A NEW BRITISH RESEARCH SHIP

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The rapid advance of oceanography in the past decade, with the consequent increase in electronic and general instrumentation has led to a demand for laboratory space which cannot now be satisfied on board the Institute's present ship, the Royal Research Ship *Discovery II*. Built as a research vessel in 1929, it is a tribute to her original designers that she is still capable of doing useful work but, in addition to the lack of space, the cost of maintenance of a ship of this age is naturally becoming increasingly expensive and cannot any longer be justified. Her replacement thus became necessary and the contract for the new vessel was placed in mid-1961 with Hall, Russell and Company Limited of Aberdeen, for delivery in October 1962. She is being built to meet both Lloyd's highest requirements (including stiffening for navigation in ice, Class II) and Ministry of Transport present and pending regulations for foreign-going ships. The principal dimensions are :

Length (overall)	260 feet
Breadth (moulded)	46 feet
Depth (moulded)	18 feet (to upper deck)
Draft (mean)	15 feet 4 inches
Displacement (approx.)	3 000 tons

Main propulsion is diesel-electric with bridge or engine room control, driving a single screw, and has been designed by Associated Electrical Industries. The electrical installation comprises a double-unit propulsion motor developing 2 000 shaft h.p., a bow propulsion unit and the motors of the two main winches. The armatures of these machines are connected in a series loop and are fed by the generators with a constant current, so that speed is controlled by variation of the motor field. The three main generators (610 kw, 504 volts D.C. each) are coupled in tandem with three auxiliary generators (200 kw, 220 volts D.C. each) and are powered by three Ruston 6 ATCZ diesel engines. Additional auxiliary power, also at 220 volts D.C., is available from two separate generators (400 kw each), powered by Ruston 6 VEBX diesel engines. Single-phase, frequency-controlled, 50-cycle alternating current at 230 volts is supplied for laboratory and scientific purposes generally by two 50 kw motor alternators. The designed full speed is 14 knots with a cruising speed, on two engines, of 10 knots, and sufficient fuel can be carried for a range of 15 000 miles at economic speed.

Many special features have been incorporated in the design and construction of the new vessel. The use of aluminium for all structure

above the fo'c'sle deck, for instance, saves top weight; the provision of a transverse thrust bow propeller (powered by a motor of 350 h.p.) will materially assist manœuvrability when the ship is hove-to on station, and the open well, or trunk on the centre line, through which instruments can be lowered directly into the sea from a laboratory is a decided advantage when using experimental apparatus. An underwater, horizontally trainable periscope, which can be withdrawn through sluice valves, is fitted in the forehold, some 32 feet from the fore perpendicular. Self-supporting *goal-post* masts, without rigging, will be a great advantage in handling awkward or bulky overside scientific equipment. Derricks forward and aft are replaced by diesel-hydraulic cranes usable at sea and, to further the safe handling of instruments, all overhanging decks are supported by cantilever beams in place of side stanchions.

Winches for scientific purposes include three small steam-driven oceanographical winches for lowering water-bottles, plankton nets and special aparatus. Of these the water-bottle winch (forward) will accommodate 10 000 metres of 4 mm diameter steel wire cord, and the plankton net winch (aft) 5 000 metres of 6 mm diameter steel wire cord. The single-barrelled electrically-driven coring winch, situated on the fo'c'sle deck, forward of the bridge, carries 10 000 metres of tapered steel wire rope (16 mm diameter inboard to 13 mm outboard) and the three-barrelled electrically-driven trawl winch (aft, on the shelter deck) carries one length (10 000 metres) of tapered warp (14-12 mm diameter) for deep plankton nets and dredging, and two lengths, each of 2 250 metres, of 16 mm diameter steel wire rope for mid-water trawling. Special equipment, recording in the laboratories, and on the bridge, has been designed for measuring the strain on the wire ropes used for coring, dredging and trawling.

Space, other than on the open deck, or in the holds, allocated for scientific and ancillary needs is, approximately, 3 500 square feet, and is distributed as follows : —

Boat deck : library and reading room, scientific plotting office (in which most navigational instruments repeat and where watch will be kept to record continuous scientific observations);

Fo'c'sle deck : rough hydro laboratory, biological, chemical, electronic and bacteriological laboratories, office and, at the after end, space for carrying a portable or *package* laboratory which can be connected to all ship's services;

Shelter deck : workshop net room and rough (or *wet*) biological laboratory;

Upper deck : low temperature laboratory (including a *deep freeze* compartment), A/S and underwater equipment room (centred on the open trunk or well through the ship), photographic laboratory and darkroom, gravimeter room, battery store, and after electronic instrument space in the tween deck;

Lower deck : scientific instrument and low power room.

Major items of navigational equipment include a Sperry Mark XX gyro compass with necessary repeaters, Tiller Pilots in the bridge wings,

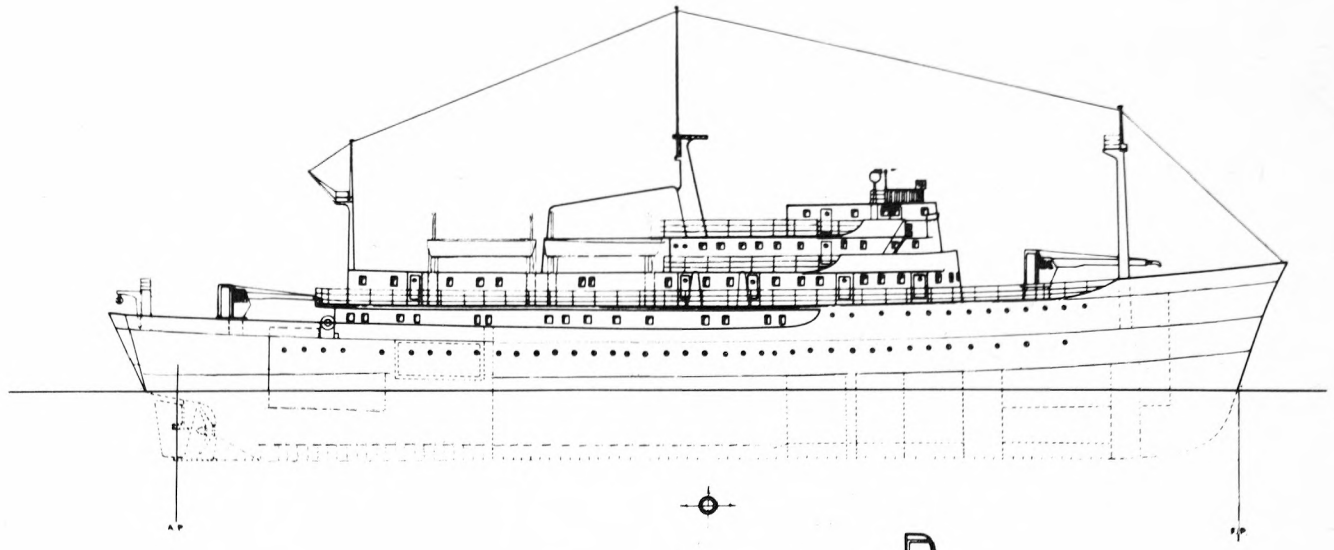
SHIP No. 899.

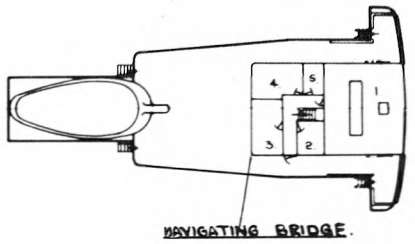
GENERAL ARRANGEMENT PLAN

DIMENSIONS :- 235'-0" L.B.P. . 46'-0" B.M. . 18'-0" D.M.

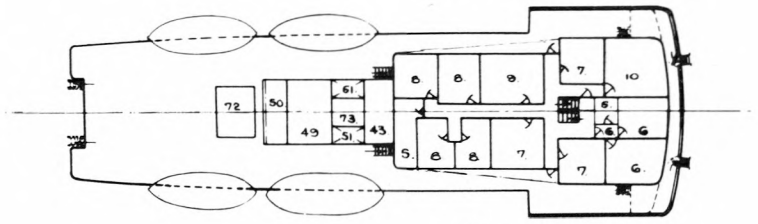
SCALE :- 1/16 . ONE FOOT DRAWING No. D/2

HALL, RUSSELL & Co. LTD. - ABERDEEN

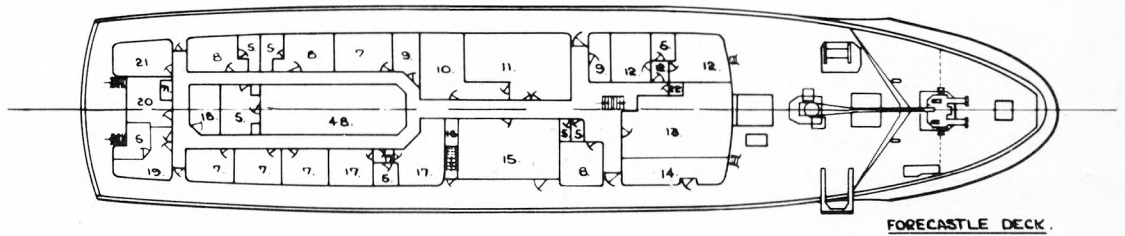




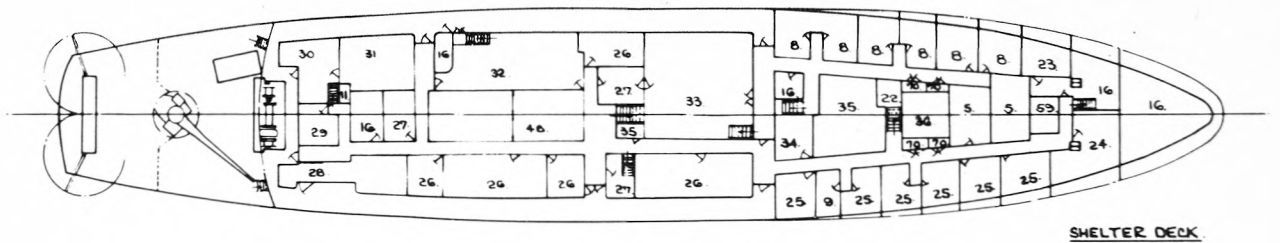
NAVIGATING BRIDGE.



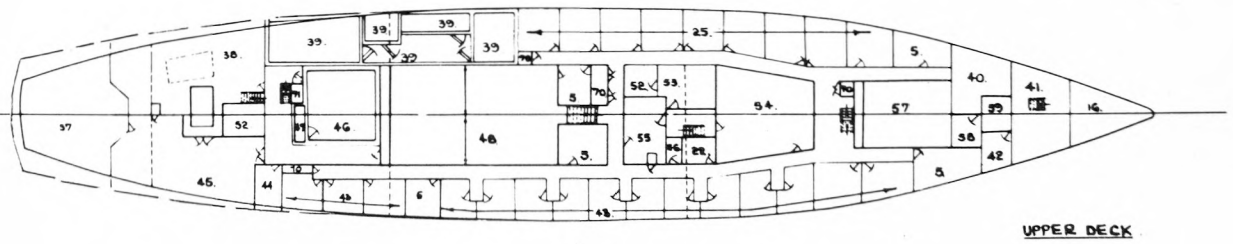
BOAT DECK.



FORECASTLE DECK.



SHELTER DECK



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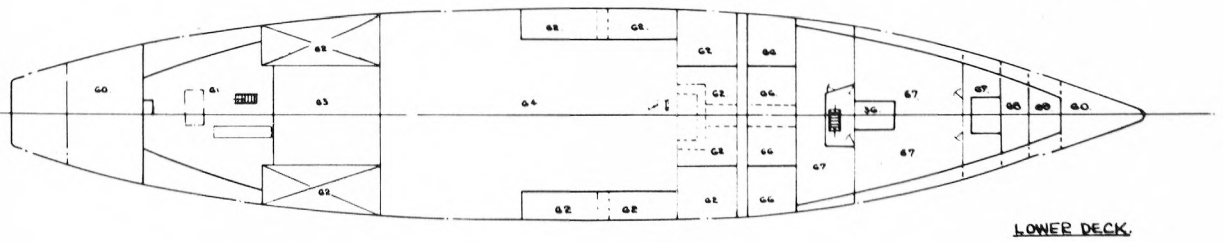
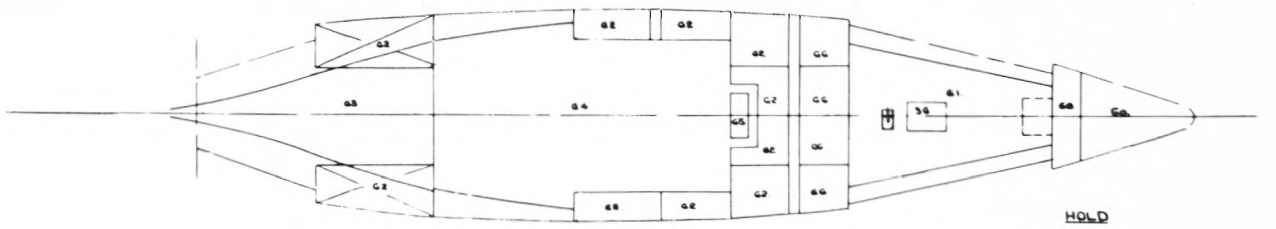


LOWER DECK.



HOLD

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Kelvin and Hughes 14/12 True Motion radar, Kelvin and Hughes Type 26B echo sounder, Decca Navigator and Plotter, Radio Direction Finder, VHF Port Radio, Bergen-Nautik Log, and Anemometer. In addition to the ordinary chronometer outfit, a master, battery-driven electric chronometer (by Mercer) is being fitted in the chartroom. This controls all electrically driven ship's clocks, the frequency of the alternating current supply and provides a pulse circuit for connections to scientific instruments which require precision time control.

Radio communication equipment comprises the Marconi Company's *Globespan* combined W/T and R/T transmitter, *Reliance* emergency transmitter, *Atalanta* main receiver and Automatic Keying Device, together with a *Fulmar-Guardian* Radio Telephone for short-range ship to ship communication, *Argonaut* Port Radio, and Automatic Alarm.

Officers and crew number 43 and the normal complement of scientists is 14. Extra bunks can, however, be fitted to bring this number up to 20.

After delivery of the ship it is expected that some three months will be spent on proving trials in the North Atlantic, when all equipment will be fully tested under working conditions. Vibration trials, in cooperation with the British Shipbuilding Research Association, will also be carried out in this period, and will include a comparison between the use of a four-bladed or a five-bladed propeller.