



National Oceanographic Library – Archive

GLORIA (Geological Long Range Inclined ASDIC) Project

Archive location	Archive A - PROJECT COLLECTIONS
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The first sidescan-sonar system was developed in 1960 by the Institute of Oceanographic Sciences (IOS), now part of the National Oceanography Centre, Southampton, for use in shallow water. In 1969 IOS introduced GLORIA, the first sidescan-sonar system capable of deep-water geologic surveying. It won the Queen’s Award for Technological Achievement in 1986.

The Mk I GLORIA System was used from 1970 to 1975, the Mk II from 1975 to 1997 (Mk2 systems were sold to the users and Marconi Underwater Systems Ltd). The GLORIA Project was led by Mike Somers. “Sidescan” refers to the shape of the sonar beam, which fans out to the sides and scans a wide “swath” of the seafloor.

GLORIA Mk II was specifically designed to map the large-scale morphology and texture of seafloor features in the deep ocean, and was hired to, and used by the United States Geological Survey to map the entire US Economic Exclusion Zone 1984-1991, carried out from the RV Farnella.

GLORIA was designed to map seabed structures using sound signals transmitted from a towed vehicle. The trials of the first GLORIA vehicle (10m long, 2m diameter) were carried out in 1969 from RRS Discovery (the only ship capable of operating the vehicle) and full operation started later that year. GLORIA soon started to reveal new seabed structures. The cumbersome vehicle was replaced with a more capable Mk 2 version in 1977 that could be fitted to almost any suitable ship, had longer range and could be towed faster. It could map around 10,000km² per day. These capabilities led to the 1984 to 1989 survey of the US Exclusive Economic Zone carried out from the RV Farnella. (see the [Introductory page](#)).

GLORIA design, construction and operation were a major undertakings but GLORIA images had a major impact on our understanding of deep ocean structures. Eventually GLORIA capabilities were overtaken by commercial towed sidescan developments and operations ceased in 1997.

Item	Box
A4 folder with instructions and photographs for terminating Mk II GLORIA tow cable 1975-1977	1
Photocopy of GLORIA Brochure in plastic sleeve.	1

The following are engineering logs and notebooks (handwritten) from GLORIA Cruises. Principle authors – Mike Somers, Jack Revie, Derek Bishop, Jon Campbell, Malcolm Harris and Andy Harris. 1970-1997. These often cover a number of cruises or specific trials. Other miscellaneous material is included at the end of the sequence. (Boxes 13 to 17, and Items held in Plan Chest Cabinet, Drawer 2)

Engineering log and notebooks listed under cruise ship.

Item	Box
<i>RRS Discovery (1962)</i>	
RRS Discovery 35, July-August 1970, Geological investigations with GLORIA, side-scan and air guns,	2
RRS Discovery 42, September 1971. GLORIA Fish detection in sea off the Hebrides, data work (Cruise Long range detecting herring by GLORIA)	2

RRS Discovery 43, October/November 1971, GLORIA Log.	2
RRS Discovery 84, June/July 1977	2
RRS Discovery 85, GLORIA Tape Log ("Colossus"), August 1977	2
RRS Discovery 90, January/March 1978	2
RRS Discovery 91, March 1978	3
RRS Discovery 101, April-May 1979	3
RRS Discovery 103, July 1979	3
RRS Discovery 104, July/August 1979	3
RRS Discovery 110, April/June 1980	3
RRS Discovery 111, June/July 1980	3
RRS Discovery 123, August/September 1981	3
RRS Discovery 142, November/December 1983	3
RRS Discovery 144, January/February 1984	3
RRS Discovery 161, August/September 1986	4
RRS Discovery 188, January/February 1990	4
RRS Discovery 1996, GLORIA Log, Atlantic Irish Regional Survey (AIRS'96) (GLORIA Survey of the Irish Continental Shelf)	4
RRS Charles Darwin	
RRS Charles Darwin 20/23, January/February 1987	4
RRS Charles Darwin 35/36, October-November 1988	4
RRS Charles Darwin 36/37, January-April 1989, Portakabin log, 1988-1989	4
RRS Charles Darwin 37 & 40, 1989	4
RRS Charles Darwin 37 GLORIA technical log plus other technical matters	4
RRS Charles Darwin 37, Index to GLORIA tapes (Print out in a BAS folder)	4
RRS Charles Darwin 64, January 1992, with printout of Log	5
RRS Charles Darwin 109B, October-November 1997	5
RV (MV) Farnella	
RV (MV) Farnella 1/1981 & 2/1981, 1981	5
RV (MV) Farnella 3/1981 & 4/1981, 1981	5
RV (MV) Farnella 5/1982 & 6/1982, 1982	5
RV (MV) Farnella 7/1982, 1982	5
RV (MV) Farnella USGS Legs 1 & 2, 1984	5
RV (MV) Farnella USGS Legs 3 & 4, (USGS & British Telecom) 1984	6
RV (MV) Farnella USGS Leg 1, 1985	6
RV (MV) Farnella USGS Legs 1 & 2, (GLORIA and others), 1985	6

RV (MV) Farnella USGS Legs 3 & 4, 1985	6
RV (MV) Farnella USGS Alaska Legs 1-4, 1986	6
RV (MV) Farnella USGS Alaska Leg 4 (continued) and Hawaii, 1986	6
RV (MV) Farnella USGS 'Carolinas' East Coast USA Survey, 1987	7
RV (MV) Farnella USGS Alaska Legs 1-3, 1987	7
RV (MV) Farnella USGS Hawaii, F3 to F6-88-HW; Aleutian Arc F7-88-AA, 1988 (2 cruise notes in one book)	7
RV (MV) Farnella USGS Aleutian Arc, F8-88-AA; Western Gulf of Alaska F9-88-WG; Hawaii F10-88-HW, 1988 (3 cruise notes in one book)	7
RV (MV) Farnella USGS F6-89-FG; F7-89-EG, 1989	7
RV (MV) Farnella USGS Hawaii F12-89-HW; F13-89-HW; F1-90-HW, 1989-90 (3 cruise notes in one book)	7
RV (MV) Farnella USGS Hawaii, F1-90-HW, 1990	8
RV (MV) Farnella USGS Hawaii, F2-90-HW, 1990	8
RV (MV) Farnella USGS Hawaii F10-91-HW, 1991	8
RV (MV) Farnella USGS Central Pacific F12-90-CP; F13-90-CP 1990; F1-91-CP; F2-91-CP; F3-91-CP 1991 (5 cruise notes in one book)	8
RV (MV) Farnella USGS Central Pacific F5-91-CP, 1991	8
Miscellaneous cruise vessels	
RRS James Clark Ross, Arctic survey July-September 1994	9
RV Jean Charcot, Walvis II, GLORIA Log, January-February 1979	9
RV Livonia, Geomar Cruise, East Greenland Continental Margin, August-September 1992	9
RV Maurice Ewing, GLORIA Log, EW91-04, 1991	9
RV Melville GLORIA Log, 05, Leg 1	9
RV Melville GLORIA Log, 06, Leg 2	9
MV Siren, GLORIA Log, Legs 1 & 2, Atlantic Irish Regional Survey (AIRS'96) (GLORIA Survey of the Irish Continental Shelf)	9
MV Soriot, Le Mission 'GLORIA', April 1983	10
DESV Starella GLORIA Sidescan and seismic data collected by the DESV Starella along the Continental Slope and Upper Continental Rise of the Eastern United States in 1979	10
Miscellaneous items, notebooks and data	
GLORIA Mk II, Towing trials, June 1977	10
GLORIA Mk II, Portakabin log, November 1983-April 1985	10
GLORIA Technical data, notebook, 1974-1980	10
GLORIA Mk III, Container log, August 1986-January 1992	10
GLORIA Jack Revie's book of notes	10
GLORIA Portakabin log/notes, 1985	11

GLORIA Mk II, Portakabin log, June 1991-November 1997	11
GLORIA Survey log, June/July 1971 (Arthur Stride notes), Trials in Southampton Dock.	11
GLORIA Record of defects on Cruises – RV (MV) Farnella, USGS Leg 1 April/May 1984; Leg 4 July 1984; USGS GOM, Leg 1, August 1985	11
OTHER MISCELLANEOUS ITEMS/ DATA	
GLORIA Folder collection of press cuttings, reports, photographs, and technical data relating to GLORIA (including two photographs, 1) of the GLORIA Team trials on RRS Discovery, 91, March 1978, Brian Barrow, Chris Flewellan, Bob Kidd & Jack Revie identified, and 2) faded photograph of GLORIA before launch, RRS Discovery 104, 1979) (transferred from NOL Library stock LD 1189 & BRITISH LPs June 2 & 22, 1986)	12
GLORIA – Envelope Press Cuttings, 1995-1966.	12
<p>Folder – marked ‘GLORIA Marketing’</p> <ol style="list-style-type: none"> 1. GLORIA, MV <i>Farnella</i> Tapes of interview of the US Secretary of the Interior, William Clark, aboard MV <i>Farnella</i>, Hull, 17 August Ca. 1984. Letter from Carroll Reid, to Dr Rees (IOS). Humberside radio interview about MV <i>Farnella</i> and GLORIA Survey, Ca.1984 2. Press cuttings, Surrey Advertiser, 28 December 1984 –agreement between Institute of Oceanographic Sciences, Deacon Laboratory and US Geological Survey GLORIA Scan US EEZ. 3. Press Briefing 16 October 1985, photographs of Deployment of GLORIA with press briefings, and Press briefing for presentation of Queen’s Award for Technological Achievement, 9 June 1986. 4. In USGS folder – copy of GLORIA Mosaic – Continental Margin of Morocco, NW Africa, - copy of Paper by K.Hinzel et al: the continental margin of Morocco, and folded map of region. 	12
GLORIA – 3 X A3 folders/cases containing circuit drawings and diagrams for the MkII GLORIA system. Includes drawings for 3.5kHz sub-bottom profiler system. This was often used at the same time as GLORIA was operational. These were produced by Derek Bishop – the drawings were produced by pen plotter. (in tied bundle)	‘box’ 13
<p>Queen’s Award for Technological Achievement awarded for the development of GLORIA</p> <ul style="list-style-type: none"> - Guidance Manual for Queen’s Award for Export and Technology - Folder containing Visitor’s Book for ceremony at the Institute of Oceanographic Sciences, 9 June 1986, and Open Day display October 1987. - Bronze Medal in presentation box and miniature “desk” flag with stand - Queen’s Award Certificate signed by HM Queen Elizabeth II ‘Elizabeth R’, and Prime Minister Margaret Thatcher 	14
<p>Queen’s Award for Technological Achievement awarded for the development of GLORIA</p> <ul style="list-style-type: none"> - Queen’s Award for Technological Achievement Flag, awarded to the GLORIA Team (Led by Mike Somers) - Folder of Correspondence – invitations to ceremony 9 June 1986 – press cuttings – letters - notes 	16
<p>Queen’s Award for Technological Achievement awarded for the development of GLORIA</p> <ul style="list-style-type: none"> - Donation from Dr A.I. Rees (Institute of Oceanographic Sciences, Deacon Laboratory) March 2007 <p>Presentation retirement glass cup in box, with engraving of “GLORIA” and “Queens Award for Technological Achievement” Logo. In presentation box labelled, <i>To Tony Rees, with best wishes from the Director and staff March 1989, Institute of Oceanographic Sciences, Deacon Laboratory</i></p>	16
GLORIA – Spectral analysis of GLORIA mosaic using laser techniques developed at Imperial College, London. Correspondence, notes, photographs and diagrams. 1975	17

<p>GLORIA - Rough drafts of figures for, RB Whitmarsh and AS Laughton, 1976, Paper in Deep-Sea Research, 23 1005-1023, 1976, with copy of paper. Some figures show early ideas of how mid-ocean rifting worked. Sketches, traces, notes, photographs</p>	17
<p>GLORIA – Natural Environment Research Council. Agreement. Charter of vessel for USGS (US Geological Survey) 1986/91. Agreement between J Marr & Son Ltd, Hull, United Kingdom, owners of Vessel MV <i>Farnella</i>, and NERC.(For charter to the Institute of Oceanographic Sciences, Deacon Laboratory).</p> <p>With folder:</p> <p>GLORIA - Details of Agreement between J Marr & Son Ltd, and NERC in folder marked MTS (Marine Transport System)</p>	17
<p>Royal Navy/ GLORIA Arctic Ocean Expedition – Draft proposal, 20 July 1992. A Plan to place Britain centre-stage in Climate Research and Arctic Exploration. By QJ Huggett, Institute of Oceanographic Sciences Deacon Laboratory & P Wadhams, Scott Polar Research Institute, University of Cambridge. 23pp.</p>	17
<p>GLORIA – Spectral analysis of GLORIA mosaic using laser techniques developed at Imperial College, London. Correspondence, notes, photographs and diagrams. 1975</p>	Archive A Plan Chest Cabinet 2
<p>GLORIA - Rough drafts of figures for, RB Whitmarsh and AS Laughton, 1976, Paper in Deep-Sea Research, 23, 1005-1023, 1976, with copy of paper. Some figures show early ideas of how mid-ocean rifting worked. Sketches, traces, notes, photographs.</p>	Archive A Drawer Cabinet 2