THE SURVEYING AND RESEARCH SHIP "GAUSS" OF THE GERMAN HYDROGRAPHIC INSTITUTE

by Adolf SIEBER

The fresh water tanker *Trave* (now *Gauss*) was built by the shipyard of D.W. Krämer Sohn, Elmshorn in 1944 for the ex Deutsche Kriegsmarine and, in the autumn of 1949, was converted into a surveying and research ship by the Howaldtswerke A.G., Hamburg.

On completion in December 1949 she was commissioned as the *Gauss*. In choosing this name, the German Hydrographic Institute aimed at doing honour to the Göttingen mathematician and physicist Carl Friedrich Gauss (1777-1853) and re-establishing the relation with the first German Antarctic Expedition (1901-1903) in the polar ship *Gauss* under the direction of Erich v. Drygalski, and with the work of the second *Gauss* (ex *Bacchus*), which served as research ship for the Deutsche Seewarte from 1939-1945.

The main dimensions of the *Gauss* are as follows :

Length overall .....approx..	56.60 m.
Length between perpendiculars	53.00 m.
Moulded breadth	8.80 m.
Moulded depth up to main deck	4.70 m.
Moulded depth up to superstructure deck.....	6.90 m.
Designed draught	3.95 m.
Speed	12 knots.
Tonnage	767 GRT

The ship is propelled by a single-acting 9 cylinder two-stroke motor, system Sulzer, type 9 TS with an output of 1000 HP.

Since the two 30 KW-Diesel units mounted in the main engine room were not able to meet the high current consumption of the laboratories and the testing installations, the water tank abaft the main engine room was converted into an auxiliary engine room. Here, a 135 KW and an 8 KW Diesel unit were installed. The two lateral water tanks now serve as a fuel oil bunker for the purpose of extending the radius of operation.

All auxiliary engines, such as the anchor capstan, cargo winches, boat winches and steering gear are operated electrically. The ship has a hot water heating system worked from a coke boiler ; the galley has oil firing.

An Anschütz gyro compass unit, the master compass of which is installed in the auxiliary engine room, operates sixteen repeater compasses. These are used for various purposes, as e. g. a steering compass on the navigation bridge, azimuth compasses, and compasses in the laboratories ; some of them can, at will, be connected to the ship's gyro compass system or to the trial gyro compass unit, as necessary.

A goniometric wireless direction finder with Telefunken bearing receiver with a range of frequency of 222 to 527 kHz is installed in the chart room (2b)

The following instruments are fitted in the chart room (2) for the performance of navigational and surveying operations :

1 50 m. Atlas echo sounder (2a) with recording apparatus and repeater indicator, 30 kHz,

1 125-1000 m. Atlas echo sounder, 30 kHz,

1 125-1000 Elac echo sounder, 30 kHz,

1 Atlas echo sounding recorder,

1 speed recorder working by means of a hydrodynamic pressure jet, and
1 distance recorder.

For communication with the coastal wireless stations, the wireless room (7) is furnished with the following equipment :

1 200 Watt Debeg long wave transmitter, range of frequency : 316-512 kHz,

1 Lorenz long wave transmitter, range of frequency : 75-1500 kHz,

1 Telefunken all wave receiver, range of frequency : 15-20 000 kHz.

To enable the ship to perform her manifold duties in the fields of surveying, nautical engineering and the various sections of oceanography, she is provided with a spacious plotting room (6) and seven laboratories for the various fields of research.

In the magnetic compass laboratory (4) on the bridge deck, all new designs in the fields of magnetic compasses and magnetic tele-compasses are tested as to their serviceability on board ship. To enable this to be done, non-magnetic steel has, in part, been used in the construction of this laboratory and the magnetic conditions in it are even better than they are in the position of the steering compass on the navigation bridge and only a trifle less favourable than they are in the centre of the compass platform. A binnacle installed at the centre line for housing experimental compasses is equipped with adjusting coils as are the binnacles of the ship's compasses. These coils are connected to the constant and course-regulated parts of the ship's magnetic mine protection gear and bring about the automatic compensation of all influence exercised on the trial compass by the mine protection gear.

On the superstructure deck, underneath the navigation bridge, a recording room (5) is provided equipped with a large number of electric connections permitting the reading and registration within the room of the indications of the oceanographic measuring instruments in operation, viz. the direction and velocity of the currents at varying depths, observations of temperature and turbidity, etc. From this room, the attendance of the measuring instruments can be supervised and regulated by loudspeakers. Switch boards are installed for the supply of different voltages and systems of current so that, in co-operation with the physics laboratory (14), it is possible to execute all types of oceanographic work.

On the main deck, the geology (16), physics (14), chemistry (15), and echo sounding laboratories (17) are installed, all of which are equipped with switch boards for the supply of different voltages and systems of current.

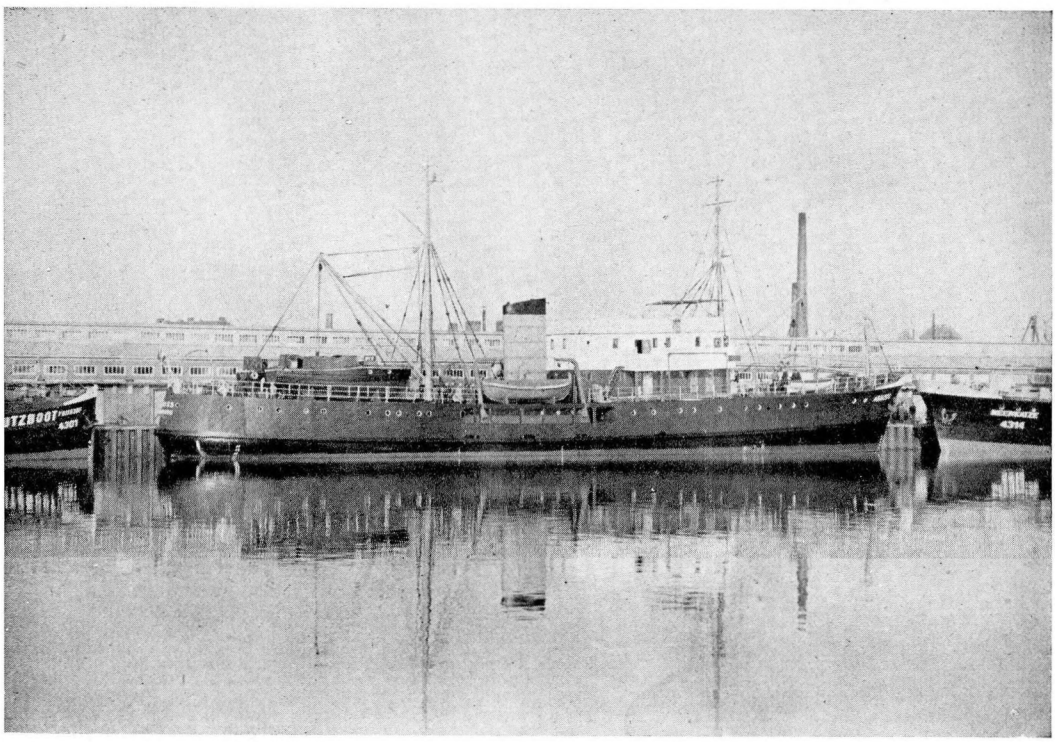
The geology laboratory (16) is equipped with two spacious work benches and with receptacles for the storage of cores and sounding tubes.

In the chemistry laboratory (15) there are two work benches for chemists and laboratory assistants for chemical and physical investigations, basins and fresh and sea water taps, as well as cabinets for storing material and instruments.

The physics laboratory (14) has a big work table.

The echo sounding laboratory (17) has a 3 kHz ELAC echo sounder for taking soundings of more that 1000m. Next to the echo sounding laboratory, a sounding shaft (40) leads down to the ship's bottom enabling the lowering of experimental echo sounding instruments.

On the lower deck, the laboratory for gyro-compasses (41) and the laboratory for speed recorders (42) are installed.



M. S. GAUSS, Surveying and Research Ship of the German Hydrographie Institute.

The gyro compass laboratory (41) is equipped with a trial gyro compass system with delta contrivance which operates independently of the ship's gyroscopic system. There are facilities for installing further experimental gyro compass systems. A switch board for various voltage connections, a receiver of a speed recorder and a repeater compass which may be connected at choice either to the ship's gyroscopic system or to the trial system, as well as large work benches, complete the equipment.

A repeater compass of the ship's gyro compass system, a speed recorder receiver, a distance recorder and a switch board with connections at choice are installed in the speed recorder laboratory (42).

On the port side of the superstructure deck there is a large LUKAS sounding coil with electric drive, while on the starboard side a small winch for serial measurements as well as a winch for current measurements are installed.

Each side of the ship is provided with a folding frame (10) (11) for the lowering of oceanographic measuring instruments, particularly current-meters.

On the forecastle is a hatch leading to a hold for the storage of heavy gear and instruments, as e.g. deep-sea gauges and current-meters, and next to the hold there is a dark room (18). In the bows, forward of the hatch, there is a stump mast and cargo derrick for lowering and hoisting in oceanographical instruments. A workshop (19) is likewise installed on the forecastle.

The ship's crew numbers 42. The master and ship's officers are specialists in surveying and the men are trained for the surveying service. The composition of the crew permits the ship to work simultaneously with three groups when surveying the coasts. For this purpose, the ship is equipped, in addition to the life boats, with two powerful motor boats which are stowed on the afterpart of the superstructure deck and can be hoisted out by derrick.

In addition to accommodations for the crew (27-38). there are cabins for 10 scientists (8) (20-24) and 4 technicians (25-26). When the ship is engaged on surveying the crew will use these cabins (20-26). On research voyages, part of the crew will be disembarked and the cabins will thus be available for the scientists.

M. S. GAUSS

Surveying and Research Ship of the German Hydrographic Institute

---

Bridge Deck :

1 Wheelhouse.
2 Chartroom
   a) Echo sounder ;
   b) Goniometer.
3 Captain.
4 Magnetic compass laboratory.

Superstructure Deck :

5 Recording room.
6 Plotting room.
7 Wireless room.
8 Navigator.
9 Winch for oceanographic instruments.

10, 11 } Projecting frames for current meters.
12 Sounding lead winch.

Main Deck :

13 Thermometer room.
14 Physics laboratory.
15 Chemistry laboratory.
16 Geology laboratory.
17 Sounding laboratory.
18 Dark room.
19 Workshop.
20-24 Cabins for 9 scientists.
25-26 Cabins for 4 technicians.
20-26 (Available for use of crew during surveying expeditions).
27-30 Ship's officers and engineers' cabins.
31-38 Crew's quarters.

Hold (see sheer plan) *:*

39 Officers' mess.
40 Sounding shaft.
41 (Starboard side), 42 (Port side) } Compass and speed recording laboratories.
43 Echo sounder compartment.

Main Dimensions :

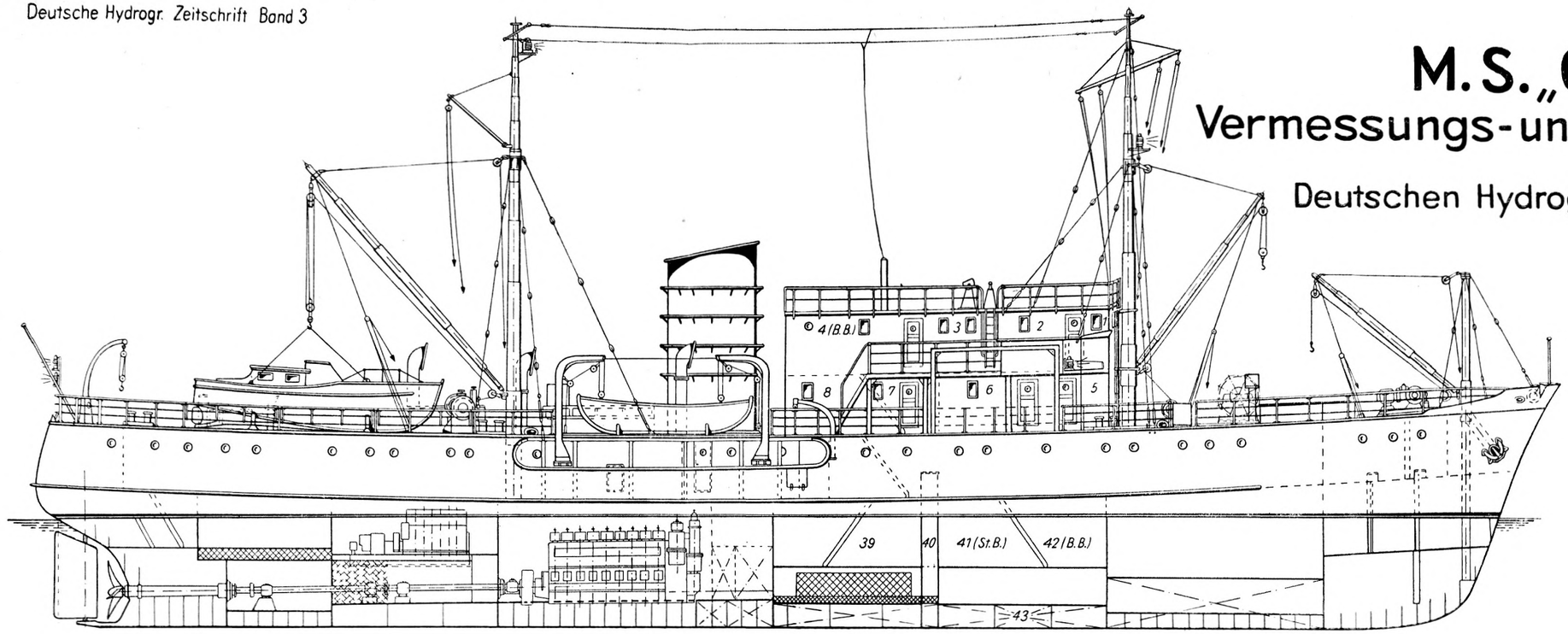
Overall length : ..... approx.....	56.60 m.
Length between perpendiculars :	53.00 m.
Moulded breadth :	8.80 m.
Moulded depth up to main deck :	4.70 m.
Moulded depth up to superstructure deck :	6.90 m.
Designed draught :	3.95 m.
Speed :	12 knots.

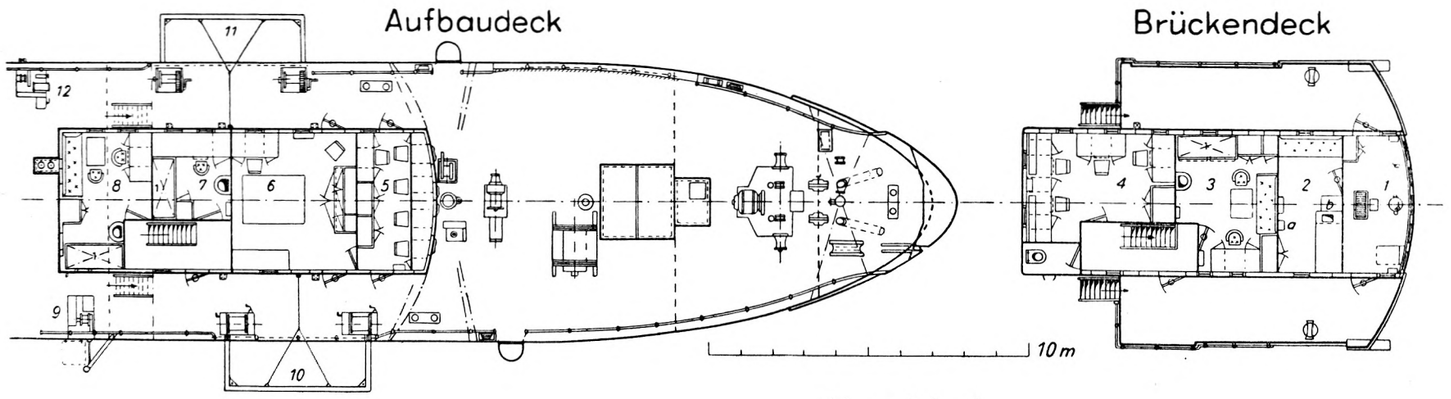
M.S. „Gauss"

Vermessungs- und Forschungsschiff

des

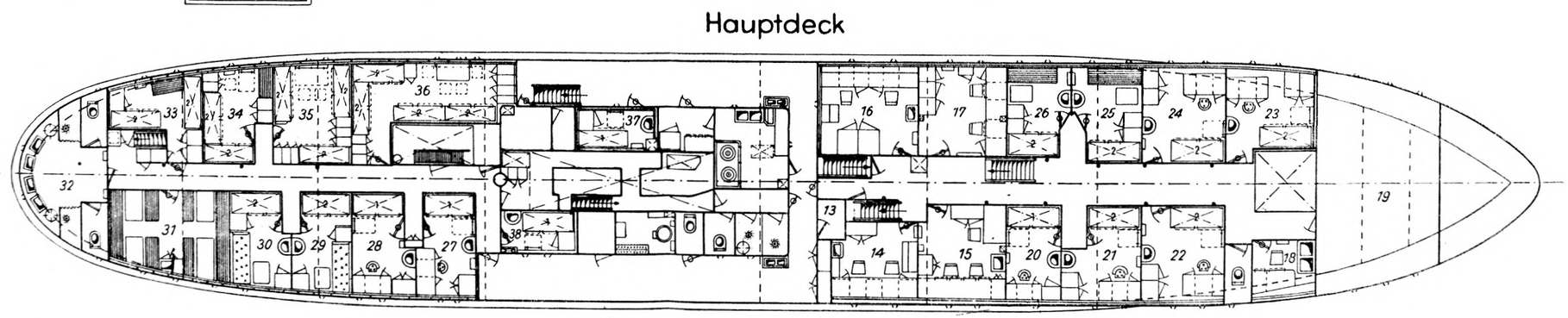
Deutschen Hydrographischen Jnstituts





Hauptabmessungen:

Länge über Alles:	ca. 56.60 m
Länge zw. den Loten:	53.00 m
Breite auf Spanten:	8.80 m
Seitenhöhe bis Hauptdeck:	4.70 m
Seitenhöhe bis Aufbaudeck:	6.90 m
Konstruktionstiefgang:	3.95 m
Geschwindigkeit:	12 Kn.



Brückendeck:

1 Steuerhaus
2 Kartenzimmer
a Echolot
b Goniometer
3 Kapitän
4 Magnetkompaß-Labor

Aufbaudeck:

5 Registrierraum
6 Zeichenraum
7 Funkraum
8 Fahrtleiter
9 Ozeanographische Winde
10 Auslegerahmen
11 für Strommesser
12 Lotwinde

Hauptdeck:

13 Thermometerraum
14 Physik-Labor
15 Chemie-Labor
16 Geologie-Labor
17 Lot-Labor
18 Dunkelkammer
19 Werkstatt
20 - 24 Kammern für 9 Wissenschaftler
25 - 26 Kammern für 4 Techniker
(20 - 26 Jm Vermessungsdienst von Mitgliedern d. Besatzung belegt)
27 - 30 Kammern für Offiziere u. Jng.
31 - 38 Räume für Mannschaften

Raum (im Aufriß):

39 Offiziermesse
40 Lotschacht
41 (St.B.) } Kreisel- und
42 (B.B.) } Fahrtmeß-Labor
43 Echolotzelle