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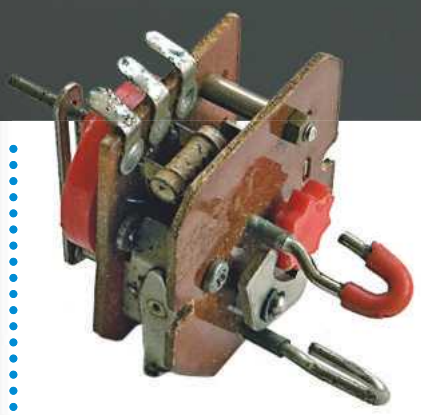

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model Boats

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contents

Regular Features

Bow piece

This October 2017 issue includes a complimentary new full-size Free Plan for Nixie, a freelance semi-scale dynamic diving radio controlled submarine. The prototype has been designed and built by Glynn Guest and as the photos demonstrate, the submarine works, and really works well, even though being only 25.5 inches long and made primarily from balsawood. Gordon Longworth returns to these pages with his radio controlled swan, all built and based on an inexpensive pond decoy bought online. Harry Hitchenes has also successfully converted the Airfix HMB Endeavour kit to radio control, no easy task bearing in mind the small scale of this plastic kit and Dave Wooley has a Photo Feature from the 2017 Mersey River Festival, an event that always has substantial support from the Liverpool area model boating fraternity. Jon Godsell has supplied a unique Photo Gallery for Goliath, a most unusual self-propelled dredger which would, with further research, make for an eye-catching and very interesting radio controlled model with all its numerous working features.

We also have all the usual regular columns, including Range Finder, Flotsam & Jetsam, Boiler Room and Waterline Models, so I hope there is something here for all our readers as we now move into the Autumn of 2017.

***Paul Freshney** - Editor*

Special Features

Compass 360

Model Boats notice board for your news

Editorial Contact - **Paul Freshney**

You can reach the Editor, Paul Freshney, on 01277 849927. The editorial postal address is: Model Boats, PO Box 9890, Brentwood, CM14 9EF.

The email is editor@modelboats.co.uk

***Model Boats** is Published by **MyTimeMedia Ltd** Suite 25, Eden House, Enterprise Way, Edenbridge, Kent, TN8 6HF.*

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Balne Moor MBC

On **Sunday 1st October 2017** this club is holding the North Sea Winches Shield ievent. Two man (or woman) tug teams compete for the sponsor's trophies, £1 per tug.

Scale sailing also available, £1.50 per boat. 1030hrs start, bacon or sausage butties are available until 1230hrs, hot and cold drinks all day and homemade cakes. Satnav location is DN14 0ER. More information from: http://balne-moor-model-boat-club.myfreesites.net/scale-and-tug-events or email: mikebutler1949@gmail.com

Kirklees MBC Open Day

Stan Reffin has advised that this 2017 event, held a couple of months' ago, raised £435 for the RNLI and he and the club would like to thank everyone for their positive support on the day.

Southern Model Show

Headcorn Aerodrome, set in the heart of Kent Countryside, will again host the Southern Model Show on the **9th and 10th September 2017.** The airfield is always busy with parachuting, pleasure, balloon and helicopter flights, plus the Lashenden Air Warfare Museum.

The Southern Model Show in association with the Maidstone Model Flying Club will feature a stunning array of model aircraft, helicopters, ships, tanks and other vehicles. A full range of other activities and a show ground packed with traders makes this a good event for anyone with an interest in our hobbies whether a professional or a beginner.

The venue is at Shenley Road, Headcorn, Ashford, Kent TN27 9HX, and gates open from 0930hrs on both days. There is free parking for visitors with plenty of onsite catering and the usual personal facilities.

This event always has a strong marine presence with a large temporary pond and supporting clubs, and apart from all the flying and model displays, the museum is well worth a look. Trade support is always good, with much of interest for model boaters'.

Midlands Model Engineering Exhibition

A reminder that is being held at the Warwickshire Exhibition Centre, Near Leamington Spa, on the Junction of the A425/B4455, Sat Nav CV31 1XN. The show runs from **Thursday 19th to Sunday 22nd October 2017.** Opening Times are 1000hrs to 1700hrs daily, but closing at 1600hrs on the final day. Although, as its title suggests, this is an engineering show, there is usually some model boating support and much on the trade stands of value to us. Advance tickets are available at a discounted rate via the website: www.midlandsmodelengineering.co.uk
Tel: 08713 861118

International Model Boat Show

A further reminder that this major event is being held once again over three days from **Friday 10th to Sunday 12th November** at the Warwickshire Exhibition Centre. The show will now include a Tamiya Truckin' display arena with some new exhibitors and interests. Address is:
The Fosse, Fosse Way, Radford Semele, Leamington Spa, Warwickshire, CV31 1XN.
Further information from:
Website: www.modelboatshow.co.uk.
Tel: 01926 614101

Legoland

To celebrate the launch of two new boats joining London's growing river network, MBNA Thames Clippers has unveiled a new model boat at the Legoland Windsor Resort (UK) within its famous Miniland. Built using 6500 Lego bricks, the 76.2cm long boat is an exact replica built to a scale of 1:50 of the new Mercury Clipper, launched by MBNA Thames Clippers in July. Weighing 6.2kg, the model took a team of model makers 67 hours to build and it is made from 6500 colourful bricks. A video of it can be found at: www.youtube.com/watch?v=44h8nPBV1kM

Administration of Traplet Publications Ltd

Many readers of this magazine will be aware that Traplet Publications Ltd. went into Administration on the 18th July, just as the September issue of MB was going to the printers. It should also be mentioned that MyTimeMedia, publishers of this magazine had no financial connection with Traplet Publications Ltd.

As a result of going into Administration, the Traplet Store (within Traplet Publications) that sold our plans ceased to trade on 18th July. Since then, the Administrators have sold the Traplet Store to SarikHobbies in early August, but the magazines that Traplet Publications produced, including Marine Modelling International, have now all ceased publication, their last issues being those on general newstrade sale in August. This means that Model Boats is now the only UK produced monthly model boating magazine.
***Paul Freshney,** Editor*

SarikHobbies

The rights to sell many of the UK's r/c boat and aircraft plans have now been acquired by SarikHobbies from the Administrators of Traplet Publications. These plans include the designs from Model Boats (and Marine Modelling International magazine), as well as the aeroplane and engineering plans that used to be sold by MyHobbyStore, which was part of MyTimeMedia who own this magazine.

SarikHobbies will also be selling the range of laser cut and routed woodpacks for some of these plans as before, plus a wide selection of hulls, glassfibre and various vac-formed parts. A new online store and website is under construction at the time of writing this in mid-August, to showcase the hundreds of model plans and associated products that SarikHobbies will be offering, and their initial advertisement is on Pages 56 and 57 of this October issue. For modellers within driving distance of SarikHobbies, a collection service is also available during office hours and visitors are welcome to top up their balsa sheet and strip wood stocks at the same time.
Website: www.sarikhobbies.com

In practical terms, this means that all the Model Boats plans that were available from what was the old MyHobbyStore website, and then from September 2016 via the

Traplet Shop, should now be available from SarikHobbies by the time you are reading this. We wish them well.
Paul Freshney, *Editor*

Varmint Plan

This was featured in September Model Boats, with readers being invited to purchase the plan via the Traplet Shop. Unfortunately, the September issue of Model Boats had closed for press as the news about the demise of Traplet Publications came through. I then offered, via our Model Boats forum, to supply the PDF of the plan FOC to anyone who wanted it until the Plans Service (now in the form of SarikHobbies) was up and running again. This worked well with 17 readers taking advantage of the offer (up to 15th August). Since the plan is now available from SarikHobbies, they are the only source of plans if readers wish to purchase any of them.
Paul Freshney, *Editor*

Model Boats 2017 Winter Special Edition

This is on sale on the **27th October 2017,** following on from the regular November magazine, that is highlighted on Page 8 of this issue. Readers will no doubt be pleased to know that the MB 2017 Winter Special will include some major new articles:

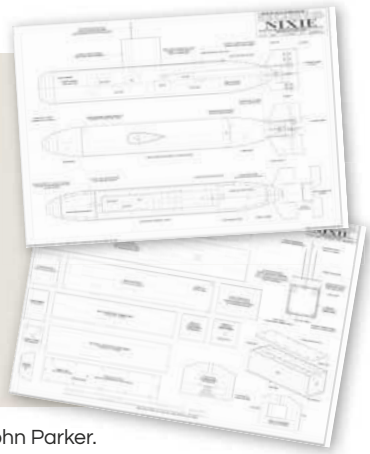
- A new Featured Plan for the Fairey Huntress 23 with a full supporting construction article by Dave Milbourn.
- An in-depth review by John Elliott of the new Kerne tug kit from Mountfleet Models.
- HMS Renown (1897 to 1913) is discussed in depth by Andrew Dalton and this is a model that won top honours at the 2016 Model Engineer Exhibition.
- A scratch built HDW Type 209 submarine project by John Parker.
- Ron Rees shows how to build a practical small vacuum moulding machine.
- Richard Simpson discusses, and shows, how to add detail to our models.
- The O & P Class WW2 Emergency Destroyers, based on the Tamiya kit, are discussed by Chris' Drage.

I hope this is something for readers to look forward to, and of course subscribers automatically receive this 100 Page Special in addition to their 12 regular monthly issues.
Paul Freshney, *Editor*

Free Plans

One or two readers have expressed concern that as Marine Modelling International has ceased publication, we here at Model Boats may change how we operate, currently with 12 regular issues per annum and a 100 pages Winter Special, plus a Free Plan in the alternate monthly magazines.

I can assure readers that there will no change in this format and the Free Plans for December 2017, February, April and June 2018 issues of Model Boats are already in-hand or commissioned. There is no intention either to change the pagination of Model Boats.
Paul Freshney, *Editor*



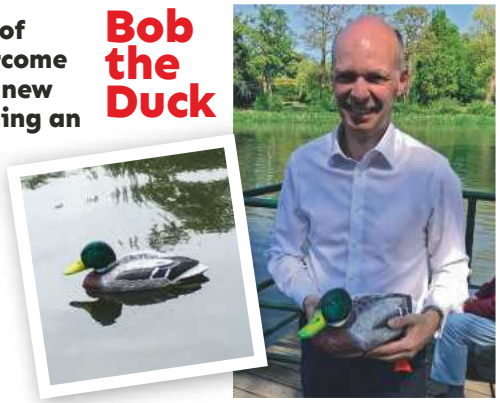
Model Boats November 2017 issue is on sale on the 6th October 2017

S.S. Mullogh

Next month in Model Boats

This issue includes the first of a new six part series on the construction of S.S. Mullogh by Phil' Button, detailing the problems that had to be overcome during the project, this being a model that can be sailed or steamed. A new contributor is welcomed to these pages, with Eric Morse-Brown converting an idea into his fully featured and properly paddling, radio controlled 'Bob the Duck'.

Bob the Duck



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

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

Don't forget! The November 2017 issue will be published on **6th October 2017** price £5.15 – don't miss it! Order your copy now! Or better still why not make it your first copy in a year's subscription to Model Boats magazine? See our subscription offer on **Page 32** in this issue...

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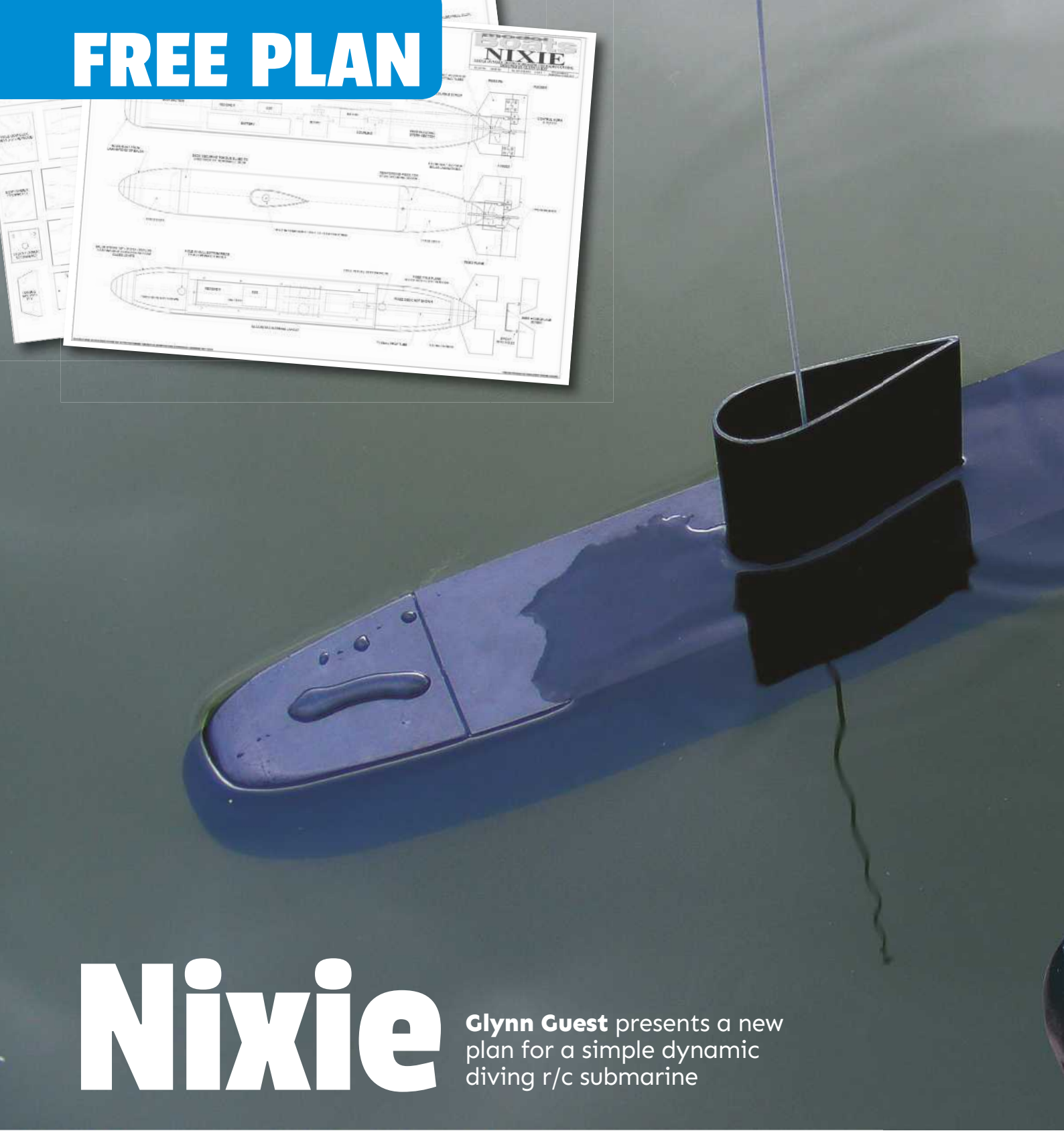
If you don't want to miss an issue Just ask!

Contents may be subject to change.

FREE PLAN



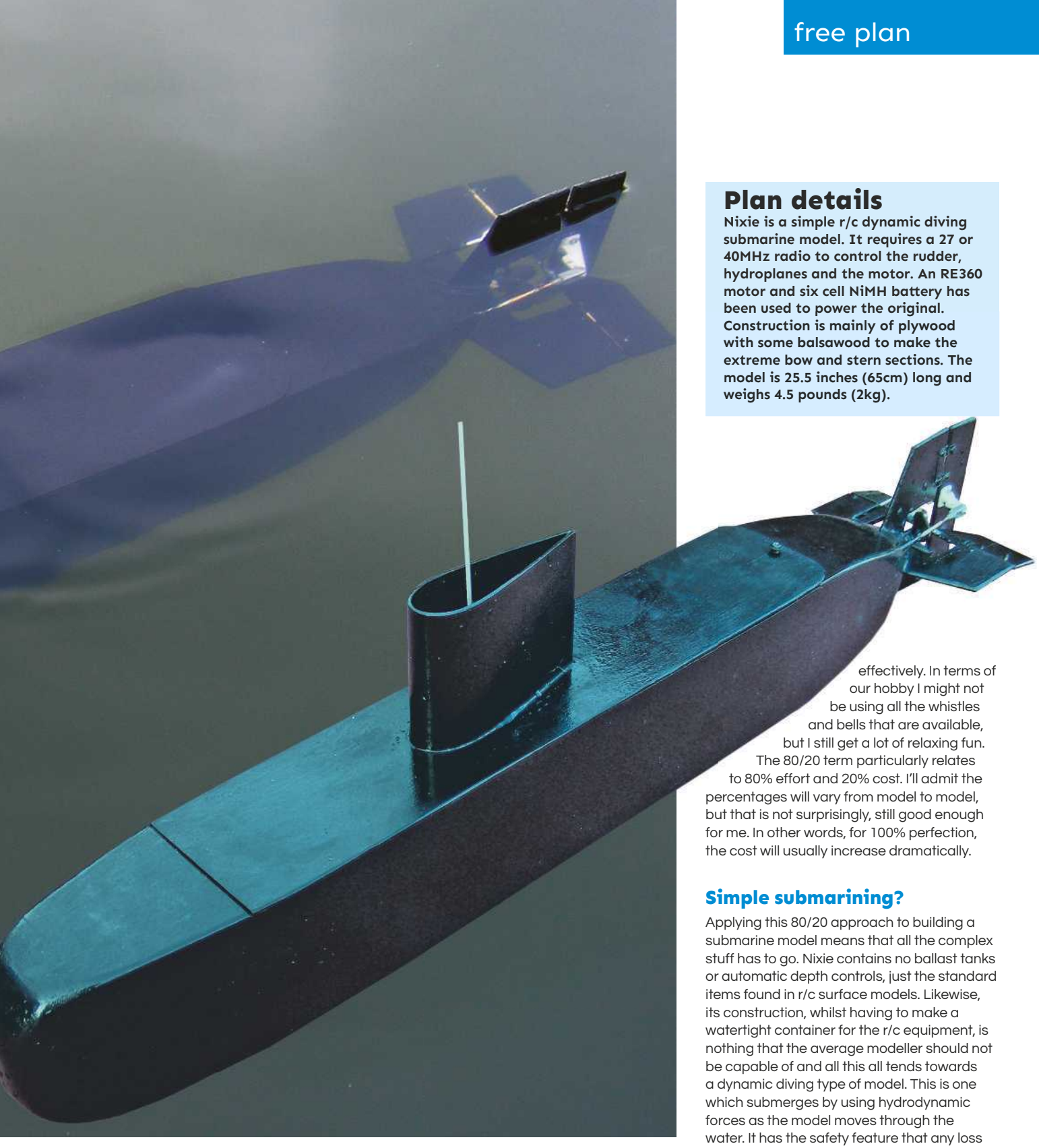
Nixie

Glynn Guest presents a new plan for a simple dynamic diving r/c submarine

Most areas of human activity have some ultimate challenge that if not impossible, is going to be very hard to achieve. That is, until someone succeeds and it soon becomes unremarkable, if not commonplace, two examples being the four-minute mile and supersonic flight, both once considered difficult but now hardly worth mentioning. Our hobby is probably no different and many ultimate types of models have slipped into the commonplace zone, often with 'Ready to Run' (RTR) commercial examples now available at modest prices. I can recall when r/c helicopters were a pipedream, but now you can find them on supermarket shelves. However, there is still one type of r/c model boat that, whilst not unknown, is often considered to be too complicated or difficult for the likes of us average modellers, and that is a working submarine model.

Why don't....?

That's the question - why don't more people try building r/c submarine models? There are several possible reasons for this, the obvious ones being that they have never tried to build one before and are put off by the tales of them being very complicated, expensive and risky to operate. True, some people, even if they have never attempted to build an r/c submarine, will regale you with tales of the vast amounts of money and time needed with these models, plus, if that were not enough, you have to be a modelling genius to achieve success. Certainly, lots of commercial items can be bought to achieve what a purist would consider to be a proper working model of a submarine. That is, one capable of static diving which involves changing the density of the model, usually with ballast tanks. Likewise,



Plan details

Nixie is a simple r/c dynamic diving submarine model. It requires a 27 or 40MHz radio to control the rudder, hydroplanes and the motor. An RE360 motor and six cell NiMH battery has been used to power the original. Construction is mainly of plywood with some balsawood to make the extreme bow and stern sections. The model is 25.5 inches (65cm) long and weighs 4.5 pounds (2kg).

maintaining a level trim when running submerged can be automated. All of this costs money, unless you want to design and fabricate everything yourself which will cost more time and unless your initial designs are perfect, probably even more money.

After all that, you are going to drop your model in the water and watch it sink from view, a worrying thought at the best of times. So you have to fit some sort of fail-safe device that should resurface the model in event of problems, but even that might not be enough if your pride and joy encounters something like a supermarket trolley when underwater.

Hence, it might not be a wonder why we see so few r/c submarine models at the pondside?

80/20 Modelling?

I have often been accused of never going that extra distance to produce a perfect result, but for me it is more an appreciation of the law of 'diminishing returns', i.e. the more you approach perfection, the more expensive and difficult it becomes, usually in an exponential fashion. My philosophy is to settle for an adequate job that works reliably and effectively. In terms of our hobby I might not be using all the whistles and bells that are available, but I still get a lot of relaxing fun. The 80/20 term particularly relates to 80% effort and 20% cost. I'll admit the percentages will vary from model to model, but that is not surprisingly, still good enough for me. In other words, for 100% perfection, the cost will usually increase dramatically.

Simple submarining?

Applying this 80/20 approach to building a submarine model means that all the complex stuff has to go. Nixie contains no ballast tanks or automatic depth controls, just the standard items found in r/c surface models. Likewise, its construction, whilst having to make a watertight container for the r/c equipment, is nothing that the average modeller should not be capable of and all this all tends towards a dynamic diving type of model. This is one which submerges by using hydrodynamic forces as the model moves through the water. It has the safety feature that any loss in power and the model will resurface, but it will still not stop you getting stuck inside a submerged shopping trolley

One problem with dynamic diving submarines is that it is tricky to maintain a steady depth and you can quickly end up over-controlling, and this often results in 'porpoising', a cycle of vigorously surfacing and diving, usually to the amusement of any spectators.

The answer to this problem has its origins in the Vic Smeed Sprat design from the 1960's which was a small free running model powered by an electric motor and a couple of dry cells. The plan featured forward

hydroplanes which were spring-loaded to a negative angle, thus the model would start to dive. A vertical length of wire was attached to the hydroplanes with a 'drag plate' fitted to the top. When the model had dived to the depth where this drag plate entered the water, the force on it rotated the hydroplanes to a positive angle and the model headed towards the surface. As soon as the drag plate left the water, the spring returned the hydroplanes to a negative angle. This resulted in the model progressing underwater in an oscillating fashion with just the drag plate dipping in and out of the water. Well that was the idea, but the keen although inexperienced and unskilled schoolboy that I was then, could never get it to work properly. I returned to this idea some years later and dispensed with the forward hydroplanes, using the rear ones to lift the stern and allow the motor to drive the model under. The drag plate idea was still used, but with a fixed wire secured to the conning tower. When the plate entered the water it caused the whole of the model to rotate and thus rise to the surface. Thus, the same sort of underwater oscillating path as intended with Vic's Sprat was then achieved.

Adding radio control

Buoyed with the confidence that this simple little model had given, a year or so later a more ambitious r/c submarine model was built. With only single channel gear available to me then (still a poor student), the model could only use rudder control, but the drag plate idea allowed it to run in an oscillating sub-surface fashion. Many years later another r/c submarine was built, but this time rudder, hydroplane and motor control was possible. I stuck with using just rear hydroplanes knowing that they would work as the front mounted ones always looked vulnerable. The receiver's aerial was a length of plastic coated steel wire mounted vertically and running through the detachable deck and conning tower. The plan was to fit a clear plastic drag plate to the aerial wire and adjust its position until the model's oscillating motion was satisfactory, but much to my surprise I found that the drag plate was not needed. The model's speed was sufficiently high that the drag force on the aerial alone was large enough to control the model's diving depth. In fact, with careful adjustments of speed and hydroplane angle it was possible to sail this model submerged in a hands-off fashion and just like a normal surface boat, concentrate on steering it around the lake.

The only drawback was that it was built using balsawood with solid bow and stern blocks, which resulted in it needing a lot of ballast to obtain the correct static trim, as dynamic diving submarines have to float with their decks almost awash. This model though became the Spook design and the plan was published in the October 1998 issue of MB. Several years later, another submarine model was built, this time loosely based on the German Type 17 U-Boat. This also worked and it appeared in the April 2006 issue of this magazine.


1

Nixie

It has taken about ten years to get around to building another r/c submarine. Learning from the previous models means that it will use the same control system, but to avoid loading it up with lead ballast, it has the r/c gear in a central watertight box and the bow and stern spaces are free flooding. To keep it attractive to the average modeller, it has been built from plywood with a little balsawood for the curved bits at each end, with no need for heavy duty construction, as it's just going to slip below the waves and not plumb the depths of the Mariana Trench. Also, as a bonus, the top of the aerial enables you to know where Nixie is when operating with other surface craft.

The resulting submarine is based on a modern diesel-electric submarine and the use of plywood has resulted in a boxy rather than rounded hull cross section, but this has not had any noticeable effect on its performance. To keep it simple, fixed vertical surfaces which carry the rudder and hydroplanes aft of the propeller have been used, just like on the previous submarines rather than a modern X-tail, which can be very complicated to set-up.

Be honest with yourself?

Although a simple model that requires no exotic skills or equipment to build, this model still needs care, notably sound glued joints are essential together with accurate construction and since any leaks might be fatal, it must be totally waterproof and watertight.

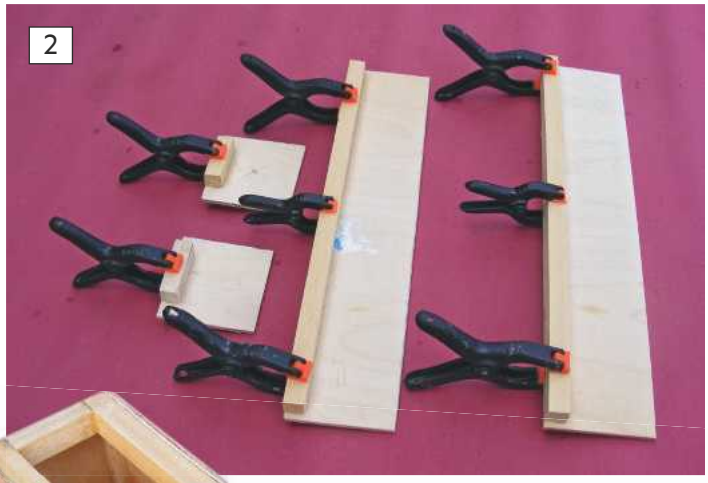
You must also be consistent and thorough in your pre-sailing preparations as well as being confident when your creation and the r/c gear it carries disappears under the water. You will need to use a 27 or 40MHz radio system for this model as 2.4GHz radios don't work underwater, at least for us modellers.

Materials

The model was built using mainly 1/8 and 1/16 inch (3 & 1.5mm) plywood. Good model quality plywood was used and not the stuff found in DIY stores for general domestic work. Some half inch (12mm) square wood strip was used to create the base upon which the removable hatch was secured.

The removable hatch on the prototype was made from a piece of transparent plastic about 1/8 inch (3mm) thick and something suitable might be found in a DIY store. The bow and stern areas have been built from laminations of balsawood sheet from the scrap box. You could use other materials, but balsawood is easy to shape and blend into the hull contours, and can also absorb any accidental bumps. Some balsawood strips were used to internally reinforce the glued plywood joints.

Previous submarine models had employed the plastic hinges used in r/c model aircraft to secure the rudders and hydroplanes. These worked well, but could be prone to damage from accidental impact on these surfaces. Some small brass hinges were used on the Nixie prototype and have worked well, the only precaution being to keep them lubricated and corrosion free. Also from the model aircraft world are the clevises and control horns used in the servo linkages. The pushrods connecting the horns to the servo must be stiff enough to avoid excessive flexing. These rods enter the watertight compartment via close fitting tubes. Some plastic insulation was stripped from a length of domestic electric cable and found to be a good sliding fit for the pushrods.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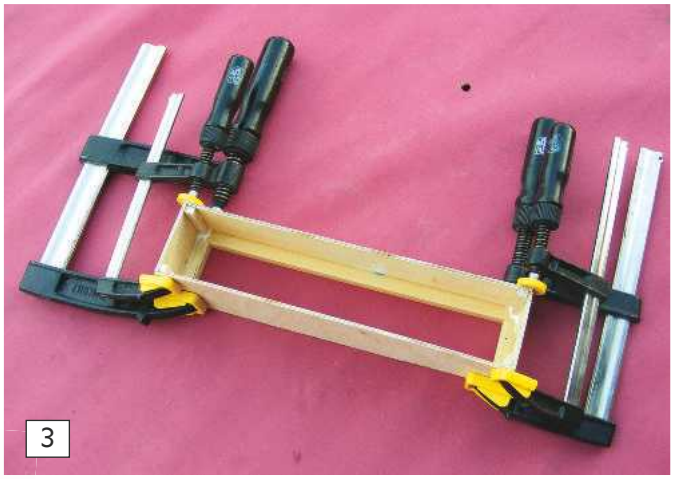
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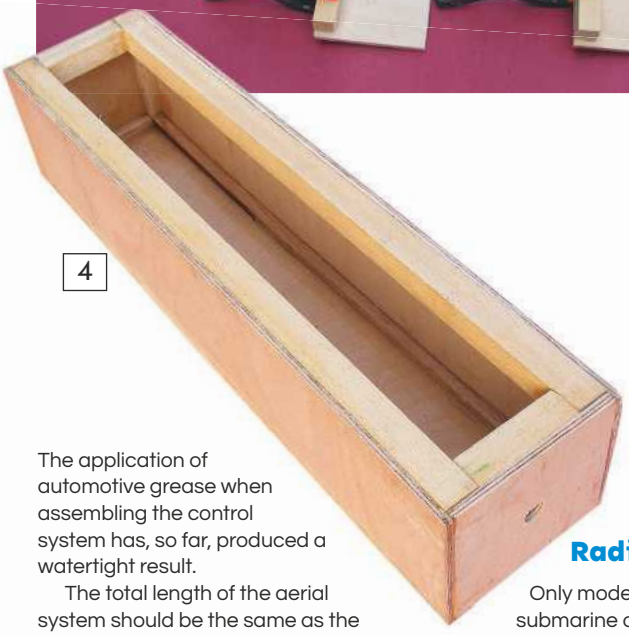
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The application of automotive grease when assembling the control system has, so far, produced a watertight result.

The total length of the aerial system should be the same as the receiver's original aerial wire. This means that the length of the antenna wire and flying lead should be deducted from the receiver's aerial wire before soldering the plug and socket in place. The other functions of the antenna are to create the bows upwards force when running submerged and most important, give you a visual indication of where Nixie is and the best material I have found for this job is some steel wire that is coated with plastic. It can usually be found in the rack of plastic strips, sections and such like in model shops which cater for the plastic kit fraternity. It can be bent, but is stiff enough for our purposes and being plastic coated keeps it out of contact with the water, preventing corrosion and radio problems. The exposed steel wire at the top end of the antenna needs sealing, and a dab of glue and a short length of soft plastic tubing achieved the desired result.

As for adhesives, a water-resistant wood working glue was used on most of the wood to wood joints. With a good initial sealing and painting job to start with, plus regular checking and a thorough drying-out session after every sailing, no problems with these glues have been encountered. Epoxy adhesive was used to secure the propshaft tube into the hull and also to fix the control surfaces into the stern block.

Radio control Stuff

Only modest power is needed for a submarine of this size, as excessive power might well lead to control problems or worse. The prototype has used a Mabuchi RE360 type motor although the RE385 would be equally suitable. Using a six cell NiMH battery pack, it turns a plastic 40mm dia. three bladed propeller. This might seem a shade oversize for this motor, but it has never shown any sign of distress even after a prolonged submerged cruise around the lake. The use of 27 or 40MHz radio gear has already been mentioned and you need three functions to control this model; rudder, motor and hydroplanes. As for the electronic speed controller, nothing exotic is needed although a BEC (Battery Eliminator Circuit) will save the need to squeeze a receiver battery inside the watertight compartment. An Mtroniks Micro Viper esc was used, its small size and 10 Amp rating being a perfect for Nixie. Standard sized servos can just about be fitted into Nixie but a couple a shade smaller from the 'spare servo box' were actually used.

The watertight box unit

After cutting the ply and strip wood parts, **Photo 1,** they were carefully checked for fit. Holes in the rear end piece can be drilled for the propshaft tube and pushrod tubes. The plans only show the former, as the position of the pushrod tubes depends on the servos and their position in the model. I'll admit on the prototype these holes were drilled later, which created the interesting challenge of making a long, but small diameter drilling tool. The hatch securing strips were then stuck around the top edges of the sides and firmly clamped until the glue had set, **Photo 2.** After this, the sides were glued together again using clamps, **Photo 3.** Some scrap strips of balsawood were glued to the inside of these joints. It is important that you check that the top of your box is flat to ensure the removable hatch will not create any gaps when it is secured. The bottom piece was added along with some more balsawood strips along the inside glued joints, **Photo 4.** The outside surfaces were then checked and sanded to produce smooth and square corners.

Creating the hull

The two hull sides are simply glued to either side of the box. The bottom of the box must be in line with the bottom of the side pieces and this will create the recess within the hull for the removable hatch. Also, and this is important, make sure the box is the right way around with the holes in the box facing backwards. A couple of old lead acid batteries were used to keep everything together whilst the glue set, **Photo 5.**

The hull sides have to be pulled inwards for the bow and stern formers to be glued in place. You could use clamps or elastic bands


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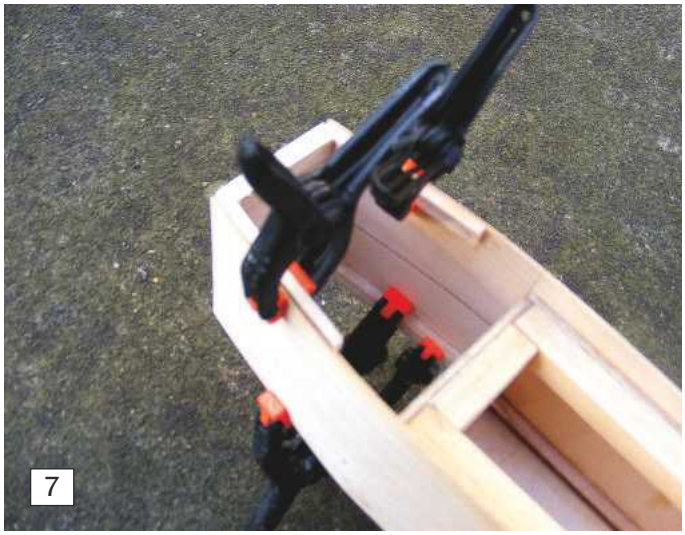
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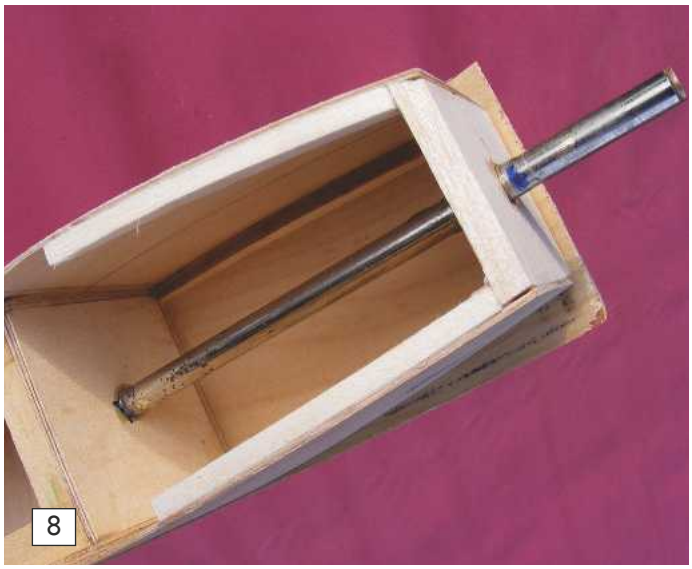
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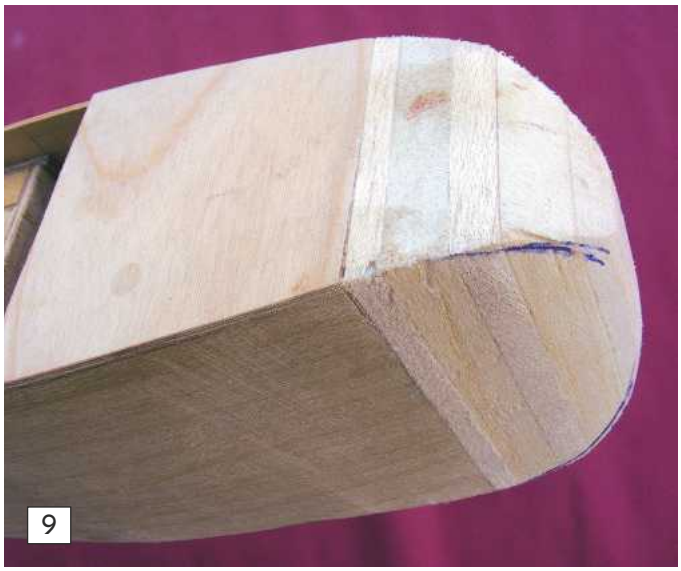
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and straps to do this, but care is needed to avoid creating inward bowing hull sides. The trusty DIY portable workbench, easily clamped the hull in place and some packing strips were used to bend the sides inwards to meet the formers, **Photo 6.**

Some balsawood strips were glued along the inside edges of the hull sides in what was to become the bow and stern free flooding section, **Photo 7.** Note that these strips only ran the lengths of the hull sides that were to be covered by the fixed deck pieces.

The hull bottom piece was glued in place and again, some weights were used to keep it firmly in position along with elastic bands at the stern. This piece will need trimming to match where the hull sides bend inwards at the bow and stern areas.

The propshaft tube was now installed so that sound joints could be easily made with epoxy adhesive, **Photo 8.** Do remember to clean and abrade the tube surface where the epoxy is to be applied for maximum strength. The bow shape was made up from laminations of scrap pieces of balsawood sheet. After the glue had set, it was carved and then sanded to produce a rounded shape which blended into the hull, **Photo 9.** The stern was completed in the same way, but with a hole through the balsawood sheet block to accommodate the propshaft tube, **Photo 10.**

Control surfaces

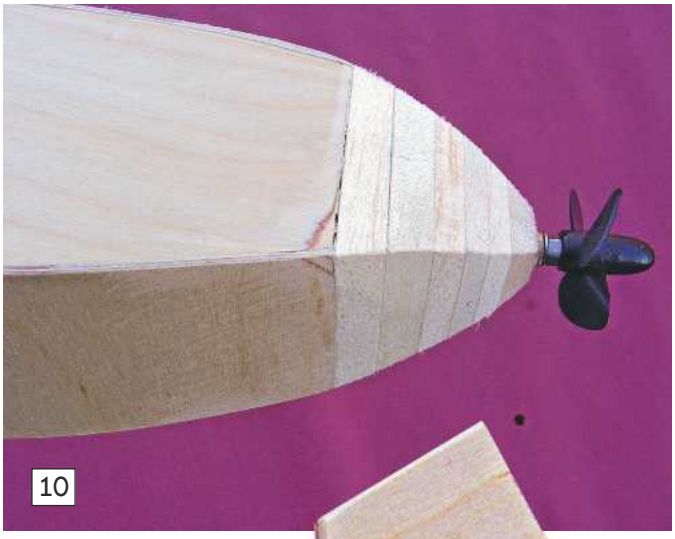
These were cut from 1/8 inch (3mm) plywood, but with both the fixed and movable surfaces (rudder and hydroplanes) in one piece. This method ensures that they are glued to the hull in the correct alignment and helps ensure smooth operation of the controls.

The fin and rudder were fixed into two slots cut into the stern block using epoxy adhesive, **Photo 11.** Using a slow setting type of epoxy does help to make a stronger bond between the plywood, balsa and the propshaft tube exposed when cutting the slots. When fully hardened, the rudder can be carefully cut away from the fixed fin. The hydroplane was installed using the same method, **Photo 12.** The movable hydroplane surfaces have to be in two parts to allow the rudder to operate. This was achieved with a wire joiner epoxied into holes drilled into the leading edge of the hydroplane and when fully set, a notch was cut through them, **Photo 13,** and this method helps to keep things correctly aligned.

Motor and servos

The motor had a metal mounting bracket and the simplest installation was to build a balsawood base inside the compartment to bring both the motor and propshaft into line, **Photo 14.** This also gave the unexpected benefit of creating a cavity in which any odd drops of water that crept up the propshaft tube would collect. The motor and propshaft was joined with a small ball and socket connector from the spares box. To be honest, with the modest power of these motors, a short length of silicone rubber (fuel tubing for i.c. motors) can make an adequate connector as long as it is a tight fit over both shafts. Whatever method used, it is worth spending some time to get a good alignment.

The servos are fitted just ahead of the motor using balsawood supports glued across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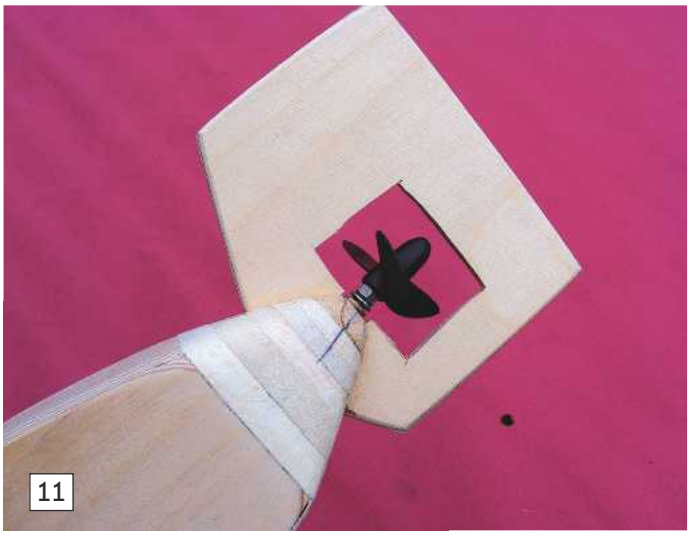
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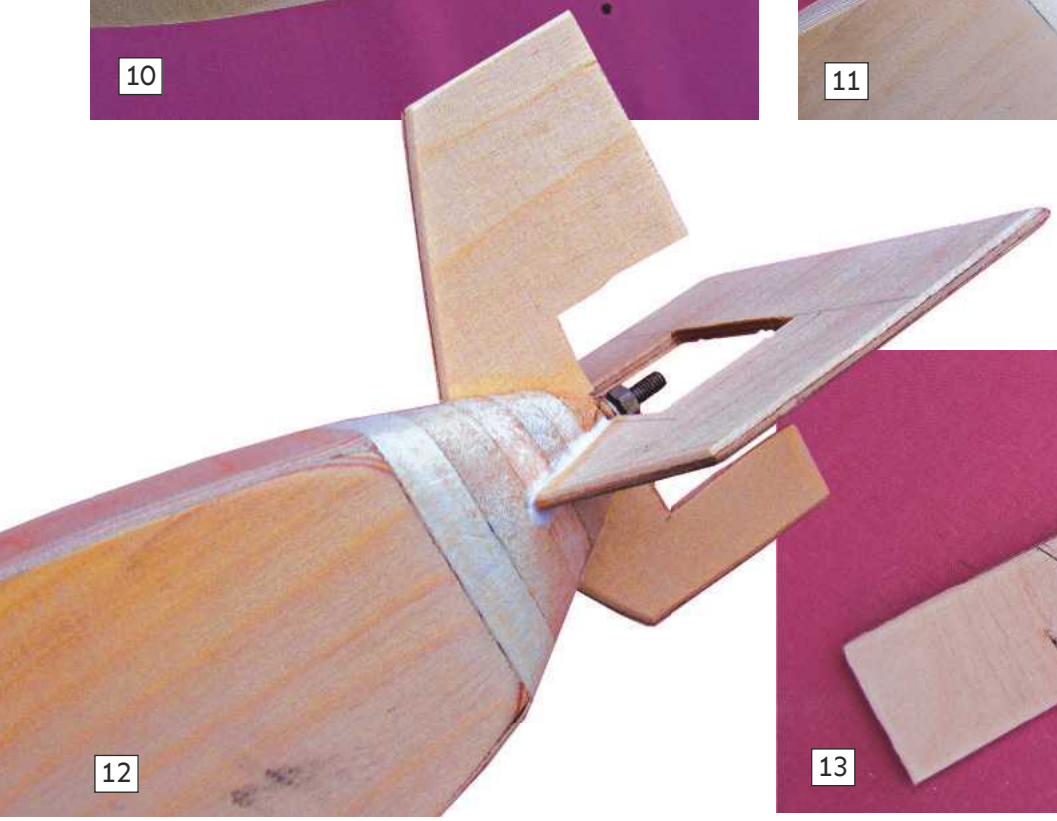
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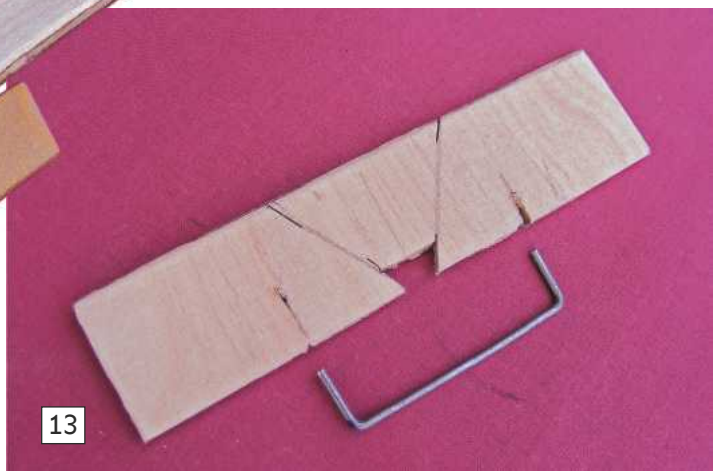
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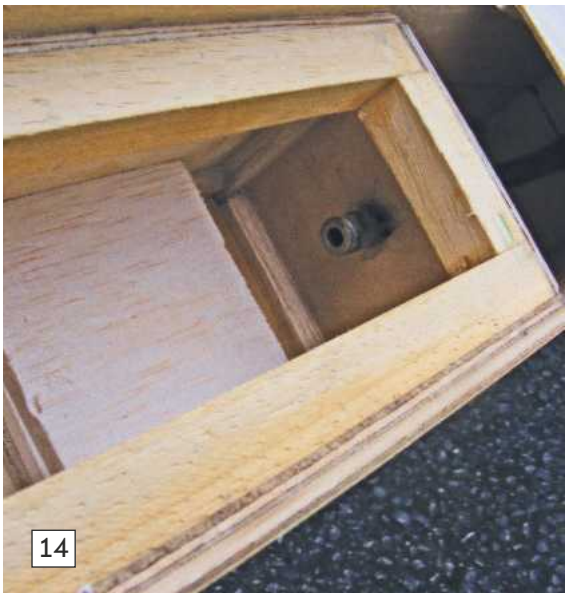
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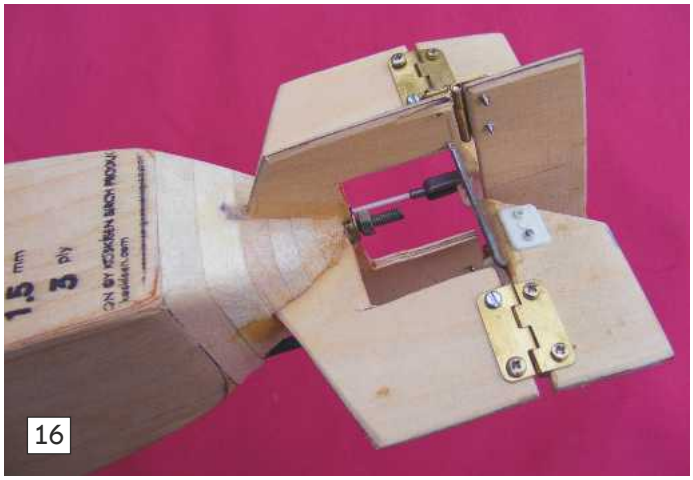
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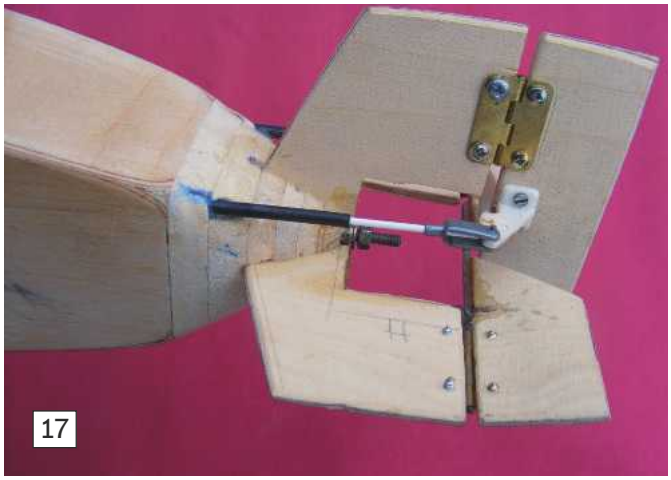
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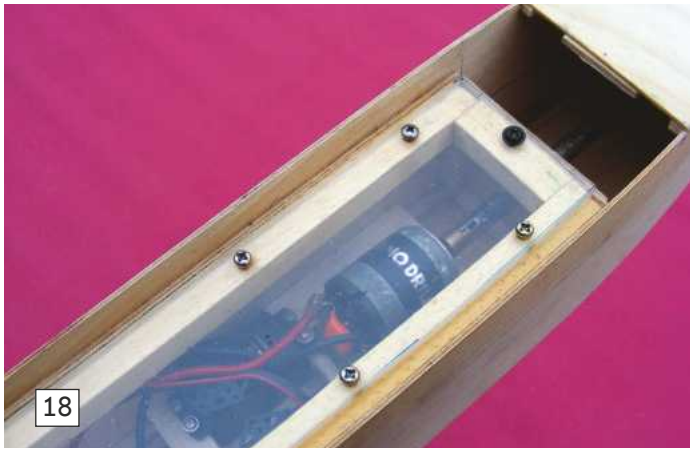
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the inside of the compartment, **Photo 15.** Adjustable pushrod connectors in the servo output discs were used and care taken to ensure that they did not foul the strips around the compartment opening.

Connecting things up

The fixed and movable surfaces were connected with some small brass hinges and screws, **Photo 16.** This may seem a little inelegant but when covered with paint the hinges will "disappear" somewhat from view and disappear even more when sailing! Some care is needed to make secure but free moving surfaces which should ideally fall under their own weight. Control horns and clevises were used to connect the pushrods to the surfaces, **Photo 17.**

The pushrods have to slide inside a close fitting tube which, together with the application of grease during final assembly, has proven to be watertight. As mentioned earlier, some plastic insulation striped from domestic electrical wires, proved to be ideal for the prototype. The pushrods need to have as straight a run as possible from a servo to the horn on the control surface. This called for some degree of 'eyeballing' when making the hole for the tubes in the stern block. I started with a pilot hole and then adjusted it with files and the odd choice word, until the pushrod ran smoothly between servo and horn.

The tubes could then be glued into the stern blocks. They also need gluing where they pass into watertight compartment, and a generous, at least I thought so, application of a viscous contact adhesive was applied.

Hatches

The model has two hatches, one secured to the top of the watertight compartment and the other forming the deck above it all. The former was made from some clear plastic sheet 1/8 inch (3mm) thick which has the comforting advantage of allowing you to see that everything is working and dry without needing to be removed. An alternative would be a piece of 1/8 inch (3mm) plywood, provided it is flat and making a good fit on the hatch securing strips, but there again, you then can't see inside.

To correctly position the holes in this hatch for the screws that hold it down, the following method was used. The positions of the holes at either end were marked on the hatch then carefully checked and rechecked, before drilling to match the screws. The hatch was replaced and the positions of these two holes marked on the support strips. The hatch was then removed and two pilot holes (i.e. smaller than the diameter of the screws) drilled. The hatch was replaced and secured with these two screws. After checking everything was still okay, holes were drilled through the hatch and into the support strips with the pilot drill. The hatch was then removed and these holes enlarged to match the fixing screws, **Photo 18.**

This might seem to be a complex process, but it does get the hatch and screws correctly placed. Badly positioned holes, which call for enlarging or even extra holes, can be bad news in any model boat and a positive disaster in a model submarine.

The other removable piece was much easier to make. I was worried that a simple piece of 1/16 inch (1.5mm) plywood would be too flexible and need stiffeners on the underside, but in fact it has worked well, so once again KIS (Keep It Simple) is best. This hatch is secured to the hull by the use of a plywood 'tongue' at its front edge which slips under the forward fixed deck, **Photo 19** and the rear end with a small screw. To ensure this screw would hold tight, a small piece of plywood was glued to the underside of the fixed rear deck, **Photo 20.**

Conning tower

Previous submarine models had featured solid conning towers, but this time a hollow but streamlined shape was chosen as being a free flooding hollow body would reduce the buoyancy forces trying to surface the model when it dives.


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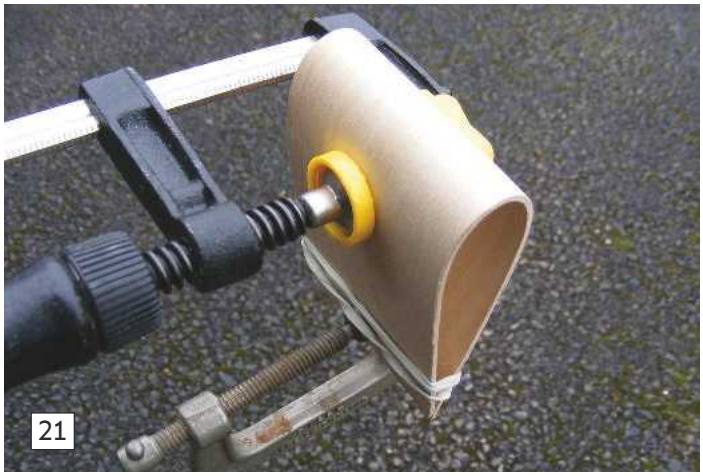
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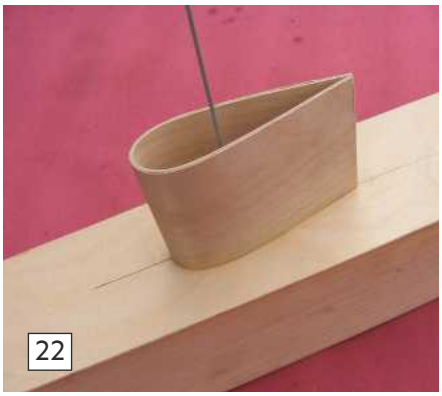
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The conning tower was made from a piece of 1/16 inch (1.5mm) plywood. Although quite flexible to start with, there was no way it would bend into the desired shape until the curved leading edge area had been given a good soak in warm water. Progressive bending soon achieved the right shape after which could be held with a couple of clamps and elastic bands as in **Photo 21.** After allowing it to dry, the streamlined shape was retained when released and a bead of glue applied to the inside of the trailing edge.

Before gluing to the hull, a hole had to be made through the deck at the conning tower position and this is for water to flow in and out of the tower when diving or surfacing. The antenna can also pass though this hole. Using the hole in the deck as a guide, the position of the hole in the hatch for the antenna was easily located, **Photo 22.** The method of connecting the antenna to the receiver aerial wire has been described earlier.

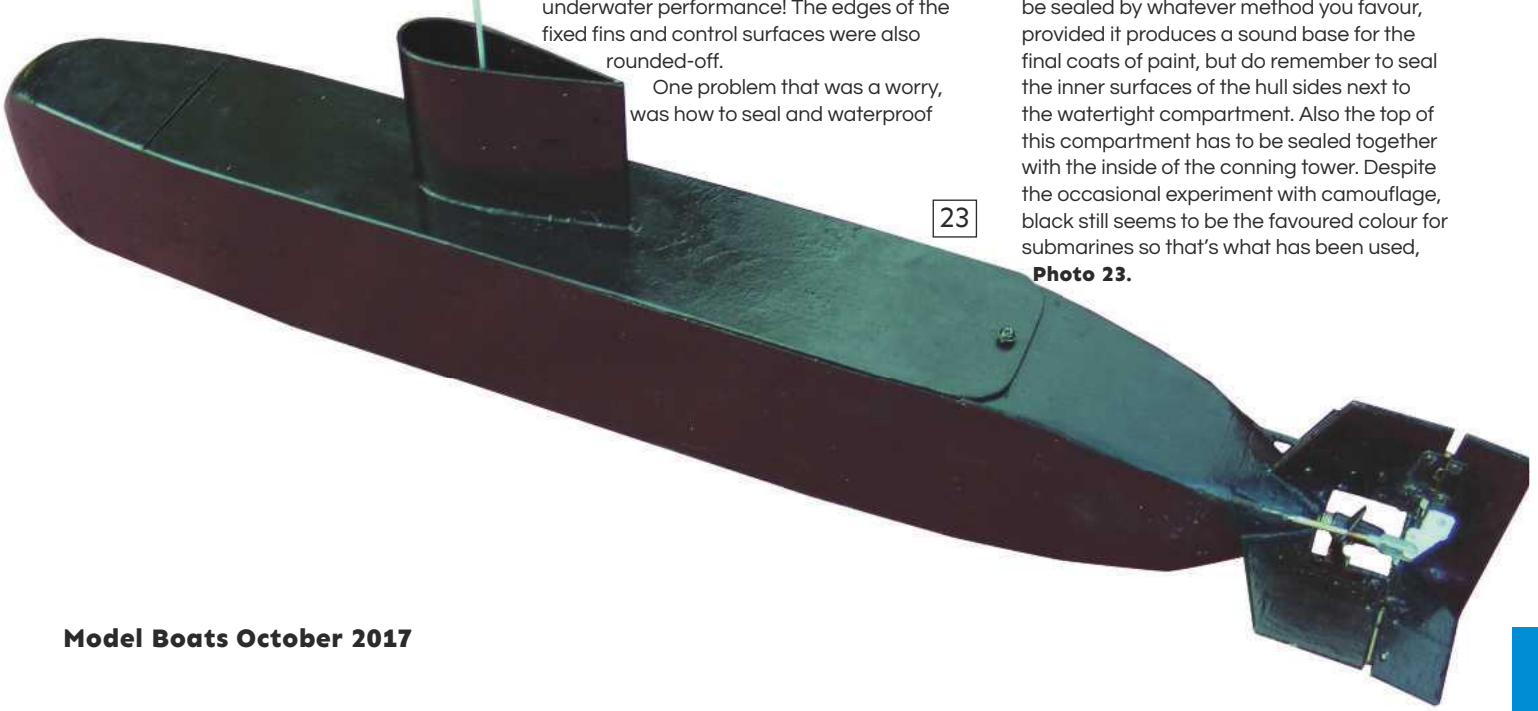
Sanding, sealing and painting

The pushrods and control surfaces were removed from the model before starting this, but the motor and servos were left in place as having spent time and effort getting them correctly positioned, this seemed sensible. However, the inside volume of the watertight compartment was filled with paper to protect the electronics from dust and paint, etc.

The outer surfaces were examined for any defects and luckily only minor dents in the balsawood bow and stern blocks needed attention. An attempt was made to round the corners of the plywood hull a little, this probably aiding paint adhesion more than underwater performance! The edges of the fixed fins and control surfaces were also rounded-off.

One problem that was a worry, was how to seal and waterproof the inner surfaces of the bow and stern free flooding areas. Access was limited and no guarantee of complete coverage could be given if a paint brush was used. The answer, like most things, was both simple and obvious, if a little messy. As this part of the model would be invisible with the deck in place, a neat and tidy finish was not going to be needed, so the model was held vertically, bow downwards, and some domestic varnish poured into this void. With a generous amount inside, the hull was rotated and twisted so the varnish would cover all the internal surfaces, but this was when it got messy as I had forgotten about the hole in the hull bottom! Luckily no clothes were damaged and a piece of tape was quickly applied to cover this hole and the varnish swirling process continued until I was sure of total coverage. The excess varnish was allowed to drain out of the previously forgotten hole, a somewhat slow process and some encouragement was applied with an old paintbrush.

Once the bow area was dry, this process was repeated with the stern free flooding area, but this time I remembered to seal the hole in the hull bottom before pouring the varnish into it. The bare surfaces of this model can be sealed by whatever method you favour, provided it produces a sound base for the final coats of paint, but do remember to seal the inner surfaces of the hull sides next to the watertight compartment. Also the top of this compartment has to be sealed together with the inside of the conning tower. Despite the occasional experiment with camouflage, black still seems to be the favoured colour for submarines so that's what has been used, **Photo 23.**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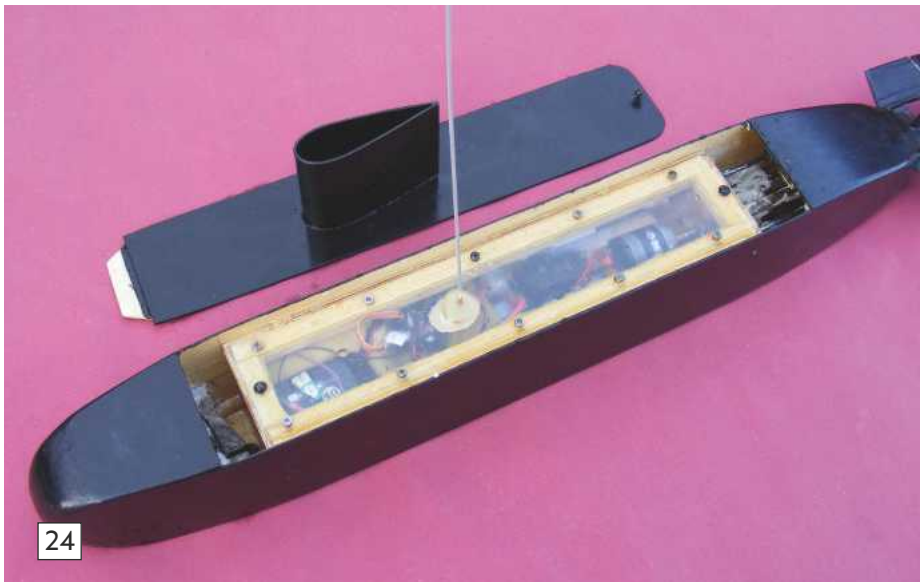
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Reinstallation and testing

The propeller and control surfaces were refitted and pushrods greased before sliding into their tubes and reconnecting. The plans suggest where to place the battery pack, receiver and esc. An alternative layout may be preferred, but you must ensure that nothing can move and so affect the sailing trim, plus linkages should not be allowed to foul the motor's output shaft or servos.

With everything checked to be okay and working, the hatch can be secured to the watertight compartment, but first a bead of grease has to be applied to the support strips around the opening. A small syringe filled with automotive grease to lay this bead did the trick, which is 2 to 3mm wide, between the screw holes and in strips. Provided that the hatch sits properly on these strips of grease, then this is enough. If a clear plastic hatch has been used, then you can see the grease being squeezed flat and making a watertight seal as the screws are tightened. By the way, it is best tighten starting in the centre of the hatch and work towards the ends. Also, excessive force is not needed, so please stop as soon as the screw head seats on the hatch and resistance is felt, and **Photo 24** is of everything assembled and the transparent hatch in place.

Ballasting trials will be needed with the aim of getting Nixie to float in what may seem to be a worrying condition with the deck almost awash. Excessive buoyancy will prevent a dynamic diving model from submerging, but fortunately only a small amount of buoyancy will have the model promptly resurfacing when the motor stops.

Weights, ideally lead or iron, can be added to the bow and stern free flooding areas until this is achieved, but do not attempt to sail Nixie just yet as the ballast needs securing in the hull to avoid any trim changes. The method used was to note the position of the ballast pieces, remove them and allow everything to dry (the r/c having been switched off, of course). Then the ballast was reloaded into the model in the same places as before, but using silicone sealant to hold the weights in the hull. Try to avoid making any water traps with the sealant and ensure the 'flooding' holes in the hull's bottom remain open.

This is also a good time to check for leaks and despite all the care lavished thus far, some water was leaking through the rear end of the watertight compartment. Its exact location was not clear, but I suspected there was a pinhole in the glue used to secure one of the pushrod tubes to the plywood. An application of some bathroom sealant, smeared in place with a finger tip, around this errant joint seemed to cure the problem. A second ballasting trial is sensible since the trim might have changed a little and the final trim position was with the bows just breaking the surface, **Photo 25,** but with the rest of the deck from just ahead of the conning tower awash and the top of the fin and rudder clear of the water.

Radio control setup

It might be worth noting the transmitter setup used to control this dynamic diving submarine. Being right handed, the rudder is on the right hand stick, but the motor control is NOT on the self-centring vertical left hand one as is usual, the reason being that when the controls have been adjusted so the model will cruise around submerged in a stable fashion, the motor control can be safely left alone.

This allows the hydroplanes to be controlled from the self-centring left hand stick. Thus if the model should start to rise, a small tap or nudge upwards on this stick will cause the hydroplanes to make the model dive and vice versa. This is clearly as a result of experience when flying model aircraft as I am much more accurate(?) when steering with one stick and controlling the elevators with the other.

The control surfaces ought to be adjusted so that the rudder and hydroplanes are at zero deflection, i.e. in line with fixed surfaces, with the transmitter trims in the central position. With luck, only small movements of the transmitter trims will be needed to get the model operating as desired.


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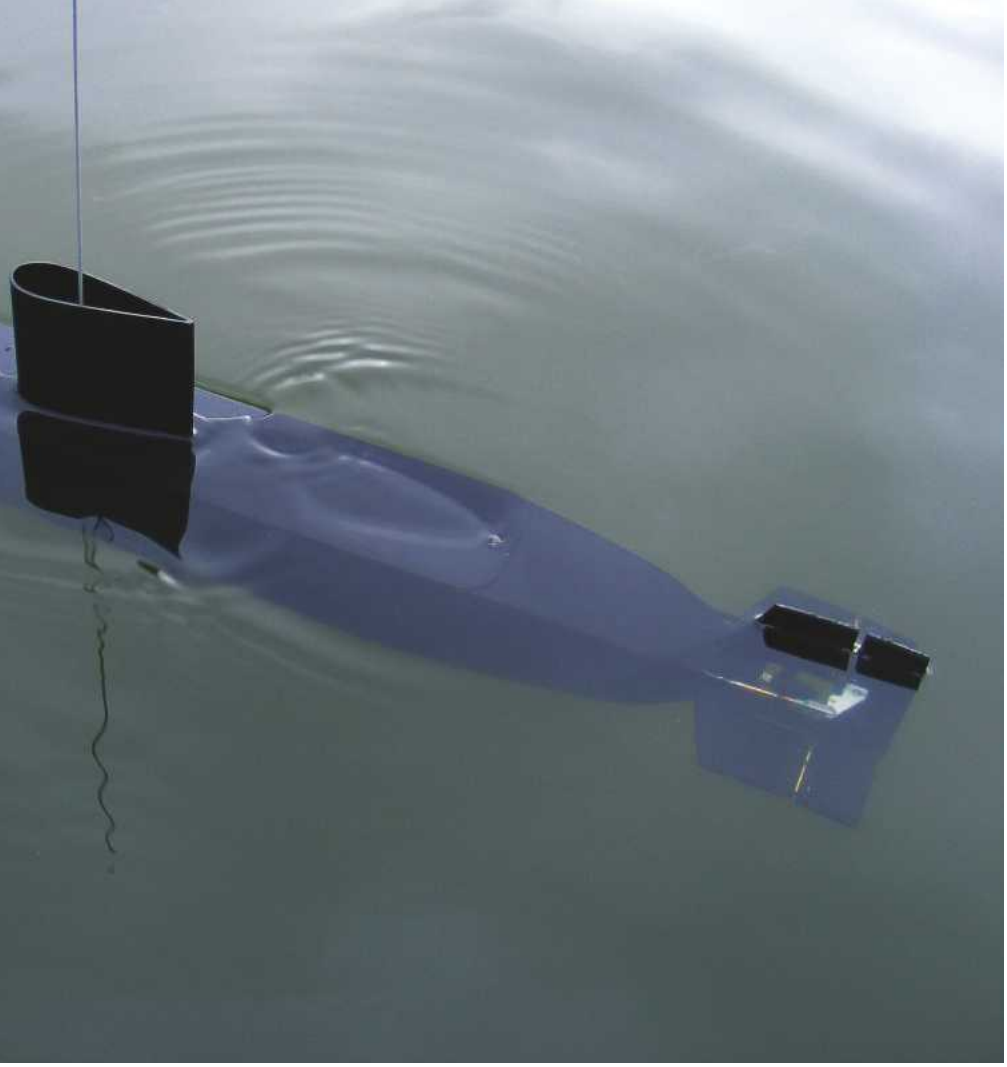
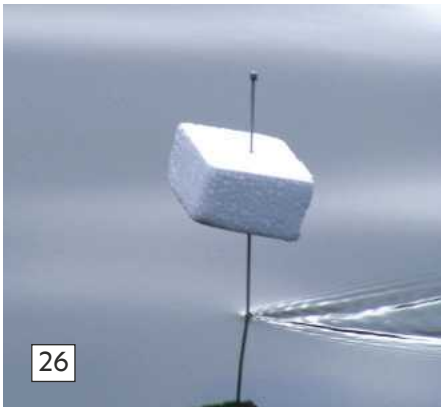
Trial runs

Before giving the model a proper sail, as opposed to the previous testing in the bath and garden pond, a precaution was sensible. This was no more than a cube of expanded polystyrene, cut from some packaging with sides of about 2 inches (50mm). A slot was cut half way through the block and it was slid on to the top of the antenna with the slot facing rearwards. The idea being that it would prevent me losing sight of where the model was, easily done when trying to get the right trim positions on the transmitter. Should the model dive suddenly or too deeply, then the drag as this cube enters the water would immediately slow the model and cause it to rise. Also, hopefully never to be used, if Nixie started to leak, then the cube might just keep it afloat long enough for recovery, **Photo 26.**

Keeping the model close to and parallel to the shoreline, it can first be sailed at slow speed to check motor and rudder performance, adjusting the rudder trim if needs be for a straight run. Once happy, then the speed should be increased as the model runs past you whilst carefully observing its behaviour.

If you are lucky it will start to slide below the surface in a smooth fashion. Should it take a sudden dive then pull back on the hydroplane stick and/or cut the power to the drive motor. Try sailing with a little less power and maybe a touch of 'up' trim on the hydroplanes as it is a matter of fine tuning all the controls to get the desired smooth diving motion. If Nixie totally refuses to dive, then add a little 'down' trim on the hydroplanes. One possible problem is that when the model starts to dive, the propeller

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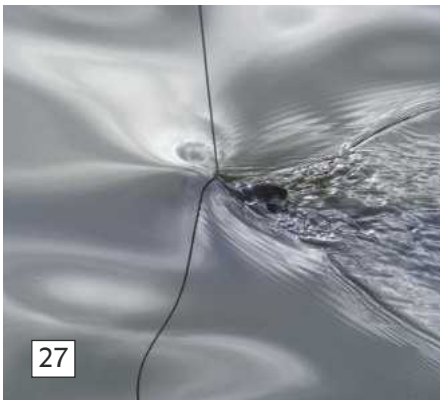
27

breaks the surface and aerates with lots of froth and noise, but little thrust. The prototype Nixie did this on the first runs and the cure was to add a little extra ballast to the stern compartment as the submarine had been under-ballasted and having left the box of lead pieces at home, it was correctly trimmed at the pondside with some mixed coinage from a trouser pocket!

When you have got Nixie to slide under the water, then all it calls for is gentle adjustments to the hydroplane, and possibly the speed control, until it runs without breaking the surface and only the antenna is visible, with or without the foam block, **Photo 27,** this picture just revealing the top of the conning tower. Nixie may be slowly oscillating, as indicated by the antenna moving up and down slightly, but this is not a major problem.

Once all set up, the submarine can be sailed around the lake without of course the cube on top of the aerial. It should maintain its submerged trim in gentle wide turns, but tight turns will slow it down and it will probably resurface, although with anticipation you can learn to apply a touch of down hydroplane to counter this effect and stay submerged. Astern operation is distinctly odd though. The prototype will start to move backwards and then begin to dive stern first and the bows may lift out of the water, so perhaps best to only use astern power for an emergency stop?

Conclusion

Nixie may be a simple model, but with careful construction and preparation it can reward you with an r/c submarine experience at a modest cost. **Photo 28** perhaps captures Nixie at its most menacing, perhaps preparing for a military deployment and action whilst on a quiet Scottish Loch somewhere? It is also a good use for that old-fashioned 27 or 40MHz outfit that you didn't discard in the mad rush to join the 2.4GHz fraternity. It would be a simple task to keep the basic layout of this design, but alter the external appearance and likewise, if you felt the watertight box were too small for your driveline equipment and r/c, that would be easy to enlarge.

Be warned though, as such an economical entry into the world of radio controlled submarines can bring out the worst in your fellow modellers. The slab sides of Nixie's hull have resulted in comments that it looks like it was made from a flat-pack kit and maybe ought to have been called HMS Ikea, but we can perhaps dismiss all that as pure jealousy maybe?

Enjoy your hobby – ***Glynn Guest***


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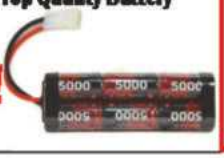

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Above: The Polish guided missile frigate ORP General Tadeusz Kolciuszko entering the River Mersey for the Battle of the Atlantic Commemoration in 2013.

Welcome once again to our regular sortie into the world of fighting ships and in this issue we have Part One of a three part feature for the Polish Navy's Oliver Hazard Perry Class frigate, ORP General Tadeusz Kolciuszko. We also continue with Part Eight of our OSA 2 project.

ORP General Tadeusz Kolciuszko – Part One

One of the NATO warships visiting the 2013 Battle of the Atlantic 75th Commemoration at Liverpool was the former USS Wadsworth, now part of the Polish Navy. USS Wadsworth was launched from the Todd Pacific Shipyards in San Pedro, California, USA, and entered service on 28th February 1980. In June 2000, she was commissioned into the Polish Navy on the 80th Anniversary of the establishment of that navy. The name relates to a Polish officer holding the rank of colonel in the Continental Army during the American War of Independence and due to his talents as a military architect he was later promoted to Brigadier General. When photographed in 2013, little had changed on this warship since 2000, but these guided missile frigates are well regarded warships having highly effective weapon systems and sensors. Currently, ORP General Tadeusz Kolciuszko has the Mk. 13 single arm missile launcher forward with 36 standard SM-1 surface to air missiles and four surface to surface harpoon missiles available to it. The gun is an OTO Melara 76mm 62 calibre weapon mounted on 01 deck amidships and the close in weapon system (CIWS) is a 'bolt-on' Phalanx gun mounted on top of the helicopter hangar. At 3658 tons, 135.64m in length and 13.72m beam, this frigate could be considered relatively small, but she does have comprehensive armour distribution of 19mm over the engine spaces, 16mm over the engine control room and 19mm of Kevlar armour around the vital electronic systems and command and control spaces. Power is provided by two gas turbines developing 41000shp to a single 5.5m dia. five-bladed


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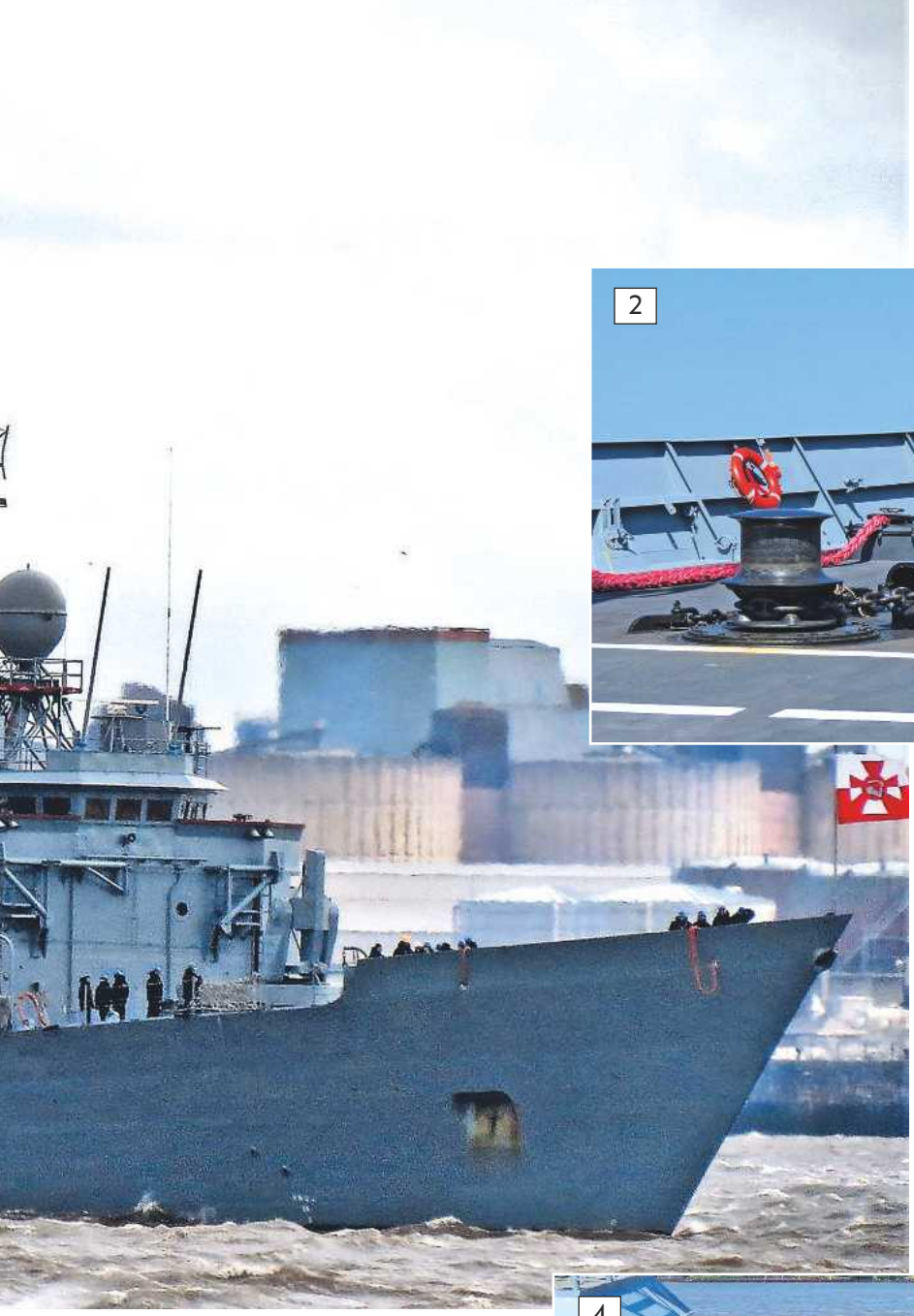


Photo 1. Looking towards the bow and please note the loudspeaker.

Photo 2. Moving further back on the forecastle and focusing on the cable holder and associated anchor handling fittings.

Photo 3. The raised bulwark just abaft of the bow to starboard with each of the panama bows having a hinged cover plate.

Photo 4. A general view showing the forecastle in more detail, especially the deck markings.

CP propeller. Also, there are two auxiliary retractable power units which can produce around 6 knots. Due to stress related problems in the hull, doubler plates have been added just below the deck edge amidships.

Ship's tour

This commences right forward with a view looking towards the bow and it is worth noting the need for the raised bulwark, as without this the forward part of the ship would be very wet in rough seas, **Photo 1.** Moving slightly further back, but remaining with this area of the bulwark, we can see the cable holder, a bonnet leading down to the cable locker and the single anchor cable feeding round the cable holder to the hawse pipe. To the right of the picture is the protective cover for the operator of the cable brake, **Photo 2.** Remaining with the bulwark, it's interesting to note from a modelling perspective the extent of the splay outboard and the need for cover plates for the mooring rings and Panama Bows, **Photo 3.** The next picture provides a different view looking from the extreme edge of the starboard bridge wing towards the forecastle, taking in part of the bridge wing and the Mk. 13 single arm missile launcher, **Photo 4.** This Mk. 13 MOD 4 missile launcher uses the Mk. 92 radar fire control director which is the egg shaped dome mounted on top of the bridge. This launcher is capable of handling both surface to air and surface to

surface missiles, **Photos 5, 6 and 7.** Remaining in the same location, but returning to the raised bulwark, we have a good impression of how the simple, but nevertheless essential lifebelt ring is mounted, together with its accompanying strobe light, **Photo 8.**

Turning 180 degrees, the upper part of the bridge comes into view and in this picture are the two swinging arms used for replenishment at sea (RAS) and the small platform above the larger of the two, **Photos 9 and 10.**

Views along the port side

Either side of the bridge at deck level are two passageways which give access down the port and starboard sides, **Photo 11.** The next picture shows the general arrangement at main deck level from the forecastle going aft along the port side. Also in this general picture, ringed in yellow, is the Mk. 92 fire control radar director and ringed in red is the SLQ 32 electronic counter measures system and mounted on top of the forward lattice mast (ringed in blue), is the SPS 49 long range two dimensional air search radar, **Photo 12.** Moving further aft we can see ringed in yellow is the gun and missile fire control radar and in red is one of the two triple Mk. 32 324mm anti-submarine torpedo tubes which used to be very common on RN warships, **Photo 13.** Also clearly visible in this last picture are the hull strengthening plates, one above the other towards the top edge of the hull, indicated by the yellow arrow.

Remaining on the main deck and the port side, here are two detailed pictures of the Mk. 32 triple ASW tubes, **Photos 14** and **15.** It's worth noting the deck inboard of this mounting in **Photo 16** with its non–slip surface and the three circular holders used for mounting gas launching cylinders for the torpedoes. Moving further aft, and still on the port side towards the hangar, clearly visible on 01 deck is the 76mm Oto Melara compact dual-purpose gun. The rails adjacent to the gun are in sections, being detachable and fitted to the upper outer edge of the deck housing, and please note the variations in the types of water tight door which are ringed in blue, **Photo 17.**

In the November 2017 issue, we will continue on 01 deck taking in the bridge etc.

Photo 5. The single arm of the Mk. 13 Mod 4 missile launcher.

Photo 6. The relatively simple circular base mounting of the Mk. 13 missile launcher.

Photo 7. The arm on the launcher is in the reload position.

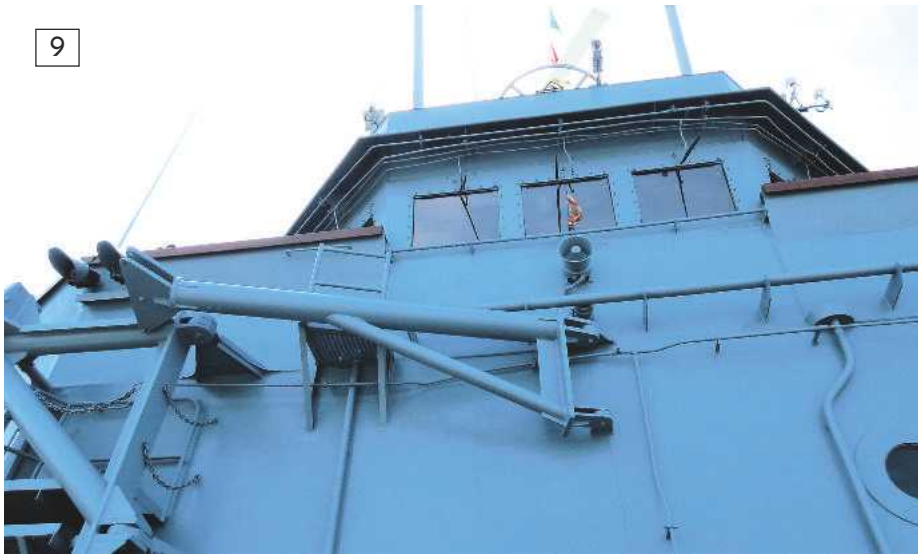


Photo 8. The lifebelts are still an essential piece of life-saving equipment.

Photo 9. These swinging arms are for replenishment at sea (RAS) purposes. The arm on the outside swings forwards so they are 90 degrees to the bridge face. The long arm in the middle is a support which is attached to the back of the outside one. There is only one of these which can be moved from either side depending on which beam they are doing the transfer.

Photo 10. The smaller of the RAS arms, fitted to the starboard side of the bridge face.

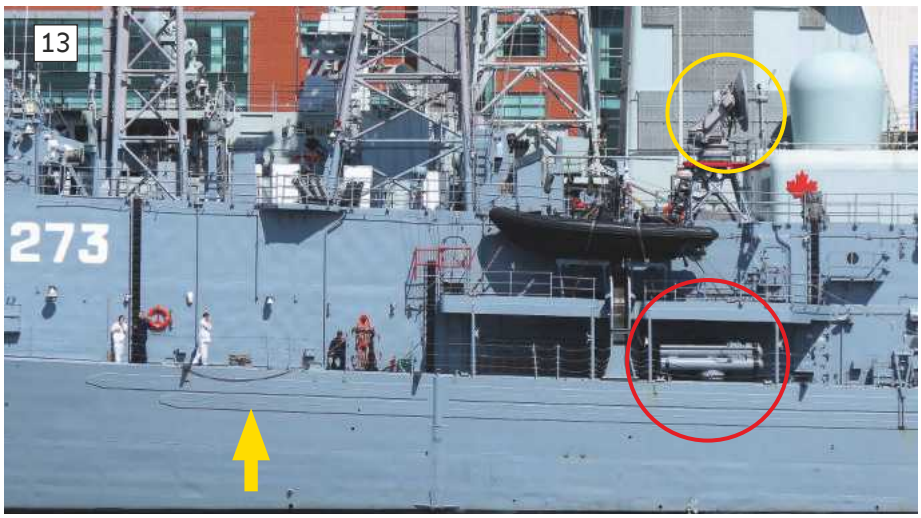


Photo 11. Over to port and the passageway along that side of the main deck.

Photo 12. A general view along the port side aft from the bridge. Please see text for description of the highlighted fittings.

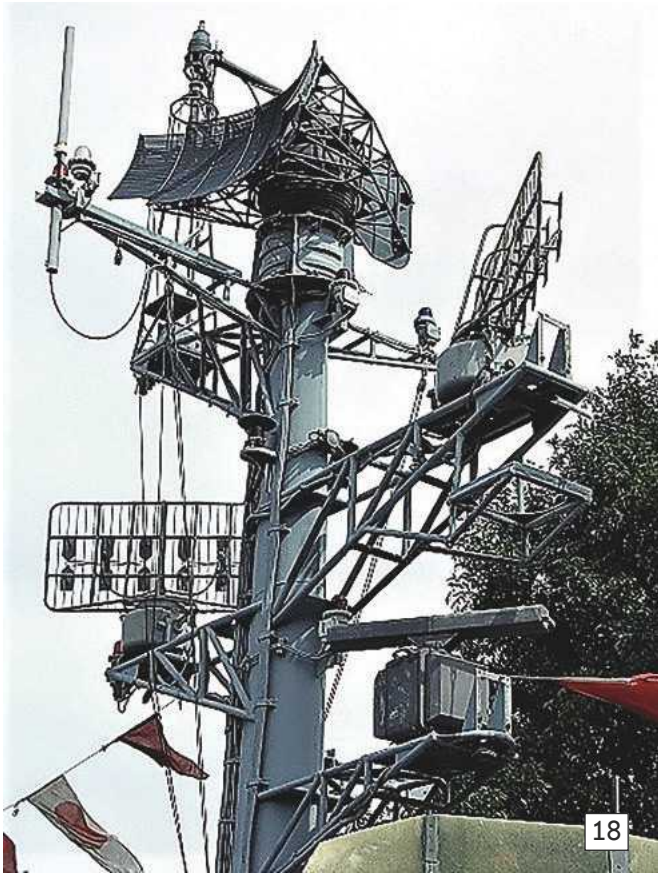
Photo 13. A view further aft showing the 18ft RHIB and its davit arrangement. Please see text for description of the highlighted fittings.

Photo 14. A detailed shot of the triple Mk. 32 ASW torpedo tubes.

Photo 15. The rear of the Mk. 32 torpedo tubes.

Photo 16. Inboard of the Mk. 32 torpedo tubes, port side. As a matter of interest the same location to starboard is different, in so much as there is no RHIB or platform for its davit.

Photo 17. The 76mm dual purpose gun is mounted one deck higher and amidships. The watertight doors and their configuration are ringed in yellow.



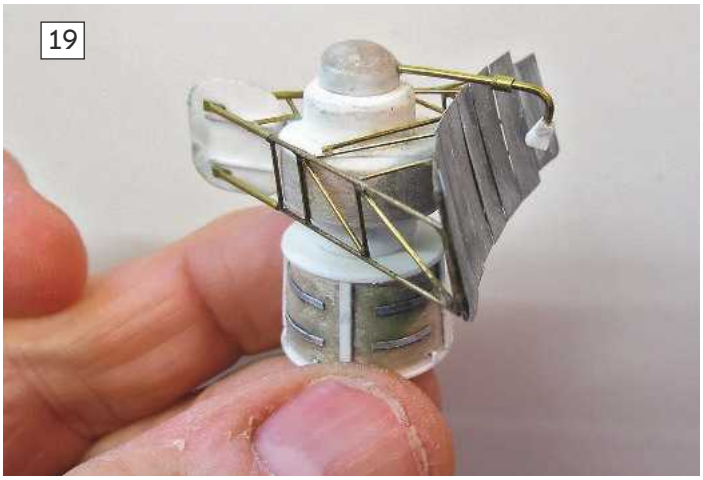
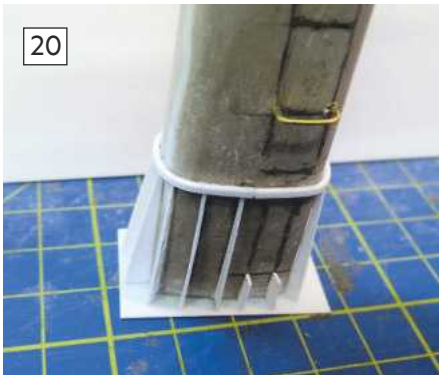


Photo 18. The foremast of an OSA 2 boat.

Photo 19. The Square Tie surface search radar now completely assembled.

Photo 20. The foot of the mast has angled strips of1mm styrene, top and bottom of the bands around the mast.



OSA 2 Type 205U Fast Missile Boat Model PART 8

Foremast and missile tubes

In this issue we will complete the foremast and start preparing the surface to surface missile launching tubes and as a reminder or what we are aiming for, here is a picture of the full-size mast, **Photo 18.** In the recent September 2017 MB, the Square Tie (NATO code) surface search radar was ready for final assembly with each segment of the reflector to be fitted to the support framework. As previously mentioned, strips of 0.5mm Litho plate were secured to the frame using superglue followed by the fixing of the feed horn into the small domed top and a final touch are the small strips of Litho plate fitted one above the other in the circular mounting, **Photo 19.**

Foremast detail work

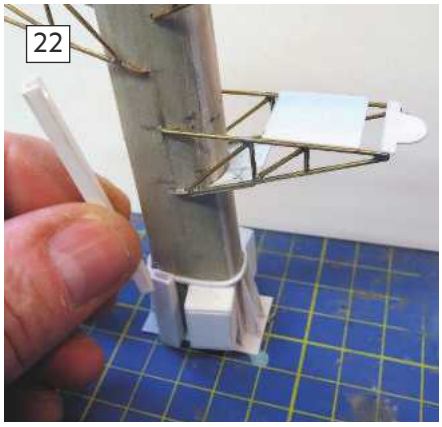
On the full-size mast, the upper section is bolted to the base with vertical angle pieces surrounding the joint with a further smaller set above the joint line. It is into these vertical angle pieces that the terminal boxes are fixed. On this model, sections have been removed to allow the boxes to fit snugly to the side of the mast, **Photo 20.**

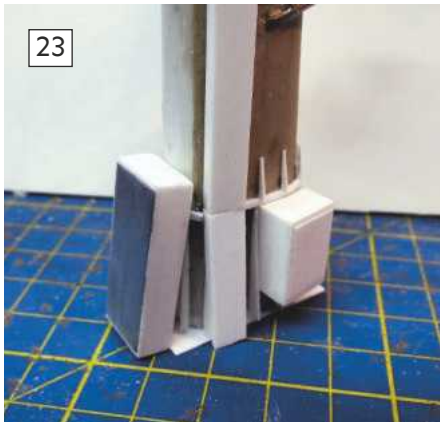
To gain access to the upper yards and radar arrays, small hand and foot grips are fitted to the right hand side of the mast using 1mm brass rod folded around a timber jig to ensure consistency. The locations were marked and drilled using a pin vice and 1mm bit as in **Photo 21.**

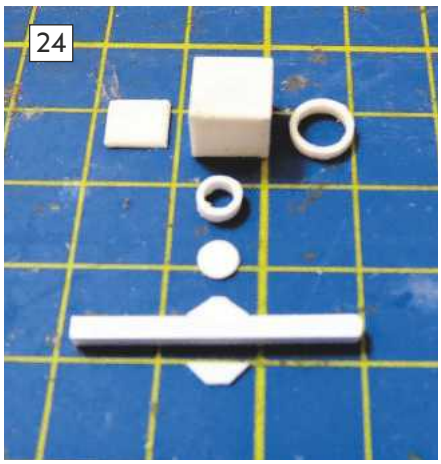
Fitted to the left hand side of the mast is box like trunking which on the full-size warship is used to encase the cabling up the side of the mast, although it terminates halfway up with exposed cabling continuing up the mast to feed each of the radars, IFF arrays and lighting. This is very convenient for this model as it allows power for the navigation lighting to be fed through this trunking and up the side of the mast as per the full-size warship, **Photo 22.** The larger of the distribution boxes is fitted to the rear of the mast and like the full-size version is angled forwards and supported here on the mast by appropriately angled styrene strips, **Photo 23.**

Navigation radar

Clearly visible in the picture of the full-size mast is the navigation radar, a box-like unit on the lower platform forward. For the model this was formed using styrene tube 6mm o.d. for the base & 4.8mm for supporting the radar scanner. The box section mounting is formed from 1mm styrene sheet with Evergreen No. 165 for the radar scanner, **Photo 24.** With the parts assembled for the box and that of the scanner, all that is required is to fit the latter with its angled brackets on to the box mounting, **Photos 25** and **26.**







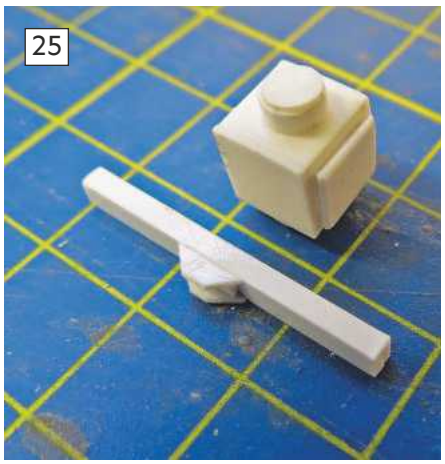


Photo 21. On the left side of the mast are a series of hand & foot rungs. On the full-size OSA boat these enable access to the various upper platforms.

Photo 22. As per the original mast there is a cable trunking running up the right hand side of it.

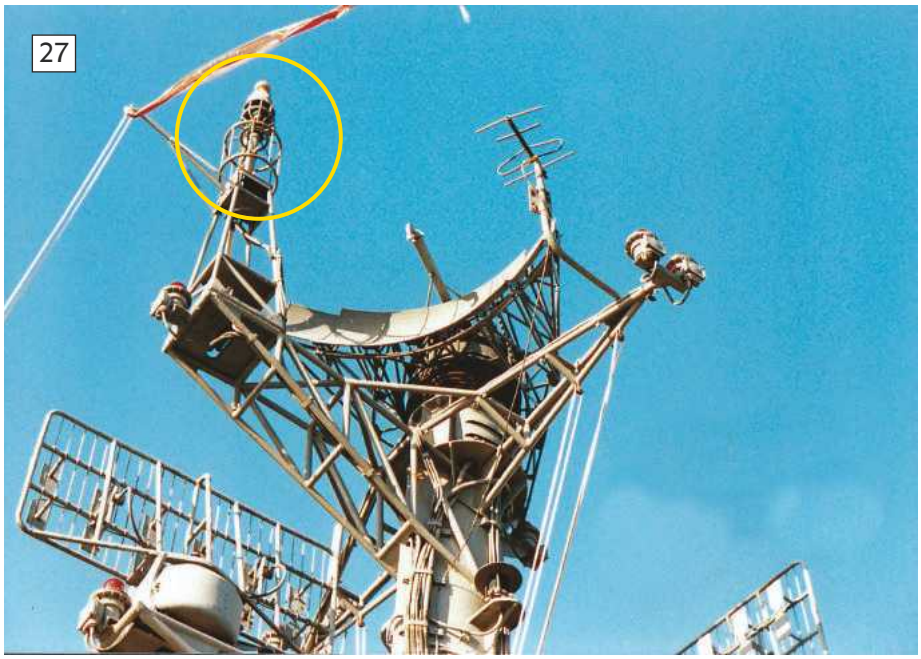
Photo 23. Now installed are the various electrical junction boxes. Strangely, there are no handles or clips on them.

Photo 24. The parts for the navigation radar are made from 1mm styrene sheet, Evergreen box section and tube.

Photo 25. The assembled radar base unit and its scanner.

Photo 26. The navigation radar ready to be airbrush painted.

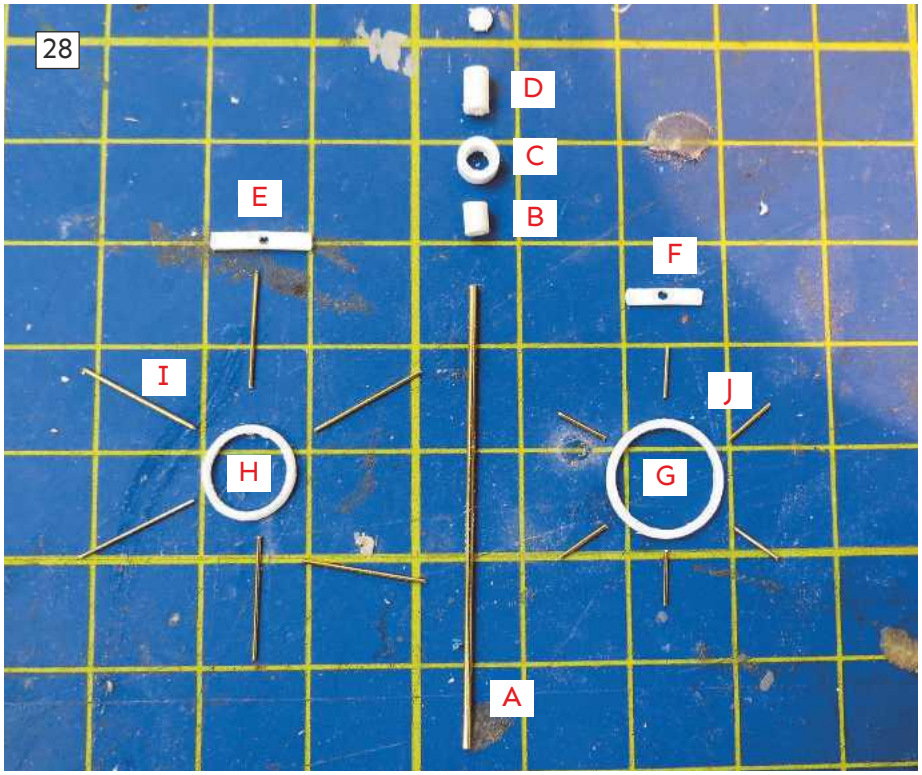
Photo 27. Positioned at the top of the after platform is the High Pole IFF array, here ringed in yellow.

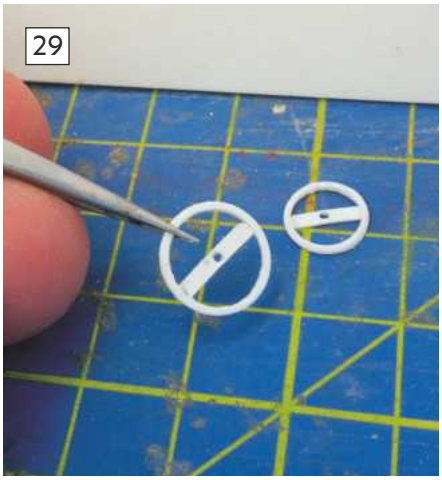


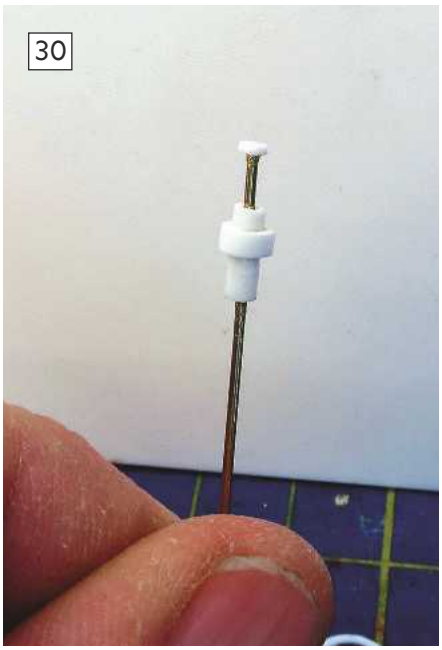
High Pole B shipborne IFF system

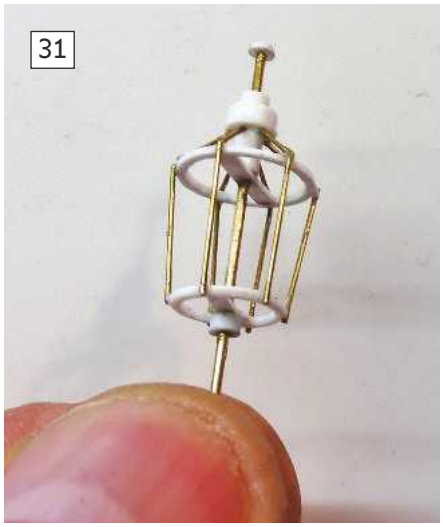
At the top of the after platform is a shipborne IFF system called High Pole B, the purpose of which is to identify this OSA boat to friendly forces of aircraft and warships, and is seen here on top of the after platform ringed in yellow, **Photo 27.**

Following the well-tried system of reducing a device to each of its component parts, this becomes much easier than might initially appear to be the case. The basic shape is rather like a hollow plant pot, but wider at the top than its bottom. To make the array fit together it was essential to have a common shaft which is marked A, with each of the parts B, C, D, E & F actually fixed to this centre shaft. Parts E & F will be fitted in to the styrene









rings (cut from Evergreen tube), **Photo 28.** The centre pieces, E & F, are fixed into the rings G & H with the height and space between the rings adjusted to suit the drawing, **Photo 29,** and **Photo 30** shows those fittings B, C & D fitted on to the top of the central shaft. The final assembly involves fitting the upper and lower rings and adding the 0.4mm brass wire strips around the circumference of each ring, followed by adding the wire stays from the top ring into the top of the mast as in **Photos 31 and 32.** All that remains then is to add the upper Dipole to the very top of the array, **Photo 33.** All the fittings discussed thus far were temporarily added to the mast to view its penultimate appearance, as the last part of this mini-build will be to add some working LED's. However, this will have to wait until we are further advanced with the remainder of the fittings, and in due course the application and laying of the Litho deck plating. For now, the mast is in it's almost completed form, albeit minus the LED's & wiring, **Photo 34.** The next mini-build project will involve the construction and fitting of the detail to the four SS-N-2 missile launch tubes. For now, here is a line-up of the materials in the raw so to speak, which include as its primary part, a length of domestic ABS piping, 43mm x 1.5m long, **Photo 35.** Of course some practical handcraft work needs to be done if we are to achieve what you see in this example of the missile tube as fitted to a full-size OSA 2 boat, **Photo 36,** a somewhat different arrangement to those on the previous OSA 1 craft.

References and acknowledgements

Oliver Hazard Perry Class FFG's refs:
Combat Fleets of the World 15th Edition, pages 911 to 913
Ships and Aircraft of the US Fleets by Norman Polmar, pages 162 to 166
ORP Generał Tadeusz Kościuszko ref:
Combat Fleets of the World 15th Edition, pages 560 to 570.
Albion Alloys for 1mm fine styrene angle.
Russ French of Task Force 72 (Australia) for his advice and assistance concerning the Oliver Hazard Perry Class FFG's.
OSA 1:35 GRP Hull is available from MTB Hulls, website: www.mtbhulls.co.uk

Photo 28. Each of the basic parts for constructing the High Pole IFF array - please see text for detailed information.

Photo 29. The separator rings which will fit on to a common shaft.

Photo 30. Top of the common shaft with the smaller parts added.

Photo 31. The almost completed High Pole B IFF array.

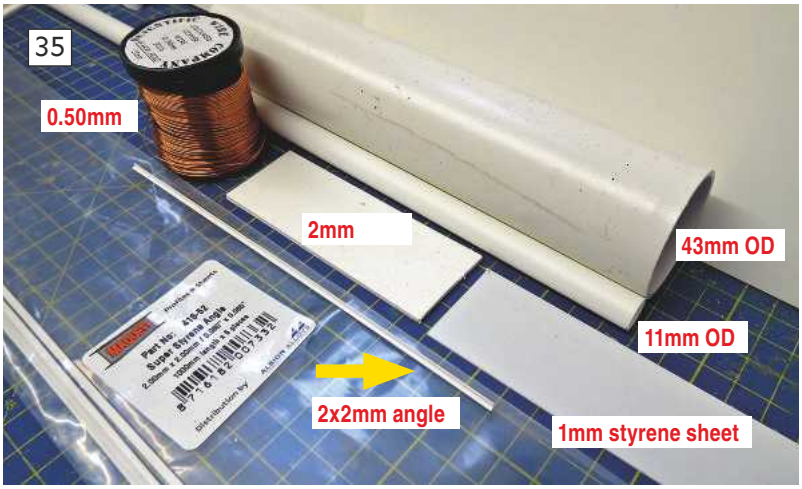
Photo 32. Top of the High Pole B IFF array.

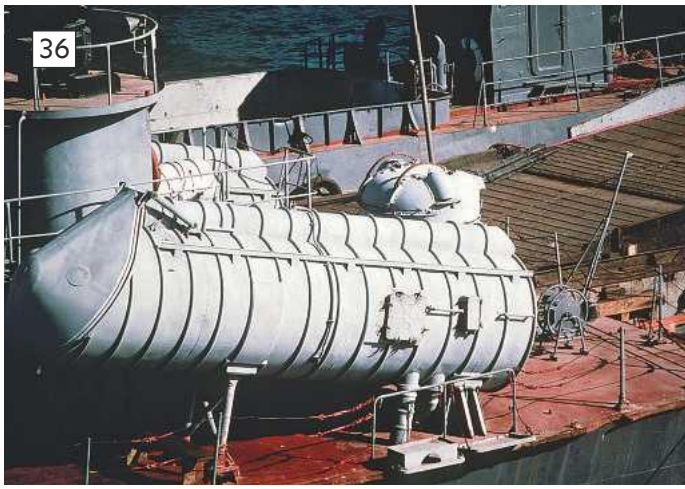
Photo 33. The completed High Pole B IFF array on the mast.

Photo 34. It is a 'busy' foremast, now completed except for the various LED's still to be added.

Photo 35. The basic parts required to build the surface to surface missile tubes.

Photo 36. What we are aiming for at 1:35 scale! An SS-N-2 missile tube, one of four mounted on these boats.





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Swan Lake

Gordon Longworth's realistic radio controlled Swan

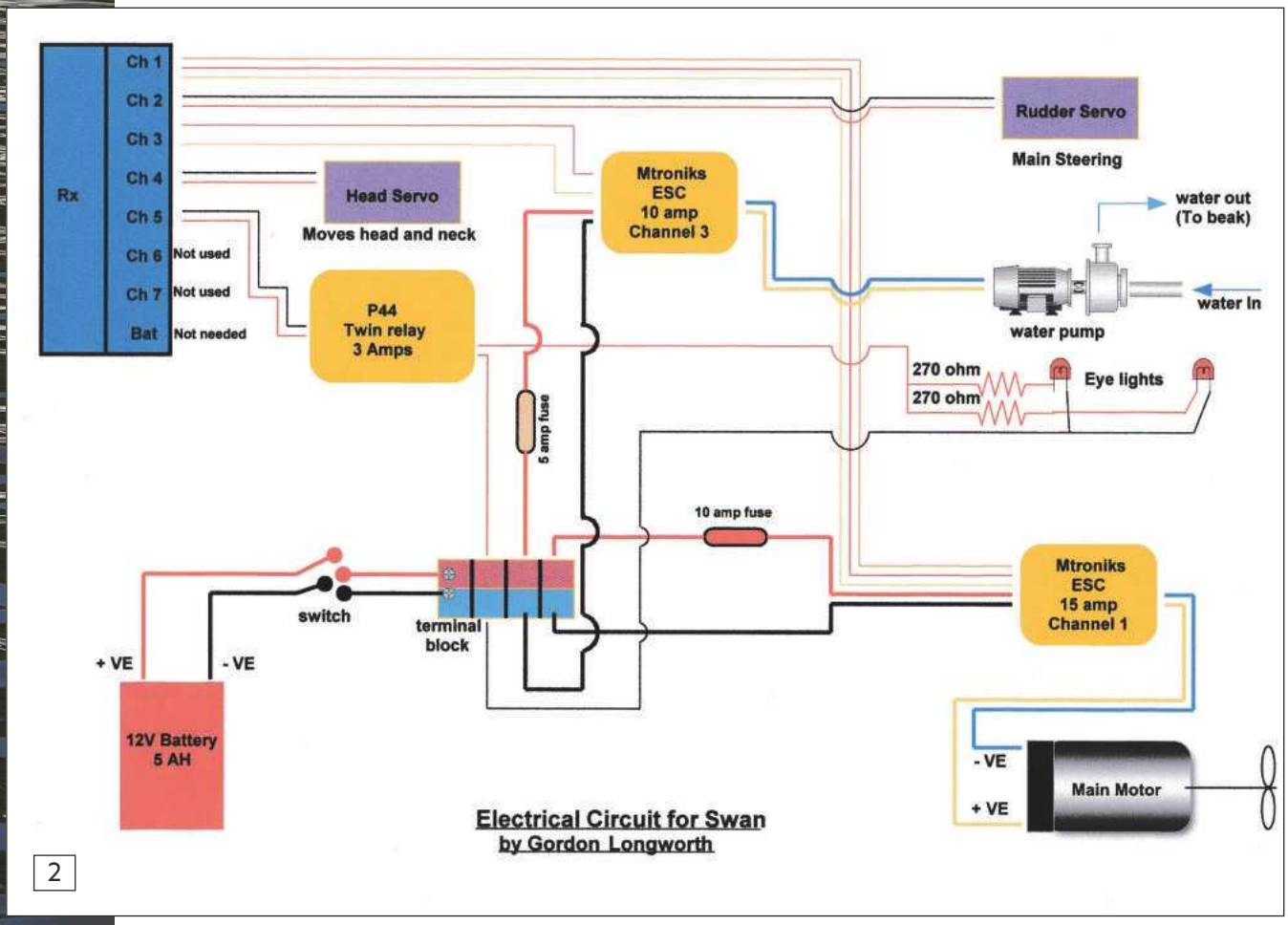
That well-known Swan Lake ballet written by Tchaikovsky, who was also famous for Sleeping Beauty and The Nutcracker, tells the story of a princess named Odette who was cursed by a wicked sorcerer and turned into a swan. This probably has its origins in an older Russian folk story called The White Duck, but be that as it may, I had already made a radio controlled plastic decoy duck some time ago, which had limitations due to its size. However, one thing discovered with the duck was that it is almost impossible to stick anything to the plastic used in these mouldings, normally of either polyethylene or polypropylene, and that model proved to be no different.

As all good fairy tales go, the white swan came to me one day, not in a dream as you would expect, as it was actually on Amazon, where lo and behold there appeared a vision of a full-size decoy mute swan, **Photo 1.** It had more than enough space to include all the goodies I wanted to install, although it did need considerable surgery from the start.


1

Radio

The circuit diagram, **Photo 2,** shows the general layout and a spare seven channel



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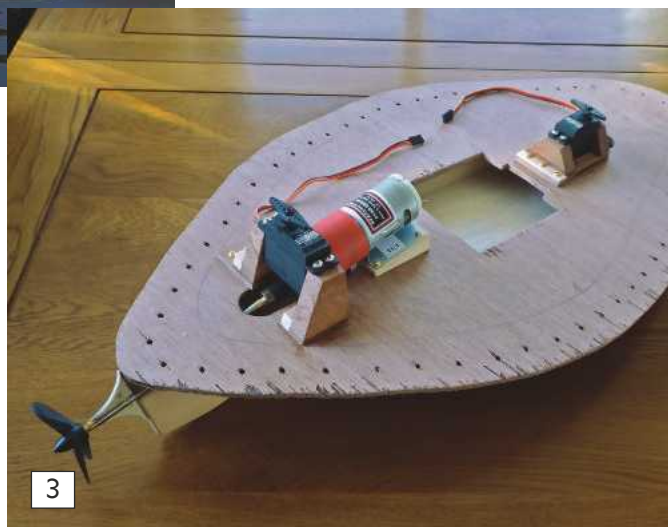
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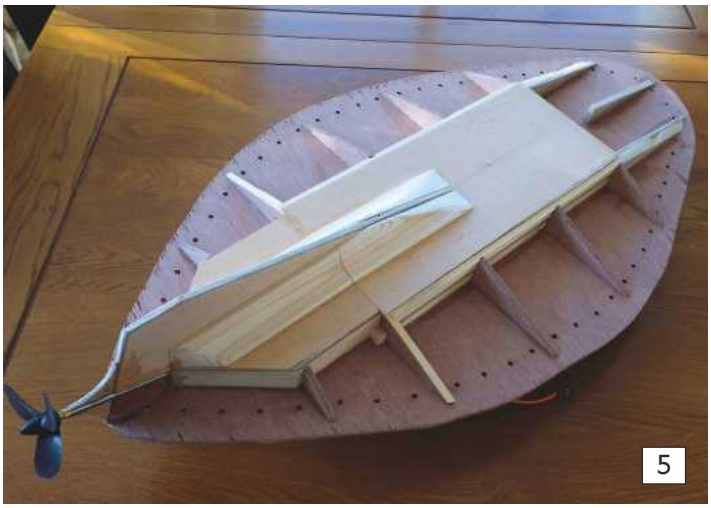
receiver was to hand, hence some unused channels, but maybe later another feature, or two, can be added later. As the neck was a separate moulding, making it moveable would be a good idea and a heavy duty servo took care of that. Two bright red LED's were fitted in the eye sockets to give the swan a bit of an evil look and a water pump to fire a jet of H2O from above the beak. An Action R/C Electronics relay acted as a switching unit, with separate esc's for both main and water pump motors. Sadly, the swan had to be beheaded to fit all the wires, resistors and tubing up through the neck into the head, and then reassembled afterwards. The rudder servo and motor controls are standard, but please notice the battery isolating switch and protective fuses fitted in-line.

As it turned out, this was not a particularly good moulding for conversion as the base of the swan was very concave. Let's face it, nobody designed it to be a working watertight model, but merely as a floating decoy, so the bottom was totally removed to be used as a testbed for the adhesives later. A 6mm plywood base, **Photo 3,** replaced the original to create a working platform on which the rudder and propshaft could be easily glued and/or screwed. Likewise, the top was carefully sawn-out to give decent access when everything was reassembled.

The basic motor and servo layout is in **Photo 4,** but to stabilise the swan it was desirable to have the centre of gravity as low as possible, so the battery and ballast weights were placed below the plywood base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in a built-up compartment which you can see in **Photo 5** looking at the underneath view, and this was all eventually planked with plywood strips to create a smooth streamlined 'bottom'. The motor and servos were installed before the base was finally fitted to the plastic upper parts.

Glue?

At this point I must have experimented with every adhesive known to mankind, and **Photo 6** is a picture of just a few of them, but there were many others. Model boating forums and other websites across the world supplied possible solutions, but anyone who has ever tried sticking something to PTFE or silicone will understand the problem. It's the same with polypropylene and polyethylene which these blown plastic decoys are made from, and nothing will bond to these materials easily, if at all. This doesn't include the normal modelling fillers, wood glues and superglues we all know and love, which were still used for the more conventional parts of the model. A word of warning if you go down this road, as some of the 'special' glues will start to cure as soon as you open them, so even if they are not suitable and go on the workshop shelf, by the time you can think of another use for them, they may have set solid.

However, the product shown in **Photo 7,** also from Amazon and although not cheap, does claim to stick this material using a polyolefin solvent primer and a separate glue, which I think is something like superglue. You can still peel things apart forcibly after using it, so it's not perfect, but does adhere better than anything else trialled. It appears to come from Poland, or somewhere in that direction, and it's difficult to say exactly where as all the instructions are in various foreign languages, the only English being on the Amazon website selling the product.

Anyway, after treating the lower surfaces with this special 'glue' as a surface preparation, the top section of the swan was joined to the plywood base, **Photo 8,** by being 'stitched' using copper wire from a stripped mains cable. This picture also shows the access hole to the battery compartment beneath the baseboard. The small uneven gap between the swan's top section and the base was bridged with wire mesh and then with fibreglass filler, which would now adhere more easily to the plastic, prior to finally being sanded smooth.

Finishing-off

A close-up of the head shows the LED eyes and beak nozzle, before it was painted black, the eyes looking surprisingly real even when not switched on, **Photo 9.** However, the main reason for the project was to get up close and personal with the wildlife on our boating lake at Etherow Park, near Stockport. To this end, a miniature HD video camera will be hidden

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in a plastic cygnet (actually a duckling) sat on top of the swan, **Photo 10,** A handle was also needed to lift the top part off the body, and the cygnet firmly fixed to the top of the swan supplies that need. The now finished base, was waterproofed with a couple of coats of paint, **Photo 11,** before the Swan was turned upright and had the remaining internal wiring fitted and tested.

On the water

At the lakeside, the stand doubles as a launching cradle, **Photo 12,** which has to be negatively buoyant so that it can be lowered under the swan for launching and retrieval, hence the lead flashing you can just see which is nailed flat to its sides.

After a little tweaking with a couple of lead weights and moving the battery a little, the swan floats perfectly and has just about the correct speed for a paddling swan, **Photo 13.** A later modification to enlarge the rudder gives a better response to steering. With a range of six metres or so for the water jet when the public get too close or boisterous is a bit of fun, and hopefully once the camera is fitted and working we can get some good video footage of the fascinating water birds who share our lake.

Enjoy your hobby - ***Gordon Longworth***


11


12

By Jon Godsell

Goliath

This is a self-propelled Backhoe dredger, which is a type of grab crane dredging pontoon. It consists of a huge hydraulic grab crane mounted on the dredging pontoon, this usually being held in place by three spud poles. Backhoes are used to dredge heavy clay, soft stone, blast rock and soil thought to contain boulders, for example in foreshore protection operations. Goliath and her sister Simson have Backacter 1100's, currently the world's largest hydraulic dredging cranes. The main bucket holds 20 to 40 cubic metres of material and can work at a dredging depth of up to 18 metres and uniquely, the vessel is self-propelled. Normally a suitable ship is moored alongside to receive and carry away the waste material.

Van Oord's two vessels of this type dredge ports and provide services worldwide to the offshore industry and Goliath was pictured here at Liverpool when being deployed on such a task. From a model making point of view, Goliath would make for a most unusual r/c model, particularly as it is self-propelled.

Principle particulars

Vessel type:	Self -propelled Backhoe dredger	**Length (OA):**	66.85 metres
Flag:	Netherlands	**Length (BP):**	64.18 metres
Manager:	Van Oord NV	**Width:**	18 metres
Built in:	2009	**Depth:**	4.25 metres
Shipyard:	Shipyard De Donge	**Total power:**	3730kW
		Crane:	Backacter 1100
		Dredging depth:	18 metres


GOLIATH


Van Oord
GOLIATH

Harry Hitchenes converts the Airfix plastic kit to r/c

HMB Endeavour

It all started on one of our weekly jaunts to the Metro Centre in Gateshead. As usual we called in to a shop selling, amongst other things, cut price books and there on the shelf was 'Captain James Cook' written by Richard Hough. Four hundred and ninety two pages for the princely sum of £2.99, which seemed like a bargain to me and back home I soon found that this was an excellent read. Full of detail yet written in a way which makes it more than just 'dry' history, reading like an adventure yarn, which of course it was. The more I read of it the more difficult it was to put down, although a 12 year-old malt whisky also has its appeal.

Reading this made me recall my early days of model making and in the middle to late-1950's I remember the good old days of balsa bundles. Take one block of balsa, carve a bow, add bits to make the raised back and front ends. Drill four holes for the masts and bowsprit and add dowel masts pinched from dad's bits and pieces with curved paper slotted on the dowels for sails. Stick a nail in the bottom with some lead for ballast and you had Captain Kidd's pirate ship ready for the high seas and if time allowed one might even paint it. Once on the lake at Paddy Freemans Park in Newcastle, it would sail brilliantly for ages, or at least I thought so.

A couple of weeks later my wife Edna and I went for a day out to York and inevitably we had a look in one of the model shops (yes, there are some) and there in the window was the Airfix model of HMB Endeavour, the HMB meaning 'His Majesty's Bark'. I was pondering on the size of the model and whether it would convert for r/c sailing, but Edna settled it by reminding me that with the new tiny receivers and miniature servos sitting in my workshop it should be easy to fit everything into the hull. So in we went and I invested £18.99 in a new challenge and the die was cast, so it had to work.

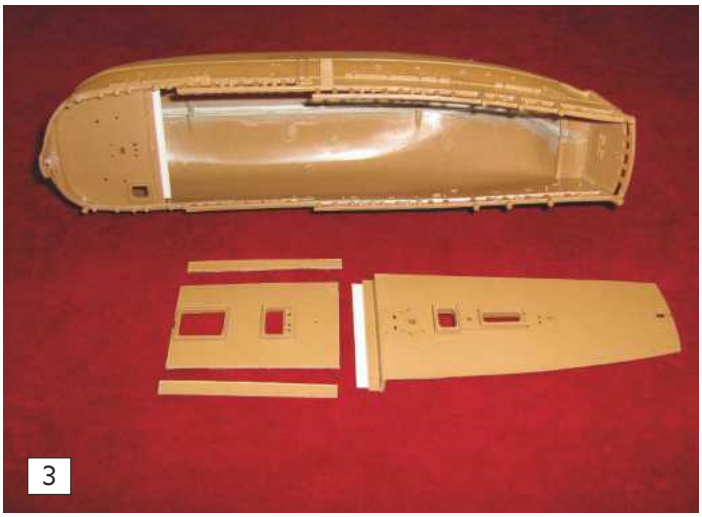
The kit

Now before we proceed I have to admit that I love the sight of a well-made model of an old sailing ship, but, and it is a big but, I shudder at the thought of having to learn all the technical terms for the plethora of standing and running rigging of those fine ships, so this model is 'Basic' with a capital B. There are bits of rigging to stop the masts falling over and some more to make the sails turn. As it so happened and to be honest, the kit sat unopened for some years before more recently I had a good look at its contents, **Photo 1**. Having just finished a Revell Flower Class corvette the first thought was: 'Where are all the parts', but on checking, they were all there provoking the immediate reaction that it could be completed over a couple of evenings. As you will by now have guessed, that was not the case, but that's how it goes.

Let's start.....

The hull was clipped together and two micro-servos, a receiver power pack and the receiver were placed inside. Loads of room for all this, so the thought was that this was going to be a doddle. The next step was to decide on the size of the keel extension to stop HMB Endeavour falling over when on the water. Now, there is a well know Geordie phrase which was regularly used by my dad and it goes; 'If it luks reet, then it probably is reet'.


2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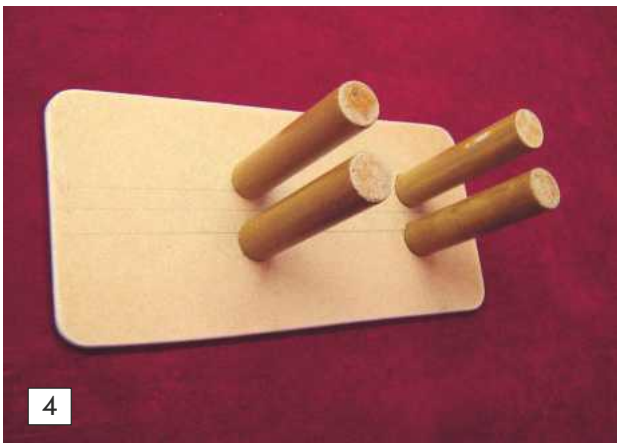
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So a quick scribble with a pencil and a bit of A4 paper and something that looked 'reet' appeared, **Photo 2** being of the hull with the keel fitted, it being sandwiched between the hull's two halves. Only time would tell if it was going to be too small or too big. The next step was put it in the sink to be tried with some weight in it and just four ounces of lead got it down to its waterline marks. At this point, the though occurred that being so small, would it ever sail? Mind you, as this is NOT the end of the article, you can safely assume that it did – eventually.

Deck and stand

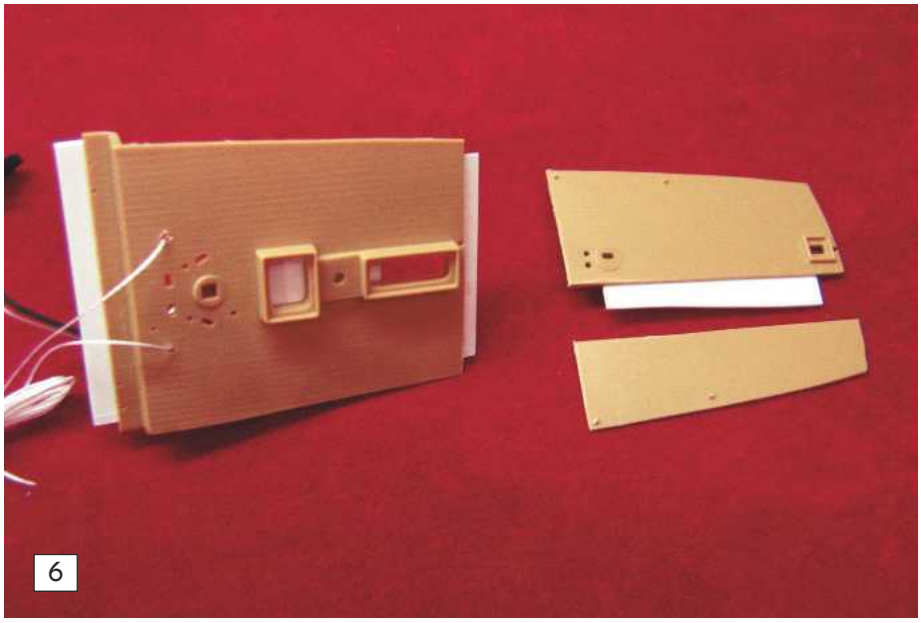
The kit has a one-piece deck section which can easily be cut into three parts; front middle and back pieces. The middle bit has to be removable to get the batteries in and out and **Photo 3** is of the surgically cut-up deck, with the forward section in the hull. You will note that narrow pieces have been from each side of the centre section, and 'lips' have been added to the front and rear parts. It was now thought becoming clear that a stand would make life easier.

This is quite simple, but is made from 'quality' materials, **Photo 4**. Its base is 6mm MDF and the uprights are 20mm dowel, actually a cut-down broom shank, but we modellers are brilliant recyclers aren't we? Yes, it is a bit basic, but the hull does sit on it okay with the keel extension 'trapped' between the dowel uprights.

Rudder

One could of course use the original from the kit, but as it is miniscule it would never turn the model when sailing, so back to the old 'let's try something that luks reet'. So, something that looks a bit like a bloated 'b' was the initial attempt and actually was not too bad, **Photo 5.** It was made a little shorter than the rudder post and at the top a triangular piece was inserted which would be used to turn the rudder via a closed loop linkage system to the servo. Braided 25lb Dacron fishing line is ideal for this, being easily obtained from numerous sources and a reel will last forever. The other property that Dacron has, is that being of nylon it slides through holes easily without fraying.

Making the hinges to hang the rudder were quite easy, a piece of plastic tube about the same length as the rudder post being initially prepared. Some close fitting rod was inserted inside it before the tube was cut into five roughly equal pieces. Three of these were glued to the rear of the kit's keel and the other two to the rudder. The hinge rod was cut approx. 2mm longer than the hinge assembly. At the bottom of the rudder post a small block of plastic (styrene) was glued to stop the rod falling out of the hinge. Now you know why the rudder is slightly smaller than the rudder post as a whole, but here the first problem arose as the rearmost section of deck could not be refitted without pulling the hull apart. The solution was simple – cut this quarterdeck section laterally across itself and the rear part longitudinally, all to be glued back together when finally assembled, **Photo 6.**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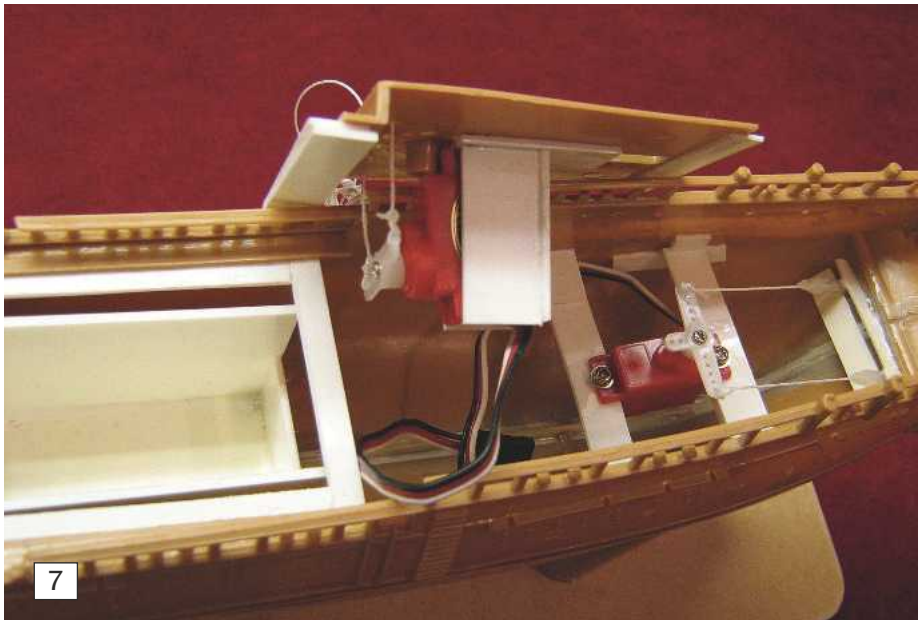
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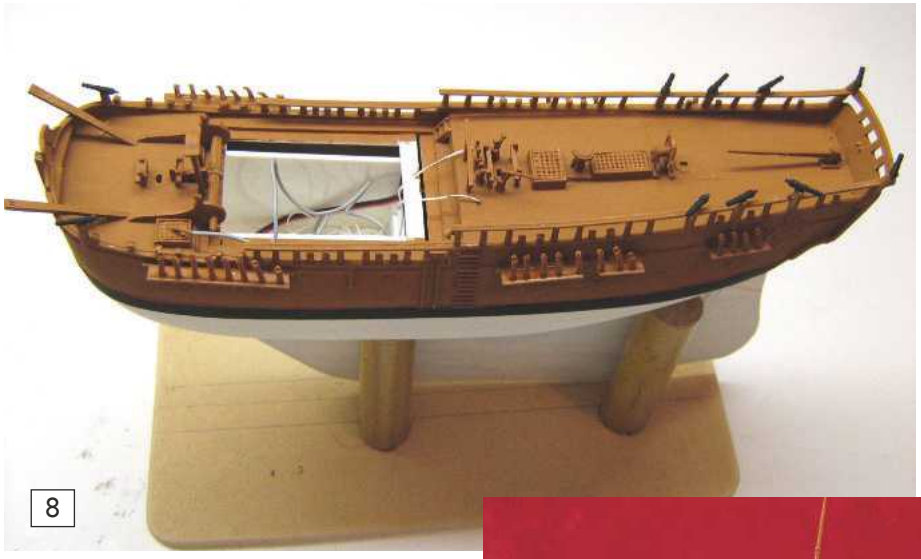
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Servos

Two plastic beams across the back end were glued into the hull to hold the micro servos. One was connected to the rudder via a continuous length of Dacron fishing line passing through the holes drilled in the cross piece at the top of the rudder, **Photo 7.** The other micro servo was fitted vertically in a styrene box which can also be seen in this last picture. The servo arm had lengths of Dacron line fitted to it, fed through the deck and up to the to the sail yard on the foremast to turn the sails, the outlet holes being visible in the previous picture of the deck pieces (Please see Photo 6 again).

The rear deck pieces were now fitted into the hull ready for the next step of adding the masts, **Photo 8.** These were not all immediately glued in place, because 'emergency' access might still be needed to the servos. You can guarantee that if something is inaccessible at an early stage in construction, then it will need to be accessed, probably sooner rather than later. Various guns and other deck fittings were now also added, followed by the masts, albeit temporarily, **Photo 9.** Everything looked reasonably okay, so the fixed deck pieces and masts were now all secured permanently.


9

Sails?

The plastic sails supplied in the kit were used as patterns for the sails, **Photo 10.** Starting at the sharp end, which is actually very blunt and almost square, the Inner Jib, Outer Jib, Foremast Topsail, Foremast Course (the big lower sail), Mainmast Lower Topsail, Mainmast Course, Mizzen Square Sail and Mizzen Fore and Aft Sail were copied on to some white lightweight nylon material. The easiest way to cut this material is with a soldering iron, a 25 Watt type being used as it had a nice sharp edge to its tip. To be safe, a metal safety ruler was used to protect my fingers from the heat amongst other things. Keeping the ruler to the sail side of the material meant that when you cut with the iron the sail would stay flat and the scrap bits to be thrown away were wrinkled. The key point is that sails made this way do not fray, as their edges are sort of melted into a continuous nylon thread run. Normally sails would be sewn to the yards, but after a couple of evenings sewing and swearing, I eventually gave up as they looked horrible and did not hang correctly. At this low point, Edna came to the rescue, she being a sewing expert and master of logic with a simple solution. 'Superglue them to the yards then paint a narrow line across the top the same colour as the yards', was her advice and would you believe it, this worked and the sails hung very nicely after the yards were subsequently tied to the masts, **Photo 11.**


10

Standing rigging

These are the bits that stop the masts falling over on the full-size ship. On this model, just the minimum standing rigging was used, basically to keep everything together. The masts were rigged to the deck and to each other and all the cordage was then coated with superglue to stiffen it, after which it was painted matt black. No attempt was made to tie the hundreds of tiny knots on the ratlines, so if the crew need to go aloft they will perhaps have to wait for a crane?

Operation

The lines from the sail servo were tied to the Foremast Course (the big sail) spar, about one inch out from the mast, meaning that the spar would turn a little more than the servo. Lines were then connected from the ends of that spar to the Mainmast Course (the big sail) spar, again about one inch out from the mast. The same connection was made from this spar to the Mizzen mast sail. After all this, some superglue had got where it shouldn't, namely on the sails, so they were painted with some thinned yellow acrylic paint, and now they just look dirty, which is perhaps how they really were?

The receiver pack goes under the removable central portion of the deck, which is held in place by a small self-tapping screw. There is no switch fitted, as one just has to connect, fit the deck and off it goes, provided the transmitter is switched on of course. Just a few pieces of lead sheet of approx. three ounces total, got HMB Endeavour down to her marks. These were epoxied to the bottom of the keel (please see Photo 11 again) and then it was floated once again in the sink. A few gentle 'shoves' showed that it was quite stiff and showed no signs of capsizing and all was looking good.

And so, off to Roker Park Model Boat Club to face the boys, but as it turned out I was initially alone on this occasion. Within minutes though, I was spotted from the clubhouse and a gang of half a dozen came to watch the square rigger. It was a flat calm as they all stood silently watching at the lakeside, but suddenly a gentle breeze came along. HMB Endeavour caught this breeze and in a lovely stately manner started to move, straight as an arrow, albeit backwards!

Obviously I claimed that this was prototypical, but somehow I do not think that they believed me. Anyway, the rest of the morning was eventually spent slowly sailing up and down the lake, **Photos 12** and **13.** It is almost


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impossible to tack without wearing ship, i.e. turning downwind to turn about, and so HMB Endeavour needs plenty of sea room or you will have bring the model in, walk back upwind and start again.

Conclusion

Would I make another one? Well, the answer is yes, but not at this size as three times this size would be easier, at least for my fingers. Okay, this Airfix HMB Endeavour is not the world's best model radio controlled square-rigger and it will become an occasional sailer for me when it is not too windy, but the biggest factor in its favour is that as it is so light in weight, it qualifies as minimalistic 'hand luggage'. The second factor in its favour is that it is an inexpensive way to have a bit of model making fun, the kit being less than £19 to purchase.

*Many thanks to fellow club mate **Barry Harman** for his on the water photographs.*


12


13

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David H Alderton Designs

A set of eight plans and hulls from David Alderton. All plans include full details for the sails, rigging and deck fittings; Hulls are made from highly detailed GRP (Glass Reinforce Plastic).

MANX NOBBY

David Alderton

A medium to large sized hull (42"). Very attractive shape with beautiful lines. The Manx Nobby was a deep water double-ended standing lug-rigged herring drifter that first appeared around 1880. They were developed from copies of the Cornish herring drifters that visited the Isle of Man. Many were eventually converted into yachts.

Plan (3 sheets)	Hull
Code: DAP005	Code: DAH005
£19.99 + p&p	£125 + p&p

SAVE

Plan & Hull
Code: DASET005
£135 + p&p

IBEX

Brixham Trawler David Alderton

Ibex BM.27 was built in Brixham by J W & A Upham in 1896. She was the fastest sailing trawler in the West Country, working all year round with a crew of four men and a boy. She was sunk by a German U-Boat in 1918 after the crew had been allowed to take to their boat. She weighed 42 tons with a 39.5' rig with mainsail, that was later cut down to 38'. A sleek, streamlined fishing boat that is fast, smooth and comes about well. A truly lovely boat to sail. She is fast! Length: 49.60" (1260 mm) Beam: 11.41" (290mm)

Plan (4 sheets)	Hull
Code: DA004	Code: DAH004
£19.99 + p&p	£113 + p&p

SAVE

Plan & Hull
Code: DASET004
£124 + p&p

HILDA 2

Bristol Channel Pilot Cutter David Alderton

Hilda No 2 was built by J. Cooper at Pill, near Bristol, in 1899. These vessels would sail out into the stormy Western Approaches where they would compete to win piloting contracts from approaching merchant ships. A larger hull (1" to foot). Faster than the MARGEURITE.

This cutter has lovely lines and a deep keel at the transom end.

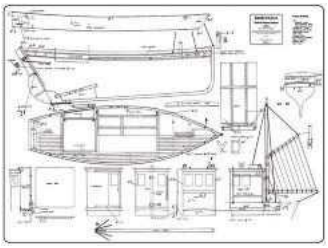
Plan (4 sheets)	Hull
Code: DA003	Code: DAH003
£19.99 + p&p	£125 + p&p

SAVE

Plan & Hull
Code: DASET003
£135 + p&p

LINDY LOU

Mevagissey Fishing Boat David Alderton



Lindy Lou was built in Looe, Cornwall in 1947 by Curtis & Pape, where she fished the local waters.

She later moved to Mevagissey and is now used for charters out of Falmouth.

Plan (1 sheet)
Code: DA007
£14.99 + p&p

KATIE

Gaff Rig Pilot Cutter David Alderton

A 1:12 scale model of the fast and manoeuvrable Bristol Channel Pilot Cutter, sometimes described as the best sailing boat design ever made. Katie uses the same hull as Lady Ma. This smaller version of the Pilot Cutter is easy to transport and ideal for use in shallow waters. This hull is not a copy of any particular cutter, but designed by D H Alderton to be deeper than normal, which allows her to perform well in high winds. Length: 40" (1012mm) Beam: 12.5" (319mm)

Plan (3 sheets)	Hull
Code: DA001	Code: DAH001
£14.99 + p&p	£101 + p&p

SAVE

Plan & Hull
Code:ASET001
£108 + p&p

SMALL KATIE

Mevagissey Lugger David Alderton

Luggers were widely used as fishing boats, with lugsails set on two or more masts. This one was used in the beautiful Cornish fishing port of Mevagissey. 1st of the DHA boats.

Small and compact, ideal for Sunday afternoon sailing on small lake or pond.

Plan (3 sheets)	Hull
Code: DA002	Code: DAH002
£14.99 + p&p	£50 + p&p

SAVE

Plan & Hull
Code: DASET002
£57 + p&p

MARGUERITE

Bristol Channel Pilot Cutter David Alderton

Marguerite is one of the handful of surviving Bristol Channel Pilot Cutters.

She was built in 1893 by E. Rowles in Pill, near Bristol, and is now based on the river Fal in Cornwall. A medium sized pilot cutter (3/4 to the foot).

Performs well in moderate winds.

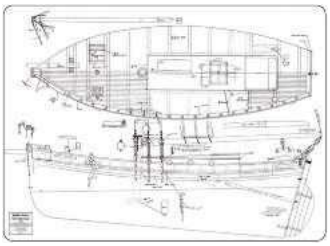
Plan (4 sheets)	Hull
Code: DA008	Code: DAH008
£9.99 + p&p	£115 + p&p

SAVE

Plan & Hull
Code: DAHSET008
£120 +p&p

BREEZE

Bristol Channel Pilot Cutter David Alderton



Breeze is sister ship to Hilda 2 and has a nippy performance under sail. Breeze was built in 1887 by J Cooper in Pill, near Bristol. Hundreds of these cutters were built, but today only a handful survive. Breeze was still afloat and fully commissioned in 1992, but then fell into disuse. In 2013 she was being professionally restored.

Length: 40" (1016mm) Beam: 13" (330mm)

Plan (3 Sheets)	Hull
Code: DA006	Code: DAH006
£14.99 + p&p	£125 + p&p

SAVE

Plan & Hull
Code: DASET006
£132 + p&p

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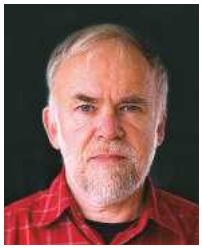
Flotsam & Jetsam



John Parker delves into the archives

55: Air, Rubber and Clockwork

Alternative energy in the form of air, rubber and clockwork motors for model boats are today only a curiosity, but in the 1930's when other options were more limited or expensive, they were looked upon as a viable alternative, even for serious models. They are of course examples of 'stored power' motors as the manual energy expended in charging or winding them up is released slowly during their power run. Another example of a stored power motor is the inertia, or flywheel, motor but this was mainly limited to powering toy vehicles.

Compressed air motors

The compressed air motor can be made quite light and is generally reliable. Typically consisting of a single cylinder, or alternatively two or more cylinders arranged radially around a common crankshaft, the pistons were driven by expanding air from a chamber charged by a common bicycle pump, via a valve that acted as the throttle. Naturally, more cylinders meant more power, but also greater air consumption and therefore less duration from a given air chamber. Without a regulator, the power output was encouraging at first, but then tapered off, and was lessened by the cooling effect of the air expanding through a small nozzle.

An illustration from a 1928 catalogue shows four sizes of engines and their air chambers available for fitment to model boats or model aeroplanes. The four cylinder engine and chamber combination at twenty-five shillings and three pence (25s 3d) pre-decimal UK currency represents about £73 in today's money. The firm of Bowman's offered a boat that was powered by compressed air at about this time, but it was never as popular as the steam and rubber powered ones.

Rubber motors

Motors that use the energy of tightly-wound strip rubber are the simplest and cheapest type. They were popularised by the competition rubber-powered model aircraft, whose huge propeller would take the model into an effortless near-vertical climb with the airframe sorely challenged to withstand the stresses of all that wound-up rubber. To put some numbers to it, it was figured that one pound (about 450gm) weight of rubber could store 18000 foot-pounds (24400 Joules) of energy and release it at a rate of over 0.5 horsepower (375 Watts) for one minute. Witnessing this was a sure cure to calling the model elastic-band powered, and thereafter it was always a more respectful 'rubber-powered'.

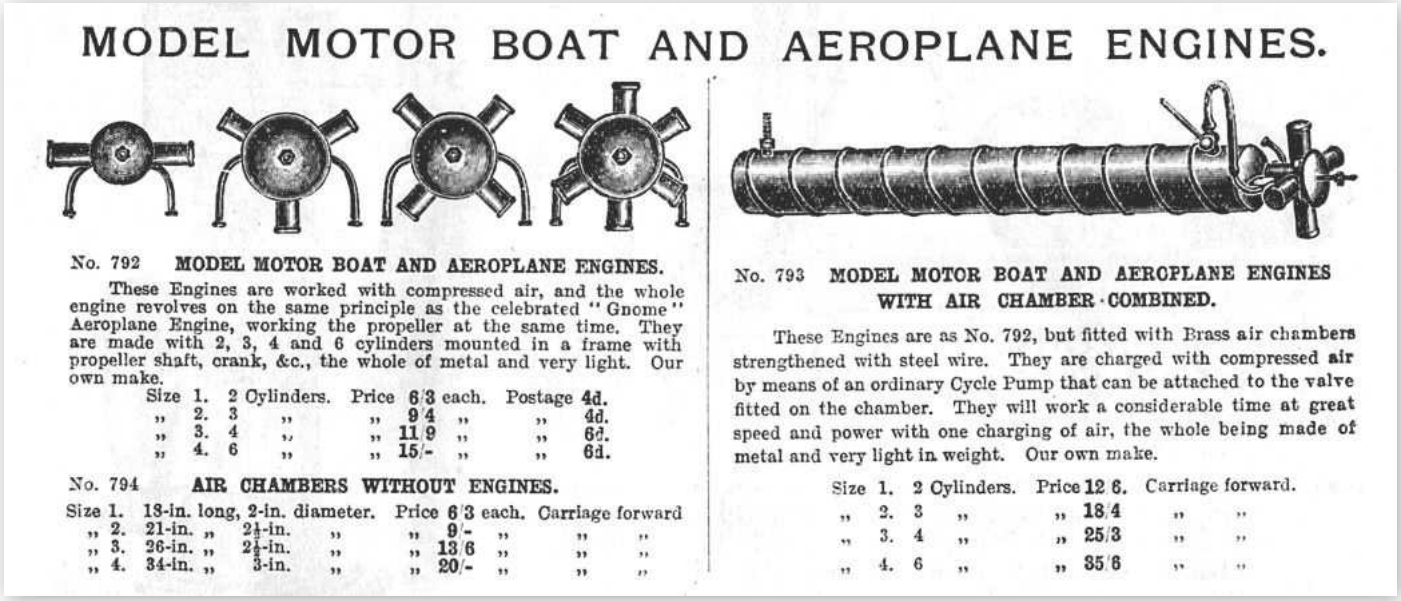
The lack of heavy gears and 'engineering' gave the rubber motor its lightness that made it a success in aeromodelling, and for all its simplicity and lack of 'works' it is probably more efficient than a clockwork motor. On the other hand it was not durable, required careful running-in and lubrication with a messy castor oil formulation, and could ruin your day, and possibly your model, if those last few turns snapped the rubber and its energy was released, not in the record breaking flight you envisaged, but in the confines of the lightly-constructed balsawood fuselage.

Powering a model boat by rubber was a less stressful experience. My first ever model boat was a model submarine, made from a length of PVC pipe with a nose and tail from a rocket-shaped torch, with a home-made propeller and the rubber motor from my model aircraft, which was about all I could salvage from it after a nasty crash! The nose was unplugged and the rubber stretched out whilst winding on the turns with the aid of a hand drill and I learned to stop when the elastic took on a 'triple knotted' appearance. When released at one end of a swimming pool, it shot forward at surprising speed, diving dynamically as it did so toward the deep end of the pool and came to the surface again as the rubber motor ran out.

That rubber power was ideal for simple model submarines had long been known to manufacturers. Amongst the many offerings they made was the Glenbur model submarine of 1949, of which I have a rather poor example. The rubber motor was mounted below the 14 inches long wooden hull, doubled over for extra length, whilst the chore of winding it up was eased somewhat by the built-in winder. A ninety-foot run was promised, with deep, medium or shallow dives pre-selected. 'As purchased by H.R.H. Queen Mary' reads the advertisement, making it in all likelihood the first model submarine to have royal endorsement, but one wonders where she operated it?

The Model Mechanic, a distant ancestor

Below: Compressed air engines, from a 1928 catalogue.



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„ 4.	6	„	„	15/-	„	„	6d.

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Size 1.	18-in. long,	2-in. diameter.	Price	6/3	each.	Carriage forward
„ 2.	21-in. „	2¼-in. „	„	9/-	„	„ „
„ 3.	26-in. „	2½-in. „	„	13/6	„	„ „
„ 4.	34-in. „	3-in. „	„	20/-	„	„ „

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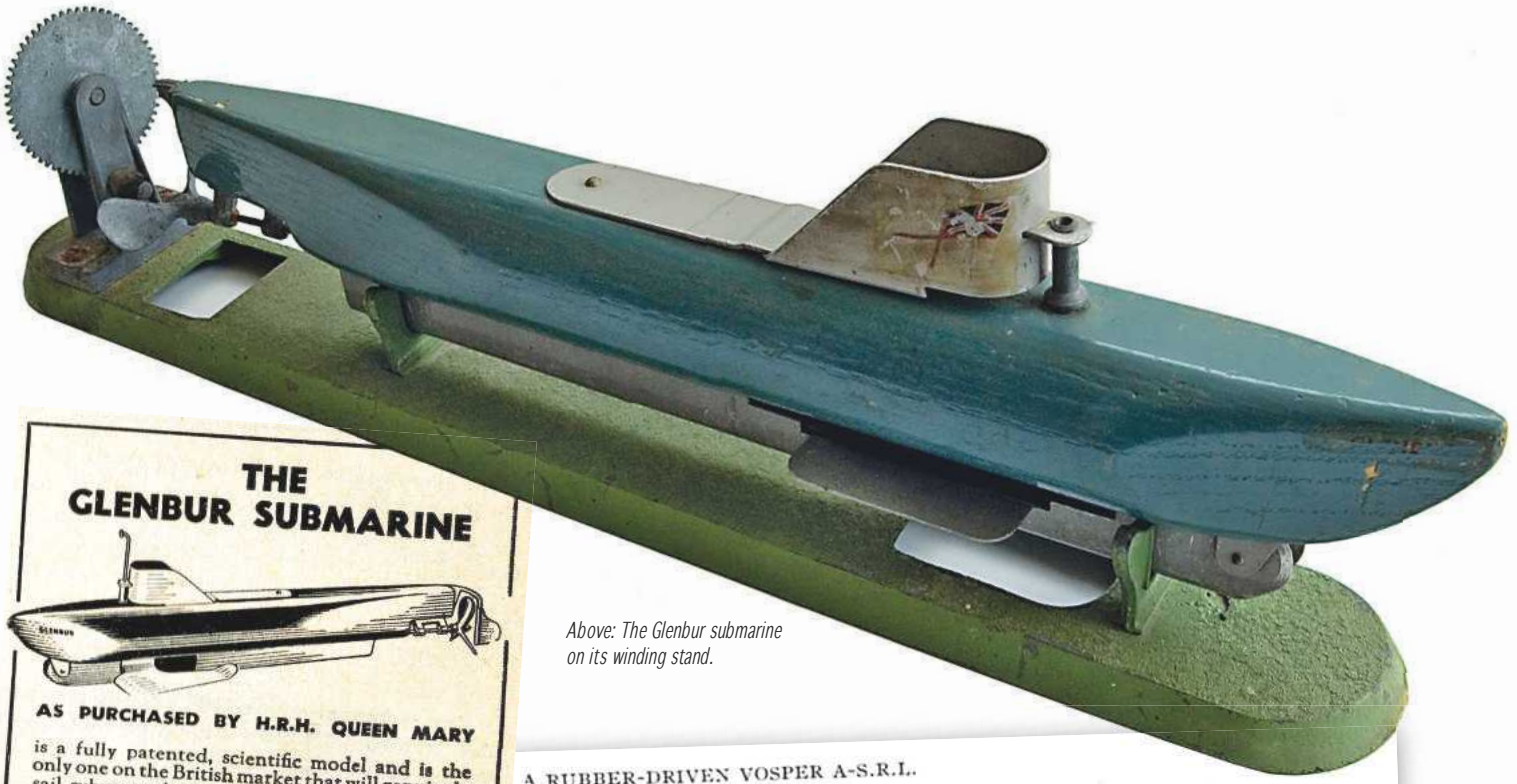
These Engines are as No. 792, but fitted with Brass air chambers strengthened with steel wire. They are charged with compressed air by means of an ordinary Cycle Pump that can be attached to the valve fitted on the chamber. They will work a considerable time at great speed and power with one charging of air, the whole being made of metal and very light in weight. Our own make.

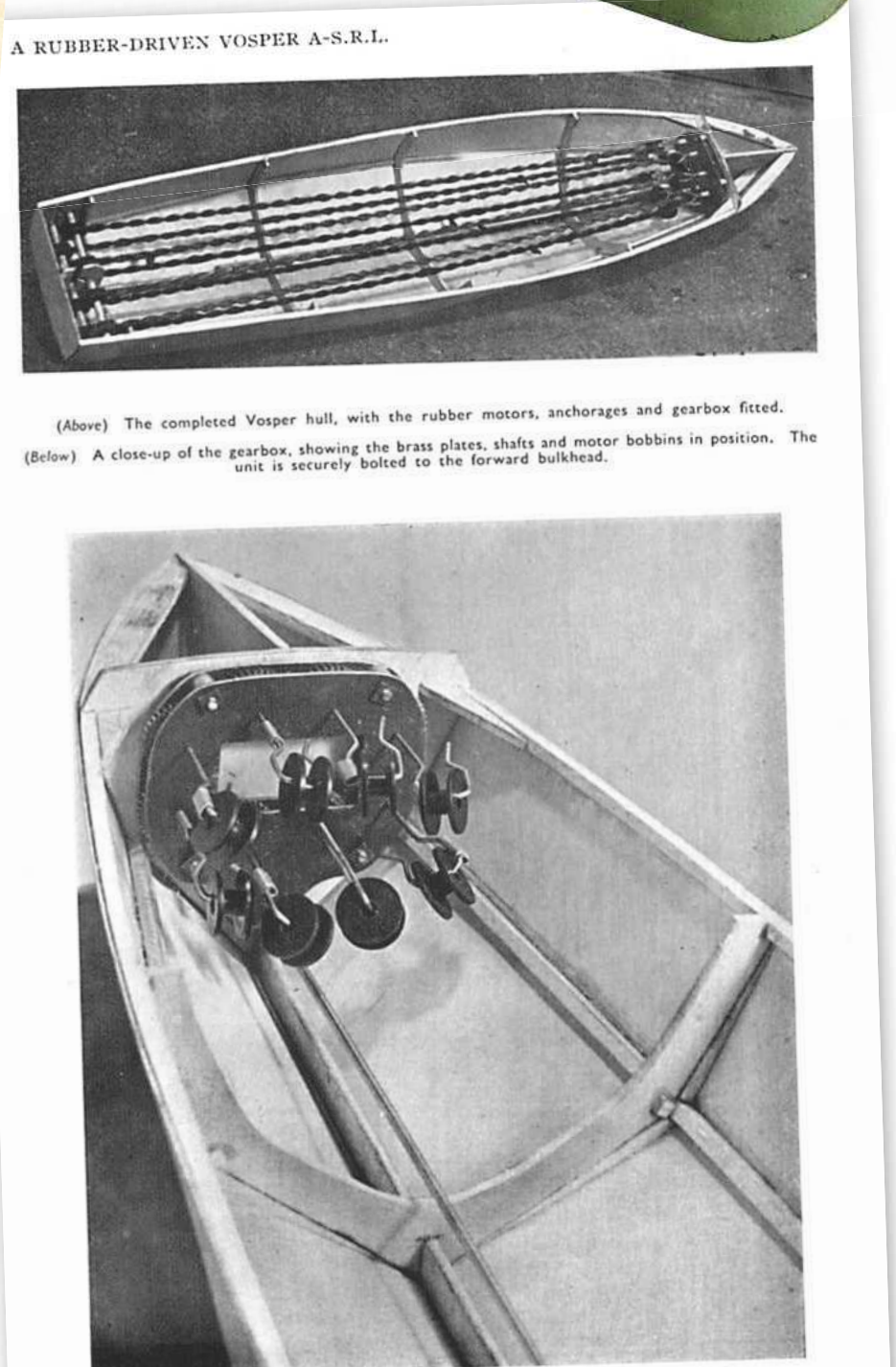
Size 1.	2 Cylinders.	Price	12/6.	Carriage forward.		
„ 2.	3	„	„	18/4	„	„
„ 3.	4	„	„	25/3	„	„
„ 4.	6	„	„	35/6	„	„



Above: The Glenbur submarine on its winding stand.

Above: Advertisement for the Glenbur submarine, 1950.

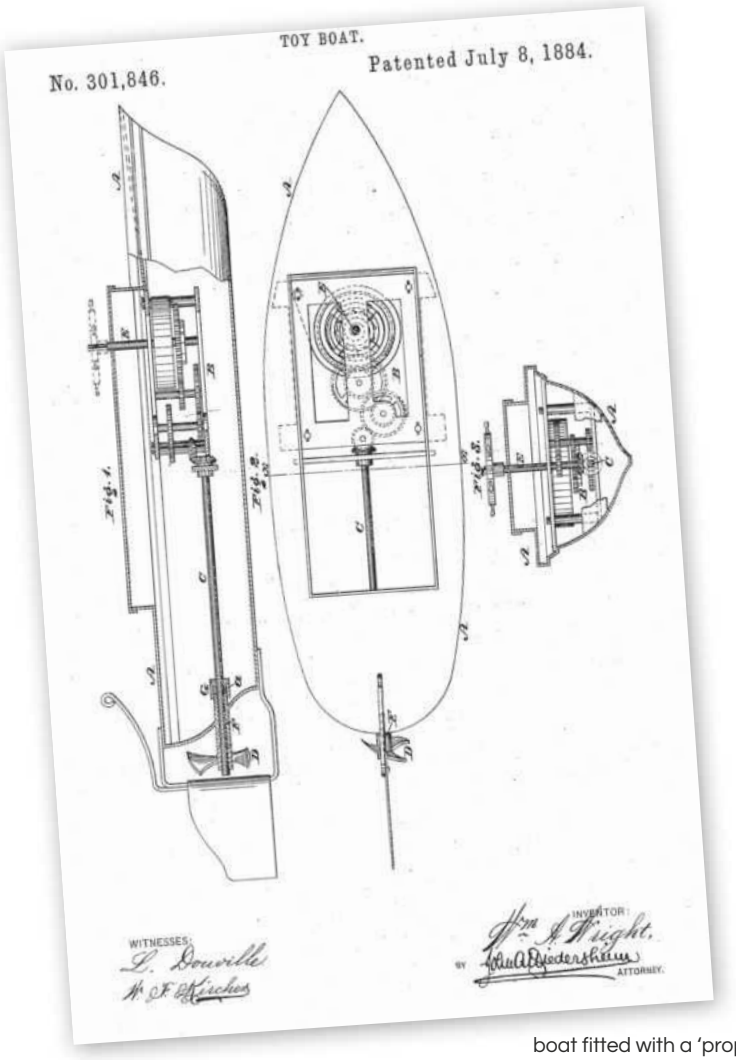
Right: Multiple rubber motors geared together in a model Vosper ASRL.


A RUBBER-DRIVEN VOSPER A-S.R.L.

(Above) The completed Vosper hull, with the rubber motors, anchorages and gearbox fitted.

(Below) A close-up of the gearbox, showing the brass plates, shafts and motor bobbins in position. The unit is securely bolted to the forward bulkhead.

of Model Boats magazine, published a series of four designs for Air-Sea Rescue Launches in 1946 (repeated in The Model Boat Book of 1950) and given that this was post-war austerity Britain, rubber and clockwork motors were options on all four, with the Walton Thames ASRL depicted on the plan with a rubber motor and the British Power Boat ASRL with twin clockwork motors. The Walton type was chosen as the most suitable for rubber power due to its greater length (36.5 inches at 1:24 scale), but even so, only a limited amount of rubber could be provided in a single skein. To overcome this, eight skeins of rubber (effectively eight motors) were fitted in the hull and geared together via a homemade or commercial combining gearbox with a ninth spindle to provide the final drive. The performance to be expected with this complicated set-up was four knots, equal to the figure quoted for electric power, but of course it only lasted for a couple of minutes.


TOY BOAT.

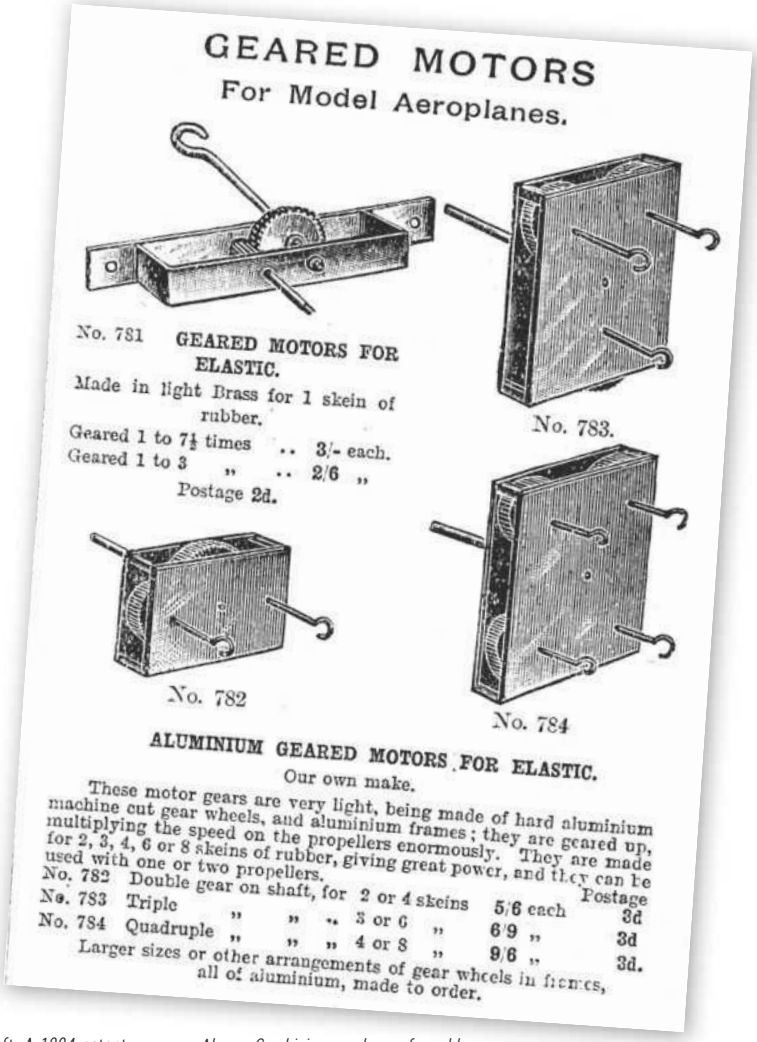
No. 301,846. Patented July 8, 1884.

Fig. 1. Fig. 2. Fig. 3.

WITNESSES: L. Douville, H. F. Richer

INVENTOR: Wm. A. Wright. BY John A. Wiedersheim ATTORNEY.

Left: A 1884 patent for a clockwork boat.


GEARED MOTORS

For Model Aeroplanes.

No. 781 GEARED MOTORS FOR ELASTIC.

Made in light Brass for 1 skein of rubber.

Geared 1 to 7½ times .. 3/- each.
Geared 1 to 3 „ .. 2/6 „
Postage 2d.

No. 783.

No. 782

No. 784

ALUMINIUM GEARED MOTORS FOR ELASTIC.

Our own make.

These motor gears are very light, being made of hard aluminium machine cut gear wheels, and aluminium frames; they are geared up, multiplying the speed on the propellers enormously. They are made for 2, 3, 4, 6 or 8 skeins of rubber, giving great power, and they can be used with one or two propellers.

No. 782	Double gear on shaft, for	2 or 4 skeins	5/6 each	Postage 3d
No. 783	Triple „ „	3 or 6 „	6/9 „	3d
No. 784	Quadruple „ „	4 or 8 „	9/6 „	3d.

Larger sizes or other arrangements of gear wheels in frames, all of aluminium, made to order.

Above: Combining gearboxes for rubber motors from a 1930 catalogue.

Clockwork motors

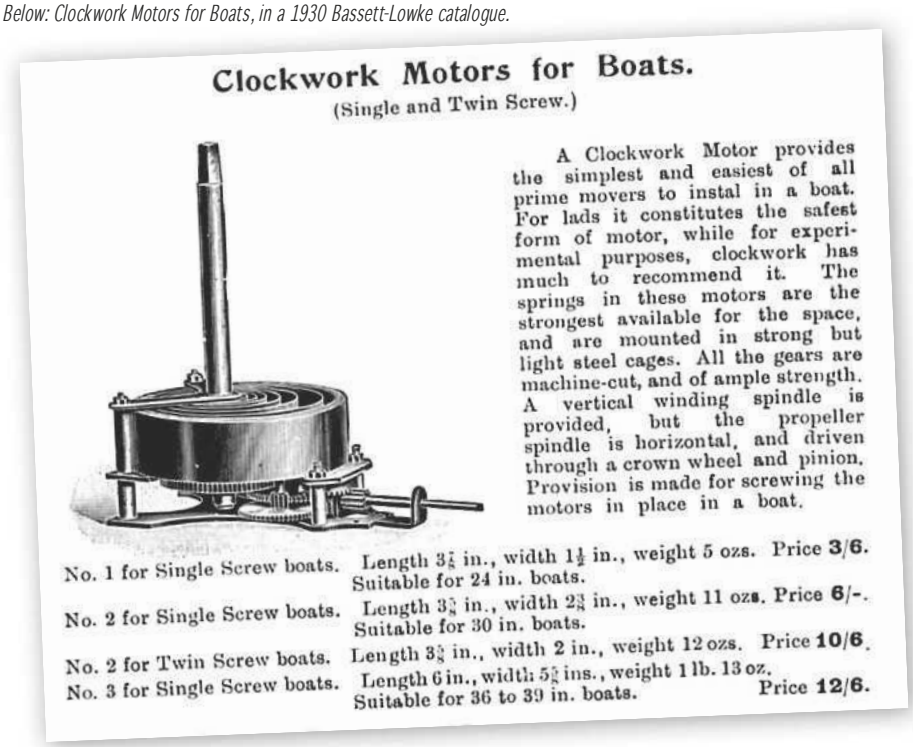
Clockwork motors have a long history powering model boats, as the accompanying patent drawing from 1884 demonstrates. Clockwork was also used in clocks, gramophones, construction and other toys, but could unleash an unwanted surprise on the model boat builder who attempted to use one of these motors rather than the custom-made model boat motor, details of which he would have found in any model boat hardware and fittings catalogue of the 1920's or 1930's.

The dedicated model boat clockwork mechanism had a horizontal configuration for a low centre of gravity, a vertical spindle for winding (to be hidden in the superstructure) and right-angle gears to take the drive, or drives in the case of twin-shaft model, from the rear of the motor. So far, so good. The motor from a scrapped clock or gramophone could be adapted as necessary, but there was one other requirement that wasn't obvious as the motor had to release its spring in a balanced manner as it unwound. In other applications, this didn't matter, but if the heavy mainspring was disgorged from just one side of the frame it could cause the model boat to tip progressively to one side as the motor ran down until it was in danger of capsizing.

We can see in one of the photos a model boat fitted with a 'proper' marine clockwork motor, and how the mainspring has unwound with just a slight rearward weight shift rather than to one side or the other. Notice too, how much extra room the unwound spring takes up and how the catalogue makes mention of the space needed for this. The motor appears to be of the M208 Clockwork Motor for Launches type at the bottom of the catalogue page, suitable for hulls 18 to 24 inches (450 to 600mm); the K193 motor at the top of the catalogue page is for a model of up to 48 inches (1220mm) long and its price of 33s 6d, if we assume the catalogue to be from 1930, is the equivalent of about £105 today.

The commercial clockwork toy launch was extremely popular pre-war, but never quite re-captured this popularity in the post-war years. A Hornby speedboat (Flotsam and Jetsam No. 21, MB December 2014 issue) was the one to have, said to be capable of 500 feet on a winding, more than enough to cross

Below: Clockwork Motors for Boats, in a 1930 Bassett-Lowke catalogue.


Clockwork Motors for Boats.

(Single and Twin Screw.)

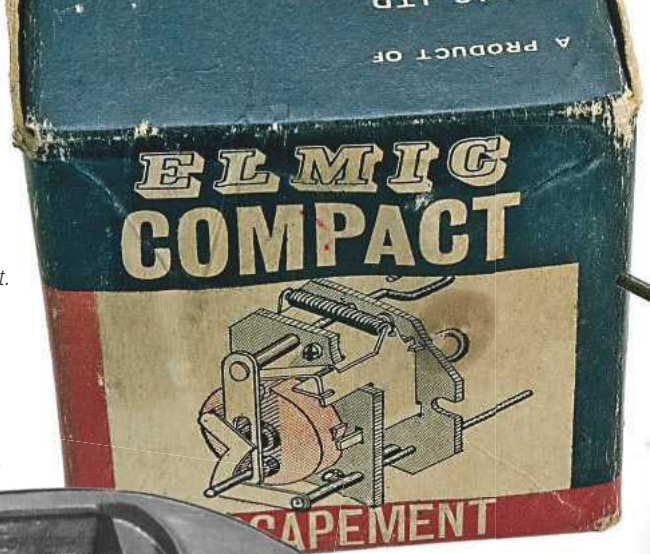
A Clockwork Motor provides the simplest and easiest of all prime movers to instal in a boat. For lads it constitutes the safest form of motor, while for experimental purposes, clockwork has much to recommend it. The springs in these motors are the strongest available for the space, and are mounted in strong but light steel cages. All the gears are machine-cut, and of ample strength. A vertical winding spindle is provided, but the propeller spindle is horizontal, and driven through a crown wheel and pinion. Provision is made for screwing the motors in place in a boat.

No. 1 for Single Screw boats. Length 3¼ in., width 1½ in., weight 5 ozs. Price **3/6.** Suitable for 24 in. boats.

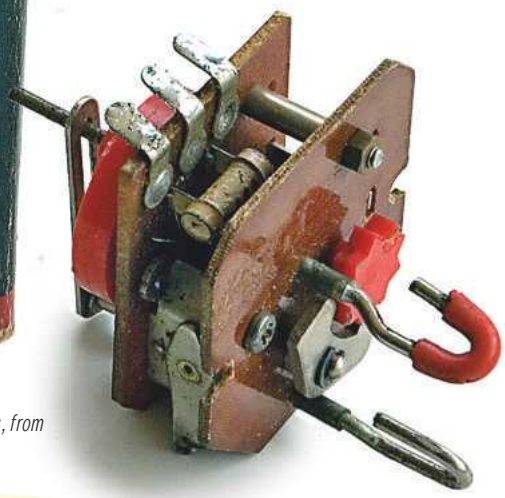
No. 2 for Single Screw boats. Length 3⅞ in., width 2⅜ in., weight 11 ozs. Price **6/-.** Suitable for 30 in. boats.

No. 2 for Twin Screw boats. Length 3⅞ in., width 2 in., weight 12 ozs. Price **10/6.**

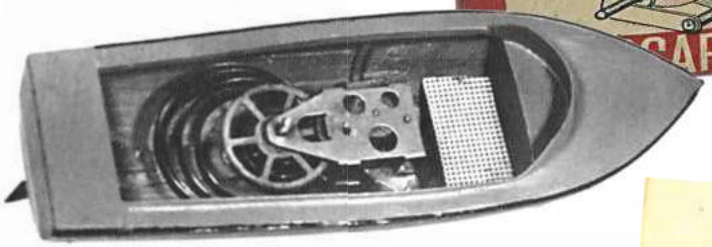
No. 3 for Single Screw boats. Length 6 in., width 5⅝ ins., weight 1 lb. 13 oz. Suitable for 36 to 39 in. boats. Price **12/6.**



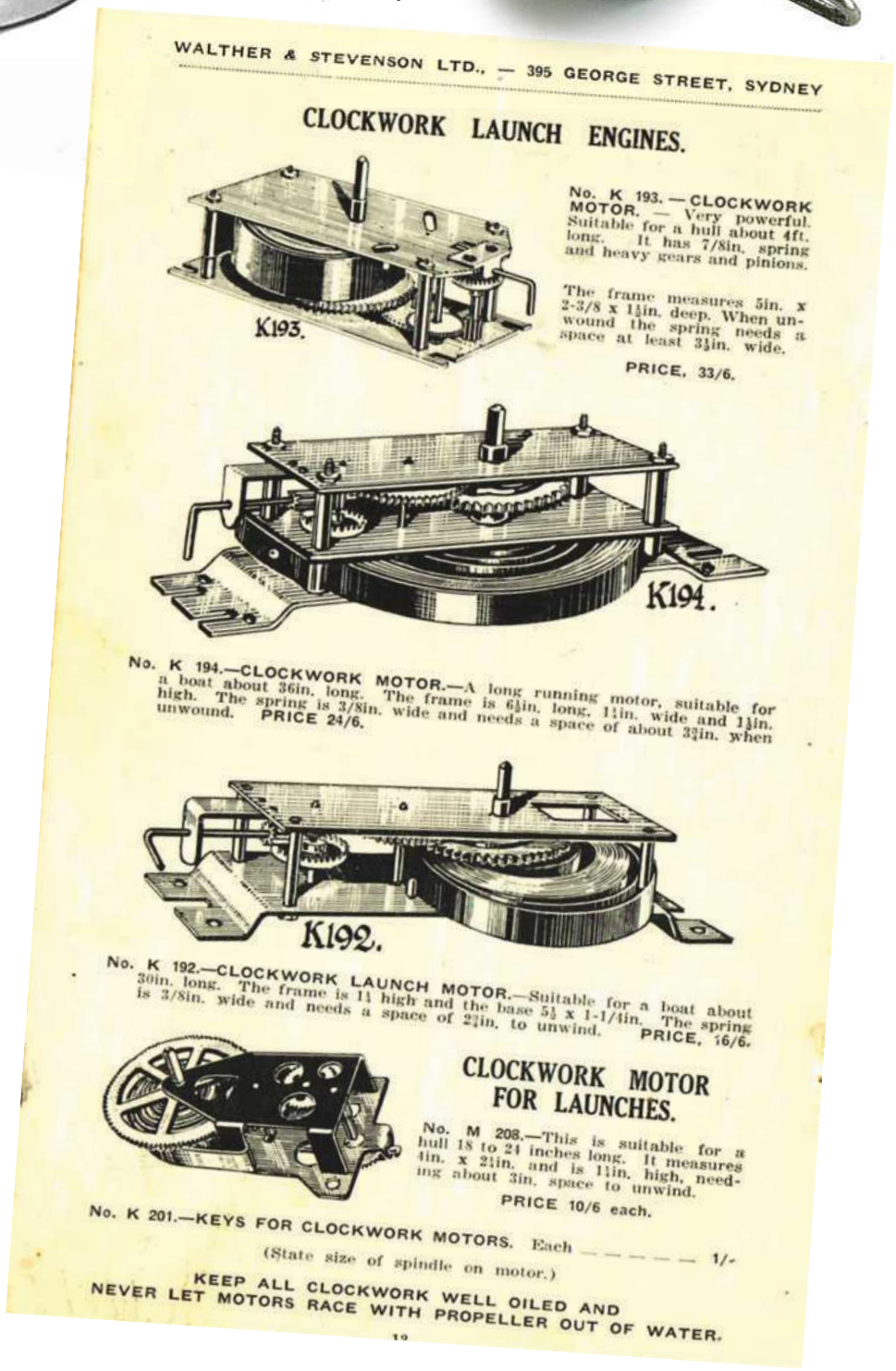
Right: Elmic Compact rubber-driven escapement.



Below: A model launch with a clockwork motor.



Below: Clockwork launch engines, from an undated Australian catalogue.



WALTHER & STEVENSON LTD., — 395 GEORGE STREET, SYDNEY

CLOCKWORK LAUNCH ENGINES.

No. K 193.—CLOCKWORK MOTOR. — Very powerful. Suitable for a hull about 4ft. long. It has 7/8in. spring and heavy gears and pinions.

The frame measures 5in. x 2-3/8 x 1½in. deep. When unwound the spring needs a space at least 3½in. wide.

PRICE, 33/6.

No. K 194.—CLOCKWORK MOTOR.—A long running motor, suitable for a boat about 36in. long. The frame is 6½in. long, 1¼in. wide and 1½in. high. The spring is 3/8in. wide and needs a space of about 3¾in. when unwound. PRICE 24/6.

No. K 192.—CLOCKWORK LAUNCH MOTOR.—Suitable for a boat about 30in. long. The frame is 1¼ high and the base 5½ x 1-1/4in. The spring is 3/8in. wide and needs a space of 2¾in. to unwind. PRICE, 16/6.

CLOCKWORK MOTOR FOR LAUNCHES.

No. M 208.—This is suitable for a hull 18 to 24 inches long. It measures 4in. x 2½in. and is 1½in. high, needing about 3in. space to unwind.

PRICE 10/6 each.

No. K 201.—KEYS FOR CLOCKWORK MOTORS. Each ——— 1/-

(State size of spindle on motor.)

KEEP ALL CLOCKWORK WELL OILED AND NEVER LET MOTORS RACE WITH PROPELLER OUT OF WATER.

the average pond. One limit to the amount of stored energy could simply be the strength and stamina of the young user and I recall getting a Meccano Number Two clockwork motor for a Christmas present at an early age and grappling with an enormous, seemingly immovable key, using both hands in an effort to wind it up. It had a governor, which limited the initial surge of speed. Most clockwork motors, except gramophone ones, didn't, and instructions warned you not to let them race without load. A suitably adapted gramophone motor could provide a liner or battleship with a scale cruising speed for up to five or six minutes. In effect, it could provide a whole afternoon's entertainment at the lake with successive windings, as there were never any batteries to run flat.

Escapements

Rubber and clockwork had another role to play, and it came surprisingly late in the history of model boats. This was with the application of radio control and the need for a means of driving the rudder or other control to its desired position in early single channel radio sets. Both rubber and clockwork were up to this task, releasing typically a quarter-turn of energy to move the rudder sequentially to the next position when the radio signal was received, using a form of mechanism essentially the same as the escapement of a clock. One of the photos shows a typical rubber powered escapement of the time, which was the 1960's, but by the 1970's we had moved on to electric servos.

And in summary?

Alternative energy is nothing new as air, rubber and clockwork power once provided an inexpensive means of powering your model boat and provided many hours of enjoyment in an earlier age when there weren't as many alternatives and those there were, cost far too much. No batteries were ever needed, but it paid to take some spare strip rubber and castor oil lubricant with you, or remember to tie the winding key of your clockwork motor to something that floated…..

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Boats, Trucks, Tanks, Cars

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Richard Simpson's series on model steam plants

Boiler Room

PART Eighty two: Affordable Steam PART 6

With the major parts now finished, there remains only a few bits and pieces on the hull before the model's final painting, varnishing and assembly.

Finishing the deck fittings

The last major deck fittings are the two forward coamings and the top of the stem post. Initially I thought to make the stem post from convenient scrap plywood offcuts, but when I came to look at the coaming pieces I didn't think the supplied plywood was flexible enough to bend to the shape of the hull without a real risk of it cracking. After a few dismal attempts involving steam and hot water, defeat was admitted and acceptance that the supplied plywood was just not up to the job. As a result, the kit parts were replaced with a couple of pieces of stock wood, **Photo 1,** cut to marry in to the stem post and gently curved to match the shape of the hull. These were then very easily glued in place with only a minimum of persuasion, **Photo 2,** to give a neat alternative that looks close enough to the original and makes for a realistic stem post arrangement, **Photo 3.** As a further little touch, two pieces of the pre-made planked sheet were added to create a little walkway across the deck which gives just a touch of interest to break up the otherwise very long plain plywood deck, **Photo 4.**

Rudder

The kit supplied rudder, like the rest of the kit is fairly straightforward to make and just requires a little bit of thought as to how to go

Photo 1. The heavy plywood parts supplied for the coamings at the bow were never going to bend to shape easily so were replaced by pieces of stock softwood. These conformed to the bend and sheer of the bow section much more easily.

Photo 2. The softwood could actually be pre-bent to shape to suit the curve of the hull so all that was left once the glue was applied was to persuade it to sit on the sheer neatly.

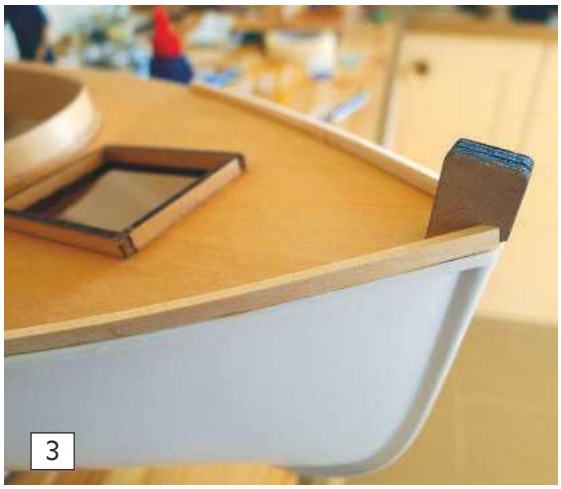


Photo 3. With the new coamings trimmed to suit the top of the stem post this produced a convincing enough bow arrangement.

Photo 4. Pre-made plank sheet is a very easy and quick way of making such parts as a planked walkway without having to lay and caulk individual wood strips. Such a simple addition makes a significant difference to the overall appearance of a model for very little effort.

about assembling it. It consists of nothing more than three pieces of plywood glued together, with the centre piece offset by a few millimeters to create a channel at its leading edge for the stock to sit within, and a corresponding extension at the trailing edge to give it a degree of shape, **Photo 5.** The idea is then to sand the laminated rudder to a smooth shape at its trailing edge. With such a significant step though, this would have meant removing quite a substantial amount of wood so this aft step either side was filled with some epoxy filler to smooth the transition and allow for a neater edge without having to sand away so much wood, **Photo 6.**

Photo 5. The supplied rudder was nothing more than three pieces of plywood glued together with the centre part offset aft around 3 mm to create a channel for the rudder stock at the front and a tapered trailing edge.

Once the rudder was sanded to a neat and consistent shape, it required bonding to the rudder stock. Care is needed here to make sure everything is glued together as it should be, because if it is out of kilter then there is no going back. To prevent the epoxy flowing out of the ends of the groove in the rudder, two small brass washers were placed on the shaft either end of the rudder and the hull was set up on its side with suitable supports. The base of the groove was coated with epoxy adhesive before placing the rudder on the stock and then filing the remains of the groove with more epoxy to give a nice neat finish of consistent depth, **Photo 7.** Once the adhesive had completely set, the rudder operates freely and has the added benefit of the two brass washers providing a rubbing face to protect the skeg and the rudder, **Photo 8.**

Final jobs

The first job was the remaining woodwork, which was all painted with an exterior grade of clear polyurethane satin finish varnish. Three coats were applied with a little light sanding between applications and I was quite pleased with the fact that the plywood deck didn't look too bland and therefore be uninteresting. The few pieces of planked sheet helped and just go to emphasise that just a little bit of personalisation can make a big difference to the overall appearance of any model. Even if you do not have access to this stock planked sheet, you could still lay a few planks yourself just to make a couple of areas stand out, without getting involved with planking the more complicated and difficult areas, **Photo 9.**

Once the three coats of varnish had been applied and properly hardened, the internal planked areas were masked and the entire inside of the hull painted with three coats of a white acrylic domestic radiator paint. This had the effect of blending the hull sides and the deck into one, providing an easy to clean finish for if (and when) it gets covered in water and oil, and this paint should also be resistant to heat. The bottom tray of the boiler is actually off the base plate so there should be very little heat getting as far as the insides of the hull. When the paint was dry the masking tape was removed, a few areas touched-up

Photo 6. To avoid having to remove a lot of wood at the trailing edge, a fillet of body filler enabled the rudder to be shaped much more easily.

Photo 7. Brass washers were fitted to the rudder stock before the stock was laid in the rudder's leading edge, pre-prepared with a bed of epoxy. More epoxy was then laid on top of the shaft to completely seal the shaft into the channel.

Photo 8. A fairly simple yet hopefully effective rudder was created, which has the added benefit of brass washers as rubbing faces to prolong its working life.

Photo 9. Three coats of clear polyurethane varnish on the woodwork seal it all and allow the colouring of the wood to be shown to its best.

Photo 10. With the internal wood parts masked off, the internal surfaces were all given a couple of coats of a white acrylic radiator paint. This provides a heat resistant and easily cleanable surface.

Photo 11. There are many different opinions of how best to generate a waterline but this works for me. Once the stem post and the stern have been marked with a pencil in the bath at the desired waterline, the hull can be set up on its stand and a pencil on a base can be used to mark around the hull. Then masking tape can be applied up to the line.

Photo 12. All the electronics in one location works well for this model with rechargeable batteries fitted and a charging connection accessible through the hatch it should be rare that anything needs maintenance. Note the two fastenings behind the aft bulkhead holding the seat and electronics platform in place, secured to their captive nuts under the main deck.

and the inside could at last be considered as complete, **Photo 10.**

The final main area of painting was the external hull and for this a single colour coat below the waterline seemed easiest. The first job was to determine the waterline, so all the main engine and r/c parts were loosely placed into the model and Anna was put in the bath and all that was needed was to mark with a pencil the forward and the aft points on the hull where the water surface was. With these points identified, the bath could return to its normal use and Anna taken back to the workshop and a marking pencil set up to draw the waterline. I have an old scribing stand, but you can really use any block of wood with a pencil set firmly on it.

The hull was set on its stand, adjusted so the pencil touched the marks both forward and aft, and then lightly secured with a few blobs of Blu Tack. It was then simply a case of gently sliding the pencil on its stand around the hull to leave a light pencil line creating the waterline, **Photo 11.** It is always worth checking from the forward and the aft ends that it is actually the same level all around the hull. Then it was simply a case of following the pencil line with some 6mm Tamiya masking tape. This was overlapped by decorator's masking tape (the standard light brown type) and then the whole of the upper hull covered with plastic sheet.

With the upper hull areas now protected, it was time for a couple of coats of levelling primer to seal the wooden parts (skeg etc.) and the associated filleting and smooth everything to a nice finish This primer was sanded with a 2000 grade wet and dry sandpaper before three top coats of Tamiya acrylic green were applied from a spray can. These three coats were enough to give a good even surface with very little evidence of the different materials being painted. The upper part of the hull has been left in bare plastic. The final fittings were a jack staff and flag pole, glued into close fitting holes drilled

Photo 13. The completed model with everything in place waiting for trials and testing on the water. It certainly looks smarter than the total cost would have you believe.

in the deck, and a wooden pedestal was fixed to the aft seat unit to secure the lubricator, but still allowing it to all be easily removed.

As far as the building goes, that is just about it. Everything is in place, electronics tested and working fine, and the steam plant bolted into Anna and all connected. Apart from the paints and glue, the grand total cost is a bit less than £340, which is less than many model boat kits cost nowadays, without any of their internals.

I have to admit to being pleasantly surprised at how good Anna looks for such a price and how neatly it has all gone together. The electronics are all nicely tucked away on the single tray aft, with access through the hatch for charging the battery, **Photo 12,** and all in all it looks very pleasing to the eye, **Photos 13** and **14.** Next month we will do a bit of bench testing, iron out any challenges that may be highlighted and give it a run on the pond.

Photo 14. As a project I'm very pleased with the end result. The proportions look pleasing, the plant is in proportion and it can all be accessed easily for operation and maintenance. Anna is certainly a simple enough model to encourage those new to the delights of steam to maybe give it a go?

Phil' Button reports from their Fourth Annual Regatta

Alvaston Pirates Model

This took place on Sunday 25th June 2017 at their usual lake in Alvaston Park, Derby. The day dawned dull, grey and overcast, with virtually no swell on the lake and a very light breeze, but there was the threat of rain to come at any time. Rain seems to be 'normal' for these 'Pirates' regattas since it has happened to us every year, but at least the rain held off until the monsoon started later on this day. However, it was not doom and gloom for everyone, as the Waterside Café, that is right next to the lake, did a roaring trade in cups of tea and coffee.

In addition to the Alvaston Pirates MBC's own offerings, we were delighted to be supported by the Hinckley & Bosworth MBC. The displays were set up under an assortment of gazebos with fingers crossed that they would not blow away if the light breeze should decide to strengthen, although the area chosen for them is quite well sheltered by trees.

The day

Photo 1 shows a general view of the boat launching area with our new trolley parking area, and **Photo 2** shows part of the display set up under the gazebos beneath the shelter of the trees. Following a briefing for boat skippers, which included the frequency discipline for anyone not on 2.4GHz, sailing began at around 1000hrs with all types and classes of boat on the water in free-sailing mode. We decided for the first time to abandon the 'slot' system and to trust in an individual skipper's self-discipline when dissimilar types of model were running on the lake at the same time. This worked really well and we had no boat to boat incidents, although one of our light buoys was unfortunately destroyed during the event, something that was not unique to 2017! Sailing continued until interrupted by the heavens opening later in the day, although some hardy souls did continue to sail, and what else would you expect from Pirates?

Photos 3 & 4 show a very nice model of HMS Dreadnought by Gerald Lough of the Hinckley & Bosworth MBC, first out on the water and then rather menacingly alongside Alvaston Pier and looking almost 1:1 scale through the buildings. **Photo 5** is a scratch built model of a tunnel hull hydroplane by Richard Davies of the Alvaston Pirates. This model has been built to a Glynn Guest design which was published in the June 2004 issue of this magazine.

Photo 6 shows two of the Pirates 'fun' boats ready for service, their actually looking like scale boats rather than a modified Club 500 boat! These boats are used to give children the opportunity to try their hand at operating a radio controlled boat as a way of introducing them to our hobby and for your interest, **Photo 7** shows some of the wildlife with which we share the lake. Unfortunately, these water fowl are not under radio control and have minds of their own making them somewhat unpredictable, so we are very, very careful if they are near our model boats.

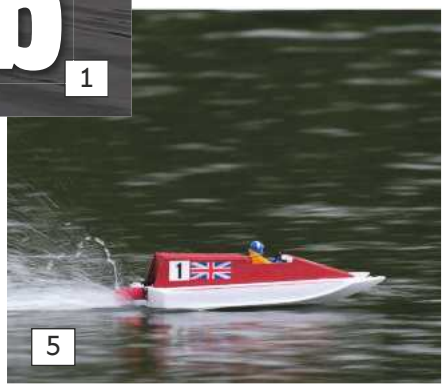
And the conclusion?

Although the weather deteriorated later in the day, a good time was had by all and the Sunday dog walkers and other visitors to the park came along to give us a look.

The club meet at the Alvaston Park Lake in Derby, Post Code: DE24 8QQ, on Saturdays and Sundays, and sometimes other days. when the weather permits and they can be easily contacted via their website: www.alvastonpiratesmodelboatclub.co.uk

Any visitors would be made most welcome. The park, which is operated by Derby City Council, has excellent facilities including free parking, an on-site café, toilets, football pitches, tennis courts, an outdoor exercise area, ducks, geese and swans for the kiddies to feed and a top class BMX bike track.

Boat Club



Acknowledgement:
Photos 1, 2, 4 & 7 were taken on the day by Ian Richardson and Photos 3, 5 & 6 by John Smith, and all are printed here with their permission – thank you.

Enjoy your hobby – ***Phil' Button***

Halvorsen Seaplane Tender

Bill Burtwell's latest model

Bill's Halvorsen Seaplane Tender has a good turn of speed.

This model is from the John Parker Model Boats plan that was featured in our 2012 Winter Special Edition. The hull was built pretty much exactly as recommended in John's article, but Bill used styrene for the upperworks.

Weight came in at 3.4kg which is a little heavy, but not by much. Although completed in the Winter of 2016/2017, Bill had to wait until this recent May for the on the water trials, as the lake he and his fellow enthusiasts use in Calgary, Canada, does not open until late-April, it often being frozen. No additional ballast was required and performance is good as the pictures show.

Left: Brushless motors and LiPo batteries keep the weight down with a good power to weight ratio.

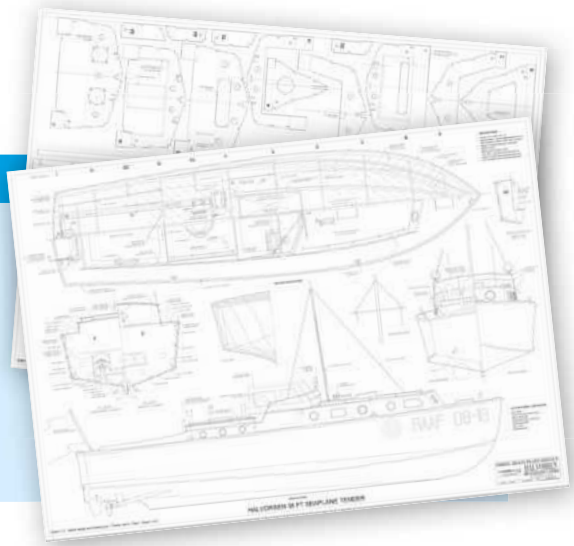
Above: Not too much detail, just like the full-size craft, but enough to make a model interesting.

Below Left: Bow view and this craft has a nice bright colour scheme.

PLANS

Halvorsen Seaplane Tender

The Model Boats Plan No. MAR2077 is available from SarikHobbies



A change in the fate of a River Cruiser

Ian Dowlman describes his latest project.....

Above: Ian Dowlman and his model.

I was meant to be making a speedboat,
A cruiser designed by Vic Smeed,
I'd got all the balsa and plywood and glue,
And everything else that I'd need.

I cut out the templates and marked out the wood,
Constructing the hull soon began,
I installed the prop shaft, the rudder too,
And planked the hull as per the plan.

But then I decided to glass fibre the hull.
Well nobody said that I shouldn't,
So I fibred and resined and let it all set,
But could I sand it smooth, no I couldn't.

I sanded and sanded and laboured and swore,
Sweat was sweated and some blood was bled,
And with Halfords car filler I nearly got there
But in despair, threw the hull in the shed.

And there it lay, gathering spiders and dust,
For much over a year sad to say,
And I got on with life, as most of us do
But things stay in your mind, eating away.

And then I woke one day with a thought,
I've got that scruffy old hull doing nowt,
Forget the flash cruiser that Vic had designed
Let's make a scruffy old sea fishing boat.

So out came the pencil and paper and ruler,
And soon a fine plan had evolved
For a basic boat, with detail to follow,
The problem with the hull was now solved.

So you see from the pictures that accompany this ode
You should never give up come what may,
For whatever you planned and started to build

It will imagine into something...one day.

And even if it's not what you started...
And maybe it's just fantasy scale...
You get pleasure from a finally successful build
Of a nice little boat you can sail

And that was how it all came about
And as finally built t'was no bother
It was mostly made up from my own little head
And I've enough wood left o'er for another.
Ian Dowlman - 2017

(Editor's note: The hull is based on Twinkler, Plan No. MM 2102 available from the SarikHobbies, and as shown in the 65 year Special Edition of Model Boats of a couple of year's ago)

Left: The interior of this classic Vic Smeed design.

Below: Based on MM2102 Twinkler, Ian Dowlman's model looks good on the water.

Mersey River Festival & Armed Forces Day

Dave Wooley reports from Liverpool

Above: The constant stream of visitors was amazed at the models on display in the Liner Terminal Hall.

Right: The Type 23 frigate HMS Iron Duke approaching the Liner Terminal under the gaze of the Liver Birds.

Held over the last weekend of June 2017, the Mersey River Festival is a well-established annual event attracting many thousands of visitors to the Liverpool waterfront, but for this year, the Saturday was, in part, given over to Armed Forces Day attended by the Prime Minister.

Armed Forces Day

Like many events, the actual setting-up will span a few days prior to the official opening and on the Friday a number of full-size vessels were arriving, including square riggers and the Type 23 frigate HMS Iron Duke. Leading the march-past on the Saturday along the esplanade close to the Liner Terminal was a Royal Marine band combined with a colourful fly past by the Red Arrows. Also, the army was on hand to show and display their latest hardware which included an Apache helicopter. As always, the military were enthusiastic about what they do and were happy to interact with the general public.

Although Saturday was the official Armed Forces Day, all of the associated exhibitions continued throughout the weekend. The Mersey River Festival supported a huge number of attractions from the Albert Dock to the Liner Terminal and beyond. These included the tall ships which proved to be a huge attraction with the visiting public as was the packed Merseyside Maritime Museum. This is home to one of the world's finest collections of ship models and maritime art, and as the Titanic was registered in Liverpool the museum is home to an absorbing collection of Titanic and White Star artefacts in a dedicated gallery. The former White Star offices, close to the waterfront and the museum have in recent years become a plush hotel with a décor reminiscent of the period of their great liners.

Below: Accomplished model builder Joe Lang of the Liverpool MBC with his 'work in progress' 1:16 scale model of the Holyhead Lifeboat Christopher Pearce No. 17-41.

The model display

This was in the Liner Terminal and local clubs, including Liverpool MBC, pulled out the stops to answer the many questions from the continuous flow of visitors through it. Bill Richardson was demonstrating traditional wood working skills in an entertaining but thoughtful way, something he also does at the Model Boat Convention. Dave Morris from the Wirral MBC headed an enthusiast group dedicated to building and sailing models of the Irish Sea pleasure steamers and IOM ferries, latest amongst this ever expanding fleet being the Lady of Mann at 1:48 scale. Under construction was a lovely 1:72 scale model of the St. Seiriol which along with the St. Tudno provided popular day trips from Liverpool to the North Wales coast in the years between the wars and on into the 1950's.

Conclusion

There was so much to see that it was almost impossible, even over the two days, to get to see all that was on offer. If you have not had the experience of visiting this great event than you really are missing one of Europe's finest maritime festivals and one of the very few locations where a city, ships and the sea are all blended into one, so there is much for families to enjoy here, and public transport into (and out of) Liverpool is very good. Please check the Liverpool Community Websites for the 2018 dates.

Below: On the Liverpool MBC display was this superb model of a gun deck from the age of sail.

Left: The fierce looking figurehead of the sailing frigate Standart.

Right: The power plant for the 1:16 scale Christopher Pearce is two 910Kv brushless out-runners with 55mm five bladed propellers.

Above: Dave Morris of the Wirral MBC with his under construction model of the IOM car ferry Lady of Mann.

Above: Stunning acrobatics with a wet bike in the Canning Dock.

Right: From a personal perspective I like to see this 1:96 scale model of the KM Tirpitz which forms part of the Battle of the Atlantic Gallery. The model has been in the museum for over 30 years.

Test Bench

Model Boats looks at new products

Attention-Manufacturers & Distributors

● These pages are open to you - your shop window to bring to the attention of our thousands of readers, new products - kits, books, videos, engines, R/C gear, motors, anything that could be of interest to model boat builders. Send your information initially to **Model Boats Test Bench, PO Box 9890, Brentwood, CM14 9EF** - or ring the Editor on **01277 849927** for more details.

You cannot afford to miss this opportunity!

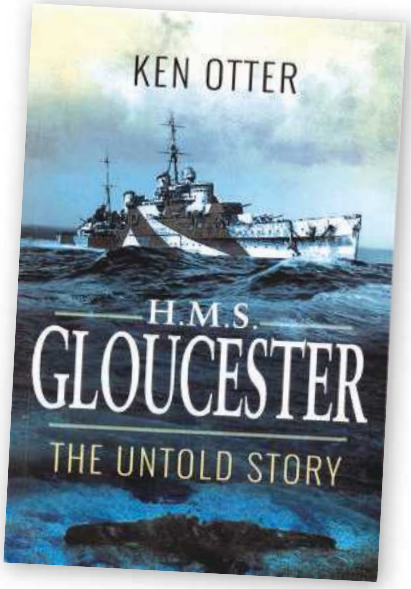
HMS Gloucester – The Untold Story

Written by Ken Otter. Softback, 206 pages, 234 x 157mm, over 100 black & white photographs and maps. ISBN: 9781526702111. Price (rrp) £14.99, published by Pen & Sword Books Ltd, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.pen-and-sword.co.uk. Available direct from the publisher or through the usual retail outlets.

On the 22nd May 1941, the cruiser HMS Gloucester was sunk by aircraft of the Luftwaffe during the Battle of Crete. Of her crew of 810 men, only 83 survived to come home at the end of the War in 1945. It is unknown how many of the men went down with ship and how many died at sea. Clinging to rafts and flotsam, the survivors hung on for almost 24 hours before finally being rescued by German naval boats searching for their own men who had been victims of a previous British naval attack. The fact that Allied destroyers were in the proximity but were recalled from the rescue mission was a serious omission of the fleet command which cost the lives of hundreds of men. HMS Gloucester had been dangerously low on anti-aircraft ammunition and her crew exhausted before being dispatched away from the main fleet to assist the stricken destroyer HMS Greyhound. With only HMS Fiji as company, she came under attack from German bombers, and when Gloucester's ammunition finally ran out, she suffered several direct hits and was soon ablaze from stem to stern and left out of control.

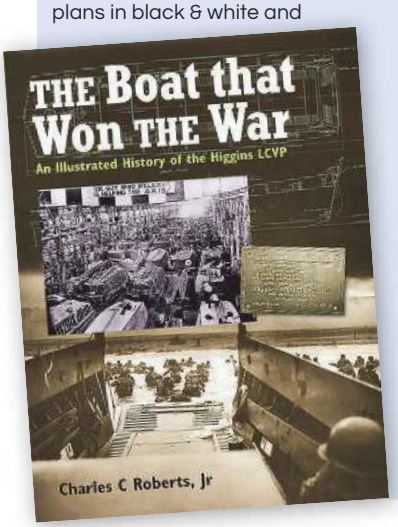
This new 'softback' edition of the book explores the ship's history and operational successes from her launching in 1937 to her tragic demise. It includes vivid first-hand accounts, together with personal photographs and letters, from the surviving crew, which combined with author's painstaking research, has revealed the awful truth about one of the Royal Navy's greatest disasters during the Second World War – highly recommended!

Book Review by ***John Deamer***



The Boat that Won the War – An Illustrated History of the Higgins LCVP

Written by Charles C. Roberts, Jr. Hardback, 128 pages, 255 x 195mm, over 300 photographs, drawings, diagrams and plans in black & white and colour. ISBN: 9781526706911. Price (rrp) £25. Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets.



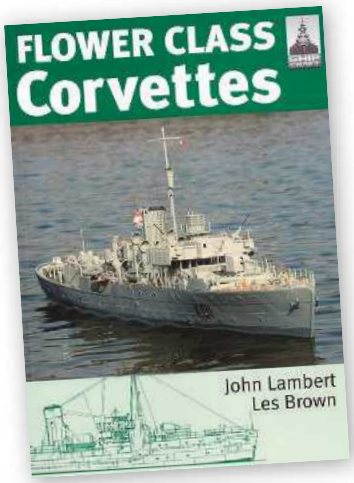
The Landing Craft Vehicle Personnel, LCVP for short or simply the 'Higgins Boat' to most of its users, was one of the keystones of victory in the Second World War. Like the military Willys Jeep and the Douglas C 47 transport aircraft, it served in almost every theatre of that war, performing unglamorous but vital service in the Allied cause. Derived from a humble workboat, the Higgins Boatbuilding Company of New Orleans designed a brilliantly simple craft that performed its role so well that over 23000 of them were constructed and a high proportion of all the troops landed on enemy beaches came ashore from LCVP's, an achievement that led General Eisenhower to describe it as, 'The boat that won the war'. As he had more experience of major amphibious operations than any other commander, it is a judgement to be taken seriously.

In this new book, the author combines the first in-depth history of the development and employment of the type with a detailed description of its construction, machinery, performance and handling, based on his firsthand experience of masterminding the restoration of a wartime example for his museum.

This book is well illustrated with boatyard plans, numerous photographs as well as coloured drawings (some with cutaway views) and diagrams of LCVP's, together with the various engine types that were installed in them. Landing craft have always been a popular modelling subject and the Higgins LCVP is certainly no exception and I'm convinced it will be of interest to model makers and enthusiasts, both naval and military.

Book Review by ***John Deamer***

ShipCraft Special Flower Class Corvettes



Written by John Lambert and Les Brown with colour profiles by Bob Pearson (all drawings by John Lambert). Softback, 128 pages, 297 x 212mm, over 220 photographs, line drawings, and plans in both colour and black & white. ISBN: 9781848320642, price (rrp) £16.99. Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets.

The ShipCraft Series provides modellers with in-depth information about building and modifying kits of famous warship types. This 'Special' has twice the extent of the standard volumes in order to give better coverage of a class that was built in large numbers and in many variations.

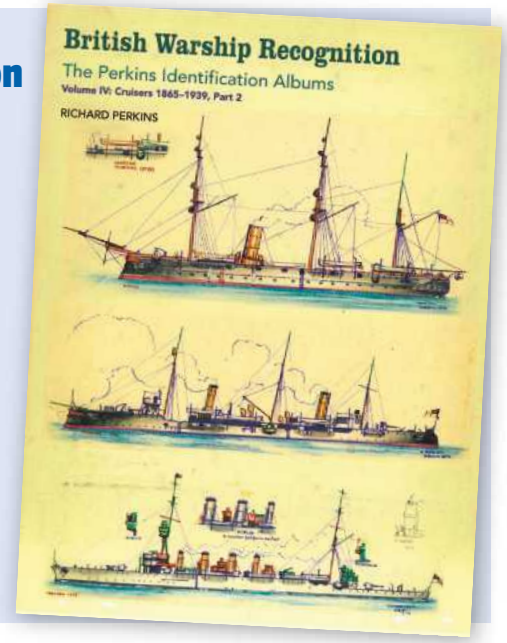
The Flower Class, based on a design for the 700 ton, 16 knot whale catcher Southern Pride, was originally conceived as a simple coastal escort that could be constructed by shipyards with little or no naval experience, but such was the shortage of ocean escorts that they became major players in the WW2 Battle of the Atlantic. Subject to continuous upgrading, hardly two of them were identical, that is besides the major differences between British and Canadian built ships, and they eventually evolved into a far more potent Modified Flower Class.

With its large number of highly detailed line drawings, scale plans, photographs of ships, fittings, weapons and equipment, this book offers the modeller an unparalleled level of information, including paint schemes and camouflage, featuring colour profiles. The modelling section reviews the strengths and weaknesses of available kits, lists commercial accessory sets for super detailing of ships and provides hints on modifying and improving the basic kit. This is followed by an extensive photographic gallery of selected high quality models in a variety of scales. The book concludes with a section for Selected References, including; books, large scale plans and relevant websites.

In short, this book is without a doubt, an essential reference source for anyone contemplating, or in the process of, building a model of one of these famous warships.

*Book Review by **John Deamer***

British Warship Recognition – The Perkins Identification Albums Volume IV: Cruisers 1865 to 1939, Part 2



Written and illustrated by Richard Perkins. Hardback, 192 pages, 403 x 311mm*. ISBN: 9781473891494. Price (rrp) £60. Published by Seaforth Publishing, an imprint of Pen & Sword Books Limited, 47 Church Street, Barnsley, South Yorkshire, S70 2AS. Tel: 01226 734222, website: www.seaforthpublishing.com. Available direct from the publisher or through the usual retail outlets.

The Identification Albums complied by naval photographer and collector Richard Perkins, comprises more than 5000 exquisitely detailed coloured drawings of every major warship built between 1860 and 1939. One of the greatest treasures of the National Maritime Museum, they are bound in eight large volumes and have, over the years, offered an unparalleled source of information for the Museum's staff. Although conceived for the purpose of identifying ship images, what Perkins albums actually provide is the most thorough and comprehensive record of British warship appearance ever achieved.

A full review of Volumes I & II was featured in the December 2016 issue of Model Boats (Page 64). This new Volume IV Part 2 is now available and details Royal Navy Cruisers from 1865 to 1939. Volume V: Destroyers, Torpedo Boats and Coastal Forces will be released, later this year, on the 30th October.

*This is a large 'coffee-table' book.

*Book Review by **John Deamer***

Haynes – HMS Warrior 1860 to Date – Owners' Workshop Manual

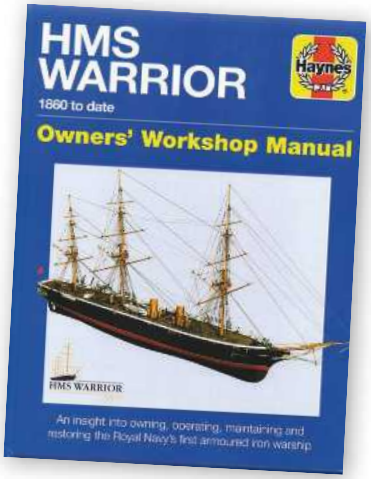
Written by Richard May. Hardback, 172 pages, 277 x 217mm, over 300 photographs, diagrams, line drawings and plans in black & white and colour. ISBN: 9781785211065. Published by Haynes Publishing Ltd. Sparkford, Yeovil, Somerset BA22 7JJ. Tel: 01963 440635 Website: www.haynes.co.uk, price (rrp) £25. Available direct from the publisher or through the usual retail outlets.

When she entered service with the Royal Navy in 1861, the 40 gun steam powered ironclad HMS Warrior was the largest and most powerful warship the world had ever seen. So powerful that she never fired a shot in anger and can be thought of as a Victorian equivalent of a nuclear deterrent: nobody would have dared to argue with HMS Warrior!

As one of the most influential warships ever conceived and built, she represented a watershed in warship design, armament and manning, where the technological advances of the Victorian age were beginning to take precedence over the muscle and wind power relied upon in the age of fighting sail.

The revolutionary design housed the main guns, ten boilers and a powerful steam engine inside an impregnable 'box' or citadel made from 4.5 inch thick wrought iron plates.

Rescued from an uncertain future in 1979, Warrior became the largest maritime restoration project ever undertaken. She is now on public display at Portsmouth Historic Dockyard where she's the sole surviving example of a 19th Century capital ship and the most complete historic warship afloat in the world today.



In this new book the author Richard May, a naval architect and volunteer guide on HMS Warrior, revisits the life and times of this surviving example of Britain's Victorian 'Black Battle Fleet'. With the support of more than 300 illustrations he gives vivid insights into her construction and operation, including the hull, armour, propulsion and armament. He also describes HMS Warrior's renovation at Hartlepool in the 1970's and 1980's and her homecoming to Portsmouth in 1987.

This book paints a compelling picture of this iconic ship, which will most certainly, appeal to ship modellers as well as enthusiasts and naval historians.

*Book Review by **John Deamer***

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STEAM LAUNCH. Twin cylinder TVR1ABB engine, certificated boiler, 44ins long, 3 servos but no r/c, plank on frame, photos available, £1100 ono. Richard Huddleston, tel: 01275 792665 (Bristol).

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GAFF RIGGED 36 INCH YACHT. GRP hull, well balanced, no r/c, £125. David McCormick, tel: 07785 994933 (Hillsborough, Belfast).

FAIREY HUNTSMAN 31, 1:16 scale. The original prototype built by the designer, featured in MB magazine Jan/Feb 2016. 23ins LOA; Turnigy brushless motor, Hawk marine esc, Hitec rudder servo. £400. Buyer collects. Dave Milbourn, tel: 01159 985069 (Nottingham).

STATIC DISPLAY MODEL YACHT. Complete with stand, 16 inches long hull & 19 inches tall mast with sails. £5 cash, buyer collects. Mr. L. Gill, tel: 07576 994111 (Merseyside).

BRIZO 1887. 1:48 scale, scratch built by deceased craftsman, but unfinished. Hull is planked above waterline, masts and other fittings. Lines by Malcolm Darch. Offers please to Elizabeth Rogers, tel: 01202 940092, (Bournemouth).

PLANET T5 2.4GHZ, used six times, £45 ono. Also: Futaba 27Mhz AM 2 Channel Attack Sport, no Xtal, £10; Blade SR HP6 DSM 6 Channel 2.4GHZ Tx & Rx with Spektrum Rx, £40 ono. Michael Tripp, tel: 07810 596914 (Grimsby).

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1:700 SCALE NAVAL DIORAMAS PART 7

Chris Drage explains how to build these miniatures

Operation Halberd 1942 featured the British cruisers Sheffield, Edinburgh and Kenya. These are 1:700 scale models and show what can be achieved just by working on a kitchen table.

A Harbour Scenario

The one big advantage of depicting ships in a harbour is that you can include a great deal of activity around them. Cranes may be loading or unloading, gangways might be deployed to welcome visiting launches and whalers can be moored at the stern, or alongside, awaiting a crew. Similarly, it gives you the excuse to introduce more vessels into the mix and the motivation for this diorama was twofold:

First, I wanted to include three new models, two of which were the latest Skytrex white metal castings, the other being White Ensign Models' latest K Class destroyer multimedia kit and the second motivator? Was there an excuse for including all three in one diorama?

As it so happened during 1941, all three ships could have been in port at Alexandria in Egypt at the same time, and I had a photograph of HMS Ajax sporting a most flamboyant WWI style of dazzle camouflage with HMS Kimberley (K Class destroyer) also just visible in the image. It could quite feasibly have happened that HMS Naiad would have been entering harbour after having been withdrawn from Arctic duties and sent to join these elements of the Mediterranean Fleet at that time. Mind you, some artistic licence should always be allowed with dioramas!

Alexandria Harbour June 1941

These were hard times in the Mediterranean for the Royal Navy. HMS Ajax lead a charmed life throughout WW2 and none more so than during the Crete campaign when without air cover, the RN had to evacuate the British forces to Alexandria as well as ensure that supplies got through to the beleaguered Nile Army. HMS Ajax had been in the heat of many actions, sustaining more near misses from bombs than anyone dared count and this lucky ship by early-June 1941 was in Alexandria Harbour anchored in close company with HMS Kimberley, but this was to be a short respite. HMS Naiad made her debut in the Mediterranean theatre as escort to a through convoy (Operation Tiger) with HMS Queen Elizabeth and HMS Fiji in May 1941. On arrival at Alexandria, she hoisted the flag of Rear Admiral B. King in command of Force C, together with HMAS Perth and four destroyers, and soon received her baptism of fire, sustaining in one two-hour period no less than 97 bombing near misses during the Crete operations.

HMS Kimberley is wearing a two-tone disruptive camouflage consisting of AP507a and AP507c. HMS Ajax is wearing a dazzle scheme based on WW1 practice, the colours

Below: This is the finished diorama with HMS Ajax and HMS Kimberley at anchor and HMS Naiad steaming into the harbour.

Above: HMS Ajax has a WW1 style of dazzle camouflage and contemporary black and white pictures confirm this.

Above left: HMS Naiad has the WW2 style of camouflage.

Left: HMS Kimberley at anchor.

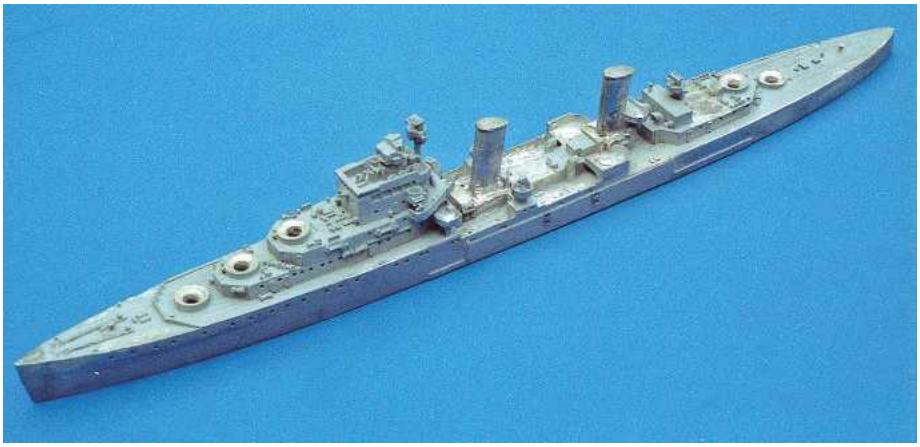
consisting of black and white. Her decks are painted in AP507a, which is evident in photos taken slightly earlier. HMS Naiad is wearing an unusual type of disruptive design, which she had worn since her completion in mid-1940. The colours are AP507a, AP507b and AP507c and her wooden decks were also painted. None of these camouflage designs would have lasted long as it became the practice to dress all Royal Navy Mediterranean ships in the dark-hull and light upper-works pattern.

The diorama depicts the scene when HMS Naiad arrives in Alexandria Harbour, passing HMS Kimberley and HMS Ajax at anchor. In the busy harbour are also two Egyptian feluccas, gibing in the steady breeze in an attempt to keep out of the cruiser's way. HMS Ajax is loading stores, whilst all appears rather quiet on HMS Kimberley's decks and HMS Naiad salutes the anchored ships with her 5.25 inch guns elevated, perhaps also in case of imminent air attack?

The warship models

Kimberley is a White Ensign Models (WEM) HMS Kashmir kit whilst both HMS Ajax and HMS Naiad are Skytrex white metal castings. Actually, HMS Naiad is a modified Skytrex HMS Dido wargamers' model and a variety of etched brass after-market sets were used to detail them. It is much easier to amend and remodel cast metal models than you may think, as all you require is a good modeller's drill with some burrs, body filler, etched brass detailing parts, plastic and/or brass rod and strip, plus good reference material and the accompanying photos show some of the steps in the process.

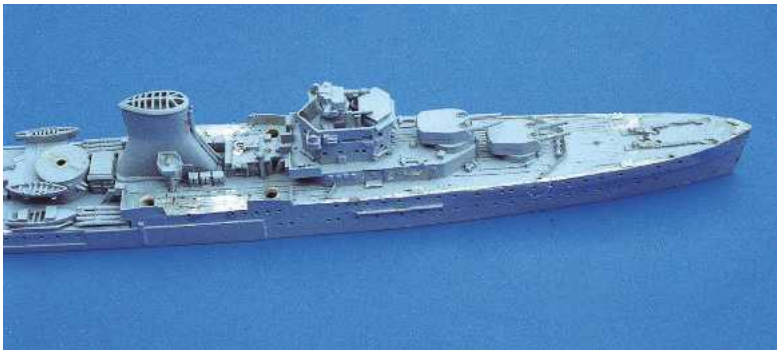
Of particular note is the construction of the tripod masts and their accompanying platforms etc. The white metal castings were so flexible and out of scale that there was

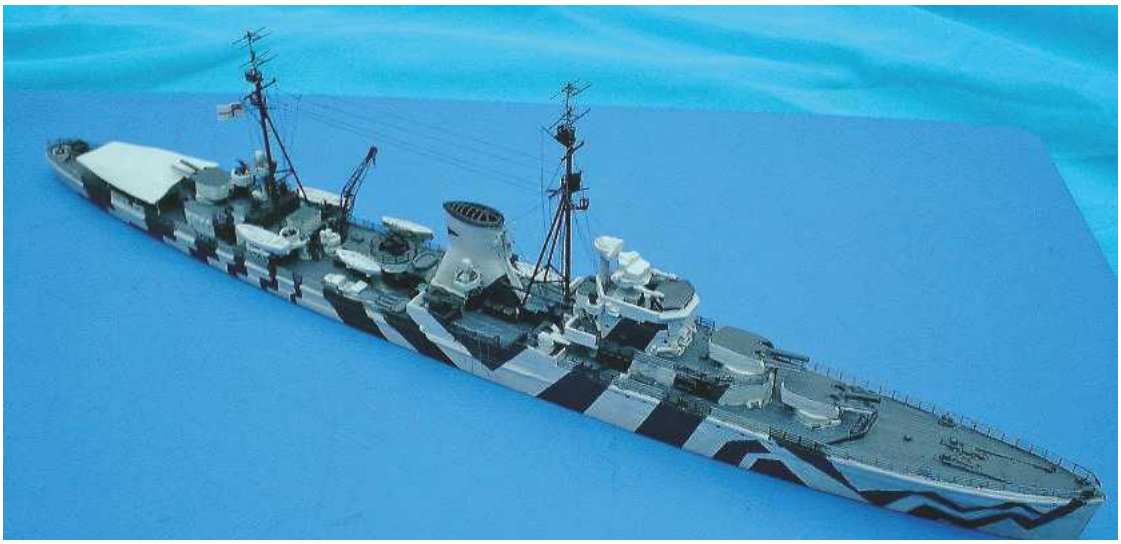


Left: The white metal casting from Skytrex was considerably modified.

Below left: The completed HMS Naiad. The rigging is fine electrical wire strands.

Below: HMS Ajax started as a Skytrex casting, but was much-modified.





Right: HMS Ajax with its unusual WW1 style of dazzle camouflage. Note the awning on the quarter deck.

Below: HMS Kimberley started life as a WEM HMS Kashmir destroyer kit.

only one place for them, namely the round filing cabinet on the floor, aka the bin! By constructing the masts using a variety of brass rod, this enabled more in-scale and stronger structures to be created. Using the fine copper wire, found in the core of old multi-strand electrical cables, is the answer to constructing realistic rigging. By removing all the insulation, one ends up with a twisted mass of fine wire and the secret is in how to get this crumpled wire perfectly straight. This is achieved by carefully rolling the wire under a steel ruler on a cutting mat surface. By placing the ruler along the length of the wire and rolling backwards and forwards with pressure, a lovely straight section of rigging can be created. Once glued into position, any overhangs can be easily snipped-off. With HMS Naiad, I also added fine resin 5.25 inch gun barrels (part of WEM's detailing sets) to her main armament, instead of opting for the white metal ones provided with the basic kit.

Using the archive photo as a guide, the canvas awning over the quarter deck was made from foil, folding it and smoothing it in order to obtain the scale canvas effect. This in turn, was glued to small rods representing the awning supports on the quarter deck. A suitable vessel from the Skywave 1:700 Tugger Set was pressed into service and converted to a lighter delivering HMS Ajax's stores which also gave the excuse to show her crane in operation. HMS Kimberley has small craft around her giving an impression of activity, even though she is very much at anchor.

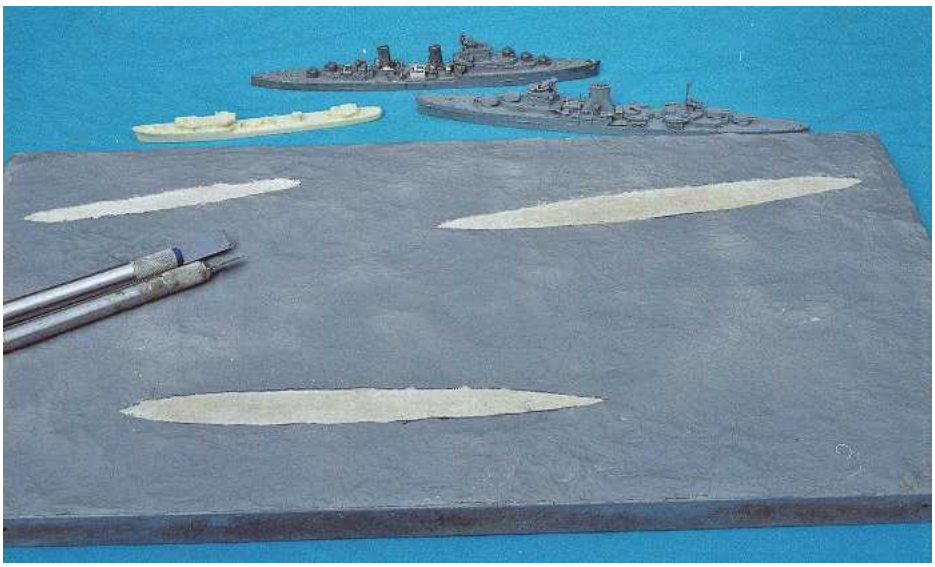
The base and seascape

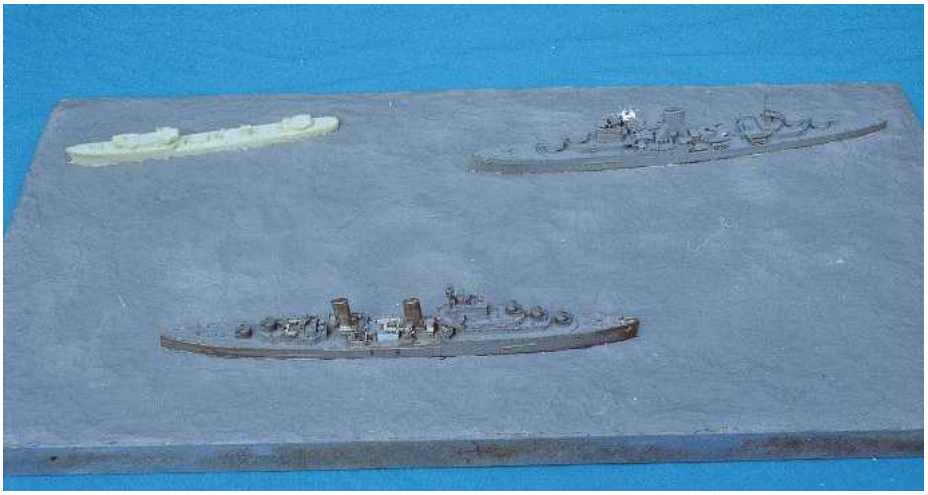
In previous articles we have discussed making a seascape, so briefly for this harbour scene, a small amount of Polyfilla on the MDF base was used to provide the slightly 'lumpy' effect to make the harbour water a little more interesting for this diorama. Once the recesses for the ships had been made, this was given alternate coats of green and dark blue acrylics so that a mix of the two colours showed through and finally, several coats of gloss varnish completed the harbour's water. To add more interest a small launch was added crossing the harbour and finally to give the whole scene an Egyptian flavour, a pair of Feluccas were scratch built with their sails billowing as they busily gibe out of the way of HMS Naiad entering the harbour. As these sailing craft ply up and down the River Nile there was no reason to suspect they did not operate in the Port of Alexandria as well.

Conclusion

To assist you to ascertain how well this diorama turned out, a black and white photo has been included, taken by a WW2 photographer. The important point is that with good references and suitable supplies of photo etched brass and resin parts, you really can make a silk purse from a sow's ear. HMS Naiad is particularly pleasing as the model is now quite hard to distinguish from being a relatively simple wargamers' kit to a high quality resin based multimedia kit. Next time, we will have another attempt at modelling Royal Navy cruisers both in action and at anchor.

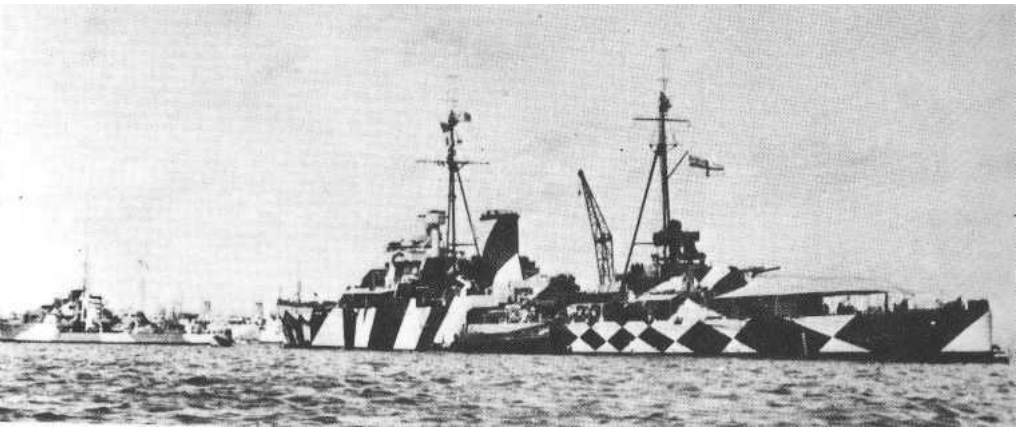
Below: The base is of MDF, covered in metal foil and Polyfilla as described in previous articles. Note the spaces for the warship hulls.





Above: Still in primer, but the warship hulls are now positioned on the MDF and metal foil seascape base. The water still has to be painted though.

Below: A contemporary picture of HMS Kimberley and HMS Ajax in Alexandria Harbour in 1941.



References

General note:
1:700 scale kits can be in and out of production and these notes reflect that, but if you search online, 99% can usually be found – somewhere and from someone.

Scalemates (for 1:700 kits)
Website: www.scalemates.com

Dido Class cruiser kit
1:700 Flyhawk Model of HMS Naiad, No. FH1112.
(Alternative to the Skytrex kit)

K Class destroyer kit
Revell 1:700 HMS Kipling kit, No. 05120.
(Alternative to the WEM kit)

Mod Roc
This is a plaster bandage used by sculptors and is handy if creating a mountain or cliff for example.

Polyfilla
Ideal for creating seascapes and any number of other features.

Primer Coat
Halford's Grey Plastic Spray Primer.

Acrylic Paints
Artist's acrylics, available from most art retailers.
The varnish is Tamiya Gloss Varnish.

Enamel Paints
Humbrol and WEM Colour Coat.

2017 R/C Marblehead National Championship

Roger Stollery reports from Fleetwood

This was a fantastic event held in early-July. Not only did the wind blow straight down the lake for most of the three days, but the 48 boat entry, including 13 competitors from overseas, was of a very high standard. Many of the top boats and skippers from last year's Marblehead World Championship at Lake Garda travelled to the exposed Lancashire coast to compete on probably the best lake in the world for some top-class radio racing. Racing started on Friday and allowed 18, three heat races to be sailed with two or three lap courses using the whole length of the 250 metre lake for the simple windward leeward courses.

Friday

A six to fourteen mph wind greeted competitors allowing B or C Rigs to be used and generating some spectacular downwind speeds, which gave some competitors a problem keeping up with these speed machines. The racing was dominated by Brad Gibson, who was taking a break from his full-size foiling Moth sailing and returning to radio control, racing his GRUNGE design with his usual finesse. Other skippers enjoying the conditions and getting podium positions were Martin Roberts sailing his elderly, but still very quick pink STARKERS, Tony Edwards, also with a GRUNGE, Matteo Longhi from Italy sailing a NIOUTRAM and Graham Bantock sailing his QUARK design.

Below: A typical start, with Peter Stollery (39) getting the best start at the windward end (left of picture).

Saturday

Light and more variable conditions coming off the sea created a problem for the Race Officer, Derek Priestley, who was forced to create a zigzag course up the 70 metres wide lake. Aided by Peter and Judith Baldwin, they called for an early lunch as the wind was dying which was a good call as after lunch the wind came straight down the middle again and gave some good light airs racing in A rig.

In the morning it was Brad Gibson who once again won every race, but in the afternoon James Edwards won Race 10 with his GRUNGE, with Frenchman Arnaud Toureau sailing a SISCO taking Race 11 and Martin Roberts winning Race 12. After racing had finished, a team race using DF One Designs it was organised and this was followed by a Lancashire fish and chip supper in the clubhouse, followed by a quiz and a good time was had by all.

Sunday

The Race Officer and his team were delighted that the wind was another north-westerly straight down the lake between 8 and 10 miles an hour, giving perfect A Rig conditions. Graham Bantock got his only win of the event in Race 13, but then let Brad Gibson take all the remaining races, except the penultimate Race 17, which was won by the Frenchman, Gilles di Crescenzo sailing another SISCO design.

This was another amazing performance by Brad and his GRUNGE, scoring under one third of the points of second placed Martin Roberts, whose performance was also remarkable and very encouraging for club sailors, as he was racing his elderly pink STARKERS, which is still available from designer & builder Dave Creed. He was squeezed between Brad and the two GRUNGE's of Darin Ballington and Tony Edwards, who finished ahead of the Italian, Matteo Longhi.

Below: Perfect conditions for close racing on the Fleetwood lake.

The boats

There was a great deal of variety in the 17 designs racing, but the common factor in the light airs was the use of the swing rig, for all except four competitors. The most interesting design was ROCKET from the board of young designer & builder Mike Cooke, because of its wave piercing 'dreadnought' bow and neutral T foil on the bottom of the rudder to keep the boat stable when pressed hard. Whilst there was insufficient wind to demonstrate the boat's ability, Mike will be developing more designs to improve the breed. There was a phenomenally high standard of the boats and equipment at this event, and this made the racing very close indeed, wherever you were in the fleet.

The Prize Giving

Brad Gibson thanked Derek and his race team for creating a great event and also Maureen Priestley whose team of friendly helpers behind the bar kept competitors fed and watered throughout the event. Competitors not sailing in the Ten Racing National Championship which followed were pleased to stop racing, which on this lake is quite physical, as in following your boat up and down the lake you will be walking or running at least 10 kilometres a day!

***Roger Stollery** – July 2017*

Results (top 10 only)

	Name	Club	Boat
1st	Brad Gibson	Birkenhead	GRUNGE
2nd	Martin Roberts	Birkenhead	STARKERS
3rd	Darin Ballington	Manor Park	GRUNGE
4th	Tony Edwards	Yeovil	GRUNGE
5th	Matteo Longhi	N.W. Garda	NIOUTRAM
6th	Graham Bantock	Chelmsford	QUARK
7th	Peter Stollery	Guildford	UPROAR
8th	Gilles di Crescenzo	France	SISCO
9th	Colin Goodman	Coalhouse Fort	QUARK
10th	James Edwards	Yeovil	GRUNGE

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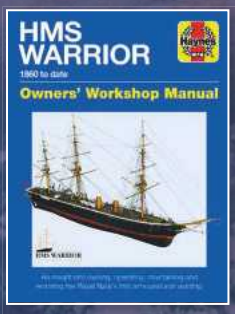
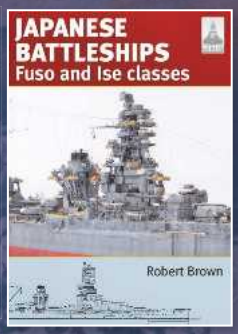


HMS Warrior Owners Workshop Manual. With more than 300 illustrations the author gives vivid insights into her construction and operation, including her hull, armour, propulsion and armament. **£25.00**



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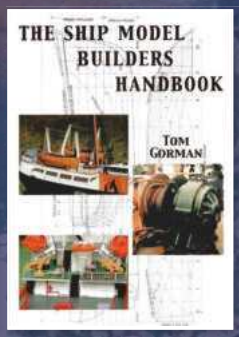

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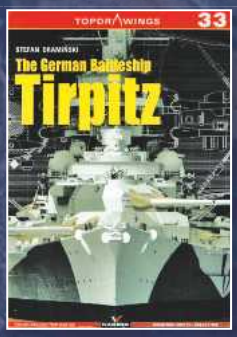

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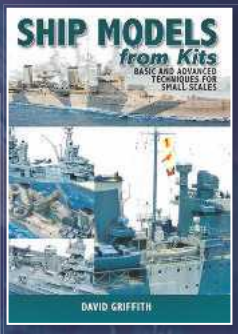

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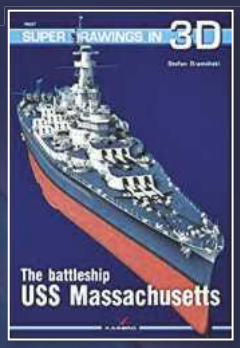

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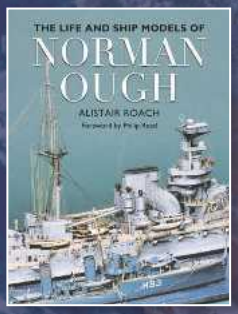

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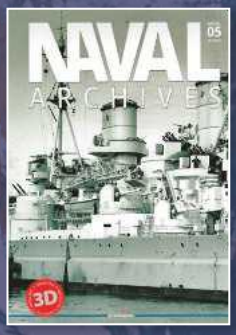

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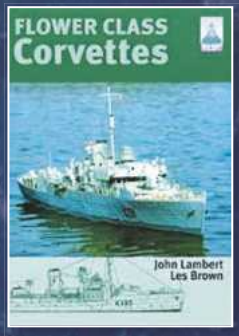

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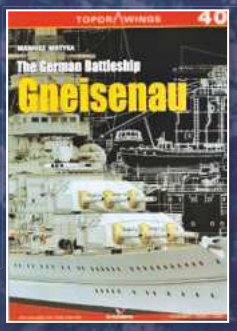

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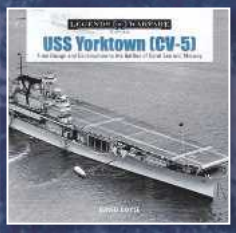

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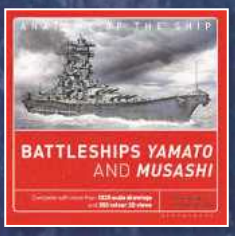

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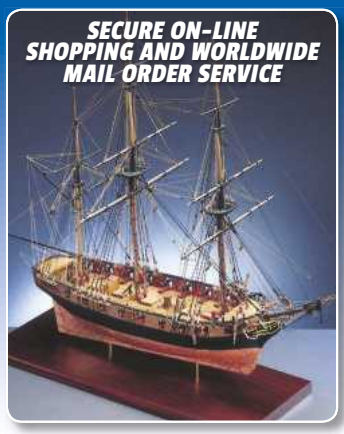

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