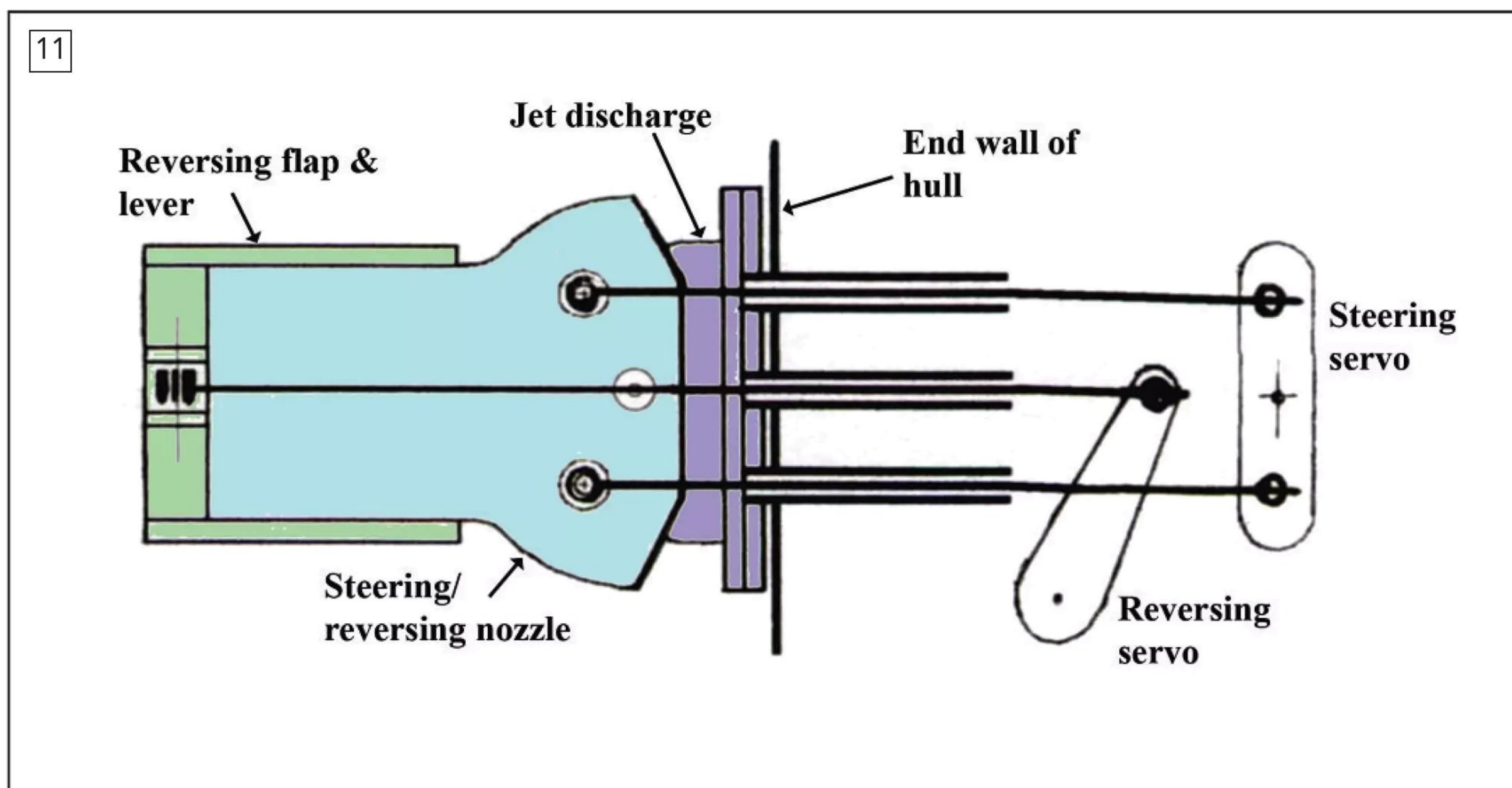
Other design considerations

I started this description with the main end product, so at this point I should go back and mention some of the considerations which affected my design.

One question was, how much should the nozzles swing from side to side? I couldn't find any definite information on this. I did find some video footage taken aboard the *Manannan* and looking down on the jets as the vessel and the nozzles were moving. The best estimate I could obtain from this was that they moved 15 degrees either side of the centreline.

“One question was, how much should the nozzles swing from side to side?”

Ideally, the steering servo should have a double arm and two operating cables, one to each side of a nozzle, so that there's always one cable in tension. The recommended setup is shown in **Photo 11**: a plan view of the waterjet adapted from the waterjet manufacturer's instruction leaflet. This would have meant two cables to each nozzle, four cables in each



box and those only for steering. The simplification I adopted is clear from Photo 10. Each pair of nozzles is linked together for steering. With only a short length of the steering cable protruding from its tube, this should be rigid enough to be used to push as well as pull. Working on this assumption, only one cable is required for the two nozzles in each box for steering.

One cable is required for the reversing flap on each nozzle. The high-speed water flow through the nozzle creates slightly lower pressure in it, tending to lift the reversing flap. Fortunately, to hold the flap down the cable has to pull on it. When reversing, the water flow helps to push the flap up against the roof of the nozzle, so the cable simply has to let it go.

Another question was, what thickness of material should be used for the nozzles? I guessed that 0.015-inch (0.38mm) would be appropriate. As a result of a miscommunication, I ended up with two sets of etches, one 0.015-inch thick and the other 0.005-inch thick. So, I built two sets, one from each thickness.

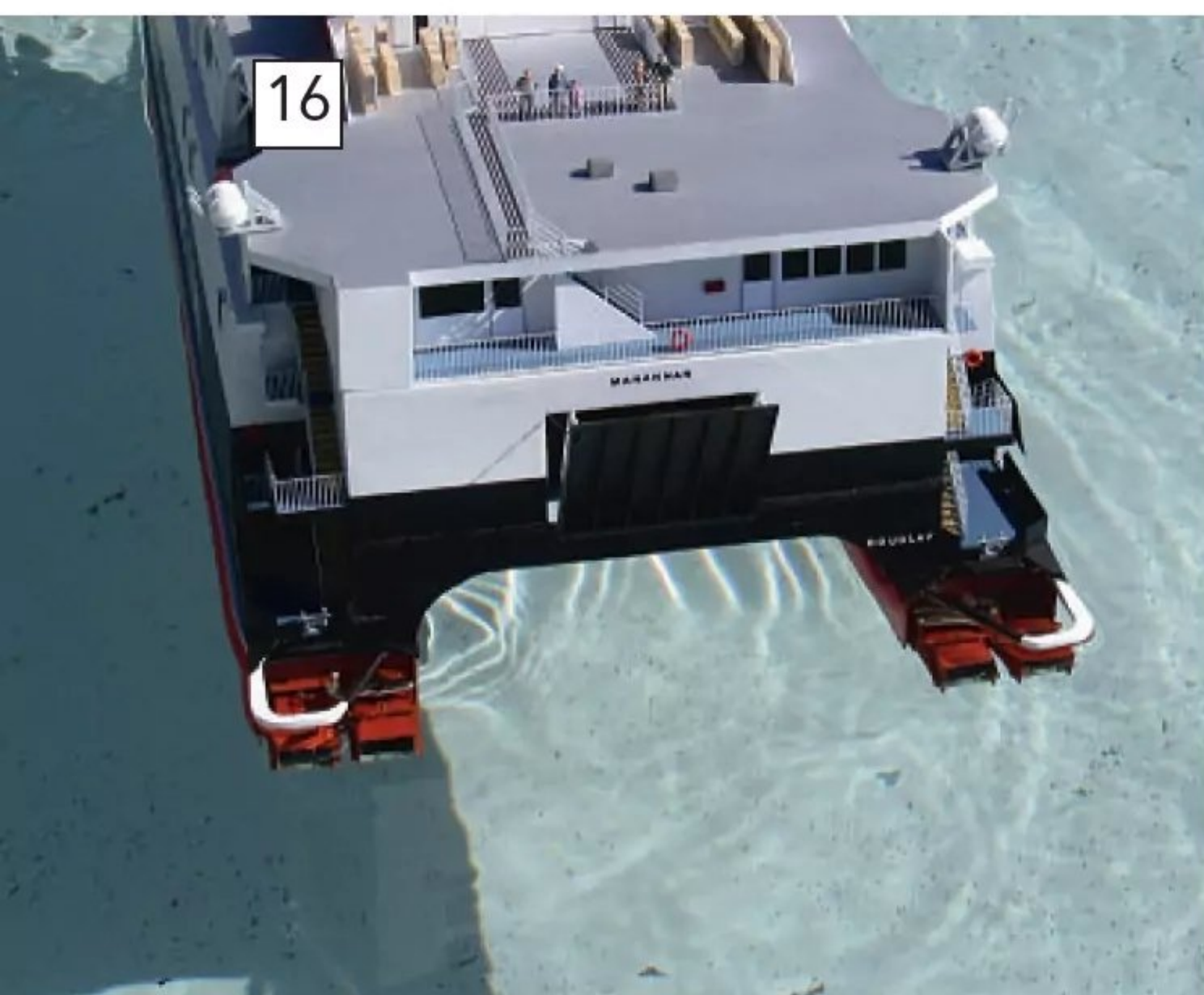
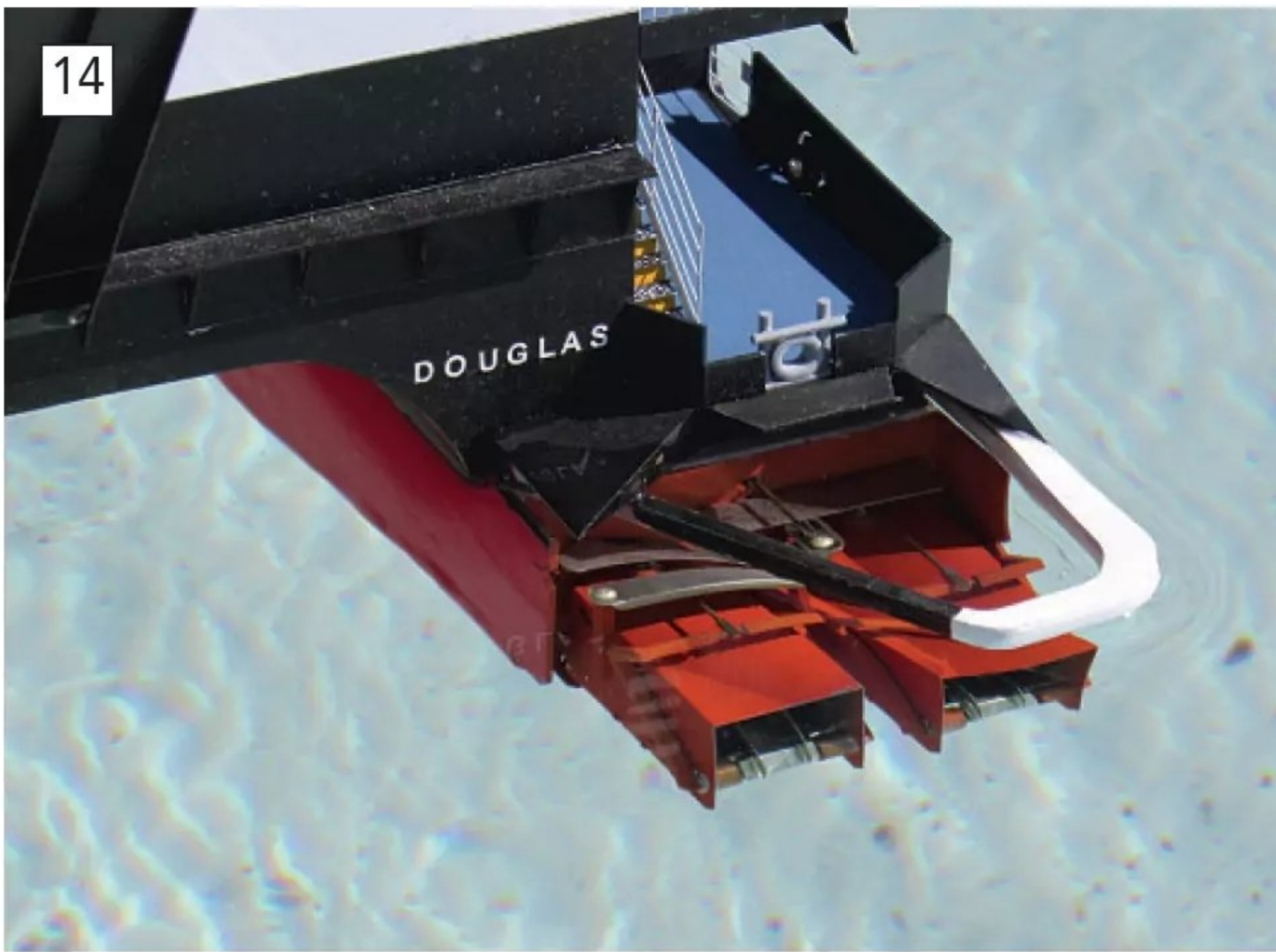
The finished nozzles in 0.005-inch seem quite strong, although they won't withstand much abuse. The corners are the weakest areas since they are grooves that were half-etched and therefore only 0.0025-inch thick. In addition, the 0.005-inch is lighter than the 0.015-inch assembly, so the 0.015-inch mounting frame is used but the rest of the parts are 0.005-inch.

Propulsion box assembly

The existing waterjets could possibly have been reused, with some work. Using a new pair, however, meant that if the intended setup didn't work out, I would still have something to use. So, I bought replacement waterjets, hoping to remove and have some future use for the old ones.

“Leak detection had been a major time consumer on the original assembly, so a different approach was tried”

Leak detection had been a major time consumer on the original assembly, so a different approach was



tried. Paste-type epoxy was again used on all the joints for its gap-filling capability and the fact that it wouldn't run while setting. Where possible, a piece of polyethylene was laid over the adhesive squeezed out of a joint, and then pressed down to compact it and close up any leakage paths. Once the epoxy had dried it was possible to remove the polyethylene. All joints were later painted over with a liquid epoxy. The theory was that the liquid stuff would seal up any minor leakage

paths in the paste, and these two changes were effective in doing so.

This time around the jet discharges are short stub pipes, cut from clear acrylic tube. The transition piece from waterjet discharge to end wall was much simplified and is built from flat pieces of styrene, as shown in **Photos 12 and 13**.

The operating levers are glued into the reversing flap with Goop. One of Goop's advantages is that it can be softened and unglued when heated with a heat gun.

Externally, with the exception of the nozzles, the boxes look exactly the same as the original installation.

Not visible in Photo 10 are the 3/32-inch diameter rivets that are the pivots for the nozzles. They are inserted from inside the nozzles and fit over the discharge tubes when the nozzles are in place, thus preventing them from falling out.

The mounting frame and its assembled nozzles are attached to the box with stainless UNC-2 sheet metal screws.

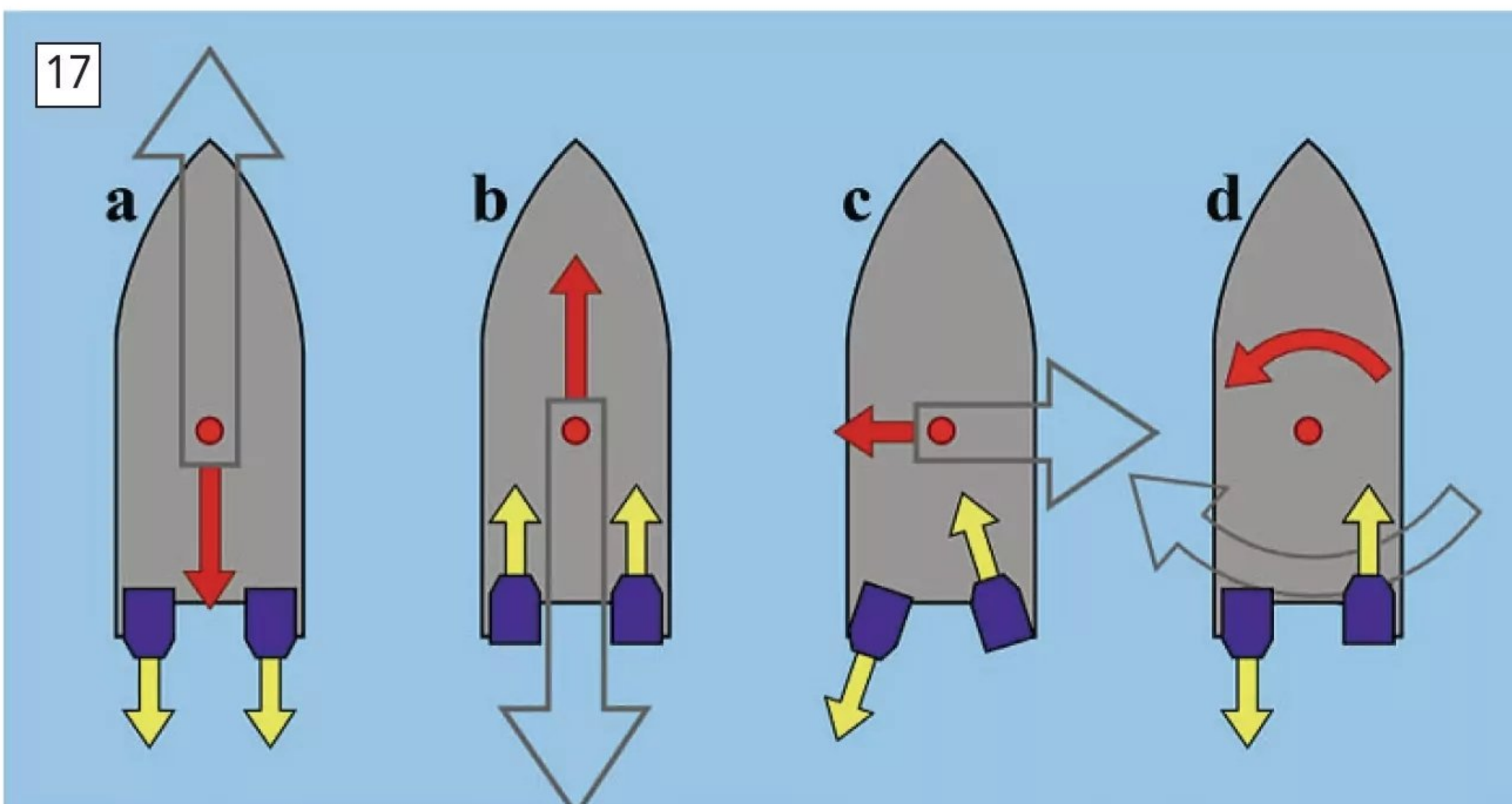
The completed installation is shown in **Photos 14, 15 and 16**.

Control

The existing servos for the reversing buckets were retained, as were the ESCs. Two new servos were required for steering, along with minor changes to the wiring and Arduino sketch to accommodate them.

With the steerable nozzles, the vessel has three distinct operating modes. These are normal at-sea operation, and two docking modes – rotating in place, and sideways movement. These motions are achieved as shown in **Photo 17**. The yellow shows the direction the water leaves the nozzles, while the red arrow shows the resulting direction of the net thrust on the water. The open arrow indicates the net thrust reaction on the vessel and the direction of movement. These modes could be replicated on the model by two-stick operation, each stick controlling the jet speed and nozzle movement. (Reversing would have to be managed by the Arduino.) Someone who likes the finesse involved in this type of control would surely use the radio this way.

I decided there must be an easier way. The 'lazy' operating method I came up with, however, involves more effort in programming. The originally-fitted Arduino was reprogrammed to do the hard work. Switching between the three modes is determined by the position of the control sticks. If the throttle stick is left in the neutral position for two seconds or more, and the rudder stick not in neutral, either of the docking modes is enabled, and the position of the rudder stick sets the movement. Docking mode is cancelled by moving both sticks to neutral and moving the throttle stick off neutral before the steering stick is moved from neutral. **Photo 18** will better help you mentally visualise how this works.



18

	Starting positions	Motion selection	Vessel motion	Jet & water direction, rev flap posn.
Normal			Normal	As directed
Docking modes				

The servos and the Arduino sketch were set up temporarily for testing, as shown in **Photo 19**. The final setup of the servos is shown in **Photo 20**.

Other improvements & changes

I made two changes to the box size when creating the new propulsion boxes. I moved the aft end wall further forward to ensure the new nozzles were underneath the guard. I also increased the depth at the aft end by 6mm, which is hardly noticeable. These two changes increased the underwater volume by a little less than 30ml in each box, equivalent to taking 60gm off the vessel weight.

I also switched from brushless 1980kV in-runner motors to 1200kV outrunners. The outrunner is a better match of speed and battery voltage. This also saved 26gms in each box, making a total saving of around 110 gms.

Now, that didn't make a lot of difference, but it was a change in the right direction.

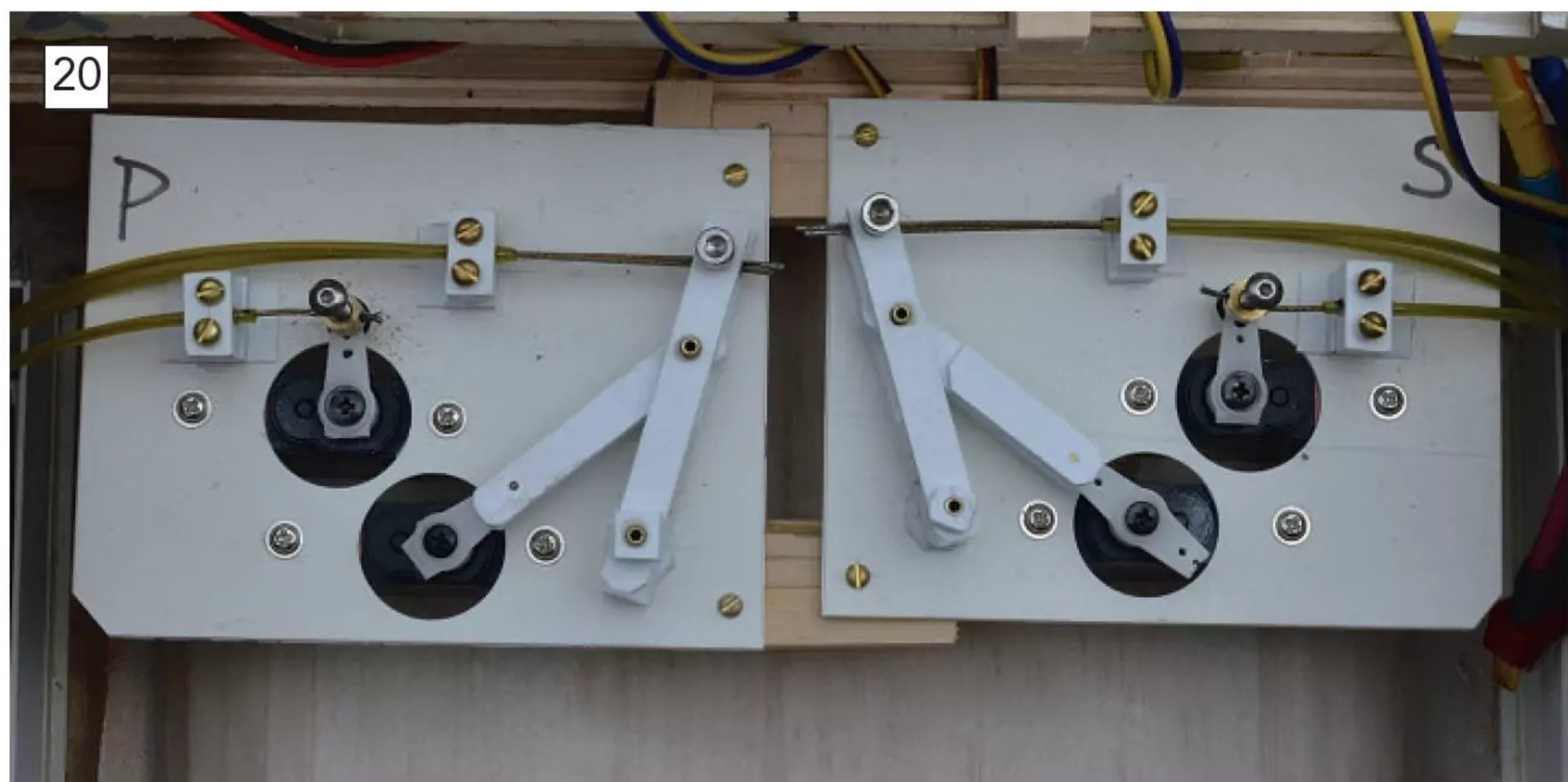
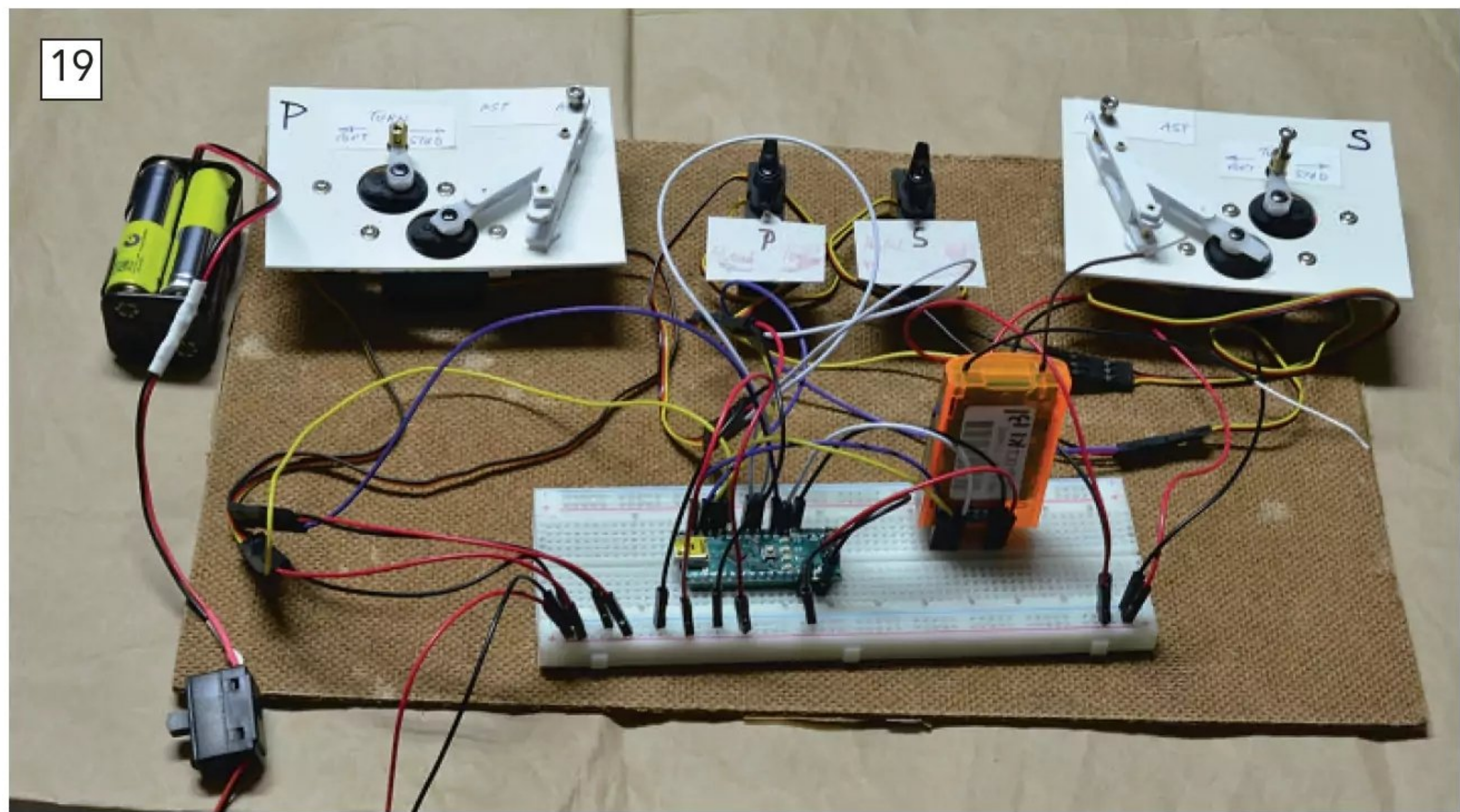
One problem I ran into with the original construction was supplying grease to the waterjet bearing (the manufacturer of the jet recommends that it be greased after each running session). A plastic tube, which appeared to be of a glue-resistant plastic, was fastened to the stub pipe on the jet and led up inside the body for regular greasing. The tube was sealed to the box cover with Goop, a tenacious, slightly-flexible-when-set adhesive which sticks to almost everything, including polyethylene film – except it didn't stick to this plastic tube, and the result was a water leak. A seal was finally achieved by lathering some grease around the glued location, sandwiched between the top of the box and the underside of the model body, which proved effective, if a little messy.

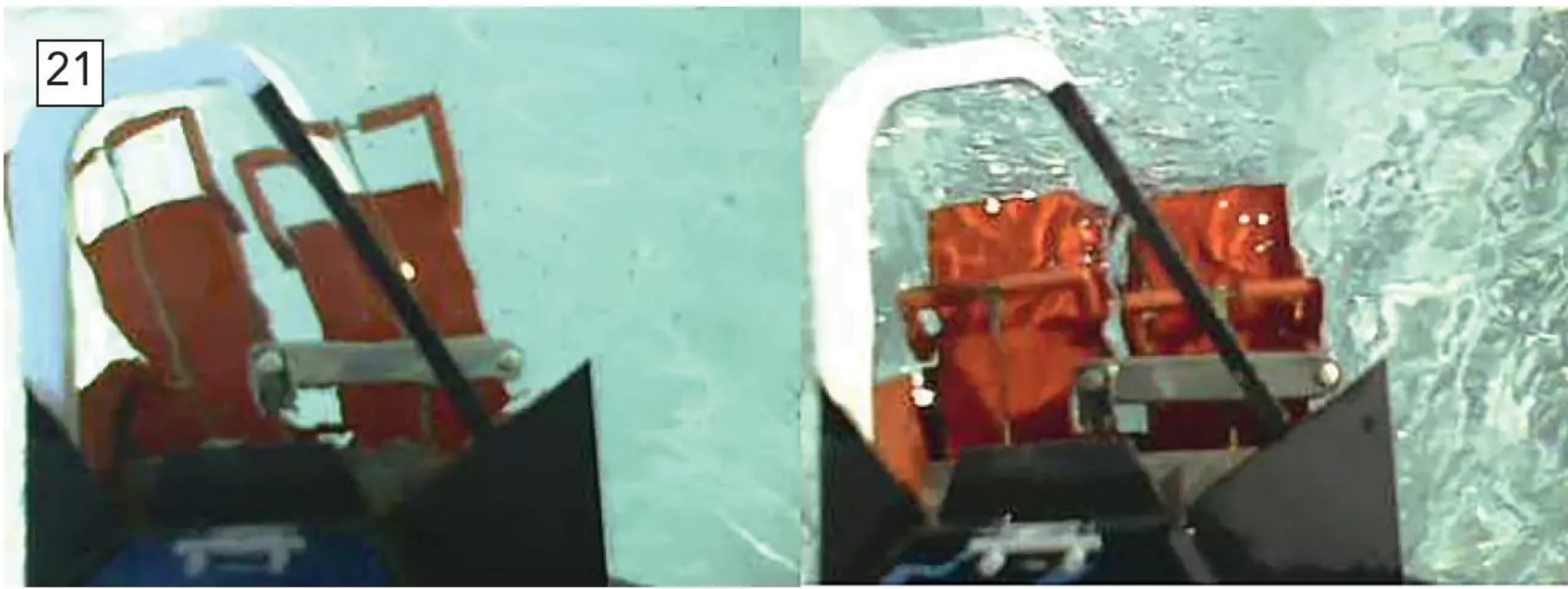
The revised arrangement uses a brass tube extension to the stub pipe, attached to the latter with a sleeve of styrene tube epoxied to it. The new tube is long enough to protrude above the matching sleeve in the vessel body, where the plastic tube can now be attached for greasing. It is only fitted when I add grease.

On the water

Normal control was good, and I was very pleasantly surprised at how effective swinging the nozzles by just 15 degrees proved in reducing the turning circle when compared with tank steering.

But while the jet nozzles and their servos worked as planned when





stationary, and the model appeared to run fine, I was keen to have some evidence of the operation of the nozzles in motion. For this purpose, a small camera was mounted on the model directly above the jets, which captured some video of the jets operating. The video confirmed that the nozzles were working as intended (see **Photo 21**).

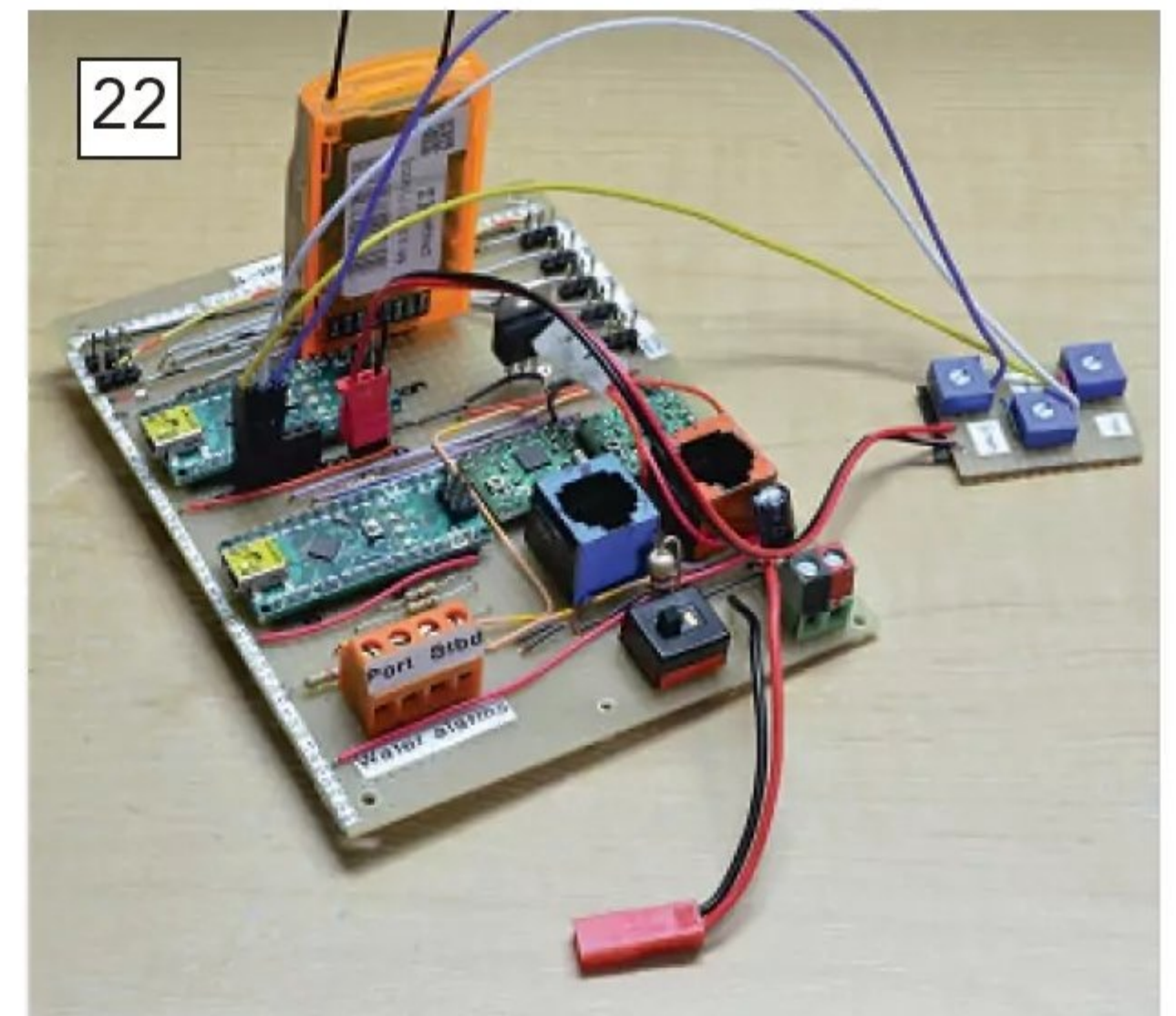
As expected, steering was quite ineffective when running astern. It was improved slightly by having the jet on the inside of the desired turn, slowed down to 30% power when the stick was hard over.

The two docking modes required some tweaking. The jets are more efficient when pushing ahead than they are when pushing astern. As a consequence, when trying to rotate in position with both jets running at the same speed, the model turned in a circle instead of rotating on the spot. Some experimenting was, therefore, required to slow the ahead-running jet speed to get the model to rotate. I started by reducing the speed by 30%, then tried 50%, but neither were satisfactory. This was a tedious process. Each change involved modifying the appropriate number in the Arduino sketch, downloading it to the motion control Arduino on the control board and

then going down to the pond and running the model to see the effect of the change, before then returning home to make further modifications. ('Sketch' is the preferred term for describing a user-written program for an Arduino board).

To short cut this process, I modified the control board by adding some testing connections with variable resistors (see **Photo 22**). After several test runs on the pond, adjusting the resistors after each one, I was quickly able to find the best settings. Back at the workshop I could measure the value of the resistors and then program those values into the Arduino.

Obtaining the desired sideways motion has so far proved impossible. I've come very close, but the model rotates slightly rather than moving sideways. The reason can be explained as follows. If you refer to **Photo 17(d)** you can see that to rotate in place the jets point axially, one pushing ahead and one astern, but the jets thrusts are balanced so that the vessel does not move ahead or astern. If the jets are moved to point slightly outwards in a synchronised manner, the rotation will decrease, and sideways motion should increase. At the right jet angle, rotation should cease, and the motion be sideways only, as illustrated



by **Photo 17(c)**. Unfortunately, as presently constructed, my jet nozzles will not turn outwards far enough.

Modifications to the design to make this possible will involve cutting back the side walls of the box and increasing the servo throw. It will not be impossible to modify the current design, but that will be a subject for another construction season, and maybe a follow-up article. For the present, I plan to enjoy sailing the model as it is.

Photo 23 shows the model riding through some choppy water. It's simply not possible, however, to show in a picture the improvement in manoeuvrability that the steerable nozzles provide. You can, however, watch video footage of the model in motion at: <https://www.youtube.com/watch?v=jmAhq9x6xqE&feature=youtu.be>, although, sadly, this does not capture the satisfying whine of the brushless motors! ●

Photo acknowledgement

Photos 1 and 3 are reproduced with the kind permission of the Isle of Man Steam Packet Co.



DAVE'S CHRISTMAS STEAM-UP!

Dave Wiggins steams into the festive season with a toast to Christmas past

With the holidays rapidly approaching, I will, in this issue and the one that follows it, be making a rare foray into the world of steam – vintage and collectable marine steam, that is – focusing on products from two leading British manufacturers that would once have been at the top of many Christmas wish lists. I will get the party started with offerings from Bassett-Lowke (whose HQ was in Northampton) and then move on to those produced by Stuart-Turner Ltd (back then located in Henley on Thames), next month.

Steam as an alternative to early radio-control

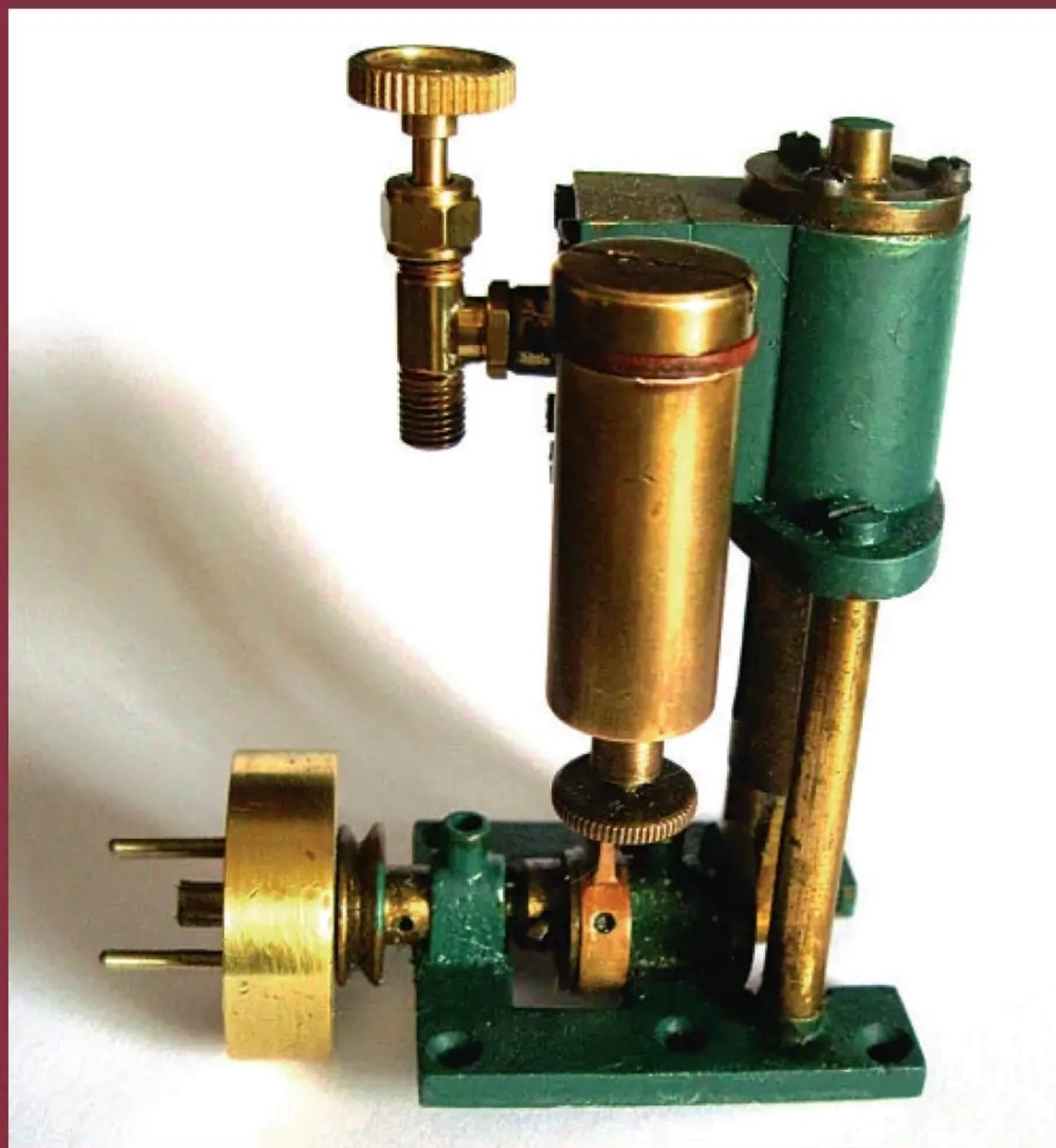
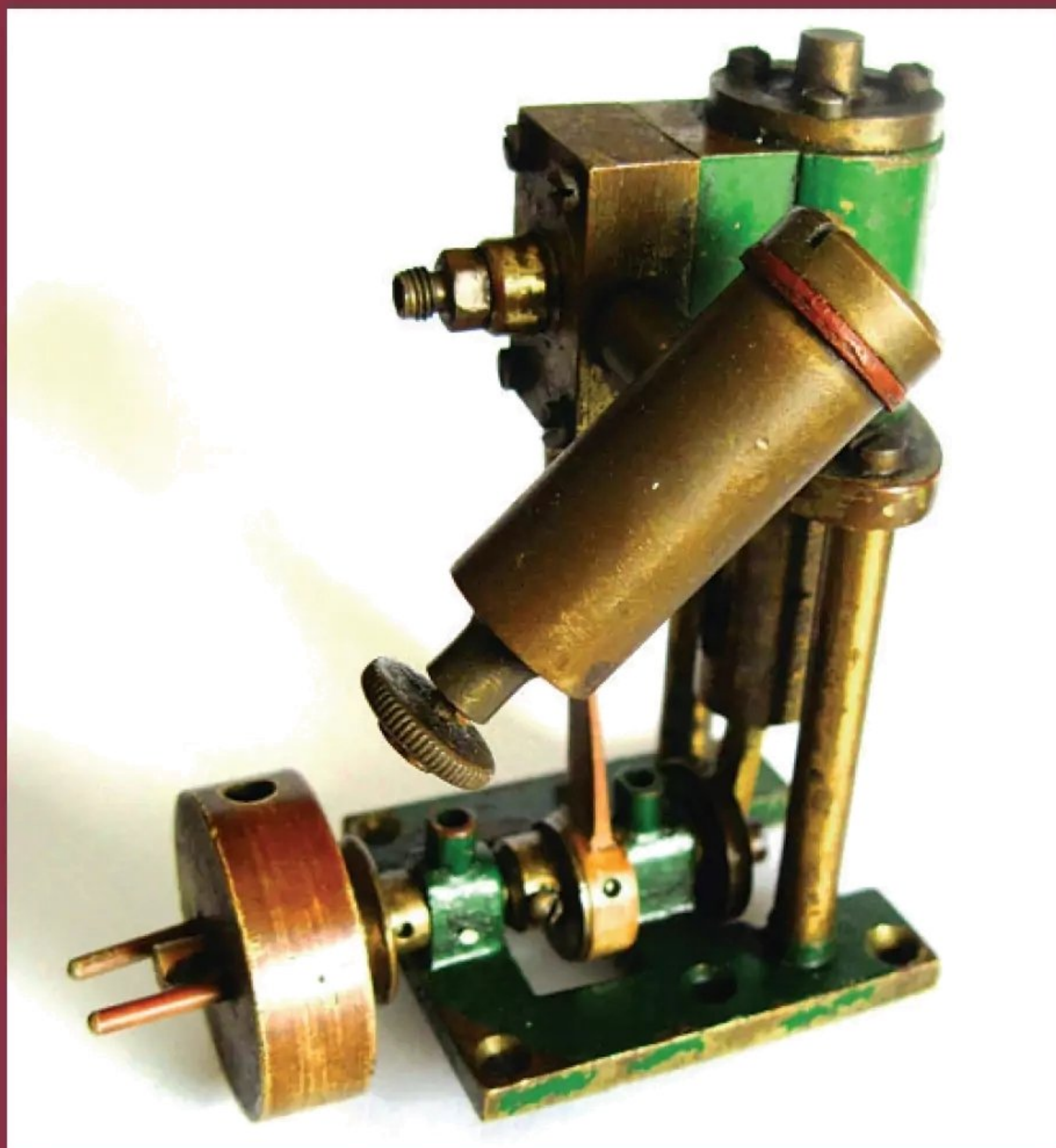
When I began in the model boating world there was still a lot of steam

activity at the pond-side and this was mostly to be seen at straight running regattas and in tethered hydroplaning, where 'flash' steam craft astonished all and sundry with their utterly amazing, near silent, speed and power and their roaring petrol blowlamps. Although I was firmly focussed on developing radio-control in those days, I nonetheless threw myself into the straight running regatta scene with enthusiasm, due to the primitive and unreliable nature of early equipment limiting one's R/C hours at the pondside.

Just like early radio equipment, commercially made steam outfits were expensive things to buy but, by saving, I managed to afford a rather nice small marine plant purchased at Bond's O'

Euston Road, on a day out in London. This comprised of a small single-cylinder, slide valve engine (rather similar to this month's first item as it happens), fired by a horizontal centre flue launch boiler and a spirit blowlamp. I wish I still had it! I used it for a fair few seasons before I decided to sell it to finance a commercial radio outfit, but having done so, I really missed having a steam-powered boat thereafter.

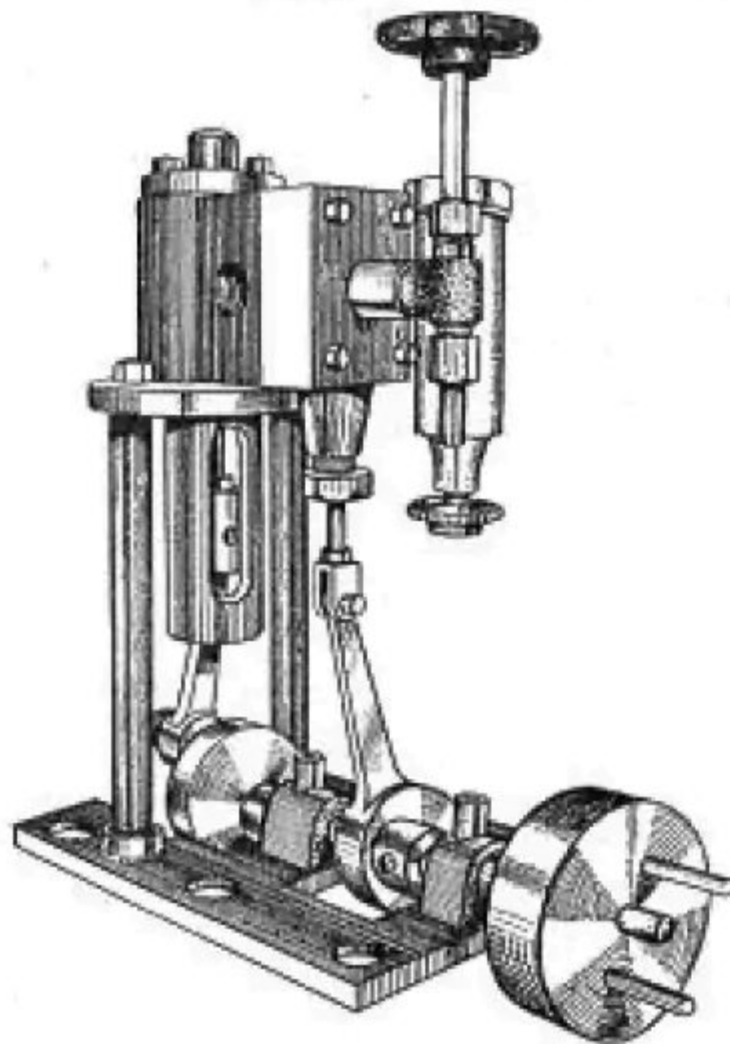
A bit later on, I got lucky and bought myself a replacement, which I still have installed in my first ever steam launch. This was a twin cylinder/piston valve unit made by Saito of Japan. It was nothing like as strongly made as the Bonds' engine but was more powerful, and examples are still available. As



Dave's example of Messrs Bassett-Lowkes' 'Eclipse' high speed marine steam engine, before and after restoration by Clevedon Steam

Model Power Boat Machinery

THE 'ECLIPSE' HIGH-SPEED MARINE ENGINE



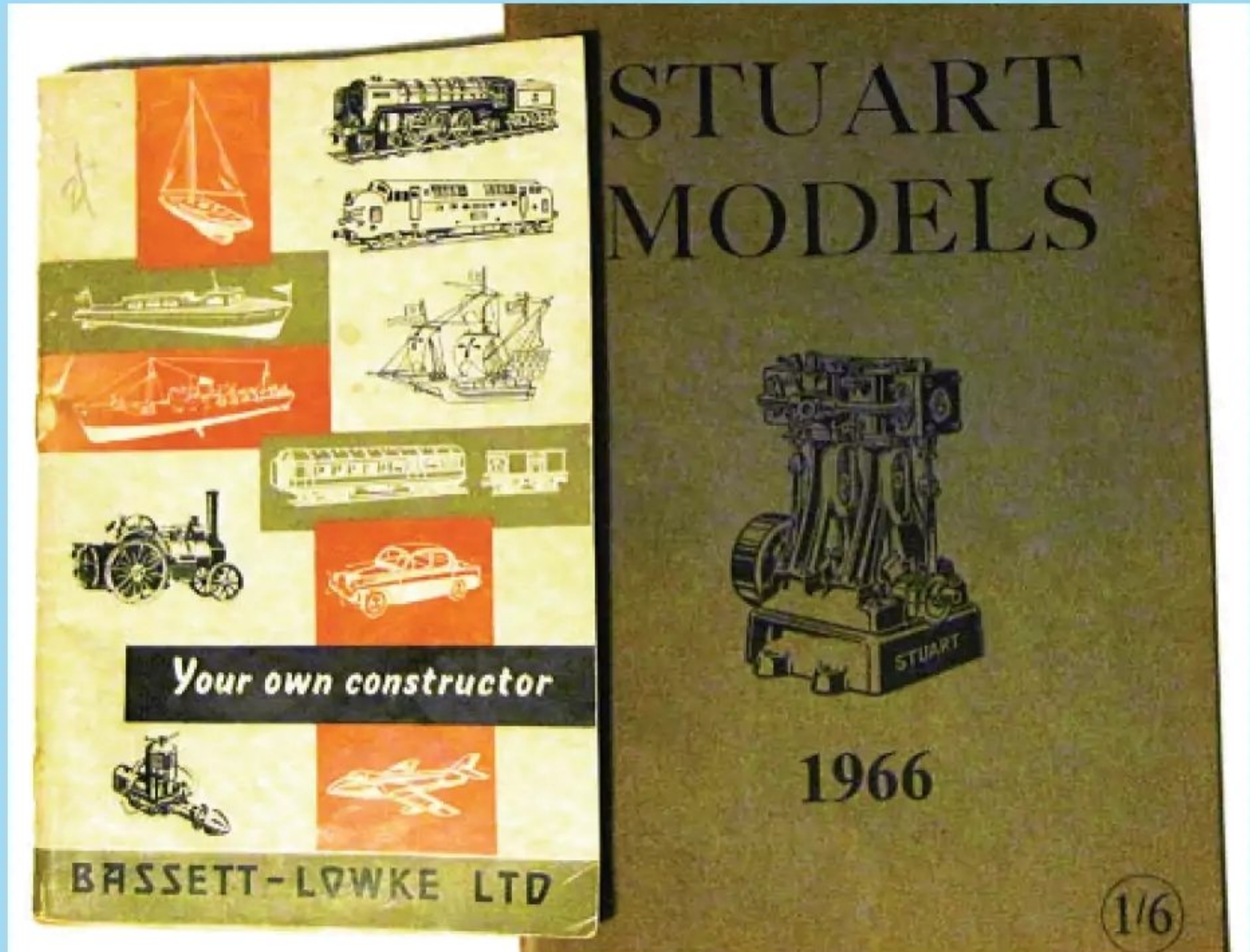
This engine is suitable for boats of good lines up to 3 ft. long where a good turn of speed is required.

ENGINE made throughout of hard brass castings and non-rusting material.

CYLINDER $\frac{7}{16}$ " stroke by $\frac{7}{16}$ " bore. Packed piston. Screw down stop valve on steam chest with union for $\frac{1}{8}$ " pipe. Exhaust $\frac{1}{4}$ ". Screwed 32 threads to suit standard unions.

Large capacity displacement lubricator. Long and properly fitted bearings. Fly-wheel complete with driving pins. Height to top of cylinder $3\frac{1}{2}$ ". Base $2\frac{1}{2} \times 1\frac{1}{2}$ ". Weight 13 oz.

The direction of the engine can be reversed by adjusting the eccentric by the grub screw. 180/-



A page and two covers from 1960's Bassett-Lowke and Stuart Turner catalogues offering the Eclipse/Meteor steam engines.

purchased, mine was defective, but a knowledgeable steam boating buddy soon got it running.

"Just like early radio equipment, commercially made steam outfits were expensive things to buy"

Shortly after that, I picked up, for next to nothing, one of the two outfits detailed this month; the other being the much simpler Stuart-Turner 'ST' plant, of which more in January.

The Eclipse/Meteor Duo

Bassett-Lowke's famous 'Eclipse' was a $7/16$ " bore and stroke single-cylinder engine, meant for Bassett's famous *Streamlinia* launch, which features in an ad from the 1960 catalogue illustrated here.

By 1960 the golden era of W.J. Bassett-Lowke's chain of retail shops

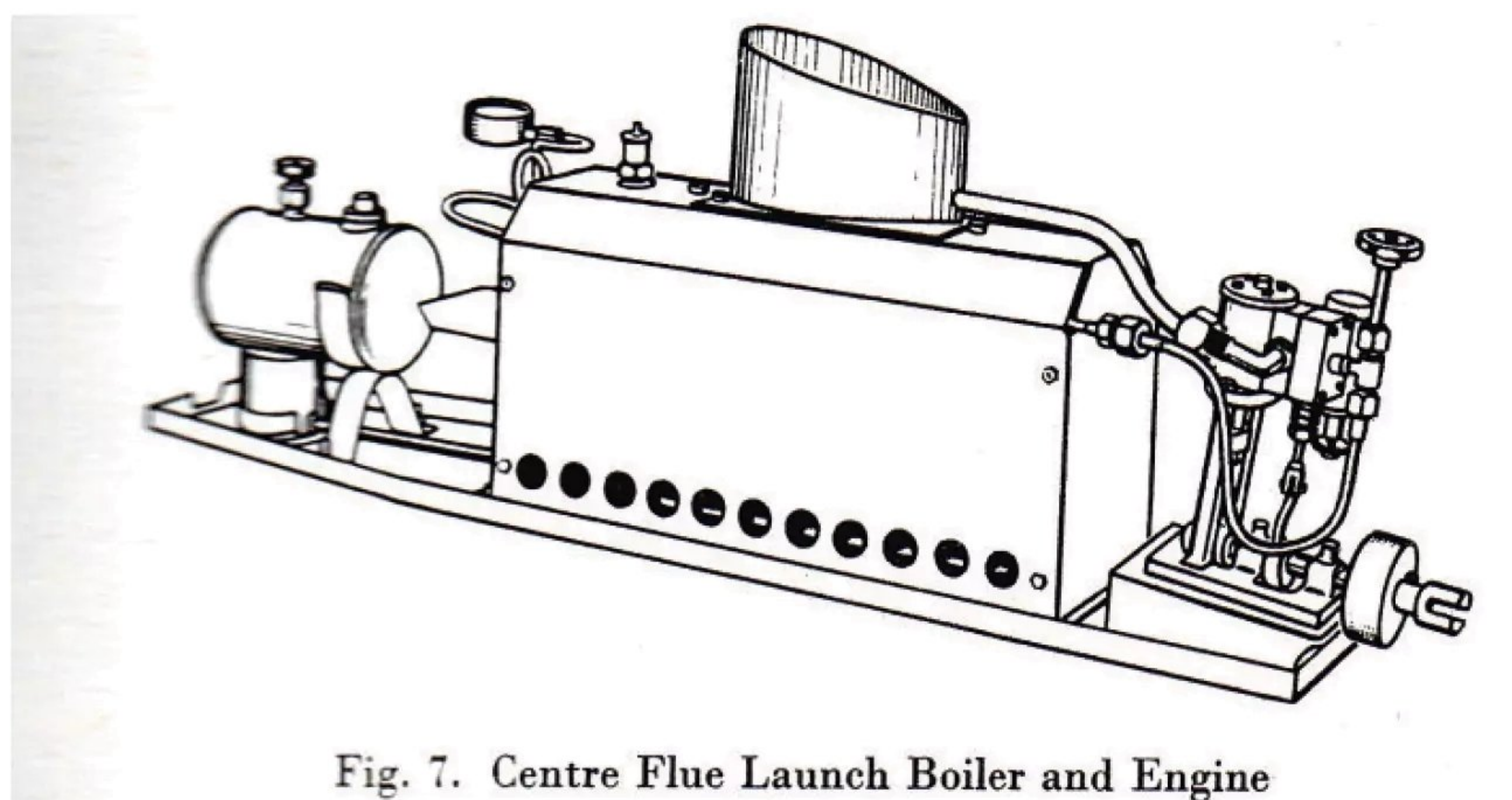
and locomotive and ship model workshops was well and truly over, and the company's handbook for that year was a sad thing, being stuffed with run of the mill model goods that any boy could buy in his local hobby shop, never mind at 112 High Holborn. That said, there were still a few genuinely marvellous Bassett-Lowke products listed, although I suspect these were more than likely unsold items from the firm's 1930s' heyday. The *Streamlinia* is a good example, although it was being offered, ready to run, at no less than £55 – which would have been an eye-watering sum of money back then.

I am also including a sample page from a 1966 catalogue issued by Stuart Turner. This firm survived the passing years in reasonably good shape and my chosen page details its 'Meteor' launch engine, also of $7/16$ " bore and stroke and virtually identical to a Bassett-Lowke Eclipse. Bassett Lowke and Stuart Turner had a good relationship, so I think it safe to say that

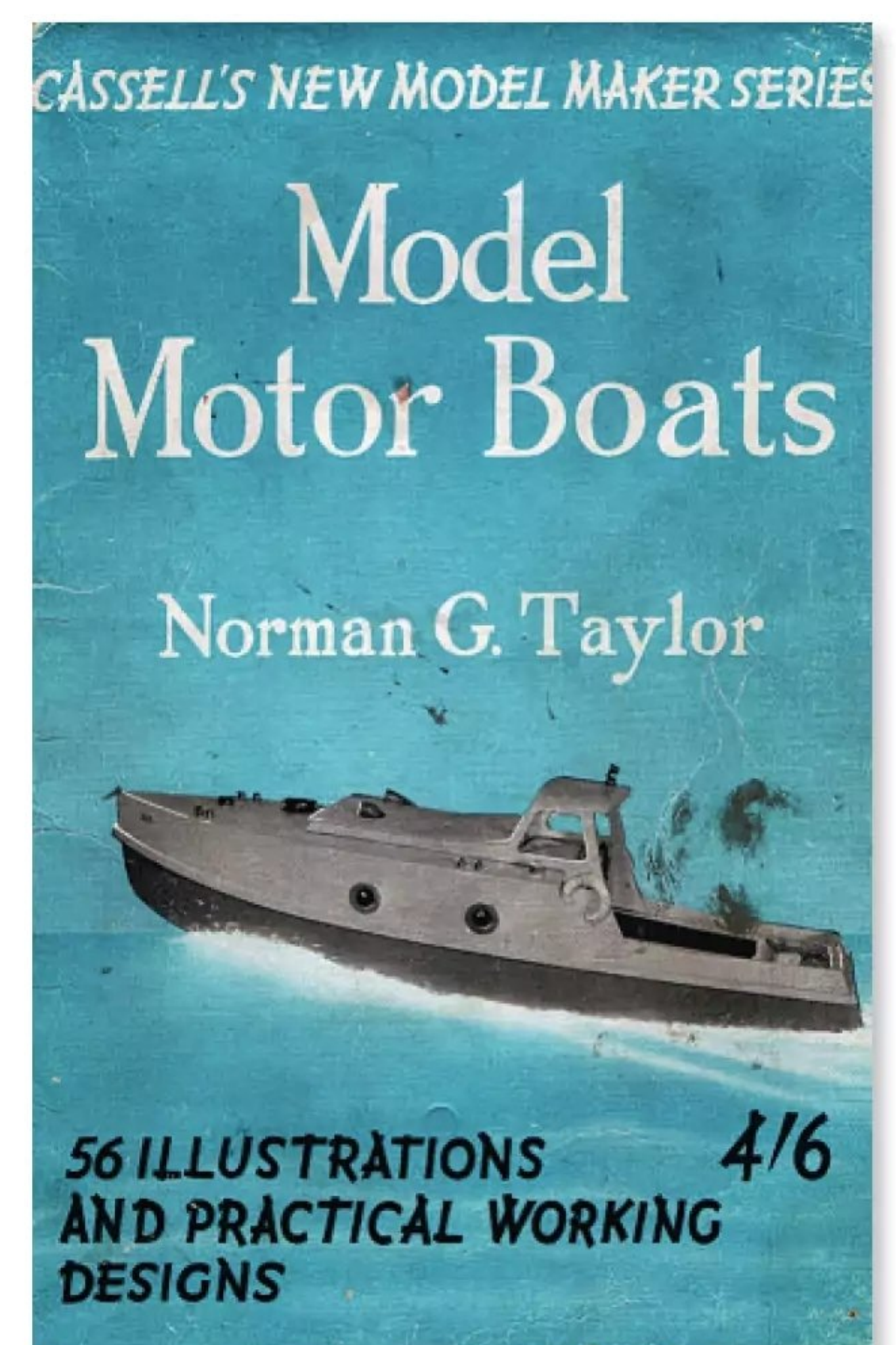
these two engines are really one and the same item.

"I think it safe to say that these two engines are really one and the same item"

There may also have been some kind of collaboration on the matching boilers being listed by both firms during the '60s. The one seen in Bassett-Lowke's 1960 catalogue certainly appears to be the 'twin drum' unit that was offered by Stuart Turner Ltd for some years. However, an example I spotted on the internet only last year had B and L stamped on the two drum faces, so I



The Eclipse pictured with Bassett-Lowke's own boiler and burner set ready to install into a *Streamlinia*, along with the period book from which this illustration was obtained (see text).

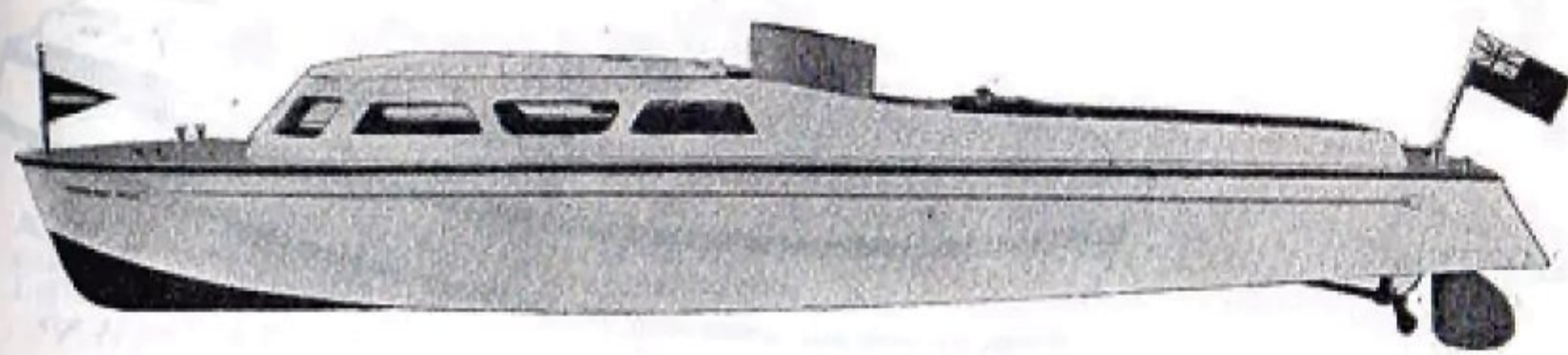


BASSETT-LOWKE LTD

READY-FOR-USE POWER BOATS

Fast Motor Boat 'Streamlinia'

39" long by 8" beam



POWERED BY STEAM

A powerful model capable of long runs at fast walking pace.

The seasoned timber hull is carved from the solid and is hard chined with a slipper stern.

The steam plant has a working pressure of 45 lb.

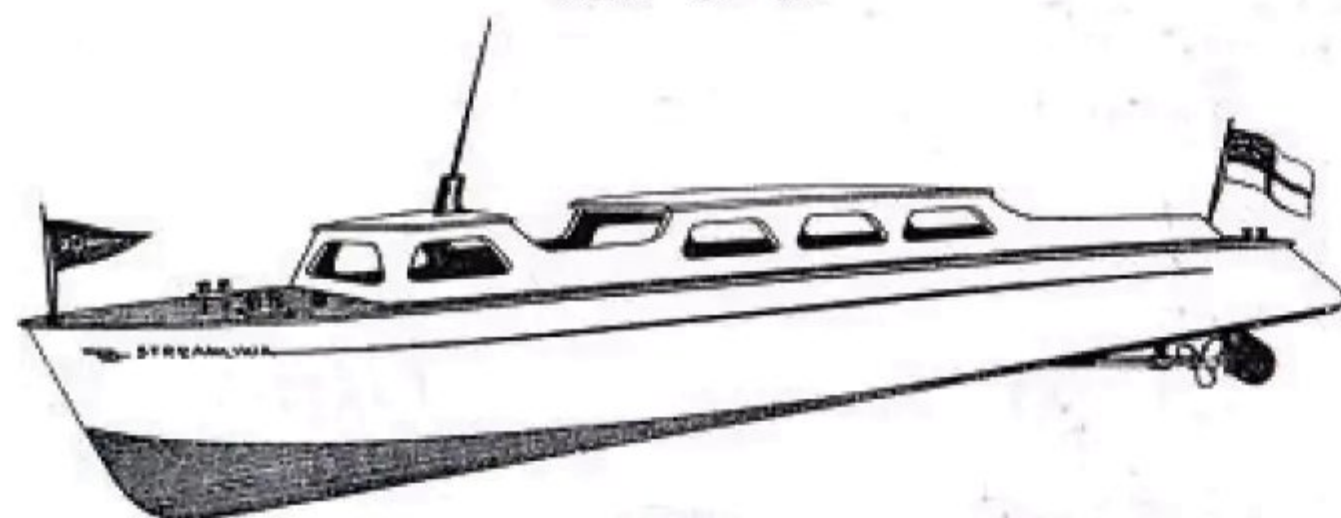
Hard soldered copper boiler fired by an automatically regulated spirit burner.

The engine is $\frac{7}{16}$ " bore and stroke—

a double acting unit with high speed and flexible performance.

A beautiful hand-built model designed for reliable and fast running.

£55. 0. 0.



ELECTRIC DRIVE

Of the same quality construction as the steam model, but styled for electric power

£35. 0. 0.

Fitted with R.M.A. Single Channel Radio operating an escapement rudder control.

£52. 10. 0.

BATTERIES EXTRA

Both models supplied in lightweight carrying case with leather straps and handle.

The famous Streamlinia steam launch (with Eclipse set), pictured in Dave's 1960's B/L catalogue at £55!

THE "METEOR"

High Speed Engine

$\frac{7}{16}$ " in. Bore $\times$ $\frac{7}{16}$ " in. Stroke

This engine is suitable for boats on fine lines up to 3 ft. long and requiring a fair turn of speed

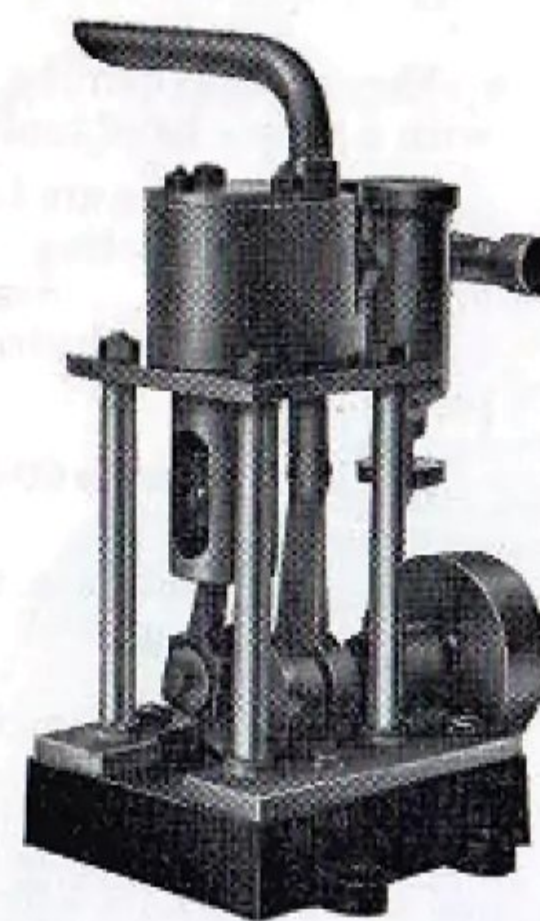
Height $3\frac{1}{4}$ ins. Length $2\frac{3}{4}$ ins.

Width $1\frac{1}{8}$ ins. Weight 15 ozs.

Complete with exhaust pipe, No. 155 displacement lubricator and stop valve.

Supplied as complete engine only

£6 15s. plus £1 2s. 6d. purchase tax



NO. 496 TWIN DRUM BOILER

Marine or Stationary

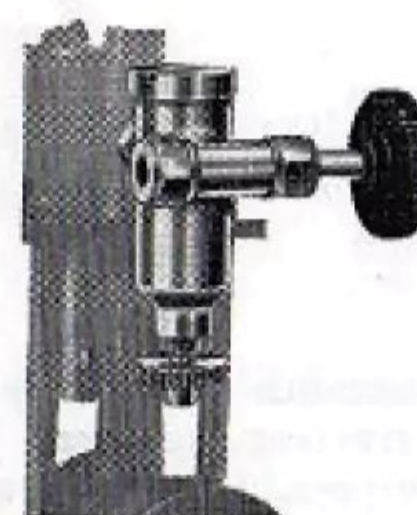
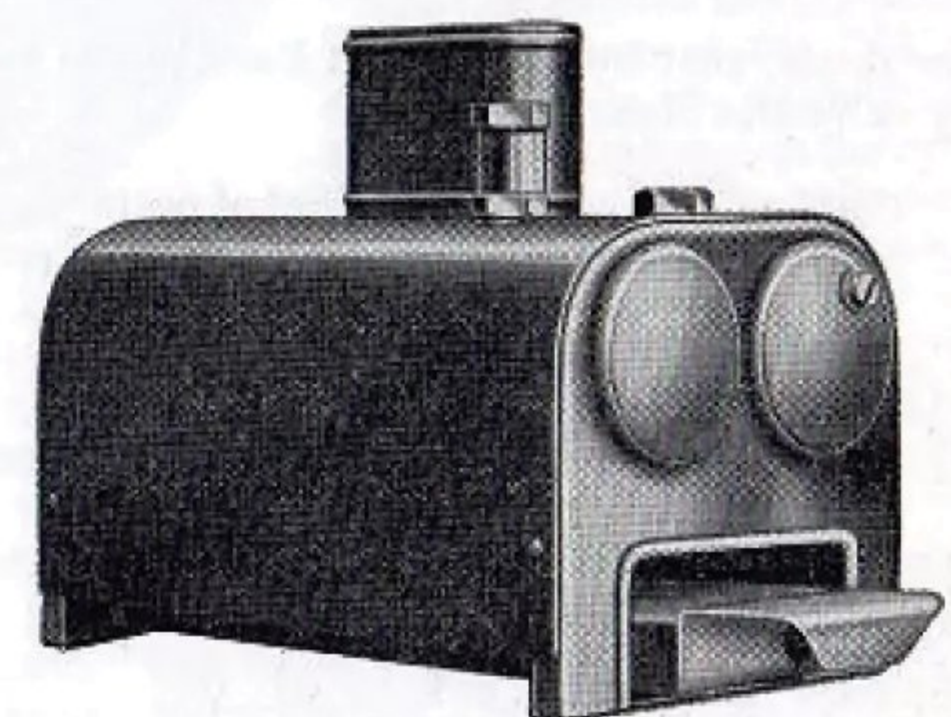
Height $3\frac{1}{4}$ ins.

Length $6\frac{1}{2}$ ins.

Width $3\frac{1}{8}$ ins.

Weight with lamp: 26ozs.

Designed for use with the "METEOR" engine; will steam for approximately 25 minutes with one supply of water and spirits £5 15s. 0d. plus 19s. 2d. purchase tax



NO. 155 LUBRICATOR AND STOP VALVE

Screwed $\frac{3}{16}$ in. $\times$ 40, for $\frac{5}{32}$ in. diameter steam pipe

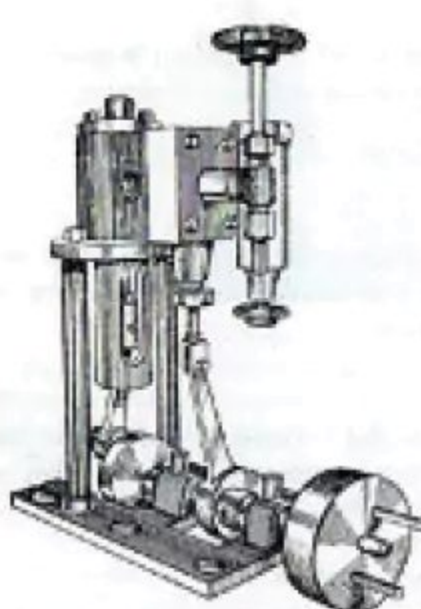
15s. 6d. plus 2s. 7d. purchase tax

24

The virtually identical Stuart Turner 'Meteor', together with Stuart's own 'twin-drum' marine boiler.

BASSETT-LOWKE LTD MODEL POWER BOAT MACHINERY

THE "ECLIPSE" HIGH-SPEED MARINE ENGINE



This engine is suitable for boats of good lines up to 3ft. long where a good turn of speed is required.

ENGINE made throughout of hard brass castings and non-rusting material.

CYLINDER $\frac{5}{16}$ " stroke by $\frac{5}{16}$ " bore. Packed piston. Screw down stop valve on steam chest with union for $\frac{1}{4}$ " pipe. Exhaust $\frac{1}{4}$ ". Screwed 32 threads to suit standard unions.

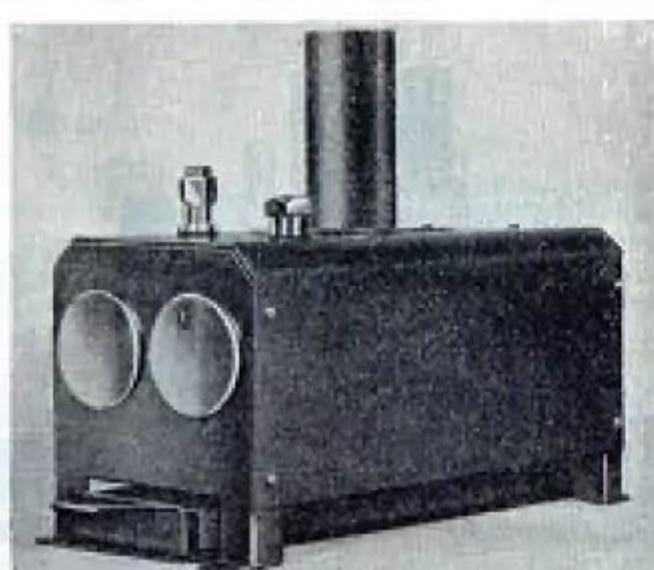
Large capacity displacement lubricator. Long and properly fitted bearings. Flywheel complete with driving pins. Height to top of cylinder $3\frac{1}{2}$ ". Base $2\frac{1}{2} \times 1\frac{1}{2}$ ". Weight 13 oz.

The direction of the engine can be reversed by adjusting the eccentric by the grub screw. Price £9/0/0

TWIN DRUM MARINE BOILER

This boiler has been especially designed for model boat work, and is capable of steaming engines up to $\frac{1}{2}$ " bore by $\frac{1}{2}$ " stroke. It is constructed from solid drawn copper tube with cast gunmetal ends, silver-soldered in, and is fitted with screwed filling plug, safety valve and steam piping with half union for connecting to engine. Size: Length $7\frac{1}{2}$ " by Height $3\frac{1}{2}$ " by Width $3\frac{1}{4}$ " (Funnel 3" high).

Complete with methylated spirit burner. Price £6/0/0



This Boiler can be fitted with Pressure Gauge and Syphon at an extra cost of 36s.



The Bassett-Lowke 'Eclipse' and a matching twin-drum boiler from one of the company's period catalogues.

cannot be 100% sure they were truly identical. Like the simpler boiler that came with the cheaper 'ST' marine plant, these boilers were reasonably fast steaming on spirit burners (a twin unit in twin-drum versions), and the boiler barrels had underside water tubes to promote this.

Stop valves

If I may offer a little personal footnote here, you'll see from the catalogue illustrations for these two engines that the displacement lubricator fitted incorporated a stop valve. This is essential, as neither boiler offered with these engines had one, and pressure was around 45psi or so. The oscillating 'ST' that follows in January also omitted a stop valve. Run at just 20psi, one was clearly not considered necessary here; the thinking seeming to be that if pressure built up then the cylinder block of any small oscillating engine would just lift off against its spring, which is obviously not the case with the Meteor/Eclipse. I don't really agree with that. I'd want a stop valve

on any steam boiler I used. Let's all stay safe, eh?

"I'd want a stop valve on any steam boiler I used. Let's all stay safe, eh?"

Alternative boiler for the Eclipse

Bassett-Lowke actually did offer the Eclipse with other boilers. The example I show here, which appeared in the book *Model Motor Boats* by Norman G. Taylor (Cassells, 1953), has a pleasingly workmanlike aesthetic and was likely of Bassett's own construction. The meths burner looks quite similar to that supplied with my first Bonds' steam-plant and would, in my experience, have produced more steam and at higher pressure than a Stuart 'twin drum' unit, and certainly more than could have been achieved by the tiny pot boiler supplied with Stuart Turners' beginners' steam plant, the very popular 'ST' unit – more on which in next month's issue. ●

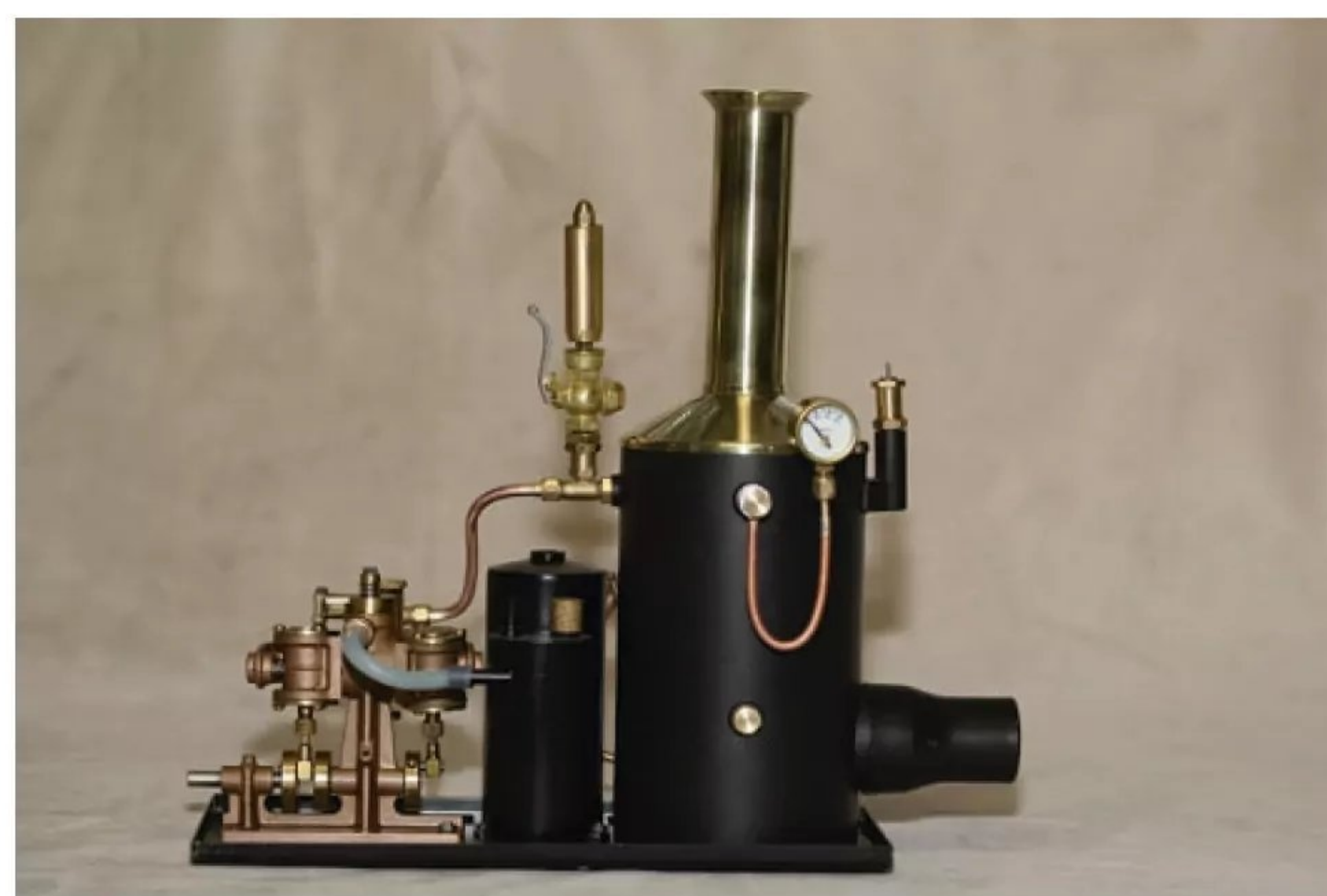


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Richard Simpson continues the story of his *Ben Ain* build

Last month we looked at starting off the build of a Mountfleet Models' kit of the *Ben Ain*. As explained then, this is most definitely not a kit review. It is, instead it is the story of a project that seriously changed course midstream, resulting in a very different model to the one I'd originally intended to create, with a strong focus on how a standard kit can be the basis for something quite unique. This month I will be concentrating on the construction of the aft accommodation unit, and it will start to become more apparent why this project took an unexpected change of direction.

Identifying the challenges

The aft accommodation unit is supplied in the kit as a fibreglass moulding. For most modellers, this provides a strong structure to build into the aft section of the ship, with plenty of scope for additional detailing. I couldn't help but notice, however, one or two aspects of the moulding that I wasn't 100% happy with.

The first was the plate detail on the bulkheads. It is normal practice for plate joints in a structure such as this to be vertical. All other structural items, such as the boat platform supports, the davit supports and davits, the funnel, etc, are vertical. The plate joints in this moulding, however, were perpendicular to the top and bottom edge. Consequently, when the unit was sat on the quarter deck the plate joints would be at a slight angle, which I was uneasy about.

Another concern was that when the moulding was sat on the deck, there were significant gaps at certain points. While this could obviously be dressed up to fit perfectly, the detail would be noticeably inconsistent with the lower edge of the unit. It also didn't sit snugly around the coaming, so modifications to remedy this would require the addition of battens and spacers.

Finally, while I had gone out of my way to create a camber throughout the bridge structure, there was no matching camber to the top of the accommodation unit, as the kit supplied moulding has a flat top. Studying the builder's plans had revealed other simplifications, such as a slight tumble home at the bulwarks and a camber to the main and quarter decks, that I didn't think merited the additional work that would be involved in correcting them, but I felt the camber on the top deck of the accommodation unit was just too noticeable not to address (see **Photo 1**).

The solution

One of my pet peeves when building a model, whether it is a railway building or a part of a model ship/boat, is gaps being evident where they shouldn't be. For me, nothing spoils the overall look more than a gap at the base of a building or at some joint in a piece of the ship's

accommodation. I always, therefore, prefer to build such structures in situ on a model or diorama, so that when removed they can be reinstated with a gap free fit.

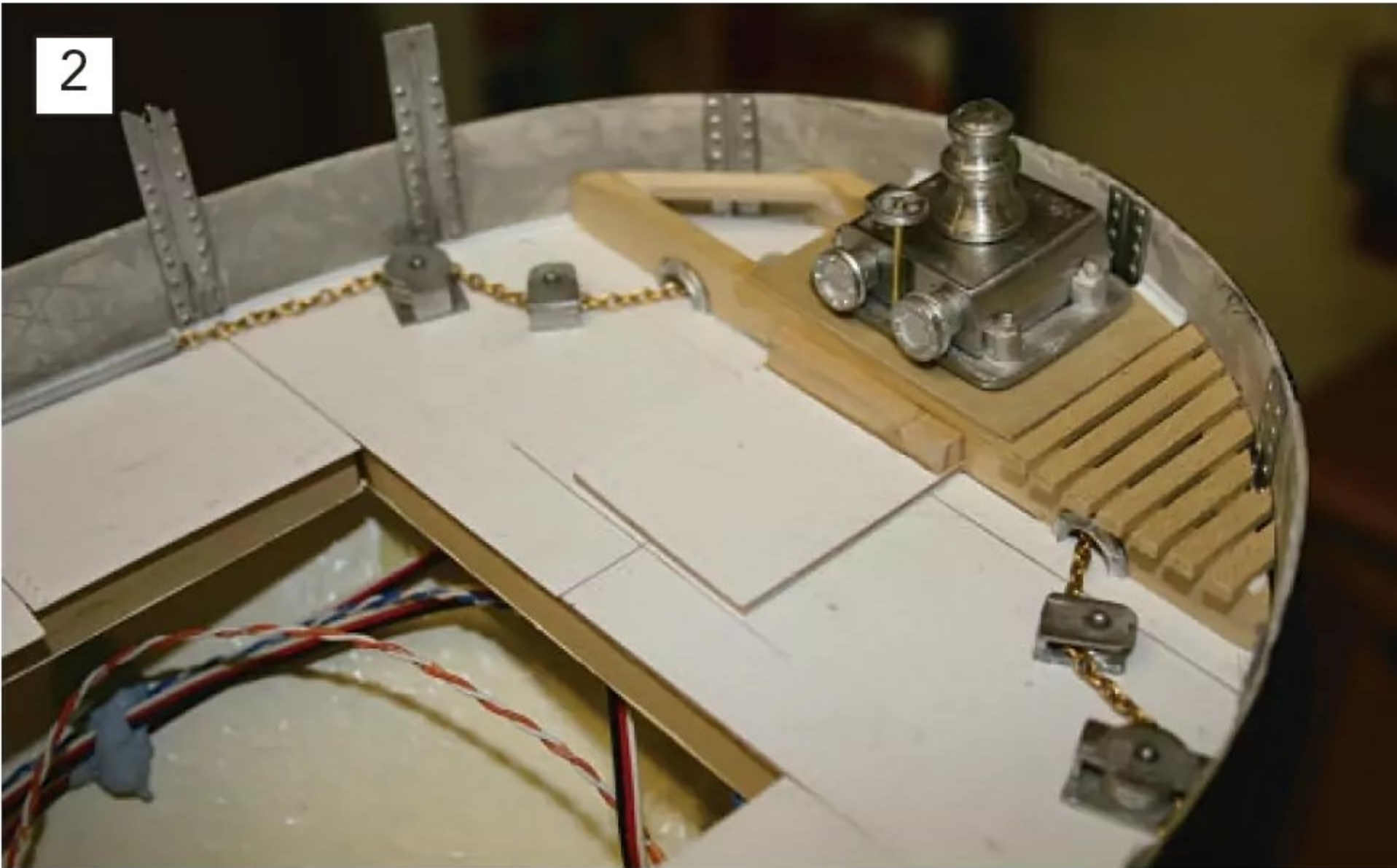
I decided the best way to address the issues I'd observed was to scratch build a replacement part. This could be constructed around the fitted coamings to give a good snug fit, and the forward bulkhead could be perfectly aligned with the rear bulkhead of the bridge to give the best fit there too. A camber could be incorporated, and the plate detail included, with vertical joints to match the rest of the structure. As the unit was going to house the boiler, I decided to use lite ply on a softwood frame, with a heat-resistant paint applied internally to protect it.

The first part of the job was to fit the quarterdeck, along with some of the associated parts such as the aft windlass mounting, the bulwark stays and capping rails and the steering

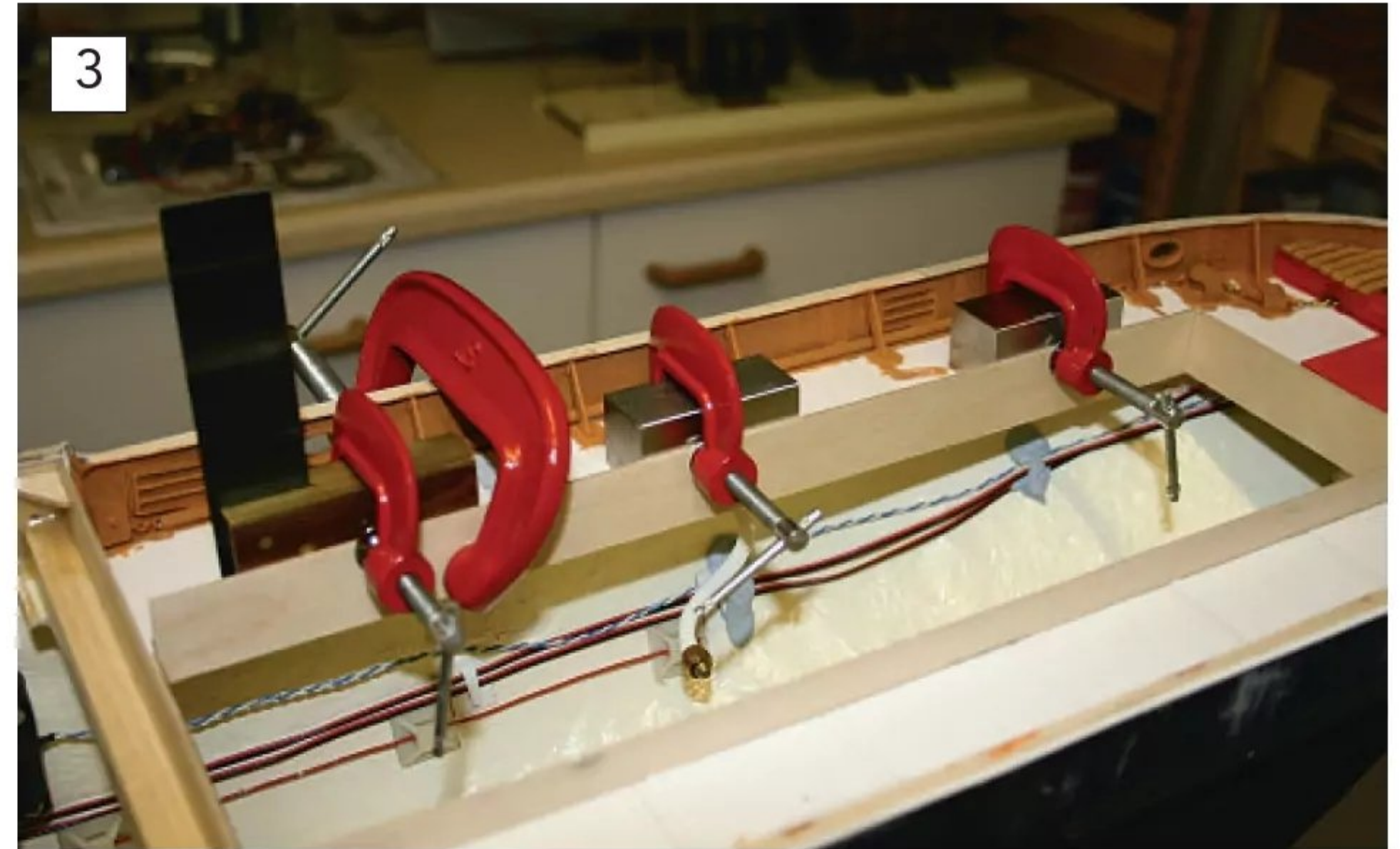
"I decided the best way to address the issues I'd observed was to scratch build a replacement part"



The kit supplied part was certainly strong and rigid, but Richard had concerns about various aspects, such as a lack of camber and the plate detail not being vertical.



Before taking on the aft accommodation unit, the deck was progressed. Details such as the aft mooring winch and steering chains were fitted, as well as paper plate detail, with flush riveting added along the edges.



A vertical coaming was fitted around the deck opening to provide a secure location for the superstructure unit, with square blocks used to ensure they remained perfectly vertical while the glue set.

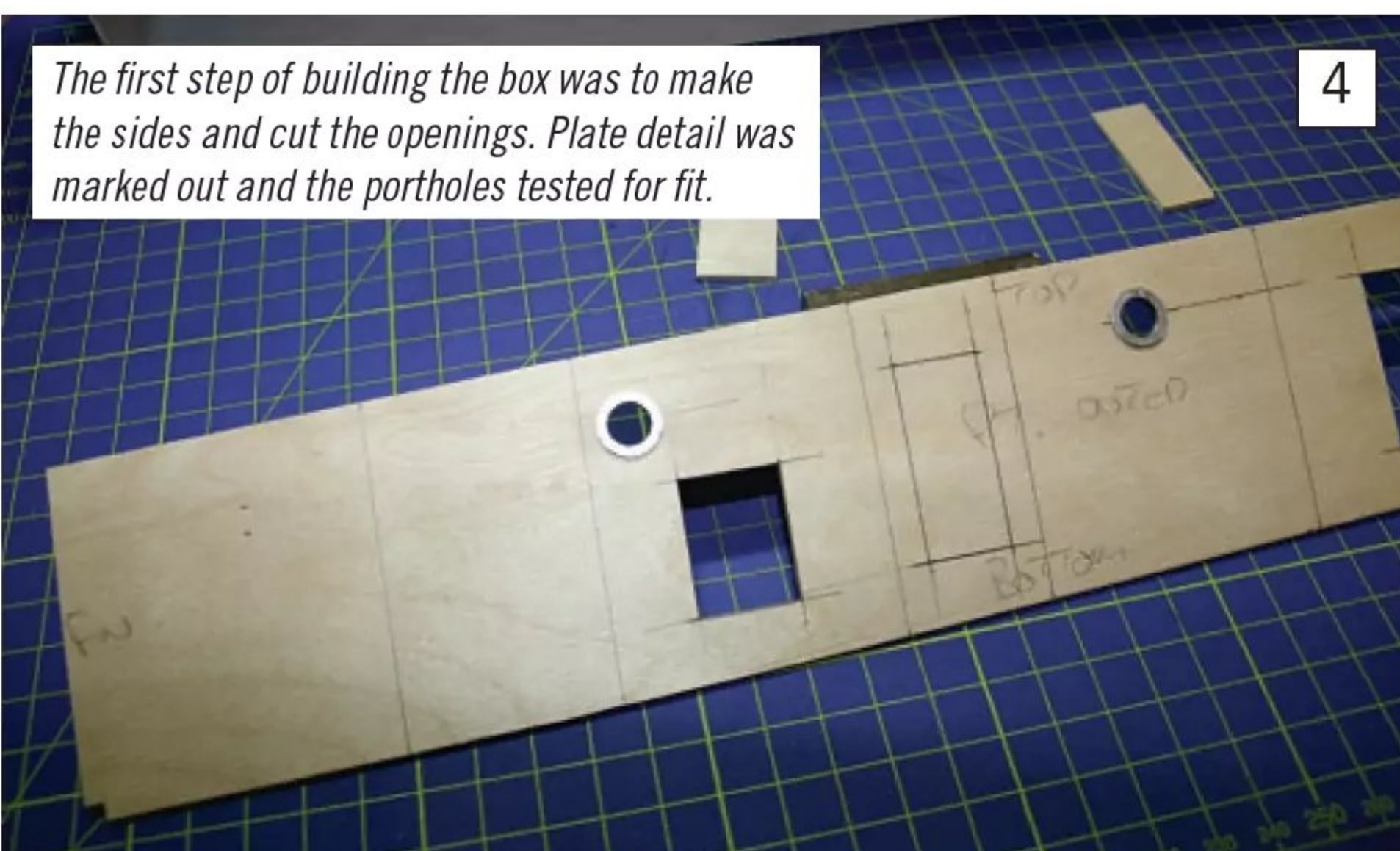
chain fittings (see **Photo 2**), and then, most importantly, the coaming that was to secure the accommodation structure (see **Photo 3**).

With that in place I could start to build the accommodation unit. I made the two side bulkheads first from sheets of lite ply, as it was easier to add the detail, such as construction lines for the plate joints, doors and portholes with it flat on the workbench (see **Photo 4**). I also added an internal softwood frame to stiffen it up and

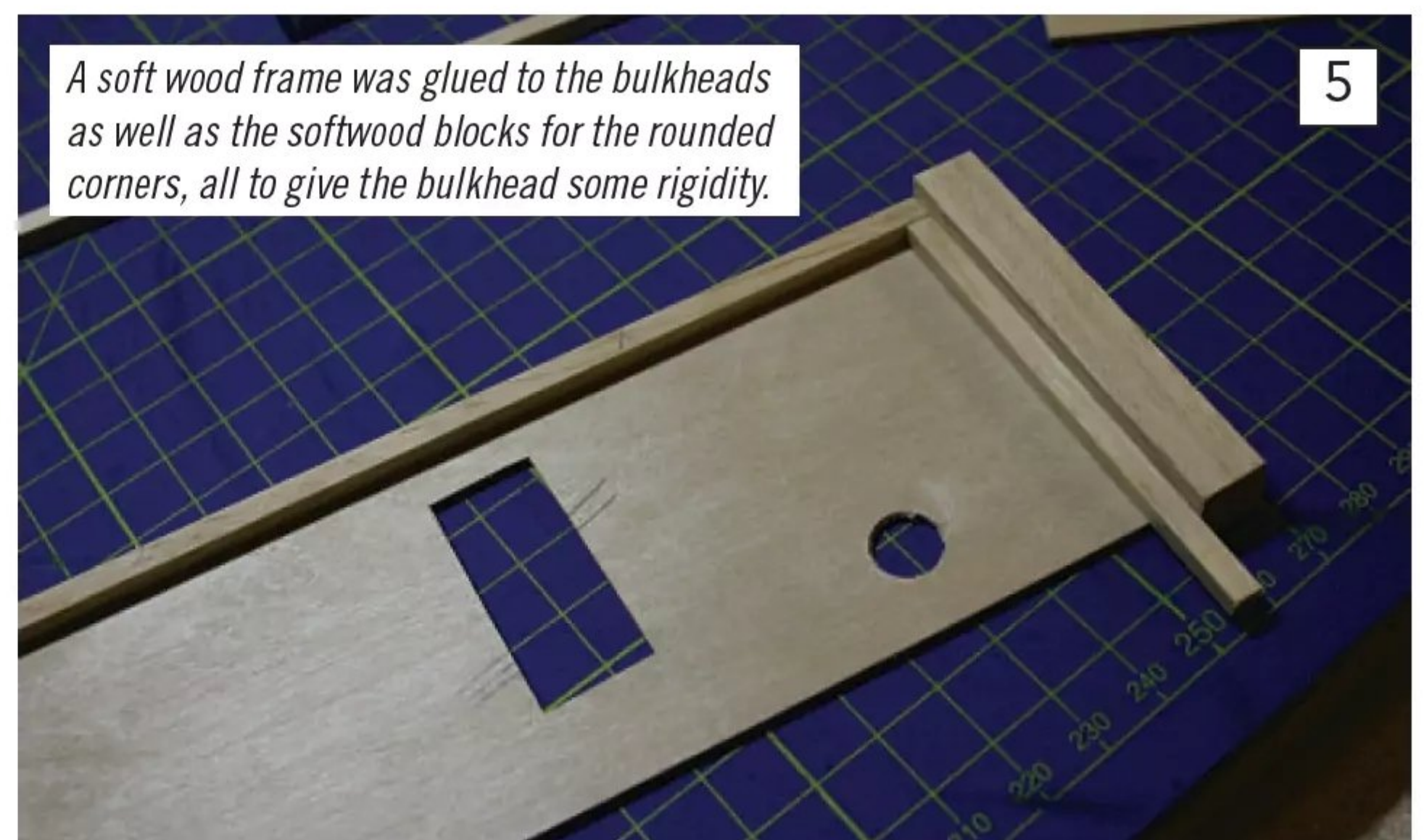
the two large section softwood pieces that would be used to create the curved corners (see **Photo 5**). These side bulkheads could then be sat on the deck, against the coaming, with a thin spacer to create a clearance. The aft bulkhead was made in a similar manner, but a camber was incorporated into the top edge to match that of the bridge deck (see **Photo 6**). A little jig was used to create the camber so that similar cambers could be cut into intermediate deck

supports that would be glued to the internal frames. The forward bulkhead was added and then the internal cross pieces were all glued in place, ensuring that everything remained perfectly flat on the deck and perfectly vertical. The internal frames were deliberately lined up with the supports for the boat platforms so that structural strength could be continued right across the structure (see **Photo 7**).

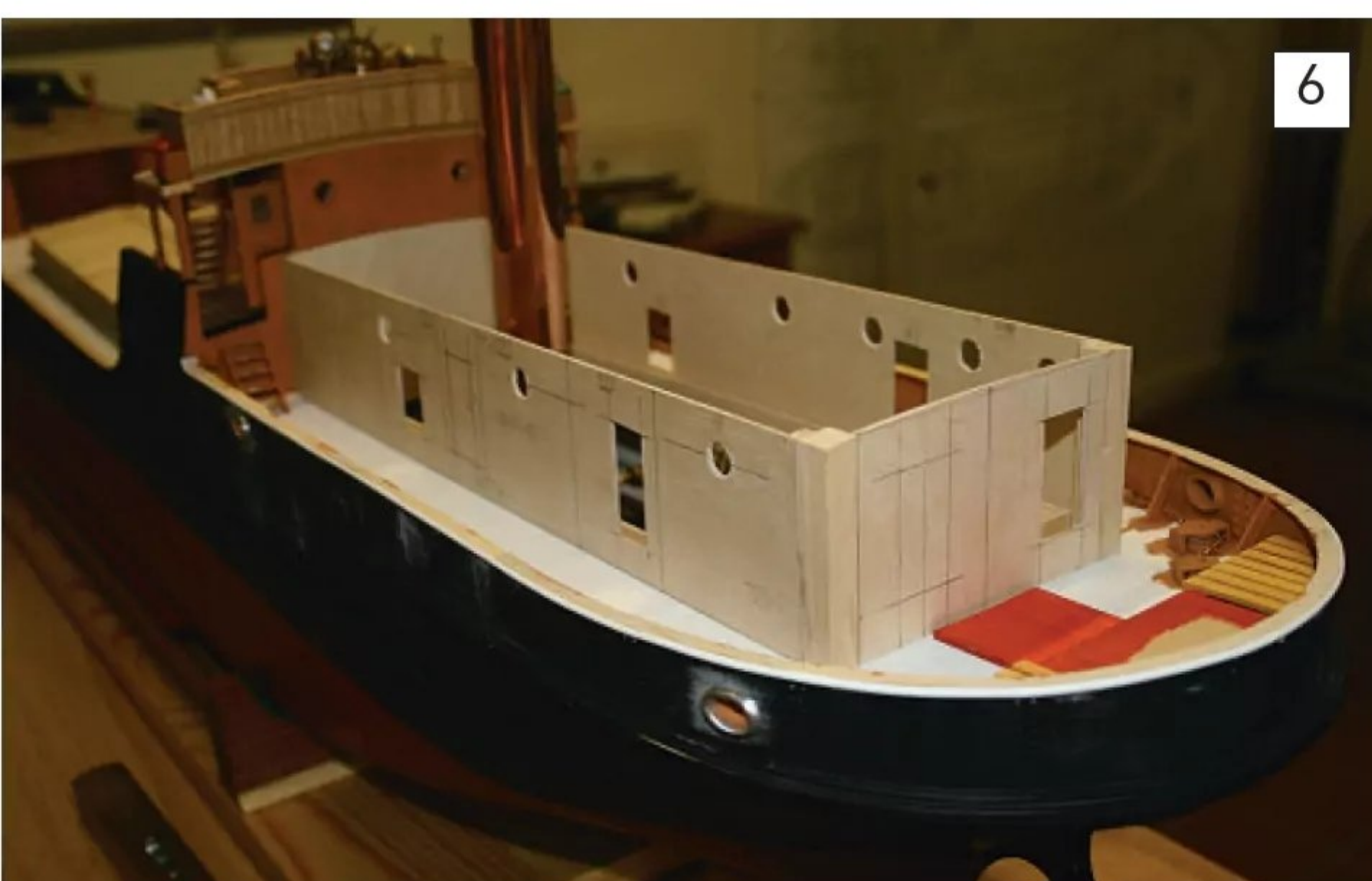
Lastly, the top deck was marked out and a hole cut for the funnel before



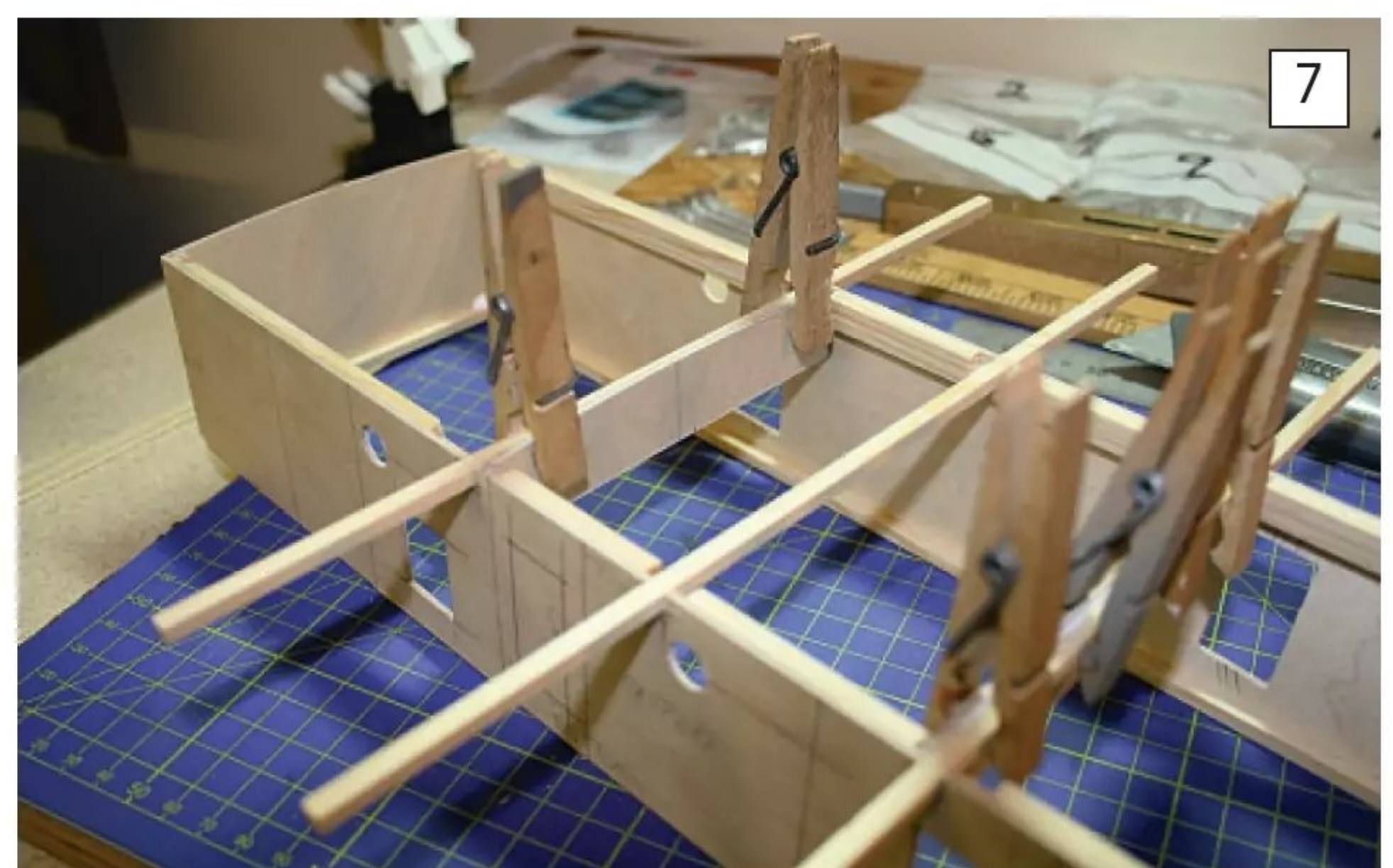
The first step of building the box was to make the sides and cut the openings. Plate detail was marked out and the portholes tested for fit.



A soft wood frame was glued to the bulkheads as well as the softwood blocks for the rounded corners, all to give the bulkhead some rigidity.



The aft bulkhead had a former cut at the top edge to give the deck the appropriate camber. A small cutting jig was made up to ensure all the intermediate bulkheads had the same camber.

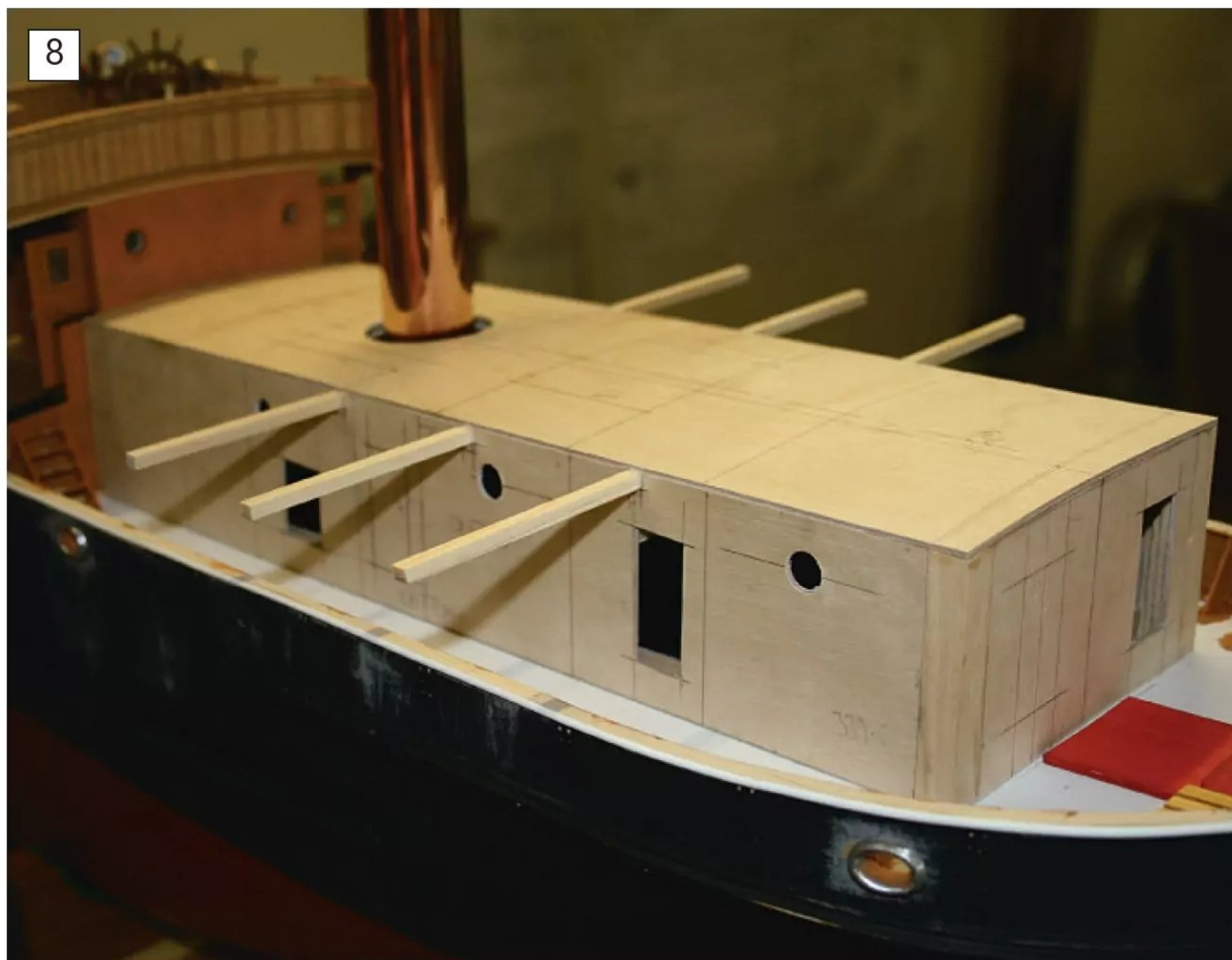


The intermediate bulkheads were fitted to the cross frames so that the deck would have a uniform camber along its length when glued in place.

“I opted to use the plastic funnel supplied with this kit. This may seem an unwise choice for a model with a steam plant, but...”

it was glued to the top edges of the cambered supports and the edges of the bulkheads. Once thoroughly set, the edges were trimmed to the bulkheads (see **Photo 8**). The unit could now be removed and replaced to give a perfectly gap free fit to the deck. Next, it was stiffened internally with additional pieces of framework and further beads of glue were run along many of the deck joints to ensure the ply remained securely attached with its cambered shape (see **Photo 9**).

Happy with the basic structure, I then felt comfortable to move forward with detailing. I opted to use the plastic funnel supplied with this kit. This may seem an unwise choice for a model with a steam plant, but as I intended to insulate the boiler flue, I was not too concerned about heat damage. The funnel fittings were all added, mainly from the kit parts, although the whistle was scratch built from metal scraps. The machinery space skylight was made from the kit parts and fixed in place on top of the deck, and the small piece of decking was laid in the same way as the bridge decks and the forecastle decks. The frame for the coal bunker was also added to the forward end of the structure (see **Photo 10**). The white metal cast ladder unfortunately didn't survive transit in the kit box, so that was replaced with a sturdier scratch built one fashioned from 2.5mm domestic copper cable core and softwood.



Once the deck was marked out and fitted, the camber matched the bridge unit perfectly, and the entire structure started to look a bit more like Richard wanted it to.

“The supplied fibreglass mouldings for the ship's boats were perfectly adequate, but I was now starting to look at the model differently...”

The boats

The supplied fibreglass mouldings for the ship's boats were perfectly adequate, but I was now starting to look at the model differently. I liked the idea of the boats being open, with a detailed interior; the standard I'd be aiming for, however, would be difficult to achieve if I used the kit's fibreglass mouldings.

As luck would have it, I spotted a lovely little clinker-built dinghy at a model show around this time, and a discussion with its builder led me to a plan for a Smack's Dinghy drawn up by Harold Underhill. I therefore

bought a set of the plans from Brown, Son & Fergusson, Ltd, Glasgow, and set about modifying them to give the same dimensions as the kit supplied boat. From that plan I made a building jig (see **Photo 11**) and began putting together a planked, clinker-construction boat, built entirely from strip wood (see **Photo 12**). It took around three months to complete, but the difference was certainly worth it (see **Photo 13**). Once happy with the port side ship's dinghy, I then adapted the building jig to give me a double ended hull and then did it all again to



Internally a little additional bracing was added, and generous beads of glue were run along the edges of the framework to ensure the strongest possible joints and no possibility of the curved deck lifting.



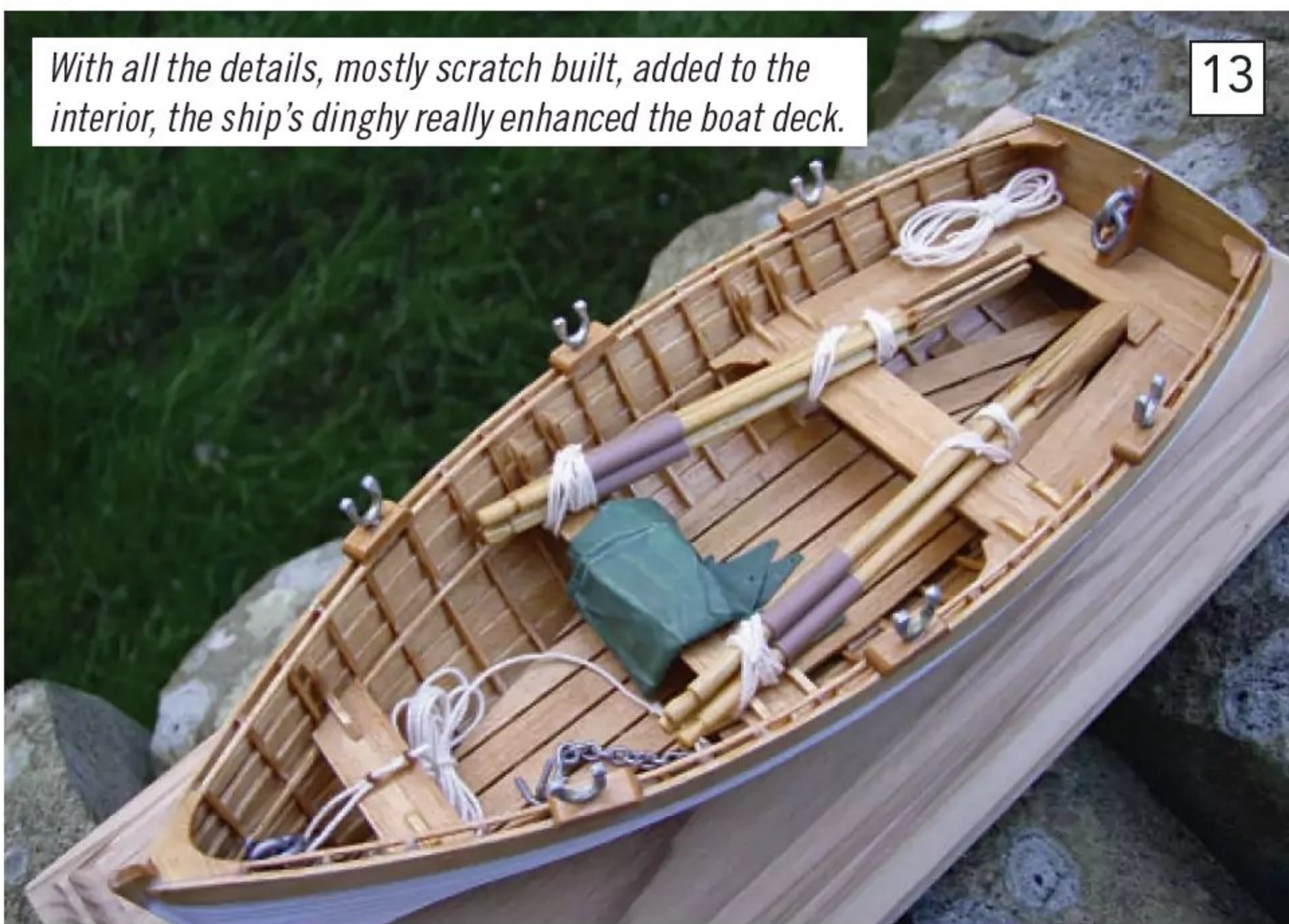
With the basic box complete, additional parts, such as the funnel with its details, the engine room skylight, the section of decking, the forward bunker and the beading around the top edge of the bulkheads, were added.



The plan was copied and adjusted dimensionally to give the appropriate length and width for the Ben Ain's dinghy. From this plan an inverted jig was made on which the model boat could be built. Being inverted, the first piece was the keel with transom and stem post that was laid across the top of the jig.



With all the planking complete around the hull sides, the familiar shape of a clinker-built ship's dingy emerged. Very pleasingly, the planking looked as good on the inside as it did on the outside, so a great foundation for a nicely detailed interior.



With all the details, mostly scratch built, added to the interior, the ship's dinghy really enhanced the boat deck.



Richard had to amend the jig for a double ended boat and then repeat the process for the ship's lifeboat.

build a ship's lifeboat (see **Photo 14**). These two boats were then fitted out accordingly with a rudder, oars, mast and sails for the lifeboat and just a set of oars for the dinghy. I eventually ended up with a pair of much more detailed boats than I could have made from the fibreglass kit items.

Detailing

I could now progress the more detailed parts of my accommodation unit. Doors and fittings were added, as were the port holes, and the plate edge joints were scored into the surface before the complete unit was given a coat of primer to help identify where there may be any areas of concern (see **Photo 15**). Handrails were then installed using the kit supplied fittings and coated rod. Following this, the entire structure was given another coat of primer, before an overall coat of the accommodation brown was brush painted in Humbrol enamel. Cladding joint detail was added to the funnel using paper strips embossed with

a pounce wheel, and the first coat of matt black enamel was then also applied with a flat brush.

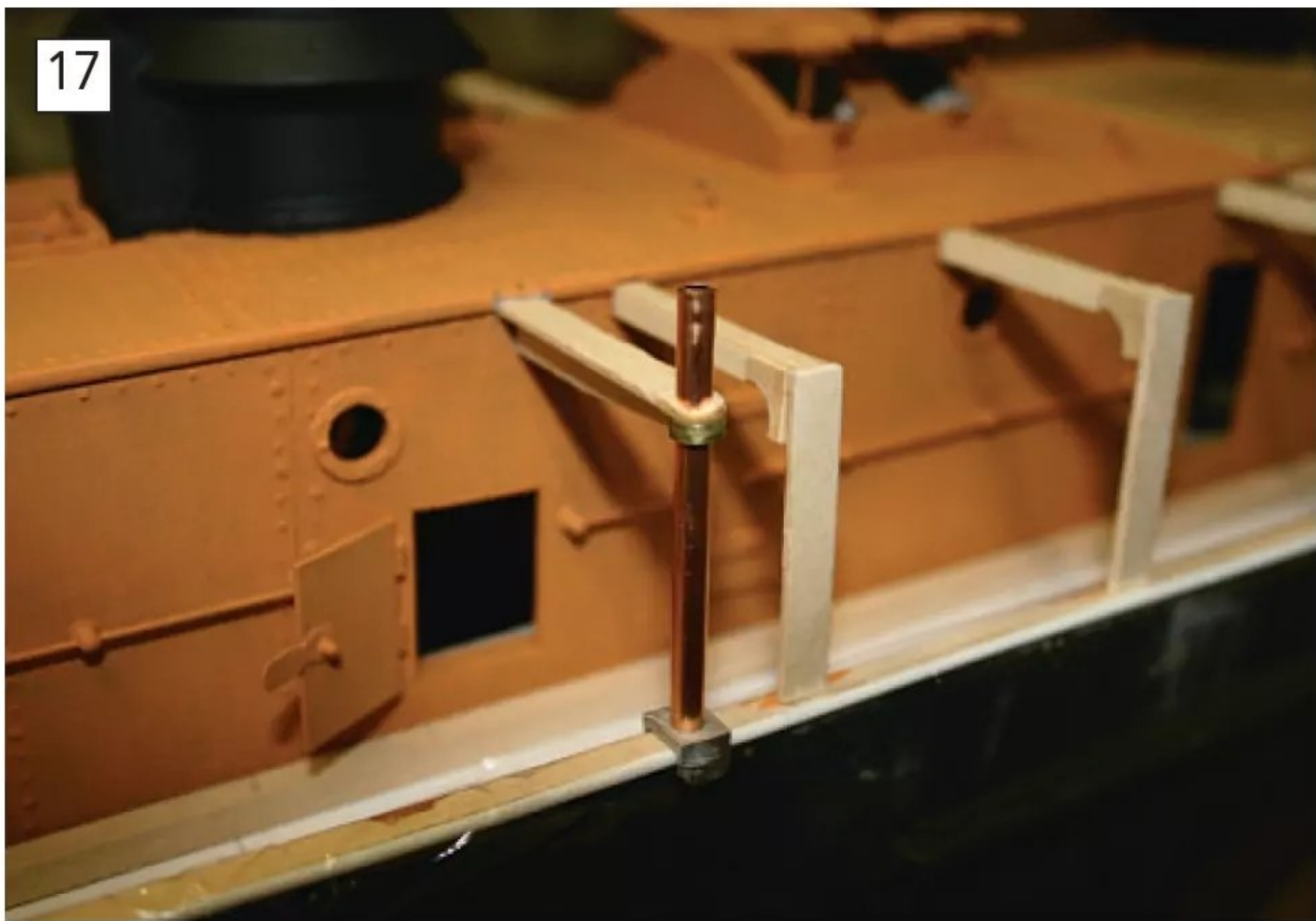
The light fittings were added internally, with the wires sealed in against moisture by covering them with epoxy glue before the entire internal surfaces were painted with a heat-resistant paint (see **Photo 16**). Lights were fitted to each internal bulkhead and a stern lamp was fitted to the aft deck of the unit.



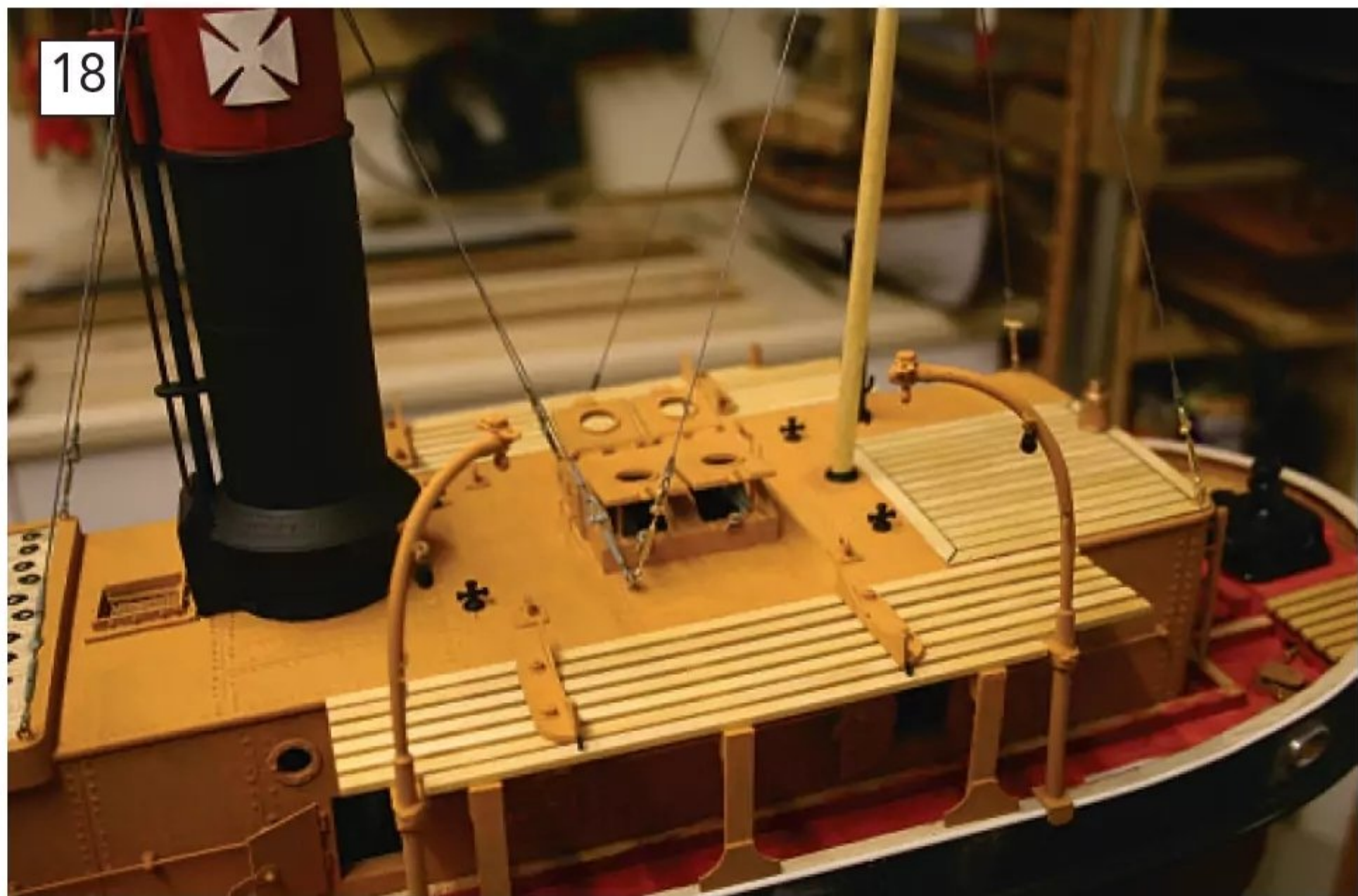
A first coat of primer showed up the surface texture and highlighted any areas that required attention, before more coats of primer and the first topcoat of brown/orange enamel was painted on.



Internally, a light on each bulkhead and a stern light on the top deck were all wired into a plug fitting that located into a socket fitted to the inside of the coaming, thereby enabling the unit to be removed without the need to disconnect wires.



With the unit in place on the model, all the boat platform supports and the davits could be fitted, ensuring there were no unsightly gaps at the bulwark capping rail.



Davits and boat platforms in place, the cradles having been fitted with BA nuts and bolts to simulate their real-life counterparts. Shrouds have been fitted to the aft mast and the funnel, with working bottle screws to ensure everything remains tensioned.



A good rummage through Richard's local model shop identified a couple of kits from which he could make up suitable crew figures. This, he points out, is where building to 1:32 scale really pays dividends, as there's a wealth of plastic kit accessories available.

“Despite being fitted with a steam plant, it was probably around this time that the build started to drift towards static display. My mind seemed to be firmly locked into building the best scale model possible, without really understanding the consequences at the time”

play, using the kit supplied white metal parts as templates. The first trial to make up the boat falls resulted in a look that I simply wasn't happy with, so the falls ended up being made again later (see **Photo 18**).

Finishing

Despite being fitted with a steam plant, it was probably around this time that the build started to drift towards static display. My mind seemed to be firmly locked into building the best scale model possible, without really understanding the consequences at the time.

Photographs of the *Ben Ain* and other similar types of vessel from the same era frequently show a lot of clutter on top of the quarter deck accommodation. The deck often served as an area where crew carried out certain maintenance tasks, and sometimes a workbench and a vice would be found up there. It was certainly used as a storage area for spare ropes, wood dunnage and any other bits and pieces that didn't have an obvious home to go to. I wanted to recreate a little bit of this atmosphere, so set about adding the required bits. First up was a couple of crew members. The kit supplied ones didn't really fit what I was after, so I decided to dig around in my

20



A little cameo on the aft deck gives the area a bit of character and life, with a sailor sat on the warm engine room skylight while repairing a mooring rope chatting to a cook just taking a breather from the hot galley.

local model shop. I came up with a Russian tank crew member repairing his uniform and a German field kitchen set that had a perfect cook in an apron (see **Photo 19**). These two were modified slightly and painted up in civilian clothing to form a chatting pair on the deck. Maybe the cook is looking for an opinion on a new recipe idea (see **Photo 20**)?

Also added were various spare bits of rope and chain. The ship's boats were both rigged with much better-looking falls and a lovely photo-etched kit of a bicycle was found as another quirky touch for my life on deck scene. The mast was installed, and shrouds fitted with real wire, while working bottle screws to the funnel and the mast helped to create the

22



A pleasing look to the aft end of the model, with lots of added detail, and the camber, the fit and the plate detail all making the accommodation unit worth the additional effort.

21



The vent cowls were machined out and fitted with copper tubes to enable as much ventilation into the hull as possible. Joints were enhanced with more riveted straps.

working atmosphere I was looking for. The boards were added to the top of the coal bunker and the canvas cover put in place as though waiting to be fitted, thus enabling the board details to remain visible. Also, the vent cowls were modified and fitted with copper tube to actually provide ventilation (see **Photo 21**).

Finally, a decision on finish had to be made. I was aiming for 'realistic' and all photographs of ships of this period looked to be in particularly heavily weathered condition. But, if I were to try and replicate this, I was worried it would end up a mess. Consequently, I did nothing more than apply a thinned down dark brown wash to the entire model, an additional rust-coloured wash over the surface of the funnel, and a black wash only to areas of the deck's flat surface where soot would have been likely to fall (see **Photo 22**).

Part 3

With the hull, the bridge unit and the raised quarter deck accommodation done, it was time to finish off the bits and pieces that would complete this model, all of which will be covered next month. ●



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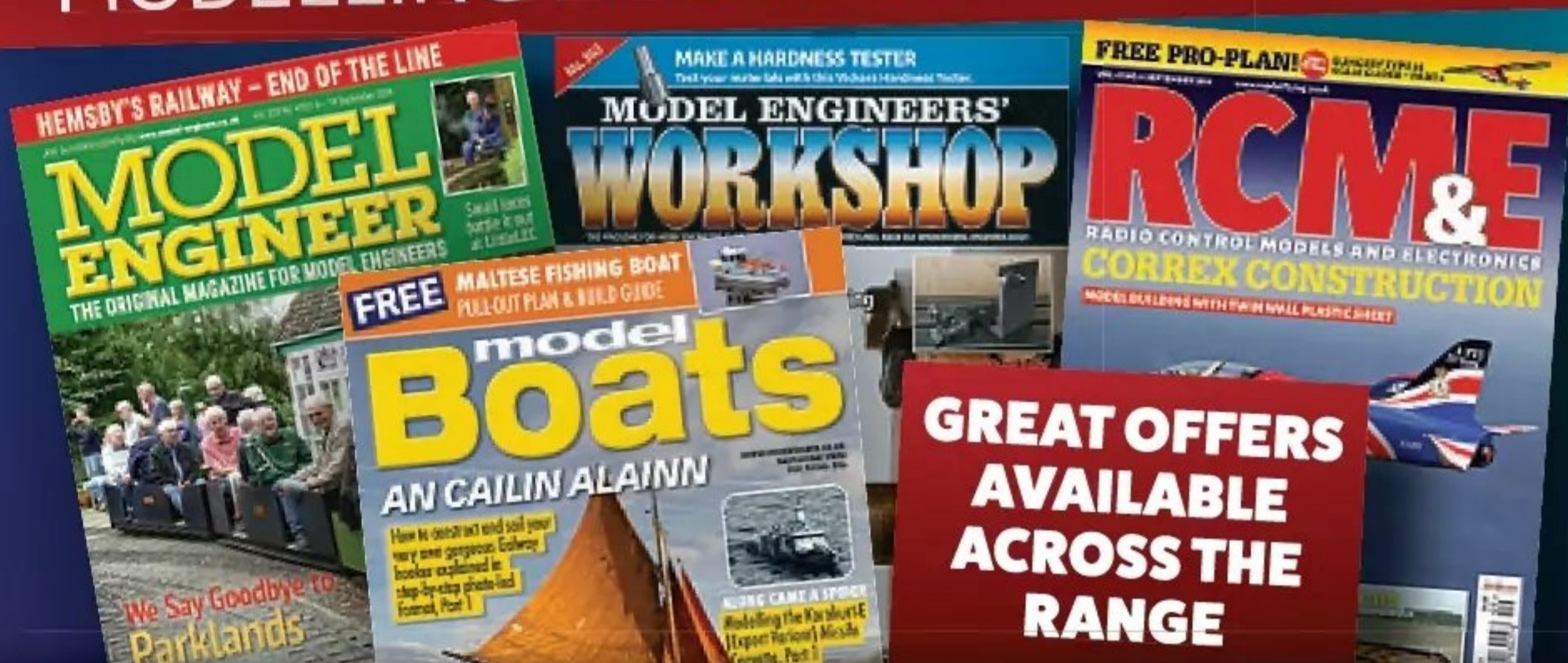
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Your Models

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

Bandita

Although it took some time to save up enough money for an engine, I was finally able to realise the dream of building a model steamboat when I purchased an oscillating two-cylinder in a V shape from the American company P.M. Research on eBay.

Having collected this from the Post Office, I then had to consider the design and overall look of the model itself. Here, I drew inspiration from the Internet, mostly from websites featuring with clinker-built vessels, and photos posted by people who run real steamboats on a lake in New Zealand.

I had already decided my steamboat would be built to 1:12 scale and that the 80cm hull would be wooden with clinker planking. Setting to work, therefore, I cut the keel from 8mm plywood, fitted it with four ribs of 4mm plywood, and fixed it to a temporary holder. I then started to put the planks over each other. I used 20 x 2mm slats that I bought in the Luna model shop in Pilsen. When gluing, it was necessary to heat the slats to adjust to the shape of the hull. The whole hull was glued with two-component epoxy adhesive. I impregnated the interior of the finished hull with Sadolin wood varnish in a shade of walnut, and once thoroughly dry wiped this over with boat varnish. Next, I applied three coats of white Balakryl to the exterior of the very solid and sturdy hull.

I cut the deck out of 2mm walnut plywood, stained and varnished it.

My friend Standa Jíša made the lettering and flag for the boat. Another friend, Roman Hrabě,

who welded the boiler for me, also deserves huge thanks for his precise work. The brass boiler is equipped with flame pipes for better heat conduction and steam development. Although it doesn't seem like it, the American two-cylinder consumes a lot of steam. I originally wanted to use a pressure gauge from a fire extinguisher which I snapped up for CZK 130, but unfortunately this didn't look good on the boiler, so I bought another, together with a steam whistle from the online store stoletipary.cz. I also bought lubrication for the steam engine, Wileco oil. The 75mm diameter brass burner was also welded by Roman.

The problem was where to get ceramics for the burner? After searching the internet, I found a company that manufactures ceramic plates for portable heaters, so I approached the company asking for some of the plates. Before long a package arrived in the mail containing two plates that the company produces as promotional items for customers. So, I put a cut-out ceramic wheel into

the burner and sealed it with K-84 high temperature resistant glue, which I bought in Hornbach. I used a small gas tank from a Var G-230 cooker. I soldered the steam engine exhaust condenser from a brass sheet and painted it black with Tamiya paint.

The reverse of the steam engine is controlled by the HS-5495BH servo with carbon gears. The rudder of the ship, made of plywood, is controlled by servo HS-430BH. The steam whistle function is controlled by servo HS-5087MH. I chose these servos because they have a power supply up to 7.4V. I used a Hitec Optima 7 receiver; the onboard R/C system is powered by a 6V lead acid battery.

The wooden figures were carved by my dad. I used servos to keep them moving.

The finished model was given several test runs. The best position was achieved in Kutý, Slovakia, where the boat took 2nd place in a mass steamboat race. That was 10 years ago now, but video footage shot is still available on YouTube: key Parní Kúty 15minutový závod (GoProHero3) into the search engine.

TOMÁŠ BLAHŮTKA
EMAIL

Bravo on your brilliant Bandita, Tomáš Ed.



Catweazle II

I am sending you some photos of my recently built catboat, *Catweazle II*. Catboats are a very particular type of sailing boat, very stable and mostly with only one big sail.

The model was built from a 'short kit' (available to order online via <https://www.b-boats.de/produkte/buzzards-bay/>), which provides a set of frames, etc, for plank-on-frame construction. The constructor and producer of this model kit is an old friend of mine, Klaus Bartolomae. He designed the first version in a smaller scale (1:10) some 25 years ago and took this to exhibition. It instantly cast a spell on me, and for the longest time I had the idea of a building one of these catboats running around in my head. So, when Klaus recently showed me the new 1:6 scale kit he's designed, I could no longer resist.

I found the build very easy, and it has resulted in a very nice model, measuring 888mm in length, with a beam of 407mm, that weighs in at 8.4kgs, and which sails very nicely.

I decided to call the model *Catweazle II* as a homage to Klaus, as his original, smaller, version had been named for the lead character in an early 1970s' children's TV series. Some of you may, like me, be old enough to remember following the adventures of the 11th century wizard, Catweazle,



after jumping 900 years into the future and finding himself in very unfamiliar world. I have, therefore, also added figures of Catweazle and, although not visible in the pics, his pet toad, Touchwood.

Videos of the model on the water can be viewed on YouTube (key https://youtu.be/XR5OXnzp_10, <https://youtu.be/0yXvU2YeY50> into your browser).

For fans of the show, I can only close with "Salmay, Dalmay, Adonay"!

CHRIS LADEL
EMAIL

Such a charming model, Chris! Ed.



Stuart Turner Henley

The first steaming of my Stuart Turner Henley (the restoration of which was documented in the June/ July 2024 issues of *Model Boats*) on open water was at the Winterbourne House and Gardens on August 24 this year. The hull of the model had been purchased exactly a year earlier at the same 'Toy and Model Steam Gathering' event.

The term 'open water' is a bit of a misnomer; in reality, we're talking a makeshift model boating pool made from a 5 metre by 3 metre plastic sheet. Because of the small size of this pool, the Henley was run with a hard right rudder to stop her hitting the pool sides too often. She was, as had been expected, quite fast, and with right rudder heeled over rather a lot. She ran for just over 10 minutes, just as she had in the test tank. She did, however, rather disgrace herself, by running over and sinking a model 'Pop-pop' boat, although fortunately causing no damage to it.



I am now hoping to run her on a larger stretch of water before winter sets in.

TONY BIRD
EMAIL

Thank you for this update, Tony – great to see you've got this beautifully restored model back on the water. She's looking gorgeous! Ed.

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**

Memories that stick

Terry's letter in the October issue brought back memories of the time when I was about 8 years old during the late 1950s. My father decided one autumn that he was going to build a sailing dinghy over the winter in his garage. A large packing crate arrived and upon helping him unpack the contents in the corner of the crate was what appeared to be a very large grey tin of paint. In fact, it was a tin, about the size of a 2.5 litre paint tin, full of Aerolite 306 resin powder. It was also accompanied by a large glass bottle of the acid hardener. We were told that the glue had been developed for use on the construction of wooden aircraft frames, such as the Mosquito, flown during World War II.

It was also used in the wooden boat building industry and was believed to be one of the strongest wood glues available, considerably stronger than Cascamite.

If my memory serves me correctly it was available in two versions, a slow setting and a fast setting. I think the fast setting took the best part of a day to harden; once set, though, the joints produced were almost unbreakable. If you managed to separate the two pieces of wood the glue did not split, instead the grain of the wood pulled apart next to the joint.

Looking on the internet I have found Aerolite 306 currently for sale. It is a Urea-formaldehyde-based glue; however, it appears to be produced

by several different manufacturers. The original was, I believe, produced by CIBA, so I suspect that company has either sold the rights or the patents have expired.

I know the above is a bit off the subject of model boats, that is unless you are building a reproduction of the beautiful old wooden pond yachts, but I hope it is of some interest.

JOHN ROGERS
EMAIL

Thanks for sharing these recollections, and further info, John. As you will now have seen from last month's issue, Terry's letter has prompted much interest and correspondence, so you are certainly not off topic! Ed.

Nostalgia button well & truly pressed!

I really like the historic articles as I can relate to them, so I found John Parker's Collectable Catch-Up in the October 2024 very interesting. I have two Graupner Nautocraft motors. The newer one was bought at The Model Shop on Blenheim St Newcastle-upon-Tyne when I was a poor engineering student. I know I didn't pay the price that John mentioned (£10.90) in his article, though. The Henry J. Nicholls ad from February 1972 Model Boats lists it at £ 2.75 (which equates to about £20 in 2024), while the RipMax ad spells it correctly and has it at £ 5.45. I suspect that as RipMax were the importer they had contractual agreements not to sell at a discount.

I also have three Decaperms, two with the old-style case and one new one. I powered my first r/c boat with a Decaperm in 1968, using a 4-channel REP valve transmitter and reed/relay receiver for control. I ran

the Decaperm on 12V for a brief time before the commutator melted! So, I did what any self-respecting 16-year-old would do – that is, I scrounged some Tufnol from the school physics department workshop and made a new commutator in the school metalwork shop. The school physics, chemistry and metalwork departments were very supportive of my eccentricity! For example, in the chemistry lab I proved that concentrated nitric acid etches printed circuit board very quickly.

In 1971, just after finishing my 'A' levels, I bought an Ariel 6 radio control set. I got it new but on clearance as by that point everyone could see that proportional was the way forward. My last day of school was an 'Open Day', and I did demonstration sailings on the school swimming pool with an Aerokits 34.5-inch RAF launch, temporarily electrically powered with a Decaperm.

I bought a six function Futaba set in 1977 (by then I was an Engineering Officer in the Merchant Navy).

I still run all my boats and my three R/C vehicles on Futaba 27 MHz gear.

I have four Climax Servomites, two relay and two relayless; however, I only have one functional Microperm motor, so if anyone knows of a supplier of brush gear for the old style Microperms I would be most grateful.

VICTOR J. CROASDALE
ILLINOIS, USA

Glad you enjoyed John's feature, Victor, and love that you've shared some of the great memories triggered by it.

I am guessing, because John lives out in Australia, that £10.90 he mentioned would have been due to an export premium.

Anyway, always lovely to hear from you and, naturally, I will forward any supplier suggestions straight on to you. Ed.

Transmitter advice required

I am sending you photos, that I hope you will be kind enough to pass on to Memory Lane contributor Dave Wiggins, of an old transmitter found when helping the family of friend to dispose of some models and equipment. The plug-in module on the rear states that it is 40 mhz but there is no crystal either inside or outside. It had an old 9.6 battery built in, with a charging plug on the outside.

Any information would be helpful in deciding what to do with it.

JEFF CARTER
EMAIL

As requested, it's over to Dave Wiggins here, who advises: "Crystals are easily sourced on eBay. 40FM radios are still fully legal in model boats and, provided there is no rot or battery leakage inside, a new battery ought to get this going quickly. It's not a valuable collectable, so watch the spend, maybe. Modern 2.4 sets for boats are just so cheap". Thanks, Dave, and hope that's of help, Jeff. Ed.



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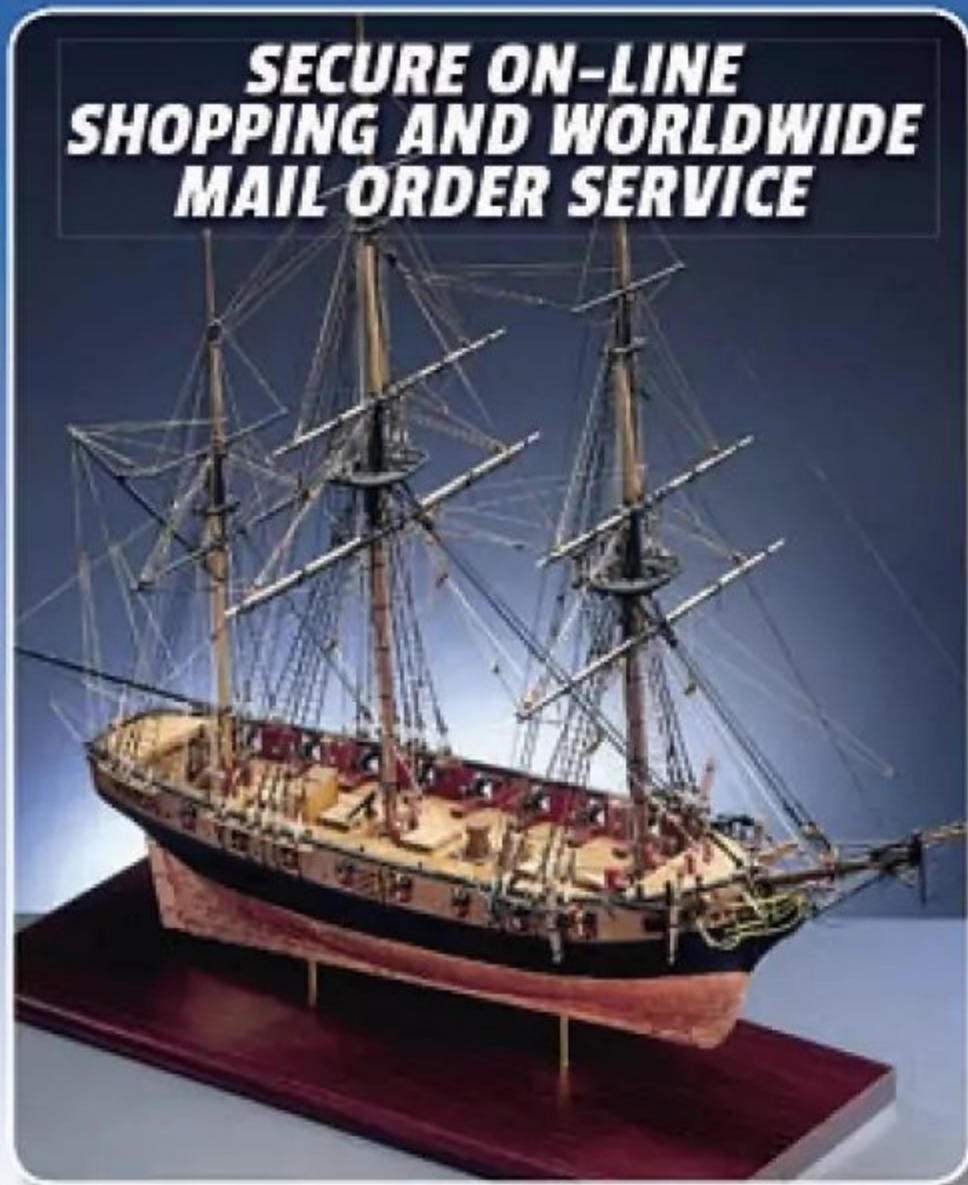
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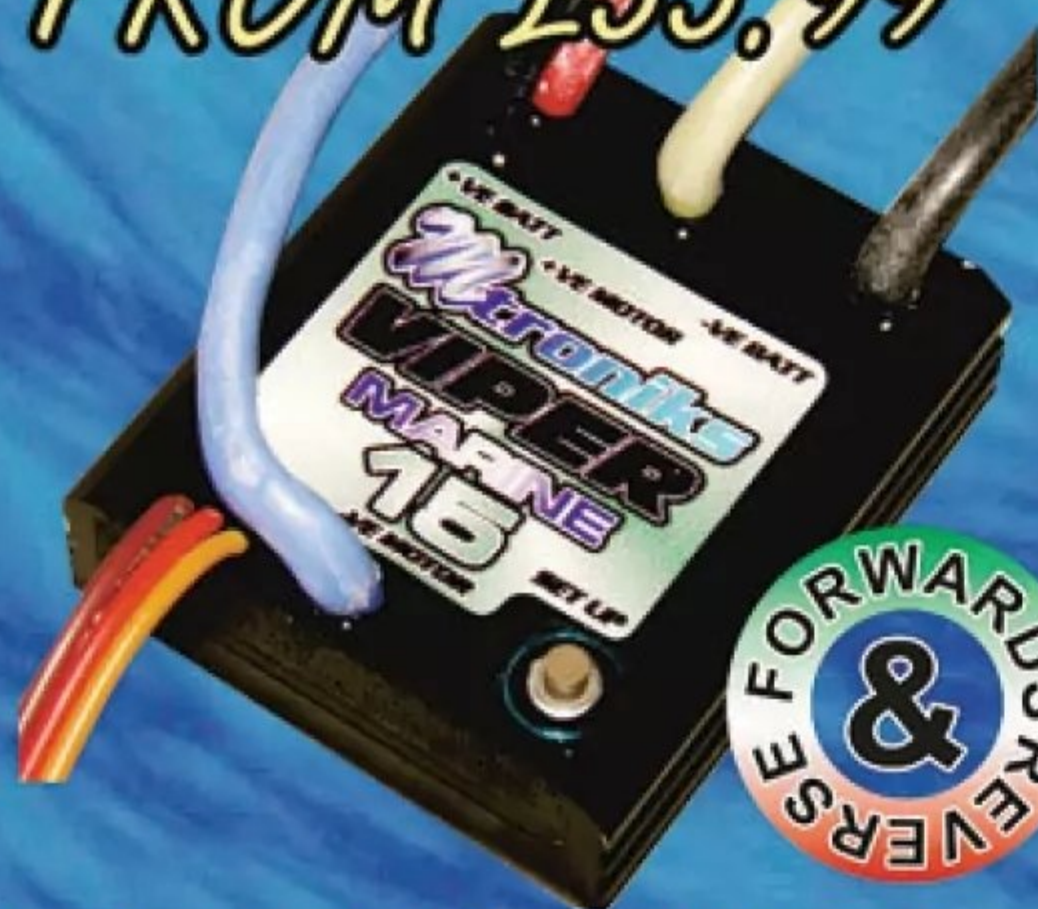


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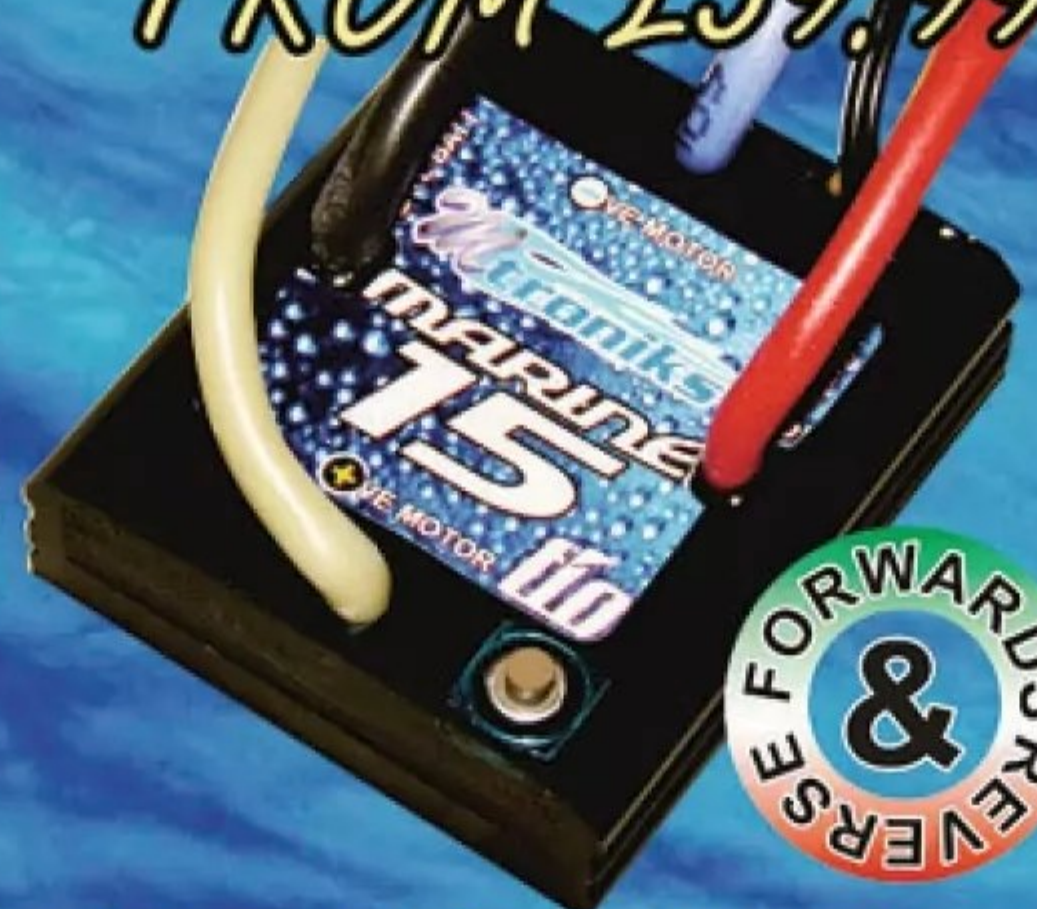
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