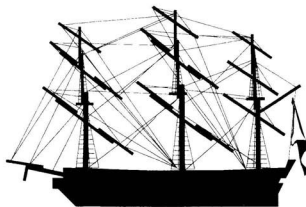




MANTUA MODEL GROUP



PRESIDENT

English Frigate of 1760

Art. 792

ASSEMBLY INSTRUCTIONS

English Version

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For the

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HISTORICAL BACKGROUND

One of the numerous light English frigates constructed between 1730 and 1760 and built in keeping with the tight economic conditions imposed by the almost continuous wars of the period.

ASSEMBLY INSTRUCTIONS

General notes:

- All dimensions given are in millimetres. The symbol \varnothing means diameter
- English translations of the Italian notes on the plans are given in these instructions.
- Component numbers (n.11, etc) refer to the numbered plywood parts on Plan 1.
- Figure numbers given below (Fig.1, etc) refer to the numbered figures on Plan 1.
- Part numbers (Part 23 etc.) refer to the detailed or exploded drawings on Plan 2.
- The sequence given here is the recommended order for completing the model.

PLAN NUMBER 1

Note: Fig.11 – Ship's Cradle. It is useful to hold the keel in a vise or cradle while the superstructure is being assembled. If you do not have a suitable vise, make up a cradle from 6x6 Lime plank as shown in figure 11, so that the keel n.15-16-18 can be held between the two wooden runners. The material for the base of the cradle is not supplied.

Figs. 1 and 2 – On the plywood panels, mark the part number on each laser-cut, plywood component with a soft lead pencil before removing the parts with a craft knife. Smooth all the edges of each piece with fine sandpaper, taking care not to damage the machined profiles of the pieces. Using Figs 1 and 2 as a guide, and without glue, test that the frames n.1-n.11 can be inserted correctly into the keel n.15-16-18, and that the half-deck plates n.19 can be inserted fully to seat down onto the frames. Carefully trim the pieces where necessary to get a good sliding fit. Glue the frames n.1-n.10 into the keel n.15-16-18, and before the glue has set, insert the two half-deck plates n.19 down onto the frames to align the frames with the keel. Check the alignment, clamp and allow to dry.

Figs. 4 and 5 – Taper frames n.1, n.2 and the two side-plates n.13 so that the fore ends of the planking will make a smooth line from the ribs to the bow, and then glue parts n.13 and n.24 in position. Note that the block N24 should not cover the bowsprit hole.

Fig. 7 – Taper the underside edge of part n.11 at about 45 degrees so that the rear ends of the planking will make a smooth line from the ribs to the stern, and then glue parts n.11 and n.14 in position. Note that part n.11 tilts backwards at about 15 degrees from vertical.

Fig. 6 – Fit decks in sequence n.20, 21, 22 and 23, ensuring that the port and starboard (left and right) edges of the deck plates make contact with, and are glued to the curved top surfaces of the ribs. A close fit with the frames is necessary in order to achieve the desired deck curvature or 'sheer'. Fit the transom (plywood part n.12) to the stern, setting the top centre 13mm above the surface of the poop (rear) deck and curving it to fit the deck end. Cut and fit a 4x60 piece of 1mm-thick plywood under the transom to extend the transom to the curve on part n.14, and trim the edges to match the transom profile.

Fig. 3 – Planking the Hull. The first (inner) layer of planks will be 1x3 Lime; the second (outer) layer of planks will be 0.5x3 Walnut. The thick black line on figure 3 shows the position of the first planking strip, which should be positioned horizontally in line with the bottom edge of the keel. Proceed with the planking in the sequence recommended in the specific instructions on planking provided in the last section of this booklet. Plank from the top of the hull to the bottom and then add more planks above the first plank to cover the ribs and bring the sides up to the levels shown in the cross sections on Plan 1. The diagram in Fig.8 provides a guide to the appearance and profile of the finished planking. Note that the stern planking is completed in two levels as described on the following page.

Figs. 9 & 10 show the procedure for covering the stern and transom (n.12). When the first layer of hull planking has been applied, cover the underside of the stern with 1x3 Lime planks and then carefully trim off the excess planking at the stern to provide a curved stern profile. Trim the hull planks to make a neat edge with the first layer of stern planks. Cover the whole stern area (including the outside face of transom n.12 with 0.5x3 Walnut planks and trim them neatly. When the second layer of hull planks has been applied, carefully trim them around the stern to make a neat joint with the stern planks.

After having completely covered the hull, use a small saw or craft knife to trim away the tips of the frames (ribs) which are still visible and which extend along the inner parapet walls. Sand the stumps flush with the surface of the deck. Only after this step has been completed can the main decks be covered with deck planks.

Fig. 8 – Deck Planking. For the deck planks, cut 0.5x3 Lime strips into accurate 50mm lengths, ensuring a neat, square cut at both ends. Note that it may be useful to make up a cutting template, as over 100 of these planks will be needed to cover the entire deck area. Position the planks alternately using the scale plan-view on Plan 2 as a guide. Trim the planking around the holes in the deck, and fit shaped pieces of planking in corners so as to cover the entire deck surface. When the deck planking is completed, plank the insides of the parapet walls (bulwarks) with horizontal 0.5x3 walnut strips as shown in the cross sections on Plan 1. Cover the inside face of the stern transom n.12 with vertical 0.5x3 Walnut strips.

Fig. 8 - Bowsprit Support Hole. Taking great care, perforate the junction point between the port and starboard planking just above the bowsprit support or ram. Use a drill of Ø5, or even better, use a drill of smaller diameter and enlarge the hole to the required diameter with a round file.

Fig 12 - Rubbing Strakes. These are timbers fitted along the length of the hull to protect the sides of the ship from damage. There are four strakes fitted to *President*: the two upper strakes are made from 2x2 Lime plank and the two lower strakes are made from 2x3 Lime plank. These are fitted once the hull and stern planking are completed. Before gluing the rubbing strakes to the sides of the hull, mark their positions using the cross-sections on Plan 1 and the scale plan-view and side-view on Plan 2 as guides. Check that they are at the same height either side, so that the rubbing strakes under the transom will line up with them and be horizontal (see Fig. 12). Glue and pin these strakes into position.

Fig 12 - Handrails – These are made from 2x2 Lime planks glued together to make 4x2 rails. Sand the top edges of the parapet walls level to take the handrails. To make the curved sections at the bow, heat the individual strips in very hot water for a minute or two and carefully form the two handrails to fit the curve of the hull. Hold in position until dry and stabilised. When the required curve has been achieved, glue the handrails together and then glue them in place on the parapets. If you experience difficulties with bending the handrails, form the curves by gluing two planks together, cut trapezoidal pieces from the planks and alternate them to achieve the curve. When glued and smoothed, the joins will disappear.

Fig 12 - Transom Trim. Make and fit a timber trim to the end of the stern planking, down the side of the transom and down the curved part under the stern. Using short pieces of 2x2 Lime plank glued together, make up the trims and fit these between the rubbing strakes as shown in Fig. 12.

Fig 12 - Painting. Paint the transom and the hull areas between the top three rubbing strakes light blue matt. Set aside to allow the paint to dry thoroughly. Suggestion: we recommend the use of an airbrush and 3 coats of matt paint diluted to 3:1 with appropriate thinners. Alternatively, paint by hand using matt paint, a good quality sable brush and employing light longitudinal brush strokes.

Fig 12 – Transom Carvings And Stern Cabin Windows. Fettle the brass castings for the transom carvings and window-surrounds with a file and a wire brush to remove any excess material and bring the castings up to a good finish. Glue the brass transom-surround into position, ensuring that the casting's mounting surface lies flat against the wooden transom. Using the scale side-view in Plan 2, position the window-surround castings on the hull and mark their outlines. Note that there is a port casting and a starboard casting. Cut away the rubbing strakes to allow the window-surround castings and window pieces to sit flat against the hull. Glue the window-surround castings in place. Touch up the paint if necessary.

Figs 12 and 13 - Windows. To prepare the stern and side window sections, lay the photoengraved brass metal window pieces on a flat work surface, and paint them all over using a dark blue acrylic paint. The colour of the windows should be darker than that used for the transom. Working on a flat surface, brush paint over the plate including the raised portions. When the paint is dry, lightly sand the surface with fine (600-grade) paper until the raised details of the plate become paint-free and polished, the paint remaining in the incised portions. Cut out the pieces with tin shears or strong scissors and finish the edges carefully with a file. Varnish the brass to keep it shiny. Glue them in place with instant glue using the colour illustration on the box as a guide. Note that the four stern windows are those on the brass plate, on the right side, those on the left top are for the left side of the hull, and those on the bottom left are to be positioned on the right side of the hull.

PLAN NUMBER 2

The numbered exploded views in this plan show the details for completing the superstructure. Refer to the scale side-view and the perspective view on Plan 2 for the numbered detail parts. **Caution: the detail drawings are not to scale.**

Gun Ports. Using the dimensions taken off the scale side-view on Plan 2, mark and carefully cut out the six gun ports (size 8x8) on each side of the ship. Line the inside edges of the gun ports with 0.5x3 Walnut plank and sand flush.

Channels. These use plywood parts D, E and F (see Plan 1). Face these plywood parts with 0.5x3 Walnut planks and fit into position on the rubbing strakes along the sides of the ship as shown in the two scale views on Plan 2. Take care to position these accurately in relation to the mast holes and fit the right channel for each mast (in order from the bow: medium 5-slot; long 6-slot; short 4-slot). Note that the channels should slope upwards slightly when viewed from the bow or stern of the ship.

Masts, Spars and Yards. Using the dowel provided in the kit, cut and taper all the masts and yards to the cutting and shaping dimensions noted on the scale side-view: L = length; \varnothing_{Max} = the largest diameter; \varnothing_{Min} = the smallest diameter.

Part 37 - Rudder. Drill the heel of the rudder (plywood part L) and fit a brass eyelet and brass ring as shown in Fig 12 on Plan 1. This will take the retraining ropes that prevent the rudder swinging too far in rough conditions. Fit three of the black 'u'-shaped rudder shackles supplied to the keel as shown in the scale side view in Plan 2. Carefully cut a hole in the underside of the stern to take the top part of the rudder and slide the rudder into position. Mark the position of the rudder shackles and fit three 'u'-shaped brackets to the rudder. Fit the rudder into position and glue the three rudder pins in place to hold the rudder onto the stern.

Part 1 - Anchor Stock. Use the plywood parts supplied, or if preferred, make these from 4x4 walnut strip 40 long and file to achieve the desired 10mm long tapers on three faces at each end. For the opening into which the upper shank of the anchor will fit, drill a hole in the exact centre of the stock and use a small file to square off the aperture to match the size of the anchor casting. Secure the stock on the anchor, then wind 5 or 6 turns of fine thread in four places on each stock as shown, fixing the thread with a little glue. Insert the brass ring on the anchor. Tie a 150mm length of large thread to each anchor ring and bind it with thin thread as shown.

Part 2 - Assembly Of Chain Plates. This shows the deadeyes assembled through the channels and secured to the hull. Assemble the pre-formed parts supplied in the kit. Fix the chain plates to the hull using the scale side-view as a guide. Note that the chain plate assemblies each slant slightly differently toward the mast to line up the rigging (shrouds) correctly. Secure each chain plate foot with both glue and a brass nail.

Part 3 - Flagpole Support. The two cheeks are made from plywood parts G (see Plan 1) covered with 0.5x3 walnut strips. Shape two 2x6 Walnut blocks as shown and drill $\varnothing 2$ to accept the flagpole. Make up the flagpole from $\varnothing 2$ dowel 110 long tapered and profiled to create a cap at one end as shown in the scale side view. Assemble the flagpole and supports away from the model, using the scale side-view to set the angle correctly, then glue the assembly onto the deck in the position indicated.

Part 4 - Pilothouse Group. Make the base by gluing five 1x5 walnut strips 36 long in place on the deck (see the scale plan view as a guide). Fettle the brass casting of the ship's wheel and drill a $\varnothing 1$ hole through the centre. Assemble the wheel, the brass drum supplied and the two end pieces (plywood parts H) onto an axle made from $\varnothing 1$ brass wire, and glue the entire assembly in position onto the base.

Part 5, 15 And 17 - Mast Feet. Three required, all different. Make from 2x8 Beech plank using the dimensions shown on the diagram.

Parts 6, 10 And 14 - Belaying-Pin Racks. Three required, but note that each has different dimensions. Following the dimensions shown, make the upright supports from 3x3 walnut strip, attaching them to the deck by means of $\varnothing 1$ brass wire studs as shown in the scale plan-view. For the pin racks, use 1x5 walnut strips, drilling $\varnothing 1$ holes for the belaying pins. *General note: The brass wire is provided as a rolled-up hank. To straighten it, clamp one end in a vise and with pliers, pull from the other end, stretching the wire slightly.*

Part 7 - Companionway Structure. For frame and handrails, use 2x2 walnut strips. Uprights are $\varnothing 2$ walnut dowels drilled and fitted with $\varnothing 1$ brass wire studs. Excluding the studs, the height of the upright supports is 10 mm. Assemble the companionway ladder parts supplied using 1x4 Walnut planks for the treads, and trial fit the ladder to the hole in the main deck. Glue the ladder, the frame and the handrails on the deck.

Parts 8 and 11 - Gratings. Make the two base structures using the diagrams and the scale plan view as the guide. The grating pieces (combs) are supplied in the kit. The large grating by the companionway is 9 combs wide by 10 combs long. The large grating to the front of the deck is 9 combs wide by 10 combs long. The smallest grating is 9 combs wide by 9 combs long. Assemble the gratings separately and glue the combs using small amounts of instant glue. Frame the gratings with mitred 0.5x3 Walnut strips, and insert the assemblies between 2x2 Walnut lengths as shown. Cover the structure as shown with 0.5x3 Walnut planks. Sand to a good finish. Assemble the Capstan on the foremost grating structure.

Parts 9 and 13 - Illustrates the method for reinforcing the front face of the foremast and mainmast. A length of 2x2 Walnut plank is glued to each mast and lashed in place in a number of places with medium thread as shown. The thread is secured with a little glue.

Part 12- Carronades. Make up twelve gun carriages, shaping the bases as shown. Glue the gun barrels into the bases, leaving the barrels protruding 6-7mm beyond the base to allow the barrels to extend 3 or 4 mm beyond the parapet walls.

Part 16 - Davits or Catheads. Make these from 4x4 walnut square strip 34 long, tapering one end and making a notch in the underside to fit the davit over the bow railings. Drill $\varnothing 1$ hole in each to take the anchor-securing rope. Tie a length of medium thread to each anchor ring, pass the threads up through the davits and secure the ends to the belaying pin support posts as shown.

Part 18 - Mast Caps. Three required. Make these from 6x6 walnut strip taking the dimensions from the scale side-view. For the three topgallant mast caps, use 2x6 walnut strips as shown in **Part 31**.

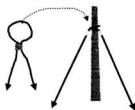
Part 23 - Assembly Of Masts And Mast Tops. Shape the mast ends and fit them into the mast caps, joining the lower mast, topmast and topgallant mast sections. Fit the support cheeks made from plywood parts N, M and O respectively to the three masts. Make and fit the tressle-trees (that sit on top of the cheeks) from 2x3 Walnut plank using the dimensions taken off the scale side-view. Make the cross-trees – the cross-structure that supports the tops (platforms) – from 2x2 Walnut plank cut to the same length as the platform that sits upon them. Note that the three tops are each different in size. The tops are made from plywood parts A, B and C, covered on two sides with 0.5x3 walnut strips, and with 1x6 Walnut planks fitted to the stern-facing straight sides. Trial-fit the masts into the deck and make adjustments to the deck holes as necessary to get a perfect vertical alignment of all three masts as viewed from the stern. Use the scale side view to align the masts with the positions on the drawing. Remove the masts and slide the base of each mast into the appropriate mast foot (parts 5, 15 and 17). Glue the masts in place ensuring that the masts align with the centre-line of the ship. Glue the mast feet in place. Glue the tops accurately in place taking care to align the tops with the centre-line of the hull, and ensuring that space is left on each side between the top and the masts through which the shrouds will pass.

Part. 22 – Lower Shroud Lines. Make these from medium thread and secure them to the masts using a seized loop as shown in the diagram.

Part 27 – Terminating The Lower Shrouds. The lower ends of the shrouds are terminated around deadeyes and the deadeyes are tensioned against the deadeyes on the channels using thin thread as shown in Part 27.

Part 20 – Top Shroud Deadeyes. Drill the tops with $\varnothing 1$ holes and fit deadeyes for the top shrouds with medium thread. Tie the threads off to the lower shroud lines as shown here.

Top Shrouds. Rig the top-shrouds as shown, using medium thread. The recommended method for fixing the top-shrouds to the mast is to make a 'seized' loop using thin thread as shown below. The loops should sit snugly on the taper of the mast. Secure the top-shrouds to the top deadeyes as shown in the scale side view.



Part 26 – Ratlines. Make and bind the ratlines to the shrouds using thin thread – once the shrouds are tensioned correctly. Secure the end knots with a drop of instant glue.

Part 25 – Yard Fenders. Glue segments of 0.5x3 walnut strips onto the yards according to the dimension shown in the scale side view. Sandpaper to remove joint edges.

Part 24 – Studdingsail Booms And Outriggers. The outrigger loops are made from Ø0.8 brass wire. Fix the outriggers and studdingsail booms into position with medium thread using the scale side-view as a guide.

Bowsprit:

- **Part 31 – Bowsprit Cap.** Make from 2x6 Walnut strip to the dimensions shown. Drill two holes Ø5 and Ø3 to accept the bowsprit sections. Glue in place.
- **Part 28 – Bowsprit Assembly.** Make the interconnecting spacer from 2x3 Walnut strip. Position the spacer between the two sections of the bowsprit and bind the two sections together using medium thread. Insert the bowsprit assembly into the support hole on the prow and bind the bowsprit to the ram using medium thread.
- **Part 32 – Bowsprit Outrigger.** Make from Ø2 walnut dowel. Drill the bowsprit and fit the outrigger in place with glue and two brass nails.

Part 29 – Rope Guides. Make from 2x3 Walnut strips and glue in place on the bow rails.

Part 30 – Hawseholes. Drill four Ø4 holes in the bow for the anchor ropes and frame them with Ø5 brass rings glued around the apertures.

Part 19 – Gaff Terminal. This diagram shows how the necks of the two gaff spars are connected to the gaff terminals (plywood part P). Make a slit of 1 mm in the dowel end and then glue the terminal in place. Drill a Ø1 hole in each prong of the terminal and fasten directly and snugly to the mast with a short length of medium thread.

Rigging Points. Working from prow to stern, drill and fit all the eyelets and anchor points for the rigging indicated on the scale plan-view.

Fixed Rigging. Working from Bow to stern fit all the permanent fixed rigging - the ropes used to tension and hold the masts and bowsprit in position.

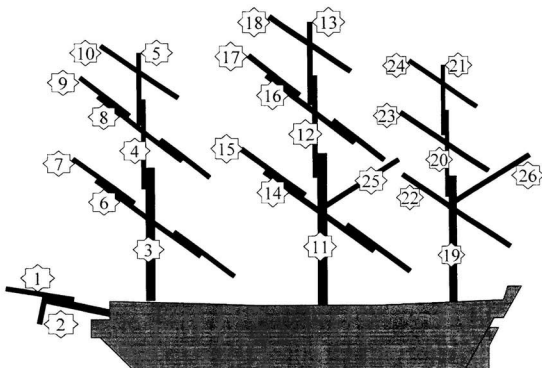
Running Rigging (the rigging used to move the yards and spars). To permit work to proceed simply and rapidly, it is recommended that all of the mast components should be prepared apart. After all the components have been finished with care, proceed to fit all of the rigging blocks, both on masts and on yards. Dimensions of small or large blocks are readily distinguished by differences in outlines in the scale side-view drawing. When complete, proceed to rig the spars and yards to the masts. **Part 21** shows how to make the halyards to support the yards, using medium thread and blocks. Working from bow to stern, fit the rigging to the numbered rigging points as in the scale side-view. **Duel** numbers indicate that the rigging is doubled and therefore needs two terminal points – one on each side of the ship. The correct lines (ropes) for the various types of rigging is indicated by the thickness of the lines drawn in the scale side-view. Apply glue to stiffen the tips of the lines to help insertion through block holes. Ensure that rigging is tight, but does not deform masts or spars. **Fig. 2, Plan 2** shows how to secure a rigging line to a belaying pin. Stow the anchors by securing the flukes to the channels with medium thread.

Figure Head And Bowsprit Supports. Fit the brass figurehead in position on the prow. Using the brass rail provided, cut, bend, drill and pin three bowsprit supports on either side of the bowsprit as shown in the scale plan-view and side-view on Plan 2.

Fig. 1 on Plan 2 shows how to secure the flag on the hauling line of the flagpole. To give the flag an appearance of weight and droop in the absence of wind, fold and secure the flag in a draped position using some thin pins, and then spray the flag with fixer or transparent hair lacquer.

Varnishing: Leave all parts their natural colour and varnish them with matt varnish.

The diagram below identifies the various masts and spars used on the *President*.



Mast and Spar Scheme on the President

Ref	Name	Ref	Name
1	Bowsprit (in two sections)	14	Main lower yard
2	Bowsprit outrigger	15	Main lower yard studdingsail boom
3	Foremast	16	Main top yard
4	Top foremast	17	Main top yard studdingsail boom
5	Fore topgallant mast	18	Main topgallant yard
6	Fore lower yard	19	Mizzen mast
7	Fore lower yard studdingsail boom	20	Mizzen topmast
8	Fore top yard	21	Mizzen topgallant mast
9	Fore top yard studdingsail boom	22	Mizzen lower yard
10	Fore topgallant yard	23	Mizzen top yard
11	Mainmast	24	Mizzen topgallant yard
12	Main topmast	25	Main gaff
13	Main topgallant mast	26	Mizzen gaff

Sails: These are not supplied in the kit as many model makers think that ship models look better without sails. However, a set of ready-made sails **Art 34011** may be purchased from Mantua Models.

LIST OF THE MATERIALS CONTAINED IN THE KIT

Plywood 1.2x175x260 mm N. 12-20-21-22-23- A-B-C-D-E-F-G-H-M-N-O

Plywood 5x190x510 mm N. 1-2-3-4-5-6-7-8-9-10-11-12-13-14-(15-16-18)-19-24- L

PLANKS AND DOWELS

Walnut

85 off 0.5x3x500 mm
1 off 1 x6x200 mm
3 off 2x2x500 mm
1 off 2x3x500 mm
1 off 2x6x150 mm
1 off 2x3x300 mm
1 off 3x3x300 mm
1 off 1x5x500 mm

Lime wood

75 off 1x3x500 mm
8 off 2x2x500 mm
5 off 2x3x500 mm
1 off 6x6x500 mm

Maple

26 off 0.5x3x500 mm

DOWELS

2 off Ø2x330 mm
2 off Ø3x400 mm
2 off Ø4x500 mm
2 off Ø5x330 mm
1 off Ø6x400 mm

FITTINGS

Deadeye pack.

44 off Dead-eyes Ø3 mm
60 off Dead-eyes Ø5 mm
1 hank Brass wire Ø0.8x400 mm
1 hank Brass wire Ø1x100 mm

Block pack.

30 off Blocks 3 mm -1 hole
12 off Blocks 5 mm -1 hole

Grating pack

50 off Gratings 34.5 mm

Ladder pack.

1 off Right ladder rail 2x3x34 mm
1 off Left ladder rail 2x3x34 mm
1 off Walnut strip 1x3x1 00 mm
1 off Walnut strip 4x4x1 00 mm
1 off Walnut strip 6x6x100 mm
1 off Lime strip 2x8x100 mm

Anchor pack.

2 off Anchors
2 off Brass rings Ø5 mm
1 off Capstan Ø8x12 mm

Nail pack.

100 off Brass nails 8 mm

Flag pack.

1 off Silk flag

Chain-plate pack.

30 off Chain-plates Ø5 mm
60 off Oval brass rings Ø8 mm
30 off Chain-plates stirrups Ø8 mm

Belaying-pin pack.

9 off Belaying-pins 8 mm
6 off Rudder hinges 0.3x2x1 0 mm
3 off Brass pins Ø2,5x5 mm
1 Steering wheel Ø15 mm
1 off Drum Ø5x8 mm
1 off Brass pins Ø0.8x30 mm
5 off Brass rings Ø3 mm
30 off Pintles 7 mm

Carronade pack.

12 off Carronades 24 mm
12 off Bodies 5x10x20 mm

Photo-etched plate pack.

1 off Brass photo-engraved plate

Rope pack.

30m thin rope Ø 0.25 mm
20m medium rope Ø0.50 mm
2 m thick rope Ø1 mm

1 off Brass moulding 1.5x2.5x500 mm

1 Casting decoration tray

2 off Construction plans

1 off Instruction booklet

Note: Depending on the availability of supplies the Mantua Model Group may from time-to-time, substitute alternative materials to those specified above.

PLANKING INSTRUCTIONS

Newcomers to this fascinating hobby, or those new to the construction of a Mantua Group period ship model, sometimes have questions when they start to work such as: "How big an obstacle is the planking? Is it possible to have something additional in the way of equipment or instructions to help in this most important part? Are there any photographs or diagrams that may help?" To assist you, we have produced this short instruction sheet in an attempt to lessen any problems you may encounter.

PLANKING OR THE APPLICATION OF STRIPS

First, a short note on the background. Each vessel was originally clad with large wooden boards positioned longitudinally or diagonally to the line of the hull, either with one plank overlapping the next (clinker-built), or plank one adjacent to the next (carvel-built), and nailed onto the ship's frames. This covering, in addition to being necessary for buoyancy (after caulking and sealing the joints) also gave considerable strength to the whole vessel.

In the case of our own models, because of the nature of the materials used, the planking will be accomplished using not short planks, but with full strips wherever possible, and doubled up in most cases, as they were in the original vessels. This technique is made possible through the flexibility and quality of the materials provided.

To achieve a high quality finish to the planking, we suggest the following system that we consider is most effective, and which is demonstrated in the diagrams on the last page.

The planking operation begins on plan number 1 of each of our model's instructions. The position of the first plank is shown on a profile of the skeleton structure after assembly. This reference point normally corresponds to the highest point of the two or three central frames and coincides with the lowest point of the curve formed by the extreme tops of the frames themselves. Where required, use a strip bender to curve the plank so that it fits the shape of the hull.

The first strip applied must be perfectly parallel to the line of the keel and should be fitted at the bow, the other end projecting beyond the length of the hull as in Fig.1 below. If the ship is to be double-planked, the initial planks may be glued and lightly pinned to the frames. The pins are to be removed once the assembly has properly set. Please note that where the upper sections of the frames are to be removed later, the planks should be pinned only at these places, i.e. no glue applied.

Proceed in the same manner from the top to bottom, fitting each plank snugly against the other, checking that they can be positioned easily without having to unduly force or twist the plank longitudinally. **Be sure to cover each side of the hull alternately, working three to four planks at a time. This avoids twisting the hull.**

After a number of these 'easy' planks have been fitted, a certain amount of difficulty will be encountered in placing subsequent strips, as the planks will now want to overlap in some places. You will now have arrived at the curve or sheer, of the vessel. Planking now requires a different procedure. All the planks must adhere to, and lie flat against, the frames for their entire width without curling, twisting or forming strange and unwanted 'ears'. We need to overlap the new plank on the previously positioned plank, allowing the strips to guide us in determining at what point the overlapping is to begin at each end. Position this overlapping plank without gluing onto the central two or three frames of the hull (see Fig.2), holding the ends down with your fingertips, mark both ends where they overlap, with a pencil. Cut along the lines drawn, using a sharp craft knife (see Fig.3).

Reposition the cut strip on the hull, fitting it snugly against the preceding plank, making slight adjustments to the angled cut as necessary, to ensure an exact fit.

Now glue and pin the trimmed plank into position. Proceed with this method working towards the bottom of the hull i.e. towards the keel. Note that if this operation is carried out with due care, the planking will create the beauty of a wood inlay as the pieces fit together smoothly.

After proceeding in this manner for a while, we arrive at a point where the strips begin to leave a space (rather than overlapping). Irregular shaped spaces appear at the bow and stern ends of the strips as we position them alongside the preceding strips. Even in this case, let the strip itself guide you. Fix the strip into position, letting it follow its own natural curve. The spaces that are left, normally acute triangles, will be filled later with segments of strip carefully cut to shape (see Fig.4).

After the lower portion of the hull has been completely covered, proceed to cover the upper areas along the upper deck parapets (if this is relevant to your model), leaving the ends of the strips extending beyond the parapet line. This will be trimmed away later to achieve the correct outline when measured against your drawings (see Fig. 5). After the application of the first layer of planking over the entire hull, it will be necessary to smooth down the surface, removing the inevitable remains of excess glue, and leveling off any small imperfections in the planked surface.

Having finished the surface to your satisfaction, if you are working on a kit that is double planked, proceed to apply the second and final layer of planking. This will be the layer that is visible. Having gained the skills carrying out the first level, you should now be well able to ensure that the quality of the second layer is of a high standard.

The second planking will follow the same process, and, assuming a good level of preparation, should be somewhat easier.

In some instances, strakes or rubbing boards that stand proud of the planking should be fitted to the first level of planking, where indicated on the drawings. However the instructions may well direct you to fit them after the second-level planking has been completed.

FINISHING

When the final planking has been completed and the glue is fully set, the next task is to smooth the entire hull. We suggest the use of a scraper, a small wood plane (set fine) and various grades of sandpaper.

At this point, after having trimmed off the excess planking, according to the general profile at the parapet line, proceed to install the handrails and the gunwales, which are those planks that extend beyond the planking.

For the handrails, since they will be placed flat it will be necessary, especially at the bow and stern sections, to cut the strips into small angled (trapezoidal) sections in order to follow the curve of the hull (see Fig 6). The joints between these sections should be carefully sanded to make them as invisible as possible and to achieve a smooth, continuous curve.

For the gunwales, the strips will be fixed "edge on". The thickness of the strips (usually 2mm.) means that it will be necessary to pre-form them to fit the curves. We suggest the following methods to achieve the desired curve. i) If only a slight curve is required, use a standard plier-type plank bender. If a deeper curve is needed, ii) soak the strip in very hot water for a minute or two, then carefully bend and hold the strip in position against the hull or over an object of the right shape until set. Alternatively, iii) wet the strip and use a wheel-type bender.

When the strip dries out it will be stabilized and can be placed into position. If there are a number of these pieces to make, build a jig to save time and increase accuracy.

At this stage, after ensuring the main decks are properly positioned, cut out the sections of the frames that are visible above the decks (extending up to the parapet tops), and smooth them off level with the deck surface. Proceed to plank the inside faces of the bulwarks, covering the inside of the first layer of white planks. Carefully sand this last section of planking smooth using progressively finer grades of sandpaper.

The foregoing briefly describes the subject of planking in an effort to assist the beginner with what appears to be a rather daunting task but which can become a very satisfying achievement. The rest "as they say" is up to you. Take your time; use your own skill and ingenuity to develop your own methods having considered our suggestions.

TOOLS FOR THE JOB

Each individual may have their own idea about how many, or what type of tool to use and what to use them for. We set out below some general advice of modeling tools and their uses for your consideration. These are just some of the tools available. Please ask your supplier for details.

- **Craft Knives.** There are a number of sizes available, the larger handle being the most useful. There are many blades available from straight edge to curved and chisel ends, together with saw blades, etc.
- **Plank Benders.** There are two main types: i) plier-type strip bender for forming dry planks (used in most applications); ii) wheel-type bender suitable for bending wet planks.
- **Strip Clamp.** This is a quick release clamp for holding strips whilst you trim them. This also doubles as a hull clamp allowing you to work with both hands on intricate work.
- **Pin Pusher.** This tool is spring loaded. A pin is inserted headfirst into the barrel then the tool is used to punch the pin into the wood, removing the need to hammer pins in delicate places.
- **Balsa Plane.** A small plane with a razor-type blade, and can be set for a fine cut.
- **Scraper.** A razor-type blade used for finishing flat surfaces.
- **Pin Vise.** A tool that looks like a jeweller's screwdriver but with collets of varying size, and which can take the smallest drill bit and act as a twist drill.
- **Sanding Stick.** A small plastic spring-loaded stick with a tapered end that takes a thin sanding belt, for sanding in tight places.
- **Razor Saw.** There are various grades of miniature saw blade available that all give a very fine cut. They are usually tenon-backed and can be obtained in sets to include the handle, mitre box, or just the blade.

