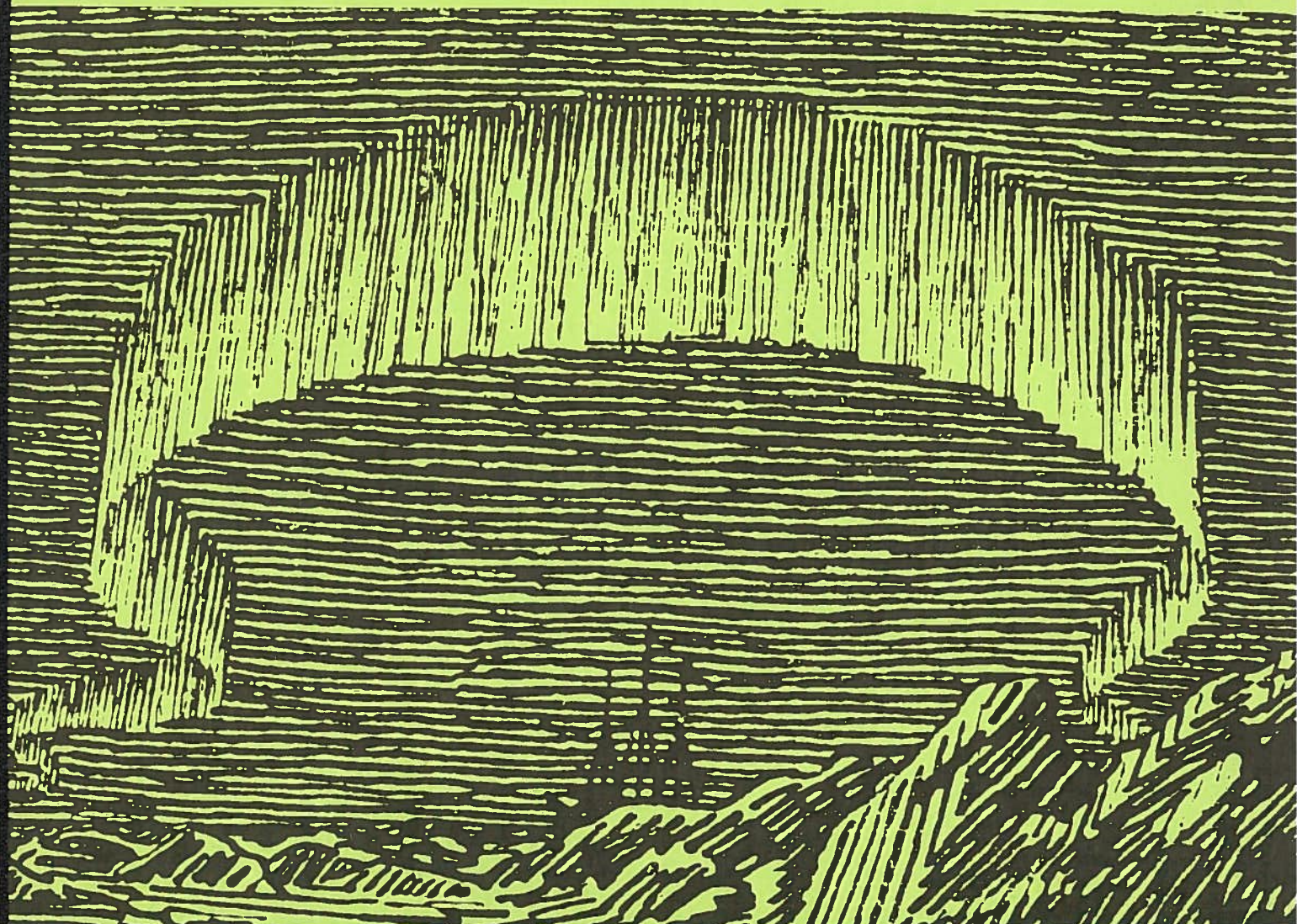


# THE AURORAL OBSERVATORY

TROMSØ

NORWAY

MAGNETIC OBSERVATIONS 1972







## INTRODUCTION

This yearbook presents the results of the geomagnetic measurements carried out at The Auroral Observatory, Tromsø, Norway. The Observatory is now an institute at The University of Tromsø. Inquiries can be adressed to:

The Auroral Observatory  
P.O. Box 953  
N-9001 TROMSØ, Norway.

The Observatory is situated 2 km NW from the centre of the town. The geographical coordinates are:

Latitude:  $69^{\circ}39'.7$  N      Longitude:  $18^{\circ}56'.4$  E

Altitude: 105 m above sea level.

### Instrument Equipment

The values of hourly means etc. are based on photographic records from the following three variometers: D and H of the Askania-Bamberg type and a Z-variometer of the type La Cour.

Insensitive recordings of the three elements are obtained by a modified La Cour system.

Pulsations recordings are obtained by a Grenet system.

The following instruments have been used for base-line controll: Askania theodolit and a double magnet suspended in a silk-thread for D-measurements, for H-measurements QHM 123 and QHM 164, and for Z-measurements BMZ 39 and BMZ 57. From 1975 will a GeoMetric G 826 protomagnetometer be used for Z-base line controll.

### Scale value determinations

The scale value of the variometers are determined by means of Helmholtz coils. The values are as follows expressed in

units pr. mm:

|         | D     | H             | Z             |
|---------|-------|---------------|---------------|
| Normal: | 1',45 | 5,28 $\gamma$ | 6,57 $\gamma$ |
| Storm:  | 3',0  | 22,2 $\gamma$ | 24.0 $\gamma$ |

Notes to the tables

The hourly mean values are centered on the half hours. The quiet mean values are estimated from selected quiet hours only.

Universal time is used everywhere in this yearbook, and the declination is reckoned positive towards west.

Stars in the tables indicates that the values are greater than - 999.

ANNUAL MEANS OF THE MAGNETIC ELEMENTS

| Year | D         | H       | Z       | Year | D         | H       | Z       |
|------|-----------|---------|---------|------|-----------|---------|---------|
| 1930 | 4°07',7 W | 11567 γ |         | 1957 | 0°15',9 W | 11182 γ | 50868 γ |
| 31   | 3°59,6    | 49      | 50198 γ | 58   | 12',7     | 94      | 902     |
| 32   | 49,0      | 499     | 95      | 59   | 08,1      | 96      | 35      |
| 33   | 37,3      | 72      | 50203   | 60   | 03,9      | 97      | 80      |
| 34   | 25,9      | 41      | 23      | 61   | 02,1      | 214     | 51004   |
| 35   | 14,3      | 07      | 47      | 62   | 00,1 E    | 17      | 37      |
| 36   | 04,8      | 379     | 76      | 63   | 03,9 E    | 22      | 65      |
| 37   | 2°53,7    | 50      | 308     | 64   | 03,7 E    | 39      | 88      |
| 38   | 44,1      | 25      | 40      | 65   | 04,6 E    | 51      | 94      |
| 39   | 35,0      | 297     | 62      | 66   | 04,5 E    | 60      | 130     |
| 40   | 26,6      | 78      | 81      | 67   | 04,0 E    | 65      | 60      |
| 41   | 16,6      | 56      | 417     | 68   | 02,0 E    | 68      | 96      |
| 42   | 10,6      | 44      | 24      | 69   | 01,5 W    | 79      | 235     |
| 43   | 02,5      | 22      | 49      | 70   | 04,2 W    | 95      | 78      |
| 44   | 1°54,3    | 13      | 67      | 71   | 05,5 W    | 333     | 303     |
| 45   | 45,7      | 199     | 503     | 72   | 05,5 W    | 64      | 19      |
| 46   | 34,6      | 79      | 54      | 73   | 03,5 W    | 70      | 65      |
| 47   | 26,5      | 74      | 85      |      |           |         |         |
| 48   | 18,4      | 56      | 94      |      |           |         |         |
| 49   | 10,5      | 53      | 612     |      |           |         |         |
| 50   | 03,6      | 52      | 47      |      |           |         |         |
| 51   | 0°54,1    | 43      | 93      |      |           |         |         |
| 52   | 43,9      | 44      | 711     |      |           |         |         |
| 53   | 36,0      | 53      | 24      |      |           |         |         |
| 54   | 29,1      | 65      | 44      |      |           |         |         |
| 55   | 24,0      | 72      | 76      |      |           |         |         |
| 56   | 18,1      | 73      | 825     |      |           |         |         |





TROMSØ. DECLINATION, D=0 DEG. W + TABULAR QUANTITIES EXPRESSED IN TENTH OF MINUTES, HOURLY MEAN VALUES

MARCH 1972

| DAY  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21   | 22   | 23   | 24   | 25  | 26 | 27 | 28 | 29 | 30 | 31 |
|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|-----|----|----|----|----|----|----|
|      | 73   | 73   | 58   | 58   | 58   | 58   | 58   | 58  | 73  | 102 | 131 | 116 | 131 | 102 | 116 | 102 | 131 | 131 | 116 | -28 | 15   | -86  | 44   | -57  | 68  |    |    |    |    |    |    |
|      | -28  | -43  | -14  | -57  | 15   | 29   | 29   | 44  | 58  | 87  | 131 | 145 | 189 | 160 | 160 | 218 | 174 | 203 | 174 | 73  | 73   | 73   | -43  | -57  | 74  |    |    |    |    |    |    |
|      | -202 | -72  | -57  | 0    | 15   | 44   | 58   | 102 | 102 | 131 | 116 | 145 | 145 | 145 | 247 | 334 | 131 | 116 | 131 | -14 | 44   | 44   | -14  | -72  | 67  |    |    |    |    |    |    |
|      | -57  | -72  | 44   | 44   | 44   | 44   | 44   | 44  | 73  | 116 | 145 | 131 | 131 | 174 | 131 | 116 | 116 | 116 | 73  | 102 | 87   | 73   | 15   | -28  | 71  |    |    |    |    |    |    |
|      | -14  | -43  | 0    | 0    | 29   | 29   | 29   | 44  | 58  | 73  | 102 | 116 | 131 | 131 | 145 | 116 | 131 | 131 | 15  | 160 | 160  | 58   | 58   | 15   | 69  |    |    |    |    |    |    |
|      | -202 | -217 | -72  | 15   | -14  | 0    | 44   | 58  | 73  | 87  | 102 | 116 | 116 | 116 | 102 | 102 | 87  | 87  | 102 | 131 | 58   | -130 | -202 | -130 | 17  |    |    |    |    |    |    |
|      | -782 | -565 | -159 | -14  | -57  | -173 | -275 | -28 | 15  | 131 | 160 | 145 | 116 | 102 | 116 | 160 | 131 | -28 | 44  | 131 | 116  | 44   | -188 | -130 | -41 |    |    |    |    |    |    |
|      | -144 | -57  | -28  | 0    | 29   | 44   | 29   | 29  | 44  | 58  | 73  | 73  | 102 | 87  | 58  | 145 | 0   | 116 | 116 | 73  | 73   | 58   | 58   | 58   | 45  |    |    |    |    |    |    |
|      | 29   | 44   | 44   | 44   | 44   | 58   | 73   | 58  | 58  | 87  | 102 | 131 | 160 | 145 | 102 | 131 | 160 | 174 | 87  | 0   | -57  | 73   | 87   | 73   | 79  |    |    |    |    |    |    |
|      | 73   | 73   | 58   | 44   | 44   | 29   | 29   | 0   | 0   | 44  | 44  | 58  | 58  | 58  | 58  | 58  | 58  | 73  | 73  | 73  | 87   | 102  | 15   | -57  | 48  |    |    |    |    |    |    |
|      | -173 | -347 | -275 | -289 | -246 | -101 | 0    | 87  | 58  | 87  | 102 | 87  | 87  | 73  | 73  | 87  | 87  | 87  | 102 | 0   | 87   | 73   | 73   | 58   | -5  |    |    |    |    |    |    |
|      | 58   | 58   | 44   | 44   | 44   | 44   | 44   | 44  | 44  | 58  | 58  | 73  | 87  | 73  | 73  | 73  | 73  | 73  | 73  | 87  | 87   | 102  | 73   | -14  | 61  |    |    |    |    |    |    |
|      | -72  |      |      |      |      |      |      |     |     | 87  | 116 | 131 | 131 | 131 | 102 | 87  | 87  | 87  | 87  | 73  | 73   | 44   | -57  | -14  | 68  |    |    |    |    |    |    |
|      | 29   | 58   | 44   | 44   | 44   | 44   | 44   | 58  | 73  | 102 | 131 | 145 | 131 | 131 | 116 | 102 | 73  | 87  | 87  | 87  | 87   | 87   | 87   | 87   | 82  |    |    |    |    |    |    |
|      | 73   | 73   | 58   | 58   | 58   | 44   | 29   | 29  | 44  | 73  | 116 | 145 | 131 | 131 | 102 | 87  | 87  | 102 | 15  | 44  | 29   | 73   | 102  | 44   | 72  |    |    |    |    |    |    |
|      | 15   | -420 | -565 | -492 | -275 | -130 | 0    | 15  | 44  | 102 | 131 | 189 | 203 | 232 | 334 | 276 | 174 | 102 | 102 | 116 | 58   | -14  | 73   | 29   | 12  |    |    |    |    |    |    |
|      | -101 | -14  | 44   | -28  | -86  | 29   | 58   | 44  | 29  | 87  | 131 | 203 | 116 | 145 | 203 | 174 | 160 | 116 | 174 | -57 | -130 | -101 | -86  | 15   | 46  |    |    |    |    |    |    |
|      | -202 | -101 | -86  | -28  | -14  | 15   | 44   | 73  | 87  | 87  | 116 | 131 | 131 | 116 | 116 | 131 | 102 | 58  | 58  | 58  | 73   | 44   | -57  | -43  | 37  |    |    |    |    |    |    |
|      | -28  | 0    | 15   | 0    | 29   | 0    | 0    | 29  | 87  | 116 | 160 | 203 | 189 | 174 | 131 | 102 | 102 | 116 | 160 | 87  | 29   | 15   | -72  | 68   |     |    |    |    |    |    |    |
|      | -144 | -72  | 44   | 0    | 15   | 29   | 15   | 29  | 44  | 87  | 116 | 145 | 174 | 174 | 189 | 218 | 189 | 116 | 102 | 87  | 87   | -14  | -57  | 68   |     |    |    |    |    |    |    |
|      | -57  | 58   | 0    | 0    | 15   | 15   | 29   | 44  | 58  | 87  | 116 | 160 | 174 | 189 | 189 | 160 | 145 | 145 | 145 | 131 | 160  | 145  | 102  | 73   | 95  |    |    |    |    |    |    |
|      | -43  | -86  | -202 | -72  | 44   | 44   | 44   | 44  | 58  | 87  | 102 | 131 | 145 | 145 | 116 | 131 | 174 | 247 | 203 | 160 | 131  | -14  | -188 | 0    | 58  |    |    |    |    |    |    |
|      | 73   | 58   | 44   | 29   | 29   | 29   | 29   | 29  | 44  | 102 | 116 | 174 | 189 | 174 | 116 | 73  | 87  | 73  | 116 | 73  | -72  | -202 | -86  | -188 | 46  |    |    |    |    |    |    |
|      | -275 | -130 | -304 | -420 | -449 | 0    | 87   | 44  | 73  | 87  | 102 | 160 | 189 | 189 | 276 | 218 | 261 | 131 | 305 | 189 | 87   | -72  | 15   | 29   | 33  |    |    |    |    |    |    |
|      | -28  | 29   | 0    | -28  | -57  | -57  | 29   | 58  | 58  | 87  | 102 | 102 | 87  | 73  | 87  | 87  | 102 | 73  | 102 | 73  | -14  | 0    | -57  | -72  | 34  |    |    |    |    |    |    |
|      | 0    | 15   | 0    | -28  | -14  | -14  | 15   | 29  | 58  | 87  | 131 | 116 | 160 | 131 | 87  | 102 | 131 | 116 | 174 | 15  | -57  | -43  | -130 | -347 | 30  |    |    |    |    |    |    |
|      | -275 | -260 | -347 | -492 | -101 | -43  | 0    | 15  | 15  | 102 | 116 | 145 | 145 | 145 | 145 | 203 | 189 | 116 | 87  | -57 | -188 | -391 | -710 | -54  |     |    |    |    |    |    |    |
|      | -246 | -130 | -57  | -43  | 15   | 0    | 58   | 58  | 73  | 116 | 131 | 131 | 116 | 116 | 87  | 73  | 87  | 87  | 87  | 73  | 73   | 73   | 73   | 73   | 46  |    |    |    |    |    |    |
|      | 58   | 44   | 44   | 44   | 29   | 15   | 15   | 15  | 29  | 87  | 131 | 160 | 145 | 174 | 189 | 290 | 377 | 406 | 261 | 218 | 232  | 0    | -57  | -202 | 112 |    |    |    |    |    |    |
|      | -420 | -637 | -492 | -637 | -130 | 87   | 87   | 0   | 102 | 116 | 145 | 174 | 232 | 218 | 290 | 319 | 363 | 348 | 232 | 218 | 203  | -28  | -115 | -101 | 23  |    |    |    |    |    |    |
|      | -144 | -217 | -144 | -72  | -28  | 0    | 44   | 29  | 44  | 102 | 116 | 160 | 145 | 174 | 203 | 189 | 189 | 189 | 15  | -57 | 29   | 73   | 15   | -28  | 42  |    |    |    |    |    |    |
| MEAN | -101 | -96  | -75  | -75  | -28  | 7    | 26   | 38  | 54  | 91  | 114 | 135 | 142 | 140 | 145 | 149 | 140 | 131 | 116 | 82  | 61   | 15   | -25  | -58  | 47  |    |    |    |    |    |    |

TROMSØ. DECLINATION, D=0 DEG. W + TABULAR QUANTITIES EXPRESSED IN TENTH OF MINUTES, HOURLY MEAN VALUES

APRIL 1972

| DAY | 1    | 2    | 3    | 4    | 5    | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20   | 21   | 22   | 23   | 24   | 25  | 26 | 27 | 28 | 29 | 30 |
|-----|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|-----|----|----|----|----|----|
|     | 3    | 47   | 32   | 18   | 18   | 18  | 3   | -25 | 61  | 90  | 119 | 148 | 206 | 192 | 148 | 134 | 119 | 105 | 76  | -127 | 18   | -11  | -707 | -344 | 14  |    |    |    |    |    |
|     | -54  | -11  | -199 | -272 | -243 | 3   | 61  | 18  | 3   | 47  | 105 | 119 | 119 | 119 | 119 | 105 | 90  | 76  | 76  | 76   | 61   | 3    | 32   | 47   | 20  |    |    |    |    |    |
|     | 47   | 47   | 47   | 47   | 18   | 18  | 3   | 3   | 18  | 61  | 90  | 119 | 134 | 134 | 119 | 105 | 105 | 105 | 105 | 134  | 119  | 90   | -83  | 3    | 66  |    |    |    |    |    |
|     | -54  | -69  | -54  | 3    | 90   | 47  | 47  | 76  | 76  | 76  | 119 | 119 | 148 | 163 | 206 | 192 | 177 | 192 | 90  | 90   | 18   | -83  | 18   | -11  | 69  |    |    |    |    |    |
|     | -127 | -199 | 3    | 32   | 18   | 90  | 90  | 47  | 32  | 61  | 90  | 148 | 119 | 134 | 119 | 105 | 90  | 76  | 90  | 90   | 90   | 76   | 76   | 76   | 59  |    |    |    |    |    |
|     | 76   | 61   | 61   | 47   | 32   | 32  | 18  | 32  | 61  | 61  | 134 | 134 | 134 | 192 | 90  | 105 | 90  | 105 | 76  | 90   | 76   | 61   | 76   | 76   | 80  |    |    |    |    |    |
|     | 76   | 61   | 61   | 47   | 47   | 47  | 18  | 32  | 32  | 61  | 105 | 134 | 163 | 221 | 177 | 177 | 163 | 163 | 134 | 134  | 119  | 105  | 3    | -54  | 93  |    |    |    |    |    |
|     | 61   | 61   | 61   | 47   | 18   | 32  | 3   | 3   | 32  | 61  | 90  | 119 | 119 | 119 | 105 | 105 | 105 | 177 | 148 | 163  | 90   | 47   | 76   | 61   | 79  |    |    |    |    |    |
|     | -127 | -54  | 32   | 32   | 18   | 18  | 18  | 18  | 18  | 47  | 76  | 105 | 119 | 105 | 90  | 76  | 76  | 76  | 90  | 90   | 76   | 76   | 76   | 76   | 51  |    |    |    |    |    |
|     | 76   | 76   | 61   | 61   | 47   | 32  | 32  | 32  | 47  | 47  | 76  | 119 | 134 | 119 | 105 | 90  | 119 | 134 | 192 | 177  | 134  | 90   | 32   | 18   | 85  |    |    |    |    |    |
|     | 47   | 47   | 32   | 3    | -25  | -40 | -25 | -11 | 47  | 90  | 119 | 163 | 177 | 163 | 105 | 90  | 90  | 105 | 119 | 163  | 3    | 61   | 61   | -11  | 65  |    |    |    |    |    |
|     | -54  | 3    | 3    | 32   | 32   | 18  | 32  | 47  | 32  | 90  | 134 | 177 | 206 | 206 | 221 | 250 | 235 | 119 | 105 | 119  | -54  | -141 | -272 | -315 | 51  |    |    |    |    |    |
|     | -344 | -199 | -54  | -25  | 32   | 18  | 32  | 90  | 90  | 105 | 119 | 192 | 206 | 177 | 221 | 351 | 235 | 221 | 134 | 148  | -127 | -156 | -199 | -83  | 49  |    |    |    |    |    |
|     | -54  | -156 | -83  | -69  | -54  | 3   | -98 | 47  | 47  | 90  | 119 | 90  | 76  | 192 | 163 | 163 | 148 | 90  | 76  | 90   | 76   | 61   | 18   | -40  | 41  |    |    |    |    |    |
|     | -54  | 32   | 18   | 3    | -11  | -25 | -40 | -11 | 32  | 76  | 105 | 148 | 177 | 163 | 177 | 221 | 235 | 105 | 134 | 134  | 61   | 18   | 18   | 47   | 73  |    |    |    |    |    |
|     | -11  | -11  | -54  | -69  | -25  | 3   | 18  | 61  | 76  | 90  | 105 | 119 | 134 | 119 | 90  | 105 | 119 | 134 | 221 | 148  | 105  | 90   | 47   | -25  | 66  |    |    |    |    |    |
|     | -199 | -69  | -25  | 18   | 3    | -11 | 3   | 32  | 61  | 105 | 134 | 90  | 90  | 76  | 76  | 76  | 90  | 221 | 221 | 206  | 163  | 61   | 18   | 63   |     |    |    |    |    |    |
|     | 61   | -54  | -199 | -446 | -272 | -69 | 3   | 32  | 18  | 163 | 540 | 743 | 946 | 670 | 511 | 569 | 627 | 453 | 264 | 293  | 308  | 206  | -54  | -127 | 216 |    |    |    |    |    |
|     | -40  | 18   | 47   | 32   | 18   | 32  | 47  | 47  | 61  | 119 | 148 | 221 | 380 | 148 | 90  | 90  | 76  | 76  | 90  | 90   | 90   | 76   | 61   | 76   | 87  |    |    |    |    |    |
|     | 61   | 47   | 47   | 32   | 18   | 3   | -11 | 47  | 47  | 76  | 90  | 134 | 148 | 90  | 177 | 177 | 206 | 235 | 235 | 18   | 61   | 3    | 105  | 92   |     |    |    |    |    |    |
|     | -417 | -286 | -199 | -344 | -272 | -54 | 61  | 18  | 47  | 105 | 221 | 395 | 511 | 366 | 279 | 322 | 511 | 366 | 308 | 163  | 105  | 76   | 32   | 32   | 97  |    |    |    |    |    |
|     | 47   | 47   | 32   | 32   | 18   | 3   | 3   | 3   | 32  | 76  | 90  | 105 | 119 | 148 | 134 | 134 | 134 | 279 | 380 | 250  | 235  | 18   | -330 | -11  | 82  |    |    |    |    |    |
|     | -25  | 32   | 3    | -25  | 3    | 3   | 18  | 3   | 18  | 90  | 105 | 148 | 134 | 177 | 192 | 163 | 119 | 134 | 119 | 134  | 76   | 90   | 105  | -83  | 72  |    |    |    |    |    |
|     | 76   | 61   | 61   | 47   | 32   | 18  | 32  | 47  | 76  | 90  | 105 | 134 | 177 | 163 | 134 | 134 | 119 | 119 | 148 | 148  | 119  | 105  | 90   | 61   | 95  |    |    |    |    |    |
|     | 61   | 47   | 47   | 32   | 18   | 18  | 18  | 32  | 61  | 119 | 163 | 148 | 134 | 119 | 105 | 90  | 90  | 90  | 90  | 90   | 90   | 90   | 90   | 47   | 75  |    |    |    |    |    |
|     | 61   | 61   | 61   | 32   | 18   | 3   | -11 | -11 | 18  | 61  | 105 | 119 | 134 | 119 | 105 | 90  | 76  | 76  | 76  | 90   | 90   | 90   | 61   | 3    | 63  |    |    |    |    |    |
|     | 61   | 47   | 32   | 32   | 18   | 3   | -11 | -25 | -11 | 61  | 105 | 148 | 163 | 177 | 163 | 134 |     |     |     |      |      |      |      |      | 68  |    |    |    |    |    |
|     |      |      |      |      |      |     |     |     |     | 32  | 47  | 105 | 192 | 337 | 453 | 4   |     |     |     |      |      |      |      |      |     |    |    |    |    |    |







































TROMSØ. VERTICAL INTENSITY, Z=51200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,  
HOURLY MEAN VALUES

NOVEMBER 1972

| DAY  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16   | 17   | 18   | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  | 29  | 30  |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1    | 281 | 314 |     |     | 281 | 195 | 182 | 162 | 195 | 97  | 84  | 90  | 5   | 51  | 215 | 176  | 162  | 149  | 136 | 162 | 149 | 156 | 169 | 162 | 162 | 149 | 156 | 169 | 162 | 162 |
| 2    | 182 | 287 | 176 | 248 | -7  | 103 | 143 | 143 | 156 | 136 | 169 | 162 | 162 | 162 | 156 | 169  | 103  | 182  | -60 | 182 | 314 | 149 | 281 | 268 | 165 |     |     |     |     |     |
| 3    | 117 | 150 | 51  | 104 | 97  | 136 | 150 | 150 | 150 | 150 | 156 | 150 | 150 | 150 | 150 | 150  | 150  | 150  | 143 | 150 | 110 | 110 | 136 | 150 | 135 |     |     |     |     |     |
| 4    | 130 | 104 | 136 | 143 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 143 | 143 | 143 | 143 | 156  | 156  | 163  | 169 | 117 | 77  | 104 | 110 | 135 |     |     |     |     |     |     |
| 5    | 117 | 150 | 143 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 143 | 143 | 143 | 143 | 143  | 143  | 143  | 143 | 150 | 143 | 143 | 130 | 123 | 139 |     |     |     |     |     |
| 6    | 130 | 136 | 143 | 143 | 143 | 136 | 136 | 136 | 130 | 130 | 143 | 136 | 136 | 136 | 136 | 143  | 156  | 162  | 149 | 143 | 90  | 123 | 110 | 103 | 134 |     |     |     |     |     |
| 7    | 130 | 136 | 136 | 136 | 136 | 136 | 136 | 130 | 136 | 143 | 156 | 169 | 162 | 176 | 149 | 143  | 156  | 162  | 143 | 123 | 84  | 110 | 70  | 156 | 138 |     |     |     |     |     |
| 8    | 150 | 123 | 110 | 130 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 143 | 150 | 150 | 136 | 163  | 156  | 163  | 150 | 143 | 130 | 130 | 136 | 117 | 139 |     |     |     |     |     |
| 9    | 97  | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 136 | 136 | 150 | 169 | 169 | 176 | 202  | 169  | 150  | 143 | 136 | 25  | 84  | 18  | 58  | 127 |     |     |     |     |     |
| 10   | 51  | 84  | 110 | 123 | 123 | 123 | 130 | 130 | 130 | 136 | 143 | 143 | 156 | 150 | 163 | 163  | 163  | 163  | 150 | 143 | 143 | 136 | 130 | 84  | 132 |     |     |     |     |     |
| 11   | 77  | 103 | 110 | 97  | 110 | 123 | 130 | 130 | 130 | 136 | 136 | 136 | 136 | 136 | 162 | 149  | 176  | 156  | 136 | 70  | 110 | 136 | 136 | 130 | 127 |     |     |     |     |     |
| 12   | 130 | 136 | 130 | 130 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 150 | 150 | 150 | 143  | 150  | 136  | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 138 |     |     |     |     |
| 13   | 130 | 104 | 110 | 130 | 130 | 130 | 137 | 137 | 137 | 137 | 130 | 130 | 130 | 130 | 137 | 137  | 137  | 137  | 143 | 137 | 124 | 104 | 124 | 129 |     |     |     |     |     |     |
| 14   | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 137 | 137 | 130 | 130 | 137 | 137 | 137 | 137 | 137  | 150  | 170  | 156 | 150 | 143 | 137 | 124 | 43  | 133 |     |     |     |     |     |
| 15   | 51  | 104 | 130 | 130 | 117 | 117 | 117 | 117 | 124 | 130 | 137 | 163 | 176 | 170 | 78  | -197 | -112 | 84   | 117 | 97  | 110 | 137 | 235 | 445 | 115 |     |     |     |     |     |
| 16   | 58  | 71  | 58  | 84  | 71  | 32  | 91  | 150 | 189 | 176 | 150 | 170 | 104 | 32  | 176 | 163  | 137  | 51   | 104 | 150 | 229 | 275 | 242 | 84  | 126 |     |     |     |     |     |
| 17   | 44  | 110 | 130 | 123 | 136 | 136 | 136 | 143 | 143 | 163 | 169 | 182 | 176 | 182 | 169 | 136  | 156  | 182  | 117 | 150 | 150 | 51  | 90  | 110 | 136 |     |     |     |     |     |
| 18   | 110 | 123 | 104 | 97  | 117 | 123 | 123 | 130 | 143 | 156 | 156 | 156 | 156 | 156 | 182 | 156  | 169  | 163  |     |     |     |     |     |     | 140 |     |     |     |     |     |
| 19   |     |     |     |     |     |     |     |     |     | 136 | 149 | 156 | 162 | 149 | 169 | 176  | 156  | 162  | 162 | 156 | 84  | 70  | 110 | 143 | 142 |     |     |     |     |     |
| 20   | 84  | 163 | -1  | -33 | 58  | 110 | 123 | 130 | 143 | 156 | 150 | 136 | 143 | 143 | 58  | -47  | 182  | 176  | 248 | 248 | 25  | 130 | 136 | 176 | 119 |     |     |     |     |     |
| 21   | 150 | 117 | 110 | 97  | 117 | 137 | 143 | 156 | 170 | 156 | 143 | 143 | 143 | 143 | 156 | 156  | 156  | 170  | 143 | 143 | 104 | 117 | 130 | 130 | 138 |     |     |     |     |     |
| 22   | 110 | 117 | 110 | 137 | 137 | 137 | 143 | 143 | 143 | 137 | 137 | 137 | 170 | 163 | 84  | -13  | -125 | -46  | 32  | 64  | 91  | 97  | 124 | 170 | 99  |     |     |     |     |     |
| 23   | 150 | 156 | 104 | 110 | 143 | 150 | 150 | 150 | 150 | 137 | 137 | 143 | 163 | 176 | 163 | 163  | 110  | 143  | 130 | 110 | 104 | 156 | 137 | 84  | 138 |     |     |     |     |     |
| 24   | 163 | 137 | 117 | 124 | 130 | 137 | 143 | 143 | 137 | 143 | 143 | 143 | 143 | 143 | 143 | 150  | 150  | 156  | 156 | 163 | 163 | 143 | 143 | 143 | 144 |     |     |     |     |     |
| 25   | 143 | 136 | 143 | 143 | 136 | 130 | 136 | 136 | 136 | 130 | 130 | 136 | 143 | 143 | 143 | 143  | 150  | 150  | 123 | 110 | 58  | 77  | 182 | 347 | 141 |     |     |     |     |     |
| 26   | 156 | 123 | 71  | 104 | 130 | 143 | 150 | 143 | 143 | 143 | 136 | 156 | 163 | 169 | 150 | 143  | 156  | 150  | 150 | 156 | 156 | 150 | 143 | 136 | 142 |     |     |     |     |     |
| 27   | 117 | 5   | 44  | 123 | 136 | 150 | 143 | 143 | 143 | 143 | 143 | 143 | 136 | 136 | 143 | 136  | -47  | -139 | -60 | 182 | 176 | 169 | 196 | 150 | 108 |     |     |     |     |     |
| 28   | 130 | 130 | 130 | 143 | 136 | 136 | 143 | 143 | 143 | 136 | 136 | 136 | 136 | 143 | 31  | -14  | -7   | 18   | 64  | 77  | 143 | 169 | 208 | 235 | 118 |     |     |     |     |     |
| 29   | 261 | 182 | 97  | 110 | 116 | 136 | 143 | 143 | 143 | 143 | 149 | 149 | 149 | 149 | 169 | 162  | 156  | 156  | 136 | 110 | 103 | 169 | 182 | 57  | 144 |     |     |     |     |     |
| 30   | 77  | 136 | 143 | 143 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 143 | 143 | 143 | 149 | 149  | 149  | 149  | 136 | 84  | 314 | 156 | 77  | 130 | 140 |     |     |     |     |     |
| MEAN | 126 | 134 | 111 | 122 | 125 | 131 | 137 | 139 | 143 | 140 | 142 | 146 | 145 | 144 | 144 | 124  | 122  | 130  | 124 | 139 | 132 | 132 | 142 | 148 | 134 |     |     |     |     |     |

TROMSØ. VERTICAL INTENSITY, Z=51200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,  
HOURLY MEAN VALUES

DECEMBER 1972

| DAY | 1   | 2   | 3   | 4   | 5   | 6   | 7     | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27 | 28 | 29 | 30 | 31 |
|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|
| 1   | 130 | 123 | 110 | 77  | 104 | 110 | 123   | 130 | 130 | 130 | 136 | 143 | 143 | 143 | 143 | 150 | 136 | 163 | 150 | 143 | 136 | 136 | 136 | 132 |     |     |    |    |    |    |    |
| 2   | 136 | 136 | 136 | 130 | 123 | 130 | 123   | 130 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 143 | 90  | 123 | 104 | 136 | 136 | 136 | 136 | 130 |     |     |    |    |    |    |    |
| 3   | 136 | 117 | 84  | 104 | 123 | 130 | 130   | 130 | 130 | 130 | 130 | 130 | 136 | 136 | 136 | 143 | 156 | 156 | 156 | 136 | 71  | 97  | 130 | 143 | 127 |     |    |    |    |    |    |
| 4   | 143 | 143 | 136 | 136 | 136 | 136 | 130   | 123 | 117 | 123 | 130 | 130 | 136 | 143 | 143 | 150 | 156 | 143 | 156 | 150 | 143 | 136 | 123 | 130 | 137 |     |    |    |    |    |    |
| 5   | 136 | 143 | 143 | 143 | 136 | 136 | 136   | 130 | 130 | 130 | 130 | 130 | 130 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 136 | 104 | 71  | 131 |     |    |    |    |    |    |
| 6   | 104 | 123 | 130 | 130 | 130 | 130 | 130   | 130 | 130 | 123 | 123 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 136 | 143 | 64  | 90  | 104 | 90  | 121 |     |    |    |    |    |    |
| 7   | 44  | 64  | 51  | 97  | 110 | 123 | 130   | 130 | 123 | 117 | 123 | 123 | 130 | 130 | 130 | 136 | 136 | 136 | 136 | 130 | 130 | 130 | 130 | 117 | 117 |     |    |    |    |    |    |
| 8   | 130 | 130 | 130 | 130 | 130 | 130 | 130   | 123 | 130 | 130 | 123 | 130 | 130 | 130 | 130 | 150 | 156 | 163 | 182 | 176 | 150 | 123 | 117 | 163 | 25  | 133 |    |    |    |    |    |
| 9   | 84  | 136 | 136 | 136 | 130 | 130 | 130   | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 136 | 156 | 156 | 162 | 149 | 143 | 136 | 51  | 70  | 128 |     |    |    |    |    |    |
| 10  | 130 | 143 | 143 | 136 | 130 | 130 | 130   | 130 | 130 | 136 | 136 | 136 | 136 | 136 | 130 | 130 | 130 | 130 | 136 | 136 | 149 | 143 | 136 | 136 | 134 |     |    |    |    |    |    |
| 11  | 136 | 136 | 136 | 136 | 136 | 136 | 136   | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 136 | 136 | 156 | 156 | 162 | 149 | 136 | 90  | 97  | 133 |     |    |    |    |    |    |
| 12  | 123 | 136 | 136 | 130 | 123 | 123 | 123   | 123 | 123 | 123 | 130 | 130 | 130 | 130 | 130 | 130 | 130 | 143 | 150 | 136 | 51  | 90  | 90  | 182 | 125 |     |    |    |    |    |    |
| 13  | 150 | 5   | 58  | 104 | 110 | 110 | 110   | 117 | 143 | 136 | 163 | 169 | 130 | 176 | 77  | 117 | -14 | -60 | 18  | 189 | 150 | 307 | 202 | 189 | 119 |     |    |    |    |    |    |
| 14  | 156 | 136 | 136 | 143 | 123 | 143 | 150   | 136 | 143 | 143 | 143 | 143 | 156 | 176 | 169 | 176 | 169 | 150 | 143 | 150 | 97  | 143 | 143 | 136 | 143 |     |    |    |    |    |    |
| 15  | 136 | 143 | 143 | 136 | 130 | 123 | 130   | 130 | 136 | 156 | 182 | 182 | 123 | 31  | 136 | 163 | 182 | 163 | 110 | 123 | 248 | 380 | 136 | 84  | 150 |     |    |    |    |    |    |
| 16  | 150 | 248 | 281 | 182 | 18  | 77  | 117   | 143 | 130 | 169 | 163 | 143 | 189 | 176 | 182 | 156 | 176 | 44  | -40 | -20 | 130 | 163 | 64  | 84  | 130 |     |    |    |    |    |    |
| 17  | 38  | 90  | 110 | 123 | 116 | 149 | 143   | 149 | 162 | 156 | 169 | 162 | 169 | 208 | 169 | 162 | 162 | 156 | 123 | 51  | 116 | 130 | 136 | 110 | 139 |     |    |    |    |    |    |
| 18  | 97  | 110 | 116 | 123 | 130 | 136 | 143   | 136 | 143 | 149 | 156 | 162 | 162 | 156 | 176 | 162 | 176 | 143 | 156 | 149 | 103 | 97  | 103 | 130 | 138 |     |    |    |    |    |    |
| 19  | 136 | 143 | 143 | 136 | 136 | 136 | 136   | 136 | 136 | 136 | 136 | 143 | 149 | 149 | 162 | 143 | 162 | 149 | 130 | 110 | 130 | 123 | 116 | 57  | 134 |     |    |    |    |    |    |
| 20  | 110 | 130 | 123 | 123 | 136 | 143 | 143</ |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |



| TROMSO,        | DECLINATION, D=0 DEG. W + TABULAR QUANTITIES EXPRESSED IN TENTH OF MINUTES,<br>HOURLY MEAN VALUES |      |      |      |     |     |     |     |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|----------------|---|------|------|------|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| JANUARY 1972   | -56   | -49  | -25  | 3    | 36  | 58  | 69  | 68  | 75 | 83  | 89  | 104 | 111 | 107 | 115 | 86  | 99  | 109 | 102 | 80  | 75  | 47  | 27  | -7  | 59 |
| FEBRUARY 1972  | -36   | -23  | -4   | 13   | 42  | 49  | 58  | 60  | 62 | 74  | 85  | 110 | 118 | 123 | 125 | 120 | 121 | 114 | 124 | 102 | 78  | 22  | 10  | -55 | 62 |
| MARCH 1972     | -101  | -96  | -75  | -75  | -28 | 7   | 26  | 38  | 54 | 91  | 114 | 135 | 142 | 140 | 145 | 149 | 140 | 131 | 116 | 82  | 61  | 15  | -25 | -58 | 47 |
| APRIL 1972     | -37   | -16  | -23  | -34  | -16 | 9   | 15  | 27  | 39 | 85  | 138 | 185 | 220 | 208 | 187 | 183 | 186 | 170 | 159 | 133 | 88  | 51  | -30 | -18 | 80 |
| MAY 1972       | -49   | -63  | -56  | -33  | -20 | -5  | 11  | 28  | 58 | 111 | 135 | 154 | 157 | 158 | 156 | 153 | 144 | 158 | 164 | 145 | 122 | 85  | 44  | -2  | 74 |
| JUNE 1972      | -46   | -67  | -89  | -66  | -46 | -41 | -28 | -7  | 23 | 83  | 108 | 135 | 165 | 169 | 185 | 190 | 195 | 194 | 184 | 180 | 136 | 77  | 35  | -13 | 70 |
| JULY 1972      | -35   | -45  | -52  | -70  | -53 | -34 | -23 | 5   | 37 | 67  | 99  | 125 | 145 | 146 | 141 | 151 | 150 | 157 | 150 | 152 | 123 | 85  | 34  | 0   | 60 |
| AUGUST 1972    | -56   | -134 | -110 | -102 | -90 | -89 | -77 | -26 | 22 | 46  | 79  | 121 | 133 | 138 | 145 | 143 | 144 | 142 | 136 | 129 | 100 | 84  | 41  | -4  | 38 |
| SEPTEMBER 1972 | -76   | -59  | -63  | -39  | -12 | 5   | 27  | 43  | 58 | 93  | 103 | 122 | 118 | 127 | 119 | 119 | 104 | 99  | 110 | 76  | 34  | -5  | -34 | -94 | 40 |
| OCTOBER 1972   | -85   | -73  | -45  | -12  | 17  | 37  | 39  | 53  | 53 | 76  | 100 | 125 | 127 | 133 | 109 | 102 | 85  | 92  | 96  | 38  | 29  | -12 | -46 | -78 | 40 |
| NOVEMBER 1972  | -42   | -60  | -13  | 13   | 23  | 40  | 46  | 59  | 69 | 69  | 82  | 95  | 102 | 102 | 103 | 95  | 97  | 78  | 85  | 42  | 46  | -10 | -18 | -55 | 44 |
| DECEMBER 1972  | -6  | 6    | -6   | 13   | 42  | 46  | 59  | 66  | 64 | 74  | 75  | 86  | 95  | 88  | 93  | 77  | 76  | 81  | 72  | 63  | 41  | 31  | -5  | -12 | 51 |
| MEAN 1972      | -52   | -57  | -47  | -33  | -9  | 6   | 18  | 34  | 51 | 79  | 101 | 125 | 136 | 136 | 135 | 131 | 128 | 127 | 124 | 102 | 78  | 39  | 3   | -32 | 55 |

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| TROMSO,        | HORIZONTAL INTENSITY, H=11200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,<br>HOURLY MEAN VALUES |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| JANUARY 1972   | 80   | 90  | 101 | 128 | 161 | 174 | 175 | 169 | 171 | 171 | 173 | 183 | 196 | 193 | 201 | 213 | 207 | 202 | 186 | 170 | 153 | 129 | 93  | 68  | 158 |
| FEBRUARY 1972  | 109  | 119 | 136 | 149 | 169 | 171 | 169 | 169 | 167 | 164 | 162 | 175 | 183 | 195 | 192 | 198 | 203 | 193 | 194 | 178 | 167 | 122 | 89  | 86  | 161 |
| MARCH 1972     | -1   | 52  | 81  | 104 | 132 | 152 | 162 | 164 | 162 | 170 | 173 | 183 | 192 | 195 | 206 | 224 | 234 | 233 | 210 | 164 | 110 | 91  | 55  | 34  | 146 |
| APRIL 1972     | 94   | 126 | 135 | 141 | 155 | 170 | 171 | 166 | 159 | 160 | 173 | 185 | 201 | 225 | 237 | 233 | 229 | 231 | 216 | 180 | 144 | 111 | 101 | 84  | 168 |
| MAY 1972       | 103  | 105 | 139 | 163 | 170 | 171 | 170 | 164 | 157 | 160 | 163 | 180 | 197 | 206 | 224 | 235 | 240 | 241 | 230 | 197 | 143 | 129 | 111 | 80  | 170 |
| JUNE 1972      | 83   | 110 | 119 | 165 | 187 | 157 | 162 | 165 | 168 | 166 | 190 | 206 | 232 | 223 | 237 | 253 | 258 | 251 | 229 | 195 | 154 | 117 | 99  | 87  | 176 |
| JULY 1972      | 116  | 130 | 138 | 147 | 157 | 169 | 168 | 167 | 162 | 164 | 169 | 177 | 185 | 211 | 233 | 249 | 253 | 244 | 230 | 211 | 180 | 147 | 101 | 94  | 175 |
| AUGUST 1972    | 76   | 69  | 96  | 114 | 118 | 86  | 128 | 146 | 166 | 174 | 174 | 199 | 220 | 244 | 255 | 247 | 244 | 238 | 201 | 170 | 131 | 88  | 64  | 97  | 156 |
| SEPTEMBER 1972 | 90   | 119 | 130 | 134 | 144 | 170 | 173 | 170 | 168 | 165 | 171 | 178 | 191 | 203 | 217 | 220 | 229 | 213 | 177 | 138 | 116 | 100 | 77  | 43  | 156 |
| OCTOBER 1972   | 45   | 102 | 129 | 155 | 169 | 174 | 176 | 176 | 176 | 179 | 186 | 198 | 212 | 217 | 220 | 227 | 220 | 207 | 187 | 130 | 101 | 106 | 62  | 48  | 159 |
| NOVEMBER 1972  | 90   | 98  | 131 | 122 | 169 | 190 | 191 | 189 | 189 | 194 | 195 | 193 | 202 | 203 | 217 | 232 | 233 | 199 | 197 | 171 | 119 | 115 | 113 | 69  | 168 |
| DECEMBER 1972  | 140  | 157 | 149 | 168 | 190 | 190 | 188 | 188 | 189 | 188 | 191 | 196 | 204 | 205 | 210 | 212 | 203 | 211 | 204 | 179 | 175 | 137 | 125 | 129 | 180 |
| MEAN 1972      | 85   | 106 | 124 | 141 | 160 | 164 | 169 | 169 | 170 | 171 | 177 | 188 | 201 | 210 | 221 | 229 | 230 | 222 | 205 | 173 | 141 | 116 | 91  | 77  | 164 |

TROMSØ. VERTICAL INTENSITY, Z=51200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,  
HOURLY MEAN VALUES

|                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| JANUARY 1972   | 105 | 90  | 77  | 74  | 82  | 91  | 98  | 102 | 105 | 109 | 112 | 114 | 115 | 111 | 111 | 87  | 77  | 78  | 82  | 95  | 110 | 97  | 96  | 108 | 97  |
| FEBRUARY 1972  | 93  | 95  | 87  | 83  | 90  | 97  | 100 | 101 | 106 | 109 | 110 | 105 | 109 | 112 | 108 | 107 | 105 | 104 | 108 | 107 | 111 | 113 | 102 | 103 | 103 |
| MARCH 1972     | 119 | 101 | 88  | 75  | 76  | 75  | 86  | 94  | 101 | 103 | 107 | 112 | 119 | 120 | 121 | 124 | 115 | 107 | 98  | 101 | 116 | 114 | 109 | 127 | 105 |
| APRIL 1972     | 104 | 102 | 100 | 89  | 85  | 88  | 95  | 100 | 105 | 108 | 109 | 112 | 112 | 112 | 115 | 114 | 114 | 111 | 100 | 100 | 111 | 132 | 141 | 122 | 108 |
| MAY 1972       | 120 | 103 | 92  | 87  | 89  | 94  | 99  | 104 | 108 | 112 | 113 | 114 | 122 | 130 | 127 | 129 | 128 | 120 | 109 | 105 | 117 | 118 | 121 | 130 | 112 |
| JUNE 1972      | 114 | 122 | 105 | 89  | 106 | 102 | 110 | 114 | 128 | 123 | 123 | 121 | 115 | 130 | 136 | 117 | 116 | 111 | 118 | 119 | 119 | 120 | 128 | 134 | 118 |
| JULY 1972      | 114 | 117 | 101 | 100 | 101 | 101 | 108 | 109 | 112 | 114 | 118 | 123 | 130 | 130 | 129 | 131 | 130 | 125 | 122 | 115 | 117 | 121 | 130 | 118 | 117 |
| AUGUST 1972    | 154 | 145 | 131 | 142 | 133 | 120 | 129 | 114 | 120 | 129 | 131 | 131 | 137 | 146 | 145 | 134 | 128 | 130 | 120 | 127 | 146 | 156 | 158 | 150 | 136 |
| SEPTEMBER 1972 | 120 | 115 | 101 | 125 | 125 | 115 | 117 | 122 | 130 | 134 | 139 | 144 | 151 | 154 | 153 | 139 | 137 | 131 | 136 | 144 | 155 | 153 | 174 | 157 | 136 |
| OCTOBER 1972   | 135 | 120 | 118 | 113 | 108 | 111 | 123 | 129 | 137 | 146 | 146 | 144 | 146 | 154 | 155 | 144 | 136 | 119 | 119 | 133 | 142 | 152 | 160 | 163 | 136 |
| NOVEMBER 1972  | 126 | 134 | 111 | 122 | 125 | 131 | 137 | 139 | 143 | 140 | 142 | 146 | 145 | 144 | 144 | 124 | 122 | 130 | 124 | 139 | 132 | 132 | 142 | 148 | 134 |
| DECEMBER 1972  | 119 | 137 | 123 | 121 | 121 | 127 | 128 | 131 | 134 | 136 | 140 | 140 | 141 | 144 | 144 | 146 | 139 | 124 | 121 | 130 | 126 | 139 | 121 | 114 | 131 |
| MEAN 1972      | 119 | 115 | 103 | 102 | 104 | 104 | 111 | 113 | 119 | 122 | 124 | 126 | 128 | 132 | 132 | 125 | 121 | 116 | 113 | 118 | 125 | 129 | 132 | 131 | 119 |

TROMSØ. DECLINATION, D=0 DEG, W + TABULAR QUANTITIES EXPRESSED IN TENTH OF MINUTES,  
QUIET MEAN VALUES.

|                |    |    |     |     |     |     |     |     |    |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|----------------|----|----|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| JANUARY 1972   | 68 | 68 | 68  | 69  | 72  | 72  | 69  | 75  | 76 | 89  | 96  | 105 | 103 | 94  | 93  | 91  | 91  | 91  | 87  | 74  | 68  | 68  | 68 | 68 | 87 |
| FEBRUARY 1972  | 65 | 61 | 58  | 56  | 51  | 57  | 58  | 55  | 57 | 76  | 87  | 99  | 109 | 102 | 101 | 93  | 90  | 91  | 88  | 76  | 64  | 63  | 63 | 61 | 76 |
| MARCH 1972     | 71 | 69 | 55  | 46  | 46  | 38  | 36  | 43  | 56 | 78  | 100 | 119 | 119 | 111 | 83  | 83  | 77  | 83  | 81  | 82  | 81  | 76  | 73 | 69 | 75 |
| APRIL 1972     | 65 | 57 | 51  | 38  | 16  | 11  | 8   | 9   | 26 | 62  | 93  | 117 | 120 | 124 | 106 | 100 | 86  | 84  | 88  | 85  | 87  | 83  | 80 | 66 | 67 |
| MAY 1972       | 56 | 36 | 8   | 1   | 0   | -4  | 2   | 20  | 71 | 108 | 137 | 154 | 153 | 137 | 131 | 115 | 119 | 120 | 118 | 113 | 94  | 80  | 66 | 63 | 85 |
| JUNE 1972      | 18 | 18 | -17 | -24 | -24 | -28 | -11 | 9   | 42 | 95  | 132 | 156 | 164 | 157 | 150 | 137 | 123 | 105 | 104 | 107 | 107 | 104 | 80 | 67 | 93 |
| JULY 1972      | 20 | 6  | -20 | -24 | -26 | -27 | -26 | -12 | 28 | 64  | 98  | 127 | 139 | 138 | 132 | 115 | 103 | 99  | 119 | 121 | 110 | 88  | 69 | 51 | 66 |
| AUGUST 1972    | 52 | 38 | 0   | -10 | -27 | -27 | -19 | 0   | 25 | 67  | 91  | 117 | 130 | 122 | 86  | 70  | 63  | 79  | 74  | 102 | 89  | 78  | 65 | 51 | 56 |
| SEPTEMBER 1972 | 49 | 33 | 24  | 11  | 8   | 11  | 20  | 33  | 54 | 89  | 90  | 95  | 94  | 96  | 82  | 77  | 67  | 70  | 87  | 84  | 72  | 64  | 51 | 53 | 60 |
| OCTOBER 1972   | 35 | 33 | 32  | 30  | 32  | 35  | 31  | 34  | 41 | 64  | 81  | 96  | 102 | 102 | 92  | 90  | 82  | 84  | 82  | 75  | 68  | 42  | 57 | 43 | 65 |
| NOVEMBER 1972  | 29 | 32 | 32  | 40  | 43  | 48  | 51  | 53  | 55 | 77  | 78  | 89  | 86  | 88  | 83  | 78  | 82  | 73  | 76  | 62  | 59  | 35  | 28 | 22 | 61 |
| DECEMBER 1972  | 46 | 46 | 45  | 50  | 51  | 50  | 56  | 59  | 63 | 70  | 75  | 77  | 77  | 78  | 76  | 75  | 76  | 74  | 67  | 57  | 48  | 46  | 47 | 48 | 62 |
| MEAN 1972      | 46 | 39 | 30  | 29  | 26  | 27  | 29  | 35  | 51 | 78  | 94  | 109 | 111 | 106 | 98  | 91  | 87  | 86  | 89  | 86  | 80  | 67  | 60 | 51 | 69 |

TROMSØ, HORIZONTAL INTENSITY, H=11200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,  
QUIET MEAN VALUES.

|                |   |   |     |
|----------------|---|---|-----|
| JANUARY 1972   | 168 168 168 168 171 172 171 170 169 167 167 169 171 170 171 171 174 176 175 173 173 168 168 168 | 170   |     |
| FEBRUARY 1972  | 171 169 171 172 174 174 174 171 168 161 158 163 167 169 171 175 176 175 174 174 174 174 168 171 | 170   |     |
| MARCH 1972     | 177 178 179 181 180 178 176 169 165 158 157 161 169 172 173 173 174 176 178 182 182 182 180 178 | 173   |     |
| APRIL 1972     | 181 182 184 182 181 177 173 165 157 146 146 155 162 165 174 181 185 185 185 185 185 182 173 177 | 173   |     |
| MAY 1972       | 190 188 180 182 180 174 166 159 152 151 153 166 179 178   | 195 194 197 194 188 180 189                 | 171 |
| JUNE 1972      | 200 197 176 180 174 161 152 143 146   | 179 179 191 202 202 195 194 205 202 202 195 | 183 |
| JULY 1972      | 182 184 181 179 177 169 160 153 147 150 153 162 173 183 191 198 209 205 206 197 197 188 191     | 173   |     |
| AUGUST 1972    | 182 183 181 181 179 174 165 157 151 147 140 143 163 170 182                                     | 211 191 181 176 177 176                     | 169 |
| SEPTEMBER 1972 | 185 184 183 180 184 177 173 166 160 162 159 159 163 172 177 185 181 185 190 189 188 190 191 189 | 176   |     |
| OCTOBER 1972   | 183 182 183 183 183 182 180 176 169 163 161 163 168 171 177 178 184 186 186 185 185 181 181 181 | 177   |     |
| NOVEMBER 1972  | 185 185 183 185 186 186 186 184 181 179 178 181 181 185 186 185 187 184 185 187 187 185 185     | 184   |     |
| DECEMBER 1972  | 185 186 186 187 190 191 191 188 188 185 184 185 188 189 191 192 190 192 189 190 189 187 185 185 | 188   |     |
| MEAN 1972      | 181 182 182 182 182 180 177 171 167 164 165 169 174 177 180 183 184 187 188 188 186 184 180 181 | 177   |     |

TROMSØ, VERTICAL INTENSITY, Z=51200 + TABULAR QUANTITIES EXPRESSED IN GAMMA,  
QUIET MEAN VALUES.

|                |   |                         |     |
|----------------|---|-------------------------|-----|
| JANUARY 1972   | 109 108 103 103 101 104 104 103 103 104 105 105 107 108 106 107 109 110 109 109 106 99 102 102  | 105                     |     |
| FEBRUARY 1972  | 106 108 109 108 107 106 107 105 105 106 108 108 110 111 111 111 111 111 111 109 111 110 105 105 | 108                     |     |
| MARCH 1972     | 107 107 106 105 105 103 104 103 102 105 107 108 113 112 113 110 108 105 103 100 101 106 105 106 | 106                     |     |
| APRIL 1972     | 106 108 108 107 107 106 105 103 103 105 106 104 105 109 111 112 108 106 106 105 101 100 101 105 | 106                     |     |
| MAY 1972       | 113 106 108 107 110 109 107 107 105 104 106 104 108 111 118 119 120 119 117 114 111 114 111 114 | 109                     |     |
| JUNE 1972      | 116 116 116 115 107 112 109 109 111 105 107 108 103 107 107 128 117 115 112 111 107 108 107 108 | 110                     |     |
| JULY 1972      | 113 113 114 113 112 111 112 112 112 108 110 110 108 108 109 110 109 116 118 117 115 113 111 111 | 112                     |     |
| AUGUST 1972    | 133 131 131 133 133 133 129 127 127 128 127 125 131 133 131 129 132                             | 136 126 129 124 124 124 | 129 |
| SEPTEMBER 1972 | 126 127 127 123 126 124 124 124 126 126 129 137 138 135 132 132 132 130 131 133 130 126 125 127 | 128                     |     |
| OCTOBER 1972   | 130 128 131 131 131 130 131 131 132 132 131 132 134 136 134 133 132 130 130 132 139 135 123 125 | 132                     |     |
| NOVEMBER 1972  | 132 134 135 134 132 133 137 139 139 136 140 141 143 143 146 145 146 145 142 140 138 138 136 135 | 138                     |     |
| DECEMBER 1972  | 136 138 137 134 132 133 133 132 132 131 133 134 135 136 136 137 138 136 140 140 137 137 134 136 | 135                     |     |
| MEAN 1972      | 119 121 121 120 119 119 118 117 118 117 119 120 123 124 124 124 123 121 121 119 118 118 116 117 | 120                     |     |

TROMSO.

K=INDICES FOR THREE-HOUR INTERVAL  
RANGE 2000 GAMMA FOR K=9, SCALE VALUES D=4.77 GAMMA H=5.28 GAMMA Z=6.57 GAMMA

JANUARY 1972

Table with 3 columns: Day (1-31), K-index (0-9), and Gamma value (0-31).

FEBRUARY 1972

Table with 3 columns: Day (1-28), K-index (0-9), and Gamma value (0-31).

MARCH 1972

Table with 3 columns: Day (1-31), K-index (0-9), and Gamma value (0-31).

APRIL 1972

Table with 3 columns: Day (1-30), K-index (0-9), and Gamma value (0-31).

TROMSO.

K=INDICES FOR THREE-HOUR INTERVAL  
RANGE 2000 GAMMA FOR K=9, SCALE VALUES D=4.77 GAMMA H=5.28 GAMMA Z=6.57 GAMMA

MAY 1972

Table with 3 columns: Day (1-31), K-index (0-9), and Gamma value (0-31).

JUNE 1972

Table with 3 columns: Day (1-30), K-index (0-9), and Gamma value (0-31).

JULY 1972

Table with 3 columns: Day (1-31), K-index (0-9), and Gamma value (0-31).

AUGUST 1972

Table with 3 columns: Day (1-31), K-index (0-9), and Gamma value (0-31).



TROMSO.

K=INDICES FOR THREE-HOUR INTERVAL  
RANGE 2000 GAMMA FOR K=9. SCALE VALUES D=4.77 GAMMA H=5.28 GAMMA Z=6.57 GAMMA

SEPTEMBER 1972

Table with 10 columns of data for September 1972, rows 1-30.

OCTOBER 1972

Table with 10 columns of data for October 1972, rows 1-31.

NOVEMBER 1972

Table with 10 columns of data for November 1972, rows 1-30.

DECEMBER 1972

Table with 10 columns of data for December 1972, rows 1-31.

JANUARY 1972  
SUDDEN COMMENCEMENTS

Table with 3 columns of data for January 1972 sudden commencements.

JANUARY 1972  
BAYS

NONE

JANUARY 1972  
SUDDEN IMPULSES

Table with 3 columns of data for January 1972 sudden impulses.

FEBRUARY 1972  
SUDDEN COMMENCEMENTS

Table with 3 columns of data for February 1972 sudden commencements.

FEBRUARY 1972  
BAYS

NONE

FEBRUARY 1972  
SUDDEN IMPULSES

Table with 3 columns of data for February 1972 sudden impulses.

MARCH 1972  
SUDDEN COMMENCEMENTS

Table with 3 columns of data for March 1972 sudden commencements.

MARCH 1972

BAYS  
NONE

MARCH 1972  
SUDDEN IMPULSES

Table with 3 columns of data for March 1972 sudden impulses.

APRIL 1972  
SUDDEN COMMENCEMENTS

Table with 3 columns of data for April 1972 sudden commencements.

APRIL 1972  
BAYS

Table with 3 columns of data for April 1972 bays.

APRIL 1972  
SUDDEN IMPULSES

Table with 3 columns of data for April 1972 sudden impulses.

MAY 1972  
 SUDDEN COMMENCEMENTS  
 1 1957 SSC - + B  
 6 1821 SSC\* + \*\* C  
 9 0517 SSC + + A  
 15 1849 SSC - - A  
 17 2100 SSC + - B  
 30 2000 SSC - - B  
 31 2200 SSC - + B

MAY 1972  
 BAYS  
 NONE

MAY 1972  
 SUDDEN IMPULSES  
 20 2154 SI - - B

JUNE 1972  
 SUDDEN COMMENCEMENTS  
 8 1951 SSC\* \*\* + H  
 17 0628 SSC + - B  
 22 2039 SSC - + A  
 23 2209 SSC - + B

JUNE 1972  
 BAYS  
 11 1300 B + A

JUNE 1972  
 SUDDEN IMPULSES  
 1 2139 SI - + A  
 4 2124 SI - - A  
 6 2212 SI\* \*\* + A  
 17 1311 SI\* + - A

JULY 1972  
 SUDDEN COMMENCEMENTS  
 6 2036 SSC + - A  
 9 1954 SSC + - B  
 14 2033 SSC\* \*\* \*\* A  
 17 2158 SSC + + B  
 19 1857 SSC + + B

JULY 1972  
 BAYS  
 4 1335 H + - A  
 24 1230 BS + - A  
 30 1318 H + - A

JULY 1972  
 SUDDEN IMPULSES  
 4 2049 SI - - B  
 9 2117 SI - - B  
 9 2146 SI\* - \*\* A  
 11 1947 SI - - B  
 26 2124 SI - - A

AUGUST 1972  
 SUDDEN COMMENCEMENTS  
 1 2251 SSC\* - \*\*  
 4 0171 SSC\* + \*\*  
 14 2130 SSC - +  
 25 2258 SSC\* + \*\*  
 29 1846 SSC + -

AUGUST 1972  
 BAYS  
 NONE

AUGUST 1972  
 SUDDEN IMPULSES  
 8 1344 SI + -  
 8 2127 SI + -  
 10 1958 SI + +  
 10 2020 SI - -  
 15 2040 SI + +

SEPTEMBER 1972  
 SUDDEN COMMENCEMENTS  
 3 1902 SSC + + B  
 13 1239 SSC\* \*\* - A  
 22 1908 SSC - + C  
 24 2037 SSC - + B  
 29 1658 SSC\* \*\* \*\* B

SEPTEMBER 1972  
 BAYS  
 NONE

SEPTEMBER 1972  
 SUDDEN IMPULSES  
 6 2050 SI + + A

OCTOBER 1972  
 SUDDEN COMMENCEMENTS  
 3 2036 SSC\* - - A  
 15 1827 SSC - + B  
 18 2154 SSC\* \*\* \*\* B  
 28 2152 SSC - + A  
 31 1655 SSC\* \*\* + A

OCTOBER 1972  
 BAYS  
 NONE

OCTOBER 1972  
 SUDDEN IMPULSES  
 NONE

NOVEMBER 1972  
 SUDDEN COMMENCEMENTS  
 7 1929 SSC - + A  
 25 1958 SSC + + A

NOVEMBER 1972  
 BAYS  
 11 1415 B + - A

NOVEMBER 1972  
 SUDDEN IMPULSES  
 6 1929 SI + + B  
 6 2021 SI\* \*\* \*\* A  
 8 2253 SI\* - \*\* B  
 13 2148 SI - - A  
 21 1945 SI + + B  
 21 2014 SI + + A

DECEMBER 1972  
 SUDDEN COMMENCEMENTS  
 2 1659 SSC + +  
 12 2000 SSC + +  
 14 2132 SSC - +

DECEMBER 1972  
 BAYS  
 NONE

DECEMBER 1972  
 SUDDEN IMPULSES  
 NONE

the 1990s, the number of people with a disability in the United States has increased by 25% (U.S. Census Bureau, 1997).

As a result of the increase in the number of people with disabilities, the need for accessible information has become more acute. The National Center for Accessible Information (NCAI) has estimated that the number of people with disabilities who are unable to access information is 100 million (NCAI, 1997).

One of the most significant barriers to accessible information is the lack of accessible electronic information. The National Center for Accessible Information (NCAI) has estimated that the number of people with disabilities who are unable to access electronic information is 100 million (NCAI, 1997).

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