

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Aeromagnetic Survey of Parts of Shannon, Carter, Oregon,
and Ripley Counties, Southeastern Missouri

by

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Open-File Report 83-87
1983

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards. Any use or trade names is for descriptive purposes only and does not imply endorsement by the USGS.

Introduction

An aeromagnetic survey of an area in southeastern Missouri (Figure 1) was flown by the U.S. Geological Survey in late 1979 and early 1980. The survey was carried out as part of a mineral resource assessment of the proposed Irish Wilderness Area. Total field magnetic data were acquired using a Geometrics Proton Magnetometer G-803 installed in a Heli-Porter aircraft. The survey was flown at a barometric altitude of 1200 feet above sea level along 37 flight lines oriented in a north-south direction at a mean spacing of 1/2 mile (805 meters).

Data reduction

The reduction of the collected data included the following: (1) flight line recovery using 35mm film strips to plot the flight path onto 1:62500 and 1:24000 quadrangle maps, (2) location of each observed data point by latitude and longitude using linear interpolation between photographic fiducial points, (3) removal of diurnal variations of the geomagnetic field as recorded on a base station magnetometer; (4) subtraction of the International Geomagnetic Reference Field (International Association of Geomagnetism and Aeronomy Division I Working Group 1, 1982) as calculated for each of the days flown, (5) projection of the data using a Polyconic map projection. Steps 2 through 5 were done by computer with standard U.S. Geological Survey aeromagnetic data-processing programs. A magnetic tape containing the reduced data in standard USGS airborne format for the Irish Wilderness Area (Fig. 1) can be obtained from the National Technical Information Service (Raab and others, 1983).

Map Compilation

Stacked profiles of the ground elevation (C7) and corrected aeromagnetic data (C5) were plotted by computer for each of the flight lines (lines 2-38, Figures 2-38). Each profile has a horizontal map scale of 1:500000. Ground elevation was calculated from the radar altimeter data and assumed barometric flight altitude of 1200 feet above sea level and plotted at a vertical scale of 500 ft/in (152.4 m/in.). Flight line 9 (Figure 9) has a ground elevation which is negative at the southern end of the line. This was due to a deviation from the scheduled flight altitude. Magnetic profiles were plotted at a vertical scale of 100 gammas/in. The horizontal axis of each set of stacked profiles is labeled in degrees, minutes, and seconds of latitude.

A corrected total field magnetic contour map (Plate 1) was compiled from gridded (Anderson, 1971) flight line data. The contour map was drafted by computer at a scale of 1:62500 with a 20 gamma contour interval. Each flight line is drawn (dashed lines) and labeled on the contour map for reference to the profiles. Latitude and longitude tick marks are plotted and labeled at 5 minute intervals.

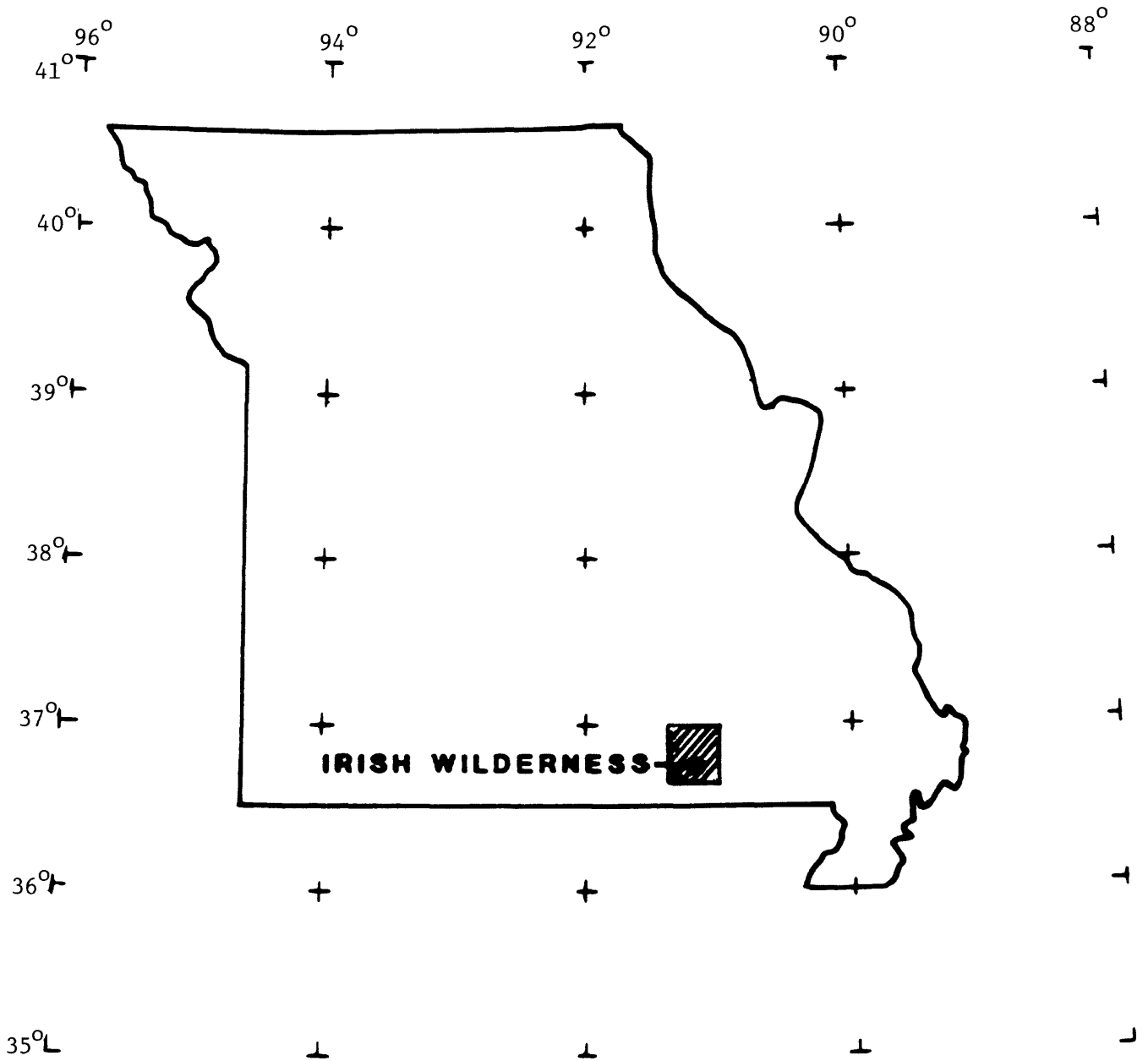
Acknowledgments

The authors wish to express their appreciation to Joe Duval for assistance in data processing, and to the flight crew, M. Steward, pilot, and R. Sneddon, co-pilot.

References

- Anderson, W. L., 1971, Application of bicubic spline functions to two-dimensional gridded data: U.S. Geological Survey Report GD-71-022 (also available as NTIS Report PB-203-579, 70 p., National Technical Information Service, Springfield, VA 25107).
- International Association of Geomagnetism and Aeronomy Division 1, Working Group 1, 1982, International Geomagnetic Reference Field 1980: Geophys. J. R. Astr. Soc. 68 p., 265-268.
- Raab, P., Abrams, G., Bradley, J., Mitchell, C., 1983, Tape of aeromagnetic data from southeastern Missouri, Irish Wilderness Area, parts of Shannon, Carter, Oregon, and Ripley Counties, Missouri: U.S. Geological Survey Report USGS GD-83-004, available from National Technical Information Service, Attn: Input Branch (DIGSGD), 5285 Port Royal Road, Springfield, VA 22161 as Report PB 83-220814.

MISSOURI



LOCATION MAP

Figure 1.

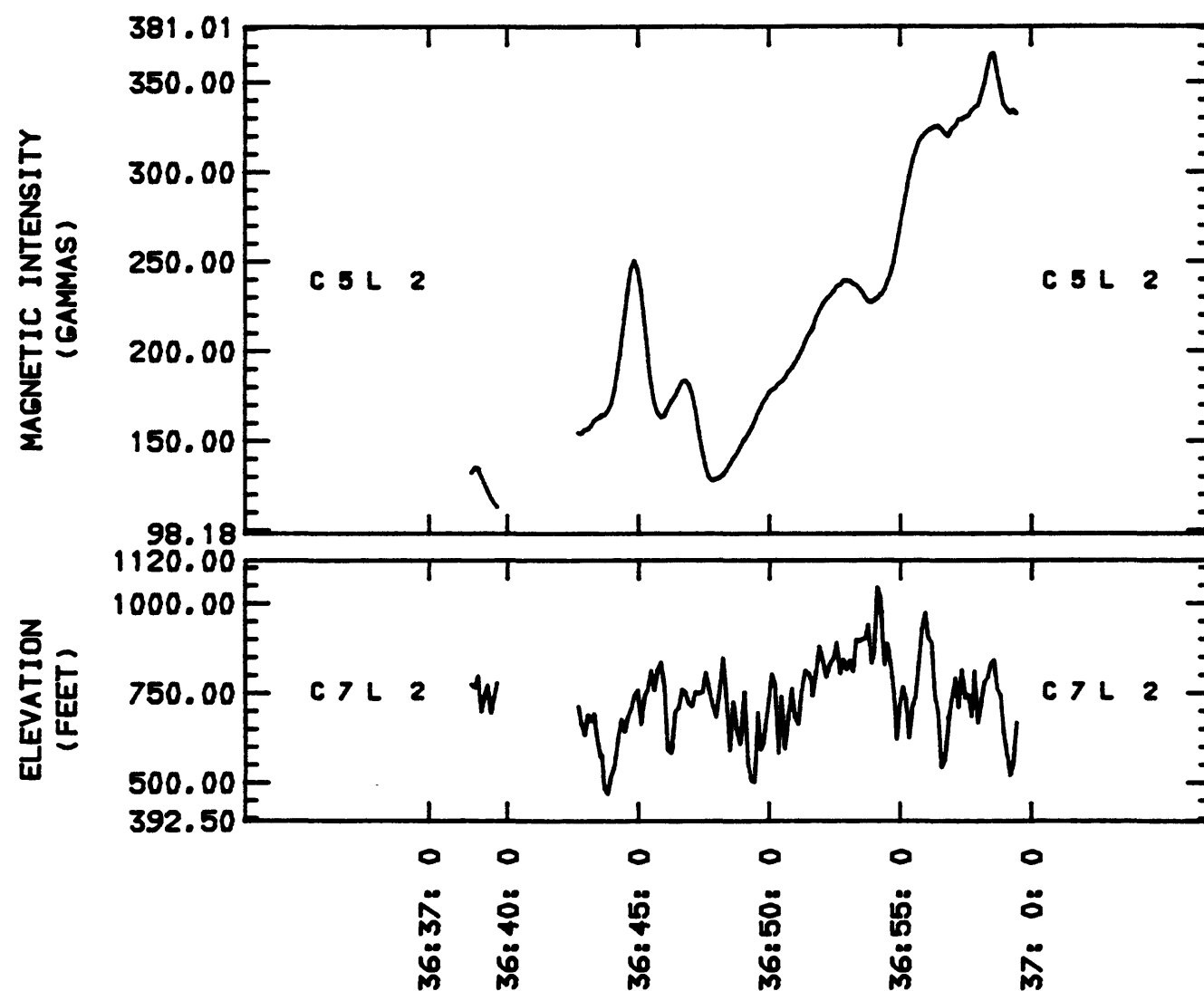


Figure 2. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 2.

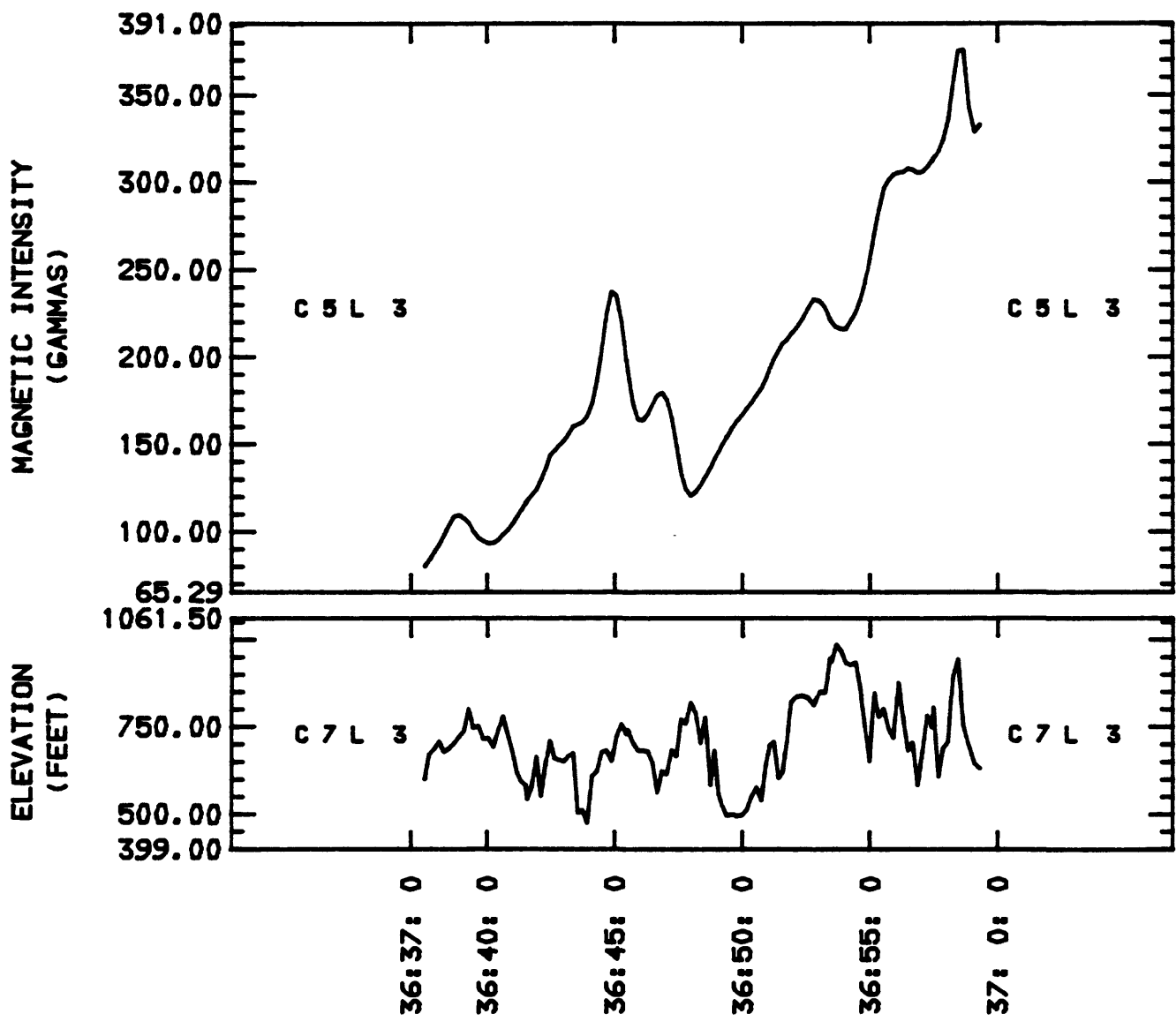


Figure 3. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 3.

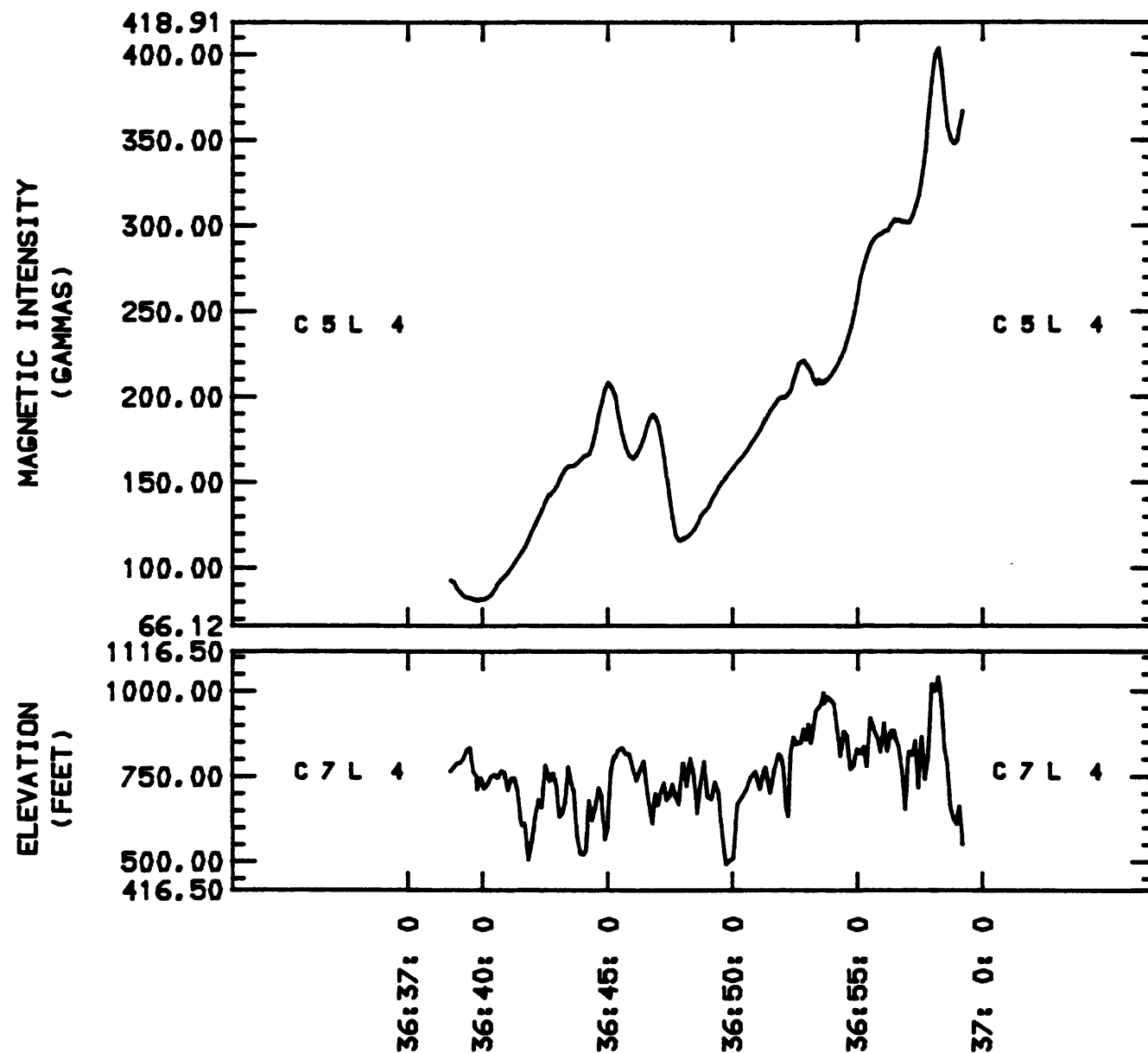


Figure 4. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 4.

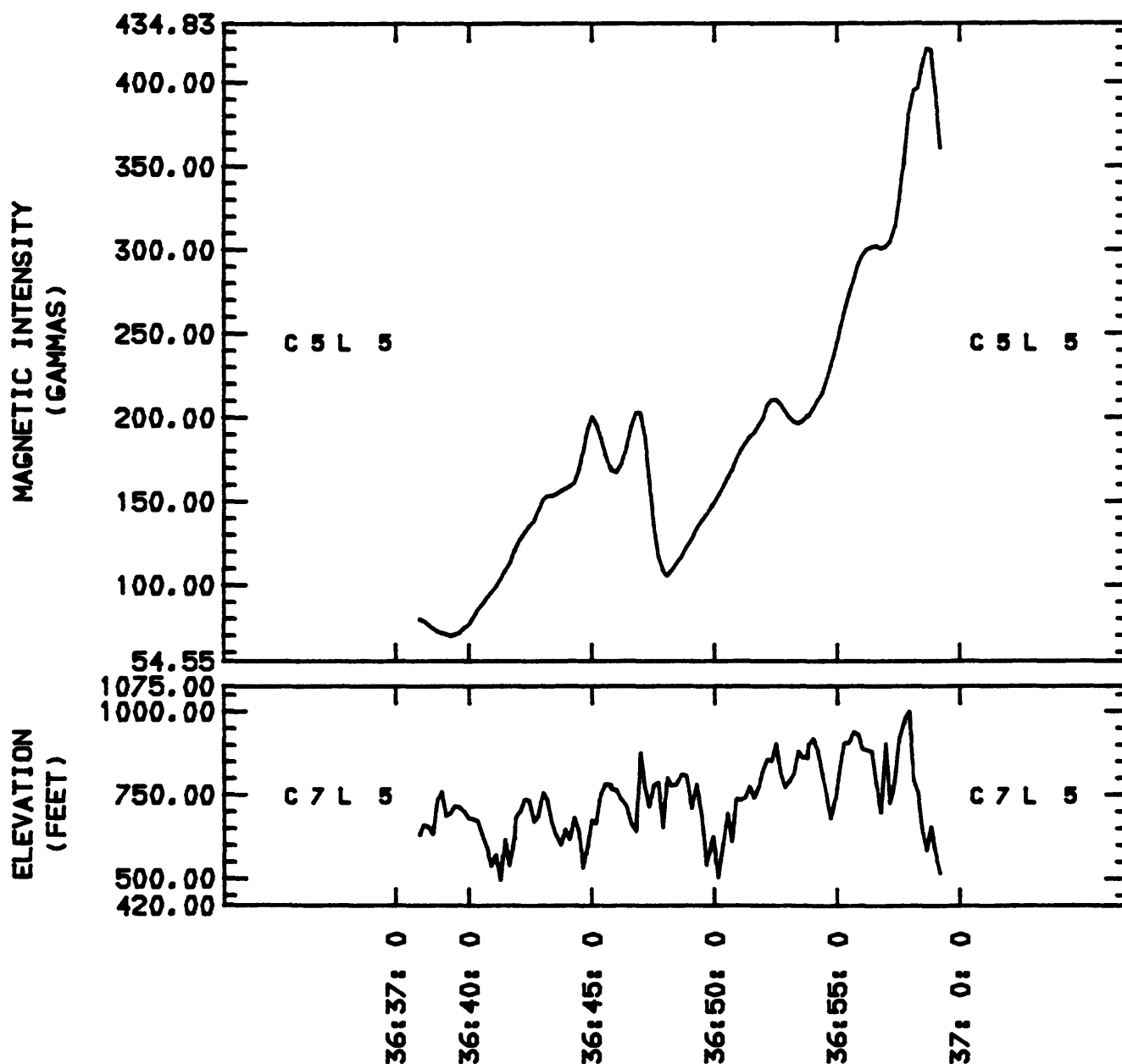


Figure 5. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 5.

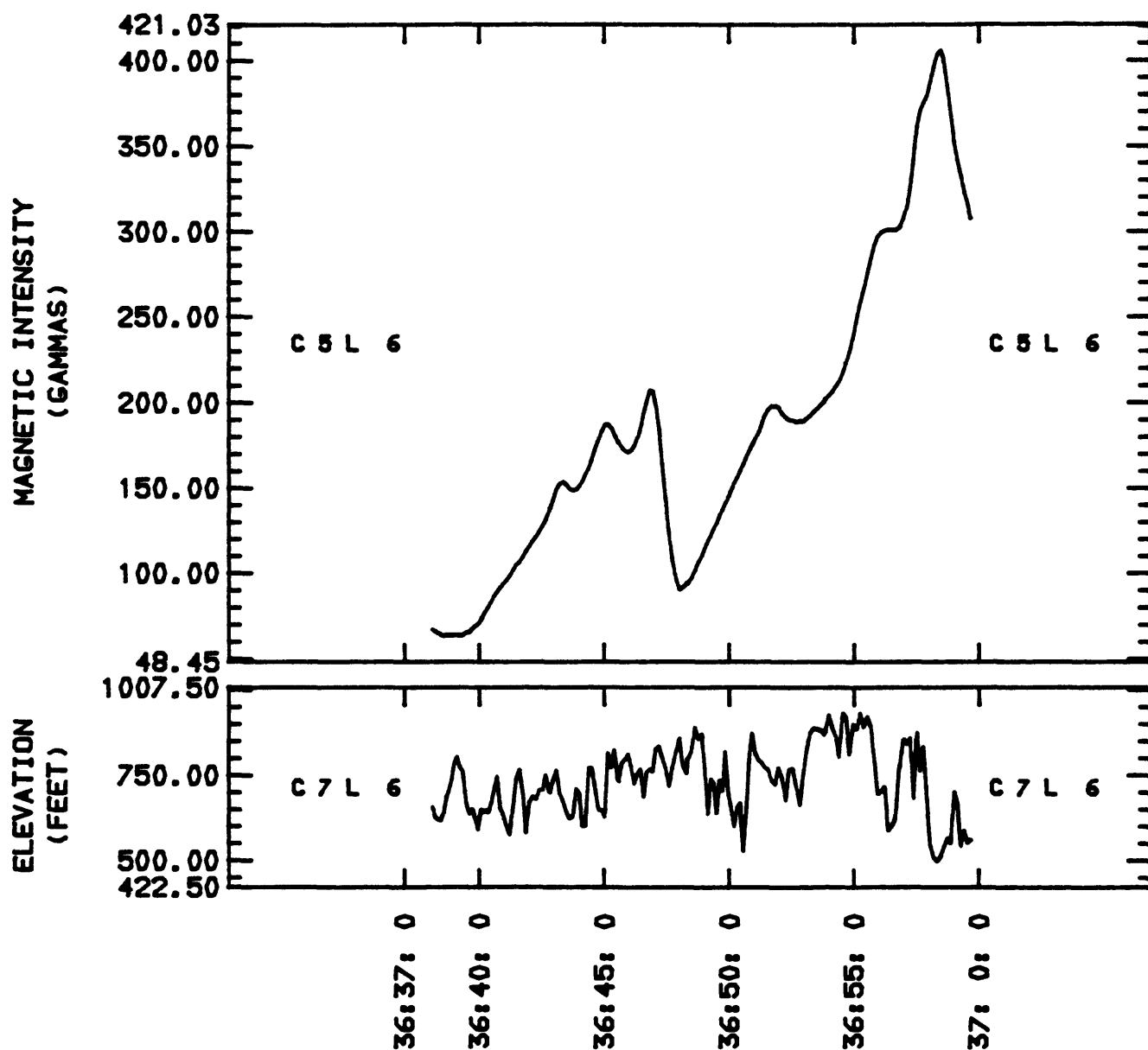


Figure 6. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 6.

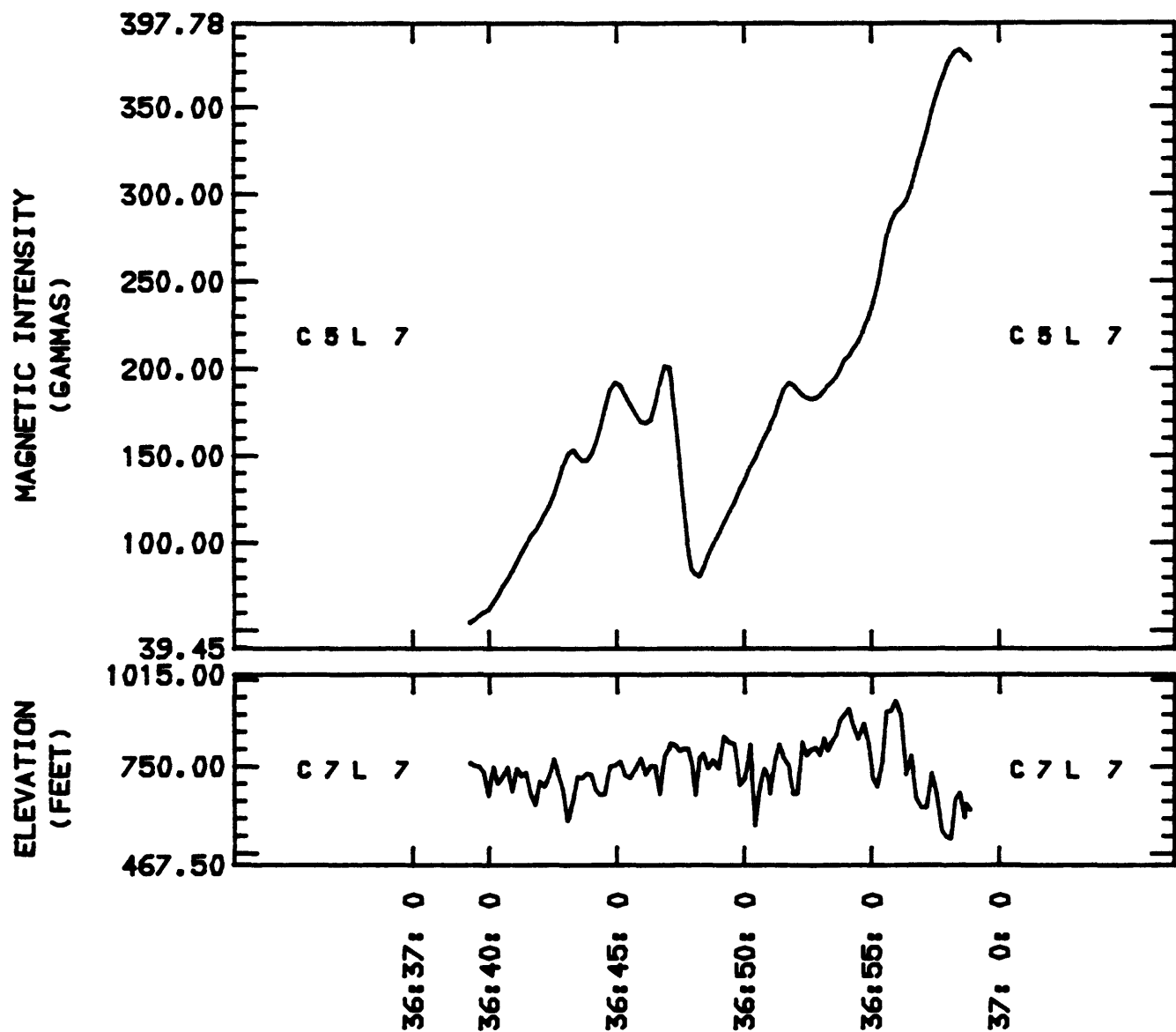


Figure 7. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 7.

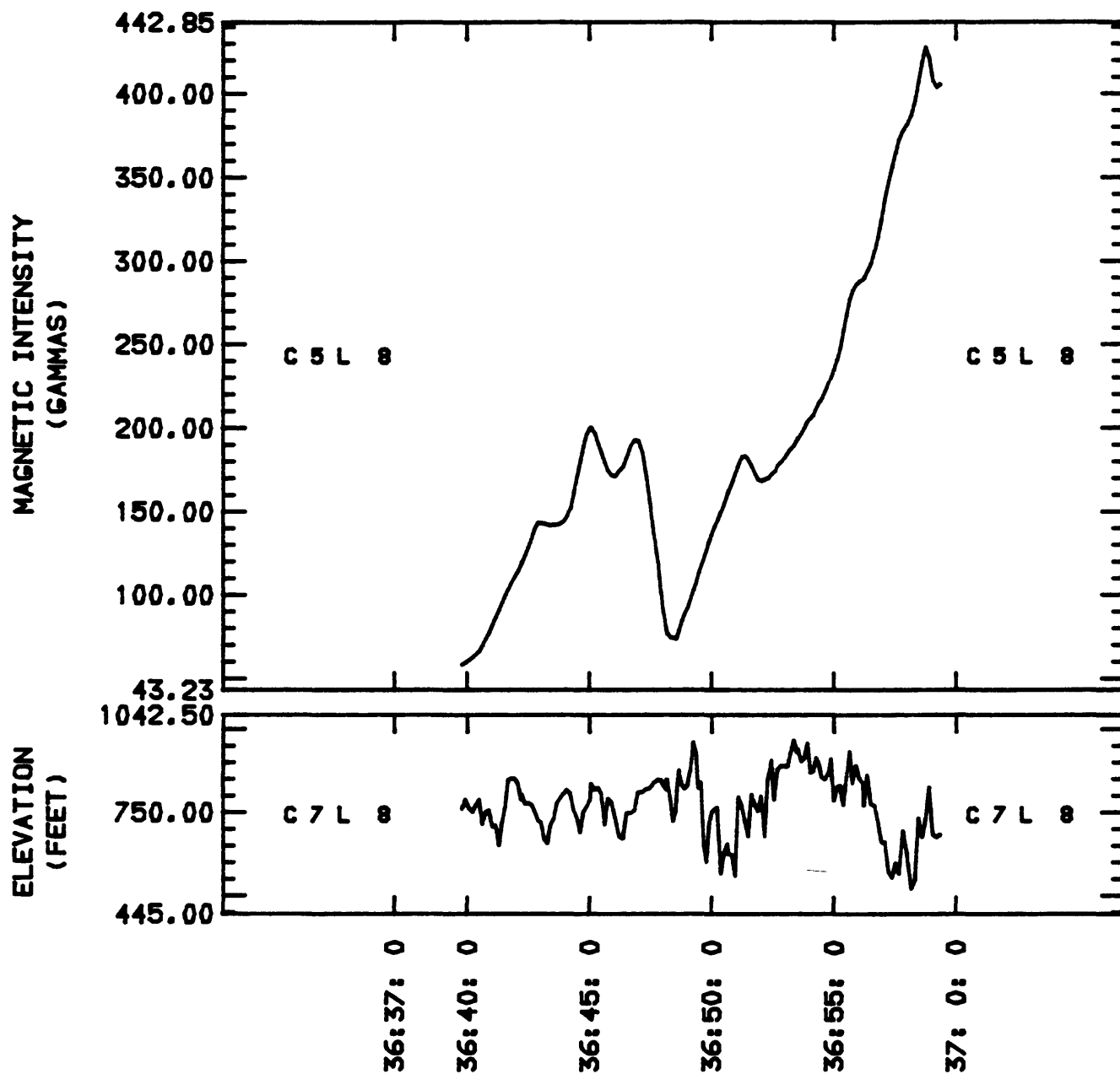


Figure 8. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 8.

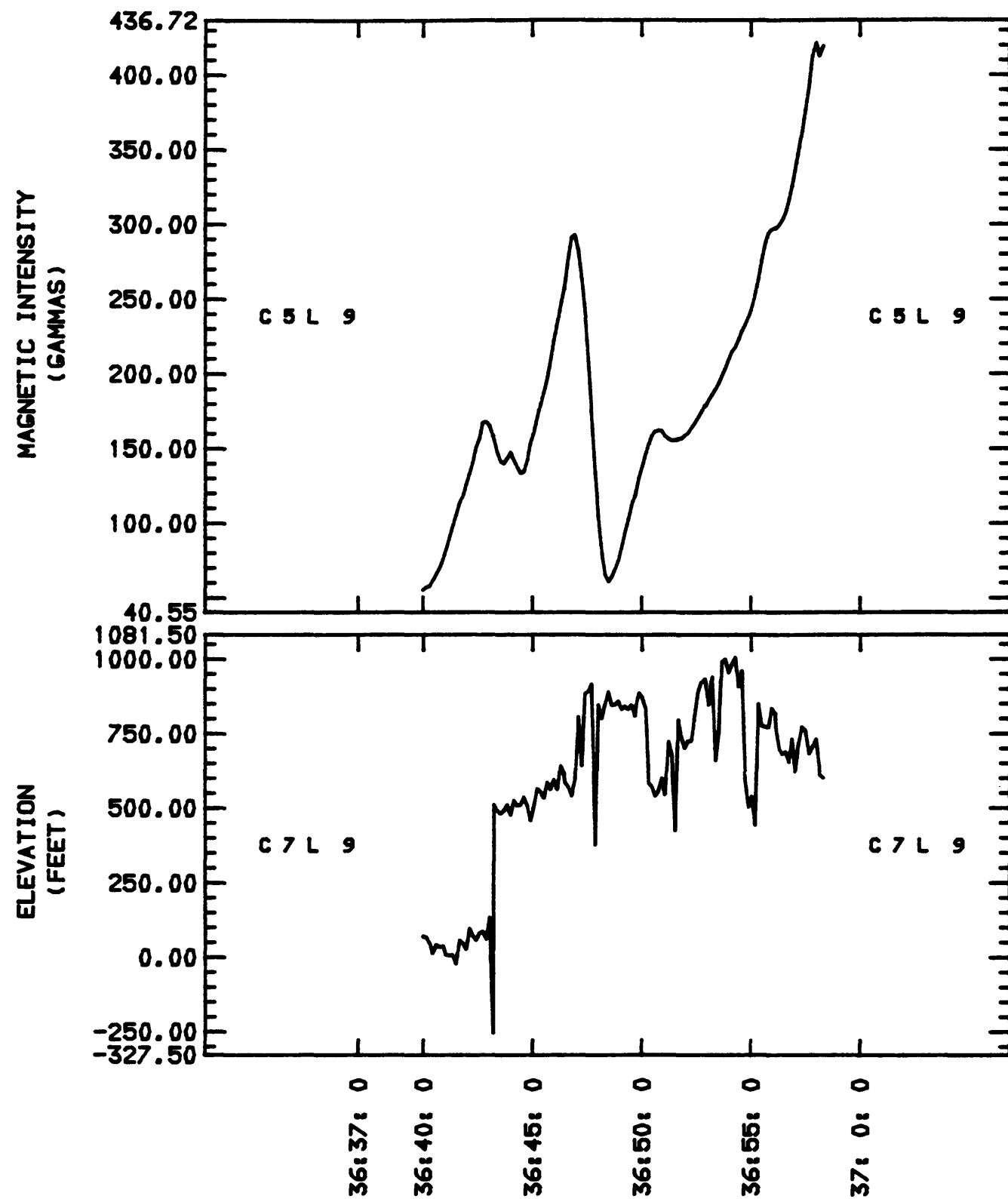


Figure 9. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 9.

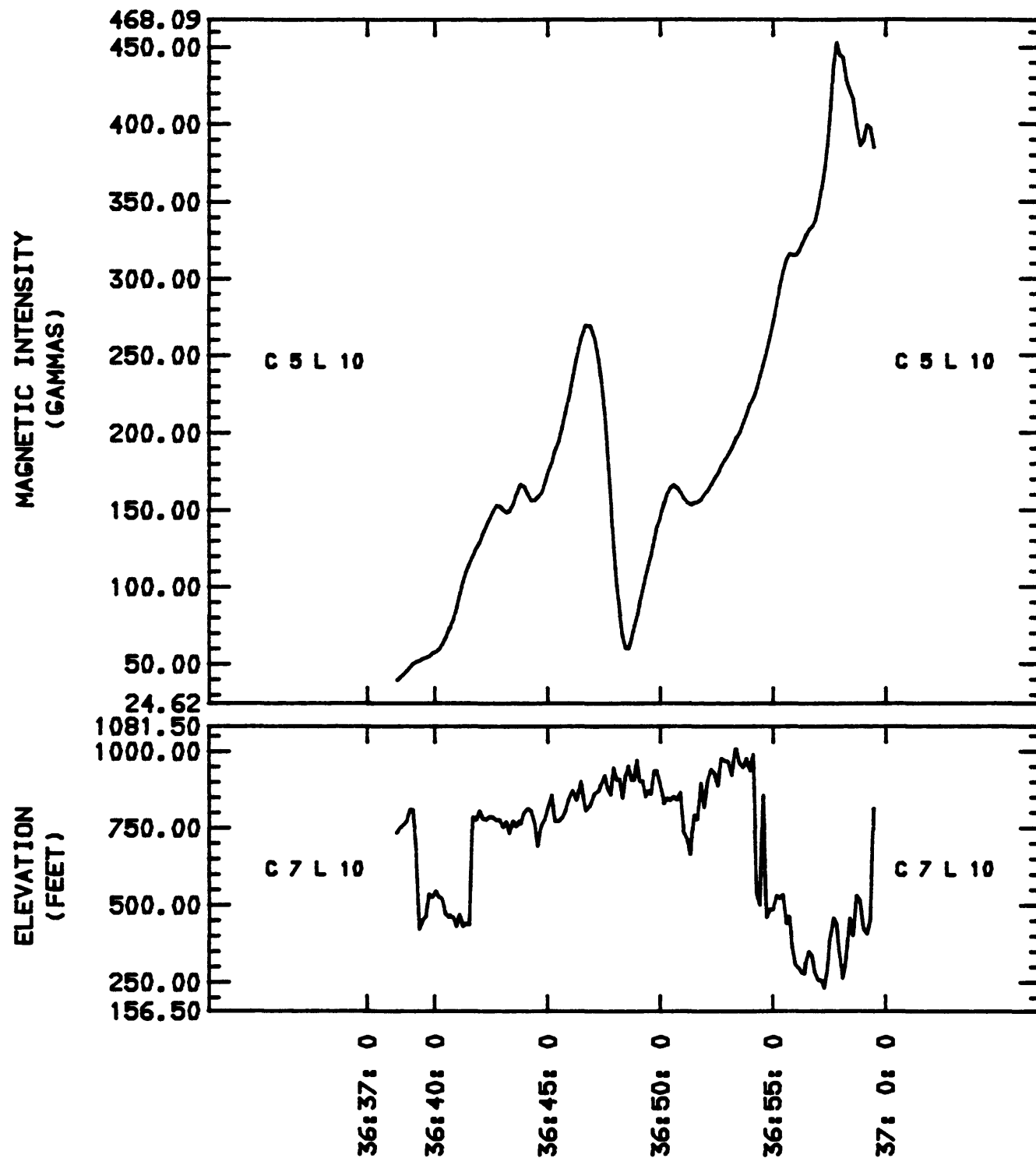


Figure 10. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 10.

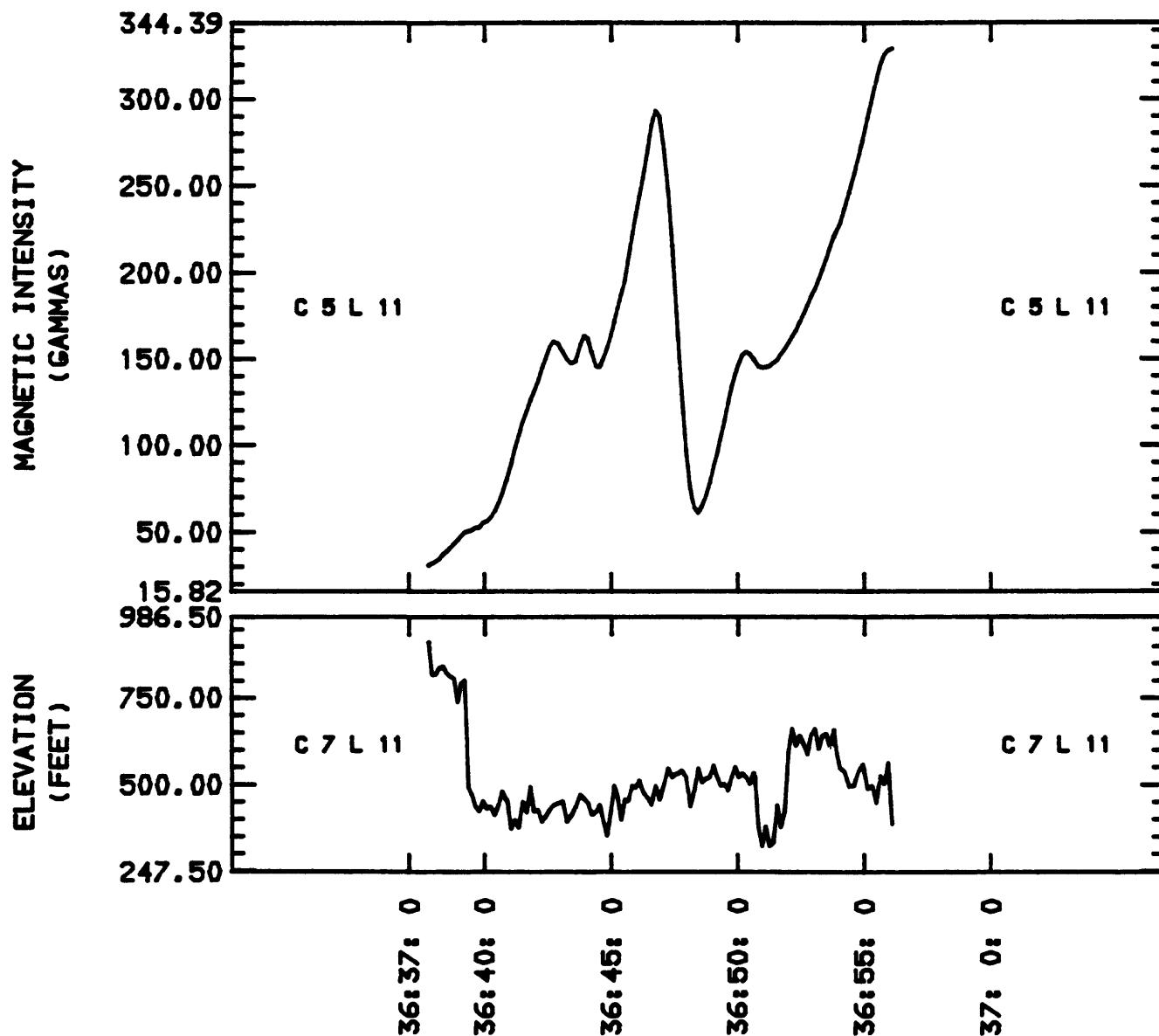


Figure 11. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 11.

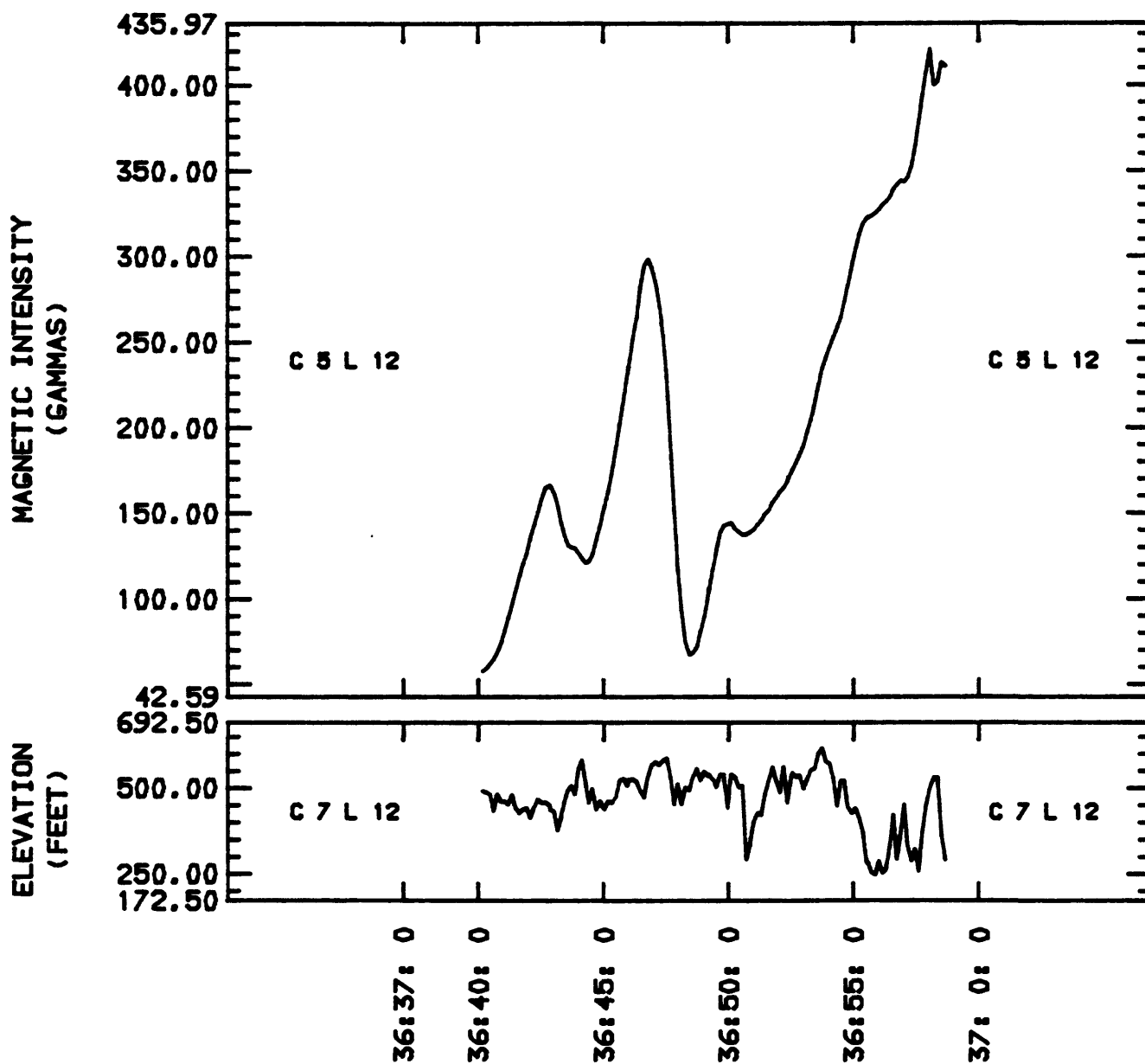


Figure 12. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 12.

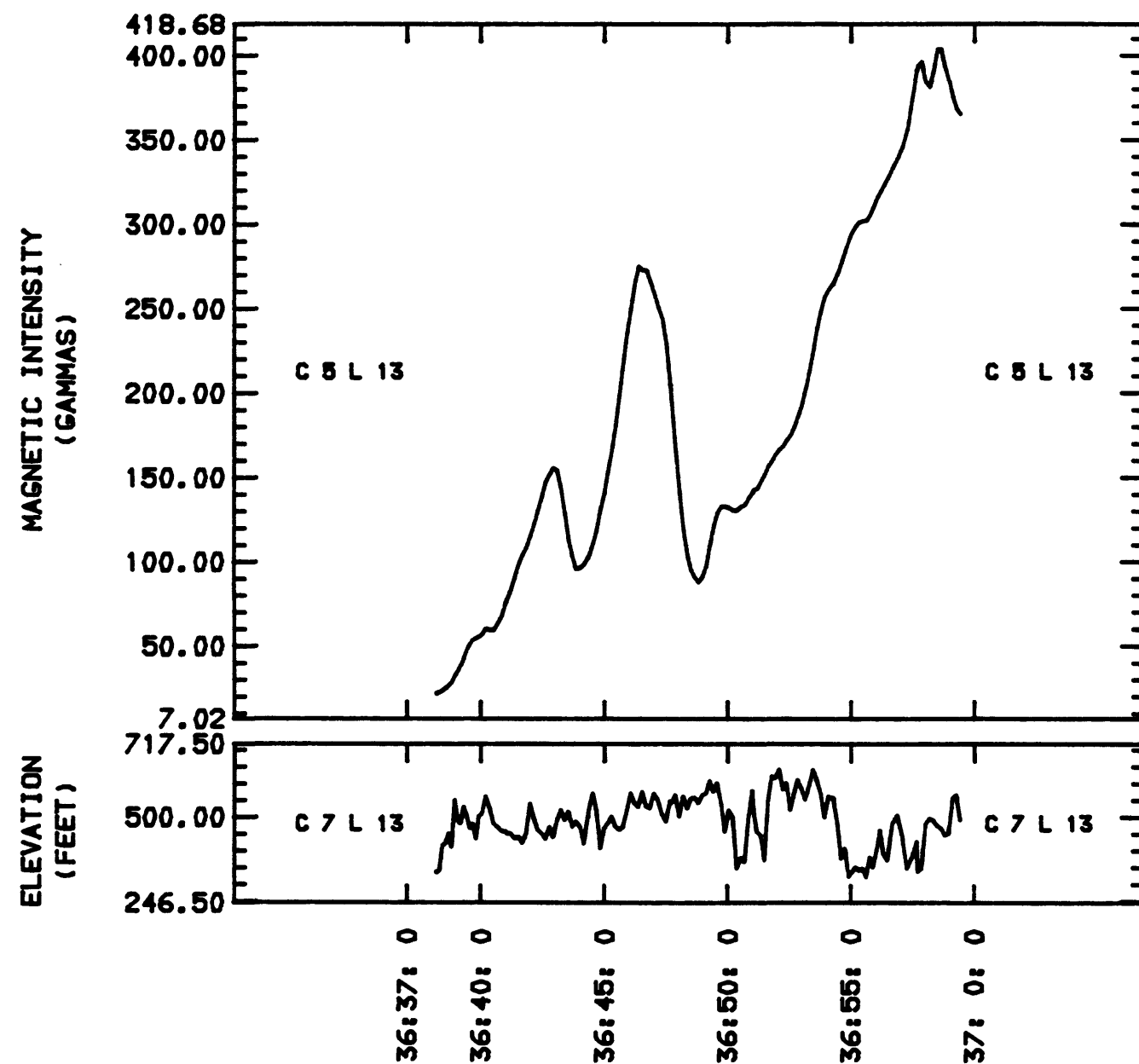


Figure 13. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 13.

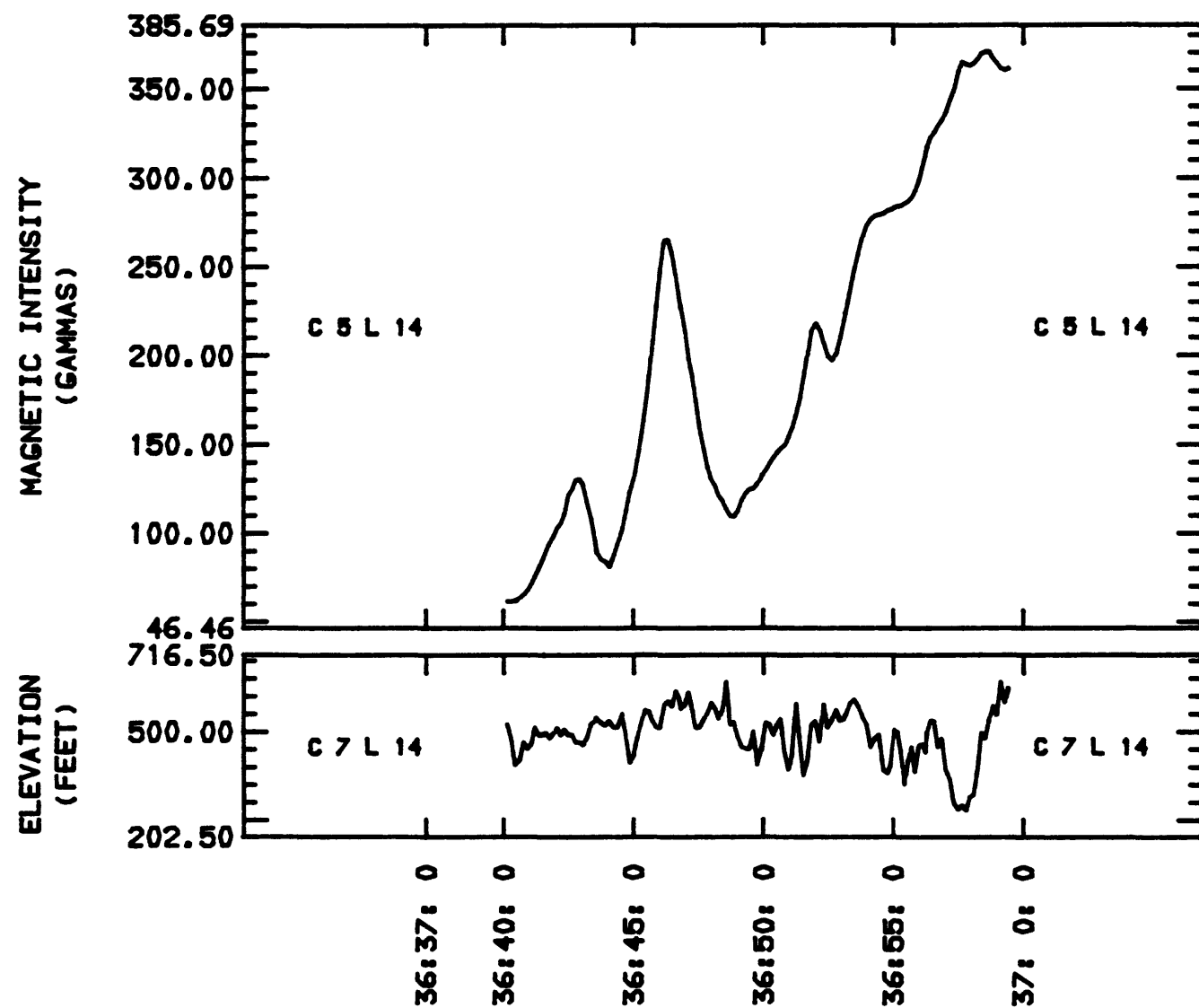


Figure 14. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 14.

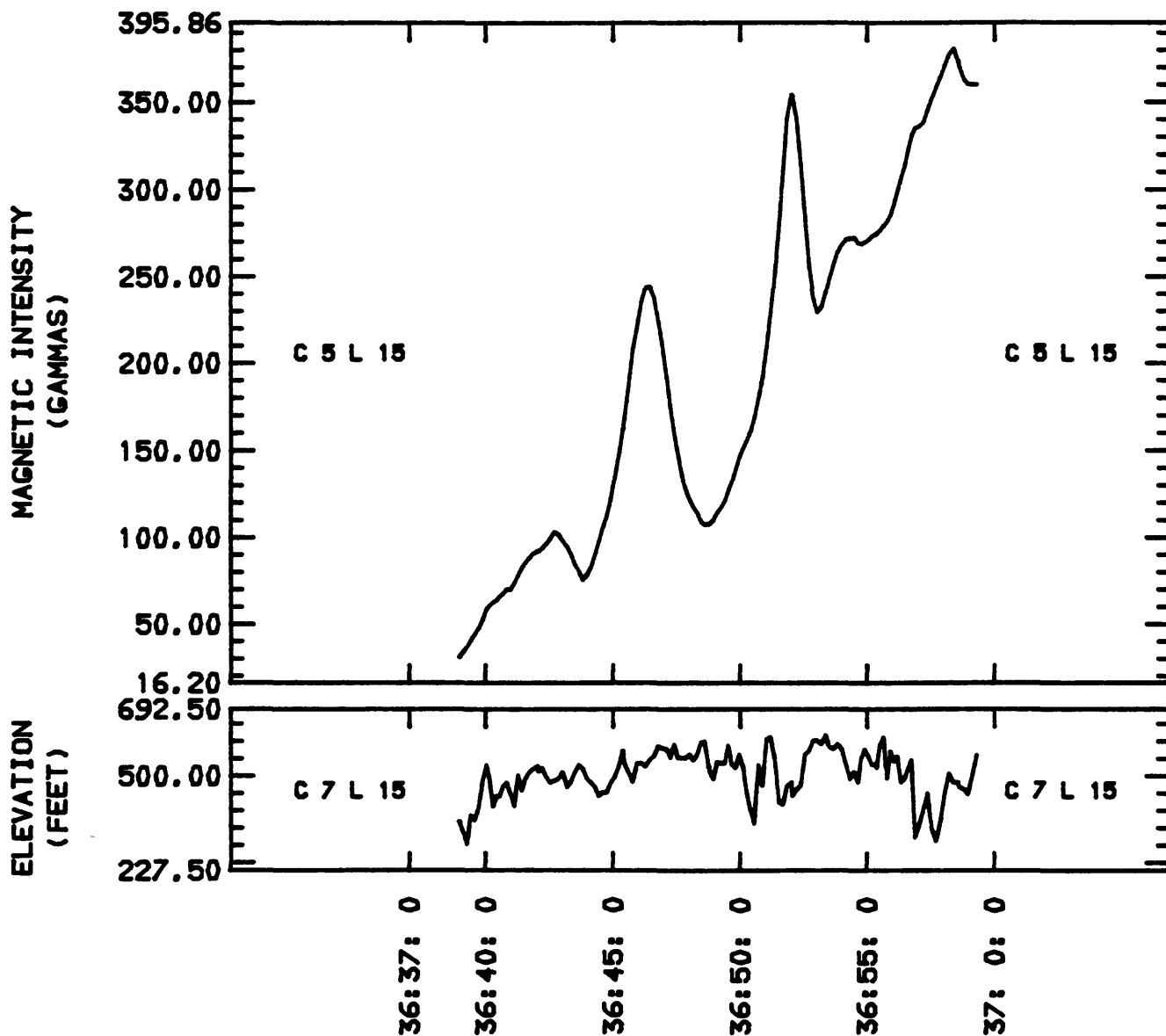


Figure 15. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 15.

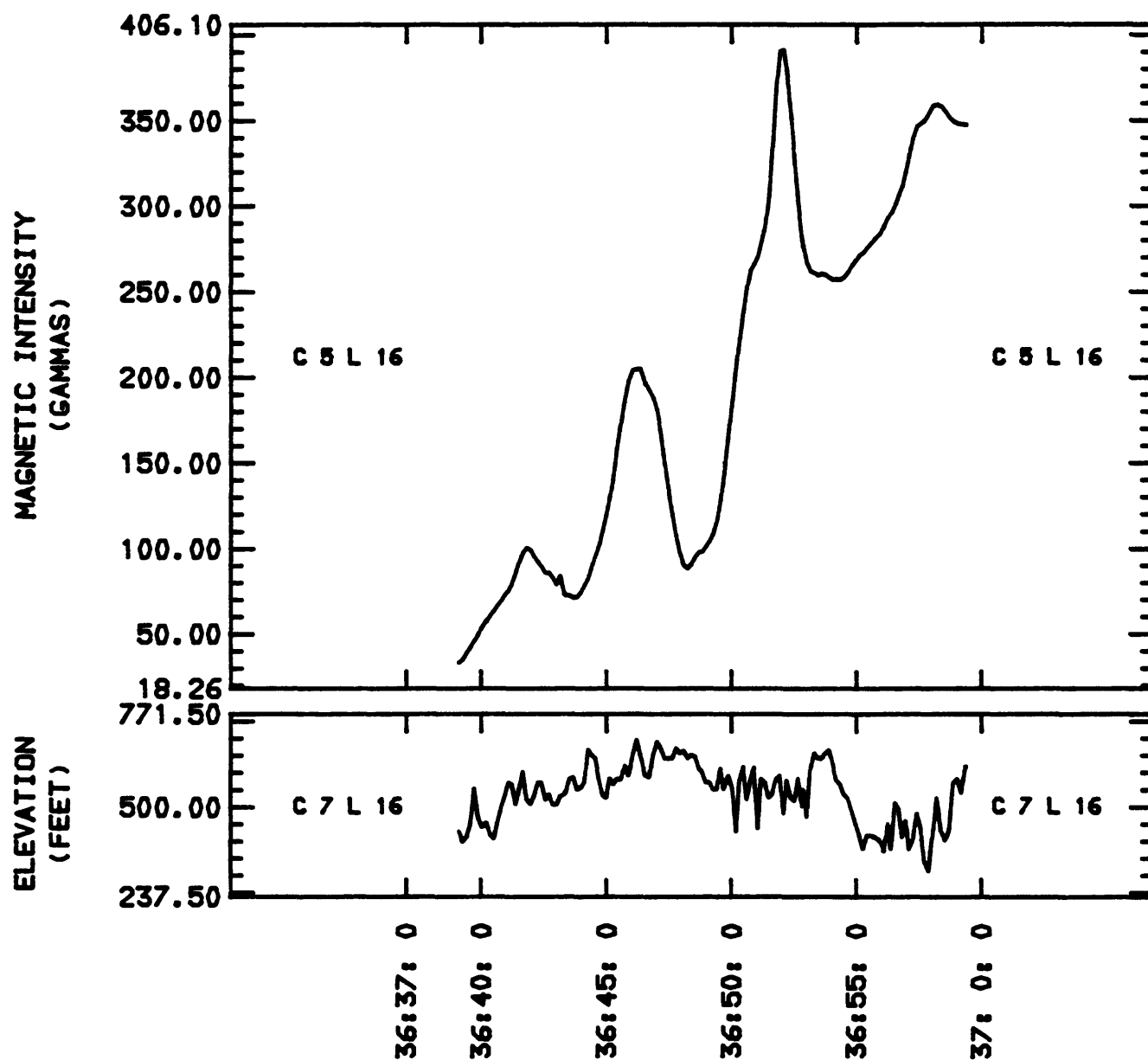


Figure 16. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 16.

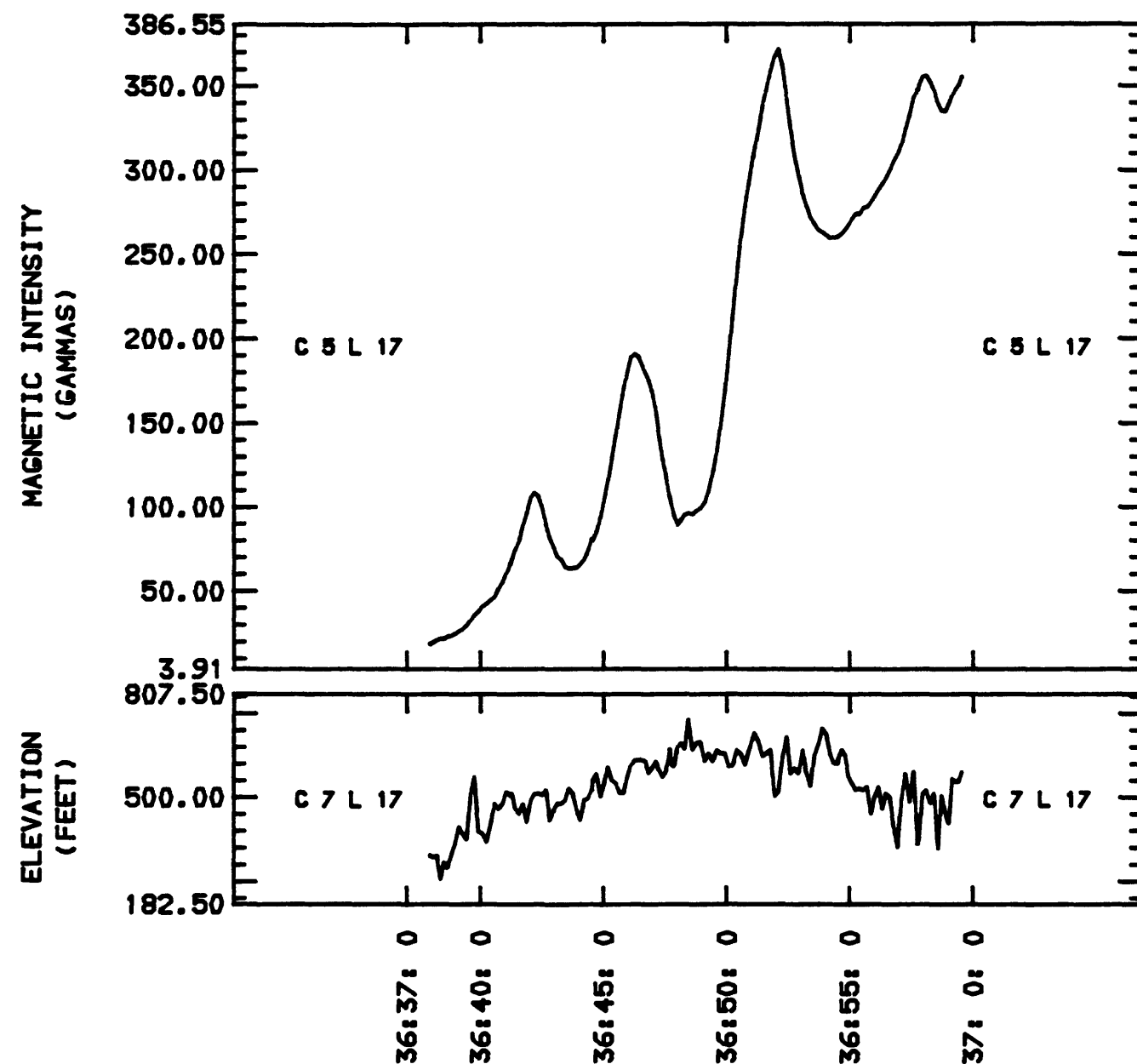


Figure 17. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 17.

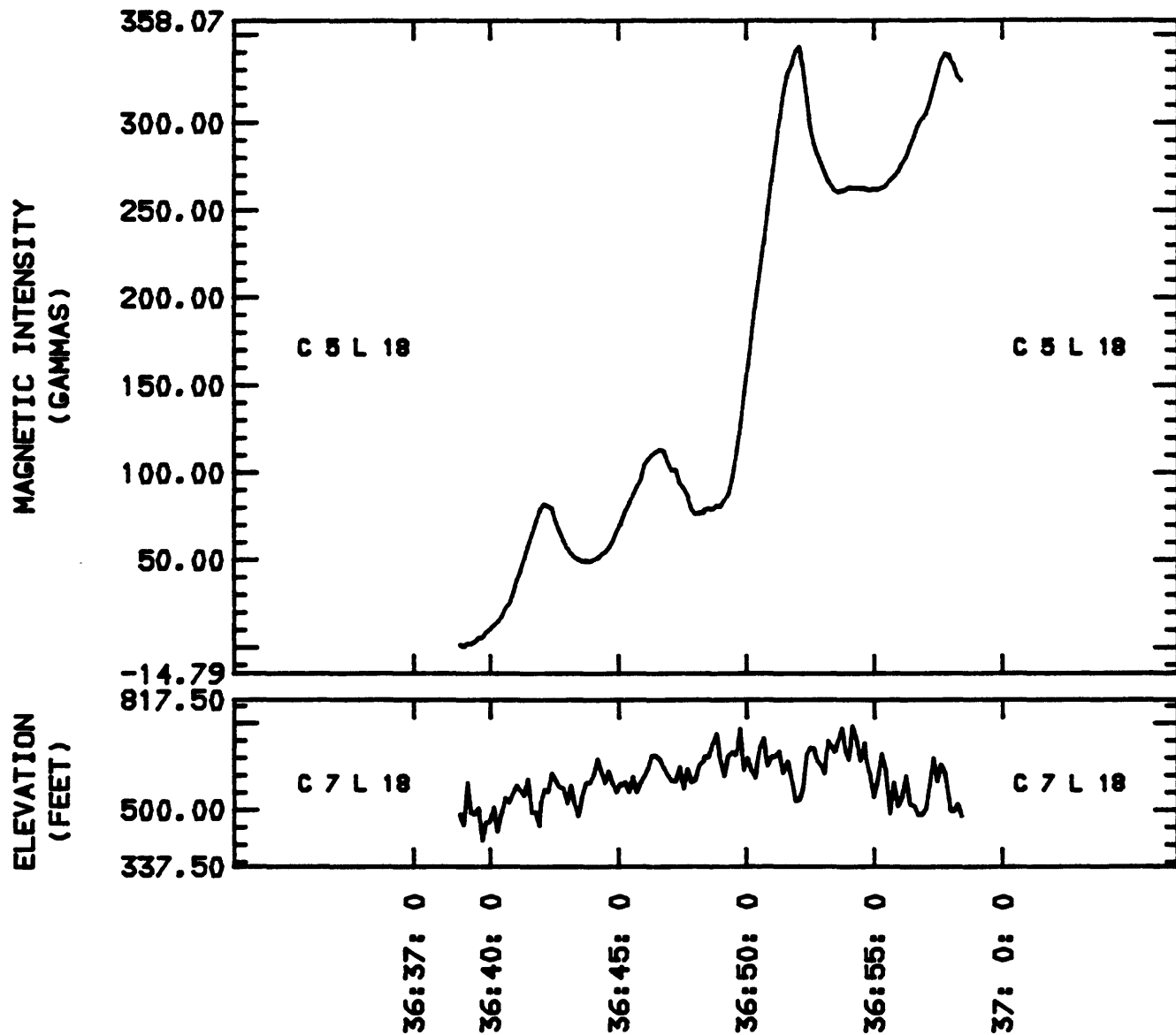


Figure 18. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 18.

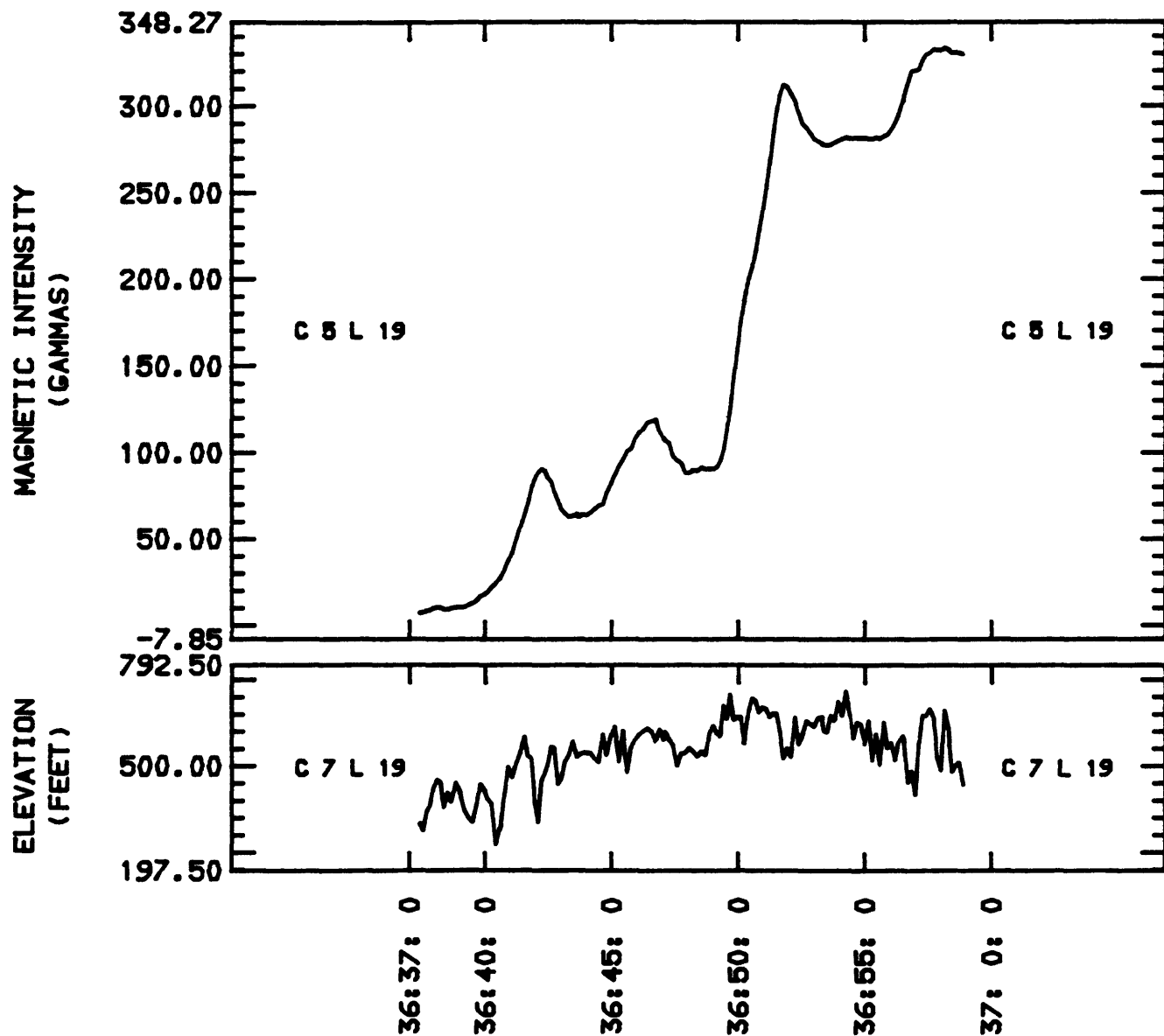


Figure 19. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 19.

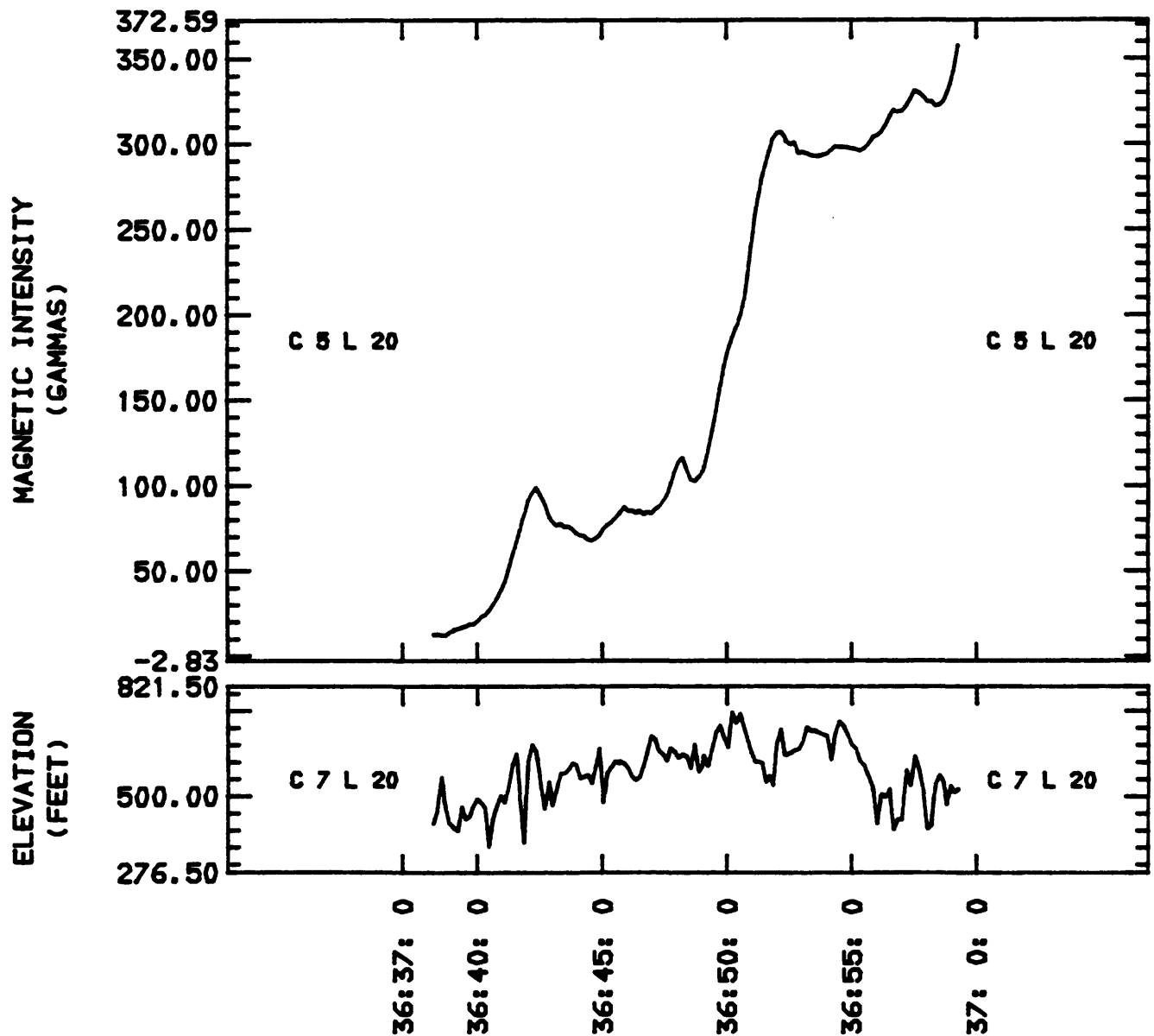


Figure 20. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 20.

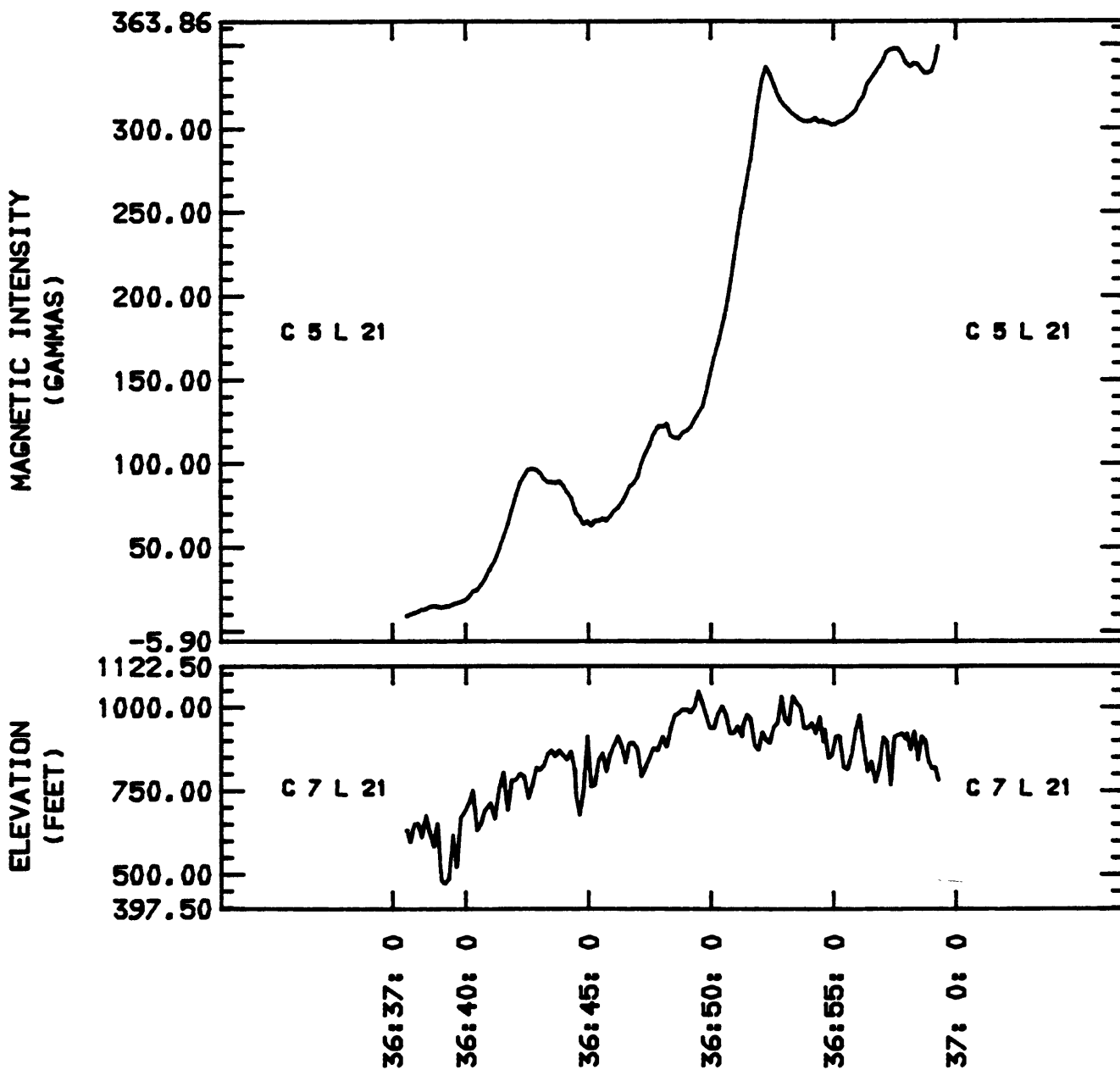


Figure 21. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 21.

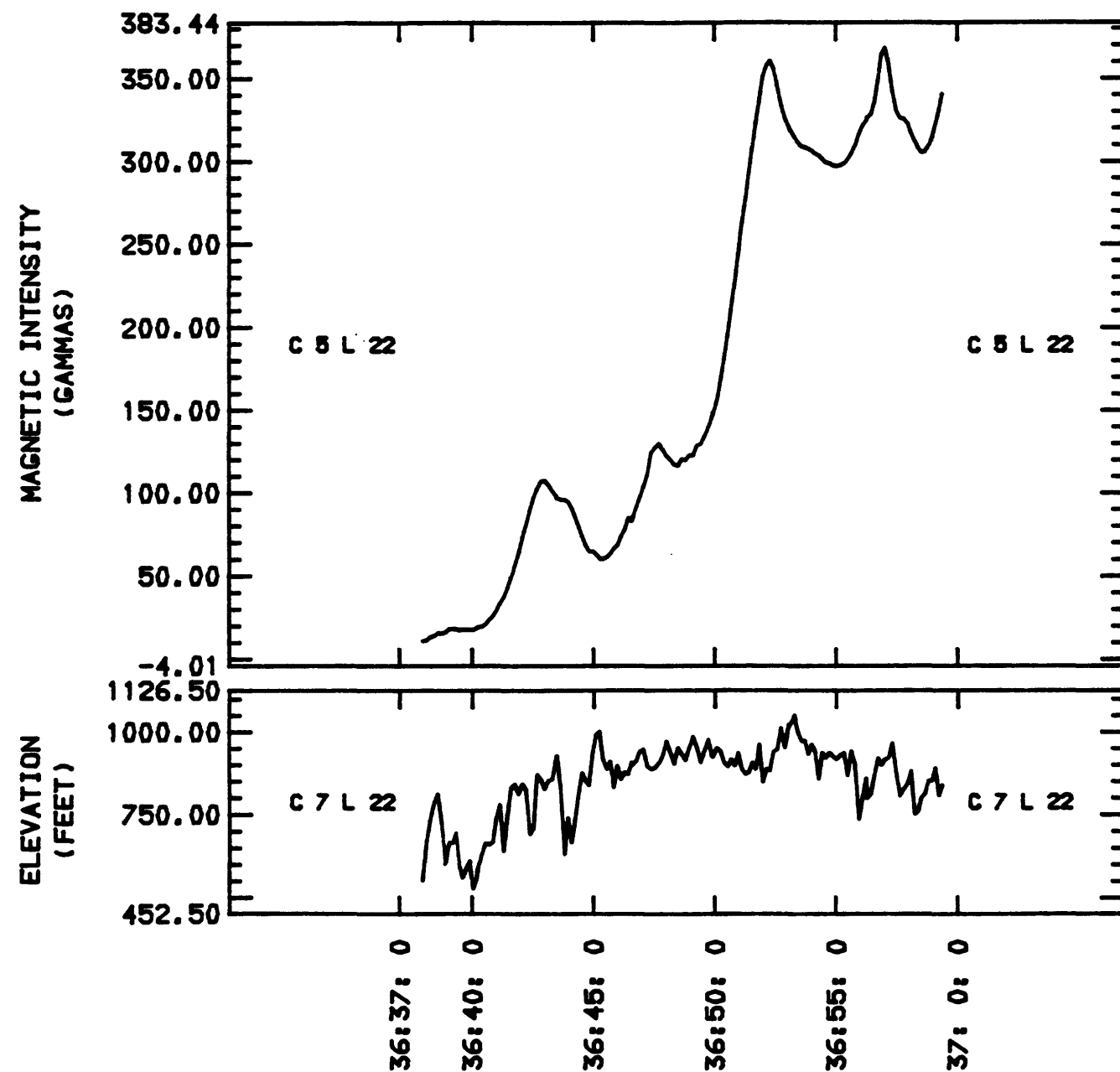


Figure 22. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 22.

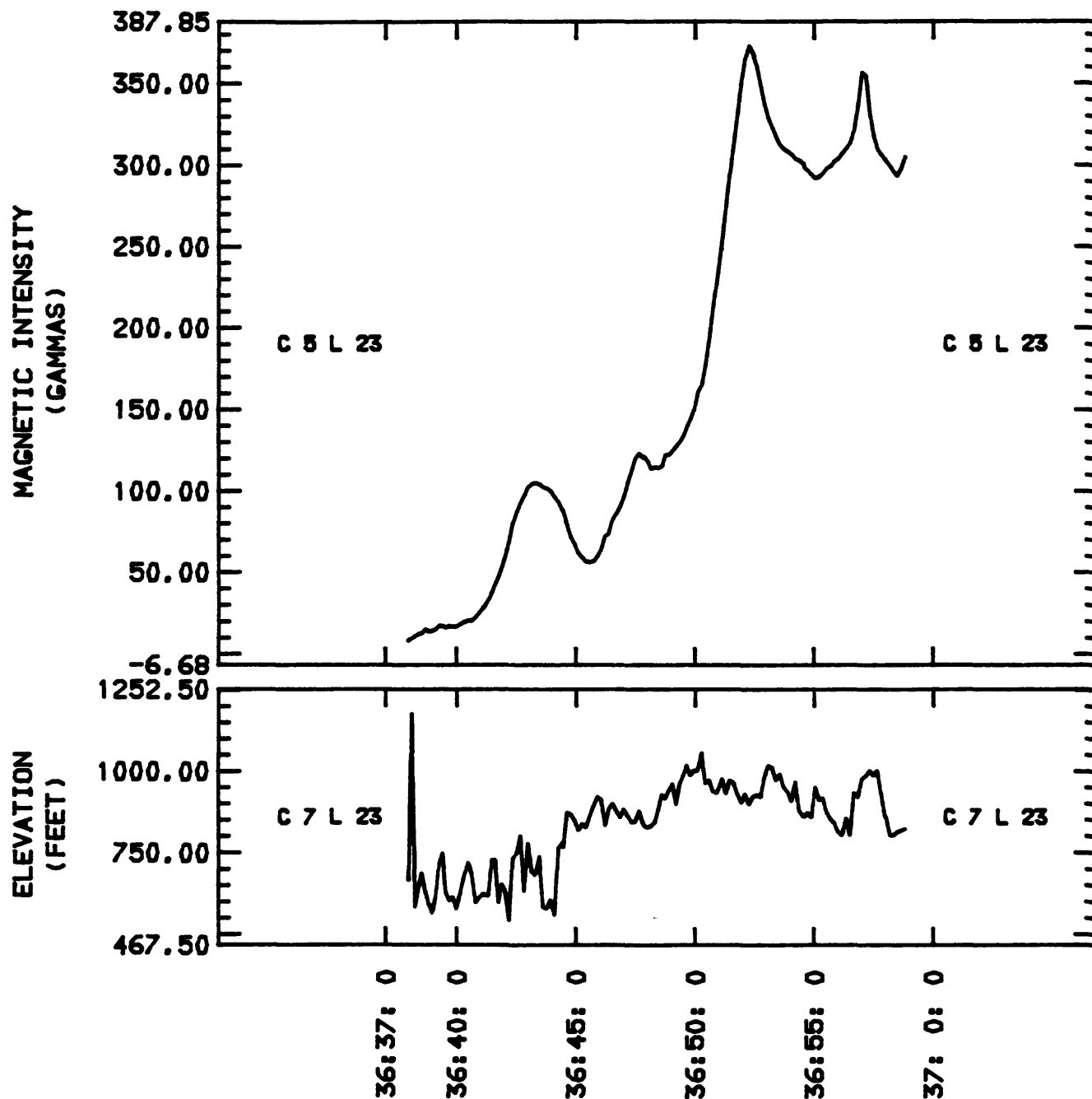


Figure 23. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 23.

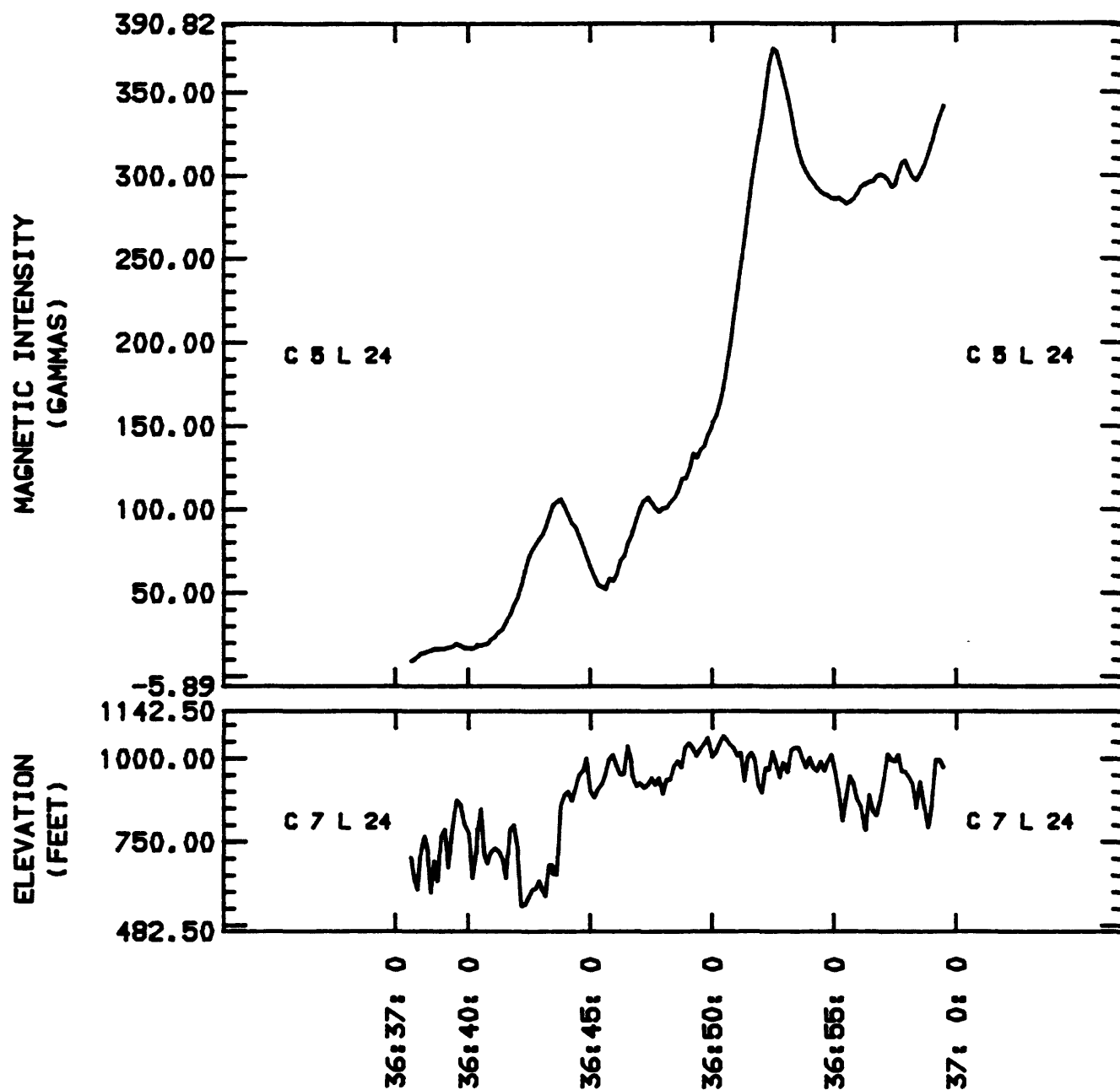


Figure 24. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 24.

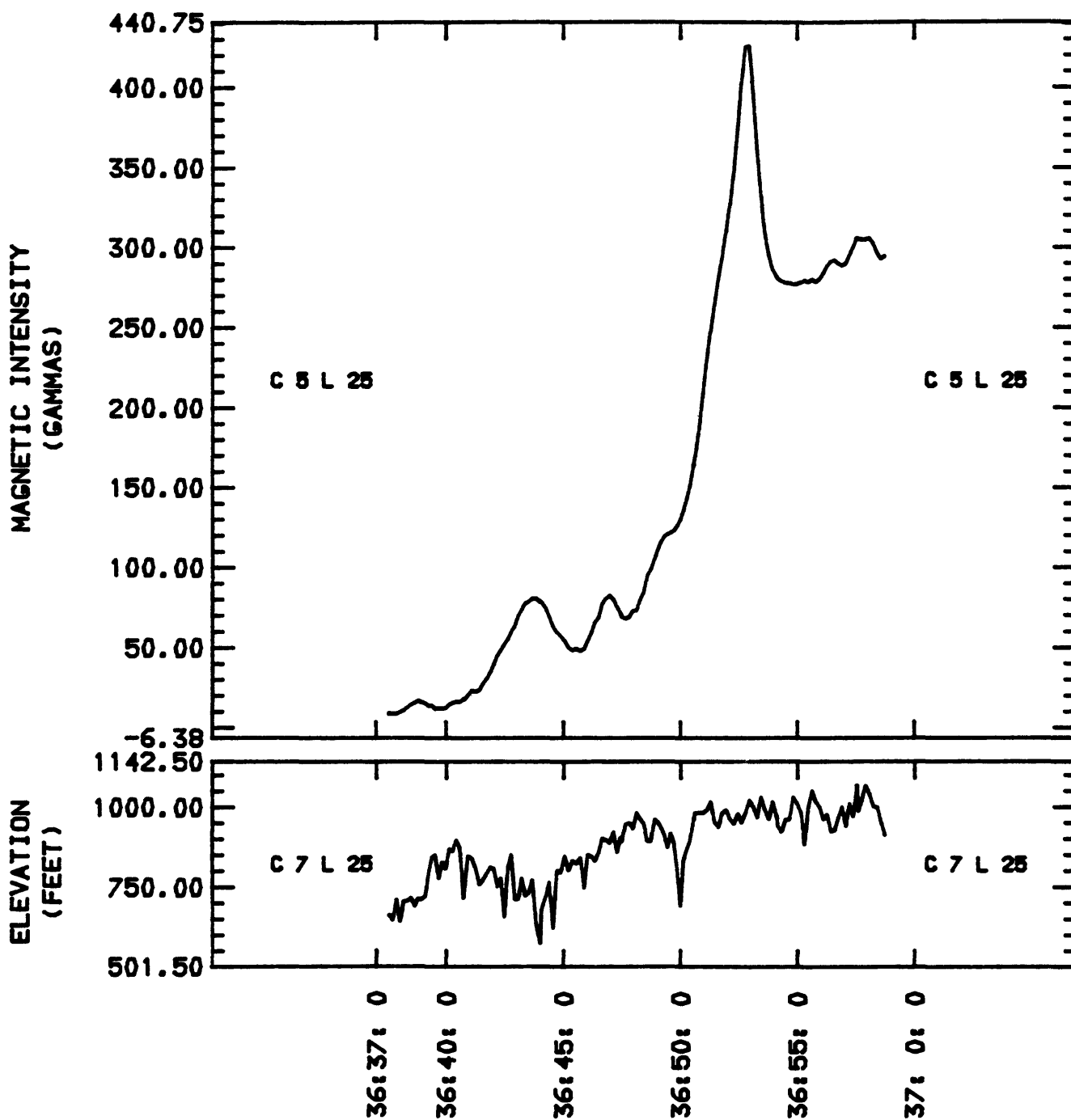


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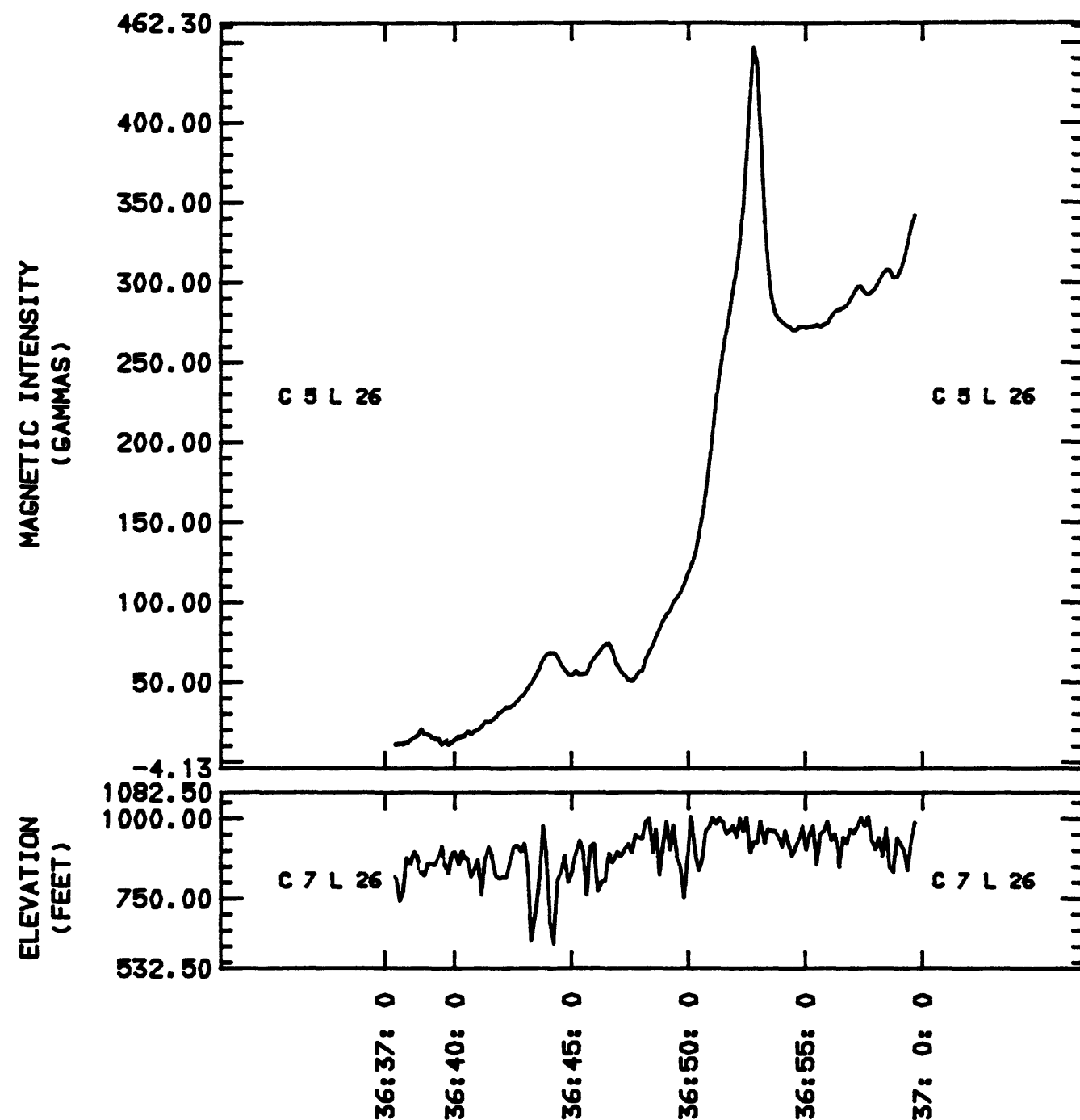


Figure 26. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 26.

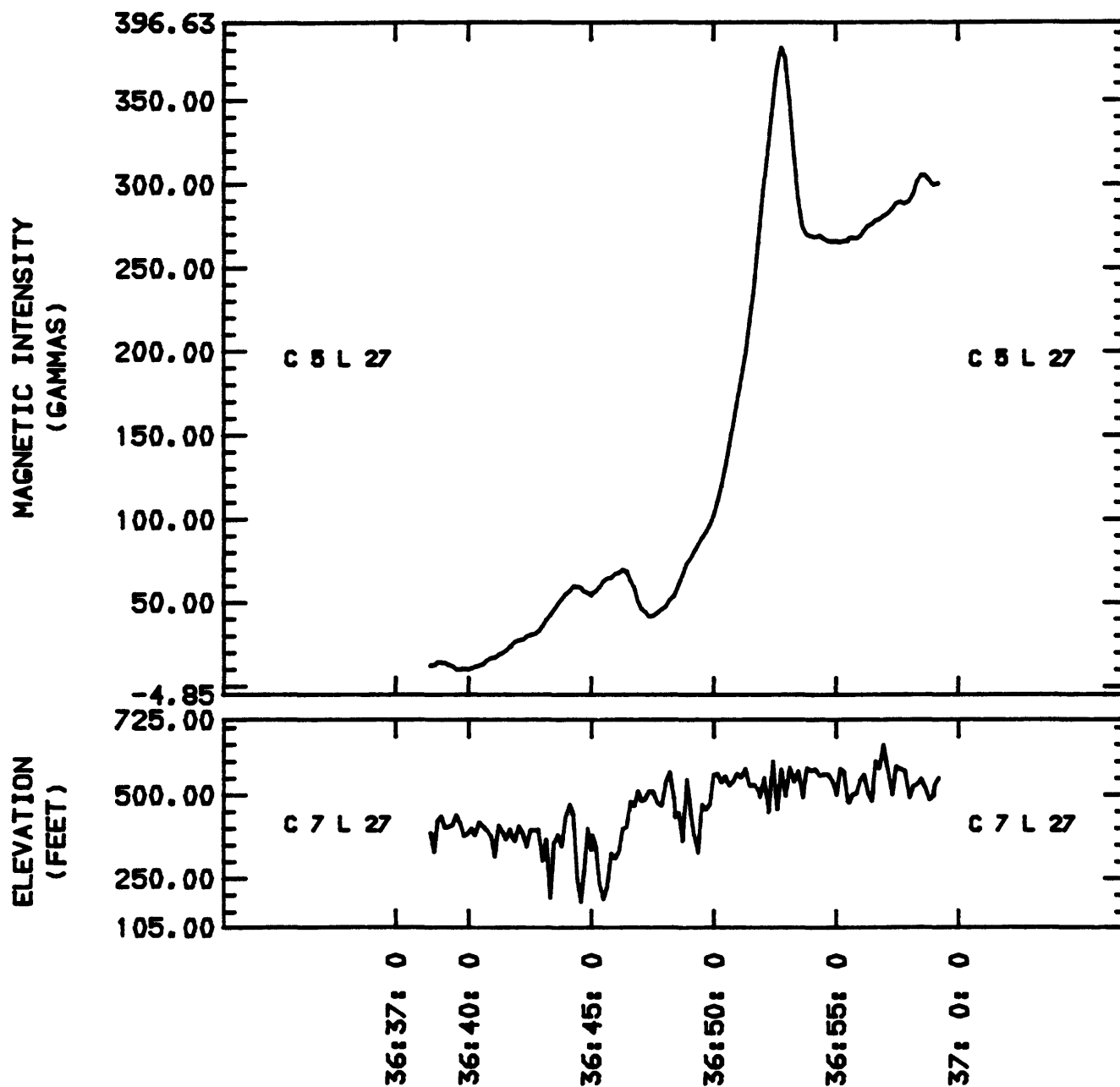


Figure 27. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 27.

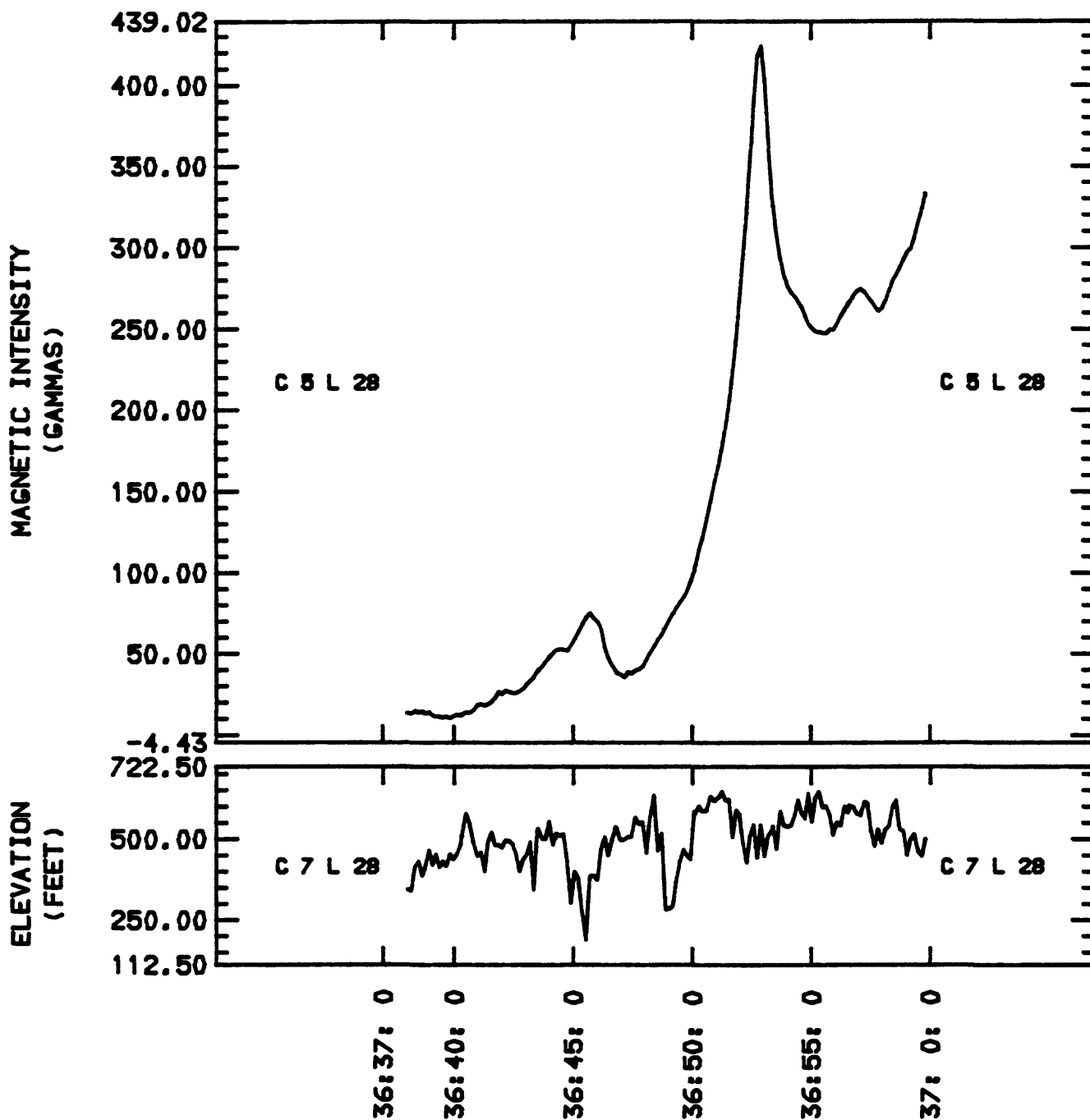


Figure 28. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 28.

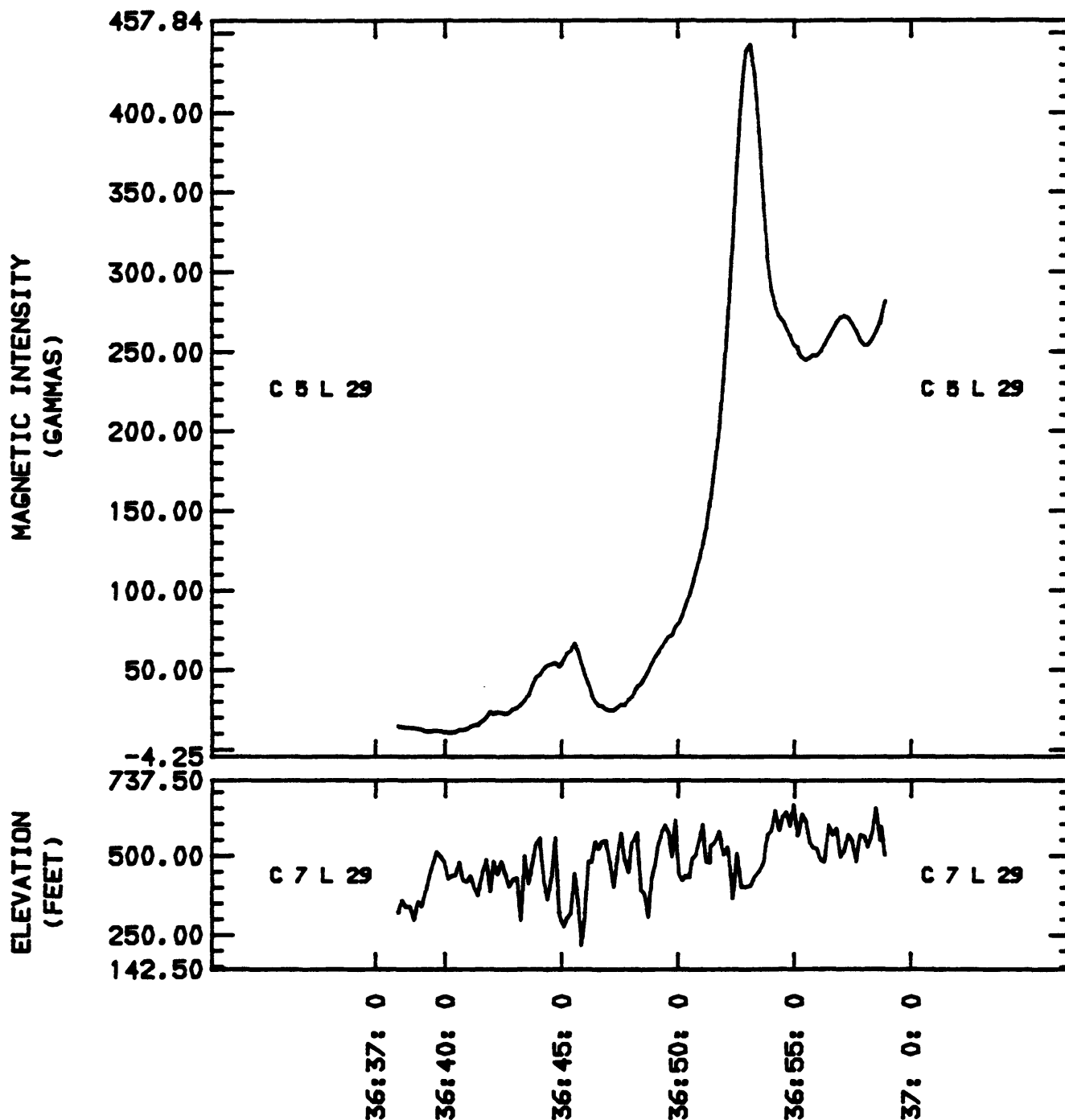


Figure 29. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 29.

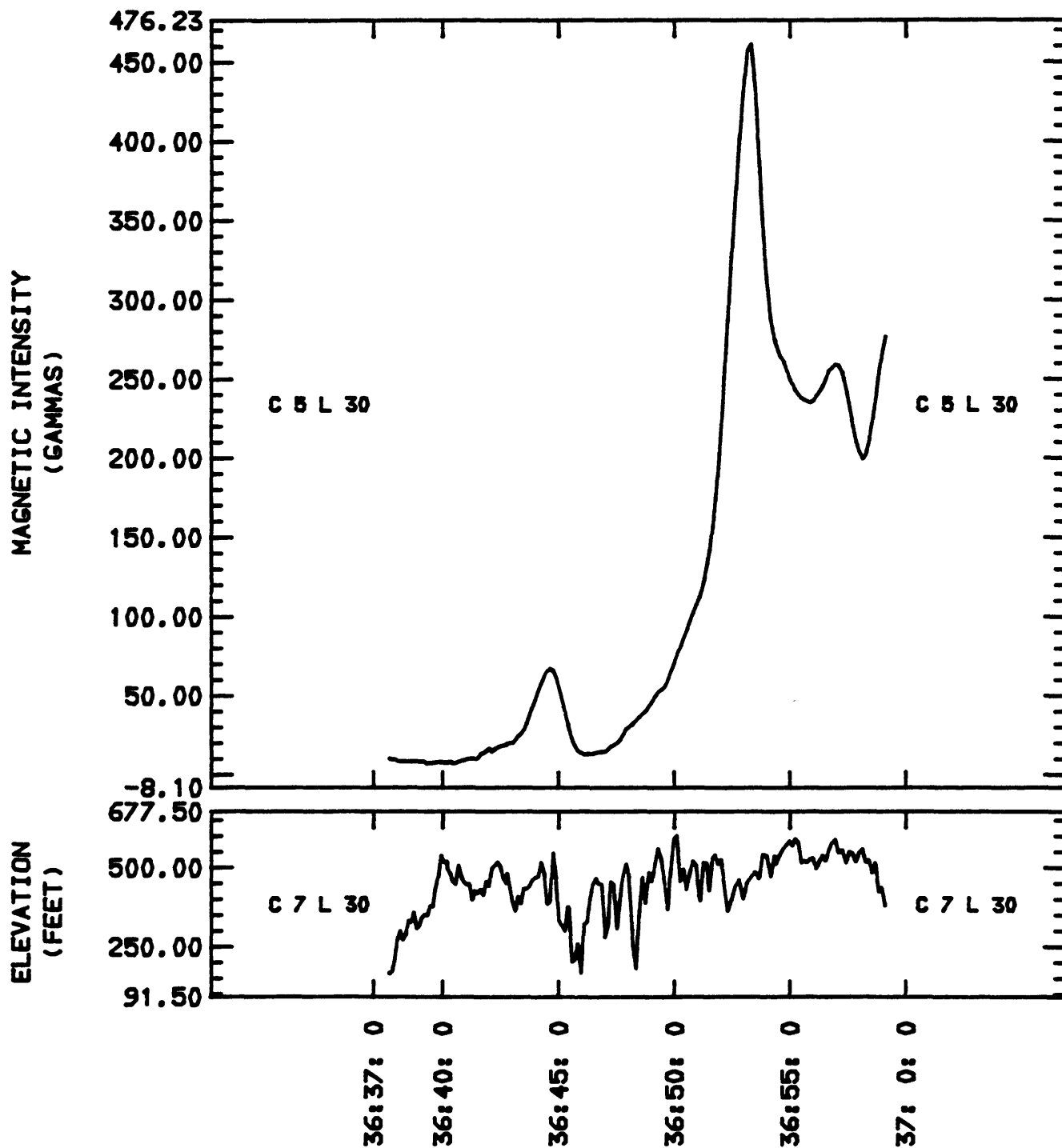


Figure 30. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 30.

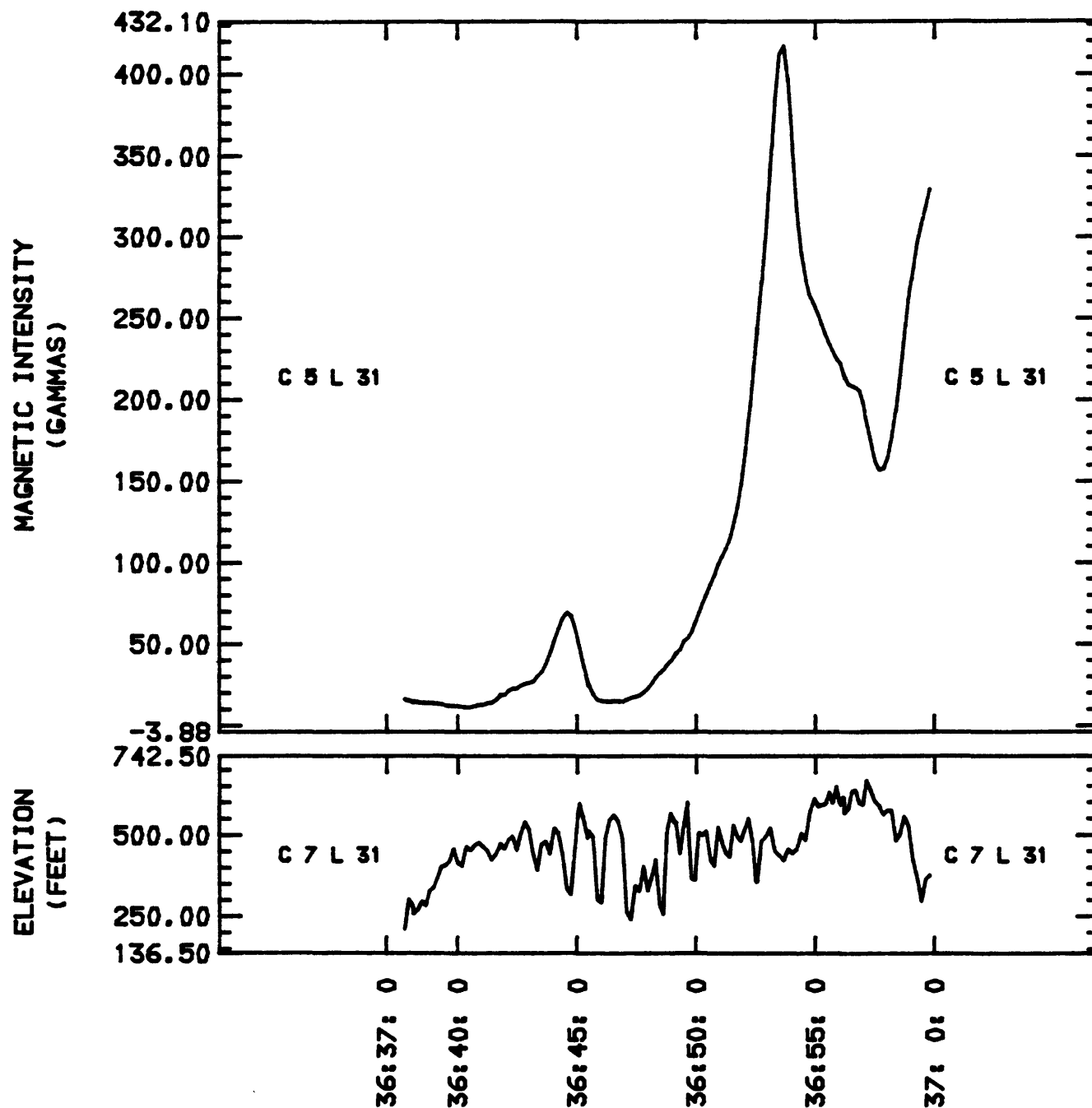


Figure 31. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 31.

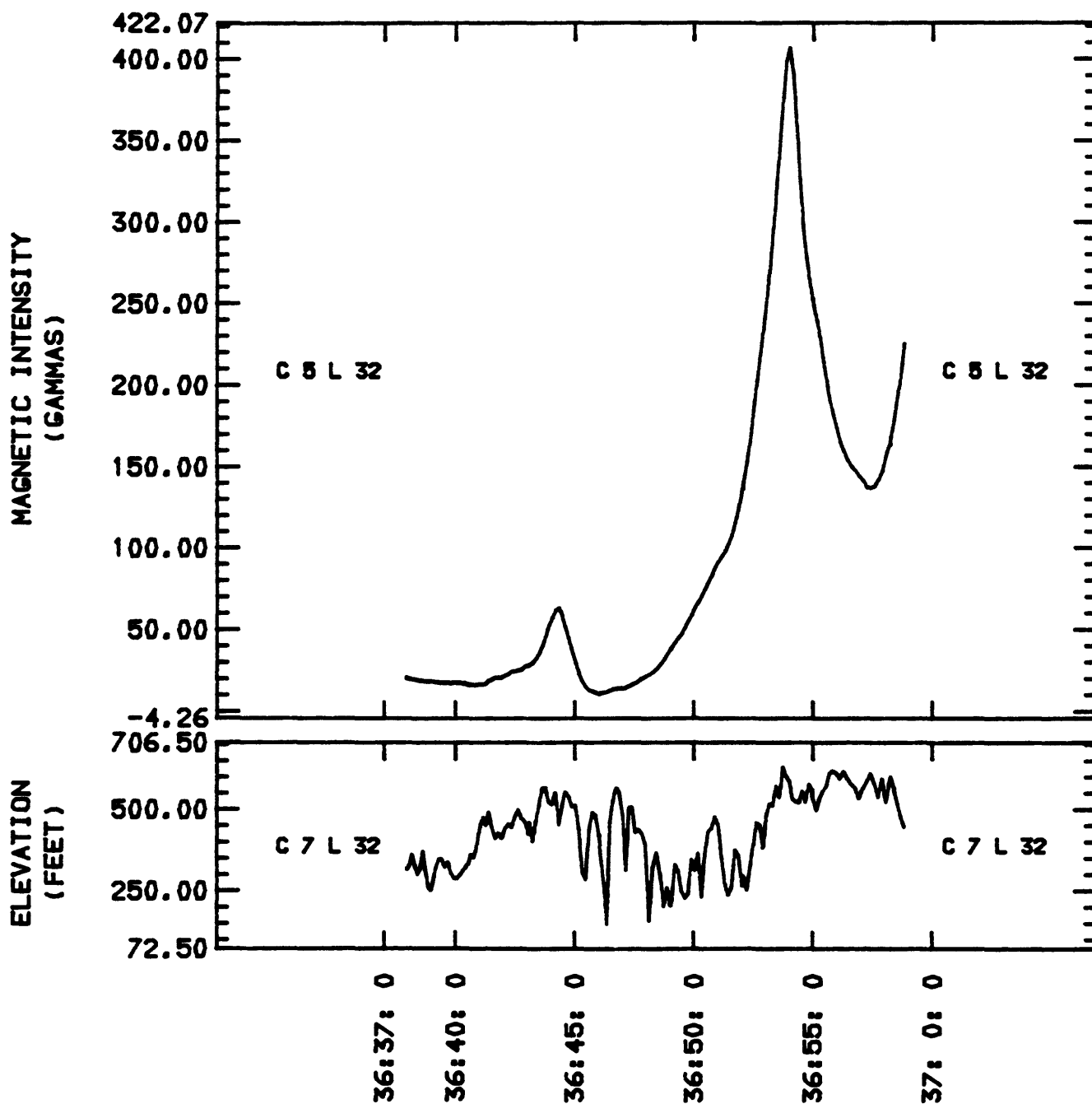


Figure 32. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 32.

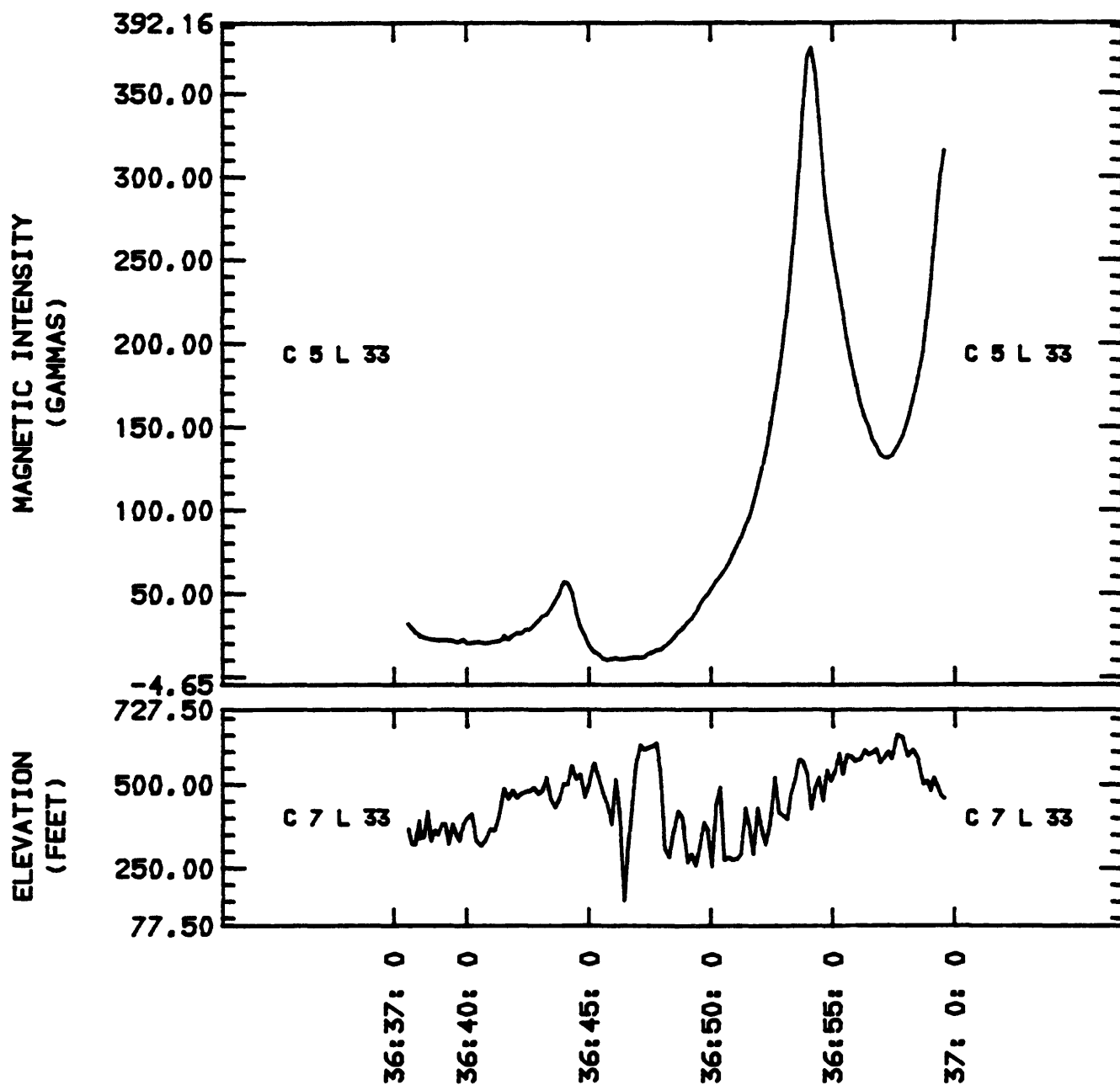


Figure 33. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 33.

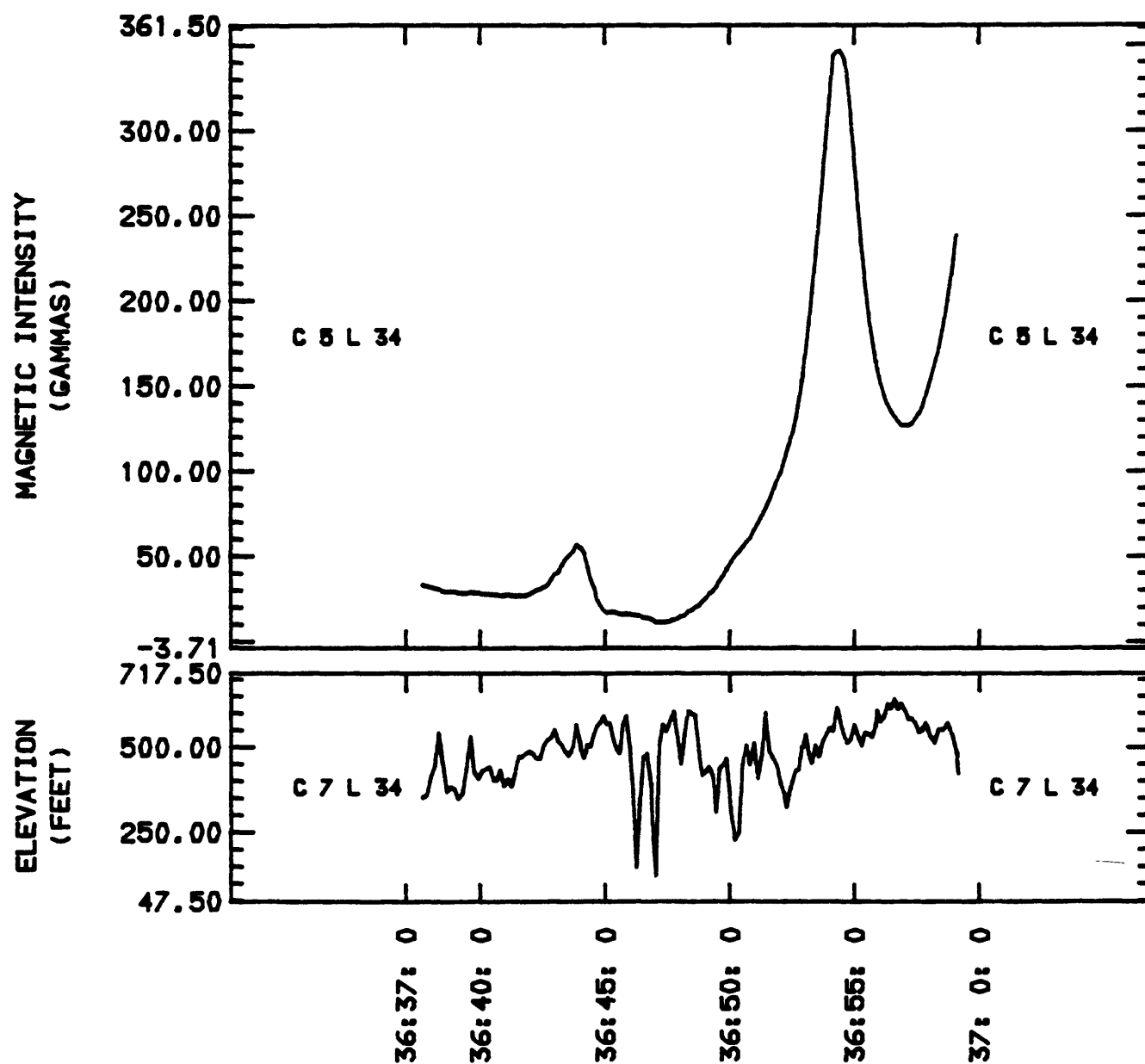


Figure 34. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 34.

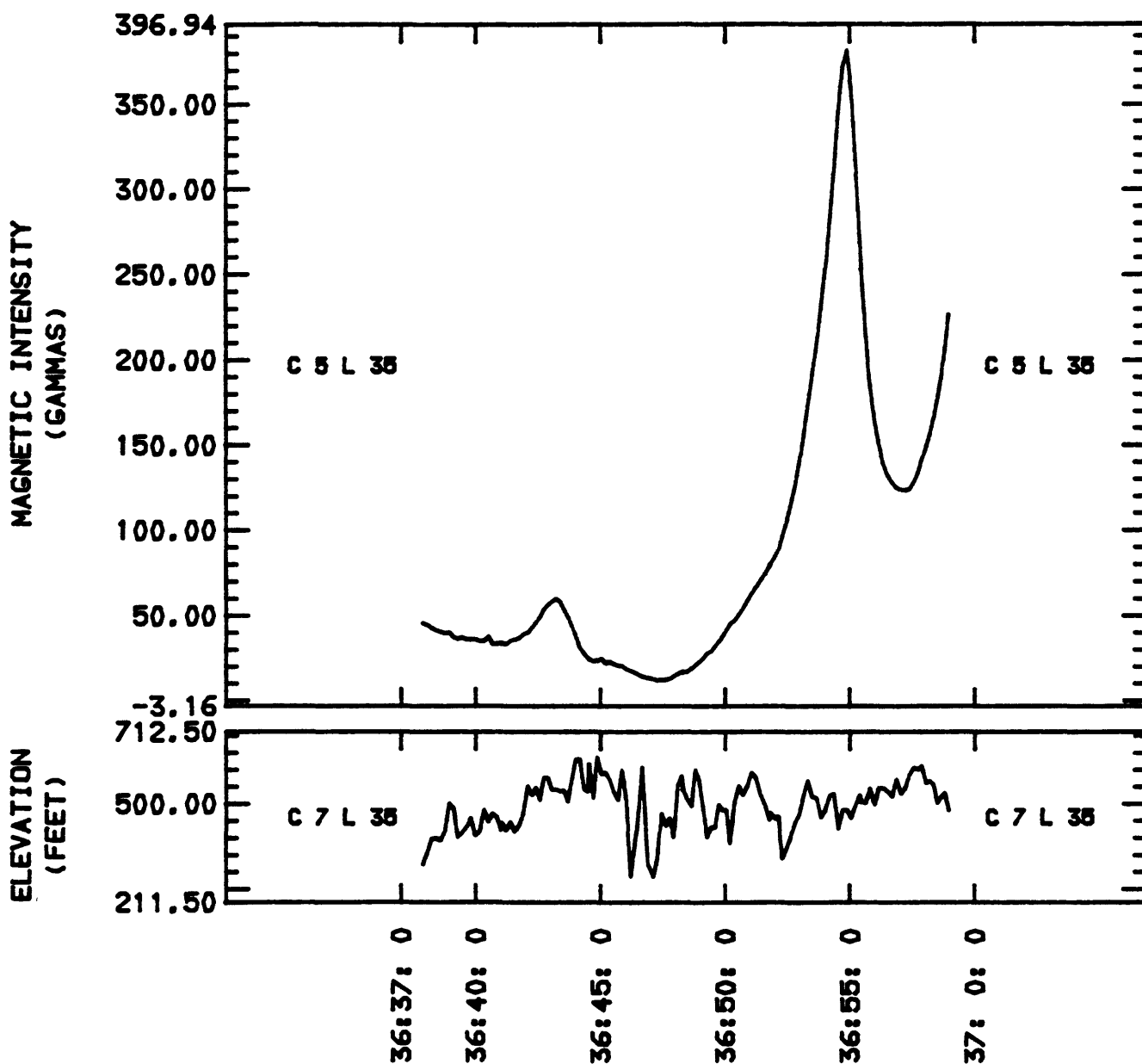


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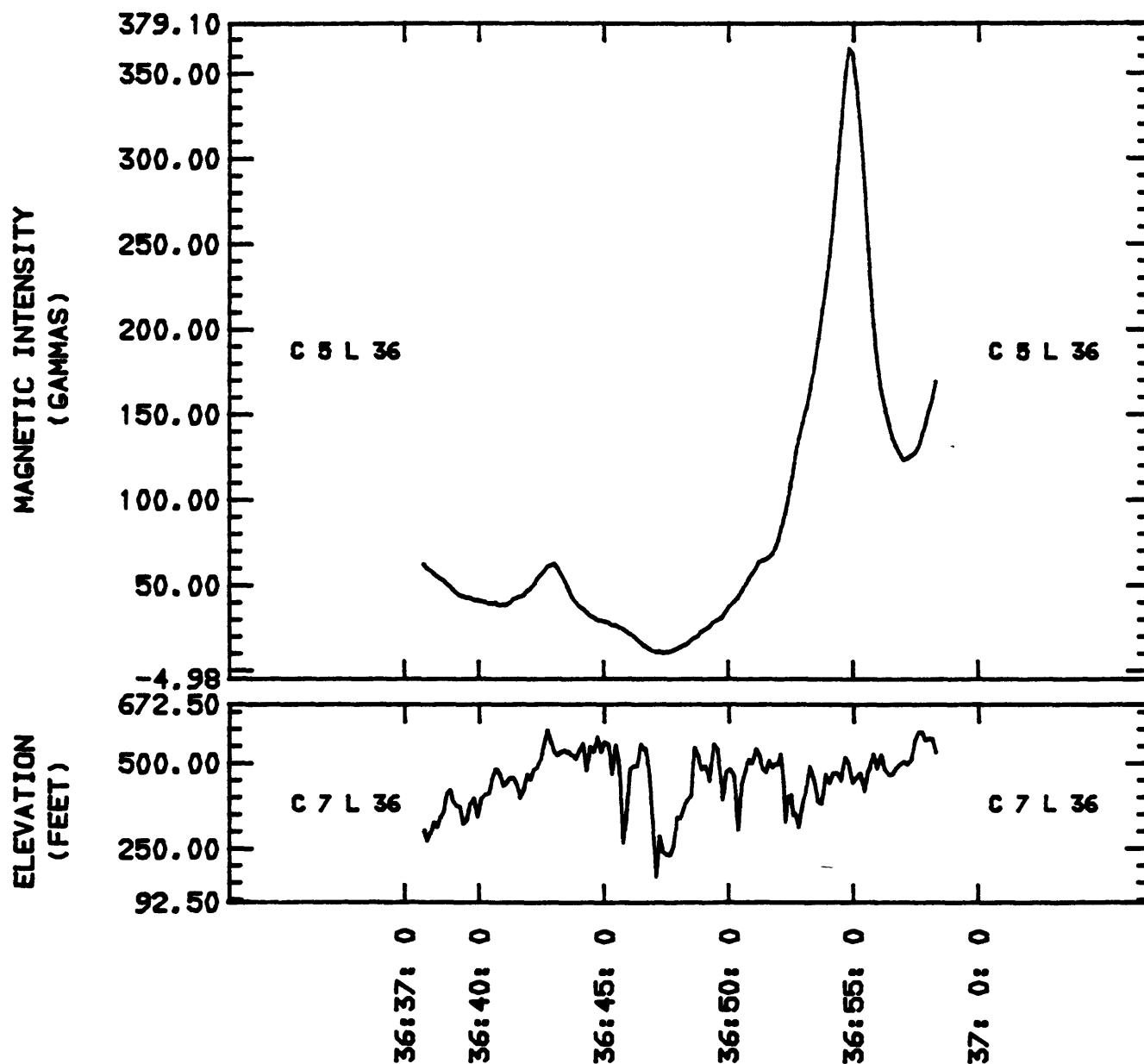


Figure 36. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 36.

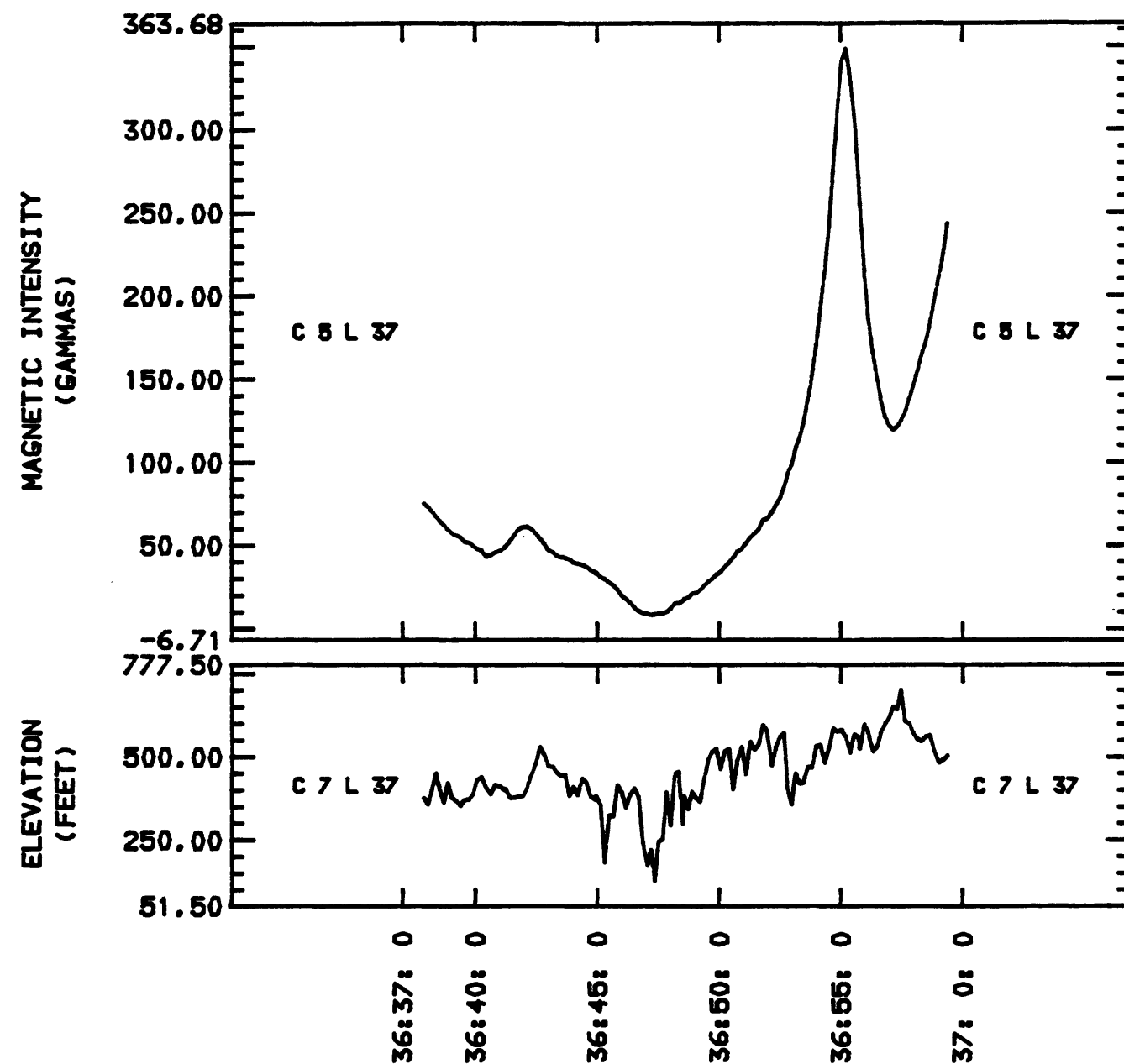


Figure 37. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 37.

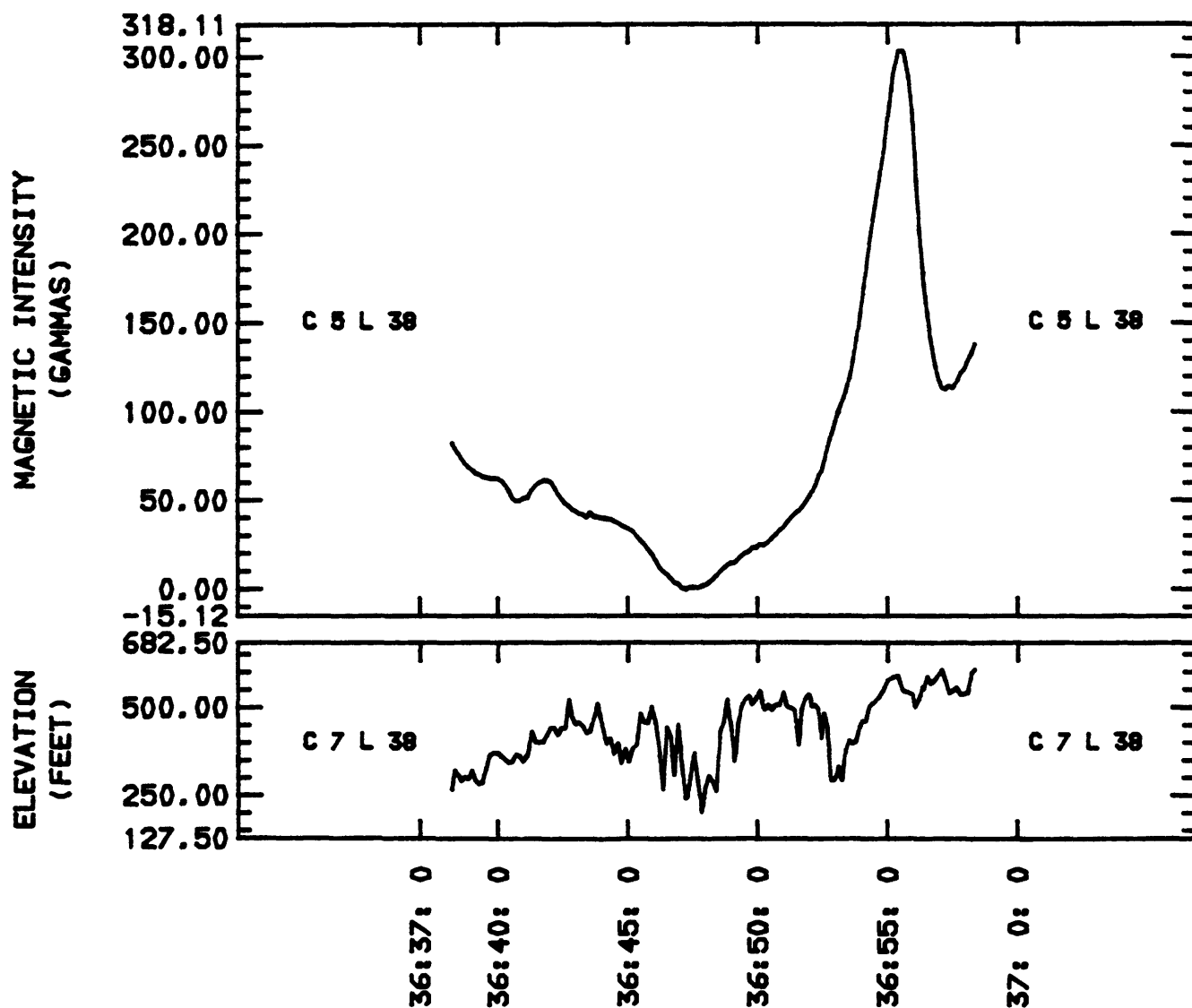


Figure 38. Stacked profiles of ground elevation (C7) and total magnetic field intensity (C5) data for flight line 38.