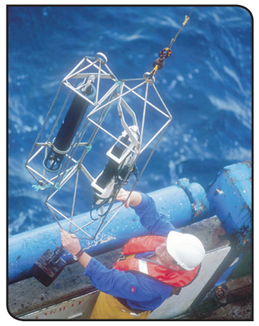
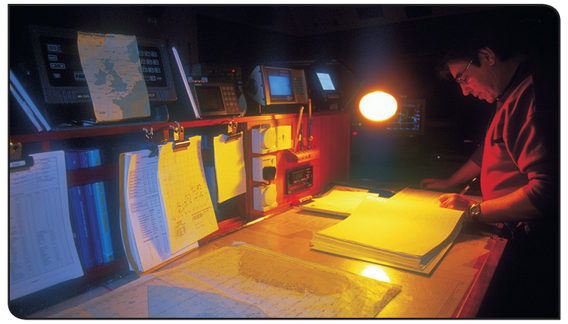




Low noise

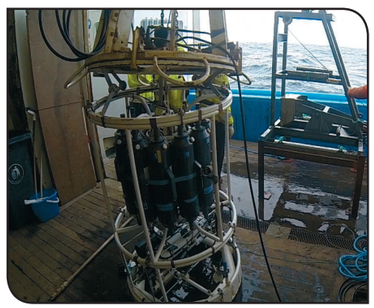
An important task for *Scotia* is the operation of acoustic surveys of pelagic fish stocks. For this, a low level of underwater noise propagation is essential, and particular attention has been paid to soundproofing the machinery and propulsion system to enable a very low level of underwater noise propagation. The hull is fitted with a drop keel to carry acoustic transducers some three metres below the ship's keel to minimise acoustic signal interference in bad weather. The drop keel can be retracted when required so that the transducers can be serviced without dry-docking.

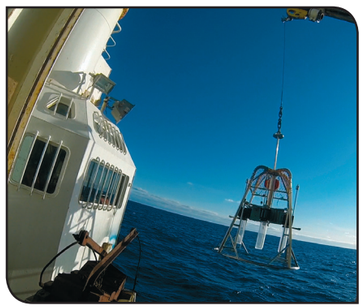
Flexible operation

The hull is designed to give good sea-keeping characteristics, even when trawling in bad weather. The diesel-electric propulsion system with three diesel-driven generators supplying power to two in-line electric motors is quiet and allows great flexibility and economy of operation. The ship can cruise on a single diesel generator, but would require the use of all three generators while towing a large pelagic trawl. Station keeping is maintained by a combination of the single screw main power drive, the rudder, an omni-directional bow thruster, and tunnel stern thruster, steered by a dynamic position-fixing system referenced through satellites.

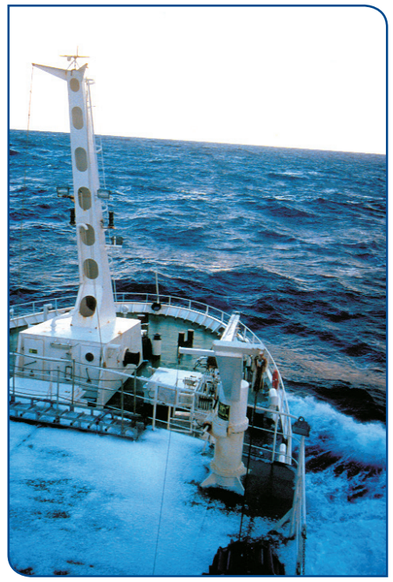
The tasks

Scotia is used to monitor and evaluate fish stocks by means of trawling, acoustic surveys, and specialised sampling. The ship is also equipped to carry out state-of-the-art oceanographic sampling in all weather conditions, and plays an important role in monitoring the seas around Scotland.





MRV *SCOTIA*



Introduction

MRV *Scotia* was built by Ferguson Shipbuilders Ltd at Port Glasgow for the then Scottish Office and completed early in 1998. Operating from her home port in Aberdeen, *Scotia* is used for fish stock assessment and environmental monitoring in the North Sea and north Atlantic waters. She carries a crew of 18 and can accommodate up to 12 scientists.

Fisheries data and other information gathered on research cruises are essential to the success of Marine Scotland Science's (MSS) scientific programme, which underpins advice given to Government. To ensure the availability of this information, MSS operates two research vessels – *Scotia* and *Alba na Mara*. Both vessels are fitted with a wide range of deployment and recovery facilities for fishing gear and equipment, scientific and environmental sensors and data gathering systems.

Much of MSS' experimental work is conducted at sea using very specialised or custom-built monitoring, measuring and observation equipment. For the design, development and maintenance of such equipment, MSS is dependent on the electronic and mechanical skills and expertise of its Engineering Services department.

Handling scientific equipment

A range of on-board cranes and winches enable the safe deployment of specialised equipment. The main winches are tension controlled to deal with surging loads, and the cranes are fitted with 'heads' that clamp equipment to their tips. A gamma frame enables equipment to be lifted from the aft deck and moved outboard from the vessel, without impeding the simultaneous use of the fishing crane.

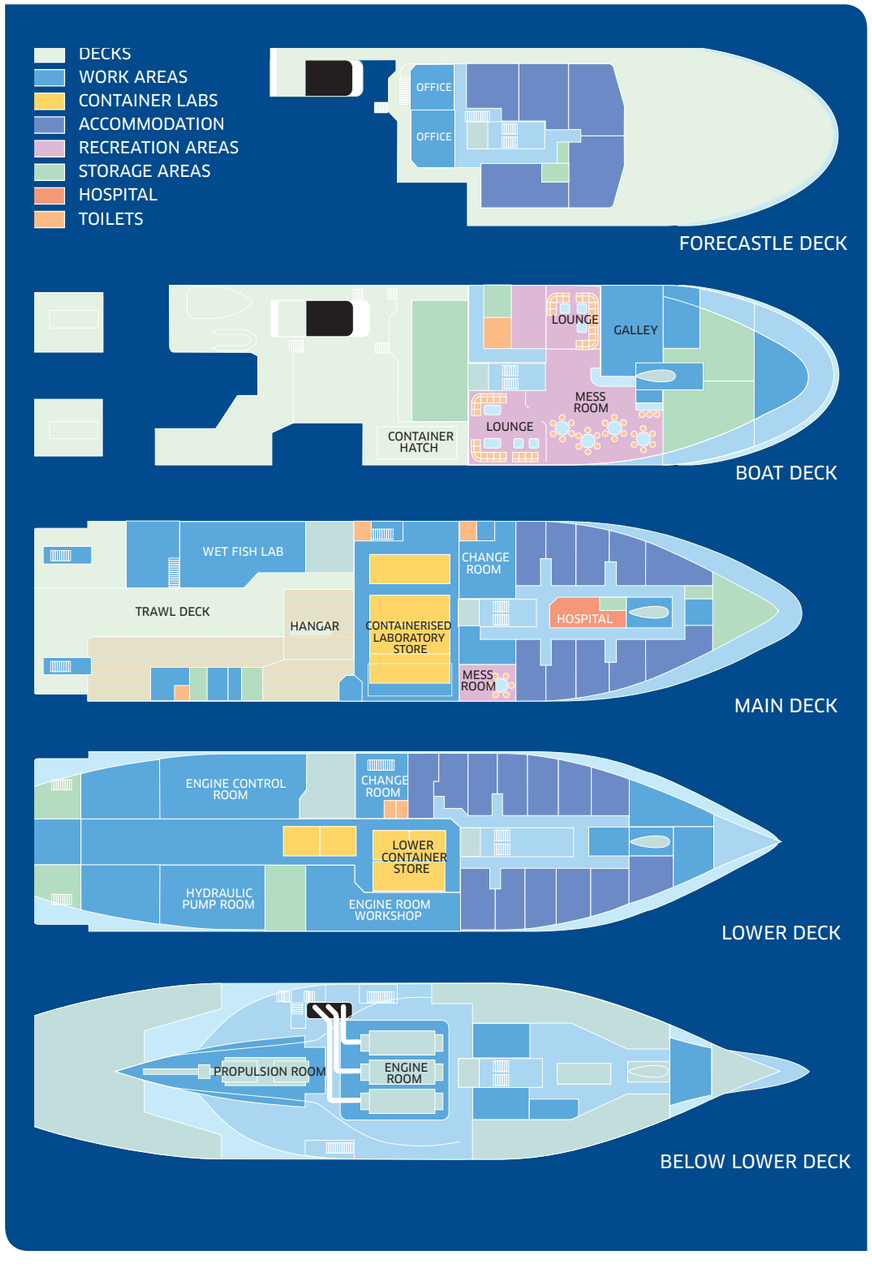
marinescotland

Trawling

Scotia is fitted with a stern ramp for trawling, with the main trawl winches fitted below deck. The trawl-deck is visible from the bridge, and from a control cabin. A fully instrumented autotrawl system and a net sensor system enables the dimensions of the net and the position of the trawl behind the ship to be monitored.

Modular laboratories

The specially equipped laboratories are containerised and can be loaded within the body of the ship, or taken away for servicing or operation on land. They can be fitted out for particular tasks (acoustic surveys, hydrography, plankton surveys, or pollution monitoring) in advance of a cruise.



Shipyard:	Ferguson Shipbuilders Ltd of Port Glasgow
Designer:	Skipsteknisk A/S, of Ålesund, Norway
Classification:	Lloyds+ 100A1 Ice Class 1D +LMC +UMS +SCM "Fishery Research Vessel"
Length OA:	68.60 metres
Length BP:	60.60 metres
Breadth mld:	15.00 metres
Draught:	5.60 metres
Service speed:	13 knots
Quiet running speed:	10-11 knots
Max towing speed:	5.5 knots (30 tonne pull)
Main engines:	3 Wärtsilä Type 9L20 DE Marine diesel engines
Generators:	3 Ansaldo Type GSCR630X8
Propulsion motors:	2 Ansaldo Type DH900DC
Auxiliaries:	1 Cummings harbour alternator (240 KW) 1 Cummings emergency alternator (88 KW)
Power supply:	A 230 volt 'clean' electrical supply is provided by two Hitzinger Motor Generators
Bow thruster:	Elliot 'White Gill' Bow thruster (720 KW)
Stern thruster:	Brunvoll electric tunnel thruster (380 KW)
Navigational:	2 Kelvin Hughes Manta KH2026 radars 1 Sercel NR 58 DGPS satellite receiver 1 Koden DGPS Type NAV KGP 913D 1 Garmin GPS 152 1 Kelvin Hughes AIS GPS 1 Robertson Autopilot 2 Gyro compass SG Brown Meridian 1 Lilley and Giles Sestreline Class A magnetic compass 1 Furuno CI -35 Current / Speed log 1 Skipper Navigation sounder GDS 101 1 Plotter Sodena Turbo 1 Plotter ECDIS system Hatteland MMC ETX 1 Olex plotter 1 Sailor communication equipment fully compliant to GMDSS area TYCO fire alarm system
Accommodation:	18 crew, 12 scientists

Cranes:	1 Aukra Type KDE60, articulated telescopic cod-end handling crane 1 Aukra 5T hydrographic equipment crane 1 Aukra 10T hydraulic plankton crane 1 Aukra 10T hydraulic crane to load containerised 1 Odim hydraulic Gamma frame (6.5T) laboratories
Winches:	2 Brattvaag Type D2M300 main trawl winches, housed below the main trawl deck. Maximum 1 Scantrol auto trawl system for automatic control and monitoring of main trawl winches 2 Brattvaag Type DMM 14185 Gilso winches, mid pull of 13T, wire capacity of 200 m 2 Brattvaag Type Net 2M4185 split net-drums with removable dividing flange. 1 Brattvaag Type Net M2202 net storage drum located in the net repair area 8 Brattvaag low pressure hydraulic winches are provided for hydrographic and specialised purposes
Acoustic Equipment:	Simrad EK60 scientific echo sounder: Split beam 18 kHz, 38kHz, 120kHz, 200kHz transducers Simrad EA 500 oceanographic sounder: 18kHz Reson 7125 multi-beam swathe echo sounder: 200 and 400 kHz Applanix Wavemaster Vertical reference unit. Fugro Seastar 6200HP Differential receiver. Valeport Sound Velocity Profiler. Valeport Sound Velocity Probe. Valeport draught gauge RDI broad band ADCP: 150 kHz Simrad SH80 short range sonar: 115-122kHz (tunable) Simrad SR 240 long range sonar: 24kHz Simrad SM2000P multi-beam profiling sonar: 200kHz Simrad ES 60 fishing echo sounder: 50/200kH Simrad ITI trawl instrumentation system Scanbas trawl instrumentation system Roxann acoustic ground discrimination system Simrad echo sounding synchronisation system