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1:24 R.N/Civilian wearing waterproof jacket	£8.12
1:24 Standing civilian captain in sheepskin jacket	£8.12
1:24 Seated ships captain with cap and pullover	£8.12
1:24 Standing officer in wet weather jacket	£8.12
1:24 R.N/Civilian wearing waterproof jacket	£8.12
1:24 R.N crew in dress uniform leaning on rail	£8.12
1:24 Seated civilian crew member 1:24 scale	£8.12
Ships cat, sitting 1:48 Scale	£1.72
Bearded Officer, 1:32 Scale	£8.75
Crew member,1:32 Scale	£8.75
Officer, clean shaven, 1 32 Scale	£7.45
Bearded Officer1:48 Scale	£6.12
Crew member, leaning on rail 1:48 Scale	£5.35
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model Boats

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Regular Features

Special Features

Bow piece

This issue includes a number of model construction articles including a Plastic Magic r/c conversion of two Tamiya 1:350 scale kits for the battleships HMS King George V and HMS Prince of Wales. As usual, Tony Dalton explains the entire process very well, building a superb radio controlled pair of these famous World War Two battleships. On the same theme, but somewhat larger, is a fantastic 1:80 scale USS Missouri battleship built from plans by Australian reader Bob Gilbert. This model, which weighs a staggering 80kg, is truly remarkable with numerous working features and a dedicated launching and transport method, all revealed in his article.

We welcome back Andy Cope with a new Fire Boat feature article for his r/c model, speedily built and entirely created from photographs. Dr. Marcus Rooks has Part Four of his HMS Dreadnought project and in this he is continuing with the detail work, although the steam turbine plant has been temporarily removed pending modifications and replaced by electric motors for the initial on the water trials.

Phil' Scales has another model gallery, this time for his Scale Supporter, a much modified Model Slipway Aziz kit. As with the other models in his fleet, Phil demonstrates how easy and practical it is to turn an already excellent kit into something quite different with a little thought and some research.

On the technical side of our hobby, Francis Macnaughton discusses a combined micro speed controller and power unit for small plastic models.

We also have all the usual regular columns, including Range Finder, Flotsam & Jetsam and Boiler Room, as well as Part Two of Chris Drage's new mini-series on 1:700 waterline models, so I hope there is something here for all our readers.

***Paul Freshney** - Editor*

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

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This issue of Model Boats

Colin Bishop edited and checked some of the content of this May 2017 magazine whilst I was on holiday in mid-March, so from me a big 'Thank You' to him for his efforts.
***Paul Freshney** - Editor*

Bournville Radio Sailing & Model Boat Club

This club has an Open Day on **Sunday 9th July.** The perfect event to show and sail your model with like-minded people, and all are welcome to attend. Venue is Bournville Lake, The Boat House, Bournville Lane, Bournville, Birmingham, B30 1QS. Refreshments will be available at all events, toilets, disabled access and parking. For more information, please contact Robert Fowler, tel: 07714 517445 or email: rob4boats@yahoo.co.uk
Website:
www.bournvilleyachtandpowerboat.org

Vintage Model Sailing

On **Saturday 20th May** at the Bournville Model Yachting Lake will be held the first sailing meeting of the MYA Vintage Branch, all day.*Information supplied by **Mr. L. W. Cooke***

Balne Moor MBC

On **Sunday 14th May,** this club is holding a scale sailing event with separate classes for large and small boats, £1.50 per boat. 1030hrs start. Also on **Sunday 28th May** there is a Tugs & Navy Day. Non-naval boats also welcome; £1 per boat, all types. Bacon or sausage butties are available until 1230hrs for both events, hot and cold drinks all day and homemade cakes until finished. 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 Model Boat Club

On **Sunday 9th July 2017** this club is holding its annual Open Day at Wilton Park, Bradford Road, Birstall, Batley, WF17 8JH, from 0900hrs to 1600hrs. All types of models are welcome with the exception of i.c. powered and high performance fast electric. All steam boats must have an up to date boiler certificate. Free sailing all day, free car parking, refreshments, a large raffle, visiting clubs, toilet facilities, trade support and a large selection of models on display. The RNLI will also be on site raising funds. Please contact Stan Reffin for more information on tel: 01132 675790, or via the club website:
www.kirkleesmodelboatclub.weebly.com

The East Midlands Model Lifeboat Day 2017

Due to the success of the sixth, 2016 event, King Lear MBC will be hosting this again

2017 Fred's Big Toephy Event

Roger Stollery and **Keith Parrott** report

The first Footy Open event for 2017 was 'Fred's Big Toephy' organised by the Guildford MYC at Abbey Meads Lake in Surrey, and it took place on Sunday 5th February.

There were ten boats on the water, which included two junior entries, these being Roger Stollery's grandchildren Oliver and Nathan, ably supported by their father Peter. The wind was a cold and deceptive variable westerly 4 to 6mph, with gusts, blowing almost straight down the lake. Race Officer Martin Crysell set a simple windward leeward course with a spreader at the windward end and a gate at the other. Being at the leeward end of the lake the water for these little boats was a little choppy and gave some problems if you were not in the right suit of sails.

The usual top skippers were immediately in the forefront of the races, with a ding-dong battle between Peter Shepherd and John Burgoine, although finishing on the same overall score, John took the victory on count-back with one more first place. Peter Jackson was campaigning a new narrow Footy design IBEX in carbon fibre and has still to develop its full potential. He battled well with David Wilkinson for third and fourth places respectively.

Above: Oliver (left) and Nathan Stollery - enthusiastic junior competitors.

Understandably for the first race of the season, there were some reliability issues among the fleet, which allowed Keith Parrott to claim seventh place overall, a pleasant surprise after a very poor start to the day when sailing his trusty ICE with last season's suit of sails. He finally settled on using his C rig which gave the most consistent results, including a second place and accepted a loss in performance downwind to others carrying bigger sails.

Sid Simms, sailing another ICE did the opposite in that that he started the day well and lost out as the day went on. With the help of their dad, which was agreed by all at the start of the event, seven year old Oliver Stollery, who was racing his ICE BREAKER for the first time managed to complete 14 races getting better during the event to achieve a

on **Sunday 18th June 2017.** All lifeboat enthusiasts are most welcome for this informal and fun event. There is a jetty and slipway for ease of access to the lake so please take your boats for a sail. There is ample parking and picnic facilities at Watermead Country Park, Leicestershire, LE7 1PD. There is a £2.50 entrance fee payable to an unmanned machine. There are no catering facilities on site so bringing your own lunch is recommended. Further information can be obtained from Marie Burdett, tel: 0116 2613959 or by email: kinglearmbc@ntlworld.com.

For up to date information please the club website: www.kinglearmodelboatclub.co.uk.

Edinburgh Model Boat Club

2017 regatta dates:
14th May: Start of season, 1100hrs start.
18th June: Tug Day.
13th August: Annual Regatta.
24th September: End of Season and Warship and Submarine Day.
Venue is: Inverleith Park, Stockbridge, Edinburgh, EH3 5NZ. All events start at 1100hrs, refreshments and toilet facilities will be provided.
Information supplied by ***David Jack***

Worcester Model Boat Club

This new club would like to introduce itself as they are a band of enthusiastic individuals and friends who have now formally started their own model boat club. They are based outside Worcester in the West Midlands and cover the local area, their sailing headquarters having excellent facilities including ample parking, toilets, plus a café and restaurant overlooking the superb lake. They sail all types of yachts and electrically driven model power boats and the venue is within the Cob House Country Park, Worcester Road, Wichenford, Worcester, WR6 6YE. Membership is open to anyone who shares their interests. For more information, please check their website: www.worcestermodelboatclub.co.uk or email James Anderson at: worcestermodelboatclubuk@gmail.com

Planet Transmitters?

Philip Bellamy wonders if anyone has had success using a Planet Receiver with a different brand of transmitter, since Planet no longer manufacture them. Replies via the Editor please or posted on the Model Boats Website Forum.

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'Mavis', featured bottom right on this page is by Bill Power, and the model boat is named after his wife a former professional singer. Dave Wooley did not know whose model it was when preparing the article.
Information supplied by ***Jack Stansfield***

Glasgow Richmond MBC

This club is holding a Tug Towing Competition on **Sunday 11th June 2017,** 1000hrs to 1630hrs at Richmond Park, Glasgow (opposite Shawfield Stadium), one mile from junction 1A of the M74. Please visit the only tug towing event in Scotland and see the extensive harbour system. Hot and cold food and beverages will be available throughout the day. Car parking is next to the pond and a helping hand to unload vehicles will be available if needed. Toilet facilities are also available. Please go along, join in the fun, as you will be made most welcome. All enquiries to the club secretary, Murray Wilson, via the club's email: glasgow.richmond@gmail.com Travel directions are on the club website: www.glasgow.richmondmbc.co.uk

Midlands Model Engineering Exhibition

Advance notice that this is being held from **Thursday 19th to Sunday 22nd October 2017** at the Warwickshire Exhibition Centre, Nr. Leamington Spa by Meridienne Exhibitions Ltd.

Crosby Model Boat Club

This club will be holding their annual regatta on Sunday 2nd July 2017 from 1300hrs to 1530hrs at the lakeside in Coronation Park, Crosby, Merseyside, L23 5RQ. This is an outdoor event consists of static displays and sailing on the council boating lake. There is on street parking. Further information on the club website: www.crosbymodelboatclub.co.uk

Model Power Boat Association

Andy Coburn has advised that the MPBA has refreshed its online content and the new website design features include a Forum and User Blog, together with one of the most up to date Club Directory and Event Calendars on the Web.

The Facebook page has also had a refresh and is a lot more active than it used to be. MPBA website is www.mpba.org.uk

Left: David Wilkinson (46) leading.

Below: Peter Shepherd (65) makes the best start.

Right: Winner, John Burgoine (right).

Results:

1: John Burgoine
2: Peter Shepherd
3: Peter Jackson
4: David Wilkinson
5: Sid Sims
6: Oliver Stollery (Junior)
7: Keith Parrott
8: Roger Stollery
9: Keith Bell
10: Nathan Stollery (Junior)

third place on his own in the very last race. His younger brother lasted only a couple of races, before joining the race committee as the official button pressing starter!

At the prize-giving, Peter Shepherd thanked the race committee and said that he thoroughly enjoyed the event and thought that this was, 'One of the best events he had attended for some time'. John Burgoine was delighted to have beaten the two Peters' and put yet another name on the infamous trophy.

Please see more details of the 2017 Footy Racing program on: www.sailfooty.uk

Model Boats June 2017 issue is on sale on the 12th May 2017

FREE PLAN

Nomad

Next month in model Boats

The June 2017 issue of Model Boats will include a full-size Free Plan for Nomad, an easy to build semi-scale tramp steamer, together with a supporting in-depth construction article, presented by Glynn Guest. In addition, Phil' Button will be restoring and sailing his Red Dragon, a recently discovered old model yacht that had seen better days.

Red Dragon

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**

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"IF IT FLOATS, WE CAN BUILD IT"

HMS King George V & HMS Prince of Wales

Tony Dalton converts two Tamiya 1:350 scale plastic kits to radio control

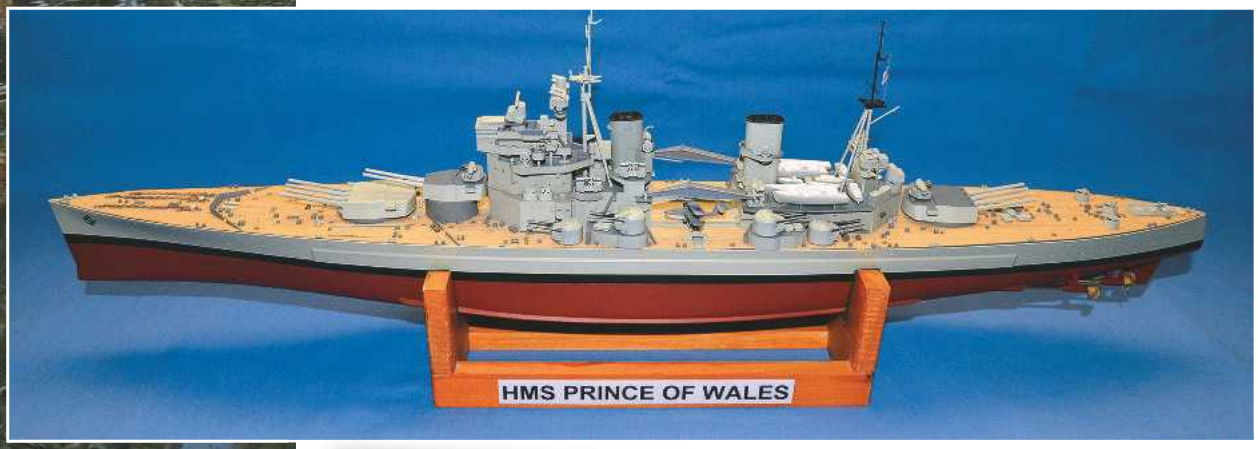
I was very lucky to be given a plastic kit of the HMS King George V battleship, followed shortly afterwards by another for HMS Prince of Wales, both to a scale of 1:350 and manufactured by Tamiya. As both models were very similar in construction, it was decided to build both of them at the same time. However, before going into a detailed description about their construction and adding that Plastic Magic touch, a few facts about the real vessels and their history would not be amiss.

The King George V Class battleships

These were the most modern British battleships during World War Two and five warships of this class were commissioned: HMS King George V (1940) as in **Photo 1;** HMS Prince of Wales (1941); HMS Duke of York (1941); HMS Howe and HMS Anson (1942).

The Washington Naval Treaty of 1922 limited the displacement and armament of warships built following its ratification, and this was extended by the First London Naval Treaty, but the agreements were due to expire in 1936. It was supposed by the designers of such battleships that the treaty might not be renewed and thus the warships of the King George V Class were designed with this possibility in mind.

All five ships would see combat during World War Two, with HMS King George V and HMS Prince of Wales being involved in the action from the 24th May to 27th May 1941 that resulted in the German battleship KM Bismarck being sunk. Following this, on the 25th October 1941, HMS Prince of Wales was sent to Singapore arriving on the 2nd December and became the flagship of Force Z. On the 10th December, HMS Prince of Wales was attacked by Japanese bombers and sank with the loss of 327 of its crew. In October 1942, HMS Duke of York was sent to Gibraltar as the new flagship of Force H and supported the Allied landings in North Africa. HMS Anson and HMS Howe also provided cover for multiple convoys bound for Russia in 1942 and 1943. In May 1943, HMS King George V and HMS Howe were moved to Gibraltar in preparation for Operation Husky. The two battleships bombarded Trapani Naval Base (Sicily) and Favignana on the 11th and 12th July and also provided cover for Operation Avalanche. During this time, HMS Duke of York and HMS Anson participated in Operation Gearbox, which was designed to draw attention away from Operation Husky. HMS Duke of York was also heavily involved in the action that sank the German



HMS King George V & HMS Prince of Wales

Sorry, the numbered legended pictures for this article are not always on the same pages as the text, principally because of space considerations, although the designer and myself tried our best to resolve the problem - Editor.


1

battleship Scharnhorst on 25th December 1943. This battle was also the last time that British and German capital ships fought each other during World War Two. In March 1945, HMS King George V and HMS Howe were sent to the Pacific as part of Task Force 57 and on the 4th May 1945, they led a 45 minute bombardment of the Japanese air facilities in the Ryukyu Islands. HMS King George V fired her guns in anger for the last time in a night bombardment of Hamamatsu. HMS Duke of York and HMS Anson were also dispatched to the Pacific, but arrived too late to take part in the hostilities. On the 15th August 1945, HMS Duke of York and HMS Anson accepted the surrender of Japanese forces occupying Hong Kong and along with HMS King George V were present for the official Japanese surrender in Tokyo Bay. Following the end of World War Two, these battleships were slowly phased out of service and by 1957 all of them had been sold for scrap.

Supplier Data

Tamiya:	KGV and POW battleship kits - prices online from £36 upwards
Electric motors:	Amazon
Speed controllers:	Component Shop - Action P78R Condor
Batteries:	Component Shop – AA Size 1100mAH NiMH
Rudder Servos:	Servo Shop - Tower Pro SG92R
Turret servos:	Amazon HiSKY HP100 Linear Servo
Eze Kote:	Deluxe Materials
LED's:	eBay - Size 0804
Wood decking:	Axels Modellbau Shop (www.axels-modellbau-shop.de) Artwox AW10029 & AW10028

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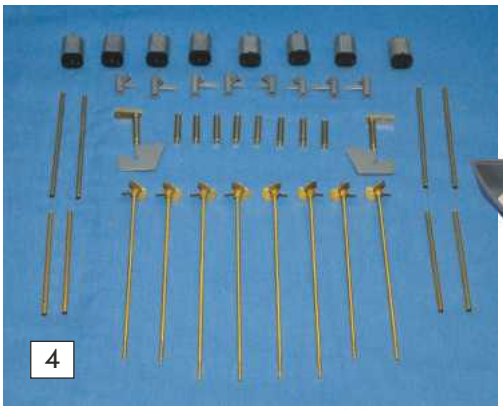
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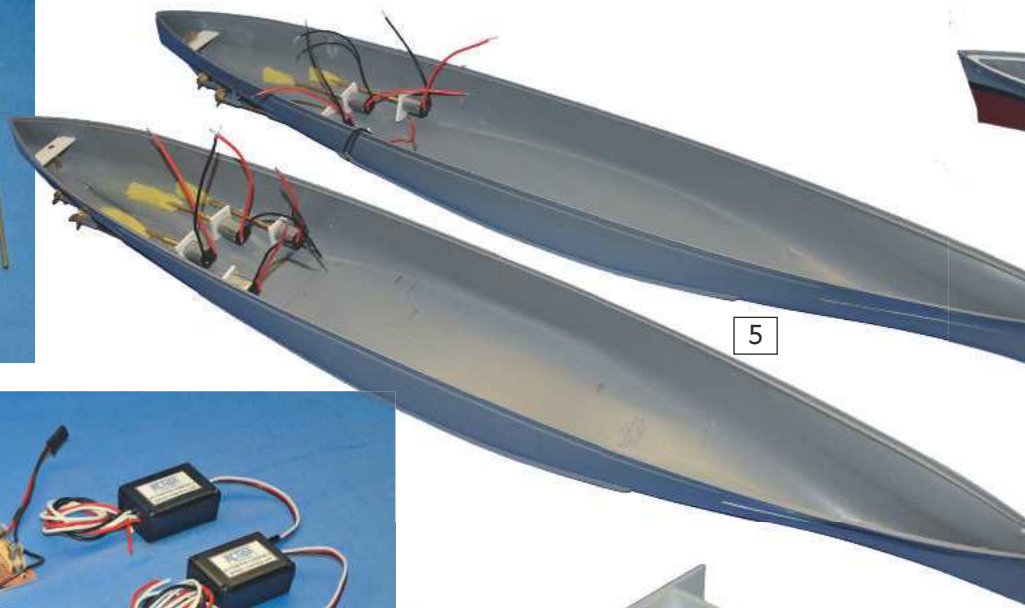
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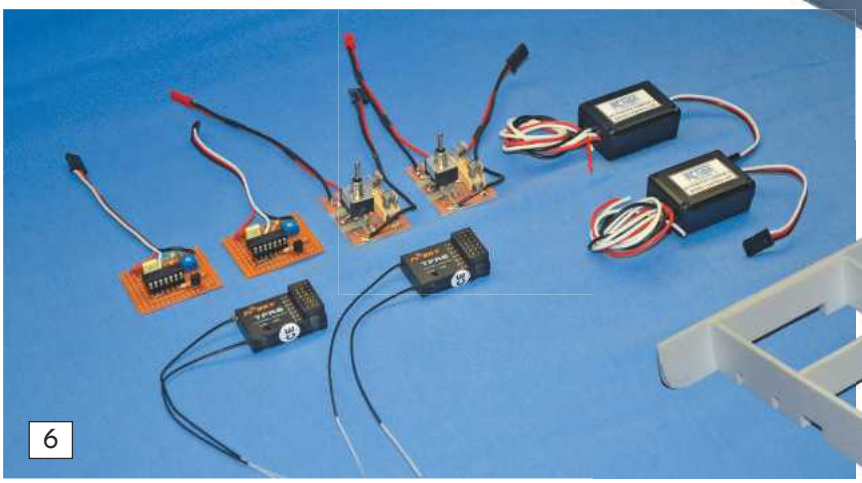
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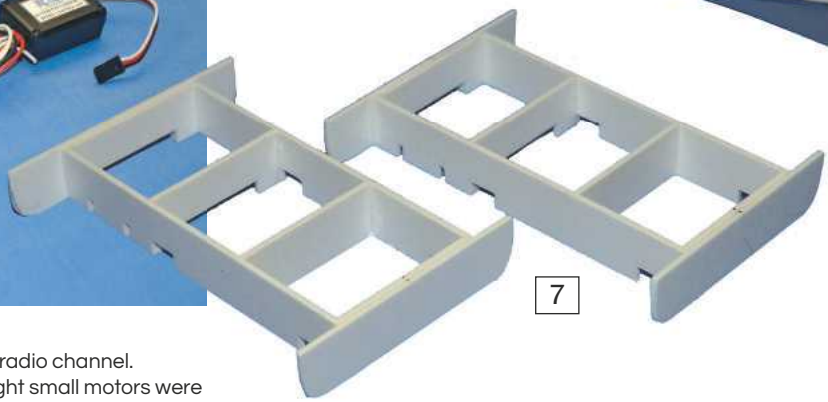
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The kits

The two Tamiya kits are numbered 78010 (HMS King George V) and 78011 (HMS Prince of Wales), and are manufactured in Japan. **Photo 2** shows the two boxes and **Photo 3** shows all the parts in their sealed bags. The kits each comprise a one piece moulded hull; a main deck in three sections; ten moulded frames containing all the small parts (just over 300 items); a 20 page booklet of instructions and a sheet of transfers. The detailed instructions are good quality, as are the moulded parts that have a lot of fine detail.

Building the kits

I planned to simultaneously build the two kits in stages, thus processing and completing each stage of the project at the same time, as the accompanying photographs will show. I also intended to make this project slightly different in that the main fore and aft (four barrelled) 12 inch turrets would traverse, controlled by one radio channel.

First though, eight small motors were needed for the propulsion systems, and as the normal source did not have anything suitable, it was on to the Internet and something suitable was found on Amazon. Having obtained the motors, it was now time to build the rest of the propulsion systems.

The running tubes were made from 2.5mm dia. brass tubing with a 2mm bore, cut to the required length and the propeller shafts are from 2mm diameter brass rod tapped M2 at both ends and the couplings are from 3mm diameter brass rod tapped M2 at one end and drilled 1mm diameter at the other, to suit the motor shafts. The eight kit supplied plastic propellers were removed from their sprues and fitted into the chuck of the lathe, drilled and then tapped M2 to suit the propeller shaft. Once completed, the propellers were screwed and bonded to each propeller shaft and painted bronze. Next, the A-frames were removed from their sprues and also fitted into the chuck of the lathe and drilled through M2 to suit the propeller shafts.

The rudder posts are from 2mm brass rod cut to length and tapped M2 at one end and machined down to 1.2mm at the other to fit into the plastic rudder blades. The moulded rudder blades halves were glued together and the slot for the rudder shaft cleaned out to suit the shaft, which was then glued into position. The tiller arms were made from brass bar and all these completed sub-assemblies can be seen in **Photo 4.**

The running tube entry points into the hull were carefully drilled 2.5mm, a round Swiss file being used to open out the holes to allow a small amount of movement of the tubes and the brackets for supporting the motors are from styrene (plasticard) sheet, the port and starboard ones being profiled to match the curvature of the hull sides.

The running tubes and A-frames were


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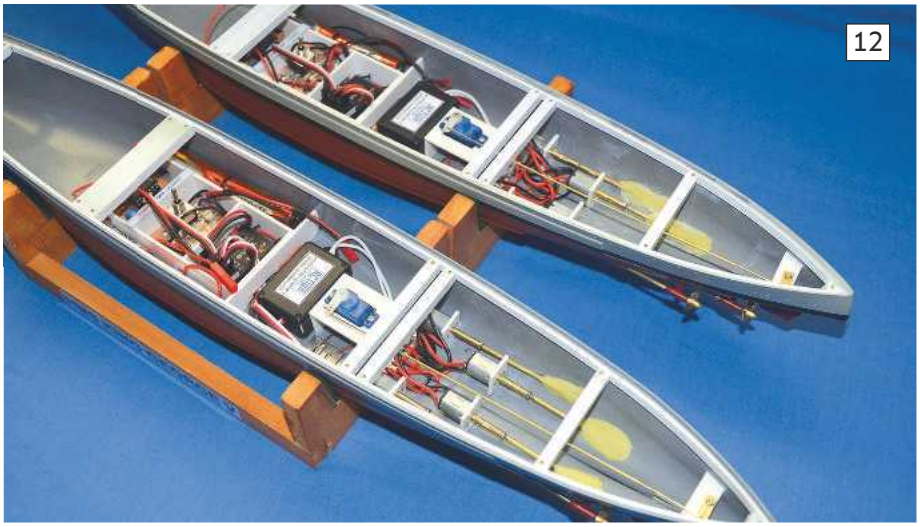
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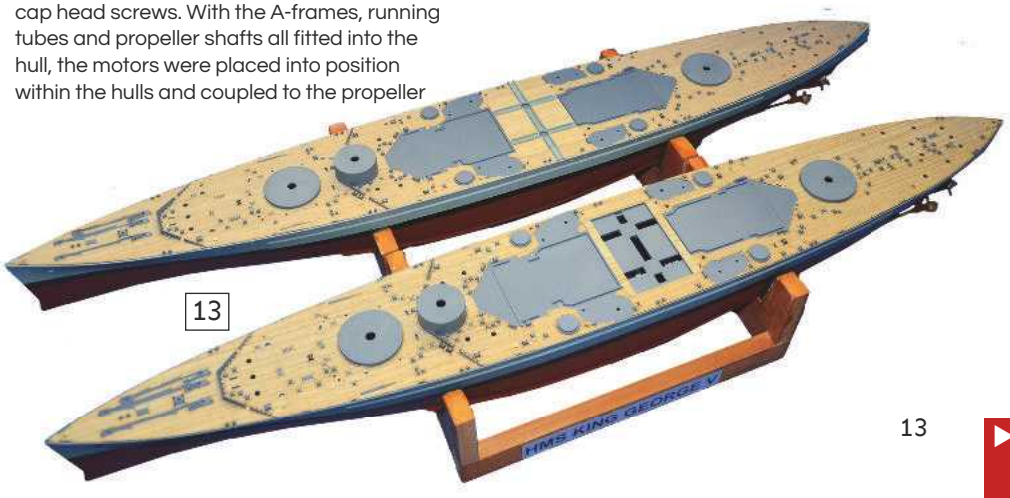
assembled into the hull and temporarily held in position with adhesive tape. A 2mm diameter shaft (pointed at one end) was inserted through the A-frames and up through the running tubes. With the motor brackets placed into position within the hulls the pointed shaft was moved up to each motor bracket in turn to mark the centre point for the motor. The brackets were then removed and drilled to clear the motor shaft bearing bush, together with two 1.6mm clearance holes for the mounting screws.

Each motor had one of the solid couplings bonded to its output shaft and in order to ensure concentricity between it and the propeller shaft, the motor housing was fitted into the main chuck of the lathe and the coupling fitted into the tailstock chuck. A small amount of thick superglue was added to the motor shaft and the tailstock was adjusted to slide the coupling into position over the motor shaft. The assembly was left to cure for 24 hours and this operation was repeated for the other seven motors.

With the couplings bonded to the motor output shafts, the completed motor assemblies were mounted on to their respective brackets using 5mm long M1.6 cap head screws. With the A-frames, running tubes and propeller shafts all fitted into the hull, the motors were placed into position within the hulls and coupled to the propeller shafts. When this had been completed, with a final check on the positioning of all the individual components, a small amount of Contacta Professional Adhesive was applied to the A-frames and superglue applied to the running tubes in order to lightly secure them in position. Finally, the running tubes were permanently secured and sealed to the hulls with fillets of Milliput. The motor brackets were NOT finally bonded to the hulls until later, after other internal work was completed, but carefully marked together with the hulls to make sure they would go back to precisely the correct positions. The rudder positions in the hull were drilled to accept the brass rudder post tubes which were inserted and bonded into position and the rudder assemblies could then be fitted into the hull, and the completed driveline, rudder installations and motor positions can be seen in **Photo 5.**

I should mention that the motors and propeller shafts, were continually tested throughout this process by applying a couple of volts to their respective terminals in order to ensure that everything was running smoothly at each stage of assembly.



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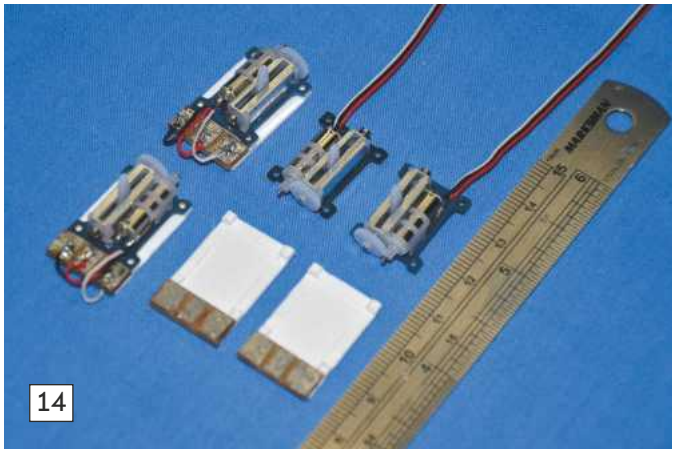
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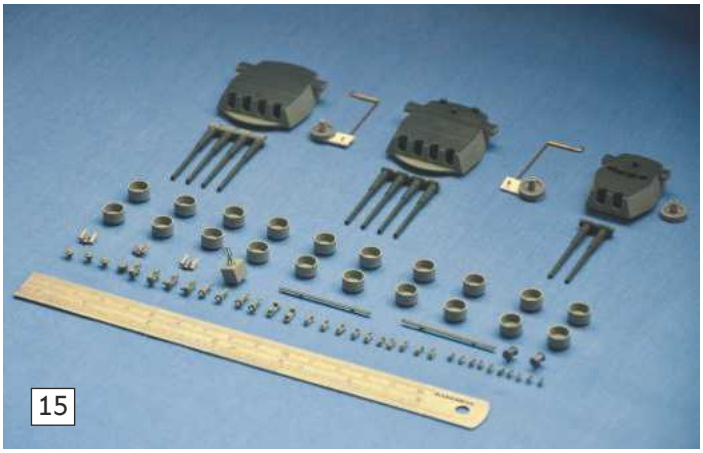
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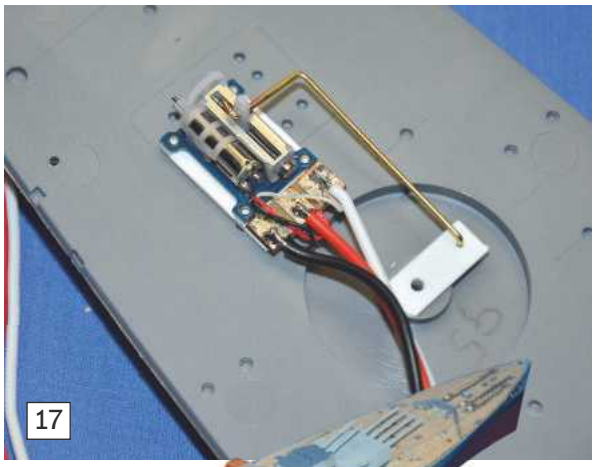
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Electronics

The next task was to design the compartments to house all the control system modules for each model. The electronics comprise radio receivers, speed controllers, electronic switches for the navigation lights, on/off and charging switches plus fuse assemblies and two of four AA size NiMH batteries (wired in parallel) for each hull, as the intention was to operate all the systems on just 4.8 volts. The actual design was very straightforward and very much along the lines used for both HMS Hood (MB November 2013) and KM Bismarck (MB July 2015) including having the main deck sections being totally removable, but secured to the hull using 12BA screws. Both models have an identical electrical system and the r/c switch board components were wired on to a piece of Vero Board and the power and switch board components wired on to a piece of copper laminate, the necessary tracks being cut into the copper. The assemblies each measure approximately 30 x 40mm. The electronic speed controllers are of the Action Electronics P78 Condor type and the 2.4GHz radio receivers are an Fr-SKY TRF6 that suit my Futaba T7C transmitter and all of these can be seen in **Photo 6.**

With the control modules completed, the exact dimensions of the holding compartments could be established. Two bulkhead formers were cut to size and trimmed to fit within the hull, and then the dividers for the actual compartments cut to size including any necessary cut-outs for routing the wiring before gluing all the parts together to form two modules. **Photo 7.**

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The inner edges of the hulls were lined with strips of styrene to form a small ledge that would mate with the underside of the deck to improve the water tightness of each hull. Braces were fitted across these to align with the positions at which the deck screws would be fitted, and an additional bulkhead with a platform was created to support the rudder servo. The deck sections were fitted and drilled through into the cross braces, then removed and drilled out to allow 12BA brass bushes to be inserted, and **Photo 8** shows the two complete assembled hulls, but still without the motor mounting brackets.

Stands

The need for these was becoming urgent as those included with the kits are of plastic and very flimsy, so new ones were made from wood and some soft strip of the same, with the mating edges to the hulls being lined with


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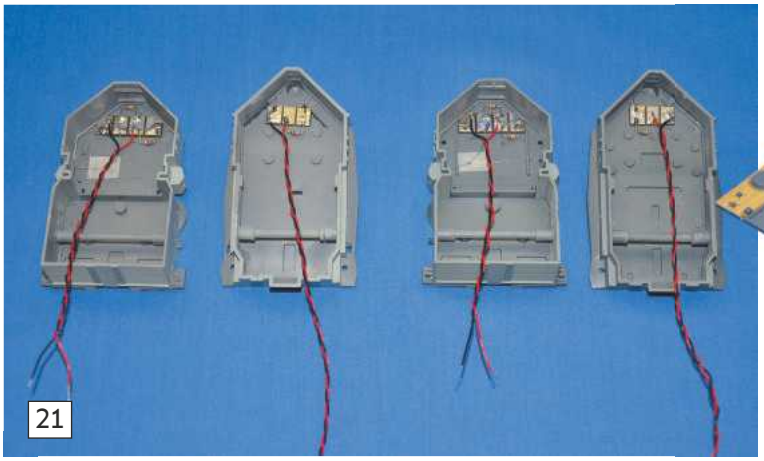
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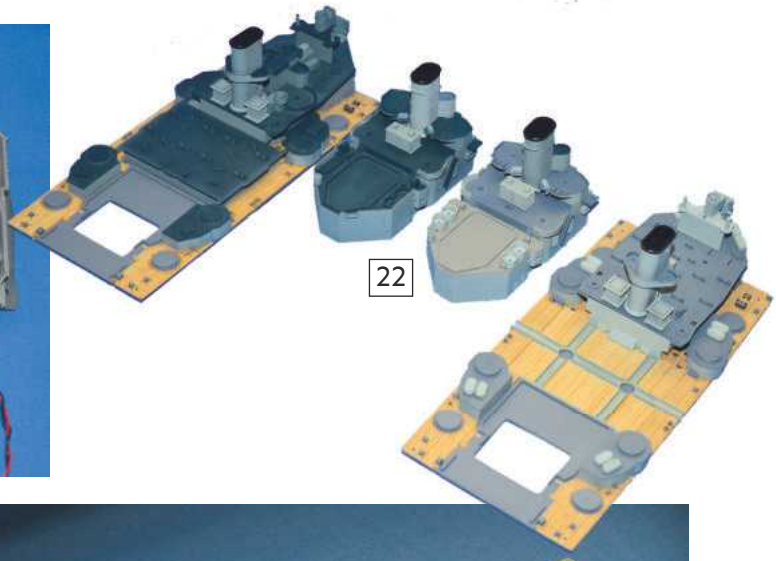
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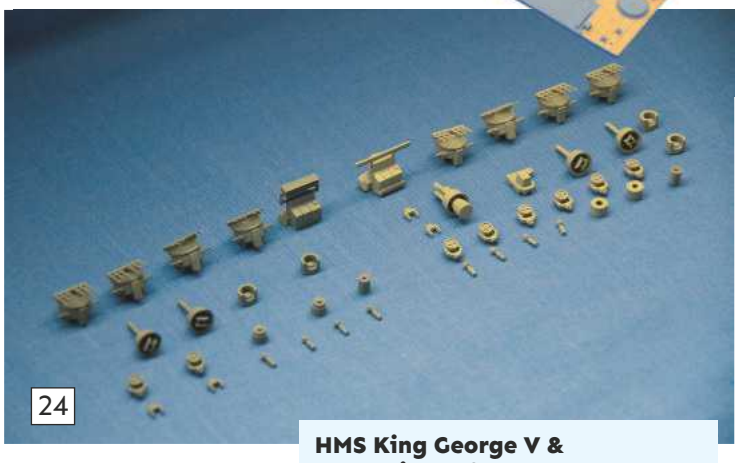
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green felt so as not to scratch the painted surfaces, **Photo 9.**

The hulls were then give two coats of Eze-Kote Finishing Resin (Deluxe Materials), sanded to a smooth finish, before being masked and painted in accordance with the kit instructions. Believe it or not, there is a distinct difference between the colours of the two hulls, **Photo 10.**

Completing the hulls

The rudder assemblies and propeller shafts were now replaced in both hulls, together with the rudder linkages, and the four motor mounts for each permanently secured in position, using Revell Contacta adhesive, **Photo 11,** the delay being because I needed to be certain everything in terms of electronics and the powertrain would fit. For electrical power, each hull has two sets of four AA size batteries in a flat 2 x 2 configuration, so that one pack of each can be laid along the inside, of each side, of its hull. The packs are wired in parallel using silicone wire and directly connected to the main on/off and charging switch and its printed circuit board. The electronic components such as the receivers and esc's were all wired together and put in their respective compartments within the hulls and duly tested, **Photo 12** being of the hulls thus far.

Decks

Now was time to pay attention to the main decks with the intention of covering them in Artwox Wood Laminate planking. It was therefore necessary to airbrush paint all the deck fittings that would protrude through the overlays and once that was completed, it was time to fit the wood laminate decking. This comes with a self-adhesive backing, but from previous experience, in time the laminate wood decking can peel away from the plastic deck beneath, probably due to expansion and contraction due to seasonal temperature changes. The solution is to apply a small bead of superglue along the edge of each of the pieces prior to placing the self-adhesive laminate into position and then pressing it firmly into place. This will help prevent any peeling of the decking and please note that the deck layout of HMS King George V is different to that of HMS Prince of Wales, **Photo 13.**

HMS King George V & HMS Prince of Wales

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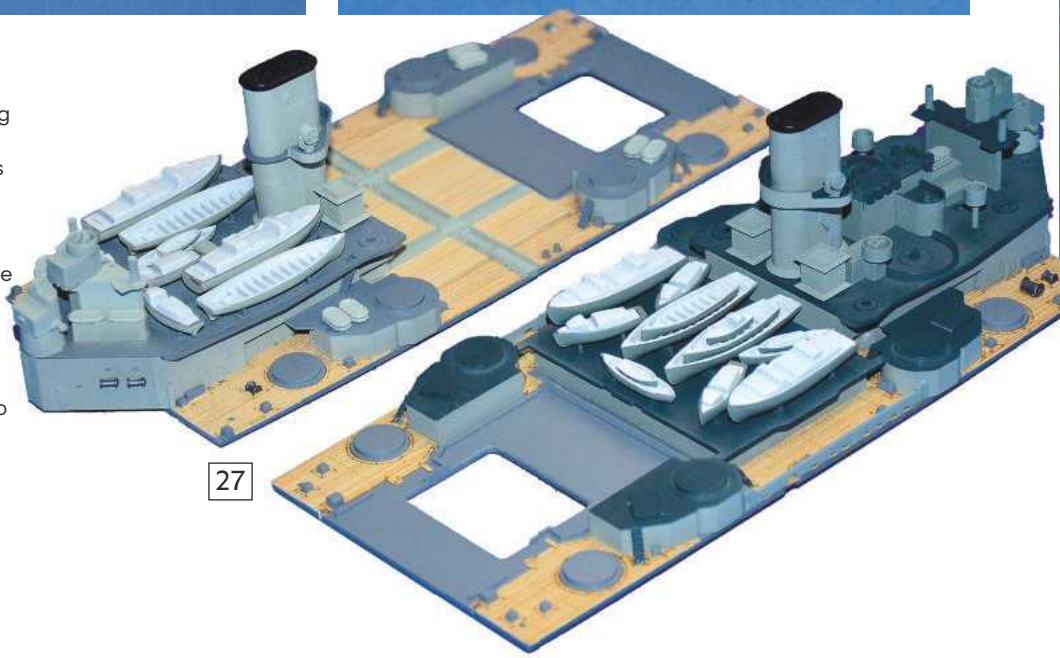
Traversing turrets

Next job was to design a method of traversing the two main four barrel gun turrets of each battleship. The single twin turret on each was not going to traverse – there is a limit to what can be squeezed in! Four linear micro-servos were purchased to operate the turrets and these were mounted on small pieces of styrene (plasticard) that were machined to clear the components on the underside of each servo. In addition, a small printed board was added to aid with the termination of their three very fine connector wires and **Photo 14** shows two servos mounted and 'terminated', and two in their un-modified state. Once all four servos assemblies had been completed, they were stored to await final assembly after the gun turrets had been assembled and painted.

The next task was to make four turret operating levers to mate with the linear servos, and these have been made from styrene card and glued to the base of each turret retaining plug. This all fits into the base of the turret pivot shaft and in addition, a brass wire connecting rod was made to link the linear servo to it all.

With the main 12 inch turret mechanisms completed, together with some of the small items removed from their sprues which were also destined to be assembled on to the main decks, these were all placed in separate boxes for painting. Once again, like the hulls, neither battleship was 100% identical to its sister. Having cleaned all the parts with any (minor) moulding marks, each item was mounted on to a piece of scrap wood using double sided tape to enable airbrushing with its appropriate colour. **Photo 15** is of the turret operating levers and their connecting rods, together with the painted parts for HMS King George V and **Photo 16** is likewise for HMS Prince of Wales. The differences between even these key fittings for each battleship being clearly evident.

With all the individual turret and gun parts painted, the barrels were assembled into the turrets and glued in position. The recommended elevation for the barrels is 10 degrees and a card template ensured that was the same for all the turrets, before they were assembled on to the main deck. **Photo 17** is looking underneath the main deck and demonstrates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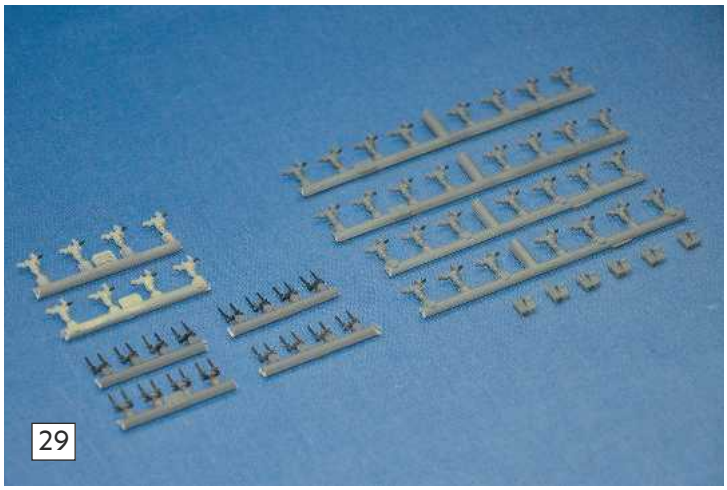
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HMS King George V & HMS Prince of Wales

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how a linear servo traverses a turret.

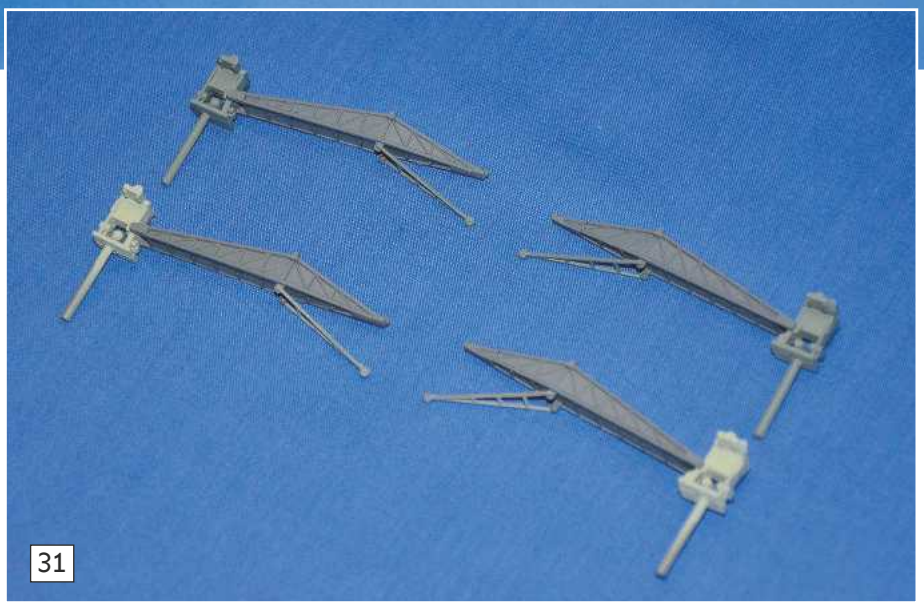
The twin barrelled 12 inch turrets are superimposed over the forward quadruple barreled turrets, but are fixed, **Photo 18,** this last picture showing that many of the deck fittings have also now been fitted.

Superstructure

Now was time to assemble the main parts of this for each battleship, each piece being removed from its sprue, cleaned, assembled and glued, **Photo 19** showing all the main parts ready for painting and yes, once again the two battleships were not 100% identical. The painting requirements are quite complicated in that the main colours for the superstructure of each battleship are different and each colour does not just come out of a pot or tin as it has to be mixed and not only that, the decks of each vessel are also a different colour. So yes, quite a challenge to get it right, but full instructions are included with each kit.

Prior to painting, the navigation lights were added to the main superstructure using surface mount Type 0804 LEDs (this means that they measure 0.08 inches x 0.04 inches) with single strand wires of 0.007 inch dia. soldered to each side of their bodies. These wires were passed through the bulkheads of the superstructure and temporarily held in the base of the bridge housing with masking tape, but eventually the wires would be soldered to a termination printed board. These painted superstructure parts can be seen in **Photo 20.**

With the main fore and aft unis of the superstructure painted, the termination boards for the LED navigation lights were fitted which enabled the fine wires from the LED's to be secured, **Photo 21.**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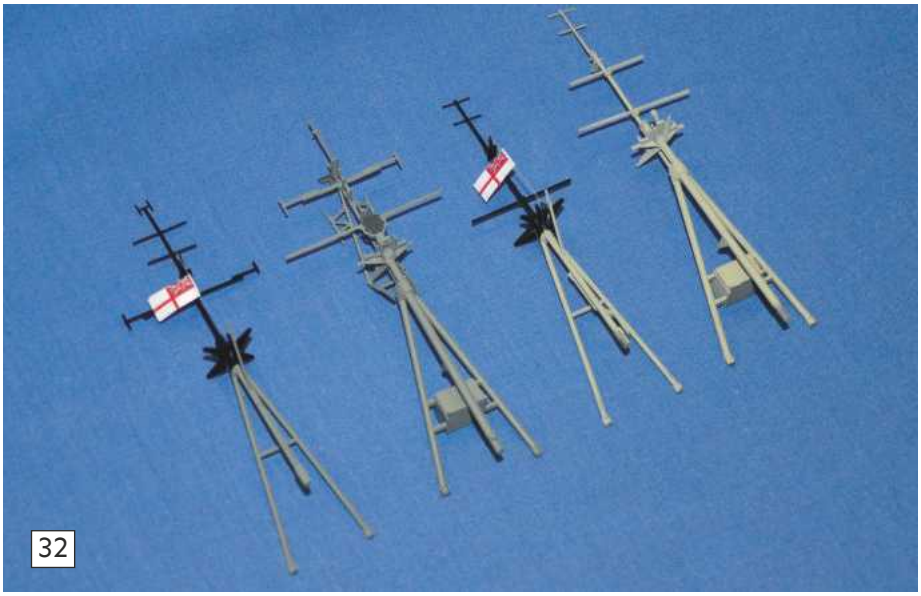
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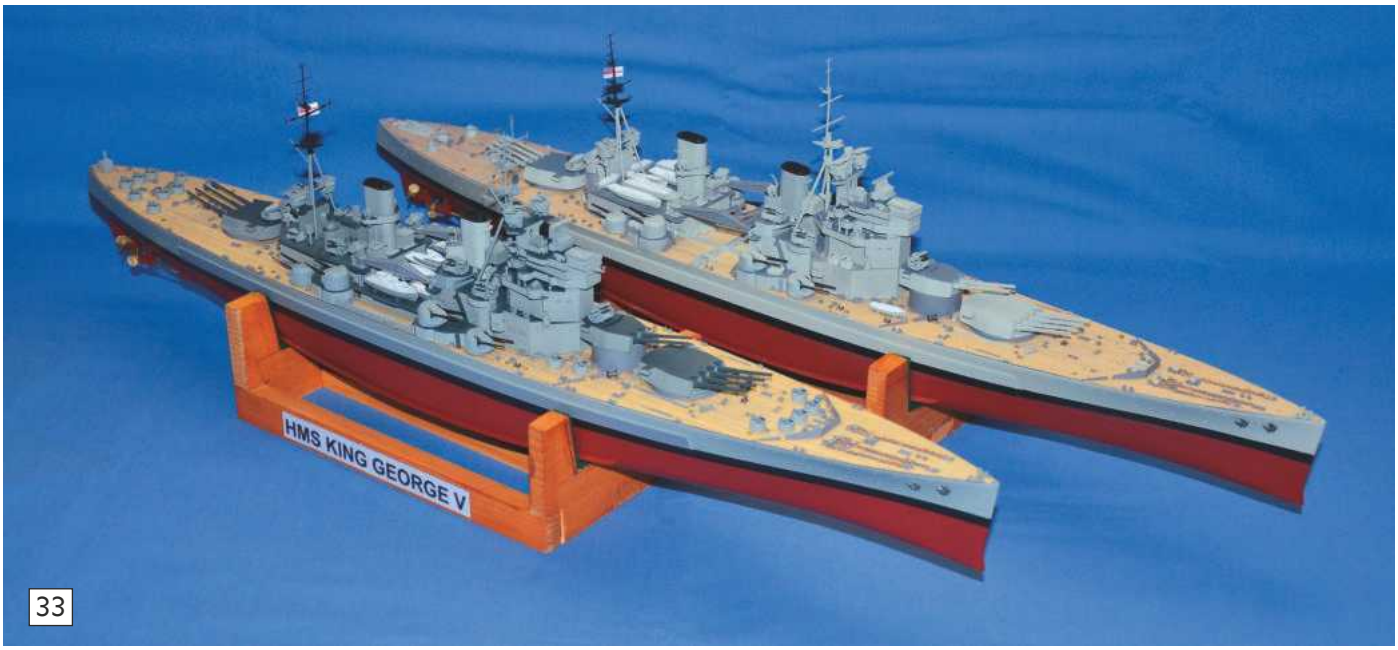

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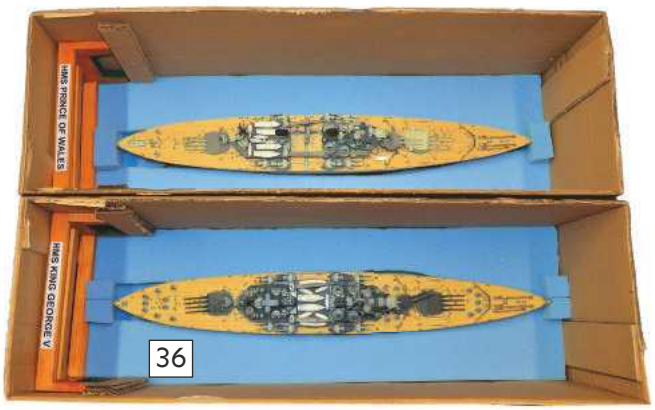

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Finishing-off

It was now time to start building the rest of the superstructure, but prior to doing that a small cutout was machined in the centre deck under the bridge unit. This would allow access to the power switch as this bridge unit was to remain removable, which in turn allows the main deck to be firmly screwed down, except when access is required for motor and r/c servicing. **Photo 22** shows this cutout in the main deck; the shelter and boat decks secured to the main deck; and the bridge superstructure unit.

The remainder of the fittings were painted and assembled and **Photo 23** shows the secondary battery and anti-aircraft guns, with **Photo 24** being of the radars and search lights etc.

Photo 25 is all the ship's boats and **Photo 26** shows the Walrus Float Plane, which is only required for HMS Prince of Wales. The lifeboats were fitted to the boat decks, **Photo 27,** which are of course different, and the radars searchlights etc. were added to the bridge unit, **Photo 28.**

The very small Oerlikon guns were hand painted on their sprues, **Photo 29,** before being fitted into their emplacements and **Photo 30** shows the two battleship models almost complete. The final part of construction was to paint and assemble their cranes, **Photo 31,** and the fore and aft masts, **Photo 32,** these having subtle differences on each battleship. These masts were fitted to the superstructure, but not glued, as they slid very snugly into the location holes provided.

Photo 33 is of the two completed 1:350 scale battleship models.

Photo 34 is of HMS King George V's main superstructure and **Photo 35** is likewise of that of HMS Prince of Wales, the differences


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now being very clear.

As always, transportation boxes need to be constructed and these are in **Photo 36**. The height of the boxes is such that their lids fit properly and clear the masts, making a 100% dust proof seal.

On the water

Although the hulls had previously been tested in the bath to check their buoyancy and waterlines when deciding on the best positions for the control systems, the time for a proper bath test was now due and **Photo 37** shows them both afloat with all systems working satisfactorily.

The first proper operational trial was at the St. Albans Model Engineering Exhibition of September 2016, and **Photo 38** has both battleships ready for their next engagement with the enemy and are they okay on open water? Well yes is the answer, and here they are at Wardown Park, Luton, later in September 2016, **Photo 39.**

Addendum

1) Included with the HMS Prince of Wales kit are two Japanese long range medium bombers which are the type that actually sank the battleship in 1941 just north of Singapore. Out of interest these aircraft were assembled and painted, and are both shown in **Photo 40.**

2) On the way home from the St. Albans Model Engineering Show, the bridge unit of HMS Prince of Wales came adrift in the box breaking the main fore topmast and one of its spars and then the following week at the lake in Luton, I managed to break off the top of the main (aft) mast.

To repair them, small pieces of sprue saved from discarded model kits were machined to create tiny sleeves. These were then painted and used to join the broken parts together, and **Photo 41** is of the foremast repairs.

So be warned, this size of detailed model may look nice, but it can be easily damaged.

Happy Modelling – ***Tony***


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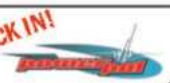

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Above: HMS Iveston, a Ton Class mine hunter in the River Mersey (Picture by Dave Wooley)

Right: HMS Bronington heading for the Alfred Lock and then the West Float at Birkenhead in 2003. (Picture courtesy of the Liverpool Echo)

Right: HMS Bronington sunk at her moorings in May 2016. (Picture courtesy of the Liverpool Echo)

Range Finder

Dave Wooley with his Worldwide Review of Warships and Warship Modelling

Welcome once again to our regular sortie into the world of fighting ships and this month sees the start of an in-depth triple part Photo Tour of the Ton Class mine hunter HMS Bronington. We also continue with Part Three of our short series on the construction of an OSA Class Fast Missile Boat.

HMS Bronington M1115

It is always sad when a ship, and particularly a former warship with royal connections, is allowed to decay to a point where it is no longer recognisable for what it once was. An example of this is the Ton Class mine hunter HMS Bronington which is now half submerged in the West Float at Birkenhead Docks. Of course, this was not always the case and as there is always an interest in these numerous minehunters, I thought it appropriate to show for the first time an in-depth photo tour of HMS Bronington soon after this ship joined the Historic Warships at Birkenhead in 2002 from her previous berth at Salford Quays. It is also worth mentioning that Dave Abbott in 1992 built an award winning model of HMS Iveston M1151, still regarded by many as the definitive model of the classic Ton Class RN mine hunter and the plans are in the MyHobbyStore Plans Service.

First though, here is a brief history of HMS Bronington. She was laid down on the 30th May 1951 by Cook, Welton & Gemmel of Beverley (and Hull) in Yorkshire and launched

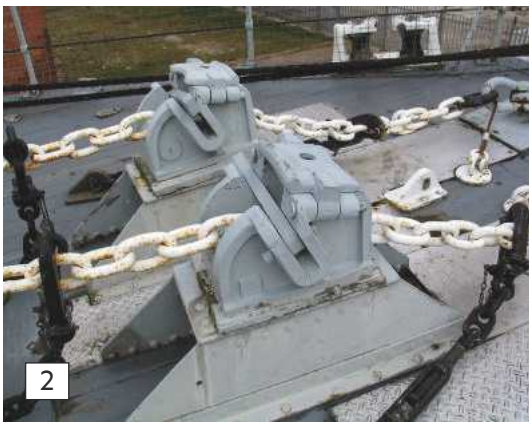


Photo 1. A general view from the bridge looking towards the bow.

Photo 2. The chain stoppers and screw slips in black.

on the 19th March 1953 and completed in June 1954, having a full load displacement of 425 tons and a double mahogany planked hull on aluminium frames, 153ft long and 28.8ft beam. HMS Bronington was one of only 17 built, from the total of 118 between 1953 and 1960, to have a fully enclosed bridge.

She was converted to a mine hunter in 1965 and power was provided by two Deltic diesel engines to two shafts developing 3000bhp with three bladed propellers and active rudders. Generally, the Ton Class as a whole had variations in weapons, depending on their role as mine sweepers or mine hunters, with HMS Bronington having a single 40mm Mk. VII Bofors gun mounted forward.

HMS Bronington was renamed in 1954 to become HMS Humber serving with the Tenth Mine Sweeper Squadron of the RNR, but later in 1958 she recommissioned as HMS Bronington. She has always been special amongst the Ton Class being commanded by the Prince of Wales, who took command from the 9th February 1976 to 15th December of the same year.

HMS Bronington paid-off on the 23rd June 1988 and was first opened to the public on 28th October 1992 at Salford Quays close to the Imperial War Museum (North). She spent the next ten years at this location until being transferred to the Warship Preservation Trust in the West Float at Birkenhead in 2002. However, there were problems surrounding the permanent berthing of the historic warships at Birkenhead including the Type 12 frigate HMS Plymouth and the O Class submarine HMS Onyx. HMS Bronington was then moved to a new location, but through lack of sufficient funds, difficulties in relocation and general neglect, sank at her moorings on 18th March 2016. These pictures were taken soon after HMS Bronington was acquired by the Warship Preservation Trust, she then being in a reasonable condition.

HMS Bronington Photo Tour – Part One

As is customary, this will commence right forward and in **Photo 1** we have a general view of the forecastle towards the stem. By 2003, the painted deck surface was starting to deteriorate and major remedial work would be required. The next picture is of the chain stoppers and screw slips, **Photo 2,** and **Photo 3** focuses on the windlass. Note how and where the anchor chains feed into their associated pipes down to the chain locker with the brakes on each gipsy and in **Photo 4** we have a close-up of the windlass motor. There are large painted warping drums on the outer faces of the gipsies.

Moving directly over to the port side deck edge, is one of the standard deck vents and a fire hydrant, **Photo 5.** Remaining on the forecastle, but turning through 180 degrees, we now have a good view of Bofors 40mm Mk. VII gun mounting and also a good view of the bridge front, **Photo 6.** From experience, you really can never get too many detailed pictures of guns when you are trying to model them in miniature, and here is another of it with the seated aimer and trainer positions left and right, with a standing ammunition

Photo 3. The windlass and its motor.

Photo 4. The drive motor for the windlass and just in view are the brakes attached to the anchor chain gypsies.

Photo 5. A standard type of deck vent and fire hydrant was fitted to the Ton class and HMS Bronington.

Photo 6. A general view showing the bridge and in the foreground is the single 40mm Bofors gun.

loader position at the rear left of the mounting, **Photo 7.**

Also, slightly over to port of the 40mm gun is a deck hatch and its worth viewing this more closely, as such fittings can add much to the fine detail of any model, **Photo 8,** and you can clearly also see how the deck surface was markedly deteriorating, even then. Anyway, following this is another view of the Mk. VII Bofors mounting and the aimer's seated position, **Photo 9.** We also have a view of the 40mm gun looking towards the trainer's position on its right side and the spent round discharge chute beneath the recoil cylinders, **Photo 10.**

To the rear of the 40mm gun is the lower portion of the bridge unit with some ready use ammunition lockers in the foreground, **Photo 11,** and moving slightly over to port we have a view looking aft with **Photo 12** being under the bridge wing, whilst **Photo 13** gives a similar view, but looking aft on the starboard side. The principal difference is that on the starboard side there is an external stairway leading up to the bridge which is not duplicated on the port side, **Photo 14.**

At the top of this stairway and on the starboard bridge wing is a signalling light and Pelorus, both duplicated on the port bridge wing and it is worth noting the wood deck planking, **Photos 15 and 16.** Notably, these navigation areas are all very cramped by current 21st Century warship standards. Our concluding picture for this issue remains on the port bridge wing showing more of its fittings such as a voice pipe and various electrical boxes, **Photo 17.** In the forthcoming June 2017 issue we will be looking at the amidships area.

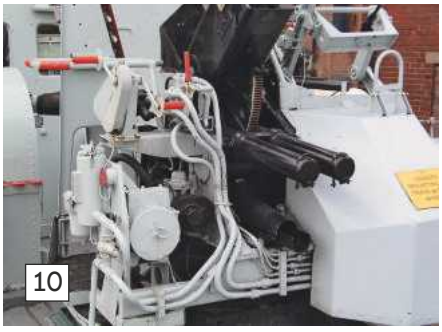


Photo 7. Looking down on to the 40mm Mk. VII Bofors mounting.

Photo 8. One of the two deck hatches on the forecastle either side of the 40mm gun.

Photo 9. A detailed view of the Mk. VII gun showing the sighting position.

Photo 10. Viewing the 40mm Mk. VII gun from the front, showing the trainer's position.

Photo 11. Ready Use (RU) ammunition lockers around the front of the bridge.

Photo 12. Port side under the bridge wing looking aft. The Ton Class minesweepers always looked to be busy ships with no wasted spaces.

Photo 13. A slightly different arrangement exists on the starboard side of the bridge unit.

Photo 14. Over on the starboard side is a stairway leading up to the bridge.

Photo 15. The starboard bridge wing.

Photo 16. The bridge wing on the port side.

Photo 17. This type of picture reveals detail within the bridge wing that will also be visible on a model.

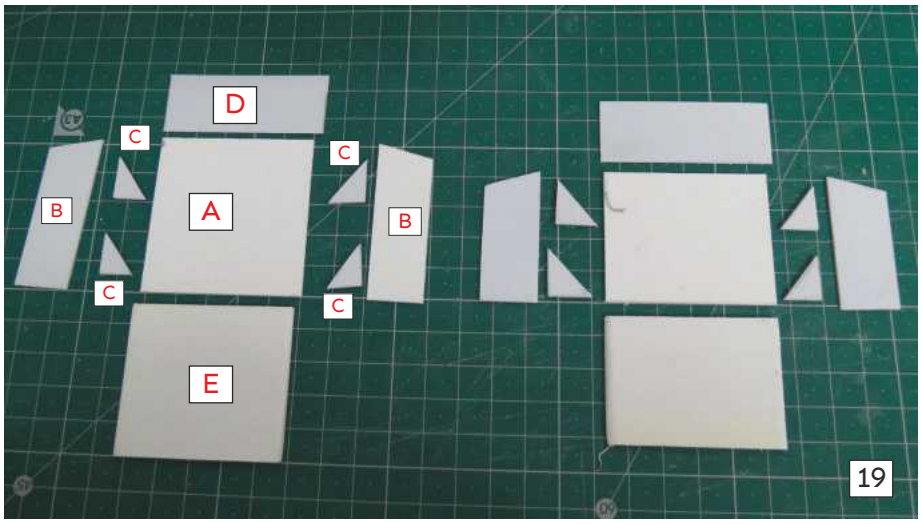


Photo 18. The box shaped vents are ringed in red as fitted to the OSA 2 Type 205U (Please note that ringed in yellow is the Base Tilt radar unit, referred to later in the text).

Photo 19. Each vent reduced to its basic parts for ease of construction.

Photo 20. Initial stage in the assembly of each box type vent.

Photo 21. Fixing the sloping section of the vent which faces forward when it is all fitted into place.

OSA 2 Type 205U Fast Missile Boat Model PART 3

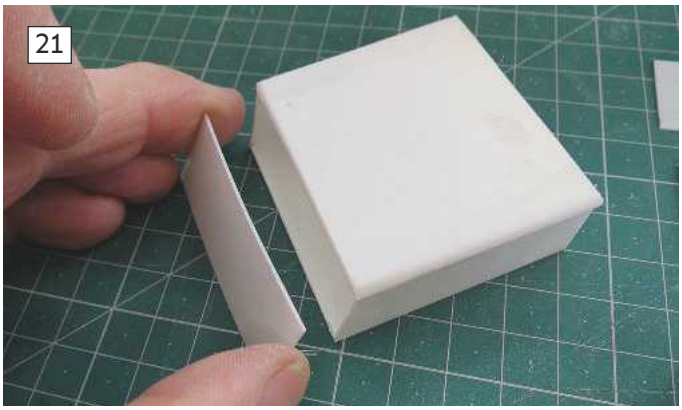
Vents and the Drum Tilt fire control radar.

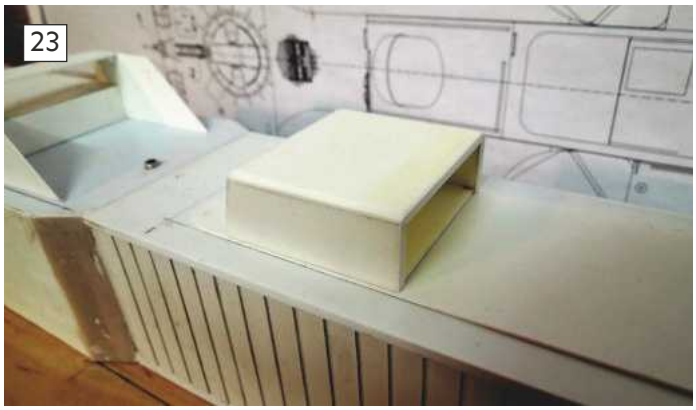
As a reminder, last month in the April issue we covered the construction of the long deck housing on to which are fitted two box type vents which in turn are fixed to two very slightly raised panels and these can be seen in **Photo 18** ringed in red (ringed in yellow are the constituent parts of the Base Tilt radar referred to later in this text). There is no direct reference as to the purpose of each vent, but it is highly likely the aft one is associated with the main engine compartment situated directly below it. Although the after vent is the smaller of the two, the basic shape is the same with openings facing aft and a sloping surface facing forward. As with every design, there are variations on fittings and this OSA 2 Type 205U is no exception. Each basic part of the vent housing was cut to size bearing in mind that the port and starboard outer top edges are slightly rounded.

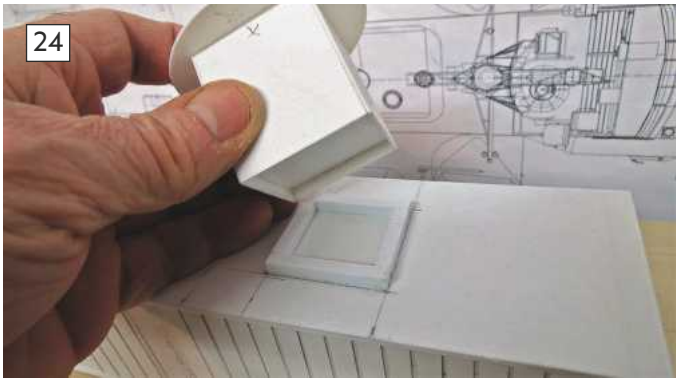
For ease of construction I have lettered each part in **Photo 19.**

Ref.	Part (styrene)
A.	Base 1mm
B.	Sides
C.	Internal supports
D.	Sloping surface
E.	Top surface

Construction is straightforward, with each side fitted to its base piece followed by the internal supports, **Photo 20.** The roof, or hood, is fitted next with the sloping surface







covered, as in **Photo 21.** Each vent will be fitted on to a thin base panel piece of 1mm styrene, rounded at each corner. The larger panel is 138 x 56mm and the smaller is 95 x 56mm, **Photo 22.** Like many of these basic fittings, more detail will be added at a later stage. For example, the top of each vent should have rails fitted and angle bar steps set into the sloping side, but here the larger of the two basic vent units is temporarily positioned on the deck housing, **Photo 23**.

Drum Tilt support platform

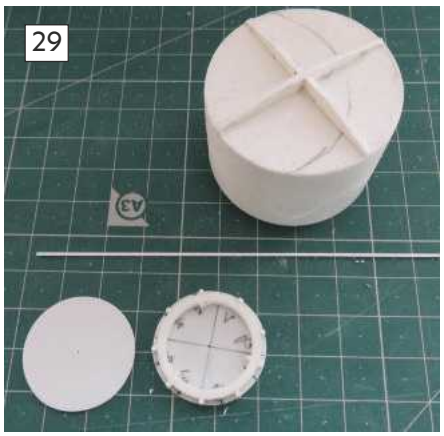
Sited aft on the elongated deck housing is the support platform for what is termed as the MR-104 Rys, or 'Drum Tilt' by NATO. Like many of the fittings on the OSA boats, there are as many variations as there were boats built, and the support housing and platform for the Drum Tilt has numerous differences in shape, it being either a box form or rounded and even semi-rounded. However, the Type 205U version was similar to that of the OSA1's, it being a box form surmounted with a circular platform. 1mm styrene was used throughout for the construction of the box, 40 x 40mm sq. and 45mm in height with a circular platform 70mm diameter on top. To provide a good fit to the deck housing, a raised inner surround, 5mm sq. was added as in **Photo 24.** The basic platform can be seen fitted, but not fixed, to the elongated deck housing in **Photo 25.** More detail work will follow in due course.

Photo 22. The vents are mounted on a slightly raised panels.

Photo 23. The forward fully assembled vent.

Photo 24. The box type of support for the Drum Tilt radar housing sits over a raised inner surrounding on the top of the superstructure unit.

Photo 25. The Vents and Drum Tilt base unit support are temporarily in place.



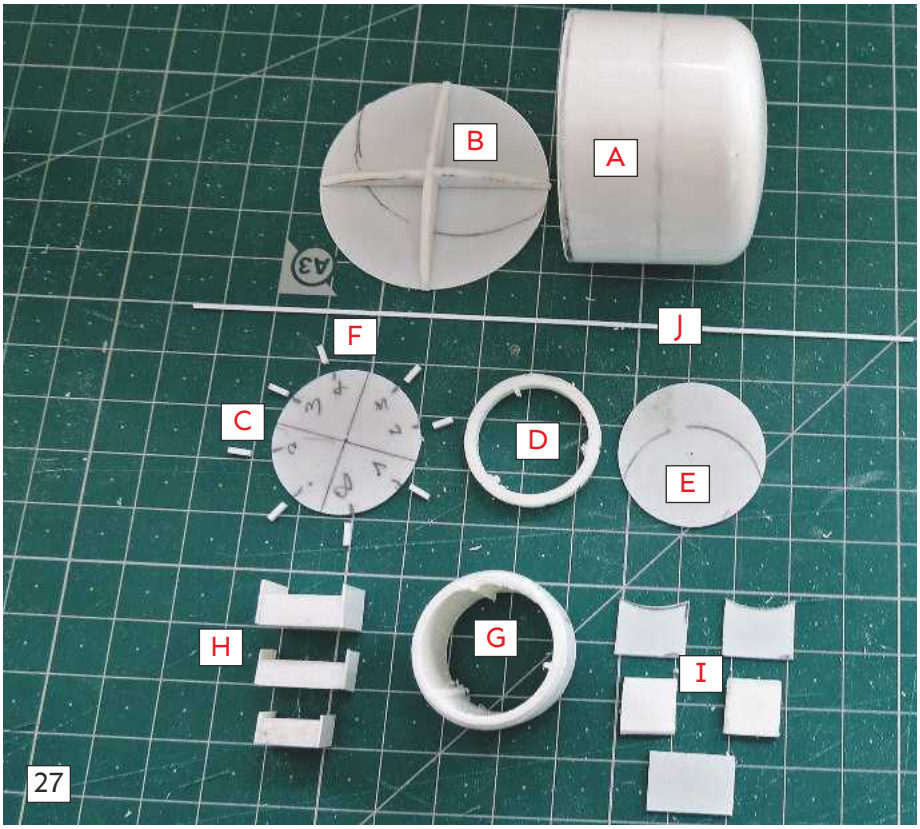


Photo 26. The GRP Drum Tilt radar housing protects a circular parabolic reflector for the fire control of the automatic twin 30mm guns, fore and aft.

Photo 27. Each initial part of the Drum Tilt radar is lettered for the sequence of assembly.

Photo 28. The drum was originally a plastic container top (it's always amazing what can be sourced from every day household objects), but it required some trimming in length and the open end covered and prepared into a convex form ready to accept filler to create the desired shape.

Photo 29. The base of the Drum Tilt is formed from two styrene discs and a styrene tube with the tube being of slightly less diameter than the discs.

Drum Tilt fire control radar

Forming radar arrays such as the Drum Tilt can be seen as a challenge, but in reality when you reduce each and every component of such a fitting to defined parts it all becomes quite easy to construct and here is how it is done. However, first a brief note on this type of radar array.

It is the fire control radar for the AK 230 twin 30mm 65 calibre automatic gun system mounted fore and aft on the OSA boats and is not unique to these warships. Enclosed within its GRP drum cover is a circular parabolic reflector with the entire housing tilted at a fixed angle of 25 degrees. In its original form, as fitted to the OSA1's, the radar required a skilled operator as there was a marked tendency to lose its 'lock' on a target. Maximum tracking range was about 22800 metres and was limited to only a single target, but it's worth remembering this was 1950's technology.

Construction

Fortunately, there is a wealth of information available about this radar with two examples, one being this picture of the Base Tilt aboard an Iraqi Navy OSA 2 ringed in yellow if you refer back to Photo 18 please, and **Photo 26** is a close-up on board an OSA 1 boat.

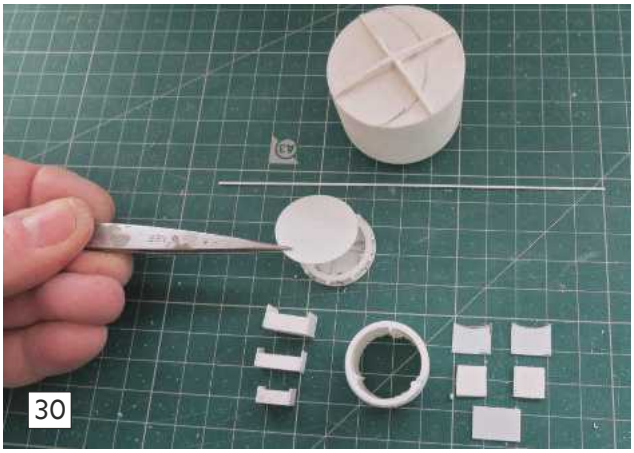
As is my usual practice, I have identified the basic parts of the Drum Tilt device and divided each major part into easily manageable bits, starting with the large cylindrical cover. This is actually the top of a discarded detergent bottle and as it so happens it was exactly the right diameter and in **Photo 27** each part is identified. What was required was to reduce the detergent bottle top length (Part A) and create a pattern for the convex shape of one end of it (Part B). Its base is divided into three sections, Parts C, D and E with a series of spacers, Parts F, which are to be added. Part G will be the tube that sits on the base and supports the cylinder housing when completed. Parts H & I are the electrical boxes and their mountings that fit around the support tube (Part G) and finally Part J is strip styrene that will form the division ribs on the drum, and to which clips will be fitted, its purpose being where the full-size GRP cylinder was separated for internal access. Please note that Parts B, C & E have been cut from 1mm styrene sheet using a compass cutter.

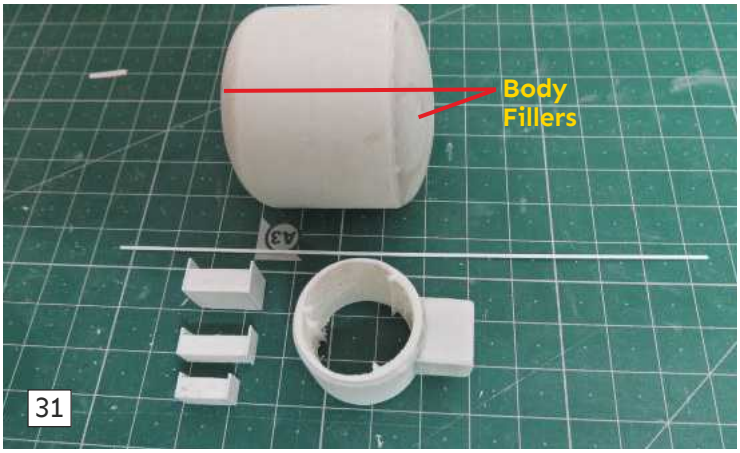
The first step in the assembly of the Drum Tilt radar was to reduce the detergent bottle top's length to 45mm and close off the open end of this 42mm diameter tube ready to form the convex shape as in **Photo 28.** This was followed by putting into place the spacers surrounding the 25 x 2mm thick inner ring of the base piece, **Photo 29,** with the latter then covered by the 28mm diameter top disc, **Photo 30.** The pile of bits is getting less quite rapidly now!

Isopon P38 car body filler was applied to each end of the cylindrical housing and carefully sanded until the desired convex

References and acknowledgements

HMS Bronington refs:
Janes Fighting Ship 1974 to 1975, page 357.
British Warships since 1945, Minesweepers, by Jack Worth, page 85.
Mine Warfare Vessels of the Royal Navy 1908 to Date by M P Cocker, pages 100 to 103.
Drum Tilt Fire Control Radar refs:
Guide to The Soviet Navy Fourth Edition by Norman Polmar, page 442.
Warships of the Soviet Navy by Captain John E Moore RN, page 74.
World Naval Weapon Systems by Norman Friedman, page 335.





curve was attained. Next, an electrical box housing, Part I was assembled and fitted to the 25mm dia. x 20mm height raised support tube as shown in **Photo 31.**

With the cylindrical radar housing drum prepared, this could be fixed to the raised support tube and the latter to the already assembled base piece. Referencing the pictures, the remaining three electrical boxes were fixed to the side of the raised tube and the Drum Tilt assembly was starting to have a recognisable form, **Photo 32.**

A second horizontal band was added to the rear of the cylindrical cover, together with three angled back supports, **Photo 33.** Our final picture for this month shows the Drum Tilt radar temporarily mounted on its after platform, **Photo 34,** and what initially appeared to be a complex unit to construct, when once broken down into its constituent parts proved to be quite simple. More next month!

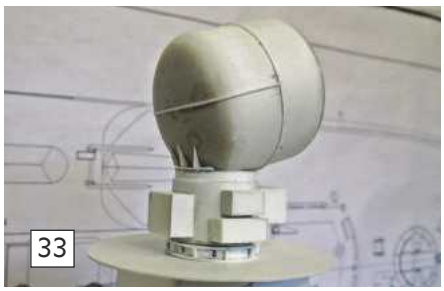
Photo 30. Assembling the base unit.

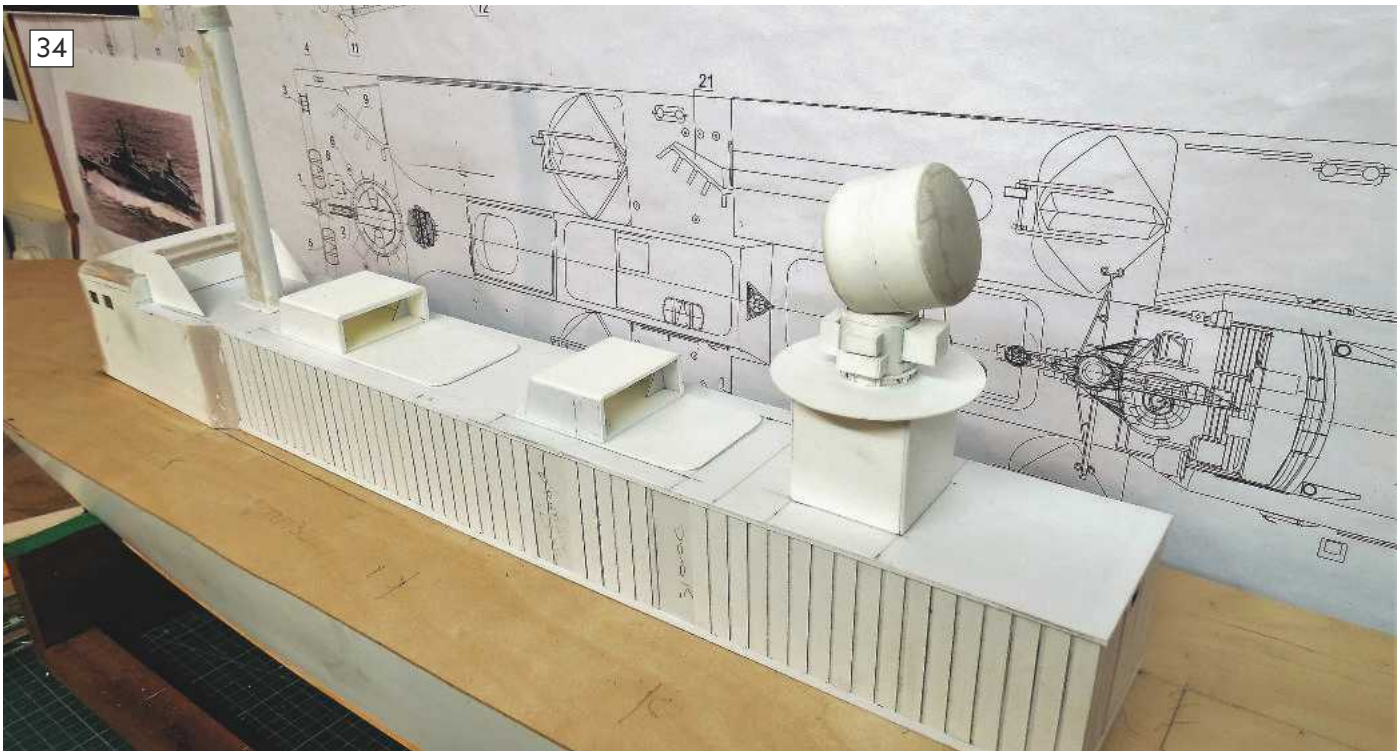
Photo 31. Body filler has been used on each end of the redundant container top, here with the initial assembling and fitting into place of the electrical boxes that surround the styrene tube that supports the completed drum.

Photo 32. A styrene strip has added to the centre of the drum around its circumference, which will eventually be surrounded by dummy clips defining one of the two access points into it for maintenance of the internal radar.

Photo 33. The basic assembly is temporarily mounted on to its platform. Please note that the second access point into the drum has been added across the diameter and length of it. Additional detail will be added at a later date.

Photo 34. What has been discussed thus far is temporarily fitted into its location on the elongated deck housing.





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Modern Fire Boat

Andy Cope's semi-scale model

I must admit that the inspiration for this model came from a friend at our local model boat club as he had scratch built from wood a lovely little fire boat reminiscent of those used in America and Australia (and probably elsewhere too), **Photo 1,** and then I just had to build one for myself.

These small fast and agile boats provide a quick response to fires on water and land adjacent to waterways, and most seem to have relatively simple angular aluminium hulls, **Photo 2,** a perfect subject to model in plywood. I also liked the idea of installing working fire monitors in a model (something that I hadn't done before) and the opportunity to fit a siren and lots of flashing lights also appealed to my more juvenile instincts.

When starting the project, I was certain that the pile of scrap ply and balsa wood lying in the corner of the garage would be sufficient to complete the project, but as I rarely draw a plan, and this being an entirely organic design process, once construction started it was quickly realised that there was not enough sheet material for the hull. There was however a plank of Pine softwood leftover from a recent DIY job that measured 1800mm x 145mm x 18mm, so that was used for the hull bottom.

By cutting the plank into four sections and chamfering the resulting edges to a shallow angle of about five degrees, the vee shaped hull bottom was easily formed in two sections. A second shallow angle cut between the fore and aft hull sections, once glued together, then formed the complete lower hull, **Photo 3.** When glued and clamped, it became obvious that this building method afforded some distinct advantages and **Photo 4** has the plywood hull sides being added and **Photo 5** is an underneath view of the stern section.

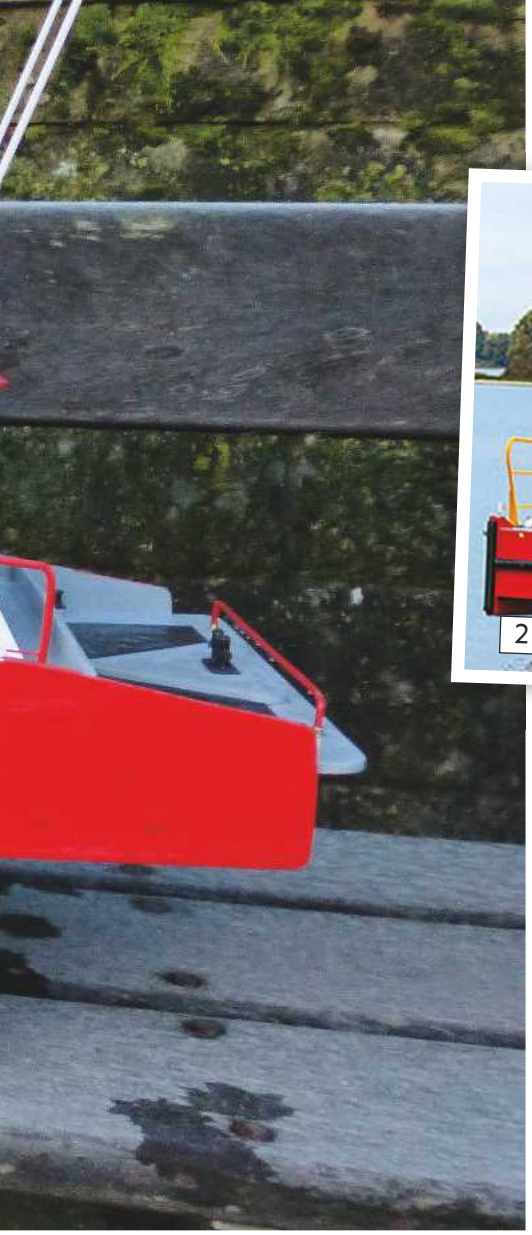
Photo 1. The inspiration was Dean's fire boat, he being a fellow member of Buxton MBC.

Photo 2. An example of the real thing, in this case a small aluminium hulled fire boat used in Melbourne, Australia.

Photo 3, A plank of Pine was cut into four sections to form the hull bottom.

Photo 4. The hull rapidly takes shape with the aid of wood glue and tins of food acting as clamps. After all, this is true dining table model making.

Photo 5. There is a small rear deck for divers and this is an underneath view of it.



2


3


4


5

The main advantage of this method of construction is that no internal framework to support the hull bottom and sides is necessary, with the second advantage being that any internal components such as the motor mount, propshaft and rudder are fully supported by the thickness of the hull bottom pieces. Short screws can be inserted into the 18mm thick Pine without penetrating the outer hull surface and better still, another advantage is that the bow and stern sections are self-supporting during construction.

With the hull now somewhat speedily completed, the dimensions of the deck, cabin and rear platform were cut to an approximate scale size by eye, keeping the proportions of the boat looking reasonable, **Photo 6.** I must admit that the cabin does now look a bit over-sized, but not enough to encourage me to build another! **Photo 7** is of the deck piece with its internal hull access cutouts and **Photo 8** is the basic cabin in place on it all. The overall dimensions of the completed model are: 70cm (28 inches) long, 28cm (11 inches) beam and 23cm (9 inches) from the keel to cabin roof.

Running gear

For this, a Johnson 600 d.c. brushed motor was installed together with a 7 inch fine-line (thin) propshaft; a 35mm diameter propeller; Acoms AS-17 rudder servo for steering and a cheap r/c buggy electronic speed controller for the speed and direction of motion control,

Photo 6. The cabin is from thin plywood and is here being offered for scale and fit.

Photo 9 showing all these components. With these items fitted and working, the whole model was given two coats of standard yacht varnish, both inside and out, for waterproofing, before colour decoration with Humbrol enamel paints as in **Photo 10,** and as you can see, this is true dining table model boat building. Additional details such as the railings have been fabricated by soldering brass rod, **Photo 11,** the squares on the cutting mat being of 1cm to give you an idea of size. Some shop bought deck fittings were also added to complete the Fire Boat, but some 'off-the-shelf' ladders and lifebelts, were still on order, although a dummy horn and some 'fire engine style' lights arrived very quickly.

Fire monitors

The really fun part was for the first time experimenting with working fire monitors. Being a big kid at heart, the aim was to maximise their range rather than achieving a scale look, so a couple of different water pumps were bought online, hoping for some power and volume, waterjet-wise. One was an automotive car windscreen washer pump and the other a small pump marketed for transferring nitro (glow) fuel into r/c model tanks. Both these pumps match 6mm o.d. silicone tubing which has a 3mm i.d. and is widely available. The pumps run on 6 to 12v d.c. supply and are self-priming, but in the end, the glow fuel pump was used in this Fire Boat. **Photo 12** is of some red HXT battery connector sleeves and what are they for you might well ask?

A single fire monitor was never going to be enough to satisfy my juvenile instincts, and I thought that three might look best. You can of course buy very nicely detailed fire monitors in various scales, but a cheap option

Photo 7. The deck with its access holes for the motor, batteries and rudder linkages etc.

Photo 8. The superstructure is completed. Please note the use of a contact lens holder to act as the double radar on the cabin roof, another brilliant idea borrowed from my friend Dean.

Photo 9. A potential crew member has made it on to the cutting mat together with the running gear and a (later) rejected prototype fire monitor made from a discarded pen body.

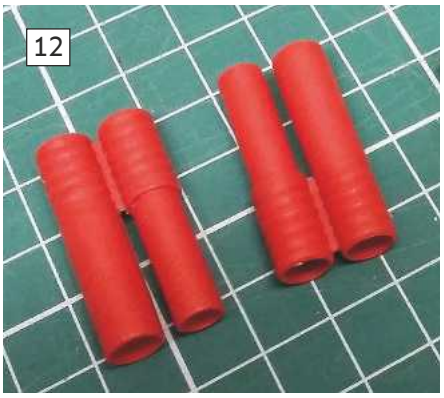


Photo 10. Once sealed and the first coat of paint is applied, the model starts to look like a fire boat.

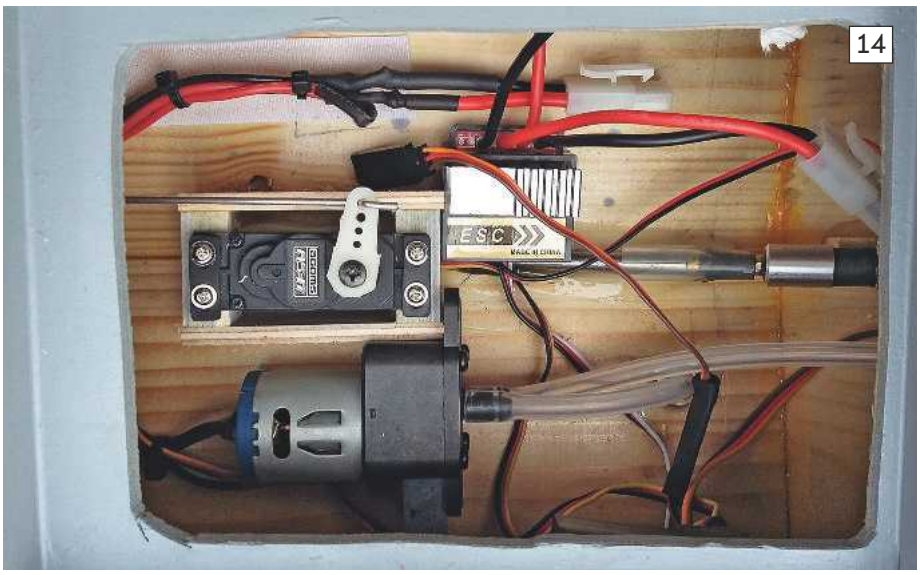
Photo 11 Brass rod has been bent and soldered into shape to create the railings, before being primed ready for final painting.

Photo 12. HXT connector sleeves. These have been cannibalised to become the body of each fire monitor.

Photo 13. The three fire monitors in position and ready to spray water and just made from battery connector sleeves, 6mm silicone tube and redundant pen nozzles.

Photo 14. In the hull, the water pump is plumbed-in next to the rudder servo and electronic speed controller. Water is sucked up through the bottom of the hull and then fed to the fire monitors.

was definitely under consideration and after some experimentation, the fire monitors were fashioned from HXT battery connectors, not least because they are red and a number of them already existed in the battery connector spares box. They were mounted on (and in) some old r/c car suspension parts and then screwed to the deck as in **Photo 13.** The HXT battery connectors are hollow and give the 6mm tubing a nice snug fit, but without glue being necessary. All three fire monitors are connected to one feed pipe using micro-irrigation connectors, before connecting the single feed pipe to the pump set within the hull, **Photo 14,** this last picture showing the pump, its inlet supply pipework, electronic speed controller for the drive motor and rudder servo. The drive motor is mounted much further forward. The fuel (water) pump is operated via a receiver activated switch and 12v battery, with a standard motor cooling pipe fitting mounted in the hull bottom for the water inlet. However, the water-jet results were initially disappointing, because although the pump efficiently delivered a large volume of water through the three monitors, almost all of it was deposited on to the deck, something that would rapidly sink the Fire Boat. The obvious solution was to reduce the size of each of the fire monitor pipe outlets from their current 3mm diameter to something much smaller. After further experimentation with ball point pen components, various bits of scrap brass tube and cheap water pistol nozzles, the best solution was to push a short section of r/c antenna aerial tubing inside the end of the silicone tube. This fitted well enough to resist the water pressure without itself being ejected, and reduced the internal diameter of the 3mm silicone piping to just under 1mm. When fitted to all three fire monitors, the resultant increase in water pressure provided them with a satisfying two metre range.



Finishing, and on the water

The completed Fire Boat was treated to some fire engine stickers found online, **Photos 15 and 16.** A crew member inside the wheelhouse seemed appropriate, **Photo 17,** with a siren (speaker) and power ready for the emergency lights in the wheelhouse by him.

On the water, the model performs very well, with a nice scale turn of speed and a tight turning circle thanks to there being plenty of throw on the rudder, **Photos 18 and 19.** While the model isn't quite finished for these photos, I am happy to call it a successful venture up to now. Experimentation with the alternative car windscreen washer pump and different fire monitor nozzles continues, as I am determined to out-spray anything else on the pond……

This Fire Boat, built without plans, is perhaps one of those projects that never really leaves the experimental stage and it should deliver plenty of fun in the coming months as the design of its fire monitors is further refined. The retro-fitting of control servos for the elevation and rotation of the fire monitors can't be too far away either? To see a short video of the Fire Boat built and on the water, please search YouTube for: 'Buxton Model Boat Club 82'.

Enjoy your hobby - ***Andy Cope***

Photo 15. The completed Fire Boat.

Photo 16. A stern view of the Fire Boat.

Photo 17. The captain awaits the wheelhouse with a siren (speaker) and power, all ready for the emergency lights.

Photos 18 & 19. On the water, and ready for duty.

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Phil' Scales converts the Model Slipway Aziz kit

Scale Supporter

A general view of Scale Supporter on the stand showing the modifications and its striking new livery.

The Model Slipway kit of Aziz is very good, but also quite common on the model boating lakes so I decided to alter it to a typical 1970's and 1980's anchor handling supply vessel with appropriate detail.

The first thing to be noted is the colour scheme, which is in blue and yellow with light grey decks, the inspiration coming from the scheme used by the Blue Company's North Sea vessels and it is also now the adopted scheme of my 'Scales Salvage and Towing Company'. Several changes have been made to the Aziz model.

Conversion of the ex-factory kit

The foredeck is slightly modified, but the biggest change is to the superstructure to more embody the style of North Sea vessels. The bridge front has been altered with the bridge wings re-shaped and repositioned, and there is now a fully detailed bridge interior with a helmsman. The rear of the bridge was also re-shaped into a projecting angled area with operating consoles inside of it. The twin funnels have been modified and the mast area completely changed. A simpler main mast has been created and the fire monitors repositioned on a platform between the funnels, with their supply pipework beneath. The existing somewhat 'scrawny' crane was substituted for a larger version and is able to reach the workboat stowed opposite.

The principal changes though have been to the main working deck areas. The bulwarks have been modified, the rear fenders discarded and a pair of opening doors placed above the 'Rescue Zone'. The original stern half-roller is now a full roller made from plastic plumber's pipe and the stern quarters modified to be wider and more rounded, using styrene card.

The crash rails have been strengthened with a lower rail and the supply and replenishment hydrants are now colour coded as appropriate and moved to the stern where they usually are. A larger sacrificial wooden working deck has been installed using individual planks set in transverse channels. The steel anchor landing deck at the stern is now extended and cable guides and chain stoppers added. A cable reel has been added to the deck above the winch and a chain gypsy wheel and chain locker hawse pipe added at the side of it all. The original diesel winch has been retained, but the 'tugger' winches are repositioned.

A full set of anchor handling equipment was added and stowed in various storage locations including items such as the J Hook, grapnels, a welding set, tool boxes and a buoy lassoo. Deck clutter includes stored ropes and a variety of recovered oil rig anchors and floats, including a torpedo anchor. For display purposes, a large (and probably oversized) anchor is held at the stern roller.

Conclusion

A good application of weathering has been added to this hard working and busy vessel. With the installed bow thrusters and the kit supplied propellers and rudders, Scale Supporter is responsive, looks good and is noticeably different on the water. It is equipped for light towing from the strengthened H-Bitts and has a Gog Eye on the rear main deck. This has been a relatively simple conversion from a well presented kit from a well-known manufacturer.

Below: An overall view afloat showing all the modifications to the superstructure and mast, as well as the busy aft working deck and striking new livery.

Right: Side view of the revised superstructure, funnels and fire fighting platform. Please note the enlarged HIAB crane.

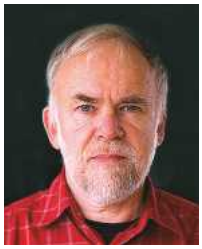
Left: The magnificent diesel winch is largely unaltered from the standard kit supplied version, but now with a chain gypsy and hawse holes; to the below deck chain storage locker. The tugger winches have been repositioned and the Rescue Zone opening gates in the bulwarks are adjacent to them.

Right: The new rear bridge extension with its large windows, a wire storage reel and the revised funnels.

Above: Afloat on the club pond showing the busy working deck area with a freshly landed 60 tonne rig anchor. This photo also shows the changes to the rear superstructure and mast.

Above: The main working deck area is part steel and part sacrificial planking. The crash rails have been modified and beefed-up; the supply pipes are repositioned and there is storage for all the other paraphernalia such as the supply pipes and grapnels etc. There is also full stern roller and on deck is a modern torpedo type of rig anchor.

Flotsam & Jetsam



John Parker delves into the archives

50: Jetex Motors

At the very dawning of the jet age, following the end of World War Two, a new type of model propulsion unit was announced. It did away with the need for a propeller and enabled model aircraft to emulate their full-size jet counterparts and streak at high speeds skyward, leaving just a faint trail of vapour and accompanied by a whooshing sound. It was called Jetex, and it caused a sensation in aeromodelling. Its impact on marine modelling, where the water propeller continued to provide the most effective propulsion for most sorts of powered craft, went almost unnoticed, but nevertheless forms an interesting footnote in the history of the hobby.

Jetex announcement

'Jetex Model Jet Motors' were introduced to the world in the June 1948 issue of Aeromodeller, with the Jetex 100 and Jetex 200 outfits initially available at a cost of 27s/6d (twenty-seven shillings and sixpence) and 37s/6d respectively – roughly £51.50 and £66 in today's money. The big-selling Jetex 50 came along a year later at 10s/6d (£17.25 today), whilst the Jetex 350, introduced in late - 1948, was quietly dropped due to poor sales. The outfits came in a yellow box that contained the motor, fuel charges, accessories and instructions needed to operate it, and the manufacturers were Wilmot, Mansour and Company Limited of Totton, Hampshire, UK.

Bill Wilmot (accompanied by his brother John until he was killed in a car accident in 1943) and Joe Mansour had developed small rocket-powered target aircraft during the World War Two under the Department of Miscellaneous Weapons Development (DMWD), which was headed by the engineer and novelist Nevil Shute Norway (Flotsam and Jetsam No. 4, MB July 2013 issue). Jetex motors were an outgrowth of this work done during the war and required the development of a safe, relatively cool burning propellant to replace the cordite-based propellant previously used. This problem was solved by an ICI chemist, Alex Hutchinson, who achieved a patent for his formulation based on a guanidine nitrate oxidiser in 1948, paving the way for Wilmot, Mansour and Co. to begin production of their Jetex motors, with ICI as a sub-contractor providing the fuel cartridges.

Jetex described

A Jetex motor consists essentially of a can-shaped combustion chamber into which the propellant charge is loaded. A wick is used to ignite the charge, exiting from the rear cover of the motor through an orifice that also serves as the jet efflux nozzle. To prevent a blocked nozzle from causing the casing to explode, a spring or system of springs forms a safety valve, holding the rear cover in place against the thrust being developed and providing a means of loading the charge. A simple clip holds the motor in place on the model. This is all shown in one of the illustrations, which is taken from a contemporary model catalogue.

Despite its name, the Jetex Model Jet Motor was actually a rocket and not a jet motor, for it provided its own oxygen for combustion. It differed from the normal rocket motor in providing a relatively weaker, longer and cooler-burning charge that made it suitable for models other than those that stood vertically on launch pads. The thrust available varied from about 0.5 to 5 ounces (14 to 140 grams) and the duration from 8 to 30 seconds, depending on the motor and number of cartridges fitted. This level of thrust required a very light model for good results to be achieved. The motor propelled a small mass of gas from its nozzle at high speed and the best propulsive efficiency occurred when a model of low mass (and drag) was able to accelerate to a similarly high speed.

Left: First ever advertisement for Jetex motors, in the June 1948 Aeromodeller.

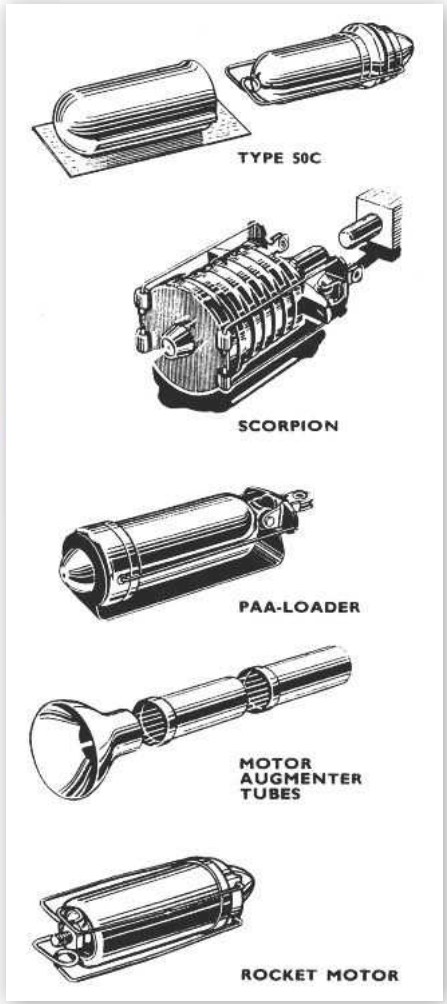
Below: An early Jetex 200 motor outfit.

Given this, a lot of ground (or water) could be covered in the short duration provided by the charge, with the Jetex motor being billed as suitable for powering planes, boats and cars.

Jetex models

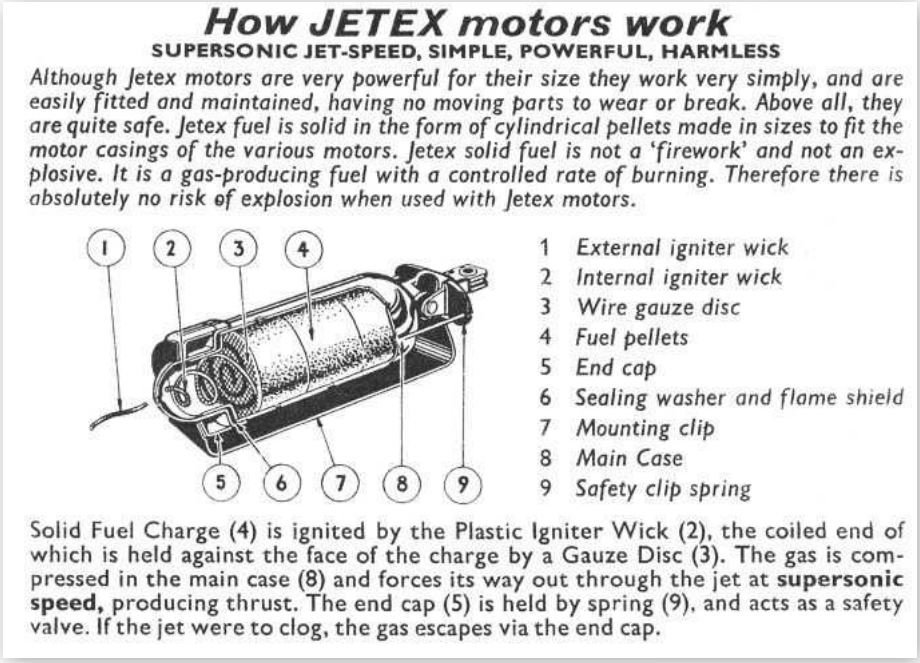
Wilmot, Mansour and Co. were initially a little slow to offer complete, ready to run models for their motors, but an advertisement from the June 1953 Boy's Own Paper magazine shows a small plastic hydroplane and racing car, along with a simple aircraft and a helicopter, all powered by the Jetex 50 motor (two motors in the case of the helicopter). These were small and toy-like models, but the company also produced a range of more ambitious model aircraft kits from 1952, added to which the traditional kit providers such as Veron soon chipped in with their own designs for Jetex powered model aircraft.

The modelling press offered further scope for those able to make their own models. The



Above: Some types of Jetex motors and augmenter tubes.

Left: Ready to run Jetex models from a 1953 advertisement.



Left: How Jetex motors work - from a model catalogue.

Hydrojet was an early published plan by M. C. Cowell for a fast hydroplane dating from 1949 (judging by its use of the Jetex 350, introduced late 1948, and appearance in The Model Boat Book, published in 1950). It had a fairly light balsawood framework covered in 1/16 inch (0.8mm) balsa planking forming a single-step hull about 390mm long, intended for free-running or tethered operation. The Jetex motor sat atop the hull amidships, exhausting over a scalloped rear hull and transom covered with tinplate to cope with the hot exhaust. As it required no air intake, the front of the motor could be covered with a shape representing the cockpit of the craft.

This type of model set the standard for a successful Jetex powered boat, with little variation from it being possible due to the need for lightness and a hull capable of running at a high speed with adequate stability. Scale detail and displacement hulls were out, as was operating on anything but calm water. Even a hydroplane hull could flip if, for example the thrust line was wrong, but the builder might have been surprised to see

The Jetex plastic hydroplane. (Courtesy of antiqythings)

his Jetex motor continuing to run underwater! Such operation was not recommended in the interest of engine life……

With the Jetex 50 far and away the most popular Jetex motor due to it being (just about) within reach of pocket money, and because a model boat was able to be made very simply and inexpensively for it, many hobby magazines and beginners modelling books featured their own version of the Jetex 50 powered hydroplane. The example chosen here is from the instructions to build 'Jetripple' in the Eagle Book of Model Boats, by Ray Malmström. A commercial kit for a Jetex hydroplane was available in the form of the Jet-Ho by Adamcraft, for the Jetex 200 motor.

There is one Jetex-powered model boat design that did break with convention and it did so in a big way. It came from the pen of Ron Warring (Flotsam and Jetsam No. 39, MB June 2016 issue) and featured in Hobbies Weekly magazine for 27th January 1954. On a principle analogous to the turbo-prop jet engine, it allowed the thrust of a Jetex 50 motor to play upon a simple turbine wheel, which in turn drove a water propeller connected to the opposite end of the shaft. I doubt if it could have been very efficient, but for sheer ingenuity and novelty it is noteworthy.

Jetex operation

The Jetex motor was inherently simple and contained no moving parts, that is if we discount the gas molecules coming out the exhaust. Yet it could potentially be unreliable if careful attention was not paid to some simple maintenance tasks. The products of combustion were corrosive, so it was very important to clean out the inside of the motor after each run with a shaped piece of wood, and experience soon taught you to allow the motor to cool down before attempting this!

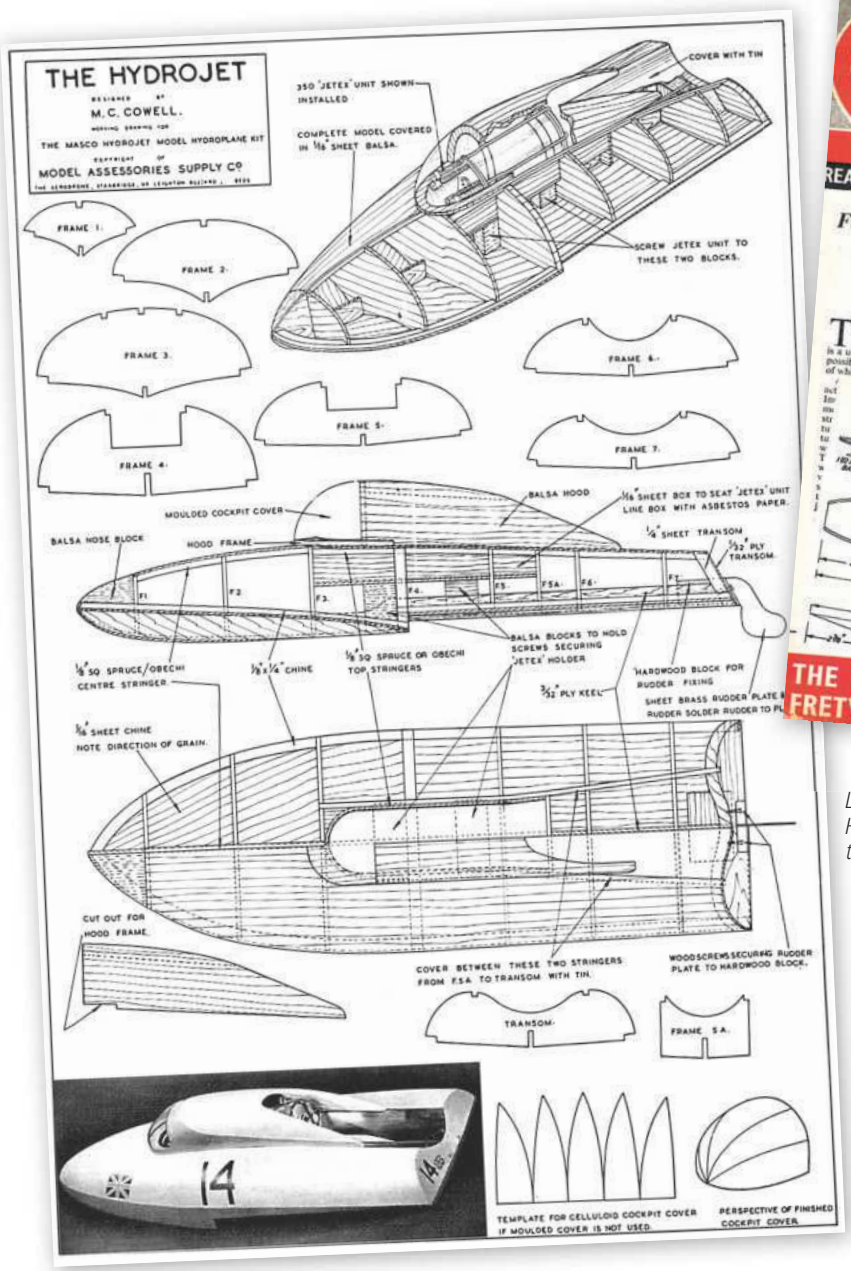
Once the solid fuel charge (or charges) were inserted, it was necessary to coil the plastic ignition wick carefully against the face of the charge and place a gauze wire disk against it. The gauze performed three functions: it held the ignition wick in place; it filtered out any pieces of burnt charge that might block the jet nozzle; and in a complex way, it affected combustion by acting as a catalyst, improving the thrust. It was best to

Below: Performance table from the book 'Model Power Boats' by Ron Warring.

TABLE 14:2. JETEX HYDROPLANE DATA

Jetex Unit	*Thrust (ounces)*	*Duration (seconds)*	*Suggested Model Length*
Atom, 35	½	8–10	6 in.
50	½–¾	8–12	6–8 in.
*100**	1	8–12	10 in.
Paa-Loader	1½–2¼	8–10	8–12 in.
*200**	2½	1 change 8–10 2 changes 20–24	12–15 in.
*350**	3½	1 change 8–10 2 changes 20–24 3 changes 24–30	15–18 in.
Scorpion	4–5	8–12	15–18 in.

*Obsolete sizes.



Left: Plan for the Hydrojet powered by the Jetex 350 motor.

Above: Turbo-Jet Speedboat design from Hobbies Weekly, 1954.

Below: Revamped Jetex models by Sebel, 1966.

replace the gauze after every few runs. It was also important to check each time that the nozzle was not getting blocked, and perform a more thorough cleaning and maintenance routine including checking the condition of the asbestos washer at the exhaust end after every twenty runs. The young friend of my youth ignored all these fiddly tasks with his Jetex 50C (which was probably typical of a schoolboy) and consequently many of his motor runs fizzled out. Storing the charges in damp conditions could also result in erratic firing, as they absorbed moisture from the air.

Jetex development and demise

The Jetex range evolved with improved models and new additions, such as the baby Atom 35 and the large Scorpion 600. Distribution in the USA was by American Telasco from 1950 where the 'PAA-Loader' competition class was popular for some time, sponsored by Pan American Airlines. Two sizes of 'augmenter tubes' were introduced, bell-mouthed exhaust extensions that entrained additional airflow to increase thrust , although somewhat negated by their additional weight, and enabled more scale-like model aircraft fuselages which otherwise had to be cut back to clear the hot exhaust. The Jetmaster engine was specially shaped to achieve the best results with the augmenter tubes.

In 1956, D. Sebel and Company Limited took over productions of Jetex products from Wilmot, Mansour and Co. when Bill Wilmot left to pursue other interests. They had to find an alternative supplier of propellant as ICI were not finding it profitable to manufacture and chose to withdraw with the change of ownership. This Sebel managed to do by 1959, but it was to a different formulation that burnt at a higher temperature, which meant that the aluminium alloy motor casings had to be retooled in steel. The Jetex 50 motor, for example, which by this time had evolved into the 50B, became the 50C with the change to a steel case. Jetex products weathered this potential disruption to supply, but by the 1960's they were declining in popularity. Sebel were caught up in the general malaise that was affecting the British toy industry by the middle of 1960's and despite a buy-out and restructuring, production of Jetex products ceased in 1972.

The aeromodelling community has enjoyed a minor revival in Jetex models, fuelled by discoveries of old stock and limited production of similar design engines, such as Jet-X. Marine modellers are however unlikely to ever again see a Jetex-powered hydroplane streak across the surface of their local lake at high-speed.

HMS Dreadnought
A Nervous Breakdown

PART 4

Dr. Marcus Rooks continues with his unique project

HMS Dreadnought

This is the fourth of an occasional series of articles covering the construction of a model of the 1906 steam turbine powered British battleship HMS Dreadnought. The first part was in May 2016 MB, the second in September 2016 MB and the third in December 2016. Marcus has been endeavouring to show that it is possible to build an aluminium hulled r/c model that uses miniature steam turbines, and that such a project need not be too daunting, but because of unexpected boiler and burner problems he has in this article temporarily fitted electric motors, if only to see the model perform on the water - *Editor.*

This was written in late November 2016, one year since embarking on this HMS Dreadnought project and Part Three which was written in late summer 2016, was published in this magazine in December 2016. I am writing this with my head metaphorically in my hands, as the last three months have been a most difficult period of the project and things have not progressed exactly as planned, since unfortunately I have had to temporarily remove the steam plant from HMS Dreadnought. Having spent many months on its construction and the additional components such as pumps, condenser, regulator, oilers and various other boiler fittings, although these were all working very well the one thing that wouldn't work properly were the boilers and more particularly, their associated burners.

The main problem with the burners, which although commercial products, is they did not seem to be up the job when it mattered. There was extreme trouble lighting them as I could get one burning, but when the other got burning, it either blew out the first burner or the build-up of gas caused a fire and on more than one occasion an almighty explosion - shades of Jutland perhaps? When they were both burning they just were not hot enough and it would take three gas refills to get the steam up to the ideal working pressure, but with all the attendant ignition problems as already mentioned.

These burners have been unable to get the steam pressure above 50psi, which is just not enough and certainly when the regulator has been opened, the pressure just drops like a stone. In the end, and after weeks of experimenting (and please remember I am very familiar with steam and all its intricacies), the conclusion was that that part of the problem lay with too much back pressure within the entire steam plant system.

This could perhaps be overcome by extending the smoke box part of the boilers, but then they would not fit in the available hull space. All this was followed by a few days of intense head scratching, but the overwhelming desire was (and still is) to see and play with HMS Dreadnought on the water with a fully functioning steam turbine propulsion system. To reiterate, the problem is not with the (dental) turbines or indeed the boilers as designed, but rather with achieving the generation of steam as required, the burner configuration seemingly being the principal problem. Reluctantly, the somewhat awful decision was made to remove the complete steam plant and replace it with electric drive, albeit temporarily, as the entire steam plant and its operation could be more easily fixed on the bench, rather than in the hull.

A step forward....

The boiler, burners, water tank, hand pumps, regulator, displacement lubricator and condenser, together with the various steam lines were removed and replaced with four Torpedo 500 motors utilising two lead acid motor cycle batteries (motor-cycling being another of my hobbies) for their power supply and **Photo 1** is of them, I am sorry to say, in place as of late 2016. This was not as easy as it may seem, as the hull was (and is) compromised for height and some of the battery protuberances had to be removed and some small cut-outs made in the deck to create sufficient clearance. The steam plant has cost a lot of money and a lot of my time, so when time permits, it will be got running properly and reinstalled, but in the interim this was the best, albeit hopefully temporary, solution to this 'steam' problem.

Anyway, notwithstanding these problems, construction of HMS Dreadnought has continued and one of the most prominent features of warships of the early 20th Century era was the anti-torpedo netting. This was a system whereby a net, normally rolled up and stowed on the warship's hull sides and deck, could be unravelled and supported by suitable booms to protect the vessel from torpedo attack.

Net booms – Photos 2 & 5

These are placed at set intervals along the hull and they swivel at their base to allow them to be swung out. A system of a hooks and eyes have been used for this purpose, which is similar to full-size. The eyes are modified 6BA screws with an eye (6BA brass washer) soldered in the screw slot, all screwed into the hull sides.

The booms are from 3/16 inch diameter aluminium rod with brass extensions that carry the hooks and the upper support eyes. These were held in place by wooden blocks, but brass was used on the model and these have also been screwed in place. Their positions had to be amended more than once to get the booms to all sit, and hang, correctly. There are also some 10BA eyelets that carry the supporting wires and these have been made in a similar fashion and screwed to the hull side.

I have to say that this whole process was very tiresome, as there are 24 beams necessitating 24 upper and lower extensions. They required 48 support eyes, each of the support eyes needing a screw and eye to be soldered together and so in total, a difficult

Photo 1. A rather sad looking temporary electric motor installation - the mountings are just held in place on a bed of silicone bath sealant to the hull's internal bottom. Not perhaps what you would expect of 'proper' model engineering, but quite practical in the circumstances.

Photo 2 Close-up of one of the Anti-Torpedo Net Boom swivel eyes. They were formed from a 6BA brass screw with the eye soldered into the screw slot. These were then screwed into the hull with a brass washer spacer.

Photo 3. The hull side showing the Anti-Torpedo Net Boom swivel eyes and the boom support blocks. The position of these support blocks was later changed. The small eyes are 10BA screw eyes for the boom support wire.

Photo 4. Close up of the Anti-Torpedo Net Boom swivel hook attached to the end of the boom. The slot allows the placement of the hook into the eye.

Photo 5. This is a complete boom, albeit a shorter one that was fitted at the front of the net system and which was connected to the winches.

and somewhat tedious task. In the end, it took several weeks before this was all ready, and even then some more work would be needed to complete it all satisfactorily.

Anchors, bollards and fairleads – Photos 6 & 14

The anchors next came to my attention and the initial intention was to cast them using the lost wax method. However, after some experimentation with my limited range of equipment, it became clear that this was not feasible, so these fittings were individually fabricated from brass and copper, all silver-soldered together. They follow the basic pattern of the full-size originals, but are simplified to aid construction. The same approach was applied to the bollards and fairleads, in that they have been individually fabricated rather than cast, and in the end some quite tolerable results have been achieved.

These accompanying pictures hopefully show the construction sequences of these fittings. Breaking something like these into smaller constituent parts actually makes their construction quite simple.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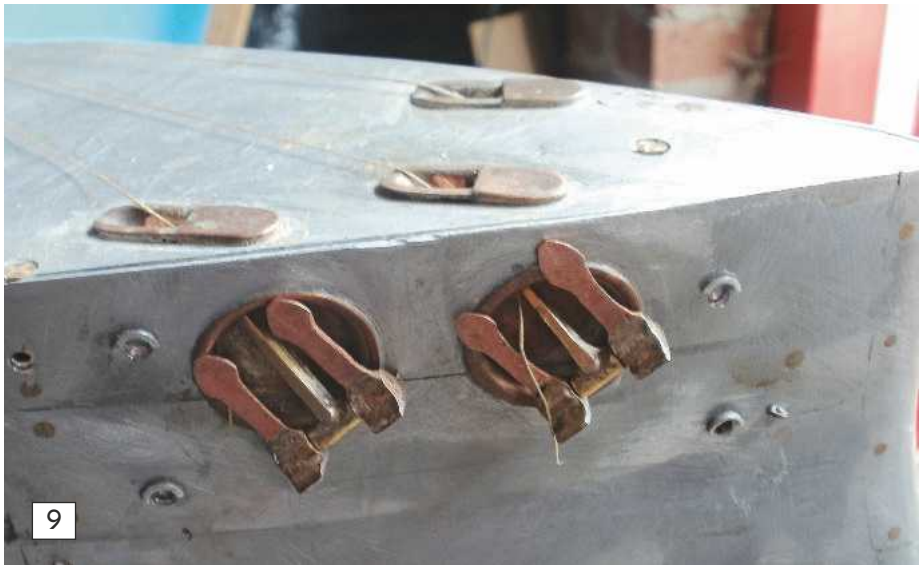
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Mast fittings and spotting tops – Photos 15 & 16

One of the features of the major warships of this era were the observation positions (spotting tops) on their tripod masts. These were also often associated with a complex starfish arrangement that was used to carry various supporting wires, halyards and ropes.

These were all fabricated from copper sections and silver soldered together. Again, this was another of those tedious jobs requiring numerous heat sinks to prevent the last soldered part from falling off when attempting to add the next piece! Mast sockets were provided for the upper masts which are from wood, as was full-size practice.


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Photo 6. The main anchor stocks have been fabricated from flat and round brass bar, and a completed one is seen here lurking in a hawse hole.

Photo 7. The first stage in making one of the anchor flanges is its basic fabrication from copper and brass.

Photo 8. A completed anchor flange; the rounded base has been made by carefully flowing a blob of soft solder on to the previously silver-soldered base piece.

Photo 9. Two completed main anchors held temporarily in place.

Photo 10. The component parts of a typical bollard comprise brass turnings and a copper baseplate.

Photo 11. A typical completed bollard screwed and fitted to the main deck.

Photo 12. The first stage of fairlead production. Brass sections were soldered together and the central space drilled and filed and the profile filed to shape before separating the two blocks.

Photo 13. The next stage in fairlead production was to solder the top (fairlead) part to its angled base.

Photo 14. A fairlead temporarily fitted whilst awaiting final finishing.

Photo 15. The foremast fittings were fabricated from copper parts, all silvered soldered together.

Photo 16. The almost complete foremast starfish and observation platform is screwed into position.


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Small guns – Photos 17 & 18

HMS Dreadnought had up to twenty 12pdr guns positioned around her superstructure, decks, and even on the turret tops so yes, yet another daunting task. It was decided to simplify the hidden superstructure guns, but definitely make those that are clearly visible much more like their full-size counterparts. These guns were all fabricated from aluminium and brass, and then fixed in place using 6BA screws and they are able to traverse.

Large superstructure parts – Photos 19 to 22

The superstructure has also now taken on a more robust state. The conning tower or armoured citadel, call it what you will, has been fabricated from copper tube and sheet, all silver soldered together with the main rangefinder support made in a similar way. The various deck housings, such as the admiral's cabin, are from flat aluminium sheet with the windows formed and then bent to shape. The boat deck was made using a brass skeleton support with an aluminium deck over it. Various fittings such as boiler room vents and searchlights are still under construction at the time of writing.

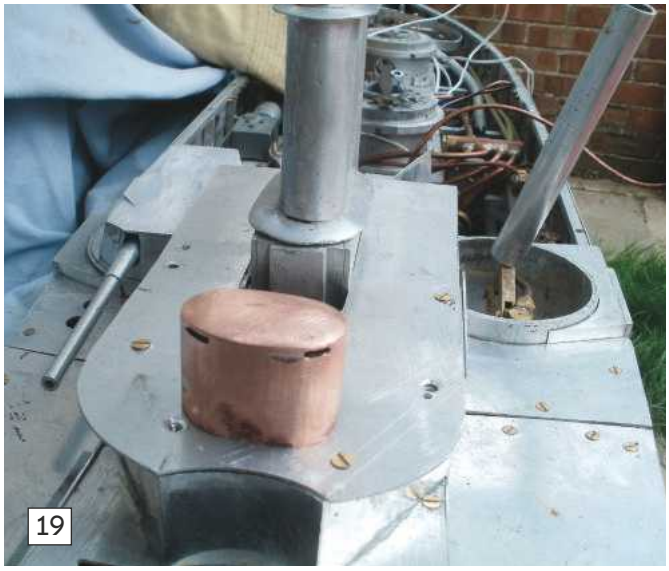
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Photo 17. The basic 12pdr gun construction, but it is simplified for those fitted within the superstructure.

Photo 18. More detailed versions of the 12pdr guns were made for the more visible positions such as on the tops of turrets and open deck mountings.

Bilge keels – Photo 23

These are formed from aluminium square section, cut and filed to a triangular cross section and screwed to the hull sides. Once again, a lot of muscle work, but they won't fall off and look right, which is perhaps the important thing.

Breakwaters – Photos 24 & 25

These were also fabricated from copper and brass and screwed into position both on the foredeck and further aft.

Ship's boats – Photo 26

Continuing with the all metal theme, these have been fabricated from copper, annealed and soldered to shape as this photo shows. Quite good fun making these as it so happened, and of course using heat in a cold(ish) workshop as winter approaches can also be quite pleasant.

Radio control

No pictures here – sorry, as everything is hidden inside the model! However, a relatively inexpensive four channel r/c system is adequate for this model and it currently controls the turrets, steering and engine speed and direction, with the fourth (unused) channel probably being utilised later to control the lighting. It was initially set-up to control the various feed pumps and boiler controls and will (yes, it really will!) once the steam problems have been resolved, revert to that configuration.

Steering. One servo controls the forward and reverse actions of the drive motor that operates the rudder. Regular readers will recall that in Part Two (September 2016 MB) I described how the rudder was operated directly by a geared motor running on 12v, rather than the more conventional model boat method of a direct linkage to a servo output arm. As was also mentioned in Part Two, the steering mechanism activates a system of a flag and ball connected to the foremast's starfish and basically, when one is

Photo 19. The armoured conning position is from copper tube, suitably annealed and formed to shape. Its roof is a separate piece of copper, also annealed to shape and soldered into position. The open bridge sits above this.

Photo 20. On top of the armoured conning position is the brass and copper support for the navigating bridge and its open wings above.

Photo 21 Front of the bridge which also acts as a support for the signal deck and you can just see the armoured con' below it. There is a sheltered passage, port to starboard, within the bridge unit.

Photo 22. Overall view of the main superstructure showing the bridge and signal deck. The admiral's walkway can be seen screwed to the deck.

Photo 23. The bilge keels were formed from aluminium square section, cut and filed to a triangular cross section and screwed to the hull sides.

Photo 24. The breakwaters were each fabricated from brass and copper, and screwed to the decks, this one being mid-way along the starboard deck in front of one of the wing turrets.

Photo 25. The foredeck breakwater is just in front of 'A' turret.

Photo 26. The ship's boats are fabricated from annealed copper pieces, all silver-soldered together.

Photo 28. HMS Dreadnought in primer.

raised the other goes down, indicating to the fleet the bearing to follow. On the other hand for this model, it indicates to the r/c operator when the rudder is amidships, since there is no true neutral as such on the r/c steering channel, the servo merely activating the rudder movement motor. So, the flag and ball also indicate (by being in neutral as it were), when the rudder is amidships. It took an age to set up the system as the lines are under tension using simple integral springs and the wires are guided via a series of pulleys. A red tube (rather than a ball) has been used together with a green flag, chiefly as some red plastic electrical covering was to hand and some green paint, but the system works surprisingly well and it should be easy to follow Dreadnought's bearing when on the proper pond.

Motors. They are connected to an old electronic speed controller from the odds and ends box and on 12v give a good turn of power at least on the garden stream & my small pond.

Turrets. A, X and Y turrets are the only turrets that rotate and there was a major problem with Y turret binding that took a couple of days to resolve, but they do now all traverse very smoothly and at a realistic speed. The wing turrets are not connected to this system, but can be traversed manually if desired. One problem that arose is that for some unknown reason, X turret got out of sync', and there was no clear answer as to why. To correct this, the turrets and rear deck had to be removed which was a real chore and in the end, the way that X & Y turrets were connected to the central driving core was altered. The driving dogs were removed, drilled and screwed with a hole in the back of the turrets which allows a grub screw to hold it in place and now it very easy to adjust a turret on its axis. None of this has been that unusual with some of the systems having to be altered in the light of experience, something that I note also happens with modern full-size RN warships.

On the water, late 2016

Here we are with HMS Dreadnought afloat (and remaining afloat!) in late 2016 prior to painting. Readers are also able to view all the model's systems in operation by tuning into YouTube, where there is also a short sequence of HMS Dreadnought showing that it has a fair turn of speed as the electric motors were only working at half power as my little pond is only big enough to check to see if things are working.

The links on YouTube are:
Dreadnought/model boats/1, 2 & 3

Conclusion

As a sunny day was upon us, a coat of grey primer was applied and suddenly the model looked very much like the battleship it was meant to be as this picture shows. I am sorry if you were expecting to see HMS Dreadnought steaming across a large pond with the turbines driving the model at a fair rate of knots and clouds of smoke emanating from the funnels. That aspiration has not been lost, but I wanted to get the model working in some form as winter approached in late 2016, and resolving the burner problem is best done with the steam plant removed from the hull and on the bench, all at leisure and after seeking further professional advice.

I have also to say that at the time of writing this, pre-Christmas 2016, an unfortunate illness has recently befallen one of my immediate family with the result that I am not able to disappear for hours on end into the workshop for some weeks to come, but fully intend to be back again here in MB very soon with Part 5 later in 2017 when I hope there will be better news. Fortunately, this is a hobby and not a business, so a few extra months is not the end of the world.

Photo 27. HMS Dreadnought afloat with no leaks. You Tube has some action sequences, please see main text for link.

Richard Simpson's series on model steam plants

Boiler Room

PART Seventy Seven: Affordable Steam PART 1

Of all the aspects of steam plants in model boats that would cause most comment when asked the question at the pond side, would be the cost. I can sympathise with both sides of the argument, having spent some considerable time speaking to traders and manufacturers of model steam plants over the years, as well as would-be modellers. Monahan Steam Models in California made some of the most beautiful engines you may ever have the luck to come across, but unfortunately the proprietor Nick Monahan once told me that he simply couldn't make it pay, based on the number of hours he had to put into each individual unit to keep to his meticulous standards. This was even when using the most modern CNC techniques to keep manufacturing costs to a minimum, and it simply wasn't worth his while remaining in the business, **Photo 1.** His company now manufactures one-off and short-run items for customers such as the medical technical industry. On the other hand, I can well see the challenges with asking modellers to part with what can be over a £1000 for a twin cylinder oscillating steam plant complete with boiler on a mounting plate and ready to install, **Photo 2**. A sophisticated model boat complete with a steam plant will cost well in excess of this, so it is not difficult to see why many are deterred by the potential cost.

And so, with a bit of prodding from our Editor, I have decided to take some time out from the usual Boiler Room articles and in the next seven or eight issues actually build with you a simple steam powered model boat, whilst spending as little money as possible, something that is always commendable.

The idea

This developed and grew into the basis of a project that might just appeal to a lot of young modellers and newcomers alike. The more I thought about it and the more I talked with friends and acquaintances, both at the side of the pond and online, the more I came to the conclusion that this really had some merit. The project had to meet four main criteria:

1 It had to be as cheap as it could possibly be.
2 It had to use readily available 'off the shelf' items that could be bought by anyone in the UK. (This requirement incidentally ruined any chances of using one of the old boilers and a hull from the 'Retirement Fund'!)
3 It had to be easy to build, therefore attractive to newcomers.
4 It had to be simple and reliable in operation.

There would probably have to be some compromises between these four criteria, but I very much wanted to meet the challenge as far as possible and have a project that would really appeal to those readers thinking about getting into steam, but were being put off by cost and technical complexity.

A 'plan' develops.....

To concentrate on cost alone, one could glue the cheapest and most basic of steam plants into the bottom of an unfinished GRP hull and it should all work. It might look a bit of a mess and not be very appealing and therefore the finished model had at least to be presentable. This pushed me away from the idea of a bare hull such as the beautiful Mini Vap from Kingston Mouldings (now apparently ceased trading, although the website is active), because newcomers would have to fit the hull with scratch built parts. Having said that, an open launch is most desirable as they can be relatively simple and easy to operate, as well as simple to build, and I wanted the engine to be visible when it set sail. One of the most rewarding aspects of a model steam plant working is watching the engine actually operate as the boat sails past.

A kit would be perhaps more appropriate such as the Midwest Fantail launch, but this kit requires some basic woodworking experience as it is a sheet on frame hull, plus it is not that readily available in the UK, so

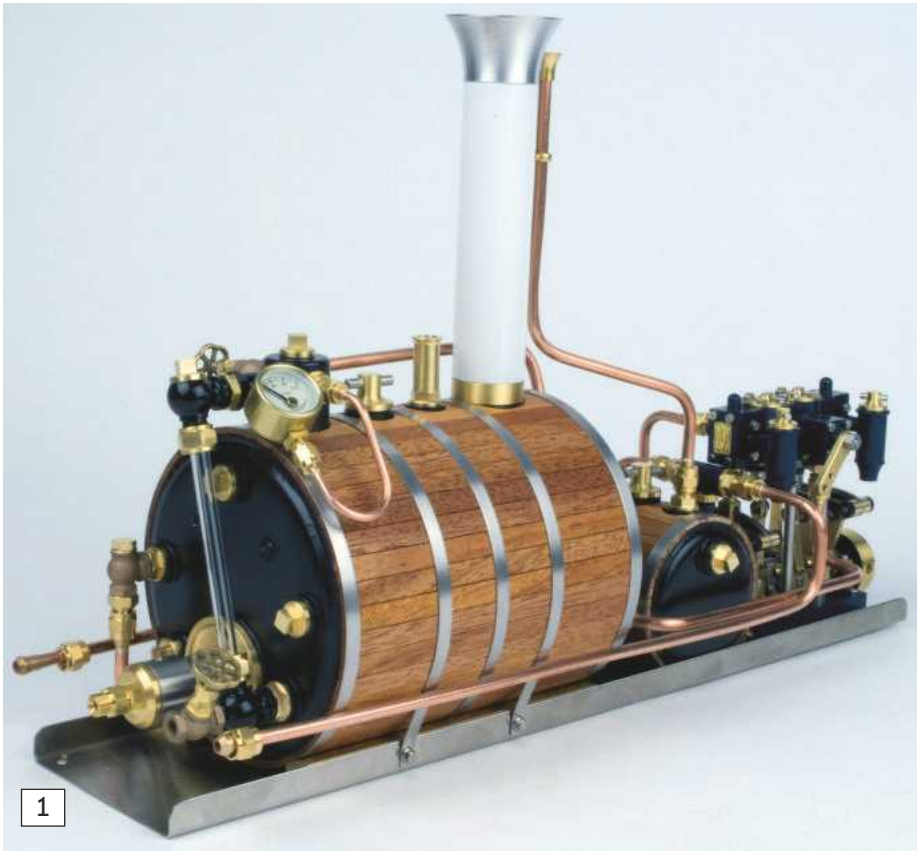


Photo 1. Beautiful steam plants such as this Monahan horizontal boiler and engine are incredibly time consuming to manufacture and consequently do not come cheap. While something to be admired for the discerning modeller the cost can be off-putting for the beginner.

Photo 2. A cheap option is a complete steam plant with boiler, engine, gas tank and even a separator, all mounted on a single baseplate. While cost effective compared to the price of the individual components, it can still come out at well over £1000, so not cheap for a beginner.

Photo 3. A proven and well established kit is always a good start and to keep the costs under control, a Krick Anna is an excellent starting point. The kit includes all the rudder hardware, shafts, propeller and laser cut parts to break you gently into the hobby.

that then took me into the area of kits with a moulded hull. The obvious examples here are the Billings African Queen, which uses a vac-formed plastic hull, or one of the Krick kits. As most of them are in the price zone of £200 to £300, the one that stands out, at least to me, is the really obvious choice of the Krick Anna kit, **Photo 3.** At the time of writing, this was available from The Model Dockyard for £99, so pretty much met most of the requirements. Further research revealed that it was designed originally for the old Cheddar Pintail unit, but it would not take a great deal of effort to adapt the model to accommodate a different steam plant.

Thoughts next turned to the steam plant itself and again I found myself chewing through many possibilities as one criteria was compared to another. One of my favourites was, and still is, the Midwest Fantail plant, which is fairly inexpensive with a very attractive vertical boiler and engine, all on a single baseplate that is perfect for dropping into an open hull. The downside though, is that it is readily available in the United States, but not quite so much in the UK. You can usually get one if you keep your eye on eBay and you can also find them from American based retailers who may ship internationally, but in practical terms this project really needed to use UK sourced components.

Staying with complete steam plants, another interesting possibility was the Wilesco D52 plant. This is nice, inexpensive and available, for example in the UK from Forest Classics, but the downside, at least for me, is the fact that it simply isn't very attractive as a unit. In particular, the engine is mounted on a tin plate that leans over at an angle and doesn't even try to emulate the layout of a traditional marine steam engine. It does however come with a shaft, coupling and propeller, so there could be significant cost savings to be had.

All these wandering thoughts pushed the thought process towards a separate boiler and engine. This is not quite as straightforward from a building point of view, but as all the plant being considered falls into what would be described as 'small', the steam pressures involved are minimal and

Photo 4. The Unit Steam Engine (USE) system, is extremely flexible and allows a combination of cylinders to create a self-starting engine. However, the engine will be of a significant size and fettling the parts to make them operate smoothly and reliably might frustrate those who haven't tried model engineering.

consequently you can actually get away with using black silicone tubing for the supply steam as well as the exhaust steam outlet, making construction much simpler.

One serious contender for the engine is the Unit Steam Engine (USE) range, available as a kit of machined parts from Tony Green Steam Models, **Photo 4.** Something that puts me off a bit though, is the thought that a kit engine may require a bit more from the modeller than simply placing it in the hull and then fettling its parts to get it running reliably and smoothly. This might just be not quite as straightforward as dropping in a readymade engine. A complete ready built boiler and engine from Tony Green Steam Models could still be a possibility though, and is certainly cost effective. Having done all this 'thinking', the one engine that finally stood out for me, is 'Tiny', as sold by Maidstone Engineering. Tiny is actually not just that, but being only single acting does create a bit of a concern from a reliability standpoint. However, for this model project although intended to be radio controlled, 'point and go' was acceptable, notwithstanding the lack of speed control or reversing ability. Hopefully after a few time trials to determine how long a sailing session would be, we could always ensure that it was back at the pond's edge before everything stopped. The fact though that 'Tiny' is supplied complete, and despite being small is made of phosphor bronze, it is a good quality little engine for the princely sum of just £45. It should also be capable of pushing the Anna hull comfortably around the pond was my reasoning, and so was added to the list,

Photo 6. Tony Green Steam Models can supply boiler and engine combinations as well as items individually. A complete plant was an option for this project, but sourcing the engine from an alternative supplier demonstrates some of the options we all have.

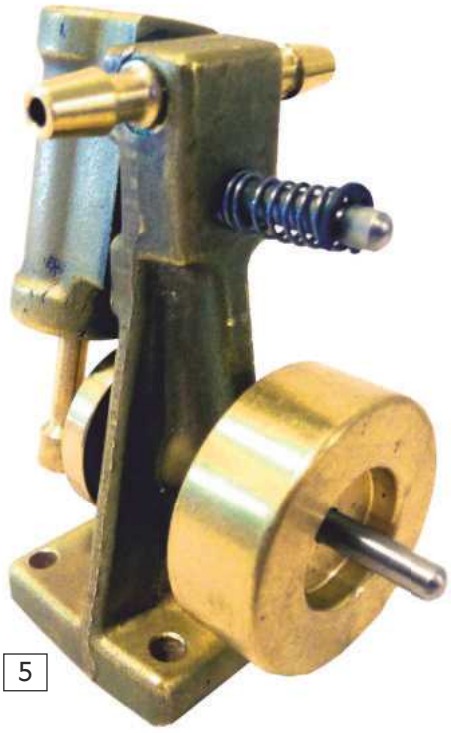


Photo 5. Tiny is aptly named, but is only single acting so will not be self-starting. It is complete and ready to go and built from phosphor bronze, and is a beautiful and quality engine for its size.

Photo 5.

Following my long-standing philosophy of first selecting the intended model boat; then the engine and finally the boiler, this just left that last conundrum. The Wilesco D52 boiler was still in contention, but what put me off a bit was the fact that the fuel burner has to be slid out from below the boiler. This means that you need suitable access in front of the boiler to get the burner out, which restricts the internal hull layout quite a bit, and means that you have to push the lit fuel into the model and then into the boiler. One boiler that does stand out as being that bit easier to work with, is the USE boiler from the same supplier as the USE engines, namely Tony Green Steam Models, **Photo 6.** This boiler hinges rearwards, so the solid fuel tablet can be placed in the base and then lit when in the model, making it that bit safer and easier to handle. The boiler is also of a perfect size as it is advertised as being suitable for a single USE engine so it should power the Tiny perfectly, at least that was my reasoning. It comes complete with a test certificate, which is important, and as it falls into the 'Simple, Small' boiler category for the sake of testing, a basic annual steam test will be enough to keep it certified. So the USE boiler from Tony Green was the final component going into this project.

Cost?
Anna kit: £ 99.00
Tiny engine: £ 45.00
USE boiler: £105.00

A total £249 for the main components of this project at the time of writing and well within budget. We still need to consider the electronics such as the r/c system and servos, etc., and there would be some further small expense with some steam related ancillaries, but we should be in with a chance of getting this model pond-worthy for a very reasonable total cost. All of the main objectives had been met with a suitable degree of compromise for a pleasing end result and these listed components were duly ordered and in next month's MB June 2017 issue in this Steam Basics column, the building fun will commence!

USS Missouri BB-63

Bob Gilbert's fantastic battleship model in his own words

Above and below: USS Missouri model completed, 3.5 metres long and weighing 79.8kg!

Having just finished a scratch built KM Bismarck, I moved on to the next project of this USS Missouri in its 1944 version which had an appeal because of her unique camouflage pattern. The project started in April 2012 and the model was built over four years, although admittedly I had a health problem for about 12 months and did very little construction work during that unfortunate period. Here is a brief description of some of the key features and the photo captions may also be helpful.

The hull

United States Navy 1:96 plans were used as supplied by the Floating Dockyard (USA), with the hull frames then being drawn using a CAD program, but scaled to 1:80. This is an unusual scale, but was required to ensure the total length of the model was within the legal length (in Australia) to transport in a box when overhanging the top of a small 6 x 4 foot

Above: The 1:96 scale engineering drawings were supplied by Floating Dockyard (USA) and the frame patterns, keel and supporting sub-frames drawn using CAD to 1:80 scale and cut and assembled ready for planking (May 2012).

Above: The frames were double planked using 14mm x 3mm x 3.6M long Tasmanian Oak planks. The bilge keels were glued to the first layer (August 2012).

Above: The Iowa class were handsome, well proportioned ships as this photo demonstrates.

Above: The unpainted hull with Western Australian Jarrah bow and stern blocks.

Above: The hull was fibreglassed to stabilise the timber planking and the superstructure framework has been started Nov 2012.

Above: The hull, here inverted, was painted in USN camouflage Measure 32, Design 22D by March 2013.

Above: The main superstructure unit under construction with 1mm cladding on the lower deck sections. The bridge part is completed and undercoated, July 2013.

trailer. The model is actually 3.25 metres long (approx. 11 feet) and weighs 79.8 kilograms (175 pounds).

Construction is generally from timber, with the principal frames of marine plywood and the hull is double planked using Tasmanian Oak milled into 14mm x 3mm x 3.6 metre plank lengths. The hull was double planked to ensure any 'hollows' were smoothed, and the bow and stern block sections are of Jarrah hardwood, readily available here in Western Australia. The hull was coated with fibreglass to stabilise and waterproof the timber before being painted in the scheme of US Navy Camouflage Measure 32 Design 22D.

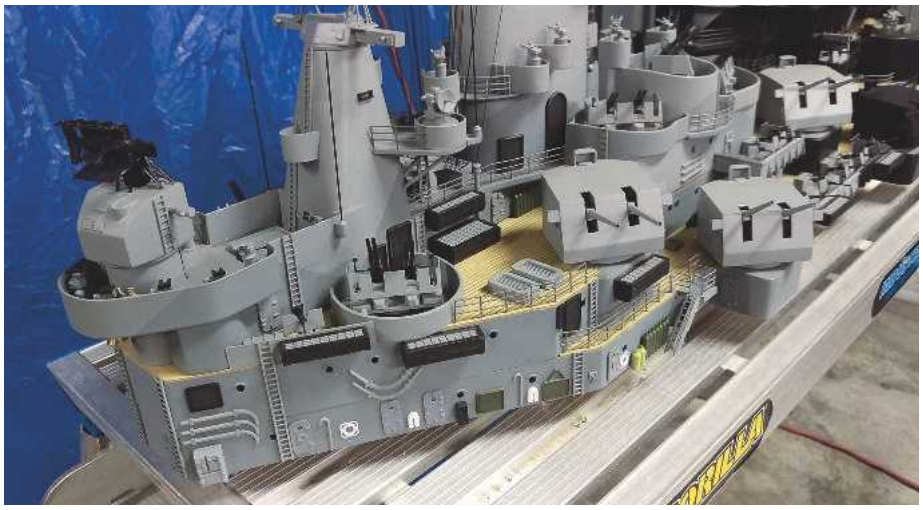
Superstructure and guns

Six millimetre marine plywood was used for the superstructure's framework, clad with 1mm aircraft grade plywood and then painted in the same US Navy Camouflage Measure 32 Design 22D as the hull. The main 16 and 5 inch gun turret frames are also from 6mm marine plywood, and likewise were clad with 1mm model aircraft grade plywood.

All the 16 inch, 5 inch, 40mm Bofors and 20mm Oerlikon gun barrels were machined from brass and there are eighty of the 40mm Bofors barrels which each took approx. 15 minutes to make. A large number of the parts for the radar arrays, gun shields, sights and seats for the 40mm Bofors and

Above: A bit of a jump forward of 30 months to February 2016, partly due to a year's illness. Many of the fittings can be seen in this picture and where possible they have been 3D printed.

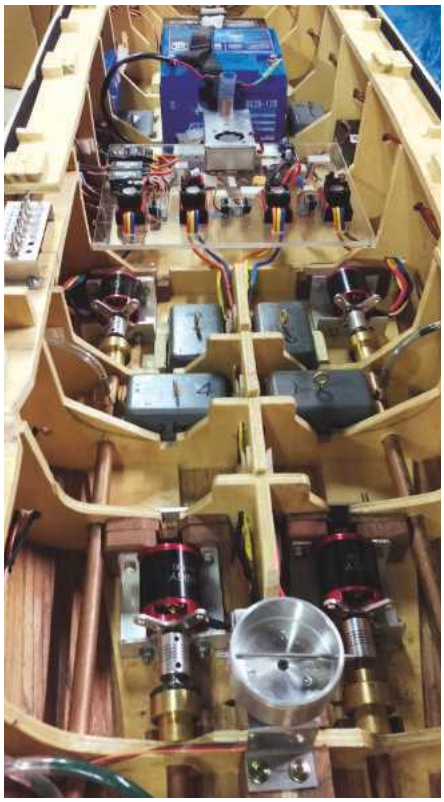
Below: The aft section completed with the crane and Kingfisher aircraft on the catapults. Numerous 20mm Oerlikon AA guns are on the quarter deck (February 2016).



Above: The main superstructure unit has the life jackets, doors, grills, ladders, oxy-acetylene bottles, radars, binoculars, stairways and other fittings all 3D printed.

Right: Another view of the superstructure, but now positioned on the hull.

Above: Conning tower detail and the illuminated starboard navigation light can be clearly seen.



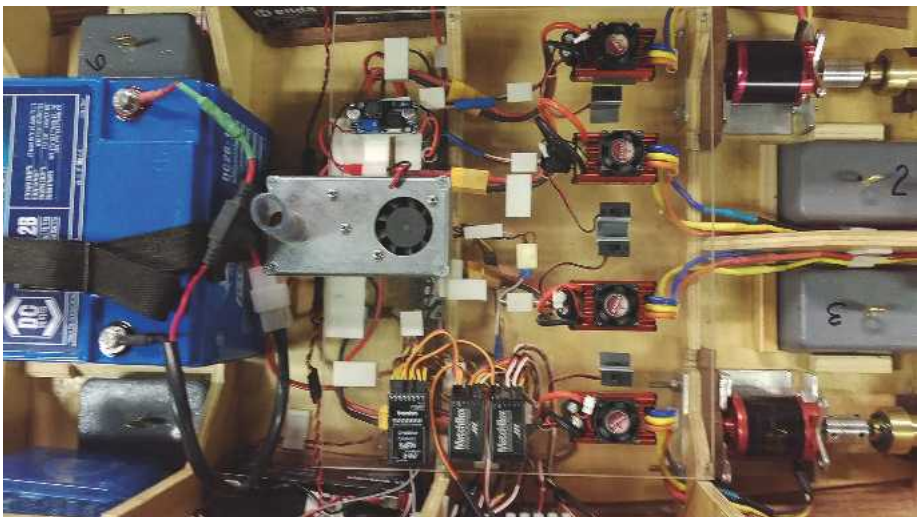
Above: The main deck is totally removable to enable easy internal hull access. The aluminium cup in the foreground is a main turret drive coupling and please note the bank of electrical switches on the port side. Active switches have a red LED to indicate when On.

20mm Oerlikons were designed using a CAD program and then laser cut from 0.5mm galvanised steel. The deck planking has been hand drawn, covering an area from the foredeck capstans to the aft fantail.

Propulsion and electronics

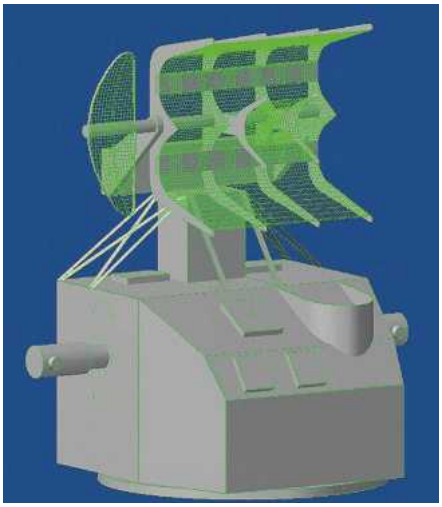
Motors: Four Turnigy 400 outrunner brushless motors 55A running on 12 volts. They are all coupled to 8mm propshafts.
Propellers: Outboard, port and starboard, are 65mm diameter four blade and inboard are 70mm diameter five blade.
Electronic Speed Controllers: Four Trackstar V2 60A brushless.
Radio Control: Futaba 8J transmitter and receiver with eight channels.
Sound Card: Shock Wave 2 from Model Sounds (Canada) which runs on both 6v and 12v. The principal sounds include the 16 inch guns firing; incoming shells and explosions; ship's horn and 'Anchors Aweigh' by a US Navy brass band. There is space on the sound card chip for a dozen other sounds yet to be added.
Turrets: These are coupled to Turnigy 15kg digital servo motors via vertical drive modules and an electronic system to make them all train together.
MatchBox servo matching/power system: This is mainly used by the r/c aircraft guys to trim flaps etc. You can align all turrets centrally and then set port/starboard rotation. It also allows the user to extend the rotation of the servo to its maximum movement and you can reverse all four outputs so that you can have all the turrets facing port or starboard as required. These devices are usually on back-order, but enable the turrets to traverse together and as one. Website: www.horizonhobby.com
Gun Barrels: These rise and fall via small digital servo motors coupled to the barrels. The LED's in the end of each 16 inch gun barrel are Luxeon Rebel 90 lumens ultra-bright mini red types, running on 3.6v 700mA which are wired to a 6v system with resistors reducing the amperage to 300mA.
Radars: The main and secondary radars are motorised using 3v geared mini-motors. Navigation Lights: The running lights port and starboard are LED's, and are also on both masts, all operating via a 6v system.
Search Lights: There are five, all on a 6v system.
Signal Lamps: Ultra-bright LED's, port and starboard, running on a 6v system are operated via Channel 8 of the transmitter to a Turnigy receiver controlled on/off switch.

(Bob is a keen Australian reader of Model Boats and I think you will agree this is a truly fantastic model, all the more remarkable because of the relatively short time span for its construction – Editor)

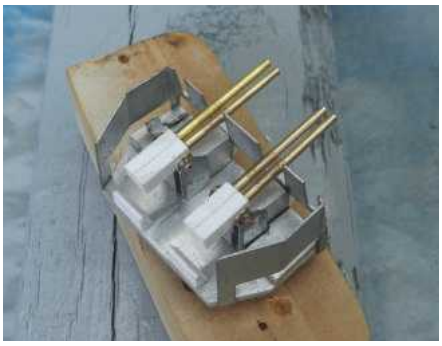


Above: Another view of the electrics showing the Perspex sheet base (in front of the blue battery) with the esc's, receiver, smoke generator and MatchBox hubs. These MatchBox hubs (centre bottom of picture) are programmable devices, used to connect all three main turrets for their correct coordinated rotation and gun barrel elevation to the receiver, but still using only two channels. This is so the three main turrets and their guns function as one together, on either beam, or fore and aft.

Right: The Shockwave 2 programmable sound card comes from Model Sounds in Canada.



Left: This CAD drawing of the Mk. 37 radar director used to construct the 1:80 scale version.



Right: An unpainted 40mm quadruple Bofors mounting. USS Missouri in 1944 had 20 of these. Eighty barrels were turned from brass, with each taking approx. 15 minutes to machine. The armour protection is 0.5mm galvanised steel, laser cut and folded using CAD drawings.

Above: USS Missouri on display with my club, The Australian Model Ship Society, on Australia Day.

Above: This is the launching slipway set-up. The model is winched sideways down into the water and this negates the need for us humans to bend over.

Left: This photo shows the ultra-bright mini LED's in the bore of each 16 inch gun barrel. They illuminate briefly in conjunction with the sound card's main battery firing sound.

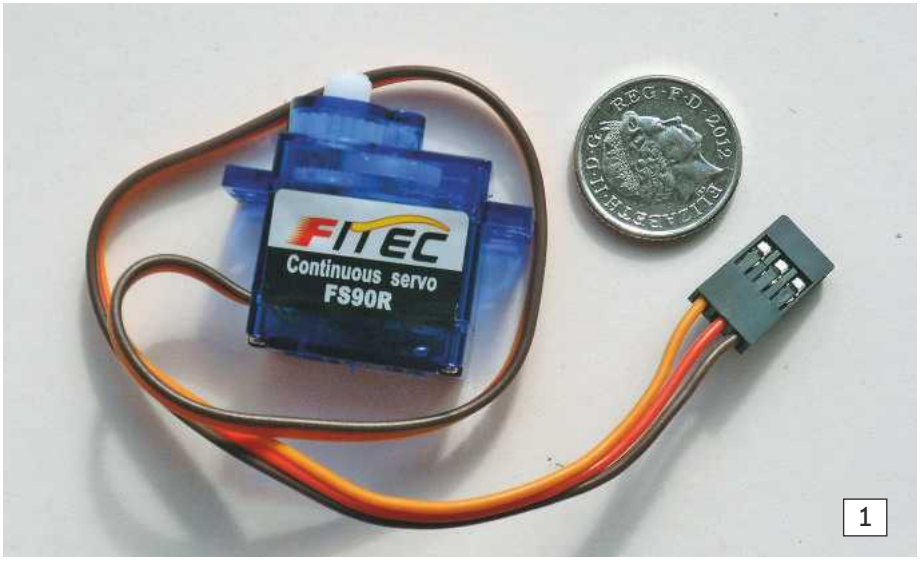
Right: This is how the 1:80 scale USS Missouri is transported to the club pond and model displays.

Combined Micro Speed Controller and Power Unit

Francis Macnaughton demonstrates how to make a low cost version for small r/c model boats

In the 40 years or so that I have been using radio control, things have developed enormously, not only in the terms of increased and improved functionality available, but also in the reduction in size, weight and cost. As a result, converting even some of the smallest plastic static kits to r/c has become feasible and affordable. However, until recently, one sticking point was the availability of really small speed controllers that also offered astern control, as most commercial brushed electronic speed controllers are intended for aircraft and are forwards direction only. For many years I have usually relied on a homemade electronic circuit design based on a dedicated servo driver integrated circuit (ZN409), and a dozen other components soldered together as close as possible. The smallest version of this is about 25mm square by 15mm high and weighs just 8.5 grams. The nearest current commercial equivalent is the Action R/C Electronics P68A Pico unit with a similar size and weight and costing about £21.

There is the alternative of taking a cheap standard servo apart and using the motor and control board, or even just the latter. This works, but only to an extent, having the disadvantage of oversensitivity in finding the stop position with the control stick. This is because normal servos need to have a very small deadband around the stop position to avoid a sloppy control response. Typically, this is between 2 and 10 micro-seconds in pulse length, while dedicated speed controllers will use a substantially larger value, perhaps of 50 micro-seconds. In practice this will mean that you would probably have to be within a degree of the neutral stick position with the servo controller to be sure of finding the stop position while the circuit for a speed controller would allow 5 degrees or so. Some might be able to work with that, but I am not one of them!



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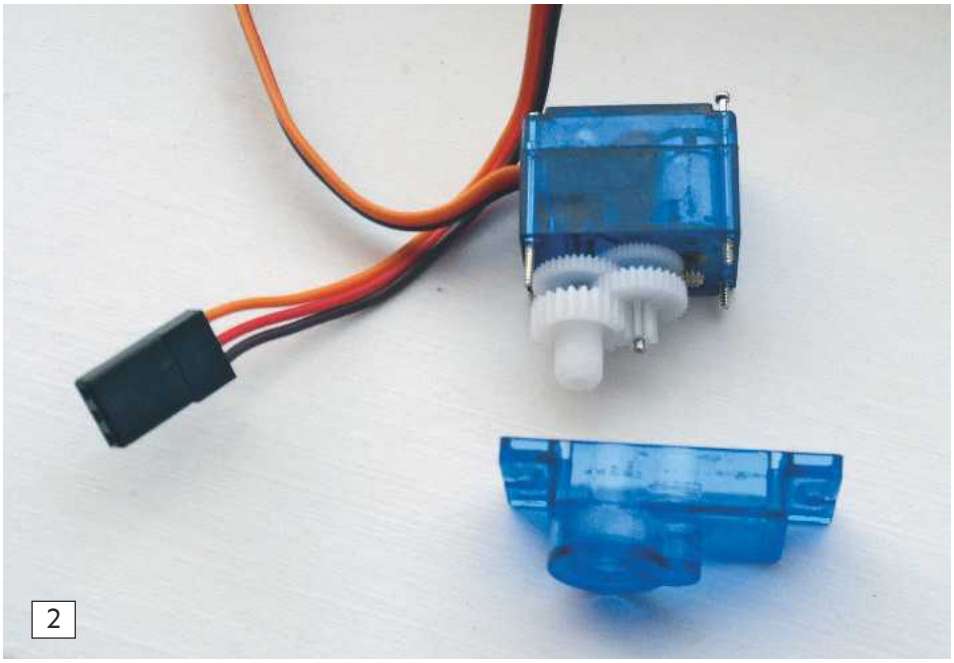
However, the ZN409 chips are now very hard to find at a reasonable price and given all the progress in r/c products, it seems reasonable to expect something nowadays a bit smaller and lighter, and perhaps even cheaper.

The search begins.....

It was with this background that I came across a recent development when searching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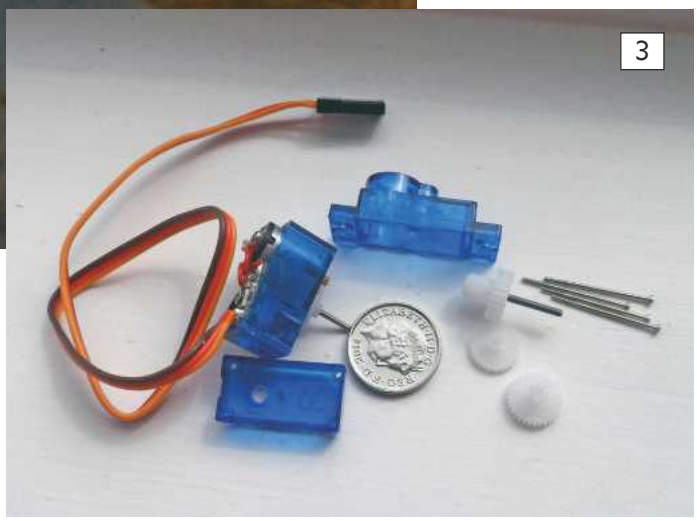
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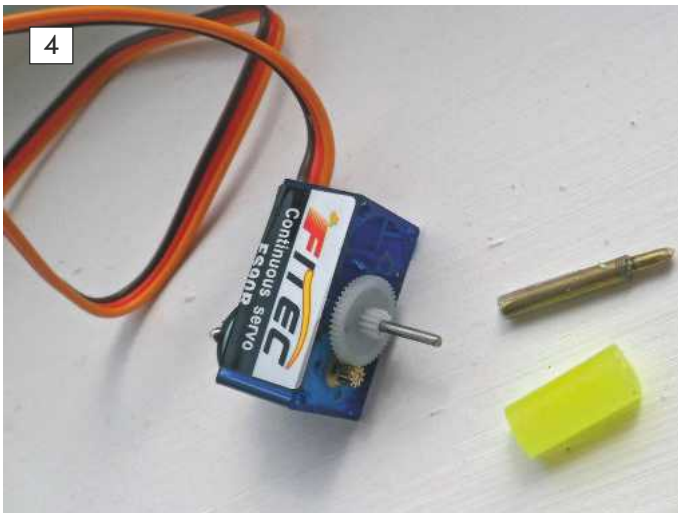

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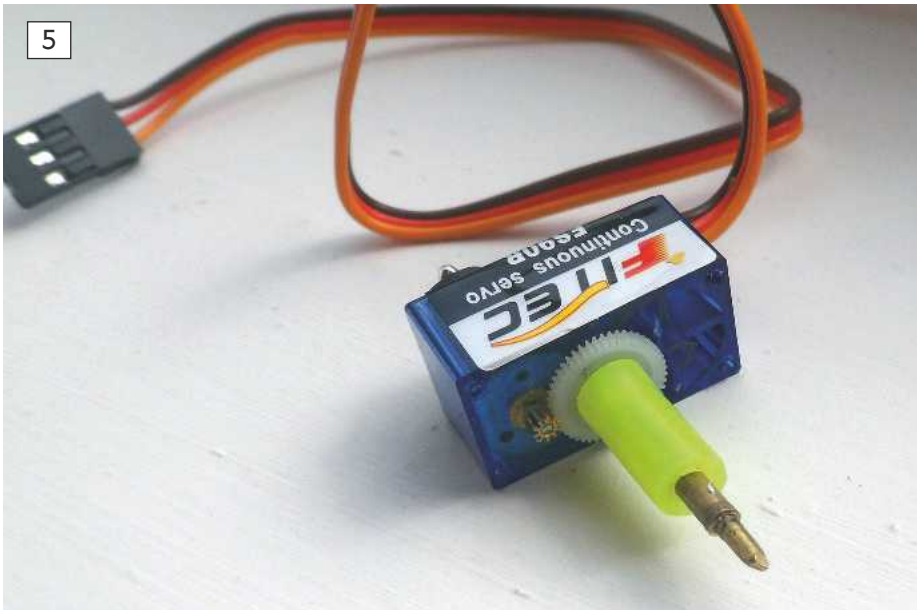
on the internet for servos, and this is the Continuous Rotation Servo which is used in the robotics field as a convenient way of controlling the movement of a small robot by mounting a wheel on its output shaft. Control is usually via a small computer such as the Arduino or Raspberry Pi which will use the same pulse width modulation technique which we have in radio control. The difference between a continuous rotation type and a conventional servo is that this new type does not monitor how far the output shaft has rotated and there are no physical stops on how many revolutions have taken place. In other words, it is a reversible speed controller driving a geared motor output packaged in a servo-shaped box. Typical maximum output speeds range between 50 and 180 rpm, but it should be possible to take the servo apart and use as many of the gear reduction stages as are needed to get a useable speed for, as an example, a propeller. Model paddle and rowing boat enthusiasts may well find the



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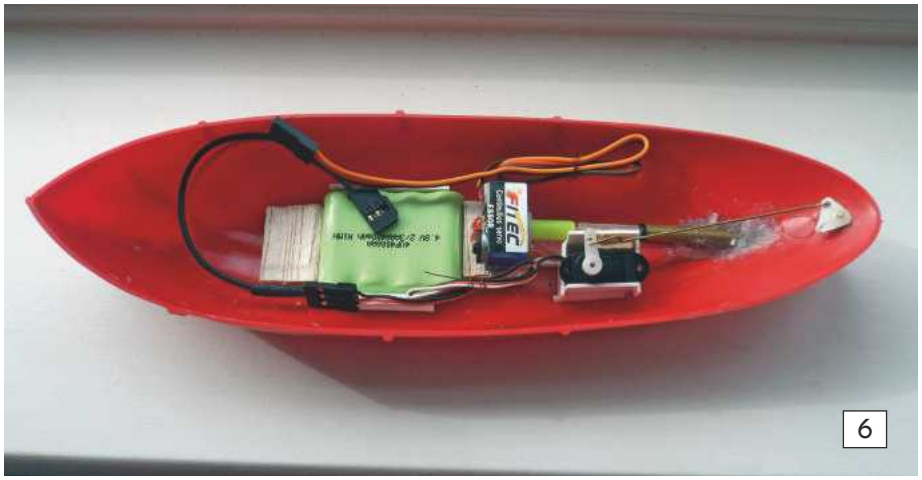
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output is already in the right range for their requirements. Power is taken via the usual servo three colour wires and many types quote an increased maximum speed if the supply voltage is increased to 6 volts. In some cases, the controller circuit's deadband has been increased from what would be normal for a servo so that the transmitter control stick does not have to be in an exact stop position, but allowing a small margin either side where the output will still be zero.

Feetech FS90R 360 degree servo

I have been experimenting with this particular continuous rotation servo which weighs 11 grams and is 23 x 13 x 22mm in size. The maximum unloaded output is quoted as 110 rpm at 4.8v increasing to 130 rpm at 6v, and **Photo 1** shows the servo as delivered.

It is held together by four tiny bolts and once these have been undone, the casing pulls apart to allow access to the gearing. There are four stages of gear reduction for about an overall 245:1 ratio and the first stage after the motor is about 4.8:1, suggesting about 5000 rpm would be available if the other reduction stages are discarded. **Photo 2** shows the full reduction gear stages while **Photo 3** shows the servo stripped of the bits that won't be needed with a UK 5p coin for scale. This seemed a good basis for driving a small propeller of a converted plastic kit, so the issue was then how to connect the two together.

The solution was to get a small piece of brass tube (about 15mm long) with an internal diameter of about 1.5mm (i.e. external diameter about 2.5mm) then glue or solder another length of tube or rod that is a tight fit inside the first, but leaving a section about 9mm clear in the first tube that can be fitted over the short shaft that the gear driven by the motor rotates on. **Photo 4** shows the tube and rod assembly ready to be fitted.

This assembly was slotted over the short fixed axle for the remaining gear and a short length of styrene tube of about 2.5mm internal diameter was pushed down over the tube assembly and then over the small 10 tooth gear so that the power is transmitted from the gear to the tube assembly. The result measures 23 x 14 x 13mm and weighs about 8.5 grams - not bad for a combined controller and power unit and **Photo 5** is the power unit ready for use.

There have been great results with this as the power unit in a Revell Lucky XI harbour tug conversion and it drives a Deans Marine 18mm plastic three bladed propeller without any problems and **Photo 6** shows it all fitted into the model before the main deck was glued over the top.


8

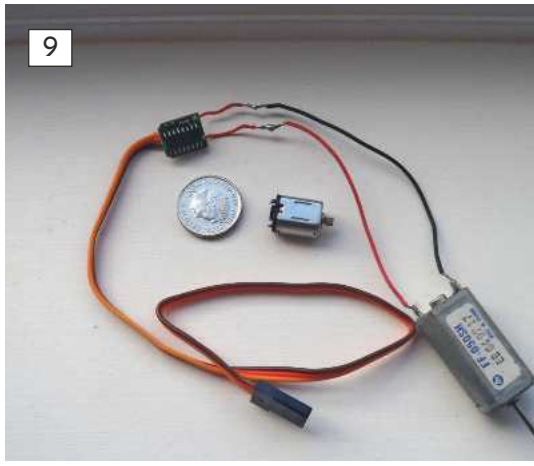

7

On the water

As **Photo 7** shows, it has a lively overall performance and indeed photographing something so small and nippy proved quite challenging and **Photo 8** is proof of its ability to go astern. It was interesting to read Phil Button's account of adapting this kit in the Model Boats March 2014 issue and his difficulty in getting decent stern control in a model of that size.

Alternatives?

If the servo motor is not to your taste, or the output arrangements described are too cumbersome, then there is the option of disconnecting the control board from the motor and using it with a different motor. As the board is connected to the servo motor by a pair of 17mm long leads there should be little risk of any damage to the circuit and it is easy to then connect it to the new motor. The control board hasn't actually been weighed, but I suspect that it is less than the weight of the lead and plug to which it is attached. Establishing then what size of motor it is capable of controlling is still ongoing, but I imagine that anything with a stall current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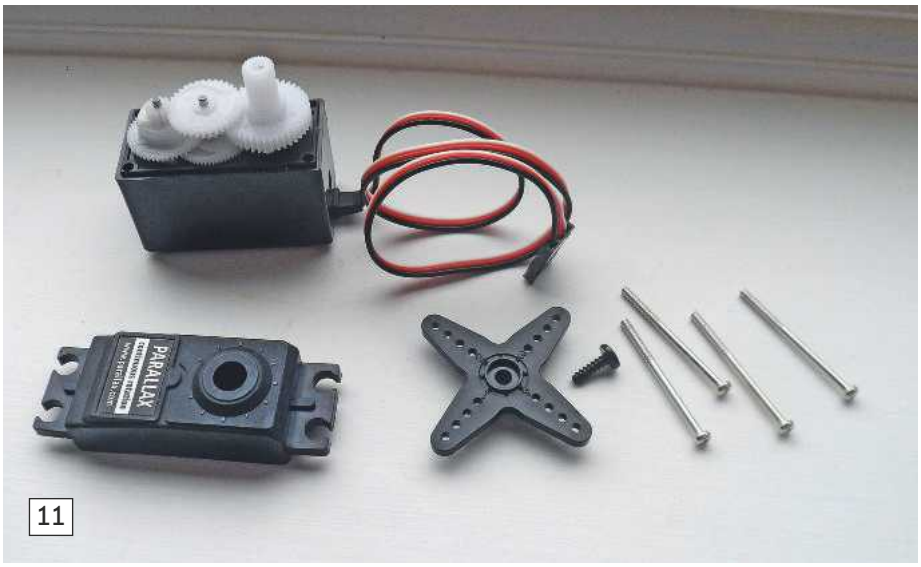

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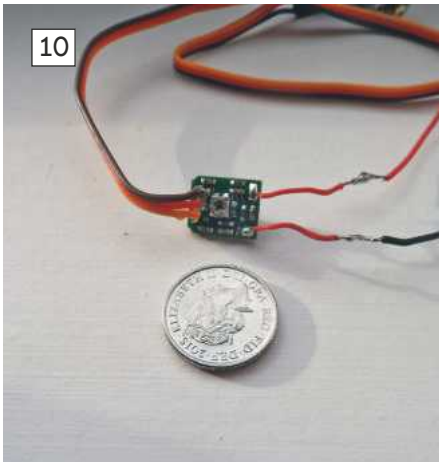
above 1.5 amps at 6 volts is probably a bit risky. However, as this servo is typically selling for around £5, testing one to destruction will not be too hard on the bank balance.
Photo 9 shows the old motor in the centre and a larger replacement connected for testing and **Photo 10** shows the control board and the adjustment point for the stop position provided to tune the servo to any controlling computer.

More thoughts

I have also had a look at the Parallax Continuous Rotation Servo which comes in 50 and 180 rpm versions. These cost around £10 each and are effectively modifications of the traditional Futaba 148 type of servo and so are much heavier and bulkier, **Photo 11.** The motor is soldered directly to the control board which makes changing it (the motor) a much riskier proposition. I also found that the deadband is very narrow and finding the stop position is much more difficult. While this doesn't matter in computer controlled circuits, it is doubtful whether this particular servo offers anything that isn't already available using a conventional servo. There are a number of other continuous rotation servos available, but to date I have not come across anything so far comparable in size and cost to the Feetech FS90R. **Photo 12** is of the much larger, and more powerful, motor used in the Parallax Continuous Rotation Servo.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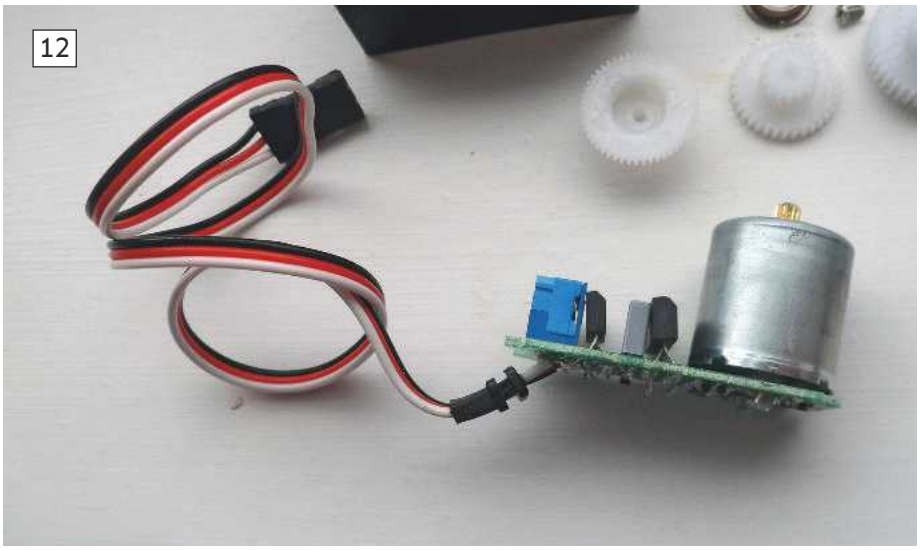
Conclusion

The arrival on the modelling scene of continuous rotation servos probably doesn't change much for the larger model boat where high power still needs to be delivered via a dedicated speed controller, but there are definitely some new opportunities at the micro end of the market. They also make the conversion of many of the plastic kits more feasible where weight was previously an issue and now allow multiple prop's to be powered in this way, with the motor and esc being truly less than £5 each. They may also be useful for paddle wheel and rowing boat models. Finally, there is also the possibility of using one to turn a radar antenna if you have a spare r/c channel available.

The Feetech FS90R continuous rotation servo is available from a variety of electronics and robotics specialists, including Rapid Electronics Online (who live up to their name!) at around £4.88 inc. VAT each, plus P&P.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Supplier information

Rapid Electronics Online: Website: www.rapidonline.com Tel: 01206 751166.

Revell Lucky XI tug:
Feetech FS90R 360 degree servo, modified as described.
Orange R610V2 2.4GHz six channel receiver for approx. from £10 Digitalcure (eBay).
A 400mAh 4.8v 2/3rds AAA NiMH Rx pack for £3.95 from Component Shop.
A two gram Ultra-Micro rudder servo for £4.50 from Component Shop.
Deans Marine three bladed plastic 18mm propeller (18-L or 18-R), £2.39.

Alvaston Park Stargazing Night

Phil' Button reports

Every year the Alvaston Park Friends, in association with Derby City Council Parks Department, hold a Stargazing Night in the park. On these nights a number of activities take place that are loosely related to astronomy and these include water powered rockets, air powered rockets, giant soap bubbles to amuse the children, an array of telescopes on the playing fields and displays inside the community centre in the park.

This year's event took place on Saturday 4th February and was well attended by the public since it was a good clear night for viewing, even though the temperature dropped rapidly as the sky cleared, unlike 2016, when it poured with rain!

The Alvaston Pirates Model Boat Club once again supported the event by putting on a display of illuminated model boats on the park's lake.

The evening

Photo 1 shows to advantage the lake that the club shares with the Earl of Harrington's Angling Club and hundreds of water birds, and shows the illuminated 'Alvaston Pier' docking facility and the flashing lighthouse, before it got too dark to see it all. Although it was rather dark for photography, **Photo 2** shows the crowds waiting their turn at one or more of the telescopes. **Photo 3** is of a realistically illuminated fishing vessel, although not actually fishing as that would get us in trouble with the angling club!

In **Photo 4** you can see the 'pit area' in the foreground with the illuminated Alvaston Pier and the skipper's area to the right of the picture. **Photo 5** is a long exposure shot of several boats moving around on the water. The millionaire's motor yacht in **Photo 6** had been dressed overall with a multitude of LED lights, some of which were set up to flash, which just goes to show that at least one owner went 'overboard' (if that is the right term) to enter into the spirit of illuminated boats. Finally, **Photo 7** shows my (Phil's) brand new and not yet finished model of a Royal Navy patrol boat, HMS Express, running very close to the lighthouse. Later in the evening, HMS Express actually collided with the lighthouse and once again I am being threatened with keel hauling for damaging Pirate property.

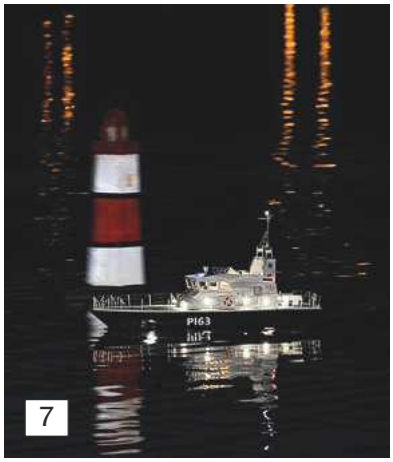
Conclusion

All in all, it was a grand way to spend an evening in support of the local park and please keep an eye open for next year's event as it's well worth attending.

The club meet at Alvaston Park lake in Derby (Sat. Nav. DE24 8QQ) on Saturdays and Sundays (and often on other days) when the weather permits and can be contacted via their website: www.alvastonpiratesmodelboatclub.co.uk

All visitors would be made most welcome. The park 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.

All these photographs were taken on the day by Ian Richardson and are published with his permission – Thank you.



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!

Hr.Ms. Van Straelen, 1:72 Scale, prototype model.

News from Deans Marine

New kits and accessories

Recently received is a press release from this long established UK manufacturer listing some new kits that should be on sale in 2017.

Kits

Hr.Ms. Van Straelen, 1:72 Scale, 440 x 95mm.
Two versions of the same type of Dutch minesweeper are available. The GRP hulled kit includes hull fenders and deck edge strip detail in its moulding. The kit includes: Computer generated laser cut 1mm and 1.5mm plastic parts for the deck and superstructure; a complete set of fittings cast in light alloy and resin; brass etched small detail parts; propshafts in stainless steel in brass tubes; vac-formed parts for motor mounts, funnel; comprehensive instructions; full-size plan in colour and a CD of the assembly of the prototype model with over 600 pictures.

Hr.Ms. Houtepen.
This is basically the same as above, but with a vac-formed hull.

Above: Some of the shipping containers.

Accessories

New items include:
Shipping containers, injection moulded 1:100 scale, pre-coloured and decorated in 20 and 40ft sizes.
New couplings with 1.5mm up to 3.2mm brass inserts, ideal for the smaller model and 35mm long.
Dynacon couplings for more heavy duty work, with inserts from 2.3 to 6mm, and M4 and M6 ends.
New rudders added to the range.
Prices to be confirmed. Pictures of the prototype Hr.Ms. Van Straelen are printed here in MB and further information can be had from:
Deans Marine, Conquest Drove, Farcet Fen, Peterborough, PE7 3DH, England.
Tel: +44 (0)1733 244166
Website: www.deansmarine.co.uk.
***Paul Freshney** - February 2017*

Below: Examples of the new rudders.

BlueJacket Shipcrafters

New Rainbow & Endeavour J-Class Yacht Model Kits

Rainbow and Endeavour were the final competitors in the 1934 America's Cup race with Rainbow barely defeating Endeavour to retain the 'Auld Mug'. These 1:180 scale finished models have a length of 8.5 inches and they feature cast resin hulls, pre-detailed laser-cut wood decks, Britannia metal fittings, cast resin parts, brass rod, and laser-cut Basswood parts. Each kit comes with complete plans, instructions, and display cradles.

These are simple, inexpensive, easy-to-build models making them an ideal gift for family or friends and are novice skill level kits.

Rainbow: Kit No: K1109, US$89
Endeavour: Kit No: K1108, US$89
Plexiglas Case: Ref No: FCP1100, US$95

BlueJacket Shipcrafters are at:
160 E. Main Street, (Rte. 1), Searsport, ME 04974, USA.
Website: www.bluejacketinc.com
Tel:1-800-448-5567

Rainbow

Endeavour

Atlas Editions Ocean Liners

RMS Titanic to 1:1250 scale

Readers may be familiar with Atlas Editions who supply models of planes, vehicles and other collectables on a subscription basis. They are part of the DeAgostini group who are well known for their Model Part Work magazines.

Atlas have recently launched a famous liners collection at the recognised 1:1250 scale and the first model in the range, RMS Titanic, has been made available for review. One of my interests is collecting German made waterline cast metal liner models to this scale, so I was particularly interested to see how the Atlas model measures up. Given that the waterline model in my collection retails at around £80, the quality of the Atlas Titanic was quite impressive given that it is also a full hull model mounted on a wooden plinth with a brass nameplate. It looks to be quite accurate and there is a very acceptable level of detail including hull portholes and windows. The propellers are correctly shown with three blades on the wing shafts and four on the central shaft. The superstructure windows are printed which is fine at this scale and probably looks better than casting and while the general level of detail is not to the expensive German model standards, it is still pretty good and neatly executed. This is certainly not a toy but a proper collectible. Model length is 21.5cm and it comes in a smart presentation box.

Potential subscribers will obviously want to know a bit more about the financial commitment entailed and this is in line with the other Atlas promotions. This initial model, RMS Titanic, is offered at the introductory price of £1.99 which includes free p&p, a rather nice small print of Titanic and a six page information booklet about the ship. The second model in the monthly subscription will be Cunard's RMS Queen Mary at a discounted price of £9.99 plus £4.99 standard UK p&p and which also includes a print of the ship plus a 'Building of the Titanic' book.

Right: The Titanic model with the included print behind it.

Thereafter, subsequent models at monthly intervals will cost £14.99 plus £4.99 standard UK p&p commencing with the French Line CGT SS France. The overall production run is intended to encompass some 30 famous liners which will include SS United States, RMS Queen Elizabeth, Lusitania, Great Eastern, Great Britain and many more.

Subscribers can terminate their subscription at any time by either returning the most recent model or by notifying Atlas that they wish to do so.
The Atlas website for subscribing is: http://bit.ly/atlastitanic

Readers will wish to make up their own minds as to whether to commit to this offer, but if the subsequent models are to the same quality standard as the Titanic then I think that £14.99 + £4.99 p&p for each of the models after the first two is excellent value for money for anyone interested in building up a collection of such an iconic group of famous ships.

Review by ***Colin Bishop***

Anatomy of the Ship – Battleships Yamato and Musashi

Written by Janusz Skulski and Stefan Dramiński. Hardback, 336 pages, 260 x 247mm, over 1020 drawings including 350 3D colour images and 45 photographs. ISBN: 9781844863174, price (rrp) £3. Published by Bloomsbury Publishing Plc, 50 Bedford Square, London WC1B 3DP, tel: 01256 302699, website: www.bloomsbury.com. Available direct from the publisher or through the usual retail outlets.

When the battleships Yamato and Musashi were commissioned into the Imperial Japanese Navy (IJN), in December 1941 and August 1942 respectively, they had the greatest displacement, largest guns and heaviest armour of any warship in the world, and bristled with the most up to date technology and were the pride of the Japanese Nation. Originally designed to be a formidable opponent to US battleships, with the capability to annihilate them in battle, Yamato and her sister ship Musashi never in fact fought against them as both these giant warships were sunk by planes from USN aircraft carriers of the American Pacific Fleet.

In this new book in the Anatomy of a Ship Series, the authors, ship enthusiast, model maker and writer, Janusz Skulski, and naval researcher and illustrator, Stefan Dramiński, draw on much new research including access to IJN documentation as well as photographic evidence from recent expeditions to the seabed where the remains of both ships lie. There are more than 1020 perspective and 3-view drawings of the main features of the ship, including general arrangements, hull construction and armour, super-structure, armament and fire control, fittings, boats and aircraft.

The completely updated, and detailed, builder's plans, with dimensions, are enhanced by a series of 350 superb 3D digital colour illustrations that bring these legendary ships to life. There is also a full description of the design and construction of them, as well as wartime modifications and career histories, together with a selection of colour photographs including some rare on-board views. There's even a series of photographs of the author's construction model.

In my opinion this is an essential reference work that contains all the relevant information required by a warship modeller to successfully build an accurate model of one of these iconic warships from the WW2 Pacific theatre.

Book Review by ***John Deamer***

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USS INDEPENDENCE LCS 2, 1:100, 52 x 13.5ins, wood, scratch built from plans, Graupner Jet Unit, 60A Hawk controller, 650kv brushless motor, Futaba HD servos and Rx, batteries, stand, RTR. Photos available, £490, buyer collects, M. Gunn, tel: 01509 881438 (Loughborough).

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MOUNTFLEET BOSTON TYPHOON KIT. Not started & complete, £400 (ex-factory price is £625). No offers or cheques, delivery can be arranged. Norman Clark, tel: 07858 726667 (Newcastle).

MODEL MAKER MAGAZINES from June 1957 to Model Boats current issue, £150 ono, buyer collects. Donald Taylor, tel: 01633 866505 (Cwmbran, Torfaen).

LARGE SAILING FISHING BOAT. Includes servos for rudder and sails, but rigging needs sorting. £200, buyer collects, A. J. Llewellyn, tel: 07773 588334 (Taunton, Somerset).

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BILLINGS META SCHOONER. Plan or kit please, any price paid. Peter Charlton, tel: 01252 681353 (Hampshire).

PLASTIC KITS, including model boats, ships & aircraft by Airfix, Revell, FROG & Tamiya etc. Please call David Sutton, tel: 07973 885754 (Kent).

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1:700 Scale Naval Dioramas PART 2

Learning to adapt kits and scratch build

Above: 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.

Chris Drage explains how to build these miniatures

One of the most appealing aspects of building in small scales is the amount of ambient or environmental detail one can include with a model ship. 'Super detail' can, more or less, be hinted at as long as the scene looks 'right', but the downside is of course that you need pretty good eyesight. I find no point in building any model unless it is historically correct in every detail, at least as far as the evidence that exists. In the absence of good evidence, the modeller has to resort to a best-guess scenario, which means doing research around the topic in question. Occasionally this effort turns out to be quite substantial, but knowing that your end product is as accurate as you can possibly make it, is very rewarding indeed. The 1:72 scale HMS Poppy diorama featured in the 2016 Winter Special issue of Model Boats perhaps represents the lengths to which one can go in order to achieve accuracy with diorama building.

On commencing building 1:700 scale dioramas, it quickly became apparent that my understanding of how a seascape should look at such a small scale was sorely lacking. Recourse to library books, videos, magazine articles, looking at other modeller's models and on occasions using the Mark One Eyeball when circumstances allowed, all helped to build up a picture of what I hoped to achieve.

The three dioramas that are described here each represent another step along my 1:700 ship-modelling career. Not being confident in being able to create a realistic rough seascape for the first two here, I continued to opt for what had worked previously and looked to reproduce calmer waters.

East Coast Convoy 1941

For this diorama including HMS Cotswold, I continued to use what was to hand viz: a 350 x 200 x 20mm piece of MDF board for the base piece with crumpled baking foil, partially smoothed, for the sea. However, this time an extra step was added in that the baseboard was roughened and a slightly undulating layer of Polyfilla plaster applied before the baking foil. To this was glued the not quite so crumpled baking foil and now there were

Above and Right: East Coast Convoy 1941: A tramp steamer has become the latest victim of Eboat attacks. As she slowly sinks, HMS Cotswold (Hunt Type II, 10th Destroyer Flotilla, Harwich) stands by to receive survivors, lowering one of her whalers in to render assistance to those in the water.

small 'lumpy' swells that looked about right. To this were applied acrylic paints, as they proved easier to control than enamels as you can wipe them clean with warm water when attempting another shade or even a different colour. Similarly, blending colours and layering them has proved more satisfactory with acrylics than enamels, and I also wanted to have another go at creating an oil slick on the grey-green North Sea water.

The next immediate problem though was HMS Cotswold's wake. Here I think it is about right for a ship heaving-to with its propellers just turning. For the stricken steamer there had to be a large disturbance where the torpedo had hit it, plus the aforementioned oil slick, and once again toothpaste and white acrylic paints were used for the white water. The result on this diorama is more convincing than those described in Part One of this mini-series in the April issue of MB.

There would also have been a lot of smoke if, as there is a big oil slick, the fuel tanks were ruptured and most likely on fire. The smoke has been created out of a fine copper wire framework being glued into holes drilled in the baseboard next to the ship, and to this was glued cotton wool which had been used to clean one of the dirty, white spirit brush cleaning pots. Further, and in this case enamel, paints were added to achieve a dirty-smoke colour. When dry and 'teased out', the cotton wool was glued to the wire framework, with a good portion of this smoke covering part of the damaged ship.

The small tramp steamer is a Len Jordan resin casting detailed with a variety of Tom's Modelworks, together with Gold Medal Models, photo etched brass parts. HMS Cotswold is actually the B-Resina Hunt Class destroyer HMS Badsworth (Ref: BR 709). HMS Cotswold was a straightforward out-of-the-box build, but the tramp steamer would need to show some damage, and how to create this?

If you ever have worked with etched brass parts, you will know that a lot of sharp twisted, and sometimes broken, bits end up as rubbish, and not to mention those tiny pieces that become carpet dwellers that seem to be able to penetrate the soles of one's slippers! Fortunately, all the detritus and hoovered-up pieces had been kept and now proved invaluable for deck damage. Also, before building the tramp steamer, its underside was sanded at an angle so that it would take on an aft tilting list when placed on the seascape.

HMS Abdiel in Valetta Harbour, Malta, mid-1943

HMS Abdiel is a Matchbox kit detailed with White Ensign Models etched brass parts whilst HMS Maori (sinking) is a Revell destroyer which comes as part of their old HMS Ark Royal kit. The various harbour craft are a selection of the Japanese produced Tugger and Harbour Craft Sets, and the rest is scratch built.

Still lacking the confidence to try a truly rough Atlantic seascape and wanting to show a lot of activity on the diorama, a calm harbour scene was tried once again. Another motivation was that the two rather poorly detailed plastic kit models were in stock. The old matchbox HMS Ariadne was detailed to become her sister ship HMS Abdiel with a range of White Ensign Models and G.M. etched brass parts, including the railings, boarding ladders, depth charge racks etc. The rather poorly moulded Tribal Class destroyer suffered drastic surgery, since a good option was to hide the poor moulding parts underwater, and therefore HMS Maori has been depicted partly sunk at her moorings in Valetta Harbour. Its hull was sawn in two, using only the forward parts for this diorama.

In terms of the build, the baseboard and harbour water were made as described in Part One of this series and given a lovely coat of 'Mediterranean Blue', topped off with several coats of enamel gloss varnish. The concrete jetty has been scratch built using Plasticard (styrene), and given some 'unrepaired bomb damage'.

Right and below: HMS Abdiel in Valetta Harbour, Malta, mid-1943. This warship continued to deliver vital supplies to the island over an extended period. In Grand Harbour, salvage operations continue on HMS Maori (Tribal Class destroyer), a victim of earlier air raids partially sunk on her mooring, whilst lighters unload HMS Abdiel.

HMS Polyanthus in mid-Atlantic

Having just received the White Ensign Models HMS Bluebell resin kit I was anxious to use this in a diorama. Remembering that these diminutive ships would 'slip on wet grass', i.e. extensively roll and toss in rough seas, it was decided to bite the bullet and have a go at creating a really rough seascape, so this diorama was more about proving my abilities with a seascape than the subject itself.

Using the technique described earlier, plaster was moulded into what one could consider to be large ocean swells, the crests of which would possibly show white horses. The ship model in this case was another out-of-the-box build with a few minor alterations to convert HMS Bluebell into HMS Polyanthus. Placing the model in the seascape, 'teased-out' cotton wool was used for spray as the warship is rising on the wave. Once again toothpaste was employed to give the tops of the waves that white 'ring of confidence', and was the result effective? Well, I am not convinced that those long swells look right as the wake and the spray does convey a sense of beating into a heavy sea and the grey-blue colours do look realistic enough, but something about those swells does not quite ring true, and the lesson drawn from this diorama? More observation of an open and rough sea is needed!

Conclusion

These three dioramas illustrate how the learning curve continues with more scratch building, added detailing and better attention to detail. Next time, we will discuss 'fudging' to get one rough seascape right and endeavour to add a landscape.

Below: HMS Polyanthus driving into the Atlantic swells in 1942. This is based around a White Ensign Models 1:700 Flower Class corvette kit.

References:

HMS Badsworth Hunt type II destroyer: IBG Models via eBay
Tramp steamer: Battlefleet Models, website: www.battlefleetmodels.com
HMS Bluebell: Atlantic Models, website: www. atlanticmodels.net
HMS Ariadne (Abdiel class) and Hasegawa Tugger and Harbour Sets: Antics Models, website: www.anticsonline.co.uk
Photo etched brass parts are available from:
Sovereign Hobbies, website: www.sovereignhobbies.co.uk
Hannants, website: www.hannants.co.uk
Primer coat: Halford's Grey plastic spray primer
Principal paints are artist's acrylics, available from most art retailers
Varnish is Tamiya gloss
Other paints are Humbrol and White Ensign Models (Colourcoat) enamels

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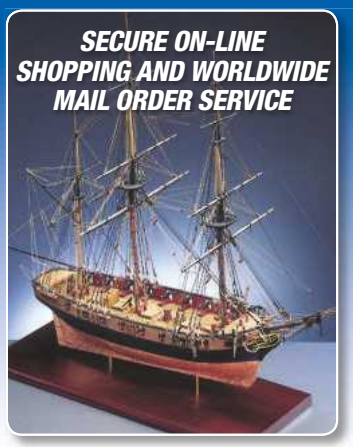

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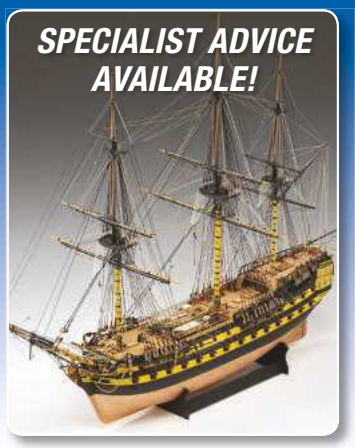

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