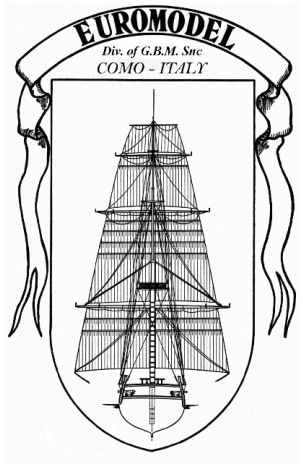
TRANSLATION LINKS

1. type into your browser ... **english+italian+glossary+nautical terms**
2. utilise the translation dictionary 'Nautical Terms & Expressions' from Euromodel website



An *interpretive* build of the Falmouth

18th. Century English Mercantile Vessel

Launched 1752

Scale 1:75

Checked the Resource File ?

HULL CONSTRUCTION.08

The *interpretive* build is based on the supplied drawings, the kit material – and an amount of extra material.

This work only illustrates how this ship might be built.The level of complexity chosen is up to the individual

This resource information was based on the original text supplied by Euromodel and then expanded in detail as the actual ship was constructed by the author, Peter Coward. Neither the author or Euromodel have any commercial interest in this information and it is published on the Euromodel web site in good faith for other persons who may wish to build this ship. Euromodel does not accept any responsibility for the contents that follow.

Falmouth

18th. Century English Mercantile Vessel

Launched 1752

Scale 1:75

This is NOT an instructional manual

It shows how the build was interpreted **utilizing the provided kit … *and supplementing with additional material* which was dictated by my own personal choices. Many steps could have been simplified by only using the material as it was supplied. This invariably is indicated by the heading 'Alternative 1'. However, where it was felt a challenge was needed with a higher degree of accuracy, this will be denoted by 'Alternative 2'.**

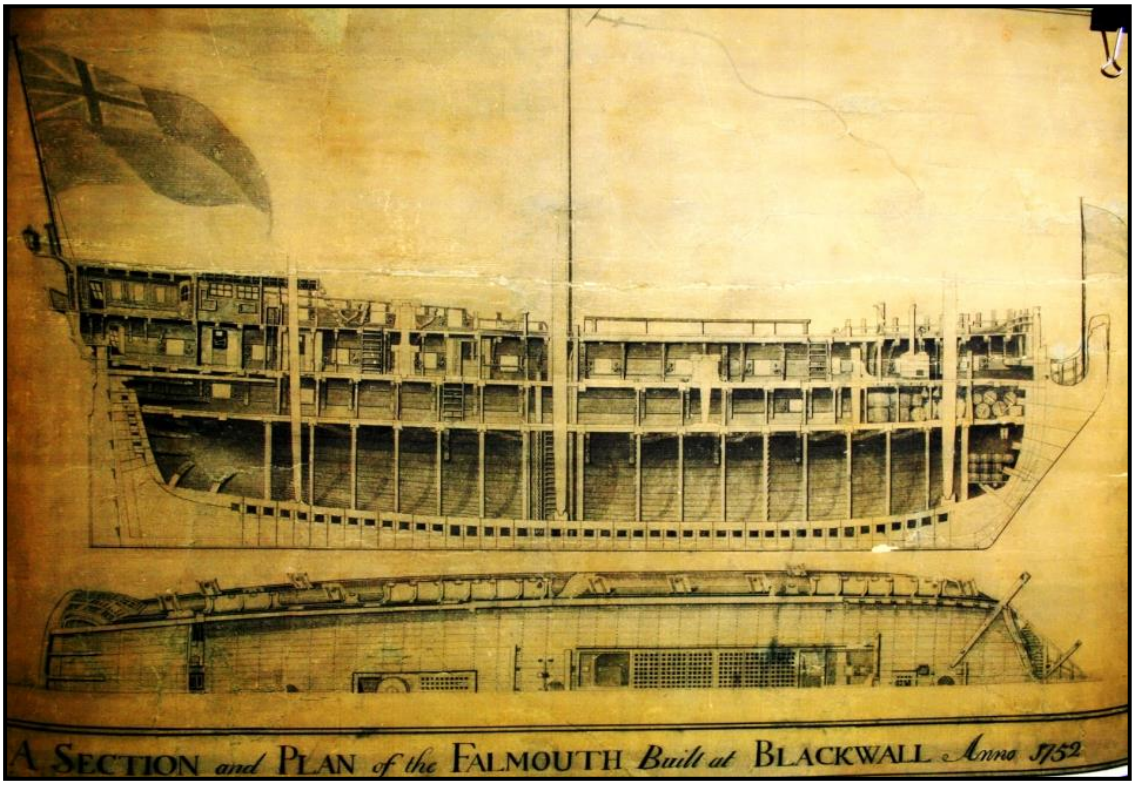
Reference Texts

The Masting and Rigging of English Ships of War 1625 – 1860 by James Lee (1984). Another indispensable book ! Without this, the masting and especially the rigging would have been difficult.

The Construction and Fitting of the English Man of War 1650-1850 by Peter Goodwin (1984)

Historic Ship Models by Wolfram zu Mondfeld (1989).

Growing Specific Shapes


A SECTION and PLAN of the FALMOUTH Built at BLACKWALL Anno 1752

[To navigate through the contents – use 'control + click']

Contents

Illustrations

[The figures below are not hyperlinked]

Chapter 1: MAST RIGGING

Rigging Systems

Rigging a ship is primarily a method of securing and tensioning all the spars (masts, yards, booms, gaffs and sprits) through a system of ***standing (fixed) rigging*** which includes *stays, backstays & shrouds.*

The rigging also includes a system of ***running (moveable) rigging*** to alter tension amongst the spars, raise and lower the yards and booms, furl and unfurl the sails, alter the positioning of sails and to generally control/restrict the movement of the large expanses of sail.

Many builders do not entertain the inclusion of sails even though Euromodel includes the material. This then reduces a large amount of the running rigging needed and makes for a far more simple process.

Plan Sheet Information

If the builder is serious about his/her task – and most are – then it is worth the time to investigate books on rigging such as …

The Masting and Rigging of English Ships of War 1625 – 1860 by James Lee (1984).

Even with the accurate drawings provided, this type of work by its very nature is complicated, painful and at times tedious. No matter how good the drawings are, reference to historically accurate texts and drawings is essential to provide a more open mind to what will be done.

In building this ship, there was a constant need to make comparisons between the original drawings and what is read in other references. *That* is what ship-building is all about. Another useful text is … ***Historic Ship Models*** by Wolfram zu Mondfeld (1989).

The following introduction simply highlights a few specific areas of the standing & running rigging.

General Rigging Sequence

Some of the following points may not be applicable to this particular ship.

Step 1: Completion of Main, Foremast, Mizzen & Bowsprit Mast with crosstrees & tops

Step 2: Masts (especially Bowsprit) fitted with any required blocks.

Step 3: Bowsprit standing rigging (excluding stays & preventer stays) completed.

Step 4: Install the two lower masts in position.

Step 5: Fix the lower deadeyes and chain plates in position.

Step 6: Attach remaining mast sections.

Step 7: Attach shrouds, futtocks and ratlines.

Step 8: Rig stays.

Step 9: Rig all spars and attach.

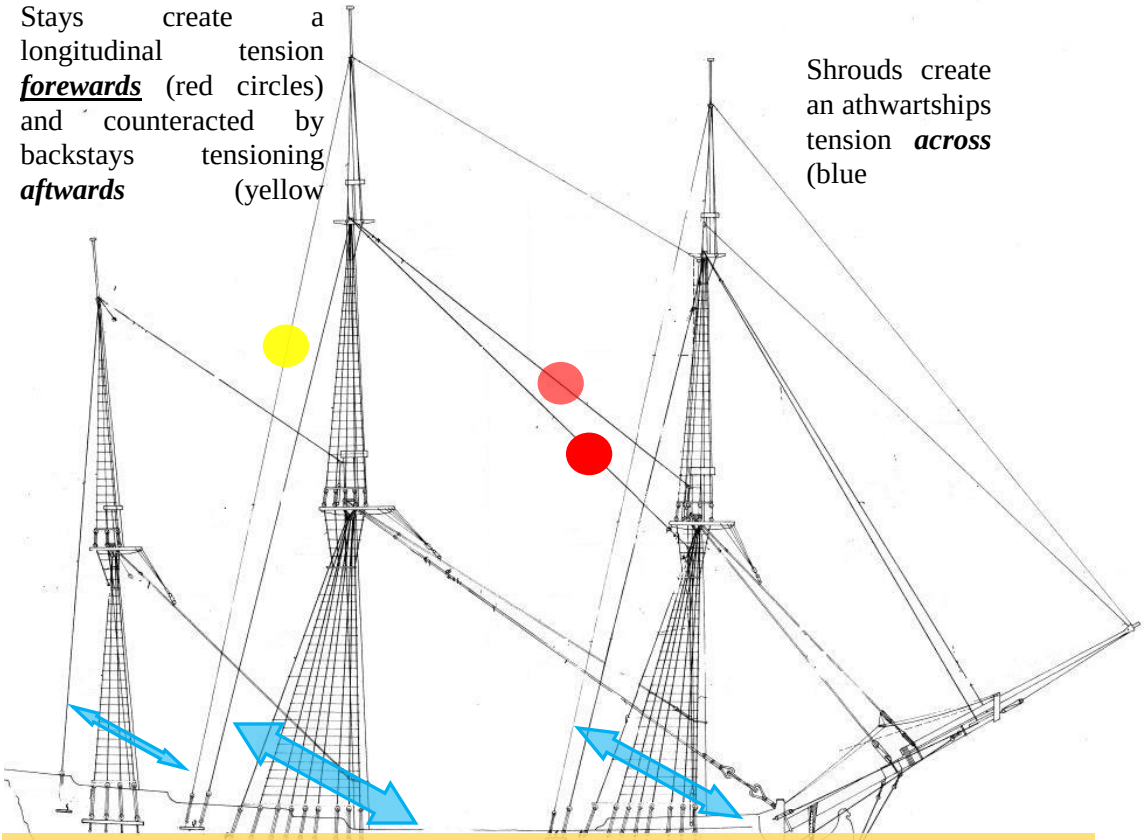
Step 10: Rig backstays.

Step 11: Brush diluted glue over all knots.

Stays

Stays create a longitudinal tension ***forewards*** (red circles) and counteracted by backstays tensioning ***aftwards*** (yellow

Shrouds create an athwartships tension ***across*** (blue



Because this system of stays, backstays and shroud ropes was in a fixed position and not subject to general handling by the seamen, it was covered in tar to preserve it. The ropes in most models will reflect this by being black or dark brown.

Figure 1: Stays, Backstays, Preventer Stays & Shrouds

Preventer stays made their appear around the start of the eighteenth century on these larger ships, were located abov stays. Their function was to spread the ter exerted on the masts and avoiding/reducing distortion along the length.

The Main Preventer Stay (Fig. 1) is atta abaft (behind) of the Foremast. Between – 1810, Amiralty Orders saw this prev stay attach to the bowsprit, passing the Mast on the same side as the stay. Post 1 this stay was attached either to the deck c bulwark passing the Fore Mast on the opp side to the stay.

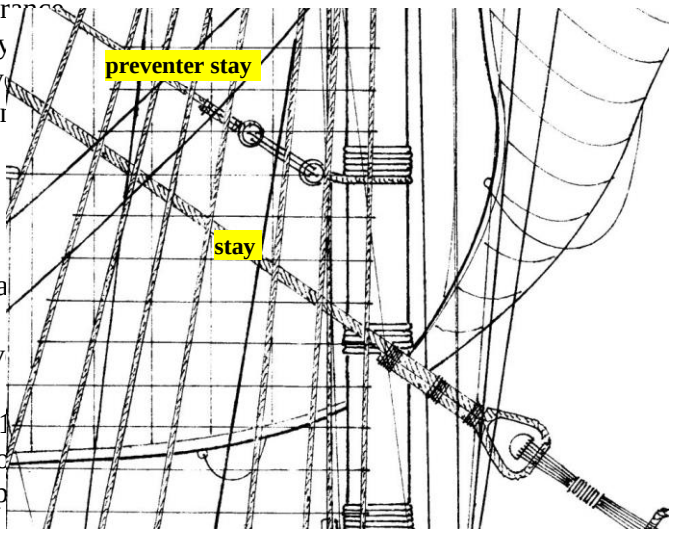


Figure 2: Preventer Stay

Crowsfeet

"Introduced in the middle of the seventeenth century, and comprised a rope spliced round the strop of the euphroe block, its other end reeving through the centre hole in the rim of the top from above, up through the next hole to port, through the upper hole of the euphroe block, up through the inner starboard hole in the top and so on until the end finally came out of the outer hole on the starboard side of the top. There it was hitched to the under part of of the previous lead through the top." (Lees, 1984, 44)

This was a slight deviation from the drawing where the reeving is shown as edge reeving rather than above and below.

Given the fragile nature of the round top, drilling holes through the top surface was the more correct and more suitable way to go.

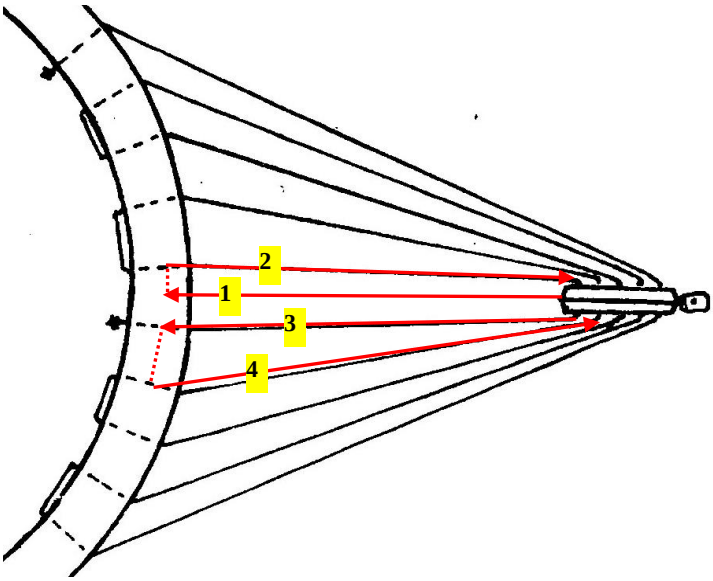


Figure 3: Modified Crows Feet (as per Lees, 1984)

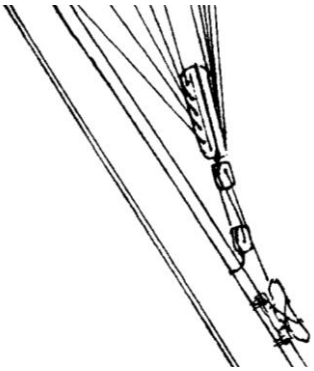


Figure 4: Euphroe Tackle

Euphroe Tackle
Two blocks – one stropped to the euphroe block and the other seized to the stay.

The standing part of the fall was made fast to the upper block, whilst the running part, after reeving through both blocks was hitched tio the stay below. In this case, the hitching is made via a cleat.

Stay Collar

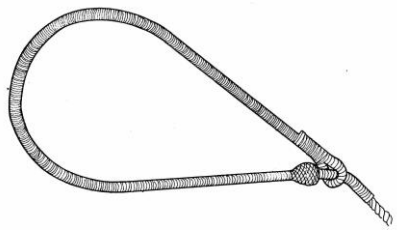


Figure 5: Stay Collar

The stay collar was wrapped around a mast but was prevented from pulling tight by the use of the stay mouse – a structure raised on the stay rope large enough not to pass through a small loop at the stay end.

The majority of builders avoid producing this piece of antiquity and yet it can be produced with a high degree of accuracy or simulated to look realistic. In both cases, a mouse is created over a wooden form. At this stage of general discussion, it is worth pointing out an interesting reference to be found on MSW ….

http://modelshipworld.com/index.php/topic/10478-novel-way-of-making-a-stay-mouse/

Bowsprit

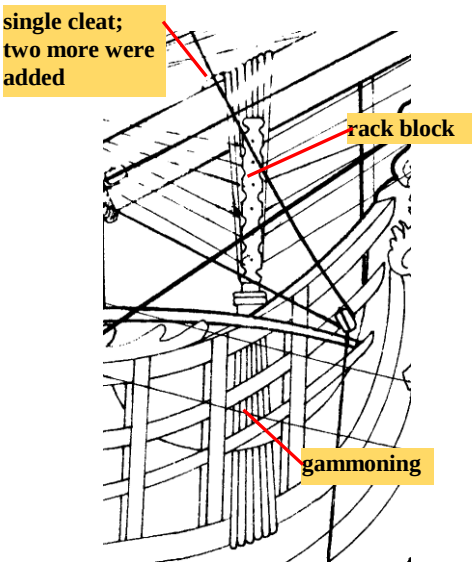


Figure 6: Gammoning

Gammoning

Rope lashing was used to strongly secure adjacent parts together. Fig. 6 shows the use of gammoning to secure the bowsprit to the ship. About ten turns of gammoning were employed, keeping the bowsprit turns forward and the turns through the lower hole aftwards. This creates a cross-over/ twist in the centre of the gammoning which is frapped with the same number of turns.

A special block – the gammon lashing or rack block – was seized to the gammoning; this block had part of the running rigging reeved through it.

Figure 7: Lash Block

Bowsprit Shrouds

To withstand the upward force on the bowsprit exerted by the stays and masts in general, ropes under tension were usually employed on the sides of, and beneath, the bowsprit mast.

Bobstays were introduced on large ships from 1685 (Lee, 1984) and followed by *shrouds* in 1720 (Mondfeld, 1989). Both were fairly similar in appearance.

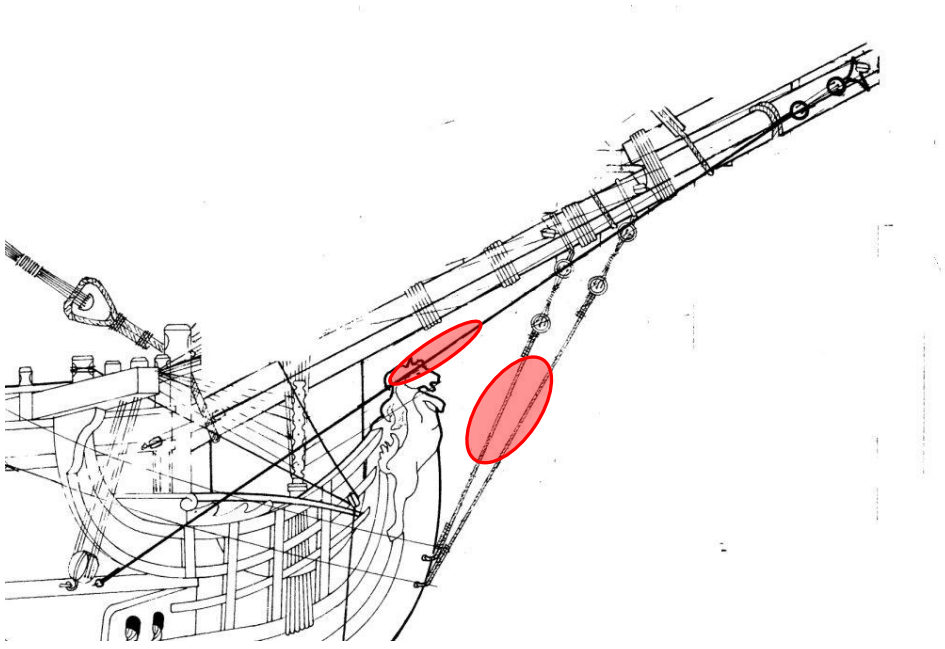


Figure 8: Shrouds

Shrouds (lower and upper)

Rope Sequencing

Shroud ropes when viewed as a group either side of a mast create a strong supporting tension athwartships. Their fixing ('wrapping') around the mast is carried out in a specific sequence that ***begins at the fore end*** of the rope group ***on the starboard side***. The sequence is explained in more detail below.

Each pair of shroud ropes (i.e. one rope doubled over) was wrapped around the mast and then 'seized' down to the deadeyes anchored on the hull just below the channels. This was then carried out for the port side and the sequence alternated until the required number of shroud ropes were added. If there were an odd number of ropes, then the first rope added was a single rope added to each side to begin with (rope 3 in Fig. 9 below).

Shroud Sequence

Fore Lower Mast:
4 - 5 - 6 - 7 – 8 – 9 – 10 - 11

Main Lower Mast:
3- 4 – 5 - 6 - 7 - 8 - 9 – 10 - 11

Mizzen Lower Mast:
4 – 5 – 6 - 7

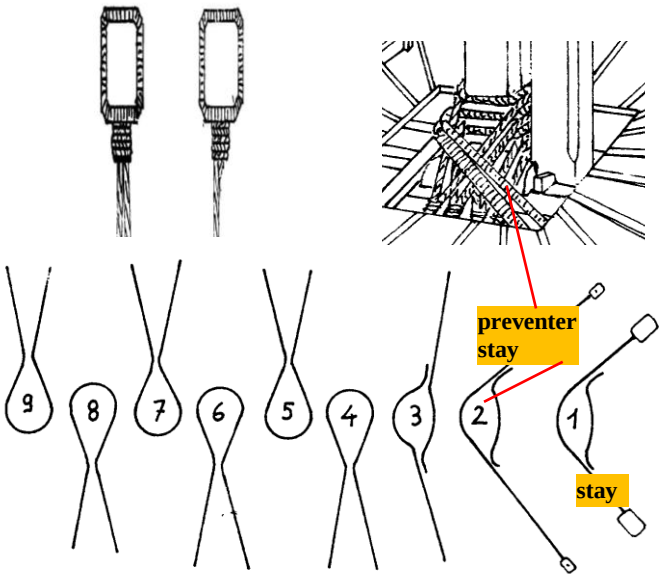


Figure 9: Shroud Sequence

Sufficient length must be left to allow for the ropes to wrap around the upper deadeyes and the short lengths seized.

Alignment of Lower Deadeyes & Chain Plates

This is a general discussion more applicable to some ships than others but the main ideas are there.

It is critical to establish the correct positioning of the lower dead eyes that will be fixed into the channels since they will not be evenly spaced apart. The shroud ropes that are now fixed in place around the masthead are used to establish the foremost and aftermost shroud positions (red lines) – Fig. 10. Other shroud positions in between these (blue lines) can then be determined by lines of best fit between gunports, etc (Fig. 11 below). The extensions of all these lines can be marked in pencil on the hull and used to determine the positions for the lower deadeyes and chain plates.

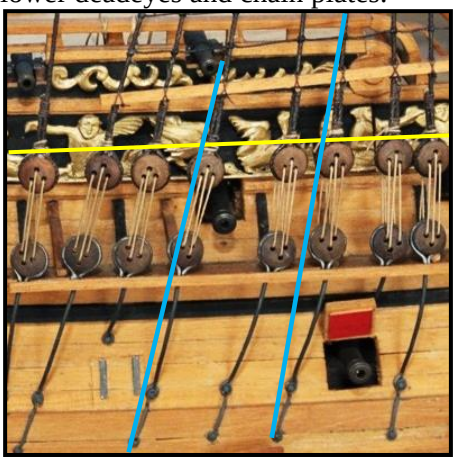


Figure 11: Alignment Through the Channels

The ***lower deadeyes and chain plates can now be fixed in position*** (see text below)

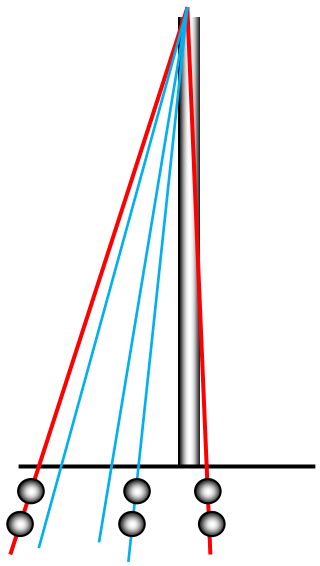


Figure 10: Positioning of Lower Deadeyes & Chain Plates

Fig. 11 illustrates the difficulty in producing the theoretically correct alignment. The blue lines tell the story – but not for this build.

Note also the need for a correct alignment for the upper deadeye level (yellow line).

Deadeyes & Chain Plates

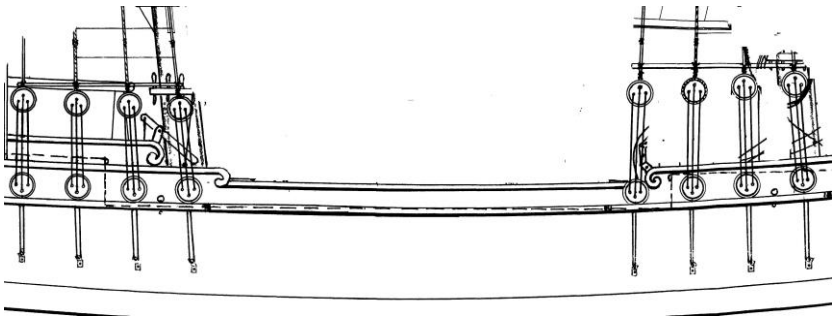


Figure 12: Fixing the Shrouds

The lower deadeyes are held by 'chain plates' that pass through the channels and fixed onto the hull beneath.

Fixing the Upper Deadeye Position & Shroud Rope Lengths

A jig can be used to create the correct shroud rope length AND the upper deadeye 'horizontal' alignment. With permission, an edited version (***not for the FW but the same principles apply***) from the Model Ship World Forum written by Gene Bodnar has been re-produced here. Thanks Gene.

"A balsawood jig is made for each side and firmly clamped onto the channel and its location marked at either end so it can be repositioned exactly at a later time.

Each shroud tackle is then pulled taut to the centre of the lower deadeye, and its 'run' marked on the balsa block to the point where it intersects the lower deadeye. Also mark a line which indicates the uppermost height of the upper deadeyes – refer to Fig. 13.

Figure 13: Shroud Jig 2 (not Falmouth)

Where this upper deadeye line intersects the tackle lines – and without worrying about orientation at this point) - the deadeyes are each fixed in position with a couple of brass plank nails that are easily pushed into the balsa wood.

Each of the shroud ropes/tackle is then pulled taut around each deadeye. Using tweezers, arrange the rope so the wrap-round occurs at the top and in line with the upper deadeye line. Seal the ropes with a drop of instant glue – without applying glue to the deadeye!! Make sure this process is repeated alternately from port-starboard-port etc.

Now orientate the deadeye correctly. Each line should tie up with the same tension with the deadeyes being at the same level (well, almost).

Seizing the Shroud Rope

Figure 14: Short End of Shroud Rope

Background discussion …

The shroud rope is secured with two or three seizings. ***Historically there were three seizings:***

1. an '**eye seizing'** nearest the deadeye,
2. a '**middle seizing'**, and
3. an '**end seizing'** near the short end of the shroud rope.

The short end …
… should always be ***forward on the port side*** and ***aft on the starboard side***.

Fig. 14 was taken from the starboard side of another model where both forward and aft positions on the deadeye are evident for the short end. A case of how exacting you wish to be

All short ends must be finished to the same length but at this stage leave excess length.

Initially, ***complete the eye seizing*** to fully secure the wrap-around. Many will choose to leave this till later but I wanted to be sure about securing that rope.

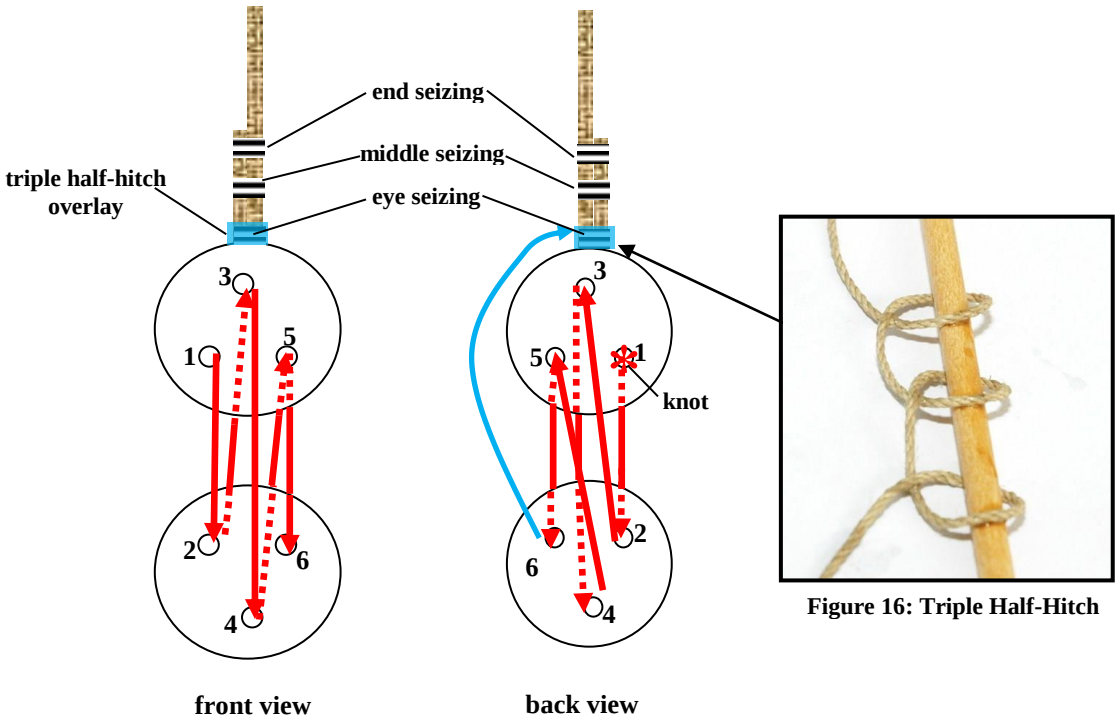


Figure 15: Order of Deadeye Rigging

Figure 16: Triple Half-Hitch

Deadeye Rigging

You should now find that rigging the deadeyes once they are mounted is a very straightforward task. Add a sticky label to each rope with a number to identify which is which. Fig. 15 illustrates the sequence normally involved in rigging the deadeye. Until that is completed, ignore the seizings included in the figure.

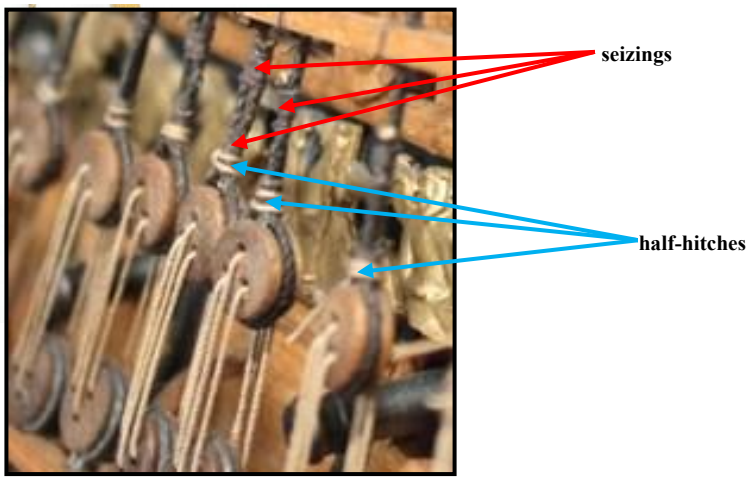


Figure 17: Seizings and Half-Hitches

With deadeyes rigged and tensioned, the ***jig was modified by adding a height to it equal to the length of the short wrap-aound rope*** which will be seized to the shroud above the deadeye. This extra height gives a gauge to determine the length of that short rope – which will vary according to the angle of each shroud rope."

Seizing Completion

In Fig. 15, the lanyard (blue line) is shown extending from the rear of the bottom deadeye and forming a triple half-hitch over the eye seizing at the base of the shroud rope. Fig. 17 shows an attempt at creating a knot/ hitch of some sorts which is suspected of not being the hitch described above but again this illustrates the variance possible in any build.

Over the lower seizing, there was usually at least a triple half-hitch (blue lines) – refer to Fig. 15. This photograph appears not to have a *triple* but perhaps a *double* half-hitch.

Once all deadeyes are rigged and tensioned, the jig is placed back in its original position and some brass nails used to secure the upper deadeyes to the jig by pushing them through the threaded holes. You may need thin brass pins for this.

The deadeyes are now held in a fixed positions and the task of seizing the shroud ropes above the deadeye should be relatively straightforward.

Ratline Rigging

Figure 19: Photographic View of Ratlines

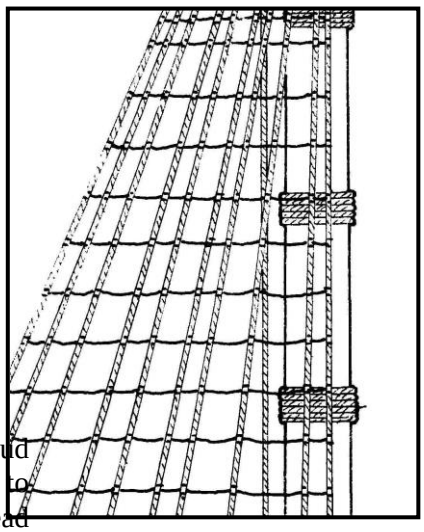


Figure 18: Diagrammatic View of Ratlines

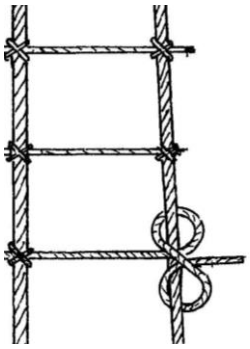


Figure 20: Seizing Ratlines

Irregularity

Figs. 18 & 19 illustrate the fact that the shroud ropes will never be uniformly spaced due to both the angle over which the ropes are spread and the fact that the deadeye anchorage points will depend on the positioning of such things as gunports.

Regularity

The spaces between successive rows of ratlines should be uniform and that is easily attained using a white card marked with black lines held behind the shroud ropes.

Rigging

Ratlines were spaced 13 – 15 inches apart which translates to ***4.2 – 4.8 mm.*** in this model.

Historically … the method of fixing to the shroud ropes was usually with a ***clove hitch (double half-hitch)*** except that an ***eye was spliced into each end*** and then seized to the fore and aft ropes of the shroud group

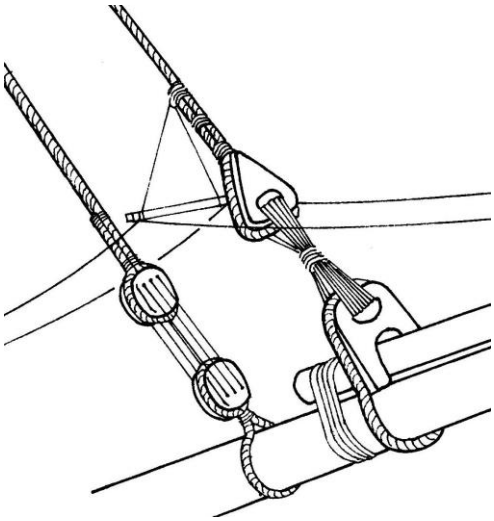


Figure 21: Hand Lines

Bowsprit Hand Lines

To add security for sa working on the bow overhead rope hand were added.

The preventer stay heart collar was made enough to fit over jibboom.

Figure 22: Absence of Hand Lines

Overhead hand lines were not included in the build shown in Fig. 22.

Chapter 2: YARD RIGGING

Foot Ropes & Stirrups

Foot ropes provided a foothold for crew whilst reefing the sails. Normally they extended along behind the yard and about 760 mm. below it. The rope had the far end with a spliced eye fitted over the yard arm and the inner end made fast either side of the sling cleat. The ropes were held by short vertical ropes known as stirrups.

Footropes of lower yards on actual ships were approx. 3 inches (76.2 mm.) in circumference giving a diameter of 24.2 mm. At this scale of 1:48, the rope diameter would be ***0.50 mm***. I used the ***0.5 mm.*** supplied in the kit.

The principles of foot rope rigging are not very clear from the plan drawings supplied. Examination of Fig. 23 shows the rigging in a complex format but in building a typical ship model, such arrangements are often simplified. What is done will be explained in the following pages.

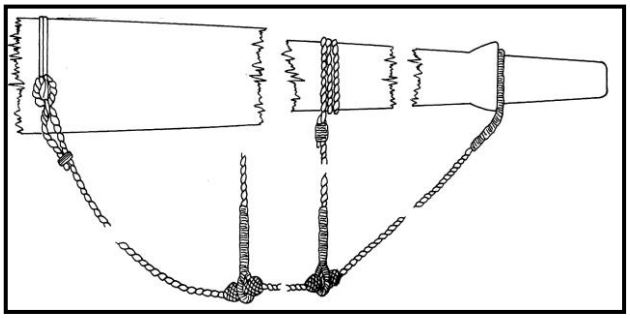


Figure 23: Foot Rope Rigging

Variations in in Footrope Construction

Before you get too concerned about what is right or wrong with the method of rigging, it might be useful to show ***the stirrup lashed to a yard and the footrope underneath*** – both of which could have been readily improved. To the casual observer, it may well be that such exacting work (or lack of it) will probably go un-noticed. ***It is more a question of what you want to achieve.***

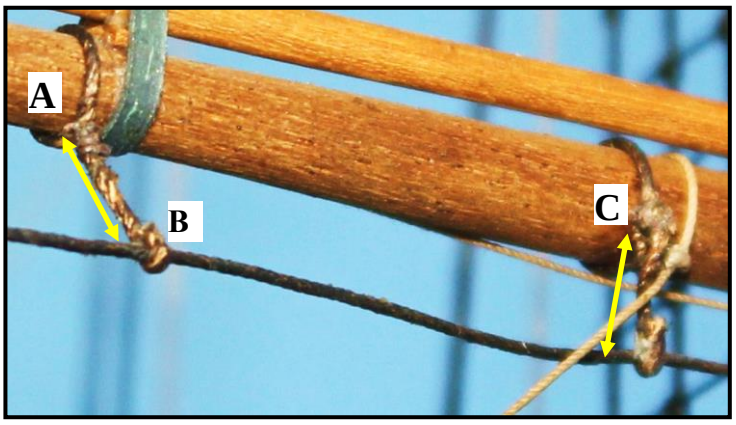


Figure 24: Stirrup Seizing, Example A

The simplest method is the single turn of rope around the yard illustrated in Fig. 23.

How this stirrup is seized together underneath the yard and above the footrope ***can be achieved by a number of different techniques***.

In Fig. 24 (from another model), the stirrup has been lashed once around the yard with the same rope serving around itself 3 – 4 times underneath the yard (‘A’) and glued in position.

The lower end (‘B’) has been bent around the footrope and glued in position. The second stirrup rope (‘C’) has somehow finished up with its ‘seizing’ on the side of the yard instead of underneath. The spacing between the yard and the footrope must be consistent but that is not the case (as shown by the yellow arrows).

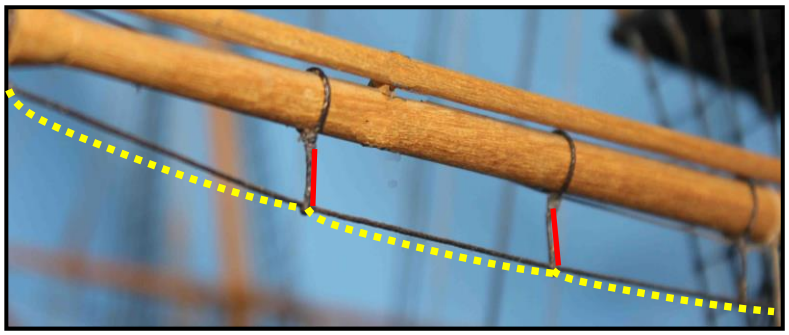


Figure 25: Making the Ropes More Realistic

In Fig. 25, there is another example of rigging 'error'. It is to do with the ***appearance of the stirrup and foot ropes***. The stirrup ropes (red lines) are not all exactly vertical which actually adds some realism but the footropes (yellow lines) should have some small curves in them and even there, not all exactly the same. The overall impression just looks so much better !

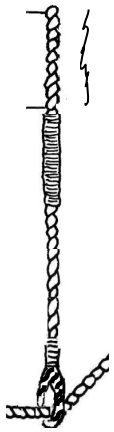


Figure 26: Basic Rigging for Footrope & Stirrup

Basic Construction of Footropes & Stirrups

The following comments all rely on ***simplifying the rigging*** for the footropes & stirrups. The following section contains far more ideas on how historical accuracy might be obtained.

Figure 26 illustrates :

single lashing around the yard,
seizing under the yard,
simple eye around the footrope,
small seizing above the eye.

Rigging at a basic level then involves a manipulation of one or more of the above four points.

Advanced Construction of Footropes & Stirrups

The following comments all emphasise the historical accuracy of the rigging for the footropes & stirrups. There are more ideas here in this section – shaded in Fig. 27 below - that you might wish to consider.

Figure 27 illustrates various combinations of rigging that *could* be used:

- multiple or single yard lashing,
- seizing under the yard,
- seizing around the eye itself,
- seizing above the eye.

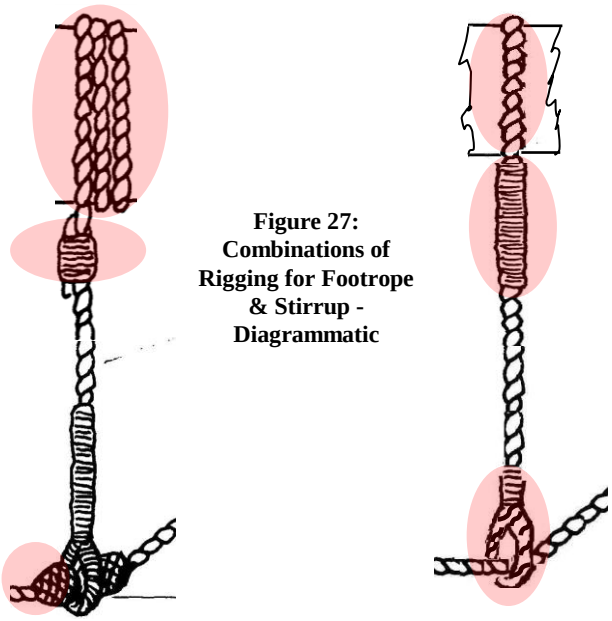


Figure 27: Combinations of Rigging for Footrope & Stirrup - Diagrammatic

Interpretation of the Foremast Topsail Rigging

- 81 (82) port (starboard)
- ‘vista da prua’ view from bow
- ‘vista da poppa’ view from stern