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09 JUN 1980

(BIDSTON)

I.O.S.

M. V. CRISCILLA

CHARTER CRUISE 1978

30 NOVEMBER - 16 DECEMBER 1978

Geophysical Studies off the Faeroes Shelf

CRUISE REPORT NO. 73

1979

NATURAL ENVIRONMENT
INSTITUTE OF
OCEANOGRAPHIC
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M. V. CRISCILLA
CHARTER CRUISE 1978

30 NOVEMBER - 16 DECEMBER 1978

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Institute of Oceanographic Sciences,
Brook Road,
Wormley, Godalming, Surrey GU8 5UB
U. K.

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DATES

| | | |
|---------------------------|--------------------|-----------|
| Sailed Montrose, Angus | 30th November 1978 | (Day 334) |
| Arrived Torshavn, Faeroes | 9th December 1978 | (Day 343) |
| Sailed Torshavn | 10th December 1978 | (Day 344) |
| Arrived Montrose | 16th December 1978 | (Day 350) |

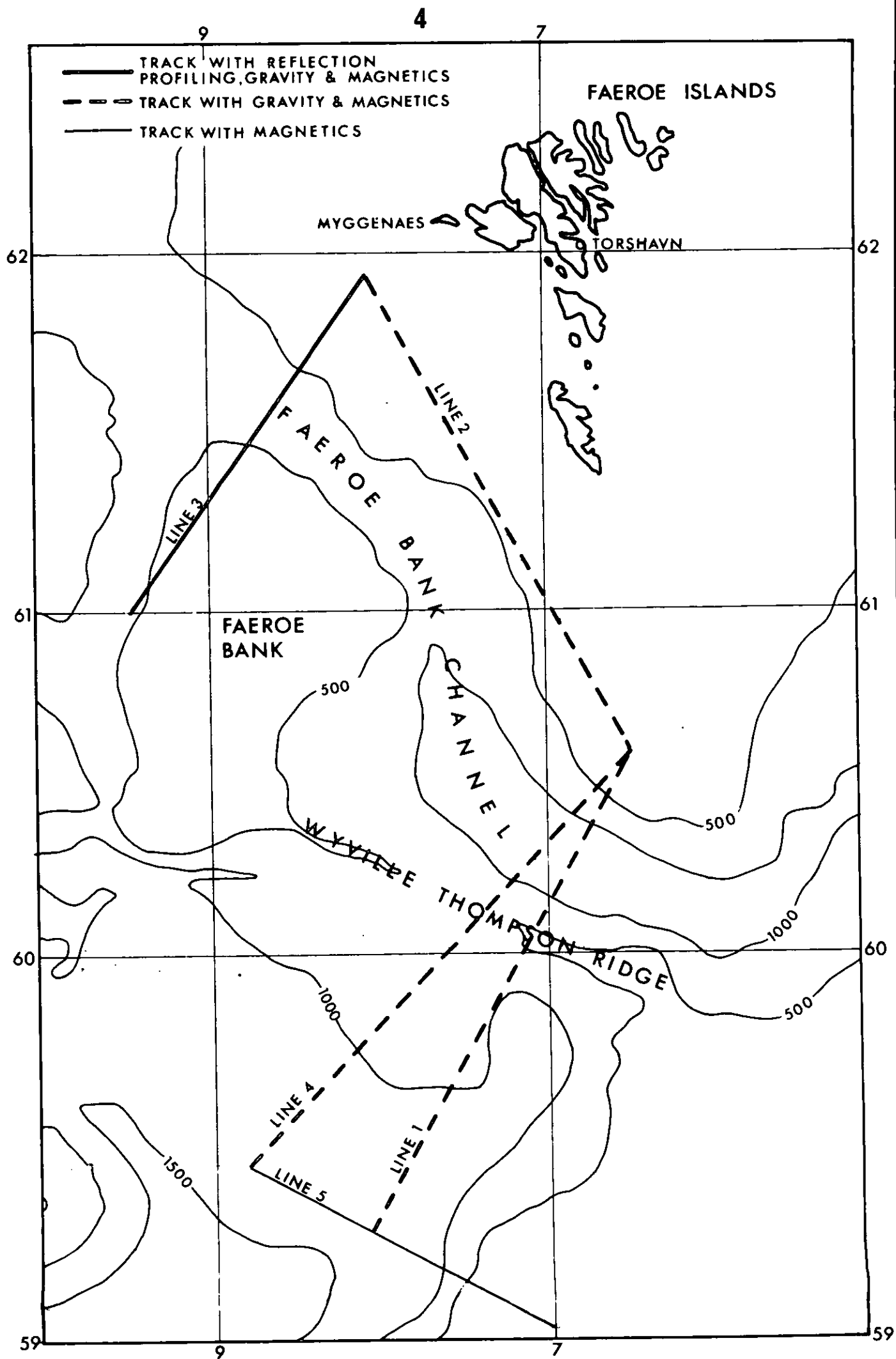
SCIENTIFIC PERSONNEL

| | | |
|----------------|---------------------|-------------|
| P. R. Miles | Principal Scientist | IOS (W) |
| D. G. Masson | | IOS (W) |
| C. L. Jacobs | | IOS (W) |
| A. R. Prigmore | | IOS (W) |
| P. R. Armitage | Engineer | IOS (B) |
| R. S. Robinson | Instrumentation | IOS (B) |
| D. Bingham | Party Chief | Sonarmarine |

In addition there were four Sonarmarine Surveyors/Engineers.

ACKNOWLEDGEMENT

I thank the Master of M. V. 'Criscilla', Mr. E. Thundercliffe, and his crew for their co-operation and assistance during the cruise in difficult conditions.



CRUISE INTENTIONS

The principal objective of the cruise was to acquire a series of multichannel seismic, gravity and magnetic profiles between the Iceland-Faeroes Ridge and the north western margin of the Rockall Plateau. These profiles were designed to cross the continent-ocean boundary or transition and provide a basis for subsequent studies of the conjugate East Greenland margin. In the northern part of the area, several of the profiles were located to traverse the series of channels marking the paths of outflow water from the Faeroe Bank channel. A secondary objective was to obtain geophysical profiles across the Wyville-Thompson Ridge and to deploy disposable sonobuoys for seismic velocity analysis over suitable geological structure.

EQUIPMENT

The M. V. Criscilla was chartered for the survey from SONARMARINE and owing to existing commitments of IOS and RVS, the major equipment used during the cruise was a hybrid of RVS and Sonarmarine geophysical hardware.

(a) Supplied by Sonarmarine:

- (i) Satellite navigation
- (ii) LORAN-C
- (iii) 24 channel digital seismic data acquisition system
- (iv) 50KJ sparker (optional)
- (v) PDR system

(b) Supplied by RVS:

- (i) Askania marine gravimeter
- (ii) Barringer magnetometer with two fish
- (iii) SAT6H compressor plus airguns
- (iv) 60 HZ generators to power the gravimeter and compressor.

(c) Supplied by IGS, Applied Geophysics Group:

Worden land gravimeter no. 144

(d) Supplied by IOS:

Sonobuoy recording system and sonobuoys.

NARRATIVE

M. V. Criscilla sailed from Montrose at 1110/334. At 1300 the array was streamed in order to check the operation of the hybrid system and in so doing produce a test tape. This was to be despatched to Sonarmarine via the Aberdeen pilot who was to deliver a delayed engine part. The 40 inch gun failed to fire, was changed for the 150 inch gun and following a system check the test tape was made. By 2000 all gear was inboard and the Aberdeen pilot was cleared at 2130. At 2300 the Gravimeter system went down and required calm conditions to be reset. During the morning of Day 335 we passed through the Pentland Firth and hove to at 1045 in Scrabster Roads to facilitate gravimeter repair. In the sheltered conditions the 40 inch gun was dismantled and made servicable and the array streamer unwound to repair an oil leak. A malfunction was noticed in the PDR fish during test and repaired. With storm warnings off the Hebrides we cleared Scrabster Roads for the Butt of Lewis at 1900/335 with an improving weather prognosis. With the weather continuing to improve at 0900/336 we set course for the start of a Wyville Thompson Ridge (WTR) line and would decide whether to continue west later. By 1500 we were in deeper water and the sea conditions had deteriorated such that the array could not be streamed but it was decided to run a gravity and magnetic line across the WTR. At 1530 we altered course to 035 and streamed the magnetometer. At 1615 the navigation computer went down and following two hours' investigation the Party Chief requested that the vessel proceed to Ullapool to meet the Sonarmarine computer specialist. In view of the poor weather I agreed to this and at 1830 we turned for Ullapool. However, after continuous work on the computer and with a radio link to their headquarters, Sonarmarine identified and rectified the fault permitting us to alter course at 2000 and resume the survey line at 6 knots.

We completed the line at 0900/337 in better than anticipated sea conditions. Speed was reduced to 4 knots to stream and position the array. This became an extended procedure that continued until 1400 when the 40 inch gun was streamed. The gun fired spasmodically and stopped. The wind freshened from the S. E. with an existing swell and Sonarmarine requested that the array be brought inboard. The seismic line was postponed at 1430 and we

set course for the start of a line running west from Myggenaes, recording gravity and magnetics en-route. During that evening the computer plotter blew a transistor and the replacement plotter was installed.

The passage line was completed at 0840/338 and with the weather from the S. E. deteriorating rapidly we set course for a lee on the north side of Stromo to test the 40 inch gun. With the wind at force 9 and a low of 954 mb moving to worsen conditions, the magnetometer was brought inboard and we hove to at Skaksfjord at 1400. By 1600 the air-gun tests were completed satisfactorily when it was decided to remain hove to overnight. The following morning we moved to the west to improve radio reception for weather reports and RT. In better weather the array, 150 inch gun and magnetometer were streamed and at 1445/339 an unplanned line was started that would take immediate advantage of the weather and place us in a position to begin an east-west line should the conditions hold. The 40 inch gun again proved troublesome and digital recording began using the 150 inch gun at 1800. The line was completed at 0912/340 and at the request of the Master all gear was brought inboard. With the gravimeter clamped, we set course for the Faeroes in rapidly deteriorating weather.

During the following morning (341) conditions prevented us from entering Torshavn and we remained in a lee off Sando for 48 hours. During this period the gravimeter generator mountings were replaced owing to loosening, and oil checks plus battery charging were made during a system rundown. At 1030/343 we entered Torshavn and made a gravity tie. In port the gravimeter generator oil was changed and Danish Navy personnel attempted to repair the telex.

We sailed from Torshavn at 1100 the next day and again took a lee off the island of Sando to await the weather. Conditions moderated in the morning (345) and we set course again to attempt the line running west from Myggenaes. In the open water a 30ft swell and increasing wind caused us to clamp the gravimeter and take a lee on the north side of Stromo.

Very strong winds necessitated sheltering until 0800/347 when, with no time left to work the main survey, we set course for the WTR and began a gravity and magnetics traverse (line 4) at 2000 running with an ENE swell; the first time during the cruise that the weather had

veered from S. E.! This line was completed by 0740/348 and with no possibility of streaming the array we began line 5 in a heavy beam sea up on to the Hebrides Shelf. The LORAN-C gave problems and the gravimeter had to be clamped in heavy rolling so the line was completed with magnetometer only at 1800. In view of the conditions, forecast and time available, we set course for the Pentland Firth. During the afternoon of 349 we rounded Duncansby Head and spent the remaining daylight hours unsuccessfully testing the 40 inch gun and stripping the Sonarmarine trigger cables.

M. V. Criscilla docked in Montrose at 1415/350.

CRUISE REPORTS

RRS DISCOVERY

CRUISE NO

REPORT NO

| | | |
|---|---------------------|----|
| 1 | JUN - AUG 1963 | 1* |
| 2 | AUG - DEC 1963 | 2* |
| 3 | DEC 1963 - SEP 1964 | 3* |

NIO CR**

| | | |
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| 4 | FEB - MAR 1965 | 4 |
| 70 | TO | 70 |
| 37 | NOV - DEC 1970 | 37 |
| 38 | JAN - APR 1971 | 41 |
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| 40 | JUN - JUL 1971 | 48 |
| 41 | AUG - SEP 1971 | 45 |
| 42 | SEP 1971 | 49 |
| 43 | OCT - NOV 1971 | 47 |
| 44 | DEC 1971 | 46 |
| 45 | FEB - APR 1972 | 58 |
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| 47 | JUN - JUL 1972 | 52 |
| 48 | JUL - AUG 1972 | 53 |
| 49 | AUG - OCT 1972 | 57 |
| 50 | OCT 1972 | 56 |
| 51 | NOV - DEC 1972 | 54 |
| 52 | FEB - MAR 1973 | 59 |
| 53 | APR - JUN 1973 | 58 |

IOS CR***

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| 54 | JUN - AUG 1973 | 2 |
| 55 | SEP - OCT 1973 | 5 |
| 56 | OCT - NOV 1973 | 4 |
| 57 | NOV - DEC 1973 | 6 |
| 58 | DEC 1973 | 4 |
| 59 | FEB 1974 | 14 |
| 60 | FEB - MAR 1974 | 8 |
| 61 | MAR - MAY 1974 | 10 |
| 62 | MAY - JUN 1974 | 11 |
| 63 | JUN - JUL 1974 | 12 |
| 64 | JUL - AUG 1974 | 13 |
| 65 | AUG 1974 | 17 |
| 66 | AUG - SEP 1974 | 20 |
| 68 | NOV - DEC 1974 | 16 |
| 69 | JAN - MAR 1975 | 51 |
| 73 | JUL - AUG 1975 | 34 |
| 74/1+3 | | 35 |
| | SEP - OCT 1975 | |
| 74/2 | | 33 |
| 75 | OCT - NOV 1975 | 43 |
| 77 | JUL - AUG 1976 | 46 |
| 78 | SEP - OCT 1976 | 52 |
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| 82 | MAR - MAY 1977 | 59 |
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| 88 | OCT - NOV 1977 | 65 |
| 89 | NOV - DEC 1977 | 67 |
| 90 | JAN - MAR 1978 | 68 |
| 91 | MAR 1978 | 69 |
| 92 | APR - MAY 1978 | 70 |

* REPORTS 1 TO 3 WERE PUBLISHED AND DISTRIBUTED BY THE ROYAL SOCIETY FOLLOWING THE INTERNATIONAL INDIAN OCEAN EXPEDITION

** NIO CR: NATIONAL INSTITUTE OF OCEANOGRAPHY, CRUISE REPORT

*** IOS CR: INSTITUTE OF OCEANOGRAPHIC SCIENCES, CRUISE REPORT

CRUISE REPORTS

| CRUISE DATES | REPORT NO |
|---|-------------|
| RRS "CHALLENGER" | |
| AUG - SEP 1974 | IOS CR 22 |
| MAR - APR 1976 | IOS CR 47 |
| RV "EDWARD FORBES" | |
| OCT 1974 | IOS CR 15 X |
| JAN - FEB 1975 | IOS CR 19 |
| APR 1975 | IOS CR 23 |
| MAY 1975 | IOS CR 32 |
| MAY - JUN 1975 | IOS CR 28 |
| JUL 1975 | IOS CR 31 |
| JUL - AUG 1975 | IOS CR 36 |
| AUG - SEP 1975 | IOS CR 41 |
| AUG - SEP 1975 | IOS CR 44 |
| FEB - APR 1976 | IOS CR 48 |
| APR - JUN 1976 | IOS CR 50 |
| MAY 1976 | IOS CR 53 |
| AUG - SEP 1977 | IOS CR 64 |
| RRS "JOHN MURRAY" | |
| APR - MAY 1972 | NIO CR 51 |
| SEP 1973 | IOS CR 7 |
| MAY - APR 1974 | IOS CR 9 |
| OCT - NOV & DEC 1974 | IOS CR 21 |
| APR - MAY 1975 | IOS CR 25 |
| APR 1975 | IOS CR 39 |
| OCT - NOV 1975 | IOS CR 40 |
| AUG - OCT 1975 | IOS CR 42 |
| OCT - NOV 1976 | IOS CR 53 |
| MAR - APR 1977 | IOS CR 66 |
| NC "MARCEL BAYARD" | |
| FEB - APR 1971 | NIO CR 44 |
| MV "RESEARCHER" | |
| AUG - SEP 1972 | NIO CR 68 |
| RV "SARZIA" | |
| MAY - JUN 1975 | IOS CR 30 |
| AUG - SEP 1975 | IOS CR 38 |
| MAR - APR 1976 | IOS CR 44 |
| MARCH 1977 | IOS CR 63 |
| RRS "SHACKLETON" | |
| AUG - SEP 1973 | IOS CR 3 |
| JAN - FEB 1975 | IOS CR 18 |
| MAR - MAY 1975 | IOS CR 24 |
| FEB - MAR 1975 | IOS CR 29 |
| JUL - AUG 1975 | IOS CR 37 |
| JUN - JUL 1976 | IOS CR 48 |
| OCT - NOV 1976 | IOS CR 49 |
| JUL 1977 | IOS CR 62 |
| MV "SURVEYOR" | |
| FEB - APR 1971 | NIO CR 38 |
| JUN 1971 | NIO CR 39 X |
| AUG 1971 | NIO CR 42 X |
| DE "VICKERS VOYAGER" AND "PISCES III" | |
| JUN - JUL 1973 | IOS CR 1 |