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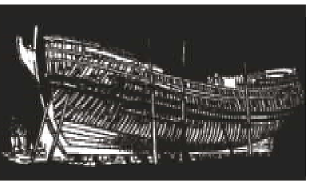

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1:192 R.N pattern 3 rail stanchions	£10.80
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This is just a selection from the huge range available

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1:24 Civilian crew member standing wearing beret	£8.12
1:24 Civilian/R.N Officer wearing cap and pullover	£8.12
1:24 R.N/Civilian wearing waterproof jacket	£8.12
1:24 Standing civilian captain in sheepskin jacket	£8.12
1:24 Seated ships captain with cap and pullover	£8.12
1:24 Standing officer in wet weather jacket	£8.12
1:24 R.N/Civilian wearing waterproof jacket	£8.12
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1:24 Seated civilian crew member 1:24 scale	£8.12
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Rigging Thread, 0.75mm Natural	£1.98
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Rigging Thread, 1.3mm Black (10mtr)	£2.84
Rigging Thread, 1.3mm Natural (10 mtr)	£2.54
Rigging Thread, 1.7mm Natural 5 mtr	£3.18
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Rigging Thread, 2.5mm Natural (2.5mtr)	£4.42

This is just a selection of the range available.

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Lime Strip 0.6 x 3mm x approx 1 metre long	£0.35
Lime Strip 0.6 x 4mm x approx 1 metre long	£0.38
Lime Strip 0.6 x 5mm x approx 1 metre long	£0.41
Lime Strip 0.6 x 6mm x approx 1 metre long	£0.44
Lime Strip 0.5 x 7x approx 1 metre long	£0.47
Lime Strip 0.6 x 8mm x approx 1 metre long	£0.25
Lime Strip 1.5 x 1.5mm x approx 1 metre long	£0.36
Lime Strip 1.5 x 10mm x approx 1 metre long	£0.73
Lime Strip 1.5 x 2.0mm x approx 1 metre long	£0.40
Lime Strip 1.5 x 3.0mm x approx 1 metre long	£0.45
Lime Strip 1.5 x 4.0mm x approx 1 metre long	£0.50
Lime Strip 1.5 x 5mm x approx 1 metre long	£0.55
Lime Strip 1.5 x 6mm x approx 1 metre long	£0.58
Lime Strip 1.5 x 7mm x approx 1 metre long	£0.61
Lime Strip 1.5 x 8mm x approx 1 metre long	£0.65
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Lime Strip 1 x 1.5mm x approx 1 metre long	£0.36
Lime Strip 1 x 10mm x approx 1 metre long	£0.55
Lime Strip 1 x 2mm x approx 1 metre long	£0.37
Lime Strip 1 x 3mm x approx 1 metre long	£0.38
Lime Strip 1 x 4mm x approx 1 metre long	£0.39
Lime Strip 1 x 5mm x approx 1 metre long	£0.45
Lime Strip 1 x 6mm x approx 1 metre long	£0.50
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Lime Sheet 4mm thick x 100mm x 1 mtr	£12.71
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Lime Sheet 6mm thick x 100mm x 1 mtr	£12.13
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Scale Model Tugs	£14.95
Period Ship Kit Builders Manual	£16.95
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Scratch Building Marine Models	£9.95
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This is just a selection from our huge range of books.

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Pin Pusher	£9.07
Waterline marking tool	£10.48
A3 cutting mat	£11.18
Pounce Tool with 4 wheels	£11.16

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editorial

One of this hobby's most endearing qualities is the opportunity it presents to recreate our long-lost maritime past. Through the medium of model-making we're able to offer our work as an accurate historic record that not only remembers lost vessels but also the people that crewed them and the hardships and struggles they endured, whether that be in the field of conflict, on a voyage of discovery, or during the seemingly benign maiden passage of an Atlantic crossing. 3D computer modelling and CGI are all very well but nowhere do you get a better sense of scale and proportion than standing alongside a carefully crafted model. As exponents of the hobby we tend to take this for granted, however when you're next at the lakeside enjoying the sight of a period ship, stop for a minute to consider what your viewing for it may just be that you're witnessing a shape on the water that hasn't been seen in the flesh for upwards of 50 or 100 years (potentially, much, much longer) and, other than in model form, will likely never be seen again.

And then there's that human element. Remembering the sacrifices that have been made in military conflict, or the lives lost through error, adverse weather or sheer foolishness, is something that, as modellers and maritime historians, we find easier than most. Many of us, for example, strive to build replicas of the ships that have shaped our military history and, in doing so, will often research and document the human cost that's associated. Where warships are concerned, the memory of the crews who manned them is kept very much alive by what we do, which, by virtue, also acts to remind others.

I can find no better example to substantiate all this than to highlight Roy Cheers' motivation behind the building of the relatively innocuous cargo liner Beaverford. As you'll know if you read Part 1 of his construction article in the last issue, here is a vessel and crew that, massively out-gunned, fought to the last in defence of convoy HX84, yet have been largely forgotten. In building his relatively small but meticulously detailed model of the Canadian Pacific steamship, Roy has very effectively highlighted the injustice of the crew's unrecognised bravery and brought it to the attention of all who set eyes on his model. Whether it be through readers of this magazine or passers-by at the pond, awareness of the ship and its plight will have been raised, and that, you have to admit, is a very powerful act of remembrance.

The same can be said for many of the models we build, whether they be submarines, cruisers or even Dunkirk little ships. Often, they have a very poignant story to tell whose value is far greater than the sum of their parts. This, then, is where scale model boat building acts to enrich our maritime history and I for one consider it a very valuable contribution.

Graham Ashby

Compass 360

Our news round-up from the model boating world

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BIG TOEPHY EVENT

Eleven entries from three districts descended on Guildford's water at Abbey Meads, Chertsey for Fred's Big Toephy Footy Open Event (there's a dreadful pun in there if you hadn't noticed – Ed). All were hoping to start the year's nine open events with a bang, however the weather was really unkind; cold, relentless rain and little wind. Still, that didn't stop Race Officers Martin Crysell and Peter Dunne from running 10 races for which they were thanked heartily by the prize-winners. These little boats usually sail well in light air but, alas, with insufficient wind there was a lot of sideways drifting to be seen in lieu of forward motion. Despite this, the boys from Abington Park coped better than most with the conditions to secure all the podium places.

Peter Jackson led the way with a win in the very first race, sailing his IBEX. The most remarkable performance however was that of David Wilkinson, who had revived his American Bill Hagerup Back Bay Footy design. This is a simple hard chine box shape made from balsa with foils of a suitably reinforced similar material. Initially with a balanced Una rig, it did not perform well, so David changed to his beautifully made and set up swing rig – similar in concept to other boats – and transformed the performance in the lightest of air. He was often seen streaking away from the starting line, leaving the fleet behind, to get two wins before lunch. However, John Burgoine, sailing an ICE, also gained two wins and was more consistent. This saw him head the lunchtime leader board with just 7 points to David's 9.

After lunch there was a touch more breeze, with puffs that allowed the boats to heel briefly and make some recognisable progress to windward and downwind. John continued to be consistent with another win and three more thirds, but not consistent enough, as he was beaten on three occasions by Keith Bell sailing an IBEX, with two seconds and two wins. This brought the scores level and Fred's Big Toephy went to John on count back, as a result of his three wins **– Roger Stollery**

Find out more

Despite being small the Footy class is one of the most interesting from a design point of view with the 1ft x 1ft x 6" dimension box ensuring a level playing field. This is still the cheapest way to get into radio sailing with an amazing number of DIY designs on the official website at www.sailfootyuk.com. Take a look, but beware! Temptation awaits.

Footy yachts from a previous Big Toephy event. The conditions at Abbey Meads weren't this

RESULTS (TOP TEN)

1.	John Burgoine	ICE	17
2.	Keith Bell	IBEX	17
3.	Peter Jackson	IBEX	20
4.	David Wilkinson	Back Bay Footy	21
5.	Roger Stollery	ICE	33
6.	Keith Parrott	ICE	51
7.	Sid Sims	ICE	54
8.	Peter Stollery	ICE	72
9.	Oliver Stollery	ICE	80
10	Nathan Stollery	ICE	87

NovICE trophy – Keith Parrott, (best skipper who has not been on the podium in previous Footy events).

A GUIDE TO EAGLE KITS

Eagle model kits first appeared in 1957 with a small range of aircraft models. Sales steadily increased and when the company released its 1/1200th scale warships sales went through the roof almost overnight. Unlike most kit brands which were sold through traditional model shops and department stores, Eagle kits were also sold in large numbers in corner shops and newsagents alongside the massively popular Eagle comic. As one decade rolled into the next, sales increased until disaster struck when a previously established licence agreement with the comic publisher, to use the Eagle brand, was withdrawn. Despite valiant attempts to keep the company afloat the end came in 1962 when the business was put into administration. Since then the kits have been enthusiastically collected and some of the rarer models can change hands for upwards of £200.

If you're an Eagle collector or enthusiast you might be interested in this new booklet. Written and published by David Welsh, A Concise Guide to Eagle Plastic Kits covers the rise and fall of the brand and details the full kit range. Illustrated in full colour with many photographs taken by the author it contains a host of new information and runs to 55 pages in A5 format.

Priced at £5.95, plus £2.00 UK p&p, it's available from the author via email to dwelsh22@virginmedia.com.

RED DRAGON

Congrats to Kevin Woods who has just won himself a load of old Junk in our recent website giveaway. Kevin's Artesania Latina plank-on-frame Chinese Junk kit is currently winging its way to him, which is our signal to fire up another giveaway. Keep an eye on the competitions section at www.modelboats.co.uk and enter for free when you see the next one arrive.

EXTRA, EXTRA!

We're acutely aware that the magazine is only 'so' big and that we often don't have the space to publish everything we'd like to, especially photographs. So, in an attempt to rectify this age-old ink-on-paper shortcoming we've opened up a new section on our website at www.modelboats.co.uk. It's called Model Boats Extra and for us it's a little like finding a new cupboard under the stairs that infinitely expands to accommodate all the stuff we can't find a home for. For you, dear reader, it's added value and we sincerely hope it enhances your enjoyment of the magazine. To kick things off we've stashed more of Fraser Gray's atmospheric Waverley images to complement those in the March issue. Just scroll down to the 'Model Boats Extra' banner on the homepage and check 'em out.

More photos, more articles, more competitions, more chat, more polls and more great offers are coming your way on the website this year so do make sure you register! Why not zip over there now and join the club?

MAILBAG

Having kick-started our readers' letters section in the last issue we've been delighted with the response and would like to thank all who have responded favourably or, better still, put pen to paper and offered an opinion, a piece of advice, a tip, or an interesting observation. Keep them coming. For the time being we plan to run the feature on a bi-monthly basis, so don't be disturbed that it's not in this issue. It'll be back next month!

DIARY DATES 2018

Sunday 4th March
Balne Moor Model Boat Club – Season's First Sail. Informal scale sailing, everyone welcome, all boats equal, no sailing fee. 10:30am start, bacon / sausage butties are available as well as hot and cold drinks and home-made cakes – until they're gone! Satnav: DN14 0ER. More information can be found at: http://balne-moor-model-boat-club.myfreesites.net/ or by contacting: mikebutler1949@gmail.com.

Saturday 24th March
Yeovil Model Show. Bucklers Mead Academy & Leisure Centre, Yeovil. BA21 4NH. 10am to 4pm. Trade stands, hundreds of display models including boats from Shepton Mallet Drifters MBC, Warminster MBC, Yeovil Warship Association, plus Weymouth & Portland MBC. Also aircraft, cars, military and much more. Free parking, hot and cold refreshments, advanced tickets available – email yeovilmodelshow@gmail.com or phone Ken on 07759 137000. Adults £5. Accompanied children (under 16) £2.50. Cash only at the door.

Sunday 25th March
The Mutual Model Boat Society Grand Modellers' Bring & Buy Sale, Crimble Croft Community Centre, Aspinal Street, Heywood, Manchester, OL10 4HL. Come along and enjoy this famous event, either to sell or purchase your supplies. Always lots of unusual bargains. Opening time for traders: 08:30am. Opening time for sales: 09:30am. Food available from 09:00am. Closing time 1:00pm. The whole site is wheelchair friendly. Admission £1.50 (includes a raffle ticket). To reserve a sellers table (6ft x 2ft) £10.00. Please contact Kevan Winward on tel. 07803 975089.

Sunday 8th April
Balne Moor Model Boat Club Tug Towing & Scale Sailing. Teams of two tugs tow vessels through a set course. £1 per tug. Also, sail your own boat through a steering course, £1.50 per boat. 10:30am start. Bacon / sausage butties, hot and cold drinks all day and home-made cakes until they're gone, so get there early! Satnav: DN14 0ER. More information can be found at: http://balne-moor-model-boat-club.myfreesites.net/ or by contacting: mikebutler1949@gmail.com.

Sunday 22nd April
Steam & Mountfleet Models Open Day. 9:30am until 4:00pm at Wilton Park, Bradford Road, Batley, W17 8JH. Open to any steam models and any Mountfleet models. Up-to-date paperwork regarding boiler testing will need to be shown on the day. Paperwork for gas tank tests may need to be seen if applicable to your club's insurance. Testing of boilers can be arranged on the day but prior notice must be given. Static and on / off the water displays throughout the day, with a steamboat sail down the lake at around 2pm. Free car parking and refreshments available. Anyone who wishes to attend with any type of model will be most welcome. We hope to have some traders on site. Email Stan at kmbc2015info@gmail.com.

Saturday 5th & Sunday 6th May
Beale Park Spring Model Boat Show, Lower Basildon, Reading, Berkshire, RG8 9NW. Contact Phil Montague on 07815 902045 or email phil.kentdda@yahoo.co.uk.

Saturday 12th May
Model Lifeboat Rally 2018. Knightcote Model Boat Club. Free car parking, club house, plus hot food and drinks. Large sailing water, model railway displays, local RNLI Guild stand and two excellent guest speakers (booked through the Lifeboat Enthusiast's Society) in the onsite conference centre. Gazebos and tables can be provided, however if these are required visitors must contact Adrian or Chris before the event. New House Farm, Knightcote, Southam, Warwickshire, CV47 2EQ. Further details from Adrian Clutterbuck – tel. 01604 846461, Chris Moir – tel. 01926 612827, or visit: kmbcmodelboatclub.com.

Sunday 13th May
Bournville Model Boat Club Submarine Day – the whole day dedicated to all that submerge. 10:00am until 6:00pm. All are welcome to attend and, as all always, tea coffee and refreshments will be available. Disabled access is a given. Visit www.bournvillersmbc.org/ for further information.

Test Bench

FREE LUNCH!

Test Bench is a service that we provide free of charge to manufacturers, distributors and retailers of model boat-related product. Covering all disciplines, anything from books to balsa is accepted for these pages. To submit material, email the editor via editor@modelboats.co.uk and make sure to include all relevant text and pricing information along with high resolution images. That's all there is to it. Don't let anyone tell you there's no such thing as a free lunch.

Back to the Future

Remember crystals? Well, those who've hung on to their 40MHz Futaba radio gear, or have recently purchased Futaba's evergreen 40MHz F-14 transmitter, will be delighted to hear that Ripmax is, once again, stocking replacement Xtals for channels 50, 51, 52, 53, 54, 55, 58, 59, 82 87, 88, 90, 91 and 92. Reintroduced to satisfy regular demand these new high-quality items offer good temperature resistance, a superb build quality and feature gold-plated pins for a reliable and secure connection. The price for each is £11.99, although do note that only dual conversion receiver crystals are available. Take a closer look at **www.ripmax.com** or pop along to your local Ripmax stockist to stock up.

UDI Arrow

Now this really does look a lot of fun. Sleek, self-righting and supplied ready to run with 2.4GHz radio, brushless running gear, a 3S LiPo, plus charger and spare props, the UDI Arrow promises a taste of fast electric thrills without the financial commitment. With a suggested retail price of just £169.99, all you need add is four humble AA alkaline batteries and you'll be on the water in the time it takes to charge the battery.

Available now from Ripmax stockists you can find out more by visiting **www.ripmax.com** or popping along to your local for a closer look.

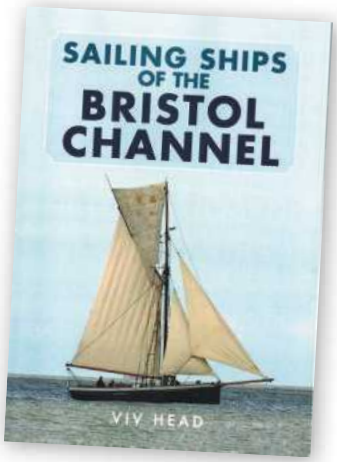
Quality control arms

Made in the UK, these new hard-wearing, glass-filled nylon, single, double and triple steering arms are sold individually and supplied complete with Allen key, grub screw and anti-slip brass sleeve to ensure accurate fine travel adjustment. Just choose your required sleeve diameter noting that sleeve sizes are available to fit shank diameters of 3mm, 4mm, 5mm, 3/16", 6G, 8G, 10G, 12G, 14G, 16G (all gauges are Standard Wire Gauge, SWG). Available from RadioActive Manufacturing and distributed in the UK by Logic RC you can see more at www.logicrc.com and, of course, at your local Logic RC stockist. Alternatively, tel. 01992 558226.

Giant gell cell

We have it on good authority that J. Perkins Distribution has just received a fresh supply of lead-acid batteries and that within said delivery are two new sizes, which could be handy if you're looking for a little extra duration or longevity between charges. So, in addition to the existing range there's also now a 6V 3.2Ah and a 12V 12Ah. In the case of the 12V battery that's quite a significant increase in capacity over the existing 12V 7Ah. Visit **www.jperkins.com** or collect one now at your local stockist.

Sailing Ships of the Bristol Channel



The Bristol Channel has an incredibly rich maritime history, stretching back to when men first went to sea in ships powered by the wind. Many were built locally on both sides of the Channel in Glamorgan and Pembrokeshire in Wales, and Somerset and Devon in England. The Bristol Channel pilot cutters have a legendary reputation right across the world; seventeen original vessels still exist and modern examples are still being built. Moreover, global explorer, John Cabot, set sail from Bristol in the Mathew and reached America, while Brunel's Great Britain was the largest ship ever to be built in, and to sail from, Bristol in 1834. At the other end of the scale, there are small double-ended 'Somerset flatners' fishing Bridgewater Bay. It goes on; at least three famous Antarctic exploration vessels loaded Welsh coal before heading south, the story of Scott's Terra Nova is well known and the Scotia, which pioneered Antarctic exploration, was later wrecked and burnt out on Sully Island.

In this new book, author and sailor, Viv Head, brings the story of the Sailing Ships of the Bristol Channel, up to date with Challenge Wales, an around-the-world racing yacht now based in Cardiff and active in sail training and youth projects. In between are a whole host of unsung vessels of all sizes, each with their own tale to tell. Maritime history is in our blood and this colourful and highly readable book will only serve to enrich it.

Written by Viv Head. Softback, 96 pages, 235 x 165mm, over 100 photographs, line drawings and maps in mono and colour. ISBN: 978-1-4456-6400-2. Price (RRP) £14.99. Published by Amberley Publishing Ltd. The Hill, Stroud, Gloucestershire, GL5 4EP. Tel. 01453 847800, www.amberley-books.com. Available direct from the publisher or through the usual retail outlets – **John Deamer.**

Battleship Warspite

Detailed in the builders' plans

The technical details of British warships were recorded in a set of plans produced by the builders on completion of every ship. Known as the 'as fitted' general arrangements, these drawings documented the exact appearance and fitting of the ship as it entered service. They were very large – more than 12 feet long for capital ships – highly detailed, annotated and labelled, and drawn with exquisite skill in multi-coloured inks and washes. Intended to provide a permanent reference for the Admiralty and the dockyards, they represent the acme of the draughtsman's art. Today these plans form part of the incomparable collection of the National Maritime Museum at Greenwich, which is using the latest scanning technology to make digital copies of the highest quality.

This book is the first of a series based entirely on these draughts which will depict famous warships in a previously unseen degree of detail – complete sets in full colour, with close-ups and enlargements to make every aspect clear and comprehensible. Extensive captions point the reader to important features to be found in the plans, and an introduction covers the background to the design and its principle characteristics.

The celebrated battleship Warspite is the ideal introduction to this new series – it is a familiar subject, but this novel form of anatomy will be a revelation to both warship modellers and enthusiasts alike. While the emphasis is on the ship as recommissioned in 1937, after her major reconstruction, sections cover the original design, the ships earlier modifications, as well as detailing action damage and wartime modifications.

Written by Robert Brown*. Hardback, 144 pages, 296 x 257mm, over 150 shipbuilders' scale drawings in colour. ISBN: 978-1-5267-1937-9. Price (RRP) £30.00. Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel. 01226 734222 / 734555, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets – **John Deamer.**

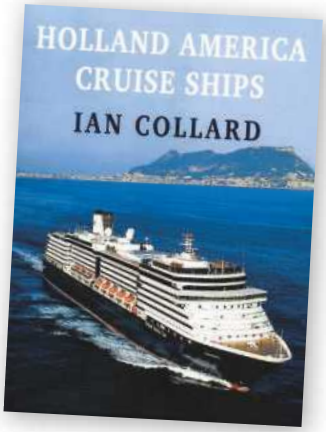
**Author, Robert Brown is a Canadian ship modeller, who has become familiar with official plans in the course of researching his models. He has also contributed to three volumes of the ShipCraft series (also published by Seaforth) the most recent being Japanese Battleships: Fuso and Ise classes (ShipCraft 24) published in 2016.*

Holland America Cruise Ships

The Holland America Line was founded in 1873 and operated a fleet of passenger and cargo vessels from the Netherlands to the east and west coast of America. The company later acquired the stock of the Europa-Canada Line and in 1964 became involved with the Swedish America Line, Axel Johnson and Wallenius Rederiana to form the Atlantic Container Line. In 1988 it was purchased by the Carnival Cruise Line and the name was retained.

Five different classes of ship are currently operated, the smaller and older 'S' class vessels; the mid-range 'R' class; the 'Vista' class; the newest and largest 'Signature' class; and the smaller 'Prinsendam' class. Koningsdam, delivered on 31 March 2016, is the largest vessel designed and built for the Holland America Line, with a beam of 35 metres she complies with the new Panamax dimensions, which enable the ship to cruise through the wider locks in the Panama Canal.

In this new, superbly illustrated, book, maritime photographer, historian and author, Ian Collard, tells the story of the Holland America Cruise Ships, utilising many rare and unpublished photographs of both the interiors and exteriors of the ships in many guises and liveries, together with advertising posters, brochures and sailing schedules etc., all with accompanying captions. For anyone with an interest in ocean liners and cruise ships, whether you're an enthusiast, maritime historian or ship modeller, this book is well worth considering.



Written by Ian Collard. Softback, 96 pages, 235 x 165mm, over 160 photographs, illustrations, line drawings, tables and maps in mono and colour. ISBN: 978-1-4456-6760-7. Price (RRP) £14.99. Published by Amberley Publishing Ltd., The Hill, Stroud, Gloucestershire, GL5 4EP. Tel. 01453 847800, website: www.amberley-books.com. Available direct from the publisher or through the usual retail outlets – **John Deamer.**

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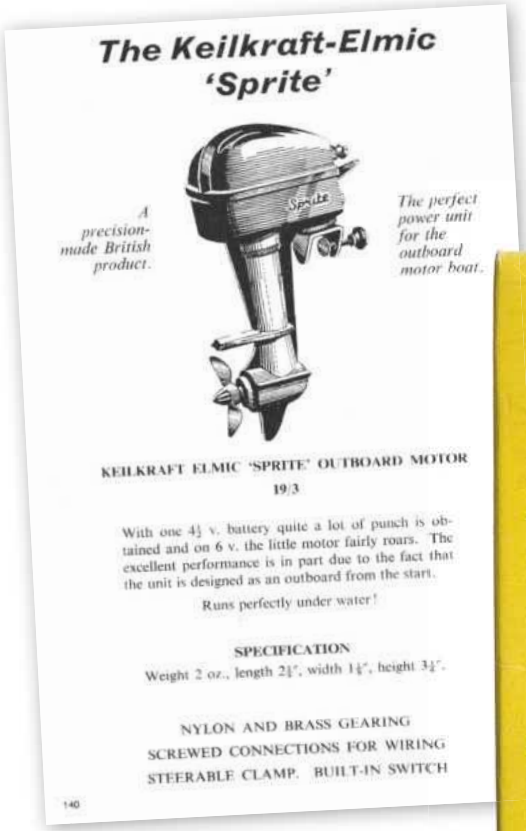
Flotsam & Jetsam

61: Elmic Sprite & Thrust-Pak

John Parker takes us back nearly 60 years to a joint venture that served the common good and helped encourage newcomers to the hobby



ABOVE LEFT: The Elmic Sprite as listed in a Bassett-Lowke catalogue.

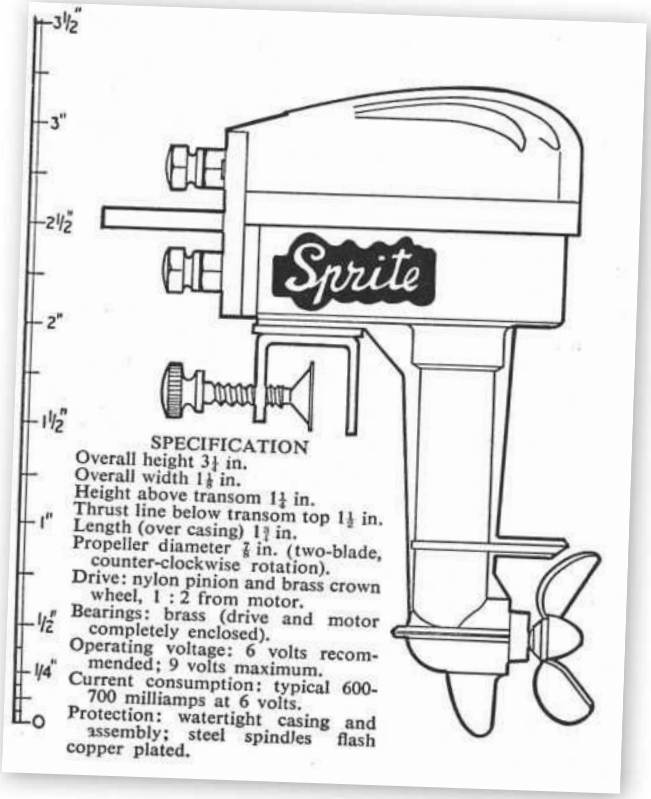
ABOVE: The Sprite as supplied in its colourful box.

Following the coverage of Keil Kraft in the March 2018 issue, we turn to two products made by the Scorpion Precision Company of Romford, Essex, England, that were developed very much with the Keil Kraft EeZeBILT boat kits in mind. Both were aimed at providing a simpler and easier way of powering the boats and took the form of the Elmic Sprite outboard motor and the Elmic Thrust-Pak inboard power unit. Elmic was the brand name of the Scorpion Precision Company, better known for its range of escapements for single-channel radio control, and Keil Kraft was its distributor. The association must have been a close one for the Sprite box is labelled, 'A Keil Kraft Elmic Product'.

Elmic Sprite

First appearing in January 1959 and closely following the Christmas launch of the EeZeBILT boat kits, the Elmic Sprite was a small electric outboard motor to suit model boats of about 300 to 450mm long, indeed it was well suited to the Keil Kraft Cresta kit, its obvious first application. In an attempt to keep the purchase price down, its housing was plastic and the 3 to 6 volt motor was built integrally with it. The metal two-blade propeller, meanwhile, was turned by gears at about a 3:2 reduction ratio. A 4.5 volt 'flat' battery was recommended, which sounds rather strange today, but 'flat' referred in this case to the shape of a, for then, common torch battery and not its state of chemical exhaustion!

Initially blue-green in colour but later also seen in a red finish with a white engine cover, the Sprite stood just 82mm high and sold, initially, for just under the magic £1 mark at 19s/10d (19 shillings and 10 pence, or about £21.50 in today's money). Some odd claims were made regarding the Sprite. 'Britain's most powerful outboard' was probably true (assuming they meant model outboard!), but then the only competition was Triang's underwhelming Swordfish. Another was 'Runs perfectly under water'. Model Maker magazine's test in the March 1959 issue explains this more fully. It was the maker's claim that the Sprite would run completely immersed in water for a minimum of 15 hours, which was handy if



RIGHT: The Sprite specification and drawing from Model Maker magazine.

ABOVE: A Sprite with its cover removed to show the integral motor.

RIGHT: A period Keil Kraft advert showing the Cresta and suggested Keil Kraft-Elmic Sprite.

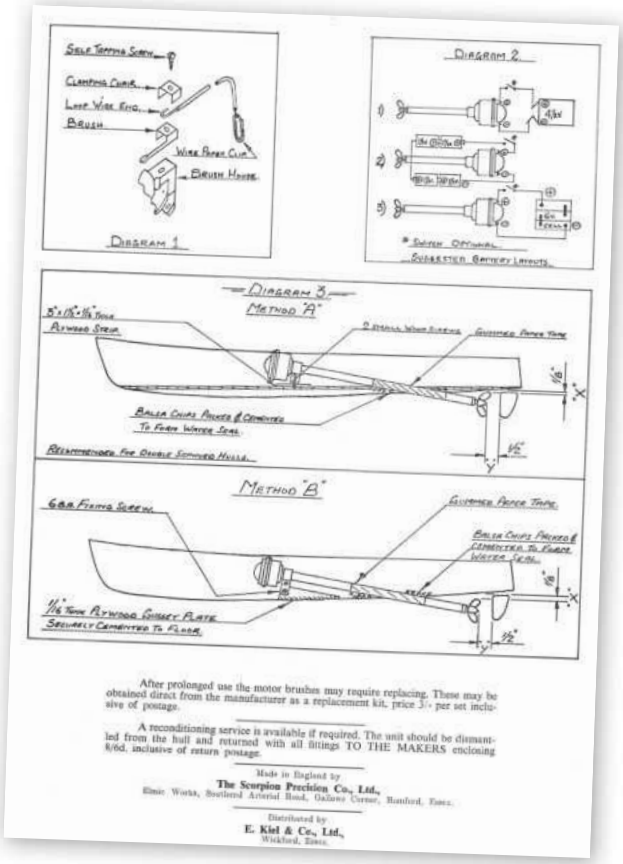
> "The real advantage of the outboard was, of course, that it did away with the need to align the motor and propeller shaft…"

your model boat was prone to sinking. It doesn't claim that it would not then seize-up completely from corrosion but this was sure to follow, with steel parts only receiving a flash plating of copper, though the gears were of nylon and brass. The limited height of the unit meant that the model's transom would often have to be cut away in part to immerse the propeller properly, and Model Maker suggested that for best performance, 9 volts could be used for short periods.

The real advantage of the outboard was, of course, that it did away with the need to align the motor and propeller shaft properly, which could be a tricky job for the beginner and often one not done well, with grave effects on performance and battery life. All you had to do with the outboard was clip it to the transom with the screw clamp provided, wire your 4.5 volt 'flat' battery to it (paperclips could be used for this, and were supplied with the kit), and away you went. But it all came at a cost as the outboard was 160% of the kit price for the EeZeBILT Cresta that it was intended for. This against the much cheaper inboard option of a Mabuchi motor that could be used with any of the other kits at only 40 to 67% of the price. It has been suggested that this is the reason for the Cresta kit being so much harder for the collector to find today, as the need for the outboard motor made it too expensive and therefore limited its sales at the time.

ABOVE: The Thrust-Pak cover removed to show the ring-magnet motor.

RIGHT: Hand drawn installation diagrams from the instruction leaflet.



Sprite production lasted until about 1969 by which time it was labelled 'Mk.III' but carried no obvious visual differences. Buyers of the Cresta kit then had to find an alternative outboard, such as the Mabuchi OB-300 or OB-500. Few other designs appeared to suit the Sprite outboard, but the aforementioned March 1959 Model Maker had plans for Vic Smeed's Slipper, a miniature hydroplane.

Thrust-Pak

Elmic's Thrust-Pak (a solution to the problem of aligning motor and propeller shaft) was announced in the second half of 1960. It featured a pre-aligned motor and shaft with removable propeller to enable installation in any 450 to 610mm long boat, making it suitable for the larger EeZeBILT kits as well those by Marinecraft and the small Aerokits. The price was 14s/7d (£15.60 today), just a little more than the price of the larger EeZeBILT kits which was 13s/1d at the time.

Once again the Thrust-Pak featured an integral 3 to 6 volt motor, this time built into a red nylon housing at the front end of the 220mm propshaft tube and driving a 25mm diameter three-blade propeller at the other end via an extended motor shaft. This long thin shaft was prone to vibration due to it 'whipping' at the higher speeds. A clip on the lower end of the motor housing could be bent in various ways to suit the mounting, whilst the tube had a hole for lubrication and the motor brushes were replaceable. To promote the Thrust-Pak, a cut-away model of the Keil Kraft Triton kit was made showing the neat and simple installation that was possible. A double-sided instruction leaflet covered maintenance and installation and outlined the reconditioning service that was available at a cost of 8s/6d upon return of the unit to the makers.

All in all, the Thrust-Pak strikes me as a well-thought design that deserved more success than its present day rarity suggests that it achieved. Listed in the 1969 Keil Kraft Handbook, but fading from the scene soon after, it was a precursor to the much later units by Graupner and the like, using a separate motor.

A bit of a mystery surrounds our final photo which shows a Russian made motor and propeller shaft unit acquired from eBay that is an exact copy of the Elmic Thrust-Pak. The motor housing is black instead of red, the terminals have flying leads soldered to them and the propeller boss is slightly longer, but otherwise the Russian unit looks absolutely identical, even down to the drive pins that hold the motor cover on. Alas, I can't read the Russian instructions but the quality control stamp date indicates 1972, and another possible date code might refer to November 1970.

So, did Elmic sell the Thrust-Pak dies to the Russians when it went out of production, to enable them to go on making it? Did they intend to buy any back for the UK market, or did the Russians employ espionage to gain Western secrets of model boat propulsion in the time of the Cold War? I am very sorry, as I have no answer to these complex questions.

A UK-built Thrust-Pak (red) with its Russian (black) counterpart.

> "Elmic's Thrust-Pak was a solution to the problem of aligning motor and propeller shaft that was announced in the second half of 1960"

A Dragon's Tale

25,000 boats sold worldwide, over 1500 registered yachts in the UK and countless clubs dedicated to the type, the DF class is firmly established, growing with every passing year and, quite clearly, here to stay. DF designer **John Tushingham** takes us back to the beginning...

One of 13 DF95s sailed by the East Kent Radio Sailing Club at Ashford in Kent. The club was formed specifically to race the DF95.

Before I get into the 'how did it happen' I need to explain why it even happened in the first place. This means going back to the winter of 2004 when I'd been looking for an appropriate way to get back into full-size sailing. This resulted in the purchase of a Laser Vortex, a new dinghy design that was catching on at my local club. Alas, I quickly discovered that it wasn't suited to me, or rather, I wasn't suited to it. While searching for an alternative I kept scanning the event reports on the Yachts & Yachting magazine's website and in early February spotted something rather interesting, a winter series for quarter-scale, radio controlled Lasers being held at West Lancs Yacht Club and being run by a name I recognised from way back. I hadn't been there since my youthful days as a dinghy sailor, so Liz and I decided to take a drive, partly for nostalgic reasons and to have a look at these R/C Lasers. I used to sail the full-size and Liz used to sell them at her father's chandlery so we both knew the boat very well.

At the lake we watched the models race and, given that it looked like fun, we went and introduced ourselves. Within five minutes of saying hello we each had a transmitter in our hands and the countdown timer was on. Several races later we were hooked but knew precious little about radio sailing. Mind you, that didn't stop us ordering two boats, which we collected at the next event two weeks later. Our dealer, Andy Kissick, had fully rigged one for us and explained all the little tips needed to get the best out of it. What service!

Cheese-fuelled ambition

We had many happy years racing the Lasers and in doing so had 'discovered' the other radio sailing classes so the garage was starting to fill up with our ever-increasing fleet. However, that easy introduction to the sport has always stuck with me; the initial publicity, the readily available boats and the service that Andy provided is surely the right way to get more people into the hobby. What's more, the further I got absorbed in other classes and experienced the long waiting lists for new equipment, the more I realised that this simplistic approach was the way forward.

May 2016. The first ever DragonFlite 95 fleet race start. Race 1 at the Dragonfest event held at West Lancs Yacht Club.

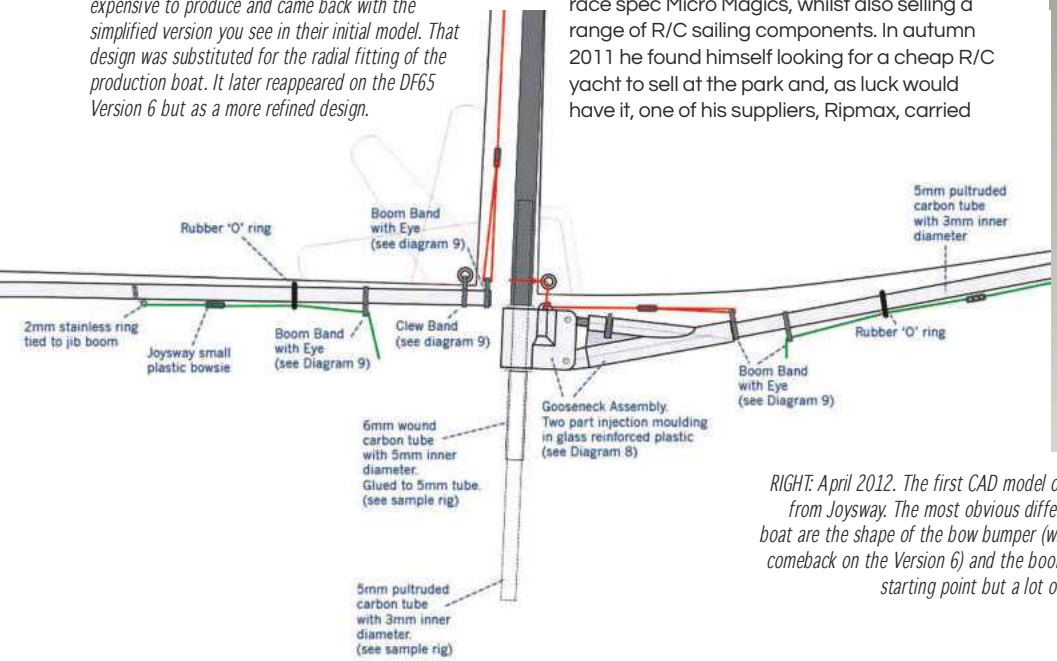
I wasn't the only one who thought this way, indeed Mike Weston, now of RC Yachts, often discussed this over many red wine and cheese-fuelled evenings. What we needed was a well-conceived, plastic, one-design yacht with three rigs, probably made in the Far East, that could be offered at a price unheard of previously and be available off the shelf, fully built. Great idea, but we didn't have the funds or the contacts to make it happen. I put this idea to quite a few of the top UK sailors at the time and was amazed by the almost total lack of interest. A disappointing response and whilst we still held on to the idea we didn't have any plan to make it happen.

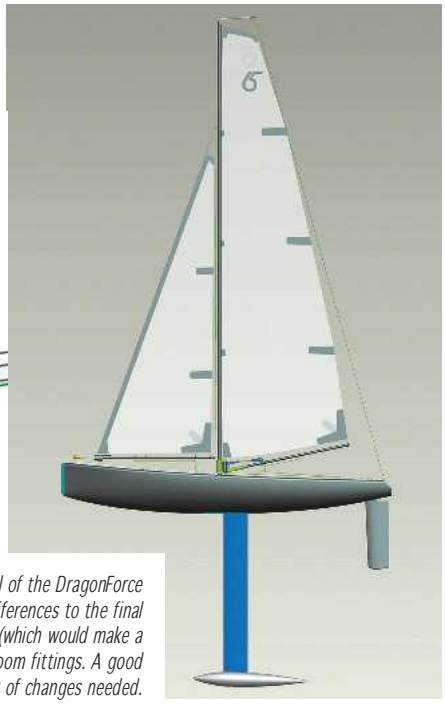
Seeing the light

At the time Mike was busy running his leisure park and doing very good business building race spec Micro Magics, whilst also selling a range of R/C sailing components. In autumn 2011 he found himself looking for a cheap R/C yacht to sell at the park and, as luck would have it, one of his suppliers, Ripmax, carried a range of products made by a company called Joysway. Within said range was a little yacht, the Caribbean, that seemed to fit the bill and he made enquiries. Ripmax' John Wesley answered the call and delivered the entire range of Joysway R/C yachts for Mike to evaluate. Here, then, was an opportunity not to be missed and in December Mike fixed up a meeting with John and invited myself and Mark Dicks along to demonstrate some RG65s and discuss the various Joysway yachts. When he saw the performance of our RG65s it took John all of ten seconds to decide that he would go away and propose a new yacht design to Joysway, this to be drawn up by a "group of experts" in the UK. His description, not ours!

As well as being a customer, John was also a trusted advisor to Joysway and would regularly help them to develop appropriate products for western markets. So, on his advice things began to move quickly and a meeting with the three of us was held in mid December where John gave us the good news that Joysway would produce a new yacht. Then he

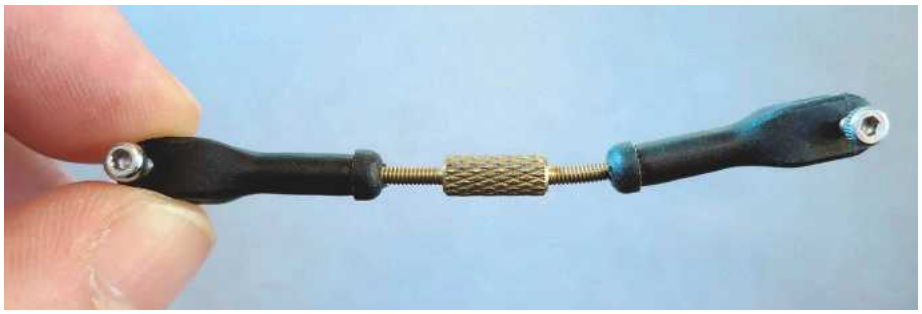
BELOW: February 2012. One of the drawings in support of the RG65 sample boat. Note the Gooseneck design. Joysway considered this too expensive to produce and came back with the simplified version you see in their initial model. That design was substituted for the radial fitting of the production boat. It later reappeared on the DF65 Version 6 but as a more refined design.





RIGHT: April 2012. The first CAD model of the DragonForce from Joysway. The most obvious differences to the final boat are the shape of the bow bumper (which would make a comeback on the Version 6) and the boom fittings. A good starting point but a lot of changes needed.

October 2012. One of the two, rather heavy, prototypes being tested in the pool (next to the bar) in our Spanish hotel during the Micro Magic Euro Cup. You'll be pleased to note that we took our testing role very seriously.



ABOVE: November 2012. Test sailing the second, lighter sample. We were happy with the performance but the hull was too fragile.

LEFT: November 2012. A test casualty. An early compression strut that clearly needed to be a lot stronger.

dropped the bombshell. They were shelving a current project and needed a prototype boat in China in five weeks! Mild panic ensued, however we realised that we already had a boat on which we could base it – Mark's RG65 design 'ICE'. Of course, Mark was in favour of it and, having squared it up with the current builder of the carbon racing version, I packed up my lovely new carbon ICE and shipped it over to Germany where Joysway were exhibiting at the massive, annual Nuremberg Toy Fair. Mike went over to meet them and I got busy producing many sheets of drawings to specify everything necessary to build a decent boat. After that we were entirely in their development engineers' hands, we didn't know them very well and they didn't really know us, but no matter, it was happening!

If we'd had more time to design and develop the boat it might have been a very different product, perhaps 750mm in length, or somewhere between an RG65 and the IOM. But we didn't have that luxury and that was probably not such a bad thing. Mark and myself were, and still are, keen supporters of the RG65 class, but like the other established classes it was suffering from a restricted supply of new boats. If Joysway could make a hull to the specification we'd given them it might just be a cheap, available introductory boat for the RG class.

Anxious wait

We had an anxious wait when all we could do was twiddle our thumbs, tap pencils on desks and keep checking our emails as the Joysway engineers translated our 2D design work into a production-ready 3D model. Would it be any good? A few months went by and as the time past our confidence took a bit of a battering. Finally, at the end of April the inbox pinged and there it was in all its 3D rendered glory. Sure, there were obvious things that needed changing but what a good position to start from and their design for the keel box structure impressed us greatly. Clearly, we were working with the right people.

Joysway's normal lead time from concept to production is around nine months and the boat was due to be on sale in late 2012. So, there we were, early May 2012 with a lot still to do if the boat was to hit the market in good enough shape to be taken seriously. It was the start of many, many emails and reports to Joysway. It's quite a lengthy process detailing the alterations, then reviewing and reporting on what was being sent through, but eventually it was push the button time and Joysway could then get started on the production tooling. At this stage we had started to build up a good working relationship, we had no prior experience in dealing with a Chinese company (I should point out that Joysway is actually a Hong Kong based company with production facilities on the nearby Chinese mainland), but John Wesley was always at our shoulder and without his early help things might not have gone as smoothly. It's no good simply asking for something to be changed, you have to support that request with a full explanation as to why it needs doing, they can then appreciate what you're asking for and are happy to make the changes. They really do care about the quality of design and construction and have continued to support the boats in this way ever since and have always absorbed the cost of modifications themselves. In truth, we couldn't really ask for better product support from the manufacturer.

Knock at the door

At some point in September 2012 the DHL delivery man rang the doorbell and handed over a big brown box! Here it was. No longer just a drawing this was our first chance to handle the real thing. By this time we knew what the final retail price would be but when we first heard the proposed pricing our collective jaws hit the ground, it was almost half of what we expected. If the boat lived up to its promise and sailed well it would be way, way cheaper than any decent racing yacht before it. It truly would be the boat we dreamed of all those years ago.

In a perfect world this would have been job done, sign it off and get on with production, not too far behind schedule. Unfortunately life's not like that, it was so nearly there but not everything worked as intended, so it was back to the drawing board for some of the components. But those were minor details compared to the big issue – weight! You see, the target overall sailing weight was approximately 1050g incorporating a keel bulb of 550g. At that weight it would be a reasonably competitive RG65, but these first sample boats tipped the scales at a shade under 1400g, which meant it was never going to be a light weather flyer. In fact,

LEFT: July 2013. An early production DragonForce 65.

RIGHT: July 2013. The so-called 'gang of three'. (L to R) Mark Dicks, Mike Weston and John Tushingham. Mike was trying out the shorter keel. I'm not sure that the 30 – 40mph winds that day were entirely suitable, but it was a fun day's sailing.

BELOW: Over 1500 DF65s are registered in the UK, this one with the Chantry Model Boat Club.

I'm not sure it would have got far past the starting line in anything under a 30mph gale. Mind you, it was tough!

Clearly it had to go on a crash diet and first to go was the full length threaded stainless rod running down the keel with heavy screw on fixings top and bottom. This was replaced by threading the ends of the tube running through the keel and using much smaller bolts at either end. A good start but clearly the hull moulding itself needed to shed a lot of weight. By early November the second prototype arrived, much lighter but perhaps a little too thin in certain parts. You might have seen this boat sailing in an early YouTube video I posted (search "Dragonforce prototype" and you should find it). I can't remember the exact weight of this hull but a compromise somewhere between the two samples would give us the best blend of performance and durability. Another long report followed detailing all the changes needed to bring it up to production specification and by December 2012 the production boat was signed off. With this, Joysway displayed a couple of boats on its stand at the Nuremberg Toy Fair in February 2013 with an expected 'on sale' date of May 2013. Fortunately, over the winter, we had a chance to test various B and C rig configurations whilst Joysway produced the final tooling.

Our dear friend John Wesley died in the spring of 2013 and never got to see the launch of the boat he opened the door for.

We miss him and in his honour we named the UK DF65 National Championship trophy in his memory and were delighted that his family came along to the inaugural championship in the autumn of that year to present it.

Finding a niche

The all-up sailing weight of the production boat ended up at 1250g, including an allowance of 50g for a battery pack, so it wasn't quite where we wanted it in comparison to top level RG65s. That was a slight disappointment but we had to be realistic about it, we had been given the chance to get a boat into production, at no expense, other than a considerable amount of time. What's more, in the process we had formed a good relationship with Joysway. It is, after all, their product but they were prepared to listen, trust us, and make nearly all the changes we requested.

During the final prototype testing we had a big decision to make. Given the weight of the boat, should we go ahead and bring it to market as a class legal RG65, or just brand it as a DragonForce and mention in the details that it does conform to the RG65 rules. We didn't want to raise expectation that you would be buying a top level RG, so eventually decided that it still had a useful role to fill as a very inexpensive introduction to the class. It is constructed to allow the fitment of a swing rig and also has deck eyes positioned for taller, high aspect conventional rigs. So, the RG65 branding remained, the thinking being that we'd wait to see what owners wanted to do with the yacht when they started to sail it. We also knew that the design had great potential as a restricted class so we clearly needed to formulate a simple set of rules for that purpose, ready for when the boat went on sale. Without such rules being available from launch we could foresee the urge for some owners to tinker with it, and at that stage it would have been very hard to pull it back into line as a restricted class.

There is, of course, much more to this story. Join me next month, if you will, when I'll be back to explain why we made the DF65 a restricted class, discuss the relationship between the DF65 and RG65, and chart the development of big brother, the DF95. Back soon...

A DF65 and 95 in close formation. Of course, many people race both.

RIGHT: Key to success with any off-the-shelf model is a ready supply of rigs, spares and accessories, indeed this has been crucial to acceptance of the class. In the foreground is a DF95 with an A rig, whilst behind is a 95 with a B rig.

Scale Model World

Hall 2. There are two others just like it.

Armed with ample provisions and an armour-plated constitution, **Dave Wooley** kits up and takes on the halls and aisles of Europe's largest plastic model show

Held at the International Conference Centre in Telford, Scale Model World is by far the largest model show of its kind in Europe and, as such attracts thousands of visitors from the UK, Europe and beyond. Organized and supported by the International Plastic Modellers' Society UK (IPMS) there is, as you can image, a strong plastic model theme, from the competitions through to clubs and vendors. Naturally such an event has a wide appeal because it embraces aviation, armour, naval / marine and sci-fi, indeed each year sees a rising presence of one or more of these facets with, perhaps, others not so popular. Of equal importance is the huge trade participation and it is here that you can glimpse, handle and buy products from around the world. It's an Aladdin's cave of tools, paints model kits and even demonstrations.

Once within the Telford ICC there are three vast halls to navigate each having a mixture of UK clubs, vendors and overseas clubs. Catering is well taken care of with three main areas each providing a good level of hot food, whilst there are also a number of smaller areas for on the go refreshments; all have plenty of table space and seating. Enter any of the halls and you get a sense of being overwhelmed by it all as there's isle after isle of both vendors and models. The trick is to start in Hall 1 and work down each isle, perhaps marking down which area you would like to re-visit. This way you will get to see more of the show and, heck, you may even get what you've been looking for!

Stiff competition

The competition area is on the first floor and covers all types. Numbers in all categories and classes ebb and flow from one year to the next and this year saw a slight dip in the marine exhibits. Even so, the standard is always very high, indeed two of the most striking models where from either end of the marine scale spectrum. On the one hand a fabulously detailed 1:35 D-Day LST depicted on 3rd of June 1944. As part of the diorama classification this exhibited many models within a model and gained both a gold medal and class winner for its builder Ian MacConagle. At the other end was a gem of a 1:700 scale model of the sail training ship the Winston Churchill by Jim Baumann.

This year saw a rise in scratch- and semi-scratch models, especially in the sail class, and all of the marine entries required time, not least to appreciate the level of skill and detail. Another fine example was a scratch-built 1:72nd Military Class Trawler, HMS Grenadier, by Barry Sharman. This was so good that you could almost believe you where viewing the real ship. One of the winners, which I must mention, was not a marine exhibit at all but, wait for it, a steam-powered motor cycle! The word incredible is the only way to describe this make-believe machine. It's more model engineering with an IPMS classification but a true masterpiece.

RIGHT: Demonstrations by clubs are stock-in-trade, evident here on this German model club stand.

RIGHT: A storm brewing in a tea cup! One of those photos I just couldn't resist.

LEFT: LCT-610 offers a masterful display of authentic weathering and presentation.

BELOW: This astonishingly detailed 1:35 scale scratch-built LCT-610 earned Ian MacGonagle not just a gold award but class winner.

RIGHT: IJN battleships, with their tall pagoda style superstructures, are not the easiest of models to build.

LEFT: This Trumpeter 1:48 scale U-Boat kit was used as a demonstrator for the latest in audio visual displays for models. A change in the internal lighting is linked to an audio system that generates the appropriate sound effects.

LEFT: Barry Sharman's 1:72 Military Class Trawler, HMS Grenadier, oozes realism wherever you look.

FAR LEFT: A fine example of how to weather and age the metal surfaces. Just take a peek at the stove pipes and the internal foot plates in the 20mm gun tubs.

RIGHT: The stern quarter of HMS Grenadier.

Vendor bonanza

Scale Model World is a magnet for vendors so there's always one that will have the product you need especially when it comes to models, tools, paints, resin products, metals and, of course, specialist books (by the thousand). As SMW is heavily focused on paints there are a number of stalls that not only sell paints but give ongoing demonstrations and offer a chance to try the product. On the resin side there was an excellent demonstration showing how to make a one-piece mould to cast, for example, a tyre. To be fair you could spend the entire day focused on these demonstrations.

The big names Like Airfix and Revell were in attendance having large well-stocked displays. Revell was showing its latest releases such as the 1:56 scale yacht USS America and the fantasy galleon Black Pearl, made famous in the film Pirates of the Caribbean. Pocket Bond, meanwhile, had a number of new smaller scale warship models such as the 1:350 Italian Cruiser ZARA. Absent this year was any new 1:200 Trumpeter kits. And, sadly, there were no new large-scale ship model kits from Italieri but all this could change in 2018.

Must see

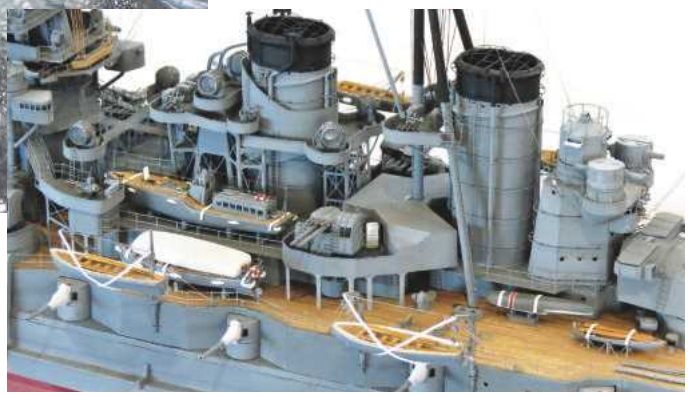
As space is a limiting factor in the pages of a magazine all I can show is a brief glimpse of what's awaiting any visitor to SMW. As always there's no substitute for actually being there as this event is truly an inspiration. Scale Model World is well organised and the so-called Yellow Shirts are always on hand to direct or provide information. In truth, by the close of the show I was starting to wilt but exit from the event and car park was trouble free. To sum up, if you've never visited SMW then you're missing a real treat but, as always, come prepared for plenty of walking.

BELOW: Not a marine subject but an amazing level of detail incorporated into this model of a modern aviation restoration facility.

ABOVE: Although precision tools such as these can appear expensive they do make the jobs much easier, especially when folding fine a delicate photo etch.

ABOVE: A superbly presented 1:350 scale scratch-built diorama by Alan Blyth depicting the torpedoing of SS Induna in March 1942.

BELOW: At 1:700 scale this model of the USS Blue Ridge (as of 2014) gained a bronze award for Italian model maker Maurizio Boverio.



RIGHT: It's hard to believe but this particular model of the Kongo class IJN battleship Hiei is made almost entirely from paper card. I've seen many models made from the same material but this is one of the best.

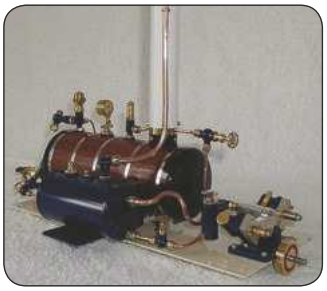
The Best of BRITISH STEAM

Beautifully Crafted Models Handmade to Order by John Hemmens

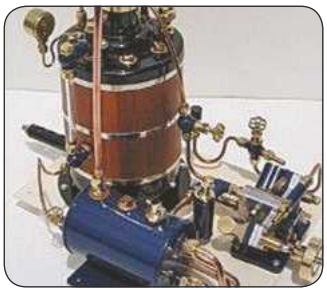
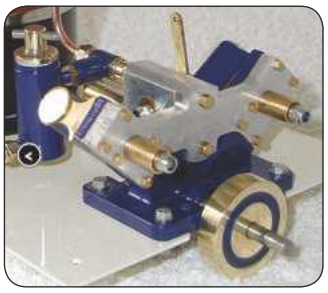
My Ribblesdale and Wharfedale plants are individually made to the highest standard demanded by my customers around the world. They are recognised as wonderful collector's pieces that over time will increase in value as have many of my other models I have made over the last 48 years.

I can proudly state that my models are "Made in Yorkshire" the birthplace of many of the best Engineers in the world





The illustration shows the "Ribbersdale" boiler mounted on a common bedplate with the "Richmond" twin cylinder steam engine and a steam oil separator. The "Ribbersdale" boiler is constructed from copper components and silver soldered. The boiler is stoved with high temperature paint at 175 degrees C. The boiler is lagged with individual hardwood planks and held by stainless steel bands. To improve the boiler performance it is fitted with a ceramic burner. The finished boiler is pressure tested to 150 psi for continuous working pressure of up to 80 psi. A test certificate is supplied with the boiler confirming the test and guarantee of quality. The boiler is fitted with a water filler bush, pressure gauge, water gauge glass and blowdown valve, safety valve, vacuum valve, steam on/off valve, ceramic gas burner, gas pipe and gas on/off valve. The white/cream stove painted chimney is pre-drilled for the exhaust pipe bracket should you wish to extend the exhaust pipe alongside the chimney.
This plant is priced at £1550


The illustration shows the "Wharfedale" boiler mounted on a common bedplate with the "Richmond" twin cylinder steam engine and a steam oil separator. The boiler can be fitted with either the "Richmond" engine or "York" engine and a steam oil separator. These can be purchased as single items. The "Wharfedale" boiler is constructed from copper components and silver soldered. The boiler is stoved with high temperature paint at 175 degrees C. The boiler is lagged with individual hardwood planks and held by stainless steel bands. To improve the boiler performance it is fitted with a ceramic burner. The finished boiler is pressure tested to 150 psi for continuous working pressure of up to 80 psi. A test certificate is supplied with the boiler confirming the test and guarantee of quality. The boiler is fitted with a water filler bush, pressure gauge, water gauge glass and blowdown valve, safety valve, vacuum valve, steam on/off valve, ceramic gas burner, gas pipe and gas on/off valve. The white/cream stove painted chimney is pre-drilled for the exhaust pipe bracket should you wish to extend the exhaust pipe alongside the chimney and also includes a polished brass flared top. This plant is suitable for installation in all my boat products with ample power to drive your boat satisfactory.
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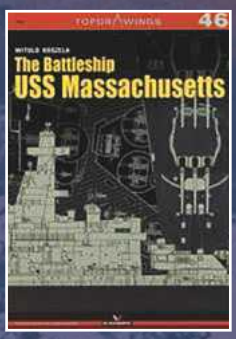

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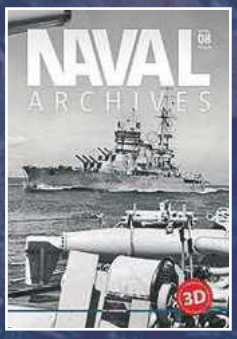

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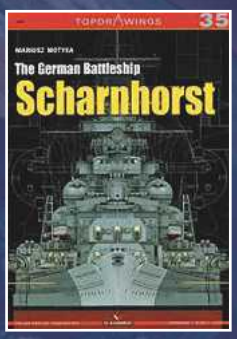

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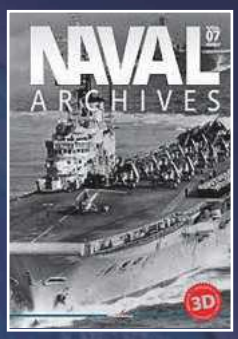

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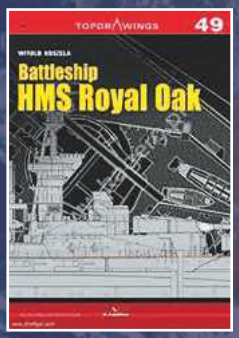

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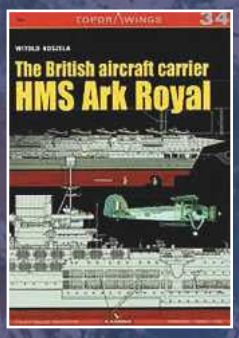

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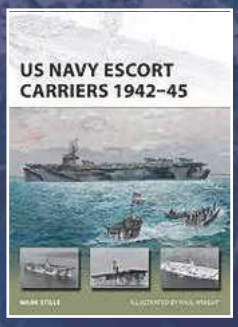

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Boiler Room

Neat and tidy or rough and workmanlike? **Richard Simpson** chooses a boiler finish then breaks out the pine

Last month we collected the items we'd need in order to assemble a working boiler from a purchased bare boiler, our chosen unit being a standard, vertical, 3.1/2 inch boiler from Pendle Model Steam. This month it's time to put our own interpretation onto it and to turn the bare copper shell into something that we've had a hand in and to which we've added a personal touch. We therefore need to decide how we want the boiler to look in our boat and, accordingly, what finishes we need to apply.

For this project I will assume that the boiler is going to be seen in something like an open launch, so our decisions will be along the lines of whether we want a heavily weathered and realistic finish or a pristine, shiny, varnished wood and polished brass example. I thought for this boiler I would go for the varnished wood and polished brass approach as those with a penchant for making things dirty can then add their creativity over the top if they so desire or go down a different path when finishing the wood and metal surfaces.

Other decisions for me, then, were what to paint and what to lag the boiler with. Some might prefer the top surface to be polished copper, whereas others may prefer to paint it. As copper tarnishes very quickly a polished boiler end would look less than polished in no time so I decided to paint the top end cover. The shell I would lag with wood staves in a fairly traditional fashion and would not bother with a layer of insulation below it. The reason behind this comes from the fact that the benefits of increased boiler efficiency mean an almost insignificant saving in gas, probably less than you will lose filling the gas tank with the Ronson type filler. This must be balanced against the hassle of fitting the insulation and the fact that the edges require to be sealed to prevent the constant fraying of the matting over time. It also significantly increases the bulk of the boiler and makes fitting the wood lagging that bit trickier. For me the wooden staves are enough.

2. Masking the threads ensures that there's no over tightening of fittings as a result of paint where it's not wanted. Note that the funnel is a tight push fit so paint would interfere with that too.

> "Wherever possible when painting a metal surface it's well worth using a primer first, indeed the best product for most metals is an acid etching primer"

Painting

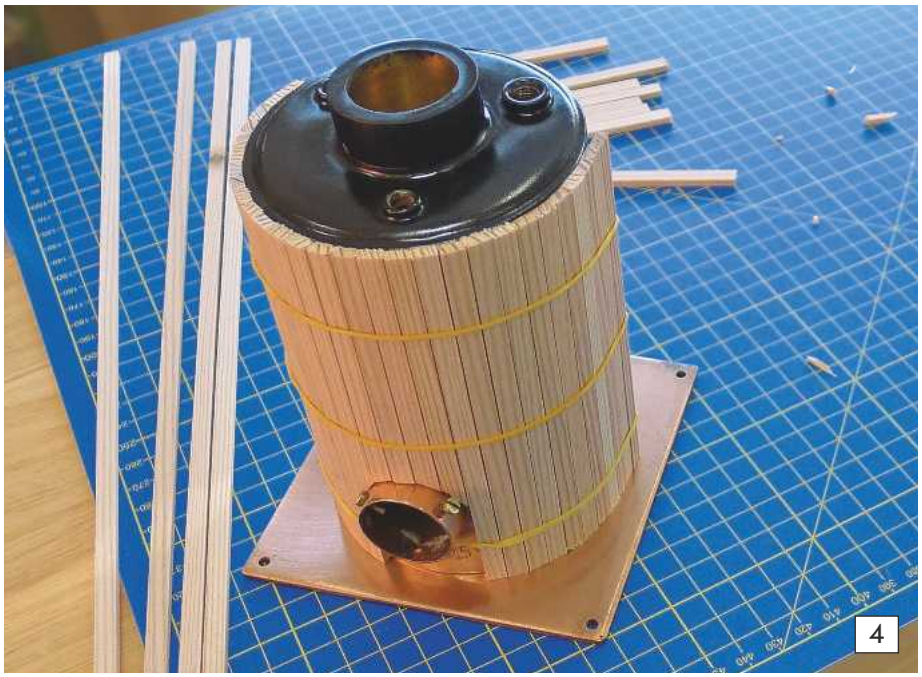
Wherever possible when painting a metal surface it is well worth using a primer first, indeed the best product for most metals is an acid etching primer, in this case followed by an acrylic heat-resistant black paint **(Photo 1)**. The primer actually eats into the metal surface as it dries and ensures the best possible key for the paint, making it the most resistant to knocks and scratches. I've come across many finishing paints that are advertised as not requiring primer but I invariably end up regretting the decision to not use it. In this case it was no more than a ten minute job to apply two light coats after covering the majority of the shell with a paper mask and protecting the threads with some rolled up kitchen towel **(Photo 2).**

1

1. I would always recommend an acid etching primer for a metal surface. In this case followed by a heat resistant satin finish black top coat. Both paints were warmed in hot water to increase pressure and improve drying, then sprayed in two light coats.

Having allowed the primer to cure overnight I gave it a couple of light coats with the heat-resistant satin black paint. I actually quite like a satin finish as gloss can look a bit too 'ornamental' for me whilst full matt can look grubby very quickly on a working boiler **(Photo 3).** Apart from which, yet again, I happened to have a spare tin of this particular black left over from an old motorcycle project. I don't know what I'm going to do when it runs out! After two coats of the black the masking was removed and the boiler left to cure again overnight.

3. The satin black top coat gives a durable heat-resistant finish that should last for many years and remain easy to clean. It should also key very effectively to the primer and be particularly resilient.



4. Starting at the burner and working away on both sides is as good a place as any and will mean that the most prominent feature, around the burner throat, is symmetrical and balanced looking.

Lagging

As with many things there are just about as many ways to lag a boiler as there are modellers doing it. I simply offer my own procedure as just one way of tackling it, rather than the 'only' way, however it works well for me and the complete lagging job, including the banding, took only a single morning.

The key, as usual is planning and preparation, and, of course, having the right tools for the job. I decided to use pine, not because I liked the colour, or because it is of a particular insulating property but, once again, because I had a couple of bundles of spare pine strip on the wood shelf waiting for a project such as this one. It's at times like this that you justify those purchases that once seemed indulgent but that you knew would one day come in handy. I've got plenty left too, so it might just appear again.

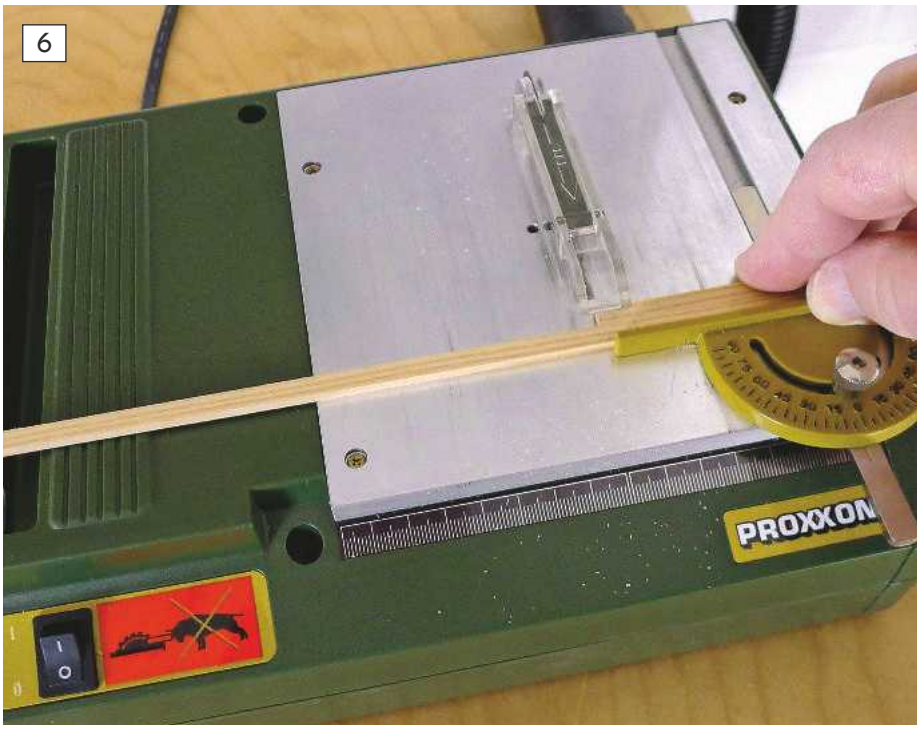
Some modellers prefer to glue the lagging onto the shell as they go along. I find this restrictive as I want the flexibility of moving the staves around a bit to best accommodate the fittings. I also prefer to avoid the unpleasant smells of burning glue the first few times you fire it up so my own procedure is to use elastic bands. These make the job very easy and flexible and you can correct mistakes or even change your mind and redo an area if you prefer.

I generally like to start on the centreline of the burner as this is a prominent feature and that way the staves can be symmetrical around the burner opening **(Photo 4).** I work away on either side dealing with the fittings as I reach them but planning on finishing behind the sight glass. This means that the single odd width stave that you will need to close the covering will be mostly behind the glass and a lot less noticeable **(Photo 5).** Incidentally, if you happen to complete the circumference of the boiler with a perfect whole number of staves and do not need to make a closing piece I suggest you go out and buy a lottery ticket immediately.

Next you're going to need a supply of staves the exact length of the boiler so I produce a 'ready to fit' pile with my Proxxon table saw. These same staves can then be cut to fit around the openings, so having a good supply is worth it. What's more, the Proxxon produces them very quickly **(Photo 6).** Just be careful with your fingers as such tools require a great deal of care and attention to operate safely. With this I simply work away from the burner throat until I get to any other bosses and cut staves accordingly to fit around them. I realise that some would prefer to make perfectly shaped circular openings in the staves, however I've found that when doing this off the boiler they invariably do not fit as well when they are

5. Finishing behind the gauge glass minimises the exposure of the closing stave, particularly if your boiler is going to be fitted with a drain on the glass.

6. Some may consider a powered table saw to be a little on the extravagant side but you only need to do a couple of jobs like this to appreciate its worth. The ends of all the staves are perfectly clean cut, which is important because they're all quite visible on the top surface.



7. The boiler ID on a Pendle is marked below the burner throat and most inspectors will want to check the ID at testing time. A simple picture such as this, offered at the time of the test, should satisfy them.

8. 2mm brass hex screws with nuts and washers and a length of brass banding are all you need. Go for a thicker rather than a thinner brass (see text).

placed onto the curved shell, plus trimming the staves on a straight cut is infinitely simpler to do. I also think the difference is hardly noticeable when the boiler is finished, so I'm happy with straight cuts. When the staves are all in place and held in position by the elastic bands it's time to turn your attention to the banding.

One thing that's worth mentioning with this boiler is the fact that the ID number is scribed below the throat of the burner **(Photo 7).** This means that if you cover it over with lagging, future boiler inspectors will not be able to see the number and may question this. You can either leave the lagging off here, which I don't think looks very good, rescribe the boiler in an alternative location, such as on the top surface, or simply take a picture and keep a copy of it with your paperwork when you present the boiler for future testing.

Banding

Banding seems to be one of those tasks that concerns many modellers and generates a degree of trepidation. That said, I've found that attention to a couple of simple aspects can make it a very simple, effective and rewarding process. I use brass banding, purchased in a coil. This is obviously the most flexible but requires a bit of effort to fit **(Photo 8).** One key point is not to purchase really thin banding. This might sit on the boiler a bit flatter and be a bit easier to form but you need the banding to be thick enough to support itself in the vice for drilling, otherwise you are into all sorts of messing around holding it in some sort of support.

With the band in the vice this is one of those occasions where the vernier really is worth its weight in gold. Use it to check the outside diameter of your screws and select a drill that gives you a good clearance **(Photo 9).** I went for a 2.5mm drill but also left a strong tab on the end of the band which would not deform. Using a new sharp drill I carefully drilled a neat hole in the end **(Photo 10).** I then bent the tab over **(Photos 11 & 12),** and carefully teased the banding into a smaller diameter so it would sit neatly on the boiler and allow me to mark the required circumference accurately. Allowing for the compression of the staves I marked out the second tab and hole and drilled the second end. This was also bent into a tab and the end trimmed with a pair of hand shears. The banding was loosely fitted to the boiler and the elastic band moved out of the way before final adjustment and tightening of the screw. Don't be tempted to cut the screw short because you need the length if you ever decide to remove the lagging and refit it again. This process was repeated another two times to give a completely lagged boiler with some very presentable brass banding.

Finishing

Finishing the lagging can be done with either of a number of different types of varnish, oil or even nothing. The weathering enthusiasts might tend to go for the last option and allow natural colouring of the wood to develop over time or even oil the wood to give it a more natural sheen but I have always been a great fan of polyurethane varnish. Again I like a satin finish as this brings out the colour of the wood, wipes down easily and does not look too shiny, as can be the case with a gloss varnish. Two coats with a light

9. Vernier calipers are an invaluable tool to have around. Tasks such as this become quick and easy with the correct selection of the drill ensuring a successful piece is created.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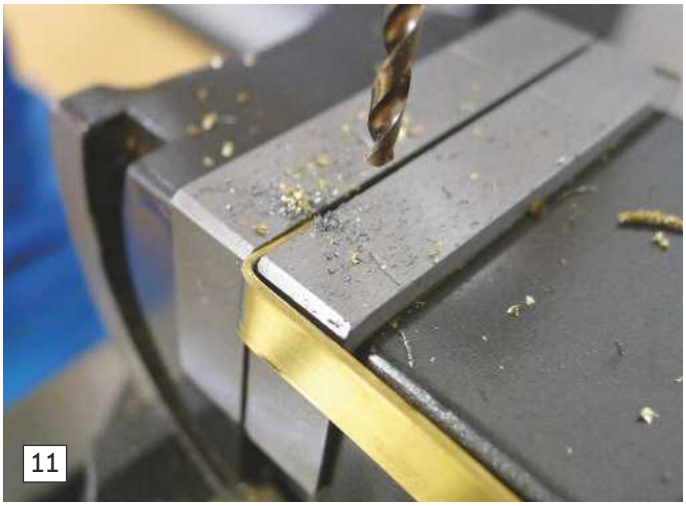
10. A sharp drill with gentle pressure should go through without any difficulty and will ensure the hole is correctly located in the tab.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11. A vice with sharp corners makes bending the tab an easy task that can be done by hand. If you don't have such a vice then you might have to use a former in, say, a pair of vice grips.


12

12. The right tools and a bit of planning should ensure that you end up with a neat tab and a perfect size hole in just the right spot. Great care should then be taken with the marking out of the second tab to ensure the correct compression of the lagging.

13. A lagged and finished boiler ready for the mountings to be fitted and with enough individuality to give a sense of accomplishment without the significant challenges that making your own can involve.


13

rub-down between them should be fine for a good looking and durable enough finish to the wood, which can be repeated in time if necessary or simply allowed to weather in a slightly more natural way **(Photo 13).** There are many other varnish types that would do the job just as well but I would stay away from flammable types for obvious reasons.

So, the boiler can now be considered as ready to have the mountings or fittings added to the shell and then tested up to pressure to see how it performs. I hope this helps potential steam modellers to realise that purchasing a bare shell from a supplier such as Pendle can be a way of obtaining a steam plant at a much lower cost than purchasing a fully fitted out and finished alternative. Plus, it allows a degree of personalisation without the added extensive demands of making your own from scratch. Next month should see us with a completed boiler ready to drop into our model boat.

NR-1

More moulds, more head-scratching and challenges of a keel kind present themselves as **Roger Suitters** presses on with the build of his nuclear-powered research submarine

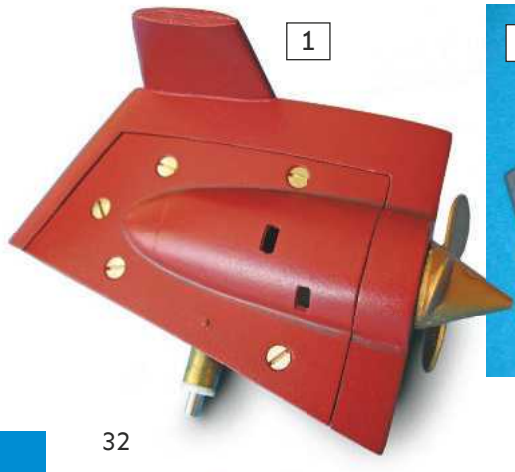
Welcome back to my detailed, serialised, description of a build that has not only offered significant challenges along the way but delivered huge reward in the process. This is often the case when designing and building from scratch, not least when working with the structural and engineering challenges associated with a static diving submarine. It's a fact that can be applied to a good percentage of the tasks, not least the next item on our list, the motor housings...

Handed housings

These, on the full-size NR-1, held the motor and gear drives to turn the propeller. They have a rear circular plate set at 90 degrees to the hydroplane body and then a shaped cowl, top and bottom, not unlike those on a wing mounted piston engine aeroplane. The risk, when doing this, was that if I got it wrong, the earlier work on the hydroplane bodies could be wasted. The solution was to temporarily fix a 0.25mm thick piece of styrene card over the existing hydroplane body then build each 'master' for the housing on top of this.

The hydroplane halves were laid on a flat surface and the rear plates, which support the propshafts, cut to shape and glued in place. The cowling shape was built-up from styrene card strips, rather like a plank-on-frame model, copious sanding of the plank edges giving a smooth-ish surface, that was then filled with the inevitable car body filler. Later, the inside was reinforced with a smear of two-part epoxy. The plan was to make a mould of this 'half' motor housing, then cast a couple of them in plaster and glue these to the hydroplane fin masters, which would then become the 'final' masters for each half of a hydroplane. Well almost.

In much the same way as the bow and stern hull sections, a silicone mould was taken, except that it was all rubber, rather than being a 'skin' mould, as before. After allowing to thoroughly cure, the silicone mould was filled with resin reinforced Plaster-of-Paris, and two castings taken in quick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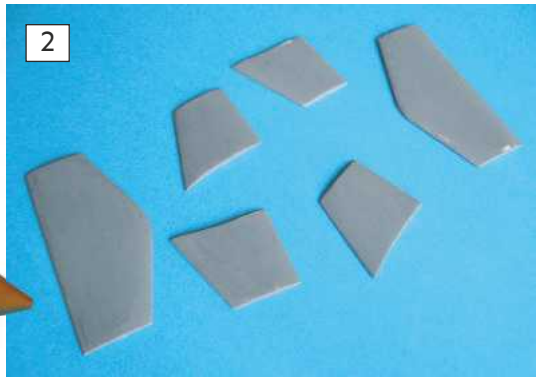
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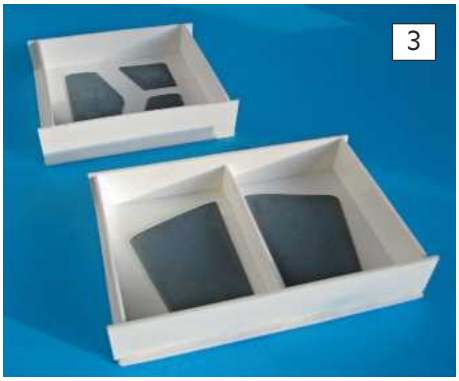
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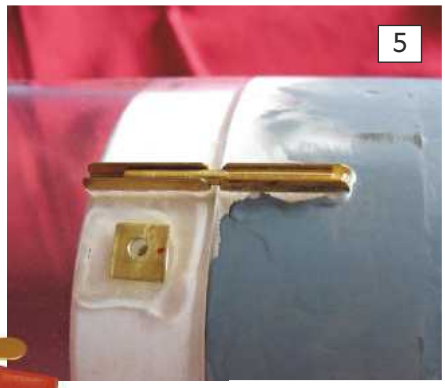
succession. It's cheaper to use plaster than polyurethane resin for this purpose. Each plaster housing was now glued to its relevant hydroplane, filler added as necessary, then primed to reveal any defects, which were then remedied. On the full-size housing, there is an inspection cover, this replicated with masking tape and fine filler. So, in summary, I now had the two halves of a hydroplane and motor housing that were mirror images of the one on the other side of the cone, simply by turning each of them over. Mind you, that's where the simplicity stops.

More moulds

Initially, the plan was to have the propellers driven by a gear train and / or motors that were to be installed in the hydroplanes. This meant that it was necessary for the moulds to produce hollow castings. In the end, however, the drive motors were installed in the rear part of the hull's internal watertight compartment, connected to the propellers by shafts with universal couplings. Alumilite 'White' was the chosen casting material, available from a number of suppliers, indeed in the UK, 'Hobbies' are a convenient source for this. To produce the required castings an inner silicone mould is placed inside the main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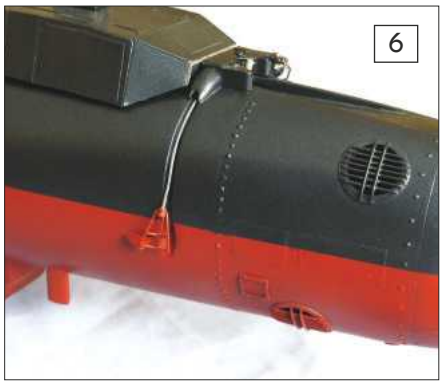
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mould to make sure that only a 'shell' is formed, rather than a solid lump of resin. Here, then, **Fig.1** shows the mould for one half of a hydroplane with the inner plug hanging from a temporary bridge over it, leaving a small void between the two. This would result in the motor housing being mostly hollow. The finished item is shown in **Photo 1,** which is of the port side hydroplane. Note the removable underside hatch for access to the (yet to be installed) drive mechanism. At the outer edge of this unit you'll also see a fin, which we'll discuss now.

Hydroplane fins & rudder

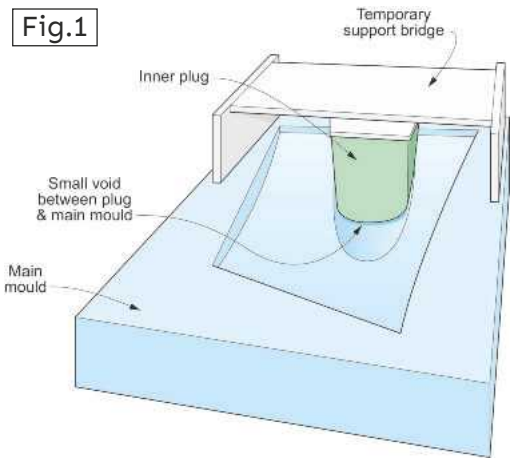
The hydroplane fins and the rudder were made in much the same way as the main hydroplane units. Each fin was fabricated in three sections, a single outer half and two inner pieces that do not quite meet, allowing for the thickness of the end of hydroplane unit. The idea here was that the fin would simply fit over the outer edge of the hydroplane. Again, Alumilite resin was used for the actual castings. On the basis that pictures tell a thousand words, **Photo 2** is of the masters for the fin pieces, **Photo 3** shows them in the mould boxes and **Photo 4** is of the completed stern section, albeit from much later in the build process. In this last shot you can see that the hydroplanes are not fixed and can move up and down, as can the rudder, albeit left and right.

Clearly, it was vital to get everything that should be square, actually square. Equally, this was not a matter of a weekend's work but took place over a very long and extended period, interspersed with other construction work. Anyway, I hope these pictures and comments show that such a project is not impossible, provided it is approached logically and broken down into smaller sub-sections along the way. Also, I cannot stress again just how good the Alumilite resin (in its various forms) is as a casting material.

Three of a kind

You may, perhaps, have been wondering when I might get round to joining the three hull sections, so let's take a look at this now. For access, both the bow and stern sections need to be removable from the central 100mm

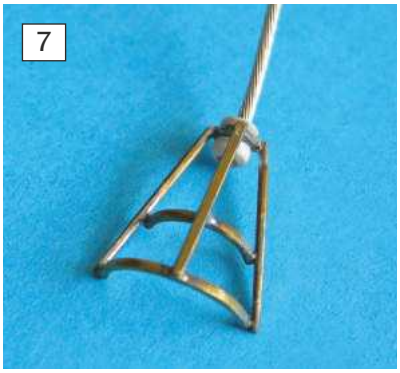
Fig.1

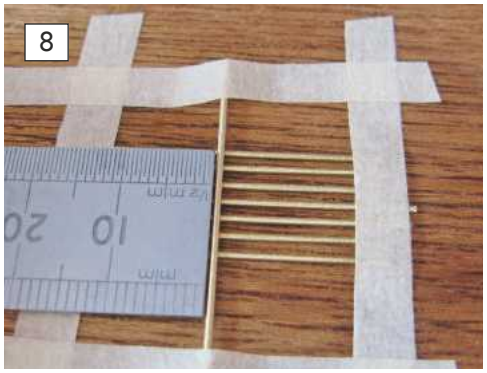


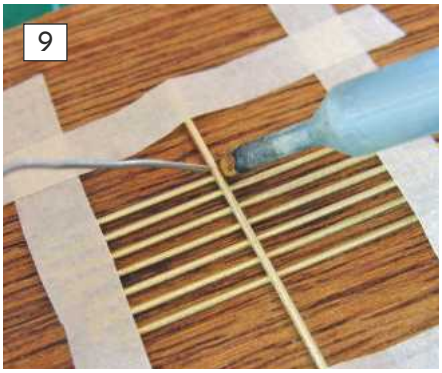
diameter tube section where, in due course, all the 'working' bits will be installed, mostly in a separate slide-in watertight compartment (WTC). Earlier in the series I mentioned that short lengths of the 100mm diameter acrylic tube were built into the masters for the bow and stern sections to ensure they would match the main central tubular part. The only problem was that the bow and stern sections were now of fibreglass. To ensure a perfect match, the solution was to add a 25mm long acrylic tube extension piece to each, with a sleeve inside that would both help secure them to the fibreglass bow and stern sections and provide a positive location into the central part of the hull.

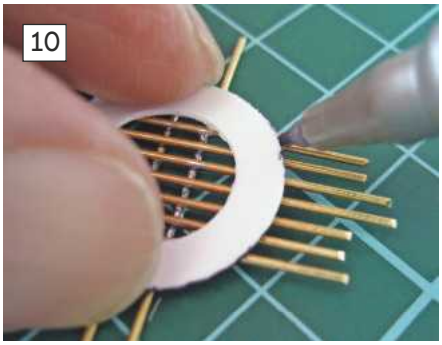
The stern section was the easier to resolve. Standing the cone upright on a flat surface, it was rotated with a clock gauge touching the point (by the stern light) to see if the circular face that would meet the central tube was indeed symmetrical. In fact, the cone moved its axis slightly, so where this occurred, the edge was sanded until there was no obvious movement and it was deemed 100% symmetrical about its axis. Incidentally, the hull's main outer central tube was cut professionally and trimmed on a lathe to ensure its ends were perfectly square to its axis.

To create the sleeve to slide inside the central tube, strips of 0.5mm styrene, 60mm wide, were laminated inside the extension piece into the cone, but also protruding outwards. Getting these styrene strips to be the exact length required some 'cutting and adjusting', before it was all glued together. Later, the whole was reinforced with resin and matting inside. **Photo 5** shows a securing bolt hole and alignment keyway. This is just brass U-section









tube with a short section of rod pressed into the two sections. This one is underneath the model and out of sight normally, but is a simple way of making sure the two hull parts always perfectly align, because inevitably, where bolts go through the hull, there must be some slight slack in their holes for them to easily engage the nut treads inside.

Patience pays

Working with large diameter tubes can be a pain. The best 'amateur' way of making sure sections align, and are diametrically (180 degrees) opposite one another, is to wrap a piece of paper around the tube, mark where it meets itself and also put a datum point on the tube itself. If you then unroll the paper, which should now be marked with the exact circumference of the tube, it is easy to halve that measurement. With care these marked points are now transferred to the tube. If the main central tube has a marked line straight down its surface from end to end, then it is now easy to get everything in line. This alignment process was repeated for the bow section, indeed careful marking, slow drilling and patience eventually meant that from bow to stern everything was in alignment and, significantly, would always be that way, even if being broken down and re-assembled numerous times.

By the way, it's worth noting that acrylic tube is usually stressed from its manufacturing process and to prevent it fracturing when being drilled or cut, you need to put tape around and over the proposed hole position and drill or cut very, very slowly.

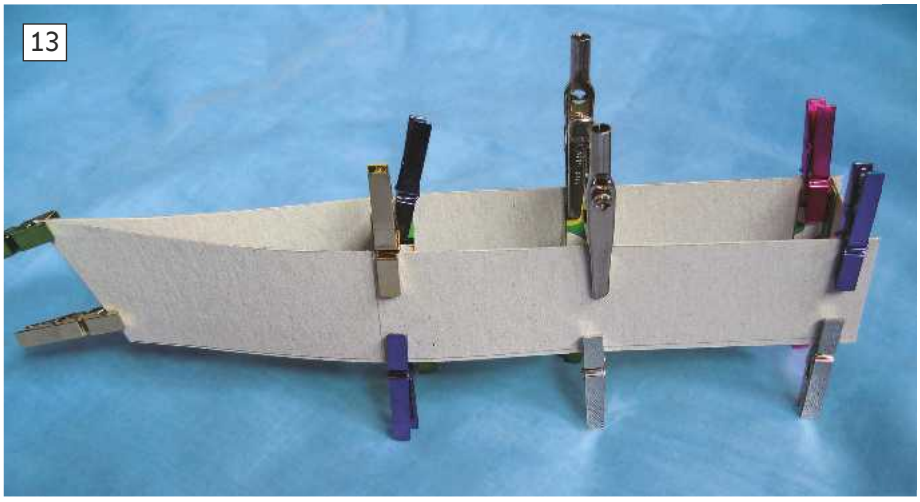
Fittings & thruster ports

On the underside of the bow section are some square inserts, which contain the lights etc. Suitable holes were cut into the bow piece and plastic boxes made to fit. Each has a sloping top with a gap at the end which allows trapped air to escape. The lights themselves were made from brass tube, glued to a piece of styrene card and then filled with a clear glue. If you hold the tube in a vertical position, gravity takes over and the 'setting' glue will then produce a curved lens. The excess plastic card was then removed.

In **Photo 6** there is a recovery basket attached to a cable on the starboard side of the bow section. The basket is from brass rod and the cover into which it disappears is of car body filler built up over a base and shaped. **Photo 7** is a close-up of the basket which, as you can see, has a genuine cable of thin steel stranded electrical wire with its plastic sheath removed.

Remember the thruster ports? These, of course, need grill covers and there are four each (water in and water out) on the bow and stern sections. Each grill had to be exactly the same, so 12 units were made, just in case! For these 0.5mm diameter brass rod was cut to the required length and thoroughly cleaned ready for soldering. The desired consistent distance between each rod was obtained by notching two strips of styrene with the appropriate spaces, then placing these over the rods to set the gaps. Once happy, the neatly aligned rods were held with masking tape. Two further rods at 90 degrees to the others were now placed over the initial set **(Photo 8)** and then soldered as in **Photo 9.** A spare thruster outer ring could now be placed over each soldered brass rod assembly and the rods cut to length **(Photo 10).** All that then had to be done was carefully roll the soldered brass grill to match the hull curvature and glue in place **(Photo 11).**

Given that this sub was designed to be towed to its intended area of operation, on top of the bow is a unit which contains the towing gear. This was built from styrene card then filled with Alumilite resin to make it into a solid block. The rollers, meanwhile, were manufactured from plastic rod (**Photo 12).** That said, since those on the full-size vessel look as if they're of a sort-of brass, mine were duly painted in Humbrol gold, then over-brushed with silver (most of which was wiped off) and the process repeated until the desired effect had been achieved.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Keel unit

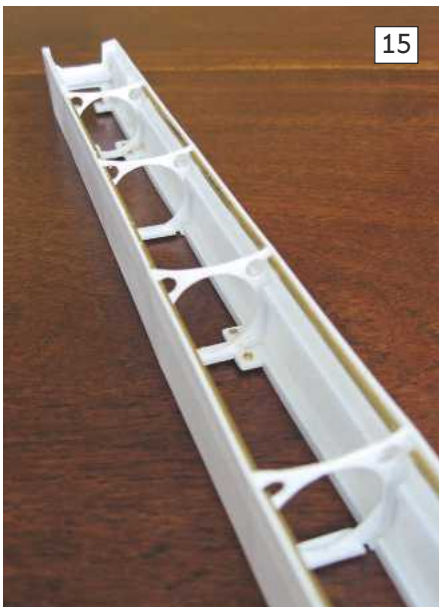
This is a prominent feature of the submarine extending, as it does, for much of the hull's length. From my model's point of view this meant that it had to be in three sections because it traverses the main central hull unit plus the bow and stern sections. These three sections are, therefore, permanently attached to the bow, central, and stern main hull sections.

The shape of the keel is quite complex so the solution was to create templates from redundant cardboard boxes **(Photo 13)** and use these to cut the equivalent styrene sheet parts. The forward part of the keel was built up in much the same way, as you can see in **Photo 14,** however the important part of the keel as a whole, is the central section, this because it was intended that it would hold the ten sub-C NiMH batteries within it in a sealed tube, all in line ahead. In the event it now holds 2.5lbs of moveable ballast for hull trimming, this because, during its six years of gestation, the model developed and various design changes had to be accommodated.

The central keel section, then, is basically a long box which has a sealed aluminium tube running down its centre that can hold the aforementioned ten sub-C cells, later substituted for a moveable ballast weight on rails – more about that later. This central section of the keel is permanently fixed to the hull's main 100mm acrylic tube and **Photo 15** is of the centre keel unit without the battery storage tube. The centre section's outer panels have a small gap running along their length at the hull / panel joint, to aid free flow of water and the underside panel of the keel also has a slot running along its length to assist flooding. With (what will be) an operational model submarine, the last thing you want is air trapped in parts of the hull and within its casings where you don't want it to be.

The keel's bulkheads are of 2mm styrene sheet, each being shaped to match cardboard templates. A simple jig was used to make sure that each bulkhead was also drilled in the correct place to take an aluminium tube which could store the sub-C cells. Incidentally, this tube also served to be the alignment tool for the keel cross-ribs. Any reader who builds model submarines will know that, invariably, they will always need lots and lots of ballast and hence the later design change. At this stage, though, the intention was still to have the NiMH batteries installed in this aluminium tube.

In order to seal it silicone rubber was used the wrong way around, a mould being created from a spare piece of blanked off tube, styrene and rod **(Photo 16),** from which a rubber plug was cast. This silicone plug has two holes running through its length, one in the centre which allows a 4BA stud bolt to be inserted and the other (close to the circumference), allowing the wiring to exit from the batteries **(Photo 17).** The 4BA stud bolt running through the silicone plug enables it to be compressed,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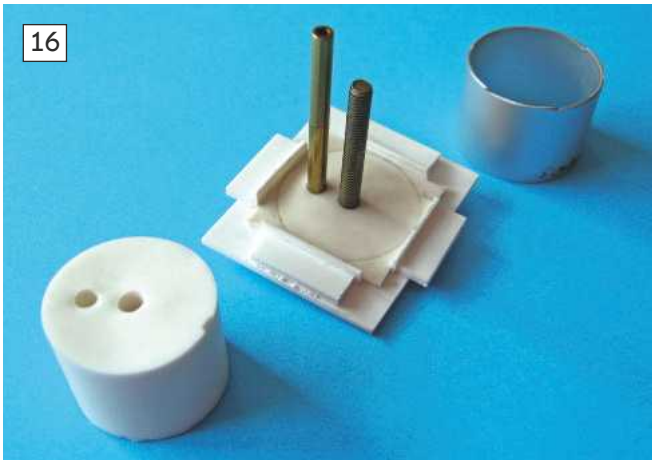
thus expanding it to a tight fit in the end of the tube. However, as you will see later, eventually this keel section had a ballast weight on rails that could be moved forward and aft by a servo, controlled by the submarine's auto-levelling device. The important point is that when developing a model like this, by the seat of one's pants, one should never do anything permanent and irrevocable as this may stifle a later improvement or modification. Back soon with more...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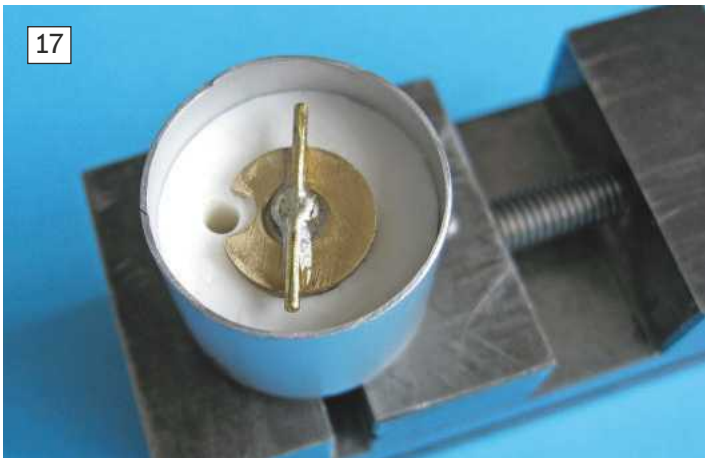
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M.T. Prestwick

James Pottinger presents plans for a classic West Country-built mid-fifties motor tug with a model-friendly hull

The well-known naval architects, Burness Kendal & Partners, developed and patented a form of hull design known as Hydroconic, which was used on numerous small craft such as tugs and fishing trawlers at home in the UK and abroad. The most obvious advantage was that the hull shell plates could be formed by conical development which avoided the necessity for furnacing and the application of heat to achieve the correct form, this giving a significant saving in production costs. Moreover, the resultant double chine shape was claimed, as a result of tank tests, to have equal or even greater propulsive efficiency when compared to the classic round-bilge hull.

Having been designed for harbour service M.T. Prestwick was the first of five identical diesel tugs for the France, Fenwick and Wear Co. Ltd, which ran trials in March 1955. It was built in seven months by the P.K. Harris Shipyard at Appledore in North Devon. The narrow and tapered funnel ensured that the helmsman had a clear view of the aft deck from windows in the wheelhouse at each side and, additionally, Perspex screens on either side on the wheelhouse roof afforded vision upwards for when close to large vessels. Please also note that the dinghy davits were so arranged as to be able to swing out the small boat either side with a single hoist.

Over the years this first vessel served under a variety of names and underwent various alterations to suit her duties, one

BELOW: Prestwick at work. Please note the bowsing rope from the tow line leading to the bollard aft.

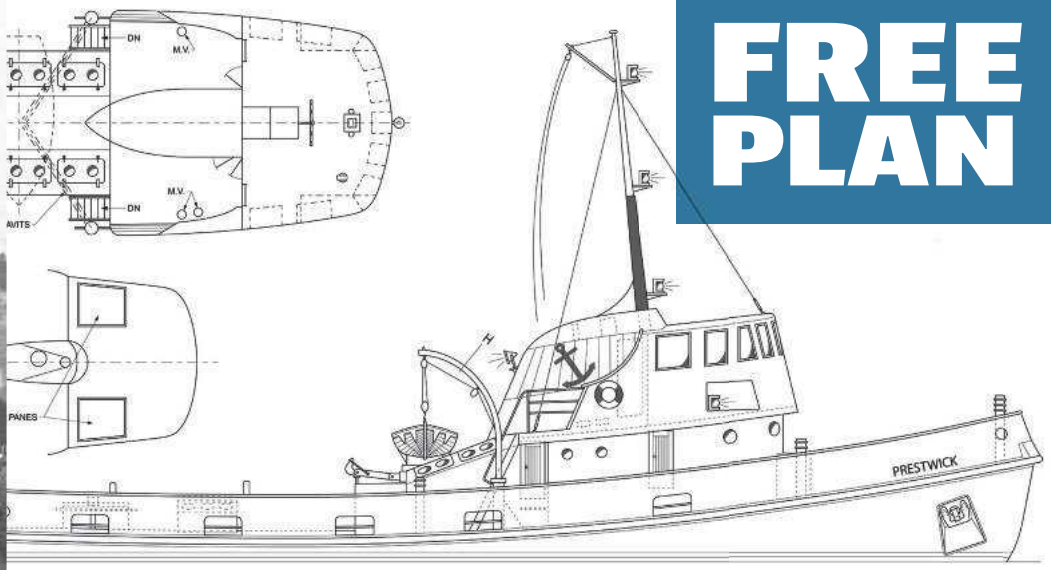
Principal particulars

Launched: 10th January 1955
Completed: March 1955
Length overall: 92ft
Length between perpendiculars: 84ft
Moulded beam: 23ft 3ins
Engine: One 12 cylinder General Motors diesel with 4:1 reduction gearbox
BHP: 1080

FREE PLAN

ABOVE: As Nore Swale. Note that the bulwark on the wheelhouse top has been removed. (Photo: Ken Smith)

BELOW: Prestwick and two other tugs. This shows her original appearance with the small boat under its davits. Note that an extension to the engine exhaust has been added. (Photo: Steven Swinhoe)



ABOVE: A good view of Prestwick in profile showing her funnel colours but without the anchor logo. (Photo: Michael Green)

LEFT: As Nore Swale and an excellent view of her aft deck and casing etc. (Photo: Ken Smith)

Service History

1955 France, Fenwick Tyne & Wear Co. Ltd.
1977 Transferred to Lawson-Batey Tugs Ltd.
1978 Chartered to Wear Tugs Ltd.
1986 Chartered to Tyne & Wear Tugs Ltd.
1987 Medway Port Services Ltd.
1993 General Port Services.
2001 N.E. Murray & Sons. Queenborough, Kent and renamed Nore Swale.
2009 New owner in Nigeria and renamed Belynda.
2009 Detained in Portugal after port control inspection.
2010 Broken up at Sines in Portugal.

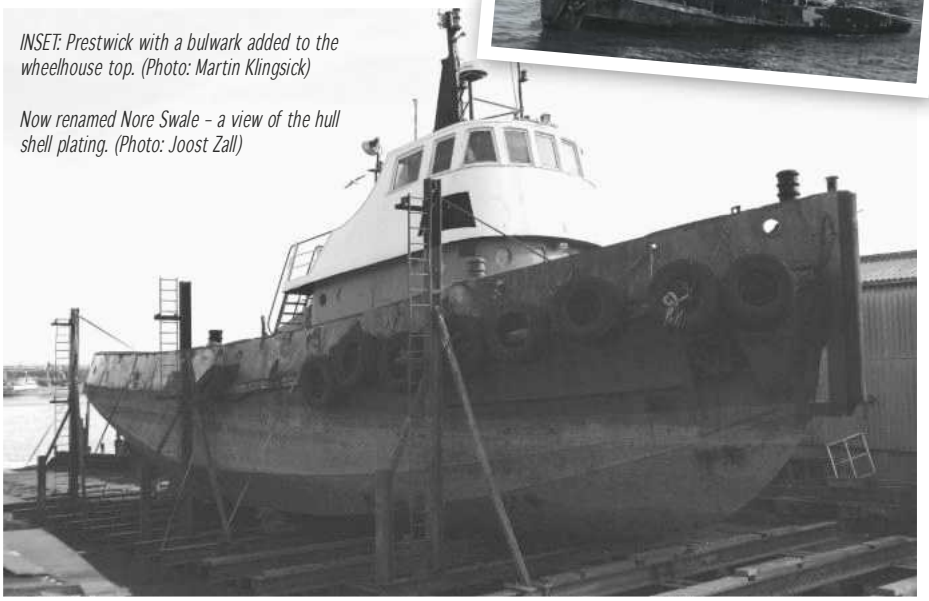
obvious difference being the removal of the small dinghy and its davits, and the addition of a flying bridge bulwark, which appears to have been removed again, but much later. The arrangement as shown on the model plans is as originally built.

Model-friendly

As is common with my plans, I do not provide a blow-by-blow construction sequence, the intention being that the plan (and photographs) is comprehensive enough for a modeller to use the hull lines and bulkhead placings to build a model as he (or she) desires. Having said that, the simple method of construction of the original tug is a boon to model makers by virtue of the double chine hull which has no drastic change of shape or section. In other words, the hull does not need to be planked in the traditional style. Instead the frames can be covered with large single piece skins.

The general arrangement of Prestwick basically follows that common to many similar tugs and can be determined from the drawings. With a suitable coaming around the main access into the hull's interior, the entire wheelhouse and deckhouse can be made to lift off as one unit, this being even easier as there are no side supports for the overhanging wheelhouse structure. The grating at the stern over the rudder head can also be made of a size to enable easy access to the steering mechanism, similarly with the store hatch and engine room skylights on the aft deck section.

INSET: Prestwick with a bulwark added to the wheelhouse top. (Photo: Martin Klingsick)

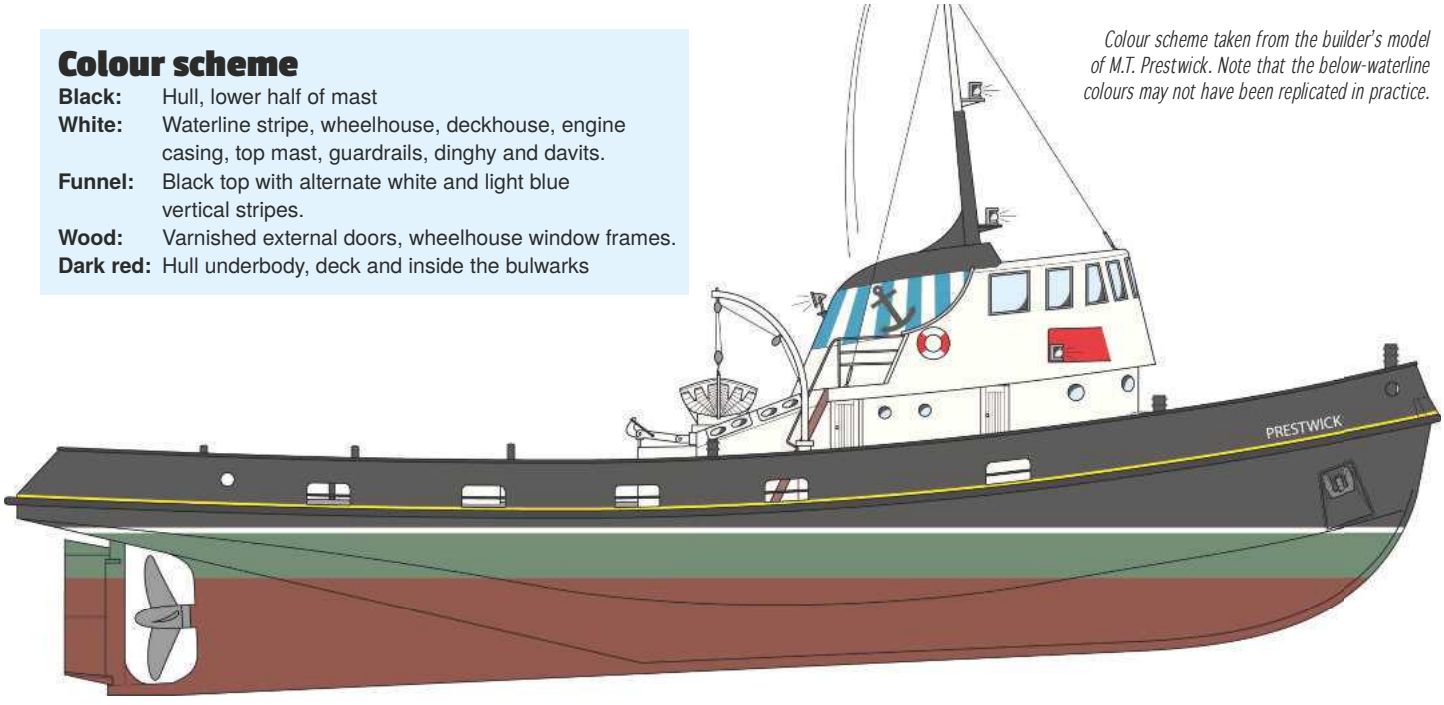


Now renamed Nore Swale - a view of the hull shell plating. (Photo: Joost Zall)

Colour scheme

Black: Hull, lower half of mast
White: Waterline stripe, wheelhouse, deckhouse, engine casing, top mast, guardrails, dinghy and davits.
Funnel: Black top with alternate white and light blue vertical stripes.
Wood: Varnished external doors, wheelhouse window frames.
Dark red: Hull underbody, deck and inside the bulwarks

Colour scheme taken from the builder's model of M.T. Prestwick. Note that the below-waterline colours may not have been replicated in practice.



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Range Finder

Dave Wooley takes his brownie aboard Type 23 Frigate HMS Iron Duke and snaps a photographic record with the model-maker in mind

Although I've visited a number of Type 23s in recent years it's been some time since I've featured a tour of a Type 23 in the pages of Model Boats. Like all warships improvements are made, some clearly visible, others less so. It is with this thought that I paid a visit to HMS Iron Duke in summer of 2017. In previous coverage of the T23s I've mention a number of salient points and rather than jump right into this new ship's tour I think it would help to reiterate some of the basic facts then define specific details in the captions.

Initially the Type 23 program was to be a replacement for the previous Leander Class but after the conflict in the South Atlantic in 1982 it was deemed necessary for such a replacement to have better air defence whilst maintaining its primary purpose of ASW (anti-submarine warfare). Thus, what evolved was more a general-purpose Frigate the thinking being that the 4300 ton ships would serve for only 18 years and eschew midlife modernization.

Iron Duke F 234 was laid down on December 12 1988 at Yarrow Shipbuilder's, entered service on April 20 1993 and by August 2017 had been around for 27 years. A Duke Class frigate, the 133m (436ft) long

ABOVE: HMS iron Duke approaching the River Mersey in a heavy swell.

HMS Iron Duke is CODLAG powered – which is a combination of diesel–electric and gas turbine – to two shafts, using fixed-pitch propellers developing 52300shp with a sustainable performance of around 25kts.

Vertical Launch System

For air defence the entire class was fitted with the vertically launched Sea Wolf system. In recent times the missile acquisition has evolved to accommodate the Sea Ceptor – a lightweight 3.2m long Mach 3 interceptor missile – with the existing VLS on the T23 able to accommodate more missiles per tube and having a range of 25km. Eventually this missile will be transferred to the Type 26 frigate force.

LEFT: A view looking forward from the starboard side on to the Forecastle. This picture details many of the salient features including the type and disposition of the ships rails.

BELOW: In the foreground is the style of cable holder as fitted to the Type 23s. It's also worth noting from a modeller's perspective that the twin bollard, both port and starboard, are canted slightly inboard.

LEFT: Moving inboard of the breakwater we have a view of the arrangement over to starboard with the rising main for firefighting in the foreground.

RIGHT: This picture on the port side shows clearly that the outer breakwater support is not vertical, a minor observation for perspective model makers but this is how it is.

ABOVE: Moving down the port side aft and along the side of the VLS housing the so-called panel WT doors come into view. They're a familiar fitting on the T23s and preceding classes of RN warships.

RIGHT: On the port side viewing aft is the raised VLS housing which accommodates the new Sea venom SAM missile which is smaller than the preceding Sea Wolf missile.

ABOVE: A pair of roller fairleads. It's worth noting for model making purposes how the two closer stanchions are fixed into the support frame of the fairlead. Also the type of stanchion used.

Guns

Standard fit on the Type 21, 22, 42 and, latterly, the Type 45, is the Mk.8 144mm / 55 calibre naval gun, indeed the Iron Duke is fitted with same. The turret housing has undergone a makeover having a lower RCS (Radar Cross Section) whilst from 2008 onwards the MOD 1 variant offers all electric loading to the original hydraulic system. Iron Duke has also received the DS30B 30mm anti-surface warfare gun system as a replacement to the DS30M. Essentially the newer gun is based on the 30mm Mk.44 Bushmaster 11, integrated with an automated mounting and remote fire control.

Radars

Radars are the eyes of the fleet and none more so than on Iron Duke. The ship was originally fitted with the Type 996 surface / air search system but was the first to receive the more versatile Type 997 Artisan 3D array which, according to official publications, is the best of its type currently available. With a performance that is four times better than the previous 996, the Artisan has the capability to track 900 targets out to 200km even in an intense electronic environment.

For missile / gun fire control, the original Type 991 radars remain in place fore and aft and will be shown in detail during our ship's tour. In addition there's the Sea Archer electro optical fire control system for the 144mm / 55 calibre Mk.8 naval guns and, of course, the existing Type 1007 navigation radar mounted on the foremast. For electronic warfare Iron Duke is fitted with the UAT-1 intercept and the DLB decoy system, although the large tube dispensers for the 2DLF (2) floating decoys seem to have been removed.

ASW

For anti-submarine warfare the ship retains the fixed 324mm torpedo tube for the Stingray torpedo. Add to that the type 2031Z towed array, the 2050 bow mounted search and attack sonar and the ASW capability of both the Merlin and Wildcat helicopters, the later aboard the Iron Duke.

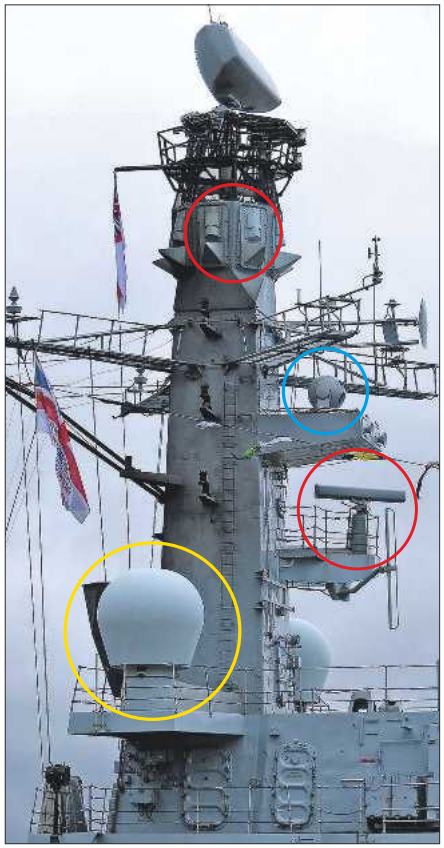
The forward face of the bridge. Note the framework (bottom of photo) for mounting the Harpoon launch canisters.

ABOVE: In the space between the bridge and the VLS housing we can see, in more detail, how the framework for supporting the Harpoon missile canisters is arranged.

ABOVE: This picture focuses on the area around the starboard bridge wing and within the centre the port navigation light boxes.

ABOVE: Just abaft of the bridge wing is one of four mini guns capable of a low angle depression to defend against small boats. Also to the left of the picture are the SRBOC Mk.36 Super Rapid Blooming Chaff launchers discharging 130mm cartridges which can be launched up to 244m.

ABOVE RIGHT: The starboard bridge wing from a different perspective. The radar mounted on the bridge roof is a Type 2008 navigation radar.



LEFT: At the head of the mast (ringed in red) is the UAF (1) electronic warfare array. Ringed in blue is the Sea Archer fire control whilst on the lower platform (ringed in red) is the 1007 navigation radar array. Finally (ringed in yellow) is the Scot-1C satellite communications radome.

Anti-ship missile system

Presently the Iron Duke is equipped with the Harpoon all-weather SSM (surface-to-surface missile), this having active radar and homing and a range of 110km with a cruising speed of just under Mach 1. Developed back in 1977 it has proved to be a long serving and valuable anti-ship asset. It is, however, to be withdrawn from service in 2018 with the prospect of having no dedicated SSM capability for at least 2 years on any RN warship. Instead the airborne anti-ship capability will rest with either the Merlin or the Wildcat helicopters, presently fitted with the 25km range Sea Skua missile which is to be replaced by the slightly shorter range but more agile Sea Venom missile in late 2020. Incidentally, included in Part 3 of this mini-series will be a detailed tour of the new Wildcat helicopter.

Right, let's dive in to the photos which commence at the bow (over the page), then move to the forcastle, bridge and foremast, highlighting, along the way, the salient features, all covered from a model-making perspective. More next month.

ABOVE: A detailed close-in picture of the new Artisan Type 997 radar surrounded by the existing inspection platform. Note the two forward-facing navigation lights (ringed in blue).

BELOW: The 1007 navigation radar is shown here in greater detail along with the platform and surrounding fittings.

Our father, Tony Lench, died in 2011. He loved the sea and especially the ships that sailed on it and so he started modelling them! Napoleonic frigates, an Elizabethan Galleon and latterly Thames barges, built with loving care, bore testament to his talent and knowledge. On his passing the collection has passed to our family, and to museums. However there are still examples of his work to find a home and as a keen lifetime reader of Model Boats we know that he would love them to go to someone who will enjoy them as we do.

Bark Fore and main masts square rigged with mizzen rigged fore and aft. **offers invited**

Sloop Single masted fore and aft rigged. **offers invited**

Two Masted Schooner Two masted fore and aft rigged. **offers invited**

Revenue Cutter c1900 We think this is Dad's first model. **offers invited**

As fellow enthusiasts we hope you enjoy his model ships as he did. For further information please contact **Michael & David Lench 07774 453382**

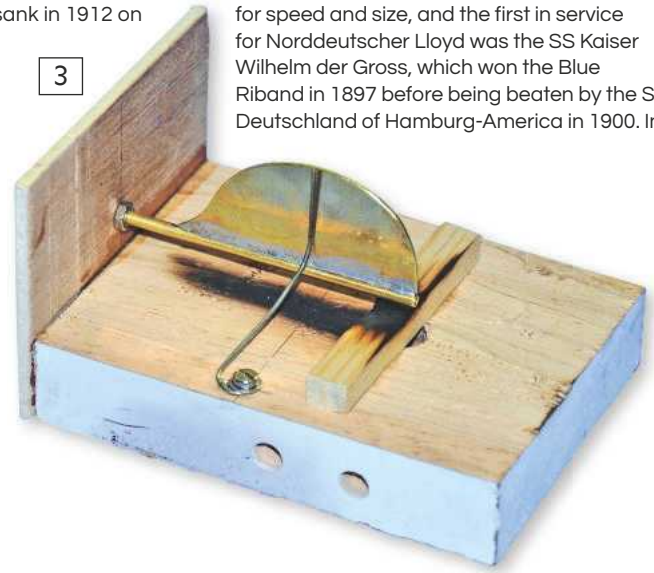
Family reunion. Impossible in real life for even before the Britannic was launched, her sister, Titanic, had been lying at the bottom of the Atlantic Ocean for almost two years.

Sister Act

Tony Dalton returns with another cunningly engineered plastic kit conversion of the Olympic Class liners whose stories conclude in infamy

The story of the White Star Line's three Olympic Class liners – Olympic, Titanic and Britannic – is well-known. Built by Harland & Wolff during the early 20th Century the Olympic was launched in 1910, Titanic in 1911 and Britannic in 1914. All were designed to be the largest and most luxurious passenger ships in the world the intent being to steal, for White Star, the advantage on the transatlantic passenger route. Titanic, of course, sank in 1912 on her maiden voyage after hitting an iceberg in the North Atlantic. Britannic was similarly lost to the sea in 1916 after hitting a mine laid by the German submarine U-73 off the island of Kea in the Aegean. Olympic, however, was more fortunate and, after a career spanning 24 years, was retired in 1934 and sold for scrap in 1935.

The Olympic Class had its origins in the intense competition between the UK and Germany. Norddeutscher Lloyd and the Hamburg-America Line, the two largest German companies, were involved in the race for speed and size, and the first in service for Norddeutscher Lloyd was the SS Kaiser Wilhelm der Gross, which won the Blue Riband in 1897 before being beaten by the SS Deutschland of Hamburg-America in 1900. In

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response to this, Cunard ordered two vessels whose speed earned them the nickname 'Greyhounds of the Sea', indeed Lusitania and Mauretania kept the Blue Riband for more than twenty years, from 1909 to 1929. The White Star Line knew that their existing quartet of ships, built for size and luxury, were no match for Cunard's new liners in terms of speed, but in 1907 J. Bruce Ismay, President of the White Star Line and William J. Pirrie, director of Harland & Wolff decided to build three vessels, namely the Olympic Class ships to surpass Cunard's largest ships, in both size and stature. They were intended to be the largest and most luxurious ships to operate the North Atlantic, but not the fastest as White Star had decided that comfort was the way forward. The three vessels were designed by Thomas Andrews and Alexander Carlisle.

Following the sinking of Titanic, the two remaining ships underwent many changes in their safety provisions, not least the addition of numerous lifeboats.

Lift the lid

Having built the Revell 1:400 scale Queen Mary 2 (MB, August 2014) the next project had to be the Titanic. After reviewing all the kits available, the 1:350 scale Minicraft Deluxe Kit was purchased but then, shortly after, someone gave me another one which was actually the earlier kit manufactured by Entex **(Photo 1).** This, incidentally, still had its price attached – £13.95! **Photo 2** is of the Entex kit, with all the parts still in their plastic sleeves. A cursory glance suggested that the two kits were identical, however during construction it became evident that some parts were quite different.

Each kit comprises a number of frets with a total of 366 parts in each. Both have a moulded hull, three mouldings for a model stand and six separate moulded parts for the decks. Also included is some rigging cord, anchor chain, pennant transfer sheet, and a decal sheet. Additionally, the Minicraft kit features an etched brass detail sheet, a 40-page instruction manual plus a four-page set of instructions for the etched brass items. This is a nice touch so in order to ensure consistency across both models an additional etched brass detail sheet was purchased for the Entex model. But it didn't end there! Not wishing to do things by halves I ordered the after-market laminated decking sets for each of the two kits, making a combined parts total of well over 1000 individual items.

Planning pays

It's never a good idea to rush into things when considering a project such as this, indeed in the early stages I was still unsure which two vessels to build. There was no shortage of suggestions from fellow modellers regarding what to do, but after careful consideration it was decided to build Titanic using the Minicraft kit and make a model of the Britannic as a hospital ship, using and modifying the Entex


Britannic's boat deck was transformed as a result of the Titanic disaster, most notably with large girder davits and, of course, more boats.


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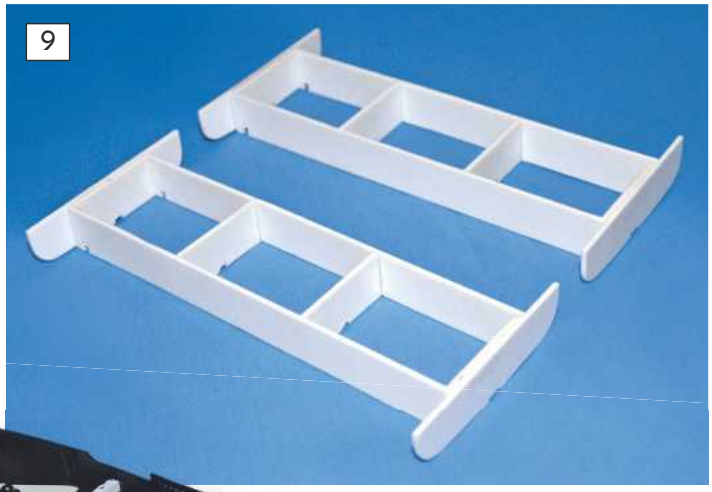
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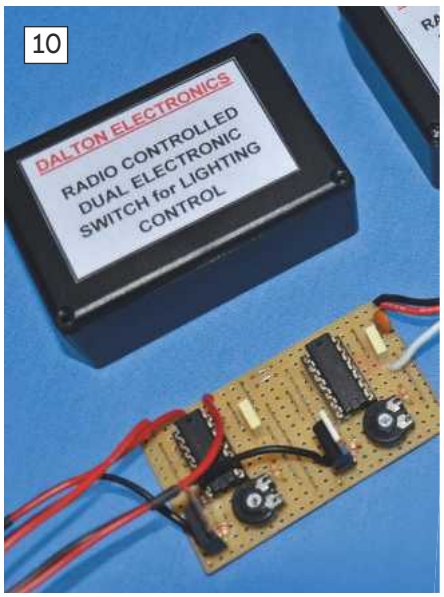

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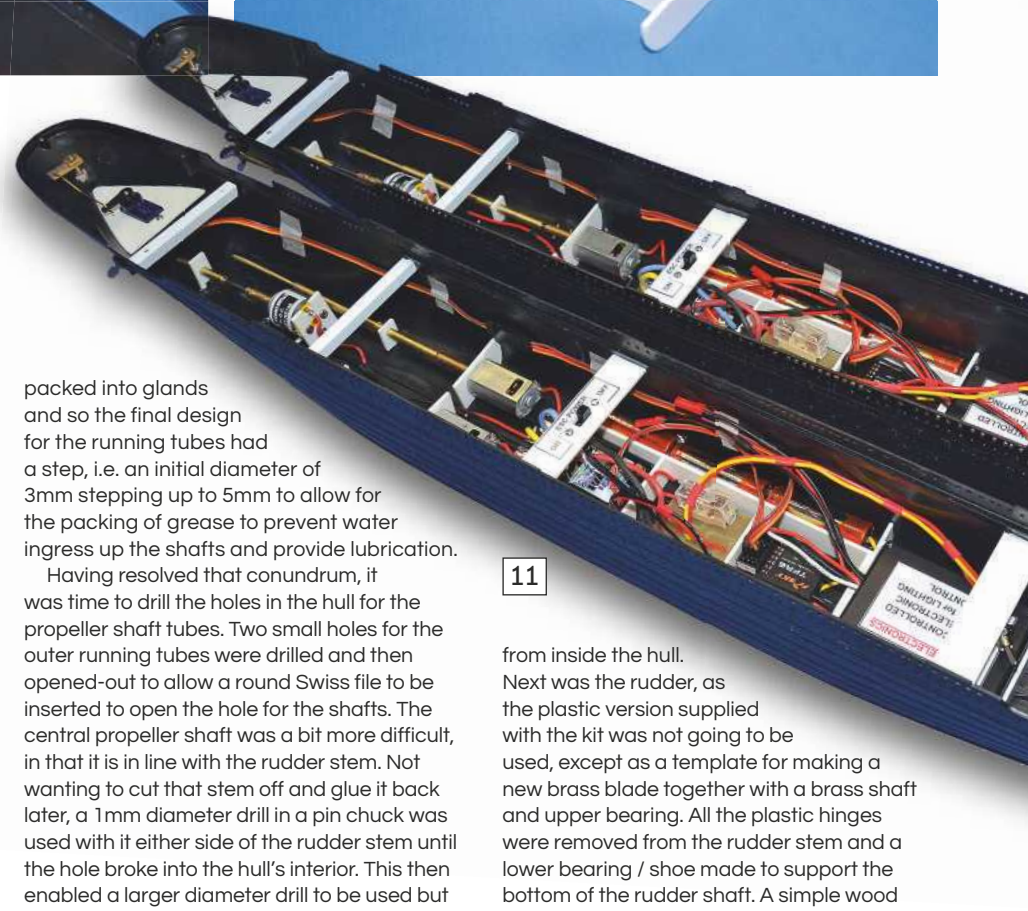
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kit, for which some research would be needed. As always nowadays, the internet came to the rescue with the 'Titanic Research and Modelling Association' website. This contains a wealth of information, including the best paints and colours to use, pictures of the ships, reference books, research articles, plans and additional modelling products to enhance the basic kits. It provided all the information I required to modify the Entex Titanic kit into the Hospital Ship Britannic.

As you'll see from the photos, both models were built in parallel, so I'll be describing a general method of construction that suits either, then picking up on any differences along the way.

Running gear

The first job was to design the three propeller shafts and their running tubes. The outer plastic dummy tubes supplied with the kits that protrude from the hull have a diameter of about 3mm. Using 3mm thin-wall brass tubing would allow the use of 2mm dia. stainless steel for the propeller shafts themselves. However, this diameter of running tube would not allow grease to be packed into glands and so the final design for the running tubes had a step, i.e. an initial diameter of 3mm stepping up to 5mm to allow for the packing of grease to prevent water ingress up the shafts and provide lubrication.

Having resolved that conundrum, it was time to drill the holes in the hull for the propeller shaft tubes. Two small holes for the outer running tubes were drilled and then opened-out to allow a round Swiss file to be inserted to open the hole for the shafts. The central propeller shaft was a bit more difficult, in that it is in line with the rudder stem. Not wanting to cut that stem off and glue it back later, a 1mm diameter drill in a pin chuck was used with it either side of the rudder stem until the hole broke into the hull's interior. This then enabled a larger diameter drill to be used but from inside the hull.

Next was the rudder, as the plastic version supplied with the kit was not going to be used, except as a template for making a new brass blade together with a brass shaft and upper bearing. All the plastic hinges were removed from the rudder stem and a lower bearing / shoe made to support the bottom of the rudder shaft. A simple wood

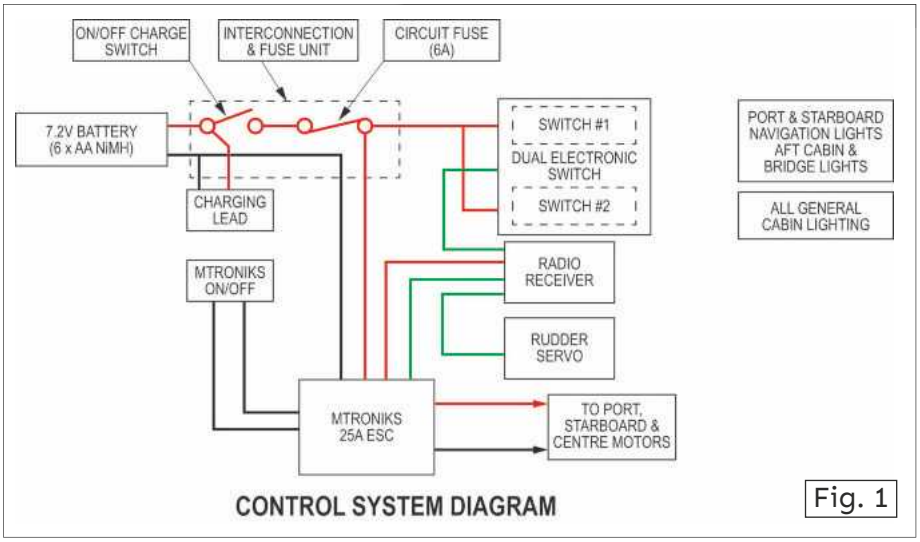
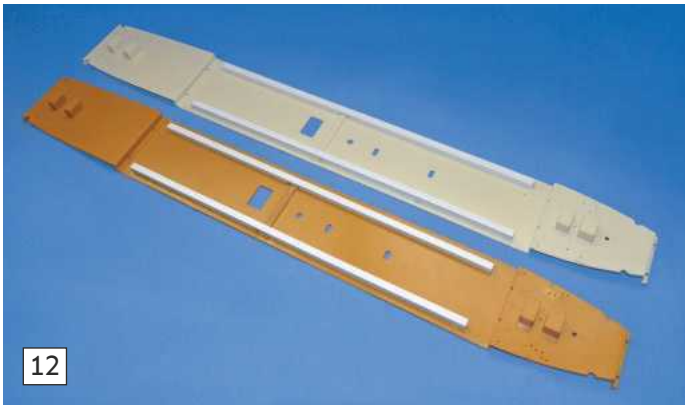


Fig. 1



ABOVE: The etched brass fittings (especially the railings) make a huge difference to these models.

jig was constructed to align and support the rudder blade and shaft whilst being soldered together **(Photo 3).** The completed rudders, parts for assembling the propeller shafts and their running tubes (for both models) are all shown in **Photo 4.** With this, the rudder parts could be assembled to the hull and temporarily bolted into position in order to check their function **(Photo 5).**

The next picture, **Photo 6,** shows the six motors, solid couplings and assembled propeller shafts ready for fitting into the hulls. Those with an eagle eye will notice that the motors for the (shorter) central propeller shafts are not the same as those for the outer shafts. Of course, there's a perfectly simple explanation in that the four suitable motors that were purchased for my earlier QM2 were far too large to fit in the scale drive pods of that ship, but proved perfect for the wing shafts of these triple screw vessels. Two MFA 140 motors are more than adequate for the centre shafts and with the drive-lines now basically complete, they were all fitted into the hulls to enable a suitable design for the motor mounting brackets to be created. These pretty simple items are made from 1.5mm x 20mm styrene (plasticard) strip, drilled to suit the motor fixings and trimmed to the required height in order to ensure the correct alignment of the shafts. You'll also note that supports were added halfway along the outer wing shafts to reduce vibration.

With the motor brackets and supports secured, the shafts were all initially 'tack' glued to the hull using cyano **(Photo 7**). One four-blade and two three-blade brass propellers were also purchased to replace the plastic items supplied with the kit.

For the rudder servo a mounting platform with a cut-out was made using 1.5mm thick styrene sheet, all trimmed to fit into the aft section of the hull. This platform was then glued into the hull and a brass wire linkage connection between the servo and the rudder's tiller arm added **(Photo 8).**

Electronics

Nothing complex here, indeed power is provided by six AA 2800mA batteries producing 7.2 volts (nominal) total. These batteries supply the Mtroniks 20 amp electronic speed controller with power via a fuse and switch unit. Only one controller is used to drive all three motors, it being connected to a 2.4GHz receiver using its BEC (battery elimination circuit) and supplying power etc. to the rudder servo and a dual electronic switch which controls the vessel's lighting **(Figure 1).**

The control system for each model is housed within a plastic module fitted in the lower central section of the hull. Each module is made from styrene sheet, prefabricated in sections, then glued together to form a number of individual cells **(Photo 9).** When complete, these were fitted and glued into the bottom of each hull.

The dual electronic lighting switch, meanwhile, is a home constructed affair and requires only seven components, these mounted on copper strip board (sometimes called Vero Board). **Photo 10** shows one of these with its case removed.

With all electronic parts built, or purchased, it was time to fit them, complete with the six batteries, into the hull and add the necessary interconnecting wiring. Each system was then thoroughly checked to ensure that everything operated satisfactorily.

ABOVE: What a difference a disaster makes! Titanic's wonderfully (and woefully) uncluttered boat deck.

Decks & upper works

Having completed the running gear installation and electronics, it was time to turn one's attention to fitting the first layer of deck. It was evident on a trial fitting of the main deck(s), that the hull sides were not completely parallel, which required some means of correction. This was achieved by adding braces across the beam, each made from 6mm square and 1.5mm thick styrene as in **Photo 11.** The lengths of the cross braces were individually trimmed to ensure that the hull sides were 'pulled in' to fit snugly against the sides of the main deck piece. Meanwhile, the fore and aft cross braces were drilled and brass tapped bushes inserted to enable the main deck section to be secured to the hull, yet also easily removed. As you can see, the ESC arming switch was fitted into a cut-out in the central hull cross brace.

As with the hull, the main decks also required attention in that neither was flat. This would affect the assembly and alignment of the upper decks and, therefore, required some longitudinal support bars to be fitted in order to remove the unwanted bow. Small cut-outs were also added in the deck to allow access for the lighting leads and battery charging lead, whilst a hole was similarly made for the main power switch **(Photo 12).** With this complete, each main deck was placed into the hull and small holes drilled into the fore and aft well-deck sections to allow 12BA screws to be inserted into the brass bushes in the cross braces, thus securing the deck piece **(Photo 13).** The fore and aft decks were secured in a similar way as there are bushes moulded into the sides of the hulls, allowing tapped brass inserts to be fitted with 12BA brass screws to secure them.

LEFT: Britannic with her rather cumbersome looking raised stern docking bridge and boat deck. Note the brass propellers and the new rudder.

Buoyancy test

This is a very sensible idea with any model before proceeding too far but more so a model that's not been designed to float. Accordingly, one's bath was duly filled and both models put into the water. Result? Two heavy steel blocks fore and aft in each hull brought them down to their waterlines. That was all good news and a massive incentive for work to continue apace.

Stern stuff

The last bit of hull construction prior to painting was to fit the stern lights. These took the form of a small white LED chip to which a pair of fine tin / copper wires were added. Two holes were then drilled though the upper part of the stern, allowing the wires to be threaded through and the LED chip to be bonded into position. The wires were terminated on a small piece of printed circuit board whilst awaiting the fitting of the main supply wires at a later date.

Mask, and mask again!

With the hulls now fully assembled it was time for painting. The rudder assemblies, propellers and shafts were all removed and both hulls masked down to their waterlines. This allowed the bottom of both hulls to be painted with anti-fouling (Red Oxide primer from an aerosol can) and after the first coat any blemishes were filled and lightly sanded before applying the final two coats of Red Oxide. All the masking from the upper hull was then removed.

The Titanic hull (Minicraft kit) was masked again leaving only the uppermost part of the hull ready for painting. The Britannic hull (Entex kit) was masked just to cover the hull below the waterline. Both hulls were also masked inside just below the level of the cross braces and were duly sprayed with white primer, any blemishes being filled and sanded prior to being given two final coats of white primer, this also being the main hull colour of Britannic.

The masking was now removed from both models and the Titanic hull masked yet again. First, below the waterline and second, down to the base of the lower deck cabins. This then allowed the sides of that hull to be painted black. Once this had been completed, all the masking was removed (again!). Both the rudders of each vessel were painted to match their lower hulls and the inside of the fore and aft well decks painted brown. The final job was to spray both the hulls all over with a clear satin varnish.

Plimsoll Line and depth marking transfers were applied to the Titanic, however these were not supplied with the Britannic (Entex Kit). HMHS Britannic was required to be adorned in green lines and red crosses, which were found in the BECC catalogue as vinyl self-adhesive decals. Studying photos of Britannic gave an idea as to the size and position of these before applying them to the sides of the hull. The painted rudders, shafts and brass propellers were then all reassembled, thus completing the basic construction of both hulls. And that is where we must leave it until the next issue when we'll take a close look at the superstructure and fittings.

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Designer: **David Metcalf**

31 in long by 9.75 in beam

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SAVE

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Designer: **Graham Bantock**

DVD
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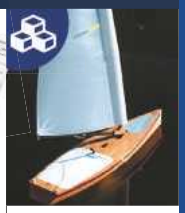

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PILOT BOAT

Designer: **Richard Webb**

630 mm long by 190 mm beam

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Designer: **K.J. Laugere**

730 mm long by 210 mm beam

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Plan & Hull
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HMS CRANE

Designer: **C. Halliwell**

1:48, 588 mm long by 160 mm beam

Plan
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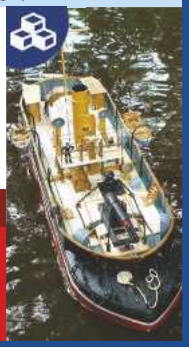

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MARINER US 80' TOW BOAT

Designer: **B. Thompson**

1:24, 1025 mm long by 235 mm beam

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SAVE

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VERONICA

Designer: **Richard Chesney**

1:24, 42.5 in long by 9.6 in beam

DVD
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Designer: **Vic Smeed**

700 mm long by 250 mm beam

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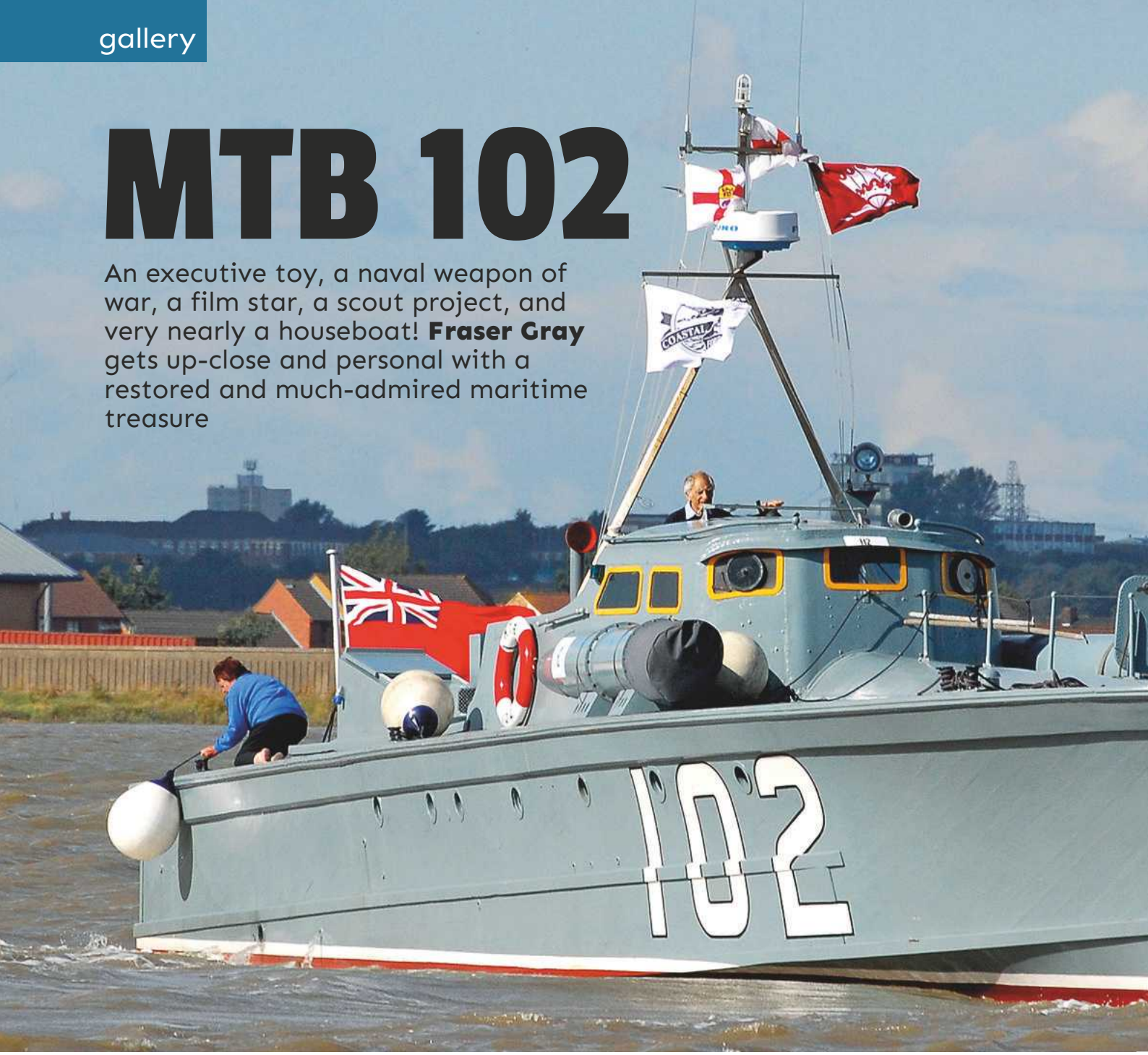
MTB 102

An executive toy, a naval weapon of war, a film star, a scout project, and very nearly a houseboat! **Fraser Gray** gets up-close and personal with a restored and much-admired maritime treasure



Designed in 1936 by Commander Peter Du Cane CBE, Managing Director of Vosper Ltd., MTB 102 was completed and launched in 1937 and ran trials on the Solent. In 1939 and 1940, having been bought by the Admiralty, she saw active service in the English Channel where she was crewed by two officers and eight men. During Operation Dynamo – the evacuation of the British Expeditionary Force from Dunkirk – she crossed the channel no less than eight times. Moreover, when the Destroyer HMS Keith was disabled by a bomb from a Stuka, Rear Admiral Wake-Walker transferred to MTB 102 and used her as his flagship for the last two nights of the operation. Once aboard he set about directing the incoming and outgoing vessels at Dunkirk from the bridge. 102 was one of the very last vessels to leave Dunkirk, ending her crucial and distinguished service during the evacuation under the command of Lt. Christopher Dreyer.

Of course, life for this maritime interceptor didn't end there, indeed other notable tasks included the transportation (in 1944) of Winston Churchill and General Eisenhower on their review of the ships assembled on the south coast for the D-Day landings. Thus, not only was 102 involved in the desperate evacuation of troops from Europe, four years earlier she also witnessed their determined return.

Post-war

At the end of the war, like most other small naval craft, this doughty MTB was sold off and converted to a private motor cruiser, fitted with two Perkins P.6 diesels. Resale came twenty years later, although this time she was destined for conversion to a houseboat but, thankfully, found in the nick of time by a Norfolk Scout Group. The year was 1973. Clearly in need of considerable attention she had been saved from an ignominious fate. It was in 1976, then, that the film industry came to the rescue, Kelso Films agreeing to refurbish 102 as a W.W.II MTB for its film The Eagle Has Landed. Returned as a fully operational sea-going vessel she spent the next 10 years in both film and public service roles, most notably as a participant in the Queen's Silver Jubilee Pageant. She was similarly seen representing 'Yesterday's Navy' at the famous Portsmouth Navy Days in '79, '84 and '86 and, significantly, returning to Dunkirk every five years for the Association of Dunkirk Little Ships anniversary crossing.

Upkeep

To keep this unique vessel operating the MTB 102 Trust has been set up, its goal being to obtain major sponsorship and finance, and to preserve, for as long as possible, this unique maritime treasure. Find out more at www.mtb102.com.

DATAFILE

Type:	Motor Torpedo Boat
Builder:	Vosper Ltd.
Completed:	1937
Length:	68ft (21m)
Beam:	14ft 9ins (4.50m)
Draught:	3ft 9ins (1.14m)
Propulsion:	Three Isotta-Fraschini 57 litre petrol engines: 3300hp (2.46MW)
Speed:	48 knots (89km/h) unloaded 43 knots (80 km/h) loaded & armed
Complement:	Two officers and eight men
Armament:	Two 21 inch (530mm) torpedoes

It's only fair to point out that this isn't my finished Sea Breeze. It is, in fact, the SLEC demonstrator and my main source of inspiration.

Sea Breeze

There's satisfaction to be found at every stage of a model boat build, not least when it's wooden and traditional. **Graham Ashby** gets to grips with templates and skins

Okay, confession time. At the end of the last instalment (January Issue) I suggested that I'd be back with this update "shortly after the festives." Alas, I have to admit, Christmas is rapidly becoming a distant memory. That said, I make no apology for taking my time with this model for, as I mentioned in Part 1, this is very much a 'between jobs' build for those thumb-twiddling times when I'm not racing my DF95 yacht, servicing my existing fleet, or actively engaged in the worthy pursuit of publishing. As friends will attest, I've never been one to rush a project; I do this to relax. Besides, like so many things in life, satisfaction in model boat building is as much about enjoying the journey as it is reaching the destination, and as far as this Sea Breeze build is concerned I have to confess that I'm absolutely loving the journey. It's due in no small part to the fact that I find boat building a massively tactile process; more so than any other model building I've been involved with. Even when I'm not cutting sticking or sanding, I'll often walk past my bench, pick the hull up, stroke it, eye its lines, nod in approval, then put it down and continue on my way. It's just one example of the subtle pleasures of the hobby and another very good reason not to bury your head in self-imposed deadlines to the exclusion of enjoyment. I'm very much on that page.

DATAFILE

Name:	Sea Breeze
Model type:	Wooden motor launch
Length:	24" (610mm)
Beam:	8" (203mm)
Chosen motor:	Turnigy 2836/11T 750KV
Chosen ESC:	Turnigy Marine 30A
Chosen battery:	3S 3000mAh LiPo
RRP:	£80.00 (kit); £10.00 (fittings kit)
Available from:	SLEC Manufacturing Website: www.slecuk.com Tel. 01953 885279

Recap

For those who've just joined us, we made a start by assembling the keel and frames, adding the stringers (top and chine) and sanding them to match the frames. In short, then, we've prepared the hull to receive the bottom and side skins.

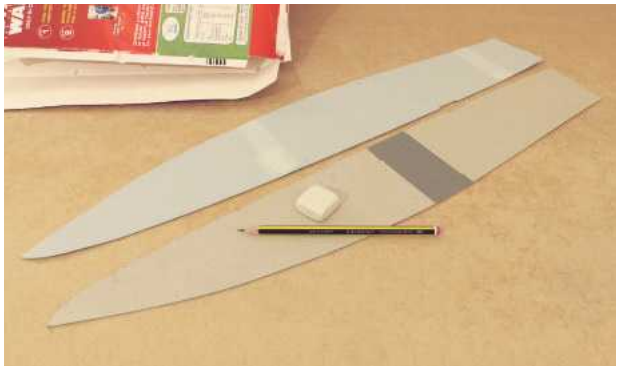
For reasons that may not be immediately obvious to first-time builders, kits of this nature don't incorporate pre-cut skins. Neither do they offer templates or, indeed, any form of guidance concerning the thorny question of fitting said skins. The best advice the instructions offer is, to be honest, pretty unhelpful. Rummage through the parts and you'll find four, unremarkable, rectangular sheets of 1.5mm 3-ply that, to all intents and purposes, are the most important bits of the boat. This can be justified by the simple fact that without them, it sinks. Of course, the interesting thing about these straight-sided flat sheets is that they must be transformed into four perfectly fitting panels that a.) don't have a straight edge among them – well, maybe one or two – and b.) are anything but flat. The Sea Breeze instruction manual, meanwhile, offers this meagre advice:

- Locate the bottom hull skins.
- Sand the skins to suit the keel.
- Glue the skins in place.

You have to chuckle. That's not terribly useful in the great scheme of things, however as luck would have it I've done a bit of this before so I knew where to start, and it certainly wasn't by "locating the bottom hull skins." Armed with a humble cereal packet, pencil, rubber and a set of French Curves a pair of card templates was duly fashioned for each of the aforementioned bottom skins. Fact: The only straight bit on these is at the transom so one must allow some time to get them right, the perfect fit achieved only after much cutting, fitting and trimming. Eventually, I arrived at a point where each template was cosy with the keel, curved nicely at the bow and overhung the chine just a little. In an ideal world you'd expect to be able to flip the template for one side and use it on the other but, of course, we're dealing with natural materials and a hand-built frame so there's very little chance of the two sides being identical. Sure enough, mine were anything but.

With the templates as accurate as possible there's every chance of cutting hull skins that fit like a glove and with this as my goal I set about transferring the shape to the ply. Again, a little care and forethought came in handy, this resulting in a process that saw the templates stuck to the ply with double-sided tape (so as not to move), traced with

LEFT: If you missed Part 1, fear not, this is where we got to.



RIGHT: Fitting the bottom skins starts with some old bits of card, a pencil, a rubber and, if you have them, some French Curves.

ABOVE: To my mind 1.5mm 3-ply seems pretty hefty for this job, however there's no denying its strength.

a sharp pencil (for security), then gently traced again with a brand-new blade in the scalpel. Three or four passes were made in this fashion until I was confident that the blade had cut a positive groove in the wood, i.e. one that it could follow without wandering. With the template removed the rest was a straightforward process of making multiple scalpel cuts until the skin was free of its parent. Wood is much nicer to work when its sanded so this first bottom skin was given smooth edges and a light 'tickle' all over with some very fine glass paper.

Eagerly offering it into position I was delighted to find that it fitted equally as well as the card template, although, being somewhat thicker, it took uncomfortable pressure to force it into submission at the bow. Time for some lateral thinking!

Now, the obvious thing to do here is wet or steam the wood on the outside to soften the fibres and encourage a bend in the desired direction. That's all very well but with tales of ply delaminating when wet, I wasn't keen. Then, as if by magic, I had the spark of an idea. You see, there's no way that 1.5mm 3-ply is necessary at the front of this boat, indeed I have no intention of using it as an ice-breaker and no plan to tenderise any meat. This being the case I decided to sand away one layer from the inside of the skin back to just behind the first frame (B1).

Once again my trusty Perma-Grit sanding block did its job perfectly, cut the ply back to 1mm, which then offered far more flexibility and in the process caused the wood to adopt a natural curve in the desired direction. This did the trick, comfortably enabling the bottom skin to neatly hug the keel and chine line around that tricky bend.

Practice makes perfect

As you'll be aware, the story doesn't end there and what I now needed was a suitable adhesive to keep the skin in place. Bending wood around the bow section and holding it firm is a job for a serious glue, so I opted for a mix; Evo-Stik (an old favourite), coupled with ZAP Thin CA and kicker (a combination that doesn't take prisoners). As a contact adhesive Evo-Stik is pretty unforgiving of errors, a fact that had me repeatedly practicing how the skin could best be applied with accuracy. Eventually, with a method established, the glue applied and a touch-dry state achieved, the skin was pressed home, working from stern to bow. On reaching the bend at the front the ply was held firmly in place, treated to a trickle of ZAP and immediately hit with kicker. Bingo! Within seconds a bond had formed and that was it, there was no going back. Fortunately all the preparation had paid off and the skin had adhered very nicely indeed. Buoyed with success my initial reluctance to tackle this job had turned to relative confidence which I used to my advantage in fitting the second skin a day or two later.

Out, once again, came the Perma-Grit block and before I knew it the chines were neatly trimmed and ready to receive the side skins. I was on a roll.

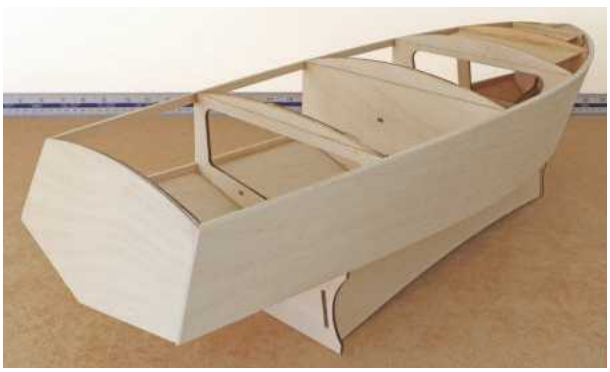
ABOVE: To its credit the instruction manual details this important joint very nicely.

ABOVE: The inner port-side skin. Note where I've sanded away a layer of ply at the bow to facilitate bending.

ABOVE: The same joint with the port-side skin applied, before sanding...

ABOVE: ...And after sanding. A bit of filler in that gap and it won't look too shabby.

LEFT: Making the most of the easy access while it's still available. As soon as that last skin goes on, reaching the forward section could be tricky.



RIGHT: Fitting the skins at the transom is, of course, a relative walk in the park compared to the bow.

ABOVE: As you can just about see, the deck takes a slight dip at the front; another area for careful profiling.

ABOVE: Sanding, I find, is a massively satisfying process that can really highlight progress.

ABOVE: With all four skins attached she really is beginning to look the part. Note the deck to the right of the picture.

Timely reminder

I have to be honest, at this point I'd quite neglected the inside of the boat. Fortunately, I received a timely reminder via the Model Boats Facebook page (where the build is being lightly documented) in that a kind soul suggested I ought to consider applying some

ABOVE: The real work here is in creating a template that fits like a glove. Double-sided tape holds it firm while cutting.

wood protection to the inside of the boat. It was a very good point, especially given the open top nature of the craft and the prospect of things getting a little damp. Two coats of varnish were duly applied in the bow section since this would be pretty much inaccessible once the side skins were attached. She was really starting to take shape now and with added incentive to move things along I made a start on the templates for the side skins.

I'm nothing if not fair, so having had a sideways dig at the instructions, one thing that is covered quite nicely is the method of tackling the junction of the side and bottom skin at the bow. If you're not already familiar with this detail you'll see how it works from the series of photos hereabouts. It's the way to go and with the last two skins cut, sanded, thinned at the front and marked with the frame lines (as a gluing guide), I broke out the Evo-Stik, ZAP and kicker and, in a repeat of the last process, stuck 'em in place, pausing between skins to apply more varnish while access was easy.

What followed was another of those wonderfully satisfying sanding sessions where everything suddenly seems to take shape. Rough-hewn timbers are trimmed, joints perfected and contours fettled. Before I knew it a hard chine hull had emerged and with it the essence of a traditional wooden motor boat. Nice.

Shake vigorously

Given that the next job on the list is to fit the deck I thought it sensible to sort the running gear and fit the motor, while access was easy. But what motor to fit? Well, the instructions are rather coy about this and since I'm generally a lazy so-and-so I decided to find a similar model and copy the set-up. Low and behold, along came Dave Milbourn's Huntress 23 of exactly the same length and style. Watch the video of it in action on the Model Boats Facebook page (9th November 2017) and you have to agree, it's pretty much perfect. Nothing more to do then but find out what Dave used and 'Add to Cart'. 48 hours later our friendly postie presented me with a package containing one Turnigy 750KV brushless outrunner and a matching 30A marine speed controller. All I have to do now is pop them in the hull, toss in a 3S 3000mAh LiPo, sprinkle with a few screws and shake vigorously until done. There can't be much more to it than that, surely? See you next time.

BELOW: I can't take credit for selecting this running gear. Truth is, I stole the whole set-up from Mr Milbourn.

BELOW: Next step: fit the motor and rudder, add a further lick of varnish inside, then on goes the deck.

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SS Beaverford

Every ship has a story to tell but in this case it's tinged with more than a little injustice. Roy Cheers concludes his account of a build driven by a desire to put this forgotten cargo liner and its crew back on the map

Anyone who has read about the Battle of the Atlantic in W.W.II will be familiar with the story of HMS Jervis Bay. She was a passenger liner fitted out with seven 6 inch guns and designated an Armed Merchant Cruiser. Outgunned and outclassed, she fought valiantly against the German pocket battleship Admiral Scheer on a November night in 1940 in defence of convoy HX84. Alas, within twenty-two minutes Jervis Bay was out of the fight, lying smashed and burning, most of her crew dead. The defence of the convoy was then taken up by the Beaverford. She was armed with only a 3" gun forward and a 4" aft. The Beaverford manoeuvred to hold the Admiral Scheer at bay for some five hours, allowing thirty-three ships to escape. Inevitably, she paid the ultimate price for her defiance being hit by 11" and 5.9" shells and finally torpedoes from the German warship. She sank leaving no survivors.

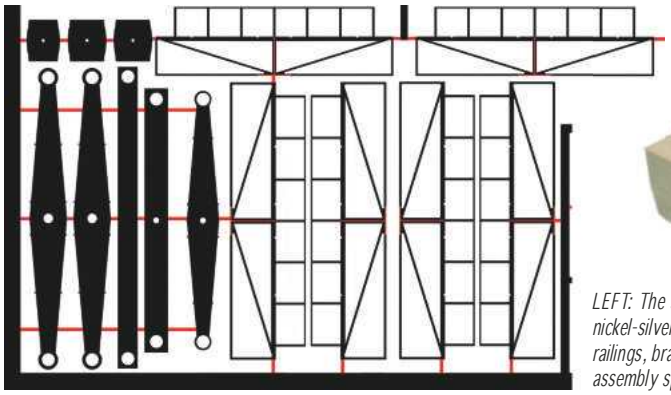
The story, and the injustice of her captain and crew's heroic 'fight to the last' having been unrecognised and largely forgotten, played a huge part in my decision to build a 43" (1:144-scale) model of this late '20s cargo liner. So, having detailed the build of the hull and superstructure (March issue) we're now going to continue with the decks, fittings and propulsion system.

Kingpost assemblies

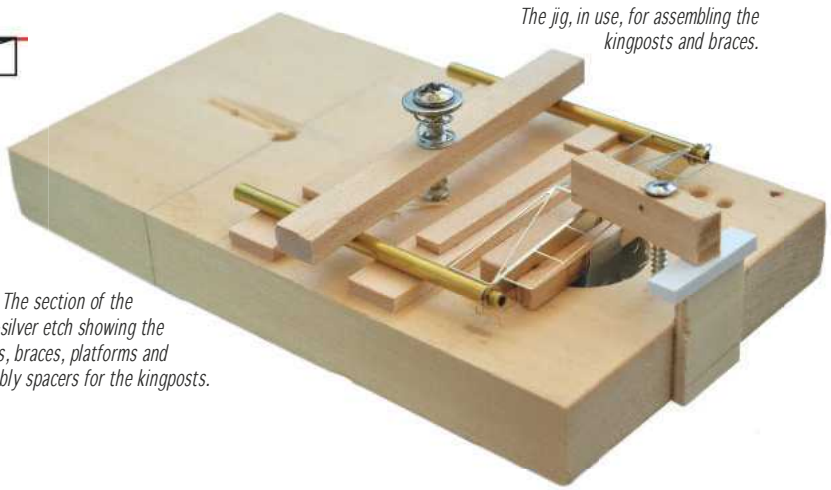
The kingposts on the boat deck, and the aftermost ones on the main deck, were simply made from 1/8" diameter brass tube. The kingposts on the main decks, however, are the most unusual feature of these vessels. They were made from 5/32" brass tube, with derricks from 1/16". Four pairs of kingposts on the main deck were joined at the top by a platform (with railings) and braces. I concluded that my best chance of making these identically and to the right shape and dimensions was to use photo-etched 0.010" thick nickel-silver frets to form the platforms and braces. Many dimensions were taken from the plans, but the cross-brace dimensions had to be estimated based on photos. The artwork was developed using Photoshop and the actual etching was done by the folk at www.modelshop.co.uk. Part of it is shown in the photo hereabouts. Since it didn't add a lot to the cost to include other parts, I also added casing tops, railings, pulley blocks, winch bases and gears to the etched fret design.

To ensure accuracy and consistency a kingpost assembly jig (see below) was made from a mix of scrap wood and sized basswood, indeed it constitutes the most complex jig I've ever made. Basically it holds one brass tube kingpost at right angles to the top platform which spans the two tubes. The opposite brass tube is fixed parallel to the first, both tubes held firmly by a spring-loaded wooden strip. The platform, meanwhile, is held by a spring clamp fitted from below. As you can see, the etching for the cross-braces and railings is held by another spring-loaded strip. With all the items located the accessible parts were soldered together before the assembly was flipped over to attach the railing / brace etching on the other side. For this a piece of wet paper towel was placed under, and in contact with, the pre-soldered assembly. Finally the small centre plate joining the bottom of the two braces was fixed with CA glue.

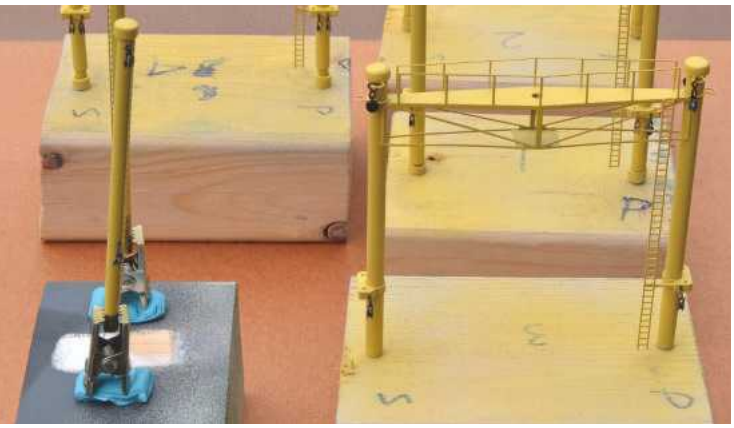
Now, the first few kingpost assemblies were soldered as described however I was

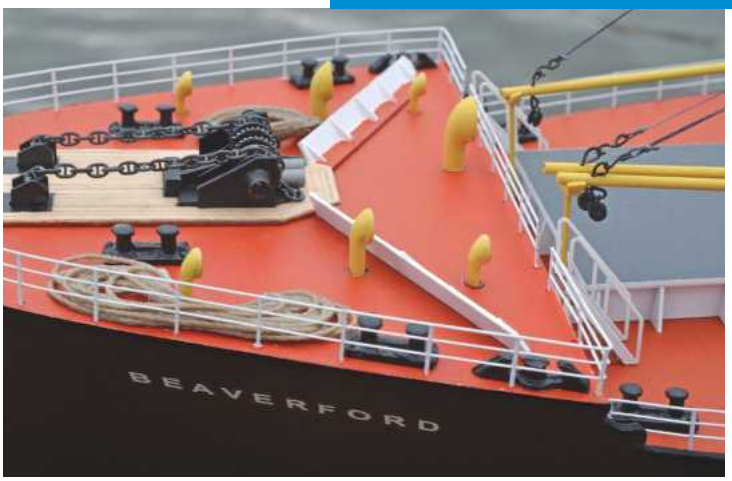


LEFT: The section of the nickel-silver etch showing the railings, braces, platforms and assembly spacers for the kingposts.



The jig, in use, for assembling the kingposts and braces.





ABOVE LEFT: The kingposts during the painting and fitting of pulley blocks.

RIGHT: Most of the model's vents on the forward deck face aft and those on the aft deck face forward. My story is that the crew were told that bad weather was coming so they needed to rotate all the vents to face aft, but were only part way through the task.

not entirely happy with the quality of my soldering and since I had two spare sets of etches, I tried assembling them using CA glue. These turned out to be much easier to do and neater than the soldered ones to the point that I wish I'd done them all this way. In truth, don't think they'll be as strong as the soldered ones, however since these pieces are more 'ornamental' than structural, strength is not the objective, they simply need to hold together.

The vent cap at the top is formed from a ring of styrene tube with the hole in the centre plugged with filler. A length of 1/8" tube was also glued into the bottom of each post for locating into the deck. You'll note that two of the assemblies have a topmast extending from the centre of the top platform, a vulnerable detail that was made removable for transport. Here, then, a short length of 3/32" tube was glued in to the platform / brace assembly to hold each mast. At the bottom of said mast is a piece of 1/16" tube, whilst the top is a darning needle glued into the tube. The supporting rigging is looped through the eye of the needle, avoiding chunky knots. The appearance is somewhat spoilt by the large cap (a glass bead) on the tip of the needle, considered a necessary safety precaution. Incidentally, the darning needles were taken from the sewing 'housewife' which my father received during his wartime RAF service. I like to think he'd be happy to see them given a second life, especially as I could see no other use for them in the future.

Main decks

Styrene of 0.060" (1.5mm) thickness is used for the decks, the fore and aft deck being locked down by several L-shape styrene brackets glued to the underside, interlocking with cross pieces on the frames. The fore deck was lowered onto the hull 3/8" aft of its position, then slid forward to lock it in place. The arrangement of the aft deck is similar and when the superstructure is dropped into place, it prevents any movement of either the fore or aft deck.

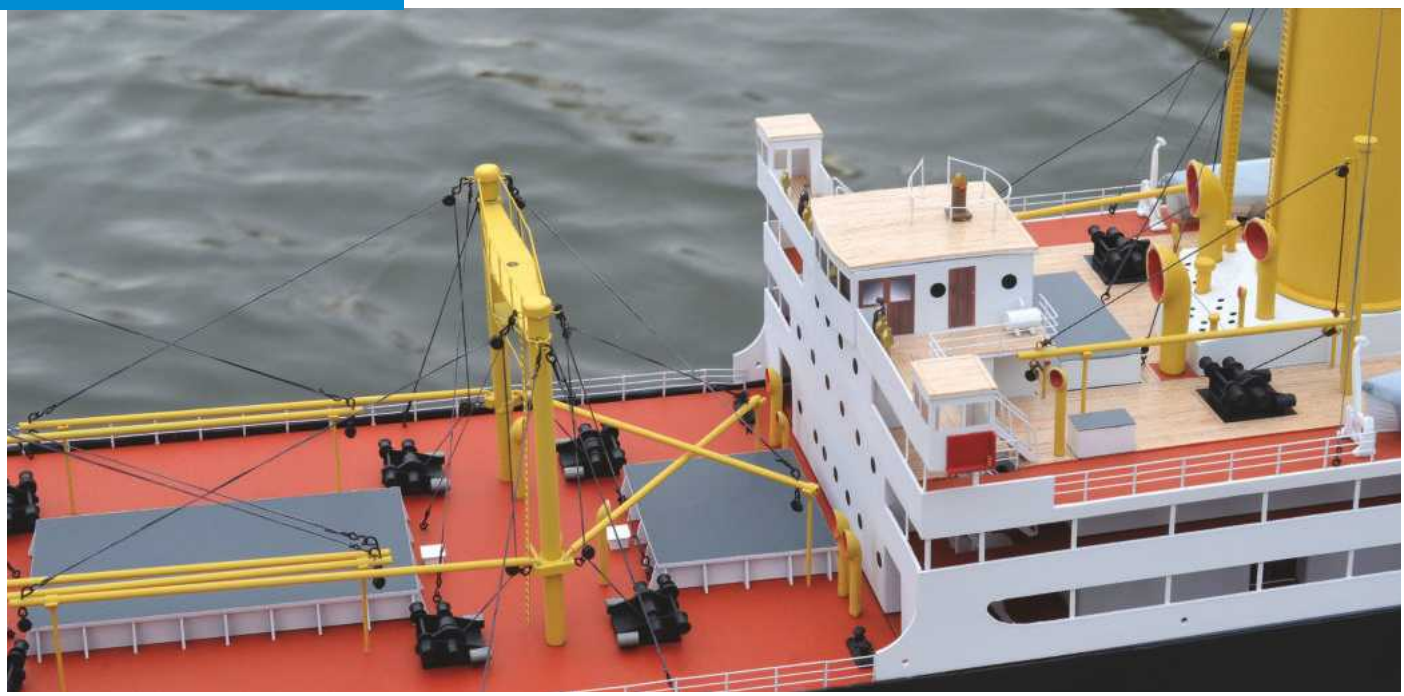
Fine detail

It can be argued that it is unwise to fit fine details, such as etched railings, on a sailing model as they can so easily be damaged. I guess that's understandable however since they add so much realism I think it worth the risk. What's more, I've found from previous models that they're more likely to be damaged during construction, than when sailing or on display.

With this in mind, the deck railings were CA-glued into notches filed along the deck edge so that, once glued, the stanchion would be inset. This, I hoped, would protect the railings from damage when putting the deck back into place. Railings atop the fo'c'sle, the aft deckhouse and the sides of the boat deck were glued into drilled holes. Although the railings were produced as straight strips, I'm pleased to say that it was possible to 'joggle' them to follow the rise of the fore deck. The trickiest railing to fit mind, was the single bar railing that wraps around the binnacle atop the wheelhouse, particularly drilling the holes for the stanchions. The fixture used for this purpose is pictured (right). A hole matching the diameter of the railing circle was cut in a piece of 0.030" styrene, and the taper towards the deck edge (where the access ladder is located) cut out. This piece was glued onto another scrap piece of styrene. Having roughly shaped the railing, it was then placed upside-down with the top rail inside the circle, and taped to hold it in place. (This represents the final shape of the railing). The position of the stanchions was marked around the edge of the circle. The railing was removed and 0.020" holes drilled inside the circle adjacent to the marks. This simple fixture then became the template for drilling the wheelhouse top for the stanchion locations.

The base of the winches and the derrick pulley blocks were etched parts. The winch drums were loco safety valve castings from the NBrass Locos range and the other parts were brass wire and styrene. Assembly of the winch drums required another jig (pictured), this made from scrap wood, styrene and Blu Tack. Ideally the brass wire representing the axles would have been extended and fitted into a hole in the drum. However, the drums

RIGHT: Making the drilling template for the railing on the wheelhouse top.



ABOVE: Note the single bar railing that wraps around the binnacle atop the wheelhouse (see text).

LEFT: The brass, styrene and nickel-silver parts that make a cargo winch. Each grid square is 10mm.

(i.e. safety valve castings) had to be cut flush from the sprue and filed flat. They are too small for me to attempt to drill a central hole, so they are attached only by glue and here, once again, CA proved ideal.

Smoke stack

The funnel was cut from an empty pound shop fragrance spray, a wrap-around paper template being marked with punched holes to locate and position anchor points for stays, ladders, and steam pipes, which were CA-glued.

Many of the remaining fittings were purchased from Model Dockyard. These include lifeboats by Quaycraft, anchors by Aeronaut, some bollards by RB Models, black vinyl dots for the portholes by BECC, and ladders by Scalelink. The stairs were by Gold Medal Models, with lifeboat davits, telegraphs, binnacles, wheels and many cowl vents, of which there are a total of 33, by Bluejacket Shipcrafters. On that latter point do note that the vessel was built in the days before forced draft ventilation and air-conditioning. The very small cowl vents, 2mm diameter and less, were made by rounding the ends of toothpicks or bamboo knitting needles, then cutting off the hemispherical end. A piece of brass wire or styrene was glued onto the back to form the vertical pipe.

Modeller's licence

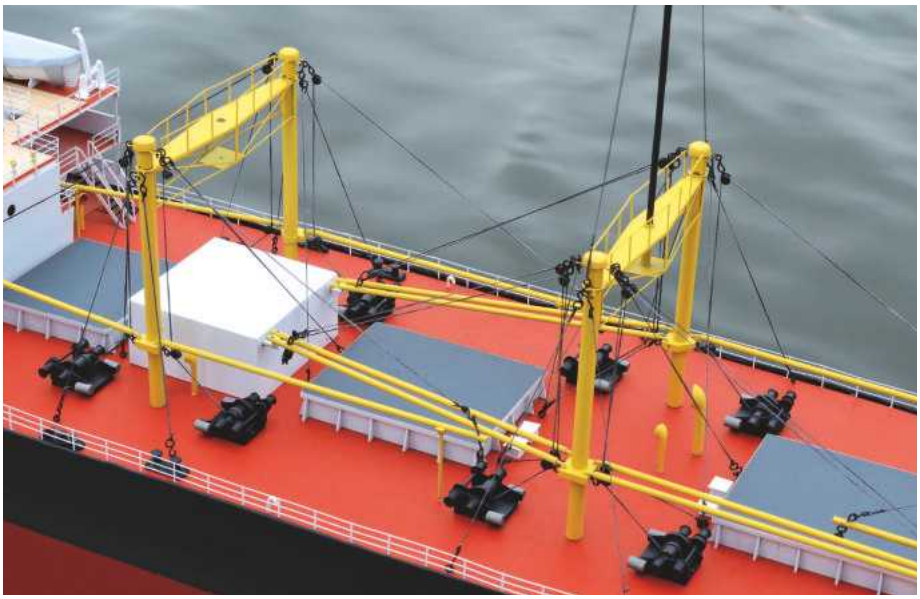
I was not up to the challenge of making and rigging all the single and multiple sheave pulley blocks that the ship would have had fitted. Instead, modeller's licence was invoked and the model has a representation of those fittings. The pulley blocks were made using parts from the etched sheet. Three are required for each derrick, making a total of 81. It sounds a laborious job but after the first few were made and a process developed, it went quite quickly and smoothly.

Most of the rigging uses elastic thread, which makes it easy to keep taut. The hooks for the rigging and kingpost stays were made by winding a length of copper magnet wire around a 1mm drill. A piece two turns long was cut off and folded flat, one turn being made into a closed loop to which the rigging line was tied, and the other an open loop forming the hook. The jig for winch drum assembly then doubled as a line-tying tool. The eyebolts in the deck, meanwhile, were formed from a length of the same magnet wire, folded in the middle and the ends twisted together.

Propulsion & Electrics

Beaverford was a twin-screw, twin-turbine vessel but in the model world it's possible to drive the two screws from one motor. I wanted to retain the prototypical practice of having

BELOW: Port side bridge and captain's accommodation. Of other interest: the four grey-topped boxes on the boat deck were coaling hatches. If I were a fan of weathering I'd have to ingrain the wood with black coal dust.



ABOVE: The hatch, derricks and winches for hold No.5.

RIGHT: The drive system, looking forwards. The white pieces visible either side of the motor are the latches for holding the deck in place.

the screws contra-rotating, so the motor drives the port shaft via spur gears and the starboard shaft via a toothed belt and pulleys. The initial installation used a 1:1 speed ratio using a Johnson 500-size motor but I was not happy with it and changed to a 2:1 speed reduction and a Mabuchi 555 motor. Due to the limited size of final drive gear that could be accommodated, and because the motor had to be near the centreline to fit, the gear train employs four gears.

The side walls of the gearbox were made from two sheets of 1.6mm styrene with suitable styrene spacers. These were marked out with an extra 15mm length at each end and the two pieces tack glued together. This assembly was clamped onto my compound table which was in turn clamped onto my drill press. The locating holes for the bearings were drilled using a step drill, which is by far the best for drilling holes in styrene. With this, the glued end pieces were cut off and the two side walls separated. At this point the walls could be trimmed to shape, removing some of the corners so that the gearbox would fit into the hull. Next, the bearings were fitted and spacers glued to one side wall. To set up for final gluing of the spacers, a piece of rod was passed through a mating bearing in each wall, and then held in the chuck of the drill press. This ensured that the two side walls were aligned and square. A second rod was passed through another pair of bearings and a small engineer's square used to ensure this was also aligned.

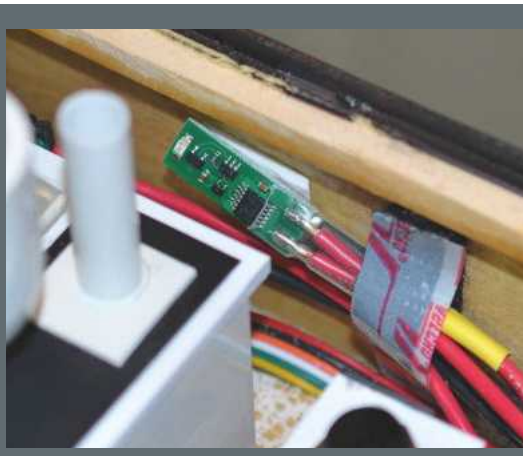
As you'll see from the photo, the gearbox is mounted on the port shaft whilst the end of the gearbox nearest the starboard shaft is supported from the hull to set the correct tension on the drive belt and counter the torque reaction. The motor is mounted between and above the shafts and attached to the gearbox through a double universal coupling. Plastic (ertacetal) gears have been used, obtained from RB Models, whist the drive belts and pulleys are 6mm wide GT2 style, obtained either via eBay or from Stock Drive Products. Shafts are supported in ball bearings purchased from eBay. Product data sheets for ertacetal state that it has "excellent sliding and wear resistance" so I'm hoping that it will not be necessary to replace worn gears during the model's lifetime. Metal gears would have better wear resistance, but they are noisy and, of course, more expensive.

Peacetime

The model is painted in colours that represent her peacetime operation. Some sources stated that the funnel and cargo-handling gear were buff, and some said yellow, so it was probably something in-between. 'Buff' can be one of numerous shades, so a mix of Humbrol 148 Radome Tan and 24 Trainer Yellow was applied, although it has turned out yellow. It was suggested to me that the decks would have been painted with red lead, so Humbrol 100 Red Brown was used for these. There was a mere hint on black and white pictures that there was a boot-topping stripe of a colour different from the underwater hull. Without good information it was kept simple and below the waterline done with Painters Touch Colonial Red.

Operating draft

Given that this vessel is essentially a rectangular box with pointed ends added on, it was easy to get a good, early, fairly accurate estimate of the displacement. The parallel mid-body is 26 inches long and 5 inches wide. The pointed ends are each 7" long, tapering from 5 inches to almost zero. From this I was quickly able to calculate the area on the waterline as close to 165sq. ins. Knowing that the loaded draft is 2.25", and the density of fresh water is 62.5 lbs/cu. ft. we can calculate that the loaded displacement would be close to 13.5 lbs. Actual weight, with the smoke unit water tank full, is 11.7 lbs. Unlike tugs, ferries, cruise ships, etc, which have a narrow range of operating draft, freighters can be anywhere between light ship and fully laden. The Beaverford operates somewhere in the middle and really does look the part with a good plume of smoke rising from her funnel. All-in-all this has been a most enjoyable and worthwhile project and one, I hope, that introduces the Beaverford story to all who see the model.



Swipe for ON

Given the delicacy of the superstructure I decided to trial a new item on Beaverford which means that there are two main power switches, in series. The first is a simple lever switch and is operated when the superstructure is removed, usually at home or sometimes in the safety of the car. The second switch is magnetically-operated, non-contact, and is activated at the pond-side. This latter switch is positioned against the inside of the hull next to the load line marking. To turn the power on, or off, I swipe a magnet beside the hull in that area. It's a very neat system obtainable from Kevin McLeod who can be contacted at kevinmc.electronics@gmail.com.

BELOW: It was suggested to me that the decks would have been painted with red lead, so Humbrol 100 Red Brown was used for these.

OSA 2 Fast Missile Boat

An exposed upper bridge is guaranteed to catch the eye and is, therefore, a prime candidate for fine detailing. **Dave Wooley** shows how...

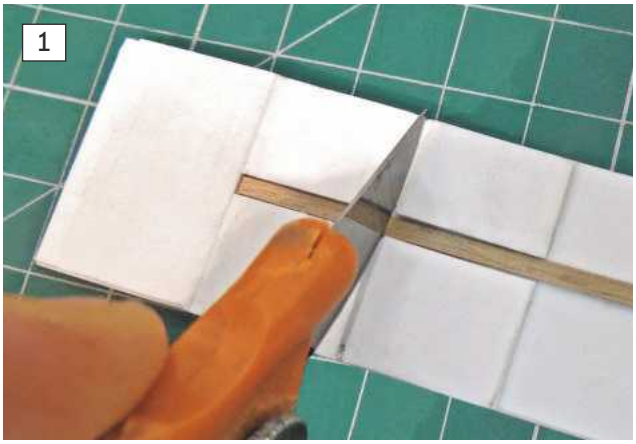
The upper control position of the full-size boat.

The upper exposed bridges on many warships and FAC boats have timber walkways laid which usually take the form of slatted planks. The OSA boats are no different. Here there are three separate timbered areas, the first two directly behind the bridge, the third sited over to port and laid parallel with the bridge surround. The slatted area immediately in front of the door which gives access into the wheelhouse below is a step lower. All the timber planks in this area are the same width but are adjusted in length.

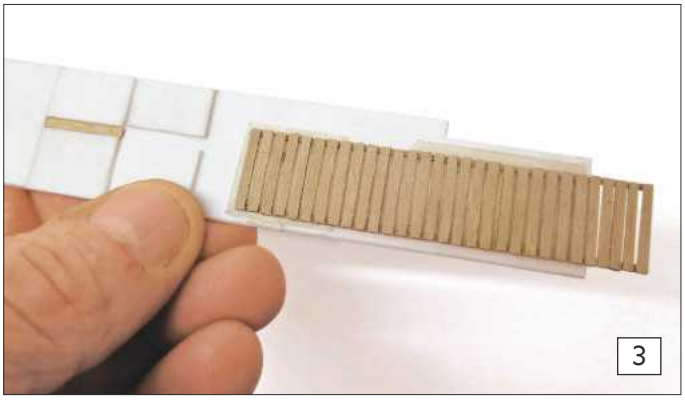
Upper bridge planking

The choice of material for the planking was 0.50mm x 2.5mm marine ply with a number of strips being prepared. The first task was to cut each strip to length bearing in mind that there are two levels. This was followed by

1. A simple jig for cutting the slatted planking fitted within the upper bridge.

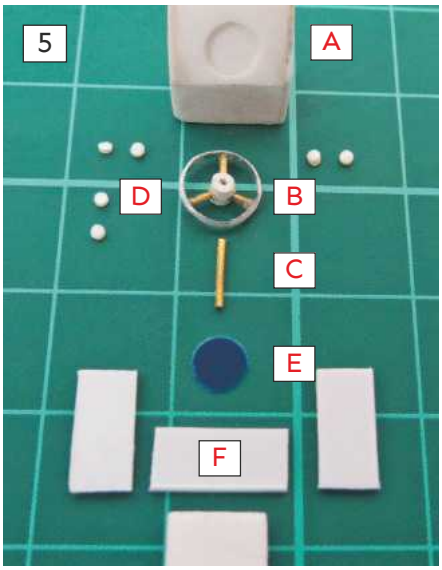


2. Here the two levels of slated planks can be seen placed in position.

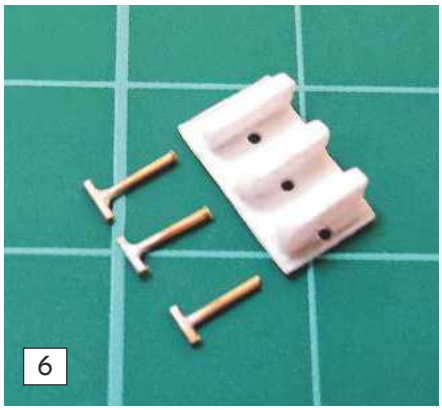


3. A section of slatted walkway formed on the jig.

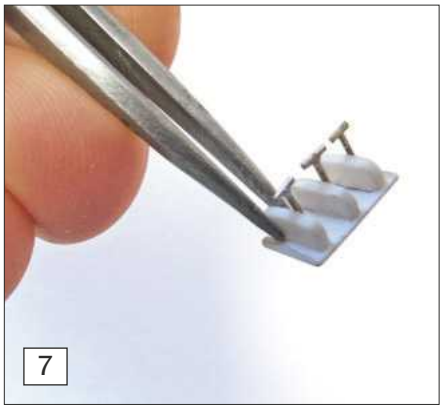
4. The slatted walkway temporarily in place.



5. Various parts that make up the steering consul (see text).



6. One of the fittings with in the upper bridge is the throttle controls seen here ready to be assembled.



7. The assembled three lever throttle control using 04mm brass wire.

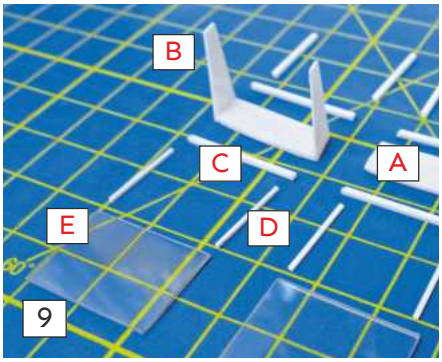
8. How the upper bridge is arranged prior to the installation of the control fittings.

cutting five strips to support the athwartship timber slats onto which each length is fixed. As the width of these support planks also corresponds to the width of the slatted planks along the side of the bridge surround a jig was made to ensure consistency **(Photo 1).** With the two slatted walkways completed both were placed in position as in **Photo 2.** The next stage was forming the walkway along the inside of the bridge surround. For this the jig worked well and, like the previous timber slated items, required two strips of ply running the length of the walkway onto which each plank is fixed **Photo 3.** When complete the results are quite satisfying yet at this juncture of the build none of the slatted walkways are fixed into position. This is to allow for both the air brushing of the surrounding structures and the application of a darker stain to the ply slats to mirror the finish of the full-size ship **(Photo 4).**

Upper bridge helm

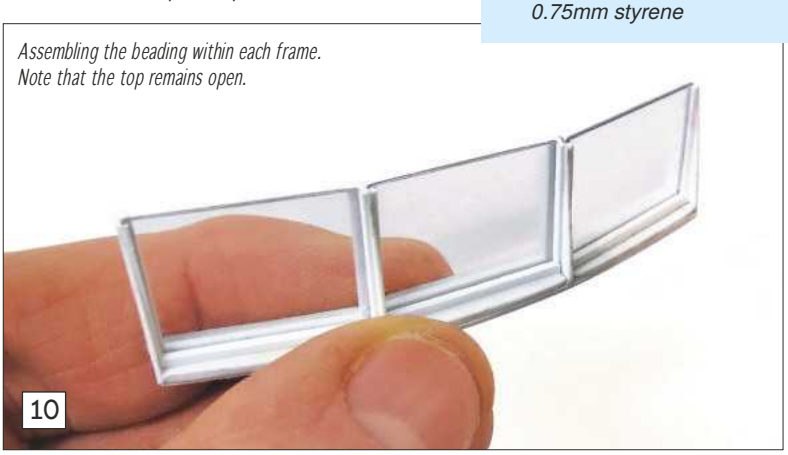
As mentioned last month the steering position is slightly over to port and consists of an angled box-like fitting onto which is fitted the steering wheel (or helm) and above that a bearing indicator (the circular disc) with various indicator lights and switches around it. We'll commence with that steering position, which is a box shape having a sloping front. The construction is straightforward however I've broken down the various parts for ease of reference (see adjacent panel and **Photo 5**).

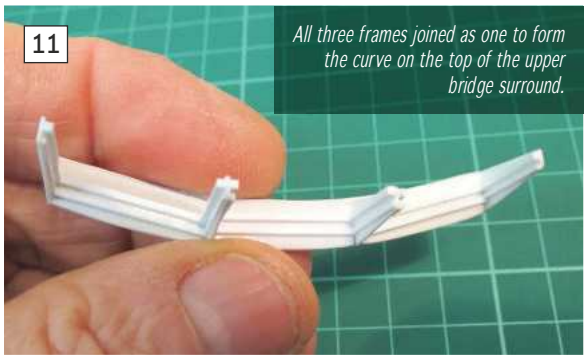
A	Bearing indicator / wheel housing *0.75mm styrene*
B	Steering wheel *7mm dia. aluminium tube, 0.5mm brass wire, 2mm OD styrene rod*
C	Steering wheel connecting shaft. *0.60mm brass tube*
D	Indicator lights *0.50mm styrene rod. Evergreen 120*
E	Cover for bearing indicator *0.25 thick acetate sheet, 3mm dia.*
F	Lower supports *0.75mm styrene*



9. One of the three segments with associated parts that make up the upper bridge windscreen.

Assembling the beading within each frame. Note that the top remains open.





Throttles and fittings

As mentioned the OSA boats have three engines and, accordingly, three throttles. The throttles are housed to the right of the steering wheel and were replicated using 0.50mm brass wire, soldered into a T section and fitted into a semi rounded mounting as in **Photo 6 & 7.**

Added to the upper bridge control position are a number of electrical and switch boxes. These are made so as they can be fitted via a pin into their respective location but at this stage are not fixed. Over to starboard is also a slightly slopping box covering the engine management controls. Additional fittings have also been added, not least a seat. It's unclear if this is the skipper's chair or if it's for a member of the ship's crew monitoring the engines. Anyway, whichever it may be the seat is formed from tube and fixed to the side of the bridge. Forming the shape was straightforward and, as can be seen in the panel below, it's made from 0.8mm extruded brass wire which is soft and bends very easily. The internal part of the seat was formed from 2mm thick styrene sheet cut and rounded to form the cushion. Again, for ease of reference the various items and their composition are noted in the panel above and on **Photo 8**.

A	Hand grip *0.6 nickel silver wire*
B	Internal supports *0.8 brass rod*
C	Internal shelf *0.25 litho plate*
D	Electrical box *Litho and styrene box section, 6.3mm square, Evergreen 199*
E	Seating surround *0.8mm extruded brass wire*
F	Tannoy *5mm aluminium tube; end formed into a bell shape then cut to size.*

12. Each acetate sheet is slotted into each frame, no adhesive required.

Windscreens

Immediately forward of the upper bridge control is the windscreen. The curved frame comprises three segments constructed from styrene and Evergreen strip. Here, each acetate screen is slotted between each frame, open at the top, and held in place by two sets of beading, thus all that's required is to slide in the screen; no adhesive needed. Using one of the screens as a guide, along with the panel below, **Photo 9** illustrates how the frame is composed. Also note that due

to the curve of the windscreen both the left- and right-hand frames are angled, whilst the centre frame is square.

A	Base *1.5mm styrene*
B	Angled Sides *0.50mm styrene*
C	Bottom beading *1.09 x 1.09mm, Evergreen 8404*
D	Side beading strips *1mm x 1mm, Evergreen 142*
E	Acetate sheet *1 x 15 x 22mm*

With each frame prepared they can be joined to the centre base and the remainder of the styrene beads fitted to the sides and bottom of the centre frame as in **Photo 10.** Please note that the front edge is more curved than the back edge. At this point all that remained was for the acetate windows to be slotted into place and as these are not fixed they can be easily removed allowing for the air brushing of the completed frameworks **(Photo 11).** Finally, the combined framework with acetate screens could be offered into place atop the upper bridge **(Photo 12).** All that has been discussed and detailed thus far can be temporarily fitted into place **(Photo 13)** to ensure there are no obstructions or future difficulties especially when all of these parts are air brushed.

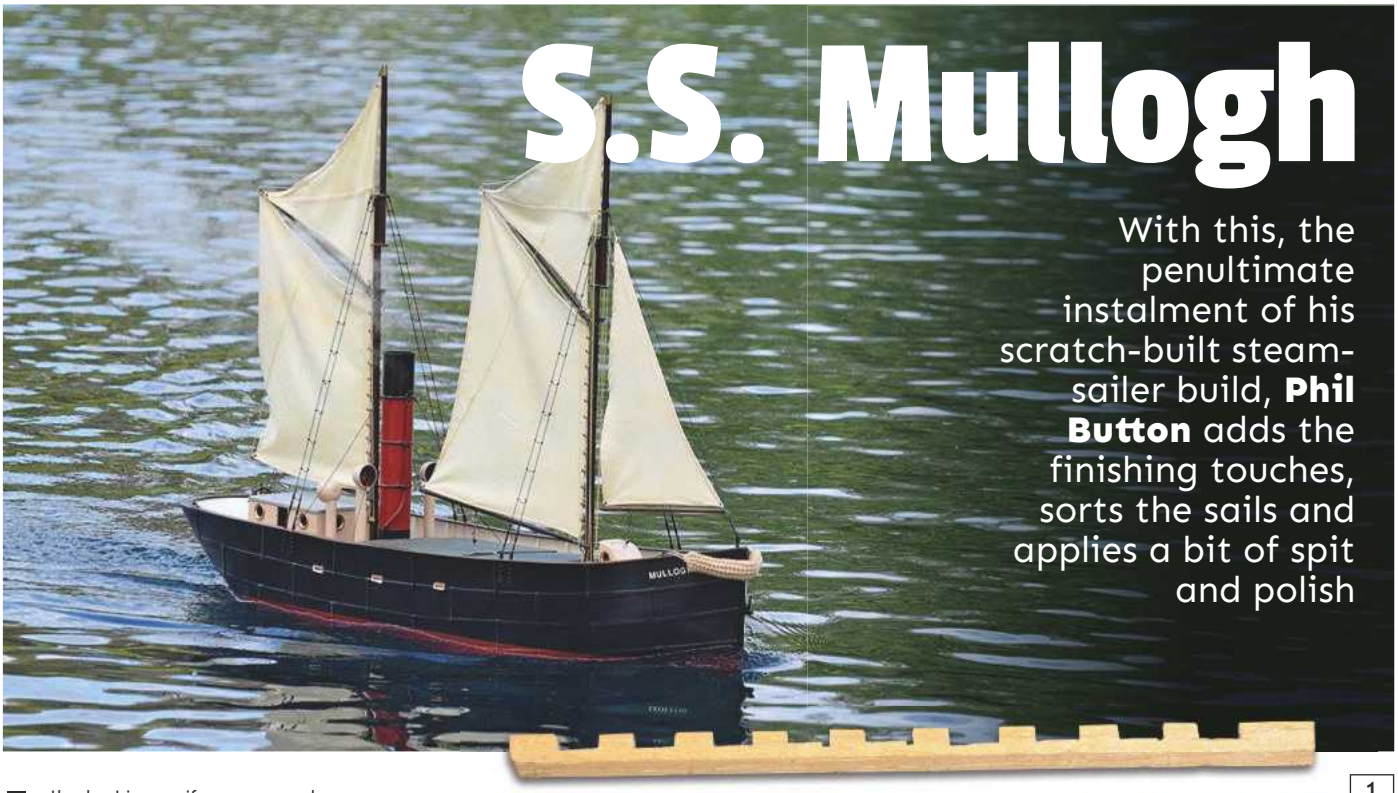
Right, that's all for now. If you need me I'll be in the workshop fixing the handrails along the top of the deck housing, which I'll be back next month to explain.

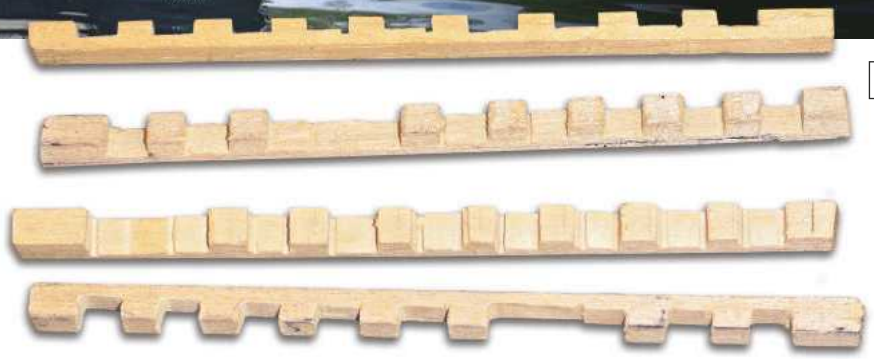
All the fittings for the upper bridge (that have thus far been discussed) temporarily added.

References & acknowledgements
Naval Fast Strike Craft by Roy McLeavy – page 26
Fast Attack Craft by John Marriot – pages 96 & 97
Guide to the Soviet Navy, Fourth Edition, by Norman Polmar – pages 243 & 244
Albion Alloys for their help and assistance

S.S. Mullogh

With this, the penultimate instalment of his scratch-built steam-sailer build, **Phil Button** adds the finishing touches, sorts the sails and applies a bit of spit and polish





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In the last issue, if you remember, we finished by fabricating a few cowl ventilators using Kinder egg cases and copper plumbing pipe, a task that leaves just one deck fitting left to describe – the grating (above the rudder servo on the after deck) that carries the ship's wheel. I suppose that I could have bought a piece of grating, however I wanted to try and build my own, not least because I had some scrap 3mm square Obechi which I thought might be ideal for the job.

To begin, the wood was marked out at 3mm intervals, then cut and filed halfway through in alternate marked sections so as to form half-lap joints. **Photo 1** gives the idea, although do note that these are the damaged rejects, not the finished items. Suffice to say the 'best' pieces were built up into a grid as in **Photo 2,** glued at the joints and pressed between two pieces of plywood, with non-stick plastic bag material sandwiched between, whilst the adhesive set.

With the grating trimmed to shape, a thin strip of 1mm plywood was added around the outside to act as a frame and a pair of rails added beneath to hold it firmly in place above the rudder servo compartment. A little cheating followed in that the ship's wheel was purchased from Cornwall Model Boats as, to be honest, I couldn't face making one. It is a strange thing with our hobby that we will often tackle the most complicated components with gusto, but when it comes to steering wheels and propellers the enthusiasm rapidly vanishes! **Photo 3** shows the wheel standard, steering chain and chain drum, all built using bits from the scrap bin. The steering position was completed with a coat of wood stain and satin varnish. By the way, the wheel doesn't actually do anything, other than hide the rudder servo beneath it, it's purely for show.

Impatience strikes again!

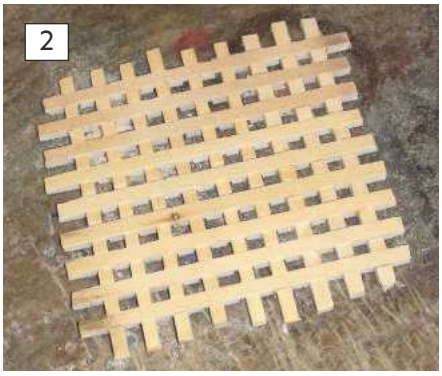
Yet again, the urge to see my handiwork on the water overcame my immediate desire to continue with the project. As the steam plant had been fully installed, I decided to give it a bench test to make sure that everything worked as it should. During such a test, I would normally have to set the safety valve and make numerous adjustments to the engine, but the steam plant had been removed from a fully working ship so I only really needed to set up control linkages and generally check everything was okay. With another box of lead weights in hand a return to the domestic test tank followed to carry out ballasting once again. This, of course, had already been carried out for the temporary electric motive installation, a process that would now need repeating for the much heavier steam plant.

For the sailing trial this time, S.S. Mullogh and I visited the Woodbridge MBC lake in Suffolk on an absolutely flat calm, and not too cold, day in January 2014. The plan for the event was simple, a voyage under steam power **(Photo 4 & 5).** After filling the boiler with water and the engine lubricator with steam oil, the gas was turned on and the burner lit from the top of the funnel. Whilst waiting for steam pressure, the engine was oiled and all radio control functions checked for correct operation. Once steam pressure was available, the regulator was opened fully and the engine turned over by hand to expel condensed steam to the oil interceptor. The regulator was then closed to wait for the safety valve to lift as a check that it was working, remembering that they do sometimes stick. Then, on to the water for her first run in steam, albeit minus hatch covers and masts as this was only a checking session.

I'm pleased to report that S.S. Mullogh steamed around the lake in grand style and proved to have a turning circle at full regulator of around 10 feet, not too bad for this 20kg tub! The only function to prove unreliable was when changing from ahead running to astern or vice versa, but this had never worked reliably on MSC Archer either. Mind you, it could probably be cured with careful attention to the setting of the engine valve gear.

Sailing rig

The masts and their standing rigging were dealt with in an earlier article and the sail winch servo was described last month (March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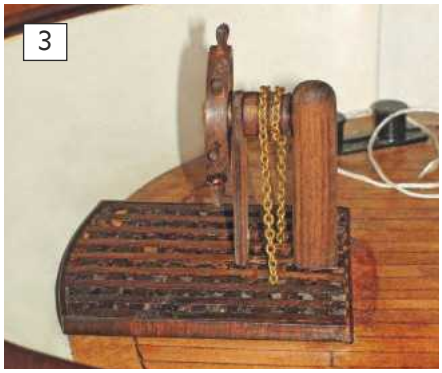
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2018), so we are now left with the remaining spars (poles to carry the sails), running rigging and, of course, the sails themselves.

The spars comprise the main boom (the horizontal pole running aft from the mast) and the gaff (the pole at the top of the mainsail that runs upwards at an angle from the mast) and there is one set of these for each mast. All the spars were made of dowel, having hardwood fork ends to fit around the mast. These were then stained and varnished to match the deck planking and provided with brass ring eyes and / or pulley blocks to carry the running rigging. The two gaffs had to have angled fork ends, which were quite a challenge to get right. **Photo 6** shows the ends of a boom and a gaff during their build. These end fittings were secured using home-made copper rivets, visible in the photo.


6

The running rigging on this model comprises the lines used to raise and lower the mainsail, topsail, gaff and jib (called halyards) on the foremast, together with the line to control the mainsail (called the mainsheet) and the line to control the jib (called the jib sheet). There is also a second set of halyards on the mainmast for its mainsail, topsail and gaff, and a mainsheet. In addition to this little collection, there is a topsail sheet and a topsail downhaul on each mast, although these are not normally adjusted during sailing.

With this model, the halyards are manually operated and have to be tied-off to cleats on each mast just above the deck, once the sails are raised, so that the mast can be removed if necessary for transport. **Photo 7** shows one of these cleats, this having been machined and filed from aluminium before being glued to the mast. The number of 'points' on it gives an indication of how many rigging lines can be tied off at it.

The two main sheets and the jib sheet are worked by the sail winch and also need to be easily disconnected from the booms to allow the mast to be removed if necessary. This was achieved by using clip on swivels (as employed by fishermen) to connect the sheets to ring eyes on the booms **(Photo 8).** The eagle-eyed among you will have realised that his last picture is actually from a different boat, but the principle is the same. Take a look at the panel herein to see how the halyards function.

Halyard functions

Jib halyard. This raises and lowers the forward sail or jib and runs from a cleat on the mast, up the forward side of the mast, over a pulley at the masthead block and is fixed to the top of the jib.

Throat halyard. Raises and lowers the forward end of the gaff and runs from a cleat on the mast, up the after side of the mast, over a pulley at the masthead block and is tied to a ring eye at the gaff jaws.

Peak halyard. Raises and lowers the after end of the gaff and runs from a cleat on the mast, up the after side of the mast, over a pulley at the masthead block and is tied to the ring eye of a pulley block. The pulley block in turn runs freely on a cord bridle that is attached to points at each end of the gaff.

Topsail halyard. Raises and lowers the topsail (the triangular sail at the top of the mast), and runs from a cleat on the mast, up the after side of the mast, over a pulley at the masthead block and is tied to the top end of the topsail. The topsail is tensioned by the topsail downhaul (which runs from the bottom end of the sail to a cleat on the mast) and the topsail sheet (which runs from a cleat on the mast to a pulley block close to the gaff jaws and is attached to the sail corner furthest from the mast).

Given the way that I planned to use the model, the sails are normally left in their raised position, but it is possible to untie the halyards and lower the sails if required, which is a good way to get into a real tangle. Another indication of the complexity of the rigging is noted by the pulley arrangement at one of the mast heads which comprises no less than four pulleys.


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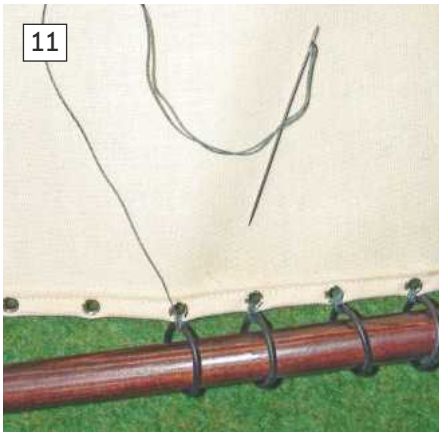
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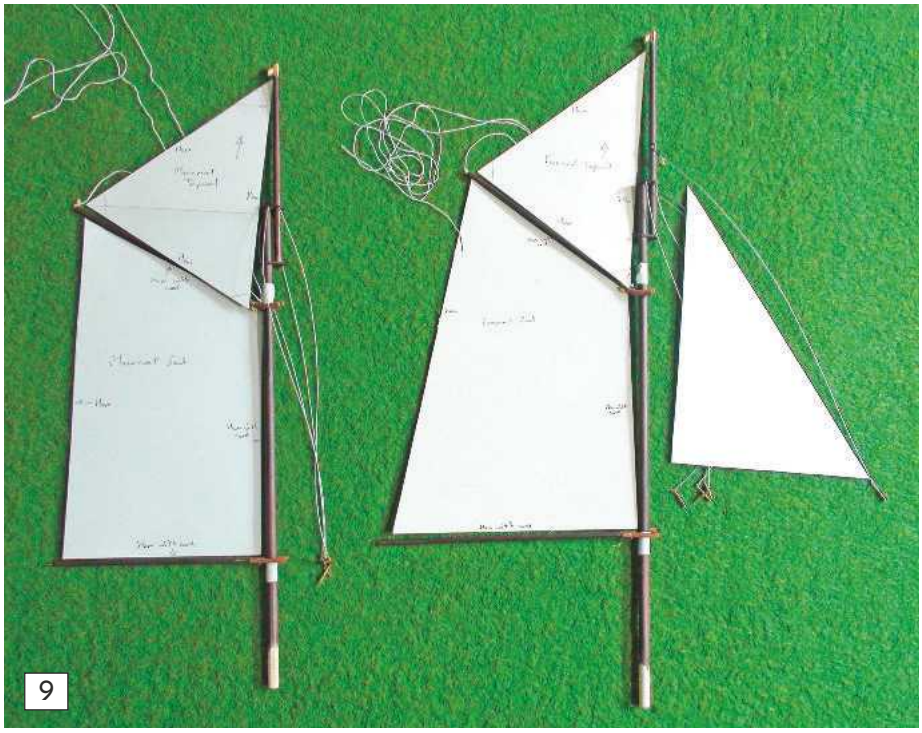
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With the masts and spars completed, the next job involved making the sails. To start this off, the masts and spars were laid out on the floor in their correct arrangement and pieces of thin card cut to create templates for the five sails as in **Photo 9**. Please note that to add to the complication, no two sails are the same for this particular rig. The card templates were then used to mark the shape of the sails on to some cotton material that was in stock (actually part of the 'inner' of an old and long-gone frame tent), making due allowance for the seams. It had been planned to use 2mm brass eyelets for the cords that lash the sails to the spars, so a seam of 6mm all round was allowed to enable the material to be turned under itself. Since I'm not very good with a sewing machine (other than maintaining or repairing it, that is!) my other half Janette, did the honours for me.

To fasten the mainsails to their respective masts it was intended to use metal rings, which had already been fitted, and to sew the sails to the rings through eyelets in the sail. So, the first job was to punch holes in the sails (with a leather punch) at the correct spacing and install the eyelets using an eyelet punch **(Photo 10).** The steel block under the eyelet was used to give something for the eyelet tool to push against as domestic carpet is not too good for this. Finally, the sails were sewn to the rings on the mast **(Photo 11)**; something I managed myself! After much cursing, as the fingers are rather too big for fiddling with rigging, both masts were finally sorted with all their standing rigging, running rigging and sails, and ready to fit to the hull.

To all intents and purposes the model was now finished and ready for her maiden voyage proper. Join me next month for a morning of sailing and steaming.


Next month we head back to Sheringham in Norfolk for a morning of steaming and sailing.

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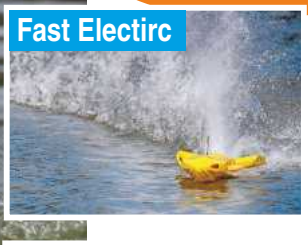

Next month in model Boats

Thank goodness, with an 84 page issue to play with we've got half a chance of fitting it all in. So, Neville Wade finally makes it into print with a 'how-to' on square rig sail control, we're throwing in an additional FREE plan for Ray Wood's Freeman 22 – a delightfully evocative late '50s cabin cruiser – we've a 1:72-scale model of the W.W.I battlecruiser HMS Invincible to show you, John Tushingham is back to round up his Dragon's Tale and there's also an adrenalin-fuelled intro to fast electric racing. But that's really only scratching the surface. Look forward to more submarine, sail and steam content, retro chat, letters, and a visit from Glynn Guest, who's popping by to discuss the thinking behind shallow draught boats as a prelude to his next free plan. Damn it, we may need more pages after all.

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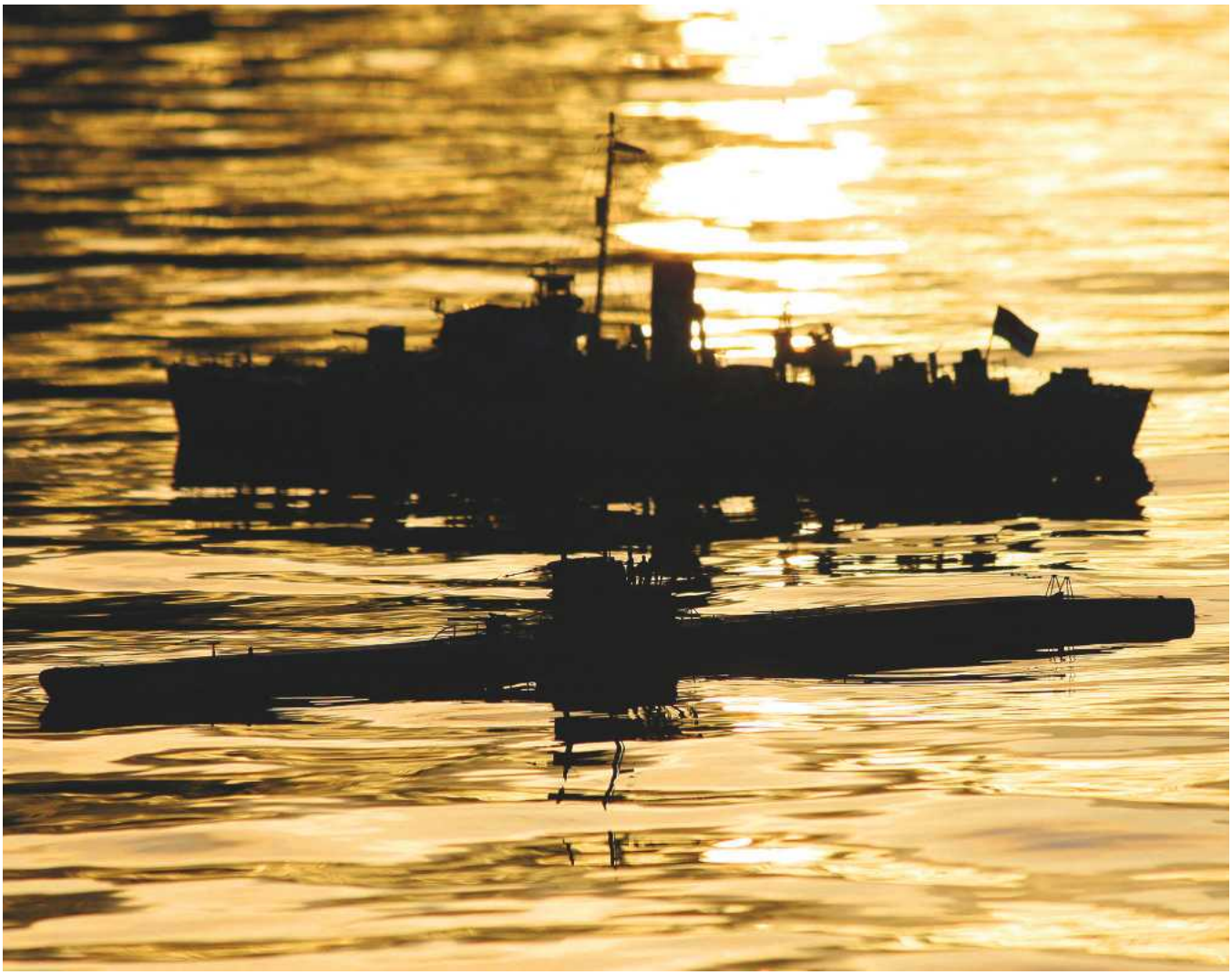
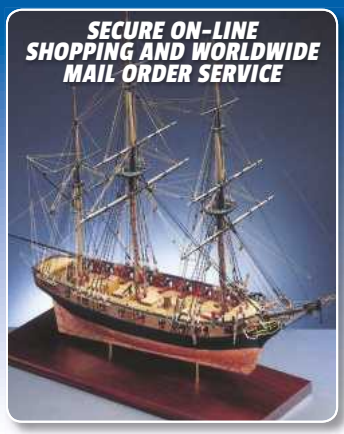
Atlantic Adversaries. Plastic magic at Batley Park in West Yorkshire. HMCS Snowberry, a converted Revell 1/72-scale Corvette, shadows a similarly converted, surface running, Revell 1/72-scale Type VII C U-Boat. The latter features a White Ensign photo etched brass set and wooden deck set, plus Heckler and Goros white metal figures on the bridge. Models by Richard Simpson.



Camera: Canon EOS 30D
Focal length: 210mm
Aperture: f8.0
Shutter speed: 1/640th second
Photographer: Richard Simpson



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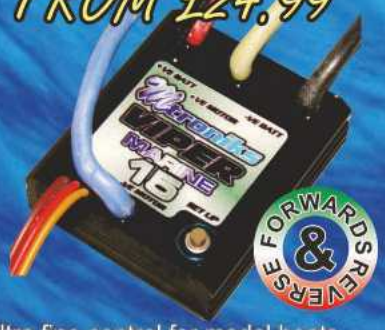

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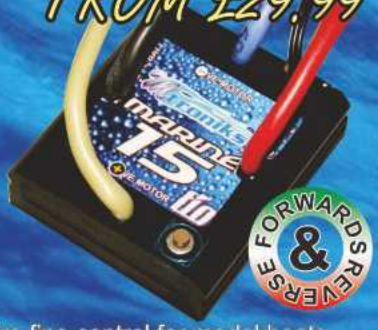

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