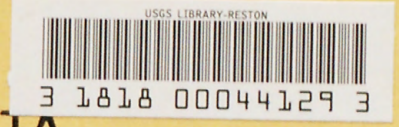


UNITED STATES DEPARTMENT OF THE INTERIOR

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no. 81-300A

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GEOLOGICAL SURVEY

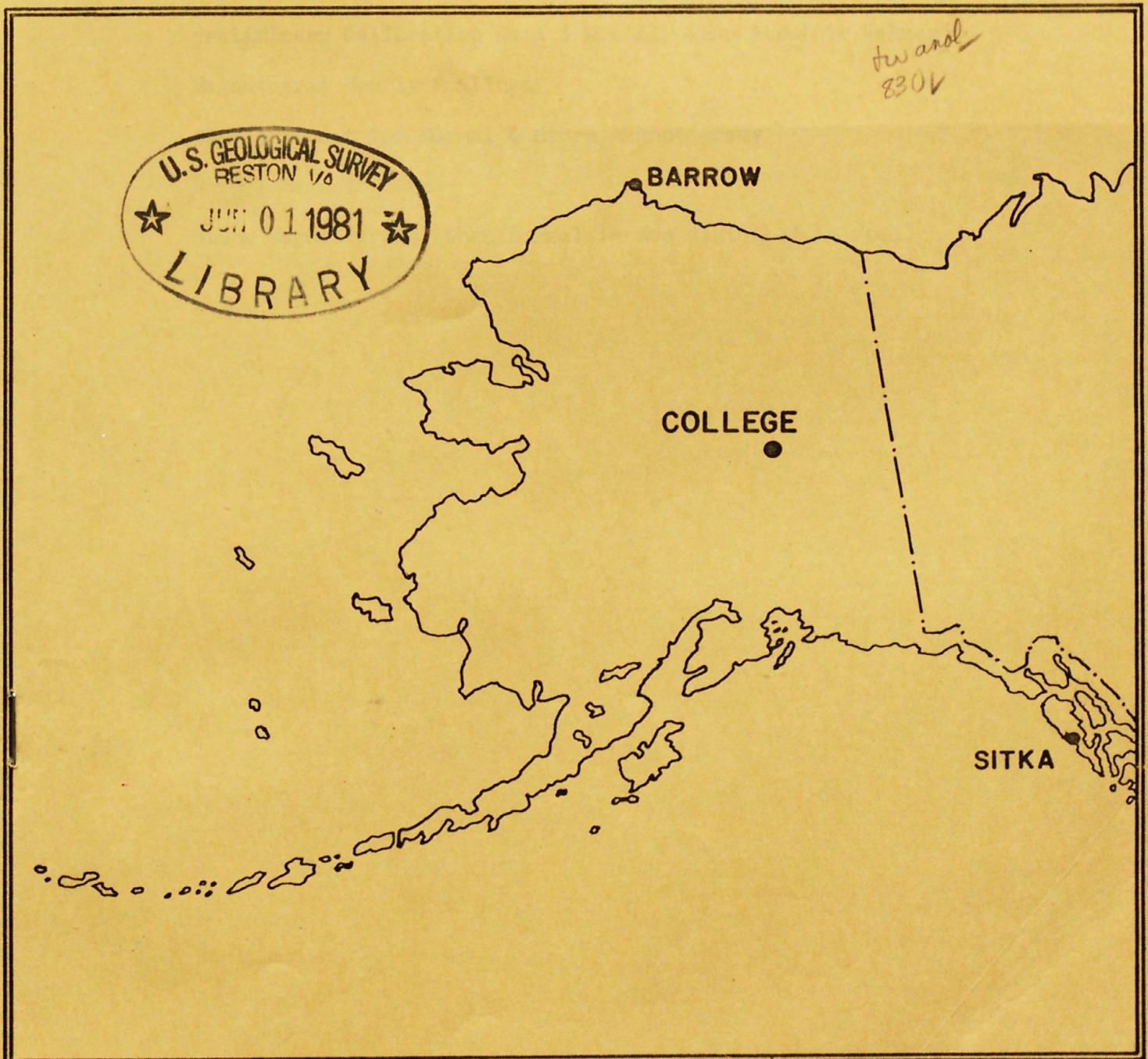


PRELIMINARY GEOMAGNETIC DATA  
COLLEGE OBSERVATORY  
FAIRBANKS, ALASKA

JANUARY 1981

OPEN FILE REPORT

81-300A







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THIS REPORT WAS PREPARED UNDER THE DIRECTION OF JOHN B. TOWNSHEND, CHIEF OF THE COLLEGE OBSERVATORY WITH THE ASSISTANCE OF OBSERVATORY STAFF MEMBERS J.E. PAPP, E.A. SAUTER, AND S.P. TILTON, AND IN COOPERATION WITH THE GEOPHYSICAL INSTITUTE OF THE UNIVERSITY OF ALASKA. THE COLLEGE OBSERVATORY IS A PART OF THE BRANCH OF ELECTROMAGNETISM AND GEOMAGNETISM OF THE U.S. GEOLOGICAL SURVEY.

COLLEGE OBSERVATORY PRELIMINARY GEOMAGNETIC DATA

INTRODUCTION

The preliminary geomagnetic data included here is made available to scientific personnel and organizations, as part of a cooperative effort and on a data exchange basis because of the early need by some users. To avoid delay, all of the data is copied from original forms processed at the observatory; therefore it should be regarded as preliminary. Inquiries about this report or about the College Observatory should be addressed to:

Chief, College Observatory  
U.S. Geological Survey  
Yukon Drive on West Ridge  
Fairbanks, Alaska 99701

Requests for copies of the magnetograms except for the current month should be addressed to:

World Data Center A-NOAA  
Environmental Data Service  
Boulder, Colorado 80302

OBSERVATORY LOCATION

The College Observatory, operated by the U. S. Geological Survey, is located at the University of Alaska, Fairbanks, Alaska. It is near the Auroral Zone and the northern limit of the world's greatest earthquake belt, the circum-Pacific seismic belt. Although the observatory's basic operation is in geomagnetism and seismology, it cooperates with other scientists and organizations in areas where the facility and personnel can be of service.

The observatory is one of three operated by the USGS in Alaska. The others are located at Barrow and Sitka.

The position of the observatory site is:  
Geographic latitude.....64°51.6'N  
Geographic longitude.....147°50.2'W  
Geomagnetic latitude.....+64.6°  
Geomagnetic longitude.....+256.5°  
Elevation.....200 meters

GEOMAGNETIC DATA

Normal, Storm, and Rapid Run magnetograms and appropriate calibration data are processed daily at the observatory and are available for analysis or copying. Also available are mean hourly scalings, K-Indices, selected magnetic phenomena reports, and on a real-time basis are recordings from a 3-component fluxgate magnetometer and F-component proton magnetometer.

Magnetic Activity

The K-Index. The K-Index is a logarithmic measurement of the range of the most disturbed component (D or H) of the geomagnetic field for eight intervals beginning 0000-0300, 0300-0600...2100-2400 UT. It is a measure of the difference between the highest and lowest deviation from a smooth curve to be expected for a component on a magnetically quiet day, within a three hour interval.

The Equivalent Daily Amplitude, AK. The K-Index is converted into an equivalent range, ak, which is near the center of the limiting gamma ranges for a given K. The average of the eight values is called equivalent daily amplitude AK. The unit 10γ has been chosen so as not to give the illusion of an accuracy not justified.

The schedule for converting gamma range to K, and K to ak is as follows:

| Gamma Range | K - Index | ak*       |
|-------------|-----------|-----------|
| 0 < 25      | 0         | 0         |
| 25 < 50     | 1         | 3         |
| 50 < 100    | 2         | 7         |
| 100 < 200   | 3         | 15        |
| 200 < 350   | 4         | 27        |
| 350 < 600   | 5         | 48        |
| 600 < 1000  | 6         | 80        |
| 1000 < 1650 | 7         | 140       |
| 1650 < 2500 | 8         | 240       |
| 2500+       | 9         | 400 (10γ) |

The Magnetic Daily Character Figure, C. To each Universal day a character is assigned on the basis C=0, if it is quiet; C=1 if it is moderately disturbed; C=2 if it is greatly disturbed. The method used to assign characters at the College Observatory is based on AK as follows:

| AK Range | C |
|----------|---|
| 0 ≈ 11   | 0 |
| 11 ≈ 50  | 1 |
| 50+      | 2 |

Routine assignment of C was discontinued at College on January 1, 1976.

Selected Phenomena & Outstanding Magnetic Effects

Prior to January 1, 1976, the Normal & Rapid Run records were reviewed at the observatory for selected magnetic phenomena and the events identified were forwarded to the IUGG Commission on Magnetic Variations and Disturbances. This was discontinued on January 1, 1976, but a report on Outstanding Magnetic Effects is prepared monthly for this report.

Principal Magnetic Storms

Gradual and sudden commencement magnetic disturbances with at least one K-Index of 5 or greater, which are believed to be part of a world-wide disturbance, are classified as principal magnetic storms. The time of the storm beginning and ending; direction and amplitude of sudden commencements; period of maximum activity; and storm range are reported. Monthly reports of these data are forwarded to the World Data Center A in Boulder, Colorado.

Magnetogram Hourly Scalings

Magnetogram hourly scalings are averages for successive periods of one hour for the D, H, and Z elements. The value in the column headed "01" is the average for the hour beginning 0000 and ending 0100. Note that the values on the scaling sheets are in tenths of mm with the decimal point omitted. The user of these scalings should keep in mind that the tabular values are hourly means and if he is interested in the detailed morphology of the magnetic field, he should refer directly to the magnetograms.

Magnetograms

The normal magnetograms in this report are reproduced at about one-third the size of the originals. Preliminary base-line values and scale values adopted for use with the original magnetograms are included. For days when the magnetic field is too disturbed for the Normal magnetogram to be readable, Storm magnetograms are reproduced.

Absolutes, Base-lines, and Scale Values

To determine the absolute value of the magnetic field from the hourly means or from point scalings the following equations should be used:

$D=B_D+d \cdot S_D$ ;  $H=B_H+h \cdot S_H$ ;  $Z=B_Z+z \cdot S_Z$   
where D, H, and Z are absolute values;  
 $B_D$ ,  $B_H$  and  $B_Z$  are base-line values;  
 $S_D$ ,  $S_H$  and  $S_Z$  are scale values;  
and d, h, and z are scalings in millimeters.

**MAGNETIC ACTIVITY**  
(Greenwich civil time, counted from midnight to midnight)

| DATE | K-INDICES |       |       |       |       |       |       |       |     | AK | TIME SCALE ON<br>MAGNETOGRAMS<br><br>20 mm/hr |
|------|-----------|-------|-------|-------|-------|-------|-------|-------|-----|----|---|
|      | 00-03     | 03-06 | 06-09 | 09-12 | 12-15 | 15-18 | 18-21 | 21-24 | SUM |    |   |
| 1    | 2         | 2     | 3     | 5     | 3     | 3     | 5     | 2     | 25  | 20 | SUDDEN COMMENCEMENTS<br>d h m                 |
| 2    | 0         | 1     | 1     | 3     | 3     | 5     | 2     | 1     | 16  | 12 |   |
| 3    | 3         | 2     | 3     | 1     | 2     | 3     | 2     | 1     | 17  | 09 |   |
| 4    | 3         | 3     | 2     | 4     | 1     | 3     | 2     | 2     | 20  | 12 |   |
| 5    | 1         | 1     | 2     | 2     | 4     | 3     | 2     | 2     | 17  | 10 |   |
| 6    | 1         | 0     | 1     | 2     | 5     | 3     | 2     | 1     | 15  | 11 |   |
| 7    | 2         | 2     | 1     | 0     | 2     | 2     | 0     | 1     | 10  | 04 |   |
| 8    | 1         | 1     | 2     | 1     | 5     | 4     | 3     | 2     | 19  | 14 |   |
| 9    | 2         | 1     | 0     | 0     | 2     | 1     | 1     | 0     | 07  | 03 |   |
| 10   | 0         | 0     | 0     | 2     | 3     | 2     | 2     | 2     | 11  | 05 |   |
| 11   | 3         | 3     | 4     | 5     | 5     | 6     | 2     | 2     | 30  | 31 |   |
| 12   | 1         | 0     | 1     | 1     | 0     | 0     | 0     | 0     | 03  | 01 |   |
| 13   | 0         | 0     | 1     | 2     | 4     | 2     | 2     | 0     | 11  | 06 |   |
| 14   | 0         | 1     | 3     | 4     | 5     | 1     | 0     | 0     | 14  | 12 |   |
| 15   | 0         | 0     | 2     | 3     | 4     | 2     | 2     | 1     | 14  | 08 |   |
| 16   | 1         | 2     | 3     | 6     | 4     | 2     | 1     | 1     | 20  | 18 |   |
| 17   | 1         | 0     | 2     | 2     | 6     | 3     | 1     | 1     | 16  | 15 |   |
| 18   | 0         | 0     | 0     | 1     | 0     | 0     | 0     | 0     | 01  | 00 |   |
| 19   | 0         | 0     | 0     | 1     | 1     | 1     | 0     | 0     | 03  | 01 |   |
| 20   | 0         | 0     | 0     | 1     | 1     | 0     | 0     | 0     | 02  | 01 |   |
| 21   | 0         | 0     | 0     | 1     | 0     | 0     | 0     | 0     | 01  | 00 |   |
| 22   | 0         | 0     | 0     | 3     | 5     | 4     | 2     | 1     | 15  | 13 |   |
| 23   | 0         | 0     | 0     | 5     | 6     | 4     | 1     | 1     | 17  | 20 |   |
| 24   | 0         | 0     | 4     | 5     | 5     | 2     | 1     | 1     | 18  | 17 |   |
| 25   | 0         | 0     | 0     | 0     | 4     | 3     | 1     | 1     | 09  | 06 |   |
| 26   | 0         | 0     | 3     | 5     | 6     | 1     | 1     | 0     | 16  | 19 |   |
| 27   | 1         | 1     | 2     | 5     | 6     | 0     | 1     | 1     | 17  | 18 |   |
| 28   | 2         | 4     | 4     | 3     | 5     | 3     | 2     | 2     | 25  | 19 |   |
| 29   | 2         | 3     | 4     | 4     | 5     | 5     | 2     | 0     | 25  | 22 |   |
| 30   | 1         | 0     | 1     | 1     | 2     | 2     | 2     | 1     | 10  | 04 |   |
| 31   | 2         | 5     | 4     | 6     | 3     | 3     | 3     | 2     | 28  | 27 |   |

POSSIBLE SOLAR-FLARE  
EFFECTS BASED ON  
INSPECTION OF GRAMS  
ALONE (WITHOUT  
REFERENCE TO DATA  
FROM OTHER SOURCES)

| BEGIN |   |   | END |   |   |
|-------|---|---|-----|---|---|
| d     | h | m | d   | h | m |

| K SCALE USED:              | D     | H     | Z |                  |
|----------------------------|-------|-------|---|------------------|
| LOWER LIMIT FOR K = 9..... | 683.8 | 321.7 |   | (mm)             |
| CURRENT SCALE VALUE.....   | 3.75  | 7.81  |   | (γ/mm)           |
| LOWER LIMIT FOR K = 9..... | 2560  | 2510  |   | (to nearest 10γ) |

SCALINGS AND COMPUTATIONS HAVE BEEN CHECKED.

APPROVED JOHN B. TOWNSHEND, CHIEF, COLLEGE OBSERVATORY  
OBSERVER IN CHARGE

OUTSTANDING MAGNETIC EFFECTS

OBSERVATORY  
COLLEGE, ALASKA

MONTH  
JANUARY

YEAR  
1981

| DATE | TIME<br>U.T. | NATURE OF<br>PHENOMENON <sup>1</sup> | REMARKS |
|------|--------------|--------------------------------------|---------|
| 09   | 15XX         | pc4                                  |         |
| 09   | 18XX         | pc5                                  |         |
| 12   | 11XX         | pi2                                  |         |
| 13/  | 08XX         | pi2                                  |         |

IDENTIFIED BY: JBT

VERIFIED BY: JEP

1. NATURE OF PHENOMENON: ssc, ssc\*, si, si\*, b, bp, bs, bps, pc1, pc2 - - - pc5, pg, pi 1, pi 2, sfe.

NOAA FORM 86-500  
(11/73)

PRINCIPAL MAGNETIC STORMS

WDC-A FOR SOLAR-TERRRESTRIAL PHYSICS  
ENVIRONMENTAL DATA SERVICE, NOAA  
BOULDER, COLORADO 80502 U.S.A.

Data from Individual Observatories: COLLEGE OBSERVATORY, COLLEGE, ALASKA  
JANUARY 1981

| Obs.<br>2 letter<br>IAGA<br>code | Geomag.<br>lat. | Commencement |                |      | SC - amplitudes |               |               | Max. 3 hr - index K |   |      | Ranges        |               |  | UT End<br>day hr |
|----------------------------------|-----------------|--------------|----------------|------|-----------------|---------------|---------------|---------------------|---|------|---------------|---------------|--|------------------|
|                                  |                 | day          | hr min<br>(UT) | type | D(')            | H( $\gamma$ ) | Z( $\gamma$ ) | day (3 hr - period) | K | D(') | H( $\gamma$ ) | Z( $\gamma$ ) |  |                  |
| CO                               | 64.6 N          |              |                |      |                 |               |               |                     |   |      |               |               |  |                  |

NO PRINCIPAL MAGNETIC STORMS TO REPORT DURING JANUARY 1981.

## NORMAL MAGNETOGRAPH

| COMPONENT | PERIOD            |                    | CALIBRATION |         |            |
|-----------|-------------------|--------------------|-------------|---------|------------|
|           | FROM              | TO                 | SCALE VALUE |         | BASELINE   |
| D         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 1.0/mm      | 3.78/mm | 27° 47.1 E |
|           |                   |                    |             |         |            |
|           |                   |                    |             |         |            |
| H         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 7.88/mm     |         | 127548     |
|           |                   |                    |             |         |            |
|           |                   |                    |             |         |            |
| Z         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 7.78/mm     |         | 551398     |
|           |                   |                    |             |         |            |
|           |                   |                    |             |         |            |

## STORM MAGNETOGRAPH

| COMPONENT | PERIOD            |                    | CALIBRATION |          |            |
|-----------|-------------------|--------------------|-------------|----------|------------|
|           | FROM              | TO                 | SCALE VALUE |          | BASELINE   |
| D         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 7.8/mm      | 29.78/mm | 23° 49.4 E |
|           |                   |                    |             |          |            |
|           |                   |                    |             |          |            |
| H         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 44.08/mm    |          | 115078     |
|           |                   |                    |             |          |            |
|           |                   |                    |             |          |            |
| Z         | 0000 U.T., 1-1-81 | 2400 U.T., 1-31-81 | 48.68/mm    |          | 540468     |
|           |                   |                    |             |          |            |
|           |                   |                    |             |          |            |

## RAPID RUN MAGNETOGRAPH

| COMPONENT | PERIOD |    | CALIBRATION |  |
|-----------|--------|----|-------------|--|
|           | FROM   | TO | SCALE VALUE |  |
| D         |        |    |             |  |
|           |        |    |             |  |
|           |        |    |             |  |
| H         |        |    |             |  |
|           |        |    |             |  |
|           |        |    |             |  |
| Z         |        |    |             |  |
|           |        |    |             |  |
|           |        |    |             |  |

## MONTHLY MEAN ABSOLUTE VALUES\*

| D          | H      | Z      |
|------------|--------|--------|
| 28° 06.0 E | 130018 | 553798 |

\* COMPUTED FROM TEN QUIETEST DAYS DURING MONTH.

DAYS USED: JAN 7, 9, 10, 12, 13, 18, 19, 20, 21, 30



MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Geologic Division  
Denver Federal Center  
DENVER, CO 80225ORSY. YEAR MONTH FILE-  
MENT  
CO 81 JAN DValues are in tenths of mm. and are averages for successive periods of one hour beginning at midnight, Hour 01 of local day (L50W M.T.) is hour 11 of the same universal day.  
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

| C                 | Q                  | S | Trn | Q | 01                                      | 02              | 03          | 04  | 05  | 06  | 07  | 08    | 09  | 10  | 11   | 12   | 13  | 14  | 15   | 16   | 17   | 18          | 19           | 20  | 21  | 22  | 23  | 24  | SUM |     |       |
|-------------------|--------------------|---|-----|---|---|-----------------|-------------|-----|-----|-----|-----|-------|-----|-----|------|------|---|---|------|--|------|-------------|--------------|-----|-----|-----|-----|-----|-----|-----|-------|
|                   |                    |   |     |   | 01                                      | 170             | 161         | 143 | 159 | 140 | 171 | 155   | 150 | 109 | 131* | 373  | 243   | 01  | 205  | 221  | 219  | 260         | 309          | 249 | 276 | 190 | 121 | 193 | 173 | 157 | 4678  |
|                   |                    |   |     |   | 02                                      | 163             | 167         | 170 | 162 | 156 | 161 | 145   | 184 | 175 | 170  | 252  | 202   | 02  | 217  | 232  | 271  | 273         | 390          | 257 | 289 | 235 | 214 | 218 | 200 | 160 | 5063  |
|                   |                    |   |     |   | 03                                      | 146             | 113         | 160 | 162 | 143 | 166 | 132   | 98  | 165 | 189  | 200  | 197   | 03  | 203  | 220  | 207  | 183         | 199          | 192 | 230 | 160 | 201 | 215 | 190 | 156 | 4327  |
|                   |                    |   |     |   | 04                                      | 155             | 105         | 133 | 115 | 105 | 130 | 158   | 189 | 170 | 246  | 189  | 184   | 04  | 201  | 212  | 207  | 211         | 192          | 213 | 220 | 219 | 182 | 158 | 159 | 161 | 4214  |
|                   |                    |   |     |   | 05                                      | 177             | 180         | 170 | 151 | 148 | 157 | 170   | 188 | 207 | 178  | 158  | 201   | 05  | 184  | 233  | 192  | 161         | 231          | 242 | 227 | 230 | 195 | 161 | 171 | 138 | 4450  |
|                   |                    |   |     |   | 06                                      | 136             | 169         | 160 | 167 | 180 | 183 | 184   | 200 | 184 | 188  | 188  | 202   | 06  | 162  | 313  | 213  | 240         | 240          | 171 | 249 | 240 | 231 | 179 | 158 | 151 | 4688  |
|                   |                    |   |     |   | 07                                      | 169             | 161         | 157 | 169 | 168 | 173 | 172   | 181 | 189 | 199  | 187  | 198   | 07  | 211  | 219  | 223  | 203         | 223          | 211 | 221 | 223 | 231 | 212 | 187 | 158 | 41645 |
|                   |                    |   |     |   | 08                                      | 149             | 161         | 159 | 151 | 149 | 168 | 184   | 161 | 180 | 203  | 182  | 198   | 08  | 257  | 281  | 210  | 241         | 243          | 247 | 197 | 224 | 218 | 201 | 186 | 191 | 4681  |
|                   |                    |   |     |   | 09                                      | 130             | 145         | 138 | 143 | 150 | 173 | 188   | 195 | 196 | 198  | 194  | 191   | 09  | 189  | 201  | 188  | 189         | 179          | 197 | 228 | 241 | 221 | 220 | 193 | 179 | 4466  |
|                   |                    |   |     |   | 10                                      | 167             | 163         | 168 | 170 | 181 | 176 | 179   | 189 | 189 | 190  | 189  | 191   | 10  | 190  | 190  | 223  | 219         | 210          | 211 | 238 | 236 | 173 | 126 | 181 | 123 | 4472  |
|                   |                    |   |     |   | 11                                      | 100             | 169         | 152 | 181 | 116 | 201 | 183   | 203 | 169 | 225  | 251  | 228   | 11  | 319  | 439  | 393* | 393*        | 257          | 221 | 240 | 219 | 163 | 161 | 153 | 163 | 5299  |
|                   |                    |   |     |   | 12                                      | 178             | 187         | 171 | 160 | 166 | 177 | 185   | 189 | 190 | 186  | 202  | 190   | 12  | 198  | 197  | 191  | 188         | 189          | 191 | 216 | 232 | 232 | 235 | 226 | 199 | 4677  |
|                   |                    |   |     |   | 13                                      | 180             | 180         | 170 | 166 | 175 | 168 | 180   | 181 | 190 | 180  | 190  | 179   | 13  | 209  | 336  | 293  | 233         | 169          | 183 | 231 | 200 | 220 | 209 | 191 | 193 | 4606  |
|                   |                    |   |     |   | 14                                      | 185             | 181         | 168 | 164 | 175 | 154 | 141   | 186 | 152 | 199  | 148  | 216   | 14  | 301  | 385*   | 222  | 160         | 194          | 210 | 220 | 225 | 229 | 230 | 214 | 183 | 4842  |
|                   |                    |   |     |   | 15                                      | 186             | 177         | 165 | 168 | 175 | 184 | 185   | 249 | 217 | 175  | 185  | 221   | 15  | 227  | 211  | 183  | 177         | 193          | 200 | 185 | 212 | 213 | 209 | 197 | 180 | 4674  |
|                   |                    |   |     |   | 16                                      | 174             | 162         | 140 | 148 | 154 | 143 | 170   | 173 | 278 | 180  | 210  | 234*  | 16  | 202  | 258  | 230  | 200         | 189          | 194 | 200 | 226 | 221 | 202 | 204 | 191 | 4683  |
|                   |                    |   |     |   | 17                                      | 185             | 174         | 169 | 169 | 171 | 179 | 179   | 178 | 194 | 169  | 211  | 186   | 17  | 236  | 198*   | 154  | 254         | 214          | 211 | 244 | 221 | 218 | 190 | 171 | 179 | 4654  |
|                   |                    |   |     |   | 18                                      | 184             | 169         | 167 | 168 | 169 | 178 | 178   | 180 | 181 | 188  | 199  | 190   | 18  | 190  | 195  | 190  | 198         | 204          | 229 | 229 | 229 | 219 | 217 | 209 | 199 | 4659  |
|                   |                    |   |     |   | 19                                      | 188             | 179         | 169 | 168 | 168 | 179 | 178   | 180 | 184 | 184  | 169  | 189   | 19  | 219  | 219  | 200  | 199         | 218          | 210 | 223 | 229 | 215 | 200 | 189 | 179 | 4635  |
|                   |                    |   |     |   | 20                                      | 178             | 156         | 155 | 150 | 160 | 169 | 179   | 179 | 188 | 176  | 195  | 189   | 20  | 199  | 189  | 168  | 187         | 201          | 211 | 209 | 228 | 220 | 220 | 214 | 198 | 4538  |
|                   |                    |   |     |   | 21                                      | 163             | 150         | 153 | 155 | 164 | 179 | 184   | 180 | 180 | 183  | 178  | 188   | 21  | 199  | 199  | 183  | 188         | 169          | 199 | 219 | 234 | 238 | 217 | 185 | 153 | 4460  |
|                   |                    |   |     |   | 22                                      | 152             | 168         | 169 | 180 | 179 | 184 | 179   | 179 | 183 | 178  | 169  | 214   | 22  | 255  | 239  | 407* | 305         | 277          | 232 | 201 | 199 | 223 | 214 | 187 | 175 | 5048  |
|                   |                    |   |     |   | 23                                      | 169             | 168         | 169 | 178 | 178 | 179 | 183   | 185 | 187 | 215  | 239  | 428   | 23  | 357  | 485  | 450  | 249         | 211          | 219 | 210 | 199 | 169 | 178 | 184 | 188 | 5577  |
|                   |                    |   |     |   | 24                                      | 178             | 171         | 178 | 173 | 178 | 169 | 174   | 157 | 156 | 153  | 153  | 170   | 24  | 191  | 305  | 225  | 187         | 199          | 228 | 232 | 252 | 212 | 188 | 195 | 188 | 4612  |
|                   |                    |   |     |   | 25                                      | 158             | 171         | 178 | 180 | 185 | 180 | 181   | 184 | 185 | 183  | 183  | 185   | 25  | 180  | 176  | 163  | 191         | 230          | 230 | 261 | 207 | 162 | 165 | 161 | 156 | 4435  |
|                   |                    |   |     |   | 26                                      | 160             | 175         | 175 | 177 | 179 | 175 | 175   | 168 | 204 | 131  | 191  | 129   | 26  | 324* | 266  | 185  | 177         | 211          | 240 | 260 | 256 | 228 | 206 | 183 | 153 | 4728  |
|                   |                    |   |     |   | 27                                      | 158             | 130         | 118 | 140 | 159 | 168 | 186   | 175 | 172 | 125  | 136  | 339   | 27  | 206* | 199  | 185  | 200         | 211          | 218 | 225 | 237 | 227 | 207 | 197 | 185 | 4503  |
|                   |                    |   |     |   | 28                                      | 153             | 141         | 102 | 83  | 67  | 44  | 95    | 89  | 216 | 124  | 175  | 178   | 28  | 230  | 218  | 277  | 269         | 280          | 220 | 230 | 252 | 248 | 138 | 69  | 110 | 4008  |
|                   |                    |   |     |   | 29                                      | 159             | 131         | 110 | 114 | 75  | 138 | 147   | 55  | 155 | 79*  | 166* | 140   | 29  | 206  | 340  | 269  | 363         | 219          | 249 | 291 | 254 | 238 | 209 | 183 | 179 | 4469  |
|                   |                    |   |     |   | 30                                      | 178             | 166         | 136 | 140 | 154 | 169 | 177   | 159 | 169 | 169  | 168  | 176   | 30  | 209  | 231  | 249  | 239         | 189          | 138 | 231 | 211 | 216 | 201 | 197 | 190 | 4462  |
|                   |                    |   |     |   | 31                                      | 162             | 157         | 144 | 129 | 106 | -7  | -107* | 202 | 202 | 186  | 400* | 336*  | 31  | 207  | 189  | 229  | 205         | 209          | 219 | 242 | 250 | 248 | 200 | 192 | 200 | 4500  |
| SCALED BY         | SPT, KKR, EAS, JEP |   |     |   | Preliminary base-line and scale values: |                 |             |     |     |     |     |       |     |     |      |      |   | <input type="checkbox"/> Interpolated<br><input type="checkbox"/> Significant portion of hour interpolated.<br><input type="checkbox"/> No records or no values available because of faulty record. |      | <input type="checkbox"/> Scaling uncertain because of magnetic storm.<br><input type="checkbox"/> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part. |      | MONTHLY SUM | 143953       |     |     |     |     |     |     |     |       |
| CHECKED BY        | JEP, SPT, EAS      |   |     |   | Interval Beginning                      | Base-line Value | Scale Value |     |     |     |     |       |     |     |      |      |   |   |      |  |      |             | MONTHLY MEAN | 193 |     |     |     |     |     |     |       |
| SIGNS REVIEWED BY | JEP                |   |     |   |   |                 |             |     |     |     |     |       |     |     |      |      |   |   |      | DATES WITH GAPS:   |      |             |              |     |     |     |     |     |     |     |       |
| PUNCHED BY        |                    |   |     |   |   |                 |             |     |     |     |     |       |     |     |      |      |   |   |      |  |      |             |              |     |     |     |     |     |     |     |       |
|                   |                    |   |     |   |   |                 |             |     |     |     |     |       |     |     |      |      | * Derived from <u>Geom</u> Mgh., converted to Normal Mgh. |   |      |  |      |             |              |     |     |     |     |     |     |     |       |

MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Geologic Division  
Denver Federal Center  
DENVER, CO 80225OBSV. YEAR MONTH ELE-  
MENT  
20 81 JAN II\* Values are in tenths of mm. and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1508 M.T.) is hour 11 of the 58190 universal day.  
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

| C                 | Q or S             | Ten Q | HR                                      | 01              | 02          | 03  | 04  | 05  | 06  | 07  | 08  | 09  | 10   | 11    | 12   | HR   | 13    | 14   | 15           | 16          | 17     | 18  | 19  | 20  | 21  | 22  | 23  | 24  | SUM  |
|-------------------|--------------------|-------|---|-----------------|-------------|-----|-----|-----|-----|-----|-----|-----|------|-------|------|--|-------|--|--------------|-------------|--------|-----|-----|-----|-----|-----|-----|-----|------|
|                   |                    |       | 01                                      | 333             | 329         | 364 | 379 | 367 | 350 | 367 | 436 | 494 | 358* | 2     | 303  | 01   | 354   | 300  | 307          | 194         | 178    | 197 | 76  | 286 | 331 | 311 | 318 | 313 | 7247 |
|                   |                    |       | 02                                      | 317             | 325         | 324 | 321 | 330 | 340 | 352 | 346 | 350 | 373  | 372   | 330  | 02   | 319   | 280  | 252          | 230         | -151   | 210 | 296 | 340 | 340 | 339 | 319 | 298 | 7152 |
|                   |                    |       | 03                                      | 295             | 370         | 312 | 325 | 354 | 355 | 410 | 480 | 385 | 340  | 317   | 318  | 03   | 303   | 289  | 308          | 307         | 304    | 346 | 320 | 307 | 295 | 310 | 310 | 301 | 7961 |
|                   |                    |       | 04                                      | 277             | 363         | 375 | 360 | 393 | 451 | 420 | 370 | 380 | 426  | 318   | 340  | 04   | 320   | 310  | 310          | 308         | 300    | 343 | 322 | 310 | 275 | 317 | 320 | 315 | 8223 |
|                   |                    |       | 05                                      | 321             | 328         | 332 | 329 | 327 | 339 | 350 | 350 | 358 | 365  | 345   | 320  | 05   | 323   | 300  | 147          | 255         | 305    | 328 | 320 | 299 | 289 | 265 | 307 | 320 | 7522 |
|                   |                    |       | 06                                      | 312             | 312         | 310 | 330 | 330 | 333 | 330 | 331 | 338 | 323  | 320   | 306  | 06   | 199   | 1  | 257          | 327         | 268    | 308 | 319 | 316 | 300 | 291 | 311 | 323 | 7095 |
|                   |                    |       | 07                                      | 313             | 327         | 339 | 326 | 361 | 360 | 349 | 350 | 340 | 329  | 321   | 321  | 07   | 320   | 309  | 269          | 310         | 327    | 333 | 330 | 321 | 316 | 300 | 301 | 300 | 7772 |
|                   |                    |       | 08                                      | 310             | 323         | 333 | 350 | 359 | 341 | 340 | 361 | 369 | 339  | 331   | 323  | 08   | 159   | 79   | 363          | 320         | 254    | 101 | 313 | 339 | 321 | 321 | 291 | 269 | 7209 |
|                   |                    |       | 09                                      | 304             | 334         | 339 | 344 | 350 | 350 | 339 | 331 | 329 | 320  | 317   | 319  | 09   | 324   | 305  | 267          | 294         | 333    | 346 | 331 | 323 | 317 | 309 | 300 | 306 | 7731 |
|                   |                    |       | 10                                      | 311             | 320         | 331 | 339 | 337 | 339 | 340 | 337 | 330 | 332  | 333   | 316  | 10   | 239   | 261  | 319          | 337         | 349    | 360 | 352 | 349 | 317 | 303 | 295 | 268 | 7714 |
|                   |                    |       | 11                                      | 324             | 331         | 371 | 439 | 456 | 349 | 353 | 389 | 291 | 239  | 77    | 95   | 11   | 71    | -98  | -217*        | -358*       | 206    | 341 | 313 | 301 | 300 | 281 | 279 | 295 | 5431 |
|                   |                    |       | 12                                      | 326             | 321         | 320 | 329 | 330 | 336 | 331 | 337 | 330 | 311  | 309   | 299  | 12   | 300   | 311  | 314          | 315         | 313    | 320 | 320 | 316 | 310 | 314 | 305 | 293 | 7610 |
|                   |                    |       | 13                                      | 300             | 307         | 307 | 311 | 313 | 305 | 325 | 327 | 325 | 308  | 320   | 300  | 13   | 239   | 32   | 155          | 261         | 301    | 284 | 316 | 314 | 315 | 318 | 309 | 298 | 6890 |
|                   |                    |       | 14                                      | 301             | 299         | 306 | 321 | 338 | 339 | 367 | 393 | 397 | 371  | 370   | 256  | 14   | -84   | -106   | 222          | 356         | 339    | 339 | 335 | 329 | 320 | 315 | 311 | 310 | 7044 |
|                   |                    |       | 15                                      | 307             | 300         | 309 | 320 | 320 | 325 | 315 | 339 | 365 | 347  | 310   | 261  | 15   | 174   | 240  | 308          | 324         | 318    | 268 | 311 | 326 | 311 | 315 | 307 | 291 | 7311 |
|                   |                    |       | 16                                      | 307             | 320         | 308 | 308 | 333 | 332 | 330 | 379 | 415 | 366  | 284   | -132 | 16   | 133   | 258  | 296          | 306         | 328    | 319 | 318 | 329 | 321 | 310 | 306 | 300 | 7074 |
|                   |                    |       | 17                                      | 308             | 307         | 308 | 304 | 314 | 317 | 325 | 328 | 329 | 341  | 336   | 328  | 17   | 248   | -270*  | 75           | 289         | 308    | 307 | 319 | 228 | 320 | 296 | 290 | 288 | 6643 |
|                   |                    |       | 18                                      | 298             | 308         | 316 | 313 | 320 | 319 | 330 | 334 | 329 | 326  | 316   | 316  | 18   | 316   | 316  | 319          | 319         | 319    | 318 | 318 | 317 | 310 | 300 | 292 | 292 | 7561 |
|                   |                    |       | 19                                      | 300             | 309         | 312 | 319 | 320 | 320 | 327 | 329 | 330 | 328  | 329   | 331  | 19   | 321   | 310  | 299          | 308         | 316    | 329 | 328 | 320 | 315 | 310 | 308 | 299 | 7617 |
|                   |                    |       | 20                                      | 300             | 300         | 310 | 319 | 323 | 326 | 328 | 339 | 331 | 326  | 329   | 319  | 20   | 320   | 329  | 326          | 320         | 320    | 319 | 316 | 313 | 319 | 304 | 294 | 296 | 7626 |
|                   |                    |       | 21                                      | 302             | 301         | 316 | 318 | 320 | 328 | 326 | 323 | 320 | 319  | 319   | 316  | 21   | 325   | 329  | 330          | 329         | 329    | 333 | 333 | 337 | 320 | 311 | 307 | 309 | 7700 |
|                   |                    |       | 22                                      | 316             | 319         | 328 | 329 | 335 | 329 | 335 | 337 | 337 | 338  | 354   | 323  | 22   | 277   | 251  | -87*         | 259         | 333    | 303 | 320 | 336 | 330 | 323 | 302 | 301 | 7228 |
|                   |                    |       | 23                                      | 304             | 309         | 319 | 322 | 327 | 323 | 314 | 310 | 305 | 297  | 160   | 2    | 23   | 62    | -307*  | -58          | 268         | 368    | 349 | 344 | 338 | 311 | 317 | 318 | 309 | 5911 |
|                   |                    |       | 24                                      | 306             | 310         | 318 | 320 | 328 | 321 | 323 | 383 | 367 | 356  | 286   | 135  | 24   | 221   | 42   | 225          | 334         | 319    | 329 | 345 | 338 | 308 | 298 | 300 | 298 | 7110 |
|                   |                    |       | 25                                      | 301             | 305         | 315 | 322 | 326 | 329 | 330 | 321 | 320 | 323  | 320   | 319  | 25   | 320   | 283  | 151          | 240         | 333    | 350 | 336 | 303 | 292 | 302 | 300 | 306 | 7347 |
|                   |                    |       | 26                                      | 302             | 304         | 312 | 320 | 321 | 329 | 330 | 341 | 397 | 394  | 310   | 165  | 26   | -234* | 146  | 361          | 353         | 332    | 338 | 336 | 320 | 305 | 295 | 296 | 295 | 6968 |
|                   |                    |       | 27                                      | 285             | 289         | 301 | 311 | 328 | 340 | 335 | 339 | 349 | 355  | 343   | 191  | 27   | -127* | 281  | 358          | 338         | 322    | 323 | 319 | 312 | 309 | 303 | 299 | 297 | 7100 |
|                   |                    |       | 28                                      | 280             | 299         | 339 | 340 | 393 | 500 | 548 | 530 | 421 | 326  | 355   | 317  | 28   | 124   | 115  | 241          | 269         | 290    | 340 | 336 | 314 | 299 | 250 | 270 | 290 | 7786 |
|                   |                    |       | 29                                      | 292             | 310         | 330 | 410 | 423 | 372 | 344 | 520 | 536 | 413  | 402   | 370  | 29   | 266   | -42  | 196          | 149         | 356    | 350 | 328 | 319 | 309 | 310 | 309 | 309 | 7901 |
|                   |                    |       | 30                                      | 305             | 309         | 326 | 329 | 339 | 339 | 339 | 359 | 350 | 349  | 348   | 325  | 30   | 300   | 289  | 285          | 278         | 328    | 323 | 318 | 330 | 320 | 320 | 312 | 300 | 7723 |
|                   |                    |       | 31                                      | 298             | 301         | 332 | 313 | 556 | 768 | 688 | 508 | 434 | 373  | -308* | -89* | 31   | 308   | 367  | 315          | 317         | 320    | 299 | 302 | 318 | 251 | 289 | 296 | 289 | 7845 |
| SCALED BY         | SPT, KKR, EAS, JEP |       | Preliminary base-line and scale values: |                 |             |     |     |     |     |     |     |     |      |       |      | <input type="checkbox"/> Interpolated<br><input type="checkbox"/> Significant portion of hour interpolated.<br><input type="checkbox"/> No records; or no values available because of faulty record. |       | <input type="checkbox"/> Scaling uncertain because of magnetic storm.<br><input type="checkbox"/> Record off sheet for part or all of hour; if value is given, curve was estimated for missing part. |              | MONTHLY SUM | 227052 |     |     |     |     |     |     |     |      |
| CHECKED BY        | JEP, SPT, EAS      |       | Interval Beginning                      | Base-line Value | Scale Value |     |     |     |     |     |     |     |      |       |      |  |       |  | MONTHLY MEAN | 305         |        |     |     |     |     |     |     |     |      |
| SIGNS REVIEWED BY | JEP                |       |   |                 |             |     |     |     |     |     |     |     |      |       |      | DATES WITH GAPS:   |       |  |              |             |        |     |     |     |     |     |     |     |      |
| PUNCHED BY        |                    |       |   |                 |             |     |     |     |     |     |     |     |      |       |      |  |       |  |              |             |        |     |     |     |     |     |     |     |      |

\* Derived from 610 Mph., converted to Normal Mph.

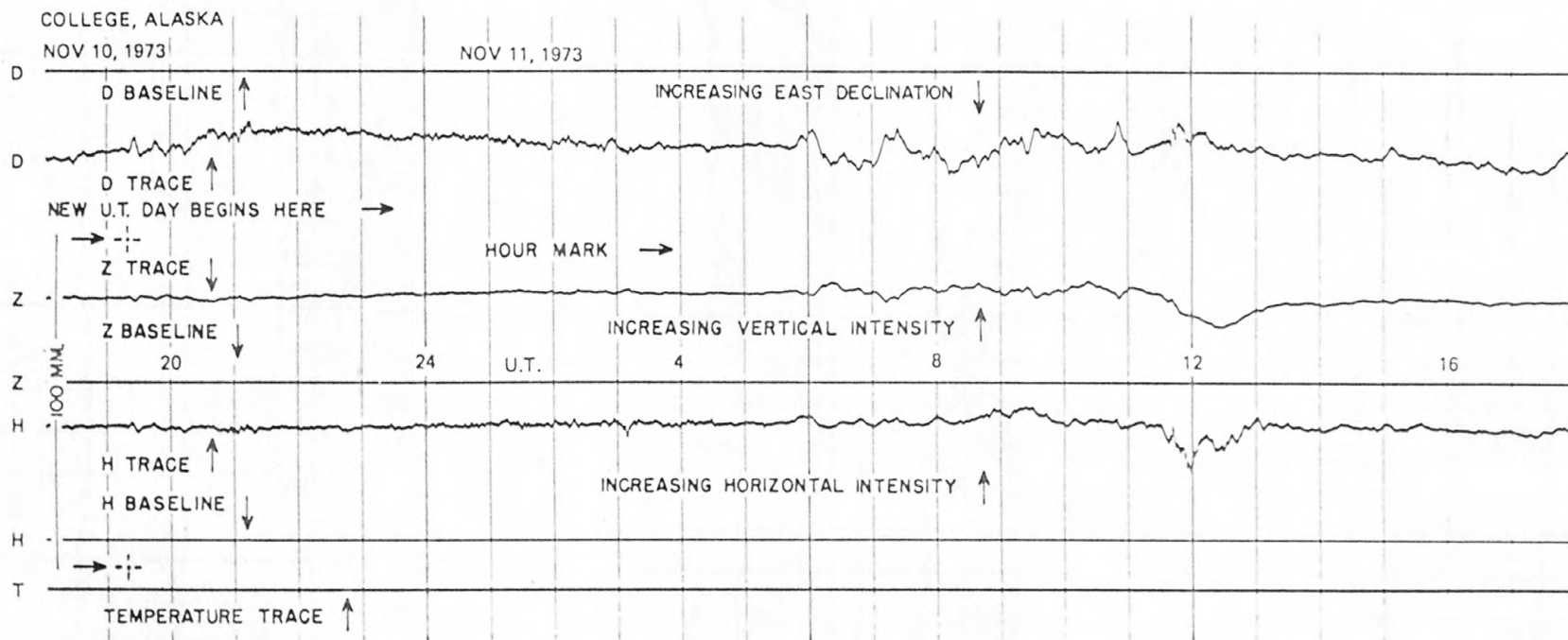


MAGNETOGRAM HOURLY SCALINGS  
(UNIVERSAL TIME)U.S. DEPARTMENT OF INTERIOR  
Geological Survey, Seismologic Division  
Denver Federal Center  
DENVER, CO 80235OBSY. YEAR MONTH FILE-  
MENT  
CO 81 JAN 7Values are in tenths of mm, and are averages for successive periods of one hour beginning at midnight. Hour 01 of local day (1500W M.T.) is hour 11 of the 6000 universal day.  
Shrinkage corrections have been applied. Negative values are in red, with minus signs shown.

| C                 | Q <sub>m</sub>     | Q <sub>s</sub> | Q <sub>o</sub> | 01                                      | 02              | 03          | 04  | 05  | 06  | 07  | 08  | 09  | 10  | 11   | 12  | 13  | 14 | 15  | 16  | 17   | 18   | 19  | 20  | 21          | 22     | 23  | 24           | SUM |     |                  |  |
|-------------------|--------------------|----------------|----------------|---|-----------------|-------------|-----|-----|-----|-----|-----|-----|-----|------|-----|---|----|-----|-----|--|------|-----|-----|-------------|--------|-----|--------------|-----|-----|------------------|--|
|                   |                    |                |                | 01                                      | 328             | 332         | 340 | 348 | 329 | 323 | 325 | 355 | 367 | 176* | 323 | 265   | 01 | 300 | 307 | 300  | 260  | 211 | 203 | 213         | 252    | 284 | 298          | 298 | 317 | 7054             |  |
|                   |                    |                |                | 02                                      | 330             | 330         | 328 | 325 | 330 | 335 | 350 | 350 | 338 | 343  | 321 | 328   | 02 | 338 | 317 | 276  | 281  | 310 | 196 | 200         | 256    | 290 | 306          | 312 | 318 | 7408             |  |
|                   |                    |                |                | 03                                      | 335             | 345         | 362 | 338 | 335 | 345 | 332 | 334 | 375 | 355  | 338 | 338   | 03 | 330 | 300 | 300  | 310  | 299 | 335 | 340         | 341    | 311 | 314          | 312 | 318 | 7942             |  |
|                   |                    |                |                | 04                                      | 325             | 343         | 368 | 350 | 360 | 353 | 350 | 363 | 332 | 265  | 253 | 343   | 04 | 332 | 323 | 315  | 305  | 293 | 310 | 316         | 293    | 290 | 285          | 307 | 318 | 7692             |  |
|                   |                    |                |                | 05                                      | 320             | 323         | 323 | 325 | 338 | 342 | 340 | 330 | 338 | 330  | 337 | 331   | 05 | 304 | 310 | 238  | 211  | 273 | 290 | 308         | 325    | 305 | 274          | 285 | 311 | 7391             |  |
|                   |                    |                |                | 06                                      | 325             | 329         | 320 | 327 | 330 | 329 | 325 | 327 | 320 | 316  | 312 | 310   | 06 | 230 | 133 | 122  | 263  | 249 | 270 | 290         | 287    | 297 | 281          | 271 | 306 | 6859             |  |
|                   |                    |                |                | 07                                      | 334             | 340         | 339 | 329 | 333 | 336 | 343 | 347 | 340 | 321  | 317 | 312   | 07 | 313 | 289 | 231  | 234  | 297 | 309 | 323         | 324    | 320 | 314          | 310 | 313 | 7568             |  |
|                   |                    |                |                | 08                                      | 319             | 323         | 327 | 337 | 337 | 340 | 337 | 356 | 360 | 344  | 330 | 327   | 08 | 319 | 264 | 249  | 309  | 281 | 217 | 219         | 230    | 303 | 313          | 318 | 304 | 7423             |  |
|                   |                    |                |                | 09                                      | 324             | 339         | 345 | 347 | 350 | 339 | 330 | 323 | 320 | 319  | 310 | 309   | 09 | 313 | 310 | 261  | 251  | 291 | 321 | 330         | 329    | 319 | 321          | 321 | 321 | 7643             |  |
|                   |                    |                |                | 10                                      | 324             | 321         | 320 | 323 | 320 | 320 | 320 | 328 | 327 | 326  | 327 | 320   | 10 | 230 | 200 | 239  | 260  | 286 | 306 | 293         | 301    | 302 | 291          | 311 | 311 | 7206             |  |
|                   |                    |                |                | 11                                      | 327             | 353         | 350 | 409 | 447 | 401 | 359 | 381 | 319 | 376  | 189 | 249   | 11 | 240 | 331 | 549*   | 259* | 34  | 221 | 263         | 263    | 301 | 331          | 326 | 321 | 7599             |  |
|                   |                    |                |                | 12                                      | 336             | 341         | 329 | 337 | 343 | 341 | 339 | 340 | 337 | 329  | 311 | 309   | 12 | 310 | 311 | 318  | 319  | 315 | 311 | 315         | 320    | 316 | 320          | 325 | 324 | 7796             |  |
|                   |                    |                |                | 13                                      | 326             | 327         | 321 | 322 | 330 | 340 | 338 | 330 | 319 | 304  | 318 | 300   | 13 | 245 | 138 | 115  | 184  | 235 | 269 | 290         | 273    | 265 | 287          | 305 | 320 | 6801             |  |
|                   |                    |                |                | 14                                      | 325             | 323         | 322 | 330 | 346 | 330 | 346 | 340 | 362 | 349  | 336 | 311   | 14 | 297 | 353 | 174  | 270  | 320 | 322 | 327         | 324    | 325 | 326          | 328 | 326 | 7712             |  |
|                   |                    |                |                | 15                                      | 329             | 327         | 320 | 324 | 330 | 330 | 331 | 361 | 335 | 349  | 321 | 274   | 15 | 223 | 204 | 265  | 298  | 308 | 290 | 287         | 302    | 309 | 316          | 321 | 326 | 7380             |  |
|                   |                    |                |                | 16                                      | 335             | 337         | 336 | 352 | 347 | 360 | 376 | 359 | 324 | 360  | 338 | 198   | 16 | 187 | 234 | 249  | 262  | 304 | 310 | 330         | 328    | 321 | 316          | 321 | 328 | 7512             |  |
|                   |                    |                |                | 17                                      | 326             | 324         | 323 | 322 | 325 | 326 | 327 | 328 | 335 | 330  | 334 | 335   | 17 | 329 | 291 | 76   | 161  | 224 | 230 | 252         | 279    | 299 | 308          | 309 | 327 | 7020             |  |
|                   |                    |                |                | 18                                      | 329             | 329         | 328 | 327 | 328 | 330 | 333 | 334 | 337 | 329  | 324 | 319   | 18 | 317 | 308 | 309  | 309  | 309 | 315 | 318         | 317    | 317 | 320          | 325 | 322 | 7733             |  |
|                   |                    |                |                | 19                                      | 319             | 318         | 318 | 319 | 321 | 323 | 323 | 322 | 320 | 318  | 319 | 330   | 19 | 326 | 311 | 285  | 265  | 283 | 299 | 308         | 306    | 301 | 301          | 302 | 310 | 7447             |  |
|                   |                    |                |                | 20                                      | 314             | 310         | 309 | 315 | 321 | 328 | 328 | 328 | 329 | 332  | 329 | 328   | 20 | 319 | 316 | 316  | 316  | 316 | 311 | 300         | 280    | 271 | 286          | 300 | 309 | 7511             |  |
|                   |                    |                |                | 21                                      | 316             | 315         | 316 | 319 | 323 | 325 | 319 | 319 | 319 | 319  | 318 | 319   | 21 | 317 | 308 | 306  | 308  | 307 | 305 | 309         | 309    | 309 | 308          | 302 | 302 | 7517             |  |
|                   |                    |                |                | 22                                      | 309             | 309         | 309 | 310 | 310 | 309 | 308 | 309 | 309 | 309  | 309 | 240   | 22 | 255 | 260 | 281  | 146  | 221 | 237 | 199         | 229    | 278 | 293          | 304 | 309 | 6652             |  |
|                   |                    |                |                | 23                                      | 314             | 314         | 313 | 314 | 311 | 310 | 309 | 308 | 311 | 309  | 272 | 210   | 23 | 154 | 139 | 82   | 154  | 240 | 289 | 298         | 300    | 298 | 300          | 315 | 320 | 6464             |  |
|                   |                    |                |                | 24                                      | 319             | 315         | 317 | 318 | 320 | 322 | 329 | 310 | 283 | 348  | 289 | 281   | 24 | 249 | 270 | 160  | 236  | 261 | 260 | 285         | 299    | 278 | 280          | 300 | 320 | 7049             |  |
|                   |                    |                |                | 25                                      | 325             | 325         | 321 | 320 | 320 | 321 | 330 | 320 | 313 | 311  | 317 | 310   | 25 | 305 | 283 | 193  | 173  | 232 | 306 | 300         | 282    | 269 | 279          | 305 | 320 | 7080             |  |
|                   |                    |                |                | 26                                      | 331             | 330         | 322 | 327 | 321 | 321 | 324 | 341 | 348 | 326  | 300 | 324   | 26 | 406 | 171 | 259  | 329  | 338 | 330 | 323         | 314    | 312 | 320          | 320 | 318 | 7661             |  |
|                   |                    |                |                | 27                                      | 330             | 325         | 345 | 345 | 333 | 340 | 331 | 322 | 335 | 309  | 350 | 338   | 27 | 374 | 230 | 285  | 322  | 320 | 319 | 320         | 320    | 316 | 320          | 321 | 326 | 7776             |  |
|                   |                    |                |                | 28                                      | 322             | 323         | 338 | 349 | 389 | 430 | 449 | 420 | 359 | 273  | 349 | 340   | 28 | 329 | 199 | 210  | 184  | 270 | 280 | 311         | 289    | 289 | 280          | 282 | 330 | 7594             |  |
|                   |                    |                |                | 29                                      | 350             | 330         | 342 | 351 | 399 | 421 | 361 | 291 | 210 | 178  | 271 | 343   | 29 | 368 | 436 | 156  | 218  | 250 | 306 | 299         | 309    | 316 | 309          | 310 | 324 | 7448             |  |
|                   |                    |                |                | 30                                      | 328             | 329         | 329 | 338 | 336 | 333 | 339 | 339 | 359 | 340  | 338 | 329   | 30 | 309 | 289 | 280  | 267  | 278 | 299 | 300         | 301    | 310 | 312          | 317 | 329 | 7628             |  |
|                   |                    |                |                | 31                                      | 327             | 321         | 330 | 339 | 326 | 190 | 51  | 334 | 324 | 262  | 1   | 328   | 31 | 227 | 287 | 332  | 308  | 326 | 320 | 320         | 319    | 308 | 302          | 322 | 335 | 6839             |  |
| SCALED BY         | SPT, KKR, EAS, JEP |                |                | Preliminary base-line and scale values: |                 |             |     |     |     |     |     |     |     |      |     | <input type="checkbox"/> Interpolated<br><input type="checkbox"/> Significant portion of hour interpolated.<br><input type="checkbox"/> No record; or no values available because of faulty record. |    |     |     | <input type="checkbox"/> Scaling uncertain because of magnetic storm.<br><input type="checkbox"/> Revised all three 1/20 part or all of hour; if value is given, error was estimated for missing part. |      |     |     | MONTHLY SUM | 228425 |     |              |     |     |                  |  |
| CHECKED BY        | JEP, SPT, EAS      |                |                | Interval Beginning                      | Base-line Value | Scale Value |     |     |     |     |     |     |     |      |     |   |    |     |     |  |      |     |     |             |        |     | MONTHLY MEAN | 307 |     |                  |  |
| SIGNS REVIEWED BY | JEP                |                |                |   |                 |             |     |     |     |     |     |     |     |      |     |   |    |     |     |  |      |     |     |             |        |     |              |     |     | DATES WITH GAPS: |  |
| PUNCHED BY        |                    |                |                |   |                 |             |     |     |     |     |     |     |     |      |     |   |    |     |     |  |      |     |     |             |        |     |              |     |     |                  |  |

\* Derived from Storm Mph., converted to Normal Mph.

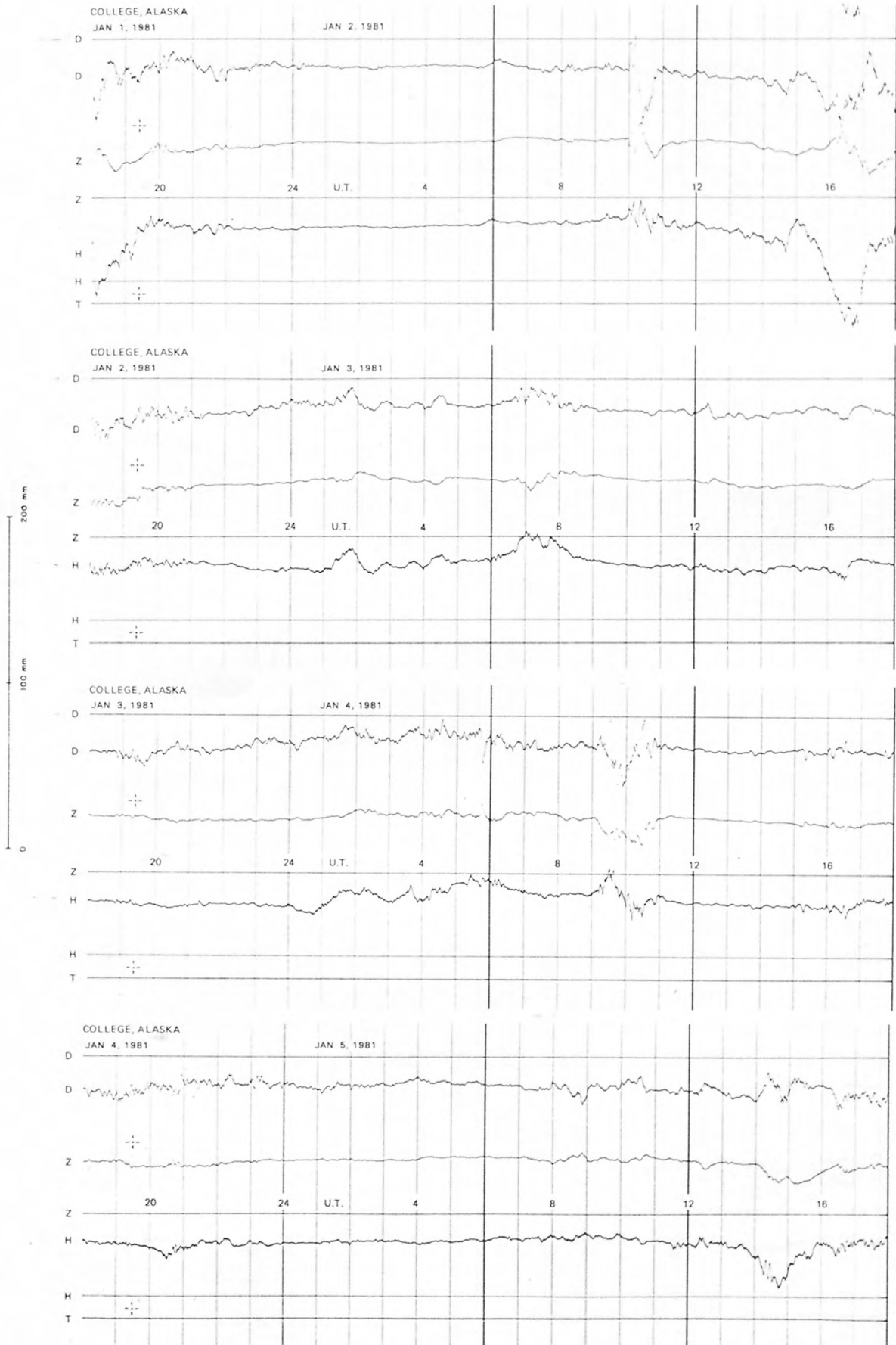
# FORMAT FOR NORMAL & STORM MAGNETOGRAMS (SAMPLE ONLY)



SEE PRELIMINARY CALIBRATION DATA FOR SCALE VALUES & BASELINE VALUES

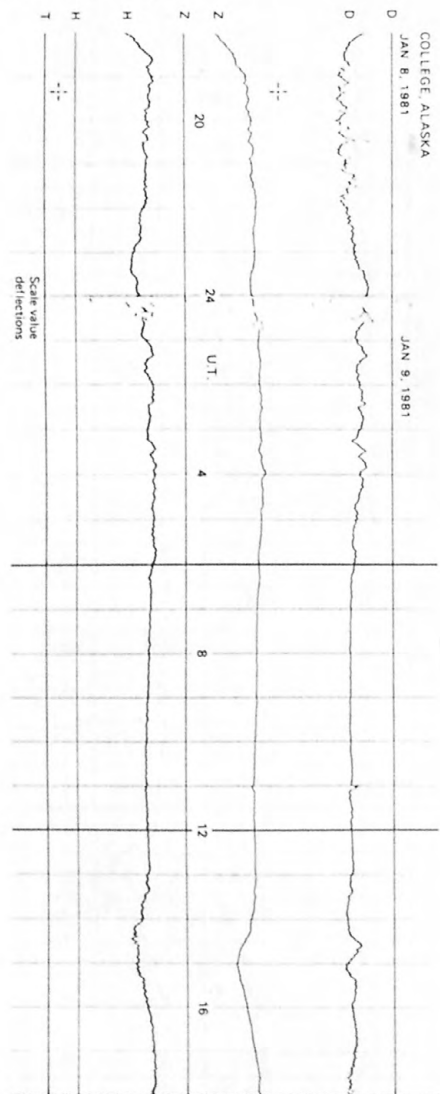
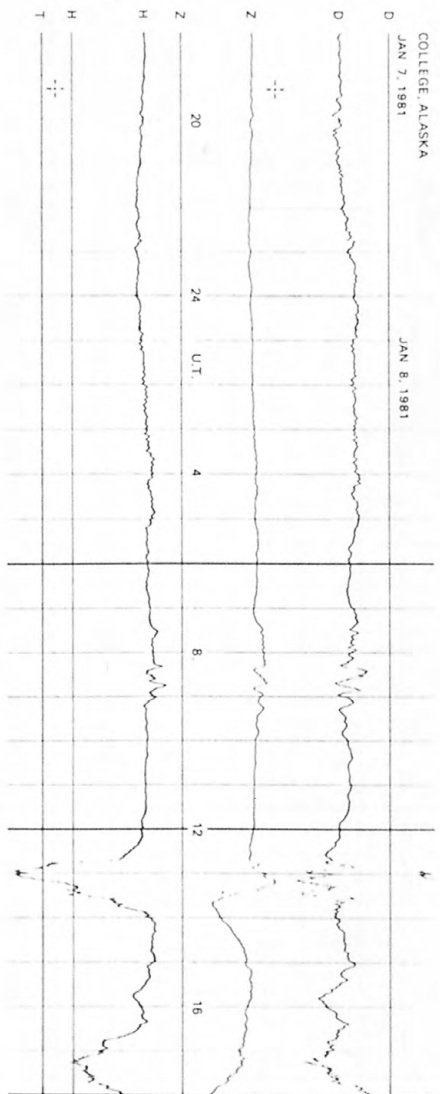
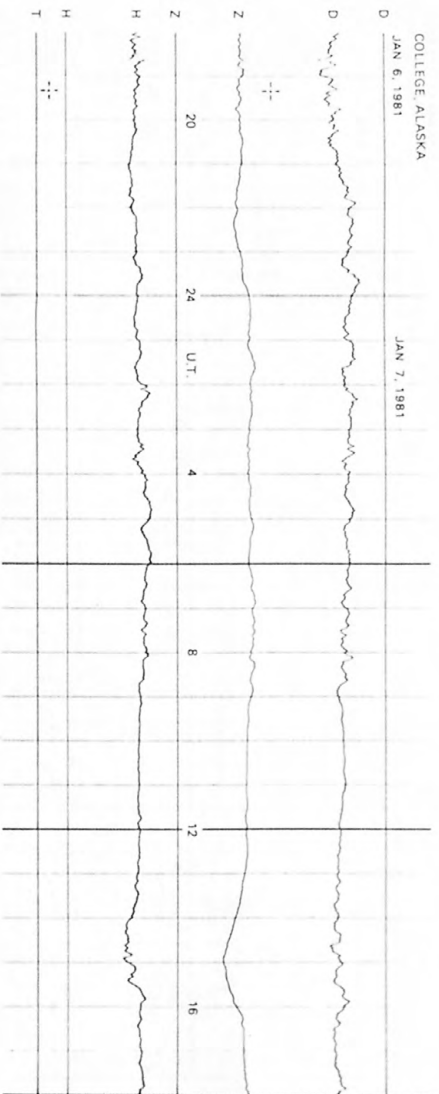
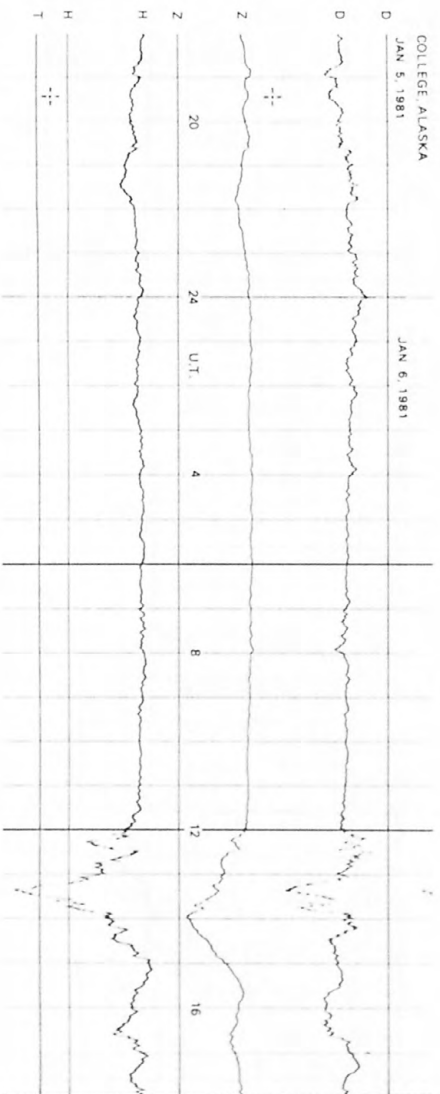


NORMAL MAGNETOGRAMS



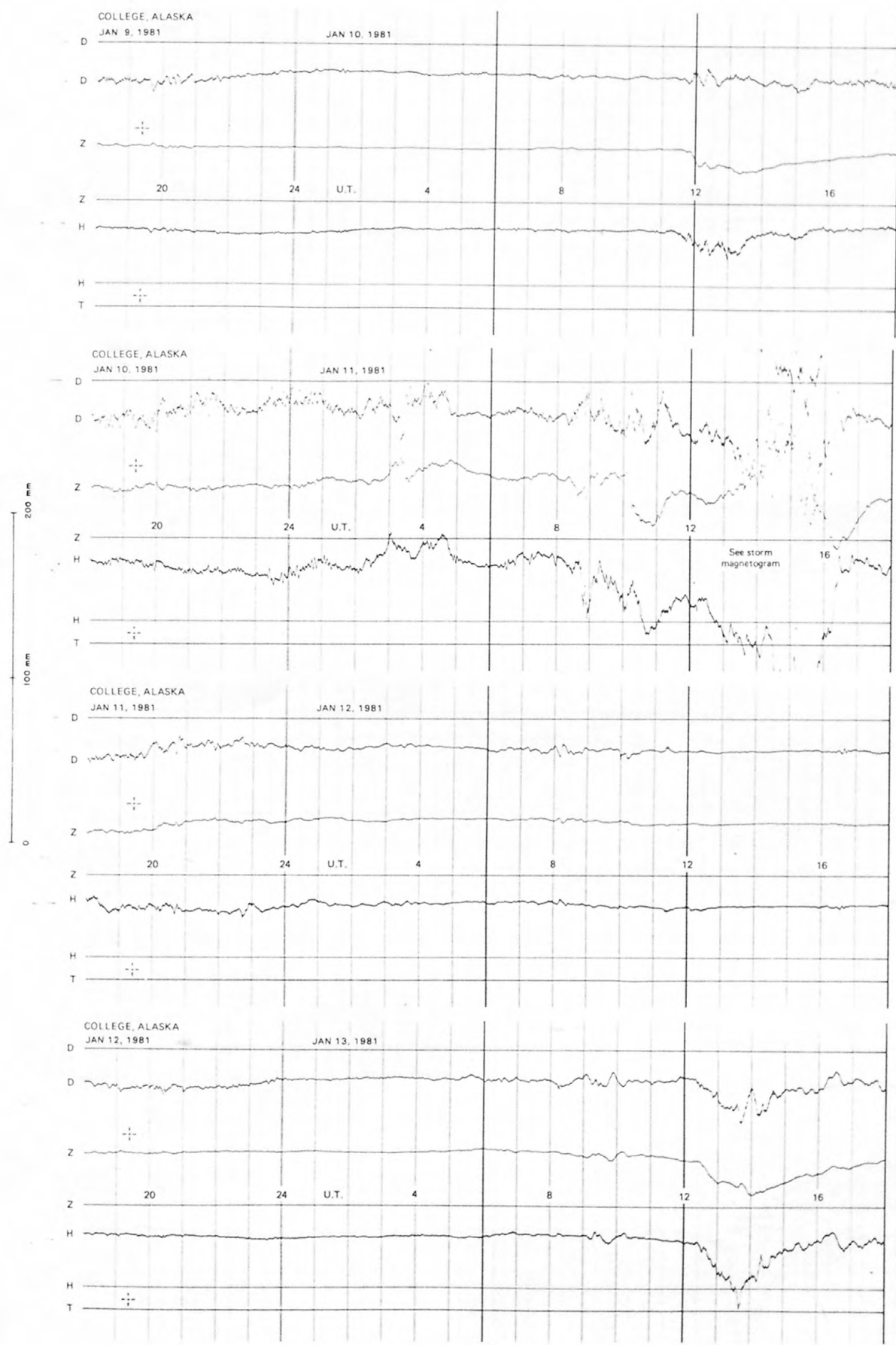
# NORMAL MAGNETOGRAMS

0                      100 mm                      200 mm

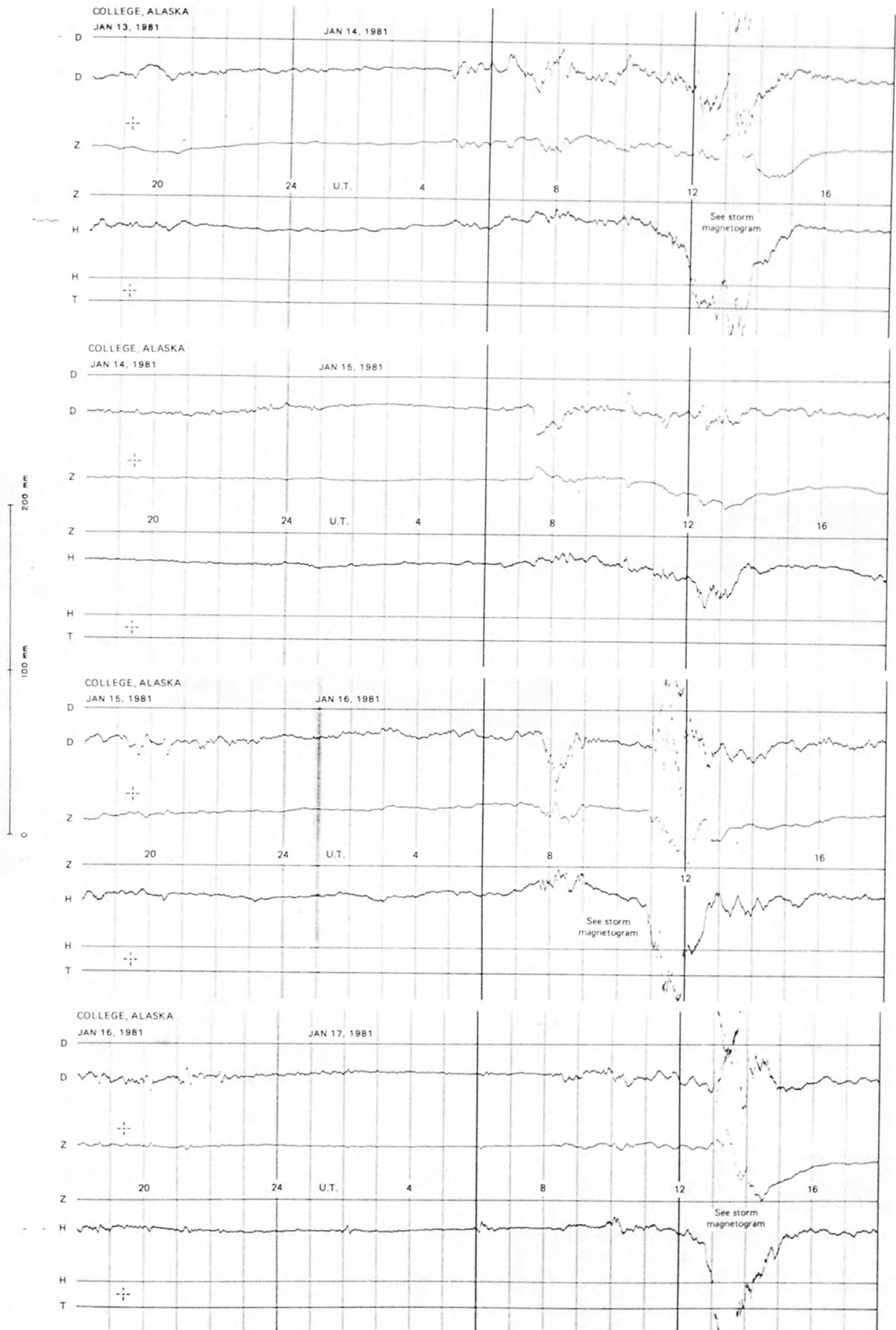




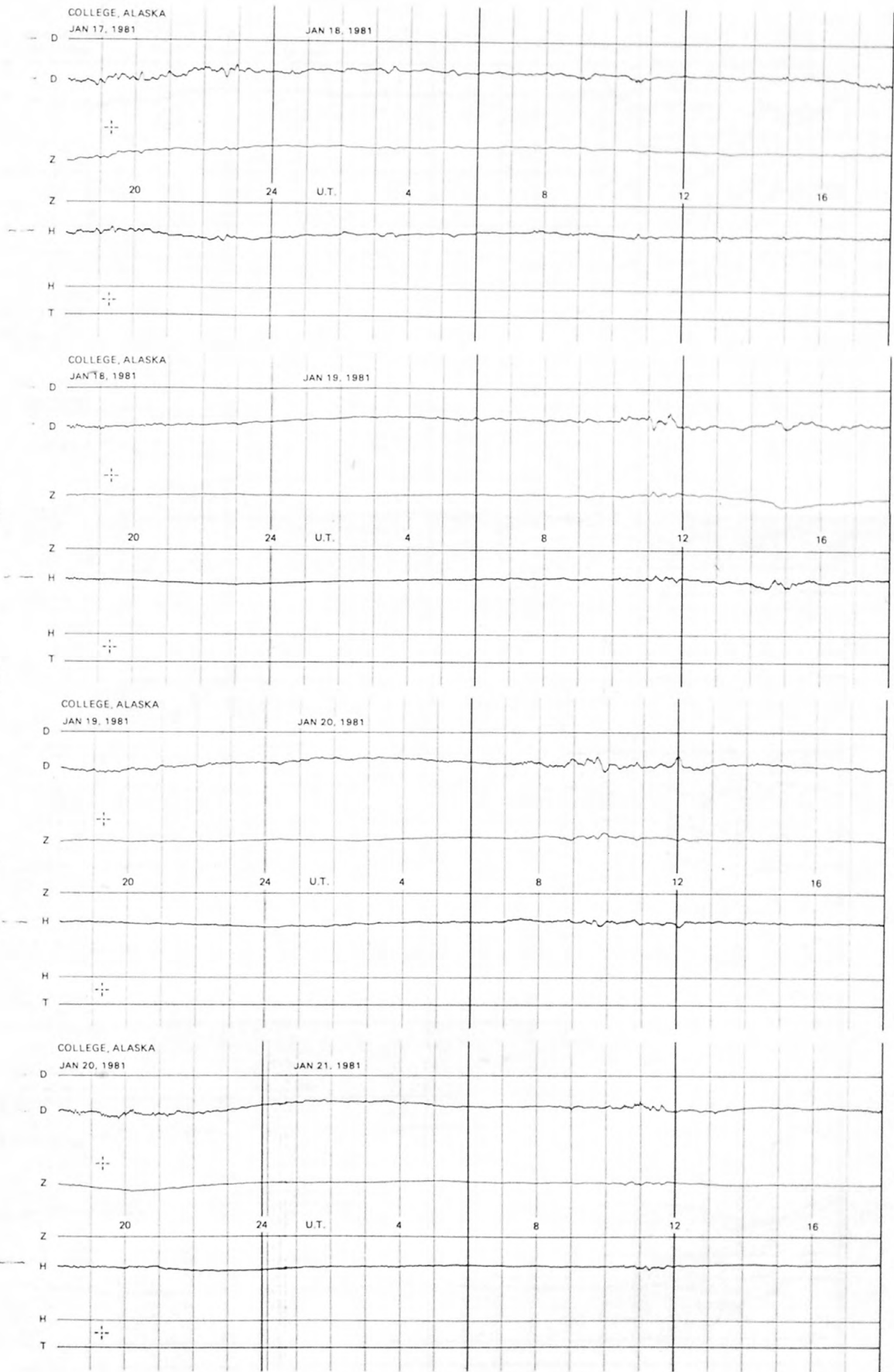
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS

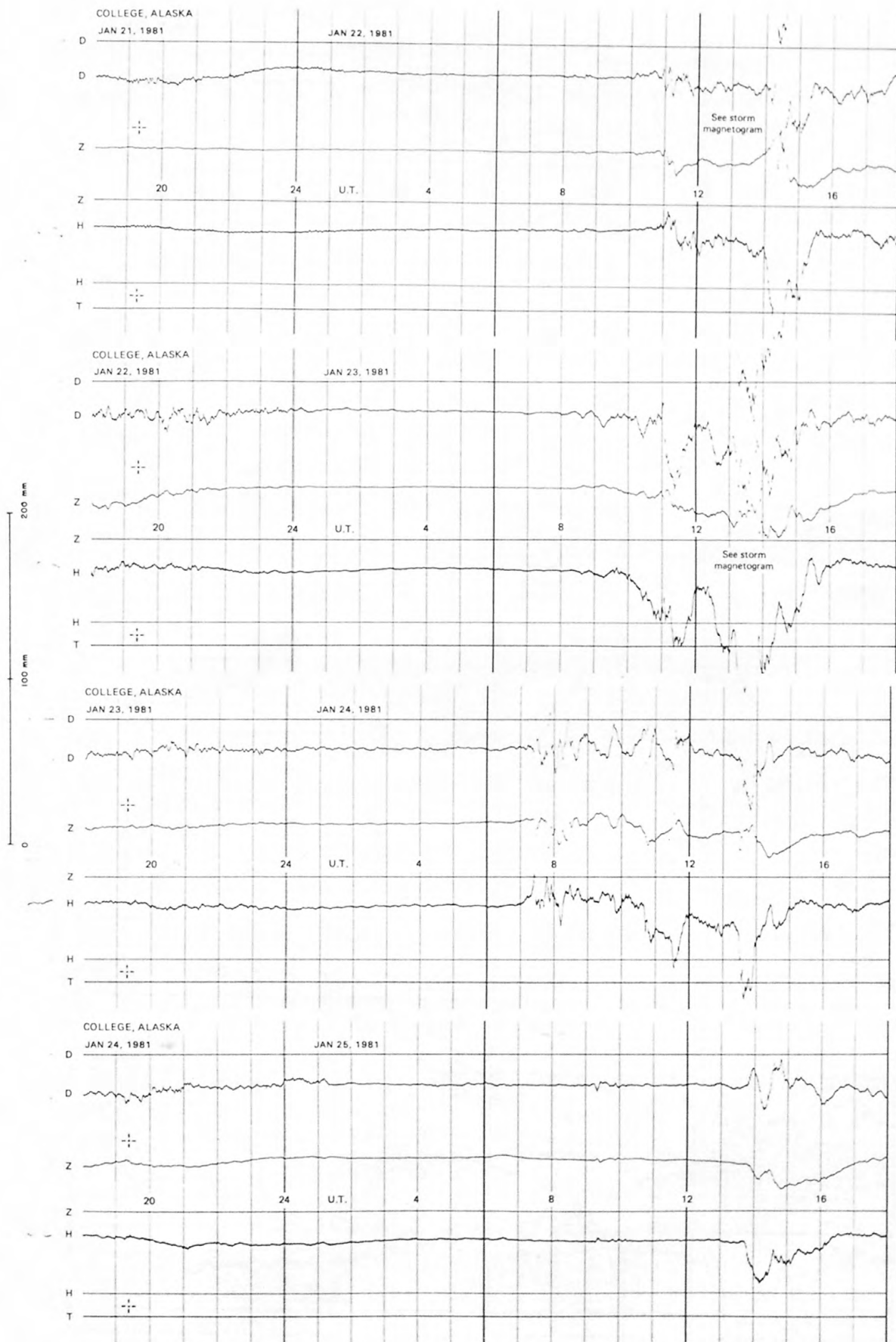


NORMAL MAGNETOGRAMS

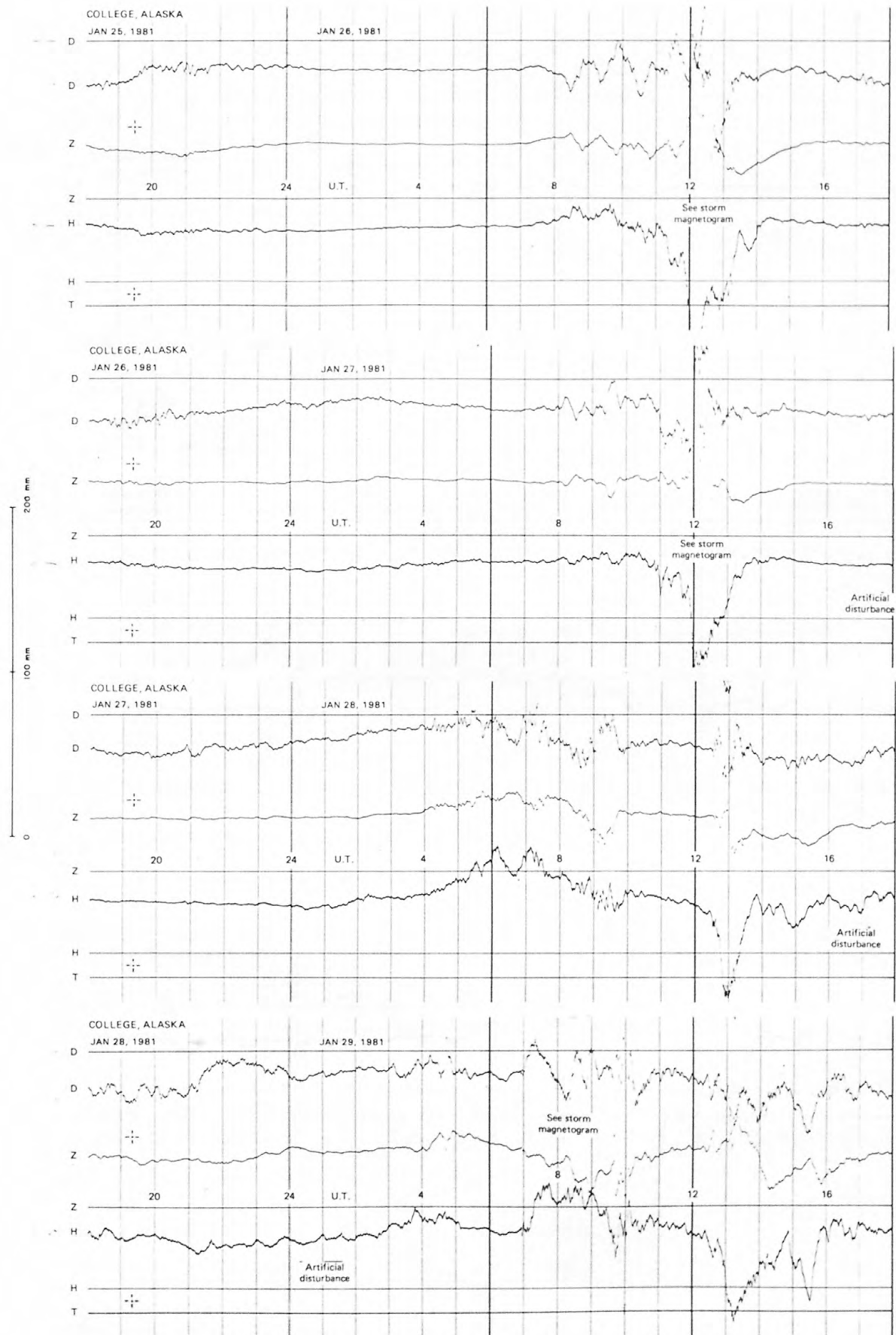




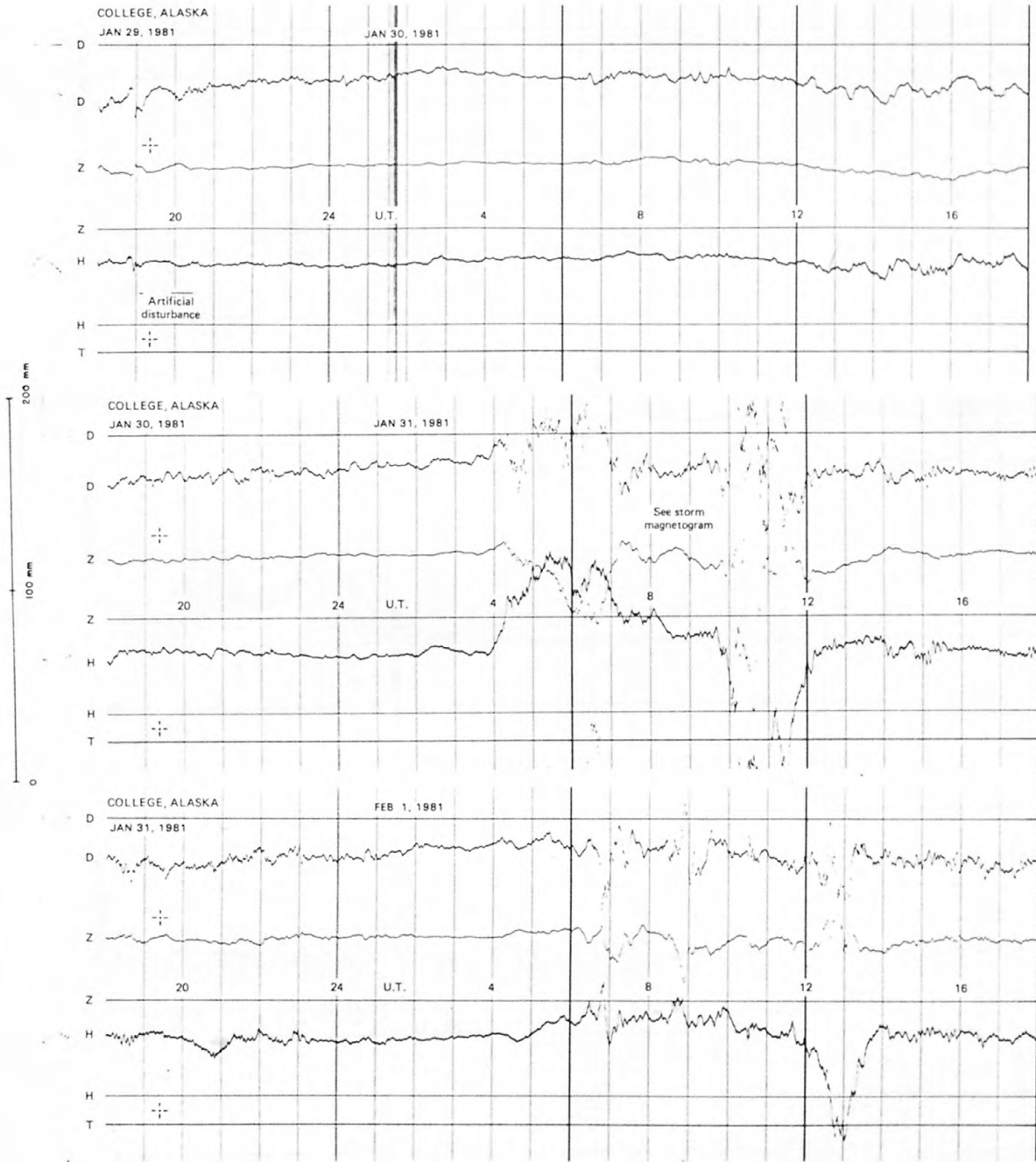
NORMAL MAGNETOGRAMS



NORMAL MAGNETOGRAMS



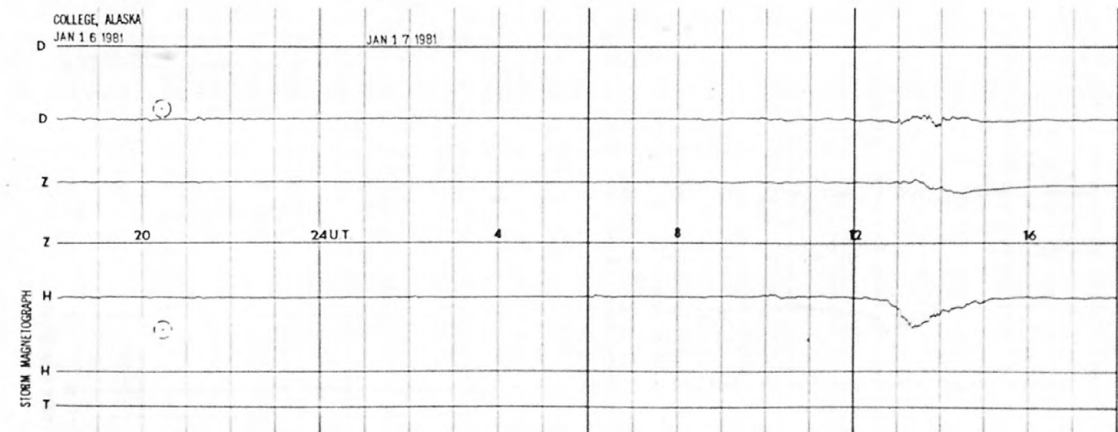
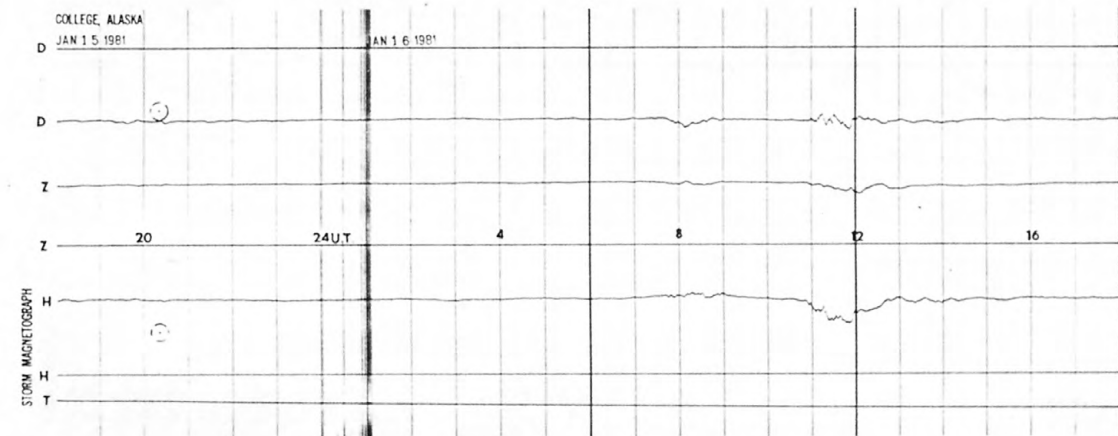
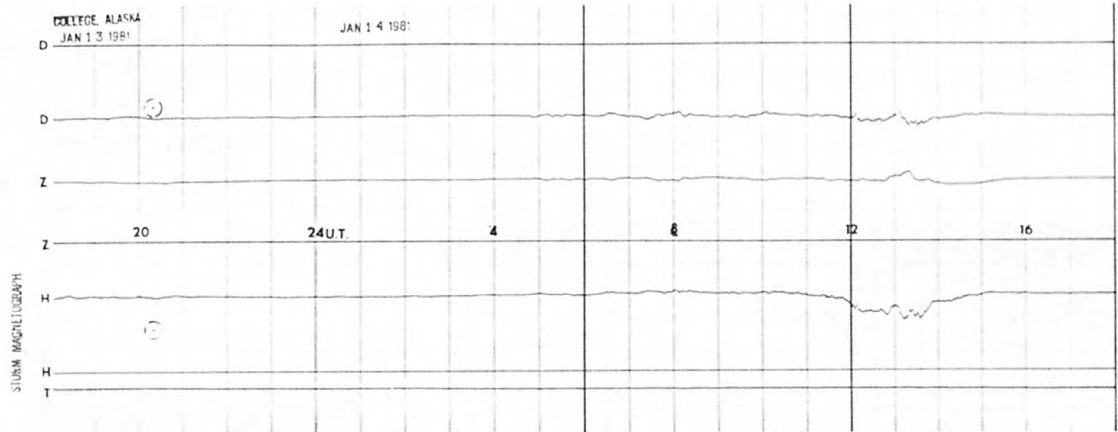
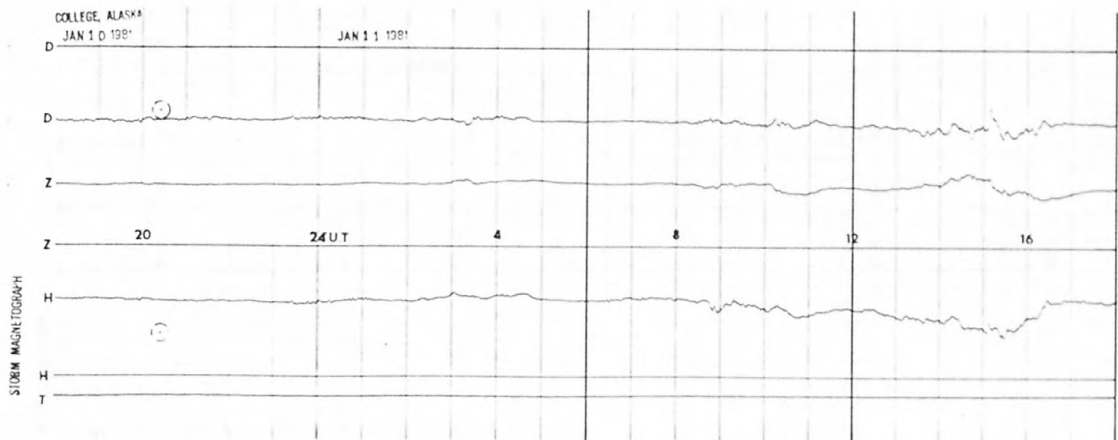
NORMAL MAGNETOGRAMS



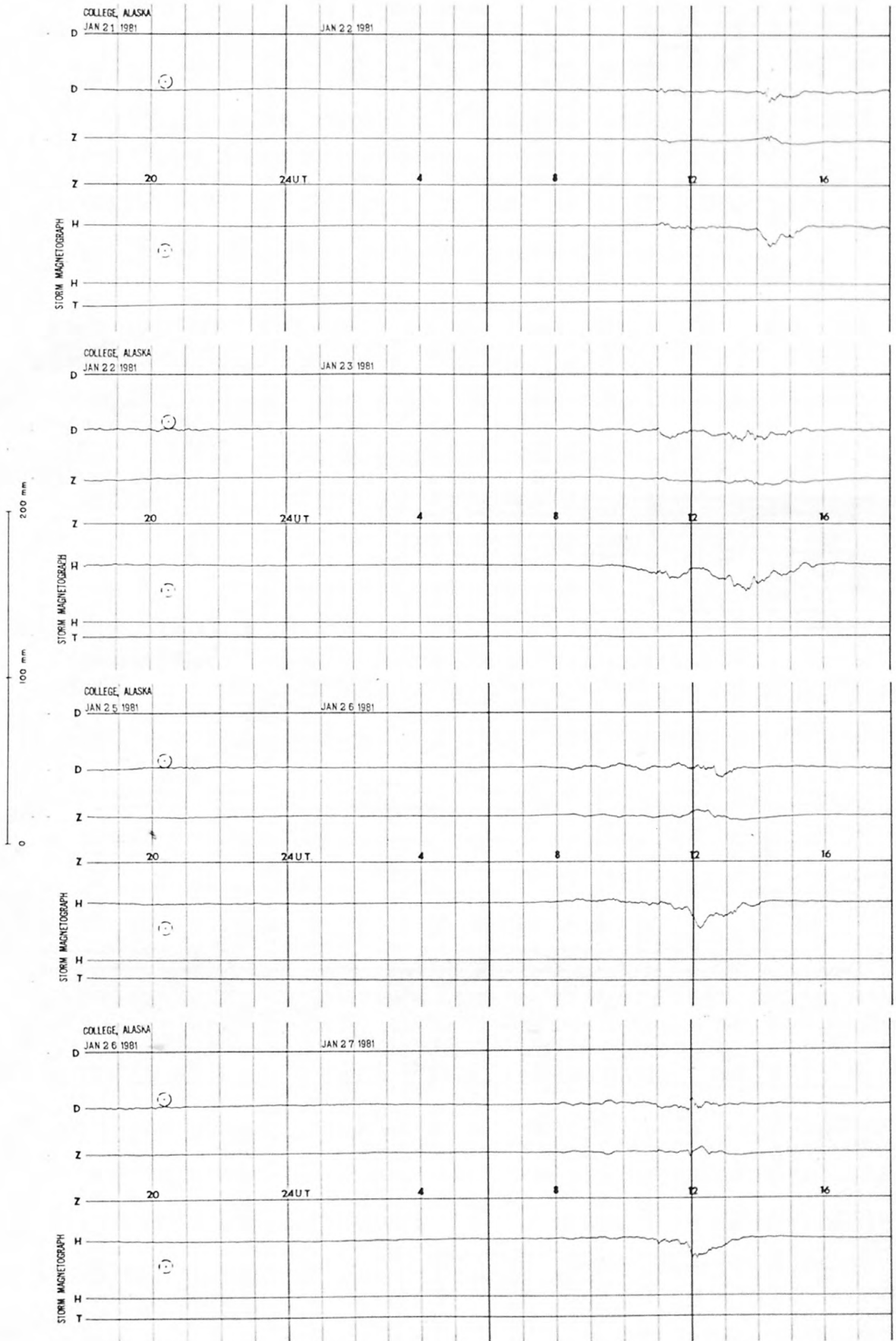


# STORM MAGNETOGRAMS

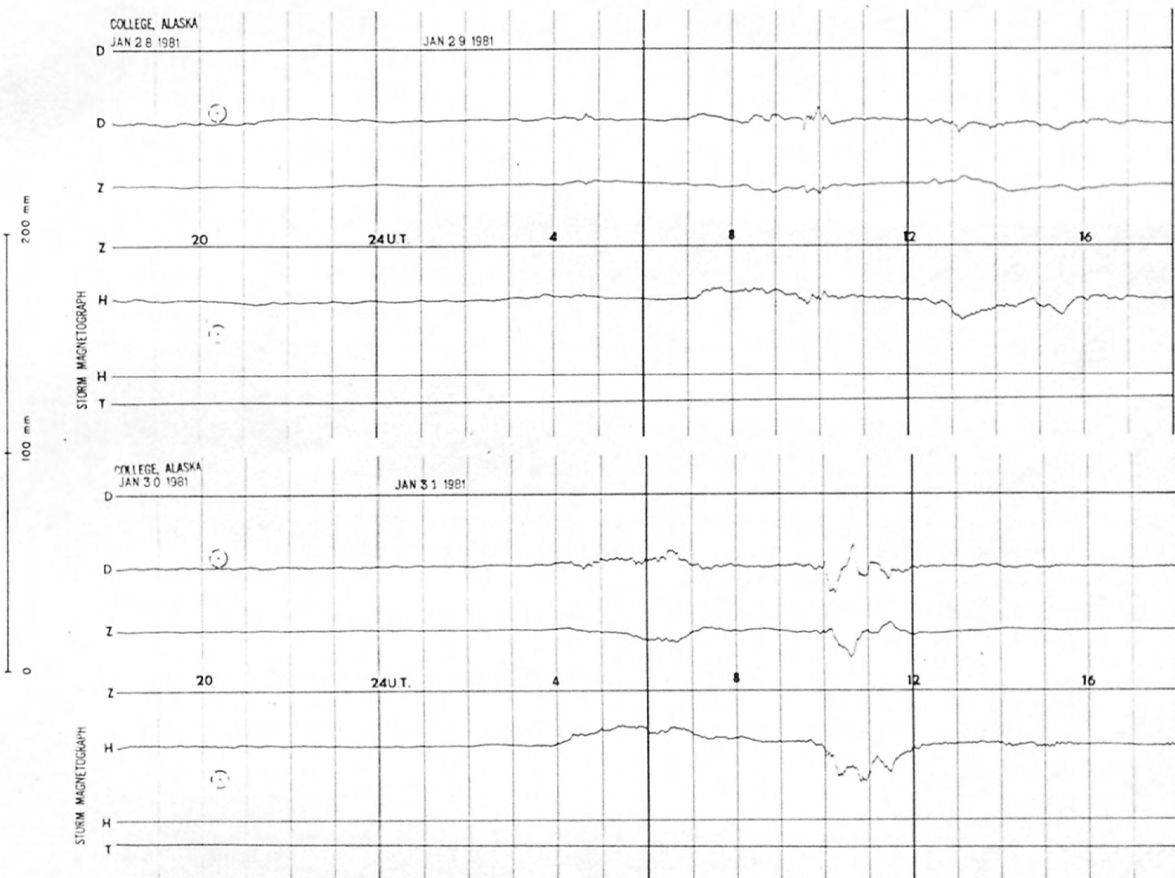
200 mm  
100 mm  
0



# STORM MAGNETOGRAMS



# STORM MAGNETOGRAMS





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