

Figure 1: General Maritime View

This manual is incomplete and is part of an editing review process so should be considered as a 'WORK IN PROGRESS'. Any changes made in subsequent versions will be shown at the start of that revised manual.

Manual 2 of 7

Hull Structure, Part 2 (Version 1)
[Armament; First & Second Planking]

This build manual 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 manual 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.

To my friend, Massimo
Whose untold generosity as owner of Euromodel G.B.M. Snc
inspired me to translate his plans and instructions.

Who opened his family to my family
and maintained a long relationship via the Internet
between Adelaide, South Australia and Como, Italy.

Who also inspired me whilst building a kit model of the
Friederich Wilhelm Zu Pferde
to create a documented manual of construction
for others to utilize.

To him I owe much

Contents

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

Euromodel Preview	4
Colours	5
Chapter 2: ARMAMENT	6
Sizing of Guns & Round Shot ('cannon balls')	6
Cannon Composition	6
Gun Carriages	7
Scratch Building - 18 Century Guns & Carriages	7
Gun Carriage Rope	9
Battery Deck – 20 guns	10
Main Deck – 18 guns	13
Forecastle & Quarter Decks – 10 guns	15
Upper Quarter Deck – 4 guns	17
Chapter 4: HULL STRUCTURE (Part 2)	19
Framework Tapering	19
First Planking	19
Bulwark Discussion	19
Gun Deck Gunport Positions	20
Starting the First Planking	20
Up from the the Main Deck level	22
Chapter 6: ADVANCED NOTES	23
Tools	24

Illustrations

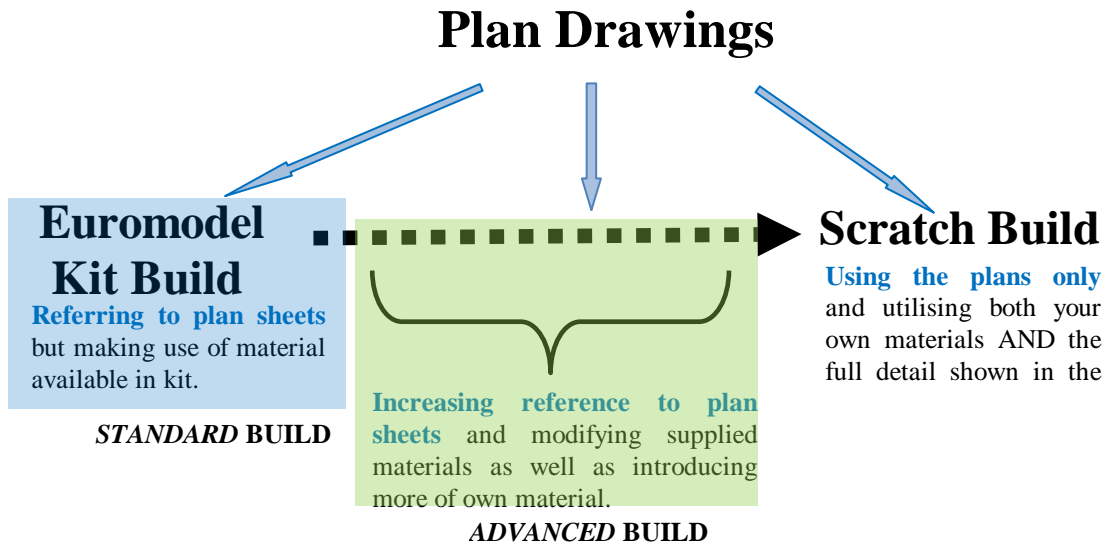
[The figures below are not hyperlinked]

Figure 1: General Maritime View.....	1
Figure 3: Stern Colouring Example.....	5
Figure 4: Colour Scheme Used by a Modeller.....	5

INCOMPLETE INFORMATION

EDITING REQUIRED

Euromodel Preview



Euromodel kits are based on sets of drawings by a naval architect and contain a comprehensive amount of detail that would be a challenge to the most serious ship modeller. This is in contrast to most other kits that whilst they also contain excellent plans, the intention there is to achieve a build similar to the plans provided. Euromodel offers plans that can be interpreted at various levels of complexity. If the builder has limited experience in the craft of shipbuilding, then the plans can be read at a simplistic level.

Whilst *all* plan drawings are important to the construction of the Friedrich Wilhelm zu Pferde, the builder is well advised to focus on three – Plan Sheets 1, 2 and especially 10

It could well be argued that *the outcome is somewhere on the continuum between a standard model construction and a scratch model*. How far you wish to extend this continuum is up to you and your build of this ship will be determined by the degree of complexity you choose (refer to the diagram above).

The kit material will go a long way towards achieving a good model but be aware that the purchase of some extra material might be necessary depending on how far you wish to go in emulating the plans. There will be little left over from the kit contents, but during the construction you should experience a compelling drive to create something better than the basic model. Euromodel is aware of this challenge and so provides just the basic needs and leaves it up to the modeller to determine how far he will extend his skills.

In summary ... my comments are not prescriptive and if the detail is sometimes a little too precise, please do not let this deter you. It will be up to you to take as much information as you wish and the rest to 'throw overboard'. It is your model, your creation, your handiwork.

Colours

Bianco - white	Rosso vivo – bright red	Legno noce – walnut
Nero – black	Giallo ocra – ochre	Verde marcio – green
Oro antico – antique gold	Azzurro scuro – dark azure blue	Azzurro pallido – pale blue
Acc. brunito – burnished steel	Quercia naturale – natural colour	

Euromodel have made the following suggestions but in the end it is up to you, the modeller.

Transom Figure

The panel must be fully painted before it is cut. The colours should be diluted sufficiently so that it produces a very light shade in order to maintain the realism of the wood panel.

sky: blue
ground: brown
horse: yellow
tunic: red
face: flesh
saddle: brown



Figure 2: Stern Colouring Example

Decks: natural colour finished with wax or varnish

Gun barrels burnished

Non-ferrous kit items not covered by the colour of the detail they are attached to (e.g. gun door hinge) can be painted with a black & silver mixture to simulate steel.



Figure 3: Colour Scheme Used by a Modeller

Red

gun carriages, winches, capstans, bits, shell holders, belaying racks, pin racks, inside of gun port doors. **[N.B. 'red' paints were manufactured using pigments such as red lead & iron oxides; the resultants paints were therefore a darker red & not a primary red colour].**

Walnut

inside bulwarks, handrails, stairs, hatchway coamings, mast coamings, masts & yards, tops & crosstrees, capstans, inside of life boats & their stands, blocks, deadeyes & belaying pins.

Chapter 2: ARMAMENT

Now seems a suitable time for an important deviation from constructing the hull. Before doing the first planking & cutting out the gun ports, it is **essential** to construct the complete gun carriages with barrels mounted for the three different sized carriages to check the height of the opening above the deck. *Even more important is the fact that the carriages will need to be fixed in position on the Gun Battery Deck before the Main Deck & other decks are installed since many gun positions will then be inaccessible. The gun barrels will then be inserted through the gun port opening.*

You may not wish to get carried away like I did but I constructed every carriage with its full detail even though 32 of the 52 carriages will not be seen. It just seemed the right thing to do.

Sizing of Guns & Round Shot ('cannon balls')

Research based on the dimensions given for barrel length & internal barrel diameter along with a knowledge of cannon ball diameters allowed me to make conclusions about the type of guns used (I have not described below whether they are 'long' or 'short'). The reason for doing this was to satisfy in my mind what would be the appropriate sized round shot to use. How far you take this is up to you but the two commercial sizes I am aware of are 1 mm. and 2 mm.

The kit provides three different gun carriage types – 35, 27 & 21 mm.

- **Gun Deck** - 20 x 18 pounders: 55 mm. cannons/ 35 mm. carriages [cannon ball calibre – 2.6 mm.]
- **Main Deck** - 18 x 12 pounders: 50 mm. cannons/ 27 mm. carriages [cannon ball calibre – 2.3 mm.]
- **Forecastle/Quarter Decks** - 10x9 pounders:45 mm. cannons/27 mm. carriages [cannon ball calibre–2.1 mm.]
- **Upper Quarter Deck** - 4 x 9 pounders: 38 mm. cannons/ 21 mm. carriages[cannon ball calibre – 1.6 mm.]

N.B. The size of the Main Deck carriages is smaller than that shown in the plan sheet but better fits the size of cannon provided.

Cannon Composition

In the 1700's, it seems that the material of choice for the cannon was cast iron since it was less than half the cost of using bronze. However, its structural integrity was very poor and accidents frequently happened. Another disadvantage of using cast iron was that after use it only had minimal scrap value whereas bronze could be re-cast multiple times. So, bronze became the material of preference until the advent of steel. In painting the cannons in this model, I had to make a decision of whether to choose an 'iron' appearance by using a silver wash over the black paint or a 'bronze' appearance by using a gold/bronze wash. Based on the correlation in the table (on the following page) between what is size is described in the plan sheets and supplied in the kit and what material best corresponds, I settled on assuming that the barrels were of cast iron and hence used a silver wash.[Reference source not known].

Gun Calibre (lbs.)	Ball Diam. (in.) [actual]	Ball Diam. (mm.) [actual]	Ball calibre (mm.) [model]	Barrel Length supplied (mm.) [model]	Barrel Length if iron (mm.) [model]	Barrel Length if bronze (mm.) [model]
4	3.05	77.47	1.6	38	38	-
9 (short)	4.00	101.60	2.1	45	45	32
12 (short)	4.64	111.86	2.3	50	57	35
18 (long)	5.04	128.02	2.6	55	57	40

Gun Carriages

Some scratch builders will become involved in the extensive dimension measurements for the gun carriages shown in Plan Sheet 3 and a few will decide to construct ‘scratch’ carriages. The reason for the latter comment is that this kit – and in fact for all other kit manufacturers – simplifies the building of these carriages enormously.

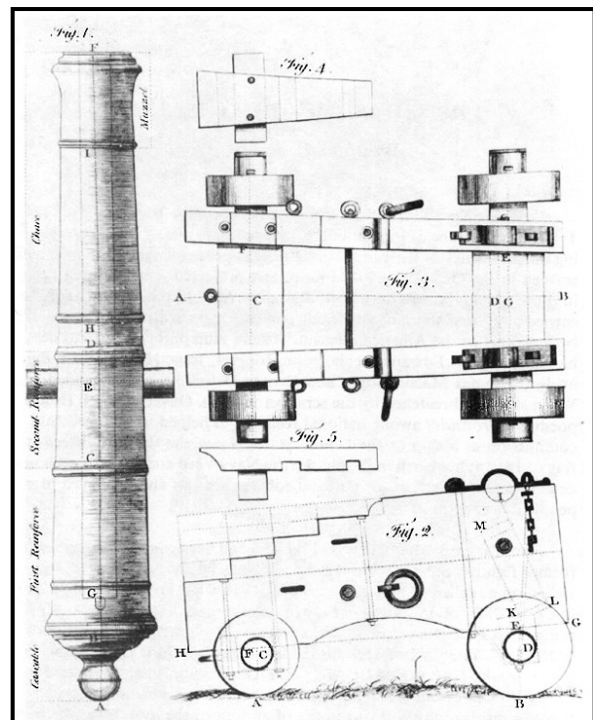
I suspect that the majority of builders will utilize the carriages supplied. For this reason, the following diagrams (taken from the plan sheet) have been highly simplified in that the majority of measurements are not shown. This has been done so that the kit/ scratch builders can concentrate on the dimensions that they may wish to alter utilizing the carriages & wheels provided. It might be likely that some builders will go with the carriages without any alteration whatsoever as they are supplied. So ... *carriages as supplied* OR *amended carriages* OR *scratch carriages* ... your choice. The carriages in fact differ markedly from that shown in the plan sheets and if some research is done, you may well decide that after all the effort in building the hull so carefully, far more time should be spent in creating a more authentic carriage.

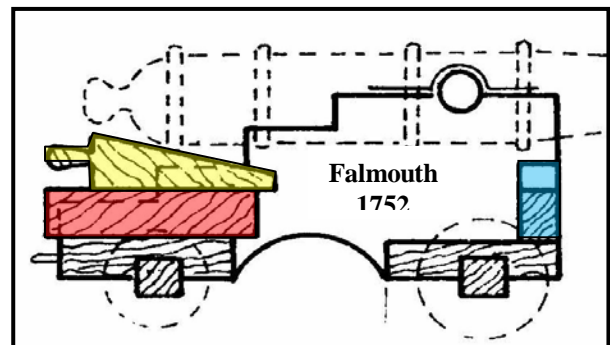
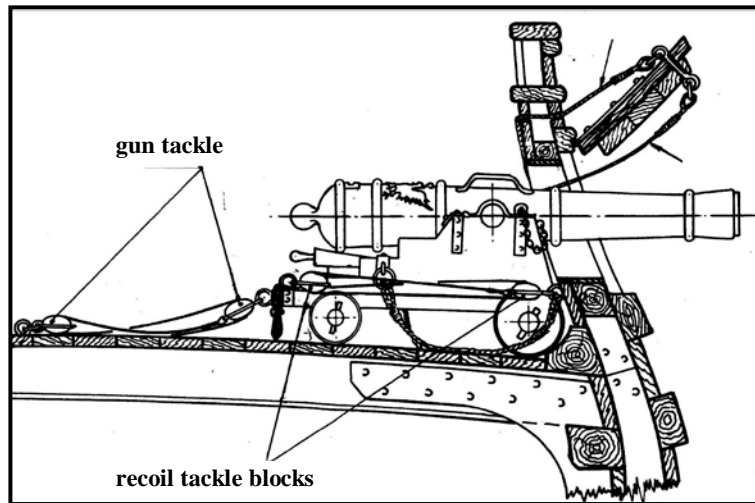
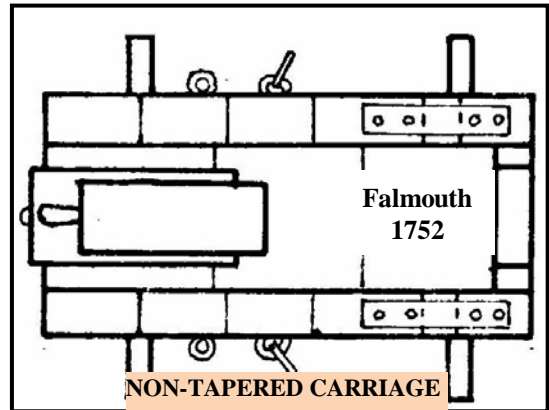
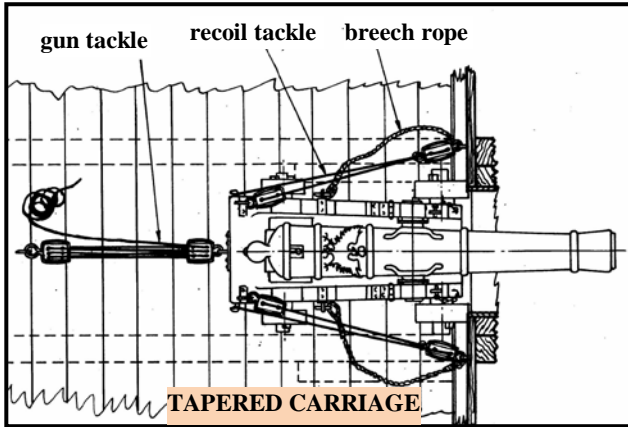
Of great significance is that many of the ‘completed’ guns will not be visible at all. If you put considerable time & effort into the carriage construction, it will not be seen ... but you will gain satisfaction from having built the full structure. This dilemma is well left to you to decide.

Plan Sheet 3 allows for the gun carriages that are not visible on both the Main Deck & Gun Battery Deck by using ‘block’ carriages designed to support the cannons. You can elect to construct these or just make the completed gun carriage whether it is visible or not. To simplify this issue, the kit *does* contain the necessary carriage forms, trucks, axles to build all the carriages in their ‘complete’ form. How ‘complete’ you wish to make them is indicated in the following diagrams.

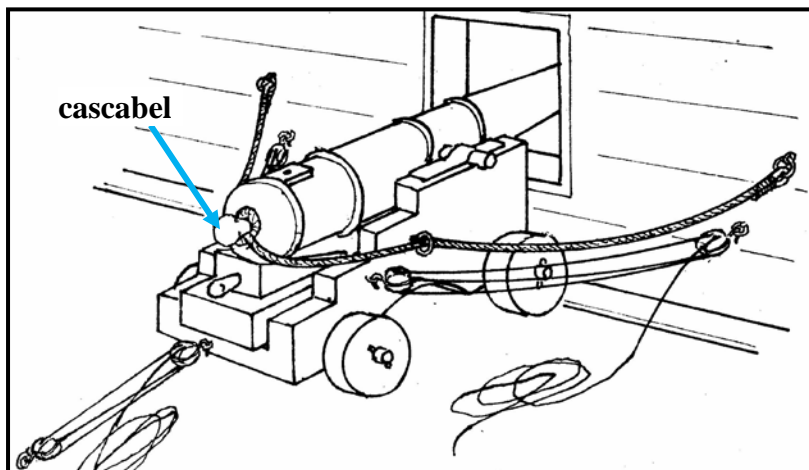
Scratch Building - 18 Century Guns & Carriages

The following diagrams illustrate some ideas for use by a scratch builder that *could* be taken to create gun carriages more authentic than that provided by the kit. Not a simple task. Most of these diagrams are taken from Euromodel’s plan sheets but again only serve as a guide to the scratch builder.



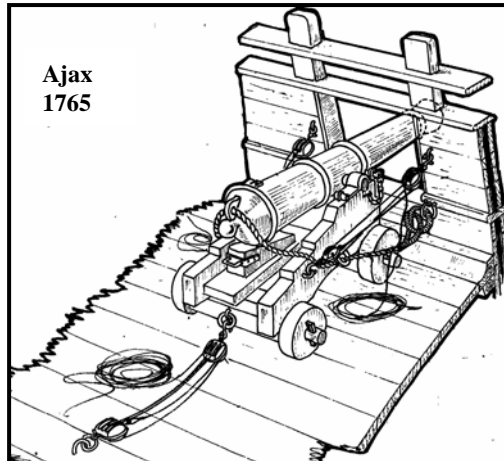
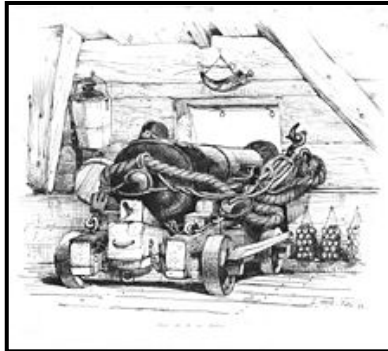


Pink: bed
 Yellow: quoin
 Blue: Transom



The breech rope was clinched to large ring bolts on the bulwarks and taken around the cascabel. The cascabel originally referred to the round knob at the breech end of the gun. However, the diagrams above only show the breech rope attached to the carriage sides and this only serves to show how much variation there was between ships and over time.

18 C illustration



Gun Carriage Rope

	Gun Deck (mm.)	Main Deck (mm.)	Quarter Deck (mm.)	Upper Quarter Deck (mm.)
BRACES	1.5	1.0	0.75	N/A
GUN TACKLE	0.75	0.5	0.4	0.25
RECOIL TACKLE	1.0	0.8	0.6	0.4
BLOCKS				

Postscript Comments

My goal was to create gun carriages utilizing the material supplied. The following comments show the steps & changes that I carried out to make a structure similar to that shown in the plan sheets. However, I must admit to having some doubts about the wisdom of doing all of this and at times wondered whether it would have been better to start from scratch or in fact just use the original carriage. In the end, I remained faithful to my philosophy of adhering to working from the kit and only modifying & adding to what Euromodel supplied for the carriage. In the diagram above you can clearly observe that the typical carriage consists of two vertical sides (*'cheeks'*) joined by two horizontal *axle trees* as well as the *quoin* used for adjusting the inclination of the cannon seated on a *'bed'*. Then, you should look at the use of *ring & eye bolts*. Carriages are hauled to and from the bulwarks via *three tackle systems* – these may or may not be included in the build. There are differences in the tackle systems utilized in England and those on the Continent but I chose to adhere to that shown in the plan sheets.

The construction of the gun carriages is very rich in diversity and complexity and can demand a high skill level in its re-creation so there will be large differences created between the same model built by different persons. I suggest that you scan through [pp. 7 – 19](#) examining the various diagrams & photos to get an overall picture in your mind of what the carriages could look like – but remember it is always your choice as to the level of complexity chosen.

Battery Deck – 20 guns

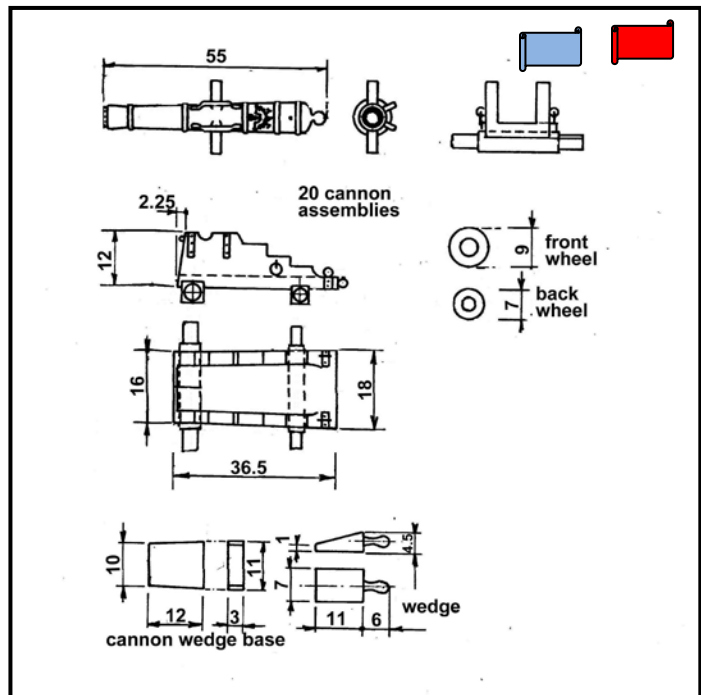
Whatever approach you use, check the dimensions from the 1:1 scale Plan Sheet 3. The dimensions shown opposite only serve to highlight some specific details you may wish to change on the supplied kit pieces.

NOTE:

- front wheels supplied have diameters of 7.5 mm. (vs. 9 mm. in drawing) whilst the narrower rear wheels are 7.0 mm.
- carriage cheek is 2.8 mm. (vs. 2.0 mm. in drawing)

After considering the plan dimensions, I chose to make certain alterations. You will need to make your own choices ...

- **length** varied, 35.0+; I left this as it was,
- **height** (of the ‘cheeks’) varied, 13.7+; I reduced the height approx. 2 mm. by removing the top step at the front and then **producing a slight concave depression to accept the cannon trunnion**,
- **width** varied, 16.3+; given the need to taper the carriage and that it would be difficult to increase the maximum width to 18 mm., I decided to make the taper based on 14-16 mm. (rather than 16-18 mm.) which accepted the trunnions more effectively.
- increasing the width of the **axle channels** to 4 and 3 mm
- increasing the **hole diameter** in the 7 mm. wheel to 3 mm.



Further to this, there are certain variations to the basic carriage configuration, some of which you may choose to ignore:

- angle for the **leading edge of the cheek**
 - construction of the **quoins** (cannon wedges) – see opposite - and supporting **beds** ... refer to
 - [Scratch Building - 18 Century Guns & Carriages](#)
- construction of the axle and wheel assemblies (**axle trees** and **trucks**). Determination of length allowed for extension past the width of the wheels since cotter pins were inserted into the axles to hold the trucks in place. Diagram above shows a square cross-section axle tree, which is correct but for the kit build, the ‘axle’ is actually the axle tree and the axle projections either side. . [A fine point of construction – and one that I did not use – is the insertion of the cotter pins on the end of the axles!]

Lengths to be cut will depend on the actual width of each carriage which given the process of tapering may show some variation ...

for the front axle: carriage + wheels + projection = +/- 14 + 8.7 + 2.6 = +/- 25.3 mm.

for the rear axle: carriage + wheels + projection = +/- 16.0 + 5.0 + 2.6 = +/- 23.6 mm.

- addition of *eye bolts* and *ring bolts* could be carried out but *trunnion bands* cannot be used due to the insertion of the cannon barrels at a later stage through the gun ports. Note than none of these items are supplied in the kit.

Construction Details (Battery Deck carriages) (based on kit material)

- STEP 1:** Widen the front axle channel on the base to 4 mm. and the rear to 3 mm.
- STEP 2 :** Cut down the centre line of the carriage with a fine-bladed jig saw.
- STEP 3:** Sand the cut edges so that combined the carriage is 14 mm. at the front and 16 mm. at the rear.
- STEP 4:** Reduce the gun carriage height down to 12 mm. causing you to reform the cut-out supports for the gun barrel trunnion – see photo opposite. To fit within the original cheek section, the steps were altered so that they were 2 mm. deep and 4 mm. wide. The latter dimension was a little smaller than that shown in the plan sheet (approx. 5 mm.).
- STEP 5:** Cut wheel axles of length +/- 23.6 mm. (rear) mm. and +/- 25.3 mm.(front) from supplied wooden rod (both lengths make an allowance for what would be cotter pin fitting). Slight chamfering of the ends of the axles prevents the wheels – which are a tight fit – from cracking.
- STEP 6:** Glue the two half sections of the carriage down onto the two axles.
- STEP 7:** At the front, create an angled slant on each cheek.
- STEP 8:** Paint the carriage with the colour of your choice (e.g. dark red).
- STEP 9:** Glue on the two front wheels (7.5 mm. supplied but plan describes 9 mm.) wheels and the two 7 mm. wheels at the back. **N.B. before sliding wheels onto the axle, test for a tight fit and, if necessary, utilize a round file to increase the wheel hole diameter.**
- STEP 10:** Create a quoin (wedge-shaped block) to support the rear of the barrel and glue in place. The interior maximum depth from the plan sheet is 6.0 mm. Using this figure, calculate the depth of bed.
- STEP 11:** Determine the inclination of the cannon required and utilize a template to maintain uniformity with all the carriages whilst gluing in the quoin. The photographs on the next page illustrate what I used.
- STEP 12:** To hold the barrel in the correct position when inserting the barrel through the port hole, I decided to include the transom detail – many would argue this was an

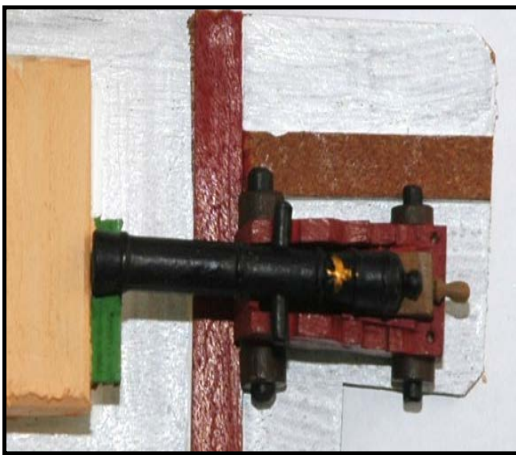
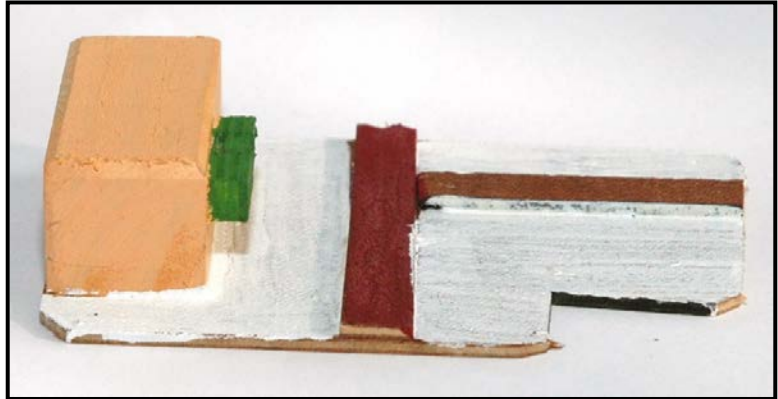


No gun carriages visible when ship complete

TEMPLATE:

Scrap pieces glued together & painted roughly for purposes of photography ...

1. Central dark red strip aligns front trucks (wheels).
2. Light brown block aligns distance barrel projects out from carriage.
3. Green block aligns inclination of barrel on carriage & position of quoin under barrel.



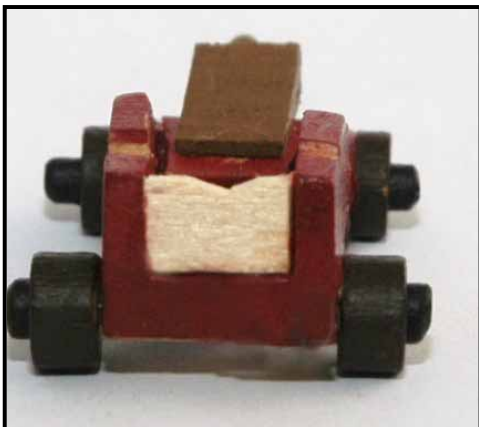
BARREL PROJECTION:

Barrel sits on small green block against larger light brown block. Any adjustments to position of trunnions can then be carried out.



BARREL INCLINATION:

Barrel sits on small green block against larger light brown block. This allows quoin to be inserted & fixed in position



TRANSOM INSTALLATION:

A small section of first planking strip was glued in position and after fixed, the top surface was adjusted to fit front of barrel – transom – trunnion – quoin alignment. Here a suitable cut has been made which will then be smoothed to fit the barrel curvature.

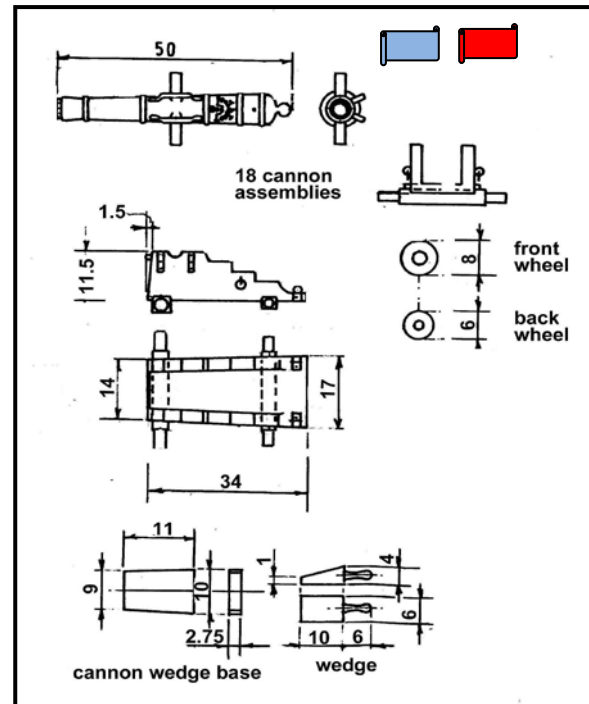
Main Deck – 18 guns

Whatever approach you use, check the dimensions from the 1:1 scale Plan Sheet 3. The dimensions shown opposite only serve to highlight some specific details you may wish to change on the supplied kit piece.

Whilst the cannon was approx. 50 mm. in length, the actual position of the trunnions compared to the drawing was 5 mm. further back! So for this reason, a 27 mm. carriage provided a better fit than the original 35 mm. carriage supplied. This latter size will still be workable but requires more work to reduce its size.

NOTE:

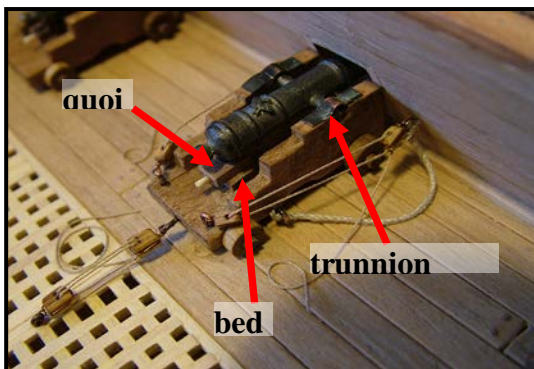
- front wheels supplied have diameters of 7.0 mm. (vs. 8 mm. in drawing) with the rear wheels being 6.0 mm.
- carriage cheek is 2.6 – 2.8 mm. (vs. 2.0 mm. in drawing)
- the cannon trunnions do not fit onto the slots provided on the cannon. However, from the point of adjusting the cannon inclination correctly, it proved better not to widen the two small channels and just have the trunnion pins sitting half in the channel/ half out of the channel. The trunnion bands then fitted neatly over the trunnions (should you choose to make them!)



After considering the plan dimensions, I chose to make certain alterations. It is here that you will need to make your own choices ...

- **width** of the 27 mm. carriage was smaller than in the drawings but I cut down through the centre line and created a taper of 13.8 – 12.6 which still accepted the cannons neatly. A considerable amount of work for a small taper but it still looked better than the original supplied carriage.
- increasing the width of the **front axle channel** to 3 mm.
- increasing the **hole diameter** in the 7 mm. wheel to 3 mm.

Further to this, there are certain variations to the basic carriage configuration:



Main Deck gun but not my construction

- angle for the **leading edge of the cheeks**,
- construction of the **quoins** (cannon wedge) and **beds**,
- **trunnion bands**,
- construction of the axle and wheel assemblies (**axle trees** and **trucks**). Determination of length allowed for extension past the width of the

wheels since cotter pins were inserted into the axles to hold the trucks in place. Drawing at top of page shows a square cross-section axle tree, which is correct but for the kit build, the 'axle' is actually the axle tree and the axle projections either side.

Lengths to be cut will depend on the actual width of each carriage which given the process of tapering may show some variation ...

for the front axle: carriage + wheels + projection = +/- 12.8 + 5.0 + 2.6 = +/- 20.4 mm.

for the rear axle: carriage + wheels + projection = +/- 13.8 + 5.1 + 2.6 = +/- 21.5 mm.

- addition of *ring & eye bolts*.
- creating *trunnion straps* to hold the cannon in place. For these, I cut suitable sections from a piece of brass 'shim' that was 0.005 mm. thickness. Painstaking task but the appearance is well worth the trouble.

Construction Details (Main Deck carriages)

(based on kit material)

- STEP 1:** Widen the front axle channel on the base to 3 mm.
- STEP 2 :** Cut down the centre line of the carriage with a fine-bladed jig saw.
- STEP 3:** Sand the cut edges so that combined the carriage is 12.6-12.8 mm. at the front with minimal removal from the rear.
- STEP 4:** Unlike the previous carriages, the height and steps in the cheeks remain the same.
- STEP 5:** Cut wheel axles of length +/- 21.5 mm. (rear) mm. and +/- 20.5 mm.(front) from supplied wooden rod (both lengths make an allowance for what would be cotter pin fitting). Slight chamfering of the ends of the axles prevents the wheels – which are a tight fit – from cracking.
- STEP 6:** Glue the two half sections of the carriage down onto the two axles.
- STEP 7:** At the front, create an angled slant on each cheek.
- STEP 8:** Paint the carriage with the colour of your choice (e.g. dark red).
- STEP 9:** Glue on the two front wheels (7.0 mm. supplied but plan describes 8 mm.) wheels and the two 6 mm. wheels at the back. **N.B. before sliding wheels onto the axle, test for a tight fit and, if necessary, utilize a round file to increase the wheel hole diameter.**
- STEP 10:** Create a quoin (wedge-shaped block) to support the rear of the barrel and glue in place. The interior maximum depth from the plan sheet is 9.5 mm. Using this figure, calculate the depth of bed.
- STEP 11:** Determine the inclination of the cannon required and utilize a template to maintain uniformity with all the carriages whilst glueing in the quoin (refer to the previous photo).
- STEP 12:** I also chose to construct a transom at the front of each carriage.
- STEP 13:** Add any further hardware (such as rings and trunnion bands) as deemed necessary.



Only EIGHT gun carriages visible when ship complete

Forecastle & Quarter Decks – 10 guns

Whatever approach you use, check the dimensions from the 1:1 scale Plan Sheet 3. The dimensions shown opposite only serve to highlight some specific details you may wish to change on the supplied kit pieces.

NOTE:

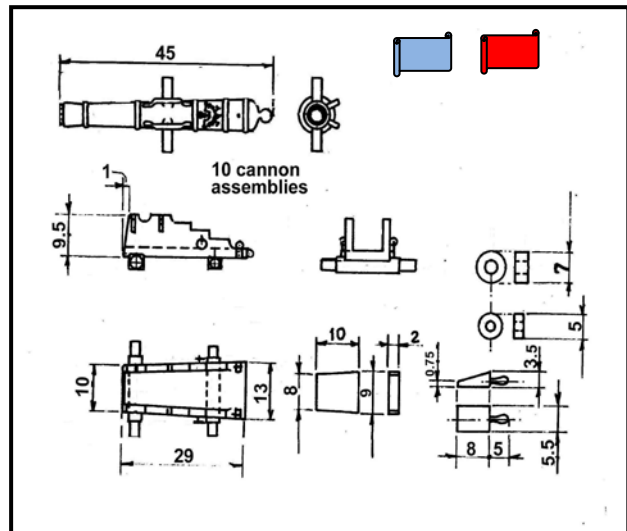
- carriage cheek is 2.6 - 2.8 mm. (vs. 2.0 mm. in drawing)

After considering the plan dimensions, I chose to make certain alterations. It is here that you will need to make your own choices ...

- **width** of the 27 mm. carriage was greater than in the drawings so I cut down through the centre line and created a taper of 13.8 – 12.0 which still accepted the cannons neatly. A considerable amount of work for a small taper but it still looked better than the original supplied carriage.
- increasing the width of the **front axle channel** to 3 mm.
- increasing the **hole diameter** in the 7 mm. wheel to 3 mm.

Further to this, there are certain variations to the basic carriage configuration:

- angle for the **leading edge of the cheek**,
- construction of the **quoin** (cannon wedge),
- construction of the axle and wheel assemblies (**axle trees** and **trucks**). Determination of length allowed for extension past the width of the wheels since cotter pins were inserted into the axles to hold the trucks in place. Diagram above shows a square cross-section axle tree, which is correct but for the kit build, the 'axle' is actually the axle tree and the axle projections either side.



Lengths to be cut will depend on the actual width of each carriage which given the process of tapering may show some variation ...

for the front axle: carriage + wheels + projection = +/- 12.0 + 5.0 + 2.6 = +/- 19.6 mm.

for the rear axle: carriage + wheels + projection = +/- 13.8 + 5.1 + 2.6 = +/- 21.5 mm.

- addition of **ring and eye bolts**.
- creating **trunnion bands** to hold the cannon in place. For these, I cut suitable sections from a piece of brass 'shim' that was 0.005 mm. thickness. Painstaking task but the appearance is well worth the trouble.

**Construction Details (Quarter & Forecastle Deck carriages)
(based on kit material)**

STEP 1: Reduce the cheek width to approx. 2.2 mm.

STEP 2: Reduce the overall length to 24.5 mm.,

STEP 3: Reduce the height to approx. 9.5 mm.

STEP 4: Reform 'slots' for trunnions,

STEP 5: Cut down the centre line of the base and creating a taper of +/-13.8 – +/-12.0 mm.

STEP 6: Due to the tapering, straighten out the front & rear axle channels.

STEP 7: Cut wheel axles of length +/- 21.5 mm. (rear) mm. and +/- 19.6 mm.(front) from supplied wooden rod (both lengths make an allowance for what would be cotter pin fitting). Slight chamfering of the ends of the axles prevents the wheels – which are a tight fit – from cracking.

STEP 8: Glue the two half sections of the carriage down onto the two axles.

STEP 9: Sand the front & rear to form straight surfaces (necessary due to the tapering).

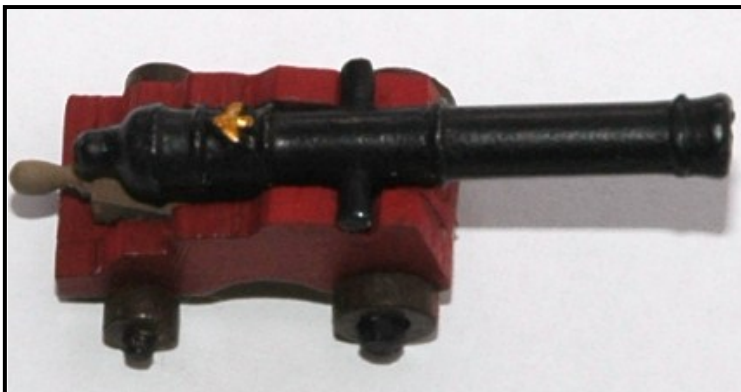
STEP 10: At the front, create an angled slant on each cheek.

STEP 11: Create a quoin (wedge-shaped block) to support the rear of the barrel and glue in place. The diagram opposite indicates the use of this wedge.

STEP 12: Paint the carriage before adding the wheels.

STEP 13: Glue on the four painted wheels.

STEP 14: Add any further hardware (such as rings & trunnion bands). The brass forming the trunnion bands required some very careful cleaning before being made up.



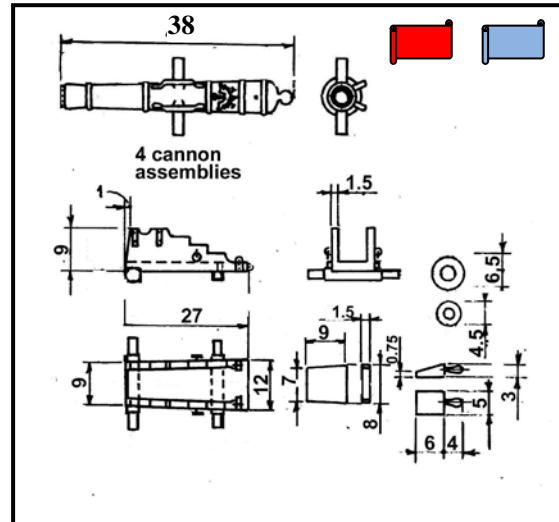
All TEN gun carriages
visible when ship
complete

Refer to page 19 to see the
trunnion bands in place.

Upper Quarter Deck – 4 guns

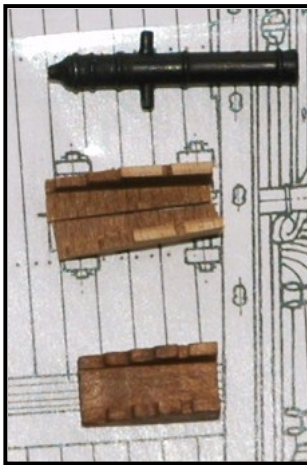
Whatever approach you use, check the dimensions from the 1:1 scale Plan Sheet 3. The dimensions shown opposite only serve to highlight some specific details you may wish to change on the supplied kit pieces.

As with the Main Deck cannons, the trunnions were set a further 3 mm. back than indicated in Plan Sheet 3. This then has the effect of pushing the cannon 3 mm. forward – I only discovered this after I had cut the trunnion channels so I chose to ignore this aspect.



Of all the carriages built so far (20+18+10!), this last section posed the biggest dilemma for me. The carriage as supplied suits the size of the cannon and most will go along with that.

However, when considering Plan Sheets 2 & 3, the following points became obvious. The plan view of the ship in Plan Sheet 2 showed the carriage as **24.5 mm.** in length, the drawing on Plan Sheet 3 indicated **27 mm.** and the carriage as supplied was **21 mm.**



Early stage of construction showing the two halves (in the upper carriage) yet to be glued onto the axles and their ends levelled across.

The 21 mm. carriage will suit although it is not tapered and this is the easiest solution to follow. I decided to work on some 27 mm. carriages I had spare and carried out the following changes. The photo opposite shows the result of my work (the 21 mm. carriage is at the bottom)

- reducing the cheek sides and the base to 1.9 mm. (plan shows 1.5 but I did not want to go this thin,
- reducing the length to 24.5 mm.,
- reducing the height so that overall the dimension was 9.5 mm. (plan showing 9 mm.)
- creating 'slots' for trunnions,
- cutting down the centre line of the base and creating a taper of +/-11.6 – +/-9.6 mm.

NOTE: Front wheels supplied have diameters of 6.0 mm. (vs. 6.5 mm. in drawing) whilst the rear wheels are 5.0 mm. (vs. 4.5 mm. in drawing)

Further to this, there are certain variations to the basic carriage configuration:

- angle for the *leading edge of the cheek*,
- construction of the *quoin* (cannon wedge),
- construction of the axle and wheel assemblies (*axle trees* and *trucks*). Determination of length allowed for extension past the width of the wheels since cotter pins were inserted into the axles to hold the trucks in place. Diagram above shows a square cross-section axle tree, which is correct but for the kit build, the 'axle' is actually the axle tree and the axle projections either side.

Lengths to be cut will depend on the actual width of each carriage which given the process of tapering may show some variation ...

for the front axle: carriage + wheels + projection = +/- 9.6 + 5.0 + 2.6 = +/- 17.2 mm.

for the rear axle: carriage + wheels + projection = +/- 11.6 + 5.1 + 2.6 = +/- 19.3 mm.

- addition of *ring and eye bolts*.
- creating *trunnion straps* to hold the cannon in place. For these, I cut suitable sections from a piece of brass 'shim' that was 0.005 mm. thickness. Painstaking task but the appearance is well worth the trouble.

Construction Details (Upper Quarter Deck carriages) (based on kit material)

STEP 1: Reduce the cheek sides and the base to approx. 2.2 mm.

STEP 2: Reduce the overall length from 27.5 mm. to 24.5 mm.

STEP 3: Reduce the height to approx. 9.5 mm.

STEP 4: Reform 'slots' for trunnions

STEP 5: Cut down the centre line of the base and creating a taper of +/-11.6 – +/-9.6 mm.

STEP 6: Due to the tapering, straighten out the front & rear axle channels.

STEP 7: Cut wheel axles of length +/- 19.3 mm. (rear) mm. and +/- 17.2 mm.(front) from supplied wooden rod (both lengths make an allowance for what would be cotter pin fitting). Slight chamfering of the ends of the axles prevents the wheels – which are a tight fit – from cracking.

STEP 8: Glue the two half sections of the carriage down onto the two axles.

STEP 9: Sand the front & rear to form straight surfaces (necessary due to the tapering).

STEP 10: At the front, create an angled slant on each cheek.

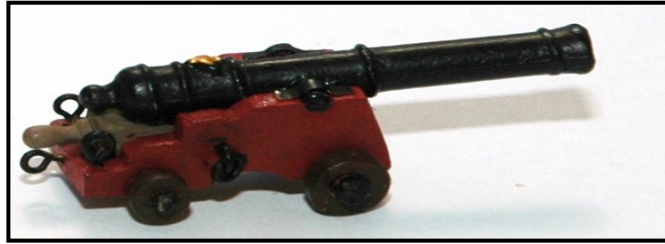
STEP 11: Create a quoin (wedge-shaped block) to support the rear of the barrel and glue in place. The diagram opposite indicates the use of this wedge.

STEP 12: Paint the carriage with your choice of colour (Euromodel suggests red).

STEP 13: Glue on the four wheels.

STEP 14: Add any further hardware (such as rings & trunnion bands).

**All FOUR gun
carriages visible
when ship complete**



Upper Quarter Deck Gun

Chapter 4: HULL STRUCTURE (Part 2)

Framework Tapering

Towards the bow & stern, the longitudinal keel must be tapered [after first planking] to obtain a breadth of 8 mm. – so that with the **second planking of 1.0 mm.** thickness walnut, the final planked surface of the hull will be continuous with the 10 x 10 mm. false keel.

First Planking

Bulwark Discussion

This is step where a decision must be made as to whether the bulwark is to be planked on the inside *and* the outside. Many models have been made with the planking on the outside only but an examination of the plan sheets will show planking on the inside as well; the cannon barrel is long enough to project through a system of double-wall planking [refer to the diagram opposite].

Alternative 1:

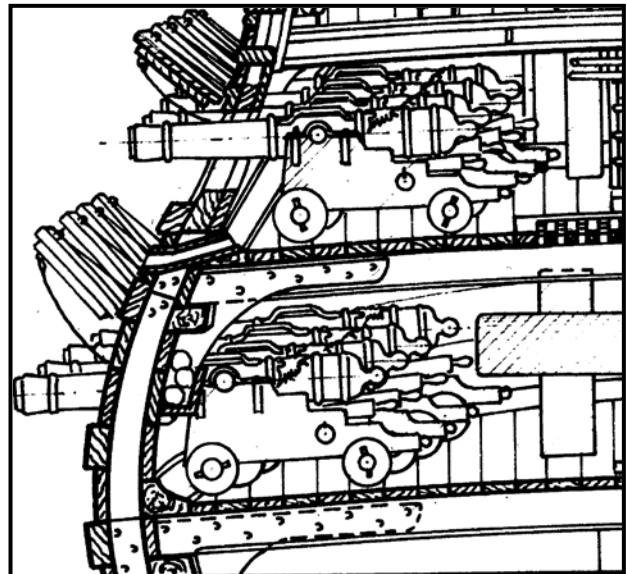
Planking on the inside surface of the frames would create a very large thickness (20 mm.) so that was out of consideration at least.

Alternative 2:

First & second planking on the outside followed by a layer of second planking on the inside – at least between Frames 4&5 and 5&6. Considered important since some of this interior will be on view.

Alternative 3:

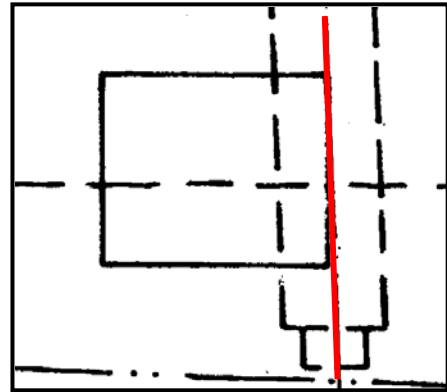
Various forms of packing on the inside so that the thickness is increased and generally gives bulk to this section.



My preference would have been to go with ‘Alternative 3’ but my desire also was not to deviate too far from the basic kit intention. Given time and if this ship was not the only one I was currently building, I would have stuck to the very labour intensive ‘Alternative 3’. After the first planking was done, I then planked internally short sections of the same material between the frames so that in the end I had

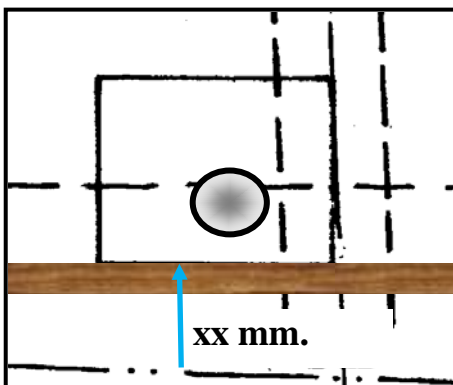
Gun Deck Gunport Positions

A reference point was taken from Plan Sheet 10 where a gun port is shown lined up with the Mizzen Mast (refer to diagram opposite). The port width from the plan is 18.0 mm. and the separation between the ports is measured at 40.0 mm. BUT working these measurements towards the bow, the last gun port straddles a frame so I reduced the separation to 39.0 mm. and that worked fine!



Starting the First Planking

The majority of planks were able to be fixed WITHOUT tapering and here I found the use of brass nails driven half way in with a ‘nail nailer’ a useful technique. Sometimes the nails were more effective bent over flat with a small hammer. Either way, after the glue had set, I had no trouble withdrawing these nails with a pair of small long-nose pliers.



This is where the carriage-mounted guns that by now have been completed and will afford an accurate measure of where to start the planking. After examination of drawings of gun projections through their gunport openings, I allowed for the barrels to be slightly below the mid-point of the openings. In my build, I decided to place the top edge of the first plank xx.xx mm above the Gun Deck level (refer to diagram opposite). This top edge then forms the bottom of the gun port opening before adding the lining. The first dry plank was then set in place on each side of the hull and using a ‘plank bender’, the curves required around

the bow posed no problems at all In total, I planked five timbers down from the deckline holding them in place by small brass nails

INCOMPLETE/ IN-ACCURATE
INFORMATION ?

EDITING REQUIRED

Obviously the planks will have swollen with



Drying out of the wet planks will result in significant gaps. However, when the planks are removed and re-set with glue, these gaps will be removed.

to
the
the



immersion in the water so I allowed 24 hours for the timber dry (and used a hair drier as well). After this time there were significant gaps between planks (see photo opposite) but when they were removed from frames and finally glued back in place, this proved to be of no consequence,

- The usual approach here is to now start planking upwards from the mid-line of the remaining space

between the five planks and the keel. As this is the first planking, I decided to follow my 'line of sight' for best fit and whilst the above guideline was not followed, it was not too far from being correct. Planking proceeded quite easily

My method of soaking planks – length of 90mm. storm water pipe sealed with a cap at the bottom & then filled with water. The width makes is easy enough to get my fingers in the top to retrieve the timbers being soaked.

and some detail in the following photos will assist. The planks visible are the ones that have dried and are now glued in place. I made no pretence at this first planking stage but still felt that the finished planking provided a sound base for the more exacting second planking. The planking though will require the use of a filler before finishing off. (***There are some obvious gaps in my handiwork*** but it is the uniformity of the surface that will be important. Do not be too judgemental !)

INCOMPLETE INFORMATION

EDITING REQUIRED

Up from the the Main Deck level

- Above the first planked timbers (and going above the main deck), four more full-length non-tapered planks were fixed in position. The bulwark support projections of the frames either side of the main deck (and on the other decks) will be removed after the first and second planking but to prevent glue adhering to the frame surfaces, some thin plastic or masking tape (see below) is put in place before planking begins. ***Make sure to mark the gun port positions even though they may need some final adjustments.***
- Shorter length planks are glued in place to build up the forecastle and quarter/ upper quarter deck areas. **Again, make sure to mark the gun port positions.** I puzzled over the two frames 4 & 5 which seemingly were out of place due to their height. However, a close examination of the plans shows a gradual tapering down of the planks from the stern down to the bulwarks of the main deck. So it is that there needs to be a number of shorter strips of planking added to the quarter/ upper quarter deck areas of the ship.

INCOMPLETE
INFORMATION

EDITING REQUIRED

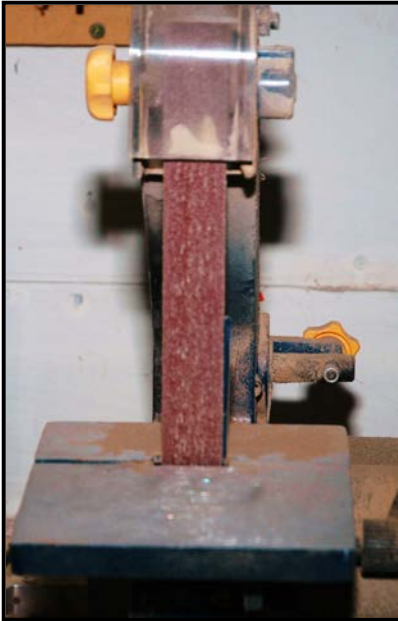
A large red scroll graphic with rounded corners and a vertical strip on the left side, resembling a rolled-up document. The text is centered on the scroll.

Chapter 6: ADVANCED NOTES

**Friedrich Wilhelm
zu Pferde**

Tools

Apart from the normal range of cutting blades, cutting mats, fine metal files, large soldering iron (plank bending) etc., the following tools were essential or at the very least *useful*....



Vertical belt sander with attached sanding disc – absolutely



Dremel tools (high speed cutter tool, sanding drum & other bits; flexible drive attachment; along with a mini **drill**)



Digital vernier calipers – how could you do without these

Jig saw – fine blade. No way I could have done without this work horse.





Lathe – for those masts & yards, etc. Not shown but also useful is an electric **min-plane (below)**.



One of my most valuable tools will always be the glue syringe. Used with care, it can deliver just one very small droplet glue to the task in hand. Alternatively, it can deliver a constant stream. The advantage of this device is that it has a very small opening at the external tip which easily seals over after use where it comes in contact with the air. When next required, a pin prick through the small pocket of solidified glue at the tip allows the syringe to come back into use. I can leave the tool for months without use and it is always ready to use. I would not be without it.

End

of

MANUAL 2 OF 7

**FRIEDRICH WILHELM
ZU PFERDE**