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* review of the Friedrich Wilhelm zu Pferde

17th. Century German Frigate

Launched 1684

Scale 1:48

Checked the *Essential* Resource Information File ?

09.STANDING RIGGING

March 2019

My *interpretive* review 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.

*This is **NOT** an instructional manual but illustrates my own interpretation based on the drawings and the supplied kit.*

- Additional material used was dictated by my own personal choices.
- Greater simplification would be achieved by using the material as it is supplied.

Reference Texts

Historic Ship Models by Wolfram zu Mondfeld (1989)
Seventeenth Century Rigging by R.C. Anderson (1955) [almost a complete copy of his earlier book ***The Rigging of Ships in the Days of the Spritsail Topmast, 1600 – 1720*** (1927)]
The Construction and Fitting of the English Man of War 1650-1850 by Peter Goodwin (1984)
The Masting and Rigging of English Ships of War 1625 – 1860 by James Lee (1984).

Growing Specific Shapes for Ship Timbers

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

Contents

Illustrations

[The figures below are not hyperlinked]

Chapter 1: TRANSLATIONS

Plan Sheet 7

Manovre Fisse E Particol. Relativi – Bigotte & Bozzelli
Detail of *Fixed* Rigging – Deadeyes & Blocks

[for translation of some words, go to the Euromodel website and download 'Nautical Terms']

piano delle manovre fisse dell'alberatura plan of mast fixed rigging

strallo di pappaficio di maestra	main topgallant stay
strallo di maestra	main stay
strallo di pappaficio di trinchetto	fore topgallant stay
strallo do trinchetto	fore stay
strallo di gabbia	main topmast stay
strallo di parrachetto	fore topmast stay
strallo di belvedere	mizzen topmast stay
strallo di mezzana	mizzen stay
paterazzi dell'alberetto di parrocchetto di bompresso	backstays of the topsail bowsprit mast

le parti indicate con line a tratto e punto sono relative al solo albero di trinchetto sia per quanto riguarda il partic. 1 che per il partic. 2.
the parts shown by chain refer only to the foremast whether for detail 1 or detail 2.

partic. delle lande e degli arridatoi delle sartie di trinchetto e di maestra
details of the fore & main chain plates & turnbuckle

partic. delle lande e degli arridatoi delle sartie di mezzana
details of the mizzen chain plates & turnbuckle

1. **l'attaco fiss (*) del cava buono di maestra deve essere eseguito dal lato di tribordo dell'albero(opposto a quanto indicato a dis.)**
   the fixed junction of the main mast rope must be carried out from the right hand side of the mast (opposite to what is shown in the drawing).

Plan Sheet 8

Manovre Volanti Dei Pennoni E Particolari
Detail of *Running* Rigging

BOWSPRIT YARDS

particolare delle manovre volanti del pennone di civada e del pennone di parrocchetto di bompresso
detail of running riggings of the bowsprit spritsail and upper spritsail yards

FORE YARDS

particolare delle manovre volanti del pennone di pappaficio di trinchetto e del pennone ... etc
detail of running rigging of topgallant yard & top yard of the foremast

particolare delle manovre volanti del pennone di trinchetto
detail of running riggings of foreyard

strallo di maestra	main stay
legare allo stroppo del bozzello "l" 8	fasten to the l 8 block strap
bitta della drizza di trinchetto	bitt of the foremast halliard

MAIN YARDS

particolare delle manovre volanti del pennone di pappafico di maestra del pennone di gabbia
detail of running rigging of main topgallant sail & upper topsail

particolare delle manovre volanti del pennone di maestra
detail of running rigging of main yard

legare incappelando all bitta	fasten, fixing at the bitt.
bitta della drizza di maestra	bitt of the main mast halliard

MIZZEN and LATEEN YARDS

dettaglio 'c' (trozza delle pennone di contromezzana)
detail of parrel of mizzen topsail yard

dettaglio 'b' (trozza delle antenna di mezzana)
detail of parrel of mizzen lateen yard
incappellaggio dello strallo - stay strap

particolare delle manovre volanti del pennone di belvedere, del pennone di contromezzana e dell'antenna di mezzana
detail of the running rigging of mizzen topgallant yard, mizzen topsail yard & mizzen lateen yard

dettaglio della trozza detail yard arm sling

In the bottom right-hand corner of Plan Sheet 8 … **NOTE**

Dettaglio A, v. nota 1

dettaglio (tipico) per l'alberetto di parrocchetto di bompresso. dell'alberetto di ... etc

detail (typical) of bowsprit sprit mast as well as the main & foremast topgallant masts.

Dettaglio B, v. nota 2

detagglio (tipico) della trozza dei pennoni del bompresso, di pappafico di trinchetto, di pappafico di maestra e del penn. di belvedere – il bozzello e relativo stroppa ... etc.

detail (typical) of the seizing of the bowsprit, of the 'pappafico' topgallant fore yard, of the 'pappafico' topgallant main yard as well as of the mizzen topgallant yard.

[N.B.
'pappafico' meaning 'in the region of' or 'near to' is an older term for the term velaccino/ velaccio]

Dettaglio C, v. nota 3

dettaglio (tipico) per l'albero di parrocch....etc

detail (typical) for the fore & main masts.

4. **dettaglio (ipico) per l'albero di trinchetto ...etc**
   detail (typical) for the fore & main topsail masts.

5. **le trozze del pennone di contromezzana e dell'antenna di mezzana devono essere .. etc.**
   the seizing of the mizzen topsail yard as well as of the mizzen lateen yard must be done as per detail "b".

6. **per il significato dei simboli riportati sulla presents ... etc**
   for interpretation of symbols used refer to the legend in plan sheet 7.

Rigging Symbols

progressive positioning number where running rigging of yards & sails must be fastened (cleats, belaying pins, deadeye fastenings, etc.)

progressive number of fixed point of a running rigging (ring, block fastening, etc.) but is a subset of the overall numbering. These symbols number from 1 – 12 and are to be found in plan sheets 7, 8 and 9.

Rhomboid locations on plan sheet 7:

- 1 is located on the *main deck*
- 2 is on the *quarter deck*
- 11 and 12 on the *mizzen mast*. The remainder are to be located on the hull sides.

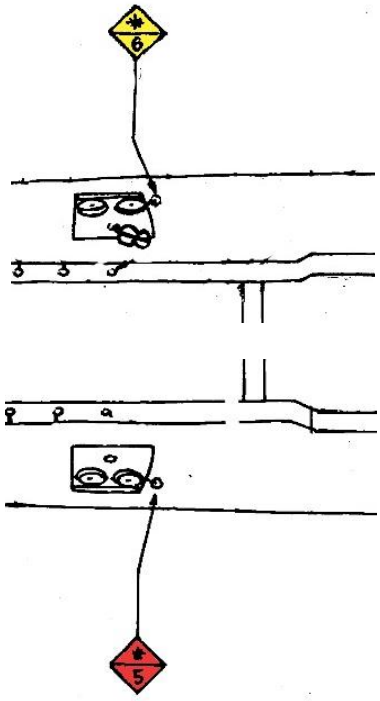


Figure 1: Plan View From Sheet 7

Figs. 1, 2 and 3 show the relationship between rhomboids 5 (red) and 6 (yellow) utilising sheets 7 and 9.

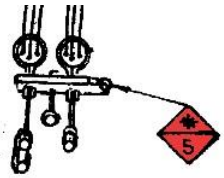


Figure 2: Starboard View From Sheet 7

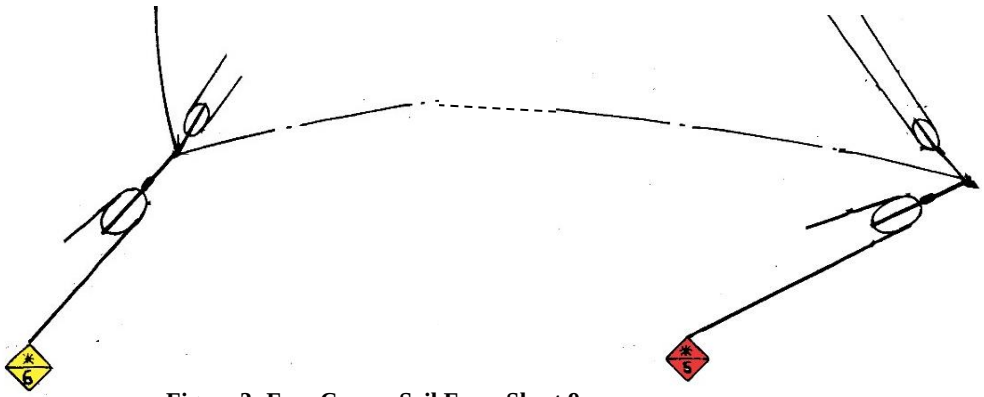


Figure 3: Fore Course Sail From Sheet 9

passage/ passing through position of running rigging before being fastened to position marked with a circle (the passage point can be a block, a chock, etc.).

In Fig. 4, there is a subtle difference in that the large staghorn labelled as '46' is seen as being different to the rigging point '46a'. *They are both the same thing* – a little commonsense is required when interpreting these points.

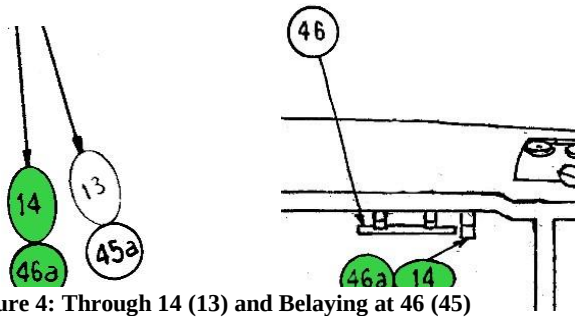


Figure 4: Through 14 (13) and Belaying at 46 (45)

this ***symbol is unnecessary*** and could be confusing; again, common sense is needed

Series of Corresponding Block Pairs

Right-hand side/ starboard **Left-hand side/ port**

“H” 1 d (1s)

bozzello tipo “H” avente lo stesso scopo, ubicazione analoga ed installato sul lato di babordo

block type H will have a similar position to the one installed on left side. [i.e. **H 1 s vs. H 1 d**]

After installing the block pairs H 1 , the *second pair* of H-type blocks are installed, they will be identified as …

“H” 2d (2s)

When the third pair of H-type blocks are installed, they will be identified as …

“H” 3d (3s)

… and so on.

Fig. 5 (from Plan Sheet 7) shows the progression of adding H blocks from H1d … H2d … H3d… H4d on the starboard side (RHS) with the corresponding H blocks on the port side (LHS) indicated in brackets.

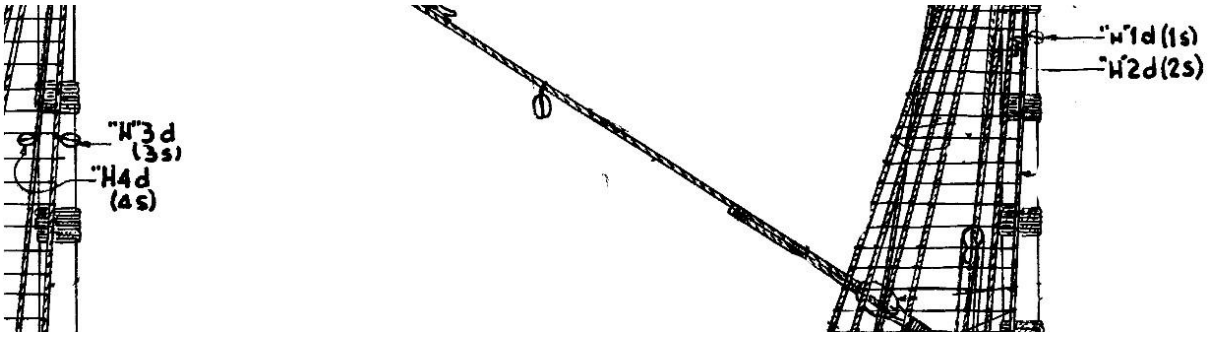


Figure 5: Addition of H Blocks in Sequence (Plan Sheet 7)

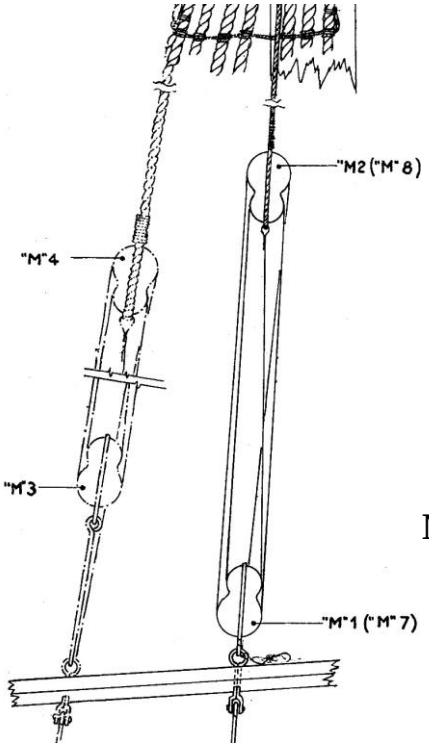


Figure 6: Lower Main and Fore Mast Top

Series of Block Pairs Combined with Singular Blocks

The 11 mm. heart-shaped blocks are identified as 'M'. Unlike the previous example involving 'H' blocks, this M block may be used either in a single application (e.g. securing a halliard tackle to the deck) or as a paired format (e.g. one per side in a similar position). If there is a repetition of a single block tackle, then it will be written "M1" ("M"7)

Figs. 6, 7 & 8 are taken from Plan Sheet 7 to visually illustrate rigging sequence from M"1 to M"5d to M"8 to M"12.

M" 1("M" 7) **i.e. "7" same as "1" –** paired format

"M" 2("M" 8) **i.e. "8" same as "2" –** paired format

"M" 3 single application

"M" 4 single application

"M" 5d (5s) paired format on ***foremast*** (Fig. 7)

"M" 6d (6s) paired format on foremast (Fig. 7)

"M" 7 and "M" 8 as shown above

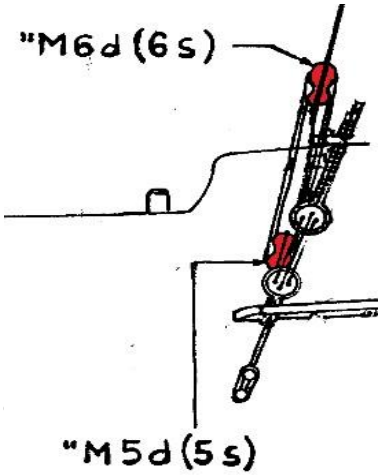


Figure 7: Foremast Channel

"M" 9d (9s) & "M" 10d (10s)
paired formats on ***main mast*** (as for "M6d (6s) "M5d (5s) on foremast channel

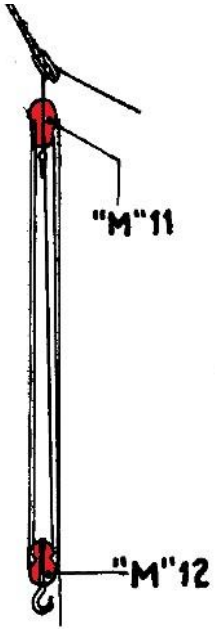


Figure 8: Lower Main Mast

"M" 11 & "M" 12
single applications for the lower mast loading tackle

Chapter 2: RIGGING GENERALISATIONS

Standing and Running Lines

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.

To be precise ….

- *Standing rigging* were lines of a fixed nature such as shrouds, stays, foot ropes and all hauling ropes.
  Shrouds ran athwartships and were tightened using dead eye blocks.
  Stays usually ran fore and aft collectively holding the masts in position.

- *Running rigging* were the lines that moved the sails, directly or indirectly.
  Braces moved the spars connected to the sails.
  Sheet lines were used to haul the sails to the spars.
  There could be more than 60 different running rigging lines, all anchored at different locations about the vessel.

Most of the contemporary models of the period showed the sail lines fitted and rove through the blocks with a small overhand knot stopping it from pulling through the block. Many builders leave about 25 mm. of scale rope dangling. Some will even argue that such lines as the sheet, tack, leech and reef (and their blocks) be omitted altogether.

It goes without saying that such lines as the **halyards** which raise and lower the spar, the **lifts** which control the position of the spars in a vertical plane as well as the **braces** which position the spars fore and aft in a horizontal plane.

Stay Diameter Gradation

The largest of the stays – the main stay – by historical standards, would have a diameter equal to one sixth of the ***9 mm.*** main mast diameter. In this case therefore the main stay would have a diameter of ***1.5 mm.*** The stay for the topmast of the main mast would then be one half of the stay below it i.e. ***0.75 mm.*** Progressing upwards, the topgallant stay would be ***0.375 mm. (i.e. 0.4 mm.)*** and the uppermost royal stay would be ***0.1875 mm. (i.e. 0.2 mm.)*** What holds true to the main mast will also apply to other lower masts and the stays above them.

Kit vs. Reality

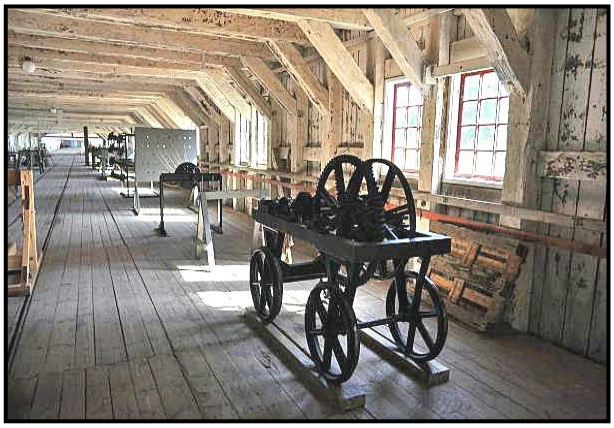
A kit will always be a compromise compared to what is found in the real ship. Euromodel have done well to supply a diverse array of components but you will need to decide how much variation to put into this build. Such an example is found with the Main Mast. The drawings show a strong correlation with the accepted stay sizes … the main stay *is* one sixth of the mast diameter, the topmast stay *is* one half the diameter of the stay below it but the topgallant stay *is not* one half the diameter of the topmast stay. The kit supplies rigging up to ***1.5 mm.*** although the drawings show the main stay collar to be ***2.0 mm.*** (Mondfeld (294, 1989) suggests that the collar is slightly thinner than the stay itself).

Your choices/ decisions need to revolve around …

1. ***following the rope dimensions of the drawings or leaning towards reality,***
2. ***observing the gradation rule,***
3. ***changing the rope colour***

Although Euromodel supplies the required rope, experience suggests that the average builder requires far more than there is in the kit. A complete set of different rope material was accessed - (***https://www.syrenshipmodelcompany.com/miniature-rope.php***) both to cover the above three points as well as having the confidence that there would be sufficient material in spite of there always being a wastage factor.

In spite of what is said, most rope coming out of the rope walks contained some tar and therefore would have shown a slight brown colouration. On the ship, standing lines were treated heavily with Stockholm tar on a regular basis and became quite blackened over time. The tar was necessary to protect the fibres from the ravages of marine air and ultraviolet radiation.



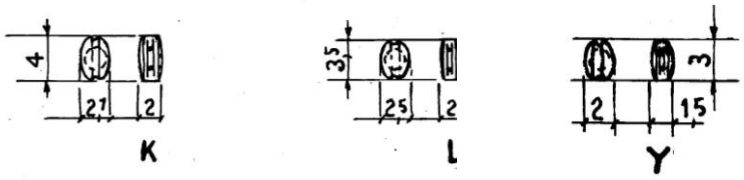
This ropewalk produced rope between 1692 and 1960. With a length of some 300 metres (980 ft), this is Sweden's longest wooden building.

Blocks

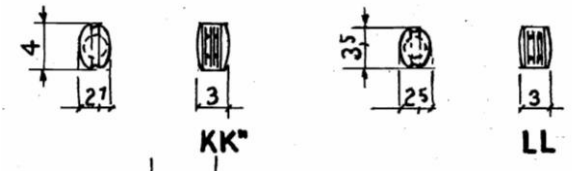
Supplied Blocks

N.B. The plan sheet shows a larger variation of block sizes than that provided in the kit. This kit has amalgamated a number of blocks with similar sizes together – e.g. Y, L and K all use the same sized block.

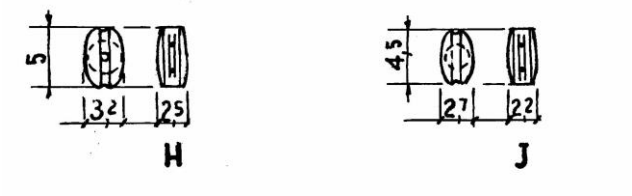
K + L + Y : 3mm., 1 hole(132) - Bozzelli da mm. 3 a 1 foro (Art.22/026)



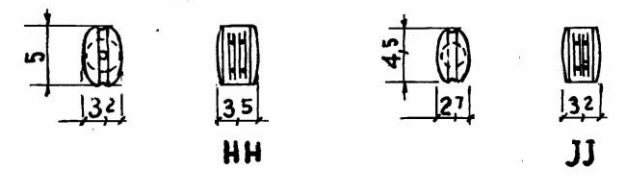
KK + LL : 3mm., 2 hole(20) - Bozzelli da mm. 3 a 2 foro (Art.22/031)



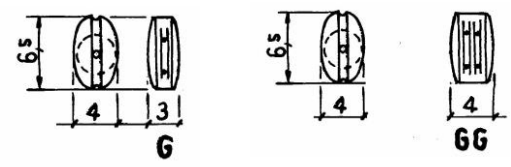
H + J : 5mm., 1 hole (50) - Bozzelli da mm. 5 a 1 foro (Art.22/028)



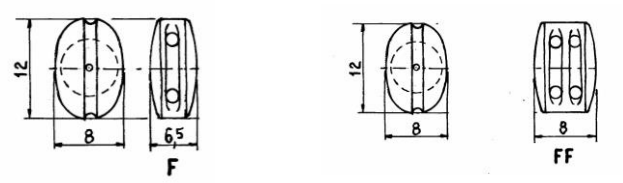
HH + JJ : 5mm., 2 hole (15) - Bozzelli da mm. 5 a 2 fori (Art.22/032)



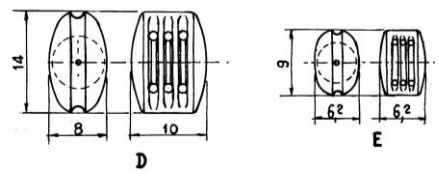
G : 7mm., 1 hole (15) - Bozzelli da mm. 7 a1 fori (Art.22/030)
GG : 7mm., 2 hole (5) - Bozzelli da mm. 7 a 2 fori (Art.22/034)



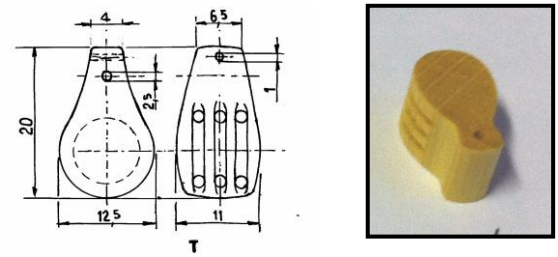
F : **10mm., 1 hole (5) -** Bozzelli da mm. 10 a 1 fori (Art.22/116)
FF : **10mm., 2 hole (5) -** Bozzelli da mm. 10 a 2 fori (Art.22/115)



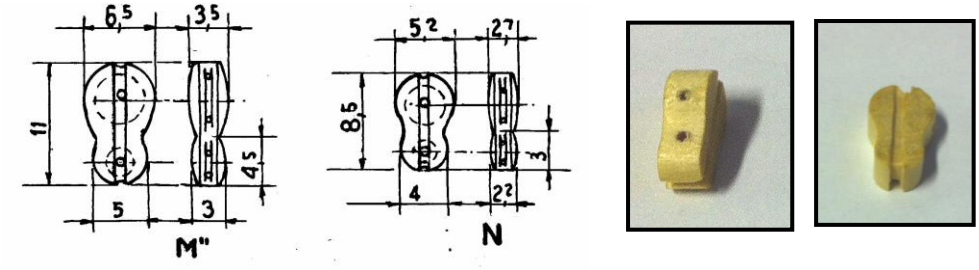
D + E : **10mm., 3 hole (5) -** Bozzelli da mm. 10 a 3 fori (Art.22/114)



T : **Viol, 16 mm. (2) -** Bozzelli a violino da mm. 16 (Art.22/129)



M : **Heart, 11 mm.(20) -** Bozzelli a cuore da mm. 11 (Art.22/084)
N : **Heart, 7 mm. (12) -** Bozzelli a cuore da mm. 7 (Art.22/083)



N.B. Euromodel supplies M & N as heart blocks; technically they are fiddle blocks but commercially difficult to source and the heart blocks can be rigged in a ‘similar’ manner.

Non-Supplied Blocks P,Q,R,S & U

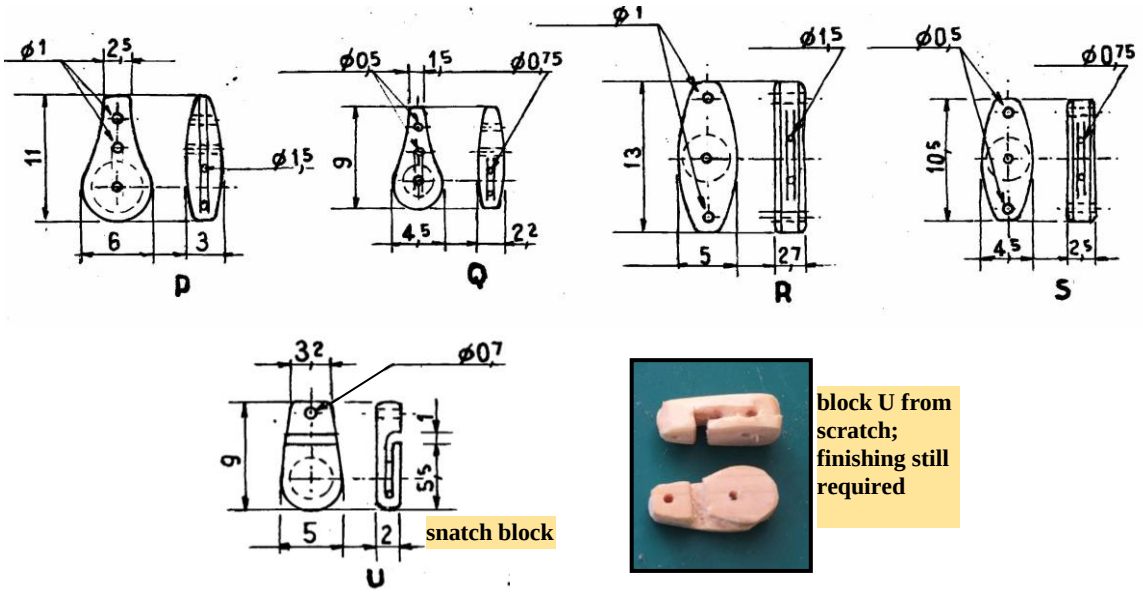
Euromodel drawings are renowned for their depth of detail and it is here that the ship builder may sense some frustration. The blocks are rather unique for this time period and in producing this kit, it was not possible for Euromodel to replicate these blocks as the cost of their exact production would be prohibitive. It is important to remember that the kit is only the basis for building a ship but the drawings show far more detail in many areas than would normally be expected.

The block drawings are a classic example – the detail is there for the enthusiasts to build their own blocks from scratch but alternative supplied blocks (**M**) that are physically quite different in shape *could* be used.

To the builder, this may seem a compromise but in the overall build, it will not be observed.

In this build there was no hesitation in creating blocks that were a replication of those shown in the drawings. This was not a difficult exercise but simply one that consumed much time and patience (many blocks were broken during this time). The exercise created an awarendess that production of such blocks would not be commercially viable.

P (4), Q (6), R (4), S (6) & U (4)



N.B. Close-up with the camera produces ‘unkind’ images showing flaws not normally observed. There are distinct variations between the block produced and the drawing – not deliberate but they occurred during production. A hole has been drilled for the spindle going through the ‘sheave’.

Standing Rigging Sequence

(some random thoughts)

Work proceeds from … ***bow to stern*** … and from … ***bottom to top***.

However, some builders will work from ***stern to bow*** and some will also work from ***top to bottom*** (the latter comment allows for work on each mast without the very wide lower yards in the way). In other words, it really comes down to what each person is comfortable with.

To add to this wide difference in approach, some will tackle the main mast first !

Success is dependent on … ***tension*** … and … ***counter-tension***. Consideration must be given to creating a tension in a rope and then taking into account the counter-tension being exerted by other connecting ropes.

1. **Masts** (especially bowsprit) fitted with any required blocks.

2. Mast Sequencing

- start with the bowsprit and then follow through aft with the fore, main and mizzen
- start with the mizzen and work forwards

N.B. if starting with the bowsprit fixed in position, some prefer to leave off the jibboom to lessen the chance of damage. Standing rigging added (including gammoning).

3. **Mast Fixing**

The alternatives for fixing the masts in position include …

- permament glueing of the foot into the hull
- using the standing rigging alone
- using a wax such as ‘Quick-Fix’ placed underneath the heel will definitely hold the mast in a fixed position and yet still allow for a bit of ‘tweaking’

4. Completed Mast or Not

- ***lower mast*** is stepped in position, or

- ***completed mast*** is assembled & stepped in position. Sometimes, an old office chair can be useful to rotate the ship instead of the builder moving around and so reducing the chance of causing damage.

- completed mast is ***assembled and rigged away from the ship*** before fixing in position

5. **Channels** added; lower deadeyes and chain plates in position.

6. **Main, Fore & Mizzen Lower Masts**
    a. **Shrouds** attached along with ratlines.
    b. **Stay lines** fixed in position.

7. **Backstays** (fore, main and mizzen) fixed in position.

8. **Topmast shrouds** (fore and main) attached along with ratlines.

9. **Etc** ……

… leave ***all lines & tackles temporarily fixed*** … until … ***all standard rigging fitted***.

Rigging Tools

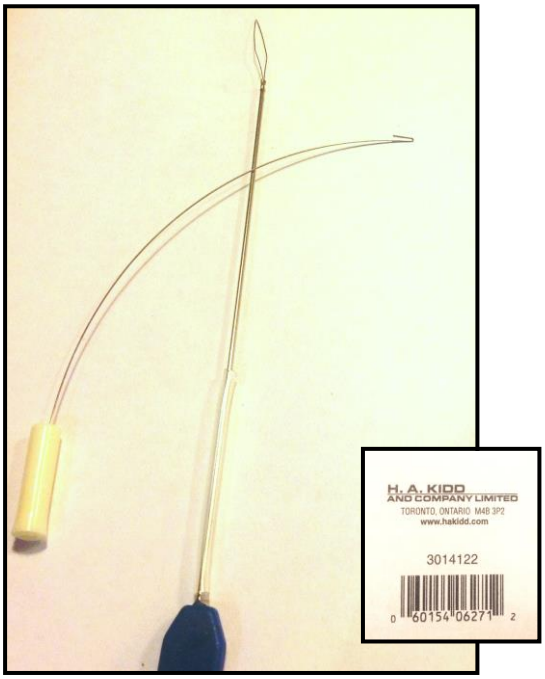


Figure 9: Two Rigging Tools

Needle Threader & Looper Threader

Whilst a normal needle threader is very useful, this combination of a needle threader and a looper threader which I came across is really fantastic to use. The threader is approx. 135 mm. in length which makes it a very handy length when getting amongst all the rigging.

Clamps

For the typically small rigging pieces/ areas of rigging, electronic 'micro-clips' are ideal ...

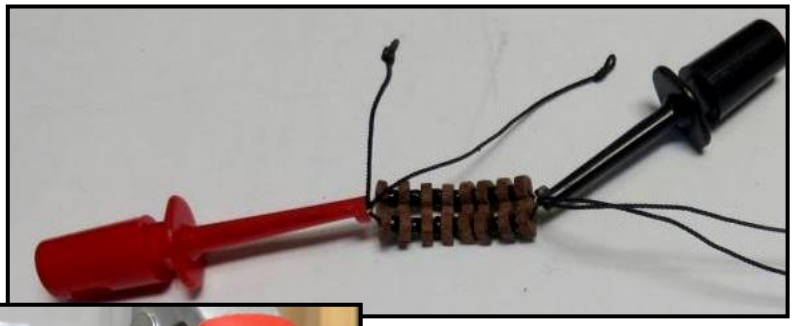


Figure 10: Small Clamping

Rigging Links

Scale Rope Hanks
YouTube: https://www.youtube.com/watch?v=bgWHqw4Pg8Q

MSW Forum: https://modelshipworld.com/index.php?/topic/1310-making-rope-coils/

Seizing a Rope or Line
YouTube: https://www.youtube.com/watch?v=nzDl5MYOgmQ

Supporting the Ship

The Dremel Portable Vice/ Vise Workstation Clamping Table proved to be an invaluable tool during the rigging process but at the same time also proved useful in holding/ clamping many other pieces during the construction process.


DREMEL

Chapter 3: STANDING RIGGING

Bowsprit

Gammoning

Historically, the lashing used was approx. 0.38 – 0.4 the diameter of the main-stay [i.e. ***0.8 mm***. c.f. 2.0 mm.]. In the drawings, the gammoning rope is shown as 1 mm. diameter. To prevent the gammoning from shifting aft down the bowsprit, there were usually five small cleats - one central and two each side. They were arranged to allow the gammoning to run straight which meant that the fore end of the cleats came above the aft end of the slit (Fig. 11 – red broken lines). The drawings show only three cleats.

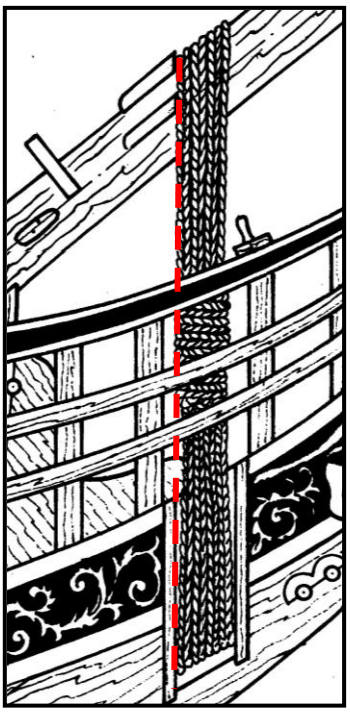


Figure 11: Cleat Alignment

Gammoning binds the lower part of the bowsprit mast to the ship's stem involving *seven turns*. The tension then enables the foremast stays in particular to be supported.

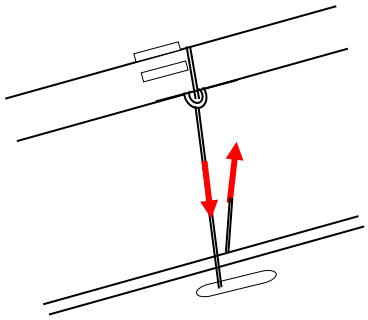


Figure 12: Beginning the Gammoning

Gammoning Method:

- off the ship, a small eye is spliced into one end of the gammoning line
- the opposite end of the line is then reeved through the eye and tightened so that the eye splice lies immediately below the bowsprit mast.
- the line then passes through the gammoning hole in the stem and up around the bowsprit (Fig. 12).
- each successive turn lays forward on the bowsprit and aft in the stem (Fig. 13) and this is what gives the gammoning its unique twisting shape. The gammoning heaving should be taut (without being excessive) during this process.
- The line is then frapped (circled around) the mid-point of the gammoning (Fig. 14). Lees [1948] states that the *number of turns on the frapping is equal to the number of turns around the bowsprit.* The frapping is pulled tight to pinch the gammoning in the middle - this means that the gammoning itself must not be too tight around the bowsprit, otherwise pulling the frapping will not be possible and the gammoning won't look right.

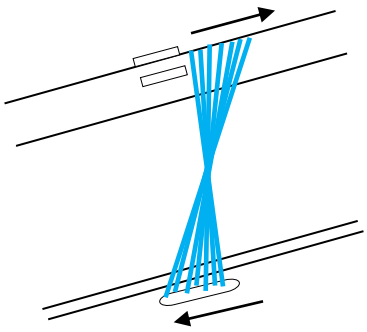


Figure 13: Successive Turns in Gammoning

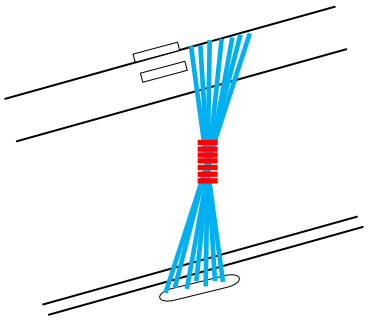


Figure 14: Frapping

Positioning of the slits and how they were used was quite variable over time without any hard and fast rule.

Sprit Topmast Backstay

Mondfeld (1989) refers to this rigging as typical of German ships around 1680 so again we have another historically accurate feature for this ship.

Most importantly, the sprit topmast must be firmly fixed or there is the inherent danger of it being *pulled back with the tensions exerted by other stays* (Fig. 15 vs. Fig. 16). It is generally acceptable to have no more than a 3º incline towards the stern but keeping in mind that this stay does not need to be as taut as the others (nor should it be obviously slack).

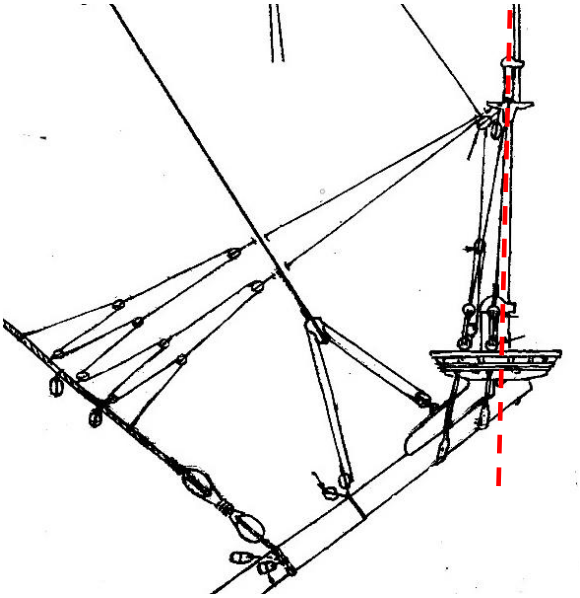


Figure 15: Sprit Topmast in Vertical Alignment

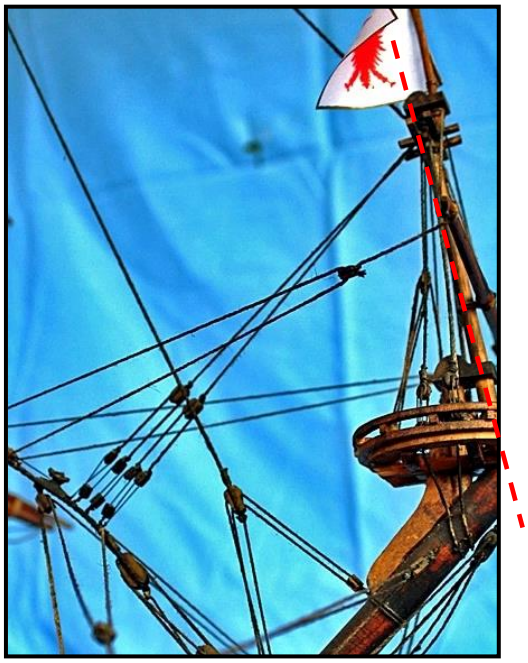
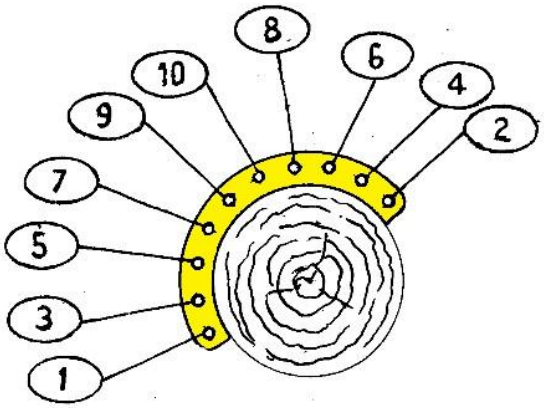
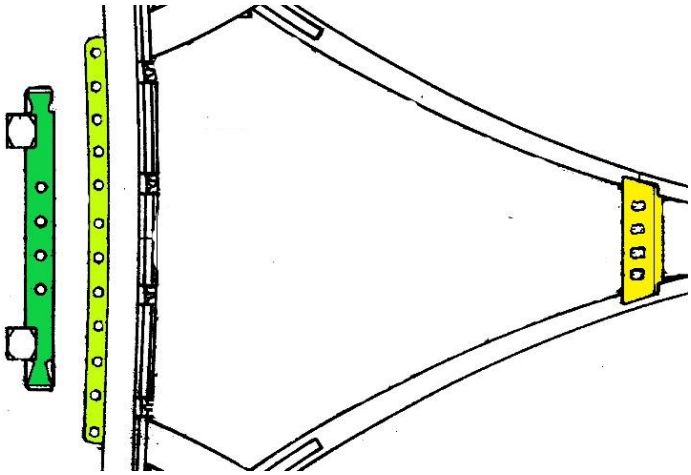


Figure 16: Sprit Topmast Pulled Aftwards Out of Alignment

Fairlead (bowsprit)





Shrouds

Generalised view of mast shrouds (not the FW) ....

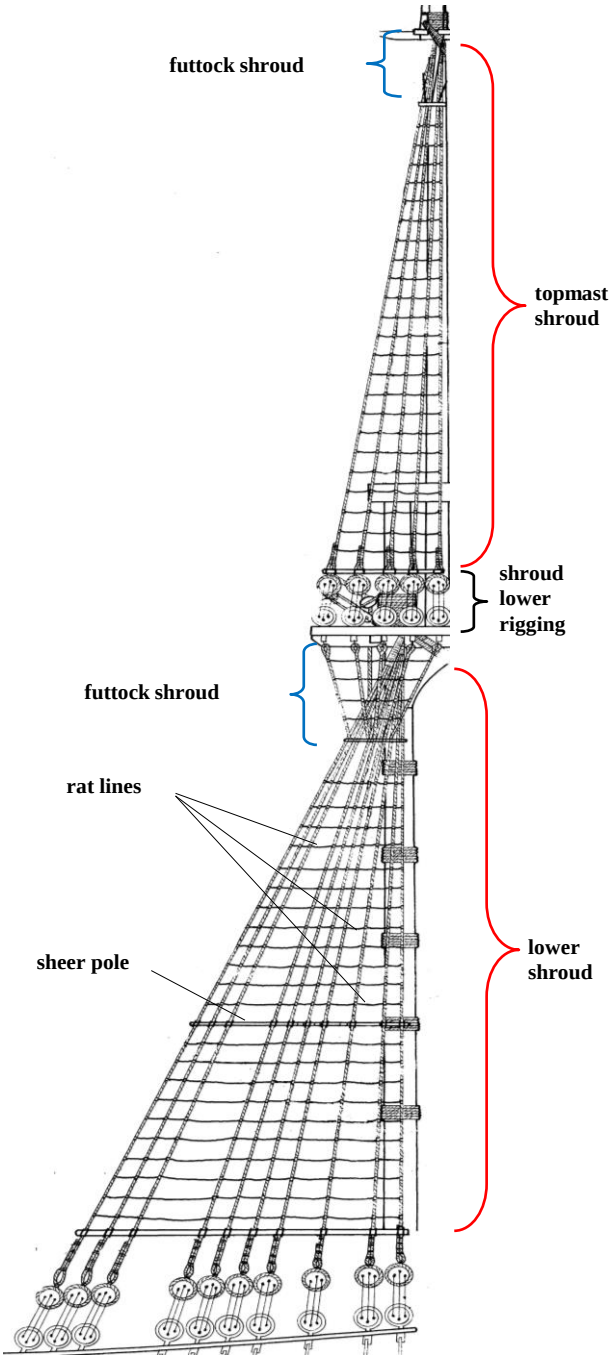


Figure 17: Mast Shrouds

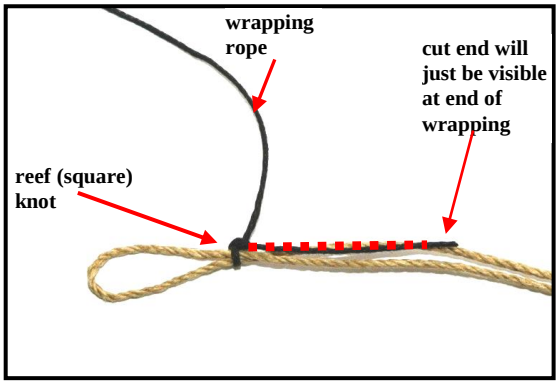


Figure 18: Shroud Collar Basic Seizing

Shroud Collar

There is an intricate way of doing the seizing but the simpler choice is most commonly used by most builders. It involves:
… a simple ***knot*** (e.g. reef knot),
….a few ***wrapping turns***, and then
… a dab of ***glue.***

In Fig. 18, one end of the seizing rope is laid down (broken red line showing the part hidden) on the ropes being seized, the other end is then wrapped around a number of times over these three ropes and held in place by glue. The other end of this seizing rope (indicated by the red circle), is then neatly cut back. ***This is the method that most will utilize !***

Rope Sequencing

Their fixing ('wrapping') around the lower mast is carried out in a specific sequence that *begins with the foremost pair* (main and mizzen) or a *single rope* (fore) *on the starboard side*. The sequence is explained in more detail below.

A 'shroud gang' was formed from one rope length well over double the distance from channel to masthead with an eye seized in the middle. The eye was very slightly larger than the mast girth and fitted over the mast with the two rope lengths coming down on the starboard side 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.

Figure 19: Shroud Sequencing

Lower mast shroud numbers …
7 foremast
8 main mast
4 mizzen mast

The fore lower mast first rope added was a single rope added to each side – this applies to the foremast only with all other gang shrouds added in pairs. Sufficient length should be left to allow for the ropes to wrap around the upper deadeyes and the short lengths seized.

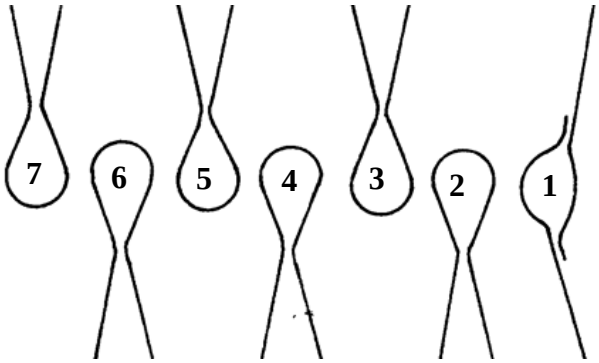


Figure 20: Foremast Shroud Sequencing

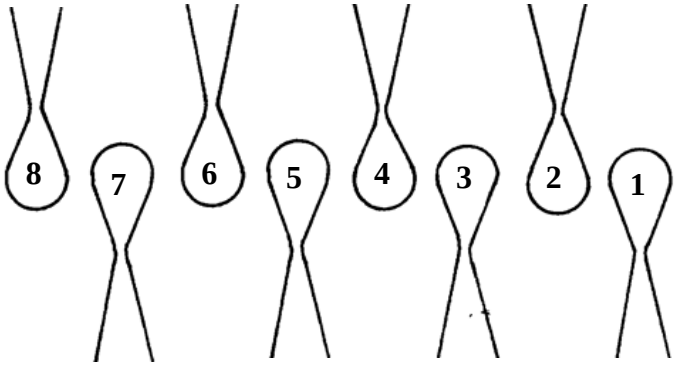


Figure 22: Main Mast Shroud Sequencing

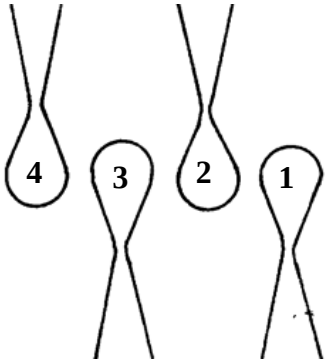


Figure 21: Mizzen Mast Shroud Sequencing

Deadeyes & Chain Plates

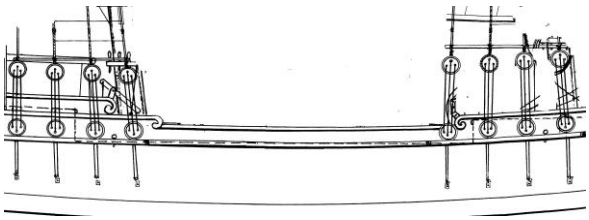


Figure 23: Fixing the Shrouds

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

Alignment of Lower Deadeyes & Chain Plates

The correct positioning of the lower dead eyes that will be fixed into the channels is essential since they will not be evenly spaced apart.

The position of the *foremost* and *aftermost* shrouds need to be established – red lines in Fig. 24. Other shroud positions in between these (blue lines) can then be determined by lines of best fit between gunports, etc (Fig. 25 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.

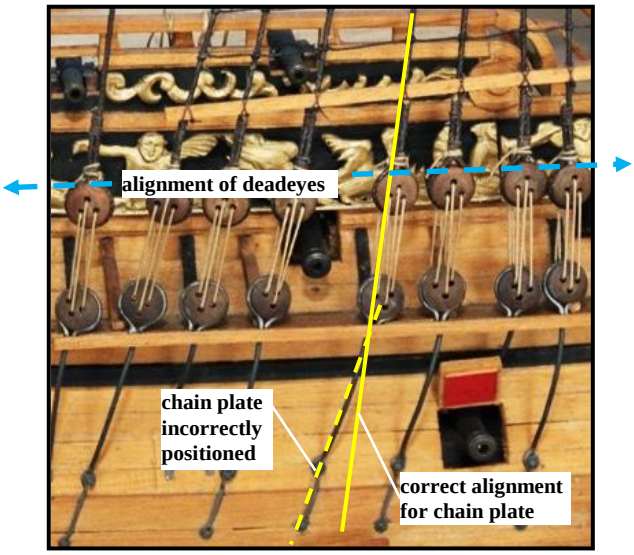


Figure 25: Lack of Alignment Through the Channels

Fig. 25 illustrates the difficulty in producing the theoretically correct alignment whilst Fig. 24 *is* correct. In this latter image (of the RW foremast) can be seen the uneven distribution of the shrouds necessitated by the presence of gun ports.

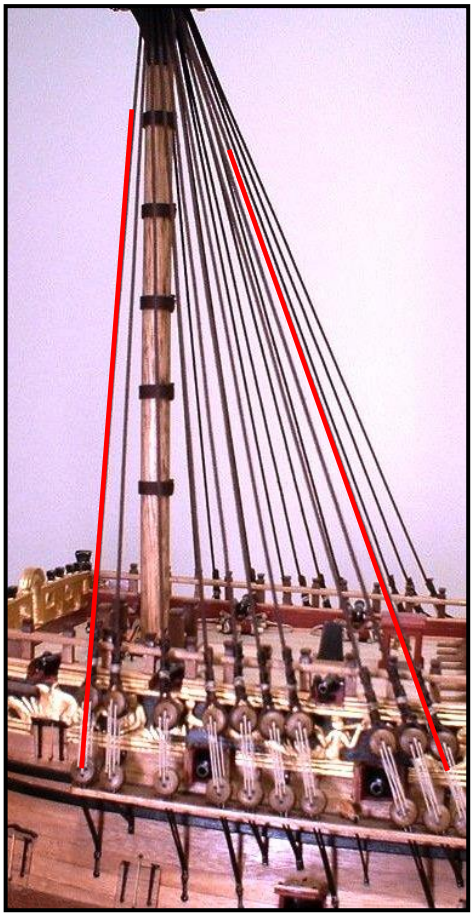


Figure 24: Correct Alignment of Chain Plates

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 is produced (***not for the RW but the same principles apply***) from the Model Ship World Forum written by Gene Bodnar. Thanks Gene.

"A balsawood jig (Fig. 26) 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. 26.

Figure 26: Shroud Jig 2 (not the RW)

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, the rope is arranged so the wrap-round occurs at the top and in line with the upper deadeye line. Ropes are sealed with a drop of instant glue – without applying glue to the deadeye! This process is repeated alternately from port-starboard-port etc.

The deadeye must have the correct orientation. Each line should tie up with the same tension with the deadeyes being at the same level (well, almost).

Figure 27: Short End of Shroud Rope

Seizing the Shroud Rope

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. 27 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.

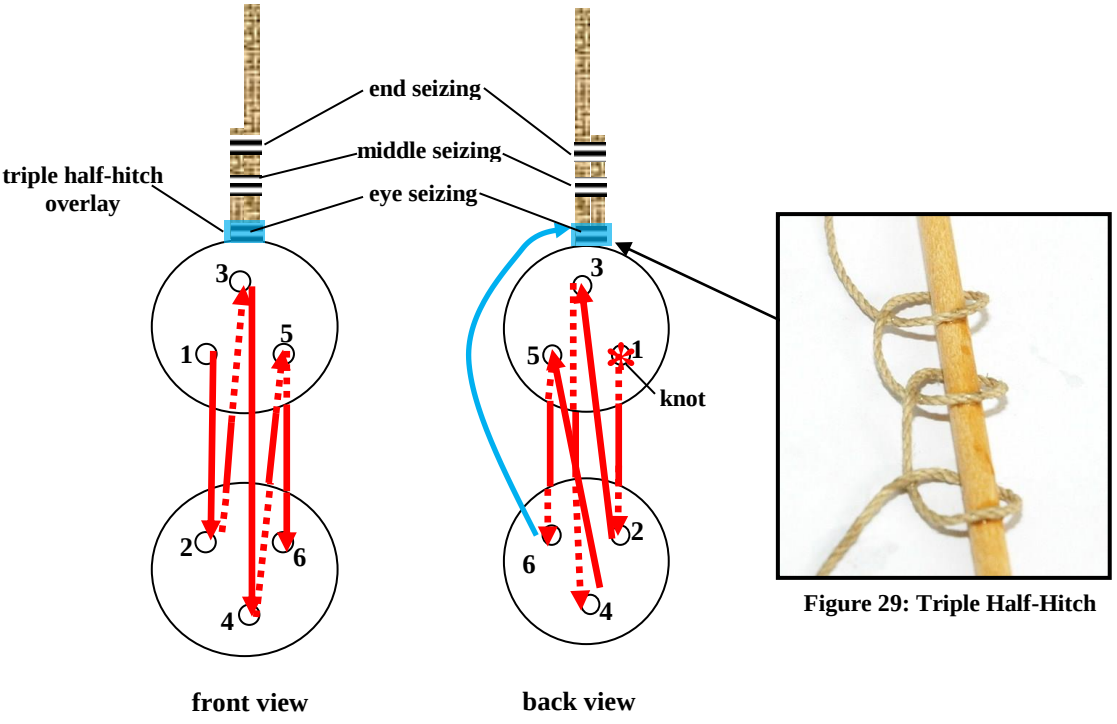


Figure 28: Order of Deadeye Rigging

Figure 29: Triple Half-Hitch

Deadeye Rigging

Rigging the deadeyes once they are mounted is a straightforward task (adding a sticky label to each rope with a number to identify each shroud can be useful). Fig. 28 illustrates the sequence normally involved in rigging the deadeye. Until that is completed, ignore the seizings included in the figure.

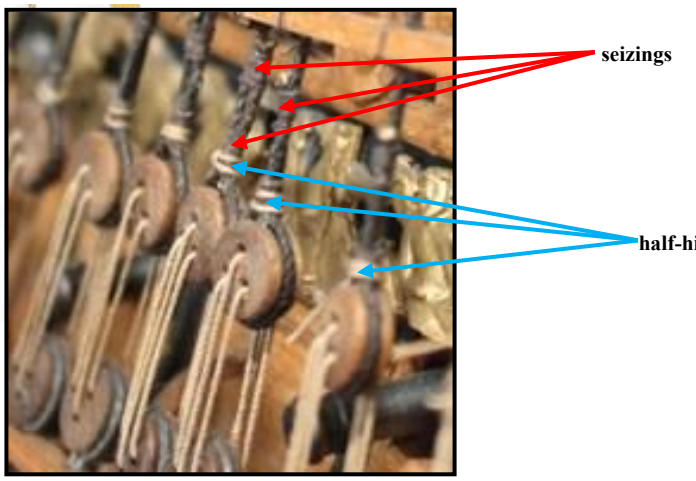


Figure 30: Seizings and Half-Hitches

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. 28, 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. 30 shows an attempt at creating a knot/ hitch of some sorts but is not the hitch described above - 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. 29. 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.

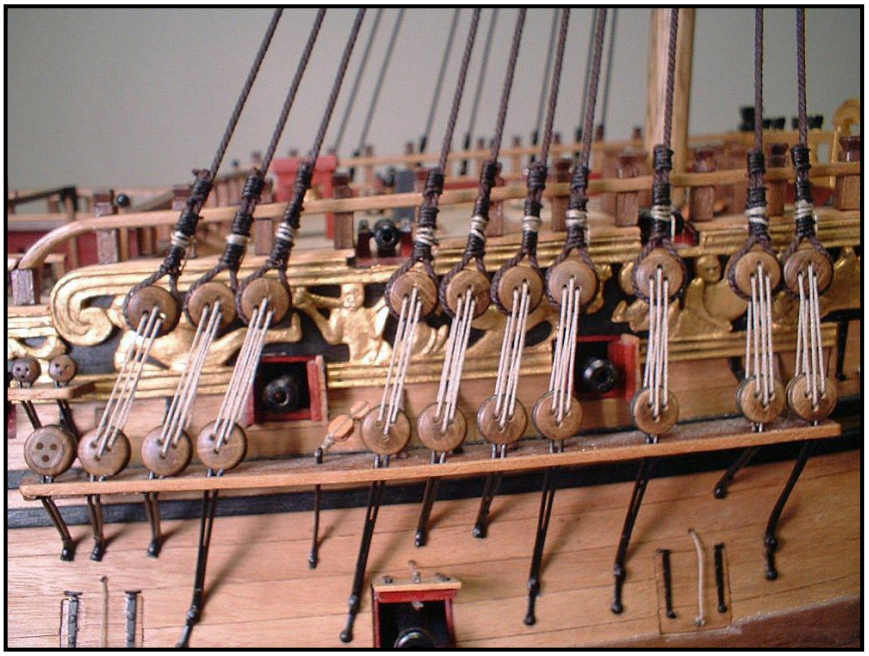


Figure 31: Deadeye Rigging (not FW)

Ratline Rigging

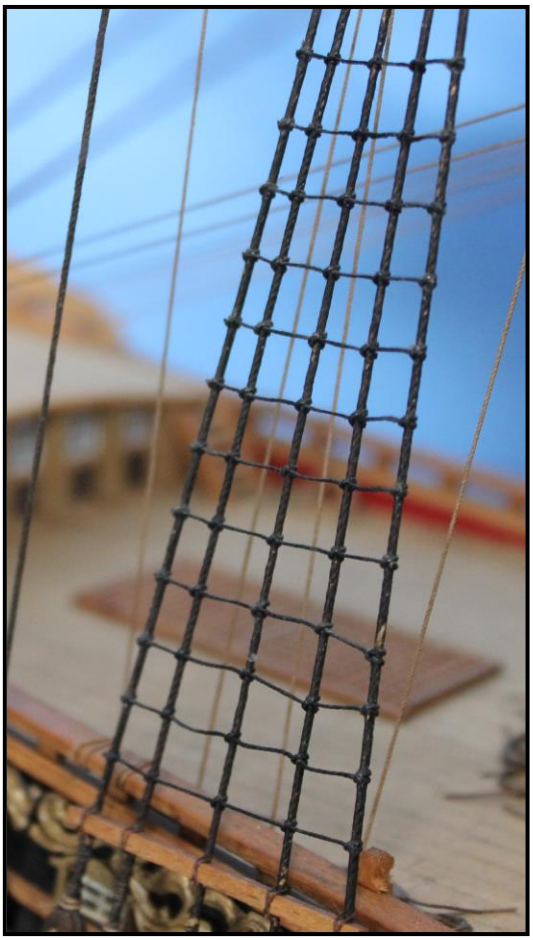


Figure 32: Ratlines

Irregularity

Fig. 32 illustrates 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. However, the futtock shrouds (Fig. 33) will be uniformly spaced.

Figure 33: Ratlines in Futtock Shrouds

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.

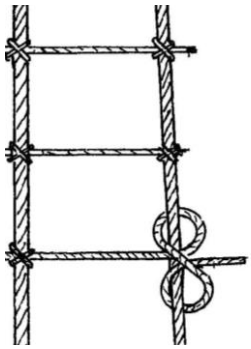


Figure 34: Seizing Ratlines

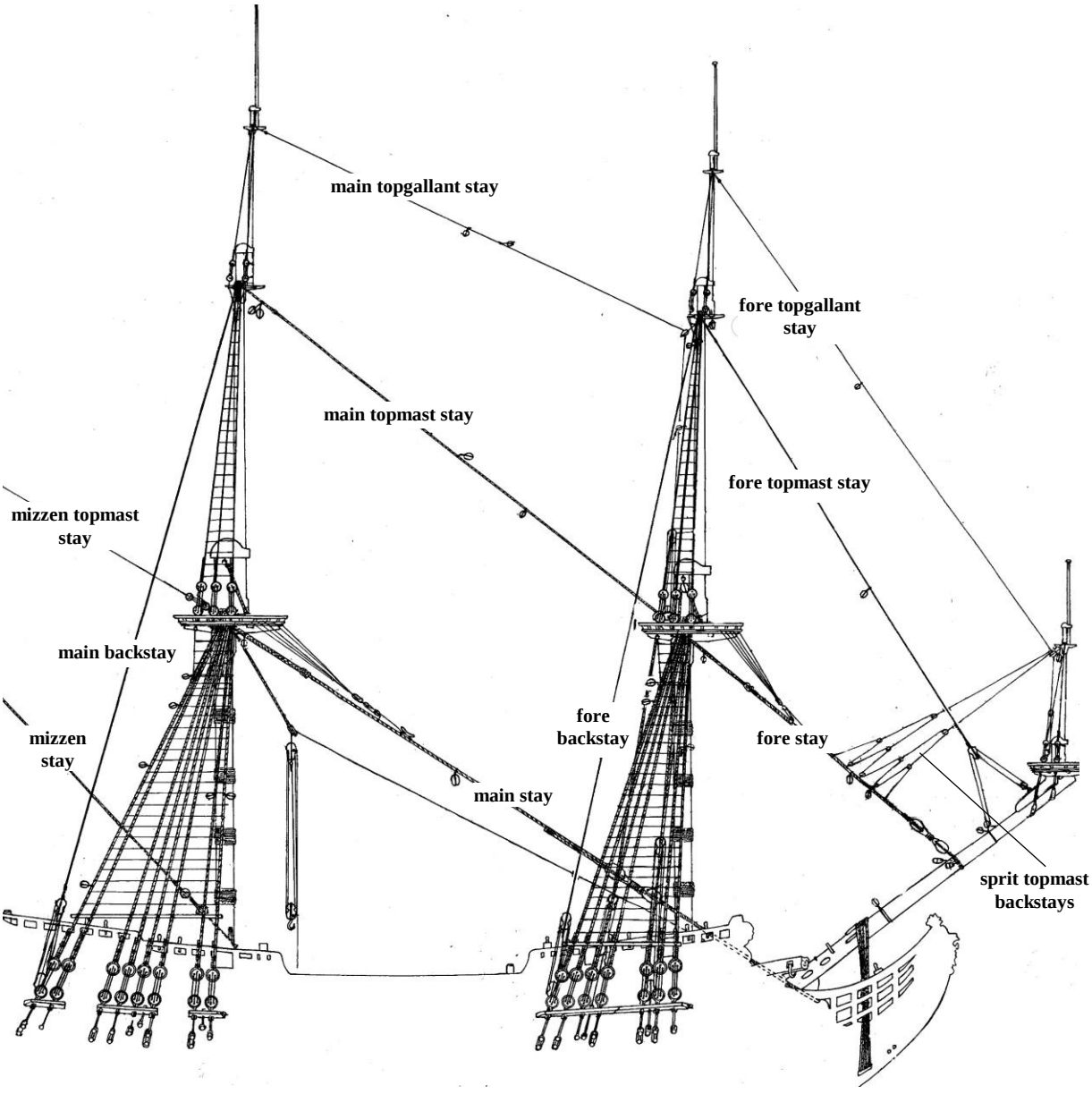
Rigging

Ratlines were spaced 13 – 15 inches apart which translates to ***4.6 – 5.3 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

Stays and Backstays

This ship had a series of lines – *stays* - that connected the masts in such a way as to create a tension from the bow to the stern giving stability to their upright positioning. To increase this stability, preventer stays were introduced (around 1700) after this ship was built and correctly are not shown in the drawings.



Stay Mouse

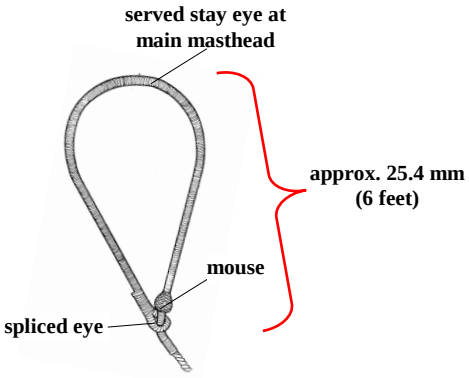


Figure 35: Stay Collar

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

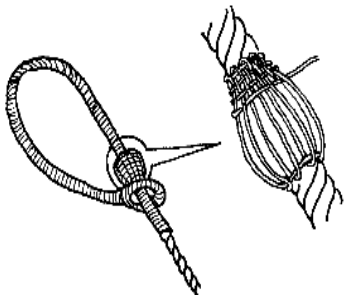


Figure 36: Stay Mouse

Figure 37: Stay Eye Without a Mouse

A woven texture is a feature of the mouse which contrasts strongly with the served collar.

A ***majority of builders avoid producing the mouse*** *(Fig. 31)* and yet it can be created with a high degree of accuracy or simulated to look realistic. Some approaches include using cotton wool packing which is then covered over with rope or the utilisation of a self-adhesive bandage to simulate the intricate weaving ! The latter interesting approach is to be found on MSW forum. Even if this method is not fully followed, there are some useful techniques that could be used.

Without getting too carried away with the complexities of the mouse and eye, Fig. 32 illustrates an effective method of construction.

Figure 38: Simplified Mouse and Eye

Toprope

Main Mast and Foremast Top

[Fig. 33 illustrates the principle for toprope rigging but is a drawing from a different ship model]

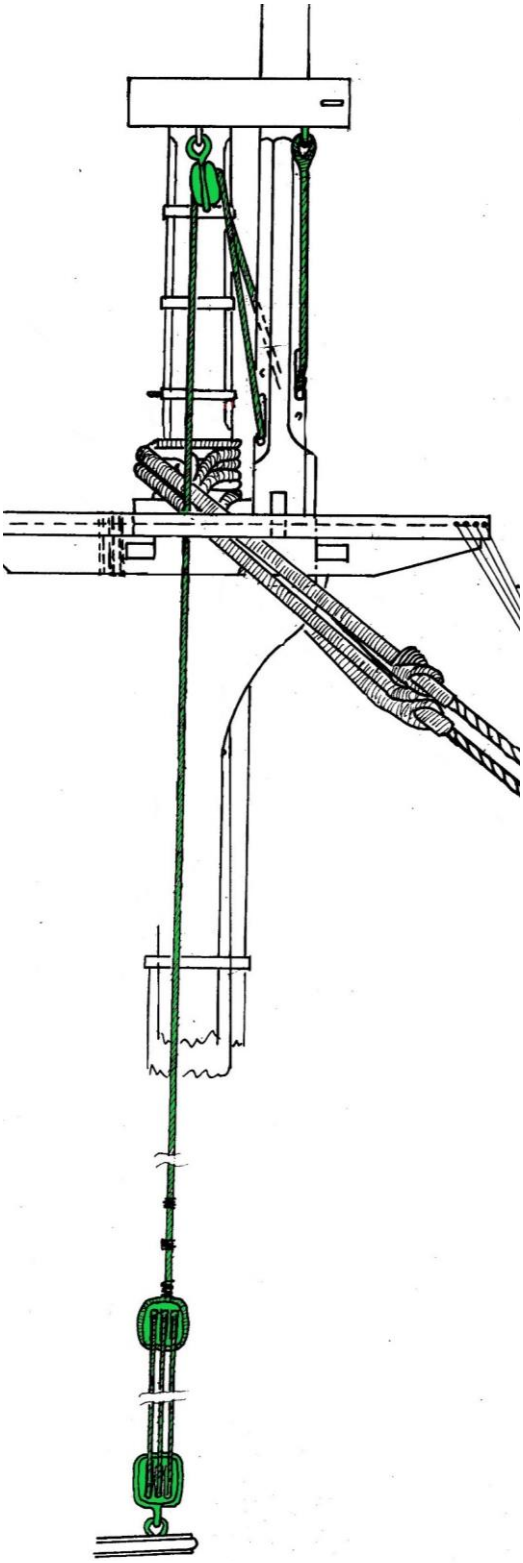


Figure 39: Toprope

The ***toprope*** (green) was used to raise or lower the topmast. To follow historical accuracy, *two* sheaves are required in the heel of the topmast. However, this line was only rigged when required so ***in a functioning ship with all its spars in position, it would be absent***. The only signs of it would be the four eyebolts under the mast cap and those on the respective channels.

There appears to be no evidence of the top rope rigging for this particular ship except for Plan Sheet 6 where sheaves are distinctly indicated (fig. 34) in the heel of both the fore and main topmasts.

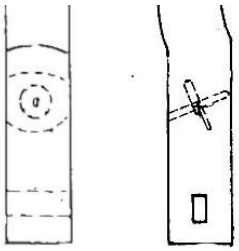


Figure 40: Toprope Sheaves

The top rope lines are pass through a tackle and belayed to an eye bolt on the respective channels.

Most builders tend to ignore both the heel sheaves and the actual line but may include the mast cap eyebolts.

Figure 41: Crowsfeet Rigging

Top Crowsfeet

The following text refers to the lower fore and main mast tops – the forward edge in both cases has ***nine holes for both masts*** (assuming that the count represents each side, then there would be four and one common on the centre line.

Lees, 1984, 44 offers an alternative approach where the *rigging holes in the rim are vertically formed* rather than horizontally through the rim… "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 the previous lead through the top."

Given the fragile nature of the round top, Lees comment about drilling through the top surface of the rim seemed a more suitable way to go and Fig. 36 follows Lees method but …

Plan Sheet 1 of the complete ship shows euphroe rigging with 4 lines
Plan Sheet 7 of the standing rigging shows 5 lines
Plan Sheet 7, Particolare 3, euphroe block has 6 holes but drawing of the block by itself shows only 5 holes.

In summary, the blocks will have 5 holes with rigging described in Fig. 36.

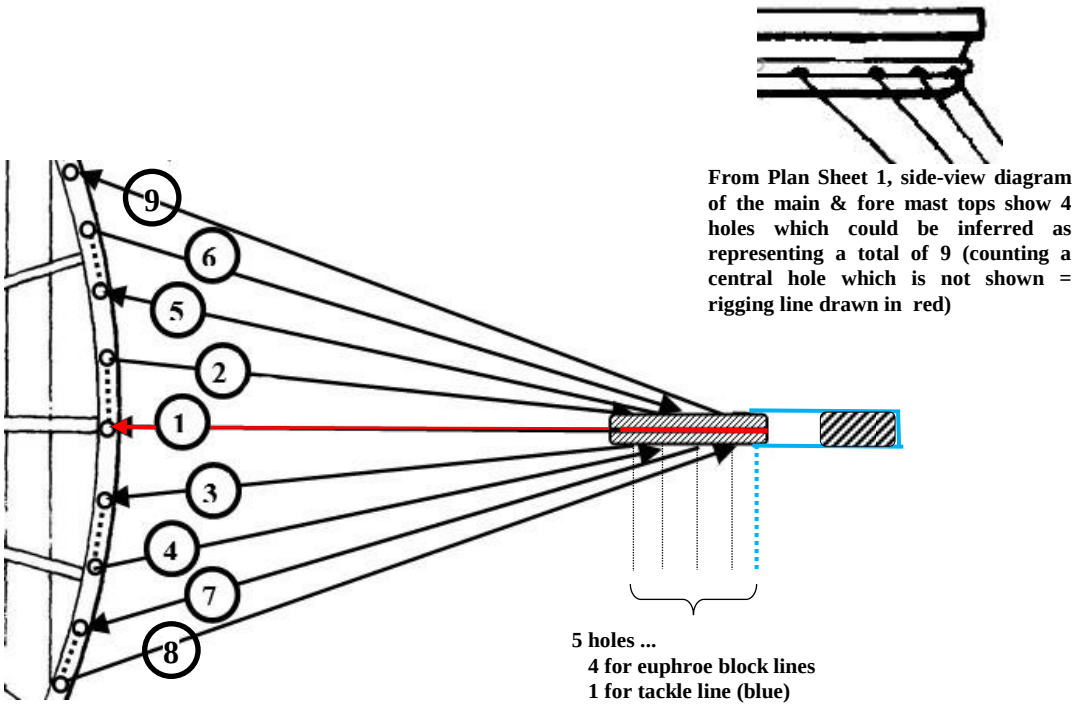


Figure 42: Euphroe Rigging

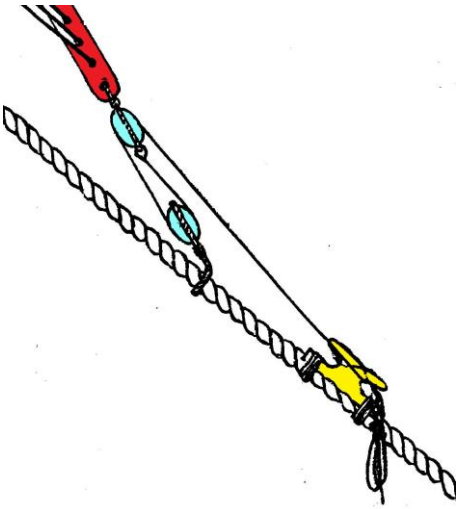


Figure 44: Euphroe Tackle

Euphroe Tackle

By the 18th century, its shape had become simply a long block (red) with ***parallel sides*** and containing a number of holes. Shaped eurphroe blocks were created *after drilling two sets of holes first* in one length of timber sufficient to create those blocks. A groove was cut around the outside surface of each of the two blocks so formed.

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