

## THE “PEREGRINE GALLEY”: A SHORT HISTORY

Aside from a few sloops, the “Galley Ship” of the seventeenth century was the first type of cargo vessel - designed primarily for speed - that was built extensively in the English colonies of North America. This class of vessel, also known as a “runner”, probably originated in the Mediterranean in the sixteenth century.

The “*Peregrine Galley*” was built at Deptford dockyard, on the river Thames, in the year 1700 as a British naval cruiser. She was designed by, and built under the supervision of the dockyard master shipwright William Lee. This handsome vessel gained the reputation of being a very fast sailor. In 1716, renamed the “*Carolina*”, she was refitted above and below deck and reduced to a government yacht. In August 1720, her lines were taken off and a “surviving draught” was made. In 1733 she was rebuilt as a Royal yacht and was renamed the “*Royal Caroline*”.

In 1749, when a replacement “*Royal Caroline*” had been built for the British Royal Family, she was cut in two and a “parallel body” inserted increasing her length by 3’9”. At that time, she was restored as a 10-gun sloop of war and renamed “*Peregrine*”. She sailed for Lisbon with dispatches on the 28th December 1761, and was never heard of again.

## ASSEMBLY INSTRUCTIONS

General notes:

- All dimensions are in millimetres. The symbol  $\varnothing$  means diameter
- Component numbers (n.11, etc) refer to the numbered plywood parts shown on Plan 5.
- Figure numbers given below (Fig.1, etc) refer to the numbered figures on Plans 1 and 4.
- Part numbers (P.23, Part.23, etc.) refer to the detailed drawings on Plans 2, 3, and 4.
- Item numbers on the plans refer out to the parts list at the end of this booklet.
- The sequence given here is the recommended order for completing the model.
- The kit contains a display cradle. This is too fragile for the construction process. Hold the keel in a vice or working cradle while the ship is being assembled. Keel-clamp **Mantua Model Art.8155** (not supplied) is ideal for this purpose. Alternatively, make up a working cradle by nailing two 200mm x 5mm wooden runners set 5mm apart onto a wooden base, so that the keel will sit between the runners.
- Depending on availability, materials described in these instructions may be substituted for others of a similar quality.

### PLAN NUMBER 5

Put the laser-engraved sheet of decorative panels to one side for use later. On the laser-cut plywood sheets supplied, and using the full-sized drawings

on Plan Number 5 as a guide, mark the identity numbers on the back of the parts with a soft pencil - so that the marks may be erased later if necessary.

Provide yourself with some numbered storage boxes. Remove all of the plywood parts from the plywood sheets by cutting through the small bridges with a craft knife, smoothing all cut edges with fine sandpaper and taking care not to destroy the laser-cut outline of each piece. Put the pieces in the storage boxes for safekeeping.

### PLAN NUMBER 1

This plan shows how to construct the framing of the ship; how to fit the deck supports and decks; and how to plank the hull and stern.

**Fig. 1:** Trial-fit frames n.1-n.10 into the keel n.11 and fit deck-plates n.12, 13 and 14 down into the frames **without glue**, filing the slots in the parts as necessary so that they slide together without being forced. **Warning: the parts are fragile and will fracture if forced.** Glue and fit frames n.1-n.10 into the keel n.11 and before the glue sets, glue the deck-plate n.12 securely in place. Using a straight-edge or ruler, check that the keel is not twisted or deformed along its length. Ensure that the frames are aligned with each other and that they are square to the keel. Clamp the assembly and put aside until the glue has set.

Trial-fit the main-deck n.18, filing the slots as necessary to get a good fit around the frames and onto the curved deck supports. *Tip: hold the sides of the deck with one hand to curve the deck from side-to-side before insertion between the frames.* Apply glue to the tops of the deck supports and fit deck n.18 in place, clamping it with temporary pins to hold the deck down firmly onto each curved support until set. Remove the pins.

Glue the deck-plates n.13 and n.14 securely in place and allow the glue to set.

Cut eight pieces of 6x6 light wood strip, 25 long. Insert and glue in place in the slots for the cannon posts. Paint the outside faces **mat black**.

**Fig. 2:** Glue the transom supports n.16 and n.17 into frames n.10 and n.9.

**Fig. 3:** This shows the framing structure (with the main deck removed for clarity).

**Fig. 4:** This shows a cross-section through the structure to aid understanding.

**Fig. 5:** Trial-fit the two decks n.19 and n.20 filing the slots as necessary to get a good fit around the frames and onto the curved deck supports. *Tip: hold the sides of the deck with one hand to curve the deck from side-to-side before insertion between the frames.* Apply glue to the tops of the deck supports and fit the decks in place, clamping them with temporary pins to hold the decks down firmly onto each curved support until set. Remove the pins.

**Ship's Cradle.** Glue the dowels item 23 into the end plates n.21 and n.22. Clamp onto a flat surface, checking that the ends are square to the sides. When dry, smooth with sandpaper and apply two coats of matt varnish, sanding lightly between coats. Put the display cradle to one side awaiting the completed model.

**Fig. 6:** Fit the stern transom n.24 to the transom supports n.16 and n.17. Moisten n.25 so that it can be curved more easily, then use glue and temporary pins to hold the assembly together until set.

**Fig. 7:** Chamfer the edges of frames n.1, n.2, n.3 and the support cheeks n.15 so that the hull planks will form a smooth curve around the frames. Glue the support cheeks n.15 in place either sides of the bow. Chamfer the edges of frames n.8, n.8 and n.9

**Important:** File down or sand the outside edges of the decks so that they are flush with the edges of the frames, to ensure that the hull planks will fit accurately against the frames and deck edges.

**Fig. 8: Planking:** *If you are new to ship-building, please first read the separate instructions on planking provided at the end of this booklet.*

Plank the inside and outside faces of the stern transom n.24 with 1x6 walnut strips laid horizontally, as shown in **fig. 8**. Fit 1x6 walnut strips between the hull planks (level with the bottom of the bowsprit hole in frame 1) to create the bowsprit deck as shown in **fig. 8**.

**Hull Planks:** Two layers of planking are applied: **The inner layer of planks uses 1.5x6 strips; the second layer uses 1x6 strips.**

Start the planking of the hull by setting the first plank on each side of the hull aligned accurately with the top of frame n.5 as shown in **fig. 4** by the thick black line. Lay the strip parallel to the keel. Now fit three more planks to each side below the first plank. The first four planks will fit without tapering. Further planks will be tapered to fit the curve of the hull

To achieve a good result, we advise you to alternate the sides every 3 planks to avoid twisting the structure. As necessary, add more planks to bring the sides up to the required height to cover the frames and deck edges and to build the parapet walls above the decks (see fig.8). Leave the stern ends of the planks protruding at least 20mm past the stern transom as these will be trimmed to shape later.

Cover the curved underside of the transom supports n.16 and n.17 with 1.5x6 mm planks cut to shape to fit between the protruding ends of the stern hull planks. After the glue has set, trim the stern planks back flush with the transom planking as shown. To prepare the hull to receive the second layer of planking, fill any cracks or splits with slivers of wood or wood filler; scrape the surface of the hull to remove excess glue and then smooth carefully with fine grade sandpaper.

Now apply the second layer of planks using **1x6 strips**, following the same instructions used for the first planking. Plank the second layer with greater care, as this is the layer that will be in view. Fill any splits or cracks with wood-coloured filler, then scrape and sand the entire hull surface smooth.

**Fig. 9:** This is a cross-section of the ship drawn to a scale of 1:1 and showing the planking, fenders and rails. Later steps also refer to this diagram.

**Fenders:** With reference to **fig.9** and to the side view on **Plan 4**, add the lower fenders item 29 made from 2x6 walnut strips and the upper fenders item 31 made from 2x3 walnut strips to the hull sides, held in place with temporary pins until the glue has set. Tip: steep the ends of the strips in hot water for a minute before bending and securing to the hull.

Protect the entire hull with two coats of sanding sealer (such as Mantua Model Art.4401714, not supplied in the kit), sanding lightly between coats.

**Lifeboat:** At the lower right of the plan are the details for constructing the ship's lifeboat. Plank outside the plastic hull with 0.5x3 walnut strips using contact glue. Make the grating from 1.5x2 walnut strip and glue in place. Protect the hull with two coats of sanding sealer. Put to one side with the two lifeboat supports n.88 and n.89 for later.

## PLAN NUMBER 2

This plan shows how to finish off the planking, how to build the ship's handrails and how to add the deck and hull items to the structure. The plan contains two views of the model at a 1:1 scale and which should be used to confirm dimensions and positions: a cross-section side view and an overhead view. The large, angled view shows the installation of the hull and deck items. The numbered parts (P.1, etc.) on this larger view refer out to the detailed drawings (Part 1 etc.) on the plan.

**Deck Planking.** For the deck planks, cut 0.5x3 walnut strips into accurate 70mm lengths, ensuring a neat, square cut at both ends. Note that it may be useful to make up a cutting jig as some 100 or so of these planks will be needed to cover the entire deck area. Draw a pencil line along the centre-line of the decks and lay the first planks along this line. Cover decks n.18, n19 and n.20 with deck planks, positioning the planks alternately using the scale overhead view as a guide to positions. Leave tiny gaps between the planks to simulate caulked joints. 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. Scrape the surface of the deck to remove excess glues and then smooth carefully with fine grade sandpaper. Varnish the deck with sanding sealer.

**Parapet Walls:** Using the side view on **Plan 2**, mark the height and shape of the parapet walls on the hull. Using a small saw and a plane, trim the parapet walls to size and level with the tops of the

frames. Sand the tops of the walls square to take the handrails. Apply sanding sealer.

**Gun Ports:** Using the side view on **Plan 3**, mark the position and size of the eight gun ports along each hull. With a brass gun port as a template, use a mini-drill and a file to cut the gun ports to size.

**Warning:** *Avoid damaging the dummy blocks situated behind the below-deck ports.* Line the eight central ports with 0.5x3 walnut strips. Sand smooth and apply sanding sealer.

**Deck Railings:** Make these from 2x6 walnut strips using the cross-sections in **Fig 9** on **Plan 1** as guides. Glue these to the parapet walls and frame tops. The beams to hold the top rails are made from 3x3 walnut strip, shaped as shown in **Part 10**. You will need 28 beams. Make and fit the rail posts **Part 13**, together with the top rails. Use the large views on Plan 2 as guides. With a small saw, craft knife or file, carefully remove the inside faces of frames n.4, 5, 6, 8, 9 and 10 vertically in line with the inner edge of the handrails. Sand smooth, paint the cut edges walnut colour and apply sanding sealer.

**Part 9: Channels.** Plywood parts n.59 to n.63 are fitted along the gunwales and carry the deadeyes for the stays that support the masts. Cover the sides and edges of the channels with 0.5x3 walnut strips. Referring to the overhead view, drill Ø1 holes in the channels to take the deadeye links. Taking the positions from the side view on **Plan 3**, cut notches in the hull sides to take the tenons on the channels and glue them in place. Fit the deadeyes to the channels as shown in **Part 9**. Fix the link plates to the gunwale planks with glue and brass nails, noting from the side view on **Plan 3** that each link is set at a different angle to line up with the mast tops.

**Forward Hold:** Plank the forward transom with 0.5x3 walnut strips laid vertically. Fit the head rail and skirting board made from 2x3 walnut strips as shown in the angled view middle-right of **Plan 2**. The forward hatch doors **Part 20** are made from plywood parts n.47A, framed and planked with 0.5x3 walnut strips. Fit the brass hinges and handles as shown. Sand smooth and apply sanding sealer.

**Stern Hold:** Make up the stern hatch doors **Part 12** from plywood parts n.48A, framed and planked with 0.5x3 walnut strips. Fit the brass hinges and handles as shown. Fit the grating made from 2x3 walnut strips under the doors. Plank the transom around the doors with 0.5x3 walnut strips laid vertically. Sand smooth and apply sanding sealer.

**Part 11: Deck supports:** Drill a hole in each forward corner of deck n.20 and in the support pedestals B, to take the pins of the two brass columns A. Slide the column and pedestal into place on each side of the deck and fix with instant glue. File down any excess brass pin protruding above the deck. Fit the lower rails made from 2x3 walnut strips around the forward edge of deck 20, using mitred joints.

**Part 7: Gratings.** Two sizes required, denoted by A and B on the cross-section view. Make the gratings from the pre-cut parts supplied. Frame them with walnut strip and glue the gratings on deck as shown.

**Part 18: Falconet Supports.** Eight required. Make these from 3x3 Walnut strips, and notch them to fit around the handrail and against the parapet wall. Drill the top of the posts and fix the falconets in place using the brass parts supplied and having formed the handle of the falconets into a 60° angle.

**Preparing the Photo-etched Brass Parts.** Lay the photo-etched plate on a flat work surface, and paint the framework with **dark blue** matt acrylic paint. Paint the window glass areas with **light-grey** acrylic paint to simulate reflected sky. When the paint is dry, lightly sand the surface with fine (600-grain) 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 (noting that the windows are not cut out individually) and finish the edges carefully with a file. Varnish the brass to keep it shiny. Put the parts in a storage box for safekeeping.

**Part 14: Stern Windows.** The transom assembly is constructed by fixing plywood part n.39 onto the back of the transom n.24 supported by wooden beams made from 2x2 Walnut plank fixed around the sides. Plank the space between the two transom plates all round with 2x6 walnut strips as shown. Sand to make smooth curves. The stern windows and decoration and nameplate are cut from the photo-etched brass plate painted previously. Fix these on the transom with instant glue and brass nails, using the illustration on the box as a guide.

**Bowsprit Transom:** Cut the bowsprit hole in the photo-engraved plate and glue the plate on the transom above the bowsprit deck.

**Part 22: Cat Davits.** Make these from 6x6 walnut strips, tapered and drilled with two Ø1 holes as illustrated. Make the supports 85G from 3x10x12 walnut blocks supplied. Glue the catheads and supports to the deck over the lower rails, taking the positions from the overhead view. Make the notched post E and fit it to the rails as shown. Rig the lifting hooks to the davits with medium thread.

**Part 22: Anchors.** File the two plywood anchor stocks n.85B to achieve the desired 20mm long tapers on three faces at each end. File square the opening into which the upper shank of the anchor 85A will fit to match the size of the anchor shaft. **Caution: the anchor castings are brittle and will snap if bent.** Secure the stocks on the anchors, then wind 5 or 6 turns of medium rope in four places on each stock as shown, fixing the thread with a little glue. Insert a Ø8 brass ring through the tail of each anchor. Tie a 150mm length of large thread to each anchor ring and bind it with thin thread as shown. Rig the anchors later after the other rigging is completed.

**PAINTING:** Using the colour illustrations on the box as guides, paint the hull area between the gunwale planks with matt dark blue acrylic paint. 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. All parts add from now on should either be painted if so stated, or should be left their natural colour and protected with sanding sealer before being fixed on deck.

**Part 23: Gun port lids.** Carefully drill a Ø0.8 hole in each of the sixteen port lids and fit a brass ring to each lid as shown. Assemble the lids to the brass port frames and fix a set in each gun port using instant glue. Drill a Ø0.8 hole above each port for the lifting rope. For each lid: Apply glue to the tip of a length of thin thread and glue the tip in the drilled hole, using a wood wedge to hold it in place as necessary. Feed the thread through the ring in the lid and lash the lid in the open position.

**Part 8: Guns.** Eight mounted guns are required for the main deck. Assemble the gun-carriages as shown in the plan. Glue the barrels in place. Apply glue to the underside of the wheels and place the gun-carriages on the main deck with the barrels protruding 8mm through the portholes. Rigging them after they have been placed on deck increases the realism, but this material is not supplied.

The remaining eight *between-deck* guns are fitted into the dummy cannon posts behind each port. Measure the spigot end of the dummy cannons and carefully drill a hole through the centre of each port into the cannon posts. Fit a dummy barrel in each port using instant glue.

**Part 5: Ladders.** Using the sidepieces provided and with 1x3 walnut strips for the treads, make two wide ladders and two narrow ladders. See the overhead view for widths. Glue the ladders in place on deck.

**Part 4: Bilge pumps.** Two required. Fix a stemmed-eyelet to the piston and connect the eyelet to the lever arm. Insert the piston in the body and fix the lever to the support, inserting a long, brass nail through the holes. Glue the support to the body. Drill a Ø1.5 hole at the bottom off the body and fit a drainpipe made from a Ø1.5 brass pin. Glue two brass hoops around the body as shown. Glue the two pumps on deck.

**Lifeboat:** Glue the lifeboat supports onto the deck checking that they are the right way round, and glue the lifeboat on top.

**Part 3: Fife rails.** Three fife rails are needed. Shape posts as shown, and reduce the ends of the posts to make Ø2 tenons. Make the rails and drill Ø1.3 holes for the belaying pins. Glue a belaying pin in each hole. Drill Ø2 holes in the deck to take

the tenons and glue the rails to the three decks as shown in the overhead view.

**Part 21: Capstan.** Assemble the brass parts and wooden parts supplied with the kit, following the diagram. Glue the capstan on deck as shown in the overhead view.

**Fig. 16: Side Windows.** This diagram shows the construction of the stern side windows. Cut through and open out the brass back plate to form the top and bottom plates of the window. Bend and fit the brass windows between the plates. Fix together with instant glue. Glue the brass back-plates onto the corresponding plywood part n.46 and fix the whole window units onto the stern sides with glue and brass nails, having noted which window goes on which side, and having carefully cut away the gunwale planks so that the units sit against the hull.

**Cleats:** Glue the plywood cleats n.77 and n.78 to the main-deck and fore-deck handrails as shown in the overhead and angled views.

**Part 2: Bowsprit Bollards.** Make the bollards from 4x4 walnut strips. Reduce the bottom end to make a tenon of Ø2, and fit to the bowsprit deck using a piece of Ø8 dowel to space the bollards correctly.

**Part 19: Anchor Pulleys.**

**Bow supports:** Fit plywood parts n. 40 and n.41 in place over the bow ram as shown in the overhead view. Curve and nail the photo-engraved brass bow support plates to the ram and bow as shown, having first cut out the hole for the bowsprit lashing ropes.

**Part 15: Hawse Hole Plates.** Make two hawse-hole plates from 2x6 Walnut strips and glue them to the bow. Drill Ø3 holes through the plates into the bow for the anchor ropes.

**Figurehead:** Fettle the brass casting supplied with a fine file and small wire brush to remove excess casting material and to achieve a bright finish. Varnish over. Fit the figurehead in place using a piece of Ø8 dowel as the bowsprit.

**Part 6: Flagpole Base and Holder.** Assemble plywood parts n.67 and n.68 and cover with 0.5x3 Walnut planks. Glue two 3x3 Walnut strips (item 69) inside the corners to strengthen the base joints. Fit the base onto the deck over the tiller and against the transom. Assemble the flagpole holder sides (plywood parts n.68) to the blocks (item 70) made from two pieces of 4x4 mm strip, chamfered and drilled with a Ø3 mm hole to take the flagpole. Glue the parts together using a piece of 3mm dowel as a temporary flagpole, and noting that the pole tilts backwards as shown in the side view. Glue the assembly onto the base and against the transom.

**Part 1: Steering Wheel.** Assemble plywood parts n.52A to the wheel, pulley body and axle provided. Glue the assembly on deck. Drill an Ø1 hole in the deck each side of the pulley body. Wind a length of medium thread around the body and glue the ends into the deck as shown in the Part 1 diagram.

**Sea Gangway.** See the side view on **Plan 3**. These are the ladder steps running up each side of the hull to the main deck rails. Make the risers of the bulwark steps from 2x2 walnut strips, surmounted by treads made from 0.5x3 walnut strips. Make the vertical slides from 2x3 walnut strips, notched over the gunwale planks.

**Part 38: Hanging the Rudder.** Fit four black 'U'-shaped rudder shackles on the keel with short brass nails as shown in the side view on **Plan 3**. 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 tops of the rudder shackles on the rudder and fit four 'U'-shaped shackles to the rudder with the bottom edges lined up on these marks. Place the rudder in position and glue the four rudder pins into the shackles to hold the rudder onto the stern.

## PLAN NUMBER 4

This shows how the sails are rigged and provides details of the rigging techniques used. Each mast or yard has a dimension table attached giving the cutting and tapering measurements.

### Cutting the Masts and Yards.

Using the dowels provided in the kit cut and taper all the masts and yards to the cutting and shaping dimensions noted on Plan 4:

**L** = length;

$\emptyset$ **Max** = the largest diameter;

$\emptyset$ **Min** = the smallest diameter.

The spars (on which the sails are hung) are tapered on both ends as is the long boom on the mizzenmast. The masts and bowsprit are tapered towards one end only. Where indicated, taper the dowels using either i) a hand plane and sandpaper, or ii) an electric drill and sandpaper, or preferably, iii) an electric lathe (such as **Mantua Model Art. 8160**).

For the yards, start the tapering 75mm from the ends, leaving the centre section unaltered. Finish the masts and spars with fine grit sandpaper and varnish with two coats of sanding sealer, sanding lightly between coats.

Temporarily label the masts and spars with masking tape until assembled.

**Part D: Tops and Lower Mastheads.** Cover the platforms (plywood parts n.93, 116 and 133) with 0.5x3 light planks on both sides as shown on **Plan 5**. Glue a 0.5x3 walnut plank around the curved edge so that it protrudes above the top surface by 1mm. Glue a 0.5x3 walnut strip on the back (straight) edge. Line the inner faces of the cat's hole with 0.5x3 walnut strips. For the upper deadeyes, drill  $\emptyset$ 1 holes through the sides of the platforms, 3mm in from the edge and positioned using the side view on **Plan 3**.

Note that the platforms, platform supports and mast items have different dimensions according to which mast they are intended for.

Taking the dimensions off the side view on **Plan 4**, file the top sections of the three lower masts as shown and fit the support cheeks on the side flats. Cover the support cheeks with 0.5x3 walnut strips. Drill the plywood masts caps n.91, n.117 and n.134 to take the mast ends. Assemble them on the masts, ensuring that they are lined up accurately with the support cheeks

Make up the cross-trees and trestle-trees to the dimensions shown, and then glue them on the support cheeks, aligned accurately fore and aft. The trestle-trees are made from 2x6 walnut strip; the cross-trees are made from 2x3 walnut strip.

Inset the topmast up through the mast cap and sit the lower end down into the cross trees. Line up the masts and secure the joints with instant glue. Slide the mast assembly up through the tops and glue the tops onto the cross trees, ensuring that the whole assembly is aligned accurately.

**Part E: Topmast Joints.** These diagrams show how the two topgallant masts are joined to the topmasts using trestle-trees, cross-trees and mast caps. The trestle-trees are made from 2x4 walnut strip; the cross-trees are made from 2x3 walnut strip. Use plywood caps nn.97 and n.121.

Assemble the masts and joining items, ensuring that the masts line up accurately vertically and fore and aft. Coat the mast assemblies with sanding sealer.

**Part F: Boom and Gaff Jaws and Collars.** Fit the plywood jaws to the mizzen mast gaff and boom spars. Drill an  $\emptyset$ 2 hole through each jaw body for the traveller ropes, which will be added later. Make the collar blocks from 6x6x40 walnut blocks provided and glue them to rear side of the lower mizzen mast in the positions shown on **Plan 4**.

**Part G: Yard Fenders.** Taking the dimensions from the main views, glue 0.5x3 walnut strips around the centre sections of the yards as shown in Part G. This diagram also shows how to lash the yards to the mast, but this should be done later.

**Part C: Studding-sail booms.** Fore mast and main mast yards only. Make the irons from  $\emptyset$ 0.8 brass wire and lash to the yards. Fit the studding-sail booms in place and lash the inner ends to the yards, as shown on the main views

**Part I: Bowsprit.** The jib-boom is joined to the bowsprit via a mast cap n.109, with the lower end sitting on a wooden jointing saddle as shown. Protect with sanding sealer. With reference to the side view in Plan 4, and using the lashing method shown in Part 4 on Plan 6, lash the lower end of the jib boom to the bowsprit with 5 or 6 turns of medium black rope. Seal the knot with a drop of instant glue.



**Bowsprit Deck Nets.** Two required. Attach the black netting provided between two railings (upper and lower) made from Ø0.8 brass wire, and fit the railings around the bowsprit deck as shown in the angled view on **Plan 2**.

**Part M: Mast stiffeners.** With reference to the side view on **Plan 3**, add stiffeners made from 0.5x3 walnut strips to the front and side faces of the lower masts, and lash the masts with medium black rope in the places shown. Seal each knot with glue.

**Stepping the masts:** Trial-fit the masts into the decks, making small adjustments to the deck as necessary to achieve a perfect vertical alignment; and the correct rake (tilt) as shown on **Plan 4**. Remove each mast in turn, glue the foot and insert the mast into the deck. Use small wedges to hold the masts in position and trim the wedges flush with the deck when set.

**Mast feet:** Make three mast feet size 12x12 in halves, from pieces of 1x6 strips. File an Ø10 semi-circular hole in each half so that the feet sit around the base of each mast. Glue to the deck.

**Fitting the Bowsprit.** Carefully open the bowsprit hole in the bow with a round file so that the bowsprit slides into place. Glue the foot of the bowsprit and align the assembly up on the bow ram between the bollards. Referring to the angled view on **Plan 2**, lash the bowsprit to the ram with medium black rope. Secure the knots with instant glue.

**Boom and Gaff.** Fit the traveller ropes to the boom and Gaff spars and around the mizzen mast. Secure the knots with a drop of glue.

**Rigging Points.** The small diagram at the bottom-left of Plan 4 identifies the rigging points on the handrails. With reference to this diagram and the side view on Plan 3, identify where each rigging point needs a brass pintle (flat brass eyelet) to be fitted. For each, drill a Ø1 hole, apply a little instant glue to the end of the pintle, and tap it home.

### **PLAN NUMBER 3**

The main side view is a reproduction of the whole model drawn to a scale 1:1 with the standing rigging (that holds the masts in place) applied. In the key at the top of the sheet, are shown the three kinds of rope, the two kinds of blocks and the deadeyes to use in order to rig the ship. The side view is annotated with reference numbers (P.1, etc.). Detailed drawings of the rigging items (Part 1, etc) are provided to show how each item is constructed.

### **Standing Rigging**

Starting from the stern and working towards the bow, first add the standing rigging to the ship. The numbers on the lines identify the rigging points (see Plan 4 for the locations). Double numbering means that two lines are used with a rigging point on each side of the ship.

**Part 1: Lower Shroud Lines.** These are the ropes securing the masts via the deadeyes. Make these from medium thread and secure them to the masts using 'seized' loops as shown in the diagram. Pass the ends down through the side gaps between the platform and mast.

**Part 6: Deadeyes.** The lower ends of the shrouds are terminated around deadeyes and the deadeyes are tensioned against the deadeyes on the channels using thin light thread as shown in **Part 6**. Make the shrouds tight, but not so tight as to deform the masts.

**Part 3: Ratlines.** Make and bind the ratlines (the rope-ladders) to the lower shrouds using thin thread – once the shrouds are tensioned correctly. Secure the end knots with a drop of instant glue.

**Part 2: Upper Shroud Deadeyes.** Fit deadeyes for the upper shrouds through the Ø1 holes in the tops with medium black thread. Tie the threads off to the lower shroud lines as shown here. Using the technique shown, lash pieces of thin thread between the shrouds to make ladders under the edges of the tops. Rig the upper-shrouds to the topmasts as shown, using medium thread. Secure the top-shrouds to the top deadeyes with thin thread as shown in the side view. The recommended method for fixing the upper-shrouds to the mast is to make a 'seized' loop using thin thread. The loops should sit snugly on the taper of the mast. ***This method should also be used elsewhere on the model to secure ropes around masts and spars.***

Make and bind the ratlines (the rope-ladders) to the upper shrouds using thin thread – once the shrouds are tensioned correctly. Secure the end knots with a drop of instant glue.

**Part 8: Mainstay Blocks.** The method of tensioning the great ropes used to support the mainmast is shown here using triple-hole blocks. Secure the knots with drops of instant glue. Working from bow to stern and following the plan, fit all the remaining standing rigging - the other ropes (or stays) used to tension and hold the masts and bowsprit in position.

**Part D.S: Rigging the Backstays.** The DS label means that the backstays are doubled, that is, rigged each side of the mast. This shows how to connect the backstays via pulley blocks to the rigging points on the rails behind each mast.

### **Running Rigging: Yards**

To permit work to proceed simply and rapidly, prepare and fit all of the mast and yard blocks on the separate parts before connecting the yards and masts together.

For clarity, the plan shows the yards angled fore and aft. These are to be set square across the ship on the model; so that the rigging is equalised each side of the ship.

**Part 7: Foot-ropes.** Add foot-ropes made from thin thread as shown to all yards - except the sprit yards and the lower mizzen yard. Secure the knots with glue, and dress the rope into curves to give the impression of weight.

**Part 4: Halyards.** The diagram shows how to rig the blocks that support the lower and upper yards on the fore- and main masts. The topgallant yards are rigged to the topgallant masts using 'seized' loops.

Working from stern to bow and from the bottom of the mast upwards, proceed to rig the halyard blocks on the yards to the halyard blocks on the masts. Lash the yards to the masts as shown in **Part G** on **Plan 4**. Terminate (belay) the rigging to the numbered rigging points identified on the plan. Dual numbers indicate that the rigging is doubled and therefore needs two terminal points – one on each side of the ship. Use thin rope. 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.

All the rigging next to the masts and coming down from blocks above the tops platforms, must first pass through the cat's hole in each mast top before being terminated at the belaying points.

**Belaying a line:** The diagram at the bottom-left of **Plan 3** shows the way to terminate a line onto a belaying pin. To make a rope loop for each belaying point, wrap a length of excess line around a 10mm former, tie the loop off and apply a drop of glue to the roll. Slide the roll off the former and loop it over the belaying pin, holding the loop down while applying glue to the loop. This technique gives the rope the appearance of weight.

**Brace lines.** Working from stern to bow and from the bottom of the mast upwards, proceed to rig the brace lines on the yards. These prevent the yards twisting round in the wind. Most braces are fed through blocks tied on the stays behind the masts. Belay the lines to the rigging points shown.

## PLAN NUMBER 4

### Fitting the Sails

The finished sizes of the thirteen sails are shown on the plan. The cutting template should allow an additional 4-6mm for hemming. Use tracing paper to make sail templates, and check these against the rigged ship. Make small modifications to the rigging and sail templates as necessary to achieve a good fit, then cut and hem the sails with a double hem (folded twice). Sails were made of many pieces sewn together. Simulate these joins by sewing bands across the sails as shown in the plan.

Sew bolt ropes around each sail and make or fit clewing eyes as shown.

When the sails are completed, soak the sails in hot tea (without milk or sugar) for several hours. This

gives a more natural golden-brown colour to the sails. When dry, bend (tie on) the sails to the masts.

**Part A** shows how to sew a bolt rope around a triangular sail and fit a clewing ring on the points.

**Part B** shows how sew the bolt rope on the square sails and how to make clewing eyes in the rope.

**Part L** shows how to fit the reefing ropes through the reefing bands on the sails. Cut the ropes off 20mm from the knots.

**Part H** shows how to bend (tie on) the triangular sails to the foremast stays using brass rings.

**Fig.1** shows how to bend the square sails to the yards using rope.

Working from the stern to the bow, and starting at the bottom of the masts, rig the sails using thin rope and blocks. Belay the lines to the belaying points shown.

Set the sails in a realistic way rather than having them all taut. The illustration on the box offers one suggestion for setting the sails.

**Fig.2** shows how to loosen the lower end of a square sail in order to give the impression of light wind, or just to break up the formal arrangement of the sails.

### Painting.

As described previously, the gunwales and the decorative panels are painted **dark-blue**. Windows are painted **light-grey** to simulate reflected sky. Where no painting details are given, this means that the parts are left their natural colour and must be protected with sanding sealer or clear varnish. All varnishes and paints should be matt, not gloss.

### Finishing Off

**Flag-pole.** Insert the flag-pole and rig the silk flag on the hauling line of the flagpole (by hemming the edge of the flag with the thin light line held inside the hem). 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.

**Anchors:** See the views on **Plan 2** and **Plan 3**. Rig the anchors to the catheads and feed the anchor ropes into the hawse-holes. Secure the ends with a drop of glue. Lash the anchor flukes to the posts on the bow rails.

Touch in any varnish or paint as necessary.

Assemble the ship on the display cradle made previously and admire a job well done.

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## 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 planked 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 proven system, 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 levelling 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, fixed on the outside of the hull.

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 a number of these are needed, 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 smooth this planking 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 modelling 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, which can be set for a fine cut.

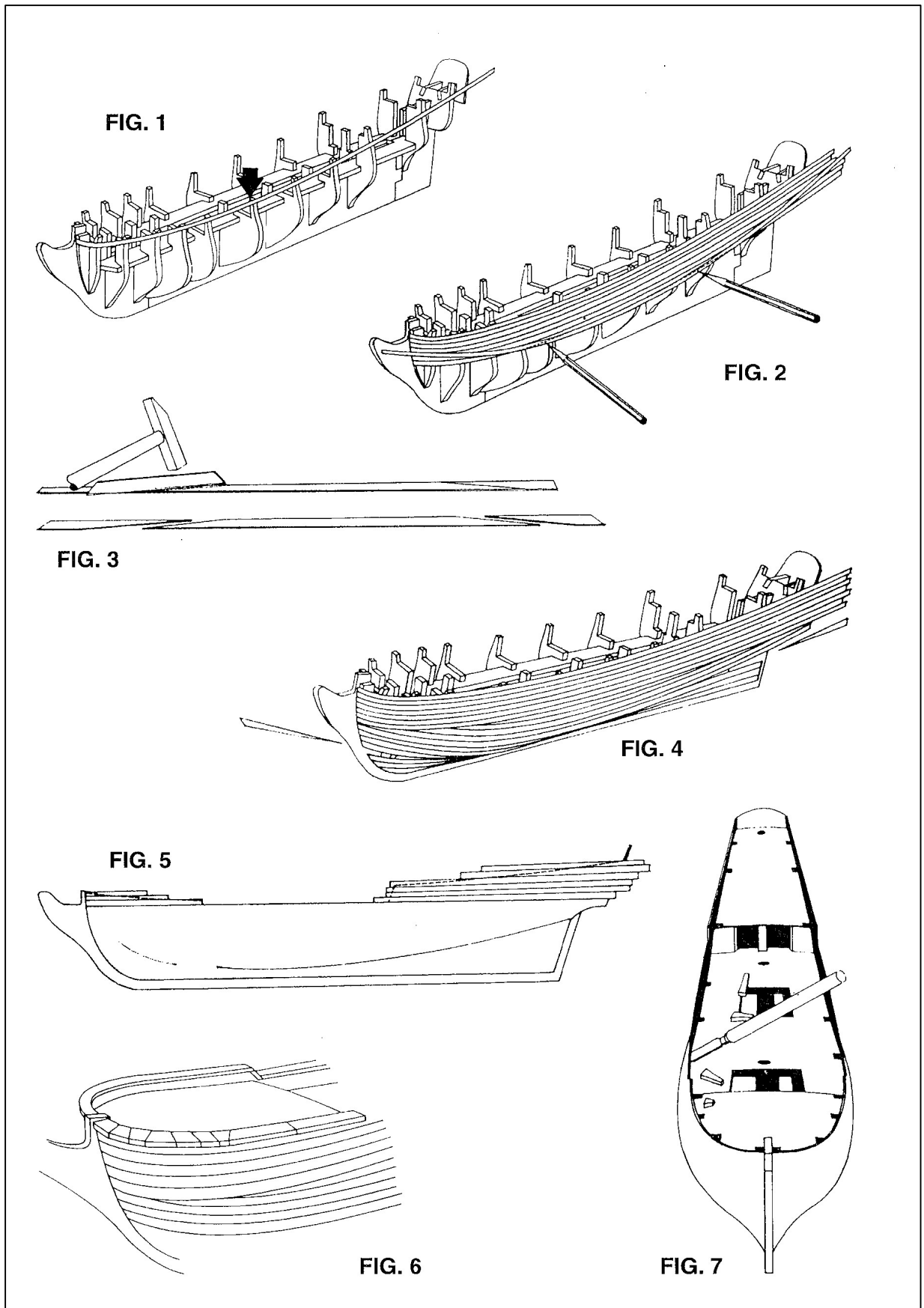
**Scraper.** A razor-type blade used for finishing flat surfaces.

**Pin Vice.** 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.** Various grades of miniature saw blades with a fine cut are available. They are usually tenon-backed and can be obtained in sets to include handle, mitre box, or blade only.

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## ITEMS LIST FOR THE KIT





