

I A G A Bulletin No. 32c

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

ASSOCIATION OF GEOMAGNETISM AND AERONOMY

## **GEOMAGNETIC DATA 1972**

### **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, S. I. Akasofu

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## INTRODUCTION

The yearly IAGA-Bulletin 32 is the continuation of the series IAGA-Bulletins 12.1 (Indices K and C) and 12.2 (Rapid Variations). In accordance with recommendations of the IAGA - Assemblies in Madrid (1969) and Moscow (1971), the publication of C and K - indices of individual observatories is discontinued, whereas planetary indices like Dst, AE, Kn, Ks, Km and a survey of magnetic storms are included instead. The compilation of C and K-indices at the data center in De Bilt and the publication of the derived indices Ci, Kp etc. continues as before, as well as the determination of the international quiet and disturbed days. The K-indices of individual observatories are put on magnetic tape in De Bilt. These are made available through the World Digital Data Centers for Geomagnetism from 1969 onwards. Besides, tables of local K-indices can be found in the bulletins of many observatories.

The IAGA-Bulletin 32 is prepared for publication by the International Service of Geomagnetic Indices (ISGI) at De Bilt. The data, based on the reports of more than 100 observatories, are provided by the following institutes (under the responsibility of the following collaborators):

Kon. Nederlands Meteorol. Inst., De Bilt (D. van Sabben): Ci, Q- and D-days.  
 Institut für Geophysik, Göttingen (M. Siebert): Kp, ap, Ap, Cp.  
 Institut de Physique du Globe, Paris (P.N. Mayaud): Kn, Ks, etc.  
 NASA-Goddard Space Flight Center, Greenbelt (M. Sugiura): Dst.  
 Observatorio del Ebro, Roquetas (A. Romaña): Rapid Variations.  
 WDC-A, Solar Terr. Physics, NOAA, Boulder (J.V. Lincoln): Magnetic storm data.  
 Geophysical Institute, College (S.I. Akasofu): Magnetograms. \*)

The ISGI, formerly called Permanent Service or "C- and K Center", operates under the supervision of IAGA-Commission IV on Magnetic Variations and Disturbances. 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, in the series "Caractère Magnétique des Jours" (et des Années) and in the Journal "Terrestrial Magnetism", together with lists of selected quiet and disturbed days. In 1938, this work was extended backwards to 1890. For the years 1884 - 1890 Ci figures were published in Terr. Magn. vol. 52, pp. 33 - 38, 1947 (see also Transacts. Washington Meeting 1939, IATME-Bull. 11, pp. 183 - 195). In 1940, the C-data and the selected days became part of the IATME-Bulletin 12, later IAGA-Bulletin 12.

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.

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

\*) The magnetogram-project for 1972 was supervised by Y. Kamide (Geophysical Institute, Alaska), assisted by W. Paulishak (WDC-A for Solar-Terr. Physics, Boulder) and K. Kawasaki (NOAA, Boulder).

city 44, pp. 411-433 (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 their mean value Km. These indices are published in the IAGA-Bulletin 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 complete series of these indices and the related quantities an, as etc. for the years 1959 through 1971 is available on punched cards at WDC - A for Geomagnetism, Boulder, in the same format as 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 Geomagnetism in Boulder.

The auroral electrojet index AE cannot yet be included in the IAGA-Bulletin. At present this index is not available in time. References to AE are given at the end of part B of this Bulletin, together with references to the indices Q and R from individual observatories.

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

Data on rapid variations are given as before in the IAGA-Bulletin 12, 2, except that, according to decisions made at the IAGA-Assembly in Madrid, 1969, certain less important cases are no longer published. The list of so called minor distur-

\*) For Kn, Ks etc. 1969 and 1968 see Supplementary Tables in Part E of the IAGA-Bulletins 32a and 32b.

bances and rejected solar-flare effects are omitted; ssc's, si's, bays and pulsations, are given only if reported by a sufficient number of stations; pulsations without bays are published in the quarterly bulletins and their yearly supplement. Checklists are sent to the observatories for the reported pg's and sfe's only.

The Bulletin 32a 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 and quarterly 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, 9 Quai Saint Bernard - Tour 14, Paris V<sup>e</sup>, France.

Monthly bulletins on Ci, selected quiet and disturbed days and preliminary data on rapid geomagnetic variations, as well as threemonthly bulletins on pulsations, are sent to about 190 observatories and institutions by the International Service of Geomagnetic Indices, c/o Royal Netherlands Meteorological Institute, De Bilt, Netherlands. A yearly supplement to the threemonthly bulletins is distributed in the same way.

The data on rapid variations, including pulsations, 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 - Commission IV on Magnetic Variations and Disturbances

J. A. Jacobs, Chairman

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## EXPLANATION OF THE TABLES AND DIAGRAMS

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 moved 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 tables of K-figures (now on magnetic tape, formerly in IAGA-Bulletin 12,1) and 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  $\gamma/\text{mm}$ , 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. 1,2 The daily international character figure  $C_i$  is defined as the mean value of the C figures of about 30 observatories. These are the observatories from which the C-figures are generally received within four weeks after the end of the month.

B. 3 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:  $A_p > 6$ , or marked by the letter K if  $A_p \leq 6$ , but one  $K_p \geq 30$  or two Kp values are  $\geq 3$ .

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

B. 4 The planetary three-hour-range index Kp is the mean standardized K-index from 13 observatories between  $46^{\circ}$  and  $63^{\circ}$  northern or southern geomagnetic latitude. The scale is 0 to 9, expressed in thirds of a unit, e.g., 5- is  $4\frac{2}{3}$ , 5o is 5, 5+ is  $5\frac{1}{3}$ . This planetary index is designed to measure solar particle radiation by its magnetic effects, especially to meet the need of research workers in the ionospheric field. Several other indices are derived from Kp, namely the 3 hour index ap (the equivalent range) and the daily indices Ap and Cp.

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

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

|         |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Kp = 0o | 0+ | 1- | 1o | 1+ | 2- | 2o | 2+ | 3- | 3o | 3+ | 4- | 4o | 4+ |
| ap = 0  | 2  | 3  | 4  | 5  | 6  | 7  | 9  | 12 | 15 | 18 | 22 | 27 | 32 |

|         |    |    |    |    |    |     |     |     |     |     |     |     |     |
|---------|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Kp = 5- | 5o | 5+ | 6- | 6o | 6+ | 7-  | 7o  | 7+  | 8-  | 8o  | 8+  | 9-  | 9o  |
| ap = 39 | 48 | 56 | 67 | 80 | 94 | 111 | 132 | 154 | 179 | 207 | 236 | 300 | 400 |

In order to use ap as an equivalent amplitude, it is considered in relation to the conditions at a standard station, which is a station having the lower limit of 500  $\gamma$  for K = 9. At such a station the average range in  $\gamma$ '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 36 $\gamma$ ). In other words ap is an equivalent amplitude in the unit 2 $\gamma$ .

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 2 $\gamma$  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  $\gamma$ , the conversion factor is obtained from the lower limit for K = 9 valid at the station by dividing the limit by 250. For instance, at Sodankylä, where the lower limit for K = 9 is 1500 $\gamma$ , the factor is 6, so that, for K = 3, the equivalent amplitude is 90 $\gamma$ , or, in other words the index ak for Sodankylä expresses equivalent amplitudes in the unit 6 $\gamma$ . Similarly, Ak is the daily average of the ak.

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

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



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

B. 5-8 These tables give the frequencies of occurrence of Kp-values during the year, the monthly average values of Ap and Cp and lists of magnetic storms and of very quiet intervals, based on the successive occurrence of certain Kp-values.

B. 9 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. 10 The three-hourly indices Kn and Ks for the Northern and Southern hemispheres are derived from the K-indices of observatories in the sub-auroral zones, 11 in the Northern and 7 in the Southern hemisphere, namely: Memambetsu (Japan), Petropavlovsk, Magadan, Tomsk, Sverdlovsk (USSR), Niemegk (Germany), Witteveen (Netherlands), Hartland (England), Fredericksburg (USA), Victoria (Canada), Tucson (USA), Amberley (New Zealand), Toolangi, Gbangara (Australia), Kerguelen (Indian Ocean), Hermanus (South Africa), Argentine Isl. and Orcadas del Sur (Argentina). \*) 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 into an equivalent amplitude and the weighted means an and as of these amplitudes are converted back into Kn and Ks. Km is derived in the same way from am, the mean of an and as. (This method is different from the method followed in the case of Kp, where ap is derived from Kp).

The tables are printed mechanically. As the indices are determined with an accuracy of one third of a unit, the values of 3Kn, 3Ks and 3Km are tabulated. 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.  $\sigma_n$  and  $\sigma_s$  indicate the standard deviations of the sector values of K in the N. - and S. hemispheres. Monthly mean values of An, As and Am are given at the bottom of the tables.

B. 11,12 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. Only the cases reported by at least ten stations

\*) For the determination of the indices Kn, Ks etc. for 1972, the data from the stations Orcadas del Sur and Tomsk could not be included.

are given. Stations in isolated regions are thereby counted morefold, depending on the local density of the stations' network. The times in the column at the left are mean values; but the earliest and latest times reported by the observatories for the beginning of the phenomenon are added in brackets. For printing reasons only the minutes are given. These minutes generally belong to the hour of the phenomenon; but if they are underlined, they belong to the preceding hour. The observatories are mentioned in six groups under the letters A, B, C, D, E, X, as follows:

A...when the phenomenon in their magnetograms is very remarkable

B...when it is a fair, ordinary, but unmistakable

C...when it is a poor or doubtful case

D...when it was decidedly not recorded in the magnetograms although the records were satisfactory

E...when the phenomenon cannot be discerned because of heavy disturbance

X...when the record is missing

In some cases one or more observatories preferred another qualification (si, b, bp, etc); these observatories are included in parentheses.

C. 2 Bays or pulsational disturbances associated with bays. The times at the left-hand side of the table have the same meaning as in table C. 1. The observatories are mentioned in groups, according to the qualification (b, bs, bp, etc) which they have attributed to the phenomenon in accordance with the definitions given by the Copenhagen- and Berkeley meetings. The classification symbols A, B, C, D, E, X, are the same as mentioned in C. 1. The meaning of the symbols b, bs, etc. is:

b...clear and isolated bay appearing during a calm period without pulsations or sharp beginning

bs...bay with sharp beginning without pulsations

bp...bay with pulsations without sharp beginning

bps...bay with pulsations and sharp beginning

pi2...train of pulsations of irregular shape and beginning mostly impulsive, with period 40 - 150 sec., consisting of several series of oscillations, each series lasting about 10 minutes (pi2 corresponds with the former pt)

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

If pulsations precede or follow the beginning of the bay with a time lag of not more than about ten minutes, then symbols bp and bps are used. If the interval is greater, both phenomena are reported separately. As for the ssc's, this list contains only the cases reported by at least ten stations (isolated stations counted morefold). Moreover it may be that a bay has been selected by the observatories out of a group of many similar disturbances all occurring on the same day. Therefore the list is not complete and it seems better not to use this table for statistical purposes without caution. This holds also for the other tables.

C. 3 Sudden impulses (si). These are sudden magnetic changes which could not be classified as ssc, bs, etc. As for the ssc's, this list contains only the cases reported by at least ten stations (isolated stations counted morefold). The mean times and extreme times of the beginning of the phenomena are given as in table C.1.

C. 4 Giant pulsations (pg) are given, which were reported originally by at least two stations (or by one station, if situated in a very isolated region and if the pg was classified as A). These pg's were checked by the observatories, mentioned in the heading of the table. It is very probable that several cases included in the Table are not real pg's in the sense given to the former classical polar pg's. Nevertheless, in order to clarify the actual signification of this denomination for the different observatories and to know the world distribution of this phenomenon, the table gives the answers to the checking-lists for all the cases in which a positive answer was given by some observatories, situated in regions where typical pg's have been observed in the past. Period and amplitude of the pg's as reported by the individual observatories are also included, as well as the times of beginning and ending of the phenomenon if these deviate from the times given in the left column.

C. 5a 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 day-light hemisphere have been written behind the indicated times and grouped in the same way as in Table C. 1. Observatories near the subsolar point are underlined. Stations lying in the twilight-zone, which reported a clear disturbance are indicated by dotted brackets. Stations under the same circumstances in full dark have been given in parentheses. Stations on the night-side of the earth, which gave a negative or doubtful answer, have been omitted.

C. 5b Doubtful solar-flare effects. In general, the following cases have been considered as doubtful: those where well located stations (with respect to the subsolar point) did not report such an effect, (although several other stations have reported it), and those where some stations in full dark mentioned a disturbance which, considering the hour and their geographic position, was probably no night-side bay 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 perturbation 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.

#### Part D. Data on special intervals.

The first lines give a survey of indices Kp, Kn and Ks for the selected periods. Dst is given in a graphical form as follows: A single horizontal line indicates that Dst is negative, a double line means  $Dst < -50$ , a triple line means  $Dst < -100$ , etc. In the list of data from individual observatories, the sign of the amplitude of an ssc

is to be taken algebraically for D and Z, D reckoned positive if towards the East and Z reckoned positive if downwards. sc\* means that the sc-movement (for which the amplitudes are given) was preceded by a small reserve impuls. The ranges of D, H and Z are the differences between the highest and the lowest values of these components attained during the storm. The end of the storm is indicated by the cessation time of reasonably marked disturbance movements in the traces, more specifically when the K-index diminishes to 2 or less for a reasonable period.

The stations for which K-indices are given, are selected on the basis of a representative distribution over all parts of the world. The stations are indicated by their symbols, according to part A of this Bulletin.

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 been subtracted from the records.

\*) Stations used in Part D, which are not included in the List of Observatories (Part A) are the following:

|    |               |           |          |          |       |       |
|----|---------------|-----------|----------|----------|-------|-------|
| CB | Cambridge Bay | 69° 1' N  | 255°     | geomagn. | +77.0 | 301.0 |
| NQ | Narssarssuaq  | 61° 11' N | 314° 35' | "        | +71.2 | 37.6  |

#### Erratum IAGA-Bulletin 12 v 1, 1967

In the list of Magnetically Selected Days 1967, in page 85 (table 3), the 5 Quiet Days abusively include the date 26 December. This date should be changed into 25 December.

## LIST OF OBSERVATORIES

| Sym-<br>bol | Observatory         | Collaborator       | Geographic |          | Geomagnetic |        | $S_H$<br>mm | K=9<br>lower<br>limit | K<br>rep. |
|-------------|---------------------|--------------------|------------|----------|-------------|--------|-------------|-----------------------|-----------|
|             |                     |                    | Lat.       | Long.    | Lat.        | Long.  |             |                       |           |
|             | Alert               |                    | +82° 30'   | 297° 30' | +85.7°      | 168.7° |             |                       |           |
| BT          | Cheisa (B. Tikhaya) | V. Y. Danilov      | +80 37     | 58 03    | +71.3       | 156.0  | 5           | 2000                  | 341 -     |
| 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     |
| MLB         | Mould Bay           |                    | +76 12     | 240 36   | +79.1       | 284.7  |             |                       |           |
| RB          | Resolute Bay        | R. G. Madill       | +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                  | 341 -     |
| MS          | Matoshkin Shar      | N. D. Medvedev     | +73 16     | 56 24    | +64.8       | 146.5  |             | 2500                  | 55C56     |
| TI          | Tiksi               | T. L. Kaplan       | +71 35     | 129 00   | +60.4       | 191.4  | 5           | 1000                  | 551 -     |
| PB          | Point Barrow        | T. L. Hardiman     | +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                  | 431 -     |
| 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 -     |
| KI          | Kiruna              | G. Gustafsson      | +67 50     | 20 25    | +65.3       | 115.8  | 11          | 1500                  | 521 -     |
| SO          | Sodankylä           | * E. Kataja        | +67 22     | 26 38    | +63.8       | 120.0  | 9           | 1500                  | 141 -     |
| WE          | Welen               | N. I. Zueva        | +66 10     | 190 10   | +61.8       | 237.1  | 8           | 1250                  | 55C -     |
| CO          | College             | * J. B. Townsend   | +64 52     | 212 10   | +64.6       | 256.5  | 8           | 2500                  | 41C -     |
| BL          | Baker Lake          | R. G. Madill       | +64 20     | 263 58   | +73.8       | 315.2  | 6           | 2500                  | 52C55     |
| RY          | Leirvogur (Reykj.)  | Th. Saemundsson    | +64 11     | 338 18   | +70.2       | 71.0   | 15          | 1500                  | 64C -     |
| SR          | Srednikan           | N. W. Savangeewa   | +62 26     | 152 19   | +53.2       | 210.6  | 4           | 550                   | 401 -     |
| DO          | Dombås              | E. Gjøl            | +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                   | 411 -     |
| PT          | Podk. Tungusta      |                    | +61 31     | 90 00    |             |        | 3           | 550                   | 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  |             |                       |           |
| SI          | Sitka               | * R. J. Main, Jr.  | +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                   | 411 -     |
| 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. Tsjerzov     | +55 50     | 48 51    | +49.3       | 130.4  | 5           | 550                   | 411 -     |
| MO          | Moskva              | W. N. Bobrov       | +55 28     | 37 19    | +50.8       | 120.5  | 2           | 550                   | 451 -     |
| 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  |             |                       |           |
| NS          | Novosibirsk         |                    | +55 02     | 82 54    |             |        | 2           | 350                   | 72C -     |
| ME          | Meanook             | Anne B. Cook       | +54 37     | 246 34   | +61.8       | 301.0  | 11          | 1500                  | 32C -     |
| HL          | Helu                | W. Czyszek         | +54 37     | 18 49    | +53.4       | 103.7  | 4           | 550                   | 56C -     |
| MN          | Minsk               | M. S. Babuchnikov  | +54 04     | 27 08    | +50.6       | 113.8  | 4           | 550                   | 62C -     |
| ST          | Stonyhurst          | J. E. Worthy S. J. | +53 51     | 357 32   | +56.9       | 82.7   | 6           | 600                   | 60C66     |
| WN          | Wingst              | * O. Meyer         | +53 44     | 9 04     | +54.5       | 94.0   | 6           | 500                   | 40C -     |
| PK          | Petropavlovsk       |                    | +53 06     | 158 38   | +44.4       | 218.2  |             |                       |           |
| WI          | Witteveen           | * D. van Sabben    | +52 49     | 6 40     | +54.2       | 91.0   | 10          | 500                   | 40C -     |
| IR          | Irkutsk             | W. S. Pirozjov     | +52 10     | 104 27   | +41.0       | 176.9  | 6           | 350                   | 411 -     |
| SW          | Swider              | Z. Kalinowska      | +52 07     | 21 15    | +50.6       | 104.6  | 4           | 500                   | 421 -     |
| 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               | J. Marianiuk       | +51 50     | 20 48    | +50.4       | 104.1  | 1           | 500                   | 60C -     |
| GT          | Göttingen           | M. Siebert         | +51 33     | 9 58     | +52.3       | 93.7   | 3           | 500                   |           |
| CM          | Collmberg           | * B. Tittel        | +51 19     | 13 00    | +51.5       | 96.5   | 1           | 500                   | 54167     |
| HA          | Hartland            | * H. F. Finch      | +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. Krański         | +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 <sub>H</sub><br>γ/mm | K=9<br>lower<br>limit | K<br>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 -     |
| BV     | Budkov              | J. Bouška          | +49 04     | 14 01   | +49.1       | 96.2   | 1                      |                       | 69I -     |
| VI     | Victoria            | B. Caner           | +48 31     | 236 35  | +54.3       | 292.7  | 2                      | 500                   | 57C -     |
| NE     | Newport             | A. H. Travis       | +48 10     | 242 32  | +55.1       | 300.0  |                        |                       | 68C -     |
| FU     | Fürstentfeldbruck * | 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   | 6                      | 750                   | 69C -     |
| NA     | Nantes              | O. Noblanc         | +47 15     | 358 27  | +50.5       | 80.1   | 6                      | 500                   | 50C59     |
| SA     | Yushno-Sakhalinsk   | B. E. Mardjferfeld | +46 57     | 142 43  | +36.9       | 206.7  | 3                      | 350                   | 54C -     |
| TY     | Tihany              |                    | +46 54     | 17 53   | +46.4       | 99.1   | 4                      |                       | 58C -     |
| OD     | Odessa              | W. N. Sjaefski     | +46 47     | 30 53   | +43.8       | 111.1  | 2                      | 350                   | 55C -     |
| KK     | Novo Kazalinsk      | A. K. Karpjenko    | +45 46     | 62 07   | +39.9       | 138.6  | 1                      | 350                   | 66C -     |
| OT     | Ottawa              | W. R. Darker       | +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 *        | T. Yoshimatsu      | +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         | E. I. Bobuljova    | +43 41     | 132 10  | +33.0       | 198.0  | 4                      | 300                   | 55C -     |
| AT     | Alma Ata            |                    | +43 16     | 77 23   | +33.4       | 152.0  |                        |                       | 64C -     |
| PN     | Panagjuriste        |                    | +42 31     | 24 11   |             |        | 2                      | 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            | Zarotsjentsjeva    | +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             | V. Seica           | +40 13     | 351 35  | +44.8       | 71.3   | 4                      | 350                   | 51C -     |
| BD     | Boulder             |                    | +40 02     | 254 42  | +48.9       | 316.4  |                        |                       |           |
| 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      | R. Kuberry         | +38 12     | 282 38  | +49.6       | 349.8  | 2                      | 500                   | 32C -     |
| PE     | Pendeli *           |                    | +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          | A. Silva de Sousa  | +37 46     | 334 21  | +45.6       | 50.9   | 4                      | 350                   | 51C -     |
| AE     | Almeria             | G. Vazquez         | +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 *           | T. Yoshimatsu      | +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. Sugizura        | +33 34     | 135 56  | +23.0       | 202.4  | 2                      | 300                   | 57C59     |
| AV     | Averroes (Maroc)    | P. Stahl           | +33 18     | 352 35  | +38.1       | 69.1   | 3                      | 350                   | 70C -     |
| DS     | Dallas              | Lavon Posey        | +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              | Clyde J. Beers     | +32 15     | 249 10  | +40.4       | 312.2  | 3                      | 350                   | 38C -     |
| KY     | Kanoya *            | T. Yoshimatsu      | +31 25     | 130 53  | +20.5       | 198.1  | 2                      | 300                   | 58C -     |
| QU     | Quetta *            | K. U. Siddigi      | +30 11     | 66 57   | +21.6       | 139.7  | 3                      | 300                   | 55I -     |
| ML     | Misallat            | M. Fahim           | +29 45     | 30 54   | +26.7       | 105.8  | 2                      | 300                   | 56C -     |
| SZ     | Santa Cruz (Ten.)   | C. Matzán          | +28 29     | 343 43  | +35.0       | 58.6   | 2                      | 300                   | 64C -     |
| LP     | Lunping *           | P. H. Kong         | +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            | R. C. Munson       | +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              |                    | +18 38     | 72 52   | + 9.5       | 143.6  | 4                      | 300                   | 40C -     |
| SJ     | San Juan            | M. Vazquez         | +18 07     | 293 51  | +29.9       | 3.2    | 2                      | 300                   | 38C -     |



LIST OF OBSERVATORIES - continued

| Sym-<br>bol | Observatory      | Collaborator               | Geographic |         | Geomagnetic |        | S <sub>H</sub><br>γ/mm | K=9<br>lower<br>limit | K<br>rep. |
|-------------|------------------|----------------------------|------------|---------|-------------|--------|------------------------|-----------------------|-----------|
|             |                  |                            | Lat        | Long.   | Lat.        | Long.  |                        |                       |           |
| HD          | Hyderabad        | B. J. Srivastava           | +17° 25'   | 78° 33' | + 7.6°      | 148.9° | 5                      | 300                   | 69I -     |
| MB          | M'Bour           | * H. G. Barszczus          | +14 24     | 343 03  | +21.3       | 55.0   | 7                      | 350                   | 52C -     |
| MU          | Muntinlupa       | * C. Palma                 | +14 22     | 121 01  | + 3.0       | 189.7  | 4                      | 300                   | 64C -     |
| GU          | Guam             | K. Cravens                 | +13 35     | 144 52  | + 4.0       | 212.9  | 3                      | 300                   | 58C -     |
| AN          | Annamalanaigar   |                            | +11 24     | 79 41   | + 1.5       | 149.4  |                        |                       |           |
| AA          | Addis Ababa      | E. Cambron                 | +09 02     | 38 46   | + 5.3       | 109.2  |                        | 300                   |           |
| TV          | Trivandrum       |                            | +08 29     | 76 57   | - 1.1       | 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          | Fdquene          | J. del C. Quintero         | +05 28     | 286 16  | +16.9       | 355.1  | 4                      | 300                   | 57C60     |
| BA          | Bangui           | A. Lapouille               | +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            | P. Herrinck                | +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            | * G. Bonnet                | -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            | (P. Herrinck<br>G. Lesambo | -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           | V. S. Moreira              | -08 55     | 13 10   | - 7.2       | 80.5   | 3                      | 350                   | 61C -     |
| PM          | Port Moresbey    | * I. B. Everingham         | -09 24     | 147 09  | -18.7       | 218.0  | 3                      | 300                   | 58C -     |
| KC          | Karavia (Congo)  | (P. Herrinck<br>G. Lesambo | -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. Cullington         | -13 48     | 188 14  | -16.0       | 260.2  | 4                      | 300                   | 40C57     |
| PP          | Papeete-Pamatai  | G. Rouchouse               | -17 34     | 210 25  | -15.3       | 282.8  | 1                      | 350                   | 68C -     |
| TN          | Tananarive       | * (Kakoto<br>Hee)          | -18 55     | 47 33   | -23.1       | 112.1  | 1                      | 300                   | 50C -     |
| MR          | Mauritius        | B. M. Badya                | -20 06     | 57 33   | -26.6       | 122.4  | 3                      | 500                   | 56C60     |
| LQ          | La Quiaca        | R. P. J. Hernández         | -22 06     | 294 24  | -10.6       | 3.2    | 3                      | 350                   | 64C -     |
| VA          | Vassouras        | L. I. Gama                 | -22 24     | 316 21  | -11.9       | 23.9   | 4                      | 600                   | 52C64     |
| LM          | Lourenco Marques | F. Augusto Leal            | -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            | R. P. J. Hernández         | -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                      | 300                   | 40C -     |
| AC          | Las Acacias      | H. A. Hartmann             | -35 00     | 302 19  | -24.0       | 10.3   | 2                      | 350                   | 64C -     |
| TO          | Toolangi         | * L. S. Prior              | -37 32     | 145 28  | -46.7       | 220.8  | 4                      | 500                   | 41C -     |
| AM          | Amberley         | * A. L. Cullington         | -43 09     | 172 43  | -47.7       | 252.5  | 5                      | 500                   | 37C -     |
| TW          | Trelew           | * O. P. Pelliccioli        | -43 15     | 294 41  | -31.7       | 3.2    | 3                      | 350                   | 57C -     |
| KG          | Kerguelen        | R. Schlich                 | -49 21     | 70 12   | -56.5       | 127.8  | 6                      | 750                   | 57I -     |
| MI          | Macquarie Island | L. S. Prior                | -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 | C. N. Horton               | -65 15     | 295 44  | -53.8       | 3.3    |                        |                       | 57I -     |
| 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           | * L. S. Prior              | -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 24  | -65.8       | 24.3   | 7                      | 2000                  | 57C58     |
| SB          | Scott Base       | * A. L. Cullington         | -77 51     | 166 47  | -79.0       | 294.4  | 22                     | 2000                  | 57C -     |
| LA          | Little America   | J. J. Gniwewek             | -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        |

TABLE 1 INTERNATIONAL CHARACTER-FIGURES, Ci, 1905 - 1971

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mean for the year |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------------|
| 1905 | 0.7 | 0.7 | 0.6 | 0.6 | 0.5 | 0.6 | 0.5 | 0.7 | 0.7 | 0.5 | 0.7 | 0.4 | 0.59              |
| 06   | 0.4 | 0.9 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.8 | 0.6 | 0.6 | 0.7 | 0.65              |
| 07   | 0.7 | 0.8 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.5 | 0.66              |
| 08   | 0.6 | 0.7 | 0.9 | 0.7 | 0.8 | 0.7 | 0.5 | 0.8 | 0.9 | 0.5 | 0.6 | 0.5 | 0.68              |
| 09   | 0.8 | 0.6 | 0.8 | 0.5 | 0.6 | 0.5 | 0.5 | 0.6 | 0.7 | 0.7 | 0.5 | 0.6 | 0.62              |
| 1910 | 0.6 | 0.7 | 0.8 | 0.7 | 0.7 | 0.5 | 0.6 | 0.8 | 0.8 | 1.0 | 0.8 | 0.8 | 0.72              |
| 11   | 0.8 | 0.9 | 0.8 | 0.8 | 0.7 | 0.5 | 0.6 | 0.5 | 0.5 | 0.6 | 0.5 | 0.4 | 0.63              |
| 12   | 0.4 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.46              |
| 13   | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.4 | 0.4 | 0.48              |
| 14   | 0.5 | 0.5 | 0.6 | 0.5 | 0.4 | 0.5 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.5 | 0.54              |
| 1915 | 0.5 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.8 | 0.8 | 0.5 | 0.62              |
| 16   | 0.6 | 0.6 | 0.9 | 0.7 | 0.8 | 0.7 | 0.6 | 0.8 | 0.8 | 0.8 | 0.8 | 0.6 | 0.71              |
| 17   | 0.8 | 0.7 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 | 0.8 | 0.6 | 0.7 | 0.5 | 0.7 | 0.66              |
| 18   | 0.6 | 0.8 | 0.7 | 0.8 | 0.7 | 0.6 | 0.7 | 0.8 | 0.9 | 0.8 | 0.8 | 0.9 | 0.75              |
| 19   | 0.8 | 0.8 | 0.9 | 0.7 | 0.8 | 0.6 | 0.5 | 0.7 | 0.8 | 0.9 | 0.5 | 0.7 | 0.72              |
| 1920 | 0.6 | 0.5 | 0.8 | 0.6 | 0.6 | 0.4 | 0.5 | 0.6 | 0.9 | 0.6 | 0.6 | 0.6 | 0.62              |
| 21   | 0.5 | 0.5 | 0.7 | 0.7 | 0.8 | 0.6 | 0.5 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.61              |
| 22   | 0.6 | 0.7 | 0.8 | 0.8 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.5 | 0.4 | 0.64              |
| 23   | 0.5 | 0.6 | 0.5 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.6 | 0.4 | 0.5 | 0.48              |
| 24   | 0.6 | 0.6 | 0.6 | 0.4 | 0.5 | 0.6 | 0.6 | 0.4 | 0.7 | 0.5 | 0.5 | 0.4 | 0.54              |
| 1925 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.7 | 0.6 | 0.6 | 0.7 | 0.8 | 0.5 | 0.6 | 0.56              |
| 26   | 0.8 | 0.8 | 0.8 | 0.8 | 0.6 | 0.5 | 0.5 | 0.5 | 0.8 | 0.7 | 0.5 | 0.5 | 0.65              |
| 27   | 0.6 | 0.7 | 0.8 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.8 | 0.8 | 0.4 | 0.6 | 0.63              |
| 28   | 0.4 | 0.6 | 0.5 | 0.5 | 0.8 | 0.7 | 0.7 | 0.6 | 0.8 | 0.8 | 0.6 | 0.5 | 0.63              |
| 29   | 0.5 | 0.8 | 0.8 | 0.5 | 0.6 | 0.6 | 0.7 | 0.6 | 0.8 | 0.8 | 0.7 | 0.7 | 0.67              |
| 1930 | 0.7 | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.9 | 0.6 | 0.5 | 0.83              |
| 31   | 0.5 | 0.6 | 0.6 | 0.4 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 1.0 | 0.8 | 0.7 | 0.66              |
| 32   | 0.8 | 0.8 | 1.0 | 0.9 | 0.8 | 0.4 | 0.5 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.70              |
| 33   | 0.6 | 0.6 | 0.7 | 0.8 | 0.6 | 0.6 | 0.5 | 0.6 | 0.8 | 0.6 | 0.6 | 0.5 | 0.64              |
| 34   | 0.5 | 0.6 | 0.8 | 0.4 | 0.5 | 0.4 | 0.4 | 0.7 | 0.7 | 0.5 | 0.4 | 0.7 | 0.56              |
| 1935 | 0.7 | 0.7 | 0.7 | 0.6 | 0.5 | 0.7 | 0.6 | 0.5 | 0.9 | 0.9 | 0.6 | 0.7 | 0.67              |
| 36   | 0.7 | 0.8 | 0.6 | 0.8 | 0.7 | 0.7 | 0.7 | 0.4 | 0.5 | 0.7 | 0.7 | 0.5 | 0.65              |
| 37   | 0.6 | 0.9 | 0.8 | 0.8 | 0.7 | 0.7 | 0.8 | 0.5 | 0.6 | 1.0 | 0.7 | 0.6 | 0.74              |
| 38   | 1.1 | 0.8 | 0.6 | 0.8 | 0.7 | 0.5 | 0.7 | 0.7 | 0.8 | 0.8 | 0.6 | 0.6 | 0.74              |
| 39   | 0.5 | 0.9 | 1.0 | 1.0 | 0.9 | 0.8 | 0.8 | 0.7 | 0.7 | 0.9 | 0.5 | 0.6 | 0.76              |
| 1940 | 0.8 | 0.7 | 0.8 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.8 | 0.73              |
| 41   | 0.7 | 0.8 | 1.0 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.6 | 0.7 | 0.6 | 0.70              |
| 42   | 0.5 | 0.6 | 0.9 | 0.7 | 0.4 | 0.5 | 0.7 | 0.7 | 0.7 | 0.9 | 0.7 | 0.6 | 0.65              |
| 43   | 0.5 | 0.5 | 0.7 | 0.6 | 0.6 | 0.6 | 0.7 | 1.0 | 0.9 | 0.9 | 0.8 | 0.6 | 0.70              |
| 44   | 0.6 | 0.5 | 0.8 | 0.6 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.3 | 0.6 | 0.53              |
| 1945 | 0.5 | 0.5 | 0.7 | 0.6 | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 | 0.3 | 0.6 | 0.47              |
| 46   | 0.6 | 0.7 | 0.8 | 0.6 | 0.6 | 0.6 | 0.7 | 0.4 | 0.8 | 0.5 | 0.5 | 0.4 | 0.61              |
| 47   | 0.6 | 0.5 | 1.0 | 0.6 | 0.6 | 0.7 | 0.6 | 0.8 | 1.0 | 0.8 | 0.6 | 0.5 | 0.69              |
| 48   | 0.6 | 0.7 | 0.7 | 0.6 | 0.8 | 0.5 | 0.6 | 0.8 | 0.7 | 1.0 | 0.7 | 0.7 | 0.71              |
| 49   | 0.7 | 0.7 | 0.8 | 0.6 | 0.7 | 0.6 | 0.5 | 0.6 | 0.6 | 0.9 | 0.7 | 0.5 | 0.65              |
| 1950 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.6 | 0.7 | 0.8 | 0.8 | 0.9 | 0.8 | 0.7 | 0.74              |
| 51   | 0.8 | 0.9 | 0.9 | 1.0 | 0.8 | 0.8 | 0.8 | 0.9 | 1.1 | 0.8 | 0.8 | 0.8 | 0.89              |
| 52   | 0.8 | 0.9 | 1.0 | 1.0 | 0.9 | 0.7 | 0.6 | 0.6 | 0.9 | 0.8 | 0.6 | 0.7 | 0.81              |
| 53   | 0.7 | 0.6 | 0.8 | 0.7 | 0.6 | 0.5 | 0.7 | 0.8 | 0.8 | 0.7 | 0.6 | 0.4 | 0.67              |
| 54   | 0.5 | 0.8 | 0.8 | 0.7 | 0.4 | 0.4 | 0.5 | 0.6 | 0.9 | 0.7 | 0.5 | 0.4 | 0.59              |
| 1955 | 0.6 | 0.7 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.59              |
| 56   | 0.9 | 0.7 | 0.9 | 0.9 | 0.8 | 0.8 | 0.6 | 0.7 | 0.7 | 0.6 | 0.9 | 0.5 | 0.76              |
| 57   | 0.7 | 0.7 | 1.0 | 0.9 | 0.6 | 0.8 | 0.6 | 0.6 | 1.0 | 0.7 | 0.8 | 0.8 | 0.77              |
| 58   | 0.8 | 1.0 | 1.1 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.6 | 0.7 | 0.4 | 0.8 | 0.77              |
| 59   | 0.7 | 1.0 | 0.7 | 0.7 | 0.8 | 0.8 | 1.0 | 0.9 | 1.1 | 0.8 | 0.8 | 0.8 | 0.83              |
| 1960 | 0.7 | 0.7 | 0.8 | 1.1 | 0.9 | 0.8 | 0.8 | 0.8 | 0.8 | 1.0 | 0.9 | 0.9 | 0.84              |
| 61   | 0.6 | 0.7 | 0.6 | 0.6 | 0.7 | 0.6 | 0.9 | 0.6 | 0.6 | 0.5 | 0.4 | 0.5 | 0.61              |
| 62   | 0.3 | 0.6 | 0.4 | 0.7 | 0.4 | 0.6 | 0.7 | 0.8 | 0.8 | 1.0 | 0.6 | 0.6 | 0.63              |
| 63   | 0.5 | 0.4 | 0.4 | 0.5 | 0.7 | 0.6 | 0.6 | 0.7 | 1.0 | 0.6 | 0.6 | 0.5 | 0.61              |
| 64   | 0.6 | 0.7 | 0.6 | 0.7 | 0.6 | 0.5 | 0.5 | 0.4 | 0.6 | 0.5 | 0.4 | 0.3 | 0.53              |
| 1965 | 0.4 | 0.6 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.4 | 0.4 | 0.4 | 0.45              |
| 66   | 0.4 | 0.4 | 0.6 | 0.4 | 0.4 | 0.4 | 0.5 | 0.6 | 0.9 | 0.5 | 0.5 | 0.6 | 0.52              |
| 67   | 0.5 | 0.5 | 0.4 | 0.5 | 0.8 | 0.7 | 0.5 | 0.5 | 0.7 | 0.6 | 0.6 | 0.7 | 0.58              |
| 68   | 0.6 | 0.8 | 0.7 | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.65              |
| 69   | 0.4 | 0.6 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.5 | 0.6 | 0.5 | 0.5 | 0.4 | 0.54              |
| 1970 | 0.4 | 0.4 | 0.6 | 0.7 | 0.4 | 0.5 | 0.8 | 0.5 | 0.5 | 0.6 | 0.6 | 0.4 | 0.52              |
| 71   | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.5 | 0.5 | 0.5 | 0.7 | 0.6 | 0.5 | 0.5 | 0.58              |

TABLE 2 INTERNATIONAL CHARACTER-FIGURES, Ci, 1972

| Day                    | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep    | Oct  | Nov  | Dec  |
|------------------------|------|------|------|------|------|------|------|------|--------|------|------|------|
| 1                      | 0.4  | 0.5  | 0.5  | 1.1  | 1.1  | 0.2  | 0.2  | 0.6  | 0.2    | 0.2  | 1.9  | 0.2  |
| 2                      | 0.6  | 0.7  | 0.6  | 0.6  | 1.1  | 0.4  | 0.5  | 0.2  | 0.4    | 0.2  | 1.6  | 0.3  |
| 3                      | 0.4  | 0.6  | 0.9  | 0.2  | 0.3  | 0.7  | 0.5  | 0.2  | 0.3    | 0.1  | 0.7  | 0.3  |
| 4                      | 0.5  | 0.4  | 0.5  | 0.9  | 0.1  | 0.7  | 0.1  | 2.0  | 0.2    | 0.3  | 0.3  | 0.1  |
| 5                      | 0.2  | 0.3  | 0.3  | 0.8  | 0.2  | 0.6  | 0.0  | 2.0  | 0.1    | 0.1  | 0.1  | 0.0  |
| 6                      | 0.0  | 0.3  | 1.1  | 0.2  | 0.6  | 0.4  | 0.0  | 1.8  | 0.6    | 0.0  | 0.3  | 0.0  |
| 7                      | 0.3  | 0.5  | 1.6  | 0.4  | 0.0  | 0.3  | 0.6  | 1.1  | 0.2*)  | 0.3  | 0.6  | 0.7  |
| 8                      | 0.2  | 0.3  | 0.8  | 0.3  | 0.1  | 0.2  | 0.5  | 0.6  | 0.6    | 0.1  | 0.4  | 0.3  |
| 9                      | 0.3  | 0.1  | 0.7  | 0.1  | 0.9  | 0.2  | 0.3  | 1.8  | 0.5    | 0.3  | 0.4  | 0.1  |
| 10                     | 0.6  | 0.7  | 0.0  | 0.1  | 0.5  | 0.1  | 0.4  | 1.1  | 1.0    | 0.4  | 0.1  | 0.0  |
| 11                     | 1.0  | 0.3  | 0.2  | 0.2  | 0.3  | 0.1  | 0.4  | 1.0  | 0.7    | 1.0  | 0.4  | 0.1  |
| 12                     | 0.2  | 0.0  | 0.0  | 0.6  | 0.5  | 0.2  | 0.5  | 0.3  | 0.2    | 1.2  | 0.2  | 0.5  |
| 13                     | 0.1  | 1.2  | 0.3  | 0.6  | 0.3  | 0.3  | 0.0  | 0.1  | 1.6    | 1.1  | 0.1  | 1.4  |
| 14                     | 0.1  | 0.8  | 0.0  | 0.2  | 0.3  | 0.5  | 0.0  | 0.4  | 1.5    | 1.2  | 0.1  | 0.4  |
| 15                     | 1.3  | 0.8  | 0.2  | 0.3  | 1.4  | 0.6  | 0.3  | 0.5  | 1.3    | 0.5  | 1.1  | 1.5  |
| 16                     | 1.5  | 0.3  | 1.2  | 0.2  | 1.1  | 0.5  | 0.5  | 0.4  | 1.2    | 0.6  | 1.4  | 1.4  |
| 17                     | 1.1  | 1.2  | 1.0  | 0.2  | 0.6  | 1.8  | 0.4  | 0.3  | 1.3    | 0.0  | 0.7  | 0.6  |
| 18                     | 1.2  | 0.6  | 0.6  | 1.3  | 0.6  | 2.0  | 0.2  | 0.7  | 0.8    | 0.9  | 0.4  | 0.5  |
| 19                     | 0.6  | 0.8  | 0.1  | 0.7  | 0.2  | 1.0  | 0.5  | 0.9  | 0.1    | 1.4  | 0.5  | 0.4  |
| 20                     | 0.6  | 0.6  | 0.1  | 0.6  | 0.2  | 0.6  | 0.3  | 0.8  | 0.1    | 0.8  | 1.3  | 0.1  |
| 21                     | 1.3  | 0.4  | 0.2  | 1.1  | 0.0  | 0.2  | 0.1  | 0.8  | 0.0    | 1.0  | 0.4  | 0.1  |
| 22                     | 1.3  | 0.1  | 0.6  | 0.7  | 0.2  | 0.6  | 0.8  | 0.4  | 0.1    | 0.8  | 0.9  | 1.0  |
| 23                     | 1.3  | 0.3  | 0.6  | 0.6  | 0.4  | 0.6  | 0.5  | 0.0  | 0.8    | 0.9  | 0.6  | 1.4  |
| 24                     | 0.7  | 1.5  | 1.1  | 0.2  | 0.2  | 0.7  | 1.0  | 0.0  | 1.0    | 0.7  | 0.1  | 0.6  |
| 25                     | 1.0  | 0.9  | 0.5  | 0.0  | 0.2  | 0.3  | 1.4  | 0.3  | 0.2    | 0.4  | 0.5  | 0.2  |
| 26                     | 1.1  | 0.3  | 0.5  | 0.1  | 0.3  | 0.5  | 1.1  | 1.2  | 0.3    | 0.5  | 0.6  | 0.1  |
| 27                     | 0.8  | 0.3  | 1.0  | 0.5  | 0.4  | 0.9  | 0.4  | 1.2  | 0.3    | 0.4  | 0.8  | 0.1  |
| 28                     | 1.1  | 0.1  | 0.6  | 1.2  | 1.2  | 0.7  | 0.2  | 0.5  | 0.5    | 0.7  | 0.8  | 0.2  |
| 29                     | 0.9  | 0.0  | 1.3  | 1.6  | 0.6  | 0.5  | 0.1  | 0.5  | 1.2    | 1.1  | 0.4  | 0.9  |
| 30                     | 0.5  |      | 1.3  | 1.0  | 0.8  | 0.1  | 0.2  | 0.3  | 0.4    | 1.1  | 0.3  | 1.2  |
| 31                     | 0.4  |      | 0.9  |      | 0.8  |      | 0.2  | 0.3  |        | 1.5  |      | 0.6  |
| Mean                   | 0.70 | 0.51 | 0.62 | 0.55 | 0.50 | 0.55 | 0.39 | 0.72 | 0.59*) | 0.64 | 0.60 | 0.49 |
| Mean for the Year 0.57 |      |      |      |      |      |      |      |      |        |      |      |      |

\*) corrected values, different from the values given in the monthly bulletin of September 1972.

TABLE 3 INTERNATIONAL QUIET AND DISTURBED DAYS 1972

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

For Erratum Quiet Days December 1967: See p. xii.

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

|    | Kp          |             |     | Sum | Jan. 1972 |    |    |    | ap |    |    |     | Sum | Ap  | Cp |
|----|-------------|-------------|-----|-----|-----------|----|----|----|----|----|----|-----|-----|-----|----|
| 1  | 2+ 1o 1o 1o | 1+ 2- 3- 3o | 14o | 9   | 4         | 4  | 4  | 5  | 6  | 12 | 15 | 59  | 7   | 0.4 |    |
| 2  | 2+ 2- 2- 1+ | 1- 2+ 4- 1o | 15- | 9   | 6         | 6  | 5  | 3  | 9  | 22 | 4  | 64  | 8   | 0.4 |    |
| 3  | 1- 1o 3+ 2+ | 1o 1o 2- 1o | 12o | 3   | 4         | 18 | 9  | 4  | 4  | 6  | 4  | 52  | 6   | 0.3 |    |
| 4  | 3+ 3o 4- 2o | 1- 1- 1o 2o | 16+ | 18  | 15        | 22 | 7  | 3  | 3  | 4  | 7  | 79  | 10  | 0.6 |    |
| 5  | 2+ 2o 2- 2o | 2o 2- 1o 0+ | 13o | 9   | 7         | 6  | 7  | 7  | 6  | 4  | 2  | 48  | 6   | 0.3 |    |
| 6  | 0+ 2o 0+ 0o | 0+ 0+ 0o 0+ | 4-  | 2   | 7         | 2  | 0  | 2  | 2  | 0  | 2  | 17  | 2   | 0.0 |    |
| 7  | 1o 1- 0o 0o | 0+ 1- 3- 1+ | 7-  | 4   | 3         | 0  | 0  | 2  | 3  | 12 | 5  | 29  | 4   | 0.1 |    |
| 8  | 2o 1+ 0+ 0+ | 0+ 1+ 2o 1+ | 9o  | 7   | 5         | 2  | 2  | 2  | 5  | 7  | 5  | 35  | 4   | 0.2 |    |
| 9  | 2o 2+ 1- 1o | 1o 1o 1+ 2- | 11o | 7   | 9         | 3  | 4  | 4  | 4  | 5  | 6  | 42  | 5   | 0.2 |    |
| 10 | 2+ 1o 0+ 0o | 0+ 3- 2+ 3o | 12o | 9   | 4         | 2  | 0  | 2  | 12 | 9  | 15 | 53  | 7   | 0.3 |    |
| 11 | 4+ 4- 3- 2+ | 3o 3- 1+ 3- | 23- | 32  | 22        | 12 | 9  | 15 | 12 | 5  | 12 | 119 | 15  | 0.8 |    |
| 12 | 3- 2o 1o 1o | 1+ 1o 1o 2- | 12- | 12  | 7         | 4  | 4  | 5  | 4  | 4  | 6  | 46  | 6   | 0.3 |    |
| 13 | 2+ 1- 0+ 0+ | 1- 1- 1o 1+ | 7+  | 9   | 3         | 2  | 2  | 3  | 3  | 4  | 5  | 31  | 4   | 0.1 |    |
| 14 | 2o 1o 0+ 0o | 1- 0+ 1o 1o | 6+  | 7   | 4         | 2  | 0  | 3  | 2  | 4  | 4  | 26  | 3   | 0.1 |    |
| 15 | 1+ 3- 2- 3o | 4+ 5o 4o 1+ | 23+ | 5   | 12        | 6  | 15 | 32 | 48 | 27 | 5  | 150 | 19  | 1.0 |    |
| 16 | 3o 3+ 3- 5+ | 4- 6- 4o 3- | 30+ | 15  | 18        | 12 | 56 | 22 | 67 | 27 | 12 | 229 | 29  | 1.3 |    |
| 17 | 4o 4o 3- 2+ | 3+ 4- 4+ 2+ | 27- | 27  | 27        | 12 | 9  | 18 | 22 | 32 | 9  | 156 | 20  | 1.0 |    |
| 18 | 4o 4- 4- 3+ | 3+ 4o 2o 2+ | 26+ | 27  | 22        | 22 | 18 | 18 | 27 | 7  | 9  | 150 | 19  | 1.0 |    |
| 19 | 3o 3- 2+ 2+ | 3- 3+ 2o 2o | 20+ | 15  | 12        | 9  | 9  | 12 | 18 | 7  | 7  | 89  | 11  | 0.6 |    |
| 20 | 1+ 3- 2o 2- | 2- 3o 2+ 2o | 17- | 5   | 12        | 7  | 6  | 6  | 15 | 9  | 7  | 67  | 8   | 0.5 |    |
| 21 | 2- 2- 2+ 3+ | 6- 5+ 2o 2- | 24- | 6   | 6         | 9  | 18 | 67 | 56 | 7  | 6  | 175 | 22  | 1.1 |    |
| 22 | 3+ 4o 4- 3- | 3o 4+ 5- 4+ | 30o | 18  | 27        | 22 | 12 | 15 | 32 | 39 | 32 | 197 | 25  | 1.2 |    |
| 23 | 5+ 5+ 5- 4- | 3+ 3- 4o 4o | 33o | 56  | 56        | 39 | 22 | 18 | 12 | 27 | 27 | 257 | 32  | 1.3 |    |
| 24 | 2+ 2+ 2+ 3o | 2- 1o 4- 2o | 18+ | 9   | 9         | 9  | 15 | 6  | 4  | 22 | 7  | 81  | 10  | 0.6 |    |
| 25 | 2- 4- 4- 3- | 3o 3+ 3+ 4- | 25o | 6   | 22        | 22 | 12 | 15 | 18 | 18 | 22 | 135 | 17  | 0.9 |    |
| 26 | 3+ 4- 3+ 5+ | 3o 3o 3+ 3- | 28- | 18  | 22        | 18 | 56 | 15 | 15 | 18 | 12 | 174 | 22  | 1.1 |    |
| 27 | 2o 3o 4- 3o | 4- 3o 3o 3- | 24o | 7   | 15        | 22 | 15 | 22 | 15 | 15 | 12 | 123 | 15  | 0.9 |    |
| 28 | 2o 3- 3- 3+ | 2+ 4+ 5+ 5- | 27+ | 7   | 12        | 12 | 18 | 9  | 32 | 56 | 39 | 185 | 23  | 1.1 |    |
| 29 | 2+ 4- 2- 2- | 3+ 4- 3+ 3o | 23- | 9   | 22        | 6  | 6  | 18 | 22 | 18 | 15 | 116 | 14  | 0.8 |    |
| 30 | 3+ 3- 1o 1+ | 1+ 2- 1o 3+ | 16- | 18  | 12        | 4  | 5  | 5  | 6  | 4  | 18 | 72  | 9   | 0.5 |    |
| 31 | 2- 2+ 0+ 1- | 1o 3o 2+ 1+ | 13- | 6   | 9         | 2  | 3  | 4  | 15 | 9  | 5  | 53  | 7   | 0.3 |    |

|    | Kp          |             |     | Sum | Feb. 1972 |    |    |    | ap |    |    |     | Sum | Ap  | Cp |
|----|-------------|-------------|-----|-----|-----------|----|----|----|----|----|----|-----|-----|-----|----|
| 1  | 0+ 1- 2- 3- | 3o 2+ 1o 2o | 14- | 2   | 3         | 6  | 12 | 15 | 9  | 4  | 7  | 58  | 7   | 0.4 |    |
| 2  | 3o 3+ 4- 2+ | 2o 3- 2+ 2- | 22o | 15  | 18        | 22 | 9  | 15 | 12 | 9  | 6  | 106 | 13  | 0.8 |    |
| 3  | 2+ 2+ 1- 2- | 2+ 4- 2o 1o | 16o | 9   | 9         | 3  | 6  | 9  | 22 | 7  | 4  | 69  | 9   | 0.5 |    |
| 4  | 3- 3o 3o 3- | 2- 1- 2- 2- | 17o | 12  | 15        | 15 | 12 | 6  | 3  | 6  | 6  | 75  | 9   | 0.5 |    |
| 5  | 1o 1+ 2- 2- | 1o 1o 3- 2o | 12+ | 4   | 5         | 6  | 6  | 4  | 4  | 12 | 7  | 48  | 6   | 0.3 |    |
| 6  | 1o 2- 2- 1o | 0+ 1- 3- 2+ | 11+ | 4   | 6         | 6  | 4  | 2  | 3  | 12 | 9  | 46  | 6   | 0.3 |    |
| 7  | 2o 1+ 1+ 1o | 1o 2- 2+ 4o | 15- | 7   | 5         | 5  | 4  | 4  | 6  | 9  | 27 | 67  | 8   | 0.5 |    |
| 8  | 3- 3o 1o 2o | 2- 1- 0+ 1o | 12+ | 12  | 15        | 4  | 7  | 6  | 3  | 2  | 4  | 53  | 7   | 0.3 |    |
| 9  | 1o 1- 0+ 0+ | 0+ 1- 2o 2- | 7o  | 4   | 3         | 2  | 2  | 2  | 3  | 7  | 6  | 29  | 4   | 0.1 |    |
| 10 | 3o 3- 2- 1o | 2o 2- 3+ 3o | 18+ | 15  | 12        | 6  | 4  | 7  | 6  | 18 | 15 | 83  | 10  | 0.6 |    |
| 11 | 2o 1o 2+ 3o | 2o 1+ 1- 1+ | 14- | 7   | 4         | 9  | 15 | 7  | 5  | 3  | 5  | 55  | 7   | 0.3 |    |
| 12 | 2+ 2+ 1o 0+ | 1- 0+ 0o 0+ | 7+  | 9   | 9         | 4  | 2  | 3  | 2  | 0  | 2  | 31  | 4   | 0.1 |    |
| 13 | 0+ 2+ 1+ 5- | 4+ 4+ 4o 4o | 25+ | 2   | 9         | 5  | 39 | 32 | 32 | 27 | 27 | 173 | 22  | 1.1 |    |
| 14 | 4o 3+ 3o 2+ | 1o 2o 3o 4o | 23- | 27  | 18        | 15 | 9  | 4  | 7  | 15 | 27 | 122 | 15  | 0.9 |    |
| 15 | 3- 4o 3+ 3- | 3- 1+ 2- 2+ | 21- | 12  | 27        | 18 | 12 | 12 | 5  | 6  | 9  | 101 | 13  | 0.7 |    |
| 16 | 3o 3- 2o 2- | 2o 2- 1+ 1+ | 16- | 15  | 12        | 7  | 6  | 7  | 6  | 5  | 5  | 63  | 8   | 0.4 |    |
| 17 | 2o 2o 1o 3+ | 4+ 4+ 5o 4o | 26o | 7   | 7         | 4  | 18 | 32 | 32 | 48 | 27 | 175 | 22  | 1.1 |    |
| 18 | 3- 3o 3o 1+ | 0o 0+ 1o 5- | 16o | 12  | 15        | 15 | 5  | 0  | 2  | 4  | 39 | 92  | 12  | 0.7 |    |
| 19 | 5+ 2+ 1o 0+ | 3- 3o 3- 2- | 19o | 56  | 9         | 4  | 2  | 12 | 15 | 12 | 6  | 116 | 14  | 0.8 |    |
| 20 | 4- 4- 2+ 3- | 3- 1+ 1- 2o | 19o | 22  | 22        | 9  | 12 | 12 | 5  | 3  | 7  | 92  | 12  | 0.7 |    |
| 21 | 2+ 3o 2o 2o | 3- 3o 2- 1- | 17+ | 9   | 15        | 7  | 7  | 12 | 15 | 6  | 3  | 74  | 9   | 0.5 |    |
| 22 | 0+ 0+ 2- 2- | 1o 2o 1- 1+ | 9o  | 2   | 2         | 6  | 6  | 4  | 7  | 3  | 5  | 35  | 4   | 0.2 |    |
| 23 | 1+ 1+ 1o 1o | 1+ 2o 2+ 2+ | 13- | 5   | 5         | 4  | 4  | 5  | 7  | 9  | 9  | 48  | 6   | 0.3 |    |
| 24 | 2o 3o 5- 5+ | 5o 5- 5- 4- | 33o | 7   | 15        | 39 | 56 | 48 | 39 | 39 | 22 | 265 | 33  | 1.3 |    |
| 25 | 4- 4- 3- 2o | 3o 4- 3o 2+ | 24o | 22  | 22        | 12 | 7  | 15 | 22 | 15 | 9  | 124 | 16  | 0.9 |    |
| 26 | 3o 2- 1+ 1o | 1o 0+ 2o 1- | 11o | 15  | 6         | 5  | 4  | 4  | 2  | 7  | 3  | 46  | 6   | 0.3 |    |
| 27 | 0+ 0o 0o 1+ | 1o 1o 2+ 3- | 9-  | 2   | 0         | 0  | 5  | 4  | 4  | 9  | 12 | 36  | 4   | 0.2 |    |
| 28 | 2- 3- 2o 1o | 1- 0+ 2- 1+ | 11+ | 6   | 12        | 7  | 4  | 3  | 2  | 6  | 5  | 45  | 6   | 0.3 |    |
| 29 | 0+ 1- 1- 0+ | 0o 0+ 0+ 0+ | 3o  | 2   | 3         | 3  | 2  | 0  | 2  | 2  | 2  | 16  | 2   | 0.0 |    |

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

|    | Kp                      | Sum | March 1972  | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 0+ 1+ 1o 2o 2+ 2- 3+ 3o | 15o | 2 5 4 7     | 9 6 18 15   | 66  | 8  | 0.4 |
| 2  | 2+ 2+ 1+ 1+ 2+ 3- 3- 3+ | 18+ | 9 9 5 5     | 9 12 12 18  | 79  | 10 | 0.6 |
| 3  | 3+ 3- 4o 3o 2+ 4o 3- 2o | 24o | 18 12 27 15 | 9 27 12 7   | 127 | 16 | 0.9 |
| 4  | 2+ 1o 3- 3- 2o 2o 1o 1+ | 15o | 9 4 12 12   | 7 7 4 5     | 60  | 8  | 0.4 |
| 5  | 2- 1o 1+ 1o 1- 1o 2o 2o | 11- | 6 4 5 4     | 3 4 7 7     | 40  | 5  | 0.2 |
| 6  | 3o 3- 2- 2- 1- 0+ 2o 7+ | 19+ | 15 12 6 6   | 3 2 7 154   | 205 | 26 | 1.2 |
| 7  | 6+ 6o 5o 5+ 4+ 3+ 3- 4- | 37- | 94 80 48 56 | 32 18 12 22 | 362 | 45 | 1.5 |
| 8  | 3+ 2+ 1o 2o 3- 5- 2o 1- | 19- | 18 9 4 7    | 12 39 7 3   | 99  | 12 | 0.7 |
| 9  | 2o 3- 2- 3+ 3- 3- 2+ 1+ | 19- | 7 12 6 18   | 12 12 9 5   | 81  | 10 | 0.6 |
| 10 | 1o 0o 1o 0o 0o 0+ 1- 2+ | 5+  | 4 0 4 0     | 0 2 3 9     | 22  | 3  | 0.0 |
| 11 | 3o 3o 3- 0o 0o 0+ 2o 0+ | 11+ | 15 15 12 0  | 0 2 7 2     | 53  | 7  | 0.3 |
| 12 | 0+ 0o 0o 1- 1+ 1- 1o 2o | 6o  | 2 0 0 3     | 5 3 4 7     | 24  | 3  | 0.1 |
| 13 | 2o 1o 2- 3o 2+ 1- 1- 2o | 13+ | 7 4 6 15    | 9 3 3 7     | 54  | 7  | 0.3 |
| 14 | 2o 0+ 2- 1+ 1- 0+ 0+ 1+ | 8o  | 7 2 6 5     | 3 2 2 5     | 32  | 4  | 0.1 |
| 15 | 0+ 0+ 1- 1o 1+ 1+ 2+ 3- | 10o | 2 2 3 4     | 5 5 9 12    | 42  | 5  | 0.2 |
| 16 | 5o 5o 2+ 3- 3+ 2o 2- 3o | 25o | 48 48 9 12  | 18 7 6 15   | 163 | 20 | 1.0 |
| 17 | 3o 3o 2+ 3+ 3o 2+ 4- 4- | 24+ | 15 15 9 18  | 15 9 22 22  | 125 | 16 | 0.9 |
| 18 | 4o 3o 3+ 2o 1o 2- 1o 1+ | 17+ | 27 15 18 7  | 4 6 4 5     | 86  | 11 | 0.6 |
| 19 | 2o 1+ 1- 1o 1+ 0+ 1o 2o | 10- | 7 5 3 4     | 5 2 4 7     | 37  | 5  | 0.2 |
| 20 | 2+ 1+ 2- 0+ 1o 1o 1o 2- | 10+ | 9 5 6 2     | 4 4 4 6     | 40  | 5  | 0.2 |
| 21 | 2+ 1+ 1- 1o 1o 1o 1o 2o | 10+ | 9 5 3 4     | 4 4 4 7     | 40  | 5  | 0.2 |
| 22 | 3o 3o 1- 2- 2- 1+ 3o 3- | 17o | 15 15 3 6   | 6 5 15 12   | 77  | 10 | 0.5 |
| 23 | 1+ 1- 2- 3o 2- 1+ 3- 3- | 15o | 5 3 6 15    | 6 5 12 12   | 64  | 8  | 0.4 |
| 24 | 4- 5- 4- 3- 3- 4o 4- 2- | 27- | 22 39 22 12 | 12 27 22 6  | 162 | 20 | 1.0 |
| 25 | 3- 3+ 2o 2- 1- 1+ 2+ 2- | 16- | 12 18 7 6   | 3 5 9 6     | 66  | 8  | 0.4 |
| 26 | 1+ 2- 1+ 2o 1+ 2o 4- 4o | 17+ | 5 6 5 7     | 5 7 22 27   | 84  | 10 | 0.6 |
| 27 | 4o 4- 3+ 2o 2- 3- 5- 3+ | 25+ | 27 22 18 7  | 6 12 39 18  | 149 | 19 | 1.0 |
| 28 | 5- 4- 3- 2- 1- 1- 1- 1- | 15+ | 39 22 12 6  | 3 3 3 3     | 91  | 11 | 0.7 |
| 29 | 2o 2o 3+ 4o 3+ 3+ 5- 5- | 27+ | 7 7 18 27   | 18 18 39 39 | 173 | 22 | 1.1 |
| 30 | 5+ 5o 4+ 3o 3o 3+ 4- 3- | 30+ | 56 48 32 15 | 15 18 22 12 | 218 | 27 | 1.2 |
| 31 | 3o 3+ 3o 2o 2- 1+ 4o 4o | 22+ | 15 18 15 7  | 6 5 27 27   | 120 | 15 | 0.8 |

|    | Kp                      | Sum | April 1972  | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 2o 2o 4o 2o 3- 2o 4- 5o | 23+ | 7 7 27 7    | 12 7 22 48  | 137 | 17 | 0.9 |
| 2  | 3- 5o 2o 2- 0+ 1- 1+ 1+ | 15o | 12 48 7 6   | 2 3 5 5     | 88  | 11 | 0.6 |
| 3  | 0o 1- 1- 0+ 0+ 1- 1+ 3- | 7-  | 0 3 3 2     | 2 3 5 12    | 30  | 4  | 0.1 |
| 4  | 3+ 3+ 3- 2- 4+ 4- 3+ 2+ | 25- | 18 18 12 6  | 32 22 18 9  | 135 | 17 | 0.9 |
| 5  | 4o 4+ 4o 3+ 3+ 2- 1+ 1o | 23o | 27 32 27 18 | 18 6 5 4    | 137 | 17 | 0.9 |
| 6  | 1- 1o 2- 3+ 3+ 2o 1+ 1- | 14o | 3 4 6 18    | 18 7 5 3    | 64  | 8  | 0.4 |
| 7  | 1- 2+ 3- 3- 3- 2- 1+ 2+ | 16+ | 3 9 12 12   | 12 6 5 9    | 68  | 8  | 0.5 |
| 8  | 1+ 1o 0+ 1- 1o 3o 2+ 2- | 11+ | 5 4 2 3     | 4 15 9 6    | 48  | 6  | 0.3 |
| 9  | 3+ 0+ 0o 0o 0+ 1- 0o 0o | 5-  | 18 2 0 0    | 2 3 0 0     | 25  | 3  | 0.1 |
| 10 | 1o 2- 1+ 1+ 1- 1+ 2+ 2- | 11+ | 4 6 5 5     | 3 5 9 6     | 43  | 5  | 0.2 |
| 11 | 1+ 3o 2- 1- 1- 1o 2- 1+ | 11+ | 5 15 6 3    | 3 4 6 5     | 47  | 6  | 0.3 |
| 12 | 2- 3- 1+ 2- 2+ 3o 3o 3o | 19- | 6 12 5 6    | 9 15 15 15  | 83  | 10 | 0.6 |
| 13 | 4- 3- 2+ 2- 3- 2o 3o 2+ | 20+ | 22 12 9 6   | 12 7 15 9   | 92  | 12 | 0.7 |
| 14 | 2+ 3- 2+ 2o 1+ 2- 1- 2- | 15- | 9 12 9 7    | 5 6 3 6     | 57  | 7  | 0.4 |
| 15 | 2o 2- 2o 1+ 2o 2- 2- 2- | 14o | 7 6 7 5     | 7 6 6 6     | 50  | 6  | 0.3 |
| 16 | 2+ 2+ 1o 1o 1- 0+ 1+ 2+ | 11+ | 9 9 4 4     | 3 2 5 9     | 45  | 6  | 0.3 |
| 17 | 3- 2- 1+ 1o 1o 1o 2- 2o | 12+ | 12 6 5 4    | 4 4 6 7     | 48  | 6  | 0.3 |
| 18 | 4+ 5- 4- 4- 3+ 3o 4- 3+ | 30- | 32 39 22 22 | 18 15 22 18 | 188 | 24 | 1.1 |
| 19 | 2+ 2- 2- 4- 4- 2- 1o 0+ | 16o | 9 6 6 22    | 22 6 4 2    | 77  | 10 | 0.5 |
| 20 | 1- 0o 1+ 2- 2- 2+ 3o 4- | 14+ | 3 0 5 6     | 6 9 15 22   | 66  | 8  | 0.4 |
| 21 | 5- 4o 3+ 3+ 3o 3+ 3- 0+ | 25- | 39 27 18 18 | 15 18 12 2  | 149 | 19 | 1.0 |
| 22 | 0+ 0o 0o 0+ 2- 3o 4o 4o | 13+ | 2 0 0 2     | 6 15 27 27  | 79  | 10 | 0.6 |
| 23 | 2+ 2- 2+ 2+ 2o 1o 2- 3+ | 17- | 9 6 9 9     | 7 4 6 18    | 68  | 8  | 0.5 |
| 24 | 1+ 1- 2- 1+ 2o 1+ 1- 1- | 10- | 5 3 6 5     | 7 5 3 3     | 37  | 5  | 0.2 |
| 25 | 1- 0+ 0+ 1- 1- 1- 1- 1+ | 5+  | 3 2 2 3     | 3 3 3 5     | 24  | 3  | 0.1 |
| 26 | 1- 1- 0+ 0o 0+ 0+ 1- 2- | 5-  | 3 3 2 0     | 2 2 3 6     | 21  | 3  | 0.0 |
| 27 | 1o 1- 1- 0o 1+ 4- 2+ 2o | 12- | 4 3 3 0     | 5 22 9 7    | 53  | 7  | 0.3 |
| 28 | 3+ 2+ 3+ 4- 4+ 5+ 3+ 1+ | 27o | 18 9 18 22  | 32 56 18 5  | 178 | 22 | 1.1 |
| 29 | 3o 5- 6- 4o 5o 4+ 5+ 5+ | 37+ | 15 39 67 27 | 48 32 56 56 | 340 | 42 | 1.5 |
| 30 | 5o 3o 2- 3o 3o 2o 2+ 3+ | 23+ | 48 15 6 15  | 15 7 9 18   | 133 | 17 | 0.9 |

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

|    | Kp                      | Sum | May 1972    | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 4- 4- 4o 3- 3- 3o 3+ 3- | 26- | 22 22 27 12 | 12 15 18 12 | 140 | 18 | 1.0 |
| 2  | 3- 3+ 4+ 4o 3o 2+ 3- 3+ | 26- | 12 18 32 27 | 15 9 12 18  | 143 | 18 | 1.0 |
| 3  | 2o 2- 2- 2o 3o 2o 1+ 1o | 15- | 7 6 6 7     | 15 7 5 4    | 57  | 7  | 0.4 |
| 4  | 1+ 2o 2- 1o 2o 2- 1+ 0+ | 11+ | 5 7 6 4     | 7 6 5 2     | 42  | 5  | 0.2 |
| 5  | 2- 2- 1- 1+ 1- 1+ 1+ 3o | 12- | 6 6 3 5     | 3 5 5 15    | 48  | 6  | 0.3 |
| 6  | 2o 1+ 3- 2o 3o 2+ 3- 2- | 18- | 7 5 12 7    | 15 9 12 6   | 73  | 9  | 0.5 |
| 7  | 2o 1- 0o 0+ 0+ 1- 1- 1+ | 6o  | 7 3 0 2     | 2 3 3 5     | 25  | 3  | 0.1 |
| 8  | 1- 1- 0+ 0+ 1o 1o 2+ 1- | 7o  | 3 3 2 2     | 4 4 9 3     | 30  | 4  | 0.1 |
| 9  | 1+ 2o 4- 3o 3- 2+ 3+ 4- | 22o | 5 7 22 15   | 12 9 18 22  | 110 | 14 | 0.8 |
| 10 | 2o 2o 3- 2+ 2o 2o 3o 2o | 18o | 7 7 12 9    | 7 7 15 7    | 71  | 9  | 0.5 |
| 11 | 1- 2+ 1+ 2o 2o 2+ 2o 2+ | 15o | 3 9 5 7     | 7 9 7 9     | 56  | 7  | 0.4 |
| 12 | 2o 3o 3o 3- 2+ 1+ 2- 1+ | 17+ | 7 15 15 12  | 9 5 6 5     | 74  | 9  | 0.5 |
| 13 | 3o 1+ 2- 0+ 1- 2+ 2+ 3o | 15- | 15 5 6 2    | 3 9 9 15    | 64  | 8  | 0.4 |
| 14 | 2+ 2- 2o 2- 2o 2- 2- 2- | 15- | 9 6 7 6     | 7 6 6 6     | 53  | 7  | 0.3 |
| 15 | 1+ 0+ 1o 2- 1o 2o 8- 6+ | 21+ | 5 2 4 6     | 4 7 179 94  | 301 | 38 | 1.4 |
| 16 | 6o 4- 2+ 3- 2- 1+ 1+ 1+ | 20+ | 80 22 9 12  | 6 5 5 5     | 144 | 18 | 1.0 |
| 17 | 3o 2+ 3- 1+ 2+ 3+ 1+ 2o | 18- | 15 9 12 5   | 9 12 5 7    | 74  | 9  | 0.5 |
| 18 | 3+ 3+ 3- 3- 2- 1o 1o 1o | 17- | 18 18 12 12 | 6 4 4 4     | 78  | 10 | 0.5 |
| 19 | 1- 1o 1- 1- 0+ 0+ 1o 2o | 7-  | 3 4 3 3     | 2 2 4 7     | 28  | 4  | 0.1 |
| 20 | 2o 1o 1- 2- 1- 0+ 0+ 2- | 8+  | 7 4 3 6     | 3 2 2 6     | 33  | 4  | 0.1 |
| 21 | 1+ 1o 1- 1- 0+ 1o 2- 1o | 8-  | 5 4 3 3     | 2 4 6 4     | 31  | 4  | 0.1 |
| 22 | 2o 2+ 1+ 1- 1- 1o 2- 1+ | 11o | 7 9 5 3     | 3 4 6 5     | 42  | 5  | 0.2 |
| 23 | 2- 1- 0+ 0+ 1+ 3+ 2+ 3- | 13- | 6 3 2 2     | 5 18 9 12   | 57  | 7  | 0.4 |
| 24 | 2+ 2+ 1+ 0+ 1- 1o 1- 0+ | 9o  | 9 9 5 2     | 3 4 3 2     | 37  | 5  | 0.2 |
| 25 | 1o 1+ 2- 1o 1o 1o 2- 2+ | 11o | 4 5 6 4     | 4 4 6 9     | 42  | 5  | 0.2 |
| 26 | 3- 2o 1o 1+ 1o 2+ 3- 3o | 16o | 12 7 4 5    | 4 9 12 15   | 68  | 8  | 0.5 |
| 27 | 2o 1+ 0+ 1- 1+ 3- 3o 3o | 14+ | 7 5 2 3     | 5 12 15 15  | 64  | 8  | 0.4 |
| 28 | 3o 2o 3- 3+ 4o 5+ 4+ 2- | 26+ | 15 7 12 18  | 27 56 32 6  | 173 | 22 | 1.1 |
| 29 | 2+ 3- 2o 3o 2+ 2+ 2- 2+ | 19- | 9 12 7 15   | 9 9 6 9     | 76  | 10 | 0.5 |
| 30 | 3o 3o 1+ 2- 3+ 4- 4- 3- | 22+ | 15 15 5 6   | 18 22 22 12 | 115 | 14 | 0.8 |
| 31 | 3- 4- 3o 3- 2+ 2+ 1+ 3o | 21o | 12 22 15 12 | 9 9 5 15    | 99  | 12 | 0.7 |

|    | Kp                      | Sum | June 1972      | ap            | Sum  | Ap  | Cp  |
|----|-------------------------|-----|----------------|---------------|------|-----|-----|
| 1  | 2+ 1+ 2- 1+ 1+ 1o 2- 1o | 12- | 9 5 6 5        | 5 4 6 4       | 44   | 6   | 0.2 |
| 2  | 1+ 2o 1+ 1+ 2- 3- 1+ 2o | 14- | 5 7 5 5        | 6 12 5 7      | 52   | 6   | 0.3 |
| 3  | 3o 2o 1+ 3- 3+ 3+ 3- 2o | 21- | 18 7 5 12      | 18 18 12 7    | 97   | 12  | 0.7 |
| 4  | 3o 2o 3- 2o 3o 4- 3+ 2+ | 22o | 15 7 12 7      | 15 22 18 9    | 105  | 13  | 0.8 |
| 5  | 3o 3o 3o 3o 2o 2- 2+ 2o | 20o | 15 15 15 15    | 7 6 9 7       | 89   | 11  | 0.6 |
| 6  | 1- 0+ 1- 1- 2+ 3- 2- 3o | 12o | 3 2 3 3        | 9 12 6 15     | 53   | 7   | 0.3 |
| 7  | 3- 2o 1+ 1+ 3o 2- 1+ 2+ | 16- | 12 7 5 5       | 15 6 5 9      | 64   | 8   | 0.4 |
| 8  | 1+ 2+ 1+ 1o 2- 2- 2- 2- | 13- | 5 9 5 4        | 6 6 6 6       | 47   | 6   | 0.3 |
| 9  | 1+ 1+ 1o 2o 1- 0+ 0+ 1o | 8o  | 5 5 4 7        | 3 2 2 4       | 32   | 4   | 0.1 |
| 10 | 1+ 1+ 1+ 1- 1o 1+ 0+ 1+ | 9-  | 5 5 5 3        | 4 5 2 5       | 34   | 4   | 0.1 |
| 11 | 2- 1o 1o 1- 1- 0+ 1o 1- | 7o  | 6 4 4 3        | 3 2 4 3       | 29   | 4   | 0.1 |
| 12 | 1- 1o 0+ 0o 2- 0+ 0+ 1+ | 6-  | 3 4 2 0        | 6 2 2 5       | 24   | 3   | 0.1 |
| 13 | 2o 1o 0+ 0+ 1- 1o 2- 2o | 9o  | 7 4 2 2        | 3 4 6 7       | 35   | 4   | 0.2 |
| 14 | 2- 2- 2+ 1+ 1+ 3- 4- 3- | 17+ | 6 6 9 5        | 5 12 22 12    | 77   | 10  | 0.5 |
| 15 | 3- 4+ 2+ 2- 2+ 3- 2- 1+ | 19o | 12 32 9 6      | 9 12 6 5      | 91   | 11  | 0.7 |
| 16 | 2- 2- 2+ 2o 2+ 1+ 2o 3- | 16o | 6 6 9 7        | 9 5 7 12      | 61   | 8   | 0.4 |
| 17 | 3- 3- 4o 4o 5+ 7- 6+ 7+ | 39o | 12 12 27 27    | 56 111 94 154 | 493  | 62  | 1.7 |
| 18 | 8+ 7+ 7o 6+ 7o 7+ 6o 4o | 53+ | 236 154 132 94 | 132 154 80 27 | 1009 | 126 | 1.9 |
| 19 | 4+ 4+ 5o 3- 3- 2o 2- 1- | 23+ | 32 32 48 12    | 12 7 6 3      | 152  | 19  | 1.0 |
| 20 | 4+ 2o 2- 1+ 2- 1o 1o 2- | 15- | 32 7 6 5       | 6 4 4 6       | 70   | 9   | 0.5 |
| 21 | 1o 1o 1- 1o 1+ 1o 3- 2o | 11- | 4 4 3 4        | 5 4 12 7      | 43   | 5   | 0.2 |
| 22 | 2+ 1o 3- 2+ 3+ 2+ 3- 4- | 20+ | 9 4 12 9       | 18 9 12 22    | 95   | 12  | 0.7 |
| 23 | 2+ 2+ 3+ 3- 3- 3o 3- 2o | 21- | 9 9 18 12      | 12 12 12 7    | 91   | 11  | 0.7 |
| 24 | 3- 1+ 2- 2o 3o 4o 4o 2+ | 21o | 12 5 6 7       | 15 27 27 9    | 108  | 14  | 0.8 |
| 25 | 1+ 1o 1+ 1+ 2- 2+ 2o 2- | 13- | 5 4 5 5        | 6 9 7 6       | 47   | 6   | 0.3 |
| 26 | 1- 3o 2+ 3- 2o 3+ 2- 2- | 17+ | 3 15 9 12      | 7 18 6 6      | 76   | 10  | 0.5 |
| 27 | 2- 2o 3o 2o 2+ 4- 5o 4- | 23+ | 6 7 15 7       | 9 22 48 22    | 136  | 17  | 0.9 |
| 28 | 4- 3- 3- 3- 3o 2+ 3o 2- | 22- | 22 12 12 12    | 15 9 15 6     | 103  | 13  | 0.7 |
| 29 | 3+ 2+ 2o 2+ 3o 2+ 2o 3- | 20o | 18 9 7 9       | 15 9 7 12     | 86   | 11  | 0.6 |
| 30 | 1o 1+ 1o 1o 1o 0+ 0+ 0+ | 6+  | 4 5 4 4        | 4 2 2 2       | 27   | 3   | 0.1 |



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

|    | Kp                    | Sum | July 1972   | ap          | Sum | Ap | Cp  |
|----|-----------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 1-0o 1o 1o 3-1+2o 1o  | 10- | 3 0 4 4     | 12 5 7 4    | 39  | 5  | 0.2 |
| 2  | 1o 2-1-1- 1+3-2+3o    | 13+ | 4 6 3 3     | 5 12 9 15   | 57  | 7  | 0.4 |
| 3  | 3+2+2o 1- 2-1+1+2-    | 14+ | 18 9 7 3    | 6 5 5 6     | 59  | 7  | 0.4 |
| 4  | 1+1+1-0+ 1+1+0+1o     | 8-  | 5 5 3 2     | 5 5 2 4     | 31  | 4  | 0.1 |
| 5  | 1-1-0+0+ 0+1-1o 1-    | 5-  | 3 3 2 2     | 2 3 4 3     | 22  | 3  | 0.0 |
| 6  | 1+1-1-0+ 0+1-1o 2o    | 7o  | 5 3 3 2     | 2 3 4 7     | 29  | 4  | 0.1 |
| 7  | 2o 2+2-2- 2+3o 3o 3o  | 19o | 7 9 6 6     | 9 15 15 15  | 82  | 10 | 0.6 |
| 8  | 3o 3+3+2o 2-1+1o 1-   | 16+ | 15 18 18 7  | 6 5 4 3     | 76  | 10 | 0.5 |
| 9  | 1o 1o 1-2o 3-2o 1+2+  | 13o | 4 4 3 7     | 12 7 5 9    | 51  | 6  | 0.3 |
| 10 | 3-2o 2-1o 2o 1+3-2-   | 15o | 12 7 6 4    | 7 5 12 6    | 59  | 7  | 0.4 |
| 11 | 1o 1+2+1+ 1+1o 3-2o   | 13o | 4 5 9 5     | 5 4 12 7    | 51  | 6  | 0.3 |
| 12 | 1o 1+2-2+ 3+1-1-2o    | 13o | 4 5 6 9     | 18 3 3 7    | 55  | 7  | 0.3 |
| 13 | 1-1+0+0+ 1o 1o 0+1o   | 6o  | 3 5 2 2     | 4 4 2 4     | 26  | 3  | 0.1 |
| 14 | 1o 1-1-0+ 0+1-1o 1o   | 6-  | 4 3 3 2     | 2 3 4 4     | 25  | 3  | 0.1 |
| 15 | 2+1+1+0+ 0+1-2-3-     | 11- | 9 5 5 2     | 2 3 6 12    | 44  | 6  | 0.2 |
| 16 | 3-2+2o 1- 2-2+3o 2o   | 17- | 12 9 7 3    | 6 9 15 7    | 68  | 8  | 0.5 |
| 17 | 2+2+2o 1o 1+1o 2+3o   | 15+ | 9 9 7 4     | 5 4 9 15    | 62  | 8  | 0.4 |
| 18 | 2o 2o 2-2- 1-1+1-1o   | 11o | 7 7 6 6     | 3 5 3 4     | 41  | 5  | 0.2 |
| 19 | 1-2-1+2+ 1+2o 3o 3+   | 16- | 3 6 5 9     | 5 7 15 18   | 68  | 8  | 0.5 |
| 20 | 1+2-2o 2o 1+1+1-1-    | 11o | 5 6 7 7     | 5 5 3 3     | 41  | 5  | 0.2 |
| 21 | 1o 1o 0+0+ 0o 1-1o 1- | 5o  | 4 4 2 2     | 0 3 4 3     | 22  | 3  | 0.0 |
| 22 | 1-0+0+0+ 1o 3o 4+3+   | 13+ | 3 2 2 2     | 4 15 32 18  | 78  | 10 | 0.5 |
| 23 | 1+3-2o 3o 3-3-2+1o    | 18- | 5 12 7 15   | 12 12 9 4   | 76  | 10 | 0.5 |
| 24 | 1-0o 1-3o 3-3o 4-6-   | 19+ | 3 0 3 15    | 12 15 22 67 | 137 | 17 | 0.9 |
| 25 | 4+5-5-4+ 5+3-2o 5o    | 33o | 32 39 39 32 | 56 12 7 48  | 265 | 33 | 1.3 |
| 26 | 3o 2o 4+3+ 3o 4o 2+3o | 25o | 15 7 32 18  | 15 27 9 15  | 138 | 17 | 0.9 |
| 27 | 2-4-3+2o 1+2o 1-1o    | 16- | 6 22 18 7   | 5 7 3 4     | 72  | 9  | 0.5 |
| 28 | 2-2-1+2o 1o 1o 1-1o   | 10+ | 6 6 5 7     | 4 4 3 4     | 39  | 5  | 0.2 |
| 29 | 0+1o 1-1o 0+1+1+1o    | 7o  | 2 4 3 4     | 2 5 5 4     | 29  | 4  | 0.1 |
| 30 | 0o 0+0+1- 1+2o 2-2-   | 8o  | 0 2 2 3     | 5 7 6 6     | 31  | 4  | 0.1 |
| 31 | 1o 1o 1o 0+ 0+0+3o 3- | 10- | 4 4 4 2     | 2 2 15 12   | 45  | 6  | 0.3 |

|    | Kp                    | Sum | Aug. 1972       | ap             | Sum  | Ap  | Cp  |
|----|-----------------------|-----|-----------------|----------------|------|-----|-----|
| 1  | 3+4o 2o 2- 2-1+1+2-   | 17o | 18 27 7 6       | 6 5 5 6        | 80   | 10  | 0.6 |
| 2  | 2+2-2-1o 1-1o 1o 1o   | 10+ | 9 6 6 4         | 3 4 4 4        | 40   | 5   | 0.2 |
| 3  | 0+1o 1o 2- 2-2o 1+1-  | 10- | 2 4 4 6         | 6 7 5 3        | 37   | 5   | 0.2 |
| 4  | 6-8+7o 4o 5+4o 7-9o   | 50o | 67 236 132 27   | 56 27 111 400  | 1056 | 132 | 1.9 |
| 5  | 8+8+7o 7+ 8-9-7+6-    | 60+ | 236 236 132 154 | 179 300 154 67 | 1458 | 182 | 2.1 |
| 6  | 7+7o 7o 5+ 5-5+7-3+   | 47- | 154 132 132 56  | 39 56 111 18   | 698  | 87  | 1.8 |
| 7  | 5-4+3+3o 3-4o 2+2o    | 26+ | 39 32 18 15     | 12 27 9 7      | 159  | 20  | 1.0 |
| 8  | 1+1-0+1- 3-2+2+4o     | 15- | 5 3 2 3         | 12 9 9 32      | 75   | 9   | 0.5 |
| 9  | 5-7-7-8+ 4o 4+3+3+    | 41+ | 39 111 111 236  | 27 32 18 18    | 592  | 74  | 1.8 |
| 10 | 2+2-3-3+ 4+4o 3o 4o   | 25+ | 9 6 12 18       | 32 27 15 27    | 146  | 18  | 1.0 |
| 11 | 3+3+2+2+ 3+3+4-4o     | 26- | 18 18 9 9       | 18 18 22 27    | 139  | 17  | 0.9 |
| 12 | 2+2+1o 1+ 1+2+2-2o    | 14+ | 9 9 4 5         | 5 9 6 7        | 54   | 7   | 0.3 |
| 13 | 1o 2-1+1- 0+2+1+1+    | 10o | 4 6 5 3         | 2 9 5 5        | 39   | 5   | 0.2 |
| 14 | 2+2-1o 2o 3+2+2+2o    | 17o | 9 6 4 7         | 18 9 9 7       | 69   | 9   | 0.5 |
| 15 | 2o 2o 4o 2+ 1+1+2+2+  | 18- | 7 7 27 9        | 5 5 9 9        | 78   | 10  | 0.5 |
| 16 | 2+2-2+1o 1+1+1+1-     | 12o | 9 6 9 4         | 5 5 5 3        | 46   | 6   | 0.3 |
| 17 | 2o 0+2-2o 2o 2o 2-2o  | 14- | 7 2 6 7         | 7 7 6 7        | 49   | 6   | 0.3 |
| 18 | 2o 2-2o 3+ 3+3o 4-3o  | 21+ | 7 6 7 12        | 18 15 22 15    | 102  | 13  | 0.7 |
| 19 | 3o 4-2+1+ 3+4-3o 2o   | 22+ | 15 22 9 5       | 18 22 15 7     | 113  | 14  | 0.8 |
| 20 | 2o 2o 2-3o 3o 4+3+4o  | 23- | 7 7 6 15        | 15 22 18 27    | 117  | 15  | 0.8 |
| 21 | 3+3+3-3- 2+3-3+3+     | 24- | 18 18 12 12     | 9 12 18 18     | 117  | 15  | 0.8 |
| 22 | 2+2o 3+2+ 2o 1o 2-1o  | 16- | 9 7 18 9        | 7 4 6 4        | 64   | 8   | 0.4 |
| 23 | 1-1-1o 1- 0+0+1-0+    | 5-  | 3 3 4 3         | 2 2 3 2        | 22   | 3   | 0.0 |
| 24 | 0o 0+1-1o 1-1-1o 0o   | 4+  | 0 2 3 4         | 3 3 4 0        | 19   | 2   | 0.0 |
| 25 | 1+0o 2-1o 1-1-1-3o    | 9o  | 5 0 6 4         | 3 3 3 15       | 39   | 5   | 0.2 |
| 26 | 4-5-5-2- 2-3-3-3-     | 24+ | 22 39 39 6      | 6 12 12 12     | 148  | 18  | 1.0 |
| 27 | 4o 5+4+5- 4-3-1+1+    | 27+ | 27 56 32 39     | 22 12 5 5      | 198  | 25  | 1.2 |
| 28 | 1o 1o 1o 3- 3-3o 3-1+ | 15+ | 4 4 4 12        | 12 15 12 5     | 68   | 8   | 0.5 |
| 29 | 2-2o 1+2- 2-2-3o 2+   | 15+ | 6 7 5 6         | 6 6 15 9       | 60   | 8   | 0.4 |
| 30 | 3o 1-0+2o 2o 1+2o 2-  | 13o | 15 3 2 7        | 7 5 7 6        | 52   | 6   | 0.3 |
| 31 | 3-2+3-1- 1o 1+1o 1o   | 13- | 12 9 12 3       | 4 5 4 4        | 53   | 7   | 0.3 |

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

|    | Kp                      | Sum | Sept. 1972   | ap            | Sum | Ap | Cp  |
|----|-------------------------|-----|--------------|---------------|-----|----|-----|
| 1  | 2+ 2- 1+ 2- 1- 1- 1- 1+ | 10+ | 9 6 5 6      | 3 3 3 5       | 40  | 5  | 0.2 |
| 2  | 0+ 1- 2- 1+ 2- 2o 2+ 3- | 13- | 2 3 6 5      | 6 7 9 12      | 50  | 6  | 0.3 |
| 3  | 2+ 0+ 0+ 1+ 0+ 1o 2+ 2+ | 10+ | 9 2 2 5      | 2 4 9 9       | 42  | 5  | 0.2 |
| 4  | 1o 3- 2o 0+ 0+ 1o 2o 2o | 11+ | 4 12 7 2     | 2 4 7 7       | 45  | 6  | 0.3 |
| 5  | 2o 1+ 1o 1- 1- 1+ 1+ 1+ | 10- | 7 5 4 3      | 3 5 5 5       | 37  | 5  | 0.2 |
| 6  | 4- 2+ 2+ 2- 3- 2+ 2+ 2o | 19+ | 22 9 9 6     | 12 9 9 7      | 83  | 10 | 0.6 |
| 7  | 0+ 2+ 0+ 2o 2o 1+ 1- 1+ | 10+ | 2 9 2 7      | 7 5 3 5       | 40  | 5  | 0.2 |
| 8  | 2+ 2+ 2o 2+ 2+ 2o 2o 3- | 18o | 9 9 7 9      | 9 7 7 12      | 69  | 9  | 0.5 |
| 9  | 1+ 3- 2o 3- 2o 1- 1- 3- | 15- | 5 12 7 12    | 7 3 3 12      | 61  | 8  | 0.4 |
| 10 | 2+ 2+ 3- 3+ 3o 4- 4+ 2- | 23+ | 9 9 12 18    | 15 22 32 6    | 123 | 15 | 0.9 |
| 11 | 2- 2+ 3+ 4- 3- 2- 2+ 1+ | 19o | 6 9 18 22    | 12 6 9 5      | 87  | 11 | 0.6 |
| 12 | 1+ 3- 2o 2- 1o 1- 1- 0+ | 10+ | 5 12 7 6     | 4 3 3 2       | 42  | 5  | 0.2 |
| 13 | 1o 2- 3- 1+ 7- 6- 7+ 6- | 32o | 4 6 12 5     | 111 67 154 67 | 426 | 53 | 1.6 |
| 14 | 7- 8o 5- 1+ 2- 3+ 4o 3+ | 33o | 111 207 39 5 | 6 18 27 18    | 431 | 54 | 1.6 |
| 15 | 3+ 5- 4- 5o 4o 3o 2+ 3+ | 29+ | 18 39 22 48  | 27 15 9 18    | 196 | 24 | 1.2 |
| 16 | 3+ 3o 4- 3- 2- 4- 4+ 4o | 26+ | 18 15 22 12  | 6 22 32 27    | 154 | 19 | 1.0 |
| 17 | 5o 4o 4+ 4- 3+ 3+ 3- 4o | 30+ | 48 27 32 22  | 18 18 12 27   | 204 | 26 | 1.2 |
| 18 | 3+ 4- 4- 4o 2- 1+ 2+ 1+ | 21+ | 18 22 22 27  | 6 5 9 5       | 114 | 14 | 0.8 |
| 19 | 3o 3- 2+ 0+ 0+ 0+ 0+ 0+ | 10- | 15 12 9 2    | 2 2 2 2       | 46  | 6  | 0.3 |
| 20 | 0+ 2o 1- 2- 1- 0+ 1o 1- | 7+  | 2 7 3 6      | 3 2 4 3       | 30  | 4  | 0.1 |
| 21 | 2- 1o 0+ 1- 0+ 0+ 0o 0o | 4+  | 6 4 2 3      | 2 2 0 0       | 19  | 2  | 0.0 |
| 22 | 0o 1- 1+ 1o 1- 2o 2o 0o | 9+  | 0 3 5 4      | 3 7 7 6       | 35  | 4  | 0.2 |
| 23 | 1- 1+ 1o 3+ 4+ 3o 3- 3+ | 20- | 3 5 4 18     | 32 15 12 18   | 107 | 13 | 0.8 |
| 24 | 3o 3- 3o 2+ 3- 4o 4- 3+ | 25- | 15 12 15 9   | 12 27 22 18   | 130 | 16 | 0.9 |
| 25 | 2o 2+ 2o 2o 1- 1- 1- 2o | 12+ | 7 9 7 7      | 3 3 3 7       | 46  | 6  | 0.3 |
| 26 | 1+ 3- 2- 2o 2+ 2- 2- 2- | 15o | 5 12 6 7     | 9 6 6 6       | 57  | 7  | 0.4 |
| 27 | 3- 3o 2- 2- 2- 2- 2- 1- | 15- | 12 15 6 6    | 6 6 6 3       | 60  | 8  | 0.4 |
| 28 | 3- 2- 1o 2- 2- 1o 3o 3o | 16- | 12 6 4 6     | 6 4 15 15     | 68  | 8  | 0.5 |
| 29 | 4- 4- 4- 3- 3+ 4+ 5o 4- | 30o | 22 22 22 12  | 18 32 48 22   | 198 | 25 | 1.2 |
| 30 | 3o 3+ 2o 1- 0+ 1o 2o 2o | 14+ | 15 18 7 3    | 2 4 7 7       | 63  | 8  | 0.4 |

|    | Kp                      | Sum | Oct. 1972   | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 3o 3- 2- 1- 1- 1o 1+ 2o | 13o | 15 12 6 3   | 3 4 5 7     | 55  | 7  | 0.3 |
| 2  | 2- 1+ 1- 0+ 1o 1- 3- 2o | 10+ | 6 5 3 2     | 4 3 12 7    | 42  | 5  | 0.2 |
| 3  | 2- 1o 1- 0+ 0+ 1o 1o 2+ | 8+  | 6 4 3 2     | 2 4 4 9     | 34  | 4  | 0.1 |
| 4  | 3+ 2- 2+ 2+ 1- 1- 1- 0+ | 12o | 18 6 9 9    | 3 3 3 2     | 53  | 7  | 0.3 |
| 5  | 0+ 0o 0o 0+ 0o 0+ 1+ 1- | 3o  | 2 0 0 2     | 0 2 5 3     | 14  | 2  | 0.0 |
| 6  | 0o 0o 0o 0+ 0o 0+ 1o 1+ | 3o  | 0 0 0 2     | 0 2 4 5     | 13  | 2  | 0.0 |
| 7  | 0o 0+ 0o 2+ 1o 1- 3o 4o | 11+ | 0 2 0 9     | 4 3 15 27   | 60  | 8  | 0.4 |
| 8  | 3o 0o 0o 0o 0+ 1- 2+ 0+ | 7-  | 15 0 0 0    | 2 3 9 2     | 31  | 4  | 0.1 |
| 9  | 0o 0+ 1- 0o 1+ 1+ 3- 2o | 8+  | 0 2 3 0     | 5 5 12 7    | 34  | 4  | 0.1 |
| 10 | 2o 1o 1o 2- 2o 2o 2- 2+ | 14- | 7 4 4 6     | 7 7 6 9     | 50  | 6  | 0.3 |
| 11 | 5- 4+ 4o 3o 3+ 3- 1o 1o | 24o | 39 32 27 15 | 18 12 4 4   | 151 | 19 | 1.0 |
| 12 | 1o 1o 1o 3- 4o 5- 5- 5- | 24- | 4 4 4 12    | 27 39 39 39 | 168 | 21 | 1.1 |
| 13 | 5- 3+ 3- 4o 3o 2+ 4- 4o | 28- | 39 18 12 27 | 15 9 22 27  | 169 | 21 | 1.1 |
| 14 | 4+ 4o 4+ 4+ 4o 4+ 2o 3o | 30+ | 32 27 32 32 | 27 32 7 15  | 204 | 26 | 1.2 |
| 15 | 1+ 3- 1+ 2- 2o 1+ 2+ 3- | 15+ | 5 12 5 6    | 7 5 9 12    | 61  | 8  | 0.4 |
| 16 | 3o 4- 2+ 2+ 3- 3o 1o 2- | 20- | 15 22 9 9   | 12 15 4 6   | 92  | 12 | 0.7 |
| 17 | 1+ 0+ 0o 0+ 0o 0o 1- 1- | 3+  | 5 2 0 2     | 0 0 3 3     | 15  | 2  | 0.0 |
| 18 | 0+ 1+ 2o 3- 1+ 3+ 2o 4+ | 17+ | 2 5 7 12    | 5 18 7 32   | 88  | 11 | 0.6 |
| 19 | 6- 5+ 5o 4+ 3+ 4- 4- 2o | 33o | 67 56 48 32 | 18 22 22 7  | 272 | 34 | 1.3 |
| 20 | 3o 3+ 3+ 3o 2+ 3- 3+ 2+ | 23+ | 15 18 18 15 | 9 12 18 9   | 114 | 14 | 0.8 |
| 21 | 2- 3- 4o 3o 3+ 4o 3o 2o | 24- | 6 12 27 15  | 18 27 15 7  | 127 | 16 | 0.9 |
| 22 | 3o 2- 3- 3o 2o 3+ 3o 3+ | 22o | 15 6 12 15  | 7 18 15 18  | 106 | 13 | 0.8 |
| 23 | 4- 3o 4- 3+ 3o 3o 3o 4- | 26+ | 22 15 22 18 | 15 15 15 22 | 144 | 18 | 1.0 |
| 24 | 3+ 3o 2+ 2o 2o 3o 2+    | 20o | 18 15 9 7   | 7 15 7 9    | 87  | 11 | 0.6 |
| 25 | 1o 1o 2o 3- 2+ 1o 1o 2- | 13- | 4 4 7 12    | 9 4 4 6     | 50  | 6  | 0.3 |
| 26 | 1o 3- 3o 2+ 2- 1+ 2- 2o | 16- | 4 12 15 9   | 6 5 6 7     | 64  | 8  | 0.4 |
| 27 | 3+ 0+ 1o 1+ 2o 2o 2o 2- | 14- | 18 2 4 5    | 7 7 7 6     | 56  | 7  | 0.4 |
| 28 | 3- 3+ 4- 3+ 1+ 0+ 0+ 2o | 17o | 12 18 22 18 | 5 2 2 7     | 86  | 11 | 0.6 |
| 29 | 3- 3+ 5o 3- 3o 4o 3o 3+ | 27o | 12 18 48 12 | 15 27 15 18 | 165 | 21 | 1.1 |
| 30 | 4o 4o 4o 4- 4+ 2+ 1o 3- | 26o | 27 27 27 22 | 32 9 4 12   | 160 | 20 | 1.0 |
| 31 | 3- 2- 1o 0+ 1o 5+ 7- 5- | 23+ | 12 6 4 2    | 4 56 111 39 | 234 | 29 | 1.3 |

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

|    | Kp                      | Sum | Nov. 1972      | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|----------------|-------------|-----|----|-----|
| 1  | 8- 8o 8- 6+ 5+ 2o 5- 4o | 46- | 179 207 179 94 | 56 7 39 27  | 788 | 98 | 1.9 |
| 2  | 6- 5+ 4- 3+ 3o 5+ 5o 5+ | 37- | 67 56 22 18    | 15 56 48 56 | 338 | 42 | 1.5 |
| 3  | 5+ 3+ 3- 2- 0+ 0+ 1+ 1+ | 16+ | 56 18 12 6     | 2 2 5 5     | 106 | 13 | 0.8 |
| 4  | 2- 2o 1- 2- 0+ 2- 1+ 3- | 12o | 6 7 3 6        | 2 6 5 12    | 47  | 6  | 0.3 |
| 5  | 1+ 1o 0+ 1- 1o 1- 0+ 1o | 6+  | 5 4 2 3        | 4 3 2 4     | 27  | 3  | 0.1 |
| 6  | 2o 2+ 1- 3- 2o 2o 2o 2- | 15+ | 7 9 3 12       | 7 7 7 6     | 58  | 7  | 0.4 |
| 7  | 0+ 2- 2+ 3o 2- 1o 2o 2o | 14o | 2 6 9 15       | 6 4 7 7     | 56  | 7  | 0.4 |
| 8  | 2+ 2o 1o 2o 2- 1+ 1+ 3- | 14+ | 9 7 4 7        | 6 5 5 12    | 55  | 7  | 0.3 |
| 9  | 2o 1+ 2- 1+ 2- 2+ 3- 2- | 15- | 7 5 6 5        | 6 9 12 6    | 56  | 7  | 0.4 |
| 10 | 1+ 2- 1- 1- 1+ 1o 1- 1+ | 9-  | 5 6 3 3        | 5 4 3 5     | 34  | 4  | 0.1 |
| 11 | 3o 1o 1o 1o 3- 2+ 2o 1o | 14o | 15 4 4 4       | 12 9 7 4    | 59  | 7  | 0.4 |
| 12 | 1+ 2- 3o 2o 1o 2- 0+ 0+ | 11+ | 5 6 15 7       | 4 6 2 2     | 47  | 6  | 0.3 |
| 13 | 1+ 1o 1o 0+ 0+ 1- 1o 1o | 7-  | 5 4 4 2        | 2 3 4 4     | 28  | 4  | 0.1 |
| 14 | 1- 1- 1o 0+ 1o 1+ 1- 2- | 7+  | 3 3 4 2        | 4 5 3 6     | 30  | 4  | 0.1 |
| 15 | 2o 3- 2- 3- 4o 4o 3+ 4o | 24+ | 7 12 6 12      | 27 27 18 27 | 136 | 17 | 0.9 |
| 16 | 4o 5+ 4+ 4o 5- 4o 3o 4o | 33+ | 27 56 32 27    | 39 27 15 27 | 250 | 31 | 1.3 |
| 17 | 3- 3- 2- 3- 2+ 3+ 3o 3- | 21o | 12 12 6 12     | 9 18 15 12  | 96  | 12 | 0.7 |
| 18 | 3- 2o 3- 2- 2+ 3o 2o 1+ | 18- | 12 7 12 6      | 9 15 7 5    | 73  | 9  | 0.5 |
| 19 | 3o 3- 3o 2+ 2o 2o 3- 3- | 20+ | 15 12 15 9     | 7 7 12 12   | 89  | 11 | 0.6 |
| 20 | 4+ 4- 3+ 5- 4+ 5- 4- 2+ | 31o | 32 22 18 39    | 32 39 22 9  | 213 | 27 | 1.2 |
| 21 | 4- 3+ 2+ 1+ 1- 1o 2o 2- | 16o | 22 18 9 5      | 3 4 7 6     | 74  | 9  | 0.5 |
| 22 | 2o 1+ 1o 2o 3o 5- 3+ 3- | 20o | 7 5 4 7        | 15 39 18 12 | 107 | 13 | 0.8 |
| 23 | 3o 2+ 1+ 1+ 3o 4- 2+ 2o | 19o | 15 9 5 5       | 15 22 9 7   | 87  | 11 | 0.6 |
| 24 | 2+ 2+ 1+ 1+ 0+ 0+ 1o 1+ | 10+ | 9 9 5 5        | 2 2 4 5     | 41  | 5  | 0.2 |
| 25 | 2- 2- 1+ 2+ 2o 1+ 3- 3+ | 16+ | 6 6 5 9        | 7 5 12 18   | 68  | 8  | 0.5 |
| 26 | 5o 3- 2+ 3o 2+ 2o 2o 1o | 20+ | 48 12 9 15     | 9 7 7 4     | 111 | 14 | 0.8 |
| 27 | 3o 2o 1+ 1o 2- 3+ 3+ 3- | 18+ | 15 7 5 4       | 6 18 18 12  | 85  | 11 | 0.6 |
| 28 | 3+ 3- 1+ 1+ 4- 3+ 2+ 2o | 20o | 18 12 5 5      | 22 18 9 7   | 96  | 12 | 0.7 |
| 29 | 3o 4- 2- 1+ 1+ 2- 2+ 2o | 17o | 15 22 6 5      | 5 6 9 7     | 75  | 9  | 0.5 |
| 30 | 2o 0+ 0o 0+ 1o 1- 2+ 2+ | 9o  | 7 2 0 2        | 4 3 9 9     | 36  | 4  | 0.2 |

|    | Kp                      | Sum | Dec. 1972   | ap          | Sum | Ap | Cp  |
|----|-------------------------|-----|-------------|-------------|-----|----|-----|
| 1  | 3o 3- 2- 1- 0+ 1o 1- 0+ | 10+ | 15 12 6 3   | 2 4 3 2     | 47  | 6  | 0.3 |
| 2  | 1- 1+ 1+ 1+ 0+ 2+ 2o 1o | 10+ | 3 5 5 5     | 2 9 7 4     | 40  | 5  | 0.2 |
| 3  | 2o 2+ 2- 1o 1o 1+ 2+ 2o | 14- | 7 9 6 4     | 4 5 9 7     | 51  | 6  | 0.3 |
| 4  | 1+ 1+ 2o 1o 1- 1- 1- 1- | 8+  | 5 5 7 4     | 3 3 3 3     | 33  | 4  | 0.1 |
| 5  | 0+ 0o 0+ 0o 0o 0+ 0+ 1+ | 3-  | 2 0 2 0     | 0 2 2 5     | 13  | 2  | 0.0 |
| 6  | 1- 1- 0+ 0+ 0o 1- 1+ 1o | 5o  | 3 3 2 2     | 0 3 5 4     | 22  | 3  | 0.0 |
| 7  | 2o 2+ 3- 3o 3- 3- 2+ 0+ | 18o | 7 9 12 15   | 12 12 9 2   | 78  | 10 | 0.5 |
| 8  | 0+ 2o 1o 2o 1+ 2o 2o 2+ | 13o | 2 7 4 7     | 5 7 7 9     | 48  | 6  | 0.3 |
| 9  | 1+ 0o 1- 0+ 0+ 1o 1+ 2o | 7o  | 5 0 3 2     | 2 4 5 7     | 28  | 4  | 0.1 |
| 10 | 1+ 1- 1o 0o 0o 0o 1- 0+ | 4o  | 5 3 4 0     | 0 0 3 2     | 17  | 2  | 0.0 |
| 11 | 2- 1- 0+ 1- 1- 1- 0+ 1o | 6o  | 6 3 2 3     | 3 3 2 4     | 26  | 3  | 0.1 |
| 12 | 1o 1- 1- 1- 2- 1+ 2+ 4o | 12+ | 4 3 3 3     | 6 5 9 27    | 60  | 8  | 0.4 |
| 13 | 5+ 4o 4- 4- 4- 5- 4- 4o | 33- | 56 27 22 22 | 22 39 22 27 | 237 | 30 | 1.3 |
| 14 | 3- 3- 2- 1+ 3o 3- 2- 1o | 17- | 12 12 6 5   | 15 12 6 4   | 72  | 9  | 0.5 |
| 15 | 1o 3- 3o 4o 4- 2+ 4+ 7- | 28- | 4 12 15 27  | 22 9 32 111 | 232 | 29 | 1.3 |
| 16 | 4+ 5o 5- 4+ 4- 4- 5- 4o | 34+ | 32 48 39 32 | 22 22 39 27 | 261 | 33 | 1.3 |
| 17 | 3o 3- 3- 4- 3+ 2+ 2+ 2- | 22- | 15 12 12 22 | 18 9 9 6    | 103 | 13 | 0.7 |
| 18 | 2o 2o 2- 2o 3- 3- 2- 2o | 17- | 7 7 6 7     | 12 12 6 7   | 64  | 8  | 0.4 |
| 19 | 2- 2- 1+ 1o 1+ 3- 2- 3o | 14+ | 6 6 5 4     | 5 12 6 15   | 59  | 7  | 0.4 |
| 20 | 1+ 2o 1o 1+ 1- 0+ 1o 1o | 9-  | 5 7 4 5     | 3 2 4 4     | 34  | 4  | 0.1 |
| 21 | 0+ 0o 0o 0+ 1o 0o 0+ 1o | 3o  | 2 0 0 2     | 4 0 2 4     | 14  | 2  | 0.0 |
| 22 | 1o 0+ 1- 2o 3+ 3+ 4o 4+ | 19o | 4 2 3 7     | 18 18 27 32 | 111 | 14 | 0.8 |
| 23 | 5o 5o 4+ 3o 3- 3+ 5o 3o | 31+ | 48 48 32 15 | 12 18 48 15 | 236 | 30 | 1.3 |
| 24 | 5- 3+ 4- 3- 1+ 1- 0o 1- | 17o | 39 18 22 12 | 5 3 0 3     | 102 | 13 | 0.7 |
| 25 | 1+ 0+ 0+ 1- 1- 1- 1+ 2+ | 8-  | 5 2 2 3     | 3 3 5 9     | 32  | 4  | 0.1 |
| 26 | 0+ 2- 1o 1+ 2+ 1+ 1- 1o | 10- | 2 6 4 5     | 9 5 3 4     | 38  | 5  | 0.2 |
| 27 | 1o 2- 0+ 0o 0o 0o 0+ 0+ | 4-  | 4 6 2 0     | 0 0 2 2     | 16  | 2  | 0.0 |
| 28 | 0o 1o 0o 1o 2o 1+ 2+ 2- | 9+  | 0 4 0 4     | 7 5 9 6     | 35  | 4  | 0.2 |
| 29 | 3o 4- 3o 2- 2o 4- 3- 3+ | 23o | 15 22 15 6  | 7 22 12 18  | 117 | 15 | 0.8 |
| 30 | 3+ 3o 3- 4- 2+ 2+ 4+ 4+ | 26o | 18 15 12 22 | 9 9 32 32   | 149 | 19 | 1.0 |
| 31 | 2- 3+ 3o 3+ 2+ 2- 2o 4- | 21o | 6 18 15 18  | 9 6 7 22    | 101 | 13 | 0.7 |

TABLE 5 FREQUENCIES OF K<sub>p</sub> INDICES, 1972

| K <sub>p</sub> | Jan | Feb | Mch | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 <sup>o</sup> | 6   | 5   | 7   | 10  | 1   | 1   | 4   | 3   | 3   | 17  | 1   | 17  |
| +              | 17  | 22  | 13  | 16  | 17  | 13  | 26  | 9   | 20  | 20  | 15  | 27  |
| -              | 12  | 16  | 19  | 28  | 23  | 13  | 36  | 18  | 23  | 14  | 13  | 28  |
| 1 <sup>o</sup> | 27  | 27  | 23  | 14  | 23  | 24  | 38  | 22  | 13  | 24  | 23  | 25  |
| +              | 16  | 18  | 24  | 24  | 30  | 32  | 32  | 22  | 20  | 15  | 29  | 24  |
| -              | 20  | 25  | 22  | 32  | 27  | 30  | 20  | 25  | 28  | 15  | 24  | 18  |
| 2 <sup>o</sup> | 20  | 23  | 27  | 16  | 29  | 25  | 26  | 24  | 25  | 22  | 29  | 19  |
| +              | 24  | 21  | 17  | 21  | 27  | 24  | 16  | 25  | 24  | 17  | 21  | 16  |
| -              | 22  | 21  | 24  | 13  | 24  | 28  | 14  | 16  | 21  | 20  | 22  | 17  |
| 3 <sup>o</sup> | 19  | 21  | 19  | 14  | 21  | 14  | 16  | 12  | 11  | 24  | 15  | 12  |
| +              | 20  | 5   | 17  | 18  | 9   | 8   | 8   | 19  | 15  | 18  | 12  | 9   |
| -              | 18  | 8   | 10  | 11  | 8   | 6   | 2   | 7   | 14  | 9   | 7   | 13  |
| 4 <sup>o</sup> | 9   | 7   | 9   | 7   | 3   | 5   | 1   | 11  | 7   | 13  | 8   | 6   |
| +              | 6   | 4   | 2   | 5   | 2   | 4   | 4   | 5   | 5   | 8   | 3   | 7   |
| -              | 3   | 5   | 6   | 3   | .   | .   | 2   | 6   | 2   | 6   | 5   | 4   |
| 5 <sup>o</sup> | 1   | 2   | 4   | 4   | .   | 2   | 1   | .   | 3   | 2   | 2   | 4   |
| +              | 6   | 2   | 2   | 3   | 1   | 1   | 1   | 4   | .   | 2   | 6   | 1   |
| -              | 2   | .   | .   | 1   | .   | .   | 1   | 2   | 2   | 1   | 1   | .   |
| 6 <sup>o</sup> | .   | .   | 1   | .   | 1   | 1   | .   | .   | .   | .   | .   | .   |
| +              | .   | .   | 1   | .   | 1   | 2   | .   | .   | .   | .   | 1   | .   |
| -              | .   | .   | .   | .   | .   | 1   | 4   | 2   | .   | 1   | .   | 1   |
| 7 <sup>o</sup> | .   | .   | .   | .   | .   | 2   | 4   | .   | .   | .   | .   | .   |
| +              | .   | .   | 1   | .   | .   | 3   | 3   | 1   | .   | .   | .   | .   |
| -              | .   | .   | .   | 1   | .   | .   | 1   | .   | .   | .   | 2   | .   |
| 8 <sup>o</sup> | .   | .   | .   | .   | .   | .   | .   | .   | 1   | .   | 1   | .   |
| +              | .   | .   | .   | .   | .   | 1   | .   | 4   | .   | .   | .   | .   |
| -              | .   | .   | .   | .   | .   | .   | .   | 1   | .   | .   | .   | .   |
| 9 <sup>o</sup> | .   | .   | .   | .   | .   | .   | .   | 1   | .   | .   | .   | .   |
| +              | .   | .   | .   | .   | .   | .   | .   | 1   | .   | .   | .   | .   |
| -              | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   | .   |
| 0 <sup>+</sup> | 248 | 232 | 248 | 240 | 248 | 240 | 248 | 248 | 240 | 248 | 240 | 248 |

TABLE 6 MONTHLY AVERAGES OF A<sub>p</sub> AND C<sub>p</sub>, 1972

|                | Jan  | Feb  | Mch  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Year |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A <sub>p</sub> | 13   | 10   | 12   | 11   | 10   | 14   | 8    | 24   | 13   | 12   | 14   | 10   | 12.6 |
| C <sub>p</sub> | 0.62 | 0.52 | 0.59 | 0.53 | 0.49 | 0.55 | 0.36 | 0.69 | 0.58 | 0.59 | 0.59 | 0.45 | 0.55 |

TABLE 7 LIST OF MAGNETIC STORMS, 1972

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.<br>d. GMT       | Duration<br>Eighths | Number of Eighths with Kp= |          |       |
|-----------|----|----|----------------------|---------------------|----------------------------|----------|-------|
|           |    |    |                      |                     | 7- 7o 7+                   | 8- 8o 8+ | 9- 9o |
| Mch       | 06 | E8 | 06 21.08             | 5                   | . . 1                      | . . .    | . .   |
| May       | 15 | E7 | 15 18.49             | 3                   | . . .                      | 1 . .    | . .   |
| Jun       | 17 | E5 | 17 13.12             | 11                  | 1 2 3                      | . . 1    | . .   |
| Aug       | 04 | E1 | 04 01.19<br>04 02.20 | 3                   | . 1 .                      | . . 1    | . .   |
| Aug       | 04 | E7 | 04 20.54             | 17                  | 2 3 3                      | 1 . 2    | 1 1   |
| Aug       | 09 | E1 | 08 23.54             | 4                   | 2 . .                      | . . 1    | . .   |
| Sep       | 13 | E5 | 13 12.40             | 7                   | 2 . 1                      | . 1 .    | . .   |
| Oct       | 31 | E6 | 31 16.55             | 8                   | 1 . .                      | 2 1 .    | . .   |

TABLE 8 VERY QUIET INTERVALS, 1972

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

| First.....last<br>Eighth |    |    |     | Duration<br>Eighths | First.....last<br>Eighth |    |     |    | Duration<br>Eighths |    |    |    |
|--------------------------|----|----|-----|---------------------|--------------------------|----|-----|----|---------------------|----|----|----|
| Jan                      | 06 | E3 | 07  | E6                  | 12                       |    |     |    |                     |    |    |    |
|                          | 14 | E2 | 15  | E1                  | 8                        |    | 13  | E1 | 14                  | E8 | 16 |    |
| Feb                      | 08 | E6 | 09  | E6                  | 9                        |    | 20  | E5 | 22                  | E5 | 17 |    |
|                          | 28 | E8 | Mch | 01                  | E3                       | 12 |     | 28 | E5                  | 30 | E5 | 17 |
| Mch                      | 09 | E8 | 10  | E7                  | 8                        |    | Aug | 02 | E4                  | 03 | E3 | 8  |
|                          | 11 | E8 | 12  | E7                  | 8                        |    |     | 22 | E8                  | 25 | E2 | 19 |
|                          | 14 | E4 | 15  | E6                  | 11                       |    | Sep | 21 | E2                  | 22 | E5 | 12 |
| Apr                      | 02 | E5 | 03  | E7                  | 11                       |    | Oct | 04 | E5                  | 07 | E3 | 23 |
|                          | 09 | E2 | 10  | E1                  | 8                        |    |     | 17 | E1                  | 18 | E2 | 10 |
|                          | 24 | E6 | 26  | E7                  | 18                       |    | Nov | 05 | E1                  | 05 | E8 | 8  |
| May                      | 07 | E2 | 08  | E6                  | 13                       |    |     | 12 | E7                  | 14 | E7 | 17 |
|                          | 18 | E6 | 19  | E7                  | 10                       |    | Dec | 01 | E4                  | 02 | E5 | 10 |
|                          | 24 | E3 | 25  | E2                  | 8                        |    |     | 04 | E4                  | 06 | E8 | 21 |
| Jun                      | 09 | E5 | 10  | E8                  | 12                       |    |     | 10 | E1                  | 10 | E8 | 8  |
|                          | 11 | E2 | 12  | E4                  | 11                       |    |     | 11 | E2                  | 12 | E4 | 11 |
|                          | 30 | E1 | Jul | 01                  | E4                       | 12 |     | 20 | E3                  | 22 | E3 | 17 |
| Jul                      | 04 | E1 | 06  | E7                  | 23                       |    |     | 24 | E5                  | 25 | E7 | 11 |
|                          |    |    |     |                     |                          |    |     | 27 | E3                  | 28 | E4 | 10 |

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 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

1972

Rot-  
No.

1894



1895



Feb 12



1896



Mar 1



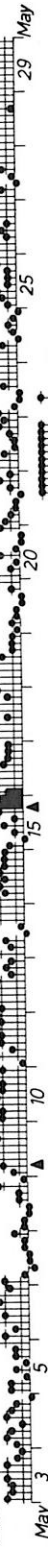
1897



Apr 6



1898



May 3



1899



May 30



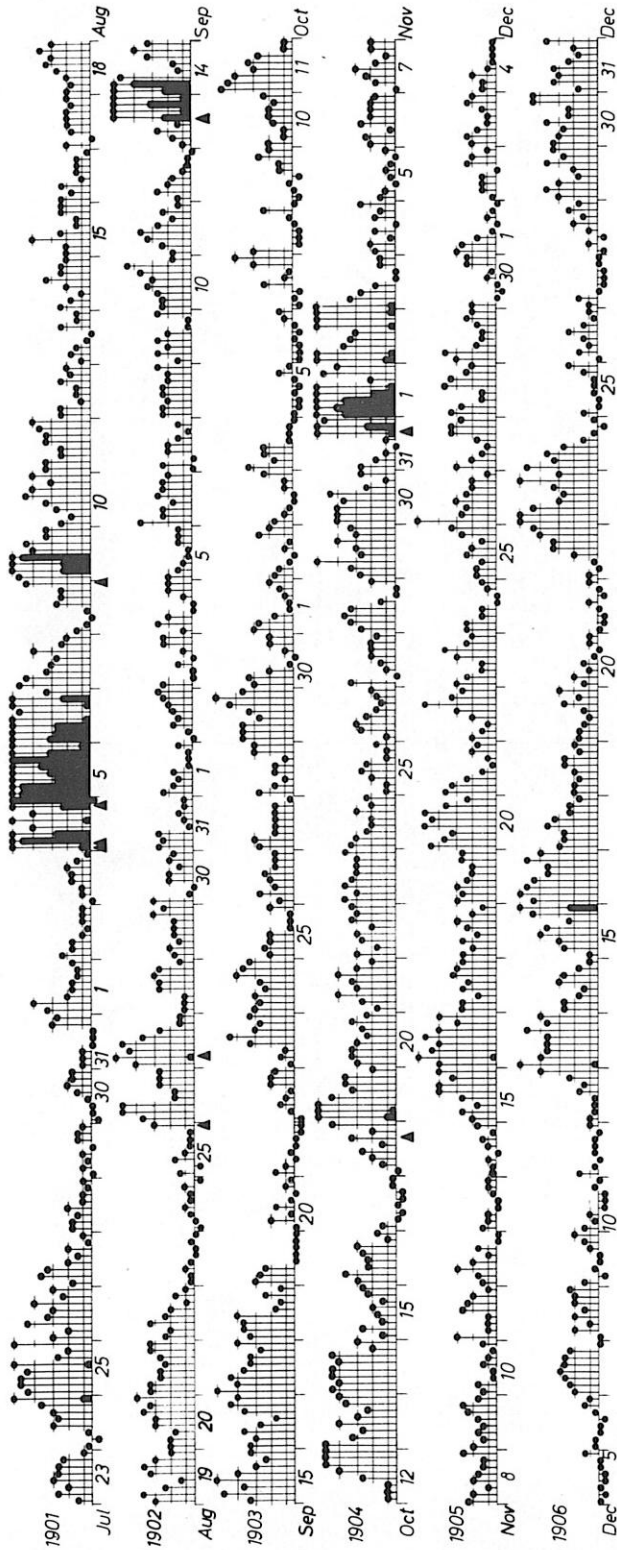
1900



Jun 26



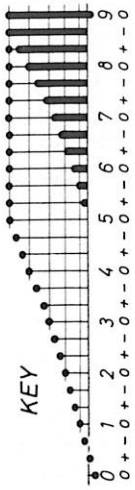




Kp (after Bartels)

1972

▲ = sudden commencement



| JAN. 1972 |    | 3 Kn |    |    |  |  |  |    |    |    |    | σn   |      |  |  |    |    |    |    |  |     | an  |    |    |  |    |     |  |  |  |  | An |  |  |  |  |  |  |  |  |  |
|-----------|----|------|----|----|--|--|--|----|----|----|----|------|------|--|--|----|----|----|----|--|-----|-----|----|----|--|----|-----|--|--|--|--|----|--|--|--|--|--|--|--|--|--|
| 1         | 5  | 2    | 4  | 3  |  |  |  | 4  | 5  | 8  | 8  | 3431 | 2335 |  |  | 11 | 5  | 8  | 6  |  | 8   | 11  | 21 | 22 |  | 12 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 2         | 6  | 4    | 5  | 4  |  |  |  | 3  | 8  | 12 | 3  | 3333 | 2331 |  |  | 14 | 9  | 12 | 10 |  | 6   | 21  | 51 | 6  |  | 16 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 3         | 1  | 4    | 8  | 5  |  |  |  | 3  | 4  | 5  | 3  | 3622 | 4321 |  |  | 3  | 9  | 26 | 12 |  | 6   | 9   | 11 | 6  |  | 10 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 4         | 8  | 8    | 9  | 5  |  |  |  | 1  | 3  | 4  | 7  | 3222 | 3135 |  |  | 21 | 26 | 28 | 11 |  | 3   | 6   | 8  | 18 |  | 15 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 5         | 5  | 5    | 5  | 6  |  |  |  | 6  | 5  | 3  | 0  | 2321 | 4311 |  |  | 12 | 11 | 11 | 14 |  | 15  | 12  | 7  | 0  |  | 10 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 6         | 1  | 6    | 2  | 0  |  |  |  | 1  | 0  | 0  | 1  | 4421 | 3202 |  |  | 3  | 14 | 5  | 0  |  | 3   | 1   | 0  | 2  |  | 4  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 7         | 5  | 2    | 0  | 1  |  |  |  | 3  | 2  | 8  | 4  | 4422 | 3253 |  |  | 11 | 4  | 1  | 2  |  | 6   | 5   | 23 | 9  |  | 8  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 8         | 4  | 3    | 1  | 2  |  |  |  | 1  | 4  | 5  | 3  | 3232 | 3142 |  |  | 8  | 6  | 2  | 4  |  | 3   | 8   | 12 | 7  |  | 6  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 9         | 5  | 4    | 2  | 3  |  |  |  | 5  | 4  | 5  | 4  | 3233 | 4244 |  |  | 13 | 10 | 4  | 6  |  | 11  | 8   | 12 | 10 |  | 9  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 10        | 7  | 3    | 0  | 0  |  |  |  | 1  | 8  | 8  | 8  | 3212 | 2672 |  |  | 17 | 6  | 1  | 1  |  | 2   | 21  | 22 | 26 |  | 12 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 11        | 12 | 8    | 7  | 8  |  |  |  | 9  | 7  | 4  | 7  | 5234 | 3324 |  |  | 52 | 24 | 20 | 22 |  | 28  | 18  | 9  | 19 |  | 24 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 12        | 6  | 3    | 2  | 2  |  |  |  | 6  | 3  | 3  | 3  | 2223 | 4323 |  |  | 16 | 7  | 5  | 5  |  | 15  | 6   | 7  | 7  |  | 9  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 13        | 6  | 1    | 1  | 1  |  |  |  | 3  | 2  | 3  | 4  | 4322 | 2224 |  |  | 15 | 3  | 2  | 2  |  | 7   | 4   | 6  | 8  |  | 6  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 14        | 5  | 2    | 0  | 0  |  |  |  | 2  | 1  | 3  | 3  | 3212 | 2333 |  |  | 12 | 5  | 1  | 1  |  | 4   | 2   | 7  | 6  |  | 5  |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 15        | 3  | 6    | 5  | 9  |  |  |  | 14 | 14 | 12 | 4  | 4221 | 3573 |  |  | 6  | 14 | 13 | 28 |  | 73  | 76  | 57 | 10 |  | 35 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 16        | 8  | 8    | 8  | 14 |  |  |  | 11 | 16 | 12 | 8  | 4333 | 4152 |  |  | 24 | 26 | 25 | 80 |  | 50  | 109 | 57 | 23 |  | 49 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 17        | 10 | 11   | 7  | 5  |  |  |  | 8  | 10 | 12 | 7  | 3312 | 3333 |  |  | 37 | 41 | 18 | 13 |  | 26  | 40  | 57 | 18 |  | 31 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 18        | 10 | 11   | 9  | 9  |  |  |  | 12 | 12 | 8  | 6  | 4621 | 6533 |  |  | 37 | 50 | 28 | 29 |  | 54  | 58  | 22 | 14 |  | 37 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 19        | 8  | 7    | 5  | 6  |  |  |  | 8  | 10 | 5  | 5  | 3321 | 2441 |  |  | 21 | 17 | 12 | 15 |  | 23  | 37  | 13 | 13 |  | 19 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 20        | 3  | 7    | 7  | 7  |  |  |  | 7  | 9  | 7  | 5  | 2354 | 5625 |  |  | 7  | 20 | 18 | 18 |  | 18  | 31  | 18 | 13 |  | 18 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 21        | 5  | 4    | 7  | 12 |  |  |  | 17 | 14 | 5  | 5  | 3345 | 4532 |  |  | 11 | 10 | 17 | 51 |  | 124 | 81  | 13 | 13 |  | 40 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 22        | 9  | 9    | 10 | 9  |  |  |  | 9  | 12 | 12 | 12 | 2365 | 3122 |  |  | 33 | 30 | 38 | 31 |  | 30  | 55  | 55 | 56 |  | 41 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 23        | 14 | 12   | 11 | 10 |  |  |  | 10 | 7  | 10 | 10 | 2232 | 4265 |  |  | 71 | 58 | 46 | 36 |  | 38  | 19  | 40 | 39 |  | 43 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 24        | 6  | 5    | 5  | 8  |  |  |  | 3  | 4  | 10 | 7  | 5222 | 3265 |  |  | 14 | 12 | 12 | 25 |  | 7   | 10  | 38 | 19 |  | 17 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 25        | 4  | 9    | 8  | 7  |  |  |  | 8  | 10 | 10 | 10 | 3123 | 3634 |  |  | 8  | 27 | 25 | 17 |  | 23  | 35  | 36 | 40 |  | 26 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 26        | 10 | 9    | 9  | 15 |  |  |  | 8  | 10 | 10 | 7  | 3621 | 4664 |  |  | 34 | 32 | 27 | 89 |  | 23  | 37  | 34 | 20 |  | 37 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 27        | 5  | 6    | 9  | 9  |  |  |  | 11 | 9  | 9  | 7  | 2143 | 3144 |  |  | 12 | 15 | 33 | 28 |  | 44  | 32  | 31 | 20 |  | 27 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 28        | 5  | 5    | 8  | 11 |  |  |  | 7  | 12 | 14 | 10 | 2223 | 3363 |  |  | 12 | 13 | 21 | 42 |  | 20  | 55  | 78 | 37 |  | 35 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 29        | 6  | 10   | 4  | 4  |  |  |  | 10 | 11 | 9  | 8  | 1523 | 4323 |  |  | 15 | 36 | 9  | 10 |  | 39  | 44  | 29 | 24 |  | 26 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 30        | 8  | 6    | 3  | 3  |  |  |  | 4  | 4  | 3  | 9  | 3311 | 2545 |  |  | 26 | 14 | 6  | 6  |  | 10  | 10  | 7  | 29 |  | 14 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
| 31        | 4  | 6    | 0  | 1  |  |  |  | 4  | 9  | 7  | 4  | 3422 | 2743 |  |  | 10 | 15 | 1  | 2  |  | 10  | 30  | 20 | 9  |  | 12 |     |  |  |  |  |    |  |  |  |  |  |  |  |  |  |
|           |    |      |    |    |  |  |  |    |    |    |    |      |      |  |  |    |    |    |    |  |     |     |    |    |  |    | 21. |  |  |  |  |    |  |  |  |  |  |  |  |  |  |

| JAN. 1972 |    | 3 Ks |    |    |    |    |    |    |   | Os   |      |    |    | as |    |     |    |    |    |     |     | As |  |
|-----------|----|------|----|----|----|----|----|----|---|------|------|----|----|----|----|-----|----|----|----|-----|-----|----|--|
| 1         |    | 4    | 3  | 4  | 4  | 3  | 4  | 10 | 8 | 3011 | 0344 | 10 | 7  | 8  | 8  | 7   | 10 | 34 | 23 | 13  |     |    |  |
| 2         |    | 6    | 5  | 5  | 3  | 3  | 8  | 10 | 6 | 2121 | 3316 | 15 | 13 | 11 | 7  | 6   | 21 | 34 | 14 | 15  |     |    |  |
| 3         |    | 2    | 6  | 10 | 8  | 4  | 4  | 7  | 6 | 3112 | 1345 | 5  | 16 | 34 | 25 | 8   | 9  | 18 | 16 | 16  |     |    |  |
| 4         |    | 9    | 7  | 9  | 5  | 2  | 3  | 4  | 7 | 2121 | 2134 | 29 | 17 | 29 | 12 | 4   | 6  | 9  | 18 | 16  |     |    |  |
| 5         |    | 5    | 4  | 5  | 5  | 6  | 4  | 3  | 2 | 1132 | 0313 | 13 | 8  | 12 | 12 | 15  | 10 | 6  | 4  | 10  |     |    |  |
| 6         |    | 4    | 3  | 2  | 1  | 2  | 0  | 1  | 2 | 1033 | 2031 | 8  | 7  | 4  | 2  | 5   | 0  | 2  | 5  | 4   |     |    |  |
| 7         |    | 5    | 3  | 1  | 2  | 3  | 1  | 7  | 7 | 3123 | 1235 | 12 | 6  | 2  | 4  | 6   | 3  | 20 | 17 | 9   |     |    |  |
| 8         |    | 7    | 4  | 2  | 3  | 3  | 4  | 5  | 4 | 4132 | 2414 | 18 | 8  | 4  | 6  | 6   | 9  | 13 | 10 | 9   |     |    |  |
| 9         |    | 4    | 4  | 2  | 3  | 5  | 5  | 7  | 6 | 2233 | 3744 | 10 | 8  | 5  | 6  | 11  | 13 | 17 | 18 | 11  |     |    |  |
| 10        |    | 7    | 3  | 1  | 1  | 3  | 7  | 6  | 9 | 4122 | 2124 | 19 | 6  | 2  | 3  | 7   | 18 | 16 | 32 | 13  |     |    |  |
| 11        | 12 | 9    | 10 | 8  | 8  | 6  | 6  | 7  |   | 5211 | 1055 | 54 | 29 | 34 | 26 | 26  | 15 | 15 | 18 | 27  |     |    |  |
| 12        | 7  | 3    | 2  | 3  | 5  | 3  | 4  | 4  |   | 1221 | 3033 | 18 | 7  | 4  | 6  | 12  | 6  | 9  | 9  | 9   |     |    |  |
| 13        | 5  | 2    | 3  | 3  | 4  | 2  | 4  | 2  |   | 1101 | 3241 | 13 | 5  | 6  | 6  | 10  | 4  | 9  | 5  | 7   |     |    |  |
| 14        | 4  | 4    | 3  | 3  | 3  | 3  | 3  | 2  |   | 3131 | 1102 | 9  | 8  | 7  | 6  | 6   | 6  | 6  | 5  | 7   |     |    |  |
| 15        | 3  | 8    | 7  | 9  | 13 | 14 | 11 | 5  |   | 2411 | 3633 | 7  | 21 | 17 | 32 | 62  | 71 | 44 | 12 | 33  |     |    |  |
| 16        | 8  | 10   | 8  | 12 | 10 | 14 | 11 | 9  |   | 3131 | 3125 | 21 | 37 | 24 | 57 | 36  | 86 | 43 | 33 | 42  |     |    |  |
| 17        | 9  | 8    | 7  | 8  | 7  | 11 | 11 | 8  |   | 1114 | 3233 | 32 | 26 | 17 | 23 | 20  | 43 | 41 | 21 | 28  |     |    |  |
| 18        | 9  | 8    | 9  | 9  | 10 | 11 | 7  | 7  |   | 1211 | 1315 | 32 | 22 | 32 | 32 | 34  | 44 | 17 | 19 | 29  |     |    |  |
| 19        | 8  | 6    | 4  | 7  | 8  | 9  | 6  | 7  |   | 1221 | 4054 | 23 | 14 | 10 | 18 | 26  | 29 | 16 | 18 | 19  |     |    |  |
| 20        | 3  | 5    | 5  | 8  | 6  | 8  | 5  | 4  |   | 2312 | 2313 | 6  | 12 | 12 | 25 | 15  | 23 | 12 | 9  | 14  |     |    |  |
| 21        | 5  | 4    | 8  | 11 | 17 | 15 | 4  | 8  |   | 1143 | 4732 | 13 | 8  | 23 | 45 | 129 | 88 | 10 | 22 | 42  |     |    |  |
| 22        | 11 | 11   | 7  | 8  | 10 | 12 | 13 | 12 |   | 1311 | 2112 | 49 | 46 | 18 | 23 | 40  | 57 | 62 | 53 | 44  |     |    |  |
| 23        | 11 | 11   | 11 | 9  | 9  | 7  | 11 | 10 |   | 3212 | 4446 | 45 | 41 | 49 | 32 | 32  | 17 | 41 | 35 | 37  |     |    |  |
| 24        | 5  | 5    | 8  | 7  | 5  | 5  | 9  | 7  |   | 1123 | 4221 | 12 | 13 | 21 | 19 | 11  | 11 | 29 | 17 | 17  |     |    |  |
| 25        | 4  | 9    | 9  | 8  | 8  | 9  | 10 | 9  |   | 4001 | 2255 | 9  | 29 | 29 | 26 | 25  | 31 | 35 | 33 | 27  |     |    |  |
| 26        | 8  | 8    | 8  | 11 | 8  | 8  | 9  | 7  |   | 3523 | 1443 | 24 | 26 | 21 | 50 | 26  | 26 | 27 | 20 | 28  |     |    |  |
| 27        | 5  | 6    | 8  | 8  | 9  | 8  | 10 | 8  |   | 1522 | 0312 | 13 | 16 | 21 | 21 | 29  | 24 | 34 | 25 | 23  |     |    |  |
| 28        | 5  | 4    | 6  | 8  | 8  | 11 | 15 | 11 |   | 1114 | 4456 | 12 | 8  | 16 | 26 | 23  | 48 | 96 | 45 | 34  |     |    |  |
| 29        | 5  | 8    | 3  | 6  | 9  | 9  | 8  | 8  |   | 1225 | 4112 | 12 | 22 | 7  | 14 | 27  | 32 | 23 | 25 | 20  |     |    |  |
| 30        | 7  | 5    | 2  | 4  | 4  | 4  | 4  | 8  |   | 4233 | 1333 | 18 | 11 | 5  | 9  | 9   | 10 | 9  | 24 | 12  |     |    |  |
| 31        | 4  | 5    | 2  | 3  | 4  | 8  | 7  | 3  |   | 4321 | 2334 | 10 | 13 | 4  | 6  | 10  | 23 | 20 | 6  | 12. |     |    |  |
|           |    |      |    |    |    |    |    |    |   |      |      |    |    |    |    |     |    |    |    |     | 20. |    |  |



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|-----------|----|------|----|----|----|----|----|----|------|------|----|----|----|----|----|----|----|----|----|------|
| 1         | 1  | 1    | 4  | 7  | 9  | 7  | 3  | 6  | 3321 | 3523 | 2  | 3  | 10 | 18 | 30 | 19 | 7  | 15 | 13 |      |
| 2         | 7  | 8    | 9  | 8  | 9  | 8  | 7  | 3  | 2335 | 3223 | 18 | 21 | 31 | 23 | 33 | 24 | 20 | 10 | 23 |      |
| 3         | 5  | 5    | 2  | 6  | 8  | 11 | 7  | 4  | 3233 | 4551 | 13 | 12 | 4  | 14 | 25 | 43 | 17 | 8  | 17 |      |
| 4         | 6  | 7    | 8  | 8  | 7  | 3  | 3  | 4  | 1233 | 5453 | 15 | 17 | 23 | 23 | 19 | 6  | 6  | 9  | 15 |      |
| 5         | 2  | 3    | 4  | 5  | 4  | 4  | 7  | 6  | 4353 | 3533 | 5  | 6  | 9  | 13 | 10 | 10 | 18 | 15 | 11 |      |
| 6         | 3  | 4    | 4  | 4  | 1  | 3  | 9  | 6  | 2333 | 4354 | 6  | 9  | 10 | 9  | 3  | 6  | 28 | 15 | 11 |      |
| 7         | 5  | 2    | 5  | 2  | 4  | 6  | 6  | 11 | 3322 | 4314 | 13 | 5  | 11 | 5  | 8  | 15 | 16 | 43 | 15 |      |
| 8         | 8  | 8    | 3  | 5  | 4  | 4  | 0  | 2  | 2412 | 4422 | 26 | 22 | 7  | 13 | 8  | 8  | 1  | 5  | 11 |      |
| 9         | 1  | 2    | 2  | 1  | 2  | 3  | 6  | 4  | 3333 | 3533 | 3  | 4  | 4  | 3  | 4  | 7  | 15 | 9  | 6  |      |
| 10        | 8  | 7    | 5  | 2  | 6  | 7  | 9  | 8  | 2134 | 2224 | 26 | 17 | 11 | 5  | 14 | 17 | 33 | 26 | 19 |      |
| 11        | 4  | 3    | 6  | 9  | 7  | 5  | 3  | 4  | 1311 | 2332 | 9  | 6  | 14 | 28 | 19 | 12 | 6  | 9  | 13 |      |
| 12        | 6  | 6    | 3  | 1  | 1  | 1  | 1  | 2  | 4442 | 3223 | 15 | 14 | 6  | 3  | 3  | 2  | 2  | 5  | 6  |      |
| 13        | 3  | 5    | 4  | 13 | 12 | 13 | 11 | 12 | 4223 | 3541 | 6  | 12 | 8  | 65 | 54 | 66 | 45 | 59 | 39 |      |
| 14        | 10 | 9    | 8  | 7  | 3  | 7  | 9  | 8  | 2122 | 3345 | 36 | 31 | 24 | 19 | 6  | 20 | 27 | 32 | 24 |      |
| 15        | 6  | 11   | 9  | 8  | 8  | 4  | 5  | 8  | 1242 | 3222 | 15 | 46 | 30 | 24 | 25 | 8  | 13 | 22 | 23 |      |
| 16        | 8  | 6    | 5  | 5  | 6  | 7  | 3  | 4  | 2334 | 4614 | 23 | 16 | 12 | 13 | 14 | 18 | 7  | 8  | 14 |      |
| 17        | 5  | 4    | 3  | 9  | 12 | 15 | 15 | 11 | 3432 | 1464 | 13 | 9  | 6  | 28 | 58 | 90 | 91 | 47 | 43 |      |
| 18        | 8  | 7    | 8  | 4  | 1  | 2  | 4  | 12 | 3433 | 2234 | 21 | 18 | 22 | 8  | 2  | 5  | 8  | 56 | 18 |      |
| 19        | 13 | 5    | 3  | 1  | 7  | 9  | 8  | 4  | 2213 | 4143 | 70 | 11 | 7  | 3  | 18 | 29 | 23 | 8  | 21 |      |
| 20        | 9  | 9    | 6  | 7  | 8  | 4  | 2  | 5  | 1412 | 2322 | 30 | 29 | 16 | 19 | 21 | 10 | 4  | 13 | 18 |      |
| 21        | 6  | 8    | 5  | 5  | 7  | 8  | 7  | 1  | 1223 | 4342 | 15 | 21 | 13 | 11 | 19 | 22 | 18 | 3  | 15 |      |
| 22        | 1  | 1    | 5  | 4  | 3  | 6  | 1  | 5  | 3333 | 4423 | 3  | 3  | 12 | 10 | 7  | 15 | 3  | 12 | 8  |      |
| 23        | 3  | 4    | 3  | 4  | 5  | 6  | 9  | 7  | 3213 | 4314 | 6  | 9  | 7  | 10 | 12 | 15 | 28 | 20 | 13 |      |
| 24        | 6  | 7    | 11 | 15 | 14 | 15 | 12 | 10 | 4324 | 4553 | 16 | 20 | 50 | 93 | 86 | 96 | 58 | 36 | 57 |      |
| 25        | 11 | 10   | 8  | 6  | 10 | 11 | 9  | 8  | 3233 | 5454 | 44 | 37 | 23 | 15 | 36 | 41 | 27 | 22 | 31 |      |
| 26        | 8  | 4    | 5  | 3  | 3  | 2  | 6  | 3  | 3531 | 3253 | 23 | 10 | 11 | 7  | 6  | 5  | 16 | 6  | 11 |      |
| 27        | 1  | 1    | 1  | 4  | 4  | 2  | 7  | 9  | 3232 | 2344 | 3  | 2  | 3  | 10 | 8  | 5  | 20 | 30 | 10 |      |
| 28        | 4  | 7    | 6  | 4  | 2  | 2  | 4  | 4  | 3333 | 2334 | 8  | 19 | 14 | 10 | 5  | 4  | 8  | 8  | 10 |      |
| 29        | 1  | 2    | 3  | 1  | 0  | 0  | 1  | 2  | 3312 | 1114 | 2  | 5  | 6  | 2  | 1  | 1  | 2  | 4  | 3  |      |
|           |    |      |    |    |    |    |    |    |      |      |    |    |    |    |    |    |    |    |    | 17.9 |

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|-----------|----|------|----|----|----|----|----|----|------|------|----|----|----|-----|----|----|----|----|------|
| 1         | 0  | 1    | 4  | 7  | 9  | 7  | 4  | 7  | 1341 | 4144 | 1  | 3  | 10 | 18  | 29 | 18 | 10 | 20 | 14   |
| 2         | 6  | 8    | 9  | 5  | 8  | 8  | 8  | 4  | 2301 | 6123 | 15 | 25 | 29 | 13  | 24 | 23 | 22 | 10 | 20   |
| 3         | 7  | 5    | 3  | 7  | 9  | 10 | 4  | 3  | 4124 | 0131 | 18 | 13 | 7  | 17  | 29 | 37 | 8  | 6  | 17   |
| 4         | 6  | 8    | 6  | 7  | 5  | 2  | 3  | 4  | 0221 | 3313 | 15 | 22 | 15 | 17  | 12 | 5  | 6  | 9  | 13   |
| 5         | 3  | 2    | 4  | 4  | 4  | 5  | 8  | 5  | 2251 | 1311 | 6  | 4  | 8  | 8   | 9  | 12 | 26 | 13 | 11   |
| 6         | 1  | 5    | 4  | 4  | 1  | 2  | 9  | 6  | 1313 | 2133 | 2  | 12 | 8  | 10  | 2  | 5  | 28 | 14 | 10   |
| 7         | 3  | 3    | 4  | 1  | 3  | 5  | 8  | 11 | 0232 | 1323 | 6  | 6  | 10 | 3   | 7  | 12 | 25 | 44 | 14   |
| 8         | 8  | 8    | 4  | 5  | 5  | 3  | 1  | 4  | 2311 | 1034 | 22 | 21 | 8  | 13  | 13 | 6  | 3  | 9  | 12   |
| 9         | 3  | 2    | 1  | 0  | 1  | 2  | 6  | 5  | 1331 | 2303 | 6  | 5  | 2  | 1   | 2  | 4  | 15 | 12 | 6    |
| 10        | 8  | 8    | 7  | 3  | 5  | 6  | 11 | 8  | 2111 | 3013 | 25 | 23 | 18 | 7   | 12 | 15 | 45 | 21 | 21   |
| 11        | 5  | 4    | 8  | 9  | 7  | 4  | 3  | 4  | 3112 | 1454 | 12 | 8  | 26 | 29  | 18 | 9  | 7  | 9  | 15   |
| 12        | 5  | 3    | 1  | 3  | 3  | 3  | 0  | 2  | 3331 | 0102 | 12 | 6  | 2  | 6   | 6  | 6  | 0  | 4  | 5    |
| 13        | 4  | 5    | 6  | 13 | 10 | 11 | 11 | 11 | 1304 | 5424 | 8  | 13 | 15 | 63  | 39 | 49 | 42 | 49 | 35   |
| 14        | 8  | 7    | 8  | 6  | 4  | 5  | 8  | 8  | 4112 | 3163 | 23 | 17 | 23 | 16  | 9  | 12 | 25 | 24 | 19   |
| 15        | 6  | 8    | 8  | 8  | 8  | 3  | 3  | 6  | 0112 | 1123 | 15 | 23 | 23 | 25  | 26 | 6  | 7  | 14 | 17   |
| 16        | 8  | 5    | 4  | 6  | 5  | 5  | 5  | 4  | 3330 | 4313 | 25 | 12 | 9  | 15  | 13 | 13 | 12 | 9  | 14   |
| 17        | 6  | 3    | 3  | 9  | 10 | 14 | 12 | 10 | 0512 | 2625 | 15 | 7  | 7  | 29  | 40 | 71 | 57 | 40 | 33   |
| 18        | 7  | 6    | 6  | 2  | 0  | 1  | 3  | 12 | 4014 | 0311 | 18 | 15 | 16 | 5   | 0  | 2  | 7  | 53 | 15   |
| 19        | 12 | 4    | 5  | 2  | 7  | 9  | 6  | 5  | 4134 | 3323 | 53 | 8  | 12 | 5   | 18 | 27 | 16 | 12 | 19   |
| 20        | 8  | 6    | 7  | 8  | 6  | 3  | 2  | 6  | 1043 | 4220 | 26 | 15 | 18 | 24  | 15 | 7  | 4  | 15 | 16   |
| 21        | 5  | 7    | 3  | 4  | 8  | 8  | 4  | 2  | 2411 | 2233 | 12 | 18 | 6  | 9   | 22 | 21 | 10 | 5  | 13   |
| 22        | 1  | 2    | 4  | 6  | 2  | 5  | 2  | 5  | 3230 | 3122 | 3  | 4  | 10 | 15  | 4  | 13 | 4  | 11 | 8    |
| 23        | 4  | 3    | 3  | 5  | 4  | 5  | 8  | 5  | 1101 | 1132 | 8  | 6  | 6  | 13  | 9  | 13 | 21 | 12 | 11   |
| 24        | 5  | 7    | 12 | 16 | 14 | 14 | 14 | 10 | 2311 | 4453 | 11 | 20 | 57 | 106 | 79 | 79 | 71 | 36 | 57   |
| 25        | 11 | 8    | 8  | 5  | 8  | 9  | 8  | 5  | 2124 | 3421 | 43 | 23 | 22 | 13  | 24 | 27 | 21 | 13 | 23   |
| 26        | 9  | 2    | 3  | 0  | 1  | 1  | 5  | 2  | 6111 | 1322 | 31 | 5  | 7  | 1   | 2  | 2  | 12 | 4  | 8    |
| 27        | 0  | 0    | 0  | 4  | 2  | 1  | 7  | 8  | 1102 | 3352 | 1  | 1  | 0  | 10  | 4  | 2  | 17 | 25 | 8    |
| 28        | 4  | 5    | 6  | 4  | 2  | 1  | 2  | 5  | 4201 | 1322 | 10 | 11 | 15 | 8   | 5  | 2  | 4  | 11 | 8    |
| 29        | 3  | 4    | 3  | 1  | 0  | 0  | 1  | 3  | 5412 | 0031 | 7  | 9  | 7  | 2   | 0  | 0  | 3  | 6  | 16.1 |

| MAR. 1972 |  | 3 Kn |    |    |    |  |    |    |    | σn |      | an   |     |     |    |    |    |    |    | An |    |     |    |
|-----------|--|------|----|----|----|--|----|----|----|----|------|------|-----|-----|----|----|----|----|----|----|----|-----|----|
| 1         |  | 1    | 4  | 4  | 6  |  | 7  | 5  | 9  | 8  | 3221 | 2253 |     | 2   | 10 | 10 | 15 |    | 19 | 13 | 28 | 24  | 15 |
| 2         |  | 5    | 4  | 4  | 6  |  | 7  | 9  | 8  | 9  | 4335 | 2423 |     | 12  | 10 | 9  | 14 |    | 18 | 28 | 21 | 29  | 18 |
| 3         |  | 8    | 5  | 10 | 8  |  | 6  | 12 | 9  | 6  | 2242 | 4453 |     | 22  | 13 | 36 | 24 |    | 16 | 56 | 28 | 14  | 26 |
| 4         |  | 5    | 2  | 8  | 8  |  | 6  | 7  | 3  | 5  | 3353 | 2633 |     | 13  | 5  | 21 | 26 |    | 14 | 17 | 7  | 11  | 14 |
| 5         |  | 4    | 1  | 4  | 3  |  | 1  | 3  | 7  | 7  | 6231 | 3363 |     | 8   | 3  | 10 | 6  |    | 3  | 6  | 18 | 17  | 9  |
| 6         |  | 7    | 7  | 5  | 6  |  | 1  | 2  | 5  | 18 | 5434 | 4342 |     | 20  | 17 | 11 | 14 |    | 3  | 5  | 12 | 154 | 30 |
| 7         |  | 16   | 15 | 14 | 13 |  | 12 | 9  | 8  | 10 | 3152 | 2653 | 106 | 101 | 84 | 67 |    | 59 | 32 | 25 | 37 |     | 64 |
| 8         |  | 8    | 5  | 4  | 6  |  | 7  | 14 | 7  | 4  | 2251 | 3232 |     | 25  | 12 | 9  | 15 |    | 19 | 81 | 18 | 10  | 24 |
| 9         |  | 4    | 8  | 5  | 10 |  | 8  | 8  | 8  | 4  | 3324 | 4432 |     | 10  | 22 | 13 | 38 |    | 26 | 21 | 22 | 10  | 20 |
| 10        |  | 3    | 0  | 2  | 0  |  | 0  | 1  | 3  | 8  | 1222 | 1232 |     | 7   | 1  | 5  | 1  |    | 1  | 2  | 6  | 22  | 6  |
| 11        |  | 8    | 8  | 7  | 0  |  | 0  | 2  | 8  | 1  | 2232 | 2232 | 25  | 23  | 18 | 1  |    | 1  | 4  | 21 | 2  |     | 12 |
| 12        |  | 0    | 0  | 0  | 0  |  | 4  | 3  | 3  | 7  | 1202 | 1114 |     | 0   | 1  | 0  | 1  |    | 8  | 7  | 7  | 18  | 5  |
| 13        |  | 6    | 4  | 5  | 8  |  | 6  | 2  | 3  | 6  | 1322 | 2242 |     | 14  | 8  | 12 | 26 |    | 15 | 5  | 6  | 15  | 13 |
| 14        |  | 5    | 1  | 6  | 4  |  | 4  | 2  | 2  | 5  | 3344 | 2232 |     | 11  | 2  | 15 | 9  |    | 8  | 4  | 4  | 12  | 8  |
| 15        |  | 1    | 2  | 1  | 5  |  | 4  | 4  | 7  | 8  | 2434 | 3152 |     | 2   | 5  | 3  | 11 |    | 10 | 8  | 19 | 25  | 10 |
| 16        |  | 12   | 12 | 6  | 9  |  | 10 | 7  | 5  | 9  | 3234 | 5432 | 60  | 55  | 14 | 32 |    | 40 | 18 | 12 | 28 |     | 32 |
| 17        |  | 8    | 9  | 7  | 9  |  | 9  | 7  | 9  | 9  | 2421 | 1234 |     | 24  | 27 | 17 | 31 |    | 29 | 17 | 33 | 30  | 26 |
| 18        |  | 11   | 8  | 8  | 6  |  | 3  | 7  | 3  | 4  | 4452 | 4425 |     | 46  | 23 | 24 | 15 |    | 6  | 17 | 6  | 9   | 18 |
| 19        |  | 5    | 4  | 3  | 3  |  | 5  | 1  | 4  | 6  | 3433 | 4233 |     | 11  | 9  | 6  | 6  |    | 11 | 2  | 8  | 16  | 9  |
| 20        |  | 5    | 3  | 5  | 0  |  | 3  | 5  | 2  | 5  | 5422 | 1423 |     | 13  | 7  | 13 | 1  |    | 7  | 11 | 4  | 13  | 9  |
| 21        |  | 6    | 4  | 2  | 4  |  | 3  | 4  | 4  | 8  | 4433 | 3432 | 15  | 9   | 5  | 8  |    | 6  | 8  | 9  | 21 |     | 10 |
| 22        |  | 9    | 7  | 3  | 4  |  | 5  | 5  | 9  | 9  | 1323 | 3434 |     | 30  | 17 | 6  | 9  |    | 12 | 13 | 27 | 30  | 18 |
| 23        |  | 5    | 2  | 6  | 9  |  | 6  | 5  | 9  | 9  | 3414 | 3252 |     | 11  | 5  | 16 | 29 |    | 15 | 11 | 30 | 28  | 18 |
| 24        |  | 9    | 12 | 9  | 8  |  | 9  | 11 | 11 | 5  | 5133 | 2484 |     | 30  | 54 | 27 | 24 |    | 28 | 50 | 45 | 13  | 34 |
| 25        |  | 7    | 9  | 5  | 5  |  | 2  | 5  | 8  | 5  | 3132 | 3343 |     | 17  | 31 | 13 | 11 |    | 5  | 13 | 22 | 11  | 15 |
| 26        |  | 3    | 4  | 4  | 6  |  | 4  | 6  | 10 | 11 | 3211 | 3333 |     | 7   | 10 | 8  | 15 |    | 10 | 16 | 40 | 41  | 18 |
| 27        |  | 10   | 8  | 10 | 6  |  | 6  | 8  | 12 | 10 | 4424 | 2253 |     | 34  | 26 | 34 | 15 |    | 15 | 21 | 52 | 38  | 29 |
| 28        |  | 11   | 10 | 8  | 6  |  | 3  | 2  | 3  | 3  | 5333 | 3321 |     | 46  | 36 | 22 | 14 |    | 7  | 5  | 6  | 7   | 18 |
| 29        |  | 6    | 6  | 9  | 11 |  | 9  | 9  | 10 | 11 | 1234 | 4554 |     | 16  | 16 | 28 | 49 |    | 32 | 33 | 38 | 49  | 33 |
| 30        |  | 13   | 11 | 10 | 9  |  | 11 | 10 | 9  | 8  | 4524 | 5545 |     | 63  | 49 | 38 | 32 |    | 44 | 30 | 30 | 21  | 40 |
| 31        |  | 7    | 9  | 8  | 7  |  | 5  | 5  | 11 | 10 | 4624 | 2373 |     | 18  | 31 | 24 | 17 |    | 13 | 13 | 42 | 39  | 25 |

| MAR. 1972 |  | 3 Ks |    |    |    |  |    |    |    |    | Os   |       |  |     | as  |    |    |  |    |    |    |     |  |     |  |  | As |  |
|-----------|--|------|----|----|----|--|----|----|----|----|------|-------|--|-----|-----|----|----|--|----|----|----|-----|--|-----|--|--|----|--|
| 1         |  | 1    | 5  | 4  | 7  |  | 7  | 4  | 8  | 7  | 3111 | 1113  |  | 2   | 12  | 9  | 17 |  | 17 | 9  | 23 | 20  |  | 14  |  |  |    |  |
| 2         |  | 5    | 5  | 2  | 5  |  | 6  | 8  | 7  | 8  | 4213 | 12241 |  | 11  | 11  | 5  | 13 |  | 14 | 21 | 20 | 26  |  | 15  |  |  |    |  |
| 3         |  | 8    | 8  | 9  | 7  |  | 5  | 10 | 7  | 5  | 3311 | 3231  |  | 21  | 21  | 32 | 17 |  | 11 | 40 | 19 | 12  |  | 22  |  |  |    |  |
| 4         |  | 5    | 1  | 8  | 7  |  | 3  | 6  | 4  | 5  | 1325 | 2414  |  | 13  | 3   | 22 | 20 |  | 7  | 14 | 8  | 11  |  | 12  |  |  |    |  |
| 5         |  | 4    | 0  | 4  | 2  |  | 1  | 2  | 5  | 6  | 3153 | 3225  |  | 10  | 1   | 8  | 4  |  | 3  | 5  | 11 | 16  |  | 7   |  |  |    |  |
| 6         |  | 8    | 6  | 3  | 4  |  | 1  | 0  | 4  | 18 | 5023 | 2032  |  | 25  | 15  | 7  | 9  |  | 3  | 0  | 10 | 165 |  | 29  |  |  |    |  |
| 7         |  | 16   | 16 | 13 | 13 |  | 11 | 9  | 6  | 8  | 1114 | 3725  |  | 106 | 104 | 61 | 70 |  | 46 | 28 | 15 | 26  |  | 57  |  |  |    |  |
| 8         |  | 9    | 5  | 4  | 6  |  | 6  | 11 | 5  | 2  | 2132 | 0111  |  | 29  | 13  | 9  | 16 |  | 15 | 45 | 13 | 5   |  | 18  |  |  |    |  |
| 9         |  | 5    | 10 | 5  | 8  |  | 7  | 7  | 5  | 3  | 1111 | 3121  |  | 13  | 34  | 13 | 26 |  | 20 | 18 | 12 | 7   |  | 18  |  |  |    |  |
| 10        |  | 3    | 0  | 0  | 0  |  | 0  | 0  | 1  | 7  | 2001 | 0024  |  | 6   | 0   | 0  | 1  |  | 0  | 0  | 3  | 20  |  | 4   |  |  |    |  |
| 11        |  | 8    | 4  | 8  | 0  |  | 0  | 1  | 6  | 1  | 3330 | 0222  |  | 21  | 10  | 21 | 0  |  | 0  | 3  | 15 | 2   |  | 9   |  |  |    |  |
| 12        |  | 0    | 0  | 0  | 3  |  | 3  | 3  | 3  | 5  | 1101 | 1111  |  | 1   | 1   | 0  | 6  |  | 6  | 6  | 6  | 13  |  | 5   |  |  |    |  |
| 13        |  | 5    | 4  | 4  | 7  |  | 5  | 1  | 1  | 4  | 2131 | 1321  |  | 11  | 8   | 10 | 18 |  | 13 | 3  | 3  | 8   |  | 9   |  |  |    |  |
| 14        |  | 4    | 1  | 4  | 3  |  | 2  | 0  | 1  | 4  | 4231 | 2023  |  | 10  | 2   | 10 | 6  |  | 4  | 0  | 3  | 9   |  | 6   |  |  |    |  |
| 15        |  | 0    | 2  | 3  | 4  |  | 3  | 3  | 5  | 8  | 1124 | 2142  |  | 1   | 5   | 7  | 10 |  | 7  | 6  | 13 | 25  |  | 9   |  |  |    |  |
| 16        |  | 9    | 11 | 7  | 9  |  | 9  | 5  | 4  | 8  | 2141 | 1441  |  | 32  | 45  | 18 | 32 |  | 32 | 12 | 8  | 23  |  | 25  |  |  |    |  |
| 17        |  | 8    | 8  | 8  | 8  |  | 8  | 6  | 9  | 10 | 3121 | 3224  |  | 24  | 23  | 22 | 26 |  | 24 | 14 | 29 | 38  |  | 25  |  |  |    |  |
| 18        |  | 11   | 7  | 7  | 6  |  | 3  | 5  | 3  | 5  | 2442 | 1314  |  | 47  | 18  | 18 | 14 |  | 6  | 13 | 6  | 11  |  | 17  |  |  |    |  |
| 19        |  | 5    | 3  | 2  | 3  |  | 5  | 0  | 3  | 6  | 2341 | 4112  |  | 11  | 6   | 4  | 7  |  | 12 | 1  | 6  | 15  |  | 8   |  |  |    |  |
| 20        |  | 5    | 2  | 5  | 1  |  | 4  | 2  | 1  | 6  | 1123 | 5336  |  | 13  | 5   | 12 | 3  |  | 8  | 5  | 3  | 15  |  | 8   |  |  |    |  |
| 21        |  | 5    | 4  | 1  | 3  |  | 2  | 3  | 3  | 6  | 1120 | 3210  |  | 12  | 8   | 2  | 7  |  | 5  | 7  | 7  | 15  |  | 8   |  |  |    |  |
| 22        |  | 7    | 5  | 3  | 5  |  | 5  | 4  | 8  | 8  | 3111 | 1144  |  | 20  | 13  | 7  | 13 |  | 12 | 9  | 22 | 22  |  | 15  |  |  |    |  |
| 23        |  | 5    | 2  | 6  | 9  |  | 5  | 3  | 7  | 7  | 4312 | 3134  |  | 11  | 5   | 16 | 29 |  | 12 | 6  | 20 | 17  |  | 15  |  |  |    |  |
| 24        |  | 11   | 12 | 8  | 6  |  | 6  | 10 | 10 | 4  | 7621 | 4554  |  | 47  | 51  | 22 | 16 |  | 16 | 35 | 40 | 10  |  | 30  |  |  |    |  |
| 25        |  | 8    | 8  | 6  | 4  |  | 2  | 4  | 6  | 4  | 3101 | 3251  |  | 21  | 23  | 15 | 8  |  | 4  | 10 | 14 | 8   |  | 13  |  |  |    |  |
| 26        |  | 4    | 4  | 3  | 5  |  | 3  | 5  | 9  | 10 | 1402 | 1324  |  | 9   | 9   | 6  | 12 |  | 7  | 11 | 29 | 35  |  | 15  |  |  |    |  |
| 27        |  | 10   | 9  | 8  | 6  |  | 4  | 3  | 11 | 9  | 3514 | 3041  |  | 38  | 29  | 23 | 14 |  | 9  | 6  | 41 | 29  |  | 24  |  |  |    |  |
| 28        |  | 8    | 7  | 7  | 4  |  | 1  | 2  | 1  | 3  | 2413 | 2221  |  | 25  | 18  | 17 | 10 |  | 3  | 4  | 3  | 6   |  | 11  |  |  |    |  |
| 29        |  | 5    | 5  | 8  | 11 |  | 10 | 9  | 14 | 12 | 1114 | 3475  |  | 13  | 13  | 26 | 45 |  | 40 | 29 | 77 | 59  |  | 38  |  |  |    |  |
| 30        |  | 13   | 11 | 10 | 10 |  | 11 | 9  | 11 | 8  | 6531 | 6443  |  | 70  | 41  | 40 | 37 |  | 43 | 29 | 42 | 21  |  | 40  |  |  |    |  |
| 31        |  | 8    | 9  | 7  | 6  |  | 4  | 4  | 11 | 11 | 8714 | 3643  |  | 25  | 27  | 17 | 15 |  | 9  | 9  | 43 | 41  |  | 23  |  |  |    |  |
|           |  |      |    |    |    |  |    |    |    |    |      |       |  |     |     |    |    |  |    |    |    |     |  | 17. |  |  |    |  |

| MAR. 1972 |    |      |    |    |    |    |    |    |      | $\Sigma$ Km |     | am |    |    |    |    |     |      |    | Am | Am2 |
|-----------|----|------|----|----|----|----|----|----|------|-------------|-----|----|----|----|----|----|-----|------|----|----|-----|
|           |    | 3 Km |    |    |    |    |    |    |      |             |     |    |    |    |    |    |     |      |    |    |     |
| 1         | 1  | 5    | 4  | 6  | 7  | 5  | 8  | 8  | 14.7 | 2           | 11  | 10 | 16 | 18 | 11 | 26 | 22  | 15   | 11 |    |     |
| 2         | 5  | 4    | 3  | 6  | 6  | 8  | 7  | 9  | 16.0 | 12          | 10  | 7  | 14 | 16 | 25 | 20 | 28  | 17   | 19 |    |     |
| 3         | 8  | 7    | 10 | 8  | 5  | 11 | 8  | 5  | 20.7 | 22          | 17  | 34 | 21 | 13 | 48 | 23 | 13  | 24   | 21 |    |     |
| 4         | 5  | 2    | 8  | 8  | 5  | 6  | 4  | 5  | 14.3 | 13          | 4   | 22 | 23 | 11 | 16 | 8  | 11  | 14   | 14 |    |     |
| 5         | 4  | 1    | 4  | 2  | 1  | 2  | 6  | 6  | 8.7  | 9           | 2   | 9  | 5  | 3  | 5  | 14 | 16  | 8    | 11 |    |     |
| 6         | 8  | 6    | 4  | 5  | 1  | 1  | 5  | 18 | 16.0 | 23          | 16  | 9  | 12 | 3  | 3  | 11 | 160 | 30   | 39 |    |     |
| 7         | 16 | 15   | 14 | 13 | 12 | 9  | 7  | 9  | 31.7 | 106         | 103 | 72 | 69 | 52 | 30 | 20 | 31  | 60   | 45 |    |     |
| 8         | 9  | 5    | 4  | 6  | 7  | 13 | 6  | 3  | 17.7 | 27          | 12  | 9  | 15 | 17 | 63 | 16 | 7   | 21   | 24 |    |     |
| 9         | 5  | 9    | 5  | 9  | 8  | 7  | 7  | 4  | 18.0 | 12          | 28  | 13 | 32 | 23 | 19 | 17 | 9   | 19   | 17 |    |     |
| 10        | 3  | 0    | 1  | 0  | 0  | 0  | 2  | 8  | 4.7  | 7           | 1   | 2  | 1  | 0  | 1  | 4  | 21  | 5    | 10 |    |     |
| 11        | 8  | 7    | 7  | 0  | 0  | 2  | 7  | 1  | 10.7 | 23          | 17  | 20 | 1  | 1  | 4  | 18 | 2   | 11   | 7  |    |     |
| 12        | 0  | 0    | 0  | 2  | 3  | 3  | 3  | 6  | 5.7  | 1           | 1   | 0  | 4  | 7  | 6  | 6  | 16  | 5    | 7  |    |     |
| 13        | 5  | 4    | 5  | 8  | 6  | 2  | 2  | 5  | 12.3 | 12          | 8   | 11 | 22 | 14 | 4  | 5  | 12  | 11   | 10 |    |     |
| 14        | 4  | 1    | 5  | 3  | 3  | 1  | 1  | 5  | 7.7  | 10          | 2   | 12 | 7  | 6  | 2  | 3  | 11  | 7    | 7  |    |     |
| 15        | 1  | 2    | 2  | 4  | 4  | 3  | 6  | 8  | 10.0 | 2           | 5   | 5  | 10 | 9  | 7  | 16 | 25  | 10   | 15 |    |     |
| 16        | 11 | 11   | 6  | 9  | 10 | 6  | 4  | 8  | 21.7 | 46          | 50  | 16 | 32 | 36 | 15 | 10 | 26  | 29   | 24 |    |     |
| 17        | 8  | 8    | 7  | 9  | 8  | 6  | 9  | 10 | 21.7 | 24          | 25  | 19 | 28 | 26 | 16 | 31 | 34  | 25   | 25 |    |     |
| 18        | 11 | 8    | 8  | 6  | 3  | 6  | 3  | 4  | 16.3 | 47          | 21  | 21 | 14 | 6  | 15 | 6  | 10  | 18   | 17 |    |     |
| 19        | 5  | 3    | 2  | 3  | 5  | 1  | 3  | 6  | 9.3  | 11          | 7   | 5  | 7  | 12 | 2  | 7  | 15  | 8    | 9  |    |     |
| 20        | 5  | 3    | 5  | 1  | 3  | 4  | 1  | 6  | 9.3  | 13          | 6   | 13 | 2  | 7  | 8  | 3  | 14  | 8    | 8  |    |     |
| 21        | 5  | 4    | 1  | 3  | 2  | 4  | 4  | 8  | 10.0 | 13          | 9   | 3  | 7  | 5  | 8  | 8  | 18  | 9    | 10 |    |     |
| 22        | 8  | 6    | 3  | 5  | 5  | 5  | 8  | 7  | 16.0 | 25          | 15  | 7  | 11 | 12 | 11 | 24 | 26  | 16   | 14 |    |     |
| 23        | 5  | 2    | 6  | 9  | 5  | 4  | 8  | 8  | 15.7 | 11          | 5   | 16 | 29 | 13 | 8  | 25 | 23  | 16   | 21 |    |     |
| 24        | 10 | 12   | 8  | 7  | 8  | 11 | 11 | 5  | 24.0 | 39          | 52  | 25 | 20 | 22 | 42 | 42 | 12  | 32   | 25 |    |     |
| 25        | 7  | 9    | 6  | 4  | 2  | 5  | 7  | 4  | 14.7 | 19          | 27  | 14 | 9  | 4  | 12 | 18 | 10  | 14   | 17 |    |     |
| 26        | 4  | 4    | 3  | 6  | 4  | 5  | 10 | 10 | 15.3 | 8           | 9   | 7  | 14 | 9  | 13 | 35 | 38  | 17   | 18 |    |     |
| 27        | 10 | 9    | 9  | 6  | 5  | 6  | 11 | 9  | 21.7 | 36          | 28  | 28 | 15 | 12 | 14 | 47 | 33  | 27   | 25 |    |     |
| 28        | 10 | 9    | 7  | 5  | 2  | 2  | 2  | 3  | 13.3 | 36          | 27  | 20 | 12 | 5  | 4  | 5  | 6   | 14   | 20 |    |     |
| 29        | 6  | 6    | 9  | 11 | 10 | 9  | 12 | 12 | 25.0 | 15          | 15  | 27 | 47 | 36 | 31 | 58 | 54  | 35   | 31 |    |     |
| 30        | 13 | 11   | 10 | 10 | 11 | 10 | 10 | 8  | 27.7 | 67          | 45  | 39 | 34 | 43 | 35 | 36 | 21  | 40   | 37 |    |     |
| 31        | 8  | 9    | 8  | 6  | 5  | 5  | 11 | 10 | 20.7 | 21          | 29  | 21 | 16 | 11 | 11 | 43 | 40  | 24   | 25 |    |     |
|           |    |      |    |    |    |    |    |    |      |             |     |    |    |    |    |    |     | 19.0 |    |    |     |

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|-----------|----|------|----|----|----|----|----|----|-------------|----|----|----|----|----|----|----|----|------|-----|
|           |    | 3 Km |    |    |    |    |    |    | $\Sigma$ Km | am |    |    |    |    |    |    |    | Am   | Am2 |
| 1         | 5  | 4    | 11 | 6  | 8  | 5  | 9  | 13 | 20.3        | 11 | 9  | 43 | 16 | 22 | 13 | 30 | 69 | 27   | 28  |
| 2         | 7  | 14   | 6  | 5  | 1  | 1  | 4  | 4  | 14.0        | 20 | 76 | 14 | 12 | 3  | 3  | 10 | 9  | 18   | 18  |
| 3         | 1  | 2    | 2  | 0  | 0  | 1  | 4  | 7  | 5.7         | 3  | 5  | 4  | 1  | 0  | 2  | 9  | 20 | 6    | 10  |
| 4         | 9  | 8    | 7  | 5  | 11 | 10 | 9  | 7  | 22.0        | 29 | 24 | 20 | 12 | 46 | 38 | 31 | 17 | 27   | 24  |
| 5         | 9  | 11   | 10 | 9  | 10 | 4  | 2  | 3  | 19.3        | 29 | 41 | 40 | 27 | 34 | 9  | 5  | 7  | 24   | 23  |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    |      |     |
| 6         | 3  | 3    | 5  | 8  | 9  | 4  | 4  | 3  | 13.0        | 6  | 6  | 13 | 26 | 32 | 10 | 8  | 6  | 13   | 14  |
| 7         | 2  | 5    | 7  | 8  | 8  | 5  | 3  | 7  | 15.0        | 5  | 11 | 18 | 21 | 22 | 11 | 6  | 19 | 14   | 12  |
| 8         | 4  | 4    | 1  | 1  | 1  | 8  | 8  | 4  | 10.3        | 8  | 8  | 2  | 2  | 3  | 25 | 26 | 10 | 11   | 11  |
| 9         | 9  | 2    | 1  | 0  | 0  | 1  | 0  | 0  | 4.3         | 33 | 4  | 3  | 0  | 1  | 3  | 1  | 1  | 6    | 9   |
| 10        | 4  | 5    | 5  | 3  | 2  | 2  | 7  | 4  | 10.7        | 8  | 12 | 11 | 7  | 4  | 5  | 17 | 10 | 9    | 7   |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    |      |     |
| 11        | 3  | 6    | 4  | 4  | 1  | 2  | 4  | 4  | 9.3         | 7  | 14 | 10 | 8  | 2  | 4  | 9  | 8  | 8    | 9   |
| 12        | 4  | 6    | 5  | 5  | 6  | 8  | 8  | 9  | 17.0        | 9  | 16 | 12 | 12 | 16 | 21 | 26 | 28 | 18   | 15  |
| 13        | 9  | 7    | 7  | 5  | 6  | 4  | 9  | 6  | 17.7        | 32 | 18 | 17 | 13 | 16 | 10 | 27 | 14 | 18   | 19  |
| 14        | 6  | 6    | 7  | 5  | 4  | 5  | 1  | 5  | 13.0        | 16 | 16 | 19 | 11 | 9  | 11 | 2  | 11 | 12   | 13  |
| 15        | 5  | 4    | 7  | 3  | 4  | 5  | 5  | 6  | 13.0        | 12 | 9  | 18 | 7  | 8  | 11 | 12 | 15 | 12   | 11  |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    |      |     |
| 16        | 6  | 6    | 4  | 3  | 1  | 1  | 4  | 7  | 10.7        | 16 | 15 | 10 | 6  | 3  | 2  | 10 | 20 | 10   | 11  |
| 17        | 7  | 5    | 5  | 4  | 2  | 2  | 5  | 5  | 11.7        | 17 | 11 | 11 | 9  | 5  | 4  | 11 | 13 | 10   | 18  |
| 18        | 11 | 11   | 10 | 11 | 9  | 9  | 9  | 10 | 26.7        | 45 | 42 | 36 | 47 | 32 | 28 | 31 | 34 | 37   | 25  |
| 19        | 6  | 6    | 7  | 9  | 10 | 4  | 3  | 2  | 15.7        | 14 | 14 | 17 | 33 | 34 | 9  | 6  | 4  | 16   | 18  |
| 20        | 2  | 0    | 6  | 5  | 5  | 5  | 8  | 9  | 13.3        | 5  | 1  | 15 | 11 | 12 | 12 | 22 | 32 | 14   | 21  |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    |      |     |
| 21        | 13 | 9    | 9  | 9  | 8  | 9  | 7  | 1  | 21.7        | 70 | 32 | 33 | 31 | 25 | 32 | 19 | 3  | 31   | 21  |
| 22        | 1  | 1    | 1  | 1  | 6  | 8  | 10 | 11 | 13.0        | 3  | 2  | 2  | 3  | 14 | 21 | 37 | 44 | 16   | 17  |
| 23        | 7  | 5    | 8  | 7  | 7  | 4  | 4  | 8  | 16.7        | 18 | 12 | 22 | 19 | 18 | 8  | 10 | 25 | 17   | 18  |
| 24        | 2  | 2    | 6  | 5  | 5  | 4  | 1  | 2  | 9.0         | 4  | 5  | 14 | 11 | 11 | 8  | 3  | 4  | 8    | 9   |
| 25        | 2  | 2    | 1  | 3  | 1  | 2  | 1  | 2  | 4.7         | 4  | 4  | 3  | 6  | 3  | 4  | 3  | 5  | 4    | 4   |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    |      |     |
| 26        | 2  | 2    | 1  | 0  | 1  | 1  | 2  | 4  | 4.3         | 4  | 5  | 3  | 1  | 2  | 3  | 4  | 10 | 4    | 4   |
| 27        | 4  | 2    | 2  | 1  | 4  | 10 | 5  | 5  | 11.0        | 8  | 5  | 5  | 2  | 9  | 34 | 13 | 12 | 11   | 15  |
| 28        | 8  | 8    | 10 | 11 | 11 | 12 | 8  | 4  | 24.0        | 26 | 21 | 37 | 50 | 47 | 56 | 24 | 9  | 34   | 34  |
| 29        | 6  | 12   | 14 | 13 | 14 | 12 | 12 | 14 | 32.3        | 16 | 54 | 79 | 63 | 76 | 52 | 57 | 76 | 59   | 47  |
| 30        | 14 | 7    | 5  | 10 | 8  | 6  | 7  | 9  | 22.0        | 78 | 19 | 12 | 35 | 25 | 14 | 17 | 33 | 29   | 40  |
|           |    |      |    |    |    |    |    |    |             |    |    |    |    |    |    |    |    | 17.4 |     |

| APR. 1972 |    | 3 Kn |    |    |    |    |    |    | On   |      | an |    |    |    |    |    |    |    | An |      |
|-----------|----|------|----|----|----|----|----|----|------|------|----|----|----|----|----|----|----|----|----|------|
| 1         | 5  | 4    | 11 | 6  | 8  | 7  | 9  | 12 | 2334 | 3353 | 11 | 10 | 46 | 15 | 23 | 17 | 33 | 59 | 27 |      |
| 2         | 7  | 14   | 6  | 5  | 1  | 2  | 4  | 5  | 2513 | 4422 | 20 | 81 | 16 | 13 | 3  | 5  | 10 | 11 | 20 |      |
| 3         | 1  | 3    | 2  | 1  | 0  | 2  | 5  | 8  | 3432 | 1334 | 3  | 6  | 5  | 2  | 1  | 4  | 12 | 22 | 7  |      |
| 4         | 9  | 9    | 8  | 6  | 12 | 11 | 10 | 7  | 3221 | 1332 | 30 | 28 | 22 | 15 | 58 | 46 | 38 | 20 | 32 |      |
| 5         | 9  | 10   | 10 | 9  | 10 | 4  | 4  | 4  | 3222 | 3223 | 29 | 40 | 38 | 28 | 40 | 10 | 8  | 9  | 25 |      |
| 6         | 2  | 3    | 7  | 9  | 10 | 5  | 4  | 3  | 4451 | 3233 | 5  | 7  | 18 | 31 | 36 | 11 | 10 | 6  | 16 |      |
| 7         | 2  | 5    | 8  | 8  | 8  | 5  | 4  | 8  | 4533 | 3224 | 5  | 11 | 22 | 25 | 25 | 11 | 8  | 22 | 16 |      |
| 8         | 4  | 4    | 1  | 2  | 3  | 8  | 9  | 5  | 3532 | 3553 | 8  | 8  | 3  | 5  | 6  | 26 | 27 | 12 | 12 |      |
| 9         | 9  | 1    | 1  | 0  | 1  | 2  | 1  | 1  | 2421 | 2422 | 33 | 3  | 2  | 1  | 2  | 5  | 2  | 2  | 6  |      |
| 10        | 4  | 5    | 5  | 4  | 2  | 4  | 7  | 6  | 5433 | 3542 | 10 | 13 | 13 | 9  | 5  | 8  | 20 | 16 | 12 |      |
| 11        | 3  | 7    | 5  | 4  | 2  | 3  | 4  | 5  | 3622 | 2333 | 7  | 17 | 11 | 8  | 4  | 6  | 10 | 11 | 9  |      |
| 12        | 5  | 7    | 5  | 5  | 7  | 8  | 8  | 9  | 3432 | 3341 | 11 | 17 | 12 | 12 | 19 | 21 | 22 | 29 | 18 |      |
| 13        | 9  | 6    | 7  | 5  | 7  | 5  | 8  | 7  | 4122 | 3342 | 31 | 16 | 17 | 13 | 17 | 11 | 24 | 17 | 18 |      |
| 14        | 6  | 6    | 8  | 5  | 4  | 5  | 2  | 5  | 2342 | 2322 | 14 | 14 | 21 | 12 | 10 | 11 | 5  | 11 | 12 |      |
| 15        | 5  | 4    | 7  | 3  | 4  | 5  | 6  | 7  | 2473 | 3355 | 13 | 9  | 18 | 7  | 10 | 12 | 14 | 17 | 13 |      |
| 16        | 6  | 5    | 4  | 3  | 2  | 2  | 5  | 7  | 4231 | 2352 | 15 | 12 | 9  | 7  | 5  | 4  | 11 | 18 | 10 |      |
| 17        | 6  | 5    | 5  | 5  | 3  | 3  | 5  | 7  | 3233 | 3543 | 14 | 12 | 11 | 11 | 7  | 6  | 12 | 14 | 11 |      |
| 18        | 11 | 11   | 10 | 12 | 9  | 9  | 11 | 10 | 2236 | 2233 | 45 | 44 | 34 | 54 | 33 | 33 | 41 | 59 | 40 |      |
| 19        | 5  | 6    | 7  | 10 | 10 | 5  | 4  | 3  | 5331 | 2324 | 12 | 15 | 17 | 35 | 37 | 12 | 9  | 7  | 18 |      |
| 20        | 2  | 1    | 7  | 6  | 5  | 6  | 8  | 10 | 4233 | 2231 | 5  | 2  | 17 | 14 | 13 | 15 | 23 | 36 | 16 |      |
| 21        | 12 | 10   | 9  | 10 | 8  | 10 | 8  | 2  | 4554 | 2433 | 54 | 37 | 32 | 36 | 26 | 34 | 22 | 4  | 31 |      |
| 22        | 1  | 1    | 1  | 2  | 7  | 8  | 9  | 10 | 3433 | 3433 | 3  | 3  | 2  | 5  | 18 | 23 | 32 | 40 | 16 |      |
| 23        | 7  | 5    | 8  | 7  | 8  | 4  | 5  | 10 | 3433 | 3543 | 17 | 13 | 26 | 17 | 21 | 9  | 13 | 34 | 19 |      |
| 24        | 2  | 3    | 7  | 6  | 6  | 5  | 2  | 3  | 3422 | 2434 | 4  | 6  | 17 | 14 | 14 | 11 | 5  | 7  | 10 |      |
| 25        | 2  | 2    | 2  | 4  | 2  | 3  | 2  | 4  | 2443 | 2124 | 4  | 4  | 5  | 8  | 5  | 6  | 5  | 8  | 6  |      |
| 26        | 2  | 2    | 2  | 1  | 1  | 2  | 3  | 5  | 3433 | 3323 | 5  | 5  | 4  | 2  | 2  | 4  | 6  | 12 | 5  |      |
| 27        | 4  | 2    | 3  | 2  | 5  | 11 | 7  | 6  | 4334 | 3523 | 8  | 5  | 6  | 4  | 13 | 46 | 19 | 15 | 15 |      |
| 28        | 9  | 7    | 9  | 11 | 11 | 13 | 9  | 4  | 3235 | 2433 | 30 | 19 | 30 | 45 | 50 | 63 | 28 | 10 | 34 |      |
| 29        | 7  | 13   | 15 | 12 | 14 | 12 | 12 | 13 | 3355 | 7565 | 20 | 63 | 91 | 54 | 80 | 59 | 56 | 68 | 61 |      |
| 30        | 12 | 7    | 5  | 9  | 8  | 6  | 7  | 9  | 4324 | 3332 | 60 | 18 | 13 | 32 | 25 | 14 | 19 | 31 | 27 |      |
|           |    |      |    |    |    |    |    |    |      |      |    |    |    |    |    |    |    |    |    | 18.7 |

| APR. 1972 |    | 3 Ks |    |    |    |    |    |    | Os   |      | as |    |    |    |    |    |    | As |      |
|-----------|----|------|----|----|----|----|----|----|------|------|----|----|----|----|----|----|----|----|------|
| 1         | 5  | 3    | 10 | 7  | 7  | 4  | 9  | 14 | 2131 | 3143 | 11 | 7  | 40 | 17 | 20 | 9  | 27 | 78 | 26   |
| 2         | 7  | 14   | 5  | 4  | 1  | 1  | 4  | 3  | 4322 | 2230 | 19 | 71 | 12 | 10 | 3  | 2  | 10 | 6  | 17   |
| 3         | 1  | 2    | 2  | 0  | 0  | 0  | 3  | 7  | 2130 | 0124 | 3  | 5  | 4  | 0  | 0  | 1  | 7  | 17 | 5    |
| 4         | 9  | 8    | 7  | 4  | 10 | 9  | 8  | 5  | 0313 | 1411 | 29 | 21 | 18 | 10 | 34 | 29 | 23 | 13 | 22   |
| 5         | 9  | 11   | 11 | 8  | 9  | 3  | 1  | 2  | 2221 | 3131 | 29 | 42 | 43 | 26 | 27 | 7  | 2  | 5  | 23   |
| 6         | 3  | 3    | 3  | 8  | 9  | 4  | 3  | 2  | 2012 | 0111 | 6  | 6  | 7  | 21 | 29 | 9  | 7  | 5  | 11   |
| 7         | 2  | 4    | 6  | 7  | 7  | 4  | 2  | 7  | 3301 | 5214 | 5  | 10 | 15 | 17 | 19 | 10 | 5  | 17 | 12   |
| 8         | 4  | 4    | 0  | 0  | 0  | 8  | 8  | 3  | 4400 | 0442 | 8  | 9  | 0  | 0  | 0  | 24 | 24 | 7  | 9    |
| 9         | 10 | 2    | 1  | 0  | 0  | 1  | 0  | 0  | 4320 | 0200 | 34 | 4  | 3  | 0  | 0  | 2  | 0  | 0  | 5    |
| 10        | 3  | 5    | 4  | 2  | 1  | 1  | 6  | 2  | 1233 | 3253 | 6  | 11 | 9  | 4  | 3  | 2  | 14 | 5  | 7    |
| 11        | 4  | 5    | 4  | 3  | 0  | 0  | 4  | 3  | 4231 | 1161 | 8  | 11 | 10 | 7  | 1  | 1  | 9  | 6  | 7    |
| 12        | 4  | 6    | 5  | 5  | 5  | 8  | 9  | 8  | 4514 | 1521 | 8  | 16 | 12 | 12 | 13 | 21 | 29 | 26 | 17   |
| 13        | 10 | 7    | 7  | 5  | 6  | 4  | 9  | 5  | 4311 | 5301 | 34 | 20 | 17 | 13 | 15 | 10 | 29 | 12 | 19   |
| 14        | 7  | 7    | 7  | 4  | 3  | 4  | 0  | 4  | 4443 | 1203 | 18 | 18 | 18 | 10 | 7  | 10 | 0  | 10 | 11   |
| 15        | 5  | 4    | 7  | 3  | 3  | 4  | 4  | 5  | 4340 | 2136 | 11 | 9  | 18 | 7  | 6  | 9  | 10 | 13 | 10   |
| 16        | 7  | 7    | 4  | 2  | 1  | 0  | 4  | 8  | 4434 | 2115 | 18 | 18 | 10 | 4  | 2  | 1  | 8  | 22 | 10   |
| 17        | 7  | 4    | 4  | 4  | 1  | 0  | 4  | 4  | 5331 | 3123 | 19 | 9  | 10 | 8  | 3  | 1  | 10 | 9  | 9    |
| 18        | 11 | 11   | 10 | 10 | 9  | 8  | 8  | 9  | 3332 | 4623 | 45 | 41 | 38 | 40 | 32 | 23 | 21 | 28 | 34   |
| 19        | 7  | 5    | 6  | 9  | 9  | 3  | 1  | 0  | 4321 | 2131 | 17 | 12 | 16 | 32 | 31 | 6  | 2  | 1  | 15   |
| 20        | 2  | 0    | 5  | 4  | 4  | 4  | 8  | 9  | 3111 | 2343 | 5  | 1  | 13 | 9  | 10 | 10 | 22 | 28 | 12   |
| 21        | 14 | 8    | 10 | 8  | 8  | 9  | 6  | 1  | 8111 | 3551 | 85 | 26 | 34 | 26 | 24 | 29 | 16 | 2  | 30   |
| 22        | 1  | 0    | 1  | 1  | 4  | 7  | 11 | 11 | 3131 | 3322 | 3  | 1  | 2  | 2  | 9  | 19 | 41 | 47 | 16   |
| 23        | 7  | 5    | 7  | 8  | 6  | 3  | 3  | 6  | 3212 | 5522 | 20 | 11 | 18 | 21 | 16 | 7  | 7  | 16 | 15   |
| 24        | 1  | 1    | 5  | 3  | 3  | 3  | 0  | 0  | 3335 | 2101 | 3  | 3  | 12 | 7  | 7  | 6  | 0  | 1  | 5    |
| 25        | 2  | 2    | 1  | 1  | 1  | 0  | 0  | 1  | 2314 | 1111 | 4  | 4  | 2  | 3  | 2  | 1  | 1  | 2  | 2    |
| 26        | 2  | 2    | 0  | 0  | 0  | 1  | 1  | 1  | 2110 | 1324 | 4  | 5  | 1  | 0  | 1  | 2  | 2  | 7  | 3    |
| 27        | 3  | 3    | 2  | 2  | 2  | 8  | 3  | 4  | 5130 | 4613 | 7  | 6  | 5  | 0  | 5  | 21 | 7  | 9  | 8    |
| 28        | 8  | 8    | 11 | 10 | 11 | 11 | 7  | 4  | 2225 | 4731 | 22 | 22 | 43 | 56 | 45 | 48 | 19 | 8  | 33   |
| 29        | 5  | 11   | 13 | 14 | 14 | 11 | 12 | 14 | 1133 | 6474 | 13 | 45 | 66 | 72 | 71 | 45 | 57 | 85 | 57   |
| 30        | 15 | 7    | 4  | 10 | 8  | 6  | 6  | 10 | 6425 | 4425 | 97 | 20 | 10 | 38 | 26 | 14 | 15 | 35 | 32   |
|           |    |      |    |    |    |    |    |    |      |      |    |    |    |    |    |    |    |    | 16.1 |





| MAY 1972 |    |      |    |    |   |    |    |    |      |             |    |    |    |    |    |      |     |    |    |    |  |     |  |  |  |
|----------|----|------|----|----|---|----|----|----|------|-------------|----|----|----|----|----|------|-----|----|----|----|--|-----|--|--|--|
|          |    | 3 Km |    |    |   |    |    |    |      | $\Sigma$ Km |    | am |    |    |    |      |     |    |    | Am |  | Am2 |  |  |  |
| 1        | 10 | 9    | 13 | 8  | 8 | 8  | 9  | 8  | 24.3 | 36          | 28 | 63 | 24 | 25 | 25 | 30   | 21  | 32 | 30 |    |  |     |  |  |  |
| 2        | 7  | 9    | 11 | 11 | 7 | 5  | 7  | 8  | 21.7 | 18          | 31 | 49 | 47 | 19 | 11 | 20   | 24  | 27 | 23 |    |  |     |  |  |  |
| 3        | 5  | 4    | 5  | 7  | 7 | 5  | 4  | 2  | 13.0 | 11          | 8  | 11 | 17 | 17 | 12 | 8    | 5   | 11 | 13 |    |  |     |  |  |  |
| 4        | 3  | 4    | 5  | 4  | 6 | 4  | 3  | 1  | 10.0 | 7           | 10 | 11 | 9  | 15 | 10 | 7    | 3   | 9  | 10 |    |  |     |  |  |  |
| 5        | 6  | 5    | 4  | 4  | 2 | 4  | 4  | 8  | 12.3 | 14          | 11 | 8  | 10 | 4  | 10 | 10   | 22  | 11 | 12 |    |  |     |  |  |  |
| 6        | 5  | 4    | 8  | 6  | 7 | 6  | 7  | 6  | 16.3 | 13          | 8  | 24 | 16 | 20 | 14 | 19   | 16  | 16 | 12 |    |  |     |  |  |  |
| 7        | 4  | 2    | 0  | 0  | 1 | 1  | 2  | 4  | 4.7  | 10          | 4  | 1  | 1  | 3  | 3  | 4    | 8   | 4  | 7  |    |  |     |  |  |  |
| 8        | 2  | 2    | 1  | 0  | 3 | 4  | 6  | 1  | 6.3  | 5           | 5  | 3  | 1  | 6  | 8  | 15   | 3   | 6  | 11 |    |  |     |  |  |  |
| 9        | 4  | 7    | 11 | 10 | 8 | 6  | 9  | 10 | 21.7 | 10          | 18 | 44 | 36 | 21 | 16 | 29   | 38  | 27 | 21 |    |  |     |  |  |  |
| 10       | 8  | 6    | 9  | 7  | 8 | 7  | 8  | 5  | 19.3 | 24          | 15 | 30 | 18 | 22 | 18 | 25   | 13  | 21 | 20 |    |  |     |  |  |  |
| 11       | 3  | 5    | 6  | 6  | 4 | 7  | 5  | 7  | 14.3 | 6           | 12 | 14 | 14 | 10 | 20 | 11   | 17  | 13 | 17 |    |  |     |  |  |  |
| 12       | 5  | 9    | 9  | 7  | 8 | 4  | 3  | 3  | 16.0 | 12          | 28 | 27 | 19 | 25 | 8  | 6    | 7   | 17 | 15 |    |  |     |  |  |  |
| 13       | 8  | 3    | 4  | 2  | 1 | 6  | 6  | 9  | 13.0 | 24          | 7  | 10 | 4  | 3  | 16 | 14   | 29  | 13 | 13 |    |  |     |  |  |  |
| 14       | 6  | 5    | 6  | 5  | 5 | 4  | 4  | 4  | 13.0 | 15          | 13 | 14 | 12 | 13 | 10 | 10   | 9   | 12 | 12 |    |  |     |  |  |  |
| 15       | 5  | 2    | 3  | 4  | 3 | 4  | 19 | 16 | 18.7 | 11          | 4  | 7  | 10 | 6  | 8  | 193  | 120 | 45 | 36 |    |  |     |  |  |  |
| 16       | 14 | 10   | 8  | 9  | 5 | 3  | 4  | 4  | 19.0 | 85          | 34 | 24 | 27 | 12 | 7  | 10   | 8   | 26 | 38 |    |  |     |  |  |  |
| 17       | 9  | 7    | 7  | 5  | 9 | 7  | 4  | 5  | 17.7 | 27          | 18 | 20 | 11 | 27 | 18 | 9    | 12  | 18 | 19 |    |  |     |  |  |  |
| 18       | 9  | 10   | 8  | 8  | 5 | 3  | 3  | 4  | 16.7 | 29          | 36 | 26 | 26 | 11 | 6  | 6    | 8   | 19 | 15 |    |  |     |  |  |  |
| 19       | 3  | 4    | 3  | 3  | 2 | 0  | 1  | 5  | 7.0  | 6           | 8  | 6  | 7  | 4  | 1  | 3    | 13  | 6  | 7  |    |  |     |  |  |  |
| 20       | 6  | 3    | 1  | 5  | 2 | 1  | 1  | 4  | 7.7  | 15          | 7  | 2  | 12 | 5  | 2  | 2    | 9   | 7  | 6  |    |  |     |  |  |  |
| 21       | 4  | 2    | 2  | 1  | 1 | 2  | 4  | 2  | 6.0  | 10          | 5  | 5  | 3  | 2  | 4  | 9    | 5   | 5  | 7  |    |  |     |  |  |  |
| 22       | 6  | 5    | 5  | 3  | 2 | 2  | 5  | 4  | 10.7 | 14          | 12 | 13 | 6  | 4  | 4  | 11   | 8   | 9  | 7  |    |  |     |  |  |  |
| 23       | 5  | 4    | 0  | 2  | 4 | 8  | 5  | 8  | 12.0 | 13          | 8  | 1  | 5  | 9  | 23 | 13   | 24  | 12 | 12 |    |  |     |  |  |  |
| 24       | 8  | 8    | 6  | 2  | 1 | 2  | 1  | 0  | 9.3  | 23          | 21 | 16 | 4  | 3  | 4  | 3    | 1   | 9  | 11 |    |  |     |  |  |  |
| 25       | 2  | 4    | 5  | 4  | 2 | 2  | 4  | 7  | 10.0 | 5           | 10 | 12 | 9  | 5  | 5  | 8    | 18  | 9  | 9  |    |  |     |  |  |  |
| 26       | 7  | 6    | 4  | 5  | 3 | 5  | 7  | 8  | 15.0 | 17          | 15 | 8  | 13 | 7  | 13 | 17   | 24  | 14 | 11 |    |  |     |  |  |  |
| 27       | 6  | 3    | 0  | 0  | 3 | 7  | 9  | 9  | 12.3 | 16          | 6  | 1  | 1  | 6  | 20 | 27   | 27  | 13 | 17 |    |  |     |  |  |  |
| 28       | 8  | 6    | 8  | 11 | 9 | 14 | 10 | 5  | 23.7 | 25          | 14 | 22 | 44 | 33 | 74 | 34   | 13  | 32 | 26 |    |  |     |  |  |  |
| 29       | 6  | 8    | 6  | 8  | 6 | 7  | 5  | 6  | 17.3 | 15          | 22 | 16 | 22 | 16 | 17 | 12   | 15  | 17 | 22 |    |  |     |  |  |  |
| 30       | 8  | 8    | 4  | 5  | 9 | 9  | 9  | 7  | 19.7 | 24          | 24 | 9  | 11 | 33 | 30 | 32   | 19  | 23 | 22 |    |  |     |  |  |  |
| 31       | 7  | 9    | 9  | 7  | 6 | 5  | 4  | 8  | 18.3 | 19          | 32 | 31 | 20 | 15 | 13 | 8    | 23  | 20 | 20 |    |  |     |  |  |  |
|          |    |      |    |    |   |    |    |    |      |             |    |    |    |    |    | 16.2 |     |    |    |    |  |     |  |  |  |

| JUNE 1972 |    | 3 Km |    |    |    |    |    |    | Σ Km | am  |     |     |     |     |     |      |     | Am  | Am2 |
|-----------|----|------|----|----|----|----|----|----|------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|
| 1         | 5  | 4    | 5  | 5  | 4  | 3  | 4  | 3  | 11.0 | 12  | 8   | 11  | 12  | 8   | 6   | 9    | 7   | 9   | 11  |
| 2         | 4  | 6    | 4  | 5  | 6  | 7  | 4  | 6  | 14.0 | 8   | 15  | 10  | 11  | 16  | 18  | 9    | 16  | 13  | 13  |
| 3         | 8  | 6    | 5  | 8  | 9  | 8  | 6  | 6  | 18.7 | 26  | 16  | 11  | 26  | 31  | 24  | 15   | 16  | 21  | 19  |
| 4         | 8  | 6    | 7  | 7  | 7  | 9  | 8  | 7  | 19.7 | 25  | 16  | 18  | 20  | 19  | 28  | 22   | 18  | 21  | 23  |
| 5         | 9  | 8    | 9  | 9  | 6  | 5  | 6  | 5  | 19.0 | 30  | 25  | 28  | 28  | 14  | 11  | 15   | 11  | 20  | 17  |
| 6         | 2  | 2    | 2  | 1  | 6  | 6  | 4  | 9  | 10.7 | 4   | 5   | 5   | 3   | 16  | 14  | 10   | 27  | 11  | 12  |
| 7         | 8  | 7    | 5  | 6  | 8  | 5  | 4  | 6  | 16.3 | 21  | 17  | 12  | 14  | 23  | 11  | 9    | 15  | 15  | 15  |
| 8         | 4  | 7    | 4  | 3  | 5  | 3  | 6  | 6  | 12.7 | 10  | 17  | 10  | 7   | 13  | 7   | 14   | 15  | 12  | 12  |
| 9         | 6  | 4    | 4  | 5  | 1  | 1  | 1  | 3  | 8.3  | 14  | 10  | 10  | 13  | 2   | 3   | 2    | 7   | 8   | 9   |
| 10        | 4  | 5    | 5  | 2  | 2  | 3  | 1  | 2  | 8.0  | 9   | 12  | 11  | 5   | 5   | 6   | 2    | 5   | 7   | 6   |
| 11        | 4  | 3    | 3  | 2  | 2  | 0  | 2  | 1  | 5.7  | 10  | 6   | 7   | 5   | 5   | 1   | 4    | 3   | 5   | 5   |
| 12        | 2  | 4    | 2  | 0  | 4  | 1  | 1  | 3  | 5.7  | 4   | 9   | 4   | 1   | 10  | 2   | 2    | 6   | 5   | 5   |
| 13        | 5  | 3    | 1  | 2  | 2  | 3  | 5  | 5  | 8.7  | 12  | 7   | 2   | 4   | 4   | 6   | 13   | 13  | 8   | 8   |
| 14        | 4  | 5    | 7  | 4  | 4  | 7  | 9  | 8  | 16.0 | 10  | 12  | 18  | 9   | 10  | 17  | 30   | 22  | 16  | 16  |
| 15        | 7  | 11   | 8  | 6  | 6  | 7  | 3  | 4  | 17.3 | 18  | 42  | 22  | 14  | 15  | 19  | 7    | 9   | 18  | 18  |
| 16        | 4  | 5    | 7  | 7  | 7  | 4  | 6  | 8  | 16.0 | 10  | 13  | 17  | 20  | 20  | 9   | 14   | 21  | 16  | 19  |
| 17        | 7  | 8    | 11 | 11 | 12 | 16 | 15 | 18 | 32.7 | 20  | 23  | 44  | 41  | 59  | 115 | 102  | 156 | 70  | 87  |
| 18        | 22 | 18   | 18 | 17 | 17 | 17 | 14 | 10 | 44.3 | 325 | 150 | 161 | 137 | 135 | 142 | 73   | 37  | 145 | 112 |
| 19        | 12 | 10   | 14 | 9  | 7  | 5  | 4  | 2  | 21.0 | 56  | 40  | 71  | 32  | 19  | 13  | 9    | 5   | 31  | 45  |
| 20        | 11 | 5    | 4  | 4  | 5  | 3  | 2  | 5  | 13.0 | 50  | 12  | 10  | 10  | 11  | 7   | 5    | 11  | 15  | 11  |
| 21        | 2  | 4    | 1  | 2  | 3  | 2  | 7  | 5  | 8.7  | 5   | 9   | 3   | 4   | 6   | 5   | 17   | 13  | 8   | 10  |
| 22        | 6  | 4    | 7  | 8  | 8  | 4  | 7  | 9  | 17.7 | 14  | 8   | 19  | 26  | 25  | 9   | 18   | 29  | 19  | 18  |
| 23        | 6  | 8    | 9  | 8  | 8  | 7  | 8  | 6  | 20.0 | 16  | 23  | 27  | 26  | 26  | 17  | 26   | 14  | 22  | 20  |
| 24        | 8  | 4    | 5  | 6  | 8  | 9  | 9  | 6  | 18.3 | 21  | 9   | 13  | 15  | 24  | 31  | 28   | 16  | 20  | 17  |
| 25        | 4  | 3    | 4  | 4  | 5  | 6  | 4  | 4  | 11.3 | 10  | 6   | 10  | 10  | 11  | 14  | 10   | 8   | 10  | 15  |
| 26        | 2  | 8    | 6  | 7  | 5  | 8  | 4  | 5  | 15.0 | 4   | 25  | 16  | 19  | 13  | 21  | 10   | 12  | 15  | 14  |
| 27        | 5  | 6    | 8  | 6  | 5  | 8  | 12 | 9  | 19.7 | 12  | 14  | 25  | 14  | 13  | 26  | 51   | 31  | 23  | 23  |
| 28        | 10 | 9    | 8  | 9  | 7  | 6  | 9  | 5  | 21.0 | 35  | 29  | 25  | 31  | 20  | 14  | 27   | 11  | 24  | 25  |
| 29        | 9  | 8    | 5  | 7  | 8  | 8  | 6  | 8  | 19.7 | 30  | 22  | 12  | 19  | 23  | 23  | 16   | 23  | 21  | 17  |
| 30        | 3  | 5    | 4  | 4  | 1  | 0  | 1  | 1  | 6.3  | 7   | 12  | 9   | 8   | 3   | 1   | 2    | 2   | 6   | 9   |
|           |    |      |    |    |    |    |    |    |      |     |     |     |     |     |     | 21.1 |     |     |     |



| JULY 1972 |  | 3 Kn |    |    |    |  |    |    |    |    |  | On   |      | an |    |    |    |    |  |    |    |    |    | An |    |
|-----------|--|------|----|----|----|--|----|----|----|----|--|------|------|----|----|----|----|----|--|----|----|----|----|----|----|
| 1         |  | 2    | 1  | 3  | 4  |  | 8  | 5  | 6  | 4  |  | 3234 | 5424 |    | 5  | 2  | 6  | 8  |  | 24 | 12 | 14 | 9  |    | 10 |
| 2         |  | 5    | 5  | 3  | 4  |  | 5  | 9  | 8  | 9  |  | 4513 | 2421 |    | 11 | 11 | 7  | 8  |  | 11 | 32 | 21 | 33 |    | 17 |
| 3         |  | 8    | 7  | 7  | 4  |  | 7  | 5  | 4  | 5  |  | 2222 | 4433 |    | 24 | 17 | 18 | 10 |  | 18 | 12 | 10 | 13 |    | 15 |
| 4         |  | 5    | 5  | 2  | 1  |  | 5  | 5  | 3  | 3  |  | 3432 | 3333 |    | 11 | 11 | 5  | 2  |  | 12 | 11 | 7  | 7  |    | 8  |
| 5         |  | 3    | 3  | 2  | 2  |  | 2  | 2  | 4  | 3  |  | 3434 | 3442 |    | 6  | 7  | 5  | 5  |  | 4  | 4  | 9  | 6  |    | 6  |
| 6         |  | 4    | 3  | 4  | 2  |  | 2  | 3  | 4  | 7  |  | 3423 | 2123 |    | 9  | 6  | 8  | 5  |  | 4  | 7  | 8  | 17 |    | 8  |
| 7         |  | 6    | 8  | 5  | 4  |  | 7  | 8  | 8  | 9  |  | 4233 | 4322 |    | 16 | 22 | 11 | 10 |  | 20 | 21 | 25 | 28 |    | 19 |
| 8         |  | 9    | 10 | 10 | 6  |  | 5  | 6  | 4  | 4  |  | 1634 | 2624 |    | 31 | 40 | 37 | 16 |  | 13 | 14 | 10 | 9  |    | 21 |
| 9         |  | 4    | 4  | 3  | 6  |  | 8  | 6  | 6  | 8  |  | 4221 | 3313 |    | 9  | 8  | 7  | 16 |  | 21 | 15 | 15 | 22 |    | 14 |
| 10        |  | 8    | 7  | 6  | 4  |  | 6  | 5  | 8  | 5  |  | 2233 | 1242 |    | 23 | 17 | 16 | 10 |  | 16 | 12 | 21 | 12 |    | 16 |
| 11        |  | 4    | 3  | 6  | 7  |  | 4  | 4  | 8  | 7  |  | 2424 | 4222 |    | 8  | 7  | 16 | 20 |  | 8  | 8  | 25 | 18 |    | 14 |
| 12        |  | 4    | 5  | 6  | 7  |  | 9  | 5  | 3  | 8  |  | 2324 | 3323 |    | 9  | 12 | 14 | 20 |  | 33 | 11 | 6  | 21 |    | 16 |
| 13        |  | 3    | 4  | 1  | 1  |  | 4  | 5  | 1  | 3  |  | 3422 | 3244 |    | 6  | 8  | 2  | 2  |  | 9  | 11 | 3  | 7  |    | 6  |
| 14        |  | 4    | 3  | 4  | 2  |  | 1  | 2  | 4  | 4  |  | 3223 | 2423 |    | 9  | 7  | 9  | 4  |  | 2  | 4  | 10 | 9  |    | 7  |
| 15        |  | 7    | 5  | 5  | 2  |  | 2  | 4  | 5  | 8  |  | 3234 | 4423 |    | 17 | 11 | 11 | 5  |  | 5  | 8  | 13 | 22 |    | 12 |
| 16        |  | 7    | 7  | 7  | 4  |  | 5  | 7  | 8  | 7  |  | 2433 | 4223 |    | 17 | 20 | 18 | 9  |  | 12 | 18 | 26 | 18 |    | 17 |
| 17        |  | 8    | 8  | 7  | 4  |  | 5  | 4  | 6  | 7  |  | 3333 | 2223 |    | 22 | 23 | 18 | 9  |  | 11 | 8  | 16 | 20 |    | 16 |
| 18        |  | 5    | 5  | 6  | 5  |  | 4  | 5  | 3  | 5  |  | 2233 | 2333 |    | 13 | 13 | 14 | 13 |  | 10 | 12 | 7  | 11 |    | 12 |
| 19        |  | 3    | 6  | 5  | 9  |  | 5  | 6  | 8  | 10 |  | 4343 | 2421 |    | 7  | 15 | 13 | 28 |  | 12 | 16 | 26 | 35 |    | 19 |
| 20        |  | 6    | 5  | 8  | 7  |  | 4  | 4  | 3  | 3  |  | 4542 | 3313 |    | 16 | 13 | 21 | 18 |  | 9  | 9  | 6  | 6  |    | 12 |
| 21        |  | 3    | 4  | 2  | 1  |  | 1  | 2  | 4  | 3  |  | 3433 | 3243 |    | 6  | 9  | 4  | 3  |  | 2  | 5  | 9  | 6  |    | 6  |
| 22        |  | 3    | 2  | 1  | 2  |  | 4  | 9  | 11 | 10 |  | 3443 | 5433 |    | 7  | 5  | 3  | 4  |  | 10 | 29 | 50 | 34 |    | 18 |
| 23        |  | 5    | 8  | 6  | 8  |  | 7  | 8  | 6  | 4  |  | 4222 | 2354 |    | 12 | 25 | 15 | 22 |  | 19 | 23 | 16 | 9  |    | 18 |
| 24        |  | 1    | 1  | 3  | 8  |  | 8  | 8  | 11 | 15 |  | 2233 | 3624 |    | 3  | 2  | 7  | 24 |  | 26 | 24 | 44 | 98 |    | 29 |
| 25        |  | 11   | 13 | 13 | 12 |  | 14 | 8  | 7  | 13 |  | 3423 | 5311 |    | 46 | 63 | 67 | 54 |  | 83 | 21 | 17 | 63 |    | 52 |
| 26        |  | 9    | 7  | 14 | 11 |  | 9  | 11 | 7  | 8  |  | 2344 | 3433 |    | 28 | 19 | 79 | 44 |  | 27 | 41 | 18 | 25 |    | 35 |
| 27        |  | 5    | 11 | 9  | 6  |  | 5  | 7  | 4  | 4  |  | 3431 | 2324 |    | 11 | 46 | 32 | 15 |  | 13 | 19 | 8  | 8  |    | 19 |
| 28        |  | 4    | 7  | 5  | 7  |  | 3  | 4  | 2  | 2  |  | 3533 | 1242 |    | 10 | 17 | 12 | 19 |  | 7  | 8  | 4  | 4  |    | 10 |
| 29        |  | 1    | 3  | 3  | 4  |  | 3  | 4  | 5  | 4  |  | 2443 | 3331 |    | 3  | 6  | 6  | 9  |  | 6  | 10 | 11 | 9  |    | 8  |
| 30        |  | 1    | 2  | 2  | 5  |  | 6  | 6  | 7  | 5  |  | 3443 | 1422 |    | 3  | 5  | 5  | 11 |  | 15 | 16 | 17 | 13 |    | 11 |
| 31        |  | 4    | 4  | 4  | 3  |  | 2  | 3  | 7  | 8  |  | 2435 | 3423 |    | 8  | 9  | 9  | 6  |  | 4  | 6  | 19 | 23 |    | 15 |

| JULY 1972 |    | 3 Ks |    |    |    |    |    |    |    | Os   |      |    |    | as |    |    |    |    |    |    |  | As |  |
|-----------|----|------|----|----|----|----|----|----|----|------|------|----|----|----|----|----|----|----|----|----|--|----|--|
| 1         | 2  | 0    | 0  | 1  | 2  | 4  | 3  | 2  | 1  | 1124 | 2132 | 1  | 1  | 2  | 4  | 10 | 7  | 5  | 3  | 4  |  |    |  |
| 1         | 2  | 1    | 2  | 1  | 1  | 2  | 4  | 5  | 10 | 3233 | 3124 | 2  | 4  | 2  | 2  | 4  | 8  | 12 | 34 | 9  |  |    |  |
| 3         | 7  | 6    | 5  | 2  | 3  | 0  | 4  | 4  |    | 4034 | 1113 | 19 | 15 | 12 | 4  | 7  | 1  | 10 | 9  | 10 |  |    |  |
| 4         | 3  | 4    | 0  | 0  | 0  | 0  | 0  | 1  |    | 0310 | 0034 | 6  | 9  | 1  | 0  | 0  | 1  | 1  | 3  | 3  |  |    |  |
| 5         | 2  | 1    | 0  | 0  | 0  | 0  | 0  | 1  |    | 3300 | 0013 | 5  | 2  | 0  | 0  | 0  | 0  | 1  | 2  | 1  |  |    |  |
| 6         | 4  | 0    | 0  | 0  | 0  | 0  | 0  | 4  |    | 3111 | 1003 | 9  | 1  | 1  | 1  | 1  | 0  | 0  | 9  | 3  |  |    |  |
| 7         | 7  | 9    | 7  | 5  | 4  | 8  | 8  | 7  |    | 4643 | 2244 | 17 | 28 | 18 | 12 | 10 | 21 | 22 | 20 | 19 |  |    |  |
| 8         | 9  | 9    | 8  | 7  | 4  | 2  | 0  | 1  |    | 7533 | 1413 | 27 | 29 | 21 | 20 | 9  | 5  | 1  | 2  | 14 |  |    |  |
| 9         | 2  | 2    | 2  | 6  | 5  | 4  | 4  | 5  |    | 1212 | 4634 | 5  | 4  | 5  | 15 | 13 | 9  | 9  | 13 | 9  |  |    |  |
| 10        | 9  | 5    | 3  | 2  | 5  | 4  | 6  | 2  |    | 5121 | 4123 | 30 | 13 | 7  | 5  | 13 | 8  | 16 | 5  | 12 |  |    |  |
| 11        | 1  | 3    | 5  | 5  | 3  | 0  | 7  | 4  |    | 2211 | 4143 | 2  | 6  | 13 | 13 | 7  | 1  | 17 | 10 | 9  |  |    |  |
| 12        | 2  | 4    | 4  | 4  | 8  | 2  | 0  | 5  |    | 1133 | 3304 | 5  | 8  | 10 | 10 | 25 | 4  | 0  | 13 | 9  |  |    |  |
| 13        | 0  | 3    | 0  | 0  | 1  | 0  | 0  | 0  |    | 0501 | 1100 | 0  | 7  | 0  | 1  | 2  | 1  | 0  | 0  | 1  |  |    |  |
| 14        | 0  | 3    | 3  | 1  | 0  | 0  | 0  | 3  |    | 1541 | 0013 | 1  | 7  | 7  | 2  | 0  | 0  | 1  | 6  | 3  |  |    |  |
| 15        | 5  | 4    | 5  | 2  | 0  | 0  | 2  | 4  |    | 2412 | 0041 | 12 | 9  | 13 | 4  | 0  | 0  | 5  | 8  | 6  |  |    |  |
| 16        | 7  | 7    | 6  | 1  | 2  | 6  | 8  | 6  |    | 4452 | 3542 | 17 | 18 | 16 | 3  | 4  | 16 | 24 | 15 | 14 |  |    |  |
| 17        | 7  | 7    | 5  | 3  | 2  | 0  | 5  | 8  |    | 3414 | 1043 | 20 | 18 | 13 | 7  | 5  | 0  | 12 | 25 | 12 |  |    |  |
| 18        | 5  | 5    | 4  | 3  | 0  | 2  | 0  | 2  |    | 2132 | 1411 | 11 | 13 | 10 | 7  | 1  | 5  | 1  | 5  | 7  |  |    |  |
| 19        | 1  | 6    | 5  | 8  | 2  | 4  | 8  | 8  |    | 3523 | 4133 | 3  | 16 | 11 | 25 | 4  | 8  | 24 | 24 | 14 |  |    |  |
| 20        | 5  | 4    | 7  | 6  | 1  | 2  | 1  | 0  |    | 7544 | 2421 | 12 | 9  | 18 | 15 | 3  | 5  | 2  | 1  | 8  |  |    |  |
| 21        | 2  | 3    | 0  | 0  | 0  | 0  | 0  | 0  |    | 3511 | 0000 | 4  | 6  | 1  | 1  | 0  | 0  | 0  | 0  | 2  |  |    |  |
| 22        | 1  | 1    | 1  | 1  | 1  | 3  | 10 | 9  |    | 3223 | 1253 | 3  | 3  | 3  | 2  | 2  | 7  | 40 | 28 | 11 |  |    |  |
| 23        | 3  | 8    | 4  | 5  | 6  | 6  | 3  | 2  |    | 2321 | 1003 | 6  | 21 | 10 | 12 | 16 | 15 | 6  | 4  | 11 |  |    |  |
| 24        | 2  | 1    | 2  | 7  | 8  | 6  | 8  | 15 |    | 3123 | 3433 | 4  | 2  | 4  | 18 | 25 | 14 | 21 | 89 | 22 |  |    |  |
| 25        | 12 | 12   | 13 | 12 | 13 | 6  | 6  | 14 |    | 7541 | 1232 | 52 | 56 | 62 | 57 | 65 | 15 | 14 | 75 | 50 |  |    |  |
| 26        | 8  | 7    | 13 | 8  | 7  | 10 | 5  | 7  |    | 3431 | 1113 | 21 | 18 | 66 | 23 | 17 | 34 | 13 | 20 | 27 |  |    |  |
| 27        | 4  | 11   | 9  | 6  | 3  | 4  | 1  | 1  |    | 3330 | 1212 | 10 | 41 | 27 | 15 | 7  | 10 | 2  | 3  | 14 |  |    |  |
| 28        | 4  | 4    | 5  | 6  | 1  | 2  | 0  | 0  |    | 3424 | 2311 | 9  | 8  | 11 | 15 | 3  | 4  | 1  | 1  | 7  |  |    |  |
| 29        | 0  | 3    | 2  | 3  | 0  | 0  | 0  | 0  |    | 0531 | 0111 | 0  | 7  | 4  | 7  | 0  | 1  | 1  | 1  | 3  |  |    |  |
| 30        | 0  | 0    | 1  | 2  | 1  | 3  | 2  | 2  |    | 0124 | 2121 | 0  | 1  | 3  | 5  | 3  | 6  | 4  | 5  | 3  |  |    |  |
| 31        | 3  | 3    | 1  | 0  | 0  | 0  | 4  | 4  |    | 5430 | 0031 | 6  | 7  | 2  | 0  | 0  | 0  | 9  | 8  | 4  |  |    |  |

| JULY 1972 |    | 3 Km |    |    |    |    |    |    | Σ Km | am |    |    |    |    |    |    | Am | Am2  |    |
|-----------|----|------|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|------|----|
| 1         | 1  | 0    | 2  | 3  | 7  | 4  | 4  | 3  | 8.0  | 3  | 1  | 4  | 6  | 17 | 10 | 9  | 6  | 7    | 6  |
| 2         | 3  | 4    | 2  | 2  | 4  | 7  | 7  | 9  | 12.7 | 7  | 8  | 5  | 5  | 8  | 20 | 17 | 33 | 13   | 13 |
| 3         | 8  | 6    | 6  | 3  | 5  | 3  | 4  | 5  | 13.3 | 22 | 16 | 15 | 7  | 13 | 6  | 10 | 11 | 13   | 13 |
| 4         | 4  | 4    | 1  | 0  | 3  | 3  | 2  | 2  | 6.3  | 9  | 10 | 3  | 1  | 6  | 6  | 4  | 5  | 6    | 6  |
| 5         | 2  | 2    | 1  | 1  | 1  | 1  | 2  | 2  | 4.0  | 5  | 4  | 2  | 3  | 2  | 2  | 5  | 4  | 3    | 4  |
| 6         | 4  | 1    | 2  | 1  | 1  | 2  | 2  | 5  | 6.0  | 9  | 3  | 5  | 3  | 2  | 4  | 4  | 13 | 5    | 8  |
| 7         | 6  | 8    | 6  | 5  | 6  | 8  | 8  | 8  | 18.3 | 16 | 25 | 15 | 11 | 15 | 21 | 23 | 24 | 19   | 18 |
| 8         | 9  | 10   | 9  | 7  | 5  | 4  | 2  | 3  | 16.3 | 29 | 35 | 29 | 18 | 11 | 10 | 5  | 6  | 18   | 16 |
| 9         | 3  | 3    | 3  | 6  | 7  | 5  | 5  | 7  | 13.0 | 7  | 6  | 6  | 16 | 17 | 12 | 12 | 17 | 12   | 12 |
| 10        | 8  | 6    | 5  | 4  | 6  | 4  | 7  | 4  | 14.7 | 26 | 15 | 12 | 8  | 15 | 10 | 18 | 9  | 14   | 13 |
| 11        | 2  | 3    | 6  | 7  | 3  | 2  | 8  | 6  | 12.3 | 5  | 7  | 15 | 17 | 7  | 4  | 21 | 14 | 11   | 12 |
| 12        | 3  | 4    | 5  | 6  | 9  | 3  | 1  | 7  | 12.7 | 7  | 10 | 12 | 15 | 29 | 7  | 3  | 17 | 13   | 10 |
| 13        | 1  | 3    | 0  | 0  | 3  | 3  | 0  | 2  | 4.0  | 3  | 7  | 1  | 1  | 6  | 6  | 1  | 4  | 4    | 7  |
| 14        | 2  | 3    | 4  | 1  | 0  | 1  | 3  | 3  | 5.7  | 5  | 7  | 8  | 3  | 1  | 2  | 6  | 7  | 5    | 6  |
| 15        | 6  | 4    | 5  | 2  | 1  | 2  | 4  | 6  | 10.0 | 15 | 10 | 12 | 4  | 2  | 4  | 9  | 15 | 9    | 9  |
| 16        | 7  | 7    | 7  | 3  | 4  | 7  | 8  | 6  | 16.3 | 17 | 19 | 17 | 6  | 8  | 17 | 25 | 16 | 16   | 14 |
| 17        | 8  | 8    | 6  | 4  | 4  | 2  | 6  | 8  | 15.3 | 21 | 21 | 16 | 8  | 8  | 4  | 14 | 22 | 14   | 14 |
| 18        | 5  | 5    | 5  | 4  | 3  | 4  | 2  | 4  | 10.7 | 12 | 13 | 12 | 10 | 6  | 8  | 4  | 8  | 9    | 11 |
| 19        | 2  | 6    | 5  | 8  | 4  | 5  | 8  | 9  | 15.7 | 5  | 16 | 12 | 26 | 8  | 12 | 25 | 29 | 17   | 14 |
| 20        | 6  | 5    | 7  | 6  | 3  | 3  | 2  | 1  | 11.0 | 14 | 11 | 20 | 16 | 6  | 7  | 4  | 3  | 10   | 11 |
| 21        | 2  | 3    | 1  | 1  | 0  | 1  | 2  | 1  | 3.7  | 5  | 7  | 2  | 2  | 1  | 2  | 5  | 3  | 3    | 4  |
| 22        | 2  | 2    | 1  | 1  | 3  | 7  | 11 | 9  | 12.0 | 5  | 4  | 3  | 3  | 6  | 18 | 45 | 31 | 14   | 12 |
| 23        | 4  | 8    | 5  | 7  | 7  | 7  | 5  | 3  | 15.3 | 9  | 23 | 13 | 17 | 17 | 19 | 11 | 7  | 15   | 16 |
| 24        | 2  | 1    | 2  | 8  | 8  | 7  | 9  | 15 | 17.3 | 4  | 2  | 5  | 21 | 26 | 19 | 33 | 93 | 25   | 30 |
| 25        | 11 | 12   | 13 | 12 | 14 | 7  | 6  | 13 | 29.3 | 49 | 60 | 64 | 56 | 74 | 18 | 16 | 69 | 51   | 45 |
| 26        | 8  | 7    | 14 | 9  | 8  | 10 | 6  | 8  | 23.3 | 24 | 19 | 73 | 33 | 22 | 38 | 16 | 23 | 31   | 33 |
| 27        | 5  | 11   | 9  | 6  | 4  | 6  | 2  | 3  | 15.3 | 11 | 43 | 30 | 15 | 10 | 15 | 5  | 6  | 17   | 18 |
| 28        | 4  | 5    | 5  | 7  | 2  | 3  | 1  | 1  | 9.3  | 10 | 12 | 12 | 17 | 5  | 6  | 3  | 3  | 9    | 3  |
| 29        | 1  | 3    | 2  | 4  | 1  | 2  | 3  | 2  | 6.0  | 2  | 6  | 5  | 8  | 3  | 5  | 6  | 5  | 5    | 5  |
| 30        | 0  | 1    | 2  | 4  | 4  | 5  | 4  | 4  | 8.0  | 1  | 3  | 4  | 8  | 9  | 11 | 10 | 9  | 7    | 6  |
| 31        | 3  | 4    | 3  | 1  | 1  | 1  | 6  | 6  | 8.3  | 7  | 8  | 6  | 3  | 2  | 3  | 14 | 15 | 13.0 | 12 |

| AUG. 1972 |    | 3 Km |    |    |    |    |    |    | $\Sigma$ Km | am  |     |     |     |     |     |     | Am  | Am2  |     |
|-----------|----|------|----|----|----|----|----|----|-------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| 1         | 10 | 10   | 7  | 5  | 4  | 4  | 4  | 5  | 16.3        | 34  | 36  | 18  | 13  | 10  | 9   | 10  | 13  | 18   | 14  |
| 2         | 6  | 5    | 5  | 3  | 2  | 1  | 3  | 3  | 9.3         | 14  | 13  | 13  | 7   | 4   | 3   | 6   | 6   | 8    | 8   |
| 3         | 1  | 3    | 3  | 4  | 4  | 5  | 3  | 2  | 8.3         | 3   | 6   | 6   | 9   | 10  | 11  | 6   | 4   | 7    | 39  |
| 4         | 15 | 20   | 18 | 11 | 12 | 10 | 17 | 26 | 43.0        | 88  | 241 | 170 | 44  | 52  | 40  | 123 | 543 | 163  | 143 |
| 5         | 22 | 22   | 19 | 18 | 19 | 21 | 17 | 14 | 50.7        | 300 | 308 | 196 | 155 | 190 | 263 | 139 | 80  | 204  | 184 |
| 6         | 18 | 19   | 18 | 13 | 12 | 13 | 15 | 9  | 39.0        | 147 | 187 | 163 | 61  | 53  | 68  | 87  | 32  | 100  | 104 |
| 7         | 14 | 12   | 10 | 8  | 8  | 10 | 5  | 6  | 24.3        | 73  | 52  | 35  | 26  | 23  | 38  | 13  | 14  | 34   | 33  |
| 8         | 4  | 2    | 0  | 2  | 7  | 7  | 5  | 11 | 12.7        | 9   | 5   | 1   | 4   | 19  | 17  | 12  | 41  | 14   | 47  |
| 9         | 14 | 16   | 17 | 20 | 10 | 11 | 8  | 9  | 35.0        | 83  | 118 | 134 | 215 | 38  | 44  | 26  | 32  | 86   | 54  |
| 10        | 7  | 5    | 8  | 10 | 10 | 10 | 8  | 11 | 23.0        | 17  | 13  | 25  | 35  | 39  | 34  | 24  | 41  | 29   | 29  |
| 11        | 9  | 7    | 7  | 8  | 8  | 10 | 10 | 9  | 23.3        | 32  | 32  | 18  | 21  | 22  | 35  | 34  | 33  | 28   | 26  |
| 12        | 7  | 8    | 3  | 3  | 3  | 7  | 5  | 5  | 13.7        | 18  | 22  | 7   | 6   | 6   | 17  | 12  | 13  | 13   | 16  |
| 13        | 4  | 6    | 4  | 2  | 0  | 7  | 4  | 2  | 9.7         | 8   | 16  | 9   | 4   | 1   | 18  | 8   | 5   | 9    | 10  |
| 14        | 6  | 5    | 3  | 6  | 8  | 6  | 6  | 5  | 15.0        | 15  | 11  | 7   | 14  | 22  | 14  | 14  | 13  | 14   | 15  |
| 15        | 6  | 8    | 11 | 7  | 4  | 3  | 5  | 7  | 17.0        | 14  | 21  | 45  | 20  | 8   | 7   | 13  | 18  | 18   | 17  |
| 16        | 8  | 6    | 7  | 4  | 5  | 5  | 4  | 3  | 14.0        | 22  | 14  | 18  | 8   | 12  | 11  | 9   | 6   | 13   | 12  |
| 17        | 5  | 2    | 5  | 7  | 7  | 4  | 4  | 4  | 12.7        | 12  | 5   | 11  | 17  | 18  | 10  | 9   | 9   | 11   | 12  |
| 18        | 5  | 5    | 5  | 8  | 9  | 8  | 10 | 8  | 19.3        | 13  | 11  | 12  | 26  | 27  | 22  | 37  | 25  | 22   | 19  |
| 19        | 9  | 9    | 8  | 4  | 8  | 10 | 8  | 5  | 20.3        | 29  | 27  | 23  | 10  | 23  | 36  | 26  | 12  | 23   | 23  |
| 20        | 6  | 6    | 6  | 8  | 7  | 9  | 8  | 10 | 20.0        | 15  | 15  | 14  | 24  | 20  | 27  | 26  | 39  | 23   | 23  |
| 21        | 8  | 9    | 8  | 8  | 6  | 7  | 9  | 9  | 21.3        | 23  | 28  | 21  | 22  | 16  | 18  | 27  | 28  | 23   | 24  |
| 22        | 6  | 7    | 9  | 7  | 6  | 2  | 4  | 2  | 14.3        | 16  | 19  | 32  | 17  | 14  | 5   | 9   | 5   | 15   | 14  |
| 23        | 2  | 3    | 4  | 2  | 1  | 1  | 1  | 1  | 5.0         | 4   | 7   | 8   | 4   | 2   | 2   | 2   | 2   | 4    | 5   |
| 24        | 0  | 2    | 2  | 4  | 1  | 2  | 2  | 0  | 4.3         | 1   | 4   | 4   | 8   | 3   | 4   | 5   | 1   | 4    | 4   |
| 25        | 4  | 1    | 5  | 3  | 2  | 2  | 2  | 8  | 9.0         | 9   | 3   | 12  | 7   | 5   | 5   | 5   | 24  | 9    | 15  |
| 26        | 11 | 11   | 12 | 5  | 4  | 7  | 8  | 8  | 22.0        | 45  | 46  | 59  | 12  | 10  | 19  | 21  | 22  | 29   | 31  |
| 27        | 10 | 12   | 11 | 14 | 9  | 8  | 2  | 4  | 23.3        | 39  | 59  | 47  | 74  | 33  | 23  | 4   | 8   | 36   | 24  |
| 28        | 3  | 2    | 2  | 5  | 7  | 7  | 8  | 5  | 13.0        | 6   | 5   | 5   | 13  | 19  | 20  | 21  | 11  | 13   | 13  |
| 29        | 4  | 5    | 5  | 4  | 4  | 4  | 8  | 7  | 13.7        | 9   | 13  | 12  | 10  | 9   | 10  | 22  | 19  | 13   | 14  |
| 30        | 8  | 1    | 1  | 6  | 4  | 4  | 5  | 4  | 11.0        | 25  | 3   | 2   | 15  | 9   | 8   | 11  | 10  | 10   | 13  |
| 31        | 8  | 6    | 7  | 2  | 2  | 2  | 4  | 2  | 11.0        | 21  | 15  | 20  | 4   | 4   | 5   | 8   | 5   | 10   | 10  |
|           |    |      |    |    |    |    |    |    |             |     |     |     |     |     |     |     |     | 32.4 |     |

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|-----------|--|------|----|----|----|--|----|----|----|----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|--|--|--|
|           |  | 3 Kn |    |    |    |  |    |    |    | On |      |      |     | an  |     |     |     |     |     |     |     | An   |  |  |  |
| 1         |  | 10   | 10 | 6  | 5  |  | 5  | 5  | 7  | 6  | 4312 | 3231 | 35  | 40  | 16  | 12  | 12  | 11  | 17  | 16  | 20  |      |  |  |  |
| 2         |  | 6    | 6  | 7  | 4  |  | 3  | 2  | 5  | 5  | 1353 | 3433 | 15  | 15  | 18  | 10  | 6   | 5   | 12  | 12  | 12  |      |  |  |  |
| 3         |  | 3    | 3  | 4  | 5  |  | 6  | 6  | 4  | 4  | 4433 | 1322 | 7   | 7   | 8   | 12  | 14  | 14  | 9   | 8   | 10  |      |  |  |  |
| 4         |  | 16   | 21 | 19 | 12 |  | 13 | 11 | 17 | 26 | 4232 | 3332 | 105 | 259 | 196 | 58  | 67  | 49  | 139 | 577 | 181 |      |  |  |  |
| 5         |  | 21   | 22 | 20 | 18 |  | 20 | 22 | 17 | 14 | 3231 | 4422 | 266 | 306 | 226 | 155 | 225 | 320 | 136 | 75  | 214 |      |  |  |  |
| 6         |  | 18   | 18 | 18 | 14 |  | 11 | 13 | 15 | 10 | 2232 | 4553 | 151 | 173 | 151 | 73  | 49  | 63  | 96  | 39  | 99  |      |  |  |  |
| 7         |  | 13   | 12 | 9  | 9  |  | 8  | 12 | 7  | 8  | 2341 | 2613 | 70  | 54  | 31  | 31  | 26  | 58  | 17  | 22  | 39  |      |  |  |  |
| 8         |  | 5    | 3  | 1  | 3  |  | 9  | 8  | 7  | 11 | 3322 | 3224 | 12  | 7   | 2   | 6   | 27  | 22  | 18  | 44  | 17  |      |  |  |  |
| 9         |  | 14   | 17 | 17 | 20 |  | 10 | 11 | 9  | 10 | 3233 | 2422 | 81  | 122 | 128 | 226 | 40  | 41  | 28  | 36  | 88  |      |  |  |  |
| 10        |  | 7    | 5  | 9  | 10 |  | 11 | 11 | 9  | 11 | 4332 | 3422 | 18  | 13  | 30  | 36  | 44  | 43  | 27  | 43  | 32  |      |  |  |  |
| 11        |  | 9    | 10 | 7  | 8  |  | 9  | 10 | 10 | 10 | 4423 | 3523 | 30  | 34  | 19  | 25  | 27  | 36  | 39  | 36  | 31  |      |  |  |  |
| 12        |  | 7    | 8  | 4  | 4  |  | 5  | 8  | 6  | 6  | 3221 | 3413 | 17  | 22  | 8   | 8   | 11  | 23  | 15  | 14  | 15  |      |  |  |  |
| 13        |  | 4    | 7  | 4  | 3  |  | 0  | 8  | 4  | 4  | 3423 | 2234 | 8   | 18  | 9   | 6   | 1   | 22  | 10  | 10  | 11  |      |  |  |  |
| 14        |  | 7    | 5  | 4  | 6  |  | 9  | 7  | 7  | 7  | 4523 | 4222 | 17  | 11  | 8   | 16  | 28  | 19  | 18  | 17  | 17  |      |  |  |  |
| 15        |  | 6    | 7  | 11 | 7  |  | 5  | 5  | 6  | 8  | 3425 | 2323 | 15  | 19  | 46  | 18  | 11  | 11  | 16  | 23  | 20  |      |  |  |  |
| 16        |  | 8    | 5  | 7  | 4  |  | 5  | 5  | 4  | 4  | 3322 | 3335 | 22  | 12  | 19  | 10  | 13  | 12  | 10  | 10  | 14  |      |  |  |  |
| 17        |  | 6    | 3  | 6  | 7  |  | 7  | 5  | 5  | 5  | 3423 | 2232 | 14  | 6   | 15  | 20  | 18  | 12  | 13  | 13  | 14  |      |  |  |  |
| 18        |  | 6    | 5  | 6  | 8  |  | 9  | 9  | 10 | 9  | 1233 | 2331 | 15  | 13  | 16  | 26  | 29  | 27  | 35  | 28  | 24  |      |  |  |  |
| 19        |  | 9    | 9  | 9  | 5  |  | 9  | 11 | 10 | 6  | 1342 | 1331 | 28  | 30  | 27  | 12  | 29  | 42  | 34  | 15  | 27  |      |  |  |  |
| 20        |  | 7    | 6  | 6  | 9  |  | 8  | 10 | 10 | 10 | 2311 | 2235 | 18  | 15  | 15  | 28  | 26  | 34  | 34  | 39  | 26  |      |  |  |  |
| 21        |  | 9    | 10 | 8  | 8  |  | 8  | 8  | 9  | 9  | 2223 | 3232 | 28  | 34  | 22  | 23  | 21  | 23  | 28  | 31  | 26  |      |  |  |  |
| 22        |  | 8    | 7  | 10 | 7  |  | 7  | 4  | 5  | 4  | 2543 | 3224 | 21  | 19  | 35  | 20  | 18  | 9   | 12  | 8   | 18  |      |  |  |  |
| 23        |  | 2    | 4  | 4  | 3  |  | 2  | 2  | 2  | 2  | 3411 | 3333 | 5   | 8   | 9   | 6   | 5   | 4   | 4   | 4   | 6   |      |  |  |  |
| 24        |  | 0    | 2  | 2  | 4  |  | 2  | 3  | 4  | 1  | 2232 | 3332 | 1   | 5   | 5   | 10  | 5   | 7   | 9   | 2   | 6   |      |  |  |  |
| 25        |  | 4    | 3  | 6  | 4  |  | 3  | 3  | 4  | 8  | 3442 | 3422 | 9   | 6   | 14  | 9   | 6   | 7   | 8   | 25  | 11  |      |  |  |  |
| 26        |  | 12   | 12 | 13 | 5  |  | 5  | 8  | 9  | 9  | 3542 | 3213 | 51  | 51  | 62  | 13  | 13  | 21  | 27  | 27  | 33  |      |  |  |  |
| 27        |  | 10   | 13 | 11 | 14 |  | 9  | 9  | 3  | 4  | 2235 | 2534 | 40  | 68  | 48  | 82  | 33  | 28  | 6   | 9   | 39  |      |  |  |  |
| 28        |  | 4    | 3  | 3  | 7  |  | 8  | 8  | 8  | 6  | 4312 | 3334 | 8   | 7   | 7   | 18  | 22  | 24  | 24  | 14  | 16  |      |  |  |  |
| 29        |  | 4    | 5  | 5  | 6  |  | 5  | 5  | 8  | 7  | 4241 | 3332 | 9   | 13  | 11  | 14  | 12  | 13  | 24  | 18  | 14  |      |  |  |  |
| 30        |  | 7    | 1  | 1  | 7  |  | 5  | 4  | 6  | 5  | 3332 | 3212 | 20  | 3   | 3   | 18  | 12  | 10  | 14  | 13  | 12  |      |  |  |  |
| 31        |  | 8    | 7  | 8  | 2  |  | 3  | 4  | 4  | 4  | 3543 | 2211 | 23  | 19  | 21  | 5   | 6   | 10  | 9   | 8   | 13  |      |  |  |  |
|           |  |      |    |    |    |  |    |    |    |    |      |      |     |     |     |     |     |     |     |     |     | 35.. |  |  |  |

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|-----------|----|------|----|----|----|----|----|----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1         | 10 | 9    | 7  | 5  | 4  | 3  | 2  | 4  | 4431 | 1235 | 34  | 32  | 20  | 13  | 8   | 7   | 4   | 10  | 16  |
| 2         | 5  | 5    | 4  | 2  | 1  | 0  | 0  | 0  | 2253 | 2111 | 12  | 11  | 9   | 5   | 2   | 1   | 1   | 1   | 5   |
| 3         | 0  | 3    | 1  | 3  | 3  | 4  | 1  | 0  | 0122 | 2120 | 0   | 6   | 3   | 7   | 6   | 8   | 2   | 0   | 4   |
| 4         | 14 | 20   | 17 | 9  | 10 | 9  | 16 | 26 | 2110 | 1212 | 72  | 222 | 143 | 29  | 37  | 32  | 106 | 509 | 144 |
| 5         | 23 | 22   | 18 | 18 | 18 | 20 | 17 | 14 | 4424 | 4211 | 334 | 310 | 165 | 155 | 155 | 205 | 143 | 86  | 194 |
| 6         | 17 | 20   | 19 | 11 | 12 | 14 | 14 | 8  | 4343 | 2833 | 143 | 201 | 175 | 49  | 56  | 74  | 78  | 24  | 100 |
| 7         | 14 | 11   | 10 | 8  | 7  | 7  | 4  | 3  | 2142 | 3430 | 75  | 50  | 39  | 21  | 20  | 18  | 10  | 6   | 30  |
| 8         | 3  | 1    | 0  | 1  | 5  | 5  | 3  | 10 | 2203 | 3313 | 6   | 2   | 0   | 2   | 12  | 12  | 7   | 39  | 10  |
| 9         | 14 | 16   | 17 | 20 | 10 | 11 | 8  | 9  | 1322 | 5643 | 84  | 113 | 139 | 205 | 37  | 47  | 24  | 28  | 85  |
| 10        | 6  | 5    | 7  | 9  | 10 | 8  | 8  | 10 | 1134 | 1233 | 16  | 13  | 20  | 33  | 34  | 25  | 21  | 40  | 25  |
| 11        | 10 | 9    | 7  | 7  | 7  | 10 | 9  | 9  | 4011 | 1112 | 35  | 29  | 17  | 17  | 18  | 34  | 29  | 31  | 26  |
| 12        | 7  | 8    | 2  | 2  | 1  | 5  | 4  | 5  | 4313 | 2313 | 18  | 21  | 5   | 4   | 2   | 12  | 9   | 12  | 10  |
| 13        | 3  | 6    | 4  | 0  | 0  | 5  | 2  | 0  | 1531 | 1441 | 7   | 15  | 9   | 1   | 1   | 13  | 5   | 1   | 7   |
| 14        | 5  | 4    | 2  | 5  | 6  | 4  | 4  | 4  | 1341 | 0121 | 13  | 10  | 5   | 13  | 15  | 9   | 10  | 8   | 10  |
| 15        | 5  | 8    | 11 | 8  | 2  | 1  | 4  | 5  | 3942 | 2232 | 12  | 23  | 44  | 22  | 5   | 2   | 9   | 12  | 16  |
| 16        | 8  | 6    | 7  | 3  | 4  | 4  | 4  | 1  | 2510 | 2311 | 22  | 16  | 17  | 6   | 10  | 9   | 8   | 2   | 11  |
| 17        | 5  | 1    | 4  | 6  | 7  | 3  | 2  | 23 | 1220 | 3241 | 11  | 3   | 8   | 15  | 18  | 7   | 4   | 6   | 9   |
| 18        | 5  | 4    | 4  | 8  | 8  | 7  | 10 | 8  | 3313 | 4135 | 12  | 9   | 9   | 25  | 24  | 17  | 39  | 22  | 20  |
| 19        | 9  | 8    | 7  | 3  | 7  | 9  | 7  | 4  | 2542 | 5433 | 31  | 25  | 19  | 7   | 18  | 29  | 19  | 9   | 20  |
| 20        | 5  | 6    | 6  | 7  | 6  | 7  | 7  | 10 | 3123 | 4346 | 12  | 16  | 14  | 20  | 14  | 20  | 17  | 40  | 19  |
| 21        | 7  | 8    | 7  | 8  | 4  | 5  | 8  | 8  | 4234 | 2142 | 18  | 22  | 20  | 21  | 10  | 13  | 26  | 25  | 19  |
| 22        | 5  | 7    | 9  | 6  | 5  | 0  | 2  | 1  | 1524 | 3113 | 12  | 19  | 29  | 15  | 11  | 1   | 5   | 2   | 12  |
| 23        | 1  | 3    | 3  | 1  | 0  | 0  | 0  | 0  | 3103 | 0110 | 3   | 6   | 6   | 2   | 0   | 1   | 1   | 0   | 2   |
| 24        | 0  | 1    | 1  | 3  | 1  | 0  | 0  | 0  | 0220 | 1110 | 0   | 3   | 3   | 6   | 2   | 1   | 1   | 0   | 2   |
| 25        | 4  | 0    | 4  | 2  | 2  | 1  | 0  | 8  | 6053 | 3212 | 9   | 0   | 9   | 5   | 5   | 3   | 1   | 22  | 7   |
| 26        | 10 | 11   | 12 | 5  | 4  | 6  | 6  | 7  | 3353 | 1221 | 38  | 41  | 56  | 12  | 8   | 16  | 16  | 17  | 26  |
| 27        | 10 | 11   | 11 | 13 | 10 | 7  | 1  | 3  | 3135 | 1535 | 38  | 49  | 46  | 67  | 34  | 19  | 2   | 7   | 33  |
| 28        | 2  | 2    | 1  | 4  | 6  | 6  | 7  | 4  | 3221 | 1511 | 4   | 4   | 3   | 9   | 16  | 16  | 17  | 8   | 10  |
| 29        | 4  | 5    | 5  | 3  | 3  | 4  | 7  | 8  | 4130 | 1133 | 8   | 13  | 12  | 6   | 6   | 8   | 19  | 21  | 12  |
| 30        | 9  | 1    | 0  | 5  | 3  | 3  | 3  | 3  | 7213 | 0121 | 30  | 3   | 1   | 13  | 6   | 6   | 7   | 7   | 9   |
| 31        | 7  | 4    | 7  | 2  | 0  | 0  | 3  | 1  | 4332 | 1123 | 20  | 10  | 20  | 4   | 1   | 1   | 7   | 2   | 8   |
|           |    |      |    |    |    |    |    |    |      |      |     |     |     |     |     |     |     |     | 29. |

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|-----------|----|----|----|----|----|----|----|----|------|------|-----|-----|----|----|-----|----|-----|----|------|--|----|
| 3 Kn      |    |    |    |    |    |    |    |    | σn   |      | an  |     |    |    |     |    |     |    |      |  | An |
| 1         | 5  | 4  | 5  | 5  | 1  | 2  | 2  | 4  | 2532 | 3343 | 12  | 10  | 11 | 13 | 3   | 5  | 5   | 8  | 8    |  |    |
| 2         | 0  | 2  | 5  | 5  | 5  | 6  | 8  | 7  | 2332 | 2442 | 1   | 4   | 12 | 11 | 11  | 15 | 23  | 18 | 12   |  |    |
| 3         | 6  | 2  | 2  | 4  | 1  | 4  | 6  | 9  | 6334 | 2531 | 14  | 4   | 4  | 9  | 2   | 8  | 15  | 28 | 11   |  |    |
| 4         | 3  | 9  | 8  | 2  | 1  | 4  | 6  | 6  | 4333 | 2411 | 6   | 30  | 24 | 4  | 2   | 8  | 14  | 15 | 13   |  |    |
| 5         | 5  | 4  | 4  | 4  | 3  | 4  | 6  | 4  | 3513 | 2323 | 11  | 10  | 8  | 8  | 7   | 10 | 14  | 10 | 10   |  |    |
| 6         | 10 | 8  | 7  | 7  | 8  | 8  | 7  | 6  | 3423 | 2521 | 38  | 21  | 20 | 20 | 23  | 23 | 19  | 16 | 23   |  |    |
| 7         | 1  | 7  | 1  | 6  | 6  | 4  | 2  | 5  | 3332 | 1232 | 3   | 20  | 3  | 14 | 16  | 9  | 5   | 12 | 10   |  |    |
| 8         | 8  | 7  | 9  | 9  | 8  | 7  | 6  | 8  | 3341 | 3333 | 26  | 17  | 27 | 28 | 22  | 19 | 14  | 23 | 22   |  |    |
| 9         | 5  | 8  | 5  | 8  | 6  | 1  | 1  | 8  | 3222 | 1335 | 11  | 21  | 13 | 25 | 16  | 3  | 3   | 21 | 14   |  |    |
| 10        | 7  | 7  | 8  | 11 | 9  | 10 | 12 | 8  | 2323 | 3142 | 19  | 18  | 24 | 43 | 33  | 34 | 58  | 21 | 31   |  |    |
| 11        | 4  | 6  | 9  | 11 | 8  | 8  | 7  | 5  | 3246 | 2654 | 9   | 14  | 29 | 44 | 24  | 23 | 17  | 11 | 21   |  |    |
| 12        | 3  | 8  | 7  | 7  | 4  | 3  | 2  | 1  | 5645 | 5423 | 7   | 24  | 19 | 17 | 8   | 7  | 4   | 3  | 11   |  |    |
| 13        | 2  | 4  | 8  | 4  | 17 | 14 | 17 | 15 | 2542 | 3234 | 5   | 10  | 23 | 10 | 141 | 85 | 145 | 93 | 64   |  |    |
| 14        | 16 | 20 | 11 | 5  | 6  | 9  | 11 | 9  | 3654 | 3555 | 118 | 241 | 49 | 13 | 15  | 31 | 44  | 29 | 68   |  |    |
| 15        | 9  | 13 | 10 | 13 | 10 | 8  | 8  | 10 | 4523 | 2232 | 32  | 63  | 34 | 69 | 38  | 25 | 21  | 36 | 40   |  |    |
| 16        | 9  | 7  | 10 | 10 | 4  | 11 | 12 | 12 | 1457 | 3325 | 30  | 19  | 40 | 37 | 9   | 42 | 57  | 60 | 37   |  |    |
| 17        | 12 | 10 | 11 | 9  | 9  | 9  | 8  | 12 | 4231 | 3331 | 54  | 39  | 46 | 32 | 31  | 27 | 21  | 53 | 38   |  |    |
| 18        | 9  | 10 | 10 | 10 | 5  | 5  | 7  | 4  | 2412 | 2543 | 33  | 37  | 34 | 38 | 12  | 11 | 18  | 9  | 24   |  |    |
| 19        | 6  | 7  | 6  | 1  | 3  | 2  | 1  | 1  | 3543 | 5322 | 14  | 17  | 16 | 3  | 7   | 4  | 2   | 2  | 8    |  |    |
| 20        | 0  | 4  | 2  | 5  | 3  | 0  | 2  | 3  | 1223 | 3123 | 1   | 10  | 5  | 11 | 6   | 0  | 5   | 6  | 6    |  |    |
| 21        | 4  | 2  | 1  | 2  | 1  | 0  | 0  | 0  | 4324 | 2211 | 8   | 5   | 3  | 5  | 3   | 1  | 1   | 1  | 3    |  |    |
| 22        | 1  | 1  | 4  | 4  | 4  | 5  | 6  | 6  | 2243 | 1213 | 3   | 3   | 8  | 9  | 8   | 12 | 16  | 14 | 9    |  |    |
| 23        | 3  | 4  | 4  | 9  | 12 | 8  | 9  | 10 | 1322 | 2245 | 6   | 8   | 9  | 28 | 53  | 25 | 31  | 35 | 24   |  |    |
| 24        | 8  | 8  | 9  | 8  | 9  | 11 | 10 | 10 | 3243 | 3334 | 23  | 21  | 33 | 22 | 28  | 42 | 34  | 34 | 30   |  |    |
| 25        | 5  | 6  | 6  | 6  | 4  | 3  | 1  | 5  | 3523 | 2323 | 12  | 16  | 14 | 15 | 8   | 6  | 3   | 12 | 11   |  |    |
| 26        | 3  | 5  | 5  | 7  | 7  | 4  | 4  | 7  | 4222 | 3234 | 7   | 13  | 13 | 19 | 18  | 9  | 10  | 17 | 13   |  |    |
| 27        | 6  | 7  | 5  | 5  | 8  | 5  | 5  | 2  | 2522 | 3353 | 16  | 20  | 11 | 13 | 21  | 13 | 13  | 4  | 14   |  |    |
| 28        | 5  | 4  | 4  | 5  | 6  | 3  | 8  | 9  | 3433 | 2154 | 13  | 9   | 10 | 11 | 14  | 7  | 26  | 27 | 15   |  |    |
| 29        | 10 | 8  | 11 | 8  | 9  | 12 | 12 | 9  | 4453 | 4543 | 35  | 24  | 44 | 25 | 32  | 59 | 55  | 31 | 38   |  |    |
| 30        | 7  | 7  | 6  | 4  | 0  | 3  | 6  | 7  | 2443 | 0122 | 18  | 17  | 14 | 8  | 0   | 7  | 14  | 18 | 12.3 |  |    |

| SEP. 1972 |    |    |    |    |    |    |    |    |      |      |     |     |    |    |    |    |     |    |    |      |  |    |  |
|-----------|----|----|----|----|----|----|----|----|------|------|-----|-----|----|----|----|----|-----|----|----|------|--|----|--|
| 3 Ks      |    |    |    |    |    |    |    |    |      | Os   |     |     |    | as |    |    |     |    |    |      |  | As |  |
| 1         | 7  | 5  | 4  | 4  | 0  | 1  | 0  | 1  | 4233 | 1304 | 18  | 11  | 10 | 9  | 1  | 2  | 0   | 3  | 7  |      |  |    |  |
| 2         | 1  | 3  | 5  | 4  | 3  | 4  | 7  | 7  | 2211 | 1614 | 2   | 6   | 12 | 8  | 6  | 10 | 17  | 18 | 10 |      |  |    |  |
| 3         | 6  | 1  | 1  | 3  | 0  | 0  | 6  | 7  | 5210 | 0123 | 15  | 3   | 2  | 7  | 0  | 1  | 16  | 20 | 8  |      |  |    |  |
| 4         | 4  | 8  | 7  | 0  | 0  | 2  | 3  | 5  | 3111 | 0221 | 9   | 23  | 17 | 1  | 0  | 4  | 7   | 13 | 9  |      |  |    |  |
| 5         | 4  | 4  | 3  | 2  | 1  | 1  | 2  | 2  | 3323 | 1221 | 10  | 9   | 7  | 4  | 2  | 3  | 5   | 5  | 6  |      |  |    |  |
| 6         | 10 | 8  | 6  | 5  | 6  | 5  | 5  | 5  | 4203 | 1211 | 34  | 22  | 15 | 12 | 16 | 11 | 13  | 13 | 17 |      |  |    |  |
| 7         | 1  | 7  | 1  | 6  | 6  | 3  | 1  | 2  | 3412 | 5123 | 2   | 18  | 2  | 15 | 14 | 6  | 3   | 4  | 8  |      |  |    |  |
| 8         | 7  | 7  | 8  | 8  | 8  | 5  | 6  | 7  | 1113 | 2314 | 17  | 17  | 26 | 21 | 22 | 12 | 16  | 18 | 19 |      |  |    |  |
| 9         | 3  | 7  | 5  | 8  | 6  | 0  | 0  | 5  | 5531 | 0014 | 7   | 17  | 12 | 26 | 15 | 0  | 1   | 13 | 11 |      |  |    |  |
| 10        | 6  | 6  | 6  | 8  | 7  | 5  | 9  | 4  | 5613 | 1114 | 16  | 15  | 16 | 26 | 18 | 13 | 32  | 10 | 18 |      |  |    |  |
| 11        | 5  | 6  | 7  | 10 | 6  | 6  | 4  | 2  | 2635 | 1444 | 12  | 15  | 18 | 34 | 16 | 16 | 10  | 4  | 16 |      |  |    |  |
| 12        | 6  | 6  | 7  | 5  | 2  | 1  | 0  | 0  | 6564 | 5311 | 14  | 15  | 19 | 12 | 5  | 2  | 1   | 1  | 9  |      |  |    |  |
| 13        | 2  | 3  | 8  | 4  | 14 | 14 | 18 | 15 | 1543 | 4656 | 5   | 6   | 21 | 10 | 76 | 79 | 162 | 93 | 57 |      |  |    |  |
| 14        | 17 | 20 | 12 | 4  | 6  | 8  | 10 | 8  | 3453 | 4355 | 121 | 211 | 54 | 10 | 14 | 26 | 40  | 25 | 63 |      |  |    |  |
| 15        | 9  | 12 | 10 | 13 | 8  | 8  | 6  | 11 | 5533 | 3145 | 31  | 59  | 40 | 62 | 24 | 23 | 14  | 41 | 37 |      |  |    |  |
| 16        | 10 | 6  | 8  | 6  | 3  | 12 | 13 | 8  | 6212 | 1411 | 34  | 14  | 26 | 15 | 7  | 53 | 62  | 26 | 30 |      |  |    |  |
| 17        | 11 | 10 | 10 | 9  | 8  | 8  | 9  | 11 | 3452 | 4443 | 45  | 37  | 38 | 29 | 26 | 26 | 27  | 45 | 34 |      |  |    |  |
| 18        | 10 | 8  | 9  | 10 | 4  | 3  | 6  | 3  | 1221 | 1123 | 34  | 22  | 29 | 34 | 8  | 7  | 15  | 6  | 19 |      |  |    |  |
| 19        | 6  | 6  | 5  | 1  | 1  | 0  | 0  | 0  | 0633 | 2110 | 15  | 16  | 12 | 3  | 2  | 1  | 1   | 0  | 6  |      |  |    |  |
| 20        | 0  | 3  | 1  | 4  | 1  | 0  | 0  | 0  | 1143 | 2011 | 1   | 6   | 3  | 10 | 3  | 0  | 1   | 1  | 3  |      |  |    |  |
| 21        | 3  | 2  | 0  | 2  | 0  | 0  | 0  | 0  | 5213 | 1000 | 7   | 4   | 1  | 5  | 1  | 0  | 0   | 0  | 2  |      |  |    |  |
| 22        | 1  | 2  | 3  | 3  | 3  | 3  | 5  | 4  | 3202 | 2211 | 3   | 4   | 6  | 7  | 7  | 7  | 13  | 8  | 7  |      |  |    |  |
| 23        | 3  | 3  | 3  | 9  | 10 | 6  | 8  | 8  | 5214 | 2514 | 7   | 7   | 6  | 27 | 37 | 16 | 26  | 22 | 19 |      |  |    |  |
| 24        | 6  | 8  | 8  | 7  | 7  | 9  | 9  | 9  | 1311 | 1414 | 16  | 21  | 23 | 17 | 18 | 32 | 29  | 32 | 24 |      |  |    |  |
| 25        | 5  | 4  | 4  | 5  | 2  | 0  | 0  | 4  | 1421 | 4103 | 13  | 9   | 10 | 13 | 4  | 1  | 0   | 9  | 7  |      |  |    |  |
| 26        | 3  | 7  | 5  | 6  | 6  | 4  | 4  | 8  | 1410 | 0335 | 7   | 18  | 13 | 15 | 15 | 10 | 9   | 22 | 14 |      |  |    |  |
| 27        | 6  | 7  | 4  | 5  | 5  | 4  | 4  | 3  | 2441 | 4541 | 16  | 18  | 9  | 13 | 13 | 8  | 8   | 6  | 11 |      |  |    |  |
| 28        | 6  | 3  | 4  | 5  | 5  | 1  | 6  | 7  | 0231 | 3323 | 15  | 6   | 10 | 13 | 12 | 2  | 16  | 19 | 12 |      |  |    |  |
| 29        | 9  | 7  | 10 | 8  | 9  | 11 | 12 | 10 | 5552 | 1424 | 33  | 17  | 38 | 22 | 32 | 49 | 54  | 38 | 35 |      |  |    |  |
| 30        | 7  | 7  | 6  | 4  | 0  | 1  | 3  | 7  | 4453 | 0324 | 18  | 18  | 16 | 9  | 0  | 3  | 7   | 17 | 11 |      |  |    |  |
|           |    |    |    |    |    |    |    |    |      |      |     |     |    |    |    |    |     |    |    | 17.6 |  |    |  |

17.6



| SEP. 1972 |    | 3 Km |    |    |    |    |    |    | Σ Km | am  |     |    |    |     |    |     |    | Am   | Am2 |
|-----------|----|------|----|----|----|----|----|----|------|-----|-----|----|----|-----|----|-----|----|------|-----|
| 1         | 6  | 4    | 4  | 5  | 1  | 2  | 1  | 2  | 8.3  | 15  | 10  | 10 | 11 | 2   | 4  | 3   | 5  | 8    | 7   |
| 2         | 1  | 2    | 5  | 4  | 4  | 5  | 7  | 7  | 11.7 | 2   | 5   | 12 | 9  | 8   | 12 | 20  | 18 | 11   | 8   |
| 3         | 6  | 1    | 1  | 4  | 0  | 2  | 6  | 8  | 9.3  | 15  | 3   | 3  | 8  | 1   | 4  | 15  | 24 | 9    | 12  |
| 4         | 3  | 9    | 8  | 1  | 0  | 3  | 5  | 6  | 11.7 | 7   | 27  | 21 | 2  | 1   | 6  | 11  | 14 | 11   | 10  |
| 5         | 5  | 4    | 3  | 3  | 2  | 3  | 4  | 3  | 9.0  | 11  | 9   | 7  | 6  | 4   | 6  | 9   | 7  | 7    | 11  |
| 6         | 10 | 8    | 7  | 6  | 7  | 7  | 6  | 6  | 19.0 | 36  | 21  | 17 | 16 | 20  | 17 | 16  | 14 | 20   | 14  |
| 7         | 1  | 7    | 1  | 6  | 6  | 3  | 2  | 4  | 10.0 | 3   | 19  | 2  | 15 | 15  | 7  | 4   | 8  | 9    | 14  |
| 8         | 8  | 7    | 9  | 8  | 8  | 6  | 6  | 7  | 19.7 | 22  | 17  | 27 | 24 | 22  | 15 | 15  | 20 | 20   | 16  |
| 9         | 4  | 7    | 5  | 8  | 6  | 1  | 1  | 7  | 13.0 | 9   | 19  | 12 | 26 | 15  | 2  | 2   | 17 | 13   | 16  |
| 10        | 7  | 6    | 7  | 10 | 8  | 8  | 11 | 6  | 21.0 | 17  | 16  | 20 | 35 | 26  | 24 | 45  | 16 | 25   | 20  |
| 11        | 5  | 6    | 8  | 10 | 7  | 7  | 5  | 4  | 17.3 | 11  | 14  | 24 | 39 | 20  | 19 | 13  | 8  | 19   | 20  |
| 12        | 5  | 7    | 7  | 6  | 3  | 2  | 1  | 1  | 10.7 | 11  | 20  | 19 | 14 | 7   | 5  | 3   | 2  | 10   | 12  |
| 13        | 2  | 4    | 8  | 4  | 16 | 14 | 18 | 15 | 27.0 | 5   | 8   | 22 | 10 | 108 | 82 | 153 | 93 | 60   | 57  |
| 14        | 16 | 20   | 12 | 5  | 6  | 9  | 11 | 9  | 29.3 | 119 | 226 | 52 | 11 | 14  | 29 | 42  | 27 | 65   | 72  |
| 15        | 9  | 13   | 10 | 13 | 9  | 8  | 7  | 10 | 26.3 | 31  | 61  | 37 | 65 | 31  | 24 | 18  | 38 | 38   | 33  |
| 16        | 9  | 7    | 9  | 8  | 4  | 11 | 12 | 11 | 23.7 | 32  | 17  | 33 | 26 | 8   | 48 | 59  | 43 | 33   | 34  |
| 17        | 11 | 10   | 11 | 9  | 9  | 8  | 8  | 11 | 25.7 | 49  | 38  | 42 | 30 | 28  | 26 | 24  | 49 | 36   | 36  |
| 18        | 9  | 9    | 9  | 10 | 4  | 4  | 6  | 3  | 18.0 | 33  | 30  | 31 | 36 | 10  | 9  | 16  | 7  | 22   | 22  |
| 19        | 6  | 7    | 6  | 1  | 2  | 1  | 0  | 0  | 7.7  | 14  | 17  | 14 | 3  | 5   | 2  | 1   | 1  | 7    | 8   |
| 20        | 0  | 4    | 2  | 4  | 2  | 0  | 1  | 2  | 5.0  | 1   | 8   | 4  | 10 | 4   | 0  | 3   | 4  | 4    | 4   |
| 21        | 4  | 2    | 1  | 2  | 1  | 0  | 0  | 0  | 3.3  | 8   | 4   | 2  | 5  | 2   | 1  | 0   | 0  | 3    | 3   |
| 22        | 1  | 1    | 3  | 4  | 3  | 4  | 6  | 5  | 9.0  | 3   | 3   | 7  | 8  | 7   | 10 | 14  | 11 | 8    | 7   |
| 23        | 3  | 4    | 3  | 9  | 11 | 8  | 9  | 9  | 18.7 | 6   | 8   | 7  | 27 | 25  | 21 | 28  | 28 | 21   | 19  |
| 24        | 7  | 8    | 9  | 7  | 8  | 10 | 9  | 9  | 22.3 | 19  | 21  | 28 | 19 | 43  | 37 | 31  | 33 | 26   | 24  |
| 25        | 5  | 5    | 5  | 6  | 3  | 1  | 0  | 4  | 9.7  | 12  | 13  | 12 | 14 | 6   | 3  | 1   | 10 | 9    | 16  |
| 26        | 3  | 6    | 5  | 7  | 7  | 4  | 4  | 7  | 14.3 | 7   | 16  | 13 | 17 | 17  | 9  | 9   | 19 | 13   | 12  |
| 27        | 6  | 7    | 4  | 5  | 7  | 5  | 4  | 2  | 13.3 | 16  | 19  | 10 | 13 | 17  | 11 | 10  | 5  | 13   | 12  |
| 28        | 6  | 4    | 4  | 5  | 5  | 2  | 8  | 8  | 14.0 | 14  | 8   | 10 | 12 | 13  | 5  | 21  | 23 | 13   | 17  |
| 29        | 10 | 7    | 11 | 8  | 9  | 12 | 12 | 10 | 26.3 | 34  | 20  | 41 | 23 | 32  | 54 | 54  | 35 | 37   | 26  |
| 30        | 7  | 7    | 6  | 4  | 0  | 2  | 4  | 7  | 12.3 | 18  | 17  | 15 | 9  | 0   | 5  | 10  | 18 | 12   | 20  |
|           |    |      |    |    |    |    |    |    |      |     |     |    |    |     |    |     |    | 19.4 |     |

| OCT. 1972 |    | 3 Km |    |    |    |    |    |    | Σ Km | am   |    |    |    |    |    |     |    | Am | Am2 |  |  |
|-----------|----|------|----|----|----|----|----|----|------|------|----|----|----|----|----|-----|----|----|-----|--|--|
| 1         | 8  | 6    | 4  | 2  | 2  | 5  | 4  | 5  | 12.0 | 21   | 14 | 10 | 5  | 5  | 12 | 8   | 11 | 11 | 9   |  |  |
| 2         | 3  | 3    | 3  | 1  | 3  | 3  | 8  | 7  | 10.3 | 7    | 6  | 6  | 2  | 7  | 6  | 22  | 17 | 9  | 9   |  |  |
| 3         | 4  | 4    | 3  | 2  | 0  | 4  | 3  | 8  | 9.3  | 10   | 9  | 6  | 4  | 0  | 9  | 7   | 22 | 8  | 12  |  |  |
| 4         | 8  | 4    | 7  | 7  | 3  | 1  | 2  | 1  | 11.0 | 25   | 10 | 18 | 19 | 6  | 2  | 4   | 3  | 11 | 8   |  |  |
| 5         | 2  | 0    | 0  | 0  | 0  | 1  | 4  | 1  | 2.7  | 4    | 1  | 0  | 1  | 0  | 2  | 9   | 3  | 3  | 2   |  |  |
| 6         | 0  | 0    | 0  | 0  | 0  | 0  | 4  | 3  | 2.3  | 1    | 0  | 0  | 1  | 0  | 1  | 8   | 7  | 2  | 4   |  |  |
| 7         | 0  | 1    | 1  | 8  | 5  | 2  | 8  | 11 | 12.0 | 1    | 3  | 2  | 21 | 12 | 4  | 25  | 43 | 14 | 9   |  |  |
| 8         | 6  | 0    | 0  | 0  | 0  | 3  | 5  | 1  | 5.0  | 15   | 1  | 0  | 1  | 1  | 7  | 12  | 2  | 5  | 8   |  |  |
| 9         | 0  | 1    | 3  | 0  | 3  | 4  | 8  | 6  | 8.3  | 0    | 2  | 6  | 0  | 6  | 10 | 21  | 15 | 8  | 8   |  |  |
| 10        | 6  | 3    | 4  | 6  | 6  | 6  | 6  | 6  | 14.3 | 14   | 7  | 8  | 14 | 16 | 16 | 14  | 16 | 13 | 20  |  |  |
| 11        | 11 | 10   | 11 | 10 | 9  | 9  | 3  | 4  | 22.3 | 50   | 38 | 42 | 39 | 33 | 27 | 7   | 10 | 31 | 22  |  |  |
| 12        | 4  | 2    | 4  | 7  | 10 | 11 | 12 | 12 | 20.7 | 9    | 5  | 10 | 19 | 39 | 48 | 60  | 55 | 31 | 28  |  |  |
| 13        | 11 | 7    | 6  | 10 | 9  | 7  | 10 | 10 | 23.3 | 47   | 19 | 16 | 38 | 30 | 19 | 36  | 35 | 30 | 39  |  |  |
| 14        | 11 | 9    | 11 | 12 | 11 | 11 | 6  | 8  | 26.3 | 47   | 30 | 43 | 60 | 41 | 41 | 15  | 24 | 38 | 29  |  |  |
| 15        | 4  | 6    | 2  | 5  | 6  | 4  | 7  | 8  | 14.0 | 10   | 15 | 5  | 11 | 14 | 9  | 19  | 22 | 13 | 19  |  |  |
| 16        | 8  | 8    | 6  | 7  | 9  | 8  | 3  | 5  | 18.0 | 21   | 24 | 15 | 20 | 28 | 25 | 6   | 11 | 19 | 14  |  |  |
| 17        | 3  | 0    | 0  | 1  | 0  | 0  | 2  | 1  | 2.3  | 7    | 1  | 0  | 2  | 0  | 0  | 5   | 2  | 2  | 9   |  |  |
| 18        | 0  | 3    | 6  | 9  | 5  | 10 | 6  | 12 | 17.0 | 1    | 6  | 16 | 33 | 11 | 34 | 15  | 54 | 21 | 27  |  |  |
| 19        | 14 | 11   | 14 | 12 | 10 | 10 | 10 | 6  | 29.0 | 78   | 46 | 80 | 54 | 38 | 34 | 35  | 15 | 48 | 37  |  |  |
| 20        | 7  | 8    | 9  | 8  | 7  | 9  | 8  | 7  | 21.0 | 19   | 25 | 30 | 22 | 17 | 28 | 26  | 17 | 23 | 25  |  |  |
| 21        | 4  | 8    | 10 | 9  | 9  | 10 | 9  | 9  | 22.0 | 10   | 25 | 38 | 27 | 27 | 37 | 29  | 17 | 26 | 24  |  |  |
| 22        | 8  | 5    | 7  | 9  | 7  | 9  | 8  | 9  | 20.7 | 21   | 11 | 20 | 31 | 17 | 31 | 24  | 28 | 23 | 25  |  |  |
| 23        | 9  | 6    | 9  | 9  | 8  | 8  | 9  | 9  | 22.3 | 29   | 15 | 29 | 30 | 21 | 24 | 31  | 28 | 26 | 23  |  |  |
| 24        | 7  | 6    | 6  | 6  | 7  | 9  | 6  | 7  | 18.0 | 19   | 15 | 15 | 15 | 18 | 29 | 14  | 17 | 18 | 19  |  |  |
| 25        | 3  | 3    | 6  | 8  | 9  | 4  | 4  | 4  | 13.7 | 6    | 6  | 15 | 26 | 27 | 8  | 10  | 9  | 13 | 16  |  |  |
| 26        | 3  | 6    | 9  | 7  | 5  | 4  | 7  | 6  | 15.7 | 7    | 15 | 29 | 19 | 13 | 8  | 17  | 16 | 16 | 14  |  |  |
| 27        | 8  | 1    | 3  | 4  | 7  | 7  | 6  | 7  | 14.3 | 26   | 3  | 6  | 8  | 17 | 18 | 16  | 19 | 14 | 18  |  |  |
| 28        | 8  | 9    | 9  | 9  | 4  | 1  | 0  | 7  | 15.7 | 21   | 33 | 33 | 32 | 9  | 2  | 1   | 17 | 19 | 21  |  |  |
| 29        | 7  | 8    | 12 | 8  | 10 | 10 | 10 | 10 | 25.0 | 17   | 23 | 59 | 25 | 37 | 37 | 34  | 34 | 33 | 27  |  |  |
| 30        | 10 | 10   | 9  | 11 | 13 | 7  | 4  | 8  | 24.0 | 36   | 34 | 31 | 41 | 69 | 18 | 8   | 21 | 32 | 27  |  |  |
| 31        | 7  | 4    | 3  | 0  | 2  | 14 | 18 | 14 | 20.7 | 18   | 8  | 6  | 1  | 5  | 78 | 167 | 74 | 45 | 70  |  |  |
|           |    |      |    |    |    |    |    |    |      | 19.5 |    |    |    |    |    |     |    |    |     |  |  |





| NOV. 1972 |    |      |    |    |    |    |    |    |      |             |     |     |     |    |    |    |    |      |    |      |
|-----------|----|------|----|----|----|----|----|----|------|-------------|-----|-----|-----|----|----|----|----|------|----|------|
|           |    | 3 Km |    |    |    |    |    |    |      | $\Sigma$ Km | am  |     |     |    |    |    |    |      | Am | Am 2 |
| 1         | 18 | 19   | 18 | 17 | 15 | 7  | 12 | 12 | 39.3 | 156         | 199 | 160 | 139 | 95 | 20 | 58 | 58 | 111  | 90 |      |
| 2         | 14 | 14   | 10 | 10 | 8  | 14 | 13 | 13 | 32.0 | 81          | 75  | 40  | 34  | 25 | 81 | 70 | 62 | 59   | 52 |      |
| 3         | 13 | 9    | 7  | 5  | 2  | 1  | 4  | 3  | 14.7 | 67          | 28  | 19  | 12  | 4  | 2  | 8  | 7  | 18   | 26 |      |
| 4         | 5  | 3    | 1  | 4  | 1  | 5  | 4  | 7  | 10.0 | 12          | 7   | 3   | 10  | 3  | 13 | 10 | 18 | 10   | 7  |      |
| 5         | 5  | 1    | 1  | 2  | 3  | 1  | 2  | 5  | 6.7  | 12          | 3   | 2   | 4   | 6  | 2  | 4  | 11 | 6    | 8  |      |
| 6         | 4  | 5    | 2  | 7  | 6  | 6  | 6  | 4  | 13.3 | 8           | 11  | 5   | 20  | 14 | 15 | 15 | 8  | 12   | 12 |      |
| 7         | 1  | 4    | 7  | 10 | 6  | 4  | 6  | 7  | 15.0 | 3           | 10  | 18  | 36  | 14 | 8  | 14 | 17 | 15   | 14 |      |
| 8         | 7  | 4    | 3  | 6  | 6  | 5  | 4  | 8  | 14.3 | 18          | 10  | 6   | 14  | 15 | 13 | 9  | 22 | 13   | 12 |      |
| 9         | 3  | 3    | 4  | 6  | 6  | 7  | 7  | 5  | 13.7 | 7           | 6   | 10  | 14  | 15 | 17 | 18 | 13 | 13   | 12 |      |
| 10        | 3  | 4    | 2  | 4  | 5  | 2  | 2  | 3  | 8.3  | 6           | 8   | 5   | 8   | 13 | 4  | 4  | 7  | 7    | 10 |      |
| 11        | 7  | 4    | 3  | 4  | 7  | 7  | 7  | 5  | 14.7 | 18          | 8   | 6   | 8   | 20 | 17 | 17 | 11 | 13   | 12 |      |
| 12        | 5  | 5    | 8  | 5  | 4  | 5  | 1  | 2  | 11.7 | 12          | 12  | 22  | 12  | 9  | 13 | 3  | 5  | 11   | 11 |      |
| 13        | 4  | 4    | 2  | 1  | 1  | 1  | 2  | 2  | 5.7  | 10          | 10  | 5   | 3   | 3  | 2  | 5  | 5  | 5    | 6  |      |
| 14        | 2  | 2    | 3  | 1  | 4  | 4  | 1  | 5  | 7.3  | 4           | 5   | 7   | 2   | 9  | 9  | 2  | 12 | 6    | 8  |      |
| 15        | 4  | 7    | 6  | 9  | 11 | 12 | 9  | 11 | 23.0 | 8           | 20  | 15  | 27  | 44 | 55 | 30 | 45 | 31   | 29 |      |
| 16        | 10 | 13   | 11 | 10 | 13 | 10 | 8  | 11 | 28.7 | 34          | 64  | 49  | 37  | 68 | 38 | 22 | 43 | 44   | 37 |      |
| 17        | 6  | 6    | 5  | 8  | 7  | 9  | 9  | 6  | 18.7 | 14          | 16  | 11  | 25  | 18 | 33 | 30 | 16 | 20   | 25 |      |
| 18        | 5  | 4    | 8  | 5  | 7  | 8  | 6  | 4  | 15.7 | 13          | 10  | 25  | 12  | 17 | 25 | 15 | 9  | 16   | 19 |      |
| 19        | 7  | 6    | 9  | 7  | 7  | 5  | 7  | 7  | 18.3 | 20          | 15  | 27  | 20  | 17 | 13 | 18 | 19 | 19   | 23 |      |
| 20        | 11 | 8    | 8  | 12 | 13 | 12 | 11 | 6  | 27.0 | 42          | 23  | 25  | 60  | 62 | 59 | 48 | 16 | 42   | 30 |      |
| 21        | 9  | 9    | 7  | 4  | 2  | 5  | 5  | 4  | 15.0 | 27          | 28  | 17  | 8   | 4  | 11 | 11 | 9  | 14   | 22 |      |
| 22        | 5  | 3    | 4  | 7  | 9  | 14 | 9  | 7  | 19.3 | 11          | 7   | 9   | 17  | 32 | 77 | 32 | 19 | 26   | 18 |      |
| 23        | 8  | 5    | 2  | 5  | 8  | 10 | 7  | 6  | 17.0 | 23          | 12  | 5   | 13  | 26 | 34 | 19 | 14 | 18   | 22 |      |
| 24        | 6  | 5    | 4  | 6  | 2  | 2  | 5  | 4  | 11.3 | 15          | 12  | 10  | 14  | 5  | 4  | 12 | 10 | 10   | 14 |      |
| 25        | 3  | 5    | 5  | 8  | 6  | 5  | 8  | 8  | 16.0 | 7           | 11  | 11  | 24  | 16 | 12 | 23 | 25 | 16   | 16 |      |
| 26        | 11 | 6    | 6  | 7  | 7  | 5  | 5  | 3  | 16.7 | 44          | 14  | 14  | 20  | 19 | 12 | 12 | 6  | 18   | 17 |      |
| 27        | 8  | 5    | 4  | 3  | 6  | 10 | 10 | 7  | 17.7 | 22          | 11  | 9   | 7   | 15 | 37 | 38 | 19 | 20   | 17 |      |
| 28        | 8  | 8    | 3  | 5  | 11 | 10 | 7  | 6  | 19.3 | 21          | 21  | 7   | 11  | 42 | 37 | 19 | 14 | 22   | 22 |      |
| 29        | 7  | 8    | 6  | 4  | 4  | 5  | 6  | 5  | 15.0 | 18          | 26  | 14  | 8   | 9  | 12 | 15 | 11 | 14   | 15 |      |
| 30        | 4  | 1    | 0  | 1  | 4  | 2  | 7  | 5  | 8.0  | 8           | 2   | 1   | 2   | 9  | 5  | 17 | 13 | 7    | 10 |      |
|           |    |      |    |    |    |    |    |    |      |             |     |     |     |    |    |    |    | 21.2 |    |      |

| DEC. 1972 |    | 3 Km |    |    |    | $\Sigma$ Km | am |    |      |    |    |    |    |    | Am | Am2  |     |    |    |
|-----------|----|------|----|----|----|-------------|----|----|------|----|----|----|----|----|----|------|-----|----|----|
| 1         | 7  | 5    | 5  | 2  | 1  | 4           | 2  | 1  | 9.0  | 19 | 13 | 13 | 4  | 2  | 8  | 5    | 2   | 8  | 9  |
| 2         | 2  | 3    | 6  | 5  | 1  | 8           | 7  | 3  | 11.7 | 5  | 6  | 15 | 12 | 3  | 23 | 19   | 7   | 11 | 10 |
| 3         | 5  | 4    | 6  | 4  | 3  | 6           | 8  | 6  | 14.0 | 11 | 10 | 16 | 8  | 7  | 14 | 21   | 15  | 13 | 12 |
| 4         | 3  | 4    | 5  | 2  | 2  | 3           | 3  | 3  | 8.3  | 6  | 9  | 12 | 4  | 5  | 6  | 7    | 6   | 7  | 8  |
| 5         | 3  | 1    | 1  | 0  | 1  | 1           | 1  | 5  | 4.3  | 6  | 3  | 2  | 1  | 2  | 2  | 2    | 11  | 4  | 4  |
| 6         | 2  | 2    | 1  | 0  | 0  | 2           | 4  | 4  | 5.0  | 4  | 4  | 3  | 1  | 0  | 5  | 8    | 8   | 4  | 7  |
| 7         | 4  | 4    | 7  | 9  | 8  | 9           | 8  | 3  | 17.3 | 8  | 10 | 19 | 30 | 25 | 29 | 24   | 7   | 19 | 13 |
| 8         | 2  | 5    | 3  | 6  | 5  | 5           | 6  | 7  | 13.0 | 4  | 11 | 6  | 16 | 12 | 13 | 16   | 19  | 12 | 12 |
| 9         | 2  | 1    | 2  | 1  | 0  | 4           | 5  | 5  | 6.7  | 5  | 2  | 5  | 3  | 1  | 8  | 13   | 12  | 6  | 8  |
| 10        | 4  | 2    | 4  | 2  | 0  | 0           | 4  | 2  | 6.0  | 9  | 5  | 8  | 4  | 1  | 0  | 8    | 5   | 5  | 6  |
| 11        | 3  | 2    | 1  | 1  | 2  | 2           | 2  | 3  | 5.3  | 7  | 4  | 3  | 3  | 5  | 5  | 4    | 6   | 5  | 5  |
| 12        | 3  | 3    | 3  | 3  | 6  | 5           | 6  | 12 | 13.7 | 6  | 7  | 7  | 6  | 16 | 12 | 16   | 54  | 16 | 22 |
| 13        | 14 | 11   | 11 | 11 | 11 | 14          | 11 | 12 | 31.7 | 76 | 42 | 42 | 42 | 41 | 79 | 42   | 59  | 53 | 36 |
| 14        | 6  | 6    | 5  | 4  | 8  | 8           | 5  | 4  | 15.3 | 15 | 15 | 11 | 9  | 24 | 23 | 12   | 9   | 15 | 28 |
| 15        | 4  | 7    | 9  | 11 | 10 | 7           | 11 | 18 | 25.7 | 9  | 18 | 30 | 50 | 40 | 17 | 49   | 148 | 45 | 39 |
| 16        | 10 | 12   | 11 | 12 | 9  | 10          | 12 | 11 | 29.0 | 40 | 56 | 44 | 56 | 30 | 36 | 56   | 41  | 45 | 45 |
| 17        | 8  | 7    | 8  | 11 | 10 | 7           | 8  | 4  | 21.0 | 22 | 17 | 21 | 44 | 37 | 17 | 21   | 10  | 24 | 25 |
| 18        | 5  | 4    | 5  | 7  | 7  | 7           | 5  | 7  | 15.7 | 13 | 9  | 12 | 18 | 18 | 19 | 11   | 19  | 15 | 15 |
| 19        | 5  | 4    | 4  | 4  | 4  | 7           | 5  | 8  | 13.7 | 11 | 10 | 8  | 8  | 10 | 19 | 11   | 22  | 12 | 13 |
| 20        | 4  | 5    | 3  | 4  | 4  | 2           | 4  | 3  | 9.7  | 10 | 11 | 7  | 8  | 9  | 4  | 9    | 7   | 8  | 8  |
| 21        | 0  | 0    | 1  | 1  | 4  | 1           | 1  | 2  | 3.3  | 1  | 0  | 3  | 3  | 10 | 2  | 3    | 5   | 3  | 6  |
| 22        | 2  | 2    | 3  | 7  | 11 | 10          | 11 | 11 | 19.0 | 5  | 5  | 7  | 17 | 50 | 39 | 48   | 49  | 28 | 25 |
| 23        | 12 | 10   | 11 | 8  | 9  | 10          | 14 | 8  | 27.3 | 56 | 38 | 44 | 24 | 27 | 40 | 80   | 25  | 42 | 41 |
| 24        | 12 | 9    | 9  | 7  | 4  | 2           | 0  | 2  | 15.0 | 58 | 28 | 29 | 19 | 10 | 4  | 1    | 5   | 19 | 22 |
| 25        | 4  | 0    | 0  | 3  | 3  | 2           | 6  | 8  | 8.7  | 10 | 1  | 1  | 6  | 7  | 5  | 14   | 21  | 8  | 7  |
| 26        | 2  | 3    | 4  | 5  | 6  | 3           | 2  | 2  | 9.0  | 4  | 7  | 10 | 12 | 16 | 7  | 5    | 4   | 8  | 8  |
| 27        | 2  | 3    | 1  | 0  | 0  | 0           | 2  | 2  | 3.3  | 5  | 7  | 2  | 0  | 1  | 1  | 4    | 5   | 3  | 5  |
| 28        | 2  | 3    | 2  | 5  | 4  | 5           | 6  | 6  | 11.0 | 4  | 7  | 5  | 13 | 10 | 12 | 14   | 15  | 10 | 11 |
| 29        | 8  | 9    | 8  | 6  | 7  | 10          | 8  | 10 | 22.0 | 21 | 27 | 23 | 14 | 17 | 38 | 21   | 34  | 24 | 22 |
| 30        | 8  | 8    | 8  | 10 | 6  | 8           | 11 | 10 | 23.0 | 25 | 21 | 26 | 36 | 16 | 24 | 47   | 39  | 29 | 28 |
| 31        | 5  | 9    | 8  | 11 | 7  | 4           | 7  | 10 | 20.3 | 12 | 28 | 24 | 41 | 19 | 10 | 19   | 35  | 24 | 26 |
|           |    |      |    |    |    |             |    |    |      |    |    |    |    |    |    | 16.9 |     |    |    |



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|-----|-------------|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 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   | -9          | -10 | -12 | -14 | -11 | -13 | -18 | -18 | -14    | -10 | -10 | -9  | -7  | -6  | -6  | -8  | -12 | -12 | -9  | -12 | -17 | -15 | -15 | -14 |
| 2   | -11         | -10 | -10 | -13 | -12 | -10 | -12 | -16 | -20    | -17 | -13 | -9  | -6  | -6  | -3  | -9  | -18 | -15 | -18 | -14 | -11 | -9  | -8  | -4  |
| 3   | 1           | 5   | 6   | 5   | 1   | -9  | -24 | -34 | -35    | -27 | -22 | -23 | -23 | -23 | -19 | -17 | -17 | -16 | -17 | -14 | -11 | -11 | -9  | -10 |
| 4   | -9          | -6  | -15 | -16 | -13 | -14 | -18 | -18 | -11    | -9  | -8  | -10 | -8  | -4  | -1  | -2  | -5  | -7  | -6  | -5  | -4  | -3  | -5  | -4  |
| 5   | -1          | -1  | -5  | -4  | -4  | -4  | -4  | -6  | -9     | -8  | -7  | -11 | -11 | -12 | -11 | -11 | -11 | -10 | -3  | 1   | 1   | -4  | -6  | -4  |
| 6   | 0           | 3   | 3   | -1  | -4  | -4  | -6  | -8  | -7     | -7  | -8  | -7  | -8  | -9  | -8  | -6  | -6  | -5  | -1  | 1   | 2   | -4  | -8  | -8  |
| 7   | -6          | -6  | -6  | -7  | -6  | -4  | -7  | -5  | -6     | -7  | -6  | -4  | -3  | -3  | -2  | -2  | 1   | 2   | 2   | -5  | -5  | -2  | -3  | -2  |
| 8   | -5          | -4  | 0   | -1  | -2  | -4  | -5  | -4  | -3     | -3  | -1  | 1   | 1   | 3   | -5  | -7  | -7  | -6  | -14 | -14 | -12 | -13 | -12 | -11 |
| 9   | -13         | -17 | -15 | -12 | -10 | -9  | -8  | -9  | -9     | -10 | -9  | -9  | -9  | -11 | -11 | -8  | -5  | 1   | -1  | 2   | -2  | -7  | -6  | -5  |
| 10  | -6          | -11 | -15 | -12 | -9  | -8  | -8  | -8  | -8     | -7  | -4  | -2  | -4  | -4  | -1  | 0   | -1  | -10 | -17 | -21 | -22 | -21 | -20 | -28 |
| 11  | -33         | -40 | -32 | -25 | -19 | -21 | -27 | -35 | -38    | -39 | -42 | -40 | -39 | -36 | -36 | -35 | -27 | -23 | -22 | -16 | -11 | -10 | -17 | -21 |
| 12  | -19         | -20 | -21 | -23 | -23 | -24 | -22 | -20 | -19    | -19 | -18 | -17 | -17 | -18 | -16 | -14 | -16 | -16 | -16 | -15 | -14 | -13 | -13 | -10 |
| 13  | -10         | -7  | -8  | -10 | -12 | -12 | -11 | -10 | -9     | -10 | -8  | -8  | -9  | -10 | -6  | -8  | -9  | -9  | -5  | -3  | -1  | -1  | 0   | 3   |
| 14  | 4           | 5   | 3   | 2   | 3   | 3   | 1   | -1  | -1     | -2  | -2  | 1   | -0  | 2   | 1   | -1  | -3  | -5  | -5  | -5  | -5  | -2  | 1   | 2   |
| 15  | 4           | 4   | 4   | -1  | -4  | -4  | -1  | 3   | 0      | -1  | -1  | 7   | -1  | -1  | 1   | -15 | -40 | -61 | -70 | -67 | -58 | -52 | -50 | -44 |
| 16  | -32         | -23 | -19 | -17 | -18 | -22 | -40 | -34 | -28    | -33 | -42 | -37 | -35 | -28 | -28 | -46 | -59 | -56 | -46 | -43 | -41 | -40 | -40 | -35 |
| 17  | -32         | -33 | -34 | -39 | -37 | -31 | -35 | -36 | -36    | -34 | -31 | -30 | -30 | -24 | -24 | -24 | -24 | -22 | -23 | -22 | -16 | -10 | -9  | -12 |
| 18  | -17         | -20 | -18 | -21 | -27 | -23 | -20 | -30 | -24    | -20 | -27 | -29 | -26 | -25 | -32 | -36 | -31 | -33 | -29 | -25 | -26 | -22 | -19 | -15 |
| 19  | -14         | -15 | -17 | -19 | -18 | -16 | -17 | -19 | -19    | -19 | -23 | -24 | -23 | -17 | -16 | -11 | -8  | -10 | -9  | -12 | -15 | -17 | -14 | -13 |
| 20  | -12         | -14 | -15 | -18 | -20 | -19 | -20 | -18 | -19    | -23 | -23 | -23 | -24 | -26 | -25 | -19 | -17 | -21 | -21 | -16 | -13 | -11 | -11 | -12 |
| 21  | -13         | -13 | -11 | -14 | -12 | -15 | -17 | -16 | -20    | -23 | -27 | -28 | -17 | -54 | -66 | -75 | -72 | -68 | -67 | -60 | -54 | -48 | -45 | -42 |
| 22  | -39         | -34 | -38 | -34 | -45 | -45 | -41 | -36 | -40    | -47 | -49 | -49 | -43 | -42 | -53 | -53 | -57 | -52 | -46 | -43 | -40 | -41 | -51 |     |
| 23  | -53         | -53 | -59 | -62 | -59 | -55 | -52 | -50 | -69    | -67 | -58 | -55 | -52 | -48 | -41 | -40 | -39 | -41 | -38 | -35 | -36 | -34 | -38 | -36 |
| 24  | -37         | -41 | -44 | -42 | -39 | -37 | -37 | -32 | -34    | -35 | -33 | -41 | -34 | -30 | -29 | -27 | -28 | -29 | -27 | -32 | -30 | -30 | -31 | -29 |
| 25  | -31         | -31 | -31 | -35 | -48 | -49 | -51 | -50 | -41    | -35 | -35 | -37 | -39 | -33 | -29 | -27 | -29 | -24 | -20 | -21 | -18 | -13 | -14 | -19 |
| 26  | -16         | -16 | -19 | -21 | -23 | -22 | -17 | -14 | -13    | -15 | -24 | -20 | -28 | -32 | -35 | -37 | -33 | -28 | -24 | -23 | -23 | -21 | -16 | -17 |
| 27  | -22         | -24 | -25 | -25 | -26 | -26 | -29 | -31 | -27    | -20 | -18 | -15 | -13 | -14 | -18 | -22 | -24 | -30 | -34 | -29 | -23 | -19 | -18 | -17 |
| 28  | -17         | -15 | -15 | -16 | -19 | -23 | -27 | -25 | -26    | -24 | -24 | -30 | -28 | -28 | -33 | -41 | -42 | -49 | -54 | -56 | -50 | -50 | -43 | -38 |
| 29  | -37         | -39 | -36 | -34 | -39 | -32 | -29 | -26 | -25    | -26 | -22 | -21 | -18 | -19 | -23 | -28 | -28 | -29 | -26 | -34 | -36 | -31 | -29 | -30 |
| 30  | -29         | -28 | -26 | -24 | -23 | -25 | -25 | -25 | -23    | -19 | -19 | -18 | -18 | -16 | -17 | -17 | -16 | -16 | -15 | -14 | -17 | -18 | -19 | -17 |
| 31  | -20         | -22 | -19 | -19 | -19 | -15 | -12 | -12 | -13    | -15 | -13 | -12 | -12 | -12 | -12 | -14 | -14 | -19 | -21 | -20 | -16 | -12 | -12 | -10 |

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|-----|-------------|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 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   | -12         | -12 | -13 | -11 | -10 | -12 | -15 | -16 | -15    | -12 | -4  | -7  | -9  | -19 | -19 | -12 | -5  | -8  | -10 | -11 | -8  | -4  | -4  | -8  |
| 2   | -15         | -15 | -13 | -19 | -20 | -20 | -30 | -36 | -26    | -18 | -20 | -22 | -19 | -16 | -15 | -4  | -8  | -5  | -4  | -5  | -11 | -15 | -16 | -22 |
| 3   | -24         | -23 | -21 | -20 | -18 | -15 | -14 | -15 | -19    | -22 | -25 | -23 | -21 | -29 | -29 | -30 | -29 | -23 | -22 | -16 | -13 | -11 | -9  | -9  |
| 4   | -9          | -10 | -15 | -23 | -23 | -17 | -21 | -21 | -22    | -20 | -19 | -24 | -25 | -22 | -21 | -24 | -26 | -23 | -20 | -18 | -20 | -21 | -15 | -11 |
| 5   | -11         | -15 | -17 | -17 | -15 | -12 | -9  | -11 | -10    | -9  | -18 | -23 | -22 | -22 | -16 | -15 | -14 | -19 | -24 | -25 | -21 | -22 | -21 | -22 |
| 6   | -21         | -19 | -17 | -16 | -15 | -9  | -7  | -6  | -3     | 1   | -4  | -6  | -7  | -7  | -4  | -3  | -1  | -3  | -8  | -16 | -22 | -26 | -29 | -29 |
| 7   | -30         | -32 | -32 | -28 | -23 | -19 | -14 | -11 | -9     | -10 | -12 | -15 | -16 | -15 | -15 | -13 | -10 | -10 | -11 | -11 | -18 | -27 | -26 | -24 |
| 8   | -22         | -23 | -31 | -33 | -29 | -21 | -17 | -16 | -13    | -10 | -14 | -16 | -14 | -13 | -15 | -14 | -11 | -10 | -10 | -11 | -12 | -11 | -12 | -13 |
| 9   | -15         | -14 | -14 | -15 | -14 | -13 | -10 | -7  | -6     | -9  | -10 | -9  | -8  | -10 | -10 | -10 | -10 | -9  | -10 | -8  | -5  | -0  | 4   | 5   |
| 10  | 5           | -1  | -5  | 5   | 7   | 6   | 3   | 2   | 1      | 1   | -0  | 0   | 3   | 6   | 3   | 5   | 12  | 20  | 19  | 13  | 8   | -2  | -6  | -4  |
| 11  | -1          | 3   | 4   | -0  | -0  | 1   | -2  | 2   | 2      | -8  | -10 | -5  | -1  | -1  | -6  | -9  | -10 | -8  | -6  | -7  | -7  | -11 | -11 | -10 |
| 12  | -11         | -12 | -18 | -16 | -12 | -8  | -8  | -8  | -5     | -2  | -2  | 1   | 0   | -1  | -2  | -1  | -1  | -0  | 1   | 1   | -0  | -2  | -2  | -4  |
| 13  | -7          | -6  | -5  | -1  | 1   | 6   | 11  | 13  | 10     | 9   | 10  | 2   | -8  | -16 | -12 | -11 | -12 | -21 | -20 | -25 | -26 | -32 | -38 | -47 |
| 14  | -45         | -38 | -36 | -36 | -30 | -23 | -28 | -28 | -26    | -21 | -19 | -13 | -13 | -14 | -14 | -15 | -14 | -15 | -17 | -15 | -14 | -17 | -17 | -23 |
| 15  | -23         | -25 | -21 | -16 | -14 | -20 | -22 | -25 | -18    | -15 | -17 | -13 | -10 | -11 | -11 | -13 | -13 | -12 | -12 | -14 | -17 | -19 | -21 | -23 |
| 16  | -25         | -24 | -21 | -20 | -18 | -16 | -14 | -13 | -11    | -10 | -9  | -6  | -2  | 0   | -1  | -5  | -8  | -9  | -10 | -10 | -9  | -7  | -8  | -15 |
| 17  | -19         | -16 | -10 | -8  | -8  | -5  | -2  | -2  | -7     | -11 | -15 | -12 | -11 | -7  | -18 | -21 | -34 | -48 | -46 | -53 | -59 | -61 | -58 | -58 |
| 18  | -56         | -57 | -57 | -52 | -45 | -45 | -46 | -42 | -39    | -35 | -34 | -35 | -32 | -30 | -28 | -26 | -24 | -21 | -19 | -14 | -13 | -18 | -25 | -26 |
| 19  | -50         | -54 | -51 | -47 | -44 | -33 | -26 | -22 | -18    | -20 | -22 | -25 | -29 | -36 | -37 | -38 | -35 | -35 | -34 | -34 | -30 | -27 | -29 | -28 |
| 20  | -26         | -28 | -29 | -31 | -30 | -32 | -34 | -33 | -29    | -28 | -28 | -26 | -22 | -24 | -26 | -31 | -34 | -31 | -28 | -25 | -23 | -21 | -20 | -21 |
| 21  | -16         | -13 | -15 | -14 | -18 | -24 | -26 | -27 | -26    | -23 | -22 | -20 | -22 | -20 | -18 | -15 | -27 | -30 | -28 | -20 | -18 | -15 | -15 | -12 |
| 22  | -9          | -7  | -6  | -7  | -10 | -11 | -11 | -12 | -10    | -12 | -15 | -15 | -14 | -12 | -13 | -16 | -19 | -19 | -17 | -16 | -15 | -14 | -12 | -12 |
| 23  | -10         | -8  | -7  | -10 | -10 | -4  | -3  | -2  | 2      | 4   | -0  | 2   | 1   | -4  | -0  | -0  | -1  | -1  | -10 | -8  | -6  | -7  | -3  | -5  |
| 24  | -9          | -11 | -18 | -15 | -9  | -12 | -7  | 4   | -16    | -28 | -50 | -53 | -67 | -83 | -78 | -86 | -83 | -80 | -77 | -78 | -71 | -71 | -74 | -72 |
| 25  | -66         | -66 | -64 | -63 | -55 | -51 | -49 | -52 | -45    | -38 | -35 | -36 | -37 | -37 | -40 | -43 | -44 | -44 | -41 | -41 | -43 | -41 | -38 | -37 |
| 26  | -37         | -33 | -32 | -32 | -34 | -36 | -32 | -29 | -28    | -28 | -27 | -23 | -23 | -24 | -28 | -27 | -24 | -24 | -22 | -23 | -27 | -27 | -26 | -24 |
| 27  | -21         | -17 | -15 | -15 | -15 | -16 | -18 | -20 | -22    | -21 | -17 | -14 | -14 | -15 | -15 | -16 | -16 | -13 | -13 | -16 | -19 | -19 | -19 | -17 |
| 28  | -16         | -13 | -12 | -14 | -20 | -24 | -31 | -33 | -35    | -30 | -26 | -24 | -24 | -24 | -22 | -21 | -20 | -19 | -17 | -16 | -17 | -16 | -14 | -9  |
| 29  | -6          | -4  | -3  | -4  | -4  | -2  | 1   | -0  | -1     | 0   | -0  | 0   | 0   | 0   | 1   | 3   | 2   | 0   | 2   | 3   | 4   | 2   | 1   | -0  |



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| UNIT=GAMMAS |     |     | G.M.T. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-------------|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|             |     |     | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |  |
| DAY         |     |     |        |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| 1           | 1   | 6   | 11     | 11  | 5   | -0  | 2   | 6   | 9   | -12 | -11 | -9  | 0   | -2  | -0  | 0   | 0   | -4  | 3   | 2   | 4   | 0   | -12 | -22 | -22 | -23 |  |
| 2           | -22 | -19 | -15    | -14 | -14 | -11 | -12 | -12 | -12 | -12 | -12 | -13 | -13 | -13 | -13 | -18 | -19 | -17 | -26 | -28 | -23 | -17 | -18 | -23 | -22 | -23 |  |
| 3           | -27 | -23 | -13    | -15 | -16 | -18 | -29 | -35 | -33 | -27 | -23 | -20 | -20 | -20 | -20 | -20 | -21 | -25 | -22 | -18 | -16 | -17 | -17 | -22 | -22 | -25 |  |
| 4           | -25 | -24 | -18    | -12 | -14 | -17 | -22 | -21 | -23 | -21 | -19 | -16 | -12 | -12 | -10 | -10 | -18 | -18 | -17 | -15 | -14 | -13 | -15 | -16 | -15 | -17 |  |
| 5           | -15 | -16 | -15    | -15 | -13 | -11 | -9  | -9  | -11 | -12 | -11 | -8  | -7  | -7  | -7  | -8  | -9  | -13 | -15 | -14 | -13 | -12 | -13 | -11 | -11 | -11 |  |
| 6           | -12 | -12 | -9     | -8  | -10 | -11 | -10 | -7  | -8  | -8  | -12 | -12 | -12 | -12 | -10 | -10 | -9  | -12 | -12 | -11 | -12 | -12 | -10 | 32  | 19  | -11 |  |
| 7           | -35 | -47 | -46    | -32 | -31 | -64 | -72 | -62 | -45 | -17 | -27 | -16 | -31 | -38 | -34 | -30 | -34 | -30 | -36 | -36 | -34 | -34 | -30 | -28 | -20 | -20 |  |
| 8           | -23 | -23 | -16    | -18 | -20 | -27 | -26 | -26 | -24 | -17 | -18 | -14 | -19 | -22 | -14 | -22 | -22 | -25 | -15 | -16 | -19 | -22 | -25 | -26 | -21 | -13 |  |
| 9           | -10 | -14 | -13    | -14 | -8  | -10 | -11 | -9  | -10 | -10 | -21 | -25 | -24 | -23 | -26 | -25 | -26 | -25 | -34 | -36 | -35 | -34 | -34 | -32 | -28 | -23 |  |
| 10          | -20 | -19 | -20    | -19 | -18 | -17 | -19 | -18 | -16 | -15 | -13 | -13 | -14 | -16 | -17 | -17 | -17 | -17 | -15 | -13 | -12 | -10 | -12 | -10 | -13 | -22 |  |
| 11          | -25 | -30 | -35    | -39 | -38 | -37 | -37 | -37 | -32 | -26 | -21 | -19 | -20 | -22 | -21 | -21 | -21 | -21 | -15 | -18 | -22 | -22 | -22 | -19 | -19 | -17 |  |
| 12          | -13 | -7  | -4     | -4  | -5  | -6  | -7  | -7  | -7  | -7  | -6  | -4  | -4  | -4  | -4  | -4  | -6  | -7  | -7  | -6  | -7  | -8  | -5  | -5  | -9  | -12 |  |
| 13          | -15 | -10 | -3     | -3  | -10 | -11 | -11 | -11 | -7  | -6  | -10 | -12 | -11 | -9  | -7  | -8  | -7  | -8  | -8  | -7  | -5  | -7  | -8  | -11 | -11 | -14 |  |
| 14          | -15 | -12 | -9     | -5  | -3  | -2  | -4  | -7  | -6  | -5  | -3  | -5  | -3  | -5  | -3  | -1  | 1   | 1   | 1   | -3  | -4  | -0  | 1   | 0   | 2   | 6   |  |
| 15          | 5   | 5   | 6      | 4   | 5   | 8   | 8   | 5   | -1  | -2  | 2   | 6   | 4   | 4   | 4   | 7   | 5   | 5   | 4   | 4   | 1   | 0   | -1  | 7   | 16  | 15  |  |
| 16          | 5   | -7  | -16    | -33 | -54 | -50 | -45 | -45 | -42 | -39 | -38 | -39 | -44 | -44 | -42 | -34 | -33 | -33 | -37 | -37 | -35 | -36 | -34 | -34 | -31 | -27 |  |
| 17          | -27 | -29 | -22    | -25 | -29 | -26 | -22 | -21 | -24 | -21 | -31 | -29 | -28 | -24 | -26 | -28 | -28 | -28 | -34 | -33 | -27 | -25 | -33 | -34 | -31 | -22 |  |
| 18          | -22 | -23 | -22    | -20 | -20 | -24 | -25 | -28 | -31 | -32 | -25 | -20 | -18 | -18 | -16 | -17 | -17 | -17 | -18 | -19 | -18 | -18 | -20 | -17 | -17 | -17 |  |
| 19          | -17 | -17 | -15    | -13 | -14 | -14 | -13 | -13 | -15 | -17 | -19 | -18 | -16 | -17 | -15 | -15 | -15 | -15 | -12 | -13 | -15 | -17 | -18 | -19 | -20 | -17 |  |
| 20          | -19 | -19 | -14    | -12 | -12 | -10 | -10 | -11 | -7  | -7  | -9  | -10 | -13 | -14 | -12 | -14 | -12 | -14 | -16 | -15 | -12 | -11 | -10 | -13 | -17 | -16 |  |
| 21          | -11 | -9  | -7     | -7  | -8  | -8  | -7  | -5  | -4  | -6  | -8  | -10 | -10 | -10 | -10 | -9  | -6  | -6  | -6  | -10 | -9  | -8  | -4  | -1  | -1  | 4   |  |
| 22          | 10  | 9   | 1      | -11 | -10 | -5  | -5  | -9  | -8  | -8  | -4  | -2  | 0   | -3  | -4  | -4  | -7  | -7  | -12 | -14 | -14 | -19 | -28 | -24 | -16 | -7  |  |
| 23          | -5  | -6  | -6     | -5  | -2  | 0   | 4   | 7   | 6   | -4  | -15 | -23 | -18 | -11 | -11 | -4  | -5  | -4  | -5  | -4  | -6  | -7  | -13 | -21 | -26 | -24 |  |
| 24          | -26 | -23 | -25    | -32 | -45 | -44 | -43 | -42 | -42 | -44 | -38 | -35 | -28 | -26 | -26 | -31 | -36 | -31 | -33 | -36 | -34 | -39 | -32 | -24 | -18 | -14 |  |
| 25          | -11 | -9  | -10    | -19 | -25 | -22 | -22 | -23 | -28 | -25 | -25 | -25 | -25 | -25 | -25 | -24 | -23 | -23 | -24 | -23 | -23 | -25 | -20 | -21 | -21 | -20 |  |
| 26          | -18 | -17 | -19    | -21 | -20 | -15 | -11 | -10 | -12 | -16 | -18 | -18 | -14 | -14 | -12 | -11 | -14 | -14 | -12 | -10 | -13 | -25 | -28 | -31 | -36 | -41 |  |
| 27          | -44 | -40 | -41    | -42 | -39 | -30 | -28 | -28 | -28 | -21 | -12 | -6  | -3  | -2  | 0   | 2   | 2   | 2   | 3   | 1   | -23 | -23 | -28 | -29 | -31 | -31 |  |
| 28          | -28 | -27 | -29    | -25 | -28 | -24 | -21 | -16 | -15 | -12 | -8  | -4  | -1  | 1   | 1   | 1   | 0   | 0   | -1  | 1   | 1   | -3  | -9  | -5  | -2  | 1   |  |
| 29          | 2   | 6   | 12     | 13  | 6   | 10  | 6   | 1   | -7  | -6  | -17 | -19 | -26 | -21 | -24 | -31 | -31 | -31 | -41 | -44 | -41 | -38 | -32 | -39 | -43 | -37 |  |
| 30          | -35 | -44 | -49    | -44 | -46 | -50 | -56 | -61 | -56 | -44 | -35 | -33 | -36 | -41 | -42 | -36 | -36 | -36 | -35 | -39 | -38 | -41 | -34 | -26 | -23 | -20 |  |
| 31          | -16 | -17 | -19    | -16 | -21 | -28 | -28 | -21 | -20 | -18 | -15 | -17 | -17 | -13 | -13 | -13 | -13 | -15 | -22 | -25 | -24 | -23 | -19 | -15 | -24 | -20 |  |

APRIL 1972

UNIT=GANMAS

| 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   | -18 | -13 | -13 | -12 | -13 | -13 | -13 | -18 | -19 | -21 | -20 | -15 | -14 | -19 | -23 | -15 | -13 | -16 | -22 | -26 | -33 | -32 | -32 | -35 |
| 2   | -31 | -25 | -28 | -40 | -46 | -32 | -25 | -25 | -24 | -22 | -26 | -22 | -22 | -19 | -18 | -20 | -24 | -25 | -24 | -21 | -20 | -20 | -16 | -11 |
| 3   | -10 | -11 | -12 | -10 | -8  | -7  | -7  | -5  | -3  | -5  | -7  | -9  | -9  | -8  | -6  | -2  | -0  | 1   | 1   | 4   | 6   | 4   | 6   | 6   |
| 4   | 15  | 21  | 19  | 0   | 2   | 7   | 10  | 4   | -1  | -4  | -7  | -8  | -6  | -4  | -9  | -14 | -16 | -17 | -19 | -20 | -21 | -21 | -20 | -22 |
| 5   | -24 | -22 | -23 | -19 | -18 | -19 | -21 | -13 | -9  | -10 | -17 | -19 | -15 | -13 | -11 | -13 | -15 | -17 | -19 | -22 | -21 | -20 | -20 | -18 |
| 6   | -18 | -18 | -16 | -13 | -12 | -10 | -10 | -9  | -8  | -8  | -7  | -13 | -9  | -6  | -7  | -8  | -11 | -13 | -14 | -16 | -16 | -14 | -12 | -13 |
| 7   | -12 | -11 | -10 | -11 | -13 | -12 | -12 | -9  | -6  | -8  | -15 | -14 | -10 | -8  | -10 | -15 | -18 | -20 | -22 | -24 | -24 | -22 | -22 | -22 |
| 8   | -19 | -15 | -13 | -12 | -12 | -10 | -8  | -3  | -3  | -3  | -4  | -4  | -3  | -2  | -0  | -3  | -7  | -14 | -16 | -15 | -12 | -9  | -9  | -9  |
| 9   | -17 | -15 | -11 | -8  | -5  | -4  | -2  | -2  | -1  | 0   | -1  | -2  | -2  | -1  | -2  | -5  | -7  | -8  | -10 | -11 | -11 | -9  | -7  | -6  |
| 10  | -6  | -6  | -3  | -2  | -1  | 3   | 5   | 4   | 2   | 3   | -0  | -2  | 1   | -1  | -2  | -1  | 1   | -0  | -8  | -16 | -17 | -14 | -10 | -9  |
| 11  | -8  | -7  | -6  | -3  | -3  | -5  | -8  | -11 | -12 | -11 | -11 | -10 | -11 | -12 | -13 | -13 | -14 | -13 | -17 | -21 | -19 | -15 | -15 | -16 |
| 12  | -16 | -13 | -10 | -6  | -2  | 2   | 1   | -3  | -2  | -4  | -6  | -6  | -10 | -12 | -9  | -9  | -11 | -11 | -12 | -15 | -20 | -21 | -24 | -29 |
| 13  | -31 | -29 | -27 | -25 | -25 | -21 | -26 | -27 | -20 | -18 | -14 | -14 | -15 | -13 | -13 | -21 | -21 | -21 | -26 | -25 | -28 | -29 | -26 | -22 |
| 14  | -17 | -21 | -24 | -25 | -22 | -22 | -24 | -23 | -20 | -16 | -17 | -16 | -17 | -14 | -14 | -16 | -14 | -13 | -15 | -16 | -16 | -15 | -14 | -11 |
| 15  | -17 | -14 | -13 | -12 | -13 | -13 | -13 | -15 | -14 | -14 | -12 | -15 | -16 | -18 | -17 | -21 | -23 | -21 | -19 | -23 | -23 | -21 | -17 | -16 |
| 16  | -18 | -17 | -17 | -13 | -11 | -11 | -11 | -16 | -16 | -14 | -13 | -15 | -13 | -12 | -13 | -12 | -10 | -10 | -12 | -14 | -15 | -14 | -13 | -7  |
| 17  | -10 | -14 | -14 | -8  | -4  | -5  | -10 | -11 | -10 | -10 | -9  | -12 | -10 | -7  | -3  | -2  | -0  | 1   | 2   | -0  | -3  | -4  | -2  | -1  |
| 18  | -5  | -14 | -21 | -29 | -33 | -34 | -29 | -33 | -35 | -44 | -45 | -46 | -37 | -35 | -32 | -36 | -35 | -44 | -43 | -38 | -38 | -42 | -43 | -35 |
| 19  | -32 | -25 | -19 | -18 | -10 | -8  | -2  | -1  | -8  | -13 | -9  | -19 | -26 | -27 | -25 | -22 | -26 | -28 | -27 | -27 | -26 | -27 | -27 | -24 |
| 20  | -22 | -15 | -17 | -13 | -10 | -7  | -3  | -3  | -2  | 0   | -1  | 4   | 2   | 5   | 8   | 5   | 0   | -2  | -8  | -14 | -13 | -15 | -12 | -21 |
| 21  | -28 | -30 | -26 | -35 | -44 | -46 | -42 | -45 | -47 | -50 | -48 | -44 | -42 | -40 | -36 | -33 | -28 | -31 | -38 | -41 | -33 | -37 | -23 | -21 |
| 22  | -20 | -18 | -15 | -14 | -13 | -14 | -14 | -14 | -14 | -16 | -14 | -13 | -13 | -2  | 2   | 1   | 5   | -3  | -19 | -33 | -39 | -39 | -37 | -31 |
| 23  | -23 | -16 | -16 | -16 | -17 | -17 | -15 | -12 | -1  | -8  | -12 | -17 | -21 | -19 | -17 | -16 | -15 | -14 | -14 | -18 | -20 | -25 | -29 | -24 |
| 24  | -23 | -23 | -22 | -21 | -18 | -15 | -13 | -13 | -7  | -6  | -4  | 3   | 5   | 6   | 6   | 7   | 5   | 6   | 8   | 7   | 8   | 8   | 6   | 4   |
| 25  | 0   | -2  | -4  | -5  | -3  | -3  | -2  | -3  | -3  | -1  | 0   | 3   | 2   | -0  | 1   | 3   | 6   | 7   | 7   | 9   | 11  | 12  | 12  | 11  |
| 26  | 10  | 12  | 15  | 16  | 14  | 13  | 13  | 13  | 13  | 14  | 11  | 11  | 13  | 11  | 10  | 11  | 7   | 7   | 10  | 9   | 9   | 8   | 9   | 9   |
| 27  | 9   | 10  | 12  | 15  | 16  | 19  | 19  | 18  | 15  | 13  | 12  | 14  | 15  | 23  | 26  | 15  | -1  | -4  | -5  | -5  | -6  | -13 | -15 | -16 |
| 28  | -16 | -14 | -11 | -8  | -11 | -12 | -11 | -21 | -35 | -47 | -57 | -54 | -47 | -49 | -54 | -61 | -67 | -59 | -49 | -43 | -40 | -38 | -34 | -34 |
| 29  | -28 | -26 | -28 | -26 | -29 | -41 | -47 | -51 | -62 | -73 | -74 | -70 | -57 | -57 | -58 | -52 | -44 | -46 | -59 | -69 | -67 | -67 | -66 | -66 |
| 30  | -57 | -48 | -37 | -35 | -32 | -32 | -31 | -32 | -31 | -34 | -30 | -33 | -36 | -37 | -34 | -36 | -35 | -41 | -44 | -45 | -47 | -40 | -35 | -29 |

| DAY | UNIT-GAMMAS |     |     |     |     |     |     |     |     |     | MAY 1972 |     |     |     |     |     |     |     |     |     | G.M.T. |     |     |     |
|-----|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|
|     | 1           | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11       | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21     | 22  | 23  | 24  |
| 1   | -21         | -28 | -30 | -25 | -24 | -26 | -27 | -29 | -32 | -24 | -23      | -25 | -26 | -26 | -25 | -24 | -26 | -25 | -27 | -27 | -26    | -25 | -27 | -28 |
| 2   | -28         | -33 | -33 | -30 | -26 | -23 | -20 | -19 | -30 | -30 | -25      | -25 | -22 | -23 | -20 | -19 | -18 | -14 | -16 | -15 | -16    | -17 | -10 | -10 |
| 3   | -13         | -14 | -16 | -15 | -12 | -12 | -13 | -11 | -13 | -13 | -15      | -13 | -14 | -14 | -12 | -12 | -17 | -19 | -19 | -18 | -15    | -13 | -11 | -9  |
| 4   | -8          | -11 | -12 | -9  | -4  | -4  | -5  | -8  | -10 | -7  | -5       | -2  | -2  | -4  | -6  | -5  | -4  | -9  | -12 | -11 | -10    | -11 | -12 | -9  |
| 5   | -8          | -8  | -6  | -5  | -6  | -6  | -8  | -10 | -10 | -10 | -9       | -5  | -5  | -4  | -3  | 0   | 6   | 5   | 6   | 8   | 8      | 6   | 8   | 12  |
| 6   | 12          | 8   | 8   | 6   | 5   | 1   | 1   | -3  | -8  | -10 | -8       | -5  | -6  | -8  | -9  | -10 | -11 | -16 | -16 | -15 | -15    | -15 | -12 | -9  |
| 7   | -9          | -9  | -6  | -3  | -5  | -8  | -8  | -7  | -7  | -7  | -7       | -8  | -8  | -6  | -7  | -4  | -5  | -8  | -8  | -6  | -5     | -8  | -9  | -11 |
| 8   | -7          | -5  | -3  | 0   | 1   | 3   | 2   | 1   | 1   | 2   | 3        | 4   | 4   | 5   | 4   | 1   | -2  | -5  | -5  | -4  | -1     | -1  | 1   | -10 |
| 9   | -0          | 6   | 6   | 7   | 7   | 13  | 11  | 5   | -17 | -25 | -19      | -13 | -15 | -16 | -17 | -18 | -20 | -25 | -29 | -34 | -40    | -44 | -41 | -30 |
| 10  | -24         | -24 | -21 | -19 | -15 | -19 | -19 | -20 | -22 | -21 | -20      | -22 | -22 | -24 | -22 | -16 | -15 | -17 | -18 | -23 | -17    | -18 | -16 | -11 |
| 11  | -8          | -5  | -4  | -2  | -3  | -3  | -9  | -8  | -5  | -6  | -6       | -5  | -10 | -13 | -14 | -2  | -7  | -9  | -17 | -22 | -20    | -19 | -18 | -12 |
| 12  | -10         | -5  | -6  | -8  | -10 | -12 | -17 | -17 | -19 | -22 | -20      | -14 | -12 | -9  | -10 | -7  | -6  | -6  | -9  | -10 | -7     | -6  | -5  | -6  |
| 13  | -8          | -13 | -14 | -8  | -4  | -4  | -6  | -10 | -10 | -7  | -4       | -5  | -5  | -5  | -5  | -3  | -3  | -8  | -10 | -11 | -15    | -23 | -28 | -22 |
| 14  | -18         | -18 | -18 | -16 | -15 | -13 | -10 | -9  | -13 | -14 | -12      | -10 | -9  | -11 | -13 | -16 | -18 | -16 | -16 | -16 | -14    | -15 | -16 | -16 |
| 15  | -15         | -14 | -9  | -7  | -2  | -0  | -1  | -1  | -3  | -3  | -2       | 1   | 1   | -0  | 1   | 4   | 6   | 4   | 20  | 38  | -1     | -36 | -46 | -48 |
| 16  | -61         | -79 | -65 | -52 | -59 | -60 | -57 | -52 | -43 | -42 | -38      | -37 | -40 | -42 | -42 | -39 | -38 | -38 | -37 | -37 | -34    | -37 | -38 | -36 |
| 17  | -36         | -42 | -35 | -25 | -27 | -30 | -36 | -31 | -33 | -31 | -29      | -28 | -32 | -33 | -31 | -25 | -24 | -24 | -24 | -23 | -23    | -23 | -21 | -18 |
| 18  | -7          | -10 | -7  | -7  | -13 | -13 | -7  | -3  | -3  | -2  | -3       | -5  | -8  | -12 | -12 | -8  | -5  | -4  | -7  | -9  | -8     | -7  | -7  | -8  |
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| 20  | -3          | -4  | -7  | -11 | -14 | -14 | -11 | -8  | -7  | -5  | -6       | -5  | -4  | -3  | -3  | -4  | -0  | 2   | 4   | 4   | 3      | 1   | 5   | 8   |
| 21  | 8           | 8   | 10  | 11  | 11  | 9   | 10  | 8   | 10  | 11  | 9        | 7   | 4   | 5   | 7   | 5   | 5   | 7   | 4   | 4   | 5      | 5   | 4   | 1   |
| 22  | -0          | -0  | 4   | 6   | 6   | 1   | -2  | -4  | -3  | 0   | 5        | 8   | 6   | 5   | 6   | 8   | 9   | 7   | 4   | -1  | -4     | -1  | 6   | 7   |
| 23  | 5           | 3   | 2   | 4   | 8   | 10  | 11  | 11  | 11  | 11  | 10       | 11  | 13  | 12  | 9   | 6   | 1   | -6  | -9  | -13 | -14    | -17 | -22 | -24 |
| 24  | -21         | -19 | -17 | -16 | -21 | -22 | -22 | -21 | -19 | -14 | -12      | -11 | -10 | -11 | -11 | 17  | -7  | -6  | -5  | -5  | -5     | -4  | -1  | 3   |
| 25  | 5           | 7   | 5   | 7   | 7   | 11  | 10  | 5   | 2   | 4   | 7        | 8   | 9   | 8   | 13  | 17  | 18  | 17  | 15  | 13  | 11     | 11  | 6   | 3   |
| 26  | 5           | 3   | 2   | 0   | -2  | -6  | -5  | -2  | -1  | -1  | 0        | 3   | 4   | 1   | -1  | -6  | -10 | -10 | -12 | -16 | -18    | -16 | -18 | -19 |
| 27  | -17         | -16 | -12 | -10 | -8  | -5  | -5  | -3  | -2  | -2  | 1        | 4   | 5   | 3   | 2   | 0   | -5  | -6  | -5  | -5  | -8     | -11 | -8  | -14 |
| 28  | -12         | -7  | -5  | 6   | 16  | 19  | 23  | 17  | 18  | 16  | 4        | -1  | 2   | 0   | 7   | 3   | -13 | -8  | -5  | -12 | -19    | -21 | -19 | -11 |
| 29  | -8          | -8  | -7  | -8  | -3  | -7  | -5  | -5  | -4  | 0   | 1        | -0  | -4  | -8  | -8  | -9  | -6  | -6  | -7  | -6  | -6     | -8  | -6  | -7  |
| 30  | -10         | -9  | -8  | -3  | -0  | 1   | 3   | 2   | 0   | 1   | 3        | 4   | 4   | 3   | 18  | 31  | 28  | 29  | 34  | 29  | 24     | 19  | 19  | 18  |
| 31  | 14          | 6   | -2  | 0   | -1  | -4  | -8  | -11 | -14 | -15 | -10      | -3  | 1   | 1   | 1   | -0  | -3  | 2   | 1   | 2   | 5      | 3   | -5  | -9  |

| DAY | UNIT=GAMMAS |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |     | G.M.T. |  |
|-----|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|--------|--|
|     | 1           | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23  | 24  |        |  |
| 1   | -6          | -5   | -4   | -5   | -5   | -6   | -4   | -3   | -8   | -13  | -9   | -4   | -0   | 1    | 1    | 6    | 7    | 5    | 2    | -2   | -2   | -3   | -0  | 1   |        |  |
| 2   | 0           | 6    | 5    | 3    | 8    | 12   | 12   | 9    | 4    | 5    | 9    | 8    | 7    | 6    | 15   | 18   | 4    | 4    | 4    | -1   | 2    | 5    | 4   | -1  |        |  |
| 3   | -10         | -11  | -7   | -6   | -9   | -5   | -3   | -3   | -4   | -9   | -9   | -5   | 5    | 7    | 7    | 15   | 18   | 6    | 3    | 1    | 1    | 1    | 2   | 1   |        |  |
| 4   | 5           | 18   | 14   | 7    | 10   | 13   | 12   | 12   | 12   | 12   | 6    | 6    | 6    | 4    | 6    | 8    | 1    | -3   | -6   | -3   | -2   | 4    | -7  | -7  |        |  |
| 5   | -8          | -14  | -19  | -20  | -16  | -11  | -9   | -10  | -10  | -12  | -8   | -9   | -7   | -6   | -3   | -0   | 1    | -0   | -2   | -5   | -0   | 1    | 1   | 3   |        |  |
| 6   | 3           | 1    | -2   | -3   | -3   | -3   | 1    | 5    | 6    | 6    | 5    | 6    | 5    | 4    | 3    | 11   | 12   | 12   | 9    | 9    | 11   | 6    | -0  | 1   |        |  |
| 7   | -1          | -5   | -9   | -14  | -12  | -6   | -0   | 2    | -0   | -1   | -3   | -4   | -4   | -4   | -5   | -4   | -4   | -5   | -7   | -9   | -9   | -8   | -5  | -5  |        |  |
| 8   | -3          | -6   | -10  | -14  | -15  | -14  | -9   | 4    | -2   | -2   | -1   | 0    | 2    | 1    | -1   | -3   | -3   | -4   | -6   | -4   | -6   | -7   | -8  | -11 |        |  |
| 9   | -15         | -14  | -13  | -11  | -12  | -11  | -9   | -6   | -4   | -2   | -6   | -8   | -8   | -8   | -7   | -4   | -1   | 2    | 4    | 2    | -1   | -4   | -3  | 5   |        |  |
| 10  | 6           | 9    | 7    | 9    | 12   | 11   | 11   | 11   | 10   | 9    | 8    | 8    | 11   | 12   | 11   | 9    | 5    | 7    | 6    | 7    | 11   | 12   | 10  | 8   |        |  |
| 11  | 8           | 8    | 10   | 13   | 14   | 14   | 13   | 14   | 14   | 14   | 16   | 20   | 21   | 21   | 19   | 19   | 21   | 19   | 17   | 15   | 13   | 12   | 9   | 7   |        |  |
| 12  | 7           | 10   | 10   | 9    | 8    | 10   | 12   | 13   | 14   | 13   | 14   | 14   | 10   | 11   | 11   | 14   | 13   | 14   | 14   | 17   | 21   | 22   | 24  | 22  |        |  |
| 13  | 15          | 10   | 6    | 8    | 10   | 12   | 14   | 17   | 21   | 24   | 26   | 27   | 28   | 24   | 22   | 22   | 22   | 20   | 14   | 9    | 11   | 12   | 8   | 10  |        |  |
| 14  | 14          | 15   | 17   | 14   | 17   | 15   | 17   | 15   | 10   | 15   | 18   | 22   | 27   | 27   | 25   | 25   | 20   | 15   | 14   | 13   | 6    | 3    | 0   | -0  |        |  |
| 15  | 2           | -3   | -0   | -3   | -4   | 0    | -5   | -10  | -5   | 0    | 2    | 11   | 13   | 10   | 5    | -0   | -0   | 1    | 3    | 4    | 6    | 9    | 11  | 10  |        |  |
| 16  | 10          | 6    | 2    | -0   | -1   | -3   | -2   | 4    | 3    | -6   | -5   | 3    | 10   | 3    | -5   | -9   | -11  | -11  | -9   | -6   | -3   | -4   | -3  | -6  |        |  |
| 17  | -6          | -11  | -11  | -9   | -11  | -12  | -11  | -6   | -16  | -12  | -26  | -28  | -4   | 13   | 17   | 15   | 8    | -3   | 3    | 5    | -4   | -29  | -46 | -73 |        |  |
| 18  | -147        | -170 | -150 | -190 | -185 | -178 | -185 | -188 | -179 | -162 | -151 | -138 | -132 | -134 | -134 | -134 | -130 | -129 | -125 | -111 | -110 | -102 | -92 | -84 |        |  |
| 19  | -82         | -91  | -88  | -92  | -97  | -102 | -99  | -92  | -91  | -89  | -86  | -83  | -82  | -79  | -74  | -71  | -65  | -66  | -67  | -69  | -67  | -65  | -61 | -59 |        |  |
| 20  | -61         | -66  | -67  | -62  | -57  | -58  | -57  | -54  | -50  | -48  | -48  | -44  | -45  | -45  | -46  | -45  | -46  | -45  | -45  | -47  | -44  | -45  | -44 | -41 |        |  |
| 21  | -40         | -43  | -46  | -49  | -50  | -48  | -44  | -43  | -41  | -40  | -40  | -37  | -34  | -32  | -32  | -32  | -33  | -34  | -36  | -33  | -34  | -34  | -34 | -34 |        |  |
| 22  | -38         | -36  | -36  | -36  | -33  | -30  | -27  | -27  | -28  | -30  | -37  | -30  | -32  | -31  | -32  | -35  | -35  | -33  | -33  | -31  | -30  | -35  | -37 | -43 |        |  |
| 23  | -35         | -36  | -36  | -34  | -35  | -34  | -33  | -35  | -35  | -33  | -28  | -32  | -39  | -44  | -45  | -39  | -36  | -40  | -46  | -46  | -38  | -31  | -30 | -32 |        |  |
| 24  | -31         | -31  | -30  | -28  | -28  | -29  | -30  | -30  | -25  | -25  | -25  | -25  | -22  | -21  | -22  | -18  | -12  | -10  | -8   | -17  | -20  | -23  | -22 | -24 |        |  |
| 25  | -30         | -28  | -31  | -31  | -31  | -31  | -30  | -29  | -28  | -27  | -25  | -24  | -22  | -20  | -18  | -19  | -20  | -21  | -19  | -16  | -13  | -11  | -10 | -12 |        |  |
| 26  | -13         | -17  | -19  | -22  | -26  | -23  | -17  | -14  | -19  | -24  | -22  | -19  | -18  | -17  | -20  | -21  | -17  | -13  | -12  | -15  | -13  | -15  | -18 | -21 |        |  |
| 27  | -20         | -18  | -13  | -12  | -17  | -16  | -16  | -18  | -18  | -15  | -10  | -13  | -12  | -9   | -9   | -12  | -12  | -18  | -18  | -22  | -22  | -27  | -30 | -31 |        |  |
| 28  | -33         | -34  | -33  | -30  | -26  | -29  | -29  | -29  | -35  | -37  | -28  | -29  | -28  | -28  | -31  | -31  | -27  | -27  | -31  | -31  | -26  | -23  | -25 | -28 |        |  |
| 29  | -28         | -29  | -33  | -34  | -32  | -32  | -28  | -26  | -26  | -26  | -25  | -23  | -19  | -16  | -17  | -16  | -16  | -17  | -20  | -25  | -28  | -31  | -29 | -30 |        |  |
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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  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| -20 | -19 | -16 | -14 | -10 | -8  | -8  | -12 | -13 | -10 | -8  | -1  | -2  | -5  | -5  | -4  | -7  | -8  | -7  | -4  | -2  | -2  | -4  | -4  |
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| -1  | -7  | -15 | -19 | -18 | -18 | -18 | -19 | -23 | -24 | -25 | -30 | -30 | -26 | -23 | -23 | -26 | -30 | -34 | -38 | -38 | -41 | -42 | -45 |
| -48 | -45 | -40 | -42 | -48 | -49 | -42 | -36 | -36 | -32 | -30 | -29 | -26 | -23 | -24 | -21 | -17 | -12 | -6  | -5  | -2  | -2  | -9  | -15 |
| -17 | -13 | -12 | -12 | -12 | -14 | -14 | -13 | -12 | -7  | -13 | -19 | -16 | -12 | -10 | -3  | -5  | -9  | -9  | -12 | -14 | -11 | -13 | -15 |
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| DAY | G.M.T. |     |      |      |      |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |    |
|-----|--------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
|     | 1      | 2   | 3    | 4    | 5    | 6   | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24 |
| 1   | -16    | -33 | -40  | -49  | -47  | -43 | -38  | -36  | -35  | -35  | -30  | -25  | -21  | -21  | -20  | -22  | -21  | -22  | -21  | -18  | -19  | -20  | -24  |    |
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| 4   | -1     | 6   | 29   | 3    | -37  | -70 | -118 | -115 | -97  | -86  | -76  | -70  | -65  | -60  | -58  | -66  | -70  | -63  | -65  | -61  | -46  | -45  | -80  |    |
| 5   | -97    | -96 | -115 | -125 | -111 | -94 | -93  | -76  | -77  | -65  | -50  | -51  | -51  | -16  | -65  | -95  | -81  | -91  | -92  | -100 | -102 | -102 | -94  |    |
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| 7   | -63    | -66 | -67  | -72  | -66  | -70 | -67  | -66  | -62  | -59  | -62  | -62  | -57  | -56  | -59  | -62  | -61  | -55  | -48  | -47  | -46  | -46  | -43  |    |
| 8   | -51    | -55 | -55  | -54  | -48  | -44 | -42  | -44  | -44  | -45  | -46  | -44  | -43  | -40  | -39  | -44  | -47  | -46  | -45  | -46  | -49  | -50  | -48  |    |
| 9   | -15    | -17 | -19  | -15  | -40  | -59 | -83  | -90  | -69  | -75  | -154 | -154 | -130 | -119 | -126 | -129 | -119 | -110 | -108 | -102 | -98  | -103 | -101 |    |
| 10  | -96    | -91 | -87  | -84  | -78  | -73 | -74  | -75  | -71  | -69  | -71  | -72  | -73  | -71  | -67  | -66  | -60  | -58  | -60  | -61  | -59  | -65  | -76  |    |
| 11  | -69    | -70 | -71  | -70  | -63  | -53 | -48  | -49  | -51  | -54  | -58  | -56  | -51  | -52  | -53  | -57  | -56  | -53  | -49  | -49  | -55  | -58  | -59  |    |
| 12  | -61    | -58 | -56  | -55  | -52  | -46 | -41  | -41  | -39  | -40  | -41  | -40  | -39  | -38  | -42  | -45  | -48  | -45  | -44  | -43  | -41  | -40  | -43  |    |
| 13  | -48    | -49 | -48  | -45  | -41  | -35 | -32  | -30  | -32  | -31  | -31  | -31  | -29  | -27  | -28  | -30  | -33  | -39  | -38  | -34  | -31  | -29  | -30  |    |
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| 16  | -37    | -34 | -33  | -36  | -32  | -25 | -21  | -25  | -25  | -22  | -20  | -17  | -15  | -19  | -26  | -26  | -25  | -29  | -32  | -35  | -35  | -35  | -38  |    |
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| 19  | -44    | -43 | -45  | -40  | -33  | -33 | -33  | -29  | -21  | -18  | -14  | -16  | -14  | -10  | -20  | -36  | -38  | -30  | -27  | -28  | -36  | -40  | -38  |    |
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SEPTEMBER 1972

| DAY | UNIT=GAMMAS |     |     |      |      |      |      |      | G.M.T. |      |      |      |     |     |     |     |     |     |     |     |      |      |      |      |
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| 6   | 0           | -8  | -17 | -7   | 1    | 5    | 0    | -5   | -6     | -6   | -2   | -1   | -3  | -3  | -15 | -18 | -10 | -9  | -4  | -14 | -15  | -9   | -4   | -3   |
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| 14  | -97         | -91 | -95 | -114 | -129 | -146 | -125 | -119 | -118   | -116 | -111 | -101 | -94 | -88 | -83 | -82 | -83 | -82 | -82 | -81 | -75  | -71  | -66  | -67  |
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| 26  | -17         | -18 | -19 | -18  | -19  | -20  | -20  | -20  | -23    | -26  | -27  | -27  | -26 | -26 | -26 | -25 | -24 | -24 | -22 | -22 | -23  | -25  | -24  | -23  |
| 27  | -23         | -24 | -27 | -24  | -22  | -18  | -17  | -20  | -22    | -25  | -26  | -23  | -21 | -23 | -25 | -30 | -31 | -26 | -22 | -18 | -15  | -12  | -13  | -12  |
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| DAY | UNIT=GAMMAS |     |     |     |     | G.M.T. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-------------|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 1           | 2   | 3   | 4   | 5   | 6      | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |
| 1   | -22         | -25 | -30 | -28 | -24 | -24    | -25 | -22 | -24 | -20 | -14 | -11 | -10 | -10 | -11 | -12 | -15 | -14 | -14 | -12 | -12 | -14 | -15 | -17 |
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| 7   | -3          | -2  | -2  | -2  | -1  | -2     | -2  | -3  | -5  | -5  | 2   | 5   | 4   | 9   | 12  | 14  | 13  | 16  | 22  | 18  | 9   | 5   | -3  | -19 |
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| 15  | -30         | -26 | -24 | -26 | -28 | -25    | -22 | -21 | -22 | -20 | -19 | -21 | -23 | -22 | -18 | -16 | -15 | -15 | -19 | -19 | -22 | -22 | -17 | -25 |
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| 21  | -39         | -39 | -37 | -38 | -39 | -43    | -49 | -49 | -41 | -36 | -38 | -37 | -31 | -32 | -30 | -31 | -30 | -37 | -39 | -39 | -31 | -32 | -35 | -40 |
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NOVEMBER 1972

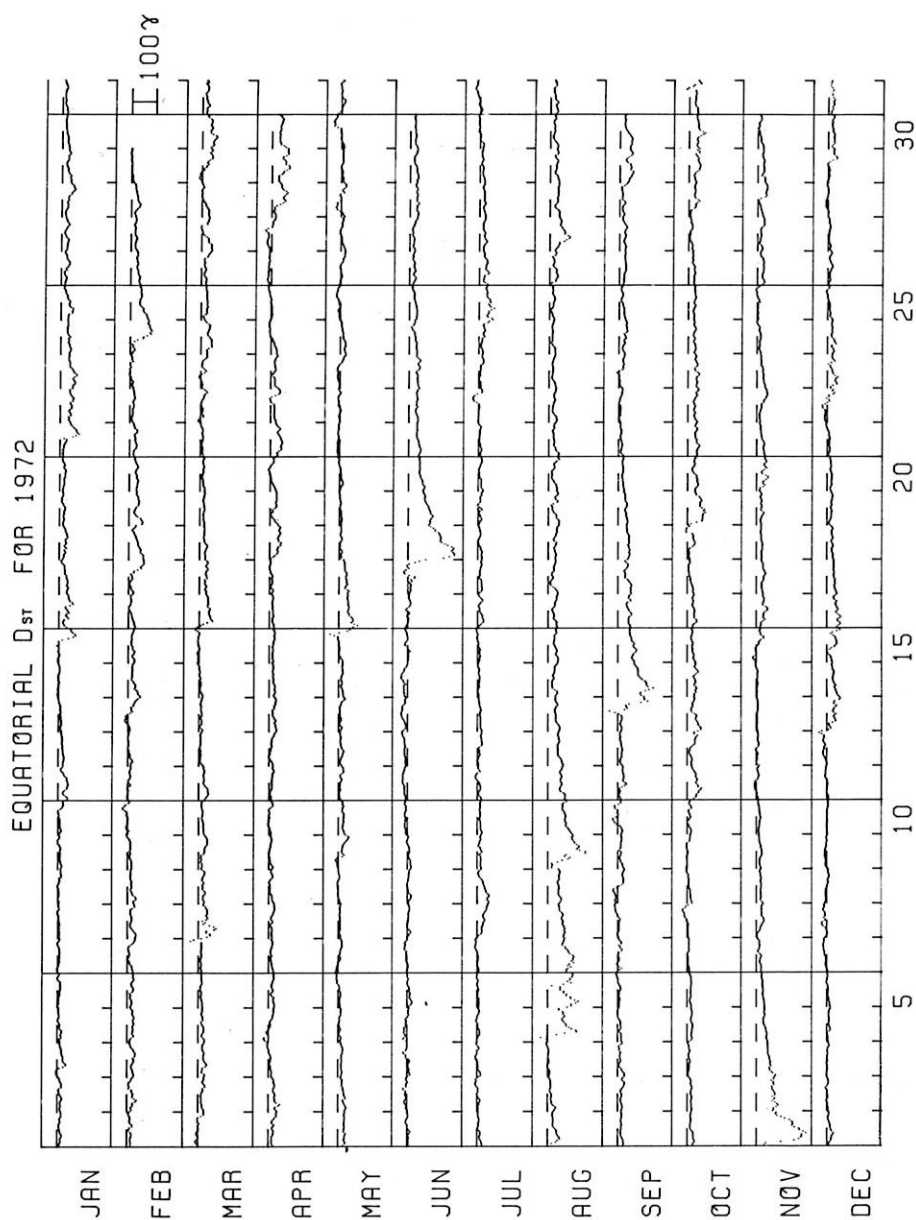
| DAY | UNIT=GANMAS |     |      |      |      |      |      |      |      |      | G.M.T. |      |      |      |      |      |      |      |      |      |     |     |     |     |
|-----|-------------|-----|------|------|------|------|------|------|------|------|--------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
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| 3   | -82         | -70 | -64  | -56  | -53  | -61  | -58  | -51  | -57  | -59  | -56    | -54  | -51  | -49  | -47  | -47  | -48  | -48  | -47  | -47  | -47 | -46 | -47 |     |
| 4   | -44         | -41 | -41  | -42  | -43  | -44  | -40  | -39  | -38  | -35  | -34    | -29  | -29  | -28  | -28  | -28  | -32  | -35  | -35  | -31  | -33 | -34 | -34 |     |
| 5   | -33         | -33 | -32  | -31  | -30  | -28  | -27  | -26  | -25  | -26  | -28    | -26  | -26  | -25  | -25  | -24  | -25  | -25  | -23  | -21  | -20 | -21 | -22 |     |
| 6   | -18         | -18 | -19  | -19  | -18  | -15  | -13  | -13  | -14  | -16  | -21    | -18  | -13  | -7   | -5   | -10  | -11  | -13  | -13  | -11  | -11 | -5  | -4  |     |
| 7   | -0          | -2  | -4   | -9   | -13  | -16  | -15  | -19  | -23  | -25  | -30    | -32  | -30  | -28  | -22  | -19  | -22  | -20  | -20  | -20  | -21 | -25 | -28 |     |
| 8   | -22         | -17 | -16  | -18  | -19  | -17  | -18  | -18  | -16  | -18  | -19    | -18  | -20  | -19  | -16  | -17  | -19  | -20  | -16  | -16  | -15 | -12 | -14 |     |
| 9   | -17         | -14 | -13  | -12  | -12  | -12  | -13  | -17  | -21  | -22  | -23    | -21  | -22  | -19  | -17  | -18  | -15  | -13  | -12  | -10  | -11 | -10 | -9  |     |
| 10  | -9          | -9  | -9   | -9   | -10  | -11  | -12  | -13  | -12  | -15  | -17    | -17  | -14  | -15  | -13  | -11  | -11  | -11  | -10  | -9   | -7  | -6  | -6  |     |
| 11  | -5          | -4  | -0   | -0   | -1   | 1    | 6    | 7    | 8    | 8    | 6      | 5    | 5    | -2   | -7   | -8   | -11  | -8   | -7   | -5   | -2  | -3  | -9  |     |
| 12  | -2          | 1   | -0   | -2   | -3   | -1   | -4   | -6   | -4   | 2    | 4      | -1   | -7   | -10  | -8   | -10  | -5   | -5   | -5   | -6   | -7  | -6  | -5  |     |
| 13  | -2          | -2  | -1   | -0   | -2   | -4   | -2   | -3   | -3   | -4   | -1     | -2   | -3   | -5   | -6   | -5   | -6   | -6   | -7   | -4   | -5  | -4  | 0   |     |
| 14  | -1          | -0  | -2   | -2   | -1   | -2   | -3   | -5   | -6   | -5   | -3     | -1   | -4   | -5   | -3   | -4   | -5   | -5   | -2   | 0    | 3   | 4   | 5   |     |
| 15  | 5           | 11  | 16   | 13   | 3    | -1   | 2    | 4    | 5    | 5    | -1     | -6   | -10  | -9   | -14  | -20  | -30  | -29  | -19  | -16  | -16 | -10 | -16 |     |
| 16  | -16         | -19 | -19  | -21  | -29  | -37  | -29  | -29  | -29  | -31  | -34    | -42  | -48  | -46  | -39  | -27  | -26  | -29  | -32  | -33  | -32 | -26 | -27 |     |
| 17  | -26         | -24 | -23  | -22  | -20  | -22  | -21  | -23  | -28  | -30  | -30    | -31  | -35  | -40  | -34  | -34  | -29  | -27  | -27  | -27  | -23 | -21 | -20 |     |
| 18  | -21         | -23 | -20  | -21  | -20  | -21  | -25  | -24  | -25  | -25  | -24    | -23  | -21  | -18  | -19  | -20  | -18  | -19  | -16  | -18  | -19 | -19 | -20 |     |
| 19  | -19         | -17 | -15  | -17  | -20  | -22  | -25  | -30  | -30  | -21  | -17    | -20  | -22  | -21  | -17  | -19  | -22  | -19  | -16  | -15  | -20 | -20 | -16 |     |
| 20  | -13         | -15 | -27  | -35  | -28  | -25  | -31  | -40  | -49  | -48  | -38    | -24  | -19  | -24  | -33  | -42  | -37  | -30  | -33  | -40  | -42 | -36 | -34 |     |
| 21  | -34         | -31 | -30  | -31  | -27  | -27  | -28  | -32  | -31  | -30  | -26    | -22  | -21  | -20  | -18  | -18  | -17  | -17  | -16  | -15  | -17 | -14 | -12 |     |
| 22  | -14         | -11 | -11  | -11  | -10  | -11  | -12  | -15  | -16  | -20  | -18    | -18  | -21  | -29  | -29  | -33  | -39  | -40  | -45  | -45  | -42 | -41 | -40 |     |
| 23  | -33         | -34 | -31  | -29  | -29  | -27  | -26  | -27  | -27  | -28  | -24    | -24  | -26  | -24  | -22  | -16  | -18  | -18  | -17  | -16  | -18 | -15 | -14 |     |
| 24  | -14         | -12 | -9   | -8   | -10  | -10  | -11  | -11  | -11  | -13  | -15    | -14  | -15  | -15  | -12  | -9   | -8   | -11  | -10  | -5   | -1  | 2   | -4  |     |
| 25  | -5          | -2  | -1   | -4   | -5   | -1   | -1   | -3   | -3   | -3   | -2     | -11  | -7   | -7   | -2   | -1   | 2    | 3    | 1    | 4    | 7   | 2   | -14 |     |
| 26  | -23         | -30 | -28  | -26  | -21  | -21  | -21  | -21  | -25  | -26  | -26    | -26  | -28  | -25  | -26  | -28  | -26  | -23  | -22  | -16  | -13 | -12 | -12 |     |
| 27  | -20         | -21 | -19  | -15  | -9   | -7   | -11  | -11  | -12  | -14  | -15    | -14  | -13  | -14  | -12  | -14  | -20  | -28  | -29  | -29  | -27 | -29 | -26 |     |
| 28  | -21         | -19 | -18  | -16  | -14  | -12  | -10  | -10  | -9   | -5   | -3     | -1   | -13  | -31  | -38  | -35  | -34  | -36  | -39  | -40  | -41 | -40 | -36 |     |
| 29  | -29         | -30 | -31  | -27  | -16  | -19  | -24  | -27  | -25  | -26  | -25    | -24  | -25  | -25  | -28  | -26  | -23  | -21  | -19  | -20  | -23 | -24 | -23 |     |
| 30  | -22         | -22 | -19  | -14  | -13  | -12  | -13  | -11  | -10  | -7   | -8     | -6   | -3   | 1    | -2   | -7   | -5   | -5   | -9   | -14  | -15 | -15 | -8  |     |

DECEMBER 1972

| DAY | UNIT=GAMMAS |     |     |     |     |     |     |     | G.M.T. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-------------|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 1           | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9      | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  |
| 1   | -8          | -9  | -12 | -17 | -17 | -19 | -19 | -25 | -27    | -19 | -16 | -13 | -12 | -12 | -11 | -9  | -6  | -4  | -2  | -3  | -6  | -8  | -7  | -5  |
| 2   | -4          | -4  | -3  | -1  | -1  | 1   | 5   | 1   | -4     | -4  | -3  | 1   | 0   | -1  | 3   | 8   | 2   | -3  | -5  | -6  | -5  | -3  | 0   | 3   |
| 3   | 3           | 1   | 2   | -1  | -2  | -1  | 0   | -1  | 3      | -2  | -2  | 0   | -0  | -1  | -3  | -4  | -0  | -2  | -2  | -5  | -10 | -7  | -5  | -4  |
| 4   | -4          | -4  | -4  | -3  | -0  | -1  | -10 | -14 | -12    | -11 | -9  | -7  | -7  | -9  | -9  | -9  | -7  | -6  | -7  | -7  | -8  | -11 | -14 | -13 |
| 5   | -11         | -10 | -10 | -7  | -8  | -6  | -5  | -4  | -4     | -4  | -4  | -4  | -4  | -3  | -2  | 1   | 4   | 1   | -0  | -1  | -3  | -2  | 0   | -1  |
| 6   | -2          | 1   | 4   | 5   | 7   | 8   | 5   | 5   | 6      | 6   | 8   | 11  | 12  | 11  | 14  | 15  | 15  | 16  | 17  | 15  | 13  | 12  | 14  | 9   |
| 7   | 4           | 0   | -2  | -0  | 2   | 4   | 7   | 17  | 21     | 24  | 19  | 10  | 7   | 15  | 9   | 9   | 9   | 11  | 18  | 17  | 13  | 12  | 13  | 10  |
| 8   | 8           | 5   | 5   | 4   | 7   | 7   | 7   | 7   | 7      | 4   | 1   | 1   | -2  | -5  | -5  | -2  | -3  | -8  | -7  | -7  | -4  | -3  | -4  | -3  |
| 9   | 3           | 8   | 9   | 7   | 6   | 6   | 8   | 9   | 11     | 9   | 9   | 8   | 7   | 4   | 3   | 3   | 3   | 3   | 1   | 0   | 4   | 3   | -0  | -2  |
| 10  | -2          | 1   | 1   | 1   | 2   | 1   | 2   | 0   | -1     | -0  | -0  | 1   | 1   | -1  | -0  | 0   | -1  | -2  | -4  | -5  | -5  | -3  | -3  | -6  |
| 11  | -5          | -6  | -5  | -1  | 2   | 2   | 0   | -0  | -1     | -2  | -4  | -2  | 0   | 1   | 5   | 8   | 8   | 6   | 6   | 6   | 5   | 4   | 3   | 2   |
| 12  | 1           | 1   | 4   | 5   | 9   | 12  | 15  | 17  | 18     | 17  | 12  | 12  | 13  | 6   | 10  | 13  | 18  | 16  | 13  | 12  | 13  | 23  | 34  | 22  |
| 13  | -7          | -16 | -12 | -8  | -8  | -23 | -35 | -35 | -31    | -26 | -30 | -37 | -28 | -23 | -28 | -29 | -36 | -39 | -28 | -29 | -31 | -50 | -55 | -50 |
| 14  | -44         | -41 | -39 | -36 | -35 | -31 | -30 | -37 | -30    | -27 | -25 | -24 | -22 | -25 | -26 | -27 | -25 | -28 | -22 | -23 | -21 | -19 | -21 | -22 |
| 15  | -19         | -18 | -17 | -14 | -10 | -3  | -1  | 1   | -11    | -19 | -30 | -35 | -41 | -40 | -39 | -37 | -35 | -32 | -25 | -15 | -23 | -41 | -53 | -48 |
| 16  | -41         | -48 | -55 | -52 | -44 | -43 | -52 | -58 | -50    | -43 | -36 | -41 | -47 | -43 | -39 | -36 | -35 | -37 | -40 | -30 | -27 | -28 | -34 | -41 |
| 17  | -40         | -36 | -34 | -31 | -29 | -34 | -33 | -33 | -31    | -35 | -29 | -29 | -27 | -28 | -31 | -27 | -26 | -27 | -29 | -27 | -28 | -28 | -28 | -26 |
| 18  | -24         | -23 | -24 | -25 | -21 | -19 | -19 | -20 | -25    | -25 | -22 | -18 | -17 | -21 | -25 | -22 | -21 | -18 | -19 | -19 | -22 | -24 | -19 | -12 |
| 19  | -8          | -8  | -10 | -13 | -17 | -17 | -18 | -17 | -18    | -20 | -17 | -15 | -15 | -19 | -17 | -16 | -16 | -21 | -21 | -22 | -22 | -20 | -17 | -15 |
| 20  | -12         | -11 | -14 | -18 | -18 | -17 | -17 | -18 | -19    | -20 | -19 | -19 | -16 | -15 | -11 | -14 | -17 | -17 | -15 | -14 | -14 | -13 | -11 | -9  |
| 21  | -5          | -5  | -8  | -10 | -10 | -10 | -9  | -7  | -8     | -9  | -8  | -9  | -10 | -8  | -6  | -7  | -7  | -3  | -1  | 2   | 4   | 6   | 6   | 6   |
| 22  | 10          | 12  | 12  | 11  | 11  | 10  | 10  | 10  | 12     | 20  | 21  | 22  | 10  | -0  | -9  | -6  | 4   | -6  | -7  | -24 | -30 | -20 | -24 | -13 |
| 23  | -13         | -23 | -38 | -38 | -32 | -32 | -36 | -42 | -31    | -23 | -22 | -18 | -20 | -15 | -11 | -11 | -4  | -17 | -31 | -26 | -20 | -19 | -20 | -20 |
| 24  | -24         | -28 | -23 | -23 | -16 | -18 | -35 | -32 | -28    | -27 | -22 | -17 | -15 | -16 | -20 | -18 | -18 | -20 | -19 | -17 | -17 | -18 | -19 | -20 |
| 25  | -17         | -10 | -9  | -11 | -10 | -9  | -7  | -8  | -9     | -9  | -8  | -7  | -4  | -1  | -0  | 2   | 2   | 2   | 6   | 7   | 2   | -5  | -7  | -5  |
| 26  | -2          | -4  | -8  | -11 | -9  | -7  | -7  | -7  | -7     | -12 | -13 | -16 | -20 | -19 | -16 | -11 | -10 | -6  | -6  | -6  | -10 | -15 | -17 | -13 |
| 27  | -8          | -7  | -10 | -10 | -8  | -5  | -4  | -3  | -2     | -2  | -5  | -4  | -5  | -3  | 1   | 2   | -10 | -8  | -8  | -4  | -6  | -5  | -4  | -0  |
| 28  | 1           | 1   | -1  | -1  | 2   | 5   | 8   | 11  | 9      | 11  | 10  | 9   | 5   | 3   | 0   | 7   | -1  | -1  | 1   | 1   | 2   | 5   | 6   | 4   |
| 29  | 4           | 2   | -1  | -2  | -5  | -3  | -2  | -1  | -6     | -3  | -3  | 2   | 4   | 0   | -7  | -18 | -34 | -37 | -30 | -23 | -22 | -22 | -22 | -25 |
| 30  | -17         | -13 | -20 | -25 | -24 | -25 | -24 | -24 | -24    | -26 | -22 | -19 | -18 | -18 | -16 | -16 | -16 | -14 | -19 | -14 | -18 | -23 | -23 | -13 |
| 31  | -10         | -11 | -13 | -19 | -17 | -17 | -22 | -22 | -20    | -22 | -27 | -18 | -19 | -15 | -17 | -16 | -19 | -18 | -15 | -10 | -8  | -11 | -12 | -14 |

## DAILY MEANS OF EQUATORIAL DST FOR 1972

| DAY  | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV  | DEC | ANNUAL MEAN |
|------|-----|-----|-----|-----|-----|------|------|-----|------|-----|------|-----|-------------|
| 1    | -12 | -11 | -1  | -20 | -26 | -2   | -8   | -27 | -15  | -18 | -133 | -12 |             |
| 2    | -11 | -16 | -17 | -25 | -22 | 6    | -2   | -14 | -17  | -15 | -75  | -1  |             |
| 3    | -14 | -20 | -22 | -4  | -14 | -1   | -2   | -2  | -11  | -7  | -54  | -2  |             |
| 4    | -8  | -20 | -17 | -5  | -7  | 5    | -4   | -58 | -7   | -18 | -35  | -8  |             |
| 5    | -6  | -17 | -12 | -17 | -2  | -7   | -3   | -84 | -4   | -14 | -26  | -4  |             |
| 6    | -4  | -12 | -7  | -12 | -6  | 4    | 1    | -83 | -6   | -5  | -13  | 9   |             |
| 7    | -4  | -18 | -36 | -15 | -7  | -5   | -26  | -59 | 1    | 3   | -19  | 10  |             |
| 8    | -6  | -16 | -20 | -9  | -0  | -5   | -27  | -46 | -6   | -7  | -17  | 0   |             |
| 9    | -8  | -9  | -21 | -6  | -15 | -6   | -12  | -89 | -13  | -2  | -15  | 5   |             |
| 10   | -10 | 4   | -16 | -3  | -19 | 9    | -12  | -72 | 0    | -10 | -11  | -1  |             |
| 11   | -29 | -4  | -26 | -11 | -10 | 15   | -5   | -57 | -18  | -36 | -1   | 1   |             |
| 12   | -18 | -5  | -7  | -10 | -11 | 14   | -10  | -45 | -13  | -23 | -4   | 13  |             |
| 13   | -7  | -9  | -9  | -22 | -10 | 16   | -10  | -35 | -35  | -33 | -3   | -29 |             |
| 14   | -0  | -22 | -3  | -18 | -14 | 15   | -4   | -26 | -97  | -34 | -2   | -29 |             |
| 15   | -19 | -17 | 5   | -17 | -5  | 2    | -3   | -32 | -60  | -22 | -6   | -25 |             |
| 16   | -35 | -11 | -34 | -13 | -46 | -2   | -12  | -29 | -46  | -27 | -30  | -42 |             |
| 17   | -27 | -25 | -27 | -6  | -29 | -11  | -12  | -22 | -40  | -12 | -27  | -30 |             |
| 18   | -25 | -34 | -21 | -35 | -7  | -145 | -8   | -30 | -43  | -13 | -21  | -21 |             |
| 19   | -16 | -34 | -16 | -20 | -5  | -80  | -9   | -30 | -31  | -52 | -20  | -17 |             |
| 20   | -18 | -28 | -13 | -7  | -3  | -50  | -9   | -24 | -18  | -32 | -32  | -15 |             |
| 21   | -37 | -20 | -7  | -37 | 7   | -38  | -6   | -24 | -10  | -37 | -23  | -5  |             |
| 22   | -44 | -13 | -8  | -16 | 3   | -33  | 3    | -23 | -7   | -31 | -25  | 2   |             |
| 23   | -49 | -4  | -9  | -17 | 1   | -37  | -9   | -18 | -11  | -36 | -23  | -23 |             |
| 24   | -34 | -48 | -33 | -4  | -12 | -23  | -20  | -15 | -25  | -27 | -9   | -21 |             |
| 25   | -32 | -46 | -22 | 2   | 9   | -23  | -39  | -14 | -15  | -26 | -2   | -5  |             |
| 26   | -22 | -28 | -18 | 11  | -5  | -18  | -26  | -22 | -23  | -22 | -22  | -11 |             |
| 27   | -23 | -17 | -22 | 8   | -5  | -17  | -20  | -51 | -22  | -10 | -18  | -6  |             |
| 28   | -32 | -21 | -11 | -37 | -0  | -30  | -19  | -32 | -14  | -24 | -23  | 4   |             |
| 29   | -29 | -0  | -17 | -53 | -6  | -25  | -12  | -27 | -43  | -35 | -24  | -11 |             |
| 30   | -20 | 0   | -40 | -37 | 10  | -20  | 0    | -19 | -33  | -40 | -10  | -20 |             |
| 31   | -15 | 0   | -20 | 0   | -2  | 0    | 8    | -22 | 0    | -27 | 0    | -16 |             |
| MEAN | -20 | -18 | -17 | -15 | -8  | -15  | -10  | -36 | -23  | -22 | -24  | -10 | -18         |



## 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  $58^{\circ}$ . (Ref.: IAGA-resolutions Toronto 1957 and Helsinki 1960). It is a quarter hourly measure, on a quasi logarithmic scale, of the maximum deviation in  $\gamma$ 's of the most disturbed horizontal component from its normal quiet-day value (the highest value of either  $\Delta H$  and  $\Delta D$ , or  $\Delta X$  and  $\Delta Y$ ). 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)  $\Delta$  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                    |
| Tiksi           | 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  $65^{\circ}$ , 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 Dominion 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),

Mirny (1956 - '67),

Tiksi (1944 - '67),

Molodezhnaya (1964 - '67),

Dikson (1934 - '67),

Lazarev (1960 - '61),

C.Chelyuskin (1935 - 1967),

Novolazarevskaya (1961 - '67),

B.Tikhaya (1934 - '58),

Vostok (1958 - '67).

O.Cheisa (1958 - '67).

Arctic drifting stations:

NP 3-13 (1954 - '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 is determined from deviations from the quiet reference level of the horizontal component H (either instantaneous or mean) of a number of stations near the northern or the southern auroral zones. It is the largest positive deviation (AU) minus the largest negative deviation (AL) from the adopted quiet time value of H at each station. To be most useful, the index should have a time resolution of less than one hour.

(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. 786 - 792, 1966)

For the period Sept. 1964 through Dec. 1968, AE-indices were determined at 2.5 minute-intervals at NASA-Goddard Space Flight Center. They are available on magnetic tape at World Data Center A for Solar Terr. Physics, National Oceanic and Atmospheric Administration, NOAA, Boulder, Colorado 80302, U.S.A. Hourly means, computed from the 2.5 minute data, are also available at WDC-A as card images on magnetic tape and as a microfilm listing of tabular values and plots of AE, AU, and AL. Only the AE indices for 1964 and 1965 are based on a complete set of stations; values for 1966, 1967 and 1968 are preliminary and based on four (or more) northern hemisphere stations. These values are to be updated as additional data are available.

AE-indices for 1970 and other recent years are determined by the NOAA-Environmental Data Service and will be made available similarly through WDC-A.

Hourly values of AE were derived and published by the Geophysical Institute of the University of Alaska, College, Alaska, for the years 1957-1964. They are based on different sets of stations and include some southern hemisphere data. These values are also available from WDC-A and contain tables and plots of AE, AU, AL, and  $\frac{AU + AL}{2}$ . Some of these data are also available at other WDC's under the WDC exchange arrangements.

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1972

Sudden commencements followed by a magnetic storm  
or period of storminess.

JANUARY

- 15 0927 A: LG SF BA; B: MA LM; C: WN VI CF GC TK EB SZ BI AC KG - (si; A:  
(19-44) ME TW; B: ES VL FU QU HO; C: SS PP).
- 15 1124 A: MG SU; B: HL SW BE TF QU TA HO TE MB; C: VL NE UB HB? TL PE  
(10-26) - (si: A: TW; B: IR PP AM; C: SS - bp: A: SJ; C: KG - sfe: BA? BI).
- 21 1151 A: SO SU LG FR AE SF KS TA HO TE SJ GU BA BI HU AP PP LM HR AC  
(42-57) AM TW; B: LE ES SW BE MA OT TF TK EB PE AV DS QU TG PM TN TO  
KG DU; C: WN PR HB? TL MB - (si: A: TR UB; B: HL OD - bs: A: MG - bp:  
B: DU).

FEBRUARY

- 09 1937 A: HU; B: QU TA PM PP AC; C: AV SZ MB BI - (si: A: TE; B: IR KS LU LM  
(26-41) TW; C: SS HO TN HR - b; C: KV - bp: B: PE; C: TK - sfe: FR?).
- 13 0940 A: SO KN MO MA HB SU LG PE SF LU AP AC; B: MG HL WN IR SW VL  
(30-54) HA KV OD GC AQ TF IK SZ TA BI PM PP LM GN TO; C: WI BE PR NE  
OT MT KA AV SS KY MB - (si: A: FU HR; B: LE ES NE UB TK KS QU; C:  
HO).
- 18 2339 A: CO MG VI AE SF HO SJ GU HU AP AC; B: HL WI SU GC AQ KS TU QU  
(33-43) PM PP LM GN AM KG DU; C: NI PR MB - (si: A: SI WN VL FU OD LG FR  
AV DS TA TE TO; B: IR DB CF TK IK EB CI TW; C: MT KA SS KY-bs: A:  
PE LU; B: BI; C: HR - bp: B: MA - bps: A: SO KN TL; B: BE KV SZ).
- 24 0642 A: SO NU MG KN ME VL FU CI FR PE EA SF KS AV SZ TA HO TE SJ  
(36-50) GU BI LU PM HU AP PP TN LM HR AC TO AM TW; B: DO LE ES HL WN  
SW HA KV MA UB HB OD SU GC MT AQ IK EB KA SS DS KY TG GN KG  
DU; C: NI NE PR CF TU MB - (si: C: TK).

MARCH

- 06 2108 A: SO CO DO NU MG LE SI KN MO ME WN WI IR NI VL HA MA DB PR  
(57-18) VI NE FU CF UB HB OD OT SU GC MT LG AQ TF TK IK EB CI TL FR  
PE AE SF KA KS DS TU KY QU SZ TA TE HO SJ GU BA LU PM HU AP  
PP TN LM HR AC TO AM TW KG DU; B: TR ES HL SW BE KV SM SS TG  
GN.

APRIL

- 20 1050 A: SO KN OD SU LG BA LM AC TW; B: DO LE MO ES HL WN VL BE HA  
(43-53) KV MA DB FU HB AQ TF EB TL SM AE TA PP KG; C: WI NI PR VI NE  
CF GC IK TK MB - (si: A: MG KS LU; B: PE AV QU HU; C: MT KA SS KY  
HO).
- 22 1255 B: KV AE QU BA; C: LG SM - (si: B: MG KS - bp: B: AP).  
(50-66)
- 23 0744 A: KS BA - B: SO MA LG SM LU; C: WN VL SU GC - (si: B: BE OD AC; C:  
(36-48) MT KA KY QU LM - bp: A: AP).
- 29 0345 A: LU; B: CI QU TE GU BA LM - (si: B: MT KA; C: KY).  
(41-48)

MAY

- 09 0518 A: CO MG VI SU LG AE SJ LU LM; B: SO LE ES HL WN WI VL HA KV MA  
(15-21) DB NE UB OD GC AQ IK CI SM QU SZ HO BA PP GN HR TO KG; C: NI  
PR CF MT EB TL KA SS TU KY MB AP - (si: A: DO FR TA TE; B: ME IR  
BE FU; C: SI - bs: HU - bps: B: PE?).
- 15 1849 A: SO DO NU MG SI KN MO ES WN WI IR VL BE HA MA DB PR VI NE  
(44-55) FU CF UB HB OD OT SU GC MT LG AQ TF TK IK EB CI TL FR PE SM  
AE KA KS SS KY QU SZ HO TE SJ GU BA LU PM HU AP PP TN LM GN  
HR AC TO AM TW KG DU; B: LE HL SW NI KV TU TA? MB TG.

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1972 - continued

## (MAY)

30 1420 A: MA OD LG SJ AC; B: VI CF UB TF IK PE SM AE KS QU TA BA PP; C:  
(15-24) WN PR NE TK TL HO MB - (si: A: KN IR SU; B: FU HU LM; C: MT KA SS  
KY - bs: B: MG).

JUNE

03 1154 A: MA; B: LE ES HL VL AE TA TW; C: WN KV PR MB - (si: A: TE; B: BE  
(50-59) FU PP; C: WI).

06 1445 A: MO MA UB OD LG SF TA SJ BA AC TW; B: LE ES HL WN WI VL BE  
(42-49) HA KV PR VI HB GC EB TL SM QU SZ PM PP TN TO; C: NI TU MB (si:  
A: DO NU MG KN DB FU SU TK IK PE AE KS HO HU LM; B: OT MT KA  
KY; C: CF SS - bs: B: SO - sfe: AQ).

17 0629 A: SO MG IR UB SJ LM; B: NU HL VL BE KV MA TK QU HO GU BA PP?  
(24-33) GN TO DU; C: HA MT KA KY TA - (si: A: TE; B: DO WN FU AC; C: GC IK  
EB SS).

17 1312 A: DO NU MG MO WN VL MA DB PR VI FU CF UB HB OT SU GC MT LG  
(06-17) AQ TF IK EB CI TL FR PE AE SF KA KS SS DS TU KY QU SZ HO TE SJ  
GU BA LU PM AP TN LM HR AC TW KG; B: LE ES WI SW NI HA KV NE  
SM TA MB TG HU PP GN TO - (si: A: OD TK AM - bs: A: SO - bp: A: KN).

24 1525 A: SU LG PE AE SF KS BA LU; B: WI EB MA CF UB SM QU SZ TA PP?  
(19-30) TN AC TW; C: VL GC EB TL - (si: A: MG KN PR FU HB OD AQ TK; B:  
WN MT KA KY LM; C: SS).

JULY

24 1856 A: LG SF TE; B: WN KV MA PR CF SU IK AE KS QU SZ TA MB PP LM;  
(53-64) C: VL BE DB HB? GC TK TL PE SM BA PM - (si: A: FU; B: OD HU).

AUGUST

04 0119 A: SO CO DO NU SI KN MO ES ME MA DB VI NE FU OD SU GC LG TF IK  
(14-31) TL FR PE AE SF QU SZ TA HO TA SJ MB GU BA LU HU AP TN LM HR  
AC TW DU; B: LE WN WI IR NI BE HA KV PR CF UB HB MT AQ EB CI  
KA TU KY PM PP GN TO AM KG - (si: A: OT DS; C: SS).

04 0220 A: SO CO DO WN WI HA PR CF HB OT GC LG AQ EB CI TL FR PE DS  
(17-22) QU SZ TE MB GU LU PM AP TN LM AC AM KG; B: LE ES KV NE MT KA  
SS KY TG TO - (si: A: SI NI MA DB FU OD TU HO SJ BA HR TW; B: PP).

04 2054 A: NU SI MO WN IR HA MA DB? PR VI CF SU GC MT LG AQ IK EB CI  
(40-67) PE AE SF KA SS DS KY QU SZ TA HO TE SJ MB GU BA LU PM GN HR  
AC TO AM TW; B: LE ES WI NI HB TL; C: BE NE - (si: A: CO FU UB OD  
OT TU HU AP).

08 1341 A: MA SU LG PE SF BA LM; B: SO WI UB OD AQ IK EB AE QU SZ AC SJ  
(37-43) AC DU; C: WN CF GC MT KA KY MB PP? - (si: B: DO KN BE KV FU; C:  
SS HO - sfe: NI HB TL).

08 2354 A: CO NU SI KN MO ME IR HA MA SU OT LG AQ TF IK FR PE SF QU  
(51-60) HO TE SJ GU LU HU AP LM; B: LE MG WN WI NI BE KV VI HB GC EB  
CI TL TG PM PP GN TO AM; C: DB NE MT KA TU KY SZ - (si: A: FU OD  
BA AC TW; B: CF DS TA; C: HA SS - bps: A: SO).

09 0037 A: CO WN DB CI FR PE SS DS KY TE GU LU PM HU AP AC AM; B: DO  
(33-39) MG WI KV NE HB GC MT EB KA TO - (si: A: SI MO MA FU OD OT AQ TU  
HO SJ BA HR TW; B: VI CF TL? SZ PP - bs: A: SO).

19 1312 B: AC; C: MA VI SZ - (si: A: TA; B: BA; C: HO - sfe: HU).  
(10-16)

25 2259 A: NU ME MA VI OD SU LG FR AE SF QU SJ GU BA HU AP AC TW; B:  
(56-62) SO LE MO ES WN WI BE HA DB PR CF OT GC AQ IK EB TL PE TU SZ  
HO MB TG LU PM TN TO AM KG DU; C: SI NI HB MT KA KY - (si: A: MG  
FU TE; B: DO DS LM HR; C: SS - sfe: GN).

26 2319 B: MG PM AM; C: TO - (si: B: KN; C: HO - bp: C: VI).

TABLE 1 STORM SUDDEN COMMENCEMENTS (ssc) 1972 - continued

SEPTEMBER

- 07 1549 B: LG AE QU LM; C: WN MA IK BA AC - (si: B: VL FU; C: SU EB - sfe: SZ).  
(43-57)
- 10 0628 A: QU BA; B: SU MB TG AP LM; C: LE ES WN VL HA VI SS SZ HO - (si: A:  
(24-33) TE; B: BE PM PP; C: MT EB KA KY TN - bs: A: AC; B: HU - bp: B: MA -  
sfe: IK).
- 13 1240 A: SO CO DO NU LE SI ES WN NI VL MA DB PR VI NE FU CF HB OT SU  
(34-42) GC LG AQ IK EB CI TL FR PE AE SF SS DS TU QU SZ TA HO TE SJ MB  
GU BA LU PM HU AP PP TN LM HR AC TO AM TW KG; B: WI BE HA MT  
KA KS KY TG GN DU.
- 29 1138 A: SU SF BA; B: SO LE ES VL MA DB LG AQ QU; C: WN WI NI BE CF HB  
(35-41) GC IK EB TL PP LM - (si: B: FU SU TA - sfe: PE AE SZ PP?).

OCTOBER

- 07 1024 A: MA VI SU LG AE KS TA MB BA LU AC TW; B: SO LE ES WN WI VL  
(19-28) BE DB VI AQ IK EB PE PP TO; C: HA CF GC HO AP KG - (si: A: PR FU  
SF QU TE LM AM; B: DO NU HB MT KA KY PM HU TN GN; C: SS SZ -  
sfe: NI TL?).
- 18 1746 A: CO DO SI WN WI MA VI FU SU OT GC LG AQ EB CI FR PE AE SF KS  
(43-52) DS QU TA HO TE SJ MB GU BA LU HU AP TN LM HR AC TW DU; B: SO  
LE ES NI VL BE HA DB PR NE CF HB MT IK TL KA TU KY SZ PM PP  
GN TO AM KG; C: SS - (si: A: NU).
- 31 1654 A: SO CO DO NU SI WN WI VL MA DB VI FU OT SU GC LG IK EB CI FR  
(48-55) SF KS SS DS KY QU TA HO TE SJ MB GU BA LU PM HU AP TN LM GN  
HR AC TO AM TW KG DU; B: LE ES NI HA PR HB MT AE AQ TL KA SZ  
TG PP; C: BE NE TU.

NOVEMBER

- 01 1826 A: LG KS LU TW; B: SU SZ TE BA; C: TL.  
(20-30)
- 01 1839 A: VI; B: MA CI TA LM; C: NE TU HO - (si: E: FU? QU; C: SS).  
(38-40)
- 02 1442 A: LG; B: SO VL MA CI LM; C: WN - (si: B: QU; C: BA).  
(39-44)

DECEMBER

- 12 2145 A: SU QU SJ AC; B: CO ES VL MA CI PE AE TI MB TG PM HU PP LM GN  
(42-49) TO DU; C: LE WN WI HA DB VI CF HB? GC MT AQ EB KA SS KY SZ HO  
- (si: A: TE TW; B: FU TA).
- 22 1024 B: IK LM; C: WN PR CF KA MB? - (si: B: FU QU; C: EB - bp: B: MA).  
(20-30)

TABLE 2 BAYS AND PULSATIONS 1972

Times of commencement of bays or pulsational disturbances associated with bays. Stations which reported other kinds of disturbances are included in parentheses.

JANUARY

- 02 1841 (28-49) b: A: SJ; B: SW MB TN - bs: A: NU MO KS; B: HL - bp: A: LG AQ EB TL PE AE SF SZ; B: LZ WI GC CI AV HR KG; C: MA - bps: A: SO MG KN WN IR VL BE KV FU HB OD SU TK IK QU LM; B: DO LE ES NI HA PR UB MT TF KA SS KY BA - (si: A: CF).
- 04 2206 (00-20) bp: A: LG PE; B: IK BI; C: LZ MA CF BA - bps: A: SO.
- 07 1927 (20-30) b: B: SW - bs: B: BE - bp: A: KN OD SU TK IK CI SF; B: LZ LE ES WN WI VL PR DB UB HB GC AQ TF EB TL PE QU KG; C: MA - bps: A: SO NU MO IR FU KS; B: DO HL KV; C: NI - (ssc: B: TR).
- 09 1902 (50-06) b: B: SW - bp: B: BE UB OD IK PE QU; C: TF TK EB BI - bps: B: SO KV; C: BA.
- 14 0215 (09-22) b: B: FU; C: WN MC - bp: A: LG CI AE SF; B: LE ES VL HA DB AQ EB BI; C: KV TL PE BA.
- 16 0110 (05-13) bs: B: HL - bp: B: HA MA EB CI TL PE SZ TA - bps: A: SO LG SF; B: BE CF TA.
- 16 0952 (45-57) b: A: MG - bp: A: FR SJ AM - bps: A: TE PP - (ssc: B: HO).
- 16 1503 (50-16) b: A: WN - bs: A: NU; B: HL - bp: A: KN MO NI PR; B: VL MA EB KG - bps: A: SO; B: BE.
- 16 1946 (45-48) bs: B: BE - bp: A: KN; B: WN NI PR IK EB KG - bps: A: SO MO.
- 17 1806 (00-12) b: A: SU EB; B: WN - bp: A: KN OD IK TL PE SF AV SZ; B: NI VL MA PR HR; C: GC KY - bps: A: SO; B: HB.
- 18 1152 (50-60) bs: A: MG - bp: A: AP; B: MT KA KY (si: B: TK HO).
- 18 1555 (46-66) bs: A: KS; B: HL BA - bp: A: IK; B: MA KG; C: NI - bps: B: MO - (si: A: KN OD).
- 19 1518 (00-30) b: B: HL WN SW SU TK - bs: B: BE - bp: A: OD SF; B: LZ LE KN VL KV MA PR IK KG; C: NI GT MT TF KA KY - bps: A: SO MO; B: MG.
- 23 2022 (11-41) b: A: SU SF; B: HL TN - bs: A: KS BA; B: HB - bp: A: FU OD AQ IK; B: WI NI VL KV MA PR GC TL AV QU TA LU LM HR KG; C: TF - bps: A: SO CF SZ; B: DB.
- 24 1927 (18-34) b: A: SU SF; B: TN - bs: A: SO KS; B: HL - bp: A: WN FU; B: LE KN ES WI HA MA CF HB GC AQ TF CI QU BI HR - bps: A: OD LG IK BA; B: DO MO NI VL BE KV DB PR AE LM; C: TA.
- 25 2314 (11-19) bs: B: BA - bp: A: CF AV; B: MA EB SZ TA AC; C: TL - bps: A: SO.
- 26 1042 (36-50) b: A: NU TE PM; B: TK - bs: A: MG - bp: A: KN NE OD TO; B: KV MA VI MT KA SS KY GU DU - bps: A: SO AP AM; B: PP - (ssc: A: UB; B: SW; C: HB? - si: A: KS HO).
- 26 2003 (57-70) b: A: NU LG; B: HL BA - bp: A: MO FU OD SU IK TL; B: LE KN ES WN WI NI VL HA KV MA TR CF AQ CI BI LM; C: GC - bps: B: DB.
- 30 2112 (00-18) b: B: SW AE LU TN - bs: B: HL - bp: A: LG SF; B: LZ LE ES WI VL HA KV MA FU CF OD SU AQ IK EB CI TL TA BI HR; C: WN NI BE PR - bps: A: SO; C: BA.
- 31 1558 (50-71) b: A: NU SU CI; B: WN SW - bs: B: IR - bp: A: SO MO OD; B: LE ES KN KV MA PR HB IK EB AE KG; C: NI GC MT KA KY - bps: C: TF.
- 31 1833 (28-38) b: A: NU SU; B: SW - bp: B: SO LE ES WN KV MA PR HB OD IK EB TL LM KG; C: NI GC HR - bps: C: TF.

FEBRUARY

- 01 2245 (40-50) bp: A: SO; B: MA VL KV CF AQ IK TL BI LU; C: EB LM HR - bps: A: DO LG.
- 03 1632 (18-40) b: B: HL SW; C: HR - bs: B: MG - bp: A: SO KN KV FU OD SU PE; B: WN WI VL HA MA PR HB TF IK EB CI AE SS KG; C: LE GC TL - bps: A: MO; B: BE UB TK KS; C: MT KA KY - (ssc: C: VI).

TABLE 2 BAYS AND PULSATIONS 1972 - continued

(FEBRUARY)

|         |   |
|---------|---|
| 06 1832 | (28-34) b; B: SW - bp; B: KN TF LM KG - bps; C: TK - (ssc: B: TR - si: HL BE).  |
| 07 2234 | (27-37) b; A: HR; B: AV MB - bs; B: LG - bp; A: SO FU OD IK AE SF SZ LU HR; B: WN VL MA PR HB EB TL BI KG - bps; A: CF PE TA; B: LE ES - (si: C: PP). |
| 13 1723 | (15-25) bp; A: HB OD; B: WN VL NI MA IK KG - bps; A: SO KN MO.  |
| 13 2240 | (33-44) b; A: LU; B: BI - bp; A: CF PE AE SF HR; B: MA KG.  |
| 14 1934 | (25-43) b; A: NU - bs; B: HL - bp; A: PE; B: KN WN VL KV MA PR HB OD IK EB TL QU KG; C: NI GC - bps; A: SO MO; B: DO BE TE.                           |
| 17 1743 | (3054) bp; A: KN SU IK SS; B: MT TL KA KY - bps; A: SO - (si: B: TK).   |
| 18 2104 | (54-17) b; A: NU - bp; A: PE; B: WN VL KV MA TF LM KG; C: PR CF EB - bps; A: SO.  |
| 20 0216 | (09-24) b; A: PE CI AE TA; C: MB - bs; A: LG - bp; A: FU CF SU SF; B: KV MA DB OD EB TL BI LU; C: HR - bps; B: AV SZ.                                 |
| 23 1804 | (57-10) b; A: OD LM - bs; B: BI - bp; A: IK LU; B: LG EB; C: KV - bps; A: AE - (si: B: PP; C: TL?).   |
| 24 2020 | (10-25) bs; A: VL; B: WN PR - bp; A: MO FU SU TL SF; B: MA IK - (si: A: CF; B: LG PP).  |
| 25 1711 | (56-26) bp; A: SO KN FU OD SU PE; B: WN NI HA KV PR HB IK EB TL HR - bps; B: VL BE TF BI - (si: B: TR).   |
| 25 2009 | (00-20) bp; A: PE; B: WN KV MA PR OD; C: TL HR - bps; A: SO; B: BE.   |
| 26 0032 | (24-40) b; A: CI; B: PE; C: MB - bs; A: LG - bp; A: SO SF AC TW; B: LZ VL MA OD EB TL AV BI LM; C: WN BE SZ - bps; A: AE HR; B: CF LU.                |
| 26 1841 | (38-45) b; B: SW - bp; A: NU; B: WI IR VL BE KV UB OD TF IK PE QU LM; C: NI PR TK EB TL TN.   |
| 27 1803 | (00-05) b; C: TK - bp; B: IR UB OD IK QU GN; C: KV KY - bps; B: KN - (ssc: B: TR).  |
| 27 2137 | (25-40) bs; A: KS - bp; A: KN PE SF HR; B: LZ WI VL KV MA CF UB OD AQ TF IK EB CI TL TA BI LU LM KG - bps; A: SO.                                     |

MARCH

|         |  |
|---------|--|
| 01 2032 | (22-42) bs; B: SO - bp; B: MA EB CI QU LM; C: TL SM - (si: B: PP; C: ES).  |
| 02 1516 | (10-20) bs; A: LG - bp; A: MG; B: NE OD SM; C: MT KA KY.   |
| 03 1510 | (00-16) b; A: NU SU; B: WN SW LU - bs; A: SO LG KS; B: HL - bp; A: KN MO FU OD AQ PE SF SS TA GU; B: NI VL KV PR VI NE HB MT EB KA KY GU HO PM LM DU; C: GC - bps; A: MG IR UB IK AE AP AM; B: BE TF TK PP KG. |
| 03 1850 | (40-63) b; B: SW - bs; B: HL - bp; A: SO NU FU CI SF LU; B: LE MO ES WN WI VL HA DB PR OD AQ IK EB TL LM GN HR KG; C: LZ NI HB GC TF SS - bps; B: DO BE KV UB - (si: B: QU).                                   |
| 04 1730 | (28-33) b; B: IR - bs; B: HL; C: UB - bp; A: MG OD SU LU; B: SO BE MA IK TK PE; C: MT EB SS LM - bps; B: KV GN.  |
| 05 1822 | (20-24) b; B: SW - bs; A: SO - bp; A: NU; B: VL MA FU OD IK LM; C: WN BE MT KA KY - bps; B: DO KV.   |
| 05 2330 | (25-34) bp; A: SO LG CI PE SF; B: LZ VL MA FU CF AQ IK EB TL TA LU - bps; B: BA.   |
| 08 1551 | (45-56) b; B: WN SW - bs; C: BE - bp; A: MO OD IK; B: HL NI KV MA PR HB DU; C: TK SS - bps; B: MT KA KY.   |
| 11 1854 | (48-60) b; A: MO IR; B: MG HL SW; C: SZ - bs; A: SO NU KS - bp; A: WN FU OD SU CI PE; B: LE KN WI VL HA MA DB PR UB GC TF TK IK EB TL AE QU KG; C: LZ NI PR HB SS LM HR - bps; B: DO ES BE; C: KV MT KA KY GN. |

TABLE 2 BAYS AND PULSATIONS 1972 - continued

## (MARCH)

- 12 2309 (00-19) b: B: SW - bs: B: HL - bp: A: OD CI PE; B: LZ WN WI VL HA MA FU CF GC LG IK EB TL LU LM; C: BE PR TF - bps: A: SO; B: KV BA.
- 13 2120 (15-21) bp: A: NU PE; B: BE MA OD LM; C: WN PR TF EB - bps: B: SO KV - (ssc: B: TR).
- 15 1820 (18-27) b: B: SW PE TN - bp: A: NU; B: WN VL BE OD TK LM KG; C: PR IK EB TL - bps: B: SO KV QU; C: TF - (ssc: B: TR).
- 15 2348 (42-54) bp: A: SO FU CF AQ TL PE; B: ES WN KV MA PR IK SZ TA; C: GC - bps: B: VL BA LU - (ssc: A: SF; C: DB - si: B: LG).
- 17 2047 (43-55) b: A: SF - bp: B: ES WN HA MA PR IK SM QU HR; C: CF EB TL - bps: A: CI LU AC; B: LE VL SZ TA - (si: B: BA).
- 18 0039 (25-47) b: B: HL; C: MB - bs: A: PE - bp: A: FU CF OD TL SF TA LU TW; B: KN ES WN HA KV MA HB EB SM SZ LM AC; C: NI PR GC - bps: A: SO; B: LE VL IK - (si: A: LG; B: BA).
- 24 1609 (08-12) bs: A: MG - bp: B: SS KY GU - bps: B: MT KA.
- 24 1952 (38-68) bs: B: HL NI PR - bp: A: KN FU CF TL SF TA; B: WN VL MA PR HB AQ EB AE LM HR KG; C: GC - bps: A: SO; B: DB IK - (si: B: BA).
- 25 0429 (25-32) b: A: SJ - bp: A: TE; B: OD EB LM; C: TL - bps: A: HU AC TW - (si: C: PP?).
- 25 1931 (27-37) b: B: SW - bs: A: KS; B: SO HL; C: NI - bp: A: NU OD; B: WN WI VL MA DB PR FU CF GC AQ IK EB TL TA LM KG; C: HB - bps: A: LG; B: DO BE KV TF BA - (si: B: KN).
- 26 1913 (00-25) b: B: SW MB - bs: C: NI PR - bp: A: FU OD; B: VL KV IK EB PE SM LM KG; C: GC - bps: A: SO KN; B: DO HL MA SZ GN; C: WN TL SS - (ssc: A: TR - si: A: LG; C: CF BA).
- 29 1107 (00-13) bp: B: LZ KN MT KA KY PP DU - bps: A: MG.
- 29 1943 (37-68) b: A: LU; B: BA; C: MB - bp: A: KN MO FU AQ TL TA; B: SU MA IK EB SM HR KG - bps: A: SO CF LG; B: VL - (ssc: A: SF - si: C: LE).
- 30 0237 (33-50) b: A: SZ; B: MB - bs: A: LU; B: BA - bp: A: TA; B: EB SM HU HR; C: TL - bps: A: AC.
- 30 1441 (30-52) b: A: PE; C: TK - bs: A: MG - bp: A: KN OD; B: MO MA - bps: A: UB - (si: BE).
- 31 1825 (00-42) b: A: SU TA; B: HL SW - bs: A: LG; B: CF - bp: A: SO MO NI FU HB CI TL LM; B: LE WI HA KV MA UB GC AQ IK EB SM SZ KG - bps: A: DO NU KN WN PR DB OD TF PE LU HR; B: VL BE - (si: B: BA; C: ES).
- 31 2201 (58-05) b: B: SW - bs: A: NU; B: BA - bp: A: WN FU OD CI; B: LE ES WI NI MA DB PR AQ IK EB PE LM KG - bps: A: SO LG TL AE; B: DO KN VL KV CF - (ssc: B: TR).

APRIL

- 01 0656 (51-58) bp: A: NE; B: VI; C: HO - bps: A: TE AM; B: HU PP.
- 01 2202 (55-17) b: A: NU; B: SU - bp: B: NI MA DB PR EB SM AV SZ KG - bps: A: SO CF LG.
- 02 0424 (02-42) b: A: SZ TE; B: MG TU MB - bp: A: SJ; B: SM LM; C: MT KA KY HO - bps: A: DS GU HU AC TW; B: HL FR - (si: C: QU).
- 03 2057 (52-60) bp: A: NU; B: LZ DO PE KG; C: EB - bps: B: SO - (si: HL).
- 03 2136 (34-39) b: B: HL - bp: A: NU IK CI PE TA; B: WN MA DB PR CF EB TL LU HR - bps: A: SO VL FU LG SF BA LM; B: LE MO ES KV HB GC AQ; C: NI - (ssc: B: AV).
- 06 1404 (00-06) b: C: TK - bs: B: MG HL - bp: B: KN KV OD GN DU; C: SS.
- 07 2220 (15-24) b: A: AE; B: HL - bp: A: OD CI PE SF TA; B: LZ LE WI VL HA MA FU CF GC AQ IK EB TL SM AV LU LM HR; C: WN PR - bps: A: SO LG BA; B: ES BE KV; C: NI.



TABLE 2 BAYS AND PULSATIONS 1972 - continued

## (APRIL)

- 08 1739 (33-45) b: A: MO AE; B: IR SW - bp: B: SO KN OD TK IK EB TA LM GN HR KG; C: GC SS - bps: B: KV QU.
- 09 0024 (18-35) b: A: SJ; B: MB AC - bs: A: KS - bp: A: LG CI PE AE TA LU; B: SO ES WI VL KV MA PR OD AQ IK EB TL AV LM HR; C: WN NI CF GC - bps: A: SF BA; B: FU; C: BE.
- 12 1600 (58-04) b: B: IR GN - bp: B: KV OD LU; C: HR - bps: B: QU.
- 12 1951 (44-55) bp: A: NU; B: DO WN VL MA FU OD IK LM KG; C: PR HB GC EB - bps: A: SO - (si: C: QU).
- 15 2117 (15-19) b: B: TN - bs: B: SO - bp: A: PE; B: VL MA AQ IK CI TL TA LM; C: PR CF TF - bps: A: LG BA LU; B: FU OD; C: KV GC EB - (si: C: LE).
- 16 2321 (07-30) b: A: SU AE; C: MB - bs: B: HL AC - bp: A: SO LU; B: VL MA FU CF AQ IK EB SM BA HU LM HR; C: LZ TL - bps: A: LG PE; B: ES BE KV DB OD AV TA - (ssc: A: SJ; B: PP - si: B: KN QU; C: ME HO).
- 21 1608 (00-20) b: A: LU; B: IK BA - bs: A: MG - bp: A: OD PE; B: EB; C: NI PR TF - bps: A: LG.
- 22 2049 (33-56) bp: A: FU; B: WN VL MA DB EB CI TL PE AV - bps: A: SO; B: NI PR.
- 29 1208 (05-15) bp: A: MT KA SS KY - bps: A: GU TO - (si: B: OD).
- 29 1501 (50-18) b: A: PE - bp: B: NI PR QU; C: MT KA KY - bps: A: KN.
- 29 2018 (12-23) b: A: SU LU - bs: A: PE; B: TA - bp: A: KN NI MA EB TL; B: HA; C: GC - bps: A: FU CF HB IK SF; B: WN VL PR AV - (si: A: LG).
- 29 2111 (05-18) b: A: SU LV - bs: B: TA - bp: A: KN EB TL SF; B: HA - bps: A: CF IK PE AC - (si: B: BA?).
- 30 0100 (50-07) b: A: CF PE LU HR; B: TA - bs: A: LG - bp: A: SF; B: EB TL SM AV KG.

MAY

- 01 2015 (09-33) b: A: CI; B: HL SU AE; C: CF - bs: B: BA - bps: A: KN PE LU; B: EB TL QU KG; C: HB TF - bps: A: SO LG.
- 02 2127 (24-30) b: A: PE AE; B: MB - bs: B: HA BA - bp: A: CI TL; B: LE ES VL MA EB TA; C: CF - bps: A: SO LG LU.
- 05 2136 (04-55) b: A: NU LG SU PE; B: WN SW BA; C: TN - bp: A: KV LG CI; B: SO DO LE HL WN WI VL BE MA DB FU OD TF IK EB TL AE QU HR KG; C: LZ NI PR HB GC LM.
- 08 1754 (50-57) b: B: SW - bp: A: LG; B: SO BE MA KG; C: IK EB - bps: C: HL KV.
- 09 1830 (27-39) bp: A: KN; B: KV MA OD IK KG; C: WN TF - bps: A: SO.
- 09 2113 (06-22) b: B: MB - bs: B: BA - bp: A: KN IK PE SZ TA LU; B: MO WN VL KV MA PR FU CF OD AQ EB TL HR - bps: A: AE.
- 10 0823 (21-24) bp: A: VI AP; B: NE PP TW - bps: A: HU.
- 10 1442 (35-51) b: C: TK - bp: A: KN IR OD; B: MG QU TA GN; C: MT IK EB KA SS KY - bps: A: UB.
- 10 1936 (25-48) b: A: SU CI; B: SW TN - bp: A: NU MO WN OD LG PE LU LM; B: LE HL VL MA PR FU UB HB GC TF IK EB TL SM TA KG; C: HR - bps: A: SO DO KN; B: BE KV AQ BA; C: NI.
- 12 1255 (52-58) bp: A: MG UB; B: LE KY GU PP GN DU; C: SS - bps: A: AP AM; B: MT KA.
- 13 0006 (54-10) bp: A: LG; B: MA TL SM; C: CF EB HR - bps: A: AE; B: VL CI SZ LM.
- 17 1403 (00-05) b: C: SS - bp: A: MG UB; B: MT KA KY.
- 19 2310 (05-15) b: B: SW - bp: A: NU; B: LZ KN KG; C: WN - bps: A: DO; B: SO KV.
- 19 2336 (25-43) b: B: MB - bp: A: LG AE; B: EB CI SM SZ LU HR; C: CF TL - bps: C: BA.

TABLE 2 BAYS AND PULSATIONS 1972 - continued

## (MAY)

- 20 2152 (46-55) b; A: HL PE - bp: A: LG; B: SO LE ES MA OD IK; C: KV CF EB.  
 25 2354 (46-69) bp: A: OD SU CI PE; B: LZ HL VL MA AQ IK SM; C: CF GC EB TL  
 bps: A: SO LG AC; B: DO KV TA BA LM.  
 26 2300 (55-07) b; A: CI PE; B: TF; C: IK - bs: B: HL WN - bp: B: VL KV PR OD QU;  
 C: TL - bps: A: SO.

## JUNE

- 04 1818 (10-25) bp: A: PE; B: KN BE KV TF IK EB QU KG; C: WN TL - bps: B: SO.  
 05 0200 (56-09) b; B: CF - bs: A: AE - bp: A: TA; B: SO EB HR; C: TL - bps: B: SZ  
 BA? LU - (si: BE).  
 06 2214 (10-18) b; C: TN - bs: A: KS - bp: A: SU PE; B: VL MA TF IK EB SM QU; C:  
 CF TL - bps: A: SO; B: LM - (si: B: BA).  
 07 2054 (52-60) b; A: NU - bp: B: VL MA OD IK EB PE; C: WN LM - bps: B: SO DO  
 - (si: B: TA).  
 15 0302 (58-05) b; B: SW; C: MB - bs: B: BE - bp: A: MG MA CF PE SJ AC; B: AQ  
 SM - bps: A: VL FU? LG CI AE SF TA BA LU HU HR TW; B: DO WN HA  
 PR EB TL SZ; C: GC - (si: A: LM; B: OD).  
 20 0104 (57-16) b; A: SU TN; B: HL SW MB - bs: A: FU; B: BE - bp: A: SO NU CF OD  
 IK CI PE SF LM HR; B: KN WN WI VL KV PR HB AQ SM SZ LU AC KG;  
 C: NI GC EB - bps: A: DO LG TA; B: ES DB BA; C: TL.  
 23 0704 (01-05) bs: A: HU - bp: A: TE; B: PP - bps: A: AC; B: TW.  
 23 1823 (16-25) bp: B: MA UB OD TK QU GN KG - bps: B: SO KV LM; C: EB - (si: A:  
 KN MO).  
 27 2016 (10-30) b; B: HL - bs: A: SO CI KS - bp: A: KN FU OD SU AQ IK TL AE SF  
 TA LM HR; B: WN KV MA HB EB SM QU KG; C: GC TF - bps: A: PE BA  
 LU; B: SZ - (si: C: PP).  
 28 1844 (30-65) b; B: CI; C: TK - bs: A: SO; B: HL BA - bp: A: KN SU PE; B: WN VL  
 KV MA FU OD IK EB TL LM KG; C: NI HB GC TF TA - bps: A: MO LG; B:  
 BE.  
 29 1446 (34-59) b; A: PE; B: WN PR - bp: A: KN OD LG; B: MG KV MA IK TF; C: SS  
 - bps: A: IR - (si: HL BE).

## JULY

- 02 1620 (10-22) bs: A: AC - bp: A: OD PE; B: KV MA SU IK EB; C: WN - bps: B: LU  
 - (ssc: B: LG KS TE LU; C: SZ - si: A: FU; B: BE QU BA?).  
 07 0309 (06-15) bp: A: AC; B: SM - bps: B: HU - (si: B: FU LM; C: UB; cr: B: PP).  
 12 2123 (19-30) bs: C: BA - bp: B: LZ SO WI VL BE KV MA OD QU LM KG; C: WN  
 EB CI.  
 15 0141 (29-57) bp: A: LG SF; B: VL EB CI SM TA; C: KV CF PE.  
 16 1948 (45-51) bp: A: LM; B: BE IK EB KG; C: WN - bps: A: SO; B: MO KV.  
 17 2201 (52-05) b; C: TN - bp: A: NU CI; B: SO ES WI HA MA DB PR OD SU IK EB TL  
 PE TA HR - bps: A: WN FU LM; B: DO VL BE KV HB; C: NI GC.  
 22 2015 (00-25) bp: A: NU; B: LZ DO WN KV MA PR SU IK EB KG; C: HB GC - bps:  
 A: SO.  
 25 1405 (00-15) bs: B: WN - bp: A: LU; B: VL PR SU IK EB DU - bps: A: MO QU KG  
 - (ssc: C: SZ - si: A: OD; B: TK).  
 25 2228 (06-48) b; A: AE HR; B: TK MB - bs: A: PE TA BA; B: WN - bp: A: OD AQ  
 TL SZ LM; B: VL MA PR HB GC TF EB SM; C: NI - bps: A: SO CF SU LG  
 IK SF QU LU; B: DB - (si: C: PP).  
 26 2123 (13-24) bs: A: SO KS BA - bp: B: WN MA; C: PR EB - bps: A: LG LM; B: VL;  
 C: TL.  
 27 0337 (30-46) b; B: MB HU - bp: A: MG EB SM SZ - bps: A: AC; B: TW - (si: BE).

TABLE 2 BAYS AND PULSATIONS 1972 - continued

AUGUST

- 07 0114 (03-31) b: A: AE LU HU; B: IK TA BA HR - bp: A: KN CF AC; B:KV SU EB; C: TL - (ssc: A: MG - si: A: TE).
- 11 2050 (42-55) b: A: CF; B: WN VL KV MA - bs: A: SO PE AE KS LU; B: SZ BA - bp: A: OD SU IK TL SF; B: LE ES PR DB EB LM HR; C: NI BE HB GC TF bps: A: LG; B: TA.
- 12 2329 (24-30) b: C: MB - bp: B: SO MA EB TA LU; C: WI CF IK LM - bps: A: LG; B: BA; C: HR.
- 17 2349 (46-51) bp: A: LG TA; B: MA EB CI PE; C: WI MB - bps: B: BA LU; C: SZ HR.
- 18 1259 (58-60) bs: A: MG - bp: A: UB AP; C: MT KA SS KY.
- 18 1814 (10-24) bp: A: KN UB OD; B: KV MA IK EB; C: MT KA SS KY - bps: A: UB; B: GN.
- 21 1904 (00-16) bp: B: KN WN KV MA EB BA LM KG; C: NI PR HB TF TL - bps: B: SO.
- 21 2134 (28-45) b: A: PE; B: KV - bp: A: OD SU SF; B: WN MA PR CF HB IK EB TL TA; C: NI - bps: B: SO BA.
- 25 0105 (57-10) bp: A: NU LG PE AE TA; B: SO CF EB CI; C: IK MB TN - bps: B: BA LV.
- 31 0112 (05-20) b: B: PE - bs: B: BA - bp: A: SU LG AE SF TA; B: MA CF IK EB CI SZ MB LU; C: BE.

SEPTEMBER

- 02 1859 (55-68) bp: A: SF; B: LZ MA SU IK QU LM GN KG; C: WN EB - bps: B: BE.
- 04 0255 (48-68) b: A: LM; B: PE TA SJ PP? AC; C: SS HO MB HR - bs: B: HU - bp: A: TW - (si: A: TE; B: BE BA DU; C: QU - sfe: GU TN).
- 04 0348 (42-54) b: A: TA SJ? LM; B: PE SS PP?; C: HO HR - bs: A: AE PM HU AC; C: MB - bp: A: TW - (si: A: TE; B: BA - sfe: QU GU TN).
- 04 0706 (02-10) b: A: SF LM; B: SU IK PE TA SJ PP?; C: SS HO HR - bs: A: AE HU AC; C: MB - bp: A: TW; C: BE - (si: A: TE - sfe: QU BA).
- 06 1558 (60-61) bs: B: SO - bp: B: WN VL MA; C: PR - (ssc: C: QU - si: B: FU SZ BA; C: LM).
- 06 2048 (45-49) bs: B: SO - bp: B: MA QU; C: WN EB TL - bps: A: LU; B: DO VL BE - (si: A: LM).
- 07 1149 (48-50) bp: A: TE AP; B: VI PP - bps: A: AM.
- 09 2159 (56-62) bs: A: KS - bp: A: NU WN VL LG IK PE; B: LE ES HA MA DB PR CF HB SU GC AQ EB TA HR; C: NI - bps: A: SO; B: DO BE BA.
- 11 0851 (48-60) bp: B: HO PP; C: MT KA SS KY - bps: A: AP AM.
- 11 2037 (30-42) bp: A: NU; B: LZ LE ES WN VL MA AQ IK EB CI TL TA LM; C: PR CF GC - bps: A: SO DO; B: BE; C: NI HB.
- 14 1608 (57-13) b: A: NU SU; B: WN - bp: A: PE; B: MA PR HB IK EB QU; C: NI - bps: B: BE.
- 14 1901 (58-04) b: B: PE - bs: A: NU; B: BE - bp: B: WN VL MA IK EB TL KG-bps: A: SO QU; B: PR; C: NI.
- 14 2234 (25-37) b: A: NU; B: SU; C: NI - bs: A: SF LU; C: BE - bp: B: WN PR CF IK EB SZ; C: HB GC - bps: A: SO MA; B: VL TL PE - (si: A: LG; B: AE BA).
- 15 2316 (13-22) b: A: SF MB; B: SZ - bs: A: BA LU - bp: A: SU; B: MA EB TL PE LM HR - bps: A: LG; B: CF TA.
- 16 1731 (23-34) bp: A: FU; B: WN VL MA PR IK KG; C: PP - bps: B: SO - (ssc: C: LM).
- 17 2259 (54-66) b: A: FU CF PE; B: DO BA; C: SZ - bs: B: TA LU - bp: A: LG IK SF; B: SU EB TL KG; C: GC - bps: A: SO.
- 23 2206 (56-15) b: A: SF - bp: A: NU FU SU IK CI PE AE; B: LE ES WN NI VL BE MA PR CF HB GC AQ EB TL BA LU LM; C: HR - bps: A: SO AP; B: SZ TA.

TABLE 2 BAYS AND PULSATIONS 1972 - continued

## (SEPTEMBER)

|         |   |
|---------|---|
| 24 1539 | (35-48) b: B; WN - bp: A; IK AE; B: NI MA PR HB QU; C: SS.  |
| 24 2007 | (55-12) bp: A; PE; B: NI PR HB IK EB QU KG; C: TL - bps: B: SO.   |
| 24 2211 | (08-15) b: A; SF - bs: B: BA - bp: A: CF CI PE; B: SO MA IK EB TL TA LU - bps: B: SZ.                             |
| 25 2300 | (53-01) bp: A: PE SF; B: SO NU MA LG AQ IK EB CI; C: WI PR CFGC LM - bps: A: SU AE; B: DO VL TA BA LU - (si: BE). |
| 27 0511 | (09-12) b: B; HU - bp: A: TE AC; B: VI PP.  |
| 28 2030 | (27-37) b: B; WN - bp: A: FU; B: VL MA PR EB TL; C: NI BE HB.   |
| 29 1931 | (23-42) b: A; SF - bp: A: IK EB TL PE; B: WN MA HB - bps: B: VL CF - (si: A: LG).                                 |

OCTOBER

|         |  |
|---------|--|
| 02 2229 | (23-35) bp: A: LG PE SF; B: SO VL MA FU CF AQ IK EB CI TL TA MB LM; C: BE - bps: B: DO SZ BA LU.   |
| 05 1933 | (30-42) bp: A: NU; B: SO MA AQ IK PE QU LM; C: BE EB - bps: B: SU.   |
| 06 2033 | (30-35) bp: A: NU PE SF; B: SO WI VL MA SU IK QU LM; C: CF - bps: A: KS; B: LU; C: SZ - (si: C: BA).   |
| 09 1851 | (50-55) bs: A: NU - bp: A: SO FU IK PE SF QU; B: WN WI VL MA PR EB; C: TL - bps: B: LM; C: GC BA.  |
| 10 0936 | (35-38) bp: B: PP; C: HO - bps: B: VI AM - (ssc: B: CO).   |
| 11 0237 | (34-41) b: A: TE SJ - bp: A: TW; B: EB MB - bps: A: HU AC.   |
| 12 1551 | (45-62) b: A: SU SF - bp: A: PE; B: EB TL QU; C: MT KA KY.   |
| 12 1831 | (22-40) b: A: SU SF - bp: A: SO WN PE; B: NI PR HB MT EB KA KY - bps: A: QU.   |
| 15 1825 | (20-27) bs: A: NU KS - bp: A: SO; B: WN VL BE MA QU SU AQ IK PE LM; C: EB - bps: B: QU.  |
| 18 0905 | (02-08) b: C: NE - bp: A: HO AP AM; B: PP; C: MT KA KY.  |
| 19 1656 | (52-58) b: C: SS - bp: B: IK QU; C: MT KA KY.  |
| 20 175. | (46-68) b: A: CF - bp: A: SO FU SU CI PE TA; B: LE WN VL NI PR HB IK EB TL KG; C: GC - bps: B: BE DB - (si: B: BA).  |
| 21 0809 | (07-11) bp: B: PP; C: MT KA KY - bps: A: AP; B: HO.  |
| 21 1729 | (27-42) b: A: SU SF - bs: A: SO KS - bp: A: MA AQ CI PE; B: LE VL EB TL KG - bps: A: WN FU CF HB IK LU LM; B: DO NI BE DB PR GC TA.                        |
| 23 0151 | (39-64) b: A: LG SF; B: WN PR CF MB; C: TL - bp: B: BE MA HB EB TA.  |
| 24 1704 | (02-10) b: B: IK - bs: A: SO - bp: B: BE QU KG; C: MT KA KY - bps: B: GN.  |
| 24 2129 | (27-30) bs: A: SO; B: BA - bp: A: SF; B: VL MA CF TL PE MB LM - bps: A: LG; B: EB TA.  |
| 26 2357 | (46-60) b: A: SU - bs: A: KS bp: A: IK EB PE AE SZ TA; B: WN HA MA PR GC TL QU LU LM; C: HR - bps: A: SO FU CF LG CI SF; B: DO LE ES WI NI VL BE DB HB AQ. |
| 28 2232 | (28-39) bp: B: ES VL BE MA DB CF EB SZ TA LU LM; C: TL - bps: A: SF; B: BA.  |
| 29 2359 | (51-64) b: A: SU - bp: A: IK AE SF; B: WN VL MA DB PR EB QU SZ MB HR; C: HB GC - bps: A: SO FU CF; B: BE TA LU KG; C: NI - (si: B: BA).                    |
| 30 0441 | (39-45) b: A: FR SJ MB HU - bp: A: EB SF TE AC TW; B: TL.  |
| 30 1223 | (20-34) bp: B: MA KG - bps: A: HO AP; B: KY PP; C: MT KA - (si: A: SS; B: QU).   |
| 30 2339 | (33-46) bp: A: AE SF; B: MA CF IK EB AE QU SZ TA - bps: B: BA.   |

TABLE 2 BAYS AND PULSATIONS 1972 - continued

NOVEMBER

- 04 2322 (13-32) b: A: SU CI PE AE SF; B: CF SZ BA; C: TN - bs: A: LG; B: SO - bp: B: LE ES WI BE HA MA FU IK EB TL TA QU LU; C: NI PR GC LM - bps: B: DB
- 06 0202 (39-48) b: A: SJ; B: MB HU - bp: A: TW; B: SZ AC; C: EB - bps: B: FR.
- 06 2021 (18-22) bs: A: NU - bp: B: LE ES WN WI VL MA FU AQ IK PE QU LM; C: PR GC EB TL - bps: A: SO; B: DO BE.
- 07 0909 (08-11) bp: A: AP; B: VI MT KA KY DU; C: NE - bps: A: AM.
- 07 2009 (07-10) bp: B: WN MA QU HO LM; C: PR EB - bps: A: SO - (si: BE).
- 08 2253 (44-59) bs: A: KS - bp: A: NU MA IK CI PE SF; B: LE ES HA AQ EB TL TA HR KG; C: WN PR - bps: A: SO FU LG; B: DO WI VL CF BA LU LM; C: NI BE HB GC.
- 09 2013 (00-30) bp: A: NU FU PE SF; B: LE WN WI VL MA PR IK EB CI TL QU LM; C: GC - bps: A: SO; B: DO; C: NI BE HB.
- 10 2324 (22-26) bp: B: VL MA LG EB PE QU; C: CF IK TL TN.
- 11 1854 (42-62) bp: A: NU SU QU; B: WN WI VL BE MA PR FU IK CI LM KG; C: HB GC EB - bps: A: SO; C: NI.
- 14 2302 (53-07) b: A: SU SF - bs: A: KS - bp: A: NU IK CI PE TA; B: LE ES WN WI MA PR CF AQ EB TL AE QU TN LM; C: HB GC - bps: A: SO FU LG SZ; B: DO VL BA LU; C: NI BE.
- 15 2256 (47-67) bp: A: CF EB SZ LM; B: MA IK CI TL - bps: B: TA - (si: B: BA).
- 16 2242 (32-45) b: A: SF - bs: A: KS - bp: A: EB CI TA; B: MA QU HR KG; C: GC - bps: A: SO VL PR FU CF LG IK PE AE SZ BA LU LM; B: WN HB AQ TL.
- 17 2009 (02-11) bs: A: LG AE KS - bp: A: AQ IK CI TA; B: WN PR CF HB TL - bps: A: SO PE SF SZ; B: VL EB BA LU LM.
- 20 0125 (18-32) bp: A: FU CF CI TA SJ AC TW; B: WN VL PR HB TL HU - bps: A: SZ; B: FR.
- 20 0906 (05-09) b: B: FR - bp: B: MT KA KY - bps: A: HO AP AM; B: PP - (si: B: SI).
- 20 1819 (18-20) bp: B: WN VL MA AQ IK EB KY; C: MT KA - bps: A: SO QU; C: GC.
- 22 1447 (33-69) b: A: EB; B: WN - bp: A: SO SU IK; B: HB MT KA SS KY; C: TL - bps: QU.
- 25 1958 (56-59) bs: A: SO - bp: B: WN MA IK PE QU KG; C: PR EB - bps: B: VL BE.
- 27 2145 (41-49) bs: C: BA - bp: A: VL MA IK PE QU; C: TL - bps: A: SO SF; B: EB.
- 28 1502 (58-04) bp: B: MT PE KA KY - bps: A: SO; B: QU - (si: C: BA LM).
- 30 2020 (16-30) bs: A: SF - bp: B: VL MA IK EB TA; C: TL - bps: A: SO PE; B: CF - (ssc: C: SZ - si: C: BA).

DECEMBER

- 01 0207 (06-12) b: A: SF; B: IK TL; C: WN BE - bp: A: CI; B: MA EB - bps: A: LU; B: SZ.
- 08 1924 (19-25) bs: A: NU - bp: B: WN VL MA IK EB PE LM; C: NI PR - bps: A: SO; B: BE QU.
- 12 2001 (00-03) bp: A: WN SU PE; B: VL MA PR IK QU; C: HB EB - bps: A: DO NU FU; B: WI BE; C: NI GC - (ssc: A: SO; B: LG LM KG; C: TL? - si: C: HO).
- 13 1717 (06-29) bp: A: LM; B: MA; C: KY - bps: A: IK QU; B: WN VL PR HB TL - (ssc: A: TI?).
- 15 2048 (42-70) b: A: MB - bp: A: FU PE; B: WN HA MA DB PR IK EB KG - bps: B: VL - (si: B: QU).
- 15 2124 (22-31) b: A: SU SF TI - bs: A: KS TA - bp: A: MA AQ EB HR - bps: A: WN VL DB PR HB IK TL PE QU LM; C: GC - (ssc: B: SZ - si: A: CF LG).
- 16 1823 (12-29) b: A: SU; C: HR - bs: B: CF - bp: A: IK TA; B: MA LM KG - bps: A: PE SF QU - (si: B: TI SZ).

TABLE 2 BAYS AND PULSATIONS 1972 - continued

(DECEMBER)

|         |  |
|---------|--|
| 16 2213 | (08-15) bp: A: NU SU PE; B: DO WN VL MA PR HB EB TL SF TI - bps: A: SO FU; B: NI IK QU.  |
| 17 1002 | (00-08) b: C: SS - bp: A: AP; B: MT KA KY PP.  |
| 18 2029 | (27-34) bs: A: SO - bp: A: NU; B: LE WI VL IK PE; C: WN EB TL - bps: B: DO.  |
| 19 1630 | ( 30 ) bp: B: IK QU GN; C: MT KA KY.   |
| 19 2157 | (45-66) b: A: AE; B: SU TI - bp: A: CI PE SF; B: VL MA IK EB TL QU SZ MB; C: CF LM HR - bps: A: TA LU; B: SO LG.                           |
| 23 0140 | (39-50) bp: A: SO CF TL TA; B: WN MA EB - bps: A: IK SF LU; B: VL HB.  |
| 23 1855 | (47-70) bs: A: SF - bp: A: SO MA FU AQ EB TI TA LM HR; B: HA GC KG - bps: A: WN DB PR CF HB IK TL PE QU LU; B: NI VL - (si: A: LG; C: SZ). |
| 24 0107 | (06-10) bp: B: WN MA; C: CF TL - bps: A: AC; B: VL MB; C: EB FR - (si: A: AE SF LU; B: SZ TA).   |
| 25 2202 | (00-03) bp: A: NU SU PE; B: WI VL MA IK TI; C: WN EB - bps: B: SO DO QU; C: NI BE.   |
| 30 2017 | (08-25) b: A: PE AE SF - bs: A: TI; B: BE - bp: A: FU; B: WN VL MA PR HB IK EB TL LM HR KG - bps: B: NI - (si: A: TA).                     |
| 31 2247 | (37-52) b: A: PE SF; B: WN MB - bs: A: CF AE - bp: A: IK CI; B: VL MA EB TA QU SZ HR; C: PR - bps: A: SO LG TL; C: NI BE.                  |

TABLE 3 SUDDEN IMPULSES (si) 1972

Times of commencement of sudden magnetic changes or impulses (si) which could not be classified as ssc, bp, etc.

JANUARY

18 0818 (15-20) B: ES WN WI VL BE AV SZ; C: CF EB - (ssc: A: LG).

FEBRUARY

01 1010 (08-15) A: TA TE; B: LE ES WN VL BE KV FU TK KS LM HR TW; C: GC EB SS TN - (ssc: A: TR MG; B: SO MA UB LG BI PM AP PP AC AM; C: LG - bs: B: HU).  
 02 0819 (15-23) A: SU; B: FU OD AV? TA BI PP - (ssc: A: SF; B: SZ MB LM - b: A: AE - sfe: HL EB).  
 02 1735 (32-50) A: ME FU OD LG AC; B: KN LE ES WN VL SU IK QU TE PP LM; C: NI PR GC MT TK EB TL? KA KY - (ssc: B: LU; C: MG).  
 10 1828 (27-30) A: TE AM; B: KN PP LM; C: MT KA KY.  
 10 1929 (28-31) B: QU LU PP; C: MT KA KY.  
 21 1457 (51-65) A: HU TW; B: MA FU SU KS AV? TA - (b: B: HL PE; C: KV TK - bs: B: BI AC; C: TF - sfe: CF CI SZ).

MARCH

07 0855 (40-67) A: FU OD TE; B: DB OT PP; C: SZ - (ssc: B: MA LG; C: CF - bps: B: AC).  
 07 2212 (08-22) A: MG KN LG TW; B: ME TE PM; C: MT KA SS KY - (ssc: A: SF BA TN; B: QU PP LM).  
 08 1516 (13-18) A: VL FU CI LU AC; B: ME WN BE PR EB PE BA; C: CF GC TL - (ssc: A: SJ; C: QU PP LM - bp: A: SO - bps: A: MG).  
 27 1805 (00-08) A: FU OD IK KS TE LU AC; B: KN VL AQ EB CI SM QU TA BA PP TN; C: TK TL KY - (ssc: A: LG PE; B: VL KV CF TF SZ DU; C: WN HB? - bp: B: MA).

APRIL

04 0253 (51-56) A: TA; B: MG HL BE SU IK BA PP; C: TL - (ssc: A: SF; B: LM; C: SM - bp: B: MA).  
 18 0630 (27-40) A: SO KN TE LU AC; B: HL WN WI VL FU SU PP; C: GC EB HO - (ssc: A: BA LU LM; B: MA AE QU; C: TA).  
 20 2207 (02-11) A: KS TE; B: OD QU PP? AC; C: EB TL - (ssc: A: LG SF; B: AV - bs: HL - bp: A: BA; B: MA - bps: A: PE).  
 29 0421 (08-26) A: DO KN FU LG PE QU TE LU AC; B: LE ES HL VL BE DB PR TK EB TL AE TA? BA PP; C: NI HA CF GC - (ssc: B: WN WI MA HB IK AV LM; C: SZ).

MAY

01 0615 (12-18) A: KN TK QU TE LM; B: ES WN VL MT SM KA KY BA PP AM; C: CF SS - (ssc: HL).  
 06 1050 (44-57) A: KN SU LG; B: WN BE HB QU; C: MG VL PR TK BA - (sfe: HL OD EB TL?).  
 15 2025 (20-29) A: OD EB PE QU TE GU; B: TL HO.  
 17 0227 (24-30) A: TE; B: FU SU AE KA SS KY QU SZ BA; C: UB MT TL? - (ssc: A: LG; B: QU LU PP - bs: A: KS - bp: B: SM).  
 18 0252 (44-54) A: KN TE; B: HL WN BE PR FU PP?  
 28 2006 (03-10) A: KN IK PE; B: VL QU PP; C: TL - (b: B: TK).

JUNE

01 1427 (26-30) b: SU SZ; C: UB BA AC - (ssc: A: SJ; C: IK - bp: B: SM).



TABLE 3 SUDDEN IMPULSES (si) 1972 - continued

(JUNE)

- 02 1347 (44-50) B: BE FU? UB OD MT TK KA QU TA; C: GC EB SS KY LM - (ssc: A: BA: B: MA KS SJ PP - bp: A: PE AP; B: SU - bps: B: KV - sfe: NI SZ?).
- 03 1242 (38-50) A: KN MA FU HB OD AE KS TA TE SJ BA AC; B: HL MT TK EB KA KY PP LM; C: WI CF - (ssc: A: SU LG SF; B: MO ME PE QU SZ; C: TL - bs: B: MG).
- 04 0124 (17-30) A: KN MA LG AE KS TA BA AM; B: HL BE FU HB OD PP; C: TK KG - (ssc: B: MO - bp: B: SM; C: WN).
- 18 0752 (48-54) A: TE; B: MT KA KY SZ; C: SS.

JULY

- 03 1406 (00-09) A: SU PE; B: BE FU IK KS QU; C: SZ - (bp: B: MA; C: KV - bps: B: OD).
- 22 1905 (54-11) A: QU TE; B: VL UB OD TL?; C: CF MT KA KY BA LM - (ssc: A: SF - bps: B: MG).
- 24 2209 (08-12) A: QU; B: OD BA PP; C: TL SS - (ssc: B: GU DU; C: AP).
- 31 2222 (20-26) A: TE; B: VL BE OD QU BA PP LM DU; C: TL.

AUGUST

- 05 1400 (59-01) A: SI OD SS; B: HU - (ssc: B: MT KA KY).
- 06 1756 (51-66) A: NU KN WN? FU CF OD LG TE; B: BA - (ssc: A: MA SZ - bs: A: MO LU; C: TA - bp: A: EB - bps: A: TL LM).
- 27 0502 (00-03) A: KN MO FU HO TE GU BA LU AC TW; B: WN HA AQ IK EB PE SZ TA HU PP; C: NI PR CF HB GC SS AP - (ssc: A: SO LM; B: WI IR MA TL PM GN TO; C: MT KA KY).

SEPTEMBER

- 10 1134 (27-38) A: PR FU QU TE; B: WN VL BE HB BA PP; C: CF MT KA SS KY - (ssc: A: SF; B: WI SZ TA; C: TL? - bs: B: SO).
- 10 1221 (19-22) A: QU TE AC; B: SS PP; C: MT KA KY - (ssc: C: BE).
- 10 1511 (10-14) A: VL PR FU SF QU AC; B: LE ES WN WI HB SZ PP; C: MT KA SS KY - (ssc: B: SU).
- 10 1656 (52-57) A: LG; B: LE ES WN PR FU EB BA HU; C: MT KA SS KY HO - (si: A: SF; B: WI VL IK KS QU AC; C: GC PP LM - bs: B: SO).
- 10 2034 (30-40) A: TE; B: QU PP DU; C: CF MT KA KY - (bps: A: DO).
- 13 1851 (49-52) A: SS QU; B: PE HO PP.

OCTOBER

- 07 1931 (24-40) A: SF TE; B: MT KA KY QU PP; C: BA LM - (ssc: C: SZ - bp: B: MA).
- 14 0745 (36-50) A: VL FU LG; B: ES WN NI BE PR HB PE? AE; C: EB BA - (ssc: B: MA SU IK - bp: B: MT KA KY - sfe: TL?).
- 31 1952 (46-55) A: QU TE PM; B: SS; C: SZ - (ssc: B: CF).

NOVEMBER

- 02 0053 (51-57) A: TE GU AC AM; B: HU PP; C: SS - (bs: A: SO).

DECEMBER

- 07 1747 (38-50) A: LG TI QU TE AC; B: ES WN BE EB MB; C: LE HA HB MT KA SS KY SZ - (ssc: A: HU; B: TA LM; C: HO - bs: A: KS - bp: B: MA FU; C: TL - bps: B: VL).
- 12 2352 (46-58) A: TE; B: QU PM HU PP; C: TL SS - (ssc: A: SF TA; B: LM - bp: B: MA - bps: A: LU; C: NI PR).
- 30 0918 (12-22) b: BE SU; C: EB TI - (ssc: B: QU - bp: A: TE; B: VI PP).

TABLE 4 GIANT PULSATIONS (pg) 1972

Times of commencement and ending of giant pulsations (pg) checked by 55 observatories, namely, CO DO NU LE SI KN ES WN WI NI VL GT HA KV MA BU NE FU UB HB OD GC RT MT LG AQ TK IK EB CI BD TL FR PE SM KA SS DS TU KY QU LP HO TE SJ HD MU GU PA HU PP GN HR TO KG. Period in minutes and amplitude in  $\gamma$ 's, as reported by some stations, are added in parentheses, e.g., (7.2 - 5) means: period 7.2 min., amplitude 5 $\gamma$ . For SS the amplitude is given in  $\gamma$ /sec. Beginning or ending times of the reported phenomenon are given in square-brackets if clearly deviating from the times at the left.

JANUARY

22 0245 A: KN(-41) KV(9-18) FU UB(4-16.4) OD(15-24) LG AQ(6-14) LP(4.3-11) PP  
-0305 (10-) HR(-23) AM [0252-] ; B: NU(-4) WN(8-35) BU(9.7-21.6) GC(9-28) RT  
FR(11-26) SS [-....] (4.2-0.20  $\gamma$ /s) DS(12-25) SJ(11-15) HD(4-8) MU KG(3.3  
-35); C: CO(10-35) DO SI GT HA NE TK BD SM TU HO GU(11-25); D: ES  
WI MA HB MT IK EB CI KA KY PA HU TO; E: QU GN -X; PE -(si: A: LE?  
WN VL TE; C: TL? - pc4: TE - pc5: C: NI [0003-05..]).

FEBRUARY

13 1620 A: RT(1.8-); B: CO(4-55) SI(4-15) NE(3-24) BD(3-3) FR(4-10) SM MU KG (2  
-1640 -3); C: NI GT KV(4-3) BU(3.3-2.4) DS(4-5) TU HO SJ GU HU; D: DO NU LE  
ES WI VL HA MA FU OD GC MT LG AQ TK IK EB CI PE KA SS KY HD  
PA HR TO; E: QU - (pi2: B: LP(1.5-0.7) - bp: B: UB - pc: C: KN TL - pc4:B:  
NI [1448-21..] TE GN [1520-1655] (2-1) - pc5: B: HB; C: WN?).

MARCH

07 0340 A: KN(-80) NI KV(6-27) FU [-0500] UB(3-41) OD(8-21) RT(4.2-) LG TL (6-  
-0547 15) HD [-0435] (6-14) GN(5-32); B: CO(6-80) DO SI(4-60) ES [-0445] VL [0342-  
0435] (5.3-15) [0435-0547] (2.2-6) GT [0420-0430] MA NE(5-54) BD(6-35) FR  
(7-50) DS(6-45) TU(5-43) HO(6-30) TE SJ(10-20) GU(5-50) HR [-0432] KG  
(1.7-75); C: GC MT(5-41) CI KA(5-38) KY(5-41); D: WI; E: NU BU HB AQ TK  
IK PE SM SS QU MU HU TO; X: PA - (pi2: A: TL - pc4: A: NI [0000-0530] ;  
C: LP(1-0.2) - pc5: A: WN(5.5-32) PP [-0500] (5.8); B: LE(3-18) HA(3.3-) EB).

APRIL

none

MAY

06 0930 A: FU [1045-1100] PE [1050-1102] (5-2) MU; B: KV(5-2) BU(6-14.5) LG KG  
-1240 (2.8-5); C: CO NI GC RT SM SJ; D: DO SI WI VL GT MA NE MT AQ TK IK  
CI BD KA SS TU KY HO GU PA HU HR TO; E: GN; X: HB - (pi2: B: NU-pc:  
A: UB [0810-1050] (2.2-2.8); B: KN(-6) OD TL; C: QU LP HD(3-<1) - pc3; B:  
ES [1030-1050] (0.7-4) NI; C: LE(0.6-2) HA [0920-1150] (0.7-2) - pc4: B: WN  
EB [-1050] TE PP(-1); C: FR DS).

17 0557 A: NU(-23) KV(6-6) FU UB(5-15-8) AQ(4-6); B: DO LE(-18) KN(-15) ES(1.1-  
-0613 16) WI(4-24) NI VL(3.3-10) GT BU(4.8-7.8) OD(9-8) GC(4-14) RT(3.7-) IK  
(4-8) CI QU(5-7) LP(4.3-5.6) MU GN(5-8) HR(6-3) KG(1.7-7); C: SI HA MA  
NE MT(5-12) BD(4-2) FR(4-) PE SM KA(5-8) SS(5-0.15  $\gamma$ /s) DS TU KY(5-8)  
HO SJ GU(4-3) HU; D: CO TK TL TE PA TO; X: LG - (pi2: B: NI HB - si: B:  
WN(3.3-20) - pc: B: BD(4-3) - pc4: C: PP(1.7-) - pc5: EB?).

JUNE

18 2239 A: FU [-2645] UB(2.2-6) OD [-2640] (15-12) RT [-2540] (0.8-) LG AM; B: CO  
-.... (3-35) KV [-2500] (9.2-24) BU [-2325] (8.3-21.9) NE(5-58) BD(8-15) TL(15-  
13) FR(9-30) HR [-2340] ; C: SI WN [-2640] (15-28) GC CI SM DS(15-25) TU  
HO SJ MU GU(3-4); D: DO LE ES WI VL GT HA MA MT EB KA KY TE PA  
KG; E: NU KN AQ TK IK PE QU LP HU; X: PP - (pi1+pi2: B: SS[2228-2500]  
(1-0.26  $\gamma$ /s) - pc: B: TO [-3005] (2-2); C: HD [-2700] (6-2) - pc4: C: GN[-3400]  
- pc5: B: NI -2640 HB[-2642]).

TABLE 4 GIANT PULSATIONS (pg) 1972 - continued

JULY

- 03 0530 A: UB [-0648] (7.5-6) RT [-0710] (0.9-) AM; B: CO(7-30) HD [-0650](8-2); C: DO LE SI(7-5) WN NI [-07..] KV [-0700] (3-2) MA GC LG TK CI BD TL? (5-4) TU QU [-0710] LP(3.1-1.4) HO MU GU HU HR; D: NU ES WI VL GT HA MT AQ PE SM KA KY TE SJ PA TO KG; E: IK GN; X: NE - (pi2: B: TL DS [-0641]; C: FR? - pc: C: KN BU(1-1.2) OD - pc4: FU [0410-0730] FR[0500-]; C: NI[0405-0648] HB [-0650] SS [-0730](3-0.09Y/s) - pc5: EB? [0420-0700]).
- 25 0438 A: UB [-531] (2.2-3.5) RT [-1440] (1.2-) AM; B: CO KV [-0600](6-4) OD[0500-0520] (7-30) LG BD(1-15) GU(1-5) HU; C: LE NI [-0730] TK TU HO SJ MU; D: DO NU KN ES WI VL GT HA MA GC MT AQ EB CI PE KA KY PA HR TO KG; E: BU IK; X: SI NE SM QU - (pi1: A: LP(0.5-2.1) - pi2: A: FR; B: WN DS PP - pc: B: TL; C: HD [-0700] (8-2) - pc4: B: TE; C: NI[0500-0730] GN [-0520] - pc5: C: HB [-0642] - pc3+pc4: FU [0438-0710]).

AUGUST

- 04 2330 A: CO(4-) SI(5-200) KN NI MA OD [-05 1330] (5-30) RT(3-) BD(4-70) TL(3-40) TU(4-98) HD [-05 1600] (4-60) GU(4-50) GN(5-) HR [-05 1530] (1 to 10-50); B: ES HO(4-45) SJ(4-); C: UB(3-89); D: LE EB; E: DO NU WN WI VL GT HA KV BU NE FU GC MT LQ AQ TK IK CI FR PE SM KA SS DS KY QU LP TE MU PA HU PP TO KG; X: HB - (pc: A: HD - pc4: A: NI[2055-34..]).
- 06 0050 A: NI OD [0040-1450] (4-20) RT(2.5-) LG; B: CO(3-) SI(2-50) UB(1.5-45) BD (2-10) FR(3-10) HO(2-5) GU(2-10); C: GC MT(5-15) TL?(5-3) SM KA(5-13) DS(2-) TU KY(5-13) HR [0059-]; D: ES WI VL HA MA EB PA; D: DO NU LE KN WN GT KV BU NE FU AQ TK IK CI PE SS QU LP TE MU HU PP GN TO KG; X: HB - (pi2: C: TL - pc: A: HD [05 2344-0200] (4-10) - pc4: A: NI[0000-13..]); C: SJ.
- 14 0425 A: NU(1.5-8) KG(2.8-12); C: CO DO SI WN [-0510] NI NE RT MU; D: WI VL GT HA KV MA BU NE FU HB GC MT LG AQ TK IK EB CI BD FR PE SM KA SS DS TU KY QU HO SJ HD GU PA HU GN HR TO; E: TE - (pi2: B: KN - pc: B: OD; C: UB(1.5-0.8) TL LP - pc5: B: LE(3-4) ES [0455] (3-3)).

SEPTEMBER

- 21 1200 A: CO(1.5-10); B: MA(-3) MU; C: NI KV(5-2) RT LG TO KG(2.8-1) D: DO NU LE SI KN ES WI VL GT HA BU NE FU HB OD GC MT AQ TK IK EB CI BD TL FR PE KA DS TU KY QU HO SJ HD GU PA HU GN HR; E: TE; X: SM SS - (pc: A: UB [1224-1348] (2.7-1.3); C: LP; pc4: B; PP[0831-1425] (1.2-) - pc5: C: WN).

OCTOBER

- 09 1655 B: CO(8-35) SI(9-20) KV(25-5) MA NE(6-9); C: NI RT LG(7-5) PE SS [1616-1712] (2-0.09Y/s) DS TU SJ HD MU TO; D: DO NU LE ES WN WI VL GT HA BU FU UB HB OD GC MT AQ TK IK EB CI KA KY LP HO GU PA HU GN HR KG; X: SM - (pi2: B: QU [1455-1822] - pc: A: UB; B: TL; C: KN - pc4: A: FR; B: TE; C: NI [1501-17..]).
- 12 0450 A: CO(3-10) RT(1.2-); B: KV [0650-] (11.7-2); C: SI BD SJ HR; D: DO NU LE ES WN WI NI VL GT HA MA BU NE FU GC MT LG AQ TK IK EB CI TL FR KA SS DS TU KY QU LP HO MU GUPA HU GN TO KG; E: TE; X: HB SM - (pi2: C: PE [0643] (3-2) - pc: B: UB(1.2-1) OD; C: KN HD [0710-0732] (6-2) - pc4: C: NI [0714-18..] - pc5: C: PP [0410-0450] (6.7-)).
- 31 14.. A: RT [1430-2155] (1.2-); B: CO(3-) LE [2010-2020] (3.3-6) SI(1-70) NI BU NE (2-12) OD [1655-2530] (5-10) DB FR DS HO(2-5) SJ(2-) GU; C: HA MT [1850-2100] (5-15) KA [1850-2100] (5-13) TU KY [1850-2100] (5-13) MU HR [1656-2100] KG(2-3); D: DO NU ES WN WI VL GT MA FU GC LG TK LG CI PA; E: KV HB AQ QU LP HD HU GN TO; X: PE SM SS PP - (pi2: B: TL - pc: B: UB 1400-1654 (2-3) TL; C: KN 1406-2136 - pc4: A: NI 1656 ;B: TE - pc3+pc4: EB).

NOVEMBER

none

DECEMBER

none

TABLE 5a SOLAR-FLARE EFFECTS (sfe) 1972

Times of commencement of solar-flare effects (sfe) checked by 65 observatories, namely, CO DO NU LE SI KN MO ES WN WI NI VL BE GT CM HA KV MA PR VI NE FU UB HB OD OT SU GC RT MT LG AQ TK IK EB CI BD TL FR PE SM AE KA SS DS TU KY QU SZ LP HO TE SJ HD MU GU PA PM HU PP GN HR TO KG ML. Stations from which the monthly reports have been used, although their check-lists were not received, are the following ones: HL CF TF KS TA MB BA TN LM AC. Strong effects are marked by an asterisk.

## JANUARY

14 1528 A: LG HU; B: OT SZ SJ HR; C: CI BD FR SM AE DS; D: ES WN WI NI VL GT HA MA PR FU RT AQ EB TL TU TE PA KG; E: {PP}.

## FEBRUARY

13 0829 A: HR; B: KV SU TK IK HD MU; C: KN NI BE GT HA HB OD GC LG SZ LP; D: DO NU MO WN WI VL MA PR FU AQ EB CI TL AE KY GN TO KG MI; E: LE ES UB PE (PP); X: QU.

22 0031 A: SS LP MU PP TO; B: SI MT KA TU KY HO GU GN; C: CO VI UB; D: NE TE PM; E: (BE); X: ML.

22 1320 A: CM LG; B: WN VL GT KV GC SZ HU HR; C: ES NI HA MA HB OD SU RT IK PE; D: DO NU LE KN MO WI PR FU OT EB CI TL FR SM AE DS TE SJ PA KG; E: BE; X: QU.

## MARCH

05 0814\* A: DO NU KN MO GT CM KV FU UB OD SU LG AQ TK IK EB PE QU SZ HD HR; B: LE ES WN WI NI VL BE MA PR HB GC CI TL SM AE [KS] LP GU [BA] (HU) GN; C: HA MT KA SS KY TO; D: RT MU KG; E: (CO) - (si: A: MU ).

06 1116 A: CM LG EB SZ; B: WN GT KV TK TL; C: KN ES NI BE HA MA OD RT IK CI PE AE QU SJ HU HR; D: DO NU LE MO WI VL FU SU GC AQ HD PA KG; E: (CO) (MI) - (si: A: [TA] - b: B: SM).

## APRIL

14 1959 B: BD FR DS TU HO; C: SI VI NE TE SJ PP; D: OT MT SM PA HU; E: CO {WN; (BE); X: SZ.

## MAY

24 0700 A: KV UB OD TK LP HD MU HR; B: {CO} WN MA IK SS QU GU; C: NI BE SU GC AQ EB CI PE SM; D: DO NU LE KN MO ES VL HA PR FU HB RT MT LG TL AE KA KY PM TO KG; X: WI GT SZ - (b: C: GN).

## JUNE

12 1325\* A: NU WN WI CM MA FU {UB} OD OT SU RT LG AQ IK EB CI DS TU SZ HU HR; B: CO DO KN ES NI KV PR NE [CF] HB GC TL FR SJ (MU) PA [AC]; C: LE SI GT TK SM AE QU; D: MO PE TE; E: BE - (si: A: [KS][BA] - b: B: HA? VI; C: HD [LM] - bp: VL).

23 1726 A: HU; B: OT RT FR SZ HO; C: LE SI ES WN BE GT KV VI NE HB OD SM DS TU SJ; D: DO NU MO WI NI VL HA MA PR FU SU GC LG AQ IK EB TL PE AE TE PA; E: CO BD PP; X: CL.

24 0701 A: UB OD LP HD; B: KN KV HB IK SS QU SZ MU; C: SU MT TK KA KY GU PM; D: DO NU LE MO ES WN WI NI VL GT HA MA PR FU GC RT LG AQ EB TL FR PE SM AE (PP) GN HR KG; E: CO BE {NE} (PP); X: CL.

## JULY

none

TABLE 5a SOLAR-FLARE EFFECTS (sfe) 1972 - continued

AUGUST

- 02 1838 A: HU; B: OT BD FR DS TU HO SJ [AC]; C: SI TE PP; D: CO DO NU LE ES  
WN WI NI VL GT CM HA MA PR VI NE FU LG EB CI TL SM AE SZ PA;  
E: {BE}.
- 07 1513\* A: WI CM LG EB BD FR DS TU SZ PA HU HR; B: KN ES WN NE HB SU  
AQ IK CI SM SJ; C: LE NI VL HA KV MA PR VI OT GC RT TL PE; D: MO  
GT FU; E: CO DO SI BE (UB) AE (PP); X: NU - (bp: B: OD?; C: HD).
- 23 1911 A: TE HU; B: OT BD FR DS HO AC ; C: SI NE SM PP; D: CO DO LE ES  
VL CI SZ PA; X: SJ.

SEPTEMBER

- 22 1042 A: RT {MU}; B: NU KN KV UB LG TK QU SZ {LP} HD (SS); C: DO LE WN  
WI NI HB SU GC AQ EB CI SJ HR; D: ES VL SM PA KG; E: (CO) BE (PP);  
X: PE - (b: B: OD).

OCTOBER

- 25 1003 A: CM KV OD SU LG; B: NU KN WN WI NI MA FU HB (OT) IK EB AE QU  
HR; C: MO VL GC RT AQ TK CI PE SM SZ; D: DO LE ES GT HA PR UB  
TL HD GN KG; E: (CO) (SI) (BD) {MI}; X: BE - (bp: LP (PP)).
- 26 0314 A: PM; B: UB (OT) MU GU GN TO; C: MT TK KA SS KY QU LP HD; D: HO  
KG MI; E: (BE).
- 26 0647 A: CM KV UB OD SU TK IK QU LP HD MU PM; B: KN BE FU HB SS GU  
HR TO MI; C: NU NI GC MT AE KA KY KG; D: MO WN WI PR RT PE; E:  
(CO); X: LG - (si: B: GN).

NOVEMBER

none

DECEMBER

none

TABLE 5b DOUBTFUL SOLAR-FLARE EFFECTS (sfe) 1972

Times of commencement of presumed solar-flare effects checked by 65 observatories, the same as for Table 5a. Effects which very probably are real sfe's are indicated by an asterisk.

JANUARY

- 14 0630 B: QU HD HR; C: KV UB LP MU GN TO; D: KN MO HB OD SU GC MT AQ TK IK PE KA SS KY GU PM KG MI - E: {BE} (PP).  
 22 0539 B: (OT) SS PM TO; C: UB MT KA KY QU GU HR; D: OD TK IK KG MI; E: (CO) (SI) KN {WN} (DS) LP HD MU (HU) (PP) GN; X: PE.

FEBRUARY

- 16 1130 A: SZ; B: (SI) RT HR; C: WN BE KV HB OD EB CI SM; D: DO NU LE KN MO ES WN WI VL GT HA MA PR FU SU GC LG AQ TK IK TL PE AE QU SJ HD PA HU KG; E: (PP) (MI).  
 16 1355 B: RT SZ HU HR; C: ES NI HA KV OD SU LG CI; D: DO NU MO WN WI VL GT MA PR FU HB OT GC AQ IK EB BD TL FR PE SM AE DS TE SJ PA KG; E: LE BE (PP) (MI).  
 22 0322 A: MU; B: (OT) TK TO; C: UB MT KA SS KY QU LP HO HD GN; D: GU PM KG MI.

MARCH

- 02 1812\* A: VI OT FR DS TE HU; B: {[HL]} NE {[CF]} {[KS]} {[TF]} [MB] BD TU HO SJ {[BA]} PP [AC] (KG); C: SM SZ; E: CO SI {WN} (HD) (MU); X: BE PA.  
 05 1137 B: RT SM HU HR; C: WN KV HB OD LG TK IK SZ; D: DO NU LE KN MO ES WI NI VL GT HA MA PR FU SU GC AQ EB CI TL FR PE AE QU SJ HD PA; E: BE.  
 05 1231 B: KV RT LG SM SZ HU; C: WN NI HA MA OD SU EB PE AE SJ HR; D: DO NU LE KN MO ES WI VL GT PR FU HB OT GC AQ TK IK CI TL FR QU HD PA KG; E: BE.

APRIL

none

MAY

- 19 0937\* A: UB LG MU; B: LE KV OD TK QU SZ LP HD [TN]; C: KN WN NI MA SU PE SM SS HR; D: DO NU MO ES WI VL GT HA PR FU GC RT MT AQ IK EB CI TL AE KA KY GN KG; E: BE (PP); X: HB.  
 27 0139 A: UB; B: MU GU; C: SS LP TO; D: SI KN MO VI NE MT TK KA TU KY QU HO HD PM GN MI; E: CO {BE} .  
 28 1324\* A: RT EB AE HR; B: WI KV MA OT TL DS TU QU; C: WN VL BE HB LG TK PE SJ; D: NU MO GT HA VI NE PA; E: CO DO LE SI KN ES NI PR FU UB; SU GC AQ IK CI BD FR SM (SS) SZ TE {HD}; HU (PP) [LM] - (bps: B: OD).

JUNE

- 20 1917 A: HU; B: OT FR; C: SI BD DS SJ; D: DO NU LE ES WN WI VL HA MA VI NE MT LG EB CI TL TU SZ HO TE PA; E: CO {BE}; X: SM AE.

JULY

- 28 1322 A: RT HU; B: SZ [AC]; C: KN ES WN GT KV MA SU LG IK CI PE SJ; D: CO DO NU LE SI MO WI NI VL HA PR VI FU HB OD OT GC AQ TK EB BD TL FR SM AE DS TU QU TE PA HR; E: BE; X: NE.

AUGUST

- 07 0252 A: LP; B: GU PM; C: KV TK SS GN TO; D: NU MO VI NE UB OD MT KA KY

TABLE 5b DOUBTFUL SOLAR-FLARE EFFECTS (sfe) 1972 - continued

## (AUGUST)

- HO; E: CO {DO} {LE} SI KN {PR} (OT) {SU} {BD} (FR) (AE) (SZ) HD MU  
PP MI; X: QU.
- 07 1302\* A: CM VI OD SU TE (MU); B: KN ES VL HA KV MA FU HB RT LG SM QU  
(SS) SZ; C: NI GT NE GC TK CI PE SJ HU MI; D: MO WI PR OT EB TL TU  
PA HR; E: {CO} DO LE {SI} WN BE IK BD FR AE DS; X: NU - (si: C: HD  
- puls.: AQ).
- 11 1230\* A: RT; B: WN WI NI GT KV HB OT {UB} SZ HU; C: LE KN MA PR GC LG  
TK TL? PE SM DS TE SJ; D: MO ES VL HA FU SU EB CI BD PA HR; E:  
{CO} DO {SI} BE AQ IK FR AE HD (PP) (MI); X: NU - (bp: B: OD).

SEPTEMBER

none

OCTOBER

- 01 1648\* A: FR DS HU (LP); B: {KV} OT BD TU (HD) (KG); C: CO DO GT MA VI NE  
RT LG SJ PA; D: LE SI ES WI NI CM VL HA FU AQ CI TL SM AE SZ HO  
TE HR; E: {UB} {HB} PP - (b: B: (GN) - bp: C: {OD} - pi2: B: EB; C: WN).
- 25 1136\* A: CM; B: BE HA KV FU HB OD LG SZ; C: NI MA SU GC RT TK IK EB CI  
SM SJ HR KG; D: DO NU LE KN MO ES WN WI VL GT PR TL PE AE QU  
HB PA HU; E: (PP) (MI) - (si: AQ?).
- 26 1326\* A: RT; B: (SI) VL MA FU (UB) OT {BD}; C: DO NU LE KN ES WN WI GT  
HA KV HB LG EB CI FR SM AE DS SZ TE HU HR; D: MO NI PR OD SU  
GC AQ IK TL PE SJ PA KG; E: (CO) BE {HD} (PP).
- 31 0500 A: MU; B: KV SS QU LP; C: MT TK KA KY HD HR TO; D: GU PM GN KG  
MI; E: {BE} (MA) UB; X: PE.

NOVEMBER

none

DECEMBER

none



TABLE 5c SOLAR-FLARE EFFECT OF 1972, AUGUST 7, 1513 UT

One sfe is selected here for a more elaborate presentation, namely the case of 1972, August, 7, 1513 UT. In this page a list is given of amplitudes (in gamma's) and times of occurrence (UT) of the maximum effect in the horizontal component ( $\Delta H$ ) and in the magnetic east component ( $H \times \Delta D$ ). The observed effects are marked by A, B etc. according to the description in page x of the Introduction.

|    |   | $\Delta H_{\max}$ |           | $H \times \Delta D_{\max}$ |      |    |   | $\Delta H_{\max}$ |      | $H \times \Delta D_{\max}$ |      |
|----|---|-------------------|-----------|----------------------------|------|----|---|-------------------|------|----------------------------|------|
|    |   | $\gamma$          | UT        | $\gamma$                   | UT   |    |   | $\gamma$          | UT   | $\gamma$                   | UT   |
| CO | E |                   |           |                            |      | IK | B | 2                 | 1527 | 13                         | 1527 |
| DO | E |                   |           |                            |      | EB | A | 19                | 1528 | -15                        | 1528 |
| NU | B | 40                | 1532      | 0                          |      | CI | B | 18                | 1527 | -14                        | 1527 |
| LE | C | 20                | 1517      | 14                         | 1521 | BD | A | 70                | 1530 | 95                         | 1530 |
| SI | E |                   |           |                            |      | TL | C | 13                | 1530 |                            |      |
| KN | B | 15                | 1532      | 39                         | 1530 | FR | A | 95                | 1528 | 46                         | 1536 |
| MO | D |                   |           |                            |      | PE | C | 5                 | 1526 | 17                         | 1526 |
| ES | B | 0                 |           | 20                         | 1528 | SM | C | 52                |      | 49                         |      |
| WN | B | 43                | 1550      | -18                        | 1526 | AE | E |                   |      |                            |      |
| WI | A | 50                | 1548      | -20                        | 1528 | KA | D |                   |      |                            |      |
| NI | C | 30                |           | -7                         |      | SS | D |                   |      |                            |      |
| VL | C | 34                | 1555      | 28                         | 1527 | DS | A | 85                | 1528 | 50                         | 1528 |
| GT | D |                   |           |                            |      | TU | A | 75                | 1528 | 109                        | 1528 |
| CM | A |                   |           |                            |      | KY | D |                   |      |                            |      |
| HA | C |                   |           |                            |      | QU | C | 3                 | 1531 | 5                          | 1531 |
| KV | C |                   |           |                            |      | SZ | A | 6                 | 1528 | -33                        | 1528 |
| MA | C | 9                 | 1545      | 26                         |      | LP | D |                   |      |                            |      |
| PR | C | 31                | 1552      | 25                         |      | HO | D |                   |      |                            |      |
| VI | C | 2                 |           | 3                          |      | TE | D |                   |      |                            |      |
| NE | B | 48                |           | ~53                        |      | SJ | B | 15                | 1528 | 15                         | 1528 |
| FU | D |                   |           |                            |      | HD | C | 4                 | 1530 | 3                          | 1530 |
| UB | E | 2                 | 1517      | 3                          | 1513 | MU | C |                   |      |                            |      |
| HB | B |                   | 1513-1516 |                            |      | GU | D |                   |      |                            |      |
| OD | B | 2                 | 1516      | 5                          |      | PA | A | 9                 | 1528 | 38                         | 1536 |
| OT | C |                   | 1515      |                            |      | PM | D |                   |      |                            |      |
| SU | B | -2                | 1517      | 1                          |      | HU | A | 175               | 1529 | 25                         | 1529 |
| GC | C | 2                 | 1515      | 1                          | 1514 | PP | E |                   |      |                            |      |
| RT | C |                   |           |                            |      | GN | D |                   |      |                            |      |
| MT | D |                   |           |                            |      | HR | A | -11               | 1528 | 13                         | 1528 |
| LG | A | 8                 | 1525      | 14                         | 1525 | TO | D |                   |      |                            |      |
| AQ |   | 10                | 1525      | 0                          |      | KG | D |                   |      |                            |      |
| TK | C |                   |           |                            |      | MI | D |                   |      |                            |      |

| Indices | 6  |    |    |    |    |    | 7  |    |    |    |    |    | 8  |    |    |    |    |    | 9  |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| UT      | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    |    |    |    |    |    |    |    |    |
| Kp      | 3o | 3- | 2- | 2- | 1- | 0+ | 2o | 7+ | 6+ | 6o | 5o | 5+ | 4+ | 3+ | 3- | 4- | 3+ | 2+ | 1o | 2o | 3- | 5- | 2o | 1- | 2o | 3- | 2- | 3+ | 3- | 3- | 2+ | 1+ |
| 3Kn     | 7  | 7  | 5  | 6  | 1  | 2  | 5  | 18 | 16 | 15 | 14 | 13 | 12 | 9  | 8  | 10 | 8  | 5  | 4  | 6  | 7  | 14 | 7  | 4  | 4  | 8  | 5  | 10 | 8  | 8  | 8  | 4  |
| 3Ks     | 8  | 6  | 3  | 4  | 1  | 0  | 4  | 18 | 16 | 16 | 13 | 13 | 11 | 9  | 6  | 8  | 9  | 5  | 4  | 6  | 6  | 11 | 5  | 2  | 5  | 10 | 5  | 6  | 7  | 7  | 5  | 3  |
| Dst     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

## Data from Individual Observatories:

March 1972

| Obs. | Geomag.<br>lat. | Commencement  |      | SC - amplitudes |       |       | Max. 3 hr - index K |    | Ranges |      |      | UT End<br>day hr |
|------|-----------------|---------------|------|-----------------|-------|-------|---------------------|----|--------|------|------|------------------|
|      |                 | day h.m. (UT) | type | D(°)            | H(°)  | Z(°)  | day (3 hr - period) | K  | D(°)   | H(°) | Z(°) |                  |
| PB   | 68.5N           | 06 2108       | SC*  | -70             | +278  | +63   | 07(1)               | 6  | 275    | 1670 | 418  | 08 24            |
| CO   | 64.6N           | 06 2108       | SC*  | +40             | -230  | +75   | 07(3)               | 6  | 120    | 800  | 270  | 08 06            |
| SI   | 60.0N           | 06 2107       | SC*  | +28             | -60   | -45   | 07(3)               | 6  | 55     | 320  | 380  | 07 16            |
| NE   | 55.1N           | 06 2108       | SC*  |                 |       |       | 06(8) 07(1,2,3)     | 6  | 35     | 165  | 135  | 08 00            |
| VI   | 54.3N           | 06 2108       | SC*  | 14.1            | +38   | -15   | 06(8) 07(1,2,3)     | 5  | 30     | 129  | 82   | 07 13            |
| WI   | 54.1N           | 06 2108       | SC   | + 8             | +135  | 0     | 06(8)               | 7  | 30     | 230  | 90   | 08 03            |
| FR   | 49.6N           | 06 2108       | SC*  | - 5             | +125  | -20   | 06(8)               | 6  | 16     | 200  | 90   | 07 13            |
| BD   | 49.0N           | 06 2108       | SC*  | - 2             | +60   | +10   | 06(8) 07(1,2,3)     | 5  | 25     | 155  | 70   | 07 17            |
| DS   | 43.0N           | 06 2108       | SC*  | - 3             | +75   | +10   | 06(8)               | 6  | 16     | 222  | 58   | 08 16            |
| IR   | 40.8N           | 06 2108       | SC*  | - 9.0           | 80    | 14    | 06(8)               | 7  | 19     | 179  | 46   | 07 13            |
| TU   | 40.4N           | 06 2108       | SC*  | + 1             | +60   | + 4   | 06(8) 07(2,3)       | 6  | 14     | 170  | 15   | 07 13            |
| SJ   | 29.9N           | 06 2108       | SC*  | - 1.0           | +40   | +12   | 06(8)               | 7  | 6      | 145  | 35   | 07 13            |
| MB   | 21.3N           | 06 2108       | SC*  | + 1.6           | +58   | - 7   | 06(8)               | 7  | 4      | 151  | 15   | 08 21            |
| HO   | 21.1N           | 06 2108       | SC*  | + 2*            | +45*  | +20   | 07(2)               | 7  | 8      | 180  | 45   | 07 13            |
| AL   | 9.5N            | 06 2107       | SC   | - 1.2           | +64   | -11   | 06(8) 07(2)         | 6  | 5      | 122  | 44   | 07 13            |
| HD   | 7.6N            | 06 2109       | SC   | - 0.8           | +63   | - 4   | 06(8) 07(2)         | 6  | 4      | 129  | 32   | 08 20            |
| GU   | 4.0N            | 06 2108       | SC*  | +01             | +39   | -14   | 07(2)               | 6  | 5      | 165  | 45   | 07 14            |
| AN   | 1.5N            | 06 2107       | SC   | - 2.1           | +77   | +36   | --                  | -- | 5      | 198  | 73   | 07 13            |
| TV   | 1.1S            | 06 2107       | SC   | + 0.5           | +61   | +78   | --                  | -- | 4      | 246  | 202  | 07 13            |
| HU   | 0.6S            | 06 2108       | SC   | 3               | 103   | 13    | 06(8)               | 7  | 9      | 358  | 39   | 07 24            |
| AP   | 16.1S           | 06 2108       | SC   | 0               | +47   | -19   | 07(2)               | 6  | 8      | 165  | 39   | 09 15            |
| PM   | 18.6S           | 06 2108       | SC   | + 1.6           | +41   | -35   | 07(2)               | 7  | 11     | 180  | 130  | 07 18            |
| HR   | 33.3S           | 06 2109       | SC   | + 4             | +59   | +40   | 06(8)               | 6  | 23     | 135  | 118  | 07 13            |
| GN   | 43.2S           | 06 2108       | SC   | + 1             | +35   | +36   | 06(8)               | 7  | 22     | 120  | 130  | 07 13            |
| TO   | 46.7S           | 06 2108       | SC*  | + 4             | +36   | + 2   | 06(8) 07(1,2)       | 6  | 30     | 200  | 55   | 08 06            |
| AM   | 47.7S           | 06 2109       | SC*  | + 7.9           | +80.0 | +47.5 | 07(2)               | 6  | 26     | 184  | 59   | 07 14            |
| KG   | 56.5S           | 06 2108       | SC*  | 14              | 58    | 16    | 06(8)               | 7  | 80     | 495  | 280  | 08 12            |

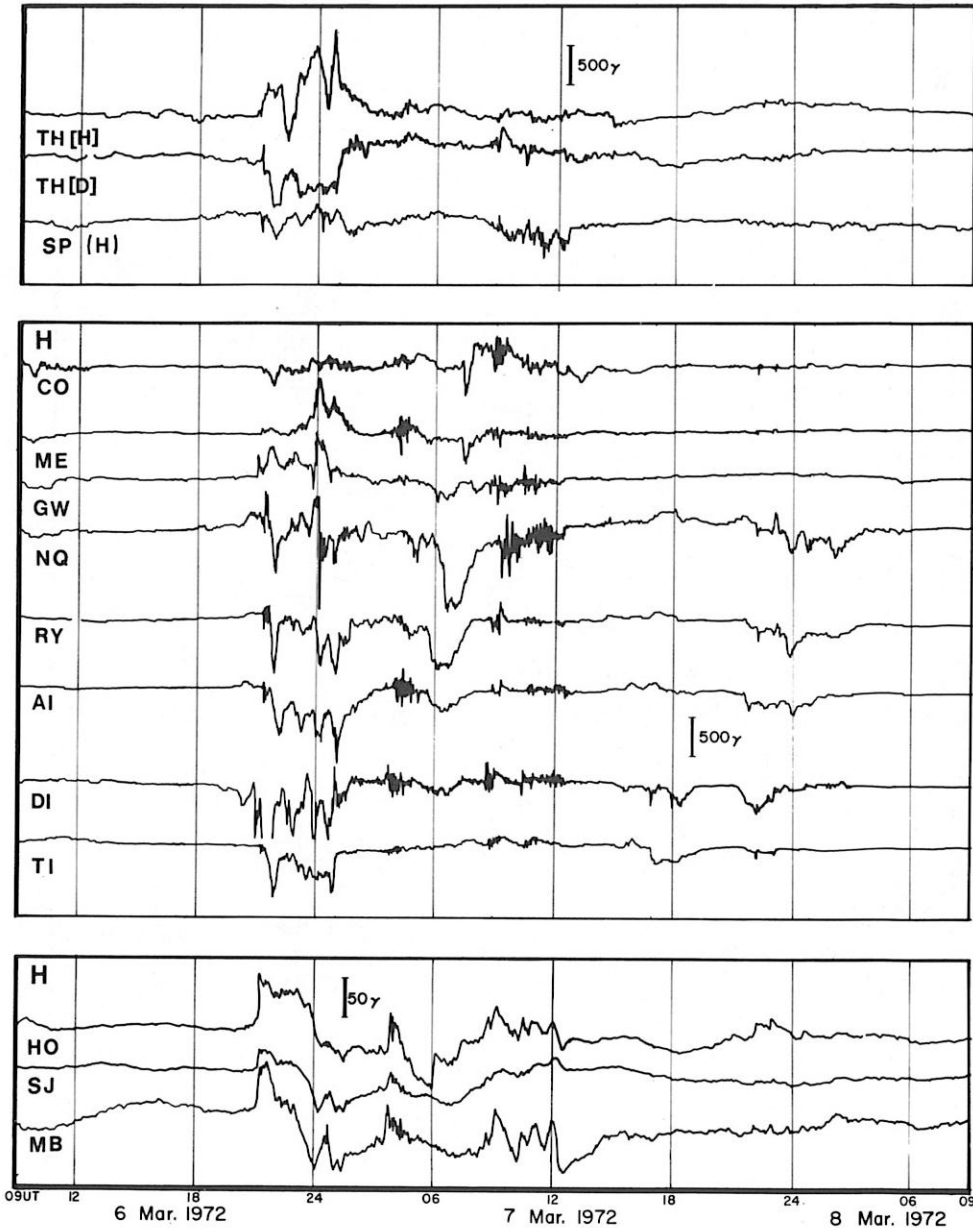
## THREE-HOUR-RANGE INDICES, K

| MAR | 6         | 7         | 8         | 9         |
|-----|-----------|-----------|-----------|-----------|
| GO  | 3222 3236 | 6344 3442 | 5212 3431 | 2223 3432 |
| BT  | 4434 3454 | 5524 3336 | 8--- 4632 | 3434 7853 |
| RY  | 5432 2237 | 7777 4336 | 5312 3541 | 4223 3432 |
| PB  | 3335 3226 | 6445 4435 | 3212 4741 | 2336 5542 |
| TR  | 5212 1147 | 7663 4445 | 5211 2431 | 2112 4451 |
| CC  | 4223 3237 | 7665 3435 | 5312 3722 | 3224 6553 |
| CO  | 2324 2115 | 5565 3323 | 2111 1620 | 1215 5421 |
| MM  | 5112 1037 | 8665 4545 | 5212 2421 | 1212 4431 |
| DI  | 5233 3358 | 8666 5566 | 4323 3752 | 3335 5673 |
| DO  | 3222 2239 | 8545 4434 | 3112 2411 | 2122 3232 |
| WE  | 2114 1025 | 5555 5323 | 2111 2611 | 1215 5431 |
| ME  | 2434 1127 | 7665 3223 | 2111 2421 | 2225 3321 |
| TI  | 2233 3237 | 5665 4655 | 3222 3832 | 2326 7762 |
| SI  | 2323 0015 | 5564 3113 | 2111 1520 | 1204 4221 |
| JO  | 2222 1126 | 5544 4223 | 3102 2321 | 2223 2121 |
| NU  | 3111 1037 | 5544 4433 | 3212 2510 | 1212 2231 |
| OT  | 2312 1017 | 6654 4223 | 2102 3421 | 2224 3221 |
| VL  | 3231 1226 | 5434 3333 | 3122 2421 | 1213 2321 |
| VI  | 1433 0015 | 5555 4223 | 2112 2521 | 1323 4321 |
| DB  | 3111 1126 | 5535 4433 | 3213 3521 | 2212 2332 |
| YA  | 3123 3137 | 6654 4545 | 4412 3632 | 2214 5443 |
| MG  | 1232 2216 | 6554 4333 | 3222 2532 | 2324 4332 |
| FR  | 2212 0016 | 5554 4223 | 3222 3432 | 2324 2121 |
| SV  | 3111 0126 | 5554 4434 | 3112 2520 | 1223 3331 |
| KV  | 3212 1137 | 5544 5445 | 3222 3621 | 1224 3342 |
| TL  | 3110 1015 | 5433 3323 | 2102 1311 | 1202 2231 |
| DS  | 3323 1027 | 6665 4223 | 3222 3432 | 2424 3232 |
| IR  | 3322 2127 | 5655 6334 | 3323 3533 | 2324 4332 |
| TU  | 2323 0116 | 5665 4213 | 3222 2522 | 1323 3222 |
| KD  | 3221 1026 | 5554 5434 | 3223 2722 | 2224 3342 |

## THREE-HOUR-RANGE INDICES, K

| MAR | 6         | 7         | 8         | 9         |
|-----|-----------|-----------|-----------|-----------|
| IK  | 3111 1137 | 6535 5334 | 2212 2521 | 2323 2332 |
| MT  | 1202 1016 | 6655 5223 | 2112 2521 | 1314 3222 |
| VK  | 3333 2126 | 6655 5334 | 4323 3532 | 3325 4333 |
| TK  | 3123 2136 | 5655 5434 | 3333 3433 | 2325 3342 |
| KS  | 3212 1148 | 6656 6445 | 3323 3533 | 2333 3433 |
| SJ  | 2211 0027 | 5555 4323 | 3222 2332 | 2323 2321 |
| TA  | 3212 0026 | 5545 5333 | 3223 2432 | 2323 2332 |
| QU  | 2222 1036 | 5544 5434 | 2223 2322 | 2334 3331 |
| HO  | 2213 0026 | 4654 4213 | 3112 2332 | 2323 3222 |
| KY  | 1202 1026 | 5655 5223 | 3213 2531 | 1324 3221 |
| AL  | 2212 2136 | 5655 5434 | 3223 3323 | 2434 3332 |
| BA  | 3222 1227 | 5555 6234 | 3224 3422 | 2324 3322 |
| GU  | 2212 2015 | 6645 4213 | 3212 2431 | 2424 3122 |
| HU  | 1112 3337 | 5554 5423 | 3333 4642 | 2213 4443 |
| LU  | 2122 0106 | 4444 4333 | 3333 2322 | 1222 2211 |
| PP  | 1212 2115 | 4664 3213 | 2212 1330 | 1223 3231 |
| PM  | 2212 2006 | 5755 5224 | 3223 2431 | 2323 3221 |
| TN  | 2011 1115 | 4444 4223 | 2112 2212 | 1224 2221 |
| AC  | 2300 1127 | 6654 5--- | -212 3532 | 2322 2332 |
| TW  | 2311 1117 | 6654 5333 | 3212 3522 | 2323 2422 |
| HR  | 3211 1026 | 5545 5223 | 3213 2421 | 2323 2322 |
| GN  | 2111 1027 | 6544 4424 | 4112 2431 | 2322 3322 |
| TD  | 1212 2016 | 6655 4323 | 3232 2421 | 2424 3322 |
| AM  | 2313 0015 | 4655 4213 | 3222 2310 | 2323 3200 |
| MI  | 2223 2014 | --55 4324 | 2211 1621 | 1314 5421 |
| NL  | 3221 1117 | 7645 3233 | 2122 1321 | 3222 1221 |
| MW  | 5332 1148 | 7565 4445 | 4322 2431 | 3423 3452 |
| MY  | 3443 3236 | 6756 5343 | 3423 2422 | 4534 3322 |
| SB  | 3222 2222 | 6544 3133 | 3111 3332 | 2323 2222 |
| VO  | 3332 3235 | 6554 4223 | 3333 4432 | 3323 2222 |

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## Indices

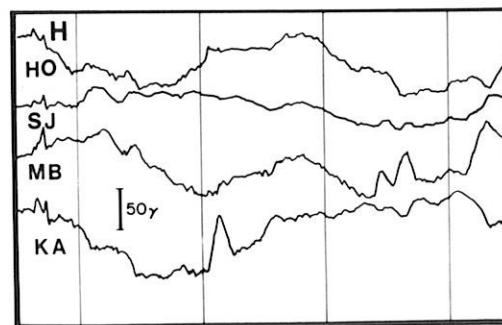
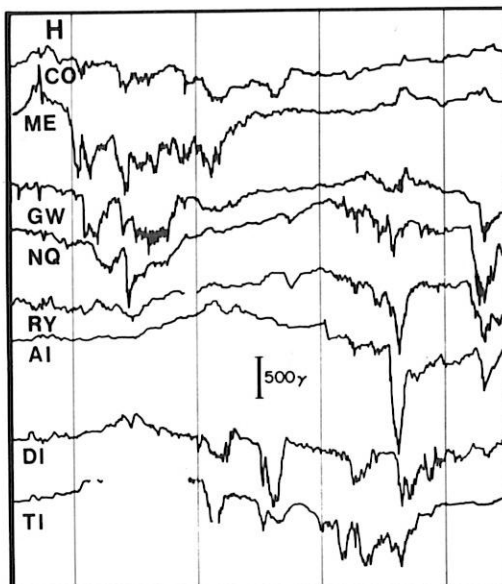
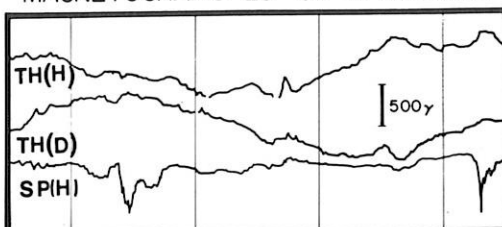
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|     | 27 |    |    |    |    |    | 28 |    |    |    |    |    | 29 |    |    |    |    |    | 30 |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| UT  | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    |    |    |    |    |    |    |    |    |
| Kp  | 1o | 1- | 1- | 0o | 1+ | 4- | 2+ | 2o | 3+ | 2+ | 3+ | 4- | 4+ | 5+ | 3+ | 1+ | 3o | 5- | 6- | 4o | 5o | 4+ | 5+ | 5+ | 5o | 3o | 2- | 3o | 3o | 2+ | 2+ | 3+ |
| 3Kn | 4  | 2  | 3  | 2  | 5  | 11 | 7  | 6  | 9  | 7  | 9  | 11 | 11 | 13 | 9  | 4  | 7  | 13 | 15 | 12 | 14 | 12 | 12 | 13 | 12 | 7  | 5  | 9  | 8  | 6  | 7  | 9  |
| 3Ka | 3  | 3  | 2  | 0  | 2  | 8  | 3  | 4  | 8  | 8  | 11 | 12 | 11 | 11 | 6  | 4  | 5  | 11 | 13 | 14 | 14 | 11 | 12 | 14 | 15 | 7  | 4  | 10 | 8  | 6  | 6  | 10 |
| Dst | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  |

## THREE-HOUR-RANGE INDICES, K

| APR | 28        | 29        | 30        |
|-----|-----------|-----------|-----------|
| GO  | 3343 4533 | 2343 5544 | 3334 5334 |
| BT  | 5545 4433 | 5765 5635 | 5654 5434 |
| RY  | 5454 6654 | 4555 3567 | 7533 4356 |
| PB  | 3354 3542 | 3445 4555 | 3436 5454 |
| TR  | 5334 6533 | 4335 5358 | 5413 4444 |
| CC  | 4345 3422 | 3564 3556 | 5244 5543 |
| CO  | 3344 5621 | 3455 4533 | 4226 4422 |
| MM  | 4225 5532 | 3335 5568 | 6323 4466 |
| DI  | 4356 5653 | 3456 6778 | 6344 6565 |
| DO  | 3233 5721 | 3334 6576 | 6423 4344 |
| WE  | 2366 7831 | 2566 7653 | 4335 6433 |
| ME  | 3356 6622 | 3787 7345 | 4325 3223 |
| TI  | 4378 7673 | 3476 8877 | 5467 7677 |
| SI  | 3245 6621 | 2577 8423 | 4215 3112 |
| JO  | 3334 4331 | 2353 4355 | 5222 2124 |
| NU  | 2233 4521 | 3334 4566 | 4313 3233 |
| OT  | 3234 4432 | 2464 4345 | 5323 2223 |
| VL  | 3233 3431 | 3343 3455 | 4313 3234 |
| VI  | 4343 5431 | 2566 5333 | 4224 3213 |
| DB  | 3233 3421 | 2342 3455 | 4222 3223 |
| YA  | 4247 5642 | 3355 8766 | 5425 4454 |
| MG  | 3235 5433 | 2545 7564 | 4324 3233 |
| FR  | 3233 4331 | 3464 4334 | 5323 2123 |
| SV  | 2224 4531 | 2443 4545 | 3222 3223 |
| KV  | 3333 3641 | 3543 4565 | 5333 3333 |
| TL  | 3213 2441 | 1331 3355 | 4111 1122 |
| DS  | 3333 4432 | 3553 4434 | 5223 3223 |
| IR  | 3345 4532 | 3454 6545 | 4423 4234 |
| TU  | 4333 3422 | 3554 3324 | 5224 2123 |
| KD  | 2223 4420 | 2333 4433 | 3222 3212 |
| IK  | 3223 3421 | 2433 4555 | 4112 2223 |
| MT  | 2244 3411 | 1454 6433 | 3213 3222 |
| VK  | 3355 4544 | 3564 6544 | 4425 4433 |
| TK  | 4335 3432 | 4554 5534 | 2324 3233 |
| KS  | 3233 3532 | 2533 4556 | 5111 2233 |
| SJ  | 3223 4432 | 3453 3344 | 5112 1113 |
| TA  | 2233 3442 | 3434 3345 | 5223 2123 |
| QU  | 3355 3442 | 2464 5534 | 3343 3232 |
| HO  | 2343 3322 | 2543 3344 | 4323 3221 |
| KY  | 2245 3421 | 1453 5333 | 3223 3222 |
| AL  | 2235 3431 | 2542 5534 | 2322 3333 |
| BA  | 2223 2422 | 2432 4345 | 5322 2223 |
| GU  | 3234 3411 | 2442 5323 | 3323 3211 |
| HU  | 3214 4542 | 3444 4533 | 4223 3333 |
| LU  | 2114 4543 | 2235 5454 | 3113 3333 |
| PP  | 3243 3310 | 2444 3324 | 3223 1212 |
| PM  | 3334 3412 | 2443 6423 | 3223 3222 |
| TN  | 1133 3221 | 1142 3334 | 3122 1122 |
| AC  | 3213 3332 | 3455 23-- | -112 3223 |
| TW  | 2223 3321 | 3445 3344 | 5112 3133 |
| HR  | 2233 4431 | 2355 3455 | 5222 2233 |
| GN  | 3324 4522 | 2443 6545 | 4113 4333 |
| TO  | 3344 4532 | 2445 6344 | 4324 4322 |
| AM  | 2243 3311 | 1344 5323 | 3124 3101 |
| MI  | 235- --31 | 2454 6444 | 3226 5522 |
| NL  | 3243 3532 | 3655 3466 | 6422 2146 |
| MW  | 5544 4444 | 3764 4567 | 6333 3457 |
| MY  | 3342 2333 | 3433 3435 | 4333 2333 |
| SB  | 3222 2112 | 2333 3214 | 3313 2113 |
| VO  | 3233 2222 | 3333 3334 | 3232 2223 |

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03UT 06 12 18 24 03  
29 April 1972 30 April 1972

## Indices

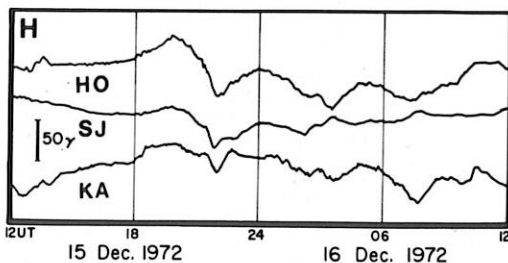
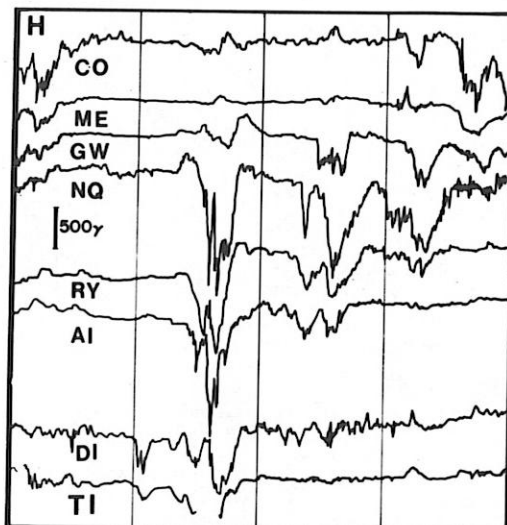
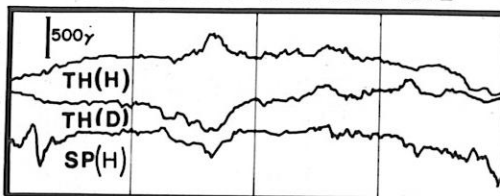
|     | 15 |    |    |    |    |    |    | 16 |    |    |    |    |    |    | 17 |    |    |    |    |    |    | 18 |    |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| UT  | 06 | 12 | 18 |    |    |    |    | 06 | 12 | 18 |    |    |    |    | 06 | 12 | 18 |    |    |    |    | 06 | 12 | 18 |    |    |    |    |
| Kp  | 1o | 3- | 3o | 4o | 4- | 2+ | 4+ | 7- | 4+ | 5o | 5- | 4+ | 4- | 5- | 4o | 3o | 3- | 4- | 3+ | 2+ | 2+ | 2- | 2o | 2o | 2o | 3- | 3- | 2o |
| 3Kn | 3  | 5  | 8  | 12 | 11 | 7  | 11 | 18 | 10 | 13 | 11 | 12 | 10 | 11 | 14 | 11 | 8  | 7  | 8  | 12 | 11 | 7  | 7  | 5  | 4  | 4  | 5  | 8  |
| 3Ka | 5  | 8  | 10 | 11 | 10 | 6  | 11 | 17 | 10 | 11 | 11 | 12 | 8  | 9  | 10 | 11 | 8  | 7  | 7  | 10 | 10 | 6  | 8  | 4  | 6  | 4  | 5  | 6  |
| Dat | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  |

## DEC

## THREE-HOUR-RANGE INDICES, K

|    | 15    |       |       | 16    |       |       | 17 |  |  |
|----|-------|-------|-------|-------|-------|-------|----|--|--|
| GO | 1235  | 4345  | 3544  | 4343  | 4245  | 4321  |    |  |  |
| BT | 1353  | 4456  | 4555  | 4765  | 5544  | 7653  |    |  |  |
| RY | 2334  | 4478  | 6764  | 4456  | 4434  | 3333  |    |  |  |
| PB | 3237  | 5345  | 4457  | 5664  | 3347  | 6553  |    |  |  |
| TR | 1113  | 3458  | 5634  | 3466  | 4322  | 4253  |    |  |  |
| CC | 2334  | 4257  | 5546  | 4664  | 4436  | 6543  |    |  |  |
| CO | 1135  | 6334  | 3456  | 6443  | 3136  | 6321  |    |  |  |
| MM | 1113  | 5569  | 6544  | 3466  | 4222  | 4152  |    |  |  |
| DI | 2235  | 6668  | 6665  | 6676  | 4435  | 6654  |    |  |  |
| DO | 0213  | 3358  | 3533  | 3454  | 3223  | 3132  |    |  |  |
| WE | 0126  | 6435  | 3347  | 6553  | 2135  | 6321  |    |  |  |
| ME | 1235  | 6224  | 3466  | 4343  | 2135  | 4321  |    |  |  |
| TI | 1225  | 7569  | 4556  | 6785  | 3225  | 6553  |    |  |  |
| SI | 0135  | 5235  | 2356  | 5332  | 1135  | 4210  |    |  |  |
| JO | ----- | ----- | ----- | ----- | ----- | ----- |    |  |  |
| NU | 0122  | 3347  | 4433  | 2454  | 3222  | 3232  |    |  |  |
| OT | 0334  | 3255  | 5544  | 4333  | 2333  | 3211  |    |  |  |
| VI | 1223  | 3257  | 4443  | 3354  | 3223  | 3232  |    |  |  |
| VL | 1235  | 5235  | 3555  | 4333  | 2145  | 4311  |    |  |  |
| DB | 1234  | 3357  | 3434  | 3454  | 3223  | 3232  |    |  |  |
| YA | 2234  | 6467  | 4546  | 4565  | 4336  | 5433  |    |  |  |
| MG | ----- | ----- | ----- | ----- | ----- | ----- |    |  |  |
| FR | 1234  | 3135  | 4534  | 3343  | 2333  | 3211  |    |  |  |
| SV | 1124  | 4336  | 3334  | 3454  | 2224  | 4332  |    |  |  |
| KV | 2324  | 4347  | 4444  | 4564  | 3224  | 4242  |    |  |  |
| TL | 0223  | 2236  | 4322  | 3343  | 2112  | 2131  |    |  |  |
| DS | 1335  | 3246  | 5544  | 4344  | 3233  | 4321  |    |  |  |
| IR | 1234  | 5456  | 4545  | 3554  | 3225  | 4332  |    |  |  |
| TU | 1235  | 3246  | 4544  | 3344  | 3234  | 3211  |    |  |  |
| KD | -023  | 3235  | 3033  | 2233  | 1011  | 1032  |    |  |  |
| IK | 1224  | 3346  | 3324  | 4454  | 3223  | 4232  |    |  |  |
| MT | 1234  | 3245  | 3444  | 3342  | 2224  | 4221  |    |  |  |
| VK | 0245  | 5355  | 4545  | 5453  | 3235  | 4323  |    |  |  |
| TK | 2334  | 3444  | 3444  | 3453  | 2223  | 3233  |    |  |  |
| KS | 1235  | 5362  | --24  | 5454  | 2223  | 434-  |    |  |  |
| SJ | 0223  | 3335  | 4343  | 2443  | 2222  | 3210  |    |  |  |
| TA | 2334  | 4346  | 3324  | 4443  | 2213  | 3332  |    |  |  |
| QU | 2335  | 4444  | 2444  | 5443  | 3132  | 3132  |    |  |  |
| HO | 2334  | 3245  | 3433  | 2334  | 3233  | 3211  |    |  |  |
| KY | 1235  | 3244  | 3444  | 3342  | 1124  | 3221  |    |  |  |
| AL | 2345  | 4345  | 2333  | 4443  | 2233  | 2232  |    |  |  |
| BA | 1243  | 4345  | 3223  | 3443  | 2123  | 3232  |    |  |  |
| GU | 1234  | 3234  | 3344  | 3323  | 2123  | 3201  |    |  |  |
| HU | 0224  | 6434  | 3232  | 4443  | 2122  | 4331  |    |  |  |
| LU | 0122  | 3235  | 1112  | 3332  | 1111  | 2110  |    |  |  |
| PP | 0223  | 2124  | 2323  | 2232  | 1123  | 2110  |    |  |  |
| PM | 1233  | 3244  | 3444  | 3323  | 2224  | 4211  |    |  |  |
| TN | 1124  | 3224  | 2224  | 4232  | 1122  | 2121  |    |  |  |
| AC | 1222  | 3245  | 3332  | 2343  | 2112  | 3311  |    |  |  |
| TV | 2232  | 3345  | 3333  | 2343  | 3122  | 2222  |    |  |  |
| HR | 0134  | 3236  | 3344  | 3343  | 2123  | 3231  |    |  |  |
| GN | 2333  | 4245  | 4444  | 3343  | 3334  | 4222  |    |  |  |
| TO | 3344  | 3235  | 4444  | 3333  | 3334  | 4223  |    |  |  |
| AM | 2334  | 3145  | 4434  | 2323  | 2324  | 3211  |    |  |  |
| MI | 2347  | 6525  | 4446  | 5552  | 2236  | 6221  |    |  |  |
| NL | 1324  | 3256  | 5643  | 3454  | 2232  | 2221  |    |  |  |
| MW | 3435  | 5347  | 5555  | 5366  | 3344  | 4354  |    |  |  |
| MY | 3456  | 4335  | 4664  | 4444  | 4556  | 3233  |    |  |  |
| SB | 3334  | 4554  | ----- | ----- | 4334  | 4443  |    |  |  |
| VO | 3443  | 3434  | 4543  | 4334  | 3333  | 3243  |    |  |  |

## MAGNETOGRAMS 15-16 DEC. 1972



| Indices | 15 |    |    |    |    |    |    |    |    |    | 16 |    |    |    |    |    |    |    |    |    | 17 |    |    |    |    |    |    |    |    |    | 18 |   |  |    |  |  |  |  |  |  |
|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|--|----|--|--|--|--|--|--|
| UT      | 06 |    |    | 12 |    |    | 18 |    |    | 06 |    |    | 12 |    |    | 18 |    |    | 06 |    |    | 12 |    |    | 18 |    |    | 06 |    |    | 12 |   |  | 18 |  |  |  |  |  |  |
| Kp      | 1+ | 0+ | 1o | 2- | 1o | 2o | 6- | 6o | 4- | 2+ | 3- | 2- | 1+ | 1+ | 3o | 2+ | 3- | 1+ | 2+ | 3- | 1+ | 2o | 3+ | 3+ | 3- | 3- | 2- | 1o | 1o | 1o |    |   |  |    |  |  |  |  |  |  |
| 3Kn     | 3  | 2  | 4  | 5  | 4  | 6  | 19 | 17 | 14 | 10 | 9  | 10 | 7  | 5  | 7  | 5  | 9  | 8  | 8  | 6  | 9  | 8  | 5  | 6  | 10 | 10 | 9  | 9  | 6  | 4  | 4  | 5 |  |    |  |  |  |  |  |  |
| 3Ks     | 6  | 2  | 3  | 4  | 1  | 0  | 20 | 16 | 15 | 9  | 7  | 7  | 3  | 1  | 2  | 2  | 8  | 6  | 6  | 4  | 8  | 5  | 3  | 4  | 8  | 10 | 8  | 8  | 4  | 1  | 2  | 2 |  |    |  |  |  |  |  |  |
| Dst     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |  |    |  |  |  |  |  |  |

## Data from Individual Observatories:

May 1972

| Obs. | Geomag.<br>lat. | Commencement  |      | SC - amplitudes |       |       | Max. 3 hr - index K |   | Ranges |      |      | UT End |
|------|-----------------|---------------|------|-----------------|-------|-------|---------------------|---|--------|------|------|--------|
|      |                 | day h.m. (UT) | type | D(')            | H(y)  | Z(y)  | day (3 hr - period) | K | D(')   | H(y) | Z(y) | day hr |
| FB   | 83.0N           | 15 1849       | SC*  | -100            | +387  | +19   | 15(7)               | 7 | 44.8   | 1905 | 540  | 16 14  |
| CO   | 64.6N           | 15 1849       | SC   | -42             | +200  | -27   | 15(7)               | 6 | 160    | 900  | 410  | 16 13  |
| SI   | 60.0N           | 15 1849       | SC*  | -20             | -155  | +20   | 15(7)               | 7 | 95     | 350  | 290  | 16 18  |
| NE   | 55.1N           | 15 1849       | SC*  | 18              | -135  | 20    | 15(7) 16(1)         | 6 | 45     | 235  | 205  | 16 13  |
| VI   | 54.3N           | 15 1849       | SC*  | -10.0           | +93   | +40   | 15(7)               | 7 | 44     | 196  | 169  | 16 12  |
| WI   | 54.1N           | 15 1849       | SC   | -6              | +150  | +9    | 15(7)               | 7 | 30     | 280  | 80   | 16 06  |
| FR   | 49.6N           | 15 1849       | SC   | +9              | +72   | -15   | 15(7)               | 6 | 25     | 235  | 100  | 16 10  |
| BD   | 49.0N           | 15 1849       | SC*  | +5              | +40   | -6    | 15(8)               | 6 | 32     | 170  | 125  | 16 12  |
| TU   | 40.4N           | 15 1849       | SC   | -3              | +25   | +3    | 15(7) 16(1)         | 6 | 16     | 180  | 30   | 16 12  |
| SJ   | 29.9N           | 15 1849       | SC   | +1              | +75   | +15   | 15(7)               | 6 | 11     | 220  | 20   | 16 12  |
| MB   | 21.3N           | 15 1851       | SC*  | -2.7            | +92   | -14   | 15(6)               | 7 | 4      | 194  | 37   | 16 15  |
| HO   | 21.1N           | 15 1849       | SC*  | +3              | +60   | +15   | 15(7)               | 6 | 18     | 145  | 65   | 16 12  |
| AL   | 9.5N            | 15 1850       | SC   | -1.0            | 84    | -10   | 15(7)               | 7 | 7      | 170  | 46   | 16 13  |
| HD   | 7.6N            | 15 1849       | SC   | -0.5            | +69   | -5    | 15(7)               | 7 | 6      | 171  | 26   | 16 13  |
| GU   | 4.0N            | 15 1849       | SC   | +01             | +58   | -18   | 15(7)               | 6 | 10     | 115  | 50   | 16 17  |
| AN   | 1.5N            | 15 1850       | SC   | -2.5            | 96    | 54    |                     |   | 5      | 183  | 95   | 16 13  |
| TV   | 1.1S            | 16 1850       | SC   | -0.9            | 77    | 105   |                     |   | 3      | 183  | 194  | 16 13  |
| HU   | 0.6S            | 15 1849       | SC   | 4               | 251   | 23    | 15(7)               | 7 | 8      | 513  | 43   | 16 04  |
| AP   | 16.1S           | 15 1850       | SC   | 0               | +47   | -16   | 15(7)               | 5 | 7      | 145  | 60   | 18 15  |
| FM   | 18.6S           | 15 1850       | SC*  | +1.3            | +64   | +60   | 15(7)               | 6 | 9      | 130  | 100  | 18 14  |
| HR   | 33.3S           | 15 1850       | SC*  | +4              | +40   | +27   | 15(7)               | 7 | 20     | 166  | 157  | 16 12  |
| GN   | 43.2S           | 15 1850       | SC*  | +9              | +57   | +50   | 15(7)               | 7 | 30     | 130  | 160  | 16 13  |
| TO   | 46.7S           | 15 1849       | SC*  | -6              | +60   | +10   | 15(7)               | 7 | 32     | 220  | 60   | 16 11  |
| AM   | 47.7S           | 15 1851       | SC   | -3.4            | +47.9 | -12.6 | 15(7)               | 6 | 15     | 199  | 46   | 16 04  |
| KG   | 56.5S           | 15 1849       | SC*  | 08              | 68    | 23    | 15(8)               | 8 | 57     | 800  | 230  | 16 13  |

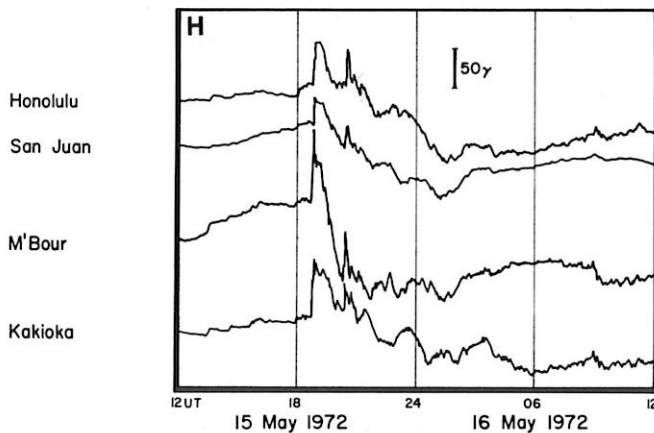
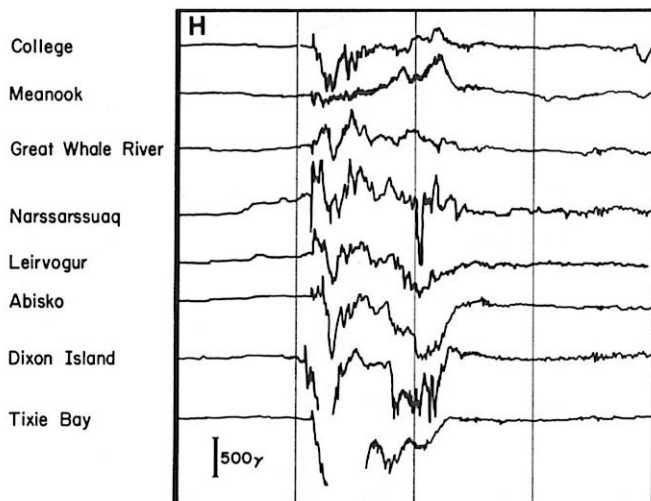
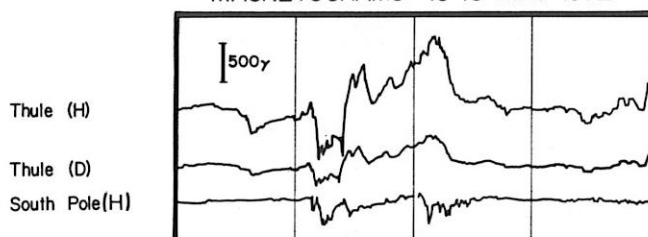
## THREE-HOUR-RANGE INDICES, K

| MAY | 15        | 16        | 17        | 18        |
|-----|-----------|-----------|-----------|-----------|
| GO  | 2133 3464 | 5333 4433 | 2344 4433 | 3344 4332 |
| BT  | 3334 3386 | 6544 3333 | 4435 5533 | 5554 3323 |
| RY  | 4211 2377 | 6333 3222 | 3232 4424 | 5552 2222 |
| PB  | 2213 2376 | 6334 3233 | 3333 5432 | 4446 3322 |
| TR  | 2201 1276 | 6423 2111 | 2123 3404 | 4323 2121 |
| CC  | 3123 2276 | 6333 2322 | 3343 5424 | 4443 2222 |
| CO  | 2112 0164 | 4324 2122 | 3323 5421 | 3335 2111 |
| MM  | 1011 1286 | 7423 3111 | 2223 4423 | 4323 2121 |
| DI  | 3222 3287 | 8434 3232 | 3345 5533 | 3344 2442 |
| DO  | 1222 2389 | 7323 3211 | 2232 4412 | 3333 3211 |
| WE  | 1111 0275 | 5333 1122 | 3222 5522 | 3334 1121 |
| ME  | 2123 1266 | 7433 2222 | 3222 3223 | 3324 3222 |
| TI  | 2223 3398 | 7433 2222 | 4444 7533 | 3444 33-- |
| SI  | 1122 1174 | 5323 1112 | 3221 3311 | 3324 1111 |
| JO  | 1122 1266 | 4322 1221 | 2222 2221 | 3333 2111 |
| NU  | 1111 2176 | 5422 1112 | 2222 3312 | 3222 2111 |
| OT  | 1023 1277 | 7333 2132 | 3221 1221 | 4422 2111 |
| VL  | 1012 1365 | 5322 2131 | 3132 3312 | 3333 2221 |
| VI  | 1122 1175 | 6334 2122 | 4322 2222 | 4444 2012 |
| DB  | 1002 2365 | 4322 2221 | 3221 2312 | 3323 2111 |
| YA  | 3222 1287 | 6444 3123 | 4343 4323 | 4434 2112 |
| MG  | 2212 1256 | 5434 2132 | 3332 4323 | 3334 1133 |
| FR  | 1122 0166 | 4333 1132 | 3221 2222 | 4432 2112 |
| SV  | 0021 2275 | 4434 2221 | 2222 4311 | 3333 2111 |
| KV  | 2232 2275 | 4434 2122 | 3333 4312 | 3344 2211 |
| TL  | 1000 1165 | 4212 1111 | 2111 1111 | 2132 1111 |
| DS  | 1123 0166 | 6434 2233 | 4332 2222 | 5543 2122 |
| IR  | 3222 2376 | 6354 3233 | 3343 4323 | 4344 3223 |
| TU  | 1122 1266 | 6343 2222 | 4332 2222 | 4433 1112 |
| KD  | 2222 2055 | 4322 2211 | 2222 3321 | 1222 2010 |

## THREE-HOUR-RANGE INDICES, K

| MAY | 15        | 16        | 17        | 18        |
|-----|-----------|-----------|-----------|-----------|
| IK  | 0001 1275 | 5323 2111 | 3122 2211 | 2223 2111 |
| MT  | 1001 2266 | 4433 2122 | 3332 3312 | 3233 2112 |
| VK  | 4343 2366 | 5434 2234 | 4343 4334 | 4333 2123 |
| TK  | 2222 3275 | 5444 2232 | 3433 4312 | 3333 2232 |
| KS  | 1001 2196 | 5434 2222 | 4233 3321 | 2233 2222 |
| SJ  | 0001 0166 | 5332 2121 | 3222 1211 | 4333 1111 |
| TA  | 2201 1275 | 4333 2122 | 3221 2322 | 2233 2121 |
| QU  | 2212 22-4 | 4343 2121 | 3332 2111 | 2233 2120 |
| HO  | 1011 1365 | 4333 1123 | 4322 2222 | 3233 2132 |
| KY  | 1001 2265 | 5434 2122 | 4332 3212 | 3333 2122 |
| AL  | 1111 2275 | 4444 2232 | 3333 3211 | 3333 2221 |
| BA  | 2012 21-7 | 4334 2222 | 3233 2222 | 2233 2121 |
| GU  | 1101 1165 | 5433 2122 | 4321 3111 | 3332 1121 |
| HU  | 1123 3476 | 6533 3331 | 3222 3321 | 3322 3322 |
| LU  | 1001 1065 | 4424 3322 | 2222 3210 | 2122 1220 |
| PP  | 1120 1156 | 4233 1111 | 3321 1011 | 2332 2121 |
| PM  | 1111 2164 | 4433 1111 | 4332 3211 | 3442 2121 |
| TN  | 1011 2054 | 3223 1110 | 2130 3111 | 1222 0110 |
| AC  | 0001 227- | 5223 2221 | 3221 --1  | 4432 2221 |
| TW  | 0001 2275 | 6332 2121 | 3222 2221 | 4431 1121 |
| HR  | 1001 1075 | 5333 2011 | 2121 3312 | 3333 2111 |
| GN  | 1100 1175 | 5222 1111 | 3232 3221 | 2222 1121 |
| TO  | 1001 1075 | 5432 1100 | 3322 3212 | 2433 2110 |
| AM  | 1001 1064 | 4323 1001 | 3321 3111 | 3333 1001 |
| MI  | 1001 0064 | 4223 1111 | 3312 5311 | 2313 2000 |
| NL  | 2111 0065 | 6422 2112 | 1221 2202 | 4432 1101 |
| NW  | 3311 2286 | 6432 1112 | 3331 3314 | 5443 2122 |
| MY  | 2221 1185 | 5433 1123 | 3333 3311 | 3343 1110 |
| SB  | 0022 1164 | 5212 2111 | 2114 2211 | 3222 1011 |
| VO  | 2112 1254 | 5333 2212 | 2422 2312 | 3333 1212 |

## MAGNETOGRAMS 15-16 MAY 1972



## Indices

ndices

|     | 16 |    |    |    |    |    | 17 |    |    |    |    |    | 18 |    |    |    |    |    | 19 |    |    |    |    |    |    |    |    |   |   |   |   |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|
| UT  | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    | 06 |    | 12 |    | 18 |    |    |    |    |   |   |   |   |
| Kp  | 2- | 2- | 2+ | 2+ | 1+ | 2+ | 3- | 3- | 4+ | 4+ | 5+ | 7- | 6+ | 7+ | 8+ | 7+ | 7+ | 6+ | 7+ | 6+ | 4+ | 4+ | 5+ | 3- | 2- | 1- |    |   |   |   |   |
| 3Kn | 5  | 5  | 7  | 8  | 9  | 5  | 7  | 8  | 8  | 11 | 11 | 14 | 17 | 16 | 18 | 22 | 17 | 18 | 17 | 16 | 17 | 14 | 11 | 11 | 14 | 9  | 8  | 6 | 5 | 4 |   |
| 3Ka | 4  | 6  | 6  | 6  | 5  | 3  | 5  | 7  | 8  | 11 | 10 | 11 | 16 | 15 | 18 | 23 | 18 | 18 | 17 | 18 | 17 | 13 | 9  | 13 | 10 | 12 | 10 | 7 | 4 | 3 | 0 |
| Dst |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |   |   |

## Data from Individual Observatories:

June 1972

| Obs. | Geomag.<br>lat. | Commencement |           | SC - amplitudes |       |      | Max. 3 hr - index K |                     |   | Ranges |      |      | UT End |
|------|-----------------|--------------|-----------|-----------------|-------|------|---------------------|---------------------|---|--------|------|------|--------|
|      |                 | day          | h.m. (UT) | type            | D(')  | H(Y) | Z(Y)                | day (3 hr - period) | K | D(')   | H(Y) | Z(Y) | day hr |
| PB   | 83.0N           | 17           | 0633      | SC*             | -101  | +485 | -121                | 18(2)               | 7 | 592    | 1647 | 1154 | 19 23  |
| CO   | 64.6N           | 17           | 06--      | ..              | ..    | ..   | ..                  | 17(5,6)             | 7 | 380    | 1810 | 1750 | 19 17  |
| SI   | 60.0N           | 17           | 1311      | SC              | -15   | -40  | -95                 | 18(3)               | 8 | 195    | 2000 | 1250 | 19 17  |
| NE   | 55.1N           | 17           | 1311      | SC*             | -14   | +40  | -20                 | 18(1,2)             | 9 | 130    | 1495 | 980  | 19 15  |
| VI   | 54.3N           | 17           | 1311      | SC*             | -12.2 | +39  | +21                 | 18(1)               | 9 | 104    | 920  | 917  | 19 14  |
| WI   | 54.1N           | 17           | 1312      | SC*             | +5*   | +71* | 0                   | 18(1)               | 8 | 60     | 490  | 330  | 19 08  |
| FR   | 49.6N           | 17           | 1311      | SC*             | -7    | -48  | +7                  | 18(1)               | 8 | 76     | 330  | 415  | 19 18  |
| ED   | 49.0N           | 17           | 1312      | SC*             | -12   | +30  | +14                 | 18(1) 19(3)         | 7 | 53     | 270  | 365  | 19 18  |
| DS   | 43.0N           | 17           | 1312      | SC*             | -6    | +30  | +18                 | 18(1)               | 7 | 37     | 290  | 128  | 19 12  |
| TU   | 40.4N           | 17           | 1311      | SC*             | -6    | +35  | +3                  | 18(1)               | 7 | 28     | 300  | 70   | 19 10  |
| SJ   | 29.9N           | 17           | 1311      | SC              | +     | +14  | +3                  | 17(8)               | 7 | 12     | 220  | 42   | 19 10  |
| MB   | 21.3N           | 17           | 1311      | SC*             | -2.7  | +29  | -17                 | 18(1)               | 6 | 4      | 97   | 28   | 19 15  |
| HO   | 21.1N           | 17           | 1311      | SC              | -     | +35  | +5                  | 17(8)               | 7 | 41     | 315  | 65   | 19 12  |
| AL   | 9.5N            | 17           | 1310      | SC              | -0.8  | +35  | -5                  | 17(8)               | 6 | 12     | 230  | 65   | 18 20  |
| HD   | 7.6N            | 17           | 1312      | SC              | -0.5  | +36  | -3                  | 18(1)               | 8 | 12     | 225  | 39   | 19 09  |
| GU   | 4.0N            | 17           | 1311      | SC*             | 0     | +39  | -12                 | 17(8)               | 7 | 10     | 285  | 35   | 19 17  |
| AN   | 1.5N            | 17           | 1310      | SC              | -1.1  | +42  | +28                 | --                  | - | 10     | 248  | 104  | 18 20  |
| HU   | 0.6S            | 17           | 1313      | SC              | 4     | 39   | 8                   | 17(6,7,8)           | 7 | 18     | 618  | 58   | 18 20  |
| TV   | 1.1S            | 17           | 1310      | SC              | +0.5  | +47  | +45                 | --                  | - | 10     | 295  | 181  | 18 20  |
| AP   | 16.1S           | 17           | 1312      | SC              | 0     | +27  | -13                 | 17(8)               | 7 | 5      | 315  | 75   | 20 07  |
| FM   | 18.6S           | 17           | 1311      | SC              | +0.4  | +38  | +33                 | 17(8)               | 7 | 12     | 300  | 80   | 19 18  |
| HR   | 33.3S           | 17           | 1312      | SC*             | 2     | 21   | 13                  | 18(1)               | 7 | 40     | 202  | 122  | 19 10  |
| GN   | 43.2S           | 17           | 1312      | SC*             | -7*   | +22  | -18                 | 17(8) 18(5) 18(6)   | 7 | 43     | 230  | 220  | 19 09  |
| TO   | 46.7S           | 17           | 1312      | SC*             | -3    | +40  | +8                  | 17(8)               | 7 | 40     | 300  | 145  | 19 13  |
| KG   | 56.5S           | 17           | 1311      | SC*             | 05    | 44   | 10                  | 17(8)               | 9 | 292    | 2118 | 944  | 17 00  |

## THREE-HOUR-RANGE INDICES, K

| JUN | 16        | 17        | 18        | 19        |
|-----|-----------|-----------|-----------|-----------|
| GD  | 2245 3334 | 4355 5665 | 5555 5663 | 5533 3432 |
| BT  | 4466 4434 | 5465 6688 | 6666 7565 | 6345 4432 |
| RY  | 2322 3425 | 6653 5676 | 8787 6675 | 7764 3333 |
| PB  | 2344 3443 | 3455 6766 | 6775 5764 | 4565 4532 |
| TR  | 1122 2234 | 5335 4576 | 7655 7653 | 7543 3432 |
| CC  | 3244 3434 | 4354 6767 | 6665 5555 | 5444 4432 |
| CU  | 1222 2222 | 2356 7744 | 6767 7753 | 3465 5421 |
| MM  | 1213 2334 | 4335 4566 | 8766 7765 | 6634 4322 |
| DI  | 3243 3546 | 5356 7888 | 9777 8866 | 7555 5433 |
| DO  | 2132 3223 | 3333 5659 | 8976 8864 | 6443 3222 |
| WE  | 1233 3223 | 2356 6755 | 7788 8763 | 3666 5321 |
| ME  | 2244 2223 | 3256 6647 | 8877 7844 | 4775 6222 |
| TI  | 2243 3534 | 3355 7889 | 9788 8775 | 5555 5433 |
| SI  | 2212 2122 | 2245 5557 | 8887 8753 | 3575 5321 |
| JO  | 1211 2133 | 2233 4447 | 8864 4453 | 4562 2121 |
| NU  | 1123 2222 | 3233 5557 | 8667 7654 | 4433 2211 |
| OT  | 2233 3133 | 3354 5567 | 9997 5664 | 4664 2221 |
| VL  | 1122 3223 | 3333 5655 | 7654 5654 | 4343 2420 |
| VI  | 2344 3223 | 3345 5575 | 7877 5544 | 4474 4212 |
| DB  | 1111 3223 | 3223 5555 | 7554 5654 | 4332 2221 |
| YA  | 3343 3333 | 3445 6767 | 7777 8864 | 4443 4322 |
| MG  | 3233 3233 | 3344 4556 | 6577 6654 | 3343 3213 |
| FR  | 2232 3133 | 2354 4566 | 8666 4444 | 3453 2221 |
| SV  | 1123 3212 | 3223 5556 | 6556 6753 | 4433 2210 |
| KV  | 1222 2323 | 3333 5666 | 7655 6764 | 4433 3412 |
| TL  | 1011 1212 | 2112 4654 | 5554 4553 | 3331 1110 |
| DS  | 2223 3234 | 3344 5566 | 7766 5454 | 4464 2211 |
| IR  | 2344 3223 | 2335 5557 | 6556 6653 | 4254 3223 |
| TU  | 2222 3233 | 3344 4656 | 7665 5543 | 3363 2211 |
| KD  | 1123 2211 | 1123 4324 | 5334 5542 | 2122 2212 |

## THREE-HOUR-RANGE INDICES, K

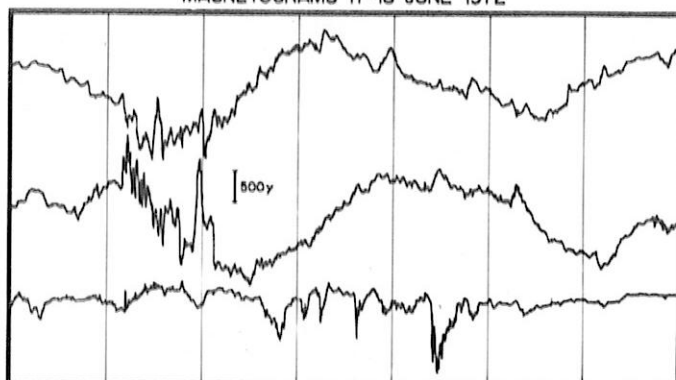
| JUN | 16        | 17        | 18        | 19        |
|-----|-----------|-----------|-----------|-----------|
| IK  | 1112 2222 | 3122 5665 | 7545 5653 | 3332 2211 |
| MT  | 2123 3122 | 1234 5547 | 6466 5443 | 3242 2111 |
| VK  | 3434 3323 | 3445 5557 | 6567 5554 | 4343 3233 |
| TK  | 2234 3322 | 2444 5556 | 6645 6644 | 3243 2322 |
| KS  | 1022 3122 | 3033 5655 | 55-- -754 | 4312 2210 |
| SJ  | 1112 3133 | 2334 4557 | 6655 5344 | 3352 2111 |
| TA  | 1123 3122 | 2333 4656 | 5555 5554 | 4332 1211 |
| QU  | 1133 3211 | 2243 4545 | 4544 5544 | 3342 2311 |
| HO  | 2133 3023 | 2244 4647 | 7556 5423 | 3243 2112 |
| KY  | 2232 3212 | 2244 5547 | 6555 5443 | 3242 2111 |
| AL  | 1232 4222 | 2333 5546 | 6454 5643 | 3442 3312 |
| BA  | 1122 3122 | 2333 465- | ----      | 3343 2221 |
| GU  | 1123 3101 | 1243 4437 | 6656 5343 | 4232 2111 |
| HU  | 2222 3332 | 1232 5777 | 7653 6553 | 3342 3320 |
| LU  | 10-- -011 | 1122 3555 | 5555 6654 | 4433 3322 |
| PP  | 2222 1012 | 2344 334- | 6655 5433 | 4342 1-11 |
| PM  | 1123 2111 | 1344 4547 | 6456 5454 | 4442 2221 |
| TN  | 1222 2111 | 2222 4533 | ----      | 1322 2200 |
| AC  | 1123 3122 | 2332 4667 | 7654 4444 | 3343 1111 |
| TW  | 1222 2112 | 2332 4567 | 7664 5444 | 3353 2121 |
| HR  | 1023 3112 | 2333 4654 | 7655 5553 | 4342 2110 |
| GN  | 2111 1221 | 2233 5667 | 6655 7753 | 4243 2211 |
| TU  | 2233 2122 | 2344 4567 | 5465 6643 | 4343 3210 |
| AM  | 1122 1111 | 1244 4544 | 5566 6543 | 3253 2110 |
| MI  | 1133 1111 | 1155 6754 | 5687 8674 | 4455 4311 |
| NL  | 1112 1113 | 3343 4548 | 9885 5663 | 6662 2211 |
| MW  | 2334 3245 | 5554 6778 | 8777 4465 | 7765 3333 |
| MY  | 2233 3442 | 3344 5766 | 4554 4463 | 4343 2222 |
| SB  | 1112 2223 | 2344 4543 | 5554 4433 | 3332 2221 |
| VO  | 1123 2223 | 3343 4555 | 4554 4333 | 3333 2221 |



Thule (H)

Thule (D)

South Pole(H)



College

Meanook

Great Whale River

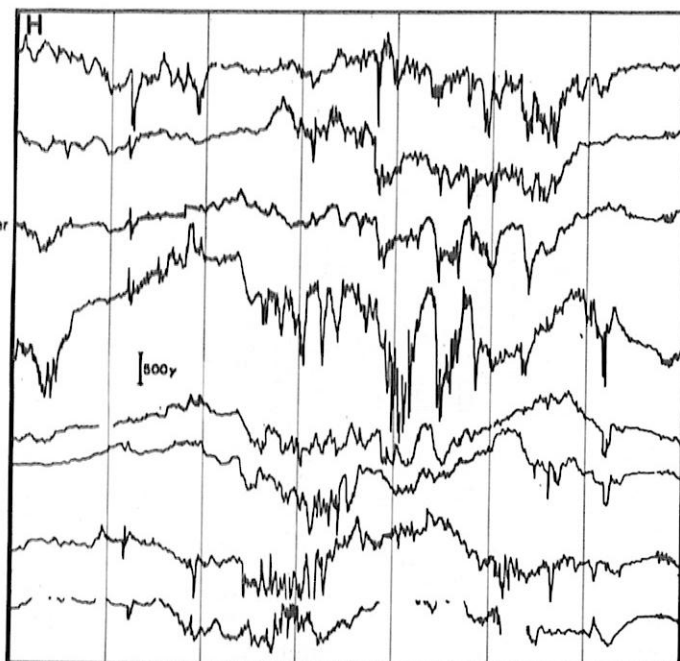
Narsarsuaq

Leirvogur

Abisko

Dixon Island

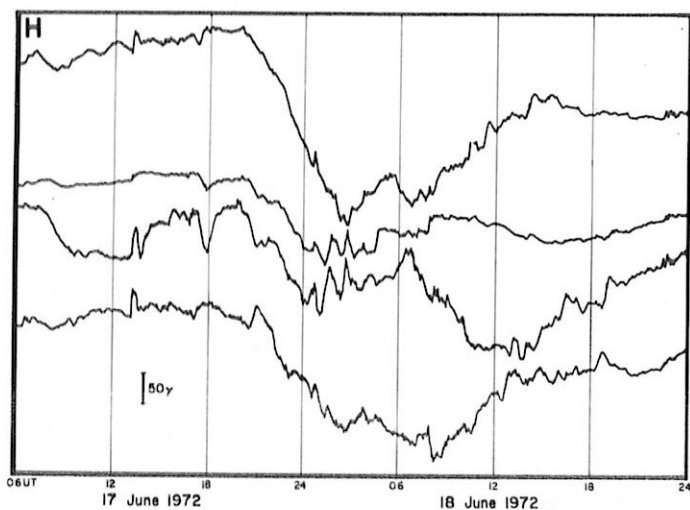
Tixie Bay



Honolulu

San Juan  
M'Bour

Kakioka



06 UT

17 June 1972

18 June 1972

## Indices

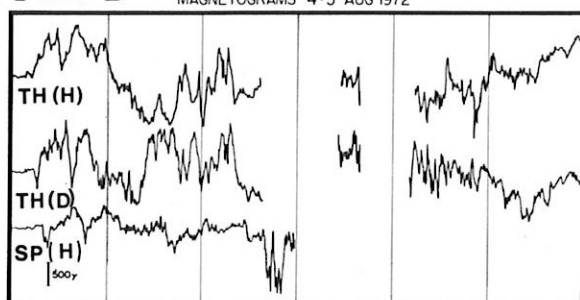
| UT  | 3  |    |    |    |    |    | 4  |    |    |    |    |    | 5  |    |    |    |    |    | 6  |    |    |    |    |    |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|     | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 |
| Kp  | 0+ | 1+ | 2+ | 2+ | 2+ | 2+ | 1+ | 1+ | 6+ | 8+ | 7+ | 4+ | 5+ | 4+ | 7+ | 9+ | 8+ | 8+ | 7+ | 8+ | 9+ | 7+ | 6+ | 7+ |
| 3Kn | 3  | 3  | 4  | 5  | 6  | 6  | 4  | 4  | 16 | 21 | 19 | 12 | 13 | 11 | 17 | 26 | 21 | 22 | 20 | 18 | 20 | 22 | 17 | 14 |
| 3Ks | 0  | 3  | 1  | 3  | 3  | 4  | 1  | 0  | 14 | 20 | 17 | 9  | 10 | 9  | 16 | 26 | 23 | 22 | 18 | 18 | 20 | 17 | 14 | 17 |
| Dst |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

## Data from Individual Observatories:

August 1972

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

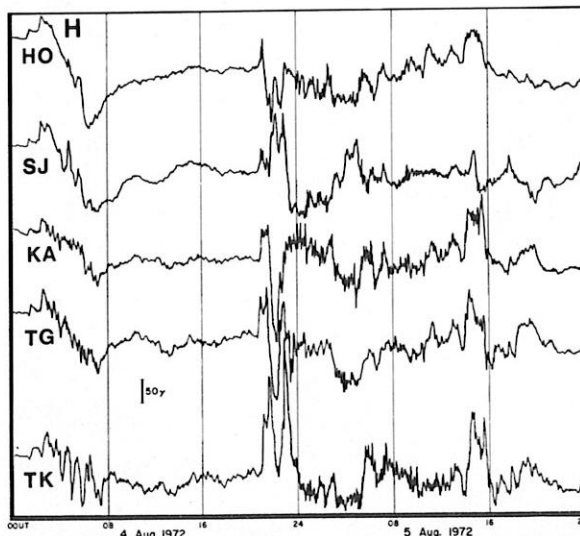
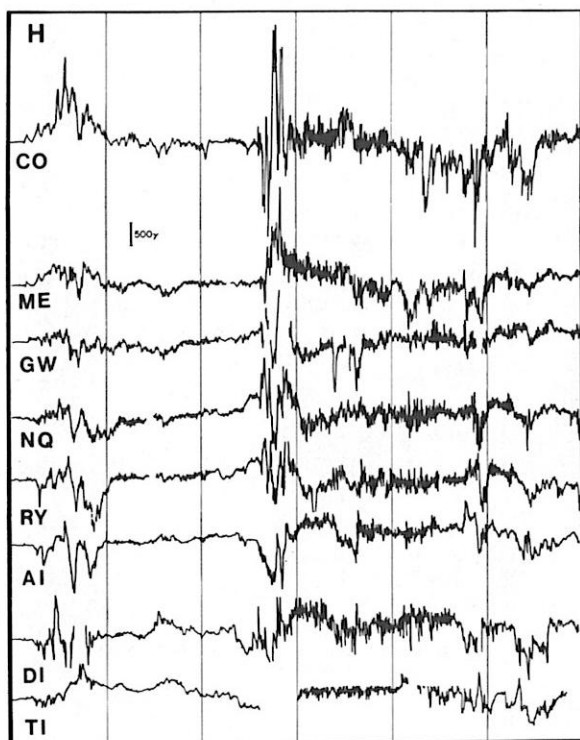
| Obs. | Geomag. | Commencement |               | SC - amplitudes |                |                | Max. 3 hr - index K |                     | Ranges |                |                |      | UT End |
|------|---------|--------------|---------------|-----------------|----------------|----------------|---------------------|---------------------|--------|----------------|----------------|------|--------|
|      |         | lat.         | day h.m. (UT) | type            | Y <sub>D</sub> | X <sub>H</sub> | Z                   | day (3 hr - period) | K      | Y <sub>D</sub> | X <sub>H</sub> | Z    |        |
| RB   | 83.1N   | 04           | 0119          | SC              | +40            | +22            | +10                 | 04(2)               | -      | <u>1227</u>    | <u>1029</u>    | 1240 | -- --  |
| PB   | 83.0N   | 04           | 0119          | SC*             | +45            | +56            | +37                 |                     |        |                |                |      | 04 18  |
| MLB  | 79.1N   | 04           | 0118          | SC*             | -37*           | 62             | +3                  | 04(2)               | -      | <u>1272</u>    | <u>1357</u>    | 852  | -- --  |
| CB   | 76.7N   | 04           | 0120          | SC              | 50.6           | -16            | +72                 | 04(6)               | -      | <u>123</u>     | <u>1040</u>    | 720  | -- --  |
| BL   | 73.9N   | 04           | 0118          | SC*             | -80*           | -39            | 40                  | 04(3)               | -      | <u>1224</u>    | <u>796</u>     | 784  | 04 11  |
| CH   | 68.8N   | 04           | 0119          | SC*             | -14*           | -31            | -17                 | 04(2)               | -      | <u>1110</u>    | <u>970</u>     | 820  | -- --  |
| GW   | 66.8N   | 04           | 0120          | SC              | -3.8           | -14            | -72                 | 04(2)               | -      | <u>376</u>     | <u>830</u>     | 1388 | 04 11  |
| CO   | 64.6N   | 04           | 0119          | SC*             | 7              | 150            | --                  |                     |        |                |                |      |        |
| ME   | 61.9N   | 04           | 0118          | SC*             | -6.4*          | +154*          | -19                 | 04(2)               | 7      | 165            | 900            | 680  | 04 11  |
| SI   | 60.0N   | 04           | 0119          | SC*             | -              | +90            | --                  |                     |        |                |                |      |        |
| JO   | 58.7N   | 04           | 0120          | SC*             | +0.8           | +40*           | +20                 | 04(2)               | 9      | 109            | 1380           | 914  | 04 11  |
| OT   | 57.0N   | 04           | 0118          | SC*             | +1.6*          | +69*           | +7                  | 04(2)               | 9      | 129            | 1340           | 1000 | 04 11  |
| NE   | 55.1N   | 04           | 0118          | SC*             | -3             | +85            | --                  |                     |        |                |                |      |        |
| VI   | 54.3N   | 04           | 0118          | SC*             | -0.7*          | +42            | +20*                | 04(2,3)             | 8      | 66             | 500            | 380  | 04 11  |
| WI   | 54.1N   | 04           | 0119          | SC*             | -6*            | +45            | 0                   |                     |        |                |                |      |        |
| FR   | 49.6N   | 04           | 0119          | SC*             | +4             | +50            | -9                  |                     |        |                |                |      |        |
| ED   | 49.0N   | 04           | 0119          | SC*             | -1             | +46            | -4                  | 04(8)               | 9      | 95             | 550            | 220  | 08 03  |
| DS   | 43.0N   | 04           | 0119          | SC*             | +3             | +43            | -7                  |                     |        |                |                |      | 04 18  |
| TU   | 40.4N   | 04           | 0119          | SC*             | -1             | +30            | +3                  |                     |        |                |                |      |        |
| SJ   | 29.9N   | 04           | 0119          | SC              | -1             | +20            | +5                  |                     |        |                |                |      |        |
| MB   | 21.3N   | 04           | 0120          | SC              | -0.2           | +27            | -2                  | 04(2)               | 7      | 7              | 147            | 22   | 04 18  |
| HO   | 21.1N   | 04           | 0119          | SC*             | -1             | +16            | +6                  | 04(8)               | 8      | 14             | 270            | 104  | 04 20  |
| AL   | 9.5N    | 04           | 0118          | SC              | -0.4           | 10             | -3                  | 04(2)               | 6      | 10             | 129            | 52   | 04 18  |
| HD   | 7.6N    | 04           | 0120          | SC              | -0.2           | +12            | -2                  | 04(2)               | 7      | 5              | 149            | 42   | 04 18  |
| GU   | 4.0N    | 04           | 0119          | SC*             | 0              | +32            | -10                 |                     |        |                |                |      |        |
| AN   | 1.5N    | 04           | 0118          | SC              | -0.5           | 16             | 8                   | 04                  |        | 6              | 297            | 150  | 04 18  |
| TV   | 1.1S    | 04           | 0118          | SC              | -0.2           | 17             | +15                 | 04                  |        | 6              | 418            | 259  | 04 18  |
| HU   | 0.6S    | 04           | 0119          | SC              | 1              | 41             | 6                   |                     |        |                |                |      |        |
| AP   | 16.1S   | 04           | 0119          | SC              | +0             | +20            | -7                  | 04(8)               | 8      | 16             | 323            | 149  | 07 12  |
| PM   | 18.6S   | 04           | 0119          | SC              | +0.1           | +25            | +27                 | 04(2,3,7)           | 6      | 8              | 210            | 140  | 04 20  |
| HR   | 33.3S   | 04           | 0119          | SC*             | +3             | +13            | +3                  | 04(2)               | 6      | 25             | 120            | 108  | 04 --  |
| GN   | 43.2S   | 04           | 0120          | SC              | +2             | +8             | +10                 | 04(2)               | 8      | 30             | 240            | 140  | 04 15  |
| TO   | 46.7S   | 04           | 0119          | SI*             | -3             | +23            | +8                  | 04(2,3)             | 6      | 29             | 250            | 120  | 04 18  |
| KG   | 56.5S   | 04           | 0119          | SC*             | 2              | 15             | 3                   | 04(2)               | -7     | 76             | 390            | 185  | 04 18  |
| RB   | 83.1N   | 04           | 2055          | SC*             | -630*          | --             | --                  | 04(8)               | -      | <u>3088</u>    | <u>3744</u>    | 2904 | 07 07  |
| PB   | 83.0N   | 04           | 2054          | SC              | -142           | +738           | +83                 | 04(8)               | 9      |                |                | 1768 | 08 02  |
| MLB  | 79.1N   | 04           | 2054          | SC*             | +525*          | -187           | -17                 | 04(8)               |        | <u>3664</u>    | <u>4100</u>    | 2470 | 07 07  |
| CB   | 76.7N   | 04           | 2055          | SC              | -1             | +580           | -55                 | 04(8)               |        | <u>4350</u>    | <u>4601</u>    | 3200 | 07 07  |
| BL   | 73.9N   | 04           | 2054          | SC              | -90            | +290           | +85                 | 04(8)               |        | <u>5488</u>    | <u>3396</u>    | 3558 | 07 11  |
| CH   | 68.8N   | 04           | 2054          | SC*             | +35            | +200           | +40                 | 04(8)               |        | <u>6268</u>    | <u>5373</u>    | 3888 | 07 17  |
| GW   | 66.8N   | 04           | 2055          | SC*             | -71.5*         | -273*          | -215*               | 04(8)               |        |                |                |      | 07 12  |
| CO   | 64.6N   | 04           | 2054          | SC*             | 50             | -635           | -50                 | 04(8) 05(5)         | 9      | 840            | 5460           | 3170 | 07 16  |
| ME   | 61.9N   | 04           | 2054          | SC*             | 66             | +81            | +38                 | 04(8)               | 9      | 437            | 5302           | 2640 | 07 12  |
| SI   | 60.0N   | 04           | 2054          | SC              |                |                |                     | 04(8)               | 9      | 340            | 2300           | 1600 | 07 11  |
| JO   | 58.7N   | 04           | 2054          | SC              | -13.4          | +90*           | +100*               | 04(8) 05(1,2)       | 9      | 207            | 2038           | 1658 | 07 08  |
| OT   | 57.0N   | 04           | 2055          | SC              | 30.1           | +90            | -150                | 04(8) 05(2)         | 9      | 261            | 2419           | 1641 | 07 09  |
| NE   | 55.1N   | 04           | 2054          | SC              |                |                |                     | 04(8)               | 9      | 203            | 1370           | 490  | 07 11  |
| VI   | 54.3N   | 04           | 2054          | SC*             | 14.6*          | -70*           | -35*                | 04(8)               | 9      | 172            | 1052           | 523  | 07 08  |
| WI   | 54.1N   | 04           | 2052          | SC              | +5             | +193           | +6                  | 04(8)               | 9      | 80             | 700            | 320  | -- --  |
| FR   | 49.6N   | 04           | 2054          | SC*             |                |                |                     | 04(8)               | 9      | 100            | 975            | 575  | 08 03  |
| DS   | 43.0N   | 04           | 2054          | SC*             | +8             | +80            | -21                 | 04(8)               | 9      | 58             | 443            | 165  | 07 24  |
| TU   | 40.4N   | 04           | 2054          | SC*             |                |                |                     | 04(8)               | 9      | 66             | 460            | 70   | 07 17  |
| SJ   | 29.9N   | 04           | 2054          | SC              |                |                |                     | 04(8)               | 9      | 20             | 330            | 115  | 04 20  |
| MB   | 21.3N   | 04           | 2053          | SC              | +1.8           | +99            | -6                  | 04(8)               | 9      | 15             | 400            | 60   | 07 03  |
| HO   | 21.1N   | 04           | 2054          | SC*             | +0             | +50            | +25                 | 04(8)               | 8      | 14             | 270            | 104  | 07 10  |
| AL   | 9.5N    | 04           | 2052          | SC              | -1.7           | 85             | -3                  | 04(8)               | 8      | 13             | 295            | 133  | 06 21  |
| HD   | 7.6N    | 04           | 2054          | SC              | -1.1           | +99            | -5                  | 04(8)               | 9      | 11             | 363            | 63   | 07 24  |
| GU   | 4.0N    | 04           | 2054          | SC*             | +2             | +57            | -17                 | 04(8)               | 9      | 20             | 330            | 100  | 07 16  |
| AN   | 1.5N    | 04           | 2052          | SC              | -3.5           | 112            | 52                  | 04                  |        | 15             | 359            | 194  | 06 21  |
| TV   | 1.1S    | 04           | 2052          | SC              | -1.0           | 106            | 122                 | 04                  |        | 12             | 413            | 337  | 06 21  |
| HU   | 0.6S    | 04           | 2054          | SC              | 1              | 142            | 14                  | 05(6)               | 8      | 21             | 530            | 61   | 07 03  |
| PM   | 18.6S   | 04           | 2055          | SC*             | +3.5*          | +65            | +60                 | 04(8)               | 8      | 21             | 340            | 260  | 07 08  |
| HR   | 33.3S   | 04           | 2054          | SC*             | 5*             | 52             | 34                  | 04(8)               | 8      | 58             | 310            | 291  | 07 16  |
| GN   | 43.2S   | 04           | 2055          | SC*             | +15*           | +80            | +70*                | 04(8)               | 9      | 80             | 380            | 390  | 07 10  |
| TO   | 46.7S   | 04           | 2055          | SC              | +6.5           | +70            | +8                  | 04(8)               | 9      | --             | 575            | 210  | 07 15  |
| KG   | 56.5S   | 04           | 2054          | SC*             | 9              | 109            | 24                  | 04(8)               | 9      | 223            | 1835           | 972  | 07 15  |



SC Aug. 4 0220/21

| Obs. | UT   | Y,D          | X,H         | Z   |
|------|------|--------------|-------------|-----|
| RB   | 0220 | <u>+23</u>   | <u>+30</u>  | +20 |
| PB   | 0220 | <u>+157</u>  | <u>+107</u> | +75 |
| MLB  | 0220 | <u>-42</u>   | <u>-181</u> | -15 |
| CB   | 0221 | <u>46</u>    | <u>-92</u>  | +36 |
| BL   | 0221 | <u>-40</u>   | <u>-64</u>  | 29  |
| CH   |      | <u>-55</u>   | <u>-90</u>  | -17 |
| GW   | 0221 | <u>-14.2</u> | <u>-55</u>  | +62 |
| CO   | 0220 | 40           | 240         | 35  |
| ME   | 0220 | -14.4        | +217        | -28 |
| SI   | 0220 |              | +125        |     |
| JO   | 0221 | 3.9          | +70         | +18 |
| OT   | 0221 | +17.3        | +88         | +10 |
| NE   | 0220 | -7           | +135        | 13  |
| VI   | 0220 | -4.7         | +48         | +16 |
| FR   | 0220 | +8           | +85         | -18 |
| BD   | 0220 | +10          | +73         | -25 |
| DS   | 0221 | +7           | +59         | -22 |
| TU   | 0220 | +5           | +55         | +7  |
| SJ   | 0220 | -1           | +55         | +12 |
| MB   | 0221 | -0.4         | +58         | -5  |
| HO   | 0220 | -1           | +25         | +12 |
| HD   | 0220 | -0.2         | +34         | -3  |
| GU   | 0220 | +1           | +48         | -17 |
| HU   | 0220 | 1            | 72          | 10  |
| TO   | 0222 | -2           | +22         | +10 |
| KG   | 0221 | 5            | 50          | 14  |

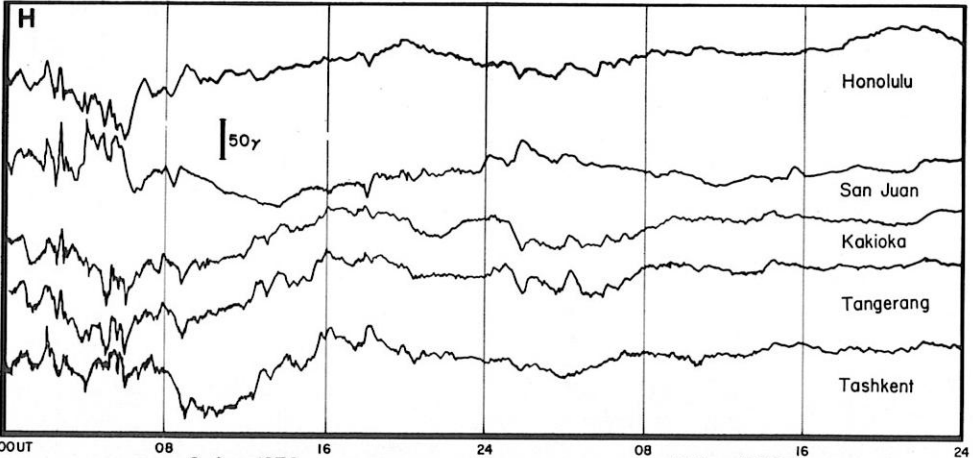
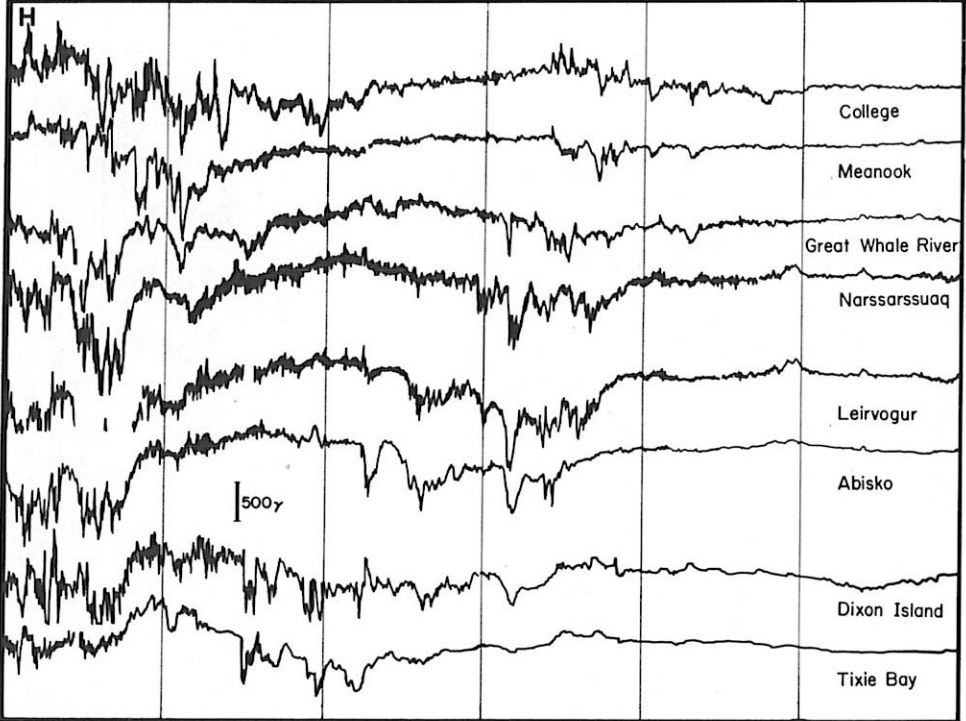
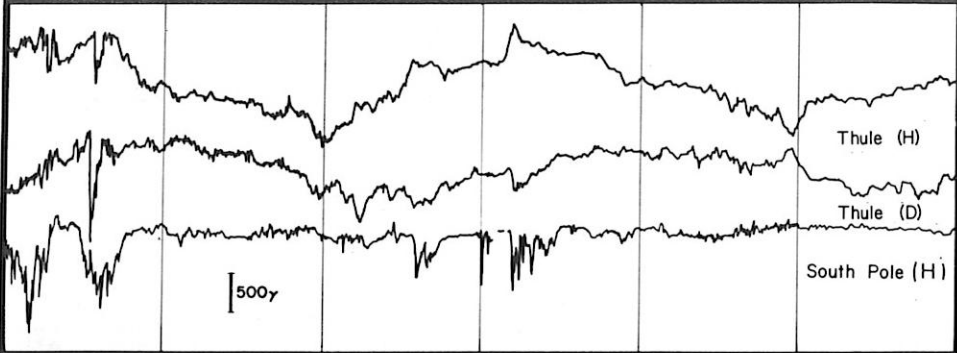
Values underlined are  
for X, Y, in gammas.  
X, Y, H and Z are given  
in gammas, D in minutes.



0000 08 4 Aug 1972 16 24 08 5 Aug 1972 16 24

## THREE-HOUR-RANGE INDICES, K

| AUG | 3         | 4         | 5         | 6         | 7         | 8         | 9         | 10        |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| GO  | 3234 4443 | 5687 8679 | 7776 8695 | 7794 9665 | 6545 6533 | 3233 4434 | 6558 6444 | 3244 5544 |
| BT  | 3344 4554 | 7886 6568 | 8877 8775 | 7766 6764 | 6565 5534 | 4323 4454 | 6877 4465 | 4456 5534 |
| RY  | 2122 2332 | 7884 4569 | 8888 7888 | 8887 6576 | 7764 4434 | 3222 3435 | 7898 4454 | 4233 5436 |
| PH  | 1232 4322 | 6855 9579 | 7767 8786 | 7666 4755 | 4656 4333 | 2212 5444 | 7667 6554 | 3336 5344 |
| TR  | 1111 2221 | 6873 4468 | 6756 6765 | 8875 9675 | 7633 3333 | 2001 3336 | 7676 4445 | 3224 3555 |
| CC  | 1234 3332 | 6774 4568 | 7866 7676 | 7765 9654 | 5454 4433 | 4222 4445 | 7766 5555 | 4334 6525 |
| CO  | 1122 3211 | 5865 5849 | 7757 7975 | 6777 5533 | 4554 4311 | 2101 3323 | 5677 5433 | 3346 4923 |
| MM  | 1112 2221 | 5764 5468 | 6767 7786 | 7775 5776 | 6533 3433 | 2112 3334 | 2112 3334 | 6667 5546 |
| DI  | 2233 4332 | 6955 6579 | 8877 8997 | 9877 7776 | 6654 4444 | 3223 3556 | 7678 5565 | 4236 7766 |
| DO  | 1222 2321 | 5974 5449 | 9867 7976 | 7765 5554 | 6443 4431 | 2222 4333 | 4667 3533 | 2224 5534 |
| WE  | 1121 2212 | 5876 5555 | 7778 7886 | 6677 6653 | 4544 5323 | 1101 3323 | 5778 6543 | 2237 6533 |
| ME  | 1113 2222 | 5765 5459 | 8878 7865 | 7776 5443 | 4755 3323 | 2101 3324 | 5779 5433 | 3246 5333 |
| TI  | 1123 3332 | 8886 7579 | 7878 9998 | 7877 8775 | 4654 4433 | 2223 3442 | 6779 5765 | 3335 7755 |
| SI  | 0112 1111 | 5955 5469 | 9878 7975 | 7787 4442 | 4553 2222 | 2101 2223 | 6895 6333 | 3235 4423 |
| JO  | 0112 2211 | 4983 4359 | 9976 7765 | 6655 3543 | 4433 2422 | 1112 2323 | 3768 4443 | 2233 3333 |
| NU  | 0101 2111 | 4765 5469 | 9877 7964 | 6655 5653 | 4322 3321 | 1001 2323 | 4556 3533 | 1123 5533 |
| OT  | 1123 3221 | 5955 5349 | 8986 6876 | 7786 4454 | 5553 2533 | 1101 2223 | 4879 4433 | 3234 3334 |
| VL  | 1112 3321 | 5764 5458 | 6656 6654 | 6664 4564 | 4323 3421 | 1012 3334 | 4557 5434 | 2224 4334 |
| VI  | 1113 2212 | 6886 5459 | 7876 6775 | 6776 3343 | 5543 4423 | 3101 2324 | 6677 5333 | 3244 4333 |
| DB  | 1202 2221 | 5764 5468 | 7766 7755 | 6654 4563 | 4323 3422 | 2002 3334 | 4557 3434 | 2123 4434 |
| YA  | 4323 3232 | 6874 4459 | 7777 8786 | 7765 7554 | 5444 4223 | 2312 4433 | 6779 5544 | 4435 6443 |
| MG  | 2222 2222 | 5774 4469 | 7775 5654 | 6654 5443 | 4444 4223 | 2121 3333 | 5667 4333 | 3334 4433 |
| FR  | 1111 2211 | 6764 4369 | 8876 7865 | 6665 3454 | 4533 2523 | 1101 3224 | 5666 3333 | 2233 3334 |
| SV  | 0111 2111 | 4774 4468 | 7776 7854 | 5654 4553 | 4433 3322 | 1101 3322 | 4556 3423 | 3235 4423 |
| KV  | 1223 3321 | 5865 5478 | 7776 7765 | 6665 4563 | 4333 3431 | 1133 3334 | 5557 4533 | 2334 4534 |
| TL  | 0111 1010 | 5753 3348 | 7655 6744 | 6653 3453 | 3212 1211 | 0000 1224 | 4337 3433 | 1132 3333 |
| DS  | 1123 2212 | 6864 5369 | 7876 6776 | 7774 4464 | 5433 2623 | 2101 3224 | 5667 3344 | 3233 4334 |
| IR  | 2332 2222 | 4975 5449 | 8666 5864 | 7864 5443 | 5543 2212 | 2432 2333 | 5567 4334 | 4444 4433 |
| TU  | 1112 2211 | 6764 4459 | 7866 5655 | 7774 3353 | 5433 3633 | 2100 2224 | 5567 3333 | 3233 3334 |
| KD  | 0231 2110 | 3764 4457 | 5745 6743 | 5543 4443 | 3422 2210 | 1122 2220 | 3555 3322 | 1214 4323 |
| IK  | 1111 1211 | 5854 5479 | 7766 7765 | 7644 4563 | 4223 2422 | 1101 2225 | 4547 3433 | 1113 3333 |
| MT  | 1112 1111 | 5664 4369 | 7776 7854 | 5653 4132 | 4433 3212 | 1101 3312 | 5657 3223 | 2134 3323 |
| VK  | 3333 2232 | 5664 4468 | 6775 6765 | 6654 5443 | 4433 3223 | 4332 3333 | 5657 4334 | 5434 4335 |
| TK  | 0123 2211 | 5774 5449 | 7776 8864 | 6644 5553 | 3343 3222 | 2333 3334 | 4668 5443 | 3243 4323 |
| KS  | 1011 1110 | 6875 5589 | 7776 8765 | 7654 4563 | 4333 2222 | 1001 2225 | 5667 3533 | 2122 3322 |
| SJ  | 0001 1100 | 5754 5469 | 6755 5665 | 6644 3343 | 4332 3422 | 1001 2124 | 5566 3332 | 2233 3324 |
| TA  | 1211 0121 | 5764 5479 | 7666 6755 | 7653 3453 | 4333 1412 | 1101 2225 | 5447 3443 | 3213 3333 |
| QU  | 1332 1110 | 4664 4367 | 6775 6754 | 6543 4442 | 2333 2211 | 1110 2224 | 3557 4432 | 3323 3223 |
| HO  | 1111 1222 | 5763 3358 | 6666 6654 | 5564 3343 | 3333 2112 | 2101 2224 | 5666 3323 | 2123 3223 |
| KY  | 1112 1111 | 5663 4369 | 7876 7754 | 6653 3332 | 4332 3212 | 1101 3313 | 5657 3222 | 2123 3323 |
| AL  | 1212 2111 | 4664 4368 | 6776 7753 | 6543 4441 | 2333 2122 | 1212 2224 | 3648 3423 | 2233 3223 |
| BA  | 1222 1211 | 5664 4565 | --66 6--5 | 6644 3353 | 4433 3322 | 1202 2224 | 4446 --43 | 3233 3333 |
| GU  | 1112 1111 | 6763 4269 | 7776 6754 | 6553 4432 | 4432 2112 | 2101 2313 | 5657 4322 | 3123 3212 |
| HU  | 0111 3221 | 5775 4568 | 6655 7865 | 5653 4453 | 4311 3632 | 1011 3324 | 5555 5533 | 2233 4433 |
| LU  | 1111 1100 | 4653 3458 | 6664 6654 | 5533 3432 | 3221 2311 | 0011 2214 | 4436 5544 | 4433 4433 |
| PP  | 1112 1012 | 4764 3267 | 6665 5544 | 5664 3333 | 3332 1111 | 1000 1122 | 4655 4233 | 2122 2112 |
| PH  | 2212 2111 | 5664 4368 | 7776 6764 | 6584 4442 | 4432 3222 | 1111 3321 | 5667 5422 | 2343 3223 |
| TN  | 2231 2000 | 5653 3447 | 6665 6644 | 6543 3442 | 3233 1222 | 0233 1213 | 4346 3443 | 3123 3332 |
| AC  | 1111 2210 | 5764 4569 | 7765 6766 | 6653 3443 | 5222 2512 | 1101 2214 | 5555 3422 | 2223 3324 |
| TW  | 0111 1210 | 5764 5358 | 6765 6765 | 5654 3343 | 5322 3322 | 1101 2323 | 5566 3423 | 2223 3423 |
| HR  | 0000 0100 | 5653 3458 | 7766 6755 | 6663 2553 | 4322 2311 | 0001 2114 | 5567 3533 | 2122 3224 |
| GN  | 0111 1110 | 5863 4369 | 7767 7764 | 6754 6542 | 4333 3121 | 1000 2214 | 5557 4433 | 2234 4324 |
| TO  | 0112 2210 | 4663 3359 | 6666 6765 | 6554 5442 | 5443 3111 | 2100 3322 | 5557 5332 | 3234 4223 |
| AM  | 0112 1200 | 5663 4359 | 7766 6665 | 6665 3342 | 4543 3211 | 1100 2214 | 5566 4222 | 2234 3222 |
| MI  | 1112 3111 | 4766 5458 | 6878 7877 | 6776 6555 | 4544 5212 | 2111 2222 | 6667 6445 | 3347 6334 |
| NL  | 1011 0100 | 6884 4469 | 9877 7866 | 9866 5464 | 5553 2122 | 1101 1223 | 5898 4344 | 3222 3335 |
| MW  | 1212 2222 | 6786 5569 | 7766 7676 | 9886 5777 | --64 3245 | 3211 3345 | 7786 4466 | 3344 5466 |
| MY  | 1222 2222 | 5887 5479 | 8877 5575 | 6754 3783 | 5444 3344 | 3233 3463 | 5776 3553 | 3443 3334 |
| SB  | 1102 2222 | 5756 5679 | 6654 5665 | 5753 3443 | 7433 3332 | 3112 3443 | 6767 4332 | 3243 3242 |
| VO  | 1222 2222 | 5766 5567 | 7765 6665 | 7754 4443 | 5443 5333 | 3222 3334 | 6666 4343 | 3234 3333 |



## Indices

| Indices | 7  |                         |   |  |  |  | 8        |  |  |  |  |  | 9        |  |  |  |  |  | 10       |  |  |  |  |  |
|---------|--|-------------------------|---|--|--|--|----------|--|--|--|--|--|----------|--|--|--|--|--|----------|--|--|--|--|--|
| UT      | 06 12 18   |                         |   |  |  |  | 06 12 18 |  |  |  |  |  | 06 12 18 |  |  |  |  |  | 06 12 18 |  |  |  |  |  |
| Kp      | 5- 4+ 3+ 3- 4o 2o  | 1+ 1- 0+ 1- 3- 2+ 2+ 4+ | 5- 7- 7- 8+ 4o 4+ 3+ 3+ 2+ 2- 3- 3+ 4+ 4o 3o 4o |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |
| 3Kn     | 13 12 9 9 8 12 7 8 5 3 1 3 9 8 7 11 14 17 17 20 10 11 9 10 7 5 9 10 11 11 9 11 |                         |   |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |
| 3Ks     | 4 11 10 8 7 7 4 3 3 1 0 1 5 5 3 10 14 16 17 20 10 11 8 9 6 5 7 9 10 8 8 10     |                         |   |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |
| Dst     |  |                         |   |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |          |  |  |  |  |  |

Data from Individual Observatories:

August 1972

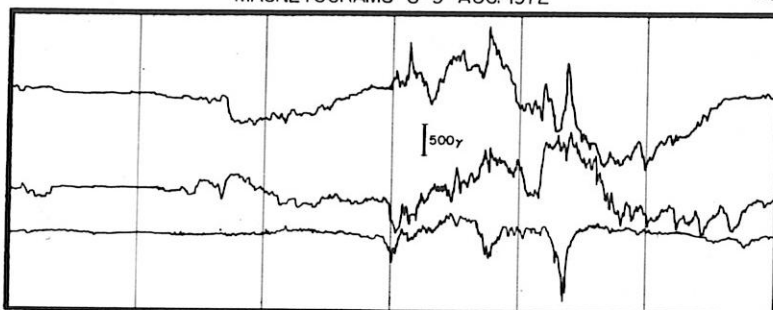
Values underlined are for X and Y.  
X, Y, H and Z are given in gammas,  
D in minutes.

| Obs. | Geomag.<br>lat. | Commencement  |      | SC - amplitudes |         |       | Max. 3 hr - index K |           | Ranges |      |      | UT End |       |
|------|-----------------|---------------|------|-----------------|---------|-------|---------------------|-----------|--------|------|------|--------|-------|
|      |                 | day h.m. (UT) | type | Y,D             | X,H     | Z     | day (3 hr - period) | K         | Y,D    | X,H  | Z    | day hr |       |
| RB   | 83.1N           | 08            | 2353 | SC*             | -34     | -24   | -10                 | 09(3)     |        | 1106 | 1066 | 1040   | 10 02 |
| PB   | 83.0N           | 08            | 2354 | SC              | +56     | +325  | +21                 | 09(4)     | 7      | 1475 | 1285 | 661    | 10 06 |
| MLB  | 79.1N           | 08            | 2354 | SC              | +30     | -168  | -52                 | 09(1,1,3) |        | 1184 | 1248 | 888    | 10 03 |
| CB   | 76.7N           | 08            | 2354 | SC              | 138     | -152  | -15                 | 09(4)     |        | 1214 | 1050 | 1344   | 10 02 |
| BL   | 73.9N           | 08            | 2354 | SC              | -121    | -104  | -106                | 09(4)     |        | 824  | 1064 | 1144   | 10 02 |
| CH   | 68.8N           | 08            | 2354 | SC              | -22     | -13   | -86                 | 09(4)     |        | 1120 | 2064 | 992    | 10 03 |
| GW   | 66.8N           | 08            | 2354 | SC*             | 16.9    | 54    | +130                | 09(4)     |        | 372  | 1720 | 2088   | 10 02 |
| CO   | 64.6N           | 08            | 2354 | SC*             | 19      | -125  | 40                  | 09(3,4)   | 7      | 355  | 2050 | 1010   | 12 05 |
| ME   | 61.9N           | 08            | 2354 | SC*             | +21.9*  | +116* | +24*                | 09(4)     | 9      | 260  | 2315 | 1728   | 10 02 |
| SI   | 60.0N           | 08            | 2354 | SC*             | +       | +55   | -20                 | 09(3,4)   | 9      | 170  | 2470 | 870    | 10 01 |
| JO   | 58.7N           | 08            | 2354 | SC              | 3.1     | +20   | +20                 | 09(4)     | 8      | 94   | 608  | 560    | 10 01 |
| OT   | 57.0N           | 08            | 2354 | SC              | 5.4     | +25   | -14                 | 09(4)     | 9      | 136  | 1036 | 731    | 10 02 |
| NE   | 55.1N           | 08            | 2354 | SC              | --      | --    | --                  | 09(3,4)   | 8      | 100  | 590  | 847    | 11 05 |
| VI   | 54.3N           | 08            | 2354 | SC*             | 3.8*    | +6    | -8*                 | 09(3,4)   | 7      | 83   | 262  | 356    | 10 02 |
| WI   | 54.1N           | 08            | 2354 | SC              | -2      | +40   | 0                   | 09(4)     | 8      | 30   | 450  | 100    | 09 22 |
| FR   | 49.6N           | 08            | 2354 | SC*             | +4      | +50   | -8                  | 09(3)     | 6      | 30   | 225  | 180    | 10 06 |
| BD   | 49.0N           | 08            | 2354 | SC              | -1      | +33   | -5                  | 09(4)     | 7      | 47   | 220  | 175    | 12 06 |
| DS   | 43.0N           | 08            | 2354 | SC*             | +1      | --    | -3                  | 09(4)     | 7      | 22   | 210  | 62     | 12 06 |
| TU   | 40.4N           | 08            | 2354 | SC              |         |       |                     | 09(4)     | 7      | 19   | 180  | 30     | 10 02 |
| SJ   | 29.9N           | 08            | 2353 | SC              | -0      | +20   | +3                  | 09(3)     | 6      | 09   | 130  | 25     | 09 12 |
| MB   | 21.3N           | 08            | 2353 | SC              | 0       | +26   | <-2                 | 09(4)     | 6      | 8    | 119  | 32     | 10 03 |
| HO   | 21.1N           | 08            | 2354 | SC*             | +0      | +17   | +8                  | 09(4)     | 6      | 11   | 198  | 46     | 09 22 |
| AL   | 9.5N            | 08            | 2351 | SC              | -0.4    | 21    | -3                  | 08(4)     | 8      | 6    | 251  | 54     | 09 20 |
| HD   | 7.6N            | 08            | 2353 | SC              | -0.2    | +24   | -1                  | 09(4)     | 8      | 5    | 301  | 40     | 09 22 |
| GU   | 4.0N            | 08            | 2353 | SC              | --      | +20   | -6                  | 09(4)     | 7      | 6    | 320  | 30     | 09 20 |
| AN   | 1.5N            | 08            | 2351 | SC              | -0.9    | 30    | 16                  | 08        |        | 4    | 337  | 140    | 09 20 |
| TV   | 1.1S            | 08            | 2351 | SC              | 0       | 24    | 35                  | 08        |        | 4    | 359  | 213    | 09 20 |
| HU   | 0.6S            | 08            | 2353 | SC              | 1       | 35    | 5                   | 09(4,5,6) | 5      | 9    | 215  | 43     | 09 21 |
| AP   | 16.1S           | 08            | 2353 | SC              | +0      | +16   | -9                  | 09(4)     | 6      | 6    | 227  | 41     | 11 12 |
| PM   | 18.6S           | 08            | 2355 | SC              | -0.1    | +18   | +9                  | 09(4)     | 7      | 9    | 300  | 140    | 10 19 |
| HR   | 33.3S           | 08            | 2354 | SC              | +1      | +21   | +11                 | 09(4)     | 7      | 35   | 226  | 177    | 09 22 |
| GN   | 43.2S           | 08            | 2355 | SC*             | +4*     | +8    | +20*                | 09(4)     | 7      | 20   | 240  | 170    | 10 00 |
| TO   | 46.7S           | 08            | 2354 | SC*             | +1.8    | -16   | 0                   | 09(4)     | 7      | 38   | 210  | 140    | 10 15 |
| KG   | 56.5S           | 08            | 2354 | SC              | 4       | 20    | 3                   | 09(4)     | 7      | 51   | 640  | 345    | 10 04 |
| RB   | 83.1N           | 09            | 0036 | SC*             | -188*   | 196   | +41                 |           |        |      |      |        |       |
| PB   | 83.0N           | 09            | 0037 | SC              | +198    | +232  | +146                |           |        |      |      |        |       |
| MLB  | 79.1N           | 09            | 0037 | SC*             | +173*   | +340* | +33                 |           |        |      |      |        |       |
| CB   | 76.7N           | 09            | 0036 | SC*             | -220.8* | +130  | +56                 |           |        |      |      |        |       |
| BL   | 73.9N           | 09            | 0037 | SC              | -201*   | -136  | +133                |           |        |      |      |        |       |
| CH   | 68.8N           | 09            | 0038 | SC              | -101    | -188  | -86                 |           |        |      |      |        |       |
| GW   | 66.8N           | 09            | 0037 | SC*             | -148.3* | -122  | -115                |           |        |      |      |        |       |
| CO   | 64.6N           | 09            | 0037 | SC*             | 30      | 520   | 60                  |           |        |      |      |        |       |
| ME   | 61.9N           | 09            | 0037 | SC*             | -24.2*  | +286  | 69                  |           |        |      |      |        |       |
| SI   | 60.0N           | 09            | 0037 | SC              | --      | --    | --                  |           |        |      |      |        |       |
| JO   | 58.7N           | 09            | 0037 | SC              | -2.3    | +52   | +52                 |           |        |      |      |        |       |
| OT   | 57.0N           | 09            | 0037 | SC*             | +10.8*  | +94   | +19                 |           |        |      |      |        |       |
| NE   | 55.1N           | 09            | 0037 | SC              | --      | --    | --                  |           |        |      |      |        |       |
| VI   | 54.3N           | 09            | 0037 | SC*             | -8.5    | -15*  | +24                 |           |        |      |      |        |       |
| FR   | 49.6N           | 09            | 0037 | SC              | +6      | +100  | -15                 |           |        |      |      |        |       |
| BD   | 49.0N           | 09            | 0037 | SC              | -4      | +60   | -12                 |           |        |      |      |        |       |
| TU   | 40.4N           | 09            | 0037 | SC              | -2      | +70   | +5                  |           |        |      |      |        |       |
| DS   | 43.0N           | 09            | 0037 | SC*             | +3      | +80   | -6                  |           |        |      |      |        |       |
| SJ   | 29.9N           | 09            | 0037 | SC              | -1      | +35   | +9                  |           |        |      |      |        |       |
| MB   | 21.3N           | 09            | 0037 | SC*             | 0.2     | +42   | <-2                 |           |        |      |      |        |       |
| HO   | 21.1N           | 09            | 0037 | SC*             | -1      | +30   | +20                 |           |        |      |      |        |       |
| HD   | 7.6N            | 09            | 0037 | SC              | -0.1    | +18   | -1                  |           |        |      |      |        |       |
| GU   | 4.0N            | 09            | 0037 | SC              | 0       | +42   | -12                 |           |        |      |      |        |       |
| HU   | 0.6S            | 09            | 0037 | SC              | 1       | 66    | 8                   |           |        |      |      |        |       |
| TO   | 46.7S           | 09            | 0037 | SI              | -7      | +23   | 0                   |           |        |      |      |        |       |
| KG   | 56.5S           | 09            | 0037 | SC              | 6       | 20    | 3                   |           |        |      |      |        |       |

Thule (H)

Thule (D)

South Pole(H)



College

Meanook

Great Whale River

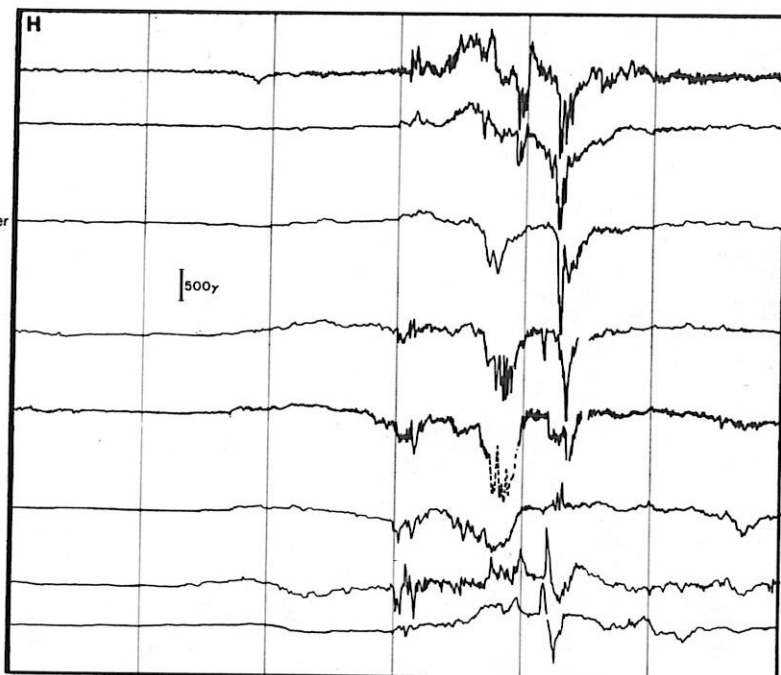
Narsarsuaq

Leirvogur

Abisko

Dixon Island

Tixie Bay



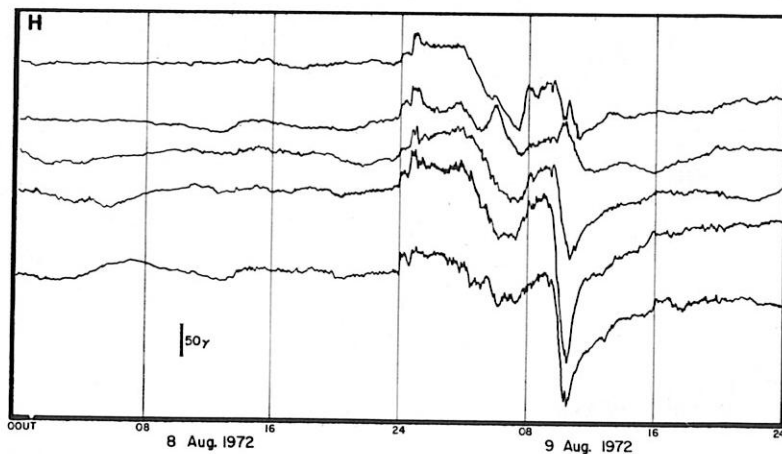
Honolulu

San Juan

Kakioka

Tangerang

Tashkent





| Indices | 12                      |  |  |    |    |    | 13 |    |    |    |    |    | 14 |    |    |    |    |    | 15 |    |    |    |    |    |
|---------|-------------------------|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|         | 06                      | 12   | 18                                     | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 |
| UT      |                         |  |  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Kp      | 1+ 3- 2o 2- 1o 1- 1- 0+ | 1o 2- 3- 1+ 7- 6- 7+ 6- 7- 8o 5-                             | 1+ 2- 3+ 4o 3+ 3+ 5- 4- 5o 4o 3o 2+ 3+ |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3Kn     | 3 8 7 7 4 3 2 1         | 2 4 8 4 17 14 17 15 16 20 11 5 6 9 11 9 9 13 10 13 10 8 8 10 |  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 3Ks     | 6 6 7 5 2 1 0 0         | 2 3 8 4 14 14 18 15 17 20 12 4 6 8 10 8 9 12 10 13 8 8 6 11  |  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Dst     |                         |  |  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

## Data from Individual Observatories:

September 1972

| Obs. | Geomag.<br>lat. | Commencement  |      | SC - amplitudes |      |      | Max. 3 hr - index K |   | Ranges |      |      | UT End |
|------|-----------------|---------------|------|-----------------|------|------|---------------------|---|--------|------|------|--------|
|      |                 | day h.m. (UT) | type | D(°)            | H(γ) | Z(γ) | day (3 hr - period) | K | D(°)   | H(γ) | Z(γ) | day hr |
| FB   | 83.0N           | 13 1240       | SC   | -               | -    | -    | 13(7)               | 6 | 346    | 1060 | 654  | 14 12  |
| CO   | 64.6N           | 13 1240       | SC*  | + 5             | 100  | -80  | 13(7)               | 7 | 175    | 1320 | 1030 | 14 08  |
| SI   | 60.0N           | 13 1240       | SC*  | - 5             | +90  | +15  | 14(2)               | 9 | 150    | 1420 | 820  | 14 08  |
| NE   | 55.1N           | 13 1240       | SC*  | -10             | 85   | + 3  | 14(2)               | 9 | 126    | 783  | 624  | 14 09  |
| VI   | 54.3N           | 13 1240       | SC*  | - 8.4           | +72  | +24  | 14(2)               | 9 | 106    | 590  | 592  | 14 08  |
| WI   | 54.1N           | 13 1240       | SC*  | 3*              | 65*  | 0    | 13(5)               | 7 | 50     | 230  | 160  | 14 07  |
| FR   | 49.6N           | 13 1240       | SC*  | - 4             | +36  | - 6  | 14(2)               | 8 | 66     | 173  | 175  | 14 09  |
| BD   | 49.0N           | 13 1240       | SC*  | - 7             | +57  | - 3  | 14(2)               | 7 | 55     | 270  | 120  | 14 10  |
| DS   | 43.0N           | 13 1240       | SC*  | - 0.3           | +59  | + 7  | 14(2)               | 7 | 36     | 229  | 59   | 14 12  |
| IR   | 40.8N           | 13 1240       | SC*  | 5.6             | 86   | 9    | 13(5,7)             | 7 | 26     | 333  | 70   | 14 08  |
| TU   | 40.4N           | 13 1240       | SC*  | - 3             | +65  | + 3  | 14(2)               | 7 | 30     | 250  | 30   | 18 12  |
| SJ   | 29.9N           | 13 1240       | SC   | - 1             | +30  | +03  | 13(7)               | 7 | 15     | 200  | 40   | 14 07  |
| MB   | 21.3N           | 13 1240       | SC*  | - 2.7           | +61  | + 9  | 13(7)               | 7 | 5      | 141  | 40   | 14 09  |
| HO   | 21.1N           | 13 1240       | SC   | + 0             | +47  | +18  | 13(7)               | 6 | 15     | 260  | 50   | 14 12  |
| AL   | 9.5N            | 13 1240       | SC   | - 1.2           | 42   | -12  | 13(5)               | 7 | 4      | 186  | 40   | 14 08  |
| HD   | 7.6N            | 13 1239       | SC   | - 0.9           | +56  | - 2  | 13(5,7)             | 7 | 5      | 207  | 39   | 14 12  |
| GU   | 4.0N            | 13 1240       | SC   | --              | +53  | -16  | 13(5)               | 7 | 6      | 230  | 50   | 14 08  |
| AN   | 1.5N            | 13 1240       | SC   | - 1.8           | +68  | +39  | --                  | 7 | 4      | 220  | 101  | 14 08  |
| TV   | 1.1S            | 13 1240       | SC   | + 0.5           | +49  | +49  | --                  | 7 | 11     | 210  | 164  | 14 08  |
| HU   | 0.6S            | 13 1240       | SC   | 4               | 119  | 11   | 13(5,6,7)           | 7 | 1      | 476  | 46   | 14 07  |
| AP   | 16.1S           | 13 1240       | SC   | 0               | +62  | -16  | 13(5) 14(2)         | 6 | 10     | 249  | 48   | 15 13  |
| PM   | 18.6S           | 13 1240       | SC   | + 0.5           | +60  | +51  | 13(5)               | 7 | 08     | 240  | 110  | 18 12  |
| HR   | 33.3S           | 13 1240       | SC*  | 5               | 50   | 47   | 13(5,7)             | 6 | 29     | 200  | 227  | 14 06  |
| GN   | 43.2S           | 13 1240       | SC   | + 3             | +46  | +15  | 13(5,7)             | 6 | 26     | 230  | 130  | 16 06  |
| TO   | 46.7S           | 13 1241       | SC*  | - 2             | +75  | +15  | 13(5,7) 14(2)       | 6 | 35     | 280  | 125  | 14 12  |
| KG   | 57.3S           | 13 1240       | SC*  | 04              | 66   | 20   | 13(7)               | 8 | 141    | 1130 | 465  | 14 22  |

## THREE-HOUR-RANGE INDICES, K

| SEP | 12        | 13        | 14        | 15        |
|-----|-----------|-----------|-----------|-----------|
| GO  | 2223 3221 | 2233 6664 | 4732 4433 | 4444 4434 |
| BT  | 3333 3322 | 2333 6574 | 6653 3664 | 4555 5465 |
| RY  | 4422 2223 | 4322 5686 | 7952 3466 | 6664 3447 |
| PB  | 2355 5211 | 1353 6565 | -----     | 3456 5443 |
| TR  | 2111 2012 | 2111 6576 | 5832 2365 | 5443 3336 |
| CC  | 2213 3212 | 2123 5475 | 5532 2444 | 4446 5355 |
| CO  | 1144 3100 | 0142 6574 | 6441 4432 | 3557 6432 |
| MM  | 1111 2111 | 1111 6687 | 6832 2465 | 4444 4437 |
| DI  | 2323 2232 | 1132 6697 | 6753 3765 | 6555 5666 |
| DO  | 0122 2111 | 2122 6688 | 8932 3434 | 3334 3424 |
| WE  | 1133 3010 | 1131 76-5 | 5762 3432 | 3457 7332 |
| ME  | 1353 2220 | 1351 7564 | 6852 2332 | 3557 6333 |
| TI  | 1224 3222 | 1123 6698 | 4752 5663 | 3456 ---- |
| SI  | 0233 2100 | 0252 7674 | 6951 1322 | 2657 6323 |
| JO  | -----     | -----     | -----     | -----     |
| NU  | 0111 1100 | 0011 6577 | 6632 2453 | 2323 2333 |
| OT  | 2422 1111 | 1331 5475 | 6971 1233 | 4544 4323 |
| VL  | 1222 2211 | 1122 5565 | 5632 3344 | 3324 3223 |
| VI  | 0433 2100 | 1342 5575 | 4962 2222 | 3645 4324 |
| OB  | 1211 0101 | 1112 6565 | 6631 1344 | 3324 3224 |
| YA  | 1234 4112 | 3132 6497 | 5752 4555 | 4447 5445 |
| MG  | 3334 3113 | 2332 6566 | 5642 3444 | 3446 4334 |
| FR  | 2432 0210 | 1231 5554 | 6841 1232 | 4534 3223 |
| SV  | 0111 1000 | 0021 6465 | 5632 2443 | 2334 3333 |
| KV  | 1223 2221 | 1212 7576 | 6642 3454 | 3335 4334 |
| TL  | 0120 0010 | 0010 6465 | 4620 0343 | 2323 2324 |
| DS  | 1432 1110 | 1241 6565 | 6741 1232 | 4544 3324 |
| IR  | 2323 3111 | 2233 7576 | 5533 3443 | 3445 4433 |
| TU  | 1332 0110 | 1232 6564 | 6751 2232 | 4545 3324 |
| KD  | 0202 3001 | 1101 4354 | 2400 2333 | 1022 3123 |

## THREE-HOUR-RANGE INDICES, K

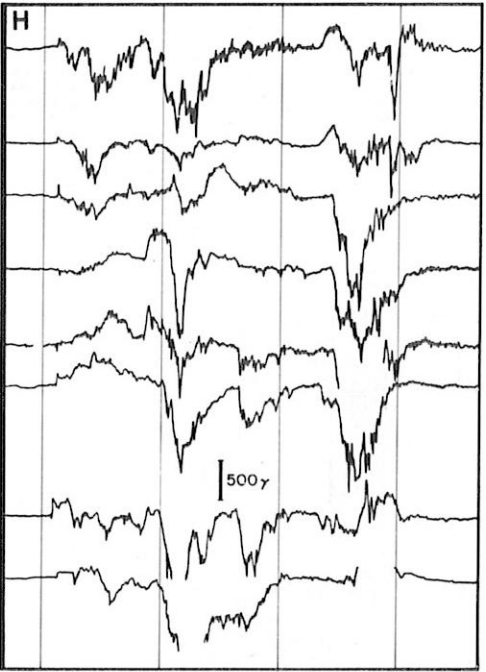
| SEP | 12        | 13        | 14        | 15        |
|-----|-----------|-----------|-----------|-----------|
| IK  | 1111 1110 | 0111 7576 | 5521 1354 | 2434 3324 |
| MT  | 1113 2000 | 0022 6565 | 5521 2232 | 2334 3322 |
| VK  | 3323 3112 | 3333 7576 | 5643 3333 | 3435 5335 |
| TK  | 1110 1100 | 0122 7576 | 5532 1342 | 2334 3332 |
| KS  | 0211 1000 | 0111 8688 | 5722 1454 | 2334 3335 |
| SJ  | 1220 0000 | 1130 5475 | 4631 1132 | 3333 2213 |
| TA  | 1111 1111 | 1112 6465 | 5631 1243 | 2333 3224 |
| QU  | 1310 2100 | 1123 7465 | 4533 2332 | 2433 4322 |
| HO  | 0132 2110 | 0021 5463 | 5641 1232 | 2434 3213 |
| KY  | 1112 2000 | 0022 7565 | 5421 2331 | 2334 3322 |
| AL  | 1221 1111 | 1122 7565 | 4532 1342 | 2434 4323 |
| BA  | 1222 2121 | 1222 64-- | 4621 1343 | 3334 2224 |
| GU  | 1113 2010 | 1122 7453 | 5542 2222 | 2324 3323 |
| HU  | 1222 2321 | 2131 7775 | 5553 4432 | 2323 3532 |
| LU  | 0101 1100 | 0001 6566 | 5555 5554 | 4433 3223 |
| PP  | 0222 0000 | 0121 5353 | 5541 0121 | 1334 2110 |
| PM  | 2213 2011 | 1133 7553 | 5553 2222 | 3335 3323 |
| TN  | 1122 1100 | 0122 6443 | 2233 3232 | 1323 4212 |
| AC  | 1221 1210 | 1221 6575 | 4630 1132 | 3323 3324 |
| TW  | 1222 1211 | 2231 5575 | 4642 3232 | 4323 3324 |
| HR  | 1111 0000 | 0022 6565 | 5622 2244 | 2334 3224 |
| GN  | 1122 2000 | 1120 6464 | 6531 3542 | 3435 3333 |
| TO  | 1233 2000 | 0032 6464 | 5632 3332 | 3435 3332 |
| AM  | 1133 2000 | 1132 5363 | 6421 2221 | 2445 3212 |
| MI  | 1235 3000 | 1131 6684 | 5651 3432 | 2457 6422 |
| NL  | 2210 0101 | 2222 4476 | 7952 1244 | 5543 2225 |
| MW  | 2432 1114 | 2222 7585 | 4963 1577 | 4564 4436 |
| MY  | 3433 2111 | 2332 4363 | 4553 2533 | 4343 4343 |
| SB  | 2221 1211 | 1221 4454 | 4431 1202 | 3533 3322 |
| VO  | 2322 2112 | 2223 5353 | 4532 2233 | 4433 3323 |



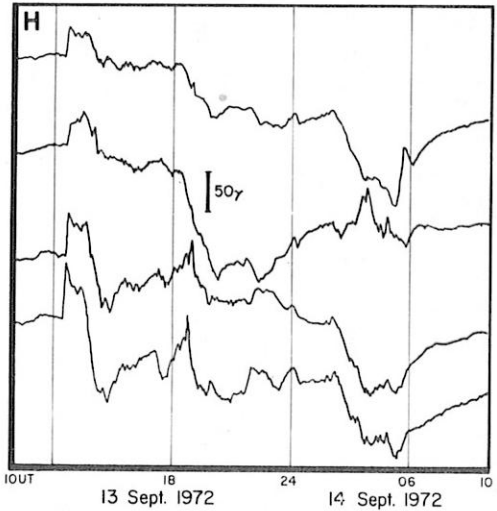
Thule (H)  
Thule (D)  
South Pole(H)



College  
Meanook  
Great Whale River  
Narssarssuaq  
Leirvogur  
Abisko  
Dixon Island  
Tixie Bay



Honolulu  
San Juan  
Kakioka  
Tangerang



## Indices

| UT  | 31                                |                                   |   | 1  |    |    | 2  |    |    | 3  |    |    |
|-----|-----------------------------------|-----------------------------------|---|----|----|----|----|----|----|----|----|----|
|     | 06                                | 12                                | 18  | 06 | 12 | 18 | 06 | 12 | 18 | 06 | 12 | 18 |
| Kp  | 3- 2- 10 0+ 10 5+ 7- 5-           | 8- 80 8- 6+ 5+ 20 5- 40           | 6- 5+ 4- 3+ 30 5+ 50 5+ 5+ 3+ 3- 2- 0+ 0+ 1+ 1+ |    |    |    |    |    |    |    |    |    |
| 3Kn | 7 4 3 0 3 14 18 13 18 19 18 17 14 | 7 12 11 14 13 10 9 8 15 13 13 14  | 9 7 7 5 1 1 4 4                                 |    |    |    |    |    |    |    |    |    |
| 3Ks | 7 4 2 0 1 14 18 14 17 20 18 17 16 | 8 13 14 15 14 11 10 8 13 14 13 12 | 9 7 4 2 1 3 3                                   |    |    |    |    |    |    |    |    |    |
| Dat |                                   |                                   |   |    |    |    |    |    |    |    |    |    |

## Data from Individual Observatories:

October 1972

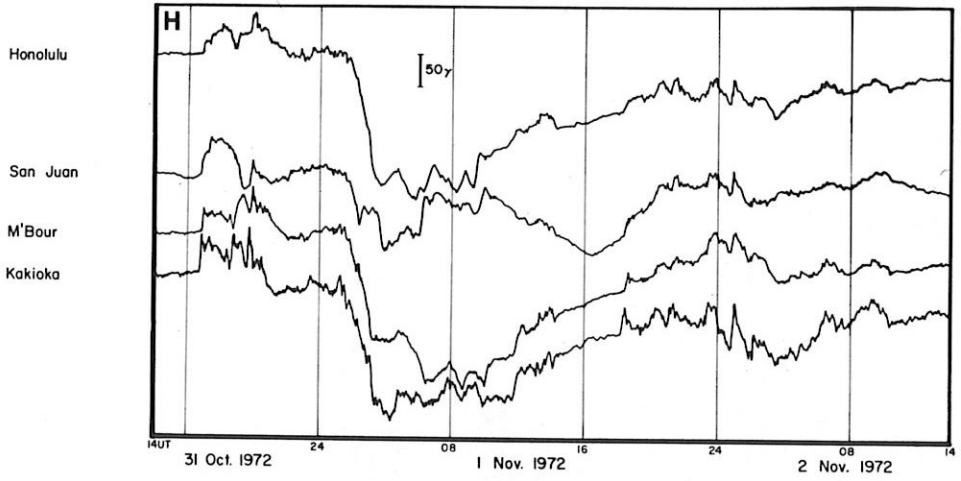
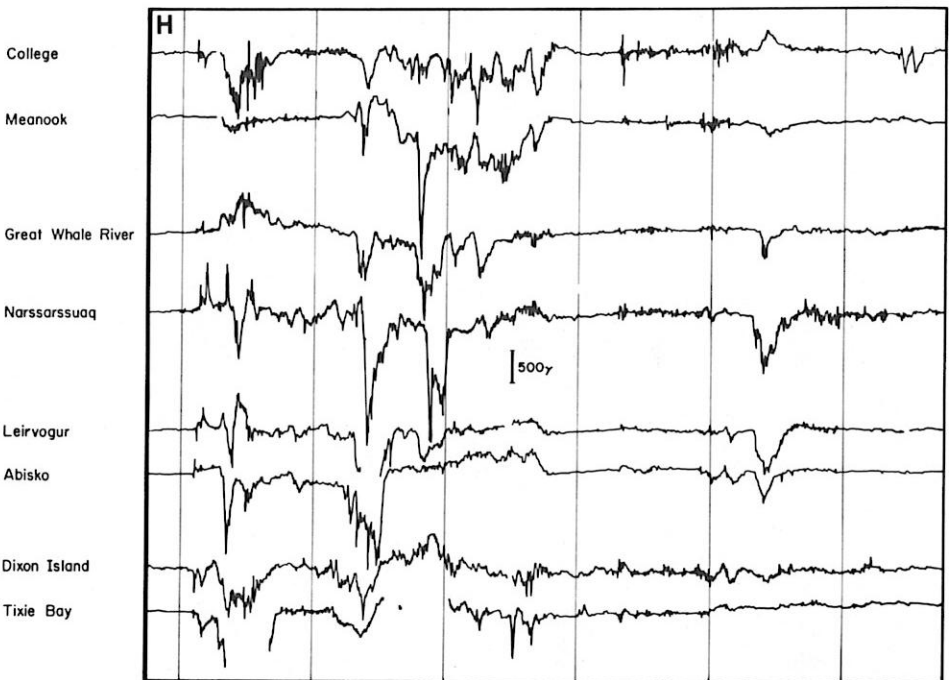
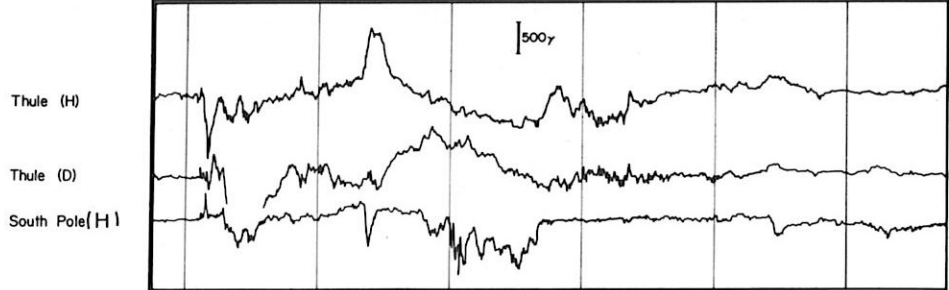
| Obs. | Geomag.<br>lat. | Commencement  |      | SC - amplitudes |      |      | Max. 3 hr - index K     |   | Ranges |      |      | UT End<br>day hr |
|------|-----------------|---------------|------|-----------------|------|------|-------------------------|---|--------|------|------|------------------|
|      |                 | day h.m. (UT) | type | D(')            | H(Y) | Z(Y) | day (3 hr - period)     | K | D(')   | H(Y) | Z(Y) |                  |
| CB   | 83.0N           | 31 1654       | SC*  | -112            | +174 | -68  | 31(7)                   | 8 | -      | -    | 612  | 03 13            |
| CO   | 64.6N           | 31 1654       | SC*  | -72             | -450 | -48  | 31(7)                   | 7 | 195    | 1450 | 1240 | 03 12            |
| SI   | 60.0N           | 31 1655       | SC*  | -16*            | +100 | +10  | 01(2)                   | 9 | 130    | 2170 | 1380 | 02 07            |
| NE   | 55.1N           | 31 1654       | SC   | --              | --   | --   | 01(2,3,4)               | 8 | 140    | 1457 | 827  | 01 15            |
| VI   | 54.3N           | 31 1654       | SC   | -9              | +41  | +25  | 01(2,3,4)               | 8 | 130    | -    | 1060 | 03 07            |
| WI   | 54.1N           | 31 1654       | SC*  | +11*            | +60* | +3   | 01(2)                   | 7 | 45     | 285  | 185  | 03 02            |
| FR   | 49.6N           | 31 1654       | SC*  | +9              | +30  | -9   | 01(2)                   | 7 | 55     | 245  | 345  | 03 06            |
| ED   | 49.0N           | 31 1655       | SC*  | +9              | --   | -10  | 01(3)                   | 7 | 45     | 225  | 250  | 03 10            |
| DS   | 43.0N           | 31 1655       | SC*  | +5              | +33  | -15  | 01(3)                   | 7 | 29     | 229  | 86   | 03 12            |
| TU   | 40.4N           | 31 1654       | SC*  | +3              | +25  | +3   | 01(3)                   | 7 | 32     | 230  | 40   | 02 15            |
| SJ   | 29.9N           | 31 1654       | SC   | -0              | +22  | +05  | 01(1)                   | 6 | 14     | 205  | 50   | 02 12            |
| MB   | 21.3N           | 31 1654       | SC*  | -1.2*           | +43  | -6   | 31(7)                   | 6 | 7      | 136  | 32   | 03 07            |
| HO   | 21.1N           | 31 1654       | SC*  | -1*             | +23  | +11  | 01(1)                   | 6 | 11     | 290  | 45   | 01 15            |
| AL   | 9.5N            | 31 1654       | SC   | -0.6            | +6   | -7   | 31(7)                   | 6 | 8      | 268  | 40   | 01 15            |
| HD   | 7.6N            | 31 1654       | SC   | -0.3            | +48  | -4   | 01(2,3,4,5)             | 7 | 8      | 264  | 32   | 03 10            |
| AN   | 1.5N            | 31 1654       | SC   | -1.4            | 57   | 25   | --                      | - | 7      | 250  | 60   | 01 15            |
| GU   | 4.0N            | 31 1654       | SC*  | --              | +32  | -10  | 31(7)                   | 6 | 8      | 305  | 42   | 03 09            |
| TV   | 1.1S            | 31 1654       | SC   | 0.5             | 51   | 64   | --                      | - | 7      | 267  | 147  | 01 15            |
| HU   | 0.6S            | 31 1654       | SC   | 3               | 118  | 10   | 31(7)                   | 7 | 22     | 588  | 69   | 02 24            |
| AP   | 16.1S           | 31 1653       | SC   | -0              | +20  | -11  | 01(1)                   | 7 | 13     | 287  | 65   | 03 09            |
| FM   | 18.6S           | 31 1654       | SC*  | +0.5*           | +41  | +34  | 31(7) 01(1)             | 6 | 15     | 300  | 720  | 03 12            |
| PM   | 33.3S           | 31 1654       | SC   | +4              | +31  | +23  | 31(7) 01(3)             | 6 | 34     | 193  | 108  | 03 04            |
| CN   | 43.2S           | 31 1654       | SC*  | +4*             | +40  | +22  | 31(7)                   | 8 | 36     | 310  | 210  | 03 12            |
| TO   | 46.7S           | 31 1655       | SC*  | 3               | 60   | 8    | 31(7) 01(2,4)           | 6 | 32     | 320  | 185  | 03 12            |
| KG   | 56.5S           | 31 1655       | SC*  | 03              | 70   | 24   | 31(7) 01(1,2,3) 01(4,5) | 7 | 112    | 1010 | 445  | 02 11            |

## THREE-HOUR-RANGE INDICES, K

| Oct./Nov. | 31        | 1         | 2         | 3         |
|-----------|-----------|-----------|-----------|-----------|
| GO        | 3232 7744 | 6754 5343 | 3533 3446 | 6333 2232 |
| BT        | 4333 3685 | 4765 6455 | 4554 2867 | 8553 1224 |
| RY        | 5222 2686 | 7975 5343 | 6843 3677 | 6543 2224 |
| PB        | 3222 3677 | 6566 6365 | 5435 5665 | 5435 2112 |
| TR        | 5100 1585 | 7954 5344 | 5632 2566 | 7431 2133 |
| CC        | 4222 2484 | 6545 5555 | 6444 3756 | 7432 2322 |
| CO        | 2100 1574 | 5667 6354 | 5434 4644 | 4323 2000 |
| MM        | 5111 1595 | 9965 6354 | 6633 3677 | 8332 2132 |
| DI        | 5222 3696 | 7876 6565 | 6545 3989 | 7443 2244 |
| DO        | 2102 1486 | 8775 6333 | 5733 3656 | 4221 1132 |
| WE        | 111- ---- | 6787 7364 | 4334 4754 | 5223 1112 |
| ME        | 2111 2564 | 8798 7245 | 6534 3444 | 3442 1212 |
| TI        | 3222 2798 | 7877 7655 | 4454 4987 | 7332 2332 |
| SI        | 1000 1564 | 8988 8355 | 6424 3544 | 4332 0000 |
| JU        | ---- ---- | ---- ---- | ---- ---- | ---- ---- |
| NU        | 2111 1464 | 7654 5243 | 4432 2655 | 4211 0021 |
| OT        | 1010 1594 | 9999 6254 | 4533 3345 | 5322 1111 |
| VL        | 3111 1564 | 6764 4233 | 4332 3555 | 5221 1112 |
| WI        | 1010 1574 | 7888 6244 | 5433 3444 | 4433 0101 |
| DB        | 3111 1565 | 6664 4344 | 5433 3655 | 5221 0122 |
| YA        | 3321 1486 | 5777 7445 | 5533 2666 | 7342 1223 |
| MG        | 3330 1475 | 6667 6344 | 4443 3555 | 6442 1222 |
| FR        | 2110 1564 | 5676 4144 | 5232 2434 | 4322 1011 |
| SV        | 2110 1465 | 6744 5343 | 3433 3654 | 4221 0021 |
| KV        | 3221 1575 | 5644 3333 | 3333 2544 | 4222 2122 |
| TL        | 3000 0565 | 6753 4333 | 4332 2553 | 4110 0011 |
| DS        | 2110 1464 | 6676 5255 | 6543 3554 | 5322 1011 |
| IR        | 1211 1565 | 7755 6454 | 4544 3655 | 5332 1121 |
| TU        | 2110 1564 | 7676 5244 | 5533 3544 | 5322 0001 |
| KD        | 2131 0354 | 5543 4233 | 2333 2444 | 3221 0001 |

## THREE-HOUR-RANGE INDICES, K

| Oct./Nov. | 31         | 1          | 2         | 3         |
|-----------|------------|------------|-----------|-----------|
| IK        | 2111 1575  | 6745 5354  | 4443 3654 | 5321 1122 |
| MT        | 2210 1564  | 6555 4244  | 5444 3544 | 4222 0110 |
| VK        | 1200 1564  | 6555 5354  | 4444 3554 | 5432 1111 |
| TK        | 2221 1575  | 6554 6454  | 4454 3655 | 5331 0022 |
| KS        | 3112 2676  | 574- -255  | 5455 ---- | --32 1122 |
| SJ        | 2110 1564  | 6665 4354  | 5433 2533 | 4321 0010 |
| TA        | 2211 1565  | 6656 4444  | 5344 3453 | 4321 1111 |
| QU        | 1122 1564  | -555 64--  | 3444 3554 | 4332 2122 |
| HO        | 2210 1554  | 6656 4145  | 5533 3334 | 4322 0010 |
| KY        | 1210 1554  | 7555 4244  | 5444 3544 | 4332 1110 |
| AL        | 2221 1565- | 6644 5344  | 5344 3544 | 4332 1222 |
| BA        | 2221 2554  | 55-- --54  | 4344 3454 | 4232 ---- |
| GU        | 2110 1464  | 6655 4135  | 6444 3443 | 4322 0001 |
| HU        | 1001 3675  | 6665 6555  | 5443 4663 | 3322 3322 |
| LU        | 2221 2555  | 5555 5544  | 4444 2443 | 3121 1011 |
| PP        | 1110 0443  | -444 4244  | 5433 3332 | 3222 0010 |
| PM        | 1210 1565  | 6955 4345  | 5444 3543 | 4332 1111 |
| TH        | 1201 2--   | -5553 3454 | 4343 3343 | 4222 1021 |
| AC        | 2111 3675  | 6665 4255  | 6343 463- | ---- ---- |
| TW        | 3112 2675  | 6665 4255  | 6444 4533 | 5322 2221 |
| HR        | 2121 1565  | 5565 5355  | 5454 4554 | 4332 1011 |
| GN        | 1210 1585  | 7755 5444  | 6443 3555 | 5321 0111 |
| TO        | 1210 1464  | 5656 5345  | 4544 3444 | 4332 1010 |
| AM        | 2110 1464  | 5666 5233  | 5543 2334 | 3322 0000 |
| MI        | 2111 1584  | 6677 7363  | 5433 3743 | 4322 1111 |
| NL        | 3111 1475  | 7775 4233  | 6733 2557 | 6421 1112 |
| MW        | 4321 2575  | 5886 6245  | 4653 3777 | 6433 3254 |
| MY        | 3343 2585  | 6764 5544  | 5654 3646 | 5443 2133 |
| SB        | 3222 3677  | 5555 4356  | 5533 3544 | 4322 1233 |
| VO        | 3233 2564  | 6565 5444  | 5544 3444 | 5333 2223 |



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