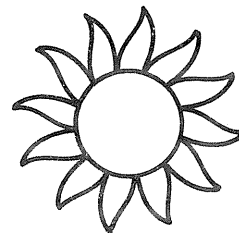
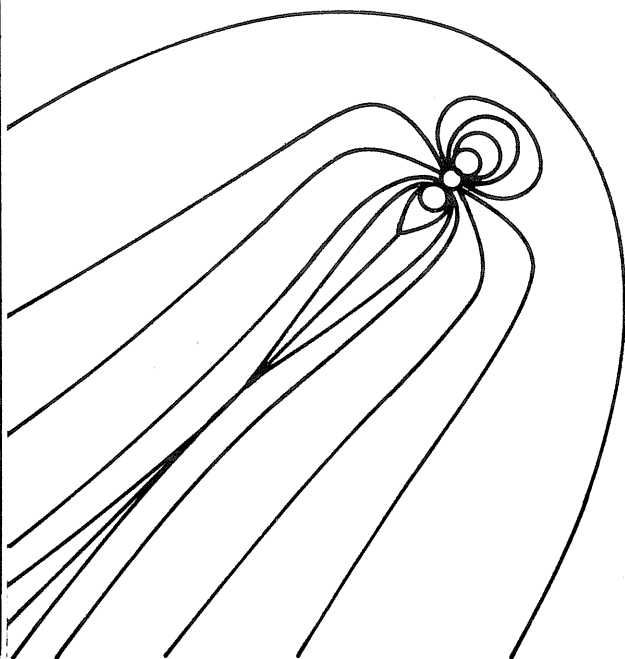


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GEOMAGNETIC DATA FOR MARCH 1976 (AE (7) INDICES AND STACKED MAGNETOGRAMS)



September 1977

IMS DATA PUBLICATION NO. 3

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WORLD DATA CENTER A for Solar-Terrestrial Physics



REPORT UAG - 63

GEOMAGNETIC DATA FOR MARCH 1976 (AE (7) INDICES AND STACKED MAGNETOGRAMS)

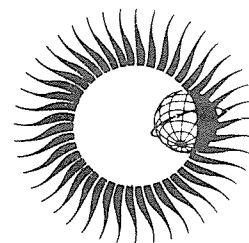
by

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National Geophysical and Solar-Terrestrial Data Center
Boulder, Colorado 80302 USA

September 1977

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Geomagnetic Data for March 1976
(AE(7) Indices and Stacked Magnetograms)

by

J. H. Allen, C. C. Abston and L. D. Morris
NGSDC/EDS/NOAA
Boulder, Colorado 80302 USA

SECTION I. GENERAL DISCUSSION

1. Introduction

This is the third of a series of data reports in support of the International Magnetospheric Study (IMS) and includes selected geomagnetic variation data for March 1976; the first (UAG-60) gave similar data for January 1976. Included herein are analog records from seven auroral zone stations; preliminary AE indices based on these data; and various related tables, graphs, and statistics. It is expected that this series will continue on an increasingly timely schedule and with data from additional stations which may be processed in time for publication.

2. Data Selection and Processing

The seven observatories supplying data for this report are shown in Figure 1. These are Leirvogur (LR), Narsarsuaq (NAS), Fort Churchill (FC), Barrow (BW), Tixie Bay (TI), Dixon Island (DI), and Abisko (AI). They were chosen from among the list of 12 observatories whose records are now routinely

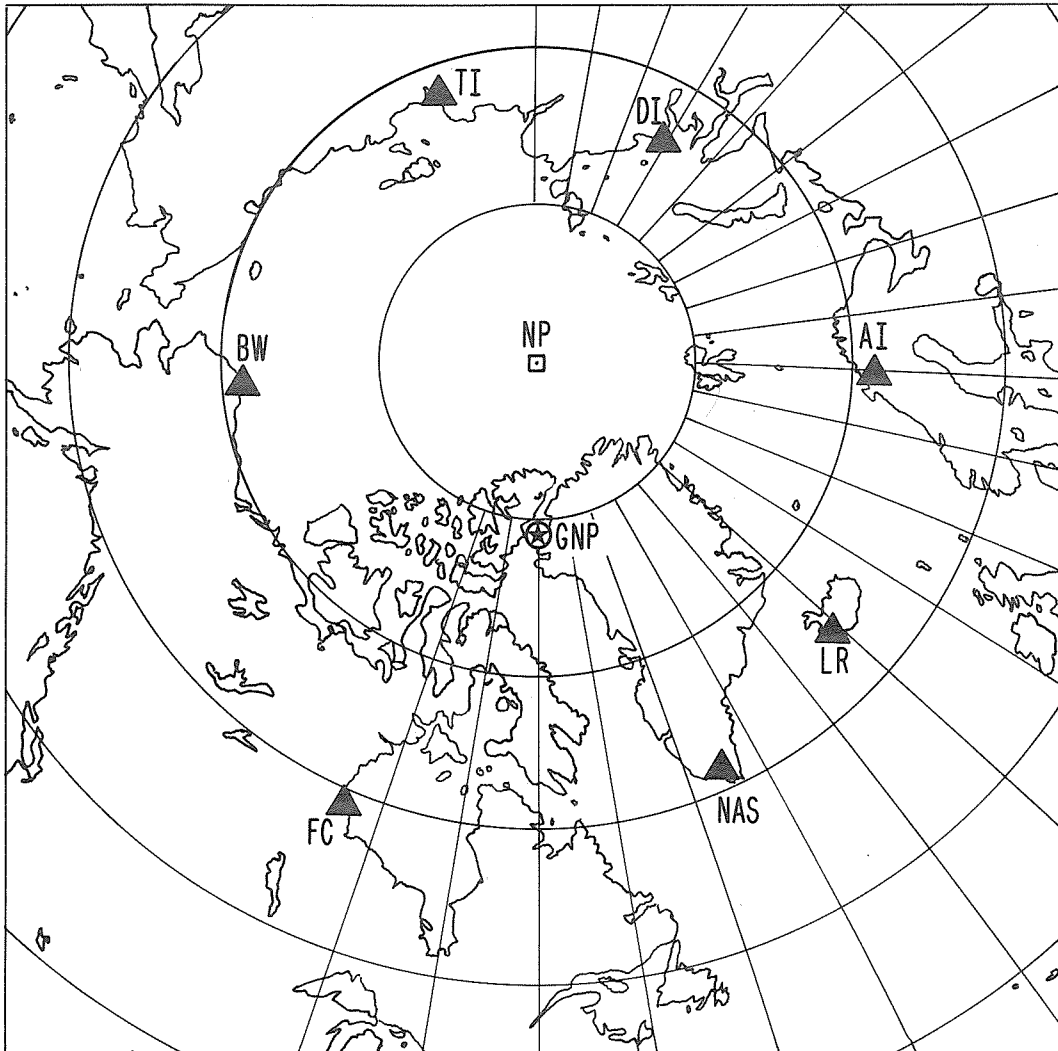


Fig. 1. Provisional AE(7) network.

used by WDC-A for Solar-Terrestrial Physics in the derivation of Auroral Electrojet (AE) magnetic activity indices. Reasons for their selection were (1) records from these sites are most promptly available, (2) the sites are about evenly spaced in longitude, and (3) each location has demonstrated its importance in the prior derivation of AE indices [Allen and Kroehl, 1975]. We hope that as digital data processing from other observatories becomes more routine the network can be expanded, and we can include data from College, Great Whale River, and Yellowknife to improve the station distribution for these prompt indices.

Among the stations supplying data for this publication, only Fort Churchill and Barrow are presently recording digital variations on-site. Both observatories use flux-gate instruments supplemented by proton precession magnetometers and generate more or less routine absolute observations. Each component's amplitude is recorded every 10 s (20 s for BW) on magnetic tape, and analog chart records are prepared as backup data. These high-time-resolution digital data are processed at central facilities responsible for each observatory. Obvious errors (usually spikes) are corrected and 1-min average values are computed. These preliminary data are sent on tape to WDC-A for Solar-Terrestrial Physics where they are plotted and checked for stability of quiet-time levels (baseline drift), presence of noise, and day-to-day continuity. As necessary, remaining spikes are removed, and "temporary" baselines are adopted to compensate for data problems that would affect derivation of AE indices.

All the other observatories record magnetic variations photographically. Their magnetograms are copied on 35 mm microfilm for transfer to WDC-A for Solar-Terrestrial Physics together with calibration information. Here they are reproduced as almost original size magnetograms and digitized at 1-min intervals using semiautomatic scaling equipment. Resulting digital tapes of component amplitudes relative to baselines are passed through the same plotting and other quality control processes as the original digital data described above.

After completion of quality control checks, all digital records are merged and replotted to common time and amplitude scales. These are the monthly D, H, and Z component and daily H (or X) component stacked plots included in this report. For most observatories intervals of missing data are apparent in one or more components. These may arise from (1) loss of on-site digital data, (2) noise in original digital data, (3) movement of traces off magnetograms during large excursions with no secondary trace for that component, (4) lack of low-sensitivity storm magnetograms for disturbed periods, and (5) loss of intermixing of analog traces during large, rapid field fluctuations. Every reasonable effort is made at WDC-A for Solar-Terrestrial Physics to curve-follow disturbed traces. Effects of data gaps are seen in AE indices only when they occur at a critically located station and in the H component. Often they are only apparent in the graphs of AU or AL.

3. Auroral Electrojet Magnetic Activity Indices

The AE index gives a global, quantitative measure of auroral zone magnetic activity resulting from enhanced ionospheric currents associated with magnetospheric substorms. As defined by Davis and Sugiura [1966], AE is the total range of H component deviations from quiet-time levels of the field at a selected group of high-latitude magnetic observatories. Typically, a constant quiet-time H value is determined for each observatory and subtracted from recorded H values. The resultant deviations for all stations may be plotted to common time and amplitude scales and graphically superposed on a common reference or zero level. Then the amplitudes of the enclosing upper and lower envelopes from moment-to-moment give the values of AU and AL, respectively. The range between them is AE, i.e., $AU - AL = AE$. Their average is $(AU + AL)/2 = A_0$ (often indicated A0 because many computers lack the ability to produce lower case characters).

Complete discussions of AE and associated indices can be found in the two papers referenced above and in the series of *WDC-A for Solar-Terrestrial Physics Reports UAG-22, 29, 31, 33, 37, 39, 45, 47, and 59* which cover the years 1966-1974. Each of these contains precautionary notes about the inherent limitations of AE indices, even when derived from a relatively complete station network. Additional notes on AE are given before the daily index graphs (page 40) and the figures based upon minute-to-minute "frequency of index provision" by each station. Also given in this report are figures showing the cumulative amplitude of H deviation for times when each station was providing AU and AL indices (pages 55 and 57).

4. Acknowledgments

The authors of this IMS data report are on the staff of the National Geophysical and Solar-Terrestrial Data Center (NGSDC) of the Environmental Data Service, National Oceanic and Atmospheric Administration. WDC-A for Solar-Terrestrial Physics is collocated with NGSDC and shares the same staff. We wish to recognize the efforts of those persons who operate the high-latitude magnetic observatories and process the data from them. Recognition is also due the operators who patiently curve-follow, check, and correct the data from which this report is compiled. Mr. W. I. Paddock has carefully adopted the temporary baseline values and checked each stage of the digitization. We hope that IMS participants who find this report useful or who can suggest improvements will correspond with the authors.

5. REFERENCES

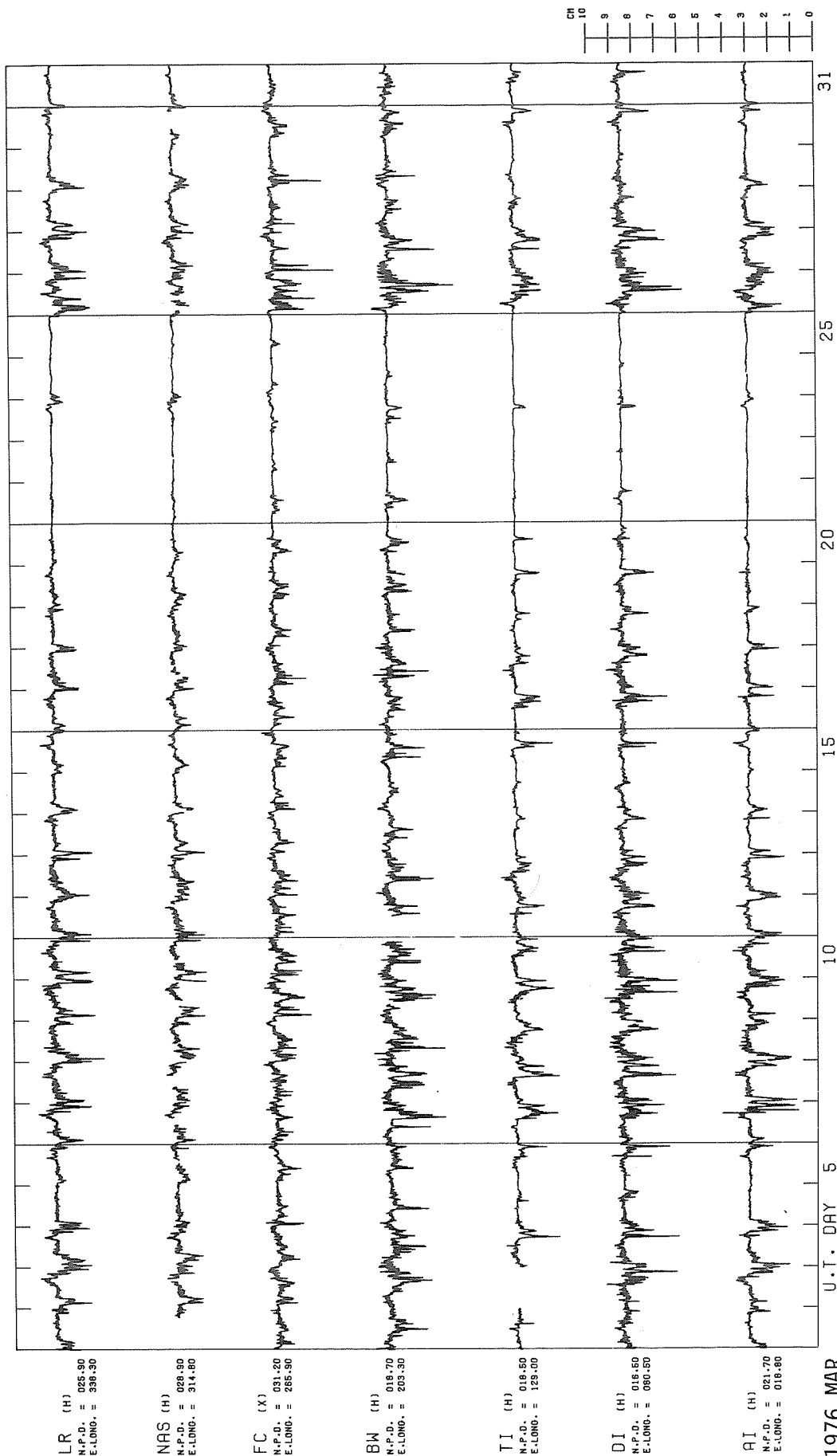
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SECTION II. COMMON SCALE MAGNETOGRAMS

1. Stacked Common Scale Magnetograms for Whole Month (H, Z, and D Variations)

The three following graphs display condensed stacked plots of the H, Z, and D variations, respectively, for seven stations minute-by-minute over the entire month. Component intensities are to the nearest 1 gamma, and declination changes are to the nearest 0.1 minute of arc. Positive H, Z, and D changes are north, down, and east, respectively. Amplitude scales given at the bottom of each figure correspond to the original centimeter scale reproduced at lower right. For each station the North Polar Distance (N.P.D.) and East Longitude (E. Long.) are given.

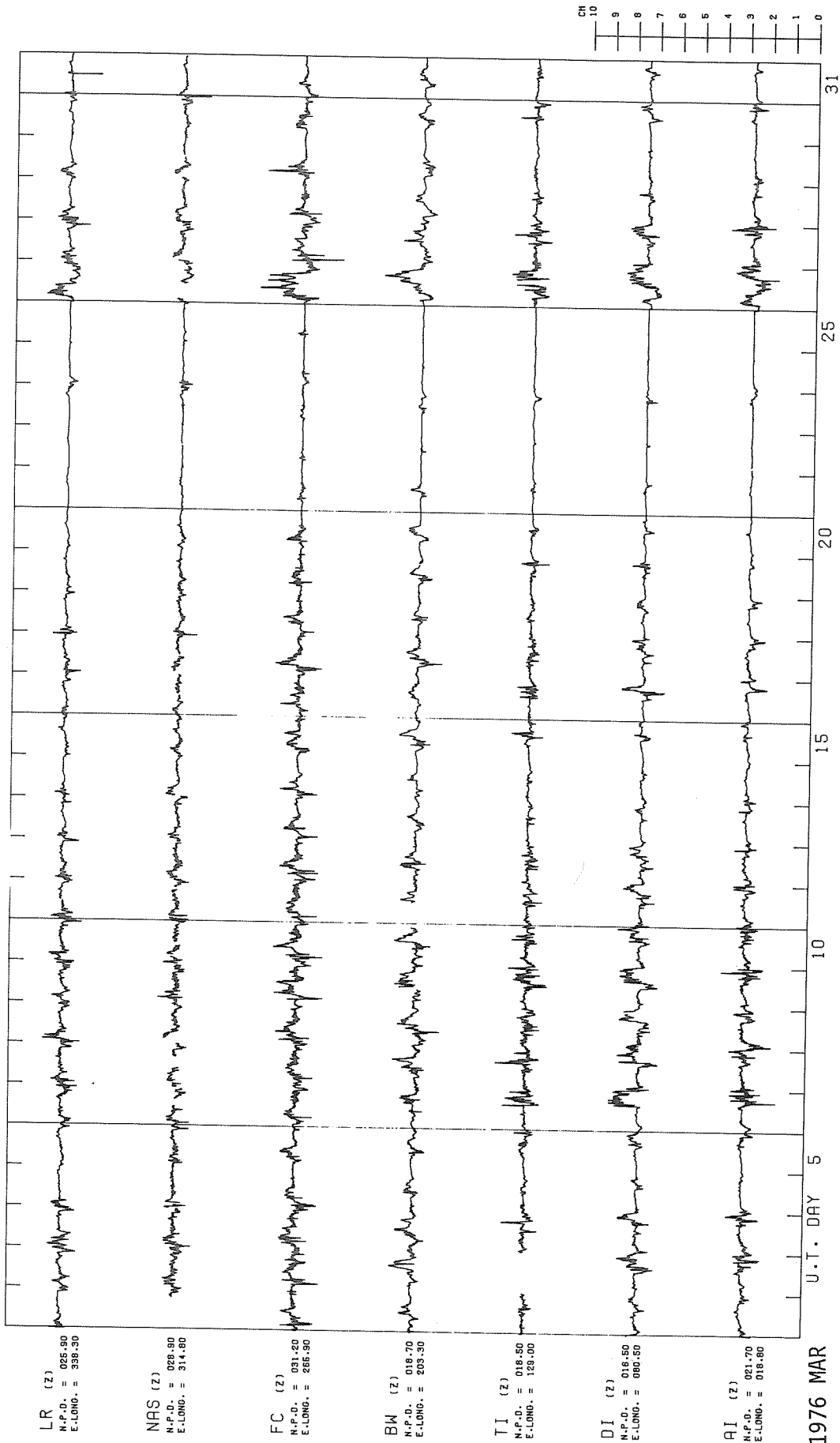
COMMON SCALE MAGNETOGRAMS - H Variations MARCH 1976



1976 MAR

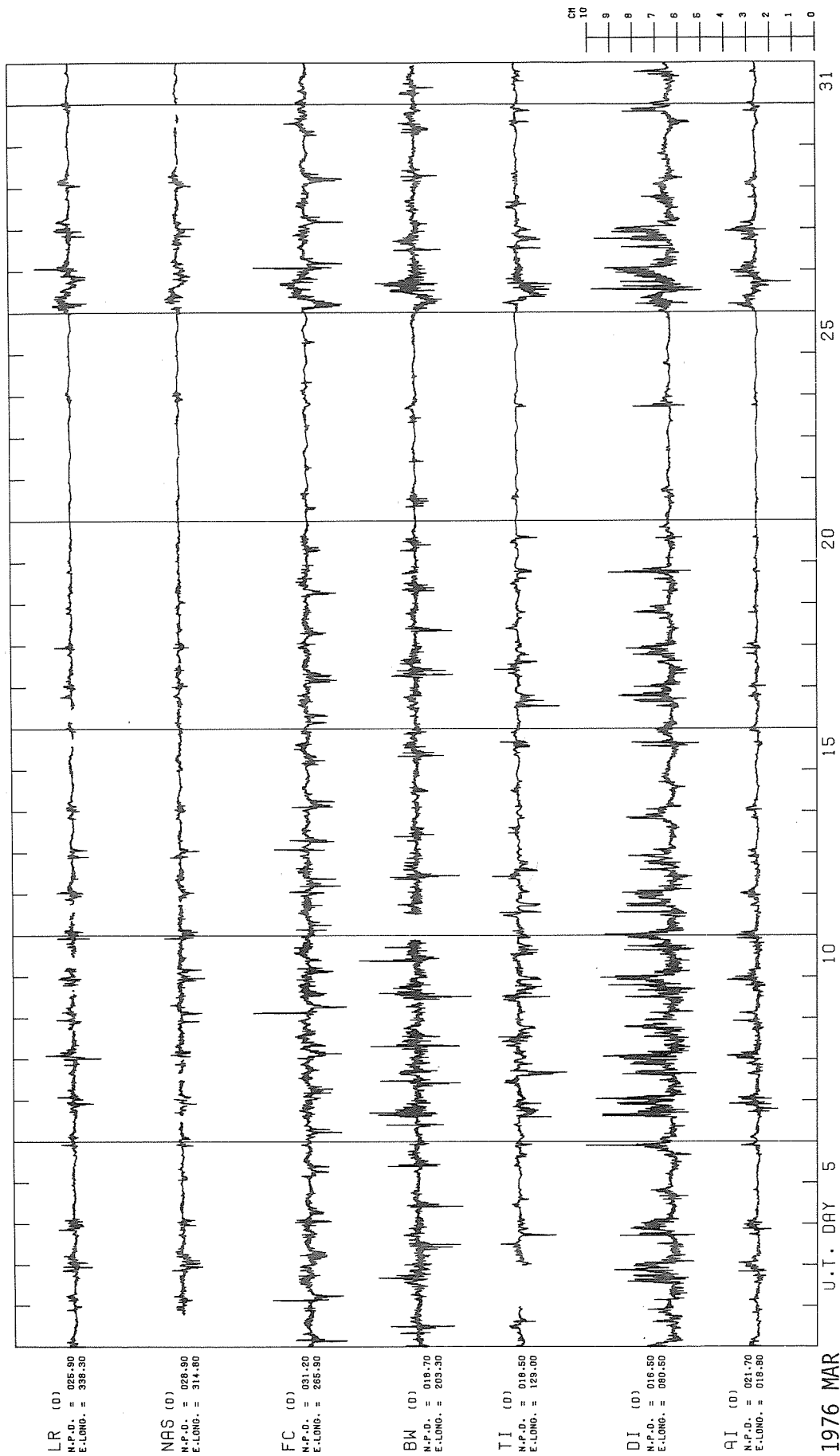
COMMON SCALE MAGNETOGRAMS - Z Variations

MARCH 1976



COMMON SCALE MAGNETOGRAMS - D Variations

MARCH 1976



1976 MAR

2. Stacked Common Scale Magnetograms by Station Day (H Variations)

The following stacked plots of H (or X) common scale magnetograms are reproduced from the digital magnetic variations data obtained as described on page 2. Each station is identified by the abbreviation from Figure 1 and two coordinates: North Polar Distance (N.P.D.) and East Longitude (E. Long.). The amplitude scale is given at lower left of each figure and corresponds to the centimeter scale at lower right. The amplitude scale is the same for each day except when the range of deviation would cause a trace to exceed the space reserved for it. For such days (see, for example, 2-3 March 1976) the scale is increased in uniform steps to assure nonoverlapping traces. To call attention to the scale change (similar to switching to storm magnetograms), the new value is enclosed in a box.

The label "NGSDC (BOULDER) yy/mm/dd", at the bottom of first day plot, identifies the source of the published data and the day on which the plots were prepared. The difference between data recording date and its preparation date provides an indication of the time required to collect the records, to initiate program development, and to process the data.

COMMON SCALE MAGNETOGRAMS BY STATION DAY 1 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

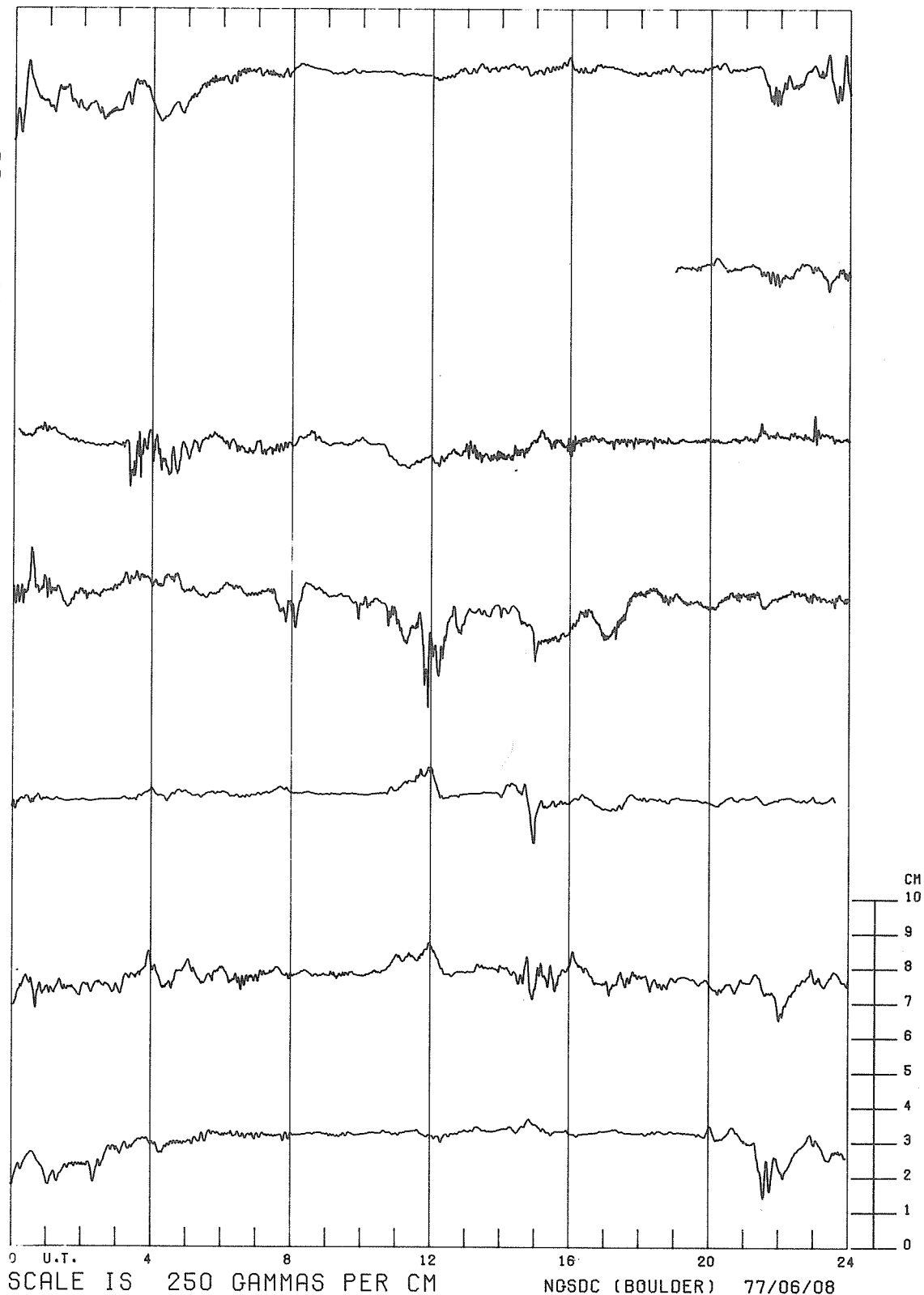
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
2 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

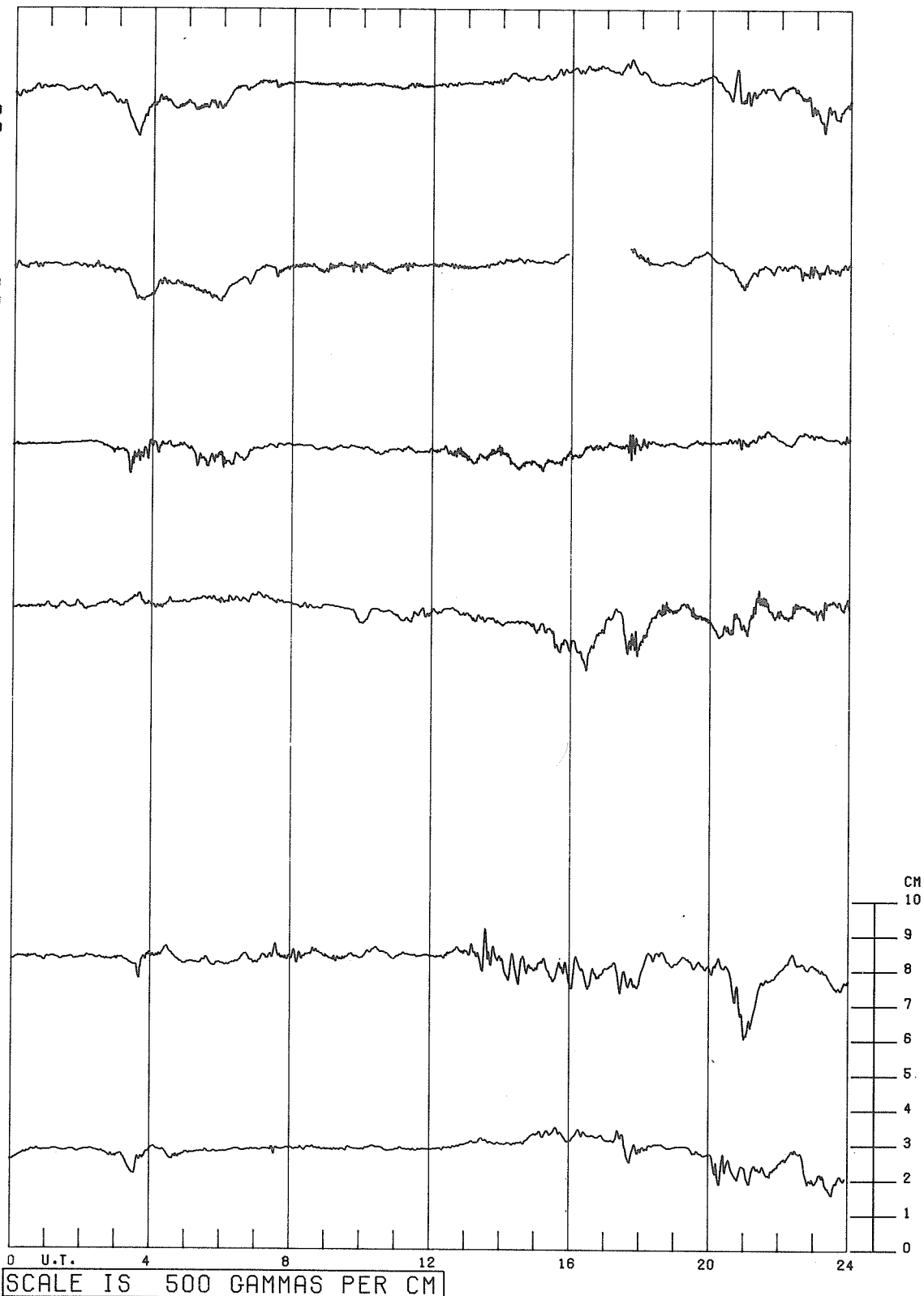
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E.LONG. = 203.30

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY 3 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

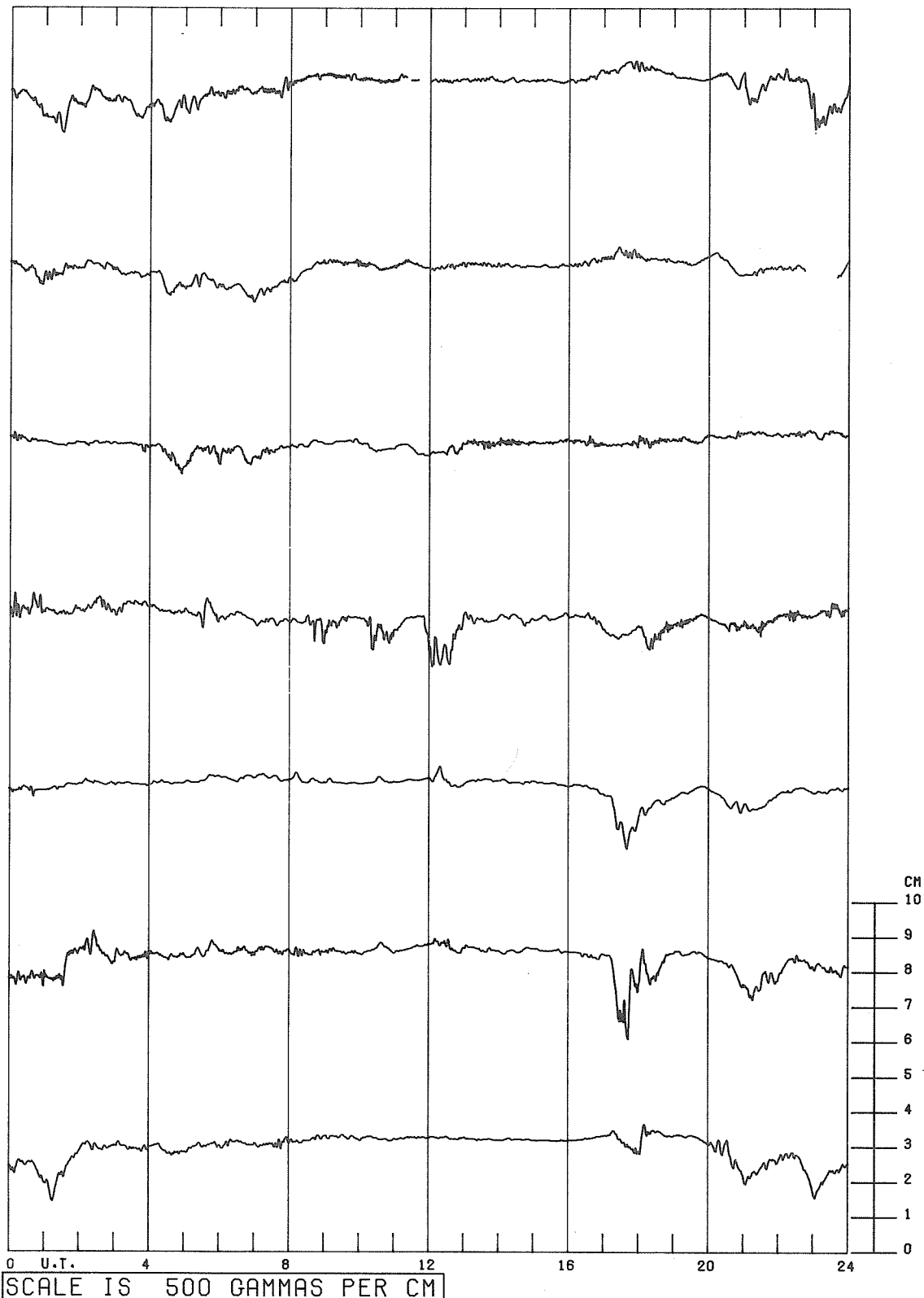
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E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

4 MARCH 1976

LR (H)
N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)
N.P.D. = 028.90
E.LONG. = 314.80

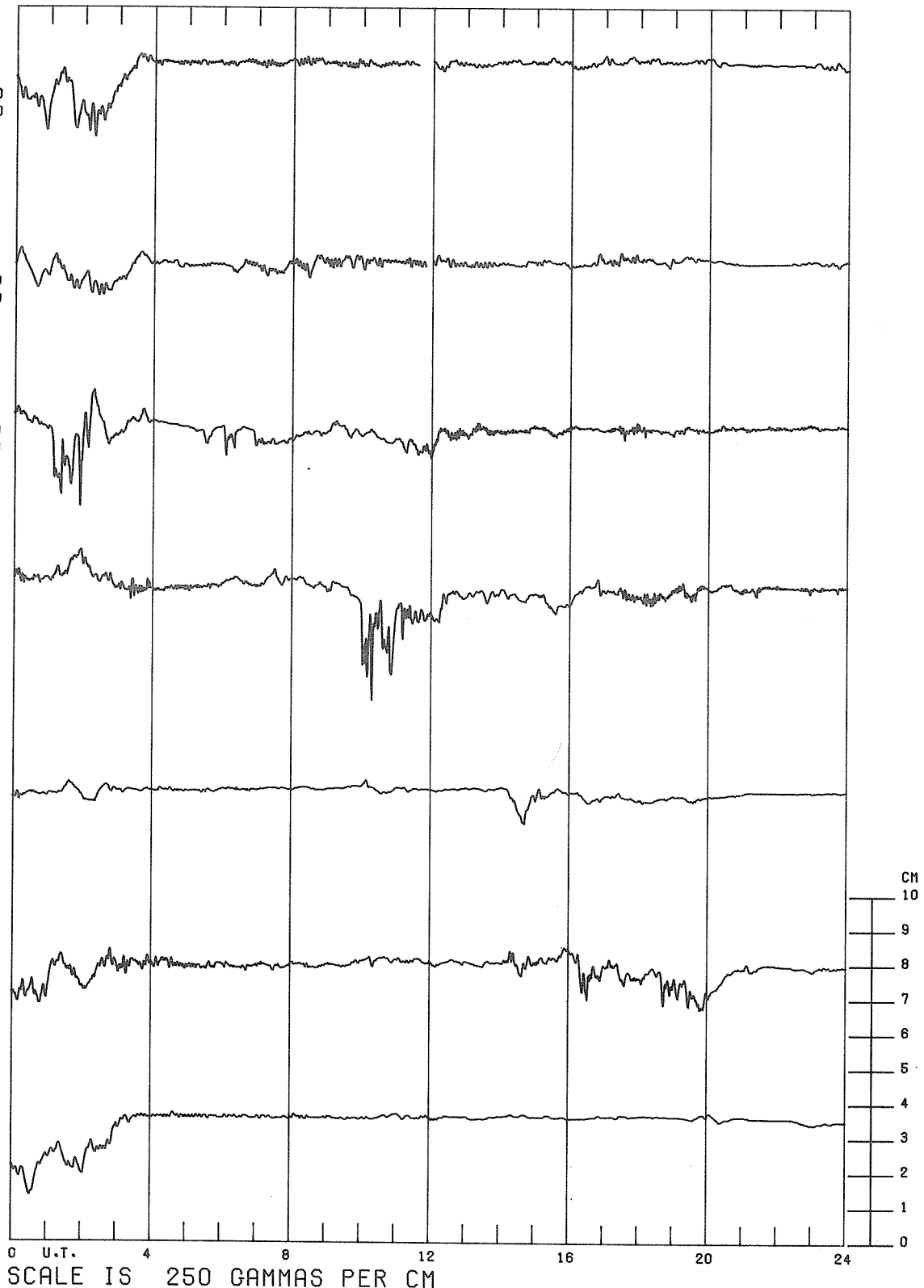
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E.LONG. = 265.90

BW (H)
N.P.D. = 018.70
E.LONG. = 203.30

TI (H)
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)
N.P.D. = 016.50
E.LONG. = 080.50

AI (H)
N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
5 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

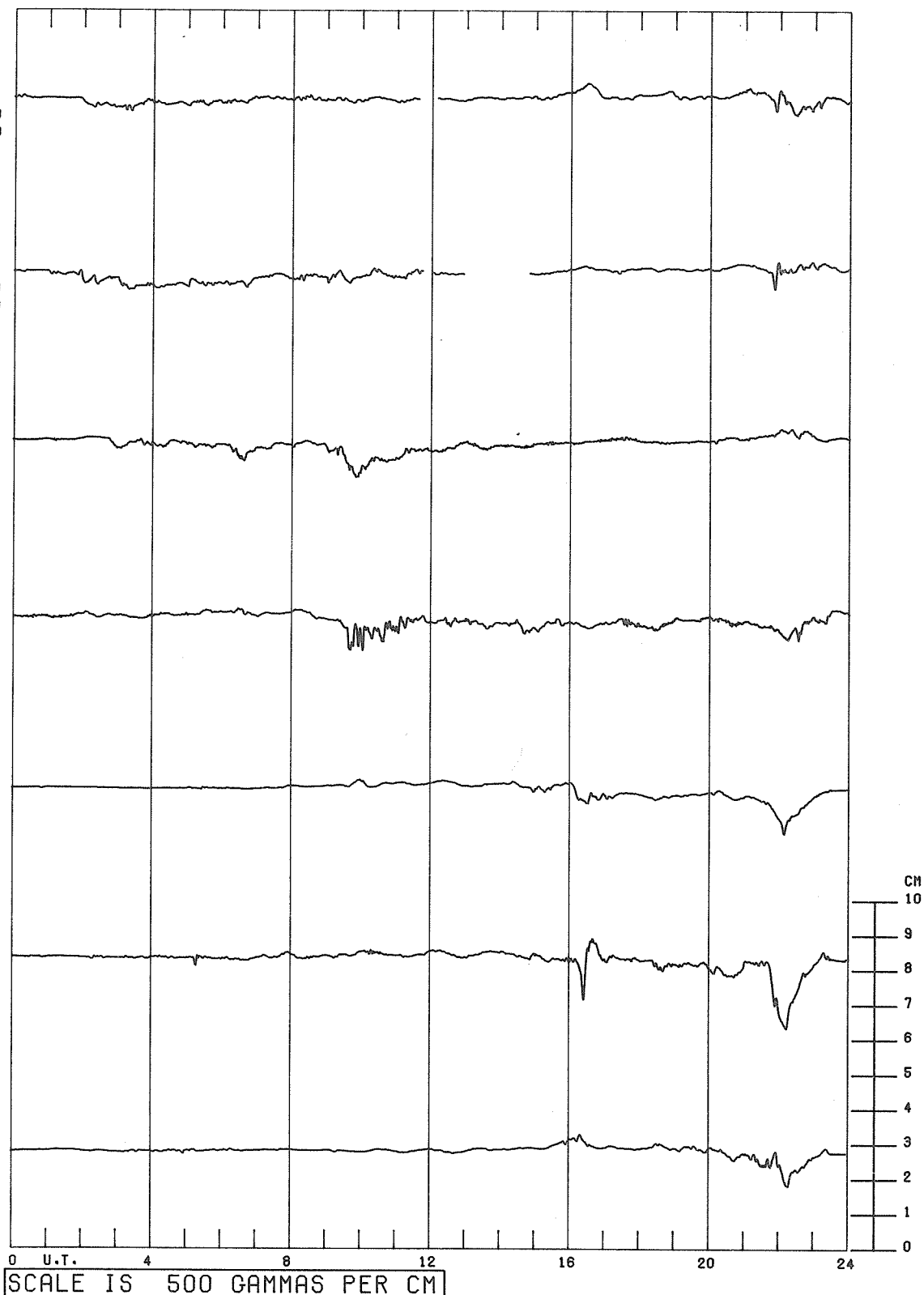
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DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
6 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

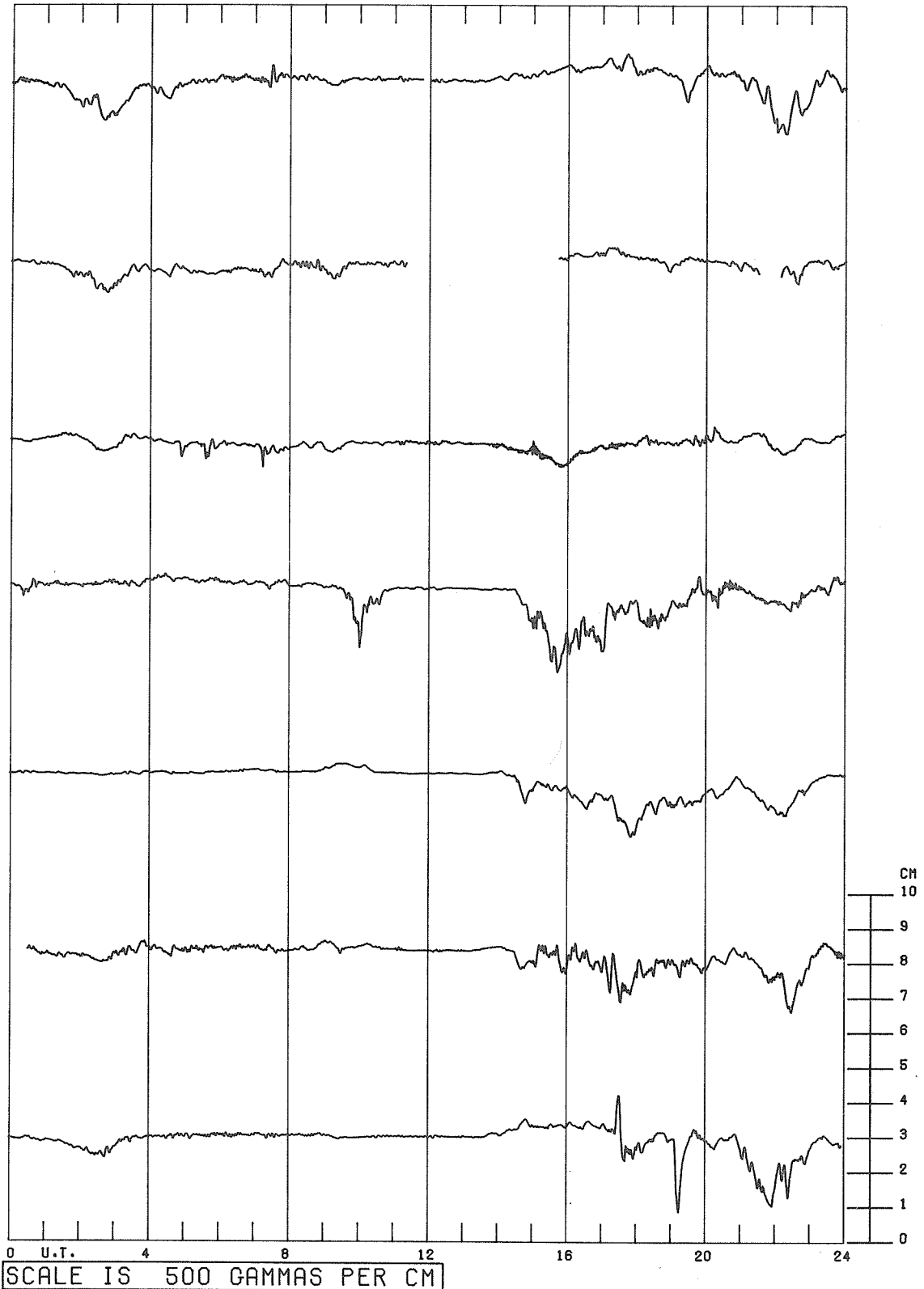
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E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS

BY STATION DAY

7 MARCH 1976

LR (H)

N.P.D. = 025.90

E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90

E.LONG. = 314.80

FC (X)

N.P.D. = 031.20

E.LONG. = 265.90

BW (H)

N.P.D. = 018.70

E.LONG. = 203.30

TI (H)

N.P.D. = 018.50

E.LONG. = 129.00

DI (H)

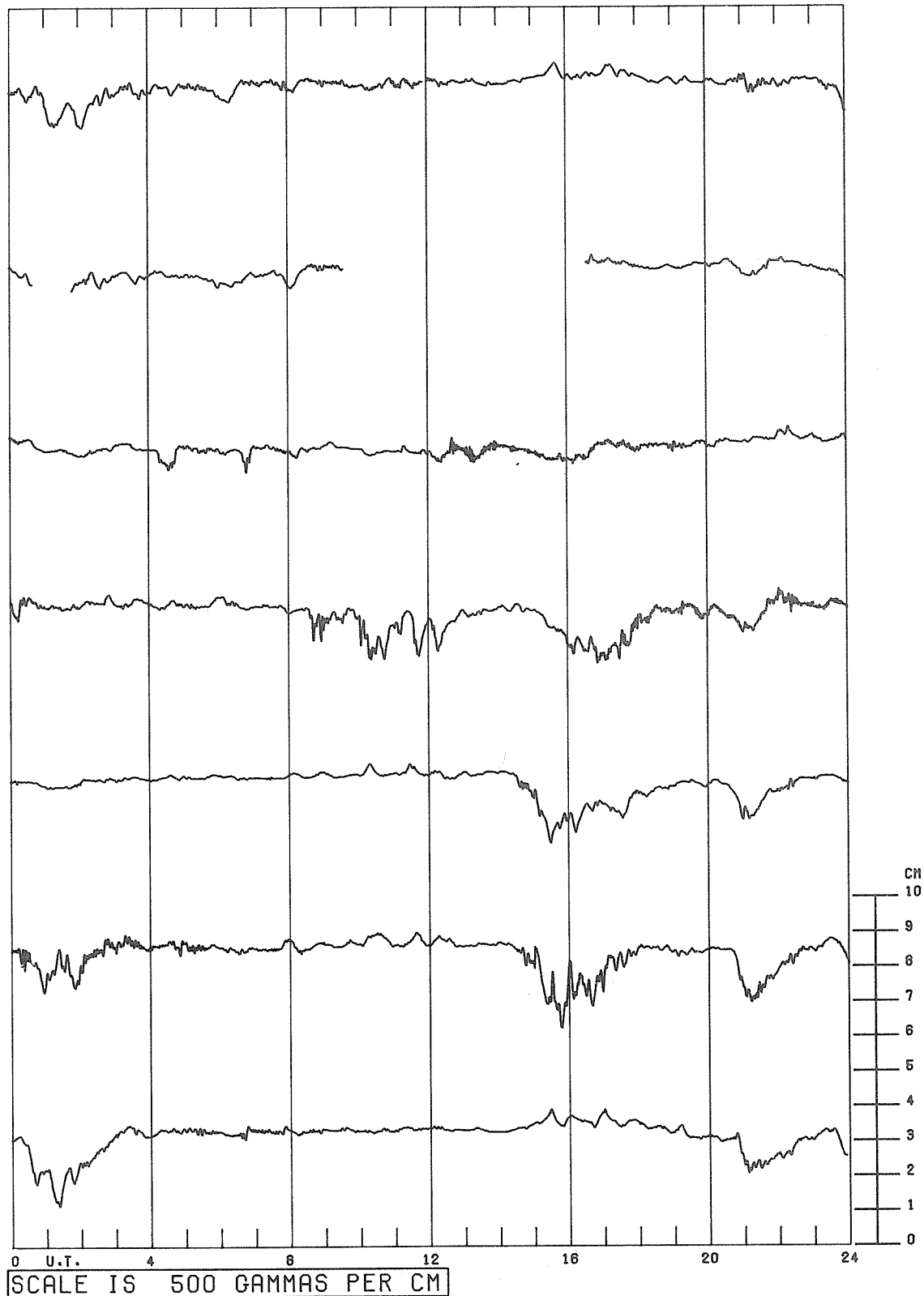
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E.LONG. = 080.50

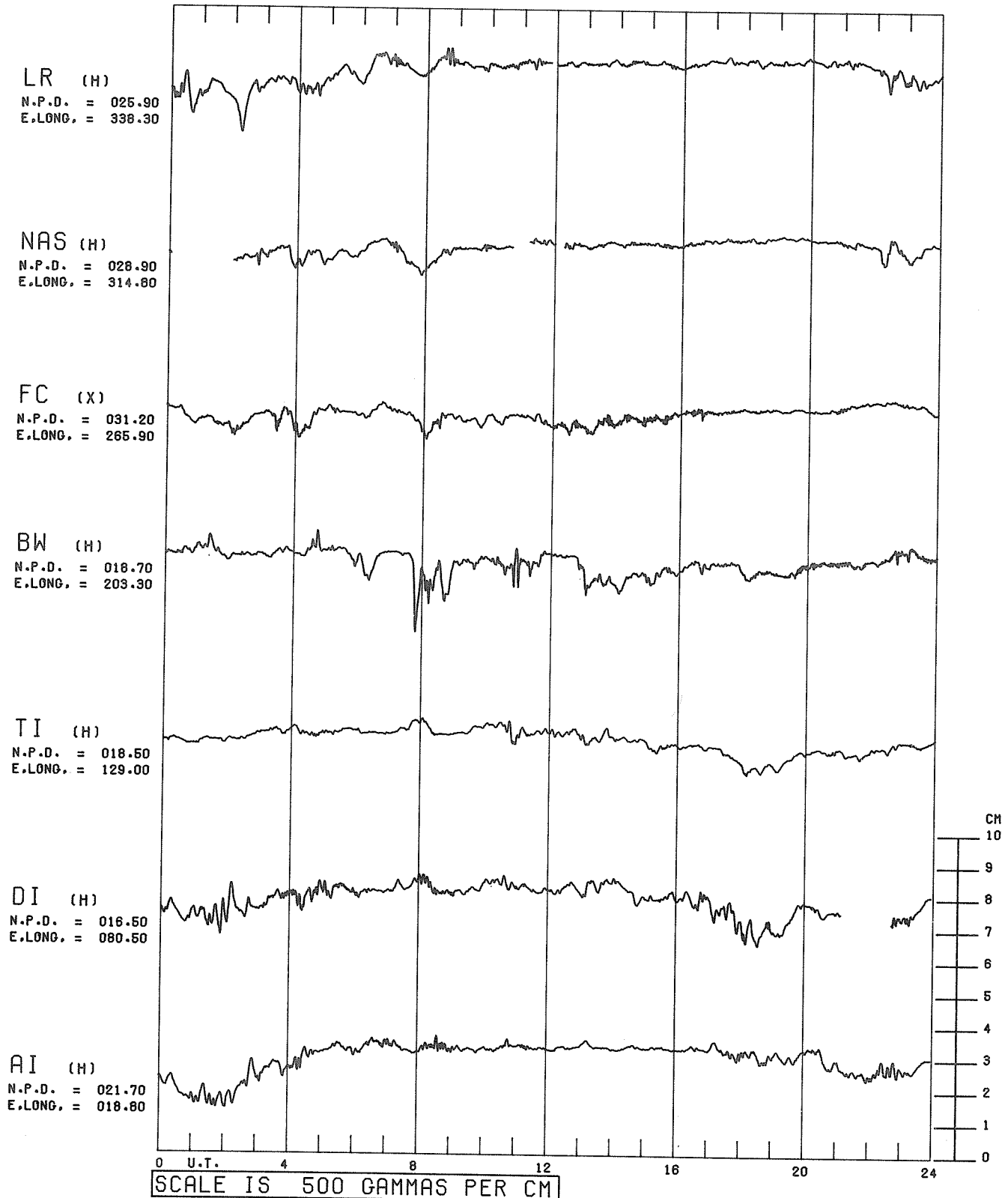
AI (H)

N.P.D. = 021.70

E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY 8 MARCH 1976



COMMON SCALE MAGNETOGRAMS BY STATION DAY

9 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

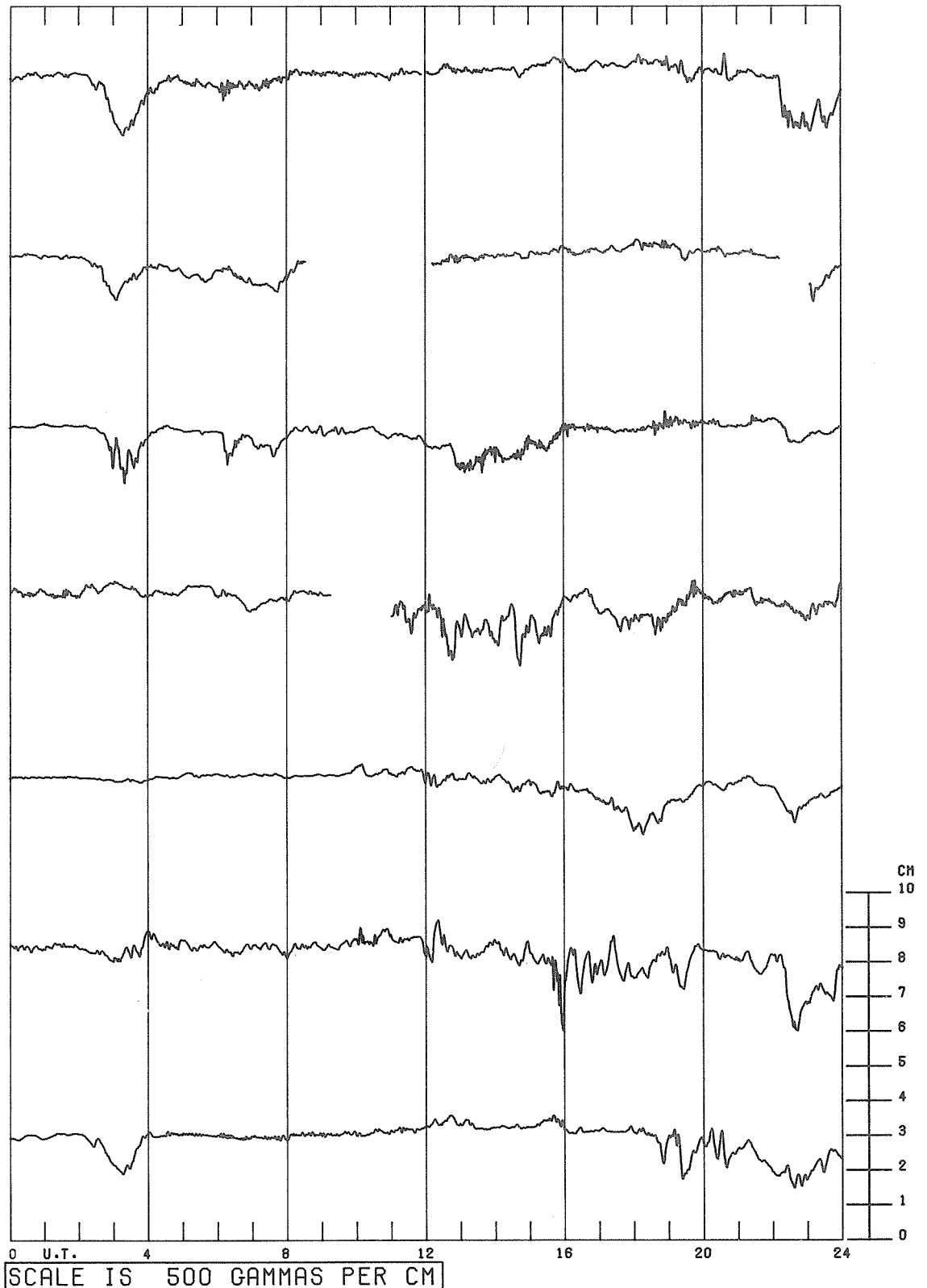
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DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

10 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

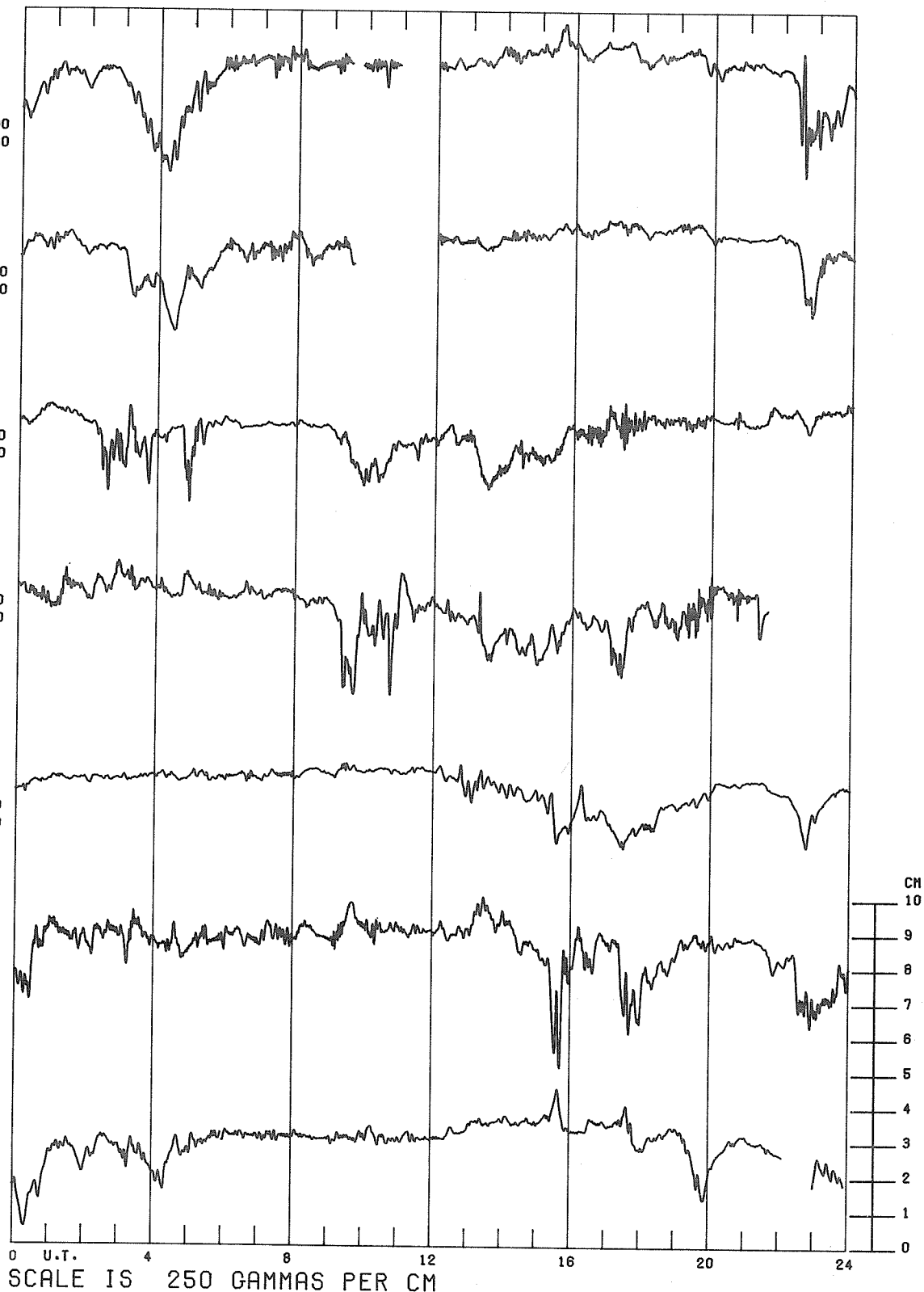
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E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

11 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

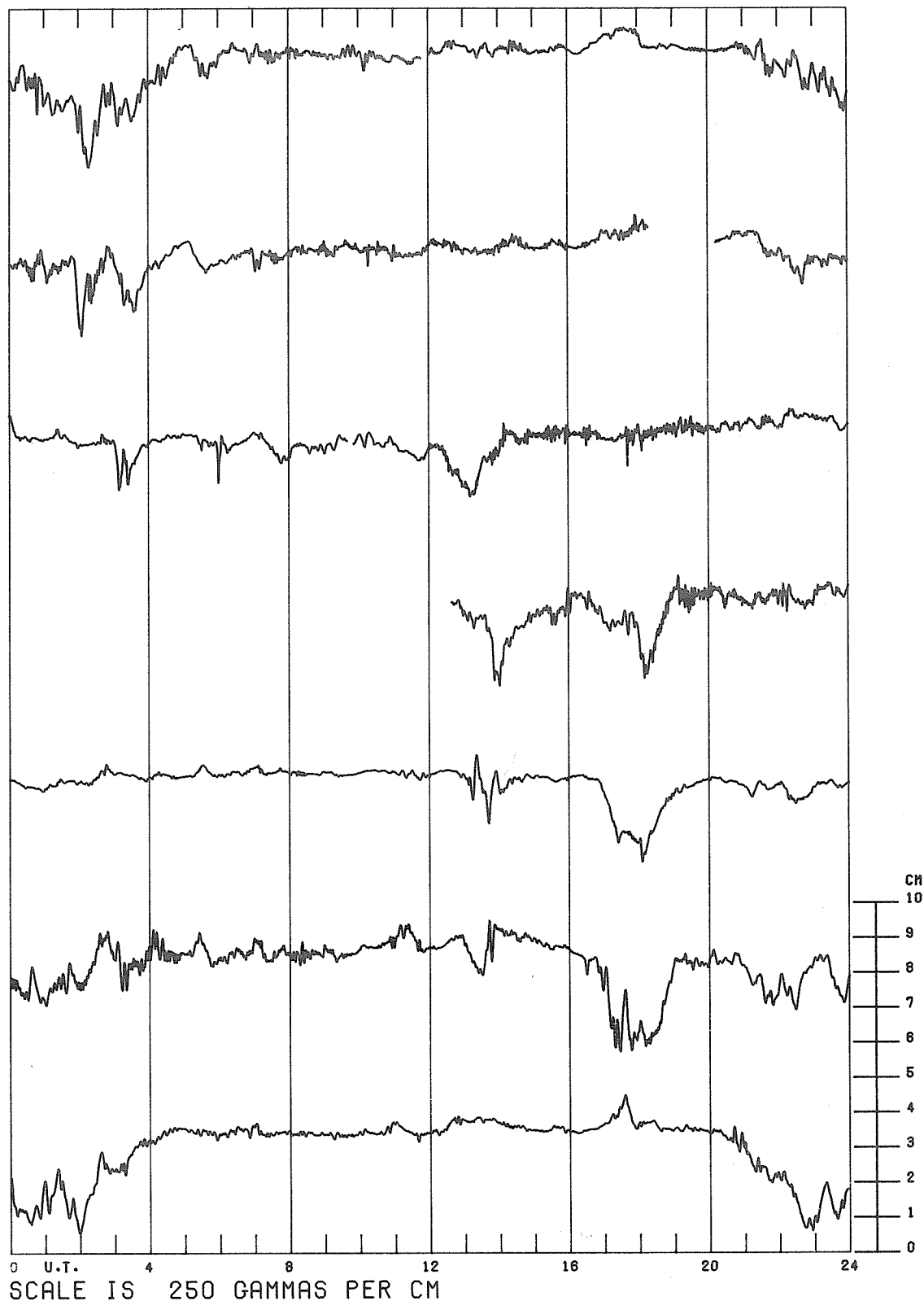
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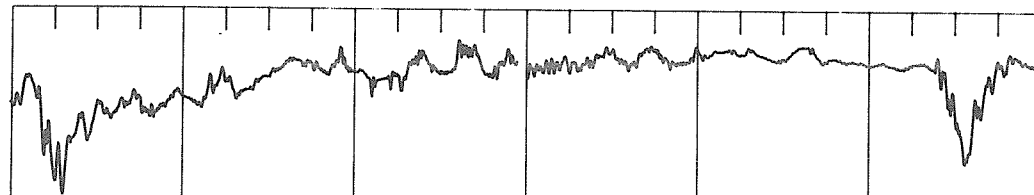
AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
12 MARCH 1976

LR (H)
N.P.D. = 025.90
E.LONG. = 338.30



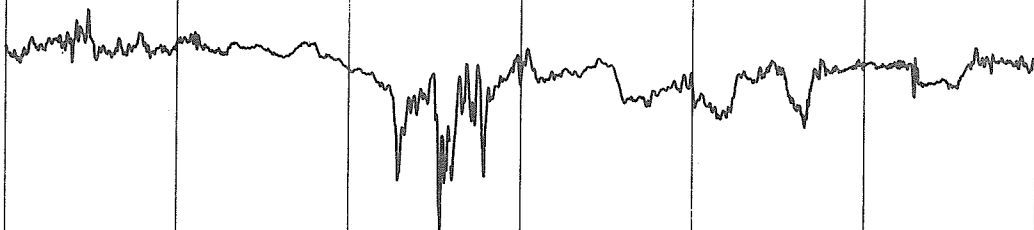
NAS (H)
N.P.D. = 028.90
E.LONG. = 314.80



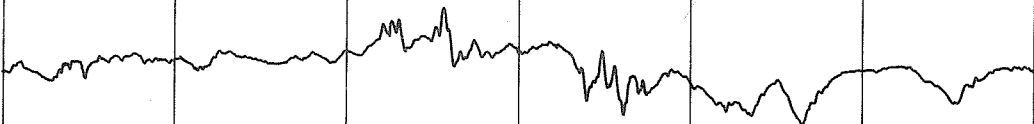
FC (X)
N.P.D. = 031.20
E.LONG. = 265.90



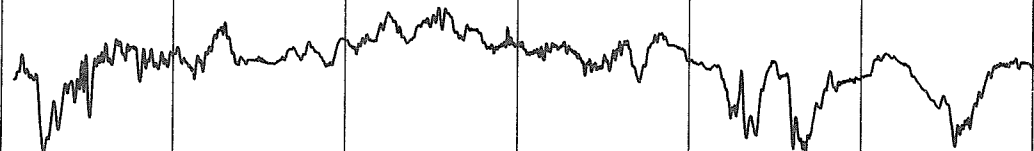
BW (H)
N.P.D. = 018.70
E.LONG. = 203.30



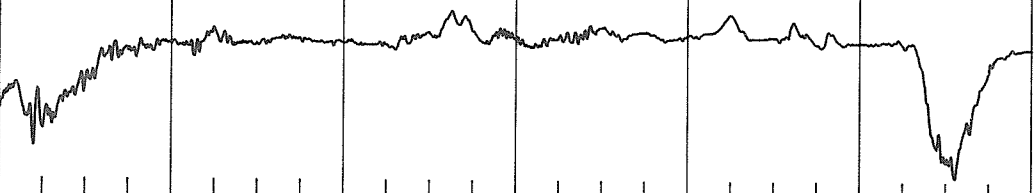
TI (H)
N.P.D. = 018.50
E.LONG. = 129.00



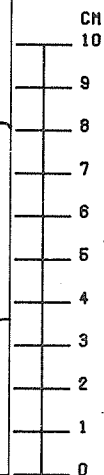
DI (H)
N.P.D. = 016.50
E.LONG. = 080.50



AI (H)
N.P.D. = 021.70
E.LONG. = 018.80



0 U.T. 4 8 12 16 20 24
SCALE IS 250 GAMMAS PER CM



COMMON SCALE MAGNETOGRAMS BY STATION DAY

13 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

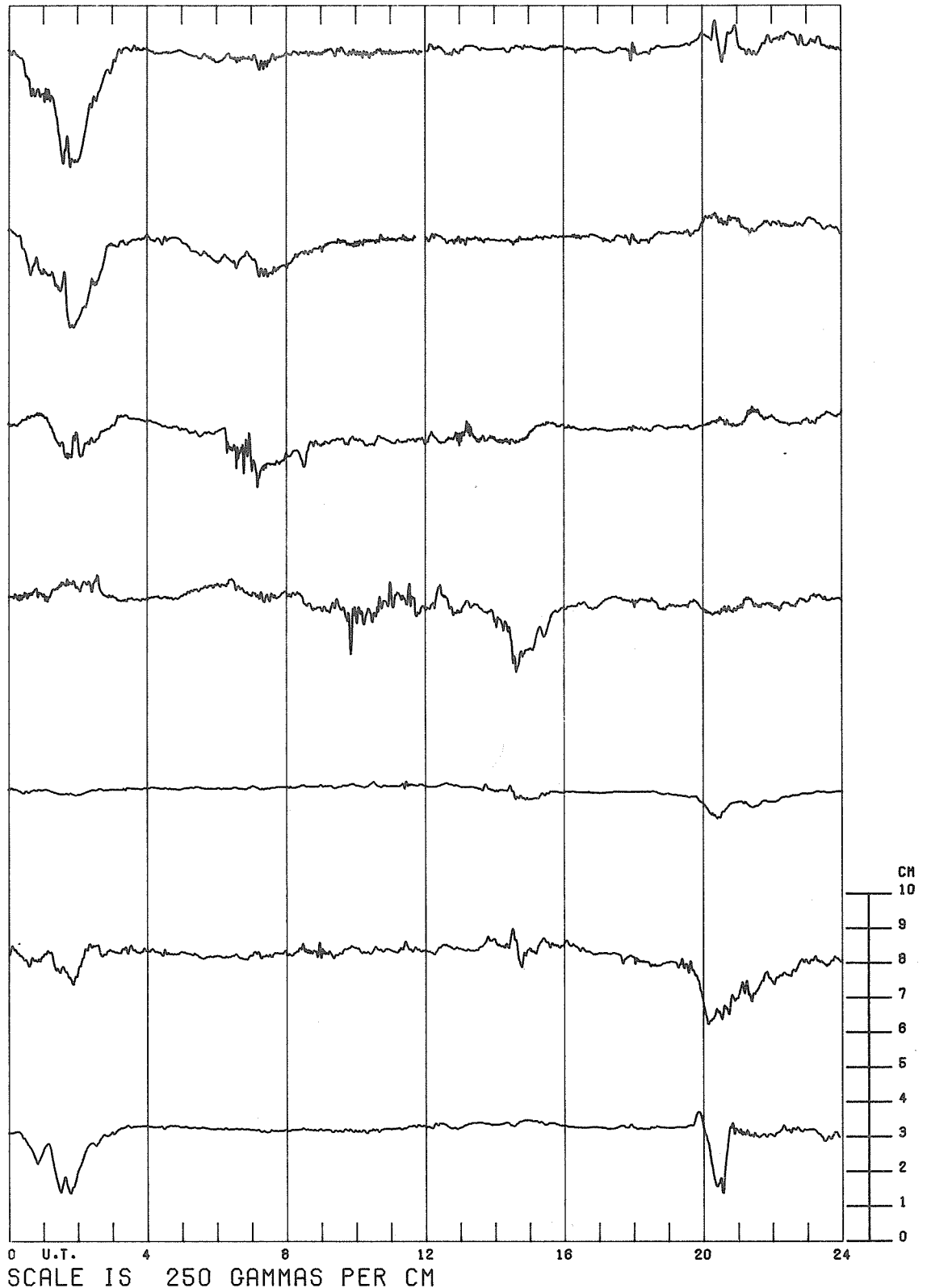
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

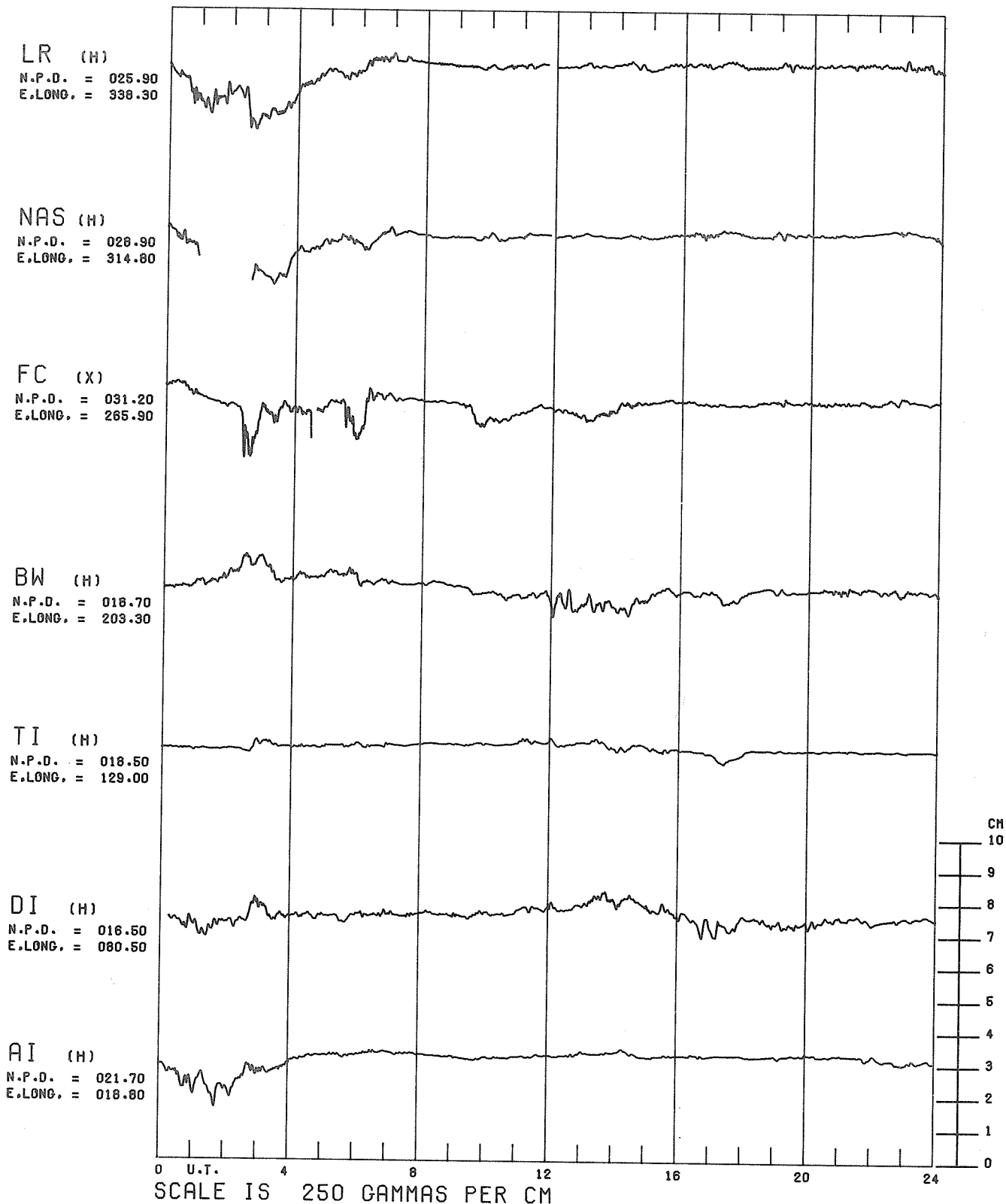
AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

14 MARCH 1976



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
15 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

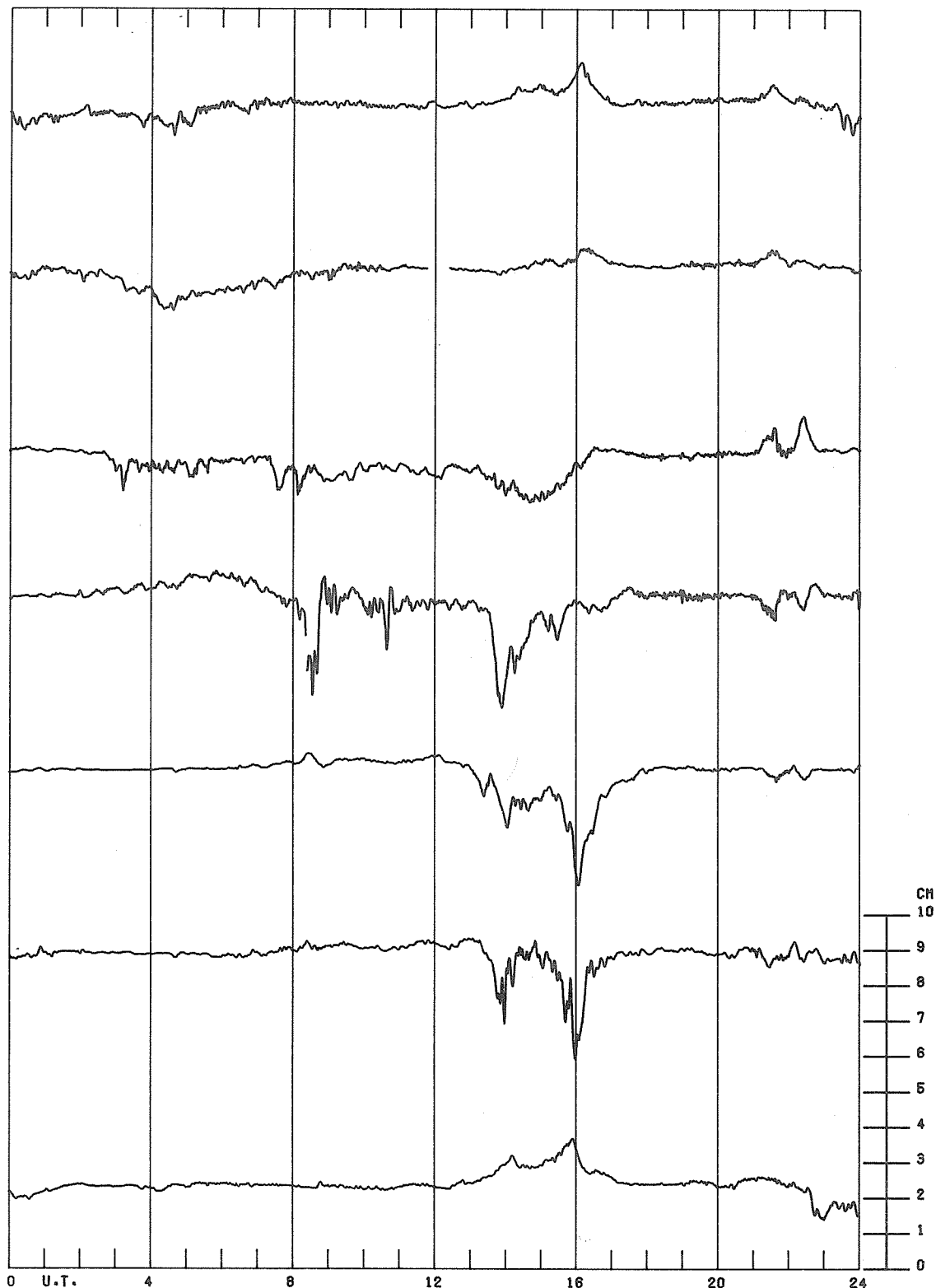
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



SCALE IS 250 GAMMAS PER CM

COMMON SCALE MAGNETOGRAMS
BY STATION DAY
16 MARCH 1976

LR (H)
N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)
N.P.D. = 028.90
E.LONG. = 314.80

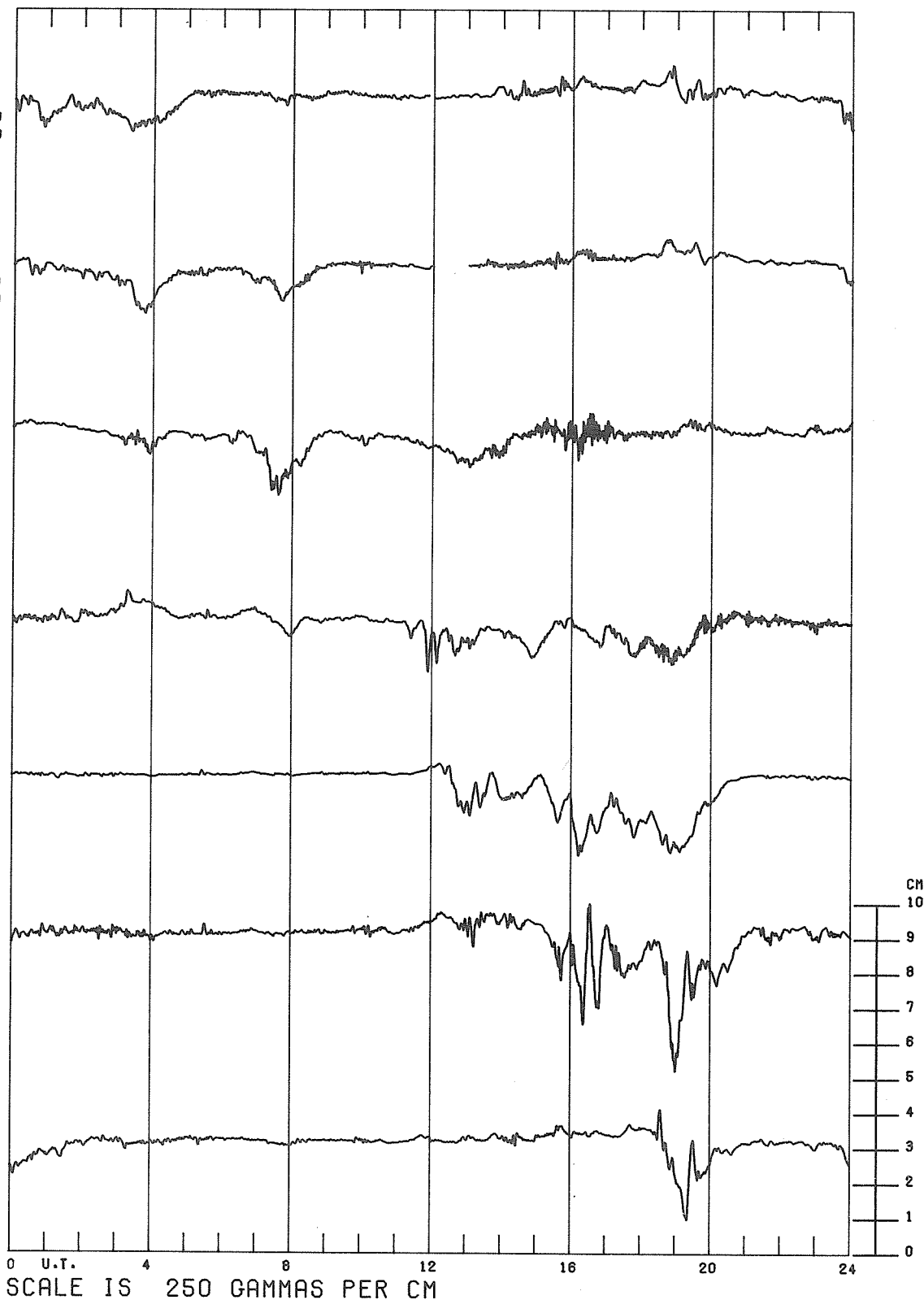
FC (X)
N.P.D. = 031.20
E.LONG. = 265.90

BW (H)
N.P.D. = 018.70
E.LONG. = 203.30

TI (H)
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)
N.P.D. = 016.50
E.LONG. = 080.50

AI (H)
N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
17 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

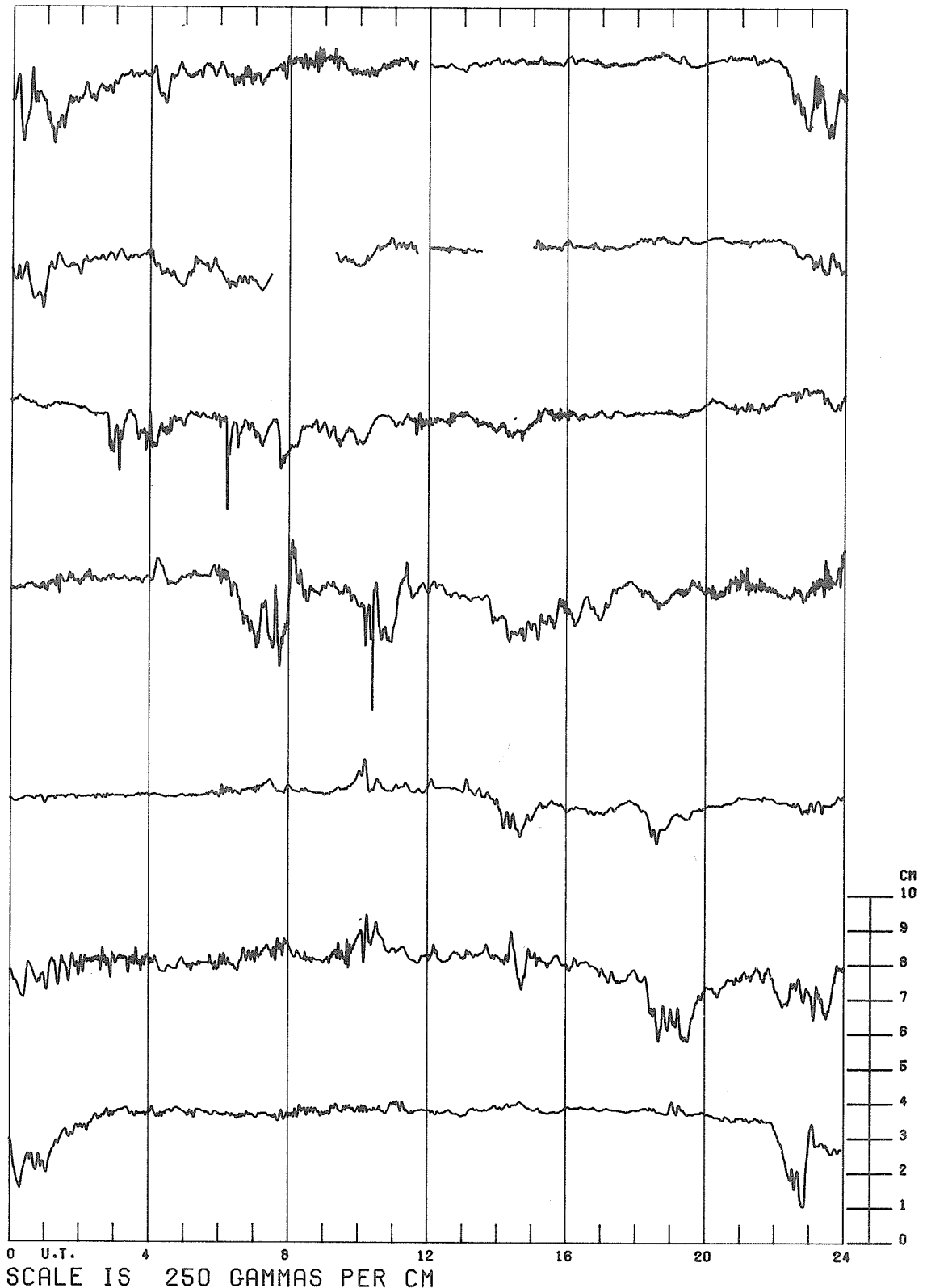
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
18 MARCH 1976

LR (H)
N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)
N.P.D. = 026.90
E.LONG. = 314.80

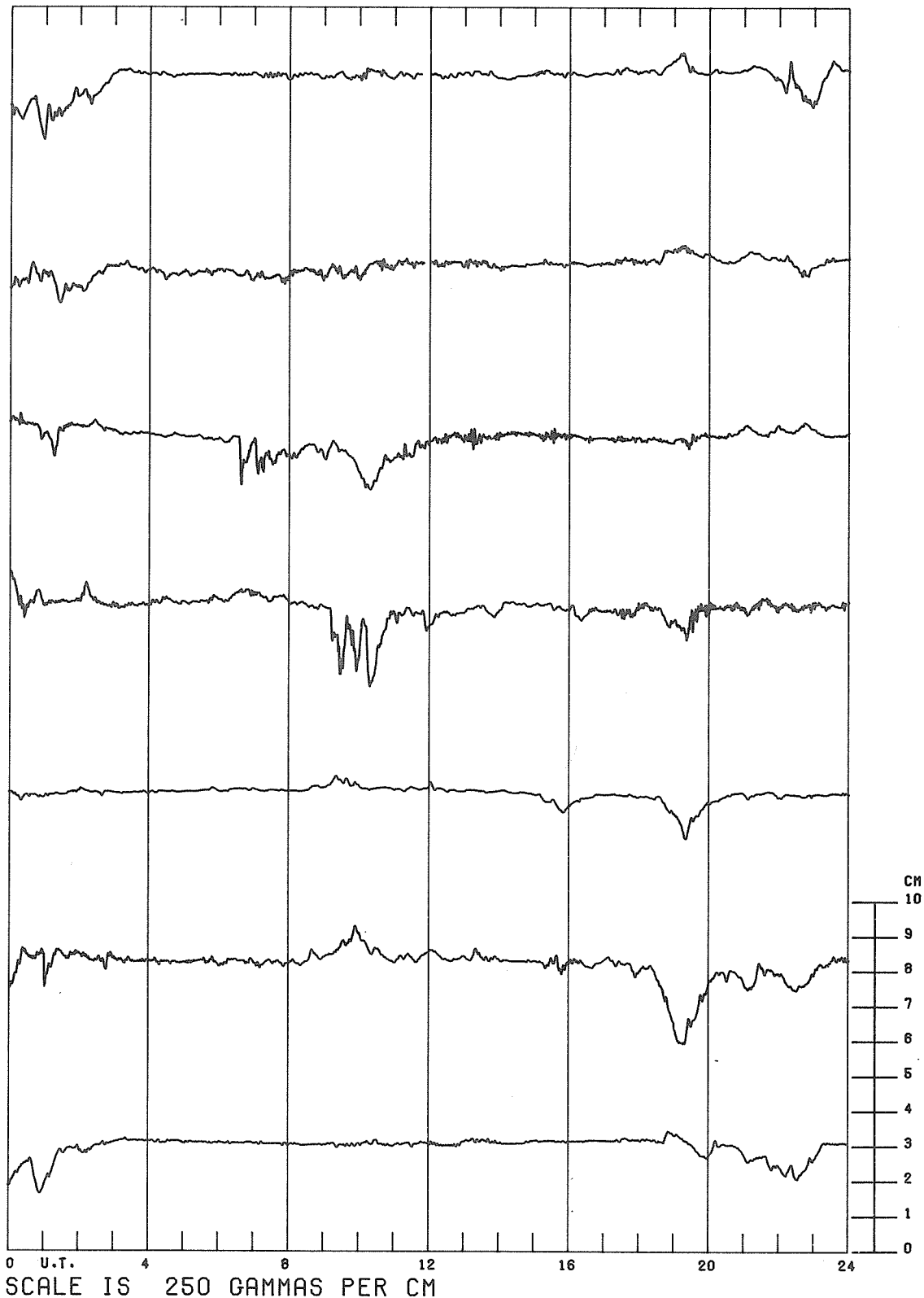
FC (X)
N.P.D. = 031.20
E.LONG. = 265.90

BW (H)
N.P.D. = 018.70
E.LONG. = 203.30

TI (H)
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)
N.P.D. = 016.50
E.LONG. = 080.50

RI (H)
N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
19 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

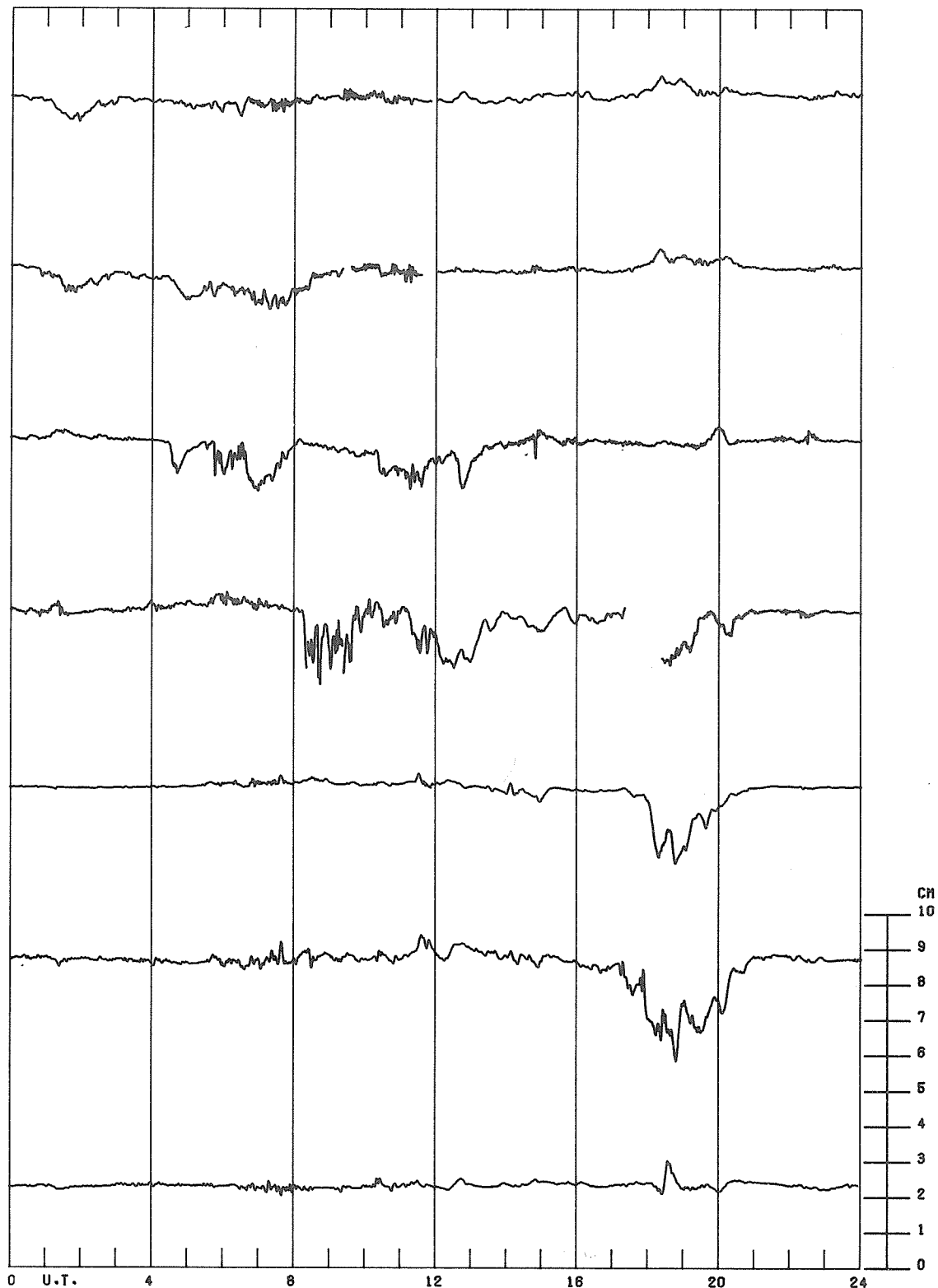
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
20 MARCH 1976

LR (H)
N.P.D. = 026.90
E.LONG. = 338.30

NAS (H)
N.P.D. = 028.90
E.LONG. = 314.80

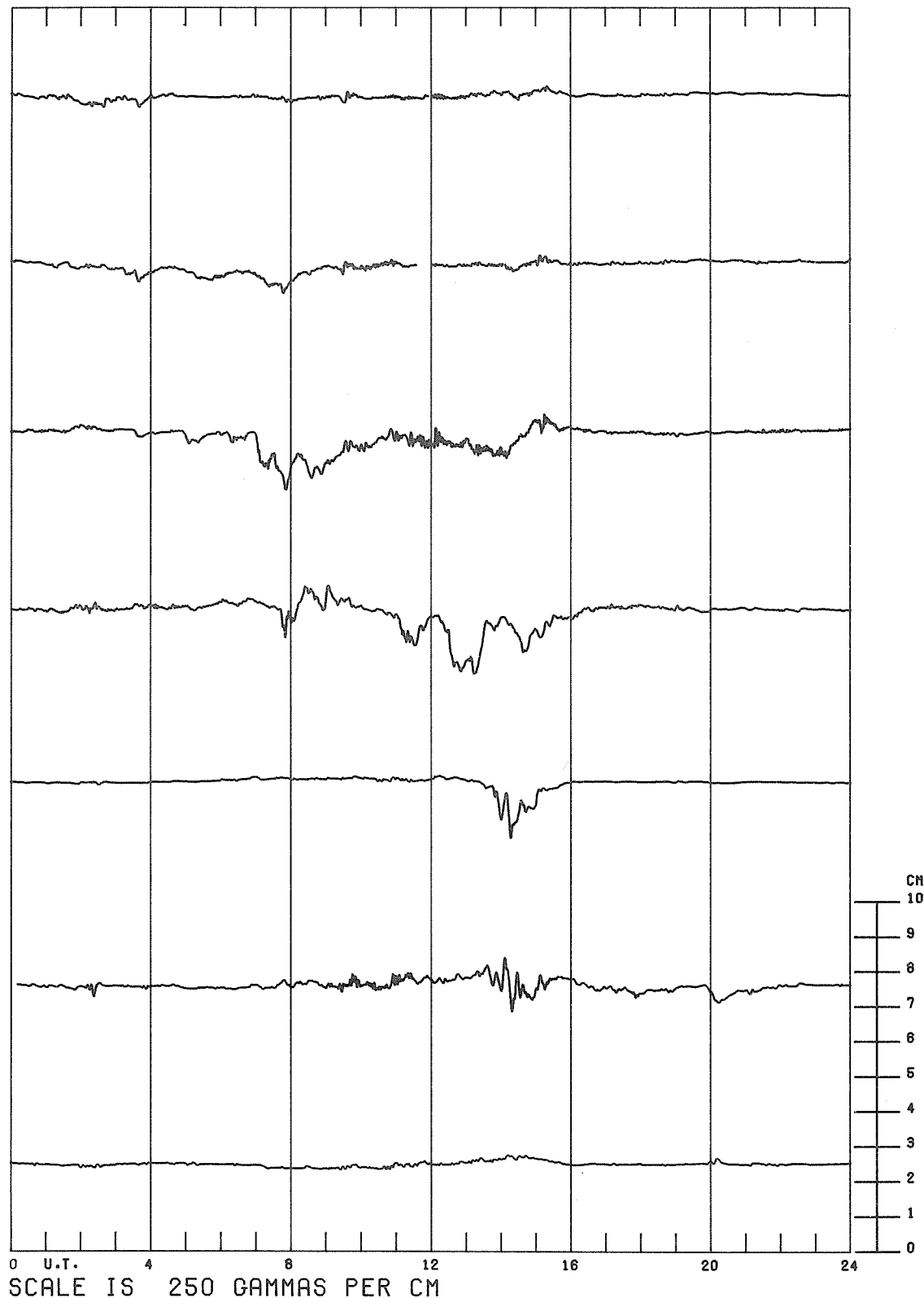
FC (X)
N.P.D. = 031.20
E.LONG. = 266.90

BW (H)
N.P.D. = 018.70
E.LONG. = 203.30

TI (H)
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)
N.P.D. = 016.50
E.LONG. = 080.50

AI (H)
N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY 21 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

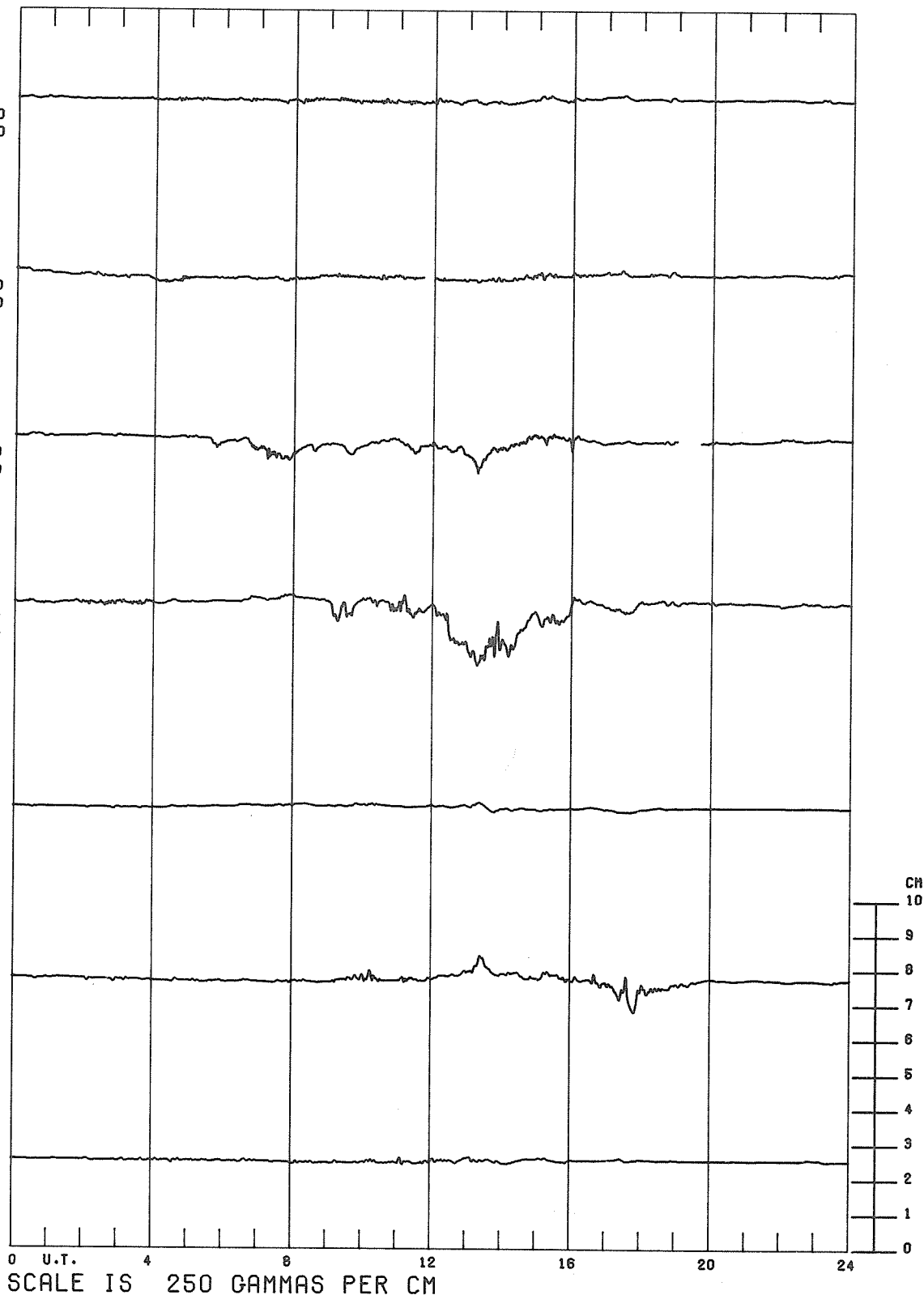
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

RI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
22 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

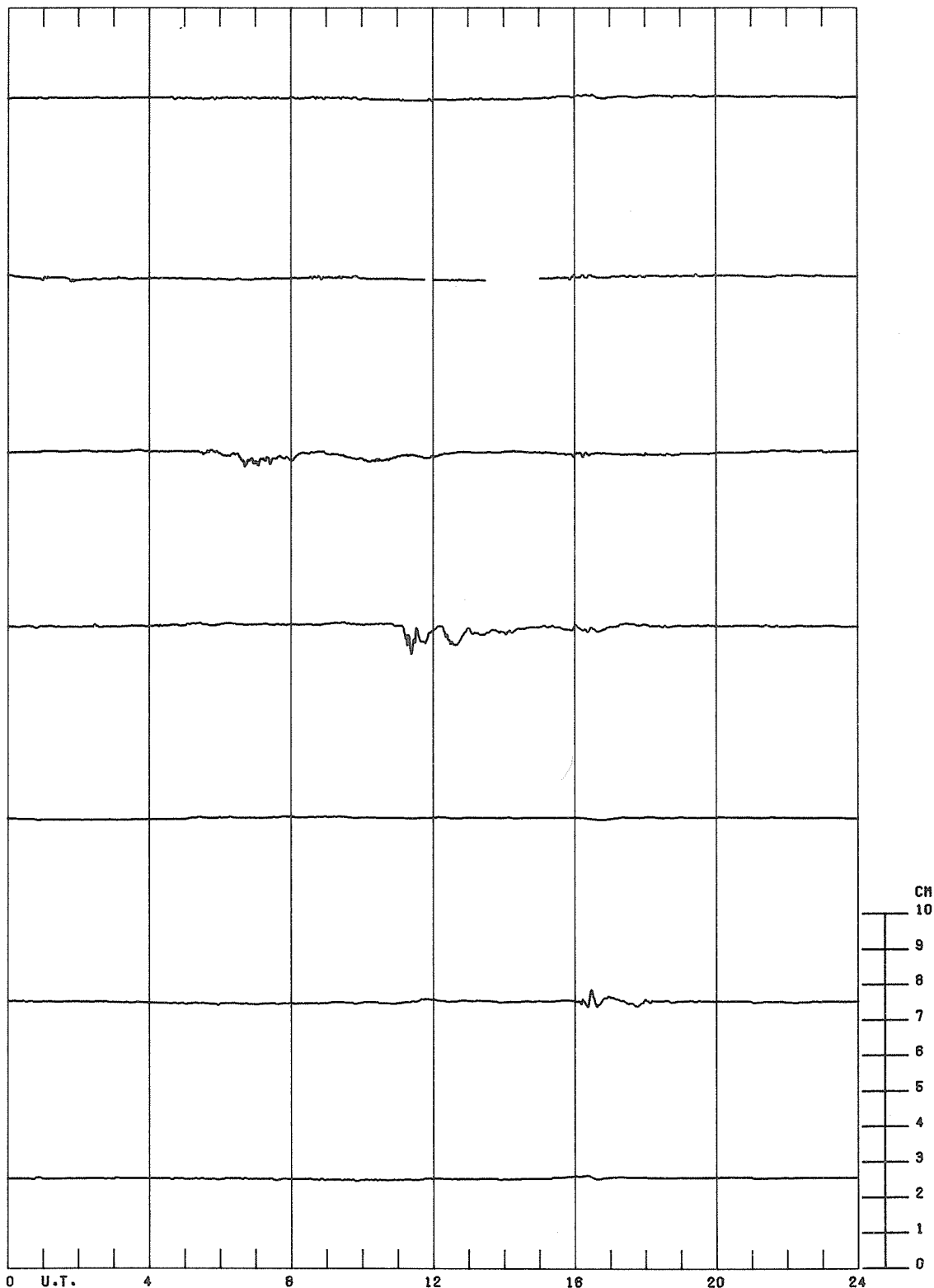
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS

BY STATION DAY

23 MARCH 1976

LR (H)

N.P.D. = 025.90

E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90

E.LONG. = 314.80

FC (X)

N.P.D. = 031.20

E.LONG. = 265.90

BW (H)

N.P.D. = 018.70

E.LONG. = 203.30

TI (H)

N.P.D. = 018.50

E.LONG. = 129.00

DI (H)

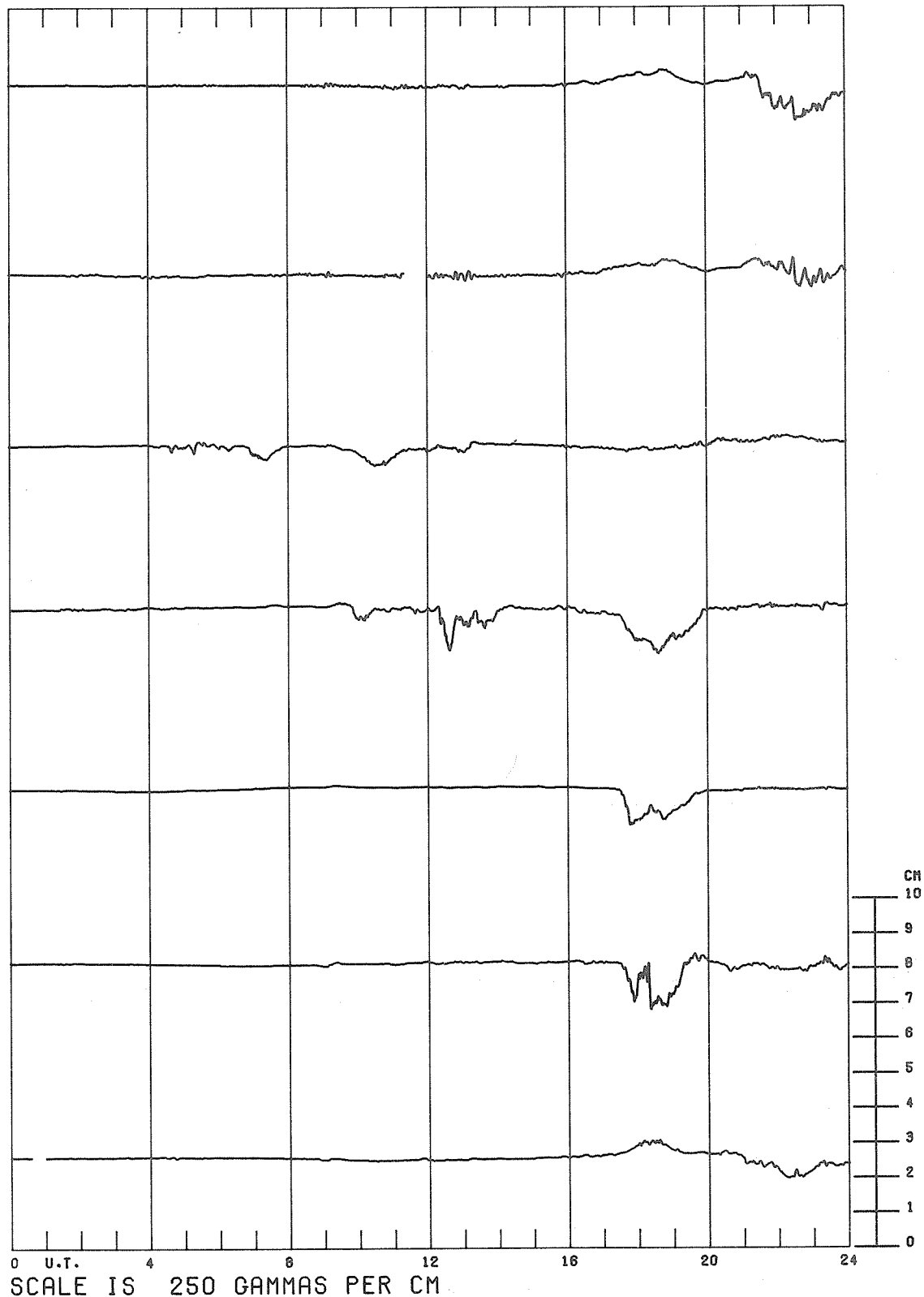
N.P.D. = 016.50

E.LONG. = 080.50

AI (H)

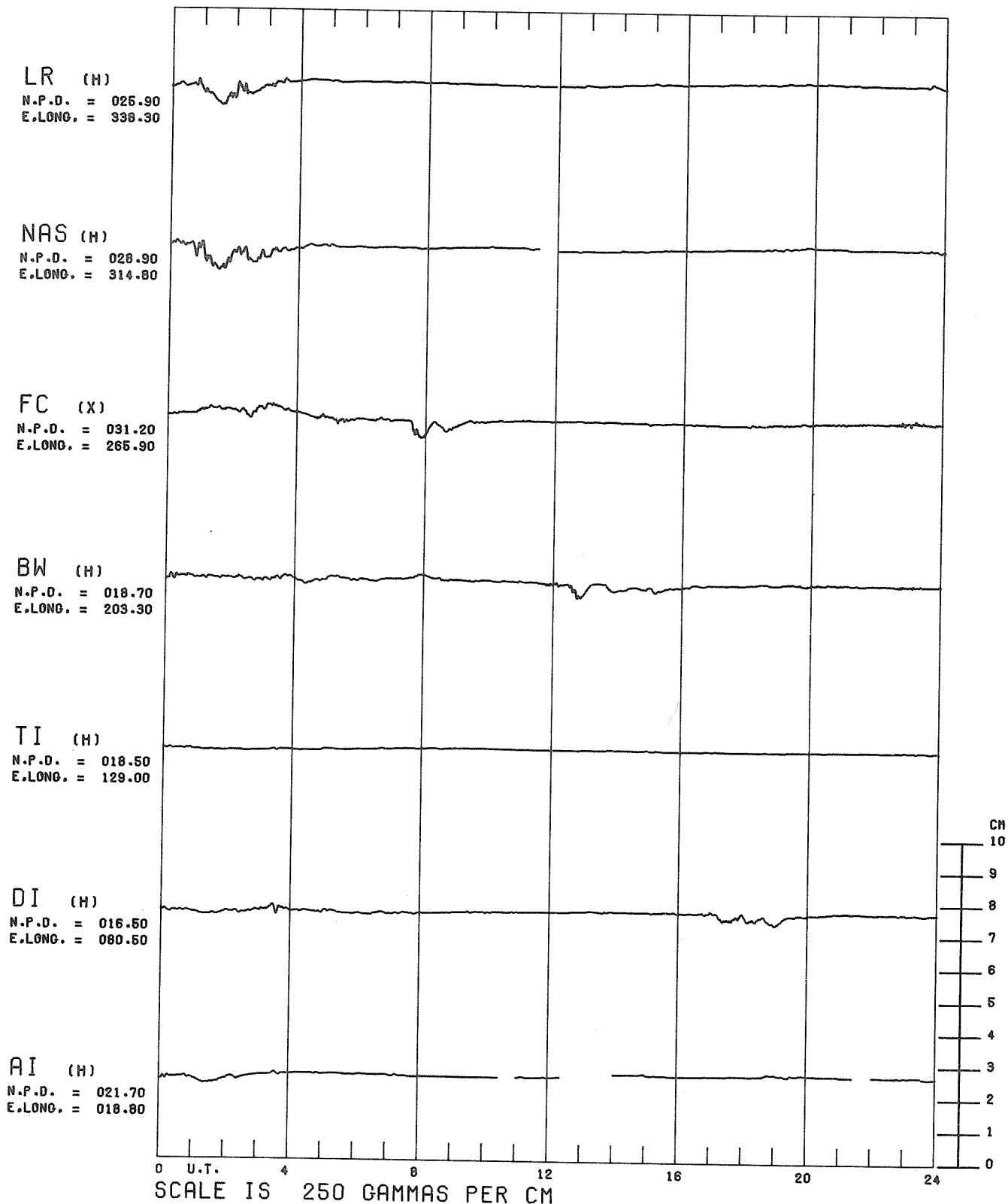
N.P.D. = 021.70

E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

24 MARCH 1976



COMMON SCALE MAGNETOGRAMS BY STATION DAY

25 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

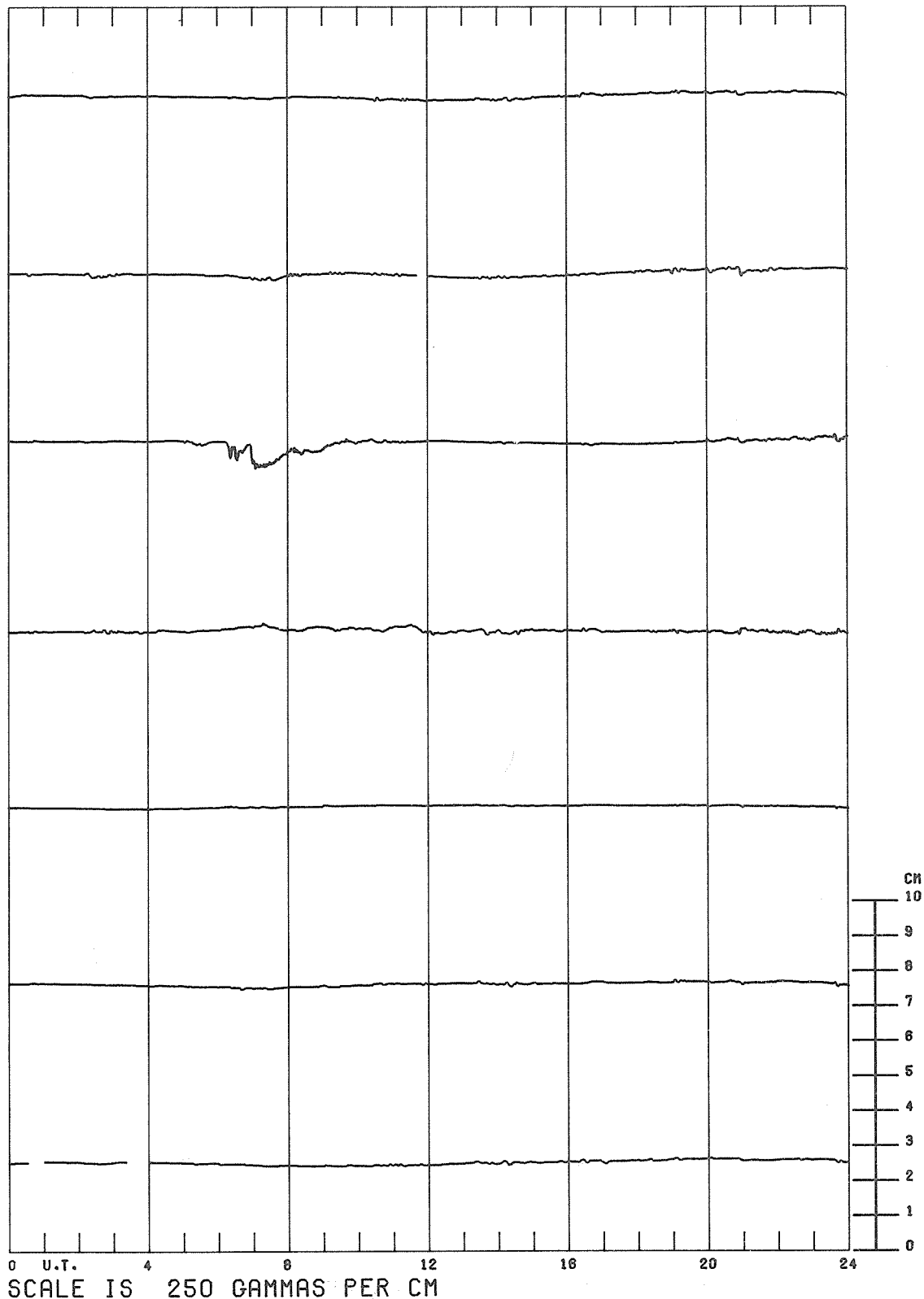
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

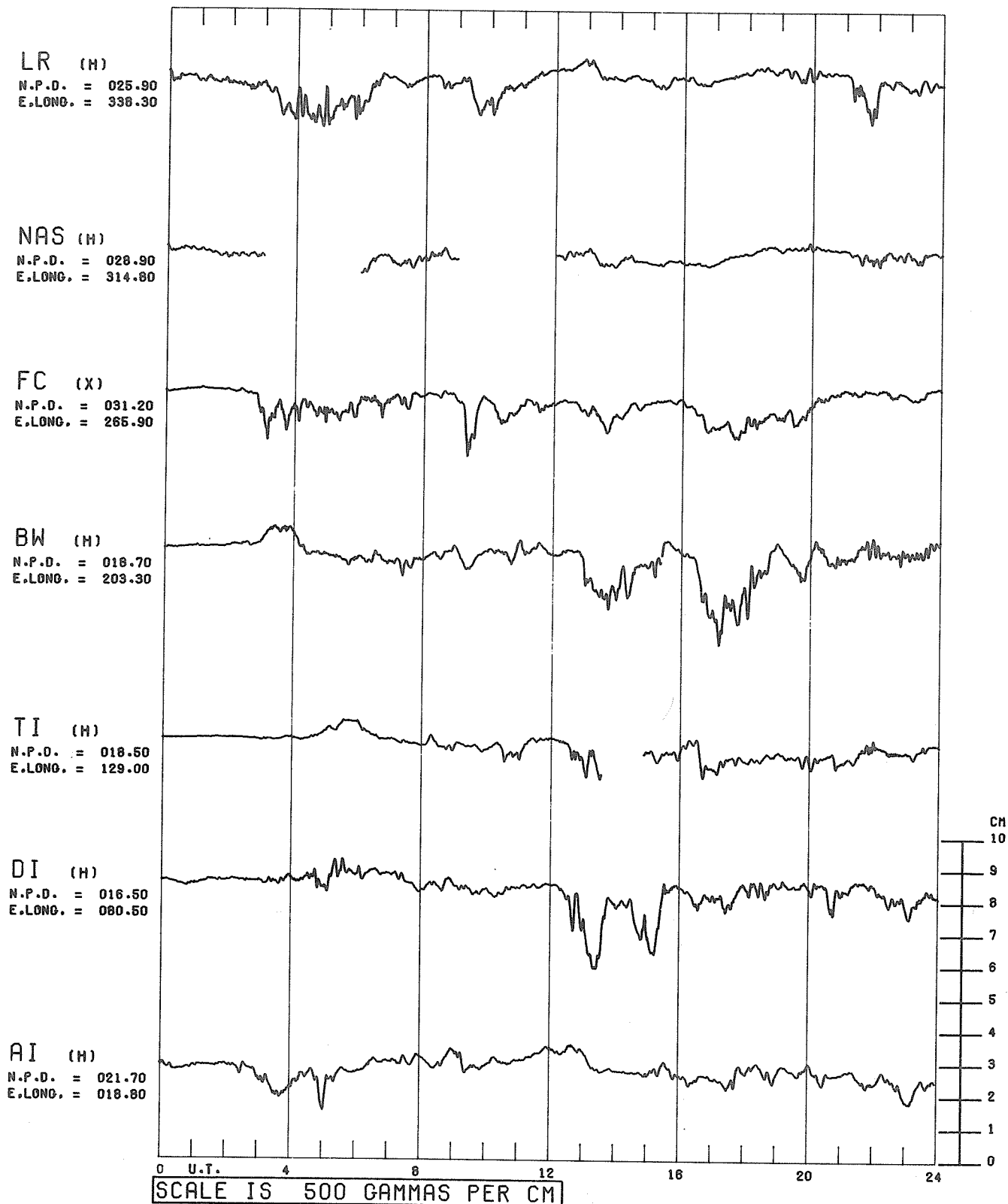
AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

26 MARCH 1976



COMMON SCALE MAGNETOGRAMS BY STATION DAY

27 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

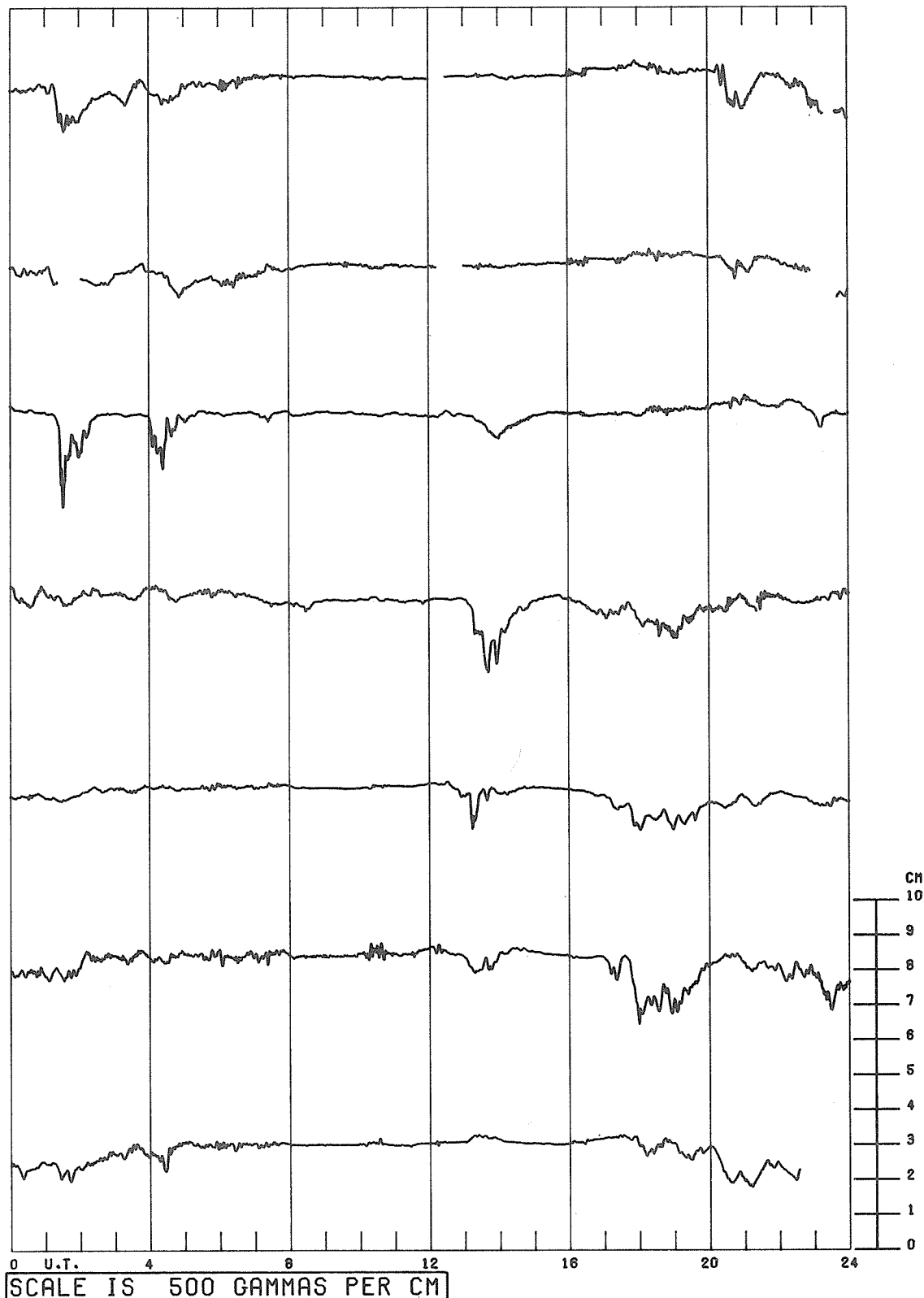
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

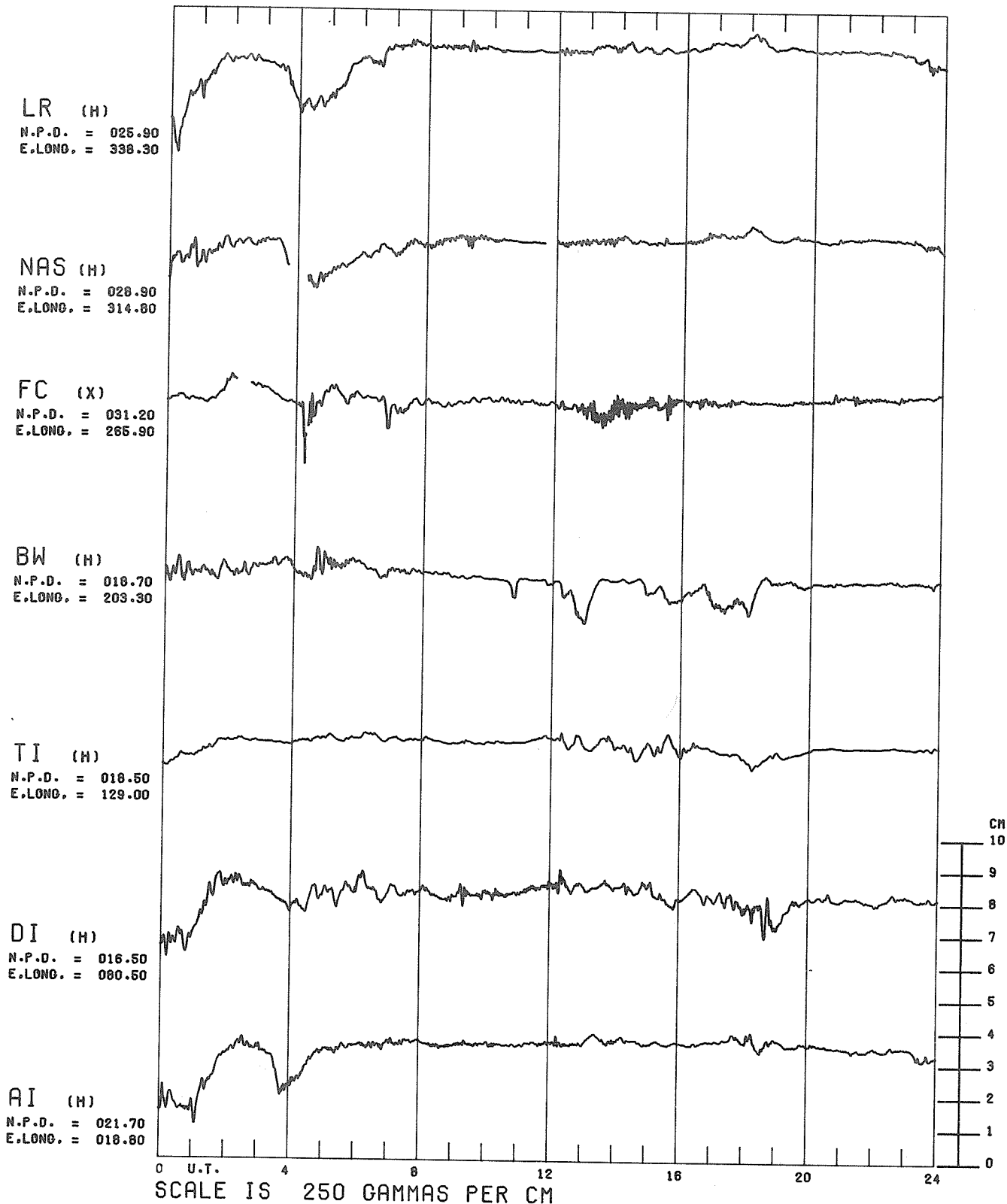
AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS BY STATION DAY

28 MARCH 1976



COMMON SCALE MAGNETOGRAMS BY STATION DAY

29 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

BW (H)

N.P.D. = 019.70
E.LONG. = 203.30

TI (H)

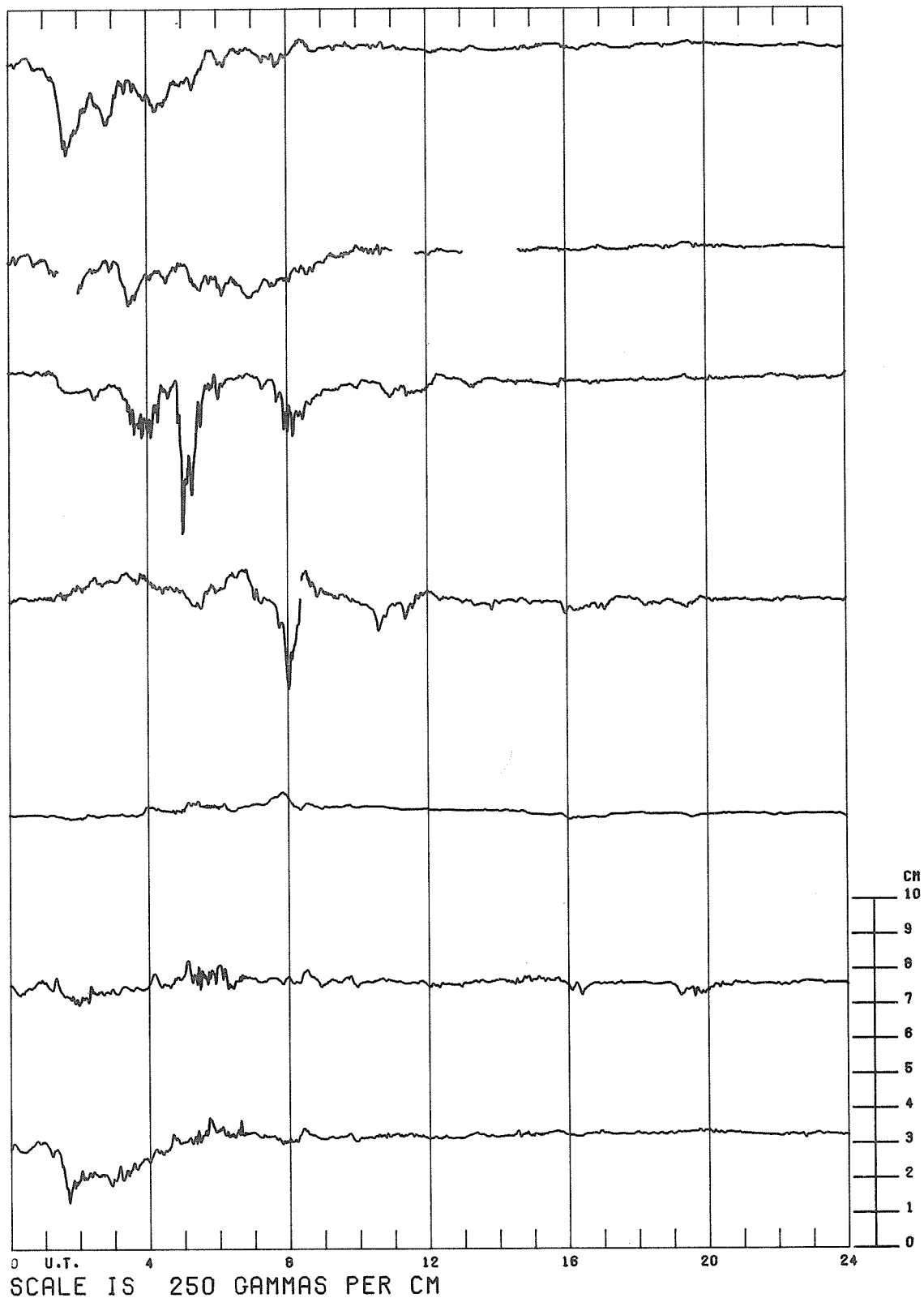
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

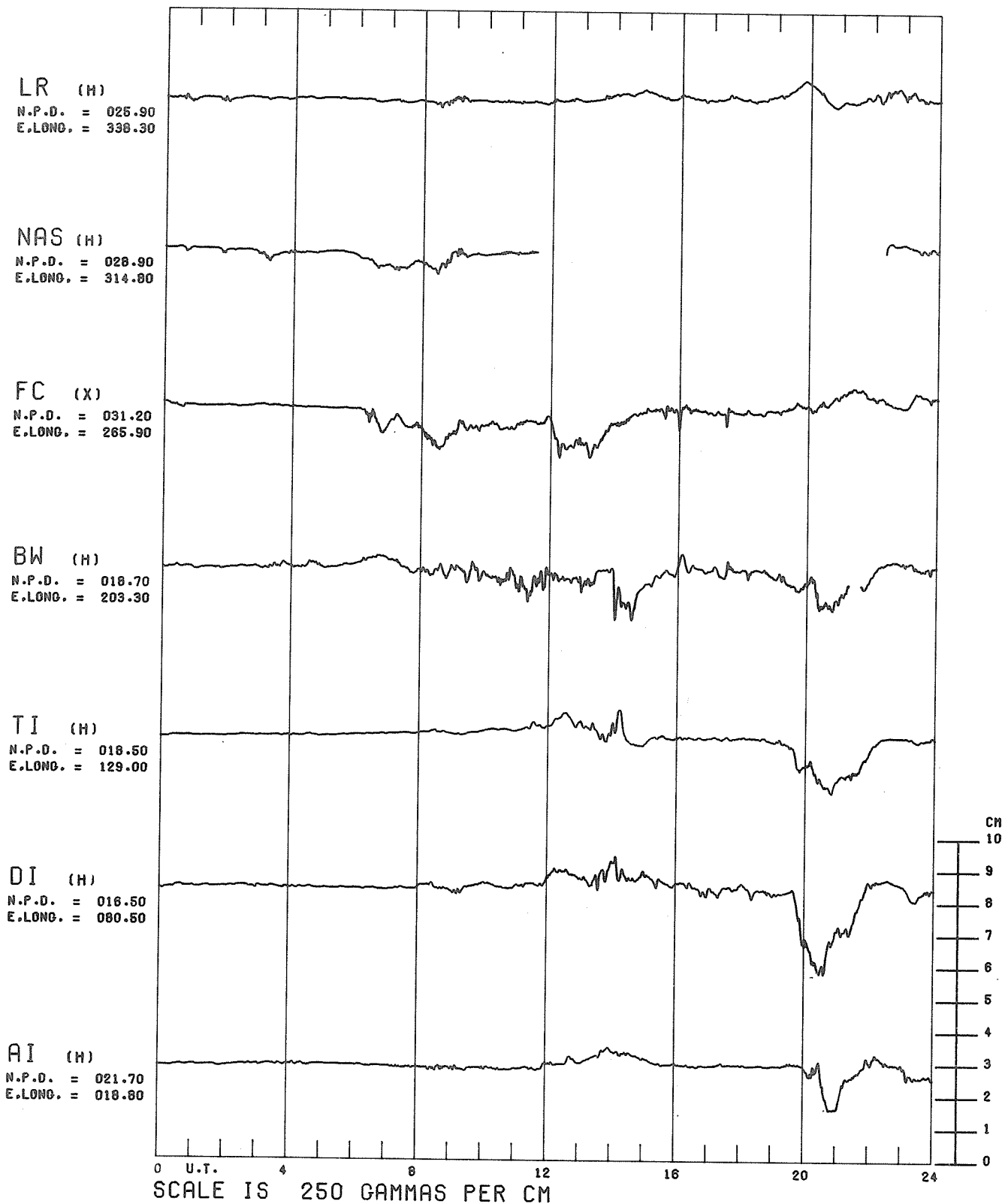
N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
30 MARCH 1976



COMMON SCALE MAGNETOGRAMS
BY STATION DAY
31 MARCH 1976

LR (H)

N.P.D. = 025.90
E.LONG. = 338.30

NAS (H)

N.P.D. = 028.90
E.LONG. = 314.80

FC (X)

N.P.D. = 031.20
E.LONG. = 265.90

RW (I)

N.P.D. = 018.70
E.LONG. = 203.30

TI (H)

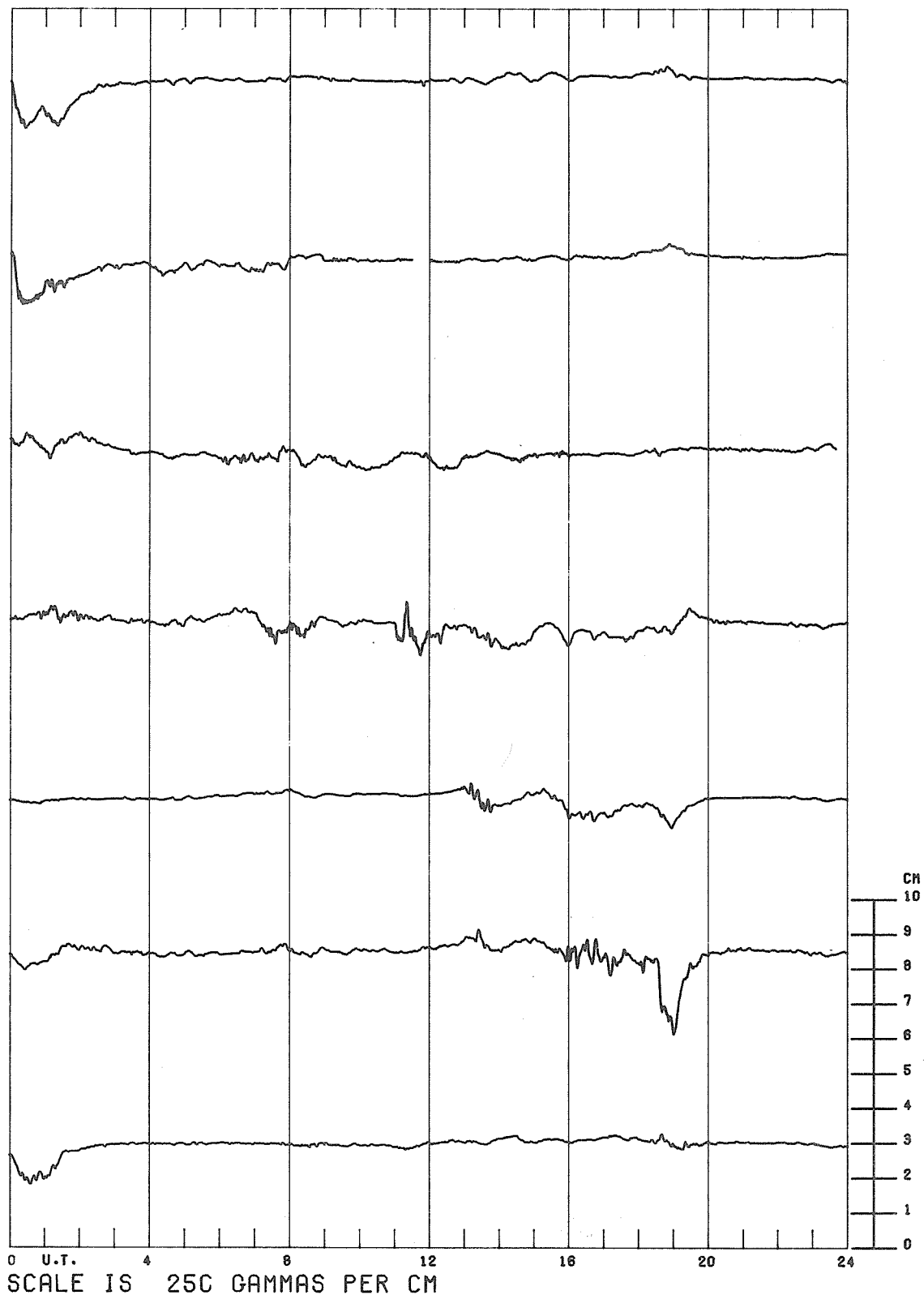
N.P.D. = 018.50
E.LONG. = 129.00

DI (H)

N.P.D. = 016.50
E.LONG. = 080.50

AI (H)

N.P.D. = 021.70
E.LONG. = 018.80



SECTION III. PRELIMINARY AE(7) INDICES, MARCH 1976

1. Discussion of Graphs, Tables, and Statistical Information

The following figures display the familiar AU, AL, AE, and AO graphs for each day of the month and are based upon 1-min data samples. As indicated at the top of each frame, these indices are derived from data from only seven auroral zone observatories and, as such, are considered "provisional." WDC-A for Solar-Terrestrial Physics intends to update these indices during and after the IMS and to publish "final" graphs and summary tables in the usual UAG Report format for each year.

Following the pages of AE graphs are Tables 1-4 (pages 47-50) containing the index (AE, AO, AU, AL) amplitudes for each hour of each UT day of the month, the monthly averages for each hour and for the hours of the designated 5Q and 5D days, and the average amplitudes for each day and for the whole month. Tables 5-6 (pages 51-52) give the station having the largest hourly average positive and negative deviations (hourly AU and AL) for each hour of each day in the month. These provide a key to the graphs of AU and AL by usually indicating which station's magnetogram provided the extreme deviations giving AU or AL for that hour. Sometimes the most extreme deviation during an hour will have occurred at another station. The general patterns, however, of UT time of AU and AL provision by each station are the same whether based on hourly averages or on minute-by-minute extremes.

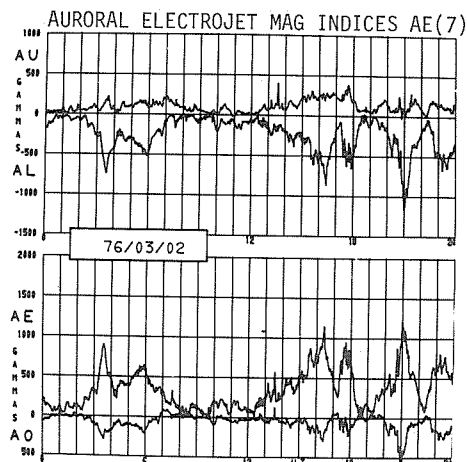
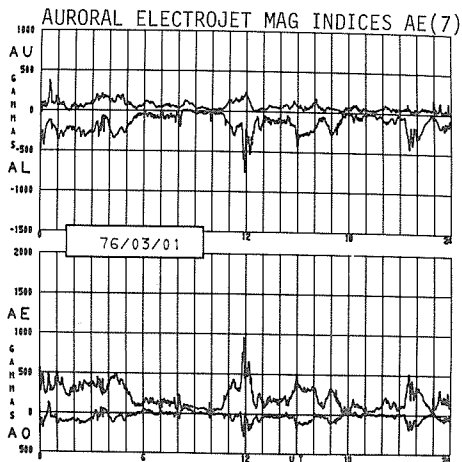
Table 7 (page 53) gives the number of times (1-min intervals) during the month when the indicated station provided the AU and AL index in each hour of the UT day. For the relatively sparse station distribution used in this AE(7) derivation, it is not surprising that each station could produce at least one extreme positive and negative deviation in almost every hour of the day. However, the overall pattern is for the most frequent observation of the maximum positive H deviation to occur around 6 hours before Local Geomagnetic Midnight (LGM) and the most negative H deviation to occur around 3 hours after LGM [Allen and Kroehl, 1975]. Individual station deviations from this pattern may be due to the dominant influence of a few isolated large substorms during a relatively quiet month. This should become apparent as more months of data are similarly analyzed.

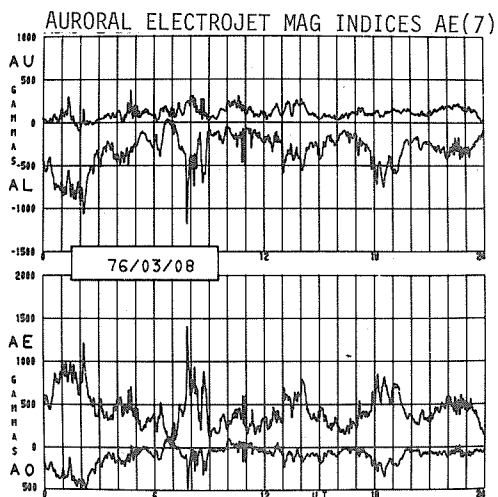
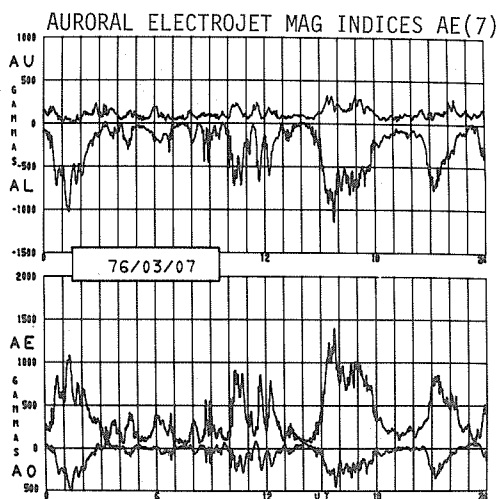
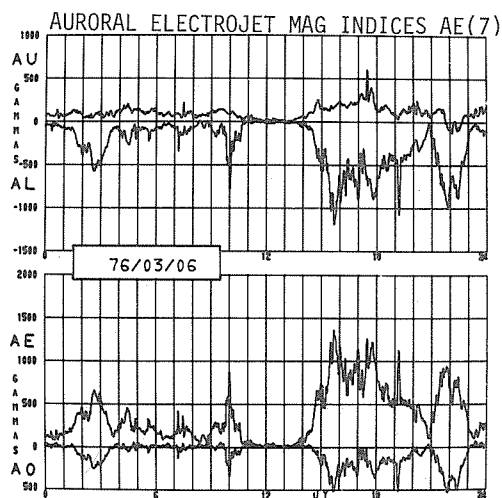
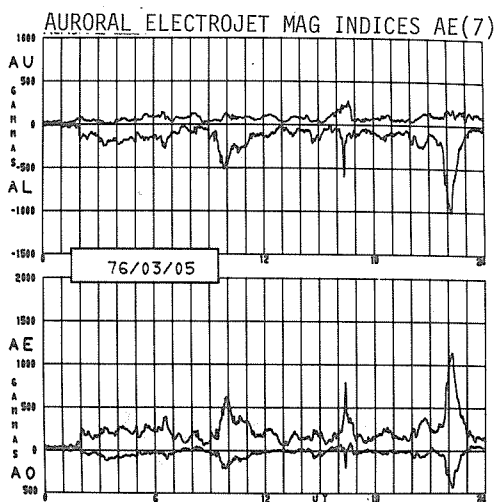
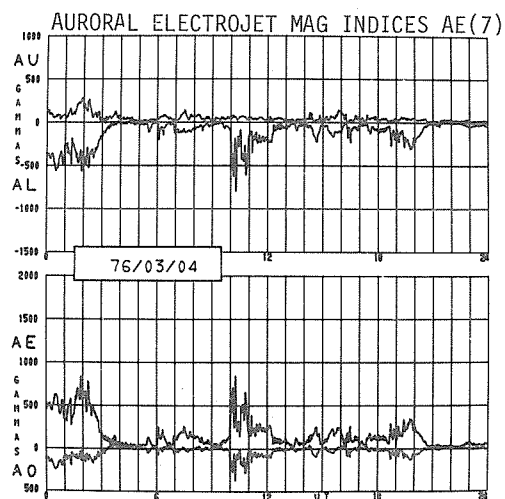
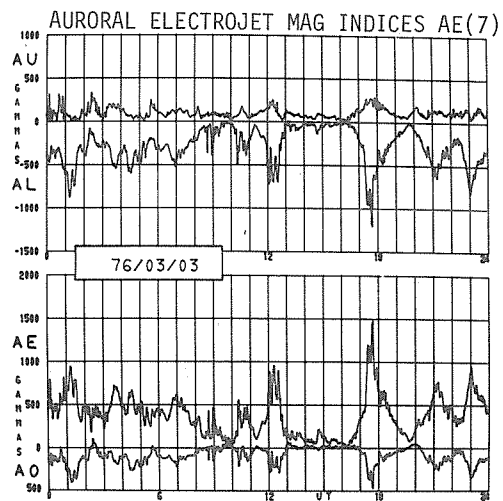
Table 8 (page 53) gives the monthly average of quiet-time H for each observatory. This is computed from the 1-min H scalings on the 5 quiet days of the month, using known or assumed H baselines.

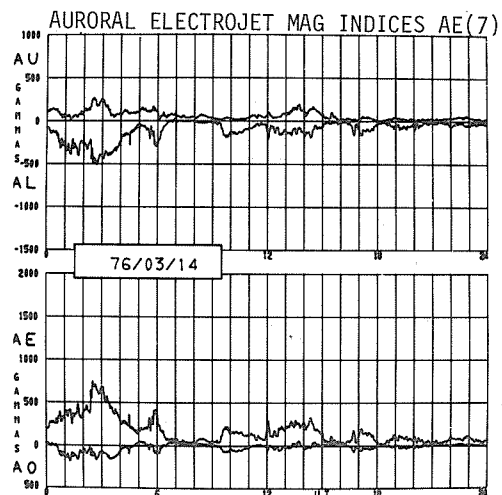
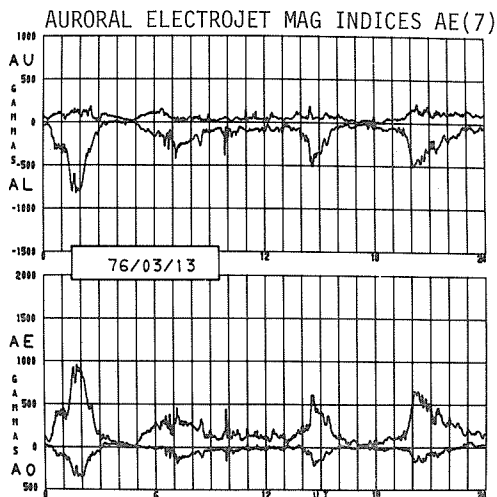
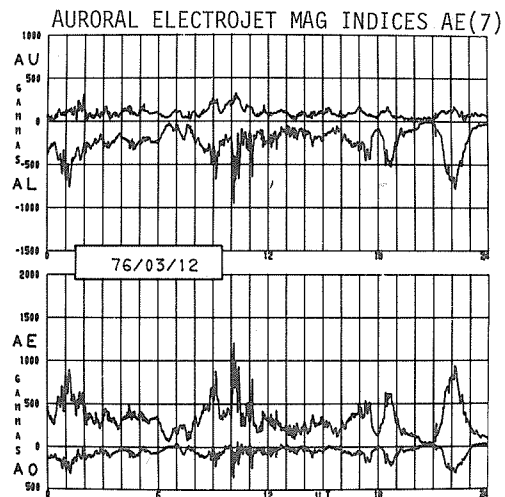
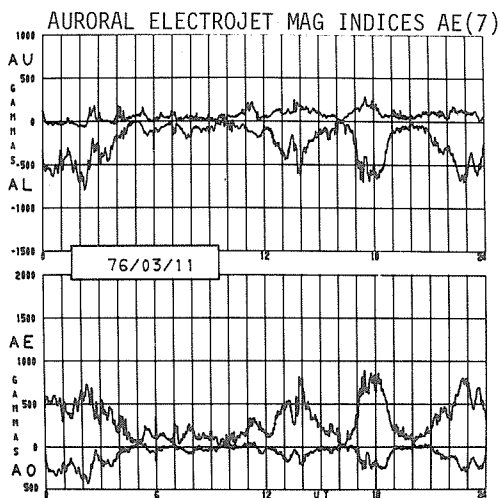
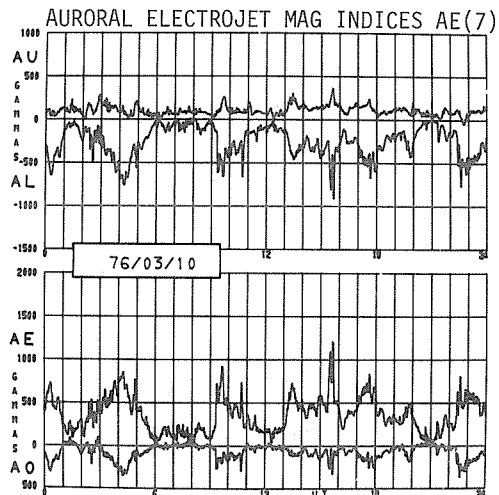
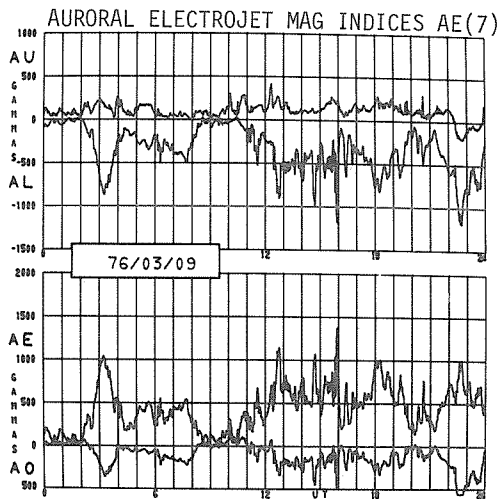
Figures 2-5 (pages 54-57) graphically display the details suggested by the tabulation of hourly station frequency of AU and AL contribution. The "frequency of 1-min AU provision by station" (Figure 2) for the month is a smoothed curve showing the number of times that each station contributed the extreme positive deviation from minute-to-minute, $N(AU)$. An 11-point running mean was used on the raw numbers of contributions for the 1440 1-min intervals of the UT day. Data for the UT day are duplicated (0000-2400 UT shown twice) so that the end of the day will not interrupt the regular pattern of progressive index contribution as each station rotates into the critical region (around 1800 LGT). Arrows mark UT times of LGM for each station. Figure 3, on the opposite page, shows the "total amplitude of most positive H variations." This is a smoothed graph for each station's cumulative amplitude of deviation for each minute when it was providing the AU index. Each scale division on the right side represents +500 gammas. Comparison of these curves with the $N(AU)$ graphs of Figure 2 shows that the largest magnitude positive excursions generally occur at the same time when the stations most often provide AU indices. Occasional postmidnight minor peaks result from disturbances for which the H component at one site is first a negative extreme (giving AL) for several minutes and then swings briefly to

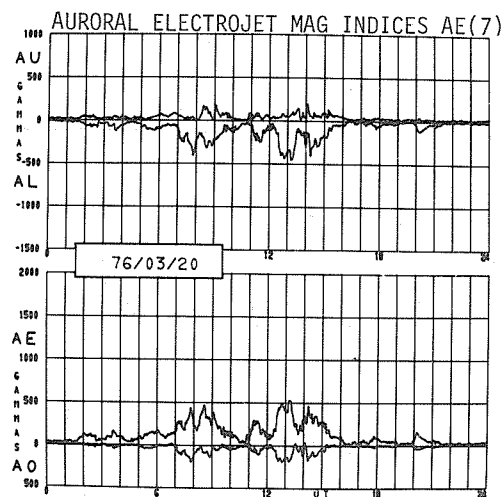
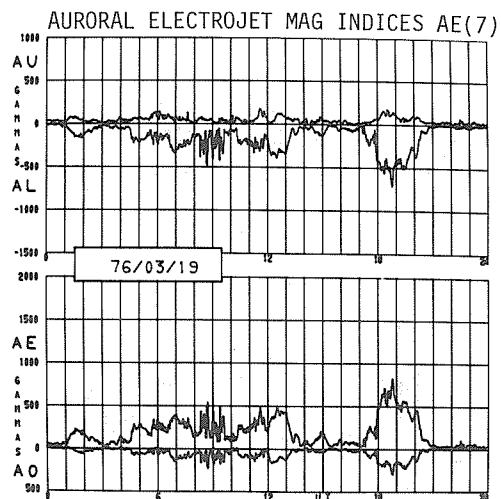
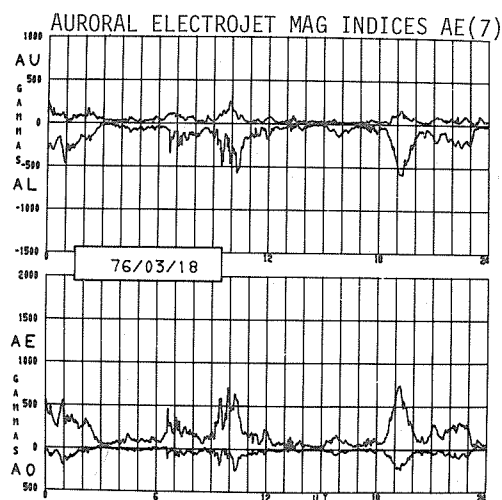
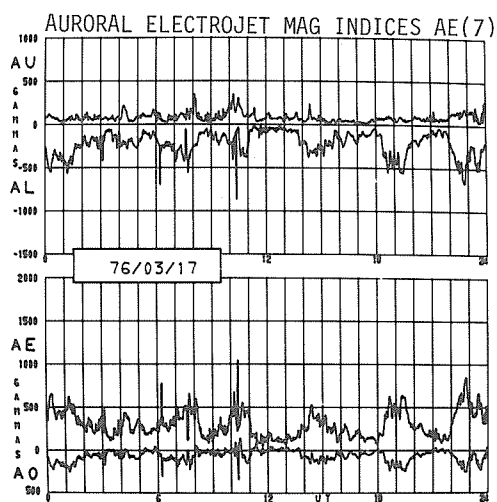
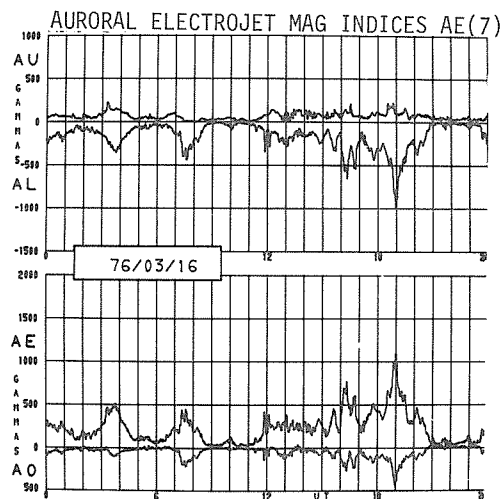
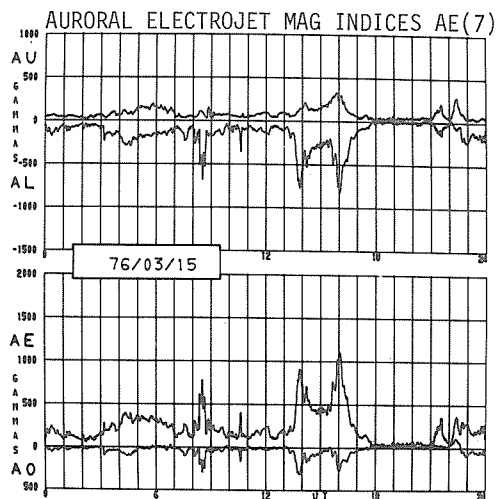
(Text continued on page 46)

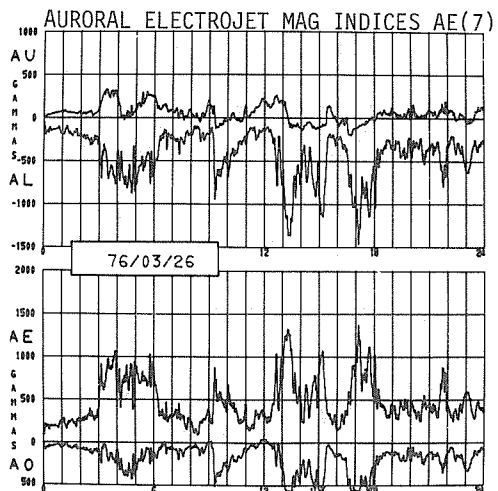
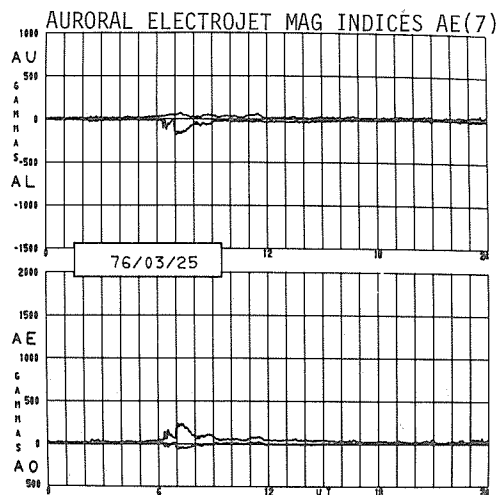
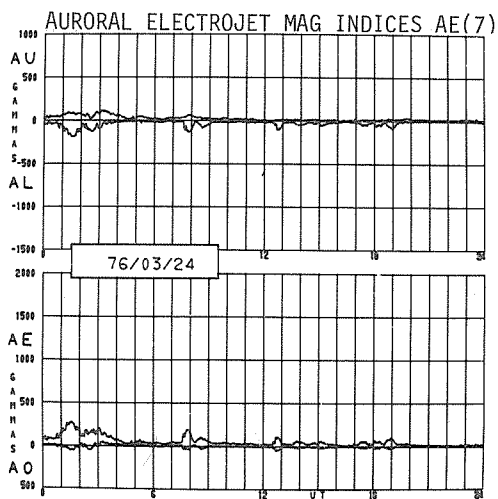
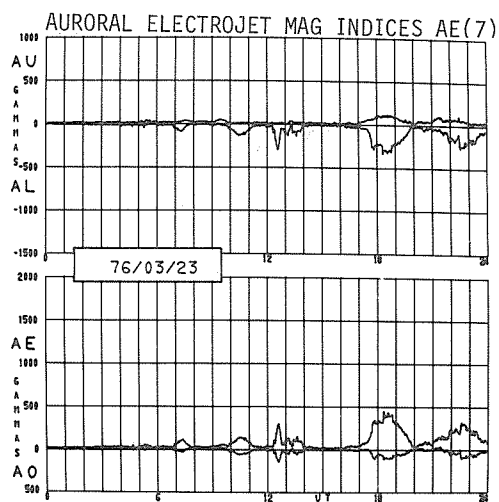
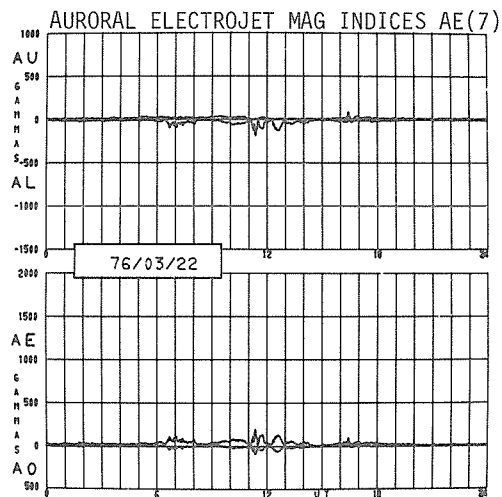
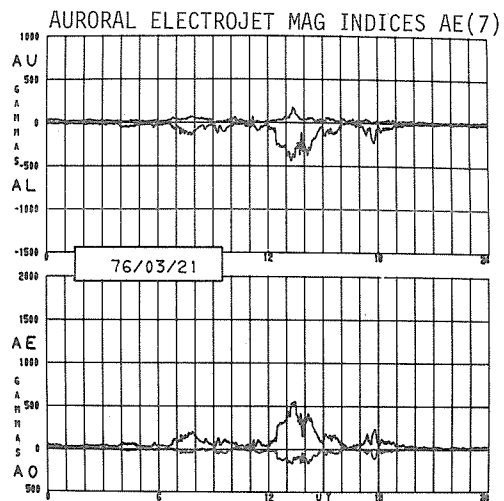
2. Graphs of AU, AL, AE, and AO for Each Day of the Month

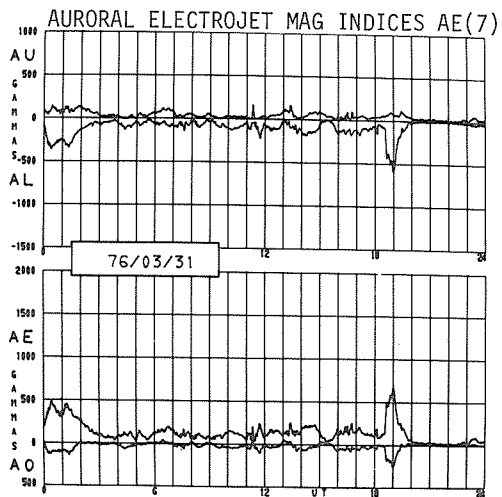
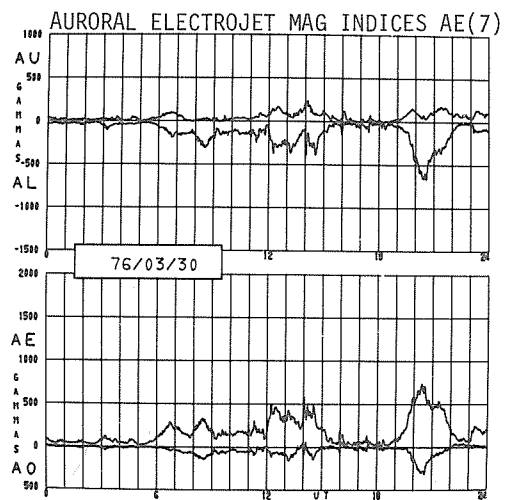
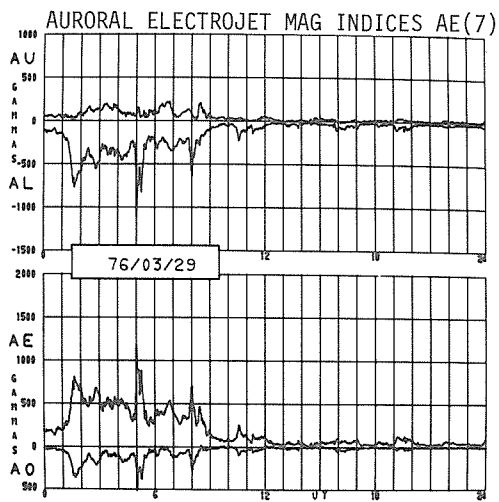
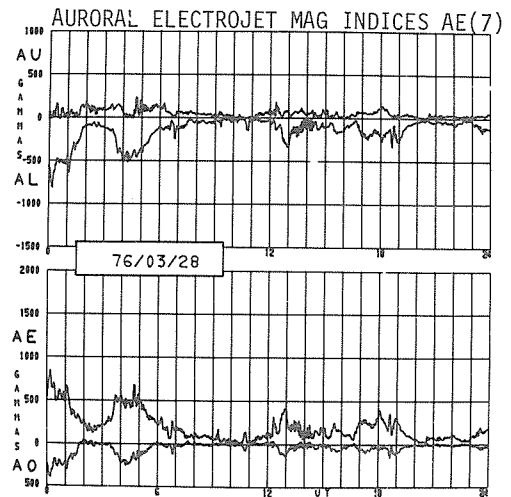
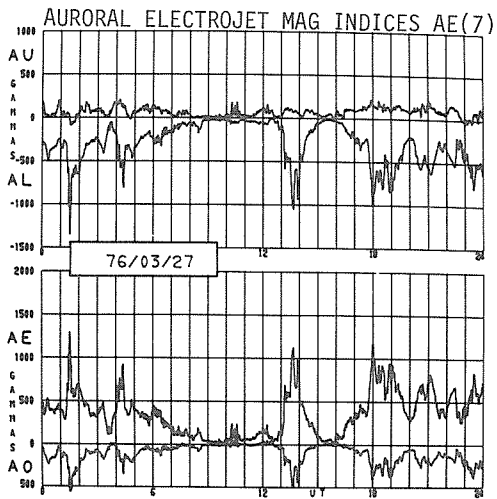












(Text continued from page 40)

a positive extreme before recovery. Such events are infrequently observed in AE indices derived from 10 to 12 stations because usually another station is in position to monitor the true eastward electrojet effect rather than having oscillatory variations near LGM providing AU.

The graph "frequency of 1-min AL provision by station" (Figure 4) shows the smoothed curve for the number of times in the month that each station provided AL during each minute of the UT day, $N(AL)$. Evidently the pattern is for a station to rotate into the most probable region for encountering extreme negative H deviations some hours after LGM. Unusual, asymmetric peaks in frequency of AL provision by any station may be attributed to disturbances on only a few days of the month. Such unevenness due to a few isolated events should average out over the course of a year. Figure 5 shows the corresponding "total amplitude of most negative H variations." This is the cumulative amplitude of negative H observed by each station during those minutes when they were providing AL. Each scale division on the right side is -1000 gammas. Again, the comparison of cumulative amplitudes and $N(AL)$ curves can indicate the most probable time of occurrence of larger amplitude events.

For Figures 2-5 slightly elevated levels of the curve for any station during normally quiet hours indicate possible difficulty with the quiet-time level for some days of the month. This information will be used as a quality control check for the final derivations of AE(12) indices at a later date.

3. Tables of AE, A0, AU, and AL Indices

Table 1. AE Indices

MARCH		1976															VALUES ARE EXPRESSED IN GAMMAS									
UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	
01	348	314	337	330	408	156	142	124	102	062	100	416	304	159	226	331	201	164	104	070	141	247	194	174	215	
02	110	098	190	570	375	536	385	191	102	085	156	137	137	292	399	637	766	594	236	209	539	688	333	618	349	
03	513	599	391	517	493	390	442	412	225	143	291	245	568	136	109	086	116	815	478	162	364	568	435	618	380	
04	501	501	449	096	042	053	106	167	100	074	421	228	135	066	131	166	122	097	133	236	117	028	033	046	169	
05	032	053	177	216	238	230	259	138	133	327	370	216	184	139	169	147	328	142	209	149	290	358	674	161	222	
06	118	258	481	289	299	217	132	203	104	295	249	033	026	041	318	894	877	963	637	586	325	678	588	195	367	
07	468	727	414	208	214	155	260	108	230	175	603	391	357	154	165	935	851	722	256	186	307	670	373	241	382	
08	651	839	644	410	481	301	247	496	568	239	361	252	324	559	469	319	228	410	662	527	328	447	501	352	442	
09	122	074	346	775	277	421	349	437	151	104	210	358	672	624	647	716	424	587	817	489	337	412	740	580	445	
10	493	204	319	563	629	264	138	139	151	471	401	227	168	490	440	629	347	609	346	351	158	177	424	500	360	
11	519	463	518	356	151	144	118	162	124	079	124	246	277	488	408	182	120	691	543	178	134	356	619	559	314	
12	444	597	320	317	357	333	172	204	424	468	558	317	269	193	263	220	331	340	412	147	060	415	565	137	329	
13	234	670	453	085	035	170	255	298	198	141	136	134	129	128	364	247	085	045	085	183	560	341	237	168	224	
14	274	365	559	465	226	252	124	049	064	118	147	108	175	248	224	064	066	132	049	088	056	046	083	058	168	
15	160	117	104	208	332	329	268	166	338	189	161	168	163	398	505	578	542	106	031	044	049	157	222	201	231	
16	244	151	164	401	191	099	128	295	125	053	052	121	261	249	253	261	505	353	570	526	268	063	059	112	229	
17	462	422	274	206	313	237	314	432	240	248	450	154	128	174	357	246	202	074	080	444	230	153	562	459	301	
18	390	300	196	056	099	096	178	218	129	365	379	147	094	069	043	102	072	139	369	261	509	131	212	269	089	185
19	045	162	097	064	157	233	278	276	247	213	194	303	395	161	103	083	070	173	621	473	190	038	044	039	194	
20	028	046	084	096	059	120	126	272	306	211	080	195	279	325	316	153	042	060	055	033	089	034	024	027	128	
Q 21	039	030	040	038	056	041	056	149	092	081	048	058	206	406	237	133	038	124	080	038	023	017	018	023	086	
Q 22	018	026	025	025	023	033	058	064	035	051	068	081	068	041	022	020	039	035	023	018	010	012	013	010	034	
Q 23	013	017	022	030	027	034	034	071	032	049	111	039	113	096	028	022	035	163	367	186	067	145	249	157	088	
Q 24	083	216	146	121	042	044	035	093	084	041	034	029	050	038	040	039	018	039	060	042	018	009	010	015	056	
Q 25	015	015	028	022	023	031	082	175	091	056	052	067	045	048	042	036	033	023	027	025	028	016	027	040	044	
D 26	185	232	299	818	818	892	408	294	218	532	650	471	495	918	522	530	439	895	472	391	401	510	384	432	509	
D 27	409	585	433	298	517	331	294	135	084	030	089	091	109	644	308	056	187	480	808	579	522	528	469	687	361	
28	611	375	187	354	495	344	187	125	087	057	043	069	222	195	135	152	128	252	268	142	051	075	065	133	198	
29	177	508	565	499	461	495	427	357	319	093	125	102	052	044	035	060	065	037	043	092	041	040	044	039	197	
30	050	043	039	076	053	048	195	167	253	148	164	180	376	318	349	103	063	062	059	294	620	415	109	180	182	
31	352	345	159	071	091	088	156	112	083	089	118	122	141	150	205	086	162	143	281	245	032	022	024	057	139	
MEAN	262	302	273	277	257	230	205	211	175	171	224	184	223	258	253	266	242	306	300	247	209	254	271	229	243	
5Q MEAN	034	061	052	047	034	037	053	110	067	056	063	055	096	126	074	050	033	077	111	062	029	040	063	049	061	
D 0 MEAN	372	387	408	573	544	442	287	300	234	275	342	280	354	647	477	450	325	596	621	467	349	415	504	510	423	

Table 2. A0 Indices

MARCH		VALUES ARE EXPRESSED IN GAMMAS																							
		1976																							
UT		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01		-062	-101	-104	-003	-066	-014	013	001	033	004	-003	-052	-089	-022	-029	-100	-028	-037	009	007	-005	-068	-036	-032
02		-026	000	-026	-180	-101	-130	-049	047	016	-008	-017	-037	-009	-021	-053	-083	-124	-041	-019	024	-170	-202	-045	-185
03		-140	-243	-044	-111	-170	-091	-127	-103	-026	003	-064	-023	-150	019	012	015	011	-197	078	001	-061	-160	-093	-191
04		-165	-094	-101	008	013	-002	001	-013	004	006	-154	-068	-027	-002	-020	-010	-008	-001	-029	-072	-024	009	008	000
05		010	003	-037	-085	-065	-031	-040	003	011	-102	-102	-034	000	-001	-017	004	014	-007	-014	-012	-050	-061	-186	039
06		014	-028	-169	-052	-001	011	018	-006	021	-022	-054	015	008	009	-025	-276	-230	-169	-170	-172	-032	-252	-302	021
07		-114	-321	-082	025	-017	005	-033	018	-023	000	-145	-069	-065	008	004	-245	-226	-151	-042	000	-040	-210	-008	009
08	D	-279	-347	-313	-132	-122	-043	-007	-088	-117	-021	026	-012	-044	-101	-100	-091	-031	-087	-219	-122	-061	-073	-062	-084
09	D	019	029	-030	-234	-031	-058	-124	-171	-003	020	071	-042	-124	-192	-216	-164	-087	-148	-196	-103	-062	-088	-425	-321
10	D	-157	005	-031	-136	-219	-059	-001	018	005	-110	-108	-013	-012	-067	-081	-115	-043	-146	-082	-058	007	-011	-150	-136
11		-263	-250	-232	-167	-020	-012	-008	-035	-027	-005	009	-008	-047	-116	-067	-020	-004	-161	-170	-009	009	-083	-186	-193
12		-151	-153	-084	-067	-063	-049	-010	-022	-086	-053	-068	-054	-030	-024	-045	-007	-067	-085	-105	-043	005	-106	-184	016
13		-039	-233	-134	031	017	000	-025	-109	-056	-034	-026	-016	-008	003	-105	-050	007	003	-015	-019	-123	-053	003	033
14		-030	-117	-087	-115	-014	001	003	025	019	-028	-043	005	-021	008	004	016	-008	-029	-002	-014	-002	008	010	002
15		-027	-015	-008	-038	-070	-006	000	-033	-094	-023	-024	-009	-005	-104	-098	-054	-113	000	021	021	027	027	023	-046
16		-054	-021	-022	-055	-026	-001	002	-117	-039	010	000	-019	-033	-036	-036	-049	-148	-099	-153	-165	-056	017	013	-011
17		-156	-146	-057	-030	-062	-010	-090	-106	-017	-030	-034	002	016	-008	-099	-076	-056	-033	-106	-157	-035	-001	-138	-094
18		-081	-085	-013	003	-012	-006	-007	-041	-030	-058	-112	-035	-008	004	006	-023	-013	-004	-050	-154	-025	-034	-067	006
19		011	-023	-018	000	-028	-036	-058	-087	-074	-074	-054	-062	-118	-024	-012	000	-012	-050	-183	-157	-031	020	013	015
20		007	003	-009	-016	-002	-027	001	-100	-073	-026	-016	-044	-089	-084	-081	-005	007	001	002	012	-016	002	010	009
Q 21		014	008	008	004	-008	000	001	-026	-003	-024	003	-015	-067	-116	-076	-031	010	-036	-015	002	006	005	007	006
Q 22		002	000	001	003	004	008	-003	-007	005	004	-009	-026	-023	-010	000	003	007	007	003	006	009	008	008	006
Q 23		005	006	005	004	003	009	006	003	012	010	-040	-003	-041	-022	006	004	002	-024	-077	-032	008	005	-055	-039
Q 24		003	-027	-009	027	010	013	007	-002	-004	005	004	000	-013	-004	-003	-005	003	-003	-009	006	014	012	011	009
Q 25		007	007	003	004	008	006	000	-040	-008	008	006	010	-002	-002	-001	004	008	005	008	017	018	015	016	006
D 26		-041	-049	-089	-138	-347	-225	-075	-092	-061	-278	-313	-123	-060	-481	-340	-256	-309	-498	-178	-146	-150	-173	-143	-170
D 27		-135	-285	-123	-072	-166	-070	-062	-023	-028	-004	007	002	006	-238	-086	005	-013	-110	-262	-161	-139	-145	-137	-304
28		-262	-116	004	-061	-180	-057	-021	-001	-002	004	-012	008	-039	-033	-013	-040	-021	-053	-051	-033	-003	-001	-002	-025
29		-032	-200	-162	-089	-142	-160	-053	-089	-069	-007	-030	-028	000	-011	000	-007	-024	-005	-002	-013	-002	-002	000	-003
30		-001	-005	-002	-012	-004	-002	-019	-055	-105	-057	-044	-030	-063	-061	-050	-001	006	000	-003	-010	-197	-059	028	014
31		-092	-071	-002	-009	-036	-001	012	-015	-008	-023	-033	-034	-022	-002	-033	004	-045	-030	-077	-049	013	011	007	009
MEAN		-071	-093	-063	-055	-062	-033	-024	-041	-027	-029	-044	-026	-038	-056	-054	-053	-050	-071	-073	-052	-038	-053	-067	-052
5Q MEAN		006	-001	002	008	003	007	002	-016	000	001	-007	-007	-029	-031	-015	-005	006	-010	-018	-000	011	009	-003	-000
5D MEAN		-119	-129	-117	-142	-177	-091	-054	-071	-041	-079	-063	-038	-047	-216	-166	-124	-097	-198	-187	-118	-081	-098	-183	-199

Table 3. AU Indices

MARCH		1976										VALUES ARE EXPRESSED IN GAMMAS														
UT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	
01	111	055	064	161	137	064	084	063	085	035	046	155	062	057	083	065	071	045	062	043	065	054	060	054	074	
02	028	048	068	105	086	137	142	143	067	034	060	031	059	124	146	234	258	255	098	129	098	141	121	123	114	
03	116	056	150	147	075	103	093	102	085	075	081	099	133	087	067	059	070	209	160	082	120	123	123	117	106	
04	084	155	123	056	035	024	054	069	054	043	056	045	039	031	045	072	052	047	036	045	034	023	025	023	053	
05	026	029	051	022	053	083	089	072	077	060	082	073	091	067	067	078	178	063	089	062	094	117	150	120	079	
06	073	100	070	092	148	120	084	094	073	124	069	032	021	030	133	171	208	311	148	120	130	086	-008	119	109	
07	119	041	124	130	089	082	096	072	091	088	155	126	113	085	087	222	198	209	085	093	113	125	178	130	119	
08	045	071	008	072	117	107	115	159	166	098	207	114	117	178	134	067	082	117	111	140	102	150	187	112	116	
09	080	067	142	153	107	151	050	046	072	072	177	136	211	119	106	193	124	145	212	141	106	117	-055	-031	110	
10	089	107	127	144	095	072	067	088	081	125	092	099	071	177	138	198	129	157	090	117	086	076	061	113	108	
11	-004	-018	026	010	055	060	050	045	034	034	071	114	091	128	136	070	061	183	101	064	076	094	123	086	070	
12	071	145	074	091	115	117	076	080	125	180	210	104	104	071	085	102	097	084	100	045	035	100	097	085	100	
13	039	101	092	074	035	085	102	039	042	036	041	050	056	067	077	073	050	025	027	071	156	117	122	118	072	
14	106	064	191	116	098	128	065	050	051	031	029	059	065	132	117	048	024	036	022	029	025	032	052	032	067	
15	052	043	043	064	095	157	133	049	074	070	056	074	075	095	154	234	157	053	037	043	052	106	135	054	088	
16	067	053	059	145	069	047	066	030	022	037	027	040	096	088	089	080	104	077	131	097	077	048	043	044	068	
17	074	065	079	072	094	108	065	109	103	093	191	079	080	078	078	046	045	036	077	063	079	075	142	135	086	
18	112	064	084	032	037	041	081	067	034	124	077	038	038	039	028	027	022	035	055	100	039	071	067	051	057	
19	034	057	030	031	050	080	080	050	048	031	042	088	078	055	039	041	022	036	126	079	063	039	035	035	053	
20	021	026	032	031	027	033	065	035	079	078	023	052	050	078	076	071	028	032	030	029	028	020	023	024	041	
Q 21	034	024	028	023	019	019	030	048	042	016	028	013	035	086	042	035	030	025	024	021	018	014	016	018	029	
Q 22	011	013	014	016	016	024	025	023	023	030	024	013	010	009	010	014	026	025	015	016	014	015	015	011	017	
Q 23	013	015	016	020	017	026	023	032	028	035	014	016	015	025	021	016	020	057	106	060	042	078	068	038	033	
Q 24	045	080	063	088	031	035	025	044	037	026	022	014	011	014	016	013	012	015	020	027	023	017	016	017	030	
Q 25	015	015	017	015	020	022	042	047	037	037	033	044	019	021	020	022	025	017	022	030	032	023	030	037	027	
D 26	051	067	060	270	062	219	127	054	047	-012	011	112	187	-022	-087	008	-089	-050	057	048	049	081	048	044	056	
D 27	068	007	092	076	091	094	084	044	013	011	053	048	061	083	067	034	079	129	141	128	121	118	097	038	074	
28	043	071	098	115	066	114	071	060	041	033	008	043	071	064	054	035	042	072	072	037	021	036	030	040	056	
29	055	053	120	160	087	086	160	088	090	039	031	022	026	010	018	023	007	013	019	032	018	017	021	016	050	
30	023	016	017	025	022	021	078	027	020	016	037	059	124	097	123	050	038	030	025	137	111	147	083	104	060	
31	083	100	077	025	008	042	090	040	033	020	025	026	048	072	068	048	035	040	063	072	030	023	020	038	047	
MEAN	059	058	072	083	066	081	078	064	060	055	067	065	073	072	072	072	079	071	082	076	071	066	074	069	063	070
5Q MEAN	024	029	028	032	021	025	029	039	033	029	024	020	018	031	022	020	023	028	037	031	026	029	029	029	024	027
5D MEAN	067	064	086	143	094	129	089	078	076	059	108	102	129	107	072	100	065	100	122	115	093	108	068	055	092	

Table 4. AL Indices

		VALUES ARE EXPRESSED IN GAMMAS																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
MARCH		1976																								
UT																										
01	02	-237	-258	-272	-168	-270	-092	-057	-061	-017	-026	-053	-260	-241	-102	-142	-266	-129	-119	-042	-027	-075	-192	-134	-120	-140
		-081	-050	-122	-465	-289	-398	-242	-047	-035	-051	-095	-106	-078	-167	-252	-402	-507	-338	-137	-080	-440	-546	-212	-495	-235
		-397	-543	-240	-370	-417	-287	-348	-309	-139	-068	-210	-146	-134	-048	-041	-027	-046	-606	-317	-080	-244	-444	-311	-501	-274
		-416	-345	-326	-039	-007	-029	-051	-097	-046	-030	-365	-182	-095	-035	-085	-094	-069	-050	-096	-190	-083	-004	-008	-023	-115
		-005	-023	-126	-193	-184	-147	-170	-066	-055	-266	-288	-142	-092	-071	-102	-069	-149	-078	-120	-087	-195	-240	-524	-041	-143
06	07	-044	-158	-441	-197	-150	-097	-048	-108	-031	-170	-179	-001	-004	-011	-184	-723	-668	-651	-489	-466	-194	-592	-597	-075	-260
		-348	-695	-290	-078	-124	-072	-163	-035	-138	-087	-447	-265	-244	-069	-078	-713	-652	-512	-170	-093	-194	-545	-195	-110	-263
		-005	-767	-635	-337	-363	-194	-131	-337	-402	-141	-153	-138	-206	-381	-335	-251	-145	-292	-551	-386	-226	-296	-313	-240	-326
		-041	-007	-203	-622	-170	-269	-299	-390	-079	-031	-033	-222	-461	-504	-540	-523	-299	-442	-605	-347	-231	-295	-795	-641	-334
		-404	-096	-191	-418	-534	-191	-070	-050	-070	-346	-309	-127	-097	-313	-301	-431	-217	-452	-255	-234	-071	-100	-363	-386	-251
11	12	-523	-482	-492	-345	-096	-084	-068	-116	-090	-045	-053	-132	-186	-360	-272	-112	-071	-507	-442	-083	-057	-261	-496	-473	-244
		-373	-452	-245	-226	-242	-216	-096	-124	-299	-287	-348	-213	-165	-121	-177	-118	-233	-255	-311	-132	-024	-314	-467	-052	-229
		-157	-568	-361	-010	-000	-085	-153	-258	-155	-105	-095	-084	-073	-060	-287	-173	-035	-019	-057	-111	-404	-223	-115	-050	-152
		-167	-300	-368	-348	-128	-124	-058	-001	-012	-087	-117	-049	-109	-115	-107	-045	-042	-095	-026	-058	-030	-014	-031	-026	-101
		-108	-074	-061	-143	-237	-171	-134	-116	-263	-118	-105	-093	-087	-303	-351	-343	-384	-053	-005	-000	-002	-051	-087	-147	-143
16	17	-176	-097	-104	-256	-122	-051	-061	-265	-102	-016	-025	-080	-164	-161	-163	-180	-401	-276	-438	-429	-190	-014	-016	-068	-161
		-388	-357	-194	-133	-219	-128	-248	-322	-137	-154	-259	-074	-048	-095	-279	-199	-158	-103	-291	-380	-150	-078	-419	-324	-214
		-277	-236	-111	-024	-062	-055	-096	-150	-095	-240	-302	-109	-055	-030	-015	-074	-050	-044	-156	-409	-091	-140	-202	-037	-128
		-011	-104	-067	-032	-107	-153	-197	-225	-199	-181	-152	-214	-316	-105	-063	-041	-047	-137	-494	-394	-126	-001	-008	-004	-141
		-006	-019	-051	-064	-032	-087	-061	-236	-227	-132	-057	-142	-229	-247	-239	-081	-014	-028	-025	-004	-061	-014	-001	-003	-086
21	22	-004	-006	-011	-014	-036	-021	-026	-101	-049	-065	-020	-044	-171	-320	-195	-098	-008	-098	-056	-016	-005	-002	-001	-005	-057
		-006	-012	-011	-009	-006	-008	-032	-040	-011	-021	-044	-067	-058	-031	-011	-006	-012	-010	-007	-001	-004	-003	-001	-001	-016
		000	-001	-005	-010	-010	-007	-010	-039	-003	-014	-096	-022	-098	-070	-007	-006	-015	-105	-261	-125	-025	-066	-180	-118	-054
		-038	-136	-083	-033	-010	-008	-010	-049	-046	-015	-012	-014	-039	-023	-023	-025	-005	-023	-039	-014	-005	-008	-006	-001	-026
		000	000	-011	-006	-003	-008	-040	-128	-054	-018	-019	-022	-025	-026	-022	-013	-007	-006	-004	-004	-004	-007	-002	-003	-017
26	27	-133	-165	-239	-547	-756	-672	-280	-239	-171	-545	-638	-359	-308	-940	-609	-522	-528	-946	-414	-343	-351	-429	-335	-387	-452
		-340	-578	-340	-222	-425	-236	-210	-091	-070	-019	-036	-042	-048	-561	-240	-022	-107	-351	-667	-450	-401	-409	-372	-648	-287
		-568	-303	-089	-239	-428	-229	-115	-064	-046	-023	-034	-026	-151	-130	-081	-116	-005	-179	-195	-105	-029	-039	-035	-092	-142
		-121	-454	-444	-339	-373	-408	-267	-268	-228	-054	-093	-080	-026	-033	-016	-037	-057	-024	-024	-059	-022	-022	-023	-023	-146
		-026	-027	-022	-050	-030	-027	-116	-140	-232	-131	-127	-120	-252	-221	-225	-052	-024	-031	-033	-157	-508	-268	-025	-075	-122
31	MEAN	-268	-245	-081	-045	-082	-045	-065	-072	-050	-068	-093	-095	-093	-077	-136	-038	-126	-102	-218	-172	-002	-000	-004	-019	-092
		-202	-243	-200	-193	-191	-148	-127	-147	-115	-115	-157	-118	-150	-185	-180	-186	-171	-224	-224	-175	-142	-180	-202	-166	-172
		-010	-031	-024	-014	-013	-010	-024	-071	-033	-027	-038	-034	-078	-094	-052	-030	-009	-048	-073	-030	-003	-010	-034	-025	-034
		-305	-323	-322	-429	-450	-312	-198	-221	-158	-216	-234	-178	-224	-540	-405	-350	-259	-497	-498	-352	-256	-306	-436	-454	-330

4. Tables of Observatories Supplying Hourly AU and AL

Table 5. Observatories Supplying Hourly AU Based on Mean Values

MARCH		1976		AU = MAXIMUM DELTA H																							
UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	BW	BW	BW	BW	BW	BW	BW	BW	TI	BW	TI	DI	DI	DI	AI	LR	LR	AI	BW	NAS	LR	FC	BW	FC			
2	BW	BW	BW	BW	BW	BW	BW	BW	TI	BW	LR	DI	DI	AI	LR	AI	LR	LR	LR	NAS	FC	FC	FC	FC			
3	BW	BW	BW	BW	TI	TI	TI	TI	TI	LR	DI	DI	DI	DI	DI	DI	LR	LR	LR	NAS	FC	FC	FC	FC			
4	BW	BW	BW	FC	FC	BW	BW	BW	BW	BW	TI	DI	DI	DI	DI	DI	AI	NAS	LR	NAS	NAS	BW	BW	BW			
5	BW	BW	BW	BW	BW	BW	BW	BW	TI	DI	DI	TI	TI	DI	TI	AI	LR	NAS	LR	NAS	NAS	FC	FC	NAS			
6	NAS	FC	BW	BW	BW	BW	BW	BW	TI	DI	DI	NAS	3W	DI	AI	AI	LR	LR	LR	NAS	LR	FC	FC	FC			
7	FC	BW	BW	BW	BW	BW	BW	BW	TI	NAS	DI	DI	DI	TI	AI	AI	AI	LR	LR	NAS	NAS	FC	FC	FC			
D 8	BW	BW	BW	TI	BW	DI	AI	DI	DI	DI	DI	DI	DI	DI	DI	AI	LR	LR	NAS	NAS	NAS	FC	FC	FC			
D 9	BW	FC	BW	BW	DI	BW	TI	TI	BW	DI	DI	DI	DI	AI	AI	LR	LR	LR	LR	FC	NAS	FC	NAS	FC			
D10	FC	BW	BW	BW	BW	BW	BW	BW	TI	DI	TI	TI	DI	AI	AI	LR	LR	LR	NAS	NAS	BW	FC	FC	FC			
11	FC	FC	TI	TI	DI	TI	LR	TI	LR	LR	DI	DI	AI	DI	DI	DI	LR	LR	NAS	LR	NAS	FC	FC	FC			
12	BW	BW	BW	BW	BW	BW	BW	DI	DI	DI	DI	TI	AI	LR	DI	DI	LR	LR	NAS	LR	BW	FC	FC	NAS			
13	FC	BW	BW	FC	FC	BW	BW	BW	TI	TI	TI	DI	DI	DI	DI	DI	DI	LR	NAS	LR	NAS	NAS	NAS	NAS			
14	FC	BW	BW	BW	BW	BW	BW	BW	TI	TI	TI	DI	DI	DI	DI	DI	NAS	NAS	BW	LR	LR	NAS	NAS	NAS			
15	FC	FC	BW	BW	BW	BW	BW	TI	TI	TI	TI	TI	DI	AI	AI	AI	LR	BW	BW	LR	LR	FC	FC	FC			
16	FC	FC	BW	BW	BW	BW	BW	TI	TI	BW	DI	DI	DI	DI	DI	LR	LR	LR	NAS	NAS	NAS	BW	NAS	FC			
17	FC	BW	BW	FC	BW	BW	TI	DI	DI	DI	DI	DI	DI	AI	AI	LR	AI	AI	NAS	NAS	NAS	FC	FC	NAS			
18	FC	BW	FC	FC	BW	BW	BW	TI	DI	DI	DI	DI	DI	DI	FC	AI	AI	LR	NAS	NAS	NAS	NAS	FC	NAS			
19	FC	FC	FC	BW	BW	BW	BW	TI	DI	DI	DI	DI	DI	AI	AI	LR	LR	LR	NAS	NAS	NAS	DI	FC	LR			
20	FC	FC	FC	BW	BW	BW	BW	TI	BW	BW	TI	DI	DI	DI	AI	FC	FC	BW	BW	NAS	NAS	LR	NAS	FC			
Q21	NAS	FC	FC	FC	FC	BW	BW	BW	TI	BW	DI	DI	DI	DI	DI	DI	DI	LR	LR	NAS	NAS	BW	NAS	NAS			
Q22	DI	FC	FC	FC	BW	BW	BW	BW	TI	BW	DI	DI	DI	DI	FC	AI	AI	LR	NAS	NAS	NAS	FC	FC	FC			
Q23	FC	FC	FC	FC	BW	BW	BW	BW	TI	TI	TI	TI	TI	FC	FC	TI	LR	LR	AI	NAS	FC	NAS	FC	FC			
Q24	FC	FC	FC	FC	FC	BW	BW	BW	BW	BW	BW	DI	DI	AI	AI	DI	DI	LR	LR	NAS	NAS	DI	NAS	FC			
Q25	FC	BW	BW	FC	BW	BW	BW	BW	BW	BW	BW	BW	TI	TI	TI	TI	BW	DI	LR	AI	AI	LR	NAS	FC			
D26	FC	FC	BW	BW	TI	TI	DI	AI	FC	AI	AI	AI	AI	LR	LR	BW	LR	LR	NAS	NAS	FC	FC	FC	FC			
D27	BW	BW	BW	BW	BW	BW	TI	LR	NAS	DI	DI	DI	AI	DI	DI	DI	LR	LR	NAS	NAS	FC	FC	FC	BW			
28	BW	BW	FC	BW	BW	BW	BW	BW	TI	LR	NAS	DI	DI	DI	DI	AI	LR	LR	NAS	NAS	NAS	NAS	FC	NAS			
29	FC	BW	BW	BW	BW	DI	BW	TI	TI	TI	TI	TI	BW	DI	DI	DI	LR	AI	NAS	NAS	NAS	FC	NAS	FC			
30	FC	FC	FC	FC	FC	BW	BW	BW	TI	TI	TI	TI	TI	DI	DI	DI	BW	LR	LR	LR	FC	FC	FC	FC			
31	FC	BW	FC	BW	BW	BW	BW	TI	TI	TI	TI	TI	DI	DI	DI	DI	AI	AI	NAS	BW	FC	FC	FC	FC			
IDENTIFICATION	GEOGRAPHIC				GEOMAGNETIC				IDENTIFICATION				GEOGRAPHIC				GEOMAGNETIC										
			LAT			LONG		LAT			LONG						LAT			LONG		LAT		LONG			
* AI = ABISKO	68	21.5			18	49.4		66.0			114.9		* FC = FT.CHURCHILL	58	48.0		-94		06.0		68.7		322.8				
* BW = BARROW	71	18.2			-156	44.9		68.5			241.1		* LR = LEIRVOGUR	64	11.0		-21		42.0		70.2		71.0				
CC = C.CHELYUSKIN	77	43.0			104	17.0		66.2			176.4		* NAS= NARSARSSUAQ	61	06.0		-45		12.0		71.0		37.0				
CO = COLLEGE	64	51.6			-147	50.2		64.6			256.5		* TI = TIXIE BAY	71	35.0		129		00.0		60.4		191.4				
GWR= GREAT WHALE R.	55	16.0			-77	47.0		66.5			347.4		UE = CAPE WELLEN	66	09.8		-169		50.1		61.7		237.0				
* DI = DIXON ISLAND	73	32.6			80	33.7		63.0			161.5																

* The seven observatories providing data for this report. Remaining stations will be added as their records become available in time for processing.

Table 6. Observatories Supplying Hourly AL Based on Mean Values

MARCH			1976			AL = MINIMUM DELTA H																							
UT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
1	AI	AI	LR	LR	LR	LR	LR	FC	FC	FC	FC	BW	BW	FC	BW	BW	BW	BW	DI	DI	DI	AI	AI	AI	AI				
2	LR	LR	LR	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	BW	FC	FC	BW	BW	BW	DI	BW	DI	DI	AI	AI	AI	AI				
3	AI	AI	LR	LR	LR	LR	LR	FC	FC	BW	BW	FC	BW	BW	BW	FC	FC	TI	TI	TI	TI	AI	AI	AI	AI				
4	AI	AI	LR	LR	LR	NAS	FC	FC	FC	FC	BW	BW	BW	BW	TI	DI	DI	DI	DI	DI	DI	AI	AI	AI	AI				
5	AI	NAS	LR	NAS	NAS	NAS	FC	FC	NAS	FC	FC	FC	FC	BW	BW	BW	TI	TI	TI	DI	DI	TI	DI	AI	AI				
6	AI	LR	LR	LR	LR	NAS	NAS	FC	FC	BW	BW	AI	AI	FC	BW	BW	BW	TI	TI	TI	TI	AI	DI	AI	AI				
7	AI	AI	LR	LR	FC	NAS	NAS	NAS	BW	BW	BW	BW	BW	FC	DI	DI	BW	BW	TI	TI	TI	AI	AI	AI	AI				
8	AI	AI	AI	AI	LR	NAS	BW	NAS	BW	FC	BW	FC	FC	BW	BW	BW	TI	DI	DI	DI	AI	AI	AI	AI	AI				
9	AI	AI	NAS	LR	NAS	NAS	NAS	NAS	NAS	FC	FC	BW	BW	BW	BW	BW	DI	TI	TI	TI	AI	AI	DI	LR	AI				
D10	AI	AI	FC	LR	LR	NAS	NAS	NAS	NAS	BW	FC	FC	BW	FC	BW	DI	TI	TI	TI	AI	AI	DI	DI	DI	DI				
11	AI	AI	LR	LR	LR	NAS	FC	FC	FC	FC	FC	FC	FC	FC	BW	BW	DI	DI	DI	TI	TI	AI	AI	AI	AI				
12	AI	LR	LR	LR	LR	NAS	NAS	NAS	NAS	BW	BW	FC	FC	FC	BW	BW	DI	DI	DI	TI	AI	AI	AI	AI	AI				
13	LR	LR	LR	NAS	LR	NAS	NAS	FC	FC	FC	FC	FC	FC	BW	BW	BW	TI	DI	DI	DI	AI	AI	DI	DI	AI				
14	AI	LR	LR	LR	LR	FC	NAS	DI	NAS	FC	FC	FC	BW	BW	BW	TI	DI	DI	DI	DI	DI	DI	DI	AI	AI				
15	LR	LR	NAS	NAS	NAS	NAS	NAS	FC	BW	FC	BW	FC	FC	BW	BW	TI	TI	TI	FC	TI	DI	DI	AI	AI	AI				
16	AI	LR	LR	NAS	NAS	NAS	NAS	FC	FC	FC	FC	FC	FC	FC	BW	TI	TI	TI	TI	DI	DI	AI	AI	LR	LR				
17	AI	LR	LR	FC	NAS	NAS	NAS	BW	FC	FC	BW	FC	FC	BW	BW	BW	DI	DI	DI	DI	AI	AI	AI	AI	AI				
18	LR	LR	LR	NAS	NAS	NAS	FC	FC	FC	BW	FC	FC	BW	BW	LR	TI	TI	BW	DI	DI	DI	AI	AI	AI	AI				
19	TI	LR	NAS	NAS	NAS	NAS	FC	NAS	BW	BW	FC	FC	BW	BW	BW	DI	DI	DI	DI	DI	DI	TI	TI	TI	TI				
20	TI	LR	LR	NAS	NAS	NAS	NAS	FC	FC	FC	FC	BW	BW	BW	TI	BW	TI	DI	DI	DI	DI	DI	TI	TI	TI				
Q21	TI	TI	TI	NAS	NAS	NAS	NAS	FC	FC	FC	LR	FC	BW	BW	BW	TI	DI	DI	DI	DI	FC	FC	DI	DI	DI				
Q22	TI	TI	TI	TI	TI	DI	FC	FC	DI	FC	FC	BW	BW	BW	BW	FC	BW	FC	FC	FC	FC	DI	TI	TI	TI				
Q23	TI	TI	TI	TI	TI	NAS	DI	FC	DI	AI	FC	FC	BW	BW	NAS	NAS	BW	BW	BW	BW	DI	AI	LR	LR	AI				
Q24	LR	LR	NAS	NAS	TI	DI	DI	FC	FC	AI	AI	LR	BW	BW	NAS	BW	FC	DI	DI	DI	TI	TI	AI	AI	AI				
Q25	NAS	TI	NAS	TI	TI	DI	FC	FC	FC	AI	LR	LR	LR	LR	NAS	NAS	FC	FC	FC	FC	BW	TI	BW	TI	TI				
D26	LR	LR	LR	LR	LR	LR	LR	BW	LR	LR	LR	FC	DI	DI	DI	DI	BW	BW	FC	FC	TI	LR	AI	AI	AI				
D27	AI	LR	LR	LR	FC	NAS	NAS	NAS	BW	AI	FC	FC	FC	BW	BW	FC	BW	TI	DI	DI	AI	AI	AI	LR	LR				
28	LR	AI	LR	LR	LR	LR	NAS	FC	FC	FC	BW	FC	BW	BW	TI	BW	BW	BW	DI	DI	AI	AI	DI	LR	LR				
29	LR	LR	LR	LR	LR	FC	NAS	NAS	FC	FC	BW	FC	AI	BW	FC	TI	BW	TI	BW	DI	TI	TI	TI	TI	TI				
30	TI	TI	TI	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	BW	FC	FC	BW	BW	TI	TI	TI	TI	DI	TI	TI	AI	AI				
31	LR	LR	NAS	NAS	NAS	NAS	NAS	NAS	FC	FC	FC	BW	FC	BW	BW	BW	TI	TI	DI	DI	TI	TI	TI	AI	AI				
IDENTIFICATION			GEOGRAPHIC			GEOMAGNETIC			IDENTIFICATION			GEOGRAPHIC			GEOMAGNETIC														
* AI = ABISKO			LAT	LONG	LAT	LONG	* FC = FT.CHURCHILL			LAT	LONG	LAT	LONG	* FC = FT.CHURCHILL			LAT	LONG											
* BW = BARROW			68 21.5	18 49.4	66.0	114.9	* LR = LEIRVOGUR			58 48.0	-94 06.0	68.7	322.8	* LR = LEIRVOGUR			64 11.0	-21 42.0	70.2	71.0									
CC = C.CHELYUSKIN			71 18.2	-156 44.9	68.5	241.1	* NAS= NARSSARSUAQ			64 11.0	-45 12.0	71.0	37.0	* NAS= NARSSARSUAQ			61 06.0	-45 12.0	71.0	37.0									
CO = COLLEGE			77 43.0	104 17.0	66.2	176.4	* TI = TIXIE BAY			71 35.0	129 00.0	60.4	191.4	* TI = TIXIE BAY			71 35.0	129 00.0	60.4	191.4									
GWR= GREAT WHALE R.			64 51.6	-147 50.2	64.6	256.5	UE = CAPE WELLEN			66 03.8	-169 50.1	61.7	237.0	UE = CAPE WELLEN			66 03.8	-169 50.1	61.7	237.0									
DI = DIXON ISLAND			55 16.0	-77 47.0	66.5	347.4																							
			73 32.6	80 33.7	63.0	161.5																							

* AI = ABISKO
 * BW = BARROW
 CC = C.CHELYUSKIN
 CO = COLLEGE
 GWR = GREAT WHALE R.
 * DI = DIXON ISLAND

* The seven observatories providing data for this report. Remaining stations will be added as their records become available in time for processing.

5. Statistical Information

Table 7. Station Frequency of AU and AL Contribution.

		March 1976																							
STA		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AU- LR	24	0	0	33	21	38	111	99	246	190	36	45	56	137	192	353	713	<u>356</u>	732	393	333	210	73	136	
AL- LR	523	830	<u>1059</u>	718	636	241	109	10	31	55	119	139	96	36	101	29	13	8	4	0	9	71	194	443	
AU- NAS	174	7	1	3	4	0	0	3	61	144	76	36	48	10	7	45	186	309	565	<u>953</u>	655	372	399	343	
AL- NAS	85	207	337	677	763	<u>1274</u>	1042	722	420	80	53	4	63	98	99	142	37	5	6	2	9	12	6	8	
AU- FC	969	921	607	505	200	69	13	12	28	25	19	15	76	75	151	143	87	38	32	105	407	861	<u>1084</u>	1014	
AL- FC	1	38	58	109	181	167	464	877	915	<u>1005</u>	933	962	760	662	274	167	121	144	192	213	132	60	6	3	
AU- BW	630	838	1093	1127	1353	<u>1439</u>	1424	1035	833	551	312	210	75	40	61	168	192	246	285	214	300	279	202	313	
AL- BW	17	8	3	23	27	0	63	117	272	401	583	645	775	905	1035	<u>1044</u>	754	451	236	168	87	77	85	65	
AU- TI	1	18	50	98	68	131	167	431	383	509	<u>594</u>	566	387	180	157	40	23	22	3	0	0	0	4	0	
AL- TI	326	266	222	239	182	29	10	0	2	5	14	7	28	102	236	324	592	<u>627</u>	509	409	482	437	419	345	
AU- DI	62	76	109	89	174	151	119	241	268	389	725	918	<u>1039</u>	1012	743	674	308	81	28	32	35	101	92	50	
AL- DI	58	28	12	13	58	144	164	111	141	61	14	20	64	47	73	128	319	621	908	<u>950</u>	886	605	441	266	
AU- AI	0	0	0	5	40	32	26	39	41	52	98	70	179	406	<u>549</u>	437	351	308	215	163	130	17	6	4	
AL- AI	<u>850</u>	483	169	81	13	5	8	23	79	253	144	83	74	10	42	26	24	4	5	118	255	598	709	730	

Table 8. Monthly Quiet-Time H Reference Values.

Station	March 1976
LR	12334 gammas
NAS	11950
FC	7330
BW	9841
TI	7949
DI	6493
AI	11822

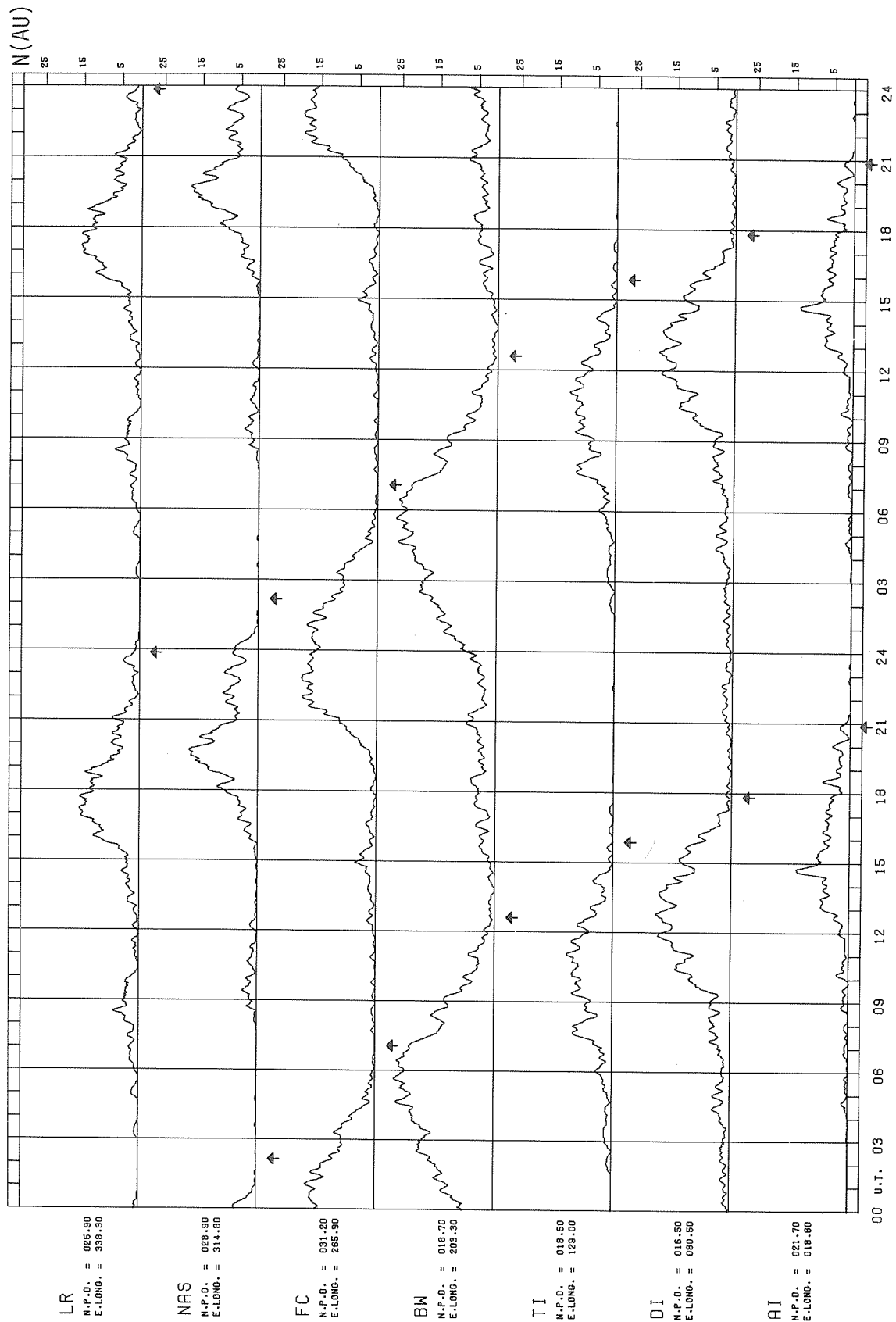


Fig. 2. Frequency of 1-min AU provision by station for March 1976.

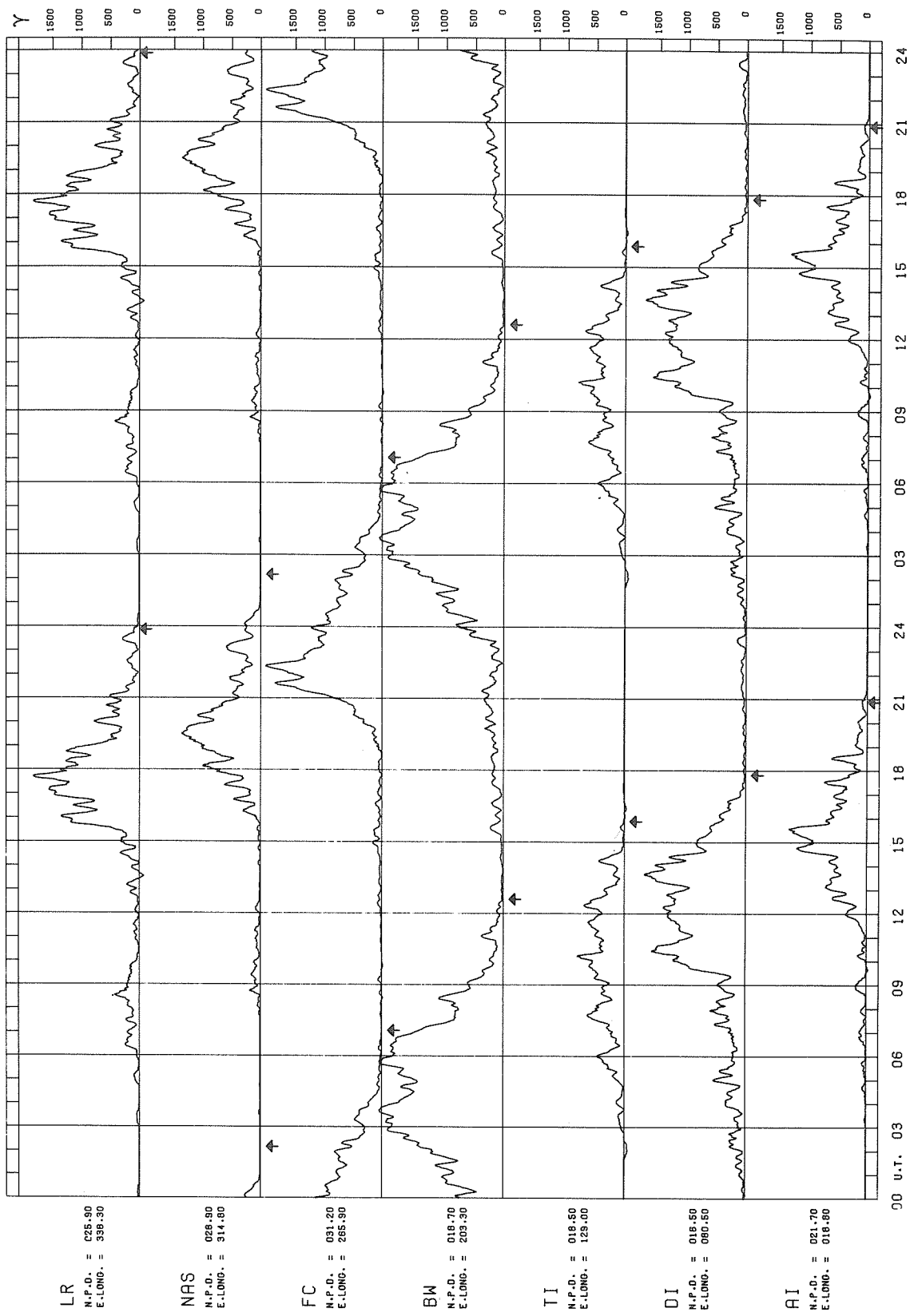


Fig. 3. Total amplitude of most positive H variations for March 1976.

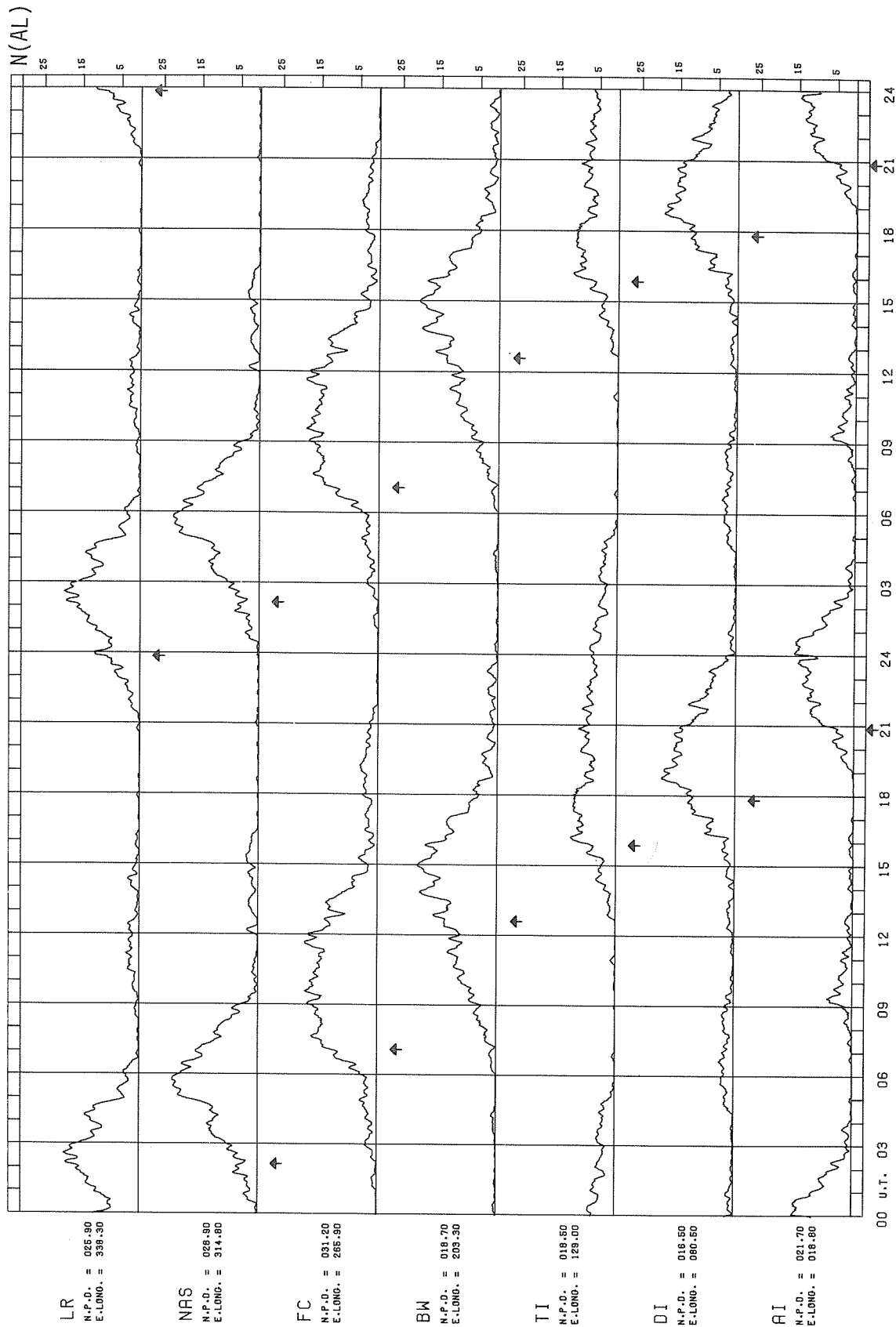


Fig. 4. Frequency of 1-min AL provision by station for March 1976.

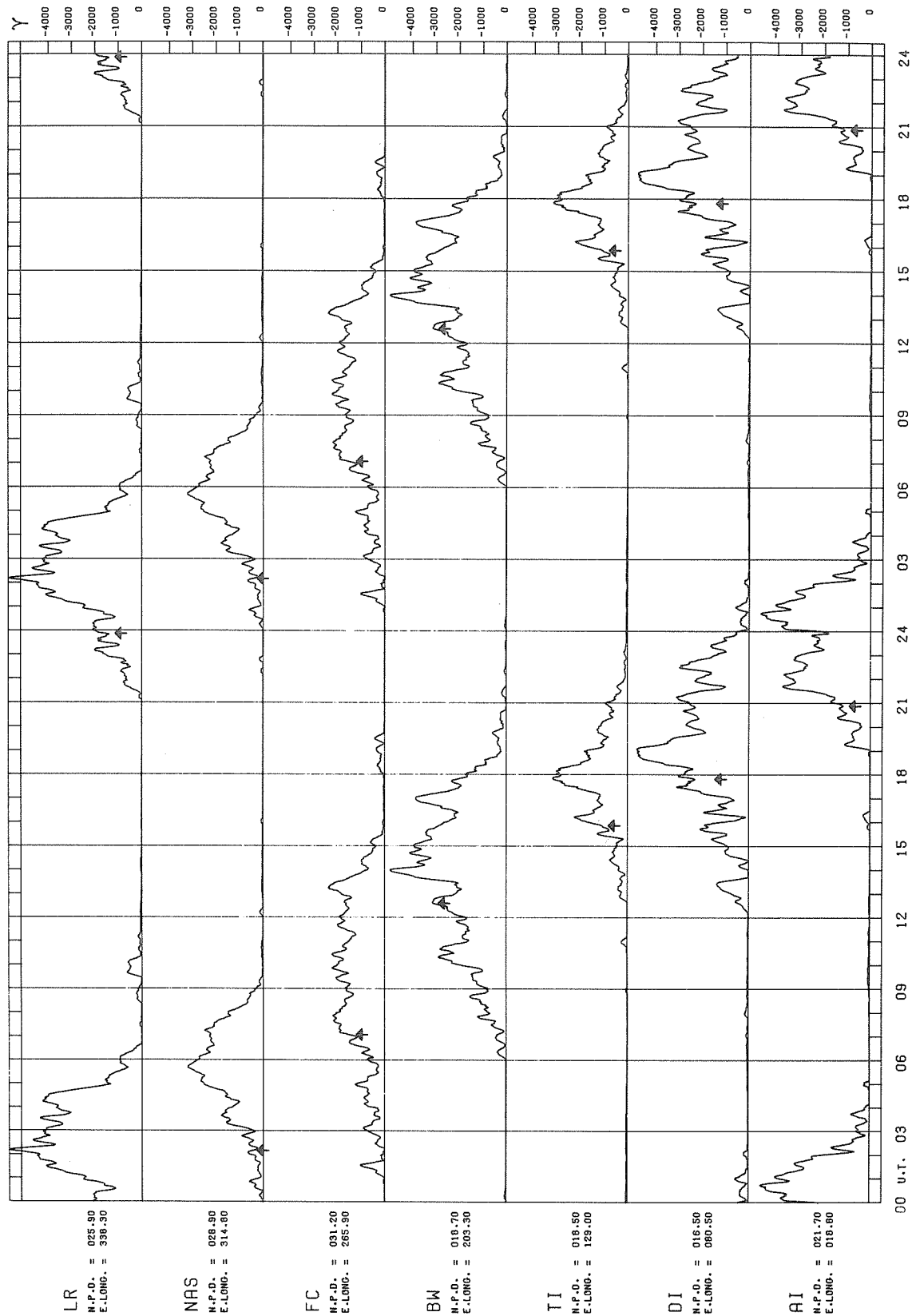


Fig. 5. Total amplitude of most negative H variations for March 1976.

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