TRANSLATION LINKS:
1. browser ... **english+italian+glossary+nautical terms**
2. Euromodel website ... translation dictionary 'Nautical Terms'

An *Interpretive* Build of the Mordaunt utilising the supplied kit

Hull Construction – Part 2.v.03

My <u>interpretative</u> 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.

Mordaunt

4th. Rate English Vessel

Launched in 1681

Scale 1:60

This is NOT an instructional manual

It shows how I interpreted the build **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 I did feel that I needed to challenge myself with a higher degree of accuracy, this will be denoted by 'Alternative 2'.**

Reference Text

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).

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Contents

Illustrations

[The figures below are not hyperlinked]

Chapter 1: SHIP'S BOAT

Construction Choice

Whatever approach is made by the builder, the supporting ***boat crutches*** and ***skid beams*** need to be constructed. Figs. 1 & 2 show timber boats rather than the current plastic resin boat supplied. Note the different positioning adopted by two different builders.

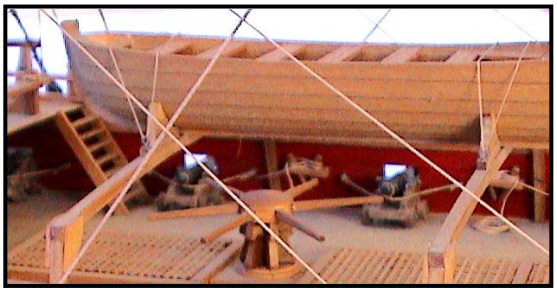


Figure 2: Off-set Positioning of Boat

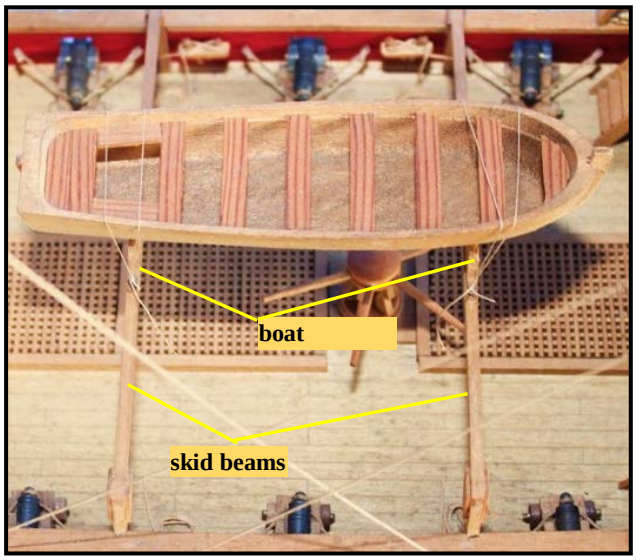


Figure 1: Central Positioning of Boat

There are a number of rational approaches that can be adopted in dealing with the ship's boats and I considered a few of them.

Alternative 1:

Most models are built with part of the gun barrels projecting out past the hull profile suggesting a state of readiness for battle. If this is the case, then to clear the Main Deck for battle, the ship's boats were removed and towed behind the ship. The ***boats then are not built***.

Alternative 2:

If the boats supplied in the kit are to be included, then they can be suitably ***painted as they are and eventually installed.*** Euromodel supplies simple plastic resin hulls which will save much time. I chose to remove the exterior clinker style and present the carvel form.

Alternative 3a:

Install interior fittings in supplied boat.

Alternative 3b:

Modify the longitudinal and interior profiles and only then *install all interior fittings.*

Alternative 4: The supplied boats are discarded and new ones ***built from scratch***. This is only for the ardent builder !

After some deliberation, I decided to adopt 'Alternative 3b' option.

Boat Dimensions

The boat hull supplied was shorter in both length and width than suggested in the drawing but a suitable boat was still able to be produced, even if there were some differences in number and placement of thwarts !

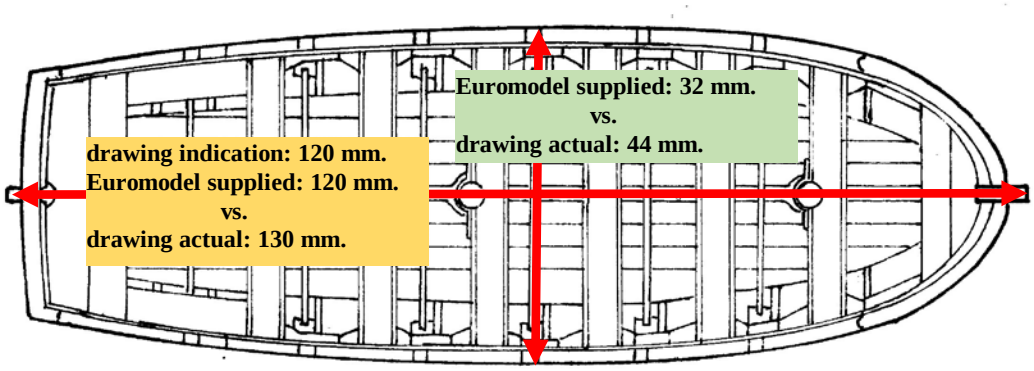


Figure 3: Variation in Boat Dimensions

Boat Terminology

Words used in describing various parts are shown below in Fig. 8. In particular, there are two technically important features rarely shown on 'kit' plans - the stretchers (green) that support rowers' feet and the thwart knees (blue). Both of these are usually omitted. Compare Fig. 7 against Fig. 1.

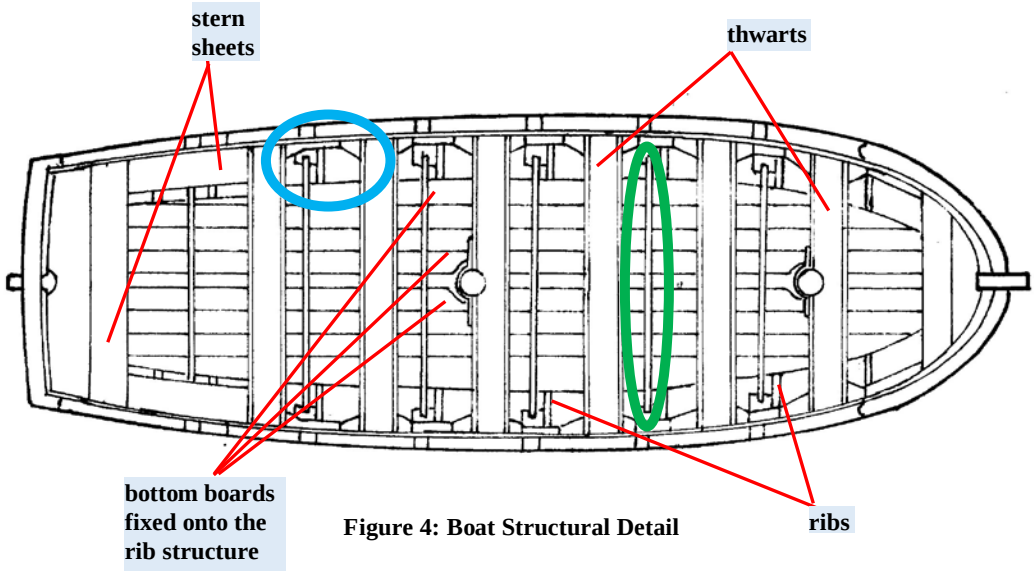


Figure 4: Boat Structural Detail

Plastic Resin vs Timber

The plastic resin was incredibly easy to work with and equipped with a Dremel and a number of differently-shaped cutting and sanding tools, I was able to alter the standard shape to conform quite closely to the drawings supplied.

Figure 5: Cutting & Sanding Tools

Figure 6: Paint Selection for Dry Brushing

Weathering

The boat needed painting to create a weathered finish. Dry brushing was utilised to achieve this. [The paints used were a brand called 'Citadel' from Games Workshop that seem to have outlets in many countries. Model Ship World Forum contains a number of very excellent & specific references.]

Wet Brush Layer

The dark bown paint (Dryad Bark) was applied to the interior of the boat before adding the thwarts.

Dry brush layers were then applied over the base, wet-brush layer once the boat construction was completed.

Dry Brushing Layers (in sequence):

1. ***75% Dryad Bark & 25% Skrag Brown***
2. ***50% Dryad Bark & 50% Skrag Brown***
3. ***Dawnstone***

Dry brushing involves a specific brush being lightly filled with the paint applied and then stroking that brush over paper until all the paint appears to be used. The brush is then lightly applied to the base coat until an amount of colouration can just be perceived. That is the point when the brushing on of that new 'layer' is stopped. If multiple brush coat 'layers' are used, then it becomes a mixture of colours rather than just a multi-layered application of paint.

Hull Modification

***Many**, in order to keep things simple, **will choose to ignore** the following discussion. But ... !*

Exterior profile

- The drawings show the gunwale as having a ***curved longitudinal profile*** (Fig. 7). I opted to shape the gunwales –curved slightly downwards from stem to stern. Note also that the stern is lower than the stem (broken blue line). The white plastic resin was remarkably easy to carve and sand.

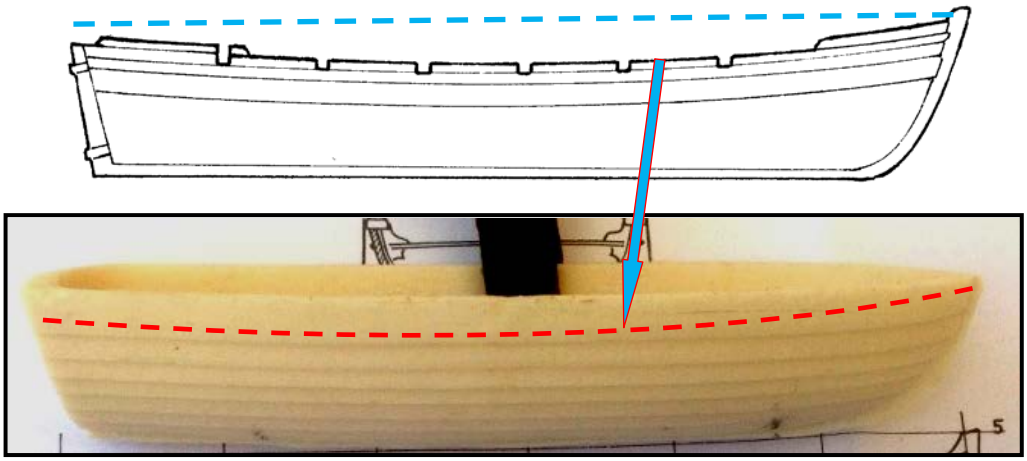


Figure 7: Longitudinal Profile

Interior Profile

- The flat inside bottom was changed into a ***concave surface matching the outside***. A Dremel cutting bit with a rounded shape made this task simple and approx. 5 mm. was cut out from the bottom (refer back to Fig. 5). The guide to cutting down to a suitable depth involved holding the boat up to a strong light and observing a uniform translucent colour (to begin with, thick bottom was totally opaque to light). The concave inner surface is evident in Fig. 8 below.

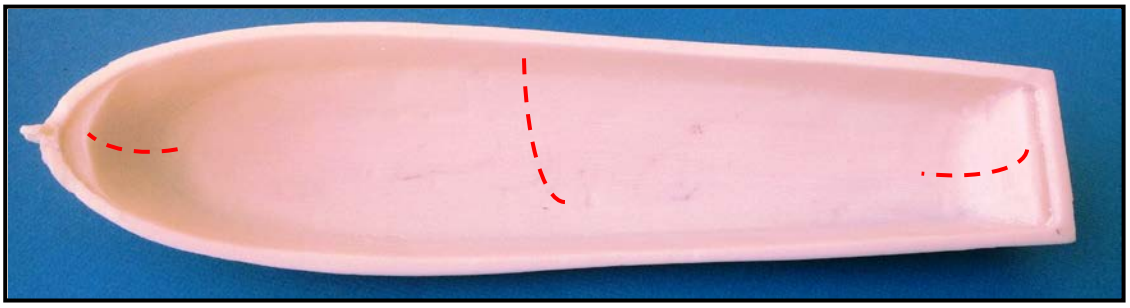


Figure 8: Internal Contouring

- Sequence of Further Possible Modifications

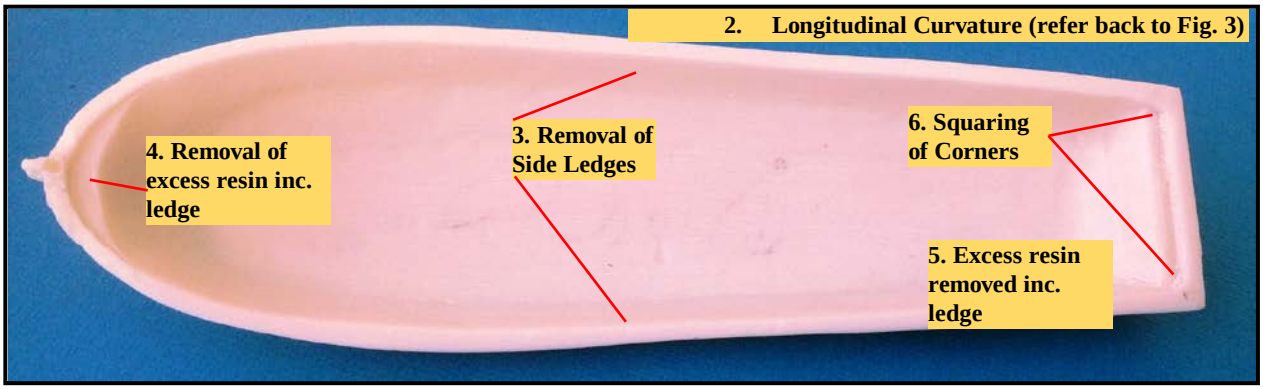


Figure 9: Further Possible Modifications

Interior Fittings

Ribs

Figure 10: Immersion in Ammonia Soln.

Eleven ribs were cut (from 0.5 x 4.0 mm. planks) to a length of approx. ***60 mm*** and a width of ***1.8 mm.*** allowing spacings along the keel approx. ***8.0 mm.*** apart.

[The extra length allowed easier manipulation of the ribs; the extra width should/could have been reduced]

To fit ribs against the curved boat interior without breaking, the strips were soaked in dilute ammonia solution – available from supermarkets as a cleaning agent called 'cloudy ammonia'.

The timber strips were removed after 6-8 hours of soaking, wiped with a dry cloth and then held in position in a block grouping (Fig. 53) allowing at least 12 hours to dry.

Even though the athwartships width varies across the boat along the length, the dry ribs were easily fitted into position.

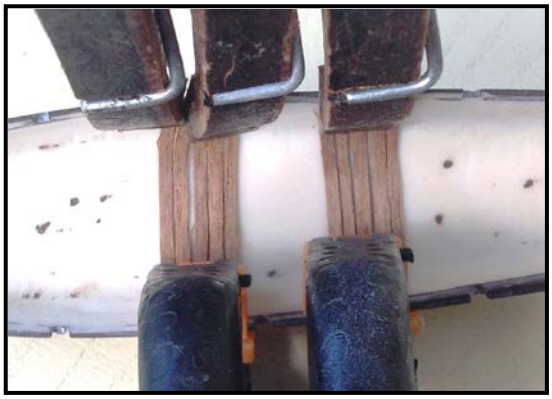


Figure 11: Rib Shaping (another ship)

- ***Keel, bottom boards*** and ***risers*** were installed.

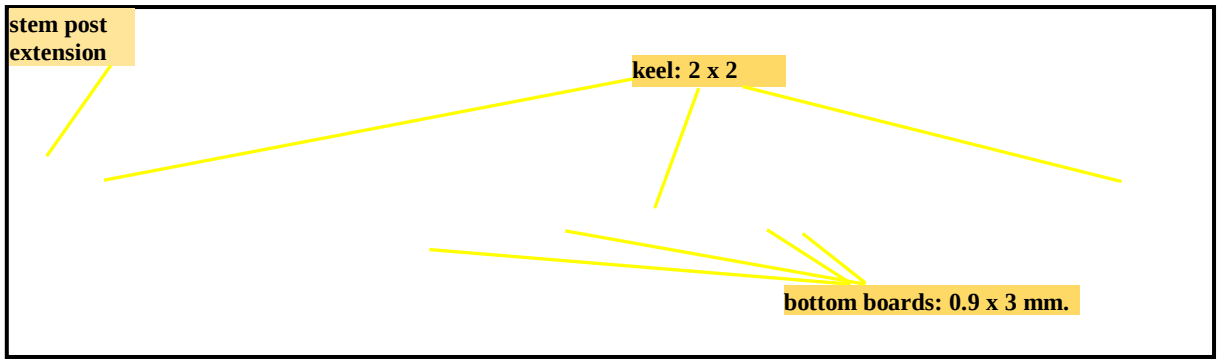


Figure 12: Interior Keel & Bottom Boards

The timber dimensions shown above and below are only there as a guide [what I used was determined by what I had in my scrap]. The stem extension shown used a small pin for reinforcement.

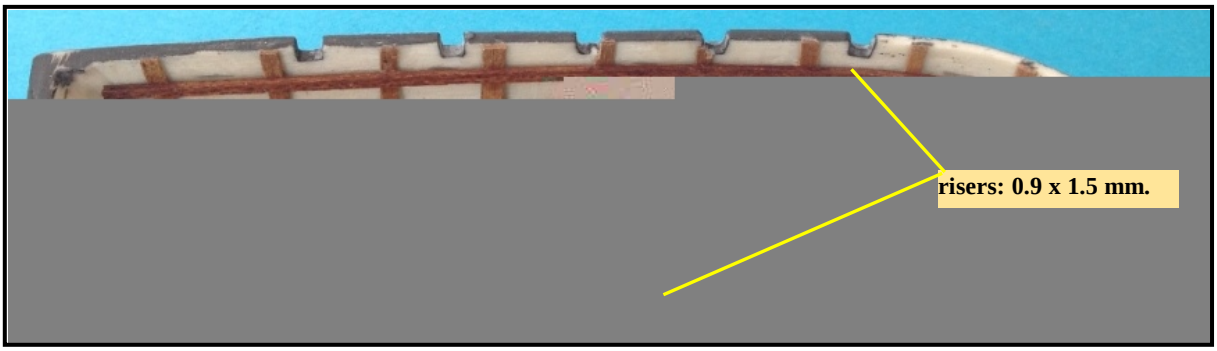


Figure 13: Risers

- ***Stern*** *and* ***aft sheets*** as well as the ***thwarts*** were added. Due to the shorter length of the boat, the stern sheet width was reduced to one half of that shown in the drawings.

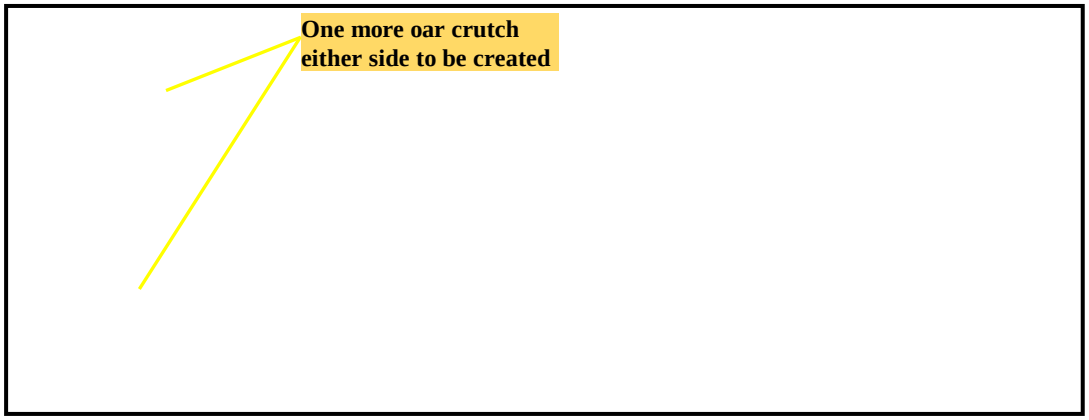


Figure 14: Reduced Size of Stern Sheet

Exterior Fittings

- A ***stern post*** was fitted along with a ***rudder***, both made from scrap timber.

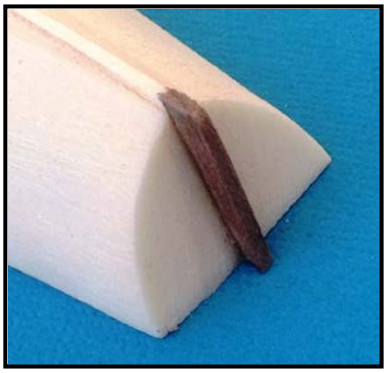
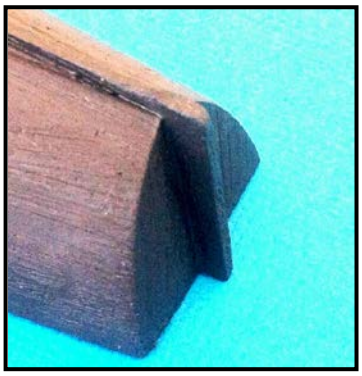



Figure 15: Boat Stern Post Installed

Figure 16: Unassembled Rudder & Tiller Arm

- Rudder was made as per the drawings but the final length was approx. 3 mm. shorter after fitting against the stern.

Chapter 2: STEERAGE, ANCHORAGE & HAULAGE

Steerage

During the 16th and 17th centuries, the larger ships were commonly steered through the 'sweep' – a tall vertical beam connected to the tiller through a swivel bearing. The helmsman could be found standing on the Main Deck looking out onto the Quarter Deck or taking directions from another crew member.

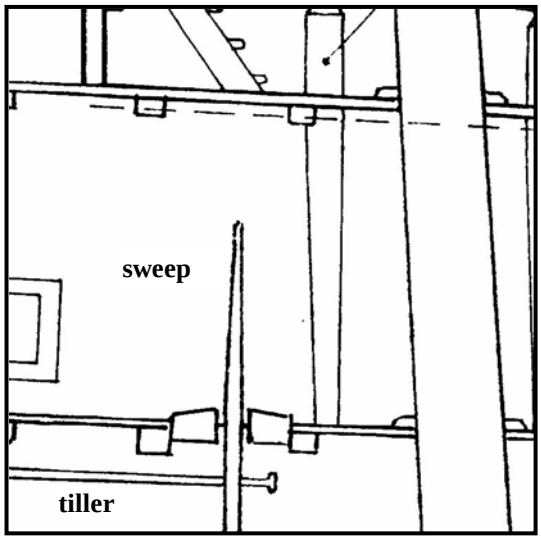


Figure 17: Sweep & Tiller

Rudder

Alternative 1: Supplied Rudder

The supplied blade is already laser-cut to shape including that required for the fitting of the pintles ('rudder irons'). With their gudgeon pins, the pintles fit into the stem post pintles of the hull. These pintles completely wrap around the rudder.

I chose to modify the rudder (next page) by :

tapering,
representing rudder as made from a group of timbers,
adding a tiller arm.

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

Rudder Pendants – an option

An **eye pin** and **ring** were inserted on each side near the top of the rudder to anchor the rudder pendants (ropes that could be used in the event of tiller damage). Where the 1.0 mm. pendant rope passes through the counter, I used two 3 mm. **brass 'portholes'** which formed a very neat appearance. To simplify matters, the rope end could be easily glued into a neat hole in the counter.

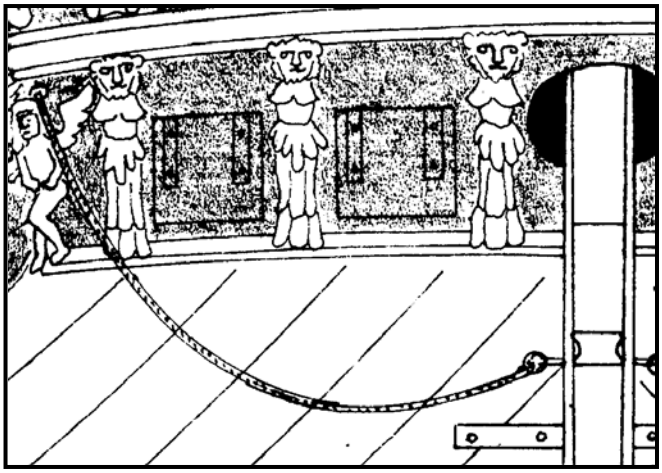


Figure 18: Rudder Pendant

Alternative 2: Modified Rudder

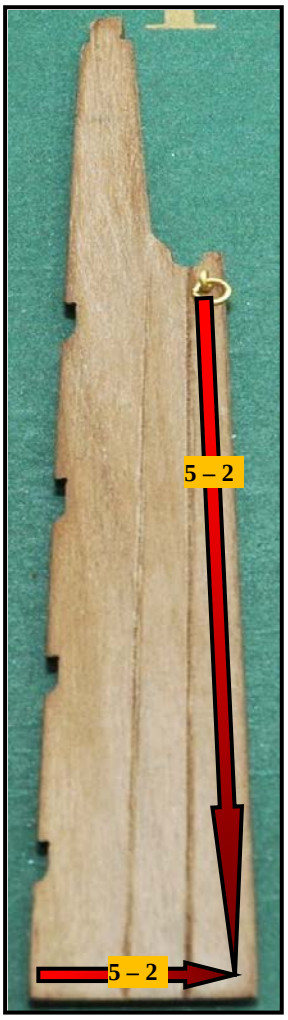


Figure 19: Mordaunt Rudder

In Plan Sheet 2, there is a drawing that indicates tapering of the rudder. I adopted the following **vertical tapers** ...

- aft edge from 5 mm. to 2 mm. (16 mm. downwards)
- also 5 mm. to 2 mm. in a horizontal sense

Thus the maximum taper is at the bottom on the aft edge [Fig. 58 illustrates the tapering by increasing darkness].

There are **a number of choices** that could be made such as illustrating the use of separate timbers in the rudder and the presence of the tiller arm.

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.

Anchorage

The larger **sheet anchor** (ancora di speranza) and the smaller **bow anchor** (ancora di posta) are to be found on each side at the bow end. The attached ropes are connected to a nearby capstan. Buoys floating on the water surface indicate the vertical position of each anchor.

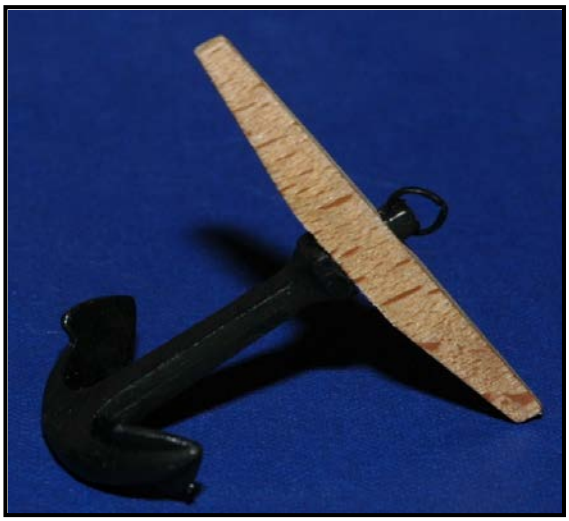


Figure 20: Complete Anchor; Basic Form

Anchors

Alternative 1: Supplied Anchor Assembly

Time needs 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) will need to be very carefully drilled through to accomodate the anchor ring - there may well be an impression of a hole. The metal is fragile and and drilling must be done by hand ***very slowly*** to avoid breakages.

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 an 'fisherman's knot' - some references confirm its use on Mediterranean vessels during this time. The 'fisherman's knot' is an easy knot to create. The photo & diagram opposite illustrate this knot. **Do not colour the rope to simulate tar**. Historically, these ropes were not coated with tar – handling would be difficult and in any case the ropes readily dried out after immersion.

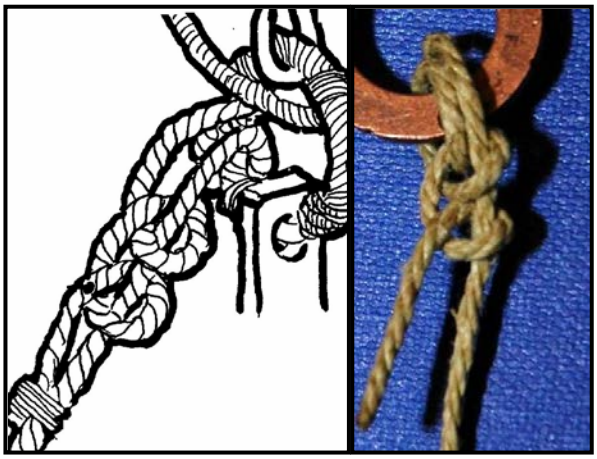


Figure 21: Fisherman's Knot

Rope Dimensions

sheet anchor cable = 1.5 mm. (largest size available in kit)
bow anchor cable = 1.0 mm. (largest size available in kit)
seizing rope = 0.25 mm.

Figure 22: Anchor Rigging Showing Fisherman's Knot

Alternative 2: Modified Anchor Assembly

The metal castings approximated **very close in length** to the drawings but the other dimensions were markedly different. The wooden stocks were also different in their dimensions when compared to the described size and appearance. I thought I could modify the stocks supplied but that was not the case.

Sheet Anchor (ancora di speranza)

Stock (ceppo dell'ancora)

Tough decision here ... do you change the stock size *and* the material ? **Reducing the stock** in size totally improves the appearance (Figs. 62 & 63). What also improves the appearance is the **dividing of the stock longitudinally into two halves** (i.e. 'baulks'; Fig. 64). So you either make the stock from scrap timber or decrease the supplied stock to drawing size of **60.0 x 6.0 x 6.0 mm.** For me, there was *not* a choice.

Figure 23: Underside View of Partially Completed Stock of Sheet Anchor; Advanced

The Bow Anchor stock I *had* to make from scrap timber (mahogany) and to keep this matching with the Sheet Anchor stock timber, I could not use the light coloured stock supplied in the kit (the stock colour is deceptive as its lighter colour is covered with a coating of a darker lacquer). I could have elected to paint them but that was something I wished to avoid.

What remained to be done was to create a square hole that will not fully house the square shank of the anchor. This then created a small space at the centre between the two baulks.

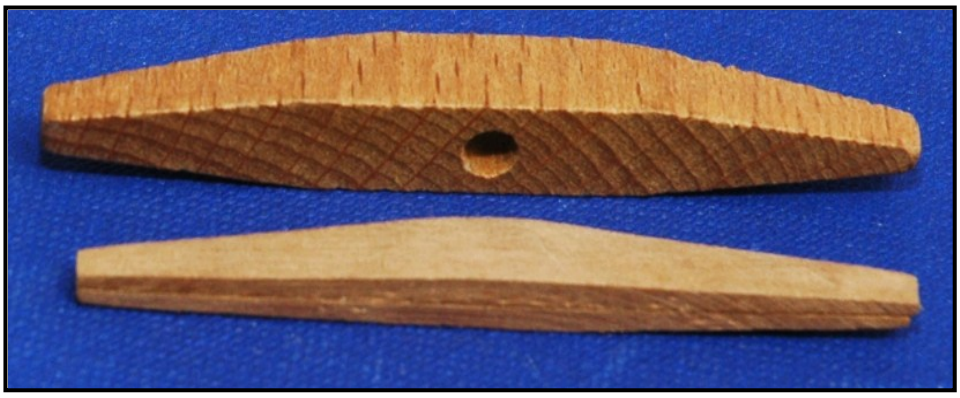


Figure 24: Side View of Partially Completed Stock of Sheet Anchor; Advanced

Metal Anchor

Figure 25: Reduction in Width of Fluke; Advanced

Figure 26: Reduction in Size of Sheet Anchor Shank; Advanced

Having created a wooden anchor stock of the plan dimensions, there was little choice but to then reduce the dimension of the metal anchor. ***Severe*** (but careful) filing of all aspects of the casting did create an anchor that was much more in proportion to the stock (Figs. 66 & 67). Most significant changes were in the width & tapering of the shank (4 mm. finished at base to 3.5 mm. finished at top), the fluke size and the fluke-to-fluke dimensions. The latter could only be reduced slightly. **There is a need to identify & create a new position for the anchor ring.**

Bow Anchor (ancora di posta)

Stock

Figure 27: Underside View of Partially Completed Stock of Bow Anchor

The drawing size of **49.0 x 5.0 x 5.0 mm.** was longer than the stock piece supplied which was only 44.5 mm. I chose to work with some scrap timber in order to create the correct dimensions. Apart from the length, the small adjustments in thickness and width simply produced a more proportioned object.

Metal Anchor

The fluke size was significantly reduced from a width of 12 mm. to 8 mm. and the shank was squared and given a taper. **The upper shank is only 2 mm x 2 mm. and is *very* fragile to work with !**

Metal Hoops

These bands hold the baulks together and for these I created some timber strips that were 0.5 x 1mm – a little thick (and also a little wider) but some careful sanding afterwards reduced the thickness. I found it easier to glue these on rather than use metal such as brass. To make my task a little easier, I painted lengths of timber black before cutting them into suitable short lengths & applying to the baulks. The method of application was to simply apply each 'hoop' in four pieces working around the four faces in that order. The stock will remain 'natural timber' so any glue residue needs to be carefully removed as you work.

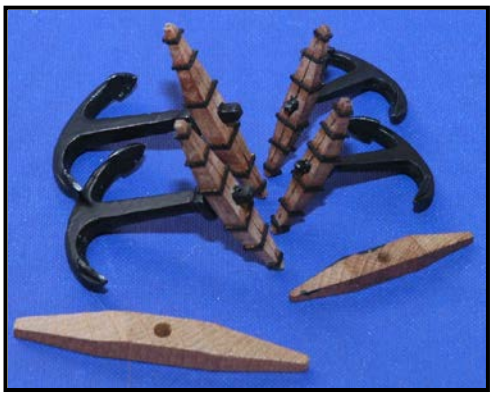


Figure 28: Anchors Complete With Metal Hoops; Stocks Supplied But Not Utilised

Figure 29: Anchor Ring & Metal Hoops; Advanced

Anchor Ring

The four brass rings supplied were all approx. 6.5 mm. in diameter and will be utilised by most modellers. However, it was here again that I decided to work from the diagrams and created rings from some 0.81 mm. brass rod I had – 10 mm. diameter for the sheet anchors and 8 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.) – see Fig. 70. At this stage, the top of the shank (above the stock) will need to be very carefully drilled through to accomodate the anchor ring.

Cathead

This heavy wooden beam, used to raise anchors, carries three sheaves ('pulleys') at its outboard end. The anchor tackle is reeved through these sheaves and belayed to a cleat or timberhead on the forecastle.

Alternative 1: Supplied Components

The drawings show a **fourth sheave on the side of the cathead** but it is not shown in Plan Sheets 1 or 2. If the anchor rigging is carried out using the latter plan sheet, then you can ignore the sheave altogether. There was no consistency in the cathead configuration during these times so it would be acceptable not to include this fourth sheave. Having said all of that, the fourth sheave does have a function in securing the bow anchor if it is left hanging from the cathead but in Plan Sheet 2, the bow anchor is shown stowed away along the channel. In Fig. 71 the cathead beams are shown with the simulated three sheaves but the fourth sheave on the side is omitted (vertical hole inboard of the three sheaves has not yet been formed).

Figure 30: Cathead with Three Sheaves; [hole still to be drilled]

The six holes passing through the cathead that simulate the three sheaves I 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, I started each hole from both sides and with some patience, the holes were drilled and channels carefully cut into the surface between each pair of holes.

Alternative 2: Modified Components

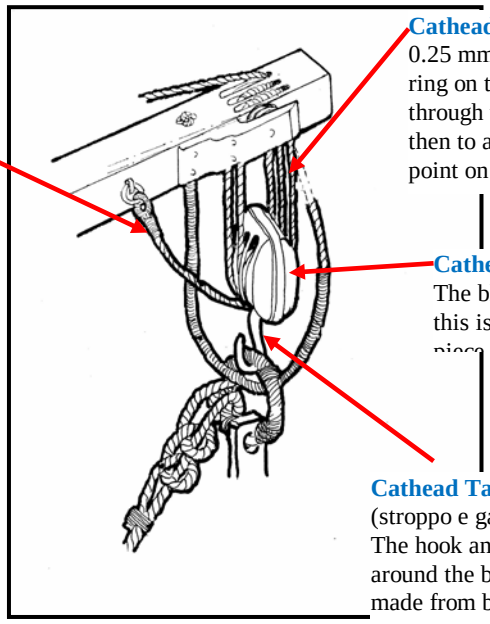
Plan Sheet 9 shows a **fourth sheave on the side of the cathead** but not in Plan Sheets 1 or 2. If the anchor rigging is carried out by using this former plan sheet (i.e. Plan Sheet 1), then you can ignore the sheave altogether. This sheave does have a function in securing the bow anchor if it is left hanging from the cathead but in Plan Sheet 1, the bow anchor is shown stowed away along the channel. ***For accuracy, I decided to include this latter sheave.***

In its construction, I followed the drawings and utilised a **2.5 mm. diameter brass sheave (thickness of 1.1 mm.)** on the side of the cathead beam as shown but could have simplified things by just inserting

Figure 31: Cathead with Fourth Sheave

a brass rod. The housing for the side sheave was made from a piece of 4 x 3 mm. wood strip.

The following diagram *could* apply to the Mordaunt but is a generic layout and hence open to interpretation.



Cathead Tackle (paranco di capone) 0.25 mm. rope usually starts from a ring on the side of the cathead, through the block & cathead above & then to a timberhead or similar fixing point on the nearby bulwark.

Cathead Stopper (amante della gru) This rope (0.8 + 0.25 mm.) , anchored with a knot above the vertical hole extending through the cathead, passes through the anchor ring of the bow anchor, over the cathead sheave on the side & hence to a timberhead or similar fixing point on the nearby bulwark.

Cathead Block (bozzello) The block available for this is a 3-hole, 5 mm. piece

Cathead Tackle Hook (stroppo e gancio in acc.) The hook and the strap around the block are both made from brass wire.

Figure 32: Typical Cathead Rigging

Capstans

The **main capstan** (argano di tonneggio), located aft of the Main Mast, was principally used to raise yards and the small boats, whilst the **anchor capstan** (argano a salpare) located forward of the Main Mast was used to raise the anchors. Both capstans were actually a double-capstan design with two barrels fitted on the same spindle situated on two decks thus allowing double the number of men to operate it. Whelps were arranged around the barrel to help prevent the rope from slipping and strengthening chocks were fitted between the whelps.

Alternative 1: Using 2 x 20 mm. Supplied Capstans

The capstans supplied are of a height and width that fits the drawing dimensions quite well – refer to Plan Sheet 9. All that was required was the assembling of the whelps [**eight** for the main capstan and **six** for the anchor capstan] and the creation of the bars. The bars are not installed in the capstan on a working ship – they are put to one side to avoid creating an obstruction. So this is one area not demanding a high degree of precision. It you do opt for the square holes, do not drill the holes as this process will readily fracture the surrounding wood but carefully utilise a fine blade - beware that this may cut into the upper and lower 'lips' on the head of the capstan.

When attaching to the deck, the capstan was glued down onto the deck planking.

Figure 33: Structure Typical for the Main Capstan

Rounded holes yet to be made square !

Alternative 2: Using Two Different-Sized Capstans

Main Capstan

The task first was to create square (2 x 2 mm.) holes out of the rounded holes to accommodate the bars. The original supplied capstan of 20 x 15 mm. could have been used be used with the height being approximately the same but the widths at the top is approx. 3.3 mm. and the base 5.6 mm. shorter. I opted for a **capstan with 25 mm. height.**

[The Anchor Capstan can still be related to the comments made in Alternative 1]

Dimensions

The drawing shows:

width at top = 16.0 mm.
width at base = 21.0 mm.
overall height = 20.0 mm.

Capstan on the left was created out of the piece on the right; bar holes still to be finally squared and chocks not yet in position between the whelps.

Figure 34: Converting a 25 mm. Capstan

I set about reducing the **25 mm. piece** down to what is shown in the drawing. I completely removed the 'domed' top to a flat surface which was then given a gentle curvature towards the top edge. I also The top width was reduced by sanding away the two 'lips' [this made the capstan look quite different to the other capstan]. The base was reduced in thickness from 3.9 mm. to 1.5 mm. by sanding off the wider 'lip' at the base - and a bit more. Combined, all three of these operations gave dimensions that compared favourably with those shown on the previous page ...

- width at top = 16.3 mm.
- width at base = 18.0 mm.
- overall height = 20.1 mm.

The six whelps were then glued in place and the six bars were produced. A common mistake is to permanently install the bars into the capstan head. In practice, these present a definite obstruction to the operations that occur on a deck and are only installed when required for raising the anchors. Otherwise, they are stowed to one side of the deck.

This completes the introduction to building the hull structure (Part 1) of the Mordaunt.