IV. GRAVITY MEASUREMENTS

Masato Joshima

Gravity measurements were carried out using a LaCoste-Romberg gravity meter. The accuracy of the equipment is within approximately one milligal. The initial gravity measurement (base reading) was 10699.4 at Funabashi berth and the final measurement at the end of this survey was 10686.4 at Funabashi. Gravity values were corrected linearly for this difference in value and an eötovös correction for ship's velocity was also made.

Free air gravity anomalies were calculated and the results are shown in Fig. IV–1 in which the units are milligals. One of the largest positive anomalies is observed west of the Oki Islands and southwest of the Koshiki Islands, where the anomaly is approximately +60 milligal. The other is observed in the Korean rise, where the anomaly is +50 milligal. One of the largest negative anomalies is observed in the deepest part of the Japan Sea, where the anomaly is −20 milligal. Other anomalies are observed in the trough, west of the Koshiki Islands, where the anomaly is −10 milligal, and in the northwest of the Tsushima Islands, where the anomaly is −30 to −40 milligal.

The negative anomalies in the continental shelf, northwest of the Tsushima Islands, may correspond to the light material of the thickly deposited layer. A zone of positive gravity anomalies is observed on the continental shelf of the Japan Sea, approximately 100 km off shore. This suggests that heavy material arches up beneath the continental shelf which is well illustrated in L23 and L27. Some of these show a magnetic anomaly, in which case the heavy material may represent volcanics; elsewhere it may represent older sedimentary layers.

The gravity anomaly values are not very large. This fact may suggest that the anomalies are caused only by geological structures.

All of profiles are shown in Fig. IV–2, with magnetic anomalies whose reference field is IGRF (1975), free air gravity anomalies, simple Bouguer gravity anomalies and water depths which are corrected by MATTHEWS' Table.

References Cited

MATTHEWS, D. J. (1939) *Table of the velocity of sound in pure water and sea water for use in echo-sounding and sound-ranging*. Hydrographic department, Admiralty, Majesty's stationery office, London.

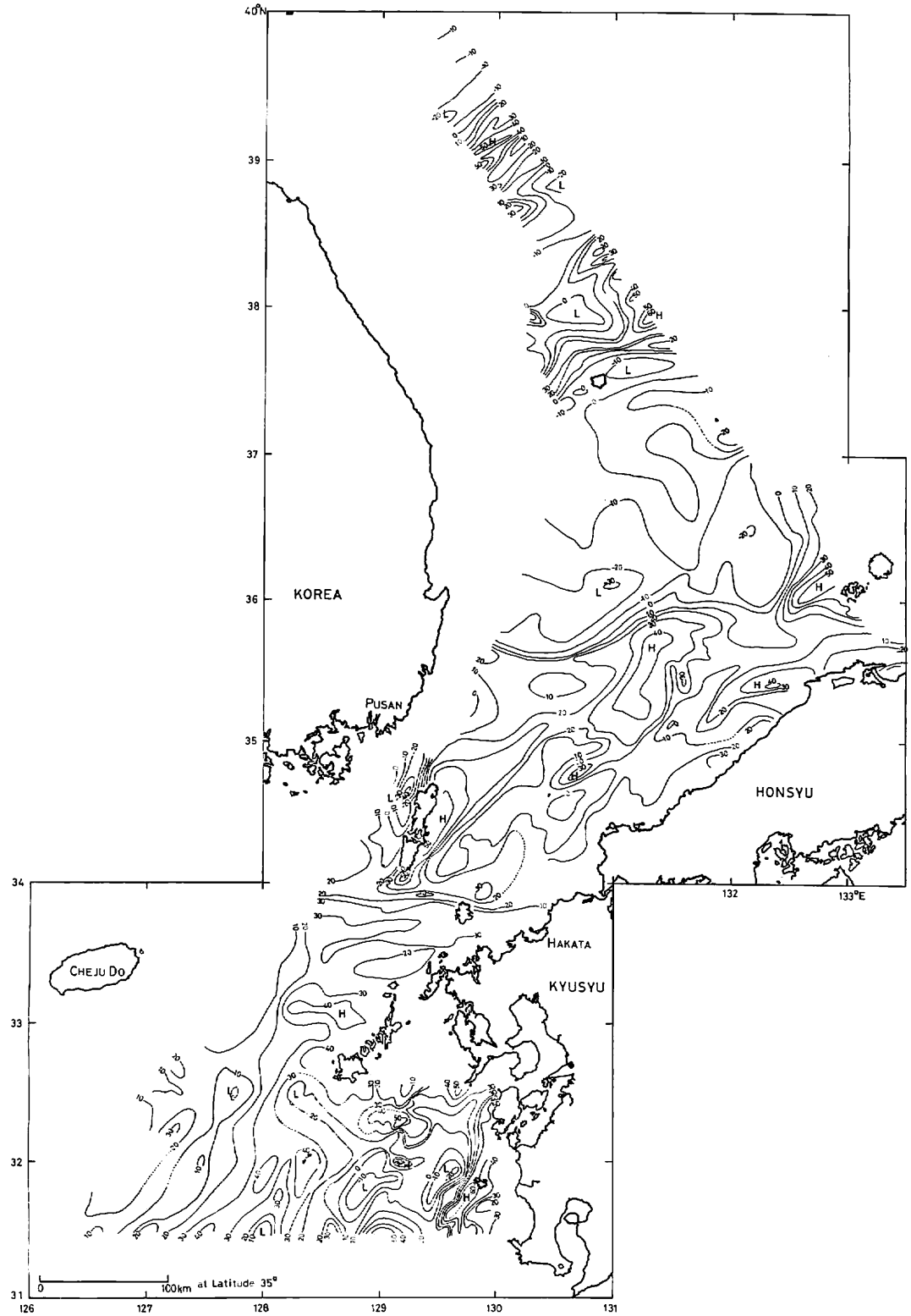
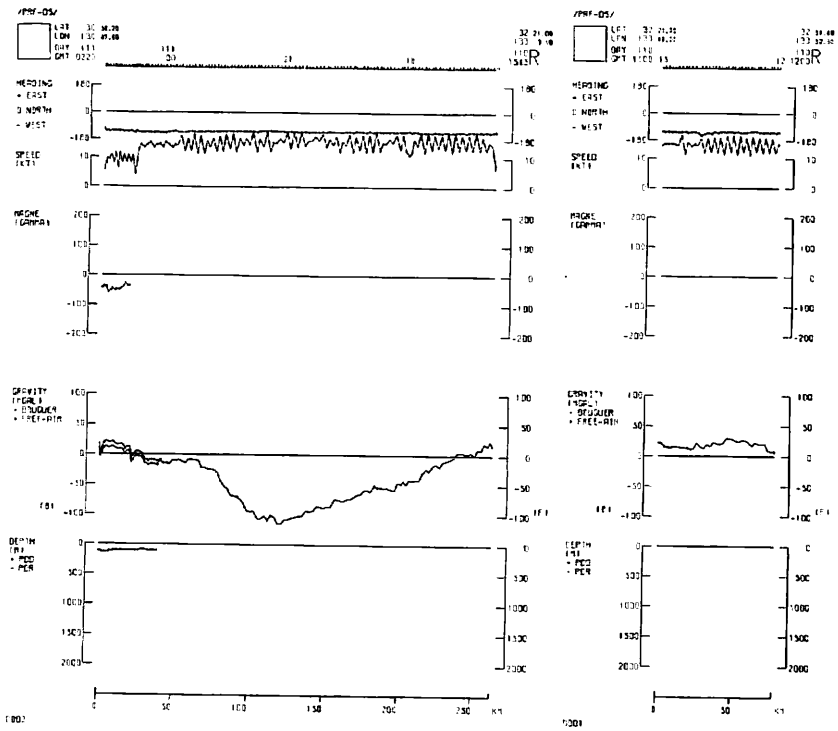


Fig. IV–1 Contour map of free air anomalies west of Kyushu and northwest of Western Honshu. The number in the contours is in units of milligals, and the contour interval is 10 milligals.



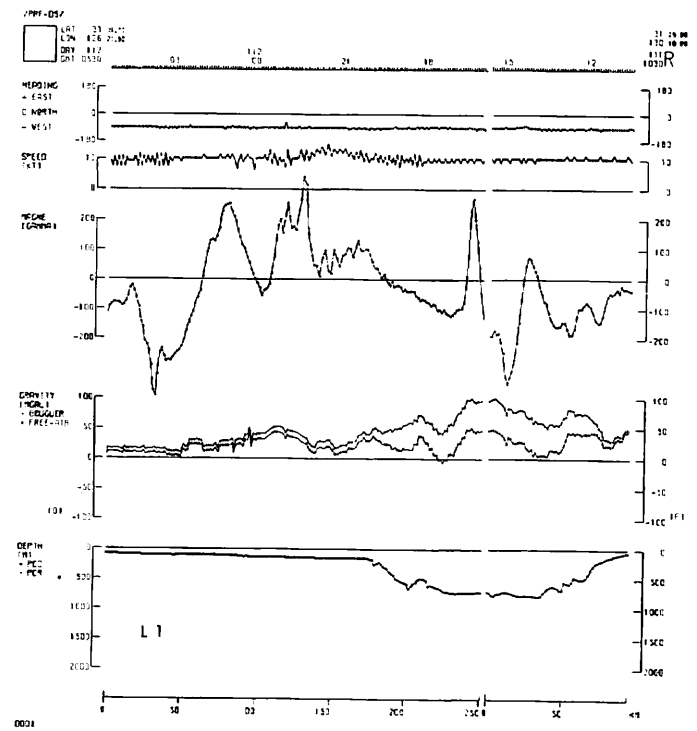
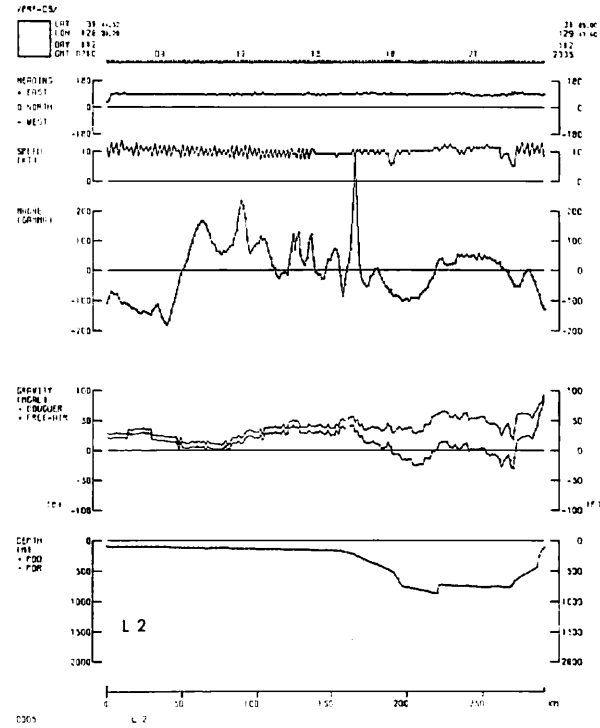
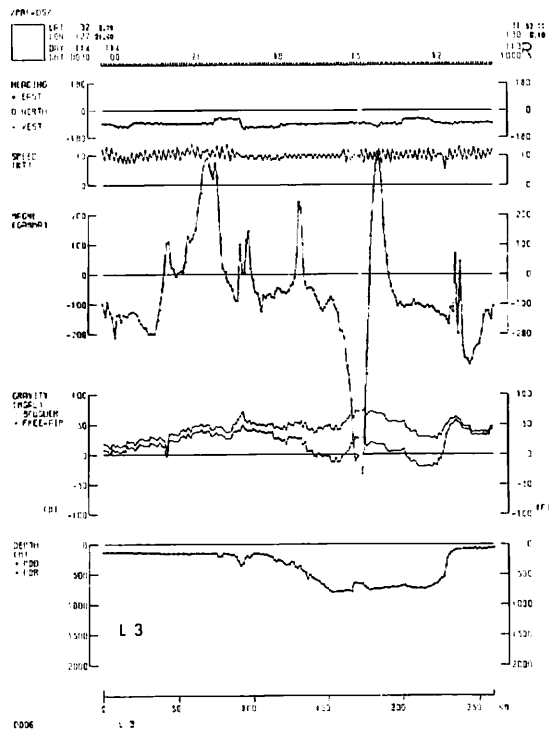


Fig. IV–2 (1) Profiles of topography and anomalies. Bouguer correction density is 2.67 gr/cm^3. Time is Greenwich Mean Time.





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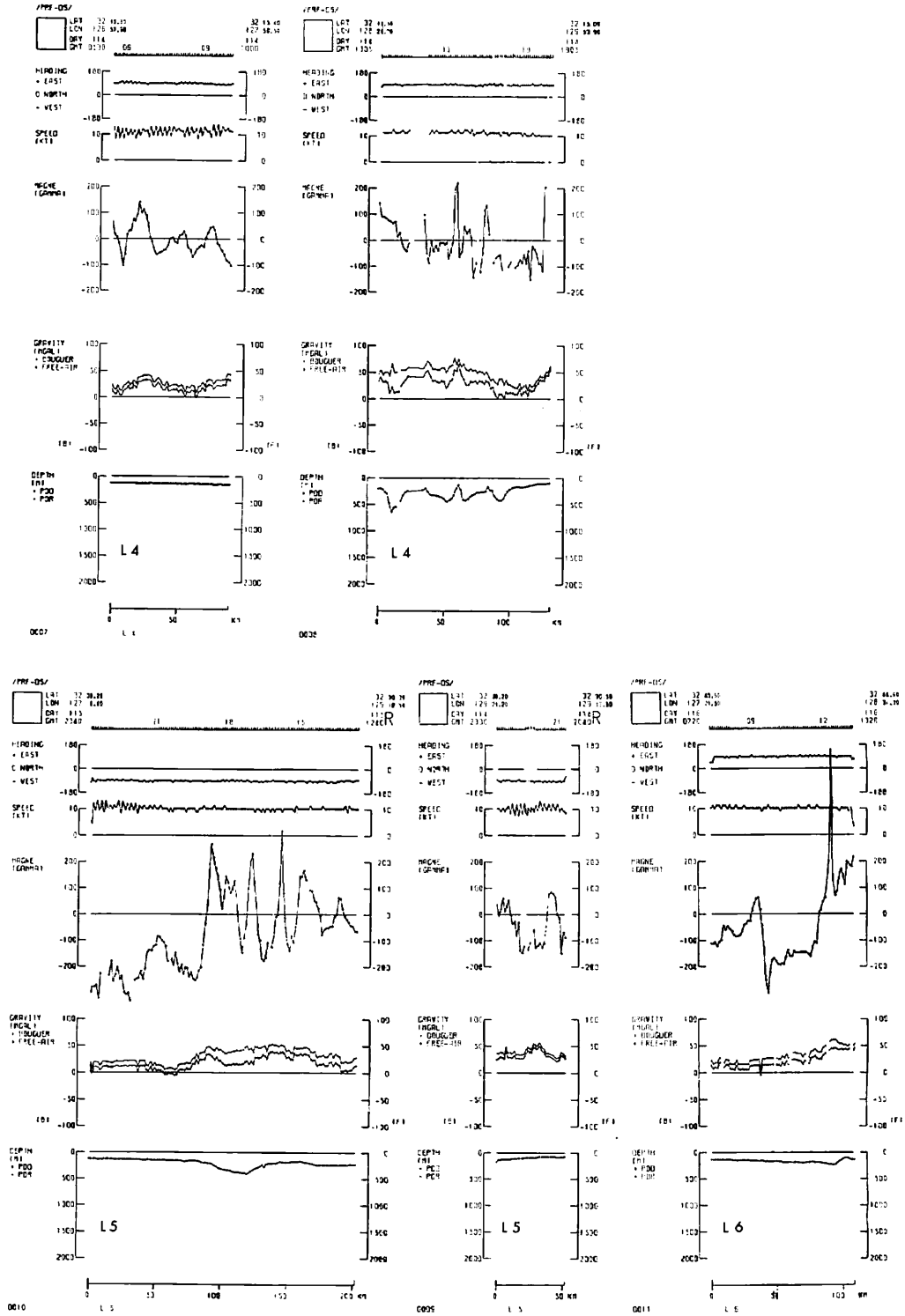

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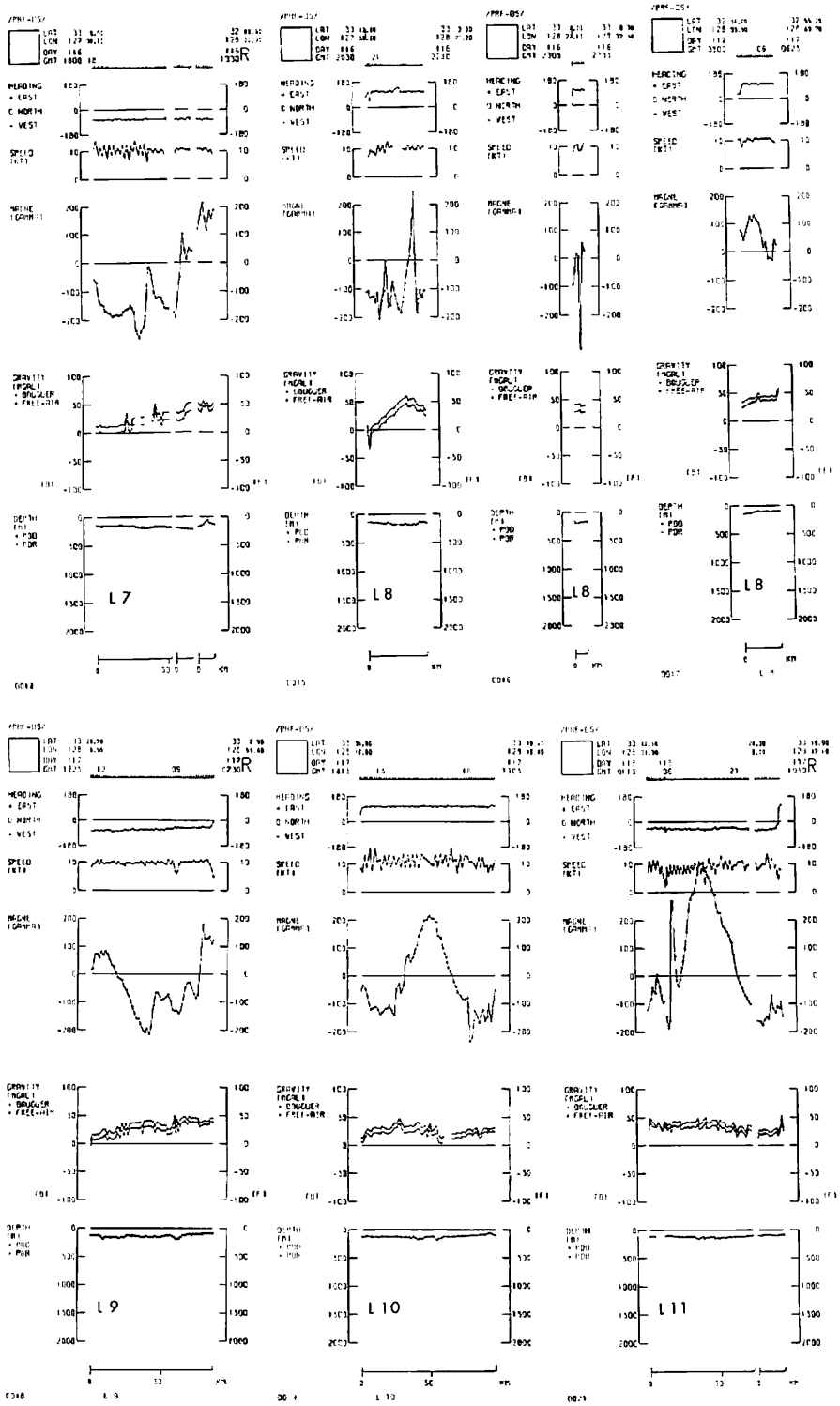

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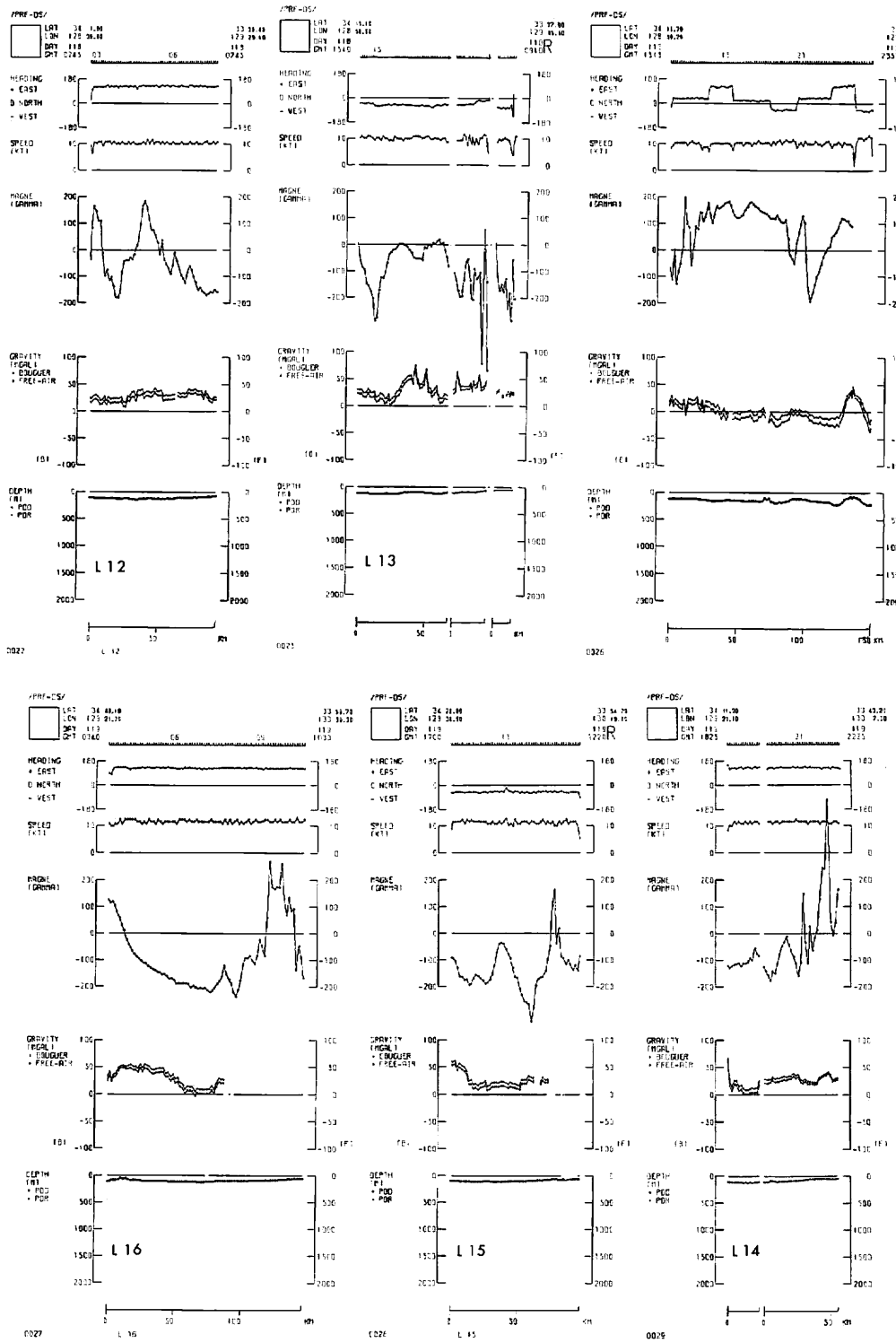

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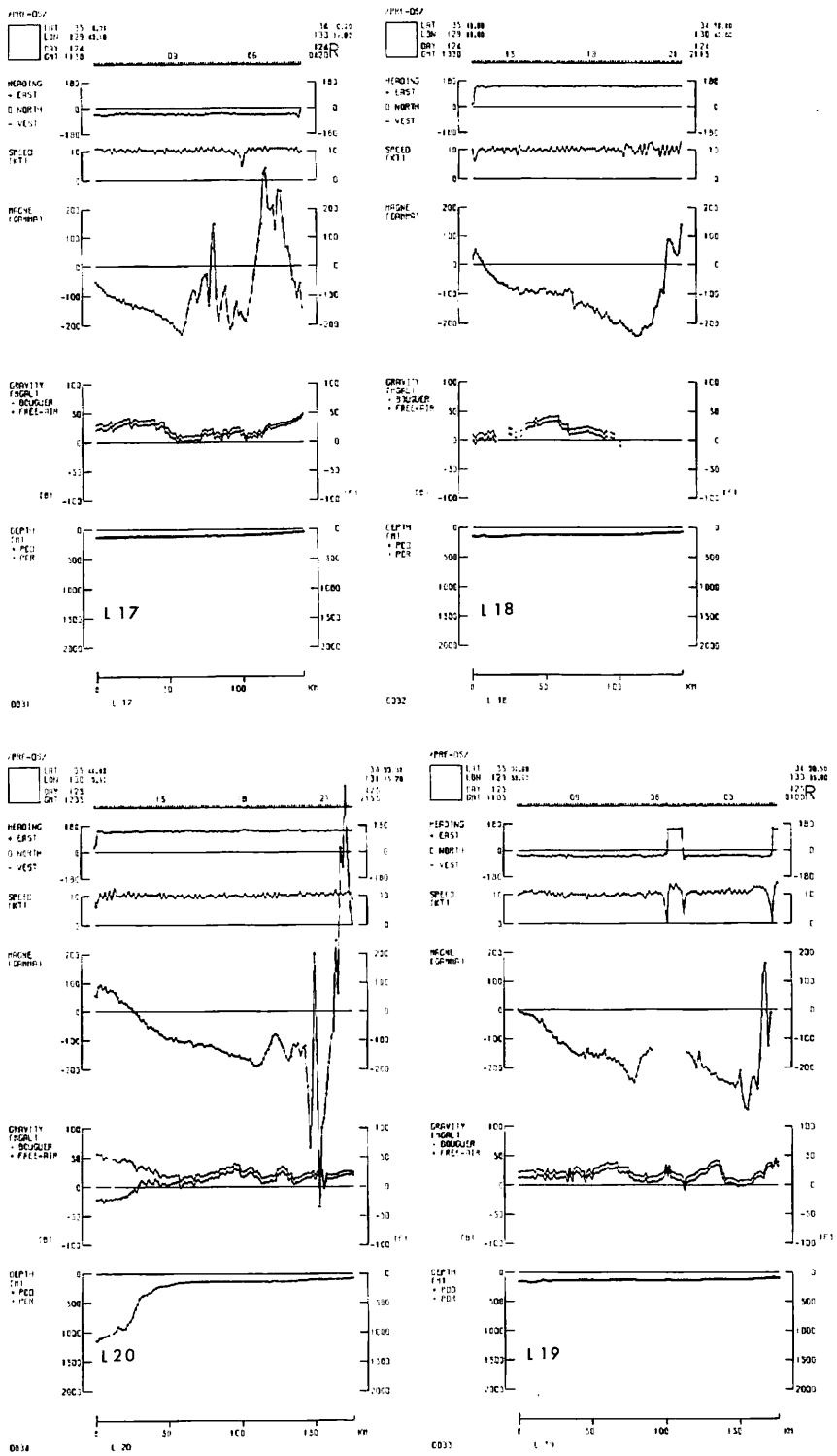

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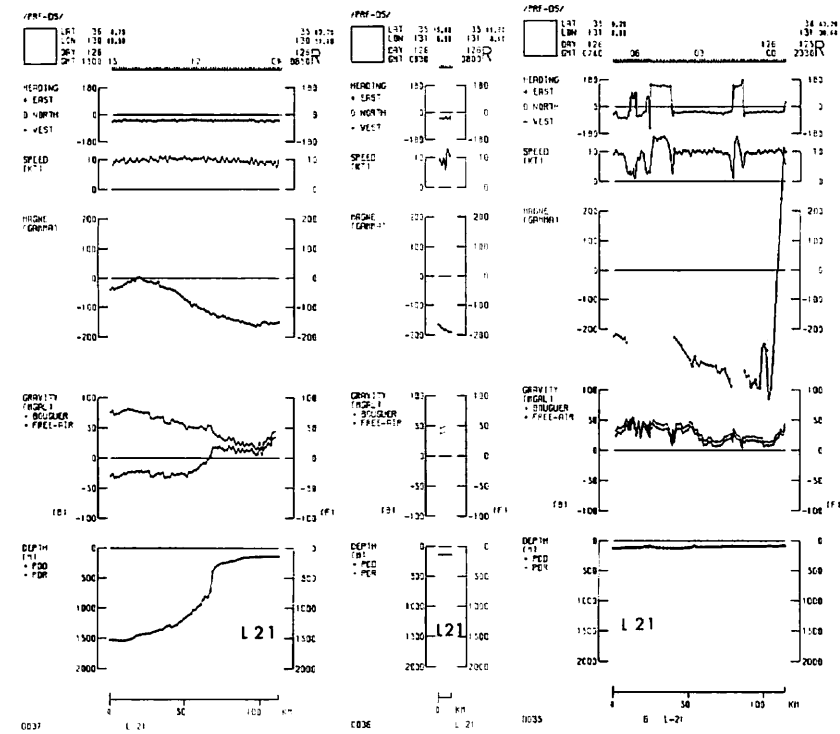

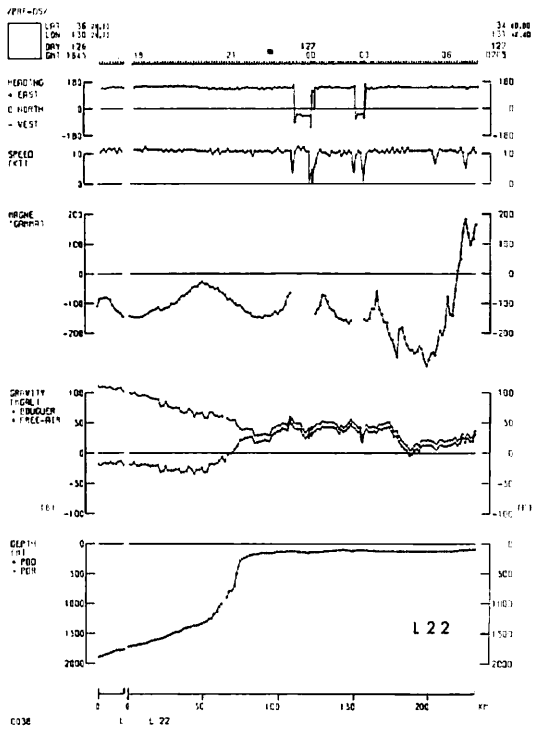

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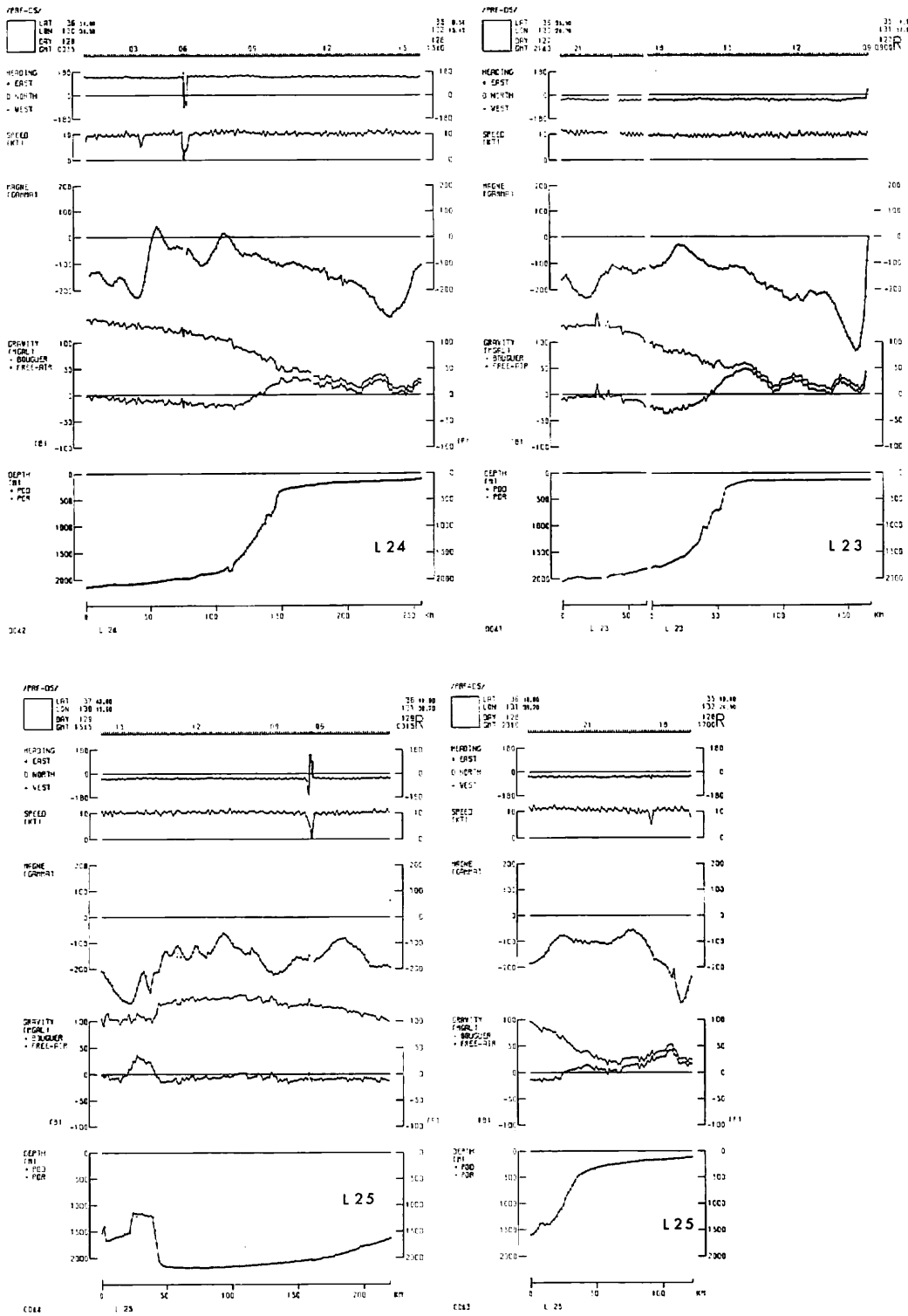

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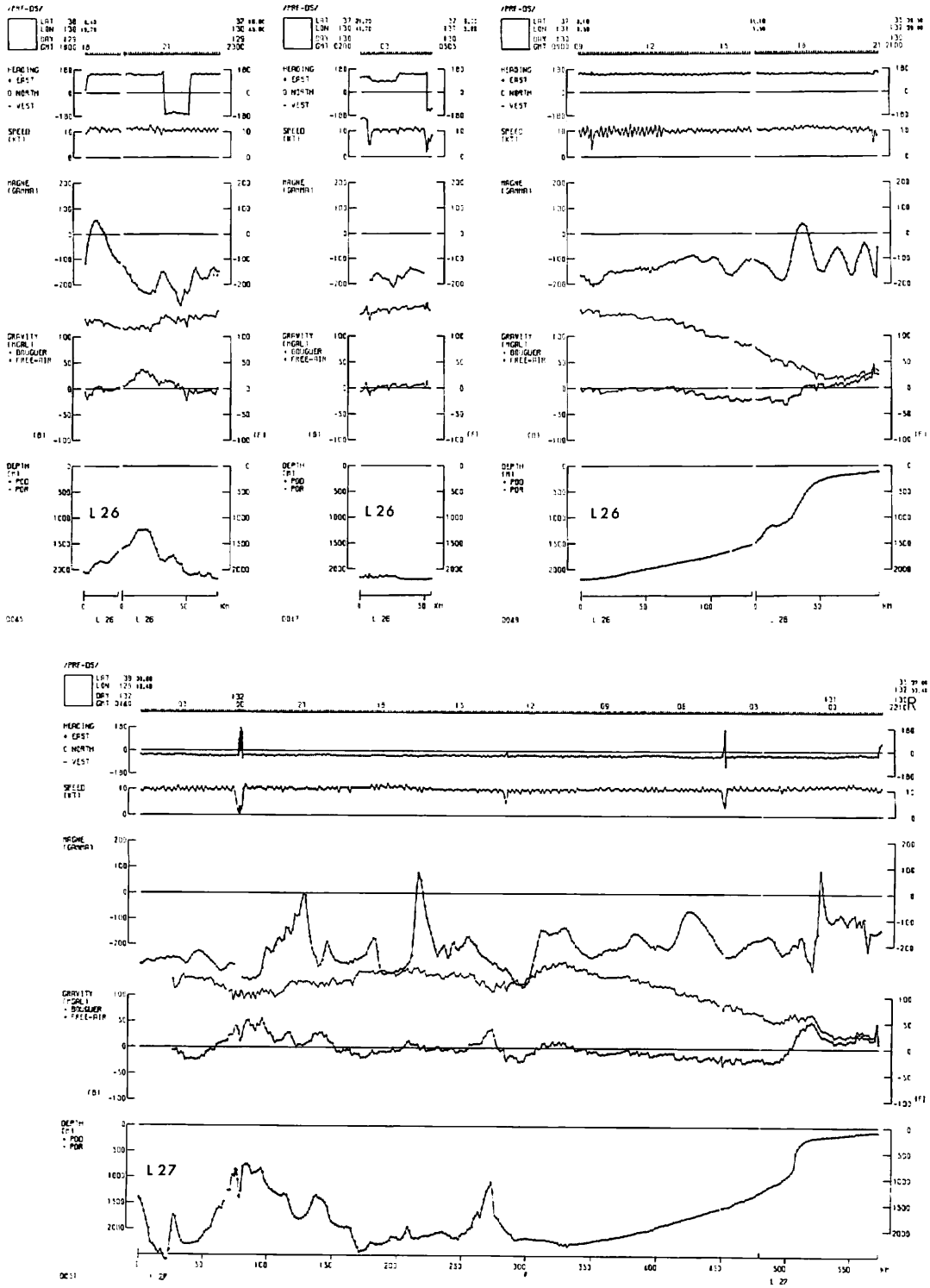

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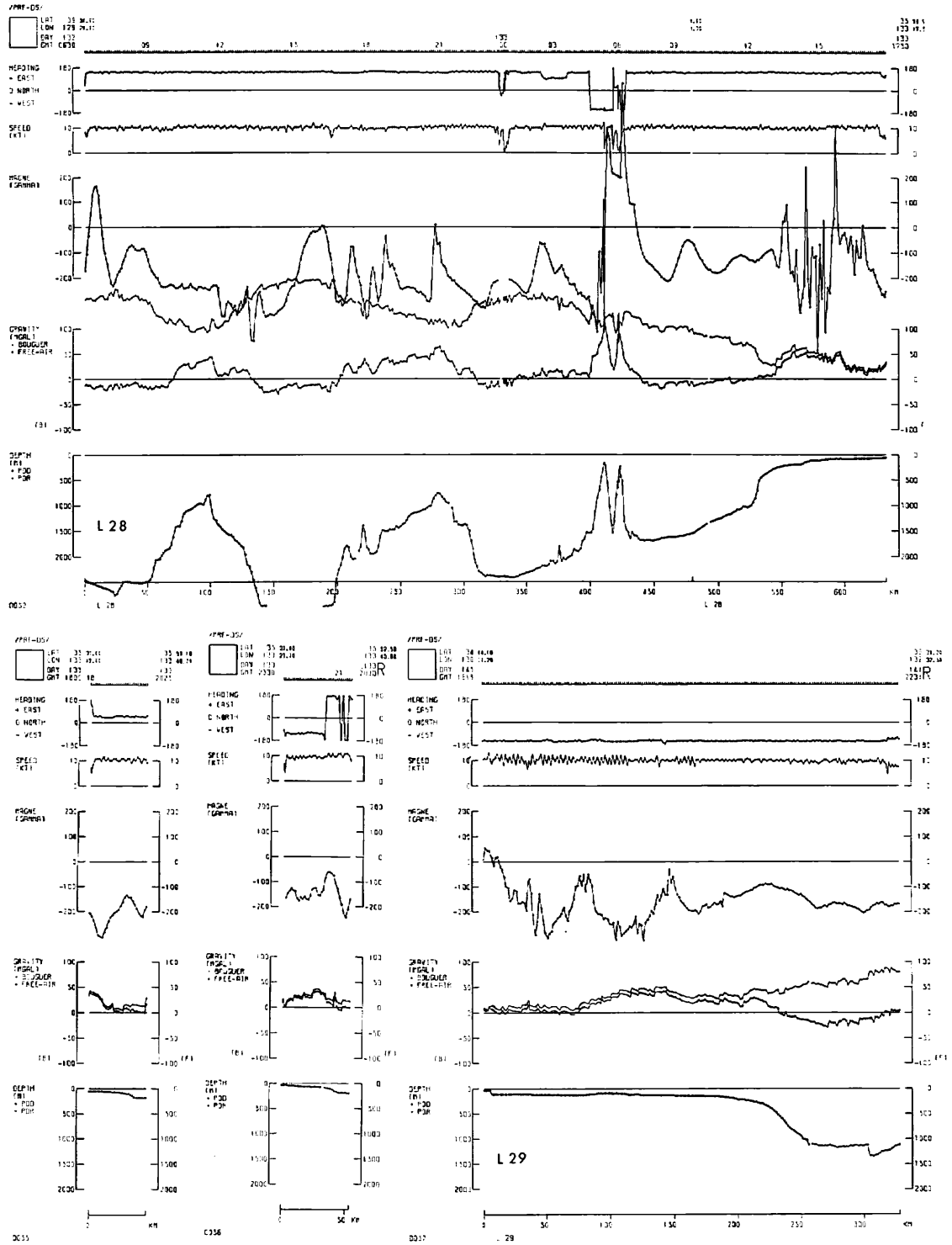

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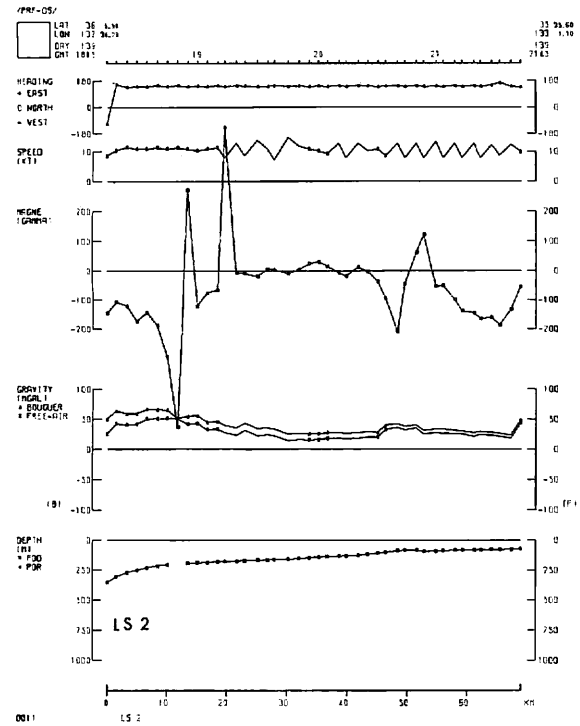
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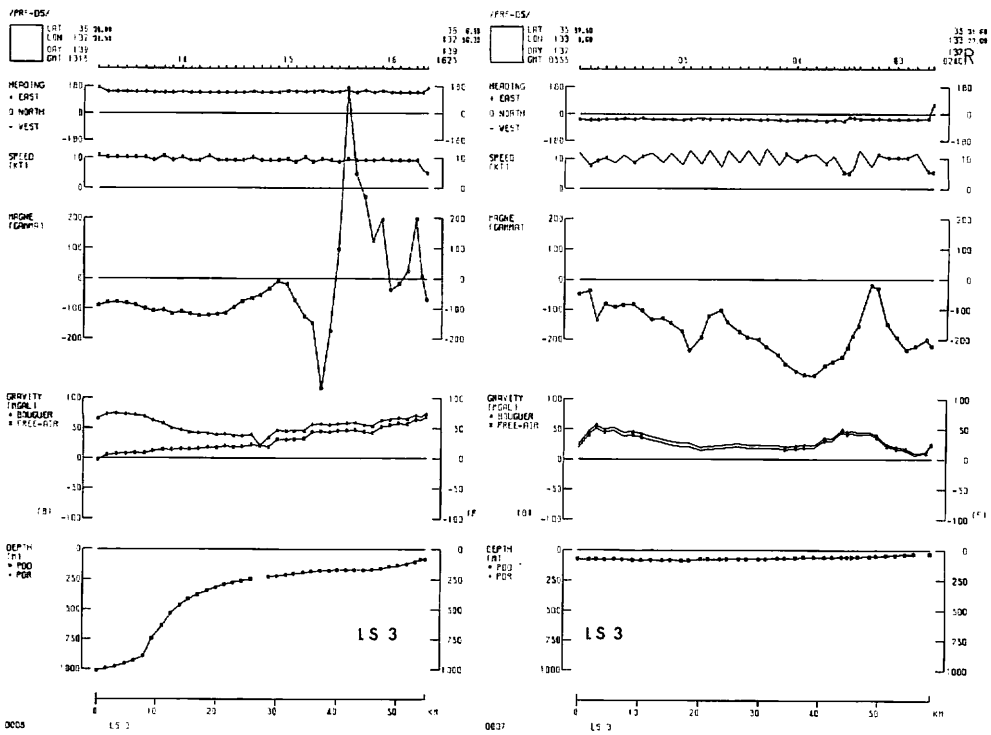
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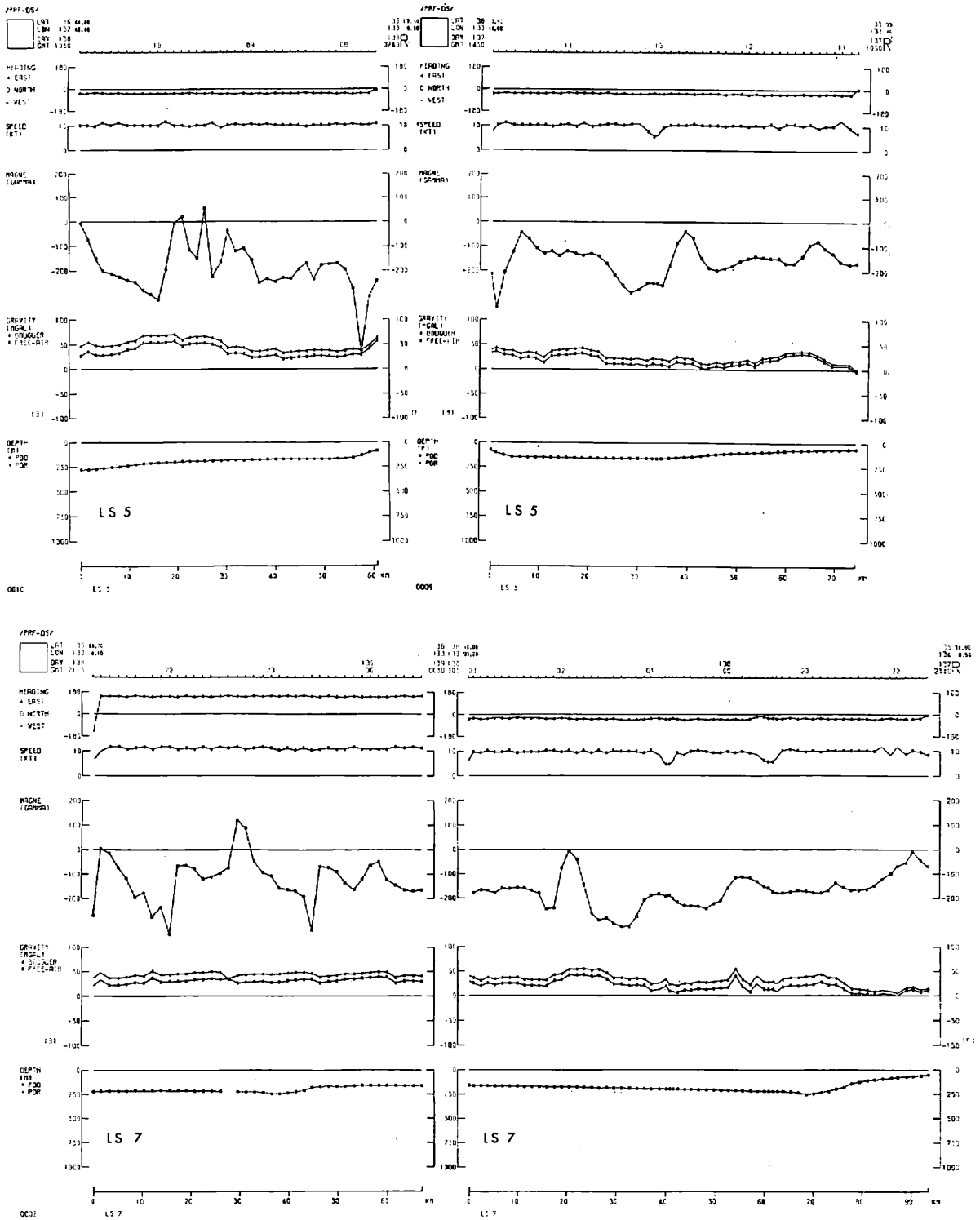

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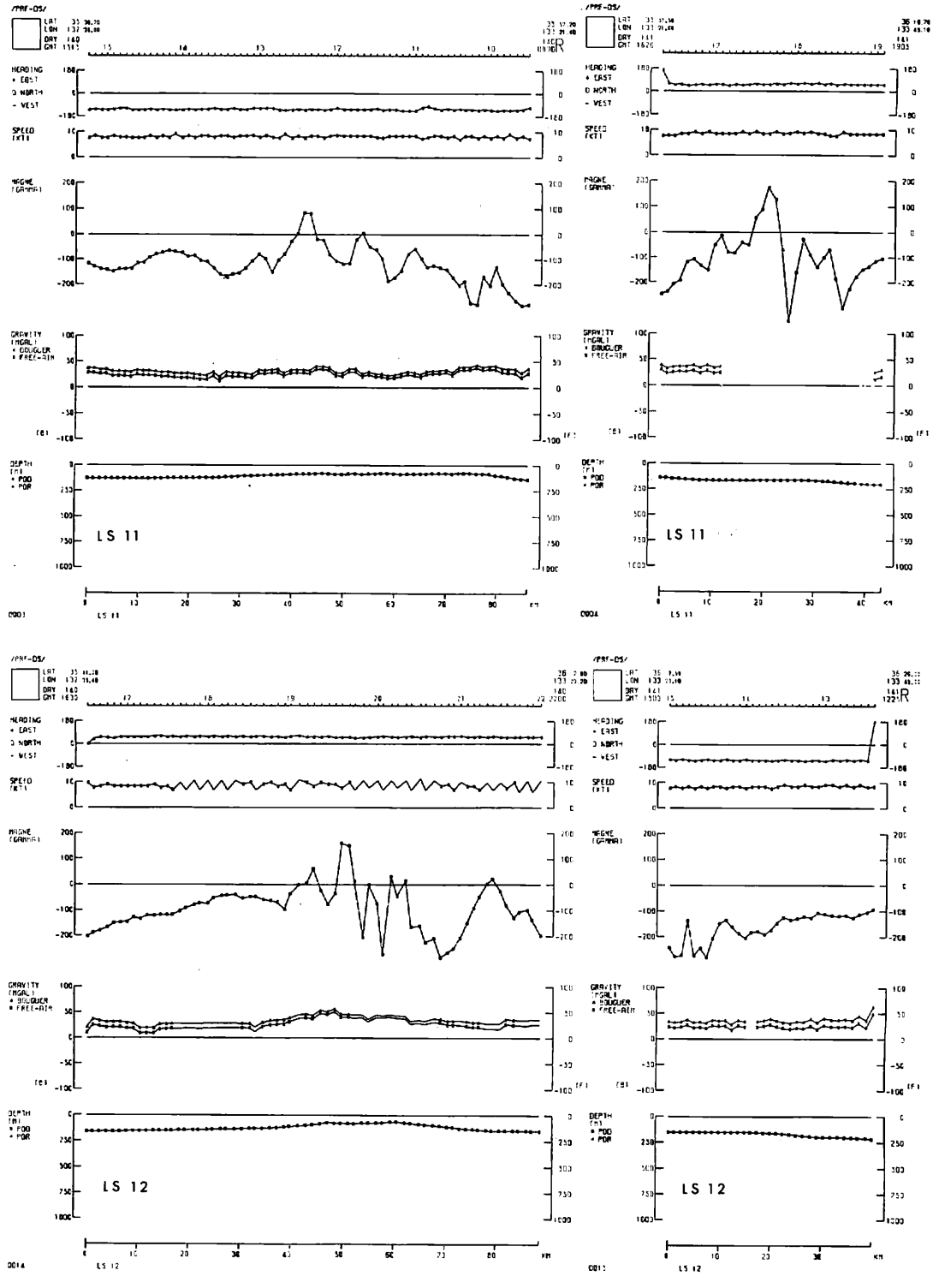
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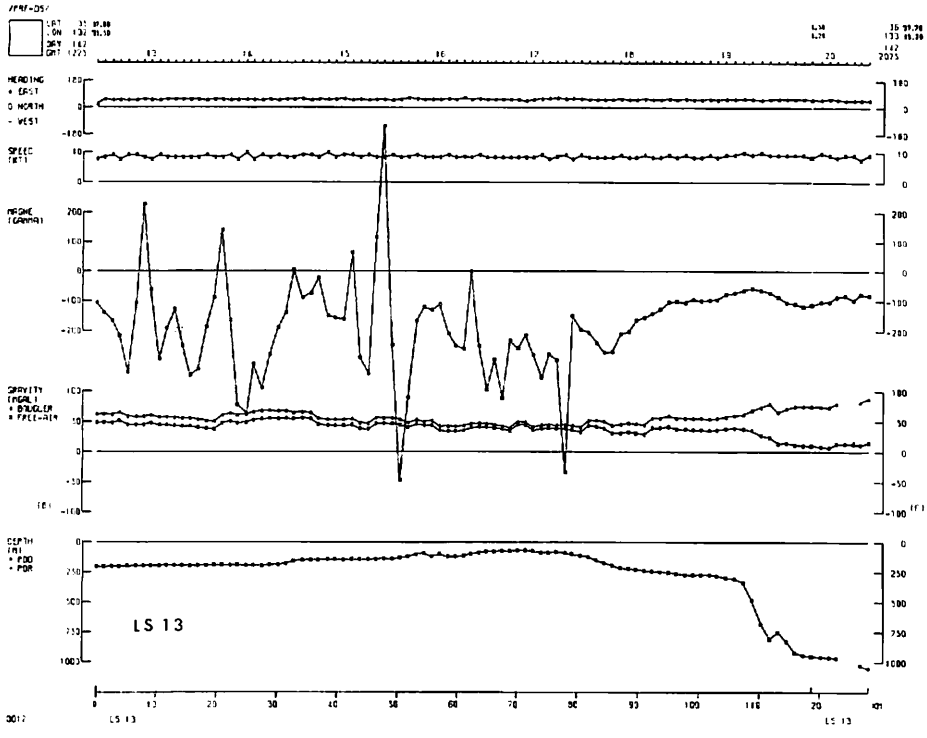
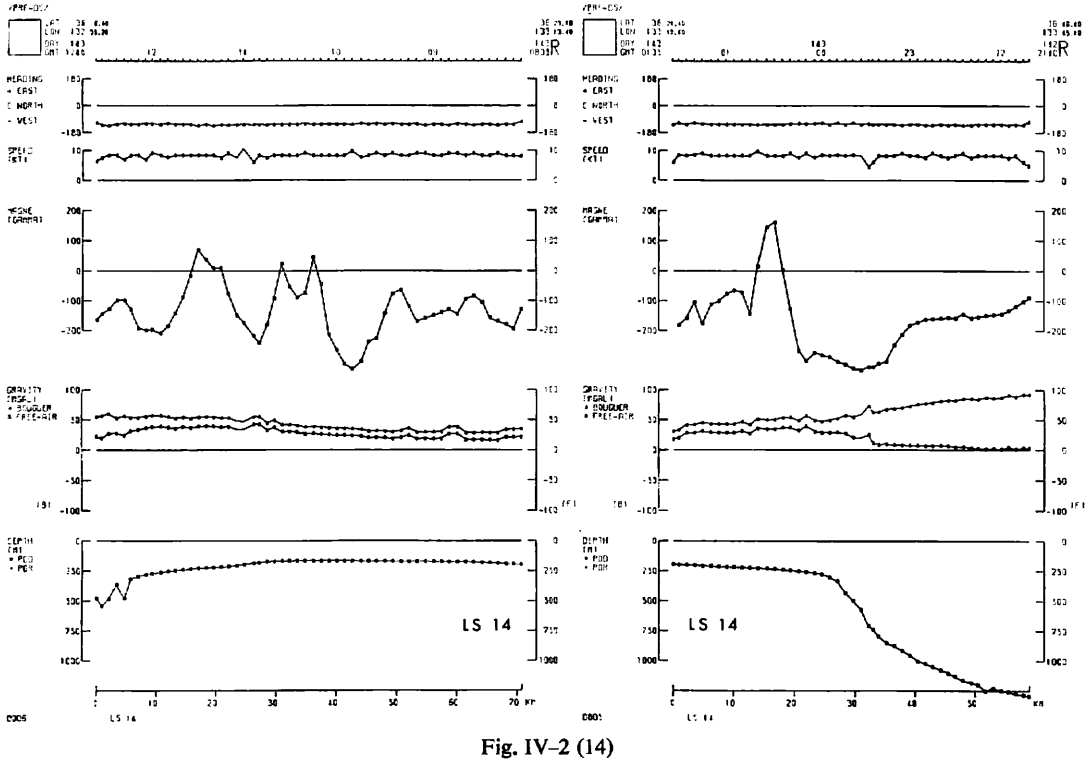
Fig. IV–2 (13)





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