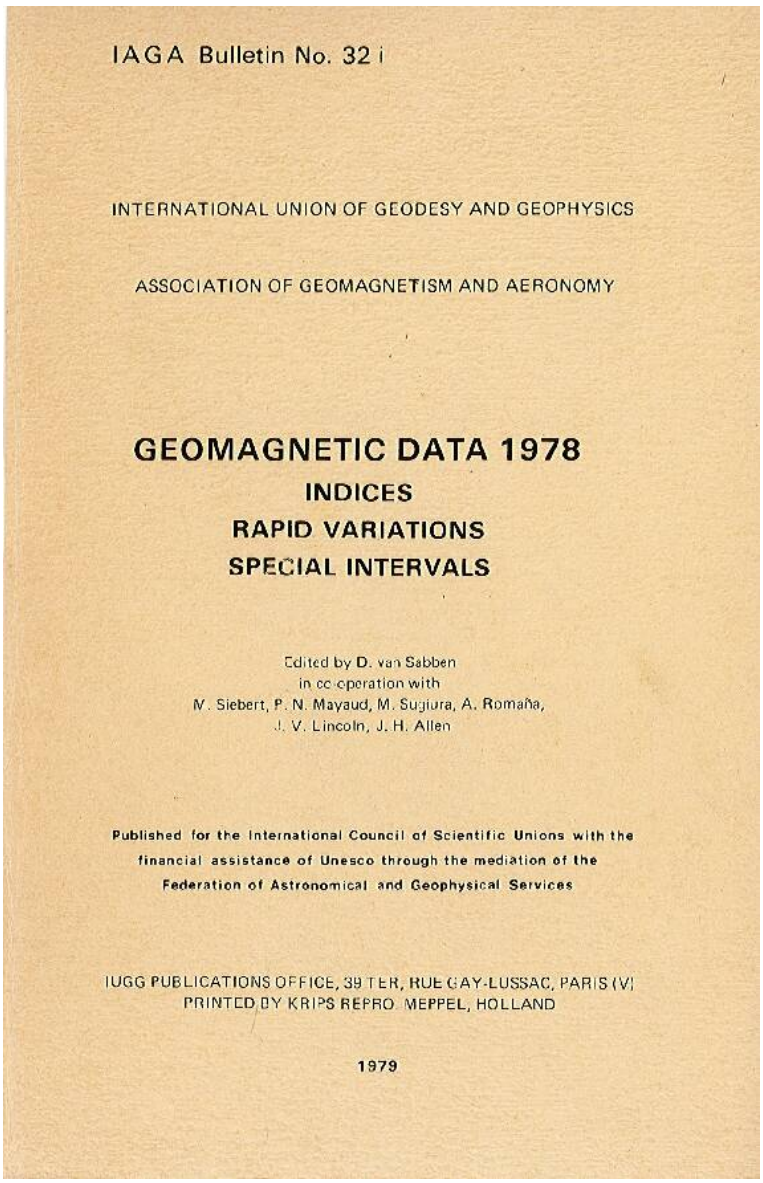


How to cite:

Van Sabben, D., Siebert, M., Mayaud, P. N., Sugiura, M., Romana, A., Lincoln, J. V., Allen, J. H., & IAGA (1979). *IAGA Bulletin No. 32i, Geomagnetic Data 1978, Indices, Rapid Variations, Special Intervals.* IUGG Publications Office. https://doi.org/10.25577/g9s1-e555

IAGA Bulletin No. 32 i

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

ASSOCIATION OF GEOMAGNETISM AND AERONOMY

GEOMAGNETIC DATA 1978

INDICES
RAPID VARIATIONS
SPECIAL INTERVALS

Edited by D. van Sabben
in co-operation with
M. Siebert, P. N. Mayaud, M. Sugiura, A. Romaña,
J. V. Lincoln, J. H. Allen

Published for the International Council of Scientific Unions with the financial assistance of Unesco through the mediation of the Federation of Astronomical and Geophysical Services

IUGG PUBLICATIONS OFFICE, 39 TER, RUE GAY-LUSSAC, PARIS (V)
PRINTED BY KRIPS REPRO MEPPEL, HOLLAND

1979

IAGA Bulletin No. 32 i

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

ASSOCIATION OF GEOMAGNETISM AND AERONOMY

GEOMAGNETIC DATA 1978

INDICES
RAPID VARIATIONS
SPECIAL INTERVALS

Edited by D. van Sabben
in co-operation with
M. Siebert, P. N. Mayaud, M. Sugiura, A. Romaña,
J. V. Lincoln, J. H. Allen

Published for the International Council of Scientific Unions with the financial assistance of Unesco through the mediation of the Federation of Astronomical and Geophysical Services

IUGG PUBLICATIONS OFFICE, 39 TER, RUE GAY-LUSSAC, PARIS (V)
PRINTED BY KRIPS REPRO, MEPPEL, HOLLAND

1979

UNESCO Subvention 1979

DG/2.1/414/47

C O N T E N T S

Introduction IV

Explanation of the tables and diagrams VII

Part A. LIST OF OBSERVATORIES 0

Part B. INDICES and INTERNATIONAL QUIET AND DISTURBED DAYS

Table 1 Indices aa, 1978 4

Table 2a Monthly and yearly aa, 1868 - 1978 6

Table 2b Monthly and yearly Ap, 1932 - 1978 8

Table 3 International quiet and disturbed days, 1978 9

Table 4 Planetary three-hour-indices Kp and equivalent ranges ap, daily indices Ap and Cp, 1978 10

Table 5 Frequencies of Kp-indices 16

Table 6 Monthly averages of Ap and Cp 16

Table 7 List of magnetic storms 17

Table 8 Very quiet intervals 17

Table 8a List of Kp' 17

27-day recurrence diagrams for Kp, 1978 18

Table 9 Indices Kn, Ks, Km, amplitudes an, as, am, daily indices An, As, Am and their monthly mean values, 1978 20

Table 10 Hourly equatorial Dst-index, 1978 38

Graph of hourly Dst-indices 50

Table 11 Daily, monthly and annual mean values of Dst, 1978 53

References to other indices:

Q. Quarter hourly disturbance index for high latitude stations . . . 54

R. Hourly disturbance index for high latitude stations 55

AE. Auroral electrojet activity index 56

Kp, Ap and Cp References to tables and diagrams 57

Part C. RAPID VARIATIONS, 1978

Table 1 Sudden commencements of magnetic storms (ssc) 58

Table 2a Solar-flare effects (sfe) 61

Table 2b Doubtful solar-flare effects 63

Table 3 Very unusual events 65

Diagram of magnetic activity, 1978 69

Part D. DATA ON SPECIAL INTERVALS

1978 January 2 - 5 70

January 28 - 31 74

February 13 - 16 78

March 24 - 27 82

April 29 - May 2 86

May 2 - 5 90

May 7 - 10 94

May 31 - June 3 98

August 26 - 29 102

September 26 - 29 106

Corrected pages 86 and 87 preliminary AE of IAGA-Bulletin No. 32g . . 110

Corrections and additions to list of observatories (IAGA-Bulletin No. 32h) 112

Appendix

A report on Km-observatory visits by P.N. Mayaud and M. Menvielle . . . 113

INTRODUCTION

The IAGA-Bulletin No. 32 series is a yearly compilation of magnetic indices and other geomagnetic data, based on the reports of a great number of magnetic observatories. The series is the continuation of the former IAGA-Bulletin No. 12 and is prepared for publication by the International Service of Geomagnetic Indices (ISGI) at De Bilt. The elaborated data are at present provided by the following institutes, under the responsibility of the adjoining collaborators:

Institut für Geophysik, Göttingen (M. Siebert): Kp, ap, Ap, Cp, Q- and D-days.
Institut de Physique du Globe, Paris (P.N. Mayaud): aa, Kn, Ks, Km, An etc.
NASA-Goddard Space Flight Center, Greenbelt (M. Sugiura): Dst.
Observatorio del Ebro, Roquetas (A. Romana): Rapid variations.
Environmental Data Service, Boulder (J.V. Lincoln): Magnetic storm data, K-tables, magnetograms; (J.H. Allen): AE-data.

The ISGI, formerly called Permanent Service or "C- and K-center", operates under the supervision of IAGA-Division V: Observatories, Instruments, Indices and Data. Since 1954 it forms part of the Federation of Astronomical and Geophysical Services. The work began in 1906 with the collection and publication of the daily character figure C (as reported by the observatories in a scale 0-2) and its daily mean value, the international character figure Ci, together with lists of selected quiet and disturbed days. In 1938, this work was extended backwards to 1890.

According to a recommendation of the IAGA-Assembly in Grenoble (1975) a new index aa is published instead of Ci since 1976 and the C-figures are no longer compiled.

The three-hourly K-index (scale 0-9) was introduced by Bartels in 1938. From the K-figures of 12 selected stations, planetary indices Kp were derived. Both K and Kp were officially adopted by the IAGA in 1951 and the series of Kp was extended backwards to 1932 during the subsequent period. The K-figures of the selected stations for these early years were published as supplementary (table 1b) in Bulletins 12g and 12l. In addition to Kp, the corresponding range figures ap and related daily indices Ap and Cp have been published regularly in the IAGA-Bulletins 12.

In accordance with recommendations of the IAGA-Assemblies in Madrid (1969) and Moscow (1971), the publication in the IAGA-Bulletins of C- and K-indices of individual observatories ended with the 1969-data, whereas planetary indices like Dst, Kn, Km and a survey of magnetic storms were included from 1970 onwards. This change marked the end of the series IAGA-Bulletin No. 12 and the beginning of the new series IAGA-Bulletin No. 32. The publication of the derived indices Ci, Kp etc. and the international quiet and disturbed days (Q- and D-days) continued in the new series (Ci up to 1976).

The K-indices of individual observatories have been put on magnetic tape for the years 1969 through 1974. These tapes are available through the World Digital Data Centers for Geomagnetism. Besides, tables of local K-indices can be found in the bulletins or yearbooks of many observatories.

The aa-indices form a series of indices beginning in the year 1868. A full description of these indices is given in the IAGA-Bulletin No. 33, which contains tables and graphs of aa for the years 1868-1967. Descriptions are also given in two short papers (Ann. Géophys., 27, 62-70, 1971 and J. Geophys. Res., 77, 6870-6874, 1972), in connection with comparisons with other indices am, ap or Ci. All data given in the tables are available on magnetic tape from the appropriate World Data Centers, using the format described in IAGA-Bulletin No. 33.

The meaning of C, Ci, K and Kp is explained in textbooks, e.g. Landolt-Börnstein, Zahlenwerte und Funktionen, Band 3. pp. 731-744 (Berlin 1952, Springer Verlag), and in Terrestrial Magnetism and Atmospheric Electricity 44, pp. 441-433 (1939) and 46, pp. 301-303 (1941). The results of an extensive study on the index K by P.N. Mayaud are given, together with practical rules for its determination, in the "Atlas of Indices K", IAGA-Bulletin No. 21 (1967). The exact definition of Kp is given in IATME-Bulletin No. 12b, reprinted at the end of the IAGA-Bulletin No. 12i, and in the Journal of Geophysical Research, Vol. 54, pp. 295-299, Sept. 1949. The indices have also been described, for use in correlation studies in other geophysical fields, in the Annals of the IGY, Vol. 4, pp. 227-236 (London, Pergamon Press 1957).

A collection of diagrams for Kp, 1932/33 and 1940 to 1950, together with diagrams for the daily characters 1884-1950, is given in: Abhandlungen Akad. Wiss. Göttingen, Math.-Phys. Klasse, Sonderheft 1 (1951). A second collection from 1937 up to 1958 has appeared in: Abhandlungen Akad. Wiss. Göttingen, Math.-Phys. Klasse, Beiträge zum Geophysikalischen Jahr, Heft 3 (1958). A discussion on time variations of geomagnetic activity, indices Kp and Ap, 1932-1961 has appeared in Annales de Géophysique, Tome 19, pp. 1-20, 1963. Tables and diagrams of these planetary indices for the whole period 1932-1961 are printed in IAGA-Bulletin No. 18.

Other planetary indices derived from the K-indices, are the three-hourly indices Kn and Ks for the Northern- and Southern hemisphere and the mondial index Km. These indices are published in the IAGA-Bulletin No. 32 from 1968*) onwards. They are described in a publication of the Centre National de la Recherche Scientifique, Paris 1968: "Indices Kn, Ks et Km, 1964-1967", by P.N. Mayaud. The indices for the years 1959-1963 are published in the special IAGA-Bulletin No. 39. The complete series of these indices and the related quantities an, as etc. for the years from 1959 onwards is available on punched cards at WDC-A for Solar Terr. Physics, Boulder, in a format analogous to the one in the above publication.

The equatorial Dst-index for ring current intensity is also published in the IAGA-Bulletin 32 from 1970 onwards. A description of this index is given in the reports for earlier years. Hourly values of Dst for the years 1957-1970 based on the data of three stations, have been published by M. Sugiura and D.J. Poros in the report No. X-645-71-278 of the Goddard Space Flight Center. This report supersedes earlier Dst-publications by Sugiura and co-workers. Recently, these Dst values have been recomputed, using the data of four stations. Hourly Dst-values for the IGY, based on the data of eight stations, are given in the Annals of the IGY, Vol. 35. The same volume contains three-hourly values of Dst for the IGY as determined by W. Kertz in a somewhat different way. The hourly values from 1957 onwards are available on magnetic tape at WDC-A for Solar. Terr. Physics, Boulder.

The auroral electrojet index AE cannot be included in IAGA-Bulletin No. 32, because this index is not available in time. However, data on preliminary AE-indices for selected intervals are included in part D of this Bulletin. References to AE are given at the end of part B, together with references to the indices Q and R from individual observatories and to indices Kp, Ap and Cp of earlier years.

A description of many indices mentioned in this introduction is given by M. Siebert in "Handbuch der Physik", Vol. 49/3, pp. 206-275 (Springer Verlag 1971).

*) For Kn, Ks etc. 1969 and 1968 see Supplementary Tables in Part E of the IAGA-Bulletins No. 32a and 32b respectively.

Data on rapid variations are given less extensive than in the former IAGA-Bulletins. According to decisions made at the IAGA-Assemblies in Madrid, 1969, and in Grenoble, 1975, the lists of sudden impulses (si), bays and pulsations, minor disturbances and rejected solar-flare effects are omitted. Storm sudden commencements (ssc) are presented in a new way (see: Explanation, page X). Pulsations without bays have been published in the quarterly bulletins and their yearly supplement up to 1 January 1974.

The Bulletin 32 further contains a data survey for special intervals (mostly magnetic storms) consisting of a survey of indices over the selected time intervals, data on sc's, ranges etc. from individual observatories and magnetograms of selected stations, reduced to the same time scale and comparable intensity scales.

Most data appearing in the yearly IAGA-Bulletin 32 have been given earlier in monthly bulletins partly in a preliminary form.

The values of Kp, Ap and Cp for a calendar month are usually available, in a table and in graphical representation, before the end of the next month, and they are distributed, in time for 27-day recurrence forecasts, to about 400 institutions in many countries. This service is carried out by the Institut für Geophysik, Herzberger Landstrasse 180, 34 Göttingen, Germany. Requests may be directed to this address.

Monthly tables of Kn, Ks, Km and related quantities are distributed by the Institut de Physique du Globe de Paris, 4 Place Jussieu, Tour 14, 75230 Paris Cedex 05, France.

Monthly bulletins on aa, selected quiet and distrubed days and preliminary data on rapid geomagnetic variations are sent to about 190 observatories and institutions by the International Service of Geomagnetic Indices, c/o Royal Netherlands Meteorological Institute, De Bilt, Netherlands.

The data on rapid variations are collected and prepared for publication at the Observatorio del Ebro, Roquetas, Spain.

Much of the data published in these bulletins can also be found in the monthly publication "Solar Geophysical Data" issued by the NOAA Environmental Data Service, Boulder, Colorado, USA.

IAGA-Division V: Observatories, Instruments, Indices and Data

Paul H. Serson, Chairman

International Service of Geomagnetic Indices

D. van Sabben, Director

Koninklijk Nederlands Meteorologisch Instituut, De Bilt, Netherlands

EXPLANATION OF THE TABLES AND DIAGRAMS

Part A. List of Observatories

The observatories are arranged according to their geographic latitudes. Only those observatories are listed which have reported data on geomagnetic indices or rapid variations. For observatories which have moved over a small distance, the old name is sometimes maintained, but the coordinates correspond always with the new site.

The first column gives the three-letter code for the observatories, which replaces the former two-letter code. (A list of three-letter symbols for all observatories has been published in IAGA-Bulletin No. 32h, page 106-116. Additions and corrections to that list are given in the last pages of subsequent bulletins of this series). The last two columns contain the lower limit for K = 9 used by the observatory in scaling K-indices and the period of time for which the observatory reported K-indices. Of this period, the first and, if the reporting has ended, the last year are given. A letter indicates whether the reporting has been continuous or almost continuous (C) or with interruptions (I). Details of the reporting periods can be found in IAGA-Bulletin 12, page 12 (up to 1947) and corresponding places in later IAGA-Bulletins, up to No. 12x (1969).

Part B. Indices

B. 1, 2a: The aa-indices are derived from the K-indices of two antipodal observatories (invariant magnetic latitude 50°). They provide a quantative characterization of the magnetic activity, which is homogeneous through the whole series. Half-daily and daily values give an estimate of the activity level very close to that obtained with am-indices. Values are in nanotesla's (nT) and correspond to the activity level at an invariant magnetic latitude of 50°. In the table B1 the following values are listed

N = daily values for the Northern hemisphere
S = daily values for the Southern hemisphere
M = half-daily values of aa-indices for the Greenwich day.

Letters C and K in the tables refer to a classification of the quiet days of the month (C = really quiet, K = quiet, but with one or a few slightly disturbed three hourly intervals). The letters on the left refer to the 24 hours Greenwich day, on the right to a period of 48 hours centered on the Greenwich noon. The five international quiet days of each month are indicated by the letter Q.

Table B2a provides a survey of monthly and yearly mean values of aa for the years from 1868 onwards.

A graph of aa-indices for these years is given below table B2a. This graph is drawn from a series of points representing yearly averages of aa-indices. The ordinate of each point (one point per month) is a twelve months average such that the points plotted at the marked year intervals are in each case averages for January to December of that year. Ordinates are in nT's.

B. 2b: For explanation of the daily index Ap, see B4.

B. 3: The international quiet and disturbed days are explained below the table.

B. 4: The planetary three-hour-range index Kp is the mean standardized K-index from 13 observatories between 46° and 63° northern or southern geomagnetic latitude. The scale is 0 to 9, expressed in thirds of a unit, e.g. 5- is $4\frac{2}{3}$, 5o is 5, 5+

is $5\frac{1}{3}$. This planetary index is designed to measure solar particle radiation by its magnetic effects, especially to meet the need of research workers in the ionospheric field. Several other indices are derived from Kp, namely the 3 hour index ap (the equivalent range) and the daily indices Ap and Cp.

The Kp-stations are: Meanook (Canada), Sitka (Alaska), Lerwick (Shetlands), Eskdalemuir (Scotland), Lovö (Sweden), Rude Skov (Denmark), Wingst (Germany), Witteveen (Netherlands), Hartland (England), Ottawa (Canada), Fredericksburg (Virginia), Amberley (New Zealand), Toolangi (Australia).

The three hour equivalent amplitude ap is related to Kp as follows:

Kp =	0o	0+	1-	1o	1+	2-	2o	2+	3-	3o	3+	4-	4o	4+
ap =	0	2	3	4	5	6	7	9	12	15	18	22	27	32
Kp =	5-	5o	5+	6-	6o	6+	7-	7o	7+	8-	8o	8+	9-	9o
ap =	39	48	56	67	80	94	111	132	154	179	207	236	300	400

In order to use ap as an equivalent amplitude, it is considered in relation to the conditions at a standard station, which is a station having the lower limit of 500 nT for K = 9. At such a station the average range in nT of the most disturbed of the three force components in a three hour-interval can be taken as 2.ap (for instance, for Kp = 3+, as 36 nT). In other words ap is an equivalent amplitude in the unit 2 nT.

The column headed Ap gives the daily average for the eight valeus ap per day. Therefore, Ap may be called the "equivalent daily amplitude Ap", expressed in the unit 2 nT for a standard station.

Observatories wishing to compute, from their own K-indices, a local equivalent amplitude ak, may proceed as follows:

K =	0	1	2	3	4	5	6	7	8	9
ak =	0	3	7	15	27	48	80	140	240	400

This table is valid for all observatories. Using the values of the table, ak has the meaning of an index. If it is desired to convert the index ak into an equivalent amplitude in the unit nT, the conversion factor is obtained from the lower limit for K = 9 valid at the station by dividing the limit by 250. For instance, at Sodankylä, where the lower limit for K = 9 is 1500 nT, the factor is 6, so that, for K = 3, the equivalent amplitude is 90 nT, or, in other words the index ak for Sodankylä expresses equivalent amplitudes in the unit 6 nT. Similary, Ak is the daily average of the ak.

Use of the daily Ap (planetary) or Ak (local value) is recommended in preference to the sum of the indices Kp or K.

The last column gives the daily planetary character figure Cp, as defined in Bulletin 12e, p. 111. It should be noted that Cp, introduced for a standardization of the international character-figures Ci, has not been approved by the Association. Instead, Ap was preferred. For a rough conversion of Ci-figures (prior to 1932) into Ap, the following table (derived from Bulletin 12e, p. 111, Table 2) may be used:

10.Ci =	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ap =	2	4	5	6	8	9	11	12	14	16	19	22	26	31	37	44	52	63	80	110	160

B. 5-8: These tables give the frequencies of occurrence of Kp-values during the year,

the monthly average values of Ap and Cp and lists of magnetic storms and very quiet intervals, based on the successive occurrence of certain Kp-values.

The diagrams of Kp show the values of Kp from the table B4 in a "musical note script" as defined in the key. The arrangement in solar rotations is made in order to show the 27-day recurrence tendency.

B. 9: The three-hourly indices Kn and Ks for the Northern and Southern hemispheres are based on the amplitude-indices an and as, which are derived from the K-indices of observatories in the sub-auroral zones of the Northern and Southern hemispheres. These K-indices are standardized according to the distances of the stations to the auroral zones. The stations are arranged in groups, each group representing a longitude sector in one of the hemispheres. The mean standardized K for each sector is converted back into an equivalent amplitude and the weighted means an and as of these amplitudes are converted back into Kn and Ks. The mondial index am is the average of an and as, and Km is determined in the same way by conversion of am (this method is different from the method followed in the case of Kp, where ap is derived from Kp).

As the tables are printed mechanically by computer, the values of Kn, Ks and Km, which vary by thirds of a unit, are tabulated in the form 3Kn, 3Ks and 3Km. An, As and Am are the daily mean values of the amplitudes an, as and am, Am2 is the mean of am over a 48-hour period centered in the middle of the day. σn and σs indicate the standard deviations of the sector values of K in the N.- and S. hemispheres. They are about equal to six times these standard deviations. Monthly mean values of An, As and Am are given at the bottom of the tables.

The diagram of magnetic activity displays the variation of (an-as)/2 (upper curve), of am = (an+as)/2 (mid curve), and Dst (bottom curve). It also shows the ssc's of the year, as listed in part C of this bulletin, in two ways: Vertical bars below the am curve refer to the quality of the ssc (the length of the bar is proportional to the sum of the five code numbers attributed to the event); those below the Dst curve refer to its amplitude. See IAGA-Bulletin 39 for other details.

B. 10, 11: The equatorial Dst-index for the intensity of the ring current is the deviation of the horizontal component H from its quiet time value, averaged over a number of low latitude stations. These stations are: Honolulu (Pacific), San Juan (USA), Hermanus (South Africa) and Kakioka (Japan). The exact definition of Dst is given in earlier data publications (see Introduction for references). Monthly tables of hourly Dst-values are given, followed by a table of daily mean values and a graph of hourly values for the whole year.

Part. C. Rapid Variations

C. 1: Sudden commencements followed by a magnetic storm or by an increase in activity lasting at least one hour (ssc). This list is based upon the data as reported monthly by the observatories mentioned in the heading of the table.

The final identification of the storm sudden commencements (ssc) is made from copies of records supplied to the central bureau by five low-latitude observatories (MBO, FUQ, HON, PMG, ABG) or five supplementary observatories (TAM, PAB, API, KNY, HYB). The copies are requested for all events, also for those reported by other observatories only.

Furthermore all events are checked on the microfilm-copies of magnetograms of two low-latitude observatories. In doubtful cases, attention is especially given to the monthly reports of all observatories. See IAGA-Bulletin No.39, pp. 103-111 for a full explanation of this method, and some statistical results concerning the years 1968-1975.

The times in the column at the left are mean values obtained from all observatories; but the earliest and latest times reported by the observatories for the beginning of the event are added in parenthesis. For printing reasons only the minutes are given. These minutes generally belong to the hour of the event; but if they are underlined, they belong to the preceding hour. The next five figures indicate the qualification given to the event by the central bureau, using the above mentioned copies of low-latitude stations (if a figure is underlined, it means that the supplementary station is used). The meaning of these numbers is as follows:

2 or 3 ..... the event can be unmistakably identified as being an ssc from the single record under consideration; 3 is imposed instead of 2 when the following three features are present: very sharp change of rhythm, large amplitude of the sudden move, remarkably morphology of it;

1 ..... means that the event seen in this particular record is possibly an ssc, but is not sufficiently clear by itself for stating that it is a true ssc; one needs records from other longitudes for getting a firm judgement;

0 ..... means that, from the record under consideration, the event could escape from the attention of the observer or does not deserve to be called an ssc.

After these numbers are given the average duration of the event in minutes (time-interval between the beginning and the maximum of the sudden move) and its average amplitude in nT at the five low-latitude observatories. The next group indicate the number of observatories which have given either letter A or letter B or letter C in their monthly report (The meaning of A, B and C is explained in the heading of Table C3. The qualification 3, 2 or 1, given by the central bureau, is independent of the qualification A, B or C, given by the observer). The last group indicates the number of observatories which have identified the event as an si (sudden impuls, a sudden magnetic change which could not be classified as an ssc).

C. 2a: Solar-flare effects (sfe) were reported by many observatories. A check of the reported cases has been made by the observatories, mentioned in the heading of the table. In some cases data from the monthly reports of other stations have also been used, in order to get a better idea of the reported effects. The symbols of such stations are included in square brackets. The times tabulated in the column at the left are mean values of the times given for the beginning of a phenomenon. In cases where a clear simultaneous disturbance from an ionospheric or solar observatory or from a radio service, which gives support to the geomagnetic solar-flare effect, has been well established, the indicated time has been underlined. The stations which reported the sfe are given behind the indicated time, grouped according to the quality-indications A, B, C, D, E in their reports (viz. heading Table C3).

Observatories near the subsolar point are underlined. Stations lying in the twilight-zone, which reported a clear disturbance are indicated by dotted brackets. Stations under the same circumstances in full dark have been given in parentheses. Stations on the night-side of the earth, which gave a negative or doubtful answer, have been omitted.

C. 2b: Doubtful solar-flare effects. In general, the following cases have been considered as doubtful: Those where well located stations (with respect to the subsolar point) did not report such an effect (although several other stations have reported it), and those where some stations in full dark mentioned a disturbance which, considering the hour and their geographic position, was probably no night-side bay co-existing with a sfe at the day-side of the earth. Further some cases were considered doubtful because the interpretation of the totality of data was hindered by simultaneous world wide pertubation and also when the solar, radio-electric and ionospheric records were available, but did not show any clear effect at the time of the presumed sfe. Nevertheless it is very probable that several of these cases are real solar-flare effects.

C. 3: Remarkable events. In this list exceptional magnetic disturbances are given of the types which are no longer reported regularly. These disturbances have been checked by the observatories mentioned in the heading of the table. They are listed because of exceptional amplitude, unusual sharp onset or other very remarkable features.

Part D. Data on special intervals

The data for each interval are given on four successive pages. One page contains a selection of magnetograms. On the opposite page, the first lines give a survey of indices Kp, Kn and Ks for the selected interval. Dst is given in a graphical form as follows: A single horizontal line indicates that Dst is negative, a double line means Dst < -50, a triple line means Dst < -100 etc. In the list of data from individual observatories the sign of the amplitude of an ssc is to be taken algebraically for D and Z; D reckoned positive if towards the East and Z reckoned positive if downwards. sc* means that the sc-movement (for which the amplitudes are given) was preceded by a small reverse impuls. The ranges of D, H and Z are the differences between the highest and the lowest values of these components attained during the storm. The end of the storm is indicated by the cessation time of reasonably marked disturbance movements in the traces, more specifically when the K-index diminishes to 2 or less for a reasonable period.

The stations for which K-indices are given, are selected on the basis of a representative distribution over all parts of the world.

Magnetograms are given for three groups of stations, namely for stations inside the polar caps (upper diagram), for stations in the auroral zones (middle diagram) and for stations in lower latitudes (lower diagram). The selected stations may not always be the same, depending on the availability of the magnetograms. The magnetograms have been reduced to the same time scale and comparable intensity scales. Only the H-component is shown, except for some stations near by the geomagnetic pole, where both H and D or X and Y are given. The Sq-variation has not been subtracted from the records.

Graphs of preliminary AU, AL and AE (= AU-AL) values for the selected intervals are given at the bottom of the magnetogram-pages in the same time scale. These graphs are indicative of the definite AE (11) values to be published later.

Tables of provisional one-minute values of AE for each selected interval are given on two pages following the two pages mentioned above. These tables contain the values of AE (5) in nanoTesla's (nT) for each minute of the 2-days-interval. The print-out is clustered in 3-line groups with 20 values per line, each group covering one hour U.T.

Erratum: The preliminary AE-indices for 19-21 Sept. 1976, given in pages 86 and 87 of IAGA-Bulletin No. 32g, are incorrect. Corrected tables are given in pages 110 and 111 of this Bulletin.

LIST OF OBSERVATORIES

Symbol	Observatory	Geographic		Geomagnetic		K=9 lower limit	K rep.
		Lat.	Long.	Lat.	Long.		
ALE	Alert	+82° 30'	297° 30'				
HIS	Heiss (B. Tikhaya)	+80 37	58 03			2000	34I -
MUR	Murchison Bay	+80 30	18 15				
CCS	Cape Chelyuskin	+77 43	104 17			2500	55C -
THL	Thule	+77 29	290 50			1000	55C70
MBC	Mould Bay	+76 12	240 36				
RES	Resolute Bay	+74 41	265 10			1500	52C55
BJN	Bjornoya (Bear Island)	+74 31	19 01			2000	57C65
DIK	Dikson	+73 33	80 34			1500	34I -
MSR	Matoshkin Shar	+73 16	56 24			2500	55C56
TIK	Tiksy	+71 35	129 00			1000	55I -
BRW	Point Barrow	+71 18	203 15			2500	57C -
TRO	Tromsø	+69 40	18 57			2000	47C -
GDH	Godhavn	+69 14	306 29			1800	43I -
CBB	Cambridge Bay	+69 06	255 00				
ABK	Abisko	+68 21	18 49			1500	
MMK	Loparskaya/Murmansk	+68 15	33 05			2500	57C -
LOZ	Lovozero	+67 59	35 01				
KIR	Kiruna	+67 50	20 25			1500	52I -
SOD	Sodankylä	+67 22	26 38			1500	14I -
CWE	Cape Wellen (Welen)	+66 10	190 10			1250	52C -
COL	College	+64 52	212 10			2500	41C -
BLC	Baker Lake	+64 20	263 58			2500	52C55
LRV	Leirvogur (Reykj.)	+64 11	338 18			1500	64C -
YKC	Yellowknife	+62 28	245 32				
SRE	Srednikan	+62 26	152 19			550	40I -
DOB	Dombås	+62 04	9 07			750	25C -
YAK	Yakutsk	+62 01	129 40			550	39I -
POD	Podk. Tungusta	+61 31	90 00			650	72C -
NAQ	Narssarssuaq	+61 06	314 48				
NUR	Nurmijärvi	+60 31	24 39			750	53C -
LER	Lerwick	+60 08	358 49			1000	32C -
MGD	Magadan	+60 07	151 01			600	67C -
LNN	Leningrad	+59 57	30 42			600	55C -
LOV	Lovö	+59 21	17 50			600	30C -
FCC	Churchill	+58 48	265 54				
BOX	Borok	+58 02	38 20				
SIT	Sitka	+57 04	224 40			1000	32C -
SVD	Sverdlovsk	+56 44	61 04			550	39I -
TMK	Tomsk	+56 28	84 56			350	58C70
ARS	Arti	+56 26	58 34				
RSV	Rude Skov	+55 51	12 27			600	40C -
KNS	Zaimishe/Kazan	+55 50	48 51			550	41C -
BFE	Brorfelde	+55 37	11 40				
MOS	Moskva	+55 29	37 19			550	45I -
ESK	Eskdalemuir	+55 19	356 48			750	32C -
GWC	Great Whale River	+55 16	282 13				
NVS	Novosibirsk	+55 02	82 54			500	72C -
KNG	Kaliningrad	+54 42	20 37				
MEA	Meanook	+54 37	246 34			500	32C -

LIST OF OBSERVATORIES - continued

Symbol	Observatory	Geographic		Geomagnetic		K=9 lower limit	K rep.
		Lat.	Long.	Lat.	Long.		
HLP	Helu	+54° 37'	18° 49'			550	56C -
MNK	Minsk	+54 30	27 53			550	62C -
STO	Stonyhurst	+53 51	357 32			600	60C66
WNG	Wingst	+53 45	9 04			500	40C -
PET	Petropavlovsk	+53 06	158 38			450	
WIT	Witteveen	+52 49	6 40			500	40C -
IRK	Irkutsk	+52 10	104 27			350	41C -
SWI	Swider	+52 07	21 15			500	37C -
NGK	Niemegk	+52 04	12 40			500	37C -
VAL	Valentia	+51 56	349 45			500	54C -
BEL	Belsk	+51 50	20 47			500	60C -
GTT	Göttingen	+51 33	9 58			500	
CLL	Collmberg	+51 19	13 00			500	54I67
ABN	Abinger/Greenwich (c)	+51 11	359 36				29C56
HAD	Hartland	+51 00	355 31			500	57C -
KIV	Kiev	+50 48	30 16			350	58C -
MAB	Manhay	+50 18	5 41			500	40C -
DOU	Dourbes	+50 06	4 36			500	55C -
PRU	Pruhonice	+49 59	14 32			500	53C73
LVV	Lvov	+49 54	23 45			550	55C -
KGD	Karaganda	+49 49	73 05			350	66C -
BDV	Budkov	+49 04	14 01			500	57I -
VIC	Victoria	+48 31	236 35			650	57C -
NEW	Newport	+48 16	242 53			700	68C -
WIK	Wien-Kobenzl	+48 16	16 19				57-58
FUR	Fürstenfeldbruck	+48 10	11 17			500	48C -
CLF	Chambon-la-Forêt	+48 01	2 16			500	40I -
HRB	Hurbanovo	+47 54	18 12			350	51C -
UBA	Ulan Bator	+47 52	107 03			300	56C -
STJ	St. Johns	+47 36	307 19			750	69C -
NTS	Nantes	+47 15	358 27			500	50C59
YSS	Yushno-Sakhalinsk	+46 57	142 43			350	54C -
TYH	Tihany/Nagycenk	+46 54	17 53				55C -
ODE	Odessa	+46 47	30 53			350	55C -
NKK	Novo Kazalinsk	+45 46	62 07			350	66C -
OTT	Ottawa	+45 24	284 27			750	68C -
SUR	Surlari	+44 41	26 15			350	57C -
GCK	Grocka	+44 38	20 46			350	58I -
ROB	Roburent/M.Capellino	+44 18	7 53				56C -
MMB	Memambetsu	+43 55	144 12			350	52C -
AGN	Agincourt (c)	+43 47	280 44			600	40C69
VLA	Ussurisk/Vladivostok	+43 41	132 10			300	52C -
AAA	Alma Ata	+43 15	76 55				64C -
PAG	Panagjuriste	+42 31	24 11			350	57C -
LGR	Logroño	+42 27	357 30			350	57C -
AQU	Aquila	+42 23	13 19			350	58C -
TFS	Tbilisi (Tiflis)	+42 05	44 42			350	40I -
TKT	Tashkent	+41 25	69 12			300	41I -
LMD	Maddalena	+41 13	9 24			350	58C63
ISK	Istanbul-Kandilli	+41 04	29 04			300	52C -

LIST OF OBSERVATORIES - continued

Sym-bol	Observatory	Geographic		Geomagnetic		K=9 lower limit	K rep.
		Lat.	Long.	Lat.	Long.		
EBR	Ebro	+40° 49'	0° 30'			350	42C -
CPI	Capri	+40 33	14 13				57-58
COI	Coimbra	+40 13	351 35			350	51C -
BOU	Boulder	+40 08	254 46			500	63C -
TOL	Toledo	+39 53	355 57			350	48C -
ONW	Onagawa	+38 36	141 28				57-59
FRD	Fredericksburg/Cheltenham	+38 12	282 38			500	32C -
PEN	Pendeli	+38 03	23 52			300	59C -
GIB	Gibilmanna (c)	+37 59	14 01			350	54C57
ASH	Ashkhabad	+37 57	58 06			300	58C -
SMG	San Miguel	+37 46	334 21			350	51C -
ALM	Almeria	+36 51	357 32			350	64C -
SFS	San Fernando	+36 28	353 48			350	40C -
KAK	Kakioka	+36 14	140 11			300	36C -
TEH	Teheran	+35 44	51 23			300	57I -
GUL	Gulmarg	+34 05	74 24				
KSA	Ksara	+33 50	35 54			300	49C -
SSO	Simosato	+33 34	135 56			300	54C -
AVE	Averoes	+33 18	352 35			350	70C -
HTY	Hatizyo	+33 04	139 50				
DAL	Dallas	+32 59	263 15				66C -
ASO	Aso	+32 53	131 01			300	57I57
TUC	Tucson	+32 15	249 10			350	38C -
KNY	Kanoya	+31 25	130 53			300	58C -
QUE	Quetta	+30 11	66 57			300	55I -
MLT	Misallat/Helwan	+29 45	30 54			300	56C -
TEN	Santa Cruz/Tenerife	+28 29	343 44			300	61C -
JAI	Jaipur	+26 55	75 48				
SHL	Shillong	+25 34	91 53				
LNP	Lunping	+25 00	121 10			300	65I -
UJJ	Ujjain	+23 11	75 47				
HVN	Havana	+22 58	277 51				64-68
TAM	Tamanrasset	+22 48	5 31			300	52I -
HON	Honolulu	+21 19	202 00			300	38C -
TEO	Teoloyucan	+19 45	260 49			300	51I -
ABG	Alibag	+18 38	72 52			300	40C -
SJG	San Juan	+18 07	293 51			300	38C -
HYB	Hyderabad	+17 25	78 33			300	69I -
MBO	M'Bour	+14 24	343 02			350	52C -
MUT	Muntinlupa	+14 22	121 01			300	64C -
GUA	Guam	+13 35	144 52			300	58C -
ANN	Annamalainagar	+11 24	79 41				57-59
AAE	Addis Ababa	+09 02	38 46			300	58-61
TRD	Trivandrum	+08 29	76 57				57C -
KOR	Koror (c)	+07 20	134 30			300	57-58
PAB	Paramaribo	+05 49	304 47				57C60
FUQ	Fuquene	+05 28	286 16			300	57C60
BNG	Bangui	+04 26	18 34			350	52I -
MFP	Moca-Fernando Poo (c)	+03 21	8 40			300	64C -
TTB	Tatuoca	-01 12	311 29				57C63

LIST OF OBSERVATORIES - continued

Symbol	Observatory	Geographic		Geomagnetic		K=9 lower limit	K rep.
		Lat.	Long.	Lat.	Long.		
LWI	Lwiro	-02° 15'	28° 48'			350	58C60
HNA	Hollandia (c)	-02 34	140 31			300	57C58
BIN	Binza	-04 23	15 16				57C69
TNG	Tangerang	-06 10	106 38			300	40I -
LUA	Luanda	-08 55	13 10			350	57C -
PMG	Port Moresby	-09 25	147 09			300	58C -
KVA	Karavia	-11 39	27 28				57-59
HUA	Huancayo	-12 02	284 41			600	37C -
API	Apia	-13 48	188 13			300	40I65
PPT	Pamatai/Papeete/Tahiti	-17 33	210 23			350	68C -
TAN	Tananarive	-18 55	47 33			300	50C -
MRI	Mauritius (c)	-20 06	57 33			500	56C60
LQA	La Quiaca	-22 06	294 24			350	64C -
VSS	Vassouras	-22 24	316 21			600	52C64
MPO	Maputo/Lourenco Marques	-25 55	32 35			300	64C68
BRS	Brisbane (c)	-27 32	152 55			500	57C64
WAT	Watheroo (c)	-30 19	115 53			350	37C59
PIL	Pilar	-31 40	296 07			300	40I -
GNA	Gnangara	-31 47	115 57			350	57C -
HER	Hermanus	-34 26	19 14			450	40C -
ACS	Las Acacias	-35 00	302 19			350	64C -
TOO	Toolangi	-37 32	145 28			500	41C -
AML	Amberley (c)	-43 09	172 43			500	37C77
TWA	Trelew	-43 15	294 41			300	57C -
EYR	Eyrewell	-43 25	172 21				77-
CZT	Crozet	-46 26	51 52			500	72C -
KGL	Kerguelen	-49 21	70 12			750	57I -
HII	Heard Isl. (c)	-53 02	73 22				52-53
SGG	South Georgia	-54 17	323 31			350	
MCQ	Macquarie Island	-54 30	158 57			1500	52C -
ORC	Orcadas del Sur	-60 44	315 13			400	69-70
AIA	Argentine Island	-65 15	295 44			500	57C -
OAS	Oasis (c)	-66 06	92 09			2000	57C58
WIL	Wilkes (c)	-66 15	110 35			2500	57I67
MIR	Mirny	-66 33	93 01			2000	57C -
DUM	Dumont d'Urville	-66 40	140 01			1800	57C -
MOL	Molodezhnaya	-67 34	45 42				
MAW	Mawson	-67 36	62 53			1500	55C -
SYO	Syowa	-69 02	39 36				67C72
CTX	Charcot (c)	-69 23	139 01			1500	57C58
PIO	Pionerskaya (c)	-69 44	95 30			2000	57C58
SNA	Sanae	-70 19	357 40				64I70
RBD	Base Baudouin (c)	-70 26	24 19				64C66
NVL	Novolazarevskaya/Lazarev	-70 46	11 50			1500	60C -
HLL	Hallett (c)	-72 19	170 13			2500	57C62
EGS	Eights (c)	-75 14	282 50				63-65
HLY	Halley Bay	-75 30	333 09			1500	57C64
SBA	Scott Base	-77 51	166 47			2000	57C -
LAA	Little America (c)	-78 11	197 50			2500	57C58
VOS	Vostok	-78 27	106 52			2000	58I -
BYR	Byrd Island	-80 01	240 29			2500	57C -
SPA	South Pole	-90				2000	59C -

	JAN.				FEB.				MAR.				APR.				MAY				JUNE			
	N	S	M		N	S	M		N	S	M		N	S	M		N	S	M		N	S	M	
1	15	12	13	15	27	22	19	30	52	45	32	65	17	20	19	19	97	93	48	142	19	11	13	17
2	12	13	21	5 KK	22	23	29	17	47	32	47	33	35	18	23	31	85	93	89	89	102	76	59	120
3	17	15	3	29	26	31	22	35	26	23	24	26	55	51	46	60	85	83	95	72	43	45	63	25
4	102	121	82	142	16	14	18	12	3	4	4	3QCK	73	57	50	81	100	117	164	54	40	31	18	53
5	40	37	49	27	30	33	29	35	10	20	9	22Q K	29	28	40	18	15	8	7	17 K	45	38	60	24
6	46	66	73	39	23	31	16	39	11	22	14	20	14	13	14	13 CC	9	7	8	8QCK	21	13	19	16
7	25	20	13	32	10	13	10	13QC	13	24	16	21	10	6	8	9QCC	15	10	10	15 CC	25	21	21	25
8	33	40	42	31	22	15	13	24	48	30	8	70	9	7	5	11QCC	29	20	13	36	19	15	20	14
9	48	32	26	55	27	24	17	34	29	18	25	23	11	7	10	8QCC	85	96	104	77	9	4	7	7QCK
10	36	40	45	31	13	17	17	14Q	14	24	18	21	52	26	6	73	13	12	4	22 K	38	31	24	45
11	10	17	14	13 K	8	10	13	5QCC	14	15	14	15	79	48	68	60	47	34	50	31	34	31	51	14
12	7	5	5	7 CC	22	18	13	28	6	4	4	6QCK	32	29	41	21	33	31	29	35	18	16	12	22
13	19	12	15	16 C	16	13	20	10	21	25	26	20	36	33	16	53	19	11	17	14	17	12	15	14Q
14	6	4	6	5QCC	17	16	12	21	17	20	12	25	73	56	63	65	20	10	12	19 K	10	8	6	12QCC
15	5	4	6	4QCC	58	103	145	16	30	26	30	27	31	26	32	25	13	7	7	14QCC	11	15	17	10QCC
16	36	27	12	51	24	27	18	33	46	44	39	51	15	18	20	14	15	8	9	15 CC	11	10	8	14QCC
17	18	12	20	11	17	8	13	12 K	42	37	31	48	14	10	11	14QC	15	8	9	15 CC	17	13	19	12
18	22	14	30	6	20	14	14	21	32	39	39	32	33	20	30	24	12	8	9	12QCC	21	16	16	22
19	14	12	16	10 CC	20	20	18	23	23	34	29	28	51	55	32	73	9	5	7	7QCC	31	27	26	33
20	6	6	7	5 CC	22	14	17	20	19	14	11	23	38	27	43	23	19	7	9	18 KK	24	16	24	17
21	4	4	3	4QCC	22	22	10	34	13	9	15	8 C	18	16	11	23	43	36	19	61	56	34	41	48
22	6	7	8	5QCC	41	27	27	42	26	23	18	31	16	7	8	16 C	43	25	26	43	29	23	25	27
23	4	5	4	6QCC	11	13	13	11QC	24	21	33	13	38	31	24	45	43	23	22	45	31	21	22	31
24	11	11	6	16 KK	6	9	8	7QCC	15	9	10	14QKK	62	61	67	57	38	42	44	36	35	25	33	28
25	22	25	13	34	25	21	11	35	6	7	6	7QC	23	32	32	23	20	17	18	20	43	23	27	40
26	26	22	35	13	62	46	46	62	58	47	36	70	30	28	32	26	14	18	17	15	60	48	51	58
27	10	6	9	8 CC	62	63	33	92	76	83	75	84	32	30	28	35	12	4	8	9QCC	27	21	26	23
28	20	14	5	30	66	59	40	84	22	29	28	23	25	12	18	20	17	16	11	22 K	21	15	16	21
29	50	63	46	67					22	28	27	23	13	10	7	16QC	17	11	6	22	55	28	15	68
30	48	55	66	37					27	23	27	23	85	40	33	93	30	21	28	24	55	32	55	32
31	43	42	36	49					14	15	6	23					20	13	24	9				
	24.6				26.3				26.1				35.0				33.4				32.2			
		24.5				25.9				25.6				27.4				28.9				24.1		
			24.6				26.2				25.9				31.3				31.2				28.3	

	JULY				AUG.				SEP.				OCT.				NOV.				DEC.			
	N	S	M		N	S	M		N	S	M		N	S	M		N	S	M		N	S	M	
1	12	12	13	11 C	9	7	8	9QCC	31	32	37	26	23	25	20	29	18	20	22	16	14	19	22	11
2	12	10	12	10 CC	8	7	4	10 CC	34	33	28	39	22	18	14	27	18	30	17	30	6	6	7	5QCC
3	18	13	11	21	35	21	19	38	24	17	24	18	15	14	17	12	22	20	19	24	9	7	7	9 CK
4	95	71	64	103	54	38	57	36	18	15	20	14	29	20	29	21	9	15	14	11 C	20	25	20	26
5	68	69	98	40	43	30	38	36	13	12	9	16 K	15	9	13	12 KK	12	10	17	6 CC	17	17	20	15
6	25	21	23	23	26	26	27	25	21	36	44	13	8	7	6	10QCC	4	8	4	7QCC	9	10	10	9 CC
7	26	23	22	27	15	10	13	12 C	12	11	8	16 C	8	8	10	7QCC	19	11	3	27	4	4	3	5QCC
8	33	16	20	31	12	12	9	16 KC	28	18	34	13	10	12	10	12 CK	22	27	34	16	6	6	5	8 CC
9	17	8	10	15 C	7	7	7	8 CC	45	69	58	57	21	25	19	27	15	15	21	10	4	7	7	4QCC
10	21	18	21	18	10	12	8	15 CC	22	20	22	21	29	21	34	16	34	31	9	57	3	4	4	3QCC
11	11	10	14	8 CC	23	14	11	27	20	23	10	34	11	8	13	7 CK	22	11	16	17	3	5	2	5QCC
12	12	8	5	15QC	34	38	48	25	20	25	20	26	21	33	17	37	87	88	97	77	8	11	4	15 CC
13	38	23	32	29	28	31	25	34	13	13	16	11 C	15	17	21	11	38	27	27	38	12	10	16	6 K
14	48	56	53	51	16	9	15	11 C	7	8	11	5QCC	9	9	5	13QCC	17	18	4	31	36	86	100	22
15	11	12	19	4 K	9	5	4	10QCC	4	7	5	5QCC	9	11	7	14QCC	15	13	16	12	29	47	47	29
16	15	11	15	11 KK	11	9	4	16 CK	13	10	11	13 CK	8	7	9	6QCC	9	15	11	14 CC	24	27	19	33
17	10	7	9	9 CC	16	16	13	20	13	13	19	8 KK	11	11	7	16 K	9	12	11	10 CC	12	19	14	18
18	33	32	17	48	41	33	18	56	4	5	4	5QCC	52	43	53	41	8	10	10	9QCK	74	69	60	84
19	21	19	29	11	19	17	21	16	3	6	4	4QCC	40	33	39	34	19	25	24	20	41	36	29	48
20	11	8	12	8 CC	6	4	5	4QCC	10	10	5	15QKK	13	20	16	18	35	44	31	48	45	35	29	51
21	13	9	11	11 CC	17	10	7	21 KK	13	20	25	9	22	20	15	28	27	17	26	19	19	16	21	15
22	21	12	16	17	12	6	11	8 CK	20	20	17	23	19	20	19	21	45	38	34	49	32	37	37	32
23	21	13	14	20	11	7	6	13QCC	23	16	14	26	11	11	12	10 CK	20	23	10	34	12	11	13	10 C
24	15	9	8	16 C	9	9	9	9 CC	20	17	11	27	11	8	8	12 CC	29	32	14	48	9	10	10	9 CC
25	19	15	14	21	16	14	13	18 K	50	49	41	58	10	15	10	16 KK	81	81	43	120	29	32	20	42
26	14	10	12	12 CK	6	7	8	6QC	36	69	59	46	34	29	13	50	45	41	41	45	15	13	16	13
27	9	8	9	9QCC	50	41	38	53	60	66	49	77	35	40	54	21	30	30	20	41	25	15	21	20
28	10	10	14	6 CC	126	156	161	122	66	59	60	65	28	20	24	25	6	6	7	5QC	31	18	10	40
29	9	9	5	12QCC	48	67	78	37	106	120	139	88	31	30	17	45	8	8	9	7QCC	38	33	17	55
30	8	4	7	5QCC	46	50	32	65	19	23	26	16	40	49	28	62	11	11	7	14QKK	47	43	46	43
31	3	3	2	4QCC	55	50	48	58					41	34	22	53					27	24	29	23
	21.8				26.4				25.7				21.0				24.6				21.3			
		17.6				24.6				28.1				20.3				24.5				22.6		
			19.9				25.6				27.0				20.8				24.6				22.0	

ANNUAL MEAN N 26.54 S 24.51 M 25.61

TABLE 2a MONTHLY AND YEARLY aa 1868-1978

	J	F	M	A	M	J	J	A	S	O	N	D	year
1868	10.6	16.0	19.7	21.0	16.4	17.9	21.5	19.4	24.0	25.9	13.3	13.7	18.3
1869	19.2	23.6	22.3	29.5	23.1	19.2	17.4	19.9	29.8	17.9	14.7	14.6	20.9
1870	21.6	23.2	21.2	25.8	20.9	16.4	14.1	21.4	35.2	26.2	21.9	19.9	22.3
1871	19.3	24.8	21.4	31.2	17.2	17.1	21.5	23.5	17.7	20.0	28.1	15.7	21.5
1872	17.0	28.0	23.0	23.4	20.4	17.7	25.3	25.2	20.7	36.6	25.0	20.5	23.7
1873	29.4	20.6	24.1	20.8	20.8	25.8	20.6	18.7	19.3	16.6	14.6	12.1	20.3
1874	17.8	16.1	12.7	19.1	14.0	12.8	13.1	13.0	15.7	17.8	14.3	10.1	14.7
1875	10.0	13.5	12.7	12.7	13.0	10.1	11.8	8.7	13.1	11.9	9.8	8.5	11.3
1876	9.8	12.6	11.0	6.5	7.6	7.7	9.1	10.2	10.1	10.5	10.2	10.1	9.6
1877	9.3	9.6	10.4	8.9	13.0	8.9	7.8	7.6	7.4	6.9	11.6	6.8	9.0
1878	7.4	7.5	6.2	8.5	7.3	8.6	4.8	6.4	7.9	6.8	7.1	9.3	7.3
1879	6.2	5.8	8.6	5.5	6.2	5.9	5.8	8.0	8.9	7.0	7.1	9.3	7.0
1880	7.3	4.7	9.8	8.9	13.1	7.3	9.9	23.1	11.4	14.4	14.5	14.6	11.6
1881	15.1	12.8	13.2	11.4	8.5	10.7	12.2	7.8	17.9	14.0	20.2	20.3	13.7
1882	15.7	19.5	16.5	35.9	20.6	19.0	14.5	19.7	15.0	25.0	55.0	20.1	23.0
1883	15.4	26.7	23.3	17.8	13.9	18.5	21.5	12.4	19.5	13.7	17.6	12.0	17.7
1884	9.1	14.3	17.5	15.6	12.8	13.1	15.5	13.0	13.5	16.0	16.9	13.2	14.2
1885	13.2	15.5	13.3	14.0	21.2	14.2	13.0	17.7	22.1	15.9	13.7	12.1	15.5
1886	17.7	17.1	27.6	21.6	22.6	21.6	19.3	18.1	19.0	21.7	20.7	20.6	20.6
1887	16.9	22.9	15.2	20.6	17.3	12.6	12.5	17.2	18.9	14.1	14.5	15.2	16.5
1888	18.2	15.9	15.2	16.4	19.3	14.5	12.9	13.7	15.1	15.0	15.3	14.0	15.5
1889	9.8	11.0	13.9	11.6	10.2	9.8	13.5	12.6	14.6	13.6	18.5	11.8	12.6
1890	11.7	11.8	10.0	8.4	8.4	7.3	10.0	10.3	13.8	15.6	13.3	8.3	10.7
1891	10.4	14.2	20.6	22.5	23.7	11.7	11.2	15.0	22.3	20.7	16.5	16.2	17.1
1892	19.5	35.1	36.3	20.4	25.1	17.7	33.7	22.1	20.1	23.1	15.7	22.1	24.2
1893	18.2	19.1	18.4	14.0	12.0	17.1	14.5	18.5	19.5	20.9	18.5	13.9	17.0
1894	19.2	33.9	20.0	17.4	19.0	20.0	26.3	21.0	22.5	17.0	21.9	12.0	20.8
1895	15.4	20.8	23.0	20.7	16.6	17.6	17.9	10.5	15.9	22.7	22.5	14.5	18.2
1896	25.4	23.6	21.8	17.2	20.6	11.7	15.6	18.1	17.8	17.5	13.1	13.8	18.0
1897	12.0	14.0	14.2	22.2	14.6	12.0	9.3	10.7	11.0	13.8	12.6	17.2	13.6
1898	13.5	15.1	20.5	13.4	15.1	14.3	13.5	14.6	21.5	14.1	13.6	13.0	15.2
1899	14.3	17.8	15.6	14.2	15.9	13.5	11.6	11.4	13.5	9.4	8.7	12.1	13.2
1900	13.5	8.9	12.5	7.2	9.6	4.7	5.2	6.0	5.2	7.1	5.4	5.4	7.6
1901	7.3	7.0	6.5	5.2	6.2	6.0	5.6	6.1	6.0	5.4	5.6	6.4	6.1
1902	6.1	7.6	5.9	7.9	5.6	5.4	6.3	6.2	7.0	7.2	7.6	6.1	6.6
1903	6.5	5.9	6.7	10.3	7.8	11.3	10.8	14.1	14.0	26.3	16.3	13.5	12.0
1904	15.1	12.6	8.7	13.1	13.0	10.5	10.8	10.2	11.2	13.0	11.6	10.6	11.7
1905	16.0	20.3	16.6	16.6	10.6	13.8	11.8	16.8	16.3	11.2	20.1	10.7	15.1
1906	7.6	17.5	14.0	11.6	11.4	11.3	12.4	12.0	14.2	12.7	9.6	16.4	12.6
1907	16.5	25.3	14.3	12.1	16.8	14.8	16.9	15.5	16.8	18.5	14.6	11.5	16.1
1908	13.6	17.0	23.2	15.6	18.9	12.5	10.4	18.2	31.6	15.8	17.4	11.4	17.1
1909	24.8	17.0	19.8	12.1	18.3	11.5	12.6	17.6	27.6	19.4	11.6	13.8	17.2
1910	12.8	14.6	20.9	19.7	17.2	13.7	10.8	20.2	19.2	24.4	17.9	19.5	17.6
1911	21.3	23.7	21.5	21.1	16.6	13.6	15.3	11.9	12.2	12.5	10.6	11.0	15.9
1912	7.6	8.0	7.7	9.4	9.6	8.4	7.8	10.5	9.8	9.5	9.4	9.4	8.9
1913	10.3	9.5	9.9	9.8	9.0	7.0	7.0	6.7	10.0	10.7	7.6	6.6	8.7
1914	7.1	7.3	10.1	13.5	8.1	10.3	12.9	14.9	11.8	13.3	13.4	9.3	11.0
1915	10.9	13.5	15.0	15.3	13.9	17.9	11.2	14.7	17.0	21.3	24.9	12.4	15.7
1916	16.0	11.6	25.0	19.2	20.2	15.7	19.7	21.4	22.4	24.5	24.0	18.9	19.9
1917	25.1	19.1	16.2	16.7	15.9	12.7	14.6	28.1	16.1	20.2	14.8	19.8	18.3
1918	17.8	21.3	19.7	20.5	18.8	15.6	17.4	22.2	28.4	26.4	23.1	28.1	21.6
1919	27.8	26.5	30.7	21.3	27.5	13.9	14.9	22.7	25.3	26.9	14.3	18.4	22.5
1920	16.7	14.1	28.5	17.8	17.7	12.4	14.0	14.8	25.7	17.3	15.1	17.0	17.6
1921	11.7	10.6	15.6	17.2	40.5	12.4	13.3	14.6	12.4	16.2	16.2	17.8	16.5
1922	18.0	18.6	24.1	23.5	18.3	18.6	20.0	20.7	19.7	20.1	13.1	10.4	18.8
1923	10.2	13.7	12.1	10.0	10.1	11.1	8.4	7.3	10.7	12.6	7.8	9.6	10.3
1924	13.6	10.9	12.9	7.3	10.2	12.3	9.7	6.9	12.6	8.7	9.3	7.9	10.2
1925	9.4	8.6	8.6	10.8	11.0	17.7	11.8	13.6	18.0	21.7	13.2	12.9	13.1
1926	27.1	26.2	27.6	27.1	19.6	16.2	11.4	13.2	22.7	23.3	11.9	13.3	20.0
1927	15.5	15.2	20.7	15.6	16.8	11.2	16.5	18.5	20.9	24.7	8.0	15.8	16.6
1928	10.1	13.5	11.3	12.8	23.6	20.2	27.8	15.9	19.6	23.4	18.2	15.6	17.7
1929	13.0	24.0	26.2	13.9	16.3	14.7	18.6	15.9	21.5	25.5	22.7	21.0	19.4
1930	20.9	27.9	30.9	38.2	36.4	33.3	28.3	33.3	28.8	29.3	18.8	17.2	28.6
1931	13.0	15.4	12.9	9.9	12.0	14.7	13.1	17.7	21.2	27.3	23.7	21.1	16.8
1932	20.2	21.4	27.9	28.2	22.2	11.8	12.4	19.1	19.1	17.2	13.8	15.3	19.0
1933	15.9	18.4	19.2	21.1	17.5	13.6	12.3	14.2	18.4	16.8	16.0	13.0	16.4
1934	11.5	14.9	20.0	11.3	11.4	10.0	10.3	17.4	17.6	11.6	9.5	15.5	13.4
1935	15.6	16.5	17.8	13.6	11.6	16.4	12.5	9.9	20.7	20.2	15.6	17.7	15.7
1936	17.4	19.8	15.5	22.1	17.5	19.8	18.0	10.2	9.8	15.4	18.0	12.0	16.3
1937	12.2	22.2	18.6	26.3	18.6	18.9	18.8	14.7	14.7	27.8	19.3	16.5	19.0
1938	46.6	26.0	20.4	26.1	23.7	14.8	19.7	19.9	24.7	24.0	17.8	19.5	23.6
1939	13.5	21.7	27.0	36.1	27.8	22.8	26.1	23.0	19.2	28.4	14.5	18.6	23.2
1940	24.8	20.1	43.9	22.4	20.0	23.6	18.4	18.4	20.1	21.9	25.1	23.7	23.5
1941	21.9	27.6	42.9	21.6	19.1	17.4	27.9	22.3	38.2	17.5	23.6	19.3	24.9
1942	14.6	18.8	32.4	24.4	14.2	14.6	23.0	21.9	25.8	30.3	22.8	18.4	21.8

TABLE 2a - continued

	J	F	M	A	M	J	J	A	S	O	N	D	year
1943	18.1	17.1	21.0	21.9	24.5	21.2	24.4	41.0	35.3	32.8	29.6	23.3	25.8
1944	21.2	17.9	26.6	21.6	16.1	14.9	11.1	16.5	17.5	17.2	11.2	21.8	17.8
1945	16.1	16.4	25.0	19.1	15.4	11.1	15.3	12.1	15.6	17.9	12.0	20.2	16.3
1946	19.2	30.2	43.5	25.0	24.1	22.3	28.6	16.7	41.7	19.6	19.3	14.3	25.4
1947	20.6	17.1	37.9	23.3	19.1	21.1	21.4	32.9	39.1	31.3	20.7	17.9	25.2
1948	20.8	21.0	24.2	17.7	23.7	15.0	16.2	28.3	22.0	36.1	23.1	23.0	22.6
1949	29.8	20.4	24.7	17.6	22.4	17.9	11.8	19.2	17.8	32.7	24.6	15.1	21.2
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.8
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.7	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.3
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.4
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.5
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.7	16.8	17.5	13.1	11.7	13.8	14.1
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.3
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.6
1969*	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.8	17.2	18.7	13.8	20.0
1970*	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	19.9
1971*	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972*	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973*	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974*	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975*	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976*	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6

* The values given in this table for the years 1969 through 1976 are revised indices. See page XII of IAGA-Bulletin No. 32h for explanation.

TWELVE MONTH'S RUNNING MEAN VALUES OF aa-INDICES, 1868-1978

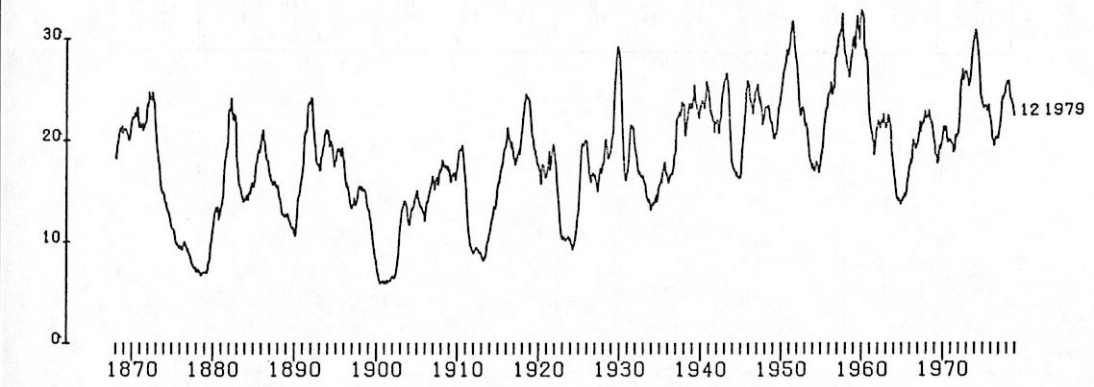


TABLE 2b MONTHLY Ap, 1932 - 1978

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
1932	11	12	18	17	15	7	7	12	12	10	8	9	11.5
1933	10	11	12	12	12	8	7	9	12	10	9	7	10.1
1934	6	8	11	6	7	5	6	9	10	6	5	8	7.2
1935	9	10	10	8	6	9	7	5	13	12	8	9	8.9
1936	9	11	9	15	10	12	11	5	5	9	10	5	9.1
1937	7	13	12	20	13	12	12	10	9	20	12	10	12.5
1938	28	16	13	18	18	9	13	12	17	16	10	11	15.3
1939	7	15	19	28	21	15	19	19	13	22	9	11	16.5
1940	15	12	36	18	13	16	12	11	14	14	16	15	16.1
1941	14	18	33	15	11	11	19	16	27	11	16	11	16.8
1942	9	12	22	17	8	8	13	13	17	22	15	11	13.8
1943	11	9	13	14	14	12	15	31	25	24	20	14	17.0
1944	13	12	17	15	9	8	6	9	10	11	6	14	10.8
1945	10	10	17	13	9	7	9	7	10	11	8	13	10.4
1946	12	22	33	20	18	16	22	11	34	13	12	9	18.6
1947	12	12	32	18	14	16	16	25	32	23	14	11	18.8
1948	12	13	17	13	19	10	10	20	15	27	16	13	15.4
1949	20	14	19	14	18	14	8	14	13	25	15	9	15.4
1950	12	18	14	18	16	14	14	25	22	28	20	16	18.1
1951	16	22	21	27	20	17	20	22	40	24	18	20	22.3
1952	19	26	33	34	27	18	15	13	23	20	12	15	21.2
1953	15	15	21	16	16	13	16	19	21	16	14	7	15.7
1954	9	16	16	14	7	6	8	10	17	15	9	6	11.0
1955	12	12	14	14	11	9	8	9	13	11	13	8	11.3
1956	18	15	20	27	26	17	13	15	18	14	24	10	18.0
1957	17	17	26	21	11	22	16	14	49	14	18	18	20.1
1958	15	27	26	20	17	24	25	18	20	16	8	15	19.2
1959	14	24	24	17	19	15	32	23	28	19	22	19	21.3
1960	15	14	18	42	24	20	20	20	20	36	32	21	23.6
1961	12	16	14	14	13	14	28	11	13	16	10	12	14.4
1962	7	11	8	14	7	9	12	15	19	20	13	13	12.3
1963	11	9	8	10	11	11	12	13	28	15	12	11	12.6
1964	12	12	13	13	10	9	9	8	11	10	7	5	9.9
1965	6	9	8	8	6	10	8	9	10	7	6	7	7.7
1966	7	8	13	7	9	6	9	11	21	11	9	11	10.2
1967	11	11	7	9	25	12	8	9	16	10	10	14	12.0
1968	11	16	13	13	13	17	10	12	14	16	17	10	13.5
1969	8	15	17	14	17	9	8	8	15	9	10	7	11.3
1970	7	7	18	15	9	10	19	13	11	12	12	9	11.9
1971	12	12	11	15	13	9	8	9	13	12	11	10	11.3
1972	13	10	12	11	10	14	8	24	13	12	14	10	12.6
1973	16	20	25	30	17	17	12	12	14	18	12	11	17.0
1974	15	16	23	21	18	17	24	19	23	26	18	15	19.6
1975	16	18	20	16	13	11	12	10	10	12	18	12	13.9
1976	13	17	23	17	14	10	9	9	13	12	9	10	12.9
1977	10	11	11	16	11	8	14	13	16	13	10	10	11.9
1978	15	16	17	24	25	20	13	17	18	12	15	13	17.0

TABLE 3 INTERNATIONAL QUIET AND DISTURBED DAYS 1978

Month	Quietest Days 1-5					Quietest Days 6-10					Most Disturbed Days 1-5				
Jan	21	23	15	22	14	20	12	27	24K	11	4	29	30	6	5
Feb	24	11	23	7A	10A	13A	12A	4A	17A	8A	28	27	15	26	22
Mar	4	12	25	24K	11A	6A	5A	21A	31A	7A	27	26	1	2	17
Apr	8	7	29	9	17A	16A	22A	6A	21A	1A	11	14	30	4	24
May	19	27	18	6	15	28A	16A	26A	7A	5A	2	4	9	3	1
Jun	9	14	16	15	13A	6A	1A	12A	8A	17A	2	26	5	21	30
Jul	31	30	29	27	12	20	26	2	17	11	4	14	5	13	18*
Aug	20	26	15	1	23	2	24	9	16	22	28	31	29	30	4
Sep	19	18	15	14K	20K	16	7K	13	5A	17A	29	28	27	26	25
Oct	6	16	7	15	14	17	24	8	11	23	18	30	27	19	31
Nov	6	28	29	30	18	4	17	5K	16	7A	25	12	26	22	20
Dec	10	11	7	9	2	8	12	3	6	24	18	30	15	20	14

These days are arranged according to their degree of quietness or disturbance, respectively.

Explanation: The selection of the quiet and disturbed days is made on the basis of three criteria: (a) the sum of the eight values of Kp. (b) the sum of the squares of these values. (c) the greatest of the eight values of Kp. According to each of these criteria, a relative "order number" is assigned to each day of a month, the three order numbers are averaged and the days with the lowest and the highest mean order numbers are selected as the five quietest, the ten quietest and the five most disturbed days.

It should be noted that these selection criteria give only a relative indication of the character of the selected days with respect to the other days of the same month. As the general disturbance level may be quite different for different years and even for different months of the same year, the selected quiet days of a month may sometimes be rather disturbed or vice versa. In order to indicate such a situation, selected days which do not satisfy certain absolute criteria are marked as follows:

A selected "quiet day" is considered not "really quiet" and marked by the letter A if for that day: $Ap > 6$, or marked by the letter K if $Ap \leqslant 6$, and one $Kp \geqslant 3o$ or two Kp values are $\geqslant 3-$.

A selected "disturbed day" is considered "not really disturbed" and marked by an asterisk if $Ap < 20$. (Ref.: P.N. Mayaud, Ann. Géophysique t. 26, 1969, pp. 901 - 921).

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIGURES Cp.

	Kp	Sum	Jan 1978	ap				Sum	Ap	Cp
1	2- 2o 2- 1+ 1- 1+ 3- 3-	14o	6 7 6 5	3 5 12 12				56	7	0.4
2	3o 4- 2- 1+ 1- 0+ 1o 1o	13-	15 22 6 5	3 2 4 4				61	8	0.4
3	1- 0o 1- 1- 2o 3o 4- 5o	16-	3 0 3 3	7 15 22 48				101	13	0.7
4	5+ 6o 6- 6o 6+ 7+ 7- 6-	49o	56 80 67 80	94 154 111 67				709	89	1.8
5	6o 6- 4+ 3- 3- 3o 3- 3+	30+	80 67 32 12	12 15 12 18				248	31	1.3
6	6o 5+ 4+ 3- 3o 3o 4o 4+	33-	80 56 32 12	15 15 27 32				269	34	1.3
7	3- 2- 2- 1+ 1+ 4- 2o 5-	19o	12 6 6 5	5 22 7 39				102	13	0.7
8	5- 3+ 3- 3+ 3+ 3+ 2o 3-	25+	39 18 12 18	18 18 7 12				142	18	1.0
9	3o 3- 4- 3- 2+ 5- 4o 5o	28o	15 12 22 12	9 39 27 48				184	23	1.1
10	5+ 4o 3+ 2+ 2o 4o 3o 4o	28o	56 27 18 9	7 27 15 27				186	23	1.1
11	1+ 2+ 2- 2+ 2+ 1+ 1o 1+	14-	5 9 6 9	9 5 4 5				52	6	0.3
12	1o 2o 1- 0o 0+ 0+ 2- 2-	8-	4 7 3 0	2 2 6 6				30	4	0.1
13	2o 3o 2- 2o 2- 2o 2o 3-	17o	7 15 6 7	6 7 7 12				67	8	0.5
14	1o 0+ 1+ 0+ 0+ 0+ 0+ 1+	5+	4 2 5 2	2 2 2 5				24	3	0.1
15	1- 1- 0o 1o 1- 0o 0o 0o	3o	3 3 0 4	3 0 0 0				13	2	0.0
16	0+ 0+ 2- 2+ 4- 4o 3+ 4+	20o	2 2 6 9	22 27 18 32				118	15	0.8
17	4o 3o 1o 1+ 1o 1- 1o 3-	15-	27 15 4 5	4 3 4 12				74	9	0.5
18	5- 4- 3- 2o 1+ 1o 0+ 1o	17-	39 22 12 7	5 4 2 4				95	12	0.7
19	2+ 2o 2- 2o 2o 1+ 1+ 1+	14o	9 7 6 7	7 5 5 5				51	6	0.3
20	1- 1- 2o 1- 1+ 1- 0o 0o	6o	3 3 7 3	5 3 0 0				24	3	0.1
21	0o 0o 0o 0o 0o 0o 0+ 1o	1+	0 0 0 0	0 0 2 4				6	1	0.0
22	1o 0+ 1o 1o 1- 0o 0+ 0+	5-	4 2 4 4	3 0 2 2				21	3	0.0
23	0o 0+ 0o 0o 0+ 1o 1o 0+	3o	0 2 0 0	2 4 4 2				14	2	0.0
24	0+ 1- 1+ 1o 1+ 3o 2+ 1-	11-	2 3 5 4	5 15 9 3				46	6	0.3
25	0+ 2o 1+ 1+ 3- 3o 3+ 4+	18+	2 7 5 5	12 15 18 32				96	12	0.7
26	5- 3o 3- 2+ 2- 2- 2- 1+	19o	39 15 12 9	6 6 6 5				98	12	0.7
27	2- 2o 1- 1o 0+ 0+ 2o 2-	10-	6 7 3 4	2 2 7 6				37	5	0.2
28	1- 0o 1+ 1o 1+ 3- 3+ 4-	14o	3 0 5 4	5 12 18 22				69	9	0.5
29	3+ 4+ 4+ 5o 5+ 6- 4+ 3o	35+	18 32 32 48	56 67 32 15				300	38	1.4
30	3o 4o 6+ 6o 3+ 2+ 3- 5-	32+	15 27 94 80	18 9 12 39				294	37	1.4
31	4+ 3+ 4- 4- 4- 4+ 4o 4-	31-	32 18 22 22	22 32 27 22				197	25	1.2

	Kp	Sum	Feb 1978	ap				Sum	Ap	Cp
1	4o 3+ 2+ 2o 3o 3o 2+ 4-	24-	27 18 9 7	15 15 9 22				122	15	0.9
2	4- 3+ 2+ 3+ 2+ 1o 2- 4-	21+	22 18 9 18	9 4 6 22				108	14	0.8
3	3o 2+ 2+ 3o 3o 3o 3o 3-	22+	15 9 9 15	15 15 15 12				105	13	0.8
4	4- 3- 3- 2o 2- 2o 2- 1+	18-	22 12 12 7	6 7 6 5				77	10	0.5
5	3+ 4- 4- 3o 3- 3+ 4- 2-	25o	18 22 22 15	12 18 22 6				135	17	0.9
6	2+ 2- 3- 3- 3+ 3o 4- 3-	22o	9 6 12 12	18 15 22 12				106	13	0.8
7	2+ 2o 1o 1+ 1o 2o 2+ 2+	14+	9 7 4 5	4 7 9 9				54	7	0.3
8	3- 2o 2o 2- 3o 3o 3- 2+	19+	12 7 7 6	15 15 12 9				83	10	0.6
9	2- 1+ 3o 3o 4o 3o 3+ 3+	23-	6 5 15 15	27 15 18 18				119	15	0.8
10	2o 2+ 2o 2- 2- 2o 2+ 1+	15+	7 9 7 6	6 7 9 5				56	7	0.4
11	2o 1+ 2+ 2+ 0+ 1+ 0+ 0+	10+	7 5 9 9	2 5 2 2				41	5	0.2
12	1o 2- 3- 0+ 1+ 2+ 2+ 4o	16-	4 6 12 2	5 9 9 27				74	9	0.5
13	3o 3o 2o 2- 1- 2+ 2o 1o	16-	15 15 7 6	3 9 7 4				66	8	0.4
14	2+ 1o 1o 3o 3- 2+ 1+ 4+	18o	9 4 4 15	12 9 5 32				90	11	0.6
15	4o 5+ 7- 7+ 4- 2+ 1+ 1o	32-	27 56 111 154	22 9 5 4				388	48	1.6
16	2- 1+ 2- 3+ 3o 2o 3o 3+	19+	6 5 6 18	15 7 15 18				90	11	0.6
17	4+ 3o 1- 1- 2- 1+ 2o 2o	16-	32 15 3 3	6 5 7 7				78	10	0.5
18	3- 3- 3- 2o 3- 2o 3- 2+	20-	12 12 12 7	12 7 12 9				83	10	0.6
19	3o 4- 2- 1+ 2+ 2- 2o 3+	19o	15 22 6 5	9 6 7 18				88	11	0.6
20	3+ 2+ 3+ 2o 3- 2- 2+ 2+	20o	18 9 18 7	12 6 9 9				88	11	0.6
21	2- 2+ 1o 2+ 2+ 4+ 3o 3o	20o	6 9 4 9	9 32 15 15				99	12	0.7
22	4o 4o 4- 2- 2+ 4o 3o 5-	27+	27 27 22 6	9 27 15 39				172	22	1.1
23	2+ 1+ 2o 1+ 2- 0+ 1o 2o	12o	9 5 7 5	6 2 4 7				45	6	0.3
24	2o 1- 1+ 2o 2- 1+ 1- 0+	10o	7 3 5 7	6 5 3 2				38	5	0.2
25	1- 1+ 1+ 2o 1o 1- 4o 5-	16-	3 5 5 7	4 3 27 39				93	12	0.7
26	5o 5- 3+ 4- 5- 5o 5o 4o	35+	48 39 18 22	39 48 48 27				289	36	1.4
27	4+ 4o 3+ 4- 6- 5+ 5+ 5+	37o	32 27 18 22	67 56 56 56				334	42	1.5
28	4- 5+ 4o 3+ 4o 5+ 6+ 6-	38-	22 56 27 18	27 56 94 67				367	46	1.5

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIGURES Cp.

	Kp	Sum	Mar 1978				ap				Sum	Ap	Cp
1	3+ 4- 3o 5- 5- 5o 5+ 5o	35-	18	22	15	39	39	48	56	48	285	36	1.4
2	4+ 4o 5+ 4- 3+ 3o 4+ 3o	31o	32	27	56	22	18	15	32	15	217	27	1.2
3	4- 3+ 3o 3- 3- 3- 3o 3+	24+	22	18	15	12	12	12	15	18	124	16	0.9
4	1+ 1- 0+ 1- 1- 0o 0+ 1-	5-	5	3	2	3	3	0	2	3	21	3	0.0
5	1- 0+ 1+ 2+ 2+ 3o 2o 2-	14-	3	2	5	9	9	15	7	6	56	7	0.4
6	1o 0+ 1- 3+ 3o 2+ 1- 1-	12o	4	2	3	18	15	9	3	3	57	7	0.4
7	1+ 2+ 2o 3o 3o 2+ 1o 2o	17o	5	9	7	15	15	9	4	7	71	9	0.5
8	1+ 1- 1+ 1+ 5- 4- 5+ 4o	22+	5	3	5	5	39	22	56	27	162	20	1.0
9	3- 3+ 3- 3+ 2+ 2+ 3+ 3-	23-	12	18	12	18	9	9	18	12	108	14	0.8
10	1- 1+ 4+ 3o 4+ 2+ 1+ 1-	18o	3	5	32	15	32	9	5	3	104	13	0.7
11	1- 1+ 2o 3o 2- 2- 2o 1+	14-	3	5	7	15	6	6	7	5	54	7	0.3
12	1- 0o 1+ 1- 1o 1- 1- 1-	6-	3	0	5	3	4	3	3	3	24	3	0.1
13	3- 3o 3+ 2+ 3- 2+ 3- 2+	21+	12	15	18	9	12	9	12	9	96	12	0.7
14	3- 3- 2- 2- 3- 2+ 3o 3-	19+	12	12	6	6	12	9	15	12	84	10	0.6
15	3+ 5- 4- 2+ 2o 3- 2+ 4o	25o	18	39	22	9	7	12	9	27	143	18	1.0
16	5- 4+ 4- 2+ 3- 4o 4- 5o	30+	39	32	22	9	12	27	22	48	211	26	1.2
17	4- 4+ 4o 2+ 4o 5- 5- 3o	31-	22	32	27	9	27	39	39	15	210	26	1.2
18	4+ 4+ 3- 4+ 3+ 4+ 3o 3+	30-	32	32	12	32	18	32	15	18	191	24	1.2
19	3+ 4- 2+ 3o 3+ 3+ 1+ 3-	23o	18	22	9	15	18	18	5	12	117	15	0.8
20	3- 2- 1+ 2+ 3- 2o 3o 2+	18o	12	6	5	9	12	7	15	9	75	9	0.5
21	2+ 3+ 2o 1+ 2- 1o 1- 2o	14+	9	18	7	5	6	4	3	7	59	7	0.4
22	1o 2+ 2+ 3o 2+ 2+ 4- 5-	22-	4	9	9	15	9	9	22	39	116	14	0.8
23	5- 3+ 3o 2+ 3+ 3- 1- 1-	21-	39	18	15	9	18	12	3	3	117	15	0.8
24	0+ 1+ 2- 1o 1+ 1- 1+ 3+	11o	2	5	6	4	5	3	5	18	48	6	0.3
25	1+ 1- 0+ 0o 0+ 0+ 1o 2-	6-	5	3	2	0	2	2	4	6	24	3	0.1
26	5- 5- 3o 3o 6o 6- 7- 4+	38o	39	39	15	15	80	67	111	32	398	50	1.6
27	7- 6+ 5+ 5- 5o 6o 6o 5+	45+	111	94	56	39	48	80	80	56	564	70	1.8
28	4+ 4- 3o 3+ 4o 4- 2+ 1+	26-	32	22	15	18	27	22	9	5	150	19	1.0
29	2+ 3- 3- 4- 3+ 4- 2+ 2+	23o	9	12	12	22	18	22	9	9	113	14	0.8
30	3o 3+ 4- 4- 4- 3- 1+ 2+	24-	15	18	22	22	22	12	5	9	125	16	0.9
31	1- 1- 0+ 2o 3+ 3o 3- 2o	15-	3	3	2	7	18	15	12	7	67	8	0.5

	Kp	Sum	Apr 1978				ap				Sum	Ap	Cp
1	4o 4- 3o 1+ 1o 2o 2- 2+	19o	27	22	15	5	4	7	6	9	95	12	0.7
2	4- 4- 1o 2o 2+ 2o 3- 5-	22o	22	22	4	7	9	7	12	39	122	15	0.9
3	2o 5+ 5+ 3+ 3o 4o 6- 6o	35-	7	56	56	18	15	27	67	80	326	41	1.5
4	5+ 5o 5- 2+ 2- 5+ 7o 6+	38-	56	48	39	9	6	56	132	94	440	55	1.6
5	6- 5o 3- 1+ 2o 2- 3+ 3o	25-	67	48	12	5	7	6	18	15	178	22	1.1
6	3- 3o 2o 2o 3o 2- 2- 2-	18-	12	15	7	7	15	6	6	6	74	9	0.5
7	2- 0+ 0+ 1+ 2- 1- 2o 2+	10+	6	2	2	5	6	3	7	9	40	5	0.2
8	1- 2- 1o 1o 2- 2o 2- 1+	11o	3	6	4	4	6	7	6	5	41	5	0.2
9	1o 3- 2o 2o 1+ 1+ 1o 1+	13-	4	12	7	7	5	5	4	5	49	6	0.3
10	1- 2- 1+ 2- 4+ 5- 5- 7+	26+	3	6	5	6	32	39	39	154	284	36	1.4
11	8- 6+ 5o 3o 4- 6- 5+ 4+	41o	179	94	48	15	22	67	56	32	513	64	1.7
12	7- 3- 4o 3+ 3- 3+ 4- 3-	29o	111	12	27	18	12	18	22	12	232	29	1.3
13	3+ 2+ 2+ 2+ 4- 3o 5- 6-	27+	18	9	9	9	22	15	39	67	188	24	1.1
14	6- 4+ 4+ 6- 6+ 4+ 5+ 4o	40o	67	32	32	67	94	32	56	27	407	51	1.6
15	5- 4- 4- 3+ 3+ 3o 2+ 2o	26o	39	22	22	18	18	15	9	7	150	19	1.0
16	3o 2+ 2o 1+ 1o 1o 2+ 2o	15o	15	9	7	5	4	4	9	7	60	8	0.4
17	2- 1+ 2o 1+ 2- 1+ 1o 3o	13+	6	5	7	5	6	5	4	15	53	7	0.3
18	4o 5- 3o 2- 1+ 4o 3+ 3-	25-	27	39	15	6	5	27	18	12	149	19	1.0
19	2- 4- 5+ 4o 5o 5+ 6o 4+	35+	6	22	56	27	48	56	80	32	327	41	1.5
20	6- 4+ 3o 3o 2- 4- 2+ 3+	27o	67	32	15	15	6	22	9	18	184	23	1.1
21	3- 2o 2+ 1+ 3o 2o 2+ 2+	18o	12	7	9	5	15	7	9	9	73	9	0.5
22	1o 2- 1o 2- 2+ 2- 3- 3o	15o	4	6	4	6	9	6	12	15	62	8	0.4
23	3+ 3- 3- 3o 5- 5- 4- 4+	29o	18	12	12	15	39	39	22	32	189	24	1.1
24	6o 6- 5o 4+ 5- 6- 3+ 4+	39o	80	67	48	32	39	67	18	32	383	48	1.6
25	5- 3o 3+ 3o 3- 3o 3- 2+	25-	39	15	18	15	12	15	12	9	135	17	0.9
26	4- 4o 4o 2+ 3- 3o 3o 3o	26-	22	27	27	9	12	15	15	15	142	18	1.0
27	3+ 2+ 2+ 3+ 2+ 4- 3o 4o	24+	18	9	9	18	9	22	15	27	127	16	0.9
28	3+ 4- 3- 3- 3+ 2o 3- 2-	22o	18	22	12	12	18	7	12	6	107	13	0.8
29	2o 1o 1o 1o 2- 1+ 2+ 2+	13-	7	4	4	4	6	5	9	9	48	6	0.3
30	3+ 3- 2o 5o 7- 8o 4- 5-	36o	18	12	7	48	111	207	22	39	464	58	1.7

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIGURES Cp.

	Kp	Sum	May 1978	ap				Sum	Ap	Cp
1	3- 5- 6- 5+ 7+ 4+ 7- 8+	45o	12 39 67 56	154 32 111 236				707	88	1.8
2	7+ 6- 7+ 7o 7o 5+ 4- 5-	48o	154 67 154 132	132 56 22 39				756	94	1.9
3	5- 5+ 6o 5+ 7- 7- 6o 7o	48-	39 56 80 56	111 111 80 132				665	83	1.8
4	7+ 8- 7+ 6+ 7- 4+ 5- 2-	46o	154 179 154 94	111 32 39 6				769	96	1.9
5	1+ 2- 1o 1o 1+ 1o 2+ 4-	13+	5 6 4 4	5 4 9 22				59	7	0.4
6	2- 1o 1+ 1o 1o 1o 1o 3-	11-	6 4 5 4	4 4 4 12				43	5	0.2
7	3- 1+ 2- 2- 1+ 2- 3- 2o	15o	12 5 6 6	5 6 12 7				59	7	0.4
8	2- 1+ 1o 3o 3o 4o 4+ 4-	22o	6 5 4 15	15 27 32 22				126	16	0.9
9	5o 5o 8- 6+ 7o 7- 5o 3+	46o	48 48 179 94	132 111 48 18				678	85	1.8
10	1- 1+ 1- 1- 1+ 1- 3+ 5-	13+	3 5 3 3	5 3 18 39				79	10	0.6
11	4o 6o 5o 3+ 3o 3o 3+ 4-	31+	27 80 48 18	15 15 18 22				243	30	1.3
12	4- 3+ 4- 3- 3+ 3o 4- 3+	27-	22 18 22 12	18 15 22 18				147	18	1.0
13	5- 2- 1o 1o 2+ 2- 1+ 3-	16+	39 6 4 4	9 6 5 12				85	11	0.6
14	3- 2o 1+ 2o 1+ 3- 3+ 2+	18-	12 7 5 7	5 12 18 9				75	9	0.5
15	1o 0+ 0+ 2o 1+ 2+ 2o 2o	11+	4 2 2 7	5 9 7 7				43	5	0.2
16	2- 2o 1o 1o 2+ 3- 2- 2-	14o	6 7 4 4	9 12 6 6				54	7	0.3
17	2- 2+ 2+ 1+ 1+ 1+ 2+ 3o	16-	6 9 9 5	5 5 9 15				63	8	0.4
18	1+ 2o 1- 1+ 1+ 2o 1+ 0+	10+	5 7 3 5	5 7 5 2				39	5	0.2
19	1o 1- 1- 2+ 2- 1o 0+ 1o	9-	4 3 3 9	6 4 2 4				35	4	0.2
20	1+ 1+ 1+ 1+ 1o 2+ 4o 1+	14o	5 5 5 5	4 9 27 5				65	8	0.4
21	2o 3o 2+ 1+ 3- 2+ 6- 6o	25+	7 15 9 5	12 9 67 80				204	26	1.2
22	5o 3- 3- 3- 3o 4o 5- 4o	29-	48 12 12 12	15 27 39 27				192	24	1.2
23	3o 4- 3o 2o 2+ 4+ 4+ 5+	28o	15 22 15 7	9 32 32 56				188	24	1.1
24	5- 3o 4+ 4+ 5- 3o 3- 4-	30+	39 15 32 32	39 15 12 22				206	26	1.2
25	4- 2+ 2+ 1o 2+ 1+ 2o 3+	18+	22 9 9 4	9 5 7 18				83	10	0.6
26	3o 2- 2- 2- 2- 2- 2- 1o	14o	15 6 6 6	6 6 6 4				55	7	0.3
27	1+ 1o 2- 1+ 1o 1- 1- 2+	10o	5 4 6 5	4 3 3 9				39	5	0.2
28	2- 1o 1+ 2- 2o 2o 3- 2-	14o	6 4 5 6	7 7 12 6				53	7	0.3
29	1+ 1- 0+ 1o 1+ 1o 4- 3+	13-	5 3 2 4	5 4 22 18				63	8	0.4
30	5o 4o 4- 2- 3- 2+ 3- 2+	24+	48 27 22 6	12 9 12 9				145	18	1.0
31	4o 4o 2+ 1+ 3- 1o 1+ 1o	18-	27 27 9 5	12 4 5 4				93	12	0.7

	Kp	Sum	Jun 1978	ap				Sum	Ap	Cp
1	1o 3- 2o 2- 1- 2o 2- 4o	16-	4 12 7 6	3 7 6 27				72	9	0.5
2	2o 2+ 4- 7o 7+ 7o 7+ 5o	42-	7 9 22 132	154 132 154 48				658	82	1.8
3	6o 5o 4- 4o 2+ 3- 5- 2+	31-	80 48 22 27	9 12 39 9				246	31	1.3
4	3o 2o 2- 3- 4+ 3o 4o 6+	27o	15 7 6 12	32 15 27 94				208	26	1.2
5	6+ 6+ 4+ 3+ 2+ 3- 4o 3+	33-	94 94 32 18	9 12 27 18				304	38	1.4
6	2+ 2- 1+ 3+ 2- 1o 2- 3-	16-	9 6 5 18	6 4 6 12				66	8	0.4
7	2+ 3- 3- 2o 2o 2+ 3o 3+	20+	9 12 12 7	7 9 15 18				89	11	0.6
8	3+ 4o 2o 1o 2o 2o 1+ 0+	16o	18 27 7 4	7 7 5 2				77	10	0.5
9	1- 2- 1+ 0+ 1o 1- 1+ 1o	8o	3 6 5 2	4 3 5 4				32	4	0.1
10	2- 1o 4- 4- 3o 4o 3o 6o	26o	6 4 22 22	15 27 15 80				191	24	1.2
11	4+ 4o 5- 3+ 2o 2- 1- 1o	22-	32 27 39 18	7 6 3 4				136	17	0.9
12	1- 2- 1- 3- 3o 3o 3+ 1+	16+	3 6 3 12	15 15 18 5				77	10	0.5
13	1+ 2- 1o 3- 3- 2o 1o 1+	14-	5 6 4 12	12 7 4 5				55	7	0.3
14	0+ 1o 1- 1- 1o 1+ 2- 2-	8+	2 4 3 3	4 5 6 6				33	4	0.1
15	2o 2o 2+ 2o 2o 2- 1o 1-	14-	7 7 9 7	7 6 4 3				50	6	0.3
16	1o 2- 1- 2- 2o 2- 2+ 2+	13+	4 6 3 6	7 6 9 9				50	6	0.3
17	2+ 3- 2+ 3o 2o 2o 2+ 2o	19-	9 12 9 15	7 7 9 7				75	9	0.5
18	3- 2o 3- 2+ 3+ 3- 3- 2+	21-	12 7 12 9	18 12 12 9				91	11	0.7
19	3- 3- 3o 3- 3o 3o 4- 4+	25o	12 12 15 12	15 15 22 32				135	17	0.9
20	3o 3- 2+ 3- 2o 2- 2+ 3o	20-	15 12 9 12	7 6 9 15				85	11	0.6
21	3+ 5+ 4- 3+ 5- 5o 5o 3+	34-	18 56 22 18	39 48 48 18				267	33	1.3
22	3+ 3+ 3- 3- 3+ 3o 3+ 2+	24o	18 18 12 12	18 15 18 9				120	15	0.8
23	3+ 3- 3- 3+ 3- 3+ 4+ 4-	26o	18 12 12 18	12 18 32 22				144	18	1.0
24	5- 4o 4- 3- 3+ 3- 3- 3-	26+	39 27 22 12	18 12 12 12				154	19	1.0
25	3- 3- 4- 4o 3- 4+ 5o 4o	29o	12 12 22 27	12 32 48 27				192	24	1.2
26	4o 5+ 6- 4+ 5- 5o 5o 5o	39o	27 56 67 32	39 48 48 48				365	46	1.5
27	4- 4o 3o 2o 3o 2+ 3+ 2+	24-	22 27 15 7	15 9 18 9				122	15	0.9
28	2+ 3- 2+ 3- 3+ 3+ 2+ 2+	21+	9 12 9 12	18 18 9 9				96	12	0.7
29	1- 2- 2o 3- 3- 4- 3+ 8-	24+	3 6 7 12	12 22 18 179				259	32	1.3
30	6o 4- 5- 4- 4o 3+ 4+ 1+	31o	80 22 39 22	27 18 32 5				245	31	1.3

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIRGURES Cp.

	Kp								Sum	Jul	1978			ap				Sum	Ap	Cp
1	2-	1+	1o	2+	2+	2-	0+	1-	11+	6	5	4	9	9	6	2	3	44	6	0.2
2	2o	1-	2o	2-	1+	2o	1o	1o	12-	7	3	7	6	5	7	4	4	43	5	0.2
3	1o	1o	2+	2o	2-	1o	2o	5o	16o	4	4	9	7	6	4	7	48	89	11	0.6
4	6o	4-	4o	4o	8-	8o	4-	6o	43o	80	22	27	27	179	207	22	80	644	80	1.8
5	6-	7o	7-	4+	4o	4-	4-	3-	38-	67	132	111	32	27	22	22	12	425	53	1.6
6	3-	2o	3+	2-	3o	4-	3-	2+	21+	12	7	18	6	15	22	12	9	101	13	0.7
7	3-	2+	2o	4-	3+	3+	4-	2o	23o	12	9	7	22	18	18	22	7	115	14	0.8
8	3-	3-	3-	2-	3+	4+	3o	2+	23-	12	12	12	6	18	32	15	9	116	14	0.8
9	3o	1o	1o	1o	2o	3+	2+	2o	16-	15	4	4	4	7	18	9	7	68	8	0.5
10	2o	2+	3+	2o	3-	2-	2+	2+	19-	7	9	18	7	12	6	9	9	77	10	0.5
11	2o	2-	1+	3-	1+	1o	1-	1-	11+	7	6	5	12	5	4	3	3	45	6	0.3
12	0+	0+	0+	1-	1o	2+	2o	2o	9o	2	2	2	3	4	9	7	7	36	4	0.2
13	3o	3o	4+	2o	4o	3o	2-	5-	26-	15	15	32	7	27	15	6	39	156	20	1.0
14	6-	5o	4o	5+	6-	5+	5o	3+	39+	67	48	27	56	67	56	48	18	387	48	1.6
15	3+	2+	1+	1-	0+	1-	1+	1+	11+	18	9	5	3	2	3	5	5	50	6	0.3
16	4-	1-	0+	1-	1+	1o	1+	2-	11-	22	3	2	3	5	4	5	6	50	6	0.3
17	2-	1+	1-	2+	1o	1+	2-	2-	12-	6	5	3	9	4	5	6	6	44	6	0.2
18	2o	2+	1-	1+	3o	4+	4o	5o	23-	7	9	3	5	15	32	27	48	146	18	1.0
19	3o	3o	4-	2+	2+	2-	1+	1o	18+	15	15	22	9	9	6	5	4	85	11	0.6
20	1+	2-	2o	1+	1o	1+	1+	1o	11o	5	6	7	5	4	5	5	4	41	5	0.2
21	2-	1+	2-	2-	2-	1+	2-	2-	13-	6	5	6	6	6	5	6	6	46	6	0.3
22	2+	3o	2+	2-	1o	1o	2+	3-	16+	9	15	9	6	4	4	9	12	68	8	0.5
23	2+	2+	2o	1o	1-	2o	3-	3-	16-	9	9	7	4	3	7	12	12	63	8	0.4
24	1+	1o	1+	1o	1+	1o	2o	3-	12-	5	4	5	4	5	4	7	12	46	6	0.3
25	2+	2-	1o	1+	2-	2-	3o	3o	16-	9	6	4	5	6	6	15	15	66	8	0.4
26	2-	2-	1-	1-	2-	1+	2o	2o	12-	6	6	3	3	6	5	7	7	43	5	0.2
27	1o	0+	0+	2-	2-	1-	1o	2o	9-	4	2	2	6	6	3	4	7	34	4	0.1
28	2-	2+	3-	2+	2-	1-	0+	0+	12o	6	9	12	9	6	3	2	2	49	6	0.3
29	0o	0+	1o	1+	1o	1o	1o	2o	8-	0	2	4	5	4	4	4	7	30	4	0.1
30	2-	1-	0+	1o	1o	1o	0+	0+	6+	6	3	2	4	4	4	2	2	27	3	0.1
31	0o	0o	0+	0+	0+	1-	1-	0+	3-	0	0	2	2	2	3	3	2	14	2	0.0

	Kp								Sum	Aug	1978			ap				Sum	Ap	Cp
1	1-	1o	1o	1+	1-	0+	1+	2-	8o	3	4	4	5	3	2	5	6	32	4	0.1
2	1-	0+	0o	0+	1-	1o	2o	2o	7o	3	2	0	2	3	4	7	7	28	4	0.1
3	2-	3-	2+	3o	3+	4-	4-	4o	24+	6	12	9	15	18	22	22	27	131	16	0.9
4	4+	6-	3o	5+	4+	3+	3o	2-	31-	32	67	15	56	32	18	15	6	241	30	1.3
5	2o	3+	4+	4+	4-	3o	4+	4-	29-	7	18	32	32	22	15	32	22	180	22	1.1
6	3-	4-	5-	2o	4-	3-	2+	2+	24o	12	22	39	7	22	12	9	9	132	16	0.9
7	3o	1o	2-	1o	2-	1+	2+	2+	14+	15	4	6	4	6	5	9	9	58	7	0.4
8	2-	1+	1+	2-	2-	3-	1+	1-	12+	6	5	5	6	6	12	5	3	48	6	0.3
9	1o	1+	1+	2-	1o	1o	1+	1+	10o	4	5	5	6	4	4	5	5	38	5	0.2
10	1+	1+	1+	2-	2o	1+	1+	2+	13-	5	5	5	6	7	5	5	9	47	6	0.3
11	3-	2-	1+	2-	3o	4o	3-	1+	18+	12	6	5	6	15	27	12	5	88	11	0.6
12	2+	4-	5o	5-	3o	3o	2o	3o	27-	9	22	48	39	15	15	7	15	170	21	1.1
13	3o	2+	2+	3+	3o	3-	2+	3o	22o	15	9	9	18	15	12	9	15	102	13	0.7
14	2+	2o	2-	1+	1o	2-	1+	1-	12o	9	7	6	5	4	6	5	3	45	6	0.3
15	1-	0o	1-	0+	2-	1o	2-	1-	7-	3	0	3	2	6	4	6	3	27	3	0.1
16	0+	0+	0o	1o	1+	1+	2+	2o	9-	2	2	0	4	5	5	9	7	34	4	0.1
17	1+	1-	1-	3o	3+	3-	2+	2+	16+	5	3	3	15	18	12	9	9	74	9	0.5
18	3+	2+	1+	1+	3+	4-	6o	4+	26-	18	9	5	5	18	22	80	32	189	24	1.1
19	4-	1-	3+	3-	3o	2o	2-	1o	18o	22	3	18	12	15	7	6	4	87	11	0.6
20	1-	1o	0+	1-	1-	1-	1o	1-	6-	3	4	2	3	3	3	4	3	25	3	0.1
21	1o	1-	0+	1-	1-	1+	2o	4-	10+	4	3	2	3	3	5	7	22	49	6	0.3
22	3-	2+	1-	1-	2o	1-	1-	1o	11-	12	9	3	3	7	3	3	4	44	6	0.2
23	0+	1o	1-	1-	1-	1+	2-	2-	8o	2	4	3	3	3	5	6	6	32	4	0.1
24	2o	1o	1o	1o	1o	1o	1-	1o	9-	7	4	4	4	4	4	3	4	34	4	0.1
25	2-	1o	2-	3o	3o	2+	2+	2-	17-	6	4	6	15	15	9	9	6	70	9	0.5
26	2-	1o	1-	1-	0+	1-	1+	1-	7o	6	4	3	3	2	3	5	3	29	4	0.1
27	4o	3+	4-	4o	5-	4+	4+	4+	33-	27	18	22	27	39	32	32	32	229	29	1.3
28	4+	7+	8+	8-	8o	6+	5-	5o	52-	32	154	236	179	207	94	39	48	989	124	1.9
29	6-	5-	6-	5-	5+	3+	3+	3o	36-	67	39	67	39	56	18	18	15	319	40	1.4
30	4o	3o	3+	4+	4+	4o	5+	5-	33o	27	15	18	32	32	27	56	39	246	31	1.3
31	6-	3+	5-	5o	5o	6+	4+	3-	37o	67	18	39	48	48	94	32	12	358	45	1.5

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIGURES Cp.

	Kp	Sum	Sep 1978	ap				Sum	Ap	Cp
1	3+ 3o 5o 3+ 4- 3o 3- 3+	27+	18 15 48 18	22	15	12	18	166	21	1.1
2	3- 2+ 5- 3o 4o 3- 4o 3o	26+	12 9 39 15	27	12	27	15	156	20	1.0
3	2+ 3- 3- 3- 3o 3- 2+ 2o	20+	9 12 12 12	15	12	9	7	88	11	0.6
4	2+ 2o 3- 2o 2o 2- 2+ 2-	17-	9 7 12 7	7	6	9	6	63	8	0.4
5	1o 1+ 1+ 2- 1o 1+ 3- 3o	13+	4 5 5 6	4	5	12	15	56	7	0.4
6	3+ 4- 4+ 4- 2+ 1+ 1o 0+	20o	18 22 32 22	9	5	4	2	114	14	0.8
7	0o 2- 1- 2- 1+ 1+ 3- 3-	12o	0 6 3 6	5	5	12	12	49	6	0.3
8	5+ 6- 4o 3- 1+ 1+ 2+ 2o	25-	56 67 27 12	5	5	9	7	188	24	1.1
9	3+ 4- 4o 5o 5- 5- 4- 4+	33+	18 22 27 48	39	39	22	32	247	31	1.3
10	4o 2- 1o 3o 4- 2o 2- 2o	19o	27 6 4 15	22	7	6	7	94	12	0.7
11	2o 0+ 0+ 2- 4o 4+ 3- 2+	18-	7 2 2 6	27	32	12	9	97	12	0.7
12	3- 3- 3+ 2+ 4- 2o 2+ 3o	22o	12 12 18 9	22	7	9	15	104	13	0.7
13	2+ 1o 2+ 2+ 1+ 2- 2- 1o	14-	9 4 9 9	5	6	6	4	52	6	0.3
14	3o 2- 0+ 1- 1- 1o 0+ 1-	8+	15 6 2 3	3	4	2	3	38	5	0.2
15	0+ 0o 1- 1o 1- 0+ 0+ 2o	5+	2 0 3 4	3	2	2	7	23	3	0.1
16	2- 3- 2- 0+ 2- 1+ 1+ 2o	13-	6 12 6 2	6	5	5	7	49	6	0.3
17	2- 3o 3+ 2- 1+ 1o 1- 2-	14+	6 15 18 6	5	4	3	6	63	8	0.4
18	0+ 0+ 0+ 1- 1o 0+ 1+ 0+	5-	2 2 2 3	4	2	5	2	22	3	0.0
19	0+ 0+ 0+ 0o 0+ 0+ 0+ 0o	2o	2 2 2 0	2	2	2	0	12	2	0.0
20	1o 0o 0+ 1- 1+ 0+ 2- 3o	8+	4 0 2 3	5	2	6	15	37	5	0.2
21	2o 4- 3o 2+ 1o 2o 1- 1-	15+	7 22 15 9	4	7	3	3	70	9	0.5
22	2o 2+ 3+ 2o 3o 3o 3o 2o	21-	7 9 18 7	15	15	15	7	93	12	0.7
23	2o 3- 2+ 3- 3- 3- 2+ 3-	20o	7 12 9 12	12	12	9	12	85	11	0.6
24	2- 3- 2o 1- 2- 3o 2+ 4-	18-	6 12 7 3	6	15	9	22	80	10	0.6
25	3- 3o 5- 5+ 5o 6- 4- 4o	34o	12 15 39 56	48	67	22	27	286	36	1.4
26	3- 5- 6o 5- 4o 5- 4o 4o	35-	12 39 80 39	27	39	27	27	290	36	1.4
27	6- 5+ 4- 4- 4- 5+ 6- 6+	39+	67 56 22 22	22	56	67	94	406	51	1.6
28	5o 5o 5+ 5+ 5o 3+ 4+ 6+	40-	48 48 56 56	48	18	32	94	400	50	1.6
29	4+ 7- 8- 8o 8o 7- 4- 2-	47-	32 111 179 207	207	111	22	6	875	109	1.9
30	1+ 4o 4- 2+ 2- 2- 2+ 2o	19o	5 27 22 9	6	6	9	7	91	11	0.7

	Kp	Sum	Oct 1978	ap				Sum	Ap	Cp
1	3- 2+ 2+ 3- 3o 3- 3+ 3+	22+	12 9 9 12	15	12	18	18	105	13	0.8
2	2- 3- 2- 3o 3+ 3o 3- 3o	21o	6 12 6 15	18	15	12	15	99	12	0.7
3	3- 2+ 3o 2- 2- 1o 1+ 2-	15+	12 9 15 6	6	4	5	6	63	8	0.4
4	4o 4- 4- 3o 3+ 2o 3- 3o	25+	27 22 22 15	18	7	12	15	138	17	0.9
5	4- 2+ 1o 2o 1+ 2o 1+ 1o	15-	22 9 4 7	5	7	5	4	63	8	0.4
6	1o 1o 1o 0o 1- 2o 1- 2-	8o	4 4 4 0	3	7	3	6	31	4	0.1
7	2- 2- 1+ 1o 1+ 0+ 1o 1-	9o	6 6 5 4	5	2	4	3	35	4	0.2
8	0o 2o 1+ 2o 1+ 1o 1o 2+	11o	0 7 5 7	5	4	4	9	41	5	0.2
9	1+ 3- 2- 3o 2o 2o 3- 4-	19o	5 12 6 15	7	7	12	22	86	11	0.6
10	4+ 4- 2+ 3+ 3o 0+ 2o 3-	22-	32 22 9 18	15	2	7	12	117	15	0.8
11	2o 2+ 2o 2- 1- 1- 0+ 1+	11o	7 9 7 6	3	3	2	5	42	5	0.2
12	1+ 1+ 1- 3+ 4o 4o 3o 3-	20+	5 5 3 18	27	27	15	12	112	14	0.8
13	3o 2+ 2+ 1+ 2- 1- 2+ 2+	16o	15 9 9 5	6	3	9	9	65	8	0.4
14	1- 1o 1o 1- 0+ 2o 2+ 2-	10-	3 4 4 3	2	7	9	6	38	5	0.2
15	1+ 0+ 1o 1+ 2+ 1o 1o 2-	10o	5 2 4 5	9	4	4	6	39	5	0.2
16	2o 2o 1- 1- 1+ 0+ 0+ 1-	8o	7 7 3 3	5	2	2	3	32	4	0.1
17	0+ 1+ 1o 1o 1- 1- 2+ 3-	10o	2 5 4 4	3	3	9	12	42	5	0.2
18	4+ 5+ 5o 4- 3+ 3+ 4+ 4o	33+	32 56 48 22	18	18	32	27	253	32	1.3
19	4o 4- 4+ 4- 4o 2+ 4- 3o	29-	27 22 32 22	27	9	22	15	176	22	1.1
20	3- 3- 2+ 3- 3- 2o 2o 1o	18o	12 12 9 12	12	7	7	4	75	9	0.5
21	1o 3o 2+ 3+ 3+ 2o 3o 3o	21o	4 15 9 18	18	7	15	15	101	13	0.7
22	2- 3+ 3- 2+ 2o 3- 2+ 1-	18-	6 18 12 9	7	12	9	3	76	10	0.5
23	0+ 3- 2+ 2- 1+ 1o 1- 1+	11+	2 12 9 6	5	4	3	5	46	6	0.3
24	2o 2+ 1o 0+ 0o 1o 2+ 1+	10+	7 9 4 2	0	4	9	5	40	5	0.2
25	1o 1o 1- 2+ 3o 3- 2- 1-	13o	4 4 3 9	15	12	6	3	56	7	0.4
26	2- 2o 2o 2- 3o 3+ 5- 5o	23+	6 7 7 6	15	18	39	48	146	18	1.0
27	4o 4+ 5+ 4+ 3o 2o 1+ 3-	27o	27 32 56 32	15	7	5	12	186	23	1.1
28	3- 4- 4+ 3o 2o 2+ 1o 3-	22-	12 22 32 15	7	9	4	12	113	14	0.8
29	3- 2+ 2o 3o 4o 4+ 3+ 3-	24+	12 9 7 15	27	32	18	12	132	16	0.9
30	2- 3+ 4- 5- 4- 5- 4+ 4-	30-	6 18 22 39	22	39	32	22	200	25	1.2
31	4- 4- 3- 2+ 4o 4o 4- 3+	27+	22 22 12 9	27	27	22	18	159	20	1.0

TABLE 4 PLANETARY THREE-HOUR-INDICES Kp, EQUIVALENT RANGES ap, DAILY AVERAGE RANGES Ap, AND PLANETARY DAILY CHARACTER FIGURES Cp.

	Kp	Sum	Nov 1978				ap				Sum	Ap	Cp
1	2+ 3o 3+ 4o 2+ 2o 2o 2+	21+	9	15	18	27	9	7	7	9	101	13	0.7
2	1- 2- 2o 3+ 3+ 3+ 2o 2o	18+	3	6	7	18	18	18	7	7	84	10	0.6
3	3- 3- 3- 2+ 2- 2o 4- 3+	21o	12	12	12	9	6	7	22	18	98	12	0.7
4	2+ 2- 2+ 1- 1+ 1- 0+ 2-	11o	9	6	9	3	5	3	2	6	43	5	0.2
5	3- 3+ 1o 1o 1+ 1+ 1- 0o	11+	12	18	4	4	5	5	3	0	51	6	0.3
6	0o 0o 0+ 1o 1- 1o 1- 1-	4+	0	0	2	4	3	4	3	3	19	2	0.0
7	1- 0o 0o 0+ 0+ 1- 3- 5o	10-	3	0	0	2	2	3	12	48	70	9	0.5
8	4+ 4+ 3- 2o 2- 3- 2o 2o	22-	32	32	12	7	6	12	7	7	115	14	0.8
9	3- 3- 3o 2o 2o 1+ 0o 1-	14+	12	12	15	7	7	5	0	3	61	8	0.4
10	1+ 1o 0+ 1+ 1+ 4- 5- 5o	19-	5	4	2	5	5	22	39	48	130	16	0.9
11	3o 3o 2+ 1- 1o 1- 3+ 3o	17o	15	15	9	3	4	3	18	15	82	10	0.6
12	6- 4o 6- 6o 5+ 4- 5+ 5o	41-	67	27	67	80	56	22	56	48	423	53	1.6
13	4+ 4o 3- 2+ 4o 4+ 4+ 1+	27+	32	27	12	9	27	32	32	5	176	22	1.1
14	1- 0+ 1- 1- 4+ 4o 3- 1+	15-	3	2	3	3	32	27	12	5	87	11	0.6
15	2o 3+ 2o 2o 0+ 2- 2o 2+	16-	7	18	7	7	2	6	7	9	63	8	0.4
16	2o 1o 2- 2- 3- 1+ 2+ 1-	13+	7	4	6	6	12	5	9	3	52	6	0.3
17	2o 0+ 2+ 2+ 2o 1o 2- 1o	13-	7	2	9	9	7	4	6	4	48	6	0.3
18	2- 2o 1+ 1o 1- 1- 1o 2+	11-	6	7	5	4	3	3	4	9	41	5	0.2
19	3- 4- 2o 3o 4- 3- 1o 2o	21-	12	22	7	15	22	12	4	7	101	13	0.7
20	3o 4+ 3o 3- 3+ 4o 4o 4+	29-	15	32	15	12	18	27	27	32	178	22	1.1
21	4+ 4- 3+ 3- 2- 2+ 2o 4-	24-	32	22	18	12	6	9	7	22	128	16	0.9
22	4o 4- 4+ 4- 5o 5o 3o 2+	31o	27	22	32	22	48	48	15	9	223	28	1.2
23	2- 1- 1o 3o 4- 3+ 3o 3-	19o	6	3	4	15	22	18	15	12	95	12	0.7
24	2+ 3- 2o 2- 4- 4- 4+ 4+	25-	9	12	7	6	22	22	32	32	142	18	1.0
25	4- 4o 4+ 5o 6o 7o 6+ 5o	41+	22	27	32	48	80	132	94	48	483	60	1.7
26	5- 5o 5- 4o 4+ 4+ 4o 3+	34+	39	48	39	27	32	32	27	18	262	33	1.3
27	3- 3+ 3o 3o 3o 4- 4o 3o	26-	12	18	15	15	15	22	27	15	139	17	0.9
28	2- 2- 1+ 1- 1+ 2- 1o 1-	10o	6	6	5	3	5	6	4	3	38	5	0.2
29	1+ 1o 0+ 2o 1- 2+ 1o 0+	9o	5	4	2	7	3	9	4	2	36	4	0.2
30	2o 1+ 0+ 1- 1+ 1- 2- 2+	10+	7	5	2	3	5	3	6	9	40	5	0.2

	Kp	Sum	Dec 1978				ap				Sum	Ap	Cp
1	2- 3+ 3+ 3o 3o 2- 1o 1o	18o	6	18	18	15	15	6	4	4	86	11	0.6
2	1+ 1- 0+ 1- 1- 0+ 0+ 1+	6-	5	3	2	3	3	2	2	5	25	3	0.1
3	2o 2o 0o 1- 1- 2- 1+ 2-	10o	7	7	0	3	3	6	5	6	37	5	0.2
4	2- 2+ 2o 3+ 3o 3o 3o 3-	21o	6	9	7	18	15	15	15	12	97	12	0.7
5	4o 3o 2- 1o 1- 1o 2o 3+	17-	27	15	6	4	3	4	7	18	84	10	0.6
6	2- 1+ 1+ 1o 1o 1o 2+ 1o	11-	6	5	5	4	4	4	9	4	41	5	0.2
7	1- 0+ 1- 0+ 0+ 1- 0+ 0+	4-	3	2	3	2	2	3	2	2	19	2	0.0
8	0o 0o 1- 2- 1- 1- 2o 1o	7-	0	0	3	6	3	3	7	4	26	3	0.1
9	0+ 2- 0+ 0+ 0+ 1- 1- 0+	5-	2	6	2	2	2	3	3	2	22	3	0.0
10	1- 0o 0o 0o 0+ 0+ 0o 0o	1+	3	0	0	0	2	2	0	0	7	1	0.0
11	0o 0o 0o 0o 0o 0o 0+ 1o	1+	0	0	0	0	0	0	2	4	6	1	0.0
12	0o 0o 0o 2- 2- 1+ 2- 2o	8+	0	0	0	6	6	5	6	7	30	4	0.1
13	3+ 3+ 1+ 1- 0+ 0o 1o 2-	12-	18	18	5	3	2	0	4	6	56	7	0.4
14	4o 5o 6- 4+ 4- 2+ 2o 2+	29+	27	48	67	32	22	9	7	9	221	28	1.2
15	4- 6+ 4+ 3+ 4- 3+ 2+ 3-	30-	22	94	32	18	22	18	9	12	227	28	1.2
16	2+ 3+ 2o 3- 3- 3o 4- 3o	23-	9	18	7	12	12	15	22	15	110	14	0.8
17	3o 2+ 2+ 1+ 2o 1o 2o 3+	17+	15	9	9	5	7	4	7	18	74	9	0.5
18	4+ 4- 5+ 5+ 6- 6- 5o 4+	39+	32	22	56	56	67	67	48	32	380	48	1.6
19	4- 4+ 3+ 3o 5- 4o 4o 3o	30o	22	32	18	15	39	27	27	15	195	24	1.2
20	4- 4- 3+ 4o 4o 4+ 4+ 4o	31+	22	22	18	27	27	32	32	27	207	26	1.2
21	3+ 4- 3o 3- 3- 2+ 2- 1+	21-	18	22	15	12	12	9	6	5	99	12	0.7
22	3- 4+ 3o 4o 3o 4o 3- 2+	26o	12	32	15	27	15	27	12	9	149	19	1.0
23	3o 2+ 2+ 1o 1o 2+ 1+ 0+	14-	15	9	9	4	4	9	5	2	57	7	0.4
24	1o 1+ 3- 2o 1o 1o 1o 1o	11o	4	5	12	7	4	4	4	4	44	6	0.2
25	3- 3- 3o 3o 6- 4+ 2o 1+	25-	12	12	15	15	67	32	7	5	165	21	1.1
26	2+ 2+ 3o 2+ 2o 2- 2- 2-	17o	9	9	15	9	7	6	6	6	67	8	0.5
27	4+ 4o 2o 1o 3- 3o 2+ 1+	21-	32	27	7	4	12	15	9	5	111	14	0.8
28	2- 3o 1o 0+ 2o 4+ 5- 2+	19+	6	15	4	2	7	32	39	9	114	14	0.8
29	3- 3- 1+ 2o 2+ 5o 5- 4o	25-	12	12	5	7	9	48	39	27	159	20	1.0
30	4o 5o 4- 4- 3o 3- 5- 4+	31o	27	48	22	22	15	12	39	32	217	27	1.2
31	5- 4- 3o 3+ 3- 3o 3- 3-	26-	39	22	15	18	12	15	12	12	145	18	1.0

TABLE 5 FREQUENCIES OF Kp INDICES, 1978

Kp	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0-	19	.	3	.	.	.	3	3	5	3	6	18
0+	22	6	9	2	5	3	18	10	22	10	11	19
1-	19	7	24	3	10	11	19	32	12	18	24	16
1o	20	11	7	14	27	13	32	25	12	25	16	21
1+	23	18	20	15	33	9	25	27	15	20	16	14
2-	17	21	9	23	25	19	33	23	23	19	17	18
2o	18	25	11	20	14	23	25	12	19	24	25	16
2+	10	31	30	22	20	24	24	18	20	26	18	19
3-	18	17	24	19	18	36	14	11	24	26	19	18
3o	14	24	24	23	13	16	12	18	17	20	15	23
3+	12	16	23	17	10	24	8	13	9	15	13	14
4-	11	14	17	15	12	13	9	11	15	16	14	12
4o	9	12	7	10	8	13	6	6	11	10	12	12
4+	10	4	12	10	7	8	4	13	5	9	15	12
5-	6	4	12	12	9	6	1	8	7	3	3	5
5o	3	3	4	6	6	8	4	4	6	2	8	4
5+	4	6	5	8	5	2	2	3	6	2	2	2
6-	4	2	1	9	3	1	3	4	4		2	4
6o	5	.	3	3	4	3	2	1	1		2	.
6+	2	1	1	3	2	3	.	2	2		1	1
7-	1	1	2	2	5	.	1	.	2		.	
7o	.	.		1	4	2	1	.	.		1	
7+	1	1		1	5	2	.	1	.			
8-				1	2	1	1	1	1			
8o				1	.		1	1	2			
8+					1			1				
9-												
9o												
	248	224	248	240	248	240	248	248	240	248	240	248

TABLE 6 MONTHLY AVERAGES OF Ap AND Cp, 1978

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Ap	15	16	17	24	25	20	13	17	18	12	15	13	17.0
Cp	0.63	0.73	0.77	0.95	0.81	0.84	0.52	0.63	0.72	0.59	0.68	0.63	0.71

TABLE 7 LIST OF MAGNETIC STORMS, 1978

Gives consecutive sequences of three-hour-intervals (Eighths E of the Greenwich day) in which at least one Kp reached or surpassed 7+, and no Kp was smaller than 5-.

Beginning	s.c. d. GMT	Duration Eighths	Number of Eighths with Kp= 7- 7o 7+	8- 8o 8+	9- 9o
Jan 03 E8	03 20.43	11	1 . 1	. . .	. .
Feb 15 E2	14 21.47	3	1 . 1	. . .	. .
Apr 10 E6	10 13.06	6	. . 1	1 . .	. .
Apr 30 E4	30 09.51	3	1 . .	. 1 .	. .
May 01 E2	01 08.28	4	. . 1	. . .	. .
May 01 E7	-	8	1 2 2	. . 1	. .
May 02 E8	-	14	3 1 2	1 . .	. .
May 09 E1	-	7	1 1 .	1 . .	. .
Jun 02 E4	01 21.43	7	. 2 2	. . .	. .
Jun 29 E8	29 09.51	2	. . .	1 . .	. .
Jul 04 E5	03 23.05	2	. . .	1 1 .	. .
Aug 28 E2	27 02.47	12	. . 1	1 1 1	. .
Sep 29 E2	29 03.01	5	2 . .	1 2 .	. .

TABLE 8 VERY QUIET INTERVALS, 1978

Kp not exceeding 1+ for at least 8 intervals
(= one day) in succession

First. . . . . last Eighth		Duration Eighths
Jan 02 E4	03 E4	9
15 E1	16 E2	10
20 E4	24 E5	34
Mar 04 E1	05 E3	11
11 E8	12 E8	9
May 19 E6	20 E5	8
Jun 13 E7	14 E6	8
Jul 11 E5	12 E5	9
28 E6	29 E7	10
30 E2	Aug 01 E7	22

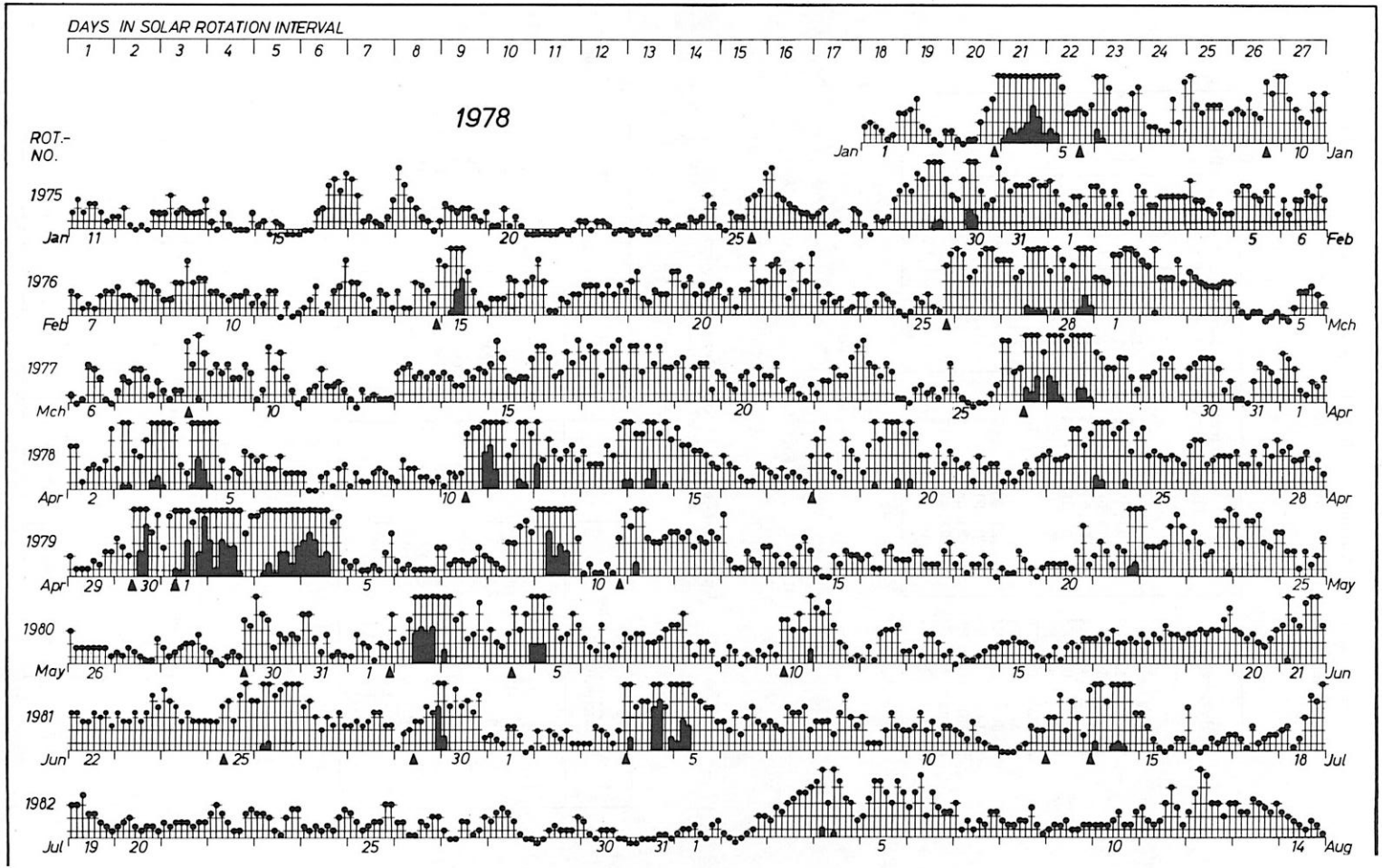
First. . . . . last Eighth		Duration Eighths
Aug 19 E8	21 E6	15
22 E6	23 E6	9
Sep 14 E3	15 E7	13
18 E1	20 E6	22
Oct 16 E3	17 E6	12
Nov 05 E3	07 E6	20
09 E6	10 E5	8
Dec 01 E7	02 E8	10
06 E8	08 E3	12
09 E3	12 E3	25

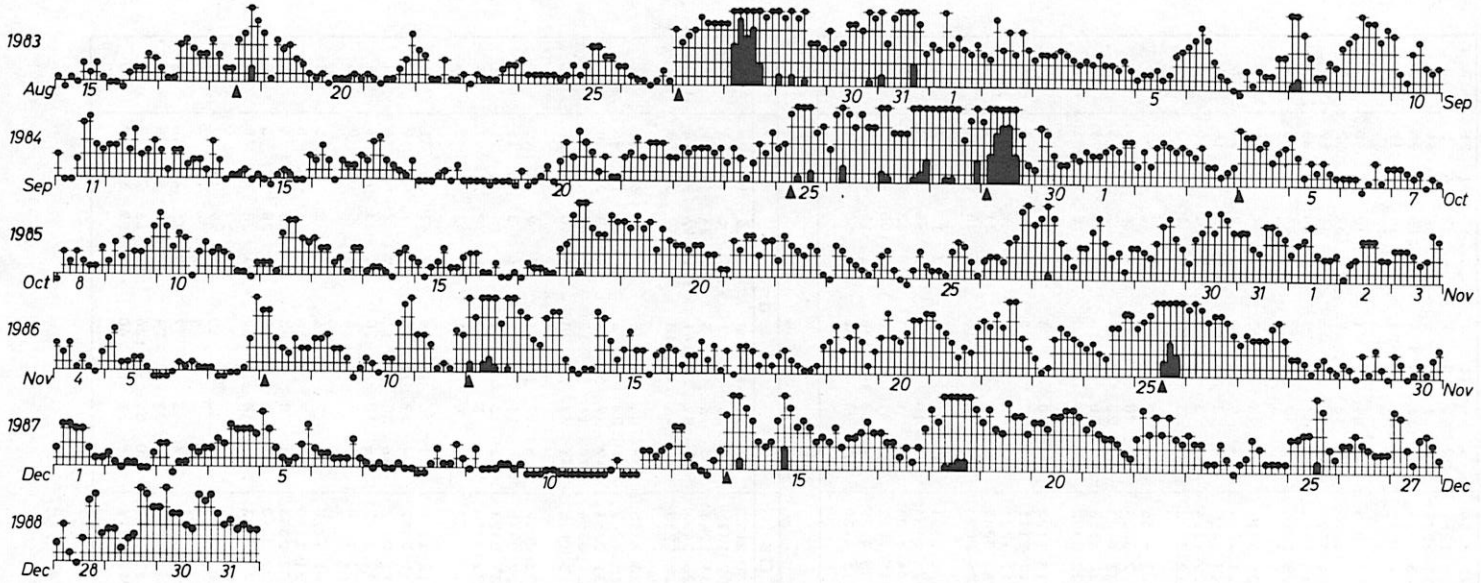
TABLE 8a LIST OF Kp', 1978

Reduction of Kp to Kp' due to solar flare effects

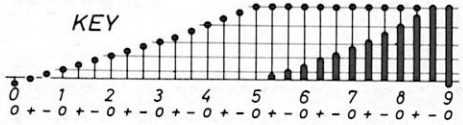
Month	Day	Eighth	Kp	Kp'
Apr	10	4	2-	1+
Jul	11	4	3-	2+
Oct	05*	4	2o	2-

* This is a doubtful case of sfe (see Part C, table 2b)


DAYS IN SOLAR ROTATION INTERVAL
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
1978
ROT.-
NO.
Jan 1 5 10 Jan
1975
Jan 11 15 20 25 30 31 1 5 6 Feb
1976
Feb 7 10 15 20 25 28 1 5 Mch
1977
Mch 6 10 15 20 25 30 31 1 Apr
1978
Apr 2 5 10 15 20 25 28 Apr
1979
Apr 29 30 1 5 10 15 20 25 May
1980
May 26 30 31 1 5 10 15 20 21 Jun
1981
Jun 22 25 30 1 5 10 15 18 Jul
1982
Jul 19 20 25 30 31 1 5 10 14 Aug



Kp (after Bartels)



▲ = sudden commencement

1978

(For explanation: see page IX)

JAN. 1978

	3 Kn								σn	an				An
1	4	4	5	3	3	5	8	8	2212 3664	8	9	11	7	6	12	21	21	12
2	8	8	4	4	2	1	3	2	2322 1213	22	22	10	9	4	3	6	5	10
3	2	0	3	2	5	8	10	13	2131 2222	4	1	6	5	13	24	37	64	19
4	14	16	14	17	18	20	20	15	2443 3454	71	111	80	124	151	218	236	95	136
5	15	13	11	8	7	9	9	10	2231 1222	94	66	45	22	17	30	27	39	43
6	17	15	11	8	8	9	12	11	4312 2045	141	89	45	23	23	30	55	45	56
7	7	5	4	4	5	9	5	12	3233 3225	17	13	9	10	11	32	13	52	20
8	12	8	7	9	9	10	5	7	5124 3323	56	25	19	32	32	36	13	19	29
9	7	6	11	9	9	14	13	14	4244 5344	18	14	41	29	30	80	61	83	45
10	13	10	8	9	6	11	8	10	2125 2414	67	37	23	27	14	44	24	35	34
11	3	5	4	8	8	4	2	3	1235 3311	7	13	9	22	23	9	4	7	12
12	2	4	1	0	1	1	4	5	2321 2244	4	9	3	1	3	3	9	11	5
13	4	7	7	7	6	5	6	7	2443 2455	10	18	17	18	16	13	16	18	16
14	2	1	4	1	1	0	1	4	3322 1114	4	3	9	3	2	1	2	10	4
15	2	1	0	4	4	0	0	1	2212 3202	4	3	1	10	8	1	0	3	4
16	0	1	5	5	12	11	9	11	2123 4256	1	2	12	11	57	43	32	42	25
17	9	7	3	4	4	3	4	8	5222 3324	31	18	7	9	9	6	8	22	14
18	11	8	7	7	5	3	1	2	6333 4222	43	23	17	17	11	7	3	5	16
19	6	4	5	6	6	6	4	4	3232 4556	15	10	13	16	15	15	9	9	13
20	2	1	5	2	4	2	0	0	2032 3302	4	3	12	5	9	5	0	1	5
21	0	0	0	1	1	0	1	2	1013 1122	1	0	1	3	2	1	2	5	2
22	2	1	3	2	3	0	1	0	1111 2111	5	2	6	5	7	0	2	1	4
23	0	1	0	1	1	4	3	0	1211 1321	1	3	1	2	2	9	7	1	3
24	1	1	3	4	5	9	7	1	2242 3332	3	3	7	8	11	31	19	2	11
25	1	4	5	6	8	9	10	10	2324 2023	2	10	11	16	23	28	35	40	21
26	11	8	7	8	5	5	5	4	5333 2321	47	21	19	23	13	13	12	8	20
27	4	4	1	4	1	1	4	3	2223 1134	8	10	3	10	2	3	10	7	7
28	1	0	4	5	4	9	11	9	2144 1623	3	1	9	11	8	33	42	32	17
29	8	11	11	15	15	16	11	8	3315 2242	26	41	41	96	103	105	48	23	60
30	8	9	16	17	11	6	8	11	3235 4225	24	33	107	138	41	15	22	47	53
31	11	8	9	10	12	11	11	10	3111 4432	41	24	31	36	51	50	42	35	39
																		24.4

JAN. 1978

	3 Ks								σs	as				As
1	4	6	5	4	2	5	7	8	2121 2132	9	16	13	8	5	12	18	24	13
2	9	8	4	5	3	2	2	3	2202 1322	31	25	9	11	6	5	5	6	12
3	2	1	2	2	6	8	12	14	1333 1243	5	3	4	5	14	24	38	71	23
4	14	15	12	17	19	19	19	15	2123 2423	81	89	55	141	191	196	182	94	129
5	14	11	10	7	8	10	10	12	3212 1235	75	48	40	18	22	39	35	58	42
6	17	14	14	10	10	11	13	10	1023 2345	134	84	76	35	37	50	61	39	65
7	8	8	4	3	5	8	7	11	2112 1242	26	22	8	6	12	26	18	46	21
8	11	10	9	11	11	10	7	7	4231 0353	47	39	30	45	48	38	20	18	36
9	7	6	7	5	7	13	11	13	3221 0354	20	16	17	12	18	68	49	65	33
10	14	10	9	7	6	10	8	9	1013 1125	71	37	31	20	15	40	26	31	34
11	4	5	4	8	7	4	1	4	1123 2012	8	12	10	21	20	9	3	10	12
12	2	5	2	0	3	1	3	5	3322 2343	4	11	5	1	6	3	6	11	6
13	5	5	4	5	5	6	5	5	4431 0323	11	13	9	11	13	14	13	11	12
14	1	1	2	1	1	1	0	3	1132 3215	3	3	4	2	3	2	1	7	3
15	2	2	1	5	4	1	0	2	3313 2202	4	4	3	11	10	2	0	5	5
16	0	3	6	8	11	11	10	9	1112 1324	1	6	14	26	44	43	34	31	25
17	8	7	5	6	4	3	4	7	4411 2342	24	19	11	15	8	7	9	19	14
18	10	9	8	6	4	3	1	4	6311 2222	35	30	21	14	9	7	3	10	16
19	6	4	6	7	8	5	4	3	4512 1322	16	10	14	20	21	13	8	6	14
20	3	3	5	3	6	2	0	0	2433 1210	6	7	11	6	14	5	1	0	6
21	1	1	1	3	0	1	0	2	2341 1210	2	2	3	6	1	2	1	5	3
22	3	1	4	3	4	2	1	0	2221 1440	7	3	8	6	10	4	3	0	5
23	0	4	4	1	1	4	4	2	1332 2333	1	8	8	3	2	8	9	4	5
24	2	2	4	2	4	9	7	2	2122 2340	5	4	9	5	9	28	17	5	10
25	2	6	5	5	8	10	11	13	3122 5333	4	14	12	12	21	38	48	68	27
26	11	10	7	5	5	4	5	5	4102 3242	48	35	18	12	11	9	13	12	20
27	4	4	3	3	2	1	4	4	4211 3232	10	9	6	7	4	2	8	9	7
28	2	1	3	3	3	9	11	11	3231 1124	4	3	7	7	7	31	44	44	18
29	11	9	9	14	14	16	12	10	2413 1244	44	33	31	74	76	104	58	38	57
30	11	12	15	17	11	6	8	12	3113 2255	50	51	93	126	42	16	25	57	58
31	11	9	10	10	11	12	12	11	5213 2126	49	31	35	40	47	59	51	49	45
																		25.0

Table 9 - continued

JAN. 1978

	3 Km								Σ Km	am							Am	Am2
1	4	5	5	4	3	5	7	8	13.7	9	13	12	8	6	12	19	23	13	14
2	8	8	4	4	2	2	3	3	11.3	26	23	9	10	5	4	6	6	11	10
3	2	1	2	2	6	8	11	13	15.0	4	2	5	5	14	24	48	67	21	35
4	14	15	13	17	18	20	20	15	44.0	76	100	68	133	171	207	209	95	132	89
5	14	12	11	7	7	10	9	11	27.0	84	57	43	20	20	34	31	48	42	83
6	17	14	13	9	9	10	12	11	31.7	137	86	61	29	30	40	58	42	60	42
7	8	7	4	4	5	9	6	11	18.0	22	18	8	8	12	29	16	49	20	30
8	12	9	8	10	10	10	7	7	24.3	51	32	24	39	40	37	17	19	32	28
9	7	6	9	7	8	14	12	14	25.7	19	15	29	20	24	74	55	74	39	36
10	13	10	9	8	6	11	8	9	24.7	69	37	27	23	15	42	25	33	34	34
11	3	5	4	8	8	4	2	4	12.7	7	12	10	22	22	9	4	8	12	14
12	2	4	2	0	2	1	3	5	6.3	4	10	4	1	4	3	7	11	6	9
13	4	6	5	6	6	5	6	6	14.7	10	16	13	14	14	13	14	15	14	9
14	1	1	3	1	1	1	1	4	4.3	3	3	7	3	2	2	2	8	4	7
15	2	2	1	4	4	0	0	2	5.0	4	4	2	10	9	1	0	4	4	5
16	0	2	5	7	12	11	9	10	18.7	1	4	13	19	51	43	33	37	25	18
17	9	7	4	5	4	3	4	7	14.3	28	19	9	12	9	7	9	20	14	24
18	10	8	7	6	4	3	1	4	14.3	39	26	19	15	10	7	3	8	16	14
19	6	4	6	7	7	6	4	4	14.7	16	10	14	18	18	14	8	8	13	10
20	2	2	5	3	5	2	0	0	6.3	5	5	11	6	11	5	0	1	6	6
21	0	0	1	2	0	1	0	2	2.0	1	1	2	4	1	2	1	5	2	3
22	3	1	3	3	4	1	1	0	5.3	6	2	7	6	8	2	2	0	4	3
23	0	2	2	1	1	4	4	1	5.0	1	5	4	2	2	9	8	2	4	4
24	2	2	4	3	4	9	7	1	10.7	4	4	8	6	10	29	18	3	10	9
25	1	5	5	6	8	9	11	12	19.0	3	12	12	14	22	33	41	54	24	23
26	11	9	7	7	5	5	5	4	17.7	47	28	19	18	12	11	12	10	20	21
27	4	4	2	4	1	1	4	4	8.0	9	10	5	8	3	3	9	8	7	8
28	1	1	4	4	3	9	11	10	14.3	3	2	8	9	7	32	43	38	18	22
29	10	10	10	14	15	16	12	9	32.0	35	37	36	85	89	105	53	31	59	56
30	10	11	15	17	11	6	8	12	30.0	37	42	100	132	42	15	23	52	55	54
31	11	9	9	10	11	12	11	11	28.0	45	28	33	38	49	54	46	42	42	35
																		24.6	

FEB. 1978

	3 Km								Σ Km	am							Am	Am2
1	10	8	6	5	9	10	8	10	22.0	38	22	15	13	31	36	21	38	27	32
2	9	8	6	10	5	3	4	9	18.0	33	22	16	35	13	7	10	27	20	23
3	8	6	6	9	9	10	9	8	21.7	26	14	15	28	32	34	27	21	25	20
4	9	6	6	5	5	5	4	4	14.7	29	14	14	13	11	12	10	8	14	22
5	8	9	10	9	9	9	11	5	23.3	25	29	34	32	29	32	43	13	30	21
6	6	3	7	6	10	10	11	8	20.3	14	7	18	16	37	35	44	21	24	23
7	8	6	2	5	3	6	7	7	14.7	23	15	5	12	6	14	20	20	14	19
8	6	4	6	5	9	7	8	7	17.3	15	8	16	13	30	20	22	18	18	17
9	4	3	8	9	12	9	10	10	21.7	10	7	25	31	52	30	35	35	28	23
10	5	7	5	5	5	7	8	4	15.3	12	17	13	11	11	19	23	9	14	20
11	4	4	6	6	1	5	1	2	9.7	8	9	14	16	2	11	3	4	8	11
12	4	6	7	1	3	7	8	11	15.7	8	16	18	3	7	17	22	41	17	14
13	8	8	5	5	1	7	7	3	14.7	21	22	13	13	3	18	17	7	14	16
14	5	4	3	8	7	7	4	13	17.0	11	8	6	25	19	20	10	70	21	47
15	12	15	17	21	10	6	5	3	29.7	54	88	136	257	40	16	11	7	76	50
16	4	4	6	9	9	6	8	9	18.3	9	9	16	30	30	14	25	27	20	19
17	11	7	2	1	4	5	5	5	13.3	44	19	4	2	8	12	13	12	14	17
18	7	5	6	5	7	7	8	6	17.0	17	13	16	11	20	18	23	15	17	16
19	7	10	5	5	8	5	4	10	18.0	19	34	11	11	22	12	10	35	19	19
20	8	5	9	6	9	7	7	7	19.3	25	12	27	15	27	17	17	20	20	18
21	4	6	3	6	7	12	9	8	18.3	9	15	6	15	18	52	28	26	21	21
22	8	9	9	5	7	13	9	12	24.0	24	27	28	12	19	69	32	55	33	27
23	7	5	4	4	5	2	4	5	12.0	20	11	9	9	12	5	8	11	11	18
24	5	2	3	5	6	5	2	0	9.3	11	5	6	12	14	11	4	1	8	9
25	2	4	4	6	5	2	11	12	15.3	4	8	10	14	11	5	47	59	20	24
26	14	11	9	10	13	12	13	11	31.0	82	45	29	36	68	53	66	45	53	43
27	11	9	9	9	16	14	14	14	32.0	48	33	32	32	106	85	79	84	62	58
28	10	14	11	10	11	14	16	14	33.3	38	71	42	38	46	73	106	83	62	62
																		25.4	

Table 9 - continued

FEB. 1978

	3 Kn								σn								An
1	10	8	5	6	9	10	8	11	4223	4343	37	25	12	14	28	35	22	42	27
2	9	8	7	11	6	3	5	9	2214	2233	32	22	17	41	15	7	12	31	22
3	8	6	7	8	10	10	9	7	2543	4452	23	16	17	22	36	34	32	20	25
4	10	6	6	5	5	6	5	4	3223	3241	34	15	15	13	12	15	13	9	16
5	9	8	10	9	9	10	11	5	2344	5653	31	26	34	32	29	37	46	12	31
6	6	4	8	6	10	10	10	7	2242	4533	15	8	22	16	34	37	40	18	24
7	6	4	1	5	3	6	7	7	1312	3222	16	10	3	11	6	14	20	19	12
8	6	4	6	5	9	7	9	7	3124	3356	14	9	14	12	29	20	28	19	18
9	5	3	9	10	12	9	10	10	3443	2355	11	7	30	36	56	29	40	37	31
10	5	5	5	4	5	6	8	4	3232	3132	13	13	11	8	11	15	21	8	13
11	4	4	7	7	1	5	1	1	3334	1222	10	8	18	20	2	11	2	3	9
12	3	4	8	1	3	7	8	11	2232	2315	7	10	22	3	7	19	22	46	17
13	8	8	5	6	1	7	6	3	2223	2321	22	21	11	14	3	18	15	7	14
14	4	3	3	8	7	8	4	12	2222	2311	10	6	6	25	19	21	9	57	19
15	11	14	17	21	12	7	4	3	4224	4321	48	72	127	270	52	17	10	7	75
16	4	3	6	9	9	6	9	9	3223	3442	10	7	15	33	29	14	27	30	21
17	11	6	2	1	4	5	6	5	4222	2242	42	16	5	2	9	11	14	13	14
18	6	6	6	5	8	7	8	7	5313	2442	15	14	16	12	25	20	25	17	18
19	7	10	5	5	8	5	5	9	4622	3233	18	35	13	11	23	12	12	32	20
20	8	6	9	7	9	7	7	7	3333	4244	25	14	28	18	32	18	19	20	22
21	3	6	3	6	7	12	9	9	1323	2534	7	14	7	14	17	57	29	31	22
22	9	9	9	4	7	14	9	11	5632	3604	29	28	31	9	18	74	28	49	33
23	6	4	4	4	5	2	3	5	3232	3324	15	8	8	8	13	4	7	11	9
24	4	1	3	5	6	5	2	0	2222	3311	10	3	7	12	15	12	5	1	8
25	2	3	5	6	5	2	11	11	4233	5134	4	7	11	15	12	5	49	50	19
26	14	11	8	10	13	12	13	11	2233	3353	76	41	24	36	65	59	67	41	51
27	12	10	9	10	17	14	14	14	2222	3234	58	34	30	40	123	85	78	81	66
28	10	14	11	10	11	14	16	14	3443	6443	39	80	45	38	47	78	108	85	65
																			25.8

FEB. 1978

	3 Ks								σs								As
1	10	7	7	5	10	10	7	10	5321	2013	40	19	19	12	35	36	20	34	27
2	9	8	6	9	5	3	4	8	3215	2213	33	22	14	29	12	7	8	22	18
3	9	5	6	10	9	9	8	8	3126	5333	28	13	14	34	29	33	23	22	25
4	8	5	5	6	4	4	3	3	2112	0341	25	13	12	14	9	10	6	7	12
5	7	9	10	9	9	9	11	5	3512	3214	19	32	34	32	30	28	41	13	29
6	5	3	6	6	10	10	11	8	3111	4121	13	7	15	16	40	34	47	25	25
7	9	7	3	5	3	6	8	8	2311	1333	30	20	7	12	7	14	21	21	17
8	6	3	7	6	9	7	7	7	4114	2344	15	7	18	14	31	19	17	17	17
9	4	3	7	8	11	9	9	10	4021	2133	10	6	19	26	49	32	31	34	26
10	5	7	6	6	5	8	8	4	2321	1442	12	20	16	14	11	22	25	9	16
11	3	5	5	5	1	5	2	3	2121	2243	6	11	11	11	3	11	4	6	8
12	4	8	6	1	3	6	8	10	3212	2222	9	21	15	3	6	15	22	36	16
13	8	8	6	5	2	7	7	3	4211	3342	21	23	15	13	4	19	18	7	15
14	5	5	3	8	7	7	4	14	5121	2235	12	11	6	26	18	19	10	83	23
15	13	16	17	21	9	6	5	3	1131	2242	61	104	145	244	29	15	12	6	77
16	4	4	6	9	9	6	8	8	3222	2431	8	10	16	28	30	15	22	24	19
17	11	8	2	1	3	5	5	5	4431	2322	46	23	4	3	7	13	12	12	15
18	7	5	6	5	6	6	8	5	5111	3122	20	13	16	11	15	16	21	13	16
19	7	9	4	4	7	5	4	10	1321	5324	20	33	10	10	20	13	8	39	19
20	8	4	8	5	8	6	6	7	4144	3135	25	10	25	11	22	16	16	20	18
21	4	6	2	6	7	11	9	7	2321	1322	10	16	5	16	18	47	27	20	20
22	7	8	8	6	7	13	10	12	2530	0335	20	26	25	15	19	64	36	60	33
23	8	5	4	4	5	2	4	5	3212	1322	24	13	9	10	11	5	9	11	12
24	5	3	3	5	5	4	1	0	2103	1311	11	7	6	12	12	9	3	1	8
25	2	4	4	5	4	2	11	13	2232	3331	4	8	9	12	9	5	46	69	20
26	15	11	10	10	14	11	13	11	3113	1052	89	50	34	36	72	47	65	49	55
27	10	9	10	8	15	14	14	14	4111	2256	39	31	34	24	90	85	80	86	59
28	10	13	10	10	11	13	16	14	0225	5334	36	61	39	38	45	68	104	80	59
																			25.1

Table 9 - continued

MAR. 1978

	3 Kn								σn								An
1	9	8	7	14	14	14	13	13	2224	3353	32	25	17	73	79	80	63	62	54
2	10	10	12	9	9	9	11	8	3233	1332	37	39	59	32	33	33	50	26	39
3	9	9	8	9	8	8	9	9	3114	2342	32	28	25	32	23	22	30	29	28
4	3	2	1	2	1	0	0	2	1312	2013	7	5	2	4	3	0	1	5	3
5	2	0	4	7	8	9	6	4	2024	3322	4	0	9	19	24	27	14	9	13
6	3	0	2	9	9	7	3	2	1234	3311	7	1	4	29	29	18	6	5	12
7	4	6	6	8	10	7	4	6	2313	4332	10	15	14	21	36	18	8	15	17
8	4	2	4	4	13	10	15	11	2222	3154	10	5	10	8	67	38	97	50	36
9	7	8	7	10	7	6	9	8	3323	4242	17	22	19	36	17	16	32	24	23
10	3	3	11	9	14	7	5	2	2334	6241	7	7	42	30	78	20	11	5	25
11	1	3	5	8	5	6	7	4	1022	3344	3	6	11	24	11	15	18	9	12
12	2	0	4	2	3	1	2	2	3121	2223	4	0	8	4	6	3	5	5	4
13	7	8	8	8	8	6	8	7	2234	2552	19	23	22	25	25	15	24	20	22
14	6	6	6	5	8	6	9	8	4453	2222	16	16	15	11	22	16	32	21	19
15	9	11	9	6	7	8	8	9	1412	2343	33	49	28	16	17	23	21	32	27
16	11	11	10	7	8	11	9	13	3122	3213	45	50	34	19	26	43	30	62	39
17	10	11	11	8	13	13	12	9	2433	5332	35	45	43	25	61	61	55	28	44
18	11	11	8	12	10	11	9	9	2133	5522	47	47	21	55	38	49	29	27	39
19	9	9	6	11	10	10	4	8	3215	2322	32	29	16	41	38	36	10	23	28
20	6	4	5	6	9	5	8	8	3233	4333	16	10	11	15	27	11	21	21	17
21	6	9	5	6	5	3	1	6	4324	4222	14	28	11	14	12	7	3	14	13
22	4	6	6	10	8	7	10	13	1302	3233	9	16	14	36	21	19	40	61	27
23	12	9	9	7	8	8	2	4	1323	2322	58	29	27	20	23	22	5	8	24
24	1	3	4	3	5	3	5	9	1121	1234	2	7	9	7	11	6	11	33	11
25	4	3	1	0	2	1	4	6	1221	2232	8	6	3	1	5	2	9	16	6
26	13	12	8	8	16	15	16	11	2122	2331	67	52	25	25	105	90	116	49	66
27	17	15	13	12	14	14	15	13	7443	4433	132	100	70	58	85	83	91	70	86
28	11	9	9	9	11	10	7	5	2342	3324	41	33	27	31	50	40	18	13	32
29	7	6	8	11	8	10	7	7	2333	1254	18	16	26	41	26	37	17	18	25
30	7	8	9	11	10	8	4	7	3543	4113	20	26	30	49	35	21	8	20	26
31	2	3	1	7	9	8	7	7	2223	0332	5	6	2	17	28	24	20	18	15
																			26.8

MAR. 1978

	3 Ks								σs								As
1	9	9	7	11	12	12	15	13	2123	2276	29	33	19	49	57	54	90	65	50
2	12	9	11	9	9	10	11	10	4010	2335	52	29	44	29	30	34	50	35	38
3	11	8	6	8	6	7	10	9	2212	3216	44	23	15	22	14	19	39	30	26
4	3	4	1	1	1	0	0	2	2221	3003	7	8	2	3	3	0	0	5	4
5	3	0	2	7	7	8	6	4	3121	1423	6	1	4	18	18	24	15	10	12
6	5	1	0	9	9	6	3	2	4213	3133	11	2	1	30	28	16	7	5	13
7	6	6	7	6	9	7	4	5	3232	3311	15	14	17	16	27	19	9	13	16
8	6	2	5	4	12	9	17	13	2121	4352	14	5	11	8	60	30	133	64	41
9	7	8	7	9	7	6	9	6	1320	3031	17	25	19	29	17	15	28	16	21
10	2	4	10	9	12	6	3	1	2231	3432	4	10	34	30	52	15	6	3	19
11	2	4	4	7	5	5	5	3	3112	1322	4	9	8	17	11	13	12	6	10
12	1	1	4	2	3	1	1	2	1223	2232	3	2	9	5	6	2	3	5	4
13	6	7	8	6	8	4	8	9	2353	2323	16	20	22	16	21	9	25	28	20
14	7	6	5	4	7	7	9	8	4320	1203	18	16	11	9	18	18	29	26	18
15	9	10	9	5	6	6	9	11	2131	2233	31	39	33	12	14	15	32	41	27
16	11	11	10	7	7	12	11	14	3021	2423	50	47	35	17	20	51	44	73	42
17	10	10	10	9	11	9	12	8	2222	3142	36	39	40	28	46	32	51	26	37
18	12	13	8	10	8	11	8	9	3423	4223	54	69	21	35	24	47	23	27	38
19	10	10	5	9	9	9	4	8	4226	3322	37	36	11	27	28	28	9	21	25
20	6	4	2	6	8	5	7	7	2113	3325	15	8	5	15	25	13	19	18	15
21	6	8	4	4	6	2	0	4	4332	4411	14	21	9	10	14	5	1	10	11
22	4	7	8	8	7	5	10	12	2421	4235	8	18	22	24	18	12	38	55	24
23	13	9	8	7	8	7	2	3	4423	1133	66	28	22	20	21	17	4	7	23
24	0	4	4	3	3	1	4	8	1001	2356	1	9	9	6	6	3	8	24	8
25	4	4	1	0	1	0	1	5	2110	2123	8	8	3	0	2	1	2	13	5
26	14	12	8	6	14	14	15	11	5321	3113	83	58	25	15	80	76	101	44	60
27	16	16	14	12	13	14	15	14	4215	2644	108	110	78	53	66	84	89	77	83
28	11	10	8	10	11	9	5	4	5444	0112	50	39	24	34	47	27	13	8	30
29	6	7	6	10	8	8	4	6	4334	2123	15	17	16	40	24	26	10	14	20
30	7	7	9	12	11	7	3	5	4545	3124	18	17	30	53	44	20	7	12	25
31	1	2	0	6	8	9	6	6	1414	2434	3	4	1	16	21	27	15	14	13
																			25.1

Table 9 - continued

MAR. 1978

	3 Km								Σ Km	am							Am	Am2
1	9	9	7	13	13	13	14	13	30.3	31	29	18	61	68	67	76	64	52	55
2	11	10	12	9	9	9	11	9	26.7	44	34	52	30	32	33	50	31	38	43
3	10	8	7	9	7	7	10	9	22.3	38	26	20	27	19	20	34	29	27	24
4	3	3	1	1	1	0	0	2	3.7	7	6	2	3	3	0	0	5	3	10
5	2	0	3	7	8	8	6	4	12.7	5	1	7	18	21	26	14	10	13	10
6	4	1	1	9	9	7	3	2	12.0	9	2	2	30	29	17	6	5	13	14
7	5	6	6	7	9	7	4	6	16.7	13	14	15	18	31	19	9	14	17	14
8	5	2	4	4	13	10	16	12	22.0	12	5	10	8	64	34	115	57	38	29
9	7	8	7	9	7	6	9	7	20.0	17	24	19	33	17	15	30	20	22	33
10	2	4	10	9	13	7	4	2	17.0	5	9	38	30	65	17	8	4	22	19
11	2	3	4	7	5	6	6	4	12.3	4	7	10	20	11	14	15	8	11	13
12	2	0	4	2	3	1	2	2	5.3	4	1	8	4	6	3	4	5	4	10
13	7	8	8	8	8	5	8	8	20.0	18	22	22	21	23	12	25	24	21	15
14	7	6	5	4	7	7	9	8	17.7	17	16	13	10	20	17	31	23	18	22
15	9	11	9	6	6	7	9	10	22.3	32	44	31	14	16	19	27	36	27	29
16	11	11	10	7	8	11	10	13	27.0	47	49	35	18	23	47	37	67	40	35
17	10	11	11	8	12	11	12	9	28.0	35	42	41	26	54	46	53	27	41	42
18	11	12	8	11	9	11	8	9	26.3	50	58	21	45	31	48	26	27	38	38
19	10	9	6	10	9	9	4	8	21.7	34	33	14	34	33	32	9	22	26	24
20	6	4	4	6	8	5	7	7	15.7	16	9	8	15	26	12	20	19	16	18
21	6	8	4	5	5	3	1	5	12.3	14	24	10	12	13	6	2	12	12	15
22	4	7	7	9	7	6	10	12	20.7	8	17	18	30	19	15	39	58	26	23
23	13	9	8	7	8	7	2	3	19.0	62	29	24	20	22	20	5	7	24	22
24	1	4	4	3	4	2	4	9	10.3	2	8	9	6	8	5	9	29	10	9
25	4	3	1	0	1	0	3	6	6.0	8	7	3	0	3	1	6	14	5	17
26	14	12	8	7	15	14	16	11	32.3	75	55	25	20	93	83	108	47	63	55
27	16	16	14	12	14	14	15	14	38.3	120	105	74	55	75	84	90	74	85	72
28	11	10	8	9	11	10	6	4	23.0	45	36	26	32	48	34	15	10	31	41
29	6	7	8	10	8	9	6	6	20.0	16	17	21	40	25	31	14	16	23	26
30	7	8	9	12	10	7	4	6	21.0	19	21	30	51	40	20	8	16	26	20
31	2	2	0	6	8	8	7	6	13.0	4	5	1	16	25	26	17	16	14	18
																		26.0	

APR. 1978

	3 Km								Σ Km	am							Am	Am2
1	10	8	8	4	3	7	6	7	17.7	39	25	23	9	6	19	15	19	19	20
2	9	8	4	5	6	6	8	13	19.7	32	23	8	13	15	16	21	65	24	27
3	6	13	13	11	11	11	14	15	31.3	15	61	62	42	42	47	79	89	55	49
4	14	13	13	8	4	14	17	17	33.3	76	65	62	21	10	79	122	134	71	62
5	14	13	8	4	5	5	9	8	22.0	78	62	23	10	11	12	27	24	31	41
6	6	8	4	5	7	4	4	5	14.3	16	21	10	13	18	10	9	12	14	13
7	4	0	2	3	4	1	5	6	8.3	8	1	4	6	10	3	12	14	7	8
8	3	3	3	2	4	6	5	5	10.3	6	7	6	4	9	14	13	11	9	10
9	3	7	5	5	3	3	2	4	10.7	7	19	13	13	6	6	5	9	10	9
10	2	3	3	3	11	11	12	19	21.3	5	7	7	6	47	49	55	192	46	47
11	18	15	14	9	9	13	13	12	34.3	153	102	83	27	28	63	70	55	73	71
12	16	8	10	9	6	8	9	8	24.7	114	22	40	30	16	26	32	22	38	37
13	8	6	6	7	9	9	12	15	24.0	24	15	15	17	30	28	54	97	35	41
14	14	11	12	14	16	11	14	10	34.0	86	50	54	83	120	41	78	39	69	57
15	11	9	10	9	9	8	6	6	22.7	47	29	40	28	30	25	16	15	29	36
16	8	6	6	6	3	2	6	6	14.3	24	14	14	15	6	5	15	15	14	15
17	4	4	6	4	5	4	3	8	12.7	8	10	15	10	11	9	6	23	12	17
18	11	12	9	6	4	10	8	8	22.7	43	55	27	15	9	36	25	22	29	27
19	4	10	13	10	13	13	15	11	29.7	10	36	68	34	67	63	93	47	52	44
20	14	11	9	9	5	9	7	8	24.0	86	41	31	28	13	27	17	23	33	37
21	7	6	6	3	9	5	7	6	16.3	19	14	16	7	29	12	17	15	16	15
22	3	5	3	5	6	4	7	8	13.7	7	11	6	12	14	10	19	23	13	17
23	9	8	7	9	10	13	9	12	25.7	31	23	18	29	37	63	33	51	36	40
24	14	14	14	12	11	13	8	13	33.0	82	79	75	52	44	65	26	63	61	51
25	12	8	9	9	7	8	8	7	22.7	59	23	29	28	19	22	24	18	28	36
26	11	11	11	7	7	8	9	8	24.0	42	41	50	19	19	23	27	25	31	26
27	9	5	7	9	6	10	8	11	21.7	28	13	18	28	14	37	23	45	26	25
28	9	9	8	7	9	5	7	5	19.7	31	29	21	19	27	12	19	11	21	20
29	6	3	3	3	5	3	7	6	12.0	14	6	7	7	11	6	18	16	11	18
30	9	7	6	14	14	18	9	12	29.7	29	18	16	71	78	164	29	55	58	45
																		32.4	

Table 9 - continued

APR. 1978

	3 Kn								σn		an						An
1	11	8	8	5	3	7	6	7	3332	1622	42	26	24	11	7	19	14	19	20
2	9	8	4	6	7	6	9	12	2224	2422	32	26	9	14	17	15	27	55	24
3	6	12	13	11	11	11	14	15	2124	5444	15	60	69	48	50	49	86	88	58
4	13	14	12	7	5	14	17	17	3432	1473	66	71	56	19	12	73	132	139	71
5	14	14	8	5	5	6	9	9	3543	1032	78	71	26	11	13	15	32	30	35
6	6	8	5	5	7	5	5	6	2433	4122	16	22	11	12	20	13	12	15	15
7	4	1	2	4	5	2	6	7	2233	1213	8	2	4	8	13	5	15	18	9
8	3	4	3	3	5	6	6	5	3212	1233	7	9	7	6	11	15	16	13	11
9	4	8	6	6	4	4	3	5	3302	3124	9	22	14	14	9	9	7	13	12
10	2	4	3	4	12	12	12	20	3313	3231	5	8	7	8	55	60	60	205	51
11	19	16	15	9	9	14	14	12	4383	3222	189	117	92	32	32	80	82	60	86
12	17	7	11	9	7	9	9	7	3221	0242	121	20	47	29	20	28	33	20	40
13	8	6	6	7	9	9	12	15	4142	3422	24	15	16	19	30	33	56	95	36
14	14	12	13	14	17	11	13	11	3452	4343	84	57	61	85	145	49	61	41	73
15	11	9	11	9	9	8	7	6	2333	1441	50	29	43	29	30	24	18	16	30
16	8	6	6	6	4	4	7	6	2132	2132	22	14	14	16	8	8	17	15	14
17	4	4	7	5	5	5	3	9	3232	2323	8	9	18	11	13	12	7	28	13
18	10	11	9	7	5	11	9	9	3332	3222	38	46	27	17	12	43	29	29	30
19	5	10	14	10	13	13	15	12	2222	2221	13	37	72	35	66	70	95	51	55
20	14	11	9	9	7	9	7	9	2432	2333	81	45	32	30	17	32	18	27	35
21	8	6	7	4	9	6	7	7	2133	4132	22	14	20	9	33	14	17	19	19
22	3	5	4	6	7	6	8	8	3222	1023	6	12	9	16	18	14	22	25	15
23	9	7	7	9	12	14	10	12	3223	2323	29	20	19	32	51	74	37	55	40
24	15	14	13	12	11	13	9	12	4322	1512	92	79	70	51	49	69	27	60	62
25	11	8	9	9	8	8	8	8	1321	2233	49	22	31	27	22	26	21	25	28
26	10	10	11	8	8	8	8	9	2242	1332	37	36	50	22	26	25	25	28	31
27	8	6	7	9	7	10	8	11	3033	2625	24	14	20	31	17	37	26	47	27
28	9	9	8	8	9	6	7	5	4443	1332	28	32	24	21	29	16	20	12	23
29	5	3	4	4	5	4	8	6	3132	1133	13	7	10	8	12	8	22	16	12
30	9	7	7	14	16	19	10	13	3243	3213	27	20	19	86	104	192	34	63	68
																			34.8

APR. 1978

	3 Ks								σs		as						As
1	10	8	8	3	2	7	6	7	3342	2330	36	24	23	7	4	18	16	18	18
2	9	7	4	5	5	7	6	14	6221	3214	33	20	8	12	13	18	16	74	24
3	6	13	12	10	10	11	14	15	2232	4345	15	61	56	37	34	44	73	89	51
4	14	12	13	8	4	14	16	17	5531	1247	85	59	68	23	9	85	111	129	71
5	14	12	7	4	4	4	8	7	5221	1122	79	54	20	9	10	10	22	19	28
6	7	8	4	6	6	3	3	4	1311	1321	17	21	10	15	16	7	7	10	13
7	3	0	1	2	3	0	4	5	1132	2113	7	1	3	4	7	1	8	11	5
8	2	2	2	1	3	5	4	4	2321	1221	5	5	4	3	7	13	10	8	7
9	3	6	5	5	2	1	1	3	2313	1323	6	16	11	11	4	3	2	6	7
10	2	3	3	2	10	10	11	19	3312	1145	5	7	6	4	39	39	50	179	41
11	16	15	14	8	8	11	12	11	3221	3331	117	88	74	23	24	46	58	50	60
12	16	8	9	9	5	8	9	8	4112	2046	108	25	33	32	13	25	32	25	37
13	8	6	6	6	9	8	12	15	5301	1323	25	15	15	16	30	23	52	100	35
14	15	11	11	14	15	10	15	10	6233	2243	88	44	47	80	96	34	95	36	65
15	11	9	10	9	9	8	6	6	3444	1153	44	29	37	27	30	26	15	15	28
16	8	6	6	6	2	1	6	6	4221	3223	25	15	14	14	5	3	14	16	13
17	4	5	5	4	4	3	2	7	4413	3232	8	11	12	9	10	6	4	19	10
18	11	13	9	5	3	9	8	6	3421	3321	49	63	27	13	6	29	21	16	28
19	4	10	13	9	13	12	15	11	3221	3114	8	35	64	32	68	55	91	44	50
20	15	10	9	8	4	8	6	7	5212	2125	92	36	30	26	10	23	16	18	31
21	6	6	5	2	8	4	7	5	5121	4143	16	14	13	5	24	10	17	12	14
22	3	4	2	4	4	3	6	8	5323	1244	7	9	4	8	10	7	16	21	10
23	9	9	7	8	8	12	9	11	4525	1222	32	27	18	25	23	52	28	46	31
24	14	14	14	12	10	13	8	13	3333	2422	73	78	81	52	39	61	26	66	60
25	13	8	9	9	6	7	9	5	1123	2221	69	24	27	29	16	18	27	11	28
26	11	11	11	7	5	7	9	8	1331	2331	46	47	50	17	13	20	29	21	30
27	9	5	7	8	4	10	7	11	5314	4424	32	13	17	24	10	38	19	42	24
28	9	9	7	6	8	4	7	4	6641	3153	33	27	19	16	25	8	18	9	19
29	6	2	2	2	4	2	5	6	7612	6124	18	5	5	5	10	4	13	16	9
30	9	6	5	12	12	17	8	11	6433	1323	31	15	12	55	52	136	23	47	46
																			29.8

Table 9 - continued

MAY 1978

	3 Kn								σn		an						An
1	8	12	14	14	19	11	16	22	2523	3223	22	56	74	77	199	48	114	315	113
2	19	14	20	18	17	12	9	12	4152	2411	185	85	214	147	141	57	33	53	114
3	12	14	15	15	16	16	15	17	2524	3144	52	77	98	99	108	110	87	132	95
4	17	20	20	18	17	11	11	6	5535	2342	133	222	233	157	131	43	48	14	123
5	3	3	3	4	4	4	8	10	1232	2243	7	7	7	8	9	10	21	36	13
6	4	2	5	4	4	4	4	7	3132	3432	10	5	11	9	10	8	9	20	10
7	8	6	5	6	4	6	8	7	2522	3334	21	15	12	15	10	16	24	19	17
8	5	4	4	9	9	11	11	10	1221	1332	11	8	10	27	27	42	43	40	26
9	14	14	21	17	18	16	13	10	2354	3632	73	75	247	144	148	119	68	40	114
10	3	4	2	3	5	3	9	13	2221	4433	6	9	5	6	13	6	32	62	17
11	11	15	13	9	8	8	9	9	3443	3222	43	103	66	31	23	24	31	29	44
12	11	9	10	8	10	8	10	9	5622	3232	45	33	34	25	36	21	34	29	32
13	11	5	4	4	8	5	4	8	3342	3223	49	13	10	9	23	12	10	24	19
14	8	6	5	6	5	8	9	8	3323	3332	22	15	12	16	11	22	29	22	19
15	4	1	2	8	6	6	6	7	2333	2233	10	3	5	22	14	16	14	17	13
16	5	5	3	4	7	8	6	6	2322	2232	12	11	7	8	18	21	14	14	13
17	4	8	8	5	5	4	6	8	2234	3343	10	24	22	12	11	8	16	25	16
18	4	7	3	5	5	7	4	1	2341	2412	10	17	6	13	12	18	10	2	11
19	2	2	4	7	6	3	2	4	1133	2222	5	4	8	20	14	6	4	8	9
20	4	4	6	5	4	7	9	5	3151	3333	8	9	15	12	9	18	32	11	14
21	7	10	8	6	8	7	15	15	2222	3333	20	37	22	16	23	20	93	95	41
22	11	9	9	8	9	10	10	10	3432	2234	49	28	27	24	28	40	39	34	34
23	8	9	9	8	6	11	12	14	2424	3342	25	31	27	23	16	44	54	76	37
24	11	9	12	12	11	9	8	10	4243	3233	50	32	56	54	42	27	22	37	40
25	10	8	8	5	8	5	5	9	2332	4132	35	25	24	11	21	13	12	29	21
26	8	5	5	7	6	5	5	4	5334	2233	26	13	13	18	14	11	11	8	14
27	3	4	6	4	4	3	3	5	4242	3423	7	10	16	9	8	6	6	12	9
28	4	4	5	7	7	6	7	5	3343	2322	10	8	13	19	19	16	19	12	15
29	4	3	4	4	6	4	10	9	3342	4230	8	7	8	9	15	10	36	30	15
30	13	9	11	7	7	7	8	7	2353	2211	70	31	41	17	19	19	24	19	30
31	11	11	8	7	8	5	5	4	3632	2231	41	44	21	20	22	11	12	8	22
																			35.8

MAY 1978

	3 Ks								σs		as						As
1	7	11	12	12	20	9	15	22	4553	4333	17	45	53	59	204	31	87	313	101
2	17	14	17	17	15	12	9	13	6223	2322	134	73	139	136	92	54	33	66	91
3	11	12	14	15	15	13	14	15	3112	0355	44	60	72	101	97	69	81	96	78
4	17	19	18	17	14	9	10	5	4515	4212	131	180	154	132	80	32	39	11	95
5	4	3	0	0	1	0	4	11	3211	0123	10	6	1	1	2	1	8	44	9
6	4	2	4	2	1	1	0	6	3212	2311	8	4	8	4	2	2	1	15	6
7	7	4	3	3	1	4	6	4	3213	2113	17	8	7	7	3	8	14	8	9
8	4	3	3	7	8	9	9	9	3213	2332	9	7	7	19	24	31	31	30	20
9	13	12	19	18	16	15	13	9	1242	2752	61	58	183	149	116	94	63	33	95
10	2	4	0	0	4	2	7	12	3111	6314	5	9	1	1	9	4	20	53	13
11	10	15	12	8	7	8	8	10	5234	2126	39	90	60	26	19	24	26	37	40
12	10	9	10	7	8	6	11	7	7351	4334	39	32	36	18	26	16	44	18	29
13	13	4	1	2	4	4	1	7	6222	3214	64	9	3	5	9	8	3	19	15
14	7	5	4	4	3	5	8	6	4552	5454	18	13	10	10	6	11	25	16	14
15	6	0	0	6	3	3	3	2	5112	3132	16	1	1	14	7	6	6	5	7
16	4	3	1	1	4	5	4	3	3103	2231	9	7	2	2	8	11	9	7	7
17	3	6	7	3	3	2	4	8	1542	5333	6	15	17	7	6	5	8	24	11
18	4	6	0	3	2	6	1	0	2311	3020	9	16	1	6	5	15	2	0	7
19	1	1	2	4	3	0	0	1	2222	1112	3	2	4	10	6	1	1	2	4
20	2	2	4	2	0	4	9	4	3213	1234	4	5	10	4	1	8	33	9	9
21	7	10	7	4	5	4	15	17	2221	2224	18	36	18	8	11	8	88	131	40
22	11	8	8	7	8	10	12	12	4521	2446	43	26	22	17	21	35	51	53	34
23	8	9	8	8	7	8	9	13	5753	4234	25	32	24	22	17	22	32	65	30
24	13	10	12	11	10	8	5	12	4251	2115	63	34	60	42	37	21	12	56	41
25	13	8	6	3	6	3	4	9	4324	2312	63	24	15	6	16	7	10	31	22
26	8	4	5	7	5	3	5	1	5234	4211	26	10	13	17	12	7	12	3	13
27	4	3	6	2	0	1	1	8	6352	1227	8	7	15	4	1	3	3	24	8
28	4	3	2	8	5	5	8	3	4114	4314	10	6	5	21	12	11	21	7	12
29	5	1	0	2	4	2	8	8	4213	5221	11	2	1	4	9	4	22	26	10
30	14	10	11	6	6	5	5	4	5441	5322	84	39	42	14	16	12	11	10	29
31	9	10	7	3	5	1	1	1	4421	2221	32	34	18	7	13	2	3	3	14
																			29.5

Table 9 - continued

MAY 1978

	3 Km								Σ Km	am							Am	Am2
1	7	12	13	13	20	10	15	22	37.3	20	51	63	68	201	39	100	314	107	109
2	18	14	19	17	16	12	9	12	39.0	159	79	177	142	116	56	33	59	103	111
3	11	13	14	15	15	15	14	16	37.7	48	68	85	100	103	89	84	114	86	102
4	17	20	19	17	16	10	11	5	38.3	132	201	194	144	105	37	43	13	109	80
5	4	3	2	2	2	3	6	10	10.7	9	7	4	4	5	6	15	40	11	20
6	4	2	4	3	3	2	2	7	9.0	9	4	9	7	6	5	5	17	8	11
7	7	5	4	5	3	5	7	5	13.7	19	11	10	11	7	12	19	13	13	12
8	4	3	4	8	8	10	10	10	19.0	10	7	9	23	26	37	37	35	23	46
9	13	13	20	17	17	16	13	10	39.7	67	67	215	146	132	107	66	36	105	62
10	2	4	1	2	5	2	8	12	12.0	5	9	3	4	11	5	26	58	15	43
11	11	15	13	9	8	8	9	9	27.3	41	96	63	28	21	24	28	33	42	35
12	11	9	10	8	9	7	10	8	24.0	42	33	35	21	31	18	39	24	30	27
13	12	5	3	3	6	4	3	8	14.7	57	11	7	7	16	10	6	21	17	19
14	7	6	5	5	4	6	9	7	16.3	20	14	11	13	9	16	27	19	16	14
15	5	1	1	7	5	5	4	5	11.0	13	2	3	18	11	11	10	11	10	11
16	5	4	2	2	5	6	5	4	11.0	11	9	5	5	13	16	11	10	10	11
17	4	7	7	4	4	3	5	8	14.0	8	19	19	9	9	7	12	24	13	12
18	4	7	1	4	4	7	3	0	10.0	9	17	3	9	8	17	6	1	9	9
19	2	1	3	6	4	1	1	2	6.7	4	3	6	15	10	3	2	5	6	7
20	3	3	5	4	2	5	9	4	11.7	6	7	12	8	5	13	33	10	12	13
21	7	10	7	5	7	6	15	16	24.3	19	37	20	12	17	14	91	113	40	31
22	11	9	8	8	8	10	11	11	25.3	46	27	24	21	25	37	45	44	34	38
23	8	9	8	8	6	9	11	14	24.3	25	32	25	23	16	33	43	71	34	38
24	12	9	12	11	10	8	7	11	26.7	56	33	58	48	40	24	17	46	40	37
25	11	8	7	4	7	4	5	9	18.3	49	25	19	8	19	10	11	30	21	23
26	8	5	5	7	5	4	5	2	13.7	26	11	13	18	13	9	12	5	13	13
27	4	4	6	3	2	2	2	7	10.0	8	8	15	6	4	5	4	18	9	10
28	4	3	4	7	6	6	7	4	13.7	10	7	9	20	15	14	20	9	13	10
29	4	2	2	3	5	3	9	9	12.3	10	4	4	7	12	7	29	28	13	21
30	14	10	11	6	7	6	7	6	22.3	77	35	42	16	17	16	17	14	29	26
31	10	10	7	6	7	3	4	3	16.7	37	39	19	14	18	7	8	6	19	17
																		32.6	

JUNE 1978

	3 Km								Σ Km	am							Am	Am2
1	3	7	7	6	1	5	4	11	14.7	6	19	18	16	3	12	9	45	16	25
2	6	7	11	18	17	17	18	13	35.7	14	17	42	164	132	134	159	64	91	70
3	17	15	11	11	7	7	12	6	28.7	131	96	50	41	19	17	53	15	53	62
4	9	7	5	7	11	7	10	14	23.3	32	20	11	19	46	20	40	73	33	42
5	15	16	13	10	7	7	8	9	28.3	100	109	65	34	18	17	25	27	49	40
6	7	4	6	8	5	4	5	7	15.3	18	9	14	26	11	8	11	20	15	18
7	6	8	9	6	4	5	9	8	18.3	16	24	27	15	9	12	28	25	20	20
8	10	12	7	2	5	7	3	1	15.7	38	52	17	5	11	18	7	2	19	16
9	2	5	4	1	2	1	2	3	6.7	4	13	9	3	5	3	5	7	6	13
10	5	4	12	11	8	10	8	15	24.3	11	8	55	49	24	38	26	88	37	33
11	12	11	13	11	5	3	2	3	20.0	52	50	65	45	13	7	4	7	30	29
12	2	5	2	8	8	7	8	3	14.3	5	12	5	25	25	19	22	7	15	12
13	4	4	2	7	7	5	2	3	11.3	8	9	5	18	17	11	4	6	10	11
14	1	3	2	3	2	4	5	4	8.0	3	6	5	6	5	9	13	9	7	10
15	5	6	8	7	5	4	3	2	13.3	11	15	23	19	12	10	6	4	13	10
16	2	4	2	4	5	3	5	6	10.3	4	9	5	10	12	7	13	16	10	12
17	7	7	7	8	5	4	6	5	16.3	18	19	19	23	12	10	16	13	16	15
18	7	5	7	7	8	7	7	5	17.7	18	12	19	19	25	18	17	13	18	18
19	8	8	9	9	7	8	9	11	23.0	23	22	28	27	17	25	27	45	27	24
20	9	8	7	7	5	4	5	8	17.7	33	23	18	20	12	10	13	23	19	27
21	10	13	11	9	10	12	11	10	28.7	34	64	41	28	36	54	45	36	42	32
22	10	9	8	8	8	7	8	7	21.7	37	30	24	26	26	20	22	18	25	30
23	9	7	8	10	6	8	11	10	23.0	32	18	24	39	16	23	41	40	29	30
24	12	11	10	8	10	6	7	8	24.0	53	48	38	24	37	15	18	21	32	31
25	6	7	11	10	7	9	11	10	23.7	15	18	43	39	20	33	44	40	32	38
26	11	14	15	12	9	11	12	12	32.0	41	81	89	53	33	44	57	60	57	46
27	11	11	9	6	7	5	9	6	21.3	47	42	30	14	19	13	27	14	26	30
28	6	8	6	8	8	8	5	6	18.3	15	24	16	23	22	23	11	14	19	18
29	3	4	6	9	7	8	9	19	21.7	6	10	16	29	20	25	28	200	42	40
30	14	11	13	11	10	7	10	4	26.7	86	45	70	42	36	19	40	8	43	41
																		28.4	

Table 9 - continued

JUNE 1978

	3 Kn								σn		an						An
1	3	7	7	7	2	6	5	12	2323	3213	7	20	20	20	5	16	13	59	20
2	7	8	11	20	18	18	19	14	2313	3313	19	21	50	205	168	152	178	82	109
3	17	16	13	11	8	8	12	7	4344	2322	125	107	62	50	23	22	53	18	58
4	9	6	6	8	12	8	11	14	3112	1342	30	16	14	21	55	24	41	85	36
5	16	17	12	9	8	8	9	9	4742	3332	107	122	52	30	23	23	31	28	52
6	7	4	6	9	6	4	4	8	3341	2243	20	10	15	29	14	10	10	21	16
7	6	8	8	5	6	6	9	9	3313	4322	15	23	25	13	14	15	29	31	21
8	9	12	6	4	7	7	3	1	2633	3422	31	56	14	8	17	17	7	3	19
9	2	5	4	3	4	3	4	4	1322	3332	5	11	10	6	8	6	9	10	8
10	6	4	14	12	9	11	8	15	1235	2222	14	10	71	58	29	41	26	97	43
11	12	11	13	11	6	4	3	4	2134	2342	54	48	68	46	16	10	7	8	32
12	3	5	3	9	9	8	8	4	2122	2342	6	13	7	30	30	26	25	10	18
13	4	4	3	8	8	5	3	4	2222	3221	9	9	7	23	22	13	7	9	12
14	2	3	3	4	4	4	6	6	2322	2311	4	7	6	8	8	9	14	14	9
15	5	5	8	8	6	5	4	3	3243	3222	12	13	25	22	16	11	9	7	14
16	3	4	2	5	6	4	7	8	1223	3322	7	10	5	12	15	10	17	22	12
17	8	8	8	9	6	6	7	7	3233	2422	23	22	22	27	15	14	19	18	20
18	7	5	8	8	9	8	8	7	2122	2332	20	12	22	21	31	26	24	18	22
19	9	8	9	8	7	9	9	11	3343	3232	28	21	33	26	20	27	33	48	30
20	9	8	8	9	6	6	7	8	2424	2332	28	22	21	27	15	14	20	22	21
21	9	14	11	9	11	12	12	10	2642	3232	31	73	48	32	46	58	51	34	47
22	9	9	9	9	9	8	8	7	1123	2451	32	27	27	29	29	24	25	17	26
23	10	7	9	11	8	8	10	10	3232	2353	34	20	30	46	21	25	40	37	32
24	12	12	10	9	10	8	8	7	4333	3332	53	51	40	28	36	21	21	20	34
25	6	6	12	12	8	11	12	11	2233	2542	16	16	55	52	26	42	53	47	38
26	12	14	15	12	10	12	12	13	3121	4224	54	77	102	52	39	53	56	61	62
27	11	11	9	7	7	6	9	7	6432	2432	47	50	33	19	20	16	27	20	29
28	7	9	7	9	9	9	7	7	2621	1122	18	31	20	27	30	30	17	19	24
29	3	5	7	10	9	10	10	20	1233	1321	7	11	19	34	27	38	35	214	48
30	14	11	14	11	11	8	11	4	3553	3554	86	48	73	48	47	26	43	9	48
																			32.0

JUNE 1978

	3 Ks								σs		as						As
1	2	7	6	5	0	4	2	9	2432	1233	5	18	16	11	1	8	5	31	12
2	4	5	10	17	15	16	17	11	1111	1043	8	12	34	123	96	115	141	46	72
3	17	14	10	9	6	5	12	5	3452	1121	138	84	38	32	14	11	52	12	48
4	10	8	4	6	10	6	10	13	4724	2214	34	24	9	16	37	15	39	61	29
5	15	15	14	10	6	5	7	9	3262	3223	93	97	78	39	14	11	18	27	47
6	6	4	5	8	4	3	5	7	4414	3554	15	9	12	23	9	6	12	19	13
7	7	8	9	6	2	4	9	7	3325	3323	17	25	28	16	5	10	28	20	19
8	11	11	7	0	2	7	3	1	6341	2312	45	49	19	1	5	19	6	2	18
9	1	6	4	0	1	0	0	1	2431	1011	3	14	8	1	2	0	1	3	4
10	4	3	10	10	7	10	8	14	1412	3015	8	6	39	40	19	36	26	80	32
11	11	12	13	11	4	2	0	3	4321	6211	50	51	61	44	9	4	1	6	28
12	2	4	1	7	7	5	7	2	2215	5232	4	10	3	19	20	13	19	4	12
13	4	4	2	6	5	4	1	1	2121	1222	8	9	4	14	12	8	2	3	8
14	0	2	2	1	1	4	5	1	1323	0342	1	5	4	3	2	9	12	3	5
15	4	7	7	7	4	4	2	0	2551	1221	9	17	20	17	8	8	4	1	11
16	0	3	2	4	4	2	4	4	1333	4203	1	7	5	9	8	4	9	10	7
17	6	6	6	7	4	3	5	4	2333	3031	14	16	15	19	9	6	12	8	12
18	6	5	6	7	7	5	4	4	2141	3132	15	11	16	17	19	11	9	8	13
19	7	8	8	9	6	8	8	11	2524	3313	18	22	23	27	14	23	21	42	24
20	10	8	6	6	4	3	3	8	5401	3322	38	24	15	14	9	6	7	23	17
21	10	12	10	8	8	11	10	10	4422	1214	37	56	35	24	26	49	39	39	38
22	11	10	8	8	8	6	7	7	3131	2233	42	34	21	24	22	16	19	19	25
23	9	6	7	9	4	8	11	11	5262	1237	31	15	19	33	10	21	41	44	27
24	12	11	10	7	10	4	6	8	4522	2225	53	45	37	20	37	10	15	22	30
25	5	7	9	8	5	8	10	9	1211	1254	13	20	32	26	13	24	34	32	24
26	9	14	14	12	9	10	12	12	4444	3142	27	85	76	53	28	36	58	59	53
27	11	10	9	4	7	4	9	4	5242	4240	48	35	27	9	17	9	28	9	23
28	5	6	5	7	6	7	3	4	2411	1122	11	16	13	18	14	17	6	9	13
29	2	4	5	8	5	5	7	19	3223	2236	4	9	13	25	13	13	20	186	35
30	14	11	13	10	8	5	10	3	6433	4453	85	42	66	35	25	13	38	6	39
																			24.6

Table 9 - continued

JULY 1978

	3 Kn								σn								An
1	6	4	4	7	7	5	2	3	3122	4333	16	8	10	20	17	12	5	7	12
2	5	2	7	7	5	6	4	3	2223	2213	12	5	18	17	12	15	8	6	12
3	3	3	8	7	7	4	6	14	2222	1232	6	6	23	20	17	8	14	71	21
4	17	11	13	13	18	18	10	15	3442	6212	123	42	63	61	167	155	38	96	93
5	13	18	18	14	12	9	9	8	2776	4131	62	160	169	78	59	30	32	22	77
6	7	7	12	6	9	10	8	6	2353	3322	18	18	56	16	28	36	23	16	26
7	8	6	8	10	9	8	9	6	2323	2311	25	16	22	38	29	24	32	16	25
8	6	8	7	6	9	12	9	7	4322	3111	16	21	19	14	32	56	27	18	25
9	8	3	4	5	7	9	7	6	2153	1223	22	7	10	11	17	30	20	14	16
10	5	8	10	8	8	6	7	8	1325	2232	13	21	38	21	22	14	17	21	21
11	6	5	5	10	4	3	2	4	1334	3234	14	11	12	34	10	7	5	9	13
12	2	2	1	2	3	7	5	7	4222	2323	4	4	3	5	6	18	13	17	9
13	10	9	13	8	10	8	6	13	2232	3324	34	33	62	23	40	24	14	61	36
14	15	14	12	16	15	13	13	10	5315	3532	96	78	52	104	94	61	63	36	73
15	10	9	6	4	2	2	4	4	1442	3323	38	31	16	8	5	4	9	9	15
16	9	3	1	4	6	4	4	5	4234	1112	27	6	3	8	14	10	8	12	11
17	5	4	3	8	3	4	6	5	2133	3132	12	8	6	22	7	8	14	13	11
18	6	8	3	7	9	12	9	15	1103	2424	15	24	7	17	32	52	32	87	33
19	8	10	12	8	8	6	4	4	3442	3133	21	40	55	21	25	15	8	9	24
20	4	6	7	4	4	4	4	4	2241	3233	10	14	17	10	8	9	9	9	11
21	5	4	7	7	6	5	5	5	3452	3331	11	10	17	18	14	13	12	13	14
22	6	8	7	5	4	4	6	7	3533	3243	16	23	19	12	9	10	15	18	15
23	6	8	6	4	2	5	8	8	3433	2434	16	25	16	8	4	13	26	21	16
24	4	3	4	4	5	4	6	7	2322	2232	10	6	9	9	11	9	15	17	11
25	6	6	3	4	6	5	8	8	3231	3224	15	15	7	10	14	13	25	24	15
26	5	4	4	4	5	5	6	6	2333	2334	12	10	8	10	12	11	14	15	12
27	3	0	1	6	6	1	3	6	2133	3332	6	1	3	15	15	3	7	15	8
28	5	7	9	8	5	2	1	1	4431	2222	13	18	27	24	13	4	3	2	13
29	1	2	4	4	4	4	4	5	2323	2223	2	4	10	10	8	8	10	13	8
30	5	3	1	3	3	3	2	1	2323	3221	12	6	3	7	7	7	5	2	6
31	0	0	1	2	2	2	2	0	2223	3421	1	1	2	4	4	5	4	0	3
																			22.1

JULY 1978

	3 Ks								σs								As
1	3	2	2	5	4	3	0	0	3423	2101	7	5	5	12	10	7	0	1	6
2	4	2	4	4	2	2	1	4	3222	1223	10	4	10	9	4	4	3	8	7
3	4	3	5	4	4	2	5	11	1221	1424	8	6	12	10	8	4	11	48	13
4	15	10	13	10	15	17	9	16	6331	2213	93	40	67	34	98	137	32	104	76
5	12	17	17	13	11	8	8	5	5615	3121	51	134	132	69	44	26	26	13	62
6	5	6	10	4	4	9	7	4	1210	2222	12	15	36	9	9	31	19	9	18
7	9	6	7	8	8	8	10	5	6222	2211	30	15	18	24	21	21	34	12	22
8	8	7	6	4	6	11	7	6	4422	0353	23	19	16	8	15	42	18	14	19
9	8	3	4	3	3	6	3	3	4213	2252	21	7	8	7	7	14	7	7	10
10	4	6	8	5	6	2	3	5	2131	5311	9	16	23	11	14	5	7	12	12
11	5	3	2	7	2	0	0	1	1216	2103	13	7	5	19	5	1	0	3	7
12	0	0	0	2	2	2	1	3	1112	1113	1	1	1	5	5	5	3	7	4
13	8	9	11	7	6	4	4	9	3122	1142	26	30	43	17	16	9	9	30	23
14	14	12	9	15	12	12	12	8	5323	2432	80	60	31	87	58	51	53	23	55
15	8	9	5	0	0	0	1	1	2221	1122	24	30	11	1	1	1	2	3	9
16	11	3	0	0	1	4	2	2	6111	2421	42	6	1	1	3	8	4	5	9
17	5	2	2	5	1	1	3	1	5302	2311	12	5	4	11	3	2	7	3	6
18	6	7	3	5	8	9	8	12	4114	2213	15	18	7	11	21	31	26	59	24
19	9	11	11	6	4	4	1	3	6221	0112	30	42	43	14	8	8	3	6	19
20	3	4	7	3	0	1	1	4	3453	1124	7	9	17	6	1	2	3	8	7
21	5	5	4	4	3	1	1	1	6311	1223	13	11	9	8	6	2	2	3	7
22	5	8	7	3	1	2	5	8	2253	1323	12	23	17	7	2	5	11	22	12
23	3	7	5	2	0	1	8	8	1331	2221	7	19	12	4	1	3	25	21	12
24	6	1	3	2	2	4	4	7	3240	2331	14	3	6	4	4	9	10	17	8
25	6	5	2	4	4	4	8	9	4114	3224	14	12	5	8	8	8	25	28	14
26	4	4	3	2	2	2	3	4	4122	2103	10	8	7	4	4	4	6	9	7
27	3	0	0	4	2	0	1	6	1110	2014	6	1	1	9	4	0	2	14	5
28	4	7	8	5	3	1	0	0	2431	3200	10	17	21	13	6	2	0	0	9
29	0	1	2	4	3	2	1	5	1213	4304	1	2	4	10	7	4	2	11	5
30	4	1	0	0	0	0	0	0	3211	1110	10	3	1	1	1	1	1	0	2
31	0	0	0	0	0	0	0	0	0000	0011	0	0	0	0	0	0	1	1	0
																			15.8

Table 9 - continued

JULY 1978

	3 Km								Σ Km	am							Am	Am2
1	5	3	3	6	6	4	1	2	10.0	11	7	7	16	14	9	3	4	9	14
2	5	2	6	5	4	4	2	3	10.3	11	4	14	13	8	9	5	7	9	9
3	3	3	7	6	5	3	5	12	14.7	7	6	17	15	12	6	13	59	17	27
4	16	11	13	11	17	17	10	15	36.7	108	41	65	48	133	146	35	100	85	75
5	12	18	18	14	12	9	9	7	33.0	57	147	150	73	51	28	29	17	69	66
6	6	7	11	5	7	9	8	5	19.3	15	17	46	12	18	33	21	13	22	25
7	9	6	7	9	8	8	9	6	20.7	27	16	20	31	25	22	33	14	24	21
8	7	7	7	5	8	11	8	6	19.7	19	20	18	11	23	49	22	16	22	20
9	8	3	4	4	5	8	6	5	14.3	21	7	9	9	12	22	14	11	13	18
10	5	7	9	6	7	4	5	7	16.7	11	18	31	16	18	9	12	17	17	16
11	6	4	4	9	3	2	1	3	10.7	14	9	8	27	7	4	2	6	10	9
12	1	1	1	2	3	5	4	5	7.3	2	3	2	5	6	11	8	12	6	13
13	9	9	12	7	9	7	5	11	23.0	30	31	52	20	28	17	11	46	29	35
14	15	13	11	15	14	12	12	9	33.7	88	69	42	96	76	56	58	29	64	43
15	9	9	5	2	1	1	3	3	11.0	31	31	13	4	3	2	6	6	12	23
16	10	3	1	2	4	4	3	4	10.3	35	6	2	4	8	9	6	9	10	9
17	5	3	2	7	2	2	4	4	9.7	12	6	5	17	5	5	10	8	9	10
18	6	8	3	6	9	11	9	14	22.0	15	21	7	14	27	42	29	73	29	24
19	8	11	11	7	7	5	2	3	18.0	25	41	49	18	17	12	5	7	22	24
20	4	5	7	4	2	2	3	4	10.3	8	11	17	8	4	5	6	8	8	10
21	5	4	5	5	4	3	3	4	11.0	12	10	13	13	10	7	7	8	10	11
22	6	8	7	4	3	3	5	7	14.3	14	23	18	10	6	7	13	20	14	12
23	5	8	6	3	1	4	8	8	14.3	12	22	14	6	3	8	25	21	14	12
24	5	2	3	3	3	4	5	7	10.7	12	5	7	7	7	9	12	17	10	11
25	6	6	3	4	5	4	8	8	14.7	15	14	6	9	11	10	25	26	15	12
26	5	4	3	3	4	3	4	5	10.3	11	9	7	7	8	7	10	12	9	10
27	3	0	1	5	4	1	2	6	7.3	6	1	2	12	10	2	4	15	7	10
28	5	7	8	7	4	1	1	0	11.0	11	18	24	18	10	3	2	1	11	9
29	1	1	3	4	4	3	3	5	8.0	2	3	7	10	8	6	6	12	7	6
30	5	2	1	2	2	2	1	0	5.0	11	5	2	4	4	4	3	1	4	4
31	0	0	0	1	1	1	1	0	1.3	1	1	1	2	2	2	3	1	2	3
																		19.0	

AUG. 1978

	3 Km								Σ Km	am							Am	Am2
1	2	3	2	4	2	1	3	4	7.0	4	7	5	9	5	3	7	8	6	4
2	2	1	0	0	1	2	4	5	5.0	4	2	1	1	2	5	9	13	5	8
3	5	7	6	8	8	9	9	10	20.7	13	19	16	26	26	31	27	37	24	28
4	11	14	9	13	10	8	8	5	26.0	45	80	28	65	37	24	26	12	40	35
5	6	9	11	10	10	8	11	10	25.0	14	28	49	38	36	21	42	35	33	30
6	7	10	12	5	9	8	6	6	21.0	20	39	53	13	32	22	15	15	26	25
7	8	4	4	4	4	3	5	5	12.3	24	8	10	9	8	6	13	13	11	13
8	4	3	4	5	6	6	3	2	11.0	10	7	9	12	14	16	7	4	10	10
9	3	5	4	6	2	1	3	3	9.0	6	11	10	16	5	3	7	7	8	9
10	3	4	4	4	5	5	4	7	12.0	6	8	10	10	13	13	8	17	11	10
11	7	5	4	5	8	10	6	3	16.0	17	11	10	13	21	38	16	7	17	23
12	5	10	13	13	9	8	7	8	24.3	12	34	69	67	32	25	17	25	35	29
13	8	7	7	11	10	7	6	8	21.3	24	17	19	41	38	19	16	22	25	22
14	7	7	4	5	4	4	4	2	12.3	18	18	10	11	8	9	8	4	11	12
15	3	0	1	1	4	4	4	2	6.3	6	0	3	3	10	8	8	4	5	5
16	0	1	0	3	3	4	6	6	7.7	1	2	0	6	6	9	14	15	7	8
17	4	1	2	9	9	7	6	7	15.0	8	3	4	30	32	17	15	17	16	15
18	9	6	4	4	8	9	14	13	22.3	33	15	9	10	26	28	84	65	34	28
19	11	1	9	8	9	5	4	3	16.7	43	3	28	21	27	11	9	7	19	23
20	2	3	1	1	1	2	3	2	5.0	4	6	2	3	3	4	7	4	4	7
21	3	2	1	2	2	4	4	9	9.0	6	5	2	4	5	9	9	31	9	8
22	7	6	3	1	4	1	1	2	8.3	20	15	7	3	9	3	3	5	8	9
23	1	3	2	2	2	2	4	4	6.7	3	6	5	5	5	5	10	9	6	7
24	5	4	4	4	3	3	1	2	8.7	13	8	8	8	7	7	3	4	7	9
25	4	2	6	8	8	7	6	4	15.0	9	5	16	25	21	18	15	10	15	10
26	3	3	1	1	1	2	4	1	5.3	7	7	3	3	3	5	9	3	5	16
27	11	9	9	10	12	11	11	12	28.3	44	33	31	40	60	45	45	54	44	69
28	11	17	22	21	20	16	12	13	44.0	50	131	293	262	235	105	52	63	149	108
29	15	13	16	13	14	10	9	8	32.7	97	67	104	68	79	34	28	24	63	69
30	11	9	9	11	12	11	14	12	29.7	43	28	27	50	51	44	84	55	48	48
31	14	9	12	12	13	15	11	8	31.3	77	32	56	59	62	98	43	22	56	52
																		24.4	

Table 9 - continued

AUG. 1978

	3 Kn								σn								An
1	2	4	2	4	4	2	4	4	2321	3232	5	8	5	10	8	5	10	10	8
2	1	1	1	1	2	4	5	6	2322	3322	3	3	3	2	5	8	12	15	6
3	6	8	7	9	9	10	9	10	3232	2222	14	23	17	31	32	37	30	37	28
4	11	15	9	14	11	9	9	6	2223	1232	48	89	30	73	46	30	28	15	45
5	7	9	12	11	11	8	10	10	1331	3332	17	29	59	45	41	23	40	40	37
6	8	10	12	6	9	8	7	7	3542	1122	23	39	56	16	33	24	18	19	29
7	8	4	6	4	4	4	6	6	3122	3335	22	9	15	10	10	8	15	16	13
8	4	3	5	5	5	8	4	3	2241	1332	10	6	12	13	13	21	9	7	11
9	4	5	5	8	4	2	4	4	3134	2323	9	12	13	23	8	5	8	10	11
10	3	4	5	5	7	7	5	7	2133	1423	6	9	13	12	17	17	11	19	13
11	7	5	5	6	8	11	7	4	5342	2222	17	13	12	15	24	42	20	10	19
12	6	10	14	13	9	9	7	9	3372	3243	16	36	81	64	28	29	20	30	38
13	9	7	8	11	10	8	7	8	1414	5334	28	19	22	44	38	23	17	21	27
14	6	7	5	5	4	6	5	2	4531	2321	15	19	11	13	10	14	11	5	12
15	3	0	2	2	5	4	5	3	2111	3242	7	0	5	4	13	10	11	7	7
16	0	1	0	4	4	5	7	7	1102	2232	1	2	0	8	8	12	17	18	8
17	4	2	2	8	10	7	7	8	2233	3222	10	4	5	26	40	20	20	24	19
18	9	6	5	6	10	9	14	12	1132	3434	30	15	12	14	36	33	77	59	35
19	10	1	10	8	9	6	5	4	2222	3234	35	2	35	25	32	14	11	10	21
20	2	3	1	2	3	3	4	3	3223	2121	5	6	3	5	6	6	10	7	6
21	3	2	1	3	3	5	5	10	1222	0442	6	5	2	7	7	11	12	35	11
22	7	5	4	3	6	2	3	4	2332	3313	18	13	8	6	14	4	6	8	10
23	2	3	3	3	3	4	5	5	1002	1222	4	6	6	6	7	8	12	11	8
24	5	4	4	4	4	4	3	3	3321	2222	13	9	9	9	9	9	6	7	9
25	4	3	7	9	9	7	7	5	3132	3232	9	6	19	28	28	18	18	13	17
26	4	4	2	2	2	3	4	2	2211	2331	9	9	4	4	4	6	9	4	6
27	11	9	9	11	13	12	12	11	3223	4426	44	31	33	46	70	54	52	48	47
28	11	17	23	22	21	15	11	13	2356	6132	44	132	339	299	263	93	50	65	161
29	15	13	16	14	15	10	10	8	5343	3324	94	63	105	71	87	37	35	25	65
30	11	9	9	12	12	11	14	12	4332	4343	50	29	29	54	57	48	73	59	50
31	14	10	13	14	14	17	11	8	6555	3421	78	37	70	82	74	123	45	24	67
																			27.2

AUG. 1978

	3 Ks								σs								As
1	1	3	2	4	1	0	2	2	3331	2122	3	7	4	9	2	1	5	5	5
2	2	0	0	0	0	1	3	5	2100	0232	4	1	0	0	0	3	6	11	3
3	5	6	6	8	8	8	8	10	2212	2215	12	15	16	21	21	25	24	38	22
4	11	14	8	12	9	7	8	4	3322	3340	42	71	26	58	28	18	24	9	35
5	5	8	10	9	9	7	11	9	3301	2323	12	26	38	32	32	18	44	30	29
6	7	10	11	4	9	7	5	4	2532	3332	18	39	50	10	30	19	11	10	23
7	9	3	3	3	3	1	5	5	4231	3233	27	7	6	7	6	3	11	11	10
8	4	4	3	4	6	5	2	0	2342	5211	10	8	6	10	15	12	5	1	8
9	1	4	4	4	1	0	3	2	2324	2101	2	10	8	10	2	1	6	4	5
10	3	3	4	4	4	4	3	6	2221	5324	6	7	8	8	10	9	6	14	9
11	7	4	3	5	7	10	5	2	4352	3132	18	10	7	11	18	34	13	4	14
12	4	9	12	13	10	7	5	7	3354	1223	8	32	56	69	36	20	13	20	32
13	8	6	7	10	10	6	6	8	3013	5112	21	15	17	38	38	15	14	23	23
14	7	7	4	4	3	2	2	1	5321	1301	20	17	8	9	6	5	4	3	9
15	2	0	0	1	3	3	2	1	3022	2120	5	0	1	2	6	6	5	2	3
16	0	0	0	2	1	3	5	5	0103	2122	0	1	0	4	3	6	11	11	5
17	3	1	1	9	8	6	4	5	2223	1223	6	2	2	33	24	14	10	11	13
18	10	6	3	3	6	8	15	14	3313	2223	36	14	7	7	16	23	90	71	33
19	11	1	8	7	8	4	3	2	6411	3111	50	3	21	17	23	9	7	4	17
20	1	3	0	0	0	0	2	0	2211	1111	3	6	1	1	1	1	4	1	2
21	3	2	1	1	1	3	3	9	2401	1203	6	5	2	2	3	7	6	28	7
22	8	7	3	0	2	1	0	0	4501	2201	23	17	6	1	4	2	0	1	7
23	0	3	2	2	1	1	4	4	1423	3112	1	6	4	4	3	2	9	8	5
24	5	3	3	3	2	2	0	0	4111	4311	12	7	7	7	4	4	1	1	5
25	4	2	5	8	6	7	5	4	2222	0121	10	4	13	22	15	17	11	8	13
26	3	3	1	1	1	1	4	1	1112	1131	6	6	2	3	2	3	9	2	4
27	11	10	9	10	11	10	10	13	4224	1115	44	35	29	34	50	36	39	61	41
28	12	17	21	20	20	16	12	13	5223	4337	56	129	247	225	208	117	54	62	137
29	15	14	15	13	14	9	8	8	3362	3323	100	71	103	66	72	31	21	23	61
30	10	9	8	11	11	11	15	12	5120	1112	37	27	24	47	44	41	96	52	46
31	14	9	11	10	11	14	11	7	7112	3423	76	28	42	37	49	73	41	20	46
																			21.7

Table 9 - continued

SEP. 1978

	3 Kn								σn		an						An
1	9	9	13	10	10	8	7	9	3233	2323	30	30	70	35	37	26	18	28	34
2	7	6	14	9	10	8	11	9	3133	3223	20	16	78	31	40	21	45	29	35
3	6	7	8	8	8	8	6	7	0332	3413	15	19	21	24	26	22	16	17	20
4	5	5	8	7	6	5	7	5	3333	2232	12	12	26	17	15	12	17	11	15
5	2	4	4	5	4	3	8	9	1743	3223	5	9	8	11	8	7	21	28	12
6	8	9	12	12	8	5	4	2	3255	3242	25	28	58	53	23	12	8	5	27
7	1	3	2	6	4	4	7	9	1214	2112	2	7	4	15	10	9	19	27	12
8	14	14	10	8	4	4	6	7	4621	2332	77	73	39	23	9	10	16	17	33
9	9	10	11	15	13	12	11	10	1135	4453	31	36	43	90	68	54	44	38	51
10	10	5	4	9	9	7	5	5	2433	3122	36	12	10	28	32	17	11	13	20
11	5	2	1	5	12	10	8	7	3213	4222	13	4	3	11	60	38	21	20	21
12	7	7	9	8	11	8	9	9	3233	5641	17	17	33	24	50	25	30	27	28
13	6	3	8	8	4	5	4	4	4233	3132	15	6	21	23	8	12	9	8	13
14	8	4	2	2	3	3	1	2	2331	2223	25	10	4	4	6	6	3	5	8
15	1	0	2	3	3	1	0	6	2213	2122	2	1	4	7	7	2	1	14	5
16	4	7	5	1	4	4	4	7	3322	4212	8	19	11	2	10	8	8	17	10
17	4	8	8	5	3	3	3	4	2122	4123	9	23	26	12	7	6	6	10	12
18	0	1	1	2	2	0	3	1	1112	2132	1	3	2	5	5	1	7	2	3
19	0	0	1	0	0	1	0	0	0120	1221	0	1	2	0	1	2	1	1	1
20	1	0	0	1	4	1	5	8	2112	3153	2	1	1	2	10	2	13	24	7
21	5	8	8	6	3	7	2	3	1315	1211	12	26	21	16	7	18	4	6	14
22	4	6	9	5	8	9	8	6	3132	3320	9	14	33	12	22	30	24	15	20
23	4	6	6	6	9	8	8	9	1322	5224	10	14	15	15	28	21	23	27	19
24	4	7	5	3	4	8	7	9	2422	2244	10	17	11	6	10	25	20	32	16
25	7	6	11	14	13	14	11	11	2413	3123	17	15	47	82	70	72	49	49	50
26	7	12	16	13	11	13	11	11	3654	2321	17	59	115	64	43	66	46	44	57
27	15	13	9	11	9	14	15	15	5124	2442	97	64	33	41	33	77	87	92	66
28	12	14	13	14	13	10	12	16	3442	3224	58	71	66	73	67	38	51	104	66
29	11	17	22	22	22	17	11	5	4336	4323	41	125	298	312	292	142	41	12	158
30	4	11	11	6	4	5	6	5	2333	3232	8	42	45	16	10	11	15	13	20
																			28.4

SEP. 1978

	3 Ks								σs		as						As
1	10	8	11	9	7	7	7	10	4214	3223	35	22	44	33	20	17	18	39	29
2	9	8	11	8	9	5	11	10	4331	2113	27	21	47	24	30	11	44	34	30
3	6	8	7	6	6	7	6	5	2350	1223	16	21	20	15	16	18	14	13	17
4	7	5	7	5	3	4	6	4	2233	1153	19	12	20	11	6	8	15	10	13
5	3	3	3	3	3	2	6	8	2241	2133	6	6	6	6	7	4	16	24	9
6	9	9	11	11	6	4	1	0	4353	3221	32	33	44	43	16	9	3	1	23
7	0	4	1	3	2	4	5	7	1222	3323	1	9	2	7	5	8	11	20	8
8	12	12	11	7	3	3	5	6	3341	2423	58	51	42	20	7	6	11	15	26
9	10	11	9	14	12	11	10	12	4346	3166	37	50	32	72	52	44	39	58	48
10	11	6	4	7	8	5	3	4	4110	2201	48	15	10	19	26	11	6	10	18
11	5	2	2	4	11	11	8	7	5201	3132	12	5	4	10	47	42	22	19	20
12	6	7	8	7	10	6	8	8	3323	2335	15	20	26	20	39	16	24	25	23
13	7	4	6	5	3	5	4	4	4413	2220	19	8	15	13	6	11	8	8	11
14	8	5	3	1	1	1	0	1	3311	1212	26	11	6	2	2	2	1	3	7
15	0	1	1	2	1	0	0	5	1113	1114	1	3	3	5	2	1	1	13	4
16	5	8	5	0	2	2	4	6	1451	3211	13	24	12	1	5	4	9	16	11
17	4	9	9	4	2	2	1	5	1242	2324	8	27	30	9	4	4	2	11	12
18	0	2	1	0	2	1	1	0	0111	4222	0	5	2	1	5	2	3	1	2
19	1	0	0	0	1	1	0	0	1110	1210	2	1	1	0	2	2	1	0	1
20	1	0	1	0	4	1	4	8	3121	2243	3	1	2	1	8	2	10	22	6
21	6	9	9	6	3	5	2	2	2421	1323	15	28	28	14	6	13	4	5	14
22	6	5	8	6	8	10	8	6	1123	1212	16	13	23	14	23	34	24	15	20
23	4	6	6	5	8	7	7	7	3413	3114	10	15	14	13	23	17	20	18	16
24	4	6	5	2	3	8	6	10	3432	1112	10	14	12	4	6	21	16	36	15
25	8	7	11	13	13	14	11	11	3142	2334	24	20	44	70	70	77	49	47	50
26	7	11	16	14	10	12	11	12	1353	3214	20	46	109	77	40	58	44	56	56
27	15	11	9	10	10	12	14	15	4312	2414	94	44	32	39	40	59	81	101	61
28	12	13	11	13	14	8	11	16	2223	1225	60	61	49	66	77	26	47	115	63
29	11	16	20	21	21	16	11	7	3212	6352	41	107	241	260	245	110	41	18	133
30	4	10	9	7	4	4	6	5	0232	2131	9	37	30	17	8	8	16	11	17
																			25.4

Table 9 - continued

SEP. 1978

	3 Km								Σ Km	am							Am	Am2
1	9	8	12	10	9	8	7	9	24.0	32	26	57	34	29	21	18	33	31	38
2	8	7	13	9	10	6	11	9	24.3	23	18	63	28	35	16	44	31	32	27
3	6	7	8	7	8	7	6	6	18.3	16	20	21	19	21	20	15	15	18	21
4	6	5	8	6	5	4	6	4	14.7	15	12	23	14	11	10	16	10	14	13
5	3	4	3	4	3	2	7	8	11.3	6	8	7	8	7	5	18	26	11	18
6	9	9	12	11	7	4	2	1	18.3	29	31	51	48	19	10	5	3	25	17
7	1	4	1	5	3	4	6	8	10.7	2	8	3	11	7	8	15	23	10	19
8	13	13	11	8	4	4	5	6	21.3	67	62	41	21	8	8	13	16	30	30
9	10	11	10	14	12	11	11	11	30.0	34	43	37	81	60	49	41	48	49	33
10	11	5	4	8	9	6	4	5	17.3	42	13	10	23	29	14	9	11	19	24
11	5	2	2	4	12	10	8	7	16.7	13	5	4	10	54	40	22	19	21	20
12	6	7	9	8	11	7	9	8	21.7	16	18	30	22	44	20	27	26	25	25
13	7	3	7	7	3	5	4	4	13.3	17	7	18	18	7	12	9	8	12	16
14	8	4	2	1	2	2	1	2	7.3	25	10	5	3	4	4	2	4	7	7
15	0	1	1	3	2	0	0	5	4.0	1	2	3	6	4	1	1	13	4	6
16	4	8	5	0	3	3	4	7	11.3	10	21	12	1	7	6	8	17	10	11
17	4	8	9	4	3	2	2	4	12.0	9	25	28	10	6	5	4	10	12	9
18	0	2	1	1	2	0	2	1	3.0	0	4	2	3	5	1	5	2	3	3
19	0	0	0	0	1	1	0	0	0.7	1	1	1	0	2	2	1	1	1	2
20	1	0	0	0	4	1	5	8	6.3	3	1	1	1	9	2	11	23	6	9
21	6	9	8	6	3	6	2	2	14.0	14	27	25	15	6	15	4	5	14	14
22	5	6	9	5	8	9	8	6	18.7	13	14	28	13	22	32	24	15	20	15
23	4	6	6	6	8	7	8	8	17.7	10	14	14	14	26	19	21	23	18	17
24	4	6	5	2	4	8	7	10	15.3	10	16	12	5	8	23	18	34	16	23
25	7	7	11	14	13	14	11	11	29.3	20	18	46	76	70	74	49	48	50	46
26	7	12	16	14	11	13	11	11	31.7	18	52	112	71	42	62	45	50	57	57
27	15	12	9	10	10	13	14	15	32.7	96	54	32	40	36	68	84	97	63	60
28	12	13	12	13	14	9	11	16	33.3	59	66	57	69	72	32	49	109	64	94
29	11	16	21	21	21	17	11	6	41.3	41	116	269	286	268	126	41	15	145	95
30	4	10	10	6	4	4	6	5	16.3	9	40	37	16	9	9	16	12	19	42
																		26.9	

OCT. 1978

	3 Km								Σ Km	am							Am	Am2
1	7	5	7	8	9	6	8	10	20.0	18	13	18	22	28	16	25	34	22	17
2	4	6	3	8	10	8	8	8	18.3	10	15	7	22	36	24	21	21	20	20
3	7	4	7	6	6	4	3	4	13.7	18	9	18	16	15	9	6	9	13	21
4	10	9	9	8	9	5	9	9	22.7	39	33	31	25	31	11	29	29	29	20
5	8	4	1	6	4	6	5	3	12.3	26	9	3	14	9	15	12	7	12	14
6	3	4	5	1	2	6	3	5	9.7	6	8	11	2	5	14	6	12	8	8
7	3	3	3	3	4	2	2	2	7.3	6	7	7	7	9	4	5	5	6	8
8	1	6	3	5	4	4	4	7	11.3	2	14	7	13	9	9	8	17	10	11
9	2	8	6	8	7	7	9	11	19.3	5	26	15	25	19	18	27	42	22	20
10	9	8	6	10	8	2	6	7	18.7	32	23	16	34	22	4	16	18	21	20
11	5	5	6	4	3	3	1	4	10.3	11	11	14	9	6	6	3	9	9	12
12	4	4	3	9	12	11	8	8	19.7	9	9	6	33	58	47	21	26	26	19
13	8	6	8	4	5	2	7	8	16.0	25	15	23	10	11	5	17	21	16	19
14	3	3	3	1	2	6	7	5	10.0	6	6	6	3	4	14	17	11	8	9
15	4	1	3	4	7	4	3	5	10.3	10	2	7	10	20	10	7	13	10	10
16	5	5	2	2	4	1	0	2	7.0	12	11	5	5	9	3	1	4	6	8
17	1	5	3	1	1	2	5	9	9.0	2	11	7	3	2	4	12	33	9	19
18	13	13	12	10	8	10	11	10	29.0	63	64	58	35	25	36	44	39	46	35
19	9	10	12	9	11	8	9	7	25.0	28	35	54	31	43	21	33	19	33	30
20	7	5	3	9	8	7	7	4	16.7	18	11	7	28	24	20	17	10	17	20
21	4	7	5	9	9	6	9	9	19.3	8	18	13	28	33	16	27	30	22	20
22	4	7	8	8	6	9	7	4	17.7	10	20	21	26	14	29	20	8	19	19
23	2	6	6	5	5	4	2	4	11.3	5	15	14	13	11	9	5	10	10	11
24	5	4	1	1	1	3	7	3	8.3	13	10	3	2	2	6	18	7	8	9
25	3	3	2	8	8	8	6	3	13.7	6	7	5	24	26	22	16	6	14	12
26	5	6	5	5	9	11	13	12	22.0	12	14	13	13	32	50	70	59	33	34
27	10	10	13	14	10	7	3	7	24.7	36	35	65	73	36	19	7	20	36	38
28	7	9	11	7	6	8	4	8	20.0	18	33	42	18	16	22	10	23	23	20
29	6	6	4	8	11	14	10	8	22.3	16	14	10	23	50	76	39	24	32	29
30	5	9	10	12	12	15	12	9	28.0	11	28	36	59	54	88	59	32	46	39
31	8	7	7	7	11	12	10	9	23.7	21	18	17	17	49	51	38	27	30	35
																		19.9	

Table 9 - continued

OCT. 1978

	3 Kn								σn		an						An
1	7	5	7	9	10	7	8	9	4234	4223	17	11	19	27	35	17	26	31	23
2	4	6	4	8	11	9	8	8	2512	4343	8	16	8	25	47	28	22	24	22
3	7	5	8	7	7	4	3	4	5245	4322	18	11	23	20	19	10	7	9	15
4	9	9	9	9	10	5	9	9	3224	3245	32	30	31	28	35	11	28	30	28
5	9	4	2	7	4	7	5	3	4315	3321	27	10	5	17	10	17	12	7	13
6	2	3	4	1	2	6	3	5	1232	3222	5	6	10	2	5	14	6	13	8
7	2	3	3	3	4	1	2	2	4222	3211	5	7	7	7	10	3	5	4	6
8	1	5	4	6	4	4	4	7	2215	2223	2	12	8	15	10	10	10	18	11
9	3	8	6	8	7	7	9	11	1331	3313	6	22	14	25	20	18	27	41	22
10	10	8	6	9	8	2	6	6	5513	2232	37	23	16	32	24	5	14	16	21
11	4	4	5	4	3	3	1	4	3231	2222	10	10	12	10	7	6	3	10	9
12	4	3	2	9	12	12	7	8	2123	4412	9	7	5	27	53	54	19	24	25
13	8	6	7	4	5	2	7	8	2222	4222	22	14	17	9	11	5	19	21	15
14	2	2	4	2	2	5	7	5	1141	2232	5	5	8	4	4	13	18	12	9
15	4	1	3	5	8	4	3	5	2122	4323	9	3	7	11	24	10	7	13	11
16	5	5	2	2	4	2	0	2	2121	3112	11	11	5	5	10	4	1	4	6
17	1	4	3	1	1	2	5	9	2322	2351	2	8	6	3	3	4	13	30	9
18	11	13	11	9	8	11	12	10	1423	3352	50	64	49	33	24	43	57	40	45
19	9	9	12	9	11	8	9	8	4244	3363	32	31	57	33	47	22	30	21	34
20	7	5	3	9	8	7	7	4	3336	3342	17	11	7	28	25	17	17	8	16
21	3	7	5	10	10	6	9	10	2225	3244	7	20	11	36	36	16	31	34	24
22	4	8	8	9	5	9	8	3	2655	2552	10	21	23	30	12	32	22	7	20
23	1	5	7	5	5	4	2	4	3351	4332	3	13	19	13	11	10	5	9	10
24	5	5	2	1	1	3	8	4	2533	3252	11	11	5	2	3	6	21	8	8
25	3	3	3	8	9	8	6	2	0234	3212	6	6	6	24	28	24	15	5	14
26	5	5	5	5	9	11	13	12	2221	3332	11	11	11	12	31	46	62	60	31
27	10	10	13	14	10	7	3	7	2346	4323	36	38	68	81	40	19	7	20	39
28	7	10	11	8	7	8	4	8	2643	2535	17	39	48	21	17	22	9	25	25
29	7	5	5	8	12	14	11	8	3142	3562	18	13	12	25	54	72	44	22	33
30	4	9	11	12	12	15	14	10	1553	4775	9	28	45	60	51	91	72	35	49
31	9	7	7	7	12	12	10	9	6545	4334	27	20	20	19	57	52	39	31	33
																			20.5

OCT. 1978

	3 Ks								σs		as						As
1	7	6	7	7	8	6	8	10	1215	2225	20	16	18	18	21	16	23	38	21
2	5	6	3	7	8	7	7	7	3402	2254	12	14	6	18	26	19	20	17	17
3	7	4	5	5	5	4	3	4	3334	4111	19	8	13	12	12	9	6	10	11
4	11	10	9	8	9	5	9	9	5322	2236	46	36	31	23	28	11	30	27	29
5	8	4	0	4	3	6	5	3	6414	2413	25	8	1	10	7	14	12	7	11
6	3	4	5	1	2	5	3	5	2321	2423	6	9	11	2	4	13	6	11	8
7	3	3	3	3	4	2	2	2	1412	2221	7	6	7	6	8	4	4	5	6
8	1	6	3	5	4	4	3	6	2133	1201	2	16	7	12	9	9	6	16	10
9	2	9	6	8	7	7	9	11	4331	4244	4	31	16	24	18	18	27	44	23
10	9	8	6	10	7	1	7	7	2223	2223	28	23	16	35	20	2	19	20	20
11	5	5	7	4	3	2	1	4	1411	2312	12	12	17	8	6	5	3	9	9
12	4	5	3	10	13	11	8	9	1430	3242	10	11	7	38	63	41	24	27	28
13	9	6	9	5	5	2	6	7	3312	1311	28	15	30	11	11	5	16	20	17
14	4	3	2	1	2	6	7	4	3112	2412	8	7	5	3	4	15	17	10	9
15	5	0	3	4	7	4	3	5	1112	1323	11	1	7	10	17	10	7	13	10
16	5	5	3	3	4	1	0	2	1231	2212	12	11	6	6	8	2	1	4	6
17	0	6	4	1	0	2	5	10	1332	1334	1	14	8	3	1	5	12	35	10
18	14	13	13	10	8	9	9	10	5431	1123	77	63	67	37	26	30	31	39	46
19	8	10	11	9	10	8	10	7	2231	2150	23	40	50	28	40	21	35	18	32
20	7	4	3	9	8	8	7	5	3331	2113	19	10	7	27	23	23	17	11	17
21	4	6	6	8	9	6	8	8	3201	1411	10	16	15	21	30	15	23	26	20
22	4	7	7	8	6	8	7	4	1312	1221	10	19	18	22	16	25	19	9	17
23	3	7	4	5	4	4	2	4	2311	2323	6	17	10	13	10	8	4	10	10
24	6	4	0	1	1	2	6	3	3111	1321	14	10	1	3	2	5	15	7	7
25	3	4	2	8	8	7	7	3	1211	3123	6	8	4	24	23	20	18	6	14
26	6	7	6	6	10	12	14	12	2121	1244	14	17	14	14	34	54	77	58	35
27	10	9	13	13	9	7	4	7	2324	2311	36	32	62	65	31	20	8	20	34
28	7	8	10	6	6	8	5	8	1111	3222	18	26	37	16	15	22	11	21	21
29	6	6	4	8	11	14	9	8	4131	3523	15	14	8	21	46	80	33	26	30
30	5	9	9	12	12	14	11	9	3322	2422	13	28	28	58	58	85	46	28	43
31	6	6	6	6	11	11	10	8	4131	3121	15	16	14	15	42	49	36	23	26
																			19.3

Table 9 - continued

NOV. 1978

	3 Kn								σn		an						An
1	6	6	8	11	7	6	6	7	3265	3124	16	14	26	47	18	16	15	19	21
2	2	3	4	10	12	10	5	6	1424	5223	4	7	10	38	54	39	11	15	22
3	6	6	6	7	4	6	11	10	4344	3153	15	14	16	17	9	14	44	35	21
4	5	4	6	1	4	4	1	5	1241	3314	13	10	14	3	10	8	3	11	9
5	7	8	2	4	5	5	2	0	4412	3411	19	21	5	8	11	12	4	0	10
6	0	0	1	3	3	4	3	2	1123	3422	1	1	2	6	7	10	6	4	5
7	1	0	0	0	1	3	8	14	2001	2124	3	0	0	1	2	7	21	77	14
8	11	9	6	6	4	8	6	5	2322	2213	41	33	16	14	8	23	15	13	20
9	7	5	7	5	5	4	0	2	4122	3120	18	13	19	11	12	8	1	4	11
10	4	3	1	4	4	12	15	13	2223	3466	9	7	2	9	9	51	93	63	30
11	7	6	5	1	3	3	9	7	3542	2365	18	16	13	3	6	7	29	20	14
12	15	9	14	17	15	11	14	12	4233	3354	87	33	78	124	89	43	71	59	73
13	11	10	7	8	12	13	12	4	4313	4341	41	34	17	22	54	61	57	10	37
14	1	0	2	3	11	11	8	4	2122	2342	2	1	4	6	48	46	26	9	18
15	5	8	5	6	1	5	6	6	4323	2321	11	26	13	14	2	12	15	15	14
16	4	2	4	5	9	5	6	2	2142	3311	10	5	9	11	28	11	14	4	12
17	4	0	7	7	7	2	5	3	3244	3123	9	1	20	19	17	5	13	6	11
18	4	4	4	2	2	3	4	6	3232	3342	8	8	8	4	5	6	8	16	8
19	7	8	5	8	10	8	4	6	3242	3241	17	21	11	26	38	23	9	15	20
20	8	10	7	8	9	12	14	11	2543	2354	21	35	20	23	32	52	73	48	38
21	10	9	8	7	4	6	6	9	4432	4314	34	29	25	17	10	16	14	31	22
22	10	8	10	10	14	15	9	6	5352	2523	36	21	37	34	86	93	27	16	44
23	4	2	2	7	11	10	10	8	3212	4343	8	4	4	20	45	36	38	25	23
24	6	5	4	6	10	11	13	11	5224	2364	15	13	10	15	36	50	63	44	31
25	9	8	11	16	19	20	18	13	5437	7885	29	24	42	113	181	212	161	66	104
26	11	14	11	11	14	14	11	9	2434	4632	41	83	49	48	75	79	46	28	56
27	7	8	7	9	10	11	11	9	3323	2644	17	23	18	28	35	41	48	28	30
28	3	4	2	2	6	5	3	2	2323	4411	7	8	5	4	14	13	6	4	8
29	3	1	0	6	3	8	3	1	4213	2521	6	2	1	16	6	23	6	2	8
30	5	3	1	2	4	5	5	7	4423	4436	11	6	2	5	10	11	13	19	10
																			24.8

NOV. 1978

	3 Ks								σs		as						As
1	5	8	8	10	7	7	6	7	1141	1323	12	21	21	34	17	17	15	17	19
2	2	2	5	10	11	9	7	7	3233	4231	5	4	13	35	48	33	18	20	22
3	7	7	5	5	5	6	10	9	1222	2412	17	17	12	11	11	14	39	29	19
4	7	8	5	2	4	3	2	5	1222	3331	18	23	13	5	10	7	5	12	12
5	6	8	4	4	4	4	2	1	4431	1233	15	24	9	8	8	8	5	3	10
6	2	0	2	1	3	5	3	4	2011	3223	4	0	4	3	7	12	6	8	6
7	3	0	0	0	2	5	8	12	2011	2333	7	0	1	1	4	13	26	58	14
8	12	12	8	8	5	9	7	6	2412	3424	59	51	21	22	12	28	18	15	28
9	6	7	8	5	7	4	1	4	3011	5423	16	18	23	12	18	8	2	8	13
10	5	4	2	4	7	12	14	13	2022	2326	12	9	4	9	18	59	73	67	31
11	7	6	5	3	4	4	9	8	1321	2155	20	15	12	6	8	8	30	25	16
12	16	13	17	19	16	11	14	13	2232	1445	116	66	123	184	108	50	77	63	98
13	11	9	6	7	11	9	10	5	4121	3133	47	32	16	18	44	33	40	11	30
14	1	1	2	3	9	10	8	4	1011	2414	3	2	5	7	32	37	24	8	15
15	4	7	4	4	0	5	7	8	1214	0412	10	19	10	10	0	11	17	22	12
16	5	2	3	6	9	4	8	3	2331	2232	13	5	7	16	32	8	25	6	14
17	4	1	4	8	5	2	4	3	1222	2312	8	2	10	21	13	5	9	7	9
18	4	4	2	3	3	3	3	9	3220	3314	8	10	4	6	7	6	7	28	10
19	6	8	7	8	10	8	4	9	2331	0315	16	25	18	24	36	26	10	29	23
20	10	12	10	8	9	13	14	11	2241	2241	39	52	34	25	30	61	78	44	45
21	9	8	8	7	5	5	7	9	3221	2323	31	23	21	17	12	13	18	31	21
22	8	8	8	11	13	14	8	7	4421	0330	21	24	23	41	67	73	23	18	36
23	3	1	2	6	9	9	8	6	1121	2222	7	3	4	16	30	31	23	14	16
24	5	5	4	5	10	11	13	11	4312	1134	12	13	10	12	36	44	64	41	29
25	7	8	10	13	17	19	17	12	1422	6552	20	23	37	69	143	189	135	52	84
26	11	11	9	11	12	12	11	9	2123	1233	44	46	33	47	52	60	41	28	44
27	5	5	6	8	8	10	10	8	1411	1311	13	13	14	23	21	36	39	24	23
28	3	2	2	2	5	5	2	2	1220	2143	7	4	4	4	11	11	5	5	6
29	1	2	3	4	4	7	4	2	1343	2022	3	5	6	9	8	19	8	4	8
30	3	3	1	1	4	4	6	6	3312	5033	6	7	2	3	8	9	14	15	8
																			24.0

Table 9 - continued

NOV. 1978

	3 Km								Σ Km	am							Am	Am2
1	6	7	8	11	7	6	6	7	19.3	14	18	23	41	17	16	15	18	20	24
2	2	3	5	10	12	10	6	7	18.3	5	6	11	37	51	36	14	17	22	19
3	6	6	6	6	4	6	11	9	18.0	16	16	14	14	10	14	42	32	20	20
4	6	6	5	2	4	3	2	5	11.0	15	16	13	4	10	7	4	12	10	15
5	7	8	3	4	4	4	2	1	11.0	17	22	7	8	9	10	4	2	10	8
6	1	0	1	2	3	5	3	3	6.0	2	0	3	4	7	11	6	6	5	4
7	2	0	0	0	1	4	8	13	9.3	5	0	0	1	3	10	23	68	14	17
8	11	11	7	7	4	8	6	6	20.0	50	42	19	18	10	26	16	14	24	23
9	7	6	8	5	6	4	1	3	13.3	17	15	21	11	15	8	2	6	12	12
10	5	4	1	4	5	12	14	13	19.3	11	8	3	9	13	55	83	65	31	21
11	7	6	5	2	3	3	9	8	14.3	19	15	12	5	7	7	30	22	15	46
12	15	11	15	18	15	11	14	13	37.3	101	49	101	154	99	46	74	61	86	54
13	11	9	7	7	11	11	11	5	24.0	44	33	17	20	49	47	48	11	34	35
14	1	0	2	3	10	11	8	4	13.0	2	1	4	6	40	42	25	8	16	21
15	4	8	5	5	0	5	6	7	13.3	10	22	12	12	1	11	16	19	13	16
16	5	2	4	5	9	4	7	2	12.7	12	5	8	13	30	10	19	5	13	12
17	4	1	6	7	6	2	5	3	11.3	8	2	15	20	15	5	11	7	10	11
18	4	4	3	2	3	3	3	8	10.0	8	9	6	5	6	6	7	22	9	12
19	6	8	6	8	10	8	4	8	19.3	16	23	14	25	37	24	9	22	21	21
20	9	11	9	8	9	12	14	11	27.7	30	43	27	24	31	57	75	46	42	33
21	9	8	8	7	5	6	6	9	19.3	33	26	23	17	11	14	16	31	21	31
22	9	8	9	10	14	14	8	7	26.3	28	22	30	37	77	83	25	17	40	27
23	3	2	2	7	10	9	9	7	16.3	7	4	4	18	37	33	30	19	19	25
24	5	5	4	6	10	11	13	11	21.7	13	13	10	14	36	47	64	43	30	34
25	8	8	10	15	18	20	18	12	36.3	24	23	39	91	162	201	148	59	93	71
26	11	13	11	11	13	13	11	9	30.7	42	64	41	48	63	69	44	28	50	65
27	6	7	6	8	9	10	11	8	21.7	15	18	16	25	28	38	43	26	26	27
28	3	3	2	2	5	5	2	2	8.0	7	6	4	4	13	12	5	5	7	13
29	2	1	1	5	3	8	3	1	8.0	5	3	3	13	7	21	7	3	8	7
30	4	3	1	2	4	4	5	7	10.0	8	6	2	4	9	10	13	17	9	12
																		24.3	

DEC. 1978

	3 Km								Σ Km	am							Am	Am2
1	5	7	8	9	8	6	4	5	17.3	13	20	25	33	21	14	9	11	18	13
2	3	3	1	1	2	1	1	3	5.0	7	6	3	3	4	3	2	7	4	7
3	4	4	0	2	3	6	4	5	9.3	10	8	1	4	6	14	10	13	8	11
4	6	7	6	10	9	9	9	8	21.3	14	19	15	40	27	28	31	24	25	20
5	10	8	5	5	1	3	6	9	15.7	40	21	11	11	3	7	14	27	17	18
6	4	4	4	4	4	4	7	4	11.7	8	8	10	10	9	10	17	8	10	9
7	1	1	1	1	3	3	2	1	4.3	3	3	3	2	6	7	4	3	4	6
8	1	1	1	6	3	1	6	4	7.7	3	2	3	14	6	3	16	8	7	6
9	2	5	2	1	2	3	2	0	5.7	4	12	4	2	5	7	4	1	5	5
10	1	1	0	0	1	1	0	0	1.3	2	2	0	1	3	3	1	1	2	2
11	0	0	0	0	1	0	2	4	2.3	1	1	0	0	3	1	4	8	2	3
12	1	0	0	6	7	7	6	7	11.3	2	0	1	14	19	17	15	19	11	10
13	9	7	5	1	1	1	4	6	11.3	28	17	11	3	3	2	9	14	11	29
14	14	14	15	12	10	7	7	7	28.7	73	74	101	58	35	20	17	19	50	39
15	11	14	9	9	10	9	8	9	26.3	49	84	32	32	37	28	22	29	39	31
16	7	9	6	8	8	9	11	9	22.3	19	30	14	22	21	32	47	27	27	24
17	9	5	6	3	7	3	6	10	16.3	30	12	15	6	18	7	14	35	17	32
18	12	10	14	14	16	15	14	11	35.3	59	40	71	75	108	99	78	50	73	48
19	9	10	9	8	13	11	11	8	26.3	29	38	28	24	70	45	41	23	37	48
20	9	8	8	12	11	12	11	10	27.0	33	24	25	54	49	58	47	39	41	37
21	7	7	7	8	7	6	5	3	16.7	20	20	18	25	20	16	11	7	17	30
22	8	11	9	12	10	12	8	7	25.7	21	42	33	56	34	51	21	17	34	24
23	7	5	5	4	5	8	4	1	13.0	20	11	12	8	11	22	10	3	12	16
24	4	3	6	6	4	5	2	3	11.0	9	6	14	14	10	11	5	6	9	13
25	7	7	8	8	17	13	7	5	24.0	19	17	22	24	138	64	18	12	39	26
26	5	4	8	8	6	5	7	6	16.3	13	9	24	23	16	12	17	15	16	28
27	10	9	4	3	8	8	8	4	18.0	39	31	9	6	22	25	22	9	20	16
28	3	7	3	0	6	12	13	6	17.3	7	20	7	1	14	59	65	21	24	21
29	7	7	5	7	8	16	13	11	24.7	18	17	13	19	21	104	62	45	37	39
30	10	12	9	9	9	8	13	11	27.0	40	57	33	29	32	23	65	45	41	43
31	12	8	8	9	8	8	8	7	22.7	52	25	21	27	24	22	21	17	26	27
																		22.0	

Table 9. - continued

DEC. 1978

	3 Kn								σn				an				An
1	4	7	9	9	7	5	4	4	2333	4333	9	17	28	33	20	12	8	9	17
2	3	2	1	1	2	2	0	3	3121	2212	6	4	2	3	4	4	1	6	4
3	4	4	0	1	2	6	4	4	3411	3333	9	8	1	3	5	16	9	10	8
4	5	6	5	9	8	8	9	7	2233	2331	11	14	11	33	26	24	30	20	21
5	10	8	4	3	1	3	5	8	4231	2222	37	21	10	7	3	7	12	25	15
6	4	3	3	3	3	4	7	3	2110	2121	8	6	7	6	7	8	17	7	8
7	1	1	1	0	2	3	1	1	2221	2021	3	2	3	1	4	6	3	2	3
8	0	0	2	5	2	1	5	3	1022	3232	1	0	4	12	5	3	13	7	6
9	0	4	1	0	2	3	1	0	1122	3421	1	8	3	1	5	7	3	1	4
10	1	0	0	0	0	1	0	0	2101	1211	2	1	0	1	1	3	0	1	1
11	0	0	0	0	1	0	1	3	1100	1143	1	1	0	0	3	1	3	6	2
12	0	0	0	5	6	6	5	6	1012	3322	1	0	1	11	16	15	11	14	9
13	9	6	3	1	1	1	3	4	3322	2112	27	16	7	2	2	2	6	9	9
14	11	12	14	12	10	7	6	7	2234	2221	43	59	76	56	36	19	14	17	40
15	10	15	11	10	11	9	7	7	2535	4532	36	94	42	34	44	32	19	20	40
16	6	9	5	8	7	9	12	7	2422	2432	14	29	13	25	20	27	56	20	26
17	7	5	5	2	6	3	5	9	1112	2222	19	13	13	5	15	6	11	29	14
18	11	9	14	14	16	16	14	12	3243	4654	41	29	75	82	115	104	74	54	72
19	9	11	8	9	14	12	11	8	3711	2331	30	50	22	27	82	55	45	25	42
20	10	9	9	13	12	13	12	11	3144	3543	36	27	28	62	57	63	55	50	47
21	8	8	8	9	8	7	5	4	2335	3342	21	25	23	27	22	18	11	8	19
22	7	11	9	12	8	12	8	7	3234	2444	20	43	32	58	26	51	24	18	34
23	8	5	6	3	6	8	4	1	4240	4531	22	12	16	6	14	22	8	2	13
24	3	4	6	7	4	4	3	3	2512	1224	7	8	16	17	8	10	6	6	10
25	7	6	9	9	18	12	6	4	2244	3533	19	15	28	29	153	59	15	9	41
26	6	4	8	8	7	6	6	5	4333	2543	14	10	24	23	17	16	16	11	16
27	11	9	5	3	8	9	8	4	2322	1683	47	32	11	7	24	29	26	8	23
28	4	7	3	0	4	13	13	7	4421	3552	8	19	6	0	10	66	62	17	24
29	7	6	5	7	8	15	13	11	2423	3555	17	16	12	18	22	91	61	47	36
30	10	12	9	9	10	8	13	11	2103	4343	36	59	30	28	35	24	70	45	41
31	12	8	8	9	9	8	8	7	2213	4223	53	26	21	27	27	22	23	17	27
																			21.7

DEC. 1978

	3 Ks								σs				as				As
1	6	8	8	9	8	6	4	5	1221	3313	16	24	21	33	22	15	10	13	19
2	3	4	2	1	2	1	1	4	2121	2322	7	8	4	3	5	3	2	8	5
3	5	4	0	3	4	5	5	6	2311	1333	11	8	1	6	8	13	12	16	9
4	6	8	7	11	9	9	9	9	5410	3222	16	24	18	47	28	31	33	28	28
5	11	8	5	6	2	4	7	9	1320	1110	44	21	13	15	4	8	17	29	19
6	4	4	5	6	4	5	7	4	2221	2432	9	10	13	14	10	11	17	9	12
7	1	2	1	2	4	4	2	2	1213	2422	3	4	3	4	8	9	5	4	5
8	2	2	1	7	4	2	7	4	2211	1423	4	4	2	17	8	4	20	10	9
9	3	6	3	1	3	3	2	0	2130	2030	6	16	6	2	6	6	5	0	6
10	1	1	0	0	2	1	1	0	2311	2311	2	2	1	1	4	3	2	1	2
11	1	0	0	0	2	1	2	5	1100	1242	2	1	0	0	4	2	5	11	3
12	2	0	0	7	8	7	7	8	2113	1534	4	1	1	17	23	20	19	23	14
13	9	7	6	2	1	1	5	7	3232	2332	28	18	14	4	3	3	12	19	13
14	16	15	17	13	10	8	8	8	1232	1232	104	89	127	61	34	22	21	22	60
15	13	14	8	9	9	8	8	10	1222	4152	61	74	23	30	30	24	25	37	38
16	8	9	6	7	8	10	10	10	2213	2221	23	30	15	18	22	36	38	34	27
17	11	5	7	3	8	4	7	11	2111	1321	42	12	17	7	21	9	18	41	21
18	14	12	13	13	15	15	14	11	2323	1433	77	51	66	68	101	95	81	45	73
19	9	8	9	8	12	10	10	8	2232	2201	29	26	33	22	58	35	36	21	33
20	9	8	8	11	11	12	10	9	4122	1223	30	21	22	47	42	52	39	29	35
21	7	6	6	8	7	6	5	3	1112	0222	20	16	14	22	18	15	12	7	16
22	8	11	10	12	11	11	7	7	2211	1124	23	42	34	55	41	50	18	17	35
23	7	4	4	4	4	8	5	1	2212	3252	18	10	9	9	8	22	13	3	12
24	4	2	5	5	5	5	2	3	3212	5431	10	4	13	11	13	12	5	6	9
25	7	7	6	7	17	13	8	6	2021	3355	19	18	16	20	124	68	22	16	38
26	5	4	8	8	6	4	7	7	4222	0243	11	8	24	23	15	9	18	19	16
27	9	9	4	3	8	8	7	5	4331	1232	31	31	8	6	21	22	17	11	18
28	2	8	4	1	7	12	13	8	3531	2233	5	21	8	3	18	52	68	24	25
29	7	7	6	7	7	16	13	11	1011	1323	20	18	15	20	20	117	64	44	40
30	11	12	10	9	9	8	13	11	1212	3232	44	55	36	30	29	23	61	44	40
31	12	8	8	9	7	8	7	6	4131	2213	52	24	22	28	20	22	20	16	26
																			22.8

TABLE 10 HOURLY Dst (for explanation see page IX)

JANUARY 1978

UNIT=GAMMAS

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
																			G.M.T.					
1	-1	-2	-1	4	8	10	5	5	4	4	4	4	4	5	8	8	8	14	16	11	7	4	-9	-15
2	-5	0	-8	-18	-17	-12	-8	-3	-3	-6	-10	-7	-6	-5	-4	-4	-5	-3	-1	-3	-5	-6	-6	-4
3	-2	-3	-3	-1	-1	0	1	3	2	0	0	0	2	3	0	-11	-20	-15	-12	-10	-5	-13	-17	-12
4	-22	-33	-33	-47	-56	-53	-51	-48	-45	-31	-38	-49	-82	-86	-98	-98	-111	-102	-112	-105	-106	-104	-116	-118
5	-121	-118	-108	-99	-98	-95	-89	-85	-79	-79	-81	-80	-73	-66	-59	-56	-54	-52	-44	-35	-32	-25	-37	-38
6	-41	-22	-36	-54	-62	-45	-34	-37	-42	-42	-47	-44	-37	-35	-31	-25	-33	-35	-42	-43	-44	-46	-51	-41
7	-36	-29	-23	-22	-30	-36	-33	-32	-38	-41	-40	-39	-37	-37	-36	-34	-26	-26	-23	-18	-23	-22	-18	-15
8	-20	-21	-22	-23	-13	-8	-6	5	19	23	1	-11	-29	-30	-24	-24	-22	-21	-16	-15	-20	-21	-27	-26
9	-26	-24	-21	-26	-31	-29	-30	-30	-28	-24	-25	-25	-26	-25	-19	-16	-2	-2	-15	-16	-17	-31	-40	-52
10	-56	-58	-55	-33	-36	-42	-44	-43	-44	-40	-37	-34	-34	-32	-33	-38	-42	-38	-34	-28	-30	-33	-31	-32
11	-33	-31	-26	-24	-26	-27	-25	-27	-27	-25	-27	-30	-29	-28	-27	-27	-26	-23	-20	-19	-22	-24	-27	-26
12	-27	-25	-26	-24	-20	-17	-15	-17	-21	-23	-21	-17	-12	-13	-15	-16	-15	-11	-8	-9	-11	-12	-16	-16
13	-15	-12	-11	-12	-13	-16	-18	-16	-18	-21	-23	-23	-17	-14	-13	-15	-15	-11	-8	-8	-14	-21	-25	-23
14	-21	-22	-22	-22	-19	-18	-17	-20	-22	-21	-22	-22	-20	-17	-15	-17	-16	-12	-9	-8	-8	-9	-8	-7
15	-10	-13	-12	-12	-10	-7	-4	-5	-6	-5	-7	-8	-10	-10	-10	-9	-8	-9	-9	-9	-8	-9	-11	-5
16	-3	-3	-2	0	1	2	6	7	7	3	5	15	10	-8	-26	-40	-52	-55	-55	-53	-52	-53	-47	-52
17	-50	-41	-34	-37	-35	-30	-25	-22	-19	-21	-19	-20	-17	-15	-14	-15	-15	-14	-12	-11	-11	-8	-12	-20
18	-31	-33	-25	-26	-29	-32	-29	-29	-31	-30	-29	-24	-23	-24	-24	-19	-16	-15	-14	-12	-8	-4	-1	-5
19	-9	-12	-19	-22	-17	-12	-9	-11	-18	-21	-23	-17	-10	-8	-16	-16	-10	-6	-7	-8	-9	-9	-11	-13
20	-12	-13	-12	-10	-10	-11	-10	-6	-5	-8	-7	-5	-1	-5	-6	-6	-3	0	1	0	-1	-3	-6	-5
21	-5	-5	-4	-3	-2	-1	-1	-1	0	1	0	5	7	8	8	8	5	2	0	-3	-2	-1	-1	-1
22	0	1	2	2	0	0	-3	1	5	7	7	6	7	4	3	5	5	6	6	8	10	11	8	7
23	6	6	6	5	1	2	2	6	7	6	6	7	7	7	6	4	5	2	1	0	-2	1	2	2
24	1	1	3	1	0	-1	-3	-4	-1	-1	1	3	5	5	9	7	-2	-5	-5	-1	4	1	1	0
25	1	0	-1	0	-1	-5	-10	-11	-6	-5	-9	-13	-11	-6	-8	-6	5	8	23	24	23	15	-2	-19
26	-19	-13	-15	-11	-14	-26	-31	-24	-21	-21	-21	-20	-19	-15	-15	-11	-12	-11	-11	-9	-11	-13	-14	-15
27	-19	-18	-16	-15	-17	-14	-12	-13	-14	-15	-16	-11	-12	-13	-13	-12	-13	-12	-11	-11	-11	-9	-10	-9
28	-8	-6	-4	-4	-3	-2	-3	-2	-5	-8	-7	-6	-4	0	5	6	8	6	8	23	20	12	10	14
29	8	-1	0	-5	-7	-22	-31	-32	-21	-20	-19	-29	-39	-43	-52	-60	-55	-55	-41	-35	-27	-26	-19	-19
30	-14	0	5	-3	-12	-16	-30	-56	-70	-67	-77	-88	-78	-69	-67	-64	-59	-55	-51	-49	-49	-45	-46	-43
31	-44	-50	-54	-53	-46	-38	-42	-36	-37	-46	-41	-50	-53	-52	-55	-54	-49	-45	-44	-54	-64	-59	-52	-47

TABLE 10 Dst - continued

FEBRUARY 1978

UNIT=GAMMAS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	G.M.T. 24
1	-44	-44	-44	-45	-37	-31	-29	-31	-30	-29	-29	-28	-25	-27	-32	-28	-25	-22	-16	-14	-14	-14	-21	-28
2	-34	-33	-32	-36	-38	-35	-28	-26	-25	-22	-23	-19	-16	-13	-13	-11	-11	-7	-6	-8	-11	-13	-13	-15
3	-20	-23	-28	-28	-27	-29	-30	-26	-27	-29	-26	-26	-27	-30	-27	-27	-28	-27	-28	-23	-20	-18	-13	-18
4	-24	-27	-25	-26	-28	-31	-31	-27	-19	-18	-15	-12	-13	-17	-19	-19	-17	-12	-7	-6	-7	-6	-8	-10
5	-12	-13	-17	-20	-28	-39	-47	-42	-35	-29	-25	-28	-32	-35	-42	-42	-43	-42	-43	-38	-34	-29	-26	-24
6	-22	-22	-21	-20	-21	-23	-28	-25	-15	-10	-12	-11	-7	-8	-13	-25	-26	-23	-30	-43	-45	-37	-34	-32
7	-31	-22	-20	-15	-17	-18	-21	-20	-19	-20	-17	-12	-11	-10	-8	-7	-13	-12	-12	-11	-9	-14	-18	-13
8	-14	-13	-13	-13	-14	-15	-18	-26	-23	-21	-17	-13	-18	-20	-20	-22	-24	-27	-25	-22	-25	-23	-23	-22
9	-18	-15	-10	-9	-11	-12	-17	-24	-33	-45	-45	-54	-52	-46	-41	-40	-36	-33	-36	-39	-43	-36	-30	-30
10	-26	-24	-20	-10	-9	-10	-6	-8	-9	-7	-8	-12	-11	-11	-6	-4	-3	-6	-6	-7	-7	-7	-10	-8
11	-8	-7	-8	-7	-5	0	0	-2	-7	-3	-6	-4	-3	-5	-7	-9	-8	-4	0	-2	-3	-1	-4	-2
12	-5	-5	-2	0	3	6	4	2	8	11	10	8	7	6	6	5	4	-2	-6	-9	-14	-14	-11	-11
13	-8	-9	-10	-10	-8	-1	4	4	7	0	-4	-6	-8	-8	-9	-9	-8	-11	-12	-11	-14	-14	-12	-11
14	-15	-18	-15	-18	-17	-12	-9	-4	-1	-1	1	-9	-13	-12	-10	-13	-20	-14	-9	-7	-8	-4	25	21
15	23	32	22	21	3	0	-4	0	-34	-72	-78	-108	-98	-97	-97	-96	-94	-85	-78	-76	-75	-72	-68	-67
16	-63	-59	-58	-58	-58	-59	-60	-58	-57	-63	-74	-77	-75	-67	-67	-68	-69	-70	-69	-69	-69	-70	-67	-66
17	-66	-62	-54	-56	-53	-48	-44	-43	-40	-39	-38	-39	-38	-37	-38	-40	-39	-37	-33	-32	-35	-35	-36	-38
18	-35	-35	-37	-41	-42	-43	-40	-38	-33	-31	-32	-32	-32	-32	-34	-33	-33	-34	-33	-34	-35	-32	-29	-28
19	-26	-27	-31	-36	-38	-39	-37	-35	-29	-26	-29	-30	-32	-33	-28	-27	-32	-33	-31	-33	-39	-41	-40	-38
20	-34	-31	-30	-32	-37	-40	-41	-41	-38	-38	-43	-44	-40	-38	-31	-24	-26	-32	-35	-36	-36	-30	-26	-25
21	-25	-23	-21	-23	-28	-25	-22	-16	-13	-13	-18	-21	-16	-12	-13	-21	-25	-33	-40	-48	-54	-57	-62	-62
22	-64	-62	-63	-63	-62	-63	-60	-44	-34	-30	-28	-27	-22	-22	-22	-29	-45	-33	-26	-32	-30	-32	-31	-26
23	-25	-20	-18	-20	-22	-22	-20	-16	-16	-18	-18	-16	-16	-17	-17	-13	-12	-13	-17	-17	-16	-15	-14	-16
24	-21	-20	-20	-22	-21	-19	-17	-14	-13	-10	-8	-11	-12	-12	-11	-12	-15	-16	-12	-10	-7	-7	-5	-4
25	-3	-2	-1	-2	-6	-11	-9	-9	-10	-12	-13	-15	-9	-6	-2	0	0	1	6	20	36	16	4	13
26	-8	-48	-41	-34	-36	-32	-23	-21	-25	-27	-29	-21	-16	-27	-33	-43	-42	-48	-50	-52	-49	-47	-45	-47
27	-47	-46	-40	-36	-39	-42	-37	-31	-25	-24	-29	-23	-24	-32	-31	-35	-51	-66	-66	-55	-66	-74	-63	-58
28	-52	-48	-53	-55	-56	-56	-61	-65	-55	-57	-52	-53	-55	-42	-41	-38	-35	-46	-52	-51	-57	-58	-53	-46

TABLE 10 Dst - continued

Part B

MARCH 1978

UNIT=GAMMAS

DAY	G.M.T. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-47	-51	-47	-47	-43	-39	-39	-39	-38	-41	-34	-37	-31	-30	-36	-45	-53	-50	-55	-55	-51	-52	-67	-69
2	-59	-59	-56	-52	-51	-48	-48	-45	-49	-47	-43	-40	-37	-32	-28	-28	-23	-26	-24	-28	-33	-38	-31	-27
3	-31	-36	-37	-33	-36	-41	-40	-35	-32	-37	-41	-35	-34	-33	-32	-33	-36	-37	-34	-34	-39	-37	-39	-29
4	-25	-24	-20	-18	-16	-15	-13	-12	-11	-12	-12	-10	-10	-10	-12	-11	-12	-13	-14	-14	-12	-13	-14	-13
5	-13	-10	-7	-7	-10	-11	-9	-8	-9	-11	-13	-15	-14	-19	-18	-25	-26	-25	-25	-21	-21	-17	-17	-20
6	-19	-17	-17	-17	-19	-20	-19	-16	-15	-16	-19	-13	-6	-10	-11	-13	-18	-19	-17	-16	-15	-13	-14	-17
7	-18	-12	-4	-6	-6	-5	-7	-11	-10	-9	-17	-16	-14	-10	-8	-16	-20	-18	-15	-17	-18	-17	-20	-23
8	-14	-8	-2	-3	-4	-1	0	3	5	4	6	5	6	14	25	44	36	26	6	-37	-88	-99	-88	-90
9	-93	-88	-85	-81	-75	-73	-70	-64	-61	-63	-60	-52	-44	-44	-45	-49	-50	-48	-41	-44	-44	-47	-44	-48
10	-48	-45	-41	-36	-35	-33	-30	-30	-35	-40	-43	-49	-48	-46	-50	-48	-46	-48	-50	-46	-44	-42	-43	-45
11	-46	-45	-40	-36	-35	-35	-30	-25	-24	-25	-21	-22	-22	-22	-23	-24	-25	-24	-24	-21	-19	-19	-24	-28
12	-26	-25	-22	-21	-21	-20	-18	-16	-19	-18	-17	-18	-14	-13	-13	-13	-13	-16	-19	-19	-20	-21	-22	-26
13	-30	-31	-23	-19	-21	-24	-22	-25	-31	-37	-37	-32	-27	-28	-29	-27	-23	-21	-24	-32	-37	-39	-35	-37
14	-38	-38	-35	-26	-27	-27	-26	-21	-17	-16	-16	-15	-15	-15	-13	-10	-16	-13	-11	-11	-8	-8	0	-8
15	-18	-28	-21	-15	-22	-31	-27	-22	-19	-26	-30	-25	-21	-20	-22	-19	-15	-14	-15	-16	-23	-30	-31	-34
16	-36	-36	-29	-27	-27	-28	-32	-32	-30	-26	-22	-23	-20	-16	-20	-26	-35	-40	-38	-31	-30	-36	-40	-40
17	-37	-39	-38	-34	-36	-40	-35	-32	-27	-24	-21	-19	-16	-17	-20	-22	-24	-25	-28	-33	-40	-40	-35	-32
18	-32	-34	-38	-40	-37	-31	-30	-30	-30	-23	-19	-22	-24	-34	-39	-42	-40	-37	-35	-37	-39	-38	-41	-43
19	-47	-42	-34	-38	-38	-37	-32	-24	-22	-22	-23	-22	-19	-22	-26	-27	-27	-29	-26	-28	-29	-30	-32	-32
20	-28	-32	-28	-27	-22	-22	-22	-22	-22	-18	-13	-9	-11	-14	-14	-12	-12	-12	-13	-15	-19	-16	-17	-20
21	-23	-26	-26	-24	-28	-23	-17	-16	-21	-25	-27	-25	-21	-21	-20	-17	-16	-18	-19	-20	-19	-15	-17	-16
22	-13	-12	-9	-8	-6	-6	-4	-3	-1	-12	-28	-22	-10	-4	-7	-8	-8	-10	-17	-31	-39	-46	-45	-38
23	-28	-40	-38	-32	-31	-31	-28	-27	-22	-18	-16	-22	-31	-34	-36	-34	-31	-28	-26	-26	-26	-24	-22	-21
24	-22	-21	-17	-11	-9	-11	-14	-13	-11	-5	-5	-7	-9	-6	-4	-1	0	2	2	-3	-8	-10	-11	-13
25	-14	-12	-4	3	6	4	4	4	2	2	2	2	3	5	4	6	8	6	10	14	19	24	23	27
26	35	20	-12	-32	-27	-23	-22	-27	-21	-14	-12	-2	6	-3	-28	-26	-16	-35	-62	-72	-71	-59	-65	-69
27	-83	-98	-85	-86	-75	-78	-83	-97	-88	-83	-72	-68	-62	-65	-62	-65	-68	-64	-65	-69	-67	-64	-68	-75
28	-69	-62	-62	-56	-56	-51	-47	-46	-46	-50	-49	-42	-38	-42	-44	-45	-44	-41	-41	-43	-42	-41	-37	-37
29	-37	-37	-36	-33	-29	-28	-32	-32	-34	-43	-46	-39	-40	-45	-43	-42	-41	-35	-31	-30	-33	-33	-33	-37
30	-39	-41	-42	-39	-38	-40	-40	-41	-39	-52	-54	-51	-44	-50	-51	-45	-45	-41	-37	-35	-35	-37	-38	-37
31	-35	-36	-36	-31	-26	-23	-23	-24	-24	-26	-27	-31	-36	-40	-35	-30	-35	-35	-28	-23	-26	-27	-27	-30

TABLE 10 Dst - continued

APRIL 1978

UNIT=GAMMAS

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
																							G.M.T.	
1	-25	-26	-30	-30	-33	-38	-36	-27	-24	-26	-30	-28	-25	-25	-25	-26	-26	-27	-26	-27	-31	-31	-30	-30
2	-37	-38	-33	-30	-26	-21	-22	-22	-18	-18	-21	-20	-24	-23	-21	-22	-23	-27	-22	-20	-21	-21	-28	-17
3	-9	-10	-9	-7	-11	-29	-41	-37	-27	-38	-46	-45	-38	-35	-33	-28	-27	-31	-41	-61	-68	-75	-89	-88
4	-74	-80	-85	-80	-66	-66	-62	-45	-34	-26	-26	-29	-26	-27	-26	-27	-34	-57	-70	-86	-84	-82	-100	-96
5	-106	-109	-99	-92	-81	-76	-74	-71	-62	-51	-47	-47	-46	-45	-42	-42	-41	-39	-36	-38	-39	-42	-34	-30
6	-40	-48	-45	-37	-33	-32	-30	-33	-34	-34	-33	-28	-27	-29	-32	-33	-30	-27	-25	-25	-28	-31	-31	-32
7	-31	-27	-23	-20	-16	-16	-17	-18	-18	-18	-18	-19	-21	-20	-18	-19	-19	-17	-13	-12	-15	-16	-19	-19
8	-20	-19	-15	-10	-7	-8	-9	-6	-4	-7	-8	-6	-6	-7	-7	-6	-8	-10	-12	-12	-11	-10	-9	-8
9	-10	-9	-5	-1	1	-1	-5	-4	-6	-9	-7	-7	-10	-12	-9	-10	-9	-8	-9	-9	-9	-8	-5	-6
10	-9	-8	-7	-3	0	1	2	2	1	3	1	0	-2	18	18	7	14	15	18	22	44	34	-37	-56
11	-82	-110	-114	-107	-96	-100	-100	-74	-58	-51	-38	-27	-25	-30	-46	-47	-48	-54	-42	-54	-52	-43	-40	-48
12	-69	-79	-80	-65	-56	-57	-55	-55	-53	-55	-53	-47	-42	-43	-42	-48	-53	-49	-52	-44	-42	-38	-33	-28
13	-31	-33	-29	-25	-22	-24	-22	-26	-24	-24	-27	-27	-26	-26	-24	-26	-30	-33	-34	-19	-11	-15	-34	-53
14	-80	-66	-54	-59	-69	-66	-62	-61	-55	-46	-55	-56	-74	-74	-62	-62	-61	-63	-67	-54	-43	-43	-46	-51
15	-59	-66	-68	-61	-57	-58	-60	-57	-43	-42	-41	-41	-43	-49	-55	-52	-46	-43	-44	-40	-36	-32	-28	-27
16	-29	-29	-33	-30	-30	-32	-28	-26	-23	-22	-21	-27	-29	-31	-32	-32	-31	-28	-27	-24	-28	-29	-25	-21
17	-20	-20	-20	-20	-17	-17	-15	-14	-16	-17	-21	-23	-23	-20	-17	-15	-19	-15	-14	-12	-9	-8	-7	-3
18	8	5	-1	-24	-43	-36	-27	-28	-34	-29	-23	-19	-16	-17	-17	-21	-22	-20	-29	-40	-37	-27	-20	-14
19	-10	-9	-9	1	5	-7	-38	-39	-30	-24	-26	-33	-36	-34	-32	-41	-48	-47	-41	-50	-43	-40	-36	-34
20	-55	-57	-52	-46	-41	-41	-35	-36	-31	-26	-27	-29	-25	-30	-34	-35	-34	-32	-37	-40	-41	-40	-41	-40
21	-32	-32	-31	-28	-29	-29	-30	-25	-24	-23	-22	-25	-30	-29	-31	-31	-28	-25	-27	-22	-20	-18	-14	-14
22	-14	-15	-14	-13	-12	-15	-17	-16	-16	-14	-9	-7	-4	-4	-4	-9	-5	-1	-1	-9	-14	-16	-12	-6
23	-7	-9	-12	-14	-11	-6	-9	-13	-18	-24	-25	-17	-12	-6	-2	-19	-23	-15	-12	-22	-24	-28	-25	-27
24	-49	-60	-48	-68	-65	-67	-67	-63	-59	-66	-63	-57	-55	-54	-54	-57	-57	-49	-47	-42	-34	-32	-30	-37
25	-42	-39	-43	-41	-41	-44	-42	-41	-42	-39	-41	-37	-29	-32	-35	-34	-31	-32	-31	-28	-26	-26	-28	-29
26	-29	-29	-27	-27	-27	-26	-36	-47	-43	-33	-29	-29	-30	-27	-26	-24	-26	-27	-21	-24	-21	-22	-21	-24
27	-25	-22	-24	-21	-19	-20	-25	-27	-23	-19	-19	-22	-23	-22	-23	-26	-21	-25	-28	-26	-23	-28	-27	-33
28	-38	-34	-36	-37	-35	-38	-35	-36	-36	-34	-32	-30	-29	-28	-28	-27	-27	-28	-30	-30	-27	-26	-24	-26
29	-26	-27	-26	-23	-20	-20	-21	-22	-23	-24	-21	-17	-15	-14	-17	-17	-16	-16	-20	-21	-21	-22	-22	-22
30	-20	-16	-24	-29	-30	-36	-34	-35	-31	-20	-8	-17	-10	-8	-8	-13	-57	-43	-33	-38	-41	-46	-45	-37

MAY 1978

TABLE 10 Dst - continued

Part B

UNIT=GAMMAS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	G.M.T. 23	24
1	-27	-30	-39	-55	-67	-77	-76	-65	-45	-44	-45	-38	-55	-88	-98	-90	-90	-92	-83	-50	-67	-89	-144	-150
2	-110	-141	-133	-129	-121	-114	-135	-145	-141	-138	-144	-137	-145	-142	-126	-117	-110	-106	-98	-96	-92	-87	-80	-57
3	-54	-69	-72	-70	-70	-71	-75	-80	-79	-84	-78	-96	-100	-105	-110	-107	-114	-113	-106	-107	-89	-96	-92	-97
4	-92	-87	-102	-119	-121	-117	-134	-147	-152	-133	-136	-148	-150	-131	-119	-115	-110	-105	-102	-93	-85	-81	-77	-74
5	-72	-69	-66	-63	-62	-63	-62	-62	-62	-60	-59	-56	-54	-51	-51	-52	-50	-48	-48	-46	-40	-47	-50	-51
6	-53	-52	-49	-41	-41	-39	-40	-40	-35	-37	-38	-40	-40	-40	-39	-39	-40	-36	-37	-36	-34	-34	-34	-38
7	-39	-38	-36	-35	-34	-34	-37	-39	-41	-42	-39	-37	-34	-32	-33	-33	-29	-26	-23	-29	-25	-24	-22	-26
8	-27	-24	-21	-23	-22	-21	-20	-25	-26	-24	-23	-27	-30	-23	-22	-17	-11	-11	-11	-8	-4	-11	7	14
9	-1	-2	3	-12	-21	-12	-17	-62	-106	-132	-125	-129	-112	-93	-97	-89	-93	-99	-99	-96	-80	-75	-63	-64
10	-60	-58	-57	-56	-54	-53	-54	-55	-56	-57	-58	-53	-48	-46	-46	-45	-43	-43	-43	-40	-26	-22	-25	-37
11	-40	-40	-41	-47	-64	-67	-67	-76	-78	-70	-67	-66	-60	-54	-57	-56	-57	-57	-53	-48	-43	-40	-43	-51
12	-51	-52	-51	-49	-49	-51	-56	-54	-46	-43	-47	-40	-34	-30	-34	-34	-37	-38	-43	-47	-38	-35	-33	-43
13	-49	-47	-44	-39	-40	-40	-38	-37	-37	-38	-37	-34	-33	-29	-28	-26	-25	-23	-22	-21	-19	-16	-13	-18
14	-20	-26	-25	-30	-31	-34	-35	-30	-27	-27	-24	-23	-19	-17	-16	-17	-17	-17	-17	-19	-14	-13	-20	-20
15	-17	-17	-11	-8	-8	-9	-9	-6	-2	4	2	-3	-5	-7	-9	-7	-4	-3	-1	-3	-2	-6	-8	-9
16	-9	-11	-12	-13	-17	-17	-13	-12	-11	-9	-9	-12	-12	-8	-7	-5	-9	-12	-13	-7	-3	-2	-3	-6
17	-7	-7	-8	-11	-9	-16	-22	-23	-19	-16	-13	-12	-13	-14	-13	-11	-9	-6	-7	-4	-7	-10	-9	-10
18	-11	-11	-12	-18	-20	-20	-18	-15	-15	-15	-13	-10	-8	-7	-6	-3	-3	-7	-7	-9	-11	-11	-9	-8
19	-11	-14	-14	-15	-12	-8	-7	-9	-9	-12	-11	-7	-3	1	2	0	-3	-3	-2	-2	0	-1	-1	1
20	2	3	5	4	2	4	6	2	-1	-3	-2	-5	-4	0	1	4	-2	17	7	-6	-15	-10	-4	-3
21	-3	-2	4	7	-2	0	6	-3	-4	-1	-2	5	9	11	14	16	18	18	14	0	-29	-55	-58	-46
22	-42	-39	-45	-54	-52	-48	-45	-36	-36	-30	-28	-32	-33	-33	-32	-38	-52	-59	-65	-66	-68	-66	-58	-51
23	-45	-47	-58	-56	-55	-58	-58	-57	-56	-49	-40	-40	-39	-36	-33	-33	-29	-29	-21	-20	-19	-35	-33	-35
24	-37	-37	-35	-31	-33	-33	-36	-38	-34	-38	-40	-30	-33	-35	-38	-33	-32	-34	-35	-30	-27	-25	-25	-28
25	-29	-28	-28	-29	-25	-29	-29	-26	-30	-28	-23	-20	-14	-11	-9	-5	-5	-6	-6	-7	-9	-12	-14	-18
26	-21	-18	-21	-23	-23	-22	-18	-15	-14	-17	-19	-18	-18	-17	-17	-17	-20	-20	-19	-20	-14	-10	-11	-11
27	-12	-12	-9	-12	-13	-9	-9	-10	-13	-11	-10	-9	-10	-10	-11	-12	-12	-12	-11	-11	-6	-4	-3	-3
28	-3	-2	0	-1	2	3	3	2	-1	-5	-9	-11	-12	-10	-12	-13	-14	-13	-16	-17	-10	-5	-3	-6
29	-8	-7	-8	-8	-9	-7	-5	-7	-5	-4	-3	-2	1	7	8	9	11	10	19	26	19	7	6	12
30	3	-15	-36	-46	-57	-58	-54	-44	-42	-34	-29	-25	-23	-23	-20	-17	-21	-20	-16	-21	-26	-23	-21	-24
31	-27	-34	-46	-45	-34	-31	-35	-37	-30	-29	-25	-19	-9	-5	1	5	5	1	1	0	1	-1	-5	-6

TABLE 10 Dst - continued

JUNE 1978

UNIT=GAMMAS

DAY	G.M.T. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-5	-6	-11	-14	-17	-15	-21	-22	-20	-20	-19	-16	-14	-12	-12	-9	-5	-2	-1	-4	-3	1	8	1
2	7	7	6	2	0	-2	-5	-4	-2	26	21	0	3	23	16	-9	-42	-36	-28	-17	-24	-32	-29	-30
3	-11	-35	-30	-21	-38	-39	-35	-33	-32	-37	-29	-28	-26	-31	-33	-26	-25	-27	-36	-33	-32	-29	-22	-12
4	-13	-7	-19	-32	-32	-30	-27	-28	-32	-30	-26	-21	-7	-8	-3	-2	-3	-7	-13	-19	-17	-25	-48	-58
5	-50	-39	-46	-61	-71	-62	-63	-71	-66	-59	-50	-51	-41	-35	-33	-29	-23	-20	-13	-12	-14	-17	-16	-14
6	-19	-20	-19	-22	-21	-18	-19	-21	-21	-23	-27	-24	-24	-28	-28	-28	-29	-28	-27	-26	-20	-19	-22	-22
7	-22	-20	-21	-20	-18	-22	-18	-15	-13	-14	-13	-12	-14	-16	-16	-15	-13	-10	-14	-21	-23	-26	-29	-24
8	-14	-12	-17	-21	-20	-15	-12	-14	-12	-10	-13	-18	-20	-22	-22	-20	-20	-19	-18	-16	-16	-16	-13	-10
9	-7	-7	-7	-10	-10	-9	-9	-10	-11	-11	-11	-10	-8	-7	-6	-4	-5	-5	-2	-1	-2	-2	0	1
10	3	3	-1	4	5	7	6	2	25	36	26	14	17	8	2	6	4	-5	-3	8	9	18	20	-20
11	-20	-16	-8	-18	-29	-25	-17	-24	-32	-39	-31	-22	-21	-21	-20	-20	-21	-19	-18	-21	-19	-18	-16	-15
12	-13	-12	-14	-18	-14	-9	-7	-8	-9	-8	-12	-22	-28	-20	-8	-5	-10	-16	-23	-24	-21	-17	-14	-10
13	-11	-12	-10	-10	-9	-7	-5	-5	-4	-5	-4	1	0	-6	-11	-8	-7	-4	-4	-3	-1	-1	0	-2
14	-1	-1	-3	-8	-8	-5	-2	0	-2	-5	-4	-4	-3	0	0	-1	-4	-7	-9	-3	-1	-2	0	1
15	2	0	-1	-1	0	-2	-7	-11	-10	-5	-5	-5	-10	-10	-10	-11	-10	-5	-3	-3	-2	-2	2	5
16	11	8	10	8	7	11	13	10	9	10	7	4	4	7	11	12	14	16	14	7	4	4	2	-2
17	0	3	7	10	9	3	0	0	2	4	-1	-1	3	7	8	7	5	5	2	-3	-8	-3	1	2
18	1	4	4	4	6	10	9	5	2	7	10	7	2	-1	4	6	7	9	6	6	-1	-2	0	5
19	9	4	6	3	8	14	9	9	10	12	14	19	10	8	11	10	5	6	0	-4	-5	-10	-17	-22
20	-23	-17	-10	-9	-13	-12	-12	-14	-16	-14	-11	-11	-18	-19	-15	-10	-8	-4	-3	-4	-8	-13	-14	-7
21	-5	-3	-11	-24	-30	-32	-29	-35	-32	-24	-20	-24	-25	-23	-18	-21	-16	-18	-16	-22	-27	-33	-31	-30
22	-33	-33	-25	-25	-25	-20	-18	-22	-24	-17	-13	-17	-22	-20	-17	-17	-14	-6	-6	-6	-8	-13	-9	-4
23	-4	-10	-23	-23	-12	-8	-7	-4	-4	-7	-11	-13	-10	-10	-12	-11	-8	-12	-15	-20	-26	-31	-29	-32
24	-28	-29	-36	-34	-30	-31	-25	-25	-25	-23	-21	-22	-21	-24	-29	-23	-19	-18	-20	-22	-22	-24	-22	-19
25	-19	-18	-17	-19	-19	-17	-14	-14	0	-3	1	4	-5	-6	-6	-6	-7	-1	2	-4	0	-2	-5	-4
26	1	0	7	1	-19	-27	-43	-43	-38	-50	-43	-51	-64	-66	-67	-74	-77	-69	-69	-70	-72	-64	-68	-66
27	-58	-47	-40	-32	-41	-37	-37	-36	-32	-28	-25	-28	-33	-38	-34	-30	-26	-29	-32	-37	-32	-30	-27	-25
28	-29	-28	-26	-26	-24	-19	-15	-14	-15	-17	-18	-17	-15	-14	-15	-21	-20	-19	-17	-16	-16	-19	-20	-16
29	-16	-18	-18	-17	-17	-15	-11	-15	-14	-7	17	22	21	27	23	15	17	23	20	10	9	-8	-54	-83
30	-79	-63	-60	-64	-64	-59	-42	-49	-52	-47	-51	-60	-60	-57	-55	-54	-51	-53	-54	-49	-46	-43	-39	-35

JULY 1978

UNIT=GAMMAS

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
																							G.M.T.	
1	-31	-28	-25	-25	-24	-22	-20	-19	-20	-21	-22	-28	-28	-27	-24	-21	-20	-22	-22	-23	-24	-23	-22	-19
2	-16	-16	-17	-17	-14	-13	-11	-12	-14	-4	4	3	1	2	1	-1	-4	-5	-8	-9	-8	-9	-7	-4
3	-5	-6	-4	-1	-1	-2	-4	-6	-5	-2	6	11	9	7	7	6	6	3	4	1	0	3	3	23
4	9	-17	-21	-4	-6	-14	-30	-30	-11	14	12	5	2	0	-40	-74	-83	-66	-51	-51	-55	-60	-71	-77
5	-88	-97	-87	-85	-67	-76	-99	-85	-95	-88	-85	-82	-80	-79	-76	-61	-55	-50	-56	-60	-57	-51	-48	-49
6	-42	-42	-43	-42	-36	-32	-26	-23	-23	-27	-26	-19	-15	-11	-10	-20	-24	-18	-10	0	-3	-5	-7	-2
7	-11	-22	-18	-16	-14	-13	-6	-4	-2	-4	-12	-13	-13	-16	-18	-21	-19	-21	-27	-28	-28	-34	-33	-30
8	-29	-30	-34	-33	-32	-31	-24	-23	-19	-16	-12	-11	-14	-10	-5	-9	-23	-17	-10	-8	-5	-5	-12	-14
9	-10	-6	-11	-10	-9	-9	-7	-5	-7	-7	-5	-5	-8	-11	-9	-9	-15	-11	-9	-7	-7	-6	-7	-6
10	-5	-2	-4	-2	-2	-4	0	-4	-10	-12	-7	-6	-8	-7	-5	-4	-7	-8	-6	-3	-4	-6	-8	-6
11	-5	-5	0	1	-1	-1	-2	-6	-8	-6	-5	2	-1	-3	-6	-10	-12	-14	-16	-16	-14	-9	-7	-6
12	-8	-11	-11	-10	-8	-6	-5	-4	-4	-5	-2	1	3	3	1	0	-1	-1	0	4	6	4	4	4
13	11	7	5	6	7	9	12	4	-8	-7	0	5	3	-2	-5	-9	-8	-6	-8	-11	-9	-10	-15	-6
14	-12	-21	-24	-21	-19	-35	-27	-24	-35	-41	-44	-48	-43	-36	-43	-54	-52	-46	-41	-42	-39	-35	-26	-21
15	-24	-27	-25	-17	-15	-6	-5	-12	-17	-24	-25	-23	-21	-21	-21	-21	-22	-22	-24	-23	-20	-15	-9	-9
16	-14	-19	-26	-22	-18	-16	-11	-8	-6	-4	-1	2	0	-2	-5	-9	-9	-5	-3	-1	-2	-2	-3	-2
17	-5	-10	-9	-10	-12	-10	-4	0	0	-3	-7	-7	-1	1	0	-3	-3	-1	1	0	0	4	4	1
18	-3	-3	-3	-7	-1	-2	0	4	8	9	10	16	29	26	24	18	7	3	4	-1	-4	-14	-19	-18
19	-18	-20	-20	-17	-13	3	-5	-8	-9	-11	-16	-15	-7	-5	-7	-14	-16	-13	-15	-15	-17	-22	-16	-10
20	-6	-4	-7	-5	-7	-7	-7	-7	-8	-12	-10	-9	-10	-11	-12	-11	-12	-12	-12	-11	-13	-18	-19	-16
21	-15	-14	-12	-7	-7	-8	-4	0	-6	-8	-8	-4	0	0	0	-3	-1	2	-1	3	4	1	-1	2
22	2	2	2	0	-7	-8	-6	-9	-11	-9	-9	-6	-3	-2	-2	-3	-5	-3	0	1	-2	-5	-5	1
23	7	10	6	-1	-7	-7	-5	-11	-15	-13	-11	-10	-9	-8	-6	-5	-5	-2	1	1	-3	-14	-20	-19
24	-15	-10	-7	-6	-5	-5	-3	-2	-3	-7	-5	-7	-6	-4	-2	-4	-6	-6	-4	-3	-2	-4	-5	-11
25	-16	-16	-13	-8	-8	-10	-6	-3	-5	-8	-12	-14	-12	-13	-14	-12	-10	-3	-1	-4	-8	-9	-13	-16
26	-17	-17	-14	-12	-13	-14	-11	-4	-4	-4	-6	-6	-6	-6	-5	-4	-3	-2	1	3	9	5	-1	0
27	0	0	0	2	3	4	7	7	7	12	8	9	9	10	6	4	2	4	3	2	5	8	5	5
28	6	8	13	12	11	7	-2	0	2	3	8	11	9	10	11	12	10	9	8	8	9	9	9	10
29	11	13	14	12	10	10	9	7	8	8	6	5	6	7	6	5	6	6	7	9	11	11	14	13
30	14	11	9	6	7	6	6	6	4	2	3	4	6	8	10	11	13	16	17	15	13	11	11	12
31	12	9	6	6	8	7	9	10	11	12	12	11	9	7	9	13	14	14	16	16	15	12	13	13

TABLE 10 Dst - continued

AUGUST 1978

UNIT=GAMMAS

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
																							G.M.T.	
1	11	10	9	6	2	0	0	0	0	-2	2	7	8	12	15	15	15	15	10	8	8	5	5	3
2	4	5	6	7	9	8	7	8	8	7	7	4	5	6	11	16	18	18	18	15	9	8	9	17
3	18	20	24	28	17	8	5	7	7	16	20	13	-2	6	10	10	9	7	-5	-2	2	2	-4	-8
4	-8	-18	-15	-21	-26	-28	-28	-23	-16	-15	-27	-32	-27	-20	-18	-23	-24	-20	-19	-18	-12	-10	-7	-5
5	-2	-2	-2	-11	-15	-18	-23	-26	-31	-27	-20	-17	-19	-20	-20	-23	-23	-22	-15	-11	-17	-21	-16	-13
6	-12	-10	-14	-18	-24	-32	-32	-32	-26	-20	-15	-18	-24	-30	-32	-32	-31	-26	-19	-15	-16	-20	-20	-18
7	-13	-13	-12	-11	-11	-11	-10	-13	-15	-12	-8	-5	-6	-9	-11	-12	-11	-6	0	0	-5	-7	-11	-9
8	-9	-13	-15	-9	-3	-2	0	-2	-5	-6	-5	-4	-7	-8	-9	-6	-3	-5	-2	-2	1	1	4	7
9	8	5	1	3	1	-3	-6	-3	-3	-4	-4	-7	-10	-10	-10	-9	-8	-5	-2	4	8	7	3	-2
10	-5	-8	-8	-8	-6	-3	0	1	1	2	2	-1	-2	-3	-5	-8	-10	-10	-5	-2	2	2	5	4
11	4	2	4	8	7	7	6	3	3	4	1	4	4	4	5	4	-4	-3	-1	0	6	8	11	12
12	13	14	6	-5	-13	-26	-35	-28	-30	-24	-33	-35	-26	-19	-15	-20	-24	-24	-21	-18	-18	-17	-13	-11
13	-11	-22	-26	-23	-21	-21	-20	-22	-20	-21	-19	-25	-24	-16	-15	-14	-18	-22	-11	-5	-8	-13	-14	-12
14	-10	-9	-8	-3	-1	0	1	2	1	3	2	-1	-2	-3	1	2	-1	0	2	0	-2	-3	-2	-2
15	-2	-1	-1	-2	-3	-4	-3	-3	-3	-2	-3	-6	-6	-5	-1	-3	-2	0	3	3	4	1	4	8
16	13	16	18	16	12	9	6	5	6	9	11	11	11	11	11	13	15	16	20	15	5	7	13	19
17	23	21	16	13	11	9	9	12	14	16	17	5	-7	-12	-7	-8	-7	-4	-2	3	0	-1	3	7
18	9	8	8	6	6	5	1	0	3	4	5	2	10	14	8	8	9	13	-13	-18	-15	-19	-30	-37
19	-19	-10	-12	-14	-13	-11	-10	-9	-13	-10	-7	-8	-7	-11	-16	-17	-13	-8	-9	-14	-13	-11	-11	-8
20	-8	-8	-7	-5	-2	-2	-1	0	-2	-1	0	1	-1	-2	-3	-3	-2	-3	-4	-5	-5	-6	-6	-2
21	-2	-1	2	6	8	7	6	4	3	3	4	3	1	2	0	-3	-2	0	5	11	18	11	5	-1
22	-2	-7	-12	-14	-10	-6	-2	0	1	4	4	4	1	1	0	1	5	9	10	10	10	8	6	6
23	5	2	0	-5	-3	0	3	4	4	4	1	1	0	0	-2	-3	0	1	0	2	6	6	3	1
24	2	3	2	10	14	18	20	21	21	22	23	23	22	20	19	22	20	22	23	22	19	15	14	17
25	16	16	16	22	25	24	24	26	23	27	24	15	11	11	10	9	10	11	9	10	14	14	11	8
26	4	1	1	1	2	3	3	5	6	7	9	7	6	6	5	4	4	4	4	4	6	6	9	13
27	14	12	17	32	32	26	11	3	10	6	-5	-6	-10	-8	-24	-22	-15	-10	1	-24	-28	-28	-24	-21
28	-29	-35	-51	-63	-54	-82	-145	-178	-215	-226	-209	-217	-191	-189	-167	-152	-134	-145	-138	-129	-129	-126	-112	-103
29	-90	-82	-88	-92	-85	-95	-97	-105	-88	-88	-82	-85	-84	-81	-76	-75	-72	-72	-70	-65	-66	-62	-58	-54
30	-55	-61	-55	-59	-61	-62	-65	-68	-72	-64	-62	-65	-57	-54	-56	-55	-61	-61	-60	-52	-53	-51	-60	-75
31	-82	-71	-69	-67	-66	-65	-68	-67	-69	-61	-62	-54	-49	-50	-56	-62	-63	-65	-59	-56	-55	-56	-52	-51

TABLE 10 Dst - continued

Part B

SEPTEMBER 1978

UNIT=GAMMAS

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	G.M.T. 23	24
1	-52	-48	-53	-53	-49	-44	-45	-52	-51	-50	-53	-51	-47	-51	-50	-49	-45	-44	-38	-37	-39	-41	-42	-43
2	-43	-40	-40	-39	-40	-38	-40	-43	-41	-40	-35	-28	-33	-35	-34	-32	-30	-30	-37	-35	-37	-40	-38	-36
3	-36	-37	-36	-34	-32	-34	-37	-45	-52	-45	-39	-37	-35	-32	-33	-33	-32	-31	-32	-32	-29	-36	-35	-33
4	-30	-32	-32	-31	-31	-27	-28	-29	-26	-23	-25	-26	-24	-23	-25	-26	-28	-30	-33	-31	-27	-26	-26	-26
5	-28	-30	-28	-29	-29	-28	-22	-20	-22	-20	-18	-19	-16	-14	-15	-17	-17	-20	-18	-3	-3	1	-3	-2
6	-7	4	7	2	0	-20	-37	-46	-52	-56	-55	-45	-45	-41	-40	-37	-38	-36	-34	-30	-28	-25	-24	-24
7	-27	-29	-29	-29	-28	-27	-23	-20	-20	-19	-18	-15	-12	-12	-13	-18	-14	-14	-10	-5	4	7	1	-10
8	-38	-60	-60	-62	-79	-72	-62	-60	-53	-45	-41	-23	-20	-18	-19	-22	-21	-20	-20	-18	-11	-9	-11	-13
9	-15	-17	-19	1	1	-6	-7	-15	-22	-31	-43	-40	-44	-52	-52	-53	-55	-53	-53	-48	-38	-41	-45	-46
10	-39	-22	-19	-23	-21	-20	-18	-17	-14	-15	-20	-19	-26	-23	-15	-10	-12	-10	-5	-6	-5	-7	-9	-13
11	-16	-16	-18	-20	-17	-15	-14	-13	-11	-3	-2	2	-4	-5	-19	-32	-27	-22	-26	-31	-35	-36	-35	-29
12	-25	-23	-28	-28	-28	-23	-10	-15	-21	-26	-32	-36	-34	-28	-26	-30	-28	-31	-34	-35	-33	-37	-34	-34
13	-35	-38	-37	-36	-33	-30	-26	-21	-17	-16	-12	-6	-4	-5	-9	-13	-15	-18	-22	-20	-17	-12	-8	-7
14	-6	1	-10	-9	-6	-6	-6	-9	-10	-12	-12	-10	-9	-10	-13	-13	-16	-18	-17	-14	-10	-7	-9	-9
15	-10	-9	-8	-8	-6	-3	-2	-3	-4	-4	-4	-6	-4	-3	-5	-6	-5	-3	-2	-1	-2	-2	-2	-1
16	1	2	2	3	-5	-14	-15	-10	-5	-3	-5	-4	-1	-2	-5	-9	-8	-8	-10	-6	-5	-1	-6	-6
17	-8	-7	-7	-4	-7	-14	-15	-12	-10	-7	-4	-3	-1	1	2	2	0	-3	-7	-10	-13	-9	-6	-5
18	-5	-5	-4	-3	-2	-1	1	3	3	1	0	0	2	3	2	0	2	0	-2	-5	-6	-5	-2	-2
19	-5	-5	-2	0	1	2	3	1	0	1	0	0	1	1	1	0	0	1	2	4	9	10	8	5
20	2	0	0	2	3	3	2	1	2	5	7	7	6	8	14	19	21	19	18	16	12	5	1	2
21	4	0	6	-4	-14	-17	-15	-4	-1	1	0	-3	1	3	3	2	-4	-5	-4	-4	-3	-3	-4	-5
22	-5	-7	-9	-5	-4	-3	-6	-6	-8	-2	-2	-1	0	-8	-16	-23	-20	-22	-30	-33	-27	-23	-21	-23
23	-23	-21	-20	-23	-21	-19	-13	-10	-11	-14	-9	-10	-11	-9	-10	-11	-14	-18	-24	-25	-22	-23	-17	-17
24	-17	-18	-16	-17	-14	-14	-18	-20	-17	-12	-8	-5	1	3	1	-2	-3	-4	-10	-7	-4	-11	-20	-21
25	-18	-12	-13	-15	-18	-21	-27	-23	-26	-28	-26	-43	-55	-45	-38	-39	-47	-36	-30	-35	-44	-45	-28	-24
26	-24	-23	-22	-23	-36	-43	-40	-44	-41	-54	-54	-40	-31	-26	-35	-44	-43	-51	-53	-53	-46	-62	-57	-43
27	-45	-58	-47	-37	-49	-52	-49	-44	-40	-38	-37	-32	-28	-25	-23	-16	-31	-34	-41	-48	-51	-57	-67	-65
28	-69	-63	-61	-64	-67	-66	-63	-58	-61	-67	-65	-60	-61	-61	-58	-53	-55	-56	-57	-52	-44	-39	-53	-62
29	-61	-62	-56	-35	-64	-69	-59	-121	-186	-186	-224	-194	-205	-198	-205	-210	-195	-176	-168	-150	-141	-131	-122	-112
30	-115	-112	-108	-99	-96	-95	-91	-91	-87	-86	-87	-82	-78	-74	-70	-66	-60	-58	-57	-56	-58	-56	-55	-55

TABLE 10 Dst - continued

OCTOBER 1978

UNIT=GAMMAS

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
																							G.M.T.	
1	-54	-56	-57	-54	-54	-52	-50	-44	-49	-56	-50	-45	-44	-41	-42	-45	-49	-47	-42	-40	-36	-33	-33	-29
2	-28	-28	-32	-33	-33	-32	-31	-34	-39	-39	-37	-37	-40	-44	-44	-42	-40	-42	-41	-41	-38	-35	-35	-38
3	-37	-34	-31	-33	-35	-35	-38	-37	-39	-37	-35	-36	-34	-31	-31	-33	-33	-33	-29	-28	-31	-32	-28	-27
4	-26	-15	-14	-10	-12	-30	-41	-42	-42	-40	-48	-51	-46	-43	-43	-42	-43	-40	-36	-34	-40	-42	-36	-35
5	-42	-40	-36	-32	-31	-31	-26	-25	-28	-29	-26	-19	-15	-15	-14	-16	-18	-23	-25	-21	-18	-14	-14	-11
6	-6	-6	-6	-11	-15	-13	-9	-7	-6	-7	-8	-9	-10	-11	-11	-12	-14	-18	-16	-14	-14	-15	-12	-13
7	-17	-20	-21	-19	-17	-16	-14	-12	-12	-11	-11	-13	-12	-11	-13	-12	-13	-13	-15	-13	-11	-10	-6	-8
8	-11	-12	-9	-9	-9	-11	-11	-6	-4	-8	-7	-7	-4	-1	-2	-1	-1	0	5	6	3	3	0	0
9	-4	-4	-4	5	20	21	23	16	8	-1	-15	-12	-1	9	7	2	-3	1	0	3	8	10	-3	-26
10	-23	-25	-25	-29	-23	-25	-24	-22	-23	-21	-19	-24	-26	-17	-13	-15	-19	-21	-18	-19	-23	-20	-15	-11
11	-11	-14	-16	-14	-11	-9	-13	-13	-15	-13	-12	-9	-11	-9	-7	-13	-15	-15	-16	-18	-17	-12	-7	-8
12	-4	1	5	9	7	4	6	4	2	-1	1	-2	-8	-9	-18	-16	-11	-7	-2	-1	-6	-18	-8	2
13	3	0	5	6	3	2	1	-15	-14	-12	-8	-9	-9	-9	-10	-12	-16	-15	-12	-11	-13	-8	-7	-6
14	-3	-4	-6	-8	-9	-8	-12	-11	-11	-13	-11	-7	-3	-2	-3	-3	-1	0	-5	-2	-2	-1	-2	-5
15	0	-1	0	3	5	4	0	-4	-5	-4	-4	-4	-5	-5	-8	-4	-1	1	1	2	1	1	2	2
16	2	1	1	-2	-3	1	0	-1	-1	0	2	0	-4	-1	1	-1	-2	-1	2	4	3	2	-1	-2
17	-2	-2	-1	1	8	14	14	9	5	5	4	4	4	3	4	4	4	5	7	11	11	13	15	15
18	0	-17	-25	-40	-46	-52	-61	-60	-60	-56	-57	-49	-35	-33	-37	-40	-36	-38	-42	-46	-47	-48	-50	-58
19	-61	-56	-46	-42	-43	-51	-57	-69	-59	-51	-48	-49	-43	-42	-39	-39	-35	-38	-36	-33	-33	-28	-24	-26
20	-28	-26	-22	-19	-18	-15	-16	-18	-21	-19	-19	-22	-23	-24	-26	-30	-30	-27	-30	-28	-29	-26	-23	-23
21	-22	-19	-18	-15	-16	-21	-19	-17	-19	-23	-21	-20	-20	-20	-21	-24	-23	-24	-23	-23	-23	-23	-25	-24
22	-27	-26	-25	-26	-31	-33	-31	-34	-38	-34	-38	-34	-31	-28	-27	-26	-24	-21	-23	-26	-25	-24	-22	-22
23	-18	-14	-13	-14	-22	-21	-22	-24	-25	-25	-26	-25	-25	-27	-27	-27	-23	-21	-15	-13	-16	-19	-18	-17
24	-15	-14	-12	-18	-18	-16	-15	-19	-19	-22	-19	-14	-15	-15	-13	-9	-8	-7	-8	-10	-7	-4	-2	-1
25	-9	0	2	9	11	15	15	11	10	11	7	-7	-19	-25	-19	-16	-13	-8	-10	-13	-12	-6	-4	-7
26	-10	-6	-2	-4	1	7	7	5	4	0	3	9	5	6	1	-4	0	-8	-27	-20	-12	-16	-28	-40
27	-51	-61	-65	-67	-68	-69	-81	-88	-103	-102	-96	-85	-77	-69	-63	-65	-68	-60	-50	-44	-44	-44	-38	-33
28	-39	-41	-46	-45	-46	-54	-54	-45	-41	-46	-46	-39	-36	-40	-44	-48	-43	-37	-36	-34	-35	-36	-32	-31
29	-28	-25	-23	-23	-22	-21	-22	-27	-30	-29	-25	-23	-29	-34	-32	-44	-52	-52	-52	-50	-47	-44	-34	-30
30	-32	-31	-29	-28	-29	-34	-43	-51	-60	-74	-81	-75	-61	-65	-76	-87	-79	-81	-80	-81	-88	-88	-87	-86
31	-86	-81	-74	-68	-63	-62	-60	-63	-63	-56	-51	-43	-40	-42	-49	-49	-45	-37	-36	-40	-44	-45	-43	-43

NOVEMBER 1978

TABLE 10 Dst - continued

Part B

UNIT=GAMMAS

G.M.T.

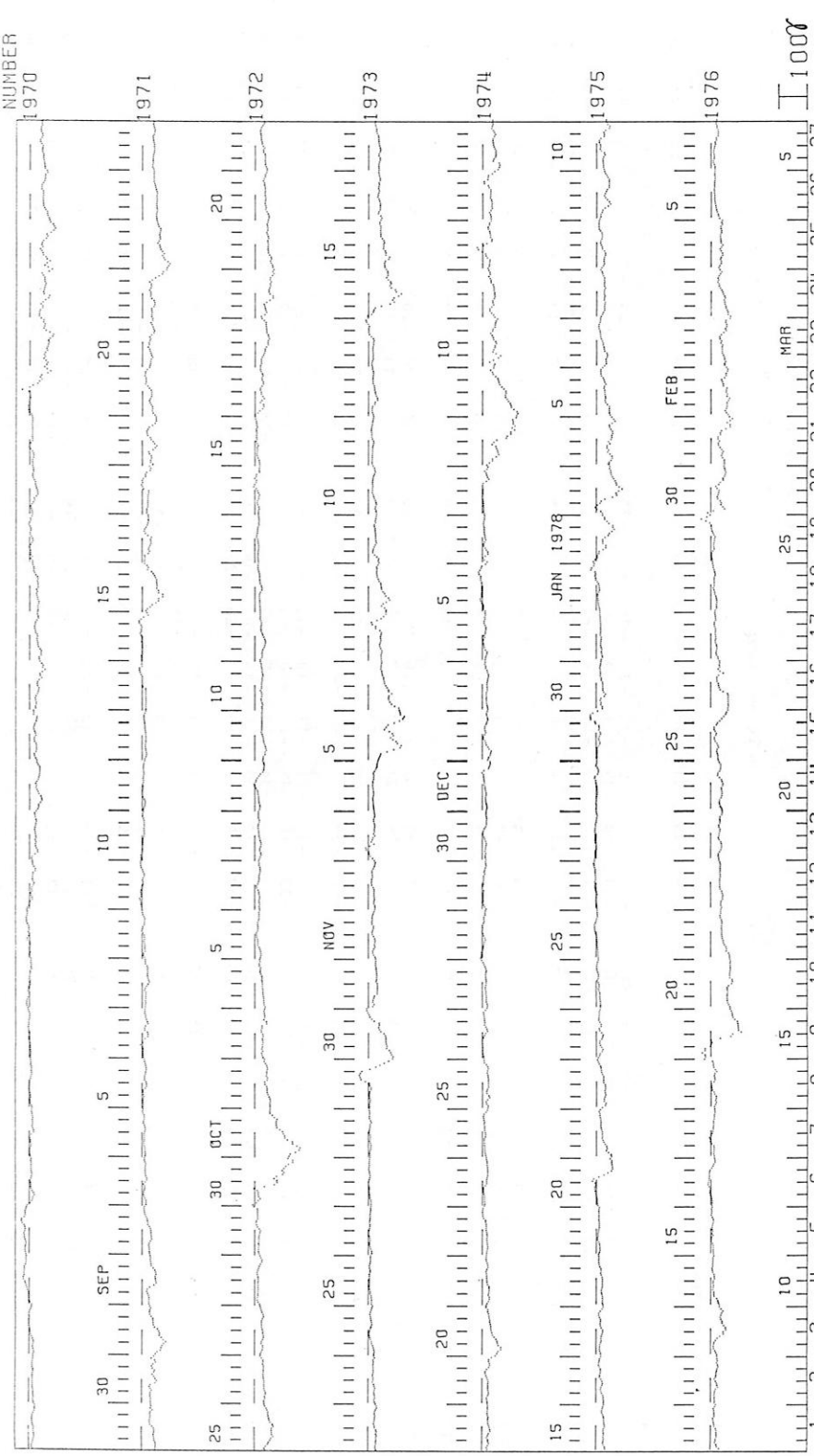
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-44	-43	-45	-46	-47	-45	-51	-64	-71	-64	-49	-49	-47	-44	-39	-35	-33	-22	-23	-25	-25	-24	-26	-25
2	-27	-29	-25	-24	-26	-23	-24	-28	-31	-39	-45	-50	-52	-48	-46	-42	-47	-48	-39	-33	-36	-37	-34	-34
3	-33	-30	-28	-30	-31	-31	-30	-33	-36	-33	-29	-24	-26	-25	-25	-24	-19	-16	-25	-28	-32	-33	-28	-24
4	-22	-21	-23	-22	-20	-22	-25	-28	-25	-25	-26	-29	-30	-28	-28	-29	-30	-26	-21	-19	-19	-17	-17	-20
5	-22	-23	-21	-14	-16	-14	-14	-17	-17	-14	-13	-14	-11	-9	-7	-5	-5	-4	0	-6	-7	-7	-6	-11
6	-14	-13	-8	-7	-8	-7	-3	-2	-2	-2	-2	-4	-5	-4	-7	-4	-2	1	3	8	7	9	7	6
7	4	4	7	8	6	8	8	7	8	11	14	14	15	14	13	12	7	5	6	6	16	11	-14	-33
8	-42	-47	-39	-35	-27	-19	-27	-28	-24	-20	-21	-17	-16	-16	-15	-13	-11	-7	-9	-11	-13	-12	-8	-7
9	-15	-23	-25	-22	-19	-25	-26	-23	-28	-25	-21	-19	-18	-15	-15	-18	-17	-11	-6	-4	-3	-3	-2	-6
10	-7	-8	-5	-5	-7	-6	-6	-7	-4	-2	5	7	10	4	6	10	-4	-14	-23	-27	-42	-62	-56	-53
11	-51	-49	-51	-47	-46	-43	-39	-34	-31	-26	-22	-21	-19	-20	-20	-23	-24	-23	-20	-16	-16	-21	-31	-38
12	-42	-18	-9	13	15	-3	-2	-10	-22	-19	-62	-90	-93	-69	-61	-71	-74	-73	-57	-55	-67	-66	-67	-73
13	-66	-65	-63	-59	-50	-51	-56	-59	-58	-53	-44	-37	-39	-35	-43	-52	-59	-65	-66	-63	-57	-52	-53	-51
14	-48	-43	-39	-38	-38	-37	-34	-32	-27	-25	-20	-21	-24	-33	-44	-50	-48	-50	-52	-52	-56	-54	-49	-49
15	-47	-44	-43	-50	-57	-55	-52	-51	-50	-46	-38	-30	-30	-31	-32	-30	-30	-26	-26	-31	-32	-25	-24	-22
16	-22	-18	-14	-12	-14	-16	-16	-19	-24	-25	-26	-18	-15	-12	-16	-18	-16	-17	-19	-20	-21	-20	-20	-18
17	-14	-11	-10	-6	-4	0	4	1	-3	-5	-9	-14	-14	-13	-10	-9	-9	-6	-4	-1	-4	-5	-5	-8
18	-10	-10	-10	-10	-8	-10	-13	-12	-9	-9	-6	-5	-6	-7	-6	-5	-4	-5	-8	-8	-7	-6	-6	-4
19	4	1	-1	-1	3	3	1	0	-1	-4	-2	-7	-25	-28	-17	-10	-10	-11	-5	-2	-2	1	10	23
20	29	26	12	0	-17	-25	-24	-24	-15	-13	-15	-14	-20	-17	-15	-14	-12	-22	-16	-22	-30	-22	-24	-31
21	-29	-26	-25	-27	-31	-33	-31	-27	-27	-22	-17	-12	-13	-12	-14	-19	-18	-16	-15	-15	-13	-17	-27	-39
22	-42	-36	-32	-32	-35	-43	-43	-37	-37	-29	-29	-32	-25	-23	-27	-17	-31	-37	-34	-30	-31	-30	-27	-24
23	-23	-22	-19	-20	-22	-22	-23	-22	-21	-21	-21	-21	-22	-19	-15	-12	-16	-18	-20	-22	-26	-31	-34	-33
24	-27	-27	-27	-21	-21	-20	-16	-20	-21	-20	-16	-12	-8	-15	-14	-18	-25	-30	-36	-41	-50	-53	-48	-44
25	-49	-49	-49	-53	-58	-65	-71	-79	-80	-80	-81	-64	-45	-54	-81	-101	-120	-135	-149	-140	-128	-124	-127	-118
26	-107	-105	-103	-99	-102	-110	-103	-84	-91	-82	-74	-66	-63	-61	-67	-72	-70	-74	-70	-66	-73	-72	-62	-59
27	-59	-59	-55	-56	-59	-60	-66	-63	-58	-55	-51	-47	-50	-46	-48	-54	-51	-52	-48	-52	-47	-43	-43	-38
28	-36	-35	-34	-37	-37	-35	-36	-37	-40	-39	-38	-36	-29	-29	-28	-29	-31	-28	-24	-27	-31	-30	-28	-23
29	-22	-23	-24	-22	-20	-20	-21	-17	-11	-10	-10	-8	-9	-11	-12	-15	-16	-14	-17	-16	-16	-15	-15	-13
30	-9	-9	-11	-11	-12	-13	-12	-9	-9	-9	-10	-9	-5	-4	-3	-3	-8	-11	-11	-11	-8	-5	-7	-11

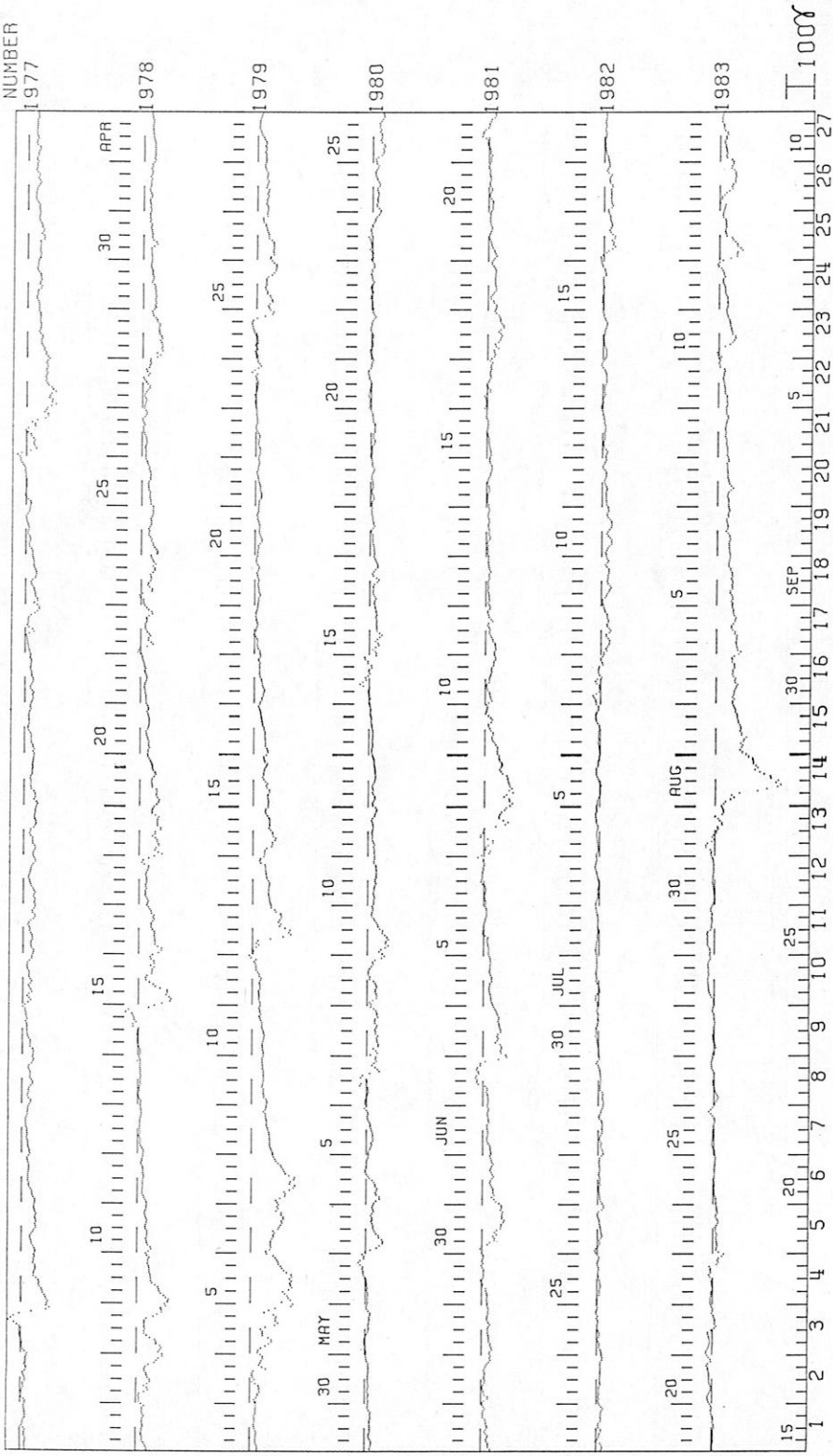
TABLE 10 Dst - continued

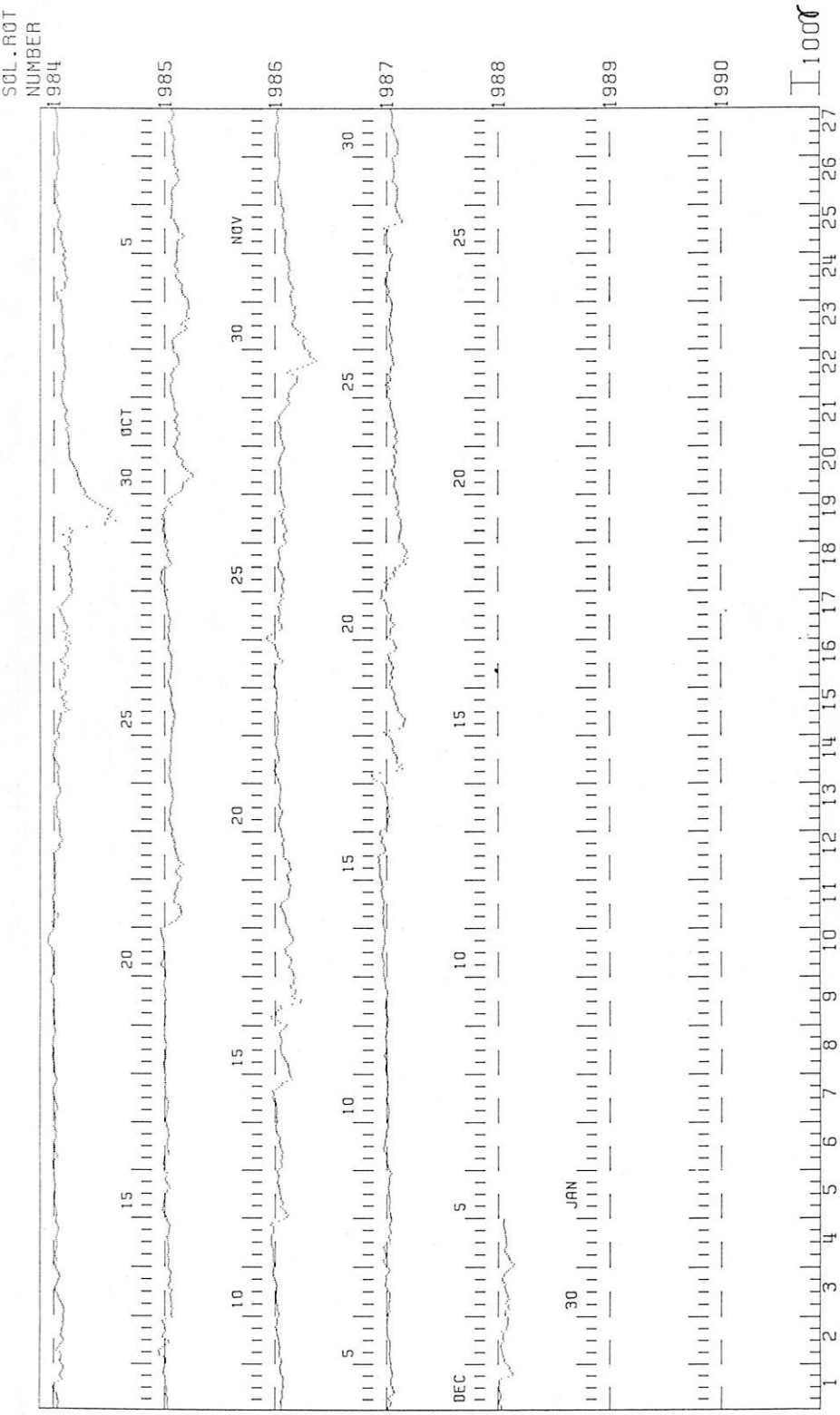
DECEMBER 1978

UNIT=GAMMAS

DAY	G.M.T. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-4	-4	-12	-16	-17	-9	-6	-13	-22	-28	-25	-22	-21	-15	-16	-15	-17	-21	-21	-20	-18	-16	-14	-16
2	-15	-13	-12	-11	-9	-10	-11	-12	-11	-12	-12	-11	-8	-4	-2	-1	-1	-1	0	-1	-1	-1	-2	-5
3	-5	-6	-12	-8	-9	-8	-8	-10	-11	-11	-12	-10	-4	-1	5	5	3	2	2	3	-2	-7	-11	-7
4	2	8	11	12	5	3	4	7	8	12	7	-11	-11	-11	-7	-8	-15	-15	-11	-8	-11	-12	-16	-17
5	-15	-13	-13	-8	-9	-9	-9	-11	-11	-11	-9	-8	-7	-8	-6	-5	-8	-9	-10	-9	-9	-13	-18	-12
6	-8	-5	-4	0	1	-1	0	-1	3	9	11	10	7	7	5	5	2	0	2	0	-2	-5	-5	-5
7	-4	-5	-7	-6	-8	-9	-8	-7	-6	-4	-1	1	-1	-4	-4	-2	-3	-4	-4	-3	-4	-2	-3	-1
8	0	2	4	3	2	0	0	2	6	9	4	1	1	1	2	2	1	3	4	2	1	0	2	-3
9	-1	-3	-6	-5	-3	2	0	1	5	4	4	4	2	1	-2	-3	-3	-1	4	4	5	7	6	7
10	10	11	11	11	13	9	8	11	13	16	16	16	13	11	12	9	6	8	7	7	7	5	6	7
11	9	12	12	12	12	10	9	14	11	12	12	10	10	9	13	16	16	18	20	17	13	17	17	18
12	21	23	25	25	24	24	24	25	29	26	27	30	23	10	4	5	7	11	18	19	15	16	23	24
13	20	7	-1	-6	-5	-5	-6	-10	-11	-7	-7	-5	-5	-5	-3	-2	-3	-2	2	3	5	5	7	13
14	18	35	46	52	52	23	-38	-58	-46	-55	-38	-37	-39	-38	-34	-29	-24	-22	-28	-24	-22	-20	-16	-9
15	2	9	-11	-48	-62	-62	-64	-68	-68	-59	-54	-47	-41	-43	-40	-35	-35	-31	-27	-29	-31	-28	-24	-19
16	-20	-12	-13	-14	-22	-21	-17	-18	-21	-25	-25	-19	-18	-12	-10	-9	-5	-14	-30	-36	-36	-30	-29	-25
17	-13	-4	-14	-15	-14	-16	-24	-30	-23	-16	-15	-17	-18	-8	-4	-3	-2	1	2	8	19	17	16	16
18	16	2	-1	-6	6	-2	-15	-30	-29	-25	-34	-32	-49	-71	-63	-65	-78	-68	-72	-76	-73	-65	-64	-59
19	-47	-46	-48	-47	-50	-51	-54	-54	-55	-52	-53	-54	-46	-41	-44	-46	-37	-35	-43	-45	-44	-41	-41	-41
20	-36	-36	-32	-28	-27	-29	-30	-33	-32	-24	-23	-20	-20	-28	-29	-32	-32	-31	-29	-28	-37	-36	-32	-26
21	-28	-35	-39	-35	-31	-34	-38	-38	-33	-28	-30	-29	-26	-24	-21	-21	-21	-18	-15	-13	-13	-15	-14	-9
22	-1	-1	-3	-3	-12	-7	4	-7	-14	-15	-11	-7	-14	-16	-15	-17	-27	-25	-22	-23	-22	-18	-16	-17
23	-16	-13	-12	-19	-22	-19	-19	-16	-14	-10	-11	-13	-14	-14	-12	-11	-17	-16	-16	-19	-20	-20	-21	-20
24	-17	-14	-9	-6	-9	-10	-7	-2	5	6	4	5	-1	-3	-2	-12	-12	-10	-12	-11	-14	-16	-20	-22
25	-16	-13	-11	-3	8	8	8	8	7	6	-1	-4	9	-8	-31	-56	-57	-49	-46	-46	-39	-37	-35	-32
26	-33	-35	-38	-39	-38	-40	-38	-39	-41	-35	-30	-22	-22	-26	-27	-27	-28	-28	-25	-25	-27	-24	-21	-22
27	-31	-40	-38	-42	-40	-43	-42	-39	-37	-35	-32	-27	-27	-26	-20	-18	-19	-21	-21	-22	-21	-20	-18	-15
28	-13	-13	-11	-1	-3	-6	-10	-10	-11	-7	-5	-1	-2	-5	-4	-4	-12	-38	-53	-52	-45	-41	-42	-35
29	-27	-22	-23	-19	-17	-14	-14	-12	-9	-10	-13	-21	-17	-18	-17	-19	-11	-30	-30	-34	-35	-34	-36	-34
30	-25	-25	-26	-40	-35	-37	-27	-32	-39	-34	-33	-29	-27	-25	-23	-27	-20	-15	-14	-20	-22	-29	-36	-43
31	-52	-57	-47	-41	-39	-36	-29	-23	-22	-27	-30	-29	-28	-28	-27	-25	-24	-25	-22	-20	-18	-19	-20	-21


SOL.ROT
NUMBER
1970
1971
1972
1973
1974
1975
1976
SEP
OCT
NOV
DEC
JAN
1978
FEB
MAR
100γ


SOL.ROT
NUMBER
1977
1978
1979
1980
1981
1982
1983
APR
MAY
JUN
JUL
AUG
SEP
100γ


SOL.ROT
NUMBER
1984
1985
1986
1987
1988
1989
1990
OCT
NOV
DEC
JAN
1000

DAILY MEANS OF EQUATORIAL DST FOR 1978

DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	4	-29	-46	-28	-71	-10	-23	7	-47	-46	-41	-16
2	-6	-20	-40	-24	-119	-6	-7	10	-37	-37	-36	-7
3	-5	-25	-35	-38	-89	-29	2	9	-36	-33	-28	-5
4	-73	-18	-14	-58	-114	-21	-30	-19	-28	-35	-24	-3
5	-71	-32	-15	-58	-56	-40	-73	-17	-18	-24	-12	-10
6	-40	-23	-16	-32	-40	-23	-21	-22	-29	-11	-2	1
7	-30	-15	-13	-19	-33	-18	-18	-9	-16	-13	7	-4
8	-15	-20	-11	-9	-17	-16	-18	-4	-36	-4	-20	2
9	-24	-31	-59	-7	-70	-6	-8	-2	-33	3	-16	1
10	-39	-10	-43	3	-47	8	-5	-3	-16	-21	-12	10
11	-26	-4	-27	-62	-56	-21	-6	4	-19	-12	-30	13
12	-17	0	-19	-52	-43	-14	-2	-18	-28	-3	-45	20
13	-16	-7	-29	-27	-31	-5	-1	-18	-19	-7	-54	-1
14	-16	-8	-18	-60	-22	-3	-35	-1	-10	-6	-40	-15
15	-9	-50	-23	-48	-6	-4	-19	-1	-4	-1	-38	-38
16	-19	-65	-30	-28	-10	8	-8	12	-5	0	-18	-20
17	-22	-43	-30	-16	-12	3	-3	5	-6	6	-7	-7
18	-21	-35	-34	-22	-11	5	3	-1	-1	-43	-8	-40
19	-13	-33	-30	-29	-6	5	-13	-11	2	-44	-3	-46
20	-6	-35	-18	-38	0	-12	-10	-3	7	-23	-14	-30
21	1	-29	-21	-26	-3	-23	-4	4	-3	-21	-22	-25
22	5	-40	-16	-10	-46	-17	-4	1	-13	-28	-32	-13
23	4	-17	-28	-16	-41	-14	-6	1	-16	-21	-22	-16
24	1	-13	-9	-53	-33	-25	-6	17	-11	-13	-26	-8
25	-1	-1	6	-36	-18	-7	-10	16	-31	-3	-88	-18
26	-16	-35	-27	-28	-18	-47	-5	5	-41	-5	-81	-30
27	-13	-43	-75	-24	-10	-34	5	-3	-42	-66	-53	-29
28	2	-52	-47	-31	-6	-19	8	-134	-59	-41	-32	-18
29	-27		-36	-21	3	-4	9	-80	-139	-33	-16	-22
30	-46		-42	-28	-29	-54	9	-60	-79	-64	-9	-28
31	-49		-30		-17		11	-61		-53		-30
MEAN	-19	-26	-28	-31	-35	-15	-9	-12	-27	-23	-27	-14

YEARLY AVE.= -22

ANNUAL MEAN -22

REFERENCES TO OTHER INDICES

Q QUARTER HOURLY DISTURBANCE INDEX FOR HIGH LATITUDE STATIONS

The Q-index was introduced in order to enable a precise correlation of geomagnetic activity with ionospheric, auroral and other observations for stations at latitudes higher than 58°. (Ref.: IAGA-resolutions Toronto 1957 and Helsinki 1960). It is a quarter hourly measure, on a quasi logarithmic scale, of the maximum deviation in γ's of the most disturbed horizontal component from its normal quiet-day value (the highest value of either ΔH and ΔD, or ΔX and ΔY). When the trace shows both positive and negative deviations during a 15 minute-interval, however, the total range is used instead.

The relation between Q and this deviation (or range) Δ is as follows:

Q =	0	1	2	3	4	5	6	7	8	9	10(T)	11(E)
$\Delta \leq$	10	20	40	80	140	240	400	660	1000	1500	2200	$>$2200

The details of the scaling technique of the Q-indices are explained in:

J. Bartels and N. Fukushima, Abh. Akad. Wiss. Göttingen, Math.-Phys. Klasse, Sonderheft 3 (1956).

or: J. Bartels, Annals of the IGY, 4, 220 - 236 (1957).

Since the IGY Q-indices have been determined and published for certain periods of time by 26 stations. In recent years only Sodankylä seems to have continued this practice. Mimeographed publications are available directly from this observatory.

The following data are available through the World Data Centers for Geomagnetism: (IGY = 7.57 - 12.58).

Arctica III	5.59 - 3.60	Welen	7.57 - 11.59, 64, 65
Heiss Isl.	64, 65	College	7.57, 6 - 9.58
Tikhaya Bay	7.57 - 2.59	Baker Lake 1)	IGY
Murchison Bay	7.57 - 7.59	Yellowknife 1)	7.57 - 7.58
C. Chelyuskin	IGY, 59, 64, 65	Nurmijärvi	5 - 6.61
Thule	IGY	Lerwick	IGY
Resolute Bay 1)	IGY	Eskdalemuir	IGY
Dikson	7.57 - 9.59, 64, 65	Macquarie Isl.	IGY
Tiksy	IGY, 64, 65	Mirny	IGY, 3 - 10,59, 64, 65
P. Barrow	7.57 - 8.58	Mawson	IGY
Godhavn	IGY	Novolazarevskaja	64, 65
Kiruna 2)	7.57 - 12.61	Halley Bay	IGY, 7.60 - 10.62
Sodankylä	1.57 - today	Vostok	64, 65
		Base Roi Baudouin	5.58 - 2.59

1) Publications of the Dominion Observatory, Ottawa, Vol. 27, No. 4 (1963)
2) Kiruna Geophysical Data, Data Report No. 631 (febr. 1963)

R HOURLY DISTURBANCE INDEX FOR HIGH LATITUDE STATIONS

For some observatories in geomagnetic latitudes higher than about 65°, hourly R-indices are available. The R-index is defined as the absolute hourly range in each horizontal component, expressed in tens of gamma (Ref.: IAGA resolution, Berkeley 1963).

The hourly range in the horizontal component was introduced as a measure of magnetic activity by Russian workers (especially Nikolski).

R-indices for Canadian stations are given in the magnetic yearbooks (Publications of the Dominian Observatory, Ottawa, Canada up to and including Volume 39; thereafter Publications of the Earth Physics Branch), for the stations:

Resolute Bay and Baker Lake (IGY and from 1960 onwards).
Alert (starting 1 October 1961).
Mould Bay (starting 1 August 1962).
Fort Churchill (IGY and from 1966 onwards).
Great Whale River (starting 1 January 1967).

Prior to 1964 the hourly range was measured at the Canadian arctic observatories in the principal horizontal component only, from 1964 onwards it was measured in both components X and Y.

R-indices of the stations Thule and Godhavn (Greenland) are determined since 1964, for the components H, D and Z. They are published in the magnetic yearbooks for these stations, which are issued by the Meteorologisk Institut, Charlottenlund, Denmark.

Daily, monthly and yearly mean values of R-indices (based on the H-component) from arctic and antarctic USSR-stations for the period 1934 through 1967 are given in a publication of the Arctic and Antarctic Institute, Fontanka 34, Leningrad (1970). This concerns the following stations:

Welen (1935 - '47, 1951 - '67),
Tiksi (1944 - '67),
Dikson (1934 - '67),
C. Chelyuskin (1935 - '67),
B. Tikhaya (1934 - '58),
O. Cheisa (1958 - '67).
Arctic drifting stations:
NP 3 - 13 (1954 - '67).
Mirny (1956 - '67),
Molodezhnaya (1964 - '67),
Lazarev (1960 - '61),
Novolazarevskaya (1961 - '67),
Vostok (1958 - '67).

R-indices of the station Loparskaya (near Murmansk) from 1954 onwards are available at WDC - B2, Molodezhnaya 3, Moscow, 117-296, USSR. These indices are also given in the publication "Auroral Phenomena" of the Polar Geophysical Institute, Ac. of Sciences of the USSR, Apatity, starting with the year 1970.

AE AURORAL ELECTROJET ACTIVITY INDEX

AE, at any instant of time, is the range of deviation from quiet time reference levels of the horizontal magnetic field (H) around the auroral oval. In practice, it is defined as the largest positive deviation (AU) minus the largest negative deviation (AL) from the H-variation records of a network of northern hemisphere auroral zone magnetic observatories. The average $\frac{AU+AL}{2}$ is called AO, an auxiliary auroral electrojet index. These indices may be derived from instantaneous values of H-deviations, or from averages over any suitable time interval.

(Ref: IAGA-resolution 2, Madrid 1969 and IAGA-resolution 13, Moscow 1971. For complete definition see: Davis, T.N. and Sugiura, M., J. G. Res. Vol. 71, 3, p. 736-792, 1966).

For the period January 1966 through December 1974, 2.5-min and hourly average AE, AU, AL and AO indices have been derived by the National Geophysical and Solar-Terrestrial Data Center of NOAA in the U.S.A. A network of stations as uniformly spaced in longitude as possible, was used. The number of stations contributing data to the derivation for each month is indicated parenthetically in identifying the index, such as, AE(10) or AE(11). These indices are available on magnetic tape from World Data Center A for Solar-Terrestrial Physics, National Oceanic and Atmospheric Administration, Boulder, Colorado 80302, U.S.A. Daily graphs of the 2.5-min indices are available on 35mm microfilm. Annual summaries of the hourly average indices, explanatory text, and 2.5-min daily graphs have been published for these years in the WDC-A UAG Report series. Graphical representations of AU, AL, and AE appear for some intervals of special interest in Solar-Geophysical Data, Part II (Comprehensive Reports), published monthly by NGSDC.

For the period September 1964 through 1965, the indices AE, AU, and AL for each 2.5-min and as hourly averages were derived at the NASA Goddard Space Flight Center. For July 1957 through September 1964, hourly values of AE were derived and published by the Geophysical Institute, University of Alaska. These indices are available from WDC-A for STP on either magnetic tape or 35 mm microfilm. All AE indices have been exchanged with other WDC's as outlined in the Guide to International Data Exchange, ICSU, December 1973.

REFERENCES TO TABLES AND DIAGRAMS FOR Kp, Ap AND Cp

Year	Kp-Indices Tables	Kp-Diagrams	Frequencies of Kp	Stormy Intervals	Quiet Intervals
	Bull. No. pp.	Bull. No. pp.	Bull. No. p.	Bull. No. p.	Bull. No. p.
1932	12 l 222-227	12 l 258-259	12 l 252	12 l 255	12 l 255
1933	12 l 228-233	12 l 260-261	12 l 252	12 l 255	12 l 256
1934	12 l 234-239	12 l 262-263	12 l 253	12 l 255	12 l 256
1935	12 l 240-245	12 l 264-265	12 l 253	12 l 255	12 l 257
1936	12 l 246-251	12 l 266-267	12 l 254	12 l 255	12 l 257
1937	12 g 97-98	12 g 113-114	12 g 112	12 g 111	12 k 154
1938	12 g 99-100	12 g 114-116	12 g 112	12 g 111	12 k 154
1939	12 g 101-102	12 g 116-117	12 g 112	12 g 111	12 k 154
1940	12 c 104-105	12 c 114-115	12 c 131	12 c 135	12 k 154
1941	12 c 106-107	12 c 116-117	12 c 131	12 c 135	12 k 155
1942	12 c 108-109	12 c 118-119	12 c 131	12 c 135	12 k 155
1943	12 c 110-111	12 c 120-121	12 c 132	12 c 135	12 k 155
1944	12 c 112-113	12 c 122-123	12 c 132	12 c 135	12 k 155
1945	12 i 106-107	12 c 124-125	12 c 132	12 c 135	12 k 156
1946	12 i 108-109	12 c 126-127	12 c 132	12 c 135	12 k 156
1947	12 i 110-111	12 i 102-103	12 c 133	12 c 136	12 k 156
1948	12 i 112-113	12 i 104-105	12 c 133	12 c 136	12 c 137
1949	12 c 102-103	12 c 128-129	12 c 133	12 c 136	12 c 137
1950	12 e 104-105	12 e 106-107	12 c 133	12 c 136	12 f 105
1951	12 f 86-87	12 f 88-89	12 f 98	12 f 105	12 f 105
1952	12 g 103-108	12 g 118-119	12 g 112	12 g 111	12 g 110
1953	12 h 80-85	12 h 88-89	12 h 86	12 h 87	12 h 87
1954	12 i 78-83	12 i 114-115	12 i 84	12 i 87	12 i 87
1955	12 j 114-119	12 j 122-123	12 j 120	12 j 121	12 j 121

Year	Ap Daily values	Ap Monthly and annual means	Cp Daily values	Cp Monthly and annual means
	Bull. No. pp.	Bull. No. p.	Bull. No. pp.	Bull. No. p.
1932	12 l 222-227	12 l 254	12 l 222-227	12 l 254
1933	12 l 228-233	12 l 254	12 l 228-233	12 l 254
1934	12 l 234-239	12 l 254	12 l 234-239	12 l 254
1935	12 l 240-245	12 l 254	12 l 240-245	12 l 254
1936	12 l 246-251	12 l 254	12 l 246-251	12 l 254
1937	12 g 109	12 g 110	12 i 85	12 i 86
1938	12 g 109	12 g 110	12 i 85	12 i 86
1939	12 g 109	12 g 110	12 i 85	12 i 86
1940	12 f 91	12 f 97	12 e 113	12 e 120
1941	12 f 92	12 f 97	12 e 113-114	12 e 120
1942	12 f 92	12 f 97	12 e 114	12 e 120
1943	12 f 93	12 f 97	12 e 115	12 e 120
1944	12 f 93	12 f 97	12 e 115-116	12 e 120
1945	12 f 94	12 f 97	12 e 116	12 e 120
1946	12 f 94	12 f 97	12 e 117	12 e 120
1947	12 f 95	12 f 97	12 e 117-118	12 e 120
1948	12 f 95	12 f 97	12 e 118	12 e 120
1949	12 f 96	12 f 97	12 e 119	12 e 120
1950	12 f 96	12 f 97	12 e 119	12 e 120
1951	12 f 97	12 f 97	12 i 86	12 i 86
1952	12 g 103-108	12 g 110	12 g 103-108	12 i 86
1953	12 h 80-85	12 h 86	12 h 80-85	12 i 86
1954	12 i 78-83	12 i 84	12 i 78-83	12 i 86
1955	12 j 114-119	12 j 120	12 j 114-119	12 j 120

The tables and diagrams of the following years up to 1970 may be found in the corresponding yearbooks of the series IAGA - Bulletin No. 12 (from 1958 onwards in the Bulletins with index 1), always in the last pages of each book, and from 1970 onwards in part B of the new series IAGA-Bulletins No. 32.
All tables and diagrams of the 30 years 1932 - 1961 are reprinted in IAGA-Bulletin No. 18.

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1978

Sudden commencements followed by a storm or period of storminess, as selected from the reports of the following 75 observatories*:
ABK SOD COL DOB NUR LER LOV BOX SIT SVD MOS ESK HLP WNG WIT NGK VAL BEL CLL GTT HAD KIV DOU BDV VIC NEW FUR CLF HRB TYH OTT MMB AAA AQU TFS ISK EBR COI BOU TOL FRD PEN SMG ALM KAK SSO HTY TUC KNY QUE TEN LNP HON SJG HYD MBO MUN GUA PAB BNG PMG HUA API PMI MPO GNA HER ACS TOO TWA CZT KGL MCQ DUM MAW and from the copies of magnetograms sent by five low-latitude observatories (MBO FUQ HON PMG ABG) or their five supplementary observatories (TAM PAB API KNY HYB).
* For explanation of the three-letter symbols: see Part A, pages 0-3.

JANUARY									
03 2042 (36-47)	22222	2.5	23	21A	16B	4G	1si		
05 1628 (25-30)	22212	5.3	12	8A	23B	7G	2si		
09 1625 (23-30)	22222	3.3	29	28A	16B	1G	1si		
25 1537 (36-40)	22222	4.9	17	5A	20B	9G	1si		
28 1853	11211	4.3	18	2A		7C			
FEBRUARY									
14 2147 (46-48)	33333	3.8	47	32A	10B				
25 1928 (24-30)	33323	4.6	42	29A	13B				
MARCH									
08 1439 (35-42)	33333	3.7	56	28A	11B		1si	1b	
APRIL									
10 1306 (05-12)	33233	3.9	36	33A	8B				
13 1925 (20-20)	21211	8.1	23	3A	4B	3C	1si		
17 2345 (40-53)	22222	4.6	18	14A	13B	3C	4si		
30 0951 (45-55)	22222	4.4	31	20A	12B	4C	1si		
MAY									
01 0828 (27-29)	11211	1.7	9	6A	11B	4C	1si	1b	
01 1835 (33-38)	33333	4.8	36	15A	7B	1C	1si		
02 2318 (14-20)	21122	4.1	21	7A	8B	3C	5si	1b	
10 2005 (00-12)	22212	6.0	10	6A	17B	5C	1si		
29 1831 (29-34)	22222	5.0	25	19A	12B	4C		1b	1sfe

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1978 - continued

JUNE									
01 2143 (40-45)	22222	3.9	17	16A	17B	1C	1si	1b	
02 0913 (10-16)	33333	5.6	69	16A	5B		1si		
04 1211 (07-13)	22222	3.9	23	20A	13B	2G	1si		
10 0828 (27-30)	22222	7.9	48	16A	13B	4G	1si		
25 0825 (24-27)	11100	5.6	25	4A	7B	4G	1si	1b	
29 0951 (45-53)	22222	10.2	24	14A	8B	10G	1si		
JULY									
03 2305 (03-13)	32233	3.7	39	26A	9B	1G			
13 0015 (09-16)	22122	5.4	16	8A	22B	3G			
13 2328 (26-33)	22222	4.5	27	15A	10B	6G		2b	
AUGUST									
18 1242 (36-46)	22222	10.3	16	4A	16B	8G			
27 0246 (42-50)	22233*	4.7	34	29A	9B	1C			
SEPTEMBER									
05 1859 (55-60)	22222	10.3	15	6A	15B	7C	1si	1b	
09 0254 (50-57)	01122	4.8	27		13B	3C	1si		
11 0900 (59-01)	-1121	3.8	7	3A	3B	9C	1si		1sfe
25 0718 (15-20)	22112	9.6	25	16A	12B	4G			
29 0301 (58-05)	33333	3.9	39	29A	4B				1pi
OCTOBER									
04 0047 (46-49)	22222	4.5	22	10A	13B	5G	2si		
09 0322 (20-24)	12221	7.8	13	1A	15B	8G	1si		
17 0430 (28-32)	11111	8.2	10	1A	7B	9C		2b	
29 1116 (14-19)	01122	10.8	11	3A	4B	7C		1b	

* Tatuoca used (Fuquene and Paramaribo missing).

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1978 - continued

		NOVEMBER					
12 0100 (54-01)	33333	12.5	45	25A	10B		1si
19 2320 (19-22)	01110	3.5	13	3A	6B	6G	
		DECEMBER					
14 0127 (20-30)	22333	5.0	35	21A	17B	1G	1si

TABLE 2a SOLAR - FLARE EFFECTS (sfe) 1978

Times of commencements of solar-flare effects (sfe) checked by 71 observatories, namely: ABK SOD COL DOB YAK NUR LER MGD LOV BOX SIT SVD ESK WNG WIT NGK VAL GTT CLL HAD KIV DOU BDV VIC NEW FUR HRB TYH OTT MMB AAA AQU TKT ISK EBR COI BOU TOL FRD PEN KAK SSO HTY TUC KNY QUE TEN LNP HON SJG HYB MBO MUT GUA PAB PMG HUA API PPT MPO GNA HER ACS TOO EYR TWA CZT KGL MCQ DUM MAW. Strong effects are marked by an asterisk. See also page X.

JANUARY

none

FEBRUARY

25 0312 A: YAK MGD GUA PMG API TOO EYR; B: MMB KAK SSO LNP HYB PPT GNA; C: TKT KNY MUT; D: BOX SVD KIV AAA HON MBO CZT KGL MCQ DUM MAW; E: DOU

25 1449 A: CLL ACS; B: WNG FRD SJG HUA MPO HER; C: SOD LER WIT NGK VAL GTT HAD KIV DOU BDV HRB TYH OTT BOU TUC PAB; D: ABK DOB NUR LOV ESK FUR AQU ISK EBR COI TOL PEN TEN MBO API PPT EYR TWA CZT; E: (MCQ)

MARCH

none

APRIL

08 1120 A: CLL; B: LER BOX WNG KIV HRB MPO; C: NUR LOV SVD ESK NGK GTT HAD BDV FUR TYH OTT AAA AQU ISK MBO API HER; D: ABK SOD DOB WIT VAL DOU TAS EBR COI TOL FRD PEN QUE TEN HYB SJG PAB ACS TWA KGL MAW; E: CZT

10 1054* A: SOD NUR BOX ESK WNG CLL KIV HRB AAA MPO ACS; B: LER SVD WIT NGK VAL GTT HAD DOU BDV FUR ISK COI HYB MBO; C: ABK LOV TYH TKT EBR TOL FRD QUE SJG HER CZT; D: AQU PEN TEN PAB API PPT EYR TWA MAW; E: DOB

17 0646 B: YAK ESK KIV HRB AAA HTY LNP HYB MUT GUA GNA TOO; C: SOD DOB LER LOV BOX SVD NGK GTT HAD BDV MMB ISK KAK KNY MPO HER KGL DUM; D: ABK NUR WNG WIT VAL DOU FUR AQU TKT EBR COI TOL PEN QUE TEN CZT MAW; E: MGD

28 1315 A: WNG NGK CLL HRB MPO; B: GTT BDV EBR TEN MBO; C: SVD NEW TYH TUC SJG; D: ABK SOD DOB NUR BOX LER LOV ESK WIT HAD DOU BDV OTT AAA TKT ISK COI FRD PEN HYB PAB HUA HER ACS TOO TWA CZT; E: KIV (EYR) (MCQ) - (b: B: FUR AQU - bp: B: VAL TOL)

MAY

07 0323 A: YAK AAA HTY LNP HYB EYR; B: MGD MMB KAK KNY GUA; C: SIT SVD KIV VIC TKT HON MUT API PPT; D: ABK SOD COL DOB NUR LOV BOX TOO KGL MCQ DUM - (b: GNA)

26 1748 A: CLL; B: VIC FRD TUC HON HUA; C: SOD COL SIT GTT NEW TYH OTT PPT TWA; D: ABK DOB NUR LER MGD LOV BOX ESK WNG WIT NGK VAL HAD DOU BDV FUR AQU EBR COI TOL TEN PAB MBO ACS EYR

28 0852 A: BOX KIV; B: SOD YAK SVD WNG HRB TYH (OTT) HTY LNP HYB MPO; C: ABK DOB NUR LER MGD LOV ESK NGK GTT HAD DOU MMB AQU TKT ISK KAK KNY QUE MUT PPT GNA HER; D: WIT VAL BDV FUR COI TOL PEN TEN MBO CZT KGL; E: AAA

JUNE

28 0245* A: GUA; B: YAK MGD SVD MMB KAK HTY KNY LNP HYB MUT GNA; C: SOD COL NUR SIT KIV VIC NEW AAA TKT HON API EYR; D: ABK DOB QUE MBO TOO MCQ DUM; E: SOD PPT (ACS)

JULY

10 0607* A: CLL MMB TKT ISK KAK HTY KNY LNP HYB; B: SVD WNG WIT NGK KIV HRB QUE MUT; C: SOD COL MGD GTT HAD AAA AQU GUA GNA KGL; D: ABK DOB NUR LER LOV ESK VAL DOU BDV FUR EBR COI TOL HER TOO CZT; E: PEN (MAW) - (b: YAK)

TABLE 2a SOLAR-FLARE EFFECTS (sfe) 1978 - continued

JULY (continued)

11 0426 A: CLL MMB KAK HTY; B: YAK SVD KIV KNY (TEN) LNP HYB MUT; C: COL MGD SIT NGK GTT HAD TYH AAA TKT ISK HON GUA; D: ABK SOD DOB NUR LER LOV ESK WNG WIT DOU BDV FUR AQU PEN QUE API TOO EYR MCQ; E: GNA KGL (DUM) (MAW)

11 0542 A: CLL; B: YAK MMB KAK HTY KNY LNP HYB MUT MPO GNA; C: MAG SVD AAA TKT ISK QUE; D: ABK SOD COL DOB NUR LER LOV ESK WNG WIT NGK VAL GTT HAD DOU BDV FUR TYH AQU EBR COI TOL PEN GUA TOO TWA CZT KGL; E: (MAW)

11 1051* A: CLL KIV FUR HRB TYH AAA AQU ISK EBR TOL FRD QUE HYB MPO HER ACS; B: SOD YAK NUR SVD WNG WIT NGK VAL GTT HAD BDV (MMB) (HTY) TEN (LNP) SJG MBO PAB (HUA); C: ABK DOB LOV ESK DOU CZT KGL; D: LER MGD OTT TKT COI PEN; E: (MAW)

11 2226* A: YAK API; B: VIC NEW MMB KAK HTY TUC KNY HON SJG GUA HUA PPT; C: COL SIT OTT FRD MUT TOO EYR; D: MGD LNP

AUGUST

none

SEPTEMBER

02 0552 A: CLL; B: YAK SVD MMB HTY KNY LNP MUT MPO; C: LER GTT HAD TKT ISK KAK HYB GUA GNA; D: ABK DOB NUR LOV BOX ESK WNG WIT NGK DOU BDV FUR TYH AQU EBR TOL PEN QUE API PPT HER TOO EYR CZT DUM; E: MGD KIV AAA KGL MCQ MAW - (pi: SOD)

OCTOBER

01 0700 A: YAK CLL; B: SOD NUR BOX SVD WNG WIT KIV TYH LNP MUT PMG TOO; C: ABK LER MGD LOV ESK NGK GTT HAD DOU MMB AQU ISK KAK KNY HYB GUA; D: DOB VAL BDV FUR TKT EBR COI TOL PEN QUE MPO HER CZT MCQ DUM; E: AAA HTY GNA MAW

13 1235 A: (MGD) CLL TEN MPO; B: WNG KIV HRB TYH ISK PEN QUE SJG MBO; C: SOD NUR LER BOX SVD ESK NGK GTT HAD DOU BDV OTT AQU FRD TUC HUA CZT; D: ABK DOB LOV WIT VAL FUR TKT EBR COI TOL HER KGL; E: (AAA) (HYB) (GNA) (MAW) - (si: ACS)

14 2334 A: HON API; B: HTY LNP MUT PMG PPT (MPO); C: COL YAK SIT NEW MMB KAK TUC KNY GUA EYR; D: TOO MCQ; E: MGD (AAA) GNA DUM MAW

NOVEMBER - DECEMBER

none

TABLE 2b DOUBTFUL SOLAR - FLARE EFFECTS (sfe) 1978

JANUARY

none

FEBRUARY

11 1425* A: CLL MPO; B: FRD TEN SJG HUA; C: LER HAD OTT ISK BOU TUC MBO ACS TWA; D: DOB LOV ESK WIT NGK VAL GTT DOU BDV FUR TYH AQU EBR COI TOL PEN PAB HER EYR CZT KGL MAW; E: WNG

MARCH

none

APRIL

09 0422 A: LNP; B: SOD {WNG} SVD KIV HRB MMB AAA KAK HTY (TUC) KNY (SJG) MUT MPO GNA; C: ABK COL YAK NUR BOX HYB GUA API; D: LOV TKT ISK QUE HON TOO CZT KGL MCQ DUM MAW; E: MGD - (b: A: (OTT); B: (VAL) {NEW}; C: (EBR) (FRD) - pt: (PAB) - pi: EYR)

12 0641 A: CLL; B: HTY LNP MUT MPO; C: YAK NUR SVD MMB KAK KNY GUA; D: DOB LER LOV ESK WIT VAL HAD DOU BDV FUR TYH AQU TKT ISK EBR COI TOL PEN QUE HER TOO CZT; E: ABK SOD MGD BOX WNG NGK GTT KIV HYB AAA GNA KGL MCQ DUM MAW

MAY

05 1027 A: CLL; B: BOX WNG MPO; C: SOD NUR LER LOV ESK HAD KIV ISK FRD QUE LNP KGL; D: ABK DOB YAK SVD WIT NGK VAL GTT DOU FUR TYH AAA AQU TKT EBR COI TOL PEN HTY HYB SJG PAB HER; E: BDV CZT

06 2015 A: TUC; B: FRD HUA PPT; C: COL SIT VIC NEW OTT HON GUA ACS TWA; D: YAK LER MMB KAK HTY KNY SJG PAB API MPO EYR; E: MGD

28 1455 A: CLL; B: KIV HRB TEN (MUT) MPO HER; C: SOD COL DOB NUR BOX SIT SVD ESK WNG NGK GTT DOU BDV VIC NEW FUR OTT AQU ISK EBR FRD TUC SJG; D: ABK LER LOV WIT VAL HAD TYH COI TOL PEN PAB HUA ACS TWA; E: {MGD} {AAA} (HTY) (HYB) MBO (MCQ)

30 0717 A: CLL; B: SVD TEN MUT; C: SOD NUR BOX ESK GTT TYH MMB KAK KNY MPO; D: DOB YAK LER LOV WIT NGK VAL HAD DOU BDV FUR AQU TKT ISK EBR COI TOL PEN QUE LNP MBO HER CZT; E: ABK MGD WNG KIV (OTT) AAA HTY HYB (PPT) GNA KGL {MCQ} {DUM} {MAW}

JUNE

22 0232 B: TKT HTY LNP MUT (MPO); C: COL YAK NUR LOV SIT SVD KIV NEW MMB AAA KAK KNY GUA; D: DOB QUE HON MBO API PPT TOO EYR; E: ABK SOD MGD HYB GNA {KGL} MCQ DUM {MAW}

JULY

06 1512 A: CLL TYH TKT COI MPO; B: KIV VIC ISK TEN; C: ABK COL NUR LOV SIT GTT DOU BDV OTT FRD TUC SJG; D: VAL EBR MBO PAB HER; E: DOB SVD WIT NEW {AAA} (HTY) (HYB) HUA (PPT) (KGL) (MCQ) (MAW) - (si: B: SOD WNG HAD FUR AQU ACS TWA; C: LER ESK NGK TOL MBO)

07 0534 A: CLL KIV; B: LER HAD AAA KAK HTY TEN MUT KGL; C: SOD COL NUR SVD ESK AQU KNY MPO CZT; D: DOB YAK MGD LOV WIT VAL GTT DOU BDV FUR TYH MMB TKT ISK EBR COI QUE LNP GUA GNA TOO; E: ABK WNG HYB {MAW} - (si: B: NGK)

07 0855 A: TYH MPO; B: NUR SVD (VIC) MMB KAK HTY KNY LNP HYB MUT; C: MGD ESK WNG GTT TKT ISK; D: DOB LER WIT NGK VAL HAD DOU BDV FUR AQU COI TOL PEN QUE HER CZT; E: ABK SOD LOV AAA (HUA) (PPT) GNA KGL (MCQ) (DUM) (MAW)

07 1440 A: CLL TYH; B: NUR {MGD} WNG KIV DOU AQU ISK (MMB) (KAK) (HTY) (KNY) HUA MPO ACS; C: COL DOB LOV SIT ESK NGK VAL GTT BDV VIC NEW FUR OTT EBR FRD TUC SJG MBO TWA; E: ABK LER WIT HAD TKT COI TOL PEN PAB HER; E: SOD SVD {AAA} (GNA) (MCQ) (MAW) - (b: {YAK})

TABLE 2b DOUBTFUL SOLAR-FLARE EFFECTS (sfe) 1978 - continued

JULY (continued)

09 1819 A: CLL; B: COL (KIV); C: SOD SIT NGK VIC NEW TYH FRD TUC HON SJG HUA PPT TWA; D: ABK DOB NUR MGD LER LOV ESK WNG WIT VAL GTT HAD DOU BDV FUR AQU EBR COI TOL TEN MBO API ACS; E: (AAA) (HYB) (DUM)

10 0522 A: YAK; B: MGD KIV HTY LNP MPO; C: COL GTT TYH MMB AAA TKT KAK KNY HYB MUT; D: ABK SOD DOB NUR LER LOV SVD ESK WNG WIT NGK VAL HAD DOU BDV FUR AQU ISK EBR COI TOL QUE GUA GNA TOO CZT; E: PEN KGL MAW

11 0359* A: LNP; B: MMB KAK HTY C: COL SVD AAA ISK KNY GUA GNA; D: ABK SOD DOB YAK NUR LER MGD LOV SIT ESK WNG WIT NGK GTT HAD KIV DOU BDV FUR TYH AQU TKT PEN QUE HON HYB MUT API TOO KGL MCQ DUM; E: (MAW)

12 0242 B: KIV MMB LNP HYB MUT; C: SOD VIC KAK GUA PPT GNA; D: ABK COL DOB YAK NUR MGD LOV SIT SVD VAL NEW AAA TKT HTY KNY QUE HON API TOO MCQ DUM

13 1349 A: NGK KIV TYH; B: WNG FUR OTT; C: COL NUR SIT GTT BDV VIC NEW TKT FRD TUC SJG MPO; D: ABK SOD LER LOV ESK WIT VAL HAD DOU AQU ISK EBR COI TOL PEN QUE MBO HUA HER ACS TWA; E: SVD AAA (HAZ) (GNA) (MCQ) (MAW)

AUGUST

none

SEPTEMBER

10 1140 A: NUR YAK BOX WNG CLL KIV FUR TYH OTT AAA COI PEN MPO; B: ABK SOD (COL) LER (MGD) LOV (SIT) SVD ESK NGK GTT HAD DOU (VIC) HRB (MMB) AQU EBR FRD (KAK) (HTY) (TUC) (KNY) SJG MBO (GUA) HUA; C: DOB VAL BDV TEN HER CZT KGL; D: WIT TKT QUE PAB; E: (LNP) (PPT) (GNA) (MCQ) MAW - (si: ISK TOL HYB ACS TWA)

16 1325 A: CLL; B: WNG COI MPO; C: LER BOX SVD NGK GTT HAD KIV BDV FUR HRB TYH OTT AQU TAS ISK EBR FRD TUC SJG MBO HUA HER; D: ABK SOD DOB NUR LOV ESK WIT VAL DOU TOL PEN QUE TEN PAB TWA CZT; E: (HTY)

17 1503 A: CLL; B: TEN MPO HUA; C: NUR BOX WNG NGK GTT HAD KIV DOU TYH OTT AQU EBR FRD TUC SJG MBO PAB; D: ABK SOD DOB LER LOV SIT ESK WIT VAL BDV FUR ISK COI TOL PEN HER TWA; E: (HTY)

21 0411 B: SVD KIV MMB HTY LNP MUT; C: LER MGD AAA KAK KNY MPO GUA EYR; D: YAK TKT HON HYB API PPT GNA TOO CZT KGL MCQ DUM; E: QUE MAW

OCTOBER

05 1114 A: CLL; B: (MGD) SVD WNG KIV HRB TYH TKT (PMG) (GNA); C: SOD NUR BOX NGK BDV ISK SJG HYB MPO MAW; D: ABK DOB LER LOV ESK WIT VAL HAD DOU FUR AAA AQU EBR TOL PEN QUE TEN MBO HUA HER ACS TWA CZT KGL; E: (MCQ) - (b: (SIT) (EYR))

19 0406 A: LNP; B: HTY QUE MUT MPO; C: MGD MMB AAA KAK KNY GUA PMG API EYR; D: TKT TOO CZT; E: SOD MGD BOX WNG HYB PPT GNA KGL MCQ DUM MAW

NOVEMBER

none

DECEMBER

07 2344 B: LNP API PPT; C: COL VIC HTY TUC KNY HON GUA PMG GNA; D: MGD SIT ESK NEW MMB KAK MUT TOO EYR TWA KGL MCQ DUM MAW

09 1100 A: CLL; B: BOX WNG KIV HRB TYH MPO; C: NUR ESK NGK GTT HAD BDV FUR AQU TKT ISK QUE SJG HYB GNA ACS TWA CZT KGL; D: ABK SOD DOB LER LOV SVD WIT VAL DOU AAA EBR COI TOL PEN PAB HUA HER DUM MAW; E: MBO

12 1007 A: CLL; B: (ABK) (SOD) NUR LOV BOX SVD ESK WNG KIV TYH (LNP) (SJG) (MUT) MPO ACS TWA; C: LER NGK GTT HAD FUR AAA AQU ISK TOL PEN MBO; D: DOB WIT VAL DOU BDV TKT EBR COI QUE API HER CZT DUM MAW; E: (MGD) HYB GNA KGL

13 1015 A: CLL KIV MPO; B: HRB TYH ACS TWA; C: BOX SVD WNG GTT BDV FUR ISK TEN MBO GNA; D: DOB NUR LER LOV ESK WIT NGK VAL HAD DOU AAA AQU TKT EBR TOL PEN QUE HYB HER CZT KGL DUM MAW; E: COI

TABLE 3 VERY UNUSUAL EVENTS

Times of commencement (and ending) of presumed very unusual events.

The meaning of the symbols at the left is as follows:

ssc sudden commencement, followed by a storm or period of storminess

si sudden magnetic change which could not be classified as ssc

pg giant pulsations, viz. exceptional pulsations of very great period and regularity, with sufficient relative amplitude

pi train of pulsations of irregular shape, consisting of several series of oscillations, each series lasting about 10 minutes; period of the pulsations: pi1 shorter than 40 s, pi2 40-150 s, pi3 longer than 150 s

pc pulsations of more continuous character, generally with long duration; period: pc1 0,2-5 s, pc2 5,1-10 s, pc3 10-45 s, pc4 45-150 s, pc5 150-600 s, pc6 longer than 600 s

E the phenomenon could not be discerned because of heavy disturbance

D it was decidedly not recorded, although the records were satisfactory

ncl no classification given in the report

cr crochet-like disturbance

X record missing

The events are checked by 69 observatories, the same as for table 2a minus CLL and ESK. The observatories are arranged in groups with respect to the quality-indications W, A, B, C, wq which have the following meaning:

W - extra-ordinary and very unusual

A - very remarkable

B - fair, ordinary, but unmistakable

C - very poor, doubtful

wq - without quality indication.

Period or duration in minutes or seconds and amplitudes as reported by some stations are added in parenthesis. Amplitudes are given in nanotesla's (nT), if not otherwise indicated. The plus or minus sign indicates the sense of the sharp movement. Beginning and ending times of the phenomenon are added in square brackets if deviating from the time at the left. Observatories giving more than one classification for the same case are marked by an asterisk.

JANUARY

06 0623 ssc: A: FRD (D: 8nT; H: 30nT) TUC (D: 7nT; H: 39nT) HON (D: 4nT; H: 26nT) GUA PMG - B: SIT (D: 29nT; H: 32nT) NEW SJG

si: W: WNG (---) - : NUR MGD LOV VAL HAD KIV FUR HRB [0635] TKT SSO (D: 12nT H: 23nT) HUA PPT (D: 0.5'; H: 33nT; Z:-11nT) ACS (D: 15nT; H: 49nT) TWA (D: -6nT; H: 50nT) MCQ (D: -60nT; H: 200nT) - B: ABK COL (D: ; H: 176nT) DOB BOX* WIT DOU BDV VIC MMB* ISK EBR BOU (D: 12nT; H: 31nT) KAK KAN TEN LNP (D: 2m 4nT; H: 3m 5nT) MBO GNA TOO CZT (D: 38nT; H: 16nT) KGL (D: 103nT; H: 34nT) MAW - C: NGK* TOL PAB DUM

pg: A: YAK AQU - B: BOX* MUT MPO (2m; D: 30nT; H: 25nT)

pi2: A: SOD MMB* - B: GTT HER

pi: A: LER - B: SVD (3m 26nT)

pc3: B: NGK*

pc2: C: NGK*

pc: B: BOX*

ncl: A: AAA [0534] COI API - B: OTT - C: PEN

X: TYH QUE EYR

TABLE 3 VERY UNUSUAL EVENTS - continued

FEBRUARY

none

MARCH

27 1708 ssc: B: QUE - C: TUC
si: A: TYH TKT - B: ABK LOV BOX* [1715] - C: KGL
bp: A: WNG AQU MPO (4m; D: 40 nT; H: 59 nT) CZT (D: 128 nT; H: 112 nT) KGL (D: 270 nT; H: 380 nT)
bs: A: AAA
bps: B: NGK* HRB
b: A: GTT* BDV*
pg: A: BOX* - C: YAK*
pi2: A: GTT* - C: YAK* BDV*
pi: B: LER [1716] HAD LNP (D: 2m 2 nT; H: 2m 2 nT)
pc5: C: NGK*
pc4: C: NEW FRD
pc: B: MUT - C: YAK* BOX* DOU
E: SOD DOB NUR VIC FUR OTT ISK MBO GNA MCQ
D: COL WIT VAL COI PEN HTY TEN GUA PAB PMG HUA API ACS TOO TWA DUM MAW
ncl: W: KIV - C: MGD SVD MMB KAK KNY HER EYR - wq: SIT HON SJG

APRIL

18 1721 ssc: A: MGD - B: NEW TUC (D: 19nT; H: 11nT) QUE [1704]
si: W: SIT (48m 50nT) HTY (D: 5m 7nT; H: 6m -29nT) - A: COL DOB KIV HRB TYH TKT ACS (D: -20nT; H: -29nT) TWA (D: -10nT; H: -20nT) - B: YAK NUR LER WNG (-X+X-) VAL DOU FUR AQU ISK HON MUT PAB [1708] - C: NGK VIC EBR [1713] TOL FRD CZT (D: 1nT; H: 3nT) KGL - wq: BDV
bp: A: MPO (4m; D: 3nT; H: 17nT)
b: B: GTT* - C: MCQ (D: -32nT; H: -57nT) - wq: BOX* [1715]
pg: A: AAA LNP (D: 5m 14nT; H: 5m 37nT) - B: BOX* SVD (9m 38nT) HUA GNA
pi2: B: PPT
pi: C: HAD
E: SJG
D: ABK WIT PEN HER DUM MAW
ncl: A: OTT API EYR - B: MMB COI KAK KNY - C: LOV TOO - wq: SOD
sfe: A: GUA - B: MBO - C: TEN

19 1850-
20 0545 si: W: KIV? - B: QUE MBO MUT
bp: A: TKT - B: DOU* AAA [1810] TOL
bps: B: LER HAD
b: B: BDV* [1853] EBR*
pg: B: YAK* BOX* DOU*
pi2: A: ACS [20 0018-0300] TWA [20 0019-0300] - B: LNP (D: 3m 3nT; H: 3m 10nT) - C: NUR [20 0100-1100] PPT*
pi1: B: BDV* [2349-]
pc5: B: GTT* [20 0340-0800]
pc4: A: MPO
pc3: A: MMB HTY [19 1834-20 0615] (20/40s 0.56nT/s) - B: NGK* BDV* KAK KNY PPT*
pc2: C: NGK*
pc: B: BOX* SVD (4m 12nT) GNA [19 2140-20 1105]
p: wq: AQU
E: ABK COL DOB LOV VIC FUR OTT ISK EBR* HUA KGL MCQ DUM MAW
D: SIT WNG VAL COI FRD PEN TUC TEN HON SJG PAB TOO CZT
ncl: B: API - C: HER EYR - wq: WIT NEW TYH GUA

20 0855-
1100 si: B: MUT - C: DOU
pg: W: BOX* (3/9m; 10nT; irreg) - A: TOL* MPO (2m; D: 22nT; H: 15nT) - B: YAK MAW - wq: KIV
pi2: A: SOD* - B: HAZ (40/60s; 0.16nT/s) - wq: NUR
pi: B: LNP (D: 2m 1.6nT; H: 2m 1.9nT)

TABLE 3 VERY UNUSUAL EVENTS - continued

APRIL (continued)

20 0855-
1100 pc5: B: GTT*
pc4: A: FUR* ACS TWA
pc3: A: SOD* NGK FUR* - B: VAL BDV MMB KAK KNY - C: WNG PPT
pc2: B: GTT*
pc: W: BOX* (35s 6nT irreg) - A: TOL* - B: LER LOV HAD AAA EBR* TEN GNA - C: CZT KGL - wq: DOB
p: B: SVD (1.5m 10/12nT) TKT - wq: AQU TUC
E: ABK WIT OTT ISK EBR* COI DUM
D: SIT VIC PEN HON SJG GUA PAB HUA TOO EYR MCQ
ncl: B: TYH - C: API HER - wq: COL NEW
X: FRD QUE MBO

MAY

none

JUNE

29 2101 ssc: A: QUE MPO (1.5m; D: 10nT; H: 29nT) - B: SOD COL* LER MGD HAD - wq: SIT* NEW* FRD* SJG* GUA* GNA*
si: W: EBR (D: 3'4; H: 55nT; Z: 36nT) - A: NUR KIV FUR HRB TYH AQU TKT ISK (D: -8nT; H: 33nT; Z: -7nT) LNP (D: 3m 15nT; H: 3m 32nT) HUA - B: COL* WNG (-++) NGK VIC TOL [2058] MBO MUT - C: HTY (D: 5nT; H: 12nT) DUM - wq: BOX* SIT* BDV NEW* FRD* TUC* SJG* GUA*
bps: B: VAL - wq: DOU
b: A: KGL (D: 450nT; H: 550nT) - B: GTT* - wq: DOB
pg: A: AAA - B: SVD (10m 55nT) - C: YAK* BOX*
pi2: A: GTT* - B: HER
pc5: A: PPT*
pc4: A: PPT*
pc: C: YAK* BOX*
E: LOV OTT MMB KAK KNY MAW
D: COI PEN PAB TOO MCQ
ncl: A: API ACS EYR TWA - wq: ABK CZT
X: TEN
sfe: A: HON - B: COL* - wq: SIT* NEW* FRD* TUC* SJG* GUA*

JULY

04 1440-
1630 ssc: A: QUE
si: A: AQU HUA ACS (D: 24nT; H: 42nT) - B: VIC TOL MBO - wq: BOX*
bp: B: VAL DUM - C: MGD CZT (D: 98nT; H: 64nT) KGL (D: 450nT; H: 550nT)
bps: B: WNG
pg: A: COL FUR TYH AAA MUT - B: BOX* SVD (20m 40/130nT) FRD TUC - C: YAK MPO - wq: DOB? TKT
pi2: B: BDV HAZ (40/120s 0.24nT/s)
pc5: B: NGK* - C: PPT*
pc4: C: PPT*
pc3: A: NGK* - B: MMB [03 2305-04 2400] KNY [03 2305-04 2400]
pc: C: BOX*
E: ABK SOD NUR LOV SIT GTT DOU OTT ISK PEN LNP GNA MCQ
D: LER HAD EBR TEN TOO TWA MAW
ncl: W: KIV - A: EYR - C: COI API HER - wq: WIT NEW HON SJG GUA
X: PMB

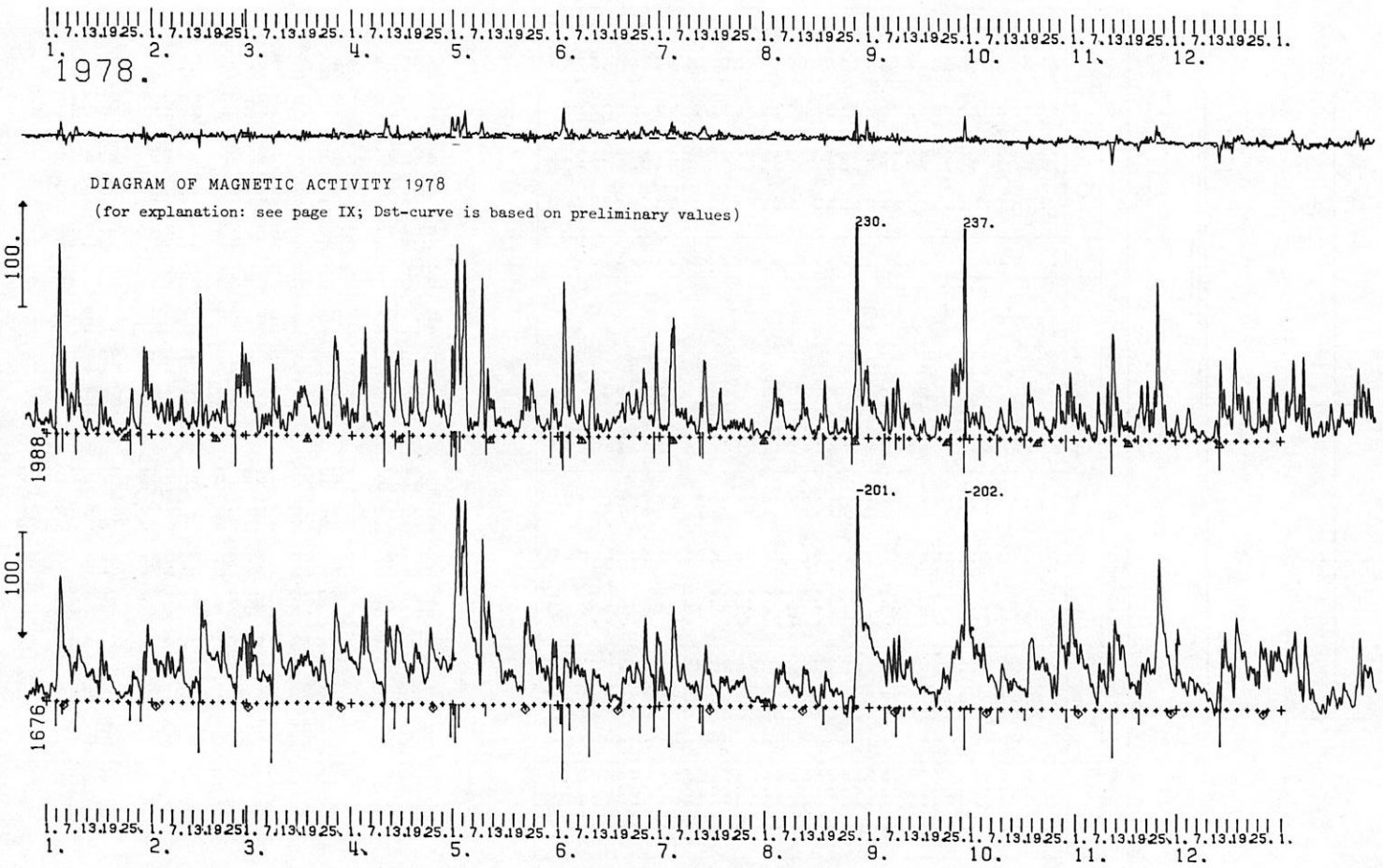
AUGUST - NOVEMBER

none

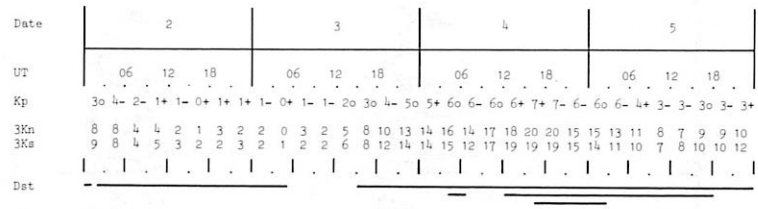
TABLE 3 VERY UNUSUAL EVENTS - continued

DECEMBER

16 1920-1927
ssc: C: TUC
si: A: NUR HRB - B: MUT KGL (D: 37nT; H: 24nT) - C: NGK HON SJG CZT (D: 24nT; H: 4nT)
pg: A: AQU ISK - B: DOU - C: BOX* - wq: KIV
pi2: W: HER 1927-1930 (60s 8nT) - A: BOX* VAL BDV ACS TWA - B: GTT MMB HTY (60/80s 0.26nT/s) KNY PPT - C: YAK
pi1: wq: WIT (70s 30nT)
pi: A: LER WNG (1m 30nT) HAD EBR TOL - B: SVD (1m 8nT) LNP (D: 1m 1.4nT; H: 1m 2.1nT) MBO
pc5: B: FRD
pc: A: TYH MPO (1m; D: 7nT; H: 8nT) - B: MGD - C: PMG - wq: DOB
p(psc)A: FUR
E: ABK SOD MCQ
D: SIT VIC OTT AAA PEN QUE PAB API GNA TOO EYR DUM MAW
ncl: B: LOV (D: 37nT; H: 13nT) - C: COI - wq: COL NEW GUA
X: KAK HUA
sfe: B: TEN


1. 7. 13. 19 25.
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.
1978.
DIAGRAM OF MAGNETIC ACTIVITY 1978
(for explanation: see page IX; Dst-curve is based on preliminary values)
100.
1988
230.
237.
100.
1676
-201.
-202.

1978, JANUARY 2 - 5



Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

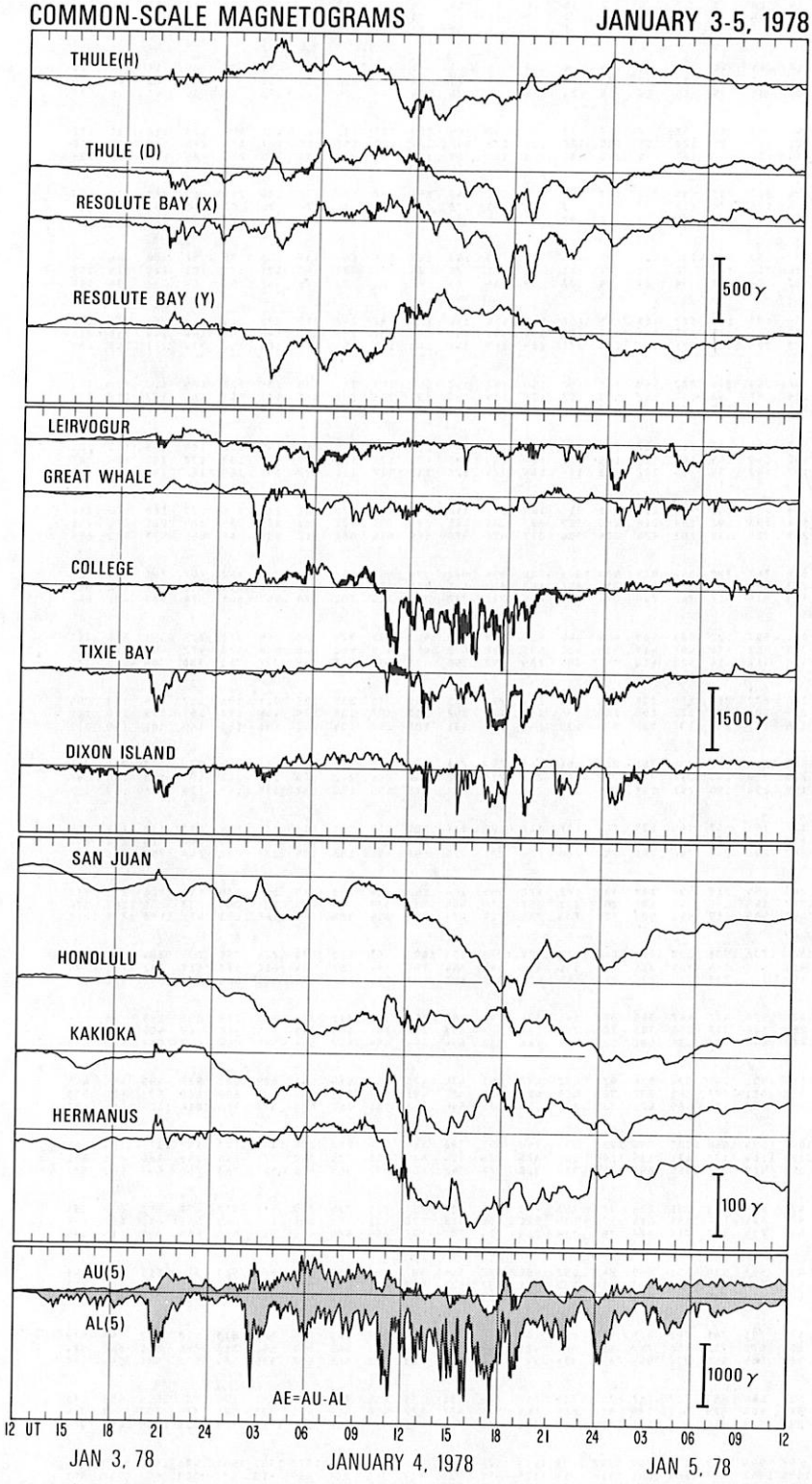
Data from Individual Observatories — JANUARY 1978

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
RES	83.0N	3	2042	SC	72	-24	36	04(6)	-	741	708	455	05	12
CBB	76.7N	3	2042	SC	--	--	--	04(5)	-	770	760	745	05	06
BLC	73.9N	3	2200	..	..	..	..	04(2)	-	1080	1060	1450	04	24
FCC	68.8N	3	2042	SC	--	--	--	04(5)	-	760	730	730	05	14
COL	64.6N	3	11--	..	..	..	..	04(4,6)	8	556	2640	1600	06	08
SIT	60.0N	3	11--	..	..	..	..	04(5)	8	--	--	800	07	00
STJ	58.7N	3	1230	..	..	..	..	04(2,5)	7	430	450	770	05	09
OTT	57.0N	3	1230	..	..	..	..	04(2,5)	7	92	355	302	05	10
NEW	55.1N	3	2042	SC*	2	18	--	04(4,5)	7	58	403	439	05	15
WIT	54.2N	3	2043	SC*	+ 2 *	+22 *		04(6)	8	45	425	115	05	08
FRD	49.6N	3	2042	SC*	+ 1	+25	- 6	04(2,6,7) 06(1)	6	45	295	97	10	22
BOU	48.9N	3	20--					04(7)	7	44	315	134	05	13
EBR	43.9N	3	2042	SC*	+ 1.2*	+14 *		04(4,6,7)	6	24	189	109	05	13
IRK	41.0N	3	1936	SC*	- 3.1	35	5	04(5,6,7)	7	36	177	92	05	09
TUC	40.4N	3	20--	..	..	..	..	04(2,4,5,6,7)	6	21	205	50	05	13
MMB	34.0N	3	2042	SC*	- 1.6*	+22	+ 4 *	04(4,6,7)	6	25	153	29	05	15
SJG	29.9N	3	2042	SC	--	+12	+03	04(6)	6	13	189	64	05	08
KAK	26.0N	3	2042	SC	+ .4	+19	+12	04(4,6,7)	6	17	146	62	05	16
GUL	24.5N	3	2042	SC	- 0.6	26	- 2	--	-	13	194	56	07	01
MBO	21.2N	3	2046	SC	- .9	+24.9	- 2.4	04(12)	5	7	89	22	05	03
HON	21.1N	3	2036	SC*	+01	+10	+02	05(2)	7	5	32	3	05	13
KNY	20.5N	3	2042	SC	+ .2	+22	+ 9	04(4,6,7)	6	16	166	62	05	15
JAI	17.3N	3	2042	SC	- 0.9	25	- 6	--	-	11	187	41	07	01
SHL	14.6N	3	2042	SC	- 0.4	23	5	--	-	8	211	44	07	01
UJJ	13.5N	3	2042	SC	- 0.6	30	- 7	--	-	9	199	53	07	01
ABG	09.5N	3	2042	SC	- 0.7	23	- 6	04(4,7)	6	8	181	45	07	01
HYB	07.6N	3	2040	SC	- 0.5	+24	- 2	04(5,6)	7	6	203	35	05	13
GUA	04.0N	3	2042	SC	--	20	-06	04(4)	6	10	160	40	05	09
ANN	01.5N	3	2042	SC	- 1.5	31	17	--	-	8	243	88	07	01
HUA	00.6S	3	1235	SC	--	5	--	04(5,6,7)	6	12	333	53	05	03
HUA	00.6S	3	2042	SC	3	60	5	04(5,6,7)	6	12	333	53	05	03
API	16.0S	3	2041	SC		18	- 9	04(4) 06(1)	5	9	182	43	07	09
PMG	18.7S	3	2042	SC	+ 0.5	+25	+16	04(4,5,6,7,8)	6	9	170	100	05	15
HER	33.7S	3	2041	SC	+ 1	+22	+10	04(5,6,7)	6	51	171	187	05	07
GNA	43.2S	3	2042	SC*	+ 3.2*	+30	+22	04(4,5,6,7)	7	34	160	220	05	13
TOO	46.7S	3	2042	SC	- 1.2	+22	+ 5	04(4,5,6,7)	6	30	320	130	05	09
CZT	51.2S	3	2042	SC	2	35	4	04(6)	7	56	353	216	07	02
KGL	56.5S	3	2042	SC	4	35	13	04(6)	9	235	2677	641	05	13
DUM	75.6S	3	2042	SC	80	28	165	04(1,2)	7	890	985	1215	05	15

THREE-HOUR-RANGE INDICES, K

	JAN	2		3		4		5	
	HIS	5433	2122	2322	3345	4665	6576	7554	3654
	CCS	4322	0122	2111	4535	5657	7777	7443	2645
	DIK	5423	3154	2122	3578	6767	8897	9644	3656
	TIK	3323	3122	2111	4578	4658	9998	8565	4644
	MMK	4311	1022	1111	1366	6655	6877	7543	3434
	KIR	3311	0022	0000	0367	6655	6877	8543	3334
	CWE	2222	2111	1112	3435	3768	8886	5564	3423
	COL	2223	2010	0001	4435	5568	7875	5454	3333
	LRV	6621	0121	1001	1366	5677	6767	8753	3434
	SOD	3301	0011	0000	0367	6645	6877	8543	2334
	YAK	----	----	----	----	----	----	----	----
	LER	2311	0011	0000	1225	5544	6876	6532	2212
	NUR	2211	0012	1001	1235	5445	6876	6432	2344
	LOV	3311	0012	0001	2335	5544	7876	6432	2323
	SIT	2211	1011	0011	2345	4667	8775	5663	2323
	ARS	2211	1011	1011	2334	4545	6775	5432	2333
	RSV	3311	0012	0000	3335	5445	5766	6432	2323
	MNK	3211	0011	0000	2334	4444	5765	5432	2323
	WIT	3311	0112	1001	2345	5555	5866	6533	2334
	IRT	3212	1001	1111	2344	5546	7776	5432	1434
	VAL	2311	0001	0001	2234	4545	4665	5432	2223
	KIV	3212	1121	1011	3344	5555	6776	6442	2334
	DOU	2311	1001	0010	1234	4445	5765	5432	2224
	KGD	2110	0000	0010	1223	3324	4453	4322	1212
	VIC	3312	1110	1021	2335	5666	7675	5553	2334
	OTT	2321	1110	0021	2344	5765	7664	5542	2333
	MMB	2211	1100	1000	1333	4446	5665	4432	2334

	JAN	2		3		4		5	
	TKT	3221	1011	1212	3444	5436	6575	5333	2334
	PEN	----	----	--12	2113	3335	5565	3421	1123
	TOL	2211	1100	0111	2234	3445	5664	4421	2224
	FRD	3321	0110	1121	2244	5655	5664	4543	3323
	COI	2322	2111	1112	2234	4445	5565	4433	3222
	KSA	322-	----	--22	4464	5467	7--6	5533	2354
	TUC	4321	0010	0010	1245	5656	6665	5443	2344
	KNY	2201	0110	0010	2343	5446	5665	5433	2334
	QUE								
	HON	3322	1211	1111	1243	6776	6677	7777	6655
	HYB	3211	1111	1011	3443	4336	7765	5333	1334
	SJG	3211	0100	0000	0134	4544	5664	4431	1233
	GUA	3212	1101	1001	2343	4436	5653	5432	2334
	BNG	3222	1211	1122	2245	4445	6565	3432	2334
	PMG	3211	1011	0000	2344	5446	6666	3332	1334
	HUA	3312	2231	0012	3455	3445	6665	4322	3544
	GNA	3212	1011	1010	2345	5547	7775	5332	3434
	HER	3322	1101	0011	3344	5545	6665	4432	2334
	TOO	3322	1000	0000	2333	4546	6665	4442	2333
	EYR								
	MCQ	3233	2011	1111	5535	6568	7975	5545	4324
	MIR	4554	2022	333-	----	4557	5474	5545	5544
	MAW	4543	2123	2222	4347	5777	6807	7764	3434
	NVL	----	----	----	----	----	----	----	----
	SBA	5443	3344	3321	3356	6656	5554	5544	3467
	VOS	----	----	----	----	----	----	----	----

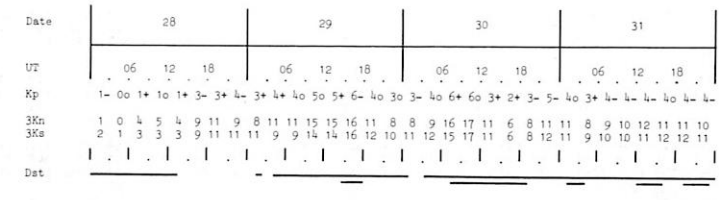

COMMON-SCALE MAGNETOGRAMS
JANUARY 3-5, 1978
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1500γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100γ
AU(5)
AL(5)
AE=AU-AL
1000γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
JAN 3, 78
JANUARY 4, 1978
JAN 5, 78

12 UT	24	24	13	2	0	0	16	16	16	16	24	24	13	13	6	20	20	20	24	24
	24	24	24	24	24	11	7	7	11	11	20	20	20	24	24	14	16	16	18	14
	9	9	7	7	7	7	7	7	7	11	11	11	11	11	11	11	11	11	3	4
13 UT	3	11	11	4	4	4	4	3	6	8	8	8	8	12	20	20	20	17	14	14
	8	6	8	12	18	22	22	22	22	22	18	18	18	18	18	18	29	29	29	35
	35	35	35	24	24	24	24	24	24	24	24	24	24	35	35	35	35	48	48	37
14 UT	48	48	59	57	57	57	70	70	90	99	113	109	106	115	121	124	113	110	121	121
	121	135	121	128	125	125	132	135	135	146	164	162	157	160	167	176	176	189	189	200
	214	205	187	182	194	196	180	178	162	160	174	199	214	233	235	230	225	218	225	220
15 UT	224	222	203	198	200	187	159	151	140	140	151	167	185	172	186	209	215	187	174	155
	126	126	126	115	93	93	70	81	93	78	85	96	86	76	76	63	66	100	107	107
	96	96	96	85	59	52	47	47	56	58	61	70	106	125	111	122	126	126	137	139
16 UT	137	137	119	130	107	96	96	93	99	103	127	144	144	135	135	86	80	80	84	75
	86	116	103	96	78	81	81	81	81	78	74	71	70	147	121	175	151	113	179	153
	157	72	92	94	84	94	107	94	84	80	82	82	70	70	67	57	63	82	94	100
17 UT	99	100	101	113	127	143	157	167	178	169	216	242	242	220	220	210	210	214	201	152
	153	161	175	175	186	175	162	152	162	145	141	137	190	160	146	145	144	144	146	311
	223	205	184	171	166	184	201	209	163	141	141	141	154	154	166	192	274	261	248	183
18 UT	196	209	274	222	169	166	152	158	157	150	145	143	141	139	135	128	124	112	107	113
	109	87	97	104	102	105	103	101	114	153	193	206	193	180	167	167	153	193	219	232
	245	249	249	236	219	193	180	193	189	176	176	202	202	180	180	174	187	187	197	210
19 UT	197	200	200	217	217	204	204	191	191	195	195	208	225	212	195	182	186	190	180	171
	162	149	149	162	179	175	162	162	149	145	132	128	124	124	137	133	133	120	120	107
	107	103	94	94	102	108	114	124	124	122	118	116	111	122	136	166	166	196	199	207
20 UT	198	228	241	224	224	211	211	198	189	192	183	174	170	161	168	176	176	168	176	180
	180	193	193	193	206	210	210	227	231	265	289	293	302	281	285	285	285	281	278	268
	268	325	330	298	236	274	304	397	421	579	615	666	641	612	537	548	565	573	529	654
21 UT	695	763	792	865	875	905	1003	1020	999	977	996	999	867	762	735	642	707	741	840	817
	783	858	891	883	887	916	890	863	852	833	785	858	894	898	886	888	876	811	711	684
	869	935	922	741	704	674	696	711	728	773	736	710	692	676	652	661	674	680	676	647
22 UT	601	557	522	509	489	469	444	429	429	429	403	398	374	378	366	377	379	353	318	313
	379	453	474	467	418	415	426	435	458	472	469	465	460	460	456	478	472	445	418	426
	420	414	418	422	413	390	385	389	393	396	406	402	411	394	377	360	330	304	283	270
23 UT	270	272	288	278	278	279	273	264	252	238	231	230	233	225	211	198	217	216	193	254
	234	201	180	173	157	136	138	130	121	142	163	147	138	178	164	153	154	155	150	125
	116	117	131	131	136	138	138	149	123	131	128	120	134	143	136	160	169	180	199	212
00 UT	236	236	241	239	251	251	261	268	269	281	292	312	316	309	266	264	230	252	271	254
	233	228	243	224	218	213	211	218	228	242	242	249	242	240	223	207	195	178	184	187
	199	188	196	201	202	215	220	206	200	190	178	189	166	182	189	169	170	176	169	117
01 UT	137	151	153	140	139	128	117	117	120	118	120	115	111	112	114	114	113	118	124	135
	152	165	175	185	180	172	164	161	164	161	160	171	191	194	203	206	207	216	230	240
	247	248	244	246	250	240	230	226	221	224	193	191	188	195	233	237	248	257	258	258
	249	234	219	192	188	183	182	172	168	166	162	164	170	170	166	176	193	206	232	230
	217	195	145	147	187	267	302	351	374	404	392	373	328	279	291	264	233	251	283	376
	459	599	619	553	503	802	789	734	704	679	751	854	984	1091	1188	1293	1471	1588	1705	1818
03 UT	1804	1736	1598	1293	1041	1047	1012	1020	1079	1054	1002	893	820	820	764	750	796	894	891	948
	910	903	884	865	884	896	881	848	846	844	765	694	567	564	610	610	617	680	722	790
	801	776	738	745	724	714	666	679	693	667	647	669	682	676	668	664	671	690	678	636
04 UT	606	526	477	447	379	333	341	322	292	269	257	302	311	324	295	279	298	283	283	279
	289	300	337	299	303	303	309	327	324	337	355	367	353	343	396	412	419	404	389	387
	408	443	433	436	491	535	525	580	582	604	656	659	647	606	587	565	549	553	541	530
05 UT	529	552	545	534	534	473	492	492	451	436	420	442	514	544	529	518	529	499	465	446
	423	411	377	351	337	367	454	422	400	425	491	548	633	665	609	609	609	573	564	538
	495	457	436	429	402	385	377	356	381	546	441	488	545	635	833	926	1016	1024	1018	859
06 UT	1022	1054	1066	1037	996	1003	988	948	852	796	864	900	1000	1106	1106	1103	1148	1178	1124	1086
	1108	1104	1123	1131	1135	1106	985	875	939	908	879	808	774	740	725	736	748	780	838	851
	856	919	868	865	894	916	912	920	972	942	888	892	861	854	807	783	768	693	663	633
07 UT	621	606	643	731	734	734	768	772	638	723	707	711	784	705	683	672	657	650	630	653
	627	581	574	555	614	522	535	531	486	516	570	601	658	664	649	663	640	841	685	655
	685	704	707	730	788	763	729	739	724	702	708	655	598	580	557	588	603	590	518	425
08 UT	439	548	536	502	490	642	653	656	587	656	597	563	552	557	565	523	515	515	451	445
	426	373	347	357	363	414	430	481	492	533	552	571	692	826	771	791	816	810	764	712
	674	638	602	623	663	702	715	744	757	774	804	877	921	942	947	921	919	940	952	939
09 UT	885	791	743	763	829	843	818	756	758	727	684	666	640	624	623	603	507	592	658	639
	651	670	735	756	713	668	640	670	597	588	665	710	645	650	667	718	741	811	880	884
	880	885	911	900	904	891	838	847	844	818	781	700	665	617	586	554	503	531	542	560
10 UT	625	648	687	707	717	707	718	712	709	731	733	756	756	785	797	756	731	659	689	670
	649	609	639	605	584	580	604	554	535	487	472	450	419	401	399	384	375	352	341	344
	330	535	815	970	1061	1118	963	821	810	719	730	963	1152	1181	1211	1393	1336	1395	1461	902
11 UT	895	944	1059	1118	1280	1352	1425	1473	1524	1546	1559	1559	1559	1572	1550	1541	1508	1600	1869	1935
	1896	1857	1773	1660	1591	1514	1314	1125	992	937	839	746	788	665	613	623	609	593	593	591
	626	659	666	664	736	690	670	678	669	562	527	469	485	511	557	537	481	433	578	677

1978 January 4, 1200 UT - January 5, 1159 UT

12 UT	774	752	905	958	858	824	769	639	488	495	518	525	534	527	559	837	935	877	862	927
	935	818	691	620	670	806	944	1000	945	825	556	388	387	395	419	409	362	349	302	322
	354	343	298	273	290	339	369	356	370	391	433	509	553	545	574	485	507	641	783	763
13 UT	827	897	953	951	1044	1062	910	788	677	669	908	679	621	909	978	581	604	623	637	636
	629	678	755	802	863	902	950	930	910	806	672	607	443	461	576	694	816	830	890	931
	945	956	959	952	944	929	951	971	938	882	805	772	728	670	613	587	553	543	509	509
14 UT	509	517	524	531	516	517	517	532	544	603	629	654	658	690	736	769	780	751	737	600
	574	556	642	687	746	783	850	872	865	806	850	861	872	894	902	842	883	945	1041	1099
	1162	1258	1324	1258	1244	1344	1263	826	589	785	884	847	684	545	368	537	605	666	580	521
15 UT	490	510	384	680	998	1253	1075	1004	944	862	825	760	698	660	558	431	412	589	929	1186
	1006	662	524	500	479	668	599	607	491	528	561	585	806	1032	973	940	896	626	823	904
	930	941	464	368	298	420	987	1056	1008	1042	1086	1341	1475	1393	1504	1393	1238	998	979	1131
16 UT	1116	990	1075	1341	1423	1334	1423	1464	1604	1537	1434	1163	1049	996	978	967	905	787	735	606
	572	522	515	637	456	426	412	454	522	533	557	589	563	514	421	482	400	530	811	837
	814	781	777	877	899	855	777	698	765	868	952	1061	1183	1279	1247	925	816	710	705	657
17 UT	672	681	718	730	757	840	922	938	973	997	1012	1037	1038	1022	970	910	900	886	893	933
	1014	1024	1009	1021	1041	1083	1090	1039	986	891	866	882	879	868	897	848	791	801	1039	1376
	1567	1626	1566	1433	1063	970	987	825	771	840	926	901	877	913	926	913	894	870	822	809
18 UT	804	798	805	795	776	704	763	814	770	674	594	466	433	448	495	495	573	677	946	986
	1015	1013	1030	1018	824	441	322	349	699	693	639	691	721	747	944	949	952	983	985	885
	852	828	863	787	726	655	607	545	532	515	524	550	671	1184	1392	1331	1257	1199	1204	1155
19 UT	1134	1058	988	824	871	901	947	1034	1138	1035	880	858	899	850	910	914	895	799	817	767
	786	822	790	787	632	609	619	659	673	616	593	592	571	519	547	568	577	584	584	578
	563	536	512	498	491	490	490	486	509	532	492	492	467	450	417	417	429	447	456	456
20 UT	465	455	458	459	524	562	592	620	643	636	614	635	644	628	623	629	604	647	644	622
	618	604	622	631	645	660	644	621	626	639	644	649	629	636	653	670	679	665	661	635
	624	619	607	596	587	600	612	617	600	558	521	503	499	481	527	542	572	583	611	677
21 UT	628	646	617	585	568	569	584	582	558	519	502	476	530	532	509	540	595	580	501	559
	588	614	684	672	667	677	699	704	678	673	683	645	569	545	516	487	466	439	416	396
	384	346	334	388	372	372	374	377	394	416	431	471	517	610	632	581	523	477	475	536
22 UT	546	539	520	515	511	447	454	735	701	679	643	643	653	673	673	646	589	494	481	470
	469	467	461	455	430	414	418	397	408	400	369	355	379	377	342	352	459	444	416	434
	459	453	421	405	445	456	435	491	544	518	492	461	430	413	387	378	358	323	311	261
23 UT	254	246	255	268	281	284	285	279	253	258	251	239	253	258	259	263	266	256	232	298
	312	315	310	329	327	336	363	377	382	384	383	397	436	410	390	373	373	395	441	467
	460	449	446	436	429	436	465	487	514	534	561	567	584	622	676	707	812	800	769	697
00 UT	613	579	598	644	679	748	829	868	925	926	880	788	816	899	884	785	777	812	884	880
	780	742	841	917	985	992	927	846	785	739	711	737	728	724	724	712	681	696	683	630
	574	607	626	671	682	752	760	798	753	714	673	631	634	616	624	616	656	604	555	517
01 UT	516	539	581	630	693	697	698	591	526	508	451	377	324	255	295	425	352	391	386	369
	370	340	351	474	532	570	569	583	553	558	542	551	589	492	426	393	379	403	490	432
	458	385	358	353	372	376	360	371	382	379	375	367	366	381	418	426	415	400	374	355
02 UT	340	333	330	350	352	334	364	386	402	379	349	345	359	359	359	371	389	391	385	385
	374	332	298	283	261	265	287	309	287	268	226	205	193	178	170	166	167	185	177	152
	145	149	181	191	163	158	176	199	192	192	188	199	200	196	187	176	173	184	187	191
03 UT	199	203	207	199	210	231	251	265	304	304	300	309	319	352	362	419	499	637	655	653
	618	592	559	589	575	524	472	479	512	540	511	495	477	453	439	450	444	439	436	415
	375	388	392	403	455	493	532	533	499	462	466	421	411	371	380	388	424	511	546	587
04 UT	603	626	659	644	545	439	417	420	406	466	485	545	571	572	542	538	552	582	643	651
	655	670	663	660	682	720	746	765	799	806	803	788	773	757	772	762	724	686	659	651
	636	616	605	609	605	590	590	572	567	585	592	596	600	581	525	511	534	601	604	605
05 UT	620	619	593	578	559	585	619	650	639	640	648	648	640	621	636	636	629	618	629	633
	610	613	590	575	571	552	559	565	572	568	553	541	530	518	503	484	488	480	447	424
	413	405	408	416	398	381	374	370	374	372	390	375	361	361	365	368	360	338	309	297
06 UT	291	286	286	299	299	309	309	305	301	310	344	365	378	378	385	444	506	520	505	459
	454	480	478	443	402	382	349	349	347	364	381	389	393	376	359	359	350	357	331	314
	305	305	309	318	323	310	313	316	313	313	313	322	301	294	287	301	299	311	320	316
07 UT	316	326	309	296	299	350	438	479	483	466	455	458	481	492	508	511	505	488	521	505
	489	477	509	509	512	515	515	511	485	439	418	404	407	402	424	447	472	478	511	535
	515	514	515	541	550	569	546	506	486	459	441	432	412	423	435	421	388	377	372	372
08 UT	377	384	391	402	424	429	447	464	464	462	460	473	473	486	484	479	477	477	459	459
	459	470	465	461	448	450	439	424	424	419	415	392	388	389	385	399	383	370	368	389
	396	400	408	404	430	457	471	444	428	412	381	381	372	379	386	381	375	377	378	381
09 UT	394	394	392	390	390	378	363	338	309	318	325	338	325	312	323	323	336	321	321	318
	331	331	334	327	312	312	312	312	312	318	321	308	316	325	325	318	338	352	352	354
	357	359	361	359	357	359	359	364	353	355	36[illegible]	364	360	355	360	364	358	358	353	351
10 UT	343	347	352	347	338	327	315	304	301	297	292	285	285	285	274	267	254	254	252	249
	242	251	251	253	258	253	251	262	266	271	278	285	294	301	314	328	321	310	319	324
	326	328	328	326	337	337	334	345	341	345	348	348	345	343	354	351	341	356	356	354
11 UT	349	349	351	354	347	340	373	378	378	373	377	368	381	372	380	376	382	364	355	351
	333	302	309	319	305	286	264	264	248	246	244	239	224	224	222	231	238	240	244	244
	238	241	247	254	259	261	268	268	268	270	277	297	299	302	302	304	297	293	290	273

1978, JANUARY 28 - 31



Data from Individual Observatories

JANUARY 1978

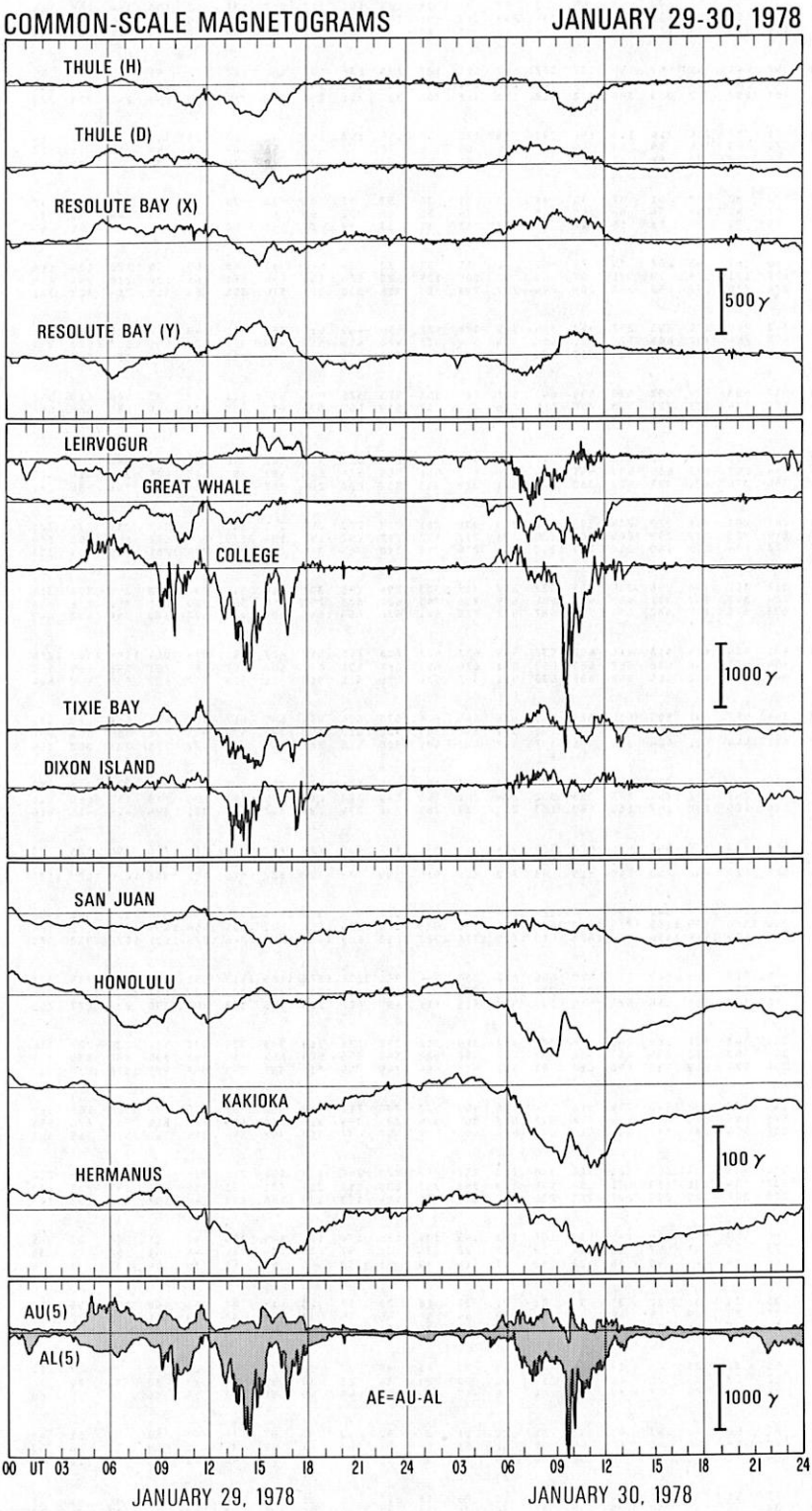
Values underlined are for X and Y, X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
SIT	60.0N	28	09--	..	..	..	..	30(4)	8	--	--	--	31	21
NEW	55.1N	28	1854	..	..	..	..	30(4)	8	56	501	297	01	06
FRD	49.6N	28	18--	..	..	..	..	29(4,5,6) 30(3,4)	5	27	139	72	01	06
BOU	48.9N	28	1854	SC	+ 1	+ 5	- 1	29(5)	6	26	110	30	29	21
EBR	43.9N	28	15--	..	..	..	..	29(5,6) 31(1)	5	10	137	50	01	05
IPK	41.0N	28	15--	..	..	..	..	29(6) 30(3,4)	6	22	180	59	31	23
TUC	40.4N	28	1854	SC		+15		29(6) 30(4)	6	14	105	30	01	08
GUL	24.5N	28	1600	..	..	..	..	--	-	7	185	41	31	01
HBO	21.2N	28	1852	SC	+ .4	+17.8	- 2.9	29(12)	4	1	45	10	30	12
HON	21.1N	28	1853	SC	+01	+04	+01	30(3)	7	11	25	9	01	05
JAI	17.3N	28	1600	..	..	..	..	--	-	8	139	40	31	01
SHL	14.6N	28	1600	..	..	..	..	--	-	5	186	32	31	01
UJJ	13.5N	28	1600	..	..	..	..	--	-	6	140	41	31	01
ABG	09.5N	28	1600	..	..	..	..	29(5,6)	6	6	150	41	31	01
HYB	07.6N	28	1500	SC	- 0.2	+16	- 2	29(5,6)	6	4	171	31	30	15
GUA	04.0N	28	1853	SC	--	15	-03	30(3)	6	10	230	40	31	24
ANN	01.5N	28	1600	..	..	..	..	--	-	6	207	59	31	01
HUA	00.6S	28	1446	..	..	..	..	29(6)	7	13	310	58	30	21
API	16.9S	28	1853	SC		15	- 9	30(4)	5	10	183	30	30	16
PHG	18.6S	28	1855	SC		+19	+16	30(3,4)	6	12	180	100	31	00
HER	33.7S	28	18--	..	..	..	..	29(6)	5	20	124	102	30	15
TOO	46.7S	28	15--	..	..	..	..	30(4)	6	30	180	30	30	13
KGL	56.9S	28	17--	..	..	..	..	29(5,6) 30(4)	6	--	--	--	30	18
DUH	75.6S	28	1700	..	..	..	..	30(1,2)	7	1090	880	1245	30	14
RES	83.0N	29	0400	..	..	..	..	29(6)	-	406	439	347	30	13
CBB	76.7N	29	0400	..	..	..	..	29(2)	-	570	680	740	29	24
BLC	73.9N	29	0400	..	..	..	..	29(4)	-	710	575	550	29	21
FCC	68.8N	29	0200	..	..	..	..	29(6)	-	648	606	556	29	22
COL	64.6N	29	04--	..	..	..	..	29(5) 30(4)	8	558	2590	1450	01	05
STJ	58.7N	29	0400	..	..	..	..	30(3,4)	4	330	230	370	30	13
OTT	57.0N	29	0300	..	..	..	..	30(3,4)	6	35	304	175	30	12
WIT	54.2N	29	04--	..	..	..	..	29(6)	6	25	175	90	30	24
MMB	34.0N	29	2016	SC*	- 1 *	+15	+ 2 *	30(3)	6	10	140	36	30	22
KAK	26.0N	29	2016	SC*	- .5*	+12	+ 8	30(3)	6	7	150	66	30	22
KNY	20.9N	29	2016	SC		+14	+ 5	30(3)	6	7	176	59	30	22
HYB	07.6N	29	2015	SC	- 0.4	+16	- 2	30(4)	6	4	171	27	31	22
HUA	00.6S	29	2016	SC	2	53	2							
GNA	43.2S	29	2017	SC	+ 1.8	+20	+11	30(4)	6	25	110	150	30	14
CBB	76.7N	30	0400	..	..	..	..	30(3)	-	770	640	670	30	23
BLC	73.9N	30	0400	..	..	..	..	30(3)	-	725	1140	1090	30	24
FCC	68.8N	30	0300	..	..	..	..	30(3)	-	850	800	785	30	24
BOU	48.9N	30	03--	..	..	..	..	30(4)	6	28	127	76	30	17
HUA	00.6S	31	3622	..	..	..	..	31(5,6)	5	9	196	58	31	21

THREE-HOUR-RANGE INDICES, K

	JAN	28	29	30	31
	HIS	2332	2564	4544	5554	3544	5653	4554	3334
	CCS	1111	2743	4333	6643	3544	2324	5435	6744
	DIK	1112	3775	5455	8764	4466	5355	6546	7855
	TIK	1111	2765	3437	8764	3378	7445	4548	7887
	MMK	0000	0345	4334	5754	2356	3246	6424	5566
	KIR	0001	1346	4333	6744	2365	3236	6433	5566
	CWE	----	----	2456	8854	2378	6323	3456	5664
	COL	0012	1332	2557	8753	3468	4323	2356	5543
	LRV	2111	1244	6565	4653	4477	4337	7654	4467
	SOD	0000	0345	3233	6643	2355	3236	6423	4566
	YAK	----	----	----	----	----	----	----	----
	LER	0000	1224	3333	5542	2243	212*	*3*2	2444
	NUR	1001	1333	2333	4542	2244	2235	4223	4443
	LOV	0001	1333	3334	6642	2354	3235	4233	4544
	SIT	0022	0232	2446	7732	1468	5232	2245	5432
	ARS	1111	1442	2334	5532	2346	3134	4333	4433
	RSV	1011	0333	3334	4543	2354	3135	4333	4544
	MNK	0011	1333	2334	5542	2344	3134	4223	4534
	WIT	0011	1344	3344	5653	3355	3235	4334	3544
	IRT	1112	1443	2445	5643	2366	5232	3233	4443
	VAL	0111	2334	3333	4542	2354	2225	4233	3444
	KIV	1122	2433	3334	5653	2355	4245	4334	4534
	DOU	0011	1333	3334	5543	2354	2235	4333	3443
	KGD	0010	0222	2223	3421	1234	3012	2122	2322
	VIC	0033	1233	3546	6632	3467	4233	3244	4333
	OTT	0021	2233	2446	5532	2466	3324	4333	3333
	MMB	0012	1433	3435	5443	3365	4222	2233	4442

	JAN	28	29	30	31
	TKT	1121	2333	3445	6643	3455	5232	2234	4533
	PEN	---	132-	----	----	---3	3224	4323	3333
	TOL	1121	1333	3234	5552	3344	3324	5233	3324
	FRD	0021	1243	3445	5543	2355	3234	4333	4333
	COI	----	----	----	----	----	----	----	----
	KSA	0011	3445	3335	6644	4365	4244	2234	4544
	TUC	0022	1253	3435	5633	3456	3233	3333	3444
	KNY	0011	1433	3434	4434	4465	5222	2233	4442
	QUE								
	HON	3111	2355	4465	5454	4477	6545	6655	5544
	HYB	1111	1333	3324	6643	3456	5232	2333	4533
	SJG	0000	0243	4334	4432	3344	2222	3233	2343
	GUA	2001	2334	5434	3333	4565	5223	2343	3443
	BNG	1222	2344	4434	6643	4445	4334	4234	4334
	PMG	0001	1343	4435	4343	4466	5223	--33	4443
	HUA	1111	2444	3334	5764	3344	5432	3333	5543
	GNA	0011	1443	4224	4534	4556	4223	3343	4553
	HER	1011	1244	3334	4543	4444	3234	4234	4334
	TOO	0001	1333	3345	5543	3356	4213	3433	4442
	EYR								
	MCQ	1111	0533	3656	8843	4557	5323	3446	7643*
	MIR	2333	2334	4556	4533	5565	4223	3555	4443
	MAW	3221	2446	4565	6634	4566	4436	6555	4655
	NVL	1111	1234	4554	5543	3457	3235	5533	3454
	SBA	3332	3457	5544	5654	6555	3445	5433	3444
	VOS	3222	2344	4454	4544	5554	4334	4343	3334


COMMON-SCALE MAGNETOGRAMS
JANUARY 29-30, 1978
THULE (H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
1000 γ
TIXIE BAY
DIXON ISLAND
SAN JUAN
HONOLULU
KAKIOKA
100 γ
HERMANUS
AU(5)
AL(5)
AE=AU-AL
1000 γ
00 UT 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21 24
JANUARY 29, 1978
JANUARY 30, 1978

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

1978 January 29, 0000 UT - January 30, 2359 UT

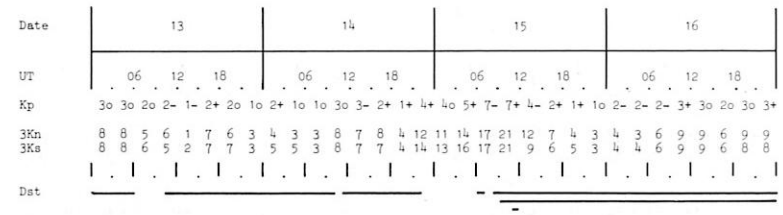
00 UT	71	53	53	53	58	45	62	80	93	93	123	141	137	137	137	142	159	164	168	168
	168	155	173	190	190	211	235	239	219	191	190	186	186	177	177	159	159	146	146	129
	119	119	115	115	119	102	84	90	90	79	72	67	67	67	72	72	69	77	89	84
01 UT	57	41	41	60	95	107	107	107	111	127	138	138	138	130	122	110	98	83	71	59
	53	53	53	53	46	94	102	129	140	125	133	171	198	237	251	254	246	265	276	280
	287	298	322	333	340	332	317	328	312	308	305	301	298	284	261	250	243	240	233	225
02 UT	221	222	214	214	210	191	190	178	175	160	149	153	153	142	123	108	103	99	95	84
	70	63	55	55	58	61	65	65	69	76	76	72	64	56	49	44	44	48	53	53
	56	60	60	55	50	50	42	46	50	53	50	66	70	70	74	74	70	79	71	81
03 UT	73	82	78	61	37	36	38	43	38	36	37	33	33	33	33	33	33	33	37	47
	43	41	54	54	54	45	48	52	56	60	68	52	56	64	62	63	55	46	38	30
	25	20	30	28	15	17	20	33	33	33	37	39	39	41	50	72	63	62	61	65
04 UT	66	67	63	67	74	78	62	50	33	33	33	34	43	63	60	69	88	120	134	148
	177	171	105	79	71	67	69	97	105	109	120	124	146	154	161	161	188	218	241	256
	276	276	257	253	260	286	294	287	296	305	316	330	323	316	308	304	311	319	327	331
05 UT	342	319	300	293	297	342	375	345	338	422	455	469	417	388	481	649	547	521	489	570
	658	764	737	689	629	612	616	614	569	521	486	486	513	518	507	502	491	507	538	538
	516	527	536	518	504	517	539	588	679	706	701	679	668	648	619	591	507	524	540	566
06 UT	582	608	635	657	679	690	643	601	585	563	573	575	542	527	511	522	533	608	619	641
	652	674	703	703	698	705	716	716	712	700	689	669	631	609	603	623	654	685	668	687
	742	779	839	821	829	827	755	735	733	696	656	664	672	666	654	648	672	657	630	619
07 UT	599	563	544	560	542	520	509	538	551	543	547	514	502	502	558	584	557	542	565	532
	538	647	673	635	590	541	514	525	540	551	566	574	545	463	407	407	425	388	414	426
	356	376	431	393	402	383	345	341	329	313	302	280	269	287	306	284	257	248	254	281
08 UT	281	281	281	270	284	299	310	315	301	281	273	270	255	255	248	253	242	231	231	220
	215	220	209	209	209	209	229	223	207	192	182	192	190	194	179	168	172	191	200	179
	183	194	205	189	210	239	243	256	274	313	310	305	300	283	270	270	281	289	294	303
09 UT	312	307	303	298	305	319	322	317	313	303	294	290	301	318	315	292	290	295	307	314
	324	350	369	397	407	477	564	629	708	740	822	823	792	754	824	820	788	751	708	698
	633	676	709	682	689	592	587	602	578	611	636	654	664	688	485	492	500	544	452	442
10 UT	431	424	424	413	411	497	530	569	622	673	703	796	812	827	851	974	1064	1085	1183	1216
	1194	972	642	638	667	668	692	671	676	659	687	691	677	668	657	680	701	692	665	669
	646	619	602	616	648	666	633	611	562	531	526	521	515	501	509	557	590	595	569	544
11 UT	544	557	601	603	616	629	645	636	649	675	675	655	654	645	617	567	526	517	470	480
	448	412	403	403	398	440	394	351	352	389	422	410	368	395	470	488	498	535	560	557
	482	444	421	404	376	401	397	397	422	491	500	426	361	398	485	437	330	331	363	364
12 UT	265	251	228	237	232	202	190	188	178	184	177	174	192	207	225	229	230	233	231	229
	240	249	257	263	277	299	302	274	261	261	240	227	213	205	183	169	139	135	146	141
	126	125	138	147	160	169	183	213	239	265	290	294	298	302	328	361	394	405	416	416
13 UT	423	423	423	445	456	478	526	574	611	651	743	739	735	732	739	765	776	798	820	798
	765	702	662	673	633	622	625	581	548	504	504	508	493	446	420	451	484	446	454	527
	568	619	682	708	745	815	793	712	801	986	999	973	908	832	871	872	931	1016	1079	1130
14 UT	1193	1153	1014	941	992	1102	1227	1227	1107	1052	1027	957	971	1000	1026	993	956	937	988	996
	996	1036	1099	1165	1219	1263	1424	1446	1535	1535	1528	1524	1560	1601	1605	1506	1459	1279	1272	1264
	1293	1454	1549	1656	1663	1678	1679	1705	1738	1727	1693	1660	1513	1459	1346	1276	1121	1022	970	970
15 UT	955	919	889	829	777	619	666	813	886	944	981	1106	1175	1186	1113	951	889	757	739	732
	806	881	1049	1153	1197	1207	1233	1262	1274	1272	1158	1129	1116	1119	1105	1109	1117	1106	1095	1018
	948	892	788	656	626	586	553	534	515	511	499	422	388	385	369	340	290	296	277	266
16 UT	299	343	321	280	269	258	277	303	315	318	330	331	319	333	335	337	337	330	323	334
	344	360	372	395	416	432	452	479	490	522	543	559	575	655	710	791	806	802	839	799
	736	624	569	530	550	612	593	542	600	666	749	745	818	935	993	997	985	1000	1036	1069
17 UT	1113	1158	1096	1048	1000	916	864	816	809	802	773	711	689	652	568	549	579	588	585	582
	579	605	639	657	624	556	512	417	365	364	384	394	405	410	444	558	854	782	676	598
	732	854	788	737	696	685	672	615	558	527	492	437	388	368	356	345	342	326	309	363
18 UT	426	436	323	307	331	319	306	273	217	233	228	206	198	196	211	225	213	198	189	203
	207	204	191	179	171	180	194	229	253	260	230	212	218	231	203	205	200	195	205	210
	208	207	209	209	207	203	200	202	195	194	184	193	189	188	202	245	197	161	163	159
19 UT	160	159	153	149	145	138	167	168	149	135	186	176	125	109	106	90	91	87	63	35
	25	27	43	57	49	45	29	17	22	36	31	57	30	34	66	46	61	52	40	30
	46	39	44	40	36	22	22	17	14	19	31	52	50	48	40	35	46	33	31	24
20 UT	25	30	32	32	33	33	28	21	22	20	20	17	23	16	32	63	160	118	195	61
	37	26	39	25	40	65	34	29	44	59	46	35	37	33	33	29	11	18	22	22
	34	25	41	57	46	38	46	57	69	73	69	45	42	45	50	37	32	22	32	51
21 UT	51	32	23	23	23	24	33	25	30	40	40	33	20	25	34	26	20	29	27	20
	22	22	34	36	20	22	17	20	20	20	34	23	30	33	35	33	30	30	30	30
	30	33	36	37	37	37	44	48	57	57	54	46	45	52	60	56	56	56	56	69
22 UT	61	54	46	43	48	47	31	22	11	37	42	42	53	57	38	43	60	62	51	49
	49	49	46	46	46	46	51	51	51	64	59	64	64	64	64	71	69	51	66	63
	54	71	71	58	56	56	56	69	75	86	75	63	71	75	58	73	119	81	110	86
23 UT	73	51	62	62	64	71	54	38	25	18	23	25	26	35	44	46	43	41	41	37
	38	34	30	30	22	22	22	26	24	11	11	26	26	24	22	22	24	29	26	33
	33	24	34	34	34	34	34	34	34	34	34	34	34	47	41	41	28	32	35	39

PRELIMINARY AE (5)-INDEX AT ONE MINUTE INTERVALS

1978 January 30, 0000 UT - January 31, 2359 UT

00 UT	30	30	33	36	34	30	43	43	43	31	24	24	26	22	25	32	38	39	32	29
	30	23	23	31	39	39	35	43	47	37	37	37	41	46	61	42	41	51	63	63
	66	70	68	68	70	71	81	85	82	83	79	90	93	90	93	98	98	96	87	92
01 UT	97	123	118	134	117	110	123	106	96	88	100	121	114	100	92	114	114	145	138	119
	129	125	122	126	120	120	120	111	106	84	84	81	65	49	37	42	46	38	35	30
	31	31	30	30	26	30	35	35	35	17	15	25	15	17	12	23	36	36	49	47
02 UT	30	28	20	25	35	25	23	30	25	25	29	29	20	37	41	45	45	29	21	17
	16	20	25	24	28	24	36	23	12	36	47	47	47	23	23	12	12	24	29	24
	36	36	36	36	60	60	36	49	64	75	78	48	36	25	73	97	95	104	93	132
03 UT	156	158	171	160	156	152	153	158	171	168	180	180	184	150	135	123	120	113	101	89
	80	63	51	43	46	63	56	48	48	52	44	34	33	43	43	56	36	39	49	51
	48	28	27	31	36	23	34	26	39	40	48	48	33	39	35	31	43	43	35	35
04 UT	36	42	42	39	35	22	25	23	22	29	42	37	30	25	28	36	36	36	36	37
	36	49	49	62	73	73	73	73	83	105	109	113	113	120	136	147	151	151	151	155
	144	144	133	118	118	103	92	88	235	240	198	187	205	203	207	195	177	144	135	154
05 UT	179	188	194	199	162	168	188	193	175	170	172	158	153	160	166	188	205	210	221	218
	209	229	268	273	268	279	263	264	308	312	334	341	352	330	314	307	296	270	259	221
	220	198	187	141	153	169	166	187	213	243	289	270	266	262	270	277	277	273	257	254
06 UT	246	242	242	246	250	235	232	232	206	172	175	134	144	164	183	264	299	336	379	426
	450	470	545	578	527	501	486	463	480	527	572	592	480	471	566	511	462	487	474	459
	528	689	789	725	582	612	609	702	604	571	509	498	471	569	572	531	540	557	576	615
07 UT	586	544	553	615	598	591	629	694	796	810	852	859	859	853	752	668	683	846	868	878
	807	746	731	675	599	554	541	555	584	617	825	845	851	812	753	738	811	834	667	533
	503	530	583	545	541	588	627	831	846	818	732	699	665	660	658	610	678	692	696	692
08 UT	663	626	577	570	563	608	634	629	627	639	664	704	703	672	669	695	726	714	692	677
	711	704	692	662	647	621	607	587	578	563	558	559	530	564	534	518	539	579	628	673
	530	552	557	562	553	540	568	578	579	593	577	559	542	524	507	492	504	514	538	535
09 UT	512	521	507	484	474	502	556	610	641	692	679	640	622	619	606	588	579	601	1225	1744
	1749	1161	1038	1202	1409	1660	1678	1702	1718	1813	2011	2048	2008	2019	1843	1743	1575	1421	1165	1094
	897	847	979	1421	1202	1248	1586	1494	1522	1595	1589	1556	1481	1390	1175	899	794	701	617	575
10 UT	582	587	609	610	663	689	749	768	689	658	654	698	688	727	831	1057	1106	1159	1209	1235
	1103	880	750	686	752	867	910	993	937	896	843	819	767	723	713	692	679	714	739	751
	745	785	808	769	745	727	686	716	666	565	518	507	512	508	585	549	495	478	471	494
11 UT	507	515	523	514	497	547	616	742	766	745	674	679	644	680	676	683	714	702	649	633
	610	568	626	685	661	676	650	611	625	599	566	554	545	540	561	547	572	592	591	599
	568	541	532	502	501	524	525	534	512	485	398	353	323	281	288	292	314	336	362	339
12 UT	389	302	246	244	226	237	242	179	173	159	145	147	149	139	156	192	224	241	249	193
	178	198	190	196	207	185	145	112	94	72	113	184	251	313	295	280	270	277	244	225
	198	234	220	244	298	331	325	259	260	253	269	259	239	203	176	154	132	132	159	178
13 UT	162	136	124	110	99	91	88	100	96	106	55	47	66	100	130	68	34	59	66	75
	123	46	79	88	68	93	108	106	81	78	74	85	106	93	104	69	71	84	73	66
	51	62	87	97	97	97	95	82	70	100	104	87	87	87	85	72	72	67	72	76
14 UT	79	84	65	68	59	73	64	69	93	100	95	112	100	100	102	97	112	124	96	96
	92	89	78	59	51	33	34	51	79	97	80	62	66	83	81	86	75	64	71	76
	78	71	75	86	92	85	60	51	51	47	36	43	75	72	73	87	95	85	90	96
15 UT	105	110	121	126	118	116	125	128	134	129	121	131	124	108	106	98	118	137	155	136
	124	120	130	135	154	128	101	52	43	53	64	72	76	76	68	60	56	77	77	81
	81	77	65	58	55	77	78	71	77	81	77	71	69	78	89	102	115	121	145	145
16 UT	145	145	145	145	145	134	134	123	123	123	123	125	125	114	114	114	103	103	92	92
	92	103	103	90	101	101	101	101	88	88	88	75	75	75	75	75	64	64	64	64
	64	64	64	56	68	51	56	49	42	64	64	51	73	84	60	49	49	52	79	79
17 UT	73	73	73	73	86	86	73	62	51	51	62	60	49	38	51	62	62	62	51	51
	62	75	75	75	75	75	75	64	51	51	63	55	47	40	40	40	51	51	51	64
	60	56	53	53	53	53	64	64	64	53	40	40	40	40	40	40	40	40	39	39
18 UT	23	30	36	36	38	34	30	27	30	38	42	38	36	37	32	28	22	14	17	17
	19	23	29	29	28	28	36	36	36	28	28	28	24	24	24	22	22	18	18	21
	24	29	29	31	29	31	36	39	41	44	39	34	45	45	61	86	103	141	154	163
19 UT	147	104	91	82	90	94	97	101	105	88	88	87	94	88	85	80	76	85	88	92
	92	88	68	64	64	64	68	68	72	83	99	108	105	98	88	88	87	83	75	78
	70	70	55	51	49	58	60	50	42	32	42	115	128	87	68	87	100	88	73	123
20 UT	144	136	75	60	70	55	82	95	66	43	36	43	63	50	46	38	34	46	57	57
	54	54	54	60	64	58	66	70	86	97	114	106	102	108	100	117	121	121	96	92
	88	101	105	109	109	105	105	114	127	140	153	166	195	205	217	217	214	214	226	239
21 UT	256	290	293	319	315	337	349	366	384	375	366	353	336	340	344	344	331	301	284	281
	260	260	256	256	258	250	242	229	221	221	203	186	168	155	155	155	173	212	243	260
	251	255	268	268	246	241	249	249	249	232	227	219	211	198	198	185	172	159	164	164
22 UT	159	172	189	194	211	215	211	211	215	224	215	202	198	211	215	220	199	199	173	142
	138	151	155	155	164	191	227	246	254	210	209	212	220	139	120	139	133	139	173	185
	198	224	220	212	216	233	246	220	228	228	223	236	241	246	250	242	239	239	238	243
23 UT	243	249	265	290	305	319	324	323	315	315	302	307	319	328	310	297	275	271	274	305
	292	261	244	248	266	240	253	268	298	348	384	385	394	418	434	456	466	476	482	480
	490	496	492	281	275	387	434	457	495	552	562	584	582	569	555	567	549	515	569	589

1978, FEBRUARY 13 - 16



Data from Individual Observatories

FEBRUARY 1978

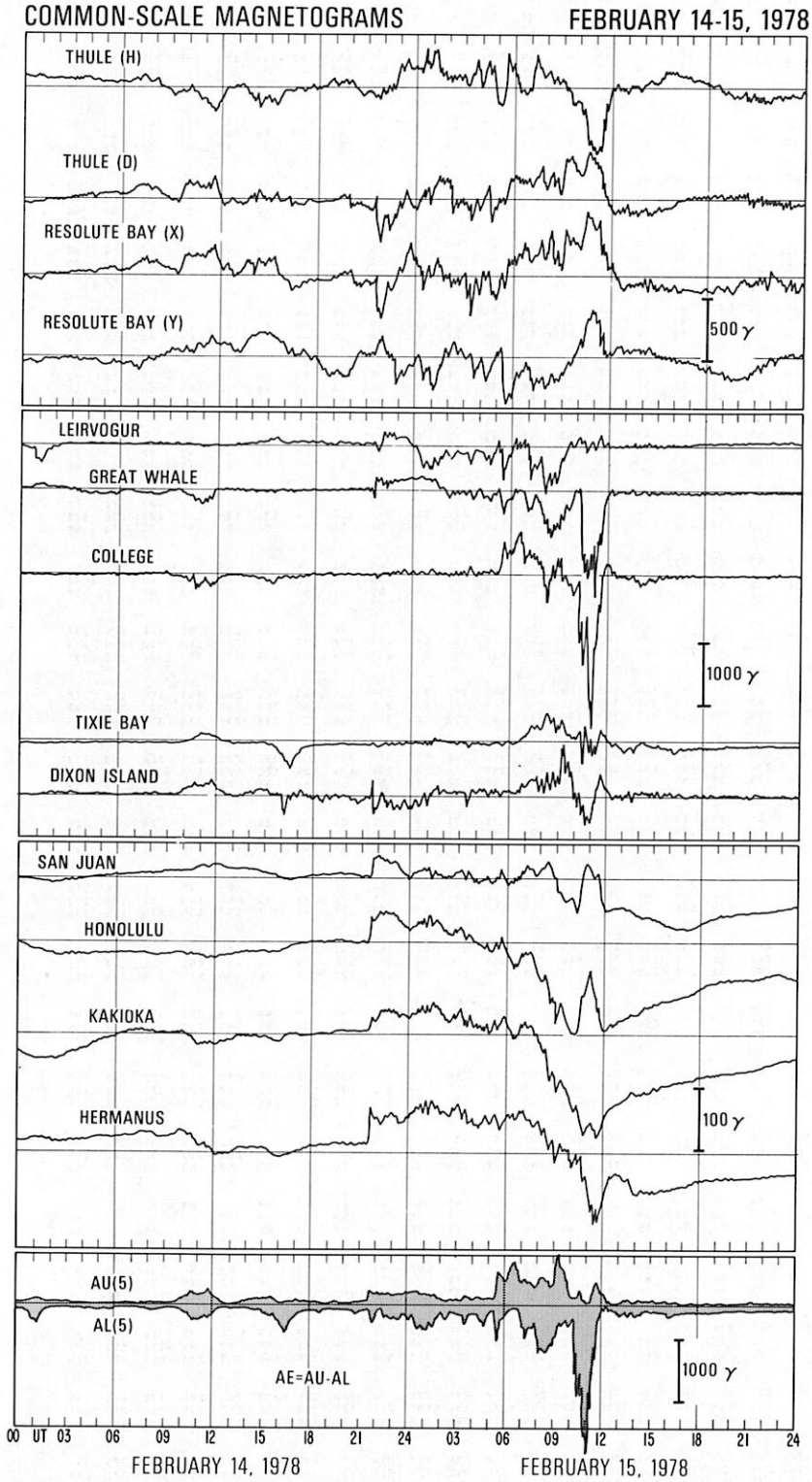
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
RES	83.0N	14	2147	SC	167	40	61	14(8)	-	837	735	581	16	03
CBB	76.7N	14	2000	..	..	..	..	15(4)	-	740	630	1420	15	21
BLC	73.9N	14	2147	SC	--	--	--	15(4)	-	1000	890	2200	15	19
FCC	68.8N	14	2147	SC	--	--	--	14(4)	-	2400	2320	1630	15	19
COL	64.6N	14	2146	SC*	--	--	--	15(4)	9	310	3090	830	15	19
SIT	60.0N	14	2147	SC*	+13 *	-33 *	-27 *	15(4)	8	--	--	770	15	20
STJ	58.7N	14	2050	..	..	..	..	15(4)	7	470	650	470	15	18
OTT	57.0N	14	2245	..	..	..	..	15(4)	8	75	539	398	15	18
NEW	55.1N	14	2146	SC	5	44	--	15(4)	9	47	740	742	15	21
WIT	54.2N	14	2147	SC*	- 5	+72	+ 3	15(3,4)	6	20	235	45	15	14
FRD	49.6N	14	2147	SC*	+ 4	+55	-11	15(4)	7	40	151	125	15	15
BOU	48.9N	14	2148	SC	- 1	+31	- 8	15(3)	6	26	150	145	15	15
EBR	43.9N	14	2147	SC	+ .9	+41	+28	15(4)	7	8	196	84	15	19
IRK	41.0N	14	2145	SC*	- 7.6	36	6	15(3)	7	28	238	86	15	21
TUC	40.4N	14	2145	SC	- 2	+45	+ 3	15(3,4)	7	14	165	35	15	17
HMB	34.0N	14	2147	SC	+ 1.3	+20	- 3	15(3,4)	6	16	223	32	15	24
SJG	29.9N	14	2145	SC	+ 1.5	+31	+ 7	15(4)	6	16	96	22	15	19
KAK	26.0N	14	2147	SC	+ .9	+27	+15	15(3,4)	6	11	223	70	15	24
GUL	24.5N	14	2145	SC	- 2.1	41	- 4	--	-	10	--	29	16	03
HBO	21.2N	14	2140	SC	- .9	+55.9	- 6.9	15(11)	5	4	132	35	15	19
HON	21.1N	14	2147	SC	02	13	06	15(4)	7	10	33	09	17	09
KNY	20.5N	14	2147	SC	+ .5	+24	+ 8	15(3)	7	8	250	72	15	24
JAI	17.3N	14	2145	SC	- 1.9	42	-11	--	-	10	271	28	16	03
SHL	14.6N	14	2145	SC	- 1.3	32	7	--	-	6	318	22	16	03
UJJ	13.5N	14	2145	SC	- 1.3	49	-12	--	-	8	294	26	16	03
ABG	09.5N	14	2145	SC	- 1.5	41	-14	15(4)	7	10	267	37	16	03
HYB	07.6N	14	1000	SC	- 1.0	+41	- 3	15(4)	8	8	308	28	16	10
GUA	04.0N	14	2147	SC	-01	38	-09	15(3)	7	--	300	30	15	15
ANN	01.5N	14	2145	SC	- 2.2	52	20	--	-	9	312	121	16	03
HUA	00.6S	14	2147	SC	3	100	12	15(4,5)	6	13	338	41	15	20
TRO	01.1S	14	2145	SC	- 0.8	41	53	--	-	5	333	194	16	03
API	16.0S	14	2146	SC	- 1	34	-13	15(4)	7	7	240	45	16	15
PHG	18.7S	14	2145	SC	- 2.8	+36	+24	15(3,4)	6	9	290	130	15	19
HER	33.7S	14	2148	SC	+ 5	+55	+41	15(4)	6	23	198	152	15	15
GNA	43.2S	14	2147	SC	+ 3.9	+24	+17	15(3)	7	10	190	240	15	19
TOO	46.7S	14	20--	..	..	..	..	15(2)	6	40	260	120	15	15
TOO	46.7S	14	2145	SC	- 6	+ 8.0	0	15(2)	6	37	285	119	15	15
CZT	51.2S	14	2147	SC	9	50	10	15(3)	6	41	170	78	15	21
KGL	56.5S	14	2147	SC	13	37	11	15(4)	8	104	671	251	15	23
KGL	56.5S	14	2147	SC*	--	--	--	15(4)	8	--	--	--	15	15
DUM	75.6S	14	2147	SC	330	70	265	14(8) 15(1,2)	8	1800	1685	2040	15	13

THREE-HOUR-RANGE INDICES, K

FEB	13		14		15		16	
HIS	4532	2544	4444	4456	6776	4355	5334	4335
CCS	3322	2443	3233	3546	6666	3332	1133	5354
DIK	3332	2544	3325	5646	6668	5443	3235	5655
TIK	3222	2662	2125	4724	5578	5431	1236	7755
MMK	3311	0342	2112	3326	5457	4222	2123	3456
KIR	4411	1341	3112	3326	5457	4222	3113	3556
CWE	2212	0221	1113	3314	4469	6311	1125	6333
COL	1122	0110	1114	3313	3579	5211	0125	5334
LRV	6522	1333	5212	2335	6776	3222	3323	2466
SOD	3300	0230	2002	2326	5457	3222	2113	2445
YAK	3221	1332	2223	2314	4557	4211	1224	4333
LER	3211	0222	2001	2203	3455	2110	2102	2233
NUR	3322	1221	2112	2214	3456	3222	2122	2233
LOV	3321	1210	2012	2214	3466	3211	2013	3233
SIT	2111	0120	1014	3214	3478	5211	0124	4223
SVD	3312	0321	1112	2314	3556	3221	2122	3233
RSV	3321	0321	2112	2214	4556	3221	2112	2233
MNK	3321	1221	2012	2214	3455	3211	1122	2233
WIT	3322	0321	2113	3325	4566	3211	2113	3344
IRT	3322	2322	2223	3314	4676	4311	2223	4237
VAL	3312	1221	2012	2214	3456	3210	1112	2133
KIV	332-	----	--12	2224	4556	3321	2223	3233
DOU	3322	1221	2112	2214	4456	3211	1113	2133
KGD	1111	0210	0111	1202	2334	2100	0111	2111
VIC	1222	0121	1003	2214	3468	6221	1134	3233
OTT	3311	2221	1113	3224	3468	6321	1123	2123
MMB	2222	0121	2133	3324	4466	3211	2223	4233

FEB	13		14		15		16	
TKT	2223	2322	1224	3324	3567	4212	3233	4123
PEN	3322	1222	2111	1315	3467	3221	1112	2133
TOL	3212	0222	2112	1114	3345	3321	0112	2032
FRD	3311	0221	2103	2214	3457	3111	1123	2122
COI	3323	3222	2123	2225	3456	3211	1123	3333
KSA	3142	0320	1133	3364	4557	4220	0213	4324
TUC	3322	0211	1123	2225	4577	5111	1123	3113
KNY	1222	1220	1113	3315	4576	3210	0223	3233
QUE	2333	2221	1---	----	-467	4431	2333	3253
HON	4422	1211	2212	1215	5477	7655	6656	6555
HYB	2333	1211	1112	3325	4578	5431	1322	3213
SJG	2232	0110	0102	1214	3456	3310	0012	1012
GUA	2223	1100	2213	3315	5576	3201	2334	4223
BNG								
PNG	2222	1110	0103	3315	4566	5311	1123	4222
HUA	2223	3432	2112	4435	4456	6332	1112	3233
GNA	2222	0221	2113	3225	5577	3211	1123	4344
HER	3222	0322	2223	3315	4556	4311	1122	2223
TOO	1232	0211	0123	2213	4677	2310	0233	4332
EYR	2322	0120	0213	2214	4667	3111	1224	3232
MCQ	1212	0111	1114	3213	4658	3211	1126	6452
MIR	4443	2223	3344	4335	5876	5333	3355	5234
MAW	3431	2243	4323	4445	6778	3334	4435	3655
NVL	3332	1332	2122	1224	4666	3222	2122	2235
SBA	3333	2443	3333	3443	6656	4545	4544	3334
VOS	3434	3339	3234	4435	6667	5335	4344	4333


COMMON-SCALE MAGNETOGRAMS
FEBRUARY 14-15, 1978
THULE (H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
1000 γ
TIXIE BAY
DIXON ISLAND
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
00 UT 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21 24
FEBRUARY 14, 1978
FEBRUARY 15, 1978

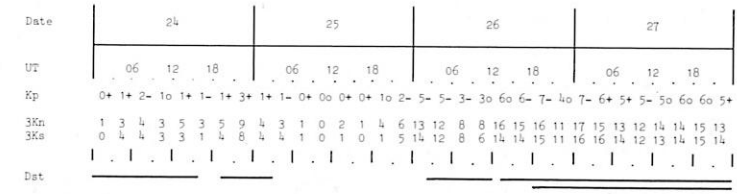
1978 February 14, 0000 UT - February 14, 2359 UT

00 UT	57	70	70	70	70	70	67	65	62	49	52	64	64	64	64	71	71	81	76	78
	81	88	88	92	92	90	90	90	90	87	87	85	85	83	83	78	71	71	78	87
	96	99	90	85	78	69	85	85	87	87	83	80	80	87	85	87	94	102	110	110
01 UT	111	107	107	106	110	114	114	118	134	141	153	165	168	156	141	119	185	216	248	286
	287	279	291	296	282	282	286	298	305	305	308	317	317	321	341	318	311	327	357	372
	384	380	369	365	357	353	330	315	284	277	269	249	237	229	221	217	197	185	165	157
02 UT	149	140	133	129	117	113	108	116	111	111	115	119	115	107	104	111	111	104	98	93
	93	86	84	86	84	87	87	93	89	86	84	84	84	86	84	87	82	87	85	85
	82	82	85	85	82	80	77	80	80	82	85	87	87	89	91	87	87	82	82	80
03 UT	80	77	73	70	70	70	73	75	71	83	80	73	71	68	64	64	64	64	62	57
	70	70	68	64	62	62	61	75	75	78	91	93	78	75	73	60	57	68	68	71
	68	68	63	57	57	57	53	62	75	78	75	62	60	47	47	47	60	62	47	44
04 UT	44	42	49	54	49	52	52	52	60	58	55	55	60	62	60	60	45	60	62	60
	57	55	58	62	62	62	52	52	62	67	76	81	70	70	85	85	85	85	85	85
	85	85	76	81	68	81	76	76	72	68	68	68	64	60	62	63	68	68	68	68
05 UT	68	68	77	81	81	81	81	81	81	81	86	90	95	90	90	94	94	99	99	99
	94	94	99	92	92	92	88	81	81	81	81	79	74	74	74	74	74	70	65	74
	70	70	70	70	70	65	61	61	61	61	61	56	45	45	48	56	61	61	65	74
06 UT	74	78	83	74	70	65	61	70	84	88	93	88	88	88	84	70	70	70	70	70
	65	61	61	56	52	48	43	43	47	51	51	46	43	43	46	46	46	46	46	46
	46	46	46	42	44	44	48	52	49	49	49	49	49	46	46	46	46	46	49	46
07 UT	46	46	46	43	43	43	43	43	49	52	52	52	48	48	48	48	46	42	42	39
	43	53	53	50	37	37	38	49	49	49	53	58	58	58	47	47	47	47	47	52
	62	62	62	49	49	55	62	62	62	62	62	62	67	67	72	72	72	76	89	85
08 UT	89	89	89	76	77	81	77	77	77	72	72	72	72	72	72	72	72	72	72	72
	72	76	76	81	81	81	85	94	112	112	112	112	112	117	130	134	130	130	130	130
	130	125	112	112	112	112	107	107	103	102	94	94	90	94	90	94	99	94	90	90
09 UT	90	90	85	81	76	71	71	71	71	71	71	68	68	74	81	69	69	69	65	65
	65	76	60	53	53	53	56	56	56	56	56	56	56	56	56	56	58	62	62	58
	54	57	57	57	57	54	58	58	58	62	62	66	64	61	57	57	57	57	57	57
10 UT	59	55	55	53	49	47	47	60	60	59	59	72	72	83	96	123	96	111	124	137
	137	155	173	147	134	142	146	151	164	160	182	178	191	182	182	206	219	219	219	219
	230	242	242	255	242	228	230	257	217	217	222	257	276	280	308	308	303	321	352	352
11 UT	352	376	387	349	334	379	379	379	368	331	335	335	322	343	341	341	345	350	350	363
	367	367	354	350	345	345	341	346	346	341	327	336	304	290	303	299	299	330	348	344
	348	358	358	344	330	303	292	292	281	292	303	314	314	314	338	338	338	351	351	376
12 UT	400	424	415	404	369	369	355	367	365	365	327	327	303	290	290	279	255	266	253	253
	242	230	206	184	160	160	160	147	147	134	134	134	134	134	123	123	123	98	85	85
	85	85	85	85	85	85	85	85	85	72	72	59	59	46	35	26	26	22	22	17
13 UT	21	24	19	19	28	31	31	31	31	31	33	31	31	31	31	34	32	34	31	29
	29	29	34	36	34	34	34	36	41	41	39	36	31	29	26	31	37	37	37	41
	39	40	39	41	44	44	45	45	50	50	50	47	47	43	43	34	40	46	37	49
14 UT	49	48	48	63	79	81	81	81	68	66	53	51	51	66	72	85	85	72	72	72
	72	72	72	72	85	98	98	123	111	98	66	75	75	71	83	96	109	123	123	123
	123	134	134	134	134	134	145	145	158	158	158	158	158	147	147	147	136	136	136	136
15 UT	136	147	160	160	160	160	160	147	147	147	147	147	147	134	134	134	145	145	143	156
	167	167	191	191	202	204	204	193	180	195	184	180	177	184	184	191	191	202	217	221
	236	247	251	240	229	233	240	240	255	266	255	233	222	211	200	196	186	194	204	210
16 UT	199	205	214	223	225	230	224	222	223	221	222	230	241	251	247	236	201	196	192	196
	209	236	257	276	290	345	330	239	253	302	346	301	297	304	356	343	337	339	353	369
	390	399	409	420	438	439	439	442	426	404	394	374	357	347	325	290	279	290	292	301
17 UT	286	268	265	266	259	259	255	249	248	248	245	239	234	235	228	221	219	222	209	202
	192	192	211	203	203	188	185	183	170	165	154	151	139	129	122	122	127	129	132	136
	127	125	119	119	117	123	120	118	124	133	131	129	120	111	111	110	110	113	111	134
18 UT	104	108	111	113	107	107	109	107	103	103	99	93	103	110	111	110	110	99	93	96
	100	96	93	86	80	90	100	108	112	112	112	98	88	70	67	105	113	96	100	103
	109	88	84	77	97	118	118	140	127	114	97	84	71	65	65	63	60	59	59	53
19 UT	65	59	70	70	59	60	66	73	71	63	63	59	62	62	62	59	63	63	66	62
	59	52	46	40	39	38	40	47	56	76	89	88	65	43	49	87	96	92	73	56
	56	70	78	76	66	43	46	66	77	79	76	70	63	68	65	69	63	65	66	59
20 UT	56	58	62	62	67	70	70	70	67	60	59	57	59	60	62	59	56	54	59	60
	57	66	82	79	62	66	83	83	88	75	75	67	75	77	75	70	70	79	76	72
	71	71	84	73	70	87	92	96	114	127	127	140	140	148	160	152	120	100	92	101
21 UT	109	113	105	88	88	105	109	96	92	92	92	96	96	79	79	70	77	84	80	75
	76	73	77	80	83	79	80	90	85	83	93	93	89	83	75	79	94	102	110	97
	85	77	66	48	255	277	298	202	154	235	371	420	399	355	369	368	378	405	377	329
22 UT	316	333	329	343	339	312	304	265	208	215	272	273	280	250	229	200	184	190	183	185
	205	194	184	150	142	162	154	168	177	196	202	221	238	289	296	242	245	316	310	284
	306	329	263	293	310	271	284	309	315	244	248	249	247	245	235	272	294	299	312	343
23 UT	326	303	365	356	343	348	317	295	303	286	268	294	281	294	299	303	303	295	304	304
	304	308	326	357	370	348	330	308	334	347	352	374	335	300	291	261	212	221	221	225
	212	221	252	273	291	295	291	278	278	291	291	305	318	348	375	335	344	384	384	362

1978 February 15, 0000 UT - February 15, 2359 UT

00 UT	353	362	358	349	327	331	341	349	349	362	375	401	397	353	274	292	301	297	283	278
	273	277	285	302	342	365	368	383	407	428	448	471	465	474	478	484	493	506	500	498
	504	556	560	563	552	528	511	487	463	455	446	465	432	429	422	398	394	424	436	452
01 UT	486	505	499	492	536	524	472	452	476	492	501	483	454	480	511	522	522	536	418	392
	380	352	348	372	375	379	389	396	394	407	424	431	407	404	381	383	391	426	424	372
	365	376	385	333	286	296	273	242	223	229	244	232	226	254	246	222	184	180	184	176
02 UT	187	185	160	149	147	155	164	180	195	187	186	186	205	221	242	242	229	215	223	227
	244	252	250	250	246	229	222	206	225	217	202	194	194	182	175	159	148	144	149	138
	138	151	147	147	151	155	163	166	170	166	149	152	148	139	144	148	148	148	165	176
03 UT	180	184	210	210	184	189	189	173	176	175	186	193	186	175	171	175	199	207	196	209
	205	184	152	148	145	176	169	152	156	149	152	217	289	375	420	432	402	368	352	337
	321	283	239	239	232	246	251	238	229	224	219	206	187	160	172	159	159	146	149	148
04 UT	96	119	140	133	152	155	148	152	169	169	142	148	176	181	163	153	153	183	178	175
	202	210	206	179	192	236	222	243	274	297	303	272	232	256	254	239	234	234	235	293
	308	274	325	376	336	336	346	311	296	224	206	195	220	201	198	184	212	189	169	139
05 UT	141	136	122	114	104	120	125	147	168	164	128	106	83	81	108	118	110	107	94	115
	126	139	163	198	265	283	328	383	414	513	595	765	848	851	865	964	917	790	793	822
	789	681	624	572	546	580	570	514	454	495	501	497	534	547	532	494	475	467	457	452
06 UT	456	454	465	480	485	472	469	460	455	444	435	386	380	451	459	441	496	543	586	527
	365	486	549	585	633	572	570	581	619	626	667	643	600	625	614	604	544	535	658	666
	608	511	340	402	459	471	363	329	417	530	519	463	265	266	402	434	430	407	443	472
07 UT	520	576	594	622	615	611	622	617	574	672	684	633	700	822	816	828	761	778	748	653
	592	574	572	582	592	552	614	662	640	584	570	565	607	573	573	599	606	606	615	611
	587	562	554	476	430	405	401	415	467	492	492	468	456	488	503	557	617	740	746	717
08 UT	707	723	820	873	983	1079	928	930	894	815	750	862	946	1024	989	943	1080	1066	1059	1008
	1006	1005	999	965	994	1015	1021	1042	1019	1014	1010	975	987	1001	967	893	864	970	873	989
	966	843	786	799	763	754	752	730	700	736	777	859	761	737	745	816	866	843	744	675
09 UT	641	642	733	786	881	973	1021	1050	1062	1113	1077	1024	953	913	872	950	1042	1003	876	805
	761	770	818	779	758	760	721	652	664	887	764	738	829	811	724	693	710	696	643	573
	542	502	523	532	557	548	496	467	437	461	470	440	460	445	441	430	360	338	333	322
10 UT	313	267	334	326	311	288	292	288	245	234	280	320	274	221	332	543	760	1165	1023	915
	751	924	952	964	1047	1145	1241	1322	1269	1195	1473	1390	1462	1452	1376	1300	1335	1265	1233	1250
	1235	1389	1412	1378	1349	1284	1333	1648	1789	1870	1873	1954	1936	1956	2009	2080	2028	1965	1942	2186
11 UT	2312	2367	2271	2015	1608	1428	1242	1309	1458	1526	1612	1637	1674	1700	1081	1073	1103	1181	1257	1195
	1052	1065	905	925	933	1083	1064	1075	1053	1056	1026	983	766	752	702	657	589	526	513	486
	468	451	451	451	379	347	315	288	242	253	273	282	282	273	242	217	208	219	235	250
12 UT	237	203	187	160	144	141	122	115	93	82	86	69	63	78	90	95	111	117	114	127
	111	93	93	63	63	63	61	69	69	66	79	64	51	33	53	67	82	80	80	80
	87	92	90	92	97	100	102	107	138	138	119	123	132	140	138	139	150	150	143	156
13 UT	166	177	196	175	175	173	157	150	145	158	158	151	133	110	114	109	130	150	160	181
	194	152	136	118	123	144	171	179	188	194	185	169	198	212	198	164	147	117	90	88
	126	126	139	139	139	128	115	116	116	128	126	137	148	159	170	192	192	192	192	192
14 UT	168	157	170	196	198	200	176	163	161	148	140	148	171	175	182	167	161	150	165	141
	116	85	81	89	103	128	115	115	116	105	92	115	123	128	125	130	117	101	95	98
	114	132	141	143	136	117	88	70	68	60	75	88	113	137	150	128	119	107	116	129
15 UT	114	106	97	92	99	114	127	147	140	122	85	103	116	113	100	102	113	113	126	123
	126	133	113	128	131	146	162	154	152	123	113	115	118	118	135	128	128	144	144	146
	131	149	162	159	163	167	142	140	152	159	159	164	191	195	200	199	206	204	199	196
16 UT	194	189	194	199	194	196	201	199	194	182	182	182	175	183	185	180	178	171	166	181
	179	176	176	171	169	164	159	164	171	166	161	151	138	138	125	117	124	121	119	119
	123	137	147	141	127	118	111	111	108	104	105	97	93	96	96	112	112	120	118	120
17 UT	122	125	130	127	120	120	133	128	126	123	123	121	110	115	113	123	121	121	121	123
	139	139	139	123	123	123	123	126	128	113	108	103	100	100	103	108	105	103	103	100
	105	110	131	138	128	123	128	126	115	113	113	108	108	110	110	123	123	126	118	109
18 UT	113	104	91	91	93	91	97	105	117	133	123	121	134	141	144	131	126	121	118	126
	118	125	104	102	100	101	105	105	102	115	102	102	104	107	106	103	101	96	94	98
	100	101	98	101	97	103	115	115	123	121	118	118	123	113	105	82	86	98	114	129
19 UT	124	117	112	122	136	111	101	99	93	98	98	93	93	96	96	93	93	104	106	109
	109	109	106	106	104	101	99	99	101	104	101	99	101	104	104	104	88	88	91	93
	91	91	88	88	88	90	90	101	99	96	99	99	99	99	99	88	83	81	81	86
20 UT	88	88	86	86	86	94	101	102	96	89	86	87	83	83	87	84	84	88	86	92
	98	94	92	92	88	88	90	93	104	117	101	90	88	90	93	89	89	87	84	82
	79	79	77	87	87	87	90	93	97	94	99	125	136	136	133	120	114	119	109	111
21 UT	109	97	94	92	89	85	81	81	86	90	104	104	102	102	101	104	106	104	101	99
	99	99	117	101	101	99	100	103	103	95	92	88	87	87	89	94	98	98	100	100
	100	100	97	97	97	97	99	105	111	120	116	110	106	97	92	94	96	88	88	89
22 UT	93	91	92	95	103	106	106	106	100	100	102	106	102	100	100	103	103	106	108	104
	104	101	94	90	88	88	97	104	104	108	112	114	111	111	107	102	99	96	92	94
	91	94	95	100	98	101	103	98	92	89	89	92	98	102	106	103	97	97	93	91
23 UT	95	99	99	101	103	102	102	96	93	91	88	92	89	96	96	96	97	97	95	92
	94	96	99	99	99	99	101	101	93	93	90	86	86	81	86	88	88	88	86	92
	92	92	88	88	86	86	82	82	86	86	86	88	92	89	86	83	83	81	81	78

1978, MARCH 24 - 27



Data from Individual Observatories — MARCH 1978

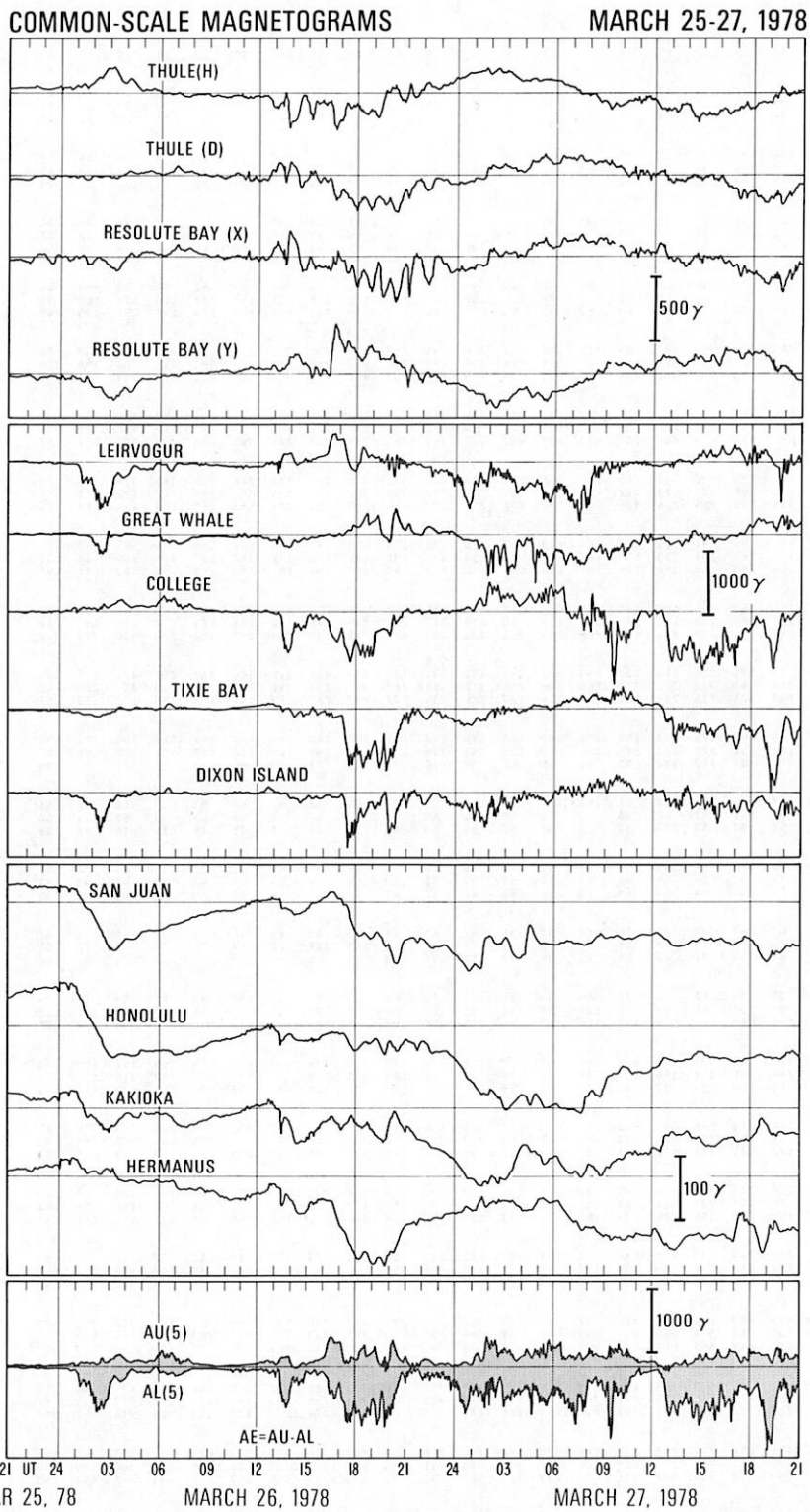
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
OTT	57.0N	25	2214	..	..	..	..	27(1)	8	109	400	391	28	04
NEW	55.1N	25	2206	..	..	..	..	26(6) 27(1,2,4)	6	46	235	335	31	01
FRD	49.6N	25	22--	..	..	..	..	27(1)	7	40	145	101	30	15
IRK	41.0N	25	22--	..	..	..	..	26(1,4) 27(5)	6	28	179	54	28	18
MMB	34.0N	25	22--	..	..	..	..	26(1,5,6,7) 27(2,5)	5	18	163	37	28	18
SJG	29.9N	25	2200	..	..	..	..	26(1)	6	12	126	39	28	05
KAK	26.0N	25	22--	..	..	..	..	26(1,5,6,7,8) 27(1,2,8)	5	14	146	77	28	18
GUL	24.5N	25	2200	..	..	..	..	--	-	9	150	51	28	00
MBO	21.2N	25	2208	SC	--	- 8.9	--	26(14)	5	5	58	20	28	03
KNY	20.5N	25	22--	..	..	..	..	26(5)	6	12	151	91	28	18
JAI	17.3N	25	2200	..	..	..	..	--	-	8	140	40	28	00
SHL	14.6N	25	2200	..	..	..	..	--	-	6	145	38	28	00
UJJ	13.5N	25	2200	..	..	..	..	--	-	7	144	38	28	00
ABG	09.5N	25	2200	..	..	..	..	26(5)	6	7	141	37	28	00
HYB	07.6N	25	2200	..	..	..	..	26(5,6,7)	6	6	161	25	28	23
GUA	04.0N	25	2208	..	..	..	..	26(1)	6	10	300	40	28	15
ANN	01.5N	25	2200	..	..	..	..	--	-	5	193	71	28	00
TRD	01.1S	25	2200	..	..	..	..	--	-	4	227	121	28	00
API	16.0S	25	19--	..	..	..	..	27(2,3)	6	6	240	38	29	15
PMG	18.7S	25	2208	..	..	..	..	26(1,5,6,7) 27(1,2,4)	5	5	160	90	28	18
HER	33.7S	25	22--	..	..	..	..	26(5,6,7) 27(1,2,3,6,7,8)	5	30	167	167	28	09
GNA	43.2S	25	22--	..	..	..	..	26(1,7) 27(5)	6	21	160	150	28	17
TOO	46.7S	25	21--	..	..	..	..	26(7) 27(2,3,4,5,8)	5	23	210	80	28	00
RES	83.0N	26	1333	SC	84		43	26(6)	-	550	637	321	28	05
CBB	76.7N	26	1333	SC	--	--	--	26(7)	-	630	620	620	27	24
BLC	73.9N	26	1333	SC	--	--	--	26(6)	-	935	670	800	27	24
FCC	68.8N	26	0012	SC	--	--	--	27(6)	-	800	365	910	28	05
COL	64.6N	26	00--	..	..	..	..	27(4)	7	211	1560	910	30	17
SIT	60.0N	26	0010	SC	+ 4	-21	- 5	27(4)	7	--	--	510	28	23
STJ	58.7N	26	0010	..	..	..	..	27(1)	7	410	520	570	28	24
WIT	54.2N	26	1334	SC*	+ 9	* -110 *		26(5) 27(6,7,8)	6	40	200	115	29	01
EBR	43.3N	25	1333	SC*	+ 4.1*	-42 *	- 9	26(5,6) 27(1,6,7,8)	5	17	141	122	28	18
HON	21.1N	25	1334	SC	- 2	- 8	- 4	27(1)	6	15	40	8	28	22
HON	21.1N	26	0012	SC	+ 1	+ 6	+ 3	26(1)	7	2	40	3	26	10
HUA	00.6S	26	0012	SC	1	23	4		-	--	--	--		
HUA	00.6S	26	1333	SC*	5	176	10	26(5)	7	9	429	46	27	22
HER	33.7S	26	1332	SC	- 6	-30	-28	26(5,6,7) 27(1,2,3,6,7,8)	5	30	122	141	28	09
GNA	43.3S	26	00--	..	..	..	..	26(7) 27(5)	6	20	70	140	28	15
TOO	46.7S	26	1340	SC	+ 1	-53	+10	26(7) 27(2,3,4,5,8)	5	22	214	139	28	00
CZT	51.2S	26	0011	SC	3	14	6	27(6)	6	45	174	129	28	18
CZT	51.2S	26	1334	SC	4	26		27(6)	6	45	174	129	28	18
KGL	56.5S	26	0013	SC	5	16	5	26(7) 27(1) 27(6)	7	83	650	267	28	19
KGL	56.5S	26	1334	SC	5	74	22	26(7) 27(1) 27(6)	7	83	650	257	28	19
OUM	75.6S	26	1334	SC	36	46	90	26(6,7,8) 27(1)	5	440	535	485	27	12

THREE-HOUR-RANGE INDICES, K

MAR	24		25		26		27	
HIS	2433	2234	4312	1223	5643	5575	5555	5433
CCS	1221	1233	1110	0012	5642	3675	4444	7665
DIK	1222	2444	2212	1223	6743	5776	6656	7766
TIK	1211	1233	2110	0112	4543	5886	6557	8797
MMK	0111	1135	1110	1112	6622	6656	6554	5777
KIR	0122	2136	1001	1012	7623	6556	6644	5777
CWE	1111	1123	1100	0012	3442	7874	6677	7774
COL	0100	0101	1000	0001	3342	6663	5467	6664
LRV	0331	1236	4012	1022	7743	5566	7675	5677
SOD	0110	1025	1000	0001	6612	6556	6654	5777
YAK	2121	1123	2100	0122	5431	4464	5355	7555
LER	0121	1024	2010	1012	5522	4783	7643	4675
NUR	0122	1124	1111	1001	4323	6584	6543	4665
LOV	0122	2124	0000	1001	5423	5574	6544	4766
SIT	0010	0001	1000	0001	3332	6554	7777	6553
SVD	0111	1123	1100	1021	4422	5553	5433	5554
RSY	0111	2124	0000	1012	4423	5554	5543	4566
MNK	1222	2134	1111	2122	4323	5553	5543	4555
WIT	1111	2125	1100	0112	4433	6554	5544	5666
IRT	1121	2222	1111	1122	6434	6554	5545	6455
VAL	0122	1114	1012	2022	4422	5453	5543	4555
KIV	1332	2124	1211	1233	4423	5654	5544	5665
DOU	0111	2114	1100	0112	4333	5443	5443	4555
KGD	0012	0010	0111	0010	3211	3432	3222	3333
VIC	0111	1112	1000	1002	4342	5554	6655	4454
OTT	1111	2123	1101	1012	4423	6474	8665	4554
MMB	0111	2112	1100	1012	5433	5554	4544	5444

MAR	24		25		26		27	
TKT'	2222	2222	2322	1133	5336	6553	4444	5533
PEN	1111	1114	1111	1022	4322	6553	2343	4545
TOL	0021	0103	1010	0121	3321	4442	3332	3545
FRD	0111	1123	2100	1012	5433	6554	7654	5444
COI	0123	3114	1112	3312	4322	5443	5443	4454
KSA	0012	2104	1102	0024	5343	7664	4434	5656
TUC	1221	2112	2110	1012	5534	5654	5644	4455
KNY	1112	2112	2111	1123	5433	6553	5544	4343
QUE	3341	3312	3441	1232	5333	6553	3445	5544
HON	1111	2112	1110	1155	7777	6555	6654	4457
HYB	1222	2112	2221	1122	5433	6664	3443	4533
SJG	1101	1112	1100	0012	6423	4553	5533	4344
GUA	1222	2112	2210	1012	6432	5444	5344	4343
BNG	2223	2234	2221	2223	5333	6653	4433	5555
PMG	0112	1102	2100	1012	5333	5553	5545	4344
HUA	1111	3222	1111	3222	5544	7664	4532	4553
GNA	0121	1012	2110	0012	6443	5564	5555	6554
HER	0222	1034	1110	0002	4433	5554	5553	4555
TOO	0221	1002	1210	0002	3432	4453	4555	5445
EYR								
MCQ	0210	0001	1100	0001	3432	6773	6587	7674
MIR	2432	1122	2231	1002	3331	2342	4454	4554
MAW	1321	1146	2200	1001	5653	4874	6765	4877
NVL	1222	1124	1101	0112	7632	3584	8754	3584
SBA	2221	1133	3211	1123	4432	3455	5444	4344
VOS	2322	2122	2222	1112	4433	4444	344-	3344


COMMON-SCALE MAGNETOGRAMS
MARCH 25-27, 1978
THULE(H)
THULE (D)
RESOLUTE BAY (X)
500γ
RESOLUTE BAY (Y)
LEIRVOGUR
GREAT WHALE
1000γ
COLLEGE
TIXIE BAY
DIXON ISLAND
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100γ
1000γ
AU(5)
AL(5)
AE=AU-AL
21 UT 24 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21
MAR 25, 78
MARCH 26, 1978
MARCH 27, 1978

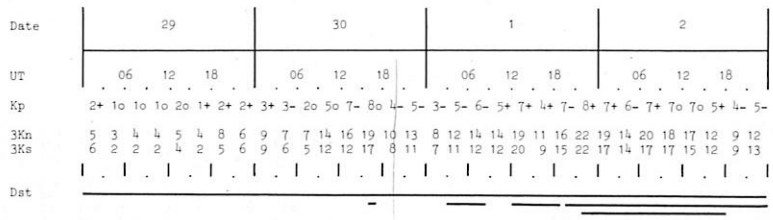
1978 March 25, 2100 UT - March 26, 2059 UT

21 UT	0	0	13	13	13	0	0	2	2	4	2	2	2	2	2	2	0	0	0	0
	0	2	2	13	13	13	13	2	13	13	13	13	15	15	15	15	15	15	15	15
	15	15	15	17	17	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18
22 UT	18	18	20	18	18	18	22	22	24	27	29	27	27	38	38	25	25	29	29	27
	27	27	27	26	22	25	34	34	34	26	34	34	34	25	29	37	37	37	37	37
	37	37	34	34	34	22	18	30	26	26	13	11	11	11	11	15	11	11	11	11
23 UT	24	24	24	18	15	11	11	11	7	3	11	11	3	2	13	13	9	11	14	16
	16	18	26	15	15	36	40	36	36	38	45	61	45	45	45	43	43	43	45	45
	45	37	32	31	31	38	33	42	40	37	37	37	24	24	24	22	22	26	26	29
00 UT	29	29	23	30	30	33	38	24	22	18	21	35	25	35	46	47	39	35	32	41
	49	57	43	33	33	30	33	35	44	48	44	44	45	37	35	37	42	39	32	37
	35	44	49	47	31	30	31	31	35	42	34	34	40	40	40	46	46	46	46	46
01 UT	40	36	47	49	52	54	51	54	51	54	54	54	54	54	59	61	56	49	54	54
	67	67	65	65	65	79	79	100	100	100	111	111	111	111	123	123	109	109	109	98
	98	98	65	54	49	33	54	54	54	54	78	89	100	119	127	124	148	179	199	242
02 UT	305	324	343	347	335	331	339	347	346	334	307	299	295	291	276	268	265	288	332	335
	343	332	320	304	312	324	347	314	299	295	288	292	284	280	288	293	301	368	368	372
	383	446	462	488	488	496	461	449	469	474	498	581	600	557	560	611	568	533	498	527
03 UT	574	617	656	707	726	707	702	709	704	715	719	705	691	691	704	696	699	724	712	692
	665	650	653	666	639	683	712	712	724	650	641	637	607	584	590	583	570	578	585	589
	589	574	559	546	503	483	470	462	415	390	351	339	312	304	300	296	304	300	307	288
04 UT	280	272	275	278	290	290	294	297	304	312	335	331	339	339	328	336	366	374	378	374
	374	386	409	425	402	402	406	395	383	383	368	368	364	361	357	345	342	326	311	311
	300	292	285	285	285	273	242	235	235	227	215	195	183	176	165	161	153	141	118	114
05 UT	106	98	94	90	102	105	109	117	125	121	128	128	147	147	147	143	140	144	156	156
	171	183	191	175	159	159	183	187	198	198	190	186	182	171	167	167	171	164	168	150
	156	156	160	172	172	164	161	169	172	184	180	157	153	146	150	153	153	150	138	145
06 UT	145	149	149	145	141	156	164	183	191	187	167	167	159	163	159	151	143	136	129	129
	129	118	118	118	104	115	115	115	115	113	113	135	135	146	164	175	182	176	185	201
	219	239	239	246	264	268	289	302	320	333	333	342	324	304	310	322	324	306	300	300
07 UT	275	253	229	220	231	245	267	285	292	298	303	292	301	296	284	277	255	251	247	251
	269	283	302	302	283	266	266	280	302	302	282	273	262	240	220	216	249	265	259	241
	230	228	212	221	212	201	235	237	226	235	257	237	223	208	197	188	186	172	159	159
08 UT	168	165	176	183	192	196	202	198	196	193	191	191	180	167	153	151	162	162	180	195
	193	190	177	177	175	172	179	159	147	136	136	143	140	129	118	107	107	107	94	87
	92	96	103	108	85	81	65	63	69	76	90	96	73	73	84	71	82	71	64	76
09 UT	87	69	82	82	81	69	73	84	84	73	51	51	62	62	62	73	73	73	62	51
	51	62	73	62	38	42	49	60	60	49	42	47	47	40	53	60	63	63	60	60
	53	53	53	53	53	53	53	53	49	49	49	49	38	38	38	38	38	38	38	38
10 UT	38	42	46	42	38	42	46	42	38	42	42	46	42	42	31	31	31	25	36	32
	34	43	54	54	50	50	50	50	50	50	50	54	54	54	58	47	47	47	49	53
	51	51	64	63	63	60	60	52	52	52	59	63	63	63	63	59	60	64	68	69
11 UT	67	67	77	73	76	84	97	86	47	57	63	65	87	64	65	72	72	60	60	62
	71	70	71	77	84	81	65	44	47	65	107	115	108	101	79	65	74	77	72	58
	68	64	71	73	68	79	95	93	111	97	93	95	98	95	98	92	88	84	89	87
12 UT	98	94	96	92	85	86	94	90	91	89	85	84	86	91	91	92	84	79	74	79
	96	100	97	92	95	106	97	97	91	82	80	93	98	97	95	99	110	107	101	103
	100	100	101	106	109	104	99	95	109	100	92	95	113	127	139	132	113	94	99	127
13 UT	130	135	135	126	137	146	137	145	151	174	179	179	174	163	155	159	164	167	169	152
	160	155	151	160	169	155	139	134	136	141	122	110	98	95	105	179	193	216	102	75
	82	129	94	77	69	78	93	126	161	183	247	284	318	406	463	534	548	537	515	559
14 UT	604	670	688	666	633	644	666	688	666	666	681	707	745	752	770	759	741	749	756	723
	701	701	701	662	643	590	541	448	399	380	361	337	315	278	226	200	166	162	150	165
	172	172	168	172	180	187	190	208	205	191	161	172	195	210	236	240	248	263	285	300
15 UT	285	270	255	237	245	238	231	235	243	262	285	296	307	315	299	291	261	223	205	209
	179	151	122	121	117	111	107	109	108	104	112	127	129	121	101	123	154	166	155	151
	151	161	166	174	174	159	153	153	136	140	134	146	146	150	142	142	138	150	171	197
16 UT	208	219	186	167	190	201	138	196	202	209	198	192	179	179	183	183	187	187	191	199
	191	203	199	199	195	199	199	226	260	250	253	246	272	310	337	349	365	393	476	548
	630	576	532	559	696	734	747	781	807	825	833	802	821	802	787	809	870	882	851	840
17 UT	868	837	800	809	824	797	801	793	790	790	779	772	776	731	728	727	731	702	669	635
	632	613	583	598	629	652	662	681	684	709	739	748	742	729	739	753	725	694	693	665
	630	641	659	647	636	652	761	779	851	896	845	818	839	861	926	927	834	767	747	813
18 UT	877	901	952	985	992	915	876	845	828	802	814	822	822	813	795	767	711	685	641	634
	658	678	746	753	749	766	783	808	826	821	791	841	838	925	953	966	972	1017	1049	1077
	1085	1118	1160	1170	1158	1110	1094	1080	1083	1085	1086	1086	1074	1055	977	969	909	908	881	903
19 UT	891	802	787	843	877	884	896	922	888	868	862	867	833	822	814	807	782	772	753	716
	702	701	737	792	825	861	861	870	900	952	954	941	1004	1010	1020	1008	1038	966	929	899
	859	822	810	820	831	783	733	685	667	592	432	395	373	385	399	436	496	642	693	748
20 UT	787	927	1025	1069	886	781	732	835	847	817	809	783	641	602	651	676	711	686	730	783
	803	918	987	1069	1033	899	937	987	1017	1030	1044	1023	891	806	845	816	780	706	658	660
	667	606	557	531	510	500	498	467	439	384	363	344	327	293	293	286	257	223	197	186

1978 March 26, 2100 UT - March 27, 2059 UT

21 UT	188	184	187	171	178	186	184	174	227	241	264	307	279	297	333	382	391	388	390	379
	334	214	221	231	229	190	127	144	150	126	97	83	86	98	106	97	27	37	41	60
	63	109	74	52	80	95	80	57	48	34	56	68	84	68	60	74	56	65	87	96
22 UT	101	89	35	20	53	78	92	80	98	139	196	246	264	253	244	221	219	255	269	269
	271	276	292	296	274	282	296	286	265	245	256	267	284	247	242	222	224	236	234	205
	291	298	294	299	270	251	227	199	181	168	164	164	155	152	156	155	156	141	137	154
23 UT	170	186	184	177	169	158	151	141	131	129	129	135	145	151	161	185	173	162	163	153
	166	196	213	178	174	172	167	162	163	157	149	157	161	177	192	193	194	207	198	187
	192	202	207	204	213	230	231	233	225	234	234	221	219	228	237	248	267	313	365	338
00 UT	279	263	251	247	236	236	255	223	213	213	227	258	301	298	302	287	290	255	243	250
	274	313	325	337	353	294	290	333	424	420	447	491	557	561	521	553	557	561	592	595
	594	582	606	611	669	669	654	674	697	744	748	760	729	725	713	725	705	659	624	609
01 UT	586	559	514	521	407	380	368	344	332	313	332	411	449	449	462	485	493	491	473	491
	494	487	448	454	453	461	461	472	474	472	483	507	534	526	542	571	598	576	540	554
	543	504	466	466	455	493	507	520	520	523	536	585	610	635	641	692	731	931	973	973
02 UT	835	840	813	812	802	799	706	644	610	595	604	602	587	597	614	850	799	647	598	557
	562	540	529	589	632	686	510	493	486	580	621	686	741	741	764	771	760	793	713	716
	711	614	555	536	496	412	418	460	404	389	400	423	418	366	383	395	389	415	481	483
03 UT	546	571	617	669	714	768	818	877	834	791	738	718	720	707	700	689	678	694	720	709
	700	689	678	657	670	725	738	731	721	710	715	672	589	560	548	519	517	563	592	608
	601	586	570	555	537	541	517	490	478	487	506	510	503	494	478	474	454	442	450	466
04 UT	493	504	520	536	528	512	515	511	526	515	511	510	513	509	513	521	528	524	489	473
	511	518	529	563	582	581	572	554	566	558	547	567	564	545	537	526	546	599	567	559
	624	615	636	859	854	733	657	390	385	407	445	453	450	446	537	551	565	619	571	541
05 UT	544	533	492	480	488	545	618	621	579	549	542	573	605	677	765	747	761	697	698	673
	666	674	729	784	849	856	825	769	720	699	711	716	675	641	660	760	801	848	900	911
	904	916	889	872	867	896	884	850	815	792	746	694	646	638	645	652	648	644	683	647
06 UT	673	661	633	622	666	722	699	628	580	631	690	638	634	638	650	638	623	639	657	641
	644	668	676	668	672	715	777	713	740	776	747	769	640	617	562	566	556	552	561	566
	567	569	597	612	637	643	656	674	648	650	668	690	665	643	633	638	617	647	756	793
07 UT	778	722	766	805	802	799	792	775	792	813	825	810	794	721	736	742	758	779	873	896
	983	994	988	998	1006	1014	910	864	844	837	657	634	613	614	614	625	635	647	644	629
	613	594	577	560	606	634	612	643	766	782	812	762	719	705	649	647	688	769	723	714
08 UT	628	597	555	538	477	429	400	393	394	456	481	490	461	439	437	439	450	454	447	437
	427	491	483	469	442	422	413	398	395	384	347	365	340	333	340	355	342	361	372	420
	436	445	455	454	454	449	428	405	386	391	364	366	356	347	342	363	388	403	447	484
09 UT	499	489	459	470	488	491	486	564	562	620	551	435	416	414	393	409	397	427	431	672
	1084	1184	1057	1110	1042	1047	1188	1225	1247	1274	1291	1342	1169	1056	974	815	682	567	425	445
	465	485	489	504	643	554	561	595	593	579	606	667	651	673	685	725	754	741	696	636
10 UT	568	594	562	578	552	576	579	567	543	527	534	575	614	663	470	475	502	532	565	591
	556	481	483	509	638	675	665	584	510	500	499	500	462	475	460	454	432	410	418	385
	311	282	302	257	258	298	273	257	277	312	277	267	248	247	266	261	254	219	221	230
11 UT	204	193	193	201	161	162	163	124	110	64	69	101	97	111	171	197	155	127	176	206
	178	150	158	167	192	169	165	128	116	153	173	162	148	121	132	132	161	149	149	147
	154	147	138	136	141	150	143	113	139	144	121	102	102	130	155	157	151	139	121	126
12 UT	135	147	151	158	151	144	135	132	112	109	114	113	108	101	93	92	89	111	125	84
	49	54	54	134	120	113	111	109	128	115	147	188	180	156	168	174	151	146	131	176
	205	245	353	413	398	348	384	502	536	577	631	660	652	656	657	644	646	759	793	712
13 UT	660	631	624	618	596	574	556	556	578	586	565	588	589	570	597	613	598	624	676	702
	729	747	765	780	784	769	735	742	779	787	768	701	693	649	600	571	560	571	584	546
	557	563	574	574	574	595	633	644	616	605	572	567	594	618	629	605	542	514	485	399
14 UT	389	422	464	547	535	519	527	560	590	617	606	568	513	506	528	614	677	717	788	810
	813	836	832	843	851	826	804	797	810	807	773	758	739	721	695	724	735	736	714	721
	817	847	957	1009	1047	1081	1066	1032	1025	994	941	891	869	854	861	884	902	876	831	789
15 UT	819	824	821	821	821	807	814	826	812	832	844	815	785	733	695	709	734	703	662	684
	784	780	727	683	687	754	743	718	710	784	791	727	686	682	649	642	646	658	573	592
	737	811	873	903	944	979	983	940	897	876	914	860	864	886	922	925	913	894	908	774
16 UT	581	514	461	418	438	483	537	581	592	607	626	613	617	597	587	674	674	604	537	722
	704	734	790	745	708	730	736	718	715	772	806	813	795	815	800	753	764	764	827	880
	994	1045	1060	934	791	779	766	756	742	813	762	691	607	581	567	608	612	612	641	610
17 UT	580	587	561	507	470	440	388	384	388	384	364	360	348	327	337	361	368	376	392	426
	421	419	435	454	439	425	416	460	464	485	456	430	429	427	432	437	451	466	493	508
	636	667	697	711	686	651	608	585	587	594	605	593	583	592	596	582	569	557	548	526
18 UT	519	515	505	496	496	491	470	467	458	457	459	461	461	450	469	525	552	575	600	647
	659	678	705	729	754	767	769	784	738	657	701	750	849	856	866	883	937	954	981	1008
	1047	1120	1208	1249	1446	1468	1459	1188	1153	1153	1176	1157	1148	1159	1176	1200	1217	1237	1249	1253
19 UT	1251	1240	1228	1221	1129	1130	1079	1048	972	949	896	859	874	904	915	928	934	923	874	835
	795	782	784	759	730	694	672	652	528	461	413	438	422	538	553	442	436	488	546	529
	524	328	273	326	363	413	424	480	518	489	419	444	450	472	507	493	491	531	566	572
20 UT	567	548	579	607	622	638	679	694	643	538	548	560	574	584	477	466	478	464	418	408
	430	443	509	543	571	511	530	477	489	504	495	473	451	441	430	425	402	382	405	308
	307	334	347	366	313	254	242	237	244	262	256	246	229	212	190	199	199	199	213	232

1978, APRIL 29 - MAY 2



Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

Data from Individual Observatories

APRIL - MAY 1978

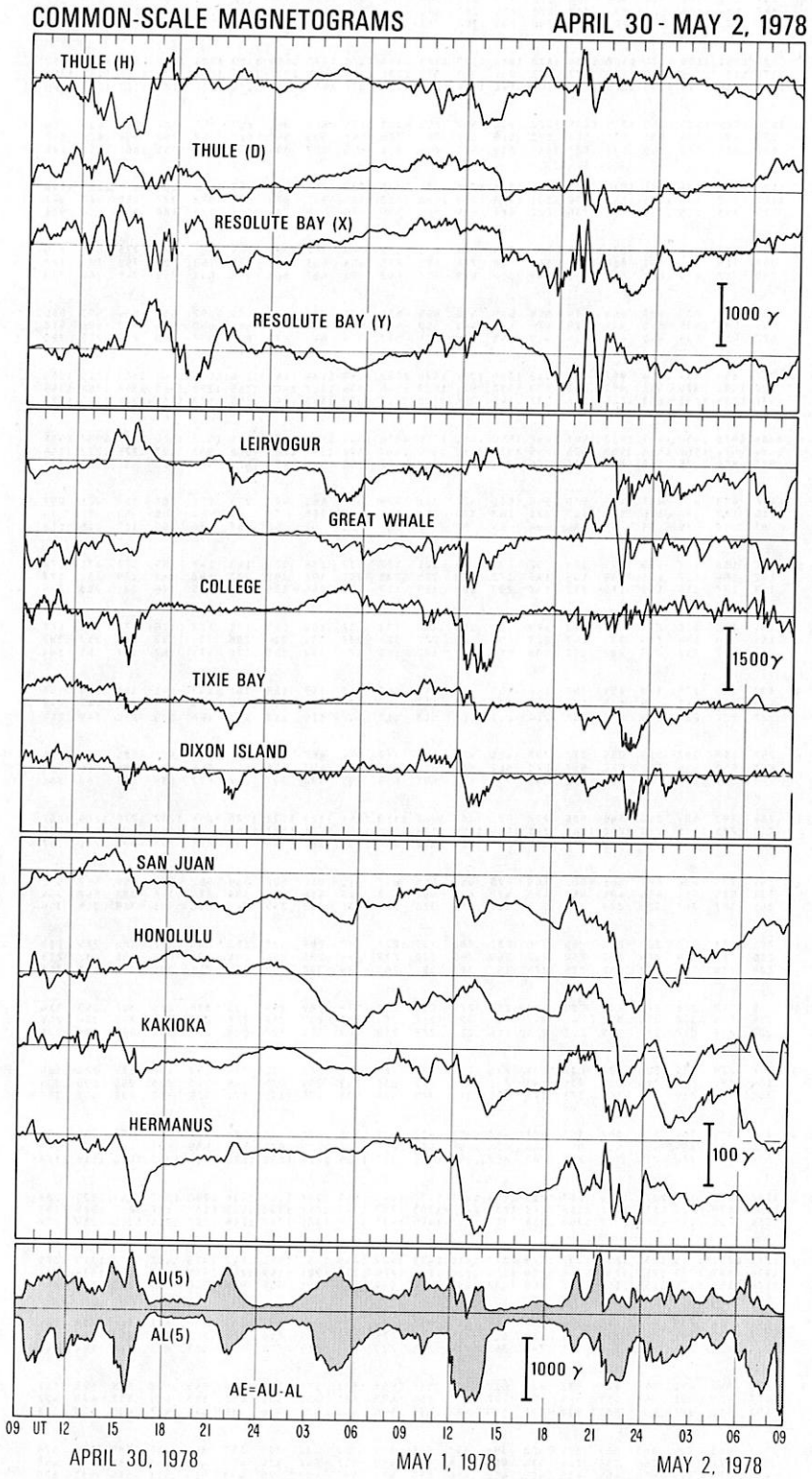
OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
HER	33.7S	29	2000	..	..	..	..	30(6)	6	15	136	135	30	24
RES	83.0N	30	0951	SC	-96	-86	-42	01(7)	-	1326	1605	1602	04	15
CBB	76.7N	30	0951	SC	--	--	--	02(3)	-	2120	1190	1830	04	24
BLC	73.9N	30	1000	..	..	..	..	01(7)	-	2400	2180	2250	04	14
FCC	68.8N	30	0900	..	..	..	..	01(8)	-	2180	2120	1980	04	20
COL	64.6N	30	00--	..	..	..	..	02(3)	8	447	2290	2330	04	21
SIT	60.0N	30	04--	..	..	..	..	04(5)	8	--	--	--	04	20
STJ	58.7N	30	0951	SC*	50	55	55	01(8) 02(1,3)	5	640	820	1140	04	18
OTT	57.0N	30	0953	SC*	12	31	17	01(8) 02(1,3)	9	720	1260	640	04	19
NEW	55.1N	30	0953	SC	5	44	--	02(3)	9	129	1049	968	04	23
WIT	54.2N	30	0952	SC*	+ 2 *	-25 *		30(6)	8	31	365	135	30	24
FRD	49.6N	30	0952	SC	- 5	+36	- 7	--	-	--	--	--		
FRD	49.6N	30	0952	SC	- 5	+36	- 7	01(8)	8	54	575	565	04	21
EBR	43.9N	30	0951	SC*		+ 3	+ 7	30(6)	7	6	173	72	01	08
IRK	41.0N	30	0951	SC*	26	23	03	30(6),1(5,8),2(3,4)	7	33	296	176	02	20
HMB	34.0N	30	0951	SC*	+19	+25 *	- 6 *	04(3)	7	24	235	74	04	20
SJG	29.9N	30	0951	SC	-1	+21	+4	30(6)	6	12	118	43	01	16
KAK	26.0N	30	0951	SC*	+ 2.2*	+22	+13	30(6) 01(5,8) 02(3) 04(3,4,5)	6	15	204	97	04	20
GUL	24.5N	30	0951	SC	- .5	28	- 2	--	-	10	148	29	01	02
HBO	21.2N	30	0950	SC	- 1.2	+42.1	--	01(22)	7	3	149	5	04	19
HON	21.1N	30	0941	SC	4	28	11	30(2)	5	117	71	24		
KNY	20.5N	30	0951	SC*	+ 2.1*	+25	+15	30(6) 01(5,7,8) 02(3) 04(5)	6	16	216	90	04	20
JAI	17.3N	30	0951	SC	- .9	28	- 5	--	-	8	144	29	01	02
SHL	14.6N	30	0951	SC	- .4	24	5	--	-	7	133	20	01	02
UJJ	13.5N	30	0951	SC	- .5	34	- 7	--	-	7	169	31	01	02
ABG	09.5N	30	0951	SC	- .8	25	- 7	30(6)	6	7	151	34	01	02
HYB	07.6N	30	0900	SC	- .4	+27	- 3	30(6)	6	6	173	16	01	02
GUA	04.0N	30	0951	SC	--	27	- 9	30(4)	5	--	90	30	01	08
ANN	01.5N	30	0951	SC	- 1.4	46	18		-	6	188	54	01	02
HUA	00.6S	30	0951	SC	1	34	7	30(6)	8	10	564	62	30	23
TRD	01.1S	30	0951	SC	.1	44	53	--	-	4	202	136	01	02
API	16.0S	30	1051	SC		31	- 9	01(8) 02(1,3,4) 04(1,2,3)	7	8	192	56	05	09
PMG	18.7S	30	0951	SC	+00.3	+33	+28	30(4)	6	4	100	60	30	18
HER	33.7S	30	0951	SC	- 2	+16	+ 4	30(6)	6	15	136	134	01	02
GNA	43.2S	30	0951	SC*	- 3.2*	+ 9 *	-10 *	01(8)	8	40	160	220	30	24
TOO	46.7S	30	0952	SC	- 1.5	+20	+ 8	30(4,6)	5	22	130	30	01	03
CZT	51.2S	30	0952	SC	3	16	8	30(6)	6	28	89	87	30	24
KGL	56.5S	30	0951	SC*	--	--	--	30(6)	7	--	--	--	01	07
KGL	56.5S	30	0951	SC	5	22	6	30(6)	7	59	505	341	01	03
OUM	75.6S	30	0951	SC	124	147	241	30(5,6) 01(1)	6	740	800	1010	01	07

For SC May 1: see list page 90.

THREE-HOUR-RANGE INDICES, K

	APR 29		30		MAY 1		2	
HIS	4445	4335	5548	7666	----	----	----	----
CCS	3133	3445	4436	5645	5666	7347	5556	6434
DIK	3233	4455	5437	6757	5667	8578	7657	9657
TIK	2233	3453	3347	7858	4667	8489	8678	8656
MMK	--11	2255	5325	6746	4645	7567	8666	6656
KIR	3122	3355	5324	7747	4655	7557	8666	6546
CWE	1122	3222	3336	7845	4666	8678	5698	7634
COL	2123	3221	3446	6743	4556	7566	5686	6634
LRV	4221	3356	5446	7747	4766	7478	6787	6547
SOD	3001	2245	4214	6736	4645	7557	8565	6546
YAK	2312	2223	3325	5635	3436	6559	5469	7434
LER	2011	1233	3224	6845	3444	7369	8576	6434
NUR	2111	2123	3225	6734	3345	9369	8666	6544
LOV	2111	2333	3224	6735	3355	8459	9567	6534
SIT	2111	2111	3335	6733	4576	8567	6588	7534
SVD	2111	2132	2215	6634	3345	7357	5465	6434
RSV	2001	2233	3214	6134	2355	7458	6556	6434
MNK	2222	2233	3324	5734	2344	7357	5455	6434
WIT	3111	2133	4214	6845	3455	6468	6666	7545
IRT	2232	2224	3226	6735	4355	7467	6577	6324
VAL	2122	1323	4113	6734	2344	5367	6555	6433
KIV	3332	2333	3335	6745	3355	7467	5556	6534
DOU	2011	1122	3214	6734	2344	5357	5455	5434
KGD	0121	1011	1123	3412	1133	4244	3233	4222
VIC	2111	2111	3335	5633	3455	7566	7686	6324
OTT	4423	3233	3325	5745	2654	7468	8687	6544
MMB	0021	1021	2325	4634	3355	6356	6455	5333

	APR 29		30		MAY 1		2	
TKT	2232	2123	2235	5634	2355	7466	5445	6434
PEN	2100	1112	2104	4744	2336	6466	5445	5435
TOL	2112	2011	2114	5734	2324	6457	5455	5434
FRD	2111	2132	3325	5634	2554	6458	7475	5534
COI	2213	3232	4223	5634	2434	6356	5455	4434
KSA	0023	3023	1155	7335	3357	666-	-655	6435
TUC	1111	1122	3235	5743	2555	6467	6466	5344
KNY	0110	1122	1325	5633	2355	6366	5565	5334
QUE	3122	1123	2334	5634	3454	5556	3555	6424
HON	1111	2211	3545	4454	7766	5556	6445	3213
HYB	1111	1122	2225	5634	2364	7566	5566	6524
SJG	1003	0012	3224	5644	2444	5457	5454	3225
GUA	1112	1011	2225	4523	2354	6457	6665	5223
BNG	3122	1222	3235	4634	3367	4675	5354	4435
PMG	0111	2022	1236	4522	2455	6356	6566	5324
HUA	1213	3331	3224	7854	2444	7567	6444	6423
GNA	1011	3133	3114	5635	2345	7458	5557	6435
HER	2011	0022	3214	4634	3334	7257	5465	5534
TOO	0001	3121	1115	4523	1255	6347	3456	5555
ERY	0012	2000	1235	4522	2344	6347	5466	5333
MCQ	1112	4121	3446	6834	4566	8578	5676	6534
MIR	2333	2223	3366	5755	4566	5367	5554	5354
MAW	5322	2255	6556	6747	5766	7467	6675	7657
NVL	3222	1233	5524	4636	5674	6369	6787	6345
SBA	2322	3332	3336	6755	5446	8476	6675	5444
VOS	2222	2223	3335	5645	4456	6366	5565	4333

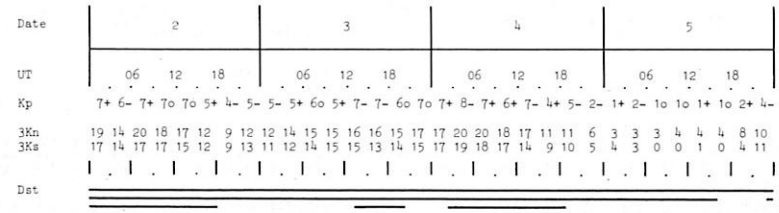

COMMON-SCALE MAGNETOGRAMS
APRIL 30 - MAY 2, 1978
THULE (H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
1000 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1500 γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
09 UT 12 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09
APRIL 30, 1978
MAY 1, 1978
MAY 2, 1978

1978 April 30, 0900 UT - May 1, 0859 UT

09 UT	344	331	321	314	309	309	322	332	347	355	362	352	360	354	322	309	307	306	296	292
	287	274	268	271	273	272	272	268	258	255	259	268	266	269	270	276	276	274	283	288
	291	291	286	288	291	286	296	299	293	310	270	286	305	414	479	605	720	753	834	897
10 UT	981	1051	1105	1134	1167	1136	1118	1086	1135	1128	1143	1178	1172	1150	1119	1083	1124	1147	1149	1169
	1170	1124	1109	1070	1029	973	953	941	949	974	1001	1013	1012	1021	1036	1061	1071	1061	1107	1203
	1275	1310	1319	1266	1225	1179	1141	1141	1086	1051	1036	1087	1056	1025	1076	1126	1139	1105	1099	1066
11 UT	1030	1025	1005	1005	1015	1035	1020	934	898	893	883	886	886	861	855	860	887	899	899	906
	898	893	898	893	873	860	830	819	821	763	726	647	598	642	670	747	792	834	829	850
	860	870	863	845	837	827	819	819	819	816	831	856	869	894	957	1006	1031	1067	1096	1175
12 UT	1185	1195	1231	1271	1279	1267	1268	1278	1281	1264	1239	1237	1216	1158	1143	1136	1131	1127	1137	1140
	1143	1135	1128	1133	1142	1132	1108	1076	1058	1033	1022	1015	992	979	958	978	987	980	977	942
	915	853	818	790	762	736	722	680	694	665	595	576	616	701	787	823	880	898	914	931
13 UT	943	957	1005	941	876	832	781	714	623	599	575	541	542	557	569	597	722	776	841	879
	847	818	801	790	810	844	844	780	734	685	677	668	663	692	737	760	788	799	792	778
	750	712	679	662	645	640	648	654	649	650	643	658	667	663	656	681	719	740	740	789
14 UT	803	829	739	699	666	654	656	679	692	665	636	620	598	589	580	552	553	554	553	556
	555	550	535	541	535	519	476	452	440	450	465	477	492	485	485	462	453	433	426	418
	427	430	439	440	425	414	419	451	472	509	527	565	603	633	667	697	740	745	745	790
15 UT	817	895	933	916	947	973	1012	1064	1057	1036	1052	1093	1134	1147	1180	1164	1144	1132	1119	1089
	1022	1001	979	958	953	943	939	932	921	1039	1246	1339	1367	1409	1366	1350	1360	1348	1304	1345
	1331	1289	1273	1257	1246	1266	1287	1346	1356	1315	1118	1095	1143	1144	1158	1128	1184	1306	1365	1379
16 UT	1404	1418	1469	1455	1433	1467	1492	1469	1582	1726	1680	1620	1490	1452	1561	1503	1526	1448	1537	1488
	1454	1471	1562	1543	1500	1426	1445	1531	1583	1572	1467	1406	1397	1264	1078	987	1123	1225	1227	1144
	920	866	925	946	856	731	706	754	788	643	552	503	449	437	476	441	418	410	388	377
17 UT	426	430	407	437	490	536	550	502	421	381	425	453	460	407	296	251	260	358	321	257
	216	180	147	136	144	163	170	168	180	168	151	129	108	77	64	60	51	63	72	76
	63	47	35	39	47	64	64	55	50	72	67	51	51	56	67	83	105	105	116	118
18 UT	122	138	123	109	109	104	92	95	95	121	117	132	188	177	163	148	155	170	171	172
	172	164	157	161	169	165	165	172	179	205	231	206	192	192	203	188	169	165	161	177
	189	197	168	159	155	190	187	203	188	169	157	143	146	186	168	135	176	231	208	204
19 UT	191	182	171	172	158	170	178	166	165	183	183	187	184	188	188	177	176	173	173	177
	185	184	194	209	233	247	223	198	190	202	226	237	234	216	206	201	203	209	213	217
	219	217	213	209	202	190	186	188	187	187	180	175	174	185	170	171	167	167	160	144
20 UT	133	120	125	140	151	150	158	169	154	147	160	160	169	166	161	143	143	148	153	158
	135	123	123	125	118	123	118	107	112	117	119	104	119	157	165	160	173	207	217	219
	227	227	213	195	177	133	114	113	128	113	110	102	115	117	143	156	189	230	249	244
21 UT	257	257	282	313	359	377	382	421	431	455	470	477	487	489	491	494	481	506	508	516
	533	530	545	538	520	517	520	512	507	500	490	476	493	506	516	516	566	598	586	569
	569	600	625	630	628	616	604	599	606	608	618	595	593	597	607	622	634	693	758	781
22 UT	786	793	800	810	845	885	927	972	1005	1062	1119	1161	1129	1129	1220	1254	1257	1279	1274	1267
	1255	1231	1211	1210	1240	1248	1223	1169	1155	1134	1072	1083	1171	1197	1237	1137	1036	997	901	902
	908	951	946	914	911	890	883	897	887	868	856	856	851	846	832	814	779	750	741	737
23 UT	741	729	696	667	651	661	669	676	663	659	637	619	614	602	569	552	555	558	557	552
	531	519	511	499	494	483	483	472	462	450	433	425	414	406	398	389	368	362	367	364
	365	357	348	329	329	333	328	320	319	323	327	331	339	355	349	336	328	319	315	306
00 UT	321	321	312	307	289	265	286	287	282	285	287	289	289	290	288	283	282	286	285	282
	286	285	279	279	267	260	267	269	268	270	279	286	290	294	294	294	293	286	282	278
	278	280	282	277	282	279	278	293	308	293	263	280	302	277	259	251	291	319	280	266
01 UT	268	272	288	279	282	289	300	285	278	291	273	276	289	299	300	306	315	327	355	334
	334	334	338	350	350	346	342	326	320	312	304	300	293	280	273	275	259	252	244	240
	236	236	227	227	229	227	220	216	221	223	218	220	220	227	229	233	231	232	230	231
02 UT	227	223	228	224	229	230	231	236	232	233	229	225	222	212	208	197	186	185	180	184
	184	193	205	216	231	231	242	242	231	227	238	249	264	279	268	220	238	260	290	294
	302	306	314	338	351	373	373	386	375	375	384	408	408	395	371	374	382	400	407	392
03 UT	392	385	385	378	382	397	427	442	427	427	431	431	428	432	424	428	417	402	394	409
	408	403	395	420	424	447	466	473	469	477	489	505	509	525	545	569	592	596	675	679
	695	695	734	754	739	735	762	852	944	1003	1007	1025	1072	1096	1112	1108	1088	1076	1111	1173
04 UT	1188	1175	1152	1076	1018	1007	1019	1019	1011	1037	1041	1053	1057	1061	1084	1096	1127	1143	1100	1088
	1069	1100	1120	1136	1132	1135	1178	1205	1233	1253	1257	1242	1211	1203	1165	1187	1217	1279	1325	1383
	1384	1408	1417	1410	1377	1353	1368	1387	1422	1445	1432	1416	1381	1283	1285	1297	1294	1316	1289	1277
05 UT	1261	1230	1215	1231	1259	1292	1329	1377	1410	1429	1439	1449	1455	1458	1441	1405	1402	1378	1349	1379
	1374	1387	1383	1258	1298	1309	1259	1224	1180	1191	1226	1253	1221	1249	1206	1135	1123	1127	1135	1123
	1126	1165	1174	1159	1160	1161	1090	1038	1003	977	994	987	991	980	961	966	946	871	838	805
06 UT	794	764	739	797	858	856	854	860	875	887	884	889	910	895	883	876	841	814	788	767
	797	785	771	757	776	801	819	819	808	798	825	839	830	818	811	822	836	842	830	830
	826	805	795	761	743	740	740	757	780	790	777	747	715	710	691	683	673	666	654	649
07 UT	644	644	651	644	628	633	630	618	610	598	588	573	571	554	540	545	532	525	525	517
	507	529	551	568	551	529	492	482	489	496	499	491	496	501	503	513	505	502	479	492
	499	512	517	533	538	530	520	505	483	458	446	443	438	436	433	436	428	423	420	418
08 UT	413	403	395	383	365	371	368	358	353	361	359	340	330	335	353	361	386	389	396	378
	373	374	374	386	389	394	434	408	418	438	498	517	541	434	452	455	468	486	473	450
	413	374	394	450	465	430	400	400	410	433	471	487	482	476	498	514	513	574	633	629

09 UT	593	583	578	560	585	590	590	592	607	622	660	698	718	695	667	697	714	709	696	689
	689	691	646	616	583	510	490	536	574	593	594	604	620	581	552	564	574	627	698	695
	677	677	688	687	745	757	751	758	772	792	789	780	830	867	939	974	998	987	840	819
10 UT	772	759	759	751	767	813	842	790	772	756	825	842	861	848	821	847	919	945	948	965
	972	1047	1034	1043	1033	1003	973	958	970	978	902	825	757	771	769	735	736	750	724	698
	710	758	800	777	601	563	571	664	729	742	729	744	731	733	671	611	599	627	645	645
11 UT	622	604	561	548	548	545	535	542	558	603	626	634	652	681	718	661	608	598	599	604
	604	596	572	589	622	636	660	579	515	553	606	639	649	596	561	559	547	527	499	538
	518	551	589	609	626	626	629	620	593	573	586	566	578	589	632	647	684	701	788	794
12 UT	767	807	770	825	991	1085	1125	1289	1223	968	892	718	614	554	578	668	678	728	817	1041
	1096	1154	1163	1180	1235	1201	1241	1247	1259	1261	1314	1360	1474	1473	1410	1520	1565	1550	1485	1462
	1233	1178	1028	1100	1191	1280	1371	1380	1376	1339	1404	1445	1438	1272	1086	1035	1019	1043	1118	1194
13 UT	1208	1188	1156	1195	1162	1057	1112	1176	1217	1291	1376	1462	1463	1347	1294	1111	831	788	704	1127
	1172	1375	1391	1471	1492	1437	1392	1408	1498	1568	1509	1529	1541	1541	1544	1540	1579	1551	1523	1609
	1648	1691	1740	1727	1702	1665	1625	1580	1479	1404	1325	1378	1491	1543	1558	1444	1493	1539	1540	1541
14 UT	1484	1404	1361	1256	1184	1141	1056	990	896	814	646	575	476	405	379	360	390	386	367	367
	352	352	357	361	357	340	328	307	306	306	301	282	260	252	264	269	262	259	251	213
	218	225	213	211	216	221	222	191	193	221	233	220	217	205	243	248	238	217	256	252
15 UT	301	303	308	308	316	318	321	308	301	296	301	306	323	311	294	279	286	279	272	276
	160	140	120	120	136	129	110	108	99	105	112	119	111	109	129	126	118	88	77	83
	76	93	166	188	194	163	127	119	119	114	108	132	132	121	123	112	112	125	125	150
16 UT	150	127	140	152	152	140	140	152	163	163	174	182	189	201	183	173	178	166	160	164
	173	172	178	178	174	172	163	178	189	200	200	200	200	193	174	189	197	196	196	189
	208	212	231	226	218	218	211	211	196	207	207	211	215	200	200	181	169	168	183	198
17 UT	210	214	207	200	211	237	278	308	282	241	222	229	258	258	244	241	234	262	239	216
	216	240	260	256	263	266	254	236	214	200	274	300	274	193	185	236	281	285	266	241
	260	275	251	235	231	258	250	236	233	222	207	192	206	213	198	203	207	219	223	234
18 UT	186	170	159	143	147	143	135	139	166	185	178	182	159	163	167	133	132	130	121	140
	162	181	155	139	111	107	121	131	158	162	132	121	106	109	113	112	198	182	184	147
	143	180	209	187	129	170	152	106	86	136	140	144	159	196	214	204	199	191	189	172
19 UT	185	192	169	129	138	190	182	304	133	168	303	113	192	132	128	177	220	231	228	299
	379	435	425	405	528	513	556	589	648	608	637	705	721	747	786	814	856	932	1059	1083
	1055	1054	1089	1092	1054	1125	1184	1172	1131	1088	1058	1073	995	963	858	794	745	658	669	649
20 UT	645	656	600	525	497	489	481	465	451	431	427	455	455	450	437	429	446	471	474	425
	378	384	408	424	418	423	500	522	541	547	537	562	548	544	522	501	513	558	603	658
	703	733	770	781	761	773	796	826	873	933	1003	1038	1115	1176	1174	1210	1209	1280	1329	1317
21 UT	1265	1284	1290	1255	1215	1193	1166	1171	1174	1167	1193	1207	1082	994	999	991	912	856	767	549
	431	628	726	573	498	500	600	720	670	663	658	691	466	474	550	498	436	417	506	517
	636	664	744	748	704	897	1076	1117	1129	1059	1079	1050	1043	982	633	541	608	621	772	958
22 UT	1042	1123	1209	1214	1109	1084	1098	952	815	800	800	801	780	791	944	896	877	826	814	883
	891	770	705	662	677	770	649	707	661	908	1023	958	910	903	979	1085	1200	1142	1086	1130
	1182	1116	1052	1028	1002	1006	1023	1068	1025	1008	983	962	934	890	857	820	832	729	753	645
23 UT	601	590	557	458	395	364	361	429	493	601	603	695	788	726	728	764	819	819	754	711
	602	485	434	400	374	342	278	267	260	239	277	300	292	292	334	380	430	495	518	496
	480	468	465	531	568	607	610	514	457	404	389	407	463	488	511	577	495	363	344	356
00 UT	386	440	507	550	569	577	619	725	742	810	861	890	873	863	821	644	603	594	527	459
	450	472	503	515	504	513	540	548	552	579	613	647	732	732	857	869	882	898	962	968
	945	926	919	935	942	937	948	952	980	973	953	924	920	889	880	887	913	893	862	847
01 UT	850	834	784	768	707	646	589	582	554	641	657	756	750	793	829	815	847	841	827	753
	752	789	775	808	892	897	966	1062	1121	1098	1131	1072	1018	996	955	918	911	880	844	824
	831	818	821	810	740	733	726	765	755	710	687	657	642	676	670	709	665	645	655	655
02 UT	651	670	697	743	725	744	800	810	833	757	725	710	687	709	743	819	826	804	781	770
	747	746	698	799	817	786	737	686	716	741	763	771	759	759	718	713	770	776	761	756
	742	758	776	752	702	673	656	641	613	601	600	600	552	526	511	518	503	499	500	497
03 UT	490	479	479	472	476	465	461	449	429	469	446	480	474	462	411	418	384	359	353	336
	361	315	283	249	235	243	285	350	367	299	315	310	403	468	432	416	454	430	388	355
	364	363	355	366	381	369	349	379	368	297	306	291	498	456	466	506	476	429	429	361
04 UT	383	586	643	599	552	533	586	694	779	700	656	636	648	652	614	568	537	528	526	579
	656	683	658	660	649	674	703	692	712	736	751	751	729	701	697	685	666	637	577	568
	567	556	575	605	639	592	514	475	478	470	451	442	457	453	437	418	391	379	360	330
05 UT	319	364	364	326	396	414	380	295	303	318	306	271	263	271	275	255	220	213	222	286
	306	297	325	358	396	384	358	329	378	426	397	402	347	303	339	402	398	406	451	535
	684	699	785	838	917	990	1021	1037	1041	960	942	1004	990	942	923	913	917	911	872	851
06 UT	833	819	797	779	763	731	718	699	686	714	733	684	669	860	1096	1182	1303	1417	1336	1205
	1046	972	880	900	896	945	982	1005	982	1055	1077	1075	1010	951	903	883	922	989	1039	1062
	1028	995	957	938	928	975	1061	1172	1256	1325	1364	1355	1347	1352	1333	1283	1215	1158	1125	1096
07 UT	1068	1090	1119	1135	1164	1190	1170	1129	1106	1084	1161	1209	1250	1274	1282	1259	1206	1177	1134	1098
	1066	1018	1014	1051	1071	1092	1100	1103	1091	1048	1023	889	874	882	903	911	919	784	714	690
	669	676	675	716	713	705	683	671	661	641	629	632	635	616	532	527	515	502	487	439
08 UT	419	427	419	463	552	541	516	631	590	601	743	710	610	1010	1087	1087	1243	1365	1456	1500
	1400	1545	1565	1376	1185	1194	1216	1128	917	684	495	492	590	824	1163	1235	1162	1116	1145	1190
	1195	1189	1108	1078	1091	1120	1185	1254	1133	1137	1093	1057	1053	999	911	804	774	813	913	1102

1978, MAY 2 - 5



Data from Individual Observatories: MAY 1978

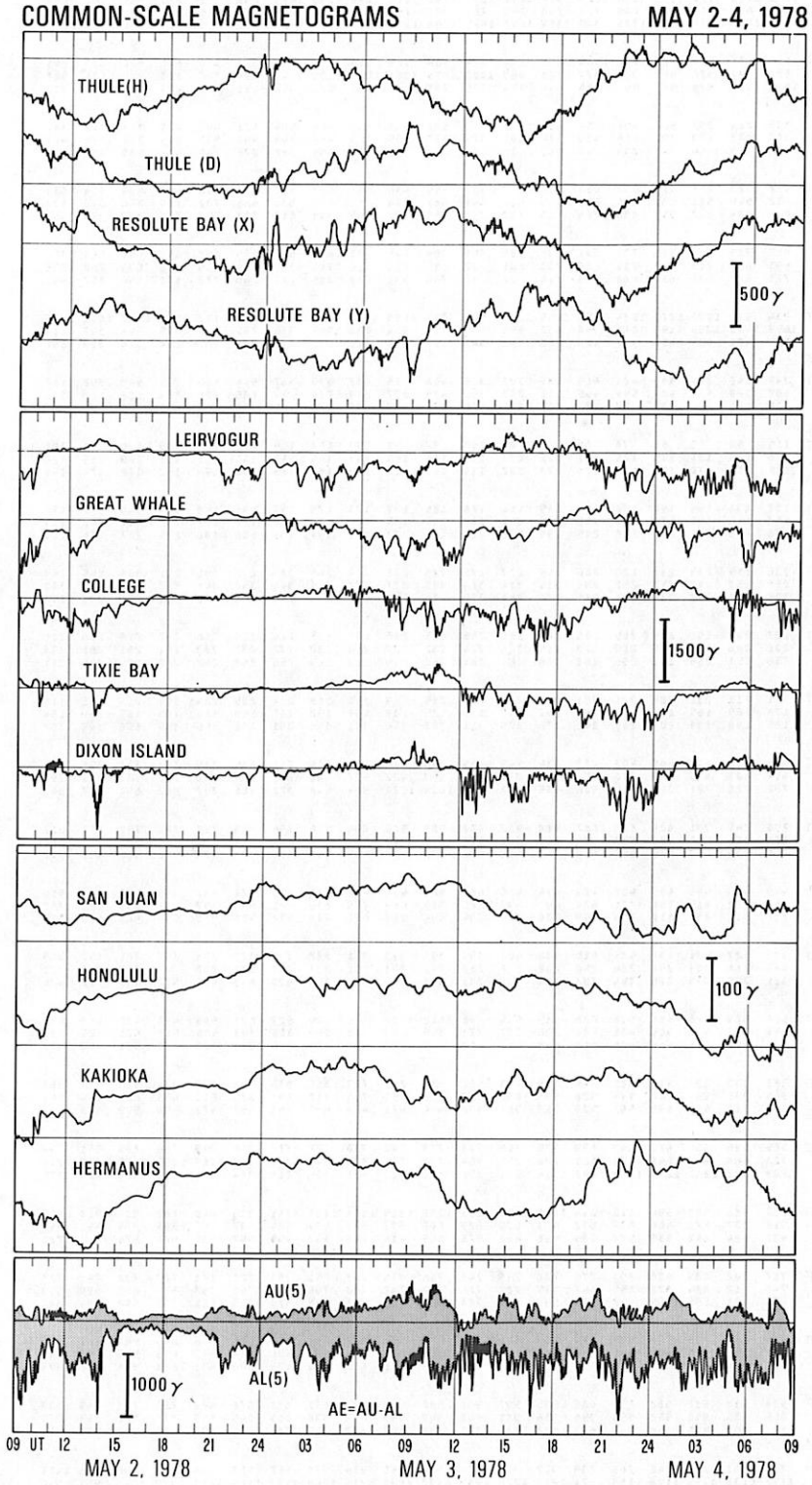
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY (3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
WIT	54.2N	1	0028	SC*	- 2 *	-45 *		01(8)	8	65	360	295	04	20
EBR	43.9N	1	1833	SC*	+ 1	+28 *	+22 *	01(8)	7	23	225	85	03	17
EBR	43.9N	1	0828	SC*	- 1.2*	+ 7 *	+10	01(5)	6	10	137	67	01	18
SJG	29.9N	1	1836	SC	- .5	+19	+ 5	01(8)	7	12	184	36	02	15
GUL	24.5N	1	0800	..	..	..	..	--	-	11	215	67	04	23
JAI	17.3N	1	0800	..	..	..	..	--	-	9	190	45	04	23
SHL	14.6N	1	0800	..	..	..	..	--	-	8	233	52	04	23
UJJ	13.5N	1	0800	..	..	..	..	--	-	6	212	45	04	23
ABG	09.5N	1	0800	..	..	..	..	01(5)	7	7	191	51	04	23
HYB	07.6N	1	0826	SC	- .2	+17	- 1	01(5)	7	6	229	20	01	18
HYB	07.6N	1	1835	SC	- .5	+44	- 2	01(7,8) 02(3,4,5)	6	6	177	39	02	19
GUA	04.0N	1	1836	SC	..	+32	- 9	01(8)	7	10	200	50	04	19
GUA	04.0N	1	0828	SC	..	+17	- 5	01(5)	6	--	120	20	01	18
ANN	01.5N	1	0800	..	..	..	..	--	-	7	246	130	04	23
HUA	00.6S	1	0828	SC	1	28	5	01(5,8)	7	12	459	70	02	21
TRD	01.1S	1	0800	..	..	..	..	--	-	4	262	182	04	23
PHG	18.6S	1	1835	SC	+ 1.5	+30	+31	01(8) 02(1,3,4)	6	7	170	80	02	15
PHG	18.6S	1	0828	SC*	- .4*	+15	+10	01(5)	6	9	120	60	01	18
GNA	43.2S	1	1836	SC	+ 6.8	+30	+36	01(8)	8	52	200	210	02	20
GNA	43.2S	1	0829	SC*	+ 1.3	+16 *	+ 6	01(5)	7	22	80	180	01	18
TOO	46.7S	1	0829	SC*	- 3.3*	+10	..	01(5)	6	33	130	40	01	18
TOO	46.7S	1	1836	SC	+ 1.2	+35	+ 5	01(8)	7	55	230	70	02	18
CZT	51.2S	1	0830	SC	2	16	8	01(8)	8	62	468	234	04	21
KGL	56.5S	1	0828	SC	5	46	11	01(8) 01(5)	9	182	1633	955	04	21
DUM	75.6S	1	0829	SC	90	90	120	01(5,8)	7	1405	955	1585	02	18
EBR	43.9N	2	2317	SC	+ .9	+38	+24	04(1,3)	6	14	146	92	04	20
IRK	41.0N	2	2320	SC	- 2.6	+19	+ 3	03(8) 04(3,5)	6	32	246	127	04	21
SJG	29.9N	2	2324	SC	+ 1	+15	+ 5	04(2)	6	12	99	29	04	19
HYB	07.6N	2	2317	SC	+ .3	+23	- 1	03(4,5) 04(2,3)	6	5	181	29	04	20
HUA	00.6S	2	2318	SC	1	22	3	03(6)	6	10	287	42	04	20
PMG	18.6S	2	2318	SC	+ .8	+12	+12	03(4)	6	6	110	80	04	20
GNA	43.2S	2	2319	SC	+ 5.2	+13	+25	03(5) 04(1,4,5)	6	21	180	180	04	21
TOO	46.7S	2	2318	SC	+ 2.6	+ 9	..	04(3,4)	7	47	240	70	04	20

THREE-HOUR-RANGE INDICES, K

MAY	2		3		4		5	
HIS	----	----	----	----	----	----	----	----
CCS	5556	6434	5666	7556	5556	7353	3221	2124
DIK	7657	9657	6667	9879	7657	8665	3323	2247
TIK	8678	8656	4668	8788	7698	8774	2222	2245
MMK	8666	6656	5656	7778	8775	5654	1211	1126
KIR	8666	6546	5646	6677	8875	4554	1122	1225
CWE	5698	7634	4678	7876	6898	7452	1111	1133
COL	5686	6634	4576	6775	5777	6451	1210	1022
LRV	6787	6547	7767	7688	7995	5453	3222	2134
SOD	8565	6546	5656	6678	8775	5553	1111	0025
YAK	5469	7434	3456	6766	4678	6343	2201	1124
LER	8576	6434	4454	6658	8774	5341	0111	1023
NUR	8666	6544	4445	6657	7675	6332	1112	1113
LOV	9567	6534	4444	6667	7775	6432	1111	1113
SIT	6588	7534	3667	8756	7787	8452	1100	1123
SVD	5465	6434	4334	5545	5564	5331	1111	1113
RSV	6556	6434	4444	5656	6665	5432	1100	1123
MNK	5455	6434	4444	4545	6654	5332	1111	1123
WIT	6666	7545	5454	5656	7765	6542	2212	1234
IRT	6577	6324	3545	5546	5565	6231	1111	1112
VAL	6555	6433	4454	5555	6664	5441	2121	1133
KIV	5556	6534	4454	4655	6655	6442	2222	1124
DOU	5455	5434	4444	4555	6664	5431	1100	1123
KGD	3233	4222	2223	3333	3332	3220	0010	0011
VIC	7686	6324	3655	6545	6986	6331	1101	1023
OTT	8687	6544	4666	5678	7887	6352	1211	2244
MMB	6455	5333	4455	4545	5576	6432	1121	1122

MAY	2		3		4		5	
TKT	5445	6434	4455	4556	5555	6422	3322	1123
PEN	5445	5435	3344	4455	4555	5432	2111	1114
TOL	5455	5434	4444	4455	4564	4431	1113	2223
FRD	7475	5534	4555	5556	6765	5452	1112	2223
COI	5455	4434	4343	4355	5564	3332	1223	2223
KSA	-655	6435	4345	5566	5564	5331	0023	3040
TUC	6466	5344	4555	5545	6665	5342	1111	2123
KNY	5565	5334	4455	4545	5455	6431	1011	1111
QUE	3555	6424	4454	4553	4555	6422	3233	1323
HON	6445	3213	3443	3444	5664	3211	1111	1---
HYB	5566	6524	3456	6554	5665	5421	1111	2123
SJG	5454	3225	4444	5445	5655	4333	1111	1023
GUA	6665	5223	4455	5535	5554	5322	2121	1112
BNG	5354	4435	4345	6455	3545	3342	2122	2233
PMG	6566	5324	4456	5545	----	-433	2321	1012
HUA	6444	6423	3334	5655	5543	5441	1001	2232
GNA	5557	6435	4555	6555	6556	6443	1111	1124
HER	5465	5534	3345	4455	5765	5341	1101	1014
TOO	3456	5555	6456	5323	5577	5431	2100	0003
EYR	5466	5333	3445	5544	4667	5331	1000	0012
MCQ	5676	6534	4576	7666	5786	6452	2200	0012
MIR	5554	5354	5554	4356	7544	3352	3442	1123
MAW	6675	7657	5766	5478	7876	4555	3331	2126
NLV	6787	6345	5665	5477	9977	4332	2221	2124
SBA	6675	5444	5 66	4444	4555	3331	2221	1223
VOS	5565	4333	5444	4444	4554	3321	2231	1233


COMMON-SCALE MAGNETOGRAMS
MAY 2-4, 1978
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1500γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100γ
AU(5)
AL(5)
AE=AU-AL
1000γ
09 UT 12 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09
MAY 2, 1978
MAY 3, 1978
MAY 4, 1978

1978 May 2, 0900 UT - May 3, 0859 UT

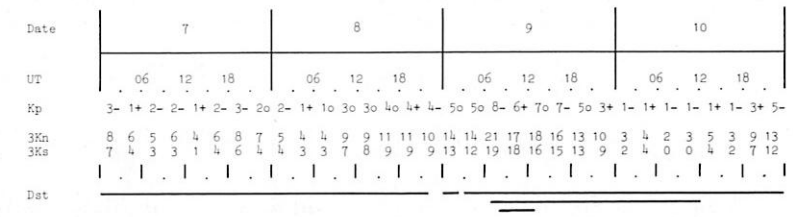
09 UT	1168	1161	1121	1096	1056	1014	984	1002	1034	1060	1063	1048	1056	1079	1049	955	875	846	862	885
	872	849	811	800	785	767	760	750	762	772	744	732	981	1049	1023	1115	1166	1250	1340	1378
	1403	1448	1417	1343	1336	1308	1319	1498	1475	1264	1194	978	968	1017	1086	1069	1018	840	850	1020
10 UT	1118	1171	1157	1122	1101	1086	1058	938	844	668	525	515	515	530	577	610	611	621	685	753
	807	827	876	889	931	977	1028	969	1000	996	1061	1064	1109	1047	894	780	803	925	924	908
	1013	1087	928	917	943	988	994	954	759	797	703	593	525	491	491	472	468	395	310	309
11 UT	333	314	357	522	598	654	653	665	675	677	646	647	626	574	522	490	430	387	347	381
	403	433	409	393	414	419	414	390	375	399	385	419	467	505	492	534	545	530	478	471
	536	569	496	341	294	343	361	407	394	370	387	398	395	392	376	369	414	438	436	449
12 UT	477	523	498	515	597	630	673	662	581	556	536	551	587	571	532	506	495	499	514	533
	532	545	581	596	615	640	635	612	643	681	744	701	657	630	666	722	789	846	850	827
	812	804	847	850	833	764	713	703	718	759	790	795	808	813	788	758	770	810	861	950
13 UT	957	939	847	811	773	791	794	794	769	754	745	671	628	592	604	647	659	666	683	700
	693	697	703	712	734	720	703	701	707	684	704	710	723	720	684	664	656	699	760	771
	721	633	636	634	680	695	718	722	752	796	836	817	805	770	740	772	802	840	867	900
14 UT	934	979	1028	1070	1074	1059	1059	1044	956	877	1005	1079	1079	1151	1186	1103	1051	1137	1515	1765
	1659	1448	1308	1199	1044	953	867	655	625	708	954	1028	1086	976	795	662	555	544	547	518
	514	491	484	487	487	479	463	448	448	457	384	311	273	273	296	287	264	300	319	352
15 UT	344	340	355	389	420	419	385	392	396	408	415	433	475	487	514	508	560	549	552	562
	557	520	484	484	500	445	411	337	355	438	377	279	215	167	186	205	164	128	129	156
	134	124	135	135	143	151	158	152	136	124	113	90	77	90	90	66	51	58	92	123
16 UT	116	89	69	81	78	85	92	83	90	97	90	103	113	115	121	116	109	138	151	146
	126	126	133	125	121	121	121	133	129	136	140	148	144	140	144	167	182	189	189	196
	185	185	170	155	151	125	128	132	114	113	122	134	167	175	192	194	182	178	178	169
17 UT	183	198	194	190	190	198	169	161	178	185	187	179	179	157	148	148	144	140	157	157
	182	166	169	174	171	166	200	200	180	155	135	124	132	162	172	187	192	207	202	210
	236	236	245	231	218	205	195	202	206	196	177	195	193	191	188	196	214	227	216	226
18 UT	236	255	239	231	228	236	265	270	278	278	276	274	269	284	276	291	291	305	265	260
	255	253	240	253	257	295	314	314	314	335	377	377	365	354	352	341	327	339	350	350
	326	313	292	289	294	281	273	263	239	236	222	234	234	234	231	231	231	226	209	203
19 UT	203	203	190	205	205	200	200	195	208	213	208	198	198	216	216	216	232	219	206	201
	201	206	206	219	219	219	219	224	224	232	227	214	232	232	237	237	251	251	251	256
	256	251	256	261	256	261	266	261	261	261	274	269	269	256	242	242	242	224	224	211
20 UT	211	211	211	206	201	201	209	204	212	215	229	218	218	204	215	204	204	215	191	178
	178	165	165	152	152	152	152	138	138	125	138	138	152	165	165	165	165	185	194	194
	180	180	199	204	209	242	276	305	315	323	346	351	351	351	351	356	365	359	349	362
21 UT	386	404	409	401	403	413	434	449	449	449	436	413	386	391	386	389	372	393	396	404
	417	409	425	406	370	354	366	390	410	453	420	422	440	632	674	698	718	733	741	753
	752	721	701	752	825	906	935	967	996	1008	1020	964	948	877	861	852	852	850	827	807
22 UT	790	764	791	829	879	887	910	913	903	902	900	894	828	796	788	797	801	792	673	612
	604	591	587	582	577	576	556	520	512	524	537	545	554	567	574	582	586	581	572	563
	546	524	507	475	469	469	442	438	431	426	427	435	446	458	473	473	473	482	498	502
23 UT	499	499	499	495	487	479	474	466	462	470	466	466	474	471	479	487	488	488	513	556
	663	812	819	781	721	634	497	492	526	605	689	759	836	881	893	857	830	815	798	787
	797	811	853	810	796	755	730	713	694	694	687	651	604	572	551	529	514	465	439	425
00 UT	423	427	431	437	435	416	408	403	399	393	393	381	377	365	328	346	361	381	397	369
	344	314	309	298	284	290	288	282	287	291	291	291	297	303	287	298	307	307	312	312
	321	325	339	376	364	353	348	333	331	343	368	384	393	420	448	460	472	495	511	526
01 UT	526	529	528	558	538	528	519	514	508	512	524	536	529	529	520	508	490	472	463	449
	445	423	403	404	408	408	396	377	373	365	361	353	360	385	393	405	417	421	429	426
	422	415	415	415	408	412	408	412	412	415	412	408	404	396	399	406	420	411	418	402
02 UT	383	390	398	413	428	444	459	483	507	634	745	773	810	886	913	934	934	953	977	962
	946	935	955	957	944	920	900	856	793	765	753	741	717	693	673	671	663	665	664	641
	622	618	610	591	561	538	519	511	496	484	472	464	460	453	457	472	490	509	535	562
03 UT	585	596	608	623	643	659	675	704	718	729	740	736	728	732	744	749	746	799	781	754
	723	660	645	648	659	685	708	752	764	772	791	834	849	883	953	1019	1099	1127	1207	1218
	1202	1222	1242	1278	1280	1307	1314	931	891	890	922	961	996	1010	994	943	806	668	709	775
04 UT	823	882	920	994	1010	1044	1083	1171	1201	1206	1215	1198	1193	1041	909	840	882	902	918	912
	916	732	671	686	697	632	601	620	629	608	592	573	535	584	597	540	505	479	491	446
	431	424	447	535	577	595	598	602	578	469	414	443	447	458	547	596	606	675	713	721
05 UT	717	702	635	606	753	776	738	739	742	796	806	857	851	763	728	721	723	732	741	723
	748	812	824	832	855	867	835	782	786	772	742	733	746	776	768	763	696	682	690	653
	635	671	695	569	652	679	599	558	588	565	525	643	648	618	759	811	738	648	654	640
06 UT	666	680	703	709	678	679	669	645	644	697	668	657	687	700	665	658	656	647	647	668
	711	721	763	827	821	826	806	770	727	685	671	618	591	596	580	575	575	555	556	541
	527	500	484	494	516	527	522	511	490	480	550	617	530	474	499	598	637	534	528	579
07 UT	584	581	582	582	595	583	596	597	591	587	587	603	655	671	676	688	703	711	749	833
	866	935	940	962	993	996	986	981	963	948	895	869	838	815	845	865	877	872	867	879
	881	850	846	848	842	832	807	739	728	730	743	732	719	714	694	702	697	647	624	654
08 UT	712	711	718	740	769	799	900	938	976	983	961	954	973	953	963	964	1009	1096	1156	1181
	1152	1136	1159	1176	1159	1171	1210	1226	1239	1190	1198	1214	1209	1187	1164	1131	1070	1040	951	942
	942	936	926	895	892	942	894	856	884	949	989	971	893	1035	1046	1137	1138	1119	1078	1045

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

1978 May 3, 0900 UT - May 4, 0859 UT

09 UT	1059	1044	1032	1044	1047	1224	1314	1272	1223	1199	1202	1170	1143	1114	1134	1062	1125	1135	1093	1331
	1087	1134	1089	1033	906	899	946	1013	994	918	839	834	837	846	900	925	908	863	859	856
	849	839	834	873	996	955	912	929	864	853	783	747	717	700	708	784	844	855	797	745
10 UT	676	553	553	545	540	557	551	576	602	583	589	543	502	486	452	434	453	551	601	748
	825	895	942	1066	1043	1135	1108	1171	1276	1312	1289	1318	1135	1130	1063	1154	1199	1274	1313	1292
	1331	1358	1391	1259	1231	1230	1230	1197	1128	1182	1283	1311	1330	1428	1456	1426	1403	1333	1250	1203
11 UT	1174	1201	1289	1266	1320	1322	1235	1031	997	1013	1085	1095	1105	1127	1132	1068	1035	1069	1150	1209
	1229	1169	1035	982	924	901	849	869	894	970	974	1047	1128	1181	1217	1128	1075	1042	1030	992
	951	941	910	895	875	833	803	820	828	823	831	814	816	829	883	889	856	831	721	645
12 UT	571	514	482	443	359	572	799	1030	1009	819	247	589	378	265	284	321	335	313	155	188
	238	316	427	510	589	629	392	379	155	256	436	148	142	200	208	178	194	177	188	239
	213	181	459	753	727	375	132	267	333	358	379	433	700	985	905	623	522	162	178	351
13 UT	411	354	364	472	489	507	511	501	441	376	325	280	232	339	468	625	661	482	492	591
	607	627	666	828	829	698	516	481	508	505	500	484	509	573	567	561	594	575	529	633
	638	638	627	552	531	538	552	536	536	560	567	532	484	450	397	378	367	359	359	411
14 UT	468	523	607	665	639	628	690	890	940	843	762	662	589	507	425	362	351	344	459	522
	523	532	541	579	696	698	722	805	957	1069	1109	1139	1054	944	859	840	878	914	862	799
	763	730	757	768	779	782	813	800	767	798	769	744	745	742	752	741	748	780	828	880
15 UT	1002	999	1017	1032	1046	1083	922	1025	992	964	929	1030	951	872	793	720	760	783	812	824
	790	878	848	885	930	969	1044	1098	1110	1134	1111	1066	996	913	856	814	828	861	911	932
	878	788	736	705	664	645	585	548	508	520	596	648	735	771	794	809	814	806	711	629
16 UT	539	580	681	626	654	588	523	563	660	850	879	822	764	799	863	980	903	881	947	1050
	1230	1279	1318	1498	1578	1578	1548	1470	1157	1076	1076	1063	1092	1108	1133	1094	970	920	794	755
	846	957	910	844	797	834	852	873	960	969	1069	1095	1038	1063	1094	1159	942	712	586	486
17 UT	549	649	671	719	932	1049	1011	956	963	912	678	637	675	631	566	558	548	518	513	508
	561	606	614	609	618	626	659	697	693	689	663	651	647	644	632	605	563	540	503	499
	536	574	618	655	673	725	688	662	653	694	783	783	743	720	640	600	537	456	419	392
18 UT	540	550	555	566	588	633	700	690	614	541	558	641	708	745	783	775	974	978	1044	1054
	898	931	904	931	1020	1042	993	898	970	994	976	925	903	839	738	661	635	611	574	564
	575	585	601	617	616	615	635	640	678	694	737	774	800	783	766	799	837	860	865	870
19 UT	864	853	842	883	890	890	890	882	835	806	743	758	777	811	931	958	1025	1076	1157	1216
	1228	1162	1044	988	1020	1104	1116	1143	1098	1052	1059	1046	991	805	823	860	786	756	747	749
	761	776	766	779	804	821	839	859	837	823	803	792	784	793	796	779	762	732	710	673
20 UT	669	693	659	612	570	584	638	656	687	716	624	598	566	626	658	734	748	735	695	731
	760	746	762	891	969	1077	1161	1199	1244	1292	1348	1347	1323	1206	1139	1044	966	862	755	702
	650	600	568	616	683	717	757	785	797	804	788	775	724	771	866	1036	1047	947	845	795
21 UT	757	752	735	689	662	635	574	561	575	597	605	626	674	798	785	764	768	801	870	927
	972	1001	1021	1065	1159	1094	1046	937	895	812	797	795	795	740	706	689	701	907	1060	1179
	1298	1380	1447	1437	1343	1394	1484	1405	1286	1200	1195	1204	1230	1182	1212	1190	1022	982	995	973
22 UT	941	948	866	810	731	687	687	581	628	709	745	702	727	720	705	759	796	800	806	800
	852	920	957	908	732	707	789	835	781	773	809	821	779	750	746	698	713	731	694	697
	600	584	602	922	937	949	979	987	988	1029	1096	1138	1104	1006	949	942	954	1005	1094	1076
23 UT	1038	1022	1006	994	968	930	930	957	916	778	790	811	794	757	794	916	977	986	969	941
	991	1149	1093	1089	992	932	891	880	853	894	989	1013	1033	1022	993	941	877	795	713	736
	870	834	811	716	688	785	818	857	799	728	757	803	824	808	771	749	749	753	760	750
00 UT	742	730	708	692	705	678	698	719	735	783	775	782	802	807	807	796	811	812	825	865
	900	919	921	841	807	799	814	825	837	861	904	911	939	954	977	993	1000	999	995	979
	956	925	883	829	753	785	795	847	892	923	959	1001	1011	987	971	967	963	971	994	1009
01 UT	1013	1052	1083	1091	1088	1061	1038	1049	1037	1006	994	900	788	797	862	886	918	879	993	1049
	1064	1049	824	853	940	985	1015	1030	979	960	995	1056	1090	1104	1093	1192	1324	1304	1284	1244
	1213	1181	1107	1036	1035	1165	1237	1273	1293	1285	1265	1213	1161	1144	1107	1048	1022	1011	1002	970
02 UT	950	839	801	792	888	903	894	862	796	738	707	804	819	831	843	835	819	787	763	692
	687	674	685	690	711	731	764	785	797	821	833	918	954	1017	1054	998	879	681	545	525
	446	411	411	419	424	563	592	667	756	911	958	962	950	891	843	819	752	731	651	627
03 UT	600	512	468	440	472	498	558	558	646	719	922	940	982	1017	1002	973	956	944	927	928
	900	780	732	740	710	708	716	831	901	893	889	728	732	755	719	686	667	755	807	840
	843	825	708	769	878	902	954	940	851	486	492	564	592	620	649	683	732	754	775	806
04 UT	895	933	981	987	976	861	714	462	557	592	684	704	913	1172	1179	1168	888	931	890	599
	510	424	349	373	387	351	335	367	396	434	514	470	475	426	385	380	380	442	530	610
	589	550	754	795	747	767	803	879	1083	1155	1188	1206	1170	1144	1135	1142	1175	1241	1245	1235
05 UT	1202	1206	1196	1176	1000	949	964	1111	1111	1088	1113	1093	1092	1056	1077	1107	1121	1028	1061	1101
	1090	1062	1091	1074	1002	946	931	1003	1023	1051	1040	916	803	778	740	750	755	795	822	867
	889	916	977	1027	995	965	992	1009	1029	1048	1038	1004	981	920	882	853	830	810	801	791
06 UT	764	722	691	641	642	670	712	730	773	936	944	962	937	910	903	895	886	870	867	775
	773	728	767	802	855	927	945	929	908	889	849	785	786	794	794	798	827	888	909	912
	862	755	695	718	769	921	985	1007	1047	1200	1242	1107	993	928	894	833	774	664	574	531
07 UT	473	282	304	387	523	971	899	759	603	634	643	636	621	626	636	633	684	663	747	803
	871	993	816	747	725	725	745	667	621	585	585	597	628	645	691	724	693	619	527	553
	630	739	750	759	591	868	777	689	500	464	487	562	529	436	487	330	279	252	260	299
08 UT	284	468	451	477	719	752	852	1058	1066	267	380	471	506	451	396	343	346	402	602	577
	520	387	375	442	511	555	725	618	588	566	704	755	798	844	915	899	733	841	903	870
	857	829	776	765	834	998	977	737	537	751	884	1029	1098	1243	919	774	972	961	914	1034

1978, MAY 7 - 10



Data from Individual Observatories — MAY 1978

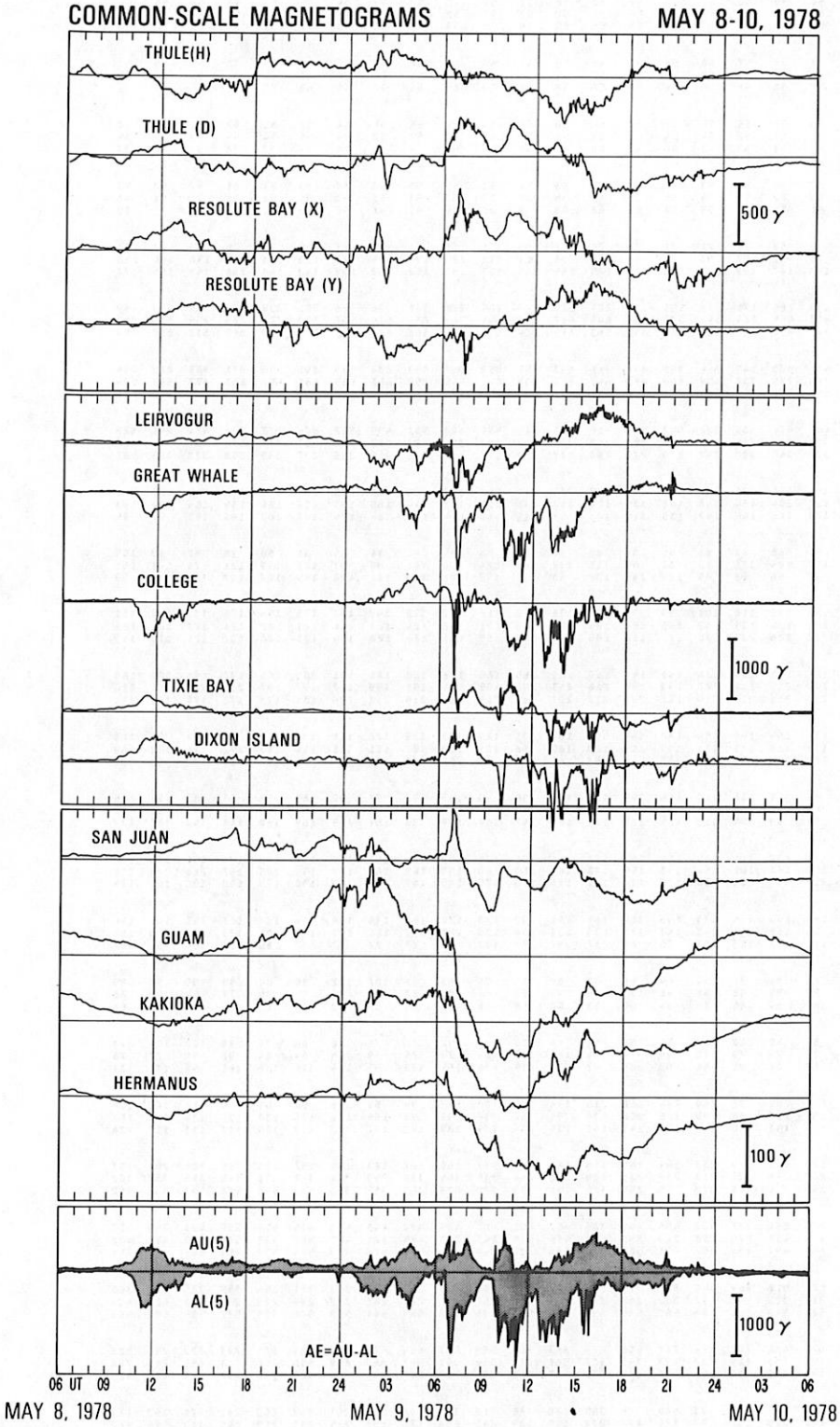
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
STJ	58.7N	7	2150	SC*	10	15	15	09(3)	7	340	760	860	09	22
OTT	57.0N	7	2155	SC*	3	31	16	09(3)	9	780	1160	920	10	01
NEW	55.1N	7	2154	SC*	+ 2	+22	..	09(3,4,5)	7	62	434	503	09	04
FRD	49.6N	7	21--	..	..	..	..	09(3)	7	50	280	190	10	00
HUA	00.6S	7	2156	SC	--	+16	+ 2	09(3,5,6)	6	11	395	50	09	23
API	16.0S	7	2154	..	..	..	..	09(3)	8	7	245	42	10	09
KGL	56.5S	7	2155	SC	1	3	5	08(6)	3	11	65	20	08	21
RES	83.0N	8	0900	..	..	..	..	09(3)	-	813	750	756	10	04
CBB	76.7N	8	0900	..	..	..	..	09(3)	-	880	1100	1020	10	02
BLC	73.9N	8	1000	..	..	..	..	09(3)	-	1075	960	1065	09	24
FCC	68.8N	8	1000	..	..	..	..	09(3)	-	2180	1080	1800	10	01
COL	64.6N	8	10--	..	..	..	..	09(3)	8	274	1670	1150	10	04
SIT	60.0N	8	11--	..	..	..	..	09(5)	8	160	--	770	09	23
WIT	54.2N	8	13--	..	..	..	..	09(3)	7	30	260	130	09	23
EBR	43.9N	8	11--	..	..	..	..	09(3)	6	19	189	92	09	24
IRK	41.0N	8	0500	..	..	..	..	09(3)	8	36	198	114	09	23
MMB	34.0N	8	13--	..	..	..	..	09(3)	7	16	209	51	09	26
SJG	29.9N	8	1200	..	..	..	..	09(3)	7	11	168	42	10	00
KAK	26.0N	8	13--	..	..	..	..	09(3)	7	14	201	92	09	24
GUL	24.5N	8	1300	..	..	..	..	--	-	9	229	82	10	03
MBO	21.2N	8	0700	SC	- .8	- 4.4	- 2.4	09(7)	5	5	78	34	09	23
KNY	20.5N	8	13--	..	..	..	..	09(3)	7	12	238	98	09	24
JAI	17.3N	8	1300	..	..	..	..	--	-	9	234	58	10	03
SHL	14.6N	8	1300	..	..	..	..	--	-	8	294	45	10	03
UJJ	13.5N	8	1300	..	..	..	..	--	-	7	259	49	10	03
ABG	09.5N	8	1300	..	..	..	..	09(3)	7	8	237	55	10	03
HYB	07.6N	8	1300	..	..	..	..	09(3)	8	7	282	36	10	01
GUA	04.0N	8	1303	..	..	..	..	09(3)	7	10	320	30	09	23
ANN	01.5N	8	1300	..	..	..	..	--	-	7	372	168	10	03
HUA	00.6S	8	1303	SC	1	15	1	09(3,5,6)	6	11	395	50	09	23
TRD	01.1S	8	1300	..	..	..	..	--	-	4	--	--	10	03
PMG	18.6S	8	11--	..	..	..	..	09(1,3,4,5)	5	10	150	130	10	00
HER	33.7S	8	1300	..	..	..	..	09(3)	6	23	176	119	10	00
GNA	43.3S	8	11--	..	..	..	..	09(6)	7	34	200	210	10	00
TOO	46.7S	8	11--	..	..	..	..	09(3,4,5)	6	47	230	120	09	23
KGL	56.5S	8	1713	SC*	--	--	--	09(5,6)	7	--	--	--	09	21
OUM	75.6S	8	1100	..	..	..	..	09(1)	6	505	725	645	09	18

THREE-HOUR-RANGE INDICES, K

MAY	7		8		9		10	
HIS	----	----	----	----	----	----	----	----
CCS	3222	3343	3224	4344	5575	4545	2422	3434
DIK	4233	3563	3-26	6444	5577	8865	3423	3446
TIK	2322	3462	3226	5543	4588	8865	1332	4434
MMK	4112	2232	2113	4343	4456	5664	1311	2235
KIR	4112	2241	1113	4333	5555	6654	1311	3236
CWE	2331	2232	2213	4343	4597	8653	2311	3133
CCJ	2222	2232	2116	5332	4586	7458	2202	2133
LRV	6221	3352	2212	4544	6676	6563	3222	2236
SOD	3011	1231	1103	4333	4455	6654	1201	2136
YAK	3222	1333	2223	3334	4467	8754	2221	3233
LER	3111	2231	1112	2332	4464	5642	0101	1205
NUR	3112	1131	1112	3433	4465	7643	0111	1134
LOV	3112	2231	1112	3433	4465	6652	0111	1124
SIT	2222	1132	2105	4433	4678	8743	1202	2034
SVD	3112	2221	1112	3343	4455	6643	0101	2134
RSV	3012	2232	1213	3443	5464	6643	0101	1134
MNK	3122	1132	2112	3433	4464	5643	1211	1134
WIT	3123	2232	1113	3554	5476	6644	0111	2134
IRT	2333	1231	2224	3443	4586	6433	1211	2234
VAL	3111	2231	2123	2444	5454	5543	1111	1233
KIV	3233	2132	2233	2444	5475	5653	0222	0134
DOU	3011	1132	1112	3443	5464	5643	0101	1033
KGD	1111	1111	1111	1222	3243	3321	1111	1022
VIC	2221	0133	2113	2433	4577	6444	1201	1024
OTT	3224	2233	2123	3344	4597	6552	1101	1145
MMB	2322	1333	1123	3434	5575	6543	1211	3134

MAY	7		8		9		10	
TKT	2022	1222	3234	3544	5475	5653	2222	0234
PEN	2112	1122	1121	2332	4354	4432	1111	1113
TOL	2013	3222	2223	2444	5464	5553	1112	1033
FRD	3221	2213	2113	3344	5575	6564	1111	1045
COI	3123	3332	2223	3444	5464	5433	1222	2133
KSA	0223	3333	2134	3555	6764	6554	0002	0444
TUC	2221	0112	2223	3334	5586	6454	1101	1034
KNY	1301	1333	2123	3444	5475	6543	1210	2133
QUE	3-32	1222	3133	3444	5375	6553	4221	3333
HON	----	----	----	----	----	----	----	----
HYB	1211	1212	1222	3444	5387	7653	1211	1134
SJG	1011	0222	1111	3444	4476	4476	1100	0034
GUA	2222	2222	3224	3434	6474	5533	1201	3134
BNG	3223	2232	2223	3444	5475	5443	1222	2134
PMG	2332	1222	2324	3444	5455	5444	2221	2144
HUA	1211	2443	1112	4554	4365	6653	0111	2243
GNA	2222	2232	1223	4344	5666	6744	1210	3233
HER	2012	0021	1012	3333	5465	5553	1100	0034
TOO	1111	1221	1013	3332	4466	6533	0100	3123
EYR	2211	0101	1113	3323	4467	5533	1201	2123
MCQ	2210	2121	1104	4222	3596	7553	1301	3122
MIR	2432	1143	3333	3223	4564	4353	3332	2225
MAW	4332	1253	2223	4444	4575	4653	1321	1154
NVL	3222	1121	3332	3221	5796	5453	2111	1126
SBA	33 2	2233	22 4	3433	4475	5333	2211	1144
VOS	2121	1232	3223	3323	4454	4333	1211	1134


COMMON-SCALE MAGNETOGRAMS
MAY 8-10, 1978
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000 γ
SAN JUAN
GUAM
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
06 UT 09 12 15 18 21 24 03 06 09 12 15 18 21 24 03 06
MAY 8, 1978
MAY 9, 1978
MAY 10, 1978

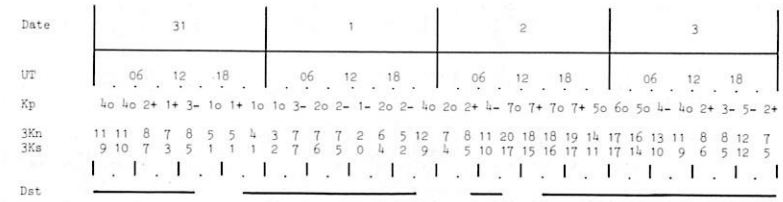
06 UT	50	50	52	52	52	52	52	52	52	54	52	52	52	54	56	56	56	56	56	56
	56	54	54	52	54	54	54	52	52	52	52	51	51	51	51	65	65	65	67	54
	56	56	56	69	56	56	56	59	59	59	59	59	59	61	51	51	51	51	53	53
07 UT	38	38	47	58	53	48	46	46	43	43	46	46	43	46	46	35	38	51	48	48
	46	46	59	59	56	56	54	54	52	52	56	56	56	56	56	56	56	56	56	56
	56	56	56	56	56	56	56	56	69	69	69	56	56	56	60	56	56	56	56	56
08 UT	56	56	56	56	56	56	56	56	56	54	54	56	54	54	52	52	52	52	52	52
	52	52	52	54	54	54	54	54	54	52	52	52	52	54	54	54	54	54	54	54
	54	41	43	43	46	46	46	46	48	48	48	24	26	26	26	33	33	33	33	33
09 UT	33	31	53	53	55	53	53	53	53	53	55	55	55	53	53	51	51	53	53	53
	53	53	55	55	55	55	55	55	55	53	53	53	53	53	51	51	51	51	51	48
	51	51	53	53	53	51	48	48	48	28	26	41	41	56	60	60	64	66	77	80
10 UT	80	80	73	71	71	71	71	71	69	71	71	71	67	67	69	71	76	80	80	80
	80	81	93	93	93	98	85	98	111	111	125	125	125	129	129	143	156	156	156	143
	143	147	160	160	160	160	165	165	165	165	152	152	152	152	143	148	148	148	165	170
11 UT	175	166	170	206	195	215	207	225	247	265	279	288	306	306	306	339	372	434	459	459
	483	495	518	545	572	590	604	617	635	644	649	653	674	698	709	729	729	765	809	843
	887	898	889	889	865	851	863	874	874	860	871	860	871	871	869	869	869	883	885	898
12 UT	900	878	843	854	840	840	816	843	856	858	858	869	883	905	896	896	871	860	825	814
	756	709	707	694	669	658	647	650	638	641	641	652	663	685	661	652	641	607	596	574
	563	530	526	521	517	517	517	503	490	495	490	472	467	463	458	454	476	481	476	463
13 UT	467	474	485	530	543	519	516	528	514	490	503	501	499	512	534	532	485	474	441	428
	406	392	366	375	372	383	357	372	397	397	386	399	437	437	417	397	406	417	414	388
	375	346	320	292	279	270	248	237	250	275	288	312	310	310	332	330	350	372	395	405
14 UT	414	426	426	428	419	399	377	330	317	292	293	304	300	295	279	275	260	249	238	221
	212	204	184	148	148	135	124	117	133	134	138	144	166	193	206	184	184	184	204	193
	179	166	166	142	130	119	108	97	110	110	124	124	124	124	103	103	103	103	95	95
15 UT	95	88	88	83	81	81	89	84	84	98	89	86	86	84	81	88	90	90	93	100
	100	105	101	92	88	85	112	132	141	124	103	101	90	97	126	130	121	129	141	141
	97	56	63	89	129	141	132	98	91	102	101	109	108	120	105	102	102	103	108	99
16 UT	114	109	116	100	99	85	109	138	142	118	110	120	142	132	126	104	106	132	152	161
	156	134	135	132	145	158	164	172	159	151	142	124	123	116	121	122	128	137	161	181
	202	226	237	236	177	168	166	176	172	158	141	126	128	134	131	128	122	121	115	119
17 UT	126	130	134	134	140	147	155	165	165	168	176	180	188	191	209	206	197	198	185	169
	239	215	160	172	189	198	218	213	207	195	194	198	199	197	197	197	203	203	210	210
	211	211	218	214	211	209	207	207	216	216	216	216	212	199	181	175	172	170	165	160
18 UT	158	154	154	154	148	144	140	134	131	129	129	129	128	125	120	112	98	94	95	108
	115	118	117	111	109	114	109	105	98	101	103	107	111	111	114	112	112	111	109	109
	88	80	65	62	58	48	57	63	73	74	67	63	73	66	79	101	111	98	92	83
19 UT	84	93	105	113	114	109	103	100	96	93	93	92	92	92	89	93	93	88	87	85
	80	82	83	81	85	87	83	83	87	87	87	94	98	99	103	99	95	91	91	92
	92	99	84	112	124	135	153	158	147	137	129	130	161	165	169	150	140	140	132	132
20 UT	132	132	141	145	149	155	157	161	158	154	152	154	157	159	157	156	173	158	154	161
	157	163	161	154	150	154	173	169	169	169	169	169	169	177	195	205	197	210	223	210
	210	197	206	206	189	184	180	176	173	172	179	187	195	189	190	175	188	192	192	175
21 UT	167	155	164	173	199	216	189	201	192	183	170	152	148	144	144	157	157	162	162	166
	156	156	143	143	143	139	139	139	139	135	127	127	123	123	132	124	120	107	103	116
	116	103	103	103	76	87	87	87	98	103	98	87	87	87	87	80	84	84	84	84
22 UT	80	84	84	84	84	88	88	88	84	95	80	80	102	102	80	84	88	99	99	99
	99	99	88	88	88	103	99	99	88	84	80	87	79	75	75	75	75	64	68	68
	68	64	64	64	64	64	68	68	68	68	68	68	68	70	75	75	75	79	84	68
23 UT	64	60	60	60	56	53	54	70	70	81	92	81	75	70	66	75	90	100	104	73
	70	75	79	100	84	84	84	100	100	84	75	75	79	84	84	84	90	90	73	73
	82	87	91	91	89	87	92	99	118	138	154	120	95	104	104	126	144	148	131	131
00 UT	268	250	232	210	206	211	216	194	158	120	103	94	50	46	51	61	86	111	109	104
	109	107	88	88	100	106	90	90	87	90	99	98	108	122	136	136	136	136	141	143
	146	143	146	148	150	143	143	134	134	139	139	129	137	132	113	109	113	113	117	128
01 UT	126	126	129	133	149	148	148	148	148	152	160	167	163	154	157	178	185	185	201	197
	202	214	230	230	238	238	226	222	254	335	364	324	299	301	340	366	366	346	339	332
	346	361	375	372	355	355	355	351	339	322	329	340	365	398	434	464	482	493	531	542
02 UT	570	554	527	533	498	444	385	403	411	423	435	430	445	453	434	407	395	403	399	417
	433	410	276	288	319	395	427	475	399	347	363	405	381	469	455	465	524	509	486	482
	462	457	453	457	493	505	531	528	539	546	539	539	573	569	546	531	564	569	547	541
03 UT	526	410	369	346	338	318	330	307	303	306	290	297	320	373	351	354	339	335	316	308
	311	303	295	287	301	289	282	289	274	267	271	271	268	272	265	269	295	361	422	493
	534	549	594	608	563	540	496	507	514	538	556	569	558	569	574	579	577	586	609	604
04 UT	629	681	722	774	717	688	679	683	703	699	683	694	679	652	641	670	703	728	758	821
	792	753	719	730	773	845	923	961	1012	1014	948	907	859	834	806	756	723	698	705	728
	688	669	662	666	666	647	632	617	613	564	518	507	504	524	528	508	488	465	478	474
05 UT	479	456	445	430	400	396	385	338	326	311	303	306	264	241	242	269	281	224	153	177
	241	215	191	179	179	172	208	186	189	246	206	171	188	225	253	219	146	113	96	172
	192	201	168	250	136	146	132	127	115	117	108	122	169	195	191	175	210	257	280	299

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

1978 May 9, 0600 UT - May 10, 0559 UT

06 UT	300	291	293	310	303	261	300	280	273	281	345	391	440	372	352	354	394	340	360	388
	397	329	320	309	361	354	383	399	435	458	363	331	409	410	329	301	283	225	189	228
	501	482	607	629	779	908	907	874	831	862	1050	1061	1150	1145	1133	1658	1715	1524	1194	1217
07 UT	1316	1322	1317	1360	1434	1404	1355	1327	1350	1422	1411	1351	1328	1372	1386	1150	942	895	853	824
	815	824	816	825	807	811	778	773	764	758	781	821	814	816	817	757	801	854	875	898
	888	838	806	768	781	847	932	970	1028	1100	1100	1065	991	1007	1014	1078	1064	1087	1134	1154
08 UT	1144	1136	1068	1028	1006	947	921	880	893	843	812	813	792	771	792	751	696	650	605	621
	614	621	628	637	605	587	565	556	560	554	564	584	590	608	537	530	502	443	444	395
	374	339	328	326	323	314	298	295	283	279	267	256	249	231	213	202	194	194	192	185
09 UT	181	174	169	144	150	163	161	149	130	119	121	122	116	138	147	132	120	131	135	130
	132	134	138	151	164	150	146	154	151	159	182	189	197	174	158	154	145	157	156	131
	130	170	186	199	239	279	305	336	356	916	982	910	906	862	785	720	471	575	547	893
10 UT	1005	1239	1337	1323	1398	1392	1282	1254	1222	1222	1226	1215	1156	1166	1183	1204	1194	1152	1164	1343
	1302	1315	1322	1347	1287	1226	1095	1027	1045	1082	1161	1172	1176	1160	1158	1152	1175	1208	1242	1416
	1523	1520	1468	1403	1363	1380	1387	1372	1361	1326	1172	1121	1002	1002	973	955	955	993	1034	1041
11 UT	996	930	888	717	719	743	781	1331	1463	1505	1317	1240	1157	1144	1107	1097	1047	933	900	850
	799	803	817	831	831	835	798	752	733	707	693	711	842	850	864	864	855	842	820	777
	748	706	663	675	682	676	634	569	546	521	517	505	496	496	495	492	485	476	457	463
12 UT	458	426	408	400	466	479	464	431	453	466	479	466	424	434	437	386	398	394	371	357
	351	350	340	340	340	355	473	524	580	598	620	694	745	756	770	855	934	1114	1145	1174
	1070	975	1020	1032	927	826	825	917	824	800	774	837	869	835	795	813	817	821	839	971
13 UT	998	998	1007	1128	1151	1088	1066	944	935	918	891	777	763	773	773	782	792	781	762	750
	754	776	890	1053	984	987	940	910	799	801	899	933	1046	1058	1052	1088	1065	1082	1124	1148
	1077	1021	1003	1089	1201	1299	1340	1425	1399	1291	1198	1152	1083	1058	1056	996	827	790	782	810
14 UT	846	830	855	942	978	997	948	896	901	854	868	838	792	775	803	882	799	752	901	949
	964	938	944	906	890	844	755	718	708	710	792	619	605	592	566	577	578	538	600	746
	777	787	784	767	754	738	742	758	724	731	747	714	700	711	684	677	663	637	606	586
15 UT	639	714	718	724	760	733	715	699	681	673	662	651	648	646	789	830	894	992	1132	1210
	1215	1130	1181	1375	1390	1106	968	915	828	750	664	672	787	741	737	798	837	1197	1040	1195
	1338	1463	1426	1000	918	970	1072	1053	965	864	822	867	943	1072	1090	1069	968	888	873	933
16 UT	925	891	810	789	801	801	808	843	890	806	763	640	660	693	688	605	575	586	558	568
	592	593	598	639	688	643	587	588	620	645	627	599	579	567	583	627	635	612	619	631
	631	612	594	580	562	537	541	540	511	493	527	542	545	520	499	467	516	579	571	539
17 UT	519	506	538	572	594	616	612	589	570	559	552	546	595	637	662	654	630	602	605	628
	647	639	622	605	626	638	621	637	548	544	534	562	556	559	544	540	546	556	568	565
	563	586	590	589	595	598	597	559	588	590	567	543	525	521	482	468	464	451	449	455
18 UT	469	476	487	488	480	455	428	406	396	394	391	389	384	386	404	420	423	424	432	442
	442	443	443	437	432	431	439	428	407	391	366	349	363	374	368	347	330	311	297	289
	286	285	285	285	283	273	278	276	285	299	328	335	344	332	323	307	302	310	317	306
19 UT	301	301	303	306	313	318	320	318	315	316	320	320	326	326	329	336	332	331	333	324
	330	333	332	315	311	317	318	311	313	320	316	316	315	324	291	303	316	329	338	352
	367	371	373	381	376	371	353	323	300	273	253	270	288	305	313	317	313	310	308	317
20 UT	303	303	290	295	286	295	304	290	285	285	268	263	242	245	250	269	283	256	238	202
	173	181	193	268	381	409	424	501	670	702	643	547	327	328	383	526	501	501	480	406
	324	284	296	303	291	272	255	189	233	245	213	225	252	206	175	152	154	144	158	163
21 UT	135	127	154	156	134	115	101	108	117	121	103	91	94	86	84	91	95	97	104	108
	126	135	130	117	126	104	99	95	81	81	78	77	77	73	64	59	57	57	50	41
	46	46	59	64	73	86	86	72	68	81	81	95	95	108	108	121	130	126	143	143
22 UT	143	130	104	68	53	104	109	72	16	41	36	50	62	45	41	50	50	26	25	32
	33	49	54	67	67	67	31	45	144	192	175	44	28	42	68	86	60	43	51	47
	73	95	103	89	90	104	109	101	92	94	85	58	68	72	63	54	54	58	58	62
23 UT	62	50	50	50	50	50	37	37	38	38	38	40	36	36	40	42	37	40	45	56
	56	62	71	59	62	53	50	62	50	36	36	37	48	62	62	50	50	50	50	50
	52	52	50	50	50	62	62	62	62	62	48	48	48	41	38	52	51	56	56	75
00 UT	62	69	69	82	78	78	61	61	47	65	58	58	64	57	44	44	47	47	47	47
	47	47	47	47	50	50	62	52	47	47	47	49	49	47	44	49	52	36	38	36
	21	30	36	38	42	42	46	46	46	47	50	54	62	63	63	77	74	74	70	66
01 UT	66	66	62	62	59	55	54	54	54	55	59	59	55	60	60	59	55	55	59	59
	59	55	51	47	47	42	42	46	46	46	46	46	46	47	47	47	47	47	47	47
	47	47	47	45	43	43	43	39	34	39	39	43	56	43	64	50	34	40	45	35
02 UT	35	35	32	32	37	32	32	32	32	29	29	30	30	24	35	18	21	21	21	24
	24	24	24	24	24	24	20	23	21	21	25	18	16	20	20	24	24	24	15	16
	20	21	21	23	23	25	24	31	31	31	29	23	23	27	27	16	19	23	23	20
03 UT	20	16	16	12	17	21	17	17	17	17	21	25	27	27	27	27	27	42	42	42
	27	27	27	20	38	51	50	37	48	37	37	37	20	28	50	62	64	75	64	55
	55	39	26	75	110	113	91	91	62	50	50	68	68	64	60	50	50	38	47	25
04 UT	25	29	48	42	42	38	17	17	13	33	38	31	30	30	34	34	33	15	19	19
	38	34	34	34	34	36	41	39	31	31	36	36	36	33	29	29	38	35	33	33
	36	36	36	36	47	47	47	49	49	52	54	52	52	49	47	44	44	47	49	49
05 UT	44	39	44	47	49	44	44	42	38	54	52	47	44	44	47	52	47	44	49	52
	52	52	38	52	54	54	54	52	56	56	56	52	52	52	49	52	49	47	41	46
	59	59	54	52	49	47	49	56	59	52	54	54	54	65	60	58	60	49	49	47

1978, MAY 31 - JUNE 3



Data from Individual Observatories

JUNE 1978

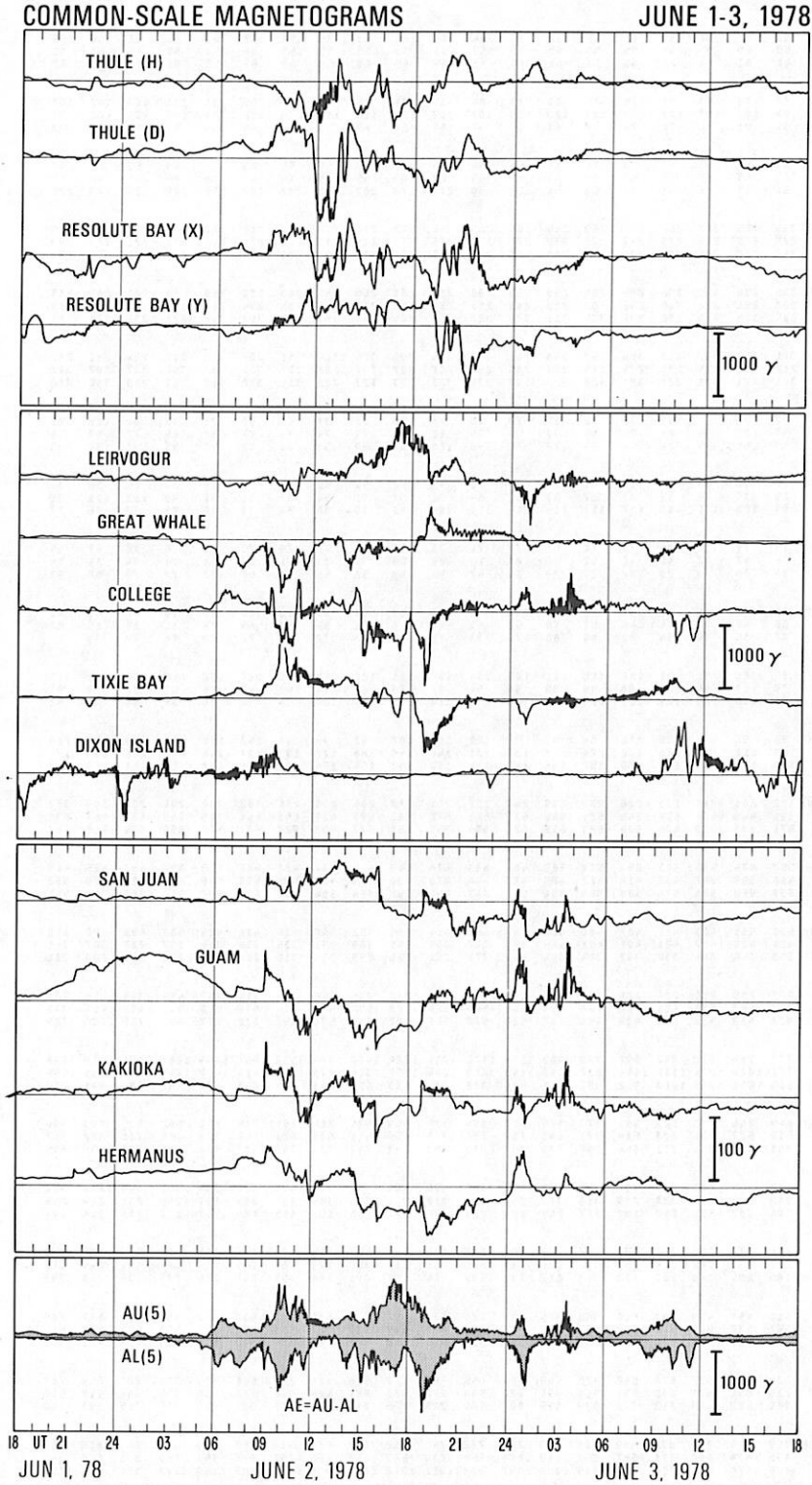
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	COMMENCEMENT hr min (UT)	COMMENCEMENT TYPE	SC - AMPLITUDES D(')	SC - AMPLITUDES H(γ)	SC - AMPLITUDES Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	RANGES H(γ)	RANGES Z(γ)	UT END DAY	UT END HOUR
RES	83.0N	1	2143	SC	-100 *	-37	30	01(8)	-	406	258	596	02	06
CBB	76.7N	1	2143	SC	--	--	--	02(7)	-	850	1630	1470	03	05
BLC	73.9N	1	2143	SC	--	--	--	02(7)	-	1144	1280	1696	03	04
FCC	68.8N	1	2143	SC	--	--	--	02(7)	-	1210	1005	910	03	10
STJ	58.7N	1	2145	SC*	15	40	25	02(7)	6	150	250	280	03	12
OTT	57.0N	1	2143	SC*	4	81	17	02(7)	7	57	342	282	03	12
WIT	54.2N	1	2143	SC*	- 1 *	+53 *		02(5,6)	7	38	425	135	03	21
EBR	43.9N	1	2143	SC*	+ 1.9*	+27 *		02(5,6,7) 03(1)	6	21	183	149	04	03
MMB	34.0N	1	2143	SC	+ .9	+ 6	- 2	02(4)	7	17	184	53	04	04
KAK	26.0N	1	2143	SC	+ .8	+ 6	+ 3	02(4)	7	12	158	91	04	04
HBO	21.2N	1	2144	SC	+ .9	+23.3	+ 3.5	02(16)	6	7	116	36	04	03
KNY	20.5N	1	2143	SC	+ .8	+10	+ 5	02(4)	7	11	183	86	04	04
HUA	00.6S	1	2143	SC*	--	32	4		-	--	--	--		
HER	33.7S	1	2143	SC	+ 2	+14	+12	02(4) 03(1)	6	18	161	118	04	03
CZT	51.2S	1	2143	SC	3	10	2	02(7) 03(1)	6	38	144	109	03	10
KGL	56.5S	1	2143	SC	6	15	3	02(7)	9	106	834	349	03	18
DUM	75.6S	1	2143	SC	110	40	110	01(8) 02(1)	5	365	285	375	02	09
RES	83.0N	2	0912	SC	-167	-37	71	02(7)	-	1255	1624	1616	03	11
HUA	00.6S	2	0913	SC	3	74	15	02(6,7)	7	16	510	44	04	04
API	16.0S	2	0914	SC		40	-14	02(4,5,7) 03(1)	5	5	109	29	04	05
GNA	43.2S	2	0914	SC	+ 5.4	+41	+25	02(7) 03(1)	6	26	140	150	03	12
TOO	46.7S	2	0914	SC	- 1.2	+42	+10	02(4,6)	6	27	160	50	03	12
CZT	51.2S	2	0728	SC	3	12	10	02(7) 03(1)	6	38	144	109	03	10
DUM	75.6S	2	0916	SC	25	90	95	02(4,6)	6	665	585	1045	03	12

THREE-HOUR-RANGE INDICES, K

	MAY 31		JUNE 1		2		3	
HIS	----	----	----	----	----	----	----	----
CCS	5332	3122	2344	2225	3356	6665	6645	2253
DIK	6443	4223	2454	2335	3357	7776	8667	4374
TIK	5333	3212	2344	1225	3357	6786	7656	4473
MMK	6312	3101	1323	1213	2236	7674	7434	3252
KIR	6311	3101	1323	2113	2236	7674	7544	2342
CWE	3333	3221	1333	1224	3347	7784	5656	2242
COL	3322	3111	2233	1223	2247	5674	5635	3231
LRV	5532	3113	2532	3234	3346	6774	7554	3353
SOD	6311	3101	0223	1113	2236	7675	7434	2342
YAK	4323	2111	1232	1223	2346	6664	6644	1343
LER	4321	2111	0311	1112	2235	6674	5333	2341
NUR	3312	3121	1223	1223	2247	8674	5433	3352
LOV	4322	3211	1322	0223	2247	7663	5433	3352
SIT	4330	3111	1231	0213	2238	7764	6556	3242
SVD	3222	3221	0223	0213	2247	7664	4544	3242
RSV	3321	3121	1322	1223	2346	7664	5433	3352
MNK	3223	2221	1222	2213	2346	7554	4433	2242
WIT	4422	3232	2322	1324	3346	7765	6534	3453
IRT	3222	3112	1233	0213	2247	6664	4533	2242
VAL	3422	3121	1321	1213	2136	5663	5422	2342
KIV	3234	3221	1322	1213	2247	7665	5433	3352
DOU	3311	3121	1211	1213	2235	7664	5523	3342
KGD	1112	2110	1211	1112	2325	6553	3333	2231
VIC	5422	2101	1232	1225	3247	6675	6654	2232
OTT	3532	3221	1323	2225	2246	6575	5453	2343
MMB	3233	2222	1222	0224	2347	6665	5644	3242

	MAY 31		JUNE 1		2		3	
TKT	3333	3223	2232	2223	2237	6665	5533	3252
PEN	3232	3231	1112	1213	2135	6654	5533	3242
TOL	3223	3321	1211	2213	1135	6661	6534	3242
FRD	4532	3122	1323	1225	2246	6566	6643	3343
COI	3434	2222	2331	2223	2236	5665	6543	2342
KSA	0334	3032	1012	3253	2566	7677	6443	3354
TUC	4433	2012	2332	0114	2246	6665	7654	2242
KNY	3323	3221	2212	0213	2237	5665	6633	3242
QUE	3333	1021	-133	3323	3336	6564	5634	3243
HON	----	----	----	----	----	----	----	----
HYB	3322	3121	1122	1313	2247	6764	5633	2252
SJG	4422	2121	1221	1223	1235	5664	6543	2234
GUA	4322	2121	2122	0213	2237	5555	6633	2132
BNG	3433	4222	2332	2324	2256	5554	5543	3242
PMG	3333	2112	1112	0213	2237	6465	6643	2142
HUA	4422	4232	1222	2323	1135	6774	5433	4352
GNA	3221	1111	1232	0114	2246	5564	6533	2251
HER	3321	2011	1222	0203	1136	5454	6433	2242
TOO	2322	2000	1112	0113	1236	5653	5534	2232
EYR	2221	2000	1122	0113	1135	5653	5534	2132
MCQ	2222	2000	1134	0002	1146	7764	5556	2142
MIR	3331	3111	2343	2224	4466	5573	4443	2271
MAW	5332	3113	3543	2324	4357	6564	8655	3363
NVL	5531	2111	1422	1203	1245	4465	7644	2242
SBA	3332	2123						
VOS	2222	2221	1223	2224	3345	6554	4323	1132

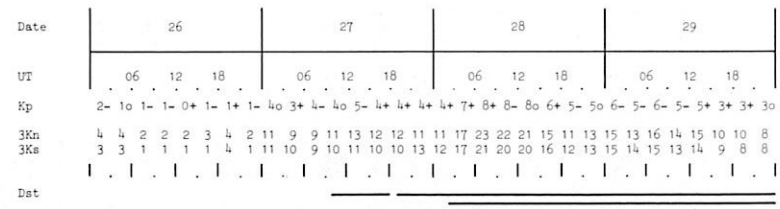

COMMON-SCALE MAGNETOGRAMS
JUNE 1-3, 1978
THULE (H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
1000 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
1000 γ
TIXIE BAY
DIXON ISLAND
SAN JUAN
GUAM
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
18 UT 21 24 03 06 09 12 15 18 21 24 03 06 09 12 15 18
JUN 1, 78
JUNE 2, 1978
JUNE 3, 1978

18 UT	90	87	87	87	87	85	83	80	84	80	80	80	76	73	67	61	61	61	60	59
	55	55	55	55	55	55	55	55	55	51	55	55	55	59	58	58	60	65	61	61
	61	61	61	61	61	61	61	61	65	65	65	69	69	69	69	69	69	69	69	73
19 UT	73	73	73	73	76	76	80	80	84	84	84	84	88	88	88	88	103	103	103	107
	96	107	107	107	103	103	103	103	103	103	103	110	110	106	106	106	106	106	106	91
	91	91	76	76	76	67	63	65	64	64	66	69	65	64	64	64	57	57	53	53
20 UT	53	67	63	63	50	50	46	46	46	46	55	55	55	55	69	69	69	69	69	69
	65	65	65	65	69	69	69	69	69	69	69	55	59	46	46	46	46	46	46	57
	61	61	61	61	61	61	61	61	50	279	279	282	282	282	282	282	279	279	279	275
21 UT	269	269	267	267	267	269	269	269	269	269	272	272	272	280	280	280	283	275	275	275
	275	275	275	275	275	275	275	275	275	275	275	275	271	271	271	271	271	271	271	269
	280	280	294	307	321	321	283	269	275	298	305	313	321	309	294	290	279	283	283	286
22 UT	286	296	296	296	296	294	296	294	290	286	280	280	280	280	280	280	283	283	283	283
	283	296	296	310	296	283	283	283	283	283	283	283	283	283	294	302	321	329	334	334
	334	336	336	336	336	335	331	327	323	331	344	356	363	367	367	367	371	371	375	375
23 UT	371	367	367	363	356	352	348	348	342	334	330	326	319	311	307	305	302	294	290	286
	282	283	275	275	275	279	283	280	294	307	307	307	307	307	307	307	307	307	307	307
	321	321	321	321	321	323	323	337	337	323	323	323	323	310	310	310	310	310	310	310
00 UT	92	92	92	92	92	92	92	78	78	78	78	82	93	90	90	95	93	90	106	95
	98	102	90	88	95	95	90	90	95	82	82	79	74	74	77	82	84	77	67	76
	87	68	74	74	74	74	77	79	90	88	90	90	90	88	90	93	93	90	90	90
01 UT	77	63	66	66	61	61	58	58	50	55	52	50	50	52	39	39	39	36	36	36
	39	39	39	37	37	37	53	60	68	72	91	91	94	87	91	95	99	103	101	99
	99	108	111	115	117	117	114	114	110	104	100	98	98	96	90	88	79	73	76	77
02 UT	75	77	80	80	73	71	68	71	71	73	77	79	79	79	79	79	76	75	67	65
	54	47	42	40	42	42	29	29	29	29	29	29	31	31	38	38	34	34	34	34
	34	36	36	29	32	35	39	39	42	44	48	52	56	63	67	72	77	79	86	90
03 UT	92	92	95	92	92	92	92	90	88	83	83	80	80	73	69	57	50	48	41	41
	39	40	44	44	48	52	56	53	50	43	40	52	55	63	65	79	81	85	85	83
	87	86	94	94	80	85	80	78	83	79	75	73	72	76	77	79	84	79	79	83
04 UT	85	88	91	98	107	115	111	109	104	102	111	120	118	116	127	132	113	100	82	75
	79	87	104	103	98	95	93	94	94	87	78	64	54	49	47	55	67	74	78	91
	98	98	104	107	103	104	108	103	96	114	112	107	107	96	96	96	96	96	96	82
05 UT	96	96	96	96	104	84	93	93	120	107	107	93	94	98	103	110	114	119	116	116
	119	110	121	126	130	124	117	133	131	140	149	168	177	193	197	200	206	206	195	172
	166	163	159	152	150	152	146	143	143	150	152	154	154	154	156	158	165	161	156	158
06 UT	192	201	210	212	226	239	239	244	252	261	272	286	288	288	282	284	291	304	309	332
	391	446	464	505	546	571	546	532	566	577	582	595	629	658	681	705	705	687	687	698
	671	633	625	636	638	620	615	624	608	595	561	577	563	527	531	527	550	574	568	552
07 UT	552	576	590	583	554	521	489	489	483	478	449	444	437	433	435	419	397	403	425	419
	418	399	397	405	414	412	425	423	444	478	496	514	514	498	499	540	583	607	566	552
	557	560	578	576	570	568	554	554	547	542	547	558	584	607	605	582	565	558	560	564
08 UT	538	511	483	495	487	480	464	447	450	454	454	452	447	434	431	424	433	429	420	418
	420	424	417	421	401	401	414	398	373	360	351	369	351	335	330	316	303	287	307	316
	348	346	341	332	307	304	304	284	277	261	266	293	309	311	307	298	282	229	209	211
09 UT	223	236	236	236	236	209	198	195	202	218	232	236	250	264	315	337	415	325	266	263
	377	463	532	621	706	708	684	609	545	529	523	533	579	556	534	500	455	457	414	372
	423	439	453	450	439	458	497	524	522	565	582	594	634	647	672	677	690	705	706	709
10 UT	737	756	812	853	892	930	989	1054	1172	1215	1324	1402	1468	1552	1661	1404	1268	1191	1179	1148
	1171	1214	1221	1187	1054	1022	1082	1143	1209	1284	1297	1338	1378	1392	1426	1412	1349	1235	1181	1166
	1118	1091	1065	1013	962	958	971	956	888	839	839	852	841	825	768	678	642	684	691	610
11 UT	649	744	772	823	905	873	859	877	854	739	664	694	714	751	775	852	662	625	593	586
	519	522	536	523	519	571	643	704	722	715	665	611	625	621	665	715	711	731	892	987
	958	918	834	791	844	857	835	833	878	808	783	749	739	768	587	590	614	698	654	505
12 UT	442	445	483	505	497	441	450	473	486	480	420	381	381	428	427	364	350	348	314	302
	334	351	382	330	275	313	375	356	329	312	311	338	355	398	385	337	246	231	234	256
	303	387	355	250	187	177	205	229	278	295	291	258	197	165	165	167	172	205	214	191
13 UT	184	175	198	231	238	226	203	193	197	185	164	167	186	226	242	207	189	189	198	205
	202	188	182	216	287	312	296	284	330	361	367	357	279	267	245	207	177	144	144	175
	189	205	212	207	212	217	217	203	196	194	191	211	240	259	247	256	275	336	380	398
14 UT	418	457	459	468	512	563	574	618	634	632	627	625	630	653	668	673	669	669	677	700
	657	632	625	638	702	803	795	780	719	691	699	628	573	569	556	571	592	591	602	617
	618	599	579	570	529	503	536	561	530	505	480	441	366	354	390	410	433	419	412	408
15 UT	524	543	532	528	542	575	560	583	646	745	912	916	871	827	841	904	920	880	869	787
	739	681	678	652	563	518	495	522	554	572	570	554	526	506	527	516	575	545	515	515
	561	602	640	712	775	839	855	807	780	823	775	711	558	600	675	706	717	715	698	746
16 UT	809	859	728	604	669	806	742	768	789	746	712	697	634	589	589	669	696	741	809	832
	855	874	882	871	867	855	869	876	850	836	863	863	856	867	874	840	855	851	840	840
	848	874	893	923	935	1019	1008	997	989	1020	1040	1033	1056	1106	1129	1167	1173	1176	1044	1055
17 UT	1143	1244	1271	1316	1336	1302	1283	1245	1367	1332	1336	1325	1291	1279	1272	1290	1316	1223	1110	1139
	1181	1259	1333	1236	1131	1208	1234	1156	1141	1142	1108	1093	1105	1129	1164	1190	1152	898	868	782
	749	736	714	691	657	641	634	620	625	613	615	633	653	676	700	696	691	672	666	670

1978 June 2, 1800 UT - June 3 1759 UT

18 UT	686	779	859	897	908	919	877	820	804	792	791	807	831	883	912	890	855	705	705	780
	806	814	791	786	797	866	912	1020	1032	1024	1027	1018	1017	1050	1061	1016	881	910	994	1055
	1026	982	931	961	925	883	945	871	910	993	1031	1168	1076	1137	1376	1436	1362	1298	1236	1222
19 UT	1220	1326	1388	1382	1358	1382	1380	1137	1028	979	949	985	1038	1088	1077	1061	910	959	1037	990
	899	839	851	879	862	843	859	854	802	831	872	787	793	803	817	687	756	778	796	783
	718	657	689	726	695	617	585	606	626	636	587	593	630	647	585	604	614	613	578	556
20 UT	585	567	479	491	521	445	515	568	538	533	613	727	631	630	613	570	529	576	619	672
	651	618	547	558	567	545	557	562	581	597	601	603	635	663	635	542	436	436	423	439
	440	428	410	377	368	359	326	293	271	258	259	216	216	228	229	205	157	167	222	241
21 UT	176	157	151	202	223	207	188	179	156	143	144	147	142	169	161	154	132	158	175	178
	182	191	194	212	197	142	148	192	252	347	197	104	142	167	151	110	78	82	132	161
	184	159	170	162	139	139	136	132	139	119	96	105	134	157	157	255	208	242	217	210
22 UT	140	131	109	129	111	107	109	124	181	186	184	161	129	143	132	125	136	146	140	144
	151	161	151	151	148	152	150	139	127	110	99	114	121	132	132	170	185	183	155	153
	132	130	122	122	152	159	166	173	180	178	182	182	168	139	123	113	123	127	134	155
23 UT	168	166	161	150	155	129	144	131	141	157	182	189	170	139	130	145	163	170	175	173
	155	139	134	136	138	140	149	159	150	143	136	120	113	111	111	120	125	127	132	115
	113	112	107	104	92	106	127	132	135	136	130	123	118	109	102	107	107	106	106	104
00 UT	118	112	135	142	143	135	155	178	189	220	223	227	208	186	179	175	184	188	197	216
	223	231	212	223	254	240	188	283	314	365	273	270	335	388	411	399	400	503	526	609
	586	575	514	511	516	506	584	573	550	573	557	510	747	886	971	923	802	784	796	774
01 UT	739	959	954	911	827	781	884	781	693	476	460	431	385	303	294	304	387	372	276	186
	187	179	168	168	202	218	222	226	215	203	199	191	175	152	144	148	152	167	167	174
	170	163	155	147	140	132	143	151	158	133	117	79	64	99	101	101	110	105	96	99
02 UT	106	109	110	117	122	131	126	120	123	123	125	111	111	78	53	53	111	98	63	73
	78	84	126	132	186	205	181	188	224	220	258	131	19	88	120	141	123	90	76	71
	67	63	37	56	77	109	115	63	94	132	116	98	198	215	155	128	133	112	85	148
03 UT	228	295	191	83	40	34	58	117	158	143	120	69	70	83	99	116	112	113	131	193
	225	229	200	146	116	176	513	506	375	149	198	240	251	98	293	605	668	498	281	218
	299	252	200	340	284	485	501	380	260	177	297	322	141	195	156	254	343	365	326	246
04 UT	219	247	238	232	237	315	323	265	212	239	264	284	315	279	288	252	227	247	234	207
	184	193	160	139	113	135	149	146	133	130	111	108	94	63	52	74	85	93	85	85
	85	85	81	78	74	69	71	66	81	111	100	67	67	86	89	86	97	115	107	91
05 UT	95	113	133	162	161	144	134	148	160	162	151	157	180	185	164	135	135	153	168	177
	143	108	81	81	87	98	87	75	64	53	64	77	62	70	75	120	153	146	101	34
	34	47	67	87	74	47	57	72	86	112	100	134	162	160	138	129	120	123	127	159
06 UT	210	205	176	165	154	145	145	145	138	149	140	118	141	168	187	129	120	146	127	127
	138	111	111	150	118	123	203	229	247	202	188	144	158	177	161	128	129	117	103	121
	132	121	124	133	123	112	110	123	125	120	102	107	101	119	125	116	129	171	162	153
07 UT	142	142	142	151	162	151	151	140	129	129	115	126	138	189	214	200	131	131	140	192
	167	104	115	135	173	162	140	113	135	135	144	162	174	178	209	195	169	158	144	153
	150	205	188	174	152	152	171	196	207	199	206	219	192	178	167	167	181	190	198	207
08 UT	196	185	199	222	235	235	224	226	213	224	241	263	251	249	269	278	273	275	284	303
	311	291	281	303	298	289	351	376	383	358	349	324	331	353	355	347	355	365	364	393
	375	374	372	409	450	472	469	458	466	442	416	406	379	338	337	364	382	390	363	351
09 UT	342	337	347	349	351	379	355	375	379	267	250	223	294	378	434	352	335	299	297	288
	283	276	281	380	426	408	375	345	353	392	430	434	366	347	318	340	362	388	448	470
	438	450	407	395	412	418	389	382	394	434	464	469	477	433	447	556	564	613	645	660
10 UT	738	776	806	891	818	717	623	610	599	599	622	600	576	564	551	526	509	488	456	401
	386	360	324	290	270	257	254	276	280	277	270	249	228	219	197	212	233	235	230	222
	220	215	216	220	227	236	248	236	290	319	341	412	446	465	506	504	511	544	598	621
11 UT	623	606	591	646	642	618	592	598	607	575	496	469	450	431	410	399	373	341	365	332
	301	225	219	192	174	169	145	123	120	122	131	123	123	118	130	138	136	133	120	109
	109	118	107	105	105	105	100	102	116	118	114	114	114	127	130	130	130	130	132	137
12 UT	134	126	131	133	133	127	132	134	134	134	134	129	127	113	111	108	97	97	92	90
	84	95	106	108	111	100	97	97	84	84	75	72	70	63	63	63	63	66	63	63
	61	61	63	62	62	62	62	69	73	75	70	63	60	61	68	77	85	82	77	57
13 UT	60	71	72	70	90	77	77	82	82	69	69	69	69	69	69	69	82	82	82	82
	93	93	82	82	82	82	93	104	118	118	107	96	86	80	84	84	109	109	109	96
	96	86	90	94	86	84	69	69	73	77	80	77	84	71	71	71	84	102	102	84
14 UT	80	77	63	68	68	68	68	71	71	100	104	92	80	109	107	79	67	86	82	78
	78	82	86	86	90	90	90	90	86	86	82	96	92	104	102	109	102	73	92	104
	123	117	113	109	98	107	100	113	109	123	121	119	123	98	107	121	125	125	125	111
15 UT	115	115	119	119	115	115	115	115	115	115	115	115	119	119	119	119	119	119	119	111
	111	111	115	119	119	119	119	119	115	115	111	115	119	119	119	102	102	103	105	
	107	115	115	119	127	123	119	119	119	119	119	119	132	132	129	129	129	129	129	115
16 UT	111	119	142	136	130	128	119	127	123	119	121	118	119	127	135	125	115	105	101	101
	103	106	108	116	123	119	116	113	109	116	124	124	123	119	132	142	138	134	132	134
	159	165	167	178	178	177	189	150	139	163	185	192	197	198	207	202	193	182	177	179
17 UT	188	197	191	180	179	177	174	179	179	183	189	192	182	182	188	204	212	212	207	199
	199	203	206	203	203	206	214	214	214	213	212	207	222	228	223	229	233	236	236	240
	240	244	247	252	257	258	256	251	247	241	241	233	234	239	244	242	244	256	256	254

1978, AUGUST 26 - 29



Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

Data from Individual Observatories

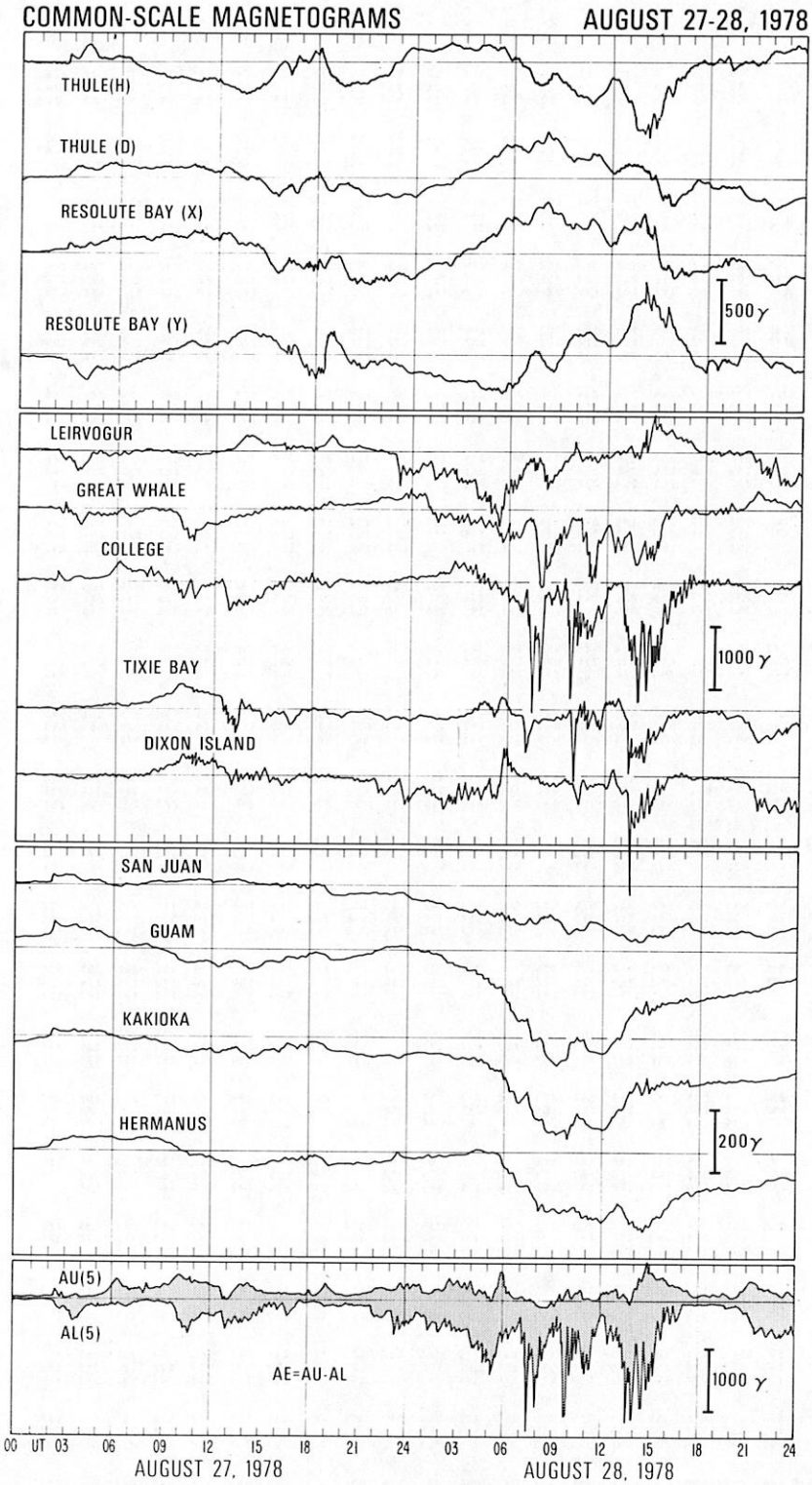
AUGUST 1978

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
RES	83.0N	27	0246	SC	-36	24	-16	27(7)	-	660	842	549	29	05
CBB	76.7N	27	0245	SC	--	--	--	27(7)	-	735	645	1155	28	24
BLC	73.9N	27	0230	..	..	..	..	28(5)	-	584	928	1224	28	24
FCC	68.8N	27	0246	SC	--	--	--	28(5)	-	1650	860	1640	29	24
COL	64.6N	27	0246	SC*	-23	+100	-16	28(3,4,5)	8	499	2430	1710	02	15
SIT	60.1N	27	0248	SC*	- 5.3*	+56.2*	+11.1	28(3)	9	250	--	--	02	19
STJ	58.7N	27	0250	SC*	15	32	20	28(3)	9	760	1020	900	29	23
OTT	57.0N	27	0232	SC*	5	62	14	28(3)	9	980	1420	1140	29	17
NEW	55.1N	27	0246	SC*	2	53	6	28(3,4)	9	157	1204	1384	05	09
WIT	54.2N	27	0247	SC*	- 8 *	+39		28(2,3)	7	32	460	300	28	24
FRD	49.6N	27	0247	SC*	+ 3	+55	- 9	28(3)	8	90	560	375	03	15
EBR	43.9N	27	0246	SC*	- 1.7*	+32 *	+16 *	28(3)	7	24	263	107	01	24
MMB	34.0N	27	0246	SC	+ 1.3	+25	- 4	28(3,4,5)	7	28	352	79	31	20
SJG	29.9N	27	0246	SC	+ .5	+26	+ 7	29(1)	6	16	198	60	29	15
KAK	26.0N	27	0246	SC	+ 1.1	+27	+14	28(3,5)	7	17	341	127	31	20
GUL	24.5N	27	0246	SC	- .4	26	- 1	--	-	17	347	97	31	23
MBO	21.2N	27	0246	SC	- .6	+39.5	- 5	28(14)	5	4	42	10	28	24
KNY	20.5N	27	0246	SC	+ 1.4	+33	+16	28(3,5)	7	14	366	126	31	20
JAI	17.3N	27	0246	SC	- .5	29	- 5	--	-	13	327	53	31	23
SHL	14.6N	27	0246	SC	.8	32	5	--	-	8	--	51	31	23
UJJ	13.5N	27	0246	SC	--	--	--	--	-	10	416	70	31	23
ABG	09.5N	27	0246	SC	- .4	33	- 5	28(3)	7	13	370	69	31	23
HYB	07.6N	27	2200	..	..	..	..	28(3,4,5)	8	10	295	47	31	22
HYB	07.6N	27	0246	SC	- .2	+37	- 5	27(5,6)	5	5	178	39	27	20
GUA	04.0N	27	0246	SC	--	+43	-12	28(5)	7	10	430	40	31	18
ANN	01.4N	27	0246	SC	- 1.4	57	21	--	-	9	435	--	31	23
HUA	00.6S	27	0246	SC	--	47	7	28(6)	7	--	356	50	29	09
TRD	01.2S	27	0246	SC	.1	52	57	--	-	7	476	237	31	23
API	16.0S	27	0245	SC		21	- 8	28(3,4)	8	8	378	63	01	03
PMG	18.7S	27	0246	SC*	+ .2*	+36	+36	28(2,3,5)	7	12	450	140	01	00
HER	33.7S	27	0246	SC*	+ 4	+22	+19	28(3)	7	54	293	150	29	16
GNA	43.2S	27	0246	SC*	- 2.2*	+ 6	- 5 *	28(2,3,4,5,6)	7	41	200	180	29	18
TOO	46.7S	27	0246	SC	- 1	+13	+ 8	28(5)	8	77	300	300	02	21
CZT	51.2S	27	0246	SC	3	12	15	28(5)	7	61	365	257	01	12
KGL	56.5S	27	0247	SC	6	9	10	28(5)	9	179	1341	556	31	22
DUM	75.6S	27	0246	SC	50	185	240	28(2,3,5)	5	655	540	765	28	18
HUA	00.6S	30	0110	..	..	..	..	30(6,7)	5	--	274	49	31	00

THREE-HOUR-RANGE INDICES, K

AUG	26		27		28		29	
HIS	4423	2333	5544	5546	5655	7546	6655	7654
CCS	2312	2343	3344	6435	5545	7636	4546	7545
DIK	2222	2353	4445	6646	6767	9657	6556	7765
TIK	2111	2122	3345	8654	4689	9766	5566	8774
MMK	2100	0121	3224	6545	5755	6577	6545	5545
KIR	2111	2110	3224	6545	6855	6677	6554	4446
CWE	1111	1112	3354	7642	4687	8844	5576	7452
COL	1001	0000	3345	5543	4588	8744	4576	6532
LRV	3111	2222	4543	5457	6886	7656	7663	4556
SOD	1000	0100	2214	6535	5765	6677	6434	4446
YAK	2120	1021	4333	6534	4488	9554	4455	7343
LER	2000	1110	2222	4334	4665	7645	6342	4333
NUR	1111	0020	3223	4344	4646	9745	5443	5433
LOV	1111	1120	3234	5334	4666	9755	5443	5433
SIT	1111	0010	4345	6442	4899	9734	5576	6332
SVD	1100	0120	2223	5443	3556	8534	4443	5433
RSV	1000	0110	4233	4445	4765	7545	5443	5433
MNK	1212	1120	3233	3434	3655	6444	4443	5433
WIT	2100	1221	4333	4555	4776	6555	5454	5444
IRT	1112	1221	3334	6554	3477	7544	4455	6333
VAL	1101	0110	3333	3444	4675	5445	5444	4323
KIV	12--	1111	3333	5544	4755	7554	4444	5533
DOU	1100	0220	4333	3445	4675	5545	4344	4423
KGD	0000	0100	1000	1322	1113	4321	2020	3202
VIC	2211	0100	4344	4442	3699	8533	5564	4231
OTT	1212	1121	4344	5343	4799	7544	7565	4342
MMB	1100	1110	4334	4544	3677	7444	4455	5332

AUG	26		27		28		29	
TKT	2211	1221	4434	5553	3665	6642	4455	5433
FEN	1110	1111	4332	3444	2675	6643	4344	4223
TOL	1002	2010	4333	4444	3575	6633	4343	4224
FRD	1200	0011	4435	5343	4587	6534	6454	5232
COI	1111	2110	4333	3344	3474	5444	5333	4323
KSA	0022	0100	4344	4444	35--	6444	3344	5334
TUC	1110	0011	4444	4343	4586	6545	5565	4442
KNY	1100	0120	4334	4543	4676	7434	3444	5332
QUE	----	----	----	----	----	----	----	----
HON	----	----	----	----	----	----	----	----
HYB	1111	0121	4434	5543	5688	8753	4345	5333
SJG	1000	0000	4432	3343	4445	5544	6444	4323
GUA	2201	0011	5435	4543	5676	7333	4343	5222
BNG	2211	1121	434-	----	--64	6533	43--	----
PMG	1101	0000	4445	4543	5776	7444	4453	5331
HUA	1111	2221	4333	5553	4566	6744	5432	5431
GNA	1111	1121	3334	5443	3665	5654	6575	6333
HER	1000	0010	4332	3344	3675	6644	5445	4334
TOO	1111	1011	3334	4433	3577	8532	4465	5322
EYR	0101	0010	4324	3333	3579	7422	4465	5222
MCQ	1001	0000	3345	6542	5686	9744	4477	6442
MIR	2221	1121	3443	3324	5356	4444	4444	4553
MAW	4211	2233	3654	5437	6746	7566	6544	4657
NVL	2111	0111	3433	3336	7997	6446	7664	3334
SBA								
VOS	1111	1111	3343	3334	3554	6533	3444	4333


COMMON-SCALE MAGNETOGRAMS
AUGUST 27-28, 1978
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000γ
SAN JUAN
GUAM
KAKIOKA
HERMANUS
200γ
AU(5)
AL(5)
AE=AU-AL
1000γ
00 UT 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21 24
AUGUST 27, 1978
AUGUST 28, 1978

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

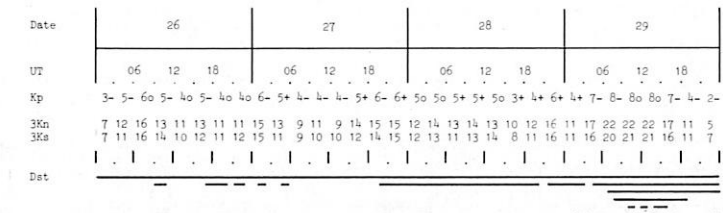
1978 August 27, 0000 UT - August 27, 2359 UT

00 UT	11	10	10	10	10	10	7	7	7	9	7	7	9	9	9	9	9	23	23
	23	11	11	11	11	14	14	11	9	9	20	20	20	20	9	9	9	9	9	11
	11	13	13	11	11	11	11	13	13	13	13	10	10	11	11	9	9	9	9	9
01 UT	9	9	9	9	11	11	11	13	13	13	24	24	24	24	24	24	24	20	20	20
	20	20	20	20	20	20	20	20	24	24	24	24	24	13	13	13	13	24	24	24
	13	13	13	13	13	13	13	13	15	15	15	15	26	26	26	26	24	24	24	24
02 UT	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	13	13	13	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	48
	36	36	48	59	59	48	30	39	97	157	166	180	175	151	146	179	191	195	176	154
03 UT	156	156	151	159	167	148	164	187	183	191	192	175	169	266	262	201	130	122	114	111
	119	147	131	123	115	114	118	130	135	140	159	161	161	157	161	180	203	211	219	215
	215	223	223	215	218	214	222	234	262	293	304	309	332	352	363	363	386	379	383	371
04 UT	363	363	355	354	343	343	343	352	375	363	359	352	340	320	327	320	297	289	289	274
	270	266	258	250	231	227	231	231	223	216	204	196	188	188	184	172	156	149	129	121
	121	117	113	111	127	120	120	116	127	122	122	122	134	134	134	122	120	136	132	127
05 UT	109	104	105	109	109	109	97	97	104	106	111	115	120	120	120	115	111	129	152	151
	170	170	172	127	117	117	122	122	127	127	127	131	156	161	170	186	190	195	195	195
	179	170	165	161	165	165	165	172	173	177	192	196	196	199	195	199	215	203	201	221
06 UT	226	237	232	244	239	234	230	221	223	223	229	229	241	254	273	284	288	304	308	315
	315	322	317	325	340	329	344	352	359	374	385	400	412	416	408	393	362	335	323	339
	327	335	346	316	305	290	290	316	309	305	319	317	310	304	292	297	302	290	284	295
07 UT	300	288	282	282	273	284	300	300	304	291	307	311	311	307	307	307	286	277	257	225
	214	225	236	236	248	257	257	257	241	225	216	207	218	218	218	218	220	216	211	213
	209	213	213	213	213	207	216	220	220	216	211	202	197	209	209	209	213	197	177	158
08 UT	146	157	180	158	158	150	154	146	146	130	130	130	109	92	94	100	101	113	131	157
	179	213	228	239	250	228	206	202	191	187	172	165	146	150	184	184	150	152	154	154
	156	161	164	166	171	173	171	171	176	188	190	192	192	199	204	204	202	200	191	191
09 UT	191	193	193	204	207	206	201	195	197	204	204	204	202	197	198	207	223	224	229	232
	236	238	234	238	246	251	256	256	258	258	263	263	272	275	282	274	274	269	271	266
	262	257	257	262	266	269	280	290	295	298	307	310	315	320	329	334	341	344	358	370
10 UT	379	389	412	403	424	426	450	468	474	490	531	551	540	540	540	537	573	580	617	652
	661	679	681	690	702	711	699	690	688	708	696	676	664	661	670	705	723	730	776	794
	694	669	737	764	766	723	730	732	730	727	725	725	731	740	743	730	725	741	754	794
11 UT	847	852	610	591	631	633	639	598	591	586	617	645	653	651	619	588	581	573	561	545
	550	559	555	560	566	552	541	538	550	554	543	536	530	532	514	518	531	527	488	495
	500	498	493	493	486	454	456	459	461	458	458	463	460	470	467	467	472	472	472	468
12 UT	477	459	459	448	443	438	436	443	450	466	471	484	478	473	468	468	470	463	459	452
	449	449	451	449	451	455	460	448	437	432	428	426	426	421	416	405	398	394	396	
	400	412	409	412	412	416	399	376	364	348	331	295	278	270	246	237	227	227	222	248
13 UT	293	314	365	386	413	395	347	347	358	399	432	440	395	368	368	357	361	369	355	336
	325	329	340	355	370	393	394	402	406	391	410	450	461	463	459	493	490	487	476	450
	420	420	417	402	406	417	440	452	459	459	463	475	483	486	486	498	525	540	566	574
14 UT	578	559	545	542	534	534	534	546	538	541	559	552	532	517	499	500	507	496	496	500
	504	508	520	509	512	526	530	546	557	557	541	548	533	529	518	500	507	507	502	487
	487	487	483	479	479	472	472	453	420	390	374	371	363	366	388	400	403	395	398	390
15 UT	390	353	353	371	367	352	356	349	342	323	293	274	285	263	241	237	281	322	291	327
	335	300	273	253	237	218	207	187	189	189	184	195	195	171	164	156	170	174	184	194
	193	201	199	201	190	179	169	157	148	137	135	134	134	140	136	145	149	153	170	182
16 UT	187	183	192	179	170	161	148	124	136	166	187	200	209	201	201	222	228	228	260	268
	254	228	187	141	108	97	93	117	120	128	128	136	140	132	116	119	129	182	205	197
	216	225	228	246	258	285	297	319	322	306	300	310	319	308	304	300	299	297	296	292
17 UT	287	283	290	287	278	263	253	251	257	250	245	222	211	203	199	188	182	179	165	153
	153	157	157	162	169	173	155	139	110	81	87	94	70	76	85	96	91	78	73	85
	74	74	69	80	60	64	68	69	69	82	95	82	99	103	93	90	93	93	97	86
18 UT	91	86	65	107	138	181	176	95	69	65	65	68	64	54	53	38	27	48	58	52
	52	69	80	48	69	81	73	59	59	74	78	80	76	90	93	92	82	76	85	93
	97	112	116	116	127	138	127	116	124	159	140	140	146	174	178	189	182	186	186	212
19 UT	216	202	221	199	191	202	232	282	329	338	324	293	277	271	273	279	287	286	286	286
	292	284	273	269	257	243	236	228	232	242	242	226	218	206	191	187	183	179	175	175
	171	173	173	173	178	177	179	175	171	174	169	171	174	178	186	191	189	186	177	174
20 UT	175	172	172	169	169	167	164	167	162	157	145	132	130	128	125	121	118	116	116	113
	113	113	111	113	113	111	111	129	129	129	116	116	116	116	116	129	142	160	160	147
	134	120	120	125	138	140	140	140	153	153	166	153	162	162	160	160	160	147	147	147
21 UT	147	147	151	164	169	169	169	169	169	169	173	178	173	173	173	160	160	165	165	165
	165	178	178	165	165	160	152	156	161	161	166	179	179	179	179	183	183	183	188	192
	192	192	197	192	192	179	179	179	166	171	184	197	215	258	289	338	355	360	351	378
22 UT	435	426	413	391	378	396	396	387	400	396	383	396	409	404	417	417	417	417	435	435
	422	435	453	453	466	466	457	457	449	453	467	453	436	436	423	423	423	410	396	392
	405	392	374	361	348	343	343	330	326	313	308	321	304	299	287	299	308	316	316	307
23 UT	294	289	289	289	276	276	282	345	366	391	404	431	498	540	559	539	643	671	691	593
	578	516	413	395	417	461	479	535	510	541	564	634	661	683	696	612	569	577	612	613
	614	601	569	555	559	572	594	571	562	571	558	622	614	651	655	669	673	623	596	587

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS
1978 August 28, 0000 UT - August 28, 2359 UT

00 UT	494	561	584	562	562	579	596	604	604	604	604	596	577	557	533	485	443	451	485	511
	540	549	553	558	543	534	531	523	488	489	474	466	446	442	418	422	405	396	395	399
	407	416	421	421	434	438	447	447	442	442	441	441	433	432	427	400	361	319	284	275
01 UT	247	239	231	247	259	243	227	238	258	293	340	400	423	424	443	447	467	494	506	526
	557	534	494	498	506	510	511	515	534	530	538	506	490	482	486	494	462	450	469	488
	469	477	492	518	530	534	538	531	499	456	428	386	401	416	416	424	444	456	475	510
02 UT	508	519	516	517	473	469	473	453	452	460	476	476	476	479	452	441	437	449	472	483
	478	458	458	461	480	503	540	506	522	582	594	656	680	687	568	586	570	588	611	639
	687	696	700	681	697	716	732	748	741	726	700	688	677	703	714	695	671	652	685	682
03 UT	687	698	725	767	745	734	734	694	743	754	732	710	676	710	710	680	662	704	750	738
	683	657	681	670	651	655	671	651	628	628	661	688	665	698	690	702	691	673	639	639
	628	587	599	637	678	681	658	654	669	691	757	835	847	863	855	867	910	875	812	783
04 UT	784	796	813	789	827	802	783	764	766	791	803	817	833	852	844	785	773	770	761	732
	739	752	749	772	795	838	867	906	890	887	890	852	796	796	847	922	921	900	887	875
	853	841	823	817	819	841	993	1021	1132	1195	1178	853	861	912	894	837	790	839	909	937
05 UT	921	921	920	925	933	966	952	922	935	912	915	893	942	960	985	1054	1074	1104	1180	1113
	960	982	911	939	983	1043	991	1004	1036	1073	1062	1023	1073	1058	1091	1065	1091	1125	1086	1046
	1074	1152	1239	1198	1179	1114	1062	1050	1048	1015	1118	1159	1199	1121	1074	966	915	874	916	1041
06 UT	1018	1037	1028	969	914	882	838	805	797	777	748	758	809	863	897	934	961	917	829	829
	839	862	809	776	757	729	694	694	681	686	686	690	682	679	687	691	673	664	646	646
	651	655	674	685	696	661	638	616	594	594	627	629	620	575	588	622	711	723	577	521
07 UT	536	653	688	812	912	946	925	880	947	799	764	745	833	1068	1133	1176	1197	1219	1251	1585
	1697	2031	2221	1715	1325	1191	1124	1127	1176	1165	963	872	881	1002	1081	1058	1047	1002	935	958
	991	1036	1094	1105	1137	1115	1293	1320	1325	1572	1796	1816	1613	1409	1319	1296	1283	1323	1332	1332
08 UT	1332	1341	1048	889	813	767	667	595	754	786	891	941	973	1010	1023	973	931	895	899	945
	973	995	940	845	785	776	809	814	818	778	786	800	800	813	817	781	730	694	685	612
	593	597	606	616	597	570	534	570	598	617	621	608	576	554	531	495	458	430	412	448
09 UT	503	630	653	667	621	570	529	488	446	414	387	386	404	409	482	533	556	591	605	599
	586	553	544	513	527	536	541	518	672	750	795	804	760	704	737	827	1017	1208	1723	1868
	1656	1642	1898	1829	1592	1332	1080	999	833	631	526	510	520	459	537	570	703	1112	1114	1153
10 UT	1128	1100	517	658	916	925	811	472	346	319	457	482	501	565	702	844	931	789	718	650
	687	724	726	728	692	603	627	629	730	788	759	751	750	761	784	761	737	722	722	702
	794	781	862	894	847	930	981	1054	912	898	839	893	1181	1193	1052	928	919	978	988	988
11 UT	928	937	942	970	1083	1115	1146	1155	1146	1023	901	769	687	636	595	576	552	561	561	565
	565	566	575	593	616	630	598	552	597	644	655	666	610	563	539	539	528	507	498	465
	420	373	360	360	360	360	351	364	360	349	356	361	364	334	305	298	298	330	344	351
12 UT	370	375	400	422	462	502	555	573	623	662	694	704	731	812	867	935	967	976	949	907
	812	708	655	655	661	622	586	554	555	587	642	683	677	682	694	724	740	758	779	788
	781	756	728	663	628	607	589	571	550	545	542	546	544	574	702	496	534	520	648	730
13 UT	734	735	787	802	746	724	754	754	765	889	1076	1117	1072	971	982	1071	906	895	953	1654
	1886	1198	1080	1005	934	847	768	700	726	783	840	814	842	1071	1182	1203	1109	1070	1050	1234
	1451	1685	1810	1915	1927	1835	1700	1593	1508	1448	1027	941	840	785	793	800	815	733	776	822
14 UT	1038	1033	1036	933	923	1079	1056	1083	1163	1194	1214	1463	1592	1759	1780	1782	1712	1195	975	994
	999	1035	1041	1045	1102	1171	1245	1211	1189	1291	1366	1512	1516	1499	1536	1571	1652	1737	1661	1576
	1550	1428	1380	1370	1497	1664	1608	1504	1475	1509	1567	1468	1245	1185	1401	1520	1396	1296	1319	1422
15 UT	1404	1460	1526	1371	971	1005	1113	1236	1174	1090	970	753	678	630	653	647	620	630	600	593
	616	658	657	657	661	698	825	871	931	916	860	800	663	637	678	652	565	508	454	435
	472	509	538	478	437	410	391	355	325	362	441	470	444	418	403	368	437	549	596	540
16 UT	439	405	405	415	415	403	403	392	392	381	372	383	392	403	390	379	288	277	276	409
	523	456	368	325	349	420	435	547	458	313	388	465	407	295	282	327	279	273	255	293
	283	273	263	266	251	285	276	250	207	200	207	252	196	203	208	216	228	224	232	226
17 UT	233	241	233	219	206	202	206	211	224	224	229	229	229	229	238	238	238	242	242	242
	255	255	255	255	255	255	251	255	255	251	246	242	242	242	255	255	255	255	255	251
	251	255	255	260	255	246	242	237	224	224	211	206	206	202	197	193	193	205	228	228
18 UT	205	201	206	206	206	210	223	223	223	237	237	237	250	246	246	259	246	250	250	259
	264	264	255	233	228	228	228	233	232	232	241	269	237	214	224	243	243	218	237	225
	217	222	229	234	251	250	247	245	255	252	252	242	222	209	214	220	219	210	223	242
19 UT	246	210	200	207	212	222	232	255	264	267	269	269	272	274	268	273	265	275	282	284
	289	289	289	289	289	289	289	284	280	275	265	255	250	250	250	237	242	242	242	237
	235	217	212	209	212	209	209	209	209	209	212	225	225	227	230	219	212	207	207	207
20 UT	209	212	214	214	217	212	212	214	233	227	229	236	234	239	246	251	271	266	275	280
	287	292	297	302	302	305	310	324	345	356	361	364	366	370	386	403	422	443	460	472
	484	505	522	528	540	547	561	573	582	580	585	590	590	595	602	602	610	615	624	644
21 UT	644	645	660	663	663	659	669	679	687	690	691	686	679	665	639	635	630	622	620	630
	625	598	596	593	593	598	600	598	590	576	571	568	559	552	550	529	524	517	522	546
	553	531	526	533	540	547	545	544	544	556	566	568	568	567	569	569	579	581	577	565
22 UT	558	549	536	522	527	529	536	527	539	551	579	590	621	609	585	581	572	560	548	544
	556	571	619	619	613	572	545	533	522	541	558	551	579	581	585	576	567	556	564	539
	519	507	522	530	537	549	541	518	503	513	526	535	545	575	617	634	632	616	597	593
23 UT	585	532	532	531	523	512	504	484	469	454	453	453	440	454	449	457	456	455	442	416
	407	443	455	455	455	458	461	461	452	448	451	462	465	448	409	389	372	367	350	361
	369	381	389	404	400	392	388	384	380	376	361	353	338	350	347	363	378	341	322	318

1978, SEPTEMBER 26 - 29



Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

Data from Individual Observatories

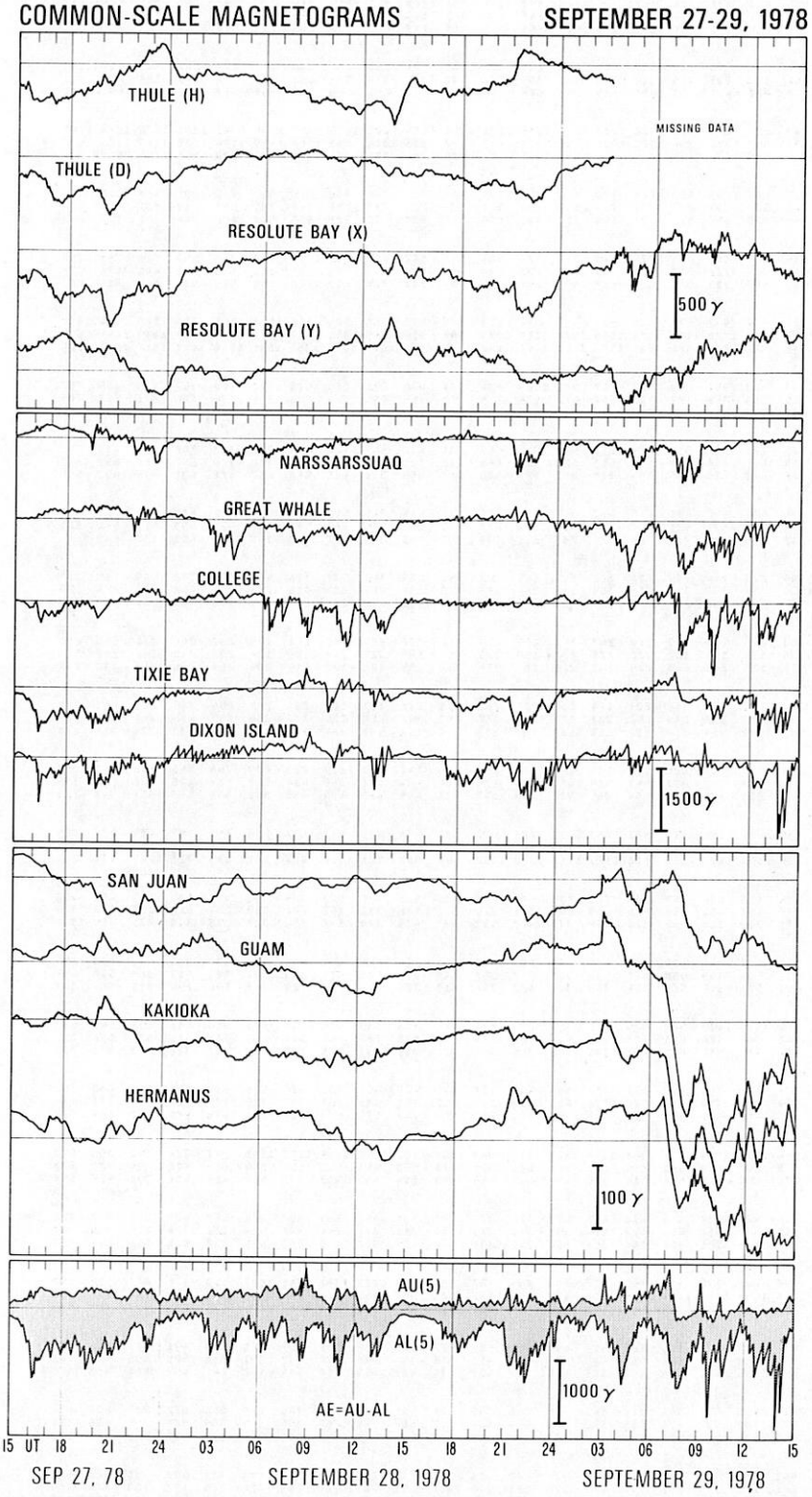
SEPTEMBER 1978

OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC – AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR – INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
COL	64.0N	25	05--	SC	--	--	--	26(3) 29(3,4)	8	354	2430	2010	29	20
SIT	60.1N	25	05--	..	..	..	..	29(5)	9	--	--	--	30	10
WIT	54.2N	25	0719	SC	- 5	+11		27(6,7) 28(8)	6	36	225	90	29	02
FRD	49.6N	25	0718	SC	+ 1	+25	- 5	29(4)	7	52	355	283	29	19
EBR	43.9N	25	0716	SC*	- 2	+11 *	--	27(6,7) 28(8)	5	18	107	80	29	02
MBO	21.2N	25	0716	SC	+ 1.1	+27.9	- 5	26(1 5)	4	2	51	8	26	21
JAI	17.3N	25	0718	SC	- .5	21	- 4	--	-	10	121	46	29	01
SHL	14.6N	25	0718	SC	.3	17	2	--	-	8	127	41	29	01
UJJ	13.5N	25	0718	SC	- .2	27	- 5	--	-	8	151	46	29	01
ABG	09.5N	25	0718	SC	- .5	22	- 3	25(4)	6	8	145	48	29	01
HYB	07.6N	25	0719	SC	- .2	+23	- 3	25(4,5,6)	5	6	139	36	26	18
GUA	04.0N	25	0718	..	..	..	..	25(4)	6	10	140	40	29	03
ANN	01.4N	25	0718	SC	- 1.1	38	14	--	-	6	166	86	29	01
HUA	00.6S	25	0717	SC	1	34	5	25(5,6,7)	6	8	296	38	26	18
TRD	01.2S	25	0718	SC		38	46	--	-	5	205	123	29	01
API	16.0S	25	0717	SC		15	- 4	29(3,4)	8	9	398	56	30	12
HER	33.7S	25	0719	SC	- 1	+ 5		29(3)	7	38	265	156	30	13
GNA	43.2S	25	0717	SC*	+ 1.4	- 7 *	+ 5	25(4,5,6)	5	20	80	110	26	00
TOO	46.7S	25	06--	..	..	..	..	26(3)	6	32	170	70	29	02
CZT	51.2S	25	0719	SC	1	11	4	29(5)	8	120	568	341	29	21
KGL	56.5S	25	0719	SC	4	48	13	25(6)	7	53	443	261	26	03
DUM	75.6S	25	0718	SC	95	50	110	26(3) 27(1)	6	686	905	730	28	17
BLC	73.9N	27	0300	..	..	..	..	28(2)	-	1360	1170	1230	29	14
STJ	58.7N	27	0000	..	..	..	..	29(3,4)	7	440	580	970	29	18
OTT	57.0N	27	1500	..	..	..	..	29(3,4)	9	660	1120	740	29	13
WIT	54.2N	27	1500	..	..	..	..	29(3,5)	7	46	335	280	29	19
RES	83.0N	29	0301	SC	45 *	24	6	29(3)	-	540	662	637	29	24
GBB	76.7N	29	0300	..	..	..	..	29(3)	-	1160	1000	950	29	24
FCC	68.8N	29	0301	SC	--	--	--	29(2)	-	1390	1000	1160	29	22
NEW	55.1N	29	0302	SC*	10	53	6	29(3,4,5)	9	131	1394	991	30	11
WIT	54.2N	29	0301	SC*	-11 *	+50		29(3,5)	7	46	335	280	29	19
EBR	43.9N	29	0301	SC*	- 2.8*	+25 *	+12	29(3)	6	17	228	128	29	21
MMB	34.0N	29	0301	SC*	+ 4.5*	+24	-11 *	29(3,5)	7	22	256	57	30	15
SJG	29.9N	29	0301	SC	--	+29	+ 8	29(3)	7	10	165	42	30	08
KAK	26.0N	29	0301	SC*	+ 2.6*	+22	+10	29(3)	7	12	262	101	30	15
MBO	21.2N	29	0300	SC	+ 1.9	+41.9	- 7.5	29(9)	7	6	51	30	30	18
KNY	20.5N	29	0301	SC*	+ 2.2*	+26		29(3)	8	13	285	101	30	15
JAI	17.3N	29	0301	SC	- 1.1	23	- 7	--	-	7	303	101	30	10
SHL	14.6N	29	0301	SC	.8	33	5	--	-	8	427	59	30	10
UJJ	13.5N	29	0301	SC	--	--	--	--	-	--	368	46	30	10
ABG	09.5N	29	0301	SC	- .7	..	- 6	29(3)	8	11	326	53	30	10
HYB	07.6N	29	0301	SC	- .4	+28	- 4	29(3,4,5)	8	9	335	54	30	20
GUA	04.0N	29	0301	SC*	+ 1	+56	-16	29(3)	7	10	360	30	30	13
ANN	01.4N	29	0301	SC	- 1.7	50	18	--	-	8	390	--	30	10
HUA	00.6S	29	0302	SC	1	53	9	29(5)	7	14	339	58	30	01
TRD	01.2S	29	0301	SC	- .2	48	52	--	-	5	444	291	30	10
GNA	43.2S	29	0301	SC*	-11 *	+22 *	-32 *	29(4,5)	8	50	230	290	29	19
TOO	46.7S	29	0301	SC*	- 5.4	+41	+ 5	29(4,5)	7	42	310	200	29	19
CZT	51.2S	29	0301	SC	6	26	5	29(5)	8	120	568	311	29	21
KGL	56.5S	29	0301	SC	15	104	33	29(5) 29(6)	8	220	1204	852	30	21
DUM	75.6S	29	0301	SC	150	85	365	29(2,3,4) 30(2)	5	580	730	770	30	13

THREE-HOUR-RANGE INDICES, K

SEPT	26		27		28		29	
HIS	4565	4655	7765	4677	8555	7467	4676	6653
CCS	5554	4656	5445	4576	7557	7446	5776	7643
DIK	5566	5867	6656	6788	8658	8779	6787	9864
TIK	4487	6878	6555	7877	6579	7668	5688	9873
MMK	3455	4665	6444	3776	7655	6467	6775	7743
kaR	3544	4555	6544	3776	6655	6467	6865	6743
CWE	3587	6844	4546	5766	5478	7455	4689	8852
COL	3486	4634	5455	4655	5467	6445	4588	7742
LRV	4665	4555	7664	3677	6765	5458	5876	6653
SOD	3454	4554	6434	3776	7555	6357	6865	7842
YAK	2365	4544	5335	3455	5456	7446	3589	9842
LER	2333	3433	5432	3557	6544	4347	6777	6641
NUR	2333	4434	5333	3566	5444	4446	5678	8732
LOV	2343	3434	5433	3566	6444	4446	5678	9642
SIT	2687	4534	5546	5546	4577	7335	4678	9741
SVD	2333	3444	4433	3565	4334	4445	3567	6731
RSV	1023	2444	5433	2111	1122	3422	0011	1010
MNK	2333	3434	4433	3555	5334	4445	4566	6542
WIT	3353	4444	5533	3665	5445	4356	5576	7642
IRT	2334	4433	5433	4555	3545	5434	3674	7642
VAL	2343	3433	4433	2545	3444	4346	4575	6532
KIV	2343	3444	5533	3565	5435	4446	4576	7642
DOU	2343	3433	4432	3555	4444	4346	4575	5631
KGD	1232	2323	3322	2233	3222	3222	2444	5421
VIC	2664	3433	5534	3444	3565	5334	3699	8641
OTT	1576	4443	7543	3456	4654	3346	3789	8532
MMB	2354	4543	5433	4355	3444	4334	3576	7531

SEPT	26		27		28		29	
TKT	2343	4343	4523	4454	4444	4435	3675	7743
PEN	2344	4---	----	----	--24	4345	3375	6652
TOL	2243	3434	4422	2444	4333	4245	3476	5543
FRD	2554	4444	6433	3445	4544	4345	3667	6533
COI	2343	3433	4323	3444	3433	4345	4574	5534
KSA	3343	4445	5233	3555	4335	5455	56--	----
JUC	2555	4544	5444	4545	4554	5445	4677	5543
KNY	2344	4443	4433	4455	3444	4323	2586	6643
QUE	4443	3343	4543	4454	4454	4434	4686	7653
HON	----	----	----	----	----	----	----	----
HYB	3433	4333	4533	3454	4334	4335	4588	8642
SJG	2444	3344	4334	4334	3544	4334	4575	5343
GUA	2444	3444	4434	4344	4443	4224	4577	6532
BNG	2334	4444	4433	3455	3224	4345	3476	5432
PMG	3444	3443	5434	4454	2344	4224	2687	6532
HUA	2444	5653	4333	5554	4434	4445	3566	7664
GNA	3465	4544	5544	4455	5545	5445	4678	8644
HER	2344	3434	4333	3445	4434	4345	4476	6543
TOO	2465	3543	5434	4355	4445	5234	3567	7521
EYR	2465	3443	3434	4343	3355	5234	2578	8521
MCQ	3686	5744	4546	4666	4466	7455	4778	7742
MIR	3455	4443	5565	3766	5454	5336	4655	5433
MAW	3567	4556	7754	3677	6566	5468	6776	5544
NVL	5655	2333	8653	3677	6644	4337	5886	6532
SBA	3465	3455	6544	3445	5444	5445	4556	5443
VOS	2455	4445	5554	3454	5444	4324	3655	4532


COMMON-SCALE MAGNETOGRAMS
SEPTEMBER 27-29, 1978
THULE (H)
MISSING DATA
THULE (D)
RESOLUTE BAY (X)
500 γ
RESOLUTE BAY (Y)
NARSSARSSUAQ
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1500 γ
SAN JUAN
GUAM
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
1000 γ
AE=AU-AL
15 UT 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12 15
SEP 27, 78
SEPTEMBER 28, 1978
SEPTEMBER 29, 1978

15 UT	276	280	321	326	303	301	326	377	395	402	338	352	310	314	278	263	251	203	184	183
	200	167	153	139	124	120	133	142	131	143	133	117	135	155	156	180	161	163	178	181
	197	216	178	189	170	150	137	160	167	169	178	182	200	195	193	209	224	256	256	261
16 UT	256	251	256	264	266	266	259	264	269	269	255	255	242	244	253	257	248	249	258	270
	284	292	299	306	316	322	343	355	374	402	391	379	381	383	378	372	377	393	402	411
	418	441	447	460	471	536	588	614	615	645	657	653	646	655	665	678	677	685	691	690
17 UT	748	820	846	953	1022	1029	1067	1093	1191	1208	1195	1205	1184	1142	1235	1241	1212	1075	1078	1240
	1091	989	976	996	1020	1035	1069	1071	1083	1087	1086	1084	1089	1080	1089	1094	1100	1105	1101	1102
	1094	1084	1076	1026	1001	956	963	965	952	926	914	896	884	882	898	876	856	844	818	811
18 UT	814	803	793	805	775	770	771	788	805	820	828	846	892	926	953	979	991	983	966	962
	943	906	859	837	771	723	669	666	673	709	726	737	750	715	709	697	712	731	744	754
	769	820	857	857	837	893	908	908	890	917	937	933	921	907	911	876	847	833	827	847
19 UT	854	848	826	821	779	748	749	778	813	823	802	761	711	716	718	705	693	718	745	750
	746	734	732	727	765	794	858	872	899	837	792	746	719	698	683	676	659	640	630	570
	582	587	589	611	625	612	635	685	765	787	801	815	810	822	830	830	825	842	866	857
20 UT	856	896	942	977	998	998	959	924	908	879	853	860	904	956	1018	1054	904	869	954	1030
	1100	1167	1170	1129	1130	1136	1187	1160	1084	955	916	855	891	942	1020	1057	1083	1092	1001	971
	940	921	884	981	1018	1036	1062	1070	1049	1039	1021	1038	1044	1061	1081	1084	1082	1037	1015	1006
21 UT	1002	983	953	939	927	937	978	1003	990	974	966	971	988	1000	1012	1020	955	899	809	787
	751	713	766	770	722	688	671	674	735	752	766	751	756	766	730	796	806	821	867	885
	925	950	937	895	880	865	864	871	867	870	895	898	881	906	909	901	889	872	853	789
22 UT	756	720	657	589	575	572	594	584	560	591	632	649	642	630	706	713	703	708	733	747
	740	655	656	669	619	583	627	600	658	712	720	712	660	676	708	724	667	658	649	638
	625	618	633	645	664	613	551	529	506	507	499	591	606	468	467	478	491	499	492	506
23 UT	496	500	497	497	485	457	452	475	491	484	505	505	511	537	568	560	484	506	558	525
	514	519	521	521	547	579	513	514	487	511	551	571	560	542	557	502	499	514	541	600
	612	613	617	765	763	738	781	811	799	869	885	859	837	819	765	707	653	637	649	694
00 UT	749	722	744	755	777	826	849	845	823	755	733	749	737	726	498	755	782	709	349	335
	335	346	337	340	318	309	289	280	279	270	254	262	303	316	285	276	262	239	276	229
	257	276	286	278	275	274	323	270	281	348	306	276	267	232	263	276	266	234	232	246
01 UT	253	256	248	239	246	248	241	229	224	222	227	234	245	241	193	182	265	301	356	276
	230	125	150	307	372	273	227	199	229	303	392	328	249	189	199	233	280	296	290	274
	220	193	233	258	286	247	216	187	274	329	189	121	130	229	286	259	246	243	230	232
02 UT	223	230	257	237	209	178	147	225	252	221	200	167	107	294	273	254	246	204	183	411
	367	285	232	239	252	293	276	274	277	287	307	258	236	234	236	283	286	250	201	184
	175	199	209	214	202	188	182	192	173	159	146	198	265	279	266	217	233	221	218	213
03 UT	208	217	217	222	219	203	169	189	257	258	242	227	225	219	239	248	240	238	267	299
	342	365	352	403	442	479	479	336	276	321	434	393	399	484	563	529	495	562	702	809
	916	908	879	895	934	965	908	736	647	530	495	495	484	462	501	449	463	511	548	579
04 UT	584	632	746	859	855	782	732	725	675	622	658	622	617	637	658	552	497	484	522	593
	609	547	528	545	549	543	560	567	533	639	725	746	760	808	862	914	964	1012	1004	995
	1025	1065	1077	1126	1120	1120	1116	1080	1052	995	988	1029	1018	946	850	809	777	740	678	640
05 UT	626	626	630	689	739	771	738	685	589	539	481	488	523	555	564	493	438	375	495	482
	437	437	481	485	436	413	386	334	315	337	336	332	283	272	288	294	318	323	345	378
	376	369	360	343	325	354	371	412	452	497	479	378	347	334	317	303	300	331	366	390
06 UT	436	441	438	426	452	474	528	453	427	458	474	444	444	422	404	424	442	460	503	526
	522	504	509	500	478	482	500	500	557	645	631	618	535	539	561	592	557	548	548	597
	610	636	619	575	724	760	944	823	744	812	776	666	647	724	783	796	854	935	964	827
07 UT	771	693	639	582	599	595	569	525	525	542	534	538	529	545	572	564	581	559	542	542
	542	567	576	603	603	614	614	587	574	572	628	727	747	691	548	637	626	637	626	612
	624	588	552	458	413	395	372	360	351	320	316	290	285	299	308	317	326	358	363	399
08 UT	373	349	358	349	353	376	385	408	417	445	477	491	509	536	578	614	646	651	683	711
	739	761	766	775	770	798	816	825	821	807	798	775	757	743	729	725	721	730	730	726
	726	717	670	675	711	693	796	720	752	766	743	679	679	722	740	676	686	782	844	975
09 UT	1044	1081	1208	1104	1059	1094	1104	1011	1043	1092	1153	1252	1214	1205	1118	977	934	942	869	833
	779	698	658	640	654	681	691	691	681	658	658	663	663	663	645	626	608	594	572	568
	559	550	550	532	514	514	486	445	459	499	504	490	463	431	431	417	404	395	437	415
10 UT	414	423	427	414	414	450	473	474	377	373	391	400	396	367	355	359	407	341	318	316
	316	327	357	514	622	614	554	320	310	310	310	334	344	392	423	322	376	415	390	381
	339	316	321	327	340	318	300	292	337	409	461	507	540	592	606	590	526	506	445	516
11 UT	639	681	775	865	955	937	890	894	887	904	953	1032	1051	1041	1037	1018	932	867	822	957
	1057	1113	1158	1159	1113	1013	968	1026	1051	973	905	943	923	843	742	628	583	584	593	638
	683	719	733	729	743	721	716	711	684	652	652	665	688	688	674	670	725	729	711	675
12 UT	615	573	527	518	509	513	495	480	529	507	495	499	532	509	466	466	491	487	482	524
	506	513	522	504	502	486	434	407	418	418	396	385	374	362	371	391	425	456	434	413
	415	414	360	404	454	477	412	417	421	435	422	404	408	418	432	441	455	464	473	478
13 UT	478	491	423	369	364	355	395	360	349	386	445	566	620	746	646	601	672	737	699	621
	554	502	502	506	506	502	475	469	505	557	667	744	768	854	968	939	906	769	639	601
	561	575	599	617	533	492	479	398	455	520	572	477	435	494	566	606	673	660	324	597
14 UT	543	502	452	452	438	393	324	280	226	218	219	228	250	272	278	323	333	331	326	321
	260	252	245	238	244	271	276	273	246	221	201	201	204	209	224	220	183	169	175	184
	182	190	199	210	208	189	187	162	188	197	189	200	211	225	222	222	220	222	225	225

1978 September 28, 1500 UT - September 29, 1459 UT

15 UT	225	227	227	225	225	223	207	207	202	197	197	181	203	222	194	189	194	199	188	193
	168	173	167	172	177	184	203	223	219	206	188	188	177	171	176	194	192	189	187	216
	216	203	205	205	205	205	205	208	208	208	194	178	178	176	176	173	171	191	191	171
16 UT	173	184	187	189	184	148	146	155	155	157	162	151	151	165	165	165	167	167	165	162
	160	157	155	168	171	178	181	185	190	190	190	190	190	193	193	198	200	200	202	202
	202	202	202	200	214	214	226	228	226	223	221	202	200	202	202	207	215	217	227	234
17 UT	239	257	262	265	267	272	275	270	261	257	255	244	253	251	241	257	255	250	247	238
	236	252	259	271	267	258	264	304	461	527	550	545	518	456	388	361	339	366	420	505
	510	519	510	492	492	510	501	533	533	515	438	461	497	511	494	471	500	510	550	577
18 UT	577	568	523	496	476	478	485	514	516	542	537	480	433	499	500	550	555	564	573	574
	671	729	747	804	805	770	865	587	555	588	608	620	576	567	505	514	525	522	523	495
	497	542	595	645	663	659	636	600	609	632	666	641	614	595	596	596	578	556	523	524
19 UT	540	561	568	553	527	502	509	524	520	496	488	469	471	487	461	449	429	429	408	375
	382	398	438	492	546	537	496	457	452	420	398	370	359	361	329	338	324	338	362	350
	362	381	386	334	335	314	328	294	287	293	248	282	315	344	327	289	263	256	294	296
20 UT	302	294	292	241	213	249	279	328	342	363	352	315	277	276	298	326	322	331	334	337
	334	324	326	336	341	349	351	365	365	355	321	336	348	335	314	295	327	367	357	346
	342	344	366	367	351	377	392	382	387	390	371	361	367	360	335	331	336	329	324	324
21 UT	341	366	376	310	272	273	477	515	542	567	614	655	681	721	754	787	823	835	867	936
	904	1030	1005	937	900	868	866	871	866	874	879	884	879	833	760	646	593	618	522	615
	639	683	710	732	694	708	758	760	846	882	860	859	845	894	929	920	1010	788	767	793
22 UT	937	931	982	1056	1083	1119	1092	1101	940	871	826	808	772	716	773	1131	978	899	1066	1155
	1149	1093	1063	951	834	751	832	877	867	812	789	761	746	773	837	855	860	848	837	778
	754	779	787	804	862	862	823	832	792	760	733	692	706	710	719	705	691	795	822	808
23 UT	826	826	844	826	768	736	776	808	794	772	794	812	762	699	600	548	551	588	609	599
	581	600	623	616	614	588	595	584	582	551	534	551	618	710	582	521	425	424	449	489
	504	507	435	396	414	399	408	415	395	375	384	360	358	341	318	371	395	367	354	340
00 UT	744	755	744	722	711	688	688	699	711	722	711	704	336	296	391	298	301	306	304	311
	274	229	207	199	207	212	212	202	219	225	215	238	240	253	256	226	224	199	190	179
	166	152	143	143	132	148	153	166	157	175	166	184	205	206	179	172	192	167	181	177
01 UT	229	256	231	231	193	155	152	152	152	142	130	130	125	141	154	173	214	260	310	232
	191	159	177	200	213	241	254	277	314	364	387	447	479	479	446	400	363	337	346	364
	386	403	394	381	412	420	416	451	464	486	472	459	437	398	389	385	371	363	332	310
02 UT	297	292	270	266	253	262	257	244	240	217	213	195	190	177	172	172	186	199	199	186
	181	168	168	170	170	167	167	167	170	159	163	163	195	237	301	264	246	329	356	347
	356	393	406	425	425	415	397	370	338	333	319	310	310	291	264	255	223	218	214	218
03 UT	227	244	224	353	930	676	403	374	433	604	504	414	355	380	446	437	358	385	460	552
	525	523	599	736	763	694	659	592	505	496	498	494	505	521	608	647	736	787	803	808
	828	834	781	772	772	756	727	736	733	738	740	728	725	723	740	844	886	904	895	980
04 UT	1062	1237	1289	1301	1322	1336	1342	1362	1306	1259	1216	1034	969	921	953	961	1085	1174	1164	1092
	1025	872	777	741	720	686	703	673	617	662	721	649	614	594	585	566	526	519	538	538
	515	559	628	510	603	572	553	496	482	496	555	641	710	664	646	622	615	617	515	490
05 UT	475	396	461	498	531	551	518	517	499	470	430	412	405	436	424	390	338	324	369	341
	331	331	364	381	341	411	418	398	406	382	358	369	373	366	429	511	431	350	372	404
	418	436	427	395	398	431	439	435	419	456	505	425	408	408	476	554	609	641	616	627
06 UT	631	654	714	732	737	709	686	641	613	590	571	562	575	589	607	616	616	617	563	577
	622	668	713	681	654	578	541	587	661	733	737	717	730	775	802	833	818	815	761	782
	759	730	722	704	641	701	709	719	782	813	977	1044	1021	980	1013	1132	1229	1224	1079	1005
07 UT	912	941	955	972	989	985	1126	1175	1190	1205	1210	1114	1082	1045	1140	1147	1153	1061	965	947
	1130	1092	964	913	922	899	890	978	1028	1051	1024	959	978	987	996	982	909	845	835	831
	845	867	886	858	839	793	770	784	784	779	779	811	876	839	798	724	692	732	811	850
08 UT	680	623	688	732	772	516	531	572	566	593	689	641	668	677	685	576	575	597	420	401
	407	385	479	525	557	548	502	465	442	447	451	506	548	571	516	452	373	279	245	205
	179	89	150	364	483	564	598	627	645	582	497	457	408	398	380	354	315	292	525	501
09 UT	677	637	539	443	586	591	707	750	882	1135	1419	1323	1408	1430	1475	1511	1448	1227	799	799
	756	775	770	729	646	619	619	700	698	561	492	456	384	350	303	376	445	485	512	474
	452	463	460	457	404	330	317	444	517	718	930	1015	927	909	943	696	647	566	558	420
10 UT	470	484	466	410	351	318	686	815	880	930	930	788	563	517	595	636	645	650	613	590
	492	395	320	255	232	213	171	180	194	216	244	271	275	275	313	425	459	492	358	322
	367	441	488	559	596	564	538	540	529	535	464	351	355	369	373	368	350	325	290	262
11 UT	239	184	206	184	193	188	236	272	279	284	291	307	319	364	416	451	410	413	445	409
	358	339	325	307	294	294	294	257	243	242	246	250	238	243	274	305	345	438	363	332
	346	418	450	522	582	603	614	625	634	596	558	500	504	543	589	549	532	515	703	818
12 UT	925	993	1006	943	905	840	730	701	721	642	570	550	528	514	523	528	525	494	483	534
	533	535	541	537	566	593	630	639	546	532	514	685	724	771	769	771	688	746	717	840
	789	692	627	663	716	861	837	889	804	672	612	506	455	461	505	942	756	747	807	895
13 UT	1027	915	845	694	618	632	645	675	1305	1418	1841	1884	1645	1328	1385	1597	1701	1395	1296	1012
	909	994	966	908	882	849	827	921	1250	1323	1512	1543	1336	1318	1341	1310	1337	1341	1021	542
	556	565	510	485	486	488	495	594	693	540	486	545	535	523	512	462	428	416	417	505
14 UT	517	529	519	523	462	439	442	448	414	404	410	416	424	463	521	560	526	483	507	564
	802	873	1126	974	843	849	884	792	714	823	887	1080	986	662	624	619	632	646	818	989
	774	640	681	682	686	703	748	754	732	680	632	613	625	670	659	525	503	482	494	569

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

1976 September 19, 0300 UT - September 20, 0300 UT

03 UT	24	24	21	21	21	18	18	25	25	25	25	25	25	28	25	25	27	38	38	38
	38	36	38	38	27	25	25	25	25	25	25	25	24	21	24	18	18	21	21	24
	31	27	31	31	31	33	33	30	30	28	28	25	25	25	25	25	25	25	28	28
04 UT	28	28	39	28	28	28	28	28	30	30	24	24	24	25	25	24	21	21	21	24
	24	24	24	24	24	24	31	31	31	28	27	30	30	30	30	30	33	33	35	38
	52	55	55	52	52	38	41	52	52	52	49	60	55	55	52	52	50	47	50	50
05 UT	64	72	69	72	74	71	74	71	69	60	58	58	58	58	47	47	44	41	41	50
	50	38	27	27	27	30	30	33	45	45	41	49	52	57	71	108	138	151	138	124
	159	167	186	194	151	132	132	143	154	173	183	183	159	121	97	103	106	113	127	151
06 UT	181	186	188	191	186	177	142	94	75	69	75	78	83	91	102	102	105	118	129	126
	110	102	97	91	91	103	111	116	119	124	127	119	116	86	76	49	43	33	27	16
	19	27	27	24	38	38	41	47	48	44	36	36	33	47	52	71	74	74	71	59
07 U	63	60	69	60	57	66	66	66	66	49	52	52	58	55	52	50	47	47	44	41
	41	41	44	47	44	41	44	55	59	59	55	58	66	64	44	44	47	58	58	58
	58	44	44	44	47	36	36	36	36	36	33	33	36	36	36	38	38	38	38	38
08 UT	27	30	41	44	47	35	38	38	47	47	44	41	38	36	33	37	56	63	56	48
	44	47	47	47	47	47	47	47	47	47	47	47	58	58	63	71	71	56	59	59
	59	61	63	67	71	71	67	67	74	74	71	81	83	86	89	89	103	103	103	105
09 UT	105	97	99	86	86	80	89	86	78	82	89	71	71	69	72	83	86	97	86	
	86	86	86	83	81	92	92	94	97	89	89	89	78	86	87	91	77	62	63	78
	59	64	67	64	52	42	31	32	41	46	52	62	58	57	61	65	72	74	69	75
10 UT	82	95	108	121	148	199	242	284	296	288	301	288	327	356	348	330	282	243	251	271
	317	362	365	360	352	393	415	439	520	514	530	565	568	535	562	615	640	635	650	672
	656	652	665	662	680	779	847	866	861	865	834	810	823	825	840	860	858	855	823	809
11 UT	767	723	689	669	626	603	603	638	675	684	693	672	649	607	609	596	571	543	520	543
	635	729	747	776	797	815	851	933	995	949	876	851	826	789	730	679	676	665	665	676
	701	714	636	632	604	585	576	532	510	481	460	458	453	470	500	513	512	548	574	602
12 UT	599	571	560	530	566	605	599	591	595	590	577	578	581	570	542	513	497	550	545	543
	564	571	564	552	538	533	531	520	494	488	491	500	538	537	531	531	530	531	511	508
	506	494	481	452	448	440	424	415	395	394	388	381	376	387	363	343	326	311	318	321
13 UT	324	329	329	324	312	308	290	297	334	386	387	349	327	314	311	343	354	365	336	323
	331	339	353	354	354	398	428	419	400	383	369	355	344	340	342	320	336	384	377	361
	341	310	305	304	283	264	243	227	238	221	180	136	126	143	157	166	173	179	210	228
14 UT	255	281	292	329	356	359	352	333	314	298	285	279	268	259	243	228	216	210	209	214
	217	222	209	195	187	181	175	167	155	145	140	132	119	111	105	105	97	88	65	59
	61	75	70	75	80	76	75	106	216	243	263	287	305	326	346	378	399	475	481	487
15 UT	476	470	465	473	480	475	486	494	495	490	430	424	425	414	406	415	424	436	448	441
	423	412	410	405	377	366	406	413	416	420	424	428	429	433	434	430	426	433	455	472
	479	496	498	506	502	514	533	567	575	612	631	661	668	679	702	713	743	731	716	705
16 UT	716	720	724	724	724	709	694	691	694	724	720	731	776	769	739	686	670	650	636	623
	615	593	570	566	573	575	585	604	634	660	667	631	654	668	796	848	814	702	593	560
	559	574	584	594	566	560	543	532	517	504	494	493	499	505	514	525	539	544	544	530
17 UT	526	519	523	524	524	517	503	496	486	480	462	443	431	422	422	423	427	431	431	426
	423	416	406	400	387	385	384	374	354	345	327	322	316	312	316	313	320	320	322	322
	328	330	336	341	347	345	346	348	353	362	379	411	420	451	440	440	435	437	438	441
18 UT	445	449	450	458	461	465	472	482	492	502	512	520	528	538	545	554	564	572	579	594
	591	596	597	580	592	617	621	628	632	626	624	622	616	613	613	603	580	577	587	580
	576	572	571	577	587	593	603	609	604	586	572	554	538	517	503	497	486	476	465	458
19 UT	456	456	467	480	493	511	517	521	528	547	599	612	613	617	615	608	605	613	632	650
	668	678	707	706	713	682	662	621	652	679	699	688	683	686	677	644	631	583	546	589
	614	639	660	608	563	609	591	561	558	556	544	529	542	551	557	559	551	563	579	583
20 UT	598	612	628	638	649	659	655	634	623	610	598	571	559	536	490	480	464	445	426	424
	422	429	436	451	434	401	413	439	445	440	443	446	468	490	501	514	517	469	420	352
	329	314	328	352	378	405	439	471	477	481	479	490	506	529	542	562	556	545	497	473
21 UT	416	383	365	356	351	348	348	351	359	359	361	355	352	349	343	334	332	332	336	331
	323	315	315	323	312	284	277	282	291	314	343	363	372	384	383	367	321	274	274	262
	269	261	259	251	251	268	312	313	304	266	225	201	185	179	176	155	136	125	130	151
22 UT	145	147	181	215	228	251	264	265	278	278	295	312	319	322	342	354	366	358	363	348
	337	329	323	320	315	315	306	297	288	283	275	269	261	249	246	261	276	286	302	291
	250	221	213	204	192	185	234	257	293	317	318	355	383	495	464	494	480	476	508	462
23 UT	458	466	460	439	442	441	430	413	375	345	331	321	307	290	258	229	214	211	216	206
	204	205	211	214	217	205	192	168	154	141	127	124	121	128	136	134	145	156	167	178
	178	174	173	169	164	158	151	147	142	132	126	115	115	117	116	112	112	116	119	124
00 UT	149	149	163	199	218	263	286	309	342	356	409	443	452	460	470	471	471	482	501	505
	589	627	711	722	723	730	749	754	814	807	788	776	769	761	754	747	747	758	776	769
	750	754	773	781	781	770	755	740	736	717	721	729	740	736	740	747	747	709	724	731
01 UT	754	720	692	684	680	650	624	627	627	616	589	551	502	528	532	493	470	451	444	429
	421	406	391	372	357	357	350	350	339	339	335	321	307	330	357	370	366	361	356	348
	340	326	306	289	283	270	262	246	235	223	208	200	195	190	193	189	187	178	177	183
02 UT	178	182	145	150	156	161	182	210	228	225	220	199	179	136	105	105	96	72	67	55
	58	58	49	58	86	97	109	143	195	201	196	245	272	306	329	337	337	341	322	299
	326	342	357	365	376	407	441	464	475	395	379	376	387	395	422	391	364	341	341	341

PRELIMINARY AE(5)-INDEX AT ONE MINUTE INTERVALS

1976 September 20, 0300 UT - September 21, 0300 UT

03 UT	345	326	315	319	337	341	337	367	375	406	428	459	474	447	432	428	428	424	428	450
	439	439	432	409	405	401	401	438	393	386	393	409	431	465	450	458	454	435	439	533
	600	657	701	852	922	869	873	933	949	1036	1068	1065	1079	1071	1056	1026	1014	1022	1018	1023
04 UT	1027	1031	930	917	941	943	936	946	986	983	837	819	914	903	801	775	844	837	802	817
	783	737	730	730	814	844	878	897	893	893	862	840	844	832	783	756	691	653	668	695
	722	711	692	692	643	665	684	685	694	736	722	745	756	550	569	565	549	534	565	591
05 UT	602	488	507	518	511	500	435	431	420	420	405	260	318	364	318	405	435	435	405	435
	416	439	473	507	584	534	534	527	504	493	478	479	500	485	541	558	571	590	617	650
	633	630	646	676	744	764	792	810	831	787	752	705	690	704	704	697	685	722	695	729
06 UT	770	846	875	845	812	828	905	900	891	852	839	830	787	733	702	667	684	706	793	826
	782	754	727	717	687	657	616	567	495	512	505	539	560	582	552	558	548	577	619	587
	577	525	420	501	452	441	471	493	455	423	425	397	407	438	467	478	439	428	407	413
07 UT	413	439	427	408	351	252	233	202	211	197	175	172	211	244	255	267	250	258	271	307
	294	342	360	299	307	319	308	289	270	264	270	284	285	299	293	290	299	232	204	256
	250	223	173	264	298	272	277	352	325	293	421	479	415	382	367	329	325	319	311	370
08	330	283	339	460	638	612	581	488	416	387	386	361	307	267	230	197	138	91	90	112
	129	134	125	103	89	90	96	110	160	203	178	164	167	165	148	143	146	138	124	113
	96	87	97	106	78	77	80	79	82	81	92	78	67	70	59	50	54	51	84	112
09 UT	126	162	162	165	171	169	147	128	138	132	129	141	138	139	145	153	178	224	244	255
	312	436	470	523	535	546	602	630	647	662	662	662	642	637	648	659	656	634	640	620
	565	490	515	513	629	657	674	573	525	603	649	811	917	929	946	993	949	975	880	789
10 UT	775	798	832	870	1080	1086	1019	969	1028	1019	957	1051	1110	1150	1195	1172	1123	1044	969	988
	1063	1128	1137	1165	1136	1066	1012	982	980	991	976	911	844	790	759	705	686	693	697	715
	721	659	619	553	514	483	439	423	411	399	375	360	333	319	324	332	354	362	367	359
11 UT	359	390	422	428	465	442	431	406	385	387	396	370	312	334	313	334	426	456	518	537
	532	516	521	529	557	579	587	581	566	552	527	490	434	386	397	389	403	409	435	453
	480	506	521	543	577	599	622	633	640	599	547	505	457	445	415	400	419	404	380	368
12 UT	360	361	403	410	388	387	446	482	512	509	527	531	456	494	497	570	596	637	566	529
	483	403	359	280	258	213	194	236	335	416	591	595	629	528	551	547	600	650	807	900
	969	964	1057	1053	1047	991	987	1006	1078	1115	1130	1160	1156	1144	1210	1184	1120	1072	1005	948
13 UT	877	858	828	769	769	747	758	728	720	777	750	698	713	702	715	746	712	656	631	624
	667	645	647	640	603	639	699	660	631	634	697	665	603	630	681	633	599	669	704	701
	673	613	585	535	534	520	483	456	478	481	491	470	423	436	463	444	386	396	418	498
14 UT	448	402	359	354	386	357	356	349	374	415	427	427	390	460	482	476	486	493	466	404
	378	440	437	405	375	300	251	272	211	178	257	193	237	245	287	303	330	386	413	450
	504	565	572	602	594	718	739	778	840	833	751	658	603	614	663	720	531	519	765	957
15 UT	1003	1018	996	995	1011	1022	993	1166	1198	1149	1070	997	758	705	777	777	753	703	711	721
	730	734	703	650	587	542	507	457	441	405	374	346	324	310	296	298	304	301	300	295
	264	267	271	281	336	300	266	264	255	249	236	221	212	197	191	185	183	177	171	165
16 UT	162	166	169	173	173	180	191	199	206	210	210	209	204	197	192	215	235	236	226	224
	225	235	240	242	248	261	262	266	270	278	283	273	255	244	237	249	253	253	249	239
	238	240	239	240	245	244	239	238	238	233	232	227	212	207	220	248	262	275	295	323
17 UT	486	558	603	636	637	593	580	562	560	557	577	590	601	645	681	670	654	667	684	728
	732	744	754	766	768	774	777	780	774	771	766	759	757	789	806	806	797	780	777	803
	829	823	793	737	718	757	675	650	637	633	658	668	674	697	719	750	750	713	674	681
18 UT	696	728	743	796	841	854	883	897	918	930	936	911	844	806	771	747	755	778	801	832
	857	897	854	815	873	904	912	906	895	918	953	970	982	1002	1043	1047	1070	1092	1075	1038
	1011	985	968	962	956	944	987	1013	972	949	839	821	769	738	695	644	684	696	711	694
19 UT	680	686	692	736	768	755	724	722	745	758	766	771	775	765	739	697	639	675	648	604
	611	698	719	769	779	787	762	761	789	828	806	718	660	638	713	753	771	795	809	829
	809	700	644	623	631	624	619	615	611	595	572	568	562	581	580	512	498	487	496	520
20 UT	550	524	510	418	417	463	493	500	481	451	441	413	440	437	426	398	395	393	396	388
	390	390	382	390	395	400	413	410	404	395	376	348	336	332	327	328	331	317	300	256
	324	484	433	399	394	368	340	331	325	372	454	542	611	508	437	439	350	731	598	551
21 UT	510	458	418	373	306	291	280	290	312	352	342	348	351	342	355	376	417	341	652	653
	663	694	736	605	532	447	444	470	480	464	445	428	395	365	336	288	251	240	239	495
	576	632	677	717	736	742	712	691	679	664	641	584	588	583	510	498	518	518	494	513
22 UT	492	456	414	387	343	306	296	340	374	306	299	280	279	281	262	227	204	168	151	151
	147	140	121	117	103	98	94	97	106	109	109	107	104	100	113	117	118	122	145	157
	176	187	198	225	235	253	263	249	227	212	183	163	184	184	186	234	273	329	348	374
23 UT	369	361	395	437	468	503	522	517	503	511	501	535	526	520	508	497	483	477	487	484
	481	497	541	548	532	502	479	444	402	389	382	392	428	426	411	365	353	340	451	454
	402	417	432	509	510	312	299	278	219	203	239	295	282	265	249	232	256	320	331	308
00 UT	263	256	271	276	269	254	247	231	224	208	198	182	183	172	162	155	148	148	146	144
	145	185	208	241	261	250	198	214	222	213	209	205	217	236	268	318	288	261	252	265
	274	280	291	299	304	315	316	311	306	290	271	259	257	266	270	283	287	296	292	274
01 UT	257	225	217	193	181	172	186	202	201	191	166	152	148	147	147	139	132	137	141	114
	127	137	139	142	135	127	123	123	129	140	159	172	185	220	258	251	258	251	256	269
	263	251	275	288	314	312	287	273	278	274	267	267	270	266	244	193	219	213	192	159
02 UT	150	208	140	156	164	157	147	137	140	153	154	155	153	147	141	132	193	182	145	117
	157	172	166	153	146	140	133	127	123	173	190	180	207	191	184	168	195	236	263	250
	231	222	213	207	208	213	214	217	225	280	245	220	219	230	252	230	220	232	228	251

THREE-LETTER CODE OF MAGNETIC OBSERVATORIES

Corrections and additions to the list in
IAGA-Bulletin No. 32h, page 106-116.

LAT.	LON.	CODE	STATION NAME
55 38	11 40	BFE	BRORFELDE
66 48	33 48	BOY	BOYARSKAYA
22 21	103 50	CHA	CHA-PA
-35 19	149 22	CNB	CANBERRA
23 6	113 21	CNT	CANTON
56 44	13 13	ESM	ESMARED
61 53	12 14	FLO	FLOTNINGEN
63 1	22 34	HOP	HOOPAKA
43 55	359 39	HRQ	HUROQUE (MP)
- 0 23	199 58	JRV	JARVIS ISLAND (C)
41 25	69 12	KEL	KELES (C)
-11 39	27 28	KVA	KARAVIA - CONGO
36 5	103 51	LZH	LANCHOW
39 17	141 12	MIZ	MIZUSAWA
40 2	116 10	PEK	PEKING
53 6	158 38	PET	PETROPAVLOVSK
62 34	30 16	RKS	ROSKA
53 59	41 51	SHT	SHATSK
39 33	355 39	SPO	SAN PABLO, TOLEDO
28 29	343 44	TEN	TENERIFE (SANTA CRUZ)
28 29	343 44	TEN	SANTA CRUZ (SEE TENERIFE)
42 5	44 42	TFS	DUSHETI SEE TBILISI (TIFLIS)
46 57	142 45	TYN	TOYOHARA NEW (C)
46 57	142 43	YSS	YUZHNO SAKHALINSK
46 57	142 43	YSS	SAKHALINSK (SEE YUZHNO SAKHALINSK)

MP = micropulsations
C = closed

A REPORT ON Km-OBSERVATORY VISITS

by

P.N. MAYAUD

and

M. MENVIELLE

Institut de Physique du Globe de Paris

Introduction

At the Scientific Assembly of IAGA in Seattle (1977), the Working Group on Geophysical Indices, and then Division V requested one of us to visit the Km-observatories to discuss the method of the K-scalings with the observers (IAGA Bulletin n°41, p.40 and 82). The project was endorsed by the IAGA Executive Committee (loc.cit., p.33).

This report contains three sections, the second prepared with M. Menvielle. The first section describes the work done by Mayaud at each observatory and the consequences expected in the future. The second one is a quantitative analysis of the results obtained, and describes the way in which the quality of the K scalings will be monitored in the future. The third section lists various general recommendations some of which have been discussed by the Working Group on Geophysical Indices during the IAGA Assembly at Canberra in 1979 and , if possible, endorsed by it and forwarded to the Observatory Directors.

1. The work carried out at each observatory, and the results expected.

The work carried out by Mayaud had a two-fold goal : (1) by rescaling a one-year sample of indices at each observatory and comparing the new scalings with the original observatory scalings, it was possible to initiate practical and fruitful discussions with the observers about the discrepancies observed, and (2) by rescaling the same one-year sample at all the Km-observatories, it will be possible to have at one's disposal a reference sample in order to monitor in the future the evolution of the quality of the observatory scalings.

The Km-observatories visited by Mayaud either at the station itself or at a central bureau where the concerned observer met him are : Magadan, Petropavlosk, Memambetsu, Tunguska, Sverdlovsk, Novosibirsk, Niemegk, Witteveen, Hartland, Ottawa, Fredericksburg, Newport, Victoria, Tucson, Amberley, Toolangi, Gnangara, Kerguelen, Crozet, Hermanus, Argentine Island, South Georgia, Trelew. The records of Novosibirsk could not be scaled because of too much contamination by artificial disturbances but its observer was trained on the Sverdlovsk magnetograms. At all the others (that is the 22 observatories whose scalings are discussed in section 2), new K scalings

of a one-year sample were made independently in each horizontal component (H and D). Such independent scalings in each component were the condition for achieving the first result of the mission, that is to leave a copy of these scalings at the observatory which would serve as a reference, in the future, for the training of new observers. Indeed, scaling only the largest K (which is a possible way of carrying out the scalings) would not permit the observer being trained to know, on many occasions, the source of the differences between his own scalings and these reference scalings ; it only becomes possible with scalings made in each of the two components.

Menvielle visited with Mayaud four of the Km-observatories (Kerguelen, Crozet, Argentine Island and South Georgia) and carried out similar scalings on his own. All differences between Mayaud's scalings and his scalings were discussed and resolved. The last three observatories are rather difficult to scale because of the great day-to-day variability of the regular daily variation S_R (remember that the elimination of this daily variation is the main problem in the scalings), and the goal of this supplementary work was to train Menvielle for advising observers in the future.

At every observatory, the comparison of the new scalings with the observer's scalings was the starting point of the discussions with the observer. In most cases, the source of the differences was found (for further details, one can see the recommendations given in part 3) ; sometimes, however, the sample worked out had been scaled by an observer now retired ... Furthermore, and most of the time, checks were made by asking the observer to make new scalings. Often, after this had been done, the number of differences between the scalings by the observer and Mayaud fell below 5 %, which is a satisfactory threshold. Reports were prepared and left at each observatory. They indicated the main sources of the differences observed and the improvements to be carried out. The "training" of the observer, and the expected implementation of the recommendations left, constitute a second result of the mission : one may expect that the standard of the K scalings will remain at a good level in the near future. Besides, if the one-year scaling sample left as a reference is used for the observer's training, it may be considered as a guarantee that the standard will remain at a reasonable level in the long term. Finally, we describe in the next section

how permanent control of this level is now possible at the central Km-bureau.

2. A quantitative analysis of the differences between the observatory and new scalings

Since the K indices are in general less difficult to scale when the geomagnetic activity is high, the sample to be used should not be too disturbed. But because some of the Km-observatories are rather recent, the window for choosing a suitable one-year sample was rather narrow, given the high activity level during the last years. The twelve months July 1976-June 1977 were finally chosen. The average value of 'am' is 18.4 nT for that period, which represents an average level with a sufficient number of quiet days, but also a number of moderately disturbed days ; the latter are most significant, in many respects, when checking the quality of the scalings. Indeed, on the condition that the observer does not have a completely wrong understanding of the method (using, for instance, the iron-curve method in which the average Sq variation is eliminated), the quiet days are easy to scale.

The main differences between the observer's original scalings and the new scalings are : (1) for a low activity level, the first scalings are often higher than the new scalings. This can be due partly to the statistical procedure as the new K are taken as the starting point, but in most cases, it has appeared that it was due to an insufficient elimination of the regular daily variation S_R. This is shown on the left-hand panel of Figure 1 and we can see that it is, in general, more pronounced in summer-time. (2) for a moderate activity level (K = 4 and 5 : this level cannot be qualified as being a high activity level), the tendency is reversed. This is due to one of three factors: first to the fact that a given observer neglects one component in scaling, or second to the elimination of smooth variations during the nighttime when there was no reason to identify any S_R variation at these hours (this is not always the case, however, at some longitudes or seasons ; see the Atlas of K indices, Mayaud, 1967), or third, to different interpretations of the borderline cases (indeed, some observers hesitated to choose the higher index when the trace just crossed the border).

As it stands, these statistics could seem rather deceiving and apparently lead to questions about the possibility of obtaining reliable scalings. At the minimum, the threshold of 5 % for the number of differences mentioned above, and concerning the level below which differences should fall between observers well trained, is far from being reached. Table 1 gives the number of observatories for which the percentage of differences calculated over the whole sample (2920 intervals) is comprised between given limits. The three observatories of the first class (lowest percentages) are numbered 1, 8 and 16 in the Figure 1.

In section 3, we shall comment on the possibility and the conditions for improving in a definite way the standard of the scalings. Before that, we have to estimate the influence of these differences in the resulting 'an', 'as' and 'am' indices. Such indices have been computed for the one-year sample with the set of original observatory scalings (K_1) and with the set of new scalings (K_2). If one compares the monthly averages for the twelve months of the sample (Table 2), the differences appear to be rather low and question the usefulness of the work undertaken. One has however to be aware of two points. First, there is a balance between low indices (K = 0 and 1) scaled too high, and high indices (K = 4 and 5) scaled too low since the former are more numerous (see legend of Figure 1). There is also compensation between observatories : for instance, local day and nighttime indices are averaged in the planetary indices. However, we shall see later how the differences contaminate the estimate of the low activity levels, and one cannot insist too much on the fact that, for many investigations, it is as important to know the absence of disturbance as to be able to estimate their intensity when they exist. Secondly, we shall see how the quality of the standard has varied considerably with time in the past at most of the observatories. This variation should be avoided, and one can hope that the impetus given by the visit to the observatories will prevent any large deviations in the future.

Figure 2 presents histograms of the difference between the 3-hour indices ('am', 'an' and 'as') derived from the original observatory scalings and from the new scalings for different levels of activity. As expected from Figure 1, the planetary indices derived from the original observatory

scalings are higher at low activity levels (histograms are shifted towards the right-hand side) and lower at high activity levels. As it has been stated before, one part of this effect can be due to the statistical procedure. At low levels, the effect is greater in each hemisphere during the local summer, which indicates that the contamination by the daily variation S_R becomes larger at this season in the two hemispheres. Let us note that this effect is greater in the northern hemisphere, a fact already noted by Mayaud (1970, 1979) for the whole series of the 'am' indices. Two other facts can be mentioned. (1) The histograms are wider in the southern hemisphere. This is probably due to the smaller number of observatories used in the derivation of the 'as' index. (2) There is but a slight shift towards the left-hand side of the histograms of 'an' and 'as' for the class 20-39. We think that this indicates that a contamination by the S_R is still present at this activity level during local summertime, as the histogram of 'am' indicates that similar histograms of 'an' and 'as' for wintertime would be much more asymmetric.

Differences at moderate or high activity levels are relatively much smaller : for instance, a difference of -4 nT (the histogram of 'am' at the bottom) when 'am' is equal to 50 or 60 nT, is not very significant. But, at very low activity levels, discrepancies can easily reach 100%. This is certainly too much and should be avoided if one considers that such planetary indices are the only possibility for classifying and ranking the quiet periods.

The repartitions of the differences between the daily indices derived from the K_1 and K_2 data sets are presented in Table 3 in the case of 'am', 'an' and 'as' for two classes of activity. One can note again that positive differences are most numerous, but the differences are smaller in this case compared to that obtained from the three-hour values (see Figure 2).

The above quantitative analysis bears on the one-year sample 1976/1977 only, but it is possible to investigate what happened in the past. The process used consists in computing the variation of the ratio of the average activity in a given observatory over the corresponding hemi-

spheric average activity; diagrams have been drawn for each observatory in the case of running averages calculated each month over 4 months or over 12 months, and we show on Figure 3 the diagrams for five Km-observatories whose K indices have been used from the beginning of the Km-series, 1959. At each observatory, the value of this ratio is compared to its average value calculated from the new indices scaled in the one-year sample 1976/77, as is indicated by the bold straight line. Such diagrams have been sent to each observatory with the relevant comments, and will be sent regularly in the future, and thus, observatories can check their standard continuously.

The use of 4-month averages instead of 1-month averages reduces the noise due to the non-sufficiently-random occurrence of great disturbances within a single month with respect to the local time. Because the amplitude of the 12-month wave of the geomagnetic activity varies with longitude in each hemisphere (Damaske, 1977 ; Mayaud, 1977, 1979), ratios computed from the 4-month averages undergo a 12-month wave which varies from one observatory to another. The use of 12-month averages eliminates this effect, but the consideration of the 4-month curves is still of interest in order to estimate whether there exists a contamination of the K indices by an insufficient elimination of the regular daily variation S_R (remember that the contamination by the S_R can be greater in summertime). On the other hand, the choice of the 12-month ratio derived from the new scalings as a reference must not be considered as a definitive one ; in many aspects, the sample is too short to be considered as an absolute reference. One may expect that, in the coming years, discrepancies existing between nearby observatories will be greatly reduced and that a more reliable reference will be obtained by comparing the behaviour of the ratios from one observatory to another. The interpretation of the curves of Figure 3 for all observatories is sometimes difficult; in particular, what is the influence of known incorrect scalings at a given observatory on the values of 'an' or 'as' used in the computation of the ratio for other observatories? A trace of this fact or others appears in the comments sent to the observatory Directors.

Let us give a few comments on the curves of Figure 3. First, all the original observatory K-scalings used in this Figure were made previous to the visits of the Km-observatories. At observatory number 4, the ratio varies slightly all along the series, and is close to the reference ratio. The deviation around 1970 would possibly correspond to a deviation for a short period. At the time of the reference sample, the small difference observed was identified during the visit as being due to an insufficient knowledge of the day-to-day variability of the S_R, and it is possible that the amplitude of the annual variation appearing all over the series is greater than it should be. As a whole, however, this observatory is good and stable for many years. It probably constitutes a standard to be reached by any observatory, that is deviations of the 12-month average ratio much smaller than 10 % (the distance between the bold horizontal line and one or the other thin horizontal lines) from the reference ratio. Number 9 shows the result caused by a change of the observer after 1968 : in the first part of the series, the observer correctly eliminated the variation S_R although he possibly went a little too far, while, in the second part, the new observer did not sufficiently eliminate this variation. Number 16, among the observatories displayed in this Figure, shows the best agreement between original observatory scalings and the new scalings : the bold curve almost coincides with the thin curve for the twelve months of the sample. This observatory belongs to the first class (15.5 % - 17.5 %) of the Table I. But, during previous years, great deviations from the standard appear. One of us had the opportunity of visiting this observatory in 1971, hence the change which intervened after that year. Number 19 is interesting because it displays the effect of giving up the iron-curve method ; this occurred after the publication of the Atlas of K indices (1967). The effect is a spectacular one. Note that the annual variation has an opposite phase to the one of number 4, which is absolutely normal. Finally, number 21 has a clear tendency to scale too low all over the series ; this is mainly due to the fact that the D component was often neglected in scaling. With the exception of three other observatories, all the others display variations of the ratio which are quite large in one or another part of the series, as they appear in Figure 3. Certainly, and to repeat a remark made above, there is some compensation between one observatory and another when computing the planetary indices, but one may expect in the future any large deviations will be definitely avoided.

3. Recommendations to the observatory Directors

In order that the following recommendations be well understood, we wish to commence with two remarks. (1) The following quotation of Bartels in his report at the IAGA Berkeley Meeting in 1963 (see IAGA Bulletin n° 19, p. 224), as Chairman of the Committee on Characterization of Magnetic Activity, must be recalled : "Should we aim at improving K indices by the introduction of more stringent directions ? A reasonable demand on the attention of the observer seems to be justified, but I should be opposed to overloading the observer by expecting from him a perfection which, in any case, would not much increase the intrinsic value of the produced K index". And, to some people who think that the production of good K indices could be obtained only by doing the work at a central bureau, we would propose an answer that one of us heard several times from Bartels : "An international project must be run by involving local people in the job, and to withdraw the observers from it would be disastrous. Their patient and daily work is so important for our science that, without them, we cannot do anything, and they must have priority. Any other attitude would be unfair to them". (2) We emphasize in section 2 the contrast between the discrepancies illustrated by Figure 1 and the small differences observed at the level of the planetary indices. On the other hand, Figure 3 shows that, in the past, the homogeneity of the K series was quite poor at some observatories. This again contrasts with the possibility of detecting a lot of true and fine geophysical features in the planetary indices (see, in Mayaud , 1980, the description of the true features of the 'am' index, as found by various workers). Both these contrasts plainly justify the choice of deriving the 'am' index by using two or three observatories within each longitude sector : it allows for a compensation not only of abnormal induced effects at a given observatory but also of differences in scalings.

Does it mean that the scientific community can be indifferent to the quality of the scalings ? We believe that an international project has to be run as well as possible because data of high quality could lead to the discovery of new properties. But a just balance has to be kept between the "reasonable demand on the attention of the observers" and an unreasonable burden imposed on them. The following recommendations aim at such a balance. Most of them come from the discussions with the observers

during the visits made at each observatory. They summarize the sources of errors which were observed. By enumerating them all, one could prevent other observatories from falling into similar errors. They are classified under various items. The two most important recommendations have been submitted for the approval of Working-Group 6 on Geophysical Indices of IAGA Division V.

3.1. The K-scales

Three points have to be considered : (a) any scale must be strictly proportional to the fundamental scale given in the Atlas of K indices, p. 5 ; (b) the scales must follow changes in the scale values ; (c) the scales must be of sufficient quality.

(a) Before undertaking new scalings at a given observatory, we always checked the scales used by the observer, and sometimes discrepancies appeared. At times, these discrepancies were due to errors in the drawing of the scale. At other times, they were due to the unexpected finding that the successive limits used by the observatory concerned, as they were taken from Bartels et al. (1939, their Table 2, p. 418), were not strictly proportional to the scale with a K = 9 lower limit equal to 500 (see, for instance, the scale 350 of this Table which begins with multiples of 4 instead of multiples of 3.5). Any such rounding process must be avoided, since the position of a given line on the scale, which has to be drawn with an accuracy of a tenth of a millimeter, finally depends on the scale value of the record of a given component ; the rounding process must intervene at this last step only. We recommend that a reasonable care be taken at this preliminary level of the drawing of each scale. Lines also must be parallel (see point c).

(b) The acceptable tolerance when the scale value of the record changes should not exceed 1 % - 2 %. Since such variations are undiscernable for the first two or three steps of the scale but become significant for the subsequent steps, the drawing of supplementary small lines as illustrated in Figure 5 of the Atlas of K indices should give the scale a longer lifetime (see however point c below). Let us note that, if the D scale is based on a scale-value in minutes at the time of its making, one has to take

care that the secular variation of the H component does not change the scale-value in nT.

(c) A good quality of the scale greatly facilitates the work of the observers. The model given in the Atlas is not compulsory but presents several advantages. The support should be truly transparent (this facilitates the choice of the index for the borderline cases) ; sufficiently stable (i.e. do not use transparent paper) ; somewhat flexible (the scale is then easier to handle). Lines should be very thin. On this point, the best K-scales presently used in the world are those of the British Antarctic Survey. A mastercopy has been made with a laser on a glass base. Then a negative film copy is obtained, which provides any desired scale by photographic enlargement on a transparent flexible base. This guarantees a perfect thinness and parallelism of the lines and, as well, a perfect proportional variation of the scale. This also provides the means of always having at one's disposal a set of slightly different scales, which allows for any variation in the scale values of the records. Any observatory that wishes to have a negative copy of this mastercopy could contact the British Antarctic Survey, Geomagnetic Division, at Cambridge (Great Britain). We would strongly recommend doing this.

3.2 Check of the scalings

Any scaling made at an observatory has to be checked before being put at the disposal of the scientific community. We wish to indicate several points along this line. Some are very important, other are only pieces of advice.

(a) At some observatories, K-indices have to be scaled every day for distribution to a national agency. In that case, one must never scale the last 3-hour interval of the record, or even the last two intervals. Identification of the variation S_R can be uncertain if one does not see the record on either side of the 3-hour interval concerned, and scientists requesting a rapid distribution should understand this fact : such scalings made for the last 3-hour intervals of the last record available are not reliable.

(b) It is much better not to scale day by day, but to scale week by week or fortnight by fortnight. The coherency in the identification of the

daily variation S_R is thus much greater. And, according to the following items, day by day scalings should be considered as being provisional.

(c) Given the short time needed for the scalings, the ideal way (this is not at all compulsory) is to scale independently each component twice at a separation of several days. Clear mistakes due to the inattention (to some extent, the scaling is so easy on many occasions that inattention necessarily plays a role) can thus be avoided. Furthermore, and this is most important, doubtful cases can be solved more easily. Particularly, when one is hesitant about the identification of the S_R, one makes a first choice. If one chooses the same value when scaling again, it indicates that the choice was probably good ; if not, one has to opt for the most prudent solution (see section 3.3). Let us note that scalings treating each component independently is the only serious way of checking, because one can identify the source of the difference.

(d) Double scalings can be made more easily at the observatories where several observers are at work. Obviously they must be made entirely independently, and with the same correct method. Several times, when investigating differences between the original observatory and new scalings on the one-year sample, we observed that there were abrupt changes from month to month (or, even, from week to week). This was due to scalings made by different observers. It is evident that an agreement must be reached between the observers of a given observatory.

(e) A minor point merits mentioning. Sometimes, during discussions with the observers, it appeared that differences in a given month came from holiday absences of the main observer. In such a case, one must not hesitate to consider the first scalings as provisional. These provisional scalings should be sent to the control Km-bureau to avoid delaying the provisional computation of the planetary indices. Later on, the definite values, after the check has been made, should also be sent.

(f) Finally, it would be worthwhile to recommend that the observatory Directors notify any change of the chief-observer (or the observer if he is alone) to the central Km-bureau. In that way, the central

bureau could follow carefully the indices which arrive and inform the observatory Director whether the standard is maintained or not. This last point is rather important and has been submitted to the approval of the Working Group on Geophysical Indices.

3.3 The method of scalings

The professional requirements needed for scaling K indices are rather high, and, during the visits to the Km observatories, it appeared that observers were not always sufficiently trained and helped in their work. Sources of the differences observed between the original observatory scalings and new scalings were partly due to either the poor quality of some scales used or insufficient checks. At some places, it was also due to the lack of attention given to one component, hence the interest of scaling independently each of the horizontal components as mentioned above. But the main source of the differences was the insufficient knowledge of the day-to-day variability of the S_R (hence, a frequent and more or less unconscious use of the iron-curve method) and of the existence or the non-existence of the variation S_R at night. At some observatories, in the reports left at each observatory, this fact has been mentioned. The following recommendations can be made.

(a) The Atlas of K indices contains a description of the day-to-day variability of the regular variation S_R, and its author got the impression during the visits made that, in many respects, it does not achieve its goal. He believes however that one of the reasons of the failure is that one of the recommendations given in it (see, p. 91) was not followed. Indeed, the best way for acquiring a true knowledge of the S_R variability is to set up an Atlas of the records of the observatory. Only two Km-observatories had such an Atlas at the time of the visits. However, one may assert that an Atlas is of great help in two ways : (1) when, on a given day, observers are in doubt, a look at this collection of records helps a lot in sólving the difficulty, and (2) when one has to train a new observer, the task is greatly facilitated. We cannot insist too much that each observatory Director undertake the setting up of such an observatory Atlas, possibly with the aid of a qualified scientist.

(b) When setting up such an Atlas, one has to give the same weight to the nighttime as to the daytime. It is important to know the various possible shapes of the variation S_R which may occur during daytime, but it is as important to know the various times at which the S_R can begin or end, and what are the possible occurrences of "regular" S_R variations at night such as they exist at some longitudes or seasons. Indeed, the main source of the differences observed between the observatory and new scalings was an insufficient knowledge of the variability during daytime (hence, K indices scaled too high) and a tendency to interpret smooth variations during nighttime as being the variation S_R while they were not such (hence, K indices scaled too low). Let us note that, when a variation of the field has to be interpreted as being the S_R during the night, its amplitude is never large (except sometimes in the D component during summertime), and it can be interpreted as such only when the field is sufficiently quiet to permit the observer to recognize it.

(c) The objectivity of the K scalings has been often questioned. If a supplementary result comes from the visits to each of the Km observatories, it is that this objectivity exists as soon as the observer is well trained. It was a surprise to see how rapidly full agreement could be reached in the scalings : as we said in section 1, the number of differences falls below 5 % for the scalings remade by the observer. But this requires that the observer does not speculate. Figure 1 shows that differences between the original observatory and new scalings exist not only for the low indices (K = 0,1) but also for K = 2,3 or K = 4,5 ; their source, on many occasions, was a tendency to imagine the variation S_R when it is not identifiable. In fact, as said in the Atlas of K indices, the K scalings depend on an intelligent estimation by the observer of the necessity (or the non-necessity) of eliminating the S_R. The difficulty in scaling does not arise in the extreme cases : very quiet days or very disturbed periods. In the first case, the S_R appears in its pure shape ; in the second case, it becomes negligible with respect to the K variations. Hence, it is obvious that the precision with which the identification of the S_R has to be made varies inversely with the intensity of the activity. In intermediate cases, quiet parts of the record often permit the observer to identify the S_R ; but, as soon as reasonable uncertainties arise (we mean by 'reasonable" that the observer has a true knowledge of the S_R variability at his observatory), the

only way to be objective consists in refusing to speculate, that is to imagine a possible S_R. When one does not see the S_R, one should not inject any assumed S_R ; it would be a return to a method like that of the iron-curve. On a given occasion, one would inject a given S_R, and, on another occasion, another one for the same record. In order to maintain a consistency (or an objectivity) either between the scalings of a given observer, or between two observers scaling the same records, or from one observatory to another, any observer has to be increasingly prudent when the S_R becomes undiscernable : "when in doubt, don't", that is do not imagine what it is.

(d) We said in section 2 how we hope to be able at the central Km-bureau to follow the evolution of the standard of the scalings at each observatory, and to keep in close contact with them on the future. We believe however that a further step should be carried out : the observers have to be helped and controlled by a qualified scientist in each country. This qualified scientist should have a true interest in the field, and believe that, because indices derived from the K indices are a useful tool for the international scientific community, good scalings are of importance. This last recommendation has also been submitted for approval to the Working Group on Geophysical Indices. The choice of the qualified scientist for each country (or for a region) could be made through an agreement between the Working Group and the observatory Directors. We are convinced that, in that way, some of the defects appearing in Figure 3 could be avoided in the future.

4. Conclusion

One of us who initiated the Km project was constantly wondering, from the beginning, about the quality of the indices used. By comparing the frequency distributions of the observatories, he could guess that problems existed ; sometimes, abrupt changes were so clear that he supposed a change of the observer and enquired about that. But many other discrepancies remained unsolved.

After the visits to each observatory, many problems have been clarified. For instance, it appears clearly that, because of smaller activity in the southern hemisphere (see Mayaud, 1980), the number of low

indices is greater in this hemisphere than in the northern. Furthermore, one now has a real possibility of monitoring the quality of the indices used. Hence, we are confident that, if most of the recommendations listed in section 3 are implemented, the quality of the planetary indices distributed to the international scientific community will definitely rise to a good level.

References

Bartels, J., N.H. Heck and H.F. Johnston, "The three-hour range index measuring geomagnetic activity", Terr. Magn. Atmos. Elect., 44, 491, 1939.

Damaske D., "Magnetospheric modulation of geomagnetic activity. I - Harmonic analysis of quasi-logarithmic Kn, Km and Ks", Ann. Géophys., 33, 461, 1977.

Mayaud, P.N., "Atlas of K indices, vol. I, Text, vol. II, Figures". IAGA Bulletin n° 21, 1967.

Mayaud, P.N., "Sur quelques propriétés de l'activité magnétique déduites de l'analyse d'une série de neuf années des indices Kn, Ks et Km, I - Comparaison des niveaux de l'activité dans chaque hémisphère", Ann. Géophys., 26, 109, 1970.

Mayaud, P.N., "Analyse d'une série centenaire d'indices d'activité magnétique IV - Les diverses composantes de l'onde annuelle aux latitudes subaurorales", Ann. Géophys., 33, 479, 1977.

Mayaud, P.N., "On the sources of the 12-month wave in the an and as geomagnetic activity indices", J. Geophys., 46, 261-271, 1979.

Mayaud, P.N., "Derivation meaning and use of geomagnetic indices", Amer. Geophys. Union, Monograph 22, 1980.

Table 1

	15.5-17.5%	17.5-22.5%	22.5-27.5%	27.5-33.8%
n	3	9	6	4

Number,n, of observatories for which the number of differences between original observatory and new scalings are between certain percentages.

Table 2

					an							
K_1	17.9	17.7	22.8	20.5	15.6	17.5	17.3	19.5	18.6	25.8	20.4	16.4
K_2	17.5	16.9	22.7	20.3	15.6	17.5	17.7	19.5	18.4	25.5	19.5	15.0
					as							
K_1	14.8	14.6	21.2	18.1	15.1	19.0	19.2	20.3	18.6	23.7	16.9	11.2
K_2	14.7	14.6	21.4	18.5	15.5	19.3	18.3	20.3	18.5	24.4	17.6	11.3
					am							
K_1	16.3	16.1	21.9	19.3	15.3	18.2	18.3	19.9	18.6	24.8	18.7	13.8
K_2	16.1	15.7	22.0	19.4	15.5	18.4	18.0	19.9	18.5	25.0	18.5	13.2

Comparison of the monthly averages of the planetary indices 'an', 'as' and 'am' for the two sets of scalings K_1 and K_2

Table 3

	-3	-2	-1	0	+1	+2	+3
classes				am			
0-9	0	0	2	36	43	3	0
10-19	0	0	20	86	49	2	0
				an			
0-9	0	0	0	1	14	5	2
10-19	0	0	1	22	33	9	2
				as			
0-9	0	1	4	7	9	2	0
10-19	0	2	8	20	14	6	1

Differences between the daily values derived from the original observatory and new scalings using the one-year sample for 'am, and only the local summer for 'an' and 'as'. Two classes are considered: 0-9 and 10-19 nT

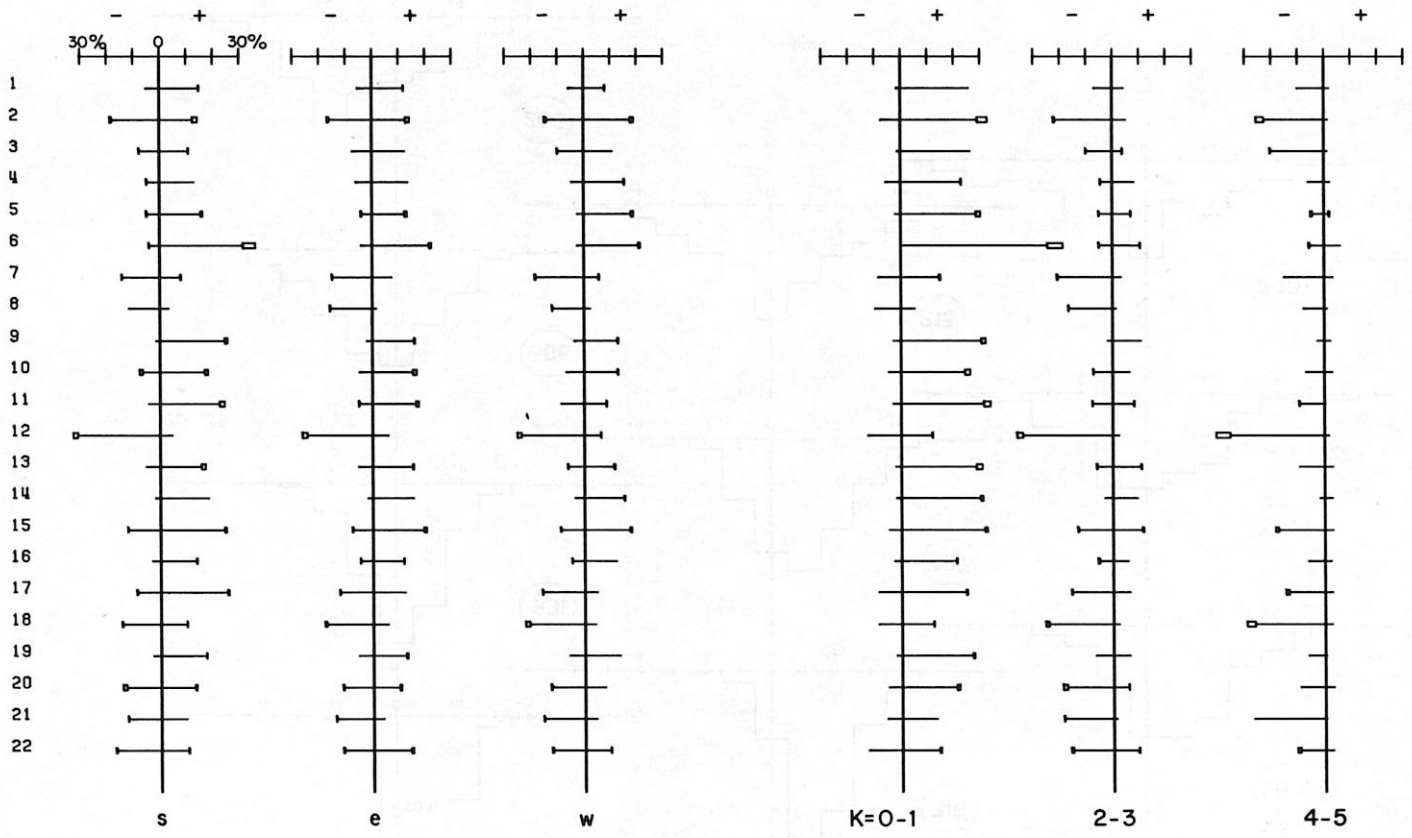


Figure 1. For legend: See last page.

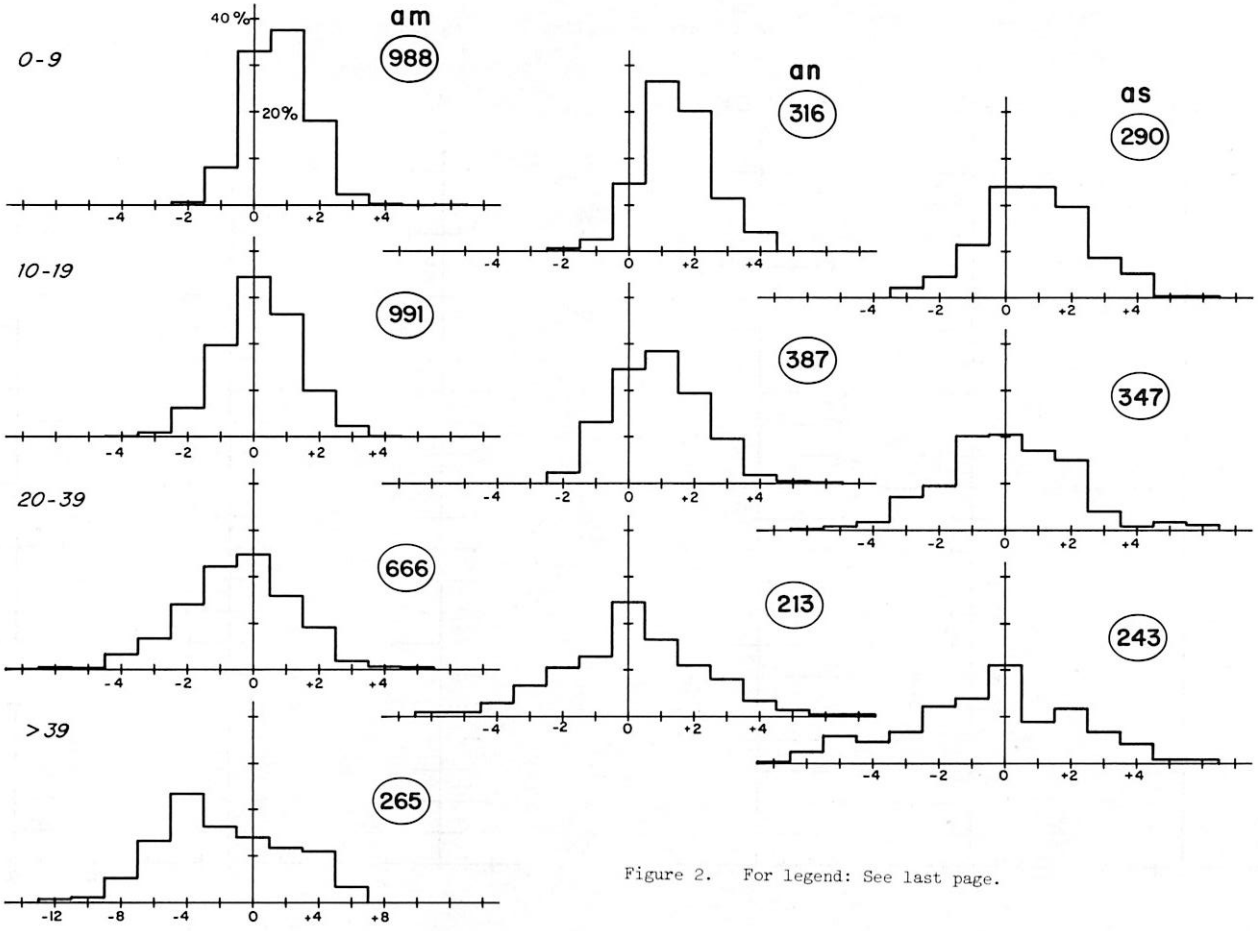


Figure 2. For legend: See last page.

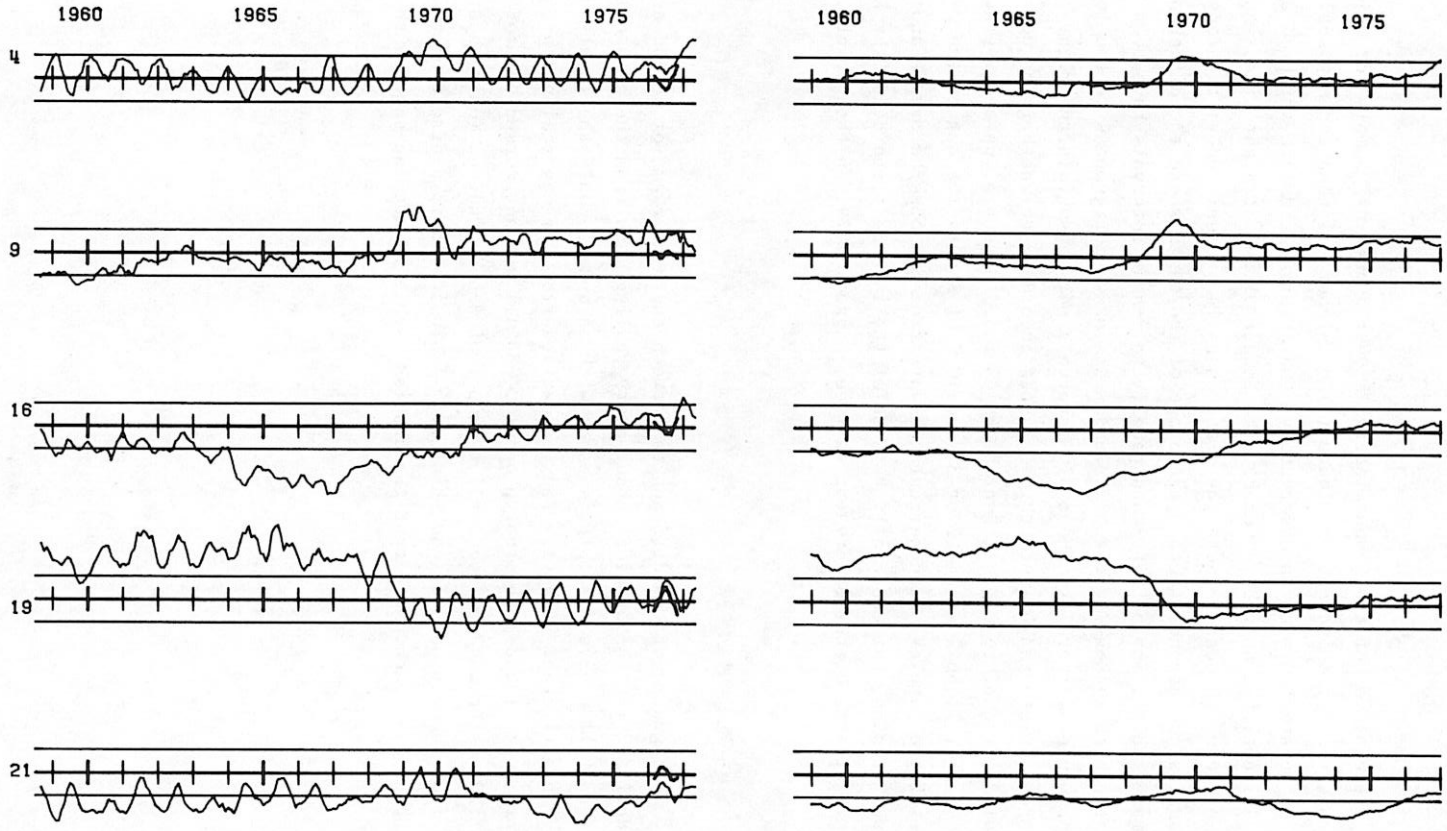


Figure 3. For legend: See last page.

Legend of figures

Figure 1. Percentages of the 3-hour intervals over a one-year sample for which original observatory K indices are lower (-) or higher (+) than the new scalings. Each row is related to a given observatory; the observatories are arranged at random and identified only by a number. The length of the straight lines indicates the percentage of the cases where the differences is one unit only; the length of the rectangles corresponds to the percentage of the cases where the difference is two (or more) units. In the left-hand panel, the 3-hour intervals have been ranked into three seasons s, e and w. Season s (or w) corresponds to the local summer (or winter). There are about 970 intervals per season. In the right-hand panel, intervals are ranked into three classes according to whether the new value scaled is equal to 0 or 1, 2 or 3 and 4 or 5. There are, on the average, 33 % of K = 0 or 1, 56 % of K = 2 or 3, and 10 % of K = 4 or 5 out of the 2920 intervals of the samples. Such percentages vary from one observatory to another for various reasons, but especially because of the incorrect choice of the K = 9 lower limit at some of the observatories (see, Mayaud, 1979, on that point).

Figure 2. Histograms of the differences between the 3-hour am (or an and as) indices derived from the original observatory scalings and from the new scalings. With am, the full one-year sample is used; with an and as, only the local summer season is investigated. Planetary indices derived from the new scalings are ranked into four classes; the fourth one ($>$ 39 nT) was not worked out for the an or as indices because of too small a number of 3-hour indices (only about 80). The number of indices used or each histogram is indicated in a circle on the right-hand side of each. Note that the abscissa scale is not the same for the sample $>$ 39 nT.

Figure 3. Comparison of the activity level at a given observatory with the planetary level as measured by the an or as indices. The observatories displayed are identified by the same number as the ones used in Figure 1. Values plotted are the ratio of the average activity at the observatory over the average activity in the hemisphere concerned (an or as). One point per month is plotted : it corresponds to 4-month averages in the left-hand panel, and to 12-month averages in the right-hand panel. Thin curves correspond to the values of this ratio when computed from the scalings of a given observatory and from the planetary indices an (or as) derived from those of all Km observatories. Short bold curves in the left-hand panel correspond to the 4-month values of the ratio when computed from the new scalings of the one-year sample at a given observatory and from the planetary indices an (or as) derived from those of all Km-observatories. In the right-hand side, no such curve can be plotted since there exists only one 12-month value with the one-year sample; but the value of this 12-month ratio can be identified in the drawing since the ordinate of each bold horizontal line corresponds to that value in this panel. In the left-hand panel, the ordinate of the bold horizontal line is that of the average of the 4-month ratios for the new scalings. In both panels, the difference between the ordinate of a thin horizontal line and of the bold one corresponds to a variation of the ratio by 0.1. Averages values of the ratios vary from one observatory to another but are close to one unit. Mark times of each year are plotted at the center of the year concerned; that is at the abscissa of the May-August average with the 4-month running averages, and at the abscissa of the January-December average with the 12-month running averages.

TRANSACTIONS OF IAGA MEETINGS

Bulletin		US $
No. 3	Transactions of the Rome Meeting, 1922	8.00
No. 5	Transactions of the Madrid Meeting, 1924	8.00
No. 8	Comptes rendus de l'Assemblée de Stockholm, 1930	8.00
No. 13	Transactions of the Oslo Meeting, 1948	8.00
No. 14	Transactions of the Brussels Meeting, 1951	8.00
No. 15a	Le Noyau Terrestre, Rome, 1954	8.00
No. 15b	Problèmes de la Physique de la haute atmosphère, 1954	8.00
No. 16	Transactions of the Toronto Meeting, 1957	8.00
No. 16a	Paléomagnétisme et Variation Séculaire, Toronto, 1957	8.00
No. 16b	Aéronomie, Toronto 1957	8.00
No. 16c	Rapid Magnetic Variations, Utrecht 1959	8.00
No. 19	Transactions of the Berkeley Meeting, 1963	8.00
No. 21	Atlas of Indices K (Vol. 1 : Text ; Vol. 2 : Figures)	8.00
No. 24	Programme and Abstracts of the St Gall Meeting, 1957	8.00
No. 25	Transactions of the St Gall Meeting, 1967	8.00
No. 26	Programme and abstracts of the General Scientific Assembly, Madrid, 1969	8.00
No. 27	Transactions of the General Scientific Assembly, Madrid, 1969	8.00
No. 28	The World Magnetic Survey, 1957-1969	12.00
No. 29	Grid values for the IGRF 1965	4.00
No. 31	Transactions of the XV General Assembly, Moscow, 1971	8.00
No. 34	Programme and abstracts for the Second General Scientific Assembly, Kyoto, 1973	8.00
No. 35	Transactions of the Second General Scientific Assembly, Kyoto, 1973	8.00
No. 36	Programme and abstracts of the XVI General Assembly, Grenoble, 1975	8.00
No. 37	Transactions of the XVI General Assembly, Grenoble 1975.	
No. 38	Grid values and charts of the IGRF 1975.	
No. 41	Transactions of the Third General Scientific Assembly, Seattle 1977	8.00

PROCEEDINGS OF IAGA SYMPOSIA

		US $
IAGA	Symposium No. 2, Communications présentées à la Réunion de Berkeley, 1963	8.00
IAGA	Symposium No. 3, Symposium on Magnetism of the Earth's Interior, Pittsburgh, 1964	8.00
IAGA	Symposium No. 4, Communications présentées à la Réunion de Cambridge (Mass.), 1965	8.00
IAGA	Symposium No. 5, Communications présentées à la Réunion de São José dos Campos (Brésil), 1966	8.00
IAGA	Symposium No. 6, Symposium on Aurora and Magnetic Storms, Birkeland, 1967	8.00
IAGA	Symposium No. 7, Symposium on Upper Atmospheric Winds, Waves and Ionospheric Drifts, St Gall, 1967	8.00
IAGA	Symposium No. 8, Symposium on Laboratory Measurements of Aeronomic Interest, Toronto, 1963	8.00
IAGA	Symposium No. 9, Symposium on Multidisciplinary Studies of Unusual Regions of the Upper Mantle, Madrid, 1969	8.00

PUBLICATIONS

by the

INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY

The following IAGA Publications are on sale at the IUGG Publications Office, 39 ter, rue Gay-Lussac, 75005 Paris (France).

GEOMAGNETIC INDICES AND GEOMAGNETIC DATA

Bulletin		US $
No. 12	Geomagnetic Indices, K and C, 1940-1946	3.60
No. 12a	Geomagnetic Indices, K and C, 1947	3.60
No. 12b	Geomagnetic Indices, K and C, 1948	out of print
No. 12c	Geomagnetic Indices, K and C, 1949	3.60
No. 12d	Geomagnetic K-Indices, International Polar Year, August 1932 to 1933.	3.60
No. 12e	Geomagnetic Indices, K and C, 1950	3.60
No. 12f	Geomagnetic Indices, K and C, 1951	3.60
No. 12g	Geomagnetic Indices, K and C, 1952	3.60
No. 12h	Geomagnetic Indices, K and C, 1953	3.60
No. 12i	Geomagnetic Indices, K and C, 1954	3.60
No. 12j	Geomagnetic Indices, K and C, 1955	3.60
No. 12k	Geomagnetic Indices, K and C, 1956	3.60
No. 12l	Geomagnetic Data, 1957, Indices K and C, Rapid Variations	3.60
No. 12m1	Geomagnetic Data, 1953, Indices K and C	3.60
No. 12m2	Geomagnetic Data, 1958, Rapid Variations	3.60
No. 12n1	Geomagnetic Data, 1959, Indices K and C	3.60
No. 12n2	Geomagnetic Data, 1959, Rapid Variations	3.60
No. 12o1	Geomagnetic Data, 1960, Indices K and C	3.60
No. 12o2	Geomagnetic Data, 1960, Rapid Variations	3.60
No. 12p1	Geomagnetic Data, 1961, Indices K and C	3.60
No. 12p2	Geomagnetic Data, 1961, Rapid Variations	3.60
No. 12q1	Geomagnetic Data, 1962, Indices K and C	3.60
No. 12q2	Geomagnetic Data, 1962, Rapid Variations	3.60
No. 12r1	Geomagnetic Data, 1963, Indices K and C	3.60
No. 12r2	Geomagnetic Data, 1963, Rapid Variations	3.60
No. 12s1	Geomagnetic Data, 1964, Indices K and C	3.60
No. 12s2	Geomagnetic Data, 1964, Rapid Variations	3.60
No. 12t1	Geomagnetic Data, 1965, Indices K and C	3.60
No. 12t2	Geomagnetic Data, 1965, Rapid Variations	3.60
No. 12u1	Geomagnetic Data, 1966, Indices K and C	3.60
No. 12u2	Geomagnetic Data, 1966, Rapid Variations	3.60
No. 12v1	Geomagnetic Data, 1967, Indices K and C	3.60
No. 12v2	Geomagnetic Data, 1967, Rapid Variations	3.60
No. 12w1	Geomagnetic Data, 1968, Indices K and C	3.60
No. 12w2	Geomagnetic Data, 1968, Rapid Variations	3.60
No. 12x1	Geomagnetic Data, 1969, Indices K and C	3.60
No. 12x2	Geomagnetic Data, 1969, Rapid Variations	3.60
No. 18	Geomagnetic Planetary Indices Kp, Ap and Cp, 1932 to 1961	5.60
No. 20	List of Geomagnetic Observatories	3.60
No. 21	Atlast of Indices K (Vol. 1 : Text ; Vol. 2 : Figures)	8.00
No. 32a	Geomagnetic Data, 1970, Indices, Rapid Variations, Magnetic Storms.	3.60
No. 32b	Geomagnetic Data, 1971, Indices, Rapid Variations, Special Intervals	3.60
No. 32c	Geomagnetic Data, 1972, Indices, Rapid Variations, Special Intervals	3.60
No. 32d	Geomagnetic Data, 1973, Indices, Rapid Variations, Special Intervals	3.60
No. 32e	Geomagnetic Data, 1974, Indices, Rapid Variations, Special Intervals	3.60
No. 32f	Geomagnetic Data, 1975, Indices, Rapid Variations, Special Intervals	3.60
No. 32g	Geomagnetic Data, 1976, Indices, Rapid Variations, Special Intervals	4.50
No. 32h	Geomagnetic Data, 1977, Indices, Rapid Variations, Special Intervals	5.00
No. 33	A hundred year series of Geomagnetic Data 1868-1967	8.00
No. 39	Supplementary Geomagnetic Data, 1957-1975	5.00

(continued inside back cover)