FRV 'EXPLORER'

Cruise 1/84   1ER84

REPORT
9-27 January 1984

Objectives:

1) To carry out an echo-integration survey for sprats in the Western Sea between the Moray Firth and Flamborough.

2) To identify the echo traces using midwater trawl PT154 (Young Gadoid Trawl) and Isaac Kidd midwater trawl.

3) To collect acoustic data for each consecutive transmission for subsequent detailed analysis.

General:

'Explorer' sailed from Aberdeen at 13.00 on 9 January and sailed directly to the Dornoch Firth where the acoustic equipment was calibrated. The acoustic survey started at 15.50 on the 10 January, the survey grid being dictated by the strong south westerly gales. Explorer docked at 03.30 on the 17 January, the half landing being brought forward because of poor weather conditions and a bad forecast.

'Explorer' sailed from Aberdeen on the morning of 18 January and proceeded to survey the area south of Aberdeen. Because of prolonged periods of severe weather the survey was largely restricted to inshore areas. A second calibration of the acoustic equipment was carried out in the Forth on 23 January. 'Explorer' returned to Aberdeen at 17.00 on 26 January because of problems with the boiler tubes.

Results:

The cruise track (Figure 1) is attached along with a total biomass contour diagram (Figure 2) and estimates of sprat and herring biomass (Figure 3). The total biomass contour is based on a target strength of -34 dB per kg in order to remain compatible with previous results, however the estimates for sprat and herring are based on length dependent target strengths as recommended by the ICES Planning Group (ANON 1983). The target strength for sprat was calculated from the mean length of sprat in each area as measured by the pelagic trawl hauls by application of the targ strength equation TS/kg = 8.7log L - 19.6dB (L in cm). The target strength of herring w calculated by half cm length group, as measured by the pelagic trawl hauls using the following equations:

TS/individual = 20log L - 71.2dB (L in cm)
Wt (gm) = 0.002604 L^3.3230 (L in cm)

The total biomass was partitioned using the equations of NAKKEN and Dommasnes (1975) assuming that gadoid fish have a target strength of -29dB/kg (Forbes et al 1982) and that other species have a target strength of -34dB/kg.

In general concentrations of clupeoids were higher than last year with concentrations re-appearing in the traditional areas off Montrose and off the North East coast of England, however concentrations are still very low with peak densities of 5 tonnes/km^2. Although in the majority of hauls sprat were the more abundant species in number because the sprat were small, 1 group fish the clupeoid catch by weight was dominated by herring.

Conclusions:

Pelagic fish traces were, as in 1983, scarce and echo integrator readings low. Though the clupeoid stock appears to be higher than in 1983 a larger proportion of the stock is small herring. The persistent gale force winds prevented the completion of the survey grid, but the areas in which high concentration have previously been found were adequately covered.

J I Edwards
D W McKay
20 March 1984
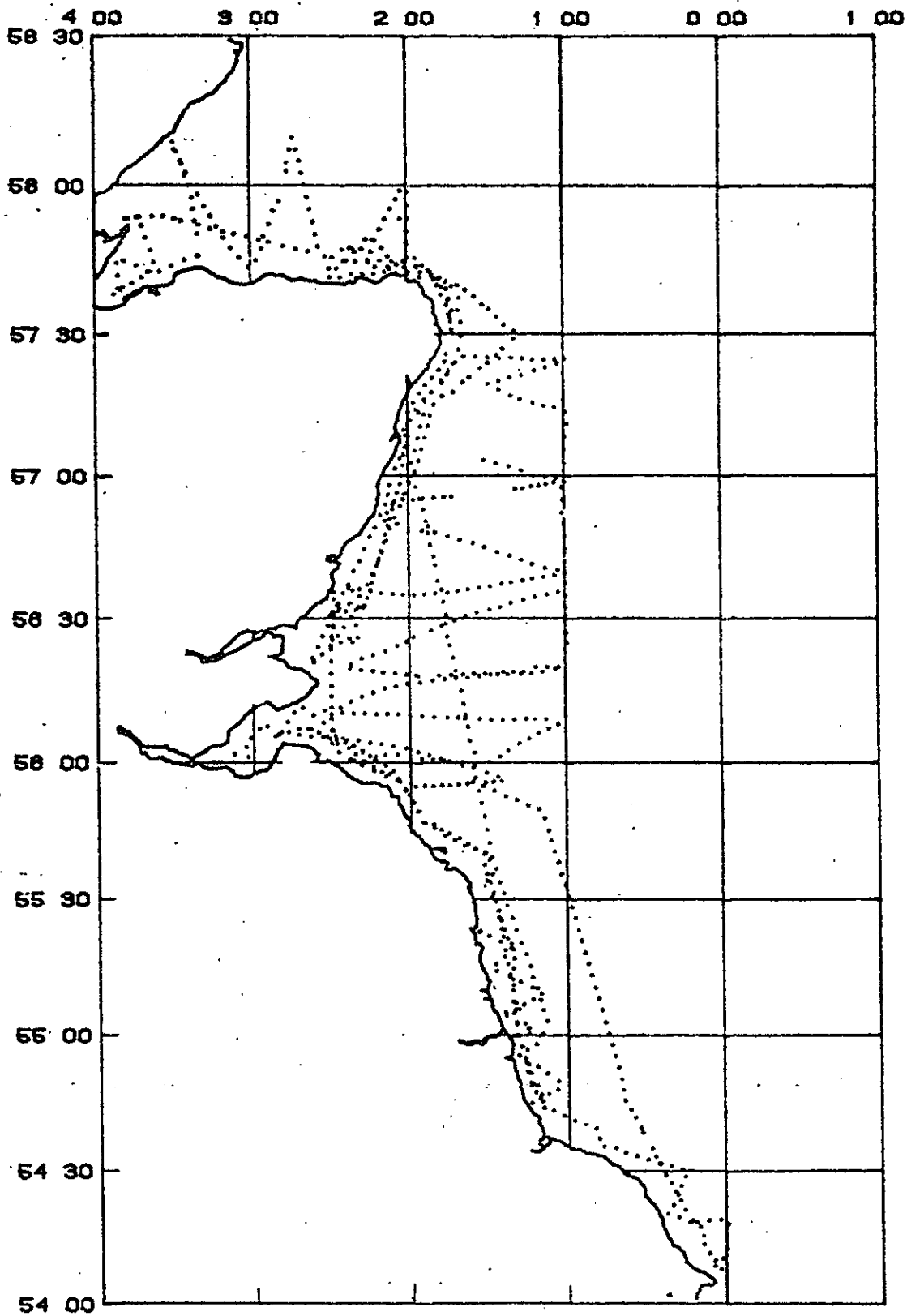
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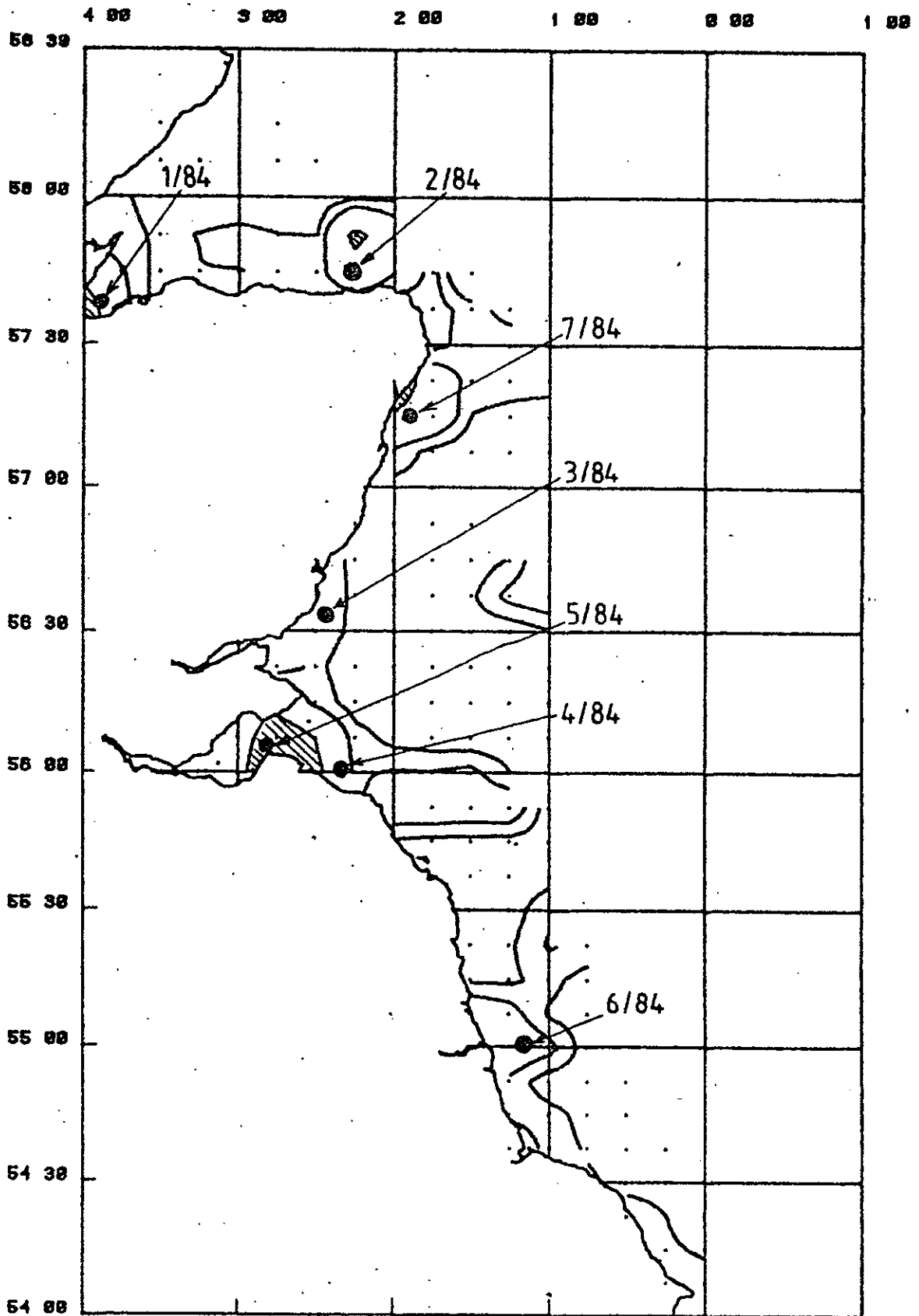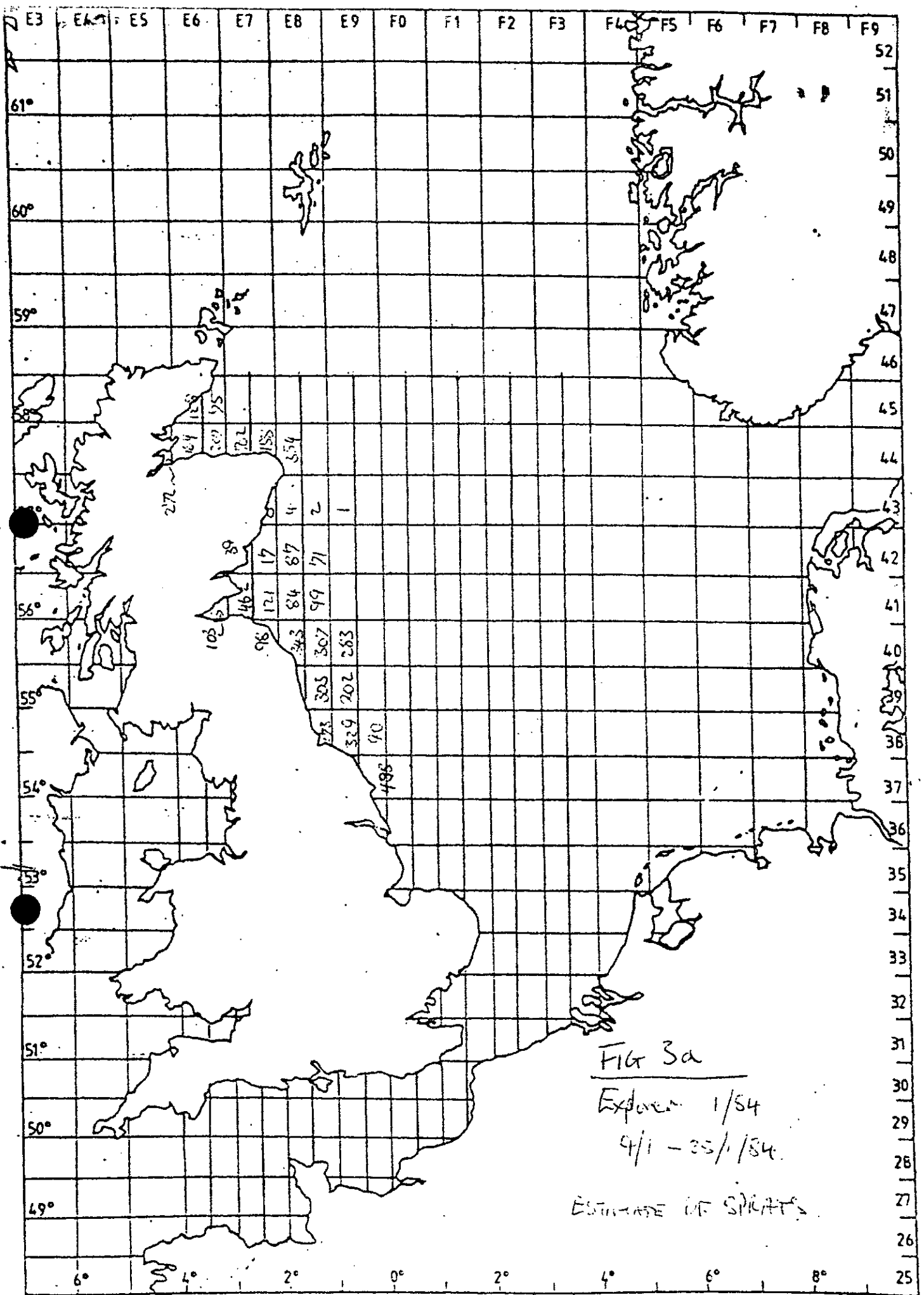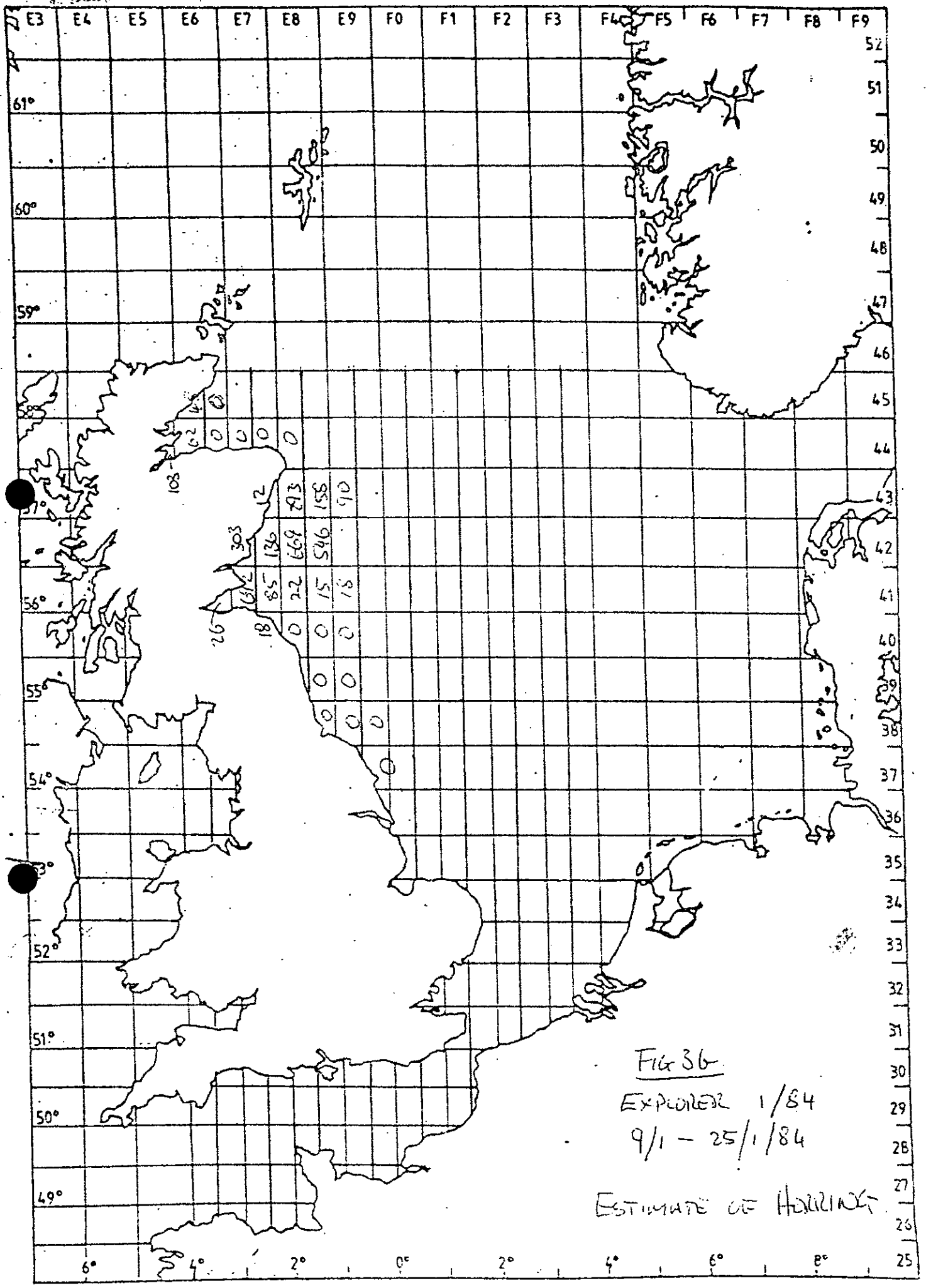
Fig I Explorer   9/1 — 25/1/84

Fig 2 Explorer 9/1 — 25/1/84

Top axis labels: E3 E4 E5 E6 E7 E8 E9 F0 F1 F2 F3 F4 F5 F6 F7 F8 F9

Right axis: 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25

Left axis: 61° 60° 59° 56° 55° 54° 53° 52° 51° 50° 49°

Bottom axis: 6° 4° 2° 0° 2° 4° 6° 8°

Grid values (approximate readings):
64 113 / 307 95 / 227 / 155 / 354
272 / 4 2 1
89 / 17 87 71
462 121 84 99
105 / 96 143 307 283
325 202 263
193 329 90
485

FIG 36.

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ESTIMATE OF HERRING