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75-11 3.4

AIRBORNE GEOPHYSICAL SURVEY

of an area within

EL 2/70, Mackintosh

EL 15/73, Hatfield

EL 5/74, Mayday

November, 1975.

S.S. Webster

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of an area within

EL 2/70 (Mackintosh), EL 15/73 (Hatfield), EL 5/74 (Mayday)

SUMMARY

An airborne geophysical survey was flown in March-April 1975, over an area within EL's 2/70, 15/73 and 5/74. The survey, utilising magnetic and electromagnetic techniques, was designed to locate any conductive ore-lenses similar to those discovered previously and to trace stratigraphic units in an area which is not conducive to ground mapping.

Four EM anomalies due to known sources and seven EM anomalies warranting ground follow-up were detected during analysis of the survey data and are described in this report. The magnetic data show several linear trends which are useful markers in correlating geologic units between areas of observed outcrop.

Survey Equipment

The airborne geophysical survey was contracted to McPhar Geophysics Pty. Ltd., to commence operation in October 1974. The survey was to utilise a modern version (H-500) of the EM system which discovered the conductive Que River mineralisation in 1972. However, due to equipment problems, this system would not operate in a helicopter although the fixed wing version had been flying successfully for 12 months.

It was decided to revert to the old H-400 equipment configuration, which had already proven its efficacy in the North-West Tasmania environment. This conversion took six months to complete, mainly due to transfer of the company and equipment to new ownership, and the survey was re-contracted to Geoex Pty. Ltd.

The H-400 EM system is a mobile transmitter - towed bird receiver arrangement recording quadrature response for two frequencies (340 hz and 1070 hz) at one second intervals. The EM is time shared with a Geometrics 804 proton precession magnetometer measuring total magnetic field intensity, every second, to one gamma accuracy.

The survey data were recorded on six channel analogue charts, with the magnetic data also recorded, onto film, in digital format. This latter data were computer processed into contour cuts on the flight path recovery and hand contoured with 5 gamma contour interval.

Survey Procedure

A total of 1070 line miles of combined magnetic and electromagnetic traversing were flown with 160 metre line spacing at a nominal terrain clearance of 160 metres.

The EM system was imperically calibrated for terrain attenuation of signal by several traverses over the conductive Que River ore lens. Traverses were flown at elevations of 500 feet, 600 ft., 700 ft., and 800 ft., to determine at what terrain clearance the response due to the orebody merged into background noise.

It was determined from this study that base metal mineralisation could not be uniquely resolved in areas with required terrain clearance in excess of 700 ft. Despite efforts to maintain optimum terrain following the topography of the area necessitated approximately 45% of the survey to be flown outside these specifications.

Results

Analysis of the EM data showed four anomalies which could be related to known geologic conductors. They are anomalies 75/1, 75/2, 75/6 and 75/8 (anomaly 75/10 is probably a continuation of 75/8). Copies of the relevant analogue tapes are appended to this report.

Anomaly 75/1, is the conductive lens of the Que River orebody, and duplicates results of the 1972 survey.

Anomaly 75/2 was detected on 20 flight lines, giving a strike length of approximately 3 km. The anomaly is due to the pyritic and graphitic content of the Que River shales, the proportions of which vary along strike, giving rise to anomalies of different magnitude.

Anomaly 75/6 is a very weak anomaly of doubtful significance. It is included here, because its plotted position is coincident with the "lode horizon", along strike from the Que River ore lenses.

Anomaly 75/8 is also a weak anomaly and correlates with the inferred position of the Que River shales. The low amplitude of this response is possibly due to the low flight line angle to strike or to a reduced pyrite/graphite content. Anomaly 75/10 is possibly a continuation of this rock unit.

A further seven anomalies were selected for ground follow-up, either for their geophysical response or because of their correlation with interesting geology and/or geochemical anomalies.

Anomaly 75/3 occurs only on two lines, however, the lines on either side were flown at greater than 700 feet. The anomaly on line #40 at fiducial #2900 is similar to anomalies observed over the Que River body, and rates a very high priority for follow-up.

Anomaly 75/4 warrants ground follow-up, but must be regarded with some reservation. It occurs in rugged terrain, and it is possible to generate false anomalies due to aircraft manouvers required to negotiate ridges.

Anomaly 75/13 is a weak anomaly which occurs on only one line over a button grass swamp. This anomaly requires follow-up as it is located over the predicted tailings-dam site.

Anomaly 75/17 (and 18?). This anomaly is undoubtedly due to the Que River shales, but is located in an area of geological significance. The shales are faulted in this position by the fault which displaces the lode horizon near the Que River orebodies.

Anomaly 75/25 (and 26?) is a broad, weak anomaly which is typical of the response of conductive formation. As this anomalous trend is flanked by a 20 gamma magnetic trend, it may be mapping the "lode horizon" and, as such, warrant follow-up.

Anomaly 75/43. This broad anomaly appears on nine lines and, as above, may be relevance for stratigraphic purposes.

An additional 41 anomalous EM indications were studied in this analysis, but were regarded as not requiring follow-up due to a low signal to noise ratio or to lack of correlation with interesting geology on geochemistry.

Recommendations

The seven anomalies mentioned above are recommended for ground follow-up. This work will necessitate either extending regional traverse lines or cutting new access lines. Each locality should be examined and sampled by a geologist, if easily recognised. Several EM traverses could be necessary if the conductor is not readily recognisable.

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Conclusions

The airborne geophysical survey was flown over an area of 100 sq. miles within EL 2/70, EL 15/73 and EL 5/74. A total of eleven anomalies were selected as having significance for the occurrence of base metal deposits. Four of these anomalies were due to known conductors, whilst seven are recommended for ground follow-up.

The EM (H400) data were compared with reconnaissance TURAIR survey data where overlapped coverage existed. The H-400 data had significantly greater anomaly resolution and sensitivity. Though these equipment properties would be a marked hindrance for the system in more conductive terrains, they were a marked advantage in this area of rugged terrain, where ground clearance was often not within normally acceptable survey requirements.

S.S. Webster

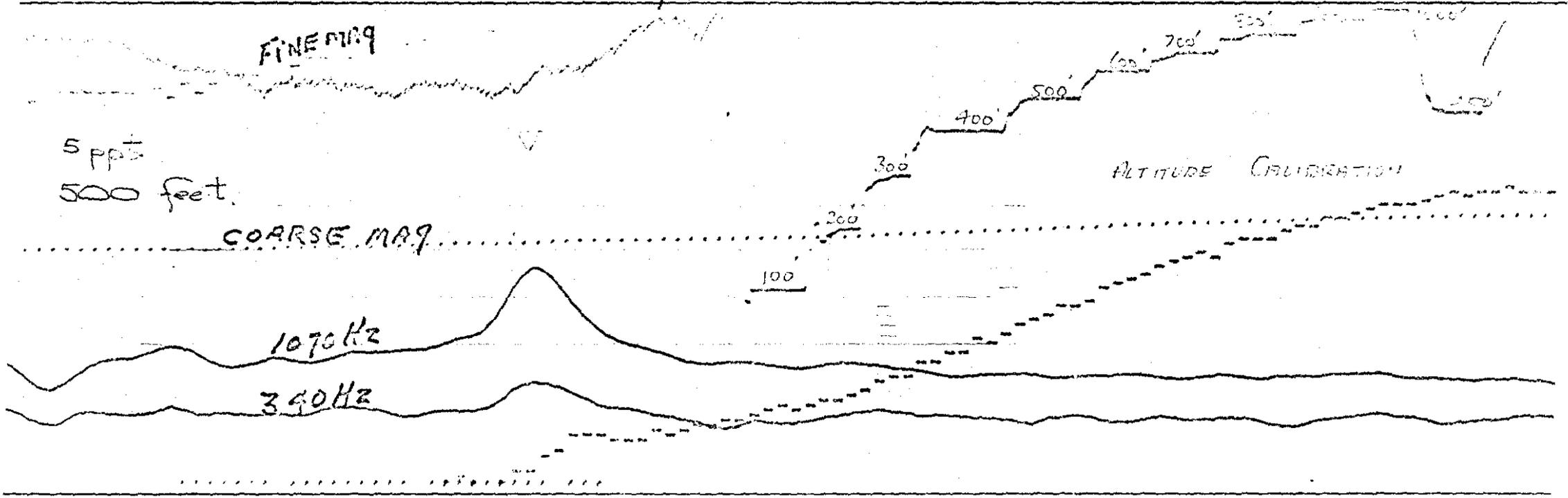
S.S. Webster

November 19, 1975

Maps. Airborne Electromagnetic Anomaly Map
(Flown 1975)

DT 58 A, B, D

E.M. / ALTITUDE CALIBRATION



Terrain Clearance
Fine Mag
(1000 f.s.d.)

487007

10 ppt
600 feet

Coarse Mag
(1000 f.s.d.)

1070 Hz
340 Hz

E.M./ALTITUDE CALIBRATION

Terrain Clearance

Fine Mag
(1000 f.s.d.)

10 ppt
500 feet

Coarse Mag
(1000 f.s.d.)

1070 Hz
340 Hz

em. trace log
(in ft. intervals)

300

007

E.M./ALTITUDE CALIBRATION

FINE Mag.
(1000 f.s.d.)

487008

± 10ppt.
800 feet

Coarse Mag.
(1000 f.s.d.)

1070 hz.

240 hz.

EM/ALTITUDE CALIBRATION

Terrain clearance

FINE Mag.

± 10ppt.

700 feet

Coarse Mag.

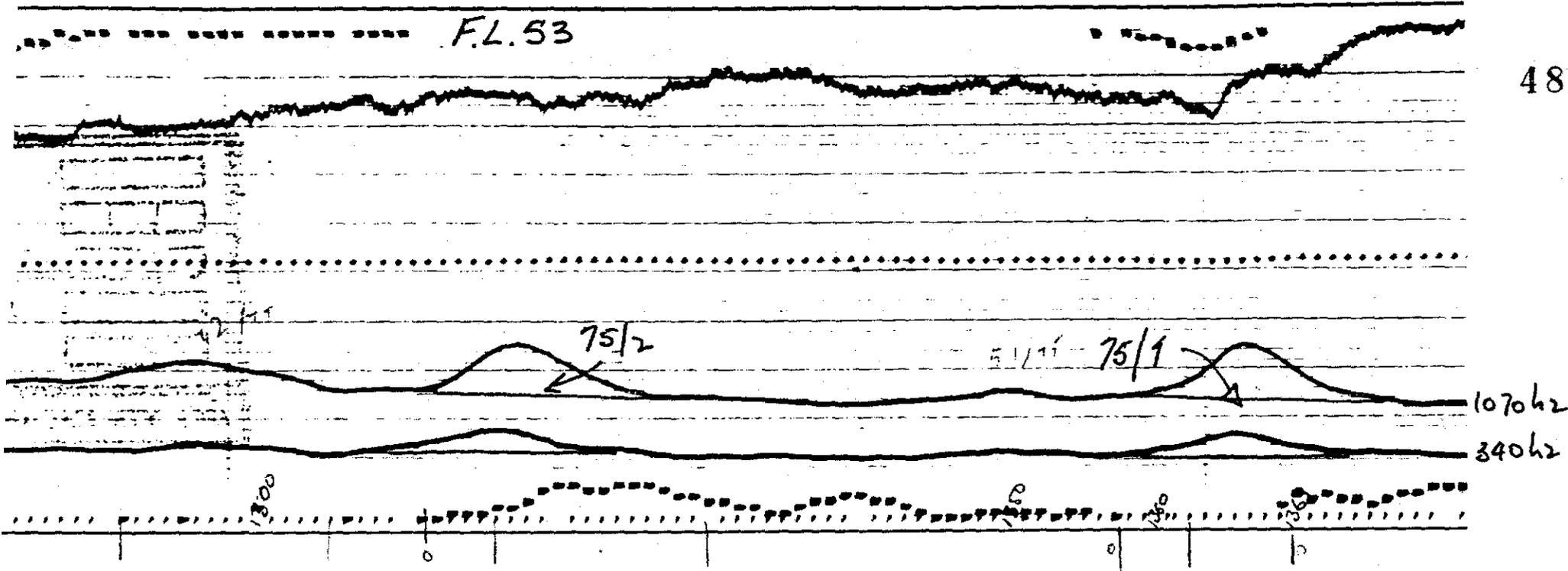
1070 hz.

240 hz.

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F.L. 53

487009



F.L. 54

Anomaly # 75/2

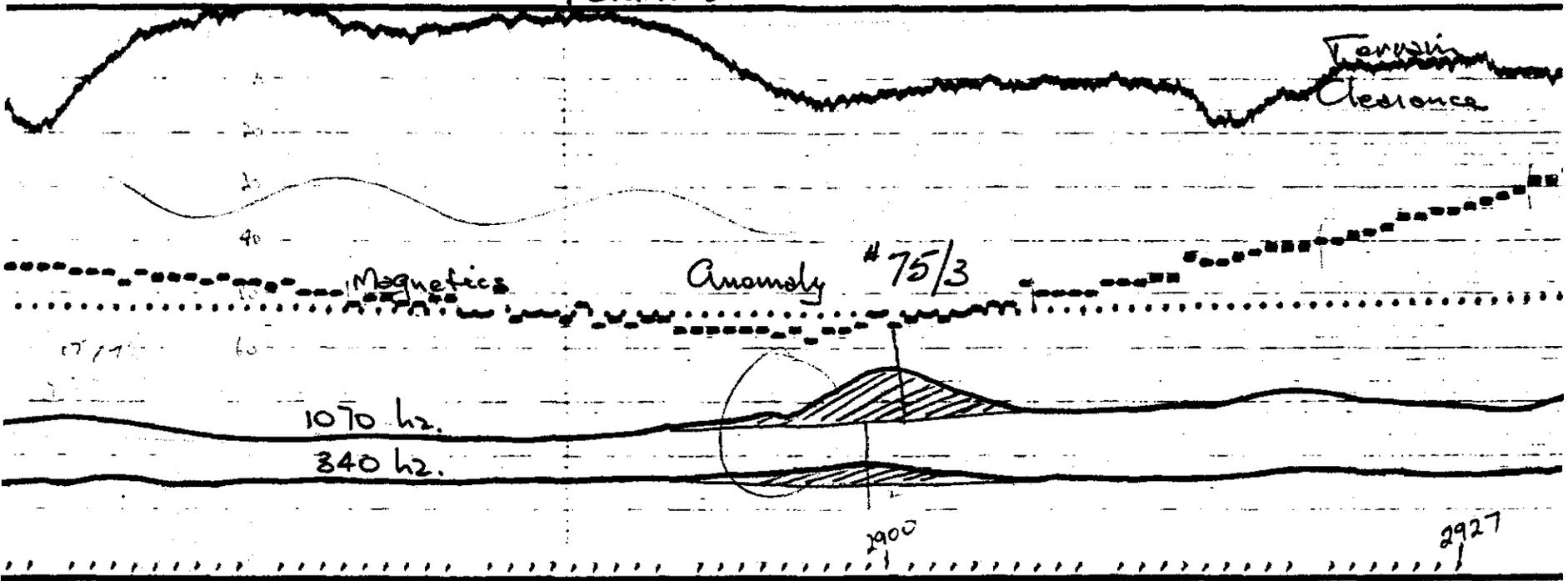
Anomaly # 75/1



009

487010

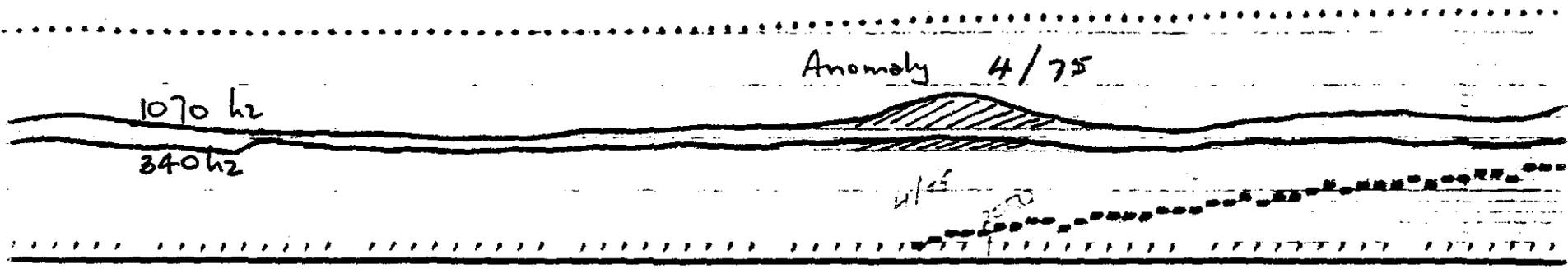
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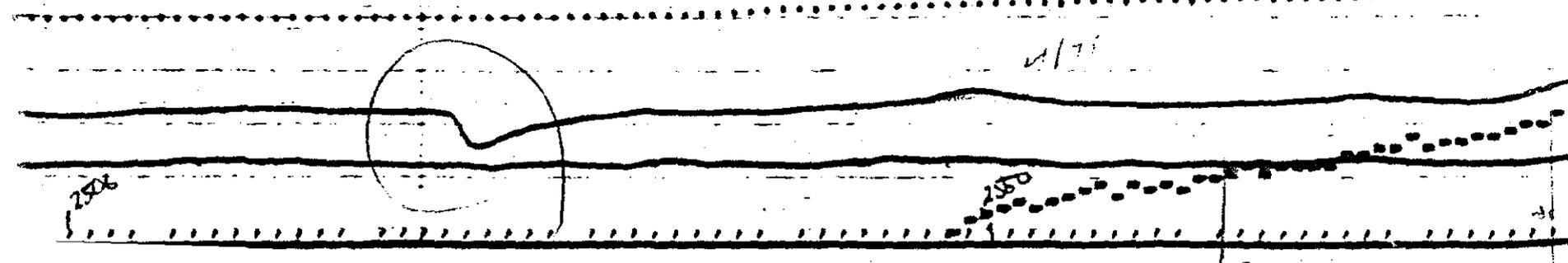
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FLIGHT 30
LINE



FLIGHT #31
LINE

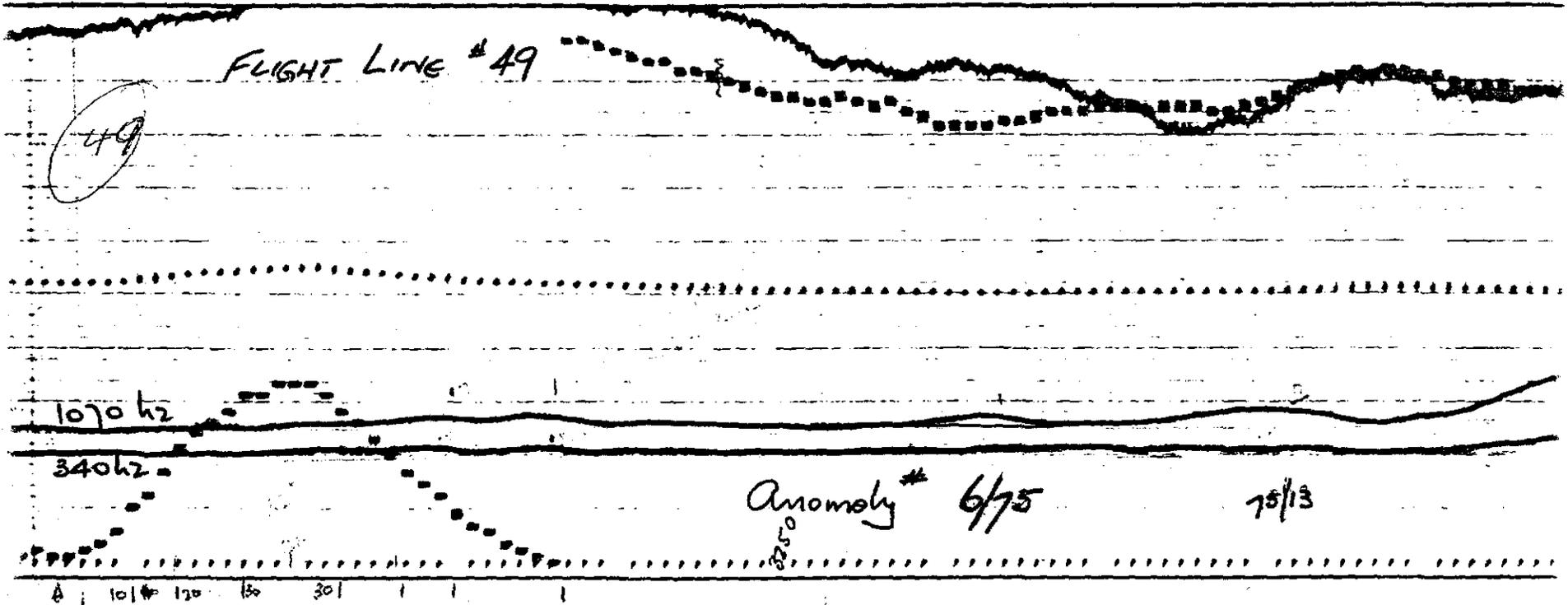


Anomaly # 71/4

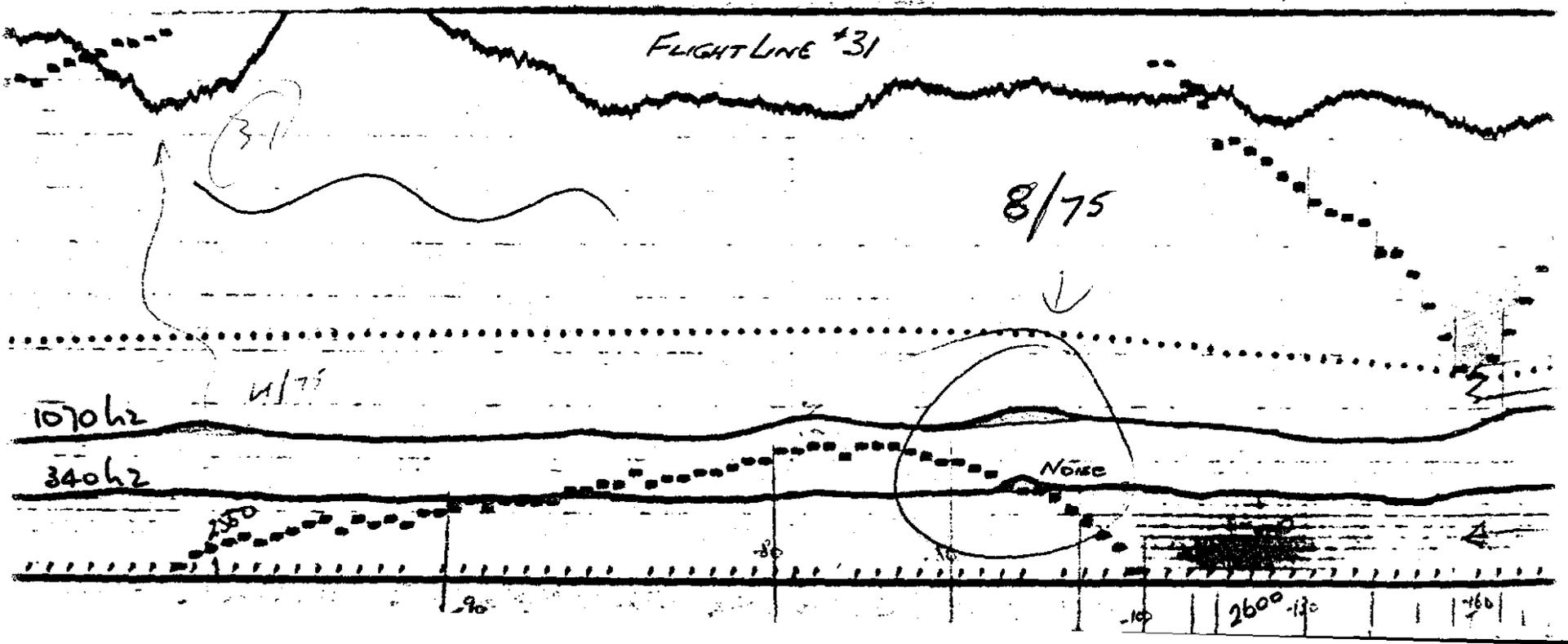
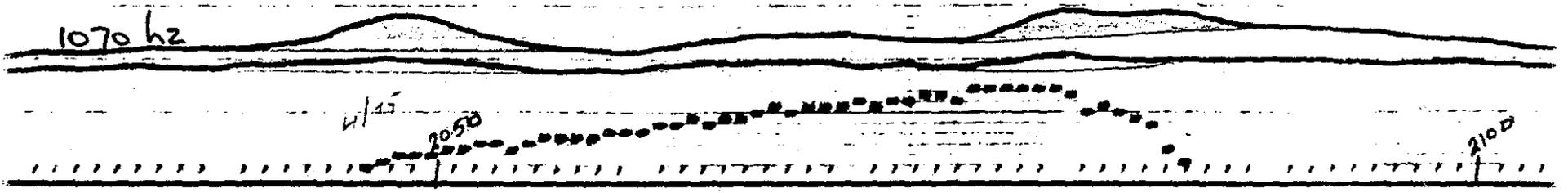
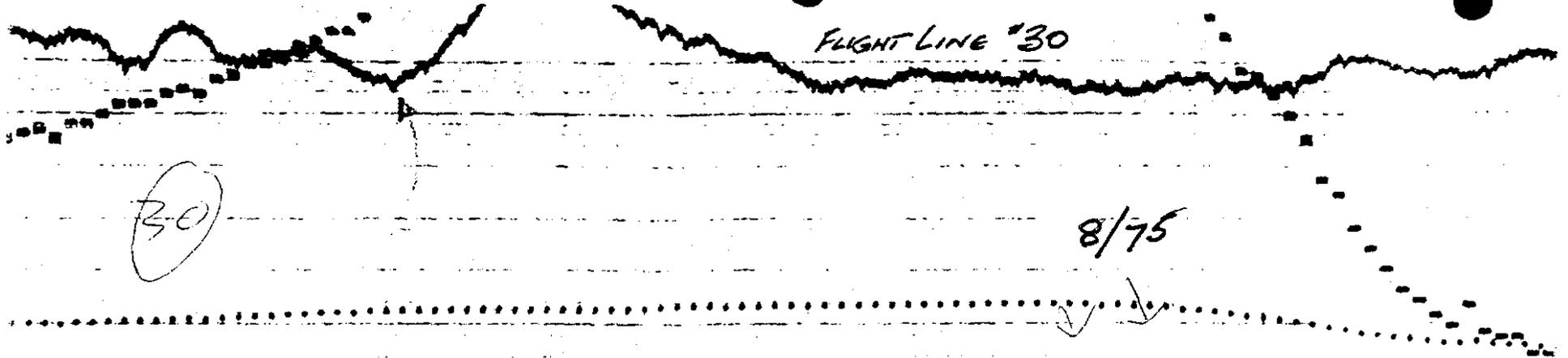
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487012



012



487013

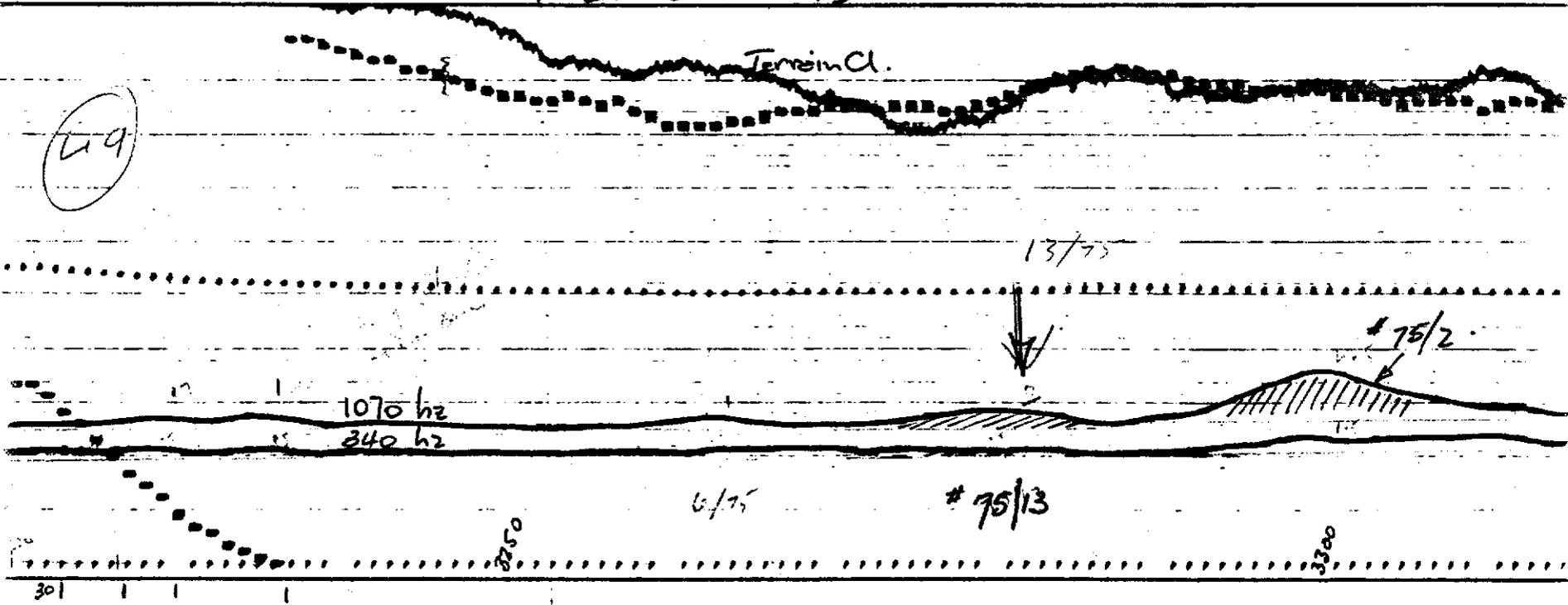
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FLIGHT LINE # 49

(49)

Terrain Cl.

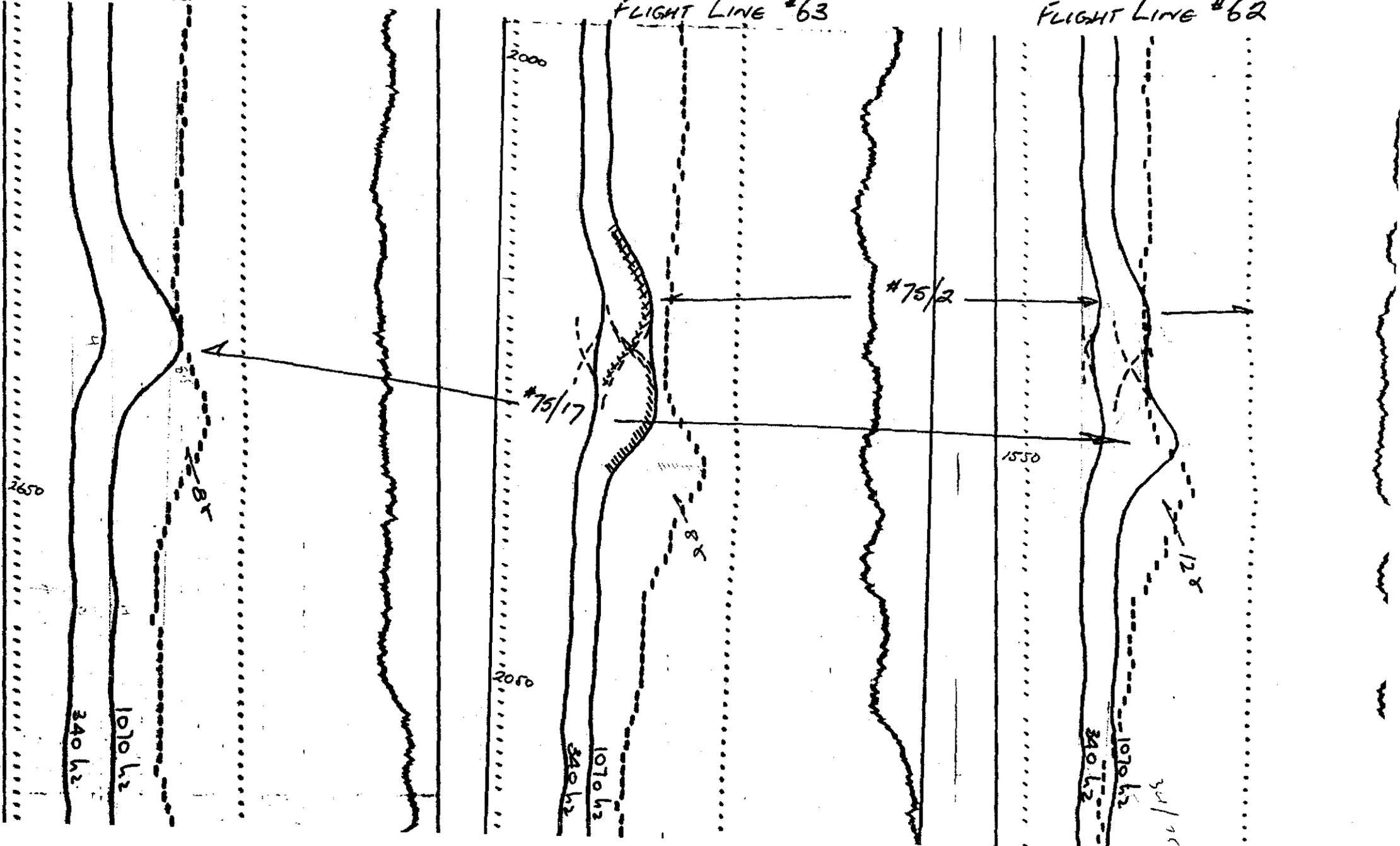


ANOMALY 75/17

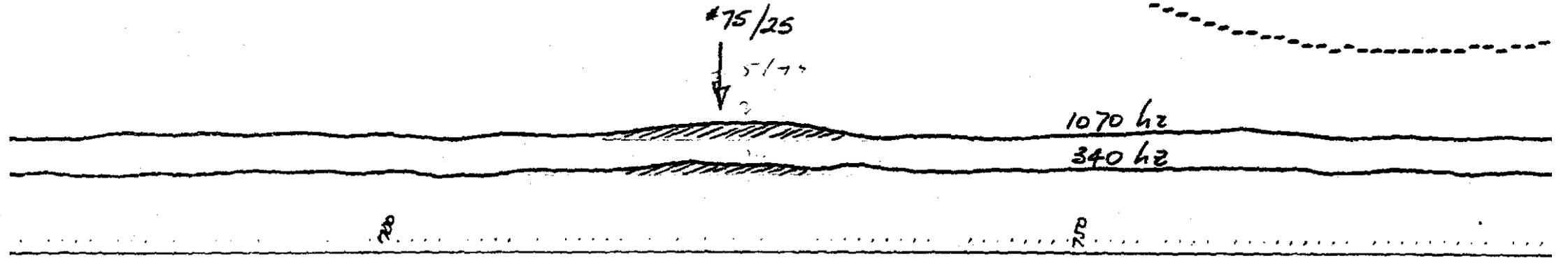
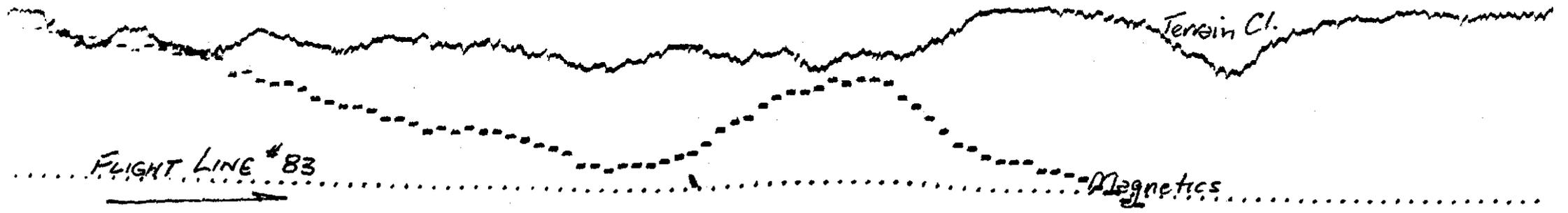
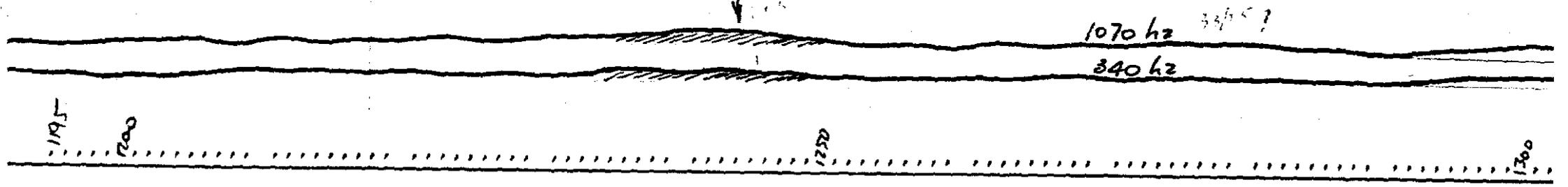
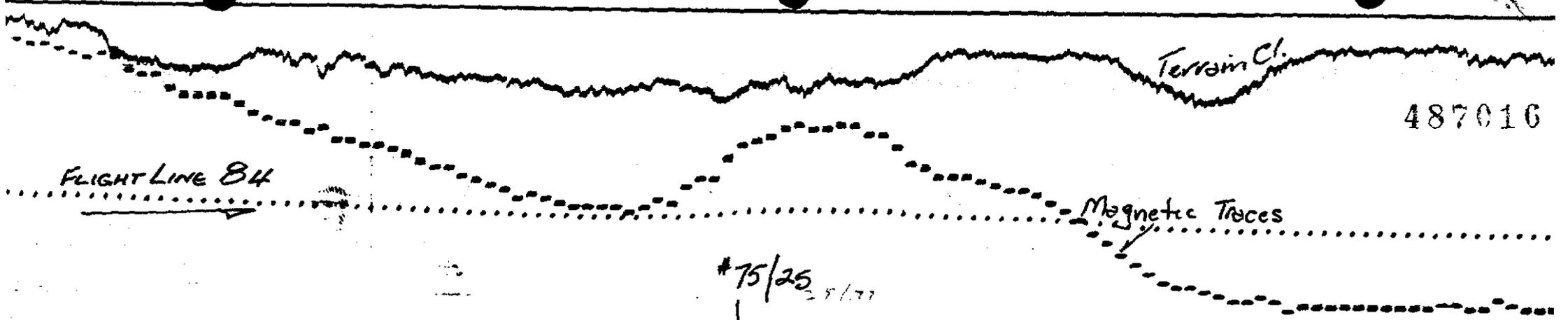
FLIGHT LINE # 64

FLIGHT LINE # 63

FLIGHT LINE # 62

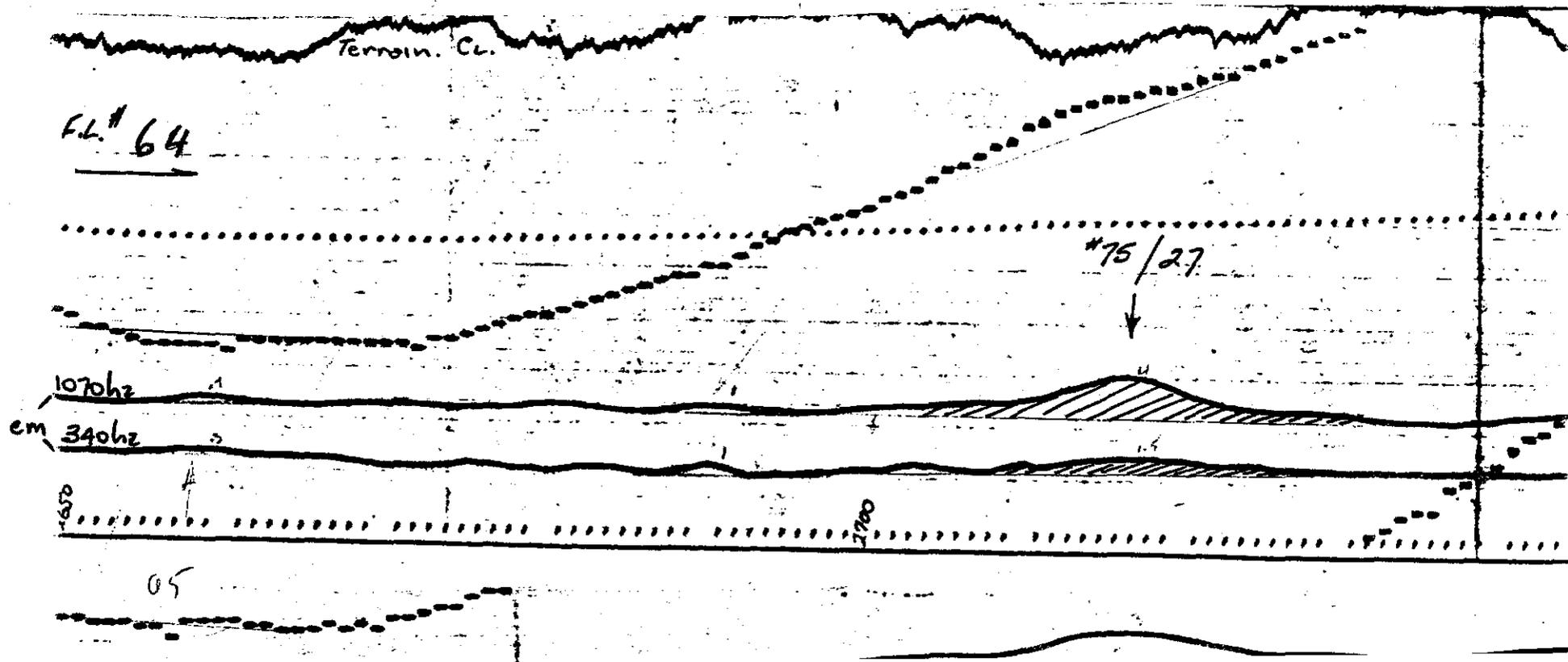
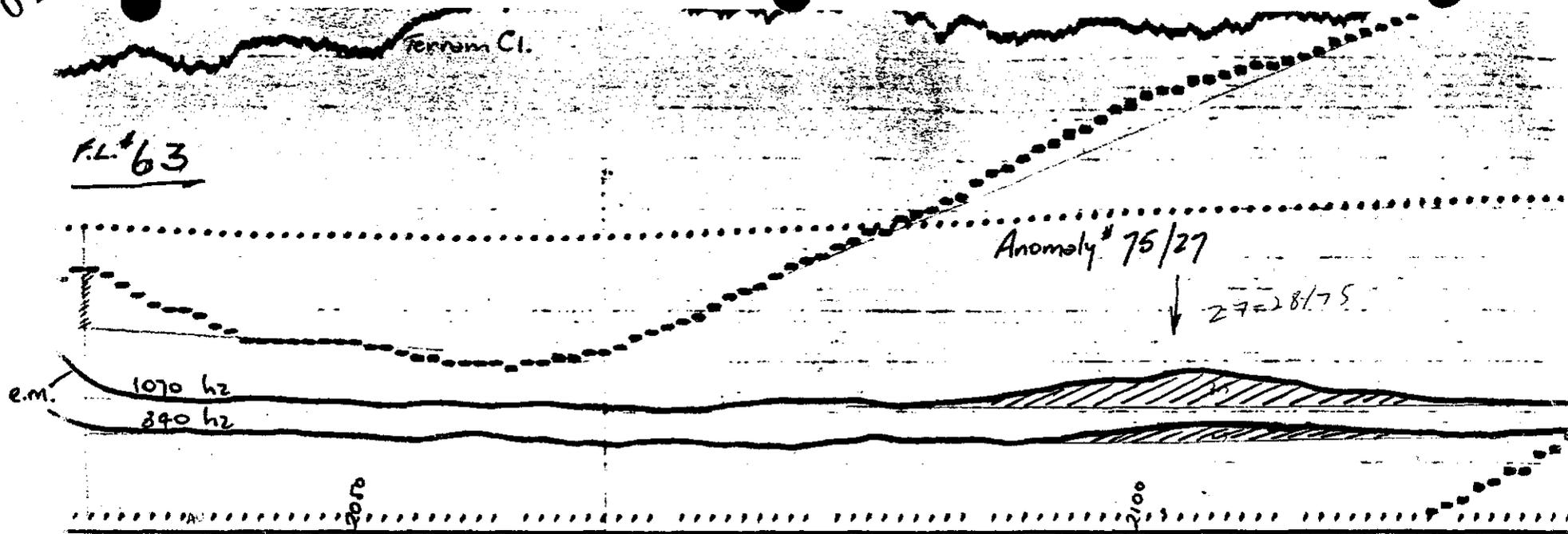


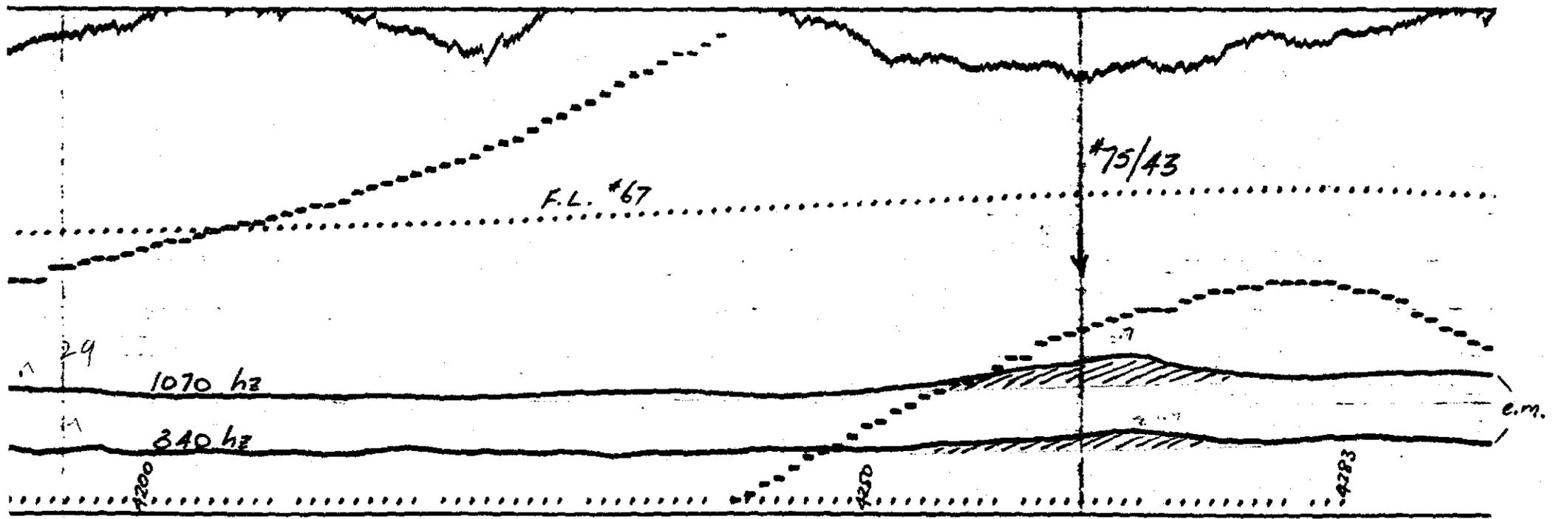
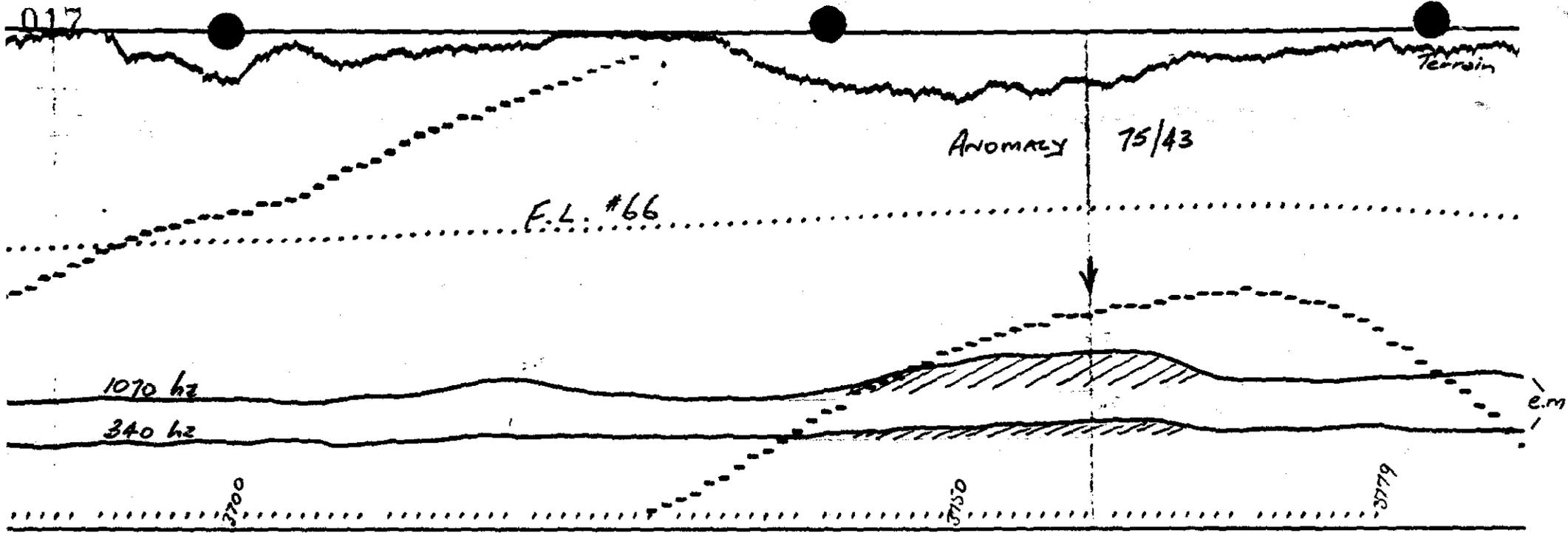
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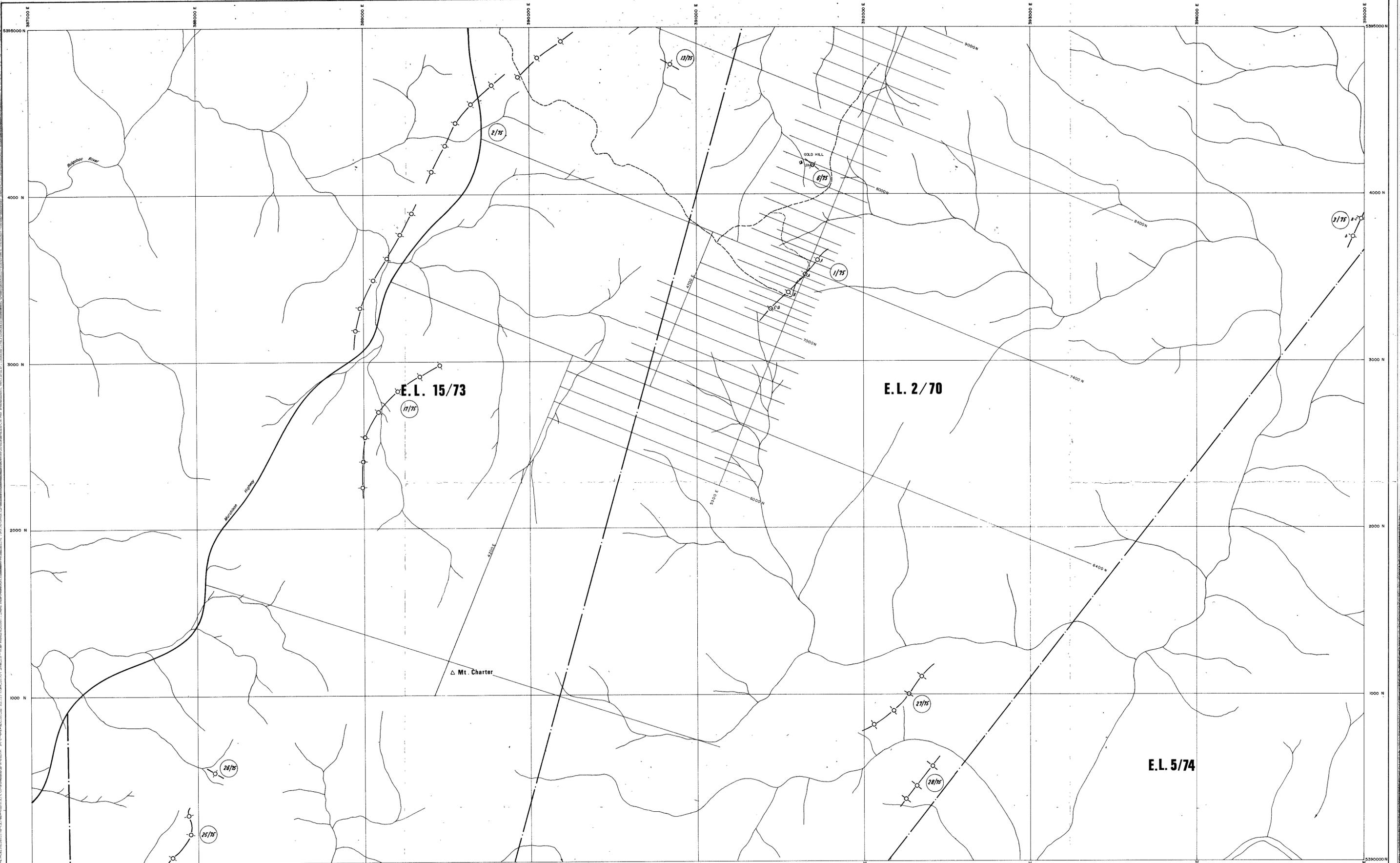


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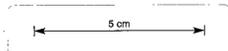
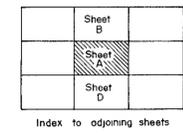
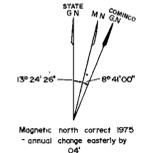
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- Man road
- - - Secondary road
- - - Track
- - - Railway
- - - Abandoned railway
- - - Power transmission line
- - - Fence
- ⊗ Mine
- Quarry or pit
- △ Trip station
- River, creek
- Survey line
- - - Tenure boundary



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Checked by	

NORTH WEST TASMANIA
DUNDAS TROUGH

AIRBORNE ELECTROMAGNETIC ANOMALY MAP (FLOWN 1975)

018

Location code K55/6/44	Scale 1:10000	Date NOV 1975
		Plate 47.58-A



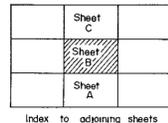
E.L. 15/73

E.L. 2/70

Murchison Highway

8/75
10/75

4/75



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Drawn by	Traced by
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Location code K55/6/44	Scale 1:10,000
Date NOV 1975	Plate 27 59-B

NORTH WEST TASMANIA 019
DUNDAS TROUGH
**AIRBORNE ELECTROMAGNETIC
ANOMALY MAP (FLOWN 1975)**

