

IN CONFIDENCE: NOT TO BE QUOTED WITHOUT REFERENCE TO THE LABORATORY

R1/12

FRV SCOTIA

CRUISE 6/83

REPORT:

8-28 June 1983

OBJECTIVES:

- (1) To carry out a survey for mackerel eggs along the edge of the Continental Shelf from the Bay of Biscay to West of Ireland as part of a co-ordinated international survey to determine western mackerel spawning stock size.
- (2) To sample mackerel concentrations in the survey area.
- (3) To interface the satellite navigation system with the computer.

NARRATIVE:

"Scotia" sailed from Aberdeen at 1430 on 8 June and made passage via the Pentland Firth to the survey area west of Ireland. En route surface water samples for radio caesium monitoring were collected at the three stations listed in the programme. Five additional plankton stations were worked close to the 200 metre contour between 56°30'N and the northern end of the grid to provide some indication of the extent of spawning north of the survey area.

During the first half of the cruise 55 plankton hauls, one pelagic trawl and one handline haul were made between 48°30'N and the northern end of the grid prior to docking in Brest at 0900 on 17 June (see attached Figure 1(a)). Progress was impeded to some extent by gale force winds between 10 and 13 June.

During the half landing J.L. Cort the Spanish observer was recalled to Spain and departed on 18 June. "Scotia" sailed at 1100 the same day for the southern end of the survey grid. In the second half of the cruise a further 59 plankton hauls, 9 handline hauls and one pelagic trawl haul were made between 45°N and 50°30'N. "Scotia" docked in Aberdeen at 1300 on 27 June.

Radio contact was maintained with research vessels "Cirolana" and "Challenger" during the cruise.

THE EGG SURVEY

Plankton sampling with the high speed Loch Ewe sampler was carried out to a depth of 70m south of 50°30'N, where the thermocline was clearly defined and to a depth of 100m further north. Fish eggs were picked out from all hauls using trays designed for work at sea. Throughout the cruise surface temperature, salinity and chlorophyll were monitored continuously.

A preliminary analysis of the samples indicates that mackerel eggs were abundant between latitudes 47° and 54° N. At both the northern and southern ends of this range the area of abundance appeared to be confined to a fairly narrow band near the edge of the Continental Shelf while in the central zone, between $48^{\circ}30'$ and 51° , mackerel eggs were abundant from the vicinity of the shelf edge to the eastern boundary of the survey area. The areas of high mackerel egg abundance appeared to correspond closely to those of high crustacean zooplankton abundance and negatively to those of high salp/ctenophore abundance. The latter were abundant in the deeper water west of the shelf.

Preliminary investigations of surface hydrography indicated that surface water along the edge of the shelf between $49^{\circ}30'N$ and $47^{\circ}30'N$ was colder than water to the east or west indicating that some upwelling had probably taken place there. This colder surface water was associated with higher chlorophyll levels than the surrounding warmer water on most transects across the shelf edge. No corresponding differences in salinity were apparent in this area.

MACKEREL SAMPLING

Fishing yielded small quantities of mackerel on 6 out of 10 occasions by handline and on one out of two hauls by pelagic trawl. Most fish were caught near the edge of the Continental Shelf and within the top 70 metres generally in the absence of any conspicuous echo traces. The size range of the 484 mackerel caught was 27-42cm with modal lengths at 30 and 32 cm. The predominant age groups were 2, 3, 4, 5 and 7 year old fish ie year classes 1978-1981 and 1976. Over 95% of fish caught were mature and had already begun to spawn, the majority of gonads were between $\frac{3}{4}$ and $\frac{1}{2}$ full.

Two samples of mackerel were deep frozen for parasite investigations in the Marine Laboratory and 49 mackerel ovaries were collected for fecundity investigations by the MAFF Laboratory in Lowestoft.

Other species caught by pelagic trawl were adult horse mackerel, immature blue whiting and lantern fish (Lampanychus crocodilus). No other species were caught by handline.

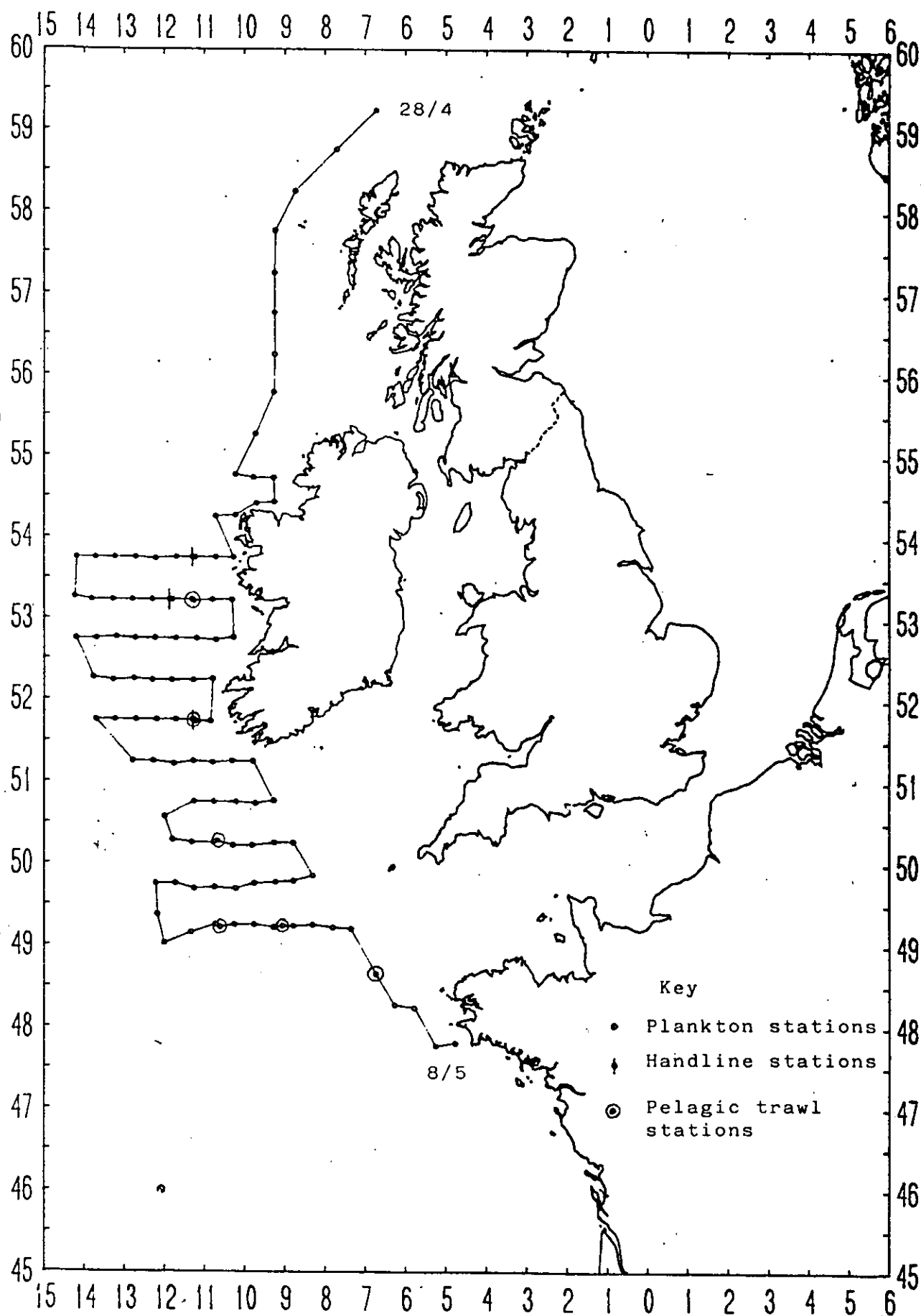
Satellite navigation interfacing with computer:

This work was deferred until the arrival of a new software package in the near future.

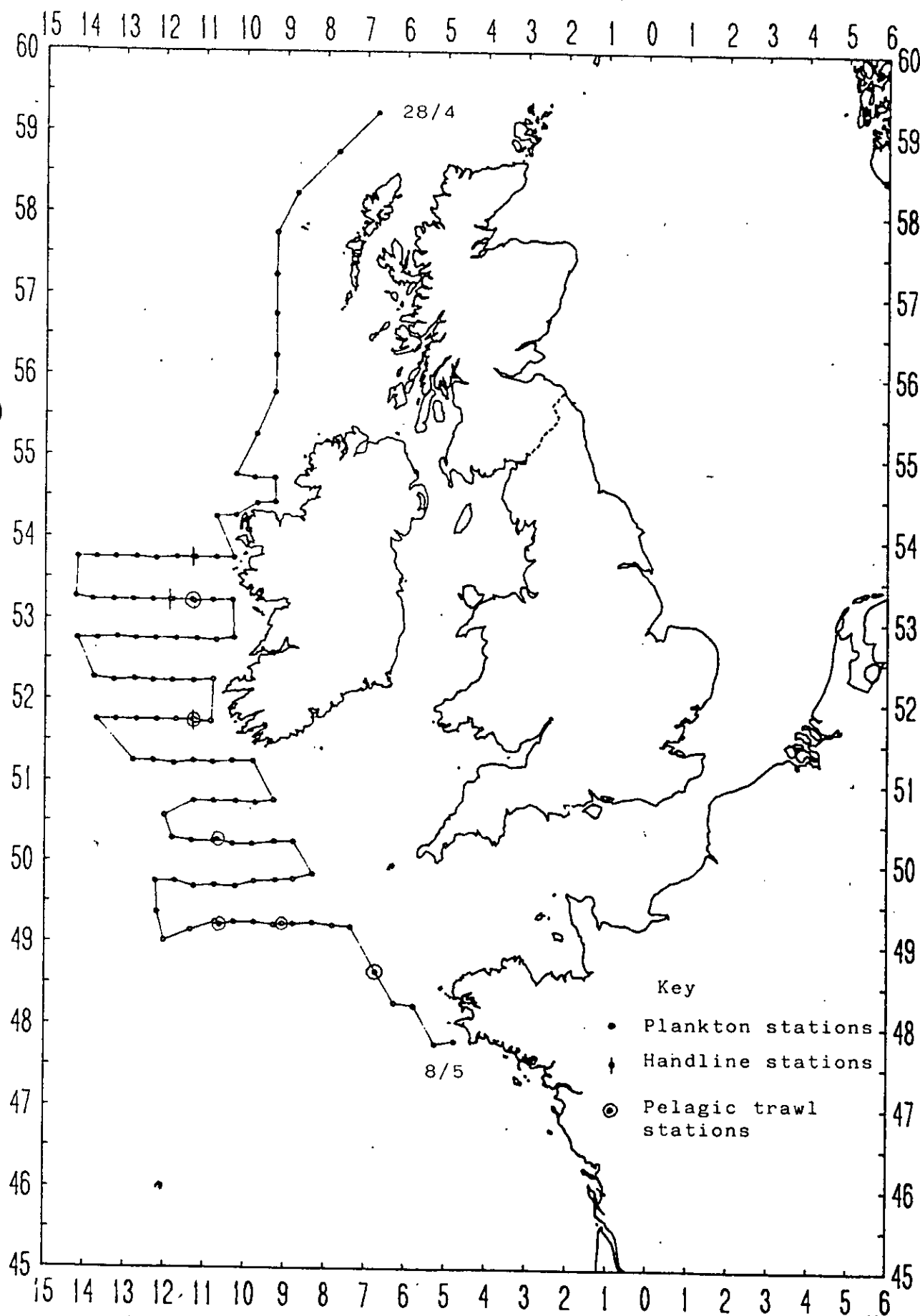
M. Walsh
5 July 1983

Seen in draft: J W Gillon

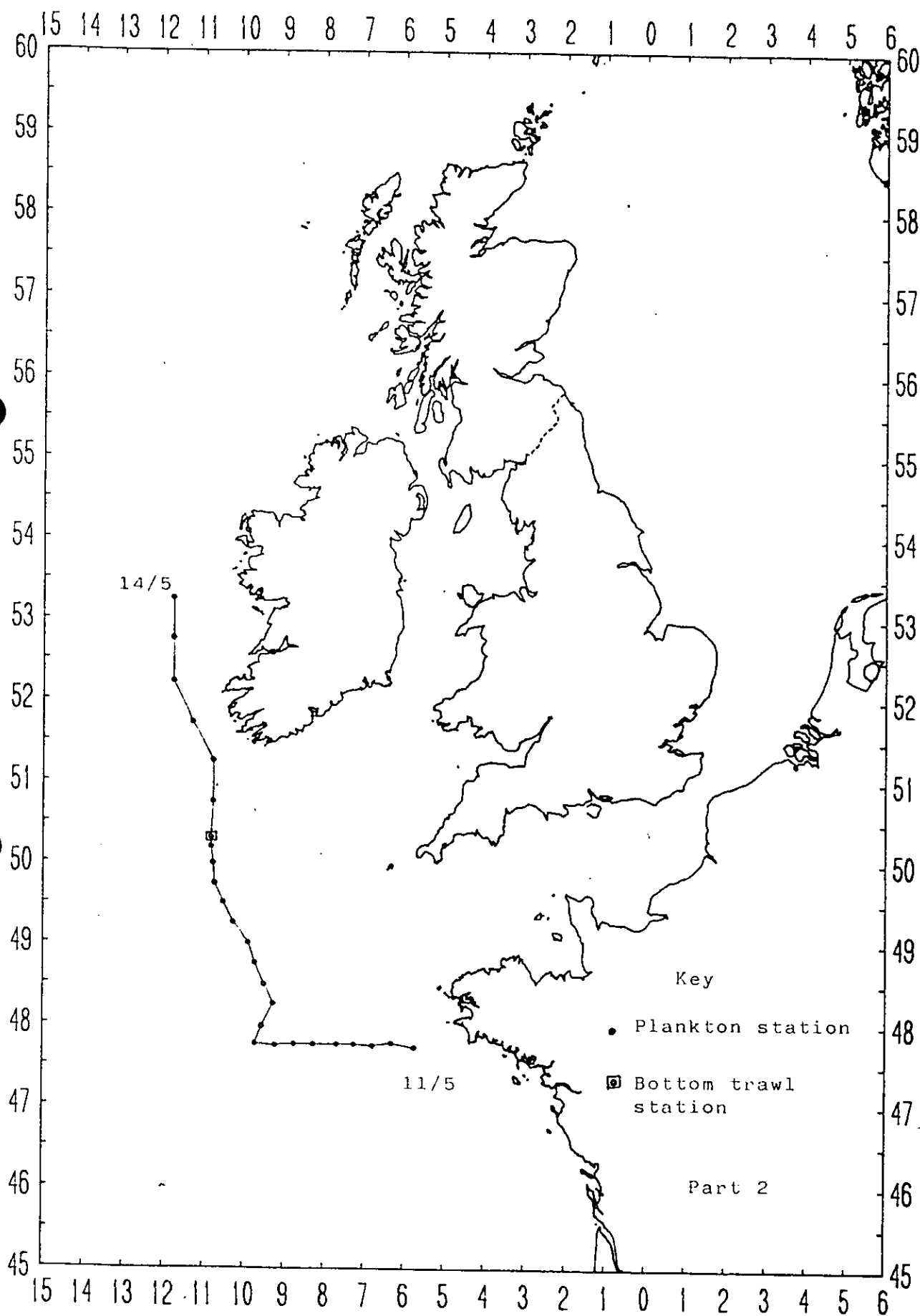
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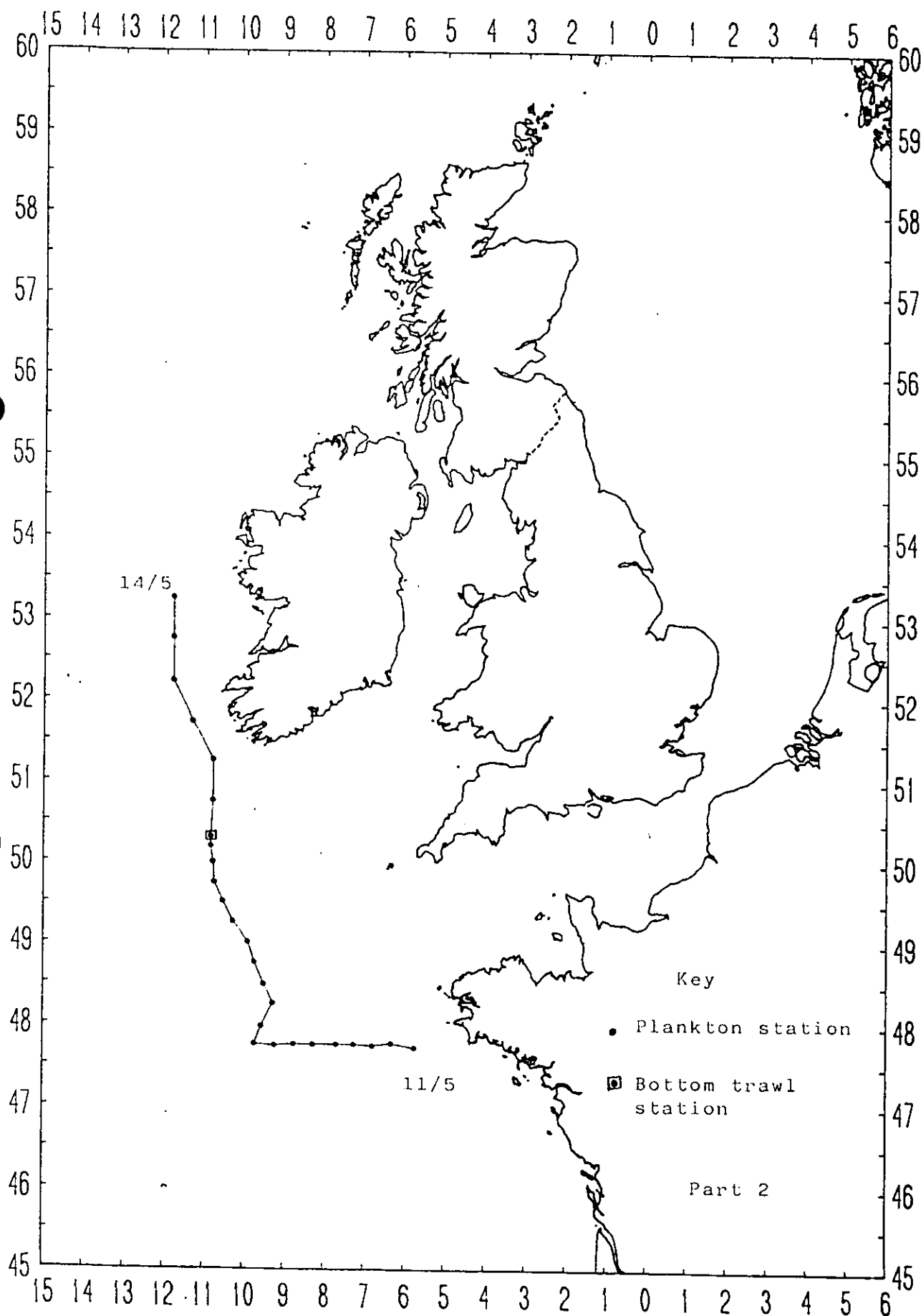


Figure 1(a)

Scotia 6/83

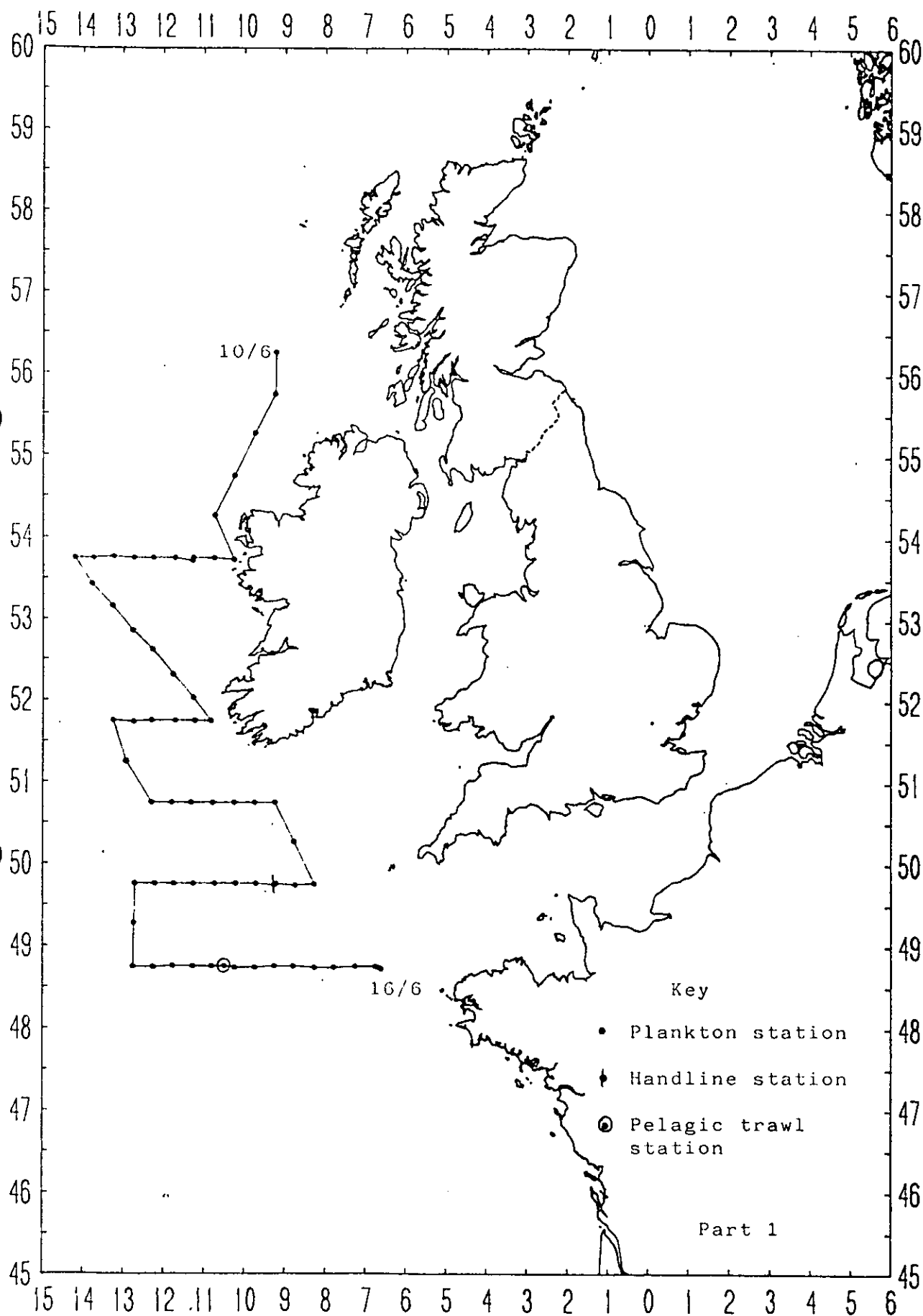
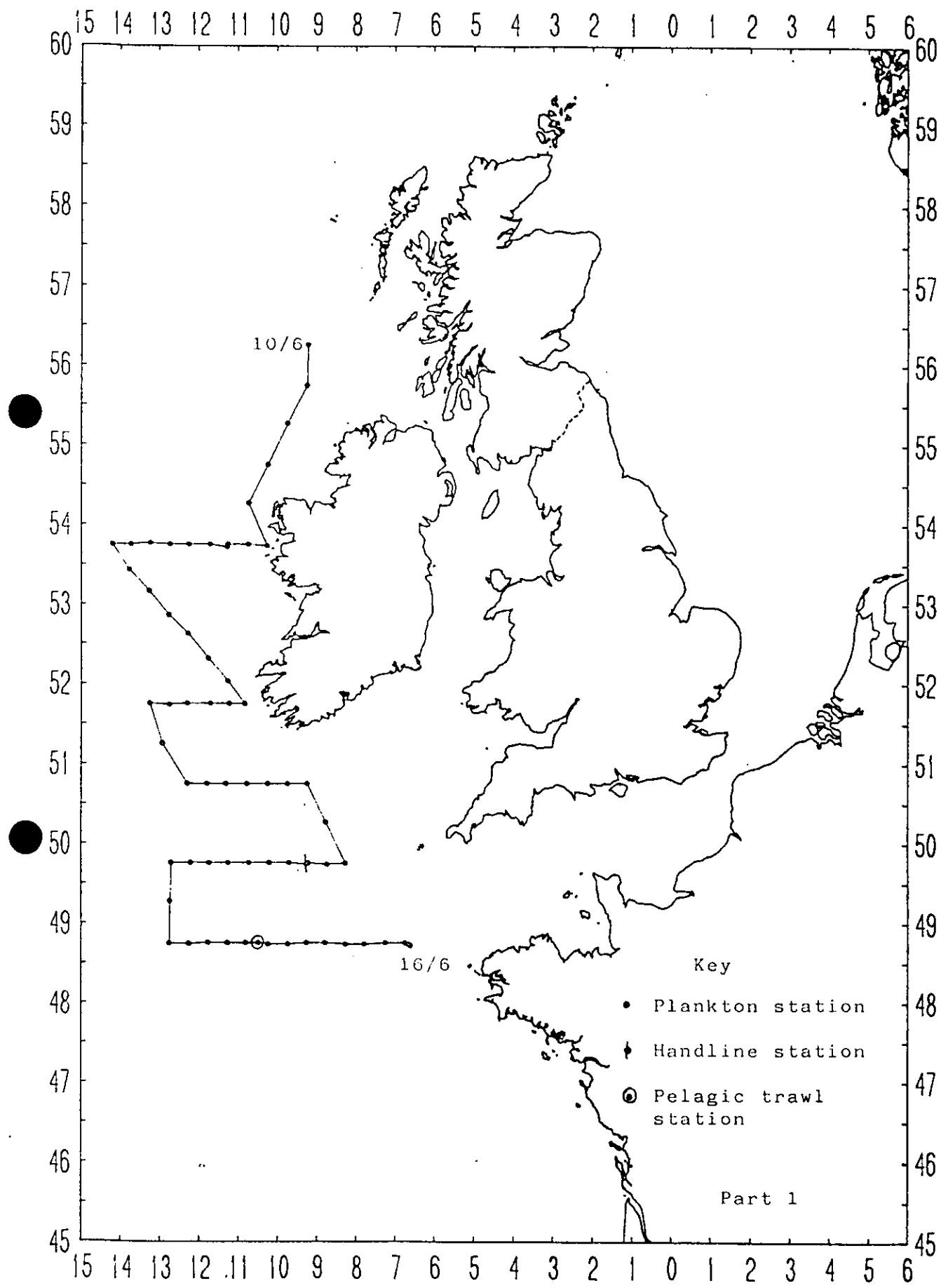


Figure 1(a)

Scotia 6/83



Scotia 6/83

Figure 1(b)

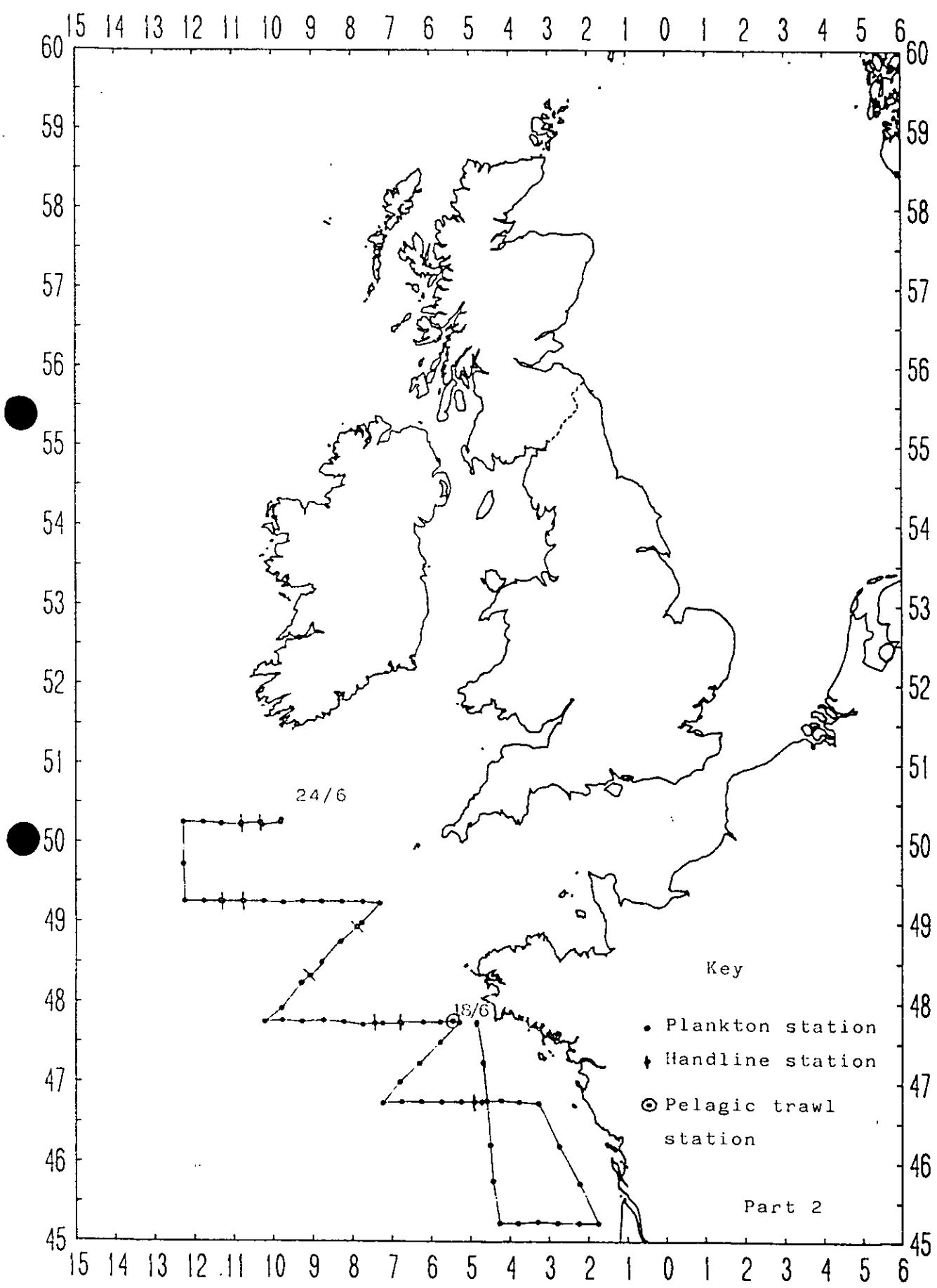


Figure 1(b)

