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 Derfflinger

17C Dutch Fluyt

1675

Scale 1:80

Checked the *Essential* Resource Information File ?

04.FITTINGS

July 2020

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 interpretive 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.

Plan Sheets 1, 3 and especially 5 were used for the *base references*. If there was any question about other drawings, it was these three that were kept in mind.
Plane Sheet 5 contains the detailed scratch-build drawings upon which this kit is based.

Reference Text

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).

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CHAPTER 1: FITTINGS

Anchorage System

Cathead

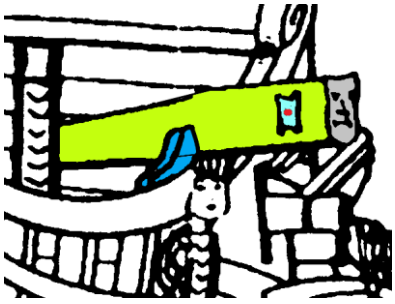


Figure 1: An Early Cathead Drawing from Derfflinger

Cathead beams projecting outwards were used to raise the ship's anchors into a vertical position adjacent to the bow prior to their being stowed. Often made from oak, these heavy timbers were inclined in both the vertical (15-20 degrees) and horizontal (45 degrees). They were generally square in cross-section.

Fig. 35 is from an early drawing of the Derfflinger and shows a tapered aft section but that is not evident in the Euromodel drawings. Some liberty in interpretation is required. Also shown is a cathead support (blue) mounted on the top head rail.

The cathead carries ***two internal sheaves*** ('pulleys'). The anchor tackle is reeved through these sheaves & belayed to a cleat or timberhead on the forecastle. In Fig. 36, the cathead beam (***6 x 6 mm***. tapering to ***5 x 5 mm.***) is shown with the two sheaves.

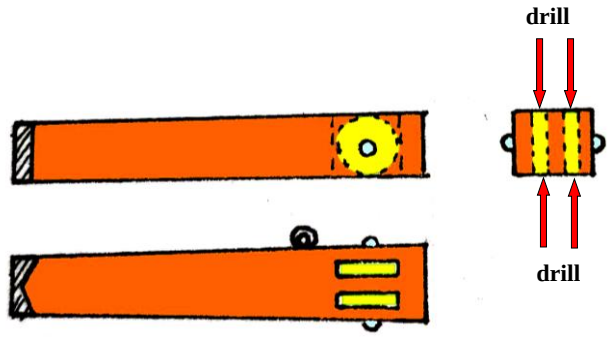


Figure 2: Cathead Configuration

A very fine drill is used to produce four holes (red arrows) passing through the cathead that simulate the two sheaves. The hole drilling must be done slowly and care taken that the bit is at right angles to the surface. 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.

The very extremity was fitted with a cap of richly carved timber or cast metal. So fitted, a cap provided both decoration and weatherproofing for the end grain. There are two metal catheads supplied in this kit.

It is traditional amongst modelers to paint the cathead ornamentation with a gold/ brass finish. The reality is, however, that amongst sailors there was *a belief that a black cat brought good fortune at sea* (but bad luck, of course, on land) – a black finish was quite common even if there were classic examples of gold plating.

Figure 3: Cathead - Black Finish

Anchor

Classification

On almost all ships, there are two forward bow anchors, one carried on port side and the other on the starboard side. They are often fixed to timber heads and the fore part of the channel. They have a rope permanently attached to them enabling rapid deployment.

Aft of these two anchors and on the same channel are the two sheet anchors (although the starboard anchor is singly called the sheet anchor whilst the port anchor is often referred to as the 'spare' anchor.

Interestingly, Mondfeld quite clearly describes both the bow and the sheet anchors as being of the same size. This contrasts with many kits where there is a distinct size difference between the bow and the sheet anchors – confusion reigns here so no further discussion is warranted.

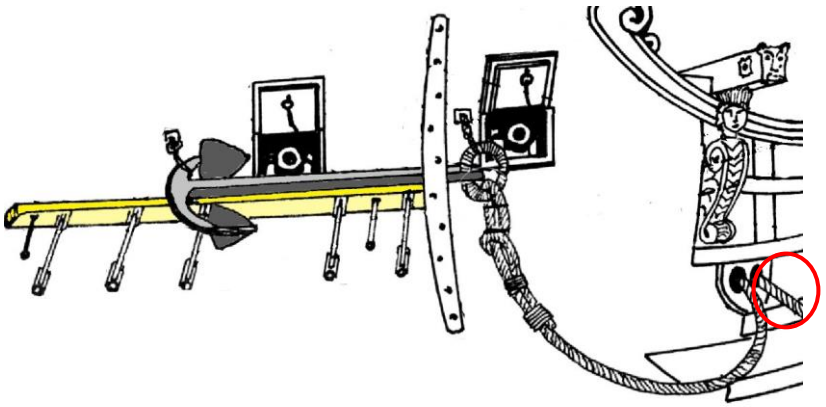


Figure 4: Starboard Bow Anchor (Euromodel drawing)

Fig. 4 from Plan Sheet 1 clearly suggests the presence of the sheet anchor (hawser for a separate anchor in red circle) but is clearly omitted to preserve a basic approach to this build.

Features

The features of the anchor are presented as a means of explaining the text that follows.

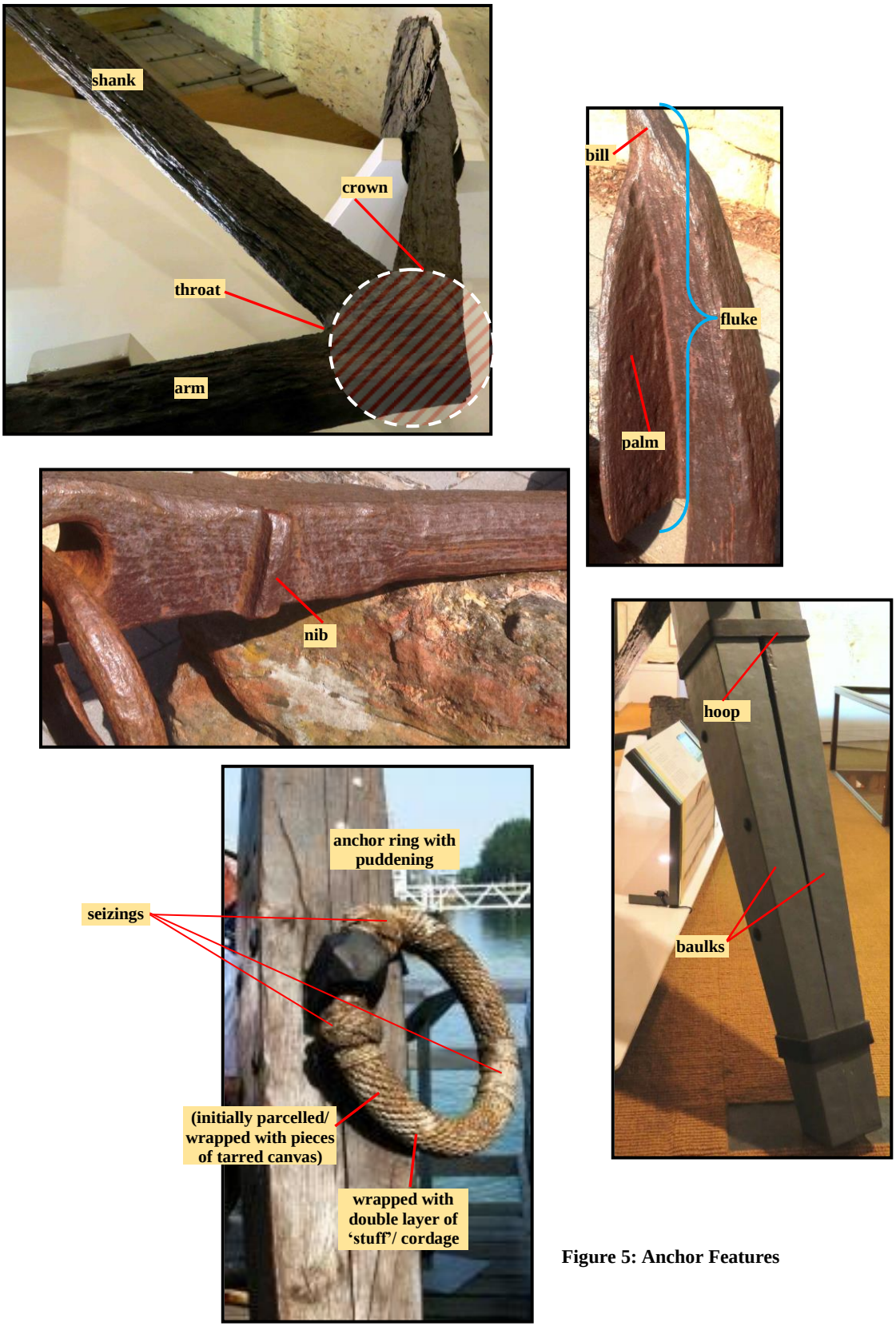


Figure 5: Anchor Features

Lack of Proportion

The supplied metal anchor could be used as supplied (Fig. 6) but neither that or the attached timber stock really relate to the drawing (Fig. 7) and so certain modifications could/ should be made.

Figure 6: Anchor and Stock from Supplied Items

Modifications

Timber Stock

*In Plan Sheet 4, the timber stock of the anchor is shown as **straight** BUT Plan Sheet 1 shows it as **curved.***

Obviously since this is a 'kit', the builder could be forgiven for using the straight stock piece supplied but the shape and the dimensions do differ between the two drawings. In this build it was decided to replicate what was seen in Plan Sheet 1. The dimensions for the ***curved*** stock were ***40.0* x 3.4/2.6 x 2.0 mm**. The stock was made in ***two halves*** from 1 mm. scrap timber forming the historically correct twin ***baulks*** – a laborious task but worth the effort.

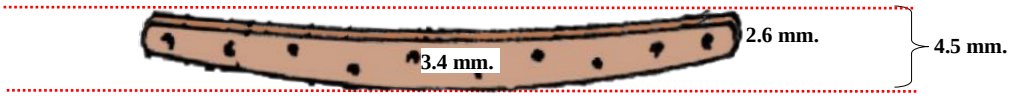


Figure 7: Curved Timber Stock

Metal Anchor

Having created a stock size to 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. 8.

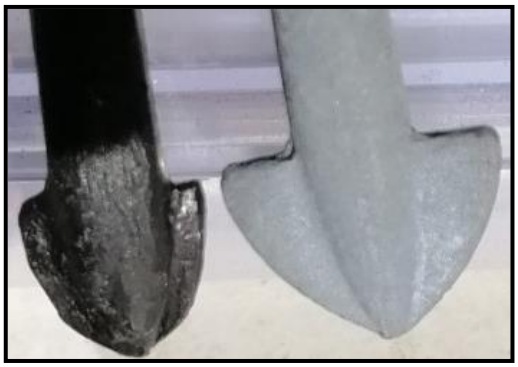


Figure 8: Fluke Size Reduced

Figure 9: Shank and Nib Size Reduced

- *width of the shank was reduced…*
  upper from ***4.5 mm.*** to approx. ***2.9 mm.***
  lower from ***5.0 mm.*** to approx. ***3.0 mm.***
- nib was reduced from ***8.0 mm***. to ***6.2 mm***.

- The upper part of the shank above the nib was reduced from ***4.4 mm.*** square to ***3.0 mm.*** square.

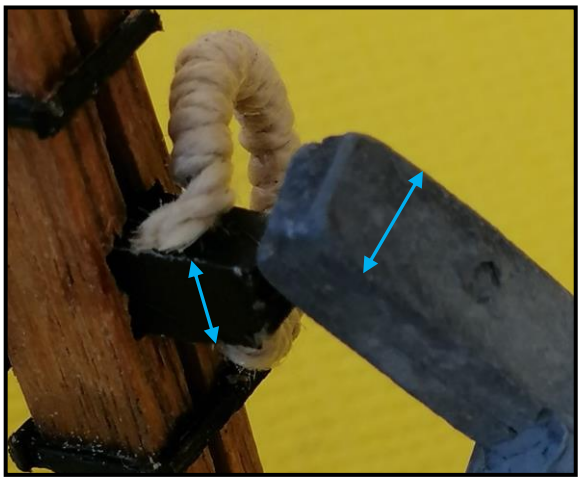


Figure 10: Top Portion Shank Size Reduced

Figure 11: Anchor Ring Puddening (not Derfflinger)

Anchor Ring

The ring had 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.***).

Anchor Cable

At sea, the cable was often unreeved (‘unrove’ or ‘undone’) from the anchor ring and secured along the deck.

The cable was secured to the ring with a clinch knot wrapped once through the ring (‘fisherman’s knot or bend). The anchor bend is an easy knot to create and is illustrated in Figure 12.

Historically, these ropes were not coated with tar – handling would be difficult and in any case the ropes readily dried out after immersion.

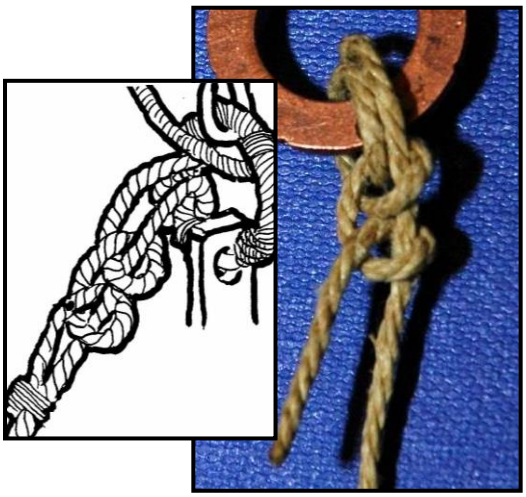


Figure 12: Anchor Clinch Knot Detail

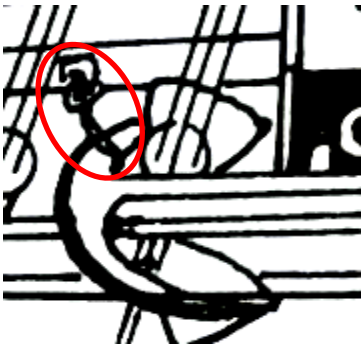


Figure 13: Shank Painter

Raising and Storing the Anchor

This is a major diversion from the kit build – my apologies to Euromodel - to allow some discussion on the system used to raise and store the anchors. Some builders may well be led to re-think what is prescribed in the kit regarding the handling of anchors.

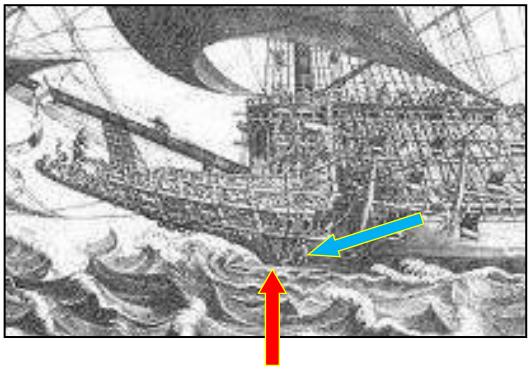


Figure 14: Cat Hook and Anchor Ring Are Joined

Step 1: Connecting the Cat Tackle

As the timber stock of the anchor breaks through the water, The hook of the cat tackle is connected to the anchor ring. Fig. 14 illustrates this rather precarious task where a sailor (blue arrow) standing on the anchor stock (red arrow) can just be seen (although the resolution is rather poor).

Step 2: Catting

The anchor is **raised out of the water and vertically up to the cathead** using a cathead tackle system ('cat').

Figure 16: Anchor Catted

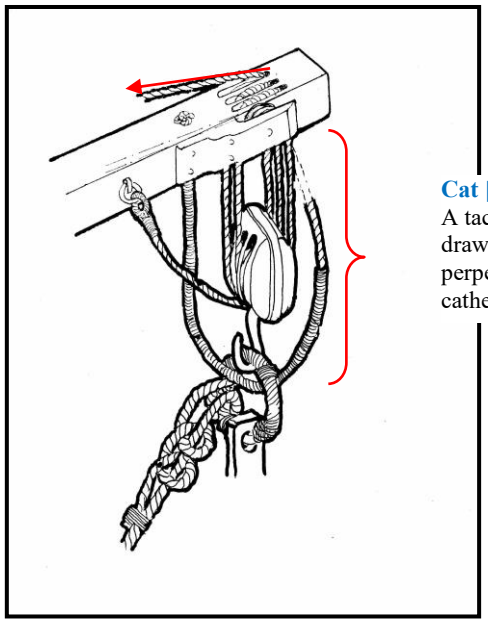


Figure 15: Generalised Cathead & Tackle

Whilst one anchor may be kept in this vertical position for rapid deployment, the other anchors (usually three) needed to be hauled into a position against the hull side where they could be safely and securely stored ...

Step 3: Fishing

After catting, the anchor would be **swung upwards and aft** bringing it roughly parallel to the upper deck. Lifting of the anchor into a roughly horizontal position where it can be stowed was achieved by a number of different means including, for this era, fish davits.

Figure 17: Half-Length Fish Davits

Fish Davit

It was a square-sectioned timber length with a length approx. equal to just over half the ship breadth with a large block and tackle used to lift the anchor into a horizontal position (described in detail in the following text). There were many methods of davit support including sliding through stanchions already present below the bulwark rails (Fig. 17) or specialised cleats (Fig. 18).

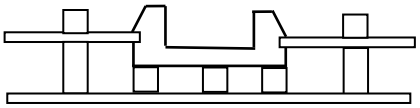


Figure 18: Fish Davit Cleat

In use, the davit was extended out beyond the confines of the vessel with the other end being secured by deck-fitted eyebolts which prevented any movement as well as enabling the anchor weight to be taken.

The required movement of the davit was enabled by two special adaptations:

- ***eye-bolt*** on the upper face allowing the topping lift to take the weight,
- ***a hand-rope*** was formed along both the fore- and aft- sides to allow for manipulation.

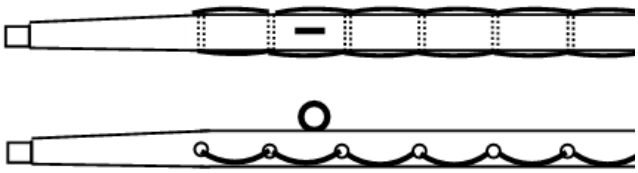


Figure 19: Davit Views (diagrammatic only)

Figure 20: Fish Davit Handrope

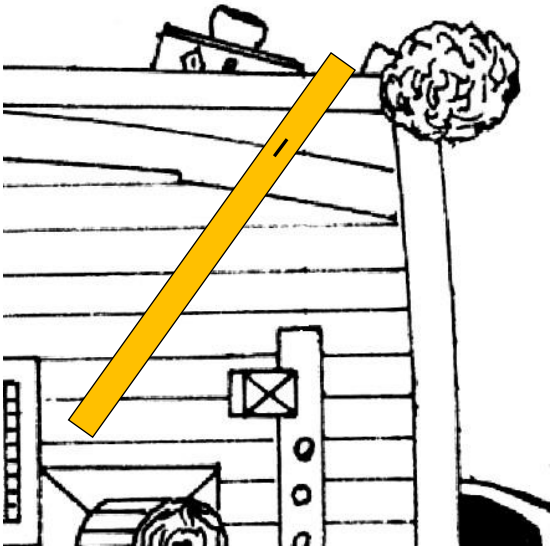


Figure 21: Davit Positioning (diagrammatic)

Davit beam (at the time of writing) anticipated to be ***30 x 5 x 5 mm.*** Note the eye bolt on the upper surface.

Actual positioning was yet to be determined.

Refer to the Appendix for details on the davit tackle system.

In spite of the detail just described, it is not uncommon for the builder to simplify matters as shown in Fig. 22.

Figure 22: Simplified Cathead Rigging

Belaying Points

Bitts

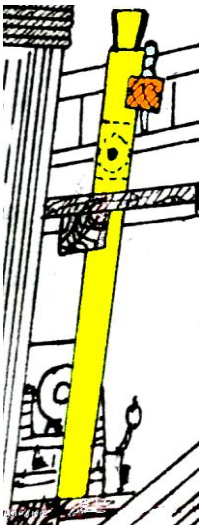


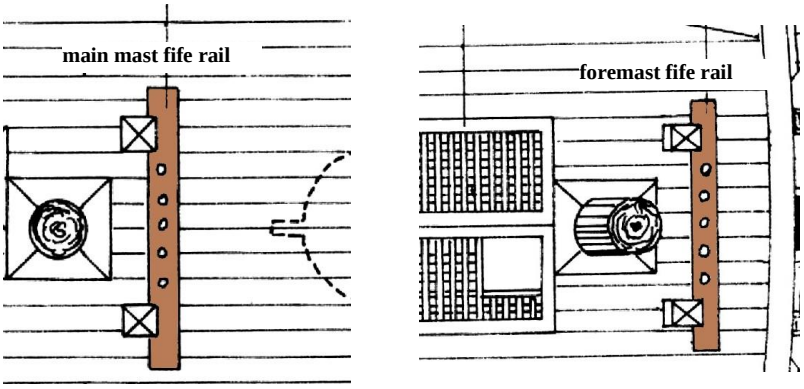
Figure 23: Fore Fife Rail and Bitt

The basic approach is to pin the supporting bitts (i.e. ***5 x 5 x 16 mm.***) to the foc'sle deck for the fore rail and to the main deck for the main rail. However, sets of bitts were extended in length but still in a slightly truncated (i.e. ***5 x 5 x 37 mm.*** for the fore rail and ***5 x 5 x 40.5 mm.*** for the main rail) which allowed them to extend down to the main deck and lower deck respectively.

It was found easier if the cutting, shaping & drilling was carried out on one double piece of ***5 x 5 mm.*** timber (Fig. 24) that was then cut into two separate bitts as the final step. The drilling out of the holes posed no problem with the holes begun from both sides. That way, any small mis-alignment was corrected as the drill passes through the centre.

Figure 24:Main & Fore Mast Bitt Construction

Fife Rails



Plan Sheet 2 shows a fife rail, each with five belaying points, abaft of both the main mast and the foremast (Fig. 25).

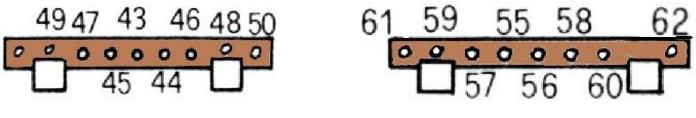
Figure 25: Fife Rails (basic)

Figure 26: Main Mast Fife Rail

Figure 27: Foremast Fife Rail

The basic approach with only five belaying points per rail is dependent on sails not being added *and* not utilizing the common technique of adding running rigging up to the various blocks (see below).

Plan Sheet 7 portrays a different perspective with eight belaying points per rail (Fig. 28) to take into account all of the running rigging.



main mast fife rail **foremast fife rail**

Figure 28: Fife Rails (comprehensive)

Some builders opt to ***leave these running lines and their blocks off the ship altogether*** (as indicated in Fig 25 above) although the traditionalists will complete the rigging rove through the last block concerned with a small length on the other side as shown in Fig. 29.

To allow for the belaying of all running rigging, the fife rail lengths will have to be larger.

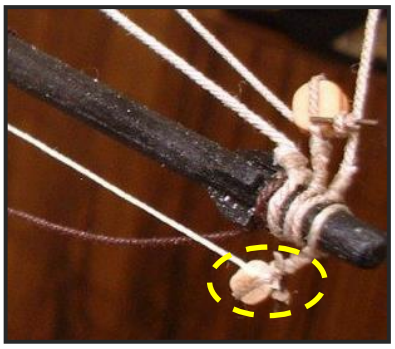


Figure 29: Running Line Incomplete

Binnacle

Given the harsh conditions that occurred on the deck of a ship at sea, it is not surprising that the need to protect the compass soon saw its enclosure inside a timber cabinet – the binnacle - but with the ability to still observe it through a glass cover. Illumination for night use was enabled through the inclusion of ship's lanterns. Also present were usually a number of storage areas such as drawers.

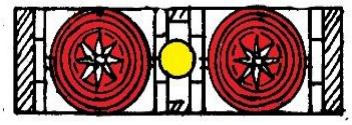


Figure 30: Plan View of Compasses and Lamp

Ships began using single binnacles (with only one compass) but often with two, sited on either side of the wheel. This gave way to a double binnacle with **two compasses** and a ship's lantern located in the centre. In both situations, the *illumination was far from perfect* and there was also the obvious *danger that the light could be seen* at a distance from the ship.

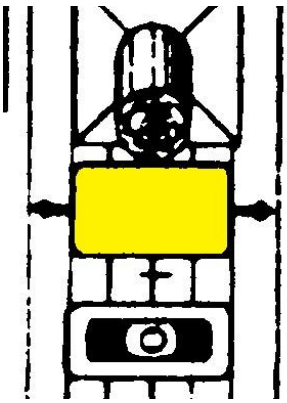


Figure 31: Double Binnacle

There is one Euromodel drawing (Plan Sheet 5) that suggests the presence of a double binnacle (Fig. 31), typical of that found on 18C/19C ships, well after the time of the ***Derfflinger.*** Apart from this rectangular shape, *there is no further detail provided for this cabinet*. Some builders will decide to include the binnacle as shown ….

The double binnacle typically contained:

- upper drawers,
- lower cupboards,
- two compasses in the central section,
- lamp in between the two compasses for illumination at night,
- external metal chimney mounted on upper external surface.
- clear glass-filled doors

Whether the builder chooses to just create two solid doors or go to the trouble of forming two glassed doors is going to be a significant step.

- a spare stanchion was placed in a central position to act as a lamp
- door and drawer handles were created from small brass nails painted over with black paint
- two compasses - flat discs – were to be added
- two venting chimneys were yet to be added

Figure 32: Ship's Binnacle

After considerable research, it seemed most likely that a binnacle did not exist on the Derfflinger.

Its first existence seemed to occur many years later … "*In a MSW post on 27 September 2014, robin b claims that in a personal correspondence he had with author Brian Lavery, it was stated that a single binnacle was 'invented around 1810' but its origin was obscure and so its use could have been before this date*."

The Euromodel drawings were based on a set of much earlier drawings (author unknown) and it is believed that the binnacle shown on the deck plan was added as an afterthought.

It is worth noting that the Danish frigate of 1860, the Jylland, contained two single binnacles. Whether these were preferred to a double binnacle is uncertain but this was a particularly large ship (71 m length x 13,5 m beam) with a large wheel and perhaps the compass bearings were more easily taken from either side of the wheel.

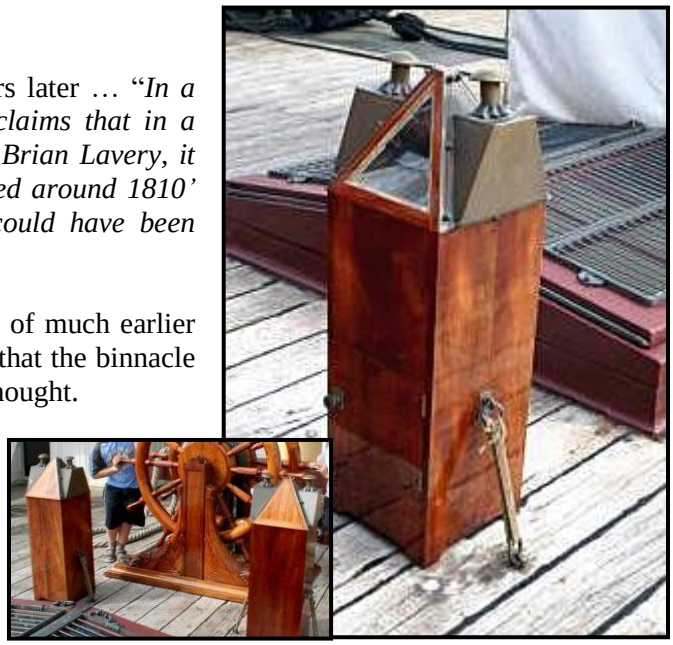


Figure 33: Single Binnacle: *Jylland*, 1860

Bitts

Refer to ‘Belaying Points’

Channels

parasartie

The channel timber is supplied as … 2 x 10 x 28 0 mm. (1)

The reality is that there were a *number of timbers joined together to form that width*. Either using a number of such lengths or simulating the timber widths would be an obvious step for the builder.

The channel dimensions taken off the drawings are quite different to the stated dimensions – important to go with the latter. Interestingly, the cross section shows two variations …

- supplied timber is 2 mm. thickness but the drawing infers a tapering from 3 mm. down to 2 mm. ; little choice but to taper slightly downwards from the 2 mm. !
- drawings infers tapering on both upper and lower surfaces (Fig. 34) but traditionally that only occurs on the upper surface (Fig. 35).

Figure 34: Tapered both Sides

Figure 35: Tapered on Upper Surface Only

Apart from the tapered upper surface, Fig. 35 also portrays a capping strip placed along the outer edge of the channel.

Both the fore and the main channel strips have a straight outer edge whilst the inner edges are curved to match the hull profile.

Overview

The lower of each deadeye pair is connected to a metal strap which passes through the channel and secured to the hull underneath.

By necessity, chain plates consist of a number of sections linked together to enable maneuvering the chain assembly around such things as gun ports (Fig. 36). The plates supplied in kits are greatly simplified but will generally be quite suitable.

Many builders simply drill holes through the channel (as the plans indicate) to allow the plates to pass through the channel but in reality notches were created along the outer edge with a capping strip placed over the notch openings.

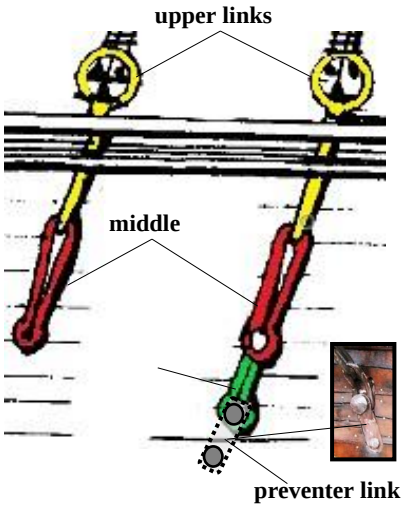


Figure 36: Chain Plate Links

From two respected authors …

Anderson (1955, 37) ...."*Deadeyes in the period 1650-1720 and later were set in slots on the outer edge of the channels, and covering strips were nailed over them*"

Goodwin (1987, 187) ... " *In 1771, an improvememnt was made to facilitate removal of the deadeyes, for replacement or maintenance. This modification required slots to be cut into the outer edge of the channel, in place of the original holes through which the chain plates passed. Over these slots, along the edge, a thin capping was nailed, to prevent the deadeyes and chainplates from being unshipped. This batten was made to 2/3 of the thickness of the outer edge of the channel, and was generally fashioned with a plain moulding*"

Figure 37: Mis-Aligned Chain Plates

Two thirds of 2 mm. is approx. ***1.3 mm.*** Fig. 37 ignored the capping strip altogether but the upside of adding the capping strip is that it will supplement the width of the supplied channel material.

If the holes or slots are created too early in the building process, then the photo in Fig. 37 illustrates the likely outcome of chain plate mis-alignment.

Fig. 38 shows the necessary alignment of the shroud lines with the underlying chain plates.

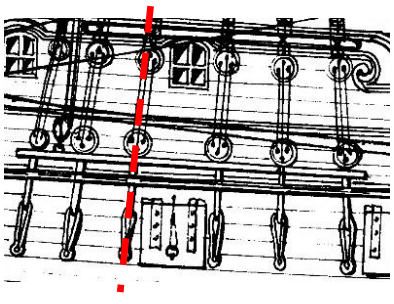


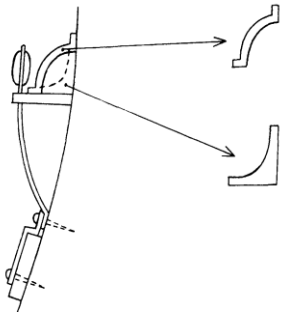
Figure 38: Shroud & Plate Alignment

It is recommended that the holes/ slots be determined and created only after the shroud lines are ready to be installed.

Supports

Due to the lateral stresses that the shrouds control, the channels were typically pinned through the hull side and greatly strengthened by the presence of knees and spurs (Fig. 39) located along the channel upper surface. They appear to be absent from this Euromodel-designed ship.

Due to the presence of gun ports, their distribution along the channels was invariably uneven.



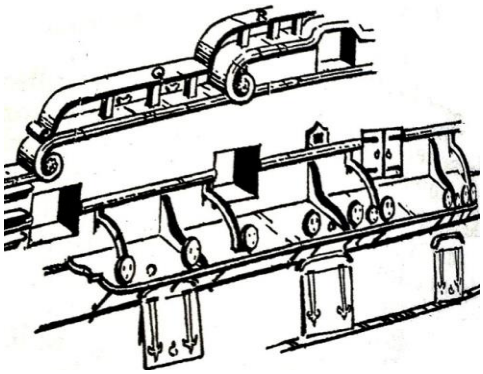


Figure 39: Channel Spurs & Knees

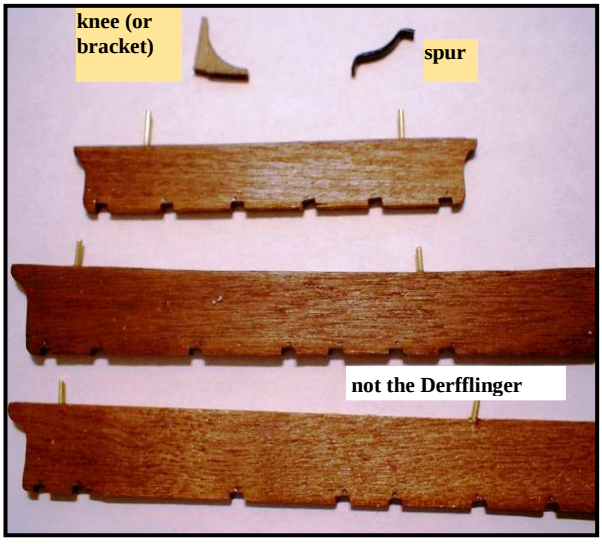


Figure 40: Channel Support

How they are produced is up to the individual but one person made the comment … "the metal spurs were made from 0.8 x 1.5 mm. brass strip using a combination of looping & needle nose pliers".

Brass pins were installed to help hold the channels in place.

Locations

The drawings show no channel adjacent to the mizzen mast and the thinking here would have been that the hull is sufficiently near vertical not to require the use of a channel to extend the width of the ship. However, many builds show a mizzen channel so its inclusion is up to the individual.

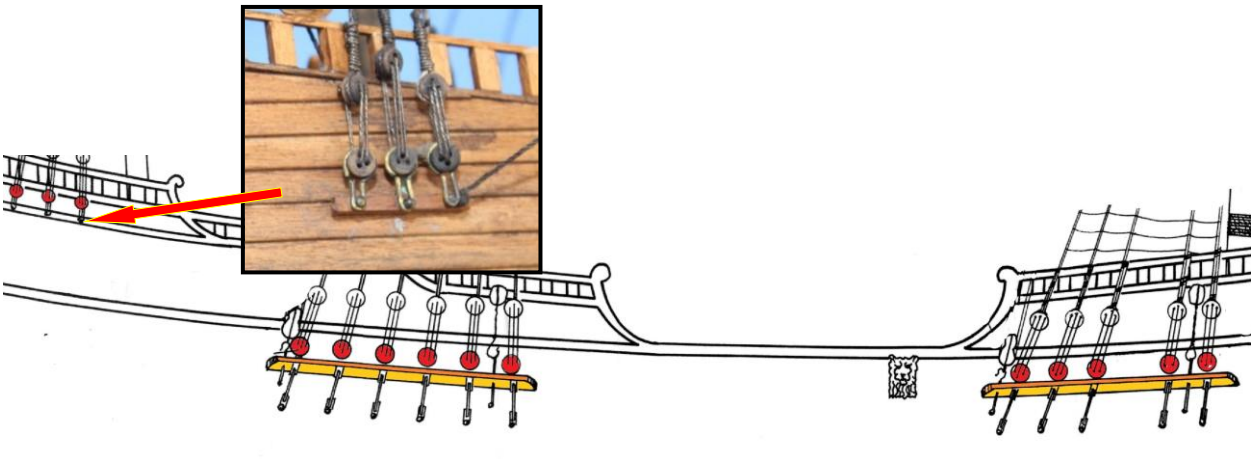


Figure 41: Mizzen Shrouds without Channel

Figure 42: 'Mini' Mizzen Channel

Fig. 42 above has utilized the prescribed clinker planking and this combined with the added spacer on its surface should be sufficient to create enough of an extension outwards.

The smooth planked (carvel) surface in Fig. 42 does not produce the same thickness as clinker planking and perhaps this is a reason for adding the channel ?

Precisely where each of the channels are fixed to the hull surface will be determined by the individual's build. The drawings, of course, will give a strong indication of positioning but some minor adjustments may well need to be made.

Main Channel

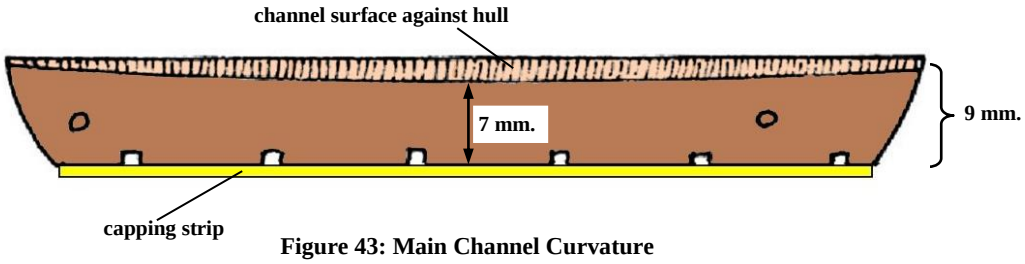
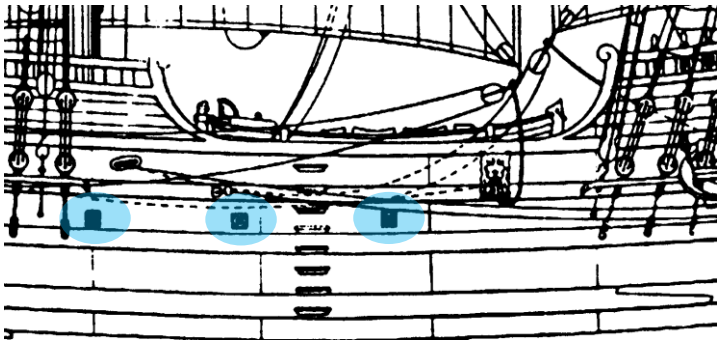


Figure 43: Main Channel Curvature

Drainage of Deck

Whether you wish to include the following detail is very much up to you - compare Figs. 68 & 69.



Scuppers (outlet channels for storm & waste water accumulating on decks) and ***waterways*** are important historically but are features many builders ignore. Given that this deck has a significant curvature, it is worth considering as an *important* feature.

Figure 44: Drainage Scuppers

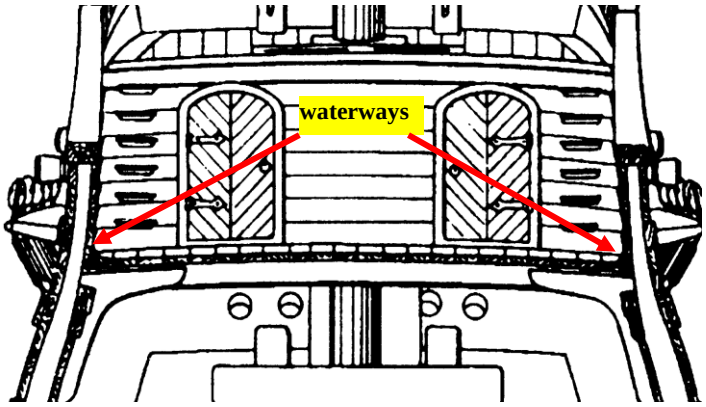
A: Scuppers

Three scuppers occur on the Main Deck level as shown above in Fig. 44. These were constructed at a later stage.

Figure 45: No Drainage Scuppers

B: Waterways

There is also the aspect of waterways – the ***concave*** timber strip between the vertical bulwark and the 'horizontal' deck that forms a drainage channel along each side of the deck. Gaps were incorporated along each length for the scupper drains. Again, this important drainage feature is not often seen. Rather than spend the time constructing a concave strip, I placed a flat timber along the deck – *another shortcut*. A real advantage of adding this strip, of course, is that it masks the joint between the bulwark sides and the deck.



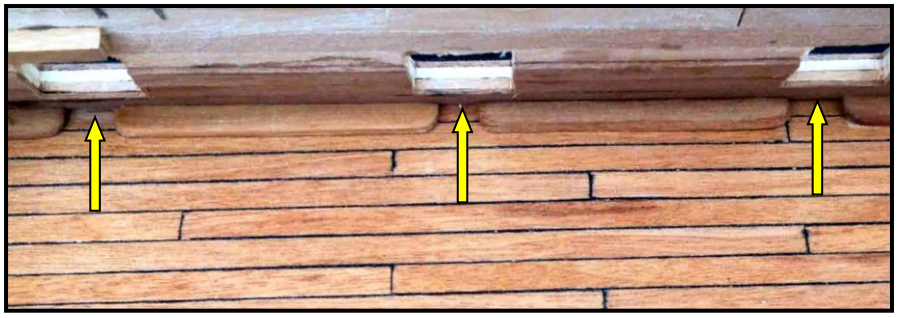


Figure 46: Scupper Position on Main Deck

Fife Rails

Refer back to 'Belaying Points'

Grates

The drawings suggest the outer timber borders for each grate unit are ***1.5 x 1.5 mm***. However ...

- strips provided form a grate approx***. 3.2 mm.*** thickness
- timber provided for the *outer edges is* ***1 x 2 mm.***

The basic approach seems to be to form a flat grate that is reduced in thickness to ***2 mm***. with a surrounding border with a width of ***1 mm***. However, in this build, this was done and also managed to produce a *slight concave/ convex configuration* (Part C, below) with the *final thickness being* ***1.5 mm.***

- In building the Euromodel Derfflinger, there will need to be some rationalization between dimensions shown in the drawings and what can be obtained with the commercial grate strips supplied.

- In producing grates, ensure that the visible complete grate lengths are running fore & aft (Fig. 47; red grate examples and yellow line).

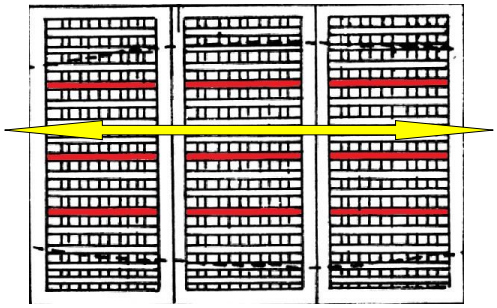


Figure 47: Orientation of Grate Strips

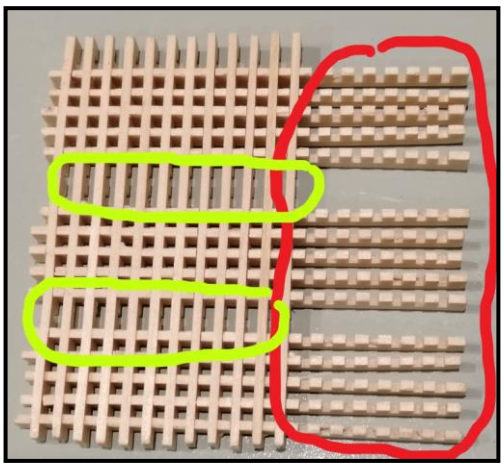


Figure 48: Excessive Wastage of Strip Material

- There is sufficient material to produce the required grates but great care must be taken in how the strips are assembled in order to avoid wastage. The following photo illustrates how NOT to produce waste.

  The green and red areas should be avoided in the first place. Through calculation, individual strips can be cut to the required lengths to avoid almost any wastage at all. Alternatively, a total block of strips might be produced and then sub-blocks cut from that. In any case, some careful thought is required.

- It was ***found necessary to slightly enlarge each slot*** by sanding. If the strips did not slot in easily, the small amount of timber between each two slots tended to break easily.

- After producing the grate blocks, they were quickly immersed in a PVA: water mixture (1:1), removed and allowed to dry for 24 hours.

- The outside edges were sanded back to the required dimensions (using a bench grinder).

- The block faces were sanded back on both sides so that a grate of ***2 mm.*** thickness was produced.

- ***1 x 2 mm.*** strips were glued on to all four edges of each block as indicated in Plan Sheet 4.

Main Deck

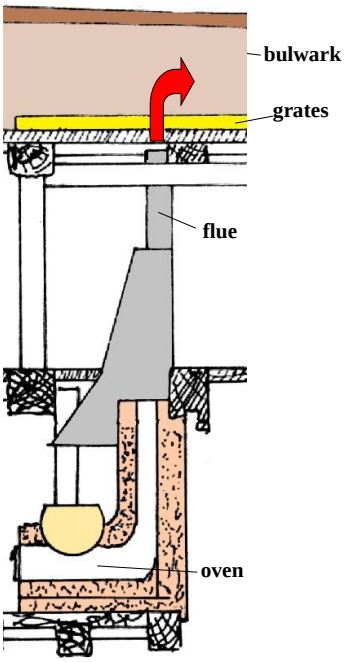


Figure 49: Venting of Kitchen Gases

These grates would serve a number of purposes including…

- venting air from storage areas below deck
- allowing light to penetrate through to lower decks
- venting cooking gases from the kitchen (Fig. 49).

Grates (x 3) …
drawing: ***13 x 30 mm.***
actual: ***13.4 x 31 mm.***

Deck Camber:
The grate assemblies are often added directly onto the deck surface. Allowance could be made for the deck camber before fitting by producing a slight concave under-surface but at this scale, the camber was barely noticeable.

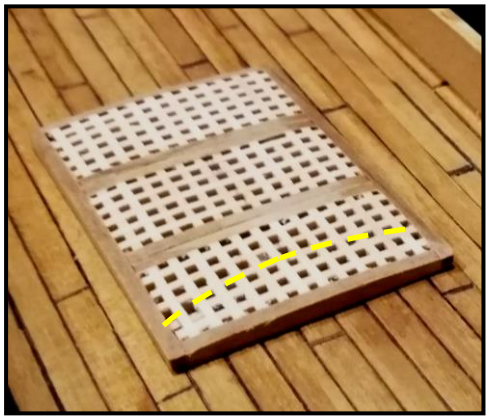


Figure 50: Main Grate (not sanded or stained)

What did improve the appearance was the **formation of a distinct curvature over the top surface** - 3 mm. along the center line reducing down to 1.5 mm. along the outer edges (Fig. 50).

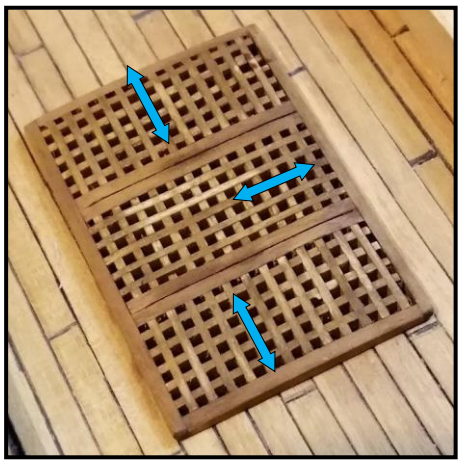


Figure 51: Main Grate (sanded & stained)

After sanding, the grate was brushed over with a stain darker than that on the surrounding deck. After a minute, this was wiped over with some methylated spirits producing an uneven, weathered appearance.

With even the best of intentions, errors do occur … the central grate was fixed in position upside down (Fig. 51; refer back to Fig. 47).

The reality is that construction of grates is a little more complex in design than that shown in most kit drawings.

Quarter Deck

Grates (x 3) …
drawing: ***10 x 19 mm.***
actual: ***11 x 19 mm.***

Figure 52: Quarter Deck Grates

Focs'le Deck

With commercial grate strips, it is always a lottery as to how the overall width of assembled strips turn out. There was a choice between the actual grate width being ***11.0 mm*** or ***9.15 mm***. The latter was too small to accommodate the grate opening, so the width of ***11.0 mm.*** was the only realistic outcome using the supplied grate pieces.

Grates (x 3) …
drawing: ***9.5 x 20 mm.***
actual: ***11.0 x 19 mm.***

For this set of grates, the ***orientation of strips is different*** to those of the main and quarter decks (blue arrow, Fig. 53). It was necessitated by the two narrow grates having a positioning in a fore-aft rather than the athwartship direction of the other two sets .

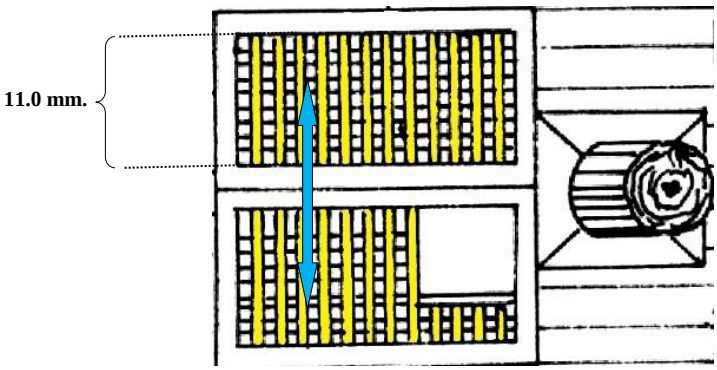


Figure 53: Grate Strip Orientation

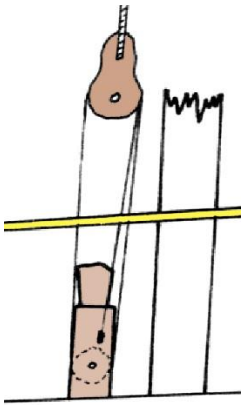


Figure 54: Bitt Below Grate

SPECIAL NOTE

At this stage, the rigging shown in Fig. 54 will have been carried out. When fitting the focs'le deck grate onto the deck, the fiddle/violin block must be pulled upwards through the grate opening. The block measures ***6.3 x 7.2 mm*** in cross-section.

It follows that the grate opening must be slightly larger than those dimensions.

Mast Collar

Figure 55: Mast Collar on Restored Batavia

The Euromodel Derfflinger has a square mast collar which it is assumed was made from four timber pieces which perhaps taper down towards the deck.

Interestingly, the mast 'collar' on the restored fluyt, Batavia, appears to be made from a number of layers of leather laced together (Fig. 53).

There was uncertainty about this method as in many other ships, there were a series of wedges (forming a complete ring) pushed into a narrow space between the mast and the surrounding space. Above the deck surface, this timber ring was usually covered by a fairing of canvas known as the mast coat. There must have been some wedge system underneath the leather collar in Fig. 56. [Photo 56 of the ***Batavia***, was copied from MSW and reproduced by courtesy of Tadeusz43].

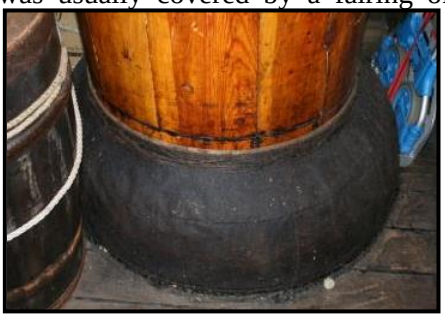


Figure 56: Mast Coat

Figure 57: Main Mast Collar

Opposite is a mast collar from another build of the Derfflinger. This follows the design drawing from Euromodel.

Mizzen Mast Deck Opening

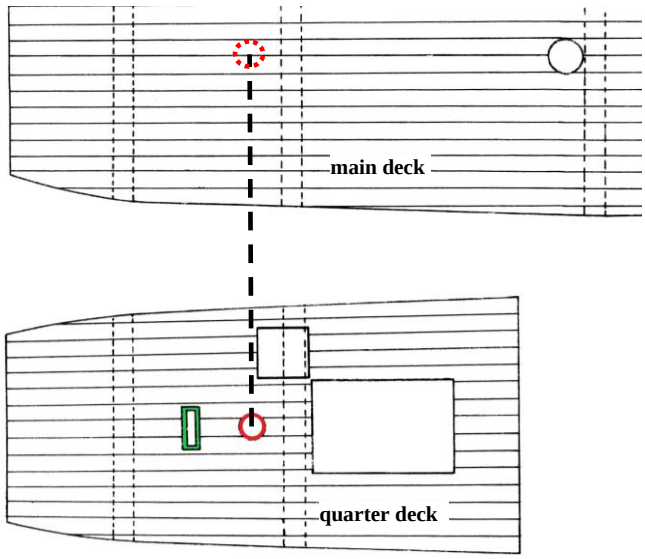


Figure 58: Mizzen Mast Hole in Main Deck

There is a mast step in the laser-cut keel but no corresponding opening in the drawing for the main deck directly above it (Fig. 58). A suitable opening in that deck was made and it was assumed that the stated length only allowed for the mast to be seated on the deck - it was difficult to ascertain that from the only available drawing (Plan Sheet 1) - and so added another ***6 mm.*** in the overall length of the mast.

The mizzen mast was constructed - ***28 mm.*** from the base of this ***166 mm***. length, the it was tapered from ***5 mm.*** to ***4 mm.*** This then allowed a check for a suitable fit in the mast step *and* the hole position in the quarter deck as those planks were laid.

Whipstaff

Figure 59: Whipstaff on Restored Batavia

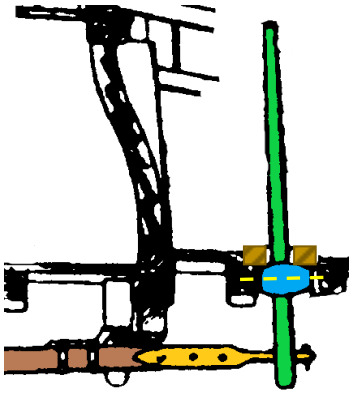
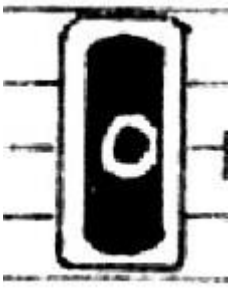


Figure 60: Whipstaff (diagrammatic)



APPENDIX

Fish Davit Rigging

(as described by Lees, 1984, 128)

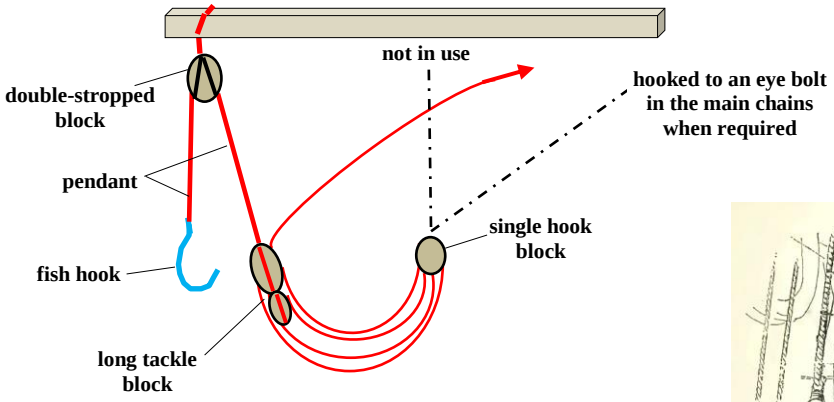


Figure 61: Full Length Fish Davit Rigging

The davit tackle rove between the pendant long tackle block and a single hook block which was hooked to an eye bolt in the main chains when required to be used.

Some ships had no tackle, the pendant being taken to the capstan via a lead block in the main chains [Lees, 1984, 128].

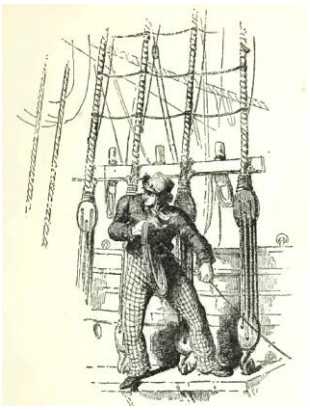


Figure 62: Heaving the Lead in the Main Chains (shrouds)