

ACHILLES

Pilot Boat 1815

Art. 794

ASSEMBLY INSTRUCTIONS

English Version

*Newly translated and improved by
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For the

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HISTORICAL BACKGROUND

The Achilles was a high-speed sloop used essentially as a courier vessel. As understood in the nineteenth century a sloop was a small cruiser, below a frigate but above a gunboat in size and status. Achilles was rigged as a ketch with a mainmast and mizzenmast, but no foremast and was unarmed. The raked masts and lowered bowsprit give this ship its characteristic fast lines. Built in New York in 1815 as a pilot boat, the Achilles was originally named the "Anna Maria"

ASSEMBLY INSTRUCTIONS

General notes:

- All dimensions given are in millimetres. The symbol Ø 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 (Figure.1, etc) refer to the numbered figures on Plan 1.
- Part numbers (Part 12, 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

This plan shows how to construct the frame of the ship, and how to plank the hull and stern. The two drawings of the laser-cut plywood parts can be used as reference to identify the parts. On the thick plywood sheet containing the keel and frames, mark the identity numbers on the parts with a soft pencil. Remove all of the plywood parts from both plywood sheets with a craft knife, smoothing all edges with fine sandpaper and taking care not to destroy the laser-cut outline of each piece.

Figure 1. Test the correct assembly of all of the frames without glue, inserting all the frames n.1-n.11 and the false deck n.18 into the keel n.15, carefully filing or sanding to get a good sliding fit where necessary.
Warning. The frames are delicate and will fracture if forced.

Figure 2. Glue the frames into the keel, leaving off the transom n.12, n.22 and n.23. Before the glue sets, glue and insert the false deck n.18, which will bring the frames into alignment. Check the frames are square to the keel and aligned down the centre-line of the keel, clamp until dry.

Figure 4. Add the two transom longerons n.23, lining up the top surfaces of the longerons with the slanting top of the keel. Fit the square block n.23 between the longerons. Support with clamps or pins until set. Glue and clamp the stern transom n.12 on the longerons n.23 ensuring that the transom is aligned with the stern and is flush with the bottom edges of n.23. Fit the two curved battens n.22 to each side of the transom as shown in the diagram. Carefully file the bottom joint of n.12 and n.22 to increase the area of adhesion of the hull planks that will make a smooth line from frame n.11 onto the transom.

Figure 12. Bevel support cheeks n.13 as shown in Fig.12, to permit the correct fit of the eventual planking strips around the frames to the bow, and to provide a broader area for adhesion. Glue and clamp until dry.

Figure 5. Number and cut out the plywood parts from the thin laser-cut sheet. Apply glue to the tops of the frames and fit the decks n.19 and n.20 ensuring that the decks sit down tight against the frames to get the correct 'sheer' or curve to the decks. Note that you will have to 'curl' the decks slightly to fit them between the side ribs, but once inserted, they should fit against the frames under slight pressure. Clamp the decks to the frames until dry. Glue and pin deck n.21 in place on the frames n.8, n.9 and n.10, overhanging the front edge of frame n.8 by 14 mm, and ensuring that the companionway cutout is to the stern. The decks can be identified from Figure 5 and from the cross-section views through the frames n.4, n.6, n.9 and n.11 at the bottom right of the plan.

Figure 6 and Figure 7. The hull of Achilles is double-planked. 1x3 Lime planks are used for the thicker, inner planking and 0.5x3 Walnut planks are applied for the thinner, outer planking. Start the application of the strips at the point indicated in Fig. 7 by the thick horizontal line, setting the first plank parallel to the line of the keel. Note that the bow ends of the planks need to be curved using a plank-bending tool. Proceed with the planking according to the special instructions on planking provided at the end of this booklet. When the second layer of hull planking has been completed, cut off the tops of the frames that protrude above the decks (see figure 6) using a small saw and craft knife, and sand the stumps down until they are flush with the deck. Clean any excess glue from the inside face of the bulwarks and sand or scrape them smooth.

Figure 8 - Cabin. On either side of cabin deck n.21, glue 0.5x3 Walnut planks to the frames laid horizontally, and fit 0.5x3 Walnut planks between the cabin sides and the bulwarks. When dry, cut off square with the ends of the cabin deck. Fix a 2x2 Lime plank directly below the front edge of cabin deck n.21 on the rear edge of main deck n.19 to act as a batten to support the cabin transom planking. Also fit two pieces of 2x2 Lime on deck n.20 below the stern edge of n.21 either side of the companionway cutout. Cover the fore and aft cabin transoms with 0.5x3 Walnut planks laid vertically.

Figure 9. Initially, the side planking strips will extend beyond the stern as shown in Figure 6. Carefully trim them flush with the edge of the transom n.12 as shown in figure 9.

Figure 10. Cover the rear of the stern transom n.12 with 0.5x3 Walnut planks laid horizontally as shown in the diagram, and trim them to make a neat joint with the hull planks. Plank the inside face of the stern transom with 0.5x3 Walnut planks laid vertically. Glue a strip of 0.5x3 Walnut plank around the curved top edge and sides of the stern transom and trim neatly. Plank the inside face of the parapet walls (bulwarks) above deck with 0.5x3 Walnut plank laid horizontally. When the planking is dry, trim the top edge of the planking above-decks to bring the parapet height level with the top of the ribs, and sand the top edges of the parapet walls to take the handrails. Use the four cross section views as a guide to the parapet heights.

Figure 11 – Ship's Cradle. It is useful to hold the keel in a vice (such as *Mantua Model Art. 8155*) or a cradle while the superstructure is being assembled. If you do not have a suitable vice, make up a cradle by fixing two pieces of 5mm thick plank onto a base as shown, so that the keel n.15 will slot in and be held between the two wooden runners. The material for the cradle is not supplied in the kit.

PLAN NUMBER 2

This plan shows full-sized overhead (plan) and side views including rigging. These views should be used to check the dimensions and positions of the various items on the ship. The perspective view shows additional details of the superstructure items. The numbered items on the plan view are belaying (terminating) points for the rigging. The numbered items (P.23, etc.) on the side view and the perspective view refer out to the exploded views on Plan 2 which show the detailed parts to be made up and fitted to the ship. **Caution: the detail drawings are not to all to the same scale.**

Deck Planking. Make the deck planks by cutting 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. Draw a pencil line down the exact centre of the ship as a reference line, and mark lines at right angles corresponding with the positions of the joints. Starting from the centre line, glue a small area of the deck and position a first plank carefully. Plank the entire length of the centre line leaving small gaps between planks, to simulate the caulking between joints. Continue planking across the deck, leaving small gaps between plank sides and joints – and staggering the joints alternately - using the scale plan view on Plan 2 as a guide. Cover all the decks including the cabin deck n.21. Trim planking around holes in the decks, and fit shaped pieces of planking in corners to cover the entire deck surface.

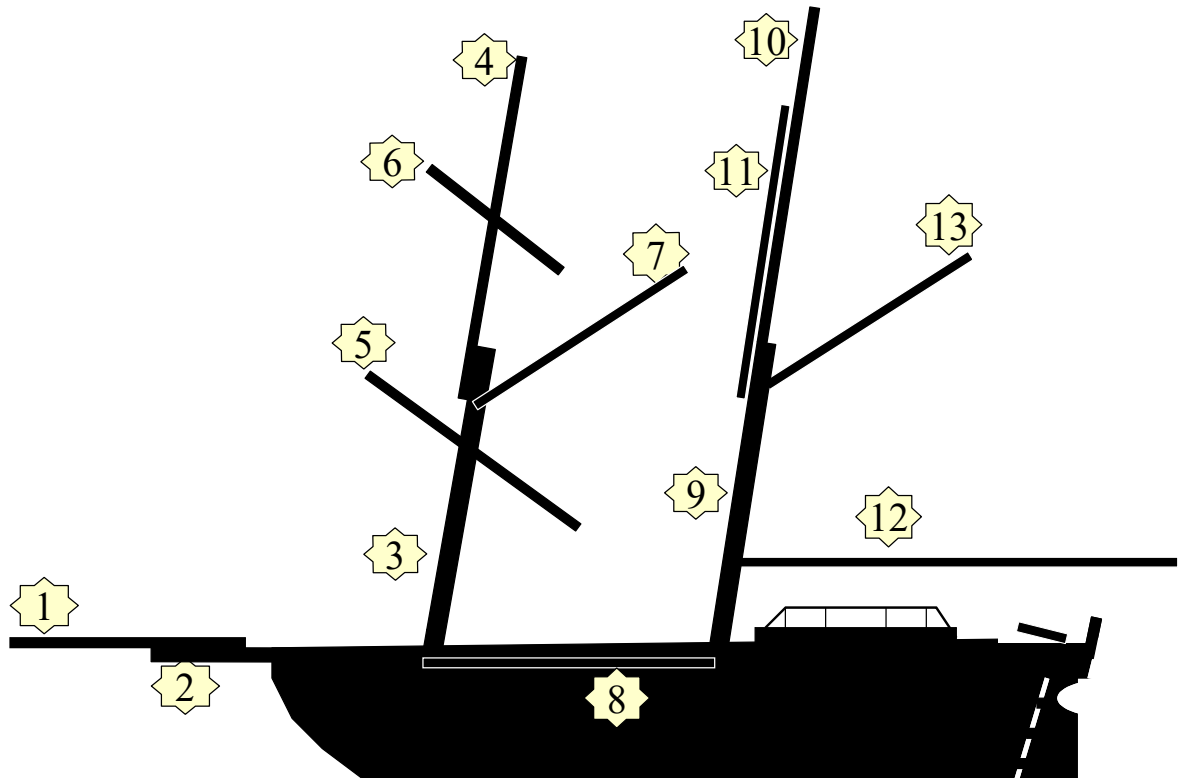
Handrails. Refer to the four cross sections on Plan 1, and the scale side-view on Plan 2. The colour photograph on the outside of the kit's box is also useful as a guide to the shape and positioning of the handrails. Make the handrails from 2x3 Lime plank. To make the curved sections at the bow, heat 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 in clamps until dry and stabilised. When the required curve has been achieved, glue them in place on the parapets. If you experience difficulties with bending the handrails, cut trapezoidal pieces from straight planks and alternate them to achieve the required curves. When glued and smoothed, the joins will disappear.

Rubbing strakes are timbers fitted along the length of the hull to protect the sides of the ship from damage. Refer to the four cross sections on Plan 1 and the scale view on Plan 2. The colour photograph on the outside of the kit's box is also useful as a guide to the shape and positioning of the strakes. To each side of Achilles, fit an upper strake made from 2x2 Lime plank and a lower strake made from 2x3 Lime plank. Before gluing the rubbing strakes to the sides of the hull, mark their positions on the hull with tape. Check that they are at the same height either side, so that the mouldings on the transom will line up with them and be horizontal (see Figure 28 on Plan 2). Glue and pin these strakes into position. Fit strips of 2x3 Walnut moulding to the stern - **see Part 28.**

Varnishing. Coat all unpainted areas with two coats of matt varnish, sanding lightly between coats.

Masts, Spars and Yards.

The diagram below identifies the various masts and spars used on the *Achilles*. Cut and taper the dowels provided to the dimensions stated in the cutting table below. Taper the masts and spars using a drill and sandpaper, or using a hand plane and sandpaper, or preferably, using a lathe such as **Mantua Model Art. 8160**. Smooth and apply two coats of matt varnish to all masts and spars, sanding lightly between coats. Label the parts temporarily with masking tape.



Mast and Spar Scheme on Achilles

Identifier	Length	ØMin	ØMax	Name
Bowsprit				
1	110	3	5	Upper bowsprit
2	95	5	5	Lower bowsprit
Mainmast				
3	264	4	6	Main mast
4	168	3	4	Main topgallant mast
5	198	2	4	Mainsail yard – tapered both ends
6	125	1	2	Main topgallant yard – tapered both ends
7	98	1	2	Main gaff
8	100	2	4	Mainsail outrigger booms (2 needed)
Mizzenmast				
9	264	4	6	Mizzen mast
10	155	3	4	Mizzen topgallant mast
11	145	2	2	Mizzen topgallant mast reinforcer
12	205	2	4	Mizzen boom
13	95	1	2	Mizzen gaff

Superstructure items

Part 2 - Anchors. Make the stocks from the two plywood parts P2 supplied, using a file to taper the ends as shown. Wind 5 or 6 turns of Ø0.5 rope in four places on each stock as shown, fixing the thread with a little glue. Drill a hole through the centre of each stock and fix the stocks on the anchors, ensuring that the stocks line up at right angles to the flukes. **Warning. The anchor castings are brittle and will snap if bent.** Insert a Ø5 brass ring on each anchor tail. Tie a 150mm length of Ø1 rope to each anchor ring and bind it with thin thread as shown. The anchors will be placed on the hull after the rigging has been completed.

Part 3 – Capstan. Assemble the capstan and glue onto the deck behind the mainmast as shown in the plan view.

Part 4 – Capstan Foot Grips. Make the eight foot grips from 0.5x3 Walnut plank 15mm long, cutting the pieces longitudinally with a Stanley-type blade to make strips 1.5mm wide. Glue to the deck around the capstan base.

Part 5 – Outrigger Supports. Two required. Make these from 4x4 Walnut plank 16mm long. Fix each brass axle support with a brass nail and instant glue to the end of the Walnut block. Shape the end of the outrigger booms and fit them to the supports using brass nails for axles.

Part 6 – Channels. These are made from 2x8 Lime plank. Take the dimensions and positioning relative to the masts from the plan view. Cut 2mm wide slots for the chain-plates. The mainmast channels have 3 slots and the mizzenmast channels have 2 slots. Cut away the handrail on each side of the mainmast to fit the mainmast channels. Fit the mizzenmast channels under the handrail either side of the mizzenmast.

Painting. Paint the area between the handrails and the rubbing stake with matt dark brown acrylic paint. Avoid painting (mask off) the railings or rubbing stakes, which should be left their natural wood colour. 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.*

Part 7 – Chain Plates. These are made from the brass parts and the Ø5 wooden deadeyes supplied. Bend the brass chain plates to curve the deadeyes towards the mast as shown. Fit the chain plates into the channels and nail them to the rubbing stakes with brass nails and a drop of instant glue.

Part 8 – Main Deck Hatch. Frame the deck aperture with 2x3 Lime plank. Cover plywood part n.27 with 0.5x3 Walnut planks and trim the side also with 0.5x3 Walnut planks. Fit three 2x2 Lime reinforcing strips across the hatch. Glue the assembly in position on the main deck.

Part 11 - Preparation of the Photo-Etched Brass Parts. Working on a flat surface, paint the whole plate with dark brown matt acrylic paint. When the paint is dry, place the plate on a flat surface and sand the surface of the plate with 600-grain sandpaper until the raised details emerge from the paint and a fine polished brass surface is achieved. Coat with a clear matt varnish to prevent tarnishing. After varnishing, cut out the pieces with tin shears or strong scissors and finish the edges carefully with a file.

Part 9 – Outrigger Support Shoes. Make these from the two narrow brass straps supplied on the photoengraved plate and fix them to the hull sides with glue and a brass nail in each.

Part 12 – Cabin Deck Hatch. Frame the deck aperture with 2x3 Lime plank and trim with 0.5x3 Walnut plank. Make up the hatch ladder from the two sides supplied and make the treads from pieces of 1x3 Walnut plank. The finished ladder should be 13mm wide. Fit the ladder in the hatchway with the bottom resting on the false deck n.18.

Part 13 - Skylight. Use 2x8 Lime planks for the gable ends and 2x6 Lime planks for the sides. Position the structure along the edge of the skylight aperture. Glue 0.5x3 Walnut planks on the gables and eaves. Cut out the two skylight windows from the photo-etched plate and glue them in place on the skylight using instant glue.

Part 14 – Cabin Deck Handrails. Glue 0.5x3 Walnut planks along the edges of the cabin deck to make the handrail bases. Drill six Ø1 holes in each base for the stanchions and handrail ends, taking the positions from the plan view. Position and glue the brass stanchions supplied in the holes, checking alignment. Feed a length of Ø0.8 brass wire through the stanchions and form the ends with round-nosed pliers, inserting the free ends into the end holes drilled previously. Secure with instant glue.

- *Tip: The brass wire is provided as a rolled-up hank. To straighten it, clamp one end in a vice and with pliers, pull from the other end, stretching the wire slightly.*

Part 15 – Rudder and Tiller.

- **Rudder.** Carefully cut a 1.5x1.5 square hole in the top of the rudder stem (plywood part n.24) to take the tiller. Fit three of the black 'u'-shaped rudder shackles supplied to the keel as shown in the side view. Carefully cut a hole in the underside of the stern planking to take the top part of the rudder and slide the rudder up into position. Mark the position of the rudder shackles on the rudder and fit three 'u'-shaped brackets to the rudder blade. Fit the rudder in position and glue the three rudder pins in place to hold the rudder onto the stern.
- **Tiller.** Make the tiller from 2x6 Lime plank 30 long. Ensure that the tenon on the tiller is no larger than 1.5x1.5 square. Glue the tiller into the stem of the rudder. Frame the tiller well with 2x3 Lime strips.

Part 16 – Companionway. Make the structure from plywood parts n.25 and n.26. Cover with 0.5x3 Walnut planks. Glue on the door (from the photo-etched brass plate) using instant glue. Glue the companionway into place at the rear of the cabin deck n.21.

Part 18 – Support Bases For Rigging Eyelets. Make the bases from 2x3 Lime plank, chamfering the ends and sides carefully. Glue them to the deck as shown in the plan view. Drill Ø1 holes through the bases and insert the three eyelets (brass pintles) into each base. Tap the eyelets into the deck with a small hammer and secure with instant glue.

Part 19 – Air Vent. Make the supporting castle from 2x6 Lime plank to the dimensions shown on the drawing. Drill a Ø5 hole in the top for the vent pipe. Cover the sides with 0.5x3 Walnut planks. Make the vent pipe from Ø5 dowel. The vent hole is Ø3. Glue on the deck with the vent pipe facing to the stern.

Bowsprit Assembly

- **Part 20 – Bowsprit Supporting Bitt.** Make the uprights from 4x4 Walnut Plank and the cross-member from 1x3 Lime plank. Drill a Ø0.8 hole in the base of each upright and glue in a piece of Ø0.8 brass wire to act as a tenon. Drill two Ø0.8 holes in the deck and glue the support in place with instant glue.
- **Part 29 – Bowsprit Splice.** Splice the two parts of the bowsprit as shown in the side view and Part 29's diagram. The length of the splice should be 30mm. Glue the two parts together, ensuring that the bowsprit is straight when assembled. Modify the single mast cap (plywood part P.23) and slide it over the end of the bowsprit joint, gluing it in place. Bind the back end of the splice with medium thread using the same lashing method as used on the anchor stocks (Part 2).
- Carefully cut away the bow railings at the prow and file a Ø5 half-round notch through the prow planking down to 1.5mm above the level of the deck to take the round section of the bowsprit.
- **Part 21 – Bowsprit Brackets.** Make four flats on the base of the lower bowsprit and fit four pieces of 1.5x6 Lime plank, ensuring that they line up with the vertical and horizontal radii of the bowsprit. Smooth the profile to that shown in Part 21. Cut the three brass strips from the photo-etched plate supplied. Drill a Ø0.8 hole in the end of each bracket and form the brackets around the bowsprit. Glue the bowsprit to the deck and prow, and pin the brackets to the deck with brass nails.
- **Part 1 - Hawse holes.** Make the centre support plate from 2x6 Lime 15mm long. Make the two hawse hole plates from 2x6 Lime 14mm long and chamfered on one side to but up against the support plate. Carefully drill a Ø2 hole in each hawse hole plate to take the anchor ropes, as shown in the perspective view. Glue in position on the prow.

Part 22 – Mizzen Topgallant Reinforcer. File a flat area 100mm long on the front face of the mizzen topgallant mast. Slightly flatten the bottom 100mm of the reinforcer. Glue the two parts together, checking alignment.

Part 23 – Assembling the masts.

Tip: Use the side view as a guide to dimensions and positioning of the mast parts.

- Using a round file, carefully enlarge the holes in the mast caps (plywood parts P.23) to Ø4 to take the ends of the masts. Insert the mast ends into the caps and glue in position after ensuring that the mast sections are in alignment and that the caps are 30mm apart on the mainmast and 27mm apart on the mizzenmast. **Don't force these parts as they may split.**
- Make two sets of notched support cheeks from 1.5x6 Lime plank (one 30mm and one 27mm long) and paint them matt white. Fit them either side of the mast joints between the mast caps.
- Make two support brackets for each mast from 2x8 Lime plank and fit above and below the mast caps. Varnish and allow to dry.
- Trial fit the mainmast and mizzenmast assemblies into the deck, making adjustments to the mast holes as necessary to ensure perfect alignment. When satisfied, remove the masts from the deck. Slide each mast into a mast foot (plywood part **P.10**). Apply glue to the bottom-most sections of the masts and insert the masts into the deck. Using small slivers of wood to hold the masts in place, ensure that the masts line up with the centre-line of the ship and make the raked angle to the deck as shown in the side view. Trim off any wood slivers and glue the mast feet down to the deck. Put aside to dry.

Part 17 – Gaff and Boom Jaws. Make a flat on each of the lower ends of the two gaff spars and the boom, and fit plywood part n.17 to each with glue. Drill two Ø0.8 holes in each and secure the assembly with two brass nails. Carefully drill a Ø1 hole in each of the prongs of the jaws and fit the gaffs to the masts using medium thread tied around the mast and knotted under each prong. Make a third jaw from the thin plywood sheet and fit it to the Mizzen boom using the above method.

Part 24 – Gaff and Boom Rotating Supports. Make the supports from Ø2 dowel and glue them to the masts under the two gaff jaws and the boom jaw in the positions shown on the side view.

Double Bitts. Fettle the four cast parts provided and paint them matt black. Glue them to the deck.

RIGGING

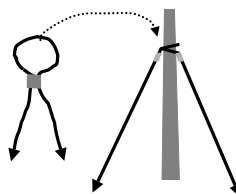
Rigging Eyes.

- Drill Ø1 holes and glue in eight brass rigging pintles on each side of the ship as shown in the side view (rigging points 1, 2, 7, 8, 9, 10x2 and 13 on the port side, and 27, 26, 21, 20, 19, 17x2, 14 on the starboard side). Fit a pintle on either side of the bowsprit stem (rigging points 3 and 25) as shown in the plan view. See the items numbered 3 and 25 in Part 27 to identify the pintles.
- Drill a Ø1 hole and in the bow under the bowsprit and fit a brass wire eyelet.
- Drill Ø1 holes and fit a pintle in the back of the upper caps on each mast (for the gaff stays).
- Drill Ø1 holes and fit a pintle either side of the mainmast cap (for the mainsail yard halyards).

Stage 1: Fixed Rigging

The fixed rigging holds the masts in place. Ensure that the rigging is tight and under tension, but does not deform the masts.

Part 25 – Rigging the Shroud lines and Deadeyes. Rig the shrouds (the stays supporting each side of the masts) as shown in the scale side-view, using medium thread. The recommended method for fixing the 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. Use this method to secure all ropes around the masts.



The shrouds are terminated around deadeyes. These deadeyes are rigged and tensioned to the deadeyes in the chain plates using the method shown in **Part 25**. Use thin thread for the deadeye ropes and secure the knots with a drop of instant glue.

Rigging the Other Stays. Working from the stern to the bowsprit, fix the other mast stays in place following the details in the side view.

Part 27 – Rigging the Mizzenmast Mainstays. These two large-diameter mainstays (made with large rope) are tensioned with deadeyes and rigged to the pintles in the deck by the bowsprit, one either side of the mainmast.

Stage 2: Running Rigging

Fitting the Blocks. Before securing the yards to the mast, it is advisable first to tie all the necessary blocks to the masts and the yards separately, before bringing them together on the ship. The side view shows where the blocks need to be fitted. All blocks are single-hole and of the same size. The thicknesses of the lines on the diagram indicate the three rope thicknesses: thin, medium or thick rope.

Rigging the yards. The recommended sequence for rigging is to follow the small numbers 1 to 27 shown on the side view starting with the bowsprit stays 1,2 3 and 4. The terminal points are shown on the plan-view and side-view. Dual ropes indicate that the rigging is doubled and therefore needs two terminal points – one on each side of the ship. 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.

Part 26 - Halyards. The sketch shows the method of securing the yards to the masts using halyards made from blocks and rope. The free end of the rope is terminated to a rigging point with a half hitch and a drop of instant glue.

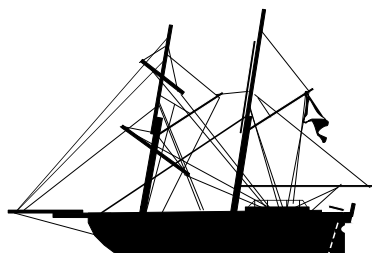
Bowsprit Rigging. Rig the bowsprit stays to the pintles either side of the bow. Rig the bowsprit tip to the eyelet under the stern with two sprit stays tensioned with a halyard of two single blocks. Tie the free end of the halyard around the fore sprit stay and secure with a drop of instant glue.

FINISHING OFF

- **Rigging the anchors.** Secure the anchors in place on the bows. Coil the anchor ropes on deck and secure with a drop of glue.
- **Cabin Portholes** - Cut out the porthole strips from the photo-etched plate and fit them to the cabin transoms with instant glue as shown in the perspective view and on the kit's box. The large strip is fitted on the fore transom and the two single porthole strips are fitted either side of the companionway door.
- **Part 28 – Nameplate.** Cut out the nameplate from the photo-etched plate and fit it to the stern transom with instant glue.
- **Part 30 - Flag.** Secure the flag on the mizzen gaff hauling line. 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.

SAILS

Sails have not been included with this model. However, please note that a ready-made set of sails for the Achilles together with rigging instructions may be purchased separately from Mantua Models Part number **Art 34013** refers.



LIST OF THE MATERIALS CONTAINED IN THE KIT

Plywood laser-cut board 5x165x480mm

Plywood laser-cut board 1x175x230mm

Limewood Planks

60 off 1x3x400
1 off 1.5x6x400
2 off 2x2x400
1 off 2x3x400
1 off 2x6x400
1 off 2x8x400

Walnut Planks

55 off 0.5x3x400
1 off 4x4x200
1 off 2x8x400
1 off Moulding 3x2 x250

Dowel

1 off Ø2x500
1 off Ø3x500
2 off Ø4x500
1 off Ø5x500
2 off Ø6x500

White Maple Planks

30 off 0.5x3x400

FITTINGS

Capstan Pack

4 off Bitts 6x8x15mm
2 off Blocks 4x5x14mm
1 off Capstan Ø12x20
1 off Gear 2x12mm
1 off Support 2x9mm
1 off Cap Ø10x3mm

Anchor pack.

2 off Anchors 28x40mm
2 off Brass rings Ø5 mm

Rudder Pack

8 off Ball stanchions 2x12mm
1 off Brass Eyelet
2 off Brass Outrigger Supports
6 off Rudder hinges 0.3x2x10mm
3 off Hinge Pins Ø2.5x5

Chain Plates Pack

10 off Ø5 chain plate rings
10 off chainplate stirrups

Deadeyes Pack #1

20 off deadeyes Ø5 mm
19 off Single blocks 5mm – one hole

Deadeyes Pack #2

1 off Right ladder side
1 off Left ladder side
1 off Walnut strip 1x3x60
4 off Deadeyes Ø3 mm
1 off American flag - silk

Pintles Pack

1 off Hank of brass wire Ø0.8x250
22 off Brass pintles 7mm

Rope Pack

12m thin, light rope Ø0.25mm
18m medium, light rope Ø0.50mm
9m thick light rope Ø1mm
1 off brass photo-etched plate
50 off nails 8mm

1 off Construction plans (2 sides)

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 proven system that 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 this manner from 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. **To avoid twisting the hull, cover each side of the hull alternately, working three to four planks at a time.**

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 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 that extend beyond the hull 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. Plank the inside faces of the bulwarks, covering the inside of the first layer of white planks. Carefully smooth this last section of 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 modeling tools and their uses for your consideration. These are just some of the tools available. Please ask your supplier for details.

- **Craft Knives.** A number of sizes are available, the larger handle being the most useful. Many blades are 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.** Various grades of miniature saw blades are available. All give a very fine cut. Usually tenon-backed, these can be obtained in sets to include handle, mitre box, or just the blade.

