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ANATOMY OF THE SHIP

A 10-gun brig and survey ship, HMS *Beagle* became famous for its survey voyages under Commander Robert FitzRoy, especially once Charles Darwin, a passenger on the second expedition, wrote *On the Origin of Species* which was based on studies undertaken during the four-year voyage. Under the command of her dedicated officers, the ship sailed to some of the most desolate places on earth, mapping the coastlines and passages to make these areas much safer for all future shipping.

Despite her fame a three-dimensional model of the ship has been neglected by museums, as specific plans do not exist, but the author has researched the three different ages of *Beagle* to draw his own accurate plans and build a 1/64 scale model. His research, photographs and plans are now available in this volume to bring HMS *Beagle* nearer to the heart of modelmakers and ship historians and hopefully to restore her to her rightfully-earned place in the parthenon of ships.

THIS VOLUME FEATURES

- Full introduction on *Beagle's* career and design, which includes a chart of her survey voyages and three original layout sketches.
- Photographic section depicting the building process of the author's own model and including a number of artworks.
- Detailed, perspective drawings with in-depth keys on every aspect of the three different stages in the ship's design.
- One large-scale plan on the reverse of the new fold-out jacket.

HMS BEAGLE

ANATOMY OF THE SHIP

HMS BEAGLE

Survey ship extraordinary



THIS highly-acclaimed series aims to provide the finest documentation of individual ships and ship types ever published. It is a radical departure from the usual monograph approach, which concentrates on either the ship's service history, its technical details or external appearance. All of these aspects are included in the 'Anatomy of the Ship', but what makes the series unique is a complete set of superbly executed line drawings, the conventional 3-view type of plan as well as explanatory perspective views with fully descriptive keys. These drawings are accurate, visually exciting and totally comprehensive, offering ship enthusiasts, historians and modelmakers a novel insight into the technicalities of each ship type covered. Following a full introduction on the service and design history, each title also includes a photographic section which illustrates the vessel, and subsequent models, in close detail.

THE AUTHOR

Karl Heinz Marquardt is an internationally known modeller who has spent a lifetime researching the era of the sailing ship. He has models in some eleven European museums as well as in Australia where he has lived for the past twenty-five years. Whilst researching this volume, he built a 1/64 scale model of HMS *Beagle* for the Deutsche Schiffahrtsmuseum. Marquardt is an accomplished draughtsman and is a regular contributor to the Conway journal *Model Shipwright*. He has previously written *Captain Cook's Endeavour* for the Conway Anatomy series, and was author and illustrator of the highly-praised Conway title *Eighteenth Century Rigs and Rigging*.

Cover illustration by Ross Watton

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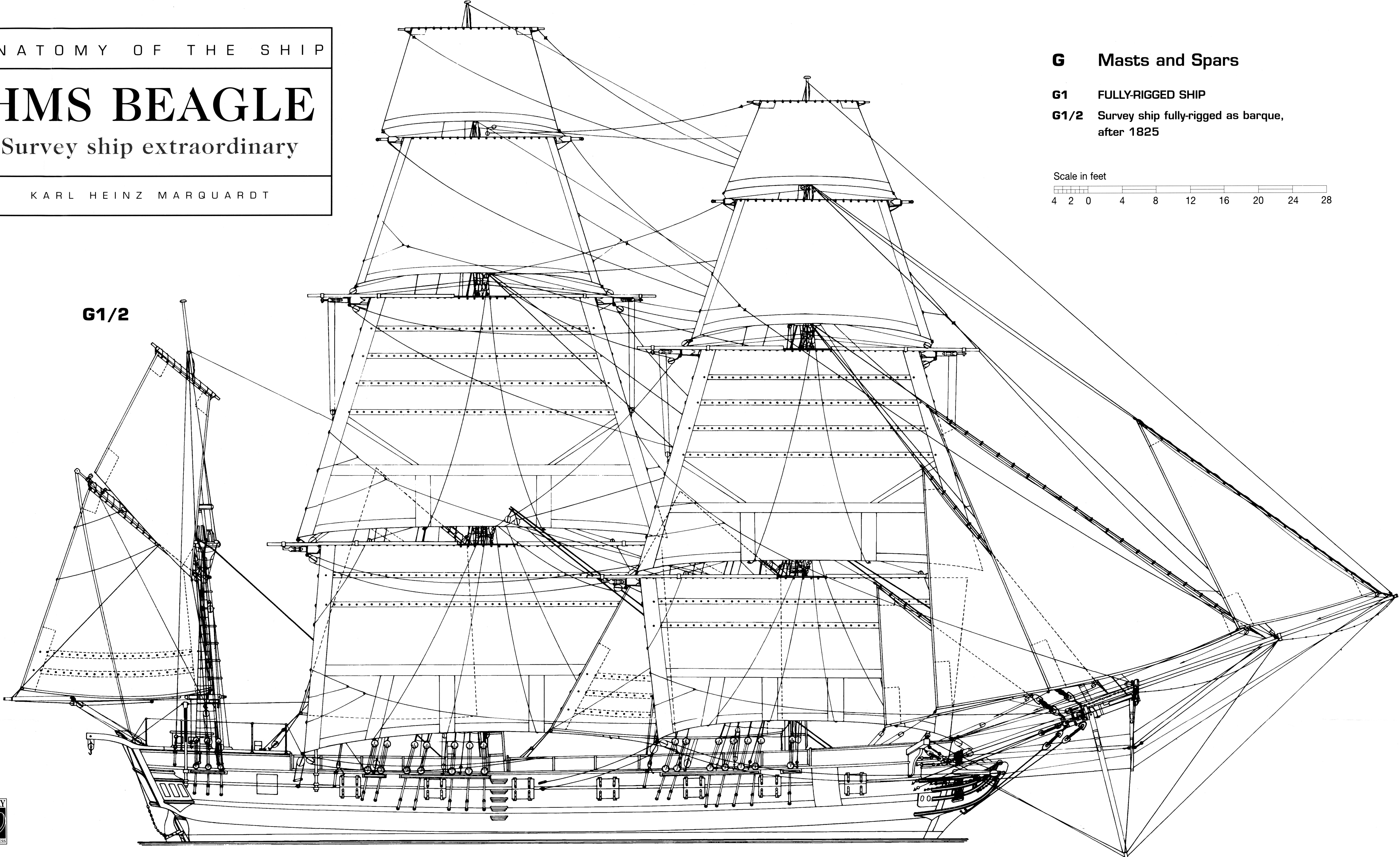
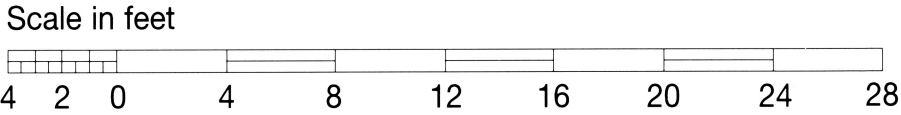
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Survey ship extraordinary

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- G1 FULLY-RIGGED SHIP
- G1/2 Survey ship fully-rigged as barque, after 1825



G1/2

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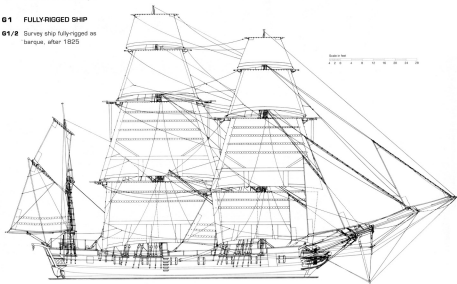
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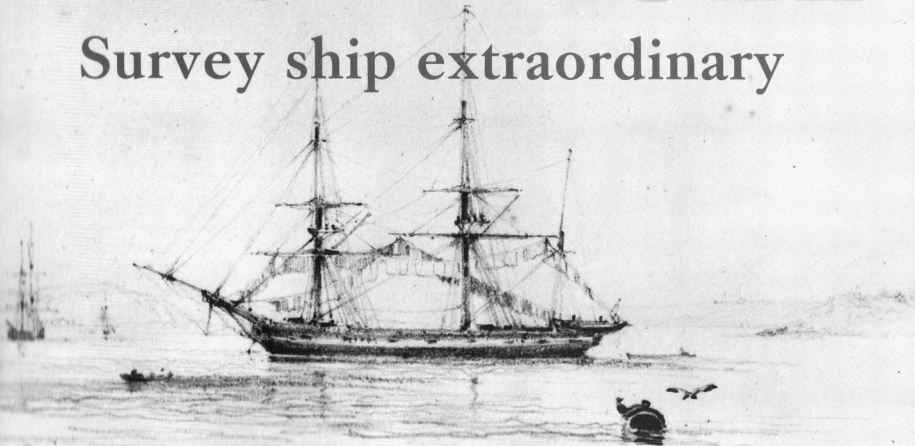
G1/2 Survey ship fully-rigged as
"barque", after 1825



A N A T O M Y O F T H E S H I P

HMS BEAGLE

Survey ship extraordinary



*W. H. S. Beagle
Sydney, N.S.W., 1879*

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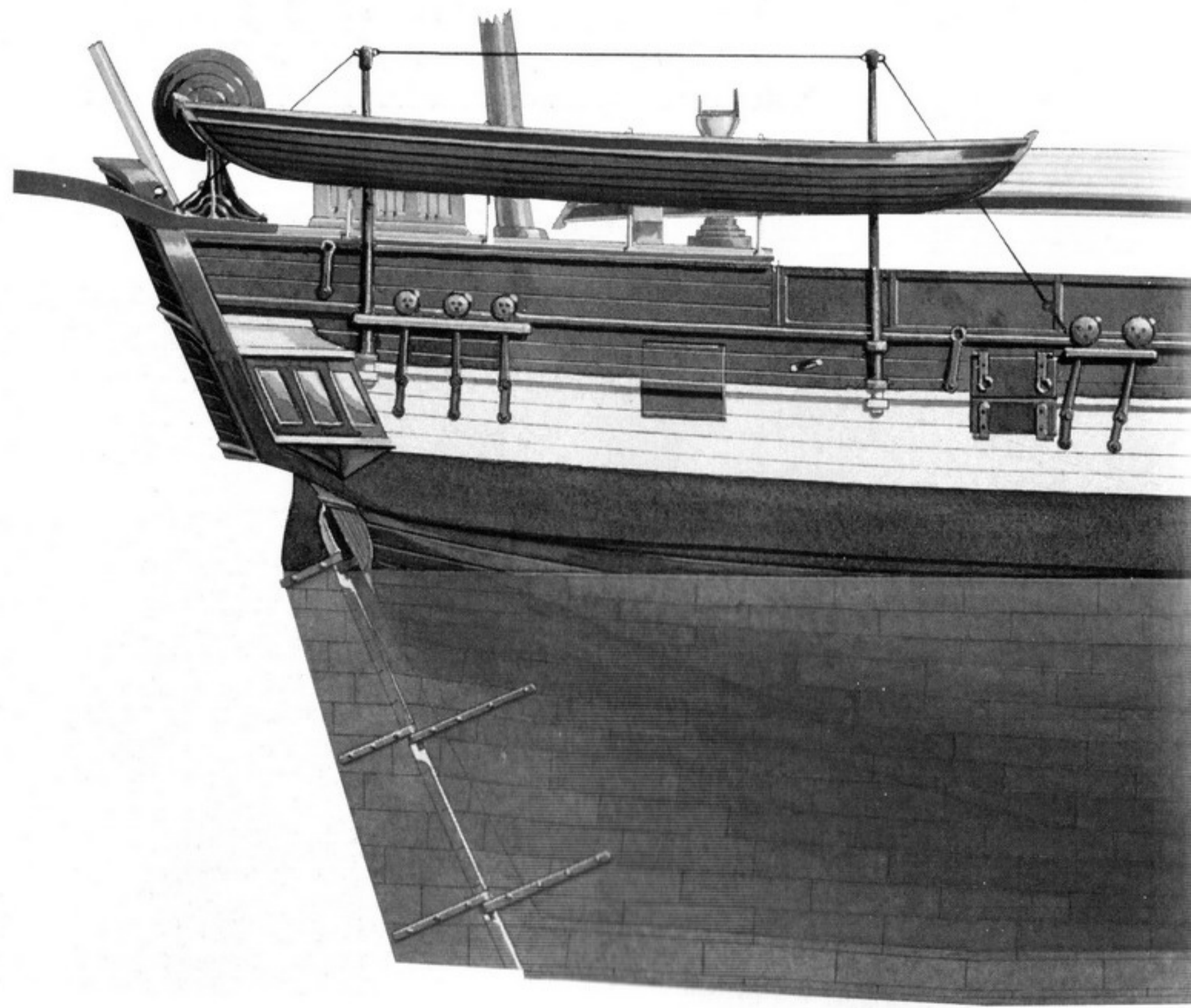
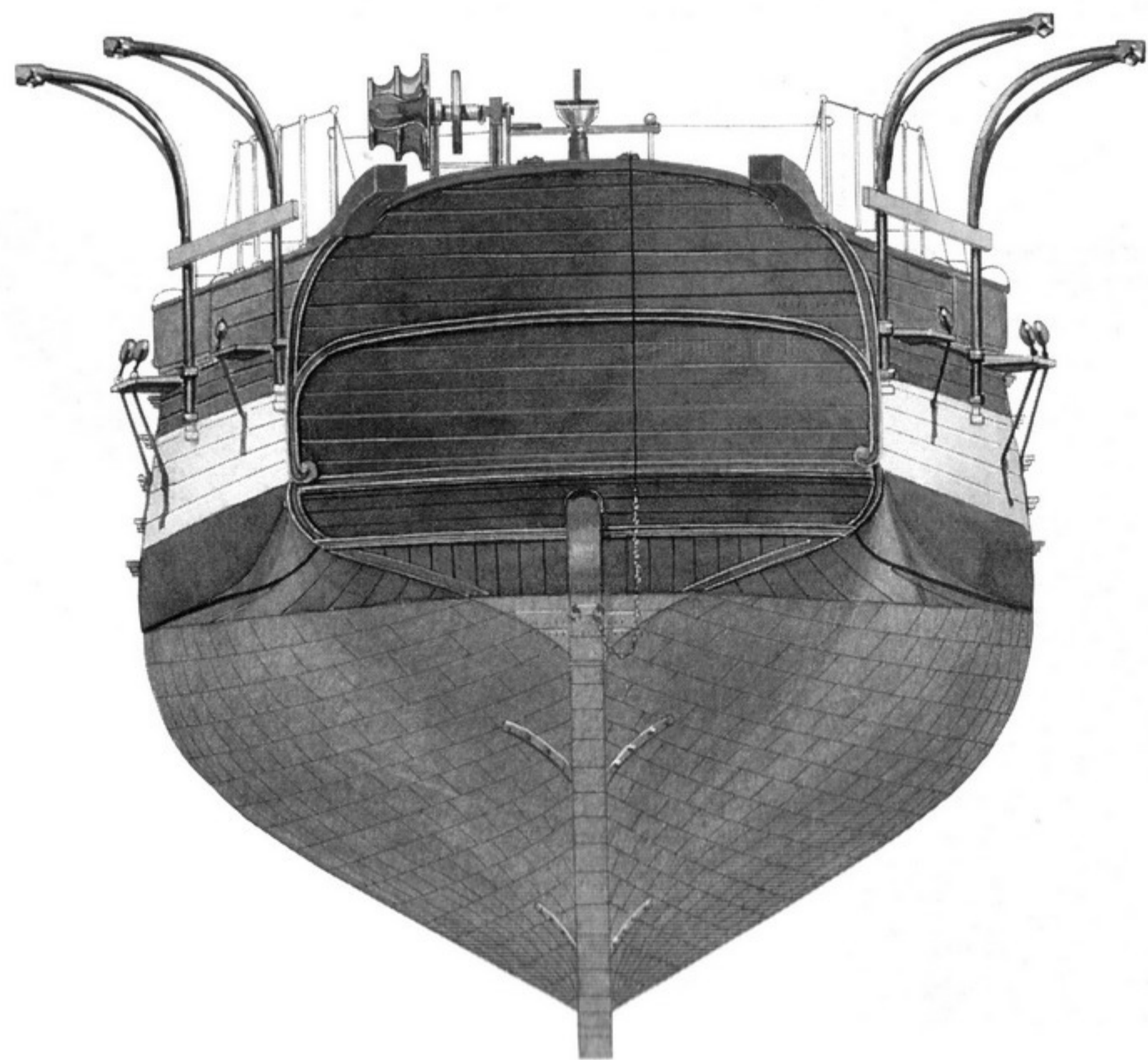
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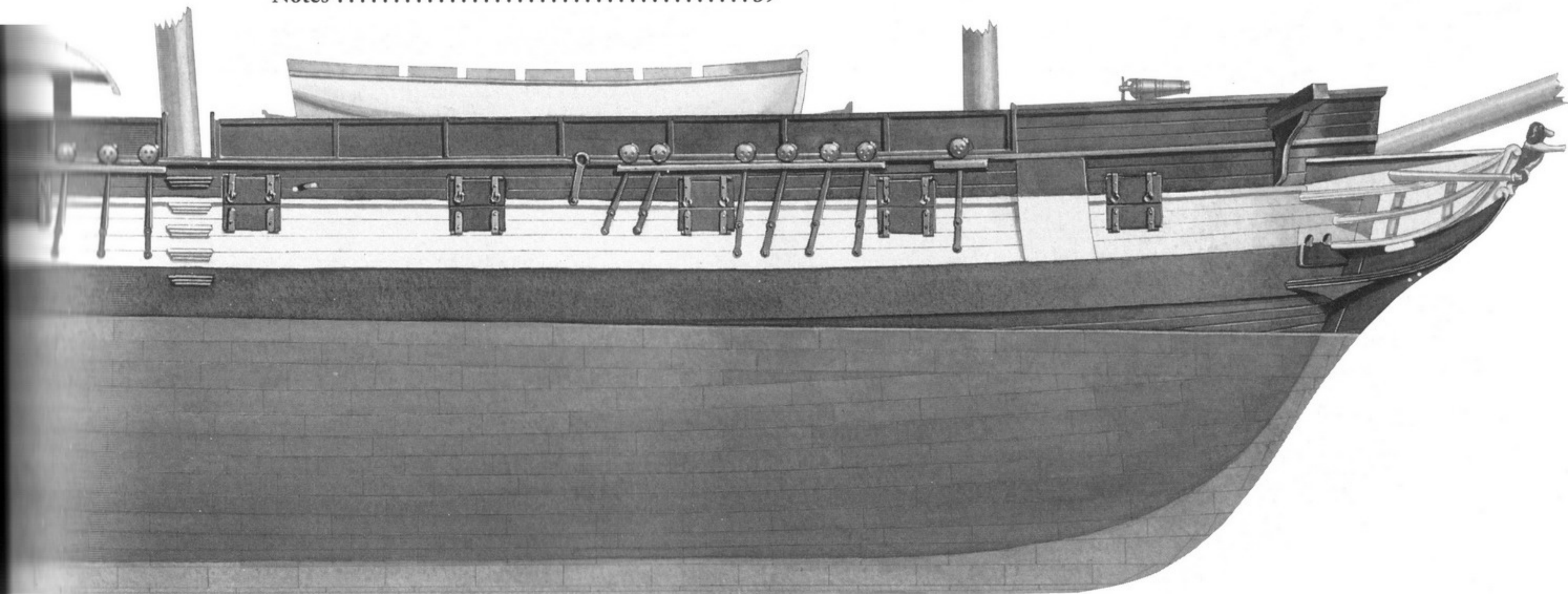
Opposite title page: G1/2 Plan (also printed to a large scale on the reverse of book jacket)

Title page: 'HMS *Beagle* in Sydney Harbour, 1839'; pencil sketch by Conrad Martens.

(Courtesy of Mitchell Library, State Library of New South Wales)



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...wherein we afterwards found good anchorage; it was named Beagle Bay, and may serve hereafter to remind the seamen who benefit by the survey in which that vessel bore so conspicuous a part, of the amount of his obligations to the Government that sent her forth, the skill and energy that directed her course, and the patient discipline by which, during her long period of active service, so much was done for the extension of our maritime knowledge.

Admiral John Lort Stokes

(Midshipman, Mate, Lieutenant and Captain of HMS *Beagle*)

I N T R O D U C T I O N

WITH the weapons silenced in Europe's giant struggle for domination and dusk approaching the great era of global discoveries, the nineteenth century heralded a new age. Peace and *Pax Britannica* instilled a sense of security on the high seas. No longer needing to defend their nation's honour with blazing guns, the navies of the world's powers loaned more of their resources to the expansion of world trade, to guard the merchant shipping against piracy, to suppress slavery, and to science, in particular the science of protecting man from the sea itself, hydrography.

Since the dawn of seafaring, hydrography, the art of nautical surveying, was essential for man's survival on that fast and sometimes turbulent element, the sea, and therefore always on the mind of mariners. The ships of the ancient world were originally guided by a verbal collection of landmarks and celestial constellations, but by two thousand years ago the knowledge of coastal outlines had already advanced to such an extent that a work appeared during the second century AD which was to change the face of surveying entirely. Created in Alexandria by Claudius Ptolemaeus, an Egyptian of Greek descent, the *Geographical Treatise* listed 8,000 locations, and was published alongside an atlas of the known world, creating in it a good picture of most of Europe, Arabia and parts of Asia. Early ship masters were obliged to hand over their observations, usually contained in a 'Rutter' (an early log book) to be added to the cartographic works of

their forebears. Jealously guarded as 'State secrets' these early charts and written information of anchorage, sailing instructions and of sketched coastal appearances provided a better understanding of distances across the oceans, the shape of their coastlines and of danger points on those voyages – thereby developing more and more into a reliable navigational tool.

The advent of printing in the sixteenth century, and subsequent reproduction of charts from engraved copper plates, eliminated not only copyist's errors but improved manufacture of charts which appeared in greater numbers and at a cheaper cost. It also broke down the taboos of secretive trade routes and gave everyone a better understanding of our worldly habitat. One of the great innovations of that century, the projection of longitude and latitude, initiated by Gerardus Mercator, was widely adapted for navigational use during the following century. The invention of more precise measuring instruments in the seventeenth century also led to increasingly accurate cartography. Rapid advances were made in the eighteenth century with John Hadley's invention of the quadrant in 1731, which twenty-five years later became the sextant, and John Harrison's first marine timekeeper for finding longitude in 1735. Such instruments in the hands of navigators with excellent surveying and cartographic skills, such as James Cook and Louis de Bougainville, produced excellent results.

The demand for a larger number of more accurate charts,

instigated by France, led to the founding of the Académie Royale des Sciences in 1666 for the government-inspired training of 'Ingenieurs hydrographes'; and in 1720 to the establishment of a national centre for the collection and examination of uncollated hydrographic material, the Dépôt des Cartes et Plans de la Marine. The Danish Navy created a Hydrography Department in 1784 and Britain concentrated their various hydrographic activities in 1795 by creating the Hydrographic Office of the Admiralty. The first commissioned Hydrographer to the Royal Navy was Alexander Dalrymple, who brought to that Office a wealth of experience as a cartographer and as the East India Company's first official Hydrographer, an appointment he had held since 1779 and during which he had published more than 400 charts. He continued in this dual duty as Hydrographer to the Royal Navy and the East India Company until a few weeks before his death in 1808. His new office at the Royal Navy, staffed with two draughtsmen and two engravers, produced its first Admiralty chart in 1801. With 3,089 charts offered by the end of that century, the Hydrographic Office rose during its first hundred years to the position of being the world's largest publisher of sea charts.

Dalrymple's successor, Captain Thomas Hurd (who took on the role from 1808 to 1823), was the first senior naval officer to head this Office. He concerned himself very much with making hydrography a Royal Navy service with specially built ships and trained men. The first special survey ship for home waters, a small 121-ton brig named HMS *Investigator*, was launched on 23 April 1811 at Deptford dockyard and remained in survey service until 1836. Another, the only 83-ton schooner-rigged paddle steamer *Congo*, was designed in 1816 by Robert Seppings, 'for the purpose of exploring the interior of Africa by the River Congo'. Intended to be the first paddle steamer in the Royal Navy she was, however, found not to be strong enough to carry steam-propulsion and went under sail to Africa on a disastrous expedition. In 1817 the Admiralty established a corps of surveying officers, adding a special rate of pay as an incentive. All nautical surveys thenceforth became the responsibility of the Hydrographer, who subsequently

always carried the rank of a senior naval officer. Permission was granted in 1819, by the Lords of the Admiralty, for Admiralty charts to be also made available to merchant shipping.

British colonial expansion and growing spheres of interest all around the globe required a worldwide Royal Navy presence. The Hydrographic Office, with its special ships and personnel, had the arduous task of providing safe sailing instructions for those guardians of the British Empire. Systematically measuring the depth of ocean floors and following every inlet of barely-charted inhospitable coastlines with their boats, those hydrographic vessels produced, and improved, charts from every nook and cranny of the world's oceans.

As they were usually required to be away from civilisation for years, especially dedicated men were needed to crew such ships and persevere for the benefit of mankind in that not illustrious, but so necessary, job of painstakingly adding details to earlier discoveries. Not even very well known to their contemporaries, those men in their small schooners, brigs and barks would now only be a footnote of history was it not for a request by Commander Robert FitzRoy to have an unpaid naturalist accompanying HMS *Beagle's* second survey voyage to South America.

It was standard naval practice to combine hydrographic work with general scientific observations on land and to collect rare or unknown flora, fauna and geological species for the betterment of scientific knowledge. His restricted interest in these fields made FitzRoy pledge after returning from his first command:

... if I ever left England again on a similar expedition, I would endeavour to carry out a person qualified to examine the land; while the officers and myself would attend to hydrography.

Again commissioned to command HMS *Beagle* on a second survey voyage, FitzRoy's request for such a person was met (on the suggestion of the Navy's Hydrographer, Captain Francis Beaufort) by a frustrated twenty-two year old Bachelor of Arts with studies in medicine and

religion and an intense interest in natural history. This young gentleman's name was Charles Darwin, and fate lifted FitzRoy's small 'discovery ship' eternally into the league of famed vessels. It was those five years with the ship's specially-trained officers which enabled Charles Darwin to study the natural history of all countries visited. By originating an opinion about the development of flora, fauna and geology, he laid the foundation for his genial work *On the Origin Of Species*. These thoughts which, during his own lifetime, were very controversial, were predestined to change man's entire conception of evolution. The extraordinary quality of the small group of officers around Darwin during that now so famous voyage is highlighted by their further naval and civil advancement. No less than five of *Beagle's* officers were destined to reach the rank of Admiral in the Royal Navy; one was knighted, another became a Member of Parliament and two Fellows of the Royal Society. Two also reached the positions of Governor-General of New Zealand and Governor of Queensland.

With HMS *Beagle's* ascendancy to fame based on a naturalist's voyage around the world, it should not distract from the fact that, beside playing host to a man who was later to become world famous, the exacting completion of her assignments alone would have earned her a place in history. She was only a small vessel, actually too small for the task given.² In three voyages (22 May 1826 – 27 October 1830, 27 December 1831 – 28 October 1836 and 5 July 1837 – 30 September 1843) she sailed to the most desolate places on earth, to the southern tip of South America and to the western, northern and southern coastlines of Australia. There her dedicated officers and men fought with high seas, cold temperatures as well as blistering heat, in hostile

environments and with frequent shortages of water and provisions, to painstakingly map, in more than 15 years, vast areas of the coast to make them all much safer for future shipping. They mapped some of the Argentine and Chilean coast, the Falkland Islands, passages in the proximity of Cape Horn, the Magellan Straits, the Galapagos Islands, the empty coastline of North and Western Australia, the Torres Strait and parts of the Victorian coast including Port Phillip Bay and the islands of treacherous Bass Strait. Under Captain FitzRoy alone, HMS *Beagle* provided the Admiralty with eighty-two coastal sheets, eighty plans of harbours and forty views, covering the southern part of the South American continent.

Substantial literature has been produced around Charles Darwin's journey in the *Beagle*, but her first and third voyage were never really emphasised in modern writings and only lately has the interesting story of her work in Australia between 1837 and 1843 been told.³

Specific plans of HMS *Beagle*, in her various guises during the ship's naval life, do not exist and several profound research studies have been undertaken to reconstruct her directly from general contemporary evidence. The major studies of the past fifty years, those by David Stanbury, Lois Darling and Keith Steward Thomson, unearthed a wealth of detail about the ship, but failed to a certain extent in shaping the known 10-gun brig Admiralty draughts into believable drawings. Therefore it is natural that, despite HMS *Beagle's* fame (which was mainly Darwin's fame), a complete three-dimensional model of the ship has been overlooked by museums and modellers. This study hopes to remedy that neglect and bring HMS *Beagle* nearer to the hearts of model makers and ship historians alike.

SHIP'S HISTORY

1817

16 February Ordered as one of a group of twelve to be built.

1818

June Keel was laid at Woolwich Dockyard.

1820

11 May Launched and placed 'in ordinary'. Her costs were £7,803.

July Coronation of King George IV. HMS *Beagle* took part in the Review of the Fleet and had the distinction of being the first man-of-war to sail fully under the old London Bridge.

1825 First commission: Commander Pringel Stokes

7 September Appointed as captain to HMS *Beagle*, just allocated to the Surveying Service.

27 September Docked at Woolwich for repairs and fitted out for her new duties. Reduced her guns to six and changed the rig to barque rig.

1826

16 May Admiralty ordered that an accurate survey be made of the southern coasts of the Peninsula of South America, from the southern entrance of the Rio de la Plata round to Chiloe Island, and of Tierra del Fuego: 'In such manner and order, as the state of the season, the information you may have received, or other circumstances, may induce you to adopt. You are to continue on this service until it shall be completed.'

22 May *Beagle* sailed on her first voyage together with HMS *Adventure* (store ship) under the overall command of Captain Phillip Parker King, to the southern coast of South America. Calling at Madeira, Tenerife and Cape Verde Islands.

2 October After repair and supplies taken on at Rio de Janeiro, sailed to Montevideo. Survey practice on northern side of the Rio de la Plata between Cape St Mary and Montevideo.

19 November Left for the southern coast of Patagonia and Tierra del Fuego.

28 November Porta Santa Elena. Set up a small observatory to observe the eclipse of the sun. Weather too bad for observation. Continued sailing with HMS *Adventure* through the narrows of the Magellan Strait towards Port Famine.

1827

15 January *Beagle* left Port Famine westward with orders to return in March. Had a collision with a rock, whereby a part of her forefoot and false keel was dislodged. Examined western entrance to the Strait. Rescued the crew of the British sealing schooner *Prince of Saxe Coburg*.

6 April HMS *Beagle* overdue, but met HMS *Adventure* several days later and sailed for Montevideo.

24 April Both ships arrived in Montevideo and went further to Rio for refitting and stores. Captain King bought the schooner *Adelaide* to speed up his survey work.

23 December Together with schooner *Adelaide*, the three ships sailed south again, *Beagle* being sent to Port Desire to make chronometric measurements. Commander Stokes also examined the whole coast from Port Desire to Cape Virgins at the eastern entrance of the Strait.

1828

- 17 March HMS *Beagle* went westward again from Port Famine to continue surveying the western coast of South America between the Strait and 47° south. Orders to return by 24 July.
- 24 March Run into a stiff gale from the north, northwest and southwest with a confused mountainous sea. For four days the decks were constantly flooded and the little boat astern was washed away. Continued up to the Gulf of Peñas, surveyed the harbour of Santa Barbara, and moved further north according to order.
- 9 May New anchorage with ample water and fuel. Bad weather continued. Slowly sailing to the Gulf of Estevan. More foul weather and a new problem, ice.
- 10 June Yawl badly damaged while trying to take her in during a gale off the Chilean coast. Had to cut her adrift.
- 15 June Returned to Port Otway for repairs. Surgeon Bynoe advised the captain that many men aboard were sick and the general situation was critical. All non-essential duties were suspended and officers and men gathered shellfish to recover their strength.
- 29 June Heading back to Port Famine, Captain Stokes no longer left his cabin and began to neglect his duties.
- 27 July *Beagle* rejoined the two other ships, with almost no food aboard and the crew starving. The captain was now seriously ill, as were a large number of the ship's crew, with scurvy and pulmonary infections.
- 1 August The exhausted and depressed captain, Commander Pringel Stokes, committed suicide by shooting himself. He was buried at Port Famine. First Lieutenant Skyring took interim command.

16 August With only a few men in the small survey fleet still in good condition, and with an extreme shortage on provisions, the ships headed for Montevideo.

13 October While HMS *Beagle* remained in Montevideo, Captain King sailed to Rio de Janeiro to collect stores and to have HMS *Adventure* caulked.

Second commission: Commander Robert FitzRoy

13 November Commander-in-Chief of the South American Station, Admiral Sir Robert Otway, commissioned Commander Robert FitzRoy to take charge of HMS *Beagle* for the duration of the survey.

1829

30 January Lost two men overboard during a bad storm at the mouth of Rio de la Plata. Masts and spars damaged, one whaleboat lost and another badly damaged. Only a quick letting-go of the bowers saved the ship from destruction.

late February On her way to Port Desire the ship lost another boat in a gale.

1 April Back in the Magellan Strait, they passed the first narrows at night after an anchor cable parted.

4 April After passing the second narrows, continued survey toward Port Famine.

7 May Explored the Jerome Channel with cutter and whaleboat.

30 May J L Stokes returned in the cutter to the *Beagle*.

8 June FitzRoy safely returned in the whaleboat.

9 July San Carlos. Lost another boat on the way. Refitted the ship, and the carpenter, J May, built new boats.

- 18 November New orders to survey the southwestern coast of Tierra del Fuego. Rendezvous at Port Famine on 1 April, or 1 June, at Rio de Janeiro.
- 24 November Reached the western entrance of the Magellan Strait and surveyed the southwest coast of South Desolation Island.
- 29 November A party under Master Murray left with the new whaleboat. During the night Fuegian's stole the boat. Three men of the party returned in a makeshift boat, made of branches and a part of their canvas tent, to alarm the ship.
- 5 December The search for the lost boat led only to the discovery of the boat's gear. Some Fuegians were taken hostage but nearly all escaped.

1830

- 28 February Anchored in Christmas Sound, still searching for the lost boat. Found only traces of it and took some new hostages. As they could not recover the boat, Mr May built another boat from boards sawn from a salvaged spar. The four Fuegian hostages stayed aboard and were taken to England.
- 16 April Sailing again, they collected geological samples and left a memorial in a stone jar at Cape Horn. Surveyed in boats the coast as far as Cape Good Success.
- 2 August Reunited with HMS *Adventure* and HMS *Adelaide* in Rio de Janeiro.
- 6 August HMS *Beagle* and HMS *Adventure* sailed for home.
- 14 October Returned to Plymouth.
- 27 October The ship was paid off.

1831 Third commission: Commander Robert FitzRoy

- 25 June Re-appointment of Commander Robert FitzRoy; ship extensively refitted and improved, partly at the expense of FitzRoy.
- 5 September Charles Darwin met Robert FitzRoy and was accepted by the latter as an unpaid naturalist.
- December Ready for the voyage.
- 27 December After attempts to leave Plymouth were abandoned on 10 and 21 December because of bad weather, *Beagle* departed for South America.

1832

- 4 January Landfall at Madeira. Storm did not allow *Beagle* to anchor in Funchal roads. Proceeded to the Canary Islands.
- 6 January Prepared to anchor at Tenerife, but rumours of cholera in England would have ordered the ship to stay in quarantine for twelve days. Sailed on to Cape Verde Islands.
- 16 January/
8 February Bay of Porto Praya at St Jago.
- 16 February Examined the St Paul Rocks (Peñedo de San Pedro).
- 17 February Crossing the line.
- February Anchored for one day off Fernando Noronha, a small Brazilian convict island.
- 28 February/
18 March Bahia, then sailed southeastward to the Abrolhos Islands to check their accuracy on the chart.
- 21 March Two days of surveying and sounding at the Abrolhos.
- 4 April Rio de Janeiro, establishing exact longitude.

- 2 May A snipe shooting party went upriver in the cutter and returned sick.
- 10 May Another trip to Bahia to check a discrepancy in longitudes between the *Beagle's* surveys and French charts. Three men of that ill-fated boat excursion died of fever.
- 6 June Returned to Rio de Janeiro, increased her crew again, received another gun and sweeps and made necessary repairs.
- 5 July Sailed from Rio de Janeiro southwards.
- 26 July On arrival at Buenos Aires, Argentine guard ship fired two shots and customs officers tried to enforce a quarantine inspection. Sailed on to Montevideo.
- 27 July Montevideo. Black troops revolted and HMS *Beagle* supplied a force of fifty-two men (nearly all the crew) to protect British merchants.
- 19 August Departed from Montevideo, sailing south.
- 6 September/
17 October Stayed at Bahia Blanca and began coastal survey with the help of two very small hired schooners of 9 and 15 tons, the *Paz* and *Liebre*.
- 18 October Left the schooners under the command of Lieutenant Wickham to continue survey and returned to Montevideo for supplies.
- 27 November Left Montevideo for Tierra del Fuego, returning the three Fuegian hostages and a missionary, Richard Matthews, to bring Christianity to that desolate part of the world.
- 4 December Rendezvous with Lieutenant Wickham's two schooners in the Bay of St Blas, south of Bahia Blanca. Schooners continued the survey of the coast toward Port Desire until *Beagle's* return from Tierra del Fuego.
- 17 December Tierra del Fuego, anchored in the Bay of Good Success.
- 21 December Sailed further south and rounded Cape Horn the next day. Continued survey work at the southern part of Tierra del Fuego.
- 1833**
- 13 January Avoided near disaster, when three consecutive huge waves struck the ship and she was close to foundering. Lost one whaleboat.
- 19 January Established a place for the missionary and his three Fuegian converts.
- 6 February The mission was plundered by cannibalistic Fuegians. Richard Matthews was taken back on board.
- 26 February Finished survey and left Tierra del Fuego.
- 1 March Port Luis on the Falkland Islands. Surveying the islands. Commander FitzRoy bought an available sealing schooner of 170 tons, the *Unicorn*, and re-named her *Adventure*. Of great advantage to their further survey work, she was commanded by Lieutenant Wickham after refit.
- 6 April Left the Falkland Islands for the Argentine coast.
- 19 April At the Rio Negro estuary, no success in finding Lieutenant Wickham and his two small schooners.
- 28 April After arrival at Maldonado, FitzRoy chartered another small schooner, the *Constitucion*, to return to Rio Negro in search of Lieutenant Wickham.
- 2 May *Beagle* returned to Montevideo to procure planks, copper and carpenters for *Adventure's* refit.
- 18 May Back at Maldonado.

28 May Hove down *Adventure* and applied new copper sheathing. Lieutenant Wickham arrived in the *Constitucion* and left Mr Stokes (no relation to the first captain) in charge of the two small schooners.

June Remained in Maldonado for refitting and painting the *Adventure*.

24 July Completed survey of the Patagonian coast south of Bahia Blanca.

24 September/5 October Back on the Rio de la Plata, alternating between Maldonado and Montevideo. Small schooners paid off and discharged.

6 October/19 October Maldonado.

21 October/5 December Montevideo, completing the charts of the Patagonian coast.

6 December Sailed south, accompanied by *Adventure*.

23 December Port Desire.

1834

4 January Left for Port Saint Julian after some surveying of the river by yawl and surveying the coast towards the next port of call. *Adventure's* schooner rig was changed from fore-and-aft to topsail.

9 January Port Saint Julian.

19 January Survey completed, *Beagle* sailed back to Port Desire.

22 January *Adventure* ready for sea again and, under the command of Lieutenant Wickham, continued surveying the Falkland Islands, while *Beagle* went to the northeastern shore of Tierra del Fuego.

25 February Sailing through the Strait of Le Maire, anchored off Wollaston Island, then back to the eastern end of *Beagle* Channel, along to Posonby Bay where they had left the three Fuegians at Woollya thirteen months earlier.

5 March Arrived to learn that every civilisation effort had failed.

10 March Berkeley Sound, Falkland Islands.

13 March Joined *Adventure* to finish their survey of the islands during the following three weeks.

6 April Returned to the Patagonian coast.

13 April A three-week partial exploration of the Santa Cruz River. Having struck an underwater rock earlier, the ship was laid ashore for a tide to examine the keel and check the coppering before entering the Pacific. It was found that a piece of false keel under the forefoot was damaged and a few sheets of copper strongly rubbed.

12 May Next three weeks sounding and surveying on both sides of the eastern entrance of the Magellan Strait.

23 May Joined by *Adventure*.

3 June Moored in Port Famine to prepare for their voyage into the Pacific.

9 June Sailed from Port Famine through the Magdalen and Cockburn Channels into the Southern Pacific.

28 June Bad weather forced the ship to stay for two weeks at San Carlos on the northern tip of the island of Chiloe.

13 July Sailed north toward Valparaiso.

22 July *Beagle* and *Adventure* arrived at Valparaiso. Admiralty ordered the schooner to be sold. Stayed for the rest of the southern winter completing the charts of their last survey of Patagonia, Tierra del Fuego and the Falklands.

10 November Sailing once more southward to complete the survey of Chiloe and the Chonos Archipelago. At San Carlos Lieutenant Sullivan took command of the yawl and a whaleboat to examine the inner eastern coast of the island, while the *Beagle* went down the western coast, to rendezvous at the island's southern tip.

8 December Boats arrived one day after the *Beagle* at the island of San Pedro.

1835

5 February Completed surveying and sounding around Chiloe and Chonos archipelago. Departure from San Carlos.

8 February Arrived at Valdivia, 150 miles north.

20 February Experienced a strong earthquake.

22 February Left to continue survey towards the north.

24 February Anchored at Mocha. Frequent earth tremors.

4 March Anchored at Concepción and saw the city in ruins after earthquake. Left the port after three days.

11 March After mishaps and losing some anchors, arrived at Valparaiso to obtain more anchors. Commander Robert FitzRoy received promotion to Captain. Returning to the coast off Concepción to measure geological movements after the earthquake.

23 April Called in at Valparaiso to take Darwin on board and continued surveying the Chilean coast.

4 May/
6 June Moored the ship in Herradura Cove. Crew encamped on shore while she was cleared out, re-stowed and painted, making her ready to receive a large supply of stores and provisions at Valparaiso.

14 June Arrived at Valparaiso and began preparations for her home passage across the Pacific.

16 June News of the shipwreck of HMS *Challenger*. Captain FitzRoy, with two men and a whaleboat, sailed with HMS *Blonde* in search of survivors. *Beagle*, now under temporary command of Lieutenant Wickham, continued north to Copiapò to rendezvous with Charles Darwin on 5 July.

6 July *Beagle* left Copiapò. A short stay at Iquique before setting sail for Callao.

19 July Anchored at Callao, the port of Lima.

7 September Set sail for the Galapagos Islands.

15 September Reached Chatham Island (San Cristobal) and surveyed the group for the next five weeks.

20 October Left for the Society Islands 4,000 miles westward.

9/13 November Passed through the Tuamotous.

15 November Anchored at Matavai Bay, Tahiti.

26 November Left Tahiti towards the North Island of New Zealand.

19 December Sighted New Zealand.

21 December Anchored near the northern tip in the Bay of Islands. Remained there over Christmas.

30 December Left for Australia.

1836

12 January Sydney Cove until 30 January.

5 February Hobart, Van Diemen's Land (Tasmania). Remained for twelve days, then rounded the island to sail westward.

6 March Anchored for a week at King George Sound (Western Australia).

1 April/
12 April Cocos (Keeling) Islands. Sounded and measured the tides with the ship's boats.

29 April Ten day stay at Mauritius.

31 May/18 June Simons Bay, Cape of Good Hope.

8 July Called at St Helena for six days.

19 July Brief stay at Ascension Island.

23 July Did not sail directly to England, but crossed the Atlantic again to check errors in longitude.

1 August Bahia, Brazil.

12 August After leaving Bahia, *Beagle* called briefly at Pernambuco, the Cape Verde Islands and the Azores on her way home.

2 October After a voyage around the world lasting four and three-quarter years, HMS *Beagle* arrived again in England and anchored at Falmouth. During the following weeks *Beagle* travelled to Plymouth and Portsmouth.

28 October Arrived at Greenwich, the last station, where observations were made and chronometer rates ascertained.

17 November Paid off at Woolwich.

1837 Fourth commission: Commander John Clement Wickham

second week of February Recommissioned at Woolwich Dockyard.

9 June Departed Woolwich in tow of HM Steamer *Boxer*. Sailed for Portsmouth to exchange some crew and then for Plymouth to be swung, to determine her compass deviations and check her chronometer rates. She also received more stores, two extra crew members and took in a land-exploring party of thirteen men under Lieutenant George Grey (later Sir

George Grey, Governor of South Australia, New Zealand and the Cape Colony) for an expedition into northwestern Australia.

5 July After being paid the day before, HMS *Beagle* weighed anchor at 5.15am and left Plymouth in the company of HMS *Princess Charlotte*.

18/23 July Santa Cruz, Tenerife. Quick reaction in bringing out anchors and heaving on them avoided collision with a dragging USS *Constitution*.

10 August Crossing the line.

17 August San Salvador, Bahia. Rigging had to be reset.

25 August Left for Cape of Good Hope.

21 September Rounded Cape of Good Hope and anchored in Simons Bay. Lieutenant Grey hired the schooner *Lynher* for his party to sail directly to Hanover Bay, northwestern Australia. Several unsatisfactory seamen replaced with men from other ships.

12 October Sailed towards Australia.

15 November Anchored in Gage's Road off Swan River (Fremantle).

25 November Commander Wickham sick. Lieutenant Stokes charted local waters, Gage's Road, Rottnest Island etc, until 3 January, when an anchor fluke was broken.

1838

4 January After the captain recovered, they sailed for Dampier Land (northwestern Australia).

15 January Off Roebuck Bay. Broke a fluke of the best bower during a violent electrical storm and drifted leeward until the anchor fouled a rock. The second unserviceable anchor already.

25 January Beagle Bay; the near daily search for fresh water proved again unsuccessful. A safe anchorage.

- 31 January Extending their survey north they anchored at Karrakatta Bay. Tropical rain provided the urgently needed fresh water.
- 10 February While weighing anchor they struck an underwater rock without damage.
- 13 February A sudden violent storm pressed the ship to about 200 yards off lee shore rocks.
- 23 February King's Sound. Stokes discovered a river, naming it, in memory of his former captain, FitzRoy River.
- 7 March Explored the Fitzroy River, penetrating 90 miles.
- 29 March Survey of King's Sound completed. Sailed north in search of the *Lynher* and Lieutenant Grey's party.
- 9 April Found *Lynher* in Hanover Bay short on food, but no news of an overdue Lieutenant Grey and his men. Lieutenant Stokes had set out the day before in a whaleboat to explore and survey Collier Bay.
- 15 April Lieutenant Grey and his party returned, ill and famished. Stokes returned one day later.
- 19 April *Beagle* and *Lynher* left Hanover Bay; *Beagle* for Fremantle and the latter for Mauritius.
- 25 May Arrived off Fremantle. Ship was refitted, but unable to get supplies in the Swan River Colony.
- 20 June Sailed toward Sydney via the Great Australian Bight and around Tasmania.
- 9 July Anchored after a stormy passage in Sullivan's Cove, Hobart Town.
- 19 July Left for Sydney, where she arrived on 24 July and stayed for three and a half months to be completely refitted for their Bass Strait survey in the months ahead. Most survey tracings completed and shipped to England for engraving.
- 11 November Cleared Sydney heads and headed for Bass Strait.
- 18 November Surveyed channels in the two-and-a-half-mile wide Rip, the only entrance to Port Phillip Bay. Established a base at Geelong for their work in the western part of the Strait.
- 26 November Surveyed Cape Otway, King Island and the western entrance to Bass Strait.
- 15 December Circular Heads, North Tasmania, then Port Dalrymple.
- 23 December Arrived for Christmas in Hobson's Bay, in close proximity to the settlement of Melbourne, then only three years old. Lieutenant Stokes surveyed the Bay.
- 31 December Sailed for Geelong, again surveying the Rip, the entrance to Port Phillip Bay. Bad weather drove them for nine days into Western Port Bay. Overhaul of the rigging.
- 1839**
- 14 January Returned to Melbourne for supplies. When leaving the Bay, *Beagle* ran aground for four hours in the south channel. Returned to Circular Heads in time for stormy work in Bass Strait.
- 20 February Back in Melbourne for hogging (cleaning the bottom) and further survey of Port Phillip Bay.
- 2 March Sailed for Sydney to prepare for Torres Strait survey. Completed work on the Bass Strait charts.
- 20 March Near collision with HMS *Pelorus*, when the latter slipped the nipper of an anchor leaving Farm Cove.
- 19 May Alexander B Usborne, the ship's master, was declared unfit for tropical service and left the ship.
- 22 May Left Sydney for the tropics.

- 27 May Experienced a sudden gale which carried away three half-ports.
- 3 June At anchor in Port Stephens. Stuck for twenty-four hours on a sandbank.
- 11 June Saved passengers and cargo from the stranded brig *Francis Freeling*.
- 16 June Left Port Stephens and sailed James Cook's route inside the Great Barrier Reef.
- 13 July Reached Torres Strait after following the route of the great navigator. Stokes named a peak at Cape York, Point Cook.
- 17 July Arrived at the newly-established, but ill-fated settlement of Port Essington. Met HMS *Britomart* and exchanged mate Tom Birch with Crawford Pasco, who became mate of the *Beagle*.
- 24 July Left Port Essington.
- 27 July River discovered and named Adelaide River after the Queen Dowager. Explored the river for several days.
- 18 August Returned to Port Essington. The arrival of HMS *Pelorus* and the merchantman *Maria* with supplies, caused Commander Wickham to change his plans. Instead of returning to Sydney, he continued to extend his survey in the north westward and searched for new supplies at Swan River Colony. Took from HMS *Pelorus* another officer, Charles Codrington Forsyth, a competent surveyor, who had already served in the *Beagle* under FitzRoy.
- 4 September Left Port Essington.
- 9 September Exploring in a whaleboat Lieutenant Stokes discovered a large harbour, which he named Port Darwin in honour of his close friend and shipmate of the previous voyage, Charles Darwin. Today, this is the capital of Australia's Northern Territory.
- 14 September With *Beagle* arriving, all boats were sent out to survey Port Darwin. A watering party began to dig a well which eleven days later, at a depth of 34ft, provided the ship with enough water for all tanks.
- 26 September Sailed to Port Patterson, to stay a further six days on an island they named Quail Island.
- 6 October Headed southwest towards Point Pearce, where they expected to find a major river.
- 16 October By edging along the coast, a river was found and named Victoria River after the Queen.
- 22 October Mate Fitzmaurice returned to the ship with the news of another river, subsequently named Fitzmaurice River by Commander Wickham.
- 29 October *Beagle* entered Victoria River in search of fresh water and to conduct an examination. Followed the river for 75 miles in their whaleboats. Lieutenant Stokes continued the examination with a party of seven in more than 40° heat at the onset of the wet season.
- 11 November Stokes reached a distance of 140 miles from the sea before returning to the ship.
- 18 November Reached the ship after meeting the watering party.
- 30 November Trying to leave Victoria River the anchors and chains became embedded in quicksand. Lost small bower and 36 fathoms of chain.
- 1 December Lost best bower and 12½ fathoms of chain also. Ship was free to move.
- 3 December Ship cleared the river.
- 5 December After spending some time surveying the river's estuary, weighed anchor for Point Pearce.
- 7 December While setting up surveying equipment, Lieutenant Stokes was speared in the shoulder by an aborigine. The place was named Treachery Bay.

12 December Stoke's serious wound delayed the ship leaving Treachery Bay by five days. Eventually left for Swan River Colony.

31 December Water and provisions very low, half rations ordered.

1840

19 January Malnutrition and scurvy affected the crew. The cook, William Mitchell, died at 73 years-of-age, being 'worn out by old age and bodily infirmities'.

31 January With all provisions exhausted, *Beagle* anchored after fifty days in Gage's Road, Swan River Colony.

4 April After refitting, rest and re-supplying, the ship sailed for the Houtman's Abrolhos, surveying these islands and reefs for six weeks. Discovered some relics of earlier Dutch wrecks, including *Batavia*.

23 May Next destination Depuch Island off the northwest coast. Short on fresh water, they hoped to replenish their stocks on the island. Found some exquisite aborigine rock paintings and continued in search of water.

13 July Left North Turtle Island after finding many turtles as food supplement, but no water.

23 July Arrived in Coepang, Timor.

6 August Left Coepang. Unable to obtain sufficient provisions and with their water impure, the crew was sick with dysentery.

18 August Bezout Island, Dampier's Archipelago. Ten-day survey of the archipelago. Sailed to Montebello Islands to find the Tryal Rocks and Ritchie's Reef.

9 September Left the islands and sailed for Swan River.

30 September Back at Fremantle to recuperate the crew.

24 October Set sail for Sydney, stopped for a week at Albany and reached Adelaide a month later. Paused in Investigator Strait to commit the body of Nicholas Lewis, who died of Timorese dysentery, to the deep.

7 December Departed Adelaide on a slow voyage to Sydney.

23 December Arrived in Sydney for Christmas, and refitting and re-supplying. Lieutenant Stokes married.

1841 Fifth commission: Commander John Lort Stokes

24 March Commander J C Wickham invalided and left HMS *Beagle*, later to become Governor of the Colony of Queensland. Commander Owen Stanley, captain of HMS *Britomart*, and a ranking Royal Naval officer in the Colony, installed Lieutenant J L Stokes as acting commander and captain of HMS *Beagle*.

April Lieutenants Emery and Eden, also left the ship and took passage for England. Lieutenant Graham Gore, a grandson of Lieutenant John Gore (of James Cook's HMS *Endeavour*) became the ship's First Lieutenant. The Admiralty installed C J Parker as new master instead of the acting master Tarrant; Fitzmaurice was made acting assistant surveyor.

12 May Left Sydney for another trip to the north coast of Australia.

15 May Port Stephens. Chronometers rated and survey of the port's entrance conducted.

30 May Sailed again in the wake of *Endeavour*.

3 June Accompanied by four merchantmen, who looked for a safe inner passage along the Great Barrier Reef.

- 19 June Reached Restoration Island with their convoy and, after a further two days, Torres Strait. With fresh water running low, the four merchantmen provided *Beagle* with as much as they needed instead of waiting until some could be found.
- 24 June Having left the inner passage behind, the merchantmen and *Beagle* parted company, with *Beagle* heading south into the uncharted waters of the Gulf of Carpentaria, looking again for a major river.
- 5 July After reaching the head of the Gulf and sailing west towards Mornington Island, a full survey of Investigator Road and the island was made.
- 7 August After discovering the Flinders and Albert Rivers, sailed for Van Diemen's Inlet to take aboard assistant surveyor Fitzmaurice, who was accidentally shot in the foot.
- 13 August After nearly 200 miles closely examined in boats, twenty-six inlets and two rivers were discovered and course was set again north to Booby Island. There, sounding of a safe passage for large ships through Endeavour Strait and a compilation of sailing directions was undertaken. Sailed a week later, toward Port Essington.
- 7 September Having stayed for several weeks to assist Fitzmaurice's recovery, *Beagle* left Port Essington and sailed for Coepang on Timor to take in some provisions. Again some of the officers fell ill but soon recovered.
- 22 October Continued the 1840 unfinished exploration of the northwest coast between Roebuck Bay and North Turtle Island before returning to Swan River Colony.
- 23 November Back in Gage's Road off Fremantle, the place where the survey of Australian waters began four years earlier.
- 12 December Sailed to Champion Bay, and proved a planned settlement there was wrong.
- 16 December Back to Swan River for Christmas and then to Australind, Leschenault Inlet, another early settlement soon to fail.
- 29 December Departed for another voyage along the south of the Australian Continent to check meridian distances between Swan River and Sydney. First port of call Albany in King George's Sound.
- 1842**
- 26 January Arrived in Glenelg, South Australia. Several days of harbour survey.
- 7 February Sailed to Portland Bay, NSW (now Victoria) to fix the 141st meridian of east longitude, the western border of NSW.
- 20 February Easterly wind prevented sailing through Bass Strait and forced the ship to take an alternative route around Tasmania.
- 26 February Arrived in Hobart Town. Governor Sir John Franklin agreed a request for a colonial vessel to help in their survey work. The Colonial cutter *Vansittart*, commanded by Forsyth with Pasco as first officer, began surveying on the eastern side of Bass Strait, while *Beagle* was on her way to Sydney.
- 15 March Anchored in Farm Cove, Port Jackson. Official confirmation of Stoke's rank and command. Refitting and supplies.
- 15 April Hampered by relentless gales, survey work proceeded for the next two months between Twofold Bay and the Kent Islands.
- 16 June Examination of Wilson's Promontory, the southernmost tip of continental Australia.

- 30 June Joined *Vansittart* at Port Dalrymple, Tasmania. Careened *Beagle*, and found many sheets of copper gone and some of the extra 2in timber sheathing worm-eaten. After one month of repair, refloated and returned to Sydney.
- 3 August Sydney. Stores arrived from England with news of a recall without delay. Stokes played for time to finish his work.
- 31 October Back in Bass Strait. Surveying Banks' Strait (Flinders Island towards Tasmania).
- 26 November Joined up with *Vansittart* at Port Dalrymple. *Beagle* remained there as mother ship and the adjacent coast was surveyed by boat.
- 19 December Both ships sailed, *Vansittart* for Flinders Island and *Beagle* for Wilson's Promontory to establish three survey parties. *Beagle* sailed then to Geelong for a further survey of Port Phillip Bay.

1843

- 14 January Departed Port Phillip Bay to meet *Vansittart* at Circular Heads (northwest Tasmania).
- 28 January Back to Sydney. Commander Stokes took wife and child aboard and prepared for the home voyage.
- 18 February Weighed anchor and sailed toward Hobart Town with certain instructions of further survey on their way home.
- 15 March Left Hobart Town via the southwest Cape.
- 23 April Arrived off Fremantle and took in provisions for the Indian Ocean passage.
- 6 May Weighed anchor for the last time in Australian waters. Five and a half years of tedious work by the officers and crew of HMS *Beagle* eradicated all the blank spots from Australia's coastline not filled in by

previous explorers. They also made Endeavour Strait, Bass Strait and the entrance to Port Phillip Bay safe for large ships. On their long way back to England the ship called at Mauritius, Simons Bay, St Helena, and Ascension.

- 30 September After more than six years of absence, arrived at Spithead.
- 14 October Payed off at Woolwich Dockyard. The captain, Commander John Lort Stokes, left HMS *Beagle* at the same place he had first stepped on to the ship's deck as a young midshipman eighteen years before.
- 20 October Sent to Sheerness Dockyard.

1845

- 14 June After spending eighteen months at Sheerness, she was sold to the coastguard, and the ship was fitted out as a watch vessel.
- 11 July Left for Southend and Paglesham on the Crouch in Essex to be stationed as watch vessel. For her stationary duties her upper masts were dismantled and taken away.
- September A small caboose was installed.

1850

Beagle Watch Vessel was removed from the middle of the river and moored at Pagelsham.

1863

- 25 May After the Royal Navy integrated coastguard operations in 1859, all watch vessels were stripped of their former RN names. HMS *Beagle* was redesignated *WV7*.

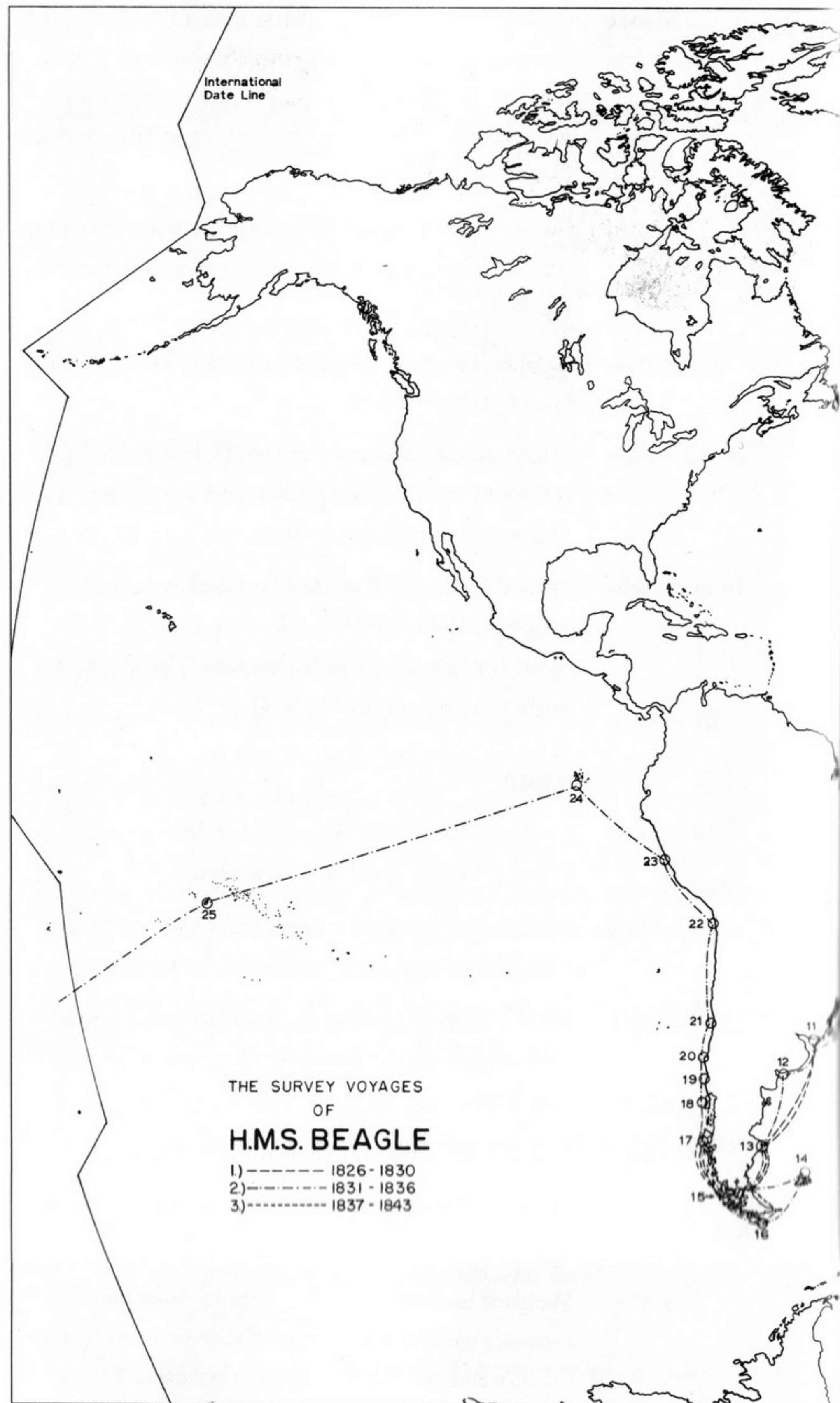
1870

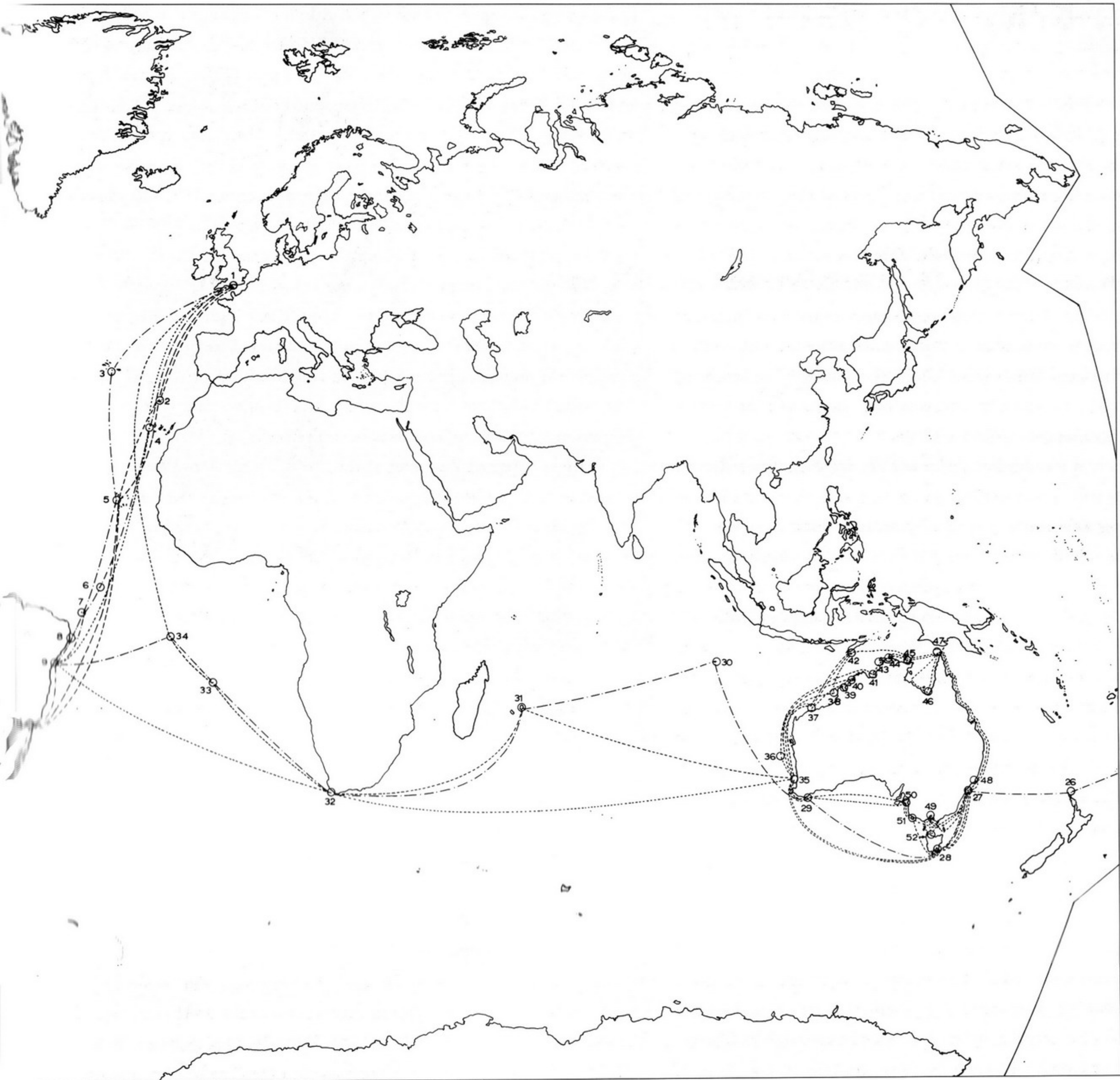
- 13 May *WV7* sold to Murray & Trainer to be broken up.

THE SURVEY VOYAGES OF HMS BEAGLE

*Stations of Beagle's voyages,
not in chronological order*

- | | |
|--|---|
| 1 Plymouth | 26 Bay of Islands, New Zealand |
| 2 Madeira | 27 Sydney |
| 3 Azores | 28 Hobart |
| 4 Canary Islands | 29 Albany, King George Sound |
| 5 Cape Verde Islands | 30 Cocos Islands |
| 6 St Paul Rocks | 31 Mauritius |
| 7 Fernando Noronha | 32 Simons Bay, Cape of Good Hope |
| 8 Pernambuco | 33 St Helena |
| 9 Bahia | 34 Ascension Island |
| 10 Rio de Janeiro | 35 Swan River Colony |
| 11 Montevideo, Maldonado | 36 Houtman's Abrolhos |
| 12 Bahia Blanca | 37 Dampier Land |
| 13 Port Desire, St Julian | 38 Northwest coast |
| 14 Falkland Islands | 39 King's Sound, Fitzroy River |
| 15 Magellan Strait, Port Famine:
[Captain Pringel Stokes died] | 40 Collier Bay |
| 16 Cape Horn | 41 Victoria River |
| 17 Gulf de Pènas | 42 Coepang, Timor |
| 18 Chiloe Island | 43 Port Darwin |
| 19 Valdivia | 44 Adelaide River |
| 20 Concepción | 45 Port Essington |
| 21 Valparaiso | 46 Flinders River, Albert River |
| 22 Iquique | 47 Endeavour Straits |
| 23 Callao | 48 Port Stephens |
| 24 Galapagos Islands | 49 Melbourne, Port Phillip Bay,
Geelong |
| 25 Tahiti | 50 Adelaide, Glenelg |
| | 51 Portland |
| | 52 Port Dalrymple, Bass Strait |





Widespread adoption of carronades in the last quarter of the eighteenth century led to a reduction in the size of sloops during the Napoleonic wars, thereby maximising quantity whilst reducing costs. One of the resulting new vessels was the 235-ton brig sloop armed with ten guns, designed in 1807 by Sir Henry Peake, Surveyor of the Navy 1806-22, which was known as the *Cherokee, Cadmus, Rolla* class. Considered the smallest class of seagoing cruisers, the *Cherokee* class was, beside the 18-gun *Cruizer* class brig sloops, in numbers the largest group of ships built to one design. HMS *Beagle* became the forty-fifth of more than one hundred built to that 10-gun brig design, the last being launched in 1832. Armament consisted of eight 16- or 18-pdr carronades and two long 6-pdr chase guns.

Built with only a low freeboard, these brigs were easily awash and their solid bulwarks prevented a quick run off. A succession of overcoming waves therefore created a very unstable situation, often with disastrous results. About twenty-five per cent of that class were lost, wrecked or foundered in bad weather, and sailors very soon gave them none too pleasing nicknames such as 'Half Tide Rock' or 'Coffin Brig'.

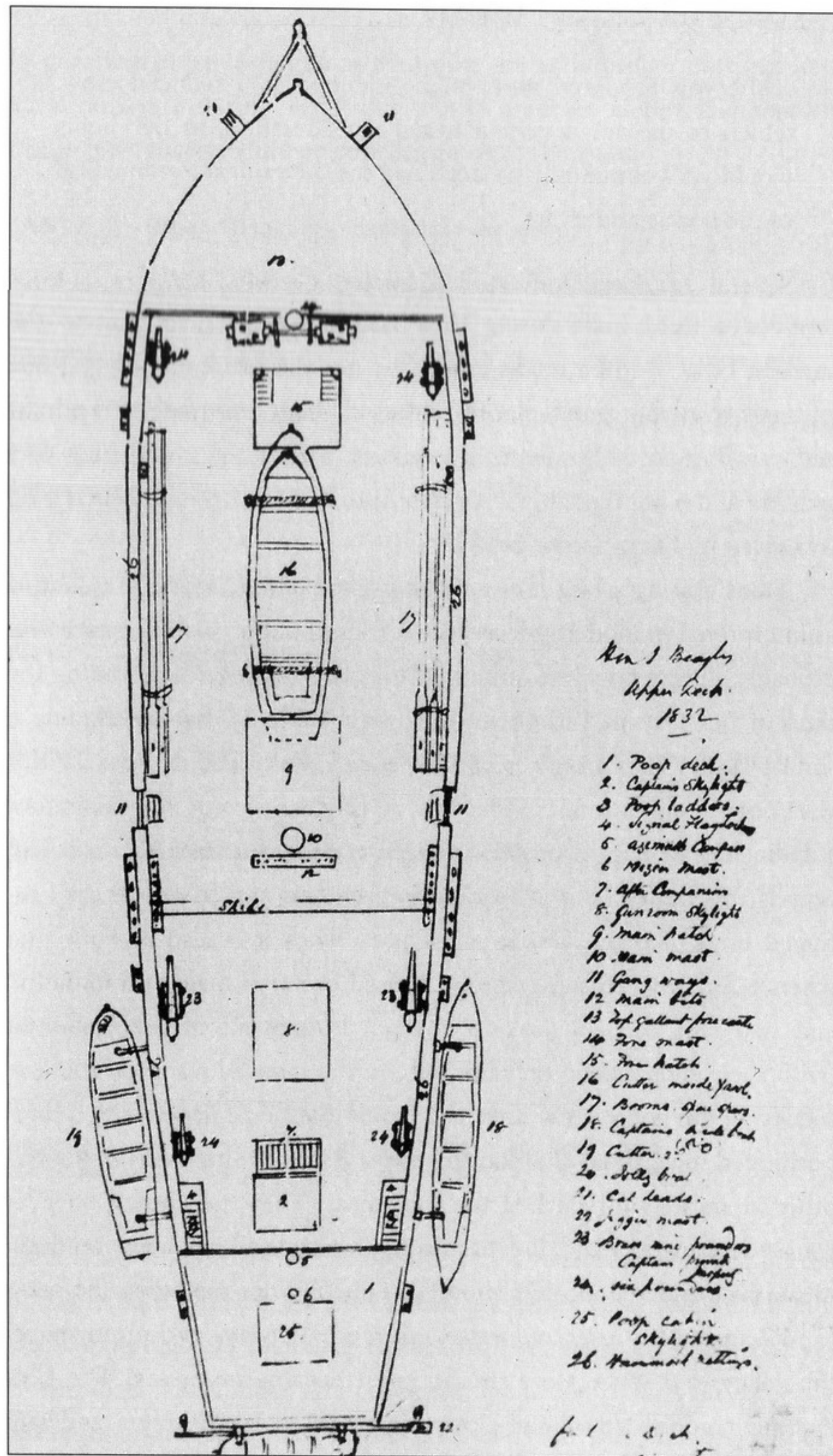
Not all of the *Cherokee* class brig sloops saw service as cruisers. Thirty-one were converted to, or completed as, packets, ten became tenders or were considered for other duties, and six were taken into survey service, with the second being HMS *Beagle*. The first taken into survey service was HMS *Barracouta*, a sister ship two days younger than *Beagle*, under Commander Vidal. She accompanied Captain William FitzWilliam Owen's 20-gun sloop HMS *Leven* in a survey of the African coast from 1821 to 1825. During that assignment she received a barque rig. Refitted in 1829 as a packet, she was disposed of in 1836.

Apart from their dissimilar service duties one can see that being 'built to one design' did not necessarily indicate a mirror image for all these various purpose vessels. Not only was their construction influenced by war or peacetime requirements but being built at different yards also contributed to a vessel's individuality. This is quickly realised by comparing some of the surviving sheer plans of

Peake's 10-gun brigs with each other: Admiralty draught No 3971 of 10 November 1807, designated *Rolla*; 3974A of 23 February 1808, designated *Cadmus & Chanticleer*; 3861 of July 1817, designated *Brisk*; and 3974C dated 16 April 1823, designated *Cadmus* Class. An overlay of 3974C on 3974A, for example, shows that both draughts have not much more in common than their main dimensions, their mast positions and the general shape of the body lines. With the earlier-dated draughts being of relatively similar appearance, 3974C is in several points different, resulting in a broken forecastle sheer, a forecastle 4ft 6in longer and a cathead placed further forward. Gun ports are differently placed and sized, the stem is slightly more upright, while the stern is leaning further back and the channels have altered positions, to point out just a few of the obvious divergences. Compare this again with the known artistic impressions and yet another suggestion for ports and channels becomes evident.

With no original designated draught available for HMS *Beagle*, it seemed proper to include at least two variations of the aforementioned draughts in this study. *Beagle*, as modified for survey duties, survived only in a few pictures and the above draughts must be considered as reconstruction bases for established plans in her refitted stages as a survey vessel. The plan dated earliest (3974A) indicates probably that HMS *Beagle* was launched in 1820, when she sailed as first man-of-war through the old London Bridge during the Naval review of 1820. This plan, designated *Cadmus* and *Chanticleer*, which were built within a few months of each other, is mentioned in a study by Professor K S Thomson of Yale University who states that a written remark on a draught designated *Cadmus*, in the draught room of the National Maritime Museum, suggests that copies were sent on 16 July 1817 to Woolwich for the construction of HMS *Barracouta* and HMS *Beagle*. He also referred to a second draught (4056) designated *Brisk*, with construction modifications by Seppings and dated July 1817, which showed an annotation that a copy went to Woolwich for the construction of *Beagle*. Lois Darling, who wrote several articles about the ship and made a disputable reconstruction of the 1831 refit, named these draughts as No 3861, July 1817 and No 3862, 16 February 1818.

A major factor in the reconstruction of HMS *Beagle*, as she appeared



Upperdeck layout sketch by P G King with windlass placed abaft the foremast. (Photograph: Author; Courtesy of Commander M Hordern)

during the famous Charles Darwin voyage, are the rough layout sketches by Phillip Gidley King (midshipman during the FitzRoy/Darwin voyage) in a letter of 3 November 1897 to A H H Murray. These sketches from memory provide our only deck and interior knowledge of the ship. Made sixty-two years after the voyage, their overall authenticity was seen by researchers as suspect in detail, even with King claiming that they were as accurate as one can possibly make them and naming the then eighty-four year old former mate of HMS *Britomart* Crawford Pasco, who joined *Beagle's* crew at Port Essington in 1839, as his witness. When discounting the dimensional inaccuracies of a rough sketch and preparing a plan by using all the right dimensions, King's claim must be underwritten. Circumspect only are the placing of muskets, pistols and other hand arms on racks and other fittings at the chartroom's outside wall. Constant exposure to salty air and seawater would soon have rendered these weapons useless and an open display of the ship's arsenal of hand arms to, and in reach of, everybody was not in the ship's best interest. Circumspect also is the rope around the companionway. Whilst one of the earlier draughts indicated a capping over the companionway, King's sketched rope might have been a fine weather solution, but would not have been adequate on a deck repeatedly awash.⁴ He also placed on his profile sketch the windlass below the forecabin and forward of the foremast, something both Darling and Thomson followed in their designs. However, the upper deck layout sketch set the windlass behind the mast and clear of the forecabin, making the windlass operational. Another layout indication for reconstruction is an accurately-scaled chartroom sketch, found more recently amongst some of Darwin's papers, which was probably prepared for him by the then mate John Lort Stokes.

For details, not obtainable from draughts and King's sketches, one has to consult the various artistic impressions by Augustus Earle and Conrad Martens (*Beagle's* artists), John Lort Stokes (midshipman, mate, lieutenant and later captain of HMS *Beagle*), Owen Stanley (captain of HMS *Britomart*) and Henry I Campbell, as well as written 'Narrative's' and other general contemporary evidence. Considering all the known detail for dimensions and deck fittings of the original 10-gun brig draughts (see Table 1) and their application to the refitted survey ship of 1825 in conjunction with later dated artwork, one must conclude

that major reconstruction took place during this first repair and refitting period, not only in terms of rigging, but also in regard to hull and deck furniture.

TABLE 1 Specifications – HMS *Beagle* 10-gun brig/brig sloop

DIMENSIONS

Length over deck	90ft
Length of keel	73ft 7 ⁵ / ₈ in
Breadth extreme	24ft 6in
Depth in hold	11ft
Tonnage	235 ⁹ / ₆₄ tons
Complement (brig)	75
Complement (survey ship 1825)	62
Complement (survey ship 1832)	59 and 1
Complement (survey ship 1837)	64
Armament (brig)	2 x 6-pdr carriage guns 8 x 16-pdr carronades
Armament (survey 1825)	6 guns (2 x 6-pdr carriage guns and 4 x 16-pdr carronades?)
Armament (survey 1832)	4 x 6-pdr brass carriage guns 2 x 9-pdr brass carriage guns bought at Rio de Janeiro. 1 x 6-pdr boat carronade 1 x 4-pound howitzer, lost at sea 1832

Beagle was always known during her long life as a brig; Charles Darwin opens his book *The Voyage of the Beagle* with the line:

‘After having been twice driven back by heavy south-western gales, Her Majesty’s ship *Beagle*, a ten-gun brig, under the command of Captain FitzRoy R.N., sailed from Devonport on the 27th of December, 1831.’

Despite this, all the known pictures of HMS *Beagle* show her as a three-masted, barque-rigged ship. Built as a true brig, her rig must be considered that of a barque after conversion for survey duties. This followed an early nineteenth-century trend, which saw a large number of brig sloops being converted to ship sloops and smaller brigs rigged as barques. The reason for this was a reduction in manpower on packets and on survey ships. The adding of a third mast on HMS *Barracouta*, one month after starting her career as a survey ship, was

explained by Captain W F W Owen as:

...she was rendered more manageable with a reduced crew, which to us was a very material consideration, as our boats would very commonly be detached for the critical examination of the coasts and rivers.

Several of these converted *Cherokee*, *Cadmus*, *Rolla* class brigs received a third mast during their refurbishment. Belonging to the smallest class, *Beagle*’s mizzenmast was not the usual fully-rigged one and was relatively small, placed further aft than a normal mizzenmast and carrying an early nineteenth-century barque rig, comprising of a spanker and a lug-rigged gaff topsail. An early description of such a rig was given by Darcy Lever in 1818.⁵

Transforming a brig into a three-masted barque was not as simple as interpreted in modern reconstructions. Just adding another mast was probably all that could be done in *Barracouta*’s change of rig during the time of her stay in Lisbon in 1822 (see Table 2), but concluding a similar rig for HMS *Beagle* from that could be misleading because this was not at all normal procedure. A brig’s rig with her mainmast standing far aft had its position altered in consequence (see ‘Rig’). Not only is this hinted at in all artists’ impressions and in draughts of re-rigged brigs, like the *Cruizer* class HMS *Wasp*, it is also obvious that when a 28ft yawl (first voyage) is housed between main and foremast, and two 28ft whalers (second voyage) housed aft of the mainmast (with their ends resting on skids behind the main bits and on the fore section of the poop deck), the latter could not be achieved with a brig-positioned mainmast. The housing of the 28ft yawl indicates also a few other alterations forward of the mainmast. They are shown on P G King’s deck layouts and, for reasons of placing the large boats on deck, must be considered as 1825 modifications. Besides removing the main topsail sheet bits, a rearrangement of the hatchways and a moving of the galley to a place afore the foremast became necessary. The Lois Darling reconstruction⁶ did not observe these basic points and still indicates for the 1831 (second) alteration the original furniture concept of the 1807 brig design. Keith S Thomson’s drawings⁷ demonstrate a mixture between those and P G King’s sketch and assumes *Barracouta*’s

'makeshift' barque rig as relevant. With HMS *Beagle* being the second 10-gun brig to be re-rigged as a barque, not in a foreign port but in a naval dockyard during her major refit as a survey ship, the mainmast would have received the position as given for barques.

TABLE 2 Other 10-gun brig design survey ships

	BUILT BY	LAUNCHED	REMARKS
<i>Chanticleer</i>	List at Cowes	26 July 1808	1827-31 survey ship, 1833 sold to Customs, later <i>WV13</i> , 1865 sold
<i>Barracouta</i>	Woolwich Dockyard	13 May 1820	1821-25 survey ship, 1822 converted to barque-rigged, 1829 packet, sold 1836
<i>Fairy</i>	Chatham Dockyard	25 April 1826	1831-40 survey ship, sunk in North Sea
<i>Saracen</i>	Plymouth Dockyard	30 January 1831	1854-60 survey ship, sold 1862
<i>Scorpion</i>	Plymouth Dockyard	28 July 1832	1848-58 survey ship, sold 1858 to Thames River Police, 1874 broken up

small cabins, causing the new poop deck to reach forward enough to overhang and provide some shelter. The cabin on portside was occupied during the second voyage by the assistant surveyor, while on starboard a storage room extended over the whole length and included an officer's WC. Close to the poop's break stood a large azimuth compass and aft of the mizzenmast was the centre filled by a large skylight above the chart table, providing enough daylight for drafting. Further skylights were fitted to the captain's cabin and the gunroom, adding extra airing and light beside that of the bull's eyes (small glass prisms fitted into the deck planks) to those lower deck lodgings. An interesting description of these small cabins on the lower deck, after the refit for the second voyage with the deck raised, was given by the ship's artist from Rio – Valparaiso, Conrad Martens, who described his own cabin.⁸

With the first voyage ending on 14 October 1830, HMS *Beagle* was laid again 'in ordinary' at Devonport Dockyard. Fame could have eluded her if HMS *Chanticleer*, a sister ship twelve years older than HMS *Beagle* and refitted in 1827 as a survey ship (barque-rigged) for the same South American waters, had not been in need of an extensive overhaul. As *Chanticleer* was therefore unable to make the second surveying voyage to South America, HMS *Beagle* became the obvious next choice. Similarly not in prime condition, she was re-commissioned in late June 1831 and taken to Plymouth Dockyard for a refit.

Commander Robert FitzRoy took great care to supervise that work himself and wrote that he was:

...resolved to spare neither expense nor trouble in making our little Expedition as complete with respect to material and preparation, as my means and exertion would allow, when supported by the considerate and satisfactory arrangements of the Admiralty.

True to his words, the refurbishing proved to be very extensive and costly. At £7,583, it was just £220 less than the brig's initial construction costs.

A general description of the ship, as she was leaving Rio de Janeiro on 5 July 1832, was recorded by FitzRoy in his *Narrative*,⁹ which helps

D E S C R I P T I O N

After lying 'in ordinary' for nearly five years, HMS *Beagle* docked on the 27 September 1825 at Woolwich and underwent a considerable refit. Her coppering was removed, rotten planking replaced, then she was re-sheathed with timber and coppered again. Indications on the early draughts and later artists' impressions indicate that the brig's short forecastle became enlarged and received a low bulwark. A chartroom was added at the rear, taking in all the quarterdeck area aft of the wheel and housing the tiller. Flanking the steering wheel were two

us to examine certain aspects of the ship in more detail.

With the larger part of her planks rotten after six years of service, the ship was stripped down to her timbers and replanked. She also received an additional sheathing with 2in fir planks followed by a coating of felt and was finally coppered again. Commander FitzRoy also requested to have the upper deck raised by 8in. With a replacement of decaying spirketting and deck timbers imminent, additional costs were considered minimal and it was agreed to. In its new position the deck forward was higher by 12in and aft by 8in. Added to the 5ft between decks, the extra space provided generous headroom for the whole crew, making life not only much more comfortable below deck, but also increased upper buoyancy. This 'proved to be of greatest advantage to her as a sea boat', wrote FitzRoy after the famous voyage. Arguments by modern researchers, such as Darling and Thomson, that after raising the upperdeck *Beagle's* height of sheer stayed the same, are based on a letter by FitzRoy to the Commissioners of the Navy dated 9 July 1831.¹⁰ However, FitzRoy's expressed hope for a lower waist by only raising the upperdeck within the set sheer height would not have worked out. A 1ft reduction in waist height from 4ft 4in (top of gunwale to upperdeck) to 3ft 4in caused a number of problems. Not only was a lower gun port sill readjustment upward, by a minimum of 1ft 3in above deck, necessary for a 6-pdr carriage gun on upperdeck, but the height of that calibre's gun port of 2ft plus the upper sill thickness would have exceeded the suggested waist without even considering sheer rail and gunwale. From the bow section below the forecandle (only 4ft in height anyway) and the chartroom below the poop deck not to be reduced to unworkable heights, their final location above sea level must have increased by 12in and 8in respectively. A reconstruction making the necessary height adjustments for poop and forecandle, which includes enlargement of the stern but maintaining the original sheer-line, would furnish a picture contrary to the visual impressions given by the captains O Stanley and J L Stokes, by a trained artist and a former midshipman. *Beagle's* known artwork indicates also an approximately 1ft high bulwark around the forecandle and a plank strake above the gun ports where the channels were fitted, instead of between the ports as indicated in the early

drawings. By taking these observations under consideration in reconstruction, subsequent drawings will show a very similar waist height as before the upper deck raising and verify the impressions immortalised by the artists of the day. All alterations added about 15 tons to her displacement.

LIGHTNING CONDUCTORS

With lightning being one of the major hazards at sea, and FitzRoy's determination to have the best-equipped, up-to-date vessel possible, he requested that the conductors newly invented by W S Harris, FRS be fitted.¹¹ These ran continuous copper strips from the masthead vane, built into masts and spars, and led outboards to the copper sheathing for grounding in the water. The conductors proved to be a very necessary and useful addition. Hit by lightning several times during her long service in surveying desolate shores, HMS *Beagle* never received any damage. William Snow Harris was later knighted for this invention.

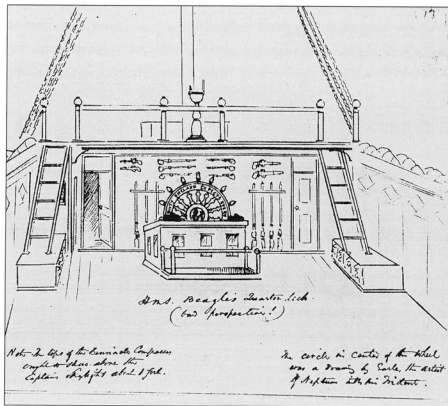
RUDDER

FitzRoy also had a new type of rudder fitted. Recently designed by Captain J Lihou, RN, it consisted of the now cylindrical pintle which could be replaced if broken. From a description of Lihou's rudder by D Stanbury¹² it can also be assumed that several chains were used as rudder pendants and to hold the parts of the rudder together instead of nails, nuts and bolts, and also that the sternpost was grooved for the helm to turn in. It was not possible to find a drawing of Lihou's rudder, but the sparse evidence given on Stokes' chartroom drawing, where a round helmport and an iron tiller is drawn, suggests that the rudder would have included the Snodgrass idea with its offset upper helm where the hinge-point axis of the lower rudder ran through the centre of a rounded upper helm. The helmport and casing in that design were only fractionally larger than the rounded helmport itself, a concept embraced by the Royal Navy after trials had taken place during the early 1830s. An old style rudder, as fitted to the Peake-designed but no longer to the 1832 Symonds-designed 10-gun brig, was hung in a straight line aft of the sternpost. A lower deck sketch by P G King with a circular helmport gives additional evidence to confirm that idea. Already developed in 1779

by G Snodgrass for East Indiamen, that design was embraced internationally during the early decades of the nineteenth century as shown in German nautical literature of 1835.¹³

POOP

Beside the aforementioned large skylight for the chartroom and the azimuth compass near the deck's break, a deep-sea sounding winch¹⁴ was fitted near the stern and horn davits reached aft to keep the dinghy in place. Iron davits at both quarters carried the 25ft whaleboats, and probably from 1833 onwards a 25ft gig, at portside, while a handrail with brass stanchions secured the break between the deck-housed whaleboats. Ropes restored the rail during the absence of these boats. Being a work and observation platform, the poop deck would not have been adequately closed off without an open stanchion railing at the sides. Outboard hanging boats and the mizzen shrouds alone would not have provided security on a strongly labouring ship. Near the sides,



Sketched view towards the poop by P G King.

(Photograph: Author; Courtesy of Commander M Hordern)

ladders led from the break to the main deck, or better, on to the top of 1-1½ft high signal-flag lockers, adjacent to the poop cabins.

MAIN DECK

Closer to the mainmast, but at poop deck level, a skid beam reached athwart ship for the stowage of two 28ft whaleboats. With their stems resting in its clamps, the sternposts were placed in similar clamps on the poop. Afore the chartroom bulkhead, but still within the poop deck overhang, stood the steering wheel. Its hub contained a picture of Neptune holding his trident, painted by Augustus Earle during the early part of the second voyage, and the words 'England Expects Every Man To Do His Duty' around its rim reminded the crew of their arduous daily chores. Forward of it stood two binnacles, the skylight for the captain's cabin, the companionway (shown by King with only a fine weather handrail, but on the original draught 3974A with a capping), a skylight for the gunroom and aft of the mainmast the main bits. Bolted to the bulwark abreast of it were pin rails, with inner gangway steps forward of them.

The main hatchway directly in front of the mainmast was followed by the fore hatchway. Both hatchways are in P G King's profile sketch fitted with ladders. How these accesses to the between deck, used by most of the crew, were secured cannot be concluded from that sketch. Trapdoors could have been fitted, or a cover with a hood was possible, with either forward or sideways opening doors. Iron boat cradles containing the large boats stood between and above both hatchways. The windlass was situated between fore hatchway and foremast, just below the forecastle break. This description follows the second voyage layout; variations during the first voyage include a capstan afore the companion, a smaller skylight for the gunroom, no skid beam aft of the mainmast for extra whaleboats, and at the place of the windlass stood riding bits.

PUMPS

Two normal suction pumps were situated between mainmast and main hatchway.

motion, men had to bend and straighten up to use their muscle power to the full extent. This was not possible in a constantly stooped position. Another factor against that placement was the width. From the writings of FitzRoy and Darwin we know of storage cabins fitted below the forecastle. Common to all ships, such cabins belonged usually to the boatswain and carpenter. Room between them would not have been wide enough for a windlass with extended crank handles. One must therefore consider this an oversight by P G King when drawing the profile, a mistake he corrected in his sketch of the ship's upper deck, where the windlass takes its proper place at the former riding bits position aft of the fore mast – a place much more suitable for operating such a devise.

Lack of drawings of this particular patent windlass allow only assumptions that it was similar to the windlasses fitted to the Seppings-designed 1829 *Hornet* class of 6-gun brigantines¹⁶ and the Symonds-designed 1832 *Bonetta* class of 10-gun brigs. In the latter class, an upper deck draught of HMS *Dolphin*¹⁷ reveals a windlass with crank handles extending toward the bulwarks. The above is only one of the many improvements to the old-style windlass after the introduction of the chain cable.

ANCHOR, CHAIN AND OTHER CABLES

The number of anchors carried aboard was approximately double the normal allotment for a 10-gun brig (three bowers – 14cwt, one stream anchor – 5cwt, one kedg anchor – 2cwt). In August 1831 HMS *Beagle* received five bowers – 14cwt, two stream anchors – 7cwt, and four kedg anchors – 3cwt. When reading through the *Beagle* story, one discovers that in their difficult work anchors were used far more often than in a normal ship's routine and many of them broke, or were lost. FitzRoy wrote in a letter, 'Having broken or lost all our anchors except one I was obliged to repair to Valparaiso sooner than I intended.' In order not to jeopardise the completion of his remaining survey obligations and the home voyage, he bought another five anchors in Valparaiso, of which he lost one more before arriving in England. Similar situations happened during the third voyage when anchors broke and on one occasion two bowers and chain cable were lost

because of quicksand. The lengths of cable carried aboard is known from a requisition of 18 August 1831:

- 400 fathoms of established chain (731.52m)
- 200 fathoms of hempen cable (365.76m)
- 200 fathoms of hempen stream cable (365.76m)
- 100 fathoms of 6in cable (182.88m)
- 100 fathoms of 4in cable (182.88m)
- 100 fathoms of 3in cable (182.88m)

ARMAMENT

The ten guns (eight 16-pdr carronades and two 6-pdr carriage guns) of her brig armament were reduced to six during conversion. For that first voyage, size and type cannot be ascertained. No longer equipped as a fighting ship, the choice was either a reduction in the number of her carronades, or a replacement of the carronades with 6-pdr carriage guns. It was probably the latter, since no carronades (except for one 6-pdr boat carronade on the forecastle) were aboard FitzRoy's ship. His armament consisted of the mentioned carronade, four 6-pdr and two 9-pdr brass carriage guns, the latter purchased by FitzRoy privately in Rio. He insisted on brass guns so that they would not interfere with his compasses. Beside the carriage guns, a 4-pdr howitzer was also part of his armament for a time and mentioned as being fired once before being lost on 27 August 1832 'due to its carriage breaking in bad weather'. Where the howitzer was mounted and what type of mounting was used cannot be established. The mounting shown in the drawing section was published by J H Röding in 1794¹⁸ and was remarked on as being developed by F H of Chapman. *Beagle* was also able to provide two 5-pdr brass carriage guns in June 1833 for the refitting of the schooner *Adventure*. Their origin cannot be authenticated, but having procured planks, copper and carpenters for the refit in Montevideo, the guns probably came from the same source. In those days of revolutionary unrest in South America, additional guns were needed to demonstrate defence capability, even on a ship of thoroughly peaceful purpose. On her return trip during a short stay in Sydney in January 1836, two guns with ammunition and stores were left behind for HMS *Zebra*, an Indian-

built *Cruizer* class 18-gun brig sloop. A request was also made for 'fowling arms which could be used to augment the *Beagle's* meat supply'. According to one of King's sketches these arms were located on the outside poop bulkhead, open to wind and weather, a situation very suspect indeed, since arms would not have lasted long under such conditions. This sketch contrasts with artist C Marten's statement that guns and pistols occupied (beside books etc) one wall of his cabin. A similar plating of firearms was surely part of all officers' cabins.

FIGUREHEAD

The question of the figurehead is another unresolved matter. One school of thought asserts that the utilitarian character of those small brigs, without real embellishment anywhere, warrants only a scroll whilst the other suggests a carved figurehead. Both opinions have their merits and can be documented with surviving models of the 18-gun *Cruizer* class brig. While C Marten's watercolours and pencil drawings are too sketchy to get a clear indication of a figurehead, the O Stanley watercolour of HMS *Beagle* in Sydney Harbour and P G King's longitudinal sketch suggest an animal, probably a dog (see Drawings C3/1 and C3/2).

CHRONOMETERS

After their invention by John Harrison about 100 years earlier, chronometers were of utmost importance to a successful outcome of survey work, since the accurate finding of longitude depended on very exact timepieces. FitzRoy ensured that only the best instruments were obtained from the Admiralty and from other sources, adding his own six to the collection. 'Few vessels will have ever left this country with a better set of chronometers', said Captain Francis Beaufort, Hydrographer to the Navy. *Beagle* carried twenty-four chronometers on her second voyage of which three were still in perfect working order when the ship returned five years later. To keep chronometers completely free of accuracy-interfering vibration and shock, each was, 'suspended in gimbals, as usual, within a wooden box'. These boxes were, 'placed in sawdust, divided and retained by partitions, upon one of two wide shelves', inside a locker close to the captain's cabin.

SEPPINGS' IMPROVEMENTS

On draught No 4056 of July 1817, Sir Robert Seppings specified construction modifications to the frames by diagonal bracing. Another note on that draught mentioned that a copy was sent to Woolwich for the construction of HMS *Beagle*. Seppings' 'trussed' frames for a small ship were iron riders of 1¼in thickness and 6in width, fitted at a 45° angle and 5ft apart to the inside of a frame. Such riders leaned upward forwards afore midship, and aft of that point in the opposite direction. Longer riders consisted of two parts, with the upper adjacent to the lower and overlapping by between 4ft and 6ft.

The use of Seppings' new butt-joined and coaked frames in the construction of HMS *Beagle* is debatable and both methods of frame construction can be considered. With the keel of the ship laid at the same time as the new construction method was ordered to be tried in 1818, it is conceivable, but nothing directly indicates *Beagle* to be one of the trial vessels.

BOATS

Boats were the eyes and ears, the essential tools, of a survey ship. They explored rivers to considerable lengths, examined the inlets of islands, sounded unknown waters for weeks on end and were doing most of the inshore work where a ship could not go. A variety of boats were necessary, and included heavier boats such as a yawl and cutter for sailing close to shore, smaller ones like the jolly boat for other duties, and light whaleboats for surveying in shallow waters. How many of these boats were carried? We know of seven for the second voyage and six for the third, but one of the more dubious factors is the number and type of boats during HMS *Beagle's* first voyage. When considering a normal contingent of a brig's boats as yawl, cutter and jolly boat, another two or three 25ft whalers would have been added. The first three types are named in FitzRoy's *Narrative*, and the loss of the yawl was reported on 10 June 1728 by Commander Pringel Stokes:

Anxious to clear the entrance, I had not wanted to hoist in the yawl ... expecting to find smooth water as we went out; but the sea we met made it unsafe to tow her, and while hauling up

to hoist her in, she was so badly stove by blows received from the violent motion of the ship, that we were obliged to cut her adrift. [The mentioned yawl] was a beautiful boat, twenty-eight feet in length, pulled and sailed well, and was roomy, light and buoyant.

Hydrographer in 1857, that he always carried seven boats in the *Beagle*, is probably only correct for his second voyage.

Better documented are the boats of that famous second voyage. The two larger boats, yawl and cutter, were requested by Fitzroy as 26ft and 23ft in length and that:

I have also to request that the Yawl and Cutter may be built on Mr. John's principle of diagonal planking; and that the Yawl may be fitted with the Windlass invented by Captain, the Hon'ble George Elliot.

By granting his request the Navy Board made an exception to their rule of restricting this new construction method to launches. Mr Jones, a foreman in Plymouth Dockyard, invented a new method of planking consisting of crossing a double layer of diagonal planks, thus making boats slightly heavier, but very strong and durable. This invention proved very popular in later years and realised the sum of £300 for Jones in 1840.

The yawl, the larger of the two boats, had a length of 26ft, giving her a breadth of 6ft 6in or 6ft 8in and a depth of 2ft 11in according to a 1798 draught and 1848 dimensions. The rigging of the yawl was two-masted as J L Stokes mentioned, and C Martens' watercolour 'Bivouac at Port Desire' shows a bare-poled yawl with lowered long spars suggesting a sprit-rig. A similar rig to the yawl was possible for the cutter, but without having direct evidence, a two-masted lug-rig can also be considered. Cutters were usually built with a slightly wider beam and had less depth than a yawl of similar length. A 23ft cutter had an approximate breadth of 6ft 9in and a depth of 2ft 6in. However, it is a reasonable assumption that for the purpose of 'nesting' the cutter in the yawl, both boats needed to be of very similar proportional dimensions. Therefore *Beagle's* cutter width must have departed from the standard proportions of the day with a beam of not more than 6ft 4in. Placing of the boats between fore and mainmast was expressed by FitzRoy as:

... amidships two boats, on the diagonal principle, one stowed inside the other, and as close to the deck as possible; being secured by iron cranks, or supports.

This points to a number of alterations on deck. King's sketch with

A nineteenth-century yawl was unlike her earlier sisters, not being clinker-built and considered the fifth class of ship boats, but boats of that type since about 1800 were carvel-built and the largest of the ship boats. The lost yawl had nearly one-third of *HMS Beagle's* length and her approximate beam would have been 7ft 6in, by a depth of at least 3ft 4in. A boat trial in December 1825 spoke of *Beagle's* 25ft cutter. It can be assumed that this was one of those carvel- (not clinker-) built standard cutters (length 25ft, breadth 6ft 11in and depth 2ft 5in) issued for foreign service. The reason for carvel construction was the much easier repair of such boats away from home. The cutter was also mentioned several times as one of the surveying boats. The small or jolly boat, hanging astern on davits, was lost in a stiff gale on 24 March 1828. In regard to other boats, we learn that during the River Plate storm on 30 January 1829, 'the starboard quarter boat was stove by the force of wind and the other was washed away', indicating the placing of two further boats, probably whaleboats, on outboard davits. A late February 1829 entry reports that another boat was lost in a gale with a further one going in early July 1829. A whaleboat stolen by Fuegians was not returned, despite four natives being taken hostage, who eventually went with the ship to England. During the first voyage six boats were lost and one was damaged. With such losses occurring in a part of the world where replacement was not easily available, the *Beagle* must have carried adequate material, malls etc, for the ship's carpenter and his crew, not only to repair, but also to replace some lost boats. Two notes in FitzRoy's *Narrative* refer to this. One, of 9 July 1829, tells us that after reaching San Carlos and refitting the ship, the carpenter, Mr May, began the construction of new boats. The second report, dated 28 February 1830, mentioned Mr May building another boat from boards sawn from a salvaged spar to replace the whaleboat stolen by the Fuegians. FitzRoy's remark in a letter to the

smaller boats not drawn proportionally made it look easy, but the deck situation of a true 10-gun brig would mean a 28ft yawl would only just have fitted between the main topsail-sheet bits and the oven flue, covering thereby the entire fore hatchway and making access to the crew quarters only possible by stowing the yawl at a minimum of 3ft above deck. The same would not have been possible on the barque rigged vessel with her mainmast placed more forward in correct position. The cook's galley, originally situated aft of the foremast, had to be moved to a place in front of the mast, while the main topsail-sheet bits were removed to house the same boat. Both alterations were indicated by P G King, who also implied a redesigned fore hatchway with stairways fitted at each side of the boat's stem. Not one of these necessary alterations was considered in either the Darling or the Thomson reconstructions.

FitzRoy specified the housing of the other boats aboard as:

... over the quarter-deck, upon skids, two whale-boats, eight-and-twenty feet long were carried; upon each quarter was a whale-boat twenty-five feet length, and astern was a dinghy.

We know further from his words that during the second voyage quarter boats were carried three feet higher than in the previous voyage, and that:

... four of the [boat] set were built by Mr. Jones, the well known boat-builder in Plymouth Dockyard, and the other two by Mr. May, our carpenter.

The two officially requested 25ft whaleboats were part of William Jones' contract, while the 28ft whaleboats constructed by the ship's carpenter were probably considered Commander FitzRoy's private property.

With no draught of *Beagle's* boats available, all shapes can only be developed from general evidence of that period. Whaleboats were double-ended, clinker-built, and most had stem and sternpost equally canoe-shaped, except for some American whalers with straight sternposts. From P G King's sketches and pictures of these boats by crew members, one can assume the shape of the former was followed. D.

Steel's *Naval Architecture* (1804) presents such a one on p.I.XXI, but this is a slightly larger boat. Dimensions of that boat give length as 32ft 9in, beam 5ft 2in and depth 1ft 9in. A 28ft or a 25ft whaleboat would not have been much narrower or shallower. The rig of a whaler could be identified from an 1834 sketch by FitzRoy as a single dipped lug-sail.

While FitzRoy's *Beagle* carried four whaleboats on her second voyage, or three whaleboats and a gig after the loss of one of them in early 1833, only two can be confirmed for the third voyage under the Commanders Wickham and Stokes. The boat complement during her third voyage according to J L Stokes' 'Narrative' was a yawl, a cutter, two whaleboats, a gig and a dinghy, therefore one boat less than under the command of FitzRoy.

Having lost one of the 25ft whaleboats during a storm on 13 January 1833, the replacement was later spoken of as a second cutter or gig. It is not known when and where the gig was added. Researchers assumed she was taken from the sealing schooner *Unicorn*, which was purchased during their stay in Port Luis, Falkland Islands in March 1833, to assist in and extend their surveying task. The schooner was renamed *Adventure* by FitzRoy, similar to *Beagle's* companion of the first voyage. However, it seems highly unlikely that the gig was taken from a vessel acquired as an additional survey ship. By enlarging the capacity for a satisfactory completion of his task, FitzRoy would not have denuded the schooner of her essential tools, when she needed every single boat for the work she was bought for. A probable acquisition of the gig from the French ship *Le Magellan*, shipwrecked in the Falklands, seems more reasonable.¹⁹ In 1890 Captain H Paasch²⁰ described a gig as 'a long narrow boat of good pattern, chiefly for the shipmaster's use, when going ashore or returning on board'. She was also mentioned by B Helpman, a mate on the third voyage, as the 'Captain's gig'. Other titbits of information tell of *Beagle's* gig being named *Black Joke*, that she was 'cedar built and iron fastened', had a considerably lesser draught than the yawl, and that she was of light fine weather construction.²¹ King's sketch shows her as slightly shorter in length than the cutter, but with all his boat lengths not in relation to each other, the sketch cannot be depended on for measurements. Brian Lavery revealed in *The Arming And Fitting Of English Ships Of War*

1600 - 1815, that in the 1800s some brigs had 22ft gigs issued instead of a cutter or jolly boat and others were bought privately. Early gig dimensions from 1763 were 24ft 1in x 6ft 5½in x 2ft 2in; another captain's gig from 1806 was considerably narrower at 25ft x 4ft 6in x 2ft 4in; a similar boat from 1815 was 25ft x 5ft 7in x 2ft. If we consider King's sketch, a 22ft gig could be relevant for *Beagle*; with her beam in between 4ft 6in and 5ft and a depth around the 2ft mark. However, with no direct evidence about her actual length, the boat could well have been as long as the lost outboard whaleboat, therefore 25ft. A gig had a near vertical sternpost and was commonly narrower in her beam than a cutter or yawl. The gig was probably considered a second cutter due to her appearance. Like a normal cutter, she was clinker-built, had a narrow transom and row locks cut into the gunwale, but she was in contrast mainly a single-banked and usually six-oared rowing boat.

The smallest of the seven boats was the dinghy. Carried at the stern, her length had to be within its confines, therefore not much larger than 15ft. Any greater length would have interfered with the 25ft whaleboats at the quarters. The name Dinghy or Dinky (an Indian term for a small boat) was used by R FitzRoy in his *Narrative* to describe the small stern boat, otherwise called 'jolly boat'. Descriptions of the type 75 years apart are very similar: the 1815 Jolly boat was 'a smaller boat than a yawl, kept on board ships, for going on shore, and other lighter work'²² (the term Yawl in that connection was the older definition of a clinkered boat smaller than a cutter); the 1890 Dinky was described as 'A boat of very small size, employed, when a vessel is in port for landing etc, or when painting and cleaning the topsides of the ship.'²³ The use of the dinghy has barely been mentioned, only in a few references to shooting trips and watering, where access with larger boats was not possible. Belonging to the inferior group of boats, not much has been said about them in contemporary literature. In the languages of Northern Europe the term yawl, jolle, jol or julle was used during the eighteenth century, usually for clinker-built smaller boats between 9ft and 20ft in length, with the smaller group being termed 'jolly boat' in English nautical terminology. One boat draught can be found, by F H af Chapman,²⁴ of fitting size for *Beagle*'s stern. The length of that yawl was 15ft 5in, breadth 5ft 8in and depth 1ft 11in. She was

propelled with three pairs of oars. The dinghy or jolly boat was rigged in single-masted sprit or lug fashion.

IRIG

Some modern descriptions consider the change of *Beagle*'s rig from brig to barque as part of her second voyage refit. Documented remarks however prove a barque rig was already in place for her first survey voyage. In his narration on the aforementioned pampero (30 January 1829) FitzRoy remembered:

... so loud was the sound of the tempest, that I did not hear the masts break, though standing, or rather holding, by the mizen rigging.

B J Sullivan, who joined the *Beagle* a few weeks after FitzRoy took command, also mentioned HMS Barque *Beagle* in letters dated 1829. Based on this evidence, a reconstruction of the vessel as she might have appeared during her first voyage has been added to the two brig drawings as a link to the major drafting work mainly concerned with the ship's look after her 1831 refit.

MASTS AND SPARS

John Fincham published proportional mast and spar dimensions for period brigs in 1829.²⁵ His table [Table 3, below] provides for three brigs-of-war and one brig-rigged yacht. The grouping of three carried the dimensions of one Swedish and two British brigs-of-war. While the first example is for a vessel of 100ft in length and 30ft 6in of breadth, identical to the *Cruizer* class 18-gun brig sloop dimensions, the 90ft x 24 ft 6in dimensions of the second example are those of the *Cherokee, Cadmus, Rolla* class of 10-gun brig sloops. Not only are length and breadth identical with that class, but the fore and mainmast position, the masts rake and bowsprit's stive, the listed lengths of the masts below the load waterline, as well as the bowsprit's length inside the stem compare favourably on the draughts with Fincham's data. It can therefore be assumed that Fincham's table contains the proportional data for these two well known classes of brig sloops.

TABLE 3: Dimensions of a 90ft x 24ft 6in brig sloop, as calculated from 1829 published tables by John Fincham

				NAME	KNOWN QUANTITIES	LENGTH	DIAMETER
NAME	KNOWN QUANTITIES	LENGTH	DIAMETER				
				Fore topsail yard	Main topsail yard x 1.0	37ft 2in	8.25in
Mainmast, hounded	Breadth x 1.91	46ft 10in	18in	Main topgallant yard	Main yard x 0.55	20ft 6in	7in
Mainmast, headed	Hounded length x 0.1933	9 ft		Fore topgallant yard	Main tg yard x 1.0	20ft 6in	7in
Foremast, hounded	Mainmast hound. x 0.855	40ft	15.5in	Main royal yard	Main tg yard x 0.7	14ft 4in	2.75in
Foremast, headed	Hounded length x 0.1933	7ft 9in		Fore royal yard	Main royal yard x 1.0	14ft 4in	2.75in
Main topmast, hounded	Breadth x 1.126	27ft 7in	10.4in	Spritsail yard	Main topsail yard x 1.0	37ft 2in	8.25in
Main topmast, headed	Hounded length x 0.1585	4ft 4in		Main boom	Length x 0.56	50ft 5in	11.5in
Fore topmast, hounded	M t'mast hounded x 1.0	27ft 7in	10.4in	Main gaff	Main boom x 0.59	29ft 9in	8in
Fore topmast, headed	Hounded length x 0.158	4ft 4in		Trysail gaff	Gaff x 0.3	8ft 11in	5.5in
Main topgallant mast, hounded	Breadth x 0.722	17ft 8in	5.75in	Fore try sail gaff	Gaff x 0.5	14ft 10in	7.25in
Main topgallant mast pole	Hounded length x 0.734	13ft		Swing-booms	Lower yards x 0.6	28ft 7in	
Fore topgallant mast, hounded	M tg mast hounded x 1.0	17ft 8in	5.75in	Mainmast abaft the middle	Length on the water line x 0.138	12 ft 5in	
Fore topgallant mast pole	Hounded length x 0.734	13ft		Foremast before the middle	Length on the water line x 0.323	29ft	
Bowsprit	Fore mast hounded x 0.9	36ft	16.25in	Mainmast to rake	In 12 feet	9 inch	
Jib-boom	Bowsprit x 0.75	27ft	8.125in	Foremast to rake	In 12 feet	2 inch	
Flying jib-boom	Jib-boom x 1.2	32ft 5in	5in	Bowsprit to stive	In 12 feet	48 inch	
Main yard	Length x 0.53	47ft 8in	11in	Mainmast below the load-water line	Breadth x 0.255	6ft 3in	
Fore yard	Main yard x 1.0	47ft 8in	11in	Foremast below the load-water line	Breadth x 0.224	5ft 6in	
Main topsail yard	Main yard x 0.78	37ft 2in	8.25in	Bowsprit housed from the fore part of the stem	Breadth x 0.53	13ft	

With *Beagle's* mast and spar dimensions as a 'true' brig established, her specifications after transformation to barque rig cannot be as easily documented. It was not just that a mizzenmast was added, the large spanker exchanged with a trysail and the third mast given a smaller spanker as concluded in the aforementioned reconstructions. If contemporary pencil drawings and watercolours are to be believed, the brig's mainmast position was also moved forward during her rig change. Obviously, one does not consider artwork a guide to establishing a correct mast position, especially with a variety of artists involved. However, the trend in all known pictures suggests a mainmast position more in line with a ship sloop (approx. 0.08 abaft centre of waterline) than a brig (approx. 0.130 abaft). The pictures, including some very interesting rough sketches by P G King, also point to similar proportions of the interior and deck layout. Therefore, a certain reliance on artwork besides contemporary literature is, to some extent, necessary. Similar mainmast repositioning can be observed on various draughts of other ships: by comparing the mast positions of the *Cruizer* class brig draught *Scout* (1804) with the spar plan of a converted ship sloop *Wasp* of the same class (1828), we detect an identical situation.²⁶ In that instance the mast was brought forward by slightly more than a gun port's width.

From a layout of *Beagle's* poop cabin, drawn accurately and accompanied by a scale, the position of her mizzenmast can be established. Being fitted 8ft 4in inside the stern, the mast position was further abaft the centre (by about 0.07 length of load waterline) than a normal barque-rigged sloop's mizzenmast (0.356). The layout also verifies the diameter of that mast as 1ft, giving an indication of its length. By an underlying mizzenmast diameter of $\frac{1}{4}$ in for every yard of length, the mast's actual length was approximately 41ft 2in, which is about 7ft shorter than a normal mizzenmast and corresponds with the impression given in the various ship portraits. Cross reference with Fincham's tables suggests a 41ft mizzenmast of 12in diameter and a hounded length of 36ft 5in. He also gives two comparative values for the length of a barque's hounded mizzenmast, the lower .732 and the upper .992 of a hounded mainmast. An application of the lower would give the mizzenmast a

length of 34ft 4in; therefore 36ft 5in is an acceptable length.

In comparing the dimensions of masts and yards of merchant ships with those given to ships of war, we find that instead of the merchant ships (though requiring fewer men to work them, and not needing to sail with the same speed,) having less masts and yards, it is frequently the case that they carry a greater quantity of sail than ships of war, in relation to their principal dimensions;

With these words of a well respected master shipwright of the *Beagle* period, John Fincham,²⁷ it would be safe to accept his spar dimensions for the 10-gun brigs, and consider in addition certain dimensions for the barque conversion, given in his table 'Barques', which have been used to create Table 4. With all the artworks showing a slightly shorter than normal and more aft standing mizzenmast, they are also in agreement that the change over to barque rig was more than just shifting the mainmast forward and adding a mizzenmast. While the brig dimensions provide for equal lengths in topmasts and topgallant masts, *Beagle's* artists observed unequal lengths for these masts on fore and mainmast, a fact also indicated in Fincham's barque masts and spars tables. Considering naval economy, lower masts and bowsprit, as long as they were in good order, would probably have been re-used, while top- and topgallant masts were cut to barque dimensions. Table 4 is an attempt to reconstruct the mast and spar dimensions of *Beagle's* barque rig with the help of proportions given in Fincham's work. With the lower masts of the brig rig considered unchanged for the barque rig, the discrepancy between these and equally sized merchant barque's lower masts was 2ft 9in for the main and 7ft 10in for the foremast. All further spar dimensions are worked out to the proportion they had to their respective lower mast. The mizzenmast dimensions are determined from the given diameter of 12in on the poop cabin drawing. A rig reconstructed according to this principle will be slightly less in height and volume and will underline Fincham's words that a merchant ship of equal principal dimensions carried a larger rig than a man-of-war.

TABLE 4: Reconstruction of mast and spar dimensions of HMS *Beagle's* barque rig

NAME	LENGTH	DIAMETER
Mainmast, hounded	46ft 10in	18in
Mainmast, headed	9ft	
Foremast, hounded	40 ft	15 ¹ / ₂ in
Foremast, headed	7ft 9in	
Mizzenmast, hounded	36ft 5in	12in
Mizzenmast, headed	4ft 9in	
Main topmast, hounded	27ft	10 ¹ / ₂ in
Main topmast, headed	4ft 4in	
Fore topmast, hounded	25ft 4in	10 ¹ / ₂ in
Fore topmast, headed	4ft 2in	
Mizzen topmast, hounded	23ft 4in	8 ¹ / ₂ in
Mizzen topmast, pole	6ft 1in	
Main topgallant mast, hounded	18ft	5 ¹ / ₂ in
Main topgallant mast pole	14ft 6in	
Fore topgallant mast, hounded	16ft 11in	5 ¹ / ₂ in
Fore topgallant mast pole	12ft 11in	
Bowsprit	36ft 0in	16 ¹ / ₂ in
Jib-boom	27ft	8 ¹ / ₂ in
Flying jib-boom	32ft 5in	5in
Main yard	47ft 8in	11in
Fore yard	45ft 6in	11in
Main topsail yard	37ft 2in	8 ¹ / ₂ in
Fore topsail yard	35ft 3in	8 ¹ / ₂ in
Main topgallant yard	23ft 10in	5 ¹ / ₂ in
Fore topgallant yard	23ft 1in	5in
Main royal yard	17ft 4in	2 ¹ / ₂ in
Fore royal yard	14ft 4in	2 ¹ / ₂ in
Spritsail yard (one half) [Spreader]	17ft 6in	8 ¹ / ₂ in
Main boom	24ft 7in	5 ¹ / ₂ in
Gaff	17ft 2in	3 ¹ / ₂ in
Topsail yard	10ft 5in	2 ¹ / ₂ in
Main trysail gaff	14ft 8in	7in
Fore trysail gaff	16ft 3in	7 ¹ / ₂ in
Main swing-boom	28ft 7in	7 ¹ / ₂ in
Fore swing-boom	27ft 3in	7in
Mainmast abaft the middle	3ft 6in	
Foremast before the middle	29ft	
Mainmast to rake	6in for every 12ft	
Foremast to rake	2in for every 12ft	
Mizzen mast to rake	10in for every 12ft	
Bowsprit to stive	48in for every 12ft	
Main mast below the load water line	6ft 3in	
Fore mast below the load-water line	5ft 6in	
Bowsprit housed from the fore part of the stem	13ft	

A simple sail plan of a barque-rigged sloop in Fincham's work in conjunction with a list of *Beagle's* suit of sail, compiled by Commander Wickham, and reserve spars and sails requested by Commander FitzRoy (see Table 5), are also helpful in establishing the ship's rig.

TABLE 5: FitzRoy's request for extra spars and sails, 19 September 1831

- 1 – topmast, 1 – topsail yard, 1 – topgallant yard,
- 2 – topmast studdingsail booms,
- 1 – lower studdingsail boom

- 1 – Flying jib, 1 – jib, 1 – fore-topmast staysail
- 1 – fore staysail, 1 – fore royal, 1 – fore trysail
- 1 – main course, 1 – main topsail, 1 – main topgallant sail, 1 – main royal, 1 – spanker, 1 – gaff topsail
- 1 – monkey topsail [shorter topsail], 2 – fore topgallant studding sails, 1 – main lower studding sail
- 1 – main topmast studding sail

The trysails on fore and main masts are mentioned, as are the studding sails, but both lists do not indicate staysails between the masts. 'Very few ships carry any other kind of stay-sails than the fore, main, and mizen-stay-sails, which are used in bad weather', wrote George Biddlecombe in 1848,²⁸ and with these words one can conclude that the FitzRoy/Wickham lists of sails were complete. With the main and mizzen staysails being substituted by trysails on both masts, the vessel had an even better use of her fore and aft sail capacity.

TABLE 6: J C Wickham's two suits of sail, 1837

- Flying and standing jibs, fore topmast and fore staysails,
- fore courses, topsails, topgallant sails, royals
- main courses, topsails, topgallant sails, royals
- fore and main trysails
- spankers and gaff topsails
- lower, top and topgallant studding sails

From FitzRoy's description of the ship, it is known that 'her masts were strongly supported by squarer cross-trees and tops'. This can be understood to mean that the normal cross-tree dimensions of 5in width x 3ft depth had their depth enlarged to about 5in. The tops

themselves, according to a Conrad Martens' drawing, were of a shape described by Fincham as 'the new Made-tops' and described as:

... in order to reduce the chafing of the top-sails against the top rim, as the yards are now braced sharper up, the tops are made narrower fore-and-aft At the fore cross-tree the tops are athwart ships $\frac{1}{2}$ the whole length of the top-mast; but they are wider at the after part, or made to fan, so as to be $\frac{2}{3}$ of the length of the top-mast; and fore- and-aft they are $\frac{3}{4}$ of their breadth at the fore cross-tree.

FitzRoy further mentioned that the masts were also supported 'by larger rigging then usual' and that 'chains were used where found to answer.' Therefore, the rope sizes would have been slightly stronger than normal and the block sizes one number up on the usual, hence, 'in no place was a block or a sheave allowed which did not admit the proper rope or chain freely'. The use of chains in the rigging was mainly restricted to yard slings, trusses, futtock necklaces, for gammoning, to secure the jib-boom and as backstays for bumpkins, according to Lieutenant George S Nares, RN, in his work, published thirty years after FitzRoy's mention of chains in *Beagle's* rigging.²⁹ The official dates for the introduction of these measures, as cited in the Royal Navy documents, are at least a decade after FitzRoy's statements mentioned above. The use of chains in the rigging of HMS *Beagle* can therefore only be guesswork, guided by contemporary works like Nares' and Biddlecombe's.

When further considering the rigging, one must know that FitzRoy was also able to obtain several of the new hooked iron blocks, as two double cat-blocks, one treble cat-block and eight single-sheaved signal halyard blocks.

One could always write a lot more when describing a ship, but many details cannot be put into words. It is the purpose of the drawings to guide readers and modellers alike through the ship in her state as a 10-gun brig and the two stages of her refitting as a survey ship: thereby the main purpose and thrust has been to detail the ship in her 1831 guise. I can only hope that this undertaking has been completed to the modeller's and reader's satisfaction.

NOTES

INTRODUCTION

- 1 Stokes, J L, *Discoveries in Australia*, p 369: 'Torres passed through this strait in 1606, but despite the great importance of the discovery, its existence remained unknown until 1762, from the jealousy of the Spanish monarchy, which kept the reports of its navigators a secret from the world. At the time in question, however, Manila fell into our hands, and in the archives of that colony, a duplicate copy of Torre's letter to the king of Spain was found by the hydrographer, Mr. Dalrymple.'
- 2 FitzRoy in a letter of 16 November 1833 to Hydrographer: 'When I reply to your letter of 4 Sept [Beaufort] I will enter rather more upon a subject which is made more galling by reflection. A vessel (considered too small for a commander – therefore generally given a lieutenant) has more arduous duties to perform than any other surveying vessel [larger though they be] on foreign Stations.'
'She obtained neither the help of dockyards nor of men of war: she is obliged to be crowded with provisions and stores in a manner previously unknown in a vessel of her class.'
'Her employment is in the stormy southern latitudes, she has a long voyage in prospect.'
'Perhaps other surveying vessels have dockyards within reach- perhaps they have tenders, or a tender, perhaps their voyages are not long.'
'I am sorry that, because I have offended, the Service should suffer. Captain King with far less extensive orders had three vessels upon this station - *The Adventure*, the *Beagle*, and the *Adelaide* tender - which was purchased at this place by the government for two thousand pounds sterling before any expense was incurred in an entirely new outfit.'
A good spring should bend and be elastic. I hope it will not break.'
- 3 Hordern, M, *Mariners are Warned!* (Melbourne University Press, 1989)

DESIGN

- 4 Stokes, J L, *Discoveries in Australia*, p 47: '... we encountered a good deal of heavy weather; shifting winds, and consequently irregular seas, ... and owing to the deep state of the loaded little vessel, her decks were almost constantly flooded. For many days we had never less than an inch and a half of water on them all over...'
- 5 Lever, D, *The young Sea officer's Sheet Anchor*, p 67: 'Ships rigged in this Manner can sail with a Hand or two less, and answer very well for working through Narrows, there being no after Sail to brace about, but the Main Topsail and Main Top-Gallant Sail, and their Braces lead forwards.'
- 6 Darling, L, 'HMS *Beagle* 1820 -1870: Voyages Summarised, Research and Reconstruction', p 8
- 7 Thomson, K S, *HMS Beagle, The Story of Darwin's Ship*, p 119

DESCRIPTION

8 Martens, C, *Notes on painting*: 'Suppose me then where I am now writing, in my cabin, which by the by I must tell you is allowed to be a pattern of neatness and convenience, the door which opens into the gunroom. It is lighted by two bulls eyes from the upper deck in the manner of a skylight, and as I am upon too familiar a footing with my messmates ever to think of shutting the door, a good deal of light comes in that way also. A tasty blue cloth curtain, however, is drawn at night, closing likewise a small window alongside of it. Facing the door, built in as it were and occupying the whole length of the cabin, is a nest of drawers of 3 tiers, above which is the bed place, particularly well adapted for those who like to lie high, being at least 4½ feet from the deck. The dimensions of the cabin is 6 feet long by rather more than 5 feet wide and 6 feet high. The bedplace is not very wide, being of course only intended for one person. ... On the left of the door is my table, desk, lamp, and drawing materials. The end ... is occupied by books, guns, pistols, my plate, a picture, and sundry other useful articles, arranged and fixed in such a manner that the outmost motion of the vessel will not disturb. The whole is painted in imitation oak ... with the exception of the drawers, which are of mahogany...'

9 FitzRoy, R, *Narrative of the surveying voyages of HMS Adventure and Beagle between the years 1826 and 1836*: 'While in harbour, a few alterations had been made in the disposition of our guns and stores, as well as some slight changes in the sails and rigging; and as the Beagle's equipment afterwards remained unaltered, I will here briefly describe it. She was rigged as a bark; her masts were strongly supported by squarer cross-trees and tops, and by larger rigging then usual in vessels of her tonnage, 242 tons. Chains were used where found to answer, and in no place was a block or a sheave allowed which did not admit the

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proper rope or chain freely. There were large trysails between the masts, made of stout canvas, with several reefs, and very useful we found them. On the forecastle was a six-pound boat carronade: before the chestree were two brass six-pound guns: close to the bulwark on each side of the waist were the "booms"; and amidships two boats, on the diagonal principle, one stowed inside the other, and as close to the deck as possible; being secured by iron cranks, or supports. Aft the main-mast were four brass guns, two nine-pound, and two six-pound: the skylights were large; there was no capstan; over the wheel the poop-deck projected, and under it were cabins, extremely small, certainly, though filled in inverse proportion to their size. Below the upper deck her accommodation were similar to, though rather better than those of vessels of her class. Over the quarter-deck, upon skids, two whale-boats, eight-and-twenty feet long, were carried; upon each quarter was a whale-boat twenty-five feet length, and astern was a dinghy.'

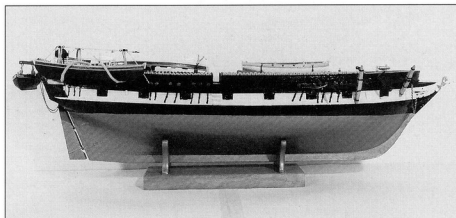
10 FitzRoy, R, 'Letter to the Principal Officers and Commissioners of His Majesty's Navy', 9 July 1831: 'The *Beagle* is ordered to carry only two six pound guns, therefore raising the deck will not be of consequence as respect the guns, and their ports. By making this alteration, the

storage and comfort of the vessel will be very greatly increased. She will be much dryer upon deck: - Her waist will be less deep, and as she carries only two guns, the stability of the vessel will not be affected.' (L Darling, 'HMS *Beagle* 1820-1870')

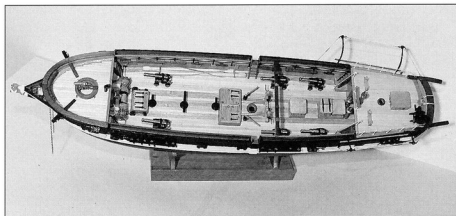
- 11** FitzRoy, R, *Narrative*: '... and caused copper plates to be applied to the *Beagle*'s spars forthwith commencing with a copper vane spindle screwed into each truck connecting with copper bands into aft side of the masts and conducted down through the upper deck to the underside of a beam which was in the Purser's cabin, thence through to outside and down to the copper in the bottom.'
- 12** Stanbury, D, *The Ship* ms p 15
- 13** Klawitter, G D, *Vorlage - Blätter für Schiffbauer* (Reference sheets for the shipwright; Berlin, 1835) p 23: '... the upper part of the helm, the rudder head is nowadays rounded from above the upper gudgeon onward and brought forward by half its diameter.'
- 14** FitzRoy, R, *Narrative*: 'In again trying for soundings with three hundred fathoms of line, near the Island of St. Jago, we became fully convinced of the utility of a reel, which Captain Beaufort had advised me to procure. Two men were able to take in the deep sea line, by this machine, without interfering with any part of the deck, except the place near the stern, where the reel was firmly secured. Throughout our voyage this simple contrivance answered its object extremely well, and saved the crew a great deal of harrassing work.'
- 15** Falconer, W, *A New Universal Dictionary of the Marine* (1815) ed: 'Half-Ports, a kind of shutters, with circular holes in their centre, large enough to go over the muzzles of the guns, and furnished with pieces of canvas, nailed round their edges, to tie upon the guns, whereby the water is prevented from entering in at the ports, although the guns remain run out. They are principally used upon the main-deck, and particularly in ships carrying one tier of guns.'
- 16** Goodwin, P, *The Construction and Fitting of Sailing Man of War 1650-1850* (London, 1987)
- 17** Admiralty Draught No 4030A, 27 October 1836
- 18** Rödiger, J H, *Allgemeines Wörterbuch der Marine* (Hamburg, 1794; repr Amsterdam, 1969)
- 19** Stanbury, D, *The Ship* p 32
- 20** Paasch, Captain H, *Illustrated Marine Encyclopedia* (1890) p 153
- 21** Roots, B, *The Boats of HMS Beagle in Australia* ms p 11
- 22** Falconer, W A, op. cit.
- 23** Paasch, Captain H, op. cit. p 153
- 24** Chapman, F H af, *Architectura Navalis Mercatoria* (Stockholm 1768; repr Rostock, 1962) plate XXV/7
- 25** Fincham, J, *A Treatise on Mastng Ships & Mast Making* (London, 1829; 3rd ed. 1854, repr London, 1982) p 88
- 26** Lyon, D, *The Sailing Navy List* (London, 1993) pp 140-1
- 27** Fincham, J, op. cit. p 167
- 28** Biddlecombe, G, *The Art of Rigging* (repr London, 1990) p 106
- 29** Nares, G S, *Seamanship* (London, 1862; repr Old Woking, 1979)



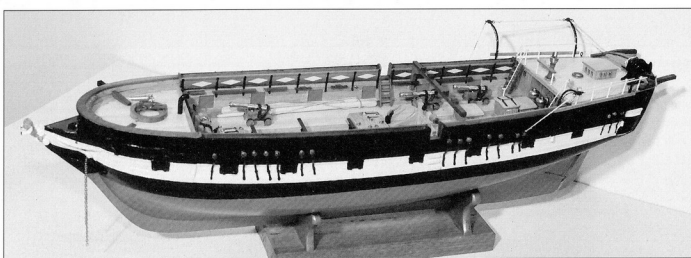
Starboard bow detail fully-rigged.



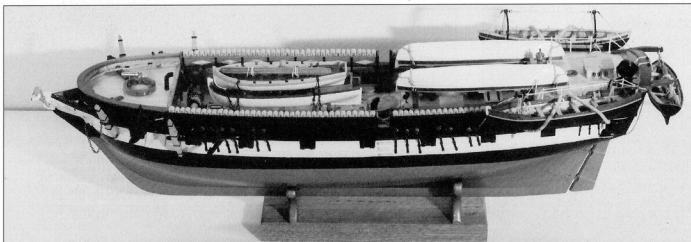
HMS *Beagle*, 10-gun brig of the *Cherokee, Cadmus, Rolla* class and built in 1820. This shows the ship after the Robert FitzRoy-inspired refit following the famous Darwin voyage, and is a starboard side view of a $\frac{3}{16}$ in:1ft scale model built by the author for the Deutsches Schiffahrtsmuseum at Bremerhaven, Germany. For better detail identification, the model is shown before masting and rigging.



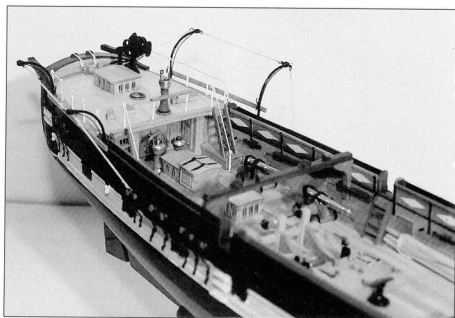
Deck view of the model during construction without boats. The layout follows P G King's rough sketch (see p 25) and uses the actual dimensions for each item. Note the spare timbers, the windlass, the iron boat stands and davits, the positioning of the guns (including the 6-pdr boat carronade on the forecastle) and the sounding winch at the stern.



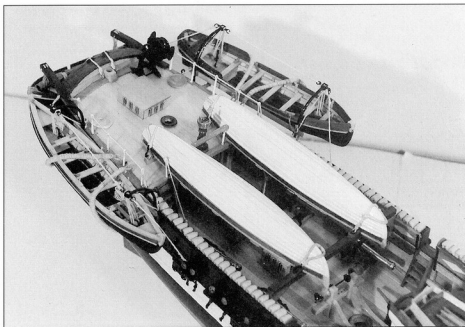
Port side view without boats or anchors and with empty hammock rails.



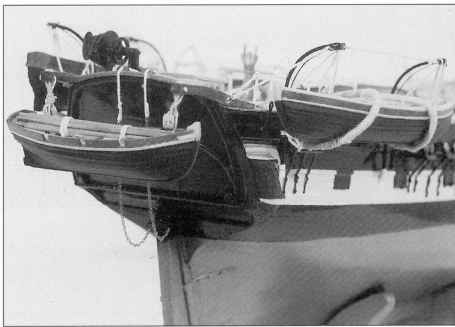
A similar view with all boats, anchors and hammocks in place.



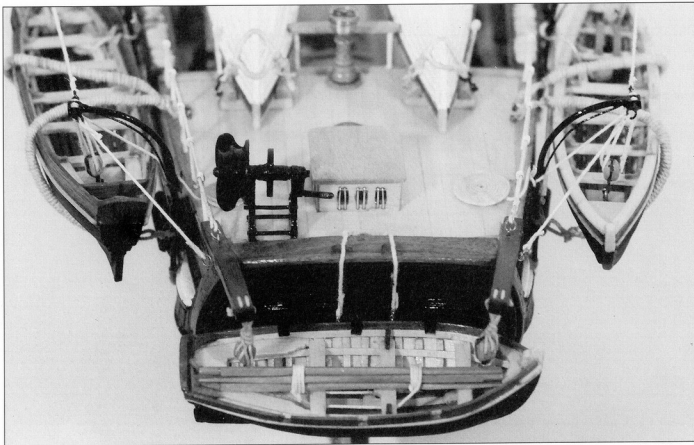
Midships to stern with all deck furniture. Visible aft of the companion and captain's cabin skylight are the two compasses and the steering wheel below the poop overhang. Close to the poopdeck break are the azimuth compass and the 28ft whaleboat chocks, with the chartroom skylight and the deep-sea sounding winch close to the port taffrail.



A similar view with the 28ft whaleboats placed on skid beam and poop, the 25ft whaleboat on starboard, a similar sized gig in the port davits, and the dinghi athwart ship in stern horn davits.

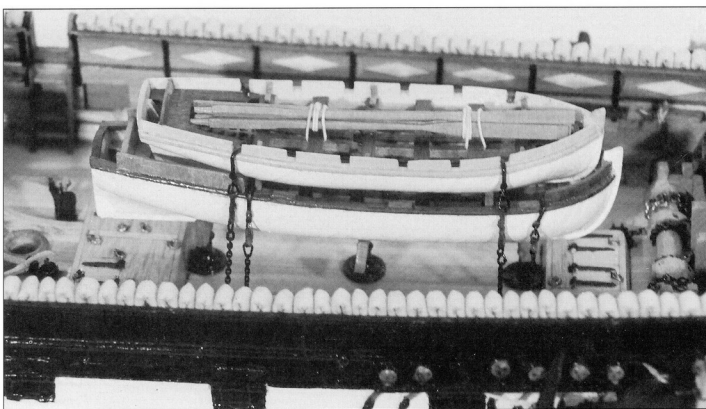


Starboard rear quarter view, with the quarter badge and, across the stern, the jolly boat which was named the dinghi by FitzRoy.

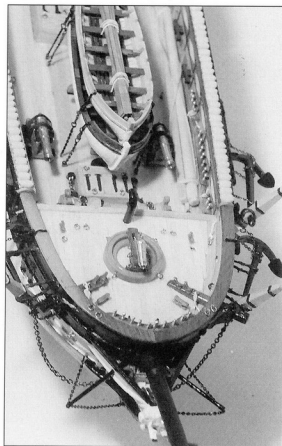
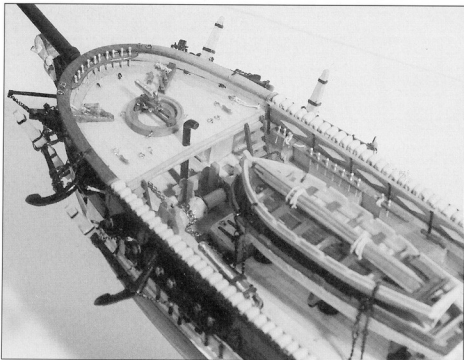


Poop Deck from above with chartroom skylight, sounding winch and azimuth compass. The boats are in their davits and partly secured by gripes.

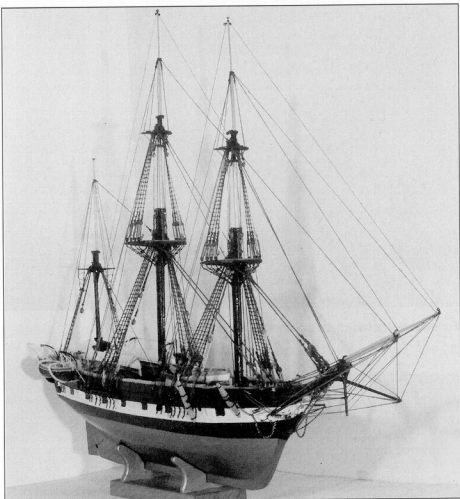
Beagle's 26ft yawl sitting in iron boat-chock standards with the 23ft cutter nested inside.



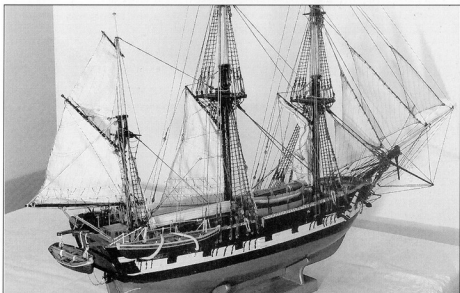
This photograph illustrates the very confined space aboard the ship and why the crank-handle windlass could not have been placed below the Forecastle Deck, as discussed in **Design**.



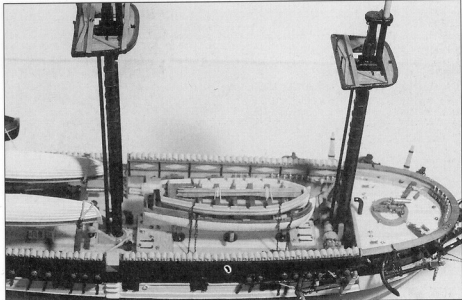
Forecastle and head with boomkins. On the port upperdeck some stowed spare timbers are apparent. The carriage guns are secured with their breechings and placed according to P G King's upperdeck sketch (p 25). The bowers are of both the original and updated type, indicating the various anchors fitted, bought and lost during *Beagle's* survey voyages.



Masted ship with her standing rigging; three-quarter bow view.



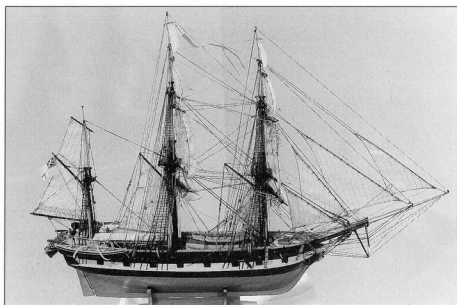
Ship with her fore-and-aft sails rigged; three-quarter stern view.



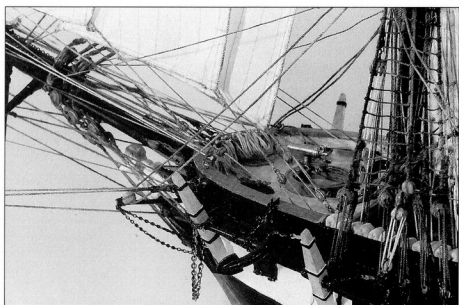
Fore and mainmast with fitted trysail masts.



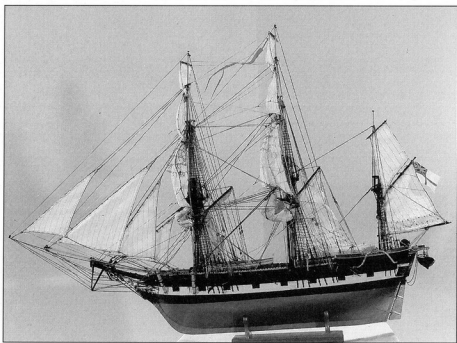
Port bow view with complete rigging. She was barque-rigged since her first refit as a survey ship in 1825.



Starboard side view, fully rigged.



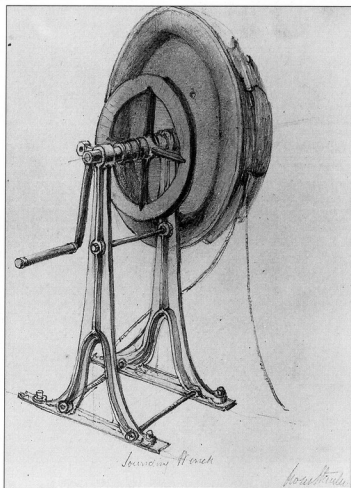
Foremast detail of the completed model.

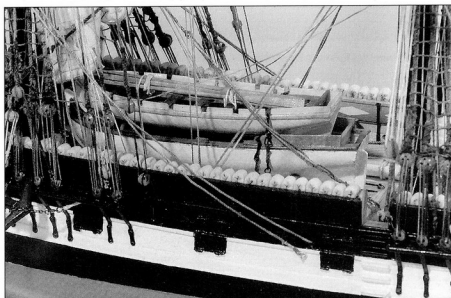


Port side view under all sails.

Sounding winch.
Pencil drawing by Owen Stanley.

(Courtesy of Mitchell Library, State Library of
New South Wales)

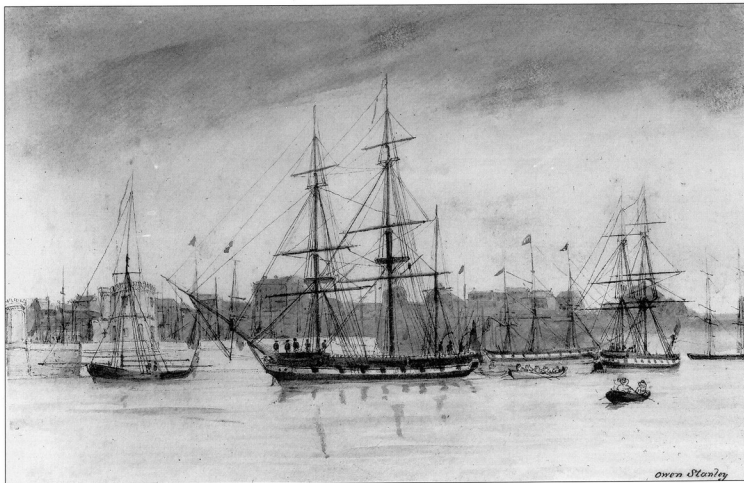




Midship detail.



Poop detail of the completed model.



'HMS *Beagle* off Fort Macquarie, Sydney Harbour'. Watercolour by Owen Stanley, 1841.

(Courtesy of National Maritime Museum, Greenwich)

Owen Stanley

T H E D R A W I N G S

A General arrangement

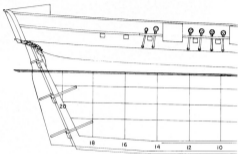
A1 10-GUN BRIG ACCORDING TO A DRAUGHT DATED
23 FEBRUARY, 1808, DESIGNATED: ROLLA

A1/1 Sheer elevation

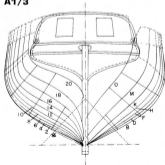
A1/2 Half-breadth with waterlines

A1/3 Body plan

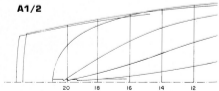
A1/1

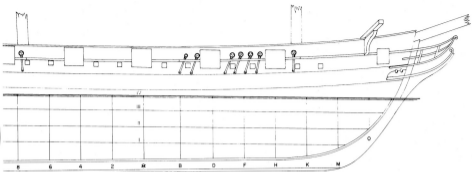


A1/3

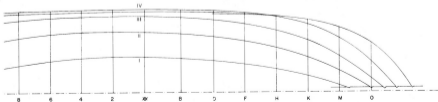


A1/2





Scale in feet



A General arrangement

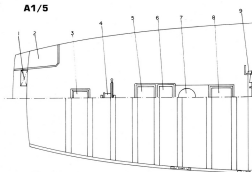
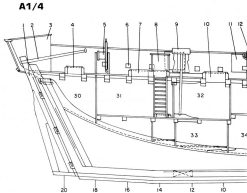
A1/4 PROFILE

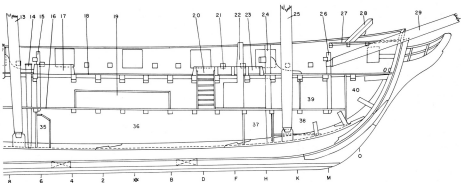
- 1 Rudder
- 2 Tiller
- 3 Officers toilette
- 4 Scuttle to bread room
- 5 Steering wheel
- 6 Rowing ports
- 7 Companion to Captain's cabin
- 8 Companionway
- 9 Capstan
- 10 Companion to mess room
- 11 Gun port
- 12 Main jeer bits
- 13 Mainmast
- 14 Pump
- 15 Main Topsail sheet bits
- 16 Lower deck
- 17 Main hatchway
- 18 Upper deck
- 19 Sail room
- 20 Fore hatch and ladderway
- 21 Grating above oven
- 22 Oven
- 23 Grating above galley
- 24 Main or cable bits
- 25 Foremast
- 26 Bowsprit step and bits
- 27 Forecastle
- 28 Cathhead
- 29 Bowsprit
- 30 Bread room
- 31 Captain's cabin
- 32 Mess room
- 33 Magazine
- 34 Well
- 35 Shot locker

- 36 Hold
- 37 Provisions
- 38 Boatswain's stores portside, carpenter's starboard side
- 39 Boatswain's cabin portside, carpenter's starboard side
- 40 Gunner's cabin

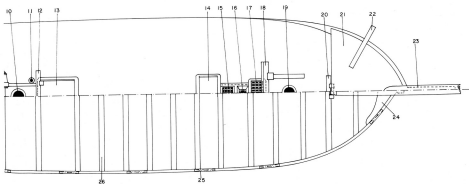
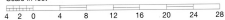
A1/5 Upper deck and beams

- 1 Stern gun port
- 2 Officers toilette
- 3 Scuttle to bread room
- 4 Steering wheel
- 5 Companion to Captain's cabin
- 6 Companionway
- 7 Capstan
- 8 Companion to mess room
- 9 Main jeer bits
- 10 Mainmast
- 11 Pump
- 12 Main topsail sheet bits
- 13 Main hatchway
- 14 Fore hatchway
- 15 Grating above oven
- 16 Oven flue
- 17 Grating above galley
- 18 Main bits
- 19 Foremast
- 20 Bowsprit steps and bits
- 21 Forecastle
- 22 Cathhead
- 23 Bowsprit
- 24 Deck hook
- 25 Gun port
- 26 Beam





Scale in feet



A General arrangement

A1/6 Lower deck

- 1 Bread room
- 2 Captain's cabin
- 3 Scuttle
- 4 Scuttle to magazine
- 5 Scuttle to light room
- 6 Messbar
- 7 Passageway
- 8 Surgeon
- 9 Mess room
- 10 Purser
- 11 Scuttle to spirit room
- 12 Steward room
- 13 Mainmast
- 14 Pumps
- 15 Scuttle to well
- 16 Main hatchway
- 17 Boatswain's store bin, 2ft 6in from the deck
- 18 Sail room
- 19 Fore hatchway
- 20 Den
- 21 Galley
- 22 Scuttle to coals
- 23 Foremast

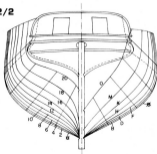
- 24 Scuttle to boatswain's stores
- 25 Gunner's cabin
- 26 Boatswain's cabin
- 27 Carpenter's cabin
- 28 Scuttle to carpenter's stores
- 29 Scuttle to dry provisions
- 30 Carpenter's store bin, 2ft 6in from the deck
- 31 Gunner's store room
- 32 Scuttle to mess room stores
- 33 2nd Lieutenant
- 34 1st Lieutenant

**A2 10-GUN BRIG
ACCORDING TO A
DRAUGHT DATED
16 APRIL, 1823,
DESIGNATED: CADMUS
CLASS**

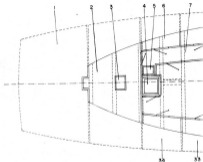
A2/1 Sheer elevation

A2/2 Body plan

A2/2



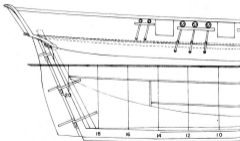
A1/6

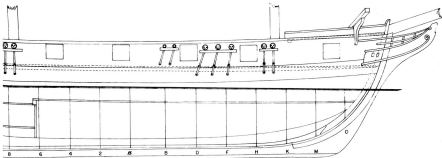
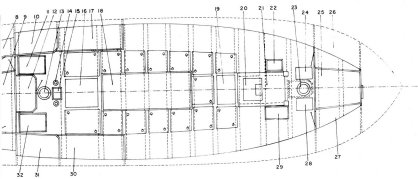


Scale in feet



A2/1





A General arrangement

A3 SHIP AFTER 1825 REFIT

A3/1 Sheer elevation

- 1 Horn davits
- 2 Faked quarter gallery
- 3 Poop skylight
- 4 Iron quarter davits
- 5 Mizzenmast
- 6 Azimuth compass
- 7 Planked over gun port
- 8 Channel
- 9 Mainmast
- 10 Gun port with halfport lids
- 11 Foremast
- 12 Cathead
- 13 Bowspit



A3/2

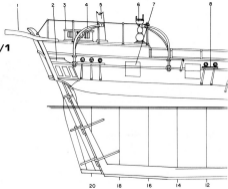
A3/2 Stern

A3/3 Profile

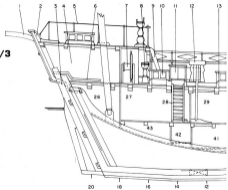
- 1 Horn davit
- 2 Extended stern
- 3 Rudder
- 4 Chart room
- 5 Open stanchion rail
- 6 Iron biler
- 7 Steering wheel
- 8 Compass
- 9 Ladderway to poop
- 10 Companion to Captain's cabin
- 11 Companionway
- 12 Capstan
- 13 Companion to mess room
- 14 Pinnacel
- 15 Hammock rail
- 16 Main jeer bits
- 17 Inner gangway ladder
- 18 Pump
- 19 Main hatchway
- 20 Fore hatchway
- 21 Main bits
- 22 Forecastle ladderway

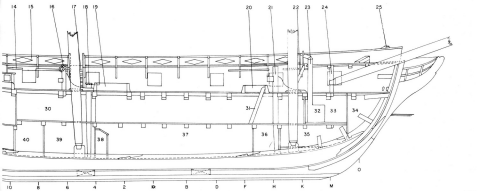
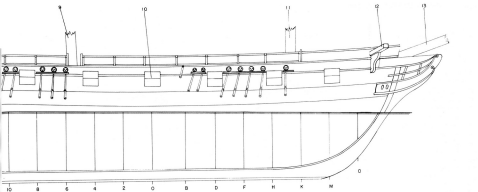
- 23 Oven flue
- 24 Bowspit steps
- 25 Cathead
- 26 Bread room
- 27 Captain's cabin
- 28 Companion ladder
- 29 Mess room
- 30 Lower deck
- 31 Fore hatch ladderway
- 32 Oven
- 33 Galley
- 34 Gunner's store room
- 35 Boatswain and carpenter store
- 36 Galley store
- 37 Hold
- 38 Shot locker
- 39 Wall
- 40 Spirit room
- 41 Magazine
- 42 Mess room store
- 43 Captain's store

A3/1



A3/3



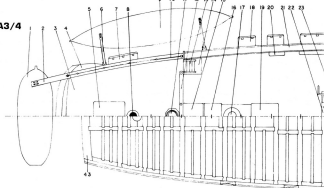


A General arrangement

A3/4 Decks and beams

- 1 Jolly boat
- 2 Horn davit
- 3 Poopdeck
- 4 False quarter gallery
- 5 Skylight to chart room
- 6 Iron quarter davits
- 7 Mizzen channel
- 8 Mizzenmast
- 9 25ft whaleboat
- 10 Loose stanchion rail
- 11 Azimuth compass
- 12 Breast rail
- 13 Poop ladder
- 14 Flag locker
- 15 Companion to Captain's cabin
- 16 Companionway
- 17 Captain
- 18 Main channel
- 19 Companion to mess room
- 20 Pin rail
- 21 Hammock rail
- 22 Main jeer bits
- 23 Mainmast
- 24 Gangway
- 25 Pump
- 26 Main hatchway
- 27 20ft yawl
- 28 25ft cutter
- 29 Fore channel
- 30 Fore hatchway
- 31 Main bits
- 32 Foremast
- 33 Forecastle ladder
- 34 Deen flue
- 35 Forecastle
- 36 Cathhead
- 37 Dock hook
- 38 Gun port
- 39 Deck clamp
- 40 Carling
- 41 Beam
- 42 Halfbeam or ledge
- 43 Wing transom

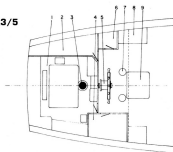
A3/4

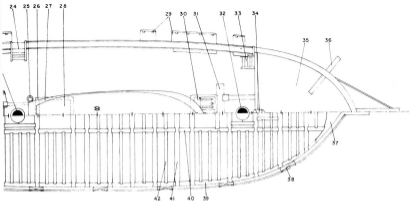


Scale in feet



A3/5





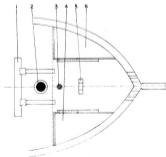
A3/5 Below the poop deck

- 1 Chart room
- 2 Store room and toilette
- 3 Mizzenmast
- 4 Master
- 5 Steering wheel
- 6 WC (according to P & G King)
- 7 Compass
- 8 Flag locker
- 9 Companion to Captain's cabin

A3/6 Below the forecastle

- 1 Main bits
- 2 Foremast
- 3 Oven flue
- 4 Carpenter's store
- 5 Bowsprit steps
- 6 Boatswain's store

A3/6



A General arrangement

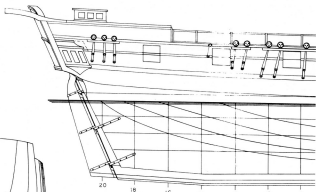
A4 SHIP AFTER 1831 REFIT

A4/1 Sheer elevation

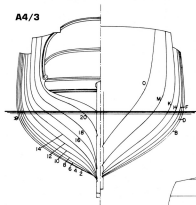
A4/2 Half breadth plan and waterlines

A4/3 Body plan

A4/1



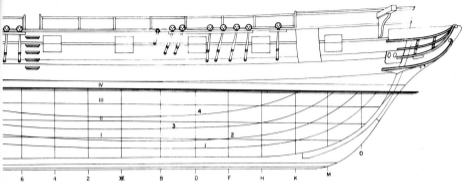
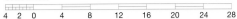
A4/3



A4/2



Scale in feet



A General arrangement

A4/4 Profile

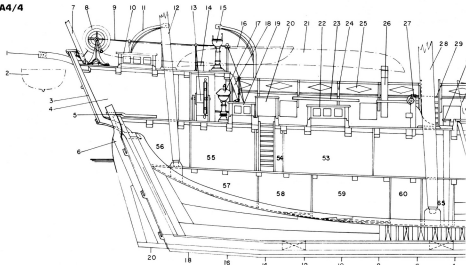
- 1 Horn deak
- 2 Dinghy
- 3 Stair
- 4 Chart room
- 5 Iron tiller
- 6 New rudder
- 7 Ensign staff
- 8 Deep sea sounding winch
- 9 Loose stanchion rail

- 10 Skylight
- 11 Iron quarter davits 3ft higher
- 12 Mizzenmast
- 13 Steering wheel
- 14 Stowage blocks for 28ft whaleboat
- 15 Azimuth compass
- 16 25ft whaleboat
- 17 Compass
- 18 Ladder to poop

- 19 Companion to Captain's cabin
- 20 Companionway
- 21 28ft whaleboat
- 22 Companion to mess room (gun room)
- 23 Pin rail
- 24 Hammock rail stanchion
- 25 Hammock rail
- 26 Boat-beam athwart ship
- 27 Main jear bits
- 28 Mainmast
- 29 Gangway ladder
- 30 Pump
- 31 28ft yawl

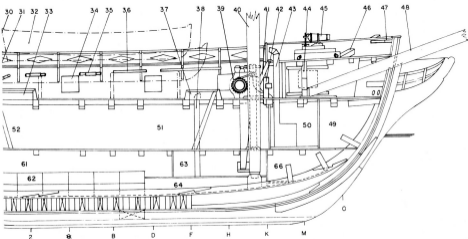
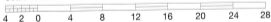
- 32 23ft cutter
- 33 Main hatchway
- 34 Gun port
- 35 Kavel
- 36 Pin rail
- 37 Fore hatchway
- 38 Chain pipe
- 39 Windlass
- 40 Foremast
- 41 Ladder to forecabin
- 42 Fore topsail sheet bits
- 43 Oven flue
- 44 Bowsprit step
- 45 6-pdr boat carronade

A4/4



- | | |
|------------------------------------|-----------------------------------|
| 46 Cathead | 57 Bread room |
| 47 Pin rail | 58 Mess room stove |
| 48 Bowsprit | 59 Magazine |
| 49 Sick bay and locker room | 60 Spirit room |
| 50 Galley | 61 Hold |
| 51 Lower deck | 62 Iron water casks |
| 52 Main hatchway ladders | 63 Sail room |
| 53 Mess room (gun room) | 64 Chain locker |
| 54 Passage | 65 Well |
| 55 Captain's cabin | 66 Coal and dry provisions |
| 56 Captain's store room | |

Scale in feet



A General arrangement

A5 CROSS-SECTIONS

A5/1 Cross-section D

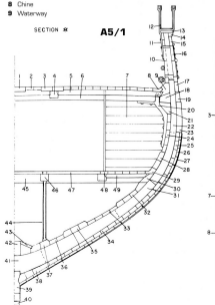
- 1 Partners
- 2 Deck planks
- 3 Binding strakes
- 4 Carling
- 5 Halfbeam or ledge
- 6 Beam
- 7 Carpenter's cabin
- 8 Chine
- 9 Waterway

- 10 Gun port
- 11 Hammock rail stanchion
- 12 Hammock rail lining
- 13 Gunwale
- 14 Plank sheer
- 15 Sheer strake
- 16 Half ports
- 17 Side planks
- 18 Clamp
- 19 Thickstuff above the wales

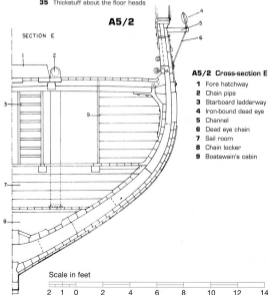
- 20 Iron knee
- 21 Thickstuff below the clamp
- 22 Fourth futtock
- 23 Wales
- 24 Lower deck ceiling
- 25 Diminishing strakes
- 26 Bin fir sheathing
- 27 Copper sheathing
- 28 Lower spiricket
- 29 Lower waterway
- 30 Lower clamp
- 31 Second futtock
- 32 Thickstuff below the lower clamp
- 33 Ceiling in the hold
- 34 Bottom planks
- 35 Thickstuff about the floor heads

- 36 Floor planks
- 37 Limber strakes
- 38 Garboard strakes
- 39 Keel
- 40 False keel
- 41 Floor timber
- 42 Keelson
- 43 Limber board
- 44 Hold stanchion
- 45 Lower deck beam
- 46 Carling
- 47 Loose floor hatches
- 48 Lower deck planks
- 49 Halfbeam

SECTION * A5/1



SECTION E A5/2



A5/2 Cross-section E

- 1 Fore hatchway
- 2 Chain pipe
- 3 Starboard ladderway
- 4 Iron-bound dead eye
- 5 Channel
- 6 Dead eye chain
- 7 Sail room
- 8 Chain locker
- 9 Boatstair's cabin

A5/3 Cross-section H

- 1 Oven flue
- 2 Forecastle
- 3 Windlass
- 4 Carpenter's store
- 5 Ladder to the forecastle
- 6 Pin rail
- 7 Hammock rail

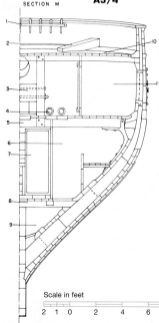
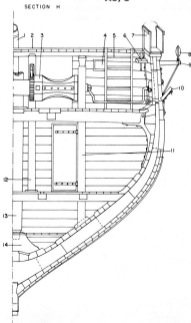
A5/4 Cross-section M

- 8 Iron-bound dead eye with chain
- 9 Channel
- 10 Half port
- 11 Bit pin
- 12 Pawl bit pin
- 13 Foremast
- 14 Mast step

A5/4 Cross-section M

- 1 Pin rail
- 2 Carthead
- 3 Bowsprit step
- 4 Hasse holes
- 5 Upper deck
- 6 Sick bay
- 7 Galley

- 8 Lower deck
- 9 Dry provisions starboard; coal portside
- 10 Forecastle
- 11 Carpenter's store

A5/3**A5/4**

Scale in feet



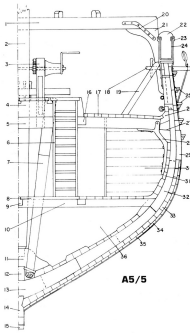
A General arrangement

A5/5 Cross-section 2

- 1 Boats or skid beam
- 2 Mainmast
- 3 Main jerr bits
- 4 Main hatchway

- 5 Upper deck beam
- 6 Portside ladderway
- 7 Pump
- 8 Inlaid floor hatch

SECTION 2 REARWARD

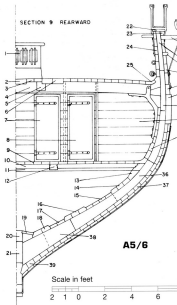


A5/5

- 8 Carling
- 10 Lower deck beam
- 11 Mast step
- 12 Keelson
- 13 Floor timber
- 14 Keel
- 15 False keel
- 16 Carling
- 17 Deck planks
- 18 Pin nail
- 19 Inner gangway ladder
- 20 Iron jining strip
- 21 Hanging boat beam knee
- 22 End-board of hammock rail

- 23 Stanchion of hammock rail
- 24 Hammock rail timber lining
- 25 Outer gangway steps
- 26 Waterway
- 27 Clamp
- 28 Iron beam knee
- 29 Wakes
- 30 Dispensary
- 31 Ceiling
- 32 Frame
- 33 Outer planking
- 34 Timber sheathing
- 35 Copper sheathing
- 36 Hold

SECTION 9 REARWARD



A5/6

A5/6 Cross-section 9

- 1 Mess or gun room companion
- 2 Partners
- 3 Deck planks
- 4 Upper deck beam
- 5 Carling
- 6 Binding strakes
- 7 Door to mess room
- 8 Door to passageway
- 9 Lower deck planks
- 10 Halfbeam or ledge
- 11 Lower deck beam
- 12 Carling
- 13 Lower deck clamp
- 14 Thickstuff below clamp
- 15 Floor ceiling
- 16 Thickstuff about the floor heads
- 17 Floor planks
- 18 Limber strokes
- 19 Limber board
- 20 Keelson
- 21 Deadwood
- 22 Gunwale

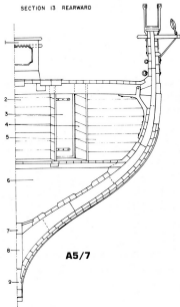
Scale in feet



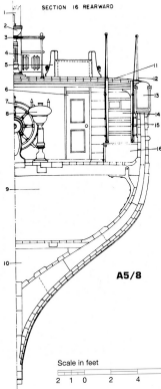
- 23 Sheer rail
- 24 Spiketting
- 25 Chine
- 26 Iron-bound dead eye with chain
- 27 Channel
- 28 Top timber
- 29 Waist rail
- 30 Side planks
- 31 Thickstuff above the wales

- 32 Wales
- 33 Fourth futtock
- 34 Assistant Surgeon
- 35 Lower deck spiketting
- 36 Second futtock
- 37 Bottom planks
- 38 Floor timber
- 39 Garboard strokes

SECTION 13 REARWARD



SECTION 16 REARWARD



A5/7 Cross-section 13

- 1 Companionway
- 2 Mess or gun room
- 3 Door to Captain's cabin
- 4 Passageway
- 5 Master's cabin
- 6 Mess room store
- 7 Starnson
- 8 Deadwood
- 9 Keel

A5/8 Cross-section 16

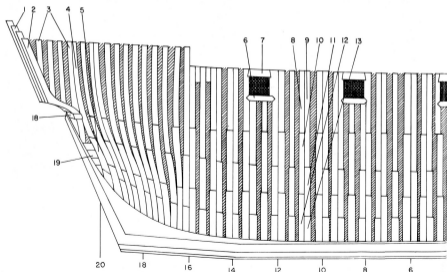
- 1 Mizzenmast
- 2 Azimuth compass
- 3 Breast rail
- 4 Skylight to chart room
- 5 Boat stowage blocks
- 6 Door to storage and toilette
- 7 Steering wheel
- 8 Compass
- 9 Captain's cabin
- 10 Bread room
- 11 Poop deck
- 12 Handrail stanchion
- 13 Endpiece to hammock rail
- 14 Storage or WC (?)
- 15 Ladder to poop deck
- 16 Flag locker

B Hull structure

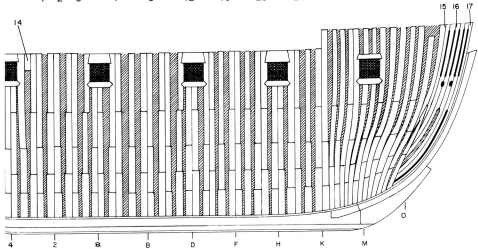
B1 FRAME DISPOSITION

- | | | |
|-------------------------------------|--------------------------|--------------------|
| 1 Stern timber | 6 Port sill | 13 Floor timber |
| 2 Outer stern timber | 7 Overhead filling piece | 14 Filling chock |
| 3 Timbers on the outer stern timber | 8 Short top timber | 15 Knuckle timbers |
| 4 After fashion futtock | 9 Long top timber | 16 Howse pieces |
| 5 Forward fashion piece | 10 Third futtock | 17 Knightheads |
| | 11 Second futtock | 18 Wing transom |
| | 12 First futtock | 19 Transoms |

B1



Scale in feet

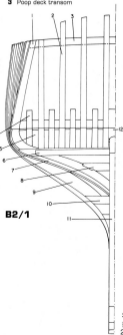


B Hull structure

B2 FRAMING OF THE STERN

B2/1 Stern frame from aft

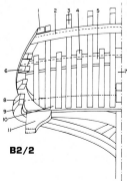
- 1 Outer stern timber
- 2 Long stern timber
- 3 Poop deck transom



- 4 Short stern timber
- 5 Filling pieces
- 6 Wing transom
- 7 After fashion piece
- 8 Transom
- 9 Forward fashion piece
- 10 Transoms
- 11 Sternpost
- 12 Filling piece for helmpost

B2/2 Stern frame from above

- 1 Outer stern timber
- 2 Poop deck transom
- 3 Long stern timber
- 4 Short stern timber

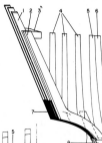


B2/2

Scale in feet



- 5 Filling pieces
- 6 Timbers on the outer stern timber
- 7 Helmpost filling piece
- 8 After fashion futtock
- 9 Forward fashion piece
- 10 Wing transom
- 11 Horizontal transom knee



B2/3 Stern frame from starboard

- 1 Long stern timber
- 2 Outer stern timber
- 3 Poop deck transom
- 4 Timbers on the outer stern timber
- 5 After fashion futtock
- 6 Forward fashion piece
- 7 Short stern timbers
- 8 Wing transom
- 9 Sternpost
- 10 Transom
- 11 After fashion piece
- 12 Transoms
- 13 Cent frames
- 14 Inner sternpost
- 15 Copper joining plate
- 16 Inner keel
- 17 Outer keel
- 18 False keel
- 19 Horizontal transom knee
- 20 Sternson
- 21 Filling piece
- 22 Deadwood

B2/3

B2/1

B3 BOW ASSEMBLY**B3/1 Bow timbers from afore**

- 1 Cathhead
- 2 Carcframe
- 3 Knuckle timber (fill pieces)
- 4 Hawse timbers
- 5 Knightheads timbers
- 6 Starn

B3/2 Keel and stam assembly

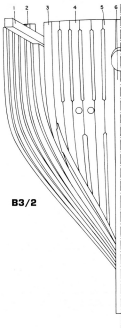
- 1 Keelson
- 2 Deadwood
- 3 Apron
- 4 Boxing
- 5 Keel
- 6 Lower breast hook
- 7 Copper horseshoe plate
- 8 Rabbits
- 9 Hook scarf

10 Starnson

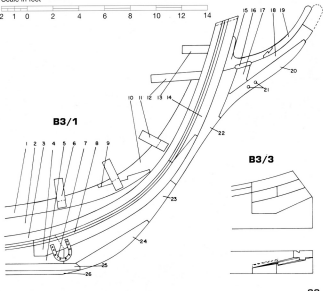
- 11 Upper breast hook
- 12 Decks hook
- 13 Breast hook above the hawse holes
- 14 Starn
- 15 Gammoning knee
- 16 Gammoning slot
- 17 Chock
- 18 Lacing to the figurehead

19 Eiking

- 20 Bobstay piece
- 21 Bobstay holes
- 22 Upper main piece
- 23 Lower mainpiece
- 24 Grips
- 25 Lower keel
- 26 False keel

B3/3 Boxing (twice enlarged)

Scale in feet



B Hull structure

B4 SEPPINGS' IMPROVEMENTS

B4/1 Trussed frame cross section

- 1 Short iron truss
- 2 Long iron truss

B 4/2 Trussed frame profile

- 1 Forked iron hanging knees
- 2 Long iron trusses
- 3 Short iron trusses

B4/3 Forked hanging knee (no scale)

B4/4 New frame construction

- 1 Dowels to connect each piece with another
- 2 Dowel to fasten the floor timber to the keel
- 3 Bolt to connect the cross piece to the keel
- 4 Floor timber
- 5 Cross piece
- 6 Dowel holes

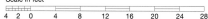
B4/5 Pieces of a frame

- 1 Dowel
- 2 Dowel hole
- 3 Floor timber
- 4 Dowel into keel
- 5 Dowel hole
- 6 Dowel
- 7 Cross piece
- 8 Hole for keel bolt
- 9 First futtock
- 10 Dowel
- 11 Second futtock
- 12 Third futtock

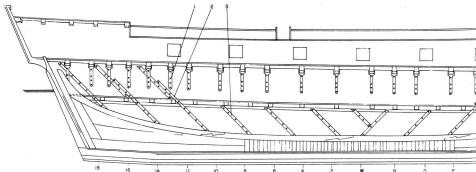
13 Fourth futtock

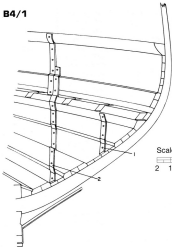
- 14 Fifth futtock
- 15 Sixth futtock
- 16 Seventh futtock
- 17 Eighth futtock
- 18 Long top timber
- 19 Short top timber
- 20 Lengthening piece

Scale in feet

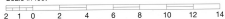
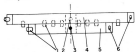
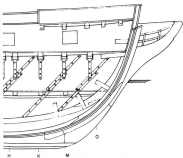
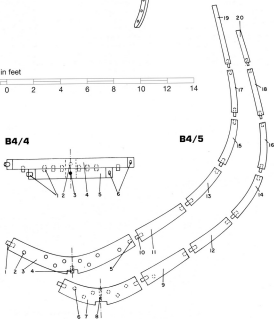


B4/2



B4/1**B4/3**

Scale in feet

**B4/4****B4/5**

C External Hull

C1 SIDES

C1/1 Side elevation

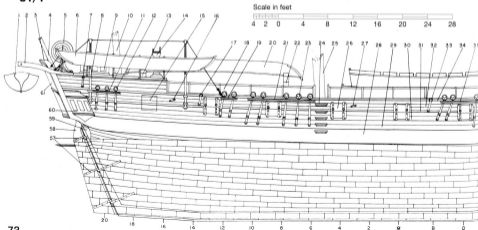
- 1 Dinghy
- 2 Horn davit
- 3 Taffrail
- 4 Ensign staff
- 5 Deep-see sounding winch
- 6 25ft whaleboat
- 7 Chained thimble for mizzen backstay
- 8 Iron quarter davits
- 9 Popp skylight
- 10 Mizzenmast
- 11 Mizzen channel

- 12 Dead eye, iron-bound and chained
- 13 Timber block for stowing the 28ft whaleboat
- 14 Azimuth compass
- 15 Planked over: but marked gun port
- 16 Main sheet fairlead
- 17 Chained thimble for main topgallant backstay
- 18 Hammock roll
- 19 Main backstay channel
- 20 28ft whaleboat
- 21 Main channel
- 22 Skid beam
- 23 Mainmast dead eye, iron-bound and chained
- 24 Outboard gangway steps
- 25 Mainmast

- 26 Gun port with half port lids
- 27 Fore sheet fairlead
- 28 Wale
- 29 Thickstuff above the wales
- 30 Side planks
- 31 Waist rail
- 32 Sheer planks
- 33 Chained thimble for fore topgallant backstay
- 34 Sheer rail
- 35 Fore channel
- 36 23ft cutter
- 37 28ft yawl
- 38 Gunwale
- 39 Foremast
- 40 Anchor lining
- 41 8-pdr boat carronade
- 42 Cathood
- 43 False rail

- 44 Bumpkin
- 45 Bowsprit
- 46 Main rail
- 47 Lower rail
- 48 Hair bracket or upper cheek
- 49 Head timber
- 50 Gammoning slot
- 51 Lower cheek
- 52 Bobstay holes
- 53 Naval hood
- 54 Hasse holes
- 55 Wash cart
- 56 Copper sheathing
- 57 Pinstles and gudgeons
- 58 New type rudder
- 59 Square tuck
- 60 False quarter gallery
- 61 Enlarged stern

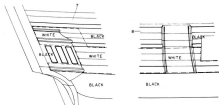
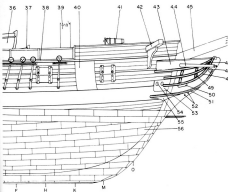
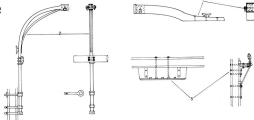
C1/1



C1/2 Side details

- 1 Horn davit
- 2 Quarter davit
- 3 Channel, fitted with iron hanging knee etc.
- 4 Gangway step
- 5 Fairlead
- 6 Half port lids
- 7 False quarter gallery with colour scheme
- 8 Anchor lining with colour scheme
- 9 Copper side sheath
- 10 Copper keel sheath

C1/2



C External Hull

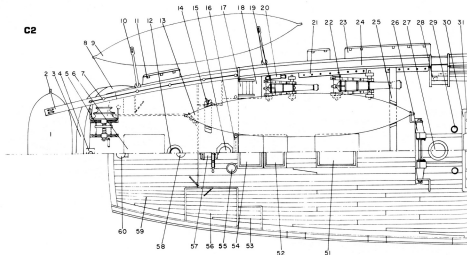
C2 UPPER DECK PLAN

- 1 Dinghy
- 2 Horn davit
- 3 Taffrail
- 4 Ensign staff step
- 5 Deep sea sounding winch
- 6 Skylight to chart room
- 7 Loose stanchion rail
- 8 False quarter gallery

- 9 25ft. whaleboat
- 10 Iron quarter davits
- 11 Mizzen channel
- 12 Mizzenmast
- 13 25ft. whaleboat
- 14 Stowage blocks
- 15 Azimuth compass
- 16 Breast rail
- 17 Ladder to poop
- 18 Flag locker
- 19 8-pdr carriage gun
- 20 Kavel
- 21 Pin rail
- 22 8-pdr carriage gun
- 23 Main channel
- 24 Hammock rail
- 25 Boat beam
- 26 Main jeer bits
- 27 Mainmast
- 28 Gangway ladder
- 29 Pump
- 30 Main hatchway
- 31 25ft yawl
- 32 23ft cutter
- 33 Reserve spars
- 34 Main channel
- 35 8-pdr carriage gun
- 36 Fore hatchway

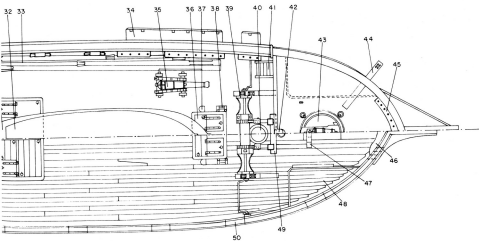
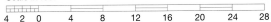
- 37 Chain pipe
- 38 Chain stopper
- 39 Windlass
- 40 Foremast
- 41 Ladder to forecastele
- 42 Oven flue
- 43 6-pdr boat carronade
- 44 Cathead
- 45 Pin rail
- 46 Breast hook
- 47 Bowsprit atop
- 48 Carpenter's store
- 49 Fore topsail sheet bits
- 50 Gun port

C2



- 51** Mess room companion hatch
- 52** Companionway
- 53** Flag locker
- 54** Companion hatch to Captain's cabin
- 55** Compass
- 56** Mr Stokes' cabin
- 57** Steering wheel
- 58** Mizzenmast
- 59** Chart room (Mr Darwin's cabin)
- 60** Helmsport

Scale in feet



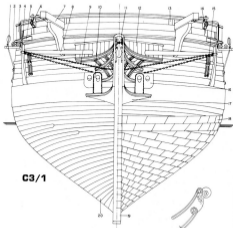
C External Hull

C3 BOW DETAILS

C3/1 Bow from afore

- 1 Iron-bound dead eye
- 2 Fore channel
- 3 Hammock rail
- 4 Anchor lining
- 5 Anchor bed
- 6 Slip hook for shenk-painter chain

- 7 Cathead
- 8 Bumpkin
- 9 Bumpkin backstays (chain)
- 10 Additional bolster for anchor chain
- 11 Figurehead
- 12 False rail
- 13 Exposed top timber for anchor stock selvage straps
- 14 Exposed top timber for anchor shaft selvage straps



C3/1

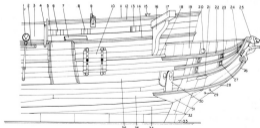
C3/2

- 15 Gun port
- 16 Naval hood
- 17 Wash cant
- 18 Copper sheathing
- 19 Stem
- 20 Timber sheathing

C3/2 Bow from starboard

- 1 Dead eye, iron-bound and chained
- 2 Fore channel
- 3 Hammock rail
- 4 Hammock rail stanchion
- 5 Anchor lining
- 6 Exposed top timber to secure shenk-painter
- 7 Anchor bed
- 8 Exposed top timber for selvage strap
- 9 Slip hook for shenk-painter chain
- 10 Gun port with half lids
- 11 Fore castle planksheer
- 12 Forecastle rail
- 13 Exposed top timber for anchor stock selvage strap
- 14 Sheer rail
- 15 Belay deck
- 16 Cathead knee
- 17 Cathead
- 18 Waist rail
- 19 False rail
- 20 Bumpkin hole
- 21 Gammoning slot
- 22 Main rail
- 23 Lower rail
- 24 Hair bracket or upper cheek
- 25 Figurehead
- 26 Lower cheek
- 27 Head timber
- 28 Head
- 29 Bobstay holes
- 30 Naval hood with added bolster for chain
- 31 Wash cant
- 32 Stem
- 33 Copper sheathing
- 34 Timber sheathing
- 35 Wale
- 36 Thickstuff above wale
- 37 Alternative figurehead (scroll)

Scale in feet



C3/3 Cross-section A - A

- 1 Upper cheek
- 2 Head timber
- 3 Lower rail
- 4 Cross piece
- 5 Main rail
- 6 Seat of ease
- 7 False rail

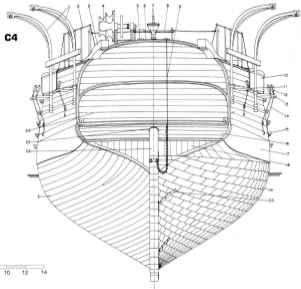
C3/4 Head from above

- 1 Main rail
- 2 False rail
- 3 Ledges
- 4 After cross piece
- 5 Seat of ease
- 6 Carling
- 7 Ledges
- 8 Middle cross piece
- 9 Forward cross piece
- 10 Figurehead
- 11 Lower cheek
- 12 Upper cheek
- 13 Lower rail

C4 STERN

- 1 Quarter devise
- 2 Poop handrail
- 3 Horn devit
- 4 Deep-sea sounding winch
- 5 Chest
- 6 Taffrail
- 7 Azimuth compass
- 8 Breast rail
- 9 Rudder pendant
- 10 Hammock rail
- 11 Mizzen channel

- 12 Iron-bound dead eye
- 13 Main backstay channel
- 14 Chains
- 15 Gangway steps
- 16 Counter
- 17 Wales
- 18 Square tuck
- 19 Copper sheathing
- 20 Rudder gudgeon
- 21 Timber sheathing
- 22 Rudder
- 23 Helmport
- 24 Stern

C3/3**C3/4****C4**

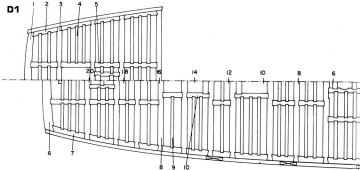
Scale in feet



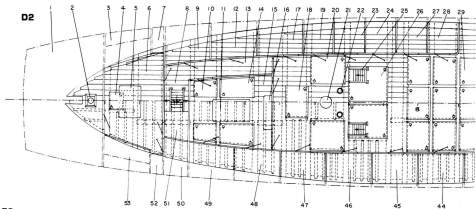
D Internal Hull

D1 UPPER DECK, POOP DECK AND FORECASTLE STRUCTURE

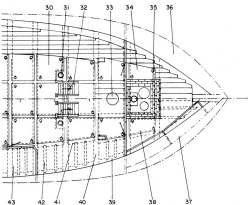
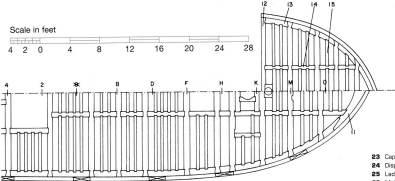
- 1 Poop endbeam (transom)
- 2 Clamp, poop deck
- 3 Beam
- 4 Halfbeam or ledge
- 5 Carling
- 6 Wing transom
- 7 Clamp, upper deck
- 8 Beam
- 9 Halfbeam or ledge
- 10 Carling
- 11 Deck hook
- 12 Beam, forecastle
- 13 Clamp, forecastle
- 14 Carling
- 15 Halfbeam or ledge



D2



Scale in feet



D2 LOWER DECK

- 1 Captain's store room
- 2 Mizzenmast
- 3 Sofa and bed
- 4 Scuttle to bread room
- 5 Captain's table
- 6 Captain's cabin
- 7 Wardrobe
- 8 Companion ladder
- 9 First Lieutenant's cabin
- 10 Floor hatch to mess room stores
- 11 Messroom or gunroom table
- 12 Messer's cabin
- 13 Passage
- 14 Floor hatch to magazine
- 15 Messroom or gunroom
- 16 Buffet
- 17 Assistant Surgeon's cabin
- 18 Floor hatch to spirit room
- 19 Slops store room
- 20 Floor hatch to hold
- 21 Mainmast
- 22 Pumps
- 23 Captain's steward's pantry
- 24 Dispensary
- 25 Ladderway, main hatch
- 26 Main floor hatch
- 27 Messroom kitchen
- 28 Messroom steward's pantry
- 29 Floor hatches to hold
- 30 Floor hatches to sail room
- 31 Chain pipe
- 32 Ladderway, fore hatch
- 33 Foremast
- 34 Floor hatch to coals
- 35 Galley
- 36 Men's locker room
- 37 Sick bay
- 38 Floor hatch to dry provisions
- 39 Clamp, lower deck
- 40 Beam, lower deck
- 41 Carling
- 42 Halfbeam or ledge
- 43 Boatswain's cabin
- 44 Gunner's cabin
- 45 Carpenter's cabin
- 46 Midshipmen berth
- 47 Purser's cabin
- 48 Surgeon's cabin
- 49 Second Lieutenant's cabin
- 50 Captain's wash room
- 51 Chronometer room
- 52 Wardrobe
- 53 Captain's bedplace

D Internal Hull

D3 BOW SECTIONS (no scale)

D3/1 Forecastle

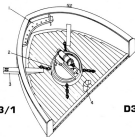
- 1 Pin rail
- 2 6-pdr boat carronade
- 3 Cathead
- 4 Oven flue

D3/2 Upper deck level

- 1 Breast hook above hawse holes
- 2 Bowsprit
- 3 Hawse hole
- 4 Carpenter's store room
- 5 Bowsprit step
- 6 Ladder to forecastle
- 7 Pin rail
- 8 Windlass
- 9 Boatswain's store room
- 10 Oven flue
- 11 Foremast with trysail mast
- 12 Fore hatchway
- 13 Chain stopper
- 14 Chain pipe

D3/3 Lower deck level

- 1 Stum
- 2 Deck hook
- 3 Breast hook
- 4 Sick bay
- 5 Galley
- 6 Oven flue
- 7 Foremast
- 8 Pawl bitpin
- 9 Windlass bitpin
- 10 Chain pipe
- 11 Men's locker room
- 12 Ladderway, fore hatchway
- 13 Floor hatch



D4 LOWER DECK, CABINS AND STORE ROOMS (no scale)

- 1 Captain's store room
- 2 Mizzenmast
- 3 Captain's cabin
- 4 Sofa and bed
- 5 Wardrobe
- 6 Passage and companionway
- 7 First Lieutenant's cabin
- 8 Messroom or gunroom
- 9 Master's cabin
- 10 Assistant Surgeon's cabin
- 11 Mainmast
- 12 Slops store room
- 13 Pumps
- 14 Ladderway, main hatchway
- 15 Captain's steward's pantry
- 16 Dispensary
- 17 Mess room kitchen
- 18 Mess steward's pantry
- 19 Floor hatch
- 20 Stompost
- 21 Transom
- 22 Captain's bed place
- 23 Wardrobe
- 24 Captain's washroom
- 25 Chronometer room

D3/2

- 26 Second Lieutenant's cabin
- 27 Surgeon's cabin
- 28 Purser's cabin
- 29 Midshipmen's berth
- 30 Carpenter's cabin
- 31 Gunner's cabin
- 32 Boatswain's cabin

D5 POOP (no scale)

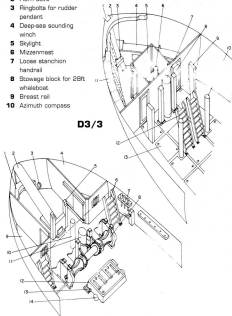
D5/1 Poop deck

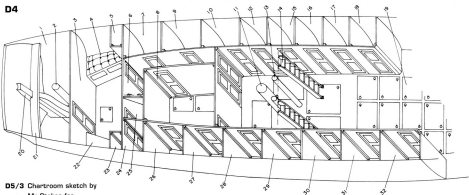
- 1 Ensign staff
- 2 Horn davit
- 3 Ringbolts for rudder pendant
- 4 Deep-sea sounding winch
- 5 Skylight
- 6 Mizzenmast
- 7 Loose stanchion handrail
- 8 Stowage block for 2Bft whaleboat
- 9 Breast rail
- 10 Azimuth compass

D5/2 Upper deck level

- 1 Water closet
- 2 Passage and storage space
- 3 Water closet or store (?)
- 4 Ladder to poop deck
- 5 Flag locker
- 6 Chart room, Mr Darwin's cabin on second voyage
- 7 Mizzenmast
- 8 Mr Stokes' cabin on second voyage
- 9 Helmsport and stempost

D3/3

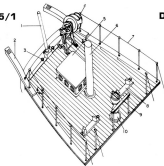
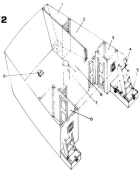
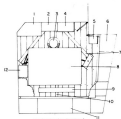


D4**D5/3** Chartroom sketch by

Mr Stokes for

Mr Darwin

- | | | |
|----------------------|----------------------------|---------------------|
| 1 Chest of drawers | 5 Oven | 9 Cover over tiller |
| 2 Wash stand | 6 Book cases | 10 Tiller |
| 3 Mizzenmast | 7 Covered up steering rope | 11 Book cases |
| 4 Instrument cabinet | 8 Large table | 12 Cabinet |

D5/1**D5/2****D5/3**

E Fittings

E1 STEERING ARRANGEMENT

E1/1 Side elevation and plan

- 1 Rudder coat
- 2 Ring-bolt for rudder pendant
- 3 Pintle and gudgeon
- 4 Rudder pin to lift the pintle brace slightly off the gudgeon
- 5 Rudder
- 6 Rudder head
- 7 Iron tiller

- 8 Small platform over the tiller
- 9 Tiller rope sheave, covered
- 10 Cover over tiller rope
- 11 Steering wheel
- 12 Tiller rope foot block
- 13 Emergency steering tackle

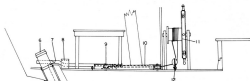
E1/2 Steering details

- 1 New rudder with offset and rounded head as installed for the second voyage
- 2 Iron tiller

- 3 Steering wheel spoke
- 4 Fellies
- 5 Inscription around the rim
- 6 Hub
- 7 Axle
- 8 Barrel
- 9 Support post with Neptune picture (nos 3-8 scale doubled)
- 10 Pintles and gudgeons (no scale)

E2 SKYLIGHTS AND COMPANIONWAY

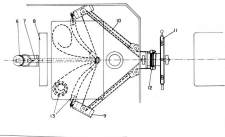
- 1 Poop skylight (no scale)
- 2 Mess or gun room skylight (no scale)
- 3 Companionway and Captain's cabin skylight side elevation
- 4 The same from abaft
- 5 The same from above
- 6 Inside companionway

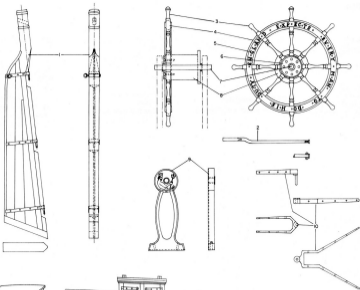
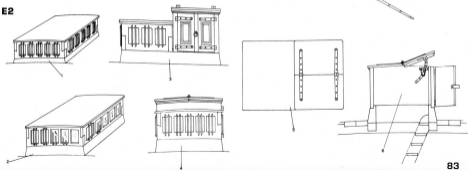


Scale in feet



E1/1

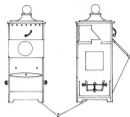


E1/2**E2**

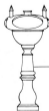
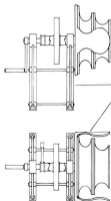
E3

**E3 NAVIGATIONAL
IMPLEMENTS**

- 1 Deep-sea sounding winch
- 2 Single binnacle stand around 1815
- 3 Single binnacle with stand around 1835
- 4 Azimuth compass
- 5 Azimuth compass in a box, for use in boats (no scale)

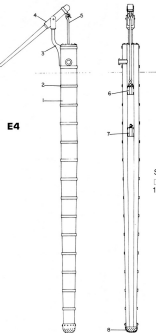


Scale in feet

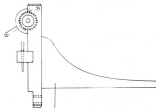
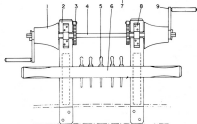


E4 PUMP

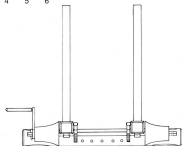
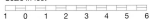
- 1 Suction pipe
- 2 Iron bands
- 3 Forked brake stanchion
- 4 Brake
- 5 Spear
- 6 Pump shoe
- 7 Pump bucket
- 8 Basket

**E4****E5 MAIN JEER BITS WITH ATTACHED WINCH**

- 1 Warping end
- 2 Bit pin
- 3 Ratchet wheel and pawl
- 4 Axle
- 5 Belay pin
- 6 Cross-piece
- 7 Standard knee
- 8 Axle bracket
- 9 Handle

**E5**

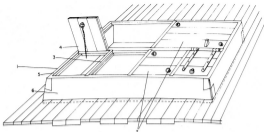
Scale in feet



E Fittings

E6 HATCHWAYS (no scale)

- 1 Main hatchway
- 2 Fore hatchway
- 3 Gutter ledge
- 4 Hinged hatch cover
- 5 Hatch coaming
- 6 Hatch head ledge
- 7 Hatch cover



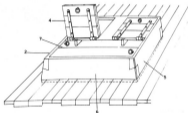
E7 HAMMOCK RAIL STANCHION (no scale)

E7

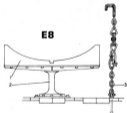


E8 BOAT STAND (no scale)

- 1 Boat check
- 2 Boat check standard
- 3 Boat gripe

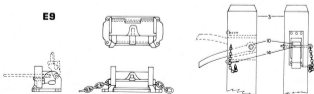


E8



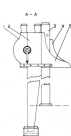
E9 CHAIN STOPPER (no scale)

E9

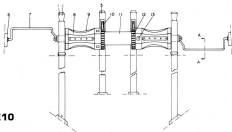


E10 WINDLASS

- 1 Cheek
- 2 Carrick or windlass bit pin
- 3 Pawl bit pin
- 4 Pawl bit standard knee
- 5 Carrick bit standard knee
- 6 Crank-handle support
- 7 Crank-handle
- 8 Main piece
- 9 Whelp
- 10 Pawl in iron casing
- 11 Barrel
- 12 Pawl-rim
- 13 Spike socket
- 14 Pawl safety pin with chain
- 15 Bottom bracket



E10

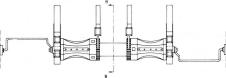
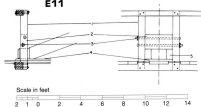


E11 BOWSPRIT STEP

- 1 Uprights
- 2 Cross-piece
- 3 Forelocked bolts
- 4 Doubled planking below bowsprit
- 5 Side piece



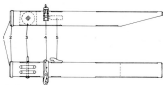
E11



Scale in feet

2 1 0 2 4 6 8 10 12 14

E12/1



Scale in feet

1 0 1 2 3 4 5 6

E12 CATHEADS [no scale]

E12/1 Cathead

- 1 Cathead
- 2 Iron band
- 3 Ring-bolted sheaves
- 4 Slip-hook
- 5 Thumb cleat

E12/2 Cathead with stopper chain on slip-hook

E13 BUMPKIN FITTING



E12/2



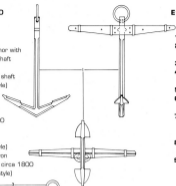
E13

E Fittings

E14 ANCHORS AND FASTENINGS

E14/1 Anchor

- 1 Bower or sheet anchor with ring and octagonal shaft (old style)
- 2 Bower with rounded shaft and shackle (new style)
- 3 Large shackle
- 4 Stream anchor with iron stock, old style from circa 1800
- 5 Stream anchor, iron stock bend by for storage (new style)
- 6 Kedge anchor with iron stock, old style from circa 1800
- 7 Kedge anchor (new style)



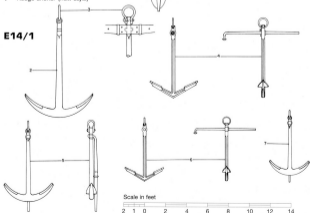
E14/2 Puddening, knots, buoys (no scale)

- 1 Puddening of an anchor ring
- 2 Ring-replacing shackle on the new styled anchor
- 3 Cable clinch on ring
- 4 Anchor chain connected to large shackle
- 5 Fisherman's bend on ring
- 6 Cable shackled to new style anchor
- 7 Cork buoy, at the lower end a buoy rope and at the top a short lanyard
- 8 Metal buoy with buoy rope and lanyard
- 9 Buoy rope connection to anchor



E14/2

E14/1



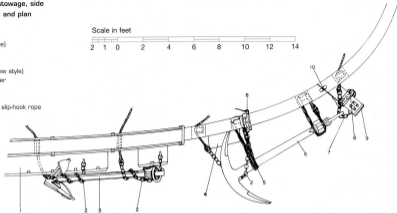
Scale in feet



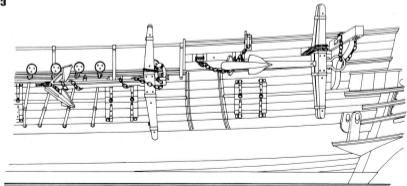
E14/3 Anchor stowage, side elevation and plan

- 1 Fore channel
- 2 Shank-painter
- 3 Bower (old style)
- 4 Anchor bed
- 5 Selvage
- 6 Best bower (new style)
- 7 Cathead stopper
- 8 Slip-hook
- 9 Cathead
- 10 Belay cleat for slip-hook rope

Scale in feet



E14/3



F Armament

F1 GUNS

F1/1 Gun, side elevation and plan

- 1 6-pdr gun
- 2 8-pdr gun
- 3 Casable
- 4 First reinforcement
- 5 Second reinforcement
- 6 Chase
- 7 Butt
- 8 Breech
- 9 Pan
- 10 Chamber
- 11 Trunnion
- 12 Bore
- 13 Muzzle
- 14 Ball

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 Capequane joint-bolt
- 8 Capequane joint-bolt
- 9 Capequane
- 10 Transom bolt
- 11 Transom
- 12 Fore axle
- 13 Fore truck
- 14 Linch pin
- 15 Breeching ring-bolt
- 16 Bed-bolt
- 17 Bolster
- 18 Hind truck
- 19 Hind axle

F1/3 Gun, stowed seaworthy on deck

- 1 Breeching, wrapped around gun and carriage
- 2 Gun tackles fastened rearward
- 3 Gun tackles fastened forward
- 4 Stopper blocks for the trucks, nailed to the deck
- 5 Tompan

F2 CARRONADE AND CARRIAGE

F2/1 6-pdr Carronade

- 1 Elevating screw
- 2 Breeching ring
- 3 Breech
- 4 Base patch with pan
- 5 Bore
- 6 Stop sight
- 7 Elevating screw box
- 8 Casable loop

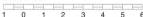
F2/2 Carriage

- 1 Train tackle ring
- 2 Elevating screw plate
- 3 Gun tackle ring-bolt
- 4 Breeching ring
- 5 Joint check
- 6 Gudgeon
- 7 Carriage
- 8 Skead breeching ring-bolt
- 9 Skead or slide
- 10 Truck
- 11 Turntable ring-bolts
- 12 Iron skid base
- 13 Lowered truck level
- 14 Turntable

F1/3



Scale in feet



F2/3 Assembled carronade

- 1 Carronade
- 2 Breeching
- 3 Carriage
- 4 Gun tackle
- 5 Skead
- 6 Iron skid base
- 7 Truck level
- 8 Turntable

F3 HOWITZER

F3/1 4-pdr Howitzer, side and plan

- 1 Casable
- 2 Breech
- 3 Powder pan
- 4 Trunnion
- 5 Muzzle

F3/2 Carriage

- 1 Bracket
- 2 Capequane eye-bolt
- 3 Capequane
- 4 Capequane joint-bolt
- 5 Capequane key
- 6 Transom
- 7 Carriage base

F3/3 Turning base

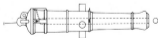
- 1 Turning base
- 2 Turning disk
- 3 Bolts
- 4 Gudgeon
- 5 Iron fastening plates

F3/4 Assembled howitzer

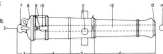
- 1 Howitzer
- 2 Bracket
- 3 Guoin
- 4 Guoin underlay
- 5 Carriage base
- 6 Turning base
- 7 Turning base support

F3/5 Gun implements

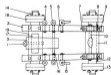
- 1 Sponge
- 2 Rammer
- 3 Worm
- 4 Ladle

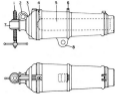
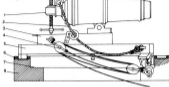
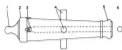
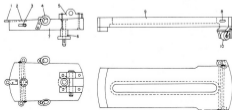
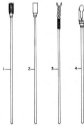
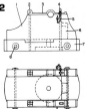
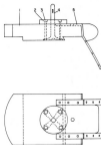
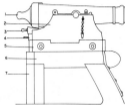


F1/1

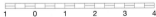


F1/2



F2/1**F2/3****F3/1****F2/2****F3/5****F3/2****F3/3****F3/4**

Scale in feet



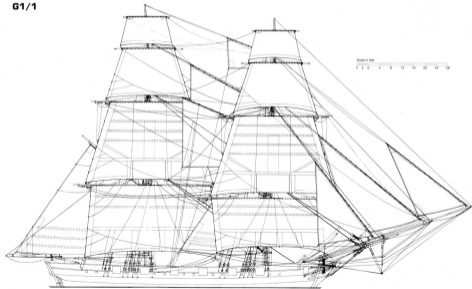
G Masts And Spars

G1 FULLY-RIGGED SHIP

G1/1 Fully-rigged 10-gun brig, about 1820

G1/2 (Opposite title page and printed to a large scale on the reverse of book jacket)

G1/1



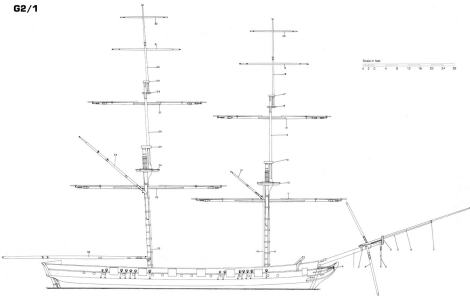
G2 MASTS AND SPARS**G2/1 10-gun brig with all masts and spars in position**

- 1 Bowsprit
- 2 Jib-boom
- 3 Spreader
- 4 Dolphin striker
- 5 Bowsprit cap

- 6 Flying jib-boom
- 7 Jib-boom cap
- 8 Bumpkin
- 9 Foremast
- 10 Trysail mast
- 11 Fore yard
- 12 Fore top
- 13 Foremast cap
- 14 Fore topmast
- 15 Fore topsail yard
- 16 Fore topmast trees

- 17 Fore topmast cap
- 18 Fore topgallant mast with long pole head
- 19 Fore topgallant yard
- 20 Fore royal yard
- 21 Trysail gaff
- 22 Mainmast
- 23 Main yard
- 24 Main top
- 25 Mainmast cap
- 26 Main topmast

- 27 Main topsail yard
- 28 Main topmast trees
- 29 Main topmast cap
- 30 Main topgallant mast with long pole head
- 31 Main topgallant yard
- 32 Main royal yard
- 33 Main gaff
- 34 Main boom

G2/1

G Masts And Spars

- 6 Flying jib-boom
- 7 Jib-boom cap
- 8 Bumpkin
- 9 Foremast
- 10 Fore bryssel mast
- 11 Fore yard
- 12 Fore top
- 13 Foremast cap
- 14 Fore topmast
- 15 Fore topsail yard
- 16 Fore topmast trees
- 17 Fore topmast cap

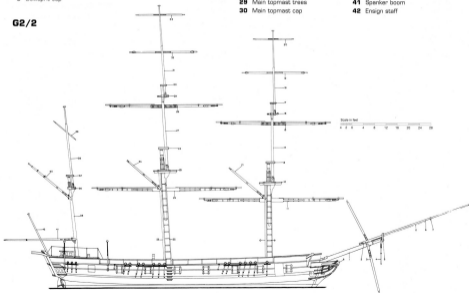
G2/2 Survey ship with all masts and spars in position, 1831 rig

- 1 Bowspit
- 2 Jib-boom
- 3 Spreader
- 4 Dolphin striker
- 5 Bowspit cap

- 18 Fore topgallant mast with long pole head
- 19 Fore topgallant yard
- 20 Fore royal yard
- 21 Fore bryssel gaff
- 22 Mainmast
- 23 Main bryssel mast
- 24 Main yard
- 25 Main top
- 26 Mainmast cap
- 27 Main topmast
- 28 Main topsail yard
- 29 Main topmast trees
- 30 Main topmast cap

- 31 Main topgallant mast with long pole head
- 32 Main topgallant yard
- 33 Main royal yard
- 34 Main bryssel gaff
- 35 Mizzenmast
- 36 Lower cap
- 37 Mizzenmast cap
- 38 Mizzenmast with normal pole head
- 39 Mizzen topsail yard
- 40 Spenker gaff
- 41 Spenker boom
- 42 Ensign staff

G2/2



G3 LOWER MASTS, 1831**RIG****G3/1 Lower masts**

- 1 Mizzenmast
- 2 Mainmast
- 3 Foremast, front
- 4 Foremast, side
- 5 Foremast, aft
- 6 Cap tenon
- 7 Masthead hoop
- 8 Masthead
- 9 Cheek
- 10 Bib
- 11 Cheek
- 12 Rubbing paunch
- 13 Hoop upon cheek

14 Mast hoop

- 15 Main trysail mast
- 16 Main trysail mast hoop
- 17 Main trysail mast step
- 18 Heel
- 19 Hounds
- 20 Bib
- 21 Copper surround for spanker gaff
- 22 Copper surround for spanker boom
- 23 Boom support (crutch)
- 24 Fore trysail mast
- 25 Fore trysail mast heel hoop

G3/2 Main masthead, side and front, lower main and fore trysail mast

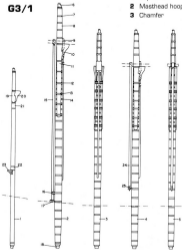
- 1 Cap tenon
- 2 Masthead hoop
- 3 Chamfer

4 Masthead

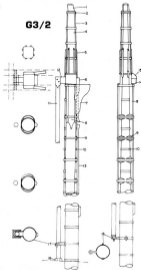
- 5 Mast batten
- 6 Chock
- 7 Bib
- 8 Cheek
- 9 Hoop upon cheek and filling chock
- 10 Mast hoop
- 11 Trysail mast
- 12 Filling chock
- 13 Rubbing paunch
- 14 Trestle tree
- 15 Bolster
- 16 Fore trysail mast's heel hoop
- 17 Main trysail mast hoop
- 18 Main trysail mast step

G3/3 Trestle and cross trees

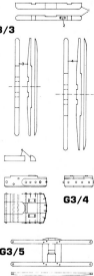
- 1 Trestle tree
- 2 Fid plate
- 3 Forward cross tree and upper cross tree
- 4 Rear cross tree and upper cross tree
- 5 Bolster

G3/4 Mizzenmast's lower cap (no scale)**G3/5 Mizzenmast's lower cap with spreaders, plan****G3/1**

Scale in feet
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

G3/2

Scale in feet
0 2 4 6 8 10 12 14

G3/3**G3/4****G3/5**

G Masts And Spars

G3/6 Tops

- 1 Main top
- 2 Fore top
- 3 Trestle tree
- 4 Rim
- 5 Handrail stanchion
- 6 Rear cross deals
- 7 Rear upper cross-tree
- 8 Rear diagonal braces
- 9 Iron strap
- 10 Futtock mortice
- 11 Length deals
- 12 Lubber hole

- 13 Scuttle
- 14 Side diagonal braces
- 15 Fore upper cross-tree
- 16 Fore cross deals
- 17 Fore rim
- 18 Bolster for sling
- 19 Hole for lower yard sling

G3/7 Caps

- 1 Mainmast cap
- 2 Iron band
- 3 Tenon hole
- 4 Eye bolt
- 5 Iron plate with eyes for lower yard lifts
- 6 Topmast hole
- 7 Eye bolt

- 8 Leather lining
- 9 Mizzenmast cap
- 10 Eye bolt for Peak halvyard

G4 TOPMASTS, TOPGALLANT MASTS AND ENSIGN STAFF

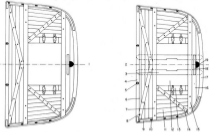
G4/1 Topmasts, toppallant masts and ensign staff

- 1 Main topmast
- 2 Fore topmast
- 3 Mizzen topmast
- 4 Main toppallant mast
- 5 Fore toppallant mast

- 6 Ensign staff
- 7 Cap tenon
- 8 Masthead
- 9 Hounds
- 10 Top rope sheave
- 11 Heel
- 12 Fid hole
- 13 Truck
- 14 Normal pole head
- 15 Tye sheave
- 16 Royal halvyard sheave
- 17 Long pole head
- 18 Mast stop
- 19 Topgallant halvyard sheave
- 20 Flag line sheave
- 21 Belay cleat

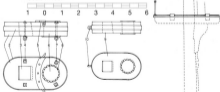
G3/6

Scale in feet
0 2 4 6 8 10 12 14

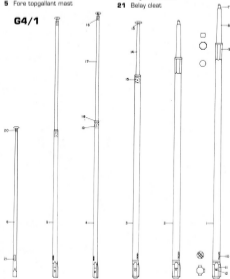


G3/7

Scale in feet
0 1 2 3 4 5 6



G4/1



G4/2 Details of topmast/topgallant mast connection

- 1 Topmast hounds
- 2 Trestle tree
- 3 Crosstree
- 4 Circular piece
- 5 Iron stay, connecting the crosstrees
- 6 Fid
- 7 End hoop
- 8 Bolster
- 9 Topgallant mast
- 10 Topmast cap
- 11 Topgallant mast stop
- 12 Long pole-head
- 13 Truck

G4/3 Topmast cap

- 1 Cap
- 2 Iron band

- 3 Hole, topmast tenon
- 4 Eye bolts
- 5 Hole, topgallant mast
- 6 Leather lining

G4/4 Trestle and crosstrees

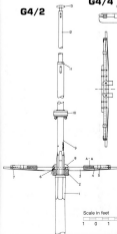
- 1 Trestle tree
- 2 Rear crosstree
- 3 Iron stay
- 4 Sheave, rear topgallant shroud
- 5 Sheave, main topgallant bowline
- 6 Rear cross piece
- 7 Bolster
- 8 Fore crosstree
- 9 Sheave, fore topgallant shroud
- 10 End hoop
- 11 Fid plate
- 12 Circular piece
- 13 Fore cross piece
- 14 Bolts
- 15 Span piece

G5 BOWSPRIT, JIB-BOOM AND FLYING JIB-BOOM

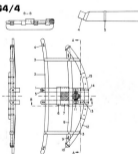
- 1 Bowsprit
- 2 Jib-boom
- 3 Flying jib-boom
- 4 Bowsprit heel
- 5 Iron hoop
- 6 Gammoning fish
- 7 Stop cleats
- 8 Jib-boom saddle
- 9 Chamfer for bee placement
- 10 Bowsprit tenon
- 11 Bowsprit cap
- 12 Iron band
- 13 Hole, flying jib-boom tenon
- 14 Eye bolts
- 15 Leather lining
- 16 Hole, jib-boom
- 17 Hole, bowsprit tenon
- 18 Bee

- 19 Bee-block
- 20 Sheave, fore topmast preventer stay
- 21 Sheave, fore topmast stay
- 22 Small sheaves for fore courses and fore topsail bowlines (probably in use at a later date than 1831)
- 23 Jib-boom cap
- 24 Notches in heel to secure jib-boom
- 25 Sheave, outhauler
- 26 Squared heel
- 27 Sheave, jib stay
- 28 Stop
- 29 Cap octagonal
- 30 Flying jib-boom tenon
- 31 Octagonal heel
- 32 Sheave, flying jib stay
- 33 Stop with notch for royal stay

G4/2



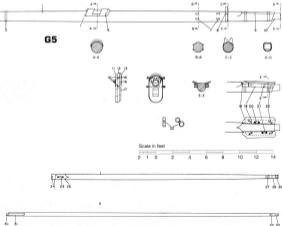
G4/4



G4/3



G5



G Masts And Spars

G6 YARDS, GAFFS AND BOOMS

G6/1 Yards

- 1 Main yard
- 2 Fore yard
- 3 Main topsail yard
- 4 Fore topsail yard
- 5 Main toppallant yard
- 6 Fore toppallant yard
- 7 Main royal yard
- 8 Fore royal yard

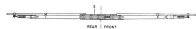
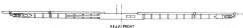
G6/2 Yard details (no scale)

- 1 Lower yard, plan
- 2 Thickened sling section
- 3 Sling cleats
- 4 Hoop
- 5 Jackstay bolts
- 6 Betten on mast side
- 7 Studdingsail boom
- 8 Inner-studdingsail boom iron
- 9 Yard-arm square
- 10 Topsail sheet cheek-block
- 11 Yard arm

- 12 Outer studdingsail boom iron
- 13 Topsail yard, plan
- 14 Sling battens
- 15 Sling cleats
- 16 Hoops and fill pieces
- 17 Jackstay bolt
- 18 Studdingsail boom
- 19 Inner boom iron
- 20 Yard-arm square
- 21 Toppallant sheet cheek-block
- 22 Yard arm
- 23 Sheave, reef tackle
- 24 Outer boom iron
- 25 Toppallant yard, plan
- 26 Sling cleats

- 27 Octagonal sling section
- 28 Jackstay bolt
- 29 Yard-arm square
- 30 Royal sheet cheek-block
- 31 Yard arm
- 32 Fenule
- 33 Eye bolt, jewel block
- 34 Royal yard, plan
- 35 Sling cleats
- 36 Octagonal sling section
- 37 Jackstay bolt
- 38 Yard arm
- 39 Fenule

G6/1



Scale in feet



G6/2



G6/3 Studdingsail yards and booms

- 1 Lower main studdingsail boom
- 2 Lower fore studdingsail boom
- 3 Stop
- 4 Iron hoop with eyes
- 5 Ferule
- 6 Gosenack
- 7 Boom, as fitted to the main channels
- 8 Main studdingsail yard
- 9 Halyard stop cleats
- 10 Yard-arm stop cleats
- 11 Fore studdingsail yard
- 12 Main topsail studdingsail yard
- 13 Fore topsail studdingsail yard
- 14 Topgallant studdingsail yard

28 Boom stop

29 Ferule

30 Yard-arm stop cleats

31 Halyard stop cleats

32 Sheave, jibstay

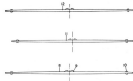
33 Hoop

34 Sheave, fore topgallant stay

35 Eye bolt, martingale stay

36 Sheave, flying jibstay

37 Sheave, fore royal stay



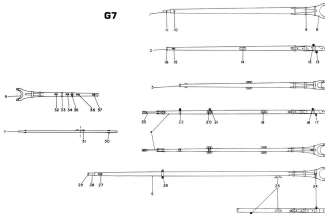
G7 GAFFS AND BOOMS

- 1 Spreader
- 2 Fore trysail gaff
- 3 Main trysail gaff
- 4 Spanker gaff
- 5 Spanker boom
- 6 Dolphin striker
- 7 Mizen topsail yard
- 8 Jaws, leather-lined
- 9 Hoops
- 10 Hole, jib-boom guy
- 11 Hole, flying jib-boom guy
- 12 Eye bolt, sling
- 13 Eye bolt, middle brail block
- 14 Cheek-block, upper brail
- 15 Peak stop cleat
- 16 Ferule
- 17 Eye bolt, brail double block
- 18 Eye bolt, throat halyard
- 19 Cheek-block, middle brail
- 20 Cheek-block, upper brail
- 21 Eye bolt, peak halyard block
- 22 Eye bolt, peak halyard
- 23 Iron flag-line block extension
- 24 Eye bolt, spanker tack
- 25 Eye bolt and cleat, spanker sheet tackle
- 26 Eye bolts, boom sheeta
- 27 Sheave, spanker sheet

Scale in feet



G7



H Standing Rigging

- 6 2. Bobstay
- 7 Fore topgallant stay
- 8 Meringale stay, aft. of dolphin striker doubled to both sides of the bow
- 8 Flying jibstay
- 10 Fore royal stay
- 11 Jibstay
- 1 Jib-boom horse
- 13 Fore topmast stay
- 14 Fore topmast preventer stay
- 15 Forestay
- 16 Fore preventer stay

- 17 Fore mast-tackle
- 18 Fore shrouds
- 19 Ratlines
- 20 Fore breast backstay
- 21 Futtock shrouds
- 22 Fore topmast shrouds
- 23 Fore burton tackle
- 24 First fore backstay
- 25 Second fore backstay
- 26 Fore topgallant shrouds
- 27 Fore topgallant backstay
- 28 Main preventer stay
- 29 Mainstay
- 30 Main topmast preventer stay

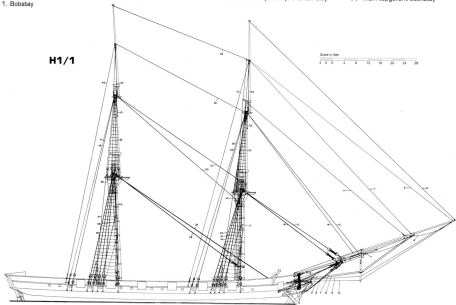
- 31 Main topmast stay
- 32 Main topgallant stay
- 33 Main royal stay
- 34 Main mast-tackle
- 35 Main shrouds
- 36 Ratlines
- 37 Main breast backstay
- 38 Main futtock shrouds
- 39 Main topmast shrouds
- 40 Main burton tackle
- 41 First main backstay
- 42 Second main backstay
- 43 Main topgallant shrouds
- 44 Main topgallant backstay

H1 PROFILES

H1/1 Profile of 10-gun brig about 1820

- 1 Gammoning
- 2 Bumpkin shrouds
- 3 1. Bowsprit shroud
- 4 2. Bowsprit shroud
- 5 1. Bobstay

H1/1



Scale in feet
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

H1/2 Profile of survey ship in 1831

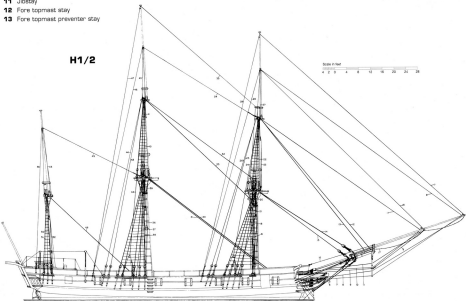
- 1 Gammoning (chain)
- 2 Bumpkin shrouds (chain)
- 3 First bowsprit shroud
- 4 Second bowsprit shroud
- 5 First bobstay
- 6 Second bobstay
- 7 Fore royal stay
- 8 Plying jibstay
- 9 Martingale stay (towards the bow doubled)
- 10 Fore topgallant stay
- 11 Jibstay
- 12 Fore topmast stay
- 13 Fore topmast preventer stay

- 14 Fore stay
- 15 Fore preventer stay
- 16 Bowsprit horse
- 17 Jib-boom horse
- 18 Fore shrouds
- 19 Ratlines
- 20 Futtock shrouds (chain)
- 21 Fore mast-backle
- 22 Fore topmast shrouds
- 23 Fore burton tackle
- 24 Fore breast backstay
- 25 First fore backstay
- 26 Second fore backstay

- 27 Fore topgallant shrouds
- 28 Fore topgallant backstay
- 29 Fore royal backstay
- 30 Mainstay
- 31 Main preventer stay
- 32 Main topmast stay
- 33 Main topmast preventer stay
- 34 Main topgallant stay
- 35 Main royal stay
- 36 Main mast-backle
- 37 Main shrouds
- 38 Ratlines
- 39 Futtock shrouds (chain)
- 40 Main topmast shrouds

- 41 Main burton pendant
- 42 Main breast backstay
- 43 First main backstay
- 44 Second main backstay
- 45 Main topgallant shrouds
- 46 Main topgallant backstay
- 47 Main royal backstay
- 48 Mizzen stay
- 49 Mizzen topmast stay
- 50 Mizzen shrouds
- 51 Ratlines
- 52 Mizzen burton tackle
- 53 Mizzen topmast shrouds
- 54 Mizzen backstay

H1/2



H Standing Rigging

H2 SHROUDS AND STAYS

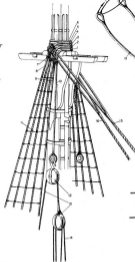
H2/1 Shrouds, backstays, etc on channel [no scale]

- 1 Dead eye, iron-bound Channel
- 3 Dead eye chain link and preventer link
- 4 Dead eye lashing, seen from inside
- 5 Mast-tackle fall



H2/1

- 6 First shroud, served over for protection again chafing
- 7 Mast-tackle runner
- 8 Ratlines
- 9 Breast backstay with runner and tackle
- 10 Backstay
- 11 Topsail yard tye tackle
- 12 Topgallant backstay
- 13 Royal backstay



H2/2

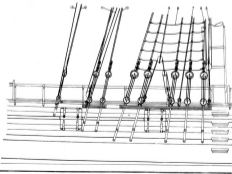


- 6 Sixth pair of shrouds (port)
- 7 Seizing
- 8 Shroud pair loop (served over)
- 9 Foremost shroud (served over)
- 10 Mast-tackle pendant (served over)

H2/2 Shrouds, mast-tackle and stays on masthead [no scale]

- 1 Foremost shroud and mast-tackle pendant pair (served over) [starboard]
- 2 Second shroud and mast-tackle pendant pair (served over) [port]
- 3 Third pair of shrouds [starboard]
- 4 Fourth pair of shrouds [port]
- 5 Fifth pair of shrouds [starboard]

- 11 Ratlines
- 12 Single block with hook for mast-tackle runner
- 13 Runner with double tackle block seized in
- 14 Fall
- 15 Mainstay
- 16 Main preventer stay
- 17 Warming
- 18 Heert
- 19 Upper section of stay (doubled and served over)
- 20 Lashing



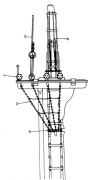
H2/3 Mast top with futtock shrouds, topmast and topgallant shrouds

- 1 Dead eye with futtock iron
- 2 Futtock chain
- 3 Shackles
- 4 Double futtock chain collar
- 5 Topmast shroud
- 6 Topgallant shrouds, leading down and fastened with block and tackle to the uppermost shroud loop

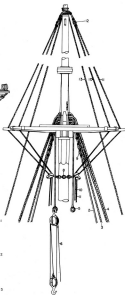
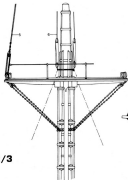
H2/4 Topmast and topgallant shrouds, backstays and burton tackle

- 1 Topmast shrouds
- 2 Foremost topmast shroud (served over)
- 3 Breast backstay
- 4 Topmast backstay
- 5 Burton pendant
- 6 Burton tackle

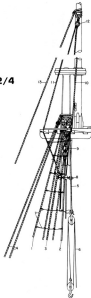
- 7 Ratlines
- 8 Single chain collar
- 9 Sisterblock
- 10 First topgallant shroud
- 11 Second topgallant shroud
- 12 Seized in thimble
- 13 Topmast backstay



H2/3



H2/4



H Standing Rigging

H3 STAY DETAILS

H3/1 Stays on bowsprit, jib-boom and flying jib-boom

- 1 Fore preventer stay
- 2 Fore stay
- 3 Closest heert seized to stay
- 4 Lashing
- 5 Open heert with double strap
- 6 Fore topmast preventer stay
- 7 Fore topmast stay
- 8 Jibstay
- 9 Fore topgallant stay
- 10 Flying jibstay
- 11 Fore royal stay
- 12 First bowsprit shroud
- 13 Second bowsprit shroud
- 14 First bobstay
- 15 Second bobstay
- 16 Chain crupper and heel lashing
- 17 Bowsprit horse
- 18 Jib-boom horse
- 19 Meringle stay (forward section)
- 20 Meringle stay (doubled in rear section)
- 21 Gemmonging

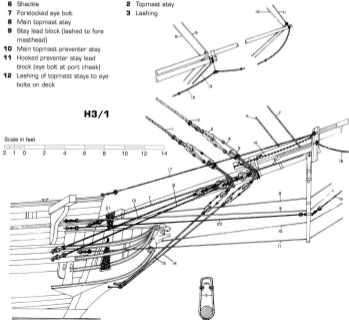
H3/2 Main and mizzen stays at their lower ends

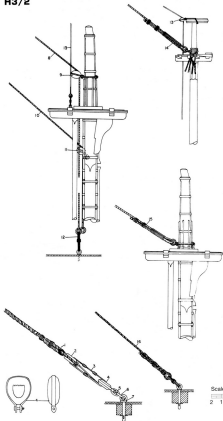
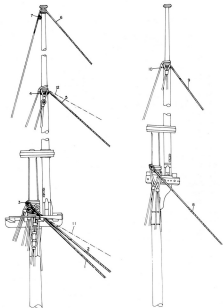
- 1 Main (starboard) or preventer stay (port)
- 2 Heert
- 3 Lashing
- 4 Iron-bound heert
- 5 Chain link
- 6 Shackles
- 7 Forelocked eye bolt
- 8 Main topmast stay
- 9 Stay lead block (lashed to fore masthead)
- 10 Main topmast preventer stay
- 11 Hooked preventer stay lead block (eye bolt at port cheek)
- 12 Lashing of topmast stays to eye bolts on deck

H3/3 Main topmast, topgallant and mizzen stays at their upper ends (no scale)

- 1 Topmast preventer stay
- 2 Topmast stay
- 3 Lashing

- 4 Grummet
- 5 Topgallant stay
- 6 Royal stay
- 7 Seized thimble
- 8 Mizzen stay
- 9 Mizzen topmast stay
- 10 Grummet
- 11 Jibstay (fore topmast only)
- 12 Flying jibstay (fore topgallant mast only)



H3/2**H3/3**

Scale in feet



I Running Rigging

I1 RIGGING OF YARDS, GAFFS AND BOOM

I1/1 Profile of 10-gun brig with all yards, etc

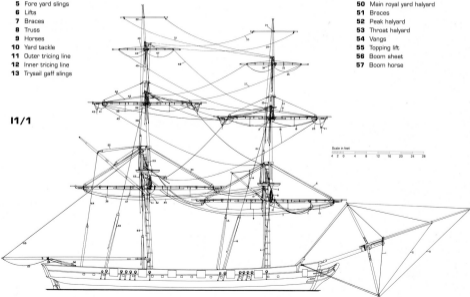
- 1 Spreader lift
- 2 Jib-boom guy
- 3 Flying jib-boom guy
- 4 Fore yard jeers
- 5 Fore yard slings
- 6 Lifts
- 7 Braces
- 8 Truss
- 9 Horses
- 10 Yard tackle
- 11 Outer tricing line
- 12 Inner tricing line
- 13 Trysail gaff slings

I1/1

- 14 Peak span and pendant
- 15 Vangs
- 16 Fore topsail yard tye and halyard tackle
- 17 Parrel
- 18 Braces
- 19 Horses
- 20 Flemish horses
- 21 Reef tackle
- 22 Lift
- 23 Fore topgallant yard tye and halyard tackle
- 24 Truss parrel

- 25 Lift
- 26 Horses
- 27 Braces
- 28 Fore royal yard halyard
- 29 Truss parrel
- 30 Braces
- 31 Main yard jeers
- 32 Truss
- 33 Slings
- 34 Lifts
- 35 Braces
- 36 Horses
- 37 Stirrups

- 38 Main topsail yard and halyard tackle
- 39 Parrel
- 40 Horses
- 41 Flemish horses
- 42 Reef tackle
- 43 Braces
- 44 Lifts
- 45 Main topgallant yard tye and halyard tackle
- 46 Truss parrel
- 47 Horses
- 48 Braces
- 49 Lifts
- 50 Main royal yard halyard
- 51 Braces
- 52 Peak halyard
- 53 Throat halyard
- 54 Vangs
- 55 Topping lift
- 56 Boom sheet
- 57 Boom horse



**11/2 Profile of survey ship
with all yards etc.
after 1831 refit**

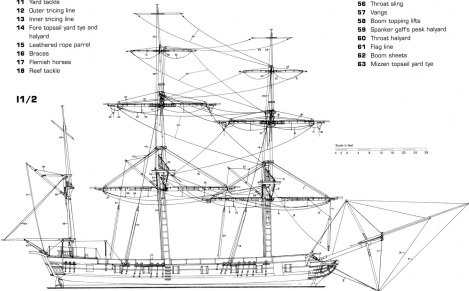
- 1 Spreader lift
- 2 Crupper
- 3 Jib-boom guy
- 4 Flying jib-boom guy
- 5 Fore yard chain slings
- 6 Chain trusses
- 7 Lifts
- 8 Braces
- 9 Horses
- 10 Stirrups
- 11 Yard tackle
- 12 Outer tricing line
- 13 Inner tricing line
- 14 Fore topsail yard tye and halyard
- 15 Leathered rope parrel
- 16 Braces
- 17 Flemish horses
- 18 Reef tackle

- 19 Lift
- 20 Fore topgallant tye
- 21 Braces
- 22 Horses
- 23 Lift
- 24 Slings parrel
- 25 Fore royal yard tye
- 26 Braces
- 27 Fore trysail gaff peak span and pendant
- 28 Throat sling
- 29 Vangs
- 30 Main yard chain slings

- 31 Chain trusses
- 32 Iron block
- 33 Truss pendants
- 34 Truss tackle
- 35 Lifts
- 36 Jacketay
- 37 Braces
- 38 Stirrups
- 39 Horses
- 40 Main topsail yard tye and halyard
- 41 Leathered rope parrel
- 42 Horses

- 43 Stirrups
- 44 Flemish horses
- 45 Reef tackle
- 46 Braces
- 47 Lifts
- 48 Main topgallant yard tye
- 49 Braces
- 50 Slings parrel
- 51 Lifts
- 52 Horses
- 53 Main royal yard tye
- 54 Braces
- 55 Main trysail gaff peak span and pendant
- 56 Throat sling
- 57 Vangs
- 58 Boom topping lifts
- 59 Spraker gaff's peak halyard
- 60 Throat halyard
- 61 Flag line
- 62 Boom sheets
- 63 Mizzen topsail yard tye

11/2



I Running Rigging

I1/3 Lower yard (no scale)

- 1 Chain sling
- 2 Double chain around the yard
- 3 Chain trusses
- 4 Truss pendant
- 5 Iron blocks
- 6 Truss tackle
- 7 Lifts
- 8 Topsail sheet
- 9 Brace block, dog end bitch connection
- 10 Yard tackle pendant
- 11 Outer tricing line
- 12 Jackstay
- 13 Quarter blocks
- 14 Clew-garnet and yard block
- 15 Burlines
- 16 Leech line
- 17 Horses
- 18 Stirrups
- 19 Quarter block span
- 20 Main braces
- 21 Chain truss bracket

I1/4 Sling and truss details (no scale)

- 1 Double sling chain around the yard
- 2 Shackle connecting 1
- 3 Smaller shackles to connect with slip-hook
- 4 Slip-hook
- 5 Swivel link
- 6 Short chain
- 7 Shackle to connect B to B
- 8 Chain around masthead
- 9 Truss chains around the yard
- 10 Small shackles to connect to the truss chain around the mast

- 11 Larger shackle to lead truss pendant via iron block at top
- 12 Mast bracket for truss chains
- 13 Truss chain
- 14 Rose lashing

I1/5 Temporary fitting jeers (no scale)

- 1 Long double stropped double mast block
- 2 Jeers
- 3 Double stropped single yard blocks

I1/6 Bunt of lower yard

[rear view]

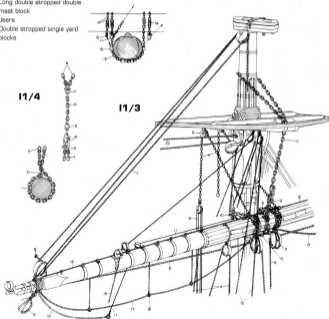
- 1 Single, double stropped jeer block
- 2 Single, double stropped quarter block
- 3 Clew-garnet block
- 4 Tricing line block
- 5 Double chain sling with shackle
- 6 Double chain truss
- 7 Quarter block span
- 8 Jackstay

I1/7 Jackstay lashing

- 10 Horses
- 11 Centre lashing of the horses
- 12 Stirrups (served over)

I1/7 Topsail yard (no scale)

- 1 Single eye blocks, stropped to the yard
- 2 Iron-bound single blocks, under treble trees
- 3 Tye, stropped around masthead
- 4 Lift



- 5 Reef tackle
- 6 Toppallant sail sheet
- 7 Quarter block
- 8 Clew line and yard block
- 9 Buntline block
- 10 Buntline
- 11 Brace block (Dog and bitch connection)
- 12 Jewel block
- 13 Horses

- 14 Stirrups
- 15 Flemish horses
- 16 Jackstay
- 17 Sister block

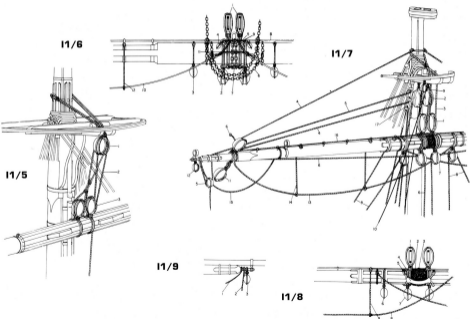
**11/8 Bunt of topsail
(rear view)**

- 1 Single eye block
- 2 Matbing
- 3 Jackstay lashing
- 4 Jackstay

- 5 Double strap parrel (leathered)
- 6 Clew line block
- 7 Quarter block
- 8 Horse
- 9 Stirrup

11/9 Yard arm

- 1 Horse
- 2 Reef tackle
- 3 Jewel block



I Running Rigging

I1/10 Toppallant and royal yard (no scale)

- 1 Toppallant tye
- 2 Lift
- 3 Royal sail sheets (toggled)
- 4 Double block for 3 and 9
- 5 Brace
- 6 Jewel block
- 7 Parrel
- 8 Horse
- 9 Claw line
- 10 Jackstay
- 11 Royal yard tye
- 12 Lift (not in use when royal sail was set flying)
- 13 Brace strap (toggled)
- 14 Jackstay

I1/11 Bunt of toppallant yard (rear view)

- 1 Tye
- 2 Jackstay
- 3 Jackstay lashing
- 4 Sling parrel
- 5 Double lead block
- 6 Horse

I1/12 Sling parrel (no scale)

I1/13 Trysail gaff

- 1 Peak span
- 2 Pendant
- 3 Throat sling
- 4 Wing pendant
- 5 Peak brails
- 6 Middle brails

I1/14 Spanker gaff and boom

- 1 Peak halyard
- 2 Throat halyard
- 3 Parrel
- 4 Peak brails
- 5 Middle brails
- 6 Double lead block for 4 and 5

- 7 Topsail sheet
- 8 Flag line
- 9 Topping lift
- 10 Spanker sheet
- 11 Boom sheet
- 12 Parrel

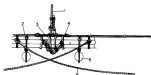
I1/15 Spanker topsail yard

- 1 Halyard

I1/16 Bowsprit

- 1 Spreader rope parrel
- 2 Lift
- 3 Jib-boom guy
- 4 Flying jib-boom guy
- 5 Crupper

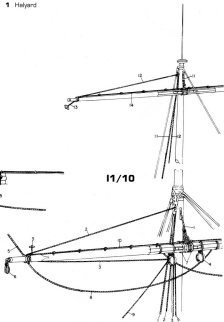
I1/11



I1/12

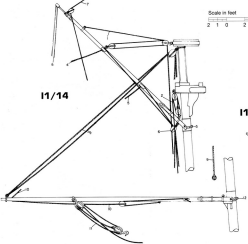


I1/10



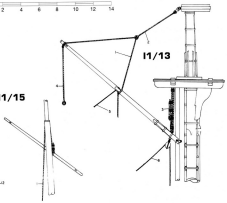
Scale in feet
2 1 0 2 4 6 8 10 12 14

11/14

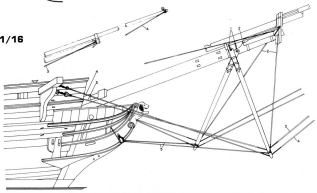


11/13

11/15



11/16



I Running Rigging

I2 RIGGING OF THE SQUARE SAILS

I2/1 Profile of 10-gun brig with normal square sail set

- 1 Fore course buntlines
- 2 Clew-gamets
- 3 Leach lines
- 4 Sheets
- 5 Tacks
- 6 Bowlines
- 7 Fore topsail sheets

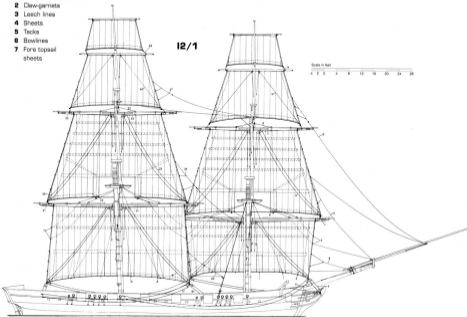
- 8 Buntlines
- 9 Clew lines
- 10 Bowlines
- 11 Fore topgallant sail sheets
- 12 Clew lines
- 13 Bowlines
- 14 Fore royal clews lashed

- 15 Main course buntlines
- 16 Clew-gamets
- 17 Sheets
- 18 Tacks
- 19 Leach lines
- 20 Bowlines
- 21 Main topsail sheets

- 22 Buntlines
- 23 Clew lines
- 24 Bowlines
- 25 Main topgallant sail sheets
- 26 Clew lines
- 27 Bowlines
- 28 Main royal sail clews lashed

I2/1

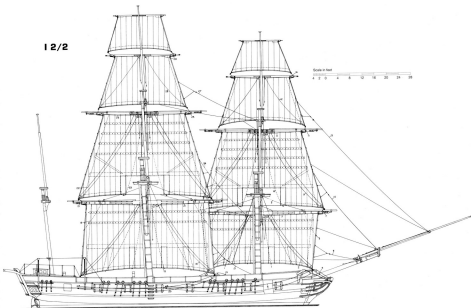
Scale in feet
0 2 4 6 8 10 12 14 16 18 20 22 24 26



12/2 Profile of survey ship

after 1831 refit

- | | | |
|--------------------------------|---------------------------------------|---------------------------------------|
| 1 Fore course buntlines | 9 Claw lines | 19 Tacks |
| 2 Clew-gamets | 10 Bowlines | 20 Sheets |
| 3 Leech lines | 11 Fore topgallant sail sheets | 21 Main topsail sheets |
| 4 Bowlines | 12 Clew lines | 22 Clew lines |
| 5 Tacks | 13 Bowlines | 23 Buntlines |
| 6 Sheets | 14 Fore royal sail sheets | 24 Bowlines |
| 7 Fore topsail sheets | 15 Main course buntlines | 25 Main topgallant sail sheets |
| 8 Buntlines | 16 Clew-gamets | 26 Clew lines |
| | 17 Bowlines | 27 Bowlines |
| | 18 Leech lines | 28 Main royal sail sheets |

12/2

I Running Rigging

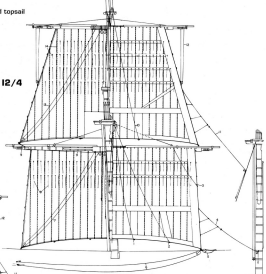
12/3 Fore course and topsail

- 1 Inner buntline
- 2 Outer buntline
- 3 Leech line
- 4 Bowline
- 5 Clew-garnet
- 6 Reef points
- 7 Sheets
- 8 Tacks
- 9 Topsail sheets
- 10 Buntlines
- 11 Bowlines
- 12 Reef tackle
- 13 Clew line
- 14 Reef points

12/4 Main course and topsail

- 1 Inner buntline
- 2 Outer buntline
- 3 Leech line
- 4 Bowline
- 5 Tacks
- 6 Sheets
- 7 Clew-garnet
- 8 Reef points
- 9 Topsail sheets
- 10 Buntlines
- 11 Bowlines
- 12 Reef tackle
- 13 Clew line
- 14 Reef points

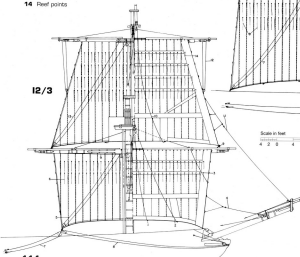
12/4



Scale in feet

4 2 0 4 8 12 16 20 24 28

12/3

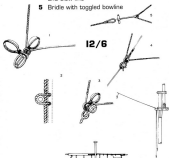


12/5 Topgallant sail and royal sail

- 1 Topgallant sail sheet
- 2 Fore topgallant sail bowline
- 3 Main topgallant sail bowline
- 4 Clew line
- 5 Royal sail sheet

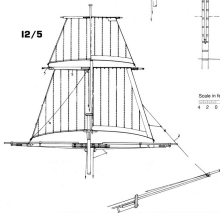
12/6 Sail details (no scale)

- 1 Course clew with seized in tack block, stropped on sheet block and clew-garnet block above
- 2 Boltrope cringle with thimble
- 3 Topseil clew with sheet and stropped clew line block
- 4 Toppallant sail clew with sheet and clew line
- 5 Bridle with toggled bowline

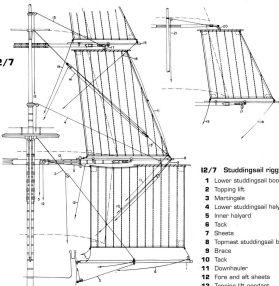


12/6

12/5



12/7



12/7 Studding sail rigging

- 1 Lower studding sail boom
- 2 Topping lift
- 3 Martingale
- 4 Lower studding sail halyard
- 5 Inner halyard
- 6 Tack
- 7 Sheets
- 8 Topmast studding sail boom
- 9 Brace
- 10 Tack
- 11 Downhauler
- 12 Fore and aft sheets
- 13 Topping lift pendant
- 14 Topping lift (burton tackle)
- 15 Topmast studding sail halyard
- 16 Topgallant studding sail boom
- 17 Jewel block
- 18 Tack
- 19 Sheet
- 20 Topgallant yard jewel block
- 21 Topgallant studding sail halyard

I Running Rigging

13 RIGGING OF THE FORE AND AFT SAILS

13/1 Profile of 10-gun brig with all fore and aft sails

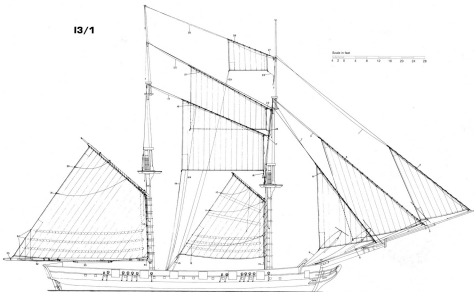
- 1 Flying jib halyard
- 2 Downhauler

- 3 Sheets
- 4 Jib halyard
- 5 Downhauler
- 6 Sheets
- 7 Fore topmast staysail halyard
- 8 Downhauler
- 9 Sheets
- 10 Trysail peak brails
- 11 Middle brails

- 12 Throat brails
- 13 Sheets
- 14 Tack
- 15 Middle staysail
- 16 Downhauler
- 17 Nock bindsel
- 18 Tack
- 19 Sheets
- 20 Main topgallant staysail halyard
- 21 Downhauler
- 22 Nock bindsel
- 23 Tack

- 24 Sheets
- 25 Royal staysail halyard
- 26 Downhauler
- 27 Nock bindsel
- 28 Tack
- 29 Sheets
- 30 Spenser peak brails
- 31 Middle brails
- 32 Reef pendants
- 33 Sheet
- 34 Tack
- 35 Gaff downhauler

13/1



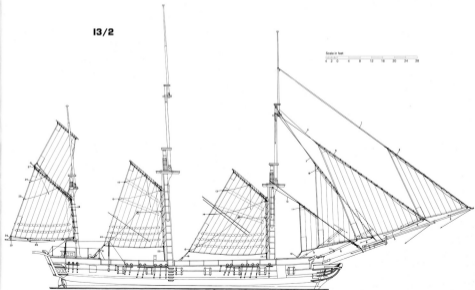
13/2 Profile of survey ship
after 1831 refit with all
fore and aft sails

- 1 Flying jib halyard
- 2 Downhauler
- 3 Sheets
- 4 Jib halyard
- 5 Downhauler
- 6 Sheets
- 7 Fore topmast staysail halyard
- 8 Downhauler
- 9 Sheets

- 10 Fore staysail halyard
- 11 Downhauler
- 12 Sheet
- 13 Fore trysail peak brails
- 14 Middle brails
- 15 Throat brails
- 16 Sheet
- 17 Tack
- 18 Main trysail peak brails
- 19 Middle brails
- 20 Throat brails
- 21 Sheet
- 22 Tack

- 23 Sparker clew lashing
- 24 Peak brails
- 25 Middle brails
- 26 Sheet
- 27 Sparker topsail sheet
- 28 Tacks

13/2



I Running Rigging

- 4 Nock lashed to hweert
- 5 Sheet
- 6 Fore topmast staysail sheet
- 7 Halyard over starboard masthead block
- 8 Downhauler
- 9 Nock lashed to stay
- 10 Jib halyard over portside masthead block
- 11 Downhauler

- 12 Nock lashed to stay
- 13 Sheets
- 14 Flying jib halyard
- 15 Downhauler
- 16 Lacing
- 17 Sheet
- 18 Nock lashed to flying jib-boom atop

I3/3 Headsail rigging

- 1 Fore staysail halyard
- 2 Hanks
- 3 Downhauler

I3/3

I3/4

I3/4 Trysail rigging

- 1 Peak bails
- 2 Middle bails
- 3 Throat bails
- 4 Sheet
- 5 Tack
- 6 Gaff lacing
- 7 Trysail mast lacing

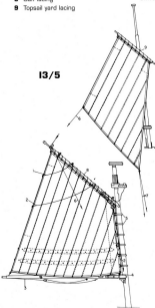
Scale in feet



13/5 Sparker and spanker topsail rigging

- 1 Peak brails
- 2 Middle brails
- 3 Sheet
- 4 Tack lashing
- 5 Hoops
- 6 Topsail sheet
- 7 Tacks
- 8 Gaff lacing
- 9 Topsail yard lacing

13/5



13/6 Various blocks (no scale)

- 1 A long tackle
- 2 Double stropped double block
- 3 Two single stropped single blocks, forming leg and fall block
- 4 Catblock
- 5 Sheet block, iron-bound and swivel (bumpkin block)

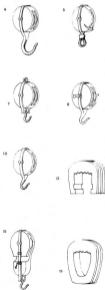
13/6



- 6 Single stropped single block
- 7 Swivel hooked and iron-bound double block
- 8 Double block with beley pin, iron-bound and hooked
- 9 Sisterblock
- 10 Single block, iron-bound and hooked
- 11 Stropped single block with short and long leg
- 12 Open heart



- 13 Stropped single block with hook and thimble
- 14 Snatch block with stropping hole
- 15 Snatch block with swivel hook, iron-bound
- 16 Stropped single block with long and short eyes
- 17 Stropped single block with tail
- 18 Dead eye
- 19 Closet heart



I Running Rigging

I4 BELAYING POSITIONS

I4/1 Plan

Bowsprit

- 1 Jib-boom guy
- 2 Flying jib-boom guy

Spreader

- 3 Lift
- 4 Crupper

Fore staysail

- 5 Halyard
- 6 Sheet (Luff tackle)
- 7 Downhauler

Fore topmast staysail

- 8 Halyard
- 9 Sheets
- 10 Downhauler

Jib

- 11 Halyard
- 12 Sheets
- 13 Downhauler

Flying jib

- 14 Halyard
- 15 Sheets
- 16 Downhauler

Fore course

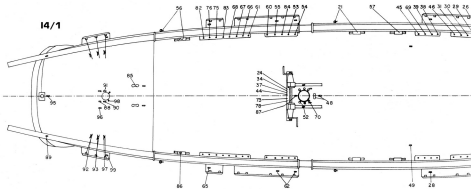
- 17 Clew-garnets
- 18 Buntlines
- 19 Leech-lines

Mast

- 20 Lifts
- 21 Sheets
- 22 Tacks
- 23 Bowlines
- 24 Braces
- 25 Inner tricing-line
- 26 Outer tricing-line
- 27 Mast tackle

Fore topsail

- 28 Tye
- 29 Lifts
- 30 Clew lines
- 31 Buntlines



Scale in feet



- 32 Bowlines
- 33 Sheets
- 34 Braces
- 35 Reef tackle, belayed at the top

Fore topgallant sail

- 36 Halyard
- 37 Braces
- 38 Lifts
- 39 Claw lines
- 40 Bowlines
- 41 Sheets

Fore royal sail

- 42 Halyard, belayed at the top
- 43 Sheets, belayed at the top
- 44 Braces

Fore try sail

- 45 Peak brails
- 46 Middle brails
- 47 Throat brails
- 48 Sheet
- 49 Vangs

Main course

- 50 Main stay

Main preventer stay

- 52 Claw-garnets
- 53 Buntlines
- 54 Leech-lines
- 55 Lifts
- 56 Sheets
- 57 Tacks
- 58 Bowlines
- 59 Braces
- 60 Inner tricing-line
- 61 Outer tricing-line
- 62 Mast tackle

Main topsail

- 63 Main topmast stay
- 64 Main topmast preventer stay
- 65 Tye
- 66 Lifts
- 67 Claw lines
- 68 Buntlines
- 69 Bowlines
- 70 Sheets
- 71 Braces
- 72 Reef tackle, belayed at the top

Main topgallant sail

- 73 Halyard
- 74 Braces
- 75 Lifts
- 76 Claw lines
- 77 Bowlines
- 78 Sheets

Main royal sail

- 79 Halyard, belayed at the top
- 80 Sheets, belayed at the top
- 81 Braces

Main try sail

- 82 Peak brails
- 83 Middle brails
- 84 Throat brails
- 85 Sheets
- 86 Vangs

Spanker

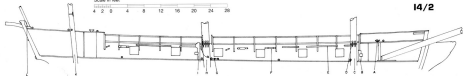
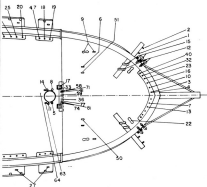
- 87 Mizzen stay
- 88 Boom topping lifts
- 89 Boom sheets
- 90 Gaff peak halyard
- 91 Gaff throat halyard
- 92 Peak brails
- 93 Middle brails
- 94 Sheet, belayed at the boom
- 95 Flag line

Gaff topsail

- 96 Halyard
- 97 Sheets
- 98 Tacks
- 99 Burton tackle

14/2 Profile

- A Eye bolt
- B Topsail sheet bits
- C Foremast
- D Spider-hoop
- E Pin rails
- F Kneel cleats
- G Belay cleats
- H Mainmast
- I Jeer bits
- K Mizzenmast
- L Ensign staff



14/2

J Sails

J1 SAIL PLAN OF SURVEY SHIP AFTER 1831 refit

- 1 Flying jib
- 2 Jib
- 3 Fore topmast staysail
- 4 Fore staysail
- 5 Fore course
- 6 Fore topsail
- 7 Fore topgallant sail
- 8 Fore royal sail
- 9 Fore lower studdingsail
- 10 Fore topsail studdingsail
- 11 Fore topgallant sail studdingsail
- 12 Fore trysail
- 13 Main course
- 14 Main topsail
- 15 Main topgallant sail
- 16 Main royal sail
- 17 Main lower studdingsail
- 18 Main topsail studdingsail
- 19 Main topgallant sail studdingsail

J2 HEADSAILS

- 1 Fore staysail
- 2 Fore topmast staysail
- 3 Jib
- 4 Flying jib
- 5 Bobrope, leech and foot 2 1/4in. head 1 1/4in diameter
- 6 Lining at portside
- 7 Clew
- 8 Peak

J3 SQUARE SAILS (no scale)

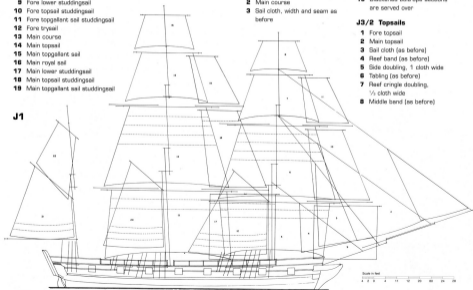
- 9 Tack
 - 10 Tabling, leech and foot 2in. head 3in
 - 11 Hank holes
 - 12 Sail cloth, 24in wide, flat seam 1-1 1/4in overlapping
 - 13 Blackened bobrope sections are served over
- J3/1 Courses**
- 1 Fore course
 - 2 Main course
 - 3 Sail cloth, width and seam as before

- 4 Reef band with reef point holes, 1/2 cloth wide
- 5 Tabling, dimensions as before
- 6 Middle band, 1/2 cloth wide
- 7 Side doubling, 1 cloth wide
- 8 Buntline lining, 1 cloth wide
- 9 Ribband holes
- 10 Head rope, 1 1/2in diameter
- 11 Leech and foot rope 4in diameter
- 12 Cringle
- 13 Claw rope
- 14 Neck earing
- 15 Foot lining 1/2 cloth wide
- 16 Blackened bobrope sections are served over

J3/2 Topsails

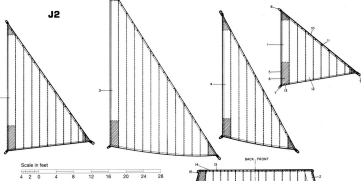
- 1 Fore topsail
- 2 Main topsail
- 3 Sail cloth (as before)
- 4 Reef band (as before)
- 5 Side doubling, 1 cloth wide
- 6 Tabling (as before)
- 7 Reef cringle doubling, 1/2 cloth wide
- 8 Middle band (as before)

J1

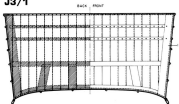


- 9 Foot lining, 1/2 cloth wide
- 10 Buntline cloths (as before)
- 11 Top lining (between buntline cloths)
- 12 Mast cloth, 1 cloth wide between middle band and second reef band
- 13 Roband holes
- 14 Boltrope, head 1 1/2 in diameter
- 15 Neck earings
- 16 Boltrope, leech and foot 3/4 in diameter
- 17 Cringles
- 18 Claw rope
- 19 Blackened boltrope sections are served over

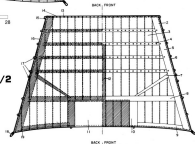
J2



J3/1



J3/2



BACK FRONT

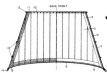
BACK FRONT

J Sails

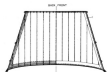
J3/3 Toppallant and royal sails

- 1 Fore toppallant sail
- 2 Main toppallant sail
- 3 Fore royal sail
- 4 Main royal sail
- 5 Sail cloth (as before)

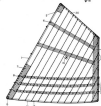
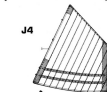
- 6 Side doubling, $\frac{1}{2}$ cloth wide
- 7 Tabling (as before)
- 8 Foot lining (as before)
- 9 Boltrope, foot and leech $1\frac{1}{2}$ in diameter
- 10 Roband holes
- 11 Boltrope, head $1\frac{1}{2}$ in diameter
- 12 Nock earrings
- 13 Cringles
- 14 Clew rope



J3/3



J4



- 1 Blackened boltrope sections are served over
- 16 Nock patch, 1 cloth wide

J3/4 Studdingsails

- 1 Lower main studdingsail
- 2 Lower fore studdingsail
- 3 Main topsail studdingsail
- 4 Fore topsail studdingsail
- 5 Fore toppallant sail studdingsail
- 6 Main toppallant sail studdingsail
- 7 Cringle
- 8 Reef band (as before)
- 9 Sail cloth (as before)
- 10 Tabling (as before)
- 11 Strengthening patches, $\frac{1}{4}$ - 1 cloth wide
- 12 Clew rope
- 13 Earrings
- 14 Roband holes
- 15 Headrope
- 16 Foot and leechrope
- 17 Blackened boltrope sections are served over



J3/4



Scale in feet
0 2 4 6 8 10 12 14 16 18 20 22 24 26

J4 TRYSAILS, SPANKER AND SPANKER TOPSAIL (all linings at portside, except for tabling)

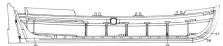
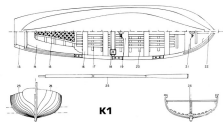
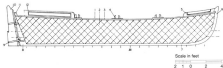
- 1 Fore trysail
- 2 Main trysail
- 3 Spenker
- 4 Spenker topsail
- 5 Peak lining
- 6 Strengthening bands
- 7 Clew lining
- 8 Reef band
- 9 Burt lining
- 10 Tack doubling
- 11 Boltrope
- 12 Tabling
- 13 Thimble, as sewn into clew, tack, peak and nock
- 14 Cringles
- 15 Holes for mast lacing
- 16 Patch at both sides with strapped in thimbles
- 17 Sets of two holes for mast hoop fastening
- 18 Boltrope tack loop
- 19 Earrings
- 20 Holes for gaff lacing

K Ship's Boats

K1 DOUBLE DIAGONAL-BUILT 26ft YAWL

- 1 Yawl
- 2 Double diagonal planking
- 3 Gunwale
- 4 Tholes
- 5 Washboard (bow)
- 6 Stem
- 7 Keel
- 8 Stempost
- 9 Pintles and gudgeons
- 10 Rudder
- 11 Stern
- 12 Washboard (quarters)
- 13 Coxswain's seat
- 14 Stern-sheer bench

- 15 Grating
- 16 Thwart
- 17 Spaced foot waling
- 18 Windlass
- 19 Mainmast thwart
- 20 Floor timber
- 21 Foremast thwart
- 22 Breast hook
- 23 Body lines towards stern
- 24 Body lines towards bow
- 25 Deck
- 26 Cross-section
- 27 Apron
- 28 Mast step
- 29 Thwart stanchion
- 30 Sternson

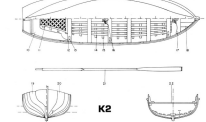
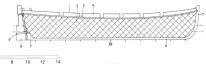


K2 DOUBLE DIAGONAL-BUILT 23ft CUTTER

- 1 Cutter
- 2 Double diagonal planking
- 3 Rowlock
- 4 Washstrake
- 5 Stern
- 6 Keel
- 7 Sternpost
- 8 Rudder
- 9 Pintles and gudgeon
- 10 Stern-sheer bench
- 11 Grating
- 12 Thwart
- 13 Thwart knee
- 14 Spaced foot waling
- 15 Floor timber
- 16 Mainmast
- 17 Foremast thwart

- 18 Decking
- 19 Body lines towards stern
- 20 Body lines towards bow
- 21 Car
- 22 Cross-section
- 23 Apron
- 24 Mast step
- 25 Sternson

K3 YAWL OR CUTTER WITH A TWO-MASTED SPRIT RIG



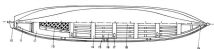
K Ship's Boats

K4 STOWAGE OF YAWL AND CUTTER ON DECK (no scale)

- 1 Cutter
- 2 Yawl
- 3 Boat stand (standard and chock)
- 4 Boat gripes
- 5 Fender
- 6 Keel
- 7 Sternpost
- 8 Rudder
- 9 Pintles and gudgeon
- 10 Stern
- 11 Tiller
- 12 Horizontal stern knee
- 13 Stern-sheet bench
- 14 Grating
- 15 Thwart
- 16 Spaced foot waling
- 17 Floor timber and futtock
- 18 Mast bracket
- 19 Thwart knee
- 20 Breast hook
- 21 Body lines towards stern
- 22 Body lines towards bow
- 23 Car
- 24 Cross-section
- 25 Apron
- 26 Mast step
- 27 Sternson

K5 CLINKER-BUILT 25ft GIG

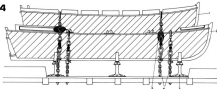
- 1 Gig
- 2 Washboards
- 3 Rowlock
- 4 Clinker planking
- 5 Stern
- 6 Keel
- 7 Sternpost
- 8 Rudder
- 9 Pintles and gudgeons
- 10 Tiller yoke
- 11 Coxswain's seat
- 12 Stern-sheet bench
- 13 Grating
- 14 Thwart
- 15 Floor timber and futtock
- 16 Spaced foot waling
- 17 Thwart knee
- 18 Keelson
- 19 Breast hook
- 20 Body lines towards stern
- 21 Body lines towards bow
- 22 Car
- 23 Cross-section
- 24 Apron
- 25 Sternson



K5

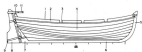


K4

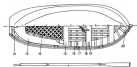


K7 CLINKER-BUILT 25ft AND 28ft WHALEBOATS

- 1 25ft whaleboat
- 2 28ft whaleboat
- 3 Thole
- 4 Clinker planking
- 5 Stern
- 6 Keel
- 7 Sternpost
- 8 Rudder
- 9 Pintles and gudgeons
- 10 Tiller
- 11 Decking
- 12 Foot waling



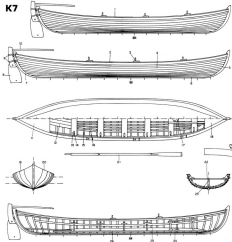
K6



- 13 Thwart
- 14 Thwart knee
- 15 Floor timber and futtock
- 16 Spaced foot waling
- 17 Tabernacle fitting for mast
- 18 Decking
- 19 Body lines aft
- 20 Body lines forward
- 21 Or
- 22 Cross-section
- 23 Thwart stanchion
- 24 Mast step
- 25 Riling
- 26 Keelson

**K8 STOWAGE OF 20ft
WHALEBOATS**

- 1 Whaleboat
- 2 Boat gripes
- 3 Resting blocks on poop deck



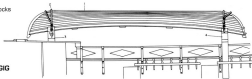
- 4 Boats skid and locating blocks athwart ship
- K9 LUG-RIGGED
WHALEBOAT**
- K10 STOWAGE OF 25ft
WHALEBOAT AND GIG**

- 1 Whaleboat
- 2 Quarter davit
- 3 Boat tackle
- 4 Davit guys and head
- 5 Boat gripes, pointed over

K11 STOWAGE OF DINGHY

- 1 Dinghy
- 2 Triparted gripes, pointed over
- 3 Horn davit
- 4 Boat tackle

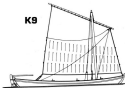
K12 LUG-RIGGED DINGHY



K8

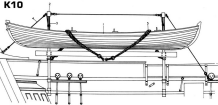
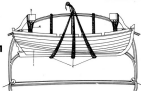
K9

K12



K11

K10



Scale in feet



ORIGINAL DRAUGHTS

No 3971, Box 56 – dated 18th Nov 1807, of a 10-gun brig, designated *Rolla* and approved by the Admiralty No 3974A, Box 56 – dated 23th Feb 1808, designated *Cadmus* and *Charivari*
 No 3974C, Box 56 – dated 16th April 1823, designated *Cadmus* Class
 No 3861, Box 55 – dated July 1817, designated *Brisk*

CONTEMPORARY ARTWORK

Augustus Earle: 'Crossing the Line'
Conrad Martens: *Beagle and Adventure at Port Desire*, 'The Beagle in Murray Narrow, *Beagle Channel*', 'MS *Beagle* laid

ashore', 'Bivouac at Port Desire', 'MS *Beagle* in Sydney Harbour'
Owen Stanley: 'MS *Beagle* off Fort Macconnie', 'Sounding wind'
Henry I Campbell: 'MS *Beagle*, Sydney'
John Lort Stokes: 'Poop cabin layout', 'The *Beagle* in Murray Pass, Kent Group, Bass Strait'
Graham Gore: 'Coasting from the Anchorage', 'South branch of the Albert River', 'Hope Reach, Albert River', 'Killing an Alligator, Victoria River'
Philip Gidley King: 'Longitudinal sketch of MS *Beagle* 1832', 'Upper deck sketch', 'Lower deck sketch', 'MS *Beagle*'s quarter deck', 'Poop cabin'
Unsigned: 'MS *Beagle* rounding the Cape of Good Hope', 'A critical situation, MS *Beagle* – East Coast of Patagonia, S. America'

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