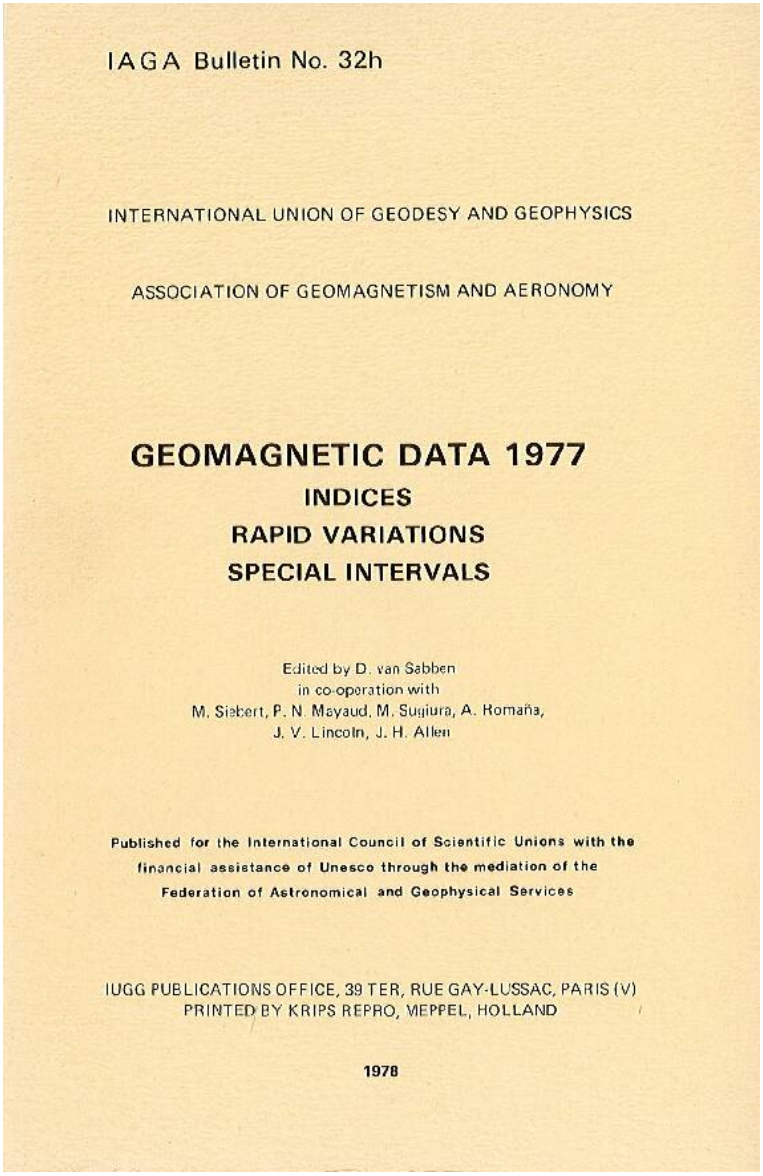

IAGA Bulletin No. 32h

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

ASSOCIATION OF GEOMAGNETISM AND AERONOMY

GEOMAGNETIC DATA 1977

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

1978

How to cite:

Van Sabben, D., Siebert, M., Mayaud, P. N., Sugiura, M., Romana, A., Lincoln, J. V., Allen, J. H., & IAGA (1978). *IAGA Bulletin No. 32h, Geomagnetic Data 1977, Indices, Rapid Variations, Special Intervals.* IUGG Publications Office. https://doi.org/10.25577/m51s-5g66

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UNESCO Subvention 1978

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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 Ci, together with lists of selected quiet and disturbed days. In 1938, this work was extended backwards to 1890.

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.

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.

According to a reccommendation 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 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 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 in Boulder.

The auroral electrojet index AE cannot yet be included in the IAGA - Bulletin. At present 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 32a and 32b.

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. Checklists are now sent to the observatories for the reported "very remarkable events" and solar-flare effects only.

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, 4 Place Jussieu, Tour 14, 75230 Paris Cedex 05, France.

Monthly bulletins on aa, selected quiet and disturbed 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

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Part A. List of Observatories. *)

The observatories are arranged according to their geographic latitudes. The two letter symbols have been chosen as far as possible in accordance with the List of Observatories, compiled by G. Fanselau (IAGA-Bulletin No. 20, 1965). For observatories which have removed over a small distance, the old name is sometimes maintained, but the coordinates correspond always with the new site. The symbols are used in the lists of rapid variations (Part C of this Bulletin). Observatories taking into consideration certain data from ionospheric or solar observatories for their reports of solar-flare effects, are marked by an asterisk.

The last three columns contain the scale value of the H-records in nT/mm, 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.

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 quantitative 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 for 1976:

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.

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

Note that for the years 1974 - 1976 the N and M values (as well as the classification of C and K days), given in the tables B1 and B2 of this Bulletin, are slightly different from those published in the Journal of Geophysical Research. This difference is because of the erroneous substitution of the constant of Abinger instead of that of Hartland - see Bulletin No. 33, p. 6, Table III - when computing the monthly values. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected in February 1977.

A g r a p h of aa-indices for the years 1868 - 1977 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

*) Another list of observatories is added to Part D of this Bulletin. It gives an explanation of the newly introduced three-letter symbols, used in Part D.

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 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 2/3, 5o is 5, 5+ is 5 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 γ for K = 9. At such a station the average range in γ's* 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 36γ). In other words ap is an equivalent amplitude in the unit 2γ.

The column headed Ap gives the daily average for the eight values ap per day. Therefore, Ap may be called the "equivalent daily amplitude Ap", expressed in the unit 2γ 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 γ*, 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 1500γ, the factor is 6, so that, for K = 3, the equivalent amplitude is 90γ, or, in other words the index ak for Sodankylä expresses equivalent amplitudes in the unit 6γ. Similary, Ak is the daily average of the ak.

* 1γ = 1 nT

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 of very quiet intervals, based on the successive occurrence of certain Kp-values.

The diagrams of Kp show the values of Kp from the table B 4 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 others 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 (MB , FQ, HO, PM, AL) or five supplementary observatories (TA, PA, AP, KY, HD). These 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 Bulletin 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 obser - vatories; 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, either letter B or letter C in their monthly report (letters A, B and C are approximatively equivalent to the preceding numbers 3, 2 and 1*; they differ from them because at the central bureau the observers give their qualifications independently). 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. Stations in the daylight hemisphere have been written behind the indicated time and 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 twi-

* The meaning of the letters A, B, C is explained in the heading of Table C3.

light-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) dit 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 coexisting 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, radioelectric 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 sscis to be taken algebrafcally 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 are indicated by their three-letter symbols, adopted by IAGA in 1977. An explanatory list of these symbols is given at the end of Part D.

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 diagrams) 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.

The tables and graphs of preliminary AE are included only if the number of observatories from which the data have been received is sufficient.

Note on the unit γ

In this Bulletin the unit γ (gamma) for the intensity of the geomagnetic field has still been used in some tables and diagrams, although the IAGA has now officially adopted the SI-unit tesla. One gamma corresponds with one nano-tesla (nT).

Revised aa-indices, 1969 - 1976

In the course of the year 1977, a clear deterioration of the standard of the K scalings used in the derivation of the aa index appeared. For instance the activity level for June 1977 was twice greater in the Northern hemisphere than in the Southern hemisphere. Furthermore Dr. Siebert drew Dr. Mayaud's attention to a possible shift of the aa-index with respect to the am-index during preceding years. After enquiring, it was decided to re-scale the years 1969 - 1977 at both the antipodal observatories. Accordingly, the aa-values as published in IAGA-Bulletin No. 39 (1969 - 1975) and in IAGA-Bulletin No. 32g (1976) had to be revised. Also, the aa-values for 1977 published in IAGA-Bulletin No. 32h differ from those distributed in the monthly bulletins of the International Service of Geomagnetic Indices or in the Journal of Geophysical Research. The revised aa-indices for the years 1969 - 1975 are published as a supplement to the IAGA-Bulletin No. 39 and sent to recipients of that Bulletin. Those for 1976 are included in IAGA-Bulletin No. 32h (Table 1a).

Steps have been taken in view of avoiding in the future any slow deterioration of the quality of the aa-indices. This will be done in a way similar to that described in the report on Km-observatory visits to be published in the next issue of the IAGA-Bulletin No. 32.

LIST OF OBSERVATORIES

Symbol	Observatory	Collaborator	Geographic		Geomagnetic		S_H γ/mm	K=9 lower limit	K rep.
			Lat.	Long.	Lat.	Long.			
AT	Alert		+82° 30'	297° 30'	+85.7°	168.7°			
BT	Heiss (B. Tikhaya)	V. Y. Danilov	+80 37	58 03	+71.3	156.0	5	2000	34I -
CC	Cape Chelyuskin	V. A. Smirnov	+77 43	104 17	+66.2	176.5	10	2500	55C -
TH	Thule	K. Lassen	+77 29	290 50	+89.0	358.0	8	1000	55C70
MX	Mould Bay		+76 12	240 36	+79.1	284.7	13		
RB	Resolute Bay		+74 41	265 10	+83.0	289.6		1500	52C55
B4	Bear Island	S. Berger	+74 31	19 01	+71.1	124.0	17	2000	57C59
DI	Dikson	A. M. Denisova	+73 33	80 34	+63.0	161.6	10	1500	34I -
MS	Matoshkin Shar	N. D. Medvedev	+73 16	56 24	+64.8	146.5		2500	55C56
TI	Tiksy	T. L. Kaplan	+71 35	129 00	+60.4	191.4	5	1000	55I -
PB	Point Barrow	J. B. Townshend	+71 18	203 15	+68.5	241.1	30	2500	57C -
TR	Tromsø	S. Berger	+69 40	18 57	+67.2	116.8	5	2000	47C -
GO	Godhavn	K. Lassen	+69 14	306 29	+79.9	32.5	10	1800	43I -
CB	Cambridge Bay		+69 06	255 00			10		
AI	Abisko	K. Borg	+68 21	18 49	+66.0	115.0	10	1500	
MM	Murmansk	G. A. Lokinov	+68 15	33 05	+63.5	126.2	7	2500	57C -
LZ	Lovozero		+67 59	35 01	+62.8	127.3			
KI	Kiruna	G. Gustafsson	+67 50	20 25	+65.3	115.8	11	1500	52I -
SO	Sodankylä *	E. Kataja	+67 22	26 38	+63.8	120.0	9	1500	14I -
WE	Welen	N. I. Zueva	+66 10	190 10	+61.8	237.1	8	1250	55C -
CO	College *	J. B. Townshend	+64 52	212 10	+64.6	256.5	8	2500	41C -
BL	Baker Lake		+64 20	263 58	+73.8	315.2	13	2500	52C55
RY	Leirvogur (Reykj.)	Th. Saemundsson	+64 11	338 18	+70.2	71.0	15	1500	64C -
YK	Yellowknife		+62 28	245 32			10		
SR	Srednikan	N. W. Savangeewa	+62 26	152 19	+53.2	210.6	4	550	40I -
DO	Dombås	E. Gjøen	+62 04	9 07	+62.3	100.1	9	750	25C -
YA	Yakutsk	A. A. Danilov	+62 01	129 40	+51.0	193.8	6	550	41I -
PT	Podk. Tungusta		+61 31	90 00			3	650	72C -
NU	Nurmijärvi *	M. Kivinen	+60 30	24 39	+57.8	112.6	8	750	58C -
LE	Lerwick *	B. R. Leaton	+60 08	358 49	+62.5	88.6	4	1000	32C -
MG	Magadan *		+60 07	151 01	+50.6	210.1	2	550	67C -
LN	Leningrad	G. D. Swetlajev	+59 57	30 42	+56.2	117.4	3	600	55C -
LO	Lovö	F. Eleman	+59 21	17 50	+58.1	105.8	4	600	30C -
CH	Churchill		+58 48	265 54	+68.8	322.5	13		
SI	Sitka *	W. J. Osbakken	+57 04	224 40	+60.0	275.4	7	1000	32C -
SV	Sverdlovsk	T. N. Panov	+56 44	61 04	+48.5	140.7	5	550	41I -
TM	Tomsk	O. K. Gordjejev	+56 28	84 56	+45.9	159.6	4	350	58C70
RS	Rude Skov	A. Lundbak	+55 51	12 27	+55.8	98.5	10	600	40C -
KN	Kazan	M. P. Tsjerzor	+55 50	48 51	+49.3	130.4	5	550	41I -
MO	Moskva	W. N. Bobrov	+55 28	37 19	+50.8	120.5	2	550	45I -
ES	Eskdalemuir *	B. R. Leaton	+55 19	356 48	+58.5	82.9	4	750	32C -
GW	Great Whale River		+55 16	282 13	+66.8	347.2	13		
NS	Novosibirsk		+55 02	82 54			2	500	72C -
ME	Meanook	Anne B. Cook	+54 37	246 34	+61.8	301.0	11	500	32C -
HL	Helu	W. Czyszek	+54 37	18 49	+53.4	103.7	4	550	56C -
MN	Minsk	Yu. N. Kuznetsov	+54 30	27 53	+51.5	112.0	3	550	62C -
ST	Stonyhurst	J. E. Worthy S. J.	+53 51	357 32	+56.9	82.7	6	600	60C66
WN	Wingst *	D. Voppel	+53 45	9 04	+54.5	94.1	5	500	40C -
PK	Petropavlovsk		+53 06	158 38	+44.4	218.2		350	
WI	Witteveen *	D. van Sabben	+52 49	6 40	+54.2	91.0	10	500	40C -
IR	Irkutsk	W. S. Pirozjkov	+52 10	104 27	+41.0	176.9	6	350	41I -
SW	Swider	Z. Kalinowska	+52 07	21 15	+50.6	104.6	4	500	42I -
NI	Niemegk *	K. Lengning	+52 04	12 40	+52.2	96.3	2	500	37C -
VL	Valentia *	S. Mc Williams	+51 56	349 45	+56.6	73.4	3	500	58C -
BE	Belsk	A. Gnoiński	+51 50	20 47	+50.4	104.1	1	500	60C -
GT	Göttingen	M. Siebert	+51 33	9 58	+52.3	93.7	3	500	
CM	Collmberg *	R. Schminder	+51 19	13 00	+51.5	96.5	1	500	54I67
HA	Hartland *		+51 00	355 31	+54.6	79.0	4	500	29C -
KV	Kiev	I. A. Mjelnitsjoek	+50 43	30 18	+47.3	112.2	2	350	58C -
MA	Manhay	L. Koenigsfeld	+50 18	5 41	+52.0	88.8	2	500	40C -
DB	Dourbes *	A. de Vuyst	+50 06	4 36	+51.7	88.7	4	500	55C -
RA	Racibórz	W. Kraiński	+50 05	18 11					
PR	Pruhonice *	V. Bucha	+49 59	14 32	+49.9	97.3	4	500	53C -

LIST OF OBSERVATORIES - continued

Symbol	Observatory	Collaborator	Geographic		Geomagnetic		S_H γ/mm	K=9 lower limit	K rep.
			Lat.	Long.	Lat.	Long.			
LV	Lvov	P. W. Soemaroek	+49° 54	23° 45	+48.0°	105.8°	3	550	55C -
KD	Karaganda	G. I. Gerasimov	+49 49	73 05	+40.0	148.4	2	350	66C -
WS	White Shell		+49 45	264 45			5		
BV[1]	Budkov	M. Konecný	+49 04	14 01	+49.1	96.2	1		69I -
VI	Victoria		+48 31	236 35	+54.3	292.7	2	500	57C -
NE	Newport	L. E. Kerry	+48 16	242 53	+55.1	300.0	4	600	68C -
FU	Fürstenfeldbruck *	K. Wienert	+48 10	11 17	+48.8	93.3	3	500	48C -
CF	Chambon-la-Forêt*	J. P. le Mouel	+48 01	2 16	+50.4	83.9	6	500	40I -
HB	Hurbanovo *	S. Pintér	+47 54	18 12	+47.1	99.8	4	350	51C -
UB	Ulan Bator	G. Chimiddorj	+47 52	107 03	+36.1	178.0	1	300	56C -
JO	St. Johns	G. A. Brown	+47 36	307 19	+58.7	21.4	5	750	69C -
NA	Nantes	O. Noblanc	+47 15	358 27	+50.5	80.1	6	500	50C59
SA	Yushno-Sakhalinsk	B. E. Mardjerfjeld	+46 57	142 43	+36.9	206.7	3	350	54C -
TY	Tihany	P. Toth	+46 54	17 53	+46.4	99.1	2		58C -
OD	Odessa	V. N. Shaevsky	+46 47	30 53	+43.7	111.1	3	350	55C -
KK	Novo Kazalinsk	A. K. Karpjenko	+45 46	62 07	+39.9	138.6	1	350	66C -
OT	Ottawa	J. Hruska	+45 24	284 27	+57.0	351.5	6	750	32C -
SU	Surlari		+44 41	26 15	+42.5	106.0	2	350	57C -
GC	Grocka *	M. Stojković	+44 38	20 46	+43.6	100.9	3	350	58I -
RT	Roburent *	M. Bossolasco	+44 18	7 53	+45.8	88.5			56C -
MT	Memambetsu *	K. Kawamura	+43 55	144 12	+34.0	208.4	2	350	57C -
AG	Agincourt	A. A. Onhauser	+43 47	280 44	+55.0	347.0	5	600	40C69
VK	Vladivostok	V. V. Osipov	+43 41	132 10	+32.8	198.1	3	300	55C -
AT	Alma Ata	V. V. Kazakov	+43 15	76 55	+33.3	150.5	3		64C -
PN	Panagjuriste	K. Kostov	+42 31	24 11			3	350	72C -
LG	Logroño *	T. Miguel Lafuente	+42 27	357 30	+46.1	77.0	4	350	57C -
AQ	Aquila *	F. Molina	+42 23	13 19	+42.9	92.9	5	350	58C -
TF	Tbilisi (Tiflis)	N. A. Katziachwili	+42 05	44 42	+36.7	122.1	1	350	40I -
TK	Tashkent	Zarotsjentseva	+41 25	69 12	+32.4	143.7	2	300	41I -
MD	Maddalena	M. Giorgi	+41 13	9 24	+42.7	88.5	3	350	58C63
IK	Istanbul-Kandilli	O. Uyar	+41 04	29 04	+38.5	107.5	3	300	52C -
EB	Ebro *	J. O. Cardus	+40 49	0 30	+43.9	79.7	3	350	42C -
CI	Coimbra	J. Vilela	+40 13	351 35	+44.8	71.3	4	350	51C -
BD	Boulder	L. R. Wilson	+40 08	254 46	+49.0	316.5	2	500	
TL	Toledo	R. Gómez-Menor	+39 53	355 57	+43.6	75.7	6	350	48C -
ON	Onagawa		+38 36	141 28	+28.4	206.7			
FR	Fredericksburg	C. Beers/A. Travis	+38 12	282 38	+49.6	349.8	2	500	32C -
PE	Pendeli *	A. Stavrou	+38 03	23 52	+36.2	102.0	4	300	59C -
GI	Gibilmanna *	M. Georgi	+37 59	14 01	+38.5	92.2	2	350	54C57
AK	Ashkhabad	W. G. Dubrovskij	+37 57	58 06	+30.5	133.4	2	300	58C -
SM	San Miguel	M. Trepa	+37 46	334 21	+45.6	50.9	4	350	51C -
AE	Almeria	L. Valbuena Vera	+36 51	357 32	+40.6	75.3	5	350	64C -
SF	San Fernando	M. Catalán	+36 28	353 48	+41.0	71.3	3	350	40C -
KA	Kakioka *	K. Kawamura	+36 14	140 11	+26.0	206.0	3	300	36C -
TP	Teheran (Persia) *	H. K. Afshar	+35 44	51 23	+29.3	126.4	2	300	57I -
KS	Ksara	J. Plassard	+33 50	35 54	+30.4	112.0	6	300	49C -
SS	Simosato	K. Sugiura	+33 34	135 56	+23.0	202.4	2	300	57C59
AV	Averroes (Maroc)	D. Ben Sari	+33 18	352 35	+38.1	69.1	3	350	70C -
DS	Dallas	R. A. Martin	+32 59	263 15	+43.0	327.7			69C -
AS	Aso *	Y. Tamura	+32 53	131 01	+22.1	198.1	3	300	57I57
TU	Tuscon	J. Minsch/L. Davis	+32 15	249 10	+40.4	312.2	3	350	38C -
KY	Kanoya *	K. Kawamura	+31 25	130 53	+20.5	198.1	2	300	58C -
QU	Quetta *	K. U. Siddiqi	+30 11	66 57	+21.6	139.7	2	300	55I -
ML	Misallat	M. Fahim	+29 45	30 54	+26.7	105.8	2	300	56C -
SZ	Santa Cruz (Ten.)	A. G. Cogollor	+28 29	343 43	+35.0	58.6	2	300	64C -
LP	Lunping *	Yinn-Nien Huang	+25 00	121 10	+13.8	189.5	2	300	68C -
TA	Tamanrasset	L. Le Donche	+22 48	5 31	+25.4	80.6	4	300	52I -
HO	Honolulu	J. Zebro	+21 19	202 00	+21.1	266.5	3	300	38I -
TE	Teoloyucan *	C. Cañón Amaro	+19 45	260 49	+29.6	327.1	3	300	51I -
AL	Alibag	B. N. Bhargava	+18 38	72 52	+ 9.5	143.6	4[2]	300	40C -
SJ	San Juan	M. Vazquez	+18 23	293 53	+29.9	3.2	2	300	38C -

[1]) Symbol BU is used as well

[2]) from November: 1,5

LIST OF OBSERVATORIES - continued

Symbol	Observatory		Collaborator	Geographic		Geomagnetic		S_H	K=9 lower limit	K rep.
				Lat	Long.	Lat.	Long.	γ/mm		
HD	Hyderabad		B.J. Srivastava	+17° 25'	78° 33'	+ 7.6°	148.9°	5	300	69I -
MB	M'Bour	*	O. Fambitakoye	+14 24	343 03	+21.3	55.0	6	350	52C -
MU	Muntinlupa	*	C.M. Santos	+14 22	121 01	+ 3.0	189.7	4	300	64C -
GU	Guam		W.S. Jacobs	+13 35	144 52	+ 4.0	212.9	3	300	58C -
AN	Annamalainagar		B.N. Bhargava	+11 24	79 41	+ 1.4	149.4			
AA	Addis Ababa		P. Gouin	+09 02	38 46	+ 5.3	109.2		300	
TV	Trivandrum		B.N. Bhargava	+08 29	76 57	- 1.2	146.4			
KR	Koror		K. Gravens	+07 20	134 30	+ 3.2	203.4		300	58
PA	Paramaribo		D. van Sabben	+05 49	304 47	+17.0	14.5	7		57C58
FQ	Fúquene		J. del C. Quintero	+05 28	286 16	+16.9	355.1	4	300	57C60
BA	Bangui		J. Vassal	+04 26	18 34	+ 4.6	88.5	3	350	52I -
MC	Moca		A.G. Cogollor	+03 21	8 40	+ 5.7	78.6	3	300	64C -
BN	Bunia		E. Nkanga	+01 32	30 11	- 0.4	99.3	2		
TT	Tatuoca		J.A. Ferreira	-01 12	311 29	+ 9.6	20.8	3		
LR	Lwiro	*	L. Ntumva	-02 15	28 48	- 4.0	98.2	5	350	58C60
HN	Hollandia		D. van Sabben	-02 34	140 31	-12.6	210.3	5	300	57C58
BI	Binza		E. Nkanga	-04 23	15 16	- 3.4	83.2	4		65I -
TG	Tangerang		R. Susanto	-06 10	106 38	-17.6	175.4	4	300	40I -
LU	Luanda		C.A.F. Monteiro	-08 55	13 10	- 7.2	80.5	3	350	61C -
PM	Port Moresbey	*	I.D. Ripper	-09 25	147 09	-18.6	218.0	3	300	58C -
KC	Karavia (Congo)		E. Nkanga	-11 39	27 28	-12.7	94.1	5		
HU	Huancayo	*	A.A. Giesecke M.	-12 02	284 41	- 0.6	353.8	3	600	37C -
DA	Darwin		L.S. Prior	-12 20	131 00	-22.0	201.3			
AP	Apia	*	A.L. Burrows	-13 48	188 14	-16.0	260.2	4	300	40C57
PP	Papeete-Pamatai		H.G. Barsczus	-17 34	210 25	-15.3	282.8	2	350	68C -
TN	Tananarive	*	Rakotondrainibe	-18 55	47 33	-23.1	112.1	1	300	50C -
MR	Mauritius		S. Chacowry	-20 06	57 33	-26.6	122.4	3	500	56C60
LQ	La Quiaca		M. De O'Neill	-22 06	294 24	-10.6	3.2	3	350	64C -
VA	Vassouras		R. de Godoy	-22 24	316 21	-11.9	23.9	4	600	52C64
LM	Lourenco Marques		S. Muiambo	-25 55	32 35	-27.7	95.8	3	300	67C68
BR	Brisbane		R.F. Thyer	-27 32	152 55	-35.8	226.9		500	57C64
WA	Watheroo		P.M. Mc Gregor	-30 19	115 53	-41.8	185.6	3	350	37C59
PI	Pilar		M. De O'Neill	-31 40	296 07	-20.2	4.0	3	300	40I -
GN	Gnangara	*	P.J. Gregson	-31 47	115 57	-43.2	185.8	3	350	59C -
HR	Hermanus	*	L. Loubser	-34 25	19 14	-33.7	81.7	2,3	300	40C -
AC	Las Acacias		O. Sidoti	-35 00	302 19	-24.0	10.3	2	350	64C -
TO	Toolangi	*	N.G. Chamberlain	-37 32	145 28	-46.7	220.8	4	500	41C -
AM	Amberley[1]	*	A.L. Burrows	-43 09	172 43	-47.7	252.5	5	500	37C -
TW	Trelew	*	O.P. Pelliciuoli	-43 15	294 41	-31.7	3.2	3	350	57C -
CZ	Crozet		R. Schlich	-46 26	51 52	-51.4	109.7	2	500	72C -
KG	Kerguelen		R. Schlich	-49 21	70 12	-56.5	127.8	6	750	57I -
SG	South Georgia			-54 17	323 31	-42.2	26.0	5	350	
MI	Macquarie Island		N.G. Chamberlain	-54 30	158 57	-60.7	243.0	25	1500	52C -
OR	Orcadas del Sur			-60 44	315 13	-50.1	18.2		400	
AR	Argentine Island		J.C. Farman	-65 15	295 44	-53.8	3.3	4	500	57C -
OA	Oasis			-66 06	92 09	-77.2	160.8	8	2000	57C58
WK	Wilkes	*		-66 15	110 35	-77.2	179.2	25	2500	58C66
MY	Mirny		U.N. Oviannikov	-66 33	93 01	-77.0	146.8	6	2000	57C -
DU	Dumont d'Urville		R. Schlich	-66 40	140 01	-75.6	230.9	8	1800	57C -
MW	Mawson	*	N.G. Chamberlain	-67 36	62 53	-73.2	103.1	10	1500	55C -
CT	Charcot			-69 23	139 01	-78.3	234.5		1500	57C58
PO	Pionerskaya			-69 44	95 30	-80.3	146.5	12	2000	57C58
NL	Novolazarevskaya		V.A. Kazarin	-70 46	11 50	-66.2	53.6	15	1500	60C -
BB	Base Baudouin			-70 26	24 19	-69.	63.			64C66
HT	Hallett			-72 19	170 13	-74.7	278.2	31	2500	57C62
HY	Halley Bay		J.C. Farman	-75 31	333 20	-65.8	24.2	7	1500	57C -
SB	Scott Base	*	A.L. Burrows	-77 51	166 47	-79.0	294.4	22	2000	57C -
LA	Little America		J.J. Gniewek	-78 11	197 50	-74.0	312.0		2500	57C58
VO	Vostok		I.N. Babakov	-78 27	106 52	-89-2	91.4	11	2000	58I -
BY	Byrd Island			-80 01	240 29	-70.6	336.3	24	2500	58C60
SP	South Pole			-90		-78.5	0.0	29	2000	60

[1] Closed since end of 1977. Replaced by Eyrewell.

	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	38	32	33	37	14	10	10	15 K	26	20	15	32	7	10	10	8QCC	28	19	12	36	20	14	12	23
2	9	7	11	7QC	39	28	38	29	12	11	8	15QC	10	8	9	10QCK	85	96	56	125	26	25	21	31
3	17	13	11	19 K	22	15	18	20	6	9	8	8QCC	21	16	23	15	23	27	34	16	11	8	11	9 C
4	19	18	13	25	7	8	10	6QC	6	5	3	9QCC	40	36	39	36	37	24	10	52	14	10	15	9 CC
5	27	18	20	26	14	22	24	13	6	9	6	9QCC	19	19	15	24	23	18	17	25	12	20	17	16 K
6	18	16	20	15	34	33	14	53	17	15	7	26 K	61	49	22	89	21	24	22	23	10	8	11	8QCK
7	12	12	13	11 CC	32	32	27	38	9	10	12	8 CK	54	59	67	46	15	8	11	12 CK	12	7	9	10 CC
8	12	18	13	18 K	36	18	17	38	22	17	8	31	41	56	43	54	6	5	4	6QCC	15	9	8	17 CC
9	9	14	10	13 CK	46	36	25	57	54	66	49	70	33	40	41	32	16	14	13	17 K	15	6	9	12 C
10	5	10	7	9QCC	23	27	21	30	38	32	34	36	25	25	21	30	18	21	18	21	17	15	24	8 K
11	22	26	6	42	27	25	26	26	39	34	22	51	27	23	16	34	52	32	26	58	7	4	5	7QCC
12	24	20	20	24	17	9	14	12 C	40	32	34	38	20	18	12	27	21	31	41	11	9	6	7	8QCC
13	17	12	15	14	20	21	17	25	28	20	21	28	10	8	10	9 C	10	11	8	13 KK	12	10	8	15 C
14	40	25	26	39	27	23	14	36	22	18	31	10	21	19	21	20	16	15	17	15	21	13	24	11
15	22	17	24	16	22	13	10	25	12	10	14	7 CC	16	13	20	9	24	25	26	24	9	4	5	8QCC
16	12	12	8	17 KC	12	11	17	7QC	13	10	11	12 CC	36	25	13	48	42	36	41	36	22	13	8	28
17	10	15	11	14 K	19	25	10	34	23	17	15	26	18	14	22	11	29	41	44	25	22	13	18	18
18	20	22	31	11	28	27	34	23	21	16	23	15	17	14	12	19	23	25	31	17	19	21	16	25
19	21	15	14	22	13	19	13	20Q	10	8	7	12 C	60	83	90	53	14	6	9	11 CK	16	19	17	18
20	23	19	25	18	10	13	10	13QC	25	18	21	23	42	45	41	47	20	22	16	26	21	18	27	13
21	8	11	14	5QKK	16	18	14	20 K	23	18	8	33	22	16	21	18	11	5	8	9QC	13	10	12	11 CC
22	16	15	8	24 K	17	15	7	26	14	13	20	8	11	11	12	11 CC	11	18	22	8 K	25	17	10	33
23	13	13	9	18 K	32	31	19	45	23	23	14	32	12	8	7	13 CC	18	9	13	14 C	22	13	21	14
24	16	16	16	17	28	23	13	39	22	17	20	20	23	21	13	31	17	13	15	15	14	9	13	10 CC
25	17	19	11	26	26	17	14	30	32	18	14	36	24	31	46	10	12	9	10	11 CC	12	7	8	12QCC
26	9	5	8	6QCK	16	10	13	13 C	29	26	34	20	9	6	10	6QCC	7	3	3	7QCC	14	8	11	11 CC
27	7	11	8	11QCC	6	5	4	8QCC	20	16	14	22	6	7	7	7QCC	7	5	7	6QCC	16	10	15	11 C
28	24	22	7	40	15	12	15	13 C	25	23	21	27	9	6	5	11QC	13	11	11	13 CC	26	19	22	23
29	32	27	41	19					22	22	25	20	31	47	44	35	7	4	4	7QCC	17	9	14	13 C
30	47	52	38	62					9	11	8	13 CK	18	13	13	19	10	6	9	8 CC	20	12	11	21
31	31	21	36	16					6	9	9	7QCC					16	9	10	15 CC				
	19.4				22.2				21.1				24.8				20.9				16.3			
		17.9				19.5				18.5				24.9				19.1				11.9		
			18.7				21.0				19.9				24.9				20.1				14.2	

	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	28	22	29	21	14	9	7	16 KK	9	4	8	4QCC	6	5	4	7QCC	7	7	8	6 CC	15	13	4	24
2	25	16	19	23	9	8	10	9QCK	15	9	5	19 KK	9	12	15	7 CC	12	6	8	10 CC	90	74	62	103
3	19	16	13	23	14	8	6	17 CK	14	10	19	5 K	13	20	12	21	6	9	8	7 CC	19	13	13	19
4	17	13	19	11	20	14	16	19	10	12	14	8 CC	10	14	16	9 C	13	14	5	23 K	23	26	7	43
5	11	11	5	17 KK	62	67	70	60	7	4	5	7QCC	13	14	15	13 C	19	11	17	14	27	26	38	17
6	45	26	12	59	36	36	36	36	7	4	4	6QCC	15	15	16	15 K	11	16	14	13 KC	9	11	15	5 CK
7	25	23	33	16	30	37	30	37	10	6	5	12 CC	11	8	7	12QCC	8	10	8	10 CC	6	7	5	8QCC
8	28	22	26	25	26	18	25	19	14	10	13	12 CK	4	11	6	9 CC	7	8	7	8QCC	3	5	6	2QCC
9	29	23	22	30	40	32	30	43	19	21	17	23	6	4	4	5QCC	5	8	6	8QCC	4	10	10	4 CC
10	28	34	31	31	24	24	25	23	24	25	29	21	9	6	6	9QCC	13	23	5	32	8	11	6	13 K
11	19	16	23	13	48	30	35	43	29	28	28	29	29	16	14	32	12	12	12	12 C	55	63	68	50
12	10	4	7	7QCC	19	23	25	17	15	9	15	10 K	40	57	67	31	29	39	32	36	27	31	34	24
13	18	20	15	23	25	24	20	29	40	46	33	53	24	27	24	28	52	39	43	48	34	27	27	34
14	28	40	55	13	21	27	14	34	15	11	18	9 K	28	19	13	33	71	59	48	82	12	11	13	10 C
15	25	15	17	24	21	23	29	15	14	15	22	8 K	36	37	50	23	42	39	51	29	9	10	12	8 CC
16	38	41	40	38	13	18	9	23	17	11	8	20	15	12	12	16	27	30	27	31	16	16	6	26
17	28	25	24	30	40	56	41	55	14	17	20	11	25	17	16	27	17	13	18	13	17	18	27	9
18	16	17	14	20	19	25	22	22	11	8	10	10 CK	34	27	22	39	11	14	12	14 CK	4	7	7	4QCC
19	43	36	30	50	36	38	39	35	60	62	14	108	38	45	62	22	15	11	12	14 CC	4	7	6	5QCC
20	45	49	53	41	16	12	18	10	50	56	44	62	14	13	9	19	7	7	8	6 CC	7	7	7	8QCC
21	19	13	18	15	8	9	10	8QCC	69	67	77	60	12	7	10	9 C	8	6	9	5 CC	11	12	7	16 CC
22	19	24	28	15	12	6	7	11QCC	68	91	70	89	34	36	39	31	6	6	10	3QCC	10	10	14	7 CC
23	12	6	12	6 CC	15	12	8	19 K	28	48	16	60	14	7	13	9 C	4	4	2	5QCC	7	6	4	10 CC
24	18	10	11	17 C	20	19	18	22	22	17	21	19	11	13	13	12 CC	4	4	5	3QCC	6	11	11	6 CC
25	12	7	10	10QCC	39	49	26	61	20	16	14	23	8	8	5	11QCC	27	27	4	50	7	9	4	12 CK
26	7	3	5	5QCC	28	23	27	24	27	35	19	44	9	11	8	12 K	30	24	33	22	21	17	19	20
27	7	2	3	6QCC	29	32	35	26	30	20	43	8	73	86	66	92	22	15	28	10	8	14	14	9 CC
28	7	3	4	7QC	13	12	13	12 C	15	17	13	19 K	64	49	74	40	7	12	13	8 CC	20	22	12	31
29	69	103	101	71	11	9	10	10 CC	5	5	5	5QCK	17	19	16	20	15	12	10	18	15	16	20	12
30	25	23	37	12	10	9	6	13QCC	6	8	7	8QCC	17	20	11	26	23	23	30	17	12	11	11	12 CC
31	18	14	19	13 C	8	5	6	6QCC					9	9	11	8 CK					10	13	10	14 C
	23.8				23.4				22.7				20.9				17.7				16.7			
		21.9				23.0				23.1				20.7				16.9				17.2		
			22.9				23.2				23.0				20.9				17.3				17.0	

ANNUAL MEAN N 20.83 S 19.54 M 20.27

1976

TABLE 1a

REVISED INDICES aa, 1976

Part B.

	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	7	12	9	10QCC	41	29	27	43	36	28	31	34	102	141	192	51	20	19	12	27	13	14	10	18
2	7	9	5	11QCC	40	32	24	48	58	41	27	72	29	20	18	32	81	77	42	116	16	10	14	13 CK
3	35	36	19	52	27	28	30	25	46	52	37	62	53	53	35	70	121	120	192	50	18	13	9	23
4	18	22	17	24	28	20	17	32	21	18	24	15	40	47	50	38	34	39	31	43	36	29	43	22
5	19	18	22	16	16	17	9	25	26	30	20	37	38	42	41	39	22	30	32	20	40	32	34	36
6	26	19	11	34	18	14	19	13	54	39	25	67	36	64	56	44	16	22	19	20	18	17	16	20
7	21	19	21	20	47	36	30	53	47	44	41	50	39	40	37	42	23	17	20	21	29	22	24	26
8	13	9	8	15 CK	55	50	42	63	57	63	70	50	22	21	23	21	20	12	21	11	15	16	20	12
9	6	5	7	5QCK	41	41	41	41	54	56	45	65	29	24	23	31	10	6	11	6QCC	7	6	9	4QCC
10	68	75	23	119	43	35	34	44	52	45	41	57	16	20	23	12	13	13	8	19 KK	11	11	9	13 C
11	70	46	66	51	28	23	20	31	36	42	31	48	28	24	22	31	22	18	17	24	34	50	48	37
12	21	21	20	23	31	23	26	29	35	49	43	41	17	14	21	11	15	13	17	11	15	16	11	20
13	14	16	19	11	45	34	39	40	19	22	18	24	19	17	14	23	17	10	11	17 C	7	6	7	7 CK
14	16	21	19	19 K	26	31	29	28	20	24	31	14	26	25	18	34	6	4	4	5QCC	7	5	7	5QCC
15	15	10	4	21 K	19	15	10	25Q	25	32	20	38	6	4	5	5QC	11	10	4	17 KC	8	5	2	11 CC
16	24	19	12	31	12	11	10	14QC	36	32	26	43	11	11	14	9 CC	13	7	13	7QCC	13	6	10	9 C
17	24	24	20	29	28	26	12	43	31	34	39	26	7	12	13	6 CC	6	6	6	6QCC	27	26	25	29
18	20	17	22	15	45	37	50	32	21	20	21	20	3	3	4	2QCC	7	3	3	7QCC	36	36	46	27
19	14	14	12	17	47	38	36	49	18	23	22	20	8	6	7	8QCC	25	11	4	32	8	6	7	8QCK
20	22	23	12	33	31	33	29	35	15	17	19	13	4	4	4	4QCC	31	30	32	29	11	9	11	10 CC
21	34	42	34	43	28	23	26	26	8	12	7	14QCK	9	12	7	13QC	20	21	20	21	6	4	3	7QCC
22	49	39	29	59	24	18	24	19	4	5	5	4QCC	28	42	44	26	26	23	20	29	7	4	4	8QCC
23	36	37	32	41	7	9	9	7QCC	11	10	4	17QKC	13	9	13	9 C	25	26	20	31	9	5	7	6 CC
24	33	34	36	31	5	6	4	7QCC	7	5	8	4QCC	24	34	27	32	13	9	13	9 C	40	23	11	53
25	16	18	17	18	7	7	8	6QCK	8	7	4	11QC	14	14	12	17	23	18	18	23	36	26	30	33
26	9	14	14	9QCK	13	17	14	16	118	167	135	150	10	12	11	11 C	14	6	9	11 C	16	12	8	21
27	8	16	13	11 CC	43	44	23	65	48	56	42	62	21	24	22	23	10	10	12	8 C	18	12	17	14
28	8	7	8	8QCC	32	37	24	46	21	29	28	22	19	13	17	15	26	33	30	29	14	7	8	13 CC
29	9	11	13	8 CC	55	34	50	39	22	24	39	8	32	33	17	48	40	41	31	50	13	5	9	10 C
30	18	17	5	30					20	27	9	39	20	16	23	13	31	32	36	27	34	44	51	27
31	45	49	28	67					18	23	23	18					19	18	17	21				
	23.3				30.5				32.1				24.1				24.5				18.8			
		23.1				26.4				34.7				26.7				22.7				15.9		
			23.3				28.5				33.4				25.4				23.7				17.5	

	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	31	38	46	23	17	16	12	21	24	18	19	24	26	30	33	23	19	14	19	15	13	14	7	21 K
2	22	21	21	23	19	12	21	11	33	48	53	29	31	33	43	22	16	12	11	17	4	7	5	7QCC
3	28	30	30	28	23	19	16	27	22	25	24	23	16	16	18	14	18	9	12	16 K	7	6	5	8QCK
4	29	36	32	34	14	11	11	14 C	26	24	23	28	12	11	10	13 C	9	10	11	9 CK	28	38	31	36
5	15	16	12	20	14	12	9	17 KK	21	21	27	16	20	17	27	10	7	11	10	9QCC	10	12	11	11 C
6	14	11	14	11 C	13	7	11	9 CC	17	14	17	14	20	20	25	15	4	6	6	4QCC	7	6	4	9QCC
7	23	12	20	16	12	14	10	16 KC	18	19	18	20	14	7	7	14 CK	6	9	10	5 CC	19	20	14	25
8	27	23	20	30	11	7	9	9QC	18	13	17	14	13	13	8	20 K	11	12	7	18 KK	26	34	38	23
9	26	14	24	17	24	29	31	22	11	11	15	8QCC	13	12	11	15 C	15	15	18	13	26	30	26	31
10	13	11	15	10 CC	19	20	22	17	11	11	8	14QCC	15	12	10	17	41	33	21	53	24	20	15	30
11	11	6	8	10QCC	9	9	12	7 CC	11	10	10	11QCC	19	15	14	21	47	38	26	58	26	22	31	18
12	12	11	10	13 CC	10	6	5	11QCC	22	17	19	21	32	16	13	36	48	30	38	42	29	26	20	37
13	10	5	8	7QCC	10	5	8	8QCC	13	8	12	10QC	13	14	17	11	48	46	50	45	13	14	14	13 K
14	13	9	13	10 CC	10	12	12	10 KC	22	18	20	21	13	12	8	18 K	30	24	19	37	6	4	5	4QCC
15	36	23	13	46	6	6	4	8QCK	20	20	25	15	50	42	36	57	20	19	15	24	3	4	4	3QCC
16	29	32	32	29	19	17	12	24 K	13	9	11	11 CC	42	47	62	27	9	14	9	14 C	12	20	12	20 K
17	11	8	9	10 C	14	6	9	12 CK	21	15	15	22	50	45	48	48	13	14	16	11 CC	19	24	13	30
18	13	8	11	10 CC	12	6	9	10QCC	35	52	62	25	36	24	31	30	10	4	5	8 CC	42	34	55	22
19	14	8	13	9 CC	11	13	13	11 CC	37	36	25	48	20	15	8	27	18	17	18	18	11	12	13	10 C
20	10	4	8	7QCC	13	5	9	10 CC	71	61	65	67	17	14	16	15	15	20	20	15	9	10	9	10 CC
21	9	6	7	7QCC	20	19	16	24	43	35	29	50	14	15	16	14	7	8	8	8 CC	8	14	10	13 CC
22	11	10	14	8 CC	13	7	11	10 C	36	33	33	37	11	19	18	12Q	7	11	11	8 CC	15	22	16	22
23	15	8	9	14 CC	56	66	30	92	22	26	26	22	10	14	14	11 CC	8	7	8	8QCC	8	11	13	6 C
24	12	7	5	15 C	36	46	50	33	15	11	16	11 K	14	12	9	18 KK	5	6	7	4QCC	12	14	14	12 CC
25	22	17	22	18	45	39	45	40	46	41	34	53	12	8	13	7QCK	18	19	18	20	16	21	15	22
26	11	6	8	10QCK	32	30	34	28	29	22	28	24	9	4	6	7QCC	19	24	17	26	12	12	14	10 C
27	19	21	16	24	30	24	30	25	18	26	25	20	18	12	8	22 K	14	13	17	11	16	13	9	21 K
28	38	36	36	38	23	23	17	29	16	8	12	13QC	8	12	7	14QCK	4	6	4	7QCC	11	13	9	15 K
29	33	34	36	31	12	14	14	12 C	20	16	14	23	5	4	5	4QCC	13	10	7	17 CK	52	85	102	34
30	42	28	39	32	12	8	8	13 CC	23	13	10	27	33	29	13	50	20	20	19	22	21	36	17	39
31	19	16	20	16	15	12	7	21					59	47	50	56					26	19	22	24
	19.9				18.5				24.4				21.5				17.4				17.2			
		16.6				16.7				22.8				19.1				16.1				19.9		
			18.4				17.7				23.7				20.4				16.9				18.6	

ANNUAL MEAN N 22.69 S 21.72 M 22.28

TABLE 2a MONTHLY AND YEARLY aa 1868 - 1977

	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

* The values given in this table for the years 1969 through 1976 1976 are revised indices. See page XII for explanation.

TWELVE MONTH'S RUNNING MEAN VALUES OF aa - INDICES, 1868 - 1977

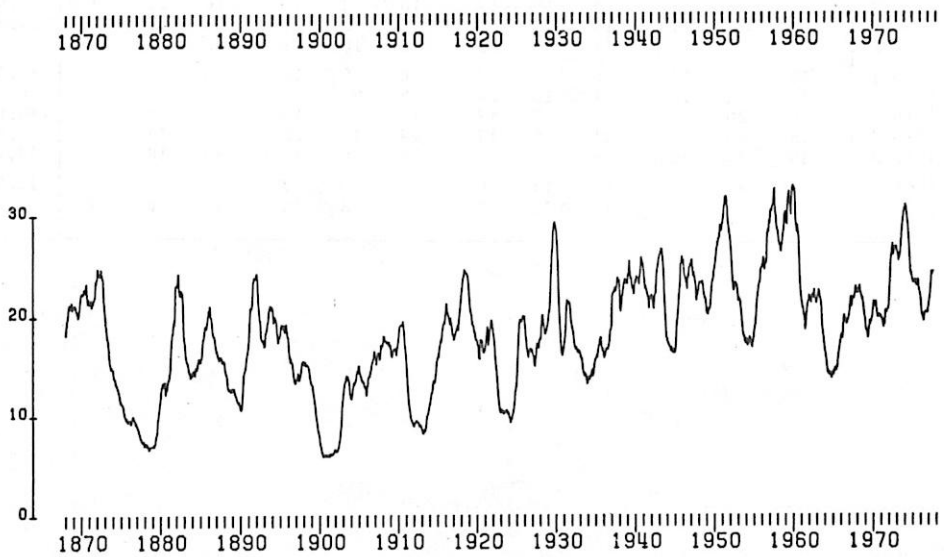


TABLE 2b MONTHLY Ap, 1932 - 1977

	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

TABLE 3 INTERNATIONAL QUIET AND DISTURBED DAYS 1977

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

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 1977	ap				Sum	Ap	Cp
1	3- 3o 4- 4- 3+ 2o 3- 4o	25o	12 15 22 22	18 7 12 27				135	17	0.9
2	3o 1o 1o 0+ 0+ 1- 1o 1-	8o	15 4 4 2	2 3 4 3				37	5	0.2
3	2o 2o 1+ 1o 0+ 2+ 2+ 2+	14-	7 7 5 4	2 9 9 9				52	6	0.3
4	1+ 1+ 2o 3- 3- 3o 3- 3-	18+	5 5 7 12	12 15 12 12				80	10	0.6
5	4- 4o 2o 1+ 1+ 3o 3- 4o	22o	22 27 7 5	5 15 12 27				120	15	0.8
6	4o 3- 2- 1+ 2o 2+ 2+ 2o	18+	27 12 6 5	7 9 9 7				82	10	0.6
7	3o 2o 3- 1o 1+ 1o 2- 1-	13+	15 7 12 4	5 4 6 3				56	7	0.4
8	1+ 2- 1+ 2o 2o 3- 1+ 1o	13+	5 6 5 7	7 12 5 4				51	6	0.3
9	0+ 3- 1o 1+ 1+ 2o 2+ 1+	12+	2 12 4 5	5 7 9 5				49	6	0.3
10	0+ 0+ 0+ 1o 1+ 1+ 1o 0+	6o	2 2 2 4	5 5 4 2				26	3	0.1
11	0+ 0+ 1+ 2- 3- 5o 3+ 3+	18o	2 2 5 6	12 48 18 18				111	14	0.8
12	3+ 3+ 3o 2+ 3- 3- 2+ 2o	22-	18 18 15 9	12 12 9 7				100	12	0.7
13	3- 3o 1o 1- 1- 2- 1+ 2o	13o	12 15 4 3	3 6 5 7				55	7	0.3
14	3o 3+ 3o 3- 2+ 4o 3+ 4+	26o	15 18 15 12	9 27 18 32				146	18	1.0
15	4- 4- 4- 2+ 2+ 2o 2o 2-	21+	22 22 22 9	9 7 7 6				104	13	0.7
16	1o 2+ 2+ 1- 2- 3- 2- 1+	14-	4 9 9 3	6 12 6 5				54	7	0.3
17	2o 2- 2- 1+ 2o 3- 1- 1o	13o	7 6 6 5	7 12 3 4				50	6	0.3
18	3o 3+ 4- 3- 2o 1o 1- 1-	17o	15 18 22 12	7 4 3 3				84	10	0.6
19	3o 2- 1o 1+ 0+ 2- 3- 3+	15o	15 6 4 5	2 6 12 18				68	8	0.5
20	3+ 4o 2+ 2+ 2- 1+ 2+ 3o	20+	18 27 9 9	6 5 9 15				98	12	0.7
21	3- 1- 2- 2+ 0+ 2- 0+ 0+	10o	12 3 6 9	2 6 2 2				42	5	0.2
22	0+ 2- 1o 1+ 3o 1+ 2o 3-	13+	2 6 4 5	15 5 7 12				56	7	0.4
23	2- 1- 0+ 1o 1o 2- 2+ 3-	11+	6 3 2 4	4 6 9 12				46	6	0.3
24	3o 2+ 2+ 1+ 2o 2o 2o 1+	16+	15 9 9 5	7 7 7 5				64	8	0.4
25	0o 1- 3- 2- 3+ 2+ 3o 3-	16+	0 3 12 6	18 9 15 12				75	9	0.5
26	2- 1o 1- 1o 0+ 0+ 1+ 1o	7+	6 4 3 4	2 2 5 4				30	4	0.1
27	1- 0+ 1- 2- 1- 1+ 1+ 1o	8-	3 2 3 6	3 5 5 4				31	4	0.1
28	1o 0+ 1- 1o 1o 2- 4o 5+	15o	4 2 3 4	4 6 27 56				106	13	0.8
29	5- 3+ 3+ 3- 2o 2+ 2- 3-	23-	39 18 18 12	7 9 6 12				121	15	0.9
30	5- 4o 4- 3+ 4+ 4+ 4+ 5-	33+	39 27 22 18	32 32 32 39				241	30	1.3
31	5+ 3+ 4- 3- 4+ 0+ 1o 1o	22-	56 18 22 12	32 2 4 4				150	19	1.0

	Kp	Sum	Feb 1977	ap				Sum	Ap	Cp
1	2- 3+ 1+ 0+ 1- 1- 1+ 3o	12+	6 18 5 2	3 3 5 15				57	7	0.4
2	4- 4+ 4- 4o 4- 1o 3- 4o	27o	22 32 22 27	22 4 12 27				168	21	1.1
3	3+ 3+ 1+ 1o 1- 2+ 2- 4-	17+	18 18 5 4	3 9 6 22				85	11	0.6
4	2+ 1+ 1+ 1o 1+ 1- 0+ 0o	8+	9 5 5 4	5 3 2 0				33	4	0.1
5	0o 1o 4o 3o 2o 3- 1o 2-	15+	0 4 27 15	7 12 4 6				75	9	0.5
6	2+ 1+ 1+ 3- 3o 3o 4- 4+	22-	9 5 5 12	15 15 22 32				115	14	0.8
7	4+ 3+ 2+ 3- 3o 3o 4- 4-	26o	32 18 9 12	15 15 22 22				145	18	1.0
8	3+ 3o 3- 2+ 3- 4o 4o 4o	26o	18 15 12 9	12 27 27 27				147	18	1.0
9	4o 3+ 3- 4o 4+ 4+ 4o 4o	31-	27 18 12 27	32 32 27 27				202	25	1.2
10	3+ 2o 2+ 3- 3o 3- 1- 3+	20o	18 7 9 12	15 12 3 18				94	12	0.7
11	3- 3+ 3o 3o 3+ 3- 1+ 3-	22o	12 18 15 15	18 12 5 12				107	13	0.8
12	3- 2o 1+ 2+ 1+ 1+ 2+ 2-	15o	12 7 5 9	5 5 9 6				58	7	0.4
13	3o 3o 2+ 2- 1o 3- 4- 2+	20-	15 15 9 6	4 12 22 9				92	12	0.7
14	2+ 3- 2- 1+ 3- 2+ 4- 3-	19+	9 12 6 5	12 9 22 12				87	11	0.6
15	2+ 3- 2- 1o 1o 2o 2+ 3o	16o	9 12 6 4	4 7 9 15				66	8	0.4
16	3o 3- 2+ 1- 0+ 1- 1o 1-	11+	15 12 9 3	2 3 4 3				51	6	0.3
17	2+ 1+ 1+ 1+ 2o 3- 3o 3o	17o	9 5 5 5	7 12 15 15				73	9	0.5
18	4o 5+ 3- 1+ 2+ 2o 3- 2+	23-	27 56 12 5	9 7 12 9				137	17	0.9
19	3- 2- 1+ 1o 2o 2o 2o 1o	14-	12 6 5 4	7 7 7 4				52	6	0.3
20	1+ 1o 2+ 1- 1o 1- 1+ 2+	11-	5 4 9 3	4 3 5 9				42	5	0.2
21	2- 1o 2- 2- 3- 3- 2- 1-	14-	6 4 6 6	12 12 6 3				55	7	0.3
22	1o 2- 0+ 1- 1+ 2o 3+ 3o	13+	4 6 2 3	5 7 18 15				60	8	0.4
23	3o 3o 3- 3o 3+ 4+ 3o 4-	26o	15 15 12 15	18 32 15 22				144	18	1.0
24	3- 1o 1+ 3- 3o 2+ 5o 2o	20o	12 4 5 12	15 9 48 7				112	14	0.8
25	3+ 3- 2o 2- 1+ 2o 3o 3+	19+	18 12 7 6	5 7 15 18				88	11	0.6
26	3o 3o 1- 1+ 1+ 2- 2o 1o	14o	15 15 3 5	5 6 7 4				60	8	0.4
27	0+ 0o 0+ 1- 1o 1- 1- 2-	5+	2 0 2 3	4 3 3 6				23	3	0.1
28	3+ 2o 2- 2o 1- 0+ 2o 2+	14+	18 7 6 7	3 2 7 9				59	7	0.4

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

	Kp	Sum	Mar 1977	ap				Sum	Ap	Cp
1	3o 1- 1o 2- 2- 2+ 3+ 4o	18-	15 3 4 6	6	9	18	27	88	11	0.6
2	0o 1- 1- 2- 1+ 1o 2+ 2o	10-	0 3 3 6	5	4	9	7	37	5	0.2
3	2o 1o 1o 1o 1o 1- 0+ 1-	8-	7 4 4 4	4	3	2	3	31	4	0.1
4	0o 0+ 1o 0+ 1+ 1- 1- 1o	5+	0 2 4 2	5	3	3	4	23	3	0.1
5	1- 2- 1o 1- 1+ 0+ 1o 0+	7o	3 6 4 3	5	2	4	2	29	4	0.1
6	0+ 1- 1o 1o 3- 2+ 2+ 2o	12+	2 3 4 4	12	9	9	7	50	6	0.3
7	2+ 2- 2o 1o 1o 1+ 1- 1o	11o	9 6 7 4	4	5	3	4	42	5	0.2
8	2- 1+ 1o 1o 2- 3o 3o 5-	17+	6 5 4 4	6	15	15	39	94	12	0.7
9	4- 4o 5- 4+ 5+ 5o 4o 5+	36+	22 27 39 32	56	48	27	56	307	38	1.4
10	4o 4- 4- 2+ 3o 3o 3+ 4-	27-	27 22 22 9	15	15	18	22	150	19	1.0
11	3o 3- 2+ 2+ 3- 4- 5- 4-	25o	15 12 9 9	12	22	39	22	140	18	1.0
12	4+ 3+ 4- 4- 2- 4- 4+ 3+	28o	32 18 22 22	6	22	32	18	172	22	1.1
13	4+ 3- 2o 2- 2- 2+ 2+ 4-	21-	32 12 7 6	6	9	9	22	103	13	0.7
14	4+ 4+ 3- 1o 1o 1+ 1o 1+	17o	32 32 12 4	4	5	4	5	98	12	0.7
15	2- 1- 2+ 2o 2- 1+ 0+ 0o	10o	6 3 9 7	6	5	2	0	38	5	0.2
16	2- 2+ 2- 1o 1- 1o 2+ 2+	13o	6 9 6 4	3	4	9	9	50	6	0.3
17	3- 2+ 1o 2o 2o 3o 3o 2-	18-	12 9 4 7	7	15	15	6	75	9	0.5
18	4- 4- 2o 2o 3- 2- 2- 1+	19-	22 22 7 7	12	6	6	5	87	11	0.6
19	0+ 2- 1+ 0+ 0+ 1+ 2+ 2+	10o	2 6 5 2	2	5	9	9	40	5	0.2
20	4o 2+ 1+ 2o 1+ 2- 3o 4o	20-	27 9 5 7	5	6	15	27	101	13	0.7
21	1o 2o 1+ 1o 1+ 3- 4o 3+	17-	4 7 5 4	5	12	27	18	82	10	0.6
22	3- 2+ 3- 2o 1o 2o 1- 0o	13+	12 9 12 7	4	7	3	0	54	7	0.3
23	2- 1+ 3o 2o 3o 3o 3+ 4o	21+	6 5 15 7	15	15	18	27	108	14	0.8
24	4+ 3o 2- 2- 2+ 2+ 2o 3-	20o	32 15 6 6	9	9	7	12	96	12	0.7
25	3o 2- 1- 2+ 2- 2- 4o 4o	19o	15 6 3 9	6	6	27	27	99	12	0.7
26	4o 5o 3- 2o 2o 3+ 2- 0+	21o	27 48 12 7	7	18	6	2	127	16	0.9
27	1+ 1o 2+ 2- 2- 1+ 3- 3+	15+	5 4 9 6	6	5	12	18	65	8	0.4
28	3o 4- 2+ 2- 2o 3+ 3o 4o	23o	15 22 9 6	7	18	15	27	119	15	0.8
29	5- 4o 1+ 2- 3- 2+ 2+ 1o	20o	39 27 5 6	12	9	9	4	111	14	0.8
30	0+ 1- 2o 2o 1o 2+ 1+ 2-	11+	2 3 7 7	4	9	5	6	43	5	0.2
31	2o 0+ 1- 1o 0+ 0+ 1o 1+	7o	7 2 3 4	2	2	4	5	29	4	0.1

	Kp	Sum	Apr 1977	ap				Sum	Ap	Cp
1	0+ 1+ 2+ 1- 1- 1o 1o 0+	8-	2 5 9 3	3	4	4	2	32	4	0.1
2	1- 1+ 1+ 2o 0+ 1o 0+ 3-	10-	3 5 5 7	2	4	2	12	40	5	0.2
3	4o 3- 3- 2+ 1+ 1+ 2o 3o	19+	27 12 12 9	5	5	7	15	92	12	0.7
4	5+ 4+ 4+ 2+ 3+ 3- 3+ 3+	29o	56 32 32 9	18	12	18	18	195	24	1.2
5	4- 2+ 3- 2- 2- 2o 3o 3+	20+	22 9 12 6	6	7	15	18	95	12	0.7
6	4o 4o 3o 2- 4- 6- 6+ 7o	35+	27 27 15 6	22	67	94	132	390	49	1.6
7	7- 6o 5+ 4o 4+ 3- 5+ 3-	37o	111 80 56 27	32	12	56	12	386	48	1.6
8	4+ 3+ 4+ 4- 3+ 5- 4- 4+	32-	32 18 32 22	18	39	22	32	215	27	1.2
9	4+ 4o 4o 3o 4- 4- 3- 3o	28+	32 27 27 15	22	22	12	15	172	22	1.1
10	3o 4- 3- 1+ 2+ 4- 3o 2o	22-	15 22 12 5	9	22	15	7	107	13	0.8
11	3+ 3+ 2o 1+ 3o 2+ 3+ 4-	22+	18 18 7 5	15	9	18	22	112	14	0.8
12	3o 1+ 0o 1+ 2o 2- 2o 4-	15o	15 5 0 5	7	6	7	22	67	8	0.5
13	2+ 0+ 2- 1o 1+ 1+ 1o 2o	11o	9 2 6 4	5	5	4	7	42	5	0.2
14	3+ 1+ 4- 2o 1- 2- 2+ 4-	19-	18 5 22 7	3	6	9	22	92	12	0.7
15	3+ 4- 3o 2- 2o 1o 1- 2-	17o	18 22 15 6	7	4	3	6	81	10	0.6
16	1+ 3+ 2o 1+ 3+ 4o 4+ 4-	23+	5 18 7 5	18	27	32	22	134	17	0.9
17	3+ 3- 2+ 2+ 1+ 1+ 2o 2o	17+	18 12 9 9	5	5	7	7	72	9	0.5
18	2o 2- 1- 2+ 3- 3o 2o 2-	16o	7 6 3 9	12	15	7	6	65	8	0.4
19	3+ 6- 6+ 6- 5o 4+ 4- 5-	39-	18 67 94 67	48	32	22	39	387	48	1.6
20	4+ 4- 4+ 5- 3o 5o 3+ 3o	31+	32 22 32 39	15	48	18	15	221	28	1.2
21	3+ 3o 4- 2o 1+ 2- 3- 2+	20o	18 15 22 7	5	6	12	9	94	12	0.7
22	2- 2- 3- 1o 1- 2- 2- 0+	11+	6 6 12 4	3	6	6	2	45	6	0.3
23	1- 2o 2- 1+ 1+ 1o 2- 2-	11+	3 7 6 5	5	4	6	6	42	5	0.2
24	2o 1+ 1+ 3- 2+ 4o 3- 3-	19o	7 5 5 12	9	27	12	12	89	11	0.6
25	6- 5o 4- 3o 1+ 2o 1o 1+	23o	67 48 22 15	5	7	4	5	173	22	1.1
26	1+ 1+ 1+ 1o 1- 1+ 1- 1-	8+	5 5 5 4	3	5	3	3	33	4	0.1
27	1+ 1+ 1- 1+ 1o 1- 0+ 1o	8-	5 5 3 5	4	3	2	4	31	4	0.1
28	1o 1o 0+ 1- 0+ 1+ 2o 2+	9o	4 4 2 3	2	5	7	9	36	4	0.2
29	3+ 4- 4o 3+ 4- 2- 3- 4-	26o	18 22 27 18	22	6	12	22	147	18	1.0
30	2o 3o 1+ 2- 2- 2- 2o 2+	16-	7 15 5 6	6	6	7	9	61	8	0.4

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

	Kp	Sum	May 1977	ap	Sum	Ap	Cp
1	2+ 2+ 2- 2- 2- 2o 4+ 4+	20+	9 9 6 6	6 7 32 32	107	13	0.8
2	6- 5o 4o 5o 6+ 6+ 6o 6-	44o	67 48 27 48	94 94 80 67	525	66	1.7
3	5- 4- 4- 3+ 2- 1+ 1o 2o	21+	39 22 22 18	6 5 4 7	123	15	0.9
4	1o 2- 2o 1+ 2+ 5+ 5o 3+	22o	4 6 7 5	9 56 48 18	153	19	1.0
5	3o 2o 3o 2- 2o 3- 3- 3o	20o	15 7 15 6	7 12 12 15	89	11	0.6
6	3o 3- 2o 2o 2o 3- 3- 2o	19o	15 12 7 7	7 12 12 7	79	10	0.6
7	2+ 2- 2- 1o 0+ 1- 2o 2+	12o	9 6 6 4	2 3 7 9	46	6	0.3
8	0+ 1o 0+ 1- 1o 1- 1- 1+	6o	2 4 2 3	4 3 3 5	26	3	0.1
9	2- 2o 1+ 2o 2o 3- 2- 1+	15-	6 7 5 7	7 12 6 5	55	7	0.3
10	1o 2- 4- 2o 2o 2+ 2- 2+	17-	4 6 22 7	7 9 6 9	70	9	0.5
11	2o 2- 4o 3o 3o 5o 5+ 3o	27o	7 6 27 15	15 48 56 15	189	24	1.1
12	3o 6- 4o 3o 3- 2- 1+ 1-	22o	15 67 27 15	12 6 5 3	150	19	1.0
13	1- 2- 1o 1+ 1- 0+ 3o 2+	11o	3 6 4 5	3 2 15 9	47	6	0.3
14	2o 3- 2o 1+ 1+ 1+ 2- 3o	15+	7 12 7 5	5 5 6 15	62	8	0.4
15	4- 2+ 2+ 3o 3o 3- 2+ 3+	23-	22 9 9 15	15 12 9 18	109	14	0.8
16	4- 4+ 3o 4o 3o 3+ 4o 4-	29o	22 32 15 27	15 18 27 22	178	22	1.1
17	3+ 4o 5- 3- 3o 3o 3- 2o	25+	18 27 39 12	15 15 12 7	145	18	1.0
18	3o 3o 3- 3o 3- 2o 2o 1o	19+	15 15 12 15	12 7 7 4	87	11	0.6
19	2- 1o 1+ 1+ 1o 1+ 1+ 1-	10-	6 4 5 5	4 5 5 3	37	5	0.2
20	2o 2o 2o 2- 2+ 3- 4- 2o	18+	7 7 7 6	9 12 22 7	77	10	0.5
21	1- 0+ 1+ 1- 0+ 1+ 1o 2-	7+	3 2 5 3	2 5 4 6	30	4	0.1
22	2o 3o 3o 1o 1o 1- 1o 1o	13-	7 15 15 4	4 3 4 4	56	7	0.4
23	2+ 2- 1o 1- 2- 3o 1+ 2-	13+	9 6 4 3	6 15 5 6	54	7	0.3
24	2o 2+ 2o 2o 2o 3o 2o 2o	17+	7 9 7 7	7 15 7 7	66	8	0.4
25	2+ 1o 1+ 1o 1+ 2- 1+ 1o	11o	9 4 5 4	5 6 5 4	42	5	0.2
26	0+ 1- 0o 0o 0+ 1o 1+ 1o	5-	2 3 0 0	2 4 5 4	20	2	0.0
27	1- 1o 2- 0+ 1o 1o 1- 0+	7-	3 4 6 2	4 4 3 2	28	4	0.1
28	1o 2o 1- 3o 2+ 1o 3- 1o	14-	4 7 3 15	9 4 12 4	58	7	0.4
29	1o 0+ 0o 0o 1o 1- 0+ 0+	4-	4 2 0 0	4 3 2 2	17	2	0.0
30	1- 1+ 1+ 2- 2- 1o 1+ 1-	10-	3 5 5 6	6 4 5 3	37	5	0.2
31	2o 2o 2+ 1+ 2+ 2+ 1o 2o	15+	7 7 9 5	9 9 4 7	57	7	0.4

	Kp	Sum	Jun 1977	ap	Sum	Ap	Cp
1	2+ 2o 1+ 1o 2- 2+ 3+ 3o	17o	9 7 5 4	6 9 18 15	73	9	0.5
2	4- 3- 2+ 2o 3- 3o 2- 4+	22+	22 12 9 7	12 15 6 32	115	14	0.8
3	2- 2o 2o 1+ 2o 0+ 1o 2o	12+	6 7 7 5	7 2 4 7	45	6	0.3
4	2o 2o 1+ 2o 2o 1o 1- 1-	12-	7 7 5 7	7 4 3 3	43	5	0.2
5	1+ 2o 1o 2+ 3+ 2- 1- 1o	13+	5 7 4 9	18 6 3 4	56	7	0.4
6	2- 1+ 2o 1o 1+ 1- 1- 2-	10+	6 5 7 4	5 3 3 6	39	5	0.2
7	1- 1o 2- 2- 2o 1o 3- 2-	12+	3 4 6 6	7 4 12 6	48	6	0.3
8	0+ 1o 2- 1+ 2o 2o 2- 2o	12o	2 4 6 5	7 7 6 7	44	6	0.2
9	1+ 1o 2o 1o 1o 1o 2- 3-	12-	5 4 7 4	4 4 6 12	46	6	0.3
10	3o 3- 2+ 2o 1+ 1- 2- 2-	15+	15 12 9 7	5 3 6 6	63	8	0.4
11	1- 2- 1- 0+ 1- 0+ 1o 2o	7+	3 6 3 2	3 2 4 7	30	4	0.1
12	2o 1+ 0+ 0o 0+ 0+ 2o 1+	8-	7 5 2 0	2 2 7 5	30	4	0.1
13	1+ 2- 1+ 1- 1o 1o 2o 3o	12o	5 6 5 3	4 4 7 15	49	6	0.3
14	4o 3- 2o 1+ 1+ 1- 2- 2o	16-	27 12 7 5	5 3 6 7	72	9	0.5
15	1- 1+ 1- 0+ 0+ 0+ 1+ 1+	6+	3 5 3 2	2 2 5 5	27	3	0.1
16	2- 1+ 1o 1+ 3o 4- 3- 2o	17-	6 5 4 5	15 22 12 7	76	10	0.5
17	2o 3- 2+ 1+ 2+ 3- 1+ 2o	17-	7 12 9 5	9 12 5 7	66	8	0.4
18	1o 2o 3+ 2o 1+ 3- 3o 3-	18o	4 7 18 7	5 12 15 12	80	10	0.6
19	2+ 3- 3- 2o 2+ 3o 1+ 2o	18+	9 12 12 7	9 15 5 7	76	10	0.5
20	4- 3- 3o 2o 3- 1+ 2o 1+	19-	22 12 15 7	12 5 7 5	85	11	0.6
21	1- 2+ 2+ 2- 2+ 2- 1+ 1o	13+	3 9 9 6	9 6 5 4	51	6	0.3
22	2- 1+ 1- 1o 3o 3+ 4o 2-	17-	6 5 3 4	15 18 27 6	84	10	0.6
23	4o 3o 2- 1+ 2+ 2+ 2- 1+	18-	27 15 6 5	9 9 6 5	82	10	0.6
24	2o 3- 3- 1o 1o 2- 2- 2o	15-	7 12 12 4	4 6 6 7	58	7	0.4
25	1+ 1o 1o 1o 2- 2o 1o 1+	10+	5 4 4 4	6 7 4 5	39	5	0.2
26	2- 2- 2- 2o 2- 2- 1- 2-	13-	6 6 6 7	6 6 3 6	46	6	0.3
27	3o 2o 2- 1+ 2- 2- 2o 1-	14o	15 7 6 5	6 6 7 3	55	7	0.3
28	2- 3- 3o 3+ 3o 3- 3- 2+	21+	6 12 15 18	15 12 12 9	99	12	0.7
29	3o 2+ 2- 1+ 1o 2- 1o 2-	14-	15 9 6 5	4 6 4 6	55	7	0.3
30	2- 1+ 1+ 2- 2o 3- 3+ 3-	17-	6 5 5 6	7 12 18 12	71	9	0.5

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

	Kp	Sum	Jul 1977	ap	Sum	Ap	Cp
1	3- 2+ 4o 4o 2- 3+ 3o 2+	23+	12 9 27 27	6 18 15 9	123	15	0.9
2	3o 2o 2o 2o 2+ 3o 3o 3-	20o	15 7 7 7	9 15 15 12	87	11	0.6
3	1+ 1+ 2o 2o 3+ 3- 2+ 2-	17-	5 5 7 7	18 12 9 6	69	9	0.5
4	2+ 2+ 3o 2o 1o 1o 1o 3o	16-	9 9 15 7	4 4 4 15	67	8	0.5
5	2- 0+ 0+ 2- 2- 2+ 2- 1+	11o	6 2 2 6	6 9 6 5	42	5	0.2
6	1+ 1- 2- 3o 6- 5+ 4+ 5-	27-	5 3 6 15	67 56 32 39	223	28	1.2
7	5- 4- 4- 2o 2+ 1+ 2- 2+	22-	39 22 22 7	9 5 6 9	119	15	0.8
8	3- 4- 2+ 3+ 3o 3o 2+ 3o	23+	12 22 9 18	15 15 9 15	115	14	0.8
9	3+ 3- 3- 3o 2+ 3- 4o 4-	24+	18 12 12 15	9 12 27 22	127	16	0.9
10	4o 3+ 2o 2o 3- 3- 3+ 3o	23o	27 18 7 7	12 12 18 15	116	14	0.8
11	3- 3+ 3o 2- 2- 1+ 2+ 2-	18-	12 18 15 6	6 5 9 6	77	10	0.5
12	1+ 1o 1- 1+ 0+ 0+ 1+ 1+	8-	5 4 3 5	2 2 5 5	31	4	0.1
13	3- 3- 2o 1+ 2+ 2o 3- 2o	18-	12 12 7 5	9 7 12 7	71	9	0.5
14	3+ 5- 5- 4- 2o 2- 2o 1+	23+	18 39 39 22	7 6 7 5	143	18	1.0
15	3- 3o 3- 2o 2+ 3- 3- 3+	21+	12 15 12 7	9 12 12 18	97	12	0.7
16	3- 3- 4+ 5o 4o 4o 3+ 5-	31-	12 12 32 48	27 27 18 39	215	27	1.2
17	3o 3- 3o 3- 2- 3o 3+ 4-	23o	15 12 15 12	6 15 18 22	115	14	0.8
18	2o 2- 2- 2- 3- 2+ 2- 2o	16-	7 6 6 6	12 9 6 7	59	7	0.4
19	3+ 2o 4+ 4- 4+ 4+ 4o 3o	29o	18 7 32 22	32 32 27 15	185	23	1.1
20	4o 4o 5o 5- 4+ 3+ 4- 3+	32+	27 27 48 39	32 18 22 18	231	29	1.3
21	4- 3- 3- 1+ 2o 2o 2+ 2o	19-	22 12 12 5	7 7 9 7	81	10	0.6
22	3o 3- 3o 3+ 1+ 2o 2o 2+	20-	15 12 15 18	5 7 7 9	88	11	0.6
23	3- 2o 2o 1- 2- 1- 1- 1+	12-	12 7 7 3	6 3 3 5	46	6	0.3
24	2- 1+ 1+ 2o 2o 2- 3- 2o	15-	6 5 5 7	7 6 12 7	55	7	0.3
25	2- 1+ 1+ 1o 1+ 1- 1- 2o	10o	6 5 5 4	5 3 3 7	38	5	0.2
26	1- 1o 0+ 1- 1o 1+ 1- 0o	6-	3 4 2 3	4 5 3 0	24	3	0.1
27	0o 1- 1o 0+ 1o 0+ 0+ 2-	5+	0 3 4 2	4 2 2 6	23	3	0.1
28	1o 1o 0+ 1- 1o 1+ 1o 1+	8-	4 4 2 3	4 5 4 5	31	4	0.1
29	6o 7- 6o 5+ 7- 4+ 3- 2o	40-	80 111 80 56	111 32 12 7	489	61	1.7
30	4+ 4+ 4o 3+ 2- 2- 2- 2-	23-	32 32 27 18	6 6 6 6	133	17	0.9
31	3- 3- 2o 2o 2- 1- 1+ 2+	15+	12 12 7 7	6 3 5 9	61	8	0.4

	Kp	Sum	Aug 1977	ap	Sum	Ap	Cp
1	1+ 2- 2- 2- 3- 2- 1- 1o	12+	5 6 6 6	12 6 3 4	48	6	0.3
2	2o 1+ 1- 1+ 1- 1o 1+ 0+	9-	7 5 3 5	3 4 5 2	34	4	0.1
3	1o 1o 1o 1- 1+ 2o 3o 3-	13-	4 4 4 3	5 7 15 12	54	7	0.3
4	3- 3o 1+ 2o 2- 2o 3- 2o	17+	12 15 5 7	6 7 12 7	71	9	0.5
5	4o 4o 6o 5o 5o 4o 5o 3o	36o	27 27 80 48	48 27 48 15	320	40	1.4
6	4- 4+ 3+ 3+ 3- 3o 4o 4o	28+	22 32 18 18	12 15 27 27	171	21	1.1
7	2+ 3- 4- 4o 2+ 3+ 2+ 4o	25-	9 12 22 27	9 18 9 27	133	17	0.9
8	4- 3+ 3- 2+ 1+ 2o 3- 3o	21o	22 18 12 9	5 7 12 15	100	12	0.7
9	4o 3o 3- 2o 5- 4- 4- 3o	27-	27 15 12 7	39 22 22 15	159	20	1.0
10	3o 3+ 3+ 2o 2o 2+ 3- 2o	21-	15 18 18 7	7 9 12 7	93	12	0.7
11	3+ 4+ 4+ 3+ 4o 3+ 5o 4+	32o	18 32 32 18	27 18 48 32	225	28	1.2
12	1+ 3+ 2+ 4- 2+ 2+ 2o 2+	20-	5 18 9 22	9 9 7 9	88	11	0.6
13	3o 3- 2+ 2o 3- 2o 2- 3+	20-	15 12 9 7	12 7 6 18	86	11	0.6
14	1+ 1- 2+ 2+ 4+ 3- 3o 2+	19o	5 3 9 9	32 12 15 9	94	12	0.7
15	2+ 4- 3+ 3o 2o 1o 2- 1+	18+	9 22 18 15	7 4 6 5	86	11	0.6
16	1o 2- 1o 2- 4o 2- 2+ 2o	15+	4 6 4 6	27 6 9 7	69	9	0.5
17	2o 3o 4o 6- 5o 4+ 3o 3+	30+	7 15 27 67	48 32 15 18	229	29	1.3
18	4- 3- 3o 2+ 3- 3- 3- 2+	22o	22 12 15 9	12 12 12 9	103	13	0.7
19	5o 5- 2+ 3+ 2o 3o 3+ 5-	28+	48 39 9 18	7 15 18 39	193	24	1.2
20	3+ 2o 3- 2o 2o 2- 1+ 1+	16+	18 7 12 7	7 6 5 5	67	8	0.5
21	1+ 1o 2+ 1o 1+ 1o 1- 1o	10-	5 4 9 4	5 4 3 4	38	5	0.2
22	1- 1o 1o 1o 0+ 1- 2- 3-	9o	3 4 4 4	2 3 6 12	38	5	0.2
23	1+ 1- 1o 2- 2- 3- 2+ 2o	13+	5 3 4 6	6 12 9 7	52	6	0.3
24	2o 3- 2+ 3o 3o 3o 1+ 0+	18-	7 12 9 15	15 15 5 2	80	10	0.6
25	1o 1+ 3+ 5- 5+ 5+ 4- 3+	28o	4 5 18 39	56 56 22 18	218	27	1.2
26	3o 3- 3o 3o 4o 2+ 2- 0+	20o	15 12 15 15	27 9 6 2	101	13	0.7
27	2- 4- 4- 3+ 2+ 2+ 3o 2+	22+	6 22 22 18	9 9 15 9	110	14	0.8
28	2- 3- 2o 2- 2+ 2o 2o 1-	15o	6 12 7 6	9 7 7 3	57	7	0.4
29	2+ 2+ 1+ 2- 2o 1- 1- 1-	12-	9 9 5 6	7 3 3 3	45	6	0.3
30	1o 1+ 2- 1o 1o 1+ 2- 2-	11-	4 5 6 4	4 5 6 6	40	5	0.2
31	1o 2o 1o 1- 0+ 1- 1- 1o	7+	4 7 4 3	2 3 3 4	30	4	0.1

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

	Kp	Sum	Sep 1977	ap				Sum	Ap	Cp
1	2- 1o 1o 1- 1+ 1- 0+ 1-	7+	6 4 4 3	5 3 2 3	30	4	0.1
2	1o 1o 0+ 1- 2o 2+ 2- 3-	12-	4 4 2 3	7 9 6 12	47	6	0.3
3	3+ 3+ 2- 1+ 1+ 1o 1- 1o	14-	18 18 6 5	5 4 3 4	63	8	0.4
4	1o 1+ 3- 3- 2- 1+ 1- 1o	12+	4 5 12 12	6 5 3 4	51	6	0.3
5	1o 0+ 0o 1+ 1+ 0+ 1- 1-	6-	4 2 0 5	5 2 3 3	24	3	0.1
6	0o 1o 1- 1+ 1+ 1o 0+ 1+	7o	0 4 3 5	5 4 2 5	28	4	0.1
7	1- 2o 1o 0+ 1- 1- 2o 3+	11-	3 7 4 2	3 3 7 18	47	6	0.3
8	3o 2o 3o 1+ 1+ 1+ 2- 2o	16-	15 7 15 5	5 5 6 7	65	8	0.4
9	2o 3- 3- 3- 3o 3o 3- 1+	20o	7 12 12 12	15 15 12 5	90	11	0.6
10	4- 3+ 2+ 3o 3- 1+ 2+ 3-	21+	22 18 9 15	12 5 9 12	102	13	0.7
11	3+ 4- 4- 4- 3o 3+ 4- 3-	27o	18 22 22 22	15 18 22 12	151	19	1.0
12	1- 3o 1o 0+ 1- 1- 1+ 3o	11-	3 15 4 2	3 3 5 15	50	6	0.3
13	4- 3- 4o 4- 4- 5o 5+ 3+	31+	22 12 27 22	22 48 56 18	227	28	1.2
14	4o 4- 1o 1+ 1o 1+ 2- 2-	16-	27 22 4 5	4 5 6 6	79	10	0.6
15	2o 3o 3+ 3+ 2- 1- 1- 1-	15+	7 15 18 18	6 3 3 3	73	9	0.5
16	1o 1+ 1+ 2o 3- 2o 3- 2o	15o	4 5 5 7	12 7 12 7	59	7	0.4
17	2+ 3- 4+ 2o 2- 1+ 1- 1-	16-	9 12 32 7	6 5 3 3	77	10	0.5
18	1+ 3o 2- 2- 2o 1- 1o 1+	13-	5 15 6 6	7 3 4 5	51	6	0.3
19	1o 1- 1o 4o 6o 6- 6o 6-	30o	4 3 4 27	80 67 80 67	332	42	1.5
20	6- 5- 5o 5- 5o 5+ 4o 4o	38+	67 39 48 39	48 56 27 27	351	44	1.5
21	4+ 5+ 6o 7- 5- 3- 4+ 7+	41+	32 56 80 111	39 12 32 154	516	64	1.7
22	6+ 6o 4+ 4o 5- 6+ 7- 4o	42+	94 80 32 27	39 94 111 27	504	63	1.7
23	3- 1+ 1o 4- 4o 5o 4+ 3+	25+	12 5 4 22	27 48 32 18	168	21	1.1
24	3o 4- 2+ 3o 2o 3- 2o 3-	21+	15 22 9 15	7 12 7 12	99	12	0.7
25	2+ 3- 3- 2+ 1+ 2+ 3o 2+	19o	9 12 12 9	5 9 15 9	80	10	0.6
26	1o 2- 2+ 4o 3o 4o 3o 5-	24-	4 6 9 27	15 27 15 39	142	18	1.0
27	6- 6- 4+ 2+ 1+ 1- 1o 1-	22-	67 67 32 9	5 3 4 3	190	24	1.1
28	1+ 1+ 3- 2+ 2+ 4- 2- 1o	16+	5 5 12 9	9 22 6 4	72	9	0.5
29	0o 2- 2- 0+ 0+ 1o 1o 1-	7-	0 6 6 2	2 4 4 3	27	3	0.1
30	1- 1- 1- 2- 2o 1- 1o 1-	8o	3 3 3 6	7 3 4 3	32	4	0.1

	Kp	Sum	Oct 1977	ap				Sum	Ap	Cp
1	0+ 1+ 1- 1o 1o 1- 1- 1+	7o	2 5 3 4	4 3 3 5	29	4	0.1
2	2o 2- 2o 2+ 2- 0+ 0+ 1-	11o	7 6 7 9	6 2 2 3	42	5	0.2
3	0+ 2o 3o 2+ 4- 3- 2o 1-	17-	2 7 15 9	22 12 7 3	77	10	0.5
4	3- 2+ 2+ 2- 2o 1- 1+ 2o	15o	12 9 9 6	7 3 5 7	58	7	0.4
5	2+ 1+ 2+ 2+ 3- 2+ 2o 1o	16+	9 5 9 9	12 9 7 4	64	8	0.4
6	3o 2+ 3- 1+ 2- 2o 2o 2-	17-	15 9 12 5	6 7 7 6	67	8	0.5
7	0+ 0+ 1- 2- 1o 0+ 1- 1-	6-	2 2 3 6	4 2 3 3	25	3	0.1
8	1- 2- 1o 1+ 2o 2- 3- 1o	12o	3 6 4 5	7 6 12 4	47	6	0.3
9	0+ 0+ 0o 0+ 1o 1- 0+ 1-	4-	2 2 0 2	4 3 2 3	18	2	0.0
10	0o 0o 0o 3- 1+ 1- 1+ 2o	8o	0 0 0 12	5 3 5 7	32	4	0.1
11	3- 2- 2o 1o 2- 2+ 3o 5-	19o	12 6 7 4	6 9 15 39	98	12	0.7
12	4o 5o 5- 5o 4o 3+ 3- 2-	30+	27 48 39 48	27 18 12 6	225	28	1.2
13	2- 4o 3+ 3- 4o 1+ 2+ 3-	22o	6 27 18 12	27 5 9 12	116	14	0.8
14	2- 0o 0+ 4o 3- 2+ 3- 5-	18+	6 0 2 27	12 9 12 39	107	13	0.8
15	4+ 2+ 5- 4+ 2- 2- 3o 3-	25-	32 9 39 32	6 6 15 12	151	19	1.0
16	2+ 3o 1o 1o 2o 2- 2- 2+	15o	9 15 4 4	7 6 6 9	60	8	0.4
17	2+ 3o 2+ 2o 2+ 3+ 3- 3+	21+	9 15 9 7	9 18 12 18	97	12	0.7
18	3+ 3+ 4- 3- 2+ 3o 4+ 5o	28-	18 18 22 12	9 15 32 48	174	22	1.1
19	6o 5o 4+ 3+ 3+ 3+ 2+ 0+	28o	80 48 32 18	18 18 9 2	225	28	1.2
20	0o 1+ 1+ 2o 2+ 3o 1+ 2+	14-	0 5 5 7	9 15 5 9	55	7	0.3
21	3- 0+ 1o 1o 1- 1+ 1+ 2o	10+	12 2 4 4	3 5 5 7	42	5	0.2
22	4- 4o 5o 3o 3o 3+ 3- 4-	28+	22 27 48 15	15 18 12 22	179	22	1.1
23	3- 3- 2- 1- 0o 0+ 2o 2-	12-	12 12 6 3	0 2 7 6	48	6	0.3
24	2+ 2o 1+ 1+ 1+ 1o 1+ 2-	12+	9 7 5 5	5 4 5 6	46	6	0.3
25	2- 0+ 1- 0+ 0o 1+ 2o 2o	8+	6 2 3 2	0 5 7 7	32	4	0.1
26	1- 2+ 2- 1o 0+ 1- 1o 3o	11-	3 9 6 4	2 3 4 15	46	6	0.3
27	4o 3+ 3+ 6+ 6- 5o 7- 7-	41o	27 18 18 94	67 48 111 111	494	62	1.7
28	6o 7+ 5+ 3- 3+ 3+ 4+ 2o	34+	80 154 56 12	18 18 32 7	377	47	1.5
29	2+ 2o 1o 3- 4- 2+ 1o 2-	17-	9 7 4 12	22 9 4 6	73	9	0.5
30	1+ 1o 2- 2o 2+ 4o 2o 2-	16o	5 4 6 7	9 27 7 6	71	9	0.5
31	2o 2- 2- 2- 1o 1o 2o 1+	12+	7 6 6 6	4 4 7 5	45	6	0.3

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

	Kp	Sum	Nov 1977				ap				Sum	Ap	Cp
1	1+ 0+ 1+ 1o 1o 1- 1+ 2+	9+	5	2	5	4	4	3	5	9	37	5	0.2
2	2+ 1+ 1o 1o 1o 1o 2+ 1+	11+	9	5	4	4	4	4	9	5	44	6	0.2
3	0+ 2- 1o 1o 0+ 1+ 1o 0+	7o	2	6	4	4	2	5	4	2	29	4	0.1
4	1+ 0+ 0+ 1o 2o 4- 3- 2+	14-	5	2	2	4	7	22	12	9	63	8	0.4
5	4+ 3- 2o 2- 1o 2o 1o 2-	16+	32	12	7	6	4	7	4	6	78	10	0.5
6	2+ 1+ 2o 2o 2+ 2+ 1+ 1-	14+	9	5	7	7	9	9	5	3	54	7	0.3
7	2- 2o 1+ 2- 2o 1o 0+ 1+	11+	6	7	5	6	7	4	2	5	42	5	0.2
8	1- 1- 1+ 1- 1o 1- 2- 0o	7-	3	3	5	3	4	3	6	0	27	3	0.1
9	1o 2- 1- 1- 0+ 1- 1o 0o	6o	4	6	3	3	2	3	4	0	25	3	0.1
10	0+ 0+ 2- 1+ 3o 3+ 2o 3o	15o	2	2	6	5	15	18	7	15	70	9	0.5
11	2+ 1+ 1+ 2- 2o 1+ 1+ 2-	13o	9	5	5	6	7	5	5	6	48	6	0.3
12	3+ 4+ 3+ 3+ 3- 3o 3- 4-	26+	18	32	18	18	12	15	12	22	147	18	1.0
13	4o 4+ 3+ 4o 4o 5o 3o 3+	31o	27	32	18	27	27	48	15	18	212	26	1.2
14	4o 4+ 5o 4+ 5o 5o 4+ 6-	38-	27	32	48	32	48	48	32	67	334	42	1.5
15	6- 3+ 3o 5- 3+ 4- 2+ 3o	29o	67	18	15	39	18	22	9	15	203	25	1.2
16	4- 3- 3o 3o 3+ 3o 3- 2o	23+	22	12	15	15	18	15	12	7	116	14	0.8
17	3- 3- 2- 2+ 0+ 0+ 1- 3+	14o	12	12	6	9	2	2	3	18	64	8	0.4
18	1+ 3- 2- 2o 2o 1+ 1+ 1+	14-	5	12	6	7	7	5	5	5	52	6	0.3
19	2o 2+ 2- 1+ 1o 1+ 2o 2+	14o	7	9	6	5	4	5	7	9	52	6	0.3
20	2- 1+ 1- 1o 1- 1o 1o 1o	8+	6	5	3	4	3	4	4	4	33	4	0.1
21	3o 1+ 1- 1- 1o 1- 1- 1o	9o	15	5	3	3	4	3	3	4	40	5	0.2
22	1- 1+ 1o 2o 0+ 0+ 0+ 0+	6+	3	5	4	7	2	2	2	2	27	3	0.1
23	1- 1- 0o 0+ 1- 1- 0+ 1o	4+	3	3	0	2	3	3	2	4	20	2	0.0
24	0+ 0+ 1- 1o 0+ 1- 0o 0+	4-	2	2	3	4	2	3	0	2	18	2	0.0
25	1- 0+ 0+ 1o 3o 3- 4+ 5o	17+	3	2	2	4	15	12	32	48	118	15	0.8
26	5+ 3+ 2o 3+ 3o 3o 2o 3o	25o	56	18	7	18	15	15	7	15	151	19	1.0
27	5o 2+ 3- 2o 2- 1+ 2- 1+	18o	48	9	12	7	6	5	6	5	98	12	0.7
28	2- 2+ 2- 2- 1- 1o 1- 1+	11o	6	9	6	6	3	4	3	5	42	5	0.2
29	2+ 2o 1o 1o 1+ 1o 2o 2+	13o	9	7	4	4	5	4	7	9	49	6	0.3
30	2+ 3o 4- 3+ 2+ 1+ 2- 2+	20o	9	15	22	18	9	5	6	9	93	12	0.7

	Kp	Sum	Dec 1977				ap				Sum	Ap	Cp
1	1o 0+ 0+ 0+ 1- 2- 3+ 3o	11-	4	2	2	2	3	6	18	15	52	6	0.3
2	5o 7- 6- 4+ 4+ 6+ 7o 5-	44o	48	111	67	32	32	94	132	39	555	69	1.7
3	3+ 2+ 2- 2+ 2+ 2- 2+ 2o	18o	18	9	6	9	9	6	9	7	73	9	0.5
4	1- 2o 1+ 1o 2o 3+ 4o 5-	19o	3	7	5	4	7	18	27	39	110	14	0.8
5	4o 5- 5- 3- 3- 1+ 2o 2o	24o	27	39	39	12	12	5	7	7	148	18	1.0
6	3- 2- 2- 0+ 0+ 0+ 1o 1o	9o	12	6	6	2	2	2	4	4	38	5	0.2
7	1o 1- 1- 0o 0o 1- 1+ 1+	6-	4	3	3	0	0	3	5	5	23	3	0.1
8	1o 0+ 0+ 0+ 0o 0+ 0+ 0+	3o	4	2	2	2	0	2	2	2	16	2	0.0
9	0o 2- 2o 0+ 0+ 0+ 1- 0+	6-	0	6	7	2	2	2	3	2	24	3	0.1
10	0o 0+ 1o 1- 0+ 0+ 2- 2+	7-	0	2	4	3	2	2	6	9	28	4	0.1
11	4o 5- 5+ 5+ 5+ 4- 3o 4+	36-	27	39	56	56	56	22	15	32	303	38	1.4
12	4+ 6- 3o 3- 3o 2- 2+ 3-	25+	32	67	15	12	15	6	9	12	168	21	1.1
13	4o 3o 3o 3- 3o 4- 3+ 2o	25-	27	15	15	12	15	22	18	7	131	16	0.9
14	3- 3- 2+ 1+ 2o 2- 1+ 1o	15o	12	12	9	5	7	6	5	4	60	8	0.4
15	2- 2- 2- 2- 2o 1- 1- 0+	10+	6	6	6	6	7	3	3	2	39	5	0.2
16	0+ 1o 1+ 1- 2o 3- 3o 4-	15-	2	4	5	3	7	12	15	22	70	9	0.5
17	4- 5o 2o 1- 1o 1- 2- 2-	16+	22	48	7	3	4	3	6	6	99	12	0.7
18	1o 1o 0+ 1- 0+ 0+ 0+ 0+	4+	4	4	2	3	2	2	2	2	21	3	0.0
19	1- 0+ 1- 0+ 0+ 2- 0+ 1-	5o	3	2	3	2	2	6	2	3	23	3	0.1
20	1o 0+ 0+ 1+ 1- 1- 2- 1-	7-	4	2	2	5	3	3	6	3	28	4	0.1
21	1+ 0+ 1+ 1- 1+ 2- 2- 3o	11+	5	2	5	3	5	6	6	15	47	6	0.3
22	3+ 3- 1- 0+ 1o 1- 1- 2-	11o	18	12	3	2	4	3	3	6	51	6	0.3
23	2- 0+ 0o 1+ 2- 1o 1o 2-	9-	6	2	0	5	6	4	4	6	33	4	0.1
24	2o 1o 1o 2o 1+ 2- 1o 1o	11o	7	4	4	7	5	6	4	4	41	5	0.2
25	0+ 1o 1+ 1+ 1+ 1- 2+ 2o	10+	2	4	5	5	5	3	9	7	40	5	0.2
26	3o 3o 2o 2+ 2- 2+ 3- 3-	20-	15	15	7	9	6	9	12	12	85	11	0.6
27	2+ 2+ 2- 2- 2- 1+ 1o 0+	12+	9	9	6	6	6	5	4	2	47	6	0.3
28	1- 2- 1+ 1+ 1o 2- 4+ 3+	15+	3	6	5	5	4	6	32	18	79	10	0.6
29	3o 3o 1+ 1o 1+ 1+ 1+ 2+	15-	15	15	5	4	5	5	5	9	63	8	0.4
30	2o 1+ 1+ 1o 1+ 1o 2- 2o	12-	7	5	5	4	5	4	6	7	43	5	0.2
31	1o 1+ 1o 2o 2o 1o 2o 3-	13o	4	5	4	7	7	4	7	12	50	6	0.3

TABLE 5 FREQUENCIES OF Kp INDICES, 1977

Kp	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0o	1	3	4	1	4	1	2	.	3	8	4	6
0+	21	7	15	9	13	10	9	5	9	18	24	37
1-	17	17	17	14	19	18	13	16	30	18	26	25
1o	27	18	31	14	31	28	13	23	26	20	31	29
1+	28	25	21	32	25	36	24	20	28	21	31	27
2-	23	17	31	22	26	42	27	22	16	28	20	31
2o	23	17	22	22	36	40	32	27	15	26	20	20
2+	22	22	27	15	19	16	19	28	13	27	19	13
3-	28	29	14	17	15	22	30	23	21	21	11	13
3o	15	25	16	16	25	14	20	22	15	11	15	13
3+	15	15	9	19	5	6	16	19	10	14	13	6
4-	9	10	13	21	7	3	9	11	12	5	5	4
4o	8	11	13	9	6	3	10	12	10	8	4	4
4+	5	6	7	11	3	1	9	6	6	5	7	5
5-	3	.	4	3	2		6	4	5	4	1	5
5o	1	1	2	3	4		2	6	4	6	6	2
5+	2	1	2	3	2		2	2	3	1	1	3
6-				4	3		1	1	5	1	2	2
6o				1	1		2	1	4	2		.
6+				2	2		.		2	1		1
7-				1			2		2	2		1
7o				1					.	.		1
7+									1	1		
8-												
8o												
8+												
9-												
9o												
	248	224	248	240	248	240	248	248	240	248	240	248

TABLE 6 MONTHLY AVERAGES OF Ap AND Cp, 1977

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Ap	10	11	11	16	11	8	14	13	16	13	10	10	11.9
Cp	0.53	0.59	0.55	0.71	0.53	0.38	0.65	0.64	0.66	0.57	0.46	0.44	0.56

TABLE 7 LIST OF MAGNETIC STORMS, 1977

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
Sep 21 E8	21 20.45	3	. . 1	. . .	. .
Oct 27 E4	26 23.30	8	2 . 1	. . .	. .

TABLE 8 VERY QUIET INTERVALS, 1977

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

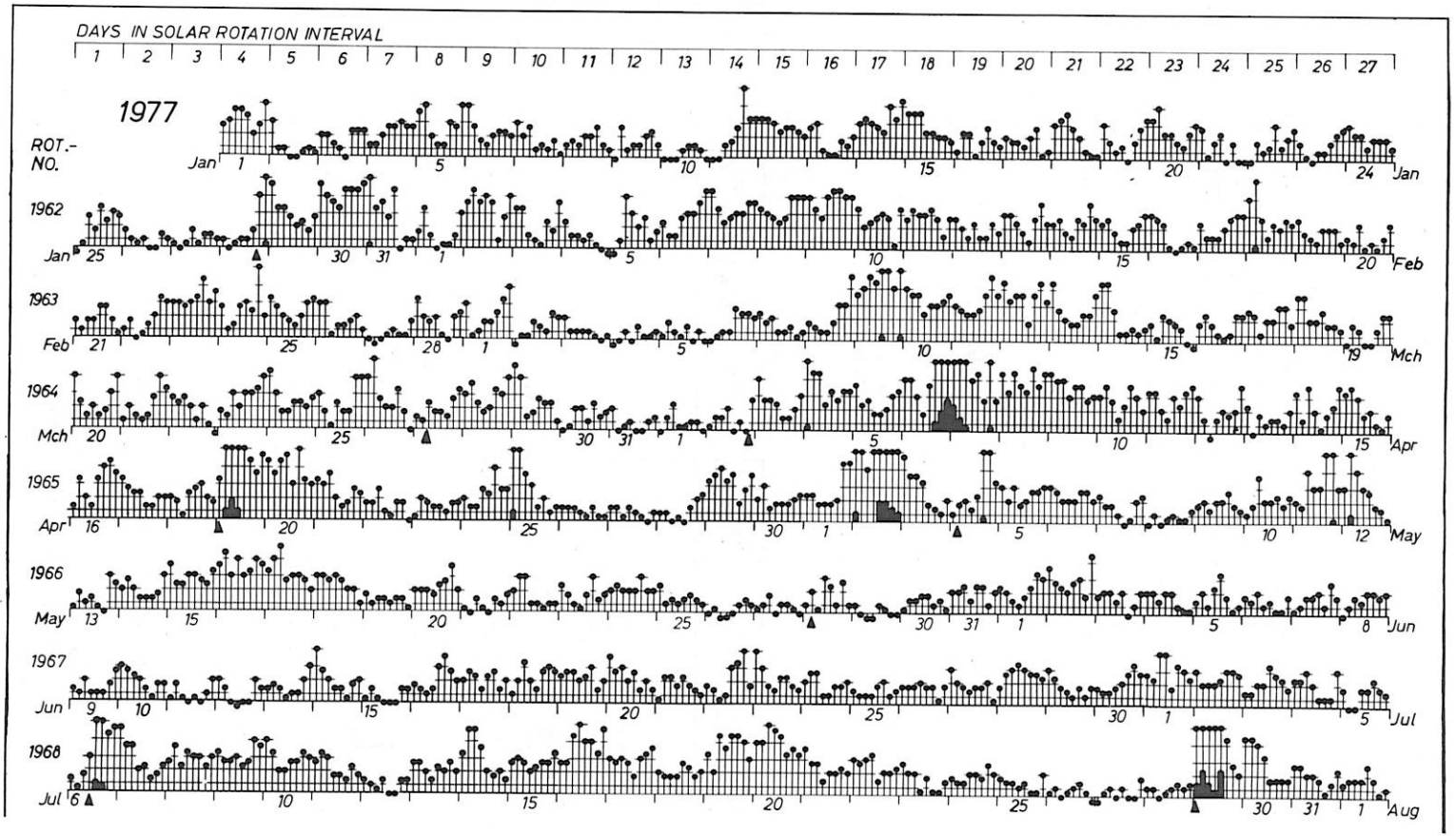
First. . . . . last Eighth			Duration Eighths
Jan	09 E8	11 E3	12
	26 E2	27 E3	10
	27 E5	28 E5	9
Feb	04 E2	05 E2	9
	26 E8	27 E7	8
Mar	03 E2	05 E1	16
	05 E3	06 E4	10
	31 E2	Apr 01 E2	9
Apr	01 E4	02 E3	8
	25 E7	28 E6	24
May	08 E1	08 E8	8
	25 E7	27 E2	12
	28 E8	30 E3	12
Jun	15 E1	15 E8	8
Jul	12 E1	12 E8	8
	26 E1	27 E7	15
	28 E1	28 E8	8

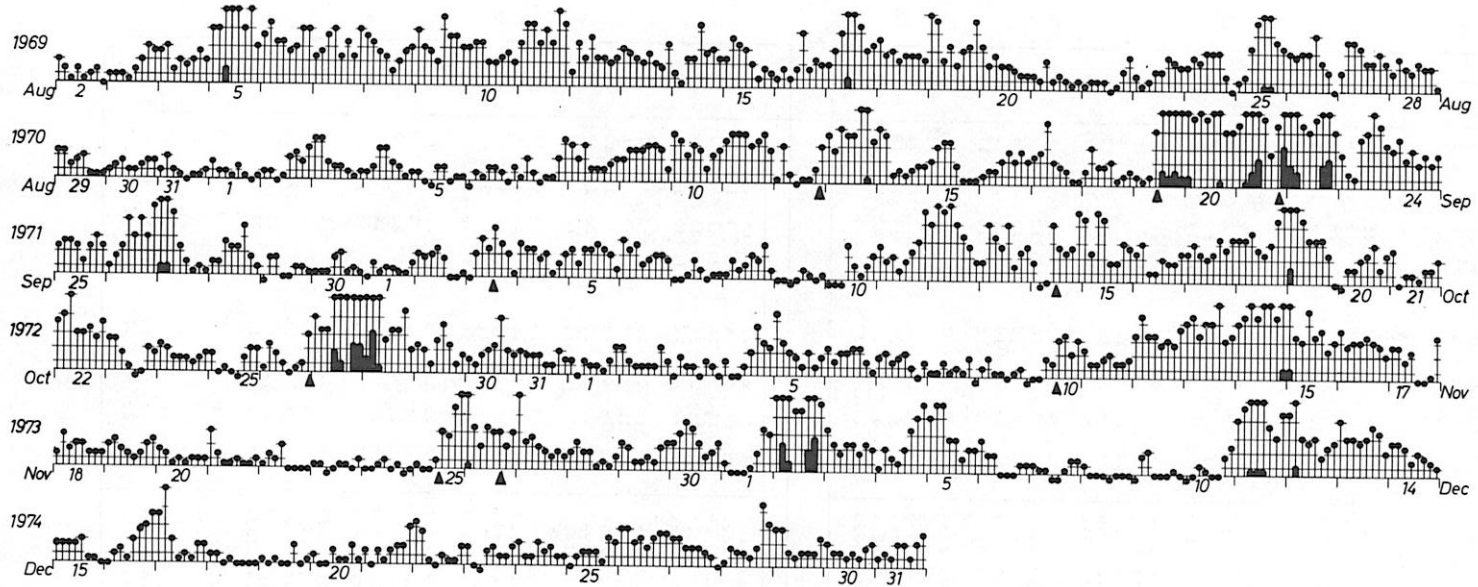
First. . . . . last Eighth			Duration Eighths
Aug	02 E2	03 E5	12
	21 E4	22 E6	11
Sep	01 E2	02 E4	11
	04 E6	07 E1	20
	29 E4	30 E3	8
	30 E6	Oct 01 E8	11
Oct	08 E8	10 E3	12
	31 E8	Nov 01 E7	8
Nov	03 E3	04 E4	10
	07 E6	08 E6	9
	09 E3	10 E2	8
	21 E2	22 E3	10
	22 E5	25 E4	24
Dec	06 E4	09 E1	22
	09 E4	10 E6	11
	18 E1	19 E5	13
	19 E7	20 E6	8
	24 E7	25 E6	8

TABLE 8a LIST OF Kp', 1977

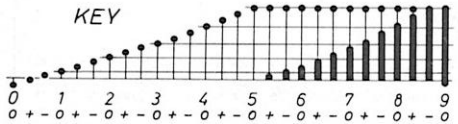
Reduction of Kp to Kp' due to solar flare effects

Month	Day	Eighth	Kp	Kp'
Apr	12	4	1+	1o
Nov	22	4	2o	1+


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
1977
ROT.-
NO.
Jan 1 5 10 15 20 24 Jan
1962
Jan 25 30 31 1 5 10 15 20 Feb
1963
Feb 21 25 28 1 5 10 15 19 Mch
1964
Mch 20 25 30 31 1 5 10 15 Apr
1965
Apr 16 20 25 30 1 5 10 12 May
1966
May 13 15 20 25 30 31 1 5 8 Jun
1967
Jun 9 10 15 20 25 30 1 5 Jul
1968
Jul 6 10 15 20 25 30 31 1 Aug



Kp (after Bartels)



▲ = sudden commencement

1977

Table 9 Indices Kn, Ks, Km, etc.

(For explanation: see page IX)

JAN. 1977

	3 Kn								σn		an						An
1	7	7	8	8	10	8	8	11	4231	4645	17	17	24	25	39	22	22	41	26
2	8	3	3	1	1	2	4	1	3121	1333	21	6	6	2	2	5	8	3	7
3	4	4	4	4	2	7	8	7	2313	3335	8	8	9	9	4	20	21	20	12
4	3	3	4	9	8	8	9	7	2024	2355	7	7	10	29	24	22	30	17	18
5	10	11	5	4	5	10	8	10	3513	4635	35	41	11	9	12	34	24	37	25
6	10	6	6	4	7	8	8	6	5352	3243	38	16	15	10	18	23	21	15	20
7	7	4	7	3	5	4	5	2	4232	5541	18	10	20	7	11	8	11	4	11
8	3	3	4	6	7	8	4	3	2223	5521	7	7	10	14	19	23	9	6	12
9	2	5	3	4	7	7	6	4	2323	4421	5	12	7	8	17	18	15	8	11
10	2	1	2	3	5	5	3	0	3233	4540	4	2	5	6	12	12	7	0	6
11	1	1	4	6	8	16	10	9	2234	2541	2	3	9	14	23	107	38	30	28
12	9	8	8	6	9	7	8	4	2321	5542	27	21	22	15	33	20	23	10	21
13	5	7	3	3	2	5	4	6	4144	4433	13	18	7	6	5	12	9	15	11
14	8	7	8	8	7	11	10	10	4322	2333	21	20	21	24	20	46	34	38	28
15	9	10	9	7	8	7	7	5	3402	4554	31	35	30	17	23	19	17	11	23
16	2	6	7	3	5	7	4	3	2634	2642	4	15	19	7	12	20	10	6	12
17	3	3	5	4	7	9	1	3	2223	3432	6	6	12	10	19	27	3	6	11
18	7	7	9	7	6	3	2	3	4202	1231	19	19	30	20	14	7	4	6	15
19	7	4	3	3	3	6	7	9	3202	1544	18	8	6	6	6	14	20	27	13
20	8	9	6	8	5	5	6	8	3223	3542	22	32	15	21	13	11	15	25	19
21	6	2	4	7	3	5	1	0	2222	2421	14	4	10	17	6	11	2	1	8
22	1	4	3	6	9	5	6	7	2322	5366	2	9	7	14	32	12	16	17	14
23	4	2	2	4	4	5	8	8	2333	3154	8	4	4	9	10	13	23	23	12
24	8	5	7	4	8	6	6	4	3142	5053	22	12	18	10	22	14	15	6	15
25	0	1	8	5	10	6	9	7	1222	2143	1	3	21	12	40	16	29	17	17
26	4	2	2	3	2	1	4	2	2222	2254	9	5	5	7	4	2	9	5	6
27	1	0	2	4	2	5	4	2	3122	3321	3	1	5	10	5	12	10	5	6
28	3	0	2	4	5	5	12	14	1131	4333	6	1	4	8	11	12	56	71	21
29	11	8	9	8	7	7	5	7	3254	4544	46	25	32	25	17	19	11	19	24
30	14	11	9	9	14	12	14	11	2334	6464	73	43	30	31	80	60	81	48	56
31	14	8	10	7	12	2	3	2	3142	3223	72	21	40	17	56	5	7	5	28
																			17.3

JAN. 1977

	3 Ks								σs		as						As
1	8	8	9	10	10	8	9	9	3211	1153	21	22	31	35	35	24	27	31	28
2	6	4	4	2	1	3	4	2	2123	1222	15	9	10	4	2	7	10	5	8
3	4	5	6	6	4	8	8	7	4200	2324	10	11	14	14	9	22	21	20	15
4	5	5	6	8	9	10	9	8	2211	2212	12	11	15	24	28	35	31	24	23
5	10	11	6	6	7	9	10	10	4521	2132	38	42	14	14	17	30	34	38	28
6	11	5	5	6	7	9	9	8	5213	2542	43	13	12	16	18	30	33	21	23
7	7	5	6	3	4	5	6	3	1111	2532	19	12	14	7	9	12	15	6	12
8	5	6	6	6	6	7	4	4	2121	2144	12	16	14	15	16	20	10	10	14
9	4	6	4	5	7	7	7	6	3111	2443	10	16	9	13	17	20	20	15	15
10	5	4	4	5	7	5	4	1	5111	1452	11	6	10	12	16	12	9	2	10
11	2	3	4	7	8	15	11	10	2123	1232	5	7	10	19	24	88	41	34	29
12	9	7	6	6	9	9	8	6	3211	3223	31	18	15	15	29	28	25	14	22
13	7	8	5	5	4	5	5	7	2223	1254	18	21	12	11	9	11	11	17	14
14	8	8	7	7	8	11	10	11	2312	3255	23	23	16	18	22	50	38	45	30
15	10	10	8	6	8	7	7	5	3211	3253	37	34	25	16	23	18	18	11	23
16	3	5	5	4	7	8	5	4	2323	4054	7	11	11	8	20	22	12	10	13
17	4	4	5	5	8	7	3	4	4322	2263	8	9	12	11	24	18	7	9	12
18	6	9	11	8	8	5	4	5	4420	4544	15	29	41	22	25	12	9	13	21
19	7	7	5	5	5	6	9	10	2211	3335	18	18	12	12	11	14	30	40	19
20	10	9	7	5	8	5	9	9	5312	4442	37	31	19	13	21	13	27	28	24
21	8	4	4	5	2	4	2	2	5111	3233	24	10	10	13	5	9	4	4	10
22	3	4	2	4	9	7	6	7	3224	3346	7	9	5	8	29	18	14	18	14
23	5	4	4	5	5	9	8	8	3422	2943	11	8	9	11	13	33	25	22	17
24	7	5	7	7	8	6	6	5	3224	2123	19	13	18	18	22	15	14	11	16
25	2	4	9	5	11	8	9	6	2242	2333	5	8	29	11	41	22	30	16	20
26	5	3	2	2	2	1	4	2	4232	3222	13	6	4	4	4	3	8	4	6
27	2	2	5	6	4	5	4	2	3323	2422	4	4	13	16	10	11	10	5	9
28	2	3	2	4	5	8	13	15	2122	2445	5	6	5	10	11	21	68	93	27
29	11	10	10	9	8	7	5	8	3231	2236	50	34	37	31	21	17	11	26	28
30	13	10	9	11	12	12	11	13	3442	2214	61	36	29	43	53	53	48	62	48
31	14	8	10	8	11	2	4	4	7420	0422	80	25	35	22	49	5	9	8	29
																			19.6

Table 9 - continued

JAN. 1977

	3 Km								Σ Km	am							Am	Am2
1	7	7	9	9	10	8	8	10	22.7	19	20	28	30	37	23	25	36	27	21
2	7	3	4	1	1	3	4	2	8.3	18	7	8	3	2	8	9	4	7	14
3	4	4	5	5	3	8	8	7	14.7	9	9	12	12	7	21	21	20	14	12
4	4	4	5	9	8	9	9	8	18.7	10	9	13	27	26	29	31	21	21	21
5	10	11	5	5	6	9	9	10	21.7	37	41	12	12	14	32	29	37	27	25
6	10	6	6	5	7	8	9	7	19.3	40	14	14	13	18	26	27	16	21	21
7	7	5	7	3	4	4	5	2	12.3	19	11	17	7	10	10	13	5	12	14
8	4	5	5	6	7	8	4	4	14.3	10	11	12	14	17	22	10	8	13	11
9	4	6	4	4	7	7	7	5	14.7	8	14	8	10	17	19	17	11	13	12
10	4	2	4	4	6	5	4	0	9.7	8	5	8	9	15	12	8	1	8	10
11	1	2	4	7	8	15	10	9	18.7	3	5	10	17	24	98	40	32	29	22
12	9	7	7	6	9	8	8	5	19.7	29	19	19	15	31	24	24	12	22	26
13	6	7	4	4	3	5	4	6	13.0	16	20	10	8	7	12	10	16	12	17
14	8	8	7	8	8	11	10	11	23.7	22	22	20	21	21	48	36	41	29	24
15	10	10	9	6	8	7	7	5	20.7	34	35	27	16	23	18	18	11	23	23
16	2	5	6	4	6	8	5	4	13.3	5	13	15	8	16	21	11	8	12	13
17	3	3	5	4	8	8	2	4	12.3	7	7	12	10	22	22	5	8	12	15
18	7	8	10	8	7	4	3	4	17.0	17	24	35	21	19	9	7	10	16	16
19	7	5	4	4	4	6	8	9	15.7	18	13	9	9	9	14	25	33	16	17
20	9	9	7	7	7	5	8	8	20.0	29	32	17	17	17	12	21	26	21	19
21	7	3	4	6	2	4	1	1	9.3	19	7	10	15	5	10	3	2	9	11
22	2	4	3	5	9	6	6	7	14.0	5	9	6	11	31	15	15	17	14	10
23	4	3	3	4	5	8	8	8	14.3	10	6	6	10	11	23	24	22	14	16
24	7	5	7	6	8	6	6	4	16.3	20	12	18	14	22	15	15	9	16	16
25	1	3	8	5	11	7	9	7	17.0	3	6	25	11	41	19	29	17	19	15
26	5	2	2	2	2	1	4	2	6.7	11	5	4	5	4	3	9	4	6	11
27	1	1	4	5	4	5	4	2	8.7	3	2	9	13	8	11	10	5	8	7
28	3	2	2	4	5	7	13	14	16.7	6	4	5	9	11	17	62	82	25	23
29	11	9	10	9	7	7	5	8	22.0	48	29	34	28	19	18	11	23	26	35
30	13	11	9	10	13	12	13	12	31.0	67	41	30	37	67	57	65	55	52	40
31	14	8	10	7	12	2	4	3	20.0	76	23	38	19	53	5	8	7	29	33
																		16.5	

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	3 Km								Σ Km	am							Am	Am2
1	4	8	5	2	4	4	5	9	13.7	9	23	12	4	8	8	11	29	13	20
2	8	11	10	11	11	4	9	11	25.0	24	42	37	43	41	9	28	42	33	24
3	8	8	4	4	4	7	6	9	16.7	25	25	10	9	9	17	14	30	17	19
4	7	4	3	4	5	3	1	2	9.7	19	9	7	9	12	7	2	4	9	14
5	3	4	10	9	7	7	4	5	16.3	7	10	40	29	17	18	9	11	16	14
6	5	4	5	8	10	9	11	12	21.3	13	9	11	21	34	31	46	53	27	24
7	11	8	6	8	10	9	11	10	24.3	48	26	16	24	34	27	41	34	31	31
8	8	6	8	7	9	13	12	11	24.7	26	16	22	18	30	63	58	46	39	34
9	9	9	8	11	13	11	12	9	27.3	32	28	22	42	64	50	51	32	40	37
10	8	5	6	8	10	8	3	9	19.0	26	12	15	24	35	22	7	29	21	29
11	8	8	8	9	11	9	4	7	21.3	21	22	23	27	44	28	8	17	24	21
12	6	4	3	6	5	4	6	5	13.0	14	10	7	15	12	9	14	11	12	16
13	7	7	6	5	5	8	11	8	19.0	18	19	14	12	11	24	42	26	21	17
14	6	6	5	4	9	8	10	7	18.3	16	16	12	9	30	21	39	17	20	19
15	5	5	5	3	4	7	8	9	15.3	13	12	11	7	10	17	22	28	19	18
16	8	7	7	3	2	4	4	4	13.0	21	17	18	6	5	9	9	8	12	14
17	7	3	4	4	7	9	9	10	17.7	19	7	10	10	17	31	33	37	21	22
18	12	14	8	4	8	6	7	6	21.7	59	72	21	8	21	16	17	14	29	24
19	6	5	5	3	7	8	7	4	15.0	14	11	11	7	19	22	20	8	14	14
20	4	5	6	4	5	3	5	8	13.3	10	11	15	8	11	6	13	22	12	13
21	4	5	6	4	9	8	4	3	14.3	10	11	16	10	28	22	9	6	14	12
22	4	4	3	3	6	7	10	8	15.0	8	9	7	7	14	18	34	26	15	17
23	8	8	8	8	10	11	8	11	24.0	22	23	22	23	34	49	25	44	30	25
24	6	4	5	8	10	8	14	7	20.7	16	8	13	22	39	25	76	17	27	27
25	8	6	6	4	6	6	8	9	17.7	25	16	15	9	16	16	24	31	19	23
26	8	7	2	4	5	6	5	3	13.3	21	20	5	8	12	14	12	7	12	12
27	1	1	1	3	4	4	3	4	7.0	2	2	2	7	9	8	7	9	8	9
28	8	4	6	5	4	2	7	7	14.3	22	9	16	13	8	5	18	19	14	12
																		20.0	

Table 9 - continued

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	3 Kn								ϭn				an				An
1	3	8	5	2	3	3	4	9	1523	2422	7	26	11	4	7	7	10	28	13
2	9	11	9	11	10	4	8	11	3713	2321	27	41	30	43	36	9	23	43	32
3	9	9	4	4	3	7	5	9	3422	2214	27	27	10	9	7	17	13	27	17
4	6	4	4	4	5	3	0	1	2222	3101	16	9	8	9	11	6	0	2	8
5	2	3	11	9	6	6	3	5	3332	0112	5	6	43	29	14	16	7	11	16
6	5	4	4	8	10	9	11	11	1213	5446	11	8	8	21	37	33	48	47	27
7	11	8	6	8	10	9	11	9	2203	6132	48	22	15	23	39	27	45	32	31
8	8	7	8	6	9	13	11	11	2331	4535	21	17	22	15	28	66	49	50	34
9	10	9	7	12	13	12	12	10	2224	3441	36	30	20	52	66	58	55	39	45
10	8	5	6	9	10	8	3	9	2124	5433	22	12	14	27	34	22	6	27	21
11	7	8	8	9	11	8	3	7	3422	4624	19	24	26	27	50	25	7	18	25
12	6	5	3	6	5	4	6	5	4511	2333	16	11	6	16	12	8	15	12	12
13	7	8	5	6	4	7	11	7	4532	2352	19	23	12	14	9	19	45	20	20
14	6	5	5	4	9	7	10	7	2223	4662	14	13	12	8	32	20	39	19	20
15	5	5	4	3	4	6	7	8	1120	2634	12	13	10	7	9	16	19	21	13
16	7	5	6	2	2	3	3	3	2113	3211	19	13	15	4	4	6	7	6	9
17	6	3	4	5	7	9	9	9	1124	3543	16	6	9	12	18	29	33	31	19
18	11	14	7	4	8	6	7	6	2323	4433	43	76	17	8	23	18	17	15	27
19	6	4	4	3	7	8	7	3	4211	3641	14	8	9	7	19	23	20	6	13
20	3	3	7	3	5	3	5	7	1232	5323	7	7	18	7	11	7	12	20	11
21	4	4	5	5	9	8	4	2	2323	4331	8	8	12	11	31	23	10	4	13
22	2	4	2	2	5	6	10	8	1232	4264	5	9	4	5	13	16	34	23	14
23	7	9	8	8	9	11	8	10	4642	2533	20	27	23	25	32	49	26	34	30
24	6	2	5	8	10	8	14	6	3123	4253	15	5	12	22	39	22	80	15	26
25	9	7	6	4	7	7	8	9	4331	5344	27	18	15	10	18	18	24	31	20
26	7	7	3	5	5	6	5	4	3314	4454	18	19	6	12	12	15	13	8	13
27	0	0	1	3	3	3	3	4	2123	1422	1	1	2	7	7	7	7	9	5
28	8	4	7	6	3	2	6	8	3241	2322	21	10	17	14	8	4	14	21	13
																			19.5

FEB. 1977

	3 Ks								σs				as				As
1	4	7	5	2	4	4	5	9	3321	2345	10	19	13	5	10	8	13	30	14
2	8	11	11	11	11	4	9	11	3322	3334	21	43	43	43	44	9	32	41	33
3	8	8	5	4	4	7	6	9	5521	2413	24	23	11	9	10	17	16	32	18
4	8	4	3	4	5	4	1	3	3211	2333	22	10	7	10	13	8	3	7	10
5	4	6	10	9	7	8	5	5	4411	3432	9	15	37	29	19	21	11	12	19
6	6	4	6	8	9	9	11	12	3230	2235	16	10	14	22	31	29	44	58	28
7	11	9	7	8	9	9	10	10	3322	1333	48	30	17	25	29	27	37	37	31
8	9	6	8	8	9	12	13	11	3102	2124	31	15	22	21	31	60	67	41	36
9	9	9	8	9	13	11	11	8	1332	2044	29	27	24	31	62	43	46	25	36
10	9	5	6	8	10	8	4	9	5212	1233	30	13	16	22	35	22	9	31	22
11	8	7	8	9	10	9	4	6	2222	4233	23	20	21	27	38	31	8	16	23
12	5	4	4	6	5	4	5	4	2302	4436	12	9	6	14	12	9	13	10	11
13	7	6	7	5	5	9	10	9	5322	3333	17	15	17	11	13	30	40	32	22
14	7	7	5	4	9	8	10	6	2222	3342	18	20	13	9	26	21	38	15	20
15	5	5	5	4	4	7	8	10	4320	4234	13	11	11	8	10	18	25	34	16
16	8	7	7	3	3	5	4	4	3431	2544	22	20	20	7	6	12	10	9	13
17	8	4	4	4	6	9	9	11	4332	3222	21	9	10	8	16	33	33	44	22
18	14	13	8	4	7	6	7	5	5523	1223	75	68	24	9	20	16	18	13	30
19	6	6	5	4	7	8	7	4	3112	3222	15	14	12	8	18	21	20	10	15
20	6	6	5	4	5	2	6	8	3322	1232	14	15	13	8	12	5	14	25	13
21	5	6	8	4	8	8	4	3	2241	2243	13	14	21	10	24	21	9	7	15
22	5	4	4	4	6	7	9	9	3222	1233	11	10	9	10	14	20	33	30	17
23	8	7	8	8	10	11	8	12	5342	2014	24	19	21	22	37	49	24	54	31
24	7	5	6	8	10	9	14	7	3114	2322	18	12	14	23	39	28	72	18	28
25	8	6	6	3	6	6	8	9	3341	1236	24	14	16	7	15	14	24	31	18
26	8	8	2	2	5	5	5	2	6222	1243	25	21	5	5	12	13	11	5	12
27	1	1	1	3	5	4	4	4	2131	3343	3	2	3	7	11	9	8	9	7
28	8	4	6	5	4	3	8	7	3222	4532	23	9	16	13	9	6	22	18	15
																			20.6

Table 9 - continued

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	3 Kn								σ_n								a_n				A_n
1	7	2	3	4	5	7	9	10	3222	2234	17	5	6	9	12	20	32	36	17
2	1	2	2	6	4	4	6	7	3334	4333	3	4	5	14	10	9	14	17	10
3	5	3	3	4	4	4	1	2	2203	4622	12	6	6	8	8	8	3	4	7
4	0	1	4	1	5	3	3	4	1242	3133	1	3	8	2	12	6	7	9	6
5	2	4	3	3	5	2	3	1	1313	4302	5	10	7	7	12	4	6	3	7
6	2	2	3	3	8	6	6	6	2222	3433	4	5	6	7	24	15	16	16	12
7	5	4	5	4	4	4	2	3	2232	3423	12	10	12	8	10	8	5	6	9
8	4	3	3	3	5	9	9	11	4122	2403	9	7	6	7	11	32	28	48	19
9	9	10	13	12	14	14	11	14	0243	1223	28	37	68	53	84	81	46	82	60
10	11	9	10	8	9	9	9	9	1333	4334	46	30	38	24	31	29	31	33	33
11	7	7	7	8	8	10	11	10	3333	4443	20	18	19	24	26	40	50	36	29
12	11	8	10	11	5	10	11	10	6223	1443	46	21	40	43	13	40	43	36	35
13	10	7	7	6	6	7	7	9	4344	3535	40	18	19	15	15	20	19	32	22
14	11	10	7	5	6	5	4	4	4333	5222	50	39	18	11	14	11	8	10	20
15	3	2	7	7	6	4	0	1	4212	2312	6	4	17	17	15	9	1	2	9
16	5	5	6	3	3	3	6	7	2252	2124	11	11	16	7	7	7	15	17	11
17	7	5	3	6	7	9	9	5	2222	3352	17	13	7	14	18	29	28	12	17
18	9	9	4	7	8	6	5	5	4513	2222	27	31	10	18	24	14	11	11	18
19	1	5	5	2	2	5	6	7	2232	0334	3	11	11	5	4	11	16	16	10
20	11	5	5	6	4	6	8	10	2222	1433	46	13	12	16	9	15	25	39	22
21	3	4	4	4	4	9	11	9	2332	2553	7	10	10	8	10	30	42	32	19
22	7	5	7	7	3	6	2	1	4233	2312	20	12	20	17	7	14	5	3	12
23	4	3	10	7	9	9	9	11	3142	3533	9	7	35	18	29	27	33	45	25
24	9	8	6	4	7	8	6	8	3233	2423	33	22	15	9	19	24	14	23	20
25	7	4	3	6	5	5	11	10	4322	2143	18	8	7	16	13	13	48	38	20
26	10	11	8	7	8	9	5	1	4423	5312	36	46	22	18	24	32	13	2	24
27	4	3	8	6	7	4	7	9	2220	2222	10	6	22	14	17	9	19	30	16
28	7	8	8	6	6	9	9	10	2323	2432	19	25	22	15	14	32	27	35	24
29	12	10	6	5	8	7	7	4	4221	2420	60	36	14	13	23	20	18	9	24
30	2	3	6	7	4	7	4	5	2312	2232	4	7	15	17	8	20	10	12	12
31	5	2	3	5	2	3	4	5	2335	2323	12	4	7	13	5	6	8	12	8
																			18.6

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	3 Ks								σ_s								a_s				A_s
1	7	4	5	5	6	8	9	11	2212	3333	18	9	13	11	15	22	30	45	20
2	2	4	2	4	5	4	5	6	1223	2234	5	8	5	9	11	10	13	16	10
3	6	5	5	4	3	4	1	2	3331	0220	15	11	11	9	6	9	3	5	9
4	1	1	3	1	5	3	4	4	0120	2333	2	3	6	2	13	7	8	10	6
5	4	4	4	3	5	2	4	2	3231	2232	10	10	10	7	13	4	8	5	8
6	4	3	4	3	9	8	8	6	3121	3343	9	7	8	7	27	22	22	16	15
7	6	4	5	4	5	5	3	2	1241	2233	16	10	13	10	11	11	7	5	10
8	5	5	5	4	6	9	9	12	3231	1033	11	12	12	9	15	29	31	54	22
9	10	10	12	11	14	14	11	15	2423	2444	39	36	52	42	71	85	43	87	57
10	13	11	10	7	8	9	10	10	3223	1025	63	46	37	19	26	29	36	36	37
11	8	8	7	6	8	11	12	11	2132	1242	23	21	19	15	23	41	53	46	30
12	12	7	9	9	4	10	11	11	7423	1134	53	17	31	29	10	40	49	49	35
13	12	7	7	4	5	8	8	10	5464	3123	54	18	17	10	12	21	22	35	24
14	12	10	7	4	5	5	3	5	5422	1222	54	39	19	10	13	12	7	11	21
15	4	3	6	6	5	3	0	0	4320	2510	8	7	16	14	12	6	1	0	8
16	4	4	4	3	3	3	7	7	1332	1645	9	9	10	6	6	7	17	18	10
17	8	6	4	6	5	9	9	6	5222	1234	21	15	8	14	12	29	30	14	18
18	8	10	4	6	7	6	5	4	2522	2334	23	35	10	14	18	14	11	10	17
19	3	5	5	1	1	5	6	7	1331	2332	6	11	11	2	3	11	15	20	10
20	11	5	6	6	3	5	9	12	4411	2244	41	13	16	14	7	13	31	56	24
21	4	6	5	2	4	9	10	10	2331	2147	10	14	11	5	9	30	38	38	19
22	8	4	7	5	4	5	3	1	5231	3322	25	10	18	13	8	12	7	2	12
23	5	3	8	6	8	8	10	11	3031	2246	11	6	23	14	21	25	38	43	23
24	9	8	5	4	7	9	6	8	5331	3255	33	22	11	10	20	27	15	21	20
25	8	4	3	6	5	6	12	11	5122	3265	25	9	6	14	12	14	56	42	22
26	10	11	8	6	7	8	5	0	3731	3241	34	47	23	15	19	25	11	1	22
27	4	4	9	5	7	3	7	9	1241	3324	9	9	33	13	18	6	17	28	17
28	7	8	7	4	5	9	9	11	5422	1333	19	25	18	10	12	31	27	49	24
29	12	11	6	5	8	6	6	2	4112	2141	54	41	14	13	21	16	16	5	23
30	1	3	5	4	3	7	4	5	1121	3223	2	6	12	10	6	19	8	11	9
31	7	3	2	5	1	1	2	3	4125	1132	17	6	5	11	2	2	5	7	7
																			19.0

MAR. 1977

	3 Km								Σ Km	am							Am	Am2
1	7	3	4	4	5	8	9	10	16.7	18	7	9	10	13	21	31	40	19	14
2	2	3	2	5	5	4	5	6	10.7	4	6	5	11	11	9	13	16	9	14
3	5	4	4	4	3	4	1	2	9.0	13	9	8	9	7	8	3	5	6	6
4	0	1	3	1	5	3	3	4	6.7	1	3	7	2	12	6	7	9	6	6
5	3	4	4	3	5	2	3	2	8.7	7	10	9	7	12	4	7	4	8	8
6	3	3	3	3	8	7	7	6	13.3	6	6	7	7	25	19	19	16	13	11
7	6	4	5	4	5	4	3	3	11.3	14	10	12	9	11	10	6	6	10	12
8	4	4	4	4	5	9	9	12	17.0	10	9	9	8	13	30	30	51	20	23
9	10	10	12	11	14	14	11	14	32.0	34	36	60	47	78	83	44	85	58	46
10	12	10	10	8	9	9	9	10	25.7	54	38	37	21	28	29	33	34	34	40
11	8	7	7	7	8	10	12	11	23.3	22	19	19	20	24	40	51	41	30	31
12	11	7	10	10	5	10	11	11	25.0	49	19	36	36	11	40	46	43	33	33
13	11	7	7	5	5	7	7	10	19.7	47	18	18	13	13	20	20	34	23	28
14	12	10	7	5	5	5	3	5	17.3	52	39	19	11	13	12	7	11	21	19
15	3	3	7	6	6	3	0	0	9.3	7	6	17	16	14	7	1	1	9	9
16	4	4	5	3	3	3	6	7	11.7	10	10	13	6	7	7	16	18	11	10
17	7	6	4	6	6	9	9	5	17.3	19	14	6	14	15	29	29	13	18	17
18	8	9	4	6	8	6	5	4	16.7	25	33	10	16	21	14	11	10	18	16
19	2	5	5	1	1	5	6	7	10.7	4	11	11	3	3	11	15	19	10	14
20	11	5	6	6	4	6	9	11	19.3	43	13	14	15	8	14	28	47	23	17
21	4	5	4	3	4	9	10	10	16.3	8	12	10	7	10	30	40	35	19	20
22	8	5	7	6	4	5	3	1	13.0	22	11	19	15	8	13	6	3	12	17
23	4	3	9	6	8	8	10	11	19.7	10	6	29	16	25	26	35	44	24	19
24	9	8	5	4	7	8	6	8	18.3	33	22	13	10	19	26	15	22	20	21
25	8	4	3	6	5	5	12	10	17.7	22	9	7	15	12	13	52	40	21	23
26	10	11	8	7	8	9	5	1	19.7	35	46	23	17	21	29	12	2	23	23
27	4	4	9	6	7	4	7	9	16.7	10	8	28	14	17	8	16	29	17	17
28	7	8	7	5	5	9	9	11	20.3	19	25	20	13	13	32	27	42	24	24
29	12	10	6	5	8	7	7	3	19.3	57	38	14	13	22	18	17	7	23	21
30	1	3	6	6	3	7	4	5	11.7	3	7	14	14	7	20	9	12	11	12
31	6	2	3	5	1	2	3	4	8.7	14	5	6	12	3	4	6	10	8	9
																		16.9	

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	3 Km								Σ Km	am							Am	Am2
1	2	4	8	1	4	3	3	2	9.0	5	10	23	3	8	7	7	4	8	8
2	3	4	5	6	2	4	1	8	11.0	6	8	11	15	4	8	2	23	10	12
3	10	7	8	7	4	4	7	9	18.7	37	17	22	20	8	9	18	27	20	24
4	14	11	11	6	8	8	10	9	25.7	84	43	50	16	24	22	39	33	39	29
5	10	6	7	7	5	7	9	9	20.0	39	14	18	18	13	20	28	29	22	26
6	11	10	9	5	8	15	15	16	29.7	43	34	28	11	24	101	97	111	56	53
7	15	14	14	11	12	8	13	9	32.0	102	76	82	49	59	21	68	28	61	63
8	12	9	11	11	10	11	10	12	28.7	59	29	46	48	40	50	39	59	46	45
9	12	11	11	9	11	10	7	8	26.3	51	45	48	27	41	34	19	25	36	36
10	10	9	8	3	7	10	8	7	20.7	38	31	22	7	20	35	23	20	25	25
11	9	8	6	4	8	8	9	10	20.7	29	23	15	10	24	24	32	36	24	21
12	9	4	1	4	6	5	6	10	15.0	27	8	2	8	16	13	16	38	16	18
13	6	2	5	3	4	2	3	6	10.3	14	5	12	7	8	5	6	14	9	16
14	9	4	10	8	4	6	8	9	19.3	29	8	39	22	9	16	23	32	22	19
15	8	10	9	4	6	3	2	5	15.7	25	36	27	10	15	7	4	11	17	18
16	4	9	6	5	8	11	13	11	22.3	10	28	15	12	23	50	63	42	30	23
17	9	7	8	8	5	4	6	5	17.3	31	18	21	22	12	8	14	13	17	23
18	6	4	3	8	7	7	6	4	15.0	16	10	6	23	17	19	15	9	14	33
19	10	15	17	15	14	12	10	12	35.0	34	98	139	91	72	52	40	57	73	52
20	11	10	12	12	10	13	9	9	28.7	48	36	58	54	36	67	31	27	45	43
21	9	8	10	7	4	5	8	8	19.7	30	22	37	18	9	11	22	21	21	24
22	4	5	8	4	2	5	5	2	11.7	10	12	22	8	5	12	11	5	11	12
23	2	6	5	4	5	4	5	4	11.7	4	15	12	8	12	10	12	10	10	11
24	5	4	6	9	8	10	7	7	18.7	11	8	15	27	22	36	18	18	19	25
25	15	12	10	8	3	5	3	4	20.0	88	55	38	25	7	11	7	10	30	23
26	3	5	4	4	1	4	3	2	8.7	6	12	9	10	3	8	7	4	7	8
27	3	4	3	4	3	2	1	4	8.0	7	8	7	9	6	4	2	8	6	6
28	1	2	1	2	2	5	6	6	8.3	3	5	3	4	4	11	14	15	7	15
29	10	10	12	10	10	5	7	9	24.3	34	40	52	34	37	11	18	33	32	23
30	5	8	5	4	6	5	6	7	15.3	12	26	13	9	16	12	15	18	15	17
																		24.9	

Table 9 - continued

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	3 Kn								ϑn								An
1	1	4	8	1	4	4	4	2	0231	3531	3	9	22	3	8	9	8	4	8
2	3	3	5	6	2	4	1	8	1230	2222	7	7	11	14	4	8	2	26	10
3	10	6	8	8	4	4	7	8	4222	2323	34	16	21	22	8	10	18	26	19
4	14	11	12	7	9	8	10	10	4253	2254	80	50	56	18	27	23	37	35	41
5	10	6	7	7	5	7	9	8	3322	2423	37	14	20	18	13	17	28	25	22
6	11	10	9	5	9	15	15	17	2651	1534	42	40	32	13	29	102	102	127	61
7	16	14	15	12	13	8	14	8	5664	4332	116	85	96	54	61	22	76	25	67
8	12	9	12	12	10	11	10	11	2145	2321	56	26	52	56	34	46	34	49	44
9	11	11	12	9	11	9	7	8	2443	3221	45	46	57	30	41	28	19	24	37
10	9	9	8	4	8	10	8	6	4221	3532	30	33	22	10	21	36	24	16	24
11	9	8	6	5	8	8	9	10	2312	3433	27	24	14	11	24	21	30	34	23
12	8	4	1	4	6	6	7	9	3236	2533	25	8	3	8	16	15	16	33	16
13	6	2	6	4	4	3	4	6	2442	2221	14	4	14	8	10	7	8	16	10
14	8	4	11	8	4	6	8	9	1245	3422	25	9	41	24	8	15	23	29	22
15	8	10	9	5	6	4	2	4	3541	3312	26	34	28	12	16	8	5	10	17
16	4	8	6	6	8	11	12	10	2223	2352	10	24	15	14	26	41	60	36	28
17	9	7	8	8	5	4	6	6	3234	3411	31	19	24	23	11	8	15	14	18
18	6	4	3	8	7	8	7	5	3224	3322	16	10	7	25	19	23	17	12	16
19	9	15	17	15	13	11	10	12	3353	2334	31	100	144	89	64	48	36	53	71
20	11	10	14	13	10	13	9	9	3353	3520	47	38	74	62	34	70	31	28	48
21	8	8	10	7	4	5	8	7	3332	2234	24	22	37	18	9	12	24	20	21
22	5	5	8	4	3	5	5	2	2221	2422	12	12	24	8	6	13	12	5	12
23	2	6	5	4	5	4	5	6	1421	3322	5	16	13	10	13	9	12	14	12
24	5	4	6	9	8	10	8	8	3252	3432	11	9	14	28	21	37	22	21	20
25	15	12	11	9	4	5	4	5	3252	2122	88	53	44	28	8	12	8	12	32
26	4	5	5	5	3	5	4	3	2323	3222	8	13	11	12	6	12	9	7	10
27	4	3	4	4	3	2	2	5	2232	2223	8	7	8	10	7	5	4	11	8
28	1	2	2	3	2	5	7	7	2311	1111	3	5	5	6	4	13	17	18	9
29	10	10	12	9	10	5	7	9	1443	3223	35	36	52	33	37	13	20	32	32
30	5	9	6	5	7	5	6	8	1543	3222	13	31	16	13	18	11	14	21	17
																			25.6

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	3 Ks								ϑs								As
1	3	5	8	1	4	3	2	1	3122	2142	7	12	24	3	8	6	5	3	9
2	2	4	5	6	2	4	0	7	2332	2312	5	8	11	16	5	9	1	20	9
3	10	7	8	7	3	4	7	9	5541	1423	40	18	23	18	7	8	18	28	20
4	15	10	11	6	8	8	10	9	5322	2141	88	37	43	14	21	21	40	32	37
5	11	5	6	7	5	8	9	9	3112	2224	41	13	16	17	13	22	28	33	23
6	11	9	8	4	7	15	15	15	2362	3133	44	28	25	8	18	101	92	96	52
7	15	13	13	11	12	7	13	9	5544	2434	89	66	68	44	57	20	61	31	55
8	13	9	10	10	11	12	11	13	3341	3224	63	31	40	40	47	53	44	68	48
9	12	11	10	8	11	10	7	9	5333	1123	57	43	40	25	41	40	18	27	36
10	11	9	8	2	7	9	8	8	4322	2325	46	29	21	4	19	33	22	24	25
11	9	8	6	4	8	8	10	10	3461	3105	31	21	16	10	24	26	35	37	25
12	9	4	1	4	6	5	6	11	7215	3325	29	8	2	8	16	12	14	42	16
13	6	2	4	3	3	2	2	5	3031	5221	14	5	10	7	6	4	5	12	8
14	9	4	10	8	4	6	8	10	4131	1333	33	8	37	21	10	16	22	35	23
15	8	11	8	4	6	3	2	5	5841	2214	25	41	26	8	14	6	4	12	17
16	4	9	6	4	7	12	13	11	5432	3135	10	32	15	10	19	58	66	49	32
17	9	7	7	8	5	4	5	5	4625	3242	31	17	17	21	13	9	12	11	16
18	6	4	3	8	6	6	5	3	5233	1233	16	10	6	21	15	14	12	7	13
19	10	15	17	15	14	12	11	13	5221	1137	37	95	133	93	79	56	43	61	75
20	11	10	11	11	10	13	9	8	4424	2344	50	35	41	46	39	65	31	25	42
21	10	8	10	7	4	4	7	8	6312	3114	36	22	37	18	8	9	20	22	22
22	4	5	7	4	2	5	4	3	3320	2333	8	11	20	8	5	11	10	6	10
23	1	6	5	3	5	5	5	3	3331	1413	3	14	11	6	12	11	12	6	9
24	5	4	6	9	6	10	6	6	5311	3433	11	8	15	27	23	35	14	16	19
25	15	12	9	8	3	4	3	3	3252	1211	87	57	33	21	7	9	7	7	29
26	2	4	4	4	0	2	2	1	2112	2121	5	10	8	9	1	5	5	2	6
27	3	4	3	4	3	1	0	2	0212	2012	7	8	6	8	6	2	1	5	5
28	1	2	0	0	2	4	5	5	2111	5231	3	4	1	1	4	9	11	12	6
29	9	11	12	10	10	4	6	10	4354	2234	33	43	52	36	36	9	16	34	32
30	5	8	5	2	5	5	6	6	3430	4232	11	21	11	5	13	13	16	14	13
																			24.4

Table 9 - continued

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	3 Kn								ϭn								an				An
1	6	7	6	5	7	7	11	12	2222	3432	16	18	14	12	17	20	42	51	24
2	14	13	10	14	16	16	15	14	4544	2624	86	65	37	85	110	119	96	76	84
3	11	9	11	11	6	5	4	7	3365	4323	46	30	50	49	16	11	9	17	29
4	4	5	7	6	8	14	13	10	1322	3333	8	13	19	14	26	86	64	37	33
5	9	6	10	5	5	7	7	8	3342	2432	27	15	40	12	13	19	17	22	21
6	8	8	6	7	7	8	8	6	2312	3332	26	26	16	19	18	21	21	14	20
7	6	5	6	3	2	2	6	7	3332	3246	15	12	16	7	4	5	14	18	11
8	2	4	2	2	3	2	2	4	3132	2232	5	8	5	5	6	4	5	8	6
9	4	6	4	7	5	8	5	4	3222	4613	10	14	8	18	13	22	12	10	13
10	3	4	11	7	7	8	5	7	2342	3323	7	10	41	20	18	21	11	18	18
11	6	5	10	10	9	12	14	8	1146	1362	14	12	39	37	27	57	76	21	35
12	7	15	11	9	7	4	4	3	2333	4321	20	100	47	29	19	10	9	7	30
13	3	5	4	5	3	2	8	6	3222	2343	6	13	8	11	6	4	24	16	11
14	6	7	7	5	5	4	6	9	3131	3320	14	19	19	12	11	10	14	28	16
15	10	6	8	9	8	7	7	9	2032	3231	37	14	22	33	26	19	19	29	25
16	10	11	9	10	9	10	11	10	3433	2313	37	49	28	38	27	34	44	34	36
17	9	11	12	9	9	9	8	6	2433	0330	30	45	54	31	28	30	21	15	32
18	8	8	8	9	9	6	5	4	3344	3333	25	26	23	32	27	15	13	8	21
19	5	4	4	5	5	5	4	3	2223	3231	13	9	9	11	11	13	10	7	10
20	5	5	7	6	8	8	10	6	2220	4222	12	12	17	14	23	23	37	15	19
21	3	3	4	4	3	5	4	7	3233	3222	7	6	9	9	6	12	8	17	9
22	6	11	10	4	4	3	4	4	1452	3122	15	45	35	9	10	7	9	9	17
23	7	5	4	5	5	8	5	5	2123	1431	18	13	9	11	13	23	12	13	14
24	6	7	7	7	7	8	7	6	0323	2321	15	20	17	19	17	24	20	15	18
25	7	4	7	6	5	7	4	4	2133	3322	18	8	17	14	12	19	10	9	13
26	2	3	1	1	2	4	4	5	2131	1233	4	7	3	2	5	9	9	13	7
27	3	4	5	3	4	4	3	2	1233	3312	7	8	13	7	10	10	6	5	8
28	3	6	3	10	7	4	8	4	1234	2211	7	16	7	40	20	9	25	8	17
29	4	2	2	1	5	3	3	3	2231	2022	10	5	4	2	12	7	7	7	7
30	4	4	5	6	5	5	5	3	2232	2221	9	8	13	15	13	12	12	6	11
31	6	7	9	4	8	7	4	7	1241	2322	14	20	28	10	22	19	10	20	18
																			20.4

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	3 Ks								ϭs								as				As
1	7	5	5	4	5	6	12	11	5342	2143	20	11	13	8	11	14	59	45	23
2	16	11	9	14	16	17	14	14	6425	2434	109	49	27	71	111	122	85	71	81
3	9	9	8	9	5	4	2	4	4333	2243	30	30	23	30	11	8	5	8	18
4	2	6	6	4	6	12	13	10	2313	2436	5	15	16	8	15	59	67	35	28
5	9	6	10	4	4	7	9	9	6351	2237	33	15	37	9	10	17	27	28	22
6	11	9	6	8	6	7	7	5	3314	2112	42	28	15	24	16	18	19	12	22
7	7	6	4	3	0	0	6	6	6431	1134	19	15	10	7	1	1	14	16	10
8	2	2	0	2	2	0	0	3	2413	2112	5	5	1	4	4	1	1	6	3
9	4	5	4	6	4	7	4	2	4123	2132	9	12	9	16	10	19	8	4	11
10	2	4	9	8	5	7	4	7	4222	2223	5	9	32	22	11	17	8	18	15
11	6	4	10	9	8	11	15	9	6241	2354	15	10	39	31	21	43	94	28	35
12	8	14	11	8	5	4	3	2	5542	2013	24	80	46	22	13	8	7	4	26
13	1	5	2	4	1	0	8	5	1212	1143	3	12	4	9	3	1	26	13	9
14	7	6	6	4	3	4	5	8	5211	3343	20	14	16	8	6	8	12	22	13
15	12	7	6	9	8	7	7	9	3411	3225	56	17	16	31	24	17	19	33	27
16	12	12	9	9	9	10	12	11	4531	4234	59	51	30	29	27	35	51	41	40
17	10	12	11	10	7	9	9	5	4526	1311	40	54	45	35	18	29	30	12	33
18	9	8	9	8	7	4	5	2	6532	1031	27	26	29	25	18	8	11	4	19
19	5	5	2	2	3	4	2	3	2121	1124	11	12	4	5	7	10	4	7	8
20	4	6	6	5	7	6	9	4	3515	1132	8	14	14	11	16	16	30	9	15
21	1	0	3	2	0	3	1	4	2022	1233	2	0	6	5	1	6	3	9	4
22	4	10	8	2	3	1	3	1	3233	5210	10	34	22	4	6	3	6	2	11
23	6	4	2	3	4	5	2	5	3222	1135	15	10	5	6	8	12	5	11	9
24	5	7	7	6	3	7	7	5	1531	1200	12	19	19	15	6	18	17	11	15
25	6	4	5	3	2	5	2	1	2221	2342	14	9	12	6	5	12	5	3	8
26	2	1	0	0	0	0	2	2	3212	1124	4	3	1	1	1	1	4	5	3
27	2	1	2	1	1	2	1	0	2122	2211	4	2	5	2	3	5	2	1	3
28	2	5	1	8	7	2	4	2	2313	2352	5	12	2	23	17	4	9	4	10
29	4	0	0	0	3	1	0	0	4100	2110	8	1	0	0	6	2	1	0	2
30	1	1	3	4	4	1	1	0	3031	2221	2	2	6	10	8	3	3	1	4
31	5	6	8	2	5	4	1	4	2352	1222	12	15	24	4	12	10	3	10	11
																			17.4

Table 9 - continued

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	3 Km								Σ Km	am							Am	Am2
1	7	6	5	4	6	7	12	11	19.3	18	15	13	10	14	17	51	46	23	32
2	15	12	9	14	16	17	15	14	37.3	98	57	32	78	110	121	91	73	83	56
3	10	9	10	10	6	4	3	5	19.0	38	30	37	39	14	9	7	13	23	39
4	3	6	7	5	7	14	13	10	21.7	6	14	17	11	20	72	66	36	30	24
5	9	6	10	5	5	7	8	8	19.3	30	15	39	11	12	16	22	25	22	29
6	10	9	6	8	7	7	7	5	19.7	34	27	16	21	17	19	20	13	21	16
7	7	5	5	3	1	1	6	7	11.7	17	13	13	7	2	3	14	17	11	11
8	2	3	1	2	2	1	1	3	5.0	5	6	3	5	5	3	3	7	5	6
9	4	5	4	7	5	8	4	3	13.3	10	13	8	17	12	21	10	7	12	12
10	3	4	10	8	6	7	4	7	16.3	6	9	36	21	14	19	9	16	17	16
11	6	5	10	10	8	11	14	8	24.0	14	11	39	34	24	50	65	25	35	33
12	8	15	11	8	6	4	4	3	19.7	22	90	47	25	16	9	8	6	26	26
13	2	5	3	4	2	1	8	6	10.3	5	13	6	10	4	2	25	14	10	11
14	7	6	7	4	4	4	5	8	15.0	17	16	18	10	8	9	13	25	15	17
15	11	6	7	9	8	7	7	9	21.3	47	16	19	32	25	16	19	31	26	26
16	11	11	9	9	9	10	11	10	26.7	48	50	29	33	27	35	48	37	38	35
17	10	11	11	9	8	9	8	5	23.7	35	49	49	33	23	30	25	13	32	32
18	8	8	8	9	8	5	5	3	18.0	26	26	26	29	23	12	12	6	20	16
19	5	4	3	4	4	5	3	3	10.3	12	10	7	8	9	12	7	7	9	11
20	4	5	6	5	8	7	9	5	16.3	10	13	16	13	21	20	33	12	17	12
21	2	1	3	3	1	4	3	5	7.3	4	3	7	7	3	9	6	13	7	14
22	5	10	9	3	4	2	4	2	13.0	13	40	29	6	8	5	8	5	14	12
23	6	5	3	4	4	7	4	5	12.7	16	12	7	8	10	18	8	12	11	12
24	5	7	7	7	5	8	7	5	17.0	13	20	18	17	11	21	18	13	16	14
25	6	4	6	4	4	6	4	3	12.3	16	8	15	10	9	15	8	6	11	10
26	2	2	1	1	1	2	3	4	5.3	4	5	2	2	3	5	7	9	5	6
27	2	2	4	2	3	3	2	1	6.3	5	5	9	5	7	7	4	3	6	8
28	3	6	2	9	7	3	7	3	13.3	6	14	4	31	18	6	17	6	13	9
29	4	1	1	0	4	2	2	1	5.0	9	3	2	1	9	4	4	3	4	7
30	2	2	4	5	4	3	4	2	8.7	5	5	9	12	10	7	8	4	8	9
31	5	7	8	3	7	6	3	6	15.0	13	17	26	7	17	15	6	15	15 16.9	13

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	3 Km								Σ Km	am							Am	Am2
1	6	7	5	4	6	8	8	8	17.3	16	17	13	10	15	22	26	24	16	16
2	11	8	7	5	8	8	7	11	21.7	42	23	18	13	22	23	19	50	26	22
3	4	6	6	4	6	2	2	5	11.7	10	16	14	8	15	5	5	12	11	16
4	5	6	5	5	5	3	3	1	11.0	11	14	12	12	12	6	6	3	10	11
5	4	7	4	7	9	4	3	3	13.7	10	18	10	19	31	10	6	7	14	12
6	7	4	5	3	4	2	3	5	11.0	17	10	12	7	10	4	6	11	10	10
7	2	3	4	5	5	3	7	4	11.0	5	6	9	13	13	6	17	10	10	9
8	2	3	5	4	6	5	5	6	12.0	4	6	12	9	16	12	11	14	11	11
9	5	3	5	3	3	3	5	8	11.7	12	7	12	7	6	6	12	23	11	14
10	8	9	7	7	3	2	3	5	14.7	26	28	20	17	7	5	7	13	15	12
11	3	5	3	2	2	1	3	5	8.0	6	11	6	4	5	3	7	13	7	7
12	5	5	1	0	1	1	6	4	7.7	13	11	3	1	2	3	15	9	7	6
13	4	5	4	3	3	3	4	8	11.3	10	13	9	7	7	7	10	24	11	13
14	11	8	7	5	5	2	5	6	16.3	46	22	19	11	11	5	11	15	18	13
15	3	4	1	1	1	1	4	3	6.0	6	10	3	2	2	3	9	7	5	6
16	5	3	5	5	9	9	7	6	16.3	11	7	12	13	28	32	19	14	17	14
17	7	8	7	5	7	7	5	5	17.0	17	23	19	13	16	17	11	12	16	19
18	4	6	10	7	6	7	8	8	18.7	9	15	34	20	16	20	26	23	20	19
19	8	7	8	8	7	7	4	5	18.0	21	19	21	22	18	20	8	11	16	20
20	10	8	8	7	9	4	5	4	18.3	35	22	26	18	27	8	12	10	20	17
21	3	6	7	5	6	5	4	3	13.0	7	14	17	12	15	11	9	7	12	12
22	5	4	3	5	8	8	9	4	15.3	11	10	7	11	22	22	30	10	15	16
23	10	8	5	4	6	6	5	5	16.3	40	26	11	9	15	14	11	12	17	18
24	5	9	9	4	4	4	5	7	15.7	11	27	27	8	8	10	11	17	15	13
25	5	4	4	4	5	4	3	4	11.0	12	10	8	9	12	10	6	8	9	10
26	5	4	5	5	5	5	2	4	11.7	11	10	12	13	12	11	5	9	10	11
27	8	6	5	4	5	5	6	2	13.7	21	14	12	9	13	12	15	5	13	15
28	5	8	8	11	8	7	8	7	20.7	12	21	23	42	23	18	25	20	23	19
29	8	7	6	6	4	4	4	6	15.0	25	19	16	14	8	10	8	14	14	16
30	6	5	6	6	5	5	8	8	16.3	15	11	15	15	12	13	21	23	16 14.0	20

Table 9 – continued

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	3 Kn								∂n				∂n				An
1	7	7	6	5	7	8	9	9	2224	3231	19	16	15	11	16	21	30	26	20
2	11	8	7	6	8	9	7	11	2331	2353	41	25	19	16	25	28	16	47	27
3	5	7	6	4	7	3	4	6	2201	2221	11	16	14	10	20	6	10	15	13
4	6	6	5	7	7	4	4	3	3133	3222	14	15	13	19	17	9	9	6	13
5	5	7	5	8	9	5	4	4	3234	1321	11	16	12	25	31	11	10	9	16
6	7	5	6	4	5	2	3	5	3212	3211	16	11	14	8	11	5	7	13	11
7	4	3	5	6	5	4	8	5	1122	1321	6	7	12	15	15	9	22	11	12
8	2	4	6	5	7	7	6	6	2321	2212	5	6	14	12	16	17	14	16	13
9	5	4	6	4	3	4	6	8	3212	2324	12	8	15	9	7	10	14	24	12
10	9	9	8	7	4	4	5	6	2233	2121	29	33	21	16	8	6	11	15	16
11	4	5	4	3	3	2	4	6	2132	3222	6	12	6	5	7	5	9	15	9
12	5	4	2	1	2	2	6	5	2231	2332	13	10	4	2	4	5	16	12	8
13	5	6	4	4	4	4	6	9	2433	2324	12	16	10	9	8	10	14	31	14
14	10	8	7	5	5	4	5	6	2223	3122	40	23	20	12	13	8	11	15	16
15	3	5	3	2	1	3	4	5	1332	1232	7	11	6	4	3	6	9	11	7
16	5	4	5	6	10	11	9	7	1234	3322	12	9	13	14	37	41	27	17	21
17	7	9	8	6	8	8	6	6	2033	1221	19	26	23	15	21	23	15	15	20
18	5	7	10	8	7	8	9	9	3244	5340	12	20	36	23	16	26	30	30	25
19	7	8	8	8	8	8	5	6	2423	3421	19	22	21	25	23	24	12	16	20
20	9	8	9	7	9	5	5	5	3132	2132	32	25	32	20	28	12	13	12	22
21	4	7	7	6	7	5	4	5	2222	2122	9	17	20	15	16	13	9	11	14
22	6	4	4	5	9	9	10	5	2122	3522	14	9	9	12	30	29	36	13	19
23	11	9	6	5	7	7	6	5	4223	3311	43	29	14	12	20	17	14	13	20
24	6	9	9	5	5	6	6	8	2341	2323	14	30	32	11	12	14	14	23	19
25	5	5	4	5	6	5	4	5	2343	2424	11	12	10	11	15	13	10	11	12
26	5	5	6	7	6	4	3	5	1133	2312	13	11	14	16	15	10	7	13	13
27	8	6	5	5	7	6	7	4	2212	3022	25	14	13	12	17	15	20	9	16
28	5	8	8	11	9	8	8	7	3212	4423	13	24	25	41	29	23	22	20	25
29	8	7	6	7	5	6	4	7	3434	3422	22	16	16	17	11	14	9	19	16
30	6	5	7	7	6	7	8	8	3233	3532	14	11	16	17	15	20	25	21	18
																			16.4

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	3 Ks								∂s				as				As
1	6	6	5	4	5	8	8	7	3233	3124	14	16	11	8	11	24	22	20	16
2	11	8	7	4	7	7	8	12	4441	2223	43	21	17	10	16	17	21	54	25
3	4	6	5	3	5	2	0	4	2443	3512	9	15	13	6	11	4	1	10	9
4	4	5	4	3	3	1	2	0	2220	1130	9	12	10	6	7	3	4	0	6
5	4	7	4	6	9	4	1	2	2320	2233	9	16	9	14	31	9	3	4	12
6	7	4	5	3	4	1	2	4	4522	1222	17	9	11	6	8	2	4	9	8
7	1	2	2	4	5	1	5	4	3322	3322	5	5	5	10	11	5	12	9	7
8	1	2	4	3	6	3	4	5	1243	4235	2	4	10	7	14	7	8	11	8
9	5	3	4	2	2	1	4	8	1122	2326	12	6	9	5	5	3	10	22	9
10	8	8	7	6	3	1	1	5	2533	1233	23	24	19	16	7	2	2	11	13
11	2	5	1	0	2	0	2	5	1321	3123	4	11	3	1	4	1	5	11	5
12	5	5	0	0	0	1	6	3	5511	0223	12	12	1	1	0	2	14	7	6
13	4	4	3	2	2	2	2	7	3432	0312	9	10	7	4	5	4	5	17	8
14	12	8	7	4	4	1	5	6	4412	3254	52	22	19	9	8	2	11	16	17
15	2	4	0	0	0	0	4	1	2311	1121	5	9	1	1	1	1	9	3	4
16	4	2	5	5	7	8	5	4	4136	1322	10	4	11	13	19	23	12	10	13
17	6	7	6	5	6	4	3	4	5242	1241	15	16	16	11	16	10	7	9	13
18	3	5	9	7	6	6	8	6	1632	4133	7	11	29	17	14	14	22	16	16
19	8	6	8	7	5	6	2	3	2443	3143	23	16	21	19	13	16	5	6	15
20	10	7	8	6	8	2	5	3	4221	2222	36	19	21	16	25	5	11	7	16
21	2	5	5	4	5	4	4	2	3321	2011	4	11	13	8	11	8	9	4	9
22	4	4	3	4	6	6	8	3	3222	1323	8	10	6	10	15	15	24	7	12
23	10	8	4	3	4	5	4	4	5321	2114	37	22	9	7	10	12	9	10	15
24	4	8	8	3	1	3	3	4	3533	2444	9	23	23	6	3	7	7	10	11
25	5	4	3	3	4	3	1	3	3361	3322	12	9	7	7	9	6	2	6	7
26	4	4	4	4	4	5	1	2	4232	3524	9	9	9	9	9	11	3	5	8
27	7	6	5	3	4	4	5	0	3113	3431	18	14	12	7	9	9	11	1	10
28	5	7	8	11	7	5	9	7	5323	2235	11	18	21	43	17	12	27	19	21
29	9	7	6	5	3	3	3	4	4253	5124	27	20	15	11	6	6	6	9	13
30	6	4	5	6	4	3	6	8	5222	2312	15	10	12	14	10	7	16	25	14
																			11.6

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	3 Kn								ɐn		ɑn						An
1	9	8	12	12	5	9	8	7	1244	2322	27	24	54	54	12	32	25	19	31
2	8	6	7	7	7	9	8	8	2232	3322	23	16	20	17	18	27	23	23	21
3	5	4	8	7	9	8	6	5	3133	2513	11	10	22	19	27	23	16	12	18
4	7	6	9	7	4	3	3	9	3423	3321	20	15	27	18	8	7	7	29	16
5	4	2	3	6	7	7	5	5	1332	3322	10	5	7	15	18	20	12	11	12
6	4	3	7	10	14	14	11	12	1222	3432	9	7	17	35	83	71	43	57	40
7	13	11	11	7	7	6	5	6	2423	1222	62	46	44	17	20	14	12	16	29
8	8	11	7	9	8	9	8	9	2423	2231	23	42	19	28	25	32	21	26	27
9	10	9	7	9	7	8	10	9	3124	2242	35	27	18	33	17	24	36	33	28
10	11	10	7	8	8	9	9	8	2232	3321	44	38	20	21	26	27	26	26	29
11	8	10	11	6	7	5	7	5	1343	2133	21	34	44	15	18	13	18	12	22
12	4	4	4	5	2	2	4	5	2222	1321	10	9	8	11	5	5	9	12	9
13	7	9	6	6	8	6	8	6	3332	3431	17	31	16	15	24	15	21	15	19
14	9	14	13	12	7	5	6	5	3122	1123	31	72	67	55	17	12	14	11	35
15	8	9	8	6	7	8	7	10	1422	2122	23	28	22	16	17	21	19	37	23
16	7	8	13	14	11	11	8	11	2341	3313	20	22	67	77	43	46	25	50	44
17	8	8	10	9	5	9	9	9	1223	2244	26	22	34	27	12	27	32	32	27
18	6	6	6	6	8	6	5	7	0312	2323	15	15	14	14	23	15	13	17	16
19	9	6	12	11	11	11	10	9	3232	3531	28	15	60	44	42	43	36	33	38
20	10	12	14	12	12	9	9	9	1353	3521	35	56	80	57	52	33	28	33	47
21	11	8	8	5	6	8	7	7	3522	3332	44	24	22	11	15	21	20	19	22
22	8	9	10	11	5	6	6	7	3454	4333	25	27	36	48	11	15	16	18	25
23	8	6	7	4	6	2	4	4	4242	3222	21	16	20	10	15	5	8	10	13
24	5	4	4	8	7	7	8	7	2122	4333	11	9	10	21	19	18	26	17	16
25	5	4	4	4	5	4	3	6	1322	2321	12	10	10	8	11	8	6	16	10
26	4	4	2	4	4	5	3	1	2223	2311	9	9	5	9	8	12	7	2	8
27	1	3	4	4	3	2	4	5	2133	4221	3	6	10	8	7	4	8	12	7
28	4	4	2	4	4	5	4	4	2333	3322	10	8	5	9	9	12	8	10	9
29	16	19	18	14	18	12	7	8	1462	3323	105	181	148	85	154	51	20	22	96
30	13	13	12	11	6	6	6	5	2655	0302	67	68	52	42	14	14	14	11	35
31	7	9	6	7	5	4	4	7	3513	1433	20	30	14	17	13	9	10	17	16
																			25.4

JULY 1977

	3 Ks								ɐs		ɑs						As
1	9	10	10	10	4	7	6	5	4623	2202	28	36	39	37	10	18	14	12	24
2	8	5	8	6	4	7	8	6	4320	1123	22	13	21	14	10	19	23	16	17
3	3	3	6	6	6	6	5	4	3310	2112	6	6	14	14	14	15	12	9	11
4	7	6	10	4	1	2	2	8	5451	1224	17	16	35	10	3	4	5	22	14
5	4	1	2	4	8	5	3	4	5112	4333	8	3	4	9	22	13	7	8	9
6	5	1	4	9	11	9	9	9	4221	2213	11	3	9	29	50	28	27	31	24
7	12	11	9	6	7	5	3	8	3511	3106	51	45	33	14	20	12	7	25	26
8	9	10	6	8	8	9	4	8	6433	1116	32	40	15	24	23	27	9	25	24
9	9	8	7	11	5	7	10	11	4232	3156	32	23	19	41	11	20	37	45	29
10	13	10	5	6	9	8	10	10	5522	2224	70	35	12	14	31	25	35	34	32
11	10	11	9	6	5	3	7	7	4633	1325	34	41	29	15	12	7	18	19	22
12	5	4	2	2	1	1	1	3	4232	2323	12	8	4	5	3	3	3	6	6
13	6	10	6	4	6	4	8	5	5552	1212	16	37	15	9	15	10	24	11	17
14	9	13	12	11	6	4	4	2	5524	1222	28	66	51	48	14	8	9	4	29
15	7	7	7	4	4	6	5	8	5341	1113	20	18	17	10	10	16	13	24	16
16	5	7	12	12	9	10	7	11	1221	1315	12	20	57	56	33	40	19	44	35
17	8	8	8	8	4	7	11	9	2333	3134	24	24	26	24	9	19	41	33	25
18	5	3	5	4	7	3	4	5	4223	4132	13	7	11	9	19	7	8	11	11
19	9	6	13	11	10	10	8	9	5132	2223	32	16	65	45	38	38	22	31	36
20	11	11	11	10	12	10	9	9	2332	1415	44	49	49	40	54	34	30	32	42
21	10	8	7	4	4	6	8	5	3332	2245	34	23	20	8	9	14	25	12	16
22	8	7	9	8	4	3	5	7	3534	1224	23	20	27	25	8	7	11	20	18
23	8	8	5	1	3	0	2	3	6131	2123	25	21	11	3	6	1	5	7	10
24	4	3	3	5	4	4	6	5	3211	1223	10	7	6	12	10	9	14	11	10
25	5	3	2	0	1	2	0	5	4131	2201	11	6	4	1	3	4	0	12	5
26	2	3	1	2	1	1	1	0	1322	2320	5	7	3	4	3	3	3	0	4
27	0	1	3	1	2	0	1	3	1112	1023	1	3	6	3	4	0	3	7	3
28	4	3	0	3	0	4	1	2	3424	2112	8	7	1	7	1	9	3	4	5
29	15	16	15	12	18	9	7	5	2424	3444	95	120	98	57	158	32	17	13	74
30	14	12	9	8	4	5	6	4	4653	2334	74	59	33	25	9	11	14	8	29
31	7	9	6	6	4	2	4	7	7632	2124	18	28	15	14	9	5	8	17	14
																			20.6

Table 9 - continued

Part B.

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	3 Km								Σ Km	am							Am	Am2
1	9	9	11	11	5	8	7	6	22.0	28	30	47	45	11	25	20	15	28	23
2	8	6	8	6	6	8	8	7	19.0	22	15	21	16	14	23	23	19	19	17
3	4	4	7	7	8	7	6	5	16.0	9	8	18	17	21	19	14	11	15	17
4	7	6	9	6	2	3	3	8	14.7	19	16	31	14	5	6	6	25	15	14
5	4	2	2	5	7	6	4	4	11.3	9	4	5	12	20	16	10	9	11	12
6	4	2	5	9	13	11	10	11	21.7	10	5	13	32	67	49	35	44	32	29
7	12	11	10	6	7	5	4	7	20.7	56	45	39	16	20	13	9	20	27	33
8	9	11	7	8	8	9	6	8	22.0	28	41	17	26	24	29	15	26	26	24
9	9	8	7	10	6	8	10	10	22.7	33	25	18	37	14	22	36	39	28	26
10	12	10	6	7	9	8	9	9	23.3	57	36	16	17	29	26	31	30	30	29
11	9	10	10	6	6	4	7	6	19.3	28	38	37	15	15	10	18	15	22	20
12	5	4	3	4	2	2	3	4	9.0	11	9	6	6	4	4	6	9	7	12
13	6	10	6	5	7	5	8	5	17.3	16	34	16	12	19	12	22	13	16	23
14	9	13	12	12	6	4	5	4	21.7	29	69	59	51	16	10	12	8	32	25
15	8	8	7	5	6	7	6	9	18.7	21	23	20	13	14	19	16	30	20	23
16	6	8	13	13	10	11	8	11	26.7	16	21	62	66	36	43	22	47	37	31
17	8	8	9	8	5	8	10	9	21.7	25	23	30	26	11	23	36	32	26	25
18	6	5	5	5	8	5	5	6	15.0	14	11	12	11	21	11	11	14	13	22
19	9	6	13	11	10	11	9	9	26.0	30	16	62	44	40	41	29	32	37	35
20	10	12	13	11	12	9	9	9	28.3	39	52	64	49	53	33	29	32	44	37
21	10	6	8	4	5	7	8	6	18.7	39	24	21	10	12	17	22	15	20	26
22	8	8	9	10	4	5	6	7	19.0	24	24	31	37	9	11	14	19	21	19
23	6	7	6	3	4	1	3	4	12.0	23	16	16	6	10	3	7	9	12	12
24	4	4	4	6	6	6	7	6	14.3	10	8	8	16	15	14	20	14	13	10
25	5	4	3	2	3	3	1	6	9.0	11	8	7	5	7	6	3	14	8	9
26	3	4	2	3	2	3	2	0	6.3	7	8	4	6	5	7	5	1	5	6
27	1	2	4	2	3	1	2	4	6.3	2	4	6	5	6	2	5	10	5	5
28	4	3	1	4	2	4	2	3	7.7	9	7	3	8	5	10	5	7	7	33
29	15	18	17	14	18	11	7	7	35.7	100	151	123	71	156	41	19	17	65	57
30	13	13	11	9	5	5	6	4	22.0	70	63	42	33	11	12	14	10	32	35
31	7	9	6	6	5	3	4	7	15.7	19	29	14	16	11	7	9	17	15	13
																		23.0	

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	3 Km								Σ Km	am							Am	Am2
1	4	5	5	5	8	4	2	3	12.0	9	11	11	11	21	9	5	7	11	10
2	5	4	3	4	4	4	3	1	9.3	13	10	7	9	8	9	7	3	8	9
3	3	4	4	2	4	7	8	7	13.0	7	9	9	4	10	17	23	18	12	13
4	8	9	5	6	5	6	8	6	17.7	21	30	11	14	12	14	24	15	18	30
5	11	11	16	14	12	11	13	9	32.3	43	50	107	76	58	44	61	31	59	45
6	12	12	10	11	7	9	10	11	27.3	52	59	34	41	18	27	34	47	39	40
7	8	9	10	12	8	10	7	11	25.0	21	27	40	52	22	34	19	44	32	31
8	11	10	8	6	4	6	7	8	20.0	41	36	23	14	10	16	20	24	23	27
9	11	10	9	7	11	10	10	8	25.3	50	35	29	20	50	34	36	25	33	29
10	9	11	8	8	7	7	8	8	22.0	30	41	22	21	19	19	23	22	25	32
11	9	12	12	10	10	10	11	10	28.0	29	54	56	36	37	35	47	37	41	33
12	4	10	8	11	6	7	5	7	19.3	10	35	22	44	16	17	12	17	22	27
13	8	8	8	8	9	5	5	9	20.0	25	26	21	23	28	12	13	28	22	19
14	3	2	8	8	13	8	8	7	19.0	6	5	22	25	62	21	25	18	23	24
15	8	10	9	8	6	4	4	5	18.0	21	40	31	26	16	9	10	12	21	20
16	4	5	2	4	11	7	7	6	15.3	9	12	5	9	44	18	20	14	16	22
17	6	8	11	14	13	11	8	9	26.7	15	26	47	84	66	45	24	32	42	34
18	10	8	8	7	9	7	8	6	21.0	38	21	22	20	30	20	21	14	23	33
19	13	11	8	11	7	8	9	12	26.3	68	49	21	41	19	26	29	57	39	29
20	8	6	8	6	6	5	3	5	15.7	23	16	22	14	15	12	7	11	15	19
21	4	4	7	5	5	3	2	4	11.3	10	9	19	12	12	6	4	8	10	10
22	3	3	4	3	1	3	6	7	10.0	6	6	9	6	2	6	14	17	8	8
23	4	2	2	6	5	9	7	5	13.3	8	4	5	15	13	28	20	13	13	14
24	7	8	6	7	11	9	4	1	17.7	17	21	15	20	42	30	8	2	19	21
25	3	6	9	12	12	14	10	8	24.7	7	14	28	54	55	81	35	23	37	30
26	8	8	7	9	11	7	7	3	20.0	26	22	20	30	41	19	17	6	23	30
27	4	9	9	10	7	7	9	6	20.3	10	33	30	37	19	17	29	15	24	21
28	4	8	6	5	6	6	5	3	14.3	9	22	15	12	16	14	12	6	13	15
29	6	7	5	5	7	3	2	2	12.3	14	16	12	13	20	6	4	5	12	11
30	3	4	5	3	3	6	4	5	11.0	7	9	13	6	6	14	9	12	10	9
31	2	5	3	2	2	3	1	3	7.0	5	13	7	5	4	7	3	7	6	6
																		22.6	

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	3 Kn								∂n		∂n						An
1	4	5	5	6	8	5	3	4	2242	2412	10	12	12	14	23	11	7	10	12
2	6	4	4	5	5	5	4	2	1231	4323	14	9	8	12	12	11	8	4	10
3	4	4	4	3	5	7	8	8	1232	3432	8	8	10	6	12	20	26	22	14
4	8	9	5	6	6	7	8	7	1222	0232	22	28	11	15	14	18	21	17	18
5	11	12	16	14	12	11	12	9	2522	3331	43	55	111	83	60	43	60	27	60
6	11	13	10	11	8	9	10	10	2532	2242	42	67	37	42	22	28	34	38	39
7	7	9	11	12	8	10	7	10	1462	3512	17	30	46	53	24	40	18	39	33
8	10	10	8	7	5	7	8	9	3333	2322	39	38	24	19	12	19	23	27	25
9	11	10	9	8	12	10	10	9	1463	2240	46	40	32	21	60	37	40	28	38
10	8	11	8	8	8	8	8	5	2323	3241	23	43	24	25	21	23	22	13	24
11	9	11	12	10	11	11	13	11	4643	3353	28	50	59	39	44	41	63	42	46
12	5	10	8	12	7	8	6	7	2324	1212	11	37	24	52	18	21	15	20	25
13	9	9	8	8	9	5	6	9	2414	3343	27	29	22	26	28	13	15	30	24
14	3	3	8	9	13	8	8	7	1234	4342	7	6	25	27	66	26	25	19	25
15	7	11	10	9	7	4	4	5	3434	3414	19	45	39	31	19	10	10	12	23
16	4	5	3	5	11	7	8	7	2122	3322	10	11	6	12	47	18	25	18	18
17	6	8	12	15	14	11	8	9	2142	2212	14	25	57	88	71	41	25	30	44
18	10	8	8	8	10	8	8	7	2313	4332	39	21	24	21	35	21	22	18	25
19	13	12	8	11	8	8	9	12	2433	2422	64	52	23	44	21	26	29	56	39
20	8	7	9	6	7	6	4	5	2212	2231	26	17	29	15	18	15	9	12	18
21	4	5	8	6	5	3	2	4	3533	2232	8	12	22	14	12	7	5	8	11
22	3	2	4	4	1	4	6	7	3143	1313	6	5	10	8	3	8	15	18	9
23	4	2	3	7	5	8	7	5	3232	2432	10	4	7	17	13	26	19	12	14
24	6	8	7	8	11	9	4	2	1331	5422	16	25	17	25	46	33	10	4	22
25	3	6	9	13	12	14	9	8	1423	3425	7	14	30	62	57	74	33	22	57
26	6	8	8	9	12	8	6	3	2224	3222	26	25	22	32	52	21	16	6	25
27	5	10	10	11	7	7	9	7	1324	3452	12	35	35	44	19	18	30	17	26
28	4	8	6	6	7	6	6	3	2313	3232	10	24	15	16	20	16	14	7	15
29	6	7	5	7	8	3	2	3	3434	3220	14	17	12	19	22	7	4	6	13
30	3	4	6	4	4	6	4	6	1253	2635	6	10	16	8	8	16	10	14	11
31	3	5	4	3	2	3	1	4	2211	2423	6	13	8	6	4	7	3	8	7
																			24.2

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	3 Ks								∂s		as						As
1	4	4	5	4	7	3	1	2	3132	3312	9	10	11	8	20	7	3	4	9
2	5	5	3	3	2	3	3	1	4421	3130	12	11	6	7	4	6	6	2	7
3	3	4	4	1	3	6	7	5	1334	1253	7	9	9	3	7	14	19	13	10
4	7	9	5	5	4	4	9	6	4521	2123	20	32	11	12	10	9	28	14	17
5	11	11	15	13	12	11	13	10	6522	1034	42	45	103	69	56	46	63	34	57
6	13	11	9	10	5	8	10	12	4112	1145	62	50	31	40	13	26	34	57	39
7	8	8	9	11	8	9	7	11	6222	2015	25	25	33	50	21	29	19	49	31
8	11	9	8	4	4	5	7	7	4422	3156	43	33	21	9	8	13	17	20	21
9	12	9	8	7	10	9	9	8	3533	3115	54	30	26	20	40	30	32	21	32
10	10	10	7	6	7	6	8	9	5421	2154	36	40	20	16	17	15	23	30	25
11	9	12	12	9	9	9	9	9	6644	3544	30	59	52	32	29	28	31	33	37
12	4	9	7	10	6	5	4	6	4422	1313	9	32	20	36	14	13	10	15	19
13	8	8	7	7	9	5	5	9	5343	2323	24	23	20	20	27	11	11	27	20
14	2	2	7	8	12	6	8	7	3313	2145	5	4	18	23	57	15	25	17	21
15	8	10	8	8	5	3	4	5	6332	2443	23	34	23	22	13	7	9	12	18
16	4	5	1	3	11	7	6	4	2432	4233	9	13	3	7	41	19	15	10	15
17	6	8	10	14	13	11	8	9	4332	2222	16	26	37	81	62	48	23	33	41
18	10	8	7	7	8	7	7	4	4413	2222	38	21	20	20	25	18	20	9	21
19	14	11	7	10	7	8	9	12	3422	0313	72	47	20	38	17	26	30	59	39
20	7	6	6	5	5	4	2	4	2011	1214	20	14	16	12	12	9	5	9	12
21	5	3	6	4	5	2	1	3	7031	2213	12	6	16	10	11	5	3	7	9
22	2	3	4	2	0	2	5	6	4332	1124	5	6	8	5	1	4	12	16	7
23	3	2	2	6	6	9	7	6	4212	2244	7	4	4	14	14	29	20	15	13
24	7	6	5	6	10	9	3	0	3541	4121	18	16	12	15	39	27	6	1	17
25	4	6	8	11	12	15	10	8	4322	1225	8	15	26	46	54	89	38	24	38
26	8	7	7	9	9	6	7	2	5541	1331	26	18	17	29	31	16	18	5	20
27	4	9	8	9	7	6	9	5	3321	2144	8	31	24	29	19	16	28	13	21
28	4	7	6	4	5	5	4	2	3452	3222	8	20	14	9	13	11	10	5	11
29	6	7	5	3	7	2	1	1	4540	4222	14	18	12	7	18	5	3	3	10
30	3	3	5	2	2	5	4	4	4432	1325	7	7	11	5	5	12	8	10	8
31	2	5	2	1	1	3	1	2	3422	2214	5	13	5	3	3	7	3	5	6
																			21.0

Table 9 - continued

Part B.

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	3 Kn								⊕n		an						An
1	4	2	4	3	5	3	2	3	3322	3021	9	5	10	7	13	6	4	7	8
2	4	3	2	3	5	8	7	9	1120	4331	9	7	4	6	13	24	20	27	14
3	9	8	5	5	5	3	1	3	1212	4012	29	25	13	12	11	7	3	7	13
4	2	5	8	9	6	4	4	4	3331	3432	5	11	25	28	16	10	8	8	14
5	3	2	2	4	5	1	4	3	1222	3221	7	4	4	8	11	3	8	6	6
6	1	3	3	5	4	3	3	5	2013	3223	2	6	7	11	9	7	7	11	8
7	2	5	3	2	2	3	6	9	3222	3213	4	12	7	5	5	6	14	31	11
8	6	5	9	4	5	4	4	7	2122	2322	22	13	30	8	12	8	10	17	15
9	5	6	8	9	9	9	8	5	2223	1223	11	16	22	28	30	30	22	12	21
10	10	8	8	9	7	5	8	8	4322	1463	34	25	21	32	20	13	21	25	24
11	9	10	11	10	9	9	10	8	3562	3264	28	36	41	40	29	28	40	22	33
12	3	8	4	2	2	4	4	8	3433	3232	7	24	9	4	5	8	10	21	11
13	9	5	11	13	11	14	13	8	4265	2661	29	13	45	63	44	72	66	23	44
14	11	8	2	4	4	5	6	5	2222	1232	41	23	4	8	8	11	15	11	15
15	4	8	8	10	6	3	2	4	3343	1212	10	22	26	36	15	6	5	8	16
16	3	4	4	7	8	5	8	6	1322	3162	7	6	9	17	21	12	25	14	14
17	7	7	13	8	7	5	2	3	5383	4523	17	20	66	21	19	12	5	6	21
18	3	7	5	5	6	3	2	5	1422	3222	7	19	12	11	14	6	5	11	11
19	3	3	4	11	15	14	16	15	2223	2232	6	6	9	41	102	83	104	93	56
20	15	13	13	13	12	14	11	11	6653	2652	97	62	62	65	56	72	50	49	64
21	10	14	16	16	13	8	11	18	3352	3235	37	71	107	153	61	23	42	147	80
22	15	15	12	12	13	16	17	11	2444	3433	94	91	59	59	65	118	129	42	82
23	8	4	3	9	13	13	12	9	1223	6444	21	8	7	29	64	66	59	31	36
24	7	8	7	10	6	9	6	8	3423	0336	20	26	18	35	14	31	15	23	23
25	6	5	8	8	5	7	9	7	2132	2333	14	13	23	22	12	18	27	17	18
26	3	5	7	11	10	11	10	12	3432	6442	6	13	18	50	40	49	36	59	34
27	15	15	11	6	5	3	4	3	4542	2113	89	89	50	16	11	7	8	6	35
28	4	3	8	8	8	10	5	4	2134	4511	8	7	22	26	26	35	12	9	18
29	1	4	6	1	1	3	3	3	2350	2112	2	9	14	3	3	7	7	7	7
30	2	3	4	5	6	4	3	3	1331	1221	4	6	8	11	16	9	7	6	8
																			25.3

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	3 Ks								⊕s		as						As
1	4	5	3	1	3	1	0	0	5510	2201	10	12	7	2	6	3	0	1	5
2	3	3	1	2	5	7	5	8	3222	3425	7	7	2	4	11	20	13	23	11
3	10	10	4	4	2	2	1	4	4422	1314	39	39	10	9	4	4	2	8	14
4	3	5	7	7	5	3	1	3	2311	0322	7	11	19	20	11	6	3	6	10
5	4	2	1	3	4	0	2	1	2231	3131	9	5	2	7	9	1	4	3	5
6	0	3	3	3	2	2	1	5	1212	3223	1	7	7	7	4	5	2	11	6
7	0	5	2	1	1	2	6	10	1411	2400	1	13	5	3	3	5	14	35	10
8	9	5	8	3	4	3	4	5	4441	2332	31	13	21	7	10	6	8	13	14
9	6	7	7	8	9	7	8	4	3533	2323	15	19	19	25	27	19	22	10	20
10	11	8	6	10	8	5	6	8	5532	1245	41	25	16	38	25	11	14	24	24
11	9	10	9	10	8	9	10	7	5241	2125	30	34	33	35	22	33	35	19	30
12	3	8	3	0	2	1	3	8	2301	0224	6	22	6	1	5	3	6	22	9
13	9	6	9	11	9	13	13	10	6355	2334	29	14	29	43	33	65	68	38	40
14	11	8	2	3	2	3	5	4	3411	2531	44	26	5	7	5	6	12	9	14
15	5	7	7	10	5	3	2	3	2234	2432	13	20	19	38	13	7	4	6	15
16	3	4	4	6	6	5	7	5	2341	3332	6	9	10	14	15	11	18	11	12
17	7	6	10	7	8	5	1	2	4442	2233	17	16	36	17	21	11	3	4	16
18	4	7	4	4	5	2	1	3	1421	3532	8	17	10	10	11	5	3	7	9
19	3	3	3	10	14	14	16	15	4012	2244	7	6	7	35	81	75	119	98	54
20	14	11	12	11	13	13	11	11	4214	2343	79	50	52	43	62	65	46	47	56
21	10	12	13	18	13	6	11	16	5420	0247	40	59	69	151	63	15	47	112	70
22	15	15	9	12	13	16	17	12	4325	2337	98	94	33	55	67	111	135	60	82
23	8	4	2	9	12	11	11	8	3113	2444	22	8	5	29	57	47	46	25	30
24	6	7	5	7	4	8	5	8	3341	1154	16	18	13	19	9	26	13	22	17
25	6	6	4	6	4	4	8	7	3321	2124	15	14	9	15	9	10	25	17	14
26	2	5	5	9	9	10	8	11	2321	5134	5	11	13	31	30	40	24	46	25
27	15	15	11	7	4	2	2	3	7662	2321	96	91	50	20	10	5	5	6	35
28	4	3	7	8	8	9	5	4	1122	2224	10	7	17	25	23	32	11	8	17
29	0	4	4	1	1	1	4	3	1440	1333	1	9	10	2	2	2	8	7	5
30	3	3	3	4	6	4	4	3	3111	1313	6	7	7	10	16	10	8	6	9
																			22.6

Table 9 - continued

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	3 Km								Σ Km	am							Am	Am2
1	4	4	4	2	4	2	1	2	7.7	9	8	8	5	9	4	2	4	6	6
2	4	3	1	2	5	6	6	8	12.3	8	7	3	5	12	22	16	25	12	13
3	10	9	5	4	3	2	1	3	12.3	34	32	12	10	7	5	2	7	14	15
4	3	5	8	8	5	4	2	3	12.7	6	11	22	24	13	8	5	7	12	9
5	4	2	1	3	4	1	3	2	6.7	8	4	3	7	10	2	6	4	6	6
6	1	3	3	4	3	3	2	5	8.0	2	6	7	9	7	6	4	11	7	6
7	1	5	3	2	2	2	6	9	10.0	2	13	6	4	4	5	14	33	10	11
8	9	5	8	4	5	3	4	6	14.7	27	13	26	8	11	7	9	15	13	16
9	5	7	8	8	9	8	8	5	19.3	13	18	21	26	29	25	22	11	21	20
10	10	8	7	10	8	5	7	8	21.0	37	25	18	35	23	12	17	25	24	26
11	9	10	10	10	8	9	10	7	24.3	29	35	37	37	25	30	38	20	31	23
12	3	8	4	1	2	3	4	8	11.0	7	23	8	2	5	6	8	22	10	20
13	9	5	10	12	10	13	13	9	27.0	29	13	37	53	39	68	67	31	42	29
14	11	8	2	4	3	4	5	4	13.7	42	25	4	8	7	9	13	10	15	26
15	5	8	8	10	6	3	2	3	15.0	11	21	22	38	14	6	4	7	15	13
16	3	4	4	6	7	5	8	5	14.0	7	9	10	16	18	12	22	13	13	15
17	7	7	12	7	7	5	2	2	16.3	17	18	51	19	20	12	4	5	16	16
18	4	7	5	5	5	3	2	4	11.7	8	16	11	11	12	6	4	9	10	11
19	3	3	4	10	15	14	16	15	26.7	7	6	8	38	92	79	112	95	55	45
20	15	12	12	12	12	13	11	11	32.7	88	56	57	54	60	69	48	48	60	75
21	10	13	15	18	13	7	11	17	34.7	39	65	88	152	62	19	45	130	75	70
22	15	15	11	12	13	16	17	12	37.0	96	92	46	57	66	114	132	51	82	81
23	8	4	3	9	13	12	12	9	23.3	22	8	6	29	61	57	52	28	33	44
24	7	8	6	9	5	9	6	8	19.3	18	22	15	27	12	28	14	23	20	26
25	6	5	6	7	5	6	8	7	16.7	14	13	16	19	11	14	26	17	16	18
26	2	5	6	10	10	11	9	12	21.7	5	12	16	40	35	44	30	53	29	35
27	15	15	11	7	5	3	3	3	20.7	92	90	50	18	11	6	6	6	35	31
28	4	3	7	8	8	10	5	4	16.3	9	7	19	26	24	34	12	8	17	12
29	0	4	5	1	1	2	3	3	6.3	1	9	12	2	2	4	7	7	6	9
30	2	3	3	5	6	4	3	3	9.7	5	6	7	11	16	9	7	6	8	7
																		23.9	

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	3 Km								Σ Km	am							Am	Am2
1	2	2	2	3	4	3	1	4	7.0	5	5	4	6	8	7	3	10	8	10
2	5	5	6	9	6	0	1	3	11.7	11	13	14	28	14	1	2	6	11	12
3	2	6	8	9	9	9	6	3	17.3	5	14	24	29	33	27	15	7	19	15
4	8	7	7	4	6	3	4	6	15.0	23	18	17	10	14	6	8	16	14	16
5	6	4	6	6	7	8	5	3	15.0	16	9	15	16	17	22	12	6	14	14
6	7	5	8	5	6	7	5	4	15.7	19	13	22	11	16	18	13	9	15	13
7	2	1	4	6	3	1	1	2	6.7	5	3	8	15	6	3	2	4	6	8
8	2	4	2	4	6	5	8	2	11.0	5	10	5	9	14	13	21	5	10	7
9	1	1	0	1	3	1	3	3	4.3	3	3	1	3	7	3	6	6	4	7
10	0	0	0	8	4	3	5	6	8.7	1	1	1	21	9	6	11	14	6	8
11	6	4	6	4	5	7	9	13	18.0	14	10	15	8	12	19	29	64	21	28
12	11	11	13	14	10	9	8	6	27.3	41	45	69	77	38	32	21	15	42	35
13	5	11	8	8	12	5	7	7	21.0	12	44	21	22	58	11	18	19	26	23
14	4	0	1	11	7	6	9	12	16.7	8	1	2	43	18	14	30	57	22	28
15	12	6	12	11	7	6	9	8	23.7	52	15	57	49	16	16	31	26	33	27
16	8	7	2	2	7	6	5	8	15.0	21	18	5	5	17	14	11	23	14	17
17	6	7	6	6	7	9	7	9	19.0	15	19	14	14	19	31	19	28	20	20
18	7	8	9	8	8	9	13	13	25.0	20	21	29	24	23	31	66	66	35	37
19	14	12	11	11	10	9	7	1	25.0	78	51	47	42	40	29	19	2	39	33
20	0	2	2	6	7	8	4	7	12.0	1	4	5	14	19	24	9	16	12	13
21	6	1	3	2	3	5	4	5	9.7	14	3	6	5	7	11	10	12	9	17
22	9	8	12	8	9	9	7	9	23.7	29	24	51	25	30	31	18	30	30	20
23	7	6	4	2	1	1	6	5	10.7	17	14	10	5	2	2	14	11	9	14
24	5	5	4	5	5	4	4	5	12.3	12	11	8	12	11	8	10	12	11	9
25	5	3	2	1	1	4	6	6	9.3	11	6	4	2	3	9	15	16	8	10
26	3	7	5	4	3	4	3	9	12.7	7	17	12	9	6	9	7	29	12	24
27	11	9	11	17	16	15	17	17	37.7	47	29	41	123	112	96	135	144	91	69
28	15	17	13	8	11	11	11	5	30.3	91	142	63	22	42	41	49	12	58	62
29	6	5	3	6	11	8	4	5	16.0	14	12	6	14	47	21	8	13	17	20
30	4	4	6	5	7	11	7	4	16.0	10	8	14	13	17	46	17	10	17	17
31	5	3	4	5	4	5	5	5	12.0	12	7	10	13	8	11	11	11	10	12
																		20.7	

Table 9 - continued

Part B.

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	3 Kn								ϑn	an							An
1	2	2	2	3	4	4	2	5	2233 3322	5	4	5	6	9	9	4	11	7
2	4	5	5	9	6	1	1	3	2314 0230	10	12	13	30	14	2	3	6	11
3	1	5	8	9	10	8	6	4	2135 2131	3	12	24	32	36	25	14	8	19
4	7	6	7	5	7	2	4	6	3324 2232	20	16	17	12	17	5	9	14	14
5	6	4	7	7	7	8	6	3	2233 4212	15	8	19	18	19	25	14	7	16
6	7	5	8	5	6	7	6	4	4323 3313	18	12	22	11	16	19	15	10	15
7	2	2	4	6	3	2	2	3	2233 2333	4	4	8	16	6	4	4	6	7
8	2	4	2	4	6	6	8	3	1413 2121	5	10	5	10	15	14	22	7	11
9	1	1	0	1	4	2	3	3	3212 2112	3	3	1	3	8	5	6	7	5
10	0	0	0	7	4	3	5	6	0102 1122	0	1	0	20	8	7	11	15	8
11	5	4	5	4	6	7	9	13	3212 1312	13	9	12	9	14	20	30	67	22
12	11	11	14	14	10	10	8	6	2375 3422	45	48	83	81	40	40	22	14	47
13	5	11	8	7	13	5	7	7	2432 6253	13	48	22	19	66	11	20	20	27
14	3	0	1	10	7	7	8	12	4112 2325	6	1	2	39	17	17	25	59	21
15	13	6	13	12	7	7	9	8	3233 2343	61	15	64	54	18	18	30	23	35
16	7	8	3	2	8	5	5	8	3401 4142	19	21	7	5	21	13	12	21	15
17	6	7	7	6	7	10	8	10	3331 2333	14	17	17	16	20	37	23	34	22
18	8	8	9	9	8	9	13	13	3132 3134	23	23	31	32	25	30	64	70	37
19	15	13	11	11	11	10	8	1	5335 5542	69	62	50	48	44	36	23	3	44
20	0	2	4	7	8	8	4	7	1112 2333	1	5	8	17	22	24	9	18	13
21	7	1	4	2	4	5	4	6	4322 3551	17	3	8	5	8	13	10	14	10
22	9	9	12	9	9	10	8	10	2552 4436	32	27	58	27	33	35	22	35	34
23	7	5	5	3	0	0	6	4	4221 1142	19	13	12	6	1	1	15	10	10
24	6	5	4	5	5	3	4	5	4113 2233	16	11	8	12	12	7	9	12	11
25	4	2	2	1	1	4	6	6	3222 2221	10	4	4	2	2	9	15	14	8
26	2	5	5	4	2	3	2	8	2212 2234	4	12	12	8	5	7	5	24	10
27	11	8	10	17	16	15	17	17	2222 3543	44	23	35	131	114	95	141	137	90
28	16	17	12	7	10	11	11	4	4433 4552	104	140	59	19	38	45	43	9	57
29	5	5	4	6	11	8	3	5	1232 5421	13	11	8	15	49	21	6	12	17
30	4	3	5	6	7	11	7	4	2221 2432	8	6	13	14	17	48	17	9	17
31	4	3	6	6	4	5	5	4	2142 2322	10	7	14	14	8	11	11	10	11
																		21.6

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	3 Ks								ϑs	as							As
1	2	3	1	2	3	3	0	4	1211 1213	4	6	3	5	7	6	1	8	5
2	5	5	6	8	5	0	1	3	3431 2011	13	13	16	25	13	0	2	7	11
3	3	6	8	8	9	9	6	3	2414 1313	6	16	23	26	31	30	15	6	19
4	8	7	7	4	5	3	3	7	4400 2332	26	20	17	8	11	6	7	18	14
5	7	4	5	6	6	7	4	3	2122 3532	18	9	12	14	15	20	10	6	13
6	7	6	8	4	7	7	4	4	3021 2312	19	14	22	10	17	18	10	8	15
7	3	1	4	6	3	1	0	1	0022 3312	6	2	8	14	6	2	1	2	5
8	2	4	2	4	6	5	7	2	0320 2242	5	9	5	8	14	12	20	4	10
9	1	2	0	1	3	0	3	2	3122 3132	3	4	1	3	6	1	6	5	4
10	0	0	1	8	4	3	4	5	2123 2413	1	1	2	22	10	6	10	13	8
11	6	5	7	4	4	7	9	13	3220 2233	15	11	17	8	10	17	27	61	21
12	10	11	12	14	10	8	7	6	3344 2343	37	41	56	73	35	24	20	16	38
13	5	11	7	8	11	5	6	7	2242 4345	12	41	20	25	49	11	16	19	24
14	4	1	1	11	7	5	10	12	2023 2425	9	2	2	47	20	12	34	56	23
15	11	6	11	11	7	6	9	9	6321 3354	43	15	50	43	19	15	32	28	31
16	8	6	2	2	6	6	4	8	6322 3342	23	16	4	5	14	15	9	25	14
17	6	7	5	5	7	8	6	8	2422 4142	15	20	11	13	17	26	16	23	18
18	7	7	8	6	8	9	13	13	4441 3545	18	20	26	16	22	32	68	66	34
19	13	11	11	10	10	8	6	0	1314 1331	67	41	45	37	37	22	15	1	33
20	0	2	1	4	6	8	4	7	2111 1234	1	4	3	10	16	25	8	18	11
21	5	1	2	2	3	4	4	4	2212 2324	12	2	4	4	7	8	9	9	7
22	8	7	11	8	9	9	6	8	1222 0224	26	20	45	23	28	27	14	26	26
23	6	6	3	2	1	1	5	5	4310 2324	16	15	7	5	3	2	12	12	9
24	4	5	4	5	4	4	5	5	3123 1332	9	12	8	12	10	9	11	11	10
25	5	4	2	1	1	4	6	7	2022 3433	11	8	4	2	3	9	16	18	9
26	4	8	5	4	4	4	4	10	2422 2234	10	21	12	10	8	10	9	34	14
27	11	10	11	16	16	15	17	18	2321 4226	50	35	46	114	109	96	129	151	91
28	14	17	13	8	11	10	12	6	5321 3161	77	144	67	26	46	38	56	15	59
29	6	5	2	6	11	8	4	5	2222 3223	15	13	5	14	46	21	10	13	17
30	5	4	6	5	7	11	7	5	3231 2232	12	10	15	12	17	43	18	11	17
31	6	3	3	5	4	4	4	5	3111 3223	14	7	7	12	8	10	10	11	10
																		20.0

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	3 Kn								ơn				an				An
1	3	1	3	3	4	2	4	6	2210	3233	6	3	7	6	9	5	8	14	7
2	5	2	2	3	4	4	6	4	4111	1242	13	4	5	7	8	9	14	9	9
3	2	4	4	4	1	4	4	1	2343	2342	4	9	9	8	3	10	9	4	7
4	2	1	2	3	7	11	7	7	4221	2333	5	2	5	7	17	44	20	17	15
5	11	6	5	6	5	8	5	5	6333	3543	43	16	11	15	12	21	11	13	18
6	6	3	6	7	9	7	4	2	3353	6321	14	6	16	18	28	19	8	4	14
7	4	4	6	6	7	4	2	3	3353	2335	10	8	15	14	20	9	5	7	11
8	1	1	5	4	5	3	6	0	2253	3251	2	3	13	8	11	6	14	1	7
9	2	4	3	1	3	4	5	0	2521	3561	5	6	6	3	6	9	11	1	6
10	1	1	6	5	9	10	6	8	1254	4232	2	3	15	11	28	35	16	24	17
11	6	3	3	4	5	4	4	5	4212	3223	15	7	7	9	12	9	8	11	10
12	9	10	9	9	9	10	8	9	3522	3636	28	35	32	32	29	36	23	31	31
13	10	11	8	12	14	15	8	9	5433	8644	34	42	21	59	75	98	25	32	48
14	9	12	13	12	14	15	12	15	5543	2634	31	55	61	60	65	98	60	102	69
15	14	9	6	12	11	10	8	9	3222	3543	80	27	16	57	43	36	25	32	40
16	9	6	8	10	10	8	8	5	3333	4342	31	15	24	39	38	23	24	11	26
17	6	7	5	7	2	1	1	9	4222	2233	15	18	12	17	5	2	2	30	13
18	3	6	5	6	7	5	3	4	2621	3331	7	15	13	15	20	13	7	8	12
19	4	5	4	5	3	5	7	6	2324	2364	9	11	8	13	7	11	18	15	12
20	3	3	2	3	2	2	4	4	1212	1134	7	7	5	6	4	5	8	8	5
21	6	3	2	2	3	3	2	2	5212	3322	16	7	5	4	7	7	4	5	7
22	3	3	4	4	1	1	0	1	2134	2112	6	7	8	9	2	2	1	3	5
23	1	2	0	1	2	2	2	2	2112	2113	2	5	1	2	5	5	4	5	4
24	1	1	2	4	2	4	0	0	1124	3301	2	2	5	8	4	8	0	1	4
25	1	1	1	3	10	8	13	14	2223	2333	2	2	3	7	35	26	69	84	28
26	13	8	7	10	9	9	6	8	4253	3122	61	23	17	38	29	30	16	25	30
27	11	6	7	6	4	5	5	3	4240	3230	48	14	17	14	10	11	12	6	17
28	3	4	4	4	3	4	3	3	0432	1213	6	10	10	10	6	8	8	7	8
29	4	3	2	4	6	5	4	6	5412	5556	10	7	5	8	15	12	10	15	10
30	6	7	11	9	7	4	4	5	2240	3236	14	18	46	28	20	10	10	13	20
																			17.0

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	3 Ks								ơs				as				As
1	4	2	4	3	5	3	4	5	2111	2042	8	4	8	7	12	7	9	12	8
2	6	3	2	4	3	4	5	4	5131	1342	15	7	4	9	7	8	13	10	9
3	3	5	4	3	3	5	4	1	2222	3112	7	13	9	7	7	12	5	2	8
4	3	3	3	4	8	11	6	7	3211	3214	7	6	7	10	22	44	15	18	16
5	10	5	3	4	5	6	4	5	8211	4332	38	13	6	10	13	15	8	11	14
6	5	3	5	5	6	5	4	4	3120	1142	11	7	11	11	15	13	10	8	11
7	5	5	3	6	7	5	2	3	4310	3523	13	11	7	14	19	12	5	6	11
8	3	2	3	5	4	4	5	1	2213	2331	6	5	7	11	9	8	13	3	8
9	3	4	3	2	2	4	3	0	0112	1331	7	9	7	4	5	9	6	1	6
10	1	1	4	4	10	11	9	10	1123	2353	2	2	10	9	36	45	28	35	21
11	7	4	6	5	7	5	4	6	3103	2421	18	10	14	11	17	12	9	15	13
12	8	10	9	8	7	9	7	10	5210	1245	24	37	33	22	20	31	20	35	28
13	10	9	8	10	11	12	9	10	4403	3435	34	31	22	35	50	51	30	36	36
14	10	11	11	12	14	13	12	15	6223	1337	39	41	46	59	71	63	53	96	59
15	14	8	6	10	10	9	8	9	6301	2243	85	22	14	37	34	28	22	27	34
16	9	6	7	9	10	8	7	6	3122	1341	32	16	20	27	37	21	18	14	23
17	5	5	5	7	2	1	3	8	2212	2332	12	12	12	17	5	3	7	25	12
18	4	5	4	4	6	4	3	3	1223	3331	8	13	9	10	16	9	7	7	10
19	4	4	4	6	5	6	6	6	1222	3532	10	9	8	14	11	15	16	14	12
20	4	4	3	4	5	3	4	4	2222	3231	10	8	6	10	11	7	10	8	9
21	8	4	4	4	4	3	3	3	3121	2220	24	10	8	8	8	7	6	7	10
22	3	4	5	6	2	0	1	4	1125	1111	7	9	11	16	4	1	3	8	7
23	2	3	1	1	4	3	2	3	2132	2332	5	7	2	2	8	6	4	6	5
24	2	2	2	3	1	4	0	1	0101	2512	5	5	5	7	3	8	1	3	5
25	1	3	3	2	11	10	15	15	1211	3663	2	6	7	4	45	35	88	87	34
26	11	8	5	7	9	11	7	11	3212	3544	50	24	12	18	29	44	20	41	30
27	12	7	7	7	6	5	6	4	3112	2311	54	20	20	18	14	11	16	9	20
28	5	6	4	5	4	4	4	4	2112	1443	11	15	8	11	10	10	10	10	11
29	5	5	3	4	6	5	4	6	2142	1212	12	12	6	9	16	11	10	15	11
30	9	11	12	10	8	5	6	5	3222	2233	27	41	53	40	25	12	16	13	28
																			17.0

Table 9 - continued

NOV. 1977

	3 Km								Σ Km	am							Am	Am2
1	3	1	3	3	4	3	4	5	8.7	7	3	7	7	10	6	8	13	8	8
2	6	3	2	4	4	4	6	4	11.0	14	6	5	8	8	8	14	9	9	9
3	3	5	4	4	2	5	4	1	9.3	6	11	9	8	5	11	9	2	8	8
4	3	2	3	4	7	11	7	7	14.7	6	4	6	8	19	44	17	17	15	14
5	11	6	4	5	5	7	4	5	15.7	41	14	9	12	12	18	9	12	16	17
6	5	3	6	6	8	6	4	3	13.7	13	6	14	14	21	16	9	6	12	12
7	5	4	5	6	7	4	2	3	12.0	12	9	11	14	19	10	5	6	11	10
8	2	2	4	4	4	3	6	1	8.7	4	4	10	10	10	7	14	2	8	8
9	3	4	3	2	2	4	4	0	7.3	6	8	6	4	5	9	9	1	6	7
10	1	1	5	4	9	10	8	9	15.7	2	2	13	10	32	40	22	30	19	14
11	7	4	5	4	6	5	4	5	13.3	17	9	11	10	14	11	8	13	12	21
12	8	10	9	9	8	9	8	9	23.3	26	36	32	27	25	33	21	33	29	26
13	10	10	8	11	13	14	9	10	28.3	34	36	21	47	63	75	27	34	42	40
14	10	11	12	12	14	14	12	15	33.3	35	48	54	59	78	81	56	99	64	55
15	14	8	6	11	10	9	8	9	25.0	82	24	15	47	39	32	23	29	36	44
16	9	6	8	9	10	8	8	5	21.0	32	15	22	33	37	22	21	13	24	24
17	6	6	5	7	2	1	2	9	12.7	14	15	12	17	5	3	4	27	12	15
18	4	6	5	5	7	5	3	3	12.7	8	14	11	13	18	11	7	7	11	11
19	4	4	4	5	4	5	7	6	13.0	10	10	8	13	9	13	17	15	12	11
20	4	4	3	4	4	3	4	4	10.0	9	8	6	8	8	6	9	8	8	10
21	7	4	3	3	4	3	2	3	9.7	20	8	7	6	8	7	5	6	8	8
22	3	4	4	5	1	0	1	2	6.7	6	8	9	13	3	1	2	5	6	5
23	1	3	1	1	3	2	2	2	5.0	3	6	2	2	6	5	4	5	4	4
24	1	1	2	3	1	4	0	1	4.3	3	3	5	7	3	8	0	2	4	4
25	1	2	2	2	10	9	14	14	18.0	2	4	5	5	40	30	76	66	31	24
26	12	8	6	9	9	10	7	9	23.3	55	24	15	28	29	37	18	33	30	36
27	12	7	7	6	5	5	6	4	17.3	51	17	19	16	12	11	14	8	19	19
28	4	5	4	4	4	4	4	4	11.0	9	12	9	10	8	9	8	8	9	9
29	5	4	2	4	6	5	4	6	12.0	11	9	5	8	16	12	10	15	11	16
30	7	9	11	10	8	5	5	5	20.0	20	30	50	34	23	11	13	13	24	16
																		16.9	

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	3 Km								Σ Km	am							Am	Am2
1	3	1	1	1	3	6	10	9	11.3	6	3	3	2	7	16	39	27	13	29
2	13	15	14	12	13	17	18	14	38.7	66	97	81	60	68	140	159	80	94	56
3	9	4	4	6	7	5	6	5	15.3	29	10	8	16	19	11	16	11	15	37
4	2	4	3	3	7	9	13	13	18.0	4	10	6	7	18	32	64	63	26	25
5	9	11	11	8	8	4	5	5	20.3	31	43	42	21	23	10	13	13	25	26
6	7	5	5	1	2	2	3	3	9.3	17	12	12	3	4	4	6	7	8	9
7	2	3	3	1	1	3	4	4	7.0	5	6	6	2	2	6	8	9	6	5
8	2	3	2	3	0	0	1	1	4.0	5	6	5	6	1	1	3	2	4	6
9	0	5	7	2	1	2	3	1	7.0	1	12	18	4	3	4	6	3	6	5
10	1	3	3	2	2	2	5	9	9.0	3	6	6	5	5	4	13	27	9	21
11	10	11	13	15	16	10	9	11	31.7	40	45	67	102	110	37	32	45	60	41
12	10	12	7	7	10	7	7	7	22.3	38	58	19	18	38	20	20	20	29	34
13	9	6	8	8	10	10	9	5	21.7	28	16	22	21	36	40	30	13	26	22
14	6	6	5	5	6	6	3	3	13.3	15	16	12	11	16	14	7	6	12	16
15	4	4	4	5	7	4	2	0	10.0	9	10	9	12	18	8	5	1	9	9
16	1	2	4	3	7	8	8	11	14.7	3	4	8	7	17	25	22	41	16	16
17	9	11	5	3	5	3	6	5	15.7	33	48	12	6	11	7	14	12	16	17
18	2	3	3	3	2	1	1	1	5.3	5	7	6	6	4	3	2	2	4	6
19	1	2	4	1	1	6	2	2	6.3	3	4	9	3	2	16	4	5	6	5
20	1	2	3	4	3	3	4	3	7.7	3	4	6	10	7	6	9	6	6	7
21	3	1	4	4	6	5	5	8	12.0	6	2	10	8	14	13	12	23	11	10
22	7	5	2	1	4	3	3	5	10.0	20	12	4	3	9	6	6	11	9	10
23	4	1	1	5	7	3	3	5	9.7	8	3	3	12	17	7	7	12	9	9
24	4	4	3	7	4	4	3	3	10.7	10	8	7	19	9	9	6	7	9	9
25	2	2	4	3	4	4	7	7	11.0	4	4	8	7	9	8	20	17	10	11
26	7	7	6	7	6	7	9	7	18.7	17	18	16	20	14	17	28	17	18	16
27	6	6	5	5	5	5	4	1	12.3	14	14	11	12	13	13	8	2	11	12
28	1	4	4	5	4	6	13	9	15.3	3	10	10	12	10	16	65	31	20	16
29	7	8	5	5	5	5	5	7	15.7	20	22	11	12	12	11	11	18	15	17
30	4	4	4	3	5	3	6	4	11.0	10	9	8	6	12	7	14	10	10	10
31	2	4	4	6	7	3	5	7	12.7	5	8	9	16	20	7	12	19	12	20
																		17.0	

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	3 Kn								∂n				an				An
1	2	1	1	0	3	7	11	9	2211	1673	4	2	2	1	6	17	41	28	13
2	13	16	15	12	14	18	19	14	3472	4245	62	105	93	60	73	152	178	75	100
3	9	5	3	7	7	5	6	5	3133	3244	28	11	7	20	20	11	16	11	16
4	2	4	3	4	7	9	12	12	3312	3444	4	9	7	8	18	33	52	56	23
5	10	10	11	8	8	4	5	5	3234	3221	36	40	46	23	21	9	11	12	25
6	6	5	5	1	1	2	2	3	4241	2223	15	11	13	2	3	4	5	6	7
7	2	2	2	0	0	3	4	4	2321	1135	5	5	5	0	1	6	6	10	5
8	2	1	2	2	0	0	1	0	1232	2131	5	2	4	5	1	1	3	1	3
9	0	4	5	1	1	1	3	1	1241	2212	1	10	13	3	3	3	6	2	5
10	1	2	2	2	3	2	5	7	2311	3222	2	5	5	5	6	4	11	20	7
11	9	11	13	16	17	10	9	10	3253	3334	32	46	64	111	125	39	28	40	61
12	11	12	7	6	10	7	7	6	3542	6232	42	59	19	16	38	18	19	16	28
13	9	6	8	8	10	11	10	5	6133	3562	30	16	21	22	38	41	37	12	27
14	6	7	6	5	7	7	4	2	3314	3621	15	19	16	13	18	17	6	5	14
15	4	4	5	6	8	3	2	0	2333	3121	8	9	11	15	21	7	4	1	10
16	1	2	4	4	7	9	8	10	2233	3632	2	4	9	9	18	27	24	39	17
17	9	12	4	3	3	3	5	4	2221	3121	29	53	9	6	7	6	11	10	16
18	2	2	1	2	1	1	0	0	2221	2211	4	5	3	4	3	3	1	1	3
19	1	1	3	1	0	5	1	1	2222	2222	2	2	7	2	1	13	3	3	4
20	1	1	2	5	3	3	4	2	2114	2352	3	2	4	12	7	6	10	4	6
21	2	1	4	2	6	5	5	8	2112	4345	5	2	8	5	14	12	11	23	10
22	7	5	1	0	4	2	2	4	4221	4112	18	12	3	1	9	5	4	9	8
23	4	1	0	4	6	3	2	4	3114	5123	9	2	1	10	14	6	4	9	7
24	4	3	3	7	4	4	3	3	2112	3210	9	6	6	17	10	10	6	6	9
25	1	2	4	2	4	3	7	5	2331	2252	2	5	8	5	8	7	18	13	8
26	6	7	5	6	6	6	9	7	4220	1353	14	18	13	14	14	14	28	17	17
27	5	5	4	4	5	5	3	0	3123	2521	12	12	6	10	12	13	6	1	9
28	1	3	3	5	4	5	12	9	2114	3254	2	7	7	12	10	12	60	30	18
29	7	8	4	4	4	4	4	7	2612	1316	19	22	8	10	9	8	8	18	13
30	5	3	3	2	5	3	5	4	3213	2234	11	6	7	5	11	6	11	10	8
31	2	2	4	7	7	2	5	7	2332	4125	4	5	8	17	18	5	12	18	11
																			16.4

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	3 Ks								∂s				as				As
1	3	1	1	2	4	6	10	8	2122	2220	7	3	3	4	8	16	38	25	13
2	13	15	13	13	13	17	17	14	3322	3118	69	89	69	61	63	129	140	84	88
3	9	4	4	5	7	5	7	5	6023	3324	30	9	10	13	19	11	17	12	15
4	2	4	3	3	7	9	14	13	1311	3433	5	10	6	7	18	32	75	70	28
5	8	11	10	7	8	5	6	6	4323	2433	26	47	37	18	24	12	15	14	24
6	7	5	5	2	2	2	3	4	4312	4431	19	13	12	4	4	5	7	8	9
7	3	4	4	2	1	3	4	4	2123	3234	6	8	8	4	3	7	8	9	7
8	2	4	3	3	0	0	2	2	4333	1111	5	9	7	7	1	1	4	4	5
9	0	6	8	2	2	2	3	2	1322	3522	1	14	22	5	4	4	6	5	8
10	2	3	4	3	2	2	6	10	1221	3313	4	7	8	6	4	5	15	35	11
11	11	11	13	15	15	10	10	11	3731	3443	47	44	70	93	94	35	37	50	59
12	10	12	7	8	10	8	7	8	3123	3452	35	56	15	21	38	22	20	24	29
13	8	7	8	7	9	10	8	5	4212	2323	26	17	23	20	33	38	24	13	24
14	6	5	4	4	6	5	3	3	5222	3322	15	13	9	10	15	12	7	7	11
15	4	5	4	4	6	4	3	1	1222	1451	10	11	8	9	15	9	7	2	9
16	2	2	3	2	6	8	8	11	3222	3532	4	4	6	5	16	23	21	44	15
17	10	11	6	3	6	4	6	6	4211	5243	37	44	15	7	14	9	16	14	20
18	3	4	4	4	3	1	1	1	2242	2321	7	9	8	5	6	3	2	3	6
19	2	3	5	2	1	7	3	4	1023	2343	4	7	12	4	3	20	6	8	8
20	1	2	3	3	3	3	4	3	1232	1222	3	5	7	7	6	7	8	7	6
21	3	1	5	5	6	6	5	8	2322	3341	7	2	12	11	14	14	12	22	12
22	8	5	2	3	4	4	4	5	2231	3332	23	12	4	6	10	8	8	12	10
23	3	1	2	6	8	4	5	6	2141	2331	7	3	4	14	21	6	11	15	10
24	4	4	4	8	4	4	3	3	1101	4311	10	10	9	21	9	8	6	7	10
25	2	1	4	4	4	4	8	8	2123	3313	5	3	9	10	9	8	22	22	11
26	7	7	7	8	6	7	9	7	2023	3332	19	18	19	25	14	20	28	18	20
27	6	6	5	6	6	5	4	1	1201	1431	15	15	13	14	14	13	9	3	12
28	2	5	5	5	4	7	14	9	2321	3322	5	12	12	12	10	20	71	33	22
29	8	8	6	6	6	5	6	7	1121	1554	21	23	14	15	14	13	14	17	16
30	4	5	4	3	5	4	7	5	3221	0452	10	11	9	7	13	8	18	11	11
31	3	5	4	6	8	4	5	8	1131	1343	6	11	10	15	21	8	11	21	13
																			17.5

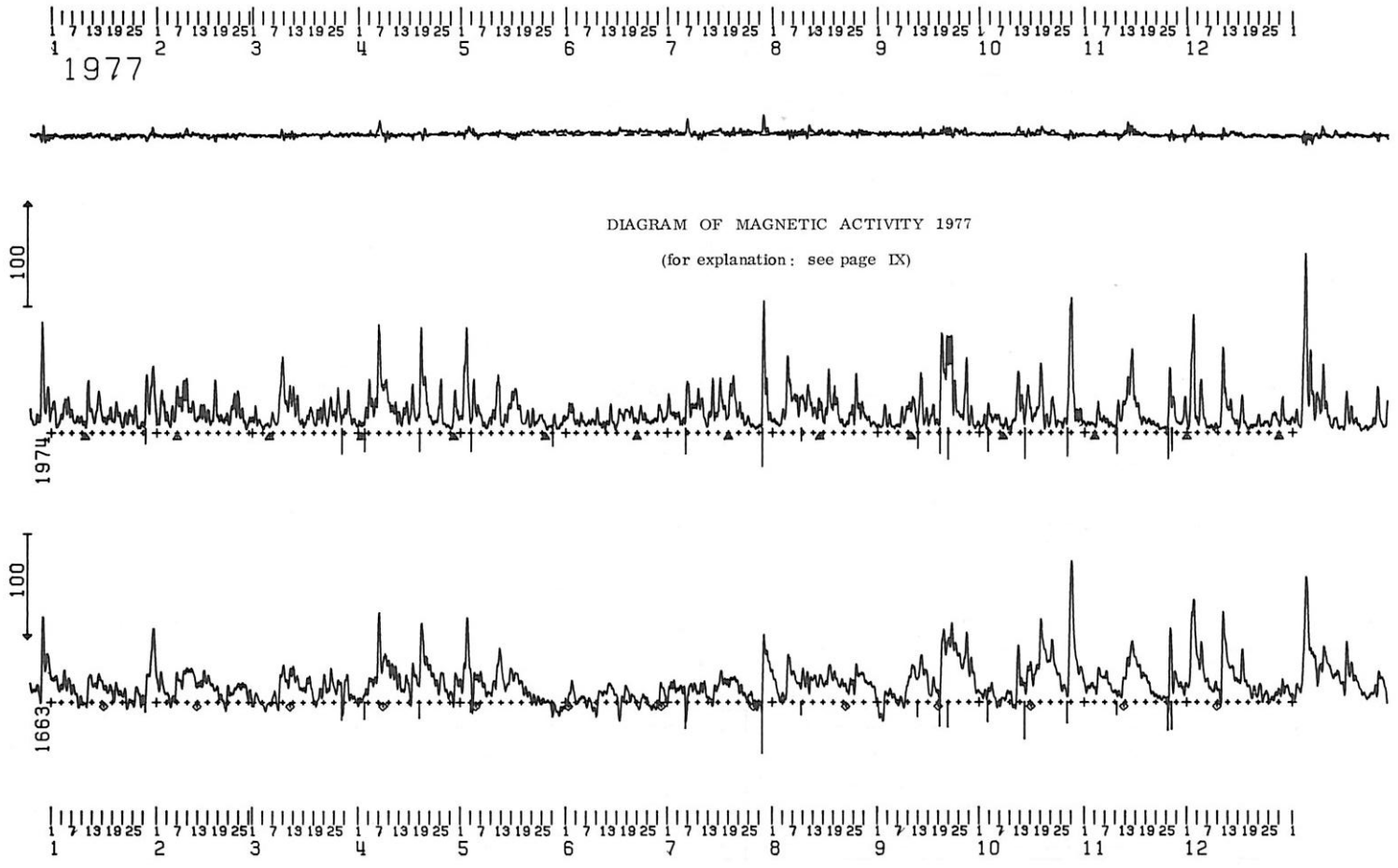
1977
DIAGRAM OF MAGNETIC ACTIVITY 1977
(for explanation: see page IX)
100
1974
100
1663

TABLE 10 HOURLY Dst Part B.

(for explanation see page IX)

JANUARY 1977

DAY	UNIT=GAMMAS 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	-14	-15	-16	-20	-25	-27	-24	-23	-23	-23	-19	-19	-23	-23	-22	-20	-17	-18	-20	-18	-18	-28	-25	-19
2	-22	-24	-24	-27	-27	-23	-23	-23	-25	-25	-24	-24	-29	-27	-24	-23	-17	-16	-17	-14	-14	-13	-13	-13
3	-12	-10	-11	-12	-10	-9	-11	-12	-11	-11	-10	-8	-10	-10	-8	-11	-12	-22	-28	-25	-19	-16	-17	-14
4	-11	-12	-13	-12	-12	-14	-9	-11	-11	-12	-15	-19	-19	-22	-30	-35	-36	-34	-34	-34	-32	-30	-27	-26
5	-26	-24	-21	-20	-18	-12	-10	-8	-13	-7	-8	-9	-14	-17	-15	-9	-13	-16	-14	-20	-23	-30	-27	-22
6	-21	-27	-20	-18	-17	-18	-21	-25	-27	-25	-21	-18	-19	-18	-17	-16	-10	-7	-6	-5	-6	-3	-5	-4
7	-7	-10	-10	-10	-10	-14	-20	-22	-22	-19	-19	-17	-15	-14	-14	-14	-16	-13	-10	-5	-9	-13	-11	-9
8	-8	-6	-6	-5	-1	-4	-8	-10	-11	-11	-10	-12	-12	-10	-8	-1	2	4	5	6	3	-1	1	5
9	8	9	7	6	5	6	2	1	0	-2	-3	-3	-10	-11	-10	-10	-9	-11	-2	0	-5	-3	-1	3
10	3	3	2	4	7	7	5	1	1	-2	1	1	3	1	3	4	3	3	2	0	-2	-2	0	1
11	1	-1	-1	1	4	5	0	2	3	10	15	10	6	4	-1	-10	-20	-26	-18	-20	-15	-19	-20	-23
12	-26	-32	-32	-26	-22	-21	-24	-23	-22	-24	-23	-21	-24	-27	-27	-28	-32	-35	-23	-16	-19	-21	-19	-15
13	-13	-14	-12	-15	-18	-16	-17	-18	-16	-14	-12	-11	-13	-15	-18	-23	-22	-18	-17	-18	-17	-15	-16	-14
14	-19	-20	-18	-14	-10	-16	-19	-15	-11	-10	-13	-11	-10	-14	-18	-18	-19	-33	-37	-29	-24	-25	-29	-31
15	-26	-23	-23	-27	-25	-24	-24	-28	-21	-18	-22	-22	-17	-15	-15	-18	-23	-25	-24	-25	-22	-18	-16	-17
16	-17	-20	-20	-19	-19	-16	-14	-16	-11	-8	-5	-4	-6	-11	-17	-16	-18	-15	-14	-16	-18	-17	-14	-15
17	-16	-15	-16	-18	-15	-16	-14	-11	-7	-3	-2	-3	-2	-4	-11	-19	-19	-14	-9	-10	-10	-9	-7	-6
18	-8	-12	-17	-17	-13	-16	-32	-27	-15	-12	-17	-17	-5	-7	-11	-11	-15	-16	-15	-14	-10	-9	-10	-7
19	-5	-5	-9	-2	-2	-2	-5	-5	0	3	6	2	3	-1	-1	0	0	-6	-16	-25	-25	-22	-24	-24
20	-19	-14	-12	-10	-16	-22	-20	-14	-9	-10	-11	-11	-12	-13	-10	-9	-10	-7	-5	-7	-3	-1	-2	-9
21	-10	-8	-6	-7	-10	-12	-14	-13	-12	-14	-13	-11	-8	-7	-6	-6	-7	-7	-5	-4	-4	-6	-7	-8
22	-9	-8	-4	-2	-2	-3	-4	-5	-6	-9	-12	-14	-16	-14	-14	-12	-11	-13	-14	-14	-13	-8	-6	-2
23	4	9	10	13	13	12	7	6	3	0	0	0	1	7	8	7	9	6	-3	-9	-7	-2	-5	-3
24	-3	-3	2	-1	-2	-2	-6	-4	-5	-5	2	3	2	1	2	1	0	-3	-4	-3	-3	-1	1	2
25	1	0	2	3	4	1	0	0	9	10	13	10	4	-3	-7	-6	-9	-9	-9	-12	-19	-20	-19	-16
26	-13	-12	-13	-14	-13	-14	-13	-13	-12	-12	-13	-13	-10	-8	-7	-8	-8	-6	-6	-7	-7	-8	-9	-11
27	-12	-10	-8	-5	-3	0	5	9	10	13	11	8	7	5	1	-6	-7	-9	-10	-10	-9	-7	-5	-5
28	-5	-5	-5	-5	-7	-7	-6	-6	-7	-8	-3	1	4	5	4	3	8	13	8	11	-12	-32	-38	-28
29	-23	-18	-20	-18	-27	-27	-26	-27	-35	-38	-33	-22	-20	-20	-24	-25	-24	-24	-24	-26	-27	-29	-28	-24
30	-15	-18	-30	-27	-32	-39	-47	-54	-54	-52	-51	-49	-46	-41	-45	-44	-44	-49	-53	-62	-76	-89	-95	-88
31	-56	-67	-66	-65	-62	-59	-60	-69	-61	-53	-47	-46	-46	-39	-32	-30	-28	-27	-28	-27	-26	-26	-22	-21

FEBRUARY 1977

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	G.M.T. 24
1	-17	-14	-16	-25	-28	-25	-20	-18	-12	-11	-13	-15	-13	-11	-12	-11	-8	-6	-4	-7	-14	-15	-16	-24
2	-32	-32	-33	-32	-29	-32	-29	-23	-29	-19	-31	-24	-18	-18	-19	-17	-15	-13	-13	-21	-19	-16	-11	-18
3	-13	-8	-7	-12	-8	-8	-8	-11	-9	-10	-12	-11	-10	-8	-4	-3	-2	-5	-8	-13	-16	-15	-15	-12
4	-5	-4	-1	-2	-5	-12	-14	-12	-9	-10	-7	-7	-4	-1	-1	0	3	1	1	0	0	0	1	3
5	5	6	11	14	11	10	11	-1	-13	-12	-6	-6	-10	-9	-4	-1	0	0	-3	-6	-8	-10	-10	-7
6	-4	0	2	1	-3	-5	-3	1	4	5	3	0	-13	-18	-18	-21	-23	-28	-35	-39	-38	-33	-27	-28
7	-27	-26	-18	-16	-20	-15	-20	-20	-17	-21	-30	-27	-25	-21	-15	-14	-18	-17	-21	-20	-24	-24	-26	-23
8	-25	-21	-16	-17	-16	-13	-15	-15	-14	-11	-9	-10	-11	-10	-12	-16	-22	-26	-41	-37	-31	-31	-34	-32
9	-28	-23	-23	-27	-23	-29	-31	-29	-26	-27	-27	-29	-28	-24	-27	-35	-34	-33	-31	-31	-37	-35	-34	-33
10	-30	-28	-29	-30	-30	-28	-26	-29	-29	-25	-28	-30	-36	-40	-35	-27	-25	-25	-24	-25	-24	-27	-34	-36
11	-37	-34	-31	-24	-34	-32	-30	-29	-27	-27	-31	-30	-27	-29	-34	-34	-31	-24	-22	-24	-25	-26	-24	-25
12	-27	-25	-24	-24	-25	-25	-21	-19	-18	-17	-16	-13	-16	-16	-14	-13	-15	-12	-13	-14	-16	-16	-12	-11
13	-14	-16	-21	-28	-27	-22	-19	-20	-19	-16	-13	-12	-11	-14	-16	-17	-15	-10	-14	-23	-25	-28	-28	-25
14	-20	-16	-17	-20	-16	-14	-11	-10	-11	-11	-11	-12	-19	-24	-29	-30	-24	-23	-26	-37	-37	-38	-36	-33
15	-29	-25	-24	-25	-22	-18	-18	-17	-15	-16	-19	-20	-20	-16	-17	-19	-23	-19	-11	-15	-23	-23	-20	-25
16	-26	-27	-32	-29	-25	-23	-28	-23	-22	-18	-16	-16	-18	-21	-20	-21	-19	-19	-15	-16	-15	-14	-12	-9
17	-10	-16	-23	-24	-23	-20	-19	-18	-17	-14	-10	-12	-14	-18	-17	-16	-12	-13	-11	-9	-12	-13	-7	-8
18	-9	-16	-3	-15	-23	-13	-9	-9	-13	-13	-12	-12	-12	-12	-16	-18	-17	-18	-19	-19	-15	-15	-12	-11
19	-10	-8	-3	-3	-4	-5	-2	0	-1	0	0	1	-3	-5	-6	-1	-11	-11	-12	-10	-13	-10	-6	-7
20	-6	-2	-2	2	0	1	1	0	0	-2	-2	-4	-4	-5	-3	-1	-1	3	4	5	9	8	2	0
21	6	6	6	5	8	10	13	8	5	9	12	14	7	-7	-13	-14	-13	-14	-16	-15	-17	-18	-18	-19
22	-20	-17	-14	-13	-14	-9	-4	-1	-1	-1	-2	-1	-7	-9	-11	-17	-16	-12	-8	-6	-7	-11	-6	-5
23	-4	-7	-11	-7	-10	-11	-3	-3	-12	-10	-8	-3	-3	-6	-14	-14	-16	-12	-10	-13	-14	-14	-16	-15
24	-14	-12	-13	-14	-16	-12	-10	-5	-5	-14	-22	-18	-16	-15	-18	-19	-15	-10	-16	-17	-14	-10	-11	-20
25	-22	-27	-27	-20	-19	-16	-12	-12	-15	-14	-14	-15	-14	-12	-13	-11	-12	-10	-11	-12	-9	-8	-13	-18
26	-24	-28	-25	-20	-22	-19	-16	-14	-11	-12	-14	-15	-17	-16	-12	-14	-17	-15	-14	-14	-14	-13	-15	-18
27	-20	-23	-23	-21	-18	-13	-11	-9	-8	-9	-13	-12	-8	-6	-6	-5	-3	-1	0	-1	0	1	0	-3
28	-7	-6	-10	-14	-17	-17	-16	-15	-13	-7	-8	-9	-9	-9	-10	-8	-6	-1	4	5	-4	-2	3	2

TABLE 10 Dst - continued

Part B.

MARCH 1977

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	0	-4	-4	-1	5	8	9	9	8	6	3	2	1	-1	-1	-3	-5	-4	-12	-13	-8	-10	-9	-9
2	-8	-6	-8	-11	-10	-9	-8	-7	-5	-3	-3	-6	-6	-6	-4	-4	-5	-5	-2	0	0	3	2	-3
3	-3	-3	0	-1	-3	-2	1	4	6	4	2	0	1	1	-2	-1	1	4	5	4	3	3	4	2
4	2	0	-1	1	3	6	6	6	4	3	3	3	5	8	11	10	8	9	10	10	9	8	8	8
5	8	8	5	5	1	0	0	-1	-1	3	4	2	3	4	0	0	1	3	1	0	-1	0	2	0
6	1	-4	-2	-1	4	5	5	5	8	6	5	3	4	-3	-4	-7	-5	2	0	-6	-9	-3	-2	-8
7	-3	-6	-6	-3	-6	-8	-11	-13	-9	-5	-8	-8	-11	-12	-15	-18	-16	-10	-3	-1	2	3	1	-1
8	-2	-1	0	3	4	6	6	3	1	4	10	9	10	16	14	6	0	5	12	4	4	-19	-35	-38
9	-31	-26	-24	-25	-24	-25	-28	-20	-17	-24	-25	-18	-23	-31	-26	-20	-21	-33	-29	-21	-24	-34	-37	-45
10	-41	-34	-39	-36	-34	-32	-32	-32	-30	-28	-25	-21	-19	-18	-18	-22	-20	-15	-20	-17	-17	-19	-24	-22
11	-23	-25	-26	-23	-23	-20	-15	-14	-14	-13	-13	-12	-10	-11	-12	-16	-19	-17	-21	-18	-26	-26	-29	-36
12	-44	-37	-39	-37	-31	-28	-26	-25	-29	-25	-22	-20	-20	-20	-23	-26	-29	-27	-29	-36	-35	-36	-42	-39
13	-42	-37	-33	-29	-27	-24	-20	-20	-18	-17	-18	-21	-21	-20	-18	-16	-15	-20	-24	-20	-20	-24	-29	-30
14	-30	-25	-23	-21	-18	-22	-25	-28	-27	-24	-18	-19	-22	-21	-20	-14	-9	-7	-11	-10	-11	-14	-12	-13
15	-15	-16	-15	-15	-15	-11	-9	-12	-16	-16	-17	-14	-14	-12	-9	-6	-5	-6	-9	-11	-14	-15	-16	-14
16	-12	-11	-13	-18	-18	-18	-15	-12	-9	-7	-7	-10	-10	-12	-12	-9	-7	-5	-9	-11	-18	-26	-34	-33
17	-28	-23	-19	-21	-24	-22	-18	-14	-13	-11	-10	-14	-17	-23	-26	-21	-24	-32	-33	-28	-25	-25	-22	-17
18	-15	-11	-14	-16	-12	-11	-11	-13	-14	-13	-11	-12	-13	-18	-10	-8	-5	1	4	2	-2	0	-2	-1
19	0	0	0	1	-2	-6	-6	-4	-2	-1	2	4	3	3	4	8	11	11	10	3	-2	-7	-6	3
20	2	-6	-13	-5	0	-1	1	-1	5	0	-7	-7	-8	-7	-6	-5	-3	-9	-14	-22	-22	-28	-24	-15
21	-8	-7	-3	-1	0	1	-2	-5	-6	-5	-4	-5	-8	-10	-6	0	2	-11	-19	-30	-36	-38	-31	-29
22	-27	-23	-21	-19	-19	-25	-27	-29	-26	-19	-16	-16	-14	-12	-11	-6	-3	-7	-8	-7	-10	-12	-13	-14
23	-15	-13	-10	-9	-9	-9	-11	-16	-17	-15	-16	-16	-16	-12	-6	0	0	-7	-21	-33	-34	-30	-28	-36
24	-44	-45	-37	-28	-26	-24	-27	-25	-22	-20	-20	-18	-24	-18	-16	-16	-17	-16	-13	-14	-18	-18	-16	-14
25	-13	-12	-11	-13	-13	-11	-8	-9	-9	-7	-8	-9	-8	-10	-10	-6	-1	-1	-9	-12	-16	-23	-16	-14
26	-18	-26	-33	-24	-23	-21	-17	-17	-18	-19	-15	-14	-15	-18	-15	-17	-20	-19	-23	-21	-18	-20	-20	-20
27	-21	-16	-11	-8	-8	-8	6	15	24	27	25	19	11	0	3	6	7	7	3	-4	-4	-9	-12	-19
28	-22	-24	-25	-22	-22	-23	-21	-20	-21	-19	-17	-17	-20	-21	-21	-21	-26	-32	-34	-33	-28	-29	-28	-23
29	-22	-15	-14	-14	-7	3	2	-2	-3	-2	3	1	-3	-3	-3	-3	-6	-6	-5	-11	-10	-8	-11	-14
30	-12	-8	-5	-4	-4	-4	0	-1	-6	-4	-3	-1	0	-3	-7	-8	-8	-8	-7	-7	-6	-2	-5	-8
31	-8	-4	-4	-2	0	2	3	1	-1	-6	-7	-1	1	1	1	2	2	0	-2	0	1	1	3	5

TABLE 10 Dst - continued

APRIL 1977

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	G.M.T. 24
1	5	5	7	7	6	5	-2	-7	-3	-2	-5	-7	-9	-10	-5	0	1	0	-2	-3	-1	-2	-1	-1
2	-2	-3	-3	-1	1	2	0	-4	-5	-7	-3	-4	-6	-9	-10	-8	-5	-7	-8	-9	-9	-6	5	4
3	-3	-11	-22	-22	-16	-11	-16	-17	-13	-10	-7	-10	-11	-9	-4	-2	1	-1	-8	-11	-8	-7	-10	-10
4	-11	-18	-28	-27	-29	-27	-29	-29	-27	-21	-16	-20	-21	-20	-13	-11	-15	-20	-27	-27	-27	-27	-27	-28
5	-24	-16	-17	-17	-16	-17	-19	-17	-17	-15	-13	-13	-12	-12	-12	-13	-20	-28	-32	-31	-27	-21	-22	-28
6	-26	-20	-14	-19	-22	-27	-24	-25	-19	-16	-12	-13	-15	-10	-10	-16	-34	-46	-56	-65	-80	-94	-99	-105
7	-95	-92	-87	-81	-81	-81	-75	-71	-64	-61	-52	-50	-47	-47	-35	-37	-29	-29	-18	2	-33	-32	-30	-31
8	-35	-31	-28	-29	-31	-41	-42	-43	-45	-41	-48	-43	-37	-33	-36	-44	-55	-54	-42	-35	-40	-39	-41	-52
9	-57	-53	-42	-41	-39	-40	-44	-43	-39	-33	-29	-24	-27	-30	-34	-33	-37	-41	-41	-41	-40	-44	-46	-47
10	-43	-35	-32	-29	-32	-34	-29	-26	-24	-15	-13	-15	-17	-21	-25	-31	-34	-30	-32	-34	-37	-41	-46	-44
11	-38	-36	-33	-34	-33	-29	-28	-25	-26	-25	-23	-18	-15	-17	-19	-19	-18	-23	-32	-44	-45	-39	-37	-44
12	-44	-33	-27	-23	-23	-21	-18	-16	-14	-11	-10	-11	-11	-13	-12	-9	-9	-14	-21	-21	-25	-32	-35	-33
13	-32	-28	-26	-24	-25	-24	-20	-17	-15	-13	-10	-7	-8	-7	-9	-9	-10	-10	-14	-15	-13	-15	-16	-16
14	-14	-9	-6	-6	-8	-7	-10	-14	-24	-17	-10	-6	-4	-8	-10	-14	-8	-11	-16	-18	-16	-19	-31	-30
15	-26	-24	-27	-32	-31	-26	-25	-21	-17	-12	-11	-16	-20	-23	-23	-23	-21	-15	-13	-13	-15	-16	-18	-16
16	-8	-2	-2	-3	-6	-12	-9	-2	2	6	13	20	13	10	11	-5	-8	-20	-36	-45	-45	-40	-37	-39
17	-36	-33	-32	-34	-33	-34	-30	-25	-29	-29	-23	-23	-21	-24	-21	-21	-25	-24	-23	-25	-26	-30	-35	-35
18	-30	-21	-16	-16	-21	-20	-17	-16	-17	-14	-15	-21	-17	-11	-12	-16	-20	-17	-17	-18	-17	-19	-20	-20
19	-18	-3	2	-12	-41	-56	-57	-71	-74	-89	-91	-83	-81	-78	-68	-64	-71	-67	-74	-69	-65	-69	-68	-66
20	-62	-58	-50	-44	-42	-45	-48	-49	-40	-36	-31	-30	-29	-30	-32	-40	-42	-37	-34	-36	-44	-49	-54	-52
21	-50	-45	-37	-36	-31	-29	-30	-41	-49	-43	-34	-29	-27	-27	-28	-27	-26	-27	-33	-32	-33	-36	-39	-41
22	-40	-38	-38	-34	-33	-31	-30	-30	-27	-22	-20	-22	-21	-21	-23	-26	-27	-28	-29	-28	-28	-30	-33	-32
23	-27	-23	-19	-21	-27	-32	-28	-23	-20	-18	-16	-15	-13	-14	-15	-17	-17	-13	-14	-16	-18	-23	-26	-28
24	-28	-22	-20	-21	-19	-19	-17	-15	-10	-14	-12	1	0	-3	-5	-3	-13	-11	-11	-7	-9	-17	-22	-22
25	-17	-14	-25	-29	-25	-28	-36	-33	-33	-30	-30	-28	-23	-21	-23	-28	-29	-28	-28	-25	-25	-27	-32	-32
26	-29	-26	-24	-20	-20	-17	-13	-11	-8	-13	-13	-13	-9	-7	-7	-10	-14	-13	-11	-9	-11	-10	-10	-15
27	-18	-16	-13	-13	-9	-6	0	2	0	-1	-4	-6	-3	-4	-5	-6	-8	-8	-6	-7	-8	-10	-12	-12
28	-11	-10	-9	-12	-14	-12	-8	-8	-8	-10	-8	-7	-6	-6	-9	-10	-8	-5	-3	3	3	4	5	7
29	21	22	10	11	-5	-21	-27	-36	-38	-33	-33	-32	-21	-22	-27	-22	-20	-21	-22	-29	-36	-36	-30	-27
30	-17	-13	-16	-16	-20	-17	-16	-16	-15	-13	-14	-14	-13	-14	-16	-16	-16	-14	-14	-16	-22	-27	-29	-32

TABLE 10 Dst - continued

Part B.

MAY 1977

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	-29	-27	-24	-18	-12	-12	-7	-5	-4	-5	-8	-7	-8	-11	-13	-13	-14	-10	-10	-12	-29	-32	-34	-46
2	-45	-35	-44	-45	-45	-34	-30	-28	-25	-24	-35	-20	-17	-28	-56	-65	-74	-68	-70	-81	-85	-94	-98	-89
3	-76	-75	-76	-77	-73	-69	-68	-62	-56	-43	-40	-37	-37	-33	-31	-32	-32	-27	-26	-24	-26	-35	-43	-43
4	-38	-32	-23	-19	-14	-11	-6	0	2	5	9	10	13	21	18	14	26	16	-7	-23	-33	-35	-39	-37
5	-34	-28	-22	-25	-24	-23	-29	-25	-19	-18	-16	-18	-21	-21	-25	-26	-26	-18	-18	-25	-29	-31	-32	-33
6	-28	-26	-24	-23	-21	-16	-14	-17	-17	-16	-16	-20	-22	-23	-23	-26	-28	-24	-23	-23	-27	-33	-37	-38
7	-35	-31	-26	-23	-19	-17	-16	-17	-17	-14	-13	-14	-12	-13	-13	-15	-17	-16	-13	-12	-15	-20	-23	-26
8	-26	-22	-17	-15	-13	-11	-10	-9	-9	-9	-7	-6	-4	-3	-4	-4	-4	-4	-8	-9	-5	-8	-10	-10
9	-8	-11	-12	-13	-15	-15	-10	-6	-7	-8	-9	-9	-7	-6	-6	-10	-15	-14	-9	-7	-7	-6	-7	-9
10	-8	-9	-9	-5	-2	3	5	-6	-17	-22	-23	-21	-21	-21	-22	-21	-20	-15	-15	-15	-17	-21	-26	-26
11	-26	-23	-17	-13	-5	-2	-7	-19	-23	-19	-14	-5	-8	-15	-22	-31	-43	-46	-47	-38	-38	-42	-41	-34
12	-32	-26	-15	-12	-38	-50	-37	-59	-53	-47	-48	-50	-50	-49	-50	-52	-54	-49	-47	-44	-41	-40	-38	-36
13	-34	-34	-32	-31	-30	-30	-27	-24	-22	-23	-24	-25	-22	-18	-18	-19	-19	-17	-17	-20	-23	-20	-19	-19
14	-15	-4	0	-5	-6	-12	-13	-6	-13	-17	-17	-17	-15	-16	-15	-17	-16	-12	-10	-12	-21	-25	-26	-19
15	-17	-19	-21	-17	-16	-15	-9	-12	-13	-16	-21	-31	-34	-34	-36	-35	-38	-34	-29	-26	-28	-30	-32	-28
16	-34	-34	-31	-33	-34	-34	-31	-26	-19	-18	-21	-19	-22	-18	-17	-17	-18	-19	-25	-24	-26	-25	-23	-26
17	-24	-24	-27	-32	-28	-31	-35	-30	-28	-27	-24	-23	-24	-24	-24	-26	-29	-34	-32	-31	-26	-24	-24	-23
18	-22	-14	-11	-15	-19	-22	-18	-19	-15	-16	-14	-18	-19	-20	-20	-20	-20	-20	-20	-19	-19	-21	-21	-22
19	-21	-21	-23	-21	-18	-15	-14	-12	-11	-10	-8	-8	-7	-5	-4	-3	-3	-5	-4	-7	-12	-14	-15	-14
20	-12	-12	-12	-18	-21	-22	-16	-11	-16	-15	-10	-8	-7	-3	-1	0	-3	-6	-7	-6	-1	-5	-9	-9
21	-8	-10	-12	-11	-10	-9	-9	-10	-10	-12	-9	-8	-8	-7	-7	-5	-2	0	0	1	-3	-4	-2	1
22	2	4	9	11	16	-1	-8	-7	-6	-5	-4	-6	-8	-12	-11	-10	-11	-10	-7	-4	-1	-2	-2	-3
23	2	2	6	5	1	0	3	5	6	7	3	0	-3	-1	-2	-10	-10	-6	-2	-5	-8	-6	-6	-6
24	-4	-2	-3	-2	-4	-3	1	2	-1	2	4	6	3	1	2	1	1	-1	0	4	3	-1	-1	0
25	1	-2	-3	-1	-3	-4	-4	-11	-10	-6	-5	0	3	0	-4	-3	-2	-1	5	4	2	0	0	-1
26	-2	-1	1	0	0	-1	1	2	3	1	0	-3	-3	-3	-1	-2	-3	-4	-4	-4	-3	0	4	1
27	3	2	1	0	-2	-2	-1	-1	-2	0	2	2	2	2	1	-1	3	3	7	9	12	13	14	16
28	15	14	11	10	14	16	16	16	13	10	5	3	0	1	1	1	-3	0	4	3	1	3	6	2
29	9	9	11	11	11	9	8	9	11	11	9	8	8	8	10	11	10	8	8	8	9	10	12	16
30	19	18	17	15	14	13	9	9	7	7	4	2	0	-3	-1	2	6	8	9	9	8	7	9	11
31	13	13	10	8	4	-6	-12	-6	3	6	8	9	9	8	10	9	6	4	3	2	1	2	3	-2

TABLE 10 Dst - continued

JUNE 1977

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	-1	3	8	6	8	3	1	-1	-1	1	4	5	5	2	0	-2	-6	-4	-5	-9	-13	-17	-10	-5
2	-3	-6	-8	-8	-10	-15	-12	-9	-10	-8	-5	-4	-10	-21	-22	-21	-20	-28	-28	-23	-18	-16	-23	-19
3	-15	-9	-9	-9	-11	-12	-13	-14	-13	-10	-9	-13	-7	-6	-5	-5	-5	-3	1	2	2	-1	-4	-3
4	3	3	6	6	5	4	1	-2	-3	-3	-1	3	2	2	2	0	-2	-3	-1	-1	2	-3	-6	-8
5	-8	-6	-1	0	-4	-6	-2	2	1	0	-1	-8	-14	-11	-6	-7	-6	-6	-7	-7	-1	0	-1	-4
6	-4	-3	-3	-4	-5	-8	-10	-8	-9	-8	-6	-1	-1	-2	-2	-1	-1	-1	-5	-2	1	5	8	8
7	6	6	5	7	4	4	4	4	5	2	-1	1	1	-2	-2	-3	-4	-4	-4	-5	-5	-10	-7	-4
8	-3	-1	0	0	2	1	-2	-4	-1	-1	0	-1	1	0	2	3	3	6	11	15	16	11	6	6
9	5	7	5	6	7	7	6	2	-1	-2	5	7	8	8	8	9	6	4	5	13	19	21	15	15
10	23	24	22	11	0	-1	-1	2	5	3	-5	-9	-11	-11	-10	-8	-10	-11	-10	-11	-10	-11	-13	-14
11	-10	-8	-7	-9	-11	-12	-12	-10	-10	-9	-10	-12	-12	-9	-6	-7	-7	-5	-3	-4	-6	-5	-6	-6
12	-7	-9	-13	-15	-14	-12	-10	-9	-9	-9	-11	-10	-10	-10	-9	-11	-12	-10	-9	-8	-6	-6	-9	-9
13	-8	-5	-5	-7	-9	-13	-16	-16	-17	-16	-19	-21	-20	-18	-15	-13	-14	-16	-21	-23	-21	-23	-17	-12
14	-7	-8	-14	-20	-24	-24	-21	-16	-15	-13	-13	-14	-13	-9	-7	-10	-11	-13	-14	-17	-20	-21	-16	-12
15	-11	-6	-6	-3	-7	-9	-5	-6	-8	-8	-8	-7	-7	-8	-6	-7	-8	-7	-7	-9	-9	-11	-11	-8
16	-5	-4	-4	-2	-2	-2	-5	-1	2	6	11	12	16	20	16	20	20	16	22	19	21	15	15	16
17	17	16	15	13	8	-2	-9	-11	-11	-10	-5	-4	-4	-4	-2	-3	-7	-2	2	5	4	-4	-8	-8
18	-4	2	6	5	2	-4	-6	-12	-21	-26	-21	-16	-16	-15	-15	-14	-15	-13	-16	-14	-11	-13	-17	-22
19	-17	-13	-7	-8	-10	-9	-6	-11	-15	-14	-14	-10	-10	-9	-9	-8	-9	-4	-1	2	3	2	1	4
20	0	2	0	1	-4	-9	-10	-10	-10	-8	-7	-10	-13	-11	-6	-5	-4	-3	-4	-4	-3	-3	-5	-8
21	-10	-10	-9	-7	-4	-5	1	1	-5	-4	-4	-2	2	4	2	0	-4	-3	1	3	7	10	7	5
22	2	6	2	-1	-2	1	5	8	10	11	9	5	8	11	3	1	6	11	4	4	7	8	6	5
23	2	-3	-10	-8	-7	-3	0	0	-1	-3	-2	-3	-6	-6	-6	-5	-5	-8	-11	-10	-11	-10	-10	-7
24	-5	-4	-4	-1	1	-4	-6	-4	-5	-4	-4	-4	-4	-3	0	-1	-5	-8	-5	-6	-7	-3	-2	-7
25	-7	-4	-1	1	2	4	6	5	4	4	5	2	4	1	-1	4	3	5	5	4	6	3	1	0
26	3	3	8	12	11	8	8	6	4	8	10	5	5	9	7	3	1	3	0	0	2	0	1	6
27	6	-1	5	6	5	6	8	6	1	2	4	5	5	9	10	11	11	11	4	7	6	0	-2	-1
28	0	4	2	0	0	2	0	5	4	-4	-2	6	6	10	10	7	-3	-6	-11	-17	-19	-22	-25	-29
29	-25	-18	-12	-14	-18	-17	-15	-16	-17	-16	-15	-15	-13	-11	-10	-11	-12	-15	-16	-15	-15	-16	-17	-18
30	-12	-6	-5	-5	-8	-9	-10	-7	-2	-6	-7	-7	-9	-6	-4	0	4	5	5	4	2	5	-1	-4

TABLE 10 Dst - continued

Part B.

JULY 1977

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	-4	0	5	6	5	0	-11	-15	-23	-25	-22	-23	-18	-16	-14	-6	-1	-6	-14	-16	-19	-17	-14	-18
2	-27	-28	-25	-22	-16	-12	-13	-16	-19	-15	-9	-7	-7	-9	-10	-14	-18	-17	-16	-19	-19	-20	-24	-27
3	-28	-27	-22	-17	-10	-5	-1	-6	-8	-9	-11	-7	-6	-12	-15	-15	-11	-9	-9	-10	-13	-14	-17	-15
4	-16	-16	-13	-7	-4	-2	-4	-15	-21	-16	-13	-12	-13	-16	-17	-16	-15	-13	-11	-9	-10	-14	-18	-23
5	-24	-23	-18	-14	-10	-5	-6	-7	-8	-9	-9	-8	-5	-9	-11	-14	-11	-8	-9	-17	-19	-18	-18	-17
6	-18	-17	-15	-10	1	8	18	18	18	14	18	39	49	47	9	1	-5	-10	-13	-20	-6	8	10	8
7	0	-1	-23	-24	-14	-9	-6	-10	-19	-18	-14	-13	-13	-13	-19	-19	-20	-17	-14	-15	-13	-13	-13	-12
8	-20	-23	-27	-15	-13	-15	-11	-9	-8	-8	-9	-7	-6	-6	-11	-15	-20	-21	-19	-14	-10	-11	-14	-21
9	-28	-25	-19	-19	-17	-13	-10	-11	-10	-15	-16	-10	-4	-3	-5	-13	-12	-13	-8	-7	-5	-3	-6	-11
10	-17	-16	-13	-11	-7	-5	-4	-5	-5	-3	-4	-8	-11	-14	-15	-10	-12	-18	-21	-21	-21	-20	-21	-18
11	-18	-20	-19	-9	-7	-4	-3	-8	-8	-7	-8	-8	-11	-16	-21	-19	-18	-18	-17	-17	-15	-18	-21	-23
12	-26	-25	-22	-15	-9	-4	-4	-4	-7	-7	-8	-6	-5	-4	-3	-3	-4	-3	-3	-4	-5	-4	-2	-5
13	-8	-10	-8	-1	-2	-3	-5	-3	-4	-7	-2	-1	-5	-4	-2	-5	-4	-2	-2	-3	-1	0	0	-5
14	-3	-2	-6	-6	7	17	29	20	-1	0	-3	-5	-4	-4	-5	-9	-12	-15	-15	-14	-11	-14	-16	-18
15	-23	-25	-28	-19	-11	-1	-2	-5	-12	-17	-16	-13	-11	-11	-12	-12	-13	-10	-8	-10	-11	-19	-18	-20
16	-22	-21	-20	-17	-9	-3	-10	-18	-26	-28	-25	-18	-20	-26	-28	-30	-27	-28	-29	-31	-32	-35	-34	-32
17	-28	-25	-23	-18	-14	-12	-20	-20	-22	-22	-15	-15	-15	-13	-12	-13	-16	-20	-24	-22	-24	-22	-22	-23
18	-29	-30	-27	-20	-12	-7	-11	-12	-15	-14	-18	-21	-19	-21	-23	-23	-24	-24	-23	-23	-20	-20	-20	-18
19	-15	-16	-17	-13	-5	2	-4	-21	-26	-29	-23	-14	-17	-22	-28	-34	-26	-22	-24	-22	-19	-16	-16	-22
20	-25	-25	-24	-20	-22	-19	-19	-25	-20	-20	-19	-19	-21	-29	-25	-22	-21	-23	-27	-25	-23	-24	-19	-26
21	-25	-26	-25	-20	-14	-10	-10	-14	-18	-20	-22	-25	-26	-26	-24	-24	-22	-18	-18	-18	-11	-9	-11	-14
22	-15	-17	-13	-10	-5	2	2	-2	-11	-17	-14	-13	-13	-11	-12	-17	-19	-21	-23	-20	-16	-15	-15	-14
23	-11	-11	-16	-10	-3	1	-2	-6	-6	-8	-9	-7	-6	-9	-10	-12	-13	-13	-11	-8	-4	-3	-6	-9
24	-11	-7	-6	-5	-2	3	2	0	-1	-2	-4	-5	-6	-2	0	1	-3	-2	-5	-6	-8	-7	-4	-7
25	-9	-13	-12	-9	-6	-4	-2	-4	-6	-8	-7	-6	-7	-10	-11	-13	-12	-11	-13	-14	-11	-12	-6	-4
26	-3	-5	-4	-2	0	1	3	1	-2	0	-2	-2	-2	-3	5	-1	-2	-2	-3	-5	-2	-3	-1	-1
27	-1	-1	1	5	8	10	11	11	9	9	7	7	7	6	7	5	7	7	8	7	5	2	1	0
28	2	1	1	1	1	6	8	5	3	1	1	1	1	1	1	3	5	4	4	4	9	9	8	8
29	23	34	22	-17	-43	-90	-94	-83	-69	-52	-50	-62	-72	-65	-58	-59	-56	-52	-50	-51	-47	-45	-37	-37
30	-30	-38	-57	-55	-45	-47	-53	-56	-57	-54	-50	-46	-43	-39	-38	-37	-37	-38	-39	-38	-38	-38	-38	-37
31	-39	-43	-45	-40	-35	-33	-30	-31	-31	-27	-25	-29	-29	-28	-29	-29	-28	-28	-30	-32	-32	-33	-32	-34

TABLE 10 Dst - continued

AUGUST 1977

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	-34	-30	-26	-24	-21	-20	-18	-18	-19	-19	-20	-23	-25	-25	-24	-21	-20	-19	-21	-21	-20	-22	-20	-17
2	-17	-16	-20	-18	-13	-9	-8	-9	-10	-11	-14	-14	-12	-8	-6	-5	-3	-5	-7	-8	-9	-9	-6	-4
3	-2	-1	1	3	5	7	4	0	-3	-4	-6	-5	-4	-4	-3	-5	0	0	-10	-16	-10	-9	-5	-5
4	-11	-14	-18	-15	-7	4	2	-3	-2	-4	-5	-6	-4	-4	-1	0	4	1	-7	-12	-8	-3	4	5
5	-3	-5	-9	-9	2	1	-4	-39	-61	-53	-50	-48	-46	-42	-44	-45	-43	-39	-41	-50	-46	-44	-40	-35
6	-37	-38	-37	-41	-48	-43	-33	-32	-28	-30	-25	-23	-21	-21	-21	-28	-30	-31	-26	-23	-26	-32	-30	-27
7	-29	-30	-30	-26	-23	-25	-26	-29	-32	-33	-36	-31	-25	-19	-21	-22	-22	-23	-21	-22	-24	-22	-21	-18
8	-17	-19	-18	-18	-20	-19	-20	-20	-18	-15	-13	-14	-16	-20	-20	-20	-21	-21	-21	-14	-13	-14	-20	-21
9	-18	-14	-15	-9	-12	-11	-11	-12	-15	-12	-14	-11	-15	-14	-14	-19	-24	-31	-32	-33	-34	-35	-32	-34
10	-31	-26	-27	-30	-38	-32	-21	-22	-20	-18	-14	-16	-19	-15	-12	-11	-6	-11	-21	-21	-18	-15	-13	-11
11	-18	-28	-38	-36	-33	-28	-30	-28	-28	-25	-26	-26	-22	-22	-18	-5	-7	3	17	-1	-1	-8	-21	-20
12	-17	-17	-18	-20	-35	-30	-25	-24	-22	-26	-26	-26	-19	-17	-17	-19	-21	-21	-21	-23	-22	-25	-24	-20
13	-15	-16	-18	-20	-22	-23	-22	-27	-31	-27	-22	-23	-29	-33	-26	-21	-20	-24	-26	-24	-24	-21	-22	-15
14	-12	-8	-10	-14	-16	-16	-14	-12	-23	-21	-16	-17	-20	-14	-11	-11	-8	-9	-23	-29	-30	-29	-29	-29
15	-27	-27	-22	-20	-23	-22	-22	-24	-31	-34	-32	-23	-16	-11	-14	-17	-17	-19	-20	-23	-23	-19	-15	-12
16	-12	-15	-17	-15	-19	-16	-14	-14	-15	-14	-12	-11	-22	-25	-20	-20	-22	-21	-22	-20	-17	-19	-17	-16
17	-17	-15	-15	-18	-13	-15	-12	-18	-26	-35	-39	-44	-32	-22	-28	-34	-35	-39	-35	-32	-34	-44	-44	-36
18	-32	-31	-31	-34	-37	-31	-28	-27	-25	-21	-21	-21	-23	-27	-22	-18	-20	-20	-22	-21	-19	-20	-19	-20
19	-17	-15	-28	-32	-32	-36	-36	-34	-31	-31	-30	-26	-23	-20	-17	-15	-19	-18	-17	-24	-28	-23	-24	-29
20	-26	-20	-16	-17	-22	-22	-20	-18	-15	-14	-14	-15	-17	-16	-14	-13	-15	-16	-14	-14	-15	-14	-15	-18
21	-15	-14	-12	-12	-11	-13	-16	-21	-26	-27	-26	-24	-23	-21	-20	-20	-20	-20	-21	-19	-17	-14	-13	-12
22	-10	-10	-10	-14	-18	-22	-19	-18	-17	-16	-16	-15	-17	-18	-19	-20	-20	-18	-14	-8	-10	-6	-4	-5
23	-5	-5	-9	-15	-18	-18	-15	-10	-10	-13	-10	-3	2	4	-2	1	-10	-19	-29	-33	-33	-28	-21	-18
24	-14	-10	-15	-18	-25	-27	-23	-15	-12	-11	-11	-17	-23	-20	-20	-23	-26	-27	-24	-21	-19	-20	-16	-11
25	-7	-5	-1	4	4	-6	-8	-5	-12	-29	-23	-29	-35	-28	-25	-38	-47	-41	-38	-44	-40	-37	-34	-29
26	-25	-22	-25	-28	-27	-30	-28	-23	-16	-17	-26	-28	-26	-20	-19	-24	-30	-30	-30	-33	-33	-28	-23	-21
27	-19	-18	-21	-30	-31	-32	-31	-33	-29	-27	-27	-28	-26	-24	-21	-22	-20	-24	-33	-37	-34	-34	-29	-25
28	-20	-16	-15	-18	-22	-27	-23	-18	-16	-16	-18	-23	-25	-18	-13	-14	-15	-22	-24	-27	-23	-19	-18	-16
29	-15	-10	-11	-14	-16	-19	-21	-21	-20	-18	-19	-20	-16	-14	-14	-13	-14	-15	-18	-22	-23	-23	-24	-19
30	-17	-16	-18	-17	-17	-17	-16	-14	-14	-14	-14	-14	-14	-13	-14	-16	-15	-12	-12	-13	-14	-15	-16	-16
31	-18	-17	-15	-13	-15	-17	-16	-12	-9	-6	-3	-3	-1	1	1	0	1	-1	0	-1	-3	-7	-10	-10

TABLE 10 Dst - continued

Part B.

SEPTEMBER 1977

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	-2	1	0	1	1	2	6	8	10	13	15	20	21	17	18	16	16	16	12	10	10	10	9	11
2	13	14	13	12	10	11	14	16	17	18	15	14	15	18	24	27	26	17	14	14	14	11	9	5
3	-5	-11	-14	-16	-21	-17	-11	-8	-7	-7	-6	-3	-8	-9	-11	-10	-8	-8	-9	-8	-9	-7	-9	-5
4	-5	-3	-2	-4	-8	-9	-6	-6	-3	-1	-9	-18	-17	-14	-12	-14	-14	-13	-15	-13	-11	-10	-11	-12
5	-9	-5	-4	-4	-7	-6	-4	-1	-1	-1	-2	-3	-2	-6	-8	-11	-11	-9	-10	-9	-7	-7	-6	-5
6	-6	-7	-7	-5	-5	-5	-3	-1	2	1	-1	1	2	2	3	1	1	0	-2	-2	-3	0	3	4
7	8	9	8	6	4	-2	0	4	2	1	-4	-4	-3	-1	-2	-3	-4	-4	-9	-7	-9	-6	-7	-7
8	-1	0	-4	-1	-1	-2	-4	-3	7	7	2	-1	3	0	1	2	6	9	9	10	7	6	6	8
9	5	0	-1	-4	-12	-10	-7	-6	-10	-9	-10	-16	-18	-14	-12	-13	-14	-15	-23	-23	-17	-13	-12	-11
10	-9	-11	-22	-31	-30	-26	-23	-23	-25	-22	-25	-24	-22	-22	-20	-22	-24	-25	-27	-25	-22	-21	-20	-26
11	-32	-35	-34	-41	-47	-45	-42	-35	-32	-28	-25	-27	-23	-28	-33	-35	-37	-38	-39	-39	-38	-32	-28	-27
12	-23	-19	-18	-25	-27	-27	-27	-25	-20	-18	-20	-25	-23	-20	-17	-17	-20	-22	-26	-28	-29	-16	-17	-15
13	-23	-23	-26	-26	-23	-22	-25	-30	-33	-35	-36	-30	-30	-31	-37	-46	-40	-39	-48	-58	-49	-51	-45	-39
14	-36	-36	-43	-43	-44	-39	-33	-31	-31	-28	-28	-30	-28	-23	-22	-20	-19	-22	-23	-27	-33	-32	-29	-30
15	-31	-31	-31	-34	-35	-30	-30	-27	-26	-29	-26	-32	-32	-30	-29	-31	-29	-23	-19	-16	-17	-16	-13	-12
16	-11	-6	-11	-6	-6	-5	-2	0	-6	-10	-14	-12	-8	-3	-3	-6	-6	-2	2	-1	-5	-5	-10	-12
17	-10	-10	-7	-5	-10	-15	-19	-19	-26	-31	-30	-29	-26	-24	-22	-23	-18	-14	-12	-13	-16	-15	-14	-12
18	-13	-11	-13	-15	-17	-15	-11	-4	0	-1	-6	-12	-13	-11	-12	-12	-13	-12	-11	-11	-13	-13	-12	-10
19	-8	1	3	3	4	0	0	-1	-4	-3	-1	3	25	-1	-13	-30	-36	-45	-39	-44	-66	-76	-63	-55
20	-62	-66	-59	-52	-58	-53	-58	-65	-62	-66	-68	-70	-68	-74	-82	-85	-72	-59	-52	-55	-57	-51	-52	-42
21	-35	-38	-37	-39	-48	-48	-41	-49	-58	-68	-72	-52	-50	-53	-55	-57	-59	-55	-55	-55	-49	-45	-70	-81
22	-66	-55	-63	-73	-63	-59	-50	-48	-44	-39	-48	-44	-46	-51	-60	-65	-62	-77	-86	-92	-88	-84	-75	-72
23	-70	-65	-64	-64	-58	-54	-50	-50	-49	-49	-49	-50	-50	-49	-44	-45	-45	-50	-55	-57	-58	-58	-65	-63
24	-56	-55	-54	-53	-51	-50	-50	-50	-46	-46	-47	-49	-43	-39	-39	-45	-47	-46	-42	-41	-42	-46	-45	-46
25	-46	-48	-49	-49	-47	-44	-44	-42	-41	-44	-45	-42	-37	-29	-27	-28	-30	-31	-29	-31	-38	-31	-33	-32
26	-32	-32	-31	-29	-30	-31	-35	-30	-26	-31	-48	-53	-47	-43	-37	-43	-45	-37	-34	-40	-49	-45	-33	-42
27	-48	-54	-65	-68	-71	-77	-84	-75	-68	-61	-62	-59	-54	-44	-40	-39	-39	-38	-32	-27	-26	-28	-31	-27
28	-24	-24	-25	-24	-22	-19	-16	-18	-27	-42	-50	-48	-47	-47	-50	-48	-45	-39	-32	-31	-30	-29	-30	-28
29	-26	-25	-25	-25	-23	-25	-30	-34	-32	-32	-31	-31	-29	-25	-20	-19	-18	-17	-13	-9	-8	-6	-6	-8
30	-13	-14	-13	-9	-6	-4	-6	-8	-9	-9	-4	-10	-17	-16	-12	-11	-11	-10	-11	-12	-13	-9	-7	-7

TABLE 10 Dst - continued

OCTOBER 1977

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	-10	-12	-10	-10	-9	-7	-7	-7	-8	-8	-8	-8	-10	-12	-10	-8	-4	-5	-8	-7	-7	-2	0	-3
2	-3	-4	-3	-2	-4	-6	-3	-3	-3	-11	-16	-15	-13	-8	-8	-9	-11	-12	-14	-13	-11	-9	-7	-7
3	-3	-2	-2	-3	-3	1	8	-1	2	-9	-19	-20	-17	-8	-8	-11	-20	-17	-14	-11	-11	-8	-9	-9
4	-10	-11	-12	-10	-12	-11	-12	-12	-7	-10	-16	-21	-25	-22	-19	-18	-18	-19	-19	-19	-16	-10	-10	-9
5	-6	-3	-4	-9	-9	-8	-9	-6	-4	-7	-6	-5	-1	3	1	-1	-6	-7	-8	-9	-5	-1	1	2
6	3	4	7	7	9	11	5	5	8	6	3	0	-2	-1	1	-2	-6	-5	-1	2	6	8	8	8
7	6	7	7	3	0	0	1	-1	-1	0	-2	-5	-6	-6	-5	-5	-6	-6	-5	-5	-2	1	0	-3
8	-3	-5	-8	-9	-9	-5	0	2	2	0	-3	-3	1	-3	-2	-1	-3	-5	-3	-3	-2	-3	-5	-8
9	-8	-12	-15	-13	-11	-10	-9	-10	-12	-12	-12	-11	-11	-10	-9	-8	-8	-8	-6	-4	-4	-4	-8	-11
10	-11	-11	-11	-12	-12	-11	-11	-11	-11	-11	-10	0	2	2	2	1	2	6	10	12	11	2	4	3
11	4	5	5	1	2	2	0	2	2	5	3	3	6	10	6	5	3	7	13	14	6	-3	-20	-15
12	-11	-17	-27	-34	-47	-56	-57	-71	-71	-56	-55	-49	-51	-49	-48	-49	-45	-41	-37	-31	-17	-20	-15	-7
13	-6	-8	-8	-7	-20	-25	-21	-23	-27	-30	-29	-28	-32	-18	-9	-5	-7	-12	-16	-19	-21	-20	-20	-19
14	-14	-15	-15	-18	-19	-18	-18	-19	-19	-20	-22	-21	-2	2	5	1	3	-2	-10	-10	-14	-27	-29	-24
15	-35	-28	-28	-32	-30	-23	-21	-37	-45	-50	-42	-37	-30	-27	-17	-15	-14	-18	-23	-35	-44	-48	-48	-48
16	-43	-36	-33	-34	-34	-29	-25	-23	-27	-31	-32	-32	-29	-23	-17	-9	-12	-12	-11	-7	-9	-10	-16	-24
17	-26	-28	-28	-30	-35	-31	-28	-25	-24	-18	-22	-22	-25	-27	-24	-31	-39	-41	-38	-35	-32	-28	-35	-35
18	-31	-32	-33	-31	-31	-39	-42	-42	-39	-31	-27	-28	-28	-23	-28	-30	-29	-23	-33	-45	-57	-69	-72	-84
19	-86	-91	-96	-88	-77	-73	-69	-76	-69	-63	-60	-58	-52	-57	-61	-60	-58	-60	-63	-62	-56	-53	-51	-49
20	-48	-47	-48	-50	-51	-50	-49	-49	-51	-51	-51	-50	-52	-50	-47	-45	-44	-41	-39	-39	-40	-40	-39	-40
21	-38	-34	-35	-37	-36	-36	-37	-38	-40	-41	-41	-40	-41	-38	-37	-36	-35	-40	-42	-43	-40	-38	-37	-39
22	-37	-34	-40	-47	-50	-55	-59	-67	-61	-61	-60	-61	-67	-63	-55	-52	-50	-48	-47	-48	-44	-41	-36	-34
23	-33	-33	-37	-35	-39	-38	-35	-33	-34	-32	-34	-33	-31	-30	-30	-32	-31	-32	-31	-28	-30	-29	-24	-19
24	-20	-23	-27	-29	-28	-22	-24	-28	-31	-31	-28	-29	-26	-24	-24	-24	-24	-27	-31	-29	-25	-22	-20	-18
25	-16	-11	-8	-9	-11	-10	-11	-12	-11	-11	-11	-12	-12	-11	-8	-8	-10	-13	-15	-19	-24	-25	-20	-17
26	-14	-12	-13	-13	-14	-12	-14	-14	-14	-15	-17	-19	-14	-8	-5	-3	-5	-9	-9	-9	-9	-8	-7	5
27	9	-5	-10	-18	-12	-10	-11	-7	5	-33	-68	-77	-76	-66	-75	-97	-102	-95	-102	-109	-118	-133	-133	-116
28	-120	-125	-143	-156	-159	-147	-132	-131	-114	-105	-105	-99	-96	-86	-76	-74	-74	-74	-77	-67	-60	-52	-51	-53
29	-53	-52	-52	-54	-52	-49	-45	-42	-42	-42	-40	-34	-33	-42	-44	-39	-41	-40	-43	-43	-40	-36	-31	-33
30	-28	-25	-23	-27	-24	-26	-26	-28	-26	-26	-29	-27	-22	-22	-25	-25	-41	-39	-31	-34	-34	-32	-32	-34
31	-36	-32	-31	-31	-31	-29	-28	-28	-28	-26	-26	-26	-25	-24	-25	-24	-20	-18	-19	-20	-15	-15	-18	-16

TABLE 10 Dst - continued

Part B.

NOVEMBER 1977

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	-19	-21	-21	-19	-17	-14	-9	-10	-9	-9	-6	-5	-5	-9	-11	-10	-9	-10	-13	-15	-15	-15	-14	-17
2	-16	-15	-17	-15	-15	-17	-17	-14	-14	-11	-6	-6	-10	-13	-15	-15	-15	-17	-19	-18	-18	-14	-15	-13
3	-16	-19	-22	-20	-17	-17	-20	-22	-21	-18	-16	-14	-14	-13	-13	-11	-11	-13	-16	-15	-12	-13	-12	-12
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9	-10	-10	-9	-10	-10	-11	-12	-13	-13	-10	-10	-8	-5	-6	-8	-9	-9	-10	-13	-13	-14	-13	-12	-11
10	-11	-12	-14	-12	-8	-6	-8	-12	-13	-15	-11	-7	-3	6	2	-3	-5	2	-3	-5	-15	-14	-14	-16
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28	-22	-17	-14	-14	-18	-22	-20	-22	-23	-21	-17	-13	-12	-14	-17	-17	-12	-11	-13	-13	-13	-15	-18	-21
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30	-13	-5	-1	0	9	11	-4	-18	-8	-12	-14	-20	-16	-19	-18	-20	-20	-18	-16	-16	-19	-20	-18	-17

TABLE 10 Dst - continued

DECEMBER 1977

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	-15	-15	-14	-14	-13	-13	-15	-16	-15	-14	-13	-12	-13	-13	-16	-16	-17	-14	-19	-24	-28	-27	-30	-32
2	-35	-39	-42	-64	-88	-110	-114	-100	-95	-84	-76	-66	-82	-71	-54	-60	-67	-89	-107	-119	-124	-110	-109	-106
3	-104	-90	-79	-73	-69	-68	-70	-80	-69	-68	-63	-58	-54	-53	-51	-51	-47	-45	-44	-41	-42	-43	-44	-43
4	-42	-42	-42	-44	-45	-40	-37	-36	-39	-41	-40	-39	-42	-43	-37	-22	-22	-10	-7	-27	-42	-51	-59	-59
5	-59	-54	-43	-49	-60	-72	-68	-58	-54	-48	-43	-42	-41	-40	-34	-31	-27	-27	-25	-26	-27	-25	-30	-34
6	-31	-33	-26	-18	-12	-12	-14	-17	-21	-25	-23	-22	-22	-22	-21	-20	-20	-17	-17	-22	-21	-23	-24	-25
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8	-9	-9	-10	-10	-10	-11	-11	-11	-11	-13	-15	-14	-10	-8	-8	-8	-6	-7	-8	-10	-11	-12	-14	-15
9	-13	-10	-9	-9	-11	-18	-20	-29	-28	-24	-21	-20	-18	-17	-16	-12	-12	-11	-12	-13	-14	-13	-10	-10
10	-8	-8	-10	-13	-12	-13	-12	-11	-11	-12	-14	-14	-16	-13	-6	1	3	3	3	1	5	11	13	5
11	7	-7	-13	-15	-20	-42	-73	-88	-82	-87	-103	-112	-94	-91	-77	-72	-76	-74	-66	-60	-65	-65	-64	-59
12	-54	-53	-53	-56	-68	-71	-57	-58	-55	-49	-50	-49	-52	-49	-44	-39	-39	-38	-38	-39	-39	-35	-35	-40
13	-43	-38	-29	-31	-36	-37	-36	-37	-34	-32	-27	-29	-31	-33	-30	-31	-33	-32	-36	-36	-33	-32	-30	-32
14	-31	-31	-31	-33	-36	-36	-31	-32	-36	-38	-36	-33	-32	-31	-31	-30	-29	-25	-23	-23	-21	-19	-17	-19
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16	-18	-16	-16	-20	-23	-22	-21	-20	-21	-20	-22	-19	-16	-13	-10	-10	-16	-23	-27	-25	-22	-23	-33	-47
17	-53	-57	-67	-67	-57	-54	-53	-49	-42	-36	-34	-31	-30	-30	-28	-26	-26	-24	-22	-21	-18	-19	-12	-13
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19	-15	-16	-18	-19	-17	-16	-15	-15	-17	-15	-14	-12	-13	-13	-12	-10	-10	-3	0	0	1	0	-1	-6
20	-7	-6	-6	-6	-6	-4	-2	-3	-3	-9	-14	-14	-14	-16	-17	-17	-17	-17	-16	-14	-15	-14	-12	-12
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23	-2	1	2	1	1	2	3	3	3	-1	-5	-9	-16	-13	-9	-5	-6	-5	-4	-3	-2	-1	-8	-14
24	-16	-14	-11	-11	-12	-11	-9	-10	-8	-7	-10	-11	-12	-10	-9	-9	-10	-12	-9	-6	-3	0	5	8
25	6	6	5	1	-2	-3	-4	-6	-9	-6	-3	0	3	1	1	2	-2	-5	-3	-4	-8	-8	-9	-12
26	-6	-3	0	-2	-1	-1	-2	-3	-4	2	0	-3	-1	-3	-3	-3	-7	-5	-7	-9	-12	-10	-9	-11
27	-8	-8	-11	-7	-9	-10	-12	-13	-9	-6	-4	0	1	-1	-5	-10	-13	-13	-13	-14	-12	-11	-12	-13
28	-15	-14	-12	-10	-9	-9	-12	-12	-9	-7	-7	-5	-6	-4	-3	-2	-2	3	-4	-20	-24	-27	-25	-17
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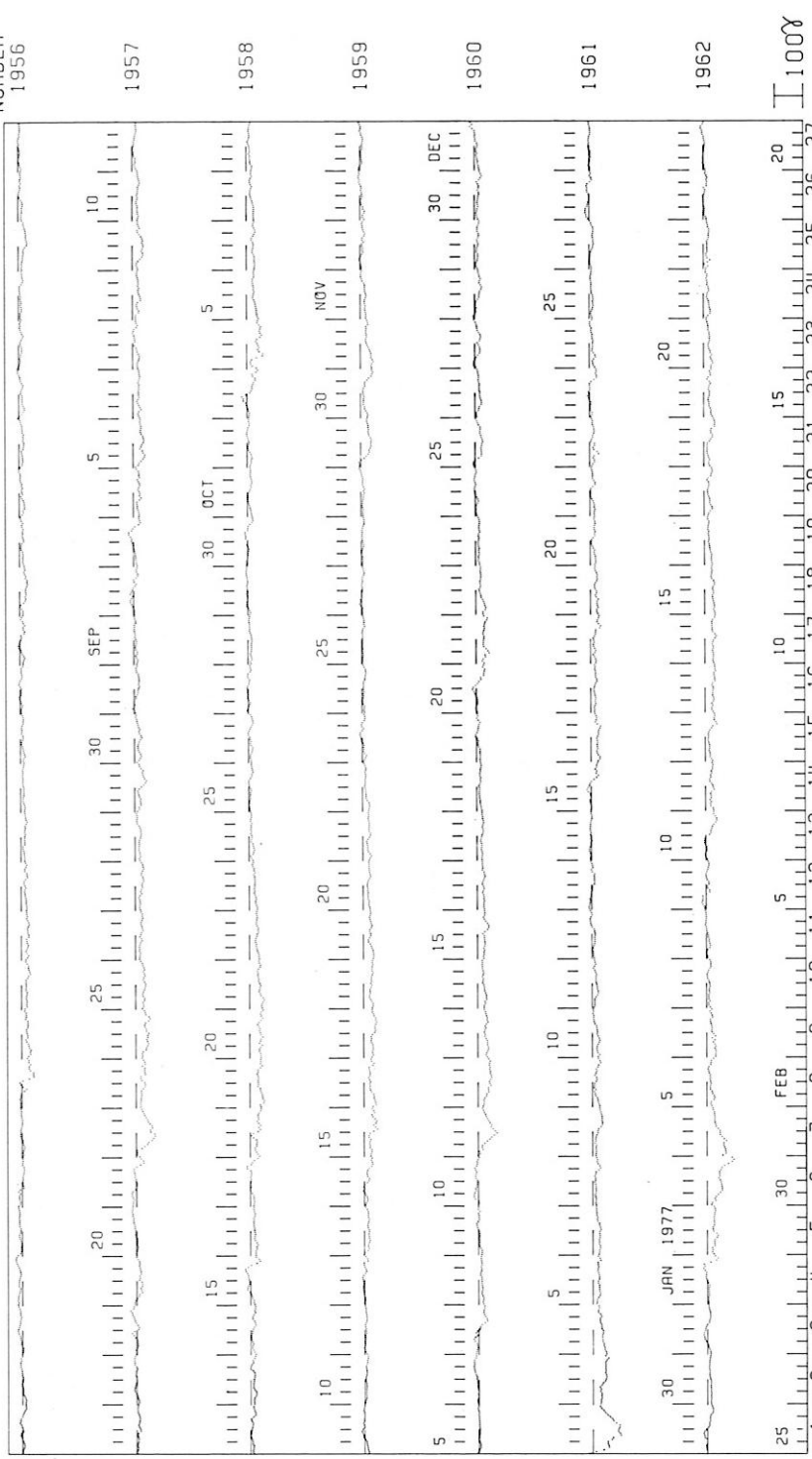
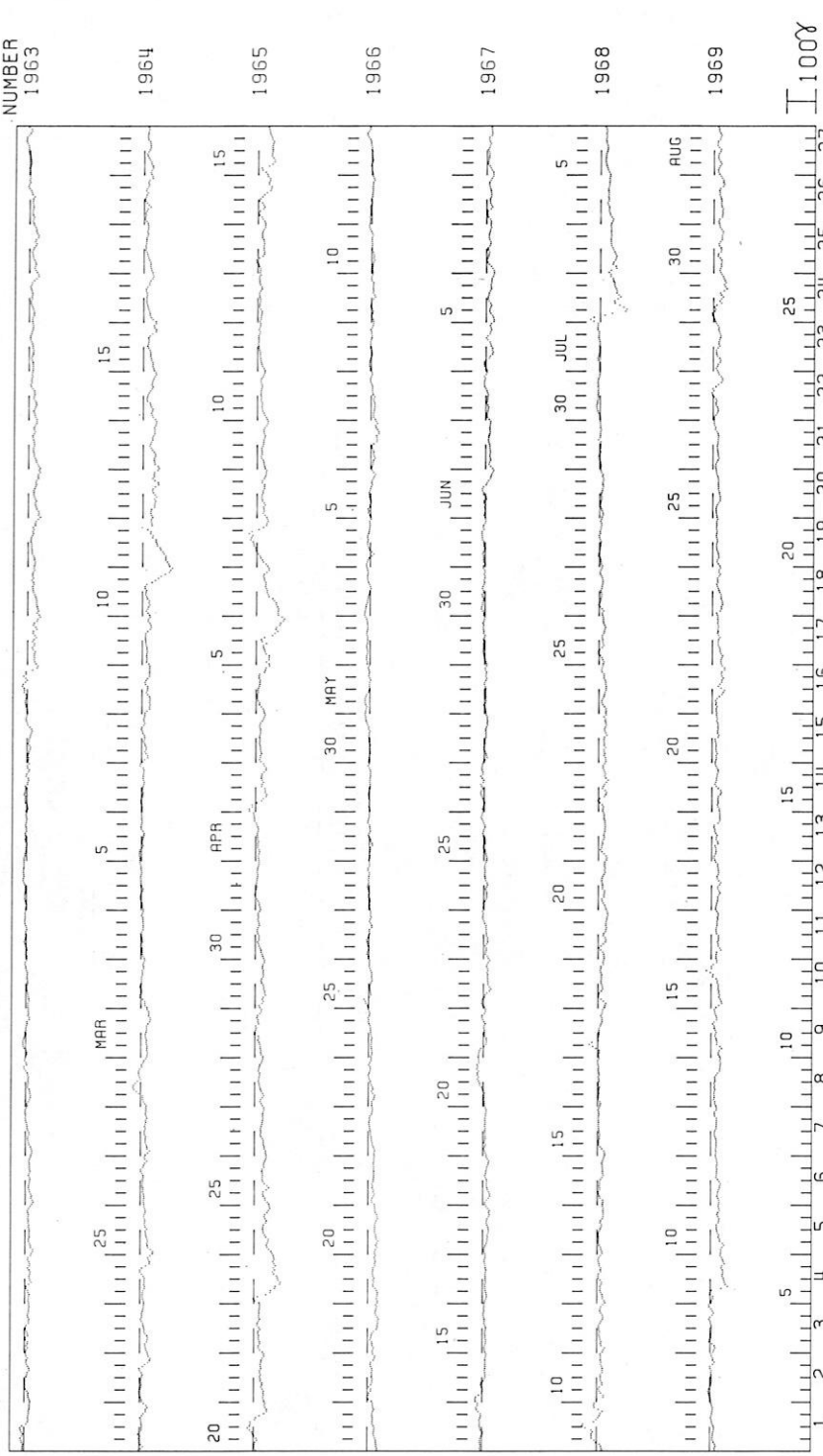
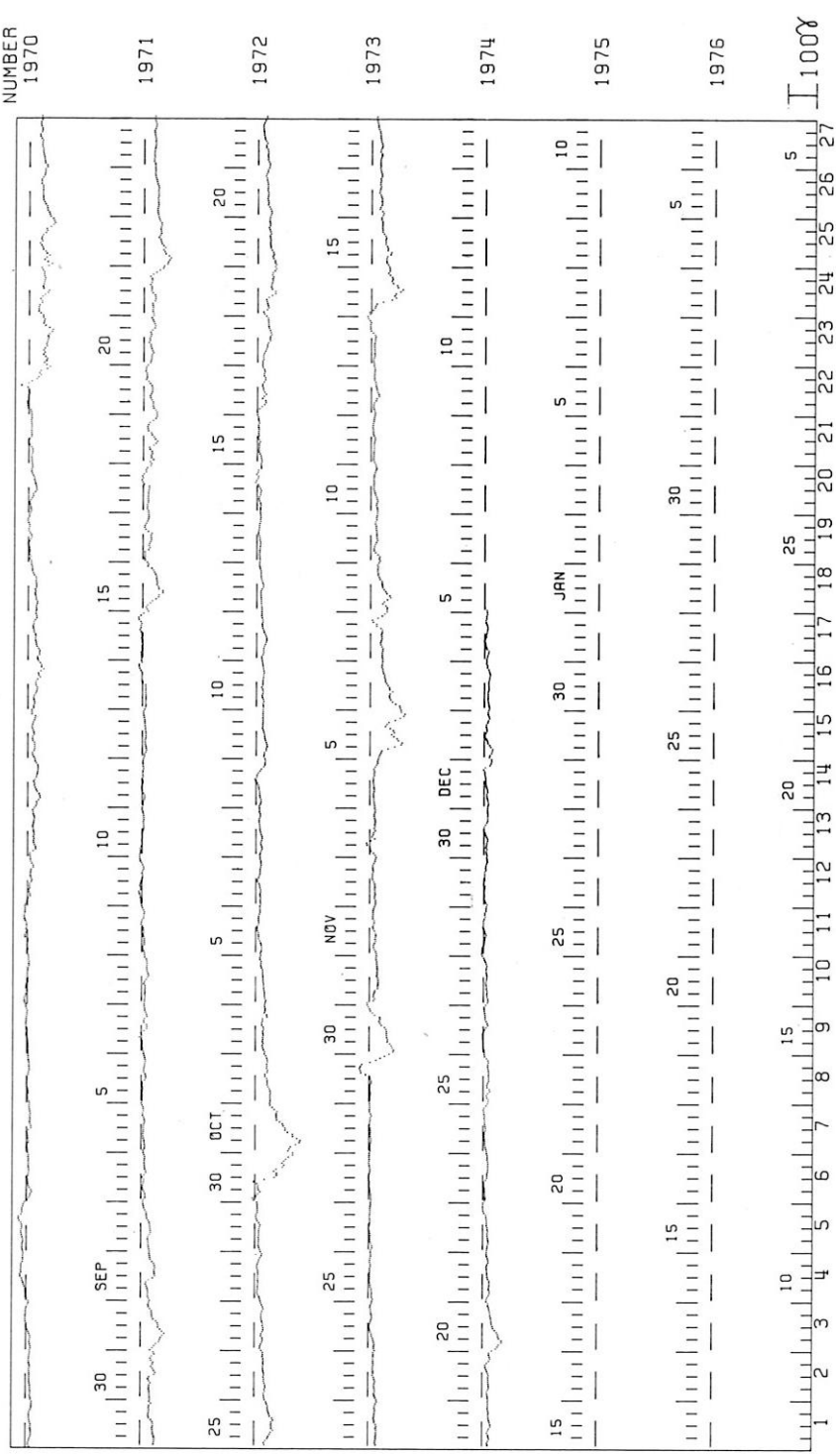
30	-16	-15	-13	-13	-12	-13	-13	-13	-16	-16	-15	-14	-15	-17	-18	-20	-19	-16	-14	-9	-10	-6	-8	-7
31	-9	-11	-14	-15	-8	-5	-3	-2	1	-2	-6	-4	-8	-9	-11	-10	-7	-4	-4	-7	-6	-9	-8	-8


SOL. ROT. NUMBER
1956
1957
1958
1959
1960
1961
1962
100γ
SEP
OCT
NOV
DEC
JAN 1977
FEB


SOL.ROT.
NUMBER
1963
1964
1965
1966
1967
1968
1969
MAR
APR
MAY
JUN
JUL
AUG
100γ


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

DAILY MEANS OF EQUATORIAL DST FOR 1977

DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	-21	-15	-1	-1	-16	-1	-11	-22	10	-8	-13	-17
2	-21	-23	-5	-4	-51	-14	-17	-10	15	-8	-14	-85
3	-13	-10	1	-10	-48	-7	-12	-3	-9	-8	-16	-60
4	-21	-4	6	-23	-8	0	-13	-4	-10	-15	-15	-38
5	-17	-2	2	-19	-24	-4	-12	-33	-6	-4	-28	-42
6	-16	-13	0	-36	-24	-3	6	-30	-1	4	-23	-21
7	-13	-21	-7	-52	-18	0	-14	-25	-1	-1	-24	-17
8	-4	-20	1	-40	-9	3	-14	-18	3	-3	-15	-10
9	-1	-29	-26	-39	-9	8	-12	-20	-11	-9	-10	-15
10	2	-29	-26	-30	-15	-2	-13	-20	-23	-3	-8	-5
11	-5	-29	-19	-29	-24	-8	-14	-19	-34	3	-6	-62
12	-24	-18	-30	-20	-43	-10	-8	-22	-22	-40	-21	-48
13	-16	-19	-23	-16	-24	-15	-4	-23	-35	-18	-34	-33
14	-19	-22	-19	-13	-14	-15	-4	-18	-30	-14	-48	-29
15	-22	-20	-13	-20	-25	-8	-14	-21	-26	-32	-47	-21
16	-14	-20	-14	-10	-25	9	-24	-17	-6	-23	-36	-21
17	-11	-15	-21	-28	-27	-1	-19	-28	-18	-29	-28	-36
18	-14	-14	-9	-18	-19	-12	-20	-25	-11	-39	-26	-17
19	-7	-5	1	-60	-11	-7	-19	-25	-19	-66	-20	-11
20	-11	0	-8	-42	-10	-6	-23	-17	-62	-46	-11	-11
21	-9	-2	-11	-35	-7	-1	-19	-18	-53	-38	-7	-6
22	-9	-9	-16	-29	-3	5	-13	-14	-63	-51	-5	-15
23	4	-10	-16	-20	-1	-6	-8	-13	-55	-32	-3	-4
24	-1	-14	-22	-13	0	-4	-4	-19	-47	-26	-5	-8
25	-3	-15	-10	-27	-2	2	-9	-23	-38	-13	-7	-2
26	-10	-17	-20	-14	-1	5	-1	-26	-38	-11	-42	-4
27	-2	-9	1	-7	3	5	6	-27	-51	-61	-25	-9
28	-5	-7	-24	-6	7	-3	4	-19	-33	-99	-17	-11
29	-25	0	-6	-20	10	-15	-46	-17	-22	-43	-16	-14
30	-50	0	-5	-17	8	-3	-44	-15	-10	-29	-12	-14
31	-44	0	-1	0	4	0	-32	-7	0	-25	0	-7
MEAN	-14	-15	-11	-23	-14	-4	-14	-19	-24	-25	-19	-22

ANNUAL MEAN -17

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^{o}, 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 1 222-227	12 1 258-259	12 1 252	12 1 255	12 1 255
1933	12 1 228-233	12 1 260-261	12 1 252	12 1 255	12 1 256
1934	12 1 234-239	12 1 262-263	12 1 253	12 1 255	12 1 256
1935	12 1 240-245	12 1 264-265	12 1 253	12 1 255	12 1 257
1936	12 1 246-251	12 1 266-267	12 1 254	12 1 255	12 1 257
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 1 222-227	12 1 254	12 1 222-227	12 1 254
1933	12 1 228-233	12 1 254	12 1 228-233	12 1 254
1934	12 1 234-239	12 1 254	12 1 234-239	12 1 254
1935	12 1 240-245	12 1 254	12 1 240-245	12 1 254
1936	12 1 246-251	12 1 254	12 1 246-251	12 1 254
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) 1977

Sudden commencements followed by a storm or period of storminess, as selected from the reports of the following 51 observatories*:
SO DO NU MO HL WN WI IR NI VL BE KV DB BU VI FU CF HB OD SU MT LG AQ TF TK EB CI TL FR PE SM AE KA KS SS KY SZ TA BA TG LU PM HU LM GN AC TO TW CZ KG DU and from the copies of magnetograms sent by five low-latitude observatories (MB FQ HO PM AL) or their five supplementary observatories (TA PA AP KY HD).
* For explanation of the two-letter symbols: see Part A, pages 1 - 3.

JANUARY							
28 1840 (39-42)	11211	3.5	9	3A	6B	8C	2si
FEBRUARY							
none							
MARCH							
27 0607 (00-09)	22222	6.9	17	5A	9B	8C	1si
APRIL							
02 2158 (56-62)	21222	7.8	16	3A	12B	6C	3si
19 0107 (05-12)	22221	10.6	15	2A	7B	10G	2b
MAY							
04 0417 (15-21)	12222	5.7	9	2A	9B	11C	2si
28 0424 (23-25)	11122	5.2	14	1A	3B	5C	4si 2sfe
JUNE							
none							
JULY							
06 1037 (30-40)	22222	6.6	25	12A	16B	6G	2si
29 0027 (24-29)	33333	2.5	49	35A	6B		
AUGUST							
09 1358 (54-64)	20102	5.1	12	1A	3B	4C	1pg
SEPTEMBER							
12 2114 (12-22)	21122	6.1	14	4A	5B	3C	2si 5b
19 1144 (41-60)	22222	10.3	23	8A	12B	4C	
21 2044 (39-50)	33222	3.7	24	16A	11B	6C	3si
OCTOBER							
03 1246 (35-48)	22122	5.9	19	11A	13B	5C	2si
14 1151 (48-55)	32232	4.5	35	36A	11B	3C	
26 2330 (22-32)	22232	4.9	20	11A	24B	3C	

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1977 - continued

NOVEMBER								
10 1309 (00-11)	22222	10.4	12	4A	8B	10G	1si	1b
25 1226 (24-30)	22233	6.9	27	17A	20B	2C	1si	
26 1215* (15)	11022	10.2	12	1B				
26 1714 (12-18)	22122	10.8	26	5A	18B	7C	3si	
DECEMBER								
none								

* This ssc was reported only by one observatory; but it appears in the magnetograms of the low-latitude observatories that send copies to prepare the ssc-list corresponding to ssc of the 26th November at 17h 04m. Requested for confirmation the magnetograms of the supplementary low-latitude observatories, it appears clearly enough with the following characteristics : qualification 10111; duration 10.4; average amplitude: 9. It seems to be a case of a double ssc preceding the same storm (see "Provisional Atlas of Rapid Magnetic Variations", fig. 11).

TABLE 2a SOLAR - FLARE EFFECTS (sfe) 1977

Times of commencements of solar flare-effects (sfe) checked by 60 observatories, namely AB CO DO NU LO SI ME WN NI VL GT CM DB BU VI NE FU TY OT GC MT AQ IK EB CI BD TL FR SM KA SS TU KY QU LP HO TE SJ HD MB MU GU BA PM HU AP PP LM GN HR AC TO AM TW CZ KG MI DU MW SB. Strong effects are marked by an asterisk. See also page X.

JANUARY - MARCH

none

APRIL

12 0946 A: NU WN GT CM HD BA LM HR ; B: LO VL DB BU FU TY AQ IK EB TL LP MB ; C: AB DO NI GC CI SM CZ KG ; D: MU GN MW

MAY - SEPTEMBER

none

OCTOBER

06 0430 A: LP PM ; B: MT KA SS KY HD LM ; C: GU TO MW ; D: MU AP GN AM CZ KG MI SB ; E: (OT) DU - (pi2: C: (AC) (TW))

06 0501 A: LP PM ; B: MT KA KY HD ; C: SS GU LM TO ; D: NU GC IK MU BA AP GN HR AM CZ KG MI DU MW SB ; E: (OT) ; X: QU - (pi2: C: (AC) (TW))

12 0151 A: LP GU PM AP ; B: MT KA SS KY HD (LM) SB ; C: HO MU TO KG ; D: CO MI ; E: SI (WN) (BU) (OT) PP (CZ) DU MW - (si: C: GN)

NOVEMBER

22 1000 A: WN GT CM TY AQ IK BA TW ; B: LO VL DB FU EB CI HD MB LM HR ; C: DO NU NI BU GC TL AC CZ KG ;D: SM GN DU MW SB ; E: (OT) ; X: QU

DECEMBER

10 0307 A: PM ; B: MT KA KY LP AP ; C: SS HD GU GN ; D: HO MU PP TO CZ KG MI MW SB ; E: (OT) DU

30 0409 A: PM ; B: MT KA KY LP HD GU (LM) GN ; C: SS MU TO CZ KG SB ; D: AP PP MI MW ; E: (OT) DU

TABLE 2b DOUBTFUL SOLAR-FLARE EFFECTS (sfe) 1977

Times of the commencements of presumed solar-flare effects checked by 60 observatories, the same as for Table 2a. Effects which very probably are real sfe's are marked by an asterisk. See also page XI.

JANUARY

none

FEBRUARY

13 1730 A: OT (LM) AC TW ; B: (NU) SI ME (FU) (MT) HD FR (KA) TU (KY) HO SJ MB (GU) (BA) HU AP (AM) ; C: VL NE SM ; D: CI TE ; E: (LP) (CZ) (DU) (MW) SB - (ssc: C: PP - si: B: (HD) - b: C: (TO) - bp: C: (KG) - b+pi2: A: (GT)

MARCH

none

APRIL

14 0541 B: CM LP ; C: AB DO NU LO WN MT KA SS KY HD LM MW ; D: NI GT DB BU FU TY GC AQ IK EB MU GU BA PM GN HR TO AM CZ KG MI ; E: DU

15 0917* B: NU WN CM BA LM ; C: DO NI GT DB FU TY AQ IK KY LP HD MB MU MW ; D: AB LO VL BU GC EB CI TL SM GN HR CZ KG

MAY

none

JUNE

27 0527 B: CM LP MU ; C: GT KA SS KY HD LM ; D: AB CO DO NU LO WN NI VL BU FU TY GC AQ IK EB GU BA PM GN TO CZ KG; E: DB

JULY

none

AUGUST

06 1025 A: MB LM ; B: WN CM (BD) LP SJ (MU) BA ; C: NI HD HR ; D: AB LO VL TY AQ EB TL SM ; E: DO NU (SI) GT DB BU FU OT GC IK CI (SS) (PM) (PP) (AM) CZ KG (DU) (MW) - (si: B: (TE))

SEPTEMBER

26 0018* A: LP ; B: MT KA KY ; C: MU PM PP GN AM ; D: CO SI ME NE BD SS TU HO TE GU TO MI SB ; E: (OT) DU ; X: AP

OCTOBER

05 1318 A: AB LO OT FR AC TW ; B: WN CM (MT) IK (KA) (KY) SJ MB LM (GN) ; C: NI BU TY GC BD BA ; D: DO GT DB AQ TL SM TE HR CZ ; E: CI (LP) HU (DU) - (si: C: VL - b: C: (AM) - pg: A: NU FU ; B: MW ; C: KG)
See the Table of Very Unusual Events at the same day and time.

NOVEMBER

none

DECEMBER

26 2326 B: MT KA ; C: MU GU PM PP TW ; D: CO SI NE BD SS TU KY HO LP GN TO MI SB ; E: (OT) DU MW - (b: C: AP - bp: (SM))

30 1252 B: CM BA HU LM ; C: NU WN TY AQ SM MB HR TW ; D: DO LO NI VL GT DB FU IK EB CI TL FR SJ AC CZ KG MW SB ; E: (OT) (LP) (DU) - b: B: (HD))

TABLE 3 REMARKABLE EVENTS

Times of commencements (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 pul - tions: 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 - 10s; pc 3 10 - 45s; pc4 45 - 150s; pc5 150 - 600s; pc 6 longer than 600s.

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 59 observatories, the same as for table 2 a minus CM. 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 pour, 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 - JULY

none

AUGUST

09 1358 ssc : B: WN ; C: TL 1355
si : A: HD ; C: VI
pg : W: HU; A: FU TY -1518 HD ;B: NI MU BA PM (15/20 m 14 nT) TO ; C: BD (21 m 28nT) PP (6/12m irreg) MW 1420-1440)
pi2 : C: SS (50/60s 0.10nT/s)
pi : A: LP (D: 10m 6nT - H: 17m 27nT)
pc6 : B: GT
pc4 : B: LM
pc3 : B: HR ; C: BU
pc : C: SI (20m 60nT) FR (22m 29nT) HO (21m 13nT) SJ (16m 8nT) GU (16m 19nT)
E : CO OT GC IK TE MB CZ KG MI DU
D : AB LO ME VL TU AP GN
ncl : A: AC TW ; B: MT KA KY AM (20m 23nT) ; C: DO DB AQ CI ; wq: NU EB (20m) SB (20m 68nT)
X : NE SM QU

SEPTEMBER

none

TABLE 3 REMARKABLE EVENTS - CONTINUED

OCTOBER

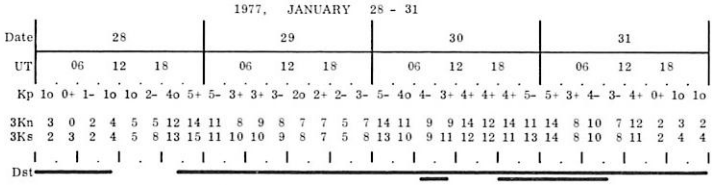
05 1315-1345	si	: B: NI* ; C: BA*
	bp	: C: LM
	pg	: W: HU ; A: GT FU AQ [1319-1332] HD* ; B: NI* TY KG (6m D 8nT H 12nT) MW; C: GC ; wq: NU*
	pi	: A: LP (D 5m 4nT H 6m 7nT) ; B: MU
	pc5	: B: BU*
	pc3	: C: BU* ; wq: NU* (30s 40nT)
	pc	: A: HD* ; C: FR (5m 18nT) BD (5m 4nT) MB BA* ; wq: SM
	E	: CZ
	D	: CO ME VL VI NE IK TL SS HO TE GU PM AP PP GN HR TO AM MI DU SB
	ncl	: A: AC TW ; B: DB OT ; C: DO SI MT KA KY SJ ; wq: AB LO
	X	: EB QU
	sfe	: b: WN

See also Table 2b of Doubtful Solar-Flare Effects 1977 at the same day and time.

NOVEMBER - DECEMBER

none

1977, JANUARY 28 - 31



Data from Individual Observatories: **JANUARY 1977**

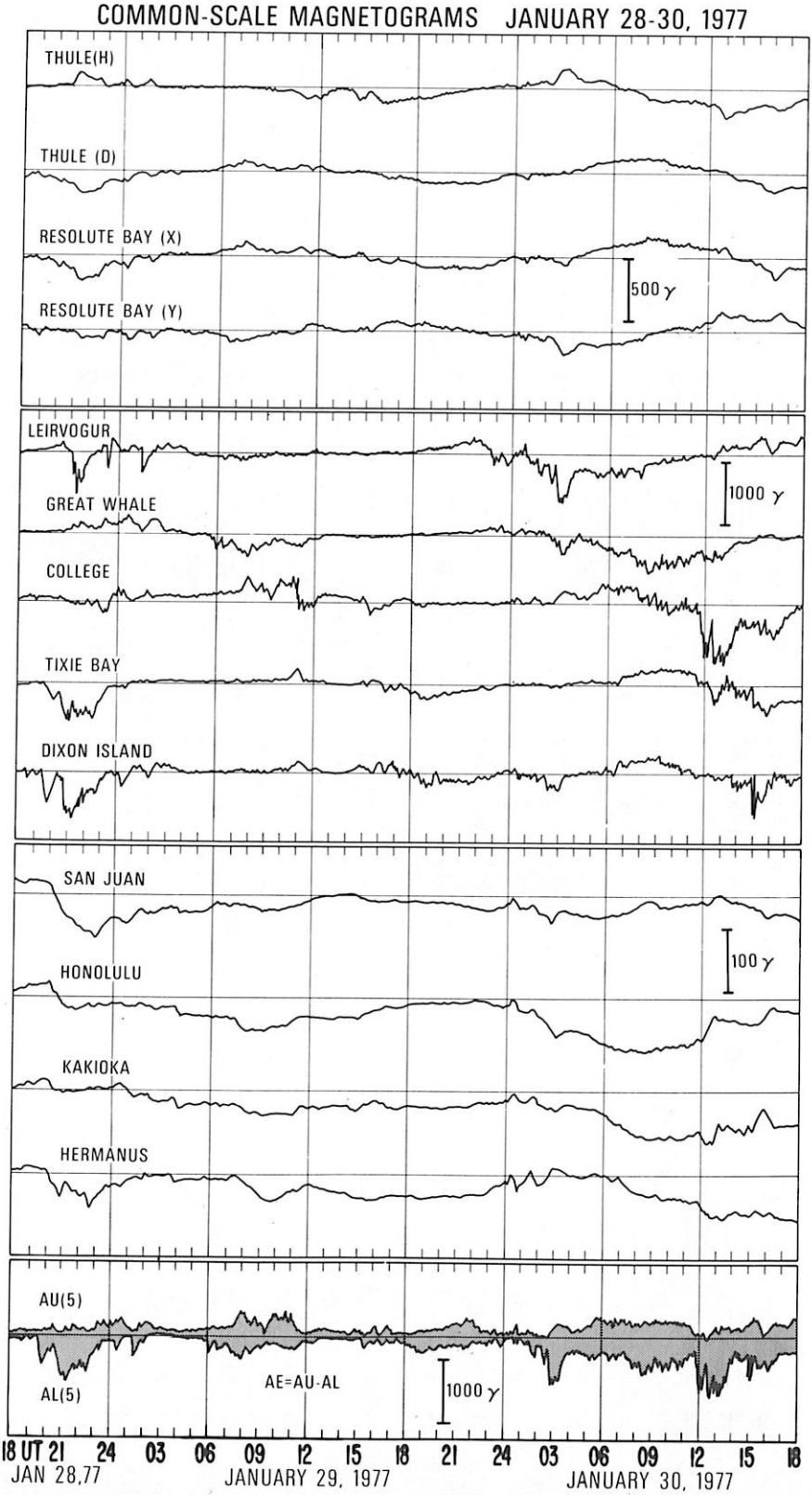
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

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
CBB	76.7N	10	1515	..	..	..	..	30(3)	-	250	370	530	30	19
WIT	54.2N	20	1840	SC	- 1	+20	0	20(8)	6	30	170	60	31	02
RES	83.1N	28	1839	SC	24	24	10	30(1)	-	364	366	188	30	20
MBC	79.1N	28	1829	SC	6	38	0	29(4)	-	353	466	326	30	20
BLC	73.9N	28	1839	SC*	26	54	28	29(2)	-	721	477	856	30	20
COL	64.6N	28	1756	SC*	..	- 9	+ 5	30(4,5) 31(5)	6	252	1340	1030	31	15
OTT	57.0N	28	----	..	..	..	..	30(1,2)	5	27	117	117	31	15
MEA	55.1N	28	1235	..	..	..	..	30(4)	6	--	--	--	31	15
VIC	54.3N	28	2010	SC	0	- 8	- 3	28(3) 29(3)	4	21	69	31	29	12
BOU	48.9N	28	2013	SC	+ 2	-18	0	31(1)	5	20	102	67	31	16
EBR	43.9N	28	1839	SC*	+ .4	+ 9	+ 7	28(7,8) 30(1) 31(1)	5	165	118	50	31	14
IRK	41.0N	28	1500	..	..	..	..	30(5)	6	23	125	55	31	09
HYB	07.6N	28	1500	..	..	..	..	28(7,8)	4	4	65	12	29	19
HUA	00.6S	28	1839	SC	2	34	3	28(7,8)	5	6	207	31	29	20
HER	33.7S	28	1839	SC	+ 1	+ 8	+ 4	28(8)	5	14	65	101	29	12
CZT	39.7S	28	1840	SC	.8	8	--	28(7)	5	190	66	54	29	03
GNA	43.3S	28	15--	..	..	..	..	28(7) 30(5,6,7)	5	18	110	120	31	15
TOO	46.7S	28	19--	..	..	..	..	30(5)	5	16	124	52	31	15
KGL	56.5S	28	2013	SC	- 2.7	-10	00	28(8) 30(7,8) 31(1)	6	73	550	380	31	03
MCQ	61.1S	28	2006	..	..	..	..	30(5)	7	192	1316	861	31	15
MAW	73.1S	28	21--	..	..	..	..	30(1,2)	7	173	1049	1001	31	15
NEW	55.1N	29	23--	..	..	..	..	31(1)	5	25	93	167	31	16
TUC	40.4N	29	23--	..	..	..	..	30(1,7) 31(1)	5	10	120	25	31	16
SIT	60.0N	30	0039	SC*	- 3.1*	-32.2*	- 8.2*	30(5)	6	50	390	460	31	14
MMB	34.0N	30	00--	..	..	..	..	30(5,7)	5	13	80	18	31	15
KAK	26.0N	30	00--	..	..	..	..	30(5)	5	9	76	42	31	15
KNY	20.5N	30	00--	..	..	..	..	30(5)	5	8	91	40	31	15
HYB	07.6N	30	0012	SC	- 0.5	+11	0	31(5)	5	3	97	20	31	15
HER	33.7S	30	00--	..	..	..	..	31(1)	5	25	100	73	31	15

THREE-HOUR-RANGE INDICES, K

JAN	28		29		30		31	
HIS	3211	2226	4344	3344	6523	3663	3334	422-
CCS	2111	3356	5334	4643	5533	5554	5336	131-
DIK	1112	3377	6434	4555	5556	5767	7434	5353
TIK	1111	4477	5235	3554	5456	7787	7343	6331
MMK	1001	1167	5323	2344	5544	5566	8433	4122
KIR	1000	0157	5323	2234	6633	5566	7423	3122
CWE	2002	3134	3246	4322	4456	8655	5244	6111
CHO	0013	3135	4345	3421	3456	6544	4344	6111
LRV	2001	1278	6444	2346	7654	5576	5653	4222
SOD	0000	0067	5222	2234	5533	5577	7423	3111
YAK	2100	3155	3224	3433	5435	7555	4322	5111
LER	0000	0146	4221	1223	4332	3456	4422	3001
NUR	1001	0156	4222	1323	3322	4445	5222	3101
LOV	1010	0256	4222	2323	4332	4555	5332	3111
SIT	0021	2134	3234	2321	3345	6534	4353	5010
SVD	1001	1255	4222	1323	5332	5554	4222	4021
RSV	1001	0246	4222	2323	4322	4554	5222	4001
MNK	0012	1124	3344	3222	3355	6435	4363	6111
WIT	1001	1256	5322	1223	5322	4554	5232	4011
IRT	2122	2345	3233	3323	5543	6554	3342	5222
VAL	1011	1145	5332	1223	4343	3443	5322	3000
KIV	2122	2255	5232	2323	4433	4554	5232	5112
DOU	1001	1145	4222	1212	4332	4443	4222	3011
KGD	1111	1233	2112	1212	3221	3333	2122	3010
VIC	1021	2234	3343	2211	4443	4432	5352	4111
OTT	1021	0134	4342	1102	5533	4335	5242	4000

	28		29		30		31	
MMB	1001	2244	3333	3311	4343	5453	3242	4111
TKT	1211	1345	2233	2322	4233	4543	4233	5222
PEG	1111	1253	3121	1123	5323	4433	3221	4112
TOL	1111	1245	3122	2213	4332	3334	3211	3110
FRD	1012	1144	4342	2112	5433	4344	5332	4010
COI	0002	1245	4322	2222	4332	4433	4222	3010
KSA	1022	2456	3322	2124	5334	5345	3235	1011
TUC	1012	1255	4343	2112	5433	4454	5343	4111
KNY	1012	2343	3333	2322	4343	5443	3242	4111
HON	1010	1142	3333	2212	4423	4333	2332	3011
HYB	1111	1344	2323	2211	3222	4433	3331	5111
SJG	0000	0254	4321	0102	4232	3364	5332	2111
GUA	1101	2344	4343	2212	4423	4434	3432	4111
BNG	2222	2365	3333	2224	5333	3353	4322	4122
PMG	1111	2243	3343	2212	3333	4434	2232	3---
HUA	1111	2355	3333	4332	4323	4334	5223	4332
GNA	1101	2244	4334	3322	4233	5555	4142	4121
HER	1102	2345	4333	3223	4333	3333	5343	4111
TOO	1212	2243	3333	3222	3334	4433	2232	4111
AML	1112	2244	3333	2201	4334	4432	3334	4011
MCQ	1101	3033	3246	3412	2556	7655	4345	6011
MIR	2323	3244	4455	3333	4544	4432	3454	4222
MAW	4322	3335	5443	3455	7764	5666	3554	4332
NVL	1111	1256	5322	2224	5443	4466	6643	3121
SBA	3222	2356	5443	3333	4544	3348	4332	4344
VOS	2222	1244	5433	3233	4453	3323	3332	4211


COMMON-SCALE MAGNETOGRAMS JANUARY 28-30, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
500 γ
RESOLUTE BAY (Y)
LEIRVOGUR
1000 γ
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
SAN JUAN
100 γ
HONOLULU
KAKIOKA
HERMANUS
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
JAN 28,77
JANUARY 29, 1977
JANUARY 30, 1977

18 UT	107	107	118	111	111	111	111	111	100	107	116	118	111	111	122	122	115	158	192	178
	161	146	155	152	132	124	109	104	96	92	98	101	98	92	87	78	86	86	81	87
	79	71	65	70	70	70	73	78	84	93	107	121	127	132	124	107	104	93	95	95
19 UT	93	87	85	85	85	96	89	93	100	89	89	89	89	89	89	89	89	89	78	98
	155	201	244	275	303	340	366	386	412	423	451	469	477	488	503	506	534	534	528	511
	491	480	472	453	453	451	441	424	393	360	342	316	299	287	294	309	320	320	324	321
20 UT	328	328	335	343	350	339	317	309	313	335	361	347	273	246	284	334	349	345	314	284
	280	280	287	295	306	332	354	361	361	390	408	427	438	445	458	473	483	486	551	608
	636	628	613	629	644	647	650	640	640	654	679	685	687	679	688	697	698	673	691	679
21 UT	731	733	749	766	771	793	807	816	813	779	761	764	751	697	712	671	654	642	616	599
	591	596	625	634	600	607	627	638	651	644	629	606	589	673	688	660	629	617	631	652
	653	654	641	628	607	633	635	592	575	572	561	555	553	549	514	490	479	497	519	538
22 UT	568	583	590	596	606	601	587	579	565	555	544	579	570	560	554	559	582	600	611	619
	608	593	575	494	474	473	507	512	506	453	445	431	425	421	390	398	369	376	386	368
	362	364	372	345	348	361	379	385	377	370	347	352	363	374	382	394	388	392	402	398
23 UT	390	372	382	353	356	355	324	426	411	310	283	252	245	237	227	214	214	220	242	272
	280	287	310	291	264	268	265	269	242	242	238	245	249	234	223	215	207	196	175	185
	188	182	193	204	215	215	227	256	279	286	297	297	297	264	253	234	228	218	211	214
00 UT	226	219	267	282	315	348	388	408	431	430	414	399	397	410	417	418	383	380	375	372
	385	395	402	397	395	390	399	384	376	376	362	334	304	283	260	243	225	214	214	211
	204	191	189	170	163	160	154	144	132	135	135	135	132	121	121	118	115	115	115	109
01 UT	106	102	102	99	96	93	90	83	71	55	113	216	335	363	421	361	322	292	314	326
	330	319	315	295	280	257	246	230	226	215	196	211	233	252	266	225	210	217	214	199
	199	184	184	204	219	239	269	253	246	229	210	270	296	288	276	259	239	208	202	202
02 UT	199	193	197	194	213	196	205	199	193	183	183	180	177	171	164	154	151	144	141	138
	135	124	118	112	108	102	99	96	90	86	80	71	63	63	63	63	63	63	63	66
	77	89	100	102	102	109	113	109	102	94	80	91	91	77	77	63	63	74	74	74
03 UT	67	56	56	63	63	63	63	63	63	63	63	63	63	52	52	52	59	62	65	69
	69	65	65	72	75	78	81	78	78	74	73	73	71	71	69	75	78	67	67	67
	72	92	84	72	89	98	89	75	65	65	66	72	78	70	67	70	73	78	81	81
04 UT	82	84	86	86	86	86	86	89	89	89	89	89	103	103	104	105	120	123	127	127
	131	131	146	146	146	146	146	135	146	146	146	146	142	142	138	127	112	97	97	105
	116	116	123	123	123	123	123	123	123	127	127	127	127	127	127	127	123	112	112	112
05 UT	112	116	127	138	131	131	123	135	150	150	150	150	146	146	146	146	146	146	146	146
	146	135	135	135	135	146	157	146	146	146	146	152	159	165	189	217	211	201	205	200
	187	173	186	195	195	208	381	348	307	309	283	305	316	337	336	344	347	345	336	323
06 UT	304	295	309	326	316	270	240	203	184	188	205	212	234	258	288	287	299	315	321	334
	321	302	305	317	307	315	318	325	318	304	298	312	315	315	326	326	320	317	299	296
	279	269	257	250	239	230	238	238	247	250	254	265	268	274	287	301	304	311	320	326
07 UT	320	331	331	341	347	350	345	352	361	386	399	411	423	428	421	409	426	429	426	423
	423	426	453	456	471	483	493	516	518	512	520	528	528	531	537	569	593	596	622	630
	641	663	687	711	725	737	717	695	686	671	650	638	625	613	606	578	580	558	534	496
08 UT	448	434	423	434	446	445	433	411	406	404	411	420	433	453	457	457	460	452	432	439
	434	443	432	437	445	453	440	436	443	444	441	456	467	475	472	465	477	454	446	435
	406	374	351	333	322	307	307	301	295	295	295	309	335	352	370	376	363	355	347	336
09 UT	336	336	336	321	312	306	299	285	276	255	215	193	148	201	164	194	199	207	209	214
	208	230	249	253	267	292	310	316	345	356	356	370	382	385	396	396	385	367	353	350
	369	369	422	456	444	441	425	417	395	406	425	447	451	439	431	431	395	406	420	409
10 UT	393	396	388	383	378	389	386	393	402	402	410	424	405	402	413	413	410	410	421	450
	439	408	389	395	421	418	432	461	528	558	536	533	552	519	493	474	466	424	416	430
	411	392	406	403	483	401	401	443	499	555	387	383	398	413	411	397	383	368	360	369
11 UT	376	385	380	368	351	345	332	314	308	302	287	264	261	252	247	224	226	229	234	225
	208	180	165	156	150	147	144	142	142	145	139	122	122	117	114	110	110	110	113	127
	125	124	134	141	141	131	125	131	133	132	146	146	150	150	157	149	142	130	139	139
12 UT	145	139	144	155	166	163	174	182	176	173	150	136	144	138	125	136	143	151	167	152
	141	141	152	146	140	134	130	136	138	138	150	146	146	124	113	116	113	113	121	118
	118	121	121	132	129	129	132	132	132	135	135	135	135	135	135	135	124	127	130	121
13 UT	121	121	120	120	121	124	124	124	123	126	126	129	129	116	119	119	116	116	116	116
	113	113	112	112	112	112	100	100	99	99	102	102	102	99	96	99	102	102	105	108
	108	108	108	108	108	108	111	114	114	117	121	117	117	117	100	100	100	100	97	100
14 UT	100	103	103	106	106	95	98	98	101	101	108	100	103	88	85	82	79	79	86	89
	92	95	95	95	95	98	101	113	110	107	103	103	94	105	102	113	120	92	100	130
	142	153	153	150	142	133	125	119	119	119	113	113	110	110	113	116	119	122	121	124
15 UT	122	116	105	94	94	91	94	109	109	116	138	169	154	171	171	183	194	190	167	186
	216	201	174	174	182	178	167	156	144	152	152	152	141	141	141	141	141	133	144	144
	144	144	156	156	172	200	214	234	237	226	234	243	248	257	252	240	243	246	252	235
16 UT	223	204	173	156	96	77	77	97	111	86	94	108	119	116	116	119	119	119	122	136
	161	167	171	201	210	215	213	207	195	190	179	178	176	174	176	181	165	154	159	156
	149	147	191	219	247	263	258	181	132	126	126	155	181	195	201	155	126	126	126	138
17 UT	149	158	150	111	104	96	124	147	147	98	90	95	92	86	89	89	100	107	124	130
	137	137	137	137	137	130	137	144	133	141	141	148	155	155	155	155	155	155	163	163
	163	144	144	137	137	144	142	149	149	167	178	181	170	185	200	200	185	171	171	163

18 UT	167	167	164	168	171	168	168	160	160	160	160	168	172	179	186	194	201	201	201	201
	201	201	201	212	212	212	205	205	205	205	212	216	223	231	246	257	276	283	290	302
	302	306	302	306	302	302	294	287	287	287	299	310	317	321	328	332	340	345	343	347
19 UT	340	328	332	328	328	336	343	336	336	321	313	306	302	302	302	313	306	310	302	306
	299	295	291	288	273	250	243	247	250	262	262	273	277	277	273	277	284	291	299	299
	303	303	303	295	295	299	296	296	317	312	306	296	296	299	292	281	277	274	281	277
20 UT	266	259	251	244	244	244	251	255	259	263	268	263	263	266	270	277	277	296	292	289
	292	296	298	300	300	308	315	315	319	316	312	300	296	296	301	301	297	293	293	298
	298	300	309	315	322	323	323	334	338	338	329	324	321	315	313	309	315	326	332	327
21 UT	324	330	337	346	345	345	344	346	350	353	357	343	330	330	339	342	338	329	328	328
	325	317	317	314	310	303	298	290	306	336	358	374	389	393	388	389	386	378	373	369
	391	440	447	425	398	386	364	363	373	385	389	385	377	363	356	349	343	344	352	353
22 UT	348	349	332	319	307	299	285	287	321	299	258	236	235	234	232	229	224	228	234	243
	245	245	250	249	244	247	235	223	209	197	193	188	187	187	182	178	173	168	160	167
	174	178	180	180	182	192	201	204	213	209	203	197	188	192	188	184	200	219	245	210
23 UT	184	167	139	134	130	132	129	126	120	107	107	119	120	131	149	169	176	183	165	163
	154	134	140	143	147	143	137	134	148	151	139	109	99	94	89	93	110	142	157	122
	126	130	149	160	168	183	198	217	201	197	197	197	185	169	162	159	156	138	121	106
00 UT	102	89	82	71	71	63	67	63	74	85	93	85	74	63	60	64	68	60	45	52
	63	74	85	100	93	93	82	82	70	76	87	91	95	95	87	78	89	114	140	172
	121	107	80	75	93	106	197	251	301	279	209	138	87	63	39	32	22	25	37	49
01 UT	55	64	76	101	108	111	115	125	133	145	157	161	157	150	140	148	156	168	179	179
	156	114	114	117	117	143	155	181	204	226	245	233	218	184	162	135	143	147	215	246
	265	273	307	315	345	345	338	334	322	304	273	292	300	308	316	355	360	342	285	229
02 UT	203	178	178	180	180	174	165	158	151	148	144	144	148	171	167	140	152	171	159	159
	163	175	186	205	247	266	293	320	339	370	404	393	385	397	419	435	339	271	225	185
	204	207	209	255	278	312	396	427	472	514	560	590	643	697	719	776	807	830	791	783
03 UT	791	787	783	783	798	817	837	867	897	836	821	832	809	794	805	786	778	797	801	816
	831	861	850	843	831	797	789	743	724	686	648	652	652	632	595	553	538	527	511	500
	526	545	530	507	500	477	443	428	428	435	438	446	412	404	401	393	401	393	397	390
04 UT	375	371	371	363	367	345	333	314	314	314	299	288	288	296	303	326	330	334	349	341
	333	326	322	322	314	307	303	299	306	306	310	310	302	310	325	344	363	356	340	337
	322	318	303	307	314	315	311	330	345	345	356	356	352	352	352	379	382	386	390	382
05 UT	394	397	416	431	428	427	446	442	442	446	469	488	518	515	526	511	522	522	534	556
	533	499	480	461	435	423	442	479	514	540	544	548	551	559	593	600	604	608	615	627
	611	611	618	615	581	573	570	547	521	506	502	502	543	539	547	550	535	502	502	509
06 UT	561	542	527	501	505	497	474	476	478	471	486	490	494	494	498	468	483	461	459	474
	487	487	506	514	514	526	537	571	567	552	548	563	548	558	553	542	537	539	563	523
	467	405	458	451	459	501	501	523	565	581	603	574	585	578	578	616	627	589	570	533
07 UT	495	458	421	477	514	540	557	563	546	540	522	530	527	513	521	514	505	494	476	465
	454	457	457	479	499	502	495	523	528	529	521	526	532	534	529	503	494	516	540	569
	548	538	550	578	599	608	596	594	603	616	628	662	715	677	672	615	587	546	555	555
08 UT	561	569	577	578	607	645	654	660	659	642	641	640	651	663	653	615	590	570	557	570
	588	610	629	660	679	693	708	723	733	746	762	767	763	759	756	773	791	811	822	802
	760	744	732	730	771	772	762	734	706	693	684	670	660	651	638	631	637	639	629	618
09 UT	623	637	646	650	675	697	709	727	742	764	739	704	658	623	613	603	635	649	589	553
	595	613	640	630	602	625	629	642	678	689	683	635	632	630	624	607	600	627	643	627
	623	637	679	707	750	711	696	688	669	635	625	613	632	666	690	700	710	694	672	637
10 UT	614	602	610	620	628	658	694	716	746	739	730	714	705	692	683	656	634	623	582	569
	557	547	532	528	547	585	588	576	561	556	560	586	614	610	589	579	571	582	596	608
	641	707	708	724	725	675	637	614	583	564	561	569	563	582	597	622	635	634	621	600
11 UT	571	541	545	557	573	556	543	539	524	503	492	481	495	500	514	503	507	512	516	504
	495	476	473	460	429	429	443	437	423	405	394	391	384	376	365	347	329	326	321	318
	329	332	331	259	258	264	268	268	269	296	316	337	355	466	447	436	488	518	495	473
12 UT	507	574	641	846	772	783	828	873	764	667	615	805	805	805	854	794	798	794	764	649
	574	504	403	391	396	394	377	353	343	352	371	368	436	513	619	731	806	881	934	870
	841	833	871	930	968	972	987	964	938	882	863	796	751	714	718	744	677	853	913	932
13 UT	943	924	884	881	855	884	947	962	995	906	857	861	946	972	972	983	990	931	872	830
	789	770	864	898	894	912	924	905	898	898	898	902	846	805	775	757	712	745	772	772
	775	798	821	828	791	734	701	633	596	555	555	552	552	556	530	511	496	466	454	447
14 UT	439	432	439	446	472	506	506	488	476	484	465	447	406	346	331	335	335	330	353	396
	365	377	368	402	428	443	454	477	458	425	380	361	380	383	391	409	424	442	461	457
	465	461	450	439	427	435	450	462	473	481	492	477	474	485	478	467	470	467	467	455
15 UT	433	444	467	493	515	508	552	658	831	647	548	509	662	922	698	584	540	506	514	538
	585	604	574	623	645	660	679	690	715	708	697	719	693	701	711	719	738	738	710	710
	730	733	703	653	655	654	661	653	638	630	607	585	570	536	517	502	501	468	475	456
16 UT	422	396	396	410	410	436	460	479	494	497	494	520	539	554	558	558	558	558	569	603
	580	543	562	562	536	559	574	563	537	552	537	582	601	613	620	613	576	538	546	542
	538	534	531	535	535	535	553	565	561	531	497	471	456	443	450	458	458	454	450	443
17 UT	443	443	450	461	443	435	427	435	439	443	450	458	446	450	446	435	420	409	409	405
	401	397	397	393	390	390	390	393	393	408	401	404	401	408	412	420	423	427	442	446
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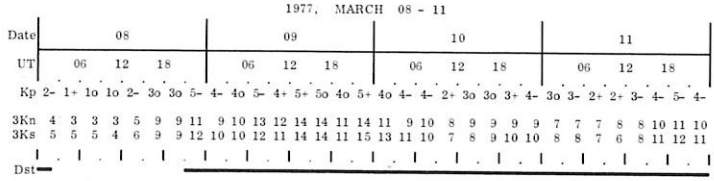
1977, MARCH 08 - 11



Data from Individual Observatories: **MARCH 1977**

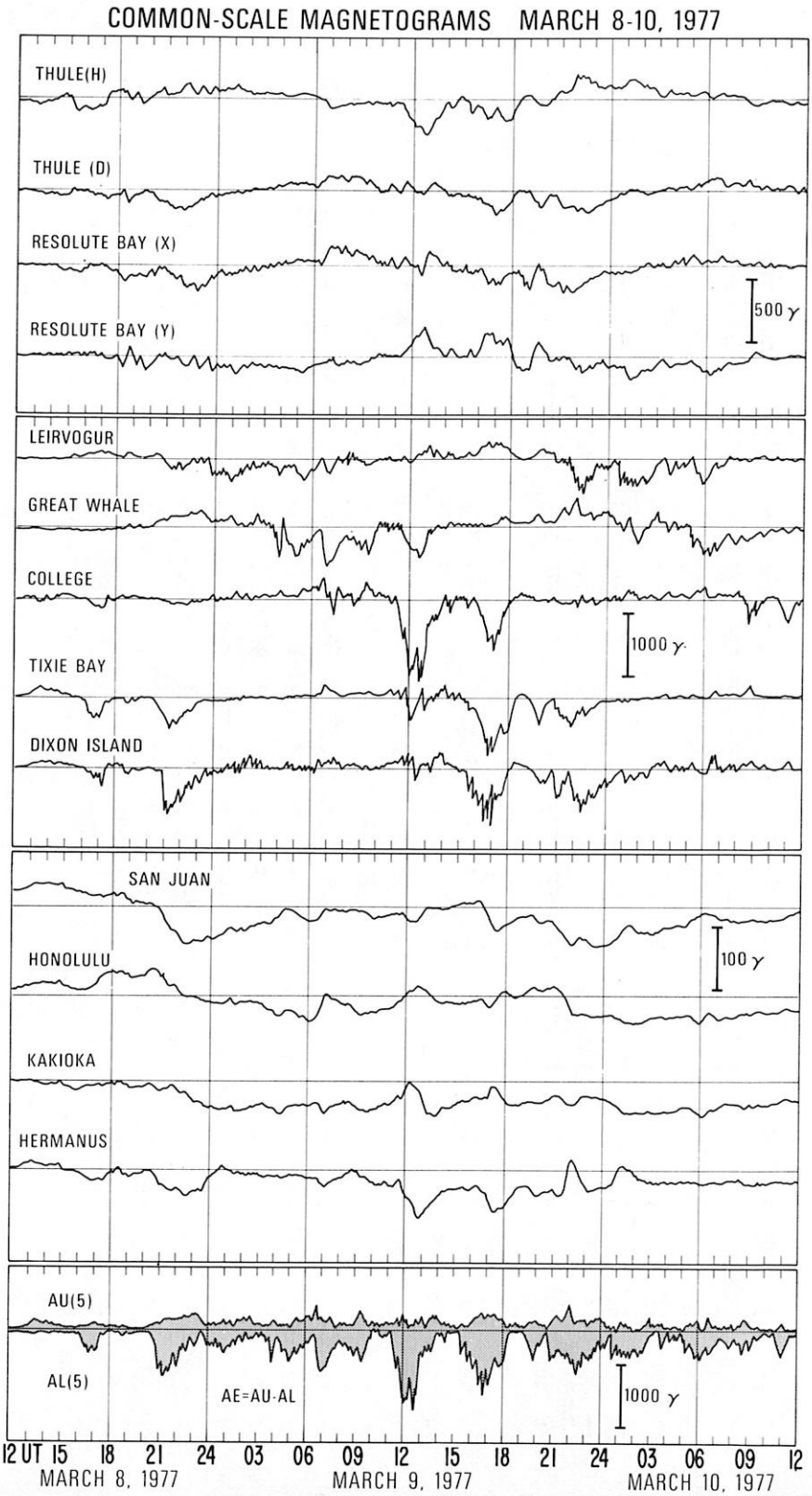
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

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	83.1N	8	1250	..	..	..	..	09(5)	-	388	417	397	11	01
HBC	79.1N	8	1330	..	..	..	..	09(5)	-	510	529	443	11	02
CBB	76.7N	8	1405	..	..	..	..	09(3)	-	600	1005	910	10	24
BLC	73.9N	8	1250	..	..	..	..	09(5)	-	900	684	845	10	23
COL	64.6N	8	08--	..	..	..	..	09(4,5)	7	240	1630	800	10	20
OTT	57.0N	8	----	..	..	..	..	09(3,5,8)	5	29	105	134	13	08
NEW	55.1N	8	1154	..	..	..	..	09(3,5,6) 12(1)	5	27	142	135	14	10
HEA	55.1N	8	1320	..	..	..	..	09(5)	7	--	--	--	13	06
VIC	54.3N	8	----	..	..	..	..	09(3)	5	23	143	121	10	09
WIT	54.2N	8	16--	..	..	..	..	09(8)	6	26	205	45	10	03
FRD	49.6N	8	17--	..	..	..	..	09(3,5,6,8)	5	19	125	55	10	10
BOU	48.9N	8	15--	..	..	..	..	09(3)	5	23	134	57	14	18
EBR	43.9N	8	12--	..	..	..	..	09(5,6,8) 11(7)	5	130	101	70	13	03
IRK	41.0N	8	1300	..	..	..	..	09(3,4,5,6,8)	5	20	81	25	10	21
JAI	17.3N	8	18--	..	..	..	..		-	6	61	37	10	17
SHL	14.6N	8	18--	..	..	..	..		-	4	69	26	10	17
UJJ	13.5N	8	18--	..	..	..	..		-	--	--	--	10	17
ABG	09.5N	8	18--	..	..	..	..	08(8) 09(3,6,7,8) 10(2,3)	4	4	71	32	10	17
HYB	07.6N	8	1000	..	..	..	..	09(5,6,7,8)	4	4	91	16	09	23
GUA	04.0N	8	1443	..	..	..	..	09(5)	5	10	90	30	10	19
ANN	01.5N	8	18--	..	..	..	..		-	3	117	45	10	17
HUA	00.6S	8	1155	..	..	..	..	09(5,6,7)	5	6	250	40	10	21
TRD	01.1S	8	18--	..	..	..	..		-	3	152	81	10	17
PMG	18.6S	8	14--	..	..	..	..	09(4,5)	5	4	60	50	10	18
HER	33.7S	8	17--	..	..	..	..	09(5,6,8)	5	19	92	93	10	09
CZT	39.7S	8	1800	..	..	..	..	09(8)	5	304	105	80	13	02
GNA	43.3S	8	13--	..	..	..	..	09(5,6)	5	19	70	90	10	19
TOO	46.7S	8	21--	..	..	..	..	09(5,6)	5	18	131	22	10	18
MCQ	61.1S	8	1157	..	..	..	..	09(4,5)	-	175	1174	761	11	00
MAW	73.1S	8	16--	..	..	..	..	08(8) 09(8) 10(1)	7	142	877	1021	10	13

THREE-HOUR-RANGE INDICES, K

MAR	8		9		10		11	
HIS	2332	2335	4455	5665	5545	4654	4553	3755
CCS	1222	2535	6446	7656	5444	5554	5444	5656
DIK	1222	4647	6556	7867	6454	4765	4433	4866
TIK	1121	5767	4456	7877	3354	5874	3334	6865
MMK	1111	2556	6445	5556	6333	3445	3322	3476
KIR	1111	2445	6434	5656	6333	3345	3312	2476
CWE	1111	3523	3368	8744	2354	4422	2234	4533
CMO	0102	3423	3357	7634	3355	5422	2333	5433
LRV	4312	2435	5564	5556	6653	4455	5322	3476
SOD	0100	1445	5334	5556	5332	3345	2312	3476
YAK	1211	2435	4354	5445	3324	4443	2333	4443
LER	1001	1324	3233	3435	4321	3233	3211	2444
NUR	1112	2235	3233	4534	4333	3323	3222	3444
LOV	1112	2335	3333	4535	5232	3334	3222	3454
SIT	1101	2334	3456	7543	2443	3332	2233	2332
SVD	0122	1324	3334	5545	4323	3333	2223	3444
RSV	1120	2335	3333	4545	4232	3334	3212	3454
MNK	1111	1323	3466	7434	3443	3322	2144	2233
WIT	1111	2335	3344	5546	4332	3345	3211	3454
IRT	2322	2434	3455	5545	0443	4443	2323	4444
VAL	1011	2344	3344	4435	4232	2334	3212	2353
KIV	1222	3445	4344	5545	5333	3344	3233	3454
DOU	1111	1334	3334	4535	4232	2334	3221	2453
KGD	1121	1213	2234	4322	2222	2222	1122	2233
VIC	1111	2333	3454	4444	4443	3332	3233	2333
OTT	2100	1233	3453	5435	4332	2233	3323	2243

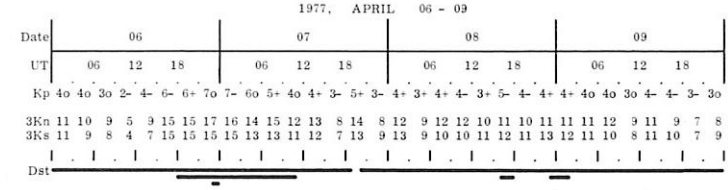
MAR	8		9		10		11	
MMB	1211	2333	3344	5434	2333	3332	1223	3333
TKT	2232	2335	2344	4554	3333	3332	2222	3542
PEG	1121	2333	3233	4445	4221	2344	2123	3344
TOL	1010	1333	3333	4445	4231	1334	2112	2343
FRD	2111	1234	3453	5545	4333	2233	3323	2333
COI	1122	3234	3333	5545	4222	2333	3222	2343
KSA	0123	4445	3344	6556	4113	3424	2113	2453
TUC	1111	2434	3454	5535	4442	3324	2233	3333
KNY	1211	2333	3344	5434	2332	3331	2122	3433
HON	1211	2333	3354	4334	3332	2212	2123	2233
HYB	1211	2333	2333	4444	2331	2322	1221	3442
SJG	0110	2345	4433	4534	4433	2222	1212	1233
GUA	2211	1333	3434	5334	3332	3312	2222	3333
BNG	2222	3444	3254	4545	4233	2334	3323	3344
PMG	2221	2333	3335	5434	3332	3322	2222	3333
HUA	0112	3444	3333	5554	3332	4442	2112	4343
GNA	1111	2334	4232	5535	4433	3342	3233	3544
HER	1233	2334	3243	5545	4432	3334	3322	2343
TOO	1211	2323	3443	5534	3443	3332	2232	3433
AML	1212	2333	3455	5433	3443	2332	2333	3333
MCQ	0201	3523	3458	8743	3465	5531	2234	4532
MIR	3332	2333	3555	5636	4454	3453	3444	3466
MAW	3332	2347	5555	4657	7554	4546	5533	3576
NVL	2211	2346	5553	3346	6552	2334	----	----
SBA	2221	2454	3454	6444	4352	3444	3333	3334
VOS	2322	2334	3444	----	3343	3433	3333	2343


COMMON-SCALE MAGNETOGRAMS MARCH 8-10, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000 γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
MARCH 8, 1977
MARCH 9, 1977
MARCH 10, 1977

12 UT	40	40	36	36	42	39	39	36	36	36	36	36	32	33	39	39	42	42	39	39
	36	36	36	36	39	42	42	42	42	43	47	47	48	58	48	48	51	51	51	51
	52	48	48	51	51	51	57	57	57	57	57	60	60	60	63	63	63	63	65	65
13 UT	65	68	71	71	74	74	77	80	86	89	98	101	104	106	106	109	119	125	137	140
	154	160	166	171	177	183	192	203	214	214	214	203	192	173	179	193	199	187	195	203
	189	175	164	161	158	159	156	150	147	142	139	138	141	141	138	138	135	135	132	132
14 UT	129	127	127	124	124	121	124	130	133	136	136	138	144	147	150	150	150	147	147	147
	147	138	136	136	139	140	134	124	127	133	136	138	133	130	133	132	132	127	124	124
	121	118	118	112	109	103	102	102	102	102	102	102	102	91	91	91	91	91	91	94
15 UT	94	98	98	98	98	98	94	94	94	91	91	88	79	77	74	74	63	66	66	69
	69	72	75	79	73	79	86	89	89	89	89	89	89	89	85	89	93	89	89	85
	82	85	85	85	85	82	85	89	85	85	85	85	85	85	81	81	81	81	78	78
16 UT	82	85	82	89	89	82	85	93	100	100	102	105	123	146	103	140	170	155	121	148
	165	183	226	247	255	279	287	284	293	293	284	279	286	314	313	331	328	325	316	313
	320	335	355	367	388	403	411	411	406	401	401	395	386	380	372	349	344	328	356	394
17 UT	392	384	377	401	428	442	449	408	421	438	456	459	411	378	392	400	369	354	375	348
	328	305	256	250	245	206	165	160	154	151	158	164	164	158	154	157	156	155	161	167
	167	164	161	154	151	144	135	125	116	106	100	91	74	62	63	67	73	67	61	60
18 UT	59	76	84	98	92	69	61	67	76	82	84	84	83	83	80	80	75	66	63	68
	71	71	74	88	80	80	72	64	71	74	65	68	70	59	65	68	74	79	83	93
	102	109	119	125	136	146	152	161	165	165	168	168	165	165	162	162	167	164	158	154
19 UT	148	136	126	120	111	101	91	83	67	61	60	62	65	68	71	74	76	79	82	85
	88	91	91	91	91	88	82	79	74	71	73	76	76	70	67	64	61	58	56	42
	39	36	37	37	37	37	41	41	41	41	30	30	41	41	41	37	37	34	34	31
20 UT	17	17	17	20	20	24	27	24	31	28	25	26	30	34	37	37	40	43	47	50
	54	57	61	63	67	74	84	93	92	102	112	117	116	122	121	127	142	151	154	160
	166	172	180	189	195	207	221	239	248	251	269	280	289	298	310	316	325	330	336	348
21 UT	360	366	372	375	480	633	672	729	686	636	602	592	615	684	705	782	820	840	851	840
	840	834	834	814	825	817	826	834	786	732	718	715	720	755	778	778	767	752	738	722
	753	764	767	767	721	693	667	659	667	670	641	624	598	541	517	511	508	527	541	561
22 UT	584	615	635	641	650	664	679	690	696	687	627	593	587	579	573	579	585	582	573	491
	443	440	445	454	457	465	474	468	460	445	426	410	414	415	436	468	463	465	471	482
	487	493	496	490	476	430	410	396	388	371	363	348	340	328	325	322	323	323	329	341
23 UT	347	356	364	379	403	418	435	447	453	455	458	464	463	466	455	447	444	436	421	400
	383	345	331	330	312	286	263	251	236	218	207	201	192	189	179	179	173	169	166	165
	170	181	184	201	212	218	222	230	239	245	251	252	264	284	302	317	317	302	289	287
00 UT	294	283	275	282	293	304	312	316	321	321	314	292	282	300	320	333	337	331	302	292
	288	290	292	306	316	335	339	341	338	329	319	294	256	230	209	209	264	332	344	330
	306	287	283	282	282	312	334	352	367	385	399	392	399	418	426	426	430	430	438	438
01 UT	496	504	494	483	442	417	399	382	372	362	352	358	377	362	354	335	339	346	361	380
	391	391	391	391	376	372	346	335	320	305	283	268	249	233	226	204	185	228	261	272
	257	242	236	215	185	164	145	176	264	289	246	237	236	246	251	249	203	180	176	180
02 UT	176	176	170	184	219	235	237	244	238	218	243	258	181	180	332	296	241	147	126	110
	129	152	206	75	208	243	173	172	237	192	219	249	236	282	315	334	311	289	253	235
	225	226	235	216	214	223	228	190	161	155	177	174	172	172	185	168	140	158	155	134
03 UT	153	161	164	168	172	187	191	198	191	183	176	172	164	161	149	142	134	126	130	134
	123	123	127	116	101	97	104	130	138	134	142	157	165	169	172	176	172	169	165	165
	170	214	255	261	277	293	263	216	210	199	263	307	350	353	362	381	410	422	444	476
04 UT	506	547	588	616	607	579	522	451	467	289	277	255	247	221	217	216	233	191	191	195
	173	165	177	177	187	235	241	260	276	263	257	286	339	324	332	342	353	371	379	370
	367	374	343	367	367	367	383	378	387	387	405	408	411	417	406	424	427	444	451	455
05 UT	466	457	438	452	477	507	485	450	457	483	510	531	523	473	451	435	436	438	413	408
	411	443	464	495	516	489	495	520	536	524	489	476	481	474	478	470	459	451	425	406
	395	368	355	371	374	393	399	412	418	408	402	394	382	369	369	363	363	360	357	353
06 UT	361	380	388	386	404	404	404	397	381	366	362	344	338	332	340	340	336	344	338	310
	303	300	283	268	257	235	265	265	262	270	267	278	289	295	327	370	405	425	431	503
	536	630	722	793	791	770	689	711	698	730	730	729	721	755	777	796	802	787	766	754
07 UT	761	768	752	719	704	697	691	688	696	681	678	673	673	673	670	667	655	643	630	606
	602	633	635	623	584	589	553	489	497	536	535	536	574	557	555	543	519	503	483	451
	434	411	394	369	376	337	323	320	305	309	312	299	290	274	264	258	260	268	276	273
08 UT	266	260	246	233	250	250	247	265	273	304	311	301	303	295	277	306	294	277	291	296
	331	331	328	318	330	328	308	256	262	275	284	303	316	290	312	328	332	335	353	346
	364	383	387	380	393	380	362	349	377	368	365	374	409	378	393	412	434	456	459	443
09 UT	399	408	413	406	424	437	440	450	440	465	511	442	437	465	578	626	620	636	623	639
	659	682	650	639	680	702	707	683	688	634	555	577	580	549	505	492	473	449	430	412
	421	434	408	355	298	273	213	184	165	178	184	194	195	191	181	151	129	137	133	129
10 UT	125	122	122	124	127	111	97	117	117	109	104	107	102	89	89	95	115	129	126	122
	111	88	84	77	87	82	82	76	71	87	101	79	55	55	92	131	136	135	123	170
	199	158	152	176	151	129	147	143	142	132	160	156	149	184	212	160	162	159	123	151
11 UT	129	140	129	139	140	140	140	115	122	133	144	138	160	146	132	149	158	180	202	218
	232	254	302	318	368	444	452	458	494	536	595	648	676	712	740	754	734	673	645	545
	536	565	556	586	722	781	865	854	930	978	1034	1084	1143	1210	1255	1161	1099	1093	1184	1280

12 UT	1423	1411	1379	1344	1284	1272	1232	1159	1145	1172	1142	1164	1220	1112	1098	1080	1063	1051	978	944
	904	830	811	804	808	793	800	838	893	963	990	1004	1053	1123	1167	1204	1237	1261	1249	1253
	1271	1300	1202	1100	1108	1089	1039	1049	1117	1098	1098	998	850	746	698	650	605	624	642	532
13 UT	548	578	604	553	574	585	548	556	575	552	518	521	476	408	371	342	301	290	304	323
	341	356	341	315	342	421	439	458	484	476	459	423	420	400	384	393	410	418	437	445
	462	473	431	412	351	360	374	389	356	308	287	282	257	248	250	273	284	275	264	235
14 UT	229	224	230	227	216	214	224	158	121	122	132	110	154	184	206	191	180	154	160	153
	153	131	120	109	101	128	165	211	236	249	260	268	214	197	111	94	94	94	91	83
	61	73	98	118	117	89	78	63	79	87	82	74	77	74	57	57	75	84	90	85
15 UT	69	80	92	121	92	77	74	74	87	70	62	63	66	66	66	63	58	59	70	72
	68	100	111	127	136	143	163	162	174	184	202	232	232	250	234	234	351	423	247	220
	217	215	223	235	292	278	284	246	238	235	274	303	550	527	390	354	374	451	442	437
16 UT	430	435	442	430	457	509	566	570	598	618	635	710	722	724	738	751	748	731	723	697
	661	638	639	721	729	705	642	651	664	671	674	693	744	760	881	1013	1027	1020	916	891
	911	927	955	945	986	955	893	869	949	979	1068	1120	1223	1178	1030	870	789	762	752	821
17 UT	883	925	975	1017	1048	1070	1074	1064	1042	1016	1000	986	958	934	912	884	879	875	869	862
	843	812	766	797	734	735	701	677	659	663	661	648	631	625	629	642	650	645	647	654
	669	685	694	696	703	712	715	711	719	732	726	713	710	696	690	684	677	669	666	659
18 UT	655	624	585	545	491	466	413	394	365	347	317	299	267	243	210	186	161	150	141	147
	164	169	152	135	120	103	97	89	80	71	71	74	77	80	84	84	89	89	89	100
	111	111	111	111	122	122	126	115	104	104	86	92	104	104	100	100	100	100	100	100
19 UT	96	85	74	74	59	59	59	59	70	66	66	62	60	69	81	50	63	75	87	93
	105	117	126	132	135	135	135	132	165	163	201	228	246	270	287	308	329	347	350	370
	382	391	408	414	420	432	446	461	475	486	526	559	586	586	563	536	478	455	433	407
20 UT	386	369	353	342	354	376	353	335	351	335	311	296	289	287	295	305	316	323	309	302
	287	285	271	254	262	253	249	248	210	205	202	201	194	174	141	133	125	117	96	67
	63	77	85	77	93	145	180	233	265	314	332	332	331	389	432	516	536	585	594	578
21 UT	559	554	563	572	587	596	605	611	617	623	624	618	613	610	571	499	511	513	528	547
	555	531	517	495	489	484	481	484	489	495	494	497	493	493	496	501	503	508	522	511
	517	532	547	551	554	555	580	598	601	603	588	582	604	669	704	723	726	683	669	686
22 UT	680	726	784	872	878	841	804	771	787	771	735	702	683	670	654	651	646	634	652	628
	599	649	651	650	644	646	717	755	776	805	808	814	812	803	714	680	657	614	603	608
	620	649	689	701	704	707	695	678	650	616	504	487	485	485	491	491	500	508	517	528
23 UT	537	534	528	527	535	541	520	502	484	463	490	503	520	535	550	569	581	587	560	543
	532	512	512	521	541	553	559	562	565	565	551	482	453	406	397	407	429	445	457	486
	497	503	500	499	476	454	419	345	342	336	336	342	346	352	369	380	395	429	449	457
00 UT	473	454	436	410	389	369	354	342	331	328	329	328	342	359	371	362	344	332	311	268
	261	261	240	226	200	209	217	209	181	138	135	148	134	127	120	124	118	127	130	119
	87	79	129	227	308	356	394	424	446	375	356	337	326	300	322	239	197	251	262	268
01 UT	257	352	393	401	420	408	389	393	385	388	430	464	486	509	539	547	512	505	494	471
	445	429	422	441	445	434	434	415	408	412	415	426	441	468	483	521	461	449	430	412
	396	393	389	408	412	438	465	476	462	428	398	379	394	401	383	360	326	289	288	299
02 UT	311	329	337	295	288	295	307	314	307	322	348	303	295	318	348	363	360	352	348	421
	402	379	375	368	364	337	333	330	341	337	341	356	352	344	348	336	332	334	351	363
	366	361	345	341	333	321	325	325	307	267	249	260	251	255	249	270	272	273	287	260
03 UT	190	171	142	120	137	137	133	142	150	148	143	130	118	108	92	85	79	74	67	94
	102	88	78	73	75	78	87	102	106	102	104	103	89	97	102	99	126	148	152	157
	187	214	237	259	270	297	342	354	361	332	313	291	275	253	222	207	218	238	230	203
04 UT	184	136	108	90	82	81	85	91	91	94	105	118	125	125	147	183	169	169	169	173
	169	177	177	173	173	177	180	184	191	176	161	153	142	138	134	123	112	150	165	177
	188	192	184	173	170	181	173	139	124	109	105	105	105	90	56	44	29	29	33	18
05 UT	26	22	25	29	45	112	152	200	194	192	184	206	215	231	246	258	326	393	362	359
	340	271	285	310	295	290	337	370	360	361	361	380	345	323	328	334	366	391	416	405
	408	408	422	437	464	460	465	482	501	528	564	558	557	563	563	568	561	538	515	496
06 UT	455	428	414	409	382	359	359	385	426	437	431	418	411	401	393	371	359	349	329	325
	322	325	330	326	332	360	388	379	471	519	492	464	436	425	438	485	514	551	575	469
	470	466	431	412	400	429	400	388	380	362	350	340	342	329	331	328	321	315	309	298
07 UT	295	295	291	288	285	268	244	228	211	205	216	213	220	214	194	170	157	157	157	151
	148	148	153	159	168	172	175	178	181	196	202	206	214	240	260	249	244	232	238	241
	244	244	244	247	250	260	286	316	311	303	307	310	313	321	318	320	321	320	315	300
08 UT	279	265	242	228	201	195	198	189	173	166	169	172	172	178	187	199	209	219	229	235
	247	253	265	274	265	268	271	275	286	289	288	292	294	294	300	290	413	425	479	543
	516	477	341	362	348	384	326	311	288	305	289	294	286	267	266	257	258	258	299	360
09 UT	357	321	296	290	235	204	200	209	201	195	182	167	134	125	134	126	107	107	107	114
	124	127	143	156	171	172	155	174	166	176	205	205	167	147	121	116	119	135	126	85
	85	94	101	83	72	66	77	71	67	67	64	61	58	55	52	49	49	49	52	52
10 UT	55	61	64	67	71	77	69	72	66	52	70	82	75	71	40	40	36	39	46	43
	41	37	33	41	41	30	22	37	47	58	72	72	86	97	89	100	100	103	117	131
	134	147	150	156	181	242	270	309	334	331	334	348	373	401	395	443	449	466	485	488
11 UT	477	463	438	416	401	382	374	360	335	324	307	290	271	245	228	187	164	147	131	131
	120	106	92	92	78	67	68	67	70	70	72	72	75	86	86	89	100	100	89	81
	70	59	59	59	48	60	82	60	45	32	35	20	23	29	48	45	53	50	47	50

1977, APRIL 06 - 09



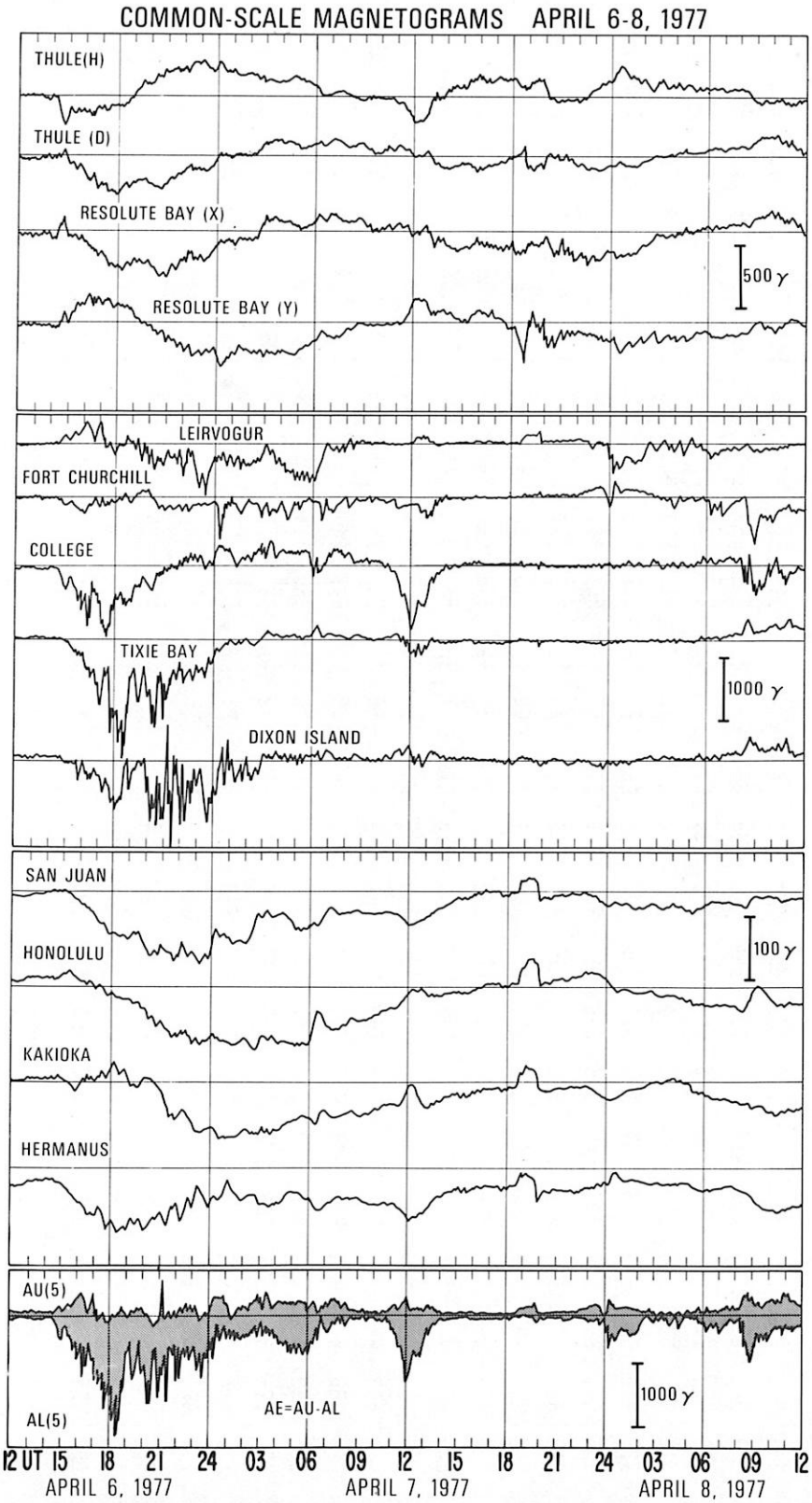
Data from Individual Observatories: APRIL 1977

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
NEW	55.1N	5	19--	..	..	..	..	07(1,3)	7	61	218	264	11	07
BOU	48.9N	5	20--	..	..	..	..	07(1)	6	40	157	93	10	12
RES	83.1N	6	1410	..	..	..	..							
MBC	79.1N	6	1410	..	..	..	..							
CBB	76.7N	6	0548	..	..	..	..	08(4)	-	820	790	730	08	24
BLC	73.9N	6	1230	..	..	..	..							
COL	64.6N	6	14--	..	..	..	..	07(5) 08(6)	7	185	1600	830	09	21
SIT	60.0N	6	05--	..	..	..	..	07(1)	7	77	820	510	07	21
OTT	57.0N	6	----	..	..	..	..	06(8) 07(1,2)	7	82	276	317	10	09
MEA	55.1N	6	1145	..	..	..	..	07(3)	7	--	--	--	10	09
VIC	54.3N	6	----	..	..	..	..	07(3)	7	48	179	216	10	12
WIT	54.2N	6	14--	..	..	..	..	06(6,7,8) 07(1,7)	6	35	255	120	08	01
FRD	49.6N	6	15--	..	..	..	..	06(8) 07(1)	6	32	125	115	07	15
EBR	43.9N	6	1138	..	..	..	..	06(6)	6	195	105	79	09	24
IRK	41.0N	6	1200	..	..	..	..	06(7,8) 07(7)	6	28	160	62	09	22
MMB	34.0N	6	13--	..	..	..	..	06(6,7,8) 07(5)	5	12	145	28	09	21
SJG	29.9N	6	1400	..	..	..	..	06(6)	5	12	133	41	08	12
KAK	26.0N	6	13--	..	..	..	..	06(7,8) 07(7)	5	8	116	58	09	21
KNY	20.5N	6	13--	..	..	..	..	06(7,8) 07(7)	5	7	108	53	09	21
JAI	17.3N	6	12--	..	..	..	..	--	-	7	83	38	09	22
SHL	14.6N	6	12--	..	..	..	..	--	-	5	97	31	09	22
UJJ	13.5N	6	12--	..	..	..	..	--	-	5	93	33	09	22
ABG	09.5N	6	12--	..	..	..	..	06(6,7) 07(7) 08(6)	5	5	78	46	09	22
HYB	07.6N	6	1133	..	..	..	..	06(6,7) 07(7)	5	4	102	37	09	21
GUA	04.0N	6	1406	..	..	..	..	06(6)	5	0	120	40	09	19
ANN	01.5N	6	12--	..	..	..	..	--	-	--	132	--	09	22
HUA	00.6S	6	1130	..	..	..	..	06(6,7,8)	5	6	290	42	07	18
TRD	01.1S	6	12--	..	..	..	..	--	-	3	196	77	09	22
API	16.1S	6	1205	..	..	..	..	06(7) 07(3)	5	5	161	34	09	14
PMG	18.6S	6	12--	..	..	..	..	06(8) 07(5,7)	5	6	120	70	09	22
HER	33.7S	6	15--	..	..	..	..	06(6,8) 07(7)	5	28	90	178	09	23
CZT	39.7S	6	1500	..	..	..	..	06(6,7,8) 07(1)	5	317	164	116	10	11
GNA	43.3S	6	13--	..	..	..	..	06(7) 08(6)	6	22	130	140	09	18
TOO	46.7S	6	14--	..	..	..	..	06(6,7,8)	5	30	203	99	09	16
KGL	56.5S	6	1600	..	..	..	..	06(7,8)	7	84	636	312	07	05
MCQ	61.1S	6	1203	..	..	..	..	06(6,7) 07(4,5)	7	182	1330	792	07	16
MAW	73.1S	6	15--	..	..	..	..	06(7,8) 07(2)	7	205	1113	1070	07	14
RES	83.1N	7	1845	SC*	60	208	31	07(7)	-	514	570	585	08	23
MBC	79.1N	7	1845	SC*	88	176	17	07(7)	-	529	680	460	09	00
BLC	73.9N	7	1845	SC*	46	163	63	07(2)	-	590	718	765	09	00
FRD	49.6N	7	19--	..	..	..	..	07(7)	5	18	130	45	10	09
HUA	00.6S	7	1846	SC	1	63	7	07(7)	6	6	207	44	08	24
CZT	39.7S	7	1845	SC	2.5	15	6	07(8)	5	317	164	116	10	11
KGL	56.5S	7	1846	SC	+ 3.9	+27	+ 8	08(1,8) 09(1)	5	36	202	175	11	06

THREE-HOUR-RANGE INDICES, K

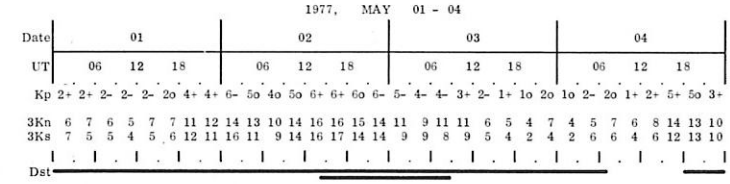
APR	6		7		8		9	
HIS	6643	4676	6556	6345	7655	6554	6654	7652
CCS	5432	3577	54-7	6244	4444	6546	6444	7644
TIK	4433	3999	6556	6344	3466	7766	6455	7764
MMK	6222	3778	6645	5235	5324	4657	7433	4545
KIR	6322	3778	6644	5234	5324	4547	7432	4544
CWE	3441	3876	6668	8231	3366	6733	4355	6532
CMO	3451	4654	5456	7332	3456	6732	3466	6532
LRV	7642	4777	5673	4354	6554	4547	7653	5334
SOD	6222	3777	6544	5235	5324	4547	7432	4544
YAK	4222	3675	5345	5142	4345	5445	5335	4332
LER	4221	3578	7642	3243	4222	2435	5321	3323
NUR	4222	2667	6443	3353	4323	3444	4333	4233
LOV	4222	3667	6543	4353	4233	3544	4332	4333
SIT	3551	3666	7766	6242	3345	5523	3463	5422
SVD	3213	2556	5334	5242	4233	3333	3332	4322
RSV	4221	3566	6433	3353	4333	3444	4332	3333
MNK	3652	3435	6776	6233	4465	4434	4563	5432
WIT	4322	3666	6544	4362	5342	3444	4333	3333
IRT	4432	2566	4345	5363	3433	4434	4344	4322
VAL	3233	3556	4544	4352	3332	3434	4433	3323
KIV	3322	3656	5433	5353	4343	3544	4333	4333
DOU	3321	2555	4443	3352	4232	3444	3332	3333
KGD	2231	1333	3233	3132	3232	2222	2222	3111
VIC	4552	3545	6674	4242	4355	3433	3563	3323
OTT	4432	3357	7763	3243	5345	3334	4553	3223
MMB	3222	2555	3344	5342	3344	3423	3343	3322
TKT	3433	2555	5444	4362	3433	3433	3352	3332
PEG	3211	2545	4333	5352	4223	2434	4332	3333
TOL	3311	1435	3433	4341	4222	2434	4332	3332
FRD	4431	3456	6553	3253	4344	3334	4442	3323
COI	3333	3545	5443	3342	4223	4342	4322	3323
KSA	3233	3556	44--	----	-525	4465	1243	4322
TUC	4542	3554	6564	4253	4445	3335	4453	3323
KNY	3322	2455	3344	5352	3334	3422	2333	3321
TAM	3311	2345	3332	4252	4322	2444	4211	2333
HON	3331	2454	3353	3253	3244	2344	3333	3323
HYB	2221	2554	3333	4352	3333	3432	1332	3321
SJG	3321	2554	5443	4343	3332	3333	3432	3322
GUA	3321	2355	4344	4342	3333	3324	4433	3342
BNG	4222	3445	4434	4353	4333	3534	3333	3333
PMG	3331	2445	3344	5353	3224	3433	2333	3323
HUA	3312	4555	4442	3363	3333	4443	3431	3432
GNA	3111	2555	4344	5253	4233	4544	3344	4432
HER	3322	2545	4333	4252	4333	3434	3332	4323
TOO	3231	2555	4354	5233	3334	3433	3343	3422
AML	4441	2544	4464	4232	4344	4434	4443	3323
MCQ	3551	4775	6557	7231	3476	7743	3356	6542
MAW	6553	3877	6765	5345	6455	5467	6454	3566
VOS	4432	-344	4333	4233	4444	3424	4433	4432


COMMON-SCALE MAGNETOGRAMS APRIL 6-8, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
FORT CHURCHILL
COLLEGE
TIXIE BAY
DIXON ISLAND
1000 γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
APRIL 6, 1977
APRIL 7, 1977
APRIL 8, 1977

12 UT	104	68	63	87	98	109	109	109	123	121	121	107	85	74	96	85	85	87	74	74
	85	74	60	49	49	49	49	49	63	63	63	63	63	63	63	63	63	63	74	74
	63	63	63	49	49	49	37	49	49	49	63	63	76	76	76	87	87	87	87	87
13 UT	77	77	77	77	77	77	74	87	87	101	101	112	112	112	112	112	112	123	112	112
	112	123	123	112	112	112	112	112	109	125	109	96	107	107	107	107	107	109	109	109
	109	109	109	109	109	98	98	98	109	109	109	109	109	109	109	109	96	96	96	96
14 UT	96	96	96	85	85	85	74	74	74	74	74	74	63	63	51	63	51	51	63	63
	63	63	63	63	63	74	74	74	74	87	87	87	98	98	85	74	71	85	96	112
	120	141	139	157	169	173	191	206	232	269	284	307	351	351	351	381	433	459	466	447
15 UT	436	436	447	455	458	454	443	435	428	442	398	309	272	246	268	272	287	283	269	276
	302	284	269	273	299	314	351	370	378	385	400	426	463	467	467	460	452	459	452	448
	474	511	515	519	508	511	526	538	564	590	620	672	709	735	750	739	717	714	706	692
16 UT	681	651	662	677	711	730	782	804	908	941	967	927	890	865	854	813	779	753	738	805
	846	975	1016	1056	1108	1159	1211	1211	1162	1006	843	699	672	690	867	932	773	609	587	606
	613	628	650	635	624	597	552	507	584	603	573	551	658	669	661	649	629	720	792	822
17 UT	874	946	850	838	857	1035	952	902	891	867	884	954	964	940	928	985	1027	1060	1064	1011
	935	887	833	857	847	822	847	927	952	1012	990	972	943	913	891	987	1035	1098	1110	1129
	1085	944	907	906	879	833	873	895	996	1148	1336	1150	1076	1005	1037	990	968	939	926	943
18 UT	992	1041	1058	984	1004	1056	1101	1125	1149	1067	1075	1073	1154	1206	1254	1280	1358	1380	1453	1531
	1571	1554	1517	1480	1422	1390	1346	1353	1361	1361	1354	1316	1259	1222	1256	1830	1797	1725	1641	1610
	1506	1466	1451	1553	1698	1735	1624	1468	1320	1164	1041	1026	1162	1189	1126	985	882	845	796	733
19 UT	677	614	566	563	589	596	573	569	558	543	524	527	552	480	421	412	400	409	432	515
	560	642	635	690	709	783	805	865	939	964	987	1006	1008	1004	1004	999	983	975	950	927
	926	908	832	787	736	699	676	657	640	609	565	530	501	478	511	582	655	694	765	817
20 UT	829	844	869	922	945	922	918	911	888	856	820	798	792	785	847	952	820	762	861	972
	1004	1105	1150	1178	1227	1275	1211	1110	1019	1000	924	955	1042	1149	1245	1173	1065	886	814	732
	621	514	403	373	436	459	493	529	466	369	344	388	440	476	622	763	786	702	607	860
21 UT	891	973	1043	1150	1106	837	814	790	722	747	769	853	1154	1365	1388	1194	1083	959	785	813
	825	832	725	651	540	506	558	714	791	1008	1240	1280	1292	1183	1058	843	462	541	555	520
	479	443	443	443	462	451	451	451	447	462	483	538	506	543	569	584	588	603	541	541
22 UT	520	501	483	624	754	849	919	976	829	886	641	496	474	469	477	529	599	648	902	972
	991	977	814	721	665	721	714	669	632	606	599	580	551	555	569	554	566	606	625	628
	632	669	759	794	699	629	614	614	606	599	603	647	695	699	684	721	769	743	669	618
23 UT	702	775	786	779	687	657	651	635	617	594	575	567	529	513	622	697	710	718	745	748
	768	772	784	803	808	839	858	839	798	707	657	585	525	491	556	542	529	542	581	687
	834	918	796	605	587	571	582	579	601	615	615	629	642	669	708	669	634	661	661	686
00 UT	672	647	634	595	582	566	574	567	589	581	560	583	583	621	673	752	752	720	674	596
	856	925	902	876	810	776	780	749	760	795	683	560	547	621	623	477	429	453	491	499
	499	565	524	522	533	549	575	595	633	620	584	523	498	469	508	496	476	478	419	404
01 UT	401	458	485	466	414	384	380	395	425	501	509	498	472	468	491	453	434	382	374	355
	325	291	277	277	305	321	351	340	285	225	173	208	220	208	231	255	286	289	354	392
	419	403	356	337	337	355	346	359	359	374	393	401	416	424	420	412	412	420	428	428
02 UT	436	439	436	443	446	438	446	446	453	461	457	457	454	450	446	427	423	408	408	408
	405	405	390	374	376	365	379	365	337	348	363	404	434	456	479	429	384	395	410	406
	402	402	417	425	429	436	455	474	477	473	458	439	408	386	386	486	529	561	569	600
03 UT	618	495	429	403	390	363	323	314	316	327	333	362	368	337	337	405	365	303	256	295
	305	386	411	363	394	430	462	486	576	624	640	606	601	605	564	510	488	490	569	562
	587	565	522	534	563	543	552	553	534	490	478	482	474	407	381	359	343	343	366	382
04 UT	431	464	449	453	468	509	520	524	524	528	524	528	528	528	531	524	512	523	581	622
	634	645	653	642	634	623	627	623	608	593	597	593	597	603	597	597	586	598	609	616
	620	635	654	657	635	612	597	605	582	597	634	650	662	662	689	685	700	712	723	731
05 UT	681	677	654	665	715	719	723	731	742	704	692	676	657	654	673	689	640	632	609	636
	651	686	640	712	739	746	745	737	718	696	684	684	673	654	635	658	680	669	695	768
	776	795	802	791	772	738	742	746	757	768	765	780	731	712	682	677	711	715	697	690
06 UT	723	612	587	582	566	570	612	669	653	661	665	626	558	542	512	516	545	549	568	575
	590	601	624	627	604	592	585	547	501	475	441	408	381	354	321	290	268	263	271	321
	359	427	412	322	286	219	124	128	147	143	140	127	158	222	245	261	281	300	304	300
07 UT	318	320	318	313	304	313	353	382	405	396	373	385	385	347	331	320	327	336	345	370
	385	396	418	418	400	377	370	403	417	403	396	363	342	331	324	320	328	321	332	332
	354	381	373	366	366	369	328	302	294	272	264	283	271	286	290	225	198	239	231	234
08 UT	220	254	268	265	281	270	142	131	156	178	200	204	178	200	244	257	303	327	346	328
	312	314	316	325	330	320	314	282	253	226	209	186	174	161	172	148	131	138	131	124
	120	115	113	113	115	122	124	120	120	120	125	132	146	148	153	155	148	148	148	148
09 UT	138	133	131	131	131	131	131	129	119	119	119	124	126	131	123	119	112	97	96	91
	87	91	91	102	102	113	113	120	75	70	62	53	68	95	97	117	126	123	107	103
	111	103	105	105	105	105	100	93	78	76	62	55	62	57	55	66	80	93	93	69
10 UT	69	60	66	71	73	76	80	71	78	80	91	114	127	98	81	85	101	114	114	114
	114	90	77	72	70	81	84	95	100	118	147	163	150	150	163	150	150	138	134	132
	125	128	116	113	109	107	107	102	97	93	95	97	105	103	104	112	103	126	139	151
11 UT	170	181	208	208	219	219	233	263	259	277	306	297	302	304	316	316	320	320	327	363
	385	407	432	443	454	454	454	451	473	482	522	505	503	539	561	561	575	586	586	572
	563	552	566	577	591	591	615	684	734	770	830	803	789	823	836	850	834	856	836	861

1977 April 7, 1200 - April 8, 1159 UT

12 UT	1049	1104	1171	1218	1287	1257	1232	1219	1205	1178	1115	1104	1082	1046	1021	985	960	933	904	890
	864	868	857	835	783	776	765	739	705	668	665	672	683	650	642	627	652	661	683	680
	664	661	657	642	649	695	699	687	676	691	725	706	695	684	661	661	679	683	690	698
13 UT	705	709	705	679	646	627	594	549	523	465	447	414	392	405	394	375	380	369	369	358
	358	355	380	414	352	338	327	385	407	440	404	328	317	330	322	311	302	280	269	258
	258	258	244	244	244	230	203	214	217	217	206	206	181	170	156	132	118	107	107	107
14 UT	107	121	121	121	109	98	91	91	91	105	105	98	89	92	86	75	70	72	65	57
	71	71	71	82	82	82	82	82	71	71	85	85	85	85	85	85	77	77	77	64
	64	64	56	56	56	56	70	70	77	64	64	50	50	50	48	52	52	44	44	37
15 UT	37	37	30	38	38	49	60	52	41	48	45	41	49	49	68	79	56	49	52	65
	63	61	56	54	44	46	46	35	31	29	35	38	30	26	36	49	47	47	54	56
	54	49	45	40	44	48	45	45	37	29	27	34	34	40	40	59	70	81	70	59
16 UT	66	74	85	81	77	89	88	88	77	70	59	59	70	70	70	66	66	74	70	70
	70	77	77	77	77	78	78	74	74	74	74	66	66	70	70	70	77	77	77	85
	85	77	77	78	75	75	79	79	79	79	75	71	71	71	78	78	78	74	74	74
17 UT	74	74	74	71	71	63	63	59	59	59	59	59	59	59	56	56	56	56	56	64
	63	63	63	71	71	67	59	59	59	63	63	67	67	63	63	63	63	63	63	67
	67	71	74	66	70	70	70	62	62	85	85	85	87	87	63	63	63	51	44	44
18 UT	37	37	37	37	30	37	37	48	48	55	60	60	62	60	60	74	74	74	81	81
	81	81	81	81	81	81	67	67	53	53	41	41	41	40	40	34	34	34	34	34
	34	34	26	19	16	18	18	34	52	85	62	80	124	102	61	38	33	49	84	132
19 UT	125	117	102	99	106	103	103	95	97	103	99	99	111	111	111	114	126	126	129	129
	129	133	133	129	129	129	129	140	140	144	148	148	148	148	144	144	144	144	144	148
	156	152	144	153	140	143	143	137	137	137	144	144	148	151	196	207	196	239	258	213
20 UT	138	126	137	139	128	137	137	133	129	115	102	98	98	77	65	68	68	54	56	59
	63	77	77	90	90	88	84	81	79	79	77	63	61	61	47	52	56	56	57	57
	50	29	31	31	29	27	27	36	40	55	55	60	62	67	65	60	65	65	65	64
21 UT	75	79	75	75	71	71	67	67	67	65	65	67	72	78	81	74	71	74	78	83
	85	88	88	78	64	64	68	60	60	60	64	64	64	76	80	94	107	107	104	104
	100	100	100	113	127	127	117	117	121	107	107	107	107	107	107	107	107	107	109	107
22 UT	107	107	98	98	98	98	98	98	88	92	87	79	75	75	75	83	83	83	75	76
	76	74	68	75	75	75	72	71	72	74	76	79	95	104	111	122	115	108	108	112
	105	104	99	102	116	120	123	129	134	136	134	134	139	141	143	151	146	137	132	137
23 UT	148	157	150	143	141	150	175	179	181	185	192	207	219	195	197	197	204	211	220	218
	211	220	216	229	234	236	238	241	238	238	234	232	234	238	241	234	236	239	236	218
	213	209	192	202	198	200	211	227	227	241	250	259	254	243	236	225	202	193	161	143
00 UT	91	91	88	84	72	67	58	55	55	48	59	51	90	174	212	228	255	232	198	168
	155	165	271	330	416	522	583	632	664	697	673	552	490	473	472	455	449	454	458	465
	468	470	468	475	475	477	470	466	466	465	473	476	469	458	454	440	426	425	436	446
01 UT	431	381	354	334	330	324	318	317	316	323	331	331	327	321	324	324	324	319	309	304
	306	314	327	333	348	338	330	330	337	341	341	336	328	330	347	356	380	409	414	412
	414	411	408	398	377	393	402	431	404	392	391	389	385	377	371	369	368	375	375	367
02 UT	356	350	351	349	343	335	339	347	354	331	320	326	324	311	289	268	247	243	235	233
	229	227	208	182	169	159	137	127	124	123	124	101	93	97	95	97	84	73	72	72
	72	70	70	79	81	60	60	60	60	60	60	68	81	119	138	149	153	161	168	172
03 UT	169	154	150	139	139	120	150	158	177	169	150	154	154	143	128	93	86	74	59	30
	22	35	46	71	71	71	71	71	71	82	96	96	96	85	87	87	76	76	76	77
	79	84	86	93	93	88	86	86	70	70	65	67	78	76	84	92	107	84	73	61
04 UT	97	95	120	131	143	169	176	175	175	184	192	210	199	185	178	162	133	132	121	121
	101	93	78	59	44	43	43	56	67	64	68	60	60	56	35	53	74	78	86	90
	116	131	166	193	215	242	238	231	220	220	197	167	144	132	126	118	93	78	67	49
05 UT	42	55	51	47	40	28	28	42	45	37	38	57	72	91	95	68	79	75	49	41
	67	79	79	82	83	63	50	43	47	47	61	78	88	88	82	97	101	123	127	127
	116	82	93	108	93	112	143	112	89	91	115	136	148	136	243	209	176	158	180	191
06 UT	195	180	157	157	173	158	147	147	155	151	155	166	166	188	195	196	196	196	196	196
	208	231	266	337	346	343	362	339	331	309	286	282	253	223	208	200	207	204	200	201
	202	225	219	225	257	254	254	252	242	232	232	236	245	253	245	241	237	211	199	191
07 UT	246	305	298	310	362	351	296	315	326	315	323	334	341	330	327	327	327	332	318	316
	309	302	307	293	293	279	268	272	261	263	274	265	247	240	247	260	256	256	258	273
	278	269	249	222	206	166	179	193	172	170	177	183	156	153	158	166	183	179	193	218
08 UT	225	237	245	248	231	223	206	210	208	183	200	204	198	179	183	191	195	179	168	168
	164	164	161	157	149	142	137	148	141	156	163	273	333	370	432	499	469	351	362	427
	538	671	749	694	709	685	659	678	704	688	712	717	709	748	809	857	882	907	896	873
09 UT	810	789	824	890	944	942	924	862	839	817	778	753	716	705	661	702	724	688	655	608
	550	493	468	463	452	441	429	414	415	438	462	485	509	520	556	567	556	534	520	485
	460	449	436	425	430	451	443	447	451	450	452	464	475	477	485	492	496	503	493	472
10 UT	468	467	473	528	550	579	587	569	567	549	547	557	564	563	566	512	482	461	473	483
	499	501	494	497	477	465	458	458	444	442	429	407	404	411	410	371	363	438	418	411
	385	384	386	402	411	351	358	359	358	375	385	382	378	395	395	373	351	350	362	395
11 UT	440	533	585	612	597	462	445	488	532	514	469	447	440	461	484	493	528	536	529	531
	517	493	490	478	461	439	433	443	424	400	393	390	393	402	424	459	482	476	407	370
	374	386	387	396	387	387	392	378	375	370	375	379	371	366	366	354	340	307	284	284



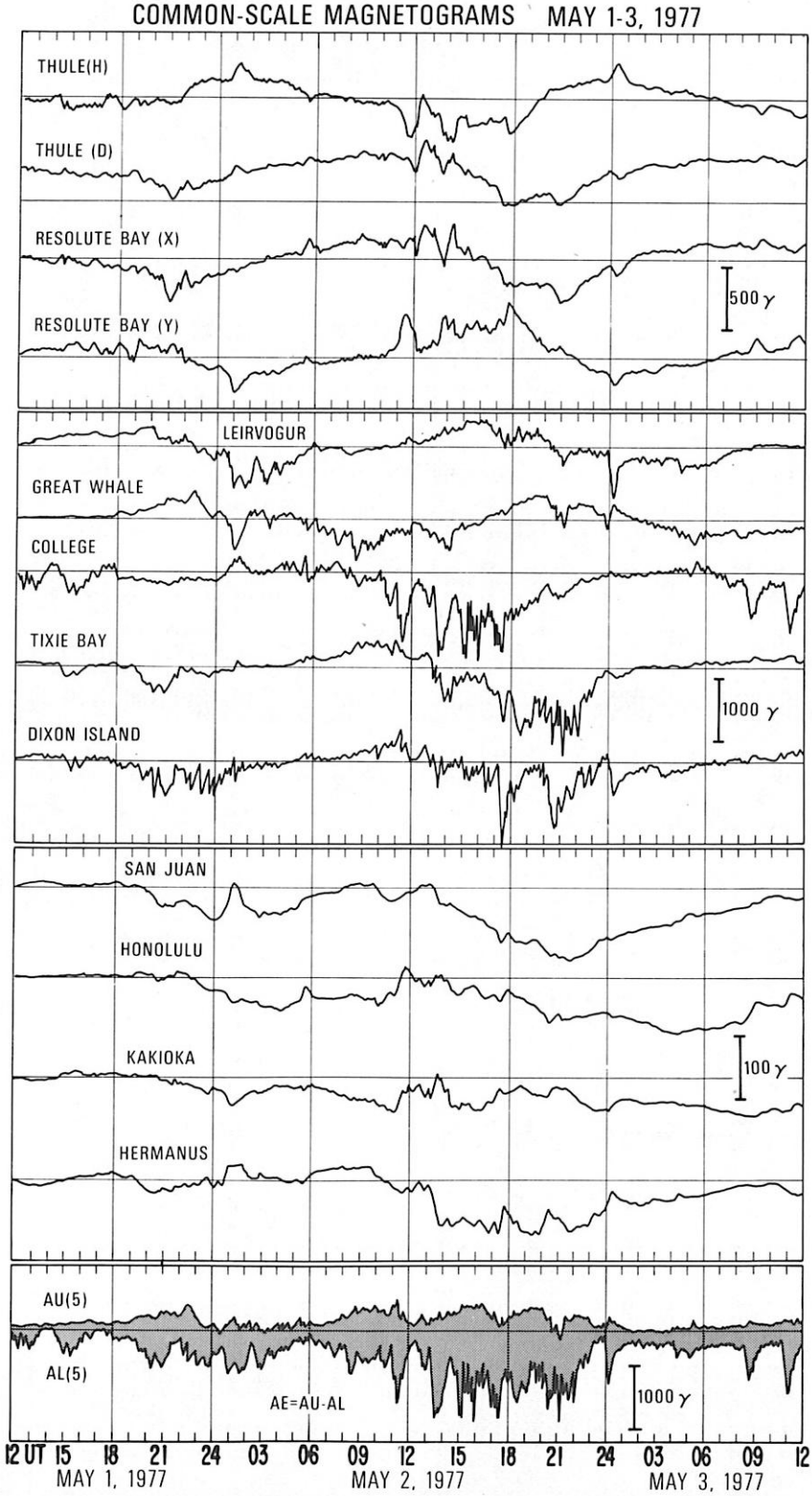
Data from Individual Observatories: MAY 1977

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	83.1N	1	1440	..	..	..	..	02(5)	-	705	694	193	03	12
MBC	79.1N	1	1700	..	..	..	..	02(5)	-	750	806	466	03	13
CBB	76.7N	1	1305	..	..	..	..	02(5)	-	595	650	790	03	24
BLC	73.9N	1	1440	..	..	..	..	02(5)	-	537	736	921	03	13
COL	64.6N	1	20--	..	..	..	..	02(4,5,6)	7	347	1670	1210	03	13
SIT	60.0N	1	20--	..	..	..	..	2(5)	7	90	--	640	03	12
OTT	57.0N	1	----	..	..	..	..	02(1,8)	6	43	270	196	03	10
MEA	55.1N	1	1805	..	..	..	..	02(5)	7	--	--	--	03	13
NEW	55.1N	1	18--		..	..	..	02(5)	6	31	240	219	03	13
VIC	54.3N	1	----	..	..	..	..	02(2)	6	27	211	199	03	12
WIT	54.2N	1	14--	..	..	..	..	02(6)	7	42	265	110	03	05
FRD	49.6N	1	17--	..	..	..	..	02(1)	6	27	142	100	03	13
BOU	48.9N	1	20--	..	..	..	..	02(1)	6	24	161	87	03	12
EBR	43.9N	1	14--	..	..	..	..	02(5,6)	6	184	99	113	03	12
IRK	41.0N	1	1400	..	..	..	..	2(5,6)	6	27	104	54	03	13
MMB	34.0N	1	14--	..	..	..	..	02(4,5,7)	5	14	89	29	03	13
SJG	29.9N	1	1600	..	..	..	..	02(5)	5	10	123	32	02	10
KAK	26.0N	1	14--	..	..	..	..	02(4,5)	5	11	61	37	03	13
HON	21.1N	1	16--	..	..	..	..	2(4)	5	09	105	38	03	12
KNY	20.5N	1	14--	..	..	..	..	02(4,5,6)	5	11	71	48	03	13
HYB	07.6N	1	1500	..	..	..	..	02(6)	6	6	117	28	03	12
GUA	04.0N	1	2135	..	..	..	..	02(5)	5	0	90	20	03	13
HUA	00.6S	1	1445	SC	1	21	1	02(5)	6	5	216	34	03	04
API	16.1S	1	15--	..	..	..	..	02(4)	5	5	92	26	03	03
PMG	18.6S	1	14--	..	..	..	..	02(4,5,6)	5	6	100	60	03	15
HER	33.7S	1	18--	..	..	..	..	02(1)	6	33	109	124	03	12
GNA	43.3S	1	14--	..	..	..	..	02(5,6,7)	6	29	90	150	03	01
TOO	46.7S	1	20--	..	..	..	..	02(5)	6	30	170	70	02	22
MAW	73.1S	1	20--	..	..	..	..	01(7) 02(7,8)	7	166	1630	1180	03	13
JAI	17.3N	2	05--	..	..	..	..		-	8	155	44	05	03
SHL	14.6N	2	05--	..	..	..	..		-	7	152	29	05	03
UJJ	13.5N	2	05--	..	..	..	..		-	7	151	48	05	03
ABG	09.5N	2	05--	..	..	..	..	05(2)	6	6	139	53	05	03
TRD	01.1S	2	05--	..	..	..	..		-	4	194	129	05	03
CZT	39.7S	2	1900	..	..	..	..	02(6)	6	306	149	109	03	13
MCQ	61.1S	2	0057	..	..	..	..	02(5)	8	277	1164	920	03	13

THREE-HOUR-RANGE, K

MAY	1			2			3			4			1			2			3			4		
HIS	4544	3555		5554	7665		6456	5432		2333	3455		TKT	1333	2233		4334	5664		3113	3222		2242	3643	
CCS	4233	5556		6545	7667		5444	3322		2232	2354		PEG	1112	1223		3333	6655		3213	1212		1122	3544	
DIK	4234	4557		7556	7988		7544	5332		2232	3475		TOL	2202	2233		4322	5544		4212	0111		1122	2444	
TIK	2233	6577		5566	8889		5444	4312		1232	2374		FRD	3221	1144		6545	5454		4354	2123		2231	2443	
MMK	3223	2356		6435	6787		7532	2111		0211	2465		COI	2122	2234		5333	5554		3323	2222		1222	3543	
KIR	4112	2247		6535	6776		7532	3111		0211	2465		KSA	1033	3344		4454	7765		1333	2223		1244	3---	
CWE	2211	2333		5558	8866		3456	2112		1211	1433		TUC	2321	2244		5645	5554		3354	2112		2232	4543	
CHO	2212	2233		5557	7755		3466	3000		1221	1432		KNY	2222	2324		3325	5543		3234	3211		1233	3532	
LRV	5322	3346		7745	5676		7552	2212		1221	2556		TAM	1112	1243		4324	5544		3322	1212		2232	3544	
SOD	3112	2246		6435	6777		7532	3100		0111	2465		HON	1121	1233		3435	4444		2343	2233		2232	3541	
YAK	2112	2335		4436	7764		4344	1122		1221	2343		HYB	1222	2233		4324	5654		3113	1112		1332	3543	
LER	2211	2235		5433	4565		5432	1101		0010	2443		SJG	2222	1144		5433	5544		3334	1112		1232	3552	
NUR	2112	2244		4334	5655		4322	2102		0122	3643		GUA	3321	2224		4435	5444		3233	3223		3222	3532	
LOV	2122	2254		4434	5765		5333	2212		1122	3543		BNG	3233	2343		4334	6555		4323	2223		2333	3544	
SIT	2211	1133		4557	7654		3365	3111		1221	2452		PMG	2222	2224		4445	5543		2233	3112		2222	3533	
SVD	1232	3344		4334	5656		4233	2211		1222	3554		HUA	2212	2344		4423	6544		3332	2322		1122	4753	
RSV	2122	2244		5324	5655		4333	1212		1121	3644		GNA	1111	2243		4325	6654		2223	1111		1231	2452	
MNK	2222	2234		5767	7554		5565	4112		1211	2443		HER	2122	2143		6333	5554		3333	1112		1121	3445	
IRT	2332	3334		4435	6655		4344	3212		2332	3653		TOO	1111	2234		4335	6543		2224	2101		1221	1442	
VAL	2212	2344		5423	5655		4323	1212		1121	2553		AML	2111	2233		4545	5544		2334	3101		1221	2332	
KIV	2333	2355		5434	6756		4333	2222		2332	3654		MCQ	1111	2333		4447	8756		3346	3000		1211	1342	
DOU	2212	2244		5313	5655		4222	1212		1112	3544		MIR	2332	2364		4334	5755		3443	3111		2332	2353	
KGD	1221	1122		3123	3443		3122	1101		1122	2322		MAW	4343	3276		6546	5877		6553	3212		2332	2476	
VIC	3322	2234		5645	5543		3455	1112		1232	3543		NVL	3222	1135		8744	4666		5532	2211		1221	1354	
OTT	2322	2243		6555	5456		4444	2123		1222	2443		SBA	2221	2244		4434	5544		4333	3222		1111	2433	
MMB	1111	2223		4325	5453		2234	3112		1222	3533		VOS	2221	1233		4333	5444		3222	2111		1222	2333	

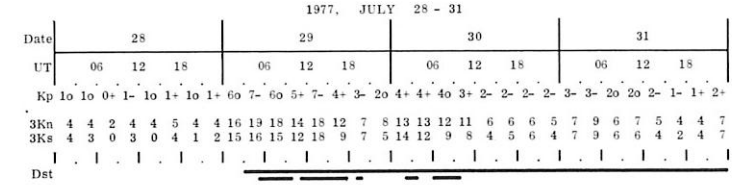

COMMON-SCALE MAGNETOGRAMS MAY 1-3, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000 γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
MAY 1, 1977
MAY 2, 1977
MAY 3, 1977

1977 May 1, 1200 - May 2, 1159 UT

12 UT	984	1007	1018	1015	970	970	981	1103	1103	1070	1026	1059	1137	1192	1148	1114	1092	1081	1092	1081
	1026	1015	1081	1203	1217	1217	1217	1251	1251	1251	1195	1173	1129	1051	1007	976	1076	1129	1148	1170
	1189	1156	1114	1051	1032	1043	1046	1079	1091	1057	1068	1046	1057	1057	1079	1124	1165	1165	1165	1176
13 UT	1210	1232	1210	1243	1254	1262	1251	1243	1176	1176	1157	1146	1157	1149	1138	1127	1127	1127	1138	1149
	1171	1149	1138	1127	1116	1105	1094	1060	1060	1038	1038	1038	1049	1049	1049	1038	1027	1027	1016	1005
	983	964	964	964	964	975	975	952	952	941	930	930	919	911	911	911	900	903	892	870
14 UT	859	859	859	870	870	870	881	881	892	892	889	889	889	878	878	878	878	878	878	875
	875	883	883	894	905	905	902	913	913	921	918	929	940	951	962	970	981	995	1018	1043
	1043	1046	1049	1027	1027	1024	1032	1040	1059	1070	1081	1114	1129	1129	1140	1143	1143	1154	1154	1157
15 UT	1159	1192	1203	1225	1259	1292	1292	1295	1273	1251	1251	1251	1251	1240	1232	1210	1187	1187	1187	1187
	1187	1187	1176	1140	1173	1195	1240	1262	1262	1273	1340	1332	1321	1279	1268	1279	1271	1260	1271	1249
	1227	1216	1249	1238	1252	1230	1230	1219	1222	1222	1211	1222	1233	1233	1233	1225	1203	1214	1225	1214
16 UT	1181	1136	1125	1114	1114	1103	1106	1106	1117	1128	1143	1143	1128	1106	1117	1114	1111	1078	1078	1070
	1048	1036	1014	995	1006	1009	1009	1035	1035	1038	1038	1038	1016	1027	1027	1030	1041	1055	1066	1066
	1077	1085	1085	1074	1066	1066	1069	1092	1106	1103	1092	1080	1069	1058	1036	1011	1000	985	985	963
17 UT	952	941	938	938	938	938	938	935	935	901	901	913	935	957	979	982	949	941	933	925
	925	936	950	961	950	928	917	917	928	928	928	925	936	933	955	955	955	955	955	955
	955	955	952	916	894	890	868	879	905	919	911	925	939	950	953	979	1015	1037	1041	1021
18 UT	1150	1153	1156	1159	1159	1148	1145	1145	1145	1145	1145	1142	1142	1131	1139	1139	1136	1136	1136	1132
	1132	1132	1129	1129	1126	1115	1112	1112	1112	1112	1112	1112	1109	1106	1103	1100	1096	1093	1079	1076
	1073	1073	1073	1073	1073	1073	1062	1065	1065	1065	1068	1079	1082	1082	1082	1082	1071	1074	1077	1084
19 UT	1101	1104	1121	1128	1142	1145	1162	1169	1172	1186	1189	1192	1192	1184	1198	1201	1205	1201	1198	1198
	1198	1198	1184	1184	1187	1184	1181	1178	1178	1178	1178	1167	1170	1167	1167	1164	1161	1161	1172	1175
	1178	1189	1192	1192	1195	1195	1198	1213	1213	1216	1219	1233	1236	1233	1222	1219	1225	1228	1231	1242
20 UT	1234	1234	1249	1249	1252	1266	1272	1275	1282	1285	1288	1277	1277	1280	1283	1283	1283	1283	1275	1275
	1278	1292	1292	1310	1327	1333	1339	1339	1339	1336	1325	1322	1319	1305	1302	1291	1279	1279	1291	1291
	1302	1305	1308	1311	1314	1317	1317	1328	1328	1335	1347	1366	1391	1394	1400	1417	1424	1427	1427	1427
21 UT	1435	1429	1437	1433	1441	1438	1435	1427	1433	1437	1443	1435	1441	1433	1433	1433	1422	1419	1419	1416
	1413	1410	1406	1400	1386	1383	1383	1386	1383	1369	1362	1356	1353	1339	1336	1336	1336	1342	1353	1359
	1359	1370	1385	1377	1388	1377	1351	1348	1320	1305	1291	1285	1271	1284	1292	1288	1288	1288	1288	1300
22 UT	1292	1295	1298	1290	1293	1296	1302	1305	1312	1304	1307	1310	1313	1319	1334	1343	1346	1352	1355	1359
	1373	1376	1382	1403	1415	1424	1451	1460	1476	1479	1487	1484	1484	1484	1476	1476	1479	1490	1496	1500
	1479	1473	1460	1437	1428	1407	1404	1396	1399	1396	1383	1334	1316	1326	1352	1365	1330	1268	1262	1256
23 UT	1246	1264	1273	1293	1303	1309	1278	1265	1245	1242	1236	1230	1226	1223	1217	1214	1211	1205	1201	1195
	1192	1178	1175	1157	1154	1157	1157	1157	1169	1180	1173	1167	1164	1161	1147	1147	1147	1147	1150	1136
	1129	1131	1125	1133	1133	1136	1139	1150	1150	1150	1164	1171	1155	1147	1144	1169	1175	1181	1188	1205
00 UT	1203	1195	1192	1181	1178	1175	1175	1175	1167	1170	1176	1186	1181	1170	1154	1123	1113	1101	1084	1084
	1069	1077	1077	1080	1069	1061	1061	1061	1050	1039	1039	972	896	846	944	936	900	798	873	878
	898	927	904	885	822	735	783	777	821	811	790	758	748	721	686	663	612	613	611	606
01 UT	457	427	402	377	364	329	336	377	365	346	459	475	389	395	399	384	392	403	399	406
	414	414	397	408	436	438	467	474	478	505	526	567	595	627	637	653	664	693	707	723
	756	792	792	773	761	787	820	878	932	957	940	944	953	963	963	957	953	963	1001	1027
02 UT	1051	1075	1054	1001	997	1019	1049	1080	1083	1080	1062	1059	1045	1051	1065	1078	1090	1103	1115	1098
	1085	1081	1062	1040	997	984	975	959	990	1008	1033	1039	1042	1034	1031	1028	1025	1025	1031	1037
	1045	1067	1068	1078	1100	1119	1106	1089	1092	1092	1081	1058	1062	1059	1047	1031	1008	998	973	964
03 UT	928	921	929	926	932	939	942	945	956	937	919	909	915	872	812	817	853	858	898	922
	934	953	960	973	1000	1012	1003	985	976	956	941	946	940	934	912	898	898	895	883	887
	893	891	886	896	905	911	913	922	931	934	920	914	911	908	905	905	908	911	906	898
04 UT	907	923	935	923	907	873	858	858	873	895	898	901	887	931	953	973	961	925	889	844
	870	895	912	952	969	956	988	1013	994	972	972	969	963	982	994	952	909	860	859	867
	889	873	856	841	824	816	830	853	861	875	878	897	927	937	967	975	972	975	975	964
05 UT	950	953	953	986	975	931	945	959	956	967	961	974	977	950	894	829	772	758	739	716
	705	684	665	663	709	761	777	802	853	827	800	794	845	892	944	979	988	993	994	999
	980	959	937	962	985	995	997	979	973	990	1009	1025	1034	1047	1035	1035	1024	1007	1005	989
06 UT	952	946	923	885	871	850	838	847	829	801	785	801	801	795	792	764	740	723	688	700
	694	709	680	709	716	750	774	791	791	796	795	782	779	779	801	790	793	804	801	792
	783	768	775	772	765	742	714	688	674	696	711	722	737	740	755	744	737	715	736	741
07 UT	744	744	736	722	705	684	686	700	706	692	678	649	640	631	626	626	626	626	637	633
	629	629	614	603	600	607	618	644	670	685	674	663	663	666	689	715	715	730	737	744
	725	699	688	677	699	728	740	785	807	805	805	799	802	821	850	910	906	917	906	888
08 UT	910	891	880	839	806	784	754	732	703	703	725	740	762	769	773	773	784	784	784	795
	806	825	843	862	873	917	906	932	906	902	943	950	991	1002	1050	1080	1091	1087	1084	1095
	1098	1091	1084	1102	1135	1158	1169	1176	1124	1095	1065	1047	1021	1002	1006	1017	1017	1017	1002	995
09 UT	973	958	924	921	962	969	976	1013	1032	1032	1032	1021	1010	1039	1047	1054	1039	1021	1017	1017
	1028	1013	1010	999	987	999	999	1010	1010	1021	1032	1032	1032	1024	1006	999	1002	1006	995	984
	984	1002	1002	987	973	965	1002	973	1028	1036	1054	1065	1061	1036	1010	936	884	850	836	854
10 UT	887	932	987	995	976	965	950	932	936	936	936	936	947	958	987	1039	1095	1164	1209	1221
	1243	1228	1217	1235	1250	1250	1221	1235	1265	1302	1324	1361	1335	1320	1324	1317	1306	1294	1294	1306
	1306	1272	1250	1235	1220	1157	1124	1102	1080	1117	1110	1121	1117	1121	1117	1121	1124	1139	1257	1302
11 UT	1320	1343	1335	1380	1439	1646	1616	1628	1653	1624	1607	1629	1740	1773	1750	1992	2125	2071	1968	1905
	1886	1865	1876	1708	1679	1567	1512	1441	1456	1509	1502	1483	1535	1532	1517	1544	1563	1511	1478	1418
	1337	1277	1255	1236	1232	1255	1273	1269	1262	1269	1284	1301	1276	1232	1187	1180	1158	1147	1095	1066

12 UT	1051	1069	1060	1040	1069	1076	1079	1073	1082	1085	1077	1080	1069	1069	1066	1049	1034	1034	1023	1004
	1015	1023	1028	1050	1055	1065	1074	1051	1010	1017	1028	1035	1080	1095	1098	1106	1125	1170	1162	1139
	1125	1121	1151	1166	1188	1199	1213	1221	1221	1239	1250	1269	1291	1313	1321	1354	1376	1387	1373	1339
13 UT	1358	1403	1418	1466	1493	1470	1392	1310	1170	1125	1103	1107	1122	1134	1141	1194	1205	1238	1234	1234
	1249	1298	1353	1501	1601	1649	1756	1797	1948	2011	2044	2263	2100	2141	2101	2068	2019	2263	2285	2201
	2193	2168	2141	2123	2134	2179	2213	2229	2229	2248	2262	2154	2132	2142	2101	2060	1886	1838	1801	1801
14 UT	1823	1838	1819	1845	1831	1812	1790	1775	1776	1780	1780	1739	1724	1713	1673	1581	1533	1504	1478	1463
	1463	1445	1433	1463	1470	1492	1481	1455	1425	1403	1381	1384	1391	1399	1399	1402	1406	1399	1406	1447
	1466	1489	1504	1537	1570	1592	1666	1647	1647	1640	1632	1625	1629	1633	1659	1729	1807	1881	1992	2081
15 UT	2106	2177	2311	2367	2382	2390	2357	2398	2409	2339	2272	2279	2312	2375	2342	2475	2209	2031	1809	1683
	1646	1595	1720	1769	1883	2069	1984	1839	1762	1651	1614	1599	1761	1898	1876	1839	1839	1961	2068	2068
	2068	2050	2072	2098	2087	2154	2194	2179	2161	2101	2031	1912	1846	1801	1809	2130	2441	2508	2357	2302
16 UT	2103	1995	1969	1891	1920	1954	1939	1979	1891	1761	1743	1824	1879	1853	1846	1805	1831	1839	1881	1888
	1877	1854	1947	2047	2017	2009	1897	1845	1698	1661	1594	1568	1652	1712	1705	1716	1690	1719	1734	1722
	1752	1725	1688	1695	1676	1643	1616	1622	1641	1716	1760	1801	1749	1741	1771	1804	1863	1988	2171	2164
17 UT	2042	2045	2045	1933	1887	1837	1831	1863	1937	2014	2121	2086	2140	2205	2029	2003	2092	2073	2165	2201
	2238	2257	2172	2288	2191	2160	2209	2038	2019	2011	1981	1673	1640	1636	1662	1671	1633	1692	1728	1769
	1753	1760	1769	1808	1821	1805	1751	1772	1770	1754	1705	1689	1709	1738	1769	1779	1777	1750	1734	1777
18 UT	1930	1930	1930	1913	1910	1895	1895	1881	1867	1834	1786	1764	1745	1762	1783	1811	1824	1818	1813	1845
	1865	1879	1848	1843	1841	1811	1771	1774	1766	1744	1722	1722	1747	1747	1750	1750	1773	1778	1773	1787
	1779	1789	1817	1831	1834	1841	1802	1798	1809	1823	1840	1835	1816	1812	1810	1794	1773	1781	1778	1750
19 UT	1724	1691	1680	1705	1739	1739	1739	1763	1775	1780	1772	1749	1756	1751	1768	1777	1768	1748	1746	1730
	1730	1730	1730	1730	1727	1702	1713	1713	1690	1724	1735	1735	1765	1773	1781	1759	1743	1694	1686	1674
	1641	1638	1635	1640	1642	1616	1605	1586	1578	1599	1605	1591	1584	1578	1575	1575	1567	1562	1565	1557
20 UT	1549	1538	1541	1530	1513	1503	1486	1473	1516	1540	1538	1510	1478	1506	1490	1426	1415	1407	1406	1421
	1425	1436	1468	1482	1499	1531	1595	1793	1670	1606	1511	1505	1502	1512	1467	1442	1530	1638	1606	1417
	1414	1400	1362	1359	1344	1359	1376	1363	1365	1360	1372	1362	1379	1401	1392	1383	1397	1423	1427	1414
21 UT	1392	1377	1370	1385	1517	1524	1617	1674	1755	1728	1600	1305	1146	1196	1315	1344	1369	1410	1466	1458
	1458	1443	1422	1425	1435	1453	1503	1560	1562	1471	1428	1405	1392	1400	1403	1423	1461	1484	1545	1559
	1577	1588	1589	1578	1572	1564	1548	1508	1426	1371	1319	1313	1330	1336	1336	1343	1344	1353	1363	1451
22 UT	1601	1626	1663	1695	1645	1564	1438	1384	1295	1304	1299	1294	1282	1296	1293	1283	1288	1285	1291	1301
	1315	1323	1323	1328	1318	1326	1329	1342	1339	1329	1312	1309	1312	1312	1320	1296	1284	1301	1285	1303
	1309	1333	1325	1307	1301	1292	1271	1251	1254	1260	1273	1268	1271	1271	1261	1249	1236	1224	1215	1208
23 UT	1202	1210	1210	1207	1207	1204	1183	1182	1171	1162	1156	1149	1146	1143	1134	1128	1126	1132	1124	1134
	1119	1102	1085	1081	1070	1081	1081	1073	1077	1083	1089	1086	1083	1091	1091	1094	1094	1097	1097	1091
	1072	1028	997	975	966	854	894	979	1015	1061	1083	1057	1020	994	914	922	948	930	942	1011
00 UT	1029	1084	1063	1054	1084	1118	1128	1170	1177	1171	1162	1154	1137	1158	1191	1142	1139	1150	1161	1161
	1158	1140	1114	1124	1113	1101	1092	1112	1124	1120	1142	1128	1118	1112	1114	1107	1101	1103	1097	1094
	1100	1106	1109	1120	1120	1128	1122	1116	1113	1110	1103	1083	1077	1070	1067	1067	1064	1072	1080	1080
01 UT	1077	1088	1088	1085	1085	1085	1085	1060	1071	1060	1057	1042	1028	1025	1025	1022	1019	1016	1009	1012
	1016	1001	998	995	995	1012	1009	1006	1009	1009	989	976	973	973	970	970	970	978	978	964
	961	943	937	934	931	934	923	926	934	936	936	936	939	943	958	967	972	959	956	986
02 UT	1002	1008	1008	1008	1022	1022	1019	1016	1000	974	964	952	942	922	919	908	908	908	900	906
	909	912	907	911	899	903	906	898	891	903	920	934	937	922	907	904	898	886	876	842
	836	829	823	820	829	839	851	870	865	874	878	878	878	878	878	878	867	867	867	867
03 UT	867	874	871	868	854	848	854	861	867	870	870	870	870	870	867	867	853	846	851	845
	836	826	820	814	811	817	823	829	839	831	828	833	842	837	843	835	827	832	831	815
	800	781	768	768	778	803	821	831	834	837	843	850	864	864	861	834	807	805	790	790
04 UT	775	761	755	755	758	758	758	760	752	696	643	648	660	668	658	671	693	692	678	675
	684	691	705	738	746	749	744	748	736	759	752	735	740	729	671	638	616	663	699	690
	683	669	675	693	687	658	682	715	712	701	709	708	716	692	685	669	674	693	687	687
05 UT	683	669	644	630	624	606	625	603	592	580	566	566	555	551	540	558	532	503	474	461
	474	527	559	560	589	587	587	603	635	683	701	705	721	713	702	691	653	635	616	618
	635	651	676	695	721	715	727	740	735	735	727	713	735	754	752	751	719	677	663	640
06 UT	640	637	656	687	683	675	679	718	726	730	722	709	717	743	737	720	725	739	745	751
	748	742	728	718	709	701	728	751	783	778	801	829	818	801	766	757	749	741	750	753
	753	753	753	750	747	755	742	765	779	782	796	799	802	828	845	840	838	819	823	830
07 UT	813	797	789	815	834	838	835	861	875	900	911	922	911	934	962	976	960	952	952	963
	978	992	1006	1012	985	977	999	971	946	963	969	983	990	987	1006	1011	1004	995	974	962
	948	914	870	870	873	861	859	851	840	847	847	855	859	863	863	870	878	885.	900	900
08 UT	900	900	893	886	874	863	863	863	871	904	922	922	908	900	900	896	937	978	966	952
	952	962	1002	993	1029	1108	1117	1091	1173	1195	1282	1322	1350	1379	1376	1370	1429	1468	1491	1505
	1504	1491	1486	1483	1394	1394	1394	1339	1305	1286	1228	1316	1386	1430	1423	1390	1345	1279	1249	1227
09 UT	1205	1183	1161	1194	1194	1168	1168	1164	1164	1138	1105	1071	1105	1120	1108	1131	1131	1086	1046	1012
	1035	1061	1061	1061	1050	1050	1038	1035	1035	1057	1046	1046	1035	1023	1009	997	994	994	994	979
	957	934	923	934	934	949	949	960	960	960	971	975	975	975	964	953	957	965	965	968
10 UT	994	998	1013	1020	1013	1009	1016	1012	1012	1012	1016	1016	1005	1005	994	983	983	979	979	990
	1001	1009	1009	1009	1005	1005	1005	1001	990	979	960	942	942	946	950	972	998	1005	1027	1038
	1072	1101	1146	1164	1197	1197	1249	1316	1304	1290	1345	1401	1530	1619	1626	1667	1700	1722	1726	1719
11 UT	1711	1693	1682	1660	1582	1494	1486	1464	1451	1418	1396	1359	1362	1368	1383	1422	1414	1406	1365	1346
	1321	1317	1295	1270	1234	1203	1192	1195	1187	1187	1202	1205	1208	1197	1189	1171	1146	1129	1118	1103
	1100	1086	1086	1072	1061	1053	1053	1042	1034	1023	1012	1015	1029	1029	1029	1029	1032	1035	1038	1038

1977, JULY 28 - 31



Data from Individual Observatories: **JULY 1977**

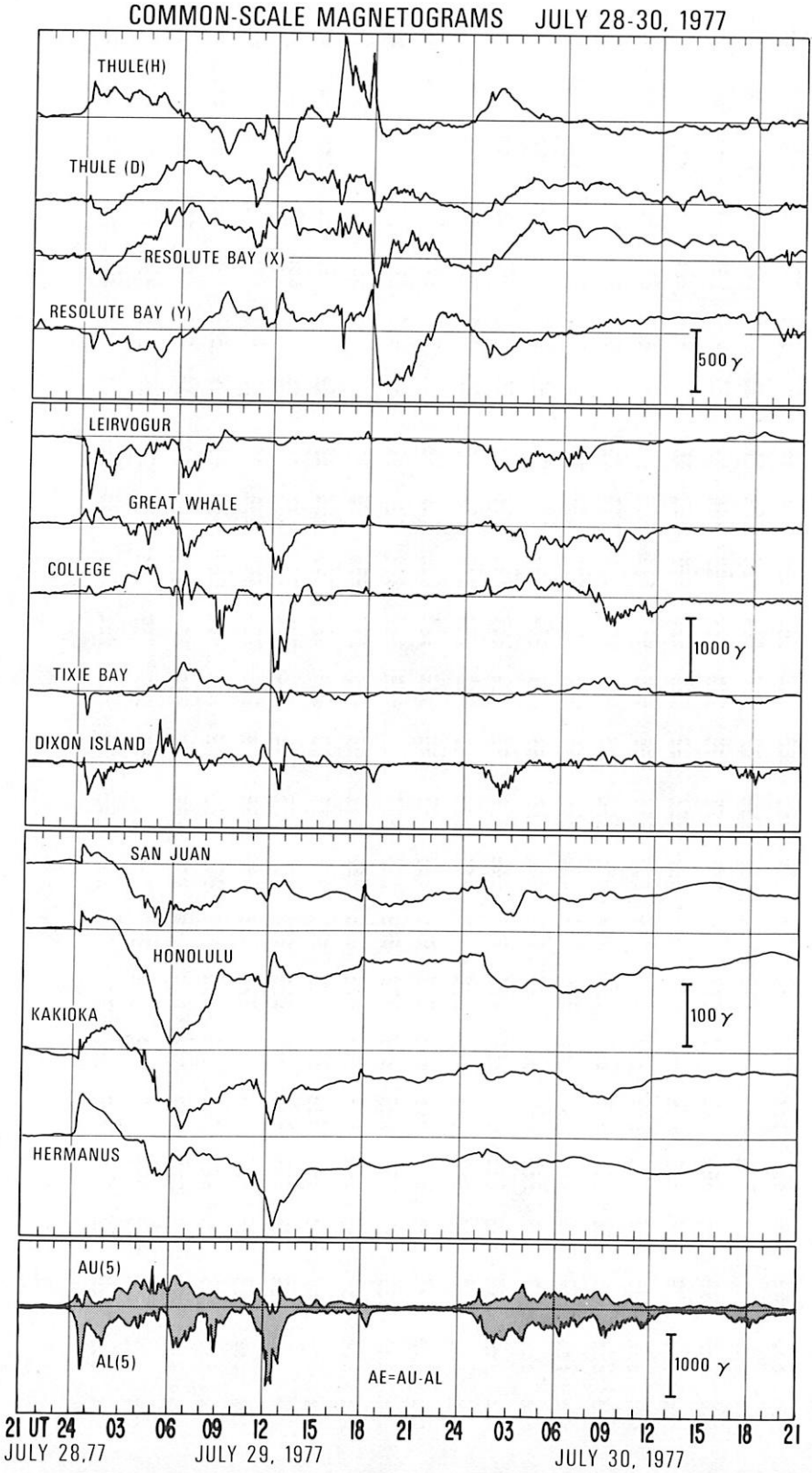
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

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
MEA	55.1N	9	0026	..	..	..	..	29(5)	8	--	--	--	30	11
RES	83.1N	28	1500	..	..	..	..							
MBC	79.1N	28	1900	..	..	..	..							
CBB	76.7N	28	1230	..	..	..	..	29(5)	-	570	510	770	31	06
OTT	57.0N	28	----	..	..	..	..	29(2,3)	8	94	419	319	30	10
MAW	73.1S	28	21--	..	..	..	..	29(1)	8	100	1050	1070	29	15
RES	83.1N	29	0027	SC*	143	135	73	29(7)	-	675	790	974	31	00
MBC	79.1N	29	0027	SC*	236	141	12	29(1)	-	733	849	616	31	02
COL	64.6N	29	0027	SC*	+41	+161	-23	29(3,5)	7	200	1680	920	30	13
SIT	60.0N	29	0027	SC*	-17.8	+58.2	+23.7	29(5)	8	--	--	--	30	12
NEW	55.1N	29	0027	SC*	6	79	10	29(2)	8	62	657	451	30	12
VIC	54.3N	29	0027	SC	- 7.7	+81	+27	29(2,3,5)	7	51	492	449	29	15
WIT	54.2N	29	0027	SC*	- 5 *	+ 7.8*	- 3	29(1,2,5)	6	30	325	75	30	12
FRD	49.6N	29	0027	SC	-05	+81	-15	29(1,2,3)	6	30	176	102	30	10
BOU	48.9N	29	0029	SC*	+ 2	-77	-10	29(2)	7	41	226	120	31	12
TUC	40.4N	29	0028	SC*	- 3	+90	+ 7	29(2,3)	7	20	200	30	30	14
MMB	34.0N	29	0027	SC*	+ 5 *	+27	-17 *	29(2,5)	6	22	173	38	30	14
SJG	29.9N	29	0027	SC	- 1	+35	+10	29(2)	6	11	134	28	29	12
KAK	26.0N	29	0027	SC*	+ 4 *	+33	+18	29(2)	6	13	164	74	30	14
HON	21.1N	29	0028	SC*	-02 *	+39	+18	29(2)	7	10	207	42	30	12
KNY	20.5N	29	0026	SC*	+ 4 *	+43	+20	29(2,5)	6	10	190	82	30	14
JAI	17.3N	29	0027	SC	- 0.8	39	- 8		-	7	243	30	29	19
SHL	14.6N	29	0027	SC	- 1.3	35	6		-	6	270	35	29	19
UJJ	13.5N	29	0027	SC	- 0.4	46	- 8		-	6	240	29	29	19
ABG	09.5N	29	0027	SC	- 0.6	34	- 5	29(2,5)	6	5	217	25	29	17
HYB	07.6N	29	0028	SC	- 0.5	+40	- 3	29(5)	7	5	252	34	30	13
GUA	04.0N	29	0027	SC*	01	65	-21	29(2)	7	0	250	30	30	13
ANN	01.5N	29	0027	SC	- 1.4	45	23		-	4	232	106	29	19
HUA	00.6S	29	0027	SC*	1	66	9	29(2)	6	10	290	49	30	21
TRO	01.1S	29	0027	SC	0.3	37	47		-	4	292	226	29	19
PMG	18.6S	29	0028	SC	--	+50	--	29(1,2)	6	--	220	--	30	15
HER	33.7S	29	0027	SC	+ 6	+39	+32	29(1,2,5)	6	22	207	101	30	10
GNA	43.3S	29	0027	SC*	- 2 *	+23	-23 *	29(5)	7	33	200	210	29	19
TOO	46.7S	29	0025	SC	+ 5	+26	- 5	29(5)	7	59	179	80	30	12
KGL	56.5S	29	0357	SC*	+14.1	+86	+30	29(5)	6	58	261	195	29	18
KGL	56.5S	29	0027	SC	- 4.8	+32	+12	29(5)	6	58	261	195	29	18
MCQ	61.1S	29	0027	..	..	..	..	29(5)	8	206	1521	669	29	16

THREE-HOUR-RANGE INDICES, K

JUL	28		29		30		31	
HIS	3323	2433	7676	6654	5555	3454	4444	4344
CCS	2112	2422	6664	5443	4443	3453	3333	3224
DIK	2222	2433	7766	7554	5554	3663	3434	3445
TIK	3122	2322	5665	7543	5455	3552	2334	3333
MMK	1101	2211	7656	7332	5433	3233	3322	2134
KIR	1111	2212	8664	6332	5423	3333	4422	2243
CWE	0110	1212	4677	8423	4544	2332	2333	2212
CMO	1000	0101	5575	7432	4465	3221	2325	3221
LRV	3111	2222	8574	4442	6563	3344	6532	2334
SOD	0001	1101	7655	6321	5433	3233	3321	2133
YAK	2202	1222	5554	7233	5433	2223	2323	2222
LER	1100	1211	5653	4321	4332	1222	3221	1112
NUR	0101	1101	5645	5322	3222	2211	2111	2022
LOV	1212	2211	6655	5322	4333	2221	3222	2223
SIT	1001	0112	57(8)7	(8)432	4565	3221	2424	2111
SVD	1111	2211	5544	5321	4233	1221	2222	1112
RSV	1211	2221	5644	5432	3332	2222	3322	1223
MNK	1111	2212	5777	8332	5677	3222	2324	3222
WIT	1101	2221	6655	6532	4333	2322	3212	2123
IRT	1122	1213	5655	7523	5344	2222	2223	2223
VAL	1112	2121	5544	5422	4433	2221	3323	1222
KIV	1222	3222	6655	6532	4333	3231	3323	2123
DOU	1101	1111	5544	5422	3332	1221	2212	1112
KGD	0221	1101	3422	4321	2231	1111	2122	0111
VIC	2111	1112	5775	7433	5645	2222	3423	2112
OTT	2221	1112	5885	6433	4654	2222	3422	2112
MMB	1111	1211	5655	6422	3444	2111	1122	1111

	28		29		30		31	
TKT	2122	1222	5655	6523	3333	3222	3233	2223
PEG	1101	1111	6534	5523	4323	2111	2111	1112
TOL	0101	2221	5435	5422	3332	2221	2222	2222
FRD	2210	1122	6665	5433	5554	2121	3421	2012
COI	2212	2212	6543	4432	3432	3222	3320	2012
KSA	0033	0016	6657	4644	5433	3122	3133	0231
TUC	1101	1112	6775	5433	6554	2211	2422	2011
KNY	1111	1201	5655	6423	4333	2121	1222	2110
TAM	1101	1121	5544	5243	3322	--32	2222	2122
HON	0001	0111	4764	5423	5332	1011	0212	1000
HYB	1111	1111	5666	7523	3322	1111	1112	1112
SJG	1100	0001	5644	4433	5533	0010	1211	1011
GUA	1112	0111	5755	5423	5324	2111	3231	1110
BNG	2112	1222	5545	5433	3323	2222	3322	2123
PMG	1011	1111	5664	4423	5333	1122	2222	2111
HUA	1211	1211	5653	4532	4432	3320	2211	2111
GNA	1001	0211	5555	7311	5333	1221	1222	1122
HER	1002	2101	6644	6422	5322	1122	2212	1113
TOO	0001	0101	4455	7211	3333	1110	0112	1001
AML	1101	0100	5555	6322	4434	2121	1223	2111
MCQ	1100	1101	3565	8412	4455	2231	1225	3201
MIR	2212	2332	5453	5232	4333	3232	2332	1124
MAW	4221	1324	8574	6332	7564	3336	5543	3346
NVL	2111	1101	6783	5222	6543	2113	3322	2123
SBA	1111	2212	4455	7433	4433	2222	2322	2122
VOS	----	----	----	----	----	----	----	----


COMMON-SCALE MAGNETOGRAMS JULY 28-30, 1977
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
21 UT 24 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21
JULY 28,77
JULY 29, 1977
JULY 30, 1977

21 UT	39	34	37	37	39	35	46	46	44	44	44	44	41	53	39	39	37	37	34	34
	34	34	23	23	23	25	25	25	23	23	23	23	23	20	20	18	18	21	21	
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22 UT	18	18	18	18	13	16	18	20	20	23	23	23	23	34	32	32	32	32	32	32
	32	32	32	27	27	16	16	16	13	13	11	13	11	11	11	11	11	10	13	21
	21	18	18	18	23	23	23	20	20	18	13	19	19	22	22	16	17	17	13	16
23 UT	16	16	16	18	18	18	18	18	21	21	18	16	16	16	19	21	21	17	15	11
	11	13	13	11	13	13	24	24	17	15	19	30	30	41	34	34	34	34	34	34
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00 UT	90	92	92	96	96	107	113	121	130	134	143	151	164	175	181	185	196	209	206	218
	232	255	297	379	388	403	395	365	289	350	409	377	327	307	570	709	758	831	893	1090
	1082	998	1029	999	911	953	892	850	800	669	596	569	542	500	475	461	421	431	457	476
01 UT	461	503	506	518	528	477	380	398	421	434	484	504	508	507	517	489	477	438	388	364
	392	401	378	428	443	446	426	396	412	426	426	448	437	415	432	439	479	472	479	495
	507	518	514	542	540	527	529	529	533	527	529	533	545	571	594	618	652	675	690	690
02 UT	679	676	685	680	555	504	509	520	489	447	411	420	450	470	478	466	436	409	401	386
	374	359	366	362	362	358	369	369	346	324	327	328	335	343	343	328	324	343	317	302
	309	305	301	286	282	278	286	316	323	360	379	419	427	445	442	445	441	437	433	430
03 UT	426	429	440	442	444	462	456	460	467	483	470	476	487	480	480	473	484	488	492	469
	451	439	466	470	485	477	474	466	448	463	478	486	467	460	464	482	498	490	505	509
	531	561	572	580	576	587	583	591	613	632	676	684	680	691	676	676	683	646	619	596
04 UT	570	558	557	553	545	512	500	493	512	658	667	674	681	689	705	701	706	685	605	512
	483	444	384	442	472	491	506	562	615	649	650	646	668	675	644	610	575	552	508	513
	488	457	425	405	346	349	365	384	373	385	370	334	333	325	306	276	344	399	386	355
05 UT	371	390	402	449	518	630	713	724	767	296	306	332	336	324	319	316	329	338	348	369
	383	426	488	528	569	534	489	480	468	482	452	373	319	324	298	274	269	253	308	384
	407	445	457	474	487	420	346	316	288	300	329	350	368	385	386	396	372	347	365	360
06 UT	362	363	374	389	425	433	447	520	577	607	642	683	786	794	812	821	822	895	923	924
	992	1069	1113	1084	1053	1017	1014	1037	1044	1035	978	950	924	926	976	1019	1010	983	971	983
	960	944	957	954	898	886	876	864	851	850	852	845	827	827	814	802	811	822	845	827
07 UT	792	790	787	785	782	785	769	789	766	792	828	862	856	853	866	871	867	836	744	743
	729	685	653	658	655	640	659	666	660	652	650	645	627	603	565	561	554	543	536	512
	500	475	436	404	371	341	304	277	280	279	279	286	298	290	286	292	302	292	291	304
08 UT	310	314	309	298	302	304	297	296	297	303	300	297	306	331	345	361	365	368	358	344
	327	313	305	298	295	291	289	281	267	258	248	306	389	657	709	732	737	733	691	660
	572	486	439	446	547	578	600	608	609	650	719	875	938	954	959	892	840	790	751	639
09 UT	502	404	359	347	348	364	422	391	382	374	373	386	383	365	337	302	321	323	327	328
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	289	275	253	244	232	220	209	199	182	168	156	151	151	156	159	159	154	150	145	141
10 UT	126	110	103	147	164	210	212	210	201	189	178	173	159	164	189	180	170	166	159	159
	164	167	174	181	190	223	235	260	229	232	232	223	204	192	176	171	169	156	131	114
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11 UT	65	64	60	66	66	89	88	86	83	199	179	170	151	141	133	112	120	172	142	193
	240	263	260	281	336	466	484	510	525	566	571	588	601	618	613	627	658	651	633	577
	519	501	492	501	501	496	496	505	514	560	581	576	521	517	519	530	533	526	530	542
12 UT	588	621	613	605	604	790	897	811	705	796	1104	1283	1140	1036	982	1054	1102	1130	1093	1098
	1010	950	966	960	1039	1037	1048	1056	1030	1057	978	953	902	818	655	585	562	553	579	605
	631	663	661	688	688	691	694	695	684	705	739	822	930	987	988	1023	973	1055	1047	994
13 UT	762	738	716	700	727	713	686	656	625	605	561	531	512	495	454	441	427	406	393	377
	338	304	289	283	289	270	260	255	257	264	271	291	288	273	270	272	284	283	273	259
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14 UT	207	214	212	218	212	207	200	189	193	196	212	214	218	232	230	238	238	232	232	218
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15 UT	102	107	117	124	131	124	110	122	138	154	183	199	207	209	209	207	199	204	198	180
	174	177	168	152	142	136	125	116	100	94	91	88	82	79	76	73	68	59	55	53
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16 UT	150	140	128	118	103	103	101	101	101	103	118	123	125	123	125	133	133	128	125	130
	130	130	130	128	128	141	149	158	161	163	171	178	180	180	168	156	148	148	146	154
	147	147	152	157	160	162	165	167	170	175	178	180	180	175	170	148	141	135	135	124
17 UT	122	122	119	108	108	108	118	129	139	149	163	181	176	168	168	170	176	168	149	142
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18 UT	97	84	103	118	125	173	194	234	257	246	241	230	232	237	237	255	275	288	295	321
	311	300	279	211	203	198	184	156	105	100	99	112	115	103	97	105	98	90	90	98
	87	82	79	76	74	70	70	59	60	65	67	69	69	69	72	72	72	74	74	70
19 UT	70	70	70	67	67	67	67	63	63	51	53	50	48	51	56	61	64	67	69	64
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	43	45	67	59	59	62	54	50	50	50	50	55	55	53	50	48	53	55	58	55
20 UT	58	51	51	48	53	53	51	53	58	60	60	60	60	58	58	56	56	56	56	56
	53	46	48	46	39	32	33	44	44	33	34	39	46	46	46	39	27	27	38	52
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21 UT	51	56	60	58	51	46	48	51	56	56	56	58	58	58	60	63	60	55	53	53
	53	53	53	55	55	55	74	55	55	62	65	63	58	53	53	58	58	60	61	61
	61	54	47	44	44	37	35	42	46	51	51	57	68	68	64	64	64	64	53	53
22 UT	53	60	58	53	53	53	49	49	50	55	60	62	45	48	50	45	43	40	34	34
	34	37	34	34	34	34	37	37	39	41	46	39	33	33	33	30	30	30	30	33
	25	29	33	45	45	45	45	41	30	26	30	30	34	38	42	46	50	50	46	46
23 UT	46	42	44	47	45	45	45	43	43	43	44	42	44	44	44	48	48	46	46	46
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	44	48	53	57	64	71	78	73	69	69	77	82	74	76	72	34	49	53	56	64
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	91	83	83	87	83	92	102	102	117	129	129	144	155	170	159	136	129	140	140	144
	133	125	137	137	152	174	174	178	178	178	193	197	190	186	191	204	208	220	219	228
01 UT	236	244	260	264	281	296	311	319	323	308	357	387	413	428	470	541	548	503	422	311
	279	261	240	346	396	305	222	276	390	390	398	387	383	402	420	410	461	460	468	468
	449	430	437	441	456	464	475	502	537	548	548	529	506	510	514	525	521	525	517	517
02 UT	509	509	516	513	513	528	535	567	615	665	594	584	576	540	519	523	531	531	531	542
	531	527	535	546	558	558	570	581	593	600	612	631	642	642	642	638	649	649	649	638
	638	627	627	623	623	634	634	642	642	642	638	638	638	634	568	583	587	614	622	618
03 UT	588	546	480	438	446	443	500	485	478	462	432	420	424	416	416	423	438	449	464	479
	498	548	559	574	578	593	593	608	612	631	650	658	674	654	635	616	604	642	684	684
	674	688	717	742	765	790	806	839	826	812	798	841	846	857	873	866	875	864	842	795
04 UT	733	722	681	603	547	511	494	485	454	447	452	443	431	428	413	406	410	415	420	413
	391	375	366	335	331	342	353	365	365	372	372	368	353	353	353	368	388	392	396	400
	392	396	385	385	374	374	362	362	351	340	344	347	347	339	328	335	342	359	384	422
05 UT	449	431	435	451	460	472	513	502	501	498	486	494	517	555	562	585	589	577	520	493
	501	482	452	433	426	448	471	490	513	521	513	539	535	528	487	456	433	422	438	443
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06 UT	505	499	533	535	519	526	526	524	529	548	556	572	595	606	599	572	478	500	448	413
	406	414	429	437	453	472	468	441	445	441	452	459	467	444	418	387	368	341	338	327
	335	380	388	410	407	415	415	411	419	375	334	280	232	262	277	261	237	281	270	258
07 UT	275	299	319	319	320	317	325	322	326	333	333	342	356	370	389	408	419	418	432	444
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08 UT	383	369	338	319	308	299	290	289	284	296	305	313	318	319	321	326	320	311	314	327
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11 UT	248	240	241	246	244	239	244	239	268	287	280	298	315	313	302	318	345	372	399	406
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12 UT	178	180	194	208	210	212	212	204	192	188	169	164	153	155	155	155	144	135	124	122
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13 UT	56	56	55	58	58	58	55	55	53	53	53	53	55	55	55	58	58	60	62	62
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	56	58	56	51	54	51	51	58	65	63	61	61	58	62	74	85	96	85	74	62
14 UT	61	63	63	66	73	77	82	87	92	92	92	95	102	107	107	102	105	112	127	129
	127	124	116	113	110	108	94	91	89	83	81	78	76	74	74	78	81	81	78	81
	81	73	70	81	83	75	78	85	90	97	100	105	99	102	113	105	96	96	98	105
15 UT	108	115	113	113	105	105	105	103	113	110	119	116	102	100	97	84	81	72	69	72
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	82	79	76	74	71	76	76	71	55	56	56	57	57	57	61	60	62	74	81	92
16 UT	87	85	80	75	72	72	81	85	75	90	103	107	97	89	82	79	79	87	98	87
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17 UT	259	242	257	274	271	263	254	246	237	210	203	202	183	172	184	187	179	172	167	167
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	97	90	88	82	80	84	94	102	110	114	127	129	118	110	102	97	93	93	90	84
	87	92	94	88	85	80	90	93	84	79	79	74	71	69	66	63	69	69	70	70
20 UT	70	71	69	69	73	71	65	63	63	59	60	71	76	80	80	69	69	58	51	41
	41	45	45	51	57	62	66	66	65	60	57	52	46	39	39	36	33	36	39	39
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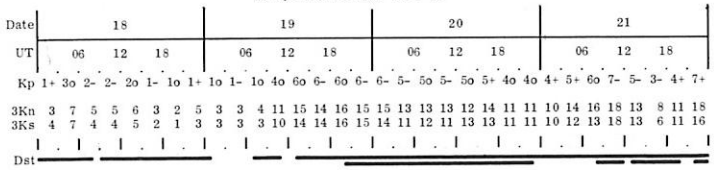
1977, SEPTEMBER 18 - 21



Data from Individual Observatories:

SEPTEMBER 1977

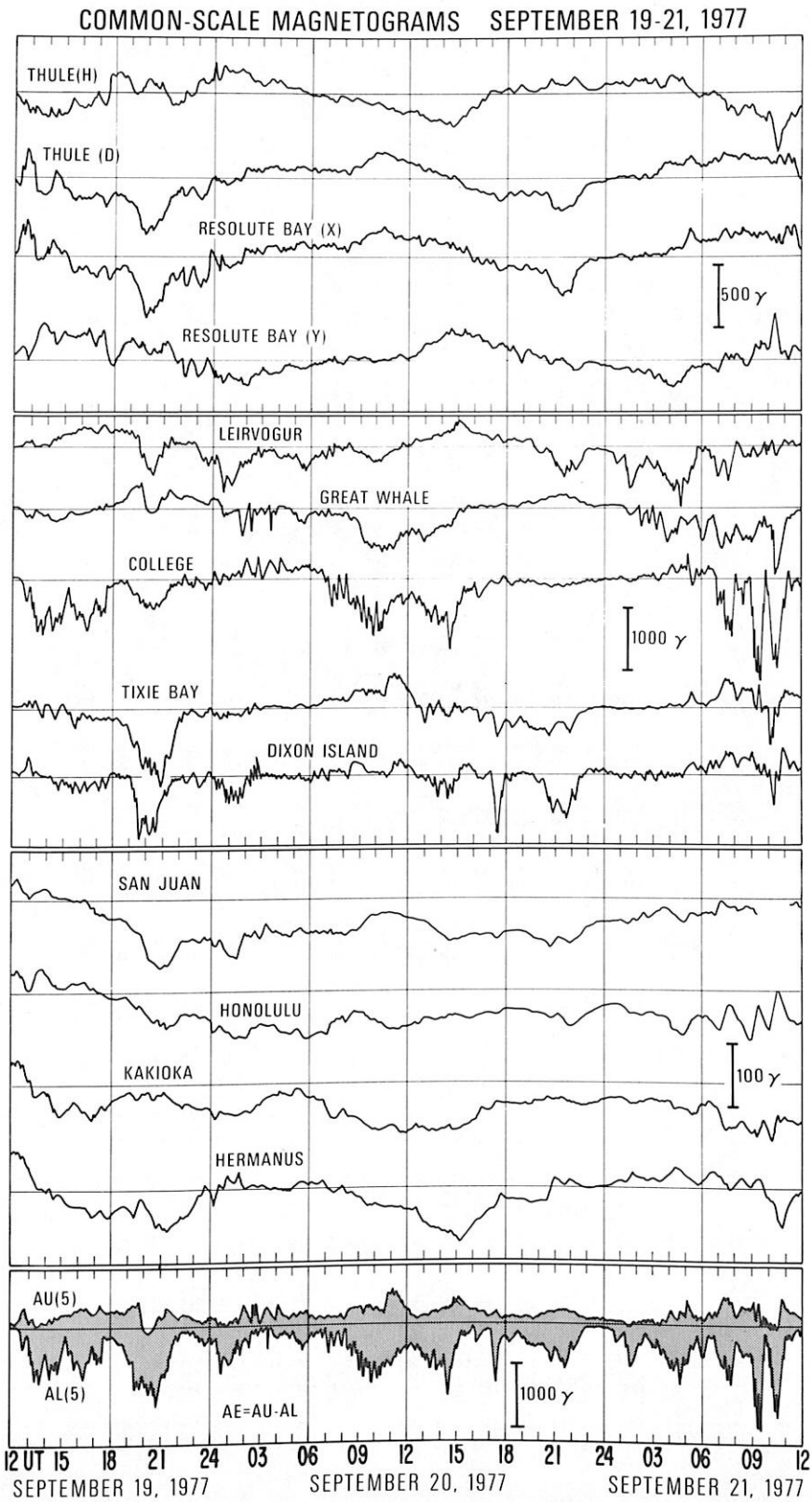
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

OBS. 3-letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	COMMENCEMENT hr min (UT)	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	83.1N	19	1130	..	..	..	..	19(7)	-	775	700	775	23	04
MBC	79.1N	19	1130	..	..	..	..	21(4)	-	741	1035	733	23	04
BLC	73.9N	19	1100	..	..	..	..	22(2)	-	1585	875	1060	23	04
COL	64.6N	19	08--	..	..	..	..	21(4)	8	362	2010	1280	23	03
MEA	61.8N	19	1130	..	..	..	..	21(4)	-	2275	1410	1310	23	04
SIT	60.0N	19	12--	..	..	..	..	21(4)	8	--	--	--	22	23
OTT	57.0N	19	1130	..	..	..	..	20(1)	-	700	585	600	23	04
NEW	55.1N	19	0535	..	..	..	..	21(4)	7	60	342	631	21	18
VIC	54.3N	19	1145	..	..	..	..	21(4)	-	225	285	425	23	04
WIT	54.2N	19	11--	..	..	..	..	19(5,7,8) 21(4)	6	43	225	100	21	14
FRD	49.6N	19	11--	..	..	..	..	20(1) 21(4,8) 22(1)	6	54	176	158	24	13
BOU	48.9N	19	11--	..	..	..	..	21(4)	7	51	195	202	23	03
EBR	43.9N	19	1141	SC	--	+ 4	--	19(5,6,7,8) 20(6) 21(2,4)	5	212	177	80	21	15
IRK	41.0N	19	1142	SC*	+ 1	+30	+ 5	21(4)	7	30	150	85	21	15
MMB	34.0N	19	1140	SC	+ 1	+24	- 2	19(5)	6	15	134	38	21	15
SJG	29.9N	19	0843	SC	- 1	+13	+ 3	19(7)	6	11	124	41	21	14
KAK	26.0N	19	1140	SC	+ 1	+20	+11	19(5)	6	10	130	53	21	15
HON	21.1N	19	1140	..	..	..	..	05(4)	4	8	14	6	20	23
KNY	20.5N	19	1140	SC	+ 1	+24	+13	19(5)	6	10	145	55	21	15
JAI	17.3N	19	1138	SC	- 0.2	27	- 5			9	172	50	21	15
SHL	14.6N	19	1138	SC	- 0.4	25	2			7	160	33	21	15
UJJ	13.5N	19	1138	SC	- 0.1	32	- 7			8	182	50	21	15
ABG	09.5N	19	1138	SC	- 0.3	24	- 4	19(5)	7	7	160	49	21	15
HYB	07.6N	19	1140	SC	- 0.1	+27	- 1	19(5)	7	7	188	32	21	15
GUA	04.0N	19	1141	..	..	..	..	19(5)	6	10	130	30	21	13
ANN	01.5N	19	1138	SC	- 0.8	30	21			5	176	77	21	15
HUA	00.6S	19	1144	SC	2	54	4	19(6,7)	6	10	321	34	21	20
TRD	01.1S	19	1138	SC	--	24	29			5	194	115	21	15
API	16.1S	19	1138	SC	0	+18	- 6	21(4) 22(2)	5	5	121	30	23	07
PMG	18.7S	19	----	..	..	..	..	22(1)	6	6	140	60	23	06
HER	33.7S	19	1000	..	..	..	..	21(4)	6	31	140	109	21	15
CZT	39.7S	19	1143	SC	.4	3	--	21(7,8) 22(8)	6	--	--	--	27	12
GNA	43.3S	19	11--	..	..	..	..	19(5) 20(6)	6	17	130	120	21	00
TOO	46.7S	19	11--	..	..	..	..	21(4)	6	28	168	127	22	22
KGL	56.5S	19	1143	SC	--	+ 4	--	19(7) 21(4,8) 22(7)	7	85	765	473	22	24
MCQ	61.1S	19	1233	..	..	..	..	22(6)	9	301	2126	1421	23	03
MAW	73.1S	19	11--	..	..	..	..	21(8)	8	144	1410	1410	23	04

THREE-HOUR-RANGE INDICES, K

SEP	18		19		20		21	
HIS	4544	3234	3324	5565	5555	5565	5676	5456
CCS	----	----	----	----	----	-----	5557	7344
DIK	2333	3334	2224	6686	8665	7877	5568	8557
TIK	2222	2111	1124	6798	6467	7767	3679	8568
MMK	1111	2123	1013	6686	7444	5767	4556	6357
KIR	1111	2123	0003	6686	7444	5667	4546	6368
CWE	2221	1111	1112	7766	5456	8644	3668	7336
CHO	1222	1000	0021	6655	5566	6533	3578	6335
LRV	3432	2123	1112	5476	7655	6666	7875	5469
SOD	1111	2012	0003	6686	7443	5776	4546	6367
YAK	2221	2111	1003	5566	5345	5645	3457	6336
LER	1211	2111	0003	5566	5433	5544	4344	4239
NUR	1112	2001	0004	6565	4334	4554	3444	4237
LOV	1222	2112	1014	6576	5334	5555	4545	4238
SIT	1211	1011	0022	6655	5465	6623	366(8)	7345
SVD	1211	1111	1213	5465	4343	4544	3446	5336
RSV	1222	2211	1004	6555	5344	4554	4444	4247
MNK	1222	1221	1122	5544	5576	7533	3787	6346
WIT	1222	2112	1015	6566	5344	4554	4456	4257
IRT	2332	2112	3224	6555	5454	4543	3457	5335
VAL	1212	2112	1013	5555	4333	3553	4445	3246
KIV	1222	2222	1124	6566	5433	4654	4556	4247
DOU	1212	2111	0004	5555	4332	4554	4445	4246
KGD	1112	1000	0112	4343	3222	2421	1234	3123
VIC	1322	1112	1123	5555	6564	4424	3577	4335
OTT	1411	3112	1113	5554	7645	4333	4666	4347
IMB	1112	2101	1124	5444	3344	3434	2455	4234

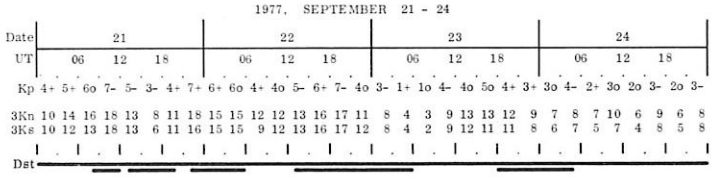
	18		19		20		21	
TKT	1133	2112	2214	6554	4343	4653	3355	4145
PEG	1211	1111	1113	6555	4333	3554	3446	4256
TOL	0211	0111	0013	5355	4332	3543	3445	4145
FRD	1321	2001	2123	5555	6555	5334	4556	4346
COI	1202	2211	1023	5354	4332	4443	4435	4245
KSA	1132	1021	0026	7565	4445	5553	2447	5266
TUC	1221	1101	1114	5566	6555	4444	3566	4246
KNY	1221	2100	2124	6433	3344	3433	2355	4235
TAM	1222	1111	2103	6355	4333	3443	3435	4355
HON	0232	2111	0014	4434	4344	2224	3455	3234
HYB	2221	1111	1114	7654	3443	4653	3446	4245
SJG	1222	1001	1003	5465	5434	4344	3444	4246
GUA	2213	2111	2114	6434	4334	2533	3355	4336
BNG	2223	2221	2224	4356	4343	4543	3445	4245
PMG	1212	2001	----	----	4343	3423	3355	3255
HUA	1222	3211	1114	5665	4334	5543	2334	4445
GNA	1112	1001	0113	5454	5442	4543	2356	5244
HER	1212	1111	1114	5555	5344	5543	4446	4245
TOO	1111	1001	0113	5444	3443	4324	2356	4122
AML	3222	1000	1113	5555	4444	4534	3456	4235
MCQ	1221	1000	0111	7665	5466	7643	3557	6235
MIR	2343	1012	2333	4365	4454	3454	4455	4235
MAW	3542	2155	4223	5476	6455	6666	5767	5268
NVL	1212	1112	1011	346-	6644	4344	6555	2257
SBA	2332	2222	2223	5454	5444	4344	3546	3334
VOS	1222	2111	1122	4454	4334	4344	4445	4235


COMMON-SCALE MAGNETOGRAMS SEPTEMBER 19-21, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
500 γ
RESOLUTE BAY (Y)
LEIRVOGUR
GREAT WHALE
COLLEGE
1000 γ
TIXIE BAY
DIXON ISLAND
SAN JUAN
HONOLULU
100 γ
KAKIOKA
HERMANUS
AU(5)
AL(5)
AE=AU-AL
1000 γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
SEPTEMBER 19, 1977
SEPTEMBER 20, 1977
SEPTEMBER 21, 1977

12 UT	320	320	338	320	306	288	315	342	315	329	338	293	293	306	306	306	306	311	297	275
	268	268	275	293	293	324	342	342	329	356	347	347	365	365	370	383	397	397	410	415
	420	415	447	488	502	552	588	628	655	678	683	669	674	692	710	714	719	719	683	660
13 UT	633	610	566	561	566	557	521	512	503	487	495	481	450	422	432	517	465	461	482	471
	652	703	667	632	618	665	681	686	750	746	778	911	885	806	793	860	849	849	793	746
	698	698	710	687	676	679	667	678	779	802	824	914	824	805	803	816	833	827	802	791
14 UT	771	753	670	612	617	617	614	582	575	547	514	491	461	505	514	519	491	497	557	621
	643	685	733	741	800	793	860	916	931	920	894	864	856	785	747	684	688	707	718	737
	801	808	812	778	782	790	782	752	756	737	707	666	636	655	685	733	819	860	857	827
15 UT	831	790	745	723	745	764	786	757	730	712	693	671	626	588	574	570	552	543	547	542
	538	533	524	519	523	514	514	513	521	521	525	525	540	611	607	600	592	604	604	615
	600	589	547	544	588	648	701	716	742	765	757	765	765	780	817	869	873	843	829	817
16 UT	810	757	739	765	765	787	810	787	784	776	810	836	862	877	877	866	851	893	930	948
	941	948	967	974	1000	1071	1079	1079	1056	1067	1052	1030	997	993	982	937	840	840	847	900
	885	844	833	810	825	833	780	780	784	772	768	753	705	682	645	593	563	559	555	566
17 UT	497	494	503	551	529	611	686	697	671	652	697	716	690	589	611	701	761	802	817	828
	840	840	833	803	818	792	781	777	792	804	818	829	848	855	840	803	754	672	586	505
	510	516	517	496	484	469	466	461	458	449	446	450	458	458	449	445	446	447	452	459
18 UT	459	461	464	467	460	451	442	446	458	449	435	426	431	440	450	441	427	424	411	400
	401	414	431	437	432	427	433	475	485	500	502	496	496	496	512	515	518	507	486	473
	464	458	454	464	482	483	483	487	502	504	507	502	494	484	479	482	495	498	514	530
19 UT	541	548	575	581	595	617	639	653	667	697	702	722	727	733	710	702	665	678	691	706
	701	681	655	653	646	639	632	662	682	691	694	733	799	1007	1036	1102	1096	1071	946	867
	855	866	873	901	925	942	958	1016	1023	1007	987	964	887	861	838	814	781	708	664	623
20 UT	569	507	462	476	567	553	521	502	492	537	537	580	604	578	552	523	487	478	500	505
	478	616	691	694	672	658	643	631	626	611	596	589	567	557	542	483	480	505	597	769
	761	752	747	742	725	757	774	886	942	1011	1082	1067	1042	1015	998	963	960	940	927	924
21 UT	918	909	895	984	968	977	920	857	782	712	681	680	699	714	719	739	722	713	727	731
	723	726	750	766	746	746	705	767	813	833	832	837	823	777	700	649	540	470	472	477
	507	422	399	384	406	435	411	382	340	328	316	320	295	269	255	237	237	238	248	237
22 UT	230	197	215	228	224	203	214	231	271	212	183	196	169	167	171	162	152	135	112	113
	135	164	153	173	156	131	132	138	138	170	175	169	150	154	156	157	176	176	154	156
	154	148	150	146	142	142	154	168	177	200	204	228	215	198	180	181	182	182	170	166
23 UT	167	168	171	164	162	154	152	152	163	156	149	143	147	147	136	141	123	134	123	127
	116	127	139	127	129	146	196	210	210	189	150	152	161	166	193	198	207	229	290	355
	356	350	346	346	373	388	407	399	373	358	354	354	333	298	285	229	242	242	248	248
00 UT	256	214	188	188	191	212	238	225	225	250	244	244	224	226	290	286	273	166	165	125
	183	204	189	186	148	129	110	110	110	198	190	280	280	294	346	371	373	382	394	503
	609	681	749	775	783	711	643	545	541	526	533	492	473	458	447	465	484	492	492	507
01 UT	488	469	436	493	515	523	553	583	560	556	598	654	643	639	658	635	616	575	567	564
	594	582	575	556	544	552	552	522	499	446	438	396	388	404	429	467	467	481	481	424
	433	443	456	464	485	469	438	488	508	517	515	552	696	793	735	668	707	629	520	550
02 UT	618	647	720	681	660	647	633	632	614	565	590	631	574	469	450	439	390	425	458	432
	455	505	616	660	713	659	641	705	592	407	348	356	372	343	464	451	437	491	429	368
	341	672	461	532	512	606	683	560	537	510	501	620	651	532	475	434	358	391	383	316
03 UT	298	329	325	320	325	343	329	325	311	352	361	361	366	348	347	389	423	448	421	406
	429	440	435	453	476	493	491	515	506	501	490	490	503	500	466	494	778	833	757	644
	548	530	541	534	512	464	433	424	424	424	406	410	413	450	473	479	429	345	331	339
04 UT	324	281	321	321	355	393	393	370	355	415	525	570	368	324	335	492	530	458	324	319
	370	476	465	397	353	395	411	405	371	353	358	380	391	380	358	369	353	353	358	347
	353	353	364	371	376	374	378	383	383	394	378	367	351	345	354	349	372	403	433	449
05 UT	443	452	477	504	518	518	485	499	503	514	503	514	485	483	489	525	573	587	617	606
	590	592	585	575	600	598	619	600	582	595	577	596	625	627	659	684	691	675	687	669
	664	666	650	644	648	650	627	613	615	615	588	568	558	529	513	535	569	571	549	539
06 UT	499	493	486	475	470	477	472	463	443	427	411	413	413	451	472	460	433	435	440	429
	431	410	401	385	379	368	383	388	386	395	414	425	448	464	457	454	461	452	441	441
	461	479	483	426	433	422	408	443	456	456	488	484	461	489	507	507	480	483	495	491
07 UT	479	453	449	447	436	422	411	383	376	380	397	425	462	472	483	492	492	512	516	512
	545	567	517	491	487	477	468	459	452	454	455	464	469	464	466	468	473	476	475	478
	480	493	502	502	489	489	483	457	471	466	466	466	468	477	472	479	494	505	517	523
08 UT	523	518	512	486	452	424	422	426	433	433	423	416	409	400	395	390	386	388	393	412
	431	440	456	471	498	525	562	585	616	634	666	689	698	693	679	666	670	666	656	653
	660	665	665	749	760	749	749	670	672	672	662	679	684	688	693	684	693	711	744	752
09 UT	744	766	780	809	830	863	882	904	895	905	959	908	907	925	935	960	978	972	1009	1023
	1016	1008	994	999	1008	998	947	982	970	1002	1014	1037	1069	1044	1061	1077	1085	1093	1110	1079
	1061	1047	1051	1060	1114	1156	1154	1140	1126	1126	1155	1132	1092	1090	1104	1099	1076	1081	1039	1041
10 UT	1049	1059	1081	1084	1067	1045	1049	1053	1047	1050	1053	1074	1077	1108	1105	1109	1125	1112	1082	1041
	1059	1075	1087	1107	1131	1106	1090	1057	1047	1033	1025	1028	1018	1051	1076	1074	1059	1049	1080	1106
	1067	1067	1078	1065	1092	1105	1109	1136	1173	1232	1242	1256	1273	1289	1279	1261	1244	1247	1262	1281
11 UT	1291	1257	1250	1331	1368	1363	1373	1375	1357	1348	1340	1320	1285	1225	1226	1203	1184	1171	1181	1196
	1210	1225	1238	1242	1242	1191	1107	1098	1087	1066	1040	1013	1015	1046	1065	1096	1142	1083	1055	1026
	1022	1006	984	973	971	969	977	943	926	880	868	873	885	892	870	837	821	820	819	838

12 UT	852	863	882	889	856	818	819	800	783	769	757	747	740	721	712	702	685	692	695	702
	706	703	686	688	715	710	719	742	800	799	776	762	778	802	763	737	707	698	677	677
	673	682	681	668	664	683	724	745	745	746	769	787	773	771	789	817	835	849	868	904
13 UT	909	886	840	808	803	803	807	821	816	812	812	817	809	795	777	768	763	763	766	775
	779	779	776	767	763	781	826	857	842	827	842	834	808	819	824	816	806	783	773	755
	750	746	745	740	745	782	850	921	928	913	872	857	842	838	816	789	801	797	801	823
14 UT	838	836	842	842	809	775	771	794	832	865	917	887	880	813	790	742	732	746	755	756
	737	757	820	873	921	1052	1085	1059	1107	1175	1209	1272	1302	1336	1298	1261	1198	1153	1033	974
	977	981	963	933	929	955	944	990	1009	994	990	1002	1009	1013	964	889	840	788	751	744
15 UT	737	726	740	785	789	793	800	778	771	782	767	767	778	729	729	700	656	649	646	648
	650	650	651	648	636	631	634	629	620	598	586	562	542	525	517	517	513	504	499	491
	483	479	470	471	464	464	465	466	459	450	443	439	431	432	433	442	450	454	454	458
16 UT	458	457	453	440	440	440	437	437	441	450	454	450	450	455	488	514	514	495	495	502
	487	476	469	469	454	443	443	443	443	431	409	418	405	405	405	386	395	402	398	394
	398	403	408	405	405	400	401	401	402	398	399	391	388	381	373	365	353	349	346	337
17 UT	333	325	321	337	337	337	337	337	336	345	352	361	365	372	376	423	454	516	534	593
	697	832	944	1002	1050	1065	1059	1032	1032	1015	984	918	867	772	722	579	512	465	462	446
	425	398	374	377	373	342	307	295	294	287	279	272	268	261	269	273	276	276	284	292
18 UT	296	298	299	305	311	320	325	323	319	322	322	320	320	332	342	378	405	413	401	404
	406	408	407	412	411	405	390	379	369	367	361	353	342	339	341	337	333	338	334	330
	327	318	318	318	318	318	323	323	318	322	322	322	317	309	289	276	263	259	275	291
19 UT	312	334	345	358	356	355	348	346	341	346	350	347	347	363	369	370	383	422	427	429
	433	443	458	464	461	444	428	421	419	417	417	414	431	462	475	476	460	433	406	391
	388	378	374	383	391	409	385	344	331	330	331	326	301	273	267	282	298	256	254	259
20 UT	270	288	293	281	285	285	277	272	261	248	255	297	318	320	318	301	293	281	287	311
	326	331	335	342	347	333	321	318	333	343	359	376	377	417	394	395	403	396	366	366
	359	359	402	427	444	454	466	475	488	475	461	466	452	443	434	434	430	385	348	317
21 UT	303	281	259	259	254	272	304	313	326	340	353	371	376	390	394	399	403	403	430	426
	426	439	453	466	484	493	507	520	529	516	502	489	489	489	502	520	547	579	606	606
	592	565	547	534	529	498	479	461	443	412	412	416	412	407	362	330	285	258	209	194
22 UT	196	198	202	216	239	259	274	274	288	288	288	296	295	256	259	271	231	228	228	217
	213	213	206	198	206	251	295	320	295	263	234	198	183	171	173	166	154	147	153	156
	170	165	165	165	165	165	165	183	197	201	201	206	219	224	224	242	242	251	256	287
23 UT	301	301	301	301	314	301	301	301	301	287	274	265	256	274	346	319	297	310	310	297
	279	265	283	283	297	310	329	356	356	356	356	356	356	360	347	320	320	315	302	283
	351	360	319	301	292	306	333	360	319	319	319	306	301	315	342	342	328	324	297	274
00 UT	274	274	270	265	265	274	274	274	260	260	260	260	274	279	265	265	252	265	270	283
	270	270	283	283	283	265	265	279	279	270	256	243	238	238	233	238	243	247	243	225
	225	225	242	267	282	309	299	286	299	286	282	278	278	261	271	253	242	231	238	234
01 UT	231	238	242	227	229	247	243	229	243	238	238	243	234	238	234	234	234	234	238	229
	243	239	244	259	304	335	327	325	318	344	394	403	439	463	522	564	594	605	617	623
	611	594	583	568	600	625	625	621	619	599	580	577	579	567	522	493	464	449	428	417
02 UT	413	409	406	402	387	368	364	356	337	341	333	326	322	330	362	354	436	473	535	547
	522	510	512	512	521	514	442	408	398	396	421	408	371	335	362	375	398	380	394	389
	384	380	348	426	499	513	591	600	550	514	509	532	522	482	477	463	468	461	476	347
03 UT	370	385	393	408	424	422	411	390	411	440	481	534	571	587	593	606	561	569	564	573
	440	417	390	377	349	353	308	322	348	387	400	431	495	524	541	556	492	469	469	474
	488	529	568	594	621	642	649	661	680	709	734	753	785	808	822	835	863	846	834	845
04 UT	841	838	836	869	865	831	842	868	876	898	880	883	834	802	793	861	846	801	778	797
	801	726	694	674	680	651	704	722	644	697	729	752	734	701	669	669	684	707	729	759
	789	842	887	1073	1126	1111	1073	967	930	858	832	767	725	702	691	615	634	653	702	781
05 UT	770	706	684	636	680	710	736	724	702	795	949	848	788	792	781	770	716	698	686	686
	680	673	670	646	639	632	616	612	607	602	602	607	589	575	562	553	544	549	535	512
	518	511	516	529	513	563	604	646	701	723	732	710	728	760	803	797	820	852	875	866
06 UT	866	875	884	893	880	839	821	812	799	821	785	766	766	772	767	751	737	721	698	681
	659	631	640	635	620	612	607	607	612	625	634	652	634	629	607	584	571	545	534	523
	496	512	530	521	529	552	561	565	579	606	633	652	666	736	768	778	787	806	837	867
07 UT	894	915	950	1022	999	985	1043	1083	1106	1137	1154	1168	1194	1203	1203	1188	1210	1227	1278	1273
	1247	1208	1191	1173	1172	1149	1085	1056	1040	1020	1020	1042	1095	1178	1211	1207	1116	1122	1148	1151
	1097	1060	1054	1091	1113	1146	1182	1243	1270	1207	1193	1167	1079	1087	1031	1028	1000	950	932	836
08 UT	813	804	804	777	746	682	659	667	722	700	691	669	672	709	768	818	840	864	886	909
	900	913	945	933	940	950	968	996	1022	1035	1049	1046	1051	1065	1060	1051	1014	1005	987	978
	978	982	986	996	1005	978	959	959	992	987	952	929	933	943	953	967	996	970	958	996
09 UT	1028	1047	1024	1010	1083	1105	1114	1433	1618	1343	1242	995	1116	1351	1284	1431	1528	1577	1577	1598
	1658	1548	1383	1373	1680	1821	1888	1782	1721	1708	1586	1470	1270	1214	1014	815	523	509	555	651
	656	699	616	589	525	485	462	458	535	549	569	540	554	566	553	535	537	556	583	601
10 UT	605	661	703	585	546	483	682	839	690	702	837	979	1005	1030	1041	1097	1137	1288	1221	1197
	1055	1204	1277	1296	1314	1228	1202	1339	1424	1348	1292	1184	1068	1097	1135	1174	1141	1138	1110	1115
	1109	1136	1167	1143	1156	1200	1200	1200	1190	1085	1062	1006	1002	948	939	916	893	884	875	838
11 UT	770	720	656	684	729	775	711	675	644	644	639	565	574	585	592	586	574	591	612	612
	619	635	614	570	572	577	592	592	579	579	579	565	524	506	495	490	495	479	468	474
	476	458	448	450	438	434	455	465	462	447	423	452	460	438	438	438	454	440	429	465

1977, SEPTEMBER 21 - 24



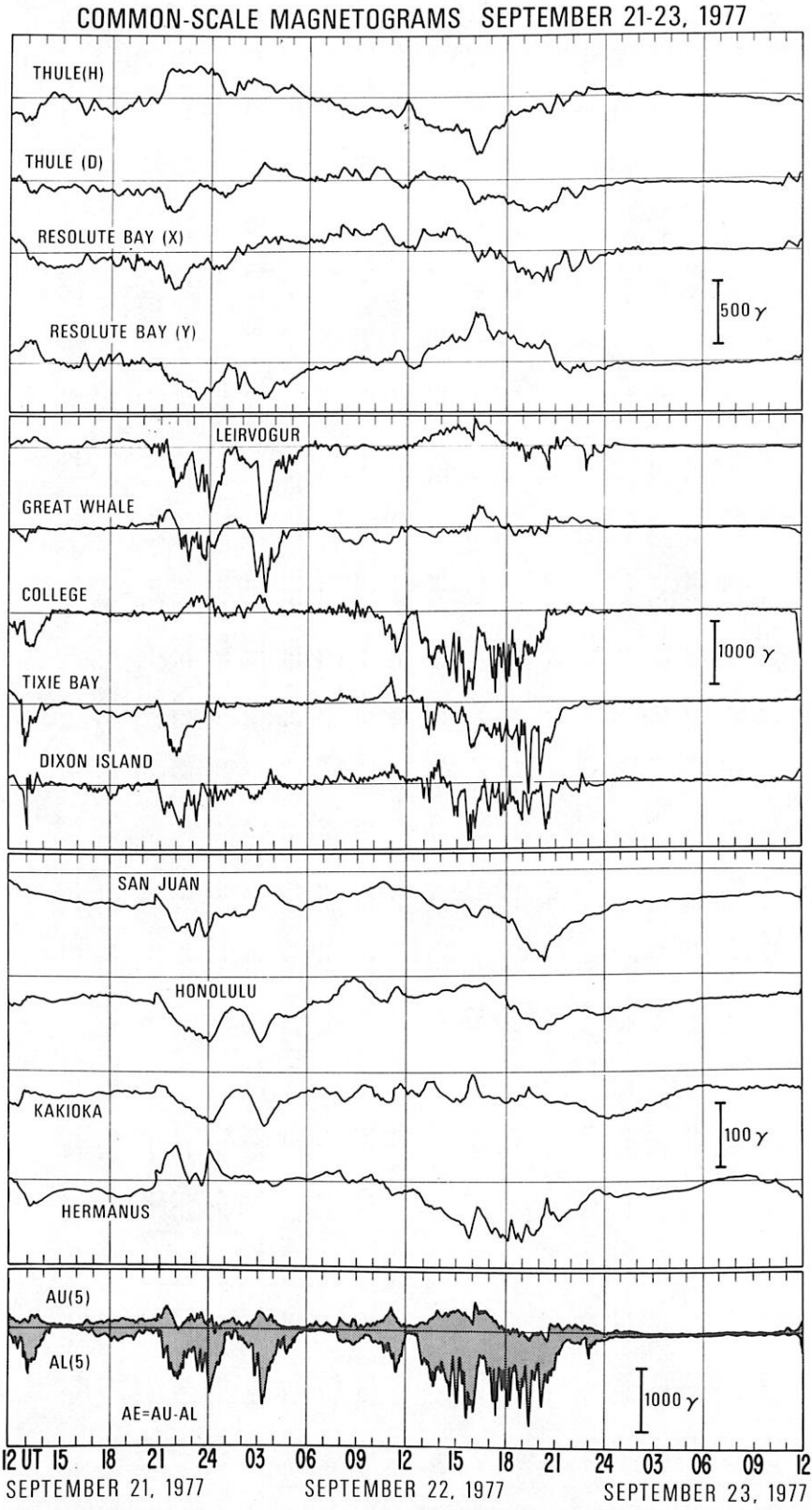
Data from Individual Observatories: **SEPTEMBER 1977**

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 LAT-ITUDE	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
NEW	55.1N	21	2044	SC*	--	22	3	22(2)	6	51	186	232	24	18
WIT	54.2N	21	2045	SC	- 4	+45	0	21(8)	7	37	300	185	24	01
EBR	43.9N	21	2045	SC	--	+32	+27	21(8) 22(1)	6	165	152	61	23	01
IRK	41.0N	21	2045	SC*	- 4..5	+20	+ 9	22(6,7)	6	26	171	53	23	03
MMB	34.0N	21	2045	SC*	+ 1 *	+ 7	- 3	22(1,2,6)	5	14	106	24	23	03
SJG	29.9N	21	2045	SC	- .5	+19	+ 6	21(8)	6	11	115	41	23	04
KAK	26.0N	21	2045	SC	+ 1	+ 7	+ 4	21(8) 22(1,2,6)	5	10	82	37	23	03
HON	21.1N	21	02--	..	..	..	..	21(3)	5	7	21	8	21	14
HON	21.1N	21	2045	SC	2	6	3	22(3)	5	4	13	1	23	04
KNY	20.5N	21	2045	SC	+ .2	+ 8	+ 3	21(8) 22(1,2,5,6)	5	10	94	47	23	03
JAI	17.3N	21	2043	SC	- 1.1	22	- 7			8	104	40	24	04
SHL	14.6N	21	2043	SC	- 0.4	18	4			6	93	31	24	04
UJJ	13.5N	21	2043	SC	- 0.6	26	- 6			7	124	37	24	04
ABG	09.5N	21	2043	SC	- 0.7	20	- 6	22(6,7)	6	7	101	45	24	04
HYB	07.6N	21	2043	SC	- 0.5	+18	- 2	22(6,7)	6	6	122	28	23	23
GUA	04.0N	21	2044	SC	--	15	-05	21(8)	6	10	60	30	23	07
ANN	01.5N	21	2043	SC	- 1.1	25	14			5	138	88	24	04
HUA	00.6S	21	2044	SC	1	49	6	22(6,7)	5	6	251	55	23	20
TRD	01.1S	21	2043	SC	--	23	27			5	168	100	24	04
HER	33.7S	21	2044	SC	+ 2	+25	+17	22(7)	6	41	145	128	22	24
CZT	39.7S	21	2044	SC	3.4	19	1	21(7,8) 22(8)	6	--	--	--	27	12
GNA	43.3S	21	2044	SC	+ 3 *	+ 8	+17	22(4,6,7)	6	24	80	160	23	21
KGL	56.5S	21	2044	SC*	+ 1.1	+18	+ 2	19(7) 21(4,8) 22(7)	7	85	765	473	22	24

THREE-HOUR-RANGE INDICES, K

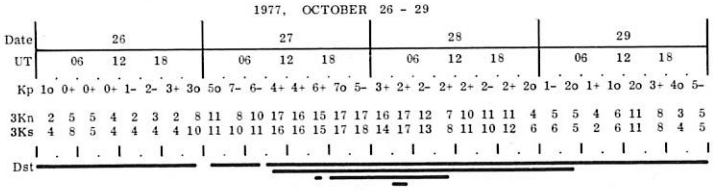
	SEP 21		22		23		24			21		22		23		24	
HIS	5676	5456	6534	7664	4455	6665	5344	3545	TKT	3355	4145	5544	5663	2334	5542	2222	1223
CCS	5557	7344	6555	7755	5223	7653	4333	3635	PEG	3446	4256	5323	4564	2113	3453	1112	1323
DIK	5568	8557	7656	7876	4225	7876	4334	4656	TOL	3445	4145	5433	4554	2102	3443	2212	1223
TIK	3679	8568	6557	8896	4124	8774	1334	3645	FRD	4556	4346	6544	4553	3113	3433	3434	2322
MMK	4556	6357	8634	5695	3224	5675	4223	3455	COI	4435	4245	5423	3553	2012	3443	1222	2312
KIR	4546	6368	8724	5695	2114	5576	5322	3455	KSA	2447	5266	5354	4664	3033	4653	1013	1340
CWE	3668	7336	4457	8883	3214	6643	2334	2422	TUC	3566	4246	6645	4553	3112	4443	3334	2321
CMO	3578	6335	5456	7773	3106	6532	2335	2411	KNY	2355	4235	5544	5542	2213	4331	1113	2312
LRV	7875	5469	9854	5676	3123	4466	6432	4446	TAM	3435	4355	5323	4554	2212	3313	2222	1222
SOD	4546	6367	8724	5785	3113	5576	4222	3444	HON	3455	3234	4355	2332	2103	4222	1223	1111
YAK	3457	6336	5556	6674	2203	6553	2324	1323	HYB	3446	4245	4533	4662	2112	4544	1111	1213
LER	4344	4239	6733	4773	2002	3453	3221	2223	SJG	3444	4246	5433	4454	3122	3443	2222	1212
NUR	3444	4237	7533	4673	2113	4544	3211	1323	GUA	3355	4336	5534	4433	2312	3223	2232	2213
LOV	4545	4238	6633	4674	2123	4554	3322	2324	BNG	3445	4245	5334	4565	2223	3443	2222	2323
SIT	366(8)	7345	5565	7663	2115	5532	2424	1311	PMG	3355	3235	6535	4542	3222	3232	1222	1211
SVD	3446	5336	5434	5654	2223	5554	2222	2424	HUA	2334	4445	4433	4553	2113	4432	2211	3312
RSV	4444	4247	5533	4674	2013	4544	3222	2334	GNA	2356	5244	5436	5663	2113	5443	2212	2412
MNK	3787	6346	6575	5763	3115	5333	2445	2222	HER	4446	4245	5533	4565	2112	3443	1113	1323
WIT	4456	4257	6544	4665	3113	4654	3323	2334	TOO	2356	4122	3445	5552	2113	4321	1112	0001
IRT	3457	5336	5545	5663	3433	6543	3334	2323	AML	3456	4235	5544	4553	2214	5332	2323	2212
VAL	4445	3246	6533	3554	2112	3444	2313	2224	MCQ	3557	6235	5546	8983	2114	6531	2344	2411
KIV	4556	4247	6534	4664	2233	4654	3333	2334	MIR	4455	4235	5455	5754	3334	3853	3444	3425
DOU	4445	4246	5433	4564	2003	3543	2211	2323	MAW	5767	5268	6654	6776	5223	4674	4443	4446
KGD	1234	3123	4323	3442	1112	3332	1122	1212	NVL	6555	2257	7733	3687	2012	3354	3232	1213
VIC	3577	4335	4655	4553	3113	3433	2434	2322	SBA	3546	3334	4533	4543	2212	4333	3333	2332
OTT	4666	4347	3543	4564	2213	3342	3323	2212	VOS	4445	4235	5434	4443	2223	4342	2333	3222
MMB	2455	4234	5544	4552	2113	5442	1213	2322									


COMMON-SCALE MAGNETOGRAMS SEPTEMBER 21-23, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500 γ
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000 γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100 γ
AU(5)
AL(5)
AE=AU-AL
1000 γ
12 UT 15 18 21 24 03 06 09 12 15 18 21 24 03 06 09 12
SEPTEMBER 21, 1977
SEPTEMBER 22, 1977
SEPTEMBER 23, 1977

12 UT	474	449	421	435	452	438	466	461	434	429	456	493	465	411	429	411	393	393	421	425
	420	429	456	437	447	466	440	441	437	434	440	421	434	467	450	436	444	470	483	439
	449	463	483	499	544	561	539	565	564	537	580	748	785	789	761	746	705	655	610	606
13 UT	777	679	599	609	605	670	624	635	643	666	647	661	697	686	689	674	648	644	644	722
	715	707	685	696	655	663	674	659	663	625	592	528	491	476	482	479	476	524	538	497
	473	435	399	435	446	432	396	363	352	319	319	319	315	311	307	312	321	321	321	321
14 UT	317	313	309	310	306	299	295	300	300	304	300	300	297	293	293	293	293	297	298	298
	291	291	291	289	298	307	325	325	325	311	307	307	289	289	293	293	284	298	298	284
	284	284	284	284	279	289	289	284	275	280	266	280	280	280	271	289	284	293	289	293
15 UT	293	293	293	293	293	280	280	275	275	275	271	284	271	271	271	271	266	266	266	252
	252	252	252	259	243	252	252	264	256	260	260	266	266	266	256	256	256	256	261	265
	265	270	270	270	274	270	266	266	266	271	271	284	284	280	275	284	289	284	278	270
16 UT	266	266	262	262	271	271	271	266	266	266	266	265	265	265	261	260	251	246	250	254
	261	273	284	288	296	308	319	319	319	327	327	332	337	333	333	337	342	346	338	330
	327	327	332	332	332	332	329	321	313	312	312	312	308	305	305	310	310	301	292	284
17 UT	279	283	287	286	286	286	286	290	294	298	298	302	301	296	292	293	293	296	296	300
	300	316	316	317	319	320	328	328	336	344	344	345	340	327	319	310	302	302	297	296
	300	304	308	308	323	310	311	327	339	342	334	343	351	356	343	339	330	330	322	324
18 UT	312	312	312	312	312	308	303	308	312	316	315	318	318	323	323	318	314	314	314	314
	311	319	327	327	314	305	297	308	318	331	335	334	338	346	354	373	377	373	373	369
	369	374	370	365	361	357	357	353	353	349	349	349	346	346	346	346	346	346	346	346
19 UT	337	337	329	320	316	307	303	294	275	258	268	265	263	267	281	284	289	294	302	307
	320	330	322	295	279	276	281	289	281	258	295	319	315	288	273	283	313	309	297	292
	295	299	294	298	302	302	298	286	277	274	269	264	268	276	287	277	265	261	254	247
20 UT	228	225	218	218	215	211	202	198	198	202	205	206	202	203	203	208	220	220	220	215
	215	210	210	192	192	192	174	170	183	188	183	184	192	195	207	203	195	183	174	169
	165	155	165	183	247	315	233	196	136	195	192	189	181	151	140	142	133	106	111	129
21 UT	115	162	288	299	245	214	228	237	299	347	391	445	553	568	513	460	429	437	414	378
	375	370	374	387	439	516	568	528	530	640	667	669	651	633	577	521	511	585	536	507
	512	642	661	674	642	652	630	617	584	572	583	670	669	688	710	682	666	735	743	754
22 UT	735	719	674	630	597	647	656	663	675	715	700	694	651	576	560	543	546	569	607	609
	634	648	643	589	587	535	492	476	522	637	688	770	780	780	826	839	830	697	699	788
	804	799	644	565	572	579	568	496	489	477	537	583	618	627	623	596	571	562	510	478
23 UT	451	467	490	450	420	384	506	567	578	606	671	671	680	744	819	853	831	801	794	733
	703	638	600	667	784	827	880	893	841	805	890	935	944	915	817	809	775	795	818	799
	836	818	703	658	563	556	556	624	689	715	806	889	904	976	1002	1033	1082	1120	1123	1086
00 UT	1056	1055	1093	1059	1025	1010	957	968	1024	1020	964	889	885	870	735	672	657	802	693	581
	711	722	669	624	643	624	583	519	541	564	562	576	518	512	510	499	443	413	384	388
	390	371	348	322	319	388	419	385	326	293	272	226	96	124	139	112	112	123	101	123
01 UT	115	118	117	115	114	115	107	114	111	111	107	106	97	92	85	81	85	76	66	118
	108	103	86	85	96	108	119	131	124	116	116	122	124	177	196	195	226	243	266	302
	310	308	280	274	257	328	272	184	184	184	175	179	184	189	193	200	198	203	198	186
02 UT	190	202	221	216	221	225	230	239	244	248	304	300	289	306	355	329	321	340	336	354
	351	355	359	355	348	342	351	376	379	381	413	440	465	490	529	602	609	646	687	712
	769	808	930	1040	1100	1121	1128	1098	1094	1064	992	978	974	996	1000	1007	1072	992	915	902
03 UT	934	943	921	916	978	1039	1107	1167	1239	1206	1184	1285	1346	1376	1406	1346	1299	1353	1333	1288
	1264	1307	1376	1332	1223	1192	1155	1085	1073	1019	910	877	914	903	937	904	917	871	766	730
	803	827	822	784	842	861	956	1020	998	930	908	876	835	812	793	757	744	748	766	761
04 UT	774	815	833	793	738	683	637	614	596	527	513	509	509	509	527	545	490	463	422	395
	343	298	275	278	303	290	302	316	335	329	324	331	349	395	414	418	407	399	400	372
	360	401	405	278	277	277	294	299	303	312	303	304	306	309	299	289	280	295	280	275
05 UT	280	285	285	291	291	264	282	260	271	282	264	269	280	275	275	271	271	266	273	262
	255	271	293	275	253	264	264	260	244	244	239	239	235	235	246	240	237	237	237	230
	244	244	239	243	244	244	239	239	252	257	262	266	271	266	275	271	271	275	270	271
06 UT	271	266	304	316	309	331	343	331	320	336	329	318	298	282	275	278	286	286	278	277
	281	284	306	297	307	288	279	360	322	279	279	284	284	293	298	307	311	306	295	294
	298	293	273	284	275	261	257	248	248	248	249	245	245	253	257	261	261	266	275	279
07 UT	280	293	343	406	406	393	398	438	416	402	407	398	384	377	355	355	348	373	357	357
	348	350	345	321	362	353	340	329	344	353	335	317	325	309	321	334	334	330	316	316
	323	323	323	334	344	354	380	403	403	421	439	453	489	525	594	634	653	657	657	621
08 UT	594	572	576	586	592	596	563	559	540	581	581	554	540	531	526	526	517	510	517	517
	495	500	513	536	531	540	536	531	490	486	509	522	527	527	523	545	559	604	640	649
	658	681	686	686	686	667	667	649	636	613	604	595	577	610	633	606	556	500	482	478
09 UT	482	478	486	482	491	500	499	486	503	490	480	458	435	435	426	435	440	422	422	426
	458	462	444	430	426	453	435	430	425	417	421	421	423	416	417	425	425	421	421	425
	439	439	448	444	435	453	471	480	494	494	517	526	522	545	572	576	585	576	577	568
10 UT	572	563	540	531	563	599	590	613	608	590	604	622	640	626	626	613	622	617	608	612
	617	631	658	644	608	599	596	626	658	676	653	676	717	712	685	686	683	688	693	693
	703	722	723	706	713	723	709	690	697	724	709	690	689	693	720	718	746	758	753	687
11 UT	737	682	736	819	736	679	620	731	755	816	858	845	856	854	840	813	825	802	784	771
	769	746	713	726	701	699	650	627	616	603	591	558	524	535	511	495	493	472	472	412
	439	443	443	379	311	279	320	347	356	356	352	338	320	318	313	309	311	311	320	315

12 UT	295	303	307	301	308	315	315	322	321	319	311	313	304	306	306	306	320	325	334	329
	311	311	311	329	325	345	354	366	371	375	375	362	375	371	384	352	364	376	380	392
	399	399	399	393	398	405	417	429	453	475	542	576	591	629	640	655	632	617	614	576
13 UT	546	554	561	580	598	587	609	613	591	565	568	587	606	643	655	668	666	685	782	823
	864	883	890	901	924	887	935	917	876	921	943	965	1051	935	894	790	782	887	947	950
	876	872	802	809	820	794	787	805	841	892	944	939	832	813	772	821	856	802	783	835
14 UT	832	798	802	854	775	704	678	648	685	723	738	761	791	906	959	936	937	952	1030	1019
	1038	1090	1083	1041	1045	1049	1108	1115	1194	1171	1160	1190	1269	1239	1254	1251	1262	1206	1198	1041
	1004	903	803	732	721	747	669	747	810	963	1012	1142	1239	1292	1299	1254	1344	1389	1411	1385
15 UT	1382	1378	1195	1121	1020	814	725	710	702	709	750	840	754	765	818	903	955	1004	1034	1071
	1056	1018	925	922	922	1008	1090	1221	1336	1515	1571	1575	1500	1508	1466	1336	1239	1126	1152	1190
	1254	1310	1309	1324	1256	1219	1264	1264	1238	1211	1230	1215	1200	1173	1165	1218	1334	1394	1402	1414
16 UT	1440	1554	1532	1574	1521	1398	1215	1136	1019	959	908	886	840	820	796	780	756	706	687	624
	613	604	620	615	614	622	632	626	614	623	664	702	709	702	695	728	706	702	720	756
	803	881	866	889	874	874	907	930	896	881	829	873	828	821	813	806	787	820	828	813
17 UT	828	828	862	895	929	1063	1220	1253	1230	1196	797	741	741	835	1028	1159	1230	1368	1469	1335
	1002	939	898	1193	1095	1009	983	800	763	684	628	617	639	740	770	796	747	680	691	766
	870	971	982	971	912	747	627	610	713	672	683	683	679	676	750	814	843	952	985	1011
18 UT	899	1011	1086	1131	1142	1097	638	537	627	851	1037	1052	954	884	817	735	597	580	607	648
	677	617	596	581	557	536	507	589	541	537	522	604	825	870	900	945	881	810	746	724
	697	670	682	805	873	974	1052	1176	1198	1157	1109	1019	869	720	675	723	806	824	787	739
19 UT	694	690	634	469	424	409	446	445	445	486	528	776	1236	1270	1263	1264	1284	1316	1258	1192
	1145	1026	989	923	985	797	718	656	589	574	551	544	544	600	645	657	612	627	634	675
	705	716	660	626	660	656	642	574	500	461	458	426	395	443	432	398	935	887	952	1134
20 UT	1151	1172	1139	1050	967	929	868	836	809	778	652	602	551	527	527	533	533	505	459	450
	446	484	588	546	472	444	513	571	600	558	520	456	496	616	663	610	615	618	598	580
	543	517	500	471	408	434	485	502	487	454	426	431	403	381	370	356	331	313	330	369
21 UT	397	439	441	447	425	430	400	378	315	268	248	215	179	168	170	188	201	221	249	264
	266	277	284	288	283	279	270	262	266	276	300	317	337	340	317	311	305	322	348	366
	366	370	366	345	319	320	309	293	277	265	249	222	221	225	229	228	232	219	210	197
22 UT	182	174	174	181	184	184	193	193	197	197	194	191	187	183	184	184	188	197	206	198
	185	185	195	195	200	205	209	210	207	206	209	209	225	256	288	333	346	369	346	341
	328	314	283	269	251	220	206	197	186	202	197	199	310	412	431	351	246	219	193	168
23 UT	152	147	162	200	197	197	186	174	159	150	154	166	175	179	182	207	207	180	217	256
	260	248	235	222	212	228	217	197	201	197	182	155	162	166	171	180	189	189	189	189
	194	199	203	199	194	199	204	206	218	230	232	235	226	226	231	231	231	224	235	246
00 UT	273	281	280	279	283	292	297	301	297	288	288	294	317	298	271	284	307	312	298	284
	280	275	275	262	266	257	280	302	298	293	298	305	309	313	329	324	328	332	334	329
	329	326	322	322	317	317	343	329	316	316	329	316	306	302	294	302	307	294	294	289
01 UT	289	302	302	316	329	329	348	348	334	339	339	343	339	339	334	334	334	334	334	348
	334	334	334	334	348	361	334	321	334	348	339	339	334	334	334	321	321	316	316	329
	343	329	302	275	294	321	339	285	280	262	271	284	311	325	316	316	329	302	302	289
02 UT	289	302	307	325	325	312	312	312	307	307	307	307	307	294	294	285	285	285	285	280
	294	294	307	307	307	294	294	275	280	280	280	294	312	285	285	294	312	312	298	298
	285	285	285	298	298	298	298	298	285	285	280	280	294	307	298	289	289	285	298	298
03	298	298	298	298	298	298	307	307	312	312	312	312	307	307	307	307	307	307	307	307
	307	307	307	307	307	307	307	307	312	312	312	312	312	312	312	312	298	298	294	294
	294	280	294	294	294	280	280	280	280	285	285	298	298	298	298	285	285	285	285	285
04 UT	294	307	294	294	298	298	298	298	298	298	298	298	294	294	280	280	273	277	277	285
	285	285	285	285	280	280	280	294	294	294	307	298	298	298	312	312	307	321	321	321
	321	307	307	307	294	280	294	294	294	294	294	294	280	280	280	267	267	271	280	294	294
05 UT	294	294	294	294	294	294	294	294	294	294	294	294	280	280	280	294	294	294	294	280	280
	280	280	280	280	280	280	280	280	285	285	298	298	298	312	312	312	312	307	307	307
	307	294	298	298	298	298	298	298	298	298	294	294	294	294	294	294	294	294	294	294
06 UT	294	307	307	294	294	294	294	294	294	294	294	294	289	275	275	275	275	289	289	289	289
	289	289	289	289	275	271	271	271	275	275	275	275	289	280	280	280	280	280	280	280
	280	275	275	275	275	275	289	289	289	289	289	289	289	289	289	289	289	289	275	275
07 UT	275	289	289	289	298	298	298	298	298	298	298	298	289	289	289	289	289	289	289	289
	289	289	284	284	284	289	289	289	275	275	275	275	266	266	264	275	275	275	275	275
	275	275	275	275	264	264	264	260	260	260	264	264	260	260	260	260	261	261	261	261
08 UT	261	260	260	271	271	271	289	289	298	298	298	298	298	298	284	284	284	284	284	284
	284	284	284	271	271	271	271	284	284	284	289	289	275	275	275	275	284	280	293	293
	280	280	284	284	289	284	284	284	284	302	302	302	289	289	284	284	284	271	271	271
09 UT	271	271	271	271	271	271	271	271	271	284	284	284	284	284	284	284	284	284	284	284
	271	271	271	271	275	275	275	275	262	252	251	251	251	257	262	271	271	275	275	275
	275	275	275	275	271	271	271	284	275	275	271	271	271	284	284	284	284	284	284	284
10 UT	284	284	284	284	271	271	271	271	271	271	257	257	271	271	271	271	284	284	284	271
	271	266	266	266	271	271	271	298	329	321	307	289	289	255	259	271	284	298	302	302
	302	289	284	284	302	316	316	339	343	343	348	370	384	402	384	388	393	393	375	375
11 UT	384	375	366	357	366	361	352	352	357	321	307	325	325	312	325	325	339	339	325	321
	321	325	343	348	343	334	348	348	339	334	344	325	330	361	384	411	407	407	425	448
	466	466	466	488	498	511	516	531	621	771	874	896	955	964	950	937	867	800	708	719

1977, OCTOBER 26 - 29



Data from Individual Observatories: **OCTOBER 1977**

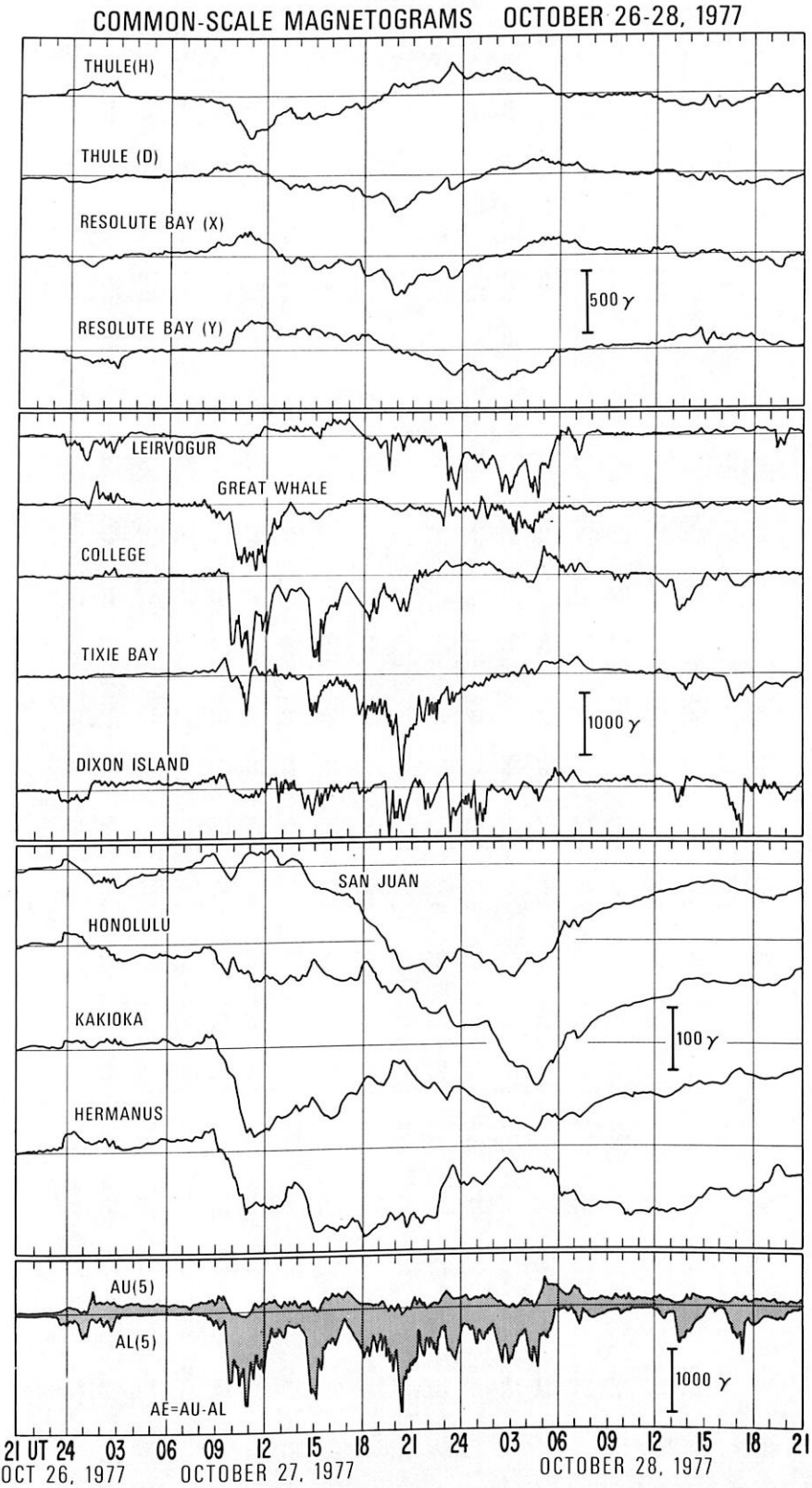
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

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	83.1N	26	2330	SC*	48	37	20	27(7)	-	526	616	215	29	01
MBC	79.1N	26	2330	SC*	71	26	6	27(7)	-	571	492	387	29	01
CBB	76.7N	26	1220	..	..	..	..	27(4)	-	440	380	660	28	24
COL	64.6N	26	2329	SC*	+13	+23	+10	27(4,5,6)	7	307	1900	730	28	21
SIT	60.0N	26	2331	SC*	- 5.0*	+37.7*	+ 5.2*	27(5)	7	--	--	--	28	21
OTT	57.0N	26	2330	SC	7.7	31.2	3.6	27(7,8) 28(2)	7	69	442	324	28	08
NEW	55.1N	26	2329	SC*	3	18	--	27(4,5,6,8) 28(1,2)	6	53	297	509	29	07
HEA	55.1N	26	2328	SC	3mm	5 mm	2m	27(4)	8	48	56	18	29	00
VIC	54.3N	26	2329	SC*	- 2.6	+26	+ 3	27(4,5,6) 28(2)	6	52	175	521	28	09
WIT	54.2N	26	2331	SC	- 2	+35	0	28(2)	7	44	200	190	28	21
FRD	49.6N	26	2329	SC*	+ 2	+21	- 5	27(4,5,8) 28(1,2)	6	38	218	183	29	15
BOU	48.9N	26	2331	SC*	- 1	+20	- 3	28(5)	6	34	230	181	28	21
EBR	43.9N	26	2329	SC*	+ 1.0	+19	+22	27(4,5,8) 28(2)	6	212	172	111	28	21
IRK	41.0N	26	2330	SC*	3.5	13	3	27(4)	7	35	201	84	28	21
HMB	34.0N	26	2330	SC*	+ 3 *	+ 9	- 6 *	27(4)	6	19	169	31	28	22
SJG	29.9N	26	2330	SC	+ 0.5	+11	+02	27(7)	6	10	202	52	28	08
KAK	26.0N	26	2329	SC*	+ 2 *	+ 9	+ 5	27(4)	7	13	163	83	28	22
GUL	24.5N	26	2330	SC	- 6	19	- 2			11	203	58	29	02
HON	21.1N	26	2330	SC*	02	07	03	28(2)	8	9	70	4	29	06
KNY	20.5N	26	2330	SC*	+ 1 *	+16	+ 8	27(4)	7	11	183	77	28	22
JAI	17.3N	26	2330	SC	- 0.8	18	- 4			8	209	41	29	02
SHL	14.6N	26	2330	SC	- 0.4	15	3			6	212	37	29	02
UJJ	13.5N	26	2330	SC	- 0.5	21	- 5			6	223	31	29	02
ABG	09.5N	26	2330	SC	- 0.5	16	- 5	27(4)	7	6	202	38	29	02
HYB	07.6N	26	2328	SC	- 0.4	+19	- 1	27(4,5,6)	7	6	239	39	29	18
GUA	04.0N	26	2329	SC*	--	30	-09	27(4)	7	0	230	30	28	20
ANN	01.5N	26	2330	SC	- 0.9	21	11			5	239	108	29	02
HUA	00.6S	26	2329	SC	1	24	5	27(5,7,8)	6	12	286	37	28	20
TRD	01.1S	26	2330	SC	0.0	14	19			4	288	193	29	02
API	16.1S	26	2330	SC	+ 0	+13	- 6	28(3)	6	7	280	34	28	12
PMG	18.6S	26	2329	SC*	- .5*	+28	+20	27(4,6)	6	8	220	90	28	22
HER	33.7S	26	2330	SC	+ 1	+21	+17	27(4,5,8)	6	37	174	134	28	20
CZT	39.7S	26	2330	SC	4.2	18	1	27(7,8) 28(2)	6	--	--	--	30	22
GNA	43.3S	26	2329	SC*	- 2.5*	+ 7	- 9 *	27(6)	7	26	180	180	28	22
TOO	46.7S	26	2325	SC	- 1	+ 4	+ 0	27(3,7,6) 28(2,3)	5	31	190	115	28	19
KGL	56.5S	26	2330	SC*	- 6.7	-21	+ 5	28(2)	8	140	956	637	28	21
MCQ	61.1S	26	2330	..	..	..	..	27(4,5,6,7)	7	223	1618	669	28	22
MAW	73.1S	26	22--	..	..	..	..	27(8) 28(7)	7	156	685	930	28	21

THREE-HOUR-RANGE INDICES, K

OCT	26		27		28		29	
HIS	3333	2223	6445	4447	5543	4453	4444	3423
CCS	1222	1014	6345	4567	3543	5644	3322	5523
DIK	2233	2235	6446	7778	7754	6864	3224	5644
TIK	1223	2214	4348	8798	6654	6763	2124	7632
MMK	0111	0114	5226	6577	7842	5572	2212	3412
KIR	0111	0004	5216	6577	7942	4473	3012	3312
CWE	1123	1113	3238	8776	5654	6542	2223	7322
CMO	0112	2001	3137	7765	4544	6422	2103	6211
LRV	2232	1114	6425	4577	7863	3463	5222	3033
SOD	0010	0003	5226	6577	7842	4572	2012	3301
YAK	2212	2112	3336	6767	4542	6543	2222	5311
LER	0110	0003	3224	5587	6842	2351	2002	3211
NUR	0111	0002	3234	4578	6742	3451	2112	3301
LOV	0111	0103	3335	5577	6742	3451	2122	3301
SIT	0122	0013	332(7)	(7)766	7(7)63	5332	2202	5211
SVD	1111	1113	3135	5565	6532	3441	2121	4412
RSV	0211	1113	4335	4466	6642	3451	2111	2312
MNK	1221	0122	4458	7765	7643	4332	2212	5212
WIT	1211	1114	4336	5466	5753	3452	2213	3312
IRT	1221	1212	4347	6666	5642	5542	2212	4312
VAL	0211	0103	3335	4356	4642	2352	2112	3211
KIV	1222	2213	4346	5566	6634	3541	2332	4312
DOU	0111	0103	4235	5456	5643	2351	2112	3211
KGD	0111	0101	2124	4344	4321	2320	0001	2200
VIC	1222	1113	3336	6654	5642	4322	2212	4212
OTT	0221	1112	4236	5477	6762	3231	2211	3112
MMB	1211	1213	4246	5555	4442	4331	2112	4211

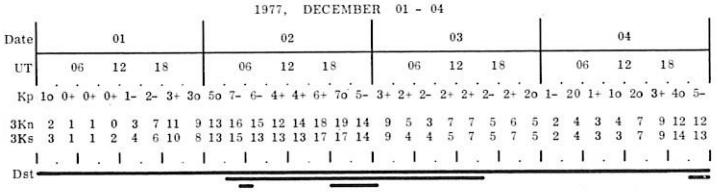
	26		27		28		29	
TKT	2221	2223	4347	5655	5542	3442	2202	3302
PEG	1111	1113	4246	6456	4442	3352	2112	3212
TOL	0211	1113	3235	5436	5542	3341	2201	3211
FRD	1221	1123	4336	6456	6642	3332	2212	3222
COI	1222	3113	4234	5345	4532	3342	2113	3312
KSA	01--	----	----	----	----	----	--11	2035
TUC	1221	0113	5445	6555	6642	3332	2212	3212
KNY	1212	1113	3347	5555	5442	4431	2102	4312
TAM	1211	1113	4335	5446	4433	2341	2202	3221
HON	1211	0113	4444	4457	8866	5442	2111	3122
HYB	1211	1213	4357	7765	4253	3431	2213	3312
SJG	0211	0113	5445	5564	5543	2121	1102	2212
GUA	1222	2224	4447	5545	5453	4332	2212	4312
BNG	1322	2224	4355	4446	4354	3352	3212	4212
PMG	1222	1214	4446	5655	5453	4431	2212	4322
HUA	0211	2323	4434	6566	6653	4443	1113	4422
GNA	1222	1213	4246	5666	5553	5442	2112	5322
HER	1212	1214	3246	6456	4543	3352	2112	3212
TOO	1212	1212	3345	4554	2552	4331	1211	4211
AML	1321	1102	4445	5554	4643	4333	2212	4211
MCQ	1222	2012	4237	7776	6654	6432	2213	7212
MIR	2443	1113	4555	4444	4664	3332	3433	3213
MAW	2441	1114	5436	5467	6664	4572	3323	3325
NVL	----	----	----	----	----	----	----	----
SBA	2223	3232	4335	4345	4443	3343	4333	3323
VOS	2333	1113	4445	4444	4443	3342	3333	4222


COMMON-SCALE MAGNETOGRAMS OCTOBER 26-28, 1977
THULE(H)
THULE (D)
RESOLUTE BAY (X)
500 γ
RESOLUTE BAY (Y)
LEIRVOGUR
GREAT WHALE
COLLEGE
TIXIE BAY
1000 γ
DIXON ISLAND
SAN JUAN
HONOLULU
KAKIOKA
100 γ
HERMANUS
AU(5)
AL(5)
1000 γ
AE=AU-AL
21 UT 24 03 06 09 12 15 18 21 24 03 06 09 12 15 18 21
OCT 26, 1977
OCTOBER 27, 1977
OCTOBER 28, 1977

21 UT	33	33	22	26	26	26	26	35	22	22	22	22	22	22	33	44	44	47	47
	47	47	47	47	22	22	22	22	22	22	22	22	22	22	22	12	25	25	25
	25	25	25	25	25	25	25	16	16	16	16	13	13	13	13	22	22	22	22
22 UT	22	22	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	15	17
	26	26	26	26	26	26	26	26	26	30	30	30	33	33	33	33	33	22	18
	21	24	24	33	24	24	24	33	33	37	37	41	41	41	41	46	46	49	49
23 UT	45	41	41	41	37	37	37	33	30	24	21	21	17	17	26	30	37	27	45	58
	58	58	45	45	44	44	34	49	56	28	63	67	121	162	184	202	180	184	185	189
	185	185	176	176	180	185	203	208	203	199	221	223	213	226	222	226	226	271	276	276
00 UT	240	240	244	244	236	236	249	245	249	254	240	222	204	199	208	213	218	218	218	218
	231	226	226	229	233	217	202	193	189	193	196	199	190	188	191	199	203	207	216	221
	198	213	260	294	265	256	233	248	251	245	292	294	298	309	339	381	369	348	328	317
01 UT	353	352	366	367	342	299	276	276	326	317	297	343	312	318	304	263	238	204	195	212
	176	192	223	277	263	255	228	263	284	313	331	345	355	374	380	397	425	424	427	416
	374	360	257	230	249	257	240	246	251	269	259	252	260	277	275	285	289	268	252	236
02 UT	232	229	213	201	192	192	210	181	172	209	266	309	322	332	320	295	253	235	242	232
	222	228	255	278	288	275	285	277	226	189	226	263	293	311	284	243	310	372	343	346
	368	410	388	350	330	340	345	342	334	314	294	278	272	264	239	222	191	174	166	158
03 UT	150	128	121	136	161	176	194	207	190	157	130	116	100	107	111	126	130	119	119	111
	90	96	90	90	92	92	92	105	105	105	105	119	119	132	121	121	121	108	108	119
	119	132	132	121	121	121	121	121	121	135	135	139	132	132	132	132	135	139	143	130
04 UT	143	143	143	143	143	143	132	132	132	132	132	132	132	132	132	132	135	153	153	153
	153	153	153	153	148	143	143	143	143	130	130	130	130	141	141	141	141	141	130	130
	130	130	119	119	119	130	130	130	130	130	130	116	117	117	117	117	117	117	117	117
05 UT	117	117	117	116	116	116	116	116	116	116	116	116	116	105	105	119	119	105	105	105	85
	99	112	121	121	126	130	148	148	135	130	117	115	105	105	105	105	105	105	105	105
	105	105	105	105	105	105	105	105	105	105	116	116	116	116	105	105	105	105	92	78
06 UT	78	78	78	78	78	89	89	89	89	89	89	89	89	103	103	103	103	108	112	117
	117	117	117	112	112	112	108	121	121	121	121	126	130	140	131	131	131	131	122	122
	122	117	117	103	103	117	117	117	117	112	116	116	116	117	122	126	126	108	108	108
07 UT	122	122	122	122	122	122	117	116	117	126	126	126	122	108	103	103	117	117	103	89
	89	103	103	89	89	62	49	62	76	89	116	130	130	130	135	135	135	135	135	140
	140	144	144	144	140	130	130	112	112	85	108	121	132	135	126	122	140	140	117	90
08 UT	103	115	129	142	159	146	143	166	143	132	148	162	149	158	172	185	172	158	171	180
	194	185	176	167	153	158	158	162	198	212	216	267	290	299	299	276	258	249	253	272
	299	322	326	326	331	336	345	396	387	373	346	323	309	291	278	273	282	273	268	254
09 UT	272	295	322	354	391	427	449	468	477	486	505	491	455	423	417	412	415	415	425	434
	445	459	454	441	432	432	416	400	367	338	317	304	473	459	468	499	542	618	717	781
	858	956	1055	1063	1061	1072	1003	1012	1023	1012	1023	978	956	1023	1012	1023	900	810	799	774
10 UT	707	651	721	743	755	818	823	823	816	786	797	793	777	772	774	779	808	823	961	991
	1036	1036	1003	969	958	942	927	886	818	852	822	819	830	825	886	866	832	821	812	790
	767	835	902	1047	1182	1271	1316	1314	1235	1191	1270	1314	1315	1300	1270	1252	1215	1129	1006	887
11 UT	805	798	750	758	803	847	904	907	908	920	962	969	985	1052	1115	1154	1129	1030	982	966
	878	850	819	800	837	854	877	803	693	748	762	798	826	860	893	904	915	893	875	845
	819	804	801	833	893	931	995	1027	1012	962	913	932	988	1048	995	931	875	846	809	771
12 UT	719	708	690	640	625	609	587	564	567	567	577	604	617	613	590	543	516	493	484	457
	390	403	419	484	484	475	493	516	525	553	584	557	529	506	479	477	471	444	395	423
	427	416	421	435	417	350	315	318	322	318	331	410	421	446	405	381	396	412	427	434
13 UT	453	486	524	538	549	524	513	488	466	441	416	341	330	336	325	338	353	330	326	304
	319	373	358	346	346	334	350	353	372	368	367	367	367	379	379	352	357	357	341	345
	356	368	379	406	387	383	380	326	322	311	315	307	307	304	289	281	273	266	258	266
14 UT	281	293	308	304	311	311	322	341	353	372	368	368	383	386	398	398	409	409	412	420
	420	439	446	461	457	465	472	468	547	622	704	763	842	928	1022	1104	1179	1219	1257	1253
	1264	1279	1283	1290	1289	1292	1299	1258	1232	1210	1191	1187	1224	1265	1299	1247	1199	1154	1124	1150
	1161	1146	1124	1045	1381	1336	1298	1246	1040	947	831	780	743	762	799	832	885	979	1025	1010
	1013	1006	950	908	867	845	827	790	768	750	757	742	750	761	769	765	765	754	732	709
	698	694	687	676	661	645	638	630	626	630	649	653	665	668	672	669	676	703	703	737
16 UT	729	696	673	685	685	704	696	654	691	743	717	699	702	714	721	722	699	666	658	647
	640	632	618	595	580	554	528	513	487	464	445	426	404	392	377	377	366	366	355	350
	372	377	352	333	321	317	321	340	348	382	412	428	435	431	435	435	461	476	480	491
17 UT	487	495	487	495	490	487	498	494	501	478	490	501	501	508	504	504	488	485	492	499
	499	511	507	518	529	529	536	536	544	544	540	547	554	547	557	562	580	714	691	659
	632	596	595	606	597	618	642	630	616	610	621	637	646	657	667	678	673	766	798	786
18 UT	772	760	747	735	718	709	742	776	803	803	781	758	713	686	675	637	630	653	646	651
	662	645	628	616	603	591	559	523	481	672	643	583	619	636	667	645	600	589	598	617
	651	695	703	695	673	615	595	571	563	559	551	544	534	540	531	521	511	467	544	556
19 UT	714	721	728	742	730	710	683	669	647	620	572	521	515	518	576	571	588	582	711	684
	667	587	578	600	649	603	652	694	720	716	708	682	712	780	828	790	783	763	798	860
	958	898	826	800	740	699	663	640	619	641	644	628	601	620	657	696	797	803	832	964
20 UT	965	1033	1124	1164	1440	1419	1420	1442	1434	1464	1568	1563	1556	1509	1507	1506	1476	1483	1056	1011
	1038	1065	1068	1009	979	943	866	910	951	1063	1057	1019	997	984	997	1010	1003	968	946	935
	932	916	902	885	887	902	868	915	959	966	962	975	943	933	901	872	858	856	839	833

21 UT	825	819	759	764	789	970	947	934	909	896	912	920	584	536	513	490	498	465	446	463
	554	571	629	735	738	753	715	708	700	687	676	665	755	705	685	671	727	712	751	700
	720	691	641	593	461	542	522	485	473	450	406	390	373	377	355	391	486	492	561	606
22 UT	621	635	648	635	637	627	607	559	521	482	504	545	675	671	632	588	557	532	522	500
	558	712	722	779	796	730	592	516	492	442	467	517	541	577	589	581	546	441	418	422
	428	459	476	487	496	493	502	497	500	518	579	556	510	475	486	497	495	471	509	522
23 UT	646	748	828	858	864	803	780	772	727	696	845	818	753	807	809	762	774	786	793	790
	797	805	817	824	832	843	851	859	881	889	900	908	916	927	958	920	828	812	793	785
	762	728	701	686	663	647	632	621	609	598	586	578	559	548	536	482	475	463	440	429
00 UT	414	410	436	455	463	459	420	420	417	424	435	450	443	428	413	417	410	398	398	402
	395	410	406	406	403	403	395	403	411	418	483	445	414	424	449	472	430	414	399	410
	421	444	479	513	517	532	551	574	578	582	660	714	717	703	703	676	651	611	568	555
01 UT	510	521	513	505	509	509	510	602	591	552	593	606	645	672	672	672	579	586	597	621
	624	632	647	590	552	551	559	578	585	601	608	585	577	581	573	535	546	561	562	554
	546	524	512	501	470	447	432	448	505	528	486	479	475	487	494	510	525	533	518	495
02 UT	503	518	518	534	538	549	568	588	619	634	630	626	645	679	699	729	740	737	764	799
	795	807	880	888	819	807	792	712	681	662	651	643	635	620	616	613	609	613	605	605
	609	617	636	667	694	701	717	847	855	816	805	801	790	754	760	771	795	818	837	842
03 UT	834	815	782	746	713	674	660	663	659	659	651	609	584	559	568	579	598	609	571	559
	532	547	562	570	551	539	533	524	512	498	483	479	492	504	510	518	536	537	544	555
	554	541	531	517	504	485	473	483	492	485	442	469	500	530	561	580	634	638	645	649
04 UT	737	785	793	783	833	844	863	806	798	803	822	844	872	906	922	911	886	831	796	710
	662	602	657	703	762	777	804	837	850	884	887	886	963	976	1007	998	966	936	789	789
	758	704	614	617	595	593	571	574	632	646	648	650	665	676	679	697	731	757	802	847
05 UT	904	900	885	852	814	784	750	750	743	743	747	762	785	808	747	689	704	704	758	758
	746	716	693	670	647	624	612	597	574	567	552	533	487	441	419	396	394	392	408	390
	380	371	357	361	357	365	343	329	368	376	349	281	252	258	277	322	317	288	284	280
06 UT	285	299	289	276	271	244	241	240	227	217	208	208	196	180	171	172	182	191	201	231
	224	199	201	213	223	230	225	214	208	226	240	235	235	244	258	280	276	257	234	250
	277	286	280	289	307	338	316	317	340	375	373	375	380	362	344	340	430	443	464	486
07 UT	498	485	484	497	513	532	545	527	515	455	426	408	390	313	294	275	260	253	230	211
	193	180	166	157	150	143	151	154	151	151	158	174	190	185	182	168	168	168	177	187
	196	205	219	223	233	242	246	246	242	237	228	219	214	223	232	237	246	260	256	242
08 UT	251	260	270	260	251	242	228	237	233	223	219	210	214	228	211	224	225	213	209	218
	228	228	232	246	246	250	250	250	250	250	250	232	232	232	232	232	227	227	227	214
	214	209	209	209	204	200	182	177	168	163	163	177	177	177	172	172	190	177	181	177
09 UT	172	168	149	140	140	149	149	168	168	168	172	172	168	172	168	181	199	217	218	213
	192	163	172	212	217	199	204	218	218	218	218	186	168	168	163	163	149	136	136	167
	158	154	154	140	192	228	264	251	228	228	195	231	244	231	219	197	186	175	190	226
10 UT	226	213	203	181	150	159	168	145	175	190	221	244	213	195	145	122	136	145	126	122
	104	104	104	104	104	108	127	122	136	140	140	136	131	113	95	86	95	85	94	94
	117	126	153	158	149	149	149	149	149	154	149	145	140	145	149	154	149	154	140	145
11 UT	140	136	136	136	131	131	126	126	122	117	122	122	122	122	126	122	122	122	122	122
	122	122	122	122	122	122	122	135	135	126	131	131	126	126	122	113	108	103	103	117
	108	113	131	136	145	168	158	172	185	185	181	181	190	172	172	172	188	188	199	199
12 UT	199	211	208	222	222	235	235	235	246	233	244	255	253	264	275	262	251	240	262	273
	262	251	251	251	248	271	282	282	293	293	293	282	282	282	271	271	246	235	224	226
	215	204	192	168	168	168	179	179	179	179	165	165	165	152	152	138	138	138	125	125
13 UT	127	138	149	183	213	242	261	295	324	354	384	422	467	489	519	530	552	575	597	597
	575	552	534	534	560	571	586	579	556	538	526	530	523	523	523	523	527	527	527	546
	535	522	562	564	567	582	598	587	549	549	549	535	522	508	495	508	522	522	508	484
14 UT	459	459	461	464	493	520	509	497	486	486	475	450	439	439	428	417	417	406	394	394
	394	383	383	370	370	358	358	358	334	334	334	320	323	323	323	323	309	298	298	298
	284	278	271	260	260	248	237	226	228	217	206	195	195	204	195	190	181	172	163	167
15 UT	158	172	167	167	167	153	144	122	112	109	106	116	116	130	130	137	128	128	128	114
	125	125	136	136	148	148	159	159	170	170	181	181	192	179	190	179	162	162	150	145
	124	121	113	113	113	109	104	95	104	104	99	95	99	104	99	97	100	100	104	109
16 UT	109	104	90	90	78	78	94	99	103	108	111	116	121	125	130	106	119	128	184	225
	296	300	317	335	325	329	324	399	444	452	453	464	478	491	505	531	555	554	548	540
	531	529	517	591	564	537	560	573	631	645	622	577	560	579	562	572	574	583	587	556
17 UT	525	506	676	797	803	809	815	832	822	801	684	458	448	408	363	373	364	358	364	396
	369	353	296	280	273	268	263	245	243	227	214	291	285	278	305	302	311	317	333	353
	377	361	348	336	346	351	362	374	377	386	386	382	377	378	386	395	390	386	381	374
18 UT	367	353	358	359	364	354	351	343	332	313	308	307	301	294	292	281	271	265	259	260
	263	265	264	266	254	261	272	276	267	262	261	260	249	230	220	221	222	225	229	234
	225	206	202	209	212	215	215	221	225	229	231	239	245	245	241	238	236	232	213	202
19 UT	223	250	266	252	252	263	275	285	281	275	222	199	204	251	271	255	219	225	221	221
	215	215	222	222	220	220	220	222	227	251	263	259	251	251	251	243	248	225	202	158
	153	169	173	173	143	129	124	119	112	107	125	109	90	110	125	146	157	173	174	178
20 UT	174	171	167	163	163	146	142	124	117	110	108	105	105	108	110	115	115	118	120	120
	126	126	128	125	127	128	126	127	125	126	120	113	107	107	98	95	106	117	117	140
	135	135	131	126	126	131	131	126	126	140	132	149	153	158	162	167	176	176	172	167

1977, DECEMBER 01 - 04



Data from Individual Observatories: **DECEMBER 1977**

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

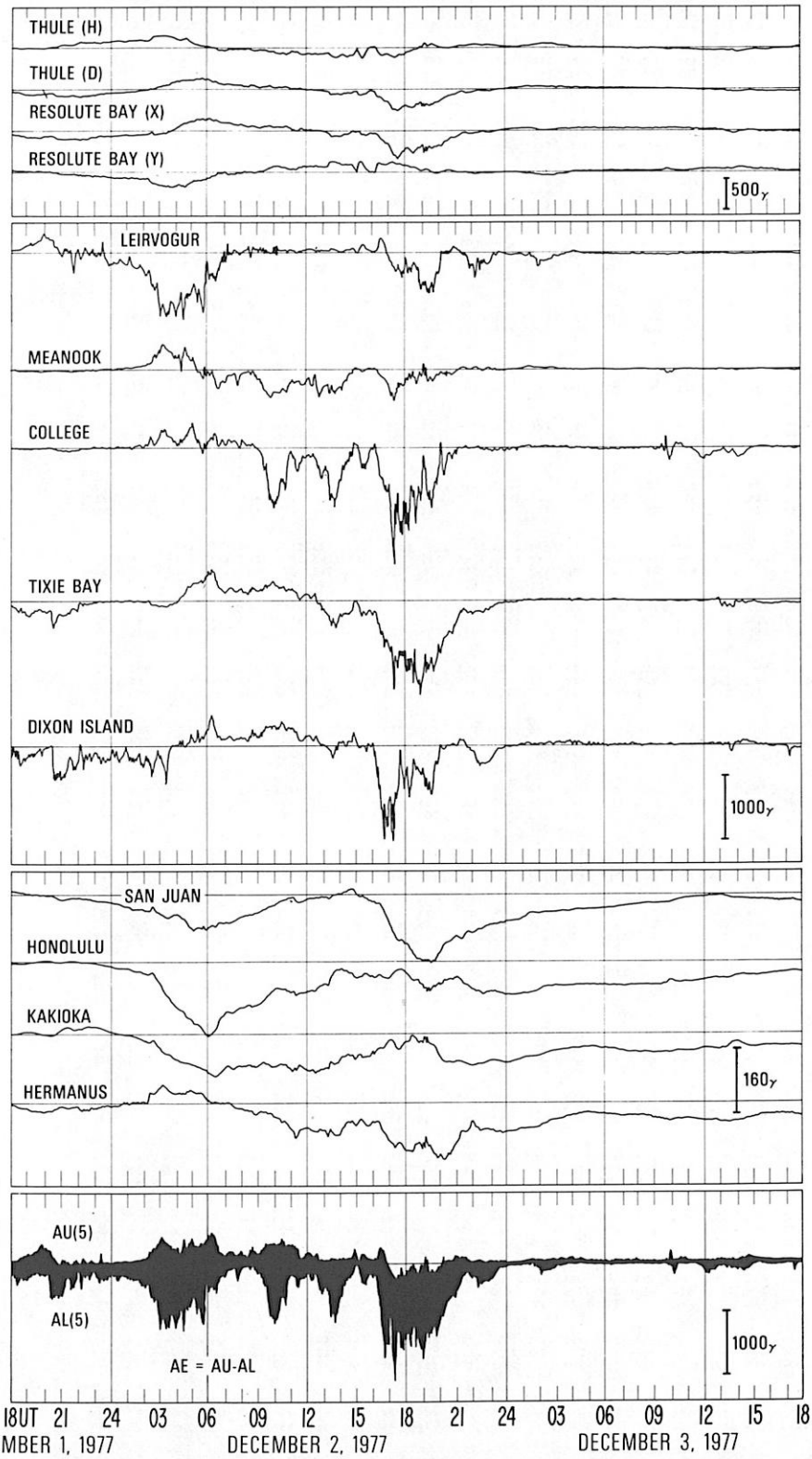
OBS. 3 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
RES	83.1N	1	2029	SC	18	12	0	02(6)	-	618	398	155	03	00
HBC	79.1N	1	2029	SC	13	26	0	02(6)	-	676	692	338	03	00
CBB	76.7N	1	1315	..	..	..	..	02(6)	-	530	450	250	03	21
COL	64.6N	1	22--	..	..	..	..	02(6)	8	373	2150	1090	03	02
SIT	60.0N	1	22--	..	..	..	..	02(6)	7	--	--	530	02	23
OTT	57.0N	1	----	..	..	..	..	02(2,3)	8	49	487	487	03	20
MEA	55.1N	1	1800	..	..	..	..	02(7)	7	--	--	--	03	00
NEW	55.1N	1	22--	..	..	..	..	02(3,6,7)	6	60	306	232	03	05
VIC	54.3N	1	----	..	..	..	..	02(6,7)	6	85	228	259	02	23
WIT	54.2N	1	20--	..	..	..	..	02(2,6,7,8)	6	52	300	150	02	24
FRD	49.6N	1	20--	..	..	..	..	02(6,7)	6	29	176	102	05	19
IRK	41.0N	1	1500	..	..	..	..	02(6)	7	28	155	91	15	00
TUC	40.1N	1	20--	..	..	..	..	02(6,7)	6	18	160	25	03	05
HMB	34.0N	1	20--	..	..	..	..	02(7)	6	14	122	35	03	20
SJG	29.9N	1	2110	..	..	..	..	02(6)	6	8	168	36	03	03
KAK	26.0N	1	20--	..	..	..	..	02(1,2,5,6,7)	5	9	122	60	03	20
GUL	24.5N	1	2000	..	..	..	..	--	-	11	160	29	03	20
HON	21.1N	1	22--	..	..	..	..	02(2)	8	3	56	5	03	--
KNY	20.5N	1	20--	..	..	..	..	02(2,5,6,7)	5	8	123	62	03	20
JAI	17.3N	1	2000	..	..	..	..	--	-	7	143	17	03	20
SHL	14.6N	1	2000	..	..	..	..	--	-	3	143	15	03	20
UJJ	13.5N	1	2000	..	..	..	..	--	-	5	154	19	03	20
ABG	09.5N	1	2000	..	..	..	..	02(2,5,6,7,8)	5	5	133	26	03	20
ANN	01.5N	1	2000	..	..	..	..	--	-	4	145	86	03	20
TRD	01.1S	1	2000	..	..	..	..	--	-	3	260	175	03	20
PHG	18.6S	1	16--	..	..	..	..	02(2,3)	6	10	150	60	03	21
CZT	39.7S	1	2029	SC	.6	6	5	02(2)	6	444	180	124	06	10
GNA	43.3S	1	15--	..	..	..	..	02(7)	7	31	110	140	03	05
TOO	46.7S	1	22--	..	..	..	..	02(7)	6	6	33	160	03	15
KGL	56.5S	1	2029	SC	-2.1	-13	-5	02(7,8)	8	109	717	391	02	24
MAW	73.1S	1	17--	..	..	..	..	02(2,6,7)	7	176	900	1110	03	18
BOU	48.9N	2	20--	..	..	..	..	02(6)	6	30	199	64	03	04
GUA	04.0N	2	00--	..	..	..	..	02(2)	6	10	160	30	02	24
HUA	00.6S	2	0052	..	..	..	..	02(6,7)	6	14	349	60	03	02
API	16.1S	2	0052	..	..	..	..	02(2)	5	6	163	39	03	03
HER	33.7S	2	02--	..	..	..	..	02(2,4,6,7,8)	5	34	185	155	02	24
MCQ	61.1S	2	0218	..	..	..	..	02(7)	8	194	1934	721	03	03

THREE-HOUR-RANGE INDICES, K

DEC	1		2		3		4	
HIS	2222	2347	5443	4764	4432	3333	3332	3755
CCS	2111	1555	5434	4764	3422	5323	2122	3544
DIK	2111	2667	6766	6996	4463	5555	2222	4766
TIK	1001	1565	4766	7997	3333	6322	1112	4767
MMK	0000	1266	6744	5777	3222	2143	1111	2455
KIR	0000	0166	7753	5877	3321	1132	1000	1465
CWE	1111	1333	3767	7884	----	----	1112	3344
CMO	1001	1112	4546	6873	3215	3221	0112	3333
LRV	1000	1156	7774	3776	5422	2224	2221	2565
SQD	0000	0256	6753	5777	3222	1132	0000	2465
YAK	1101	1344	4445	6685	2222	3222	1112	2444
LER	0000	0143	5653	3685	2211	1133	0100	1345
NUR	1000	0243	5643	3676	2111	2122	0100	1345
LOV	0000	1243	5643	4776	3222	2132	0111	2355
SIT	1000	1222	3767	7(7)(7)	3 2104	3110	0221	2233
RSV	0000	1243	4644	4765	3222	1133	0110	2344
MNK	1110	1123	5655	6673	3223	3322	1212	2333
WIT	0000	1253	5654	4666	3212	2133	1111	2455
IRT	2211	1344	5434	5764	3322	3212	1121	3354
VAL	1001	0143	4543	3565	3121	2132	0111	1344
KIV	1122	1253	5644	4756	3222	2232	0102	2344
DOU	1000	1143	5544	3665	2111	1132	0111	2344
KGD	0000	0122	2322	3443	1001	2011	1100	1233
VIC	1110	1122	3555	5663	2214	2221	1221	2333
OTT	1100	1123	4884	4554	4212	2221	1211	2235
MMB	0000	1333	4444	5564	3112	3211	0111	3444

	1		2		3		4	
TKT	2221	2243	4534	5665	3223	2222	1221	2354
PEG	1111	1132	4534	4646	3111	1132	1111	2354
TOL	0100	1132	4533	3655	3211	1222	1111	1334
FRD	1110	1123	4554	4664	4212	2221	2211	2334
COI	0002	2233	3533	3665	2222	2232	1222	2344
KSA	1011	2154	5544	5766	2111	1142	0110	446-
TUC	1000	1123	5554	5664	3103	2111	0211	3243
KNY	1010	1332	4544	5553	1111	3221	0121	3343
TAM	----	----	----	----	---1	1122	1311	2354
HON	1110	1212	5887	6567	7666	5443	3333	4555
HYB	1111	1243	3555	6665	4111	2121	1221	3354
SJG	0000	0122	3444	3654	3110	1111	0210	2353
GUA	2110	1333	4654	5453	2112	3222	1112	3345
BNG	2112	2233	4435	4646	2123	2232	1232	3354
PMG	2111	1322	4665	5553	3322	3121	2221	3353
HUA	1111	2322	3554	5665	3112	3330	1211	4464
GNA	1000	1354	5454	4664	2122	3121	0111	2254
HER	1111	1133	4535	4555	3112	2112	0112	2344
TOO	2111	1232	3544	4562	2223	3221	1111	2334
MCQ	1000	0222	5556	5783	2114	3210	1112	4434
MIR	2332	1233	4565	4543	4443	2222	3343	3433
MAW	3221	3355	5765	5774	4433	3255	3432	3554
NVL	1111	1244	7883	4565	5322	2212	1112	2356
SBA	2222	3343	5544	4554	2322	3343	3332	3444
VOS	2232	3233	4444	4554	4333	2222	3333	3433

COMMON-SCALE MAGNETOGRAMS DECEMBER 1-3, 1977



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	165	133	136	191	235	258	254	205	176	181	188	209	336	351	369	350	349	353	321	305
	324	338	324	332	310	304	291	284	278	271	284	312	326	334	346	339	317	315	316	314
19 UT	318	318	327	337	331	331	339	342	348	348	350	356	363	358	345	315	302	289	276	272
	277	308	303	306	309	302	288	291	287	274	275	284	284	294	311	322	324	320	315	306
	299	289	282	290	303	309	304	308	308	336	352	365	388	413	415	425	424	418	422	427
20 UT	433	417	403	391	377	366	377	380	385	394	402	411	409	396	391	394	388	374	353	344
	325	323	324	324	330	335	347	396	437	467	486	696	653	556	543	563	585	599	618	603
	607	596	535	505	500	553	558	578	509	477	455	478	496	480	441	396	392	379	501	507
21 UT	494	466	481	491	476	471	453	442	455	445	423	438	500	538	548	529	505	485	456	440
	399	389	389	385	367	335	270	229	230	233	208	209	199	214	222	202	199	190	192	188
	199	220	214	232	297	370	344	326	292	303	313	331	341	315	300	330	397	401	349	302
22 UT	269	300	299	286	294	294	258	188	124	51	75	110	114	105	100	96	101	160	177	203
	203	245	279	336	383	366	294	308	275	228	224	236	202	180	159	204	237	238	226	200
	167	147	137	126	116	119	116	163	203	239	245	252	236	204	219	246	245	209	177	164
23 UT	176	154	123	115	117	127	119	111	111	121	121	111	117	135	164	184	192	208	210	189
	171	184	217	230	248	266	287	295	303	298	300	302	362	323	253	202	191	199	215	228
	243	259	272	269	264	259	248	238	222	212	204	225	243	256	243	241	241	242	242	243
00 UT	212	201	189	179	195	194	175	171	179	193	196	169	141	136	146	156	173	185	189	215
	189	181	191	181	181	187	194	194	222	251	264	292	290	235	235	261	274	274	261	235
	235	220	207	204	204	202	191	181	176	184	194	198	202	205	208	212	212	216	216	220
01 UT	220	223	223	227	225	213	212	222	251	264	251	238	210	210	199	212	222	251	261	274
	272	246	235	230	226	235	261	274	274	285	285	272	265	271	275	281	285	288	289	284
	276	281	283	290	294	273	260	237	238	251	293	319	342	340	326	319	324	337	350	368
02 UT	383	389	399	368	355	372	382	396	403	410	422	426	424	419	418	428	430	408	390	364
	362	355	357	378	432	475	460	510	522	534	561	599	615	611	640	660	679	698	677	683
	697	723	767	783	781	770	755	719	685	682	701	705	691	690	763	810	873	919	957	994
03 UT	1044	1048	1077	1107	1226	1296	1317	1269	1263	1224	1194	1200	1199	1190	1174	1164	1178	1177	1190	1183
	1186	1212	1226	1241	1256	1302	1304	1287	1266	1248	1235	1213	1189	1185	1197	1208	1224	1225	1208	1153
	1105	1082	1027	1002	991	969	982	1022	992	985	976	959	952	946	977	1001	1039	1107	1098	1103
04 UT	1102	1120	1144	1152	1158	1119	1076	1072	1079	1070	1079	1061	1034	977	962	947	909	839	742	765
	769	753	712	819	895	972	1030	1078	1113	1173	1241	1287	1319	1248	1197	1085	1040	1007	966	907
	887	859	855	827	850	891	920	916	923	911	899	929	948	967	960	945	952	956	941	944
05 UT	951	958	954	950	900	855	824	786	749	753	760	776	760	800	841	871	944	943	1003	1031
	1009	973	930	887	833	803	828	852	877	896	946	981	1005	1019	1049	1073	1107	1108	1113	1129
	1132	1142	1164	1186	1220	1079	1003	837	818	776	680	653	580	542	552	540	511	487	498	526
06 UT	618	667	804	857	870	824	751	750	757	719	736	739	769	784	818	810	781	759	793	802
	815	826	829	821	807	781	775	794	797	788	755	712	677	669	663	626	551	514	477	466
	454	456	458	424	388	355	355	362	365	357	345	355	343	330	312	308	317	323	313	319
07 UT	324	334	324	314	299	286	281	268	265	251	255	237	234	244	251	261	261	261	268	273
	280	286	278	268	270	272	265	265	265	260	260	245	240	235	230	217	210	187	168	165
	181	199	217	225	241	267	335	351	371	387	360	357	352	320	310	307	296	288	282	284
08 UT	271	270	262	252	243	225	205	182	178	171	176	173	165	155	153	165	177	180	163	160
	163	158	153	145	135	128	127	122	115	107	115	128	179	288	291	254	261	232	206	207
	207	220	238	261	222	210	203	201	204	237	258	268	266	269	256	241	249	250	260	265
09 UT	284	294	299	294	286	272	275	270	274	283	305	286	293	337	408	408	359	357	364	359
	362	408	460	509	546	533	525	555	561	533	570	590	621	624	587	592	640	717	762	795
	853	920	931	920	1077	1056	989	1023	1068	1023	989	1058	1092	1055	1078	1107	1104	1091	1132	1146
10 UT	1202	1215	1159	1126	1124	1103	1135	1133	1122	1098	1053	1069	1013	1006	1053	1010	1045	1032	1021	974
	924	906	850	829	812	801	789	767	821	845	857	820	827	818	829	851	795	838	872	801
	868	875	894	855	799	767	782	756	642	538	515	512	509	522	517	519	511	504	491	475
11 UT	467	459	446	433	418	413	415	410	418	415	407	420	420	426	400	395	402	426	423	439
	410	389	414	444	487	538	550	563	575	562	533	494	455	418	395	315	280	280	291	302
	291	286	289	286	283	294	286	296	307	289	304	309	312	312	304	307	309	312	330	322
12 UT	299	293	286	278	280	267	257	244	249	244	264	280	351	353	366	387	382	390	369	348
	340	335	341	343	323	291	286	272	260	231	209	229	240	267	264	275	327	330	364	380
	377	367	383	419	443	440	451	427	393	358	385	437	475	520	520	516	493	489	486	471
13 UT	445	396	393	385	389	363	363	352	326	303	326	382	404	426	449	438	382	415	449	516
	494	594	624	665	744	818	841	856	838	860	782	801	789	745	786	782	782	815	838	838
	849	815	961	927	849	793	834	830	770	744	789	800	733	706	650	639	594	579	565	582
14 UT	560	548	522	533	533	499	520	531	486	522	466	398	369	326	360	382	336	309	387	376
	318	296	266	258	251	277	304	319	311	296	263	240	257	253	252	258	274	263	255	257
	258	235	221	214	208	203	218	226	220	205	203	220	257	269	263	244	211	160	155	139
15 UT	136	118	85	64	53	65	68	63	64	82	82	91	99	139	164	195	233	290	342	391
	425	425	381	410	422	369	396	440	452	440	407	339	361	383	402	417	349	330	304	282
	270	270	270	267	255	244	210	195	174	174	187	199	192	180	180	178	198	201	219	226
16 UT	234	249	243	242	213	191	180	188	195	241	204	194	194	197	265	319	349	385	455	501
	554	435	540	660	784	767	782	931	1014	1103	1174	1195	1174	1150	1176	1247	1321	1306	1332	1308
	1224	1149	1077	1022	1012	1125	1188	1177	1241	1120	1109	1135	1195	1183	1147	1169	1107	965	835	777
17 UT	769	749	687	692	680	694	732	851	1007	1028	1040	1148	1066	1144	1446	1300	1502	1577	1449	1188
	1072	866	706	604	817	887	619	615	705	685	709	788	821	810	746	837	839	967	1004	1055
	1143	1206	1158	1080	1059	934	1063	1100	1098	979	672	581	724	811	850	909	972	879	824	739

1977 December 2, 1800 - December 3, 1759 UT

18 UT	796	790	772	757	760	754	697	679	830	1030	926	954	877	932	936	875	1016	1158	1196	1129
	918	964	923	861	825	825	785	809	826	833	863	903	850	896	1141	1149	1091	1021	938	862
	679	753	837	757	930	935	963	976	1011	1034	1075	1092	1112	1138	1163	1217	1237	1239	1234	1227
19 UT	1166	1295	1315	1289	1258	1234	1223	1222	1226	1216	1218	1218	1189	1094	960	905	825	796	827	829
	854	772	1018	979	896	859	803	771	752	767	804	828	883	934	937	898	863	856	841	801
	738	746	735	757	794	779	777	832	896	935	957	958	938	927	920	908	917	878	854	854
20 UT	845	835	805	749	687	618	598	581	647	706	761	753	762	844	887	861	803	789	732	695
	685	688	682	656	603	575	566	556	558	583	596	604	580	545	536	576	577	557	529	499
	518	550	556	550	513	488	472	474	497	486	501	527	542	546	519	543	575	606	604	582
21 UT	589	543	466	473	481	484	467	457	440	436	436	442	430	406	385	358	334	350	338	323
	334	320	315	300	277	270	245	233	228	225	228	238	245	248	238	219	212	186	179	176
	181	181	178	183	176	170	170	172	168	169	181	193	203	201	193	190	187	224	254	238
22 UT	193	188	184	176	163	165	198	213	235	225	211	206	213	221	235	230	281	287	377	402
	416	401	381	381	308	313	303	294	279	265	281	320	337	337	329	321	313	287	296	283
	283	271	264	261	260	271	283	260	253	261	269	277	269	261	271	296	287	290	292	283
23 UT	277	284	290	282	285	285	279	274	261	264	277	277	246	243	246	235	233	215	204	186
	191	183	173	160	163	150	155	158	140	137	132	113	103	82	85	75	64	64	49	54
	58	59	69	81	92	85	73	62	58	54	54	62	65	73	77	73	73	69	65	52
00 UT	55	51	48	48	44	44	44	44	33	37	33	30	31	23	16	19	16	12	15	15
	20	25	25	28	31	28	28	31	31	33	31	31	25	27	33	29	32	27	25	25
	32	32	32	36	33	18	24	19	22	33	44	50	41	21	25	35	40	34	33	22
01 UT	15	18	33	30	41	30	22	25	18	15	23	33	36	25	32	42	55	60	59	59
	63	67	71	71	68	67	67	66	68	72	73	80	86	81	76	57	48	43	38	32
	29	57	68	86	100	91	81	71	73	80	86	61	58	60	60	71	78	96	104	94
02 UT	94	95	99	100	100	100	119	141	163	194	228	213	208	198	199	201	166	141	133	133
	138	136	142	146	150	135	130	133	137	140	126	130	145	149	149	149	137	137	133	133
	137	145	152	141	126	133	129	126	119	114	128	139	144	149	131	123	117	124	120	109
03 UT	108	104	104	100	95	87	80	72	68	60	51	49	49	46	52	69	78	85	91	96
	85	70	63	69	77	85	90	101	90	80	64	67	73	69	50	43	55	68	71	63
	56	54	52	37	29	31	27	14	18	30	41	55	55	63	64	54	46	44	38	53
04 UT	63	55	42	53	85	64	68	75	81	68	55	31	26	26	29	29	38	41	44	41
	34	41	46	65	55	53	38	38	38	28	24	26	46	59	69	62	51	38	31	28
	54	33	10	23	42	38	34	34	44	38	18	19	14	19	23	20	25	30	23	21
05 UT	31	42	31	23	26	27	34	20	19	21	27	25	38	7	12	20	49	25	29	30
	36	12	17	27	33	22	23	39	39	30	33	47	44	37	25	28	33	33	30	16
	16	13	18	24	39	37	26	28	18	37	39	37	25	25	27	23	23	34	41	25
06 UT	11	11	13	53	53	40	37	35	19	21	11	18	26	41	40	30	11	13	12	10
	8	8	11	20	27	33	51	18	11	39	39	29	25	41	22	14	14	13	21	39
	44	55	42	25	42	11	17	26	31	44	38	49	22	16	21	29	32	39	42	56
07 UT	33	17	18	15	13	11	30	58	45	41	37	24	31	26	23	32	25	21	38	45
	19	10	22	47	22	21	61	47	34	27	34	46	56	27	23	18	20	16	11	5
	10	16	16	15	15	20	24	44	26	10	12	38	25	10	15	25	22	34	65	75
08 UT	62	52	42	40	29	34	28	37	37	39	31	18	7	7	4	14	11	6	7	10
	11	9	24	29	24	21	29	21	8	7	25	33	31	23	10	20	20	12	13	15
	18	13	10	15	15	18	15	15	16	14	25	22	10	6	10	12	12	12	20	10
09 UT	7	10	12	11	29	38	25	20	29	15	15	18	18	13	15	7	5	18	20	15
	25	27	49	41	33	30	41	49	27	24	24	22	25	25	11	16	26	42	37	26
	16	8	11	18	26	36	36	25	35	69	57	38	20	23	43	36	42	52	40	39
10 UT	31	28	78	131	217	222	91	72	80	80	102	122	138	171	187	201	210	213	202	168
	157	160	149	140	107	80	47	22	20	26	28	44	54	46	54	54	60	66	75	78
	81	83	80	80	66	49	52	52	52	63	61	58	58	60	72	72	83	74	63	63
11 UT	54	38	36	24	27	29	34	20	33	28	22	20	17	20	15	10	12	15	17	23
	20	15	12	10	12	12	13	13	18	18	15	12	17	15	12	12	29	31	34	31
	37	32	41	46	54	56	56	51	43	55	70	81	74	68	68	71	79	76	90	101
12 UT	104	115	115	115	126	132	131	164	155	143	152	169	169	163	152	163	191	187	168	168
	165	182	191	197	180	158	147	149	141	130	121	135	137	151	149	146	143	146	137	129
	134	137	132	140	141	145	136	138	126	131	123	125	119	106	91	84	86	77	65	64
13 UT	77	75	75	75	90	98	106	128	120	113	102	107	88	71	76	87	112	89	92	94
	89	81	71	74	99	98	101	108	105	91	76	64	74	68	67	75	60	40	54	84
	84	101	110	118	105	91	99	116	131	126	112	93	97	97	93	94	86	82	95	101
14 UT	106	108	98	103	120	130	132	120	123	120	105	108	110	104	114	119	114	128	137	140
	140	164	169	174	180	193	186	183	189	187	173	168	165	162	156	169	182	187	176	176
	176	179	181	181	187	192	197	181	175	170	154	151	143	134	137	128	131	131	122	109
15 UT	95	87	69	71	73	76	76	66	65	60	58	58	51	56	51	48	43	38	38	38
	44	44	41	41	43	47	42	28	33	33	33	33	30	30	38	45	40	41	41	48
	40	34	32	38	45	42	52	57	57	54	51	49	57	51	54	52	60	51	54	54
16 UT	54	61	65	65	59	58	58	55	49	54	61	63	57	54	64	64	59	57	59	70
	57	55	57	59	54	54	57	57	54	52	54	54	59	58	55	51	48	48	45	42
	40	38	40	47	49	49	44	48	54	54	51	51	49	46	49	38	38	40	42	35
17 UT	33	32	30	25	25	25	35	35	29	25	32	40	32	29	27	25	27	24	27	40
	24	43	27	22	25	29	44	75	83	128	152	181	186	139	96	81	63	52	51	55
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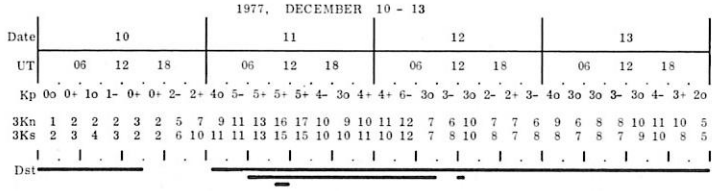
1977, DECEMBER 10 - 13



Data from Individual Observatories:

DECEMBER 1977

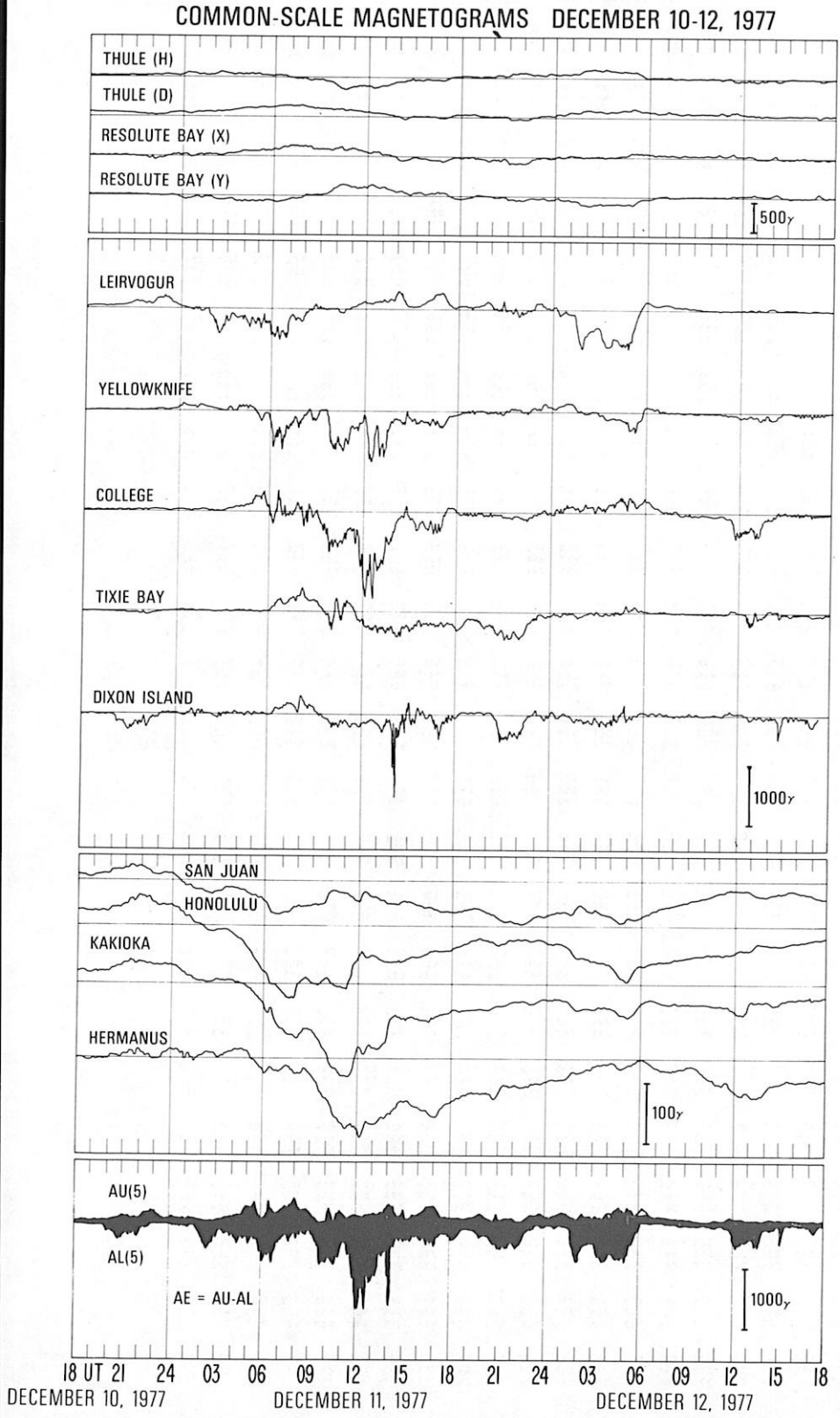
Values underlined are for X and Y. X, Y, H and Z are given in gammas, D in minutes.

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	83.1N	10	2120	..	..	..	..	11(3)	-	282	331	185	12	09
HBC	79.1N	10	2110	..	..	..	..	11(4)	-	313	333	210	12	08
CBB	76.7N	10	1735	..	..	..	..	11(4)	-	340	210	490	12	24
NEW	55.1N	10	2020	..	..	..	..	11(4,5)	6	49	235	335	12	08
VIC	54.3N	10	----	..	..	..	..	11(4,5)	6	36	200	247	12	07
WIT	54.2N	10	21--	..	..	..	..	11(8) 12(2)	5	30	190	75	12	07
FRD	49.6N	10	21--	..	..	..	..	11(5)	6	28	103	57	13	15
BOU	48.9N	10	2024	SC*	- 1	+ 6	0	11(5)	5	25	92	98	14	08
EBR	43.9N	10	20--	..	..	..	..	11(4,5)	5	130	134	57	12	08
IRK	41.0N	10	1900	..	..	..	..	11(4,5)	6	21	188	69	13	22
TUC	40.1N	10	19--	..	..	..	..	11(1,2,4,5)	5	13	110	25	12	17
HMB	34.0N	10	20--	..	..	..	..	11(3,4,5)	5	13	184	26	12	13
KAK	26.0N	10	20--	..	..	..	..	11(4)	6	8	183	67	12	19
GUL	24.5N	10	2000	..	..	..	..	--	-	5	207	32	12	16
HON	21.1N	10	20--	..	..	..	..	11(3)	7	2	36	2	13	--
KNY	20.5N	10	20--	..	..	..	..	11(4)	6	7	197	65	12	19
JAI	17.3N	10	2000	..	..	..	..	--	-	4	191	17	12	16
SHL	14.6N	10	2000	..	..	..	..	--	-	3	215	22	12	16
UJJ	13.5N	10	2000	..	..	..	..	--	-	3	189	17	12	16
ABG	09.5N	10	2000	..	..	..	..	11(4,5)	6	5	164	--	12	16
GUA	04.0N	10	20--	..	..	..	..	11(4)	6	0	230	20	12	15
ANN	01.5N	10	2000	..	..	..	..	--	-	4	211	67	12	16
HUA	00.6S	10	1343	..	..	..	..	11(5)	6	10	233	50	12	24
TRD	01.1S	10	2000	..	..	..	..	--	-	3	247	104	12	16
PMG	18.6S	10	20--	..	..	..	..	11(3,4,5)	5	9	190	60	13	15
HER	33.7S	10	20--	..	..	..	..	11(4,5)	5	24	143	92	12	15
CZT	39.7S	10	2020	..	..	..	..	11(2,3,5)	5	228	116	96	13	21
GNA	43.3S	10	19--	..	..	..	..	11(4,5)	6	19	140	160	12	07
TOO	46.7S	10	19--	..	..	..	..	12(2)	5	13	144	57	12	15
KGL	56.5S	10	2000	..	..	..	..	11(4,5)	7	64	504	270	12	06
MCQ	61.1S	10	2021	..	..	..	..	11(4,5)	7	97	1365	669	12	16
MAW	73.1S	10	20--	..	..	..	..	11(3)	7	190	960	910	12	18
COL	64.6N	11	03--	..	..	..	..	11(5)	7	296	1810	1180	12	15
SIT	60.0N	11	03--	..	..	..	..	11(4)	7	130	--	570	12	15
OTT	57.0N	11	----	..	..	..	..	11(4,5) 12(2)	6	44	164	146	12	20
HEA	55.1N	11	2000	..	..	..	..	11(4)	7	--	--	--	12	08

THREE-HOUR-RANGE INDICES, K

DEC	10		11		12		13	
HIS	2222	2135	4444	5434	5633	3344	4544	4644
CCS	0111	2123	4435	4535	4432	3344	4543	6644
DIK	1111	2155	5456	9757	5634	6665	4535	6775
TIK	1011	2123	3367	6567	4534	6454	3334	6763
MMK	0010	1133	4345	5566	5522	3344	4312	3553
KIR	0000	0023	4345	5566	5522	2234	4321	2552
CWE	1112	2112	2568	8633	3633	5233	2235	4432
CHO	0011	1001	1466	7523	3443	5233	2225	4322
LRV	0011	0024	6675	5545	7743	2234	5442	3342
SOD	0000	0023	3345	5466	5412	2234	3311	2542
YAK	0100	1013	3257	7444	4422	5333	2224	4442
LER	0000	0011	3334	4424	4432	1022	3221	2442
NUR	0001	0022	3334	5434	4412	2133	3222	3442
LOV	0010	0122	4445	5434	4422	2133	4222	3442
SIT	0011	0011	157(7)(7)423		3532	4222	1134	3221
RSV	0000	0122	3444	5334	4412	2223	4322	3442
MNK	0111	1111	2567	7324	3643	4223	2234	3222
WIT	0011	1023	4445	5445	4523	2233	4323	3552
IRT	1211	1123	2546	6433	4322	4333	3323	4442
VAL	0001	1012	3444	4334	3422	2122	3222	3441
KIV	1101	1123	4435	6434	4423	3233	4323	3551
DOU	0001	1013	3334	4434	3412	2122	3222	2441
KGD	0000	0102	1224	4222	2211	2121	1111	2221
VIC	0111	1112	2446	6323	3432	3222	2233	3322
OTT	0111	1112	3456	6323	4632	3222	4232	3222
MMB	0100	1122	3455	5332	3322	4222	2223	4331

	10		11		12		13	
TKT	2222	2223	3546	6423	3322	2223	3323	3441
PEG	1111	1113	----	----	----	----	----	----
TOL	0001	1213	3334	4423	3321	1122	3121	2331
FRD	1111	0123	4455	6333	4532	3223	4332	3222
COI	1002	2113	3444	3344	4422	2122	3222	3442
KSA	0012	1334	4547	6552	3313	3334	4213	3552
TUC	0111	0123	5545	5334	4432	3222	2232	3321
KNY	0100	0022	4556	5322	3422	3221	2222	4331
TAM	0101	1123	3335	5433	4321	1---	-211	1331
HON	1111	1223	4677	6544	6765	5421	2121	1112
HYB	1111	1123	3467	7542	3312	3222	2322	3441
SJG	0000	0123	4345	4223	3422	2113	3222	2221
GUA	1110	2223	4356	5323	3332	3222	2223	3221
BNG	1222	2124	4335	5434	3322	3233	4222	2332
PMG	1211	1123	3455	5323	3432	3223	3233	3222
HUA	1122	2233	4355	6543	2323	4332	3212	4332
GNA	1211	0024	5246	6334	3422	4323	2233	4432
HER	1111	1123	3445	5433	3433	2223	3232	2321
TOO	0111	0022	3244	4223	3522	4112	2233	3321
MCQ	1210	0012	3667	7633	5644	5222	2125	5421
MIR	2333	1124	4464	5434	4453	4333	4544	4433
MAW	2322	2134	5575	6466	6644	4335	4444	4553
NVL	1112	1112	4674	5544	5742	3222	4222	2332
SBA	3232	2345	4444	4454	4543	3555	3433	3434
VOS	1333	2224	4454	4434	4555	4433	4344	4333


COMMON-SCALE MAGNETOGRAMS DECEMBER 10-12, 1977
THULE (H)
THULE (D)
RESOLUTE BAY (X)
RESOLUTE BAY (Y)
500γ
LEIRVOGUR
YELLOWKNIFE
COLLEGE
TIXIE BAY
DIXON ISLAND
1000γ
SAN JUAN
HONOLULU
KAKIOKA
HERMANUS
100γ
AU(5)
AL(5)
AE = AU-AL
1000γ
18 UT 21 24 03 06 09 12 15 18 21 24 03 06 09 12 15 18
DECEMBER 10, 1977
DECEMBER 11, 1977
DECEMBER 12, 1977

18 UT	40	40	40	54	54	54	54	54	42	42	42	42	42	42	42	42	42	52	52	52
	52	52	52	55	57	57	46	49	49	46	46	56	55	54	54	54	54	40	42	42
	54	42	42	42	42	42	42	42	40	42	42	45	45	42	42	41	41	41	44	46
19 UT	46	49	49	49	49	49	49	49	52	52	54	54	54	54	54	54	54	52	52	49
	49	49	49	49	49	49	49	49	52	52	52	52	52	52	63	63	63	60	60	60
	60	60	60	60	57	44	43	43	43	43	42	42	46	57	55	55	55	55	55	55
20 UT	44	44	44	46	49	49	52	52	54	57	59	62	62	62	67	79	121	145	152	168
	183	169	168	155	165	165	147	139	137	142	137	143	150	150	152	147	155	167	172	161
	175	169	156	161	165	147	149	164	211	218	223	226	233	243	248	261	287	279	285	293
21 UT	310	325	332	327	329	333	335	331	323	308	283	280	307	316	331	345	339	315	320	322
	284	284	290	284	290	282	260	246	229	217	206	216	221	219	211	218	215	215	231	242
	264	276	284	277	253	241	219	195	187	202	207	209	215	223	224	233	226	211	194	160
22 UT	140	120	112	134	150	173	185	203	225	258	275	279	291	274	268	271	271	267	257	251
	245	233	226	224	216	201	205	197	190	183	177	173	173	188	201	208	216	200	190	190
	193	193	192	193	201	215	222	226	231	228	222	213	206	207	205	201	203	205	208	213
23 UT	193	186	183	185	190	196	202	206	207	207	201	179	164	164	164	164	170	174	178	178
	171	160	152	144	137	137	137	137	133	125	121	115	107	103	98	90	87	83	79	79
	83	83	84	80	76	74	74	78	74	68	64	60	56	52	49	46	42	38	41	51
00 UT	43	43	32	32	32	32	45	50	47	50	50	50	50	45	53	55	62	69	85	94
	106	124	119	115	108	110	108	108	105	112	109	94	92	89	87	95	95	98	98	100
	95	82	81	87	83	76	76	73	73	79	79	83	83	87	90	94	96	100	88	73
01 UT	69	60	56	56	64	85	93	110	100	91	99	87	79	71	56	39	44	71	71	79
	97	115	119	109	115	123	130	137	143	147	141	139	139	129	119	113	109	103	100	94
	86	80	77	75	80	82	84	87	88	91	89	84	78	70	63	65	67	75	87	133
02 UT	148	144	133	133	140	152	156	164	167	175	183	183	180	177	184	207	244	252	275	283
	250	234	222	260	272	306	349	349	333	341	353	383	410	426	437	441	441	441	437	422
	403	395	387	383	380	360	364	356	330	314	310	310	314	318	318	295	279	268	256	237
03 UT	222	206	199	179	171	164	191	237	260	271	271	271	271	267	263	260	256	248	225	217
	201	190	174	163	159	155	148	148	148	148	151	166	174	178	182	190	197	201	216	232
	235	232	232	232	232	235	239	247	251	251	258	254	250	247	243	235	231	231	235	235
04 UT	239	235	220	220	223	254	296	319	277	257	239	212	208	212	223	243	254	255	274	285
	312	319	342	354	358	361	361	361	369	388	396	418	445	457	453	426	388	358	331	319
	296	292	277	284	303	311	318	326	345	368	365	346	380	399	395	429	447	443	436	420
05 UT	416	400	404	423	442	434	457	495	484	442	426	423	434	500	565	584	572	565	576	561
	503	497	476	457	446	423	376	367	383	364	374	420	515	530	548	541	533	536	543	555
	551	529	529	511	481	428	401	356	334	408	396	381	323	311	412	512	535	577	554	542
06 UT	445	421	424	420	418	424	444	473	495	536	654	650	597	579	554	507	520	494	533	503
	466	448	434	473	523	570	647	668	669	640	660	771	759	777	683	627	585	574	593	648
	666	638	732	826	852	853	752	712	644	618	626	635	624	605	566	568	561	521	540	558
07 UT	476	423	381	386	417	447	437	441	439	427	411	407	396	391	418	413	406	414	429	425
	435	419	403	394	399	418	417	413	404	363	391	416	440	446	431	419	406	395	385	371
	373	385	375	377	355	380	434	472	520	537	498	478	488	502	482	474	469	481	471	448
08 UT	464	474	469	471	473	451	447	457	471	477	475	522	560	594	593	516	469	425	364	352
	316	273	264	268	273	273	290	316	362	308	207	206	214	209	206	212	224	238	264	270
	270	291	307	337	330	324	331	317	322	322	324	338	363	375	354	357	352	352	349	311
09 UT	297	283	256	249	233	217	203	198	193	210	225	201	196	189	195	213	239	235	223	237
	237	239	228	228	262	288	265	272	299	321	254	198	193	192	208	172	206	235	305	336
	321	254	212	216	268	302	417	585	585	578	604	631	590	478	513	520	552	555	551	568
10 UT	579	589	612	602	564	540	552	569	606	626	615	608	572	546	514	542	659	632	630	650
	671	699	738	738	757	764	729	711	703	690	672	555	538	533	536	548	566	575	582	590
	594	604	616	624	599	565	556	544	589	613	620	608	599	581	585	579	655	674	667	650
11 UT	686	664	629	556	507	504	502	488	441	418	413	416	412	400	389	374	361	356	355	375
	375	384	388	384	372	360	341	324	317	337	408	445	472	498	535	506	420	394	396	379
	356	383	394	416	465	543	603	741	797	835	928	955	880	880	850	798	753	768	847	940
12 UT	944	1000	1168	1366	1279	1245	1357	1406	1395	1429	1350	1395	1417	1361	1279	1197	1148	1059	1003	1025
	1003	1055	1051	1051	1061	1059	969	913	884	897	912	915	887	1010	1145	1272	1264	1302	1410	1466
	1392	1302	1201	955	854	761	731	795	802	757	836	880	899	933	989	1033	1019	1026	989	967
13 UT	996	1000	985	962	966	970	948	925	940	918	866	862	900	937	930	904	907	915	918	926
	937	888	817	798	783	750	682	596	584	507	533	548	552	537	530	549	575	605	643	647
	650	628	613	635	631	613	594	572	542	530	545	563	541	508	505	482	494	506	499	522
14 UT	538	572	976	1086	1035	948	582	585	608	633	643	678	749	874	1375	815	646	637	645	597
	569	524	577	514	519	569	625	624	552	472	438	405	389	372	368	339	317	311	321	311
	297	297	310	315	299	287	318	346	394	412	293	241	228	257	261	258	287	332	328	323
15 UT	322	365	442	500	505	482	461	433	408	306	284	275	265	289	297	287	296	298	288	276
	270	252	231	234	251	288	314	318	318	307	296	296	296	300	289	281	274	296	287	277
	266	266	246	244	237	239	266	287	319	323	306	302	292	294	293	285	281	275	281	287
16 UT	313	317	332	336	344	359	359	385	396	392	377	366	361	389	415	396	382	393	394	366
	363	363	361	345	342	339	342	356	397	439	480	514	533	544	507	500	485	488	474	442
	434	470	463	474	503	526	533	544	541	507	462	473	488	495	492	489	504	515	530	541
17 UT	564	649	640	573	510	518	548	543	514	472	445	413	401	398	403	410	407	390	371	365
	351	344	332	308	299	283	270	254	244	250	245	249	258	263	270	275	274	267	272	262
	257	264	264	269	276	290	290	274	269	264	253	262	267	277	280	265	271	263	259	261

1977 December 11, 1800 - December 12, 1759 UT

18 UT	244	224	230	243	271	280	288	307	322	339	336	334	332	329	324	322	323	318	316	316
	313	315	309	306	300	295	290	285	287	279	270	268	264	259	260	258	259	259	236	211
	205	198	191	184	177	172	167	162	159	155	150	145	140	137	122	122	115	110	115	122
19 UT	124	129	143	146	151	148	141	136	131	142	142	145	145	145	147	145	142	142	146	159
	164	172	177	175	165	163	163	159	152	150	160	176	189	193	195	192	185	187	195	200
	202	207	214	219	224	244	260	272	277	282	282	289	305	316	332	347	358	370	363	352
20 UT	341	330	327	319	316	310	306	305	301	297	293	287	284	276	263	246	227	234	234	229
	234	241	246	254	261	256	251	239	227	219	228	243	239	261	279	285	273	257	263	284
	283	291	289	298	301	303	315	333	355	356	363	359	351	332	306	283	302	340	369	394
21 UT	460	522	541	425	343	329	325	332	379	380	383	390	403	404	448	434	417	414	410	400
	394	387	377	379	388	397	390	373	383	399	400	410	451	458	462	462	458	448	439	441
	441	437	432	421	416	391	377	357	350	350	366	368	379	373	357	337	327	331	368	380
22 UT	387	397	399	395	402	405	405	398	407	412	420	435	438	423	414	409	399	387	365	363
	371	361	349	334	346	348	358	353	343	336	331	319	309	291	278	269	251	257	238	234
	222	209	204	196	191	188	183	190	206	206	206	204	204	204	194	190	187	191	184	183
23 UT	171	167	170	192	176	170	142	177	207	239	208	185	202	209	192	151	138	148	171	188
	201	197	122	135	135	130	128	124	124	115	114	116	118	125	123	127	139	154	165	168
	170	172	170	172	173	184	184	200	200	211	199	195	178	176	161	161	146	146	144	141
00 UT	133	136	149	147	142	141	141	134	126	127	122	110	103	106	103	98	94	87	77	81
	79	75	77	82	80	74	62	69	88	90	95	100	101	109	127	140	152	170	177	187
	203	186	178	178	174	170	164	161	167	164	164	164	160	159	164	154	152	134	139	141
01 UT	145	149	153	160	164	170	180	180	190	203	204	201	203	203	195	190	195	202	204	204
	204	204	207	211	209	202	197	193	192	190	203	196	192	188	196	211	208	223	242	258
	300	316	359	405	432	432	447	463	482	509	547	570	593	617	620	636	617	613	625	641
02 UT	656	668	660	668	672	679	687	606	567	548	532	513	479	486	505	501	509	509	512	516
	538	545	549	534	526	507	499	484	488	481	466	443	450	465	461	454	450	431	431	424
	435	446	442	446	450	454	446	443	453	427	412	419	411	411	393	397	393	397	394	387
03 UT	375	372	356	360	356	360	356	348	355	370	393	408	423	442	461	461	496	508	516	550
	573	620	624	632	574	547	532	567	583	586	613	620	647	659	655	663	678	675	686	671
	652	656	663	667	675	682	670	670	685	712	708	708	708	711	707	718	722	726	711	688
04 UT	688	680	652	626	611	614	603	611	614	614	626	652	660	664	664	634	604	585	585	596
	622	630	649	668	687	709	732	736	744	744	748	774	778	786	793	797	812	808	801	796
	811	803	815	826	774	804	830	838	842	823	801	793	778	763	762	736	728	720	706	706
05 UT	706	695	702	768	806	780	709	617	608	634	664	690	705	732	739	754	661	649	627	615
	611	600	604	562	520	486	508	485	473	544	547	533	503	496	499	476	428	391	357	328
	307	282	252	243	230	259	275	279	282	284	274	285	290	297	301	295	288	271	260	248
06 UT	174	179	169	169	164	160	169	178	194	208	192	171	176	217	234	239	221	210	181	169
	174	174	183	197	194	181	194	199	195	189	184	165	173	165	168	162	150	155	160	156
	138	128	128	119	124	122	108	108	113	110	108	94	94	92	83	86	83	83	86	83
07 UT	83	88	95	103	104	88	84	78	82	84	73	66	68	66	61	70	83	85	67	57
	60	73	77	80	72	72	76	68	66	67	73	84	94	94	98	96	92	88	87	85
	86	90	92	92	92	92	92	90	80	77	75	73	73	73	71	73	73	76	72	72
08 UT	70	70	70	66	66	63	63	59	59	56	56	55	55	59	58	59	61	61	68	70
	65	63	55	55	57	60	58	57	55	53	53	56	58	64	68	68	69	69	69	73
	73	76	76	80	80	76	72	66	66	66	62	58	56	56	53	53	53	53	58	49
09 UT	50	50	49	49	49	54	49	45	45	45	45	45	53	53	69	67	60	60	60	57
	57	57	53	56	56	56	56	56	56	56	54	54	54	50	50	50	50	50	50	48
	46	51	45	45	45	45	41	41	41	37	26	26	24	24	26	26	26	29	29	31
10 UT	31	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	31	31	31
	37	37	37	35	35	33	33	33	33	33	33	33	33	35	37	37	38	48	45	45
	41	41	41	46	57	62	65	49	41	41	46	62	75	67	59	54	54	46	48	51
11 UT	48	40	36	33	28	30	41	38	38	40	38	32	30	30	31	35	43	32	31	31
	31	31	31	31	33	40	46	53	68	68	71	76	95	100	98	98	90	92	98	100
	103	103	105	111	100	100	105	105	119	140	145	159	159	163	172	175	186	183	169	181
12 UT	217	260	304	324	338	349	344	355	391	383	397	419	430	403	299	341	378	358	374	388
	388	372	380	366	360	346	315	346	354	377	368	357	332	318	316	313	302	302	302	293
	304	316	313	316	300	272	247	267	278	298	309	298	288	270	266	258	284	295	284	273
13 UT	277	277	277	273	269	232	209	220	205	217	232	243	228	228	232	262	269	246	235	239
	250	261	295	340	351	366	370	381	347	314	291	299	348	385	396	393	389	370	374	362
	351	347	332	306	284	261	250	228	216	205	198	187	179	183	146	131	118	123	125	123
14 UT	116	102	101	82	86	101	97	113	113	94	94	109	125	145	127	100	98	110	146	167
	164	157	138	136	159	161	167	170	174	170	167	157	146	147	154	143	130	130	133	130
	126	123	126	126	121	105	96	84	84	94	105	95	82	66	82	97	92	117	96	85
15 UT	140	374	328	270	270	275	270	257	236	225	201	157	154	171	168	149	127	95	84	66
	55	44	52	56	64	66	57	50	51	51	56	56	46	43	43	43	53	65	65	70
	91	73	68	68	65	67	72	77	73	63	54	55	49	45	47	46	55	55	52	54
16 UT	52	53	53	59	45	43	59	65	59	69	71	64	55	39	32	49	71	81	66	31
	43	54	50	48	41	46	56	70	59	40	39	45	47	38	37	40	54	59	54	41
	52	70	70	58	58	58	56	54	80	90	106	80	53	56	52	50	61	71	62	70
17 UT	83	95	119	113	111	142	150	170	180	180	178	172	174	179	184	187	186	175	162	156
	150	137	121	111	98	82	74	79	90	90	69	61	59	51	47	47	45	45	43	54
	54	54	68	50	50	58	62	68	73	74	69	64	70	57	57	59	59	65	65	66

LAT	LON	CODE	STATION NAME
43 15	76 55	AAA	ALMA ATA
9 2	38 46	AAE	ADDIS ABABA
18 38	72 52	ABG	ALIBAG
68 21	18 49	ABK	ABISKO
51 11	359 36	ABN	ABINGER (C)
80 0	235 0	AB1	ARRAY BOUNDARY
75 0	235 0	AB2	ARRAY BOUNDARY
75 0	265 0	AB3	ARRAY BOUNDARY
68 0	250 0	AB4	ARRAY BOUNDARY
5 38	359 50	ACR	ACCRA
-35 0	302 19	ACS	ACACIAS (LAS ACACIAS)
-35 0	302 19	ACS	LAS ACACIAS, SEE ACACIAS
51 18	183 21	ADA	ADAK (C)
-34 36	138 24	ADE	ADELAIDE
61 59	16 25	AGB	ANGEBO
43 47	280 44	AGN	AGINCOURT (C)
23 1	72 36	AHM	AHMEDABAD
-65 15	295 44	AIA	ARGENTINE IS. - FARADAY STATION
82 0	195 0	AIF	ARCTIC ICE FLO, LAT N82-85 LONG 195-191
82 30	297 30	ALE	ALERT
36 51	357 32	ALM	ALMERIA
44 41	34 25	ALU	ALOUSHTA
69 28	61 25	AMD	AMDERMA
65 37	322 20	AMK	ANGMAGSSALIK (C)
-43 9	172 43	AML	AMBERLEY
65 48	33 48	AMN	AMBARNAYA
31 33	34 55	AMT	AMAZIA (SEE AMATSIA)
31 33	34 55	AMT	AMATSIA (AMAZIA)
61 12	210 6	AMU	ANCHORAGE (C)
11 22	79 41	ANN	ANNAMALAINAGAR
14 36	121 10	ANO	ANTIPOLO (C)
69 18	16 1	ANS	ANDENES (SC)
67 33	33 20	APA	APATITY
-13 48	188 13	API	APIA
42 23	13 19	AQU	L≠AQUILA
10 27	293 31	ARA	ARAIRA
-16 28	288 30	ARE	AREQUIPA
66 0	18 6	ARJ	ARJEPLOG
64 36	40 30	ARK	ARCHANGELSK
58 18	351 12	ARL	ARENDAL
56 26	58 34	ARS	ARTI
59 36	12 36	ARV	ARVIKA (SC)
37 57	58 6	ASH	ASHKHABAD (VANNOVSKAYA)
37 57	58 6	ASH	VANNOVSKAYA (SEE ASHKHABAD)
45 52	11 31	ASI	ASIAGO (C)
46 18	291 42	ASL	ASHLAND (MP)
32 53	131 1	ASO	ASO
38 3	23 52	ATH	ATHENS (C)
-36 31	174 27	AUC	AUCKLAND (MP)
30 11	262 32	AUS	AUSTIN (MP)
22 27	114 3	AUT	AU TAU (C)
33 18	352 35	AVE	AVERROES
68 8	214 26	AVI	ARCTIC VILLAGE (IMS)
38 12	282 38	AWS	ANDREW AFB
52 26	355 56	AWY	ABERYSTWYTH
69 54	219 48	BAD	BAR ISL.
16 25	120 35	BAG	BAGUIO
46 11	19 0	BAJ	BAJA
38 47	264 50	BAL	BALDWIN (C)
22 46	88 22	BAP	BARRACKPORE (C)
22 11	310 56	BAU	BAURU (MP)
78 38	16 23	BBG	BARENTSBURG
64 0	214 16	BDE	BIG DELTA (C)
49 4	14 1	BDV	BUDKOV
51 50	20 48	BEL	BELSK
70 50	29 5	BER	BERLEVAG (SC)
50 21	18 55	BEU	BEUTHEN (C)
73 15	70 0	BEY	BELIY ISLAND
-72 58	356 20	BGA	BORGA
62 0	134 0	BGS	BATAGAY (SIBERIA)
62 0	131 0	BGY	BATAGAY ALYTA (SIBERIA)
-4 23	15 16	BIN	BINZA
-4 16	15 22	BIN	KINSHASA-BINZA, SEE BINZA
74 31	19 1	BJN	BJORNOYA (BEAR ISLAND)
74 30	19 12	BJN	BEAR ISLAND, SEE BJORNOYA

LAT	LON	CODE	STATION NAME
57 41	265 46	BKC	BACK (CANADA)
13 43	100 34	BKK	BANGKOK
64 20	263 58	BLC	BAKER LAKE
39 29	261 52	BLT	BELOIT (C)
50 9	18 54	BMK	BEUTHEN-MIKILOW (C)
1 32	30 11	BNA	BUNIA-RUAPARA
4 26	18 34	BNG	BANGUI
9 10	18 22	BNX	BANDA (MP)
51 29	7 14	BOC	BOCHUM (C)
18 54	72 48	BOM	BOMBAY-COLABA (C)
18 54	72 49	BOM	COLABA (C), SEE BOMBAY (C)
69 18	14 25	BOO	BODO (C)
69 58	23 15	BOP	BOSSEKOP (C)
40 8	254 46	BOU	BOULDER
58 2	38 20	BOX	BOROK
33 22	243 43	BRO	BORREGO (MP)
-27 32	152 55	BRS	BRISBANE (C)
39 17	257 49	BRT	BURLINGTON (C)
71 19	203 23	BRW	BARROW (POINT BARROW)
71 19	203 23	BRW	POINT BARROW (SEE BARROW)
47 23	289 27	BSP	BAIE ST. PAUL
54 22	12 45	BTH	BARTH (C)
70 8	216 20	BTI	BARTER ISLAND (C)
-6 11	106 50	BTV	BATAVIA (C)
44 25	26 6	BUC	BUCAREST (C)
47 31	18 54	BUZ	BUDAKESZI (C)
-80 0	240 30	BYR	BYRD STATION
36 48	3 1	BZR	BOUZAREAH (C)
-52 30	169 12	CAI	CAMPBELL IS. (C)
44 26	8 56	CAO	CASTELLACCIO
40 52	14 15	CAP	CAPE DI MONTE (C)
39 22	266 32	CAX	CARROLLTON (C)
69 6	255 0	CBB	CAMBRIDGE BAY
52 10	0 2	CBG	CAMBRIDGE (IMS)
27 6	142 11	CBI	CHICHIJIMA (OGASAWARA OR BONIN IS.)
27 9	142 18	CBI	OGASAWARA (SEE CHICHIJIMA)
-6 48	280 12	CCL	CHICLAYO (C)
10 18	123 54	CCP	CEBU(C) (CEBU CITY PHILIPPINES)
77 43	104 17	CCS	CAPE CHELYUSKIN
-67 0	142 40	CDE	CAPE DENISON (C)
43 59	269 44	CDS	CAMP DOUGLAS (USA)
-77 38	255 25	CEV	CAPE EVANS
63 20	269 17	CFI	CHESTERFIELD INLET (C)
-33 56	18 29	CGH	CAPE OF GOOD HOPE (C)
51 5	245 54	CGY	CALGARY (MP)
-43 32	172 37	CHR	CHRISTCHURCH (C)
22 21	91 49	CHT	CHITTAGONG
68 30	73 36	CKA	CAPE KAMENNIY
51 8	358 10	CLB	CHILBOLTON
48 1	2 16	CLF	CHAMBON-LA-FORET
38 42	283 12	CLH	CHELTENHAM (C)
39 22	253 49	CLI	CLIMAX
51 19	13 0	CLL	COLLMBERG
51 48	10 20	CLZ	CLAUSTAHL (C)
-9 6	281 24	CMB	CHIMBOTE (C)
-32 45	151 30	CMD	CAMDEN
79 0	91 0	CMY	COLOMYANNIY ISL. (SIBERIA)
79 0	91 0	CMY	GOLOMYANNIY ISL., SEE COLOMYANNIY ISL.
40 13	351 35	COI	COIMBRA
64 52	212 10	COL	COLLEGE
55 41	12 35	COP	COPENHAGEN (C)
65 0	249 0	COW	CONTWOYTO LAKE (IMS)
74 10	125 0	CPA	CAPE PRINCE ALFRED (IMS)
40 33	14 13	CPI	CAPRI
68 55	180 31	CPS	CAPE SCHMIDT
70 10	235 17	CPY	CAPE PARRY (ALASKA)
37 14	237 52	CRC	CASTLE ROCK (C)
57 22	253 10	CRE	CREE LAKE (IMS)
50 4	19 58	CRW	CRACOW (C)
42 51	253 42	CSR	CASPER (C)
38 30	255 31	CSS	COLORADO SPRINGS
76 0	89 0	CSV	CAPE STERLIGOV (SIBERIA)
-66 17	110 32	CSY	CASEY

LAT	LON	CODE	STATION NAME
		CTE	CHATONNAYE
18 17	293 45	CTG	CAMP TORUGUERO (MP)
65 6	212 33	CTN	CHATANIKA
-33 57	18 28	CTO	CAPE TOWN (C)
46 3	11 39	CTS	CASTEL TESINO
-69 23	139 1	CTX	CHARCOT (C)
19 21	260 41	CUA	CUAJIMALPA (C)
-13 32	288 2	CUS	CUZCO
66 10	190 10	CWE	CAPE WELLEN (WELEN, UELEN)
66 10	190 10	CWE	UELEN, SEE CAPE WELLEN
		CWE	WELEN, SEE CAPE WELLEN
77 0	68 36	CZA	CAPE ZHELANIA (IMS)
-46 26	51 52	CZT	CROZET - PORT ALFRED
-46 26	51 52	CZT	PORT ALFRED (SEE CROZET)
32 59	263 15	DAL	DALLAS (C)
-12 27	130 50	DAR	DARWIN (C)
7 8	125 37	DAV	DAVAO
52 6	5 11	DBN	DE BILT (C)
30 19	78 3	DDI	DEHRA DUN (C) (INDIA)
38 26	23 46	DEK	DEKELEIA (C)
73 33	80 34	DIK	DIXON DIKSON
21 36	202 0	DIL	DILLINGHAM AFB (MP)
81 44	294 57	DIS	DISCOVERY BAY (C)
50 33	13 56	DNB	DONNERSBERG (C)
-45 54	170 36	DND	DUNEDIN (MP)
62 4	9 7	DOB	DOMBAS
50 6	4 36	DOU	DOURBES
-29 55	30 56	DRN	DURBAN (MP)
-6 47	39 13	DRS	DAR ES SALAAM (C)
58 30	355 18	DSS	DURNESS (IMS)
-66 40	140 1	DUM	DUMONT D≠URVILLE - TERRE ADELIE
-66 40	140 1	DUM	TERRE ADELIE (ANTARCTICA) (SEE DUMONT D≠URVILLE)
43 6	289 10	DUR	DURHAM
-68 35	77 58	DVS	DAVIS
52 38	1 18	EAA	EAST ANGLIA
32 54	0 33	EAS	EL ABIOD SIDI (C)
55 42	356 48	EBN	EARLYBURN
40 49	0 30	EBR	EBRO
40 49	0 30	EBR	TORTOSA (SEE EBRO)
55 52	356 49	EDI	EDINBURGH (MP)
64 3	211 55	EDO	ESTER DOME
58 39	6 6	EGR	EIGERSUND
-75 14	282 50	EGS	EIGHTS (C)
27 10	250 35	EIC	EASTER ISLAND (ISLA DE PASCUA)
-27 10	250 35	EIC	ISLA DE PASCUA, SEE EASTER IS.
64 0	344 0	EID	EIDAR (IMS)
61 6	265 56	EKP	ESKIMO POINT
-11 39	27 28	ELI	ELIZABETHVILLE (C)
64 40	212 55	ENB	EIELSON AFB
59 36	17 1	ENK	ENKOPING (NP)
35 49	253 56	EPN	ESPANOLA (C)
55 19	356 48	ESK	ESKDALEMUIR
-27 15	152 30	ESX	ESK (MP)
9 10	78 1	ETT	ETTAYAPURAM
80 0	274 18	EUA	EUREKA (IMS)
-3 52	321 35	EUS	EUSEBIO (BRASIL)
68 28	16 45	EVE	EVENESS (SC)
43 25	172 21	EYR	EYREWELL
50 9	354 55	FAL	FALMOUTH (C)
3 54	200 37	FAN	FANNING (C)
9 12	18 21	FAT	FORT ARCHAMBAULT
58 48	265 54	FCC	FORT CHURCHILL
58 48	265 54	FCC	CHURCHILL (SEE FORT CHURCHILL)
58 43	248 51	FCP	CHIPEWYAN FT. (SEE FORT CHIPEWYAN)
		FCP	FORT CHIPEWYAN (IMS)
62 0	310 19	FHB	FREDERIKSHAB (GREENLAND)
54 47	9 26	FLE	FLENSBURG (C)
56 42	248 48	FMM	FORT MCMURRAY (IMS)
56 42	248 42	FMM	MCMURRAY (MP) SEE FORT MCMURRAY
61 24	242 36	FPR	FORT PROVIDENCE (IMS)
62 48	243 54	FRA	FORT RAE (C)
38 12	282 37	FRD	FREDERICKSBURG
68 5	13 10	FRE	FREDVANG (SC)
		FRL	FORT RELIANCE (MP)
		FRL	RELIANCE (SEE FORT RELIANCE)

LAT	LON	CODE	STATION NAME
62 30	353 0	FRS	FAEROES
58 0	246 0	FSM	FORT SMITH
61 45	238 46	FSP	FORT SIMPSON (IMS)
61 45	238 46	FSP	SIMPSON (IMS) SEE FORT SIMPSON
55 59	272 21	FSV	FORT SEVERN (IMS)
8 28	346 47	FTN	FREETOWN (C)
5 28	286 16	FUQ	FUQUENE
48 10	11 17	FUR	FURSTENFELDBRUCK
66 34	214 42	FYU	FORT YUKON
		GAS	GAUSS ST. (C)
-77 58	321 12	GBO	GENERAL BELGRANO
44 38	20 46	GCK	GROCKA
69 15	306 28	GDH	GODHAVN
76 57	68 35	GEL	GELANIA
44 33	8 57	GEN	GENOVA (C)
-68 8	292 34	GES	GENERAL SAN MARTIN
64 11	308 16	GHB	GODTHAB
37 59	14 1	GIB	GIBILMANNA
56 51	265 35	GIM	GILLAM
49 0	287 24	GIR	GIRARDVILLE
35 56	74 18	GIT	GILGIT
68 38	264 5	GJO	GJOAHAVN (C)
49 38	97 8	GLL	GLENLEA
66 54	13 35	GLO	GLOMFJORD (SC)
-31 47	115 57	GNA	GNANGARA
50 20	356 46	GNH	GOONHILLY
53 20	299 30	GOB	GOOSE BAY (IMS)
-40 21	350 1	GOI	GOUGH ISL.
47 18	3 6	GRC	GARCHY (MP)
-33 19	26 30	GRM	GRAHAMSTOWN
51 29	0 1	GRW	GREENWICH (C)
51 33	9 58	GTT	GOTTINGEN
13 35	144 52	GUA	GUAM
34 5	74 24	GUL	GULMARG
-64 49	297 9	GVD	GONZALES VIDELA
55 18	282 15	GWC	GREAT WHALE RIVER
51 0	355 31	HAD	HARTLAND
62 4	16 30	HAS	HASSELA (SC)
-25 53	27 42	HBK	HARTEBEESTHOEK (SOUTH AFRICA)
57 24	265 54	HCR	HERCHMER
50 46	16 14	HDF	HERMSDORFF (C)
63 51	211 2	HEA	HEALY (C)
58 31	5 46	HEL	HELLVIK (EGERSUND) (SC)
-34 26	19 14	HER	HERMANUS
-53 2	73 22	HII	HEARD ISLAND (C)
80 37	58 3	HIS	HEISS IS. (DRUZHNAYA)
80 37	58 3	HIS	DRUZHNAYA (SEE HEISS ISLAND)
33 8	139 48	HJJ	HACHIJOJIMA (HATIZYOZIMA) (C)
22 22	114 13	HKC	HONG KONG
69 56	22 56	HLD	HALDDE (C)
-72 19	170 13	HLL	HALLETT (C) (CAPE HALLETT)
-72 19	170 13	HLL	CAPE HALLETT (SEE HALLETT)
54 36	18 49	HLP	HEL (POLEN)
29 52	31 20	HLW	HELWAN (C)
-75 30	333 9	HLY	HALLEY BAY -HALLEY STATION
-2 34	140 31	HNA	HOLLANDIA (C)
-42 52	147 20	HOB	HOBART
21 19	202 0	HON	HONOLULU
47 54	18 12	HRB	HURBANOVO
60 48	244 12	HRI	HAY RIVER (IMS)
51 1	14 45	HRT	HERRNHUT (C)
33 4	139 50	HTY	HATIZYO
-12 2	284 41	HUA	HUANCAYO
22 58	277 51	HVN	HAVANA (CUBA) (CENTRO GEOFYSICO)
22 58	277 51	HVN	CUBA (SEE HAVANA, CENTRE GEOFISICO)
22 58	277 51	HVN	CENTRE GEOFISICO (SEE HAVANA)
17 25	78 33	HYB	HYDERABAD
7 24	3 54	IBD	IBADAN
71 14	306 26	IGD	IGDLORSSUIT (GREENLAND)
68 15	226 42	INK	INUVIK (MP)
-46 24	168 18	INR	INVERCARGILL (MP)
52 10	104 27	IRK	IRKUTSK-PATRONY
52 10	104 27	IRK	PATRONY-IRKUTSK (SEE IRKUTSK)
52 10	104 27	IRT	IRKUTSK (C)

LAT	LON	CODE	STATION NAME
78 48	256 0	ISC	ISACHSON (IMS)
41 4	29 4	ISK	ISTANBUL-KANDILLI
41 4	29 4	ISK	KANDILLI, SEE ISTANBUL-KANDILLI
53 53	265 19	ISL	ISLAND LAKE (IMS)
68 36	27 29	IVA	IVALO (C)
61 12	311 51	IVI	IVIGTUT
26 55	75 48	JAI	JAIPUR
5 55	169 39	JAL	JALUIT (C)
-11 57	283 8	JIC	JICAMARCA (MP)
70 59	351 40	JMI	JAN MAYEN (C)
63 48	25 58	JOK	JOKIKYLA (PYHASALMI) (SC)
72 28	241 42	JOP	JOHNSON POINT (ALASKA)
		JRV	JARVIS ISLAND (C)
47 11	27 32	JSS	JASSY
60 43	313 58	JUL	JULIANEHAAB
36 14	140 11	KAK	KAKIOKA
24 33	121 5	KAO	KAO JUNG (MP)
68 18	306 32	KAQ	KANGATSIAQ (GREENLAND)
61 20	51 40	KEI	KENAI (IMS)
41 16	69 18	KEL	KELES (C)
65 0	34 24	KEM	KEM
49 38	262 52	KEN	KENORA (IMS)
69 45	27 2	KEV	KEVO
51 28	359 41	KEW	KEW (C)
62 1	26 39	KGA	KANGASNIEMI
49 49	73 5	KGD	BEREZNAYKA-KARAGANDA, SEE KARAGANDA
49 49	73 5	KGD	KARAGANDA (BEREZNAYKA)
-49 21	70 12	KGL	KERGUELEN (PORT AUX FRANCAIS)
-49 21	70 12	KGL	PORT AUX FRANCAIS (SEE KERGUELEN)
48 31	135 10	KHB	KHABAROVSK
71 0	67 0	KHS	KHARASAVEY (USSR)
74 0	102 0	KHT	KHATANGA (SIBERIA)
41 37	288 16	KIN	KINGSTON (MP)
67 50	20 25	KIR	KIRUNA
50 48	30 16	KIV	KIEV (DYMER)
50 43	30 18	KIV	DYMER (SEE KIEV)
57 7	9 10	KLI	KLIM (SC)
55 2	82 54	KLY	KLYUCHI-NOVOSIBIRSK
48 3	14 8	KMR	KREMSMUNSTER (C)
67 8	32 26	KND	KANDALAKSHA (C)
54 42	20 37	KNG	KALININGRAD
55 50	48 51	KNS	KAZAN (C)
10 24	5 27	KNT	KONTAGORA (C)
31 25	130 53	KNY	KANOYA
35 15	139 58	KNZ	KANOZAN
10 14	77 28	KOD	KODAIKANAL
54 50	20 30	KOE	KOENIGSBERG (C)
7 20	134 30	KOR	KOROR (C)
66 53	197 24	KOT	KOTZEBUE (C)
33 49	35 53	KSA	KSARA
41 50	44 42	KSI	KARSANI/TIFLIS (C)
71 0	90 0	KST	KRESTY (SIBERIA)
55 46	37 58	KTC	KUTCHINO (C) OR KOUTCHINO
70 25	238 2	KTG	KAP TOBIN - GREENLAND
76 0	137 54	KTL	KOTELNIY ISL (SIBERIA)
-26 31	18 7	KTM	KEETMANSHOOP
33 38	135 57	KTR	KATUURA (C)
50 36	61 4	KTS	KORETS
70 20	26 31	KUN	KUNES
65 55	29 2	KUU	KUUSAMO
74 34	302 49	KUV	KUVDLORSSUAQ (GREENLAND)
-6 2	106 44	KUY	KUYPER (C)
-11 39	27 58	KVA	KARAVIA - CONGO
66 58	17 45	KVI	KVIKKJOKK (SC)
59 30	345 0	KVT	KVISTABERG (IMS) (C)
8 43	167 44	KWJ	KWAJALEIN
45 22	78 44	KZA	KZIL-AGACH
55 50	48 51	KZN	KAZAN (ZAIMISHE)
55 50	48 51	KZN	ZAIMISHE-KAZAN (SEE KAZAN)
-78 11	197 48	LAA	LITTLE AMERICA (C)
51 22	7 6	LAB	LANGENBERG (C)
-6 44	147 0	LAE	LAE (MP)
-45 2	169 41	LAU	LAUDER
39 17	253 43	LDV	LEADVILLE (C)
39 38	285 30	LEB	LEBANON (MP)

LAT	LON	CODE	STATION NAME
53 18	246 30	LED	LEDUC (MP)
60 8	358 49	LER	LERWICK (C)
45 30	242 0	LGE	LAGRANDE (MP)
42 28	357 30	LGR	LOGRONO (C)
38 43	350 51	LIS	LISBON (C)
66 3	14 7	LKD	LEIRSKARDALEN
57 24	355 48	LLG	LOCH LAGGAN (IMS) (C)
5 38	359 49	LLN	LITTLE LEGON
41 14	9 24	LMD	LA MADDALENA (C)
41 14	9 24	LMD	MADDALENA, SEE LA MADDALENA
59 57	30 42	LNN	LENINGRAD (VOYEYKOVO)
59 57	30 42	LNN	VOYEYKOVO (SEE LENINGRAD)
25 0	121 10	LNP	LUNPING
46 55	291 53	LOB	LORING AFB
34 43	239 27	LOC	LOMPOC (USA)
59 21	17 50	LOV	LOVO
67 58	35 5	LOZ	LOVOZERO
-16 32	291 54	LPB	LA PAZ
-22 6	294 24	LQA	LA QUIACA
-22 6	294 24	LQA	QUIACA (SEE LA QUIACA)
47 52	287 33	LRB	LAC REBOURS
-37 50	77 34	LRO	LA ROCHE GODON (MP)
64 11	338 18	LRV	LEIRVOGUR/REYKJAVIK
64 11	338 18	LRV	REYKJAVIK/LEIRVOGUR, (SEE LEIRVOGUR)
-41 15	147 4	LTN	LAUNCESTON (MP)
-8 55	13 10	LUA	LUANDA BELAS
51 9	252 44	LUC	LUCKY LAKE
31 19	121 2	LUK	LUKIAPANG (C)
49 54	23 45	LVV	LVOV
-2 15	28 48	LWI	LWIRO
56 51	258 56	LYN	LYNN LAKE (IMS)
64 37	18 46	LYS	LYCKSELE
-69 58	12 55	LZV	LAZAREV (C)
50 18	5 41	MAB	MANHAY (BELGIUM)
62 11	5 6	MAL	MALOY (SC)
14 35	120 59	MAN	MANILA (C)
21 43	203 44	MAP	MAUI (MP) (PACIFIC)
69 51	22 55	MAT	MATTISDALEN (SC)
-67 36	62 53	MAW	MAWSON
72 23	52 44	MAY	MALYE KARMAKULY
76 12	240 36	MBC	MOULD BAY (CANADA)
14 24	343 2	MBO	M≠BOUR
47 38	237 39	MCG	MT. COUGAR (MP)
42 36	277 9	MCL	MOUNT CLEMENS (USA)
-77 51	166 42	MCM	MCMURDO
44 33	8 57	MCP	MONTE CAPELLINO (C)
-54 30	158 57	MCQ	MACQUARIE ISL.
40 24	356 19	MDD	MADRID (C)
28 13	182 38	MDY	MIDWAY (C)
54 37	246 40	MEA	MEANOOK
-37 49	144 58	MEL	MELBOURNE (C)
53 17	299 28	MEV	MELVILLE AFB
3 21	8 40	MFP	MOCA (FERNANDO POO) (C)
3 21	8 40	MFP	FERNANDO POO (SEE MOCA) (C)
60 7	151 1	MGD	MAGADAN
-53 12	289 6	MGS	MAGALLANES (C)
45 32	284 51	MHL	HILAIRE, MT. ST. (MP), SEE MT. ST. HILAIRE
45 32	284 51	MHL	MT. ST. HILAIRE (MP)
69 7	23 16	MIE	MIERON (SC)
70 4	19 2	MIK	MIKKELVIK (SC)
-66 33	93 1	MIR	MIRNY (ANTARCTICA)
35 19	135 7	MIU	MIYAZU
7 5	171 23	MJR	MAJURO (C)
72 0	53 0	MKM	MT. KARMAKULY (IMS)
67 53	13 0	MKN	MOSKENES
0 20	32 30	MKR	MAKERERE (MP)
29 31	30 54	MLT	MISALLAT
43 54	144 12	MMB	MEMAMBETSU
42 40	276 42	MMH	MCMATH-HULBERT
68 15	33 5	MMK	LOPARSKAYA/MURMANSK (SEE MURMANSK)
68 15	33 5	MMK	MURMANSK (LOPARSKAYA)
48 9	11 37	MNH	MUNICH (C)
54 6	26 31	MNK	PLESHENETZI-MINSK (SEE MINSK)
54 6	26 31	MNK	MINSK (PLESHENITZI)

LAT	LON	CODE	STATION NAME
44 56	93 36	MNN	MINNEAPOLIS
31 54	35 0	MOD	MODI≠IM
2 2	45 21	MOG	MOGADISCIO (C)
-67 34	45 52	MOL	MOLODEZHNAYA
55 29	37 19	MOS	MOSCOW (KRASNAYA-PAKHRA)
55 29	37 19	MOS	KRASNAYA-PAKHRA, SEE MOSCOW
-25 55	32 35	MPO	LOURENCO-MARQUES, SEE MAPUTO
-25 55	32 35	MPO	MAPUTO (LOURENCO MARQUES)
-20 5	57 33	MRI	MAURITIUS (C) OBS.
68 57	33 3	MRM	MURMANSK (C)
-46 52	37 51	MRN	MARION
67 28	28 17	MRT	MARTTI
48 12	11 15	MSC	MAISACH (C)
73 16	56 24	MSR	MATOSKIN SHAR (C)
43 15	132 20	MTU	MAITUN (C)
80 30	18 15	MUB	MURCHISON BAY (C)
-31 59	116 12	MUN	MUNDARING (MP)
68 2	23 34	MUO	MUONIO (SC)
14 22	121 1	MUT	MUNTINLUPA
34 13	241 56	MWC	MT. WILSON (CALIFORNIA)
64 0	224 0	MYO	MAYO (IMS)
-70 42	44 17	MZH	MIZUHO (IMS)
-37 50	77 35	NAD	NOUVELLE AMSTERDAM (C)
-1 19	36 49	NAI	NAIROBI
78 55	11 56	NAL	NEW AALESUND (NY ALESUND)
78 55	11 56	NAL	NY ALESUND (SEE NEW AALESUND
64 26	11 0	NAM	NAMSOS (SC)
61 6	314 48	NAQ	NARSSARSSUAQ
66 45	21 0	NAT	NATTAVAARA (SC)
-32 45	151 30	NCA	NEWCASTLE (MP)
43 43	7 16	NCE	NICE (C)
47 38	16 43	NCK	NAGYCENK
48 0	276 18	NCN	NICHOLSON (IMS)
66 36	73 0	NDA	NIDA (NYDA)
66 36	73 0	NDA	NYDA (SEE NIDA)
47 0	6 57	NEU	NEUCHATEL
48 16	242 53	NEW	NEWPORT
54 25	18 39	NFW	NEUFAHRWASSER (C)
52 4	12 40	NGK	NIEMEGK
-28 50	31 53	NGO	NGOYA
53 59	262 10	NHO	NORWAY HOUSE
45 46	62 7	NKK	NOVOKAZALINSK (KAZALINSKAYA)
45 46	62 7	NKK	KAZALINSKAYA, SEE NOVOKAZALINSK
-15 0	39 0	NMP	NAMPULA
63 30	71 24	NMT	NUMTO
51 31	38 22	NNV	NIZHNEDEVITSK (C)
69 24	88 6	NOK	NORILSK
52 43	5 39	NOP	NOORDOOSTPOLDER (MP)
81 0	150 0	NPF	NORTH POLE 6 (ARCTICA I) (C) LAT 81-86 LONG 150-39
81 0	150 0	NPF	ARCTICA I (C), SEE NORTH POLE 6
86 0	210 0	NPG	ARCTICA II (C), SEE NORTH POLE 7
86 0	210 0	NPG	NORTH POLE 7 (ARCTICA II) (C) LAT 86-85 LONG 210-326
76 0	199 0	NPH	NORTH POLE 8 (ARCTICA III) (C) LAT 76-79 LONG 199-179
76 0	197 0	NPH	ARCTICA III (C), SEE NORTH POLE 8
75 0	161 0	NPJ	ARCTICA, SEE NORTH POLE 10
75 0	161 0	NPJ	NORTH POLE 10 LAT 75-78 LONG 161-172
79 0	165 0	NPK	NORTH POLE 11
79 0	165 0	NPK	ARCTICA, SEE NORTH POLE 11
77 0	180 0	NPL	ARCTICA, SEE NORTH POLE 12
77 0	180 0	NPL	NORTH POLE 12 LAT 77-81 LONG 180-194
62 58	218 3	NRW	NORTHWAY (C)
31 44	34 36	NSH	NITSANIM
47 15	358 27	NTS	NANTES (C)
		NUN	NUNALLA (IMS)
60 31	24 39	NUR	NURMIJARVI
-70 46	11 49	NVL	NOVOLAZAREVSKAYA
55 2	82 54	NVS	NOVOSIBIRSK
-70 30	357 28	NWS	NORWAY STATION (C)
-54 39	295 51	NYI	NEW YEARS ISL. (C)
-44 59	170 58	OAM	OAMARU (MP)
-66 18	100 43	OAS	OASIS (C)
46 26	30 46	ODA	ODESSA (C)
46 47	30 53	ODE	ODESSA (STEPANOVKA)
46 47	30 53	ODE	STEPANOVKA (SEE ODESSA)
47 52	18 11	OGY	O≠GYALLA (C)

LAT	LON	CODE	STATION NAME
24 45	125 20	OKN	OKINAWA
65 54	14 16	OKS	OKSTINDAN (SC)
49 55	14 47	OND	ONDREJOV
38 26	141 28	ONW	ONAGAWA
46 39	142 46	OOT	OTOMARI (C)
-60 44	315 13	ORC	ORCADAS DEL SUR / LAURIE ISLAND
-60 44	315 13	ORC	LAURIE ISL., SEE ORCADES DEL SUR
59 55	10 43	OSL	OSLO (C)
45 24	284 27	OTT	OTTAWA
65 5	25 52	OUL	OULU
5 49	304 47	PAB	PARAMARIBO
42 31	24 11	PAG	PANAGJURISTE
5 53	197 55	PAI	PALMYRA ISLAND (C)
28 12	279 24	PCK	PATRICK (C)
39 37	249 13	PCU	PRICE (C) (UTAH)
68 32	270 29	PEB	PELLY BAY
66 51	24 44	PEL	PELLO (SC)
38 3	23 52	PEN	PENDELI (GREECE)
53 6	158 38	PET	PARATUNKA (SEE PETROPAVLOVSK)
52 58	158 15	PET	PETROPAVLOVSK
45 2	288 34	PIB	PITTSBURG
-31 38	296 7	PIL	PILAR
-69 44	95 30	PIO	PIONERSKAYA (C)
65 15	21 35	PIT	PITEA (SC)
		PJA	PT. JEANNE D≠ARC
9 21	2 37	PKU	PARAKOU (MP)
7 20	134 29	PLA	PALAU (C)
68 7	23 53	PLL	PALLASTUNTUTI
37 30	242 0	PLO	PALO ALTO
-20 26	57 40	PLS	PLAISANCE
-9 25	147 9	PMG	PORT MORESBY (NEW GUINEA)
-66 48	141 24	PMN	PT. MARTIN (C)
5 21	100 18	PNG	PENANG (MALAYSIA)
61 36	90 0	POD	PODKAMMENAYA TUNGUSKA
61 36	90 0	POD	TUNGUSKA, SEE PODKAMMENAYA TUNGUSKA
65 8	212 31	POK	POKER FLAT (AL)
44 52	13 51	POL	POLA (C)
52 23	13 4	POT	POTSDAM (C)
-17 33	210 23	PPT	PAPEETE-TAHITI
-17 33	210 23	PPT	TAHITI/PAMATAI (SEE PAPEETE)
50 5	14 25	PRA	PRAGUE (C)
42 42	2 53	PRP	PERPIGNAN (C)
49 59	14 33	PRU	PRUHONICE
48 49	2 30	PSM	PARC ST. MAUR (C)
71 23	203 45	PTB	POINT BARROW (C)
69 32	31 15	PTS	PETSAMO (C)
-79 15	40 30	PTU	PLATEAU (C)
-17 44	292 3	PTY	PATACAMAYA
62 0	34 0	PTZ	PETROZADOVSK (IMS)
40 55	12 57	PZA	PONZA (C)
30 11	66 57	QUE	QUETTA
70 5	306 59	QUT	QUTLIGSSAT (GREENLAND)
50 5	18 11	RAC	RACIBORZ
-21 12	200 12	RAR	RAROTONGA
-70 26	24 18	RBD	ROI BAUDOUIN (C)
-70 26	24 19	RBD	BAUDOUIN (C), SEE ROI BAUDOUIN
-70 26	24 19	RBD	BASE BAUDOUIN, SEE ROI BAUDOUIN
-22 55	316 49	RDJ	RIO DE JANEIRO (C)
52 18	246 10	RED	RED DEER (MP)
47 29	8 27	REG	REGENSBURG
74 42	265 6	RES	RESOLUTE BAY
64 11	338 18	REY	REYKJAVIK (C)
67 42	17 30	RIJ	RITSEMJOKK (SC)
64 30	15 8	RIS	RISEDE (SC)
62 48	267 40	RIT	RANKIN INLET
-43 37	187 36	RLL	ROLLESTON
9 24	167 28	RNA	ROI NAMUR
44 18	7 53	ROB	ROBURENT
47 13	39 41	ROD	ROSTOV ON DON
54 6	12 8	ROK	ROSTOCK (C)
68 58	19 40	ROS	ROSTADALEN (SC)
44 9	256 54	RPC	RAPID CITY (USA)
55 51	12 27	RSV	RUDE SKOV
69 54	31 54	RYB	RYBACHY
30 22	77 48	SAB	SABHAWALA

LAT	LON	CODE	STATION NAME
66 30	66 42	SAD	SALEKHARD (IMS)
72 0	235 0	SAH	SACHS HARBOUR (IMS)
52 6	253 24	SAS	SASKATOON
62 18	26 39	SAU	SAUVAMAKI/HANKASALMI (SC)
57 4	308 39	SAY	ST. ANTHONY
-77 51	166 47	SBA	SCOTT BASE (C)
70 29	338 2	SCO	SCORESBYSUND (C)
37 0	14 0	SCY	SICILY
50 40	356 45	SDH	SIDMOUTH
62 10	5 7	SDT	STADLANDET
47 38	237 39	SEA	SEATTLE
52 17	13 1	SED	SEDDIN (C)
37 35	127 3	SEO	SEOUL
70 6	72 30	SEY	SEYKHA
36 28	353 48	SFS	SAN FERNANDO (SPAIN)
-54 17	323 31	SGG	SOUTH GEORGIA-GRYTVIKEN STATION
-54 17	323 31	SGG	KING EDWARD POINT (SEE SOUTH GEORGIA)
-54 17	323 31	SGG	GRYTVIKEN (SEE SOUTH GEORGIA)
10 48	106 47	SGN	SAIGON
68 45	266 15	SHB	SHEPHERD BAY
25 34	91 53	SHL	SHILLONG
		SHT	SHATSK
49 12	357 55	SHX	ST. HELIER (C)
44 50	34 4	SIM	SIMFEROPOL
57 4	224 40	SIT	SITKA
-23 13	314 9	SJB	S. JOSE DOS CAMPOS (MP) (BRASIL)
18 7	293 51	SJG	SAN JUAN (PUERTO RICO)
18 7	293 51	SJG	PUERTO RICO (SEE SAN JUAN)
71 7	25 50	SKA	SKARSVAG
69 22	29 25	SKO	SKOGFOSS (SC)
65 25	307 6	SKT	SUKKERTOPPEN (C)
59 41	30 29	SLU	SLUTSK (C)
37 46	334 21	SMG	SAN MIGUEL
-70 19	357 40	SNA	SANAE
68 0	87 0	SNE	SNEZHNOGORSK (USSR)
-33 27	289 18	SNT	SANTIAGO (C)
67 22	26 38	SOD	SODANKYLA
62 48	46 15	SOG	SOGRA
13 3	5 15	SOK	SOKOTO (C)
22 58	277 51	SOR	SOROA
-57 12	352 52	SOU	SOUTH UIST
70 36	22 13	SOY	SOROYA (SC)
-90 0	0 0	SPA	SOUTH POLE - ANTARCTICA
78 30	15 6	SPB	SPITZBERGEN
-76 0	276 0	SPL	SIPLE
		SPO	SAN PABLO, TOLEDO
62 26	152 19	SRE	SREDNEKAN
65 47	18 11	SRV	STOROVAN (SC)
63 55	15 28	SSO	STROMSUND
33 34	135 56	SSO	SIMOSATO (C)
47 54	18 12	STA	STARA DALA (C) (O≠GYALLA)
37 16	237 54	STD	STANFORD (MP)
67 1	309 17	STF	SDR STROMFJORD
47 36	307 19	STJ	ST. JOHNS
47 36	307 19	STJ	JOHNS ST., SEE ST. JOHN≠S
53 51	357 32	STO	STONYHURST
42 12	288 43	SUB	SUDBURY (USA)
44 41	26 15	SUR	SURLARI
25 4	121 33	SUX	SUNGSHAN (C)
56 44	61 4	SVD	SVERDLOVSK/VYSOKAYA-DUBRAVA
56 44	61 4	SVD	VYSOKAYA-DUBRAVA/SEE SVERDLOVSK
56 50	60 38	SVE	SVERDLOVSK (C)
77 54	16 45	SVG	SVEAGRUVAN (C)
76 1	294 54	SVS	SAVIGSIVIK (GREENLAND)
69 26	29 59	SVV	SVANVIK
52 7	21 15	SWI	SWIDER (C)
-69 2	39 36	SYO	SYOWA STATION (SYOWA BASE)
53 27	14 34	SZA	STETTIN-ZABELSHOF (C)
-17 29	296 40	SZB	SANTA CRUZ, BOLIVIA
19 24	260 48	TAC	TACUBAYA (C)
-4 38	278 42	TAL	TALARA (C)
22 48	5 31	TAM	TAMANRASSET
-18 55	47 33	TAN	TANANARIVE
25 2	121 31	TAP	TAIPEI/TAIHOKU (C)
41 20	69 37	TAS	TASHKENT (C)

LAT	LON	CODE	STATION NAME
73 0	91 0	TAY	TAREYA (SSR)
35 44	51 23	TEH	TEHRAN
50 44	13 58	TEL	TELNITZ (C)
28 29	343 44	TEN	TENERIFE (SEE SANTA CRUZ)
28 29	343 44	TEN	SANTA CRUZ, TENERIFE
19 45	260 49	TEO	TEOLOYUCAN
57 30	72 24	TEV	TEVRIZ
42 5	44 42	TFS	TBILISI/DUSHETI
18 56	96 27	TGO	TOUNGOO (C)
77 29	290 50	THL	THULE/QANAQ
76 33	291 10	THU	THULE/CAMP TUTO
42 5	44 42	TIF	TBILISI (C)
71 35	129 0	TIK	TIXIE BAY
10 48	78 42	TIP	TIRUCHIRAPALLI
80 18	52 48	TKH	TIKHAYA BAY (BAYA TIKHAYA) (C)
80 18	52 48	TKH	BAYA TIKHAYA (C), SEE TIKHAYA BAY
41 20	69 37	TKT	YANGHI BAZAR (SEE TASHKENT)
41 20	69 37	TKT	TASHKENT/YANGHI BASAR
43 37	1 28	TLE	TOULOUSE (C)
62 18	209 54	TLK	TALKEETNA (IMS)
48 5	237 49	TLP	TULALIP (MP)
71 30	71 48	TMB	TAMBEY
56 28	84 56	TMK	TOMSK
9 25	359 7	TML	TAMALE (C)
55 43	262 7	TMP	THOMPSON
-6 10	106 38	TNG	TANGERANG
62 2	353 41	TOH	TORSHAVN (IMS)
35 41	139 45	TOK	TOKYO (C)
39 53	355 57	TOL	TOLEDO
-37 32	145 28	TOO	TOOLANGI
27 49	277 30	TPA	TAMPA (USA)
8 29	76 57	TRD	TRIVANDRUM
10 25	298 37	TRN	TRINIDAD (MP)
69 40	18 56	TRO	TROMSO
36 40	120 19	TSN	TSING TAO (C)
62 0	231 51	TST	TUNGSTEN (IMS)
-19 12	17 35	TSU	TSUMEB
-1 12	311 29	TTB	TATUOCA (BRASIL)
32 15	249 10	TUC	TUCSON
35 55	264 13	TUL	TULSA (UNIV. OF OKLAHOMA)
-19 18	146 42	TVL	TOWNSVILLE (MP)
-43 15	294 41	TWA	TRELEW (ARGENTINA)
46 54	17 54	TYH	TIHANY (HUNGARY)
47 52	107 3	UBA	ULAN BATOR
50 48	4 21	UCC	UCCLE (C)
53 45	14 4	UCK	UCKERMUNDE (C)
61 0	74 0	UGT	UGUT (USSR)
23 11	75 47	UJJ	UJJAIN
60 30	74 0	UKH	UKHTA
66 42	34 30	UMA	UMBA
70 41	307 52	UMQ	UMANAQ (GREENLAND)
72 47	303 51	UPN	UPERNAVIK (GREENLAND)
59 49	17 36	UPP	UPPSALA
59 36	251 30	URC	URANIUM CITY (IMS)
69 45	27 2	UTJ	UTSJOKI (C)
70 6	29 23	VAD	VADSO (SC)
51 56	349 45	VAL	VALENTIA
48 31	236 35	VIC	VICTORIA
43 41	132 10	VLA	VLADIVOSTOK-GORNOTAYEZHNAYA-USSURISK
43 41	132 10	VLA	USSURISK (SEE VLADIVOSTOK)
43 41	132 10	VLA	GORNOTAYEZHNAYA (SEE VLADIVOSTOK)
48 49	2 1	VLJ	VAL JOYEUX (C)
54 1	26 30	VOL	VOLOSHIN
43 41	132 10	VOR	VOROSHILOV (C)
-78 27	106 52	VOS	VOSTOK
18 7	294 34	VQS	VIEQUES (C)
-22 24	316 21	VSS	VASSOURAS (BRASIL)
73 14	56 44	VYK	VYKHODNOI (C)
65 56	269 10	WAG	WAGER BAY (IMS)
30 19	115 53	WAT	WATHEROO (C)
42 23	288 41	WES	WESTON
49 45	264 45	WHS	WHITE SHELL(IMS)
48 12	16 14	WIA	WIEN-AUHOF (C)

LAT	LON	CODE	STATION NAME
48 16	16 19	WIK	WIEN-KOBENZL
48 16	16 19	WIK	VIENNA KOBENZL (SEE WIEN-KOBENZL)
-66 15	110 31	WIL	WILKES (C)
52 49	6 40	WIT	WITTEVEEN
19 12	166 42	WKE	WAKE ISL. (USA)
52 32	8 9	WLH	WILHELMSHAVEN
-31 6	136 47	WMR	WOOMERA (MP)
53 45	9 4	WNG	WINGST
49 38	262 52	WNP	WINNIPEG
54 0	11 4	WRH	WARNKENHAGEN
71 0	181 24	WRI	WRANGEL ISL. (IMS)
54 21	12 24	WUS	WUSTROW (C)
62 1	129 40	YAK	YAKUTSK
66 0	71 0	YAR	YAR-SALE (IMS)
-15 32	285 20	YAU	YAUCA (C)
62 28	245 32	YKC	YELLOWKNIFE
49 54	23 45	YNV	YANOV (C)
53 58	358 55	YRK	YORK
46 5	142 43	YSS	YUZHNO SAKHALINSK
46 5	142 43	YSS	SAKHALINSK (SEE YUZHNO SAKHALINSK)
11 9	7 39	ZAR	ZARIA
76 0	153 0	ZHO	ZHOKHOV ISL. (USSR)
37 29	126 38	ZIN	ZINSEN (C)
31 13	121 26	ZKW	ZI-KA-WEI (C)
31 6	121 11	ZSC	ZO-SE
52 28	104 2	ZUY	ZUY (C)

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