TRANSLATION LINKS

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

A research paper including an *interpretive* build

Royal William

1st. Rate English Vessel

Originally launched in 1670 as the 100-gun HMS Prince
Re-built and launched in 1692 as the HMS Royal William
Finally re-built again and ...

Launched 1719

Scale 1:72

Checked the Resource Information File ?

06.UPPER DECKS

September 2021

This *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 MSW member piratepete007. [Additional & exceptional support was gratefully received from MSW members **marktiedens, Ken3335, Denis R, Keith W, Vince P & Pirrozzi.** My sincere thanks to them and other MSW members who gave advice and gave permission to use some of their posted photos.

This is not an instructional manual but is a collaboration amongst a number of MSW members whose interpretations were based on the drawings and the supplied kit.

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

Model Ship World Forum

I am indebted to those members who were, or are, involved in their own build of the Royal William and have allowed me to add photos from their posts – but not utilising their personal text - in the belief that the images could add both a stimulus and an interest to new builders of this ship. So my grateful thanks go to … Brian C; Denis R; KeithW; marktiedens; Vince P, Ken3335

They have taken the RW build to a much higher level than intended by this kit.

Reference Texts

Fighting at Sea in the Eighteenth Century; The Art of Sailing Warfare by Sam Willis (2008)
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).

For the purposes of discussion, this ship is considered as an 18 C build.

Content

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

Illustrations

[The figures below are not hyperlinked]

Chapter 1: QUARTER, UPPER QUARTER & POOP DECKS

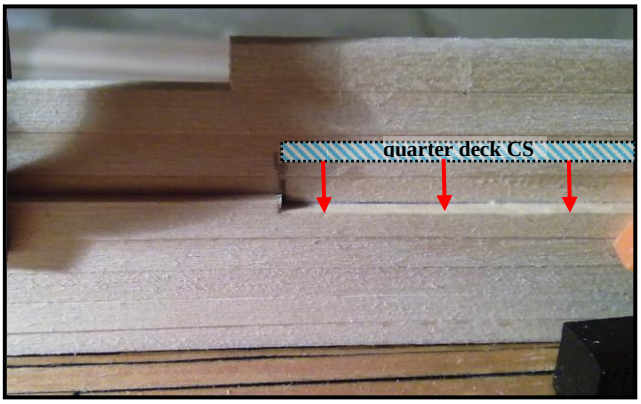


Figure 1: Quarter Deck Supporting Ledge

Quarter Deck

Installation

This deck was planked before installation.

The double planking against the inner bulwark with the first planking material was continued past the Main Deck creating a supporting ledge under each side of the Quarter Deck (Fig. 1). The Main Deck surface has a ***slight downward longitudinal curvature*** as shown by the red line in Fig. 2.

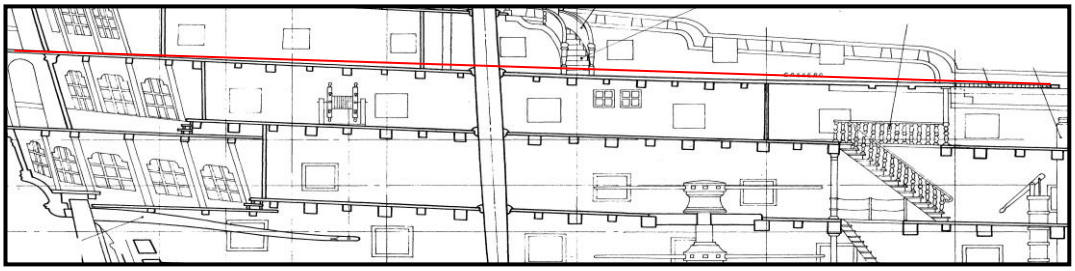


Figure 2: Quarter Deck Concave Depression

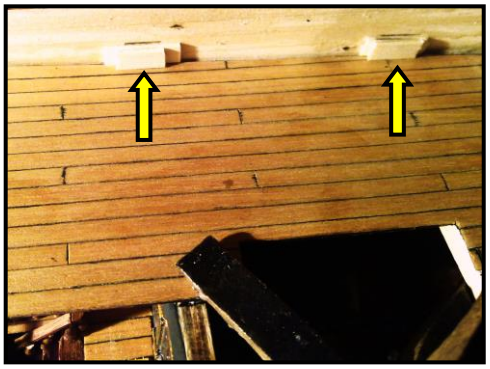


Figure 3: Holding Quarter Deck in Position

To assist holding the deck halves in place whilst maintaining the deck camber and the longitudinal depression, some temporary blocks were glued onto the inside surface of the bulwarks as shown in Fig. 3. The mizzen mast fit was checked and some important adjustments were needed (refer to mizzen mast inclination). The mast then served as an excellent guide for the final positioning of the quarter deck. However, before putting in the deck halves, the main deck was coated with a matt finish lacquer.

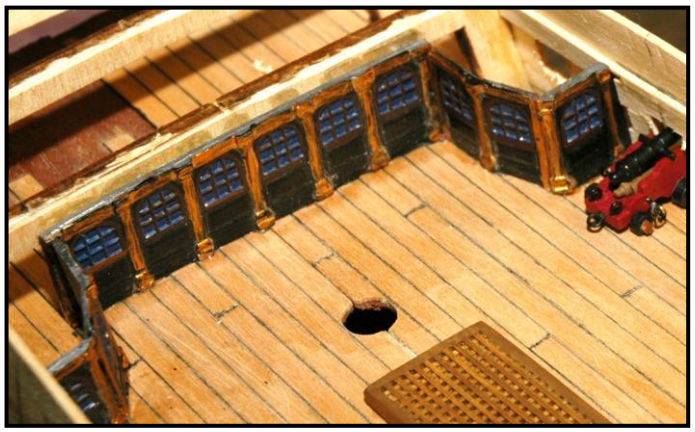


Figure 4: Quarter Deck Bulkhead

Bulkhead

The five metal pieces that make up the bulkhead (cabin fascias) on the quarter deck were then painted and installed (Fig. 4). The cannon visible in the figure is not in a fixed position.

It is essential that half-gun supporting blocks be installed before fitting the upper quarter deck (see below).

Armament & Half-gun Supports

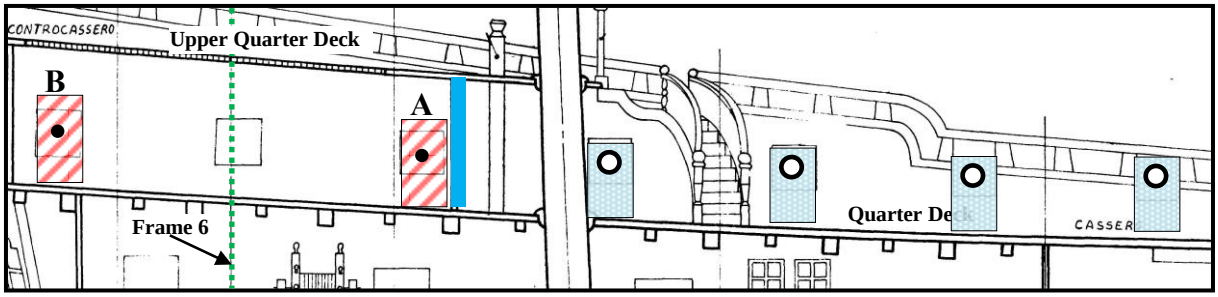


Figure 5: Quarter Deck Armament & Half-gun Positioning

Figure 6: Using Completed Gun Carriages to Determine Gunport Height

There are eight **complete cannons** on the open deck (i.e. in front of the bulkhead) – shaded blue in Fig. 5.

Fig. 6 shows cuts made through the double first planking for the two gun openings on the starboard side that are not actual 'gun ports' but openings through the balustrade ornamentation. The cuts are slightly less than the finished dimensions to allow for final trimming. Finding the correct positioning for these (and other similar openings) illustrates the absolute necessity in producing the gun/carriage assemblies before reaching this stage.

There are also four **half-guns** (shaded red in Fig. 5)…

two half-guns mounted directly behind each of the side cabin fascias
two half-guns mounted further back.

Bulwark Inner Planking

Before fixing in the upper quarter deck, the bulwark walls either side of this deck were planked with the second planking walnut strips, trimmed around the gun port openings and sanded.

Waterway

A further refinement often not done is the addition of fine strips (i.e. the *waterways*) along the edges between the bulwark walls and the decks. The kit does not provide for this addition.

Armament Consideration

With the inner bulwark lined with the second planking in position, consideration needs to be given to the armament configuration. The majority of builders will opt for the easier choice of installing the guns & carriages without any rigging – and that is the intention of the plan drawings in this kit.

If you do go with the rigging, this then entails quite a number of eye-bolts to be deployed on the deck and bulwark surfaces. This applies especially to those associated with the guns underneath the curved staircases. The extra pieces of hardware (such as rope and eye pins will need to be purchased – again if you have gone this far with buying the kit, why not go a little further?

Gratings

There was a definite dimensional difference between the gratings for the quarter & upper quarter decks when looking at the drawings and when viewing the plywood cut-outs in the decks. It was decided to produce gratings for both decks the same size from two sets of grating pieces each. The cut-out size shown in the drawings was used as a guide. Here was an opportunity to decrease wastage. For each of the two gratings, 2 x [15 + 9] grate pieces were used – refer to Fig. 7.

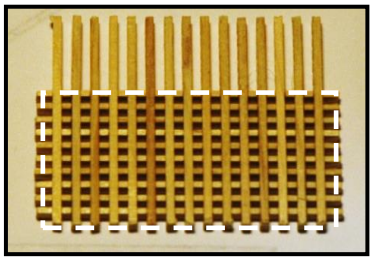


Figure 7: Minimum Grate Strips

- **Edging: 2 mm. wide x 3 mm. high**
- **Finished grate dimensions: 32.0 x 21.5 mm.**
- **No. of grate pieces required: 100**

Breast Beam

The quarter deck has the aft edge supported by a breast beam. On a real ship, it is rebated to take the planks but on this model it is glued onto the edge of the deck.

Figure 8: Quarter Deck Breast Rail

Plan Sheet 2 shows that the distance from the centre of the mizzen mast to the outer edge of this deck is ***16.1 mm***. Since this includes the 'beam', the plywood deck supplied was reduced in length by the width of the timber used as the beam (e.g. if the beam is ***3 mm.*** wide, then the length should be reduced by ***3 mm.***).

Like the forecastle deck, the beam in its basic form consists of a strip ***3 x 3 mm.*** on aft edge, and a strip of ***1 x 6 mm.*** underneath adjacent to ***3 x 3 mm.*** … and that is a reasonable structure to create to support the deck. Two 'hanging knees' behind that were also added.

From Plan Sheet 8, it is reasonable to deduce that there are two columns underneath the Quarter Deck to aid in its support. So again there are a few things you could do to improve this construction!

Figure 9: Mizzen Mast Collar

Mizzen Mast Collar

This important supporting/ sealing ring was originally made from a series of wedges driven into the mast hole opening around the mast and then covered by a 'mast coat' of canvas. Builders frequently utilize a wooden ring fashioned from some thin scrap timber but in this build a cast metal ring that simulates the wedges was used. This collar is easily installed ***after*** the upper quarter deck is fixed in place – fixing in place at this stage restricts any adjustment needed when seating the mast.

Mizzen Mast Inclination

From Plan Sheet 17, the angle of inclination of the Mizzen Mast to the Quarter Deck was measured at 94°. A cardboard template was cut out and with the mast in position, adjustments to the hole in the deck and to those in the decks below were made with a round file.

Upper Quarter Deck

Deck Length

Fig. 10 shows the length of the laser-cut deck compared to the drawing in Plan Sheet 2. The excess length was cut off.

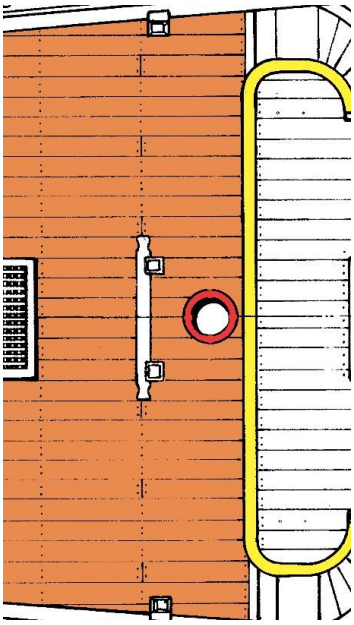


Figure 11:Length of Upper Quarter Deck Compared to Mizzen Mast Opening

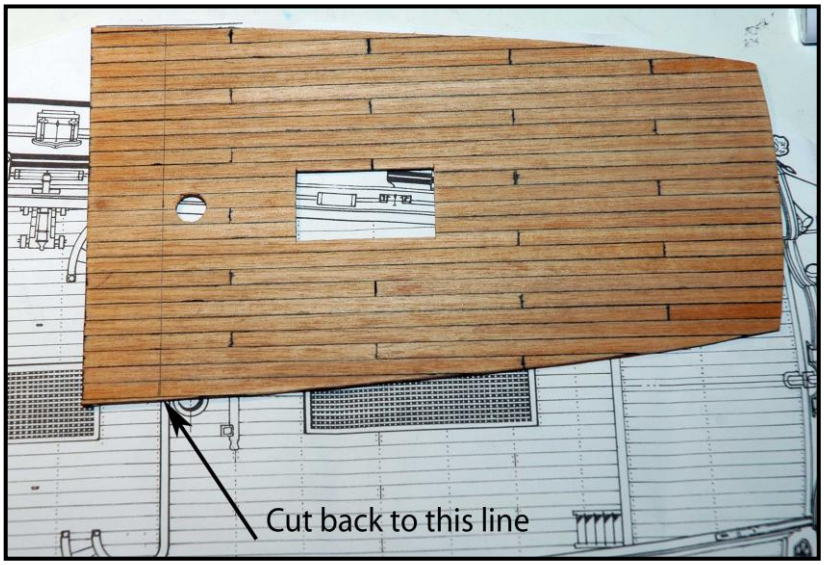


Figure 10: Shortening of the Upper Quarter Deck

Some careful sanding along the side edges produced a close contact with the bulwark lining. Again, the alignment of the mast holes (for the mizzen) ensured the correct position for the deck.

Consideration ***must*** be given to the installation of a deck beam as for the quarter deck.

Construction

There are four half-guns mounted under this deck and they need to be installed first.

Poop Deck

Implementation
Measurements from Plan Sheet 17 are necessary to produce the slope of the bulwark that partly exists on the upper quarter deck. Fig. 12 illustrates this point.

Figure 12: Bulwark Slope on Upper Quarter Deck

Figure 13: Bulwark Edge Lower Than Deck

In creating this slope, it should be evident that it has a slight downward longitudinal curvature. Also, its upper surface is **set slightly below the abaft edge** of the upper quarter deck (Fig. 13).

Metal pieces 11194/95 can be used to determine the final height required for the hull planking where it meets the transom. The yellow line in Fig. 14 shows how the upper edge of the bulwark determines the lower edge of the metal piece. In this build, the planking needed to be approx. ***24 mm.*** above the upper quarter deck at the aft end before cutting back.

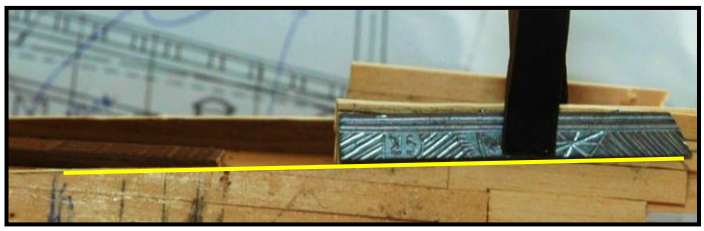


Figure 14: Metal Piece 11195 Alignment

The poop deck is ***not*** level with the upper quarter deck. Instead, the aft area immediately above the end of the upper quarter deck is **3.3 mm.** higher than it is at the abaft end. This causes the poop deck to have an inclination matching that of metal pieces immediately below (and not the deck).

A useful tip at this point: the plywood deck is soaked in water and then strongly clamped down onto the top of the curved metal cabin piece. After prolonged drying, the plywood then has the required curve. It is far easier to do this now than later when the deck is being finally fitted in place.

The cast metal forming the cabin front fascia required significant reduction in its width & height. Of significance, working from Plan Sheet 8, there was the sudden realization that if the finished height of the poop deck was to be maintained (and that was important with respect to the railings), then the metal cabin fascia was too high. Also, the plywood piece supplied for the actual deck that had to be planked resulted in a thickness of ***2.9 mm.*** vs. ***1.0 mm.*** in the drawings.

The combined height of the planked plywood + metal fascia as supplied = ***26.1 mm.***
The same combined height from Plan Sheet 8 = ***22.8 mm.***

This gives a significant difference of *3.3 mm.*

Figure 15: Poop Deck Bulkhead (another build)

It became apparent that placing the metal fascia on top of the planked upper quarter deck was compounding the height error up to a total of ***4.3 mm.*** This latter aspect was eliminated by painfully cutting out the narrow strip of planked decking underneath the metal. The former error was reduced by filing off ***1 mm.*** thickness from both the top and the bottom of the metal fascia.

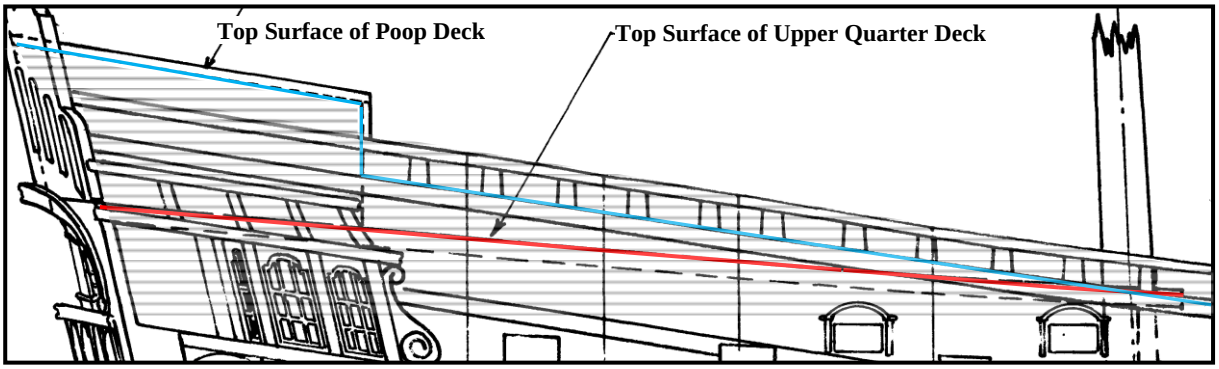


Figure 16: Poop Deck and Planking

1. The **red line** indicates the ***slightly concave surface*** of the upper quarter deck.

2. The **blue line** (in part) indicates the ***upper finished slightly concave surface edge*** of the sloping bulwark along the upper quarter deck. The aft section of the blue line indicates the extra planking needed to form the cabin sides.

4. The ***pale grey line-shaded*** area under the blue line indicates the planking. The height that forms the cabin sides is determined by the positioning of pieces 11194/95.

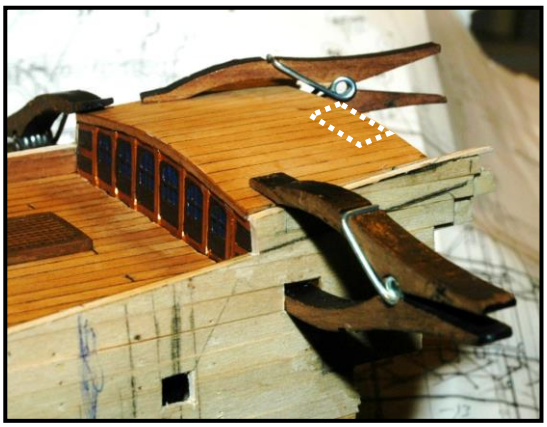


Figure 17: Last Minute Improvisation for Clamping

Installation

It would be useful to insert a small block (e.g. 10 x 20 mm.) underneath the deck to assist in supporting the flagstaff/ ensign staff at a later stage (refer to Fig. 42 on page 22 of RW.05)

Although the deck had been carefully bent to fit the shape of the cabin bulkhead, some pressure was still required for a tight bond between the deck and the metal. A hole (not an extra gunport) was cut out to allow a clamp to be put into place (Fig. 17).

Chapter 2: ACCESSORIES – PART 1

Rudder Blade

The blade is not supplied with cut-outs for the pintles ('rudder irons') with the reasoning that the easiest approach for a basic builder would be to add the pintles *over* the blade. The problem is that this generates a large gap between the rudder and the stem post, but in the scheme of things, this gap will not be noticed. Alternatively, Fig. 18 illustrates a common approach taken by builders in creating cut-outs.

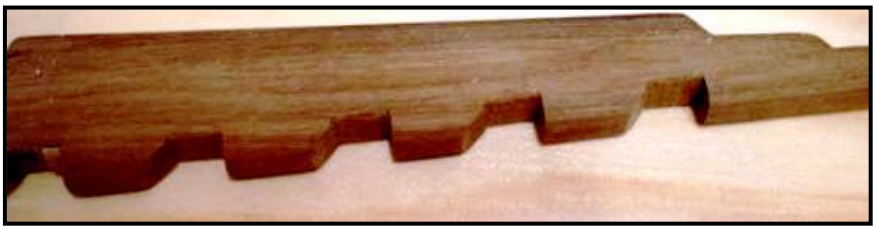


Figure 18: Modifying the Rudder Blade

Positioning the Pintles

The hinge/gudgeon pin (Fig. 20) components of the pintle can be placed *into* cut-outs to prevent the rudder assembly from being too far out from the stern post...

...or ...

... strips of extra timber called 'bearding'(Fig. 19) can be added to the forward edge of the blade, therby forming suitable gaps for the pintles.

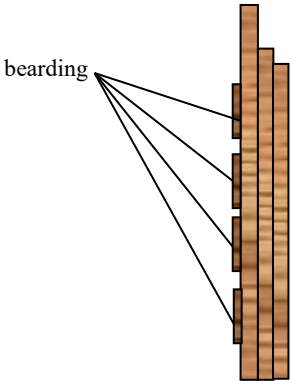


Figure 19: Typical Rudder Bearding

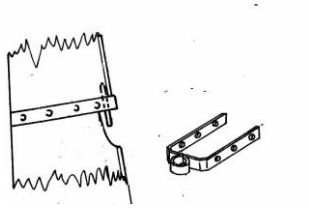


Figure 20: Hinge & Gudgeon Pin

Fig. 21 is from another build where the blade has notches cut into it. In this build, bearding was added.

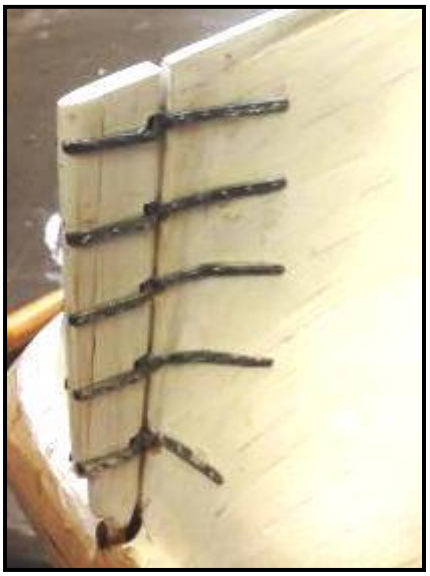


Figure 21: Rudder & Stem Pintles

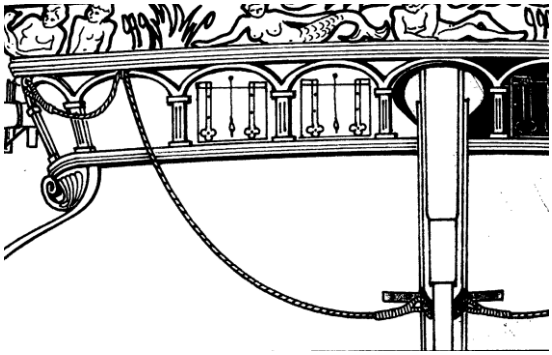


Figure 22: Rudder Pendant

Rudder Pendants

At the first rudder iron down, an eye pin and ring were inserted on each side to anchor the rudder pendants (ropes that could be used in the event of tiller damage). Where the ***1.0 mm.*** pendant rope passed through the hull, they were glued in position.

A more thorough discussion on the rudder pendant tackle is to be found in RW.03.

The rudder was modified by :

- tapering,
- representing rudder as made from a group of timbers.

These aspects could all have been ignored but they are shown in the drawings.

Tapering

In Plan Sheet 9, there is a drawing that indicates tapering of the rudder. The following **vertical tapers** were created...

- aft edge from ***7.0 mm***. to ***3.5 mm.***
- inner edge from ***7.0 mm.*** to ***5.5 mm***.

Composite Timbers

Historically, the rudder was made up with three or four lengths bolted together, each one stepped down in a "hance" to the rudder post. So deep lines were cut down either side of the blade to simulate the use of ***three timbers*** in creating the rudder blade.

Ship's Wheel

The ship's wheel , abaft of the mizzen mast, is on the quarter deck and cannot be seen. Therefore, its construction was omitted... but the enthusiast may wish to include it along with the associated full tiller arm ?

The rudder blade was controlled by a tiller arm that passed into the ship through a hole in the counter and the movement was actuated by ropes that were wrapped around a barrel controlled by the ship's wheel – Fig. 23

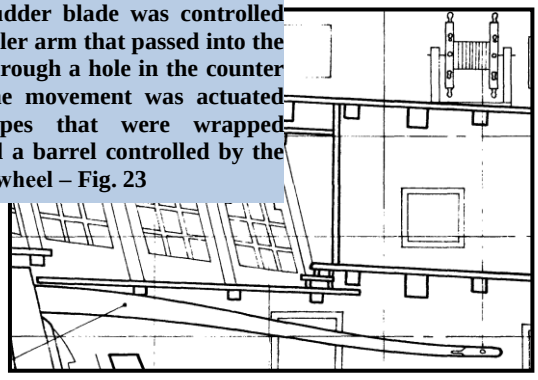


Figure 23: Tiller Arm & Ship's Wheel

Anchors

The larger sheet ***anchor*** (ancora di speranza) and the smaller bow anchor (ancora di posta) were to be found on each side at the bow . The attached ropes were connected to a nearby ***capstan***. Vertical position of each anchor were shown by ***buoys*** floating on the water surface.

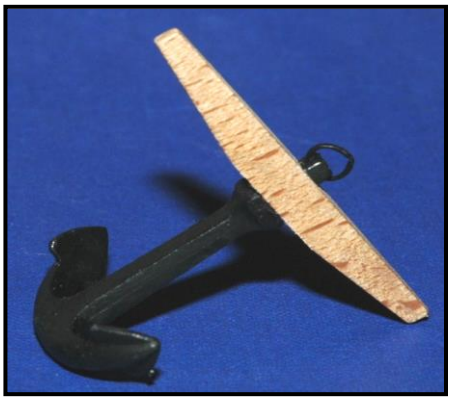


Figure 24: Stock, Anchor & Anchor Ring

Alternative 1: Supplied Components

Some time needed to be spent on the metal components filing the surfaces to remove raised casting edges. At this stage, the top of the shank (above the wooden stock) was very carefully drilled through to accomodate the anchor ring. There was more of an impression of a hole rather than an actual one, but this was re-located further up the metal shank due to the thickness of the stock. This fitted in well given the diameter of the anchor ring. The fragile metal was drilled by hand ***very slowly*** to avoid breakages. [The stock thickness had to be reduced slightly before doing all of this!].

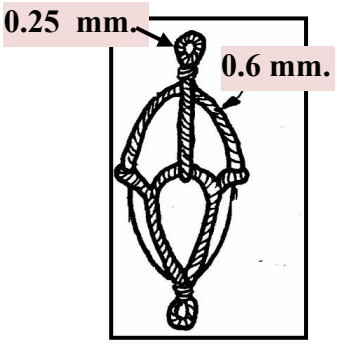


Figure 25: Buoy Rigging

The anchor buoy consisted of a light-weight wood or cork covered in tarred rope. The rope was clove hitched to the crown of the anchor with its end stopped to the shank. A diagram of this rigging follows later.

Many will just take the wooden buoys as supplied, paint them a suitable colour and add the buoy slings to complete this piece using ***0.6 mm.*** and ***0.25 mm.*** ropes. There are different ways of rigging the buoy but the easiest is the one shown in Fig 25.

Anchor cable sizes:

Sheet anchor = ***1.5 mm.***

Bow anchor = ***1.0 mm.***

Alternative 2: Modified Components

The variation in anchor sizes is very limited from the commercial sources available and with the diversity in scale for various models it is highly unlikely that the anchor supplied in a kit will be of the correct proportion. That is *not* the case here and the only small adjustment to be made is in the width of the flukes. However, the wooden stocks were different in their dimensions when compared to the described size and appearance.

Sheet Anchor

Timber Stock

The supplied stock had dimensions of 64.5 x 5.6 x 8.0 mm. which was far removed from the drawing size of ***81.0* x 6.0 x 6.0 mm.** **(**Figure 27 below shows a similar change in size for the Bow Anchor). It was decided to produce the stock from scrap timber. *Increasing the stock* in size totally improves the appearance. The stocks were created in two halves forming the historically correct twin ***baulks*** that make up the stock – a laborious task but worth the effort. Some scrap timber was used for this. Another approach is to use a single piece of scrap timber and cut a groove along the stock to simulate the baulk pair.

Metal Anchor

Having created a stock of the plan dimensions, there was little choice but to alter the dimension of the metal anchor.

- Careful *reduction of the fluke* width (***14.8*** down to ***11 mm.***) did create an anchor that was much more in proportion to the stock. Refer to Fig. 26.
- The *width of the upper shank* was reduced (***4 mm.*** to approx. ***2.8 mm.***) The width of the upper shank in the supplied piece was excessive when considering the correct width of the two baulks that were to fit around it.
- (Reducing the length of the upper shank was considered but in the end ignored)

Figure 26: Reduction of Fluke Width

Bow Anchor

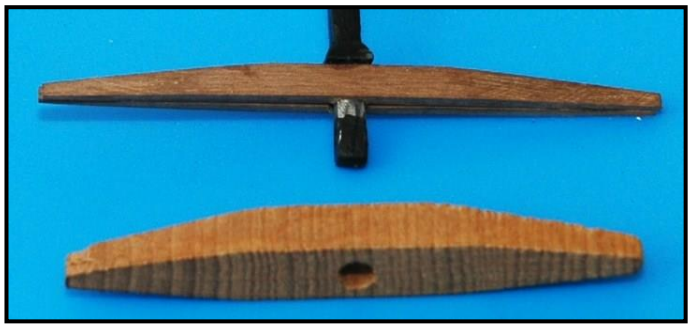


Figure 27: Kit Anchor Stock vs. Built Anchor Stock (incomplete)

Timber Stock

The supplied stock is again far removed from the drawing size of ***72.0* x 4.0 x 5.0 mm.** Similar comments apply here as they did to the Sheet Anchor except that some ***1.0 x 6.0 mm.*** planking was used and glued together to make a strip approx. ***2.0 mm.*** thick.

Metal Anchor

The only change was in the width of the fluke dimension.

Metal Hoops

These bands hold the baulks together and for this some timber strips were created that were ***0.5 x 1mm*** – a little thick (and also a little wider) but some careful sanding afterwards reduced the thickness. It was found easier to glue these on rather than use metal such as brass. To make the task a little easier, each piece was painted black before applying to the stock. The method of application was to simply apply each 'hoop' in four pieces working around the four faces in that order. The stock remained 'natural timber' so any glue residue needed to be carefully removed as they were added.

Anchor Ring

The four brass rings supplied were all approx. ***6.5 mm.*** in diameter – It was decided to work from the diagrams and create rings from some ***0.81 mm.*** brass rod that was in stock – ***12 mm.*** diameter for the sheet anchors and ***11 mm.*** for the bow anchor.

Of interest, the ring would have a series of puddening – strips of *tarred* cloth followed by rope and finally some fine yard applied at each end of the rope and also in the middle. At this scale, it is reasonable to only apply the rope (***0.25 mm.***).

Figure 28: Anchor Ring Puddening (not Royal William)

Anchor Buoy

Figure 29: Buoys Covered in Rope

The buoys floating on the surface of the sea were used to indicate the anchor position on the sea bed. They consisted of a light-weight wood or cork covered in tarred rope. The buoy rope was clove hitched to the crown of the anchor with its end stopped to the shank. A diagram of this rigging is shown in another manual.

The immediate problem was one of proportion but the diameter of the pieces supplied was ***8.4 mm.*** which is in between the two required sizes of ***11 mm.*** and ***9 mm.*** So four buoys were created all of the same size !

As mentioned at the beginning of this section, the buoy is roved in rope.

Buoy Slings

Figs. 30 & 31 explain how these slings were made. ***0.60 mm***. rope was used and there were six pieces of rope to handle. Two ropes folded and seized draped over each end and extended well past the maximum diameter position of the buoy. This had the effect of creating four ropes extending down from each end. These were then tied to two other ropes that circled the buoy either side of the maximum diameter. The method of using two circling ropes was a little different to that shown in the plan sheet diagram but formed one that was commonly used!

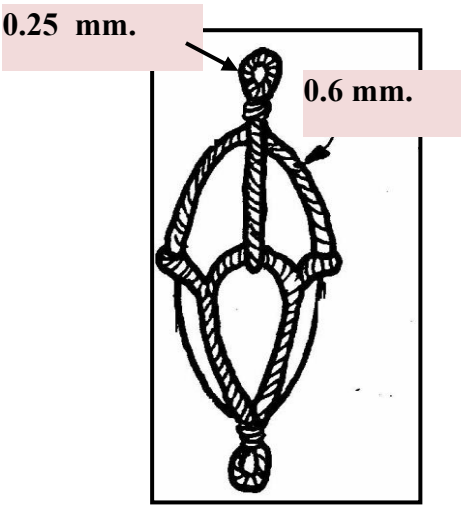
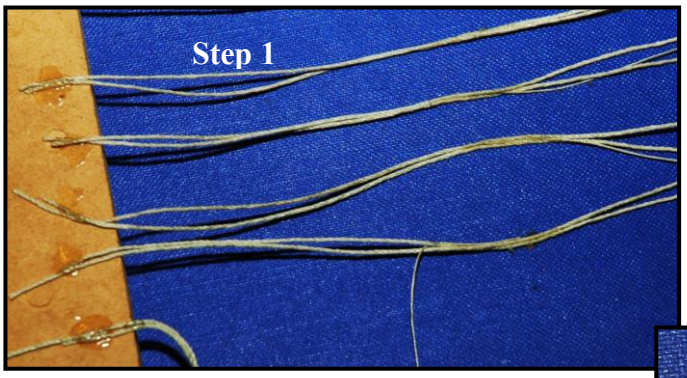
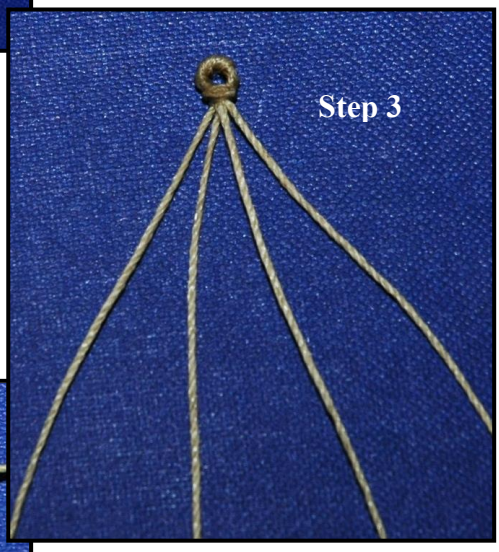


Figure 30: Buoy Slings



STEP 1: Two strands of 0.6 mm. rope are glued with PVA in the centre along with one strand of 0.25 mm. rope (approx. 12 mm. in length is glued). One end is glued onto a piece of wood. This latter point allows one hand free to carry out the seizing (refer to the photo in Step 2).



STEPS 2 & 3: Whilst one hand is holding the free end, the other hand can be used to seize the 0.25 mm. rope around around the other two strands. The effect of this step is seen in the photo below. Once folded over, the seized section is then seized to produce a loop (opposite photo) which will then be seated at each end of the buoy(see Step 4 on next page).

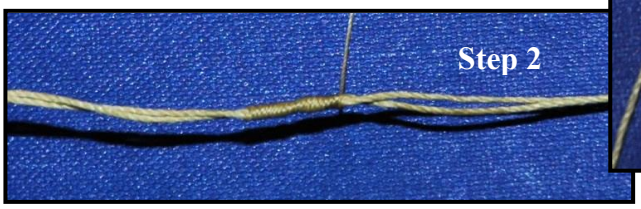


Figure 31: Steps in Rigging a Buoy

When viewing the above photographs, a reasonable representation of a typical buoy has been achieved and yet with more skill & time, there is ample room for improving the knots and rigging that surround the buoy.

Anchor Cable

At sea, the cable was often unreeved (‘unrove’ or ‘undone’) from the anchor ring and secured along the deck. During the 18th. century, the cable was secured to the ring with a clinch knot wrapped once through the ring (‘fisherman’s knot or bend) or twice (‘anchor cinch or bend) - some references confirm the use of the lesser knot on smaller Mediterranean vessels during this time but the double knot was more typical on larger vessels. However, there is very clear and contradictory evidence to this latter point if anchor photos of HMS Victory are examined. So the knot remains a point of conjecture. The anchor bend is an easy knot to create and is illustrated in Figure 100. Historically, these ropes were not coated with tar – handling would be difficult and in any case the ropes readily dried out after immersion.

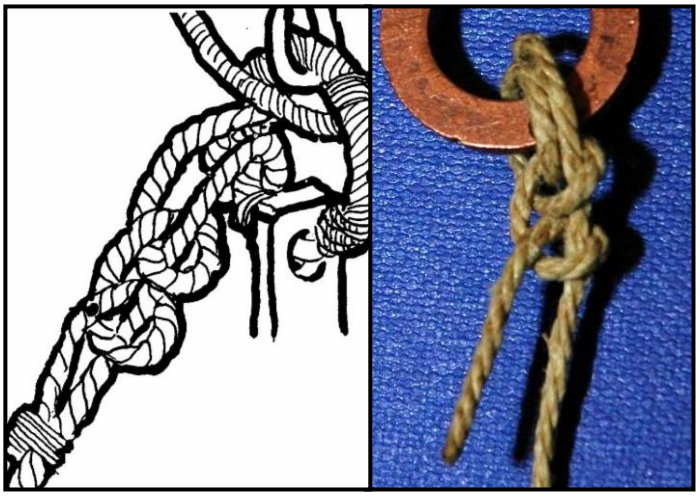


Figure 32: Anchor Clinch Knot Detail

Figure 33: Completed Inside Clinch Knot

Sizing:

1. As indicated in Plan Sheet 8]

- sheet anchor cable = ***1.5 mm***.
- bow anchor cable = ***1.0 mm.***
- seizing rope = ***0.25 mm.***

2. As based on common nautical standards

Availability of suitable dimensions within a kit is restricted by commercial considerations. However, the following table illustrates how the correct dimensions would have been calculated. A search on the internet will reveal sources for such rope.

Calculation of Rope Dimensions Based on the 12.8 m Beam Width

Using V.R. Grimwood (2003), *American Ship Models, How to Build Them* & Peter Goodwin (1984), *The Construction and Fitting of the English Man of War 1650-1850*

a. **circumference** = vessel’s absolute width in feet / 2
[i.e. 12.8 m beam is 41.99 feet; 41.99/2 = 21.0 inches]

b. **diameter** = circumference / 3 (i.e. approx. vale for ‘pi’)
[i.e. 21.0 inches / 3 = **7.00 inches** = ***2.5 mm*** **at a scale of 1:72**]

N.B. hawse hole diam. = cable diameter x 5/2
[i.e. 7.00 x 5/2 = **17.2 inches** = ***6.07 mm.*** **at a scale of 1:72**]

Cathead

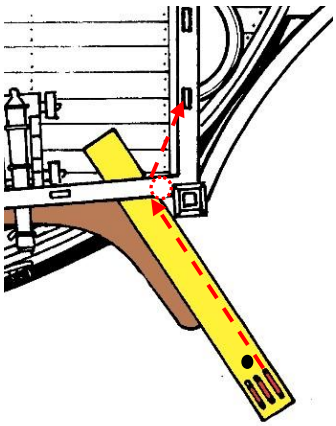


Figure 34: Cathead Overview

The cathead, a heavy wooden beam used to raise anchors, carries ***three sheaves*** ('pulleys') at its outboard end. The anchor tackle is reeved through these sheaves, passing along the beam, rove through a single sheave (not supplied) in the bulwark wall (Figs. 34 & 35) and belayed to a timberhead on the forecastle.

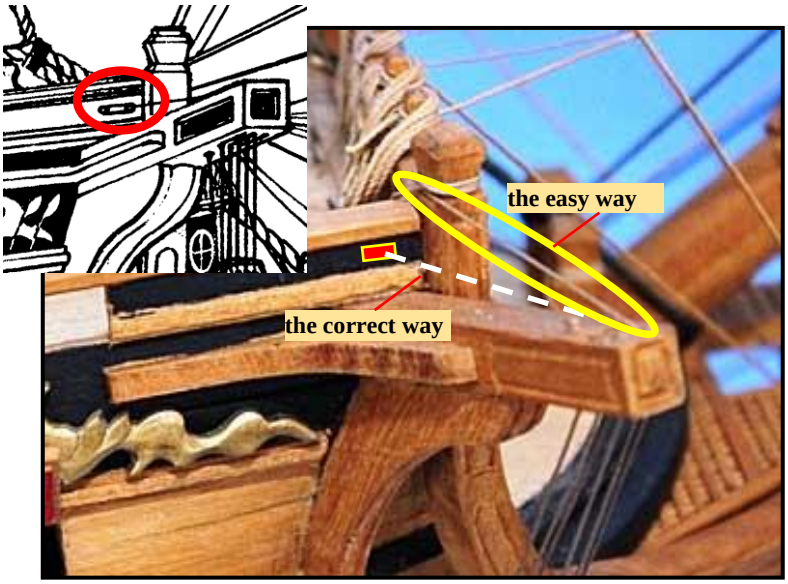


Figure 35: Hauling in the Cat Tackle

The six holes passing through the cathead simulating the three sheaves can be produced by using a very fine drill. The hole drilling must be done slowly and care taken that the bit is at right angles to the surface. Even so, it is essential to start each hole ***from both sides*** and with some patience, the holes are drilled and channels carefully cut into the surface between each pair of holes.

Fig. 36 *could* apply to the Royal William but is a generic layout and hence open to interpretation.

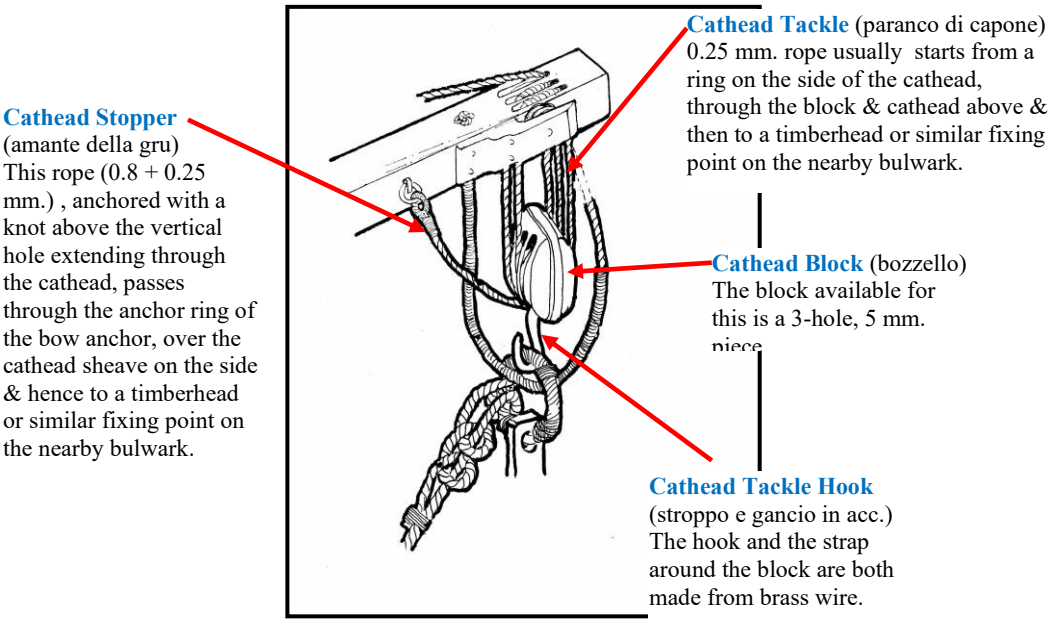


Figure 36: Cathead Rigging