MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1979 RESEARCH VESSEL PROGRAMME

REPORT: R V JEAN CHARCOT: CRUISE "TOURBILLON II"

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF:

13 French Scientists and A Bradley (USA)
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DURATION:

Sailed 1000 h 28 August 1979
Docked 0800 h 10 September 1979

All times are French local time

LOCALITY:

Within 30 miles of 46°59', 14°48', the centre of the Tourbillon Current meter array

NARRATIVE:

The scientific staff from Lowestoft travelled to Plymouth in Laboratory vans loaded with current meters and other items of gear between 0800 h and 1730 h on Sunday 26 August in order to catch the 2230 h. Plymouth-Roscop ferry. They were met in Roscop at 1060h the next morning by personnel from the Centre d'Océanographie de Bretagne (COB) and the gear was transferred to a COB van. By 1300 h all items and staff were on board the R V JEAN CHARCOT in Brest and the afternoon was spent testing gear and "lashing down". A little local difficulty with French Customs was also sorted out via a formal letter from COB explaining the purpose of the visit.

The ship sailed at 1000 h, Tuesday, 28 August for the region around 46°59', 14°48'W which had been identified as a likely "eddy" or Tourbillon area, by a drifting satellite buoy released by COB in May 1979 and a detailed water-mass survey by the SACLANTCEN vessel R V MARIA PAULINA in mid-August. Expendable bathythermographs (XBTs) were launched at hourly intervals once the Continental Slope had been crossed and on 30 August stations 6 and 7 of the Tourbillon array were laid (See Fig 1). The ship then moved to the central region of the array and during the night of 30-31 August carried out a "Sea-beam" - ie high-precision, real-time bathymetric mapping in plan format - survey in order to find a smooth region some 10 miles square. Stations 3 and 1 were laid during 31 August and 4 and 5 the next day. Meanwhile the second ship of the exercise, R V NOROIT, which was staffed by scientists from the Muséum National d'Histoire Naturelle, Paris, had arrived in the region and begun to lay two anchored acoustic beacons and launch French drifting floats at depths of 800-1800 metres.

Station 10 of the Tourbillon array was laid between 1700 h and 1810 h on 2 September and the first MAFF station (St 9 of Fig 1) was laid in 4800 meters of water by midnight. The second MAFF station was laid the next evening after a French satellite buoy had been launched en route to the station and an intensive echo- and Sea beam survey done of the region around the proposed site. Figure 2

is part of the Sea-beam results. As previously arranged RRS DISCOVERY was informed of the location of the Tourbillon array by wireless.

At 0001 h 4 September the RVs JEAN CHARCOT and NOROIT began a joint CTD survey to 4000 m of the Tourbillon array region: the former ship steaming round the northern half of the grid (see Fig 1) , the latter sampling in the south. Fixes on the floats were made concurrently with the CTD operation via a hydrophone and electronic package attached to the CTD whilst 12 water samples were taken each day by each ship as a check on the performance of the CTDs. RV JEAN CHARCOT finished the CTD grid at 0300 h 8 September and set course for Brest. On the run home a "near-bottom" CTD dip was made near Tourbillon 10 whilst two hydrophone dips were made to check the maximum range to be expected from the floats.

The vessel docked in Brest at 0800 h Monday 10 September and MAFF personnel flew to London via Paris the following day.

RESULTS

1 The Tourbillon array was laid as planned: station S of the grid of near-bottom current meter rigs put out by R V CIROLANA during Cruise 6/79 lies on the western boundary (see Figure 1).

2 The first CTD grid of the water masses in the region of the array was completed. Preliminary results suggest there is relatively warm water filling the south-central zone below 700 metres depth with a $1^{\circ}C$ temperature difference over 20-25 miles at 1500 metres.

3 11 free drifting floats were launched: 2 failed at launch, 3 are in the 800-1300 metre zone and the remainder are between 1500 and 1800 metres. Most showed signs of distinct clockwise drift of the order of 7 cm sec after 5-6 days.

4 Technically the hitherto untested float tracking system was an enormous success: a maximum working range of 125 miles was possible at this stage of the experiment and one ship could easily monitor the drift of all the floats.

5 A separate report in note form has been written of various aspects of the R V JEAN CHARCOT as a working vessel and on the detailed implications of working with the COB instrumentation on R V CIROLANA during Cruise 9/79.

J W Ramster
19 September 1979

Initialled: A J L
H W H

DISTRIBUTION:

Basic List

Mr Ramster
Mr Baxter
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14/30/40 TIME 14/47/
009° 10 M SHIPS HEAD, CONTOUR INTERVAL. 009° 10

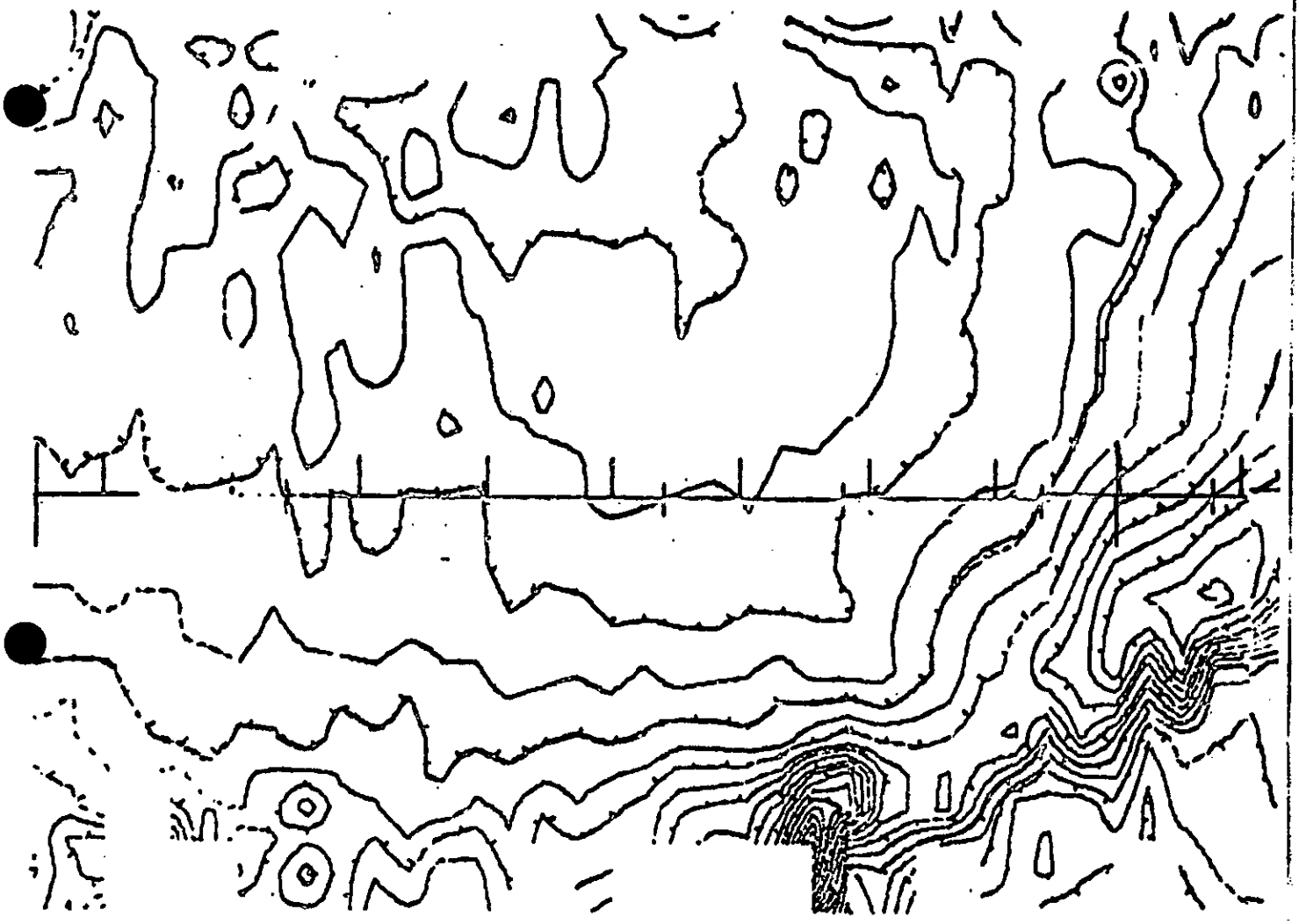

FIG. 2. PART OF ~~SEARCH~~ SURVEY FOR TDN. 8.

DISPLAY WIDTH IS 3/4 OF DEPTH.
FLEETS ON CONTOURS SHOW DOWNSLOPE DIRECTION.

EMPLACEMENT DES MOUILLAGES ET DES STATIONS BATHYSONDE

✛ 1 Mouillage de courantomètres n° 1 ST. 1 46°59.5', 14°48.6'

⊙ 1 Station Bathysonde n° 1

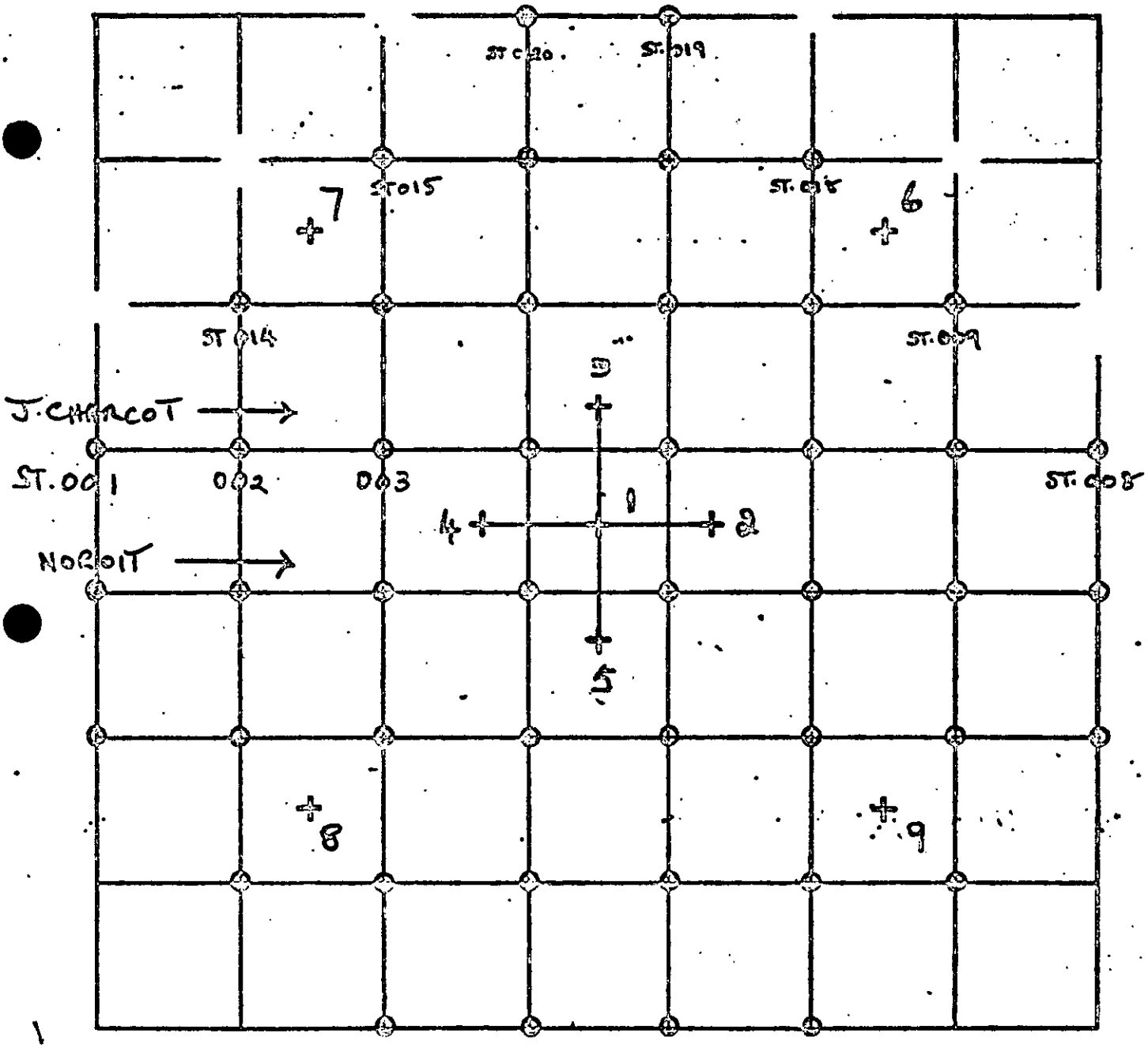

FIG. 1. TOURBILLON ARRAY AND CTD GRID.

Echelle 0 10 20 30 40 50 60 milles