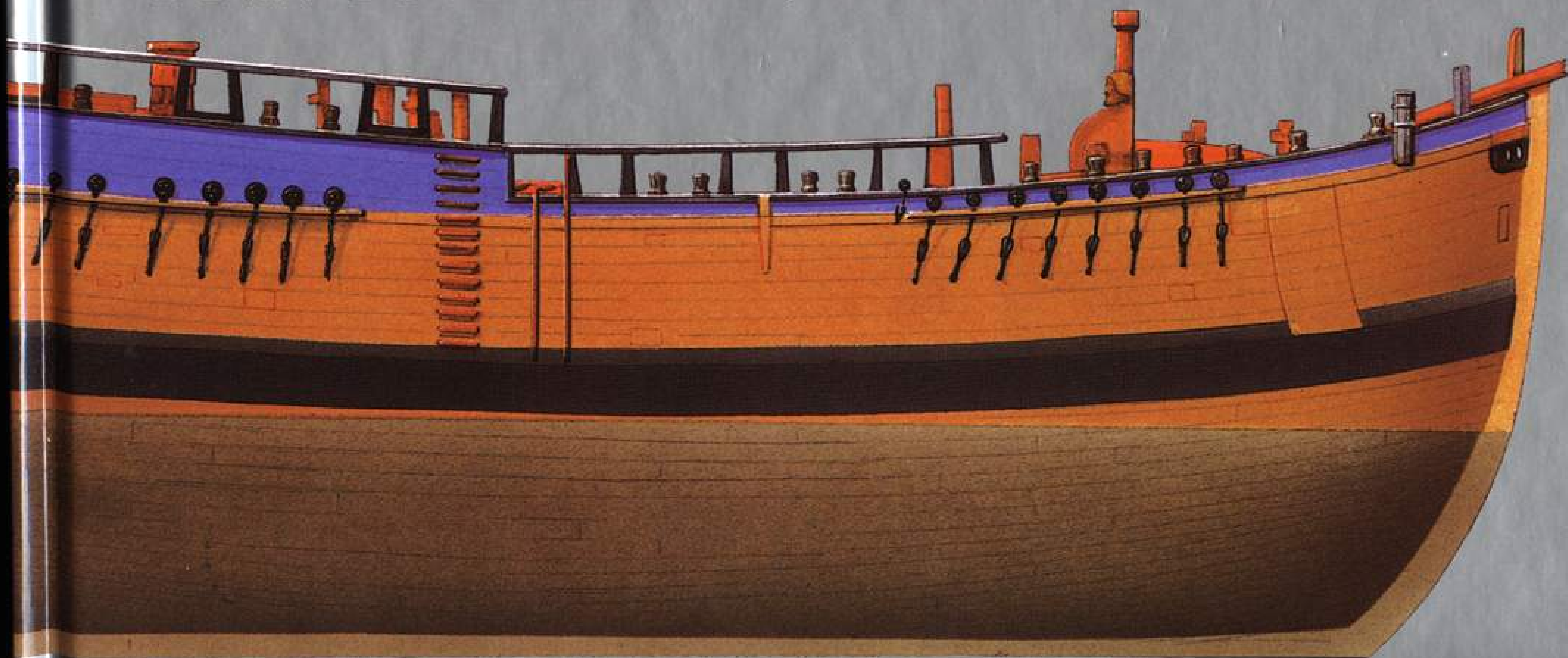
ANATOMY OF THE SHIP

CAPTAIN COOK'S ENDEAVOUR

REVISED EDITION

COMPLETE WITH 1/96 SCALE FOLD-OUT PLAN



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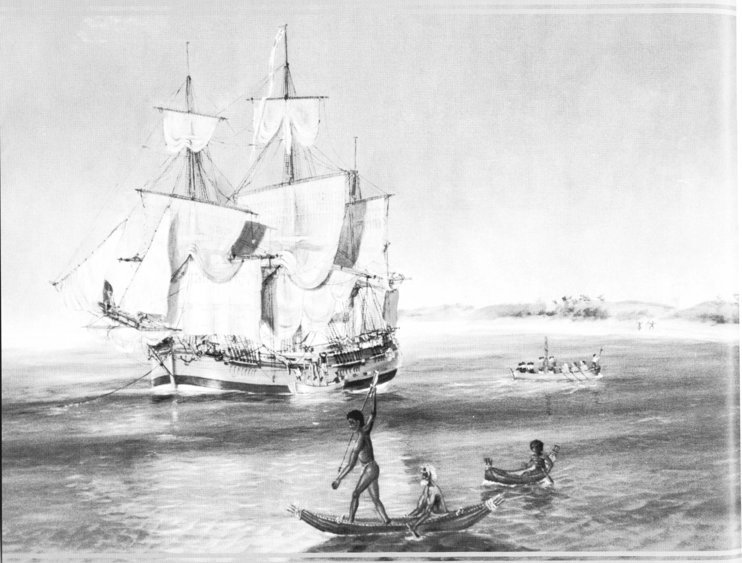

CAPTAIN COOK'S

ENDEAVOUR

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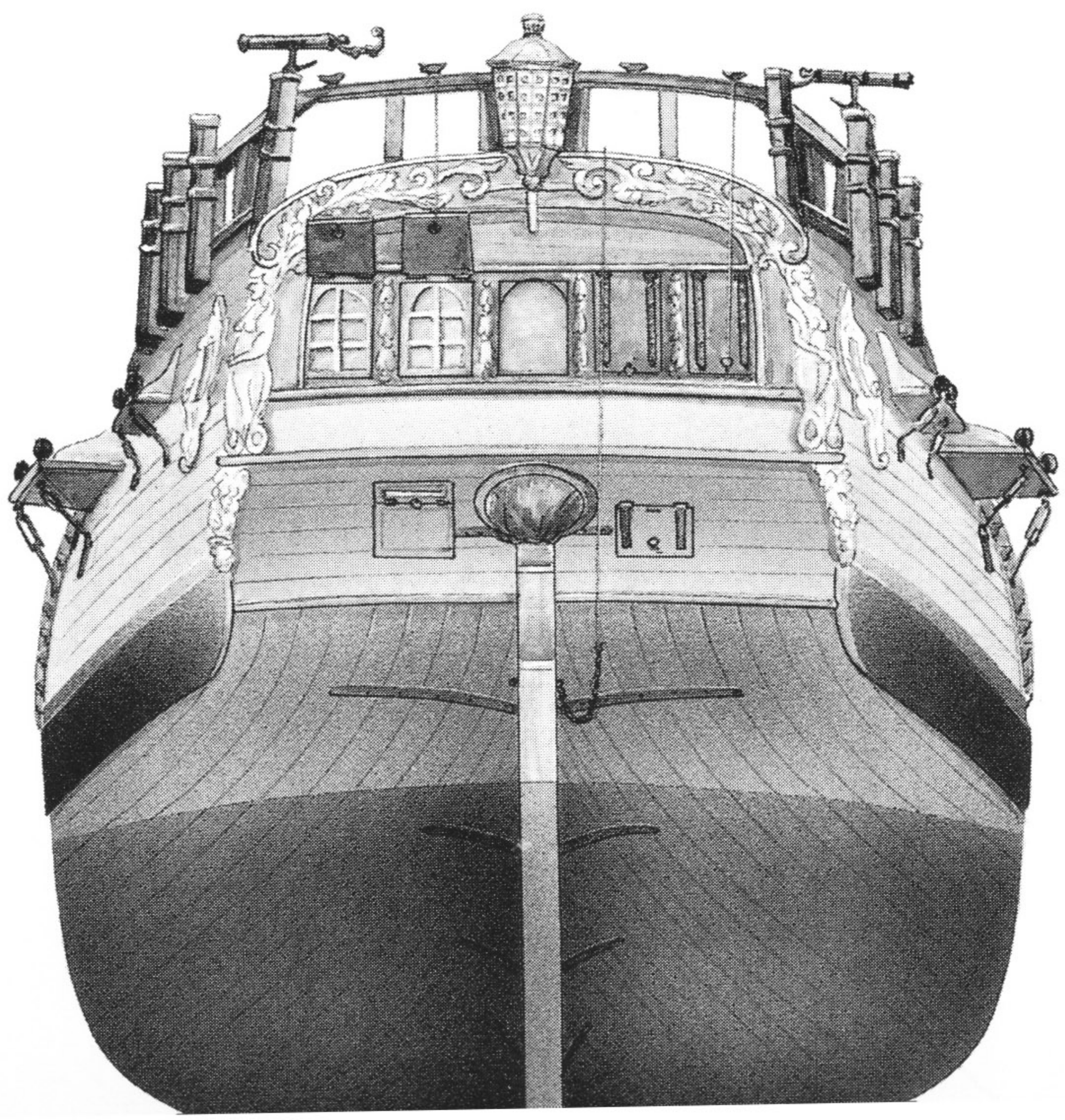
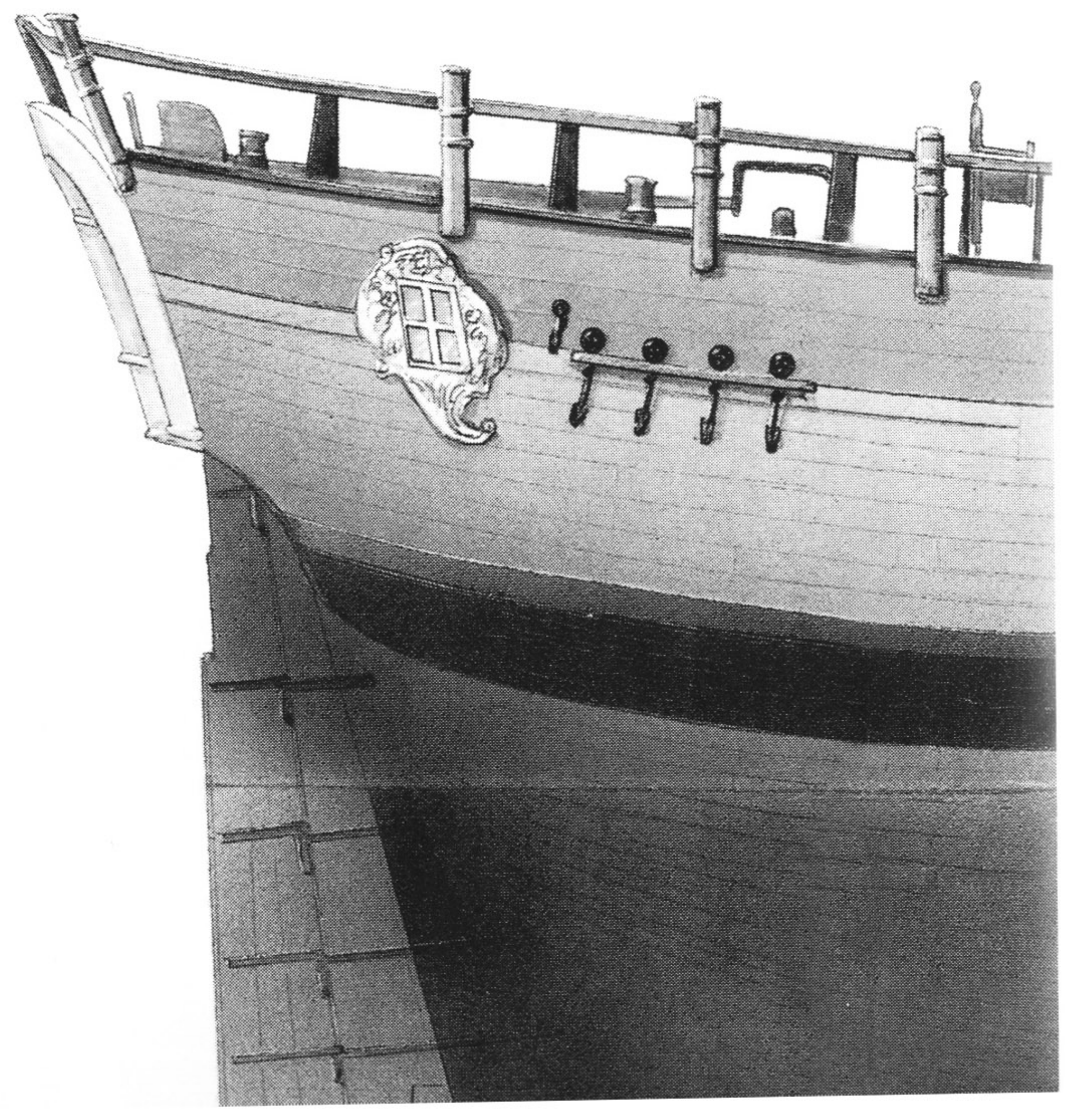
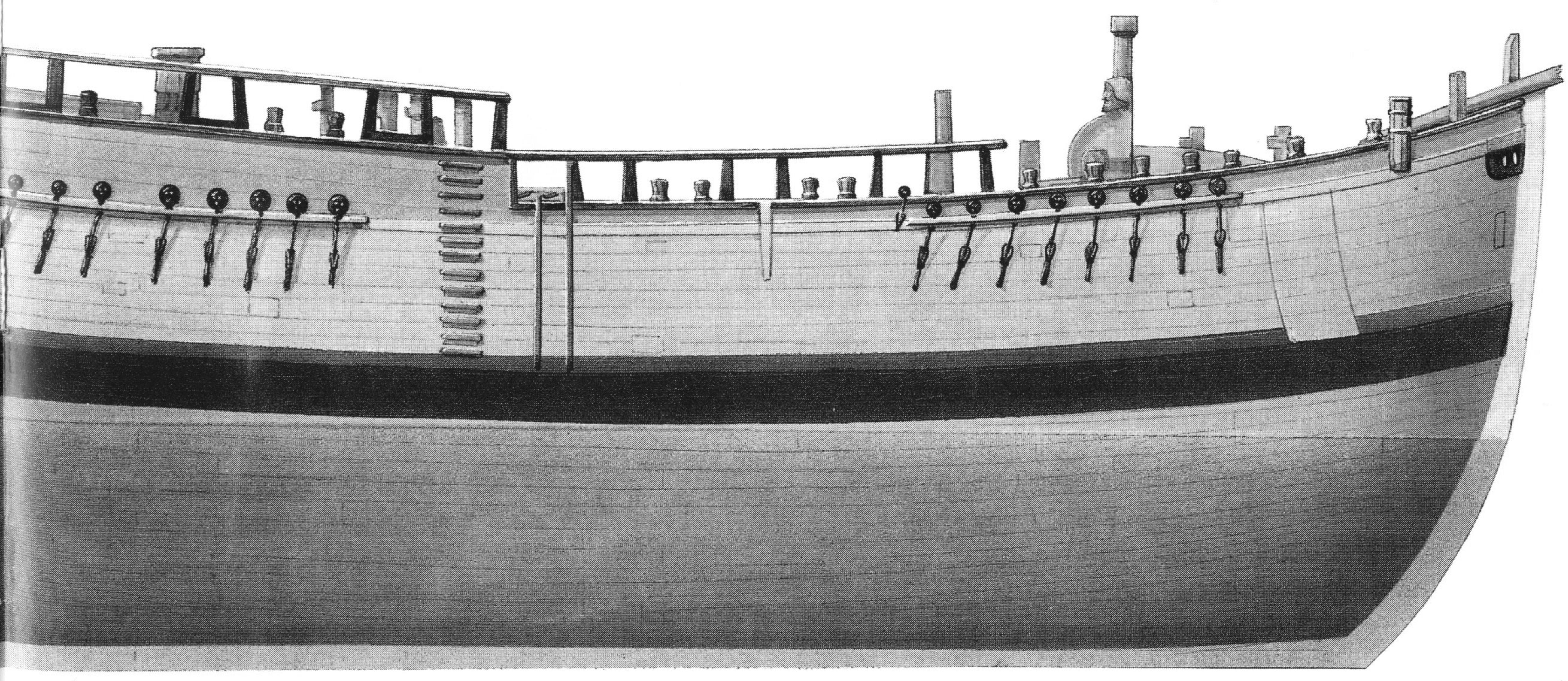
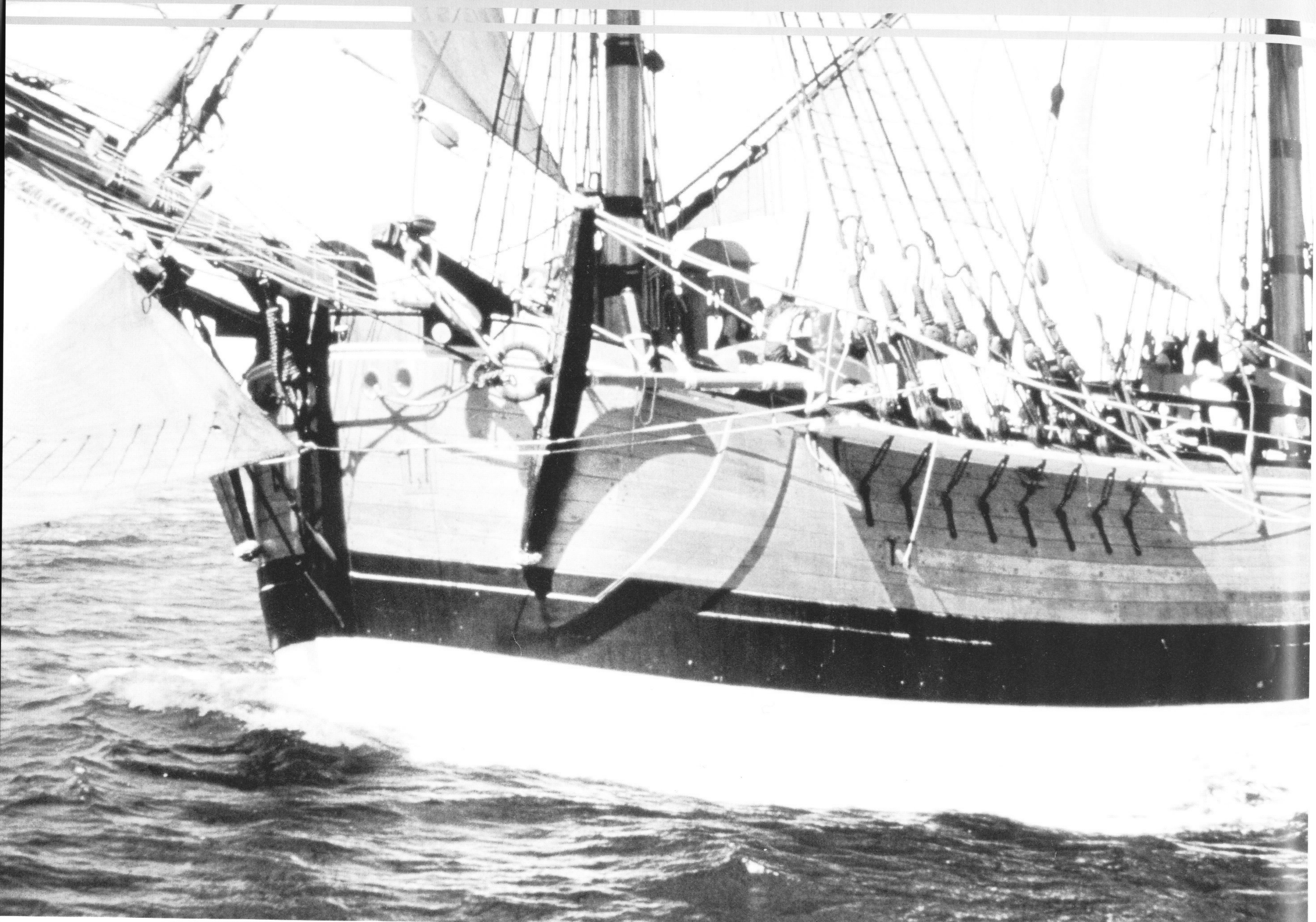
Previous pages
Left: HMS *Endeavour* at Botany Bay, 29 April 1770. Oil painting by Karl Heinz Marquardt, 1983, (now in possession of the Melbourne Maritime Museum, Melbourne, Victoria).
Right: '*Endeavour* at Sea', (British Library).









Larboard bow of the Fremantle *Endeavour* replica at sea. Note the absence of the bumpkin and the fore course with the tack leading to the cat-head, which did not come into use before 1790. The reason for the built-in main tack fairlead block is obvious when looking at the main tack and chesstress. (*John Lancaster*)

The age-old human urge to extend the boundaries of knowledge has always been a catalyst for voyages into the unknown. Thus it was in the 1760s when the Royal Society planned to send a party of astronomers to the South Pacific to observe the transition of the planet Venus between the Earth and the Sun on 3 June 1769, a rare astronomical event not to occur again for more than a century, accurate observation of which would add greatly to astronomy itself and consequently to the science of navigation. The expedition was supported both by Royalty, George III granting on 24 March 1768 the sum of £4,000 to defray expenses, and by the Royal Navy, which undertook to provide a ship. This was the Whitby collier *Earl of Pembroke,* purchased on 29 March 1768 and renamed His Majesty's Bark *Endeavour.* However, a decision still had to be made as to who was to command the ship and lead the expedition. The Royal Society's proposal of a civilian, the noted hydrographer and cartographer Alexander Dalrymple, was rejected by the Lords of the Admiralty as totally against all the rules of the Navy and a 'proper person' was selected instead.

This 'proper person' was James Cook, Master of HM Schooner *Grenville* and highly approved of by the Admiralty as a navigator, surveyor and cartographer. The choice of this 39 year-old warrant officer not only as the commander of the expedition vessel but also as one of the official observers has been proved to be the best choice Their Lordships could have made. Cook's three voyages of discovery in the Pacific put this part of the world firmly on the map and the name of his most famous ship, *Endeavour,* is, together with those of his later vessels *Resolution*, *Discovery* and *Adventure,* an outstanding memorial to an outstanding man.

Earlier narratives of the great voyages of exploration, concentrating more on the element of individual human achievement, neglected detailed and accurate descriptions of the ships involved, the means by which these great achievements were made. Demand for this sort of information developed only recently and much research still needs to be done, so detailed information on the ships of the great explorers is relatively rare. However, thanks to the British Admiralty's policy of meticulously recording the lines of all Royal Navy ships, either built, bought or captured, the *Endeavour* is an exception to this rule. Three sets of original draughts have survived, one depicting the vessel as purchased, the second as fitted at Deptford Yard for her historic voyage and the third after her return, when she was refitted for further service as a transport ship. The most important period of her service, her voyage round the world under Cook, is further documented in several journals, as well as in a few sketches by the expedition's botanical artist Sydney Parkinson.

Reconstruction of such a well-documented ship, one would assume, would not give rise to the flights of fancy that often occur with other well-known, but less well-documented, vessels. However, an exhaustive study of the original draughts, together with J C Beaglehole's *The Journals of Captain James Cook Vol. 1: The Voyage of the Endeavour 1768-1771* and other contemporary works of a more general nautical nature, has shown this not to be the case.

Few ships in history have fascinated model makers as much as the *Endeavour*, and countless models, as well as some full-size replicas, have been built by amateurs and professionals alike, many being accepted as permanent exhibits by highly reputable museums around the world, some of which are shown in the photographic section of this book. However, none of these sometimes superbly crafted miniature *Endeavours* have done much to advance our still largely superficial knowledge beyond the point of the well-known model plans of many decades ago. The situation has improved recently with the launching of a full-size replica of *Endeavour* at Fremantle, Western Australia, which has the four stern windows and their dead-lights,[1] as well as certain items of deck furniture. However, as regards the fitting of bumpkins, the length of the mizzenmast and several other points, the designer has chosen to keep to the traditional image of the *Endeavour*. This view of *Endeavour* is based on the original draughts, but the rigging and furnishing details are drawn from contemporary nautical knowledge, the results of which are not in accordance with the information in the *Endeavour* journals and have created a distorted picture of the actual ship.

Thorough examination of these journals and the draughts reveals a mine of previously unused primary source information, upon which the following drawing work has been based. Therefore these drawings do not entirely comply with existing well-known models and reconstruction drawings. These previously overlooked details will be explained both in the drawings and the text, by reference to the contemporary sources, so that past misconceptions may be corrected. These misconceptions range

1. K H Marquardt, 'Do we really know the *Endeavour*?', *The Great Circle* Vol 8, No 1 1986; K H Marquardt, 'HM Bark *Endeavour* , what do we really know about the ship?' *Nautical Research Journal* Vol 35, No 1 (1990).

from the treatment of the hull below the waterline to the controversies surrounding the stern windows, a shorter than normal mizzen mast and the bumpkins. The evidence for the correction of these misconceptions will be presented in the following sections.

Ship's history

June 1764: Built by Thomas Fishburn at Whitby as the *Earl of Pembroke*. Employed in the coal trade.

1768

Mar: For sale on the River Thames, by her owner Thomas Milner.

21 Mar: Earmarked by the Navy Board. 'The Board suggests a cat-built vessel, which would be roomy enough for the purpose. One of about 350 tons can be purchased on the River Thames'.

23 Mar: Order to survey the *Valentine*, the *Earl of Pembroke* and the *Ann and Elizabeth*.

29 Mar: 'A Cat-built Bark in Burthen 368 Tons, 3 years 9 months old, has been purchased. In what name is she to be registered?' The price was £2,212 15s 6d for the hull and £94 10s 0d for masts and spars, which was later reduced to £56 17s 10d.

31 Mar: Master Attendant and pilot brought the *Earl of Pembroke* from Mr Birds' Ways to Deptford Dockyard to have her dismasted and docked.

2 Apr: Docked.

5 Apr: Registered on the Navy List as a Bark by the name of *Endeavour*.

25 Apr: The officers of HM Yard at Deptford said the Bark *Endeavour* would be ready to receive her crew next week.

Early May: Delay because of strike on the waterfront.

18 May: Released from the single dock and moved into the basin for finishing work.

25 May: A decision was reached to have the *Endeavour* manned by seventy men and that Mr James Cook be appointed to command her with the rank of First Lieutenant.

27 May: Lieutenant James Cook hoisted his pennant at 11am and took charge of the *Endeavour*.

31 May: Stepping of the lower masts.

18 June: Pilot took charge and HM Bark *Endeavour* set sail for Galleons Reach to receive her ordnance.

30 June: Weighed anchor and sailed to the Downs. Pilot dismissed on 7 August.

22 July: Cook was informed that besides Mr Charles Green and his servant, Joseph Banks Esq. and his suite of eight people will sail with him and will have to be accommodated.

3 Aug: A decision was made to increase the *Endeavour*'s complement to eighty-five men, including twelve marines.

8 Aug: Sailed for Plymouth.

14 Aug: Arrived at Plymouth in the evening to receive further supplies.

16 Aug: Additional crew came aboard.

17 Aug: Work commenced on the refitting of the gentlemen's cabins and the building of a platform over the tiller.

18 Aug: Another four guns and stores taken aboard.

20 Aug: Preparations for sea, delayed for several days by a storm.

26 Aug: Sailed with ninety-four men aboard.

30 Aug: Very hard gale. 'Washed over board a small boat . . . and drown'd between 3 and 4 dozen of our poultry'.

14 Sept: Anchoring at Plymouth in Funchal Road, Madeira, Master's mate Weir drowned. Impressed J Thurman from a New York sloop.

19 Sept: Departed Funchal Road. Two watch routine changed to three watches.

26 Oct: Crossed the Equator.

14 Nov: Arrived in Rio de Janeiro. Ship boot-topped and all necessary repairs carried out.

20 Nov: The longboat carrying four pipes of rum sank, but was recovered.

2 Dec: Intended date of departure from Rio. The seaman Peter Flower fell over board and drowned. Hired a Portuguese seaman as replacement.

7 Dec: The *Endeavour* finally left that inhospitable place. Pilot dismissed.

17 Dec: Watch condition changed back to watch and watch about.

22 Dec: A new suit of sails was bent and the top rigging set up.

25 Dec: 'Christmas Day; all good Christians that is to say all hands get abominably drunk so that at night there was scarce a sober man in the ship' (J Banks).

1769

6 Jan: Issue of warm clothes (a Fearnought jacket and a pair of trousers) to each man.

16 Jan: Anchored in the Bay of Success to take in wood and water. Mr Banks and several men went on land to gather plants etc. Unable to come back the same day and Thomas Richmond and George Dorlton, two negro servants, froze to death overnight.

18 Jan: Lowered the six main deck carriage guns into the hold in preparation for rounding Cape Horn.

20 Jan: Completed taking on water and wood. Lost a kedge anchor.

21 Jan: Departure.

25 Jan: Rounded Cape Horn in relatively good weather.

31 Jan/2 Feb: After first being used on the 23rd, studding sails were again set. The next day Joseph Banks was allowed to row his skiff around the ship to shoot birds.

16 Feb: A very heavy sea carried away the driver boom including the lee rails to which it was lashed.

12 Mar: Return to three watches. As a precaution for an expected meeting with islanders the six waist guns were remounted.

26 Mar: Marine William Greenslade was caught stealing and jumped or fell over board and drowned.

4 Apr: Land was first sighted (an island of the Tuamotus).

13 Apr: Arrival at Tahiti

17 Apr: Alexander Buchan, landscape artist in Banks' retinue, died of epilepsy.
18 Apr: Construction of Fort Venus.
29 Apr: Mounted two of the four extra 4-pounder guns on the quarter-deck and two at Fort Venus.
25 May: Longboat's bottom found to be completely worm-eaten and was repaired.
1 June: Lt Gore, Dr Monkhouse and Mr Spöring sent in the longboat to Moorea to observe the transit of Venus.
2 June: Lt Hicks, Mr Clerk, Mr Pickersgill and Mr Saunders sent to another spot to observe the transition.
3 June: Observation of Venus' transition across the sun.
7 - 9 June: Boot-topped both sides of the ship.
18 June: Observed a total eclipse of the moon.
Beginning of July: Preparations for departure from Tahiti.
9 July: Marines Clement Webb and Samuel Gibson deserted.
11 July: Deserters back on board. Punished with twenty lashes.
12 July: Anchor stocks were found to be worm-eaten and had to be replaced.
13 July: Departure from Tahiti with the Tahitian Chief Tupia and his servant aboard.
17 July: Discovery of the island of Huahine.
21 July: Landed on Ulietea and took possession in the name of His Majesty.
22 July: Surveyed the island and sounded the harbour. Investigated and surveyed the Society Islands.
9 Aug: Departure.
24 Aug: Bad weather: fresh provisions (hogs and fowl) died in the colder latitudes.
28 *Aug*: Boatswain's mate John Reading died from excessive drinking.
2 Sept: Tempestuous winds and increasing cold at latitude 40° forced the ship to turn back.
7 Oct: The North Island of New Zealand was sighted.
9 Oct: Landed at Poverty Bay and encountered hostile Maoris. Several Maoris were killed.
21/24 Oct: Took in fresh water and wood at Anaura Bay.
25 Oct: Repaired the tiller brace.
22 Nov: A native took the half-hour glass out of the binnacle and received a dozen lashes with the cat-o'-nine-tails.
6 Dec: A near-disaster when *Endeavour* unexpectedly struck a rock, but no damage caused.
9/31 Dec: Rounded the North Cape of New Zealand.
28 Dec: Struck by a hurricane and laid to under a balanced mizzen and mizzen staysail.

1770
15 Jan: After sailing down the west side of the North Island, entered Queen Charlotte Sound for repair of the tiller brace, boot-topping and for wood and water.
6 Feb: Sailed, nearly foundering on the rocks through tidal change.
11 Feb: Completed circumnavigation of North Island at Cape Turn-again and sailed southward.
25 Feb: Lost the main topgallant mast and a fore topmast studding sail boom in a four-day gale: a fore course and a main topsail were split apart.
March/Apr: Sails had become increasingly defective. The spritsail topsail condemned and used for repair material. Used tent canvas to repair jib.
27 Mar: Circumnavigated the South Island and headed again for Queen Charlotte's Sound. Anchored in Admiralty Bay to replenish water and supply of firewood.
31 Mar: Planning their return to England. Ship's condition too poor for the direct route via Cape Horn preferred by Cook or the direct route to Cape of Good Hope during the southern winter. Decided to return via the East Indies, sailing westward and then north along the east coast of New Holland.
19 Apr: Landfall on the south-eastern coastline of Australia. Named Point Hicks after Lt Hicks who sighted it first.
29 Apr: First landing at Botany Bay.
1 May: Able Seaman Forby Sutherland died of tuberculosis.
6 May: Left Botany Bay and sailed north.
22 May: Anchored in Bustard Bay. Captain's clerk Richard Orton was the victim of a prank. Somebody cut the clothes off his back and part of both ears while he was asleep. Midshipman Patrick Saunders, under suspicion, was demoted.
29 May: Anchored in an inlet to replenish water and have the ship's bottom cleaned. Not finding any fresh water they left and named the place Thirsty Sound.
11 June: Struck the Great Barrier Reef and made much water. To lighten the ship as fast as possible, the six waist guns were thrown over board, together with about 40 to 50 tons of other ballast etc.
12 June: After 24 hours of anguish, with everybody, including the Captain and gentlemen, manning the pumps vigorously, the ship was heaved off the reef. Lost the small bower anchor. Got up the fore topmast and the fore yard and moved towards land.
13 June: Fothered the leak, got up the main topmast and main yard and continued toward land.
14 June: Anchored 1 mile off shore from a possible harbour for repair.
17 June: After 2 days of strong wind moved into the river and ran on to a sandbank.
18 June: Warped the ship off the bank and moored her alongside a steep beach. Pitched two tents, landed all the sick and the stores.
22 June: Having landed all the stores and lightened the ship forward, the ship was moved up stream to a more suitable place to beach the fore ship.
27 June: After underwater repairs completed, tried without success to float the ship's bow with thirty-eight large empty casks.
4 July: Ship refloated and trimmed. Inspected next day to see if still making water.

20 July: Moved everything back on board. The ship now ready to sail at the first opportunity.
1 Aug: Pumps overhauled, as all in a state of decay, with one falling to pieces.
5 Aug: Departure from Endeavour River. With only 3 months' worth of provisions left and in danger of being locked in by reefs and shoals, it was resolved to make for the open sea through one of the channels discovered.
15 Aug: Steering west again for fear of missing the passage between Australia and New Guinea.
16 Aug: Land was sighted with breakers over a long reef and only a small channel visible. A sudden wind change pressed the ship 80 to 100 metres close to the reef. With longboat and yawl towing and the assistance of sweeps the bow was swung around and a slight wind change gave temporary relief. With tidal change and the help of their boats, the ship was safely navigated through this channel, which was only ¼ mile wide to an anchorage inside the reef. Being the narrowest escape from destruction so far, the place was named the Providential Channel.
19 Aug: Sailed again and 3 days later found a strait between New Holland and New Guinea.
22 Aug: Landed on an island and, in the name of His Majesty King George III, took possession of the whole east coast of New Holland by the name of New South Wales. The island was named Possession Island and the Strait is now known as Endeavour Straits.
24 Aug: Lost the large bower anchor, recovered it again 24 hours later, and had another narrow escape from shipwreck.
29 Aug: Reached the coast of New Guinea. Although the water was not deep enough for going close to shore, James Cook, Joseph Banks and Dr Solander agreed to set foot at least once in that country.
18 Sept: Anchored at Savu and bought nine buffaloes, a number of fowls and 'a large quantity of syrrup'.
21 Sept: Departed from Savu.
30 Sept: Arrived near Java Heads.
12 Oct: Anchored in Batavia Road. Up to then none of the ship's company was on the sick list.
18 Oct: Moved to Cooper's Island to unrig the ship.
23 Oct: Hauled alongside a wharf to clear the ship of all stores etc.
5 Nov: Transported the ship to Onrust for careening.
6 Nov: Yard officers took over the ship.
7 Nov: The ship's surgeon William Monkhouse died after a short illness. Several of the crew fell ill.
9 Nov: Ship careened. Her bottom in a worse condition than expected. False keel lost within 20ft of the sternpost, main keel on many places considerably damaged, much sheathing lost and several planks badly damaged. It was a wonder that the ship could have sailed such a long distance in that condition. Most of the ship's crew already sick and no more than twenty officers and men fit for duty.
14 Nov: Careening completed.
15 Nov to 7 Dec: Sailed to Coopers Island to take in all the stores, and to be rigged etc. Seldom more than fourteen hands able to work.
8 Dec: Departed for Batavia Road.
11 Dec to 24 Dec: Took on water and provisions and prepared the ship for sea.
25 Dec: Minor dispute with the Dutch authorities over a runaway Englishman, who took refuge aboard. Former midshipman Patrick Saunders deserted in a shore boat.
26 Dec: Departed Batavia with more than forty sick. Six people died during their stay. The surgeon W Monkhouse, Able Seamen P Rearden and J Woodworth, Charles Green's servant J Reynolds and the two Tahitians Tupia and his servant Tarheto. Nineteen new crew members were mustered.

1771

6 Jan: Anchored off Princes Island to replenish wood and water and to buy more fresh food.
15 Jan: Left the island and on their way to Cape of Good Hope. A journey of much illness and death, which Cook attributed to the water taken on at Princes Island. The list of the lives lost is long.
24 Jan: J Truslove, Marine corporal.
25 Jan: H D Spöring, Assistant naturalist.
27 Jan: S Parkinson, natural history artist, J Ravenhill, Sailmaker.
29 Jan: C Green, Astronomer.
30 Jan: S Moody, F Hate, two of the Carpenter's crew.
31 Jan: J Thompson, Ship's cook, B Jordan, Carpenter's mate, J Nicholson and A Wolfe, Seamen.
2 Feb: D Roberts, Gunner's servant.
3 Feb: J Thurman, Sailmaker's assistant.
4 Feb: J Bootie, Midshipman, J Gathrey, Boatswain.
6 Feb: J Monkhouse, Midshipman (brother of surgeon).
12 Feb: J Satterly, Carpenter.
14 Feb: A Lindsay, Seaman.
15 Feb: D Preston, Marine.
21 Feb: A Simpson, Seaman.
27 Feb: H Jeffs, E Pharah, P Morgan, Seamen.
1 Mar: The fore topsail sheet bits were worked loose by the bowsprit. Repaired as well as the situation permitted.
6 Mar: Land was sighted nearby at first light. Had to tack for several hours not to be driven on to the rugged coast of South Africa.
13 Mar: Passed the Cape of Good Hope.
14 Mar: Anchored off Cape Town.
15 Mar: Moved twenty-eight sick crew members ashore for recuperation. R Thomas, Seaman, died.
4 Apr: J Lorrain, Seaman, died.
7 Apr: J Dozey, Seaman, died.
13 Apr: Having completed all repairs, watering and provisioning, the sick returned and the ship was made ready for sea.

Anchor lining and naval-hood. The anchor lining was an extra layer of thin planks covering the side planking above the wales in the bows, to protect this area from damage from the bow anchor's flukes when it was catted or fished in order to be stowed. As this lining is not specifically marked on the draughts, its presence can only be assumed.

The 'naval-hood', another lining of soft wood enclosing the two hawse holes by the stem, can be identified in Parkinson's sketch of the bows. This method of protection for the hawse-holes, common practice on British-built ships of the period, is in contrast to the Continental method, where a rounded softwood bolster was placed below the holes.

Gammoning. Neither the draughts nor Parkinson's sketches give any details of *Endeavour*'s gammoning. However, a note in the log written by Master's Mate Pickergill[16] on a breezy day a few days before arrival in Rio de Janeiro not only confirms the presence of a gammoning ring, but also suggests the existence of a back-up gammoning, since the breaking of one of the bowsprit's main connections with the ship, whilst under sail on a breezy day, would have caused the headsails to wreak havoc with the whole rigging had they not been secured by a back-up gammoning. A disaster of these proportions, had it occurred, would surely have received more mention in the log than Pickergill's brief note. Therefore we can deduce that there was a gammoning ring bolted to *Endeavour*'s stem facing, and probably either an oblong hole cut into the stem head, or a second ring bolted to it, for a second gammoning, which practice accords with that shown on Chapman's draughts of larger barks.

Fittings

As with the fixed outboard features described above, the following descriptions of deck furniture and other fittings will proceed in order of their position on deck, starting just inside the taffrail.

Ensign staff. The presence of an ensign staff may safely be assumed despite its not being indicated on the draughts. Standing in a step between the taffrail and the rear of the helmport, it was further secured to the taffrail with an iron bracket. Its height above the taffrail was commonly one-third of the height of the mainmast.

Iron horse and flag lockers. Likewise a short iron horse for the mizzen sheet block can be assumed to have been aft of the helmport and flag lockers positioned just inside the taffrail.

Platform over the tiller. This was built during the rush of late refitting at Plymouth before the *Endeavour* sailed and is recorded in Cook's journal on 17 August 1768. The position of this platform has frequently been incorrectly described, for example by Beaglehole who claimed that Parkinson's stern view showed this platform. In fact what Parkinson drew was an awning over the cabin section of the quarterdeck. The most probable place for such a platform would have been at the helm (rudder) end of the tiller where its arc of movement was smallest, allowing easy access from port to starboard. Such bridges over long open tillers were not uncommon.

Steering wheel. This stood between the mizzen mast and the skylight, connected to the iron bracket of the tiller head (which was bent upwards to pass over the cabin fireplace flue) by the tiller rope, an untarred rope leading from the tiller head through a series of four blocks to turn five times around the barrel of the steering wheel (the centre turn being nailed to it to prevent slippage) and then back via a similar series of blocks to the tiller.

Binnacle. Although the existance of a binnacle aboard *Endeavour* is confirmed by an incident recorded in the log where a Maori was caught stealing the half-hour glass 'out of the Bitticle', there is no direct evidence for either its position or its appearance, which must therefore be deduced from general knowledge of eighteenth-century nautical practice. The common binnacle of the period was as described by Falconer, 'a wooden case or box, which contains the compasses, log-glasses, watch-glasses, and lights to shew the compass at night'. It consisted of three compartments, the lantern in the centre and the two compasses either side. It was necessary to have the two compasses at least 7ft apart to prevent reciprocal interference. The single compass binnacle was unknown at this time, being a nineteenth-century innovation not recorded before 1810.

The binnacle was usually placed directly in front of the steering wheel, so that the compasses could be read easily by the helmsman on one side and the officer of the watch on the other. Since the space forward of the wheel on *Endeavour* was taken up by the 4ft-wide skylight, the only viable position for the binnacle was beside and across the after portion of that light, the two compass compartments either side and the lantern in a bridging compartment between them over the skylight.

Skylight. Next in line was the skylight. The draughts show head-ledges and coamings 18in high, twice that of the main hatchway. Modern models often have a low inlaid grating covering this opening, which is incorrect. Contemporary literature and models are very specific that the only covering for a skylight of this sort was a glazed box hatch with protective iron bars. Since at sea the light ports were closed and caulked and the stern and badge windows covered with dead-lights, this skylight was the only source of daylight for the cabin and gratings would have defeated the object.

Capstan. The ship had a single capstan with its shaft rotating in a step on the cabin deck below. The capstan was not moved during the refit, and the newly-fitted companionway afore it and the skylight aft of it interfered somewhat with its easy operation, as the men on the bars now had

16. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968). '. . . found ye bolt for Gammoning the Bowsprit broke'.

to step aside when the bars passed over these obstacles. Principally used for handling heavy cargo, for warping or, as W Hutchinson wrote (1794), 'when it blows so strong that all hands cannot haul aft the fore sheet, but are obliged to heave it aft by the capstern . . .', the real test of its usefulness came during the desperate hours spent on the reef off northern Queensland.[17]

Companionway. The *Endeavour*'s companionway was almost certainly fitted with a protective 'companion',[18] to prevent the cabins below being swamped in bad weather. Open stairways, frequently fitted to models, were only found on larger ships where access to the officers' accommodation was below the quarterdeck and the ladderway lead on to the upper deck. Any water washing down that way would have run out through the scuppers on the main deck. This could not have happened on flush-decked ships or ships with a direct stairway from the quarterdeck to the cabins below, and all such ships, whether naval or merchant, had a protected companionway, as numerous contemporary models and paintings show. The companionway on *Endeavour* was the only access to the cabins and as such needed to be usable in all weathers without the risk of swamping them. There are several examples in the journals of the quarterdeck being awash, such as when Mr Green's astronomical observations taken in the Le Maire Strait on 14 January 1769 were felt to be inaccurate because 'when these observations were made, yet the sea ran so high that it filled the quarter deck three times while they were observing.'

Pumps. The absence of pumps from the Greenwich-built model of *Endeavour* is a major omission, if nothing else because of their vital role in saving the ship and thus the expedition after she struck the reef. The draft of the original *Earl of Pembroke* (3814b) shows two pumps abaft the mainmast, while the later *Endeavour* draught (3814a) shows four, two abreast the mainmast and two astern of this position. The presence of these four pumps is confirmed in the journals in Cook's report of the accident[19] and later in the repairs at Batavia.[20]

Bitts and gallows. The original draught of the *Earl of Pembroke* showed only topsail sheet bitts for the fore and mainmasts. Jeer bitts were added to the rear of both masts during the Deptford refit. It was here also that the spar gallows aft of the quarterdeck bulkhead and in the fore hatchway were fitted. These carried the reserve spars and booms etc, and the two smaller boats.

Hatchways, scuttles and other manholes. The coverings fitted to hatchways etc. are another 'grey area' in modelmaking, since they are not shown on the draughts. The common expedient of fitting all such openings on models with gratings is unsatisfactory. The basis for any approach to this issue must be that a hatchway's covering was determined by that hatchway's function.

The comments on the companionway above regarding the need to prevent swamping below decks apply equally to the main and fore hatchways. Covering the main hatchway with a grating provided excellent ventilation, but would have been wholly impractical on a ship of *Endeavour*'s size. Larger warships, with gun batteries below decks, needed the extra ventilation a grating provided when in action, but when rough seas prevented the lower deck guns being used, the gratings were tarpaulined and battened down to prevent flooding. *Endeavour*'s main hatch was therefore most probably covered by an inlaid hatch, tarpaulined and battened down at sea and only opened in harbour.

The fore hatch was the main access to the majority of the crew's quarters and therefore, like the companionway, had to be accessible in all weathers without risk of flooding. A watertight, strongly-hinged lid would therefore have been required, or better still something like the built-up entranceways for hatches on migrant ships. There is nothing in the sources to help with this matter, but general nautical literature of the period suggests that such a 'hood' was commonly used to cover not only the entrance to the cabins aft but also to the crew's quarters.[21] Therefore such a capping may be more realistic even than a hinged lid. A grating could only have been used for a small ventilation port, such as the one presumed to be over the galley, which would have been covered with a box hatch and battened down in bad weather.

Further forward, a scuttle on the port side gave access to the foremost fall, a space some 4ft in height below the forecastle, used as crew accommodation during the ship's days as a collier but unsuitable for *Endeavour*'s larger complement. This space could well have been used to house the ship's livestock (poultry, pigs and a goat, among others, being

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17. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968). Cook: 'However I resolved to resk all and heave her off in case it was practical and accordingly turnd as many hands to the Capstan & windlass as could be spared from the Pumps and about 20' past 10 oClock the Ship floated and we hove her off into deep water having at this time 3 feet 9 inches water in the hold'.

18. W Falconer, *An Universal Dictionary of the Marine* (London 1780, reprint London 1970). 'COMPANION, a sort of wooden porch placed over the entrance or staircase of the master's cabin in a merchant ship.'

19. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968). 'By this time it was 5 oClock in the pm, the tide we observed now begun to rise and the leak increase upon us which obliged us to set the 3rd Pump to work as we should have done the 4th also, but could not make it work. At 9 oClock the Ship righted and the Leak gained upon the Pumps considerably. This was an alarming and I may say terrible Circumstance and threatend immidiate destruction to us as soon as the Ship was afloat.'

20. Ibid. 'Carpenter's defect report on 10 October 1770 one Pump on the Larboard side useless the others decay'd within 1′ Inch of the bore. an entry on 16 November 1770: Sent one of the decay'd Pumps up to Batavia to have a New one made by it.'

21. W Falconer, *An Universal Dictionary of the Marine* (London 1780, reprint London 1970). 'HOOD, a sort of low wooden porch, resembling the companion, and placed over the stair-case or ladder, which leads into the steerage or apartments, where the crew generally reside in a merchant-ship. The use of the hood is to admit the air and light, and at the same time prevent the rain from falling into the steerage. '
J H Röding, *Allgemeines Wörterbuch der Marine* (Hamburg 1794, reprint Leiden 1969). 'A capping can normally be found in top of the stairways to the cabin and to the crew quarters.'

mentioned). Again, given the need for constant access, a hinged, inlaid lid would have been fitted. Two doors in the rear bulkhead below gave further access to the foremost fall, and four ports in the bows, ahead of the fore channels, were for loading and ventilation.

During the restructuring of the quarterdeck at Deptford, a space 3ft wide was created athwart the main deck between the forward wall of the pantry and the quarterdeck bulkhead, which enclosed the mainmast, the rear gallows and the two forward pumps. No means of access to this space is shown on the draughts, but the need for access to all parts of the ship for maintenance purposes, as well as not to waste valuable storage space, suggests man-holes in the forward bulkhead, beside the short stairs to the quarterdeck (also not shown on the draughts).

Windlass. Endeavour's windlass stood aft of the 1ft-high step to the forecastle, right across the fore deck. Used for breaking anchors out of the seabed and other heavy heaving work beyond the capacity of the lighter capstan, it was mainly found on merchant ships and consisted of a horizontal shaft or 'barrel' between two bitt pins, sturdy oak posts with notches for the barrel trunnions to rotate in. A third post, the pawl bitt pin, stood in front of the middle of the barrel and prevented any reverse motion of the capstan when the anchor cable was under strain. Iron teeth, or 'pawls', engaged with the barrel, acting as a brake. The pawl bitt pin also supported the ship's belfry. On many models, and most recently the full-size replica of *Endeavour*, this arrangement has been shown as two pawl bitt pins with the belfry between them, but the draughts show the belfry supported by two uprights attached to a single pawl bitt pin, as shown in numerous lithographs dating from the early nineteenth century.[22]

Bowsprit step. The bowsprit step was part of the foremast topsail sheet bitts and consisted of a piece of timber, bolted above the bowsprit's squared heel to the bitt post. This was an arrangement common on barks, but a rather unsatisfactory one, as the constant strain of the headsail on the bowsprit must have had adverse results on the connections between the bitt post and the deck beams.[23]

Bumpkin fitting. Since bumpkins were needed for *Endeavour*'s rigging and are shown in Parkinson's sketch of the bows, a timber was probably bolted aft of the stem on to the foremost deck beam for the iron heel brackets to house these booms extending over the bow. Bligh made reference to iron bumpkin brackets on the *Bounty* (see *Bumpkins* p21).

Anchors. The standard complement of anchors for a ship of *c*350 tons like *Endeavour* was three bower anchors, one stream anchor and one kedge anchor.[24] However, Cook's journal shows that several spare anchors were also carried. For example, during watering at Tierra del Fuego on 20 January 1769 it is recorded that the kedge anchor was lost, yet 18 months later Cook wrote of heaving taught upon *all five* anchors during the successful attempt to warp the ship off the Great Barrier Reef, in the course of which the small bower anchor was lost and the stream anchor only saved at the expense of its cable. Once the ship had been brought into Endeavour River for repairs, Cook reported that he 'Got a spare anchor and anchor stock a shore'. The fact that he refers to 'a', rather than 'the', spare anchor suggests that more than one was carried, especially given his later remark on 27 July 1770 that 'Carpenters [were] caulking the Ship and stocking one [!] of the spare anchors'. A spare anchor was the second largest carried aboard ship, after the sheet anchor, and was kept on the lower deck, only to be used in emergencies. Finally, 8 weeks after the reported loss of the small bower anchor, it is mentioned again, again suggesting the presence of a spare. Therefore, three spare anchors can be identified. Cook usually refers only to the best and small bower anchors, the stream anchor and the kedge anchor. Three mentions of a 'Costing anchor' probably refer to the sheet anchor, which in Falconer's words was what 'the seamen call their last hope, and never to be used but in great extremity'.

The sheet anchor was stowed furthest forward on the starboard side, with its cable on the port side to counterbalance it, with the small bower anchor identically arranged astern of it. The best bower anchor was stowed on the port side with the stream anchor, their cables to starboard. See Table 2 for the dimensions of the particular anchors.

TABLE 2: **Dimensions of Anchors**

Anchor	*Weight (cwt)*	*Shank (ft-in)*	*Flukes (ft-in)*
Sheet	21	13-2	4-5
Small bower	19	12-10	4-4
Stream	7½	9-3	3-1
Kedge	3½	7-3	2-5

The *Endeavour*'s anchor cables were stored on the lower deck. Robert Molyneux, the ship's master, reported that in Tahiti, while he had the port side of the vessel boot-topped, he also had the small bower's cable stowed between decks, and while preparing the starboard side the best bower cable was stowed. A fortnight later he recorded the stowing of a new spare cable to the port side of the main hatchway.

Ordnance. The number and positioning of *Endeavour*'s guns has already been dealt with. British 4-pounder carriage guns of the 1770s, of which

22. D R MacGregor, *Merchant Sailing Ships 1775 - 1815* (Watford, Hertfordshire 1980), (probably) J. R. Jobbins, A BRIG and AN INDIAMAN SHORTENING SAILS

23. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968). 'Found the Bitts which Secure the foot of the Bow-sprit loose, this obliged us to put before the wind untill they were secured in the best manner our situation would admit.'

24. W Falconer, (Dr W Burney), *A New Universal Dictionary of the Marine* (London 1815, reprint United States 1970), Establishment and Value of Anchors for Ships of each Class in the British Navy, 1809.

ten were carried, were between 5ft 6in and 6ft long and weighed between 11 and 12cwt. They were mounted on carriages 3ft 2³⁄₁₆in long and 2ft 4¹¹⁄₁₆ in wide across the axle trees.

Endeavour's twelve swivel guns of ½ or ¾lb calibre measured 2ft 10in long. The smallest type of naval artillery, they were loaded with langrage (loose shot) for short-range anti-personnel fighting. The guns' trunnions rested in an iron crotch or fork for elevation and depression and swivelled on vertical posts on the ship's sides. They could also be used to arm ship's boats, and Cook specifically requested four extra swivel guns to be fitted to the longboat as needed, which were supplied at Galleons Reach.

Boats. Endeavour sailed with five boats aboard, her official complement of a longboat, a pinnace and a yawl, as well as a skiff belonging to Joseph Banks[25] and another boat which was lost overboard in a gale on 1 September 1768.[26] The four remaining boats were sketched by Parkinson, who also preserved details of their rigs. That four boats remained is confirmed by Gunner Forwood's note on the Providential Channel incident (16 August 1770) reporting that 'Two boats were ahead sounding, the ship was being towed by the other two . . .'.

With regard to the positioning of the boats on board, the generally-assumed nesting above the reserve spars would only have been possible if the boats could have been fitted one inside the other. But the pinnace was at least as long as the longboat, although narrower, and the smaller yawl boat was wider than both of them, so the three official boats could not have been nested, and where would Banks' skiff, a narrow boat about as long as the pinnace, have gone?

Remarks by both Cook and Banks on 16 August 1770[27] not only confirm that the boats were not nested, but also tell us that the longboat was placed below the booms on deck, probably to port of the hatchways. Another short note by Cook on 27 August 1770[28] suggests that the two larger boats stood side by side. With the two larger boats sitting on the maindeck, and the yawl and skiff placed above the booms, each boat could be accessed separately, as Cook reported.

The largest boat carried, according to Cook's journal, was the longboat, not to be confused with the slightly different launch, which did not come into general use in the Royal Navy until 1780. This did not have a coating of white lead on its underside, as modellers often show. The longboat was only varnished and the result was that its bottom was destroyed by worms.[29] Although there is no direct evidence for the boat's length, her supposed position between the quarterdeck step and the fore hatchway would limit her to a maximum length of 19ft, a measurement in line with that for longboats on Royal Navy sloops of similar tonnage. Parkinson's sketches show that the longboat's rigs were a two-masted sliding gunter rig, with and without bowsprit and jib, a two-masted settee rig and a three-masted sprit rig with the foremast being square rigged.

The second boat carried was the pinnace. This type of boat was narrower than the longboat (a width to length ratio of 1:4 or 1:4.5 for a pinnace against 1:3 to 1:3.3 for a longboat), had a lower freeboard, a narrower stern and finer lines. They were usually a few feet longer than longboats, but the same restrictions on size would have applied to the pinnace (see above). The bottom was painted with white lead,[30] and she was rigged either with a two-masted sliding gunter rig or a single-masted sprit rig.

The smallest official boat carried was the yawl. The type is described by Falconer as being smaller than a cutter, but of similar shape and used for similar duties. As such, she was probably clinker-built and, as a utility craft, relatively wide and deep, with a width to length ratio ranging from 1:2.2 to 1:3.5. It is possible that *Endeavour*'s yawl was carvel-built, as an Admiralty order of 18 July 1769 stated that for ships on foreign service carvel-built yawls would be better as they were more durable and easier to repair. Parkinson's sketch of the yawl shows her with a single-masted sprit rig.

Of the two unofficial boats carried, the small boat belonging to the boatswain only appears in Cook's log when its loss in a gale is reported, and nothing else is known of it. Joseph Banks' skiff, however, is frequently mentioned. she first appears in Banks' account of the loss of the longboat 'which [. . .] broke adrift carrying with her my small boat which was made fast to her' at Rio (20 November 1769). Cook described this boat as a lighterman's skiff in his journal entry of 1 February 1769 and a month later it is reported that they 'lowerd down the Skift Mr. Banks went a Shooting in Her . . .' With the boat established as a skiff, which in general terms was a light rowing boat, a more specific description must be established. Falconer, a contemporary of Cook, described a skiff as 'a small boat resembling a yawl, also a wherry without masts or sails, usually employed to pass the river'. Parkinson's rough sketch appears to show a wherry-type boat, and together with Chapman's[31] drawing of

25. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968).
'The weather was such as to admit Mr. Banks to row round the Ship in a Lighterman's skiff shooting birds.'
26. Ibid. 'Washed over board a small boat belonging to the Boatswain'.
27. Ibid. . . .'the Pinnace was under a repair and could not immediately be hoisted out, the Yawl was put into the water and the Long-boat hoisted out.' (Cook)
'not merely was the pinnace under repair but the longboat under the Booms was lashd & fastned so well from our supposed security that she was not yet got out.' (Banks).
28. Ibid. '. . . and hoisted in the Pinnace and Long-boat up along side'.
29. Ibid. '. . . Friday 26th May 1769. This morning we haled the Pinnace a Shore to examine her bottom and had the satisfaction to find that not one worm had touched it, notwithstanding she hath been in the water nearly as long as the Long-boat; this must be owing to the white Lead with which her bottom is painted, the Long-boat being pay'd with Varnish of Pine, for no other reason can be assignd why the one should be preserv'd and the other distroyd, when they are both built on the same sort of wood and have been in equall use. From this circumstance alone the bottoms of all Boats send into Countrys where these Worms are ought to be painted with white lead, and the Ship supply'd with a good Stock in order to give them a new coat whenever its necessary, by this means they would be preserve'd free from these distructive vermin.'
30. Supra note 29.
31. F H af Chapman, *Architectura Navalis Mercatoria* (Stockholm 1768, reprint Rostock 1968), Plate L./9.

such a wherry, a picture of Bank's boat begins to emerge. The single square sail rig shown on Parkinson's sketch was probably only rigged for pleasure sailing in sheltered Tahitian waters.

Sweeps. Chance remarks in reports of perilous situations are often the only source of certain finer details of the ship, for example that long sweeps were part of the ship's equipment, mentioned by Cook during the Providential Channel incident.[32] These sweeps, about 28ft long, were used to move the ship when becalmed or in dangerous circumstances.

Accommodation. The captain, Mr Banks and his retinue of gentlemen had the use of the cabin deck. Only accessible through the quarterdeck companionway, it consisted of the great cabin, the lobby, the after fall with its skylight, the ladderway and cabins for the captain, Mr Banks, Mr Green and the draughtsmen, as well as the pantry, which had further storage space on either side of the pump well. The foremost doors on either side lead to the cabins of the latter, the aftermost were for the captain's and Banks' cabins respectively, while the second on the port side was for the third draughtsman's cabin and on the starboard side for Mr Green's cabin.

The only other storage and accommodation space other than the cabin deck aboard *Earl of Pembroke* had been the foremost fall (see above). During the Deptford refit, a new complete lower deck was added to the ship to accommodate the additional crew and supernumeraries for her scientific voyage. This deck was built 7ft below the main deck beams, which meant that the quarterdeck and forecastle encroached on its height for two-thirds of its length, leading to the highly unsatisfactory situation of a height of just 4ft for all the officers' and warrant officers' quarters and half the crews' quarters. It was only possible for men to stand upright in an area from the mainmast forward to the cook's oven. Given that this area was also used for the storage of anchor cables, spare anchors and sometimes even to accommodate livestock, living conditions below decks must have been far from comfortable.

Space for the boatswain, the carpenter and for a sail room was partitioned off in the bows, with a second sail room immediately forward of the foremast, leaving a passage on the port side to the gunner's store, the foremost space. Some steps lead down to the magazine.

Oven. The ship's oven stood forward of the fore hatch staircase, just outside the carpenter's and boatswain's cabins. Its position and the space left for it are marked on the draughts, giving it a size roughly 4ft by 4¼ft, which are the dimensions for the oven of a 20-gun ship which was equivalent to *Endeavour* in both tonnage and complement. The oven is specifically referred to by both Molyneaux and Cook[33] as being made of copper, whilst the usual material for the navy's new standard firehearth

Hold arrangement. The foremost section of the hold, reached through the gunner's store, was taken up by the ship's magazine, consisting of the powder room and the adjacent light room. The enclosure around the mainmast, the well, prevented accidental damage to the pumps. Forward of the pump well was the shot locker, a storage space for the 4-pounders' round shot.

Entry to the general storage hold was through the fore, main and after hatchways, with the after hatch being situated below the cabin deck. To the rear of the latter a ladderway led down to the steward's room, the captain's store room and the slops storage. Below the steward's room was the fish room. Two scuttles aft of the mizzen mast gave access to the bread room at the rear of the steward's room.

Rig

Possible rig of the Earl of Pembroke. The terms 'cat-built vessel' or 'cat-built bark' were repeatedly used in correspondence between the Admiralty and the Navy board during the purchase of the *Earl of Pembroke* and they have haunted writers on the subject ever since. Why 'cat-built', and what actually is a 'cat-built bark'? Alan Villiers (in *Captain Cook, the Seamen's Seaman*) described the ship as 'a sort of ship-rigged cat'. This description may have served for a cat-built and bark-rigged vessel, but *Endeavour* was definitely not cat-built, as a comparison of the hull features of the two types shows.

First, the wing transom of a bark was always nearly straight and ship-like, resulting in a concave lower counter, as on *Endeavour*. In contrast, a cat's stern was much more rounded, lacking a lower counter and narrower than that of a bark. Second, the cabins and other accommodation on a cat extended above the level of the main deck, giving it a distinctive built-up forecastle and quarterdeck, sometimes even with a coach, and a deep and ship-like waist. A bark's accommodation was all below the level of the main deck or no more than half its height above it, and so they were commonly flush-decked. What passed for forecastle and quarterdeck on a bark was often no more than a low step in the deck fore and aft, which is clearly the case with *Endeavour*. Third, since on a bark the main deck was level with the tops of the frame timbers, no solid waist existed, an open roughtree rail surrounding the main deck.

All these features show that the *Earl of Pembroke*'s hull was not cat-built. Why then was she ever described as a 'cat-built bark'? Some clues to this problem may be found in the earliest draught (3814b) and in the purchase price of the ship, which suggest that the *Earl of Pembroke* was a 'cat-*rigged* bark' rather than the Admiralty's 'cat-*built* bark'.

The positioning of the foremost dead-eye in the fore and main channels (see *Channels* p13) on the draught of *Earl of Pembroke* indicates

32. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968).
'. . . the Yawl was put into the water and the Long- boat hoisted out and both sent ahead to tow which together with the help of our sweeps abaft got the Ships head round to the northward which seem'd to be the only way to keep her off the reef or at least to delay time.'

33. Ibid. 'Got the Copper Oven ashore and fix'd it in the Bank of the breast works.'

wider and lower courses than on the refitted *Endeavour*. A short-masted cat-rigged vessel with such sails would have required the foremost shroud placed further abaft the mast than the higher and smaller courses of a taunt-masted bark, to give the yards a similar degree of turning. One of F H af Chapman's draughts[34] shows identical placing (though smaller numbers) of dead-eyes on a smaller cat-rigged vessel. This draught of a polacre (kray) rigged small bark provides us with a comparable situation to the *Earl of Pembroke* dead-eye layout, also suggesting that the ship may have been fitted with pole masts.

Furthermore, the low valuation of the *Earl of Pembroke*'s masts and spars suggests these were the pole masts and yards of a light cat rig, worth no more than £56 17s 10d to the Navy as second-hand timber, compared with the full refit cost of £1357 17s 11d. A lighter rig such as this, associated with cats, could be worked by a smaller crew, an important economic concern in merchant ships, particularly colliers, as Hutchinson states.[35] Both sources, therefore, point to the *Earl of Pembroke* as originally purchased being a cat-rigged bark, her bark hull being described as such by the Deptford yard officers and later in her official registration.

The set-up of the dead-eyes on *Endeavour* provides the basis for the analysis of the ship's new rig. Comparable draughts by F H af Chapman[36] for a cat of 340 tons and a bark of 416 tons (both ship rigged) dated 1768 shows five fore and six main shroud pairs, whilst data from Steel[37] gives six fore and six main pairs on a sixth rate of 300-400 tons, five and five on a merchantman of 330 tons and six and six on one of 544 tons. With *Endeavour*'s eight dead-eyes on both fore and main channels, Steel's naval rig for ships of 350-400 tons, with six fore and six main shroud pairs and two standing backstay pairs, can be considered relevant for *Endeavour*. Cook's journal confirms the presence of the two backstays, reporting a sprung main topmast and both backstays broken on 22 June 1771.

34. F H af Chapman, *Architectura Navalis Mercatoria* (Stockholm 1768, reprint Rostock 1968), Plate XXIX/8.

35. W Hutchinson, *A Treatise on Naval Architecture* (Liverpool 1794, reprint London 1969). '. . . are in the colliers bound to London, where many great ships are constantly employed, and where wages are paid by the voyage, so that interest makes them dexterous and industrious to manage their ships with few men,[. . .] more so than perhaps in any other trade by sea in the world. [. . .] that these ships being adapted for this trade, are rigged as light as possible.'

36. F H af Chapman, *Architectura Navalis Mercatoria* (Stockholm 1768, reprint Rostock 1968), Plates XIX/26 and XXIV/35

37. D Steel, *Elements of Mastmaking, Sailmaking and Rigging* (London 1794, reprint New York 1932).

38. R M Bowker, *Mutiny!! Aboard H.M. Armed Transport* Bounty *in 1789* (Old Bôsham 1978) (reprint of Lt W Bligh's official log). '. . . on the 4th September from an application I had made the Lower Masts were got out and Shortned and the Lower and Topsail Yards were cut on shore agreeable to my request.'

39. W Sutherland, *The Ship-builders Assistant* (London 1711, reprint Rotherfield 1989). 'It was the Opinion of a very good Mast-maker, to take the Length of the Lower Gundeck, and the extream Breadth, and adding them together, to take 'that for the Length of the Main-mast in Feet.'

Masts. The number of *Endeavour*'s sails has given rise to the conclusion that the rig was completed in all respects in accordance with navy rules. This was not entirely the case, as the mast dimensions on draught 3814c, taken on the ship's return from its historic voyage, show. It is arguable that these variations in spar dimensions show the hand of James Cook himself, a former merchant mariner and master's mate aboard a collier, rigging a tubby bark in what he knew from experience to be the best way. Cook may not have had any part in the selection of the vessel, but rigging of the *Endeavour* did not begin until he had taken command of her. Although there is no direct evidence that Cook influenced the rig of *Endeavour*, it is known that captains frequently did have some say in their rig, an entry in Lt William Bligh's log being one example.[38]

A comparison of the dimensions taken at Woolwich and the Royal Navy standard shows the taunt nature of *Endeavour*'s masts and the varying length of her spars. Most of these mast lengths were considerably longer than the standard laid down in 1711 by William Sutherland,[39] which was still relevant to Royal Navy ships at the end of the eighteenth century. See Table 3.

TABLE 3: **Comparison of Mast Dimensions**

	Endeavour Woolwich Yard 16 Oct 1771		Royal Navy standard	
Mast	*Length (yds-ins)*	*Diameter (ins)*	*Length (yds-ins)*	*Diameter (ins)*
Mainmast	23-4	21	21-5	18¾
Topmast	13-19	12	12-21	12
Topgallant to hounds	6-10			
Pole	3-3	6		
Foremast	21-26	19¾	18-28½	16½
Topmast	12-28	12	11-6½	11½
Topgallant to hounds	5-26			
Pole	2-27	5¾		
Mizzen mast	16-29	14⅙	18-4¼	12½
Topmast	8-10		9	8⅜
Pole	3-26	8		
Bowsprit	11-12	19⅛	12-24½	18¾
Jib boom	11-15	9⅞	9-2	7⅞

Therefore, *Endeavour*'s mainmast was 5ft 11in taller than the Navy standard, her foremast 8ft 10in taller, and her mizzen mast apparently some 6ft shorter, if we accept the common interpretation of the measurements given. The topmasts and topgallants also followed this trend, as shown in Table 3.

The inconsistency of the disproportionately short mizzen mast is a feature of all modern reconstructions of the *Endeavour* and is based on two features of draught 3814c. First, the length of the mizzen mast is given as 16yds 29in and, second, the draught clearly shows the mast to have been stepped in the hold. Thus the models etc. have this shorter mizzen mast. Although it is certainly the case that the mast stepped in the hold, the height given is probably that for a mast stepped on the lower deck. No contemporary source supports the stepping of a mast of this length in the hold, and it is highly unlikely that an experienced seaman like James Cook would have accepted a ship where the important aft steering sail was 9ft shorter than usual.

No contemporary pictures of the ship show this short mizzen mast. Thomas Luny's 1781 painting of a collier identified as the *Earl of Pembroke*[40] shows a normal-sized mizzen, as does the one eye-witness representation of *Endeavour*'s rig, *The Endeavour at Sea* by Parkinson, as do the engravings made from his sketches, (1) *The Endeavour repaired in Endeavour River*, (2) *A View of the great Peak & the adjacent Country, on the West Coast of New Zealand*, (3) *A View of an Arched Rock, on the Coast of New Zealand, with an Hippa, or Place of Retreat, on the Top of it* and (4) *Matavai Bay, Tahiti.* [41] All of these have the *Endeavour* as a background feature and none shows a short mizzen mast.

As this evidence points to a different mizzen mast length than that in accepted reconstruction practice, a cross-reference to general eighteenth-century nautical practice seems appropriate. Throughout the century, the commonly-accepted formula for the length of a mizzen mast was 6/7ths of the length of the mainmast. John Davis[42] gave for taunt masts 'The Mizon Mast if it steps in the Hold 2⅓ of the Beam; but if it steps on the Gun-deck twice the Beam' and J H Röding wrote in 1794 of normal mizzen mast length being 1¾ times the beam. If all these measurements are plotted on a drawing, they result in an outcome approved by F H af Chapman, who wrote in 1768 that the correct height for the mizzen mast was level with the mainmast top. The *Endeavour*, if the length of its mainmast is taken as 16yds 29in stepped in the hold, is the only divergence from these rules. However, if the mast is stepped on the lower deck (which, admittedly, there is no indication of on the draughts) it conforms to the rigging rules of the day. Using the 6/7ths of mainmast rule, it is longer than the Naval standard by 1ft 8in.

However, it is almost certain that the draught is correct in showing the mast stepped in the hold. But the discrepancy can be explained as a draughtsman's error in copying the surveyor's notes onto the draught, since using the 6/7ths of mainmast rule the length of the mast would have been 19yds 29in, this length giving a mast of the correct proportions. It is easy to see how such a mistake could have occurred.

A further example is the *Adventure* (ex-*Marquis of Rockingham*), the smaller ship on Cook's second circumnavigation. Built in 1770 in the same shipyard and to a very similar design to that of the *Endeavour*, she was of similar dimensions, but with a mizzen mast length of 19yds 12in, close to the assumed 19yds 29in for *Endeavour* and again indicating larger masts than those laid down by the Navy.

Another means of determining the length of the mizzen mast is to take the common rule whereby the topmast was 3/5ths the length of the mizzen, the combined measurements of the topmast and pole of 12yds would give a mizzen mast length within 7in of the 19yds 29in measure. As the measurements stand, the mizzen would be too short and the topmast too long, begging the question why important steering sail volume would have been sacrificed to enlarge another driving sail. The argument presented above brings the masts into the correct proportion and agrees with the only eye-witness sketch and common sense.

Spars. Likewise, *Endeavour*'s spar measurements differed from the Naval rules of the period. Table 4 compares the measurements taken at Woolwich in 1771 with rules and dimensions taken from three eighteenth-century sources, Sutherland, Falconer and Steel, dated 1711, 1769 and 1794 respectively.[43]

TABLE 4: **Comparative Spar Dimensions**

Spar	*Rule*	*Dimension (ft-in)*
Main yard		
Sutherland	7/8 x mainmast	55-6
Falconer	(RN rule *c*1770)	
	0.561 x gundeck	54-10
Steel	8/9 x mainmast	56-4
Endeavour		**47-10**
Fore yard		
Sutherland	7/8 x main yard	48-6
Falconer	0.874 x main yard	48-0
Steel	7/8 x main yard	49-3
Endeavour		**44-2**
Crossjack yard		
Sutherland	slightly longer than main topsail yard	*c* 31-0
Falconer	as fore topsail yard	37-10
Steel	as fore topsail yard	34-9
Endeavour		**39-14 or 40-2**
Main topsail yard		
Sutherland	5/9 x main yard	30-10
Falconer	0.726 x main yard	39-9
Steel	5/7 x main yard	39-8
Endeavour		**39-10**
Fore topsail yard		
Sutherland	5/9 x main yard	30-10
Falconer	0.715 x fore yard	34-4
Steel	7/8 x main topsail yard	34-9
Endeavour		**36-1**

40. Thomas Luny, 'The *Earl of Pembroke* leaving Whitby Harbour', National Library, Canberra A.C.T.

41. (1) & (4) R & T Rienits, *The Voyages of Captain Cook* (London 1968); (2) & (3) S Parkinson, *Journal of a Voyage to the South Seas in HMS* Endeavour (London 1784, reprint London 1984).

42. J Davis, *The Seaman's Speculum* (London 1711, reprint N. R. G. 1985).

43. W Sutherland, *The Ship-builder's Assistant* (London 1711, reprint Rotherfield 1989); W Falconer, *An Universal Dictionary of the Marine* (London 1780, reprint London 1970); D Steel, *Elements of Mastmaking, Sailmaking and Rigging* (London 1794, repr. New York 1932).

Mizzen topsail yard

Sutherland	½ x fore yard	24-3
Falconer	0.75 x fore topsail yard	25-9
Steel	⅔ x main topsail yard	26-3
Endeavour		**32-1**

Main topgallant yard

Sutherland	½ x topsail yard	15-5
Falconer	0.69 x main topsail yard	27-5
Steel	⅗ x main topsail yard	23-9
Endeavour		**31-8**

Fore topgallant yard

Sutherland	½ x topsail yard	15-5
Falconer	0.69 x fore topsail yard	23-8
Steel	⅗ x fore topsail yard	20-10
Endeavour		**28-9**

Spritsail yard

Sutherland	5/7 x fore yard	34-8
Falconer	as fore topsail yard	34-4
Steel	as fore topsail yard	34-9
Endeavour		**38-9**

Sprit topsail yard

Sutherland	½ x spritsail yard	17-4
Falconer	as fore topgallant yard	23-8
Steel	as fore topgallant yard	28-10
Endeavour		**31-8**

Apart for the lower yards, which were several feet shorter than the range of eighteenth-century examples given in Table 4, all the other yards were made for larger than normal sails. The picture which emerges, therefore, is of an English bark rig with a mizzen topsail. Although the absence of a mizzen topsail would become one of the main differentiating features of a bark rig in the nineteenth century, in this period it was far less common. It was referred to by Falconer in 1769 ('however peculiarly appropriated by seamen to those which carry three masts without a mizzen topsail . . .') but only as an abnormality (hence 'peculiarly'), and Falconer did not consider it worthwhile providing a illustration of such a bark rig, although all other dominant rigs were represented. Furthermore, it was not mentioned either by Chapman in 1769, who described larger barks as ship rigged, nor by Röding in 1794, who wrote that barks carried a frigate rig, and few eighteenth-century pictures exist of such a rig, one of the earliest being by E Gwyn in 1780.[44] Features of a bark rig of this period were the long and narrow courses, which did not overlap each other, and the definitive long masts and short yards with flying topgallant sails, as described by Hutchinson.[45]

Bumpkins. One item of rigging which appears on none of the reconstructions of *Endeavour*, yet is clearly shown on Parkinson's sketches as a pair of booms extending obliquely forward from the bows, is the bumpkins. When questioned about their absence from the cutaway model on display at Greenwich, the builder R Lightley wrote that he did not know what Parkinson's sketch was supposed to represent and was not prepared to guess.[46] As Parkinson clearly showed these booms in his sketch, it is necessary to look for further evidence of their presence or absence.

Reference to Chapman, Röding, Lever,[47] Hutchinson *et al.* provides strong evidence for *Endeavour* being fitted with bumpkins. Many of the illustrations in Röding, taken from Lescallier's work,[48] indicate downward-curving bumpkins which by no stretch of the imagination could be described as catheads. They can be seen on drawings of cats, galliots, snows and brigs. Although Chapman's ten bark draughts do not specifically show bumpkins, they do show extended hawse timbers, sometimes even notched out for bumpkin support. The fact that these booms are not shown on every plan Chapman left us does not necessarily mean that those ships were not fitted with them. For example, not all of his frigate draughts show bumpkins.

The argument that bark tacks were taken under the catheads (see footnote 46) is based on a passage in Lever[49] which refers to 'small vessels in the Merchant Service'. However, small merchant vessels were rigged in a variety of ways, many being fore and aft rigged, and if square rigged, the positions of their masts and cat-heads or the cut of their sails fre-

44. In D R MacGregor, *Merchant Sailing Ships 1775-1815* (Watford, Herts. 1980).
45. W Hutchinson, *A Treatise on Naval Architecture* (Liverpool 1794, repr. London 1969). 'The square sails, suitable to taunt masts and short yards, as here recommended, will be in proportion, deep and narrow, which will trim and stand much fairer upon the wind, than if they were shallow and broader; [. . .] To endeavour to make a ship sail by the wind, and turn well to windward, deserves the greatest regard, because safety, as well as many other great advantages depend upon it. The good effects of deep and narrow squaresails, cannot be better.recommended as answering this purpose, than by the performance of ships in the coal and timber trades to London, though the designed properties in building and fitting these ships, are burden at a small draft of water, to take and bear the ground well, and to sail with few hands, and little ballast; yet these ships perform so well at sea, that government often makes choice of them for store ships, in the most distant naval expeditions; and in narrow channels among shoals; and in turning to windward, in narrow rivers, there are no ships of equal burden can match them, which I attribute a great deal to their deep narrow square-sails, [. . .] Where a deal of canvas is wanted, to sail fast large, the narrow deep square sails have in height what they want in breadth; and the flying sails, including the top-gallant sails as such, being all of lighter canvas, may be made as large as things will admit of, to answer this purpose in little winds; and when it comes to blow so strong, that these flying sails cannot be carried, then the standing squaresails will be found broad enough.'
46. R Lightley, personal communication 14 November 1983. 'This was discussed with Jim Lees (Rigger of the Greenwich-built models and author of *The Masting and Rigging of English Ships of War 1625 to 1860*), the world authority in English rigging you will agree, and he said that there is no evidence that boomkins existed on Barks. Certainly Chapman's *Architectura Navalis Mercatoria* of 1768 does not show any in something like 10 examples. Lees believes that the tacks were taken under the catheads to opposite sides and belayed. What those curved lines on the bow sketch are (they are not repeated on the stern view) is anybody's guess. I am not prepared to guess.'
47. D Lever, *The Young Sea Officer's Sheet Anchor* (London 1819, repr. New York 1963).
48. A Lescallier, *Vocabulaire des Terms de Marin* (Paris 1777, repr. Grenoble 1968).
49. D Lever, *The Young Sea Officer's Sheet Anchor* (London 1819, repr. New York 1963). 'In small vessels in the Merchant Service, the Tack is often slack-laid with four Strands, and as they carry no Boomkin, the Tack is taken under the after side of the Cat-head and belayed to the Timber-head before it.'

quently varied from those of larger ships, and therefore a need for bumpkins did not always arise. It should also be noted that merchant ships often had two cloths on each side of the foresail gored toward the clew, therefore reducing the width from clew to clew by approximately 8ft. Small ships which occasionally hoisted a squaresail when running before the wind carried a squaresail boom for clew spreading, which performed the same function as bumpkins. Furthermore, when it is considered that larger ships of the mid-nineteenth century, which had their foremasts set further aft than ships of this period, also used their cat-heads for this purpose, it becomes clear that the fitting of bumpkins was determined by necessity, by the position of the foremast, the shape of the sail and the placing of the catheads. Hutchinson also commented on the necessity for bumpkins.[50] His advice on the windward clew position, gained from experience, could only have been followed on *Endeavour* with the bumpkins sketched by Parkinson, and certainly not by taking the fore tack under the cat-heads as in all existing reconstructions. The cat-heads were approximately one-third closer to the ship's longitudinal axis than the chess-trees, which served the same purpose for the main course, and by pulling the fore course's windward clew in instead of out, they would have exerted an opposite effect to that intended.

That bumpkins were fitted to other, similar Royal Navy vessels is shown by an entry in Bligh's log of the *Bounty*.[51] It could be argued that the *Bounty*, a typical bark, differed from *Endeavour* in that she was built with a head, and bumpkins were usually fastened to the bulkhead or knight-heads and main head rails of a ship. But *Bounty*'s head would not have been able to support bumpkins of the length required, and they therefore would have to have been fitted to the foredeck as on *Endeavour*, so as to project from each side of the bow to haul in the fore tack.

The need for the windward spreading of course clews with loose bumpkins had been stated as early as 1627 by Captain John Smith.[52] Two hundred years later Bobrick gave the ideal position for a bumpkin. The position of the bumpkin's inner end is found by drawing a line half a yard's length long at an angle of 36° from the centre of the mast. The bumpkin should run out at the same angle as the fully-braced yard to a length outside the centre line determined by the fore clew. The length of such a bumpkin would therefore be half the length of the fore yard minus the length of the yardarm, less another 18in.

Topgallant yards. Another feature of *Endeavour* that has not featured in any of the reconstructions is her 'flying' topgallant yards and sails. Frequent mentions in Cook's journal of bringing the topgallant yards down or rigging them across again and references to them as light sails can be taken together with Hutchinson's description of barks employed in the London coal and timber trades, in which he classified the topgallants as flying sails.[53]

These yards were lowered and hoisted with the help of large thimbles or 'travellers'. Fitted with a tail of about 3ft of rope, they ran in pairs up and down the backstays, with the tails fastened to the yardarms to stop them swinging with the ship's motion. 'Flying of sails' was defined by Steel and Falconer as '. . . setting them in a loose manner; as royal sails without lifts, or sheets, the clues being lashed; as small topgallant-sails, jibs without stays; and as studding-sails without booms'. In this case, the sheets and braces could be untoggled and the light sling-parrel dismantled.

Flying jib. That *Endeavour* had a flying jib is show in an entry in the anonymous manuscript fragment for 28 October 1768,[54] where the loss of the jib traveller is reported. Since Cook himself did not even mention this incident, it can only have been a minor problem. A far greater problem (worthy of further mention) would have been a severed connection between the jib stay and the traveller, but the fact that the jib was simply hauled in and the traveller replaced and that there was no mention of a jib stay at all, strongly suggests that the ship carried a flying jib.

Studding sails. Three entries in Cook's journal for 23 December 1768, 31 January 1769 and 2 February 1769 point to the use of studding sails, and therefore the temporary rigging of lower and topmast studding sails can be assumed. Topgallant studding sails would not have been carried. The fitting of goose-necked swinging studdingsail booms to the mainmast is confirmed in literature dating from 1711, but there is no such evidence for a similar arrangement on the foremast before the last decade of the eighteenth century. Before that time the boat boom extended outboard between timberheads and was fastened on deck.

Two other entries on 16 February 1769[55] tell of the existence of a driver. At that time a driver was a squaresail hoisted to the gaff's peak and with its sheets fastened to a boom, pushed over and lashed to the lee rail.[56]

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50. W Hutchinson, *A Treatise on Naval Architecture* (Liverpool 1794, repr. London 1969). 'The foretacks of all ships should be made to stand by bumpkins, or at the cat-heads, &c. as far to windward as the main tacks.'

51. R M Bowker, *Mutiny!! Aboard H.M. Armed Transport* Bounty *in 1789* (Old Bosham 1978) (reprint of Lt W Bligh's official log). 'Friday 28th Dec. 1787 5 am Set the Main Staysail. A Sea carried away the larboard Bumpkin and Iron Braces'.

52. Captain J Smith, *A Sea Grammar* ed. K Goell (London 1627, reprint London 1970). 'and boomes it out with a boome or long pole; which we use also sometimes to the clew of the maine saile, fore saile and spret saile when you goe before the wind, or quartering, else not'.

53. W Hutchinson, *A Treatise on Naval Architecture* (Liverpool 1794, repr. London 1969). 'Where a deal of canvas is wanted, to sail fast large, the narrow deep square sails have in height what they want in breadth; and the flying sails, including the topgallant sails as such, being all of lighter canvas, may be made as large as things will admit of, to answer this purpose in little winds; and when it comes to blow so strong, that these flying sails cannot be carried, then the standing squaresails will be found broad enough.'

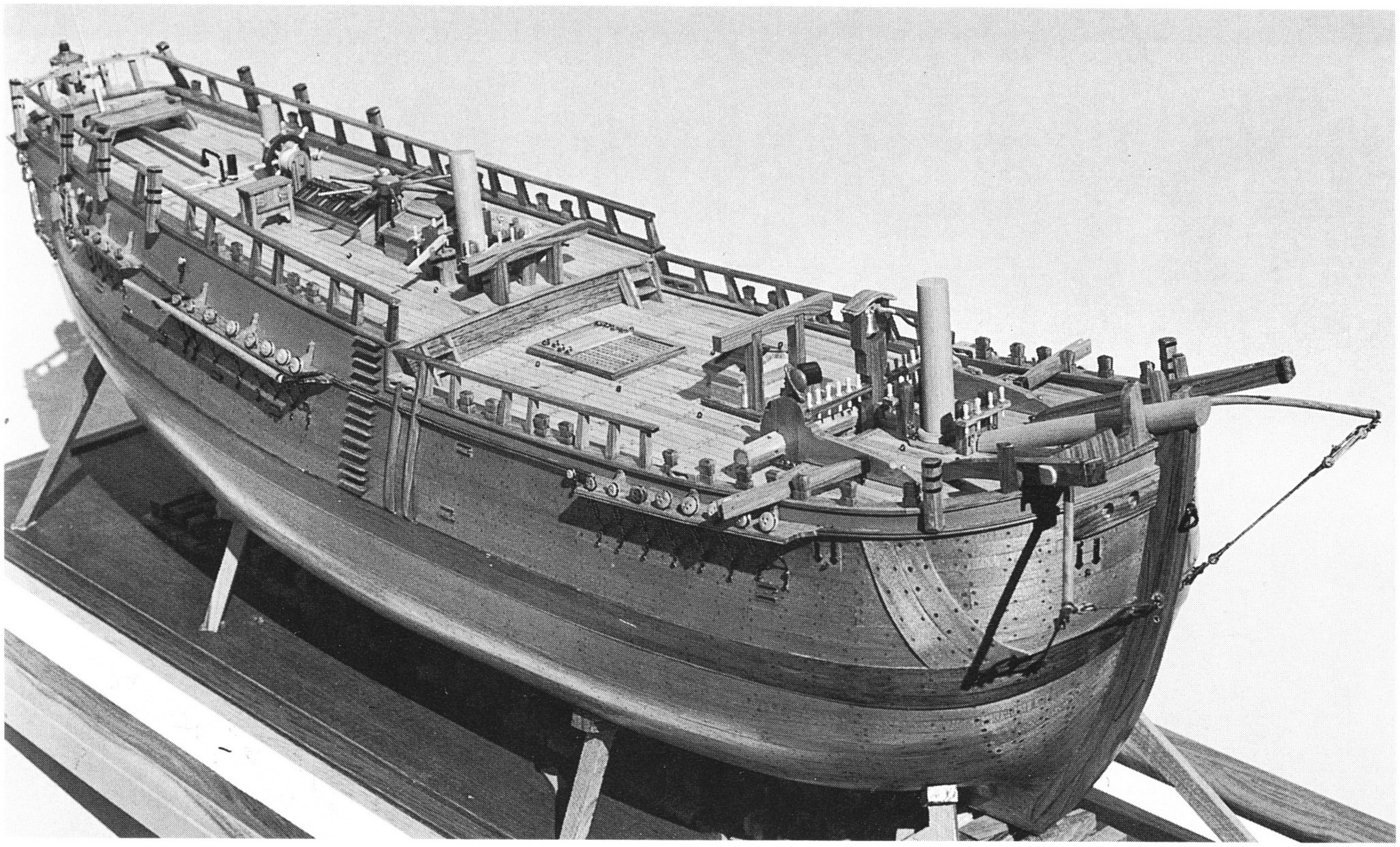
54. J C Beaglehole ed., *The Journals of Captain James Cook, The Voyage of the* Endeavour *1768-1771* (Cambridge 1968). '. . . at 6 AM found the Traveller of the Jibb Gone - hauled him down & Got a new one.'

55. Ibid. '. . . and very heavy seas from the SSW, one of which brok upon the quarter and carried away the driver boom' (Cook); '. . . Shipt a Sea on the Labd Quarter wch broke the Lashings (and with the lee Rowl lost) the Driver Boom.' (Hicks).

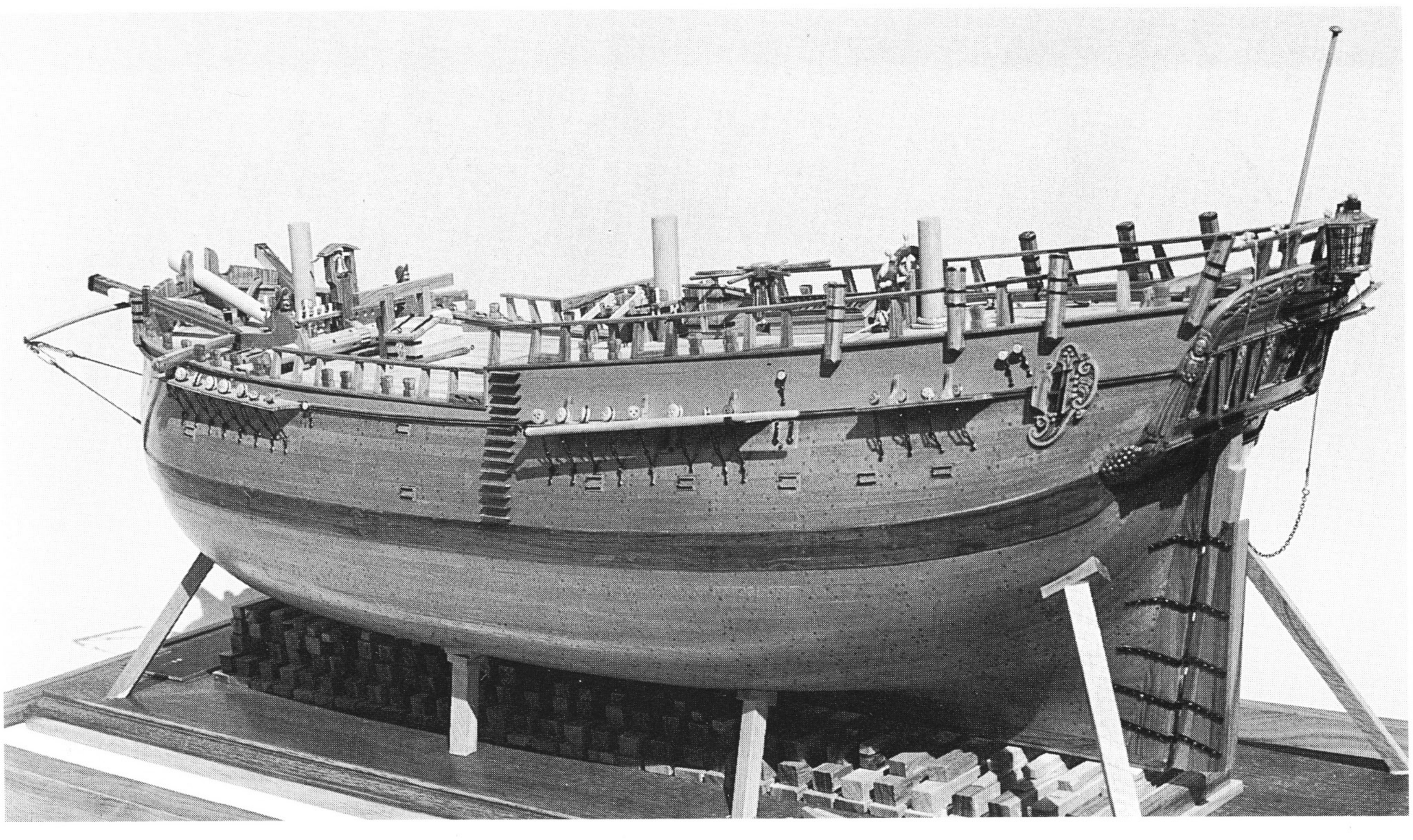
56. K H Marquardt, *Eighteenth Century Rigs & Rigging* (Conway Maritime Press 1992), pp.103, 237.

THE PHOTOGRAPHS

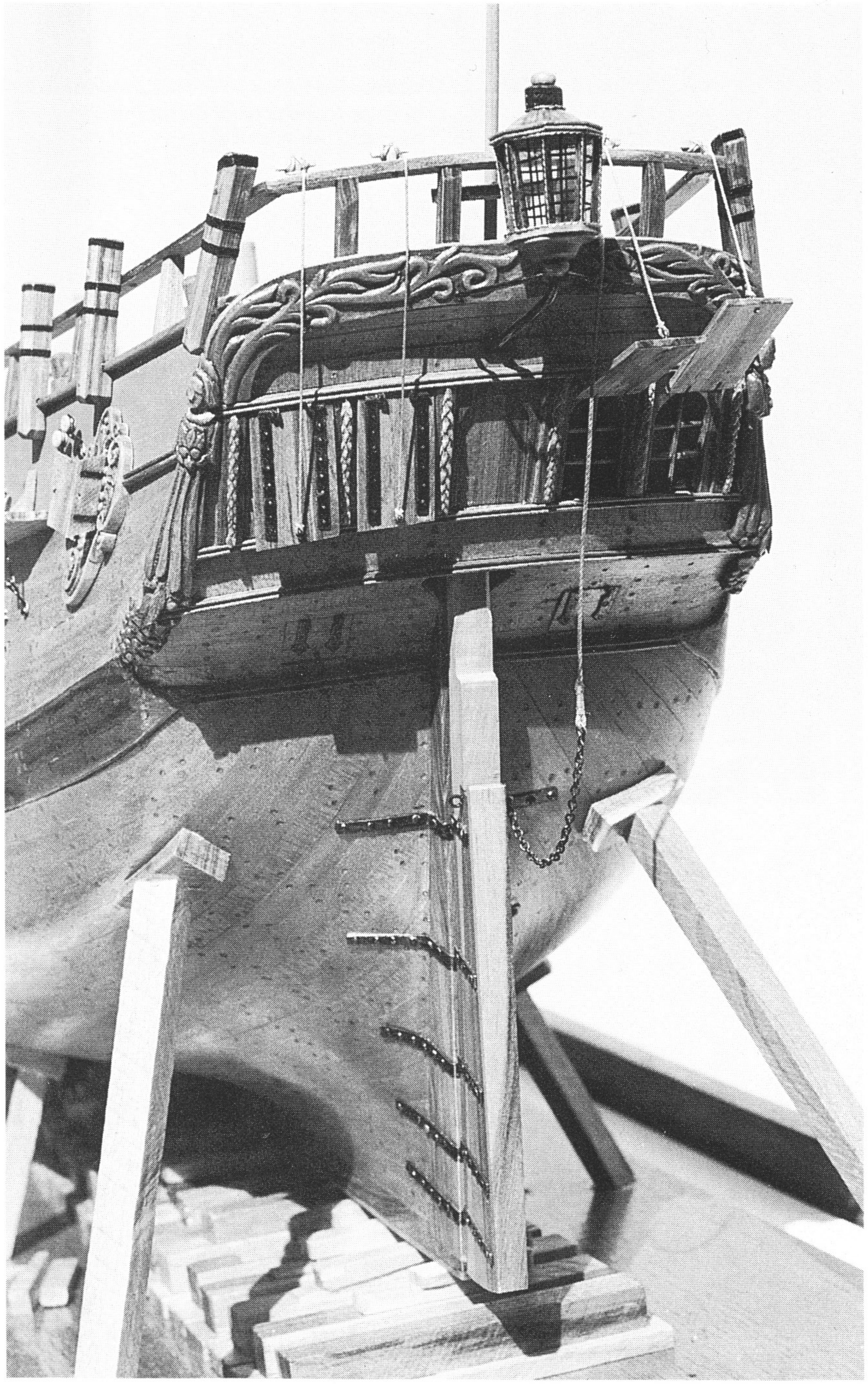
Captain James Cook, RN, FRS. Oil painting by Author 1983, after Nathaniel Dance, 1776.



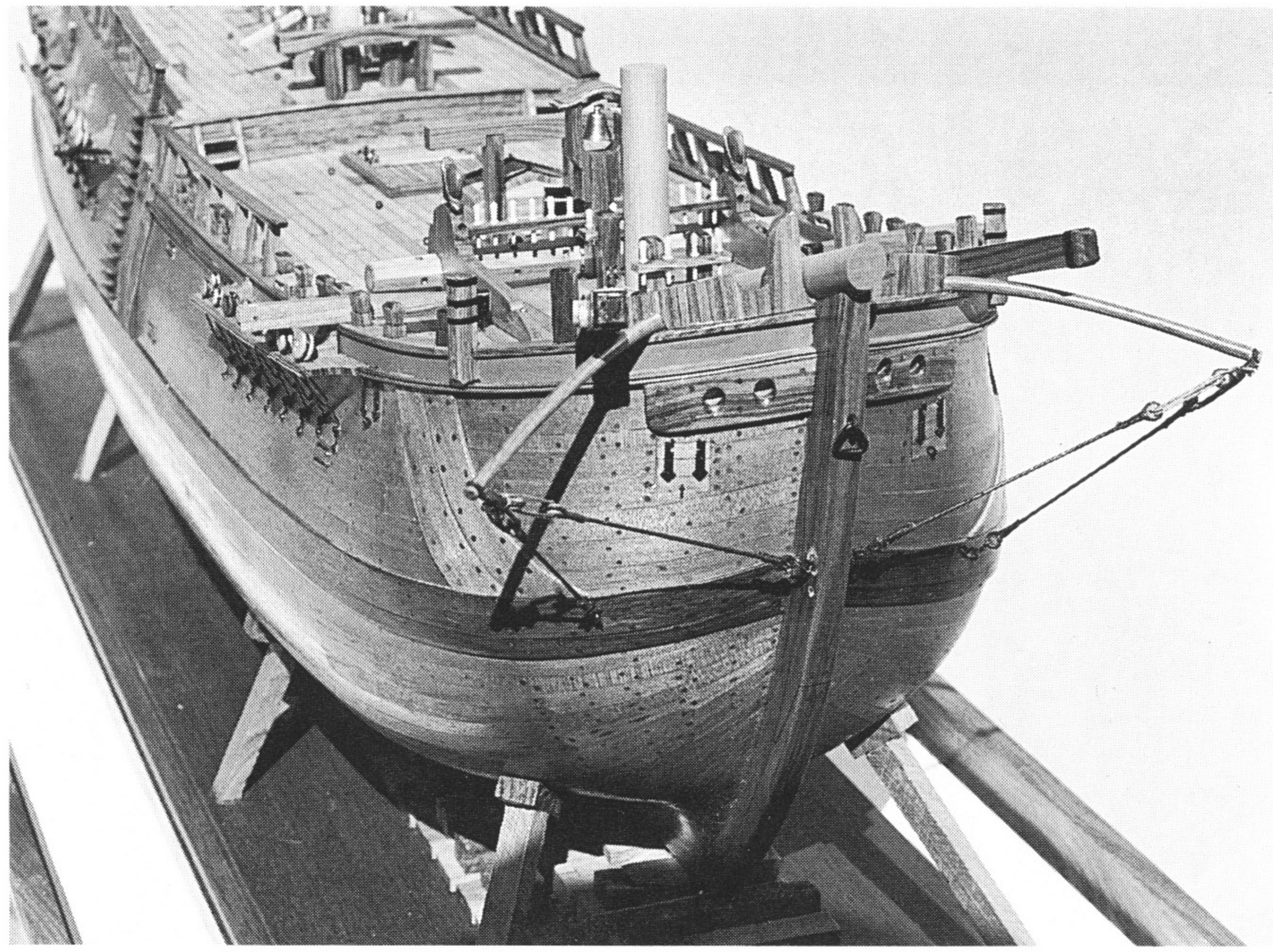
Starboard bow view of a recent model of *Endeavour* built by Mr Alan Tyler of Frankston, Victoria. Originally built from a kit, this model has been heavily modified to show features from the author's research. (*Mr Alan Tyler*)



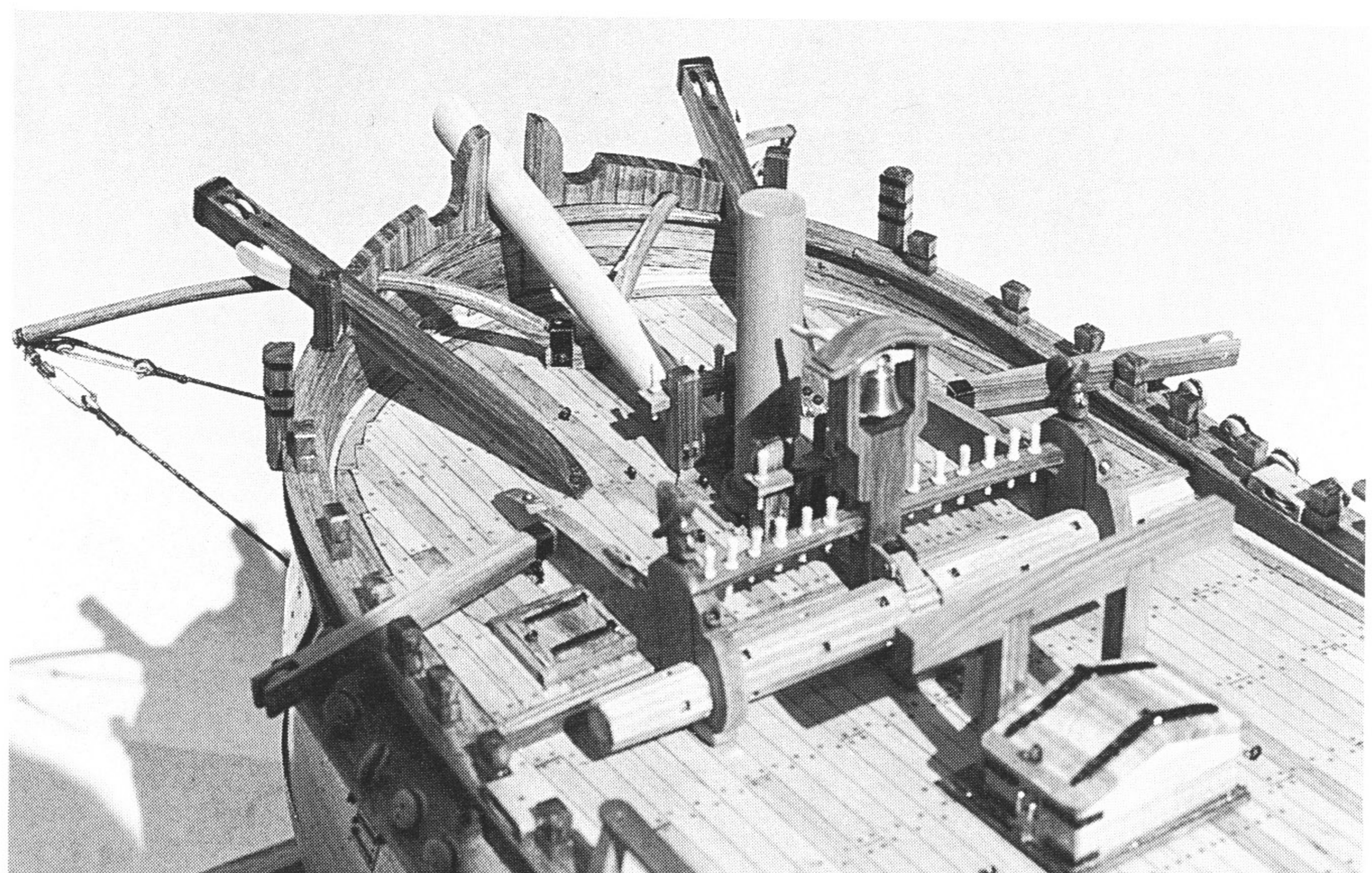
Larboard quarter of the Tyler model, showing some features from Parkinson's sketch. (*Mr Alan Tyler*)



Stern of the Tyler model, clearly showing the decoration indicated by Parkinson, the dead-lights fitted to the four windows and a rudder pendant to starboard. (*Mr Alan Tyler*)



Bow of the Tyler model with naval-hoods, bumpkins and anchor lining. (*Mr Alan Tyler*)

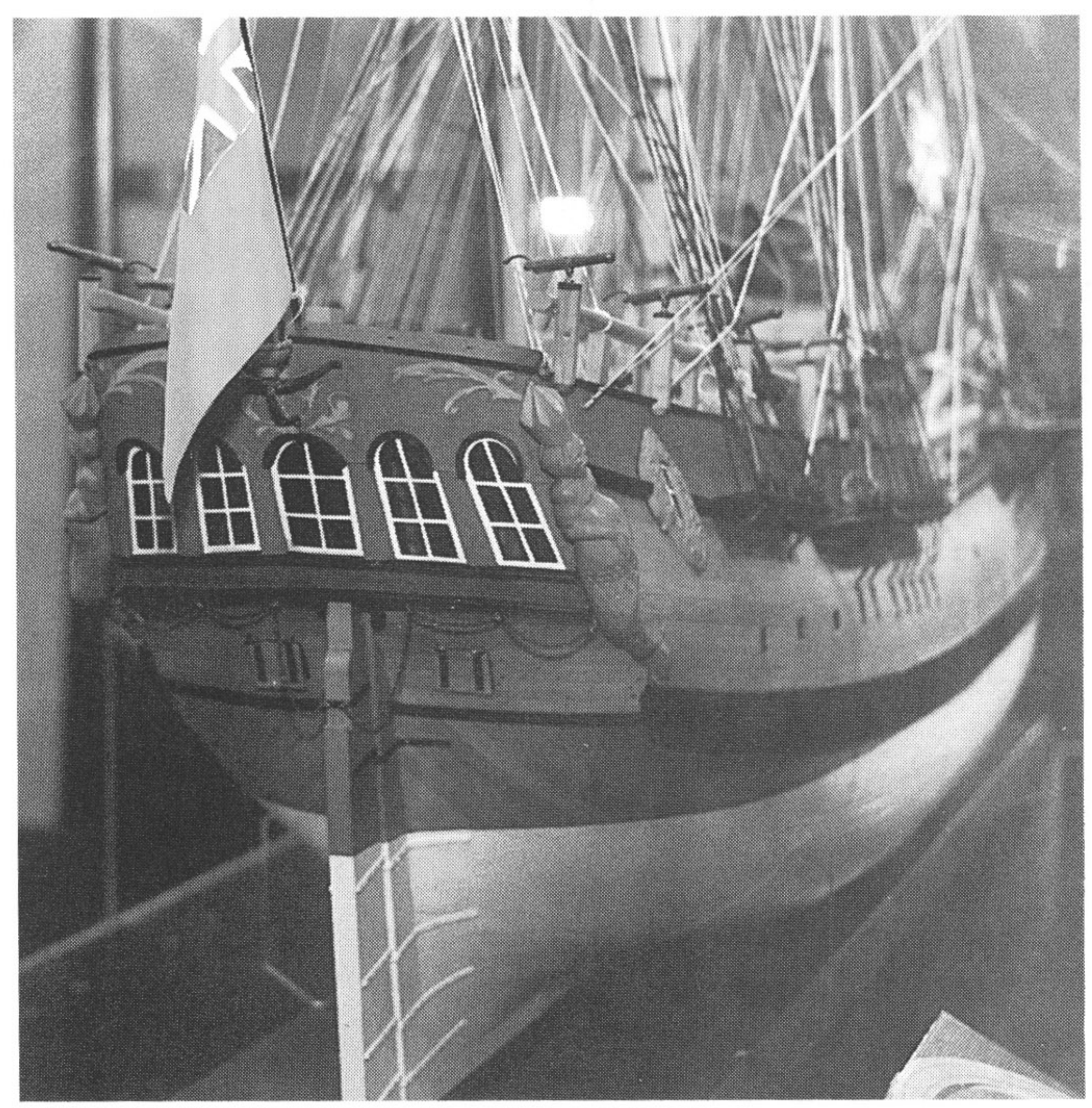


Fore deck of the Tyler model. Note the hood over the fore hatchway, the hinged fore fall hatch, the single pawl bitt with its belfry on the windlass, the belay rails between the bitts and the bumpkins. (*Mr Alan Tyler*)

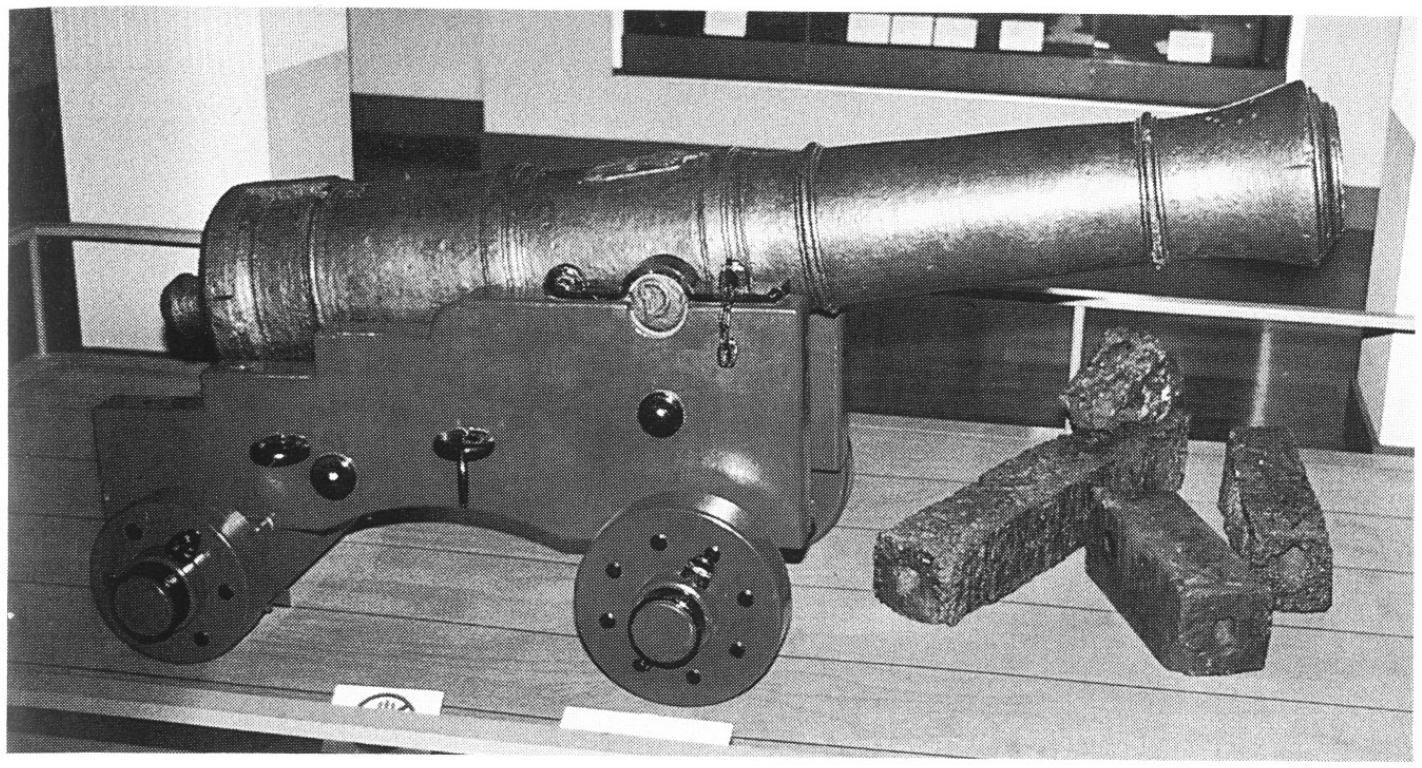
Model built at the National Maritime Museum, Greenwich and presented to the Australian nation in 1970 by the Queen, kept in the Australian National Maritime Museum, Sydney. Note the airing ports without lids, missing bumpkins, the gratings on the hatchways, the nested boats, the white-painted hull and the gun in the fore fall light port. (*Photograph by Author*)

Below left:
Larboard midships view of the Greenwich-built model. Again note the guns in the lighting ports, the grating over the skylight, the open stairways and the absence of the gangway steps and the pumps. (*Photograph by Author*)

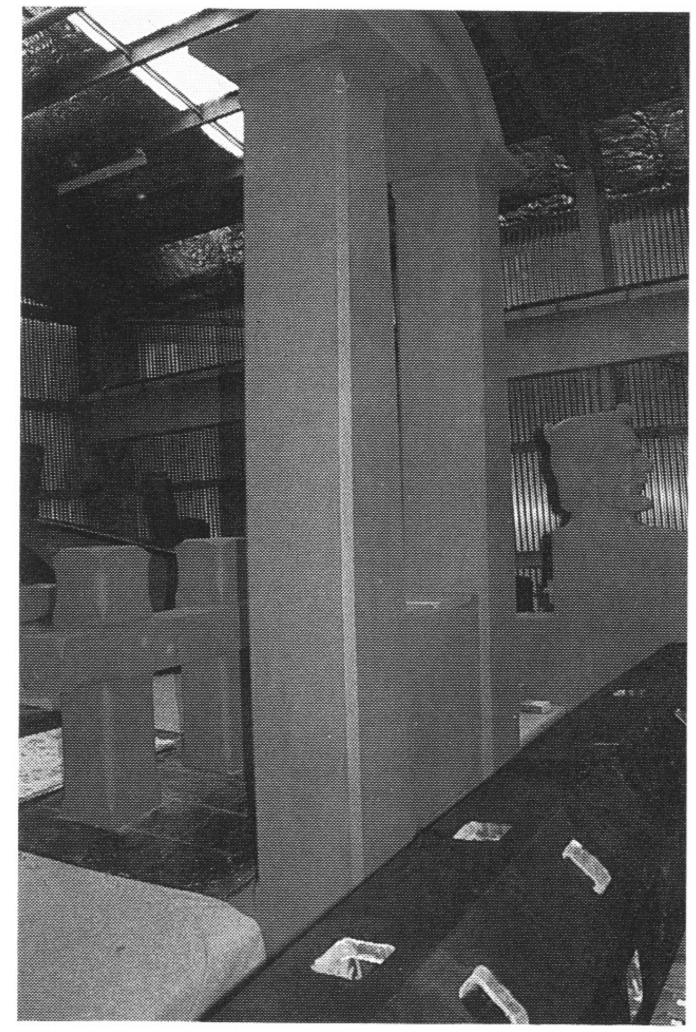
Below:
Starboard quarter of the Greenwich-built model, showing five windows, no stern roughtree rail and the rudder pendants leading across the counter. (*Photograph by Author*)



Starboard quarter view of a typical earlier model of *Endeavour*. Note the unadorned stern, the five small, rectangular windows, the name on the counter and the short mizzen mast, amongst other inaccuracies. (*Australian National Maritime Museum, Sydney*)



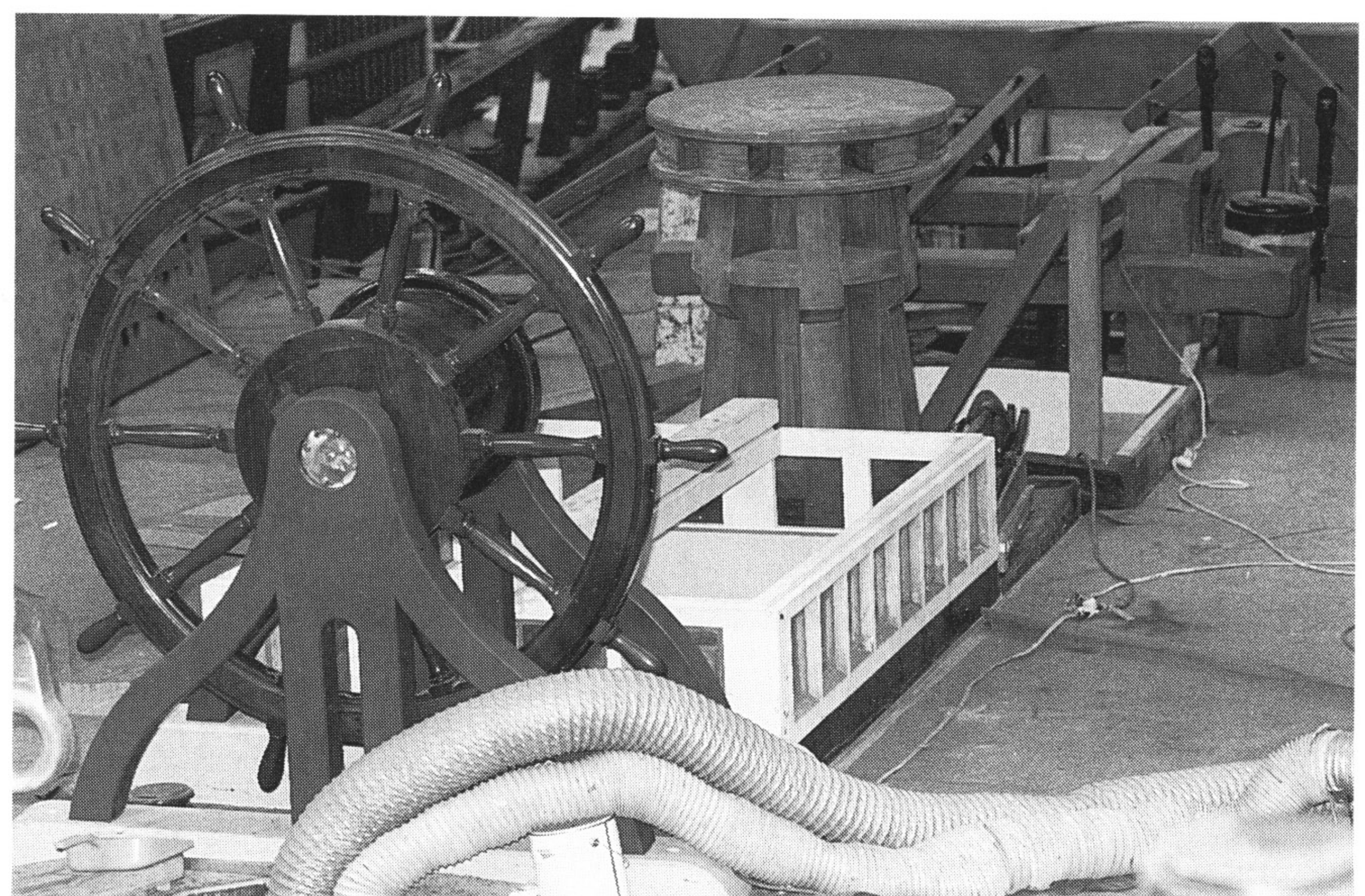
One of the six 4-pounder guns and some iron ballast jettisoned by *Endeavour* after striking the Great Barrier Reef, on display in the Australian National Maritime Museum, Sydney. (*Photograph by Author*)

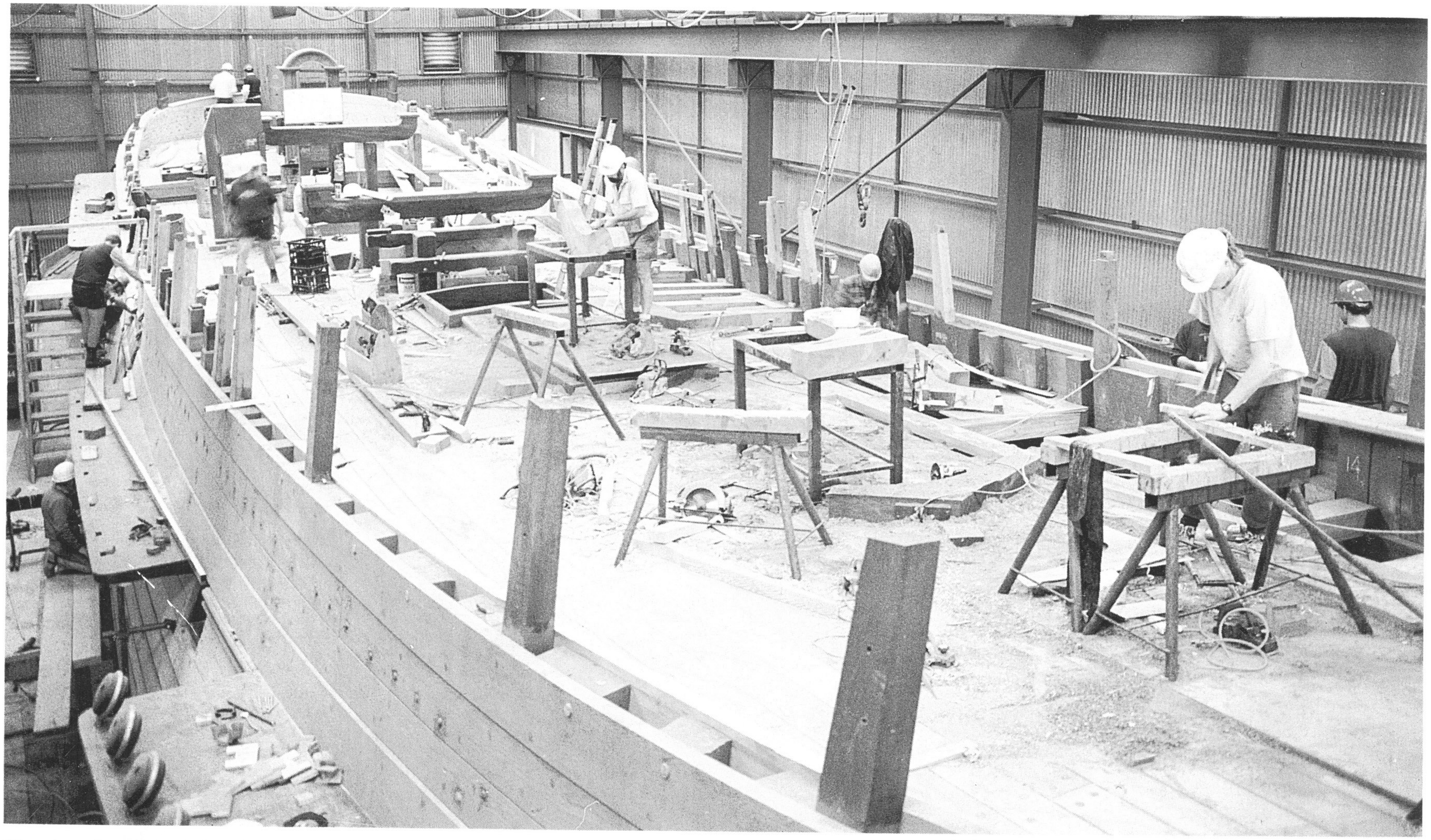


Mock-up windlass aboard the Fremantle replica, showing double pawl bitts (only a single pawl bitt on the draughts), and the ship's designer David White's head carved on the bitt pins. (*Mr William Haddock, Seaford, Victoria*)

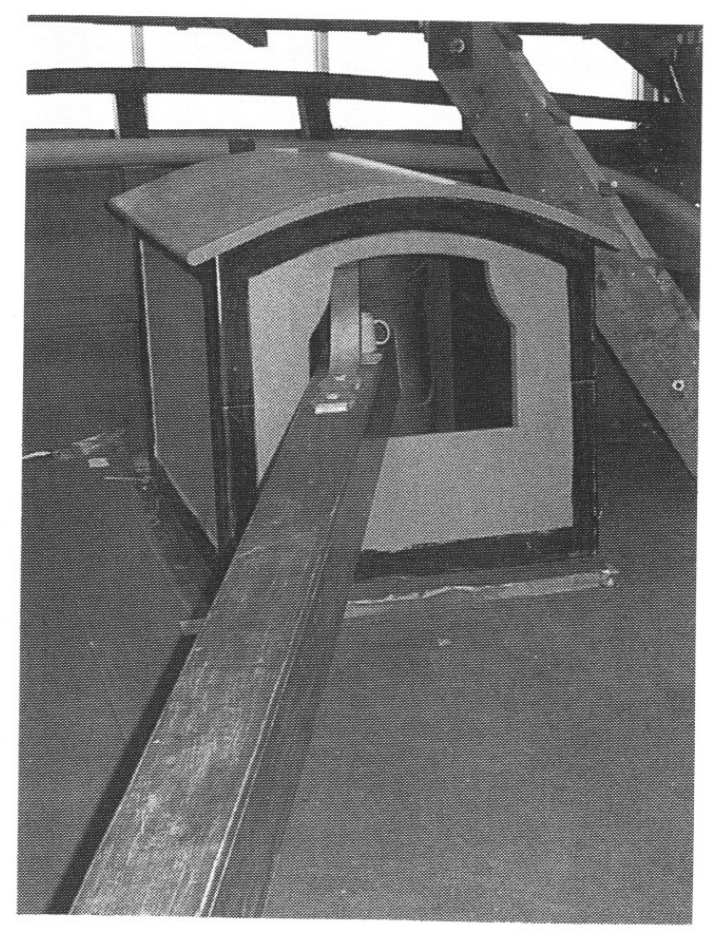
Stern view of the Fremantle replica of *Endeavour*, one day before her launch. Her designer, David White, is standing on the left. The stern is of higher and narrower proportions than indicated on the draughts, being more like that of the Greenwich based, Lightley-built model. The dead-lights are not recessed as Parkinson indicated, provision being made to hang these from eyebolts outside. There is also no taffrail cove above the windows. (*Mr William Haddock, Seaford, Victoria*)

Below:
Quarterdeck of the Fremantle replica the day before her launch, showing the wheel, skylight, capstan, companion stairway, bitts and pumps. The deck is covered with tarpaulins to protect it from damage. (*Mr William Haddock, Seaford, Victoria*)



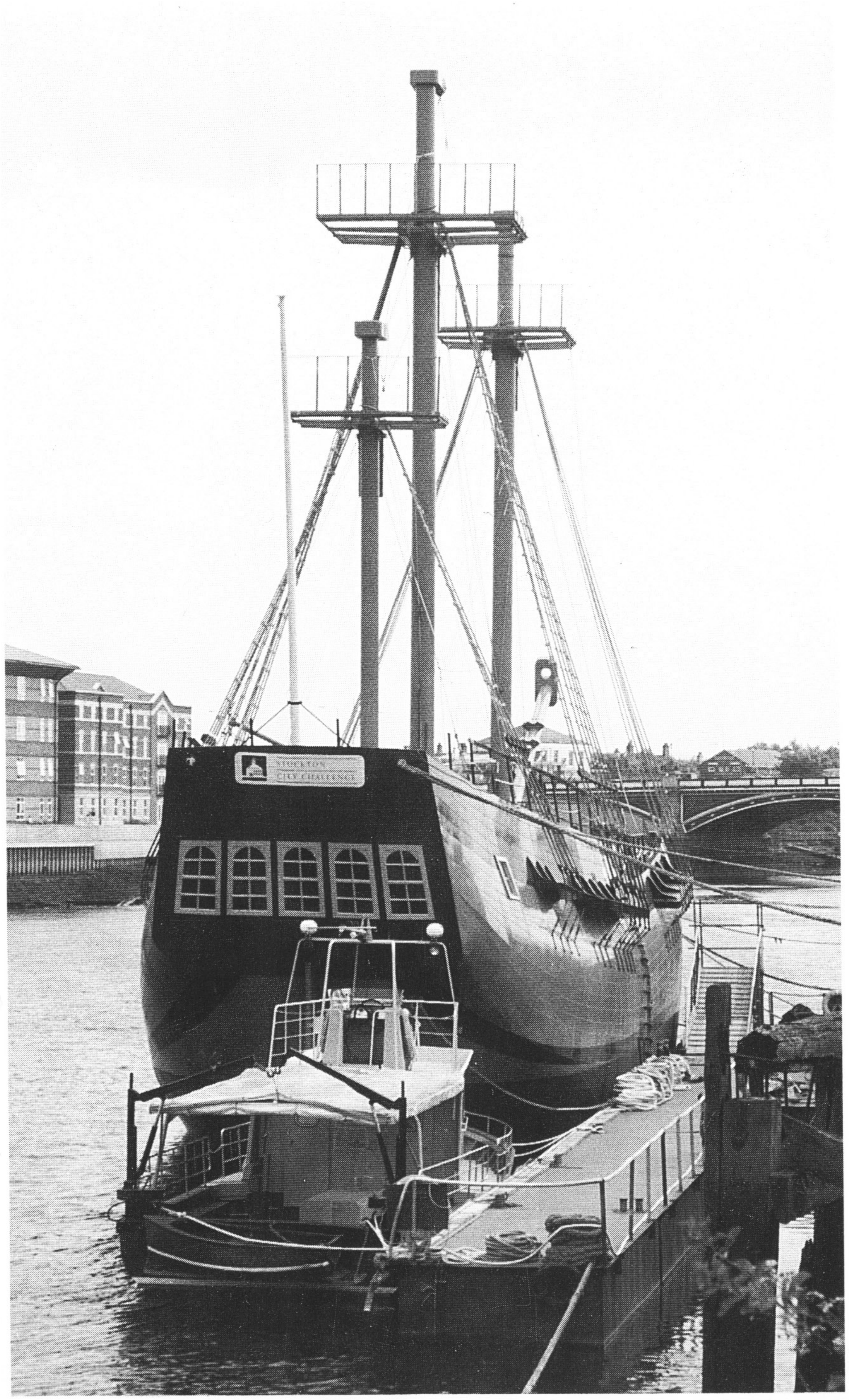


View from the quarterdeck of the Fremantle replica during construction. Note the curved spar gallows, which is not identifiable on the draughts. (*Mr William Haddock, Seaford, Victoria*)

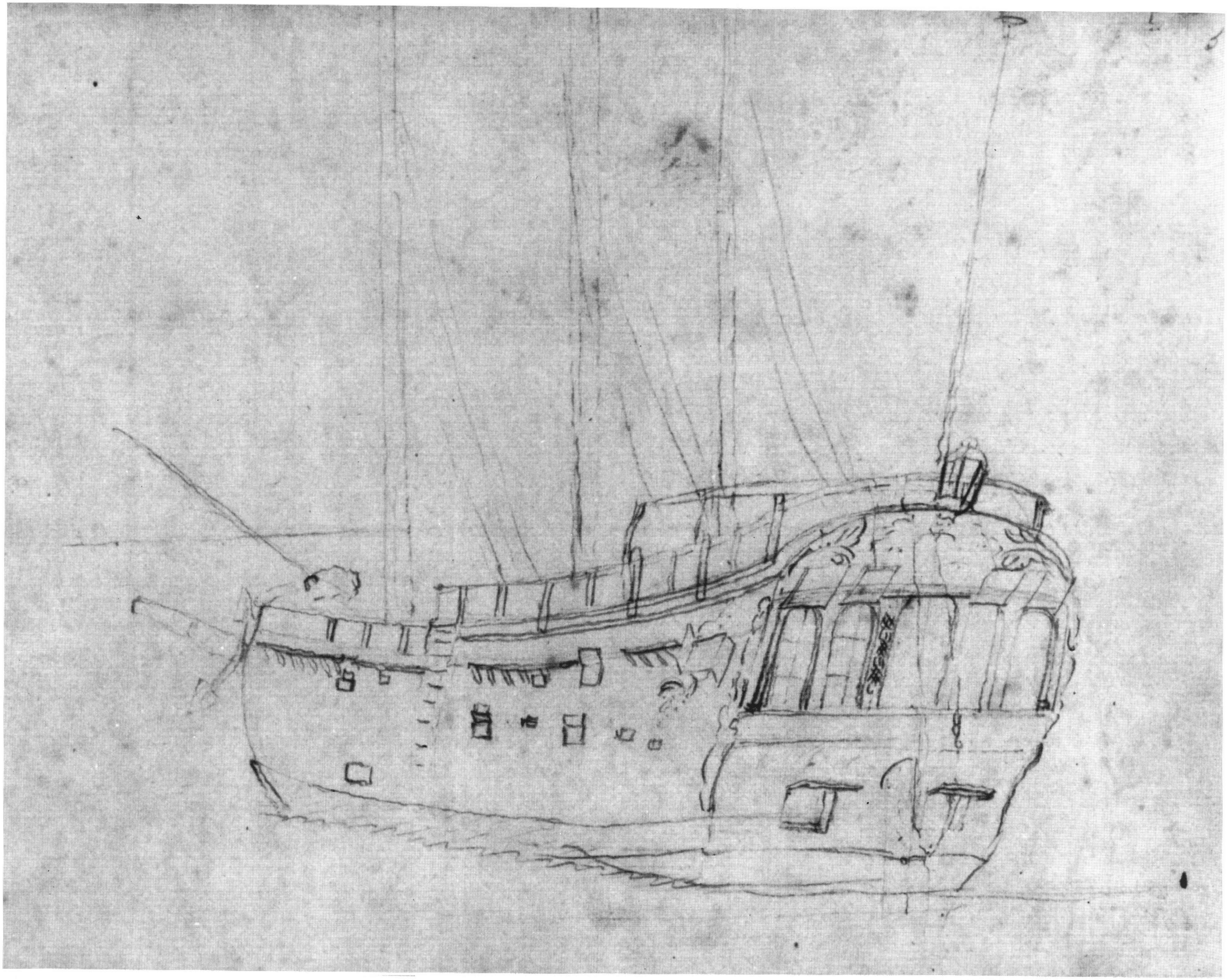


Quarterdeck of the Fremantle replica showing a small rudder house over the helmport rather than an upper helmport coat. Although not found in the draughts, it has been considered as a possibility for *Endeavour*. One is shown on the draughts of the *Bounty* and on a model of a French brig from 1805. (*Mr William Haddock, Seaford, Victoria*)

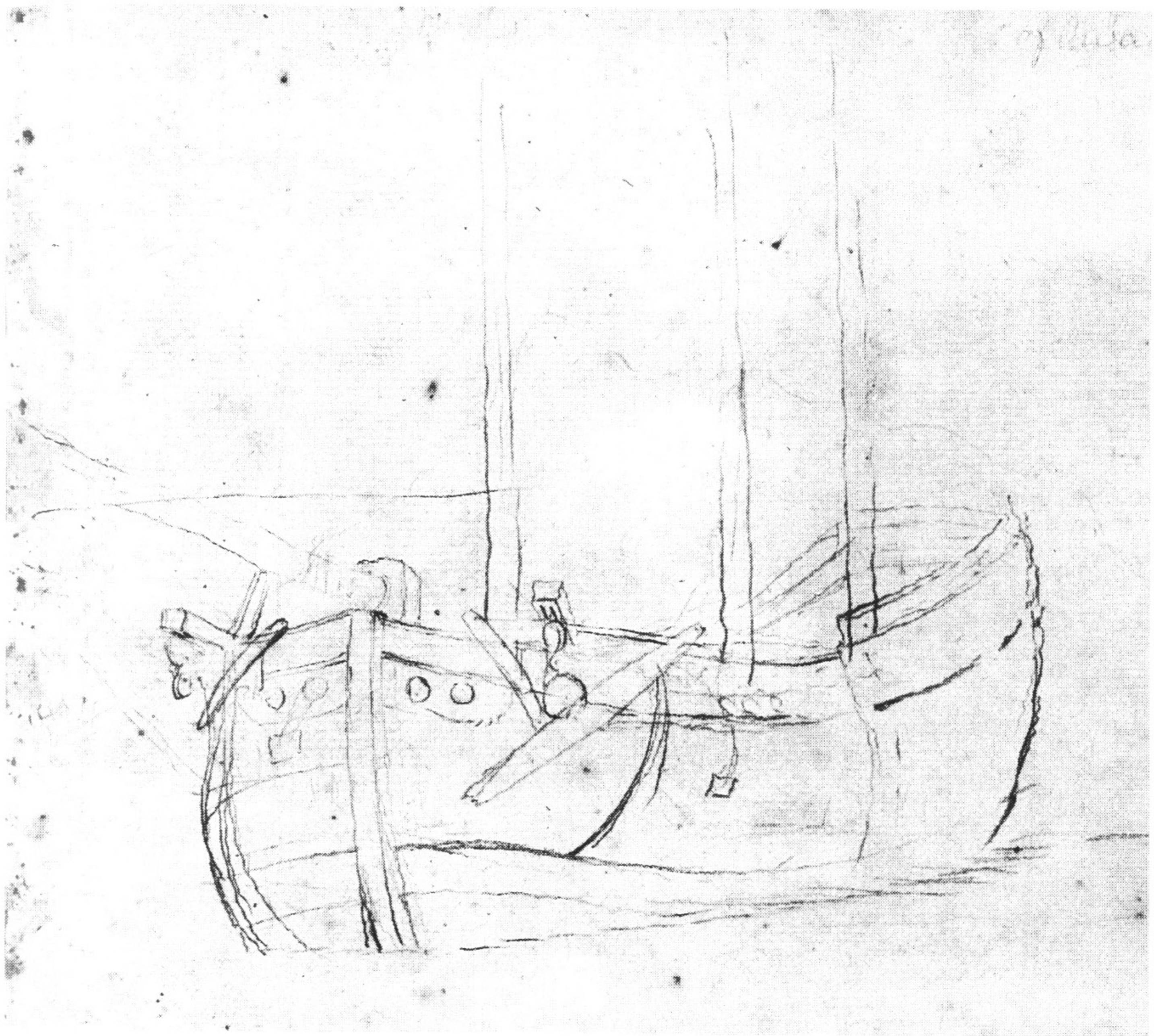
The Castlegate Quay Heritage Project's replica of *Endeavour* under construction. The hull is steel-built and at this stage all the exterior fittings have yet to be added. (*Castlegate Quay Heritage Project, Stockton-on-Tees*)

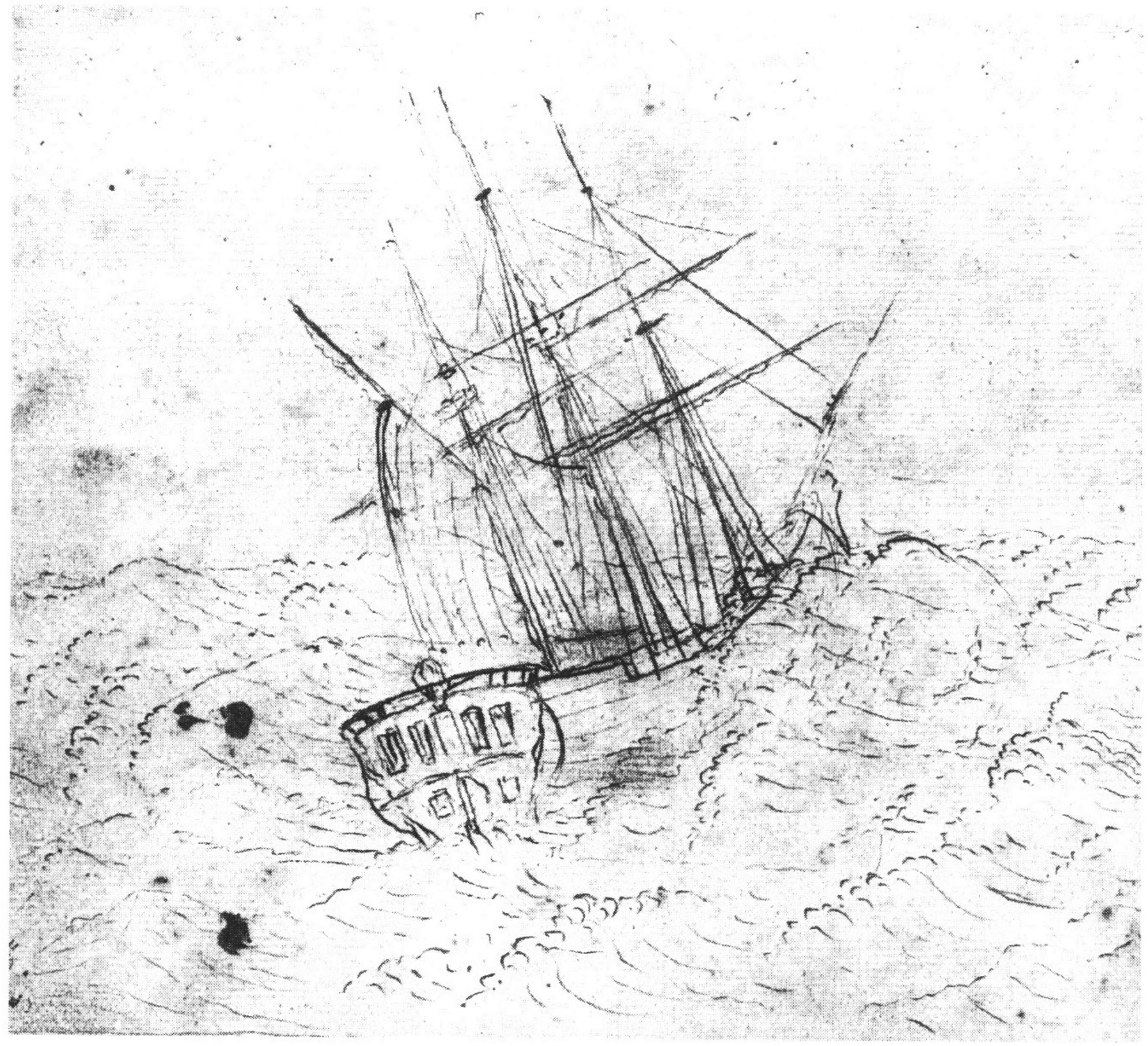


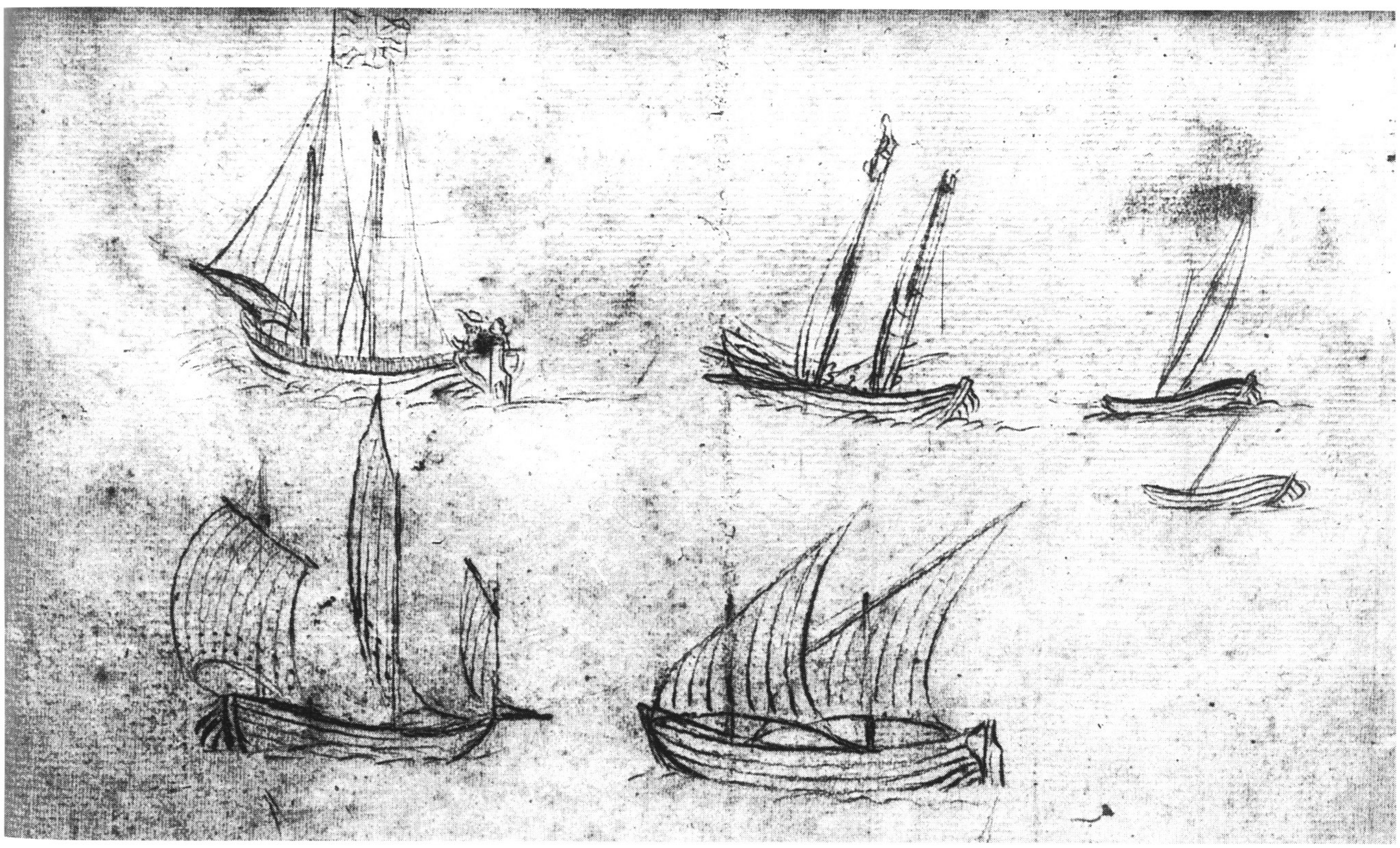
Stern view of the Castlegate Quay replica. She has five windows in her undecorated stern and here too the short mizzen mast can be seen. (*Castlegate Quay Heritage Project, Stockton-on-Tees*)



Sketch of the larboard quarter of *Endeavour*, showing stern details, by Sydney Parkinson, the expedition's draughtsman. This is a mine of information not found in the draughts or the journals, showing the stern decoration and the arrangement of the windows, the stern lantern, the rudder pendants and an awning over the great cabin. It also shows the hinged lids covering the airing ports etc., so often left off of models. The fact that all these ports are open suggests that the drawing was made during the ship's stay in Tahiti. (*British Library*)



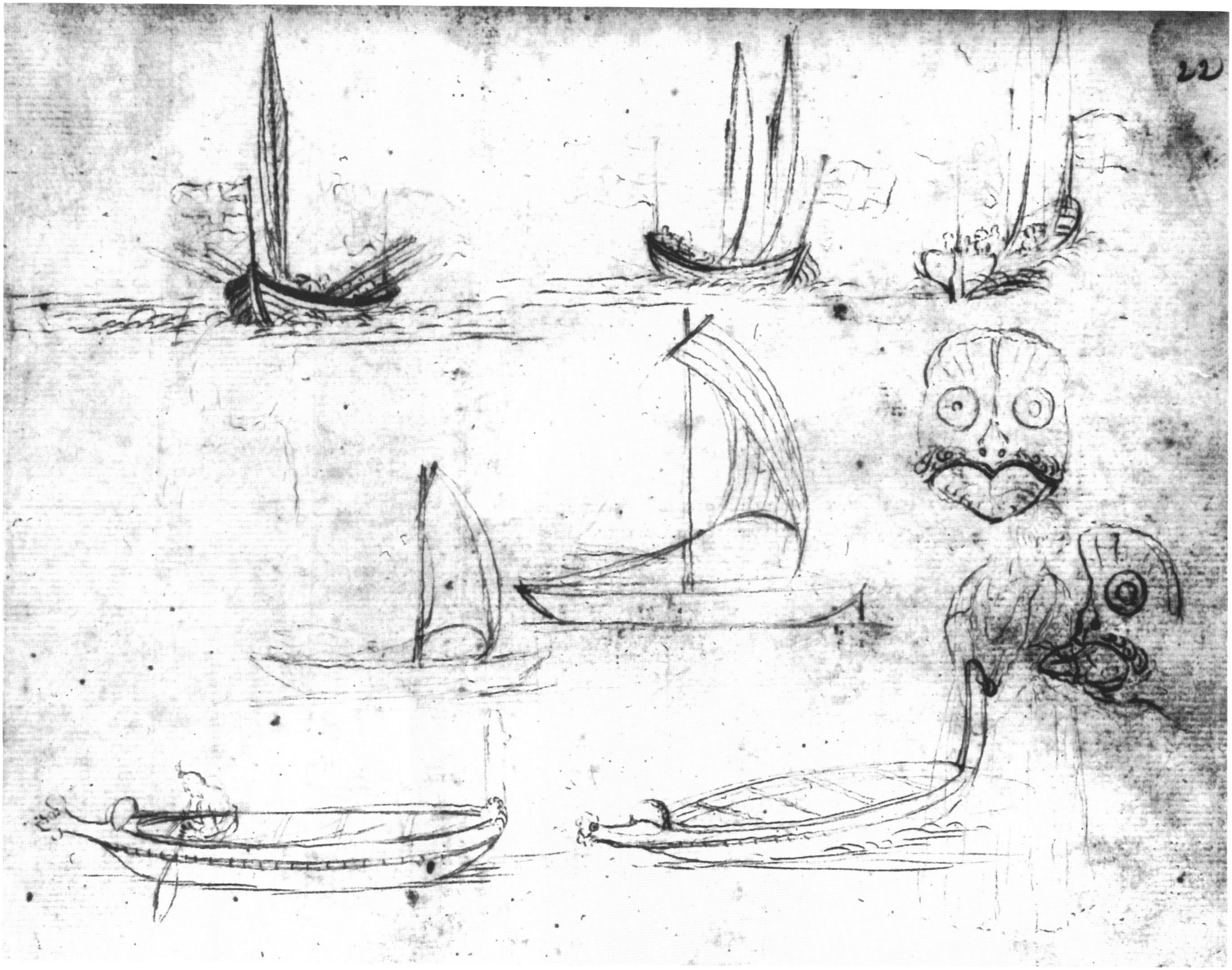




Above left:
Larboard bow sketch of *Endeavour* by Parkinson entitled 'Wie View of the entrance into the Bay of Aware, Huaheine A.A.' drawn between 17 and 19 July 1769. This sketch shows the naval hoods and, most importantly, the bumpkins. (*British Library*)

Above:
'*Endeavour* at Sea' by Parkinson, depicting the storm of 28 December 1769 off the North Cape of New Zealand. Important points to note in this sketch are the normal-sized mizzen mast and the dead-lights closed over the stern windows, with their hinges shown. (*British Library*)

Endeavour's boats sketched by Parkinson.
Top, left to right: the longboat with sliding gunter rig; the pinnace with sliding gunter rig; the yawl with sprit rig.
Bottom, left to right: the longboat with a mixed rig; the longboat with settee rig. (*British Library*)



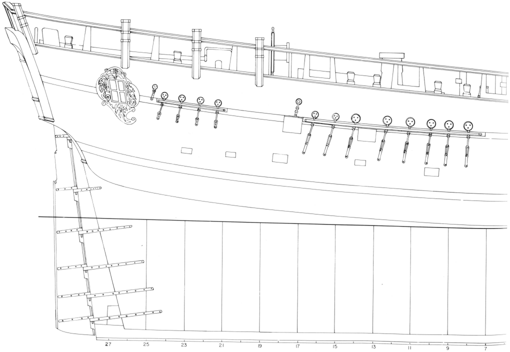
Endeavour's boats sketched by Parkinson.
Top, left to right: the pinnace with sprit-rigged mast; the longboat, bow and stern views, with a two-masted sprit rig.
Middle: skiff with a single-masted square-sail rig.
Bottom: Maori canoes.
(*British Library*)

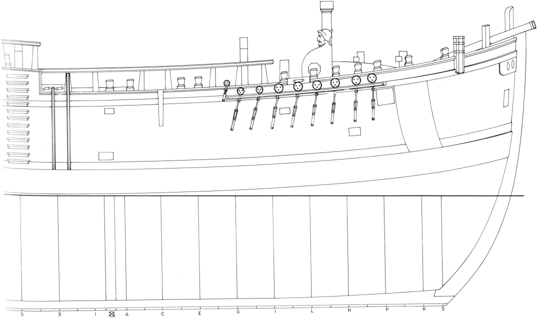
THE DRAWINGS

A General arrangement

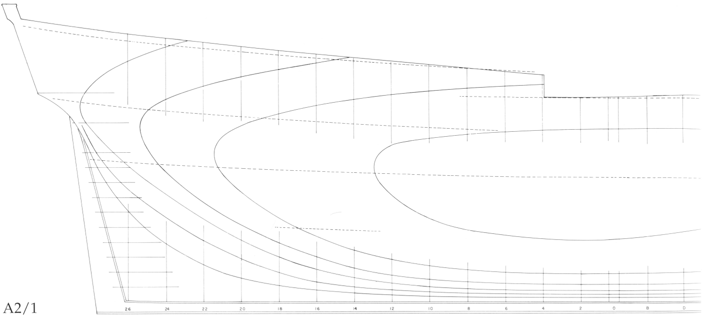
A1 SHEER PLAN (scale ⅛in = 1ft)

A1

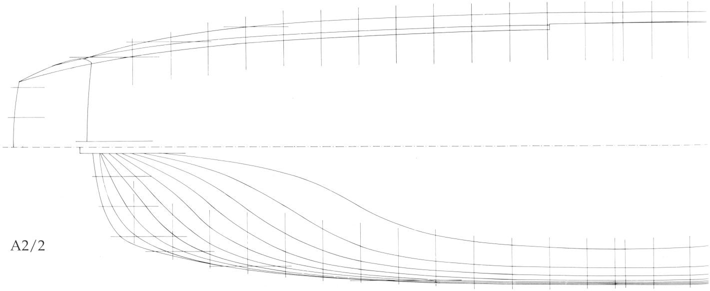



5 3 1 A C E G I L N P R S

A General arrangement



A2/1



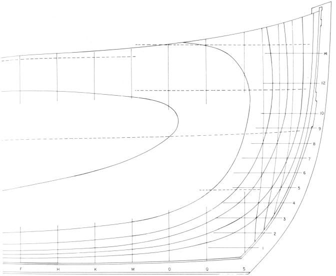
A2/2

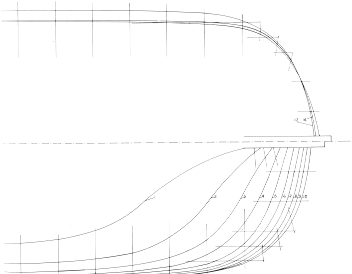
A2 BODY LINES (scale $\frac{1}{8}$in = 1ft)

A2/1 Longitudinal

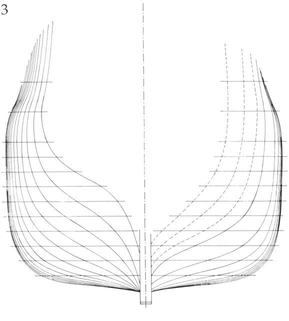
A2/2 Half breadth

A2/3 Cross-sections





A2/3

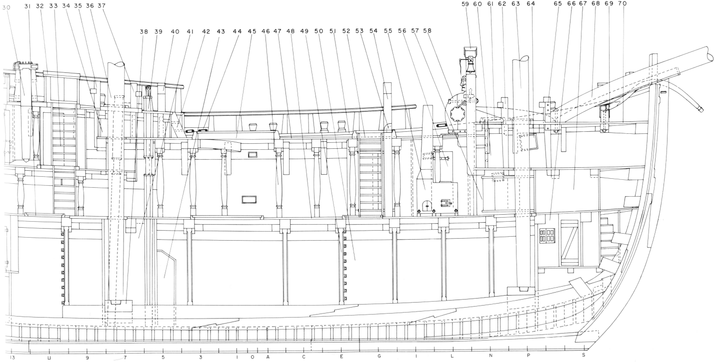


A General arrangement

A3 PROFILE (scale ⅛in = 1ft)

1 Ensign staff
2 Roughtree rail
3 Taffarel
4 Iron horse
5 Helmport casing
6 Helm (Rudder)
7 Tiller
8 Sternpost
9 Great cabin
10 Quarterdeck
11 Swivel gun stock
12 Messroom (1st Lieutenant's cabin)
13 Bread room
14 Toptimber (stanchion)
15 Timberhead
16 Scuttle
17 Fire place
18 Lobby
19 Messroom (Surgeon's cabin)
20 Mizzen mast
21 Fish room
22 Steward's room
23 Steering wheel
24 Gunner's cabin
25 Ladderway to steward's platform
26 After fall
27 Skylight
28 Slops room
29 Airing port
30 Capstan
31 After hatchway
32 Companion capping
33 Companion stairway
34 Pantry
35 Main jeer bits
36 Mainmast
37 Main topsail sheet bits
38 Mainmast step
39 Pump
40 Quarterdeck spar gallows
41 Pump well
42 Quarterdeck steps
43 Shot locker
44 Sheets fairlead
45 Main hatchway
46 Deck stanchion
47 Upper deck
48 Lower deck
49 Hold stanchion with steps
50 Hold
51 Gunwale
52 Fore hatch ladderway (hood not shown)
53 Half cleat
54 Fore hatch spar gallows
55 Oven
56 Boatswain's cabin
57 Boatswain's store room
58 Windlass
59 Belfry
60 Fore fall
61 Fore fall scuttle
62 Fore jeer bits
63 Foremast
64 Light port
65 Fore topsail sheet bits with bowsprit step
66 Magazine
67 Sail room
68 Bowsprit
69 Bumpkin
70 Forecastle

A3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38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58
59 60 61 62 63 64 65 66 67 68 69 70
13 11 9 7 5 3 1 O A C E G I L N P S

A General arrangement

A4 CROSS-SECTIONS (scale 1/8in = 1ft)

A4/1 Cross-section 0 to E

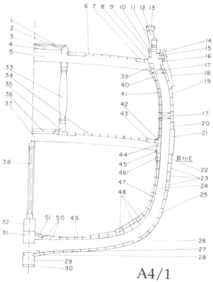
1 Main hatch-cover
2 Main hatch-coaming
3 Gutter-ledge
4 Binding strakes
5 Upper deck beam
6 Upper deck planks
7 Chine
8 Waterway
9 Spirketting
10 Gunwale
11 Timberhead
12 Toptimber (rail stanchion)
13 Roughtree rail
14 Toptimber
15 Filling plank
16 Sheer strake
17 Airing port
18 Chess-tree
19 Side planks
20 Thickstuff above wales
21 Wales
22 Thickstuff below wales
23 Diminishing strakes
24 Second futtock
25 Bottom planks
26 Floortimber
27 Garboard strake
29 Keel
30 False keel
31 Keelson
32 Deadwood above keelson
33 Deck stanchion
34 Lower deck planks
35 Lower deck binding strakes
36 Lower deck main hatchway
37 Lower deck beam
38 Hold stanchion
39 Upper deck clamp
40 Supporting thickstuff
41 Lower deck ceiling
42 Lower deck waterway
43 Lower deck chine
44 Chocks
45 Lower deck clamp
46 Supporting thickstuff
47 Hold ceiling
48 Thickstuff about the floor-heads
49 Foot-waling
50 Limber strakes
51 Limber board

A4/2 Cross-section E to K

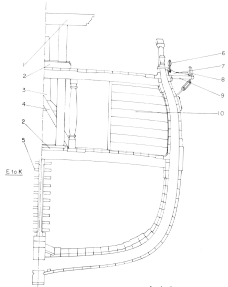
1 Fore hatchway spar gallows
2 Fore hatchway
3 Oven
4 Stairway
5 Hold stanchion steps
6 Fore topgallant backstay iron-bound dead eye
7 Fore channel standard
8 Fore shroud dead eye and chain
9 Fore channel
10 Carpenter's cabin

A4/3 Cross-section K to Q

1 Belfry
2 Pawl bit pin
3 Pinrail
4 Fore jeer bits
5 Windlass barrel
6 Spike socket
7 Bit pin
8 Main tack fairlead
9 Standard knee
10 Fore fall
11 Carpenter's store room
12 Oven
13 Foremast step



A4/1



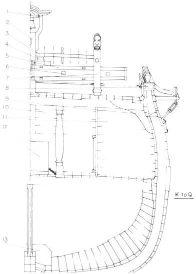
A4/2

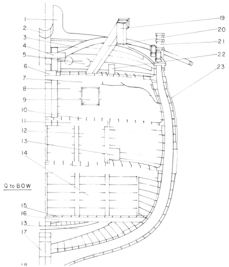
A4/4 Cross-section Q to Bow

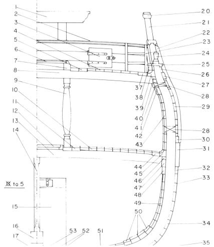
1 Knighthead
2 Stem
3 Bumpkin
4 Fore topsail sheet bits
5 Hawse holes
6 Partner
7 Decks hook
8 Fore fall
9 Timber loading port
10 Fore fall planks
11 Fore fall deck beam
12 Sail room
13 Breast hook
14 Magazine
15 Magazine platform planks
16 Platform beam
17 Forward deadwood
18 Apron knee
19 Timberhead
20 Cat-head
21 Swivel gun stock
.22 Windlass standard
23 Anchor lining

A4/5 Cross-section 0 to 5

1 Quarterdeck spar gallows
2 Quarterdeck
3 Manhole
4 Upper deck planks
5 Binding strakes
6 Main hatch cover
7 Main hatch coaming
8 Upper deck beam
9 Deck stanchion
10 Lower deck planks
11 Lower deck binding strakes
12 Lower deck main hatchway
13 Lower deck beam
14 Hold stanchion
15 Shot locker
16 Deadwood above keelson
17 Keelson
18 Keel
19 False keel
20 Roughtree rail
21 Toptimber (stanchion)
22 Skid
23 Steps to quarterdeck
24 Timberhead
25 Gunwale
26 Paint strake
27 Sheer strake
28 Airing port
29 Side planks
30 Thickstuff above wales
31 Wales
32 Thickstuff below wales
33 Diminishing strakes
34 Bottom planks
35 Limber hole
36 Garboard strake
37 Chine
38 Spirketting
39 Waterway
40 Chock
41 Upper deck clamp
42 Supporting thickstuff
43 Lower deck ceiling
44 Lower deck chine
45 Lower deck waterway
46 Chock
47 Lower deck clamp
48 Supporting thickstuff
49 Hold ceiling
50 Thickstuff about the floor-heads
51 Foot-waling
52 Limber strakes
53 Limber board







A General arrangement

A4/6 Cross-section 5 to 10

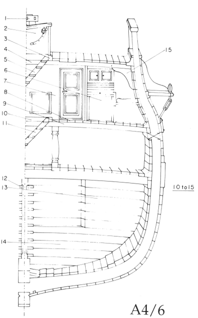
1 Pumps
2 Quarterdeck spar gallows
3 Quarterdeck planks
4 Quarterdeck binding strakes
5 Cabin deck forward bulkhead
6 Pump well
7 Quarterdeck waterway
8 Standard of main channel
9 Main channel
10 Chained dead eye
11 Gangway steps

A4/7 Cross-section 10 to 15

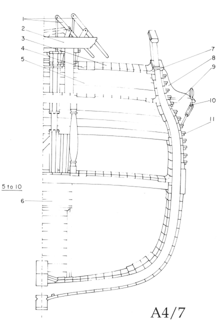
1 Capstan
2 Companion capping
3 Companion coaming
4 Quarterdeck beam
5 Companion stairway
6 Draughtsman's cabin
7 After fall
8 Cabin deck planks
9 Cabin deck beam
10 Cabin deck companion coaming
11 Cabin deck companion stairway
12 Hold stanchion steps
13 Slops room
14 Fish room
15 Standard knee

A4/8 Cross-section 15 to 20

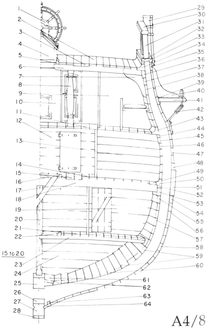
1 Steering wheel
2 Quarterdeck planks
3 Quarterdeck binding strakes
4 Skylight
5 Skylight coaming
6 Quarterdeck beam
7 Quarterdeck standard knee
8 Deck stanchion
9 Draughtsman's cabin
10 Lobby
11 Cabin deck planks
12 Mess room
13 Gunner's cabin
14 Lower deck planks
15 Lower deck binding strakes
16 Hatchway to steward's platform
17 Ladderway
18 Lower deck beam
19 Steward's room
20 Hold stanchion
21 Platform planks
22 Fish room scuttle
23 Platform beam
24 Fish room
25 Keelson
26 Deadwood
27 Keel
28 False keel
29 Swivel gun stock
30 Roughtree rail
31 Toptimber (stanchion)
32 Gunwale
33 Spirketting
34 Quarterdeck waterway
35 Paint strake
36 Quarterdeck clamp
37 Supporting thickstuff
38 Cabin deck ceiling
39 Sheer strake
40 Standard of main channel
41 Main channel
42 Chained dead eye
43 Cabin deck waterway
44 Cabin deck clamp
45 Supporting thickstuff
46 Lower deck ceiling
47 Side planks
48 Thickstuff above wales
49 Lower deck chine
50 Lower deck waterway
51 Wales



A4/6



A4/7



A4/8

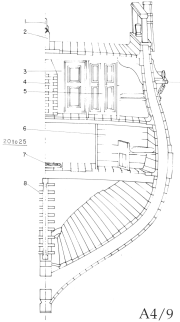
52 Chock
53 Lower deck clamp
54 Thickstuff below wales
55 Supporting thickstuff
56 Diminishing strakes
57 Hold ceiling
58 Bottom planks
59 Thickstuff about the floor-heads
60 Foot-waling
61 Limber board
62 Limber strakes
63 Limber hole
64 Garboard strake

A4/9 Cross-section 20 to 25

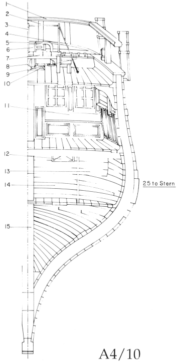
1 Tiller bracket
2 Cabin flue
3 Lobby
4 Fire place
5 Captain's bed
6 Surgeon's cabin
7 Scuttle to bread room
8 Hold stanchion steps
9 Mizzen channel

A4/10 Cross-section 25 to Stern

1 Roughtree rail
2 Stern timber
3 Bridge rail stanchion
4 Taffarel
5 Iron horse
6 Helm (Rudder)
7 Bridge over the tiller
8 Tiller
9 Flag lockers
10 Quarterdeck helmport
11 Great cabin
12 Lower counter loading port
13 1st Lieutenant's cabin
14 Messroom
15 Sternson



A4/9



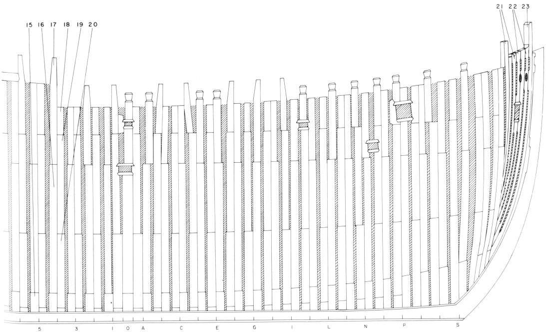
A4/10

B Hull structure

B1 FRAME DISPOSITION
(scale ⅛in = 1ft)

1 Stern timber
2 Outer stern timber
3 Timbers on the outer stern timber
4 Fashion piece
5 Window sill
6 Fashion futtock
7 Badge window
8 Overhead filling piece
9 Airing port
10 Light port
11 Port sill
12 Overhead filling piece
13 Gunport
14 Long toptimbers shaped as timber-heads
15 Floor timber
16 Second futtock
17 Long top timber shaped as rail stanchion
18 Short top timber
19 Third futtock
20 First futtock
21 Filling pieces (knuckle timbers)
22 Hawse pieces
23 Knighthead
24 Wing-transom
25 Transoms
26 Filling chocks

B1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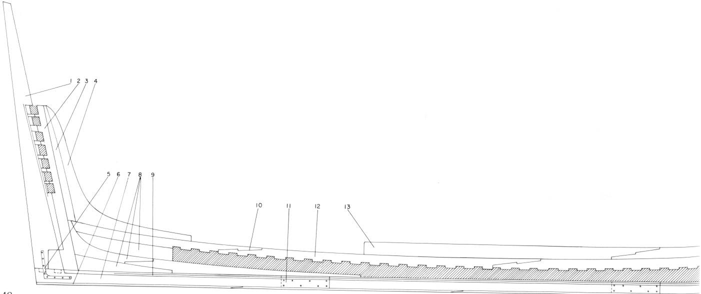
B Hull structure

B2 ELEVATION OF STEM, STERNPOST AND KEEL ASSEMBLY (scale $\frac{1}{8}$in = 1ft)

1 Sternpost
2 Inner sternpost
3 Deadwood
4 Sternson
5 Angled iron plate
6 False keel
7 Keel
8 Deadwood
9 Rabbet
10 Keelson scarf (horizontal)
11 Keel scarf (vertical)
12 Keelson
13 Deadwood above keelson
14 Deadwood
15 Horseshoe plate
16 Keel/stem connection (boxing)
17 Rabbet
18 Lower stem
19 Stemson
20 Apron
21 Upper stem

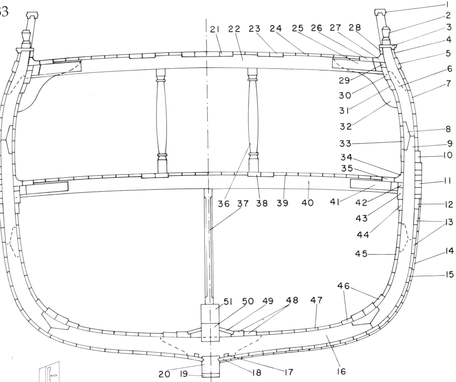
B2

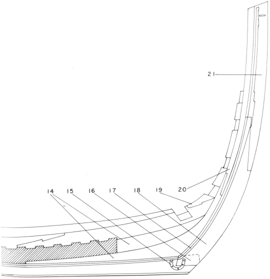


B3 MID-SECTION (scale $\frac{3}{16}$in = 1ft)

1 Roughtree rail
2 Timberhead
3 Gunwale
4 Paint strake
5 Sheer strake
6 Top timber
7 Side planks
8 Chock
9 Second futtock
10 Thickstuff above wales
11 Wales
12 Thickstuff below wales
13 Diminishing strakes
14 Sheathing
15 Bottom planks
16 Floor timber
17 Limber hole
18 Garboard strake
19 False keel
20 Keel
21 King planks
22 Upper deck beam
23 Binding strakes
24 Deck planks
25 Lodging knee

B3



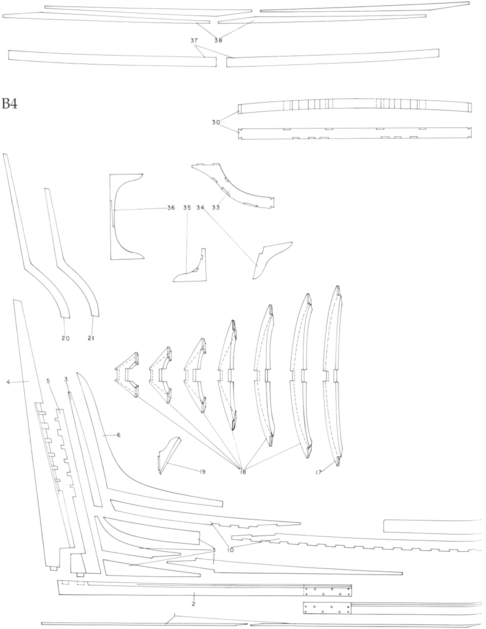


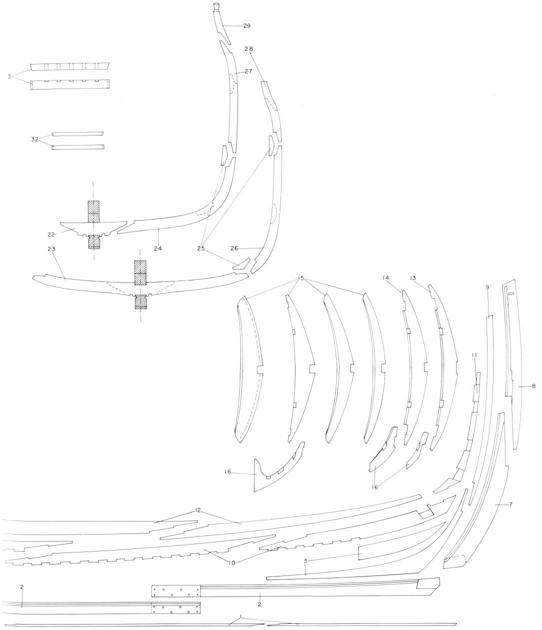
26 Chine
27 Waterway
28 Spirketting
29 Chock above clamp
30 Upper deck clamp
31 Supporting thickstuff
32 Hanging knee
33 Lower deck ceiling
34 Lower deck waterway
35 Lower deck chine
36 Deck stanchion
37 Hold stanchion
38 Lower deck binding strakes
39 Deck planks
40 Lower deck beam
41 Lodging knee
42 Chock
43 Lower deck clamp
44 Supporting thickstuff
45 Hold ceiling
46 Thickstuff about the floor-head
47 Foot-waling
48 Limber strakes
49 Limber board
50 Keelson
51 Deadwood above the keelson

B Hull structure

B4 TIMBERS OF THE SHIP
(scale ⅛in = 1ft)

1 False keel
2 Keel
3 Deadwood
4 Sternpost
5 Inner sternpost
6 Sternson
7 Lower stem
8 Upper stem
9 Apron
10 Keelson
11 Stemson
12 Deadwood above the keelson
13 Fore-castle deck hook
14 Fore fall deck hook
15 Breast hooks
16 Hook extensions
17 Wing-transom
18 Transoms
19 Filling chock
20 Stern timber
21 Outer stern timber
22 Cross-chock
23 Floor timber
24 First futtock
25 Chocks
26 Second futtock
27 Third futtock
28 Long top timber
29 Short top timber
30 Deck beam
31 Carling
32 Half beam or ledge
33 Spur beam
34 Hanging knee
35 Lodging knee
36 Midship lodging knees
37 Butt joining of planks
38 Top and butt joining of wales





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B Hull structure

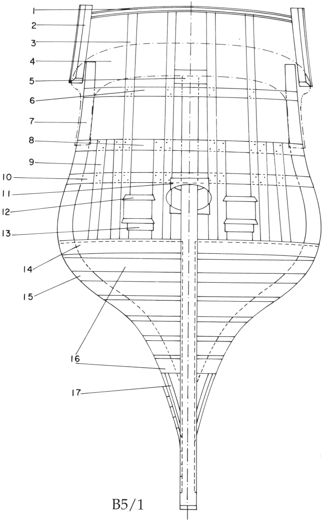
B5 STERN (scale $\frac{3}{16}$in = 1ft)

B5/1 Construction

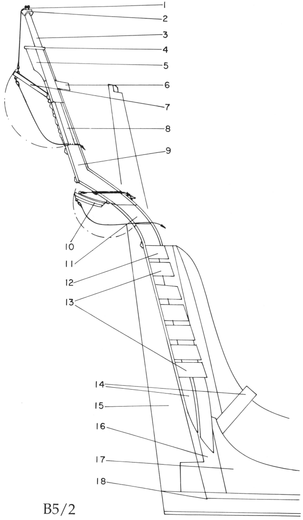
1 Roughtree rail
2 Gun stock
3 Stern timber or long counter timber
4 Taffarel
5 Chock
6 Beam above windows
7 Outer stern timber
8 Window sill beam
9 Short counter timbers
10 Counter-beam
11 Helmport chocks
12 Filling piece
13 Filling piece
14 Wing-transom
15 Fashion piece
16 Transoms
17 Filling chocks

B5/2 Stern timbers with dead-light and port

1 Cleat
2 Roughtree rail
3 Stern timber
4 Taffarel capping
5 Taffarel
6 Quarterdeck end beam
7 Dead-light
8 Window
9 Short counter timber
10 Stern port lid
11 Stern loading or light port
12 Wing-transom
13 Transoms
14 Filling chocks
15 Sternpost
16 Inner sternpost
17 Deadwood
18 Keel



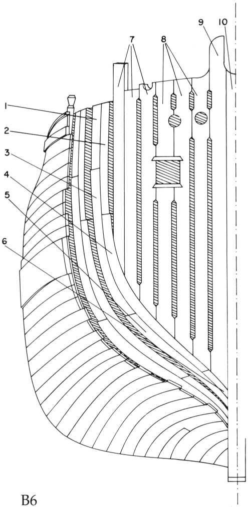
B5/1



B5/2

B6 BOW TIMBERS (scale $\frac{3}{16}$in = 1ft)

1 Short top timber
2 Long top timber
3 Third futtock
4 Second futtock
5 Futtock of the crotch
6 Crotch
7 Filling pieces
8 Hawse pieces
9 Knighthead or bollard timber
10 Stem

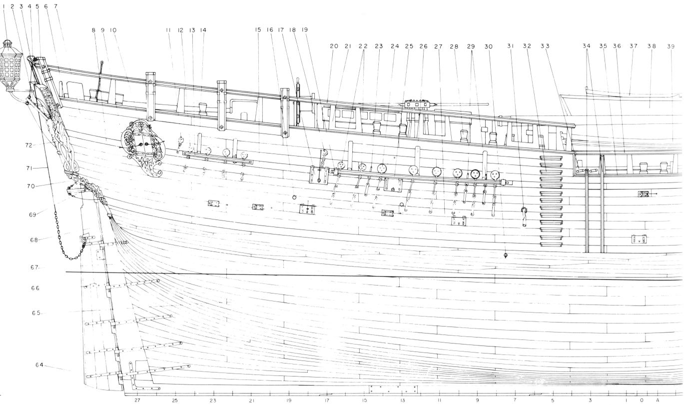


B6

C External hull

C1 SIDE ELEVATION (scale $\frac{1}{8}$in = 1ft)

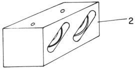
1 Lantern
2 Stern window dead-light
3 Taffarel
4 Roughtree rail above taffarel
5 Swivel gun stock
6 Quarterdeck gunwale
7 Paint strakes
8 Sheer strake
9 Quarter badge
10 Quarter badge dead-lights
11 Chained dead eye for mizzen topmast backstay
12 Chained dead eye for mizzen shroud
13 Mizzen channel
14 Mizzen channel standard
15 Airing port
16 Scupper
17 Light port
18 Chained thimble for main topgallant backstay
19 Bracket for lower main studdingsail boom
20 Quarterdeck roughtree rail
21 Port formed by top timber rail stanchions
22 Chained dead eyes for main topmast backstays
23 Chained eye for main topsail yard fall
24 Chained dead eye for main shroud
25 Main channel
26 Main channel standard
27 Side planks
28 Timberhead
29 Chained eyes for mast tackle
30 Ringbolt for lower main studding sail boom martingale
31 Scupper with hose fitted
32 Gangway
33 Sheets fairlead
34 Skids
35 Gunwale
36 Waist roughtree rail
37 Yawl, on port side above spars
38 Skiff, on starboard side above spars
39 Longboat, on port side upper deck
40 Pinnace, on starboard upper deck
41 Chess-tree
42 Chained thimble for fore topgallant backstay
43 Chained dead eyes for topmast backstays
44 Chained dead eye for fore shroud
45 Fore channel
46 Tack fairlead
47 Fore channel standard
48 Small bower
49 Chained eye for mast tackle
50 Anchor lining
51 Anchor lining bolster
52 Sheet anchor
53 Cat-head
54 Knighthead
55 Bumpkin
56 Stem
57 Gammoning ring
58 Bumpkin stay ringbolts
59 Bobstay hole
60 Wales
61 Horseshoe plate
62 Keel
63 False keel
64 Angled fish plate
65 Bottom planks
66 Pintles and gudgeons
67 Stern post
68 Helm (rudder)
69 Loading port lid
70 Counter
71 Rudder pendant
72 Stern

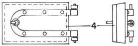


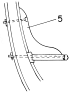
C1

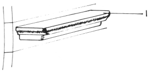
C2 SIDE DETAILS (no scale)

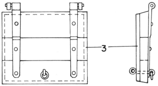
1 Gangway step
2 Fairlead
3 Light port lid
4 Airing port lid
5 Channel standard
6 Channel
7 Skids
8 Chess-tree
9 Anchor lining

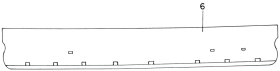


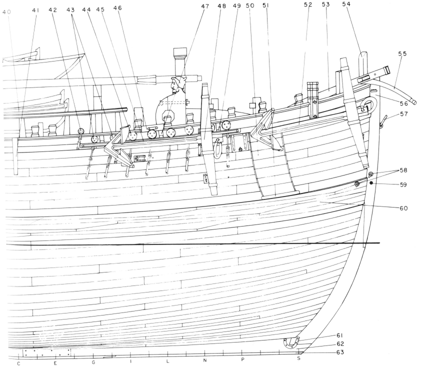


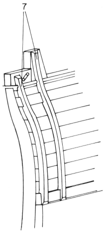


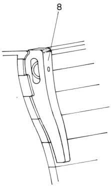


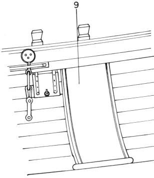








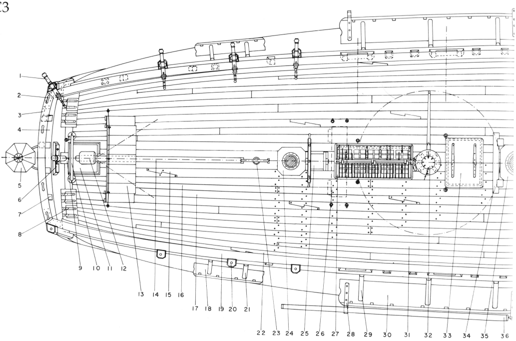


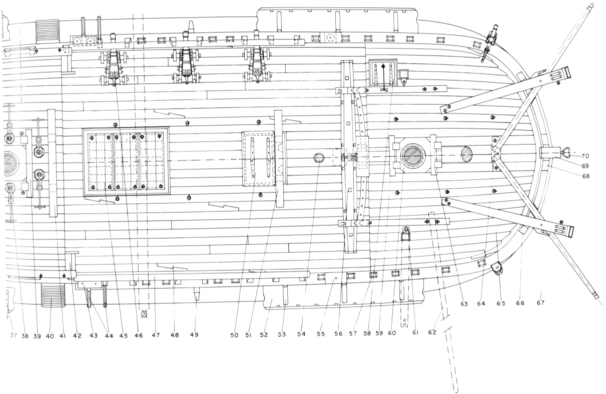


C3 UPPER DECK PLAN
(scale ⅛in = 1ft)

1 Swivel gun
2 Cleat for dead-light rope
3 Roughtree rail above taffarel
4 Taffarel
5 Lantern
6 Ensign staff bracket
7 Stern timber
8 Flag locker
9 Ensign staff step
10 Iron horse
11 Helmport
12 Helm (rudder)
13 Bridge over tiller
14 Tiller
15 King planks
16 Deck planks
17 Binding strake
18 Mizzen channel
19 Quarterdeck roughtree rail
20 Swivel gun stock
21 Mizzen channel standard
22 Quarterdeck waterway
23 Fireplace flue
24 Mizzen mast partners
25 Steering wheel
26 Binnacle
27 Skylight
28 Bracket for main studding sail boom
29 Main channel standard
30 Main channel
31 Quarterdeck
32 Capstan
33 Companion capping
34 Main jeer bits
35 Mainmast partners
36 Lower main studding sail boom
37 Gooseneck bracket
38 Pump
39 Main topsail sheet bits
40 Gangway
41 Quarterdeck spar gallows
42 Quarterdeck steps
43 Sheets fairlead
44 Skids
45 Main hatchway
46 4-pounder carriage gun
47 Waist roughtree rail
48 Chine
49 Chess-tree
50 Fore hatch hood
51 Fore hatch spar gallows
52 Fore channel
53 Fore channel standard
54 Oven flue
55 Tack fairlead
56 Windlass
57 Timberhead
58 Scuttle to fore fall
59 Fore jeer bits
60 Foremast partners
61 Davit shackle
62 Probable lower fore studding sail boom position
63 Fore topsail sheet bits
64 Bumpkin bracket
65 Forecastle
66 Bumpkin
67 Cat-head
68 Knighthead
69 Stem
70 Gammoning ring

C3

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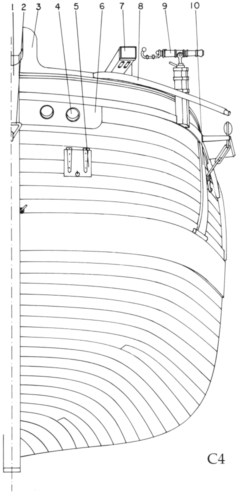
C4 BOW ELEVATION
(scale $\frac{3}{16}$in = 1ft)

1 Stem
2 Gammoning ring
3 Knighthead
4 Hawse holes
5 Bow loading port
6 Naval hood
7 Cat-head
8 Bumpkin
9 Swivel gun with stock
10 Anchor lining

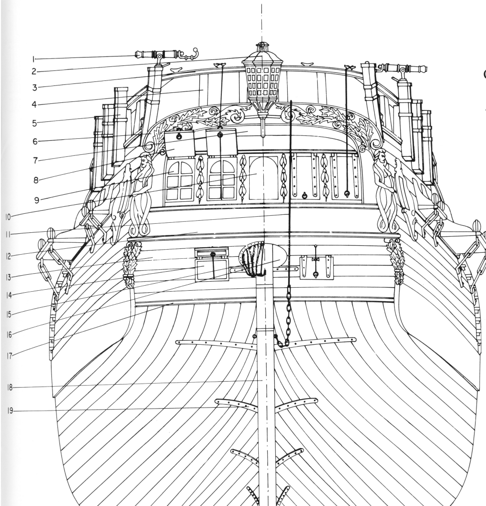


C4

C5 STERN (scale $\frac{3}{16}$in = 1ft)

C5/1 Elevation

1 Swivel gun
2 Lantern
3 Roughtree rail
4 Stern timber
5 Gun stock
6 Taffarel
7 Taffarel cove
8 Dead-light
9 Stern window
10 Sham window
11 Rudder pendant
12 Upper counter
13 Lower counter
14 Stern loading or lighting port
15 Rudder coat
16 Helmport
17 Counter-ledge
18 Helm (Rudder)
19 Gudgeon or rudder brace

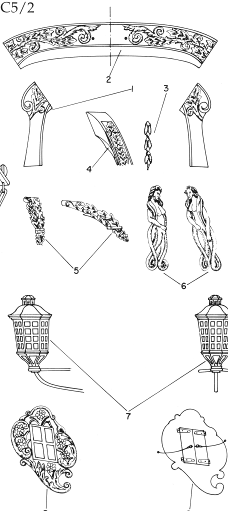


C5/1

C5/2 *Details of decoration and lantern*

1 Taffarel leaf decoration (side)
2 Taffarel leaf decoration (main piece)
3 Window mullion decoration
4 Taffarel edge decoration
5 Counter decoration
6 Figurine
7 Lantern with bracket (side and aft)
8 Quarter badge decoration
9 Quarter badge dead-lights

C5/2

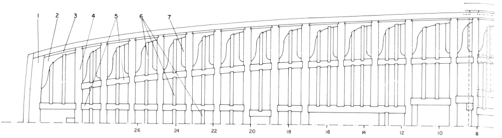


D Internal hull

D1 UPPER DECK, QUARTERDECK AND FORECASTLE BEAM STRUCTURE (scale ⅛in = 1ft)

1 Quarterdeck end beam
2 Lodging knee
3 Clamp and chock
4 Quarterdeck beam
5 Carlings
6 Half beams or ledges
7 Hanging knee
8 Upper deck beam
9 Spur beam
10 Forecastle deck beam
11 Forecastle deck hook

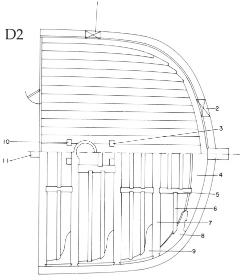
D1

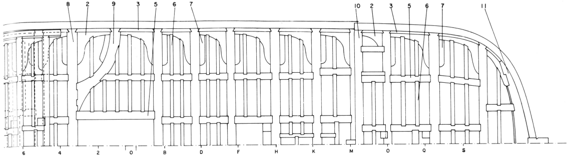


D2 FORE FALL (scale ⅛in = 1ft)

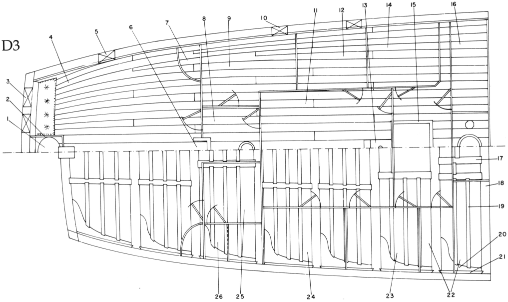
1 Light port
2 Bow loading port
3 Fore topsail sheet bits
4 Decks hook
5 Carling
6 Half beam or ledge
7 Fore fall deck beam
8 Hook extension
9 Lodging knee
10 Fore jeer bits
11 Pawl bit

D2





D3



D3 CABIN DECK (scale ⅛in = 1ft)

1 Helmport
2 Rudder trunk
3 Stern window
4 Great cabin
5 Badge window
6 Fire place
7 Utility trunk
8 Lobby
9 Captain's bedchamber
10 Light port
11 After fall
12 Draughtsman's cabin
13 Capstan step
14 Cabin for draughtsman and assistants of Mr Banks
15 Companion stairway
16 Pantry
17 Carling
18 Cabin deck beam
19 Half-beam or ledge
20 Lodging knee
21 Cabin deck clamp
22 Pantry
23 Draughtsman's cabin
24 Mr Green's cabin
25 Mr Banks' cabin
26 En suite to cabin

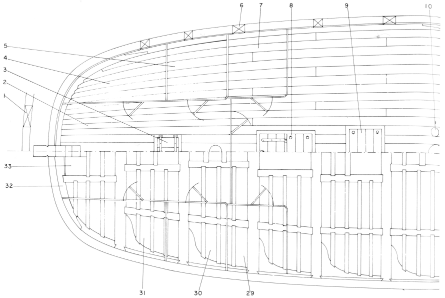
D Internal hull

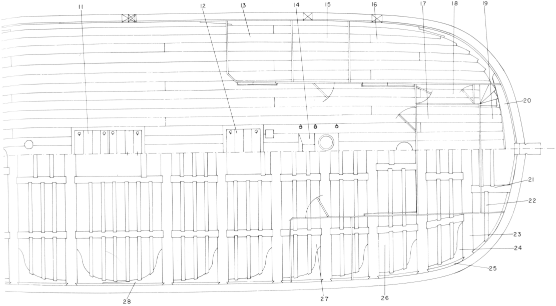
D4 LOWER DECK

D4/1 Plan (scale 1/8in = 1ft)

1 Stern loading port
2 Mess room
3 Scuttle to bread room
4 1st Lieutenant's cabin
5 Surgeon's cabin
6 Airing port
7 Gunner's cabin
8 Ladderway to steward's room
9 After hatchway
10 Pump
11 Main hatchway
12 Fore hatchway
13 Sail room
14 Oven
15 Boatswain's cabin
16 Boatswain's store room
17 Sail room
18 Passage to magazine
19 Gunner's store
20 Breast hook
21 Carling
22 Half-beam or ledge
23 Lower deck beam
24 Lodging knee
25 Lower deck clamp
26 Carpenter's store room
27 Carpenter's cabin
28 Midship lodging knees
29 Cabin of the Captain's clerk
30 2nd Lieutenant's cabin
31 Master's cabin
32 Transom
33 Scuttle

D4/1

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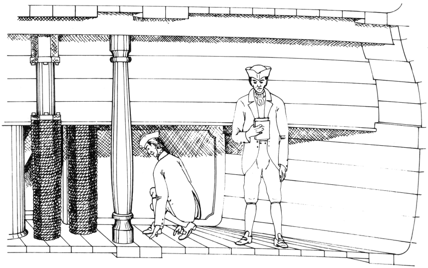
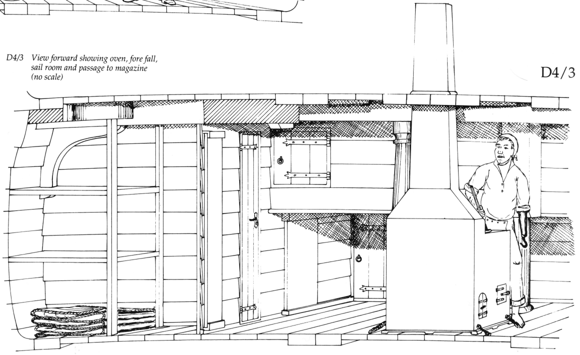
D4/2 *View aft towards the officers' quarters below the cabin deck (no scale)*

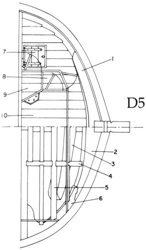
D4/2



D4/3 *View forward showing oven, fore fall, sail room and passage to magazine (no scale)*

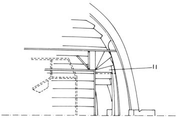
D4/3





D5

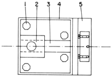
D5 MAGAZINE PLATFORM
(scale ⅛in = 1ft)



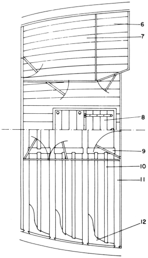
1 3rd breast hook
2 2nd breast hook
3 Lowest breast hook
4 Carling
5 Platform beam
6 3rd hook's extension
7 Scuttle
8 Magazine entrance
9 Light room
10 Magazine
11 Magazine stairway

D6 PUMP WELL AND STEWARD'S ROOM PLATFORM
(scale ⅛in = 1ft)

1 Pump
2 Main mast step
3 Keelson
4 Well
5 Shot locker
6 Slops room
7 Steward's room
8 Scuttle and hatchway to fishroom
9 Carling
10 Half-beam or ledge
11 Platform beam
12 Lodging knee



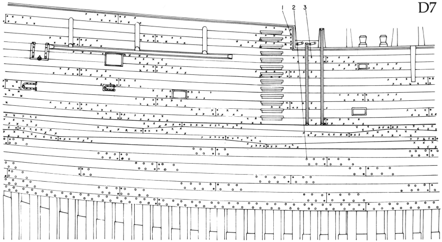
D6



D7 THE USE OF SPIKES ETC. ON LIVE AND DEAD WORK
(scale ⅛in = 1ft)

1 Bolt
2 Trennel
3 Spike

D7

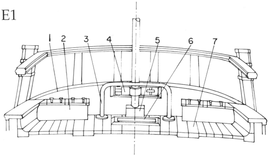


E Fittings

E1 INSIDE TAFFAREL
(scale $^3/_{16}$in = 1ft)

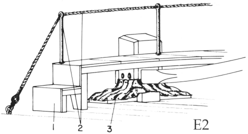
1 Taffarel
2 Flag locker
3 Iron horse
4 Ensign staff bracket
5 Ensign staff step
6 Helmport
7 Quarterdeck

E1

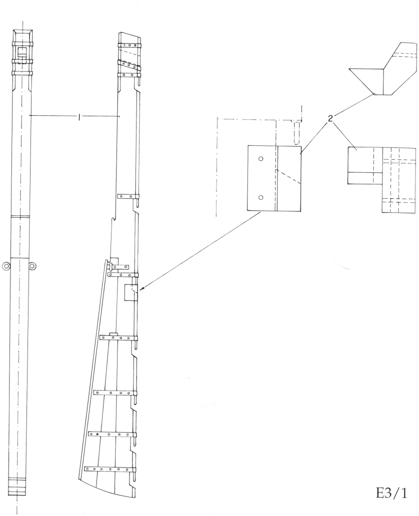


E2 PLATFORM OVER TILLER AND UPPER HELMPORT COAT
(no scale)

1 Platform over the tiller
2 Stanchion and hand rope
3 Helm with a rudder coat closing the quarterdeck helmport



E2

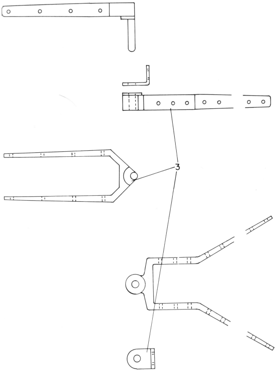


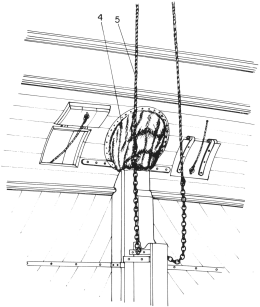
E3/1

E3 STEERING GEAR

E3/1 *Rudder (scale $^{3}/_{16}$in = 1ft)*

1 Rudder with pintles etc.
2 Woodlock (4 x enlarged)
3 Pintle and gudgeon (rudder brace) with copper washer (3 x enlarged)
4 Rudder coat
5 Rudder pendant



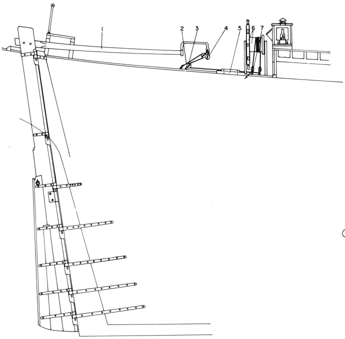


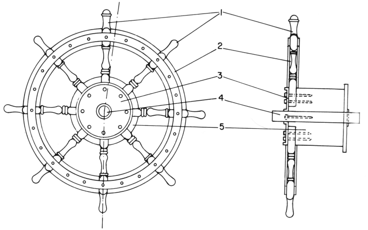
E3/2 Steering arrangement (elevation and plan) (scale $\frac{1}{8}$in = 1ft)

1. Tiller
2. Tiller rope
3. Waterway foot block
4. Tiller blocks
5. Mizzenmast partners
6. Steering wheel
7. Barrel foot block

E3/3 Steering wheel (no scale)

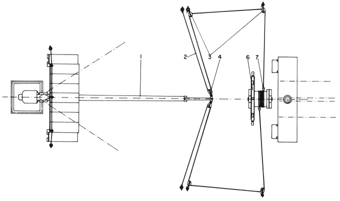
1. Spokes
2. Felloes
3. Hub
4. Axle
5. Barrel
6. Support post
7. Barrel with five turns of tiller rope and foot blocks. The middle rope nailed on top to the barrel

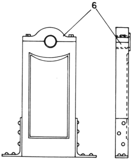


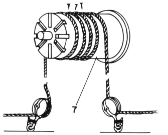


E3/2

E3/3

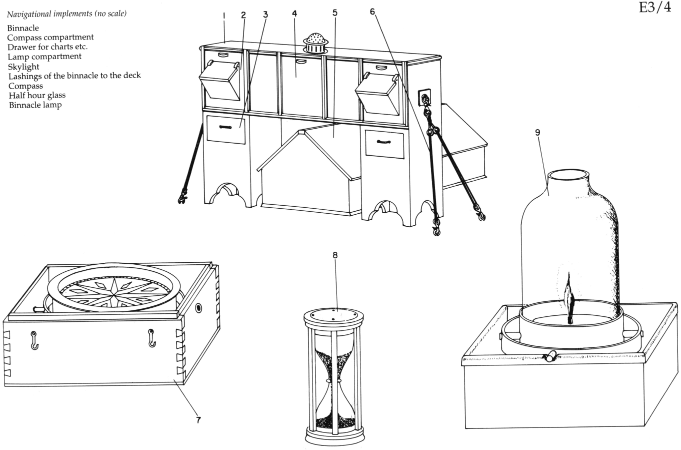






E3/4 *Navigational implements (no scale)*

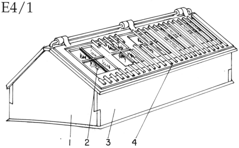
1 Binnacle
2 Compass compartment
3 Drawer for charts etc.
4 Lamp compartment
5 Skylight
6 Lashings of the binnacle to the deck
7 Compass
8 Half hour glass
9 Binnacle lamp



E4 SKYLIGHT AND COMPANION
(no scale)

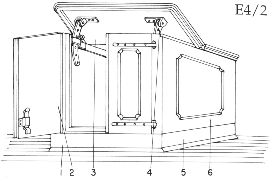
E4/1 Skylight
1 Head ledge
2 Window pane
3 Coaming
4 Protective bars

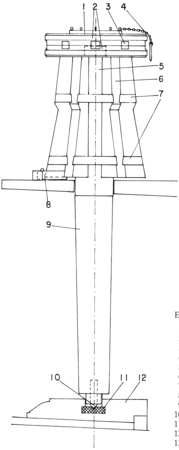
E4/1



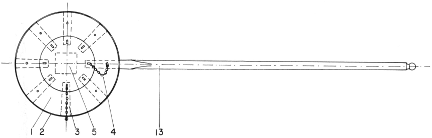
E4/2 Companion capping
1 Coaming
2 Door
3 Roof with trap-door
4 Trap-door latch
5 Head ledge
6 Wall

E4/2

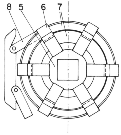


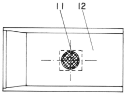


E5



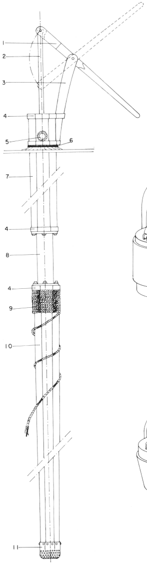
E5 CAPSTAN (scale ½in = 1ft)
1 Drumhead
2 Iron bands
3 Socket
4 Chained hand spike bolt
5 Barrel
6 Whelps
7 Chocks
8 Pawls
9 Spindle
10 Iron peg
11 Iron saucer
12 Capstan step
13 Hand spike

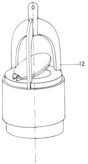




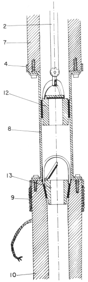
E6 PUMPS (scale ⅜in = 1ft)

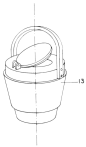
1 Brake
2 Spear
3 Forked stanchion
4 Iron bands
5 Canvas hose
6 Canvas coating over deck opening
7 Raising pipe
8 Pump chamber
9 Woolding
10 Suction pipe
11 Basket
12 Pump shoe
13 Pump bucket





E6

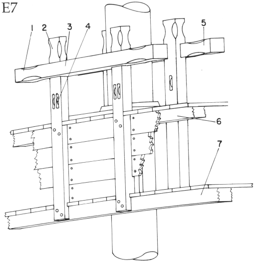




E7 MAINMAST BITS (no scale)

1 Main topsail sheet bits
2 Bit pin
3 Cross-piece
4 Sheaves
5 Main jeer bits
6 Quarterdeck beam
7 Upper deck beam

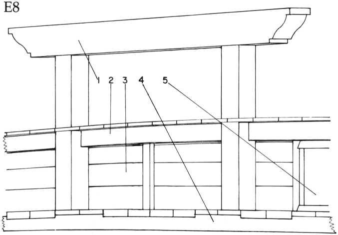
E7



E8 SPAR AND BOAT GALLOWS ON QUARTERDECK (no scale)

1 Gallows
2 Quarterdeck beam
3 Forward bulkhead
4 Upper deck beam
5 Manhole

E8

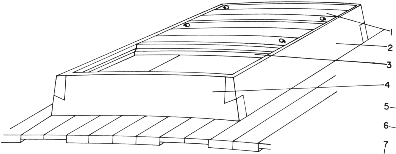


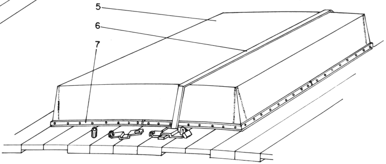
E9 HATCHES (no scale)

E9/1 Main hatchway

1 Hatch or hatch cover
2 Hatch coaming
3 Gutter-ledge
4 Hatch head ledge
5 Tarpaulin
6 Hatch bar with lock
7 Hatch battens

E9/1



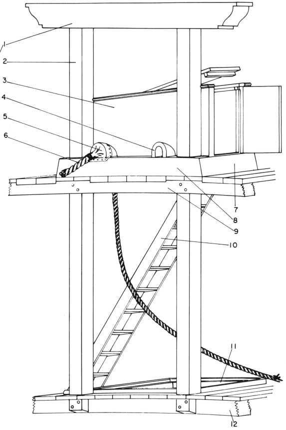


E9/2 Fore hatchway

1 Fore hatch spar and boat gallows
2 Gallows post
3 Hood
4 Cable half-cleat
5 Cable coat (at sea)
6 Anchor cable
7 Hatch coaming
8 Hatch head ledge
9 Upper deck beam
10 Ladderway
11 Lower deck fore hatchway
12 Lower deck beam
13 Alternative hinged hatch cover

E9/3 Fore fall scuttle

1 Hinged cover



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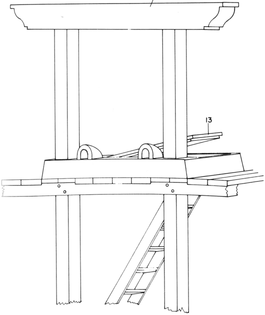

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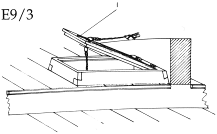


E10 WINDLASS (no scale)

1 Barrel
2 Bit pin
3 Bit cheek
4 Standard
5 Pawl bit
6 Spike socket
7 Pawl notches
8 Pawls
9 Trunnion
10 Whelps
11 Forelock bolt
12 Iron bottom bracket
13 Cable cleats
14 Barrel head
15 Belay cleat
16 Pawl bit belfry side bracket
17 Ship's bell
18 Belfry roof
19 Pinrail
20 Belay pin
21 Cable secured with a norman
22 Freeing the barrel by hanging the cable over the cable cleats

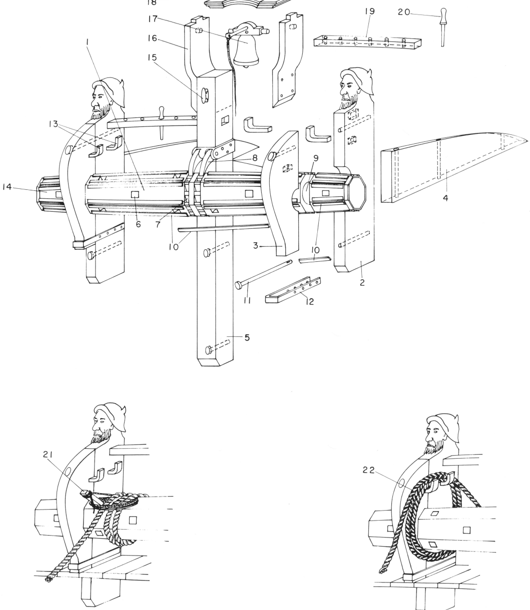
E11 FOREMAST BITS (scale $\frac{3}{8}$in = 1ft)

1 Fore jeer bits
2 Foremast coat
3 Fore topsail sheet bits
4 Forelocked preventer bolt
5 Forelocked bit bolts
6 Bit pin
7 Bowsprit step
8 Bit sheaves
9 Forelocked bolts to secure the bowsprit step
10 Cross-piece

E12 BUMPKIN FITTINGS (scale $\frac{3}{8}$in = 1ft)

1 Support timber bolted to deck
2 Iron bumpkin bracket
3 Bumpkin

E10



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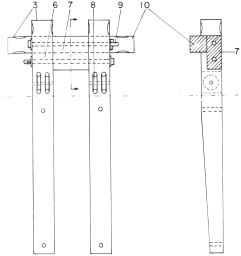

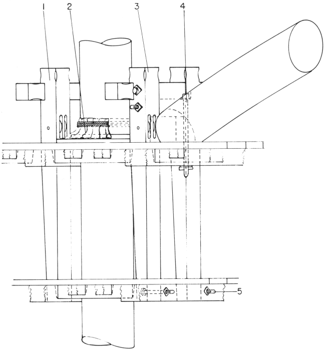

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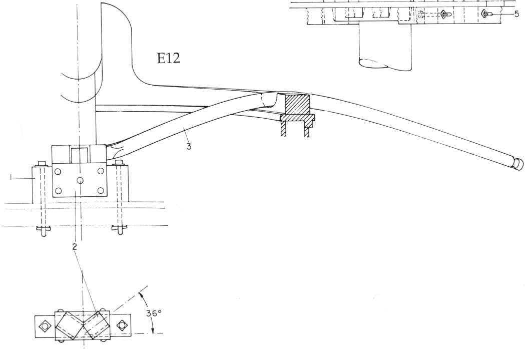


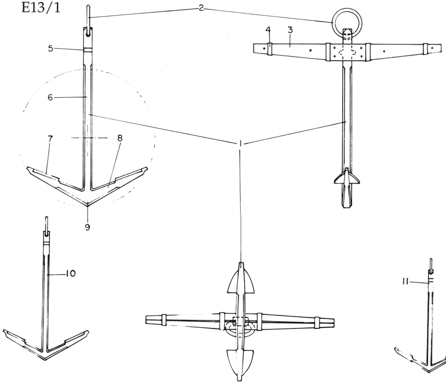
E Fittings

E13 ANCHORS AND ANCHOR TACKLE

E13/1 Anchors (scale $^{3}/_{16}$in = 1ft)

1 Sheet anchor and bower
2 Anchor ring
3 Anchor stock
4 Hoops
5 Nuts
6 Anchor shank or shaft
7 Anchor flukes
8 Anchor arm
9 Anchor crown
10 Stream anchor (stock not shown)
11 Kedge anchor (stock not shown)

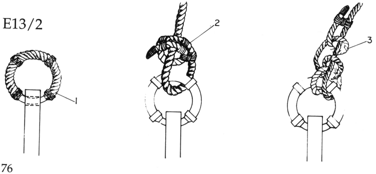
E13/1

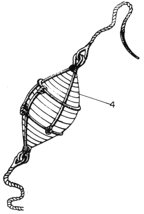


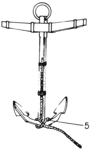
E13/2 Puddening, knots etc. (no scale)

1 Puddening of a ring
2 Cable clinch for larger anchors
3 Fisherman's bend for kedge anchors
4 Anchor buoy with a buoy-rope at the lower end and a short buoy lanyard at the upper
5 Buoy-rope connected to an anchor's shaft and crown

E13/2







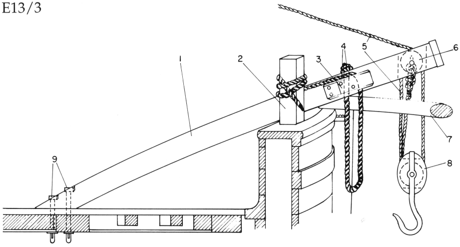
E13/3 Cat-head and cat tackle (scale 3/8in = 1ft)

1 Cat-head
2 Timberhead
3 Thumb cleat
4 Cat-head stopper
5 Cat tackle fall
6 Cat-head sheaves
7 Bumpkin
8 Cat block
9 Forelocked deck bolts

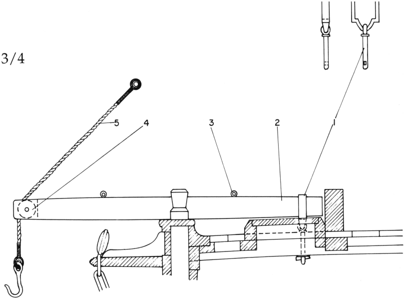
E13/4 Fish davit etc. (scale 3/8in = 1ft)

1 Davit shackle
2 Fish-davit
3 Eye-bolt
4 Open ended sheave
5 Short pendant with fish-hook

E13/3



E13/4



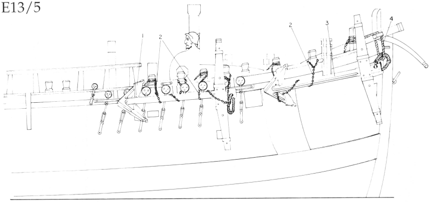
E13/5 Anchors stowed (scale 1/8in = 1ft)

1 Small bower
2 Shank-painter
3 Sheet anchor
4 Cat-head stopper

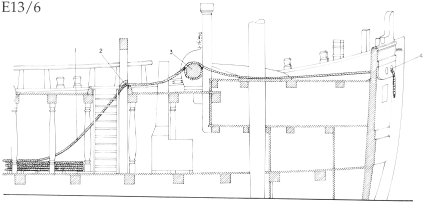
E13/6 Anchor cable from lower deck to hawse hole (scale 1/8in = 1ft)

1 Cable
2 Half-cleat
3 Windlass barrel
4 Hawse hole

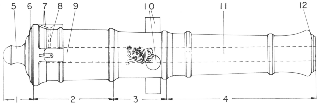
E13/5



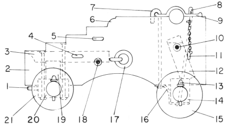
E13/6



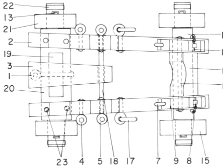
F Armament



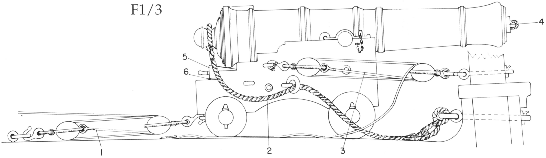
F1/1



F1/2



F1/3



F1 CARRIAGE GUNS (scale ¾in = 1ft)

F1/1 4-pounder gun, side elevation and plan

1 Cascable
2 First reinforcement
3 Second reinforcement
4 Chase
5 Butt
6 Breech
7 Pan
8 Vent
9 Chamber
10 Trunnion
11 Bore
12 Muzzle

F1/2 Gun carriage, side elevation and plan

1 Train tackle eyebolt
2 Bracket
3 Stool bed
4 Gun tackle eyebolt
5 Gun tackle eyebolt
6 Quadrant
7 Capsquare eyebolt
8 Capsquare joint-bolt
9 Capsquare
10 Transom bolt
11 Capsquare key
12 Transom
13 Linch pin
14 Fore axtree
15 Fore truck
16 Axtree stay
17 Breeching ring-bolt
18 Bed-bolt
19 Bolster
20 Rear or hind axtree
21 Rear or hind truck
22 Axtree hoop
23 Bracket bolts

F1/3 Mounted 4-pounder gun

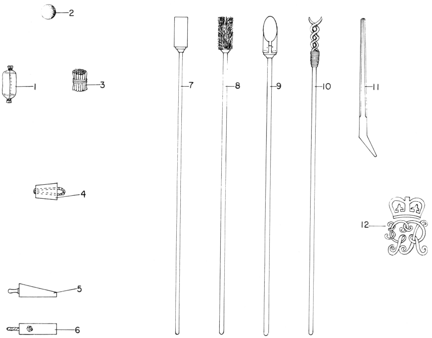
1 Train tackle
2 Breeching
3 Gun tackle
4 Tompion
5 Quoin
6 Quoin underlay

F Armament

F1/4 Ammunition and gun equipment

1 Cartridge bag
2 Round shot
3 Wad
4 Tompion
5 Quoin
6 Quoin underlay
7 Rammer
8 Sponge
9 Ladle
10 Worm
11 Crowbar
12 Gun emblem GEORGE III

F1/4

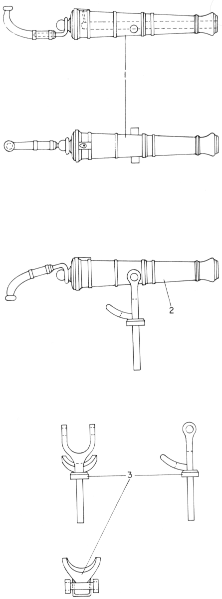


F2 SWIVEL GUNS (scale ¾in = 1ft)

F2/1 Swivel gun

1 Swivel gun with upward bent handle
2 Swivel gun with fork and downward pointing handle
3 Gun fork with semicircular rest for loading and securing

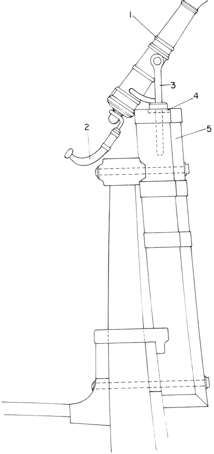
F2/1



F2/2 Mounted swivel gun

1 Swivel gun
2 Handle
3 Fork
4 Iron plate inserted in stock
5 Gun stock

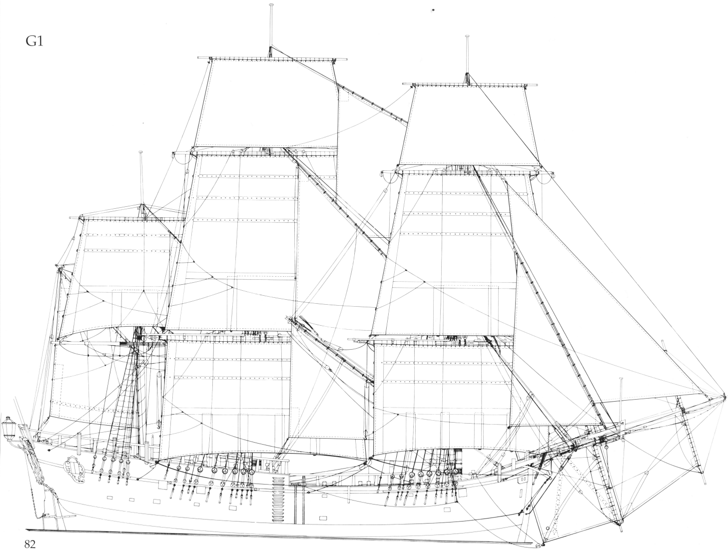
F2/2



G Masts and yards

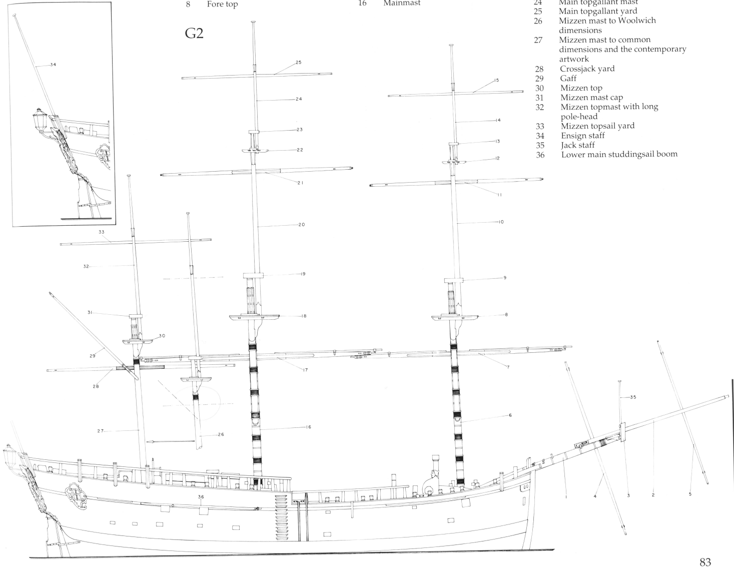
G1 FULLY-RIGGED SHIP
(scale $^{1}/_{16}$in = 1ft)

G1



G2 SHIP WITH ALL MASTS AND SPARS IN POSITION, WITH MIZZENMAST SHOWN BOTH ACCORDING TO COMMON RULES AND TO THE WOOLWICH DIMENSIONS (scale $\frac{1}{16}$in = 1ft)

1 Bowsprit
2 Jib-boom
3 Bowsprit cap
4 Spritsail yard
5 Spritsail topsail yard
6 Foremast
7 Fore yard
8 Fore top
9 Fore mast cap
10 Fore topmast
11 Fore topsail yard
12 Fore topmast trestle-trees
13 Fore topmast cap
14 Fore topgallant mast
15 Fore topgallant yard
16 Mainmast
17 Main yard
18 Main top
19 Mainmast cap
20 Main topmast
21 Main topsail yard
22 Main topmast trestle-trees
23 Main topmast cap
24 Main topgallant mast
25 Main topgallant yard
26 Mizzen mast to Woolwich dimensions
27 Mizzen mast to common dimensions and the contemporary artwork
28 Crossjack yard
29 Gaff
30 Mizzen top
31 Mizzen mast cap
32 Mizzen topmast with long pole-head
33 Mizzen topsail yard
34 Ensign staff
35 Jack staff
36 Lower main studdingsail boom



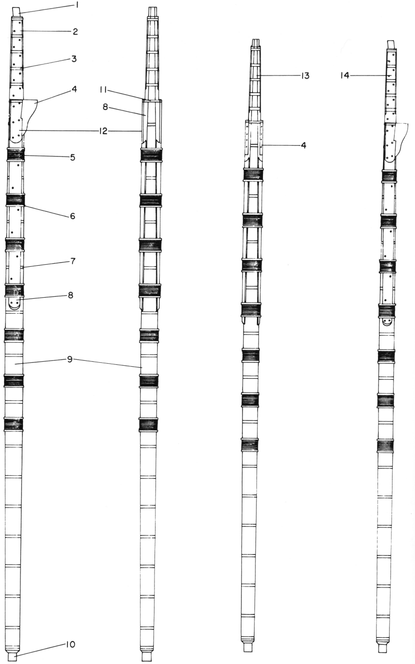
G Masts and yards

G3 LOWER MASTS

G3/1 *Mainmast (side and rear) and foremast (front and side) (scale 1/8in = 1ft)*

1 Cap tenon
2 Masthead
3 Masthead hoop
4 Bib
5 Woolding (13 turns)
6 Woolding timber hoop
7 Mast hoop
8 Cheek
9 Mainmast (side and rear)
10 Mast heel
11 Cheek hoop
12 Hounds
13 Foremast (front)
14 Foremast (side)

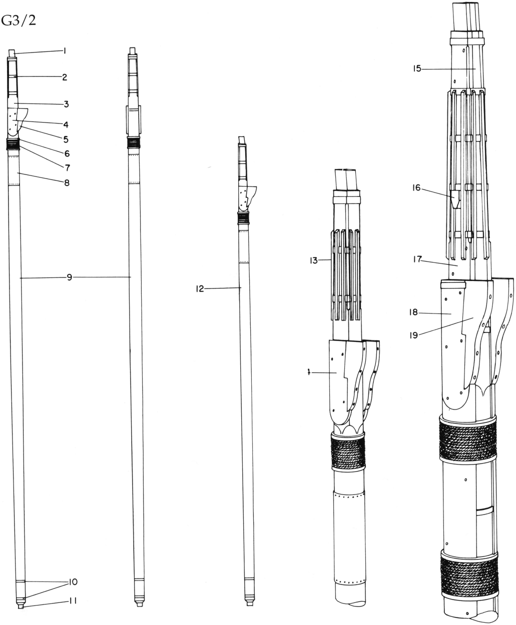
G3/1



G3/2 *Mizzen masts and mastheads (scale ⅛in = 1ft and no scale)*

1 Cap tenon
2 Masthead hoops
3 Masthead
4 Hounds
5 Bibs
6 Woolding hoop
7 Woolding (13 turns)
8 Copper sheathing to prevent chafing by gaff
9 Mizzen mast to common dimensions
10 Hoops above the heel
11 Heel
12 Mizzen mast to Woolwich dimensions
13 Mastbatten
14 Hounds and bibs bolted to mizzen mast
15 Mast spindle
16 Jeer mast cleat
17 Cheek
18 Cheek integrated hounds on main and foremast
19 Bibs (bolted on)

G3/2



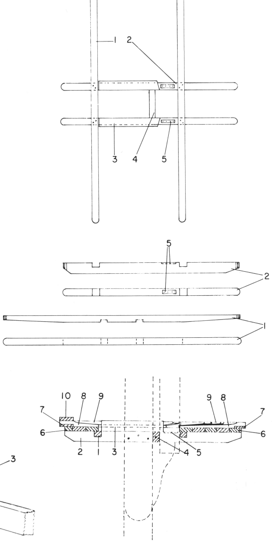
G3/3 Trestle-trees, cross-trees and section through a top (scale 1/4in = 1ft)

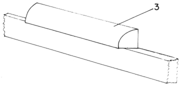
1 Cross-tree
2 Trestle-tree
3 Bolster
4 Middle chock
5 Fid plate
6 Deals
7 Rim
8 Batten
9 Filling
10 Gunwale

G3/4 Lower mast caps (scale 1/2in = 1ft)

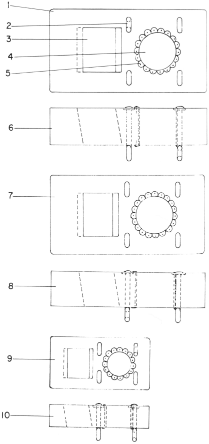
1 Mainmast cap (lower side)
2 Eyebolts
3 Hole for mast tenon
4 Hole for topmast
5 Leather cuff
6 Mainmast cap (side)
7 Foremast cap (lower side)
8 Foremast cap (side)
9 Mizzenmast cap (lower side)
10 Mizzenmast cap (side)

G3/3

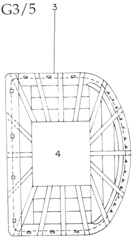


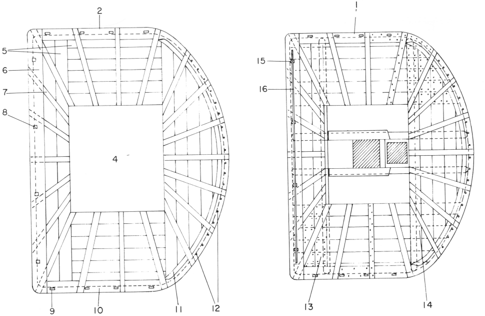


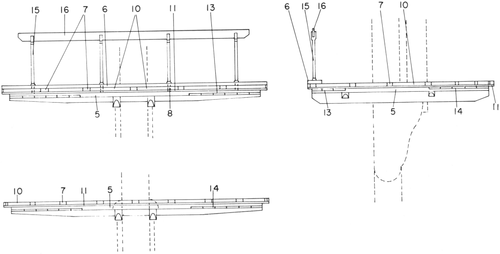
G3/4



G3/5







G3/5 Mast tops (scale ¼in = 1ft)

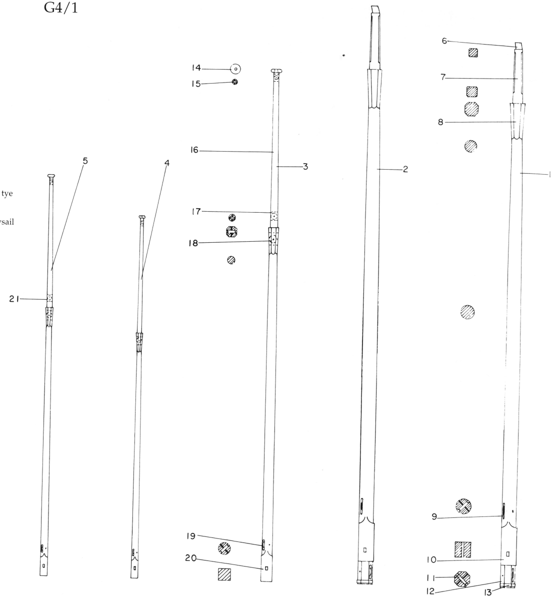
1 Foremast top, fitted to its trestle and cross-trees
2 Mainmast top
3 Mizzenmast top
4 Lubber's hole
5 Deals
6 Gunwale
7 Batten
8 Square mortises for stanchion
9 Rectangular mortises for futtocks
10 Filling between battens
11 Rim
12 14 or 18 Crowsfeet holes
13 Deal overlapping (rear)
14 Deal overlapping (front)
15 Rail stanchion
16 Rail

G4 TOPMASTS AND TOPGALLANT MASTS

G4/1 Topmasts and topgallant masts (scale 1/8in = 1ft)

1 Fore topmast
2 Main topmast
3 Mizzen topmast
4 Fore topgallant mast
5 Main topgallant mast
6 Topmast tenon
7 Topmast-head
8 Topmast hounds
9 Upper top-rope sheave
10 Square heeling with fid hole
11 Lower top-rope sheave
12 Block
13 Block hoop
14 Truck
15 Flag line sheave
16 Long polehead
17 Sheave for mizzen top staysail halyard
18 Sheave for mizzen topsail yard tye
19 Sheave for topgallant top-rope
20 Square heeling with fid hole
21 Sheave for main topgallant staysail

G4/1



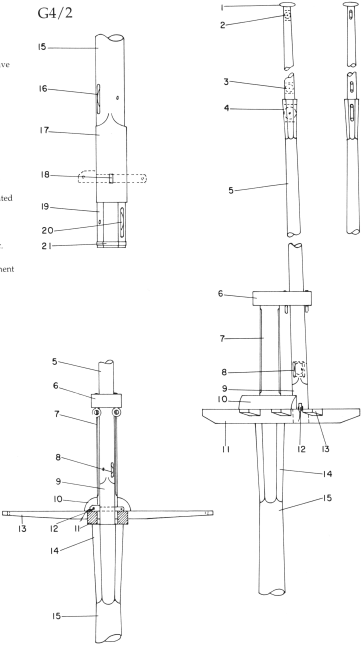
G4/2 *Details of topmasts and topgallant masts (scale 3/8in = 1ft)*

1 Topgallant mast truck
2 Flag line sheave
3 Staysail halyard sheave
4 Topgallant hounds with tye sheave
5 Topgallant mast
6 Topmast cap
7 Topmast-head
8 Topgallant top-rope sheave
9 Heeling
10 Bolster
11 Trestle-tree
12 Topgallant mast fid
13 Cross-tree
14 Topmast hounds
15 Topmast
16 Topmast upper top-rope sheave
17 Topmast heeling
18 Topmast fid hole with fid indicated
19 Topmast block
20 Topmast lower top-rope sheave
21 Block hoop

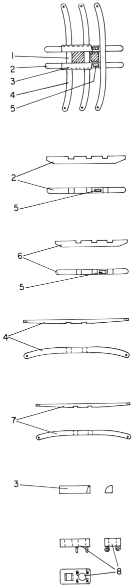
G4/3 *Topmast trestle- and cross-trees etc. (scale 3/16in = 1ft)*

1 Trestle- and cross-tree arrangement
2 Main topmast trestle-tree
3 Bolster
4 Main topmast cross-tree
5 Inserted fid plate
6 Fore topmast trestle-tree
7 Fore topmast cross-tree
8 Topmast cap

G4/2

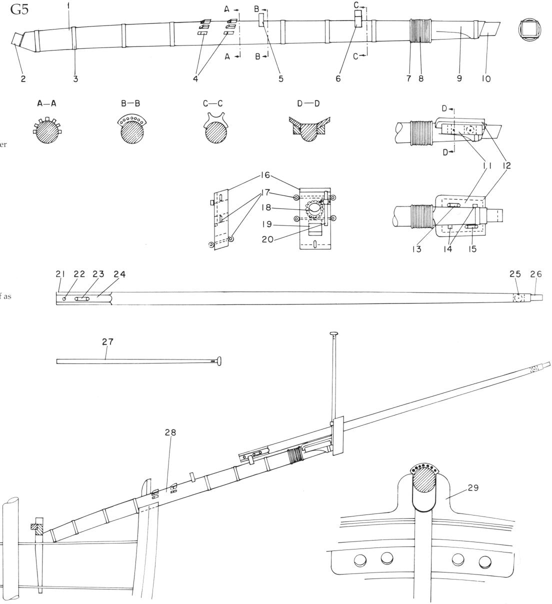


G4/3



G5 BOWSPRIT AND JIB-BOOM (scale 3/16in = 1ft)

1 Bowsprit
2 Heel tenon
3 Hoop
4 Gammoning cleats
5 Fairlead saddle
6 Jib-boom saddle
7 Woolding hoop
8 Woolding (13 turns)
9 Square
10 Cap tenon
11 Bee block
12 Bee
13 Sheave for fore topmast preventer stay
14 Holes for emergency stays
15 Sheave for fore topmast stay
16 Bowsprit cap
17 Eyebolts
18 Leather clad jib-boom hole
19 Square tenon hole
20 Jackstaff channel
21 Jib-boom
22 Hole for jib-boom lashing
23 Sheave for jib-boom outhauler
24 Octagonal jib-boom heeling
25 Sheave for traveller outhauler
26 Jib-boom stop
27 Jackstaff
28 Bowsprit, jib-boom and jackstaff as fitted (2/3 scale)
29 Bow with bowsprit between knightheads

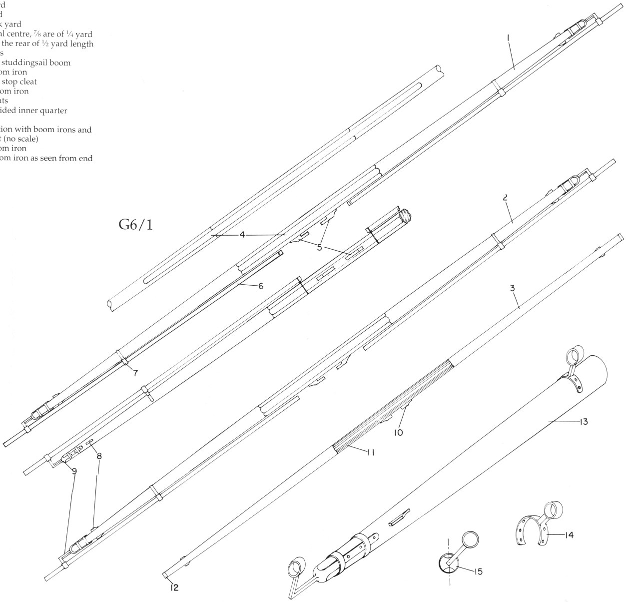


G6 YARDS (scale $\frac{3}{16}$in = 1ft)

G6/1 Lower yards

1 Main yard
2 Fore yard
3 Crossjack yard
4 Octagonal centre, $\frac{7}{8}$ are of $\frac{1}{4}$ yard and $\frac{1}{8}$ at the rear of $\frac{1}{2}$ yard length
5 Jeer cleats
6 Topmast studdingsail boom
7 Inner boom iron
8 Yardarm stop cleat
9 Outer boom iron
10 Sling cleats
11 Sixteen-sided inner quarter
12 Ferule
13 Yard section with boom irons and stop cleat (no scale)
14 Inner boom iron
15 Outer boom iron as seen from end on

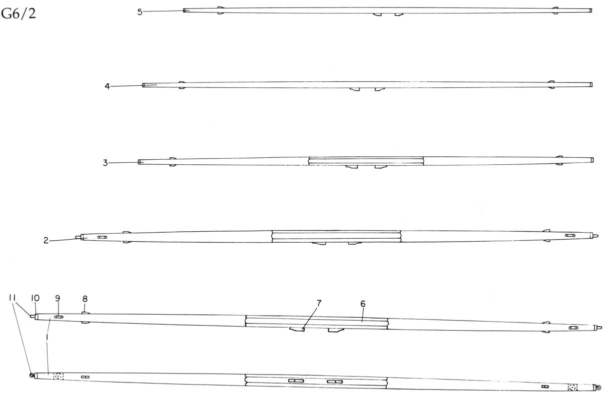
G6/1



G6/2 Topsail and topgallant yards

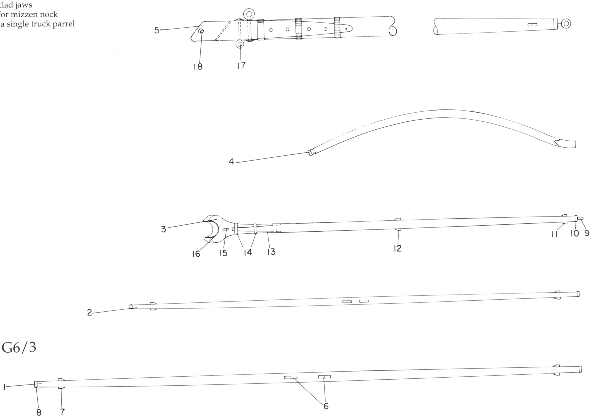
1 Main topsail yard (side and plan)
2 Fore topsail yard
3 Mizzen topsail yard
4 Main topgallant yard
5 Fore topgallant yard
6 Octagonal centre, ¼ of the yard long
7 Tye cleats
8 Yardarm stop cleats
9 Yardarm sheave for reef tackle
10 Ferule
11 Ringbolt for jewel block

G6/2



G6/3 *Spritsail and sprit-topsail yard, gaff and bumpkin*

1 Spritsail yard
2 Spritsail topsail yard
3 Gaff
4 Bumpkin
5 Gaff (enlarged)
6 Sling cleats
7 Yardarm stop cleats
8 Ferule
9 Eyebolt for flying signals or hoisting the driver
10 Peak ferule
11 Peak stop cleats
12 Cleats for peak halyard block
13 Tongue of jaws
14 Hoop
15 Eyebolt for the gaff's sling
16 Leather clad jaws
17 Eyebolt for mizzen nock
18 Hole for a single truck parrel

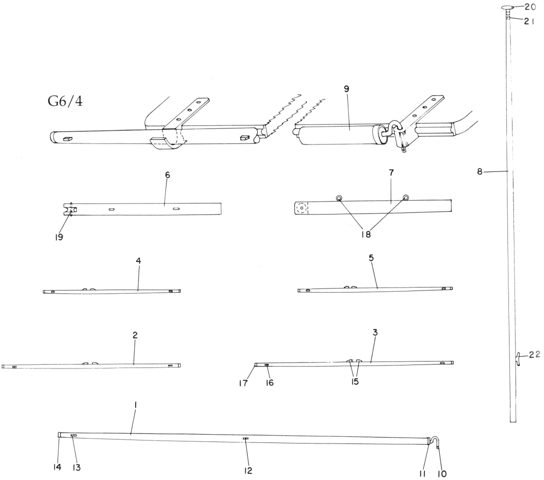


G6/3

G6/4 Studdingsail boom, yards and anchor davit

1 Lower main studdingsail boom
2 Fore lower studdingsail yard
3 Main lower studdingsail yard
4 Fore topmast studdingsail yard
5 Main topmast studdingsail yard
6 Anchor davit (plan)
7 Anchor davit (side)
8 Ensign staff
9 Main studdingsail boom placed outside the main channel
10 Gooseneck
11 Gooseneck ferule
12 Middle cleats for boom guys, martingale and lift
13 Stop cleat for tack block
14 Ferrule
15 Halyard cleats
16 Stop cleats
17 Ferule
18 Eyebolts for lifting
19 Sheave for fish-hook pendant
20 Truck
21 Flag line sheave
22 Belay cleat

G6/4

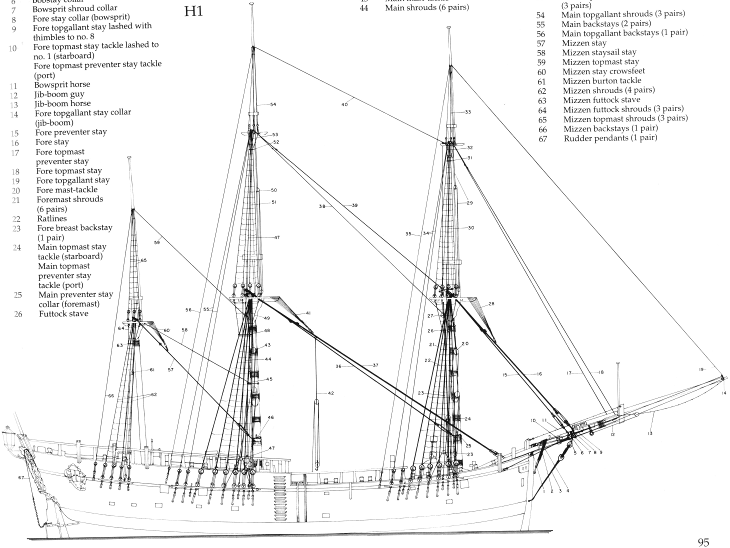


H Standing rigging

H1 PROFILE OF SHIP WITH STANDING RIGGING (scale $\frac{1}{16}$in = 1ft)

1 Inner gammoning
2 Outer gammoning
3 Bobstay
4 Bowsprit shrouds
5 Fore preventer stay collar (bowsprit)
6 Bobstay collar
7 Bowsprit shroud collar
8 Fore stay collar (bowsprit)
9 Fore topgallant stay lashed with thimbles to no. 8
10 Fore topmast stay tackle lashed to no. 1 (starboard)
Fore topmast preventer stay tackle (port)
11 Bowsprit horse
12 Jib-boom guy
13 Jib-boom horse
14 Fore topgallant stay collar (jib-boom)
15 Fore preventer stay
16 Fore stay
17 Fore topmast preventer stay
18 Fore topmast stay
19 Fore topgallant stay
20 Fore mast-tackle
21 Foremast shrouds (6 pairs)
22 Ratlines
23 Fore breast backstay (1 pair)
24 Main topmast stay tackle (starboard)
Main topmast preventer stay tackle (port)
25 Main preventer stay collar (foremast)
26 Futtock stave
27 Fore futtock shrouds (4 pairs)
28 Fore stay crowsfeet
29 Burton tackle
30 Fore topmast shrouds (4 pairs)
31 Fore topmast futtock stave
32 Fore topmast futtocks (3 pairs)
33 Fore topgallant mast shrouds (3 pairs)
34 Fore backstays (2 pairs)
35 Fore topgallant backstay (1 pair)
36 Main preventer stay
37 Main stay
38 Main topmast preventer stay
39 Main topmast stay
40 Main topgallant stay
41 Main stay crowsfeet
42 Stay tackle
43 Main mast-tackle
44 Main shrouds (6 pairs)
45 Mizzen staysail stay collar (mainmast)
46 Mizzen stay collar (mainmast)
47 Main breast backstay (1 pair)
48 Main futtock stave
49 Main futtock shrouds (4 pairs)
50 Main topmast burton tackle
51 Main topmast shrouds (4 pairs)
52 Main topmast futtock stave
53 Main topmast futtock shrouds (3 pairs)
54 Main topgallant shrouds (3 pairs)
55 Main backstays (2 pairs)
56 Main topgallant backstays (1 pair)
57 Mizzen stay
58 Mizzen staysail stay
59 Mizzen topmast stay
60 Mizzen stay crowsfeet
61 Mizzen burton tackle
62 Mizzen shrouds (4 pairs)
63 Mizzen futtock stave
64 Mizzen futtock shrouds (3 pairs)
65 Mizzen topmast shrouds (3 pairs)
66 Mizzen backstays (1 pair)
67 Rudder pendants (1 pair)

H1



H Standing rigging

H2 SHROUDS

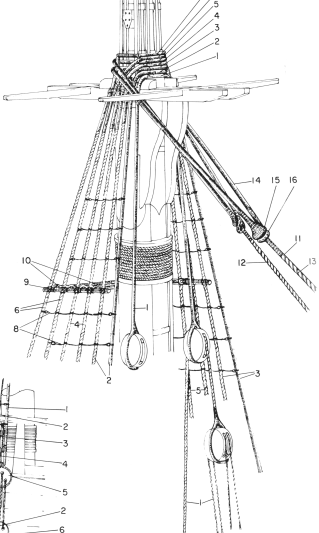
H2/1 Lower masthead with tackle, shrouds and stays (no scale)

1 Mast tackle with pendant, runner and fall
2 1st shroud pair (starboard). Foremost shrouds are served over for protection
3 2nd shroud pair (port)
4 3rd shroud pair (starboard)
5 4th shroud pair (port)
6 5th shroud pair (starboard)
7 6th shroud pair (port)
8 Ratlines; only every 6th goes to the aftermost shroud
9 Futtock stave
10 Catharpins
11 Stay
12 Preventer stay
13 Worming
14 Loop or collar (served)
15 Mouse (pointed over)
16 Eye (pointed over)

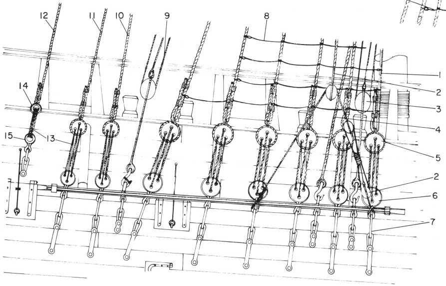
H2/2 Shrouds, backstays etc. on channel no scale)

1 Shroud
2 Breast backstay
3 Mast tackle (long stropped block)
4 Mast tackle (runner)
5 Turned-in dead eye
6 Iron-bound dead eye
7 Chain
8 Ratline
9 Topsail yard tye tackle
10 1st backstay
11 2nd backstay
12 Topgallant backstay
13 Laniards
14 Turned-in thimble
15 Iron-bound thimble

H2/1



H2/2



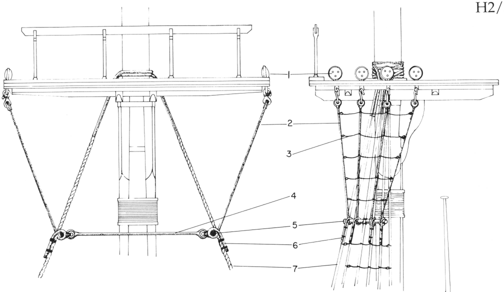
H2/3 Mast top with futtock shrouds and catharpins (scale ¼in = 1ft)

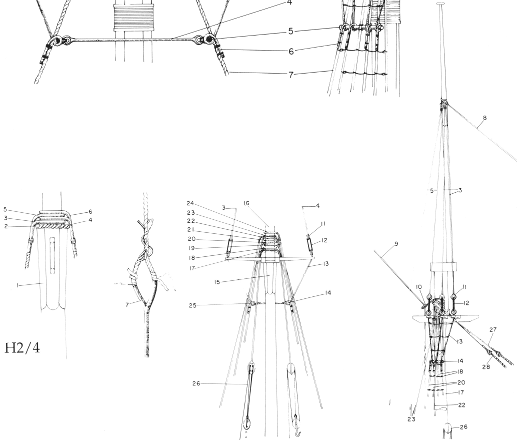
1. Futtock dead eye
2. Futtock shroud
3. Ratline
4. Catharpins
5. Futtock stave
6. Futtock shroud lashed to shroud
7. Shroud

H2/4 Topmast and topgallant shrouds etc. (no scale)

1. Topgallant hounds (enlarged)
2. Grommet
3. 1st pair of shrouds (starboard)
4. 2nd pair of shrouds (port)
5. 3rd pair, combination of shroud and backstay (starboard)
6. 4th pair, combination of shroud and backstay (port)
7. A cut splice as used for mast tackles etc.
8. Fore topgallant stay
9. Main topgallant stay
10. Main topgallant collar with thimble
11. Thimble
12. Lashing
13. Topmast futtock shrouds with thimble
14. Topmast futtock stave
15. Topmast hounds
16. Topmast-head
17. Burton pendant
18. 1st pair of topmast shrouds (starboard)
19. 2nd pair of topmast shrouds (port)
20. 3rd pair of topmast shrouds (starboard)
21. 4th pair of topmast shrouds (port)
22. Breast backstays
23. 1st pair of backstays (starboard)
24. 2nd pair of backstays (port)
25. Catharpins
26. Burton tackle
27. Fore topmast stay
28. Fore topmast preventer stay

H2/3



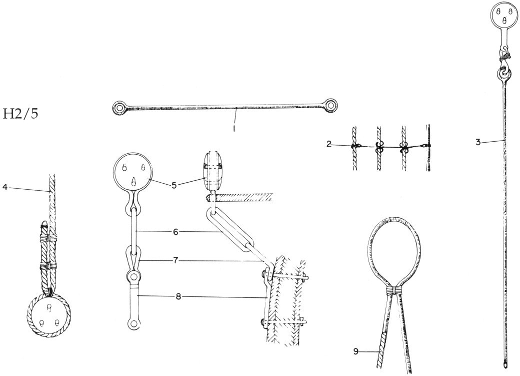


H2/4

H2/5 Shroud details (no scale)

1 Catharpin leg
2 Ratline, clove hitched and lashed with an eye at the ends
3 Futtock shroud with hook and thimble secured to a futtock dead eye
4 Turned-in dead eye with its eye, throat and end seizings
5 Iron-bound channel dead eye
6 Upper link
7 Middle link
8 Preventer link
9 Eye of a shroud pair with its seizing

H2/5

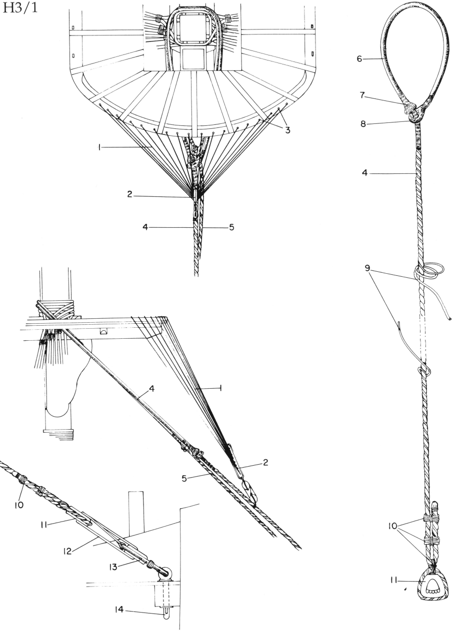


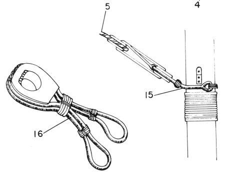
H3 STAYS (no scale)

H3/1 Main stay and top details

1 Crowsfeet
2 Euphroe with tackle
3 Crowsfeet holes at rim of top
4 Stay
5 Preventer stay
6 Collar
7 Mouse
8 Eye
9 Worming
10 Seizing
11 Heart (turned-in)
12 Laniard
13 Heart (stropped with thimble)
14 Forelocked eyebolt
15 Preventer and mizzen stay collar with a heart
16 Double stropped collar with a heart

H3/1

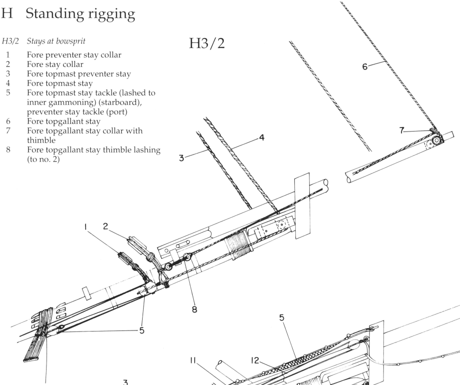




H3/2 Stays at bowsprit

1 Fore preventer stay collar
2 Fore stay collar
3 Fore topmast preventer stay
4 Fore topmast stay
5 Fore topmast stay tackle (lashed to inner gammoning) (starboard), preventer stay tackle (port)
6 Fore topgallant stay
7 Fore topgallant stay collar with thimble
8 Fore topgallant stay thimble lashing (to no. 2)

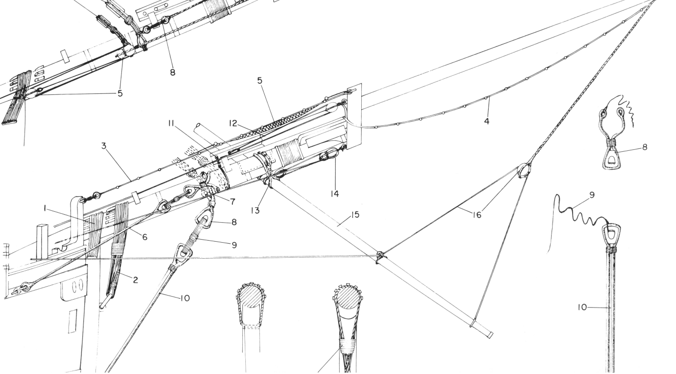
H3/2



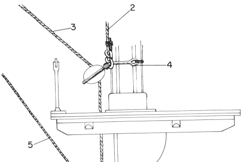
H3/3 Further details of bowsprit

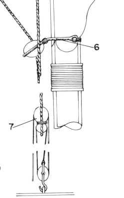
1 Inner gammoning
2 Outer gammoning
3 Bowsprit horse
4 Jib-boom horse
5 Netting for fore topmast staysail
6 Bowsprit shroud
7 Bowsprit shroud collar
8 Bobstay collar
9 Lashing
10 Bobstay
11 Jib-boom lashing
12 Jib-boom outhauler
13 Spritsail yard sling
14 Spritsail yard halyard
15 Spritsail yard
16 Jib-boom guy

H3/3



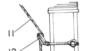
H3/4

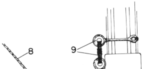




H3/4 Further details of stays

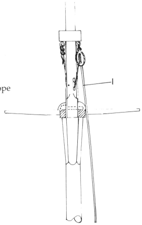
1. Topgallant stay collar
2. Main topgallant stay (hitched to main topmast stay collar)
3. Main topmast stay
4. Main topmast stay collar (with lead block)
5. Main topmast preventer stay
6. Main topmast preventer stay collar (with lead block)
7. Main topmast stay tackle (starboard). Main topmast preventer stay tackle (port)
8. Mizzen topmast stay
9. Mizzen topmast stay collar (masthead) and thimble lashing
10. Mizzen topmast stay collar (hounds) with lead thimble
11. Mizzen staysail stay
12. Mizzen staysail stay collar with lead thimble
13. Mizzen staysail stay (deck lashing with thimble and eyebolt)



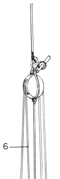


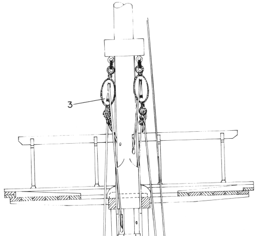
H4 TOP-ROPES AND TACKLE

1. Topgallant mast top-rope fitted
2. Topgallant top-rope foot block
3. Topmast top-rope blocks
4. Lower top-rope
5. Upper top-rope
6. Top-tackle connected to a top-rope

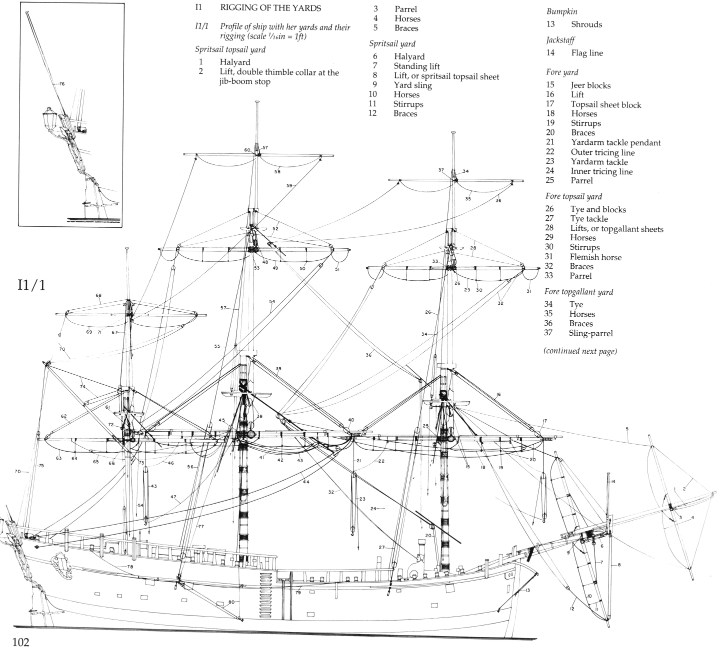


H4





I Running rigging



I1/1

I1 RIGGING OF THE YARDS

I1/1 Profile of ship with her yards and their rigging (scale $\frac{1}{16}$in = 1ft)

Spritsail topsail yard

1 Halyard
2 Lift, double thimble collar at the jib-boom stop
3 Parrel
4 Horses
5 Braces

Spritsail yard

6 Halyard
7 Standing lift
8 Lift, or spritsail topsail sheet
9 Yard sling
10 Horses
11 Stirrups
12 Braces

Bumpkin

13 Shrouds

Jackstaff

14 Flag line

Fore yard

15 Jeer blocks
16 Lift
17 Topsail sheet block
18 Horses
19 Stirrups
20 Braces
21 Yardarm tackle pendant
22 Outer tricing line
23 Yardarm tackle
24 Inner tricing line
25 Parrel

Fore topsail yard

26 Tye and blocks
27 Tye tackle
28 Lifts, or topgallant sheets
29 Horses
30 Stirrups
31 Flemish horse
32 Braces
33 Parrel

Fore topgallant yard

34 Tye
35 Horses
36 Braces
37 Sling-parrel

(continued next page)

Main yard

38 Jeer blocks
39 Lift
40 Topsail sheet block
41 Horses
42 Stirrups
43 Yardarm tackle
44 Braces
45 Parrel
46 Outer tricing line
47 Inner tricing line

Main topsail yard

48 Tye block
49 Horses
50 Stirrups
51 Flemish horse
52 Lift, or topgallant sheet
53 Parrel
54 Braces
55 Tye
56 Tye tackle

Main topgallant yard

57 Tye
58 Horses
59 Braces
60 Sling-parrel

Crossjack yard

61 Yard slings
62 Lift
63 Horses
64 Stirrups
65 Braces
66 Truss

Mizzen topsail yard

67 Tye
68 Lift
69 Horses
70 Braces
71 Parrel

Gaff

72 Slings
73 Parrel
74 Peak halyard
75 Vangs

Ensign staff

76 Flag line

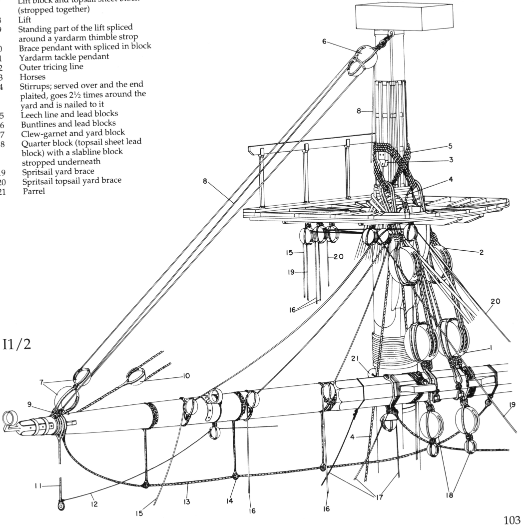
Main lower studdingsail boom

77 Lift
78 After guy
79 Forward guy
80 Martingale

I1/2 *Lower yards (no scale)*

1 Jeer double blocks (double stropped yard blocks)
2 Jeer double blocks (double stropped mast blocks)
3 Masthead jeer block cleat
4 Jeers
5 Jeer mast block lashing
6 Fiddle block (stropped with thimble)
7 Lift block and topsail sheet block (stropped together)
8 Lift
9 Standing part of the lift spliced around a yardarm thimble strop
10 Brace pendant with spliced in block
11 Yardarm tackle pendant
12 Outer tricing line
13 Horses
14 Stirrups; served over and the end plaited, goes 2½ times around the yard and is nailed to it
15 Leech line and lead blocks
16 Buntlines and lead blocks
17 Clew-garnet and yard block
18 Quarter block (topsail sheet lead block) with a slabline block stropped underneath
19 Spritsail yard brace
20 Spritsail topsail yard brace
21 Parrel

I1/2

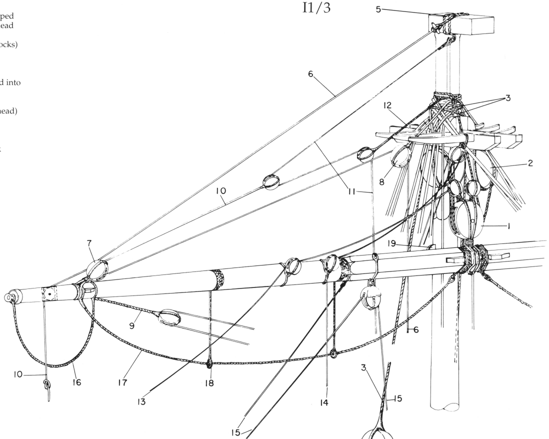


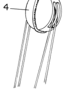
I Running rigging

I1/3 Topsail yards (no scale)

1 Tye double block (double stropped yard block with two leech line lead blocks stropped to its head)
2 Tye single blocks (masthead blocks)
3 Tye
4 Tye tackle's upper block
5 Topmast cap lift strop
6 Lift, or topgallant sheet (toggled into an eye strop)
7 Lift block (yardarm)
8 Long stropped lift block (masthead)
9 Braces
10 Reef tackle pendant
11 Reef tackle fall
12 Long stropped reef tackle block (masthead)
13 Leech line
14 Buntline
15 Clew line
16 Flemish horse
17 Horses
18 Stirrups
19 Parrel

I1/3

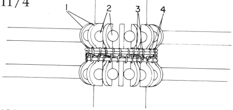


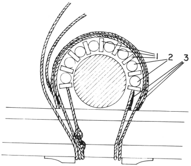


I1/4 Parrel (enlarged) (no scale)

1 Ribs
2 Trucks
3 Parrel rope
4 Marling

I1/4

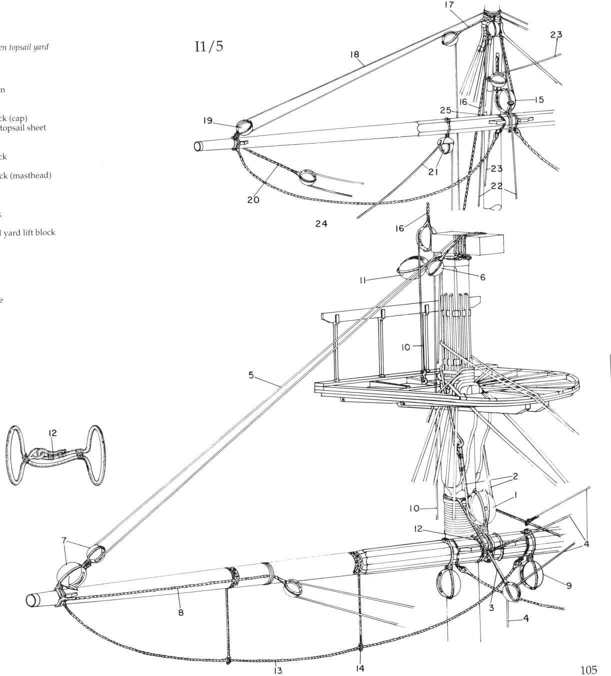




I1/5 Crossjack yard and mizzen topsail yard (no scale)

1 Yard sling block
2 Slings
3 Main topsail brace span
4 Main topsail braces
5 Lift
6 Long stropped lift block (cap)
7 Lift block stropped to topsail sheet block (yardarm)
8 Braces
9 Topsail sheet lead block
10 Topsail yard tye fall
11 Gaff peak halyard block (masthead)
12 Sling-parrel
13 Horses
14 Stirrups
15 Topsail yard tye block
16 Topsail yard tye
17 Long stropped topsail yard lift block (masthead)
18 Topsail yard lift
19 Yardarm lift block
20 Topsail yard braces
21 Clew lines
22 Buntline
23 Main topgallant brace
24 Horses
25 Parrel

I1/5



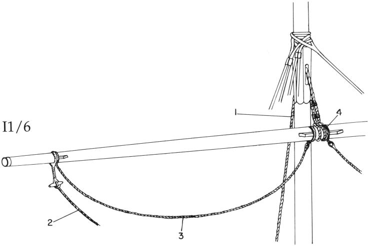
I1/6 Topgallant yard (no scale)

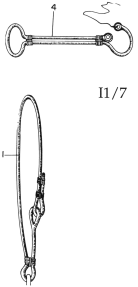
1 Tye
2 Braces (toggled)
3 Horses
4 Sling-parrel

I1/7 Gaff (no scale)

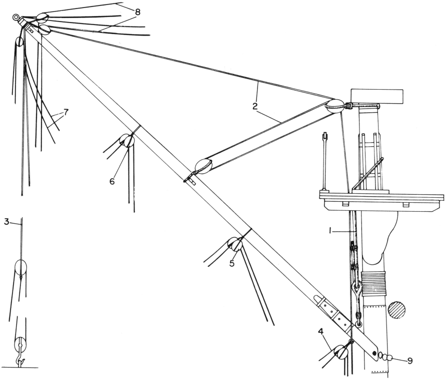
1 Slings
2 Peak halyard
3 Vangs
4 Throat brails
5 Middle brails
6 Peak brails
7 Fancy line
8 Mizzen topsail yard braces, standing part fastened to the gaff's peak
9 Parrel

I1/6





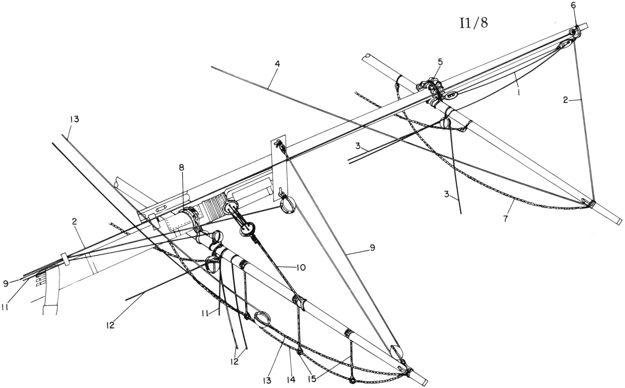
I1/7



I1/8 Spritsail yard and spritsail topsail yard (no scale)

1 Spritsail topsail yard halyard
2 Lift
3 Clewline
4 Braces
5 Parrel
6 Lift collar (two thimble collar at jib-boom stop)
7 Horses
8 Spritsail yard slings
9 Lift or spritsail topsail sheet
10 Standing lift
11 Buntline
12 Clew line
13 Braces
14 Horses
15 Stirrups

I1/8

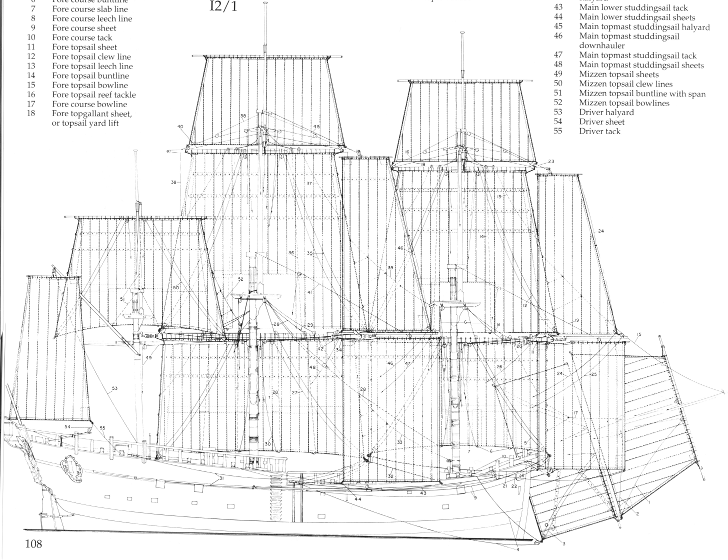


I2 RIGGING OF THE SQUARE SAILS

I2/1 Profile of ship with all square sails rigged (scale $^1/_{16}$in = 1ft)

1 Spritsail topsail clew line
2 Spritsail topsail sheet
3 Spritsail course clew line
4 Spritsail course sheet
5 Fore course clew-garnet
6 Fore course buntline
7 Fore course slab line
8 Fore course leech line
9 Fore course sheet
10 Fore course tack
11 Fore topsail sheet
12 Fore topsail clew line
13 Fore topsail leech line
14 Fore topsail buntline
15 Fore topsail bowline
16 Fore topsail reef tackle
17 Fore course bowline
18 Fore topgallant sheet, or topsail yard lift
19 Fore lower studdingsail halyard
20 Fore lower studdingsail inner halyard
21 Fore lower studdingsail sheets
22 Fore lower studdingsail tack
23 Fore topmast studdingsail halyard
24 Fore topmast studdingsail downhauler
25 Fore topmast studdingsail tack
26 Fore topmast studdingsail sheets
27 Main course clew-garnet
28 Main course buntline
29 Main course leech line
30 Main course slab line
31 Main course sheet
32 Main course tack
33 Main course bowline
34 Main topsail sheet
35 Main topsail clew line
36 Main topsail buntline
37 Main topsail leech line
38 Main topsail reef tackle
39 Main topsail bowline
40 Main topgallant sheet, or topsail yard lift
41 Main lower studdingsail halyard
42 Main lower studdingsail inner halyard
43 Main lower studdingsail tack
44 Main lower studdingsail sheets
45 Main topmast studdingsail halyard
46 Main topmast studdingsail downhauler
47 Main topmast studdingsail tack
48 Main topmast studdingsail sheets
49 Mizzen topsail sheets
50 Mizzen topsail clew lines
51 Mizzen topsail buntline with span
52 Mizzen topsail bowlines
53 Driver halyard
54 Driver sheet
55 Driver tack

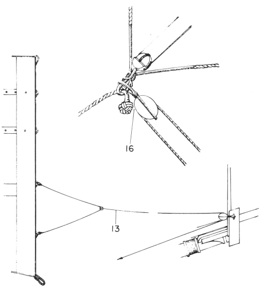
I2/1

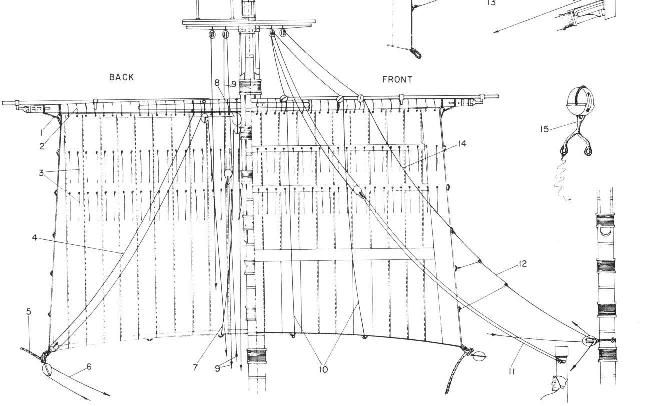


I2/2 Main and fore course rigging (scale 1/8in = 1ft)

1 Earing lashings
2 Robands
3 Reefpoints
4 Clew-garnet
5 Tacks
6 Sheets
7 Slab lines
8 Quarter block with slab line block stropped
9 Buntlines, leading aft on a fore course
10 Buntlines
11 Buntlines, leading forward on a main course
12 Main course bowlines, leading through a double block on the foremast
13 Fore course bowlines, leading to single blocks on the bowsprit cap
14 Leech lines
15 Clew-garnet, or clew line block
16 Course clew, with tack, sheet block with sheet, and clew-garnet block fitted to the clew-rope

I2/2

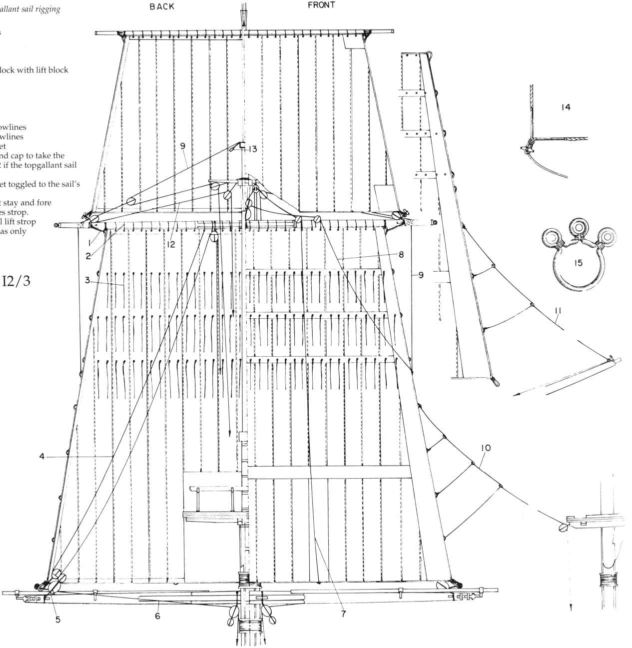




I2/3 Topsail and topgallant sail rigging (scale 1/8in = 1ft)

1 Earing lashings
2 Robands
3 Reefpoints
4 Clew line
5 Topsail sheet block with lift block stropped
6 Sheet
7 Buntline
8 Leech line
9 Reef tackle
10 Main topsail bowlines
11 Fore topsail bowlines
12 Topgallant sheet
13 Eye strop around cap to take the toggle of no. 12 if the topgallant sail is not hoisted
14 Topgallant sheet toggled to the sail's clew
15 Fore topgallant stay and fore topsail bowlines strop. Spritsail topsail lift strop is similar but has only two thimbles

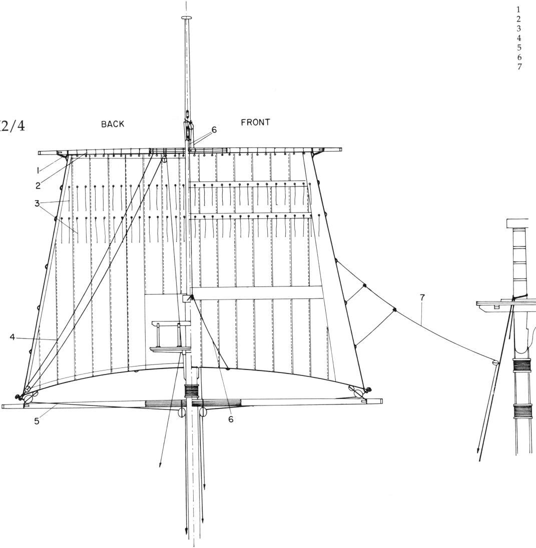
I2/3



I2/4 Mizzen topsail rigging (scale ⅛in = 1ft)

1. Earing lashings
2. Robands
3. Reefpoints
4. Clew lines
5. Sheets
6. Buntline with a span
7. Bowlines

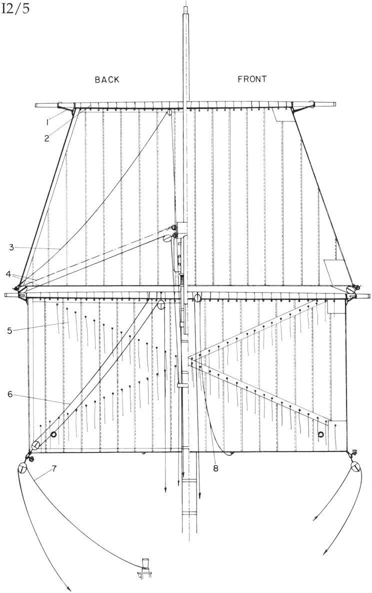
I2/4



I2/5 Spritsail topsail and spritsail course rigging (scale ⅛in = 1ft)

1 Earing lashings
2 Robands
3 Clew line
4 Spritsail topsail sheet or spritsail yard lift
5 Reefpoints
6 Clew line
7 Spritsail course sheets
8 Buntline

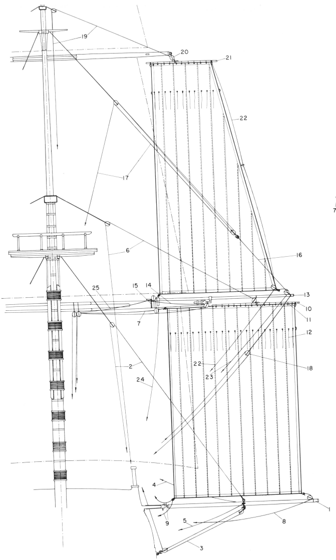
I2/5



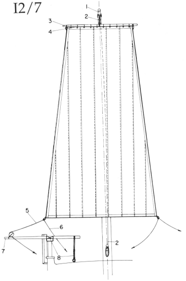
I2/6 Studdingsail rigging (scale 1/8in = 1ft)

1 Main lower studdingsail boom
2 Topping lift
3 Martingale
4 Fore guy
5 Aft guy
6 Lower studdingsail halyard
7 Inner halyard
8 Tack
9 Sheets
10 Lower studdingsail yard
11 Robands or lacing
12 Reefpoints, only on mainmast studdingsails
13 Topmast studdingsail boom
14 Topmast studdingsail boom outhauler
15 Topmast studdingsail boom lashing
16 Topmast studdingsail boom topping lift pendant
17 Topmast burton tackle
18 Topmast studdingsail boom braces
19 Topmast studdingsail halyard
20 Jewel block
21 Topmast studdingsail yard
22 Downhauler
23 Tack
24 Fore sheet
25 Aft sheet
25 Aft sheet

I2/6



I2/7



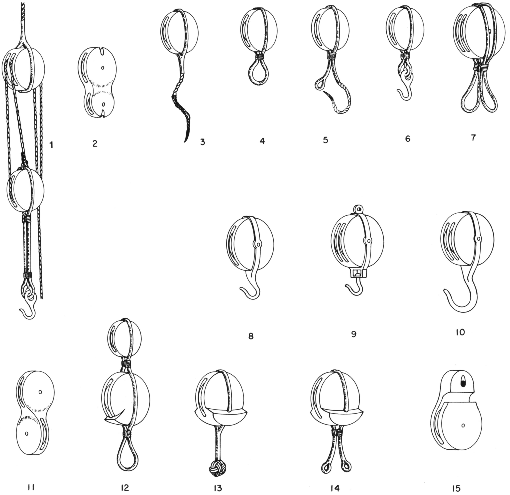
I2/7 Driver (scale 1/8in = 1ft)

1 Gaff peak
2 Halyard and block
3 Driver yard
4 Robands or lacing
5 Sheets
6 Tacks
7 Driver boom, lashed to lee-rail
8 Boom lashings

I2/8 Various block fittings (no scale)

1 A long tackle
2 Fiddle, or long tackle block, often used instead of the double block on a long tackle
3 Stropped single block with a tail
4 Stropped single block with an eye
5 Stropped single block with a short and a long leg
6 Stropped single block with hook and thimble
7 Double stropped double block
8 Iron-bound block with hook
9 Iron-bound block with swivel hook
10 Cat block
11 Shoe block
12 Stropped topsail sheet and lift blocks
13 Stropped sprit course sheet block with a spritsail sheet knot
14 Stropped clew line or clew-garnet block
15 Snatch block with stropping hole

I2/8



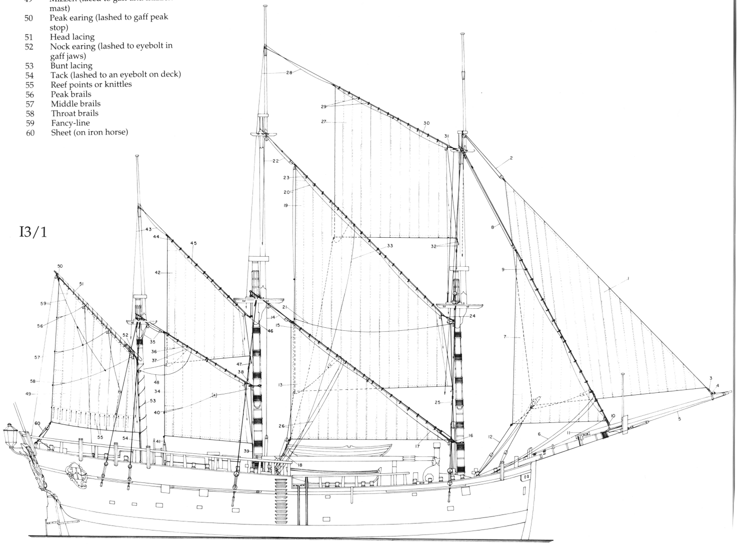
I3 RIGGING OF THE FORE AND AFT SAILS

I3/1 Profile of ship with fore and aft sails rigged (scale $1/16$in = 1ft)

1 Jib (hoisted flying)
2 Halyard
3 Tack (lashed to traveller)
4 Traveller
5 Traveller outhauler
6 Sheets
7 Fore topmast staysail (hoisted on fore topmast preventer stay)
8 Halyard
9 Wooden hanks
10 Tack (lashed to eyebolt in bees)
11 Downhauler
12 Sheets
13 Main staysail (hoisted on main preventer stay)
14 Halyard
15 Wooden hanks
16 Tack (lashed to main preventer stay collar)
17 Downhauler
18 Sheets
19 Main topmast staysail (hoisted on main topmast preventer stay)
20 Clew lifter and downhauler
21 Brails
22 Halyard
23 Wooden hanks
24 Nock (lashed to eyebolt of main topmast preventer stay lead block)
25 Double tack (leads through fairlead trucks on fore shroud)
26 Sheets
27 Main topgallant staysail (hoisted on main topgallant stay)
28 Halyard
29 Wooden hanks
30 Downhauler
31 Nock (lashed to main topgallant stay collar)
32 Double tack (leads through fairlead trucks on main topmast shrouds)
33 Sheets
34 Mizzen staysail (hoisted on mizzen staysail stay)
35 Halyard
36 Wooden hanks
37 Downhauler
38 Nock (lashed to mizzen staysail stay collar)
39 Tack (lashed to eyebolt on deck)
40 Clew lifting brails
41 Sheet (hooked to an eyebolt at the weather side)
42 Mizzen topmast staysail (hoisted on mizzen topmast stay)
43 Halyard
44 Wooden hanks
45 Downhauler
46 Nock (lashed to eyebolt of mizzen topmast stay lead truck)

47 Double tack (leads through fairlead trucks on main shrouds)
48 Sheets
49 Mizzen (laced to gaff and mizzen mast)
50 Peak earing (lashed to gaff peak stop)
51 Head lacing
52 Nock earing (lashed to eyebolt in gaff jaws)
53 Bunt lacing
54 Tack (lashed to an eyebolt on deck)
55 Reef points or knittles
56 Peak brails
57 Middle brails
58 Throat brails
59 Fancy-line
60 Sheet (on iron horse)

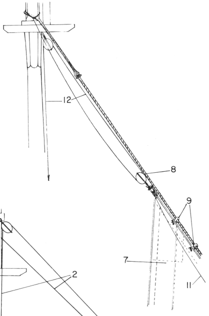
I3/1



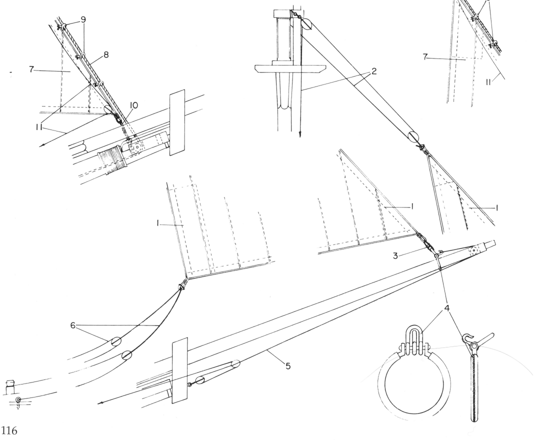
I Running rigging

I3/2 Headsail rigging (no scale)

1 Jib
2 Halyard
3 Tack lashed to traveller
4 Leather clad traveller
5 Traveller outhauler
6 Sheets (standing part fixed to eyebolt on deck, running part belayed to timberhead)
7 Fore topmast staysail
8 Fore topmast preventer stay
9 Wooden hanks
10 Tack, lashed to eyebolt in the bees
11 Downhauler
12 Halyard



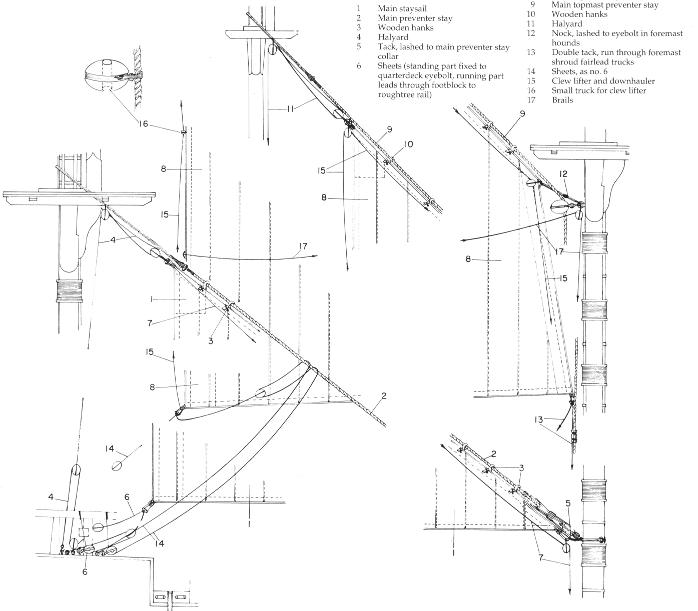
I3/2



I3/3

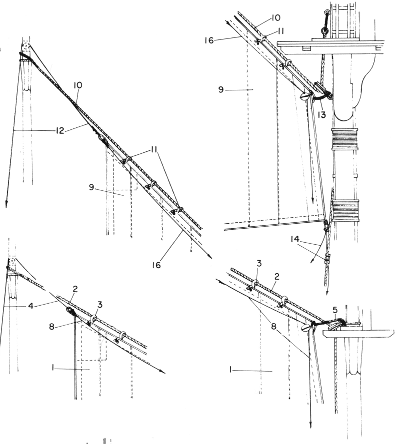
I3/3 Main staysail and main topmast stay sail rigging (no scale)

1. Main staysail
2. Main preventer stay
3. Wooden hanks
4. Halyard
5. Tack, lashed to main preventer stay collar
6. Sheets (standing part fixed to quarterdeck eyebolt, running part leads through footblock to roughtree rail)
7. Downhauler
8. Main topmast staysail
9. Main topmast preventer stay
10. Wooden hanks
11. Halyard
12. Nock, lashed to eyebolt in foremast hounds
13. Double tack, run through foremast shroud fairlead trucks
14. Sheets, as no. 6
15. Clew lifter and downhauler
16. Small truck for clew lifter
17. Brails

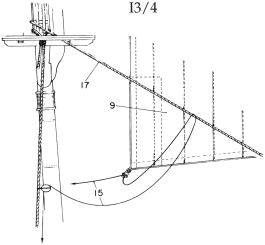


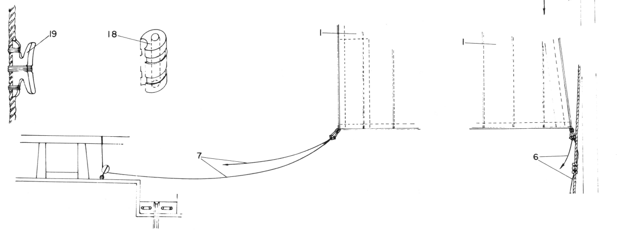
I3/4 Main topgallant staysail and mizzen topmast staysail rigging (no scale)

1. Main topgallant staysail
2. Main topgallant stay
3. Wooden hanks
4. Single halyard
5. Nock, lashed to main topgallant stay collar
6. Double tack, run through main topmast shroud fairlead trucks
7. Single sheets
8. Downhauler
9. Mizzen topmast staysail
10. Mizzen topmast stay
11. Wooden hanks
12. Single halyard
13. Nock, lashed to eyebolt in mainmast hounds
14. Double tack, run through mainmast shroud fairlead trucks
15. Single sheets
16. Downhauler
17. Mizzen staysail stay
18. Shroud fairlead truck
19. Shroud belay cleat

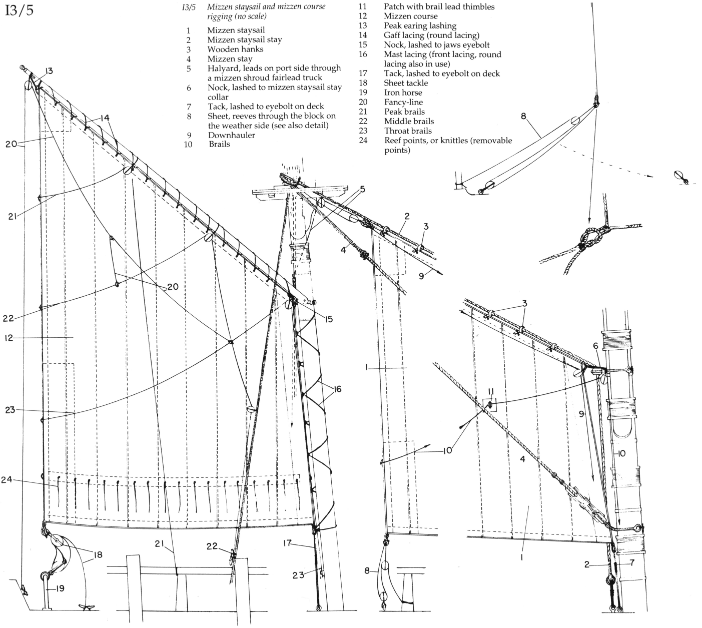


I3/4





I3/5



I3/5 Mizzen staysail and mizzen course rigging (no scale)

1 Mizzen staysail
2 Mizzen staysail stay
3 Wooden hanks
4 Mizzen stay
5 Halyard, leads on port side through a mizzen shroud fairlead truck
6 Nock, lashed to mizzen staysail stay collar
7 Tack, lashed to eyebolt on deck
8 Sheet, reeves through the block on the weather side (see also detail)
9 Downhauler
10 Brails
11 Patch with brail lead thimbles
12 Mizzen course
13 Peak earing lashing
14 Gaff lacing (round lacing)
15 Nock, lashed to jaws eyebolt
16 Mast lacing (front lacing, round lacing also in use)
17 Tack, lashed to eyebolt on deck
18 Sheet tackle
19 Iron horse
20 Fancy-line
21 Peak brails
22 Middle brails
23 Throat brails
24 Reef points, or knittles (removable points)

I4 BELAYING POSITIONS
(scale ⅛in = 1ft)

I4/1 Plan

I4/2 Profile

A Bowsprit
B Fore topsail sheet bits
C Foremast
D Fore jeer bits
E Windlass crosspiece
F Belfry
G Timberheads
H Main topsail sheet bits
I Mainmast
J Main jeer bits
K Mizzenmast
L Taffarel

Bowsprit

1 Jib-boom guy
2 Traveller outhauler

Spritsail topsail

3 Halyard
4 Lifts
5 Clew lines
6 Braces

Spritsail course

7 Halyard
8 Lifts
9 Clew lines
10 Buntline
11 Braces
12 Sheets

Jib

13 Halyard
14 Sheets

Fore topmast staysail

15 Halyard
16 Sheets
17 Downhauler

Fore course

18 Jeers
19 Clew-garnets
20 Buntlines
21 Leechlines
22 Lifts
23 Sheets
24 Tacks
25 Bowlines
26 Braces
27 Inner tricing-line
28 Outer tricing-line
29 Slab line
30 Mast tackle

Fore topsail

31 Tye
32 Lifts
33 Clew lines
34 Buntlines
35 Leechlines
36 Bowlines
37 Sheets
38 Braces
39 Reef tackle, belayed at the top

Fore topgallant sail

40 Braces
41 Halyard
42 Main topmast stay
43 Main topmast preventer stay

Main staysail

44 Halyard
45 Downhauler
46 Sheets

Main topmast staysail

47 Halyard
48 Downhauler
49 Brails
50 Sheets

Main topgallant staysail

51 Halyard
52 Downhauler
53 Sheets

Main course

54 Jeers
55 Clew-garnets
56 Buntlines
57 Leechlines
58 Lifts
59 Sheets
60 Tacks
61 Bowlines
62 Braces
63&64 Tricing lines
65 Slab line
66 Mast tackle

Main topsail

67 Tye
68 Lifts
69 Clew lines
70 Buntlines
71 Leechlines
72 Bowlines
73 Sheets
74 Braces
75 Reef tackle, belayed at the top

Main topgallant sail

76 Braces
77 Halyard
78 Mizzen staysail stay

Mizzen staysail

79 Halyard
80 Downhauler
81 Brails
82 Sheets

Mizzen topmast staysail

83 Halyard
84 Downhauler
85 Sheets

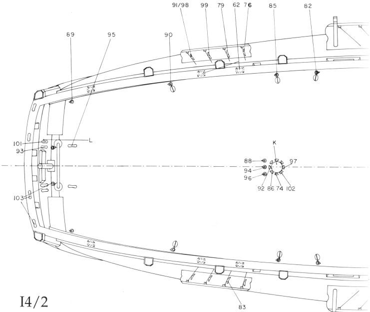
Crossjack yard

86 Lifts
87 Braces

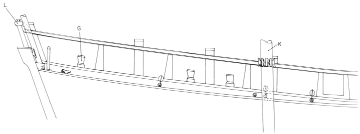
Mizzen course

88 Peak halyard
89 Vangs
90 Peak brails
91 Middle brails
92 Throat brails
93 Fancy-line
94 Tack
95 Sheet

I4/1

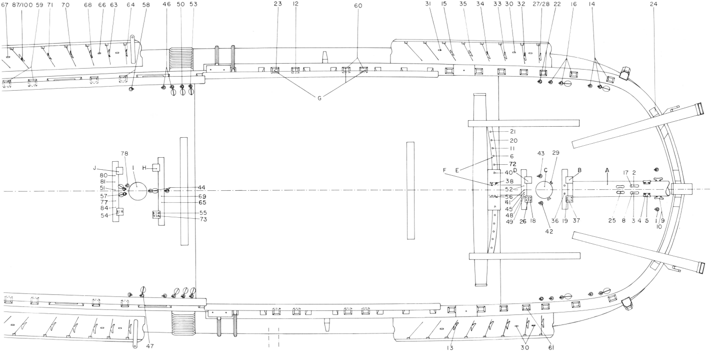


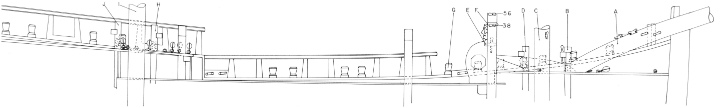
I4/2



Mizzen topsail

96 Tye
97 Buntline
98 Clew lines
99 Lifts
100 Bowlines
101 Braces
102 Sheets
103 Miscellaneous





J Sails

J1 SAIL PLAN (scale $\frac{1}{16}$in = 1ft)

Fore and aft sails

1 Jib
2 Fore topmast staysail
3 Main staysail
4 Main topmast staysail
5 Main topgallant staysail
6 Mizzen staysail
7 Mizzen topmast staysail
8 Mizzen course

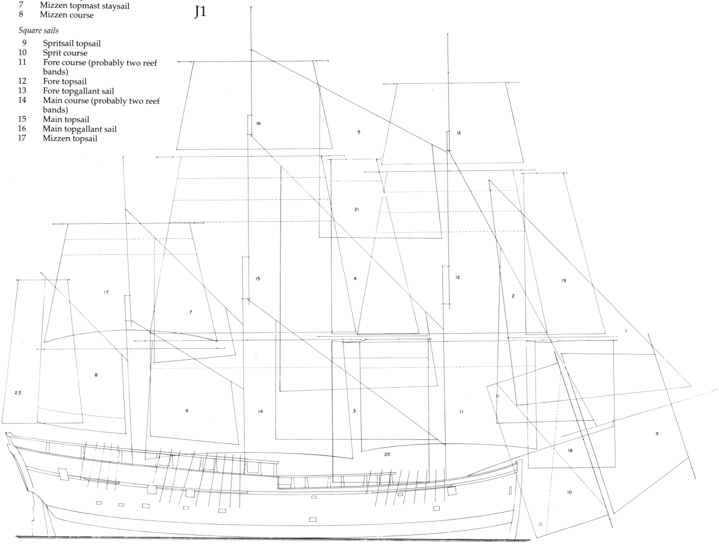
Square sails

9 Spritsail topsail
10 Sprit course
11 Fore course (probably two reef bands)
12 Fore topsail
13 Fore topgallant sail
14 Main course (probably two reef bands)
15 Main topsail
16 Main topgallant sail
17 Mizzen topsail

Studding sails

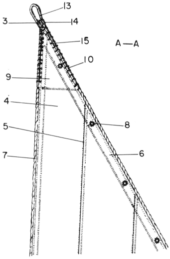
18 Fore lower studding sail
19 Fore topmast studding sail
20 Main lower studding sail
21 Main topmast studding sail
22 Driver

J1

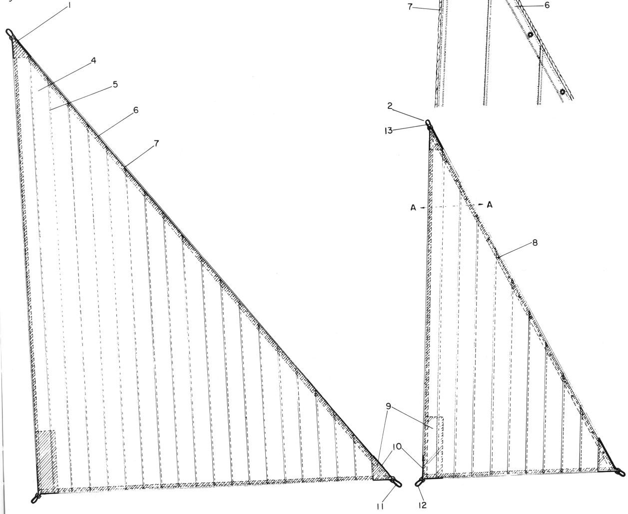


J2 HEAD SAILS (scale ⅛in = 1ft)

1 Jib (flying)
2 Fore topmast staysail
3 Fore topmast staysail section A–A (enlarged)
4 Sail cloth, 24in wide
5 Flat seam, 1 to 1¼in overlapping
6 Tabling, head 3in
  leech 2in
  foot 2in
7 Boltrope, leech and foot 2½in diameter, head 1¼in
8 Hole for wooden hank
9 Lining at port side
10 Servicing
11 Tack
12 Clew
13 Peak
14 Seizing
15 Marling and marling holes



J2

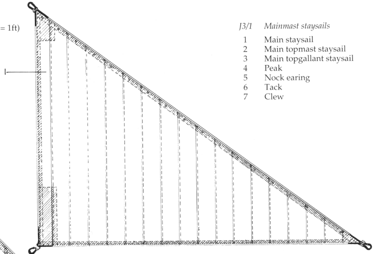


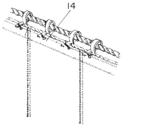
J3 STAYSAILS (scale ⅛in = 1ft)

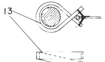
J3/1 Mainmast staysails

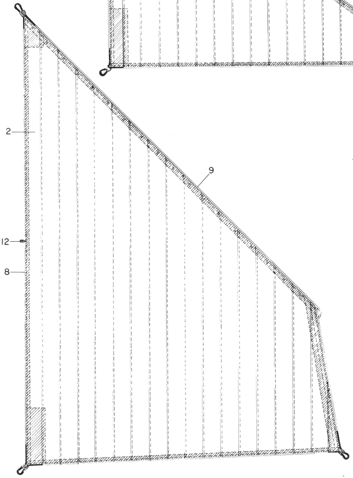
1 Main staysail
2 Main topmast staysail
3 Main topgallant staysail
4 Peak
5 Nock earing
6 Tack
7 Clew
8 Aft leech
9 Head or stay
10 Mast leech or bunt
11 Foot
12 Lead thimble (sewn to leech rope)
13 Wooden hank
14 Stay running wooden hanks (sewn to head tabling)

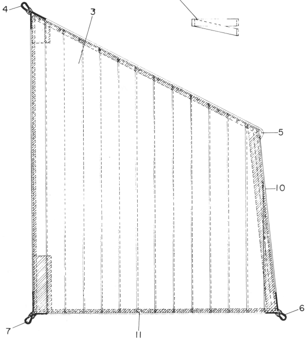
J3/1





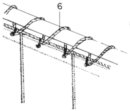




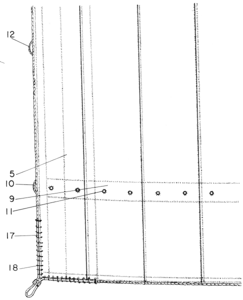


J3/2 Mizzen and mizzenmast staysails

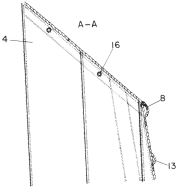
1 Mizzen staysail
2 Mizzen topmast staysail
3 Mizzen course
4 Course section A–A (enlarged)
5 Course section B–B (enlarged)
6 Detail of gaff lacing (enlarged)
7 Peak earing
8 Nock earing
9 Reefband
10 Reef cringle
11 Reefband holes
12 Brail cringles
13 Mast cringles for lacing
14 Mizzen staysail brail cringle
15 Mizzen staysail brail lead thimble
16 Mizzen head lacing holes
17 Serviced clew rope
18 Marled clew rope



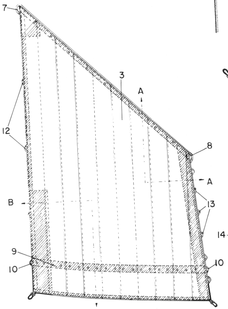
B–B

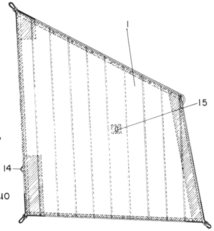


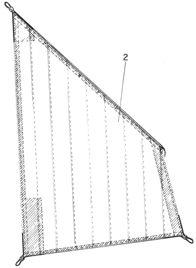
A–A



J3/2



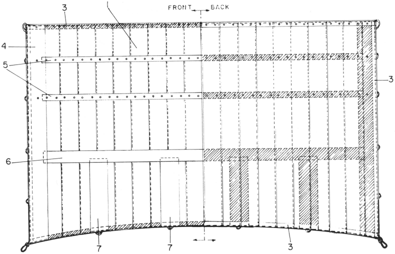


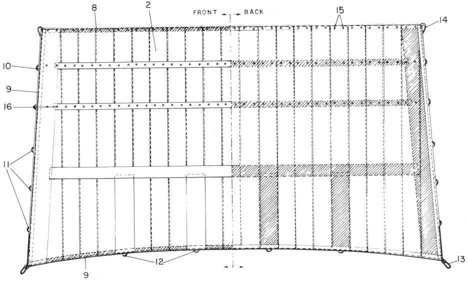


J4 MAIN AND FORE COURSES
(scale ⅛in = 1ft)

1 Fore course
2 Main course
3 Tabling (back)
4 Leech lining (front)
5 Reefbands (front)
6 Middle band (front)
7 Buntline lining (front)
8 Boltrope (head rope)
9 Boltrope (leech and foot rope)
10 Reef cringles
11 Bowline cringles
12 Buntline cringles
13 Clew
14 Earings
15 Roband holes
16 Reefband holes

J4



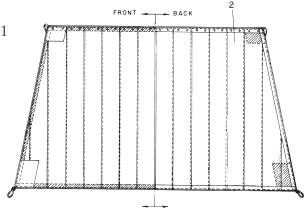


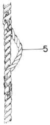
J5 TOPSAILS AND TOPGALLANT SAILS

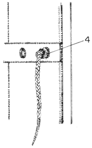
J5/1 Fore topsail and topgallant sail (scale $^1/_8$in = 1ft)

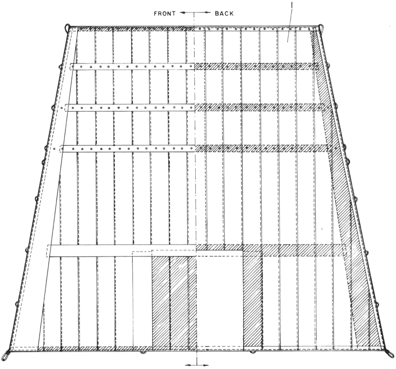
1. Fore topsail (similar to main topsail)
2. Fore topgallant sail (similar to main topgallant sail)
3. Section through sail with front and back reef points
4. Front of sail with reefband, holes and reef point

J5/1





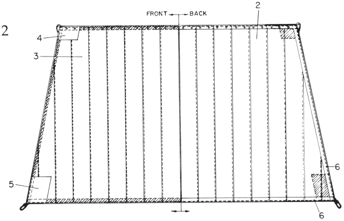


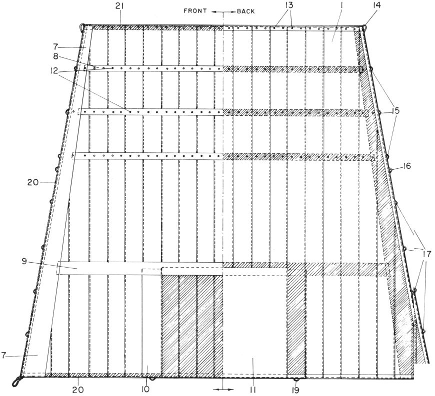


J5/2 Main topsail and topgallant sail (scale 1/8in = 1ft)

1 Main topsail
2 Main topgallant sail
3 Sail cloth
4 Nock lining (front)
5 Clew lining (front)
6 Tabling (back)
7 Leech lining (front)
8 Reefbands (front)
9 Middle band (front)
10 Buntline lining (front)
11 Top lining (back)
12 Reefband holes
13 Roband holes
14 Earing
15 Reef cringles
16 Reef tackle cringle
17 Bowline cringles
18 Loop of the clew rope
19 Buntline cringle
20 Boltrope (foot and leech rope)
21 Boltrope (head rope)

J5/2





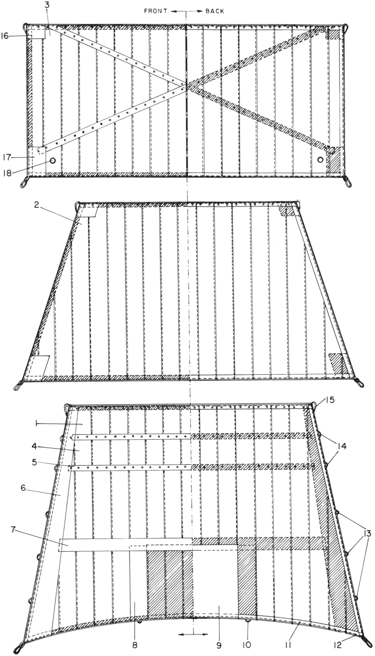
J5/3 Details of main topsail (no scale)

1 Earing formed from leech rope
2 Head rope spliced into earing
3 Roband holes
4 Roband in roband hole

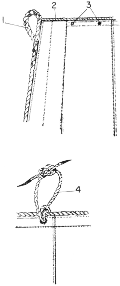
J5/4 Mizzen topsail, spritsail course and spritsail (scale 1/8in = 1ft)

1 Mizzen topsail
2 Spritsail topsail
3 Spritsail course
4 Sail cloth
5 Reefband, 8in wide (front)
6 Leech lining (front)
7 Middle band, 16in wide (front)
8 Buntline lining (front)
9 Top lining (back)
10 Buntline cringle
11 Tabling (back)
12 Boltrope with clew
13 Bowline cringles
14 Reef cringles
15 Earings
16 Nock lining (front)
17 Clew lining (front)
18 Water holes (4-6in diameter)

J5/4

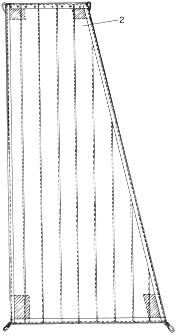


J5/3

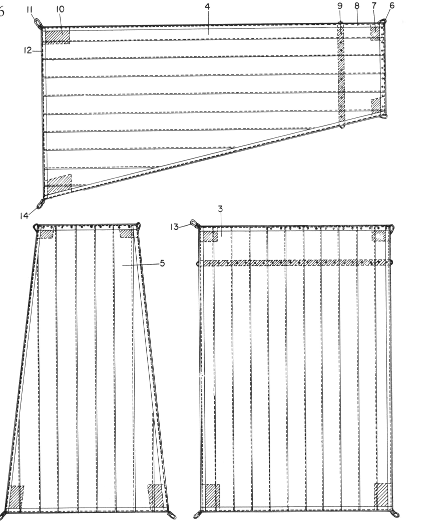


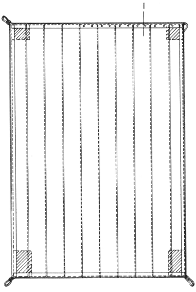
J6 STUDDINGSAILS AND DRIVER
(scale $\frac{1}{8}$in = 1ft)

1 Fore lower studdingsail
2 Fore topmast studdingsail
3 Main lower studdingsail
4 Main topmast studdingsail
5 Driver
6 Boltrope earing (nock)
7 Nock lining (front)
8 Tabling (back)
9 Reefband (front) and cringles
10 Clew lining (front)
11 Boltrope (clew)
12 Boltrope
13 Boltrope (nock)
14 Boltrope (tack)



J6

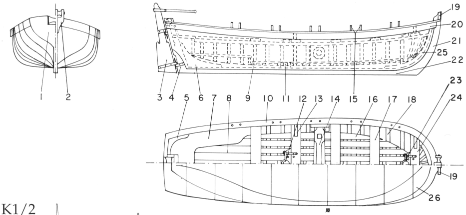




K Ship's boats

K1 LONGBOAT

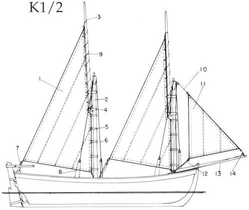
K1/1



K1/1 Carvel-built longboat (scale $\frac{3}{16}$in = 1ft)

1. After body lines, stern with built-in davit roll
2. Fore body lines with port side cable cleat (starboard side see 19)
3. Rudder and tiller
4. Sternpost
5. Transom knee
6. Sternson
7. Stern-sheets bench
8. Footwaling
9. Keelson
10. Gunwale
11. Mainmast step
12. Mainmast bracket and clamp
13. Thwart knee
14. Windlass
15. Tholes
16. Spaced footwaling
17. Loose thwart
18. Futtock
19. Bowsprit collar
20. Wales
21. Stem
22. Keel
23. Foremast bracket and clamp
24. Fixed thwart with knee
25. Apron
26. Halfbreadth lines

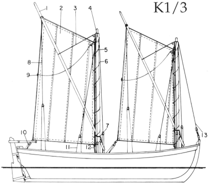
K1/2



K1/2 Longboat with 2-masted sliding gunter rig (scale $\frac{1}{8}$in = 1ft)

1. Sliding gunter sail
2. Blockmast
3. Sliding topmast
4. Double hoop for sliding topmast heel
5. Mast hoops
6. Topmast halyard
7. Sheet
8. Backstay
9. Lacing
10. Jib halyard
11. Flying jib
12. Jib sheets
13. Bowsprit
14. Jib tack

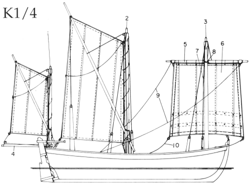
K1/3



K1/3 Longboat with 2-masted spritsail rig (scale $\frac{1}{8}$in = 1ft)

1. Sprit
2. Spritsail
3. Topping lift
4. Mast
5. Lacing
6. Spritsail halyard
7. Snotter
8. Vangs
9. Brails
10. Sheet
11. Backstay
12. Tack
13. Fore stay

K1/4



K1/4 Longboat with 3-masted square/spritsail rig (scale $\frac{1}{8}$in = 1ft)

1. Jiggermast
2. Mainmast
3. Foremast
4. Outrigger
5. Squaresail yard
6. Squaresail
7. Halyard
8. Sling parrel
9. Braces
10. Sheets

K Ship's boats

K2 PINNACE

K2/1 Carvel-built pinnace (scale $^3/_{16}$in = 1ft)

1 After body lines
2 Fore body lines
3 Rudder with an iron tiller
4 Cockpit
5 Stern-sheets bench
6 Footwaling
7 Tholes
8 Mainmast bracket and clamp
9 Spaced footwaling
10 Thwart
11 Futtock
12 Foremast bracket and clamp
13 Iron knee band
14 Halfbreadth lines

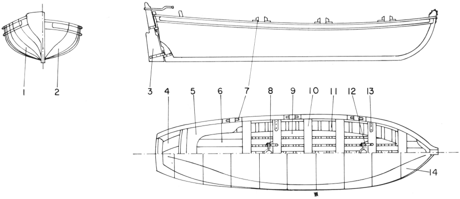
K2/2 Pinnace with 2-masted sliding gunter rig (scale $^1/_8$in = 1ft)

K2/3 Pinnace with 2-masted settee rig (scale $^1/_8$in = 1ft)

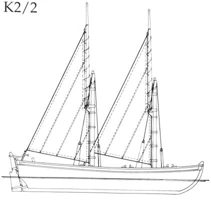
1 Settee yard
2 Settee sail
3 Peak halyard
4 Halyard
5 Tack
6 Reef point
7 Lacing
8 Bowline
9 Backstay
10 Vangs
11 Sheet

K2/4 Pinnace with single-masted spritsail rig (scale $^1/_8$in = 1ft)

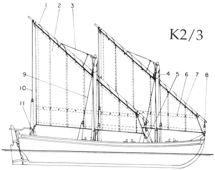
K2/1



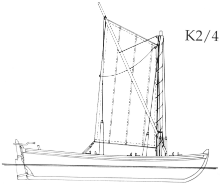
K2/2



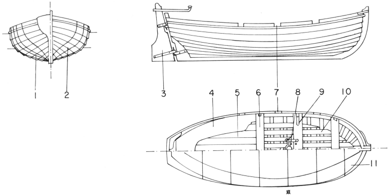
K2/3



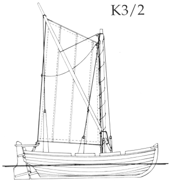
K2/4



K3/1



K3/2



K3 YAWL

K3/1 Clinker-built yawl (scale $^{3}/_{16}$in = 1ft)

1 After body lines
2 Fore body lines
3 Rudder with tiller
4 Stern-sheets bench
5 Footwaling
6 Thwart
7 Row locks
8 Mast bracket and clamp
9 Thwart knee
10 Spaced footwaling
11 Halfbreadth lines

K3/2 Yawl with single-masted spritsail rig (scale $^{1}/_{8}$in = 1ft)

K Ship's boats

K4 SKIFF

K4/1 Clinker-built skiff (scale 3/16in = 1ft)

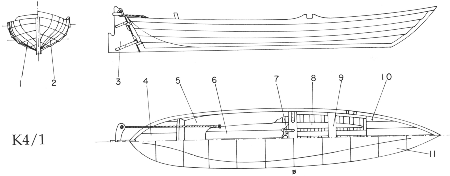
1. After body lines
2. Fore body lines
3. Rudder with tiller yoke
4. Planked stern
5. Stern-sheets bench
6. Footwaling
7. Mast bracket and clamp
8. Spaced footwaling
9. Thwart
10. Planked bow
11. Halfbreadth lines

K4/2 Skiff with single-masted squaresail rig (scale 1/8in = 1ft)

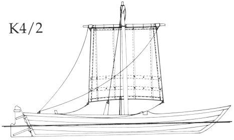
K5 BOAT EQUIPMENT (no scale)

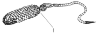
1. Fender
2. Boat's oar
3. Skiff's oar or scull
4. Boat's hook
5. Bailer
6. Grapnel

K4/1

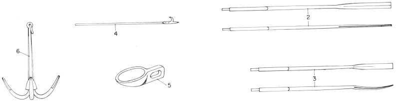


K4/2





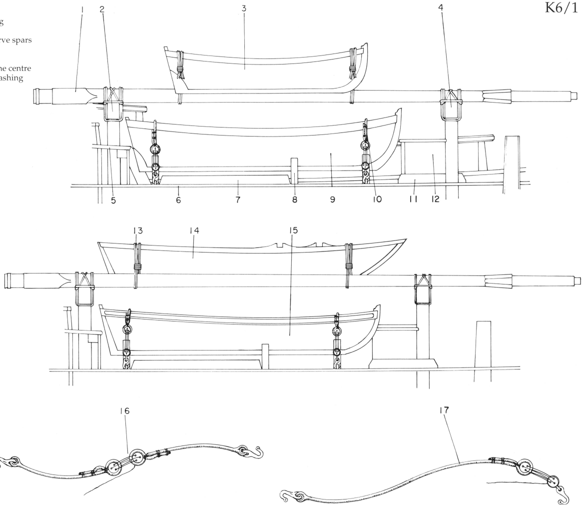
K5



K6/1 Top = port, bottom = starboard

1 Reserve spar
2 Quarterdeck spar gallows
3 Yawl
4 Fore hatch spar gallows
5 Quarterdeck
6 Upper deck
7 Main hatchway coaming
8 Middle chock
9 Longboat
10 Gripe
11 Fore hatchway coaming
12 Hood
13 Boat lashed to the reserve spars
14 Mr Banks' skiff
15 Pinnace
16 Two gripes lashed in the centre
17 Gripe with one-sided lashing

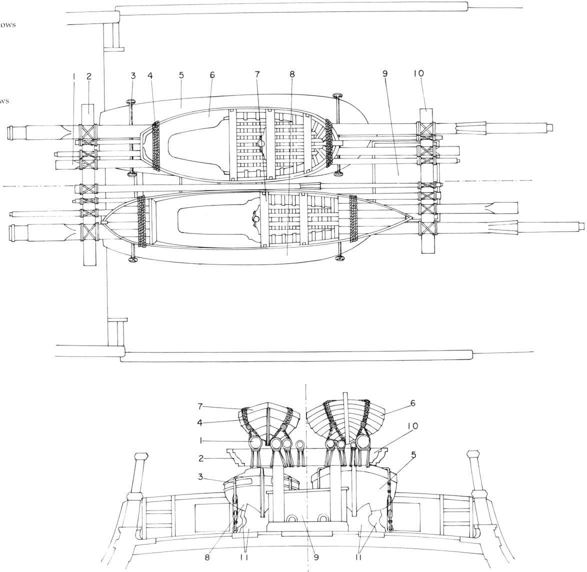
K6/1



K6/2 Boat stowage seen from above and ahead

1 Reserve spars
2 Quarterdeck spar gallows
3 Gripe
4 Boat lashing
5 Longboat
6 Yawl
7 Mr Banks' skiff
8 Pinnace
9 Hood
10 Fore hatch spar gallows
11 Boat chock

K6/2

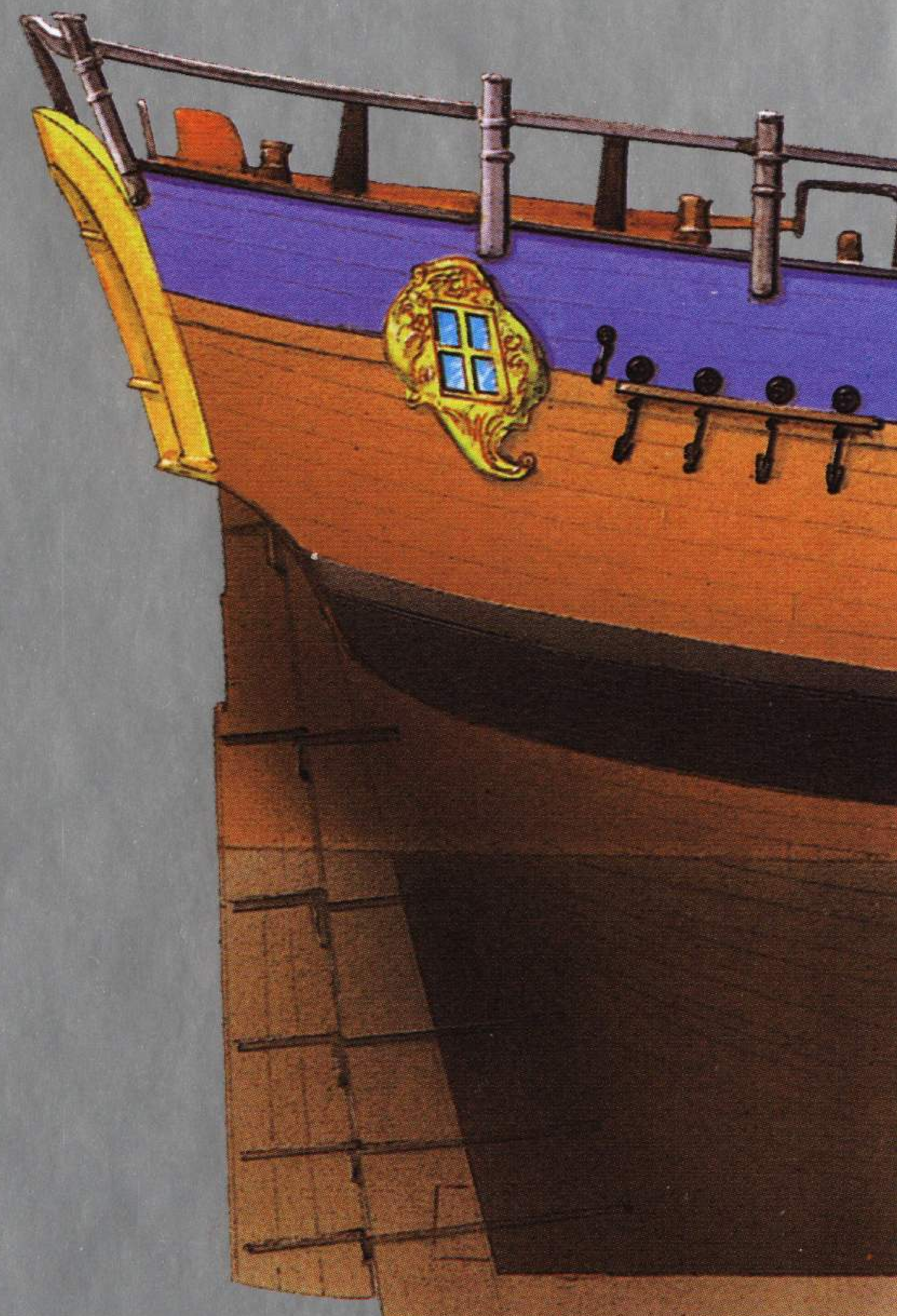


His Majesty's Bark *Endeavour*, was made eternally famous by Captain James Cook's first voyage of exploration in the South Pacific, 1768-1771. *Endeavour* was originally the collier *Earl of Pembroke* and was chosen by the Admiralty for the voyage because of her strong construction. She was purchased by the Royal Navy at Whitby and then converted to an exploration ship at Deptford. After her voyage she was sold out of service in 1775, and finally condemned in 1790.

First published in 1995, this revised edition of *Captain Cook's* Endeavour now includes a large scale plan on the reverse of the jacket.

THIS VOLUME FEATURES

- **An introductory text describing the ship, her build and rig, based on the author's fresh research, and an outline of her career.**
- **Photographic section depicting various models as well as the famous Australian replica.**
- **A guide to the vessel's colour scheme and decoration on the jacket.**
- **More than 200 perspective and 3-view drawings, with in-depth descriptive keys, of every detail of the ship hitherto misunderstood.**
- **One large-scale plan on the reverse of extended fold-out jacket.**



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