

25. SITE SURVEY REPORT: KANA KEOKI SITES 3 AND 4 HONOLULU TO PONAPE, 1971

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In May 1971, the University of Hawaii R/V *Kana Keoki* surveyed two proposed drilling sites north of the Caroline Islands. These sites were to have been drilled on Leg 20; however, equipment problems onboard the D/S *Glomar Challenger* prevented the drilling. The survey reports are presented here for possible future use.

Both sites are in sedimentary basins, site 3 being between the Mapmaker and Magellan Seamount groups and Site 4 just north of the Caroline Islands group. Site 3 would appear to be suitable for determining the volcanic and pelagic history of the deep-sea floor of the area, as it probably was effectively isolated from any continental land mass for a long period, if not from the time of its creation. Site 4 may show the effect of the island group in addition to the same influences affecting Site 3.

All times on the records are in GMT.

Navigation was satellite-controlled and subsequently smooth-plotted by computer. Bathymetry was digitized and computer-plotted, as was the magnetic field.

The generally low magnetic gradients in the survey area probably indicate that the underlying basement has low relief. The areas of most prominent magnetic relief on the east of site 3 and south of site 4 appear to be related to bathymetric features.

The transparent-layer isopachs are obtained from the 3.5 kHz records. In most cases the bottom of this layer was distinct, but in some places it becomes indistinct. In spite of this occasional variability, the values at track crossings correspond closely. The significance of this layer is not known.

For site 3 the reflection records generally show four distinct reflections at the surface of the upper transparent layer. Upper intermediate reflector at about 0.05 sec two-way time, lower intermediate at 0.15 sec, and a basement reflector at approximately 0.4 sec. There are very faint indications of a deep reflector at 0.8 to 1 sec on a few records. If these indications are genuine, the section may be more than one kilometer thick.

The standard low-frequency filter setting was 10 to 55 Hz for 15 May, 1600-1800 hours and 50-100 Hz for 15

May, 1800-2400 hours; an 80 cu in. air cannon was used. On 16 May, 0100-0500 hours, a 40 cu in. air cannon was used, and the low-frequency filter setting was 20 to 80 Hz. For the remainder of the survey the low-frequency setting was 50 to 100 Hz, and only a sparker source was used. A high-frequency filter setting of 65 to 152 Hz was employed throughout.

The track goes directly from site 3 to site 4, crossing several low features between the Magellan Seamounts and northern extension of the Ralik Chain of islands. At 0800 on 19 May, the record shows a feature remarkably similar to one seen on records obtained from the Murray Fracture Zone.

Site 4 reflection records vary in quality. The air cannon was not operative for the first part of the survey, and there was no profiler or magnetic coverage on track from 1050 on 22 May until approximately 1800-1900 on 22 May (see figures). However, records are generally good for the major part of the survey. Air cannon records indicate good reflectors down to 0.7 to 0.8 sec two-way time, with traces of a reflector at about 1.0 sec on some records. The records generally indicate that the structure is a basin and our tracks touch the edges to the north, south, west, and possibly east.

Where only the sparker was running, filter settings on the low-frequency record were 70 to 100 Hz. Where the air cannon (40-cu in. chamber) was also running, settings were generally 30 to 80 Hz. High frequency settings were always 65 to 125 Hz. Much of the noise on the records was due to sea state, which was approximately state six for the first day and then gradually moderated.

3.5-kHz isopachs: Transparent layer isopachs are subject to the same conditions as for site 3, but the layer is generally thinner. The layer appears to be softer than the underlying materials as free-fall cores dropped in the center of the survey area came back filled, but one core recovered at the northern station had only about 45 cm of sediment, and another core did not return at all. The thickness was calculated using an assumed velocity of 1500 m/sec.

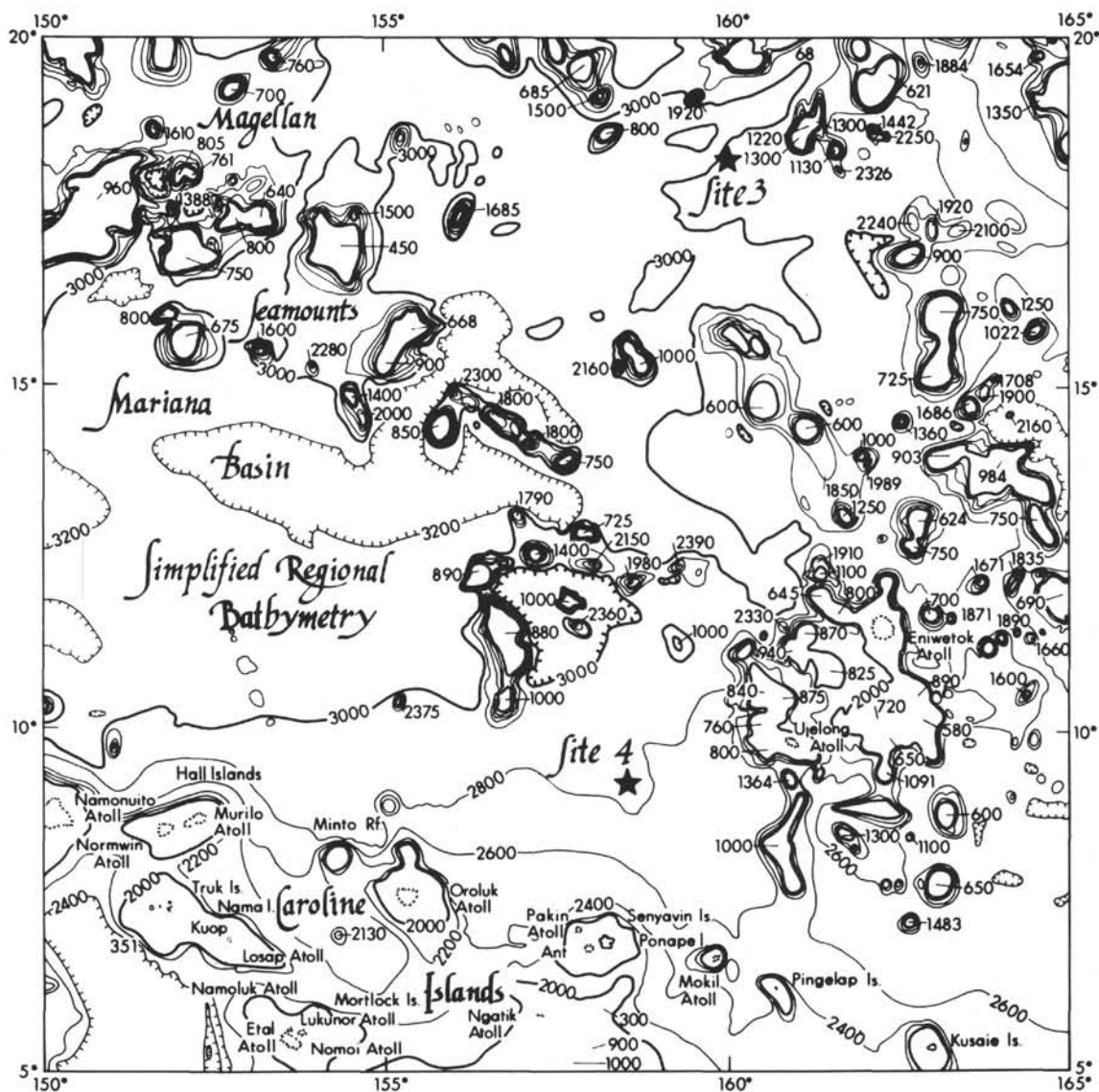


Figure 1. Simplified regional bathymetry, modified from *Bathymetry of the North Pacific*, sheets 6 and 7, T. E. Chase, H. W. Menard, and J. Mammerickx. I.M.R. Tech Report, Series TR-11.

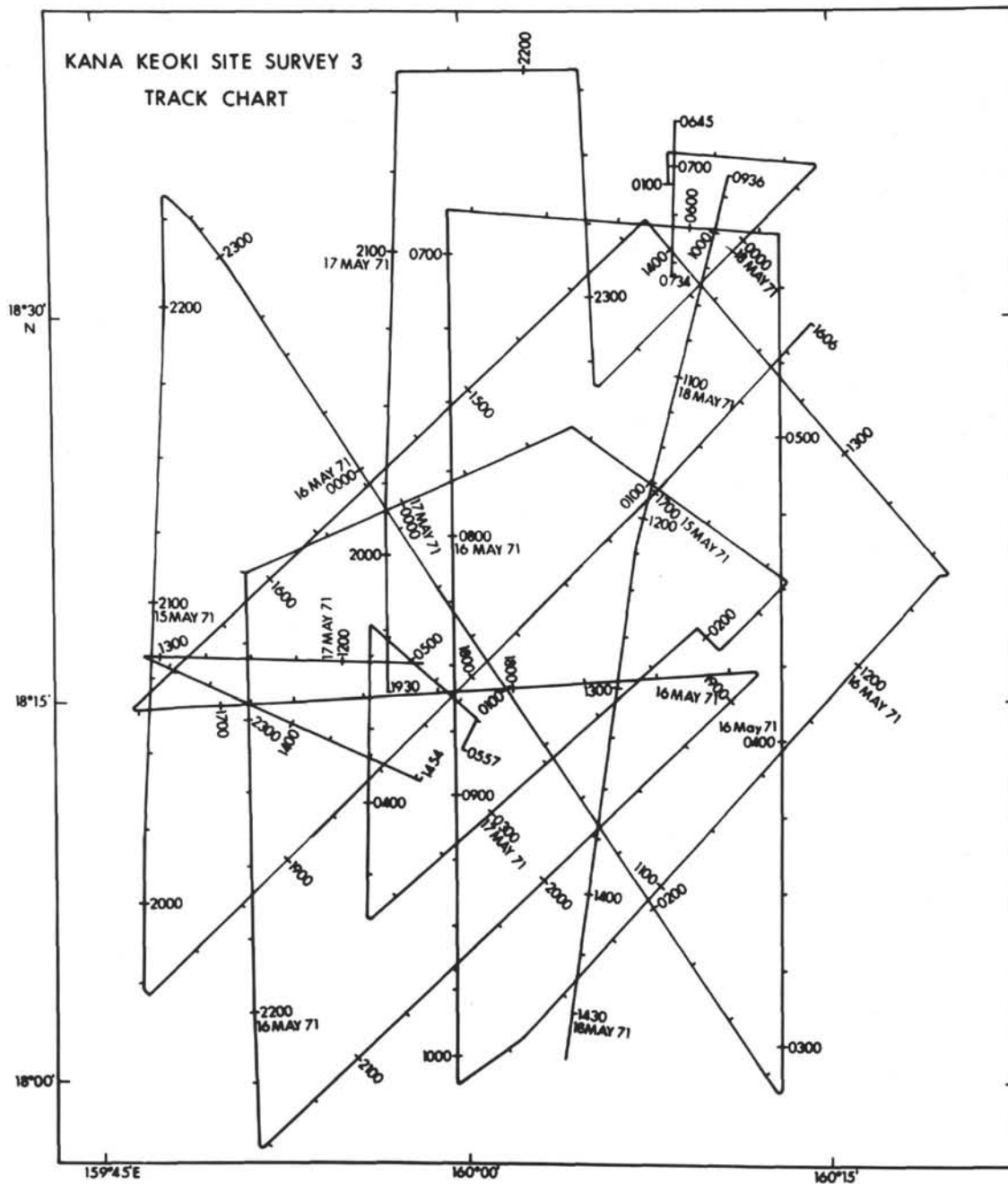


Figure 2. Site 3 – track chart.

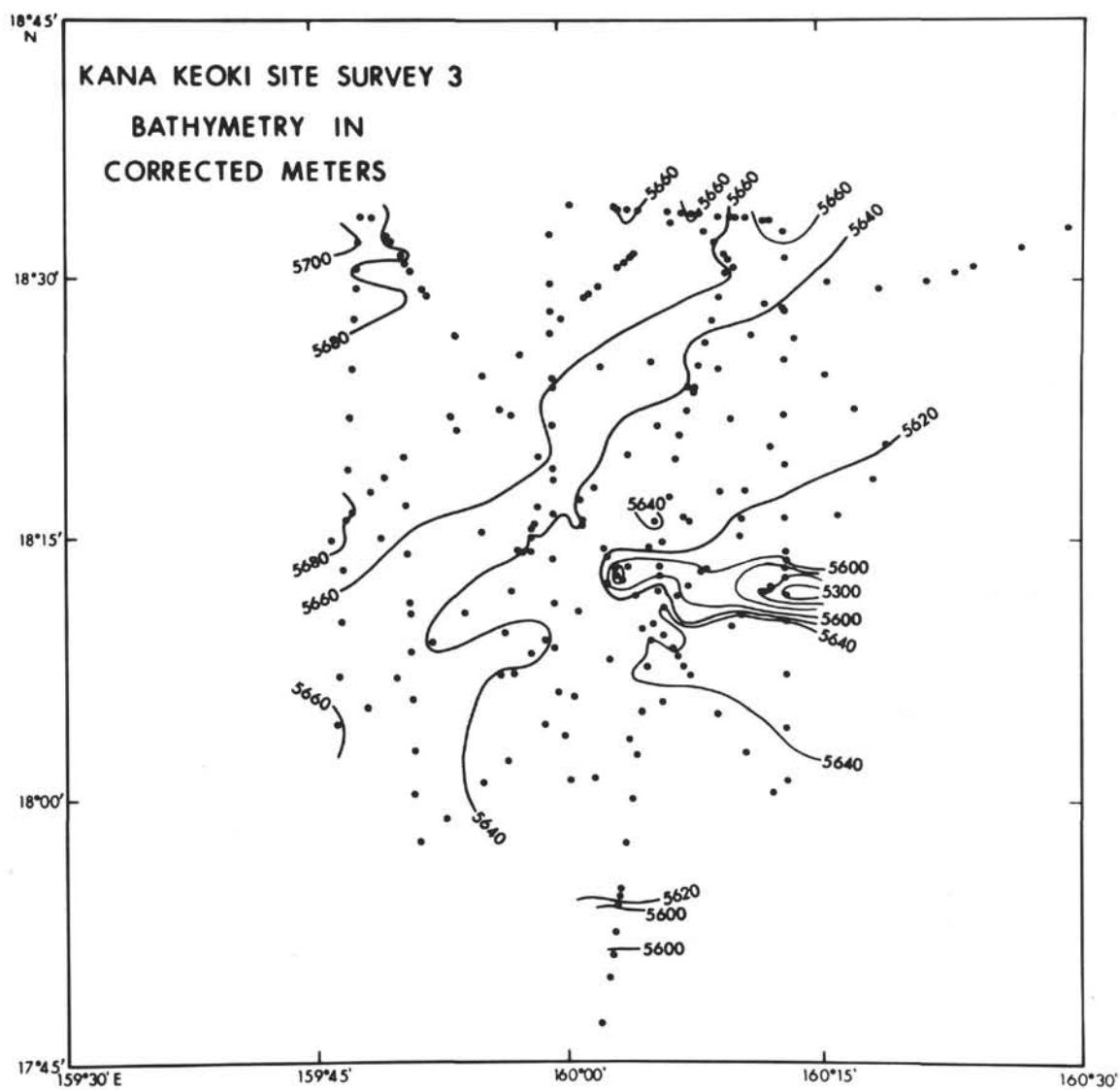


Figure 3. Site 3 – bathymetry.

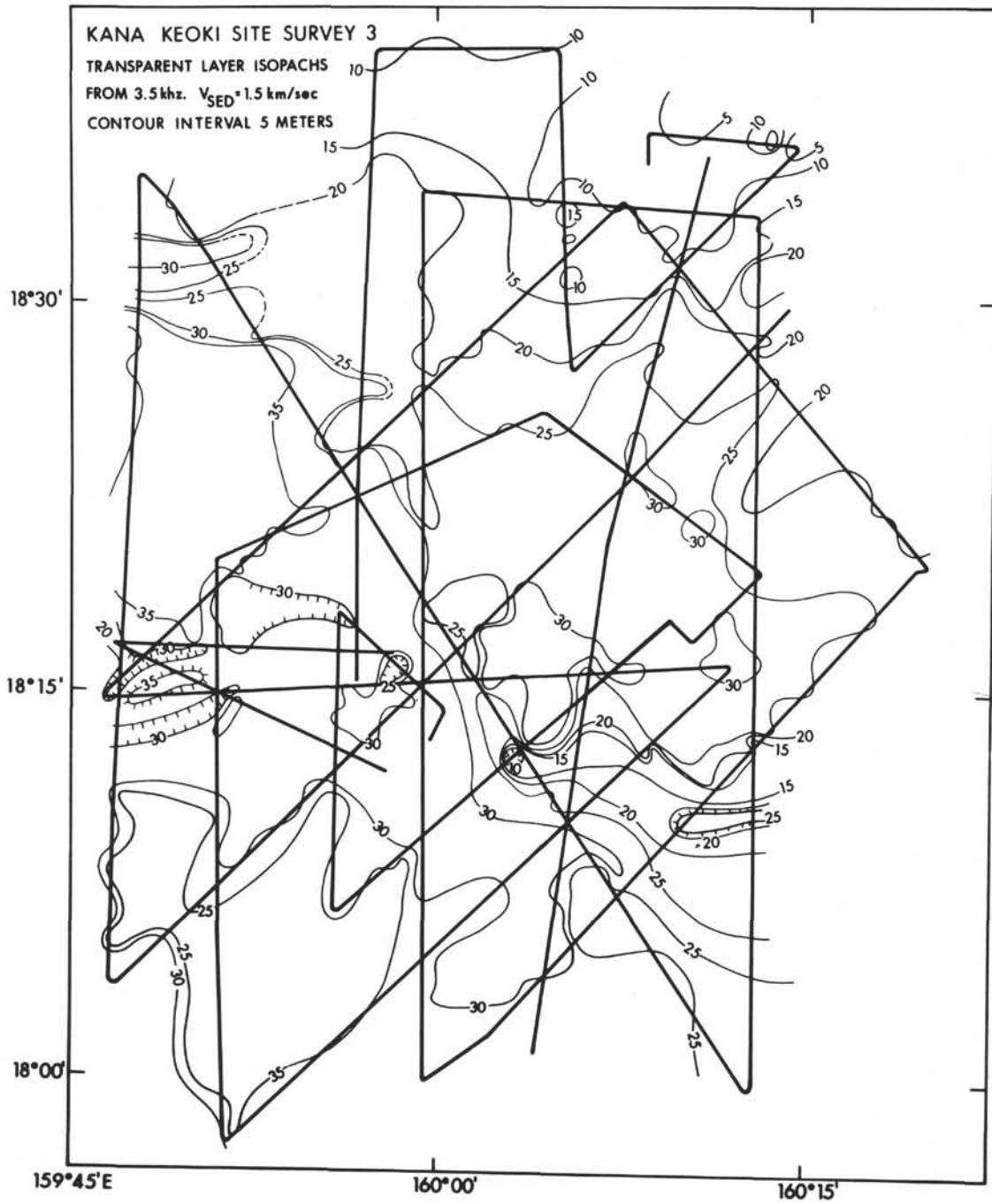


Figure 4. Site 3 - transparent layer isopachs.

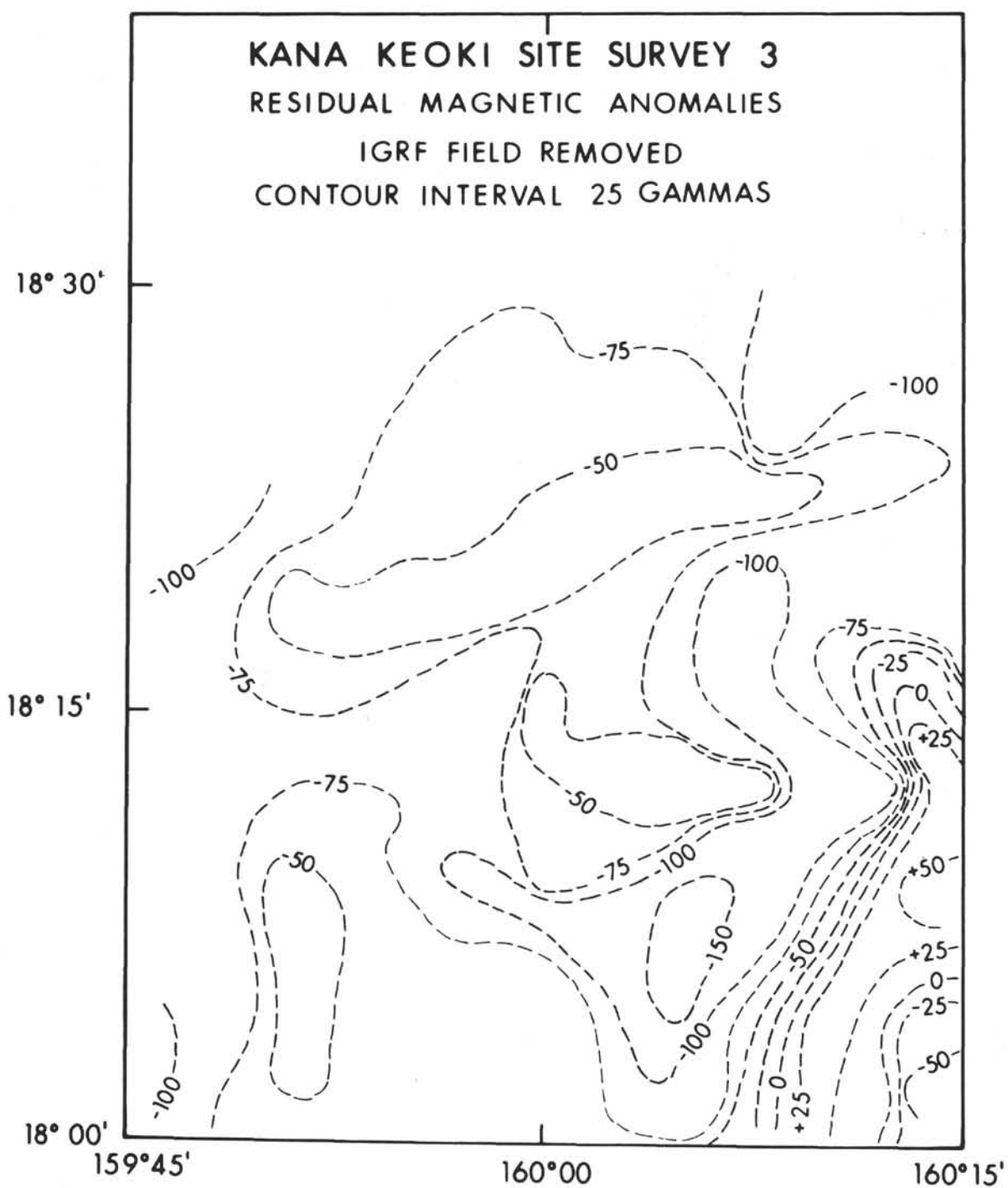


Figure 5. Site 3 – residual magnetic anomalies.

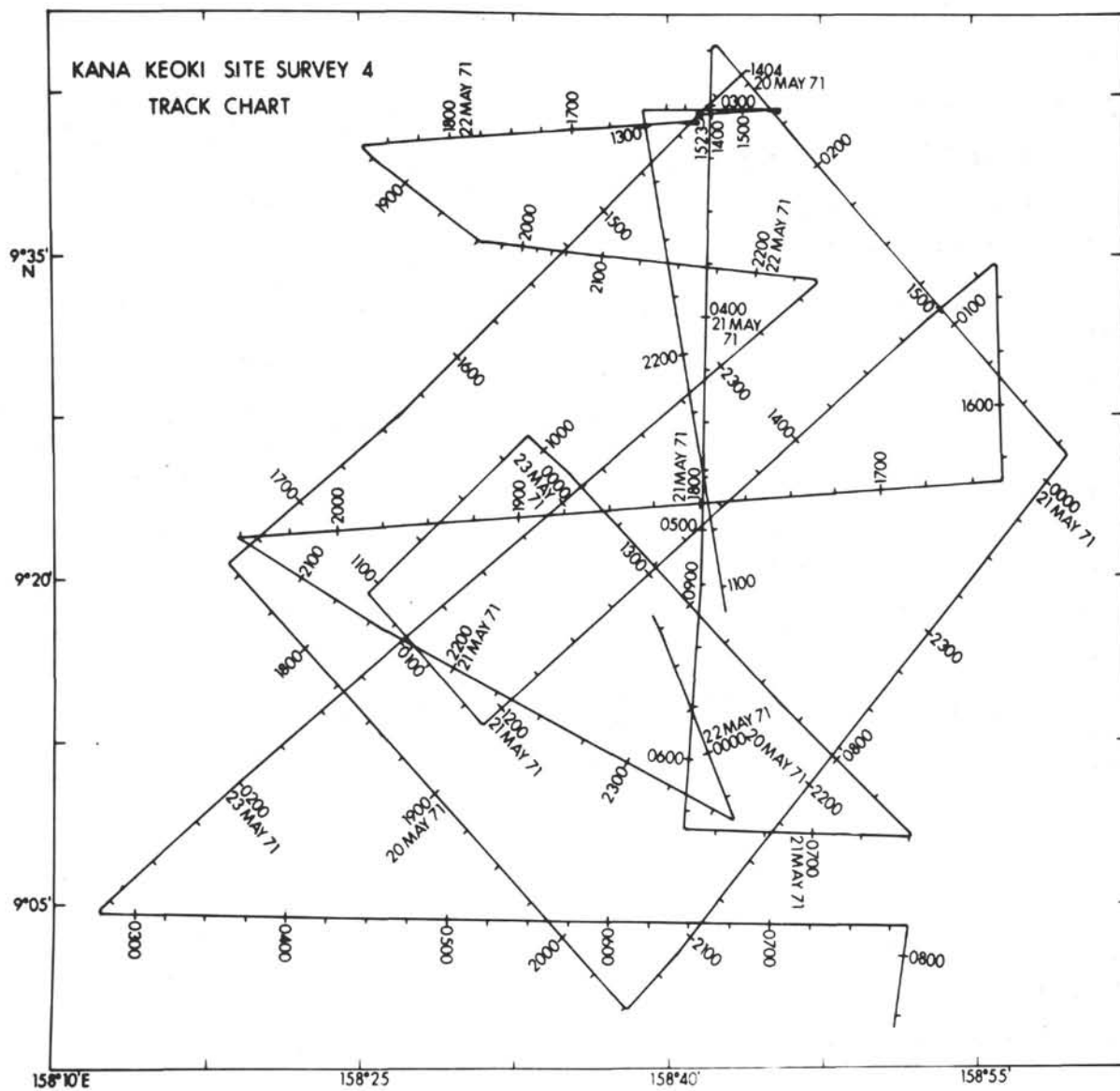


Figure 6. Site 4 – track chart.

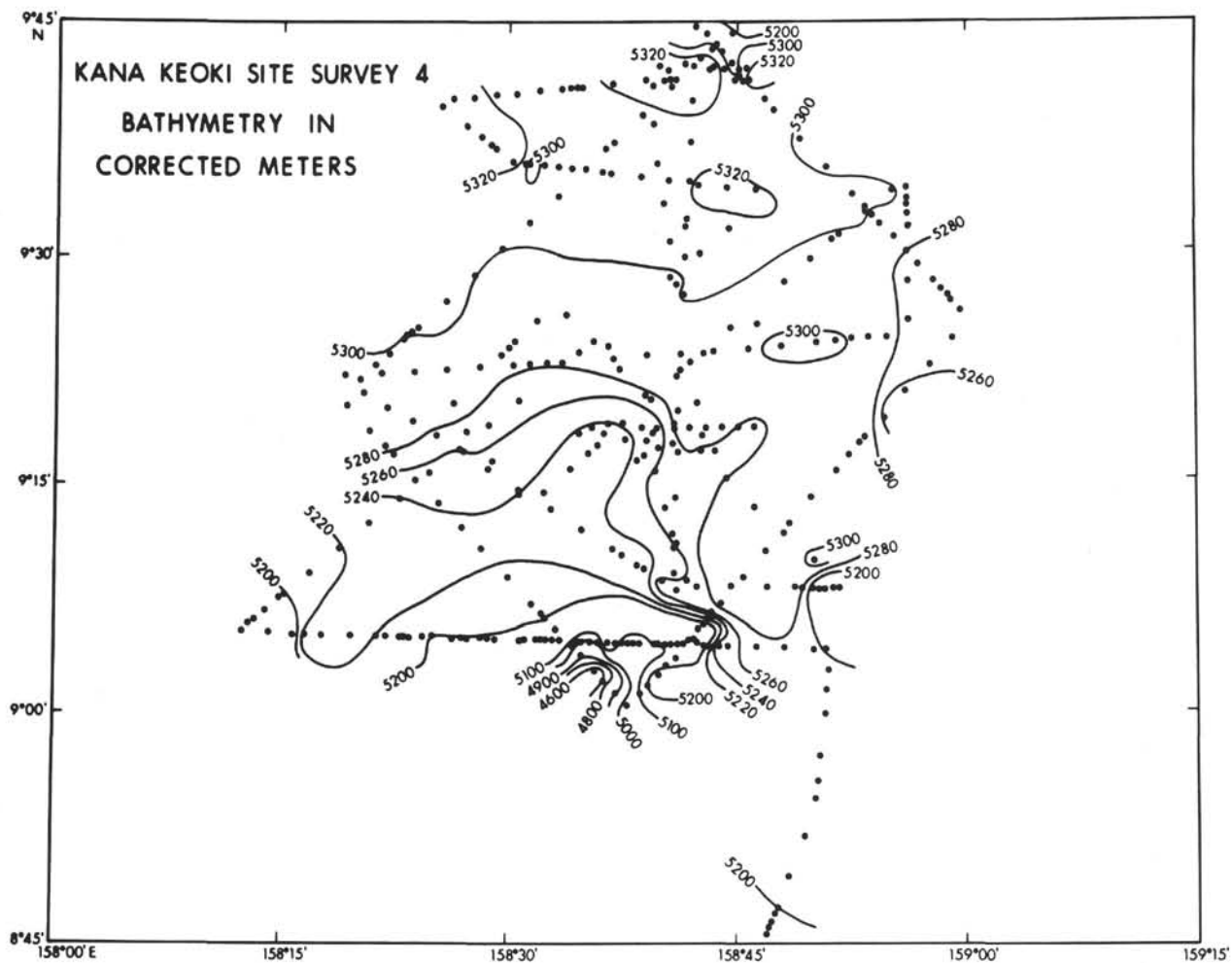


Figure 7. Site 4 – bathymetry.

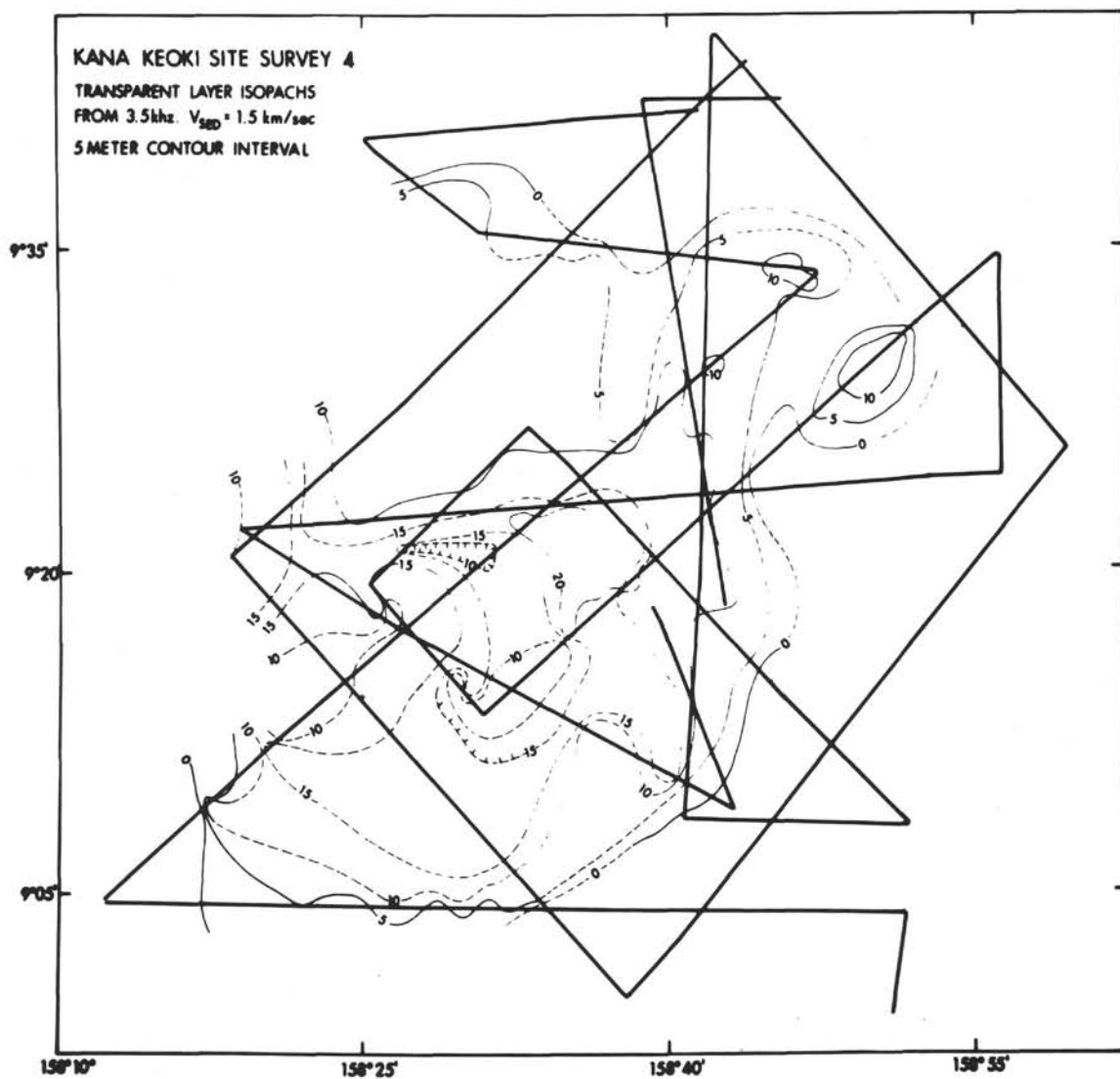


Figure 8. Site 4 – transparent layer isopachs.

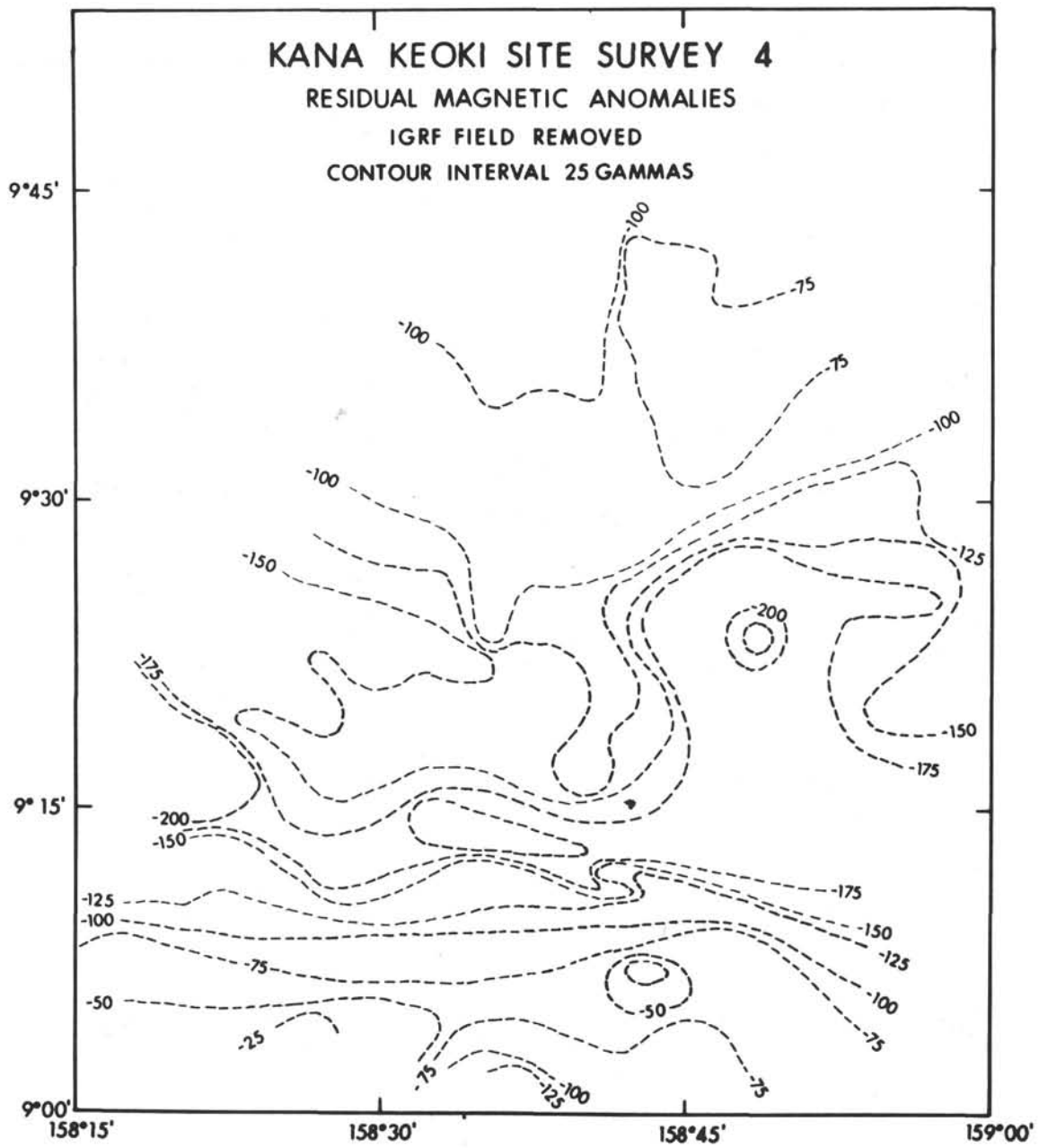
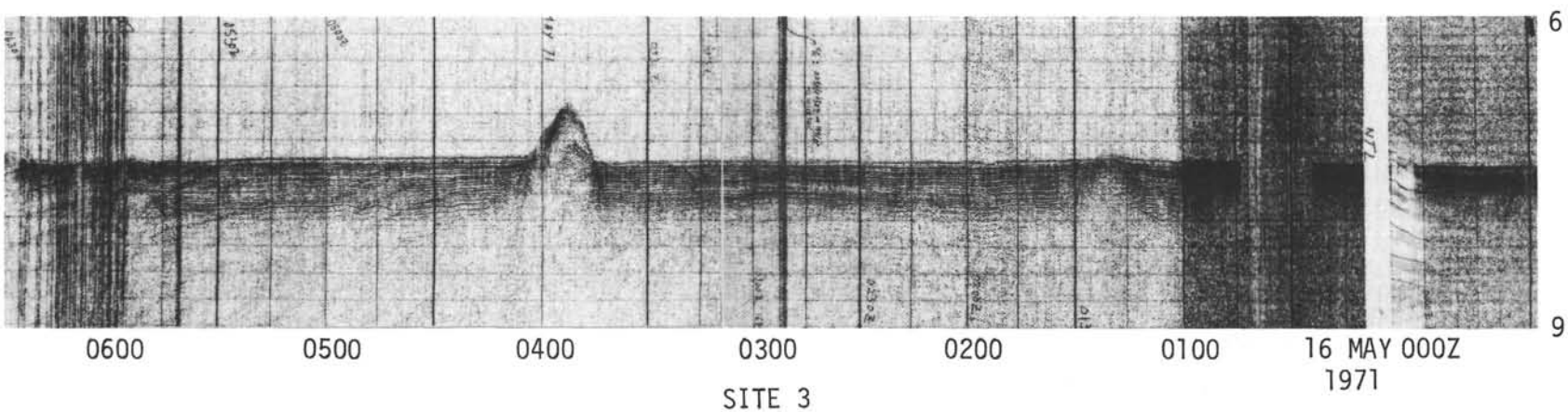
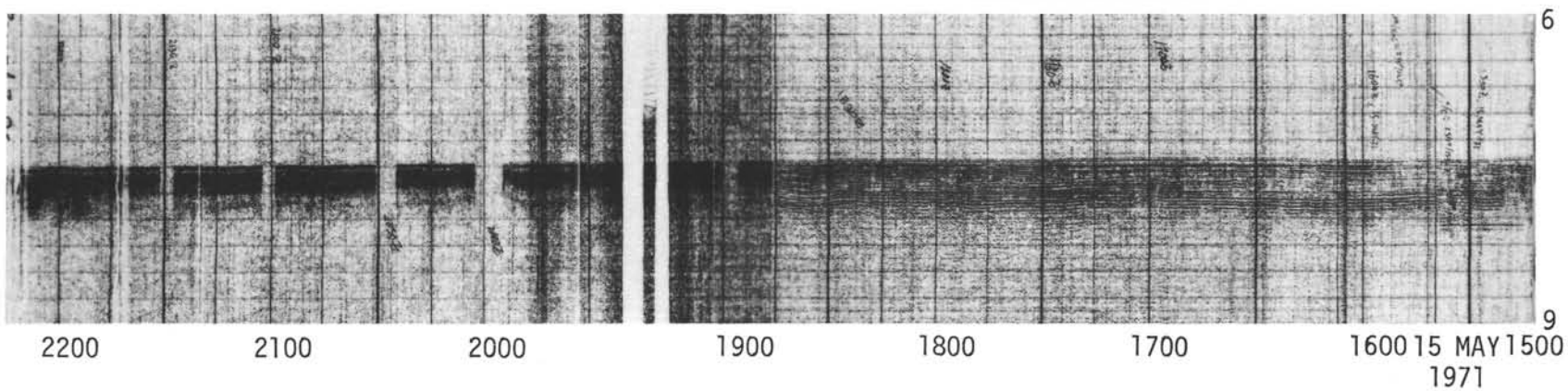
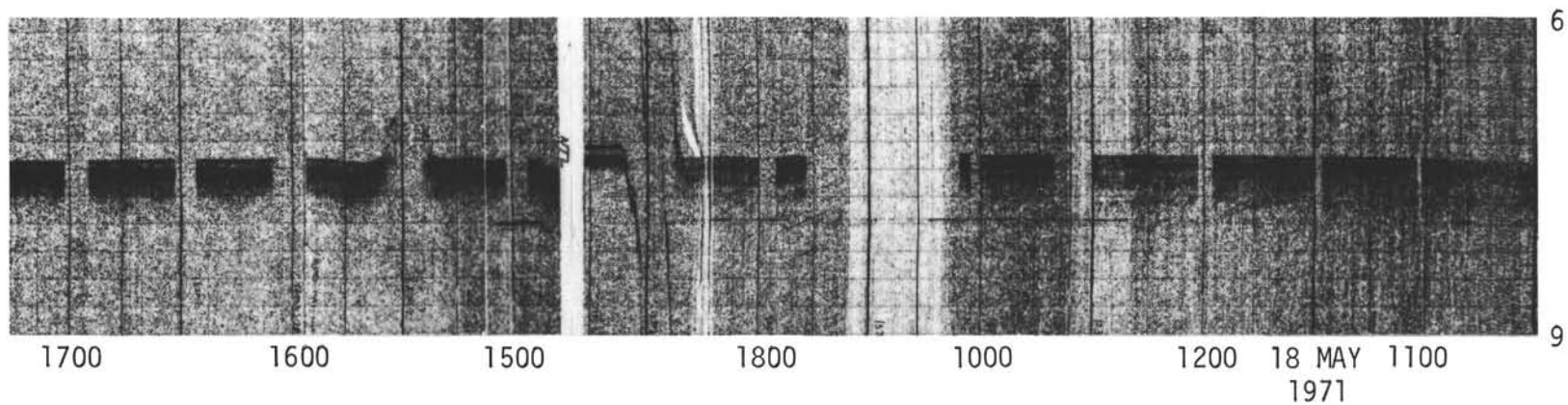
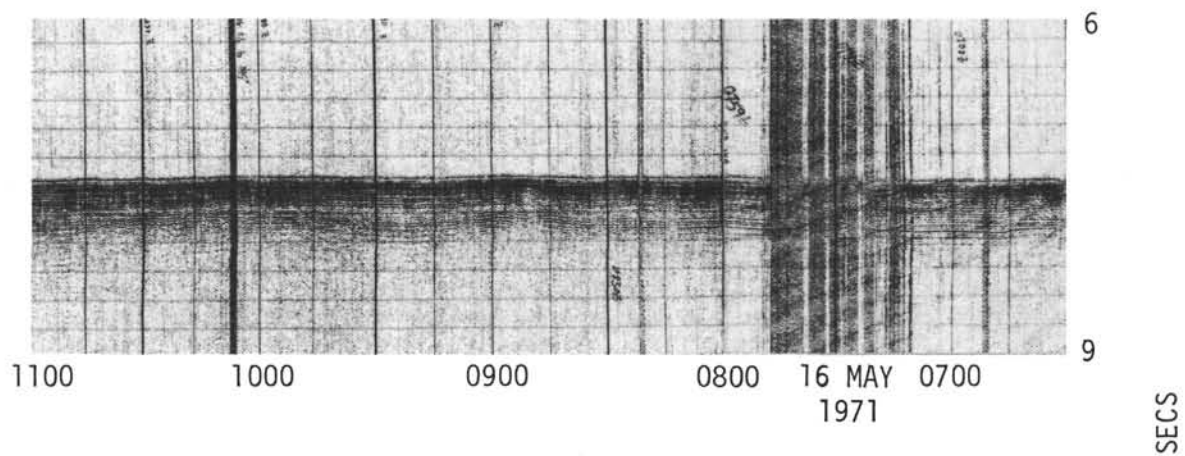


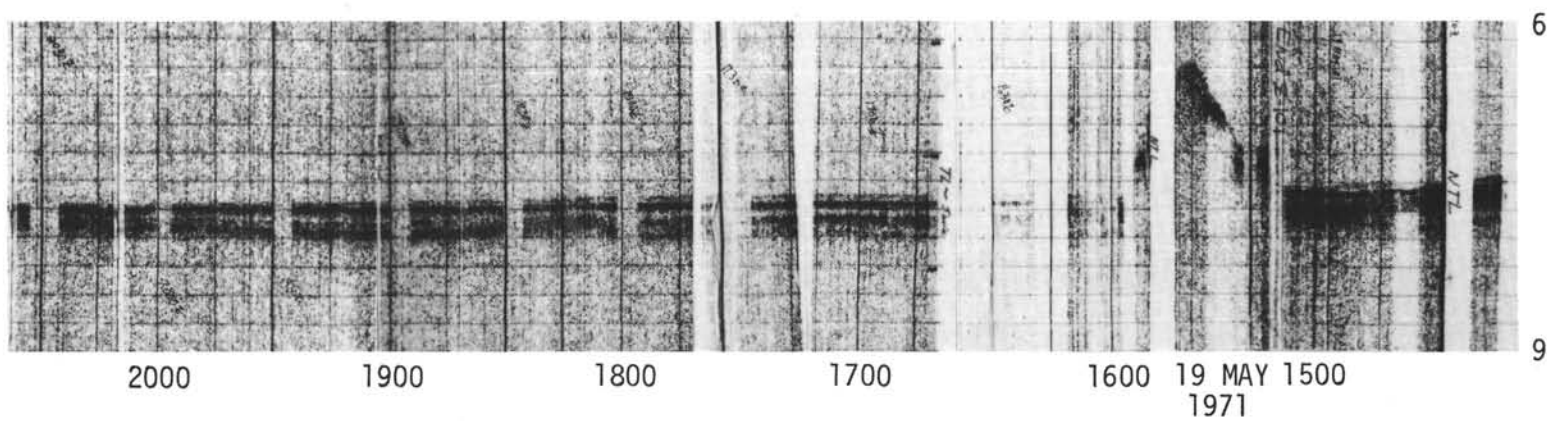
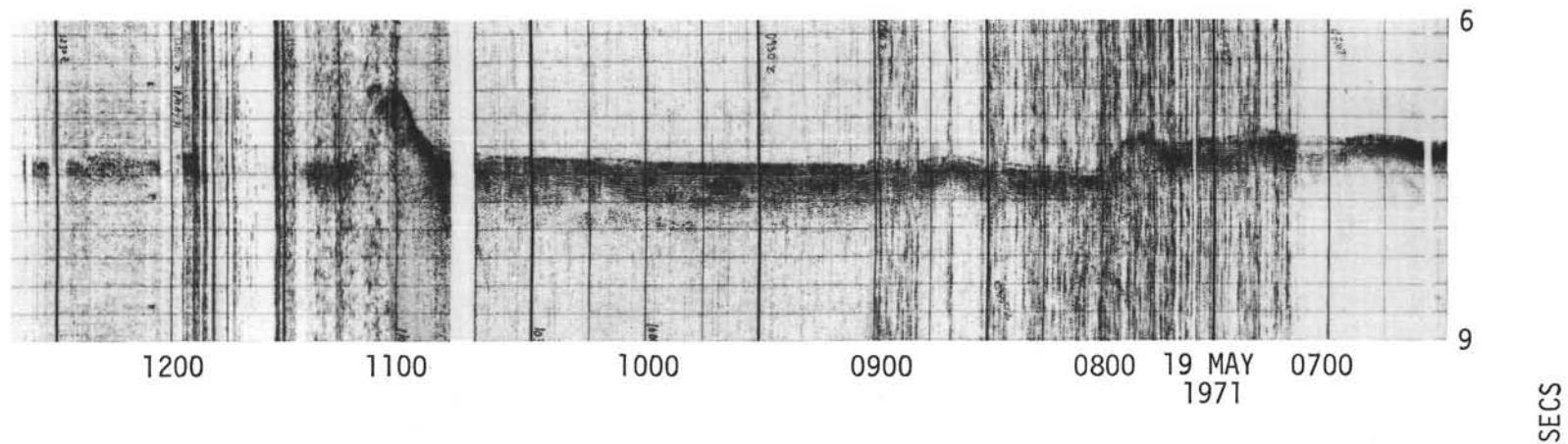
Figure 9. Site 4 – residual magnetic anomalies.



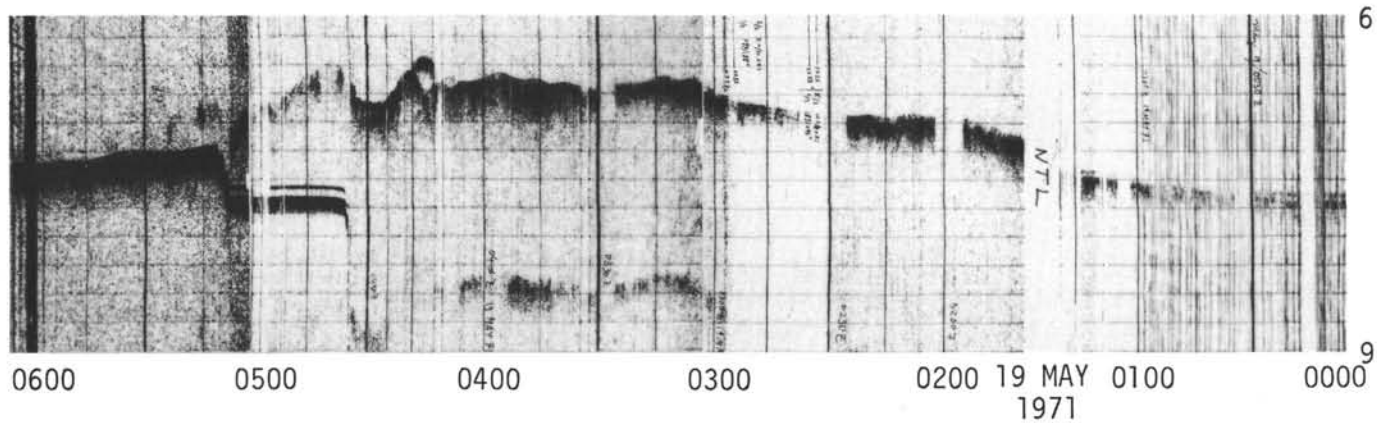
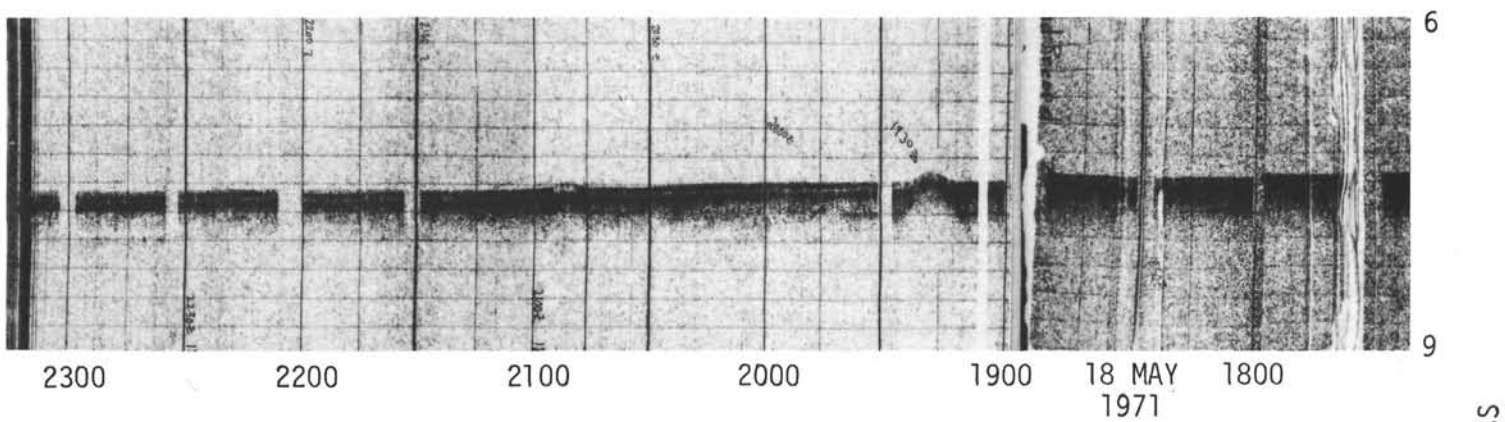
SITE 3



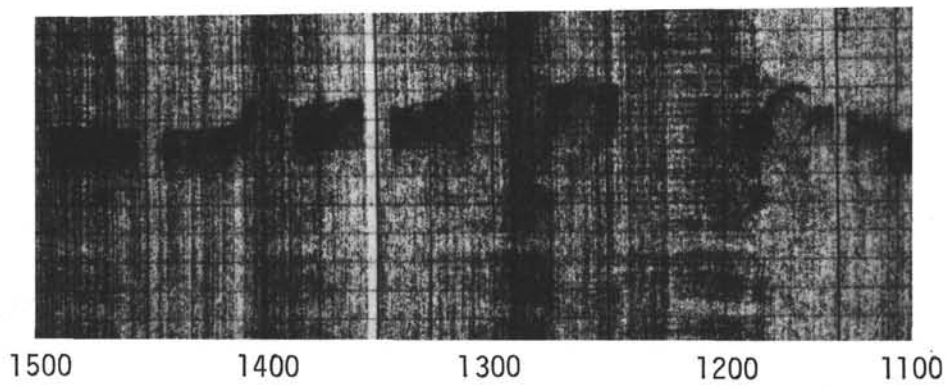
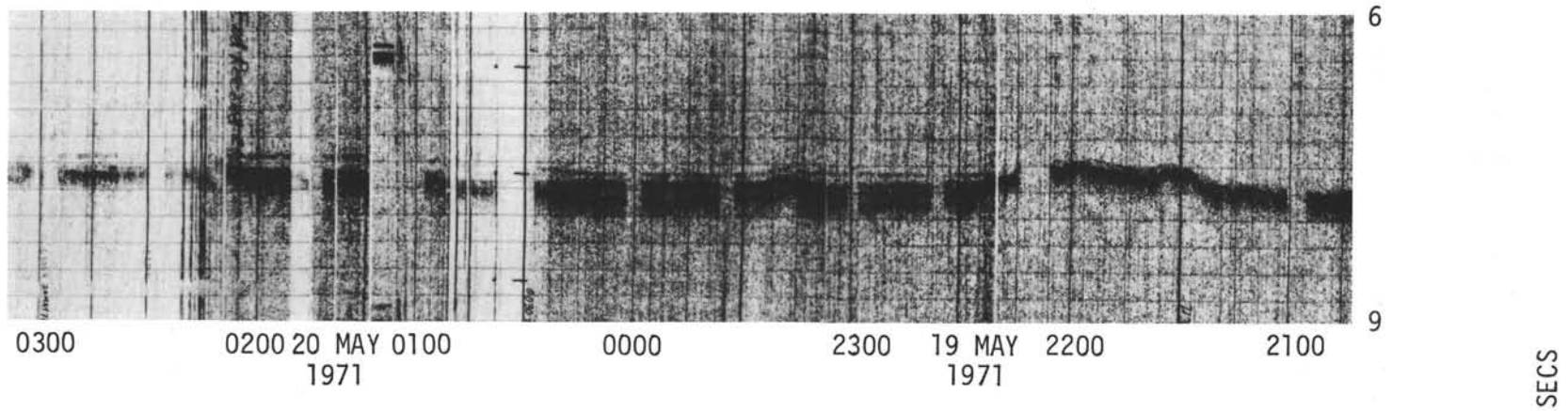
END OF SITE 3 AND START OF TRACK TO SITE 4



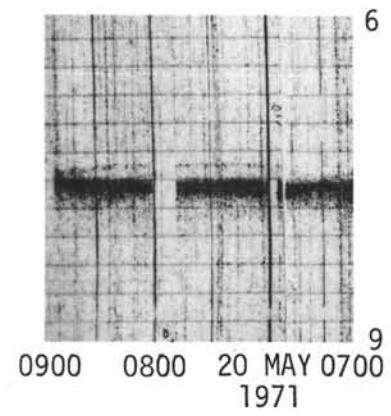
TRACK BETWEEN SITE 3 AND SITE 4

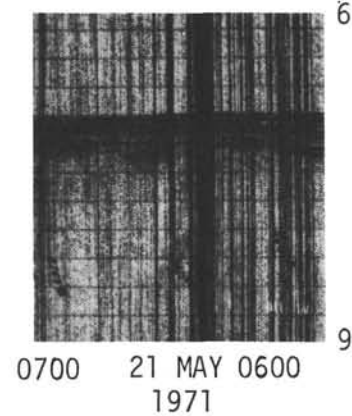
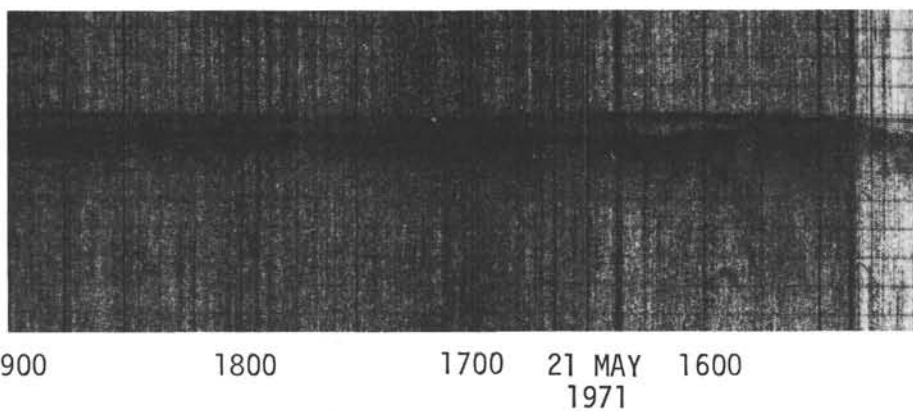
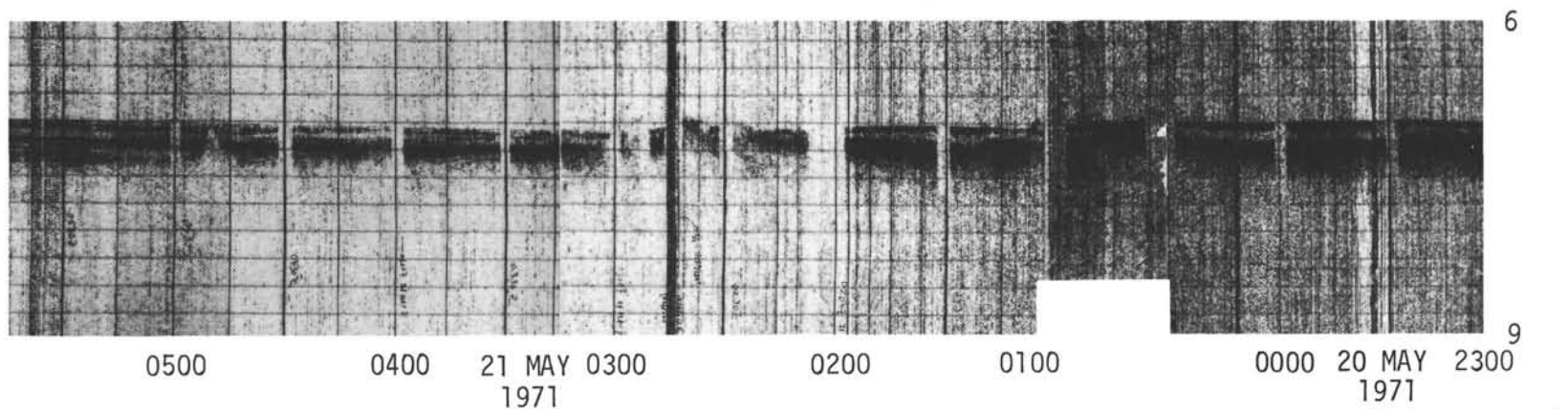


TRACK BETWEEN SITE 3 AND SITE 4

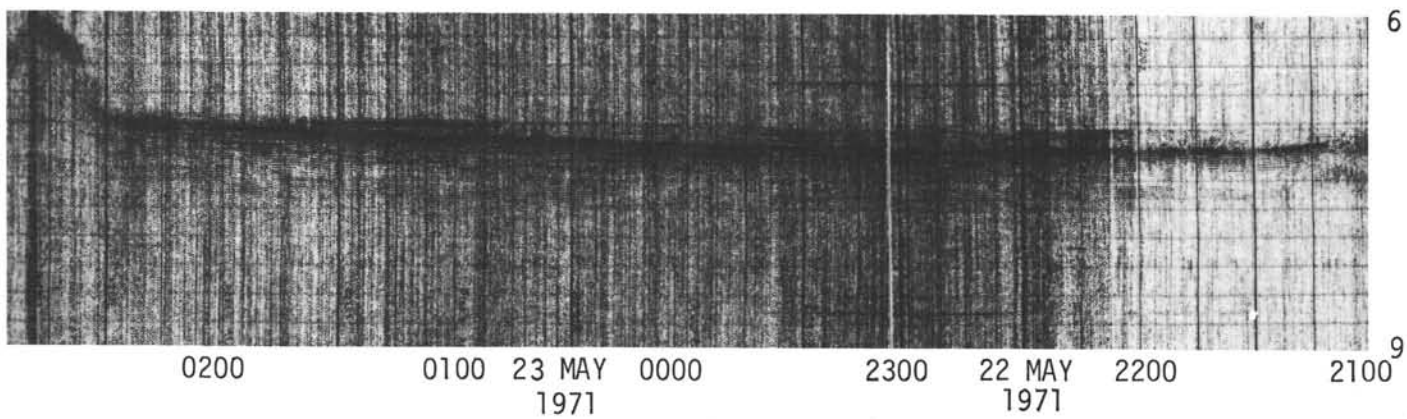
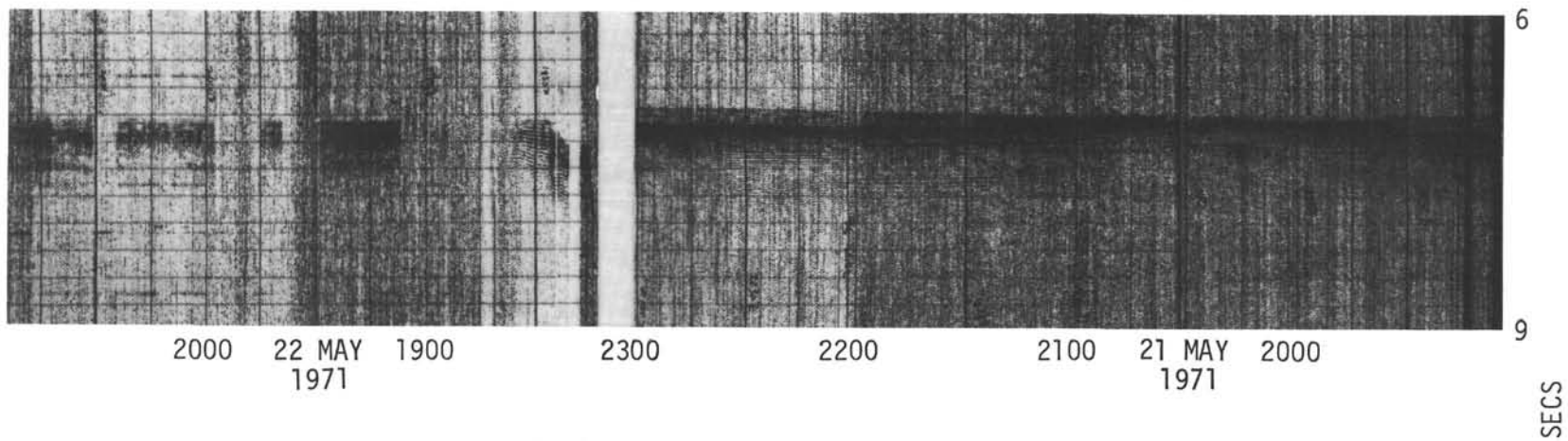


TRACK BETWEEN SITE 3 AND SITE 4





END OF TRACK TO SITE 4 AND START OF SITE 4



SITE 4