

Ancient Monuments Laboratory
Report 54/90

KEMP HOWE, N HUMBERSIDE: REPORT ON
GEOPHYSICAL SURVEY, 1988.

P Linford

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Summary

Kemp Howe, the site of a long barrow in North Humberside, was surveyed in order to locate more precisely features detected in a previous Ancient Monuments Laboratory survey. A second barrow, 250m to the NW, was also surveyed to assess the threat posed by plough damage.

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Introduction

The sites of two barrows, both excavated by J R Mortimer earlier in the century (Mortimer 1905) and in close proximity to each other, were investigated by geophysical survey.

The first, Kemp Howe (SE 9622 6630), was described by Mortimer as a round barrow (Mortimer 1905, 336) and given the reference number 209. It was then partially re-excavated in 1967 and 1968 by T C M Brewster who discovered evidence for long barrow ditches oriented NE-SW, as well as Anglian occupation (Brewster and Finney, forthcoming). Two lines of post-holes diverging eastwards from the barrow, were also revealed at this time.

A previous magnetometer survey, undertaken by the Ancient Monuments Laboratory in 1972 (Bartlett 1972) located iron objects buried in the vicinity of the barrow. Although probably of more recent origin, the possibility that these were Anglian artefacts could not be discounted. In addition, the probable terminals of the long barrow ditches were located by resistivity survey. The work described below was carried out in order to locate these features more precisely.

The second barrow, nearby (SE 9580 6645), was also investigated by Mortimer, who gave it the reference number 277. It is still visible as a mound approximately 30m in diameter, rising about 1.5m above the surrounding land surface. The location of the excavation trench dug into it is visible due to vegetation changes. The geophysical survey was conducted in order to assess the archaeological implications of ploughing over the site.

Method

The area surrounding Kemp Howe, including most of that covered in 1972, was surveyed with a magnetometer. A resistivity survey was then carried out over the area in which the long barrow ditches were thought to be. Mortimer's barrow 277, and its immediate surrounding area, was also surveyed with the magnetometer. The location of both surveys is shown on the enclosed plans (where magnetic coverage is labelled 1 - 12, and resistivity 13 - 15).

In order to locate the measured readings, the ground was divided into 30m grid squares. Each square was divided into 30 parallel traverses spaced 1.0m apart. Readings were taken at 1.0m intervals along each traverse in the case of the resistivity survey and at 0.25m intervals for the magnetometer surveys. A Geoscan RM4 constant current resistivity meter was used for the resistivity survey, connected in the twin electrode probe configuration; the mobile probes were separated by a distance of 0.5m. The magnetometer surveys were carried out with a Geoscan FM18 fluxgate gradiometer, the spacing between the fluxgates being 0.5m.

Results

Barrow 277:

The magnetometer survey of this barrow revealed several possible archaeological features with a magnetic strength only slightly above the natural background level. The precise outline of these features was thus obscured due to a low signal to noise ratio. In order to reduce the effect of the noise, the data was smoothed with an adaptive thresholding median filter (Gonzales and Wintz, 1988, 162, 354). The contrast of the resulting data was then enhanced using the Wallis statistical differencing algorithm (Wallis, 1986), so that both strong and weak amplitude anomalies were visible on the same plot. A 16 level greyscale computer plot of the final values is included as plot 1 and a trace plot of the results after the median filtering stage as plot 2. These plots represent the area labelled as squares 1-4 on the location plan.

A magnetic anomaly defining an approximately circular arc corresponding in position with the perimeter of the visible mound can be clearly distinguished. This almost certainly represents a ditch outlining an incomplete circle interrupted to the north-west. Due to the relatively strong magnetic response of the anomaly, the latter gap is likely to be a genuine feature rather than a failure to detect the ditch fill. There is also some slight evidence to suggest a second ditch outside the first along its south-west edge. However, this is close to the position where the surface vegetation suggests Mortimer excavated, hence this interpretation can be far from certain.

Several patches of enhanced soil magnetic susceptibility, roughly 2.5m in diameter, are visible in the north-western corner of square 3. There is little to suggest what they may represent but an archaeological origin cannot be ruled out.

Just to the south-east of the centre of the mound a magnetic response characteristic of iron objects can be seen. It is most clear in the trace plot although also visible (at reduced intensity) on plot 1. Whilst this may be caused by modern agricultural rubbish, the central position of the anomalies suggests an explanation related to the barrow - perhaps an infilled excavation trench.

Other anomalies revealed by the plots may be significant. For instance, an apparently linear feature has been detected running south-eastwards from the ditch circle at the junction of squares 1 and 4; also, a pair of relatively strong anomalies on the eastern edge of square 1 are suggestive of features extending beyond the limit of the survey.

Kemp Howe:

Magnetometer survey: the magnetic data is shown on plots 3 and 4 (trace and grey-scale representations, respectively). No statistical treatment was necessary.

cont/

The iron objects detected in 1972 show up clearly as sharp, high intensity deflections on plot 3. Whilst these were certainly generated by iron objects, no explanation for these was visible on the surface. Agricultural iron debris was noted in other parts of the survey area, however.

The magnetic disturbance caused by the two excavations is quite apparent in grid squares 6 and 8. A concentration of deflections probably representing iron nails, and a general increase in magnetic activity in the backfilled trenches, can be distinguished. One linear trench is clearly visible and can also be seen on the resistivity plot discussed below. Despite computer enhancement, no evidence for either the post hole alignments or the long barrow ditches could be detected.

Resistivity survey: in order to remove the effects of contact resistance, and so that features of varying amplitude could be displayed on the same plot, this data was processed in a similar manner to that for barrow 277 (see above). A 16 level grey-scale representation of the processed results is included as plot 5. Low resistivity values are shown in black, high values in white, in order to emphasize negative anomalies.

Although it now appears impossible to exactly relocate Brewster's trenches, a congruence between some of his excavated features and certain resistivity anomalies is apparent. In particular, the anomalies labelled A, B and C on the plot tie in well with the grubenhaus, facade ditch and medieval construction pit, respectively. More generally, the dark circular arcs which dominate the northern half of the plot appear to broadly correspond with the circular ditched feature identified by Brewster at the eastern end of his supposed long barrow. Although some areas of low resistivity also coincide with the postulated long barrow ditches, the existence of the latter cannot be proved on this data alone.

Some anomalies, complemented by the magnetic survey, for instance at the centre (D) of the circular feature, are perhaps best explained as resulting from former excavation trenches. The apparent variability in resistivity response may well reflect the idiosyncratic back-filling of the latter. Other anomalies such as the faint linear north-south alignments (E and F) possibly indicate a remnant of ridge and furrow cultivation.

Conclusions

This investigation of the two barrow sites has been informative despite a generally weak geophysical response confused on both sites by magnetic interference from buried iron objects. The latter may be, in part, of archaeological significance (in the case of Kemp Howe) but are perhaps more realistically explained as of recent origin - either agricultural, or from former excavations.

Barrow 277 has been shown on magnetic evidence to include a ditch apparently arranged in a somewhat circular pattern: the relevant magnetic anomalies are not continuous, however, and it is not

possible to resolve with certainty exactly what type of structure is represented. Outlying magnetic anomalies suggest that further archaeological features are present, perhaps extending beyond the limits of the survey area.

The survey results from Kempe Howe contrast with Barrow 277 in that the magnetometer has not been able to locate any significant chalk-cut features. Instead, low resistivity anomalies seem to confirm at least some of the features noted in previous excavations, but fall short of identifying the long barrow structure. Post-holes and additional Anglian features have not been satisfactorily located.

These results, despite the effects of attrition from cultivation, indicate that potentially substantial chalk-cut features survive at both sites. Both barrows appear to share a broadly similar shape, albeit detected by different means. The magnetic response from Barrow 277 is particularly encouraging and any future work in the area could well benefit by extending this survey to identify outlying features.

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A. Payne

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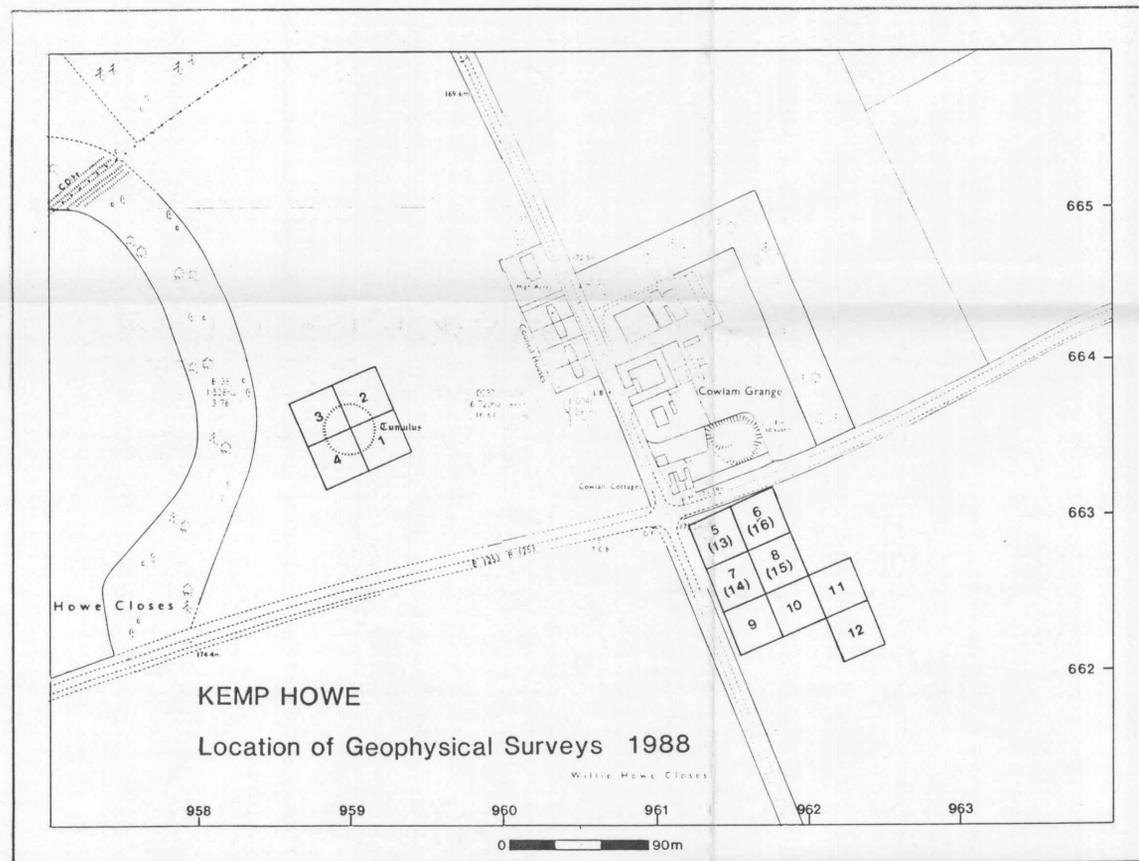
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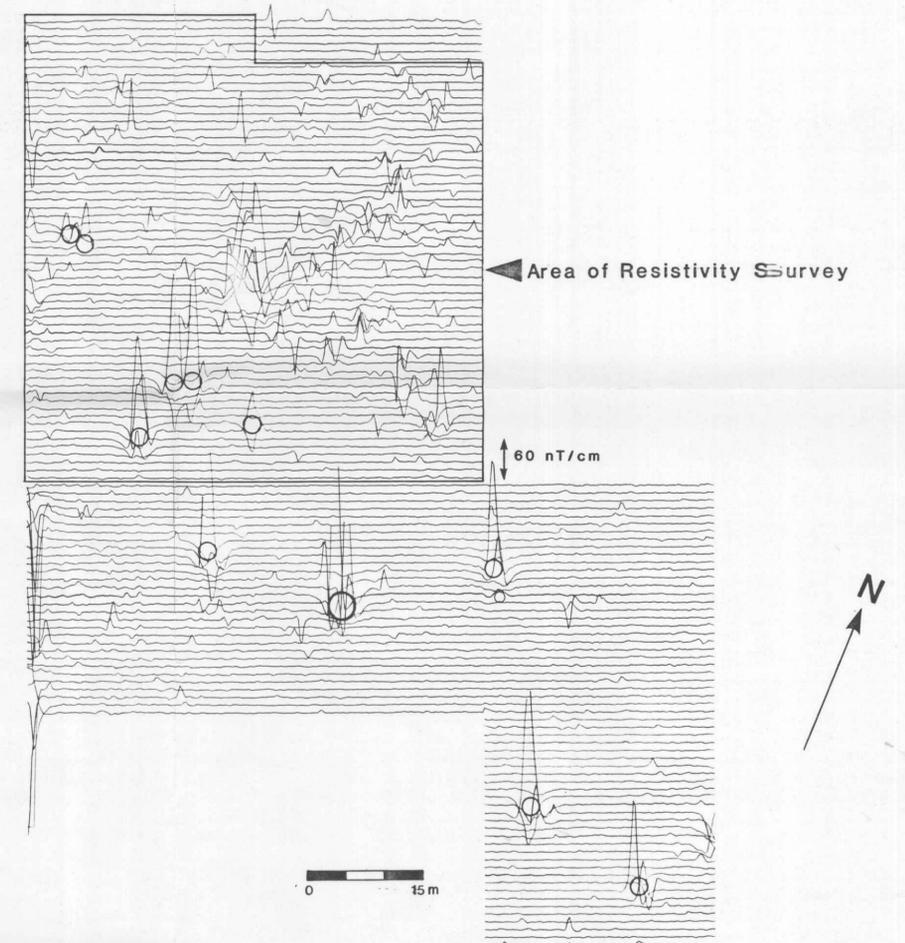
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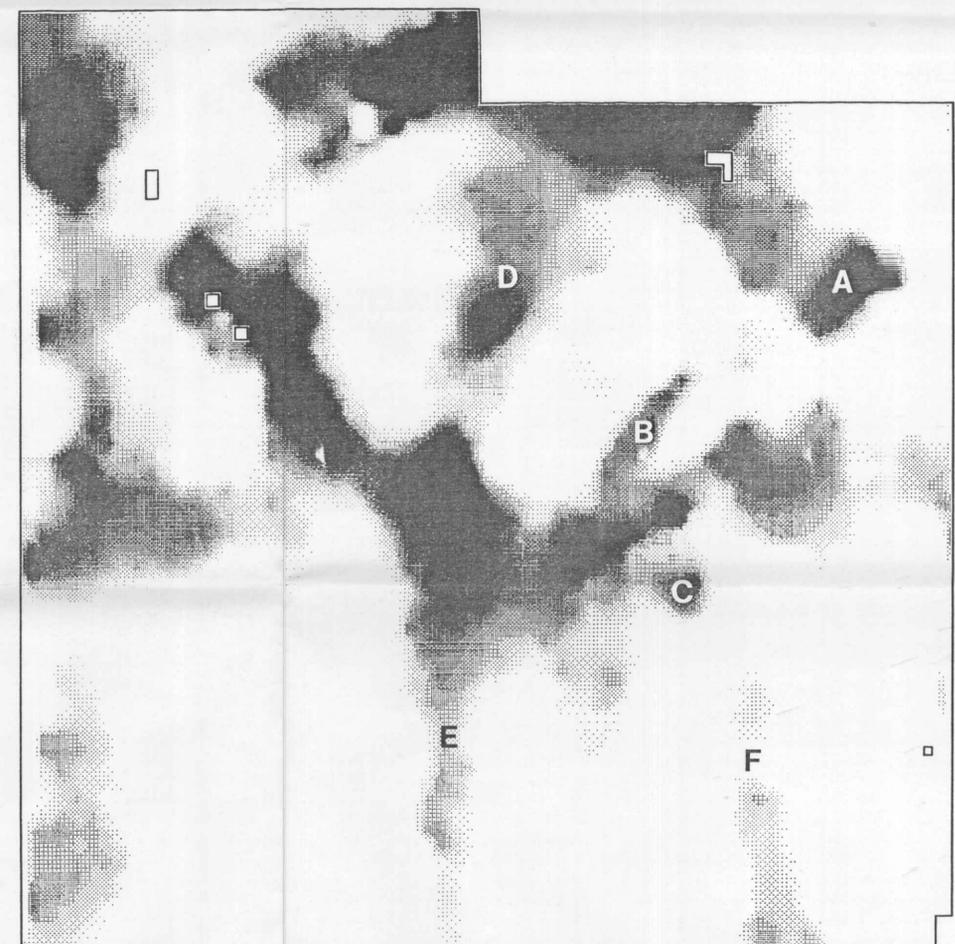
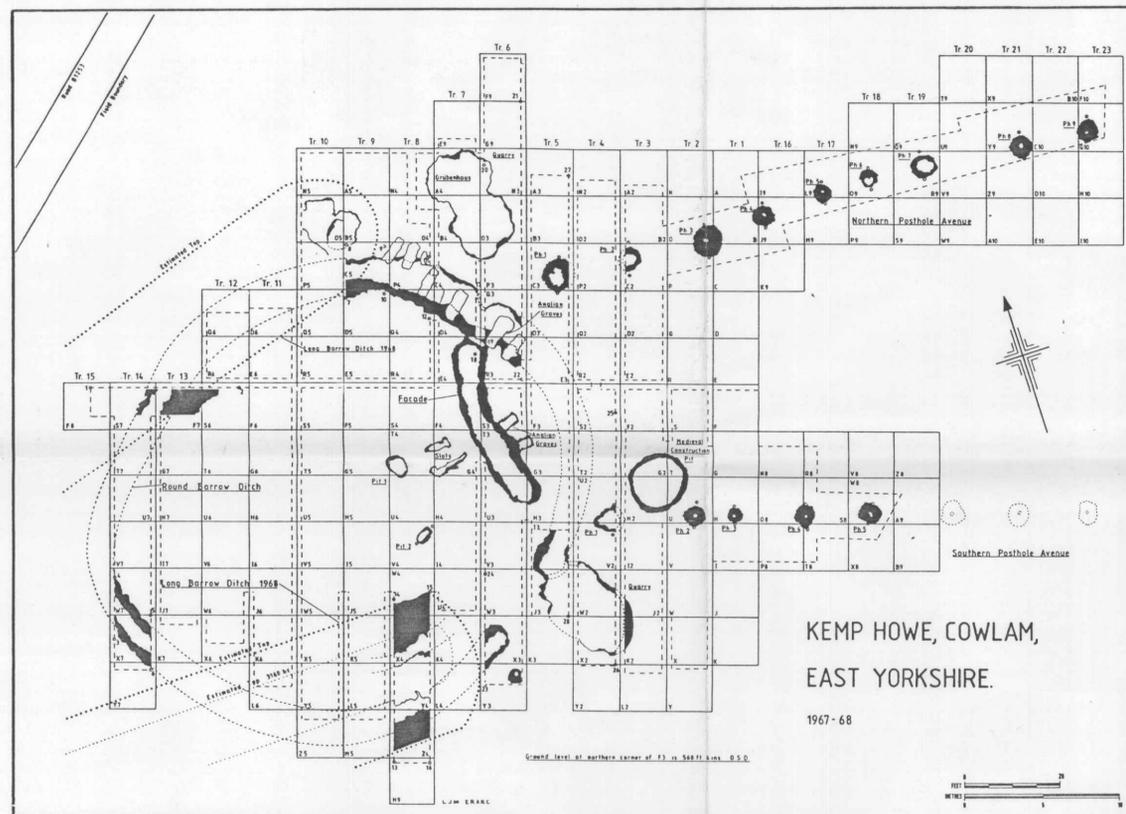
Geophysical Survey 1988



4 ▽ Trace-plot of magnetometer survey

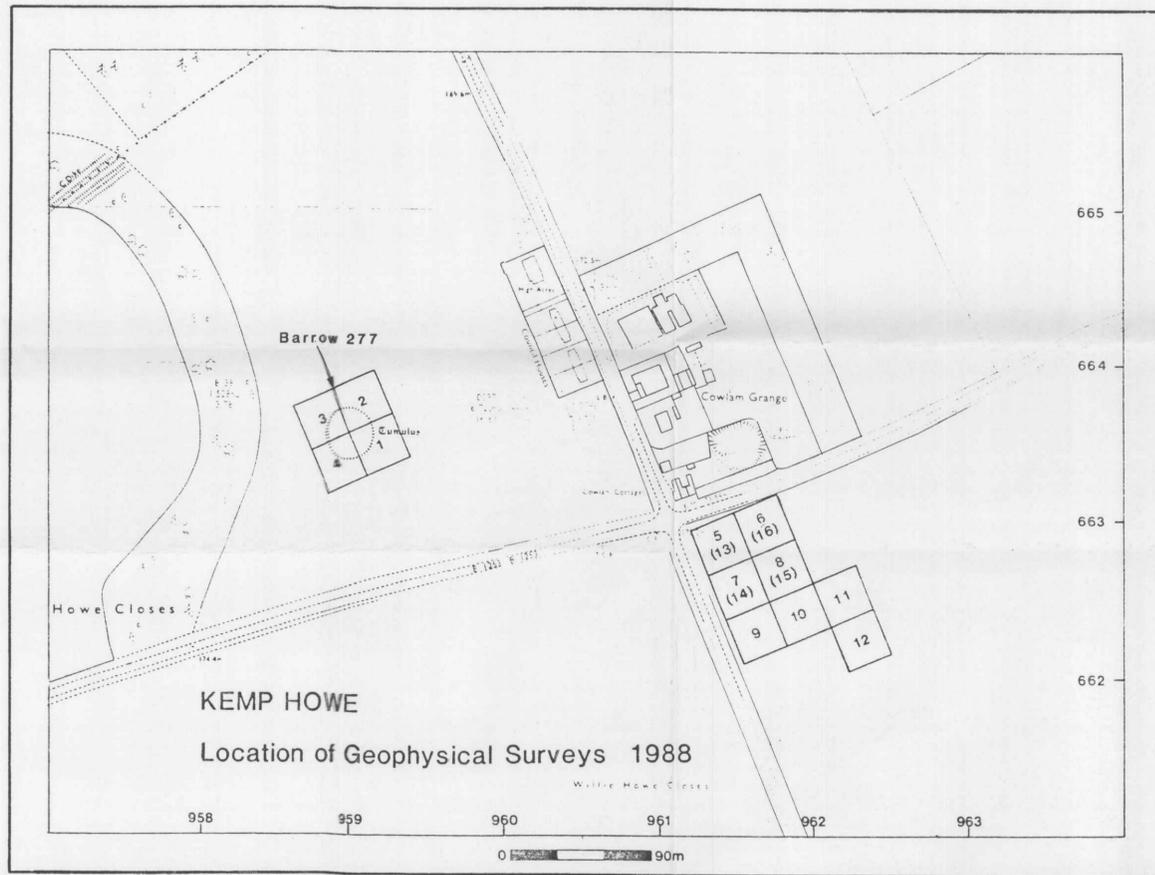


6 ▽ Plan of excavated features



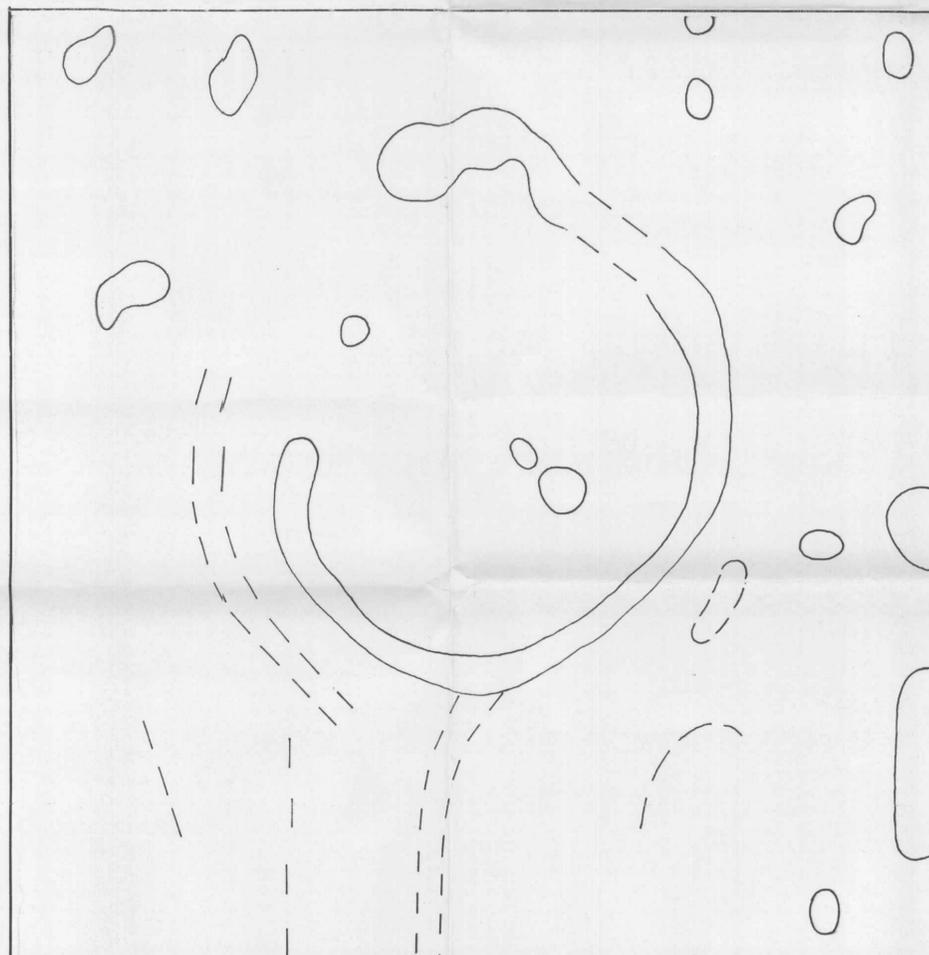
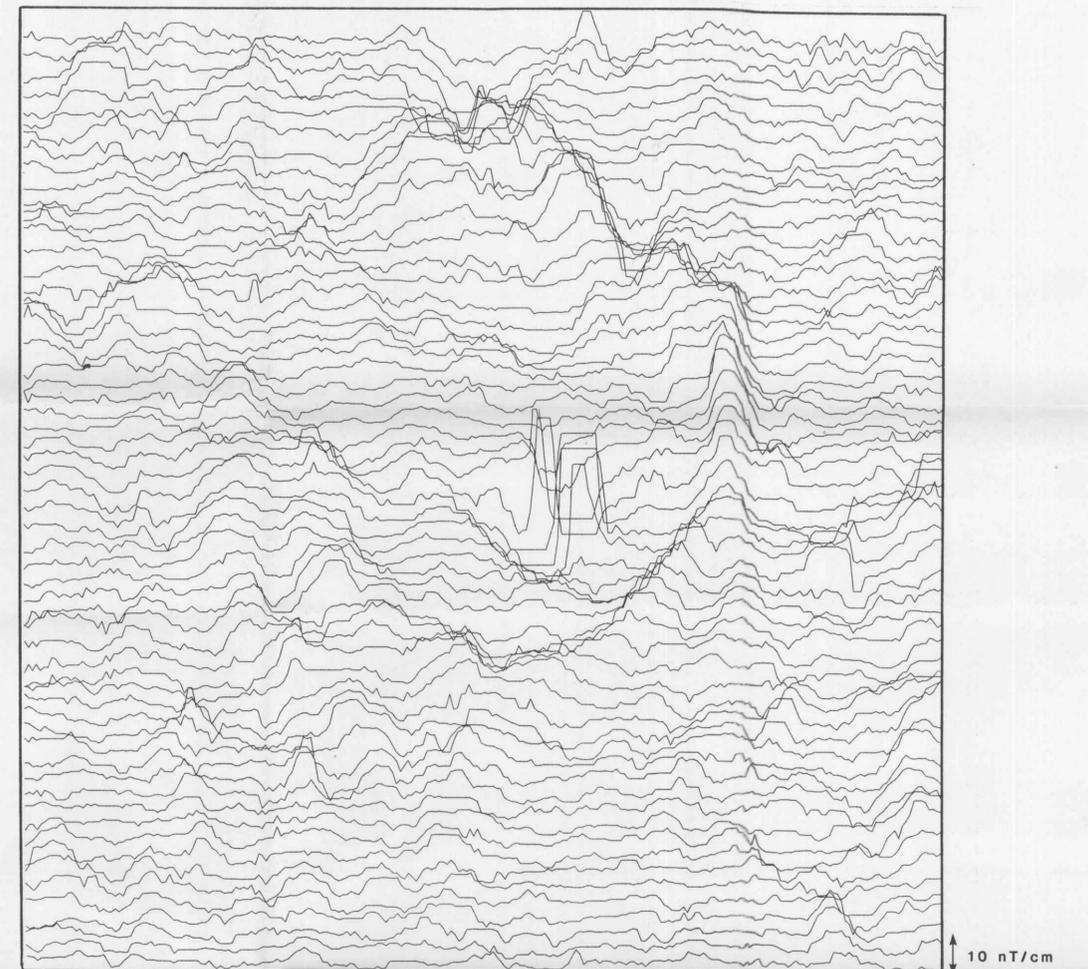
5 ▲ Grey-scale plot of resistivity survey

BARROW 277, COLLINGWOOD, N. HUMBERSIDE
Magnetometer Survey 1988



2

Trace plot



3

Interpretation



1

Grey tone image