

LIVERPOOL NAUTICAL RESEARCH SOCIETY

A Model of the 'SHAMROCK' Class Sloops.

by
W. McQ. Mather
October 1943.

This paper is addressed more to the practical model maker than to the research worker pure and simple, though it may prove of some interest to them as indicating the lines on which our own particular research must be conducted.

Unfortunately for us Lloyd's and the Customs' Registers are not sufficient since the name of the ship, her owners, port of registry, date of building and tonnage are of no help in visualizing her appearance and, even in those rare instances when the type of rig is also given, but little assistance is to be derived from it.

The first essential requirements of the actual model maker are the draughts of the particular ship it is desired to construct, and it is here that the services of the individual who I may term a 'naval architect research worker' are particularly missed.

The student of this type of nautical research is very much of a 'rara avis' and unfortunately the necessary technical qualifications are not possessed by the average modelist. It is one thing to be able to alter the scale of a set of draughts; this can quite well be done by any possessor of a pair of proportionate compasses, or, given the sheer plan and half breadths; to fair out a body plan from them. In the majority of cases, however, no plans at all are available and it is necessary to fall back on printed illustrations.

This is where the technician comes into his own, since his historical studies have familiarized him with the general requirements of the design; ratio of length to beam, type of entry and run, approximate form of amidship section, etc., while his technical knowledge enables him to produce these accurately on paper.

To instance exactly the form of knowledge that is required, I cannot do better than pay a small tribute to our late member, Mr. H. N. Leask, whose death last year was such a sad blow to this Society.

Deeply interested in the sea and ships, he was by profession a consulting engineer, which calling gave him the technicalities of designing while, in his youth, his father, a practicing naval architect, had thoroughly grounded him in the basic principals of that profession. By virtue of his gifts he had evolved a method whereby, given one good perspective illustration of a vessel, he was able to plot out the plans

plans, not only of the portion visible above water, but also of the under water body with surprising accuracy and, in the case of modern warships, to the subsequent amazement of Admiralty officials.

There were several factors that influenced me in choosing the particular model shown here this afternoon and these may be summed up as, the form of hull (The Baltimore Clipper), the uncommon type of rig for the period and lastly, but certainly not the least, the availability of the draughts together with a fair body of information.

First of all you will note that I have made no attempt to associate the model with any particular ship, but have described it only as representative of a class. The reason for this will become apparent shortly.

Before starting to describe the actual constructional work, some mention of the vessel's history is necessary.

In September, 1806, an American three masted privateer schooner, the 'Flying Fish', was captured by the Royal Navy and in accordance with its usual practice, the lines of the vessel were taken off by the Admiralty.

From these lines it was decided in March of the following year to build a class of six ships at Bermuda. These were named Shamrock, Thistle, Mistletoe, Holly, Juniper & Bramble and were known as ten gun sloops, carrying 18pdr. carronades and manned by a crew of fifty men.

In all their leading dimensions they were exact copies of the 'Flying Fish' except for two modifications, the first and least important being the increased stive given to the bowsprit, while the other completely altered the appearance of the vessels.

As originally constructed the stern of the 'Flying Fish' was of a most unusual design, there being no counter in the ordinarily accepted meaning of the term, while the stern post at the rudder head was actually abaft the transom. When the 'Shamrock' class were built, this was done away with and a normal counter stern introduced, the line of the deck being carried further aft and the transom placed in the normal position abaft the rudder head.

As you will have noted a reproduction of the 'Shamrock' draughts is given in Howard I. Chapelle's book, 'The Baltimore Clipper' and in ordinary times a photostatic reproduction could be obtained from the Admiralty Librarian on application. However, as this course could not be adopted at the time the model was built, I decided to fair out the lines from this book to the one eighth inch scale required.

For the guidance of future workers that may be faced with

a similar problem, the following are some of the snags that arose during the process.

First of all you will notice that the draughts are scattered over several pages; the sheer and halfbreadth plans are on one sheet, the inboard profile, deck and body plans on another, while the rigging plan and transom are separate again. In dealing with the sheer and halfbreadth plans no particular difficulty was met with, although allowance had to be made for the alteration to the stern; when I started with the deck plan, taken from the second page, I immediately found that there was a slight difference in the scale represented. This was too small to be noticable to the naked eye, but quite large enough to make the completed draughts quite useless for accurate working. This discrepancy was no doubt due to the printers and allowance had to be made accordingly.

The same trouble was present in the case of the body plan, printed on the same page; here not only did I discover yet a further change in scale, but some form of distortion was also present. So much so was this the case that after two attempts to fair it out to the correct scale, I was still unable to get the result to agree with the remaining plans; finally I was forced to abandon the effort altogether and construct an entirely fresh body plan, basing it on the stations given on the sheer and halfbreadth.

The remaining plan that I dealt with was the rigging, This is a reconstruction, made by Mr. Chapelle, and based on Fincham's rules, details of which he prints in the form of an appendix. This I produced to a scale of a sixteenth of an inch.

My next move was to start a note book wherein all details of the deck fittings and rigging could be entered up before actual work began. This is specially desirable in the case of the rigging, as unless the run of each rope and the position of all eyebolts and belaying points is accurately plotted beforehand, it is next to impossible to fit these once some portion of the rigging is put in place.

This note book I have also left out on the table for your inspection. Please accept my apologies for its general condition, but my excuse is that it is definitely a working tool and the many crasurs and alterations show how various methods have had to be scrapped or modified as the 'word picture' of the model grows up and each separate piece has to blend in with the design as a whole.

While on this subject, I cannot too strongly emphasise the advisability of working out a belaying plan; that in the

- 4 -

note book is shown on page 58 and is based on one published by Capt. Armitage McGann in a series of articles in Popular Science (Nov. 1934 - Feb. 1935) and describing the construction of a Baltimore Clipper schooner of about 1812. Accurate belaying plans are very difficult to come by; they are just one of those scraps of information that in the past have been considered too elementary to be worth recording. With the aid of a rope's end, it was driven into every budding seaman from the first moment when, as a ship's boy, he first took his part as a member of a watch. In later years the knowledge became so much a part of his being that he became incapable of appreciating the possibility that a generation might grow up that was completely lacking in it.

And now one more word before going on to describe the model proper and that is in the question of scale. The ideal is the standard one of a $\frac{1}{4}$ inch to the foot or 1 : 48, but from the point of view of the amateur worker there are several factors against it. First of all there is the matter of size and in the average modern house, a large model is anything but popular with the powers that be. Then too there is the matter of detail; a tremendous number of small details, specially in the rigging, must be shown on ~~xxx~~ a $\frac{1}{4}$ inch scale model and which can very well be omitted when a smaller scale is used. I do not think that I need to remind anyone present that the greater the amount of detail shown, the greater becomes the scope for errors.

On the other hand if a scale of less than $\frac{1}{8}$ inch is chosen, it becomes next to impossible to depict accurately the details of the main running rigging. Please, however, do not consider that this statement is made with any desire to depreciate the miniature, which for its fabrication requires a degree of craftsmanship quite as high as any other and for many purposes, particularly where sails are to be displayed as in a scenic model, it has certain very definite advantages.

Of the three methods of hull construction, namely solid, 'bread and butter' and 'built up', I have adopted the latter though in a considerably modified form. There has been no attempt to put in the full number of timbers, in fact I have given it no timbers at all in the true sense of the term. All I have done is to construct a solid section at end station of the sheer plan and socket them in to the keel, stem and stern posts, which are all in one piece; the plank is then laid directly on to this framework.

It is not my purpose here to go into the details of this process, time does not permit and in any case it is a matter

that can well be left over, the subject being a sufficiently large one to justify a separate paper. I propose therefore to deal first of all with the deck fittings and secondly with the mast and rigging; as far as possible quoting my authorities for each item, together with short constructional notes.

Starting from the bow, the first item to be considered is the ground tackle. Wooden stock anchors were still in general use in 1807, though the sliding stock was introduced a few years later (1); this applies also to the change over from hemp to chain cables (2). The anchors themselves are made from sheet brass with the flukes soldered on, the stocks being of boxwood made all in one piece and bored out to fit the shanks; they are bound round with copper strip and then painted black. The cable passes in through the hause holes at deck level, round the fore bitts and down to the cable tiers via the main hatch, no other opening being available on the deck.

The capstan is abaft the main hatch and a 'messenger' was probably used in hoisting in. The trunk and head are turned up from a single piece of boxwood, while the whelps were made separately and then pinned on. The capstan bars are shown in racks fitted to the bulwarks on either side.

The fitting of the pinrails was my next problem, those round the masts presenting the greatest difficulty. So far my investigations have failed to reveal any one particular system in use for small craft and in those Admiralty draughts that I have had the opportunity of examining, there is only one case where they are drawn in. This refers to the schooner 'Dominica' and is dated 1811, and those I have fitted to the 'Shamrock' are copied from that ~~XXXXXX~~ vessel (3).

I now come to the question of guns and the type of mountings to be fitted. As mentioned above these were 18 pdr. carronades and the dimensions of those shown are taken from Falconers Marine Dictionary, with some assistance from an illustration in Cooke's 'Sixtyfive Plates of Shipping and Ships' plate No.4. They are turned up from quarter inch brass rod and then silver plated and oxidised. The correct type of mounting proved a rather more difficult problem. At first I inclined to a truck carriage as shown in Cooke's plate, but subsequent experiment showed that the height of the ports would not allow of sufficient clearance for elevation; further the deck space available appeared definitely restricted for full recoil.

A recoil carriage, mounted on a slide pivotted to the waterways was used in the Royal Navy between 1812 and 1820

this permitted a lower mounting of the carronade and other-wise appeared generally suitable for the purpose. This type was therefore fitted. The guns themselves are fitted with screw elevating gear and the training tackles and breachings are also shown.

The pumps, just forward of the capstan, are shown with their operating gear dismantled, but its central pivot is in place.

The coach house, after companion, skylight, etc. call for no particular comment, as these fittings were generally common to this class of vessel. They are all made of boxwood veneer and socket into holes cut in the deck. I may mention that this method has one great advantage, in that they do not need to be finally fitted until after the rigging has been completed and, thereby, considerable risk of damage may be avoided.

The steering of all these craft was by a tiller and in the model it is shown with the securing tackles in place.

After several experiments I found that the mast coats could best be made from wood blocks, shaped up with a file. The hole through which the mast passes was first drilled vertically and the correct rake was given after by shaping up the bottom of the block. It will be found that this method is much easier than attempting to fit the blocks square with the deck first and then to drill them at such an angle that will conform with the rake of the masts.

The matter of boat equipment presented another problem. On page 170 of the Baltimore Clipper there is the following statement;- "Privateers of about 85 feet carried three - cutter or whaler, gig and jolly boats. Some had two whalers, or one whaler and one launch. These had to be carried on deck; one small boat could be slung on davits over the stern."

Actually in the 'Shamrock' draughts there is no ~~provision~~ indication of any stern davits and, in any case, in view of the low freeboard of these craft, it is very doubtful whether a boat would ever be carried in this position when the vessel was at sea.

Regarding the remaining two that were carried on deck, an examination of contemporary prints shows that these were nested, one inside the other, with the lower one resting on cheeks above the main hatch.

When constructing a model, it is a very good axiom to bear in mind that it is a mistake to overload it with detail. However good the actual work may be, the final result gives an appearance of overcrowding and a generally muddled look. I,

therefore decided that the model should have one boat only.

In Chapman's 'Architectura Navalis Mercatoria', plans are given of a 'longboat or yawl' whose main dimensions are 17 feet, 7 inches by 6 feet, 6 inches. Experiment with various paper templates showed that this size was about suitable for the 'Shamrock'. Although the time when Chapman's work was published (1768) predated the actual vessel by just on forty years, the general design of ship's boats had varied very slightly and I consequently used it as a pattern.

The boat probably carried a single standing lug (5) and is shown in the model fitted with four oars, mast and yard, together with a boathook that could also be used as a vargord. The boat itself is carved from a piece of yellow pine.

'Old Ship Figure Heads and Sterns' by L. G. CarrLaughton was the principal authority used in questions of painting; stone colour being used for inboard works and gun carriages instead of the universal red which was superseded very early in the XIXth century.

By 1807, there is no doubt at all that the underwater body would have been coppered; certainly none in this case where the vessel was undoubtedly intended for tropical service. Unfortunately when working to an eighth inch scale, coppering is not a practical proposition; on the other hand I have no love at all for such expedients as a coat of verdigris paint or some other similar material. Certainly it may produce the right colour effect when looked at from a distance, but on closer examination it shows up as definitely 'phoney'. However there is a mention in Charles G. Davis's book, 'The Ship Model Maker's Assistant', page 205, that the underwater body was not generally coppered until after the vessel had made a voyage or two. I do not know what his authority was for this ascertainment but I immediately grasped it with both hands as an easy excuse to get out of an impasse.

Having completed the hull, the next matter to be considered was the ~~rigging~~ masting. As already mentioned, I was lucky in having the lengths of the various spars already worked out for me, but there was still the question of the diameters of the lower masts to be decided and on these depended those of all the rest.

In the main the proportions of the various spars and the ratio of their diameters, one to another, are based on Steel's 'Elements of Mastmaking, Sailmaking and Rigging' but the basic figure for the diameter of the foremast was found by trial and error. Actually this is about .73 inches to each yard of length; a figure decidedly less than that quoted by Steel, but

one found to be more suited to a three masted rig which is not covered by his work.

Incidentally the same ratio was used for both fore and main masts, since it is probable that the 'Shamrock' was intended to carry square sail on both, though it is very unlikely that she ever did so in practice.

The yards are not fitted with jack stays as these were not introduced until after the first decade of the XIXth century. (6)

In the model, the stunsail booms are shown but not the swing booms, nor has the ringtail boom been fitted, though the necessary iron for it has been provided on the mizzen boom.

Since on the scale used it is next to impossible to fit sails with all the details of their running rigging, these have been omitted altogether but I have endeavoured, as far as possible, to indicate their presence by the fitting of certain pointers. For instance the sheet blocks of the main and mizzen topsails are fitted, as well as the brailing blocks for the foresail and, as will be noted, this system has been adopted in several other places.

In this model all masts and spars are made from Caspian boxwood. I have seen it stated that a hard wood should not be used, owing to the danger of twisting and that some straight grained softwood, such as yellow pine, is more suitable. Experience however has shown me that, provided the boxwood used is thoroughly seasoned, this trouble need not arise, while the hardwood naturally permits of a much higher grade of finish being given to it.

Of suitable materials for rigging I have found 'ligature silk' to be the best; it is obtainable from Surgical Instrument shops and while rather expensive, has the advantage in being made in all sizes from very fine up. The one material that should be avoided is cotton, as will both stretch and shrink subject to the amount of humidity present in the atmosphere.

All blocks have been made from holly, by far the best wood for this purpose, while the dead-eyes are from composition knitting needles; these are marketed in various thicknesses and are then cut up into sections and trimmed as desired.

In carrying out the rigging, I find that most of the so called short cuts are anything but so in practice and usually end in a botched job. It is far better to follow the actual practice, starting with the lower shrouds, then the stays and gradually building up.

The following are a few practical hints that I have found of advantage and may prove useful to others.

Ratlines These must be clove hitched, no short cut method

produces anything but a poor effect. If a boot stain is used to colour the shrouds before fitting, the ratlines may be put on white and to set them it is only necessary to touch with a little 'cinofilm' cement. This not only holds them securely but at the same time acts as a solvent to the boot stain, which runs from the shrouds and colours them automatically. If this method is adopted considerable eye strain will be avoided.

Splicing At an $\frac{1}{8}$ th scale a good practical splice is very difficult to obtain, but if the end of the 'rope' is first threaded through a needle and then sewn through the standing part, quite a good effect can be obtained.

Footropes It is better here to depart from the correct practice and make the stirrups of wire instead of rope. This corrects the tendency that I have experienced in earlier models for them to buckle and twist up, instead of hanging down straight. The difference is hardly perceptible to the naked eye.

Topmasts. In fitting these, they should be set up with fid and wedge in the proper manner; this means very little additional labour and in the present model I had every reason to congratulate myself on having done so. After the whole of the standing rigging had been completed, I found that an error had been made in the design of the fore topmast and that this necessitated its scrapping and the fitting of a new one. All that was required was to remove the fid and wedge when the mast could be slipped out downwards, the various ropes being slid off over the top; this process was then reversed when the new mast was fitted, after which all that was necessary was to tighten up the ropes by the belaying tackles already fitted. If this method had not been possible, the whole of the standing rigging would have had to be renewed.

Yards As far as is possible the fitting of these should be left to the last, since their lateral spread makes them a considerable potential source of damage when working on other items.

Deadeyes, blocks & hearts The dimensions of these have been based on Steel's tables for brigs and ketches, but for the sake of simplicity only two types are fitted, common single and double, while the number of sizes has been reduced to five of each.

For general rigging details I have relied very largely on Darcy Lever's, 'Young Sea Officer's Sheet Anchor', published in 1808, while the run of the ropes is based on the study of a large number of contemporary engravings together with a few modern reconstructions. The principle authorities consulted

being:-

The Baltimore Clippers	}	Howard I.
The History of American Sailing Ships		Chapelle.
Cooke's Sixtyfive Plates of Shipping & Craft.		
Sailing Ship's of War, 1800-1860 Sir Alan Moore		
Sailing Ship Models H. Morton Nance.		
Science Museum Handbook, Sailing Ships, Parts 1 & 2.		
The Ship Model Maker's Assisyant Capt. A. McCann.		

While I shall make no attempt here to deal with the rigging in detail, there are still a number of points to which I should like to draw attention.

First of all the topmast shrouds. These you will notice do not set up with deadeyes and a landyard as is the customary ship practice. They lead through holes in the crosstrees and thimbles are scized to their ends; these in turn are set up by a seizing to cyebolts on the lower masts.

The next point concerns the main and mizzen stays. In the reconstructed rigging plan, the foresail is shown without a boom; the mainstay, therefore, set up in the usual manner and in the model is shown as double, passing down each side of the foremast. When the vessel went about the sail was brailed up to clear it. This practice was impossible in the case of the mainsail which is fitted with a boom and, to overcome the difficulty, the mizzenstay is brought down on either side of the sail, by long tackles leading to the waterways. When going about it was only necessary to haul taut the weather tackle while the lee one was slacked off.

For the same reason as that given in the preceeding paragraph, certain of the back stays are similiarly provided with tackles.

The main boom has been provided with only a single sheet tackle, as thereby there is less danger of its interfering with the free handling of the guns. In the case of the mizzen boom, this does not arise and it has therefore been given a double tackle.

The point may be raised that, as reconstructed, the fore topsail braces will just foul the extreme tip of the fore gaff. While I appreciate this difficulty, it is impossible to modify it without altering the whole of the masting proportions. It only occurs when the yard is lowered; in its normal raised position, the braces are well clear.

The dolphin striker is double and of the fixed type, since the single swinging pattern was not introduced until about 1820.

The runner pendants have been fitted to the foremast head and these blocks would also serve for the foresail and jib

balliards.

The one remaining matter that i should like to mention is the run of the peak halliards. There are a large number of variants by which this tackle can be fitted, but the method adopted seems most likely in this class of vessel.

The wood blocks on which the model has been mounted have been so graded for height as to bring the waterlines parallel with the base board; this serves to indicate the pronounced keel drag, typical of all vessels of the Baltimore Clipper design.

The scale in feet is shown along the edge of the black base piece on which the blocks are mounted and, incidentally, this strip of blacked ivory is also equal to the length of keel from the after edge of the stern post to the touch.

In conclusion may I say that these notes, for I can call them but little else, do not make any pretence of literary effort; they have been jotted down an odd intervals, in a hurry and in between other and more pressing work. They were made, however, immediately after the model was completed and while its details were still fresh in my mind. My only wish is that they prove of some use to other enthusiasts while, as I have already mentioned at the beginning, they may indicate to the more serious research workers, the particular class of information that is required by the model making fraternity.

NOTES

1. This note is a very good example of how careful it is necessary to be in checking up information. The authority I used for the anchors on my model was that of Capt. McCann, as mentioned above. In writing this paper I accepted this as correct and merely made a note for actual authority to be inserted later. On looking the matter up recently I have discovered the following:-

Capt. Izard in 'The Ship Model Builder's Manuel of Fittings & Guns', page 58, states - "It is on record that up to 1807 iron stocks were only used for anchors up to 15 cwt. in the Royal Navy."

'The Mariners Mirror', vol. 14, page 89, note by L.G. Carr Laughton - "By order dated 14 Dec., 1805 iron stocks were given to anchors up to 15 cwt. The first reference I have to these small iron

stocked anchors is of 1780 at which date they were apparantly emerging from the experimental stage. Iron stocks for bowers and sheet anchors came very late, I believe not till after 1850, but I have not the date of the order."

The Mariners Mirror, vol.14, page 89, note by Van Nouhuys - "Pietersz de Vries mentions that on the 20th May, 1622, an iron stocked anchor was fished up by him on the road of Tampan at the mouth of the Rhone and that he considered this iron stocked anchor very curious - Iron anchors existed before the 16th century but were unknown at that date."

Science Museum, South Kensington, Cat.No.208 - 'Rigged Model of a Trading Schooner' - This has iron stocked anchors. From the above it will be seen that the wooden stocked anchors given to the 'Shamrock' are obviously incorrect.

2. Sailing Ships of War, 1800-1860, plate 18.
3. The Baltimore Clipper, pages 74 7 75 (Admiralty draughts)
4. " " " " 57
5. Architectura Navalis Mercatoria, plate 62, No.24.
6. The Ship Model Builders Assistant, page 69, gives 1812.
G.S.Laird Clowes in 'Sailing Ships' part 1, page 99 gives 1811.
Sailing Ships Of War, 1800-1860, page 20 states, "shortly after 1815."