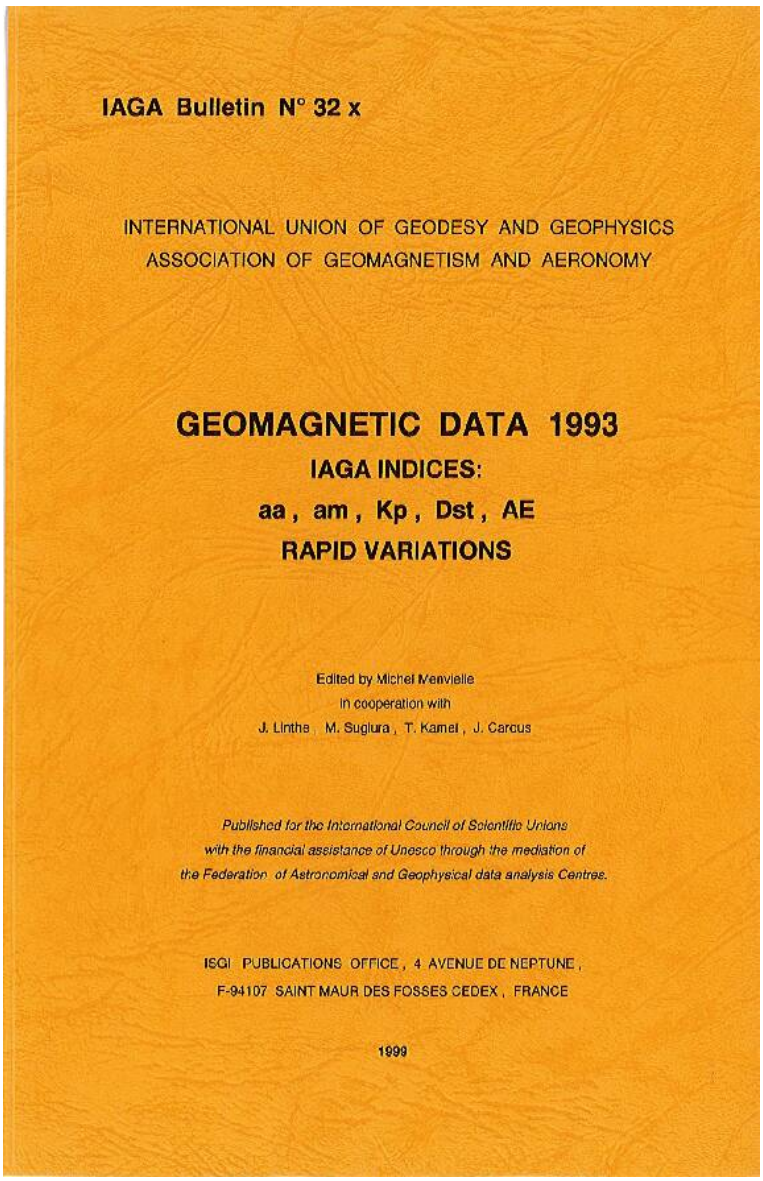


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IAGA Bulletin N° 32 x

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS
ASSOCIATION OF GEOMAGNETISM AND AERONOMY

GEOMAGNETIC DATA 1993

IAGA INDICES:

aa , am , Kp , Dst , AE

RAPID VARIATIONS

Edited by Michel Menvielle
in cooperation with
J. Linthe , M. Sugiura , T. Kamei , J. Cardus

Published for the International Council of Scientific Unions
with the financial assistance of Unesco through the mediation of
the Federation of Astronomical and Geophysical data analysis Centres.

ISGI PUBLICATIONS OFFICE , 4 AVENUE DE NEPTUNE ,
F-94107 SAINT MAUR DES FOSSES CEDEX , FRANCE

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FOREWORD

While keeping the Bulletin series as homogeneous as possible, the general information is updated in each issue, and we try to improve contents and presentation as well.

The Bulletin 32 series aims at providing a reference publication with all definitive values of indices and rapid variation data for the year. It however may happen that difficulties in the derivation of some indices could cause significant delays so that it is desirable to issue the Bulletin 32 for the year before their definitive values become available. It has already been the case in the past, and it is unfortunately the case for the AE indices this year. Because of the long delays in delivering the necessary records on the part of some of the observatories the derivation of the definitive AE indices has been significantly delayed for 1992. Therefore, we regretfully present provisional AE indices for 1992 in this issue.

A floppy with the same content as the Bulletin (except for the rapid variations) is included, with a software for visualising the tables. The floppies corresponding to the years 1981-1991 have been prepared, and are available on request at the ISGI Publication Office (c/o CETP, 4 Avenue de Neptune, F-94107 SAINT MAUR DES FOSSES CEDEX, FRANCE)

Michel Menvielle

ACKNOWLEDGEMENTS

We wish to acknowledge J.O. CARDUS, M. SIEBERT, H.-J. LINTHE, T. KAMEI and M. SUGIURA for their collaboration in preparing the data published in this Bulletin. Thanks are also due to all the organisations, which support efficiently the preparation and distribution of these geomagnetic data (as listed in Table 1, pages 9-10).

Let us add that M. SUGIURA And T. KAMEI wish specially to acknowledge the valuable assistance of T. ARAKI (Data Analysis Centre for Geomagnetism and Space Magnetism, Kyoto University) in the preparation of the Dst indices.

As for me, I am pleased to express our thanks to all those who helped in its elaboration, and in particular to D. HOVNANIAN for her valuable assistance in preparing the manuscript.

Michel Menvielle

Saint Maur, July 1999

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SECTION 1

PRESENTATION OF THE BULLETIN

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1.1. INTRODUCTION

1.1.1. The IAGA Bulletin 32 series

The IAGA Bulletin N°32 series is a yearly compilation of geomagnetic indices and other geomagnetic data, based on the report of a great number of magnetic observatories. The series is the continuation of the former IAGA Bulletin N°12 and is prepared for publication by the Publications Office of the International Service of Geomagnetic Indices (ISGI). The ISGI, formerly called Permanent Service or "C and K center", operates under the supervision of IAGA Division V : Observatories, Instruments, Indices and Data. Since 1956, it belongs to the Federation of Astronomical and Geophysical Data Analysis Services. Its present address is :

ISGI, CETP - CNRS/IPSL/UVSQ, 4 Avenue de Neptune,
F - 94107 Saint-Maur des Fossés CEDEX, FRANCE.

As for 1993, the elaborated data were provided by the following Institutes, under the responsability of the adjoining collaborators :

- Institut für Geophysik, Göttingen (M. SIEBERT),
  moved in 1996 to GeoForschungZentrum, Potsdam (J. LINTHE):
  Kp, ap, Ap, Cp, Q-days and D-days.
- CETP - CNRS/IPSL/UVSQ, Saint Maur (M. MENVIELLE):
  aa, C-days and K-days, an, Kn, An, as, Ks, As, and am, Km, Am.
- Data Analysis Center for Geomagnetism and Spacemagnetism, Kyoto (M. SUGIURA and T.KAMEI)
  Dst, AL, AU, AE.
- Observatori de l'Ebre, Roquetes (J.O. CARDUS):
  Rapid Variations.

The collection and the publication of the daily character figure C and of the international character figure Ci, together with the lists of selected quiet and disturbed days began in 1906.

The three-hourly K indices (scale 0-9) were introduced by Bartels in 1938, and, a few years later, planetary indices Kp were designed. They are computed from the K indices of 12 observatories which were routinely providing data at the time. The K indices of the selected stations for these early years were published in IAGA Bulletins N°12g and 12l. In addition to Kp, the corresponding range values ap and related daily indices Ap and Cp have been regularly published in the IAGA Bulletin N°12.

In accordance with the recommendations of the IAGA Assemblies in Madrid (1969) and in Moscow (1971), the publication of C and K indices of individual observatories in the IAGA Bulletins ended with the 1969 data, while other indices (Dst, an, Kn, as, Ks, am, Km) and a survey of magnetic storms were included since 1970.

This change marked the end of the IAGA Bulletin N°12 series and the beginning of the new IAGA Bulletin N°32 series. The publication of the Ci, Kp, ap, Ap indices, and of the international quiet and disturbed days, Q and D days, continued in the new series. Since 1976, the new index aa is published instead of Ci and the C figures are no longer compiled, according to a recommendation of the IAGA Assembly in Grenoble (1975).

A short recall of the definition of the published indices is given in the section 1.3 below. For more details, including the definition of the K indices, one can refer to the following reports:

- M. Siebert, in '*Handbuch der Physik*', vol.49/3, 206-275, Springer Verlag, 1971;
- P. N. Mayaud, *Derivation, Meaning and Use of Geomagnetic Indices*, Geophysical Monograph 22, Am. Geophys. Union, Washington D.C., 1980, gives a complete review of the present IAGA indices;
- G.K. Rangarajan, *Indices of geomagnetic activity*, in '*Geomagnetism*', edited by J.A. Jacobs, Academic, San Diego, 1989;
- M. Menvielle and A. Berthelier, *The K-derived planetary indices: description and availability*, Rev. Geophys., **29**, 3, 415-432, 1991;
- A. Berthelier, *The geomagnetic indices : derivation, meaning and uses in solar - terrestrial physics*, in '*STPW Proceedings*', ed. by J. HRUSKA et al, vol 3, 3-20, US Gov. Publications Office, 1994.

1.1.2. Data Availability

The whole series of geomagnetic indices are available at the World Data Centers (list and addresses in Table 1-a), and the IAGA Bulletins where they are published are available at the ISGI Publications Office (Table 1-c). More detailed information on the length of each series, and on the publication and availability of each index, and of the rapid variations are given below.

- The *K indices* of individual observatories are available for the years 1969-1974, at the World Data Center A (WDC-A, Table 1-a). Besides, the tables of local K indices can be found in the bulletins or yearbooks of many observatories. An extensive study on the K index by P. N. Mayaud and the practical rules for its determination are given in the "Atlas des indices K", IAGA Bulletin N°21, 1967.

- The *aa indices* constitute a series of indices beginning in the year 1868. Its description can be found in the IAGA Bulletin N°33, which contains tables and graphs of aa for the years 1868-1967. The values for the years 1968-1975 are published in the IAGA Bulletin N°39. These indices are regularly published in the IAGA Bulletins N°32 since 1976. Provisional values are regularly published in the ISGI Monthly Bulletins, in the monthly tables edited by H. Coffey in the Journal of Geophysical Research, and in the Solar Geophysical Data Publications (Table 1-c). aa indices are available at the ISGI WWW homepage (ISGI Publications Office, Table 1-c).

- The meaning of *C, Ci, K* and *Kp* is explained in textbooks (e.g. Landolt-Börnstein, Zahlenwerte und Funktionen, Band 3, 731-744, Springer Verlag, 1952), in Terrestrial Magnetism and Atmospheric Electricity (*44*, 411, 1939; *45*, 309, 1941) and in the IAGA Bulletin N°12i. Tables and diagrams of these indices for the whole period 1932-1961 are printed in the IAGA Bulletin N°18. Kp, Ap, Cp are published in the IAGA Bulletin N°32. Provisional values are regularly published in the ISGI Monthly Bulletins, in the monthly tables edited by H. Coffey in the Journal of Geophysical Research, and in the Solar Geophysical Data Publications (Table 1-c). They can be sent on request before the end of the next month by the GeoForschungZentrum, Potsdam (Table 1-b). Kp indices are available at the WWW homepage of this Institute.

- The *three-hourly indices an, Kn,* and *as, Ks,* for the Northern and Southern hemispheres and the *planetary indices am, Km,* are described by P. N. Mayaud in "Indices Kn, Ks and Km, 1964-1967" (Editions du CNRS, Paris 1968). The indices for the years 1959-1963 are published in the IAGA Bulletin N°39, and for 1964-1967 in the above quoted publication. They are published in the IAGA Bulletins N°32 from 1968 onwards. Provisional values are regularly published in the ISGI Monthly Bulletin, in the monthly tables edited by H. Coffey in the Journal of Geophysical Research, and in the Solar Geophysical Data Publications (Table 1-c). an, as, and am indices are available at the ISGI WWW homepage (ISGI Publications Office, Table 1-c).

- The *equatorial Dst index* is published in the IAGA Bulletin N°32 since 1970. The 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 X-645-71-278 of the Goddard Space Flight Center. The hourly Dst values for the IGY, based on the data of eight stations, are given in the Annals of the IGY, vol. 35. The same volume contains the three-hourly values of Dst for the IGY as determined by Kertz in a somewhat different way. Recently, M. Sugiura and T. Kamei recomputed an homogeneous series of Dst values, using the data of four stations. These Dst indices values for 1957-1986 are now published in the IAGA Bulletin N° 40 where is inserted a floppy disk containing the hourly Dst values for these 30 years. This report supersedes earlier Dst publications by Sugiura and co-workers. Provisional Dst indices are regularly published in the ISGI Monthly Bulletin, and in the Solar Geophysical Data Publications (Table 1-c). Dst indices are available at the WDC-C WWW homepage (see Tabla 1-b).

- The *auroral electrojet index AE* was originally introduced by Davis and Sugiura in 1966 (J. Geophys. Res., *71*, 785). It was first derived at the Geophysical Institute of the University of Alaska, and the hourly values were published for the years 1957-1964 in the University of Alaska Reports prepared by T. N. Davis, Y. S. Wang and C. Echols, and published in 1967 and 1968. The data for 1965 were prepared by NASA ; from 1966 to 1976, they were prepared by WDC-A. Values from 1978 onwards are computed by the Data Analysis Center for Geomagnetism and Spacemagnetism of Kyoto University and published in the data books of this Institute. The hourly mean values are published in the IAGA Bulletins N°32 since 1981. AE indices are available at the WDC-C WWW homepage (see Tabla 1-b)

- Data on *rapid variations* are collected and prepared for publication at the Observatorio del Ebro (Table 1-b), according to the decisions made at the IAGA Assemblies in Madrid (1969) and in Grenoble (1975). They are thus given less extensively than in the former IAGA Bulletins. Provisional lists are published in the ISGI Monthly Bulletin (Table 1-c).

Tables 1-a, 1-b, and 1-c give present addresses of the ISGI, of the World Data Centers, and of the National Institutes and Data Centers related to this bulletin.

TABLE 1

a - Bulletins and publications

• Solar Geophysical Data monthly publications :

NOAA National Geophysical Data Center
325, Broadway E/GC4, Dept. 961
BOULDER, Colorado 80303-3328 U.S.A.

• IAGA Bulletins and ISGI Monthly Bulletins :

ISGI Publications Office
CETP - 4, avenue de Neptune
94107 SAINT MAUR DES FOSSES CEDEX, France
E-mail automatic service : ISGI.DATA@cetp.ipsl.fr
http://tango.cetp.ipsl.fr/~isgi/homepag1.htm

TABLE 1 (continued)

b - ISGI and World Data Centers

ISGI

International Service of Geomagnetic Indices
Service International des Indices Géomagnétiques
CETP -CNRS/UVSQ, 4, Avenue de Neptune
F-94107 SAINT MAUR DES FOSSES CEDEX, France
Telephone 33 1 45 11 42 30
Telefax 33 1 48 89 44 33
http://tango.cetp.ipsl.fr/~isgi/homepag1.htm

WDC-A

World Data Center-A for Solar-Terrestrial Physics
NOAA code E/GC2, 325 Broadway
BOULDER, Colorado 80303-3328 U.S.A.
Telephone 1 303 497 6324
Telefax 1 303 497 6513

WDC-B

World Data Center-B
Soviet Geophysical Committee, Academy of Sciences of the U.S.S.R.
Molodezhnaya 3
MOSCOW 117296, U.S.S.R.
Telephone 7 095 130 05 46
7 095 228 67 88

WDC-C

World Data Center-C2 for Geomagnetism
Data Analysis Center for Geomagnetism and Space Magnetism
Faculty of Science, Kyoto University
KYOTO 606-01, Japan
Telephone 81 75 753 3929
Telefax 81 75 722 7884
http://swdcdb.kugi.kyoto-u.ac.jp/

c - ISGI Collaborating Institutes

M. MENVIELLE

Centre d'études des Environnements Terrestre et Planétaires
4, Avenue de Neptune
F-94107 SAINT MAUR DES FOSSES CEDEX, FRANCE

J. LINTHE

GeoForschungZentrum, Potsdam
Adolf-Schmidt-Observatorium für Geomagnetismus
Lindenstr. 7
D-14823 NIEMEGK, GERMANY
http://www.gfz-potsdam.de/pb2/pb23/gm/kp_index/

J. O. CARDUS

Observatori del'Ebre
c/ Horta Alta, 38,
E-43520 ROQUETES, SPAIN

M. SUGIURA

Working Group on World Data Centers
National Committee on Solar-Terrestrial Physics
Science Council of Japan
Research Institute of Science and Technology
Tokai University, 2 -28 Tomigaya, Shibuya-ku
TOKYO 151.0063, Japan

1.2. LIST OF OBSERVATORIES

A list of the magnetic observatories where continuous recordings have been made during at least five consecutive years is given pages 29-35. In this table, the observatories are listed according to the alphabetic order and one has indicated for each station, from left to right :

- its name and three-letter IAGA international code ;
- the geographic and geomagnetic coordinates, and altitude ;
- the K=9 lower limit, given only for the stations which belong to the networks used in Kp, am or aa calculation. (see section 1.3 for the description of these networks in 1993);
- the opening and closing years.

Note that temporary stations do not appear in this table, as for instance those operating during the International Polar and Geophysical years, but they can be found in the more extensive list published in the former IAGA-Bulletin n° 20 (1965).

The values of the parameters given in the table has been obtained from the following publications :

- C.R. Bock and R.W. Schumann : Katalog der Jahres mittel der Magnetischen Elemente der Observatorien und der Stationen an deinen eine Zeitlang erdmagnetische Beobachtungen Stattfanden, Geophysikalisches Institut Postdam Abhandlungen n° 8, Postdam, 1948;
- Annual mean values of Geomagnetic elements, Geomagnetic Bulletin n°10, Institut of Geological Sciences, Edinburgh, 1981 ;
- Yearbooks of individual observatories.

A list of the stations having provided continuous recordings over at least fifty years is given on pages 36-37. When one observatory has moved, the names of the different consecutive sites are indicated. The stations are listed following the alphabetic order of the oldest observatory. One has only indicated in this table the opening and closing years, as the other parameters can be found in the preceeding list.

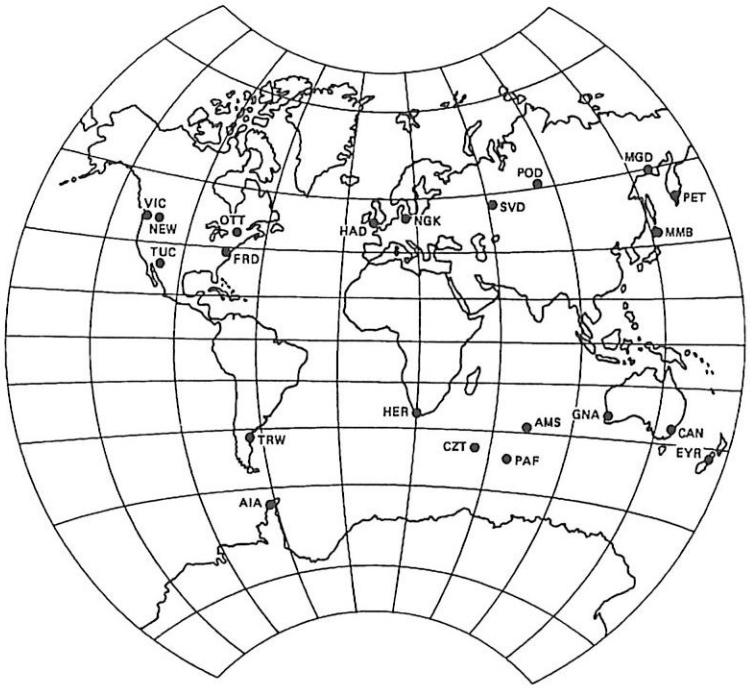


Figure 1: Distribution of am observatories



Figure 2: Distribution of Kp observatories

1.3. IAGA INDICES

1.3.1. *aa* indices

The aa indices are derived using data from two nearly antipodal observatories, where magnetograms were available since 1868. For each three hour interval, K indices are measured at the two stations and converted back into amplitude; an individual aa index is the average of the northern and southern values, weighted to account for the small difference in latitude of the two stations, or for the slight changes in the very place of the observatory. The observatories used to derive aa are given in Table 2-a (next page), with weighting coefficients given in brackets.

The aa index is in nanotesla (nT) and it represents the activity level at an invariant magnetic latitude of about 50°. The half-daily and daily mean values of aa are very close to the corresponding values of the am indices. The values for 1993 are given pages 44-46 as follows :

N = daily values for the Northern observatory (Greenwich day)

S = same for the Southern observatory

am, pm = half-daily values of aa indices for the half Greenwich day before noon and after noon.

Aa = daily value of aa

For each month, the average values of daily N, S and aa, are given at the bottom of the tables.

The letters C and K indicate the quiet 24-hour and 48-hour intervals as obtained from aa :
C = really quiet, K = quiet but with one or a few slightly disturbed three-hourly intervals (see section 4). The letter on the left column refers to the 24-hour Greenwich day, that on the right one refers to a period of 48 hours centered on the Greenwich noon. The asterisks mark the five international quietest days of the month (as deduced from Kp, see section 4).

A musical diagram of aa indices (logarithmic scale) is drawn page 43 for the whole year. The monthly and yearly mean values of aa for the years from 1868 onwards are listed pages 47-49. A graph of 12-month running mean values of aa is drawn page 50, covering the full period over which aa has been calculated so far, i.e. 1868-1993. In this graph, the point plotted at the abscissa of a given year corresponds to the average of aa from January to December of that year (unit : nT).

1.3.2. *am* indices

am, an and as indices are derived from K indices scaled at observatories located in the subauroral zones of the Northern and Southern hemispheres (Figure 1). The stations are arranged in groups (G1 to G9), each group representing a longitude sector in one of the hemisphere (see Table 2-b, next page). The corrected geomagnetic latitude indicated in this Table has been calculated by Mayaud for taking into account the actual topography of the main field.

TABLE 2

a - List of aa observatories

Northern Hemisphere				Southern Hemisphere			
Observatory			Corr. Geom. Lat	Observatory			Corr. Geom. Lat.
1868-1925	Greenwich	*(1.007)*		1868-1919	Melbourne	*(0.967)*	
1926-1956	Abinger	*(0.934)*		1920-1979	Toolangui	*(1.033)*	
1957- ...	Hartland	*(1.059)*	50.0°	1980- ...	Canberra	*(1.084)*	45.2°

b - List of am observatories

Northern Hemisphere				Southern Hemisphere			
	Observatory		Corr. Geom. Lat.		Observatory		Corr. Geom. Lat.
G1	MGD	Magadan[1]	53.8°	G6	EYR	Eyrewell	50.2°
	PET	Petropavlosk	46.4°		CAN	Canberra	45.2°
	MMB	Memambetsu	37.4°				
G2	POD	Podkammenkaya[2]	57.2°	G7	GNA	Gnangara	44.1°
	SVD	Sverdlovsk[3]	52.2°		AMS	Amsterdam	48.3°
G3	HAD	Hartland	50.0°	G8	PAF	Kerguelen	58.8°
	NGK	Niemegk	48.8°		CZT	Crozet	52.4°
					HER	Hermanus	41.1°
G4	OTT	Ottawa	58.9°	G9	AIA	Argentine Isl.	49.7°
	FRD	Frederiksburg	51.8°		TRW	Trelew[4]	27.8°
G5	NEW	Newport	55.2°				
	VIC	Victoria	53.9°				
	TUC	Tucson	39.7°				

[1] *Missing data: November and December*
[2] *Missing data: April*
[3] *Present name: Arti*
[4] *Missing data: January and May–December*

c - List of Kp observatories

Northern Hemisphere			Southern Hemisphere		
Observatory		Corr. Geom. Lat.	Observatory		Corr. Geom. Lat.
MEA	Meanook	62.5°	EYR	Eyrewell	50.2°
SIT	Sitka	60.0°	CAN	Canberra	45.2°
LER	Lerwick	58.9°			
OTT	Ottawa	58.9°			
LOV	Lovö	56.5°			
ESK	Eskdalemuir	54.3°			
BJE	Brorfelde	52.7°			
FRD	Fredericksburg	51.8°			
WNG	Wingst	50.9°			
HAD	Hartland	50.0°			
NGK	Niemegk[4]	48.8°			

[3] *Niemegk has replaced Witteveen in the Kp network since April 1st, 1988.*

For a given time interval, the K values measured at the observatories of one group are averaged and converted back to amplitude. These amplitudes are weighted for balancing the differences in longitude width of the sectors, and the hemispheric averages of these weighted amplitudes give rise to the three-hour an and as indices respectively; am is equal to (an + as) / 2. Am, An and As are the daily mean values of am, an and as. They are all expressed in nanoteslas.

For the sake of tradition and convenience, Km, Kn, Ks equivalent values are also made available by means of a conversion table (see below); they are as usually expressed by values from 0o to 9o, corresponding to the given interval of am (or an, or as).

am	0.0	1.4	3.4	5.4	7.4	10.4	13.4	16.4	20.4	26.4
Km	0o	0+	1-	1o	1+	2-	2o	2+	3-	
am	26.4	33.4	40.4	50.4	60.4	70.4	86.4	103.4	120.4	146.4
Km	3o	3+	4-	4o	4+	5-	5o	5+	6-	
am	146.4	173.4	200.4	243.4	286.4	330.4	386.4	443.4	500.4	611.4
Km	6o	6+	7-	7o	7+	8-	8o	8+	9-	9o

Monthly tables of an, and as are given pages 54-65, each line corresponding to a Greenwich UT day. Following values are displayed from left to right:

- Kn (Ks) values for the 8 three-hour intervals;
- an (as) values for the 8 three-hour intervals represent, by a code using one digit from 0 to 9, the variance of the sector values of K in the Northern (Southern) hemisphere calculated for each given three-hour interval;
- an (as) values for the 8 three-hour intervals;
- An (As) daily mean value.

At the end of each table, one can find the monthly mean value. Monthly tables of am (pages 66-71) are displayed in a similar way

- Km values for the 8 three-hour intervals ;
- daily sum ΣKm ;
- am values for the 8 three-hour intervals ;
- Am, daily mean value ;
- Am2, mean value of am over a 48-hour period centered at the middle of the Greenwich day.

Km values are displayed as "musical diagram" according to Bartels solar rotations (page 53).

A compilation of the musical diagrams from 1959 onwards is available on request at ISGI Publication Office (Table 1-a). The monthly and yearly mean values of Am from 1959 onwards are given page 72.

1.3.3. *Kp* Indices

The planetary three-hour-range index Kp is the mean standardized K-index from 13 observatories between 44° and 60° northern or southern geomagnetic latitude (Figure 2, and Table 2-c). The scale is 0o to 9o, expressed in thirds of a unit, e.g. 5- is 4 2/3, 5o is 5, 5+ is 5 1/3. This planetary index has been designed to measure solar particle radiation by its

magnetic effects. The other indices derived from Kp are the three-hour index ap (the equivalent range), the daily indices Ap, the Cp and C9 characters that are related to the daily sum of ap.

The three-hour equivalent amplitude ap is deduced from Kp as follows :

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

In order to use ap as an equivalent amplitude, it is considered in relation to the conditions at a standard station, which is a station having the lower limit of 500 nT for K = 9. At such a station the average range in nT of the most disturbed of the two horizontal components in a three-hour interval can be taken as 2 ap (for instance, for Kp = 3+, ap=18, ie 36 nT). In other words ap is an equivalent amplitude in the unit 2 nT. The column headed Ap gives the daily average for the eight values ap per day. Therefore, Ap may be called the "equivalent daily amplitude Ap", expressed in the unit 2 nT for a standard station. It is recommended to use Ap in preference to the sum of the indices Kp.

The last column gives the daily planetary character figure Cp, as defined in Bulletin 12e, page 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, page 111, their 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

Monthly tables of Kp and derived indices are given pages 76-81. Kp values are displayed as "musical diagrams" according to Bartels solar rotation page 75. These diagrams are also available on request at GeoForschungZentrum, Potsdam (Table 1-b). The frequencies of Kp indices is given by month page 82. Monthly and yearly mean values of Ap from 1932 onwards are given pages 83-84.

***Note** - Observatories wishing to compute local equivalent amplitudes ak from their local K indices, may use the conversion table given below, which consists in the amplitudes (in nT) of the middle of each K class, as firstly proposed by Bartels (IATME Bull. 12e, 1951), and following a IAGA WG 5.5 recommandation (Buenos Aires, 1993).*

K	0	1	2	3	4	5	6	7	8	9
ak	2.5	7.5	15	30	55	95	160	265	415	666

These values are given here for a K = 9 lower limit L9 = 500 nT; at stations having a different value of L9, they should be multiplied by L9/500, in order to have ak in nT (see IAGA News 32, page 23).

1.3.4. *Dst* index

The Dst index for 1993 are derived using the data from the four magnetic observatories given in Table 3.

These observatories were chosen on the basis of the quality of observation and for the reason that their locations are sufficiently distant from the auroral and equatorial electrojets and that they are distributed in longitude as evenly as possible. A map of the network is given in Figure 3.

The baseline

The baseline for H is defined for each observatory in a manner that takes into account the secular variation. For each observatory, the annual mean values of H, calculated from the "five quietest day" for each month, form the data base for the baseline.

It should be remembered that the final Dst values are determined after each calendar year and that therefore in this determination the annual mean values are available only up to and including the year (referred to below as the current year) for which the Dst is to be deduced.

The baseline is expressed by a power series in time and the coefficients for terms up to the quadratic are determined by the method of least squares, using the annual means for the current year and the four preceding years. Thus, the baseline, H_{base} is expressed as

$$H_{base}(\tau) = A + B\tau + C\tau^2 \qquad (1)$$

where τ is time years measured from a reference epoch.

It is noted here that if the polynomial expansion of the annual means is made in a straighforward manner as described above, an artificial discontinuity, although seldom large enough to be recognized by a casual inspection, can be introduced between the baseline value for the last hour of one year and that for the first hour of the following year, because these two baseline values are calculated from two different polynomials. To minimize such a discontinuity the polynomial determination is actually made in two steps.

From the polynomial expansion determined in the first step, the baseline value at the end of current year is calculated. In the second step, this value is included as an additional data point in the polynomial fitting. This procedure has been found to be satisfactory.

The baseline value $H_{base}(T)$ calculated from (1) for each UT hour of the current year is subtracted from the observed H value, $H_{obs}(T)$:

$$\Delta H(T) = H_{obs}(T) - H_{base}(T) \qquad (2)$$

The deviations, $\Delta H(T)$, form the data base in the following derivation for each of the observatories.

TABLE 3

List of Dst observatories

Observatory	*Acronym*	*Dipole Lat.*	*Dipole Long.*
Honolulu	HON	21.0° N	266.4°
San Juan	SJG	29.9° N	3.2°
Hermanus	HER	33.3° S	80.3°
Kakioka	KAK	26.0° N	206.0°



Figure 3: Distribution of the Dst observatories;
the solid line marks the dip equator.

The Sq elimination

The solar quiet daily variation, Sq, is derived for each observatory as follows. The average Sq variation for each month is determined from the values of H(T) for the internationally selected five quietest days of the month.

These quietest days are determined in UT. In order to define an average Sq variation for the local day of each observatory, we form the averages for the local hours using five quietest days. Also, using hourly values immediately before and immediately after the local days selected, we evaluate the linear change and subtract it from the Sq variation. In this manner we remove from Sq the noncyclic change, which is part of Dst variation, and also evaluate Sq from the midnight level.

The 12 sets of the monthly average Sq so determined for the year are expanded in a double Fourier series with local time, t, and month number, s, as two variables:

$$Sq(t,s) = \sum_n \sum_m A_{mn} \cos(mt + \alpha_m) \cos(ns + \beta_n)$$

This representation allows us to calculate Sq(T) at any UT hour, T, of the year. This procedure is applied to each observatory.

The Hourly Equatorial Dst Index.

For each observatory the disturbance variation, D(T), is defined by :

$$D(T) = \Delta H(T) - Sq(T) \qquad (4)$$

Then D(T) is averaged over the four observatories and normalized to the dipole equator by :

$$Dst(T) = D(T) / \cos \phi \qquad (5)$$

where the denominator is the average of the cosines of the dipole latitudes, ϕ_i (i=1,4), of the observatories contributing to the average. This normalization procedure has been found to minimize undesired effects from missing hourly values.

Monthly tables of hourly Dst-values are given pages 90-101, followed by a table of mean values (page 102). The graph of hourly values for the whole year is given pages 87-89; the table of monthly and yearly mean values from 1959 onwards is given page 103.

TABLE 4

List of AE (12) observatories

Observatory	*Acronym*	*Geographic*		*Geomagnetic*	
		Lat. (°N)	*Long. (°E)*	*Lat. (°N)*	*Long. (°E)*
Abisko	ABK	68.36	18.82	66.04	115.08
Dixon Island	DIK	73.55	80.57	63.02	161.57
Cape Chelyuskin	CCS	77.72	104.28	66.26	176.46
Tixie Bay	TIK	71.58	129.00	60.44	191.41
Cape Wellen	CWE	66.17	190.17	61.79	237.10
Barrow	BRW	71.30	203.25	68.54	241.15
College	CMO	64.87	212.17	64.63	256.52
Yellowknife	YKC	62.40	245.60	69.00	292.80
Fort Churchill	FCC	58.80	265.90	68.70	322.77
Poste de la Baleine	PBQ	55.27	282.22	66.58	347.36
Narssarssuaq	NAQ	61.20	314.16	71.21	36.79
Leirvogur	LRV	64.18	338.30	70.22	71.04

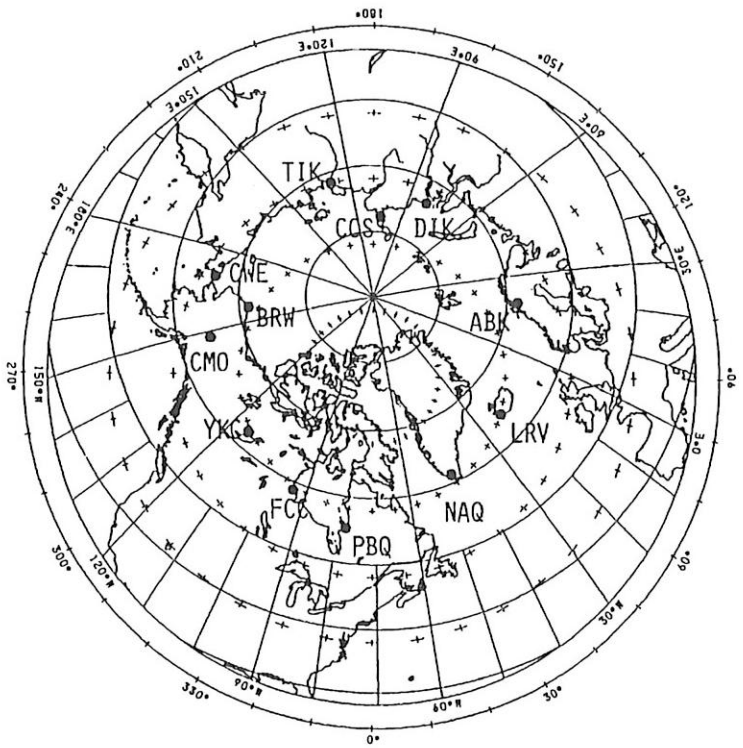


Figure 3: Distribution of AE (12) observatories.

1.3.5. *AE* index

The AE indices are derived from geomagnetic variations in the horizontal component observed at selected observatories along the auroral zone in the northern hemisphere (Figure 4, Table 4). These variations are measured from a base line determined for each of the observatories. For each given time (UT), at one minute intervals the AU and AL indices are respectively defined as the maximum and minimum values among the one minute values of the variations from all the AE observatories at this UT. The AE index is defined by AU-AL, A0 is (AU+AL)/2.

For the sake of simplicity the term "AE (Auroral Electrojet) indices" is generally used to mean all the AE associated indices, i.e. AU, AL, AE and A0. In a superposed plot of one minute values of H from all the AE observatories with a common time axis the AU and AL indices represent the upper and lower envelopes of the plotted points, respectively, and the AE value gives the separation of these envelopes.

The AU and AL indices are intended to represent a measure of the maximum current density of the eastward and westward auroral electrojets, respectively. The AE index represents a measure of global auroral electrojet activity.

One minute values of the AE indices (AU, AL, AE and A0) are calculated at the Data Analysis Center for Geomagnetism and Spacemagnetism, (same address as WDC-C, Table 1-a) and detailed plots and tables are given in the Data Book series of the World Data Center C2 for Geomagnetism. One minute values of these indices are available on magnetic tape at the World Data Center-A for Solar Terrestrial Physics in Boulder, Colorado and at the World Data Center-C2 for Geomagnetism in Kyoto (See Table 1-a).

Because of the long delays in delivering the necessary records on the part of some of the observatories the derivation of the definitive AE indices has been significantly delayed for 1993. Regrettably, therefore, provisional AE indices for 1993 are given in this Bulletin.

Tables of hourly average of AU, AL and AE are given pages 108-131; graph is given page 107. The hourly averages of AU, AL and AE are computed from the one minute values of the respective indices, therefore they may not necessarily satisfy the relationship AU - AL =AE exactly. Similarly the daily mean indices are averages of the one minute values for the whole day and are not the daily means of the hourly averages. The monthly and yearly mean values from 1957 until 1993 are given page 132.

1.4. CLASSIFICATION OF DAYS

The list of the international five quietest days and the selection of the 24-hour and 48-hour intervals which are really quiet (C) or very quiet (K) are given month by month pages 136-137. They are presented on an annual diagram for 1993 page 135. The list of the international quietest and of the more disturbed days, and a list of magnetic storms are also given page 138. These classifications are made according to the following.

1.4.1. Classification deduced from *Kp* indices

The selection of the quietest and most disturbed days of each month 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 (Table page 138, with a list of magnetic storms).

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 also for different months of the same year, the selected quietest 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 is marked by the letter A if for that day : $Ap > 6$, or marked by the letter K if $Ap < 6$, with one Kp value greater than 3 or two Kp values greater than 2+.
- A selected "disturbed day" is considered "not really disturbed" and marked by an asterisk if Ap is lower than 20 (see P.N. Mayaud, Ann. Géophys., *26*, 901, 1969).

1.4.2. Classification deduced from *aa* indices

The selection of the quiet 24-hour intervals is made firstly on the basis of the mean value of aa which must be lower than the fixed value : 13 nT. Then, each individual aa value of the day is represented by a weight p, namely :

p	0	1	2	4	6
aa	< 17	$17 < aa < 21$	$21 < aa < 28$	$28 < aa < 32$	> 32

A day with a mean value of $aa < 13$nT and for which Σp is higher than, or equal to 4 is a quiet K-day ; if Σp is lower than 4, the day is a really quiet C-day.

The same rules are applied to select the 48-hour quiet or really quiet intervals, with the same limit for the aa mean value (13 nT) and a limit for Σp equal to 6. One must note that in these intervals every local day (0 h to 24 h in local time) is really quiet, at any longitude. For further details, see P. N. Mayaud, *Derivation, Meaning and Use of Geomagnetic Indices*, Geophys. Monograph 22, Am. Geophys. Union, Washington 1980

1.5. RAPID VARIATIONS

1.5.1. Storm sudden commencements (*ssc*)

The old definition, that said that "an ssc is a sudden commencement of a magnetic storm", is now changed into "sudden commencements followed by a magnetic storm *or* by an increase in activity lasting at least one hour".

The change was introduced by P. N. Mayaud (IAGA Bulletin 33 : "*A Hundred Years Series of Geomagnetic Data, 1868-1967. Indices aa and storm sudden commencements*"; see also IAGA Bulletin 39 : "*Supplementary Geomagnetic Data 1957-1975*", including a new list of ssc's 1968-1975). In this new definition more importance is given to the change of rhythm in the magnetic activity, than to the amplitude of the magnetic storm, and therefore some ssc's included in the list are not followed by a real magnetic storm.

The routine procedure of the Service in establishing the final list consists essentially of several steps, following as much as possible the instructions given by Mayaud in order to get a continuous series of homogeneous data.

Step 1. From the monthly reports of Rapid Variations prepared by 45 magnetic observatories (see list page 146), a combined list of all events is compiled.

Step 2. This list is checked against the magnetograms of two low latitude observatories (HON and EBR), and cases reported by only a very few observatories and that are clearly not an ssc in the magnetograms of HON and EBR, are eliminated.

Step 3. All other cases are then included in a new list, and copies of the magnetograms for all of them are requested from the five collaborating low latitude observatories, that are regularly spaced in longitude (Table 5a), or from their supplementary observatories (Table 5b).

Step 4. From the copies of the magnetograms sent by the five observatories as a reply to Step 3, every ssc is evaluated independently for each observatory and a number (0 to 3) is assigned to each event, in the following scale:

0. the event could have escaped the attention of the observers or does not deserve to be called an ssc,

1. the event is possibly an ssc, but is not clear enough in itself to be identified as a true ssc without inspection of other records at different longitudes,

2. the event can be unmistakably identified as an ssc from the single record on consideration,

3. is assigned, instead of 2, when the event presents a very sharp change of rhythm in the agitation, has a large amplitude and its general morphology is remarkable.

If an event gets three codes 0 out of the five observatories, it is rejected from the list.

Step 5. Finally the duration in minutes, and the amplitude in nT are measured on the copies from the five observatories and their mean values are calculated.

TABLE 5

a - Collaborating Observatories for Rapid Variations (*ssc*)

Observatory	Symbol	Geographic		Geomagnetic	
		Lat. (°N)	Long. (°E)	Lat. (°N)	Long. (°E)
MBOUR	MBO	14.40	343.02	20.68	56.80
FUQUENE	FUQ	5.47	286.27	16.47	357.07
HONOLULU	HON	21.32	202.00	21.46	268.57
PORT MORESBY	PMG	-9.40	147.15	-17.99	219.75
ALIBAG	ABG	18.63	72.87	9.64	145.39

b - Supplementary Observatories

Observatory	Symbol	Geographic		Geomagnetic	
		Lat. (°N)	Long. (°E)	Lat. (°N)	Long. (°E)
TENERIFE	SZT	28.48	343.72	34.60	60.30
SAN JUAN	SJG	18.38	293.88	29.36	5.21
APIA	API	-13.80	188.22	-15.61	261.99
KANOYA	KNY	31.42	130.88	21.12	199.85
HYDERABAD	HYB	17.42	78.55	7.86	150.69

In the list of storm sudden commencements (section 5.1, pages 143-145) the following indications are given for each event:

a) day, hour and minute (mean value taken from the monthly reports); first and last minutes thus reported are given in brackets at the end of the line,

b) the five number codes (one for each collaborating observatory) ; if some figures are underlined, it means that the replacement observatory was used,

c) the mean average duration, in minutes, of the event and its average amplitude, in nT,

d) the following figures indicate the number of observatories that in the monthly reports have characterized the ssc by each of the three letters A, B, or C, their meaning being:

A = very remarkable

B = fair, ordinary but unmistakable

C = very poor, doubtful.

Please note that the 0 to 3 qualification is given by the Service on Rapid Variations, independently from these A, B, C, qualifications which are given by the observatories, although some sort of correlation must exist among them.

The last group indicates the number of observatories that have classified the event other than an ssc, namely:

si = sudden impulse, but not an ssc,

sfe = solar flare effect

b = bay-like disturbance.

1.5.2 Solar flare effects (*sfe*).

The aim of the Service is to provide a reliable list of times when a magnetic solar flare effect did occur. Unfortunately, the reports on solar flare effects are not provided by all the observatories sending regularly the monthly reports on Rapid Magnetic Variations to the Service. As the sfe is a phenomenon dependent of longitude, it is not an easy task to provide a complete round the world coverage.

Step 1. The list of all times given in the monthly reports from observatories as possible occurrences of sfe's are checked with data taken mainly from Solar Geophysical Data, on the occurrence of alpha-flares, radio bursts or SID's, as, by definition, the crochet-like disturbance in the magnetograms must be an effect from solar activity and more precisely of a light emission from the Sun.

Times that are not correlated with any of these solar or ionospheric phenomena are eliminated from the list except in the cases when they were reported by more than one observatory or when a single observatory gave the time with the indication that it was confirmed. These exceptions try to take into account the fact that the correlation between solar events and magnetic crochets is not hundred percent.

Step 2. The list prepared in such a way is sent to all magnetic observatories, as a *checking list*, and they are asked to inspect their magnetograms and provide their judgement in two steps:

First : Do the magnetic records show a movement at the time given ? The answer is given by the following letters:

A = very clear movement

B = fair, ordinary movement

C = very poor movement

D = movement not observed, although records are satisfactory

E = movement cannot be observed due to heavy disturbance

X = record missing

Note : Please note that this letter index refers only to the existence of a movement in the curves and not to the opinion of this movement being or not being a sfe.

Second : The opinion of this movement being or not a sfe is given after letters A, B, and possibly C, by a number index:

3 = certainly a sfe

2 = probably a sfe

1 = probably not a sfe

0 = certainly not a sfe

The answers from observatories are plotted into world maps for each event ; in these maps are also drawn times showing the sunlit hemisphere and the twilight zones.

Step 3. From these maps a judgement is made about the event being or not a sfe. A simultaneous judgment is done about the existence or not of a solar, ionospheric and radio-sun event that could be the cause of the magnetic disturbance. And finally each event is classified as a sfe, a doubtful sfe or a rejected sfe.

Tables for solar flare effects and for doubtful solar flare effects are given in Section 5.2. of the present Bulletin for the year 1993 (pages 149-171). The format is the following:

a) A summary list gives for each month, the day and time of the beginning of sfe; if the sfe is confirmed the letter C follows the time of the event. Then are indicated the number of observatories having reported a movement (letters A, B, C, see explanation in Step 2 above), and the number of observatories having not reported any movement (letters D, E, X, see Step 2 above).

b) It is followed by detailed tables giving for each event the list of observatories reporting it with the number-index, arranged according to the classifying letter and to longitude.

Stations in the twilight zone, reporting a movement (A, B, C and also E and X) are indicated by normal brackets; those in the night-side of the earth by square brackets. Station in these two zones reporting D have been omitted from the lists.

The separation into such two tables of sfe and "doubtful" sfe may be rather subjective, due to the fact that we do not really know the mechanism linking the radiation emission from a flare and its effect on the magnetic records.

For instance, if we accept that the link is an ionising radiation from a solar flare producing an electric current in some region of the sunlit ionosphere, can this current extend its effect into the night hemisphere of the earth? And can all flares, observed in the alpha-light, produce such ionisation ? We are aware, from observations of solar flux, that not all frequencies produce similar magnetic effects. Satellite observations of X-ray flares may help in solving these and similar questions, but until now we have a fairly good coverage of alpha-flares and a rather limited of X-flares. Moreover it must be taken into account that not all flares have the same emission of energy and that their effects on the earth therefore may be limited to a smaller, or to a larger region of the earth.

Following the same kind of reasoning, we may find different effects due to the geometric relative position of the angle of emission in the Sun and the angle of reception at the earth.

For all these reasons, the tables of solar-flare-effects do not appear to be directly usable for detailed statistical studies, but they may be a good indication for researchers, where to look in the magnetic records when they study some particular event.

SECTION 2

LIST OF OBSERVATORIES

LIST OF OBSERVATORIES

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
ABN	ABINGER	51.18	359.61	53.58	84.55	244	520	1925-1957
ABK	ABISKO	68.36	18.82	65.88	115.50	380		1945
AAE	ADDIS ABABA	9.03	38.77	5.19	110.97	2442		1958
ADE	ADELAIDE	-34.60	138.40	-43.99	214.06			1973
AGN	AGINCOURT	43.78	280.73	54.65	349.54	175	700	1881-1969
AHM	AHMEDABAD	23.02	72.60	14.03	145.65			1973
ALE	ALERT	82.50	297.50	86.24	163.08	2260		1961
ABG	ALIBAG	18.63	72.87	9.64	145.39	10		1904
AAA	ALMA ATA	43.25	76.92	33.69	152.21	1300		1963
ALM	ALMERIA	36.85	357.53	40.16	76.83	65		1955
ALU	ALOUSHTA	44.68	34.42	40.86	114.94			1957
AML	AMBERLEY	-43.15	172.72	-47.16	254.00	40	530	1929-1977
AWS	ANDREWS AFB	38.20	282.63	49.13	352.23			1972
ANN	ANNAMALAINAGAR	11.40	79.68	1.77	151.20	0		1957
TAN	ANTANANARIVO	-18.92	47.55	-23.85	114.58	1375		1902
ANO	ANTIPOLO	14.60	121.17	3.50	191.60	220		1910-1938
APA	APATITY	67.55	33.33	62.78	125.99			1973
API	APIA	-13.80	188.22	-15.61	261.99	2		1905
ART	ARCTOWSKI	-62.16	301.52	-51.33	9.25	16		1978
ARE	AREQUIPA	-16.47	288.52	-5.45	359.45			1958
AIA	ARGENTINE ISLAND	-65.20	295.70	-54.23	4.73	10	490	1957
SV3	ARTI	56.43	58.43	48.50	139.90			1973
ASH	ASHKHABAD	37.95	58.10	30.58	134.62		300	1958
ASO	ASO	32.88	131.02	22.58	199.85	570		1940
PEG	ATHENS	37.97	23.72	32.60	121.60	110		1900-1908
AUT	AU-TAU	22.45	114.05	11.20	184.60	60		1928-1939
AVE	AVERROES	37.99	14.02	38.13	93.59	230		1970
BKC	BACK	57.69	265.77	67.43	326.54			1978
BAG	BAGUIO	16.42	120.60	5.61	191.08	440		1967
BAL	BALDWIN	38.78	264.83	48.90	330.60	340		1901-1909
BLC	BAKER LAKE	64.33	263.97	73.67	319.15	30		1951
BNG	BANGUI	4.43	18.57	4.45	90.33	390		1952
BAP	BARRACKPORE	22.78	88.36	12.20	160.30	10		1904-1914
BRW	BARROW	71.30	203.25	69.10	243.67	7		1949
BTH	BARTH	54.37	12.75	55.00	99.90	20		1898-1903
BTV	BATAVIA	-6.18	106.83	-17.19	177.64	10		1884-1944
BJI	BEI-JING	40.06	116.18	29.12	186.20	43		1957
KGD	BEREZNIAKI	49.82	73.08	40.30	150.00			1965
BEL	BELSK	51.83	20.80	50.19	105.24	180		1960
BIN	BINZA	-4.38	15.26	-3.57	85.40	300		1953
BJN	BJORNOYA	74.50	19.20	71.06	124.67	80		1951
BOC	BOCHUM	51.49	7.23	52.42	92.24	120		1893-1912
BGA	BORGA	-72.97	356.20	-66.46	42.49			1975
BOX	BOROK	58.03	38.97	52.97	324.23			1977
BOU	BOULDER	40.13	254.77	48.88	319.04	1675		1964
BZR	BOUZAREAH	36.80	3.02	39.20	82.40	340		1912-1920
BJE	BRORFELDE	55.63	11.67	55.80	97.60	80		1978
BVZ	BUDAKESZI	47.52	18.90	46.40	101.80	410		1949-1955
BDV	BUDKOV	49.07	14.02	48.82	97.64	496		1967
BY1	BYRD STATION 1	-79.98	240.00	-70.60	336.60	1515		1957-1961
BY2	BYRD STATION 2	-80.01	240.51	-70.60	336.90	1515		1962-1965
CBB	CAMBRIDGE BAY	69.10	255.00	76.77	299.13	17		1972
CAN	CANBERRA	-35.30	149.00	-43.38	226.09	850	420	1980

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
CCS	CAPE CHELYUSKIN	77.72	104.28	66.72	177.41	10		1935
CGH	CAPE OF GOOD HOPE	-33.93	18.48	-33.10	81.80			1842-1846
CTO	CAPE TOWN	-33.95	18.47	-33.12	82.06	20		1932-1940
CWE	CAPE WELLEN	66.17	190.17	62.36	239.37	10		1933
CY.	CAPO DI MONTE	40.86	14.26	40.90	94.80	160		1883-1911
CPI	CAPRI	40.55	14.22	40.58	94.60			1957
CAO	CASTELLACCIO	44.43	8.93	45.34	90.82	1175	350	1933
CRC	CASTLE ROCK	37.23	237.87	43.56	301.06		460	1970
HVN	CENTRO GEOFISICO	22.97	277.86	34.00	347.40			1965
CPA	CHA-PA	22.35	103.83	11.38	175.03	1550		1957
CLF	CHAMBON LA FORET	48.02	2.27	50.06	85.71			1936
CLH	CHELTENHAM	38.70	283.20	49.65	352.89	72	530	1901-1956
CBI	CHICHIJIMA	27.15	142.30	17.80	210.78	154		1973
CHR	CHRISTCHURCH	43.54	172.62	47.60	254.3	10		1902-1928
COI	COIMBRA	40.22	351.58	44.53	71.78	140		1866
BOM	COLABA	18.90	72.82	9.70	145.30	10		1846-1905
CMO	COLLEGE 2	64.87	212.17	65.10	259.23	200		1948
CLL	COLLMBERG	51.32	13.00	51.16	97.70			1935
CSS	COLORADO SPRINGS	38.50	255.51	47.36	320.27			1973
COP	COPENHAGEN	55.69	12.58	55.39	99.64			1892-1900
CZT	CROZET	-46.43	51.87	-51.49	111.46	500		1974
DAL	DALLAS	32.98	263.25	42.73	330.14	210		1964-1974
DRS	DAR ES SALAAM	-6.51	39.18	-10.17	108.56			1896-1900
DAV	DAVAO	7.08	125.58	-3.49	196.39			1968
DVS	DAVIS	-68.60	78.00	-76.81	124.34			1973
DBN	DE BILT	52.10	5.18	53.40	90.56			1899-1938
DDI	DEHRA DUN	30.32	78.06	20.50	151.60	680		1903-1943
DIK	DIXON	73.55	80.57	63.36	162.45	20		1933
DOB	DOMBAS	62.07	9.12	61.97	100.94	660		1916
DOU	DOURBES	50.10	4.60	51.60	88.99	208		1955
DL	DUBLIN	53.35	353.73	56.90	80.00			1841-1850
DRV	DUMONT DURVILLE	-66.66	140.01	-75.06	232.15	40		1957
TFS	DUSHETI	42.08	44.70	36.50	23.50	982		1938
KIV	DYMER	50.72	30.30	47.30	113.60	100		1964
EAA	EAST ANGLIA	52.63	1.30	54.64	87.01			1973
EIC	EASTER ISLAND	-27.17	250.58	-18.37	324.28			1959-1963
EP.	EASTPORT	44.90	293.02	56.20	4.80			1860-1867
EBR	EBRO	40.82	0.50	43.45	81.13	50		1910
ENB	EIELSON AFB	64.67	212.92	65.06	260.11			1966
ELI	ELIZABETHVILLE	-11.63	27.42	-13.00	95.93	1230		1932-1957
ESK	ESKDALEMUIR	55.32	356.80	58.04	84.07	245	660	1908
EKP	ESKIMO POINT	61.10	265.93	70.78	324.73			1973
EYR	EYREWELL	-43.41	172.35	-47.48	253.71	390	540	1979
FAL	FALMOUTH	50.15	354.92	53.60	79.40	50		1892-1912
FCC	FORT CHURCHILL 1	58.80	265.90	68.53	325.60	15		1964
FCC	FORT CHURCHILL 2	58.77	265.73	68.70	325.20	15		1964
FMM	FORT MCMURRAY	56.70	248.60	64.18	305.05			1973
FSV	FORT SEVERN	55.98	272.35	66.34	336.32			1977
FSM	FORT SMITH	58.00	246.00	65.01	301.02			1973
FYU	FORT YUKON	66.57	214.70	67.08	259.59			1957
FRD	FREDERICKSBURG	38.20	282.63	49.13	352.23	69	520	1956
FTN	FREETOWN	8.46	346.79	14.21	59.59			1961-1967
FUQ	FUQUENE	5.47	286.27	16.47	357.07	2543		1954

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
FUR	FURSTENFELDBRUCK	48.17	11.28	48.48	94.62	572		1939
GEN	GENOVA MC	44.55	8.96	45.50	91.00	700		1958-1962
GEN	GENOVA C	44.43	8.93	45.50	91.00	350		1933-1969
GIT	GILGIT	35.93	74.30	26.67	148.86	1494		1967
GIM	GILLAM	56.40	265.30	66.11	326.54			1975
GIR	GIRARDVILLE	49.00	287.40	60.01	357.77			1973
GNA	GNANGARA	-31.78	115.95	-42.71	187.94	60	440	1959
GDH	GODHAVN	69.23	306.48	79.25	34.62	8		1926
GOT	GOTTINGEN	51.55	9.97	51.97	95.00	270		1957
GVD	GONZALES VIDELA	-64.82	297.15	-53.88	5.80	60		1961
VLA	GORNOTAYEZHNAYA	43.68	132.17	30.10	199.60	200		1958
GRM	GRAHAMSTOWN	-33.28	26.48	-34.01	90.04	650		1974
GWC	GREAT WHALE RIVER	55.30	282.25	66.21	350.32	25		1965
GRW	GREENWICH	51.48	0.00	53.79	85.10	50		1846-1925
GCK	GROCKA	44.63	20.77	43.28	102.27	231		1958
GUA	GUAM	13.58	144.87	4.57	214.76	150		1957
HLL	HALLET	-72.32	170.22	-74.42	278.16			1957-1963
HBA	HALLEY BAY	-75.50	333.40	-66.36	25.85	30		1957
HBK	HARTEBEESTHOEK	-25.88	27.71	-27.01	93.14			1980
HAD	HARTLAND	50.98	355.52	54.17	80.29	95	530	1957
HTY	HATIZYO	33.07	139.83	23.45	207.83			1978
HVN	HAVANA	22.97	277.85	33.75	347.53			1964
HII	HEARD ISLAND	-53.03	73.37	-61.50	132.30	10		1950-1954
HIS	HEISS ISLAND	80.62	58.05	71.60	156.33	20		1959
HLP	HEL	54.60	18.82	53.19	104.80	4		1957
HLW	HELWAN	29.87	31.33	26.98	108.01	120		1903-1959
HCR	HERCHMER	57.40	265.90	67.16	326.86			1973
HER	HERMANUS	-34.42	19.23	-33.73	82.67	26	300	1941
HNA	HOLLANDIA	-2.57	140.52	-11.94	212.17	98		1957-1962
HKC	HONG KONG 1	22.30	114.18	11.00	184.70	30		1884-1928
HKC	HONG KONG 2	22.20	114.20	11.22	184.82	555		1972
HON	HONOLULU 1-2-3	21.32	202.00	21.46	268.57	4		1902
HUA	HUANCAYO	-12.05	284.67	-1.06	355.67	3313		1922
HRB	HURBANOVO	47.87	18.18	46.89	101.07	120		1938
HYB	HYDERABAD	17.42	78.55	7.86	150.69	500		1965
IBD	IBADAN	7.43	3.90	10.17	76.46	300		1956
IRT	IRKUTSK	52.17	104.45	41.18	176.22	470		1887-1914
ISL	ISLAND LAKE	53.90	265.30	63.65	327.61			1976
ISK	ISTANBUL KANDILLY	41.07	29.07	38.31	108.87	130		1947
JSS	JASSY	47.18	27.53	44.40	109.60			1935-1957
KAK	KAKIOKA	36.23	140.18	26.62	207.77	28		1913
KNG	KALININGRAD	54.60	20.20	52.94	106.06			1964
KNY	KANOYA	31.42	130.88	21.12	199.85	105		1957
KNZ	KANOZAN	35.25	139.97	25.63	207.70	342		1961
KGD	KARAGANDA	49.82	73.08	40.56	150.04			1966
TFS	KARSANI	41.83	42.70	36.20	123.50	1100		1905-1934
KZN	KAZAN	55.83	48.85	49.36	131.52	80		1909
KEL	KELES	41.42	69.20	32.40	145.20	450		1936-1963
KEM	KEM	65.00	34.40	60.26	124.74			1973
KEW	KEW	51.47	359.68	54.10	85.10	10		1857-1924
KHB	KHABAROVSK	48.48	135.07	38.39	201.74			1972
KIV	KIEV	50.72	30.30	47.42	113.40	100		1963
KIR	KIRUNA	67.83	20.42	65.14	116.19	390		1950

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
KLY	KLYUCHI	55.03	82.90	44.70	159.00			1967
KOD	KODAIKANAL	10.23	77.47	0.81	148.93	2323		1902
KTS	KORETS	50.60	61.07	42.64	140.10			1968
KOR	KOROR	7.33	134.50	-2.64	205.21	10		1957-1966
MOS	KRASNAYA	55.47	37.32	50.70	121.70	190		1930
KSA	KSARA	33.82	35.88	30.03	113.26	920		1937-1968
KUY	KUYPER	-6.03	106.73	-17.04	177.54	1		1950-1962
KWJ	KWAJALEIN	9.05	167.20	3.13	237.11			1973
AQU	L'AQUILA	42.38	13.32	42.52	94.35	682		1960
LQA	LA QUIACA	-22.10	294.40	-11.13	5.01	3464		1920
LAS	LAS ACACIAS	-35.00	302.32	-24.24	11.86	20		1964
LDR	LAUDER	-43.03	169.41	-37.70	232.10	370		1977
LRV	LEIRVOGUR	64.18	338.30	69.71	71.98	30		1957
LNN	LENINGRAD	59.95	30.70	56.14	118.32	70		1869-1877
LER	LERWICK	60.13	358.82	62.15	89.55	105	920	1923
LIS	LISBON	38.72	350.85	43.30	70.60			1890-1900
LGR	LOGRONO	42.45	357.50	45.59	78.66	445		1957
MMK	LOPARSKAYA	68.25	33.08	63.30	126.70	200		1961
LOB	LORING AFB	46.95	292.12	57.95	3.89			1966
LA.	LOS ANGELES	34.05	241.74	41.20	305.70			1882-1889
LMM	LOURENCO MARQUES	-25.92	32.58	-27.98	97.96	40		1957
LOV	LOVO	59.35	17.83	57.84	106.75	25	720	1928
LOZ	LOVOZERO	67.97	35.02	62.90	127.64			1957
LUA	LUANDA	-8.92	13.17	-7.63	82.48	53		1956
LB	LUBECK	53.86	10.69	54.00	97.00			1885-1893
LUK	LUKIAPANG	31.32	121.03	20.20	190.80	100		1908-1933
LNP	LUNPING	25.00	121.17	14.21	191.28		100	1965
LVV	LVOV	49.90	23.75	47.80	107.10	400		1952
LWI	LWIRO	-2.25	28.80	-4.06	99.10	1680		1958-1970
MBO	MBOUR	14.40	343.02	20.68	56.80	10		1952
MCQ	MACQUARIE ISLAND	-54.50	158.95	-60.54	244.48	4		1951
MGD	MAGADAN	60.12	151.02	51.28	212.15		610	1966
MSC	MAISACH	48.20	11.26	48.50	94.90	480		1927-1932
MQ	MAKERSTOUN	55.58	357.48	52.20	85.30			1841-1849
MAB	MANHAY	50.30	5.68	51.60	90.15	440		1936-1971
MAN	MANILA	14.58	120.98	3.50	191.40			1891-1904
MRN	MARION ISLAND	-46.85	37.87	-49.30	96.75	45		1972
AMS	MARTIN DE VIVIES	-37.83	77.57	-46.94	142.78			1981
MSR	MATOCHKIN SHAR	73.26	56.40	64.80	147.40	250		1937-1944
MRI	MAURITIUS	-20.09	57.55	-26.80	124.40	50		1892-1965
MAW	MAWSON	-67.60	62.88	-73.32	106.62	6		1955
MEA	MEANOOK	54.62	246.67	61.88	304.02	686	1360	1916
MEL	MELBOURNE	-37.83	144.98	46.60	222.30	30		1865-1921
MEV	MELVILLE AFB	53.28	299.47	64.05	14.25			1966
MMB	MEMAMBETSU	43.90	144.20	34.61	210.23	39	340	1950
MNK	MINSK	54.10	26.52	51.32	111.51			1961
MIR	MIRNY	-66.55	93.02	-76.80	151.15		20	1956
MLT	MISALLAT	29.52	30.90	26.72	107.52	120		1960
MIU	MIYAZU	35.32	135.11	25.30	203.32			1973
MIZ	MIZUSAWA	39.01	141.08	29.47	208.21			1969
MFP	MOCA	3.35	8.67	5.27	80.39	1949		1958-1971
MOL	MOLODEZHNAYA	67.67	45.85	70.10	87.50	854		1965
MOS	MOSCOW	55.48	37.32	50.79	121.62	190		1880-1888

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
MBC	MOULD BAY	76.30	240.60	79.62	259.89	150		1962
MWC	MT WILSON	34.14	241.97	41.19	306.30			1926-1958
MNH	MUNCHEN	48.15	11.61	48.40	95.20	530		1842-1926
MUT	MUNTINLUPA	14.37	121.02	3.58	191.57	62		1951
MMK	MURMANSK	68.25	33.08	63.45	126.43	210		1958-1960
NCK	NAGYCENK	47.63	16.72	46.93	99.59	160		1961
NAI	NAIROBI	-1.28	36.83	-4.60	107.19	1673		1964
NTS	NANTES	47.25	358.44	50.10	81.70	35		1923-1958
NAQ	NARSSARSSUAQ	61.20	314.6O	70.60	38.66	4		1973
NL	NEW ALESUND	78.92	11.93	75.43	130.70	12		1966
NEW	NEWPORT	48.27	242.88	55.14	302.78	780	700	1966
NYI	NEW YEAR ISLAND	54.65	295.85	43.30	5.20			1902-1916
NCE	NICE	43.72	7.30	45.00	89.00			1889-1901
NGK	NIEMEGK	52.07	12.68	51.94	97.77	78	500	1932
NSM	NITSANIM	31.73	34.60	28.21	111.55	150		1963-1967
NOK	NORILSK	69.20	88.00	58.68	165.77			1969
NKK	NOVOKAZALINSK	45.77	62.12	37.76	139.83			1974
NVL	NOVOLAZAREVSKAYA	-70.77	11.82	-66.76	55.88	460		1961
NVS	NOVOSIBIRSK	55.03	82.90	44.92	159.07		480	1967
NUR	NURMIJARVI	60.52	24.65	57.71	113.51	105		1953
ODE	ODESSA	46.78	30.88	43.52	112.42	50		1896-1925
OGY	O'GYALIA	47.88	18.19	46.80	101.30	110		1906-1912
OKN	OKINAWA	24.75	125.33	14.14	195.18			1977
ORC	ORCADAS DEL SUR	-60.74	315.22	-50.30	20.00	4		1931-1962
OSL	OSLO	59.98	10.72	59.60	101.10			1843-1930
OTT	OTTAWA	45.40	284.45	56.37	354.11	75	790	1968
PAG	PANAGYURISHTE	42.52	24.18	40.61	104.75	556		1948
PPT	PAPEETE	-17.55	210.38	-15.09	284.44			1958
PAB	PARAMARIBO	5.82	304.78	16.41	16.28	2		1957
PET	PARATUNKA	53.10	158.63	44.80	220.00	110		1973
IRK	PATRONY	52.17	104.45	40.90	176.10	500		1959
PEB	PELLY BAY	68.50	270.20	78.39	323.86			1977
PEK	PEKING 1	39.95	116.47	28.70	186.30			1870-1883
PEK	PEKING 2	40.04	116.18	28.80	186.10			1957-1964
PEG	PENDELI	38.03	23.52	36.38	102.73	495		1958
PRF	PERPIGNAN	42.70	2.88	44.90	84.30	30		1890-1900
PIL	PILAR	-31.67	296.12	-20.73	6.39	336		1905
PLS	PLAISANCE	-20.43	57.67	-27.02	124.68	123		1966
PZ	PLESHCHENITZI	54.50	27.88	51.40	113.10	200		1961
POD	PODKAMENAYA TUNG	61.40	90.00	50.84	165.64		670	1968
POL	POLA	44.86	13.26	44.80	95.90	30		1883-1922
PAF	PORT AUX FRANCAIS	-49.35	70.22	-57.31	130.79	50	750	1957
PMG	PORT MORESBY	-9.40	147.15	-17.99	219.75	80		1957
PBQ	POSTE DE LA BALEINE	55.30	287.25	66.31	357.38			1984
POT	POSTDAM	52.38	13.06	52.16	98.28	80		1890-1907
PRU	PRUHONICE	49.98	14.55	49.59	98.55	329		1946
QUE	QUETTA	30.18	66.95	21.77	141.35	1737		1953
RIT	RANKIN INLET	62.80	267.90	72.64	326.36			1975
REG	REGENSBERG	47.48	8.44	48.40	91.70	605		1957-1969
RES	RESOLUTE BAY	74.70	265.10	83.14	295.98	25		1954
RDJ	RIO DE JANEIRO	-22.91	316.83	-12.80	26.00	60		1899-1906
ROB	ROBURENT	44.30	7.88	45.41	89.74	815		1964
RSV	RUDE SKOV	55.85	12.45	55.56	99.61	48	600	1907-1978

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
SAB	SABHAWALA	30.33	77.80	20.78	151.34	498		1964
SFS	SAN FERNANDO	36.47	353.80	40.47	72.90	28		1891
SJG	SAN JUAN 1-2-3	18.38	293.88	29.36	5.21	100		1903
SNA	SANAE	-70.30	357.65	-64.23	46.20	52		1962
STJ	SAINT JOHNS	47.59	307.32	58.20	23.30			1968
PSM	SAINT MAUR	48.81	2.49	50.80	86.60			1883-1900
SMG	SAN MIGUEL	37.77	334.35	45.04	52.61	175		1911
SBA	SCOTT BASE	-77.85	166.78	-78.84	293.24	15		1957
SED	SEDDEN	52.28	13.01	52.10	98.50	40		1908-1931
STF	SDR STROMFJORD	67.02	309.28	76.83	36.25			1972
SSH	SHE-SHAN	31.10	121.19	20.30	191.03	100		1934
SHB	SHEPERD BAY	68.75	266.25	78.14	316.78			1966
SHL	SHILLONG	25.55	91.88	14.99	163.95			1975
SSO	SIMOSATO	33.57	135.93	23.62	204.24	59		1954-1978
SIT	SITKA	57.07	224.67	60.31	278.12	22	1020	1902
SOD	SODANKYLA	67.37	26.63	63.68	120.64	178		1914
SLU	SLUTSK	59.68	30.48	55.80	118.30			1878-1941
SGG	SOUTH GEORGIA	-54.28	323.52	-44.82	27.73		350	1974-1982
SPA	SOUTH POLE	-90.00	0.00	-78.98	0.00	2820		1959
SRE	SREDNIKAN	62.43	152.32	53.67	212.35	61		1936-1966
MGD	STEKOLNI	60.12	151.02	51.00	211.80			1966
ODE	STEPANOVKA	46.78	30.88	43.40	112.50	140		1948
STO	STONYHURST	53.85	357.53	56.52	83.91	116		1865-1967
SUA	SURLARI	44.68	26.25	42.32	107.42	84		1949
SVD	SVERDLOVSK	56.73	61.07	48.64	141.89	290	530	1887-1931
SWI	SWIDER	52.12	21.25	50.38	105.79	100		1921
SYO	SYOWA BASE	-69.03	39.60	-70.10	79.70	15		1958-1970
TAM	TAMANRASSET	22.80	5.53	24.94	81.23	1395		1932
TNG	TANGERANG	-6.17	106.63	-17.18	177.43	14		1964
TKT	TASHKENT	41.33	69.62	32.51	145.52	500		1883
TTB	TATUOCA	-1.20	311.48	8.98	220.50	10		1957-1971
TEH	TEHERAN	35.73	51.38	29.36	128.05	1367		1960-1973
SZT	TENERIFE	28.48	343.72	34.60	60.30	310		1959
TEO	TEOLOYUCAN	19.75	260.82	29.35	329.24	2280		1923
TAA	TERRE ADELIE	-66.67	140.02	-75.07	232.18	40		1957
TMP	THOMPSON	55.72	262.12	65.09	322.65			1969
THU	THULE/CAMP TUTO	76.55	291.17	87.53	11.26	480		1932-1952
THL	THULE/QANAQ	77.48	290.83	88.46	14.10	57		1956
TFS	TIFLIS	42.08	44.70	36.62	123.49	982		1879-1905
THY	TIHANY	46.90	17.90	46.01	100.41	187		1949
TKH	TIKHAYA BAY	80.30	52.80	71.74	153.42	10		1932-1958
TIP	TIRUCHIRAPALLI	10.80	78.70	1.26	150.19			1975
TIK	TIXIE BAY	71.58	129.00	60.99	192.81	40		1944
KAK	TOKYO	35.75	139.72	26.10	207.41	20		1897-1912
TOL	TOLEDO	39.88	355.95	43.39	76.18	501		1947
TMK	TOMSK	56.47	84.93	46.21	160.93	200	510	1958-1969
TOO	TOOLANGI	-37.53	145.47	-46.05	222.66	457	510	1922-1980
AGN	TORONTO	43.67	280.50	54.80	349.10			1872-1898
TLE	TOULOUSE	43.61	1.46	46.00	83.20	190		1894-1905
TGO	TOUNGOO	18.93	96.45	7.90	167.80	300		1905-1923
TOH	TOYOHARANEW	46.95	142.75	37.20	208.30	70		1932-1941
TRW	TRELEW	-43.25	294.68	-32.28	4.81		290	1957-1970
TRD	TRIVANDRUM	8.48	76.95	-0.88	148.24	300		1957

LIST OF OBSERVATORIES (continued)

IAGA Code	Name	Geographic		Geomagnetic		Alt (m)	K=9 lower limit	Open -Closed
		Lat	Long	Lat	Long			
TRO	TROMSO	69.67	18.95	67.00	117.16	105		1930
TSN	TSINGTAO	36.07	120.32	25.00	189.90	80		1924-1936
TSU	TSUMEB	-19.22	17.70	-18.59	84.83	1300		1964
TUC	TUCSON	32.25	249.17	40.37	314.57	770	380	1910
TUL	TULSA	35.92	264.22	45.75	330.78	257		1961
UCC	UCCLE	50.80	4.36	52.30	89.40	100		1896-1919
UBA	ULAN BATOR	47.85	106.75	36.84	178.03			1966
WIT	UTRECHT	52.00	5.12	53.40	90.80			1891-1896
VLJ	VAL JOYEUX	48.82	2.02	50.87	85.83			1901-1936
VAL	VALENTIA	51.93	349.75	56.15	74.79	14		1899
VSS	VASSOURAS	-22.40	316.35	-12.53	25.70	457		1915
VIC	VICTORIA	48.52	236.58	54.33	295.66	185	660	1956
VQS	VIEQUES	18.15	294.55	29.11	5.93			1903-1924
VLA	VLADIVOSTOK	43.12	131.90	32.84	199.68			1932
LNN	VOEIKOVO	59.95	30.70	56.00	118.50	70		1947
VOR	VOROSHILOV	43.78	132.03	33.20	199.60	30		1952-1957
VOS	VOSTOK	-78.45	106.87	-89.31	139.62	3500		1958
SVD	VYSOKAYA	56.73	61.07	48.40	141.90	290		1932
WAT	WATHEROO	-30.30	115.90	-41.23	187.82	240		1919-1958
WES	WESTON	42.38	288.68	53.40	359.49			1960
WHS	WHITE SHELL	49.80	264.80	59.56	328.39			1975
WIK	WIEN	48.25	16.36	47.60	69.70			1892-1898
WIA	WIEN-AUHOF	48.20	16.24	47.50	69.60	2050		1929-1950
WIK	WIEN-KOBENZL	48.27	16.32	47.62	69.48	400		1954
WLH	WILHELMSHAVEN	53.53	8.15	54.20	94.50	10		1884-1911
WIL	WILKES	-66.25	110.58	-77.26	182.71			1957-1966
WNG	WINGST	53.75	9.07	54.22	95.21	50	550	1939
WNP	WINNIPEG	49.63	262.87	59.19	326.02			1969-1975
WIT	WITTEVEEN	52.82	6.67	53.79	92.39	17	540	1938-1988
YAK	YAKUTSK	62.02	129.72	51.53	195.40	100		1931
TKT	YANGI BAZAR	41.33	69.62	32.30	145.60	500		1964
YAU	YAUCA	-15.53	285.33	-4.54	356.36			1957-1960
YKC	YELLOWKNIFE	62.47	245.53	69.14	296.56	198		1958
YSS	YUZHNO SAKHALINSK	46.95	142.72	37.49	208.45			1948
KNK2	ZAIMISHCHE	55.83	48.85	49.20	131.60	80		1914-1972
ZAR	ZARIA	11.15	7.65	13.12	80.89			1964
ZKW	ZI KA WEI	31.22	121.43	20.20	191.20	10		1875-1907
ZIN	ZINZEN	37.48	126.63	26.60	195.30	50		1921-1941
ZSC	ZO SE	31.10	121.19	20.00	190.80	100		1933-1974
ZUY	ZUY	52.47	104.03	41.20	17.80	430		1915-1958

LIST OF OBSERVATORIES (continued)

Sites of observatories having provided records over 50 years or more

First observatory Name	Open -Closed	Further Observatories, if any Name	Open -Closed
AGINCOURT	1881 - 1969	OTTAWA	1968 - ...
ALIBAG	1904 - ...		
AMBERLEY	1929 - 1977	LAUDER	1977 - ...
ANTANANARIVO	1890 - ... (1894 - 1901 and 1923 - 1928 missing)		
APIA	1905 - ...		
ASO	1940 - ...		
BATAVIA	1884 - 1944 (1899 - 1902 missing)	KUYPER TANGERANG	1950 – 1962 1964 - ...
CAPE CHELYUSKIN	1935 -... (1946-1950 and 1952-1953 missing)		
CAPE TOWN	1932 - 1940	HERMANUS	1941 - ...
CAPE WELLEN	1933 - ... (1944 - 1949 missing)		
CHELTENHAM	1901 - 1956	FREDERICKSBURG	1956 - ...
COIMBRA	1866 - ...		
COLABA	1846 - 1905	ALIBAG	1904 - ...
DIXON	1933 - ... (1945 and 1947 missing)		
DOMBAS	1916 - ...		
EBRO	1910 - ... (1938 - 1942 missing)		
ESKDALEMUIR	1908 - ...		
FURSTENFELDBRUCK		1939 - ...	
GODHAVN	1926 - ...		
GREENWICH	1846 - 1925	ABINGER HARTLAND	1925 – 1957 1957 - ...
HELWAN	1903 - 1959 (1952 - 1955 missing)	MISSALAT	1960 - ...
HURBANOVO	1938 -...		
HONG KONG	1884 - 1928	AU TAU HONG KONG	1928 – 1939 1972 - ...
HONOLULU	1902 - ...		
HUANCAYO	1922 - ...		
KAZAN	1909 - ...		
KELES	1936 - 1963	YANGI BAZAR	1964 - ...
KEW	1858 - 1924		
KODAIKANAL	1902 - ...		
KRASNAYA	1930 - ... (1934 - 1937 and 1939 - 1945 missing)		
LA QUIACA	1920 - ...		
LENINGRAD	1869 - 1877 (1871 missing)	SLUTSK VOEIKOVO	1878 – 1941 1947 - ...
LERWICK	1923 - ...		
LOVÖ	1928 - ...		
MANILA	1891 - 1904	ANTIPOLO MUNTINLUPA	1910 – 1938 1951 - ...

LIST OF OBSERVATORIES (continued)

Sites of observatories having provided records over 50 years or more

First observatory Name	Open -Closed	Further Observatories, if any Name	Open -Closed
MAURITIUS	1892 - 1965		
MEANOOK	1916 - …		
MELBOURNE	1865 - 1921	TOOLANGUI	1922 – 1980
		CANBERRA	1980 - …
OSLO	1843 - 1930		
PILAR	1905 - …		
POTSDAM	1890 - 1907	SEDDEN	1908 – 1931
		NIEMEGK	1932 - …
RUDE SKOV	1907 - 1978	BJORFELDE	1978 - …
SAINT MAUR	1883 - 1900	VAL JOYEUX	1901 – 1936
		CHAMBON LA FORÊT	1936 - …
SAN FERNANDO	1891 - …		
SAN JUAN (PUERTO RICO)	(1925 missing)	1903 – 1924	
SAN MIGUEL	1911 - …		
SITKA	1902 - …		
SODANKYLA	1914 - ... (1945 missing)		
STONYHURST	1865 – 1967 (1944 - 1960 missing)		
SVERDLOVSK	1887 - 1978	VYSOKAYA - DUBRAVA	1932 - …
SWIDER	1921 - …		
TEOLOYUCAN	1923 - …		
TIFLIS	1879 - 1905	KARSANI	1905 – 1934
		DUSHETI	1938 - …
TIKHAYA BAY	1932 - 1958 (1947 - 1950 missing)	HEISS ISLAND	1959 - …
TOKYO	1897 - 1912	KAKIOKA	1913 - …
TROMSÖ	1930 - …		
TUCSON	1910 - …		
UCCLE	1896 - 1919 (1943 - 1945 missing)	MANHAY	1936 – 1971
		DOURBES	1955 - …
UTRECHT	1891 - 1896	DE BILT	1899 – 1938
		WITTEVEEN	1938 - 1988
VALENTIA	1899 - …		
VASSOURAS	1915 - …		
WATHEROO	1919 - 1958	GNANGARA	1959 - …
WILHELMSHAFEN	1884 - 1911	WINGST	1939 - …
YAKUTSK	1931 - …		
ZAIMISHCHE	1914 - 1972		
ZI - KA - WEI	1875 - 1907	LUKIAPANG	1908 – 1933
		ZO - SE	1933 - 1974

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MUSICAL DIAGRAM OF aa 1993



aa INDICES 1993

JAN. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	20	42	42	20	31	
2	42	55	46	51	48	
3	59	49	55	54	54	
4	62	54	53	63	58	
5	28	24	28	24	26	
6	26	23	23	26	25	
7	57	33	28	63	45	
8	29	24	19	34	27	
9	34	23	27	30	29	
10	32	45	55	23	39	
11	48	39	18	68	43	
12	25	16	23	17	20	
13	32	21	11	41	26	
14	40	32	37	35	36	
15	29	21	21	29	25	
16	19	26	22	23	22	
17	25	19	28	15	22	
18	20	27	16	31	23	
19	48	44	44	49	46	
20	29	36	36	29	33	
21	17	13	19	11	15	*
22	14	11	8	17	12	K K *
23	10	9	9	10	10	C K *
24	22	19	18	23	21	
25	57	43	15	86	50	
26	45	28	44	29	37	
27	24	14	19	19	19	
28	14	11	15	10	13	C C *
29	12	7	7	12	10	C K *
30	24	22	21	25	23	
31	74	83	77	81	79	
Mean values	32.8	29.5			31.1	

FEB. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	47	43	33	56	45	
2	41	22	35	29	32	
3	21	13	10	25	17	
4	17	10	12	15	14	
5	14	13	11	15	13	C C
6	11	10	10	11	11	C *
7	54	40	38	56	47	
8	69	55	56	68	62	
9	48	41	44	45	44	
10	31	30	18	44	31	
11	43	24	25	42	34	
12	31	20	33	18	26	
13	22	17	22	17	20	
14	12	9	13	8	11	C C
15	9	10	8	11	9	C C *
16	9	12	14	7	11	C "
17	56	64	44	76	60	
18	29	27	16	40	28	
19	14	12	16	10	13	C
20	42	39	37	44	40	
21	48	48	32	65	49	
22	47	55	53	49	51	
23	20	14	17	17	17	
24	13	10	12	11	12	C C
25	11	13	9	15	12	K C
26	13	9	7	15	11	C K *
27	9	10	8	12	10	K *
28	28	34	30	32	31	
Mean values	28.9	25.2			27.1	

MAR. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	38	33	24	47	36	
2	42	34	29	47	38	
3	56	37	29	63	46	
4	37	24	41	19	30	
5	14	9	14	9	12	C *
6	19	20	13	25	19	*
7	45	26	37	34	36	
8	45	46	23	68	46	
9	76	83	100	60	80	
10	29	17	27	20	23	
11	68	75	34	109	71	
12	52	30	35	47	41	
13	43	49	44	49	46	
14	43	32	26	49	38	
15	55	89	67	77	72	
16	56	51	55	52	53	
17	41	32	38	35	37	
18	31	28	39	20	29	
19	19	18	15	22	19	*
20	42	35	35	42	38	
21	44	46	42	48	45	
22	50	31	40	40	40	
23	21	19	16	24	20	
24	74	67	92	49	71	
25	28	27	30	25	27	
26	20	14	14	20	17	*
27	34	21	19	37	28	
28	37	37	26	48	37	
29	26	18	31	13	22	
30	42	37	30	49	39	
31	22	17	17	22	19	*
Mean values	40.3	35.5			37.8	

APR. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	19	13	12	20	16	
2	10	7	10	7	8	C C *
3	10	4	6	8	7	C C *
4	81	64	9	137	73	
5	90	83	97	77	87	
6	27	22	20	30	25	
7	25	19	16	28	22	
8	55	34	33	56	44	
9	43	37	19	61	40	
10	32	36	39	29	34	
11	19	11	12	18	15	
12	32	16	38	10	24	
13	60	61	78	44	61	
14	31	22	25	29	27	
15	43	51	37	57	47	
16	38	21	33	26	29	
17	21	28	18	32	25	
18	35	28	42	21	32	
19	18	21	15	24	20	
20	34	35	35	35	35	
21	54	37	42	49	45	
22	42	25	22	45	33	
23	24	17	17	24	20	
24	21	16	18	19	19	
25	19	16	23	12	18	
26	11	11	10	11	11	C C *
27	9	7	5	11	8	C C *
28	11	6	7	10	8	C C *
29	27	14	9	33	21	
30	22	23	26	19	23	
Mean values	32.2	26.2			29.1	

aa INDICES 1993 (continued)

MAY 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	13	10	19	4	12	K K
2	12	10	7	15	11	C C
3	17	16	17	16	17	
4	11	7	7	12	9	C K
5	11	10	11	10	11	K K
6	21	20	17	23	20	
7	32	36	16	51	34	
8	62	76	60	79	69	
9	66	87	86	66	76	
10	60	71	86	46	66	
11	10	7	9	8	8	C
12	32	32	25	40	32	
13	25	14	17	22	19	
14	23	22	21	24	22	
15	30	21	19	33	26	
16	27	22	29	20	24	
17	47	34	30	51	40	
18	16	10	7	19	13	K
19	27	24	22	29	26	
20	15	15	19	11	15	
21	9	4	7	6	6	C C *
22	10	7	8	9	8	C C *
23	7	5	5	7	6	C C *
24	8	4	7	5	6	C C *
25	6	2	4	4	4	C C *
26	10	4	5	9	7	C K
27	30	23	28	25	27	
28	43	28	36	35	35	
29	18	16	23	11	17	
30	11	6	9	9	9	C C
31	13	7	7	13	10	C C
Mean values	23.3	21.0			22.1	

JUNE 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	10	5	8	7	7	C C *
2	13	9	10	13	11	C K
3	29	25	24	30	27	
4	74	81	84	72	78	
5	62	60	77	45	61	
6	34	35	35	34	35	
7	43	37	38	41	40	
8	31	14	22	23	23	
9	16	8	11	13	12	C
10	45	25	9	62	35	
11	22	16	21	16	19	
12	21	22	23	20	21	
13	31	22	31	22	26	
14	18	18	23	14	18	
15	13	7	14	6	10	C C
16	9	5	8	6	7	C C *
17	12	6	7	11	9	C C
18	10	3	4	9	7	C C *
19	13	9	10	12	11	C C
20	12	4	9	7	8	C C
21	6	2	4	4	4	C C *
22	12	6	6	12	9	C C
23	39	17	17	39	28	
24	50	44	46	49	47	
25	36	28	36	28	32	
26	15	7	11	11	11	C
27	13	8	11	9	10	C C
28	9	5	8	6	7	C K *
29	22	20	21	22	21	
30	25	11	14	22	18	
Mean values	24.8	18.6			21.7	

JULY 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	44	39	39	45	42	
2	48	40	31	58	44	
3	44	17	38	23	31	
4	18	15	21	12	16	
5	16	7	16	8	12	K K
6	12	9	11	10	11	K K
7	18	7	14	11	13	C
8	33	28	34	27	31	
9	43	15	23	35	29	
10	25	19	20	24	22	
11	31	43	51	23	37	
12	17	12	15	14	14	
13	26	22	29	19	24	
14	8	3	5	6	6	C K *
15	13	7	8	12	10	C C
16	9	5	6	8	7	C C *
17	6	4	5	5	5	C C *
18	11	6	8	10	9	C C
19	14	5	8	11	9	C K
20	35	18	19	34	27	
21	24	25	22	27	24	
22	22	23	24	22	23	
23	14	8	11	10	11	C K
24	13	7	7	13	10	C C *
25	12	4	11	5	8	C C
26	12	7	9	10	9	C C *
27	25	12	10	27	18	
28	18	8	16	10	13	C
29	41	19	10	51	30	
30	13	9	14	7	11	C
31	17	8	15	10	12	C C
Mean values	22.0	14.4			18.2	

AUG. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	10	2	6	6	6	C C *
2	7	4	5	6	6	C C *
3	16	7	8	15	11	C C
4	55	26	18	63	40	
5	30	28	42	17	29	
6	28	32	29	32	30	
7	36	31	31	36	33	
8	15	13	19	9	14	
9	28	24	27	25	26	
10	17	11	13	15	14	
11	9	4	8	5	6	C C
12	14	12	12	14	13	C C
13	9	6	8	7	7	C C
14	8	2	4	7	5	C C *
15	29	20	8	41	24	
16	102	76	81	98	89	
17	35	22	41	16	28	
18	35	27	32	30	31	
19	29	16	21	24	23	
20	15	13	18	10	14	
21	9	9	9	8	9	C C
22	14	10	11	13	12	K C
23	8	4	7	5	6	C C *
24	10	6	8	9	8	C C
25	9	3	5	8	6	C C *
26	13	8	8	13	10	C C
27	39	30	15	54	35	
28	25	23	18	30	24	
29	23	12	19	16	18	
30	9	5	7	7	7	C C
31	12	6	9	9	9	C C
Mean values	22.5	15.9			19.1	

aa INDICES 1993 (continued)

SEP. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	7	2	4	5	5	C C *
2	13	11	7	17	12	C K
3	62	34	25	71	48	
4	43	40	51	32	41	
5	24	22	27	19	23	
6	27	20	24	23	24	
7	17	10	12	15	14	
8	21	7	17	11	14	K
9	11	8	7	12	9	C C
10	9	8	7	9	8	C C *
11	18	6	10	14	12	C C
12	35	25	10	50	30	
13	99	119	132	86	109	
14	42	44	51	35	43	
15	26	19	26	19	23	
16	13	7	8	12	10	C C
17	8	6	7	7	7	C C *
18	8	7	8	7	7	C C *
19	10	6	8	8	8	C K *
20	38	40	24	54	39	
21	28	15	22	21	22	
22	13	11	15	9	12	C K
23	28	13	4	37	20	
24	37	29	27	39	33	
25	25	18	15	28	22	
26	17	19	24	12	18	
27	19	14	17	16	17	
28	18	17	10	24	17	
29	45	36	22	60	41	
30	34	24	25	32	29	
Mean values	26.4	21.2			23.8	

OCT. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	42	35	51	26	39	
2	20	14	11	23	17	
3	12	7	5	14	10	C K
4	15	11	7	19	13	K K
5	13	8	6	15	11	C
6	27	13	29	12	20	
7	9	6	8	8	8	C *
8	25	46	38	33	35	
9	59	60	69	51	60	
10	46	43	46	43	44	
11	54	40	44	50	47	
12	38	27	31	34	33	
13	23	13	19	17	18	
14	21	10	19	12	15	
15	7	7	9	6	7	C C *
16	13	10	7	15	11	C K *
17	19	9	15	13	14	
18	14	12	12	14	13	C
19	21	11	17	15	16	K
20	11	8	8	11	9	C C *
21	9	10	12	7	9	C
22	34	29	32	31	31	
23	25	20	28	17	22	
24	24	16	24	16	20	
25	55	77	43	89	66	
26	35	26	13	48	31	
27	62	60	57	64	61	
28	36	38	34	41	37	
29	22	16	16	22	19	
30	8	7	8	7	7	C K *
31	21	17	9	28	19	
Mean values	26.5	22.7			24.6	

NOV. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	28	15	19	24	22	
2	9	10	13	6	9	C K *
3	32	22	5	49	27	
4	107	81	98	91	95	
5	66	47	52	61	57	
6	52	46	44	54	49	
7	38	28	24	41	33	
8	43	21	25	39	32	
9	25	14	22	17	20	
10	26	17	21	21	21	
11	11	11	13	9	11	C K
12	8	6	7	7	7	C C *
13	20	15	9	26	18	
14	28	29	14	44	29	
15	28	24	16	36	26	
16	23	17	15	25	20	
17	20	8	10	19	14	
18	58	52	11	100	55	
19	69	39	48	60	54	
20	15	16	20	11	16	
21	17	11	17	11	14	C
22	10	8	10	8	9	C C
23	15	9	12	12	12	C C
24	10	10	10	10	10	C C *
25	13	15	11	17	14	
26	41	29	21	49	35	
27	16	11	13	14	14	
28	10	7	5	12	9	C *
29	30	20	23	27	25	
30	10	7	10	8	9	C *
Mean values	29.2	21.6			25.4	

DEC. 1993	Day N	Day S	Half Day am	Half Day pm	Daily aa	Quiet Days
1	56	51	25	82	54	
2	69	58	42	86	64	
3	52	43	58	37	47	
4	20	12	11	21	16	
5	23	18	10	31	20	
6	12	8	9	11	10	C
7	44	37	13	69	41	
8	68	86	102	51	77	
9	5	6	4	7	6	C *
10	18	15	11	22	17	
11	14	12	15	11	13	C
12	13	10	10	12	11	C C
13	9	4	5	8	7	C C *
14	8	7	9	6	8	C K *
15	17	29	27	20	23	
16	48	44	35	58	46	
17	38	26	25	39	32	
18	36	28	24	40	32	
19	23	13	20	16	18	
20	27	26	27	26	27	
21	38	32	26	43	35	
22	22	21	25	18	21	
23	29	17	15	32	23	
24	22	26	20	28	24	
25	25	17	22	20	21	
26	22	14	12	24	18	
27	13	15	11	17	14	
28	8	6	5	9	7	C C *
29	8	6	7	7	7	C C *
30	8	9	11	6	9	C
31	36	36	41	31	36	
Mean values	26.8	23.7			25.2	

MONTHLY and YEARLY aa 1868 - 1993

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1868	10.6	16.0	19.7	21.0	16.4	17.9	21.5	19.4	24.0	25.9	13.3	13.7	18.3
1869	19.2	23.6	22.3	29.5	23.1	19.2	17.4	19.9	29.8	17.9	14.7	14.6	20.9
1870	21.6	23.2	21.2	25.8	20.9	16.4	14.1	21.4	35.2	26.2	21.9	19.9	22.3
1871	19.3	24.8	21.4	31.2	17.2	17.1	21.5	23.5	17.7	20.0	28.1	15.7	21.4
1872	17.0	28.0	23.0	23.4	20.4	17.7	25.3	25.2	20.7	38.6	25.0	20.5	23.7
1873	29.4	20.6	24.1	20.8	20.8	25.8	20.6	18.8	19.3	16.6	14.6	12.1	20.3
1874	17.8	16.1	12.7	19.1	14.0	12.8	13.1	13.0	15.7	17.8	14.3	10.1	14.7
1875	10.0	13.5	12.7	12.7	13.0	10.1	11.8	8.7	13.1	11.9	9.8	8.5	11.3
1876	9.8	12.6	11.0	6.5	7.6	7.7	9.1	10.2	10.1	10.5	10.2	10.1	9.6
1877	9.3	9.6	10.4	8.9	13.0	8.9	7.8	7.6	7.4	6.9	11.6	6.8	9.0
1878	7.4	7.5	6.2	8.5	7.3	8.6	4.8	6.4	7.9	6.8	7.1	9.3	7.3
1879	6.2	5.8	8.6	5.6	6.2	5.9	5.8	8.0	8.9	7.0	7.1	9.3	7.1
1880	7.3	4.7	9.8	8.9	13.1	7.3	9.9	23.1	11.4	14.4	14.5	14.6	11.6
1881	15.1	12.8	13.2	11.4	8.5	10.7	12.2	7.8	17.9	14.0	20.2	20.3	13.7
1882	15.7	19.5	16.5	35.9	20.6	19.0	14.5	19.7	15.0	25.0	55.0	20.1	23.0
1883	15.4	26.7	23.3	17.8	13.9	18.5	21.5	12.4	19.5	13.7	17.6	12.0	17.6
1884	9.1	14.3	17.5	15.6	12.8	13.1	15.5	13.0	13.5	16.0	16.9	13.2	14.2
1885	13.2	15.5	13.3	14.0	21.2	14.2	13.0	17.7	22.1	15.9	13.7	12.1	15.5
1886	17.7	17.1	27.6	21.6	22.6	21.6	19.3	18.1	19.0	21.7	20.7	20.6	20.7
1887	16.9	22.9	15.2	20.6	17.3	12.6	12.5	17.2	18.9	14.1	14.6	15.2	16.4
1888	18.2	15.9	15.2	16.4	19.3	14.5	12.9	13.7	15.1	15.0	15.3	14.0	15.5
1889	9.8	11.0	13.9	11.6	10.2	9.9	13.5	12.6	14.6	13.6	18.5	11.8	12.6
1890	11.7	11.8	10.0	8.4	8.4	7.3	10.0	10.3	13.8	15.6	13.3	8.3	10.7
1891	10.4	14.2	20.6	22.5	23.7	11.7	11.2	15.0	22.3	20.7	16.5	16.2	17.1
1892	19.5	35.1	36.3	20.4	25.1	17.7	33.7	22.1	20.1	23.1	15.7	22.1	24.3
1893	18.2	19.1	18.4	14.0	12.0	17.1	14.5	18.5	19.5	20.9	18.5	13.9	17.0
1894	19.2	33.9	20.0	17.4	19.0	20.0	26.3	21.0	22.5	17.0	21.9	12.0	20.7
1895	15.4	20.8	23.0	20.7	16.6	17.6	17.9	10.5	15.9	22.7	22.5	14.5	18.1
1896	25.4	23.6	21.8	17.2	20.6	11.7	15.6	18.1	17.8	17.5	13.1	13.8	18.0
1897	12.0	14.0	14.2	22.2	14.6	12.0	9.3	10.7	11.0	13.8	12.6	17.2	13.6
1898	13.5	15.1	20.5	13.4	15.1	14.3	13.5	14.6	21.5	14.1	13.6	13.0	15.2
1899	14.3	17.8	15.6	14.2	15.9	13.5	11.6	11.4	13.6	9.4	8.7	12.1	13.1
1900	13.5	8.9	12.5	7.2	9.6	4.7	5.2	6.0	5.2	7.1	5.4	5.4	7.6
1901	7.3	7.0	6.5	5.2	6.2	6.0	5.6	6.1	6.0	5.4	5.6	6.4	6.1
1902	6.1	7.6	5.9	7.9	5.6	5.4	6.3	6.2	7.0	7.2	7.6	6.1	6.6
1903	6.5	5.9	6.7	10.3	7.8	11.3	10.8	14.1	14.0	26.3	16.3	13.5	12.0
1904	15.1	12.6	8.7	13.1	13.0	10.5	10.8	10.2	11.2	13.0	11.6	10.6	11.7
1905	16.0	20.3	16.6	16.6	10.6	13.8	11.8	16.8	16.3	11.2	20.1	10.7	15.0
1906	7.6	17.5	14.0	11.6	11.4	11.3	12.4	12.0	14.2	12.7	9.6	16.4	12.5
1907	16.5	25.3	14.3	12.1	16.8	14.9	16.9	15.5	16.8	18.5	14.6	11.5	16.1
1908	13.6	17.0	23.2	15.6	18.9	12.6	10.4	18.2	31.6	15.8	17.4	11.4	17.1
1909	24.8	17.0	19.8	12.1	18.3	11.5	12.6	17.6	27.6	19.4	11.6	13.8	17.2
1910	12.8	14.6	20.9	19.8	17.2	13.7	10.8	20.2	19.2	24.4	17.9	19.5	17.6
1911	21.3	23.7	21.5	21.1	16.6	13.6	15.3	11.9	12.2	12.5	10.6	11.0	15.9
1912	7.6	8.0	7.7	9.4	9.6	8.4	7.8	10.5	9.8	9.5	9.4	9.4	8.9

MONTHLY and YEARLY aa 1868 – 1993 (continued)

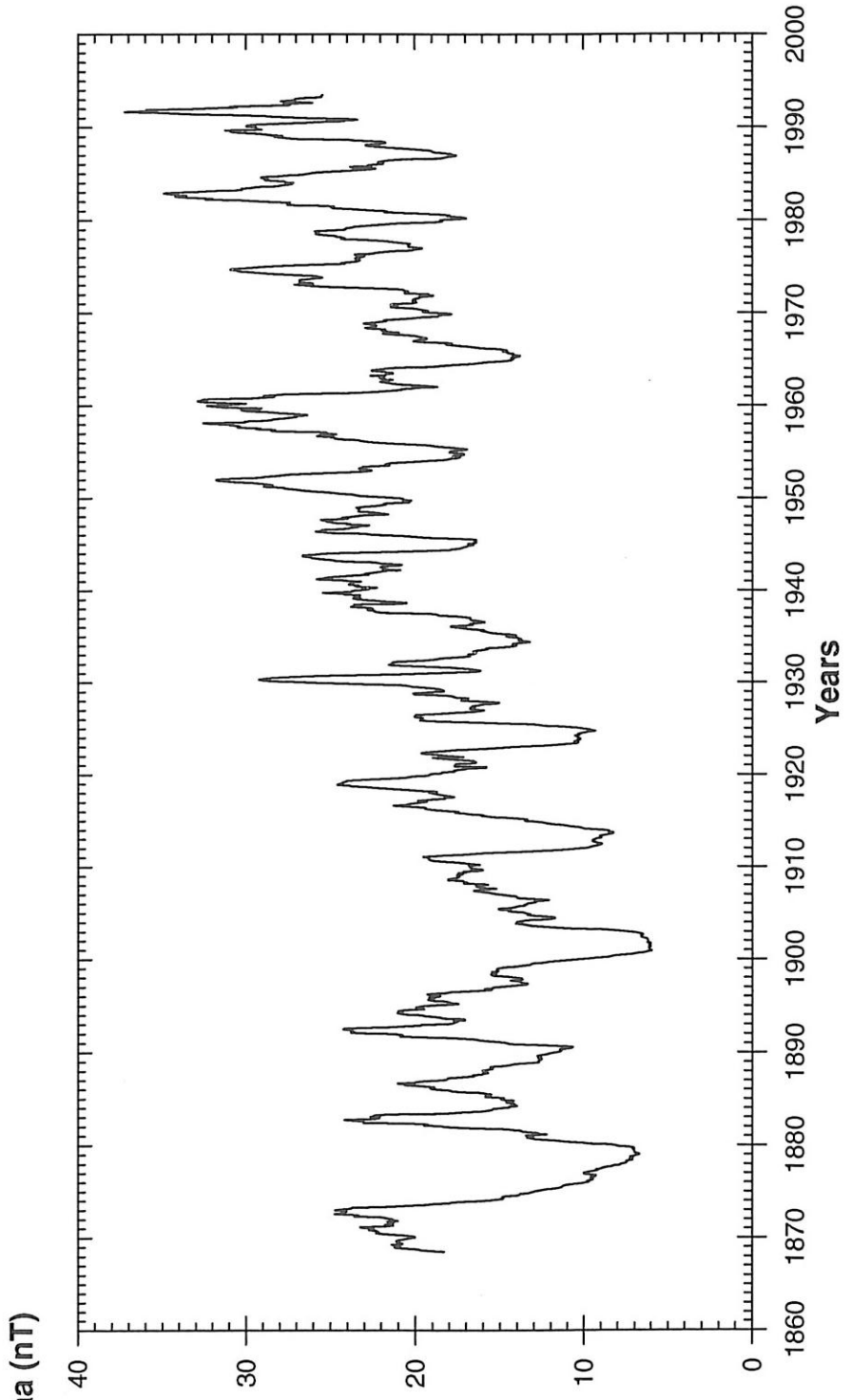
Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1913	10.3	9.5	9.9	9.8	9.0	7.0	7.0	6.7	10.0	10.7	7.6	6.6	8.7
1914	7.1	7.3	10.1	13.5	8.1	10.3	12.9	14.9	11.8	13.3	13.4	9.3	11.0
1915	10.9	13.5	15.0	15.3	13.9	17.9	11.2	14.7	17.0	21.3	24.9	12.4	15.7
1916	16.0	11.6	25.0	19.2	20.2	15.7	19.7	21.4	22.4	24.5	24.0	18.9	19.9
1917	25.1	19.1	16.2	16.7	15.9	12.7	14.6	28.1	16.1	20.2	14.8	19.8	18.3
1918	17.8	21.3	19.7	20.5	18.8	15.6	17.4	22.2	28.4	26.4	23.1	28.1	21.6
1919	27.8	26.5	30.7	21.3	27.5	13.9	14.9	22.7	25.3	26.9	14.3	18.4	22.5
1920	16.7	14.1	28.5	17.8	17.7	12.4	14.0	14.8	25.7	17.3	15.1	17.0	17.6
1921	11.7	10.6	15.6	17.2	40.5	12.4	13.3	14.6	12.4	16.2	16.2	17.8	16.6
1922	18.0	18.6	24.1	23.5	18.3	18.6	20.0	20.7	19.7	20.1	13.1	10.4	18.8
1923	10.2	13.7	12.1	10.0	10.1	11.1	8.4	7.3	10.7	12.6	7.8	9.6	10.3
1924	13.6	10.9	12.9	7.3	10.2	12.3	9.7	6.9	12.6	8.7	9.3	7.9	10.2
1925	9.4	8.6	8.6	10.8	11.0	17.7	11.8	13.6	18.0	21.7	13.2	12.9	13.1
1926	27.1	26.2	27.6	27.1	19.6	16.2	11.4	13.2	22.7	23.3	11.9	13.3	19.9
1927	15.5	15.2	20.7	15.6	16.8	11.2	16.5	18.5	20.9	24.7	8.0	15.8	16.7
1928	10.1	13.5	11.3	12.8	23.6	20.2	27.8	15.9	19.6	23.4	18.2	15.6	17.7
1929	13.0	24.0	26.2	13.9	16.3	14.7	18.6	15.9	21.5	25.5	22.7	21.0	19.4
1930	20.9	27.9	30.9	38.2	36.4	33.3	28.3	33.3	28.8	29.3	18.8	17.2	28.6
1931	13.0	15.4	12.9	9.9	12.0	14.7	13.1	17.7	21.2	27.3	23.7	21.1	16.8
1932	20.2	21.4	27.9	28.2	22.2	11.8	12.4	19.1	19.1	17.2	13.8	15.3	19.0
1933	15.9	18.4	19.2	21.1	17.5	13.6	12.3	14.2	18.4	16.8	16.0	13.0	16.3
1934	11.5	14.9	20.0	11.3	11.4	10.0	10.3	17.4	17.6	11.6	9.5	15.5	13.4
1935	15.6	16.5	17.8	13.6	11.6	16.4	12.5	9.9	20.8	20.2	15.6	17.7	15.7
1936	17.4	19.8	15.5	22.1	17.5	19.8	18.0	10.2	9.8	15.4	18.0	12.0	16.3
1937	12.2	22.2	18.6	26.3	18.6	18.9	18.8	14.7	14.7	27.8	19.4	16.5	19.0
1938	46.6	26.0	20.4	26.1	23.7	14.8	19.7	19.9	24.7	24.0	17.8	19.5	23.6
1939	13.5	21.7	27.0	36.1	27.8	22.8	26.1	23.0	19.2	28.4	14.6	18.6	23.2
1940	24.8	20.1	43.9	22.4	20.0	23.6	18.4	18.4	20.1	21.9	25.1	23.7	23.6
1941	21.9	27.6	42.9	21.6	19.1	17.4	27.9	22.3	38.2	17.5	23.6	19.3	24.9
1942	14.6	18.8	32.4	24.4	14.2	14.6	23.0	21.9	25.8	30.3	22.8	18.4	21.8
1943	18.1	17.1	21.0	21.9	24.5	21.2	24.4	41.0	35.3	32.8	29.6	23.3	25.9
1944	21.2	17.9	26.6	21.6	16.1	14.9	11.1	16.5	17.5	17.2	11.2	21.8	17.8
1945	16.1	16.4	25.0	19.1	15.4	11.1	15.3	12.1	15.6	17.9	12.0	20.2	16.4
1946	19.2	30.2	43.5	25.0	24.1	22.3	28.6	16.7	41.7	19.6	19.3	14.3	25.3
1947	20.6	17.1	37.9	23.3	19.1	21.1	21.4	32.9	39.1	31.3	20.7	17.9	25.3
1948	20.8	21.0	24.2	17.8	23.7	15.0	16.2	28.3	22.0	36.1	23.1	23.0	22.6
1949	29.8	20.4	24.7	17.6	22.4	17.9	11.8	19.2	17.8	32.8	24.6	15.1	21.2
1950	19.5	23.2	20.6	23.8	21.7	19.0	19.5	30.2	29.3	34.5	28.0	24.0	24.4
1951	23.1	29.2	28.5	32.1	25.5	23.2	25.2	29.7	44.4	30.3	25.7	28.2	28.7
1952	28.5	34.3	40.1	38.0	33.1	23.8	20.8	19.0	28.5	26.4	18.9	23.4	27.9
1953	22.3	21.2	27.4	22.7	21.4	18.4	22.5	26.1	29.0	22.4	20.2	12.6	22.2
1954	13.9	24.5	25.5	20.6	12.0	9.7	13.1	16.5	25.4	21.1	14.5	10.9	17.2
1955	19.3	18.2	23.6	21.1	16.7	15.1	12.3	14.3	19.1	17.8	19.9	14.1	17.6
1956	28.7	23.3	27.6	31.7	29.3	23.5	19.8	20.7	22.4	19.3	32.3	18.2	24.7
1957	28.7	26.8	36.7	28.8	18.1	29.1	21.7	20.7	57.0	24.0	29.5	31.7	29.3

MONTHLY and YEARLY aa 1868 – 1993 (continued)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1958	25.5	43.2	36.1	27.6	25.2	29.7	36.0	25.1	26.5	24.7	15.0	27.2	28.4
1959	24.3	35.9	29.9	24.2	25.7	21.6	42.5	31.2	36.1	28.2	32.1	30.8	30.2
1960	25.2	23.5	27.6	51.5	31.6	27.6	28.1	27.2	26.4	45.6	45.9	34.5	32.9
1961	20.6	25.1	22.0	21.8	22.3	20.1	36.0	18.5	20.7	23.3	17.3	21.1	22.4
1962	13.2	19.2	15.5	22.6	13.4	18.1	21.0	26.2	29.8	33.3	22.5	23.5	21.5
1963	19.3	15.3	14.9	18.2	20.4	20.5	20.8	22.5	40.2	23.5	20.7	18.9	21.3
1964	20.1	20.1	21.0	21.7	17.5	15.1	16.9	14.8	18.2	16.9	13.8	10.3	17.2
1965	11.8	16.3	14.3	12.6	10.5	15.7	14.8	16.8	17.5	13.1	11.7	13.8	14.0
1966	14.2	14.8	18.6	12.0	14.8	12.5	17.1	20.0	29.4	17.5	16.8	20.5	17.4
1967	18.9	19.8	13.8	15.5	33.1	18.6	14.4	17.5	24.7	17.8	18.9	24.5	19.8
1968	21.1	26.5	23.3	22.2	21.4	24.9	18.0	20.1	22.0	24.8	26.2	20.3	22.5
1969	17.8	25.8	27.3	23.6	25.2	16.7	15.0	15.3	23.9	17.2	18.7	13.8	20.0
1970	14.4	12.7	26.4	23.1	16.6	18.3	28.4	21.0	19.7	20.6	21.6	16.5	20.0
1971	23.5	21.2	21.1	23.9	21.1	17.0	15.2	17.1	21.4	22.2	18.8	18.6	20.1
1972	21.9	18.3	21.5	18.1	16.6	21.5	14.0	34.2	20.4	20.4	21.8	18.9	20.6
1973	26.1	32.7	36.9	39.6	26.1	27.3	20.9	20.6	22.8	28.2	20.7	19.9	26.8
1974	25.8	26.4	33.7	32.9	29.2	29.2	32.0	30.2	33.7	37.3	26.8	27.5	30.4
1975	27.6	31.1	32.0	24.3	22.7	20.7	21.7	18.1	16.9	20.2	29.3	21.1	23.8
1976	23.3	28.5	33.4	25.4	23.7	17.5	18.4	17.7	23.7	20.4	16.9	18.6	22.3
1977	18.7	21.0	19.9	24.9	20.1	14.2	22.9	23.2	23.0	20.9	17.3	17.0	20.3
1978	24.6	26.2	25.9	31.3	31.2	28.3	19.9	25.6	27.0	20.8	24.6	22.0	25.6
1979	27.3	23.7	26.9	33.5	21.0	18.3	17.9	26.0	22.0	19.3	17.1	16.8	22.5
1980	19.3	17.6	12.8	18.7	15.7	20.3	17.1	16.0	14.4	22.3	23.7	22.1	18.3
1981	16.8	22.9	27.1	33.4	27.3	18.1	27.6	24.3	20.8	34.4	24.5	19.7	24.8
1982	23.5	49.3	27.6	32.2	26.2	31.5	42.4	32.0	45.9	28.9	33.7	34.5	33.8
1983	26.6	40.8	34.2	36.3	32.1	25.1	21.4	25.2	24.0	28.8	34.1	26.4	29.5
1984	23.8	26.5	31.3	33.1	27.5	24.0	26.7	26.2	33.2	33.7	31.5	29.4	28.9
1985	26.1	24.4	19.2	30.0	15.7	20.1	23.7	22.3	21.4	22.5	24.0	21.5	22.5
1986	22.7	40.5	21.3	14.4	18.9	16.0	16.5	22.6	25.0	18.8	21.5	15.4	21.0
1987	14.8	16.8	17.8	13.0	14.8	13.3	19.2	24.3	30.3	25.7	22.3	15.9	19.0
1988	22.4	23.3	24.8	25.2	20.5	19.9	20.1	20.5	22.5	23.1	23.2	25.5	22.6
1989	33.9	27.4	60.0	32.7	25.7	24.9	14.3	28.3	26.6	31.3	34.6	31.3	31.0
1990	27.4	37.7	33.8	37.4	25.1	24.5	21.5	28.1	25.0	25.1	17.4	15.1	26.4
1991	17.1	20.0	37.3	24.3	27.3	56.2	35.1	40.8	30.6	44.0	49.6	27.9	34.2
1992	25.9	47.7	24.4	19.7	29.7	24.7	17.8	24.1	35.7	26.9	25.1	26.0	27.3
1993	31.1	27.1	37.8	29.1	22.1	21.7	18.2	19.1	23.8	24.6	25.4	25.2	25.4

Unit : nT

TWELVE - MONTH RUNNING MEAN VALUES OF **aa** 1868 - 1993



SECTION 3

3.2 an, as, am INDICES

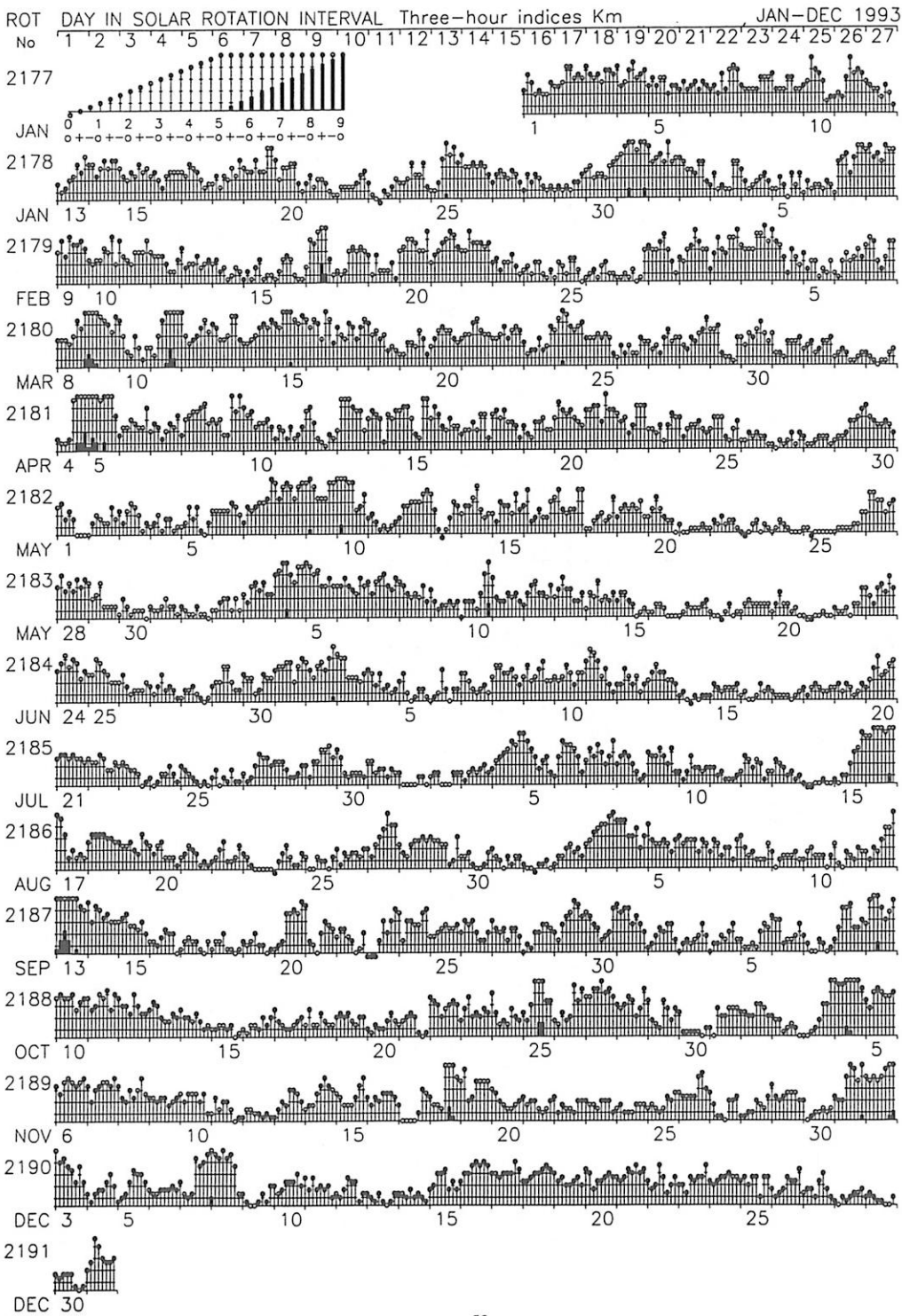
Musical diagram of **Km** 1993 53

Monthly tables of three-hour indices :
an, **as**, **Kn**, **Ks** and daily **An**, **As** values 54

Monthly tables of three-hour indices :
am, **Km** and daily **Am** values 66

Monthly and yearly mean values of **Am**
1959 - 1993 72

MUSICAL DIAGRAM OF **Km** 1993



an, as INDICES 1993

January 1993																		
	Kn								σn		an								An
1	2o	3o	3-	2o	2o	2-	2-	3-	1340	0122	16	28	22	15	15	12	13	25	18
2	3-	3-	3o	4o	5-	3+	4-	3+	2234	7233	22	22	27	57	75	39	43	34	40
3	4+	4-	3+	4-	3o	4o	4o	3o	4224	2441	68	47	38	50	30	59	52	32	47
4	4o	3-	3o	4+	5-	4-	4-	4o	4234	4434	54	24	33	61	83	43	48	51	50
5	3-	3+	3-	4-	4-	2+	3-	3o	2214	3122	26	36	21	43	42	17	23	27	29
6	3-	3o	2+	3-	3+	3-	3o	3-	4322	3333	22	32	20	21	40	22	29	21	26
7	2+	3-	2o	4-	3-	4o	4+	4o	3213	2545	17	23	15	48	23	58	67	56	38
8	3-	2o	2o	2+	3-	3+	3+	4-	2213	3323	25	15	14	17	21	36	36	41	26
9	3+	3-	3-	3-	3+	3o	2+	3-	2433	2424	40	21	24	21	36	33	19	23	27
10	3-	3+	5+	4o	4-	3o	1o	1+	5552	3121	22	34	105	51	41	31	6	8	37
11	2-	2-	2-	3+	5o	4-	4-	3+	2224	1234	11	13	11	35	95	47	46	40	37
12	3+	3-	2o	2+	2-	3-	2o	1+	5212	2334	34	24	16	18	12	25	16	9	19
13	1+	1o	1o	2o	3-	3+	2o	4o	3111	3514	9	7	7	14	21	40	16	59	22
14	3o	3+	3-	3o	3+	3+	3+	3+	2332	1323	28	40	22	29	38	36	37	37	33
15	3o	2+	2o	3o	2+	3+	3-	3o	2225	3253	30	20	15	31	17	40	25	32	26
16	2o	2+	2-	1o	2+	3-	2+	3-	3211	2433	14	19	13	6	20	25	18	21	17
17	3o	2+	3o	3o	3-	2o	1+	1+	5232	3444	27	20	33	32	21	16	9	9	21
18	1+	2o	1+	2-	2o	3o	2o	3+	3122	1435	10	15	9	13	16	28	16	39	18
19	3o	3-	3-	3+	3-	3-	4+	4+	4223	3334	32	24	22	36	22	26	68	66	37
20	3+	2-	3-	3o	4-	3+	1+	1-	2322	3412	34	12	24	27	45	37	10	5	24
21	1+	3-	1o	2+	2+	2o	1o	1-	4415	2533	9	22	6	18	20	16	6	4	13
22	1-	2-	1+	1o	1+	2-	3-	3-	2510	2343	4	11	10	7	10	13	21	26	13
23	2o	1-	0+	0+	1o	1o	1+	1+	5111	2121	14	5	2	2	7	6	8	10	7
24	1o	2-	2o	4-	2o	3-	3+	1+	0324	2462	7	11	16	46	16	23	40	9	21
25	0+	1-	2-	3o	5+	4o	5-	3+	1223	2253	2	5	11	30	105	56	86	38	42
26	4+	3o	3o	3+	3+	4-	3+	2+	2324	3532	66	33	33	40	35	41	36	19	38
27	2-	3-	3-	3-	2+	3-	3-	2-	2343	2355	12	22	26	24	18	26	21	12	20
28	1o	3-	1+	3-	3-	1o	1+	1o	1334	5131	6	21	10	22	21	7	8	6	13
29	1-	1-	1o	1o	1+	2-	2-	2+	2242	2334	5	5	7	6	8	12	11	19	9
30	2+	3o	2-	2+	2+	2o	3-	3o	2415	2235	20	33	13	20	18	16	22	27	21
31	4-	4o	5o	6-	5o	4+	5+	6-	3365	3212	44	58	96	139	89	68	106	132	92
											Monthly mean value of An								28.4

January 1993																			
	Ks								σs		as								As
1	3-	4o	3+	2o	3-	2o	2+	3o	2540	2124	25	55	40	15	24	16	17	31	28
2	3-	3o	3+	4+	4+	3+	4-	4-	1022	1213	24	30	40	69	64	39	46	41	44
3	4+	3+	3o	3+	3o	4o	4o	4o	3243	1232	63	38	32	36	29	55	51	54	45
4	4+	3o	3o	4o	4o	3+	4o	4+	5123	2313	67	29	31	54	60	35	51	69	50
5	3-	3o	3-	3+	3o	2-	3-	3-	3221	1232	26	32	25	34	32	13	26	23	26
6	2+	3-	2+	3-	3-	2+	3-	3-	3332	3322	18	21	19	21	22	18	24	24	21
7	2+	3-	2+	4-	2o	4o	4o	4-	2412	3145	20	23	17	42	16	53	59	49	35
8	3o	2+	2+	2o	2+	4-	4-	3+	1231	2243	28	19	20	16	18	42	41	34	27
9	4-	2o	2o	2o	3o	3+	3-	2o	2142	2134	48	14	16	15	31	34	22	16	25
10	3-	3o	5o	4o	4-	3o	2-	2o	2361	3264	23	31	91	58	48	29	13	16	39
11	2o	2+	2-	4-	5o	4-	4o	4-	0322	3213	15	18	13	44	87	46	57	41	40
12	3o	2+	3-	2o	2o	3-	2-	1-	4230	0143	33	20	23	15	15	26	12	5	19
13	2-	1+	2-	2o	2+	3+	3o	4o	1222	2454	13	8	11	15	17	34	28	55	23
14	4-	3+	2+	3-	4-	3o	4-	4-	2322	2345	41	36	17	25	44	30	44	45	35
15	3+	3-	2o	2o	3-	3o	3-	3o	4224	2131	34	21	15	15	21	28	22	28	23
16	2+	3o	2o	1+	2+	3-	3-	3o	3312	1252	19	33	16	10	18	22	23	27	21
17	2+	2+	3+	3o	3-	2-	2-	2-	3321	2235	20	18	40	28	25	12	12	13	21
18	2-	2+	1+	2+	2o	3o	3-	4-	2322	1322	12	19	9	20	14	27	22	46	21
19	3+	3o	3-	4o	3o	3-	5-	5o	3143	0325	35	29	24	51	30	23	81	87	45
20	4+	3-	3+	3o	3+	3o	2-	1o	4223	2035	62	21	40	29	35	30	11	7	29
21	2o	2-	1+	2-	2-	1+	1+	1o	1242	1344	14	13	9	11	13	8	8	6	10
22	1-	1+	1o	1+	1+	2-	2+	3-	2342	1232	5	8	7	10	9	12	18	26	12
23	2-	1-	0+	0o	1+	0+	2-	2+	2321	1323	12	5	2	1	8	3	12	19	8
24	2+	2-	2o	3o	2+	2o	3o	1+	3202	3052	17	13	15	31	18	15	33	8	19
25	1+	1+	2-	4o	6-	4-	5-	3+	3120	3332	9	8	12	55	131	50	73	39	47
26	4o	3-	3+	3o	3o	3o	3o	3-	4241	1132	55	25	34	32	28	32	28	21	32
27	2-	2o	3-	2o	2-	3-	2+	2-	1252	2252	13	16	22	15	11	22	18	11	16
28	1+	2+	2-	2+	2-	1+	1o	2o	1311	3355	9	18	13	17	11	9	6	14	12
29	1+	2-	1o	2-	1o	1+	1+	2o	4212	1224	9	11	7	13	6	10	10	15	10
30	3-	3o	2o	2+	2+	2o	3o	4-	2513	1114	22	29	16	19	17	16	32	41	24
31	4-	4o	5-	5o	5-	4+	5-	5+	2555	5225	43	59	73	103	85	68	73	115	77
											Monthly mean value of As								28.5

an, as INDICES 1993 (continued)

February 1993																			
	Kn								σn		an								An
1	5-	3+	4o	4+	4-	5o	3+	3+	4235	3624	73	40	51	66	43	95	35	39	55
2	4o	3+	3-	3-	3-	3+	4-	2-	2324	2431	51	40	24	25	26	37	41	12	32
3	1o	2+	1+	1+	1+	1+	3+	3+	1322	1344	7	20	8	10	8	8	39	36	17
4	3-	1+	1o	2-	2-	2+	2+	2-	2323	2325	22	10	6	11	11	18	20	13	14
5	1o	1-	2-	1+	0+	2+	1+	2+	3133	2423	7	5	12	10	2	19	9	17	10
6	1-	2-	1+	1o	1+	1o	2-	1+	2312	4244	4	13	8	7	9	6	13	8	9
7	1-	3+	4o	4o	2+	4-	4+	4+	4235	1324	5	37	52	57	18	43	70	62	43
8	4o	5-	4-	4-	3+	5-	4+	5-	3243	3333	55	76	47	49	40	82	63	73	61
9	3+	4o	3-	5-	4-	4-	4-	3+	3323	3442	34	58	26	76	50	44	46	38	47
10	2o	2+	2+	3-	4-	3o	5-	2o	2325	4232	15	17	19	22	42	28	78	14	29
11	4-	3-	3-	2+	3o	3o	3o	4+	2223	2244	43	22	22	19	28	28	32	61	32
12	3o	3-	3-	3o	2+	1+	1+	3-	2333	2214	33	22	22	29	17	10	9	21	20
13	3o	2-	2o	2+	3-	2-	2-	2+	3342	3233	31	12	16	17	26	13	12	19	18
14	2-	2+	1+	1+	1o	1o	2o	1+	2223	2233	12	19	9	10	7	7	14	9	11
15	0+	1-	1-	2-	2+	1o	1o	1-	2323	4212	2	5	4	11	18	7	6	4	7
16	0+	1o	2+	2+	3-	1+	1-	0+	2434	3222	3	7	20	20	21	9	5	3	11
17	1+	4-	3o	4+	6-	6-	2+	1o	1223	1631	10	45	28	67	144	123	18	6	55
18	1o	1o	1+	3-	3o	3o	4-	3o	1122	5553	7	6	8	26	33	33	43	31	23
19	3-	1o	2+	1+	2-	1+	2o	1-	3131	2342	25	6	20	9	11	10	15	4	13
20	3-	3+	4o	4o	4-	3o	3+	5-	2253	3324	21	36	57	52	45	28	34	78	44
21	2o	2o	3o	4-	4o	5-	5-	3+	0314	5354	15	16	31	42	53	82	71	34	43
22	3o	3o	5o	4-	4o	4-	3+	4-	2343	3322	27	33	95	46	56	47	34	42	48
23	2+	3-	1+	2+	3-	3o	2-	1+	3312	5413	17	21	8	17	21	30	12	8	17
24	1+	2o	1+	2o	2o	1o	1+	1+	3221	2122	9	15	8	14	15	7	8	10	11
25	1-	2+	2o	1+	2+	2+	1o	0+	2343	3412	5	18	15	8	18	19	7	3	12
26	1-	1o	1+	1-	2o	2+	1o	1o	1232	2423	5	7	9	4	14	19	7	7	9
27	1-	0+	1-	1-	1+	0+	1o	3o	1222	3212	4	3	4	5	10	3	6	33	9
28	3o	3+	3o	4-	5-	3o	2o	1+	2324	6202	33	34	31	49	75	31	15	9	35
											Monthly mean value of An								26.3

February 1993																			
	Ks								σs		as								As
1	4+	3+	4-	4-	3+	5-	3o	4-	5132	2522	70	36	49	41	37	78	33	43	48
2	3+	3+	3-	2+	2-	3o	3+	2-	4444	4342	37	37	23	18	13	32	37	11	26
3	2-	2+	1o	1+	1o	1o	4-	4-	1103	1135	11	17	7	9	6	6	41	42	17
4	3-	2-	1o	1+	1+	2-	2-	2-	4224	2224	25	11	6	8	10	13	13	11	12
5	1o	1o	2o	1o	0+	2o	1+	2+	3252	1212	6	7	16	7	2	16	10	20	11
6	1-	2-	1o	1+	1+	1o	2o	1o	0212	4132	4	13	6	9	9	6	14	7	9
7	1-	3+	3+	4o	2+	4-	5o	5-	2543	1244	5	35	40	51	17	46	95	85	47
8	4+	4+	4-	4o	3+	5-	5-	4+	3334	2244	69	68	42	56	37	80	76	66	62
9	3o	4-	2+	4-	3+	4-	4+	3o	2323	1343	30	46	18	47	35	48	62	31	40
10	3-	2-	2+	2o	3o	3-	4+	2o	2125	4221	21	13	17	14	31	25	62	15	25
11	4o	3-	2+	2-	3o	3-	3o	4o	2131	1231	59	24	17	13	29	25	31	52	31
12	3o	2+	3-	2+	2-	1+	1+	2+	2433	3322	32	20	21	20	12	10	9	19	18
13	3+	2-	2-	2-	2+	2-	2o	2+	2242	2423	39	13	13	12	19	11	15	18	18
14	2o	2+	1o	2-	1-	1o	2-	1+	3124	2232	16	19	7	11	4	7	12	8	11
15	1-	1+	1o	2-	2+	1-	1o	1+	3213	3321	5	10	6	11	20	4	6	8	9
16	1o	1+	2+	3-	2o	1-	1-	1o	1222	0124	6	8	18	22	16	5	5	7	11
17	2+	4o	4o	5-	7-	6-	2+	1o	4211	3524	17	60	54	83	219	125	18	7	73
18	1+	1+	1+	3o	3+	3o	3o	3+	1320	5235	8	8	8	32	35	29	29	36	23
19	2+	1+	3-	2-	1o	1o	2-	1-	3234	2221	18	8	22	11	7	6	13	5	11
20	3o	4-	4+	4o	4-	3o	3o	5-	2360	2213	33	44	63	59	41	27	27	86	48
21	2o	3-	3o	4o	4o	4+	4o	4-	2403	4542	16	25	32	53	56	70	59	45	45
22	3o	3o	5-	4o	4-	4-	3+	4-	2121	2113	32	30	73	51	41	47	34	48	45
23	2o	2+	1+	2o	2-	2+	1+	1o	1421	2124	15	18	8	14	11	19	10	6	13
24	2-	2-	1o	2o	2o	1o	0+	1+	2221	2522	12	12	7	14	14	6	2	9	10
25	1-	2o	1+	1-	3-	2o	1+	0+	1331	2531	5	14	8	5	21	15	9	3	10
26	1-	1o	1+	1-	2-	2o	1o	1-	3230	2121	5	7	9	4	12	14	7	5	8
27	1-	1o	1o	1-	1o	0o	1-	3o	1220	0022	4	7	7	4	7	0	4	28	8
28	4-	3o	3-	4-	4+	3o	2o	1o	4322	2021	45	30	22	45	61	32	16	6	32
											Monthly mean value of As								25.8

an, as INDICES 1993 (continued)

March 1993																			
	Kn								σn		an								An
1	2+	2-	3-	3o	5-	4-	3o	3o	2212	5644	17	12	26	31	77	50	31	29	34
2	1+	3-	4o	3o	3-	4o	4o	4-	2353	2552	10	26	58	33	23	59	54	49	39
3	3+	3o	3o	3o	4+	4o	5-	4-	3321	6554	36	32	32	31	62	58	76	47	47
4	5-	4o	3+	2+	1+	3o	2+	1+	3222	1542	79	52	34	18	8	27	20	10	31
5	2+	2-	2+	2-	1-	1+	1o	2+	4312	2321	20	11	18	13	5	10	7	17	13
6	1o	1-	2o	3-	2o	2+	3o	2+	3222	2253	6	4	16	25	16	17	29	18	16
7	3o	4o	3+	2+	1+	2+	4-	4-	4524	2353	30	51	39	18	10	19	46	46	32
8	3-	3-	3o	2+	3o	4+	4-	5+	2203	3632	23	25	30	20	30	65	43	116	44
9	6o	6o	6-	5-	4+	5-	3o	4+	4553	4533	155	157	124	84	67	71	30	68	95
10	4o	3-	2-	1+	3o	2o	1+	2+	3233	2112	53	25	12	10	29	15	8	18	21
11	2o	1+	3o	4o	5o	6o	6-	5-	5333	3464	15	8	30	59	103	157	133	82	73
12	5-	3o	2+	3o	3o	4o	4+	3+	4024	4433	84	30	19	28	29	52	64	39	43
13	4o	4o	3o	3-	3o	5-	5-	3-	1413	0373	56	58	28	25	30	80	79	25	48
14	2+	3-	3-	3o	4-	4o	4-	4o	2312	3332	19	22	25	31	47	54	47	55	38
15	4-	4-	5o	5o	6-	4o	4o	5-	2464	7471	49	50	100	100	133	57	53	80	78
16	4o	4-	4+	4-	3-	5-	4+	2+	2222	2351	60	48	68	48	23	80	66	18	51
17	4-	3o	3-	4o	4-	3-	3+	4o	1142	4233	41	28	26	51	42	21	39	59	38
18	4+	3+	3+	3-	3o	2o	2o	2o	2332	4222	61	34	38	26	30	14	15	14	29
19	1+	1+	3-	3-	2+	4-	3o	2-	2242	2331	9	9	23	21	18	46	29	12	21
20	2o	3o	3+	4-	4-	4-	3-	3-	2532	3354	15	31	39	50	43	48	25	21	34
21	3-	3o	3o	4o	5-	4-	3o	3+	2204	3311	24	33	30	57	76	45	33	38	42
22	3o	3o	4-	4o	3o	4-	4-	4-	4432	2344	31	30	42	53	30	45	50	44	41
23	2+	1+	2o	2o	3-	2-	2o	4o	1221	3211	18	9	14	14	26	13	16	52	20
24	4-	5o	6-	5o	4o	4-	4-	4-	3333	1433	41	88	137	89	54	44	42	49	68
25	3-	3-	3+	3+	3o	3+	3-	1+	2335	4231	24	26	36	37	32	37	26	9	28
26	1o	2+	2-	2o	2-	1+	3o	3o	2321	2254	7	20	12	16	12	9	28	28	17
27	3-	2o	2+	2-	3-	3+	2o	3o	3122	2524	23	14	18	13	26	39	16	31	23
28	3-	2o	2-	3o	2+	3o	3+	4+	4116	4453	26	15	13	29	19	32	39	69	30
29	4-	4-	4o	2-	1o	1o	1o	3o	4253	2122	42	43	57	13	7	7	6	31	26
30	3o	2+	3+	3-	4-	4o	3o	2+	3322	2222	31	17	36	26	43	54	27	20	32
31	4-	2-	2-	1+	2+	2+	2+	3-	3113	2233	41	13	11	8	19	20	19	24	19
											Monthly mean value of An								37.8

March 1993																			
	Ks								σs		as								As
1	3-	2o	3o	3+	4+	3+	3-	3o	2213	1323	21	15	28	38	66	37	24	27	32
2	1+	2+	4o	3o	3-	4-	4o	5o	1313	2265	8	18	51	27	25	49	51	92	40
3	4-	3o	3o	3o	4+	4+	5o	4-	4351	3243	41	28	30	28	63	68	99	43	50
4	5o	4-	3+	2+	1o	3+	3-	2-	8533	1422	91	46	37	19	6	38	21	11	34
5	3o	1+	2o	2+	1-	1o	1o	2-	5321	1113	28	8	14	17	5	7	6	12	12
6	1+	1-	2o	3-	2+	3-	3-	2o	3233	2313	8	4	15	25	17	21	24	16	16
7	4-	4+	4o	2-	1+	3-	4o	3+	5442	2633	44	66	54	13	10	22	51	40	38
8	2+	3-	3-	2o	3o	4+	4-	6-	3423	2332	20	25	22	14	32	65	49	125	44
9	6+	5+	5+	4+	4o	4-	3+	5-	3241	2245	176	120	115	62	56	42	40	74	86
10	5-	3o	2-	1+	3-	2o	1o	2o	5112	2001	81	29	12	10	26	16	7	15	25
11	2-	2-	3o	5-	5+	6+	6-	5o	2133	3444	13	13	33	73	116	192	130	99	84
12	5o	3-	2+	2+	3o	4-	5-	3+	6333	2243	100	24	20	20	29	48	76	40	45
13	5-	3o	3-	3-	3-	5-	5o	3-	3232	2212	77	32	22	26	26	78	89	24	47
14	2+	2+	2+	3+	4-	4o	4o	5-	3111	5235	20	17	18	34	46	51	54	77	40
15	4+	4-	5+	5o	5+	5-	4+	5o	3244	3354	69	44	105	97	105	77	64	92	82
16	4+	4o	4+	4o	3-	5o	4+	2+	4333	2313	66	51	65	53	21	97	63	20	55
17	4-	3o	2o	4o	4-	3-	4-	5-	3324	2456	49	30	16	54	44	24	44	71	42
18	4o	3o	3+	3-	3-	1+	2-	2-	4442	2132	60	29	39	26	23	8	13	11	26
19	1+	1+	2+	3-	2-	3o	3-	2o	2212	2135	9	8	17	23	12	33	23	14	17
20	3-	3-	4-	4-	4-	3+	3-	2+	7433	2233	25	26	41	50	41	34	21	19	32
21	3o	3+	3o	4+	4o	3+	3-	3-	2103	4132	27	36	32	68	58	35	26	26	39
22	2+	3-	3-	4-	3-	3o	4-	3+	3433	2344	18	24	23	44	22	31	49	37	31
23	3-	1+	2-	2o	3-	2o	2o	4-	3421	2313	22	9	13	15	23	14	15	45	20
24	4-	4o	5+	5-	4o	4-	4o	4+	5352	2245	43	60	114	79	55	45	52	69	65
25	3+	3-	3-	3o	3-	3+	3-	1+	5323	3332	34	25	22	31	24	35	21	8	25
26	1+	2o	1o	2+	1+	1+	2+	2o	3314	4352	8	16	6	18	9	9	19	15	13
27	3-	2o	2-	1+	3-	3+	3-	3o	2133	2223	21	14	13	8	23	38	21	29	21
28	3o	2+	2o	3o	2+	3o	4-	5-	5356	4333	31	20	15	27	18	32	41	84	34
29	4-	3+	4-	1+	1-	1o	1-	2o	6242	1422	46	39	49	10	5	7	4	16	22
30	3-	2+	3+	3-	3+	5-	3o	2+	1444	2241	24	18	39	21	37	73	30	18	33
31	3+	1+	1+	1-	2+	2+	2+	3-	5221	4341	38	9	9	5	17	20	20	22	18
											Monthly mean value of As								37.7

an, as INDICES 1993 (continued)

April 1993																		
	Kn								σn		an							An
1	2-	2o	2o	1+	2-	2+	2+	2+	3332	2344	12	16	15	8	13	20	20	20	16
2	1+	1o	2-	1+	1o	1o	2-	1+	2433	1222	8	7	13	10	7	6	11	10	9
3	1+	1o	0+	1-	1o	1o	1+	2-	3222	2133	8	6	3	4	7	7	10	13	7
4	1+	1o	1o	1+	4+	5+	6-	6+	3341	2433	9	7	7	8	66	116	143	183	67
5	5+	6o	6-	5-	5+	5o	5o	3+	3662	5262	106	164	144	71	114	98	93	39	104
6	2-	2o	2+	3o	3-	3-	2+	4o	2132	3234	13	16	19	30	25	22	18	53	25
7	2o	3o	3-	2-	2+	3-	2+	4-	2552	2232	14	28	21	11	18	26	18	48	23
8	2-	3o	4-	4-	4-	4-	4o	3-	3222	2363	13	29	42	47	47	49	60	22	39
9	3o	3-	3o	2-	2-	5o	4-	5-	2242	2844	27	23	30	13	12	91	47	81	41
10	4o	3+	3+	2+	3-	3-	3o	2+	3254	2234	51	36	39	18	26	23	29	17	30
11	1+	3-	2o	2-	2+	2-	2o	3-	2422	3223	10	21	14	12	19	11	14	22	15
12	4o	4o	3-	2-	2-	1+	2o	2o	4322	2312	54	56	21	13	11	9	16	14	24
13	2o	5-	4+	5-	4o	4-	4-	2o	0433	3350	15	72	70	80	59	43	47	15	50
14	3-	4-	3+	3+	1o	3+	3o	3+	5545	1543	22	41	34	36	7	36	31	40	31
15	4-	4+	4o	3+	2-	2-	4+	5-	3453	2245	49	64	57	38	13	12	68	72	47
16	3o	4o	3o	2+	2+	3o	2+	2+	2533	2635	27	56	30	20	18	32	17	19	27
17	2-	2o	2o	3-	2o	3+	3+	2-	2533	5532	11	15	15	26	16	34	38	11	21
18	3+	4-	3+	4o	3o	3o	2+	1+	1233	2222	34	48	34	55	28	30	19	10	32
19	2o	1+	1o	3-	3-	3o	2+	2o	3313	3231	14	10	7	25	22	30	17	16	18
20	3o	4+	3+	3+	4-	3+	3-	2+	1335	2324	31	67	40	40	47	34	24	20	38
21	4-	3+	4+	4+	3o	5o	4-	4-	3246	1423	49	38	64	61	28	103	47	45	54
22	3+	3-	3o	2o	3-	4o	4+	4o	2542	1636	36	21	27	14	23	51	64	59	37
23	2o	2o	2-	3-	1+	3-	3+	3o	2232	2362	14	14	11	23	9	22	38	32	20
24	3-	1+	2o	3-	3-	3o	2o	2o	4313	2313	26	10	16	23	22	27	16	15	19
25	2-	3o	3o	3o	2-	1+	2o	3-	2445	2222	11	30	33	31	12	10	15	22	21
26	1+	1o	2o	1+	2o	1+	2-	1o	2453	2231	8	7	15	10	14	10	11	6	10
27	1-	0+	1o	1-	1+	2-	1-	2o	3242	1322	5	3	6	4	8	12	5	14	7
28	1+	1o	1+	1o	2-	2-	2-	1o	4311	2222	9	6	8	7	12	13	13	6	9
29	1o	1+	2-	2o	3o	3o	3+	4-	2131	2222	7	9	12	16	29	27	34	48	23
30	4o	3o	3-	2+	3-	3-	3-	2o	4433	2222	59	29	25	17	22	24	23	14	27
											Monthly mean value of An								29.7

April 1993																		
	Ks								σs		as							As
1	2-	2o	3-	1+	2-	2+	2+	3-	4562	2133	12	15	25	10	12	18	18	24	17
2	1-	1+	2-	1o	0+	0+	1-	1-	2343	2321	5	10	12	7	3	2	4	5	6
3	1+	1o	1-	0+	0+	0+	1-	1+	3323	3321	8	6	4	2	2	3	5	9	5
4	1+	1+	1o	2-	5-	6-	6o	7-	2224	3355	8	8	7	11	76	143	149	210	77
5	6-	6-	5o	4+	6-	5-	5-	3o	8434	2353	133	146	101	70	129	86	83	30	97
6	1+	2+	2+	3-	2+	2o	2+	4+	1412	1055	9	20	17	26	18	16	17	63	23
7	2o	3-	2-	1+	2-	3-	3-	3o	2522	2322	16	22	13	9	12	24	21	27	18
8	2-	3-	3+	3+	3+	4o	4+	3-	5223	1462	11	26	36	36	40	57	70	24	38
9	3-	2+	3-	1+	1+	5o	4o	5o	3332	3423	26	20	26	8	10	97	53	93	42
10	4+	3+	4-	2+	3-	3-	3+	2+	5361	2213	61	39	50	17	26	26	34	19	34
11	1+	2+	2o	1+	2o	1-	1+	2-	3311	3212	9	18	14	9	16	5	9	12	12
12	3+	4o	3-	1o	0+	0+	1+	1o	5420	2310	40	55	22	7	3	2	8	7	18
13	2o	5o	5-	5-	4o	4-	4o	2o	1133	3252	14	92	71	86	56	42	53	16	54
14	3+	4-	4-	3-	1o	3o	3o	4-	5444	2542	39	48	41	24	7	33	28	43	33
15	4-	4o	4o	3o	1+	1+	5o	5-	2333	1222	46	56	60	29	10	8	93	78	48
16	3o	4-	4-	2+	2-	3-	2+	2+	2453	3334	33	46	41	20	13	23	18	19	27
17	2-	2o	2o	3-	2o	3+	3o	1+	2334	5512	12	15	14	25	15	39	30	9	20
18	4-	4o	3o	4-	3-	3-	2o	1o	4423	2151	46	51	28	46	23	21	14	7	30
19	3-	2o	1+	3-	3-	3-	2-	2o	3122	4221	26	15	9	21	21	26	11	14	18
20	3+	4+	4-	3o	4-	3o	2+	2+	5444	3011	34	63	46	31	50	32	19	17	37
21	4-	4-	4-	3+	3-	5-	4-	4-	4535	2333	49	44	42	40	21	77	49	48	46
22	3+	3-	3-	1+	2o	4o	4-	4-	4543	0235	38	23	26	9	16	52	46	45	32
23	2o	2o	2-	2+	0+	2+	3+	3+	1224	2444	15	15	13	17	3	18	36	34	19
24	3o	1+	2-	2-	2+	2+	2-	1+	5222	2131	31	10	13	12	19	19	13	8	16
25	2o	3o	3o	3-	1o	0+	2o	2+	2432	2253	16	28	29	23	7	3	14	20	18
26	1-	1o	1+	1+	1+	1o	1o	1-	2225	2212	4	7	10	9	10	7	6	4	7
27	1-	0+	1o	1-	1-	1+	0+	2-	3231	3216	5	3	6	5	5	10	2	11	6
28	1+	0+	0+	1-	1+	1o	1+	1-	2222	2323	8	3	2	4	8	7	8	4	6
29	1-	1o	1+	1+	2-	2o	3-	3+	1121	2022	5	7	8	9	13	16	25	39	15
30	4o	3-	3-	2o	2o	2+	2+	2-	4332	2222	55	25	21	16	16	19	17	12	23
											Monthly mean value of As								28.1

an, as INDICES 1993 (continued)

May 1993																			
	Kn								σn		an								An
1	2+	3o	2-	3-	2o	1-	1-	0+	4623	2322	17	27	11	21	14	4	5	3	13
2	0+	1o	2-	2-	2-	1+	3-	2-	2133	2232	3	7	13	13	13	10	21	11	11
3	2+	1o	2+	3o	3o	2o	1o	1+	3133	2422	20	7	17	27	28	16	6	10	16
4	1o	1+	2+	1-	2-	2+	1o	1+	1231	2322	7	9	17	5	13	17	7	10	11
5	1o	1+	3-	2o	3-	1o	1-	1+	1232	2132	7	9	22	14	24	7	5	9	12
6	2+	2o	2+	3-	3-	3o	3-	2-	4034	2222	18	15	19	22	22	31	22	13	20
7	1+	3o	2+	3-	3o	3o	4-	4+	2443	3131	8	27	18	21	31	32	41	64	30
8	5-	3+	4+	4+	4o	4-	4o	4+	2223	1312	76	37	70	70	51	43	57	66	59
9	5-	5+	4+	3+	3+	4-	5-	4+	3223	2352	79	107	70	40	37	42	78	69	65
10	5-	6-	5o	5-	5-	3-	3-	4-	3642	5321	83	140	100	83	82	25	26	49	74
11	1+	2o	2-	1o	1+	1o	1+	2-	2231	2221	10	14	11	7	9	7	10	13	10
12	2-	3-	3-	3o	3o	3o	3+	3+	2332	2234	13	22	22	27	27	32	40	40	28
13	3+	2-	1-	0o	1o	2o	3o	3-	4221	0242	36	11	5	1	7	14	29	24	16
14	2o	3-	3-	3+	5-	3-	2o	2o	1343	4331	14	22	26	40	74	22	14	16	29
15	2+	2-	3o	3-	3-	3-	4-	3-	2342	2422	18	11	31	23	26	24	48	22	25
16	3o	4+	2-	2o	2+	2-	2o	3o	1332	2312	27	66	12	16	20	13	14	27	24
17	3o	4-	2o	2o	3-	2+	4+	4-	3222	2343	28	45	15	15	22	20	61	49	32
18	1o	1o	1+	2o	3-	2-	2o	3o	2232	3232	7	7	9	14	21	12	14	31	14
19	2-	3-	3-	3-	3-	2+	3o	2-	2224	2232	12	23	23	22	26	20	32	12	21
20	2o	3-	4-	3-	2o	1+	1+	1o	3225	1221	14	21	44	22	16	10	9	6	18
21	1+	1-	1-	1o	1o	1o	1+	1o	2223	1322	8	4	4	7	6	6	10	7	7
22	1o	2-	1o	2o	1+	2-	2-	1o	2242	1221	7	11	7	15	9	13	13	6	10
23	1-	0+	1-	1o	2-	1-	1o	1-	2212	2221	4	3	5	7	12	5	7	5	6
24	1-	1-	2-	1+	1o	0+	1o	1-	1141	2222	4	5	11	8	7	2	6	5	6
25	1o	1o	0o	0+	1o	0+	0+	0+	2212	2332	6	6	1	3	6	3	3	3	4
26	0+	1o	1o	1-	1o	1+	1+	2+	3111	1114	3	6	6	5	7	8	9	17	8
27	2+	4-	4-	3o	3+	2+	3o	3+	2333	3203	19	48	41	33	36	19	30	36	33
28	3+	4o	3-	4-	3o	4-	3+	4-	2124	1312	35	52	26	46	28	50	35	46	40
29	3+	2o	2+	3o	1+	2-	2-	2-	2232	2222	37	15	20	33	10	12	12	13	19
30	1o	2o	1+	1-	1+	1+	1+	1-	2121	2233	7	14	9	5	8	9	8	5	8
31	1+	1o	1+	2-	2+	1+	2-	1+	3212	2221	10	6	8	13	20	10	12	8	11
											Monthly mean value of An								21.9

May 1993																			
	Ks								σs		as								As
1	3-	3o	2-	2o	1+	0+	0+	0+	3530	2333	24	30	12	16	10	2	2	2	12
2	1-	1+	2o	2-	1+	1o	3-	2-	2452	1022	4	8	15	11	8	7	21	12	11
3	2o	1+	3-	3o	2+	2-	1-	1o	3233	3321	14	10	21	28	20	12	4	6	14
4	1-	1o	2o	0+	1+	1o	0+	1-	2113	3022	5	6	15	3	10	7	3	4	7
5	1+	1+	3o	2-	3-	0+	0+	1o	4322	3332	8	9	28	13	21	2	2	6	11
6	2+	2+	2o	2+	2o	3o	3o	2+	4404	3134	18	19	16	17	16	28	27	17	20
7	2-	2+	3-	3-	3o	3-	3+	5+	6334	3214	13	20	21	23	27	26	35	110	34
8	5o	3+	4+	5-	5o	3o	5-	5o	3334	4443	92	36	69	79	89	32	84	88	71
9	5o	6-	4+	4-	3+	3o	5o	5o	2232	3351	87	123	69	41	37	27	89	92	71
10	5+	5+	5o	5-	5-	2o	3-	4-	3452	4233	111	118	98	74	73	16	21	50	70
11	2o	2o	1+	0+	0+	0+	1-	1o	5132	3230	14	14	9	3	2	3	4	7	7
12	1+	2+	3-	3o	3o	3o	4o	5-	3323	3125	10	20	22	29	31	33	57	76	35
13	4-	3-	0+	0o	0+	1+	3+	3-	3820	2133	48	23	3	0	3	8	35	21	18
14	2-	3o	2+	3o	4o	2+	1+	2-	2730	3432	13	28	19	32	54	17	9	11	23
15	1+	1+	3-	3-	2o	1+	3+	2o	2235	2121	10	8	24	22	16	8	40	14	18
16	3-	4-	1+	1+	2+	1+	1+	3o	3231	4423	22	50	8	8	19	8	10	30	19
17	3+	4o	2+	2-	2-	2o	4o	4+	3433	3223	40	58	19	12	12	16	56	68	35
18	0+	0+	1o	1+	1+	1o	1+	3+	2201	3123	3	3	7	9	9	7	10	37	11
19	1+	2-	3-	2+	2+	2+	3o	2-	3243	3332	10	13	24	19	19	19	33	11	19
20	1+	2+	3+	2o	1+	1-	1o	0o	2355	3210	8	19	36	16	10	5	6	0	13
21	1-	0o	0o	0+	0+	0+	0+	0+	2312	2332	5	1	1	3	3	2	2	3	3
22	0+	1+	1-	1+	1-	1-	1o	0+	3323	2313	2	9	4	9	5	4	6	2	5
23	0o	0o	0+	1-	1+	0o	1-	0+	0032	4022	0	0	2	4	8	0	5	3	3
24	0+	0+	1+	1-	0+	0o	0o	0o	3242	2100	2	3	9	4	3	1	0	0	3
25	1-	0+	0o	0o	0o	0o	0o	0o	2201	0000	4	3	0	1	0	0	0	0	1
26	0o	0+	1-	0+	0+	1-	1-	2o	0322	2223	0	3	5	3	3	5	5	14	5
27	2o	4o	4o	3o	3o	2-	2o	2+	1551	3203	14	52	58	29	29	12	16	20	29
28	3o	4o	3-	3o	3-	3+	3o	3+	4520	2434	32	53	23	32	21	36	29	36	33
29	3o	2+	2o	3+	1+	1o	1o	1o	4104	1420	32	17	16	39	8	7	6	7	17
30	0+	2-	1+	0+	1o	1-	1-	0o	2232	2331	3	13	10	3	6	4	4	1	6
31	1+	1-	1-	1o	1+	1o	1-	0+	3521	2222	9	5	4	7	9	6	5	3	6
											Monthly mean value of As								20.3

an, as INDICES 1993 (continued)

June 1993																			
	Kn								σn		an								An
1	2-	1+	1+	1+	2-	1o	1o	1-	1123	1213	13	9	8	8	13	7	6	4	9
2	1o	1o	2-	2o	2+	1+	2+	2-	2132	3123	7	7	11	15	19	9	18	11	12
3	2+	2o	3o	4-	3+	4-	3-	2+	4344	2411	18	16	31	47	34	41	23	18	29
4	4-	5-	5+	6-	4o	4-	4+	5-	3335	1241	49	77	111	126	56	42	70	82	77
5	5o	4+	4-	4o	3o	3+	4o	3o	1233	2243	94	66	49	55	32	35	51	28	51
6	3o	3+	4-	3o	3-	3-	3+	3+	1324	1322	29	34	43	30	26	24	36	34	32
7	3o	2+	3+	4-	4o	3o	3-	3+	2232	1332	28	17	34	49	58	33	25	37	35
8	3+	3o	2+	2+	3-	2+	3o	2-	2311	2352	36	32	20	20	24	19	29	13	24
9	2o	2o	1+	1+	1+	2-	2-	2+	2432	3333	15	14	9	10	9	13	12	19	13
10	1-	2o	2o	2o	1+	3o	5o	6o	2332	1333	4	14	16	15	9	27	87	160	42
11	4o	2+	2o	2-	2+	2+	2+	2-	1322	4321	58	18	15	13	20	17	19	13	22
12	2-	3-	3+	4-	3-	2+	2o	3o	2352	2222	11	22	40	48	23	19	16	30	26
13	2+	3o	4-	3+	2+	2o	2o	3-	1223	2123	17	29	44	34	20	15	16	21	25
14	1+	3-	2-	4-	2-	2+	2-	2-	2214	2332	8	21	12	46	12	20	13	13	18
15	2o	2+	2+	2-	2-	1-	1o	1+	1412	2212	14	20	18	12	11	5	7	8	12
16	1o	1+	2-	2-	1+	1-	1-	0+	2114	1332	7	8	11	12	8	5	5	3	7
17	1-	1-	2-	1+	2-	2-	2o	2-	3242	2135	5	5	12	10	11	11	14	12	10
18	1o	0+	0+	0+	1o	2o	1-	1o	2322	2432	6	3	3	2	7	15	5	7	6
19	1-	2-	2-	1+	1+	2-	2-	2-	1233	2232	5	13	13	10	9	13	12	12	11
20	1-	2-	3-	2o	2-	1+	1+	1-	3432	2221	5	11	21	14	11	8	8	4	10
21	1-	0+	0+	1-	1o	1+	0+	1-	3221	0222	4	3	3	5	7	8	3	4	5
22	1o	1o	1o	2-	1o	1+	2-	3o	3214	3235	6	6	7	11	6	10	12	33	11
23	3-	2o	2o	3+	4-	3o	4+	3o	3124	4221	24	14	14	39	44	28	66	33	33
24	3+	4o	5-	3+	4-	4-	3o	3+	2333	2212	37	55	83	39	50	46	27	36	47
25	3o	3-	4o	4-	3o	3o	2+	3-	1414	1212	28	25	56	49	31	29	17	24	32
26	2+	3o	2o	2-	2-	2o	2-	2+	1323	2212	20	29	14	11	13	15	13	19	17
27	2+	1+	2o	3-	2o	2o	1+	1-	2332	4222	17	10	15	26	15	15	9	5	14
28	1+	1+	1+	2+	1+	1o	1-	1o	2134	2131	9	10	10	18	10	7	4	6	9
29	2o	2+	2+	4-	3+	3-	2-	2o	1223	4321	15	19	19	42	39	22	13	15	23
30	3-	2+	2+	1+	2-	3o	3-	3o	3142	2431	21	17	19	8	12	31	22	27	20
											Monthly mean value of An								22.7

June 1993																			
	Ks								σs		as								As
1	1+	1-	0o	0+	1-	0o	0+	0o	4232	3131	8	4	1	3	4	1	3	1	3
2	1o	1o	1+	2-	2-	1-	2-	0+	4424	3232	7	7	10	13	13	5	13	3	9
3	2+	1+	3-	3o	2+	3o	2+	2o	5333	1430	17	9	25	33	17	29	17	16	20
4	4o	4o	5-	6-	4-	3o	5-	5-	4122	3223	60	60	74	124	46	32	84	80	70
5	5+	5+	4+	4+	3o	3o	4-	3o	4454	1466	106	107	62	67	28	29	49	30	60
6	3+	3-	4-	3o	2+	2o	4o	3-	3223	1122	34	22	48	29	18	14	54	26	31
7	4-	2o	4-	4-	4o	3o	2+	4-	4243	2113	41	16	43	44	59	27	17	46	37
8	3+	3-	2o	2-	2o	2-	3+	1+	4222	0143	34	22	16	13	16	13	36	9	20
9	3o	1+	1-	1+	1+	2-	1-	1o	5325	4222	28	10	4	8	8	11	5	6	10
10	0o	1o	1+	2-	1-	2-	3-	6o	1234	3449	1	7	10	11	4	12	24	159	29
11	3+	2-	1+	2-	2-	2-	2+	1+	4325	2314	37	12	10	13	13	12	17	9	15
12	1+	2-	3-	3o	2o	2o	2-	3-	2222	1322	9	12	23	31	15	14	13	25	18
13	2-	2+	3+	2+	3-	1o	1+	2o	3572	4223	11	17	38	17	23	6	10	16	17
14	1o	2+	2+	3+	2-	2-	1+	3-	1444	2333	7	20	18	35	11	11	9	21	17
15	2-	2+	2+	1+	1o	0o	0+	1-	2352	0013	13	18	19	10	7	0	2	4	9
16	0o	0+	1o	1+	1-	0o	0o	0o	0325	3110	0	2	7	8	4	1	1	0	3
17	0o	1-	1o	1-	1-	0+	1o	1+	0542	2215	0	5	6	4	4	3	6	10	5
18	0+	0o	0o	0o	0o	0+	0o	0o	3011	2211	2	0	1	1	1	2	1	1	1
19	0+	1o	2-	1+	1+	1+	1+	1+	3443	3122	2	7	11	8	8	8	8	8	8
20	0+	1o	2o	1-	1-	0+	0+	0o	2552	2120	3	6	16	5	4	2	3	0	5
21	0o	0o	0o	0o	0o	0o	0o	0o	0000	0000	0	0	0	0	0	0	0	0	0
22	1o	0+	0+	1-	0o	1o	1o	2-	4322	0413	7	2	3	4	0	6	6	11	5
23	3-	2o	1o	2-	2+	1+	3+	2+	7412	4354	24	16	6	13	19	10	34	19	18
24	3o	4-	4-	3+	4o	3+	2o	3-	4875	6434	29	45	46	35	54	38	14	23	36
25	3-	2+	4-	4-	3-	2o	2o	1+	4476	4333	23	19	46	42	24	15	14	9	24
26	2-	2+	1+	1-	1-	1-	1-	2-	2432	2223	13	18	9	4	4	4	5	12	9
27	1+	0+	1+	2+	1o	1o	1o	1-	3224	1143	9	3	10	18	6	6	6	4	8
28	0+	1-	1o	1+	0o	0o	0o	0+	3214	1111	2	5	6	9	1	1	1	2	3
29	1o	2-	2-	3o	3o	1+	1-	1o	3336	7311	7	11	11	32	30	9	5	6	14
30	3o	2+	2+	1-	1+	2-	2-	2-	7451	4323	30	18	17	5	8	12	13	12	14
											Monthly mean value of As								17.3

an, as INDICES 1993 (continued)

July 1993																				
	Kn								σn		an									An
1	3o	3+	3o	4-	4o	2+	3+	4o	2344	3340	27	38	30	46	55	19	37	54		38
2	4-	3+	3-	3+	4-	3o	4o	5+	4243	3213	47	35	22	39	47	29	58	120		50
3	4+	4o	4o	2+	3-	3-	2+	3o	2344	3321	64	51	55	20	25	25	19	28		36
4	3+	3-	2-	3-	1+	2+	1+	2-	2334	2432	35	24	11	22	10	17	10	13		18
5	2o	3-	1o	1-	1+	2-	1+	1-	2512	3232	16	23	6	5	10	12	10	5		11
6	0+	1-	1+	3+	2-	1o	2-	2-	2234	2222	2	5	9	39	12	6	11	13		12
7	3-	3o	2+	2-	2-	2-	2+	2-	2322	2333	25	29	18	11	12	11	20	11		17
8	2+	3+	4-	3-	3o	3+	3-	2o	3322	1331	17	40	43	26	28	37	23	16		29
9	3-	3+	2o	2+	4-	4o	2+	2+	3422	3324	22	39	15	20	41	57	18	18		29
10	2o	2o	2+	4-	3o	2o	3o	3o	3224	1120	16	14	17	42	28	16	30	30		24
11	3+	5-	4+	4o	3-	3o	2o	1+	3553	3211	40	74	65	51	21	30	16	9		38
12	2o	2o	3o	3-	2o	3-	1+	2o	3352	2321	14	14	28	22	14	22	10	15		17
13	2+	3-	3+	3-	3-	2+	2+	2o	2232	2311	17	22	39	23	26	18	18	14		22
14	1+	1o	0+	0+	1-	1-	1o	1o	2122	1301	8	6	3	2	5	5	7	7		5
15	1o	2-	1+	1o	2-	2-	2-	2+	3432	2123	6	13	9	7	12	13	11	17		11
16	1-	1o	0+	0+	1o	2-	1+	1+	2232	2121	5	7	3	3	7	13	8	8		7
17	1o	1o	1+	1o	1+	1o	1o	1o	1333	2223	7	6	8	7	8	6	6	7		7
18	1+	1o	2-	2o	2-	1+	2-	2-	2122	2222	8	6	12	14	13	10	11	11		11
19	2-	2-	1+	2o	2-	1+	1+	2-	3222	3542	11	12	9	15	11	8	8	13		11
20	1+	2o	3o	4+	2+	3o	4-	4o	3333	2420	9	15	32	65	19	29	47	54		34
21	3-	3+	3o	3-	3o	3-	3-	3o	3221	2323	25	37	31	26	33	23	22	27		28
22	2+	2+	3-	3+	3-	2o	2-	2+	2325	3132	20	19	24	35	25	14	13	18		21
23	2+	2+	2-	2-	2o	2-	1-	1+	2132	1232	17	18	13	12	16	11	4	9		13
24	1+	1-	1-	1+	2-	2o	1+	1o	2213	2221	8	4	5	10	12	14	10	7		9
25	2o	2o	1+	1+	1o	1o	1o	1-	4432	3112	15	15	9	8	7	6	7	5		9
26	1o	2o	1-	1+	1+	2+	1o	1+	1532	1411	7	14	4	8	8	17	7	8		9
27	2-	1o	1-	2+	3+	3o	3+	2+	2122	3223	11	6	5	19	36	30	36	18		20
28	2+	2o	2+	2-	1+	2-	1+	2o	2423	3220	19	16	17	13	10	12	10	15		14
29	2-	1o	2o	2+	4-	4-	4+	3-	3134	2442	13	7	16	19	45	45	61	25		29
30	3o	2+	2-	1+	2o	2-	2-	1+	2241	3412	27	19	11	9	14	12	11	9		14
31	2+	3-	1+	2o	2o	1+	2-	2-	3224	2123	19	21	10	14	14	9	13	11		14
											Monthly mean value of An									19.6

July 1993																				
	Ks								σs		as									As
1	3o	3o	4-	4-	4-	2-	3o	4+	6642	5345	30	30	42	42	41	12	33	65		37
2	4-	3o	2o	3+	4-	3-	4-	5+	6414	2334	50	31	15	39	41	25	48	110		45
3	4+	4o	4o	2o	2o	2-	1+	2o	6654	2111	63	54	52	14	14	13	9	15		29
4	3-	2+	2-	3-	1o	1o	0+	1o	1153	5131	25	17	13	25	6	6	2	6		13
5	2o	3o	1o	0o	0o	1-	1o	0+	1651	0441	14	29	6	1	0	5	7	2		8
6	0+	0+	1-	3-	1+	0o	1+	1o	3223	6011	2	3	4	25	8	0	8	6		7
7	3-	2+	1+	1-	0o	1-	1-	0+	2322	1221	24	20	10	4	1	5	5	2		9
8	2o	3o	3o	3-	2+	3o	2o	1+	5333	1112	16	30	31	21	17	30	14	10		21
9	2o	3o	2o	2o	3-	3o	2-	2-	5653	3334	16	28	15	15	21	29	13	12		19
10	2+	2+	2+	3+	2o	1+	3-	2+	4444	0121	17	17	17	35	16	8	21	18		19
11	4-	5-	5-	3+	2+	3+	2-	1-	6363	1222	50	80	73	39	17	37	11	4		39
12	1+	1+	3-	2o	1o	2-	1-	2-	1253	0223	8	10	26	14	7	12	4	11		12
13	2o	3o	3o	3-	2+	2-	2-	1+	4562	3243	16	30	33	26	20	13	13	10		20
14	0+	1-	0o	0o	0+	0o	1-	0o	2331	3131	3	5	1	1	2	1	4	1		2
15	1-	2-	2-	1o	0+	1-	1+	1o	3631	2210	4	12	12	7	3	5	9	7		7
16	0+	1-	0o	0o	0o	1+	1-	1+	2311	1421	3	5	1	1	1	8	4	8		4
17	1o	1-	0o	0o	0+	0o	0+	1-	2231	3123	6	5	1	1	2	1	3	5		3
18	1o	1-	1o	1+	1o	0+	0+	1-	5333	1222	7	4	6	10	7	3	3	5		6
19	1o	2-	1-	2-	1o	0+	1o	1+	5623	3223	7	12	5	11	6	3	6	10		8
20	1+	2o	3o	4-	2o	2+	3o	3o	3552	2333	10	15	31	44	14	18	31	29		24
21	2+	3o	3o	2+	3-	3-	3-	2-	3142	4333	20	29	32	18	26	24	24	13		23
22	3o	2+	2o	3o	3-	1+	1+	3-	7425	2134	29	17	14	32	21	8	10	21		19
23	2-	2+	2o	1+	1+	1-	0o	0+	6453	3402	13	18	14	9	9	5	0	2		9
24	1o	0+	1-	1+	1o	2o	1+	0+	2232	3233	6	3	4	10	7	16	9	2		7
25	2-	1+	1o	0+	0o	0o	0+	0o	2352	0022	12	9	7	3	0	0	3	1		4
26	1-	1+	0+	1o	0+	1+	0o	0+	2425	3213	5	8	3	6	3	9	1	3		5
27	1+	0+	1o	2o	2+	2-	2o	1+	3211	1215	10	3	7	14	19	13	14	9		11
28	2+	2+	2o	1+	0+	0+	1+	2-	5352	2233	19	18	16	9	3	3	9	13		11
29	2o	1+	2+	3-	3o	3o	3o	2+	6453	3313	15	8	18	21	28	29	33	19		21
30	4-	3-	1+	0+	1o	1o	1+	1-	6232	1122	48	24	9	3	7	6	9	5		14
31	2+	2o	1+	1+	1+	1-	1+	1-	4532	2333	18	15	9	8	8	4	10	5		10
											Monthly mean value of As									15.0

an, as INDICES 1993 (continued)

August 1993																		
	Kn								σn		an							An
1	1+	0+	1-	0+	1o	2-	1+	1-	3123	1232	9	3	4	3	6	12	9	5	6
2	1+	1+	2-	1-	1-	1-	1+	1+	3143	2342	8	9	12	4	4	5	10	10	8
3	1+	1-	1+	2o	2-	2o	2+	2o	3235	3332	10	5	10	14	11	16	19	14	12
4	2o	2+	3-	3o	4-	4+	4-	5-	1122	3332	15	17	24	31	43	62	42	78	39
5	5-	4+	4-	3o	2o	2+	3-	2-	3331	4341	79	61	41	28	15	20	26	12	35
6	1o	3-	4o	4o	4-	3+	3-	2-	2244	3422	7	22	56	52	43	38	22	11	31
7	2+	4-	3o	3+	3-	2+	3-	4-	2244	6333	19	41	29	40	25	18	25	42	30
8	2o	3-	3o	3-	2o	2-	1o	1+	1222	3221	16	25	27	25	14	12	6	10	17
9	3-	2+	3-	3+	3o	2o	3o	1+	3333	3452	24	20	24	39	27	15	32	10	24
10	2-	1o	2-	3-	2-	2o	2-	2o	3223	2420	11	6	12	26	12	15	11	15	14
11	2-	2-	1+	1+	1+	1o	1o	1o	3232	3322	11	11	8	9	8	6	7	7	8
12	1o	3-	2+	2-	2+	2+	1o	2-	2312	4422	7	25	17	13	20	17	6	12	15
13	2-	2+	2-	2-	1+	2o	1o	1+	2432	3203	11	18	13	11	10	14	7	9	12
14	0+	0+	0o	1-	1-	1o	1-	1-	2212	2343	3	2	0	5	5	7	5	5	4
15	1o	1-	1+	1+	2+	3+	3+	5o	1111	3213	6	4	8	9	19	39	37	87	26
16	5-	5-	5+	5+	5o	5-	5o	5o	2411	5443	74	82	104	104	102	78	103	100	93
17	5+	5-	3o	2-	2+	2-	2o	1+	5644	4221	107	83	32	13	20	12	16	10	37
18	3-	3+	3o	4-	4-	3o	3-	2+	3245	3222	21	37	33	44	44	31	23	20	32
19	3+	3-	2+	3-	2o	2o	3o	3-	4323	1233	34	24	20	23	15	15	31	22	23
20	2+	1+	2+	3o	1+	2-	2-	1-	3323	1322	19	10	18	27	8	12	13	5	14
21	1+	2-	2+	2o	2o	1+	1+	1o	2251	3212	8	11	19	14	14	8	8	7	11
22	1o	1+	2o	3-	1+	1o	2-	2+	2333	2233	7	8	14	22	8	6	12	17	12
23	2o	1o	1-	1-	0+	1-	1o	0+	3222	2221	14	6	4	4	3	5	6	3	6
24	0o	1+	2-	2+	1+	1-	1+	2-	1422	3211	0	8	12	19	10	5	8	13	9
25	2-	0+	0+	1+	1+	1+	1o	1+	2122	2232	12	2	2	9	8	9	6	10	7
26	2-	1-	2o	2-	2o	2o	2-	2+	2242	2232	13	4	15	11	15	15	13	20	13
27	2o	1+	2+	3-	4o	5+	4o	4-	4242	2231	15	9	18	26	53	107	55	42	41
28	3-	2-	2-	2+	3o	3-	3-	3o	2234	2332	21	12	12	20	27	23	24	27	21
29	3o	3o	3-	2+	3-	1+	1o	3-	1132	2222	28	28	21	18	23	8	7	26	20
30	1+	1+	2-	1+	1-	1-	1+	2o	2243	3313	8	10	13	8	5	5	8	15	9
31	2-	1+	1o	1-	2-	1o	2-	2-	2323	2332	13	10	7	5	12	7	11	11	10
											Monthly mean value of An								20.6

August 1993																		
	Ks								σs		as							As
1	1+	0+	0o	0o	0o	0o	1-	0o	3111	0140	9	2	1	1	0	1	5	0	2
2	1-	1o	1-	0+	0+	0o	1o	1o	3151	1013	5	7	5	2	2	0	6	6	4
3	1+	1-	1o	2-	1+	1o	1+	1o	3222	4451	9	4	6	12	8	7	10	6	8
4	2-	2+	3o	3o	3+	4-	4-	5-	2453	4452	11	17	28	31	36	49	41	75	36
5	4+	4o	3+	3-	1+	2o	3-	1+	3552	2433	70	55	36	22	10	16	23	8	30
6	1-	2+	4-	3+	4-	3o	3-	1o	3433	4030	5	20	46	37	43	32	21	7	26
7	2+	3+	3-	4-	3o	2o	3-	4+	5424	2344	19	34	23	43	33	14	25	62	32
8	2-	2+	3o	3-	2-	1o	1-	1-	2453	3122	13	17	29	25	13	7	5	5	14
9	3o	3o	2+	3+	2+	2o	3+	1o	5614	2110	30	27	17	35	18	15	35	7	23
10	1o	0+	1+	3-	1+	2-	1+	2-	2212	2322	6	3	8	26	10	12	9	12	11
11	2-	2-	1o	1o	0+	0+	0o	1-	2313	2212	11	11	6	6	3	3	1	5	6
12	1+	3-	3-	2-	2+	2-	0+	1o	3773	3322	9	24	23	12	17	11	3	6	13
13	1+	2+	2o	1+	0o	1o	1-	1o	4352	1231	8	19	14	10	1	6	4	6	9
14	0o	0o	0o	0o	0o	0o	0o	0o	1100	0100	1	1	0	0	0	1	0	0	0
15	0+	0o	1-	1-	2-	2+	3o	5-	3132	2144	2	1	4	4	11	19	31	71	18
16	4+	4o	5-	5-	5o	5-	6-	5o	3222	3654	66	59	84	84	88	80	145	87	87
17	5o	5-	4-	1o	1+	1-	1+	1o	5460	1230	99	71	45	7	9	5	9	7	32
18	3-	4-	3+	3o	3o	3o	3o	3-	2745	3144	22	42	37	31	31	33	31	24	31
19	2+	2o	2+	2+	2o	1+	4-	3-	3534	3353	19	15	19	20	14	9	43	24	20
20	2+	2o	2+	2+	1+	1o	1o	1-	4534	2222	17	16	18	18	8	6	7	5	12
21	1+	2-	2+	2o	1+	0o	1o	0+	3655	3132	9	13	18	15	10	1	6	2	9
22	1o	2-	2o	3-	1-	1o	1o	2+	5652	2211	6	11	15	21	5	6	6	18	11
23	2-	1+	1-	0+	0o	0o	0o	0o	2222	0111	11	10	4	3	0	1	1	1	4
24	0+	1o	1+	2o	1o	0+	0+	1+	3523	2223	2	6	9	16	6	3	3	10	7
25	1+	0+	0+	1o	1-	0+	0o	1+	4122	2204	9	2	3	6	4	3	0	10	5
26	2o	1-	2-	1+	2-	1+	1+	2-	5322	3213	14	4	11	8	11	10	8	13	10
27	2o	1+	2o	3o	4-	5o	4-	4+	6323	2645	15	9	16	28	45	99	50	69	41
28	2+	2-	1o	2+	3-	3-	3o	3-	3202	2322	20	13	7	18	22	21	31	23	19
29	3+	3-	3o	2+	2o	0+	1o	3+	7252	2143	34	24	29	18	16	2	7	36	21
30	1+	1+	2-	0+	0o	0o	0+	1+	3261	1021	10	10	13	2	1	0	3	9	6
31	2+	1+	1o	0+	1o	0+	1+	1+	4301	4151	17	9	7	2	7	2	8	8	8
											Monthly mean value of As								17.9

an, as INDICES 1993 (continued)

September 1993																		
	Kn								σn		an								An
1	1-	0+	0+	0+	1o	1+	1+	1-	2211	4522	4	3	3	2	7	8	10	4	5
2	1o	1o	1+	2+	3-	2+	2+	1+	2423	3332	6	7	9	18	24	17	19	9	14
3	3-	3-	4-	4o	4+	4o	5o	5o	5256	3253	21	25	42	51	69	53	89	94	56
4	4+	4o	4+	3+	3o	4o	2+	3o	3532	3434	67	59	62	38	29	51	18	31	44
5	4o	3-	3-	3-	3o	2+	2-	3-	2234	4422	52	25	21	22	30	20	13	24	26
6	3-	2+	3-	3o	3-	2o	3-	3-	3322	2253	24	17	21	27	22	14	25	22	22
7	1+	3-	3-	1+	2o	2+	1o	3-	3422	2333	10	21	21	9	16	17	7	23	16
8	3o	2+	2-	2o	1+	1+	1+	2+	4322	1234	30	19	12	14	8	9	9	18	15
9	1+	0+	1+	1+	2-	1+	2-	1o	2233	3335	10	3	8	10	11	10	13	7	9
10	1o	2o	2o	1+	2-	2-	1-	1+	1441	3123	7	15	14	9	12	13	5	10	11
11	2o	1-	0+	2-	2o	1+	2o	2o	4313	2224	16	4	3	12	14	9	15	14	11
12	2o	1+	2+	2o	3o	4-	4-	5o	5825	4453	15	10	17	16	32	48	42	97	35
13	5-	6o	7-	6o	5o	5+	5-	4-	3475	3453	85	169	243	159	102	120	79	48	126
14	5-	3o	4+	4o	4-	4-	3o	3o	5345	3421	82	31	70	56	42	48	31	28	49
15	3o	4-	4-	3-	3-	2+	3o	2o	4632	3223	33	41	44	22	26	18	27	15	28
16	1+	1+	1o	2-	3-	2+	2+	1-	2123	4342	9	8	6	11	21	18	19	4	12
17	1-	1+	2+	1+	2-	1+	1-	2-	2342	2112	4	9	17	10	11	8	5	12	10
18	1o	2-	2-	2+	1o	1o	1-	1o	1335	2221	6	11	11	19	7	7	5	6	9
19	2-	1o	1+	2+	1+	1+	0+	1o	2333	2222	11	6	10	18	8	9	3	6	9
20	0+	1o	1+	3+	4-	4-	4-	5-	2223	3133	3	6	10	40	44	49	47	72	34
21	4+	2-	1o	1-	2o	3+	3o	2o	3333	2543	67	11	7	5	15	34	27	16	23
22	1+	2o	2+	2-	1+	1o	1o	2+	2452	1213	10	16	20	13	9	6	6	17	12
23	0o	0+	0o	2-	3o	2+	3o	4o	1113	2212	1	2	1	12	31	17	29	52	18
24	3+	1+	3o	3-	3o	3o	3+	4o	2213	2221	39	8	28	25	27	27	40	56	31
25	2-	2-	2o	2+	3o	2+	3-	3-	2321	2322	12	11	15	17	29	18	22	21	18
26	2-	3o	3o	3o	2o	1+	1+	2+	1433	1222	13	33	27	29	16	10	9	17	19
27	3-	2+	2+	2o	2-	3-	2+	1+	2332	2332	25	20	17	15	12	21	18	10	17
28	0+	1o	1-	2o	2+	3o	3o	2+	2224	1442	2	6	4	14	17	27	32	20	15
29	2-	1+	3-	3+	4-	5-	4o	4-	3223	5543	12	9	21	36	45	82	57	41	38
30	4-	3+	2+	3-	2-	2-	2+	4o	2313	2424	42	39	20	21	11	12	17	60	28
											Monthly mean value of An								25.3

September 1993																			
	Ks								σs		as								As
1	0+	0o	0+	0o	0o	0o	1-	0+	2120	0022	3	1	3	0	0	0	4	2	2
2	0+	1+	1o	2o	2o	1+	2-	2-	2313	4333	3	8	6	15	16	9	11	11	10
3	2o	2+	3o	3+	4-	4o	5-	5o	5353	2453	16	19	33	37	50	57	79	87	47
4	4o	4+	5-	3o	3o	4-	2o	3o	4551	1416	57	64	73	28	30	46	15	30	43
5	4-	3-	2o	2o	2+	2o	2-	2+	4410	4323	50	23	15	16	18	14	11	19	21
6	3+	2+	3-	3-	2+	1+	3-	2o	4423	3141	34	17	26	25	20	8	23	15	21
7	2-	3-	2+	1+	2-	2-	1o	2+	2734	2214	11	26	18	8	13	13	7	18	14
8	3o	1+	1o	2-	1-	1-	1-	3-	5223	1344	33	10	7	11	5	4	5	23	12
9	2-	0o	1o	1o	1+	1o	2-	1+	2121	3223	12	1	6	6	9	7	11	8	8
10	1-	2-	2o	1o	1+	1-	0+	1o	2251	2220	5	11	15	7	8	5	2	7	8
11	2+	1o	1-	1+	1o	1-	2o	2-	6523	1114	17	6	4	10	7	5	14	11	9
12	1+	0+	2-	1o	2+	3+	4-	5o	3233	1545	8	3	12	6	18	39	44	100	29
13	6-	6-	6o	6o	5o	5+	4o	4o	8463	3467	126	130	167	158	103	104	60	55	113
14	4+	3-	4+	4+	3+	4-	3o	3+	5255	2434	62	24	62	61	37	49	29	36	45
15	3o	3+	3+	2+	2o	2+	3o	2+	3533	1235	31	37	40	20	15	20	29	17	26
16	1o	1+	1o	2-	2-	1+	2-	0o	1222	4330	7	10	7	11	12	9	13	0	9
17	1-	1+	1+	1+	1o	0+	0+	1o	2334	2231	5	9	9	8	7	2	2	6	6
18	1-	1+	1o	2-	0+	0+	0o	0+	2304	3213	4	8	7	13	3	3	1	3	5
19	1+	1+	1+	1+	1-	1-	0o	0+	4423	3302	8	8	8	10	4	4	0	2	6
20	1-	1o	1+	4-	4-	4o	4-	5-	2114	2336	5	6	8	50	42	54	43	85	37
21	4+	1+	1o	0o	2o	2+	3-	3-	6121	2145	63	8	7	1	14	19	25	21	20
22	2o	2+	2+	2-	1o	0o	0o	1+	6441	0012	15	18	18	13	7	0	1	10	10
23	0o	0o	0o	1+	3o	2-	3o	4-	0101	2423	0	1	0	8	28	13	28	50	16
24	4-	1+	3o	3o	3-	3-	4-	4-	3201	2232	50	9	32	30	23	24	43	45	32
25	2-	2o	2o	3-	3-	2+	2+	3-	3113	2212	12	15	14	21	21	18	17	26	18
26	2+	3o	3-	3-	2o	1+	1+	2o	1532	1333	17	33	25	26	15	9	9	14	19
27	3+	3-	2-	3-	1o	2+	2o	2-	4343	0143	38	21	13	21	7	17	15	12	18
28	0o	1o	1o	2+	2o	2o	3-	2+	1115	1321	1	6	6	17	15	16	21	18	13
29	2o	2-	3-	3+	3+	5-	5-	3o	3223	3351	15	11	22	39	39	76	76	33	39
30	4o	3+	3-	2o	1o	2-	2o	4o	6621	2301	52	39	22	15	7	11	16	53	27
											Monthly mean value of As								22.8

an, as INDICES 1993 (continued)

October 1993																			
	Kn								σn		an								An
1	5-	4-	4o	4o	3-	3+	3-	2o	3122	3432	74	42	58	58	26	38	25	15	42
2	1o	1+	2o	2+	2+	3-	3o	1+	2321	4352	6	8	15	19	18	24	29	10	16
3	0+	1-	1o	1o	1+	2o	3-	2-	2321	3253	2	5	7	7	10	15	22	13	10
4	0+	1o	1o	2-	2-	2+	3o	1+	1223	3253	3	7	7	11	11	17	27	9	12
5	1o	1-	0+	1o	1-	2+	3-	3-	1221	2443	6	4	3	7	5	17	25	21	11
6	4-	3o	3o	1o	1+	1+	2-	3-	2341	1242	43	33	30	7	10	9	13	22	21
7	2-	1o	0o	0o	1+	1o	1-	1o	2311	2023	11	6	1	1	9	7	4	6	6
8	1+	2o	4-	4o	4+	2+	2+	3-	3335	3312	8	16	50	51	62	17	17	26	31
9	3-	5-	5-	6-	4o	3+	4-	5-	3143	4342	21	77	86	142	56	34	42	86	68
10	4o	4+	3+	4-	4+	3-	4-	4-	4223	2142	52	67	39	45	66	22	41	50	48
11	4o	3o	3o	4+	4o	4+	3-	4-	1235	3343	55	28	29	62	53	68	24	44	45
12	3+	3o	3o	2+	4o	3o	2+	2+	3423	5344	38	30	29	19	57	32	20	19	31
13	3-	4-	3+	2o	2o	2-	2+	2o	3452	2256	21	43	37	16	15	12	18	15	22
14	3+	2o	2o	2-	3-	2o	1+	1+	4224	3232	34	16	14	11	24	15	9	9	17
15	1o	1-	1o	1+	1o	1+	0+	1-	2313	3522	7	5	7	10	6	9	3	4	6
16	1o	1o	2-	2-	1+	2+	2-	2o	1323	2434	6	6	11	12	9	19	11	15	11
17	3-	2o	1o	1o	1+	2-	2-	2+	3412	2343	22	14	7	6	8	11	13	17	12
18	1+	3-	2-	1+	3-	2o	1+	1+	3523	6444	9	21	11	8	21	15	10	9	13
19	2o	2o	2o	2o	2o	2-	2+	2o	5343	3236	14	15	14	15	15	11	19	15	15
20	1+	1-	1+	1o	1o	2o	2o	1+	5252	2323	8	4	10	6	6	16	16	10	10
21	1+	2-	2o	2+	2o	1-	0+	1-	1444	4123	8	11	14	19	16	5	3	4	10
22	4-	3o	3-	2-	2+	3o	3o	3-	6631	2225	44	33	25	13	19	27	30	26	27
23	2-	3-	3+	2o	2+	2o	3-	2o	3234	2131	13	25	36	15	19	15	24	16	20
24	4-	2-	1+	2-	1o	2+	2o	2-	3322	2442	48	13	9	11	7	20	15	11	17
25	2o	2-	3-	5o	6o	6-	3+	3+	2233	4632	15	11	24	88	159	141	36	34	64
26	1+	1o	2+	1+	2o	5-	4-	4+	2221	0323	9	7	19	10	15	75	46	63	31
27	3+	4o	4+	4+	5+	4+	5-	4-	2465	5463	39	53	68	67	111	66	72	45	65
28	3o	3-	3+	4-	4-	2+	3-	4o	2125	4323	28	23	34	43	44	17	24	58	34
29	4-	2-	2-	1o	3+	3-	2-	2+	4221	5322	41	13	11	7	37	22	12	19	20
30	2-	1-	1-	0+	1-	1o	0o	1-	3242	4212	13	5	4	2	5	6	1	5	5
31	1-	0+	3-	2-	2o	3-	2+	3-	2153	3656	4	2	21	13	15	25	20	23	15
											Monthly mean value of An								24.4

October 1993																			
	Ks								σs		as								As
1	4+	4o	4o	4-	3-	3+	3-	2o	6732	3121	63	54	54	50	25	34	22	14	40
2	1-	1o	2-	2+	1+	2+	3-	2-	2124	2142	5	6	12	19	10	18	21	11	13
3	0+	1o	1+	1-	1+	2-	3-	1+	3442	1341	3	6	9	5	8	12	21	9	9
4	0+	1o	1o	2-	1+	1+	3-	1+	2323	3221	3	6	6	12	9	10	24	8	10
5	1+	1-	1-	1+	1-	2-	3-	2o	2221	2334	10	4	4	8	4	11	21	16	10
6	3+	3o	3-	1+	1+	1o	1+	2+	3432	1143	37	32	25	8	8	6	9	20	18
7	2-	1o	0+	0+	1o	1o	0+	0+	2032	2223	12	7	3	3	7	6	3	3	6
8	1+	3-	4o	4o	4+	3-	3-	3o	3351	1221	10	25	53	52	62	21	21	29	34
9	3o	5-	5+	6-	4-	3o	4-	5-	1212	2032	29	79	104	137	50	32	43	83	70
10	4-	4-	4-	4-	4-	3o	3+	4-	2222	2122	46	42	43	42	48	27	36	45	41
11	3+	3-	3-	4-	4-	4o	3-	4o	3233	2037	36	24	25	47	41	58	23	57	39
12	4-	3-	3-	2+	4-	3o	2+	2o	4333	5144	43	25	25	19	44	29	20	16	28
13	3-	3o	3-	2+	1+	2-	3-	2+	3634	2254	22	32	21	17	10	12	23	17	19
14	2+	2o	2o	2-	2o	2-	1-	1o	5522	0322	17	15	15	13	16	12	4	7	12
15	1o	1o	1+	1+	1o	1o	0+	0+	2433	3223	6	6	9	9	6	6	2	3	6
16	1+	1-	1+	1+	1o	2-	1-	2-	1332	2223	8	4	9	8	6	13	5	13	8
17	3-	1+	1+	1-	1o	1+	2-	2o	2241	2132	22	10	8	5	7	8	11	15	11
18	1+	3-	1o	1+	2o	2-	1+	1+	4423	5213	10	21	7	10	16	12	8	9	12
19	2+	2+	2o	3-	1+	1o	2-	2o	4433	3144	18	20	15	21	10	7	12	16	15
20	1-	1o	1o	1-	1-	1+	2+	2-	1241	2232	5	7	7	5	5	10	20	13	9
21	2-	2o	2-	2+	2o	1-	0+	1-	3521	2212	11	15	13	17	14	4	2	5	10
22	4o	3+	3o	2+	3-	3o	4-	3o	5553	2222	55	36	33	19	23	28	42	32	34
23	2o	3o	4o	2-	2o	2-	3o	3-	3561	0222	14	28	54	13	16	13	27	21	23
24	4+	2+	1+	2-	1+	3-	2o	2-	4333	4323	66	20	9	12	8	21	15	12	20
25	3-	2-	3+	5+	6o	6o	3+	4-	2341	1332	21	12	36	107	156	155	35	45	71
26	2o	2-	2+	2o	2-	5-	3o	4+	3211	2223	14	11	18	15	13	71	31	64	30
27	4-	3+	4+	4+	5-	4o	4+	4-	6474	2453	48	38	64	69	84	51	63	50	58
28	3o	3-	3o	3+	3+	2o	3-	4+	1302	2223	30	25	32	40	37	15	26	69	34
29	3+	2-	1+	1o	3o	3-	2-	3o	4221	4521	34	12	9	7	32	22	11	29	20
30	3-	1-	1o	1o	1o	1-	0+	1+	4211	1221	21	4	6	6	6	5	3	8	7
31	1+	1-	2+	2o	2o	3-	3-	2+	3240	3324	10	4	20	16	14	26	24	18	17
											Monthly mean value of As								23.7

an, as INDICES 1993 (continued)

November 1993																				
	Kn								σn		an								An
1	2+	2-	2-	2o	3-	3o	2+	2-	5322	1523	19	13	12	15	25	31	20	13	19
2	2o	2-	1+	1-	1o	1o	1-	0+	3333	3222	14	11	10	5	6	7	5	2	8
3	0+	0o	1-	1o	2-	3-	3o	5o	3132	2433	3	1	4	6	11	23	28	102	22
4	5o	5o	5-	6-	5+	5o	5o	4+	4454	3354	101	92	78	121	109	93	98	66	95
5	3o	3-	4+	4+	4o	4-	4-	4o	3243	4355	33	23	65	63	60	47	47	58	50
6	4-	2+	4o	4+	4-	4-	4o	4o	4225	2444	42	20	53	62	46	41	52	55	46
7	3+	2o	3+	3+	4-	4-	4-	4-	4133	2443	38	16	37	36	44	48	43	48	39
8	3+	2+	2-	3+	2+	3+	4o	3-	4324	1344	36	19	13	35	19	35	52	25	29
9	2+	3-	2o	3-	2+	2-	2o	3-	3404	2144	19	23	15	21	18	13	16	23	19
10	2+	2+	3-	2+	3o	2+	3-	1o	4332	3342	20	18	25	20	27	19	24	6	20
11	1-	2+	1+	2o	2+	1+	0+	0+	1334	3323	5	20	9	15	18	10	3	3	10
12	1-	1+	1+	1o	1o	1-	1-	0+	2322	1223	4	9	8	7	6	5	5	3	6
13	0+	1+	2o	2-	3-	3o	3-	2-	2232	2335	3	10	16	11	24	27	25	11	16
14	1+	2-	2o	3-	3o	4o	3+	3o	3334	5654	8	13	14	21	33	60	35	30	27
15	2+	2+	1+	1+	2-	2-	3o	4o	3132	1155	20	19	10	10	11	13	31	53	21
16	2+	2-	2+	2+	3-	3-	2+	2+	3243	5364	19	13	19	17	22	26	20	20	20
17	2o	0+	0+	0o	0+	1o	3+	3-	4131	1233	14	2	3	1	3	7	34	21	11
18	2o	1o	1+	1o	5+	6o	5+	4-	1232	3563	14	7	9	7	104	158	107	45	56
19	3+	5o	2-	2+	3+	4-	4o	4-	4421	5356	38	88	13	17	40	45	53	43	42
20	3-	3o	2o	2o	1+	1+	2-	2-	1411	2211	22	29	14	14	10	10	12	11	15
21	2+	2-	2-	2o	2-	1o	1+	2-	3230	3135	17	12	12	15	11	7	8	13	12
22	2o	1-	1+	1o	1+	1o	2o	2-	2122	1221	15	5	9	6	8	6	14	11	9
23	2-	2o	1+	1+	2-	2o	2o	1o	2221	2114	11	14	10	9	13	16	14	6	12
24	1+	2-	0+	1-	1-	2-	2-	1+	2221	4422	9	11	3	5	5	11	11	9	8
25	1+	1+	1o	1o	1+	2+	2o	2+	1120	2302	8	9	7	7	9	19	15	19	12
26	3o	2-	2o	2o	2+	4-	4+	2+	5211	3552	27	13	14	14	19	46	67	19	27
27	2+	1+	1-	0+	1-	2+	2-	2+	3043	1423	18	10	4	3	5	19	11	19	11
28	1-	0+	1o	1+	2o	2-	1+	2-	2112	2222	4	2	7	8	15	12	9	11	9
29	4-	2o	2-	2+	3-	3-	3-	2+	2113	3463	41	16	12	17	22	23	24	17	22
30	2-	0+	0+	1o	1-	1+	1-	1o	3121	2223	13	2	3	6	5	8	4	6	6
											Monthly mean value of An								23.3

November 1993																				
	Ks								σs		as								As	
1	2+	3-	2+	2+	3+	3-	3-	2+	3221	3424	20	22	18	17	39	25	25	17	23	
2	2o	2-	2-	1-	1+	1+	1+	0+	1232	3343	15	13	12	5	9	9	8	2	9	
3	0o	0+	1-	1+	2-	3+	3+	5o	1221	2342	1	3	5	8	12	36	34	96	24	
4	5o	5-	5-	6o	6-	5o	5o	4+	2223	5245	96	76	76	154	124	96	99	61	98	
5	3+	3o	4o	4+	4o	4o	4-	4-	3134	3462	39	30	54	65	54	52	47	47	49	
6	3o	3-	3+	4o	4-	3o	4-	4o	4245	2246	31	22	36	52	42	32	48	53	40	
7	3+	2o	3o	3o	4-	4-	3+	4o	4113	2345	40	15	28	31	41	41	34	56	36	
8	3+	3-	2o	3-	2+	3o	4-	3-	3312	1432	34	21	14	26	18	30	50	24	27	
9	2+	2+	2-	2+	2+	1+	2o	2+	3421	3226	19	17	13	17	20	10	15	18	16	
10	3-	2-	2+	3-	2+	2o	3-	1+	4332	3243	23	12	19	22	20	14	21	8	17	
11	1+	2+	1+	2o	2-	1o	0+	1-	1323	2223	8	18	8	14	13	7	3	5	10	
12	1o	1o	1o	1o	1-	0+	1+	1-	4002	2232	6	7	7	6	5	3	9	5	6	
13	1o	2-	2o	2o	3+	3o	2+	2o	1222	1134	6	11	14	15	34	29	19	16	18	
14	1+	1+	1+	3o	3+	4-	3o	3o	2221	4212	10	10	10	28	38	41	33	28	25	
15	3o	3-	2-	2o	2-	3-	4-	4o	4220	2223	32	22	13	16	12	21	46	53	27	
16	3-	1+	2+	2o	2+	2+	3-	2+	2251	2434	21	10	18	15	20	19	23	17	18	
17	2-	0+	0+	1-	0+	1-	3o	3-	2222	2236	12	3	3	4	3	5	27	25	10	
18	3-	2o	2-	1+	5o	6o	5+	4+	3112	1563	25	15	13	10	92	149	117	63	61	
19	4+	5-	2o	2o	4-	3+	4-	4o	2320	4234	61	76	15	16	41	40	43	54	43	
20	3o	3-	2-	2-	1+	1+	2-	2+	0232	2224	32	24	13	11	8	10	11	19	16	
21	2+	2o	2+	2o	1+	1-	2-	2+	3111	1223	19	15	19	14	8	5	13	19	14	
22	2+	1o	2o	1+	1+	1o	2o	2+	3112	4253	19	6	15	9	8	6	15	19	12	
23	2+	2-	2-	1+	2o	2-	2+	1+	4132	1334	17	13	12	10	15	12	19	8	13	
24	2-	2-	1+	1o	1o	2-	1+	2-	3310	4224	11	12	8	7	7	12	10	13	10	
25	2-	2o	2-	1+	1o	2+	2+	3o	2131	0134	11	14	11	8	7	17	18	33	15	
26	3-	2+	2+	2+	2+	4o	4+	3+	1333	2354	25	20	20	20	20	60	61	34	33	
27	3-	2o	1o	1o	0o	2o	2+	3-	2211	3214	26	15	6	6	1	14	17	21	13	
28	1o	1o	1o	1-	2-	2-	1+	3-	2102	2233	6	6	7	4	13	13	10	23	10	
29	3+	2+	2+	3-	3-	3-	3-	2-	3142	2252	40	17	20	22	26	26	23	13	23	
30	2o	1-	1-	1o	1+	1+	1+	2-	2231	1132	15	4	5	6	8	8	9	12	8	
											Monthly mean value of As								24.1	

an, as INDICES 1993 (continued)

December 1993																				
	Kn								σn		an									An
1	2o	1+	2-	4o	5-	4o	4-	5+	2223	4645	14	10	12	58	80	59	43	109		48
2	4-	4-	4o	4-	4o	5-	5+	6-	4442	5545	49	48	57	46	57	74	108	129		71
3	5o	4o	4+	4-	3+	2+	4o	2+	5444	2253	94	60	67	49	39	18	56	17		50
4	1+	0+	1-	1+	2-	2+	3o	2o	2222	2244	10	3	5	10	13	17	32	15		13
5	1-	1-	1o	2+	3+	3+	3o	2o	3123	4330	5	5	7	18	36	39	33	15		20
6	1+	1o	1+	2-	2o	2-	2o	2-	2113	2212	9	7	9	11	14	12	14	11		11
7	2o	1o	1o	1+	4o	4o	4+	5-	4142	2254	16	6	7	8	58	51	64	73		35
8	6-	5o	4+	5o	5-	5-	4-	1+	3466	3564	121	88	68	96	81	84	49	8		74
9	1o	0+	0+	0o	0+	1-	0+	2-	1211	1123	6	2	2	1	2	5	3	11		4
10	2-	2-	1+	2+	2+	2o	3o	2-	4424	2362	12	11	8	20	19	16	28	11		16
11	2+	1+	3-	2o	2-	2o	2o	1-	5365	2452	20	8	25	16	13	16	14	4		15
12	1+	1o	2-	3o	2+	2+	1o	1+	3235	3446	10	6	11	32	19	20	6	9		14
13	1-	1-	0+	1+	1-	0+	1-	1+	2325	2216	4	4	3	10	4	3	5	8		5
14	1o	1+	1-	1+	1-	1-	1o	1-	4422	2344	6	9	4	8	4	5	7	4		6
15	2-	2-	3o	3-	3o	2-	2-	1o	3322	2233	13	11	28	23	30	11	12	7		17
16	2-	3o	3-	4-	4o	4-	4+	4o	3433	3542	11	29	26	41	58	46	62	51		41
17	3o	3+	3-	3+	3+	3o	4o	3+	0324	3432	30	40	23	36	36	33	55	34		36
18	2+	2+	3o	3o	3-	4-	4-	3o	2212	4543	20	17	27	30	26	41	48	33		30
19	3o	2+	3-	2o	2o	3-	3-	2-	3222	0332	33	20	23	15	15	22	21	11		20
20	4-	3-	2o	3-	2+	3-	3-	2+	3123	2432	41	22	14	21	17	22	25	18		23
21	3-	2o	3-	3+	3+	4-	3+	4-	2124	3566	25	15	25	39	36	46	35	41		33
22	2+	2-	2o	4-	3-	1+	2-	2+	4324	3224	20	12	15	43	26	9	12	20		20
23	2o	2o	1o	3-	2o	3o	2+	4o	4413	2634	15	16	7	22	14	27	19	54		22
24	2o	2-	2o	3-	3o	3o	2+	2+	1214	3542	16	12	15	24	27	28	20	20		20
25	2o	3-	2o	3-	3-	1+	2+	3-	2222	2144	14	23	14	21	23	9	19	22		18
26	1+	1-	1+	1+	2+	3-	2+	3+	4322	3345	9	5	10	8	19	22	17	36		16
27	2-	2-	1+	1o	2+	3-	2-	1-	3221	3433	11	11	9	7	18	23	11	4		12
28	0+	0+	0+	1-	1+	2-	2-	1+	2132	2232	2	2	3	4	9	11	12	10		7
29	1-	1+	1o	1-	1-	0+	0+	1-	3202	3221	5	9	7	4	4	2	3	5		5
30	2-	1+	2-	1+	2-	1-	0o	0o	3233	2121	11	8	11	10	11	4	1	0		7
31	1+	3-	4+	4-	3o	3o	2+	3o	2243	5433	10	23	63	49	27	29	18	33		32
											Monthly mean value of An									23.9

December 1993																				
	Ks								σs		as									As
1	3-	2+	2+	4o	5+	5-	4o	6-	2312	2445	23	20	17	59	115	83	57	124		62
2	4+	3+	4-	4o	4o	5-	5o	6o	4321	2337	64	40	50	52	59	76	103	147		74
3	5o	4o	4+	4-	3o	3-	4-	2+	4333	1231	93	55	66	41	29	21	42	17		46
4	1+	1o	2-	2o	2-	2+	3+	2o	3120	2342	10	6	12	16	12	20	34	15		16
5	1-	1+	1+	3-	3o	3-	3-	2+	1223	2323	5	10	10	22	32	26	26	20		19
6	2o	1+	1+	2-	2-	2-	2+	2o	1122	2234	15	8	10	11	12	13	19	16		13
7	2+	1+	1+	2-	4+	4-	4-	5-	4212	1323	17	10	8	11	68	48	45	85		37
8	6-	5-	5-	5o	4o	5-	3+	2-	1362	2522	142	81	71	98	59	73	38	12		72
9	2-	1o	0+	1o	1o	1+	1-	2+	3533	5234	13	6	3	6	6	10	4	17		8
10	2+	1+	2o	3-	3-	2+	3-	2o	3123	2444	20	8	15	21	21	17	26	16		18
11	3-	2o	2+	1+	2+	2-	2o	1+	1313	1343	25	16	17	9	17	11	16	10		15
12	1+	1+	2-	2+	2o	2+	1-	2-	2221	2322	10	8	13	17	14	20	5	11		12
13	2o	1+	1o	1o	1-	0+	1o	2-	1231	2251	14	8	6	7	5	3	6	13		8
14	2o	1o	1+	2o	1+	2-	1-	1o	1211	4731	14	7	9	14	8	11	5	6		9
15	2-	2+	3+	3o	3+	2o	3-	2+	1430	3124	13	20	37	32	39	14	22	19		25
16	3o	3+	3+	4o	4o	3+	4-	4-	2331	3222	27	37	39	55	54	40	47	47		43
17	3+	3-	3-	3-	3o	3o	4o	3+	3323	1031	35	22	21	24	30	32	53	34		31
18	2+	2+	3-	3o	3o	3+	3o	3+	2320	3212	18	20	23	32	27	36	33	40		29
19	3-	2-	2+	2o	2o	2+	3-	2+	2242	2334	26	13	20	15	15	18	21	18		18
20	3+	3o	2-	2+	3-	3-	3+	3o	4534	2231	38	33	12	19	21	21	36	30		26
21	3-	2+	3-	3o	3-	4-	3-	3o	2321	2222	22	19	21	33	26	44	26	33		28
22	2+	2o	2o	3+	3-	1+	2+	3-	1123	3232	17	14	16	39	25	10	19	24		21
23	2o	2-	1+	3-	2+	3-	3-	4-	1233	4242	14	12	9	21	20	25	23	45		21
24	2+	2o	3-	3-	3-	3o	3o	3o	1223	2312	17	16	21	23	26	29	27	27		23
25	3-	3-	2o	3-	3-	1o	3-	3o	2302	2122	21	21	16	26	26	6	25	27		21
26	2-	1o	1+	2-	3o	2+	2+	3o	2212	0212	13	7	9	13	32	19	17	31		18
27	1+	2-	2-	1o	2+	3+	2o	1o	1321	3114	9	12	13	6	20	34	14	7		14
28	1-	1-	1+	0+	1-	1+	1+	2+	2233	2324	5	4	9	3	5	9	9	17		8
29	1o	1+	1+	1o	1o	0o	0+	1+	0113	0123	7	9	8	6	7	1	3	9		6
30	2o	1+	2o	2o	2-	1-	0+	1+	1111	2224	15	9	14	15	12	4	3	9		10
31	3-	3o	5-	4o	3o	3-	3o	3o	3434	0254	22	28	81	57	32	23	27	31		38
											Monthly mean value of As									25.5

am INDICES 1993

January 1993																				
	Km								Σ Km	am									Am	Am2
1	2+	4-	3o	2o	2+	2o	2o	3o	20.3	20	41	31	15	20	14	15	28	23	26
2	3-	3-	3o	4+	4+	3+	4-	3+	27.3	23	26	33	63	70	39	45	38	42	38
3	4+	4-	3+	4-	3o	4o	4o	4-	29.7	65	43	35	43	29	57	52	43	46	46
4	4+	3-	3o	4o	5-	3+	4-	4o	29.7	61	26	32	57	71	39	50	60	50	44
5	3-	3+	3-	3+	3+	2o	3-	3-	22.7	26	34	23	38	37	15	25	25	28	33
6	2+	3o	2+	3-	3o	2+	3o	3-	21.3	20	27	19	21	31	20	27	23	24	25
7	2+	3-	2o	4-	2+	4o	4+	4o	25.3	19	23	16	45	20	56	63	52	37	30
8	3-	2+	2+	2+	2+	3+	3+	3+	22.0	26	17	17	17	20	39	39	37	27	31
9	4-	2+	2+	2+	3+	3+	2+	2+	22.0	44	17	20	18	34	34	20	20	26	34
10	3-	3o	5o	4o	4-	3o	1+	2-	24.3	22	32	98	55	45	30	10	12	38	31
11	2-	2o	2-	3+	5o	4-	4o	4-	25.0	13	15	12	39	91	47	52	41	39	31
12	3o	3-	2+	2+	2-	3-	2o	1o	17.7	33	22	20	17	13	26	14	7	19	27
13	2-	1o	1+	2o	2+	3+	3-	4o	18.3	11	7	9	15	19	37	22	57	22	22
14	3+	3+	2+	3o	4-	3o	4-	4-	26.0	34	38	19	27	41	33	41	41	34	31
15	3o	2+	2o	3-	2+	3+	3-	3o	21.3	32	20	15	23	19	34	24	30	25	26
16	2+	3-	2o	1+	2+	3-	3-	3-	18.7	17	26	15	8	19	24	21	24	19	23
17	3-	2+	3+	3o	3-	2o	1+	2-	19.0	23	19	36	30	23	14	10	11	21	19
18	2-	2+	1+	2+	2o	3o	2+	4-	18.7	11	17	9	17	15	27	19	42	20	21
19	3o	3-	3-	4-	3-	3-	5-	5-	26.7	33	26	23	44	26	25	75	77	41	35
20	4-	2o	3o	3o	3+	3+	2-	1o	21.0	48	16	32	28	40	34	11	6	27	29
21	2-	2+	1+	2o	2o	2-	1o	1-	12.7	12	18	8	15	16	12	7	5	12	13
22	1-	1+	1+	1+	1+	2-	2+	3-	12.7	4	10	9	8	9	13	19	26	12	10
23	2-	1-	0+	0o	1o	1-	1+	2o	7.7	13	5	2	1	7	4	10	14	7	13
24	2-	2-	2o	3+	2+	2+	3+	1+	18.0	12	12	15	38	17	19	36	9	20	16
25	1o	1o	2-	4-	5+	4o	5-	3+	24.7	6	6	12	43	118	53	79	39	45	37
26	4o	3o	3o	3+	3o	3+	3o	2+	25.0	60	29	33	36	31	37	32	20	35	40
27	2-	2+	3-	2+	2o	3-	2+	2-	17.7	13	19	24	20	15	24	20	11	18	20
28	1o	2+	2-	2+	2o	1+	1o	1+	13.0	7	20	12	19	16	8	7	10	12	13
29	1o	1+	1o	1+	1o	2-	2-	2+	11.3	7	8	7	10	7	11	11	17	10	13
30	3-	3o	2o	2+	2+	2o	3o	3+	20.7	21	31	15	20	18	16	27	34	23	34
31	4-	4o	5-	6-	5o	4+	5o	6-	38.0	44	58	85	121	87	68	90	123	85	61
										Monthly mean value of Am								28.6	

February 1993																				
	Km								Σ Km	am									Am	Am2
1	5-	3+	4-	4o	3+	5o	3+	4-	31.0	71	38	50	53	40	87	34	41	52	57
2	4-	3+	3-	3-	2+	3+	3+	2-	23.0	44	38	23	21	19	35	39	12	29	30
3	1+	2+	1o	1+	1o	1o	3+	3+	14.7	9	18	7	9	7	7	40	39	17	18
4	3-	2-	1o	1+	2-	2o	2+	2-	14.3	24	11	6	9	11	15	17	12	13	15
5	1o	1o	2o	1+	0+	2+	1+	2+	11.7	7	6	14	9	2	17	9	18	10	11
6	1-	2-	1o	1+	1+	1o	2-	1+	10.0	4	13	7	8	9	6	13	8	9	16
7	1-	3+	4-	4o	2+	4-	5-	5-	27.0	5	36	46	54	18	45	83	74	45	39
8	4+	5-	4-	4o	3+	5-	4+	4+	33.3	62	72	45	52	38	81	70	69	61	55
9	3o	4o	3-	4+	4-	4-	4o	3+	28.7	32	52	22	61	43	46	54	34	43	42
10	2+	2o	2+	2+	3+	3o	4+	2o	21.7	18	15	18	18	36	27	70	14	27	31
11	4o	3-	2+	2o	3o	3o	3o	4o	24.0	51	23	19	16	28	27	31	57	32	31
12	3o	3-	3-	3-	2o	1+	1+	2+	18.0	33	21	21	24	15	10	9	20	19	23
13	3+	2-	2o	2o	3-	2-	2o	2+	17.7	35	13	15	14	23	12	14	18	18	16
14	2o	2+	1+	2-	1-	1o	2-	1+	12.0	14	19	8	11	5	7	13	9	11	11
15	1-	1+	1-	2-	2+	1-	1o	1o	9.3	4	8	5	11	19	5	6	6	8	9
16	1-	1+	2+	3-	2+	1o	1-	1-	11.7	5	8	19	21	18	7	5	5	11	19
17	2-	4o	4-	5-	6+	6-	2+	1o	29.3	13	53	41	75	181	124	18	7	64	37
18	1+	1o	1+	3o	3+	3o	3+	3o	19.3	8	7	8	29	34	31	36	33	23	36
19	3-	1o	3-	1+	1+	1+	2o	1-	13.0	21	7	21	10	9	8	14	5	12	26
20	3o	3+	4o	4o	4-	3o	3o	5-	28.7	27	40	60	55	43	27	31	82	46	32
21	2o	3-	3o	4-	4o	5-	4+	3+	27.7	16	21	31	48	54	76	65	40	44	46
22	3o	3o	5-	4-	4-	4-	3+	4-	28.7	29	32	84	49	48	47	34	45	46	41
23	2o	2+	1+	2o	2o	3-	2-	1o	15.0	16	19	8	15	16	25	11	7	15	21
24	1+	2-	1o	2o	2o	1o	1-	1+	11.0	10	13	7	14	15	7	5	9	10	11
25	1-	2o	2-	1o	2+	2+	1+	0+	11.7	5	16	11	7	20	17	8	3	11	9
26	1-	1o	1+	1-	2-	2o	1o	1o	9.3	5	7	9	4	13	16	7	6	8	8
27	1-	1-	1o	1-	1+	0+	1-	3o	8.3	4	5	6	5	8	2	5	30	8	16
28	3+	3o	3o	4-	4+	3o	2o	1o	23.3	39	32	27	47	68	31	16	7	33	25
										Monthly mean value of Am								25.9	

am INDICES 1993 (continued)

March 1993																		
	Km								Σ Km	am							Am	Am2
1	2+	2o	3o	3+	5-	4-	3o	3o	25.0	19	14	27	34	72	44	27	28	33	31
2	1+	3-	4o	3o	3-	4o	4o	5-	26.3	9	22	55	30	24	54	52	71	40	39
3	3+	3o	3o	3o	4+	4+	5o	4-	29.7	38	30	31	29	62	63	87	45	48	48
4	5-	4-	3+	2+	1o	3o	2+	2-	22.0	85	49	36	18	7	33	20	11	32	36
5	3-	1+	2o	2o	1-	1+	1o	2o	13.0	24	9	16	15	5	8	6	14	12	14
6	1o	1-	2o	3-	2o	2+	3o	2+	16.0	7	4	15	25	16	19	27	17	16	20
7	3+	4o	4-	2o	1+	2+	4-	4-	24.0	37	58	47	16	10	20	48	43	35	28
8	3-	3-	3-	2+	3o	4+	4-	6-	27.0	21	25	26	17	31	65	46	121	44	61
9	6o	6-	5+	5-	4+	4o	3+	5-	38.0	165	138	119	73	62	57	35	71	90	69
10	4+	3o	2-	1+	3o	2o	1o	2o	18.3	67	27	12	10	27	16	7	16	23	33
11	2o	1+	3o	4+	5+	6+	6-	5o	33.0	14	10	32	66	110	174	132	91	79	54
12	5o	3o	2+	3-	3o	4-	4+	3+	27.3	92	27	19	24	29	50	70	40	44	64
13	4+	4-	3-	3-	3o	5-	5-	3-	28.3	67	45	25	26	28	79	84	25	47	41
14	2+	2+	3-	3o	4-	4o	4-	4+	26.0	19	20	22	33	47	52	50	66	39	52
15	4o	4-	5o	5o	5+	4+	4o	5-	36.0	59	47	103	99	119	67	59	86	80	68
16	4+	4-	4+	4o	3-	5o	4+	2+	30.7	63	50	67	51	22	89	65	19	53	57
17	4-	3o	3-	4o	4-	3-	4-	4+	27.7	45	29	21	53	43	22	42	65	40	42
18	4o	3o	3+	3-	3o	2-	2o	2-	21.3	60	32	38	26	27	11	14	12	28	28
19	1+	1+	2+	3-	2o	3+	3-	2-	17.3	9	8	20	22	15	40	26	13	19	22
20	2+	3o	3+	4-	4-	4-	3-	2+	24.7	20	29	40	50	42	41	23	20	33	32
21	3-	3+	3o	4+	4+	3+	3o	3o	27.0	25	35	31	63	67	40	29	32	40	36
22	3-	3o	3o	4-	3-	3+	4-	4-	25.7	25	27	32	48	26	38	50	41	36	32
23	2+	1+	2o	2o	3-	2-	2o	4-	17.7	20	9	14	14	24	13	16	49	20	40
24	4-	5-	6-	5-	4o	4-	4-	4o	34.0	42	74	125	84	55	45	47	59	66	47
25	3o	3-	3o	3+	3o	3+	3-	1+	22.3	29	26	29	34	28	36	24	9	27	30
26	1o	2+	1+	2+	2-	1+	3-	3-	15.3	7	18	9	17	11	9	23	22	15	17
27	3-	2o	2o	1+	3-	3+	2+	3o	19.3	22	14	16	10	24	39	18	30	22	20
28	3o	2+	2o	3o	2+	3o	3+	5-	23.7	28	18	14	28	19	32	40	76	32	32
29	4-	4-	4o	2-	1o	1o	1-	3-	18.3	44	41	53	11	6	7	5	24	24	29
30	3o	2+	3+	3-	3+	4+	3o	2+	24.3	28	18	38	24	40	64	29	19	33	23
31	3+	2-	1+	1o	2+	2+	2+	3-	17.0	39	11	10	6	18	20	20	23	18	22
										Monthly mean value of Am								37.7	

April 1993																		
	Km								Σ Km	am							Am	Am2
1	2-	2o	2+	1+	2-	2+	2+	3-	16.3	12	15	20	9	13	19	19	22	16	15
2	1o	1+	2-	1+	1-	1-	1o	1+	9.0	7	8	12	9	5	4	7	8	8	10
3	1+	1o	1-	0+	1-	1-	1+	2-	7.7	8	6	4	3	4	5	8	11	6	7
4	1+	1o	1o	1+	5-	6-	6-	6+	27.0	9	7	7	10	71	129	146	197	72	67
5	5+	6o	6-	5-	6-	5o	5o	3+	40.7	119	155	122	71	122	92	88	34	100	89
6	2-	2+	2+	3o	3-	2+	2+	4o	20.7	11	18	18	28	22	19	18	58	24	37
7	2o	3-	2+	1+	2o	3-	2+	3+	18.7	15	25	17	10	15	25	19	37	20	25
8	2-	3o	3+	4-	4-	4o	4+	3-	26.3	12	28	39	42	43	53	65	23	38	31
9	3o	3-	3o	2-	2-	5o	4-	5o	25.7	27	21	28	11	11	94	50	87	41	42
10	4o	3+	4-	2+	3-	3-	3o	2+	24.0	56	37	45	18	26	25	31	18	32	35
11	1+	2+	2o	1+	2+	1+	2-	2+	14.7	10	20	14	10	17	8	11	17	13	21
12	4-	4o	3-	1+	1o	1-	2-	1+	16.3	47	56	21	10	7	5	12	10	21	29
13	2o	5-	5-	5-	4o	4-	4-	2o	29.3	14	82	71	83	57	43	50	16	52	37
14	3o	4-	3+	3o	1o	3+	3o	4-	24.0	31	44	37	30	7	34	29	41	32	39
15	4-	4o	4o	3o	2-	1+	5-	5-	27.0	47	60	59	33	12	10	80	75	47	39
16	3o	4o	3+	2+	2o	3o	2+	2+	22.3	30	51	35	20	15	27	18	19	27	29
17	2-	2o	2o	3-	2o	3+	3+	1+	18.3	11	15	14	26	16	37	34	10	20	26
18	3+	4-	3o	4-	3-	3-	2+	1+	22.7	40	50	31	50	25	25	17	8	31	25
19	2+	2-	1+	3-	3-	3o	2o	2o	17.7	20	12	8	23	22	28	14	15	18	25
20	3o	4+	4-	3+	4-	3o	3-	2+	26.0	32	65	43	36	49	33	22	19	37	36
21	4-	4-	4o	4o	3-	5o	4-	4-	30.3	49	41	53	51	25	90	48	46	50	39
22	3+	3-	3o	2-	2+	4o	4o	4o	25.0	37	22	27	12	20	52	55	52	35	34
23	2o	2o	2-	2+	1o	2+	3+	3o	17.7	14	14	12	20	6	20	37	33	20	25
24	3o	1+	2o	2+	2+	3-	2o	2-	17.3	29	10	15	17	20	23	14	11	17	21
25	2o	3o	3o	3o	1+	1o	2o	3-	18.0	14	29	31	27	10	7	14	21	19	16
26	1o	1o	2-	1+	2-	1+	1+	1-	10.0	6	7	13	9	12	8	9	5	9	9
27	1-	0+	1o	1-	1o	2-	1-	2-	7.7	5	3	6	4	7	11	4	13	7	7
28	1+	1-	1-	1o	1+	1+	1+	1-	8.3	9	5	5	6	10	10	10	5	8	8
29	1o	1+	1+	2-	3-	3-	3o	4-	17.3	6	8	10	12	21	21	30	43	19	19
30	4o	3o	3-	2+	2+	3-	2+	2-	21.0	57	27	23	17	19	21	20	13	25	24
										Monthly mean value of Am								28.8	

am INDICES 1993 (continued)

May 1993

	Km								Σ Km	am							Am	Am2
1	3-	3o	2-	2+	2-	0+	0+	0+	12.3	21	28	11	18	12	3	3	2	12	13
2	0+	1+	2o	2-	1+	1+	3-	2-	12.3	3	8	14	12	10	9	21	11	11	11
3	2+	1+	2+	3o	3-	2o	1-	1+	15.7	17	9	19	27	24	14	5	8	15	13
4	1o	1+	2o	1-	2-	2-	1-	1o	10.0	6	8	16	4	11	12	5	7	9	11
5	1o	1+	3-	2-	3-	1-	0+	1+	11.7	7	9	25	13	22	4	3	8	11	12
6	2+	2+	2+	2+	2+	3o	3-	2o	19.3	18	17	17	20	19	29	24	15	20	17
7	1+	3-	2+	3-	3o	3o	3+	5o	23.3	10	23	19	22	29	29	38	87	32	38
8	5-	3+	4+	5-	4+	3+	4+	5-	33.7	84	37	70	75	70	38	70	77	65	63
9	5-	5+	4+	3+	3+	3+	5-	5-	33.7	83	115	70	40	37	35	83	81	68	75
10	5o	6-	5o	5-	5-	2+	3-	4-	33.7	97	129	99	78	78	20	24	50	72	53
11	2-	2o	1+	1-	1o	1-	1o	1+	9.7	12	14	10	5	6	5	7	10	9	20
12	2-	3-	3-	3o	3o	3o	4-	4o	23.7	12	21	22	28	29	32	49	58	31	21
13	4-	2+	1-	0o	1-	2-	3o	3-	14.7	42	17	4	1	5	11	32	22	17	25
14	2o	3-	3-	3+	4+	2+	2-	2o	21.0	14	25	23	36	64	19	12	14	26	22
15	2o	1+	3o	3-	3-	2o	4-	2+	19.7	14	9	27	23	21	16	44	18	22	24
16	3-	4o	1+	2-	2+	2-	2-	3o	18.3	24	58	10	12	20	11	12	28	22	24
17	3+	4o	2+	2o	2+	2+	4o	4o	24.3	34	51	17	14	17	18	59	59	34	23
18	1-	1-	1+	2-	2o	1+	2-	3+	12.7	5	5	8	11	15	9	12	34	12	20
19	2-	2+	3-	2+	3-	2+	3o	2-	18.7	11	18	23	20	23	19	32	12	20	20
20	2-	2+	3+	2+	2-	1+	1+	0+	14.3	11	20	40	19	13	8	8	3	15	14
21	1o	0+	0+	1-	1-	1-	1o	1-	5.3	6	3	2	5	5	4	6	5	5	6
22	1-	1+	1o	2-	1o	1+	1+	1-	9.0	4	10	6	12	7	9	9	4	8	6
23	0+	0o	0+	1o	1+	0+	1o	1-	5.0	2	1	3	6	10	2	6	4	4	5
24	0+	1-	1+	1o	1-	0+	0+	0+	5.0	3	4	10	6	5	2	3	3	5	4
25	1-	1-	0o	0+	0+	0+	0+	0+	3.0	5	5	1	2	3	2	2	2	3	3
26	0+	1-	1-	1-	1-	1o	1o	2o	7.0	2	5	5	4	5	6	7	15	6	13
27	2o	4-	4-	3o	3o	2o	3-	3o	23.0	16	50	50	31	32	15	23	28	31	27
28	3o	4o	3-	3+	3-	4-	3o	4-	26.0	33	53	25	39	25	43	32	41	36	31
29	3+	2o	2+	3+	1+	1+	1+	1+	16.3	35	16	18	36	9	9	9	10	18	20
30	1-	2o	1+	1-	1o	1o	1o	0+	8.0	5	14	9	4	7	6	6	3	7	8
31	1+	1o	1o	1+	2o	1+	1+	1-	10.0	10	6	6	10	14	8	8	5	8	7
										Monthly mean value of Am								21.1	

June 1993

	Km								Σ Km	am							Am	Am2
1	1+	1o	1-	1-	1+	1-	1-	0+	6.7	10	7	5	5	9	4	4	2	6	8
2	1o	1o	2-	2o	2o	1o	2o	1o	11.7	7	7	11	14	16	7	15	7	11	13
3	2+	2-	3o	3+	3-	3+	2+	2+	21.0	18	13	28	40	26	35	20	17	25	36
4	4o	4+	5o	6-	4o	3+	5-	5-	35.7	54	69	93	125	51	37	77	81	73	62
5	5o	5-	4o	4+	3o	3o	4-	3o	30.7	100	86	56	61	30	32	50	29	56	52
6	3o	3o	4-	3o	3-	2+	4-	3o	24.3	32	28	46	30	22	19	45	30	32	33
7	3+	2+	3+	4-	4o	3o	3-	4-	26.0	34	17	39	47	58	30	21	41	36	31
8	3+	3o	2+	2o	2+	2o	3o	2-	19.7	35	27	18	16	20	16	32	11	22	23
9	3-	2-	1o	1+	1+	2-	1+	2-	12.7	22	12	6	9	8	12	8	12	11	13
10	0+	2-	2-	2-	1o	2+	4o	6o	18.7	3	11	13	13	7	19	55	159	35	26
11	4-	2o	2-	2-	2+	2o	2+	2-	17.3	48	15	12	13	17	14	18	11	19	30
12	1+	2+	3o	3+	2+	2+	2o	3o	19.7	10	17	31	39	19	17	15	28	22	21
13	2o	3-	4-	3-	3-	2-	2-	2+	19.3	14	23	41	26	21	11	13	18	21	21
14	1o	2+	2o	3+	2-	2o	2-	2+	16.3	7	20	15	40	11	16	11	17	17	16
15	2-	2+	2+	2-	1+	0+	1-	1o	11.3	13	19	18	11	9	2	4	6	10	10
16	1-	1-	1+	1+	1o	0+	0+	0+	6.0	4	5	9	10	6	3	3	2	5	5
17	0+	1-	1+	1o	1o	1o	1+	2-	8.3	3	5	9	7	7	7	10	11	7	5
18	1-	0+	0+	0o	1-	1+	0+	1-	4.3	4	2	2	1	4	8	3	4	4	6
19	1-	1+	2-	1+	1+	1+	1+	1+	10.3	4	10	12	9	9	10	10	10	9	8
20	1-	1+	2+	1+	1+	1-	1o	0+	9.0	4	8	18	10	8	5	6	2	8	7
21	0+	0o	0o	0+	0+	1-	0+	0+	2.3	2	1	1	3	3	4	2	2	2	4
22	1o	1-	1-	1o	0+	1+	1+	3-	9.0	6	4	5	7	3	8	9	22	8	9
23	3-	2o	1+	3-	3o	2+	4-	3-	20.3	24	15	10	26	32	19	50	26	25	27
24	3o	4-	4+	3+	4o	4-	2+	3o	27.3	33	50	65	37	52	42	20	29	41	37
25	3-	3-	4o	4-	3o	3-	2o	2o	22.7	26	22	51	45	28	22	15	16	28	27
26	2o	3-	2-	1o	1+	1+	1+	2o	13.3	16	24	12	7	9	10	9	16	13	15
27	2-	1o	2-	3-	1+	2-	1+	1-	12.0	13	7	13	22	10	11	8	4	11	10
28	1-	1+	1+	2-	1o	1-	0+	1-	7.7	5	8	8	13	6	4	3	4	6	10
29	2-	2o	2o	3+	3+	2o	1+	1+	17.0	11	15	15	37	35	16	9	10	19	15
30	3-	2+	2+	1o	1+	3-	2+	2+	17.0	25	17	18	7	10	22	17	19	17	22
										Monthly mean value of Am								20.0	

am INDICES 1993 (continued)

July 1993																			
	Km								Σ Km	am								Am	Am2
1	3o	3+	3+	4-	4-	2o	3+	4o	26.3	28	34	36	44	48	16	35	59	38	32
2	4-	3o	2+	3+	4-	3o	4o	5+	28.3	49	33	18	39	44	27	53	115	47	45
3	4+	4o	4o	2+	2+	2+	2o	3-	24.0	63	52	53	17	19	19	14	21	32	36
4	3o	3-	2-	3-	1+	2-	1o	1+	15.3	30	21	12	23	8	11	6	9	15	15
5	2o	3-	1o	0+	1-	1+	1+	1-	10.0	15	26	6	3	5	8	9	4	10	10
6	0+	1-	1o	3o	1+	0+	1+	1+	9.3	2	4	7	32	10	3	10	9	10	11
7	3-	3-	2o	1+	1o	1+	2-	1o	13.7	24	25	14	8	7	8	12	6	13	16
8	2+	3+	3+	3-	3-	3o	2+	2-	21.3	17	35	37	23	23	33	19	13	25	20
9	2+	3+	2o	2+	3o	4-	2o	2o	20.7	19	34	15	17	31	43	15	15	24	23
10	2+	2o	2+	3+	3-	2-	3-	3-	19.7	17	16	17	38	22	12	26	24	22	32
11	4-	5-	4+	4-	2+	3o	2-	1o	24.3	45	77	69	45	19	33	13	7	39	29
12	2-	2-	3o	2+	2-	2+	1o	2-	15.3	11	12	27	18	11	17	7	13	15	18
13	2o	3-	3+	3-	3-	2o	2o	2-	19.0	16	26	36	24	23	15	15	12	21	14
14	1-	1o	0+	0o	1-	0+	1-	1-	4.3	5	6	2	1	4	3	5	4	4	8
15	1-	2-	1+	1o	1+	1+	1+	2-	10.3	5	13	10	7	8	9	10	12	9	7
16	1-	1o	0+	0+	1-	2-	1o	1+	7.0	4	6	2	2	4	11	6	8	5	6
17	1o	1-	1-	1-	1-	0+	1-	1o	5.7	6	5	5	4	5	3	4	6	5	6
18	1+	1-	1+	2-	1+	1o	1o	1+	9.7	8	5	9	12	10	7	7	8	8	8
19	1+	2-	1o	2-	1+	1-	1o	2-	10.3	9	12	7	13	9	5	7	11	9	14
20	1+	2o	3o	4o	2+	3-	3+	4-	22.3	10	15	31	55	17	24	39	41	29	23
21	3-	3o	3o	3-	3o	3-	3-	2+	22.0	23	33	31	22	30	24	23	20	26	26
22	3-	2+	2+	3o	3-	2-	2-	2+	18.7	25	18	19	33	23	11	12	20	20	20
23	2o	2+	2o	2-	2-	1+	0+	1-	12.0	15	18	14	11	13	8	2	5	11	11
24	1o	0+	1-	1+	1+	2o	1+	1-	8.7	7	3	4	10	9	15	9	5	8	8
25	2o	2-	1+	1o	1-	0+	1-	0+	8.0	14	12	8	6	4	3	5	3	7	8
26	1o	2-	0+	1o	1-	2-	1-	1-	7.7	6	11	3	7	5	13	4	5	7	7
27	1+	1-	1o	2o	3o	3-	3-	2o	15.3	10	4	6	16	28	21	25	14	16	13
28	2+	2+	2+	2-	1o	1o	1+	2o	14.0	19	17	17	11	7	7	10	14	13	16
29	2o	1o	2+	2+	3+	3+	4-	3-	20.7	14	7	17	20	36	37	47	22	25	20
30	3+	3-	1+	1o	1+	1+	1+	1o	13.3	37	21	10	6	10	9	10	7	14	19
31	2+	2+	1+	2-	2-	1o	2-	1+	13.3	19	18	9	11	11	6	12	8	12	9
										Monthly mean value of Am								17.4	

August 1993																			
	Km								Σ Km	am								Am	Am2
1	1+	0+	0+	0+	0+	1o	1o	0+	5.0	9	3	3	2	3	6	7	3	5	6
2	1o	1+	1+	0+	0+	0+	1+	1+	7.3	7	8	8	3	3	3	8	8	6	6
3	1+	1-	1+	2-	1+	2-	2o	1+	11.3	10	4	8	13	10	12	14	10	10	12
4	2-	2+	3-	3o	3+	4o	4-	5-	25.3	13	17	26	31	40	55	41	77	38	34
5	5-	4o	3+	3-	2-	2+	3-	1+	22.7	75	58	38	25	13	18	24	10	33	37
6	1o	3-	4o	4-	4-	3+	3-	1+	22.3	6	21	51	45	43	35	22	9	29	26
7	2+	3+	3-	4-	3o	2o	3-	4o	23.7	19	37	26	41	29	16	25	52	31	28
8	2o	3-	3o	3-	2o	1+	1-	1o	15.3	14	21	28	25	14	9	5	7	15	22
9	3o	3-	3-	3+	3-	2o	3+	1+	21.0	27	23	21	37	22	15	34	8	23	17
10	1+	1-	1+	3-	2-	2-	1+	2-	12.3	8	5	10	26	11	13	10	13	12	13
11	2-	2-	1o	1+	1-	1-	1-	1o	8.7	11	11	7	8	5	4	4	6	7	11
12	1+	3-	2+	2-	2+	2o	1-	1+	14.3	8	24	20	13	18	14	5	9	14	11
13	1+	2+	2o	2-	1o	1+	1-	1o	11.3	9	19	14	11	6	10	5	7	10	8
14	0+	0o	0o	0+	0+	1-	0+	0+	2.3	2	1	0	2	2	4	2	2	2	4
15	1-	0+	1o	1o	2o	3o	3+	5-	16.0	4	3	6	6	15	29	34	79	22	32
16	4+	4+	5o	5o	5o	5-	6-	5o	39.0	70	70	94	94	95	79	124	94	90	69
17	5o	5-	3+	1+	2o	1+	2-	1+	20.7	103	77	39	10	15	9	13	9	34	50
18	3-	3+	3+	3+	3+	3o	3o	3-	24.7	22	40	35	37	37	32	27	22	32	24
19	3-	2+	2+	3-	2o	2-	3+	3-	19.7	26	20	20	21	15	12	37	23	22	23
20	2+	2-	2+	3-	1+	1+	1+	1-	13.7	18	13	18	23	8	9	10	5	13	15
21	1+	2-	2+	2o	2-	1-	1o	1-	11.3	9	12	18	15	12	4	7	4	10	10
22	1o	1+	2o	3-	1o	1o	1+	2+	12.7	6	10	14	22	7	6	9	18	12	9
23	2-	1+	1-	0+	0+	0+	0+	0+	5.3	12	8	4	3	2	3	3	2	5	7
24	0o	1o	2-	2+	1+	1-	1-	2-	9.3	1	7	11	17	8	4	5	12	8	6
25	1+	0+	0+	1+	1o	1o	0+	1+	7.0	10	2	2	8	6	6	3	10	6	7
26	2o	1-	2-	1+	2-	2-	1+	2o	12.3	14	4	13	10	13	12	10	16	12	12
27	2o	1+	2+	3o	4-	5o	4o	4o	25.3	15	9	17	27	49	103	52	56	41	28
28	2+	2-	1+	2+	3-	3-	3o	3-	18.7	20	12	10	19	24	22	27	25	20	32
29	3o	3-	3-	2+	2+	1-	1o	3o	17.7	31	26	25	18	19	5	7	31	20	19
30	1+	1+	2-	1-	0+	0+	1-	2-	8.0	9	10	13	5	3	3	5	12	8	10
31	2o	1+	1o	0+	1+	1-	1+	1+	9.3	15	10	7	3	9	4	10	10	9	6
										Monthly mean value of Am								19.3	

am INDICES 1993 (continued)

September 1993																				
	Km								Σ Km	am									Am	Am2
1	1-	0+	0+	0o	1-	1-	1o	0+	4.0	4	2	3	1	4	4	7	3		4	6
2	1-	1+	1+	2o	2+	2-	2o	1+	12.7	5	8	8	16	20	13	15	10		12	15
3	2+	3-	3+	4-	4o	4o	5-	5o	29.7	18	22	37	44	60	55	84	90		51	43
4	4+	4+	4+	3o	3o	4-	2o	3o	27.7	62	62	68	33	30	49	16	31		44	47
5	4o	3-	2+	2+	3-	2+	2-	3-	20.7	51	24	18	19	24	17	12	22		23	26
6	3o	2+	3-	3-	3-	2-	3-	2+	20.0	29	17	23	26	21	11	24	18		21	19
7	2-	3-	2+	1+	2o	2o	1o	3-	15.7	11	23	20	8	14	15	7	21		15	16
8	3o	2o	1+	2-	1o	1o	1o	2+	13.3	31	15	9	13	6	6	7	20		13	12
9	2-	0+	1o	1+	1+	1+	2-	1o	9.7	11	2	7	8	10	9	12	7		8	9
10	1o	2-	2o	1+	1+	1+	0+	1+	10.3	6	13	14	8	10	9	3	9		9	9
11	2+	1-	0+	2-	1+	1o	2o	2-	11.0	17	5	3	11	10	7	14	13		10	10
12	2-	1o	2o	2-	3-	4-	4-	5o	21.3	12	6	15	11	25	44	43	99		32	57
13	5+	6o	7-	6o	5o	5+	4+	4o	42.7	106	150	205	159	103	112	70	52		120	87
14	5-	3o	4+	4o	3+	4-	3o	3o	29.0	72	28	66	59	39	49	30	32		47	53
15	3o	3+	4-	3-	3-	2+	3o	2o	22.7	32	39	42	21	21	19	28	16		27	25
16	1+	1+	1o	2-	2+	2o	2o	0+	12.0	8	9	6	11	17	14	16	2		10	13
17	1-	1+	2-	1+	1+	1-	0+	1+	8.7	4	9	13	9	9	5	3	9		8	9
18	1-	1+	1+	2o	1-	1-	0+	1-	7.7	5	10	9	16	5	5	3	5		7	8
19	1+	1o	1+	2o	1o	1o	0+	1-	8.7	10	7	9	14	6	6	2	4		7	9
20	1-	1o	1+	4-	4-	4o	4-	5-	22.7	4	6	9	45	43	51	45	78		35	24
21	4+	1+	1o	0+	2o	3o	3-	2+	17.0	65	9	7	3	14	27	26	19		21	28
22	2-	2+	2+	2-	1+	0+	1-	2o	12.3	12	17	19	13	8	3	4	14		11	12
23	0o	0o	0o	1+	3o	2o	3o	4o	13.3	0	1	1	10	30	15	29	51		17	17
24	4-	1+	3o	3o	3-	3-	4-	4o	24.0	45	9	30	27	25	26	42	51		32	27
25	2-	2-	2o	2+	3-	2+	2+	3-	17.7	12	13	14	19	25	18	19	23		18	24
26	2o	3o	3-	3o	2o	1+	1+	2o	17.3	15	33	26	28	15	10	9	16		19	20
27	3o	2+	2o	2+	1+	2+	2+	2-	17.3	31	20	15	18	9	19	17	11		18	14
28	0+	1o	1-	2o	2o	3-	3-	2+	13.7	2	6	5	16	16	21	26	19		14	16
29	2o	1+	3-	3+	4-	5-	4+	3+	25.3	14	10	21	38	42	79	67	37		39	32
30	4-	3+	3-	2+	1+	2-	2o	4o	21.0	47	39	21	18	9	12	16	56		27	42
										Monthly mean value of Am									24.0	

October 1993																				
	Km								Σ Km	am									Am	Am2
1	4+	4-	4o	4o	3-	3+	3-	2o	26.7	69	48	56	54	25	36	24	15		41	29
2	1-	1o	2-	2+	2o	3-	3-	1+	14.3	5	7	13	19	14	21	25	10		14	15
3	0+	1o	1+	1o	1+	2-	3-	2-	11.0	3	6	8	6	9	13	22	11		10	11
4	0+	1o	1o	2-	1+	2o	3-	1+	11.3	3	6	6	12	10	14	25	9		11	10
5	1+	1-	1-	1o	1-	2o	3-	2+	11.3	8	4	4	7	5	14	23	19		11	16
6	3+	3o	3o	1o	1+	1+	2-	3-	17.3	40	32	27	7	9	8	11	21		19	15
7	2-	1o	0+	0+	1+	1o	0+	1-	6.7	11	7	2	2	8	6	3	5		6	14
8	1+	2+	4o	4o	4+	2+	2+	3o	23.7	9	20	51	52	62	19	19	28		33	39
9	3-	5-	5o	6-	4o	3o	4-	5-	33.3	25	78	95	139	53	33	43	84		69	54
10	4-	4o	4-	4-	4o	3-	3+	4-	28.7	49	55	41	44	57	25	38	48		45	45
11	4-	3-	3o	4o	4-	4+	3-	4o	28.0	45	26	27	55	47	63	23	51		42	39
12	4-	3o	3o	2+	4o	3o	2+	2+	23.7	41	27	27	19	51	31	20	17		29	33
13	3-	3+	3o	2o	2-	2-	2+	2o	18.7	22	37	29	16	13	12	20	16		21	22
14	3-	2o	2o	2-	2+	2-	1o	1+	14.7	26	15	15	12	20	13	6	8		14	13
15	1o	1o	1+	1+	1o	1+	0+	1-	8.0	6	6	8	9	6	8	2	4		6	8
16	1o	1-	1+	1+	1o	2o	1+	2o	10.7	7	5	10	10	7	16	8	14		10	9
17	3-	2-	1+	1o	1o	1+	2-	2o	12.7	22	12	8	6	7	9	12	16		12	12
18	1+	3-	1+	1+	2+	2-	1+	1+	13.3	9	21	9	9	19	13	9	9		12	13
19	2o	2+	2o	2+	2-	1+	2o	2o	15.7	16	17	14	18	12	9	15	16		15	12
20	1o	1-	1+	1o	1o	2-	2+	2-	10.7	7	5	9	6	6	13	18	11		9	11
21	1+	2-	2o	2+	2o	1-	0+	1-	11.0	10	13	14	18	15	5	2	4		10	16
22	4-	3+	3o	2o	3-	3o	3+	3o	24.0	50	35	29	16	21	27	36	29		30	23
23	2-	3-	4-	2o	2+	2o	3-	2+	19.3	13	26	45	14	17	14	25	19		22	24
24	4o	2+	1+	2-	1+	3-	2o	2-	17.0	57	17	9	12	8	21	15	12		19	24
25	2+	2-	3o	5o	6o	6o	3+	3+	30.7	18	12	30	98	157	148	35	39		67	40
26	2-	1+	2+	2-	2o	5-	3+	4+	21.3	12	9	18	12	14	73	38	63		30	53
27	4-	4-	4+	4+	5o	4o	4+	4-	33.0	44	46	66	68	98	59	68	48		62	51
28	3o	3-	3o	4-	3+	2o	3-	4+	24.7	29	24	33	41	40	16	25	64		34	38
29	3+	2-	1+	1o	3+	3-	2-	3-	17.7	38	12	10	7	35	22	11	24		20	21
30	2+	1-	1-	1-	1-	1-	0+	1o	7.0	17	4	5	4	5	5	2	7		6	12
31	1o	0+	3-	2o	2o	3-	3-	3-	16.0	7	3	21	15	14	25	22	21		16	13
										Monthly mean value of Am									24.0	

am INDICES 1993 (continued)

November 1993																			
	Km								Σ Km	am								Am	Am2
1	2+	2+	2o	2o	3o	3o	3-	2o	19.3	20	17	15	16	32	28	22	15	21	18
2	2o	2-	2-	1-	1o	1+	1o	0+	9.7	14	12	11	5	7	8	6	2	8	11
3	0+	0+	1-	1o	2-	3o	3o	5o	15.0	2	2	5	7	11	29	31	99	23	38
4	5o	5-	5-	6-	5+	5o	5o	4+	39.7	98	84	77	138	117	95	98	63	96	70
5	3+	3-	4o	4+	4o	4-	4-	4o	29.7	36	26	59	64	57	50	47	53	49	58
6	3+	3-	4-	4o	4-	3+	4-	4o	28.3	36	21	44	57	44	36	50	54	43	42
7	3+	2o	3o	3+	4-	4-	3+	4o	26.3	39	16	32	34	43	44	38	52	37	36
8	3+	2+	2o	3o	2+	3o	4o	3-	22.7	35	20	14	30	18	33	51	24	28	30
9	2+	2+	2o	2+	2+	2-	2o	2+	17.3	19	20	14	19	19	11	16	20	17	21
10	3-	2o	3-	3-	3-	2o	3-	1o	18.3	21	15	22	21	23	16	22	7	18	16
11	1o	2+	1+	2o	2o	1+	0+	1-	11.0	7	19	8	15	16	9	3	4	10	11
12	1-	1+	1+	1o	1o	1-	1o	1-	7.7	5	8	8	7	6	4	7	4	6	8
13	1-	1+	2o	2-	3o	3o	3-	2o	16.3	5	10	15	13	29	28	22	14	17	13
14	1+	2-	2-	3-	3+	4o	3+	3o	21.0	9	12	12	25	35	51	34	29	26	23
15	3-	2+	2-	2-	2-	2+	3+	4o	19.7	26	20	11	13	12	17	38	53	24	25
16	2+	2-	2+	2o	3-	3-	3-	2+	18.7	20	12	19	16	21	23	22	18	19	18
17	2-	0+	0+	0+	0+	1o	3o	3-	9.7	13	2	3	3	3	6	31	23	11	14
18	2+	2-	2-	1+	5o	6o	5+	4o	27.3	19	11	11	8	98	153	112	54	58	43
19	4-	5-	2o	2+	4-	4-	4-	4-	27.3	49	82	14	17	41	42	48	48	43	52
20	3o	3-	2o	2-	1+	1+	2-	2o	15.7	27	26	14	12	9	10	11	15	16	23
21	2+	2-	2o	2o	1+	1o	1+	2o	13.7	18	13	16	15	9	6	10	16	13	12
22	2+	1o	2-	1+	1+	1o	2o	2o	12.7	17	6	12	8	8	6	15	15	11	11
23	2o	2-	2-	1+	2o	2o	2o	1o	13.7	14	13	11	9	14	14	16	7	12	11
24	1+	2-	1o	1o	1o	2-	2-	2-	11.0	10	12	6	6	6	11	11	11	9	10
25	1+	2-	1+	1o	1+	2+	2o	3-	13.7	9	11	9	7	8	18	16	26	13	14
26	3-	2+	2+	2+	2+	4o	4+	3o	23.3	26	17	17	17	20	53	64	27	30	22
27	3-	2-	1-	1-	0+	2o	2o	2+	12.3	22	13	5	5	3	16	14	20	12	18
28	1-	1-	1o	1o	2o	2-	1+	2+	10.7	5	4	7	6	14	12	9	17	9	14
29	3+	2+	2o	2+	3-	3-	3-	2o	20.0	40	17	16	20	24	24	23	15	22	16
30	2o	0+	1-	1o	1o	1+	1o	1+	8.7	14	3	4	6	6	8	6	9	7	16
										Monthly mean value of Am								23.6	

December 1993																			
	Km								Σ Km	am								Am	Am2
1	2+	2o	2o	4o	5o	5-	4-	5+	29.0	19	15	14	59	98	71	50	116	55	42
2	4o	4-	4o	4-	4o	5-	5+	6-	35.0	57	44	53	49	58	75	106	138	73	74
3	5o	4o	4+	4-	3+	2+	4-	2+	28.7	94	57	67	45	34	20	49	17	48	50
4	1+	1-	1+	2-	2-	2+	3o	2o	14.0	10	5	9	13	12	18	33	15	14	17
5	1-	1o	1+	2+	3+	3o	3o	2+	17.0	5	7	8	20	34	33	30	18	19	17
6	2-	1+	1+	2-	2-	2-	2o	2-	13.0	12	8	10	11	13	12	16	13	12	16
7	2+	1+	1o	1+	4+	4-	4o	5-	22.7	17	8	7	9	63	50	54	79	36	45
8	6-	5-	4+	5o	4+	5-	4-	1+	33.7	132	85	69	97	70	79	43	10	73	53
9	1+	1-	0+	0+	1-	1+	1-	2o	7.3	9	4	2	3	4	8	4	14	6	19
10	2o	1+	2-	2+	2+	2+	3o	2o	17.0	16	9	12	20	20	17	27	14	17	15
11	3-	2-	3-	2-	2o	2-	2o	1o	15.3	23	12	21	12	15	13	15	7	15	16
12	1+	1o	2-	3-	2+	2+	1-	1+	13.3	10	7	12	25	17	20	5	10	13	11
13	1+	1o	1-	1+	1-	0+	1-	1+	7.3	9	6	4	8	5	3	5	10	6	9
14	1+	1+	1o	2-	1o	1+	1o	1-	9.3	10	8	6	11	6	8	6	5	8	11
15	2-	2o	3o	3o	3+	2-	2+	2-	18.7	13	15	33	27	35	12	17	13	21	20
16	2+	3o	3o	4-	4o	4-	4o	4-	27.3	19	33	32	48	56	43	55	49	42	33
17	3o	3o	3-	3o	3o	3o	4o	3+	25.0	32	31	22	30	33	32	54	34	34	35
18	2+	2+	3-	3o	3o	3+	4-	3+	23.7	19	19	25	31	27	38	41	37	30	30
19	3o	2+	3-	2o	2o	2+	3-	2o	19.0	30	17	21	15	15	20	21	15	19	25
20	3+	3o	2-	2+	2+	3-	3o	3-	21.0	39	28	13	20	19	21	30	24	24	23
21	3-	2+	3-	3+	3o	4-	3o	3+	24.0	23	17	23	36	31	45	30	37	30	27
22	2+	2-	2o	4-	3-	1+	2o	3-	18.3	18	13	16	41	25	10	16	22	20	23
23	2o	2o	1+	3-	2+	3-	3-	4-	19.3	14	14	8	21	17	26	21	49	21	20
24	2+	2o	2+	3-	3-	3o	3-	3-	20.3	17	14	18	24	26	28	24	23	22	23
25	2+	3-	2o	3-	3-	1o	3-	3-	18.7	17	22	15	23	24	7	22	24	19	18
26	2-	1o	1+	2-	3-	2+	2+	3+	16.3	11	6	10	11	25	20	17	34	17	16
27	1+	2-	2-	1o	2+	3o	2-	1o	13.7	10	12	11	7	19	28	12	6	13	14
28	1-	0+	1o	1-	1o	1+	1+	2-	8.0	4	3	6	4	7	10	10	13	7	9
29	1o	1+	1o	1-	1-	0+	0+	1o	6.3	6	9	7	5	5	2	3	7	6	8
30	2-	1+	2-	2-	2-	1-	0+	1-	9.7	13	9	12	13	12	4	2	5	9	16
31	2o	3-	5-	4o	3o	3-	3-	3o	24.7	16	26	72	53	29	26	23	32	35	30
										Monthly mean value of Am								24.6	

MONTHLY and YEARLY am 1959 - 1993

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1959	25.5	35.8	30.2	24.2	25.6	22.8	42.2	31.6	37.0	28.3	33.0	31.7	30.6
1960	25.7	23.5	27.3	53.5	31.5	27.4	27.4	27.9	27.1	45.0	44.5	32.2	32.7
1961	19.5	24.1	21.3	20.7	21.1	20.3	34.4	17.8	19.4	22.0	15.7	19.6	21.3
1962	13.0	18.4	14.0	21.6	12.8	17.1	19.9	24.9	27.8	29.9	20.4	21.1	20.1
1963	17.3	13.9	13.2	15.4	17.9	17.9	19.5	21.2	38.0	22.2	19.0	16.9	19.4
1964	17.9	17.5	19.0	19.7	15.9	13.7	15.4	13.3	16.2	15.0	12.5	9.3	15.4
1965	10.9	14.7	13.2	11.5	9.8	14.9	13.6	14.8	16.2	11.8	10.9	12.3	12.9
1966	12.8	13.2	17.8	11.1	14.0	11.6	15.4	18.2	28.2	16.2	15.4	18.5	16.1
1967	17.7	18.4	12.0	14.0	32.8	17.8	12.8	15.3	24.0	16.8	17.4	23.2	18.5
1968	19.3	25.1	21.9	20.2	21.5	24.3	16.4	18.5	21.1	24.1	25.1	17.7	21.2
1969	15.3	23.5	26.1	22.4	23.6	15.7	12.4	13.5	21.7	14.5	16.9	11.9	18.1
1970	12.5	11.2	24.9	21.0	14.1	16.2	25.5	18.5	17.6	19.2	19.9	14.9	18.0
1971	21.0	19.0	18.4	23.2	20.3	15.8	13.8	15.9	20.1	19.4	17.0	18.2	18.5
1972	20.6	16.9	18.9	17.3	16.2	21.0	12.9	32.2	19.4	19.4	21.1	16.9	19.4
1973	25.0	29.8	34.9	39.5	25.9	26.5	20.4	20.1	21.9	27.4	20.1	19.2	25.8
1974	24.1	25.2	33.7	31.5	28.0	27.2	33.2	30.3	33.5	37.2	27.1	26.1	29.8
1975	25.9	29.5	30.8	24.7	23.3	19.8	21.4	17.9	15.9	18.4	28.8	20.3	23.0
1976	22.0	26.8	33.4	26.4	22.9	16.9	16.2	16.0	21.8	19.2	15.2	18.1	21.2
1977	18.5	20.0	18.7	25.0	18.9	13.9	22.9	22.6	23.9	20.7	16.9	16.8	19.9
1978	24.6	25.4	25.9	32.2	32.5	28.3	18.9	24.3	26.8	19.7	24.3	22.1	25.4
1979	26.5	24.2	27.6	35.3	21.6	17.4	17.9	25.9	21.1	18.6	16.9	16.2	22.4
1980	18.0	17.9	11.8	17.3	15.1	19.4	16.1	15.8	13.7	22.6	22.4	22.5	17.7
1981	16.4	23.3	28.4	35.9	28.3	17.7	28.7	24.2	19.8	34.5	24.9	18.6	25.1
1982	20.7	48.2	26.8	31.8	26.0	32.1	43.7	32.2	50.4	29.0	34.5	35.6	34.1
1983	25.7	39.3	34.3	35.2	32.0	24.1	21.8	25.8	23.0	27.3	32.0	24.1	28.6
1984	20.6	25.7	30.5	34.1	26.5	23.8	26.8	25.7	33.1	33.3	31.5	28.0	28.3
1985	25.0	23.3	17.8	30.3	14.8	19.4	24.4	22.3	20.8	23.0	23.5	21.4	22.1
1986	21.3	40.5	20.7	13.4	18.4	15.2	15.0	22.5	25.6	18.0	20.7	14.7	20.4
1987	13.5	16.6	16.9	11.8	13.5	12.8	17.3	23.5	29.7	24.7	21.3	14.9	18.0
1988	21.0	22.4	23.3	24.4	18.7	18.1	18.4	19.1	20.0	20.9	22.1	24.6	21.1
1989	32.6	25.9	61.8	33.7	25.6	24.9	13.2	30.4	25.9	32.6	33.3	29.2	30.8
1990	23.4	36.3	33.7	40.4	24.5	23.0	20.5	28.2	22.7	24.2	16.1	13.5	25.5
1991	14.9	18.9	39.6	25.7	27.4	58.0	37.5	44.0	30.7	47.6	48.9	26.3	35.0
1992	24.7	51.4	24.0	19.3	30.6	24.1	16.9	24.6	37.2	25.8	24.9	24.4	27.3
1993	28.6	25.9	37.7	28.8	21.1	20.0	17.4	19.3	24.0	24.0	23.6	24.6	24.5

Unit : nT

SECTION 3

3.3 Kp INDICES

Musical diagram of **Kp** 1993 75

Monthly tables of three-hour indices :

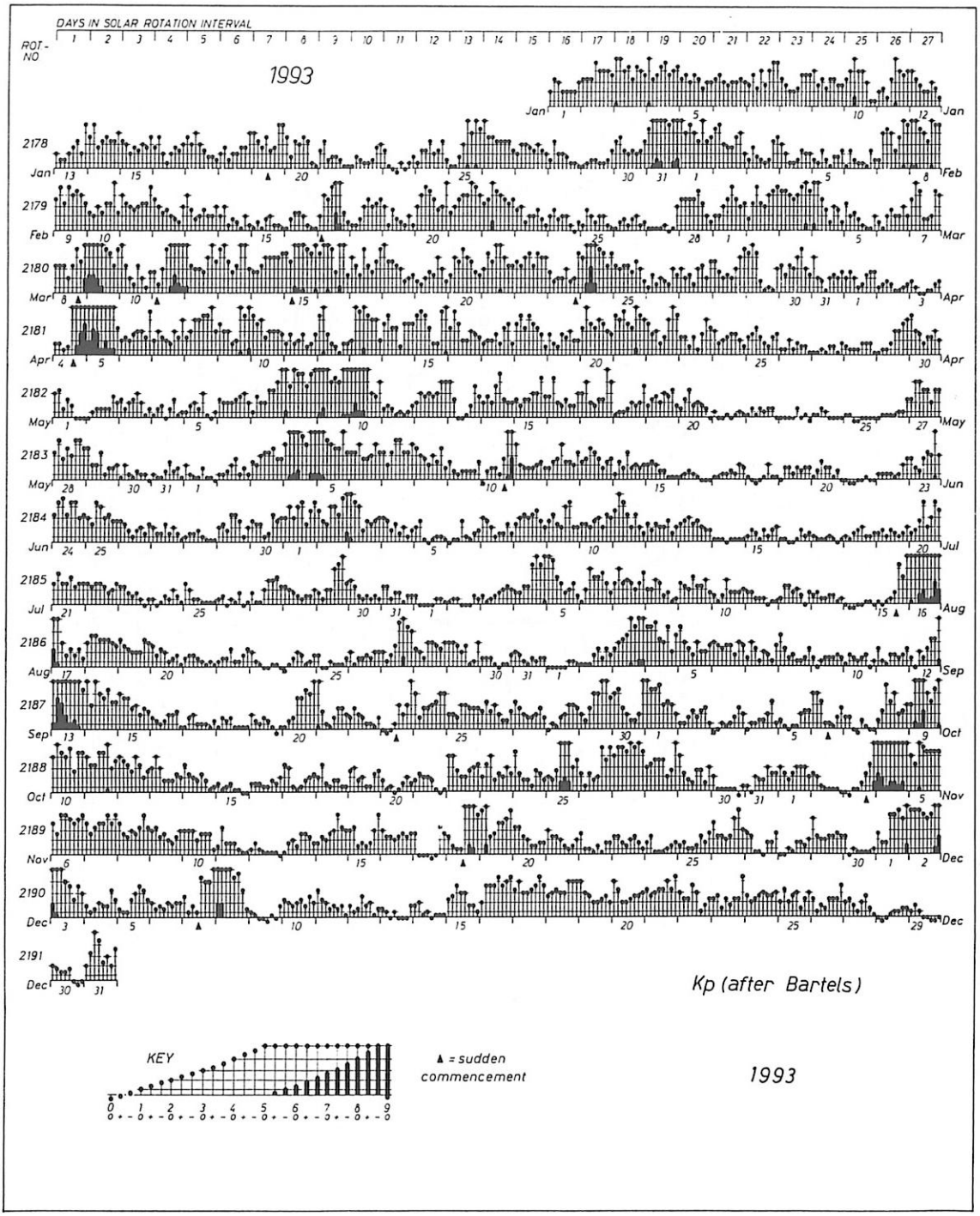
Kp, **ap** and daily **Ap** and **Cp** values 76

Frequencies of **Kp** indices 82

Monthly and yearly mean values of **Ap**

1932 - 1993 83

MUSICAL DIAGRAM OF **Kp** 1993



Kp INDICES 1993

	Kp								Sum	Jan 1993 ap								Sum	Ap	Cp
1	2o	3+	3o	2o	2o	2o	2o	3o	19+	7	18	15	7	7	7	7	15	83	10	0.6
2	3+	3+	3+	5-	4o	4o	4o	4-	30+	18	18	18	39	27	27	27	22	196	24	1.2
3	5+	5o	4o	4+	3+	4+	4o	4-	34o	56	48	27	32	18	32	27	22	262	33	1.3
4	5+	3+	4-	4+	5-	4-	4o	4+	33+	56	18	22	32	39	22	27	32	248	31	1.3
5	3+	4-	3o	4-	3+	2+	3o	3o	25+	18	22	15	22	18	9	15	15	134	17	0.9
6	3+	4-	3o	3-	3o	3o	3+	3o	25o	18	22	15	12	15	15	18	15	130	16	0.9
7	3-	4-	2+	4o	3-	4o	5-	5-	29-	12	22	9	27	12	27	39	39	187	23	1.1
8	3+	3-	2o	2o	2+	4-	4-	4-	23+	18	12	7	7	9	22	22	22	119	15	0.8
9	4o	3-	3+	2+	3+	3+	3-	3-	24+	27	12	18	9	18	18	12	12	126	16	0.9
10	3+	4o	6o	4o	4o	3o	1o	1o	26+	18	27	80	27	27	15	4	4	202	25	1.2
11	2o	2+	1+	3+	5+	4o	4-	4o	26o	7	9	5	18	56	27	22	27	171	21	1.1
12	4o	3+	3-	2o	2o	3o	2+	1+	21-	27	18	12	7	7	15	9	5	100	12	0.7
13	2o	1+	1+	2o	3-	3+	2o	5-	19+	7	5	5	7	12	18	7	39	100	12	0.7
14	4-	5-	3-	3+	4-	3+	3+	4o	29-	22	39	12	18	22	18	18	27	176	22	1.1
15	3+	3o	2o	3-	2+	3o	3-	4-	23-	18	15	7	12	9	15	12	22	110	14	0.8
16	3-	4-	2o	1o	2o	3-	2+	3o	19+	12	22	7	4	7	12	9	15	88	11	0.6
17	4-	3o	4o	3o	2+	2-	2-	1+	21-	22	15	27	15	9	6	6	5	105	13	0.8
18	2o	3-	1+	2o	2o	3-	3-	4o	19+	7	12	5	7	7	12	12	27	89	11	0.6
19	4o	3+	3-	4-	2+	3-	5-	5-	28o	27	18	12	22	9	12	39	39	178	22	1.1
20	4-	2-	3+	3o	4-	3+	1o	1-	20+	22	6	18	15	22	18	4	3	108	14	0.8
21	2+	3+	1+	2-	2-	1+	1-	1-	13o	9	18	5	6	6	5	3	3	55	7	0.3
22	1-	2-	1+	1o	1o	1+	3-	3o	13-	3	6	5	4	4	5	12	15	54	7	0.3
23	2+	1-	0+	0o	1o	0+	1o	2-	7+	9	3	2	0	4	2	4	6	30	4	0.1
24	1o	2+	2+	3+	2o	2+	3+	1+	18o	4	9	9	18	7	9	18	5	79	10	0.6
25	1-	1-	2-	3o	5+	4o	5+	4+	25o	3	3	6	15	56	27	56	32	198	25	1.2
26	5o	4-	4-	3+	3+	3+	3+	2+	28o	48	22	22	18	18	18	18	9	173	22	1.1
27	2o	3o	3o	3-	2+	3o	2+	2o	20+	7	15	15	12	9	15	9	7	89	11	0.6
28	1+	3+	2o	2o	2-	1o	1o	1-	13o	5	18	7	7	6	4	4	3	54	7	0.3
29	1-	1o	1+	1+	1o	1o	1+	2+	10o	3	4	5	5	4	4	5	9	39	5	0.2
30	3+	4-	2+	2o	2+	2o	2+	3+	21+	18	22	9	7	9	7	9	18	99	12	0.7
31	4+	5+	6o	6-	5o	5-	6-	6o	43-	32	56	80	67	48	39	67	80	469	59	1.7

	Kp								Sum	Feb 1993 ap								Sum	Ap	Cp
1	5o	4o	5-	4o	3+	5o	3+	4-	33o	48	27	39	27	18	48	18	22	247	31	1.3
2	4+	5-	3o	3-	3-	4-	4o	2o	27o	32	39	15	12	12	22	27	7	166	21	1.1
3	1+	3-	2-	1+	1o	1+	3+	4-	16+	5	12	6	5	4	5	18	22	77	10	0.5
4	3o	2o	1o	1o	1+	2+	2o	2o	15-	15	7	4	4	5	9	7	7	58	7	0.4
5	1+	1o	2+	1+	1-	2-	2-	2+	12+	5	4	9	5	3	6	6	9	47	6	0.3
6	1-	2+	1+	1o	1o	1-	2+	1+	11-	3	9	5	4	4	3	9	5	42	5	0.2
7	1+	4o	4+	4o	2+	4-	5+	5-	30-	5	27	32	27	9	22	56	39	217	27	1.2
8	5+	5+	4+	4o	3+	5+	5-	5-	37o	56	56	32	27	18	56	39	39	323	40	1.5
9	4-	5-	3+	5-	4o	4+	4o	3+	32o	22	39	18	39	27	32	27	18	222	28	1.2
10	2+	2o	3o	2+	3+	3+	5o	2+	24-	9	7	15	9	18	18	48	9	133	17	0.9
11	4o	3+	3o	3-	3o	3+	3+	5-	27+	27	18	15	12	15	18	18	39	162	20	1.0
12	4-	3o	2+	3-	2o	2-	1+	3o	20-	22	15	9	12	7	6	5	15	91	11	0.7
13	4o	3-	2-	2o	3-	2o	2o	3o	20o	27	12	6	7	12	7	7	15	93	12	0.7
14	2o	3o	1o	2-	1+	1-	2o	1o	13-	7	15	4	6	5	3	7	4	51	6	0.3
15	1-	1+	1-	2-	2o	1o	1o	1-	9o	3	5	3	6	7	4	4	3	35	4	0.2
16	1-	2-	2+	2+	2o	1o	1-	1-	11+	3	6	9	9	7	4	3	3	44	6	0.2
17	2o	4o	4-	5-	7-	6-	2+	1+	30+	7	27	22	39	111	67	9	5	287	36	1.4
18	1o	1o	2-	3o	4-	3o	3+	4-	20+	4	4	6	15	22	15	18	22	106	13	0.8
19	3o	1o	3-	2-	1+	1o	2o	1o	14-	15	4	12	6	5	4	7	4	57	7	0.4
20	3o	4o	5-	4+	4-	3-	3o	5o	30+	15	27	39	32	22	12	15	48	210	26	1.2
21	2+	3o	4-	4o	4o	5o	5-	4o	31-	9	15	22	27	27	48	39	27	214	27	1.2
22	3+	4-	6o	4+	4o	4-	3+	4-	32o	18	22	80	32	27	22	18	22	241	30	1.3
23	3-	3o	1+	2o	2o	3-	2-	1o	16+	12	15	5	7	7	12	6	4	68	8	0.5
24	2o	3-	2-	2o	2o	1o	0+	1+	13o	7	12	6	7	7	4	2	5	50	6	0.3
25	1o	3-	2o	1+	2o	2o	1o	1-	13-	4	12	7	5	7	7	4	3	49	6	0.3
26	1-	1+	2-	1o	2-	2o	1o	1+	11-	3	5	6	4	6	7	4	5	40	5	0.2
27	1-	1-	1-	1-	1o	0+	1-	3o	8-	3	3	3	3	4	2	3	15	36	4	0.2
28	4-	4-	4-	4-	4+	3+	2o	1+	26-	22	22	22	22	32	18	7	5	150	19	1.0

Kp INDICES 1993 (continued)

	Kp	Sum	Mar 1993 ap								Sum	Ap	Cp
1	2o 2o 3o 4-	5- 4- 3o 3+	25+	7	7	15	22	39	22	15	18	145	18	1.0
2	2- 3+ 5- 3+	3o 4o 4+ 5-	29o	6	18	39	18	15	27	32	39	194	24	1.2
3	4+ 4+ 4o 4-	4o 5- 6- 4+	35o	32	32	27	22	27	39	67	32	278	35	1.4
4	6- 5o 4- 3-	1+ 3o 3- 1+	25+	67	48	22	12	5	15	12	5	186	23	1.1
5	3+ 2o 2+ 2-	1o 1- 1- 2o	14-	18	7	9	6	4	3	3	7	57	7	0.4
6	1+ 1- 2o 3-	2o 2o 3o 2o	16-	5	3	7	12	7	7	15	7	63	8	0.4
7	4- 5o 4+ 2-	2- 2o 4+ 4o	27-	22	48	32	6	6	7	32	27	180	22	1.1
8	3+ 3+ 3+ 2o	3+ 5- 4- 6+	30o	18	18	18	7	18	39	22	94	234	29	1.3
9	7- 7- 6+ 6-	5- 4+ 3+ 5-	42+	111	111	94	67	39	32	18	39	511	64	1.7
10	5o 3+ 2o 1+	3+ 2o 1o 3-	21-	48	18	7	5	18	7	4	12	119	15	0.8
11	3- 1+ 3o 5-	6- 7- 6o 6-	36-	12	5	15	39	67	111	80	67	396	50	1.6
12	6- 3+ 3o 3o	3- 4o 5o 4-	30+	67	18	15	15	12	27	48	22	224	28	1.2
13	5- 5o 4- 3-	3+ 5o 5o 3o	32+	39	48	22	12	18	48	48	15	250	31	1.3
14	3- 3- 3+ 4o	4o 4o 4o 4+	29o	12	12	18	27	27	27	27	32	182	23	1.1
15	4+ 4- 6- 5+	5+ 5- 4+ 5+	39-	32	22	67	56	56	39	32	56	360	45	1.5
16	4+ 5o 5+ 5-	3- 6- 5o 2+	35o	32	48	56	39	12	67	48	9	311	39	1.4
17	4o 3+ 2+ 5-	3+ 3- 4- 5-	29-	27	18	9	39	18	12	22	39	184	23	1.1
18	5o 4- 4- 3+	3o 2- 2o 2+	25-	48	22	22	18	15	6	7	9	147	18	1.0
19	2- 1+ 2o 3-	2+ 4o 3o 2-	19-	6	5	7	12	9	27	15	6	87	11	0.6
20	2+ 4o 4- 5-	4o 4- 3- 2+	27+	9	27	22	39	27	22	12	9	167	21	1.1
21	3o 4+ 4- 5o	5+ 4o 3+ 3+	32o	15	32	22	48	56	27	18	18	236	30	1.3
22	4- 3+ 4o 4+	3+ 4+ 4o 4o	31o	22	18	27	32	18	32	27	27	203	25	1.2
23	3- 2- 2o 2o	3o 2- 2o 4+	19+	12	6	7	7	15	6	7	32	92	12	0.7
24	4o 6o 7+ 6o	5- 4+ 3+ 4+	40o	27	80	154	80	39	32	18	32	462	58	1.7
25	3+ 3o 3+ 3+	3- 4- 3o 2-	24o	18	15	18	18	12	22	15	6	124	16	0.9
26	1o 2+ 1+ 2o	2- 1+ 3o 2+	15o	4	9	5	7	6	5	15	9	60	8	0.4
27	3o 2o 2+ 1+	3o 3+ 2o 4-	21-	15	7	9	5	15	18	7	22	98	12	0.7
28	4- 3- 2o 2+	2o 3o 4o 5-	24+	22	12	7	9	7	15	27	39	138	17	0.9
29	4+ 5o 4+ 2-	1- 1o 1- 3o	21-	32	48	32	6	3	4	3	15	143	18	1.0
30	3+ 2+ 3+ 3o	4o 5- 3o 2+	26o	18	9	18	15	27	39	15	9	150	19	1.0
31	4o 2o 2- 1-	2o 2+ 2o 3-	17+	27	7	6	3	7	9	7	12	78	10	0.5

	Kp	Sum	Apr 1993 ap								Sum	Ap	Cp
1	2o 3- 2o 1o	1+ 2+ 3- 3-	17-	7	12	7	4	5	9	12	12	68	8	0.5
2	1o 1+ 2- 1+	1- 1- 1o 1+	9o	4	5	6	5	3	3	4	5	35	4	0.2
3	2- 1o 0+ 0+	1- 1- 1+ 2-	8-	6	4	2	2	3	3	5	6	31	4	0.1
4	2- 2- 1o 1+	5o 6o 7o 8-	31+	6	6	4	5	48	80	132	179	460	58	1.7
5	6+ 7+ 7o 6-	6+ 6- 6- 3+	47+	94	154	132	67	94	67	67	18	693	87	1.8
6	2o 2+ 2o 3-	3o 3o 2+ 5-	22o	7	9	7	12	15	15	9	39	113	14	0.8
7	2o 3o 2+ 2o	2- 3o 2+ 4o	20+	7	15	9	7	6	15	9	27	95	12	0.7
8	2+ 3o 4o 4o	4+ 4+ 5o 3o	30o	9	15	27	27	32	32	48	15	205	26	1.2
9	4- 3o 3o 2-	2o 5+ 4+ 6-	29-	22	15	15	6	7	56	32	67	220	28	1.2
10	4+ 4- 4o 2+	3o 3o 3o 3-	26o	32	22	27	9	15	15	15	12	147	18	1.0
11	2- 3- 2- 2o	3- 1+ 2- 3-	16+	6	12	6	7	12	5	6	12	66	8	0.4
12	4+ 5+ 3- 2-	1+ 1- 2- 2-	19+	32	56	12	6	5	3	6	6	126	16	0.9
13	2o 5o 5- 6-	4+ 4o 4o 2o	32-	7	48	39	67	32	27	27	7	254	32	1.3
14	4- 4+ 3+ 3+	1+ 4- 4- 4-	27o	22	32	18	18	5	22	22	22	161	20	1.0
15	4+ 5- 4+ 3+	2- 2- 5- 5+	30o	32	39	32	18	6	6	39	56	228	28	1.2
16	3+ 5- 4- 2o	2o 3o 3- 2+	24-	18	39	22	7	7	15	12	9	129	16	0.9
17	2- 2o 2o 3-	2- 3+ 4- 2-	19-	6	7	7	12	6	18	22	6	84	10	0.6
18	4- 4+ 3+ 4+	4- 3+ 3- 1+	27-	22	32	18	32	22	18	12	5	161	20	1.0
19	3- 2- 1+ 3-	2+ 3o 2o 2o	18-	12	6	5	12	9	15	7	7	73	9	0.5
20	3+ 5o 4- 3+	4o 4- 3o 3-	29-	18	48	22	18	27	22	15	12	182	23	1.1
21	4+ 4o 5- 4-	3+ 6- 4+ 4o	34o	32	27	39	22	18	67	32	27	264	33	1.3
22	4- 3- 3o 2-	2+ 4o 5o 4+	27-	22	12	15	6	9	27	48	32	171	21	1.1
23	2+ 2+ 1+ 2+	1o 3- 4o 3+	19+	9	9	5	9	4	12	27	18	93	12	0.7
24	3o 2- 2o 2+	3- 3- 2o 1+	18-	15	6	7	9	12	12	7	5	73	9	0.5
25	2+ 3- 3+ 2+	2- 1+ 2+ 3-	19-	9	12	18	9	6	5	9	12	80	10	0.6
26	1o 1o 2o 1o	2- 1+ 1+ 1-	10o	4	4	7	4	6	5	5	3	38	5	0.2
27	1- 1- 1o 1-	1+ 1+ 1- 2-	8o	3	3	4	3	5	5	3	6	32	4	0.1
28	1+ 1o 1o 1o	2- 2- 2- 1-	10o	5	4	4	4	6	6	6	3	38	5	0.2
29	1- 1o 1o 2-	3o 3o 4- 4o	18o	3	4	4	6	15	15	22	27	96	12	0.7
30	4+ 3o 3- 2-	2+ 2+ 3o 2o	21+	32	15	12	6	9	9	15	7	105	13	0.8

Kp INDICES 1993 (continued)

	Kp								Sum	May 1993	ap				Sum	Ap	Cp
1	3o	3+	1+	2+	2-	0+	0+	0+	13-	15	18	5	9	6	2	2	2	59	7	0.4
2	0+	1o	1+	1+	1+	1+	3-	2o	11+	2	4	5	5	5	5	12	7	45	6	0.3
3	2+	1+	2o	2+	3o	2o	1-	1+	15o	9	5	7	9	15	7	3	5	60	8	0.4
4	1-	1+	2-	0+	1+	2+	1-	1o	9+	3	5	6	2	5	9	3	4	37	5	0.2
5	1o	2-	2o	1+	3o	1-	0+	1o	11o	4	6	7	5	15	3	2	4	46	6	0.3
6	2+	2o	2o	2o	2+	3-	3o	2o	18+	9	7	7	7	9	12	15	7	73	9	0.5
7	1o	3-	2o	2o	3+	3+	4o	5o	23+	4	12	7	7	18	18	27	48	141	18	1.0
8	6-	4-	5o	5-	5-	4-	5-	5o	37o	67	22	48	39	39	22	39	48	324	40	1.5
9	5+	6o	5o	4o	4+	4o	5+	5+	39+	56	80	48	27	32	27	56	56	382	48	1.6
10	5+	6+	6-	6-	5o	3o	3-	4o	38-	56	94	67	67	48	15	12	27	386	48	1.6
11	1+	2-	1+	1-	1o	1-	1o	2-	9+	5	6	5	3	4	3	4	6	36	4	0.2
12	2o	3o	3-	3o	3-	3o	4o	4o	24+	7	15	12	15	12	15	27	27	130	16	0.9
13	4o	2+	0+	0+	1-	2-	4-	3-	16-	27	9	2	2	3	6	22	12	83	10	0.6
14	2o	3-	2o	4-	5-	2+	2o	2o	21+	7	12	7	22	39	9	7	7	110	14	0.8
15	2+	2-	2+	2+	3o	3o	4+	3-	22-	9	6	9	9	15	15	32	12	107	13	0.8
16	3-	4+	2o	2-	2+	2-	2-	3o	19+	12	32	7	6	9	6	6	15	93	12	0.7
17	3o	4o	2o	2-	2+	2+	5o	4o	24+	15	27	7	6	9	9	48	27	148	18	1.0
18	1-	1o	1o	1+	2o	2-	2o	4-	13+	3	4	4	5	7	6	7	22	58	7	0.4
19	2-	2+	3-	2o	3o	3-	3+	2-	19+	6	9	12	7	15	12	18	6	85	11	0.6
20	1+	2+	3+	2-	2o	2-	1+	0+	14o	5	9	18	6	7	6	5	2	58	7	0.4
21	1o	0+	0+	1-	0+	1-	1o	1-	5o	4	2	2	3	2	3	4	3	23	3	0.1
22	1-	1+	1-	1+	1o	1+	1+	0+	8o	3	5	3	5	4	5	5	2	32	4	0.1
23	0+	0+	0+	0+	1+	0+	1-	0o	4-	2	2	2	2	5	2	3	0	18	2	0.0
24	1-	1-	1+	1o	0+	0+	0+	0+	5o	3	3	5	4	2	2	2	2	23	3	0.1
25	1-	1-	0o	0o	0+	0+	0+	0+	3-	3	3	0	0	2	2	2	2	14	2	0.0
26	0+	1-	1-	1-	1-	1o	1o	2+	7+	2	3	3	3	3	4	4	9	31	4	0.1
27	2+	4o	4o	3+	3+	2o	3+	3+	26-	9	27	27	18	18	7	18	18	142	18	1.0
28	3+	4+	3-	4-	3o	4+	4+	4-	29+	18	32	12	22	15	32	32	22	185	23	1.1
29	4-	2o	2o	3+	1o	2-	2-	2o	17+	22	7	7	18	4	6	6	7	77	10	0.5
30	1-	2o	1o	1-	1+	1o	1o	0+	8o	3	7	4	3	5	4	4	2	32	4	0.1
31	1o	1-	1-	1+	2+	1+	2-	1-	10-	4	3	3	5	9	5	6	3	38	5	0.2

	Kp								Sum	Jun 1993	ap				Sum	Ap	Cp
1	2o	1o	1-	1-	2-	1-	1-	0+	8-	7	4	3	3	6	3	3	2	31	4	0.1
2	1o	1o	1+	2o	3-	1o	2-	1o	12-	4	4	5	7	12	4	6	4	46	6	0.3
3	2+	2o	3o	3+	3+	4-	3-	3-	23o	9	7	15	18	18	22	12	12	113	14	0.8
4	4o	5+	6-	6o	5-	4o	6-	6-	41o	27	56	67	80	39	27	67	67	430	54	1.6
5	6-	5+	4+	4o	4-	4-	5o	3+	35o	67	56	32	27	22	22	48	18	292	36	1.4
6	3+	3+	4o	3-	3-	3o	4o	3+	26+	18	18	27	12	12	15	27	18	147	18	1.0
7	3+	2o	3+	4+	4+	3+	3+	4o	28o	18	7	18	32	32	18	18	27	170	21	1.1
8	4-	3o	3-	2o	3o	2+	4-	2-	22o	22	15	12	7	15	9	22	6	108	14	0.8
9	2+	1+	1o	1+	1+	1+	1+	2+	12+	9	5	4	5	5	5	5	9	47	6	0.3
10	0o	1+	2-	2-	1o	3-	5+	7o	21-	0	5	6	6	4	12	56	132	221	28	1.2
11	4o	2o	2-	2-	2-	2o	2+	2-	17o	27	7	6	6	6	7	9	6	74	9	0.5
12	2-	2+	3-	4o	2+	2+	2o	3+	21-	6	9	12	27	9	9	7	18	97	12	0.7
13	2+	3-	4-	3+	3-	2-	2+	3-	21+	9	12	22	18	12	6	9	12	100	12	0.7
14	1o	2+	2-	3+	2-	2o	2-	2o	16-	4	9	6	18	6	7	6	7	63	8	0.4
15	2o	2+	2o	1+	1+	1-	1-	1-	11o	7	9	7	5	5	3	3	3	42	5	0.2
16	1-	1o	1+	1o	1-	0+	0+	0+	6-	3	4	5	4	3	2	2	2	25	3	0.1
17	1-	1-	1o	1o	1+	1o	2o	2-	9+	3	3	4	4	5	4	7	6	36	4	0.2
18	1-	0+	0o	0+	1-	2o	1-	1-	5+	3	2	0	2	3	7	3	3	23	3	0.1
19	0+	2-	2-	1o	2-	1+	2-	2-	11o	2	6	6	4	6	5	6	6	41	5	0.2
20	1-	1+	2+	2-	2-	1-	1+	0+	10o	3	5	9	6	6	3	5	2	39	5	0.2
21	0+	0o	0o	0+	0+	1-	0+	0+	2+	2	0	0	2	2	3	2	2	13	2	0.0
22	1o	1o	1o	1o	1-	1o	2o	3-	10+	4	4	4	4	3	4	7	12	42	5	0.2
23	3-	2-	1+	3-	3+	3o	5+	3o	23o	12	6	5	12	18	15	56	15	139	17	0.9
24	3+	4+	5-	3+	4+	4+	3o	3+	31-	18	32	39	18	32	32	15	18	204	26	1.2
25	3o	2+	4+	4o	3o	3+	3-	3-	25+	15	9	32	27	15	18	12	12	140	18	1.0
26	3-	2+	2-	1o	2-	2o	1+	2+	15o	12	9	6	4	6	7	5	9	58	7	0.4
27	2o	1+	1+	2+	1+	2o	1+	1-	12+	7	5	5	9	5	7	5	3	46	6	0.3
28	1o	1+	1+	2-	1o	1-	1-	1-	8+	4	5	5	6	4	3	3	3	33	4	0.1
29	2o	2+	2-	3+	3+	3-	1o	2o	18+	7	9	6	18	18	12	4	7	81	10	0.6
30	3-	2+	2+	1o	1+	3+	3-	3o	19-	12	9	9	4	5	18	12	15	84	10	0.6

Kp INDICES 1993 (continued)

	Kp								Sum	Jul 1993	ap				Sum	Ap	Cp
1	3o	4o	3o	4o	4+	2+	4-	4+	29-	15	27	15	27	32	9	22	32	179	22	1.1
2	4-	3-	2+	4o	4o	3+	5-	6o	31-	22	12	9	27	27	18	39	80	234	29	1.3
3	5+	4+	4o	2-	3-	2+	3-	3o	26o	56	32	27	6	12	9	12	15	169	21	1.1
4	3o	3-	2-	2+	1+	2o	1o	2-	16-	15	12	6	9	5	7	4	6	64	8	0.4
5	2o	3-	1-	0+	1-	1o	1o	1-	9o	7	12	3	2	3	4	4	3	38	5	0.2
6	0+	1-	1-	3-	1o	1-	1+	2-	9o	2	3	3	12	4	3	5	6	38	5	0.2
7	3o	3-	2o	1o	1+	1+	2+	1+	15o	15	12	7	4	5	5	9	5	62	8	0.4
8	2+	3o	3+	3o	3+	4-	3-	2o	23+	9	15	18	15	18	22	12	7	116	14	0.8
9	3-	3+	2+	2o	4o	4+	2o	2o	23-	12	18	9	7	27	32	7	7	119	15	0.8
10	2+	2+	2o	3-	3o	2o	3+	3o	21-	9	9	7	12	15	7	18	15	92	12	0.7
11	4-	5o	4+	3+	2o	3+	2o	1+	25o	22	48	32	18	7	18	7	5	157	20	1.0
12	2+	2-	2+	2o	2o	3-	1+	2o	16+	9	6	9	7	7	12	5	7	62	8	0.4
13	2+	3-	3o	2+	3-	2o	2-	2-	18+	9	12	15	9	12	7	6	6	76	10	0.5
14	1-	1-	1-	0+	1-	1-	1-	1-	5o	3	3	3	2	3	3	3	3	23	3	0.1
15	1o	2-	1+	1-	2-	1o	2-	2o	11o	4	6	5	3	6	4	6	7	41	5	0.2
16	1-	1-	0+	0+	1-	2-	1o	1+	7-	3	3	2	2	3	6	4	5	28	4	0.1
17	1o	1-	1-	1-	1o	1-	0+	1-	6-	4	3	3	3	4	3	2	3	25	3	0.1
18	1o	1-	1+	2-	2o	1o	1o	1+	10o	4	3	5	6	7	4	4	5	38	5	0.2
19	1+	2-	1o	2-	1+	1o	1+	2o	11+	5	6	4	6	5	4	5	7	42	5	0.2
20	1+	2-	3-	4+	2o	3o	4+	4-	23o	5	6	12	32	7	15	32	22	131	16	0.9
21	3-	4-	3-	3-	3+	2+	3-	3-	23-	12	22	12	12	18	9	12	12	109	14	0.8
22	3-	2+	3-	3-	2+	2-	2o	3-	19o	12	9	12	12	9	6	7	12	79	10	0.6
23	2+	2+	2-	1+	2-	1o	0+	1o	12-	9	9	6	5	6	4	2	4	45	6	0.3
24	1o	0+	1-	1+	1o	2o	1+	1-	8+	4	2	3	5	4	7	5	3	33	4	0.1
25	3-	2o	1o	1o	1-	1-	1-	1-	9+	12	7	4	4	3	3	3	3	39	5	0.2
26	1o	1+	0+	1o	1-	2-	0+	1-	7o	4	5	2	4	3	6	2	3	29	4	0.1
27	2-	1-	1-	2o	3o	3o	3+	2+	17-	6	3	3	7	15	15	18	9	76	10	0.5
28	2+	2o	2-	1+	1o	1+	1+	2o	13o	9	7	6	5	4	5	5	7	48	6	0.3
29	2-	1o	2o	2o	4o	4+	5o	3-	23-	6	4	7	7	27	32	48	12	143	18	1.0
30	3o	2+	1+	1o	1+	1o	1+	1o	12+	15	9	5	4	5	4	5	4	51	6	0.3
31	2+	2+	1o	2-	2-	1-	1+	1+	12+	9	9	4	6	6	3	5	5	47	6	0.3

	Kp								Sum	Aug 1993	ap				Sum	Ap	Cp
1	1+	0+	0+	0+	0+	1o	1o	1-	5+	5	2	2	2	2	4	4	3	24	3	0.1
2	1-	1o	1o	0+	0+	0+	1+	1o	6o	3	4	4	2	2	2	5	4	26	3	0.1
3	1+	1-	1o	1+	2-	2o	2+	2o	12+	5	3	4	5	6	7	9	7	46	6	0.3
4	2-	2-	2+	2+	4+	5o	4+	5+	27o	6	6	9	9	32	48	32	56	198	25	1.2
5	5o	5-	3+	3-	2-	2o	3-	1+	23+	48	39	18	12	6	7	12	5	147	18	1.0
6	1-	2o	4o	3+	3+	4-	3-	2-	21+	3	7	27	18	18	22	12	6	113	14	0.8
7	3-	4o	3-	3o	3-	2o	3-	4-	23+	12	27	12	15	12	7	12	22	119	15	0.8
8	2o	2o	3o	3-	1+	2-	1-	1o	14+	7	7	15	12	5	6	3	4	59	7	0.4
9	3-	2+	2o	3+	2+	2+	3o	2-	20-	12	9	7	18	9	9	15	6	85	11	0.6
10	1+	1-	1+	3o	2-	2-	2-	2o	13+	5	3	5	15	6	6	6	7	53	7	0.3
11	2-	2-	1o	1o	1o	0+	1-	1-	8o	6	6	4	4	4	2	3	3	32	4	0.1
12	1o	2+	2+	2-	2o	1+	0+	2-	13-	4	9	9	6	7	5	2	6	48	6	0.3
13	1+	2-	1o	1o	1+	1+	1-	1o	9+	5	6	4	4	5	5	3	4	36	4	0.2
14	0+	0o	0o	0+	0+	1-	1-	0+	3-	2	0	0	2	2	3	3	2	14	2	0.0
15	1-	0+	1-	1o	2-	4+	3+	5o	17o	3	2	3	4	6	32	18	48	116	14	0.8
16	5+	5o	6o	6+	5+	6-	7o	6+	47o	56	48	80	94	56	67	132	94	627	78	1.8
17	7-	5+	3o	2-	2+	2-	2+	1+	24+	111	56	15	6	9	6	9	5	217	27	1.2
18	3o	4-	4-	3+	3+	3+	3o	3-	26o	15	22	22	18	18	18	15	12	140	18	1.0
19	3+	3-	2+	2o	2o	2o	3+	3o	21-	18	12	9	7	7	7	18	15	93	12	0.7
20	3-	2-	2+	2o	1o	1+	2-	1-	13+	12	6	9	7	4	5	6	3	52	6	0.3
21	1+	2-	2-	1+	1o	1-	1o	1-	9+	5	6	6	5	4	3	4	3	36	4	0.2
22	1o	1+	1+	2+	1o	1o	2-	2+	12o	4	5	5	9	4	4	6	9	46	6	0.3
23	2o	1o	1-	0+	0+	1-	1-	0+	6o	7	4	3	2	2	3	3	2	26	3	0.1
24	0o	1-	1+	2o	2-	1-	1o	2-	9o	0	3	5	7	6	3	4	6	34	4	0.1
25	2-	0+	0+	1o	1-	1-	1-	1+	7-	6	2	2	4	3	3	3	5	28	4	0.1
26	2o	1-	1+	1+	2-	1+	2o	2o	12+	7	3	5	5	6	5	7	7	45	6	0.3
27	2o	1o	2-	3-	5-	6o	4+	4o	26+	7	4	6	12	39	80	32	27	207	26	1.2
28	2+	2o	1+	3o	3o	3-	2+	3o	20-	9	7	5	15	15	12	9	15	87	11	0.6
29	3o	3o	3-	2o	3-	1-	1o	3o	18o	15	15	12	7	12	3	4	15	83	10	0.6
30	1+	1+	1+	1-	0+	1-	1-	2-	8o	5	5	5	3	2	3	3	6	32	4	0.1
31	2o	2-	1o	1-	1+	1o	1+	1+	10+	7	6	4	3	5	4	5	5	39	5	0.2

Kp INDICES 1993 (continued)

	Kp								Sum	Sep 1993 ap								Sum	Ap	Cp
1	0+	0+	0+	0+	0+	1o	1o	1-	4+	2	2	2	2	2	4	4	3	21	3	0.0
2	1-	1-	1-	2-	2+	1+	2+	2-	11+	3	3	3	6	9	5	9	6	44	6	0.2
3	2+	3o	3+	4-	5+	4+	6-	6-	33+	9	15	18	22	56	32	67	67	286	36	1.4
4	4+	4+	5-	3+	3o	4+	2o	4-	30-	32	32	39	18	15	32	7	22	197	25	1.2
5	4+	3o	2+	2-	3o	2o	2o	3-	21o	32	15	9	6	15	7	7	12	103	13	0.7
6	3o	3-	2+	3-	3-	2-	3o	3-	21-	15	12	9	12	12	6	15	12	93	12	0.7
7	1+	3o	2+	1o	2o	2-	1o	3-	15o	5	15	9	4	7	6	4	12	62	8	0.4
8	4-	2+	1+	2-	1o	1o	1+	2+	15-	22	9	5	6	4	4	5	9	64	8	0.4
9	1+	0+	1o	1+	1+	1+	2-	1+	10-	5	2	4	5	5	5	6	5	37	5	0.2
10	1-	2-	1+	1o	1+	2-	0+	1o	9o	3	6	5	4	5	6	2	4	35	4	0.2
11	2+	1o	1-	2-	2-	1+	2-	2+	13-	9	4	3	6	6	5	6	9	48	6	0.3
12	1+	0+	2o	1+	2+	3+	3+	6-	20-	5	2	7	5	9	18	18	67	131	16	0.9
13	6-	8-	7+	6+	6-	6o	5+	4+	48+	67	179	154	94	67	80	56	32	729	91	1.8
14	5o	3o	5o	4o	4-	4+	3+	3+	32-	48	15	48	27	22	32	18	18	228	28	1.2
15	4o	4-	4-	3-	3o	2o	3-	2+	24o	27	22	22	12	15	7	12	9	126	16	0.9
16	2-	1+	1o	1+	2o	2o	2+	1-	12+	6	5	4	5	7	7	9	3	46	6	0.3
17	1-	2-	2o	1o	1o	1o	1-	1+	9+	3	6	7	4	4	4	3	5	36	4	0.2
18	1-	2-	1+	2-	1-	1-	1-	1-	8o	3	6	5	6	3	3	3	3	32	4	0.1
19	2o	1+	1o	2-	1+	1-	0o	1-	9-	7	5	4	6	5	3	0	3	33	4	0.1
20	1-	1+	2-	4-	4-	4+	4o	5o	24+	3	5	6	22	22	32	27	48	165	21	1.1
21	5+	2+	1o	1-	2-	3-	3-	2o	18+	56	9	4	3	6	12	12	7	109	14	0.8
22	2-	3-	2o	2-	1o	1o	1-	2-	12+	6	12	7	6	4	4	3	6	48	6	0.3
23	0+	0o	0+	1o	3o	2o	3o	5o	15-	2	0	2	4	15	7	15	48	93	12	0.7
24	4o	2-	3-	3-	3o	3+	4o	4o	25+	27	6	12	12	15	18	27	27	144	18	1.0
25	2o	2o	2-	3o	3o	3-	3-	3-	20-	7	7	6	15	15	12	12	12	86	11	0.6
26	2+	3+	2+	3o	2o	1+	1+	2+	18o	9	18	9	15	7	5	5	9	77	10	0.5
27	3+	3-	2o	2-	2-	2o	3-	2-	18-	18	12	7	6	6	7	12	6	74	9	0.5
28	0+	1o	1-	2-	2o	3o	3o	3-	14+	2	4	3	6	7	15	15	12	64	8	0.4
29	2o	1+	3-	4o	4o	5o	5o	4-	28-	7	5	12	27	27	48	48	22	196	24	1.2
30	4o	4+	3-	2o	1+	1+	2o	5o	23-	27	32	12	7	5	5	7	48	143	18	1.0

	Kp								Sum	Oct 1993 ap								Sum	Ap	Cp
1	5o	4+	4+	5-	3o	3+	3o	2o	30-	48	32	32	39	15	18	15	7	206	26	1.2
2	1o	1o	2-	2+	2-	2+	3-	1o	14-	4	4	6	9	6	9	12	4	54	7	0.3
3	0o	0+	1o	1-	1o	2-	3-	2o	9+	0	2	4	3	4	6	12	7	38	5	0.2
4	0+	1o	1o	1+	1+	2o	3+	1o	11+	2	4	4	5	5	7	18	4	49	6	0.3
5	1+	1-	0+	1-	1-	2o	2+	2+	10+	5	3	2	3	3	7	9	9	41	5	0.2
6	4o	4o	3+	1o	1o	1-	2-	3-	18+	27	27	18	4	4	3	6	12	101	13	0.7
7	2-	2-	0+	0o	1+	1-	0+	0+	6+	6	6	2	0	5	3	2	2	26	3	0.1
8	1+	2+	5-	3+	4o	2o	2+	3o	23o	5	9	39	18	27	7	9	15	129	16	0.9
9	3o	6-	5+	7-	4o	3+	4+	5+	38-	15	67	56	111	27	18	32	56	382	48	1.6
10	4o	5o	4+	4o	5-	3-	4+	4+	33+	27	48	32	27	39	12	32	32	249	31	1.3
11	4o	3+	3+	4+	4+	5+	3o	4-	31+	27	18	18	32	32	56	15	22	220	28	1.2
12	4o	4-	3+	3-	4o	3+	2o	3-	26-	27	22	18	12	27	18	7	12	143	18	1.0
13	3o	4o	3o	2-	2-	2-	2+	2o	19+	15	27	15	6	6	6	9	7	91	11	0.7
14	3+	2+	2o	2-	2+	2-	1-	1o	15o	18	9	7	6	9	6	3	4	62	8	0.4
15	1+	1-	1o	1+	1-	1-	0+	0+	6+	5	3	4	5	3	3	2	2	27	3	0.1
16	1+	1+	1+	1o	1o	2-	1+	2o	11o	5	5	5	4	4	6	5	7	41	5	0.2
17	3+	3o	1o	1-	1o	2-	2o	2+	15o	18	15	4	3	4	6	7	9	66	8	0.4
18	2o	3+	1+	1o	2-	2-	1o	1o	13o	7	18	5	4	6	6	4	4	54	7	0.3
19	3-	3o	2-	2o	1o	1o	2+	3-	16+	12	15	6	7	4	4	9	12	69	9	0.5
20	2-	1-	1o	0+	1-	1+	2o	1+	9o	6	3	4	2	3	5	7	5	35	4	0.2
21	2-	2+	2o	2o	2-	1-	0+	1-	11+	6	9	7	7	6	3	2	3	43	5	0.2
22	4o	4o	3-	2o	2o	3-	3o	3+	24-	27	27	12	7	7	12	15	18	125	16	0.9
23	2o	3+	4o	2-	2+	2o	3o	2+	21-	7	18	27	6	9	7	15	9	98	12	0.7
24	4+	2+	2-	2-	1o	3-	2+	2-	18-	32	9	6	6	4	12	9	6	84	10	0.6
25	2o	2-	3-	6o	6+	6o	3o	4-	31+	7	6	12	80	94	80	15	22	316	40	1.4
26	2+	1o	2+	2-	2o	5-	4-	5-	22+	9	4	9	6	7	39	22	39	135	17	0.9
27	4o	5-	5-	4+	5o	5-	5o	4+	37-	27	39	39	32	48	39	48	32	304	38	1.4
28	3o	3+	4-	4-	4-	2o	3-	5o	27o	15	18	22	22	22	7	12	48	166	21	1.1
29	4o	2+	2-	1+	3-	3-	1+	3o	19o	27	9	6	5	12	12	5	15	91	11	0.7
30	2o	1-	1-	1-	1-	1-	0o	1o	6+	7	3	3	3	3	3	0	4	26	3	0.1
31	1o	0+	2o	2-	2-	3o	2+	2+	14+	4	2	7	6	6	15	9	9	58	7	0.4

Kp INDICES 1993 (continued)

	Kp								Sum	Nov 1993 ap								Sum	Ap	Cp
1	3o	2+	2-	2+	3o	3o	3o	2o	20+	15	9	6	9	15	15	15	7	91	11	0.7
2	2+	2o	1o	1-	1-	1-	1-	0+	8+	9	7	4	3	3	3	3	2	34	4	0.1
3	0+	0o	1-	1-	1+	2+	3+	6o	15-	2	0	3	3	5	9	18	80	120	15	0.8
4	7-	6+	5+	6o	6o	6-	6o	5o	47o	111	94	56	80	80	67	80	48	616	77	1.8
5	4o	3+	5+	5-	4+	4+	4+	4+	35-	27	18	56	39	32	32	32	32	268	34	1.3
6	4-	3-	4+	4+	4o	4-	4o	4+	31o	22	12	32	32	27	22	27	32	206	26	1.2
7	4-	3-	3+	4-	4-	4+	4-	4+	29+	22	12	18	22	22	32	22	32	182	23	1.1
8	4-	3-	2+	3o	3-	3+	4+	3+	25+	22	12	9	15	12	18	32	18	138	17	0.9
9	3o	3+	2+	3-	2o	2-	2+	3o	20+	15	18	9	12	7	6	9	15	91	11	0.7
10	3o	3o	3o	2o	3-	3-	3-	1o	20o	15	15	15	7	12	12	12	4	92	12	0.7
11	1+	3+	2-	2-	2-	1o	1-	1-	12o	5	18	6	6	6	4	3	3	51	6	0.3
12	1o	2-	1o	1-	1-	1-	1-	0+	7-	4	6	4	3	3	3	3	2	28	4	0.1
13	1-	2-	2o	1+	3-	3-	2+	2-	15o	3	6	7	5	12	12	9	6	60	8	0.4
14	2-	2+	2o	3-	3o	4+	3+	3o	22+	6	9	7	12	15	32	18	15	114	14	0.8
15	3o	3+	1+	2-	1+	2-	3o	4+	20-	15	18	5	6	5	6	15	32	102	13	0.7
16	3o	2+	2+	2o	2+	3-	2+	3-	20-	15	9	9	7	9	12	9	12	82	10	0.6
17	3-	0+	0+	0+	0o	0+	3+	3-	10o	12	2	2	2	0	2	18	12	50	6	0.3
18	2+	1+	1o	1o	5o	6o	6-	4+	27-	9	5	4	4	48	80	67	32	249	31	1.3
19	5-	6o	2+	3-	4-	4-	4o	5-	32-	39	80	9	12	22	22	27	39	250	31	1.3
20	3+	3+	2+	2o	1+	1+	2-	2-	17o	18	18	9	7	5	5	6	6	74	9	0.5
21	3o	2+	2+	2o	1+	1o	1+	2o	15+	15	9	9	7	5	4	5	7	61	8	0.4
22	3-	1o	1o	1-	1+	1-	2-	2-	11-	12	4	4	3	5	3	6	6	43	5	0.2
23	2+	2+	2-	1+	2o	2+	2-	1o	15-	9	9	6	5	7	9	6	4	55	7	0.3
24	2-	2+	1-	1-	1-	1o	1+	2-	10o	6	9	3	3	3	4	5	6	39	5	0.2
25	1+	2-	1o	1o	1+	2+	2-	3-	13o	5	6	4	4	5	9	6	12	51	6	0.3
26	4-	2+	2+	2o	2+	4o	5-	3o	24+	22	9	9	7	9	27	39	15	137	17	0.9
27	3-	2+	1-	1-	0+	2-	2-	3-	13-	12	9	3	3	2	6	6	12	53	7	0.3
28	0+	0+	1o	1-	2-	2-	1+	2o	9o	2	2	4	3	6	6	5	7	35	4	0.2
29	4o	2+	2o	2o	2+	2+	3-	2+	20o	27	9	7	7	9	9	12	9	89	11	0.6
30	2+	0+	1o	1-	1-	1-	1-	1o	7+	9	2	4	3	3	3	3	4	31	4	0.1

	Kp								Sum	Dec 1993 ap								Sum	Ap	Cp
1	3-	2-	2-	4+	4+	5-	4o	6o	29+	12	6	6	32	32	39	27	80	234	29	1.3
2	5-	5-	5-	4+	4o	4+	6-	7-	39o	39	39	39	32	27	32	67	111	386	48	1.6
3	6+	5+	5o	4o	4-	2+	4-	3o	33+	94	56	48	27	22	9	22	15	293	37	1.4
4	2-	1o	1+	2o	2-	2-	3+	2+	15o	6	4	5	7	6	6	18	9	61	8	0.4
5	1+	1o	1o	2+	3o	4-	3+	2+	18o	5	4	4	9	15	22	18	9	86	11	0.6
6	2o	1+	2-	1+	2o	2-	2o	2o	14o	7	5	6	5	7	6	7	7	50	6	0.3
7	3-	1o	2-	1o	4+	4o	4o	5o	24-	12	4	6	4	32	27	27	48	160	20	1.0
8	6+	6+	5o	5o	4+	5-	3+	1+	36+	94	94	48	48	32	39	18	5	378	47	1.5
9	1o	1-	0+	0+	0o	1-	0+	2-	5o	4	3	2	2	0	3	2	6	22	3	0.0
10	2+	2o	2-	2o	2+	2-	3-	2o	17-	9	7	6	7	9	6	12	7	63	8	0.4
11	3+	2+	2o	1+	2-	1+	2-	1-	14+	18	9	7	5	6	5	6	3	59	7	0.4
12	2-	1o	1+	3-	2-	2o	1-	1+	12+	6	4	5	12	6	7	3	5	48	6	0.3
13	1+	1o	0+	1o	0+	0+	0+	2-	6+	5	4	2	4	2	2	2	6	27	3	0.1
14	2-	2o	1-	1o	0+	1-	1-	1-	8-	6	7	3	4	2	3	3	3	31	4	0.1
15	2+	3-	4-	3o	3o	2-	2-	1o	19o	9	12	22	15	15	6	6	4	89	11	0.6
16	2o	4-	4-	4-	4+	4-	4o	4+	29+	7	22	22	22	32	22	27	32	186	23	1.1
17	3+	4o	3o	3o	3+	4-	4+	4-	28+	18	27	15	15	18	22	32	22	169	21	1.1
18	3-	3o	3+	3o	3o	4o	4o	4o	27o	12	15	18	15	15	27	27	27	156	20	1.0
19	4o	3o	3-	2o	2o	2+	3-	2o	21-	27	15	12	7	7	9	12	7	96	12	0.7
20	4o	3+	2o	2o	2+	3-	3-	3o	22o	27	18	7	7	9	12	12	15	107	13	0.8
21	3+	3-	3o	3+	3+	4o	3+	4+	27+	18	12	15	18	18	27	18	32	158	20	1.0
22	3o	2+	2+	4-	3o	1o	2-	2+	19+	15	9	9	22	15	4	6	9	89	11	0.6
23	2+	3-	1+	2+	2-	2+	2+	4+	19+	9	12	5	9	6	9	9	32	91	11	0.7
24	3-	2o	2+	3-	3o	3-	3-	3o	21o	12	7	9	12	15	12	12	15	94	12	0.7
25	2o	3+	2o	3-	3o	1+	2+	3o	20-	7	18	7	12	15	5	9	15	88	11	0.6
26	2+	1o	2-	1+	2+	2+	2+	4-	17o	9	4	6	5	9	9	9	22	73	9	0.5
27	2o	2+	2-	1o	2o	3-	1+	1-	14-	7	9	6	4	7	12	5	3	53	7	0.3
28	0+	0o	0+	1-	1o	1o	1+	1+	6o	2	0	2	3	4	4	5	5	25	3	0.1
29	1o	2-	1o	0+	0+	0o	0o	0+	5-	4	6	4	2	2	0	0	2	20	2	0.0
30	2o	2-	1+	1+	2-	0+	0o	0+	9-	7	6	5	5	6	2	0	2	33	4	0.1
31	2o	3+	5o	4+	2+	3o	2o	4-	26-	7	18	48	32	9	15	7	22	158	20	1.0

FREQUENCIES OF **Kp** INDICES 1993

FREQUENCIES OF Kp INDICES, 1993

Kp	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0 o	1	.	.	.	3	4	.	3	2	3	2	5
+	2	2	.	2	28	13	10	20	11	11	11	15
-	9	17	6	12	27	23	34	30	20	20	25	10
1 o	14	23	4	15	20	24	29	28	20	26	17	18
+	15	20	9	19	24	23	27	30	26	16	16	18
-	9	14	13	29	19	27	24	30	28	28	25	26
2 o	26	25	25	20	26	20	27	23	22	24	15	25
+	22	14	14	19	19	20	23	16	17	21	32	25
-	21	13	17	22	13	20	25	16	21	15	21	18
3 o	22	17	22	20	14	10	14	14	17	15	17	19
+	35	15	28	13	11	21	9	10	9	15	12	14
-	23	18	19	15	8	6	6	4	9	7	10	13
4 o	20	16	21	12	11	9	7	3	9	15	6	13
+	6	7	19	15	6	7	8	4	9	11	13	12
-	9	11	17	6	4	2	1	2	1	8	4	5
5 o	3	5	12	5	6	1	2	4	7	5	2	5
+	6	4	5	3	4	4	1	4	3	3	2	1
-	2	1	8	6	3	4	.	1	5	1	2	1
6 o	3	1	3	1	1	1	1	2	1	2	6	1
+		.	2	2	1	.		2	1	1	1	3
-		1	3	.		.		1	.	1	1	1
7 o			.	2		.		1	.			
+			1	1		1			1			
-				1					1			
8 o												
+												
9 -												
o												
	2248	224	248	240	248	240	248	248	240	248	240	248

LIST OF Kp', 1993

Reduction of Kp to Kp' due to solar flare effects
as far as data were available.

Month	Day	Eighth	Kp	Kp'
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MONTHLY AVERAGES OF Ap AND Cp, 1993

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Ap	17	16	24	19	12	12	10	12	15	14	15	14	15.0
Cp	0.83	0.73	1.05	0.81	0.56	0.57	0.49	0.51	0.64	0.65	0.64	0.65	0.68

MONTHLY and YEARLY Ap 1932 - 1993

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1932	10	11	18	17	14	6	6	11	12	10	8	9	11.5
1933	9	11	12	12	11	8	7	9	11	10	9	7	10.1
1934	5	8	10	6	6	5	5	9	10	5	4	8	7.2
1935	8	9	9	8	6	9	6	5	12	12	8	9	8.9
1936	8	10	8	14	10	11	10	5	4	8	9	5	9.1
1937	7	12	11	20	12	11	12	10	9	19	11	9	12.5
1938	28	15	13	18	17	8	13	12	16	16	10	11	15.3
1939	7	15	19	27	21	15	18	18	13	21	8	11	16.5
1940	15	12	36	17	13	16	11	10	13	14	15	14	16.1
1941	14	17	32	14	10	10	19	16	26	11	16	11	16.8
1942	9	11	22	17	7	7	12	12	16	22	14	10	13.8
1943	10	9	13	14	14	12	14	31	25	23	20	14	17.0
1944	12	11	17	15	9	7	5	9	10	11	6	13	10.8
1945	10	10	16	13	9	6	9	7	9	11	7	13	10.4
1946	12	22	33	19	17	16	22	11	34	13	12	9	18.6
1947	12	11	32	17	14	15	15	25	32	23	14	10	18.8
1948	11	12	17	12	18	9	10	20	14	27	15	13	15.4
1949	20	14	19	14	18	14	7	14	12	25	15	8	15.4
1950	11	17	14	18	16	14	13	24	22	27	19	15	18.1
1951	15	21	21	27	20	17	19	21	39	24	18	20	22.3
1952	19	26	33	33	27	17	14	12	22	19	12	15	21.2
1953	15	15	20	15	15	12	15	18	21	16	13	6	15.6
1954	8	16	16	13	7	5	7	9	16	14	8	6	11.0
1955	12	11	14	13	11	9	8	8	12	11	13	8	11.3
1956	17	15	20	27	25	16	13	15	17	13	23	10	18.0
1957	16	16	26	21	10	22	15	13	49	13	17	17	20.1
1958	14	26	26	19	17	24	24	17	20	16	7	15	19.2
1959	13	24	23	16	18	15	31	23	28	18	21	19	21.3
1960	14	13	18	41	24	20	20	20	20	36	32	21	23.6
1961	11	15	13	14	13	13	27	11	12	16	9	12	14.4
1962	7	10	8	14	7	9	11	14	18	20	12	12	12.3
1963	10	8	8	9	10	10	11	13	28	15	12	10	12.6
1964	11	11	12	13	10	8	9	7	11	9	7	5	9.9
1965	6	9	8	7	5	9	7	8	10	6	5	7	7.7
1966	7	8	12	6	9	6	8	11	21	10	9	11	10.2
1967	11	11	7	8	25	11	8	8	16	9	10	14	12.0
1968	11	16	13	13	13	16	10	11	13	15	16	9	13.5
1969	8	14	16	14	17	9	7	7	14	8	9	6	11.3
1970	7	6	17	15	9	10	19	13	10	12	11	8	11.9
1971	12	12	11	14	13	9	7	8	12	11	10	9	11.3
1972	12	10	12	10	9	14	7	24	12	12	14	9	12.6
1973	15	20	25	29	16	17	11	12	14	18	12	11	17.0
1974	14	16	22	21	17	17	23	19	23	25	17	15	19.6
1975	15	18	20	15	13	11	11	10	9	11	17	11	13.9
1976	13	16	22	17	14	9	8	8	13	11	8	10	12.9

MONTHLY and YEARLY Ap 1932 - 1993 (continued)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1977	10	11	10	15	11	7	13	13	15	12	9	10	11.9
1978	15	15	16	23	24	19	13	16	18	11	15	13	16.9
1979	16	14	18	25	13	11	11	17	13	11	9	8	14.5
1980	10	10	7	11	10	13	10	10	8	14	13	12	11.1
1981	9	14	17	27	19	11	19	15	12	23	14	10	16.3
1982	11	32	17	21	17	21	30	21	35	18	20	20	22.4
1983	15	26	23	24	22	15	12	16	14	17	20	14	18.5
1984	13	16	21	25	16	15	15	16	23	23	20	17	18.8
1985	15	15	11	21	8	11	14	12	12	14	14	13	13.7
1986	13	27	12	7	11	8	8	12	16	10	13	8	12.5
1987	8	9	10	6	7	7	10	13	19	15	12	9	11.0
1988	13	14	16	12	10	10	10	12	12	11	14	0	12.7
1989	18	15	41	22	16	16	7	19	17	21	19	16	19.5
1990	13	22	23	27	15	16	13	18	13	14	8	7	16.3
1991	8	10	27	16	17	44	27	30	20	30	32	14	23.4
1992	14	31	14	11	21	15	10	15	25	15	14	13	16.5
1993	17	16	24	19	12	12	10	12	15	14	15	14	15.0

Unit : 2 nT

SECTION 3

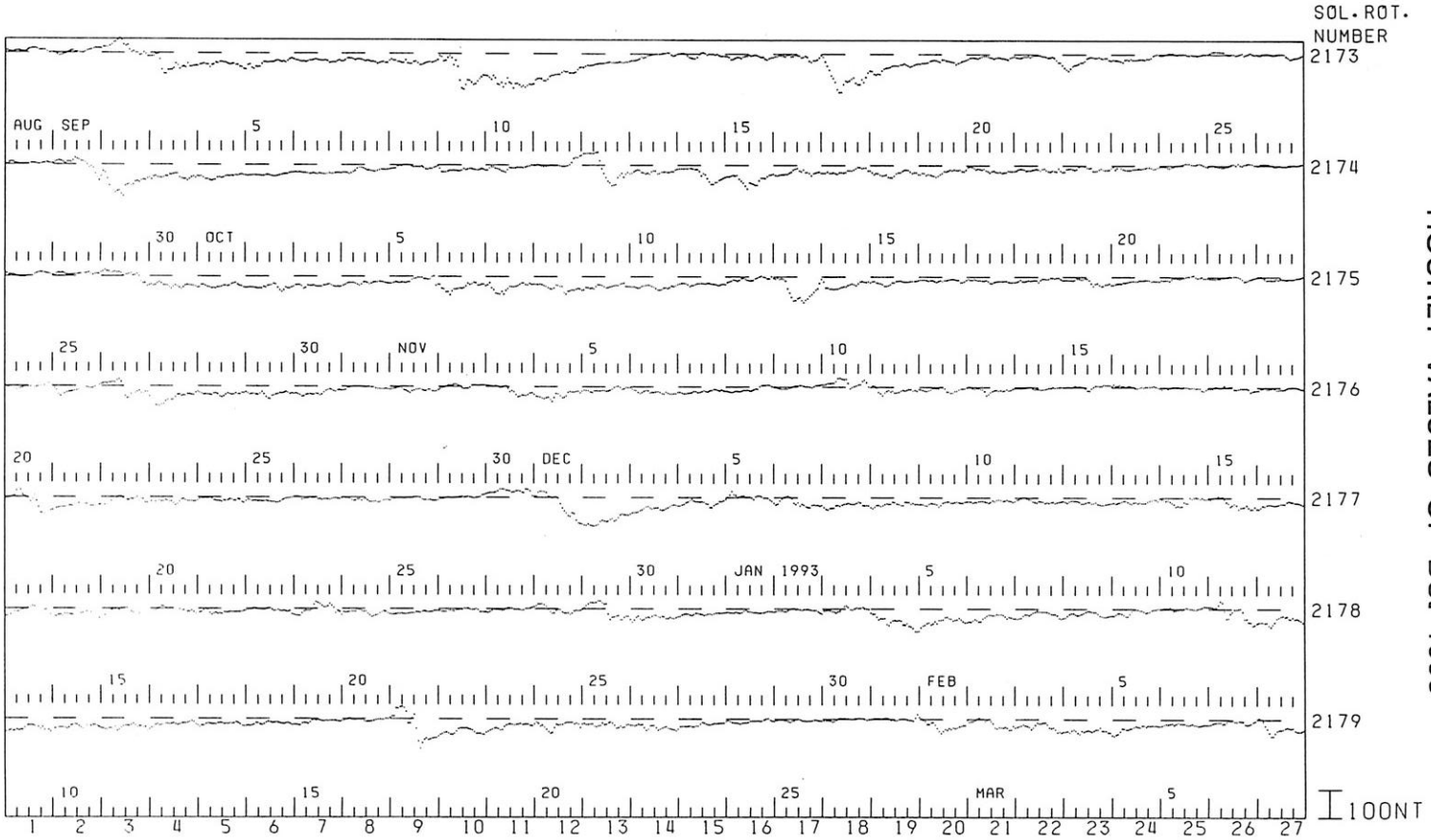
3.4 Dst INDICES

Hourly values of **Dst** 1993 (graph) 87

Monthly tables of **Dst** hourly values 90

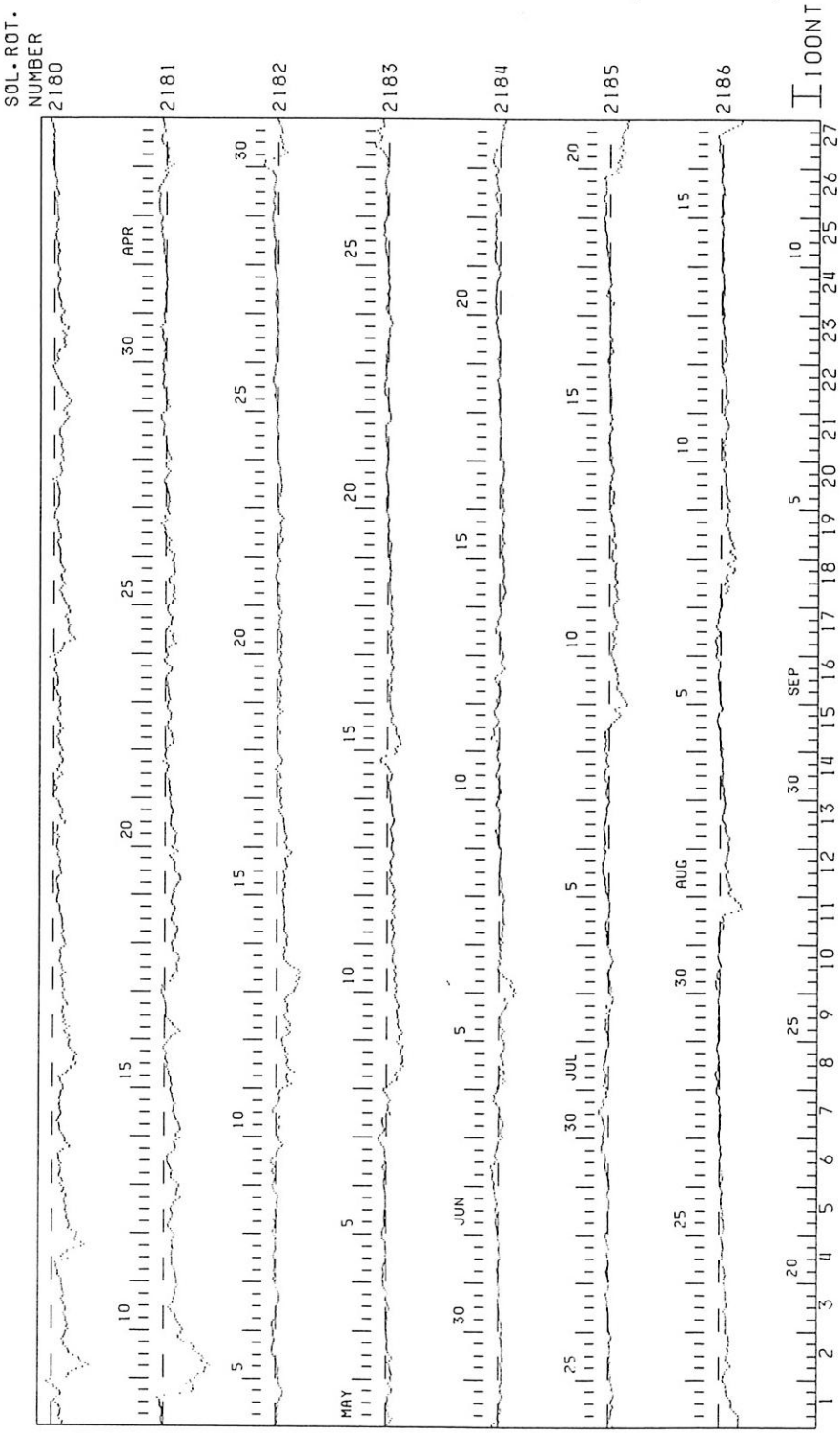
Tables of daily means of **Dst** 102

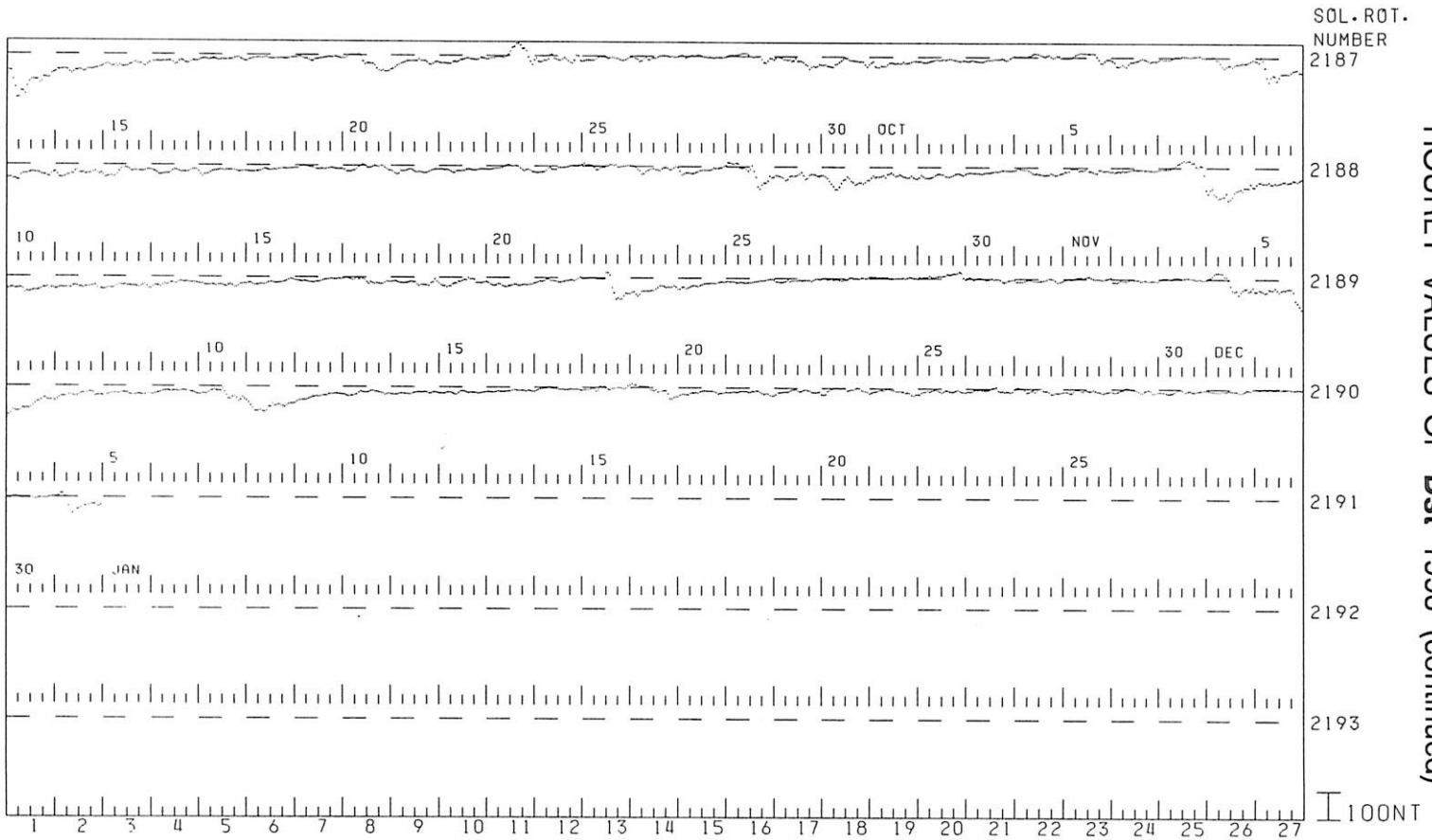
Monthly and yearly mean values
1957 - 1993 103



HOURLY VALUES OF **Dst** 1993

HOURLY VALUES OF **Dst** 1993 (continued)





HOURLY VALUES OF **Dst** 1993 (continued)

JANUARY 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-9	-2	6	19	8	5	-3	1	2	4	-1	-2	-1	-4	-10	0	3	3	0	-4	-4	-5	-12	-16
2	-23	-29	-26	-15	-8	-3	1	2	-1	-6	-23	-28	-21	-33	-27	-30	-36	-38	-39	-31	-29	-31	-31	-33
3	-31	-38	-45	-47	-41	-41	-40	-32	-31	-34	-29	-26	-25	-23	-25	-27	-27	-23	-18	-21	-31	-32	-31	-32
4	-38	-42	-37	-31	-30	-34	-32	-28	-24	-26	-26	-19	-20	-25	-27	-31	-31	-19	-19	-20	-26	-23	-27	-26
5	-28	-27	-28	-31	-32	-26	-23	-24	-24	-28	-36	-30	-22	-19	-17	-17	-21	-22	-20	-18	-20	-22	-22	-18
6	-17	-17	-17	-21	-19	-20	-16	-15	-15	-17	-19	-22	-19	-13	-16	-12	-10	-12	-15	-14	-11	-14	-15	-19
7	-16	-11	-9	-6	-2	-2	-7	-9	-10	-16	-19	-21	-15	-16	-17	-23	-20	-22	-20	-18	-23	-20	-18	-17
8	-15	-18	-21	-16	-13	-13	-14	-15	-18	-24	-24	-21	-18	-19	-24	-23	-20	-25	-28	-29	-29	-26	-25	-24
9	-23	-21	-24	-22	-20	-16	-13	-13	-18	-23	-25	-20	-18	-23	-20	-22	-23	-22	-17	-13	-12	-8	-10	-15
10	-7	-8	-10	-13	-12	-16	-21	-26	-35	-32	-35	-33	-18	-22	-23	-2	-7	-3	-1	-3	-7	-3	-7	-8
11	-7	-9	-5	-2	-2	3	0	1	-8	-18	-23	-34	-29	-24	-29	-44	-38	-37	-36	-30	-38	-44	-44	-36
12	-43	-44	-38	-32	-33	-29	-28	-28	-29	-31	-30	-28	-24	-25	-25	-18	-14	-17	-18	-21	-21	-23	-25	-29
13	-31	-29	-28	-25	-18	-13	-14	-14	-10	-6	-3	-5	0	3	7	5	-7	-12	-8	-2	-8	-7	-22	-25
14	-30	-29	-32	-26	-25	-29	-22	-22	-23	-24	-26	-28	-22	-26	-21	-19	-13	-14	-18	-17	-24	-27	-29	-37
15	-43	-36	-26	-21	-14	-9	-8	-8	-8	-8	-3	-1	0	-1	-9	-14	-18	-24	-24	-21	-19	-20	-21	-19
16	-15	-14	-11	-10	-5	0	6	5	0	-2	-2	-1	-2	-9	-7	-5	-10	-8	-12	-14	-13	-9	-15	-20
17	-20	-16	-14	-9	-3	-7	-18	-24	-20	-17	-21	-20	-21	-15	-16	-16	-14	-14	-15	-15	-15	-14	-13	-11
18	-9	-7	-5	-4	1	-3	-5	-6	-7	-7	-4	-1	0	-6	-11	-10	-6	-11	-12	-10	-12	-13	-11	-22
19	-24	-27	-28	-28	-19	-12	-10	-10	-10	-5	13	22	19	15	9	3	3	7	16	9	1	-18	-10	-14
20	-24	-14	-16	-15	-13	-12	-12	-12	-4	-6	-11	-12	-12	-20	-25	-32	-29	-26	-24	-19	-15	-11	-13	-18
21	-21	-23	-23	-22	-20	-20	-20	-21	-21	-20	-19	-18	-18	-14	-15	-16	-12	-11	-12	-14	-14	-13	-9	-9
22	-9	-10	-12	-12	-12	-10	-9	-10	-11	-9	-6	-4	-4	-1	-2	-1	-4	-5	-5	-2	-6	-14	-13	-14
23	-14	-16	-12	-9	-4	-4	-6	-8	-9	-8	-3	1	0	-1	-4	-4	-4	-6	-8	-7	-2	-2	-1	2
24	5	9	15	15	16	12	6	-4	-13	-20	-18	-9	-5	-5	-15	-18	-19	-17	-23	-19	-11	-8	-10	-8
25	-4	1	9	15	20	20	19	21	27	26	19	14	15	-22	-42	-33	-32	-29	-28	-42	-42	-34	-29	-30
26	-41	-51	-43	-34	-29	-39	-44	-41	-36	-33	-36	-30	-26	-27	-31	-34	-30	-32	-38	-38	-34	-37	-38	-35
27	-32	-30	-25	-22	-22	-22	-25	-28	-23	-19	-20	-22	-23	-27	-25	-22	-21	-24	-21	-19	-18	-19	-19	-18
28	-16	-15	-17	-18	-19	-15	-17	-19	-16	-11	-8	-12	-14	-15	-17	-16	-18	-19	-18	-17	-15	-12	-13	-13
29	-15	-12	-10	-10	-10	-13	-13	-9	-5	-3	-3	-6	-5	-6	-8	-5	-5	-4	-7	-8	-8	-8	-13	-18
30	-21	-10	-9	-8	-9	-12	-13	-17	-13	-11	-3	6	9	3	-5	-7	-3	1	-1	0	3	-1	-3	-4
31	-17	-22	-21	-32	-41	-37	-38	-37	-58	-62	-51	-45	-44	-46	-44	-46	-60	-61	-55	-65	-67	-73	-84	-85

FEBRUARY 1993

DAY	UNIT=NT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-83	-70	-64	-61	-55	-52	-60	-56	-48	-55	-44	-43	-41	-33	-32	-37	-38	-45	-43	-41	-36	-41	-48	-52
2	-52	-49	-49	-45	-40	-44	-49	-48	-38	-33	-28	-24	-24	-26	-26	-22	-23	-22	-24	-30	-37	-32	-34	-37
3	-37	-39	-37	-36	-28	-23	-23	-26	-21	-16	-13	-11	-12	-13	-13	-13	-14	-17	-21	-22	-22	-26	-36	-39
4	-36	-34	-28	-22	-19	-19	-23	-26	-24	-21	-18	-13	-10	-11	-13	-14	-14	-20	-27	-29	-32	-32	-30	-28
5	-27	-28	-23	-18	-17	-20	-24	-29	-29	-21	-11	-5	-5	-5	-8	-8	-12	-16	-15	-12	-7	-5	-5	-2
6	-4	-4	-1	1	-1	2	-3	-9	-9	-6	-3	-4	-2	2	0	-2	-3	-4	-5	-2	0	2	6	5
7	5	5	4	1	3	12	26	21	-10	-37	-36	-20	-12	-4	-4	-3	-1	-12	-39	-38	-49	-50	-63	-60
8	-54	-51	-50	-50	-53	-52	-62	-67	-58	-50	-37	-33	-29	-27	-31	-29	-37	-39	-33	-39	-37	-41	-45	-51
9	-51	-49	-46	-44	-48	-46	-42	-46	-44	-43	-36	-28	-27	-27	-27	-30	-32	-33	-40	-33	-44	-50	-44	-49
10	-43	-38	-37	-35	-35	-34	-36	-39	-35	-28	-25	-23	-24	-30	-36	-39	-34	-28	-32	-29	-25	-25	-29	-33
11	-37	-38	-41	-42	-37	-37	-42	-32	-46	-42	-36	-30	-28	-28	-29	-25	-21	-26	-33	-30	-30	-33	-33	-46
12	-41	-36	-32	-25	-22	-27	-25	-24	-20	-21	-23	-21	-19	-23	-25	-23	-20	-19	-19	-17	-15	-11	-15	-23
13	-27	-32	-27	-27	-22	-19	-20	-22	-22	-23	-18	-17	-18	-22	-20	-21	-18	-20	-19	-15	-17	-22	-28	-29
14	-28	-26	-28	-26	-23	-17	-18	-23	-24	-22	-16	-12	-15	-17	-16	-15	-16	-19	-20	-21	-18	-17	-20	-24
15	-23	-23	-25	-25	-19	-17	-18	-20	-15	-8	-7	-9	-7	-8	-11	-11	-9	-10	-9	-9	-9	-9	-11	-12
16	-10	-9	-7	-3	-2	-5	-7	-7	-4	-4	-5	-10	-12	-12	-12	-11	-9	-6	-5	-4	-5	-5	-2	-3
17	2	7	7	36	35	40	41	37	23	-18	-18	0	13	-37	-83	-110	-89	-77	-72	-78	-75	-73	-71	-70
18	-65	-59	-56	-52	-50	-53	-58	-59	-55	-47	-38	-35	-35	-36	-35	-38	-40	-42	-49	-54	-55	-54	-58	-58
19	-51	-47	-43	-40	-36	-35	-37	-42	-41	-30	-24	-21	-20	-22	-24	-22	-21	-19	-23	-22	-21	-21	-26	-27
20	-20	-13	-19	-28	-25	-32	-40	-48	-54	-51	-34	-22	-24	-23	-22	-18	-15	-15	-15	-15	-20	-17	-21	-33
21	-20	-19	-22	-22	-20	-20	-28	-31	-28	-26	-17	-23	-21	-16	-13	-17	-25	-36	-34	-28	-33	-32	-24	-22
22	-25	-25	-28	-25	-21	-24	-23	-33	-44	-39	-27	-26	-26	-34	-43	-39	-36	-32	-30	-36	-38	-40	-41	-45
23	-39	-31	-29	-29	-30	-29	-28	-31	-31	-28	-28	-21	-15	-17	-20	-23	-24	-21	-19	-19	-19	-18	-18	-17
24	-11	-8	-11	-15	-16	-16	-18	-20	-18	-16	-16	-15	-11	-10	-10	-10	-9	-11	-10	-6	-3	-1	-7	-10
25	-11	-8	-7	-6	-7	-8	-9	-11	-14	-10	-9	-5	-3	-5	-9	-9	-11	-10	-10	-8	-6	-6	-8	-9
26	-10	-9	-8	-8	-9	-12	-11	-6	-2	1	0	1	-2	-2	-3	-3	-3	-1	1	0	0	-3	-6	-4
27	-3	-2	0	-1	-1	-2	0	2	2	-2	-7	-5	-7	-7	-3	-2	-2	-2	-4	-6	-6	-8	2	15
28	5	0	-6	-10	-20	-20	-14	-13	-23	-35	-45	-53	-45	-38	-41	-35	-38	-32	-36	-32	-29	-28	-24	-24

MARCH 1993

DAY	UNIT=NT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-4	-12	-11	-10	-7	-1	3	0	-2	-10	-4	-2	-10	-17	-32	-36	-31	-32	-33	-30	-33	-41	-40	-27
2	-33	-30	-28	-25	-21	-25	-27	-30	-38	-32	-23	-14	-17	-16	-15	-14	-21	-32	-35	-32	-39	-49	-47	-51
3	-48	-47	-45	-50	-43	-39	-44	-51	-55	-44	-48	-44	-41	-44	-48	-43	-39	-39	-32	-43	-44	-44	-49	-50
4	-59	-62	-57	-54	-45	-35	-35	-39	-39	-35	-34	-30	-27	-29	-31	-24	-24	-29	-24	-25	-24	-26	-24	-27
5	-27	-25	-21	-19	-20	-18	-16	-22	-18	-13	-17	-18	-18	-21	-23	-21	-19	-22	-23	-26	-25	-23	-21	-22
6	-22	-20	-16	-14	-13	-12	-12	-18	-17	-11	-6	-7	-5	-10	-11	-7	-8	-9	-19	-21	-20	-17	-12	-8
7	-1	2	-1	-10	-25	-36	-50	-63	-62	-52	-44	-40	-40	-38	-34	-31	-33	-35	-33	-42	-45	-47	-46	-42
8	-39	-42	-43	-33	-28	-32	-34	-34	-37	-32	-29	-20	-12	-16	-23	-34	-37	-33	-24	-13	-11	9	16	1
9	-58	-64	-65	-79	-95	-117	-137	-127	-110	-105	-101	-82	-66	-64	-61	-54	-46	-47	-46	-39	-45	-49	-52	-54
10	-62	-56	-60	-57	-53	-54	-53	-48	-46	-52	-53	-52	-46	-46	-41	-37	-42	-46	-45	-42	-41	-39	-38	-37
11	-38	-37	-30	-24	-24	-24	-21	-17	-19	-15	-40	-61	-37	-44	-57	-59	-84	-109	-120	-109	-88	-86	-90	-92
12	-93	-74	-61	-65	-66	-62	-60	-56	-54	-57	-53	-50	-51	-53	-49	-47	-46	-48	-53	-52	-38	-43	-45	-37
13	-31	-40	-38	-35	-27	-27	-32	-32	-33	-29	-35	-29	-25	-25	-25	-23	-32	-42	-64	-65	-56	-48	-49	-46
14	-42	-36	-31	-28	-29	-27	-26	-19	-24	-27	-30	-34	-32	-28	-30	-26	-29	-31	-27	-29	-32	-32	-34	-41
15	-41	-39	-34	-30	-30	-25	-39	-51	-57	-70	-69	-86	-88	-79	-80	-83	-90	-84	-73	-66	-61	-60	-61	-64
16	-56	-63	-61	-49	-45	-53	-62	-49	-40	-46	-39	-42	-43	-37	-36	-40	-39	-55	-53	-48	-41	-40	-39	-38
17	-44	-44	-38	-39	-39	-37	-35	-31	-37	-47	-39	-34	-36	-33	-28	-25	-28	-30	-30	-29	-27	-32	-42	-48
18	-44	-44	-40	-37	-33	-38	-41	-36	-35	-37	-35	-35	-35	-33	-30	-26	-25	-26	-25	-23	-17	-15	-17	-17
19	-21	-23	-23	-20	-19	-18	-13	-14	-17	-23	-31	-31	-29	-27	-24	-26	-27	-28	-24	-19	-18	-22	-19	-15
20	-14	-16	-18	-18	-24	-19	-10	-16	-17	-18	-18	-43	-45	-33	-29	-27	-34	-34	-34	-29	-25	-23	-21	-14
21	-5	-2	-5	-11	-14	-15	-10	-7	-8	-18	-24	-35	-31	-18	-16	-22	-24	-33	-37	-35	-30	-25	-26	-35
22	-32	-32	-27	-22	-23	-20	-14	-20	-26	-25	-36	-27	-28	-25	-21	-17	-18	-27	-28	-24	-20	-23	-28	-27
23	-24	-26	-26	-19	-16	-13	-8	-8	-14	-18	-17	-17	-18	-15	-12	-5	-5	-10	-14	-11	-9	-9	11	-7
24	-18	-27	-33	-36	-39	-40	-60	-81	-76	-67	-59	-55	-56	-58	-63	-55	-54	-53	-44	-49	-60	-61	-55	-56
25	-50	-45	-41	-38	-33	-33	-29	-23	-29	-34	-43	-39	-33	-32	-29	-30	-39	-42	-36	-32	-28	-27	-25	-25
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28	-36	-34	-28	-32	-34	-31	-29	-29	-33	-33	-31	-27	-22	-22	-22	-23	-28	-35	-40	-44	-50	-55	-47	-47
29	-36	-40	-48	-55	-62	-64	-55	-46	-51	-48	-40	-33	-28	-29	-24	-20	-17	-15	-10	-6	-4	0	1	-6
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31	-36	-39	-32	-26	-26	-28	-25	-21	-20	-19	-18	-14	-14	-16	-19	-22	-24	-21	-16	-16	-16	-22	-22	-18

APRIL 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-16	-15	-14	-15	-14	-18	-22	-21	-16	-17	-18	-13	-10	-10	-8	-8	-11	-15	-10	-11	-11	-15	-18	-16
2	-14	-13	-13	-13	-13	-13	-12	-10	-8	-14	-19	-18	-15	-11	-9	-10	-12	-12	-9	-5	-6	-6	-3	-2
3	-1	0	1	2	1	-2	0	0	1	-1	-2	0	1	-1	-2	0	-1	-4	-3	1	1	3	9	9
4	6	2	4	5	6	3	2	1	2	5	9	7	9	10	17	-8	-64	-102	-108	-105	-106	-84	-100	-97
5	-113	-120	-125	-146	-149	-150	-165	-157	-141	-137	-143	-139	-129	-115	-106	-110	-107	-101	-75	-66	-56	-55	-65	-65
6	-71	-67	-62	-56	-53	-50	-44	-46	-42	-30	-27	-20	-26	-34	-36	-38	-39	-44	-44	-42	-44	-49	-54	-49
7	-48	-48	-46	-44	-44	-44	-41	-36	-32	-32	-32	-32	-31	-30	-31	-32	-35	-32	-32	-33	-31	-34	-37	-41
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9	-56	-49	-38	-29	-26	-27	-29	-32	-27	-23	-19	-15	-13	-15	-13	-18	-29	-40	-43	-43	-40	-38	-47	-58
10	-45	-45	-53	-59	-60	-57	-55	-52	-46	-42	-40	-38	-33	-36	-37	-37	-43	-37	-34	-31	-30	-30	-26	-24
11	-26	-30	-29	-25	-26	-25	-21	-18	-19	-15	-10	-12	-14	-10	-6	-6	-7	-9	-5	0	1	-4	-10	-15
12	-22	-25	-32	-42	-58	-52	-41	-33	-30	-22	-16	-9	-7	-8	-7	-8	-8	-7	-6	-4	-2	1	3	8
13	8	8	4	6	-2	-22	-35	-29	-32	-38	-49	-46	-47	-46	-44	-51	-54	-54	-50	-44	-32	-32	-31	-28
14	-27	-31	-41	-41	-40	-45	-47	-49	-46	-36	-34	-27	-25	-27	-30	-32	-37	-40	-37	-29	-25	-25	-29	-29
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17	-20	-24	-21	-18	-19	-19	-18	-16	-18	-13	-5	-3	-5	-9	-10	-14	-14	-8	4	-7	-4	-1	-4	-6
18	-7	-11	-19	-30	-31	-33	-27	-25	-27	-21	-13	-12	-11	-13	-13	-21	-23	-22	-24	-18	-12	-10	-10	-13
19	-13	-20	-17	-16	-13	-13	-13	-12	-9	-11	-10	-5	-5	-7	-13	-21	-25	-25	-17	-8	-1	1	-7	-11
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22	-32	-34	-23	-15	-8	-14	-13	-14	-21	-14	-7	0	2	-2	1	4	13	0	-7	0	1	-15	-11	-8
23	-10	-12	-12	-16	-13	-14	-13	-11	-9	-8	-5	-1	3	4	3	-3	-7	-12	-17	-10	-3	-2	-3	-12
24	-20	-19	-14	-12	-9	-7	-5	-5	-3	-3	-4	-2	7	6	5	6	4	3	6	11	14	14	15	7
25	-2	-10	-14	-10	-7	-10	-4	-1	-3	-3	0	5	6	10	8	6	6	5	3	6	9	8	7	10
26	7	5	3	2	2	6	3	0	1	3	6	8	11	11	8	9	12	17	10	2	3	4	4	5
27	5	3	2	0	0	-2	0	1	0	1	1	-1	-4	-5	-4	-3	-6	-5	-4	-4	-2	-1	-2	-3
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29	13	19	21	21	22	22	23	22	22	20	17	20	26	23	22	17	10	9	3	-1	-2	-7	2	-6
30	-18	-28	-11	-3	-9	-9	-6	-5	-9	-10	2	9	13	16	14	13	9	3	2	8	6	7	9	10

MAY 1993

DAY	UNIT=NT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	3	-6	-9	-10	-10	-11	-12	-8	-8	-11	-14	-10	-13	-19	-20	-26	-29	-29	-29	-25	-19	-16	-14	-13
2	-13	-13	-11	-12	-14	-14	-12	-8	-4	-4	-2	4	8	11	11	10	9	7	5	3	3	7	7	6
3	7	8	11	11	9	5	-2	-9	-6	-2	-6	-9	-7	-10	-15	-16	-15	-16	-15	-11	-7	-4	-2	0
4	2	6	5	0	2	4	4	3	1	2	2	3	6	7	4	1	-3	-2	-1	-1	-1	-1	-2	3
5	8	9	8	3	1	-1	3	6	-4	-6	-4	-2	-2	-8	-7	-6	-7	-8	-10	-9	-3	4	8	9
6	10	6	4	3	-1	-1	7	12	9	3	8	15	17	10	-3	-5	-5	-9	-15	-24	-29	-22	-15	-12
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10	-65	-67	-71	-78	-81	-74	-85	-88	-76	-87	-91	-84	-66	-52	-45	-38	-30	-30	-28	-31	-33	-34	-30	-41
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14	-19	-15	-13	-14	-14	-19	-10	-5	-2	-10	-17	-14	-13	-6	2	-4	-6	-17	-21	-22	-18	-13	-8	-5
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20	-7	-6	-2	-1	-6	-6	-13	-11	-16	-15	-18	-18	-15	-16	-16	-15	-14	-12	-11	-13	-12	-8	-6	-4
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22	1	-1	2	1	2	4	6	8	10	6	5	5	8	11	15	16	15	14	9	11	9	7	8	6
23	2	2	3	4	5	6	6	6	3	2	2	1	2	0	-4	-4	-2	0	-2	-3	-1	0	1	3
24	3	2	3	4	6	8	6	3	3	5	6	5	3	3	2	1	1	1	4	4	5	7	9	11
25	10	10	11	10	10	11	12	12	9	7	7	7	8	11	14	13	13	15	15	13	14	17	20	19
26	18	17	16	12	11	12	15	17	16	12	9	10	13	16	14	11	10	7	6	8	12	16	19	35
27	46	50	46	46	16	-11	-24	-35	-26	-19	-18	-21	-16	-16	-11	-10	-18	-17	-16	-15	-11	-5	-5	0
28	0	-10	-16	-21	-26	-15	-12	-13	-8	-3	-12	-7	-6	-9	-10	-8	-13	-22	-24	-24	-17	-12	-13	-21
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31	7	9	9	7	6	6	8	9	6	4	-1	-1	-2	0	-4	-2	-1	-1	0	0	0	5	11	11

JUNE 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	11	12	9	6	3	3	4	4	5	4	3	4	2	0	-1	0	0	0	0	0	0	1	3	4
2	5	6	6	4	2	2	2	2	7	11	7	1	3	0	1	2	4	2	4	7	14	17	24	26
3	24	19	10	5	4	8	10	12	13	10	-1	-16	-14	-7	-9	-9	-6	-12	-16	-10	-6	-5	1	8
4	6	-6	-15	-22	-38	-40	-42	-33	-38	-52	-52	-62	-55	-60	-61	-59	-60	-52	-53	-54	-59	-61	-45	-39
5	-49	-47	-47	-56	-60	-54	-46	-44	-41	-45	-45	-40	-41	-40	-38	-38	-44	-46	-44	-39	-37	-33	-31	-30
6	-35	-37	-33	-38	-37	-32	-28	-30	-34	-34	-31	-28	-33	-33	-28	-24	-23	-23	-24	-27	-28	-29	-26	-22
7	-20	-20	-23	-25	-26	-30	-28	-22	-25	-23	-18	-19	-22	-30	-28	-22	-18	-22	-26	-29	-24	-27	-32	-26
8	-22	-26	-27	-30	-26	-24	-19	-14	-11	-14	-19	-17	-13	-13	-18	-17	-14	-15	-20	-24	-26	-23	-19	-18
9	-18	-20	-20	-24	-23	-20	-19	-17	-15	-14	-18	-22	-25	-27	-27	-23	-21	-20	-20	-20	-20	-18	-13	-14
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11	-31	-29	-38	-50	-49	-48	-45	-41	-35	-34	-33	-34	-31	-24	-17	-16	-17	-22	-20	-17	-15	-13	-13	-13
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15	-8	-9	-11	-11	-13	-13	-15	-14	-10	-5	-3	-4	-5	-6	-4	-3	-3	-4	-6	-7	-4	-3	1	3
16	2	3	4	4	4	4	1	-4	-3	-2	-2	-1	1	1	2	3	4	5	4	1	3	1	-1	-1
17	-1	-1	-1	-2	-2	-2	1	4	3	5	5	6	5	6	6	5	6	6	-1	-8	-11	-11	-11	-10
18	-8	-7	-5	-5	-3	-2	-1	2	7	10	11	9	12	10	10	7	3	4	6	5	6	6	5	5
19	4	5	4	5	5	1	-2	-1	-1	0	0	-2	-4	-7	-6	-5	-6	-7	-12	-16	-14	-10	-8	-9
20	-4	2	6	6	4	0	-4	-7	-5	0	2	-4	-7	-7	-5	-3	-2	-4	-5	-3	0	-1	-1	0
21	0	0	1	2	4	5	7	8	9	9	10	9	7	8	12	15	12	10	12	13	14	12	8	5
22	3	3	4	2	1	1	3	3	3	4	6	8	6	6	8	9	10	9	9	6	4	1	-1	2
23	0	4	5	1	3	7	11	16	18	28	46	49	35	27	24	23	31	32	40	28	16	16	18	18
24	16	19	10	-7	-1	0	-3	-9	-12	-11	-6	-5	-8	-9	-13	-18	-17	-12	-9	-12	-9	-11	-15	-18
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26	-16	-18	-15	-15	-13	-11	-8	-5	-6	-7	-7	-5	-3	-3	-3	-1	-1	-5	-5	-5	-3	-6	-5	-1
27	-2	-2	-2	-2	-4	-1	2	3	-3	-5	-3	-6	-9	-9	-7	-5	-4	-4	-5	-7	-6	-3	0	0
28	1	0	1	3	4	6	7	6	5	3	4	8	8	7	3	2	1	6	8	10	11	10	12	13
29	14	12	14	19	20	18	18	17	20	25	23	12	9	3	8	11	9	6	4	1	1	-1	-2	-9
30	-18	-14	-10	-10	-11	-16	-20	-20	-19	-12	-9	-8	-4	-6	-6	-4	3	7	15	11	12	13	7	3

JULY 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	3	2	-5	-19	-28	-21	-7	-9	-24	-22	-8	-4	-21	-18	-20	-15	-11	-10	-13	-20	-24	-24	-23	-24
2	-20	-13	-13	-12	-17	-24	-17	-9	-5	-10	-11	-10	-7	-13	-14	-20	-25	-29	-31	-35	-24	-26	-55	-54
3	-62	-56	-58	-48	-44	-51	-46	-32	-22	-17	-8	0	3	0	-6	-6	-2	-11	-7	-7	-5	-11	-7	-7
4	-9	-18	-11	-9	-16	-14	-13	-16	-17	-16	-23	-19	-19	-19	-18	-17	-16	-18	-18	-18	-17	-20	-23	-20
5	-19	-16	-9	-9	-13	-13	-15	-13	-11	-11	-6	-3	-5	-4	-5	-4	-6	-6	-7	-8	-8	-10	-12	-10
6	-8	-2	2	3	3	4	4	7	10	9	-1	-5	-2	-2	-4	-4	-5	-5	-2	-2	2	8	7	4
7	-1	4	-2	-10	-9	-8	-1	-1	-4	-3	2	8	9	7	3	0	-2	-3	-4	1	3	6	4	1
8	5	4	3	1	-1	7	26	24	16	16	17	18	12	7	2	0	3	9	13	15	16	11	6	4
9	3	7	7	1	-7	-7	-8	-6	-4	2	4	9	14	12	5	-8	-13	-23	-21	-15	-10	-10	-14	-18
10	-17	-15	-13	-7	-5	-8	-6	-6	-9	-7	-1	10	10	12	8	3	3	5	1	-3	-7	-9	-7	-8
11	-6	-4	-9	-12	-17	-18	-21	-25	-24	-22	-20	-15	-17	-15	-18	-20	-21	-19	-19	-19	-17	-15	-17	-18
12	-16	-14	-11	-10	-11	-12	-14	-21	-20	-15	-14	-12	-13	-14	-13	-17	-19	-17	-14	-11	-10	-12	-14	-19
13	-20	-14	-13	-13	-15	-14	-10	-8	-15	-16	-15	-11	-9	-11	-15	-14	-15	-17	-17	-19	-18	-15	-16	-17
14	-15	-12	-10	-8	-6	-7	-5	-3	-4	-5	-5	-8	-7	-4	-4	-4	-4	-6	-7	-7	-6	-4	-1	0
15	0	-2	-2	0	1	2	4	0	-5	-2	1	3	2	2	4	6	7	3	-2	-3	0	-3	-1	1
16	2	3	7	4	1	-1	-2	-3	-3	-3	-2	-1	2	4	5	6	6	9	9	11	13	11	7	7
17	11	12	11	13	14	12	14	14	14	13	13	12	12	11	11	10	9	7	3	0	-1	-2	3	4
18	4	10	15	17	17	17	17	16	14	12	14	17	15	12	11	14	14	13	11	13	15	13	13	14
19	17	16	13	6	0	1	3	7	10	12	16	16	11	4	5	7	10	9	9	11	15	13	7	6
20	9	17	22	23	24	21	20	21	14	13	-4	-11	-4	-5	-8	-11	-9	-11	-11	-15	-17	-14	-20	-23
21	-25	-20	-13	-9	-10	-11	-12	-14	-13	-16	-21	-19	-12	-13	-17	-21	-23	-24	-21	-17	-18	-15	-15	-10
22	-11	-11	-13	-11	-7	-9	-6	-7	-10	-11	-4	-7	-10	-7	-9	-10	-9	-8	-6	-7	-12	-15	-13	-9
23	-8	-7	-6	-5	-5	-6	-5	-5	-4	-4	-2	1	-1	1	1	0	2	4	6	5	1	-3	-4	-5
24	-8	-7	-3	0	4	4	5	3	0	-5	-5	-2	-2	0	2	1	-2	-6	-3	-1	2	2	4	7
25	8	5	0	-3	-1	-2	-2	-1	-1	-1	0	-1	-3	-5	-5	-5	-6	-5	-2	1	1	0	-3	-6
26	-7	-7	-6	-6	-2	0	2	4	6	8	9	10	9	7	7	8	11	22	23	22	23	19	17	18
27	17	19	16	14	12	11	12	15	17	18	21	23	32	32	32	24	15	15	18	16	5	2	5	5
28	0	5	15	7	9	9	7	5	6	11	15	14	15	13	10	7	9	6	5	5	4	-2	-3	-4
29	-3	-1	-1	-2	1	5	9	9	8	6	8	7	-3	-4	4	-6	-8	4	5	-15	-17	-20	-17	-9
30	-8	-13	-11	-12	-8	-9	-8	-3	-1	1	2	-1	-7	-10	-11	-15	-19	-15	-12	-8	-7	-8	-8	-1
31	3	3	4	2	4	5	3	5	8	8	9	7	6	1	-3	-3	-4	-6	-5	-5	-5	-6	-3	-1

AUGUST 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	0	4	7	8	8	8	10	12	11	10	14	17	19	20	20	19	20	19	15	13	14	11	9	12
2	16	14	10	9	11	12	12	13	14	16	16	15	12	10	9	8	7	5	4	5	5	2	-1	-5
3	-2	3	6	7	7	5	4	2	2	7	11	15	14	12	13	9	3	-1	4	7	8	6	2	7
4	15	13	11	8	11	8	7	11	12	12	11	2	-7	-9	-11	-21	-29	-38	-44	-39	-28	-24	-38	-66
5	-69	-63	-59	-52	-46	-46	-40	-32	-31	-30	-35	-35	-31	-31	-33	-32	-27	-25	-29	-24	-22	-19	-19	-15
6	-11	-10	-11	-14	-18	-19	-27	-18	-20	-22	-16	-14	-18	-28	-28	-29	-34	-32	-27	-22	-21	-19	-17	-18
7	-16	-17	-22	-29	-36	-31	-28	-31	-29	-26	-21	-25	-31	-30	-24	-23	-25	-23	-24	-25	-24	-25	-29	-17
8	-12	-11	-13	-13	-15	-24	-25	-24	-18	-13	-12	-20	-21	-21	-19	-20	-18	-16	-13	-10	-9	-11	-8	-4
9	-2	-7	-10	-17	-15	-13	-17	-17	-20	-17	-10	-8	-5	-6	-7	-11	-12	-9	-14	-17	-17	-14	-10	-8
10	-9	-10	-12	-9	-8	-7	-6	-6	-1	2	-2	-3	-3	-2	-4	-8	-12	-10	-4	-6	-9	-12	-10	-9
11	-4	-4	-6	-7	-9	-9	-9	-10	-10	-8	-8	-7	-7	-3	-3	-2	-3	-3	1	1	-2	-2	-3	-2
12	1	5	5	2	-1	-10	-14	-13	-9	-6	-7	-11	-11	-6	-3	-2	-2	-3	-2	-3	-5	-3	-4	-3
13	-4	-5	-5	-3	-6	-14	-16	-7	-1	5	10	5	4	1	-4	-9	-5	-5	-4	-2	-4	-3	0	0
14	3	4	2	1	3	6	5	5	7	9	10	9	8	9	9	9	10	13	15	15	16	14	16	19
15	19	14	13	12	12	13	13	13	18	21	19	15	12	12	10	13	12	12	12	17	13	-8	-31	-24
16	-29	-40	-37	-30	-36	-44	-42	-55	-56	-46	-34	-40	-48	-47	-51	-44	-45	-47	-50	-56	-65	-66	-63	-69
17	-70	-71	-72	-72	-70	-74	-71	-64	-57	-50	-45	-46	-47	-46	-43	-36	-30	-28	-27	-28	-25	-26	-22	-17
18	-14	-16	-17	-22	-23	-31	-42	-42	-36	-33	-26	-28	-27	-32	-35	-33	-31	-36	-36	-39	-35	-36	-34	-26
19	-24	-25	-27	-25	-25	-25	-26	-25	-24	-22	-17	-22	-27	-29	-27	-24	-24	-24	-24	-25	-23	-20	-21	-20
20	-19	-22	-19	-21	-24	-20	-20	-20	-16	-10	-6	-7	-12	-14	-12	-12	-14	-16	-15	-14	-13	-12	-10	-9
21	-11	-14	-16	-19	-17	-17	-16	-16	-12	-11	-14	-12	-14	-11	-9	-9	-9	-8	-9	-9	-11	-12	-11	-7
22	-7	-8	-9	-12	-13	-13	-10	-11	-10	-6	-6	-5	-4	-3	-5	-7	-8	-7	-5	-6	-7	-3	-3	-2
23	0	2	3	-1	-4	-6	-6	-6	-6	-5	-7	-9	-7	-4	-3	-4	-4	-1	0	-3	-2	2	6	8
24	7	6	4	3	3	6	8	11	11	8	3	3	2	-1	-2	0	1	1	3	5	7	6	5	2
25	1	1	3	3	1	1	3	3	4	1	1	2	0	0	0	1	0	-1	0	2	3	2	0	-1
26	-3	-1	6	9	11	10	11	4	6	7	6	4	-2	-7	-6	-3	0	2	4	3	0	1	-1	0
27	2	3	3	3	1	-1	-2	-5	-12	-14	-14	-10	-15	-13	-10	-18	-43	-67	-79	-74	-74	-67	-57	-53
28	-40	-34	-33	-39	-41	-35	-35	-32	-27	-25	-23	-23	-31	-31	-24	-21	-19	-21	-27	-26	-27	-30	-32	-33
29	-33	-33	-30	-31	-35	-36	-29	-25	-21	-21	-19	-22	-19	-14	-10	-10	-10	-14	-15	-16	-18	-19	-20	-19
30	-17	-17	-14	-12	-15	-14	-14	-11	-9	-10	-10	-11	-10	-12	-10	-9	-9	-9	-9	-10	-11	-8	-5	-6
31	-8	-11	-8	-4	-4	-3	-1	-1	-2	-1	-1	1	3	3	6	8	8	6	4	2	-5	-9	-8	-5

SEPTEMBER 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-3	-3	-2	-1	-2	-2	1	3	3	4	4	4	4	5	5	5	4	2	-1	-2	-1	-1	6	12
2	14	12	8	10	8	11	13	15	15	10	4	-1	2	8	12	13	8	5	6	2	3	4	1	-1
3	-5	-7	-7	-5	-4	2	1	-18	-26	-23	-30	-14	-17	-27	-22	-21	-24	-45	-51	-50	-35	-27	-31	-47
4	-54	-51	-43	-35	-37	-49	-45	-42	-45	-39	-34	-34	-32	-33	-28	-27	-19	-20	-24	-24	-24	-25	-25	-32
5	-31	-25	-23	-26	-33	-30	-25	-23	-20	-22	-22	-21	-19	-17	-16	-18	-18	-19	-17	-12	-9	-15	-18	-18
6	-16	-11	-10	-13	-14	-11	-9	-9	-14	-9	-11	-17	-19	-18	-16	-20	-25	-28	-27	-24	-22	-17	-18	-11
7	-14	-13	-12	-14	-21	-27	-24	-18	-16	-19	-19	-19	-19	-19	-17	-16	-17	-17	-15	-11	-7	-8	-6	-2
8	-7	-12	-16	-16	-20	-21	-16	-13	-12	-17	-15	-14	-15	-14	-12	-10	-9	-10	-10	-8	-6	-5	-6	-8
9	-11	-10	-8	-8	-5	-3	-3	-3	-4	-7	-11	-10	-9	-10	-10	-9	-8	-9	-8	-7	-8	-5	-2	-1
10	-2	-4	-6	-8	-8	-7	-7	-7	-2	-2	-4	-3	-3	-3	-4	-6	-6	-4	-7	-7	-5	-3	0	-2
11	2	-4	-8	-8	-7	-4	-2	-2	-2	-4	-5	-11	-8	-8	-8	-6	-4	-1	0	0	-2	-3	-3	0
12	-1	-6	-6	-3	-3	0	2	1	6	9	8	8	5	7	8	11	10	-2	-10	-25	-38	-55	-68	-72
13	-75	-61	-63	-94	-124	-161	-159	-137	-138	-147	-119	-103	-96	-93	-95	-94	-107	-101	-85	-85	-88	-86	-72	-69
14	-65	-58	-59	-57	-57	-56	-59	-66	-72	-67	-60	-61	-58	-60	-65	-63	-57	-56	-58	-55	-53	-52	-49	-47
15	-43	-40	-37	-40	-46	-45	-41	-47	-42	-46	-48	-46	-45	-40	-38	-33	-31	-36	-37	-36	-43	-45	-38	-33
16	-31	-29	-28	-27	-28	-29	-26	-26	-26	-25	-26	-31	-38	-36	-27	-23	-25	-31	-33	-33	-27	-24	-25	-25
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19	-11	-11	-9	-10	-13	-15	-16	-20	-24	-24	-18	-17	-16	-14	-13	-12	-11	-9	-10	-10	-8	-9	-12	-13
20	-13	-13	-10	-3	-2	-2	-2	-3	0	-4	-25	-35	-31	-32	-33	-33	-39	-50	-57	-59	-56	-60	-61	-59
21	-54	-51	-46	-39	-36	-32	-30	-27	-24	-23	-23	-23	-23	-22	-16	-22	-22	-22	-27	-34	-36	-32	-27	-25
22	-29	-30	-30	-30	-31	-32	-32	-26	-24	-26	-23	-18	-17	-15	-12	-12	-15	-16	-17	-17	-16	-10	-11	-12
23	-15	-14	-12	-11	-11	-8	-8	-8	-9	-10	-5	2	12	26	29	40	41	35	23	23	15	-8	-23	-34
24	-18	-11	-23	-25	-23	-19	-20	-14	0	2	-12	-14	-18	-18	-15	-9	-15	-21	-26	-29	-19	-1	-3	-20
25	-22	-21	-18	-17	-18	-18	-18	-13	-8	-6	-6	-6	-8	-11	-9	-7	-9	-12	-12	-16	-19	-18	-16	-12
26	-8	-8	-10	-11	-14	-22	-20	-12	-9	-16	-15	-11	-9	-10	-6	-2	-1	-1	-1	-3	-5	-4	-6	-6
27	-6	-2	0	-3	-9	-6	-3	0	-3	-1	2	0	-3	-5	-5	-7	-6	-8	-9	-7	-7	-7	-8	-7
28	-5	-1	2	3	1	3	3	5	8	8	8	4	-2	-4	-5	-3	-4	-2	-13	-24	-26	-18	-9	-10
29	-14	-9	-2	-6	-9	-13	-13	-16	-13	-19	-17	-10	-19	-18	-20	-24	-30	-34	-47	-41	-37	-40	-37	-30
30	-33	-33	-31	-36	-37	-39	-40	-30	-29	-22	-17	-11	-8	-8	-14	-16	-16	-17	-18	-20	-19	-21	-31	-38

OCTOBER 1993

UNIT=NT

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-30	-24	-19	-37	-41	-40	-35	-37	-36	-30	-25	-24	-25	-27	-25	-26	-26	-21	-26	-25	-24	-21	-18	-18
2	-19	-19	-19	-22	-23	-22	-20	-17	-16	-13	-12	-14	-13	-11	-13	-12	-9	-10	-13	-14	-16	-17	-18	-15
3	-16	-18	-17	-14	-15	-17	-18	-19	-20	-18	-14	-12	-13	-13	-12	-10	-11	-10	-8	-11	-14	-13	-7	-2
4	0	-1	-1	0	-1	-1	-2	1	3	7	10	9	8	4	1	-1	2	4	-1	-6	-4	1	0	-5
5	-6	-7	-7	-7	-5	-1	5	8	11	13	11	12	11	10	10	11	9	-1	-12	-23	-24	-17	-11	-10
6	-11	-15	-21	-34	-37	-34	-29	-33	-37	-27	-21	-20	-18	-16	-14	-9	-7	-9	-12	-15	-19	-17	-16	-17
7	-14	-10	-10	-11	-11	-11	-11	-8	-4	-1	-1	-2	2	0	0	-1	-2	-1	0	0	1	2	-3	-4
8	-4	-4	-4	-2	-2	-11	-12	-23	-34	-41	-35	-31	-30	-36	-30	-27	-27	-25	-22	-24	-22	-19	-16	-10
9	-13	-15	-20	-3	-12	-38	-74	-91	-74	-66	-69	-86	-73	-61	-61	-60	-61	-62	-55	-50	-48	-46	-55	-57
10	-51	-48	-48	-53	-51	-56	-56	-40	-35	-34	-34	-32	-29	-29	-30	-30	-32	-36	-38	-38	-43	-45	-35	-30
11	-28	-37	-46	-47	-47	-44	-39	-38	-34	-34	-25	-21	-32	-32	-30	-35	-34	-33	-33	-29	-25	-30	-35	-31
12	-38	-46	-44	-42	-41	-44	-43	-35	-25	-16	-13	-12	-14	-18	-25	-24	-22	-23	-24	-24	-25	-23	-20	-19
13	-20	-23	-25	-30	-36	-37	-34	-33	-33	-32	-29	-23	-19	-20	-24	-27	-26	-26	-27	-25	-22	-18	-17	-18
14	-25	-35	-42	-36	-34	-33	-29	-24	-22	-22	-20	-18	-19	-21	-18	-19	-19	-19	-20	-22	-25	-24	-24	-23
15	-23	-24	-25	-25	-25	-24	-24	-22	-18	-15	-16	-19	-20	-18	-17	-18	-16	-15	-14	-13	-15	-14	-13	-13
16	-11	-12	-11	-7	-4	-4	-6	-8	-9	-9	-12	-15	-16	-15	-14	-16	-14	-13	-11	-11	-13	-14	-15	-14
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21	-24	-25	-25	-25	-24	-23	-18	-11	-9	-14	-14	-14	-9	-8	-8	-8	-7	-5	-2	-1	-1	-2	-1	0
22	3	7	1	3	1	0	-8	-15	-15	-10	-7	-7	-2	-2	3	3	0	3	-5	-5	-4	-3	-2	0
23	0	-1	-2	-6	-13	-18	-30	-29	-21	-17	-13	-11	-11	-14	-16	-17	-11	-8	-7	-9	-15	-13	-8	-4
24	-8	-19	-33	-29	-25	-25	-26	-28	-27	-24	-21	-17	-16	-15	-16	-16	-16	-13	-8	-9	-9	-8	-7	-2
25	1	12	11	8	6	10	7	-7	-9	-8	-12	-18	-12	1	-19	-39	-73	-81	-66	-59	-59	-52	-35	-41
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27	-32	-32	-37	-42	-52	-62	-71	-81	-82	-72	-59	-49	-46	-37	-42	-51	-56	-64	-61	-57	-58	-62	-56	-49
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29	-43	-38	-30	-35	-40	-41	-41	-38	-36	-31	-27	-26	-28	-29	-34	-36	-37	-34	-31	-27	-25	-25	-29	-31
30	-27	-23	-22	-22	-23	-23	-24	-24	-26	-24	-22	-21	-22	-20	-18	-17	-18	-16	-14	-13	-14	-15	-15	-14
31	-14	-11	-7	-9	-10	-11	-10	-13	-18	-23	-26	-24	-26	-27	-29	-30	-29	-29	-23	-26	-30	-29	-26	-24

NOVEMBER 1993

DAY	UNIT=NT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-22	-17	-17	-15	-7	-6	-7	-8	-14	-12	-13	-10	-4	-15	-15	-19	-22	-22	-12	-10	-15	-15	-13	-14
2	-18	-16	-20	-17	-15	-17	-13	-15	-15	-13	-12	-10	-9	-10	-11	-10	-10	-12	-12	-12	-13	-13	-14	-13
3	-12	-10	-10	-9	-9	-9	-8	-4	-1	4	10	13	18	22	18	21	21	13	15	1	-2	4	3	-28
4	-81	-95	-82	-76	-96	-102	-112	-110	-107	-105	-93	-119	-114	-107	-90	-84	-82	-79	-84	-73	-73	-74	-59	-70
5	-71	-61	-54	-54	-58	-57	-58	-53	-60	-60	-56	-59	-57	-55	-51	-51	-55	-54	-52	-46	-48	-52	-47	-42
6	-45	-47	-43	-42	-46	-46	-45	-43	-48	-62	-57	-59	-57	-54	-52	-54	-51	-47	-43	-43	-40	-49	-43	-44
7	-47	-47	-43	-41	-43	-43	-42	-43	-43	-37	-34	-37	-41	-40	-44	-39	-39	-38	-36	-37	-33	-43	-50	-46
8	-49	-48	-45	-42	-44	-43	-39	-35	-31	-32	-33	-31	-35	-34	-36	-36	-36	-38	-40	-37	-33	-29	-37	-45
9	-45	-39	-34	-34	-35	-38	-32	-28	-30	-29	-24	-23	-26	-26	-21	-18	-20	-21	-20	-21	-22	-22	-22	-24
10	-25	-27	-26	-30	-32	-31	-31	-29	-32	-34	-31	-30	-32	-35	-37	-32	-28	-33	-39	-38	-34	-28	-27	-26
11	-27	-24	-23	-28	-32	-30	-30	-28	-28	-29	-26	-22	-20	-20	-23	-24	-23	-22	-21	-19	-16	-12	-8	-10
12	-13	-14	-15	-17	-18	-16	-17	-20	-21	-21	-21	-19	-19	-17	-14	-12	-11	-10	-8	-8	-9	-9	-7	-8
13	-8	-7	-4	-7	-10	-12	-10	-4	-10	-10	-9	-11	-20	-26	-19	-23	-26	-23	-25	-26	-25	-21	-17	-18
14	-19	-18	-16	-18	-21	-22	-23	-23	-22	-20	-17	-19	-20	-28	-33	-29	-30	-30	-31	-33	-24	-20	-9	-17
15	-23	-29	-33	-33	-38	-34	-34	-27	-24	-24	-17	-17	-14	-10	-12	-4	-8	-7	-10	-21	-21	-22	-22	-19
16	-17	-21	-26	-30	-32	-30	-25	-26	-32	-35	-37	-33	-32	-30	-27	-28	-32	-31	-29	-28	-29	-29	-27	-26
17	-23	-21	-18	-15	-16	-13	-9	-8	-12	-13	-13	-15	-19	-19	-17	-16	-13	-13	-11	-11	-14	-9	-5	0
18	-5	-7	-5	-5	-3	-4	-3	-6	-8	-8	-8	-7	16	16	7	-39	-58	-82	-77	-83	-80	-69	-59	-61
19	-61	-56	-54	-63	-70	-63	-53	-51	-51	-51	-51	-49	-49	-43	-38	-32	-31	-33	-38	-36	-37	-36	-31	-35
20	-44	-44	-37	-36	-42	-39	-35	-32	-30	-32	-34	-30	-27	-24	-22	-23	-22	-21	-22	-22	-20	-17	-16	-18
21	-16	-13	-16	-15	-16	-19	-20	-17	-18	-20	-20	-19	-19	-18	-16	-15	-14	-12	-12	-12	-10	-8	-6	-6
22	-9	-15	-16	-17	-18	-16	-13	-9	-14	-12	-11	-11	-11	-9	-11	-10	-9	-10	-9	-13	-9	-5	-4	-6
23	-5	-3	-3	-8	-7	-4	-9	-6	-7	-9	-11	-10	-8	-6	-1	1	-3	-3	-3	-4	0	0	-3	-2
24	3	4	3	4	1	1	1	1	1	1	-3	-3	-3	-2	-2	-2	-2	0	-4	0	3	1	-1	-2
25	-4	2	0	2	2	3	7	4	3	4	5	6	4	7	8	13	11	12	16	14	17	21	17	0
26	-7	0	2	-2	-8	-4	-1	0	-2	-4	-8	-6	-4	-2	-5	-4	-4	-7	-13	-16	-14	-9	-8	-7
27	-9	-14	-13	-13	-13	-12	-9	-7	-8	-10	-11	-12	-11	-11	-9	-8	-5	-1	-3	-4	-9	-16	-15	-13
28	-10	-7	-4	-3	-5	-4	-1	1	2	3	0	2	4	5	1	-3	-4	-4	-4	-5	-7	-4	-3	0
29	2	-13	-14	-15	-12	-8	-10	-11	-11	-8	-3	-4	-7	-6	-6	-11	-10	-7	-9	-12	-11	-9	-9	-12
30	-11	-6	-2	0	0	-2	-4	-3	2	3	3	1	-1	-1	1	1	0	-1	-3	-5	-4	-4	-6	-7

DECEMBER 1993

DAY	UNIT=NT 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	U.T. 24
1	-6	-1	3	8	15	19	20	18	17	7	5	-6	-28	-44	-48	-45	-60	-50	-43	-38	-37	-47	-43	-34
2	-48	-48	-42	-45	-48	-53	-51	-40	-42	-42	-35	-43	-50	-44	-41	-42	-38	-38	-38	-49	-81	-90	-102	-113
3	-117	-108	-102	-90	-92	-96	-94	-91	-84	-85	-84	-85	-81	-74	-67	-61	-59	-54	-47	-46	-52	-54	-53	-55
4	-56	-51	-45	-40	-40	-40	-37	-35	-34	-37	-40	-38	-35	-30	-28	-29	-28	-24	-24	-27	-38	-36	-36	-36
5	-37	-37	-34	-32	-29	-29	-28	-29	-29	-27	-25	-26	-27	-32	-34	-34	-34	-32	-31	-33	-34	-33	-29	-30
6	-31	-33	-30	-28	-26	-24	-20	-19	-18	-19	-21	-20	-19	-20	-21	-19	-17	-18	-19	-21	-22	-24	-26	-30
7	-31	-32	-28	-29	-29	-24	-20	-17	-14	-17	-18	-19	-12	-21	-35	-47	-49	-41	-37	-45	-57	-52	-41	-48
8	-54	-61	-71	-81	-91	-92	-91	-88	-93	-95	-91	-76	-77	-65	-73	-71	-68	-71	-74	-77	-71	-66	-64	-65
9	-62	-57	-53	-52	-51	-51	-50	-46	-43	-40	-39	-37	-39	-37	-34	-34	-34	-30	-29	-29	-28	-27	-29	-29
10	-30	-31	-35	-37	-35	-34	-32	-30	-24	-19	-22	-23	-23	-21	-17	-16	-20	-20	-22	-24	-26	-31	-29	-26
11	-29	-30	-30	-30	-28	-26	-26	-27	-28	-29	-29	-25	-23	-21	-21	-22	-22	-20	-22	-26	-25	-21	-21	-23
12	-25	-25	-26	-25	-22	-21	-22	-25	-29	-29	-24	-18	-16	-18	-21	-24	-22	-22	-22	-23	-25	-24	-23	-21
13	-20	-20	-20	-21	-21	-19	-16	-19	-19	-19	-17	-17	-16	-14	-12	-13	-15	-14	-14	-15	-17	-14	-15	-18
14	-17	-14	-11	-9	-8	-5	-5	-3	-3	-6	-7	-8	-9	-10	-9	-11	-12	-11	-9	-9	-10	-9	-10	-13
15	-13	-11	-11	-12	-10	-7	-9	-16	-12	1	-2	1	-3	-9	-11	-7	-6	-5	-3	-4	-5	-8	-5	3
16	7	12	6	7	-2	3	2	3	2	1	-11	-11	-14	-11	-19	-16	-15	-14	-14	-25	-43	-44	-38	-36
17	-35	-30	-26	-26	-28	-28	-23	-21	-21	-20	-22	-17	-15	-14	-14	-15	-15	-15	-16	-20	-25	-22	-23	-21
18	-19	-20	-20	-18	-17	-19	-18	-15	-15	-15	-15	-18	-18	-14	-16	-13	-13	-18	-22	-25	-23	-24	-29	-32
19	-30	-26	-20	-19	-19	-16	-17	-17	-13	-10	-9	-9	-12	-15	-14	-10	-8	-11	-12	-17	-18	-19	-18	-16
20	-25	-28	-25	-13	-10	-6	-3	-2	-2	-3	-3	0	-4	-12	-10	-8	-8	-4	-1	-3	-10	-12	-14	-16
21	-22	-19	-16	-14	-13	-10	-9	-11	-7	-4	-6	-10	-9	-13	-14	-12	-15	-15	-20	-18	-20	-27	-29	-25
22	-24	-25	-19	-15	-14	-11	-15	-11	-10	-7	-10	-13	-18	-14	-9	-10	-13	-15	-15	-11	-8	-12	-15	-16
23	-16	-13	-14	-13	-9	-7	-8	-7	-9	-9	-10	-9	-5	-2	0	2	-10	-13	-12	-15	-14	-14	-16	-13
24	-5	-1	2	-2	-2	-9	-17	-15	-11	-9	-14	-10	-3	-2	-9	-11	-11	-15	-22	-22	-18	-18	-18	-16
25	-14	-13	-13	-18	-18	-12	-5	-5	-5	-11	-11	-7	-9	-11	-10	-7	-10	-13	-13	-16	-19	-16	-14	-13
26	-10	-13	-15	-13	-11	-9	-8	-1	2	-1	-3	-4	-7	-8	-12	-16	-16	-11	-8	-6	-9	-18	-17	-16
27	-13	-13	-15	-14	-17	-20	-19	-18	-13	-10	-6	-4	-8	-13	-13	-10	-9	-13	-14	-12	-11	-9	-9	-7
28	-8	-9	-10	-11	-12	-12	-13	-12	-10	-11	-11	-8	-9	-10	-11	-11	-14	-16	-14	-11	-6	-7	-8	-3
29	-2	-2	-4	-3	-1	0	-3	-1	-1	-3	-3	0	-1	-4	-3	-3	-3	-2	-4	-5	-5	-4	-4	-5
30	-4	-6	-8	-3	0	-1	-4	-5	-7	-5	-5	-7	-5	-5	-8	-9	-6	-4	-5	-5	-6	-3	-3	-1
31	-1	-1	3	11	11	1	-10	-34	-63	-59	-53	-46	-44	-40	-37	-33	-34	-30	-28	-28	-27	-33	-35	-30

DAILY MEANS OF EQUATORIAL DST FOR 1993

DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	-1	-49	-18	-14	-15	3	-15	13	2	-28	-14	-17
2	-22	-35	-29	-11	-1	7	-21	9	8	-16	-13	-53
3	-31	-23	-45	1	-4	1	-21	6	-22	-13	3	-76
4	-28	-23	-35	-29	2	-44	-17	-10	-34	1	-90	-36
5	-24	-15	-21	-114	-1	-43	-9	-35	-21	-1	-55	-31
6	-16	-2	-13	-44	-2	-30	1	-21	-16	-20	-48	-23
7	-15	-15	-35	-37	-8	-24	0	-25	-15	-4	-41	-32
8	-21	-44	-24	-37	-41	-20	10	-15	-12	-20	-38	-76
9	-18	-40	-73	-32	-41	-20	-4	-12	-7	-52	-27	-40
10	-15	-32	-48	-41	-59	-9	-3	-7	-5	-40	-31	-26
11	-22	-34	-55	-14	-32	-29	-17	-5	-4	-34	-23	-25
12	-27	-23	-55	-18	-35	-16	-14	-4	-9	-28	-14	-23
13	-11	-22	-37	-31	-27	-16	-14	-3	-102	-26	-15	-17
14	-24	-20	-30	-35	-12	-12	-6	9	-59	-25	-23	-9
15	-16	-14	-61	-40	-8	-7	1	10	-41	-19	-21	-7
16	-7	-7	-46	-30	-14	1	4	-48	-28	-11	-29	-11
17	-15	-26	-36	-11	-14	0	9	-47	-19	-11	-13	-21
18	-8	-49	-31	-19	-5	4	14	-30	-15	-23	-27	-19
19	-4	-30	-22	-12	-12	-4	9	-24	-14	-18	-46	-16
20	-16	-26	-24	-19	-11	-2	1	-15	-28	-10	-29	-9
21	-17	-24	-20	-28	-2	8	-16	-12	-30	-12	-15	-15
22	-8	-33	-25	-9	7	5	-9	-7	-21	-3	-11	-14
23	-5	-24	-13	-8	1	21	-2	-2	3	-12	-5	-10
24	-6	-12	-52	0	4	-7	0	4	-15	-17	0	-11
25	-7	-8	-34	1	12	-15	-2	1	-13	-22	7	-12
26	-36	-4	-18	6	14	-7	8	3	-9	-35	-6	-10
27	-23	-2	-21	-1	-4	-4	17	-26	-5	-55	-10	-12
28	-15	-27	-34	9	-13	6	7	-30	-3	-35	-2	-10
29	-9	0	-31	14	-13	11	-2	-22	-22	-33	-9	-3
30	-5	0	-31	1	-5	-5	-8	-11	-24	-20	-2	-5
31	-50	0	-22	0	4	0	1	-1	0	-21	0	-27
MEAN	-17	-24	-34	-20	-11	-8	-3	-12	-19	-21	-22	-22

ANNUAL MEAN -18

MONTHLY and YEARLY **Dst** 1957 - 1993

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1957	-19.8	-24.1	-41.3	-27.8	-5.2	-10.0	-11.7	-3.5	-64.0	-14.4	-20.7	-18.5	-21.6
1958	-18.3	-28.1	-32.3	-19.6	-10.8	-22.8	-27.5	-13.8	-24.9	-17.7	-1.1	-18.9	-19.6
1959	-10.5	-31.5	-25.1	-22.6	-14.3	-6.5	-35.6	-32.0	-39.2	-25.3	-35.1	-30.1	-25.6
1960	-17.7	-11.8	-11.5	-58.3	-28.6	-18.2	-20.7	-21.9	-30.8	-53.9	-54.5	-42.3	-30.9
1961	-17.2	-21.5	-13.6	-11.8	-7.0	-6.5	-28.3	-7.2	-8.8	-28.3	-17.5	-10.9	-14.9
1962	-3.1	-5.4	0.5	-7.6	2.1	0.2	1.1	-7.4	-19.6	-17.9	-11.6	-12.3	-6.7
1963	-6.1	-2.2	1.8	2.0	1.1	0.0	1.9	-4.2	-29.5	-23.3	-15.4	-7.9	-6.8
1964	-8.8	-9.2	-9.8	-10.1	-4.0	-0.2	1.9	2.3	-0.3	-6.2	-0.2	5.9	-3.2
1965	5.7	-1.0	0.8	-3.4	5.7	0.3	1.5	2.5	-2.2	5.3	4.6	2.4	1.9
1966	4.2	0.1	-8.2	-1.6	-3.4	0.2	-3.2	-2.1	-25.2	-10.7	-8.1	-13.9	-6.0
1967	-18.6	-19.3	-2.7	-6.1	-32.6	-25.7	-9.7	-5.0	-20.6	-14.1	-11.8	-18.1	-15.3
1968	-20.4	-26.8	-20.8	-13.9	-12.6	-13.0	-5.4	-6.2	-11.8	-16.6	-32.5	-13.7	-16.1
1969	-7.2	-21.6	-29.1	-19.8	-16.3	-2.5	3.6	-0.3	-8.3	-10.8	-4.1	2.3	-9.4
1970	-3.0	0.0	-28.5	-25.8	-10.2	-12.1	-20.4	-21.4	-13.2	-20.1	-21.5	-17.3	-16.2
1971	-15.0	-17.9	-15.0	-26.6	-17.2	-8.7	-3.5	-9.4	-16.8	-15.6	-14.9	-24.2	-15.4
1972	-19.8	-17.9	-16.9	-15.1	-8.2	-16.4	-10.1	-36.4	-22.7	-22.2	-24.2	-9.9	-18.3
1973	-12.8	-20.4	-23.9	-46.3	-17.0	-10.1	-1.2	-2.9	-10.8	-13.7	-7.3	-0.2	-13.8
1974	-4.2	-5.6	-16.3	-13.7	-8.4	-5.7	-26.6	-13.3	-20.8	-23.0	-17.1	-12.0	-13.9
1975	-10.4	-13.4	-18.2	-10.4	-6.3	0.5	-7.0	-9.0	-4.2	-9.9	-21.4	-9.5	-9.9
1976	-12.3	-11.3	-24.1	-24.6	-13.2	-4.4	-5.7	-7.5	-12.2	-16.2	-14.9	-16.1	-13.5
1977	-13.6	-14.6	-10.9	-23.3	-13.7	-3.6	-13.7	-19.3	-23.5	-25.4	-19.4	-22.4	-17.0
1978	-19.4	-26.1	-28.1	-30.8	-34.5	-14.9	-9.2	-12.1	-27.1	-22.7	-27.4	-13.9	-22.1
1979	-28.8	-26.2	-30.4	-33.4	-12.7	-4.3	1.8	-10.8	-19.3	-18.9	-11.6	-2.5	-16.3
1980	-13.1	-18.5	-3.1	-9.4	-6.6	-11.7	-6.6	-4.3	-4.8	-22.2	-18.1	-19.9	-11.5
1981	-8.5	-21.6	-35.0	-43.5	-29.9	-2.9	-21.6	-26.6	-19.9	-42.5	-27.5	-12.5	-24.4
1982	-4.0	-50.0	-18.8	-25.0	-2.7	-12.4	-31.2	-23.5	-47.8	-23.9	-26.0	-20.0	-23.5
1983	-21.2	-38.0	-35.6	-23.2	-18.5	-10.0	-1.8	-9.9	-4.8	-15.7	-17.5	-10.5	-17.1
1984	-7.5	-18.5	-26.0	-24.8	-17.6	-10.7	-9.5	-12.2	-22.6	-22.2	-20.6	-16.4	-17.4
1985	-18.5	-19.6	-9.6	-22.8	-7.7	-6.2	-11.1	-12.0	-14.2	-21.2	-18.5	-28.1	-15.8
1986	-15.5	-44.9	-26.0	-11.4	-12.4	-2.7	-1.7	-10.9	-23.1	-13.5	-18.7	-8.9	-15.6
1987	-4.5	-8.0	-9.0	-4.0	-2.0	-3.6	-5.3	-15.7	-22.3	-27.9	-22.8	-15.8	-11.8
1988	-24.0	-23.1	-19.9	-23.4	-17.7	-7.8	-10.8	-16.7	-19.0	-23.6	-23.4	-29.6	-19.9
1989	-31.7	-24.1	-64.9	-39.7	-23.5	-25.7	0.4	-25.5	-34.0	-29.0	-37.0	-22.0	-29.7
1990	-20.3	-40.6	-41.7	-51.7	-23.8	-13.2	-4.2	-26.3	-11.5	-14.2	-5.7	-0.1	-21.0
1991	-4.9	-11.8	-35.1	-20.6	-16.5	-45.5	-33.3	-42.7	-29.5	-45.7	-61.1	-20.5	-30.8
1992	-20.6	-54.1	-15.4	-8.8	-27.2	-11.9	-4.0	-12.0	-30.8	-22.0	-23.4	-14.8	-20.4
1993	-16.8	-23.7	-33.5	-20.1	-10.8	-8.2	-3.2	-11.5	-19.3	-21.4	-21.6	-22.5	-17.8

Unit : nT

SECTION 3

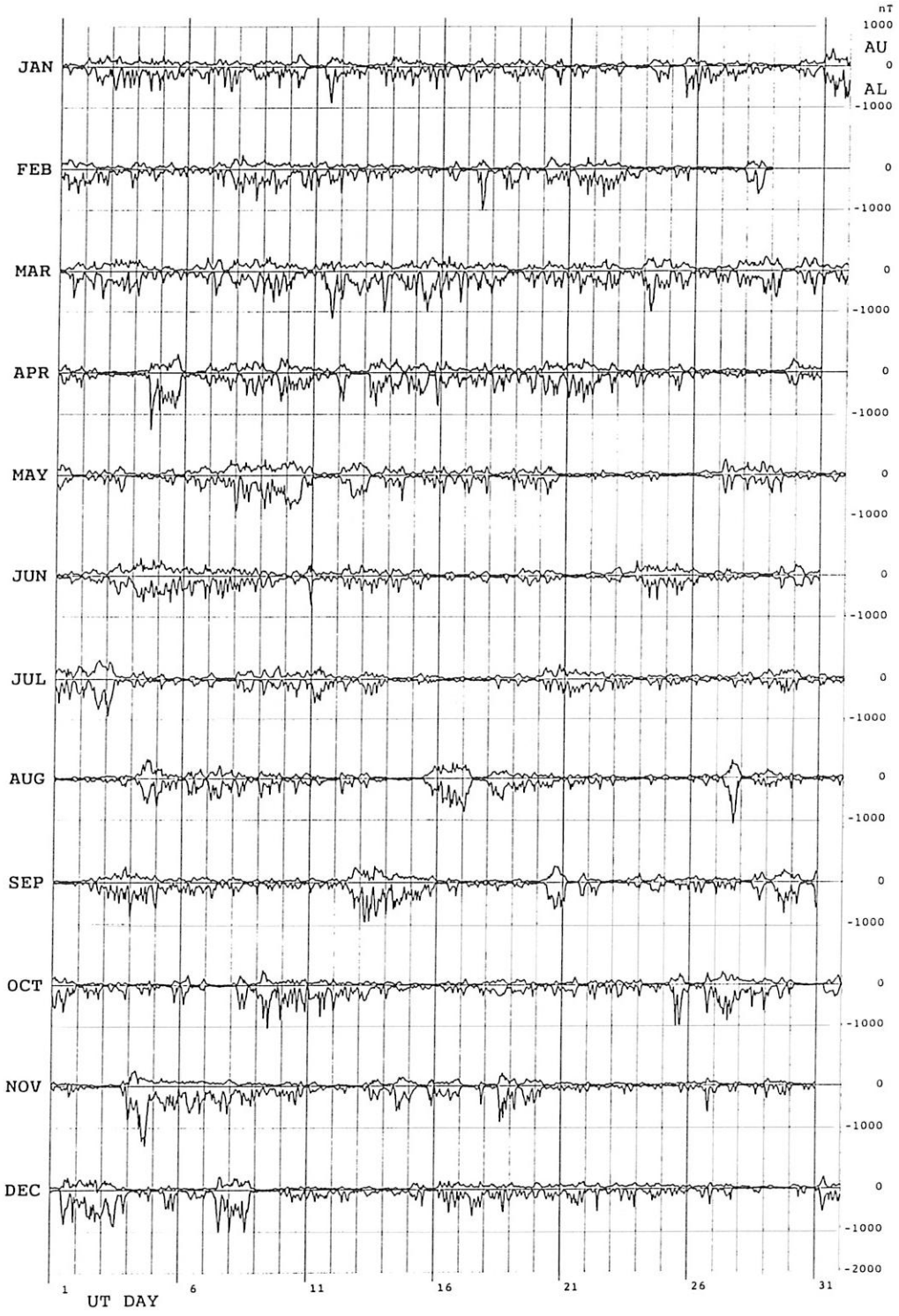
3.5 AU, AL, AE INDICES

Provisional Hourly Values of **AU** and **AL** for **1993** (graph) 107

Provisional Hourly values of **AU**, **AL** and **AE** indices
Jan - Dec 1993 108

Monthly and yearly mean values of **AE**
1957 - 1993 132

PROVISIONAL HOURLY VALUES OF **AU** AND **AL** 1993



Provisional Hourly Values (nT) of AU, AL and AE Indices JANUARY 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	36	44	52	90	41	42	53	116	75	67	77	74	51	66	48	38	30	32	54	51	36	62	107	122	61
	AL	-17	-2	0	0	-2	-16	-50	-188	-133	-37	-20	0	-3	-23	-26	-11	-14	-18	-57	-9	-7	-32	-58	-136	-36
	AE	54	47	52	91	44	60	104	304	209	105	98	73	54	89	75	50	45	52	111	60	43	95	167	259	98
2		181	246	175	118	103	117	116	83	124	173	84	236	182	76	143	116	188	221	305	196	255	151	149	147	162
		-206	-155	-148	-63	-2	-10	9	-52	-150	-359	-279	-208	-291	-380	-443	-237	-232	-167	-206	-252	-194	-35	-228	-53	-181
		388	401	324	182	105	127	107	136	275	533	364	445	474	456	587	354	420	390	512	449	450	187	379	200	344
3		157	142	203	87	221	270	266	139	103	110	127	133	94	103	82	90	66	93	79	131	117	152	123	154	135
		-217	-449	-561	-498	-307	-163	-112	0	-37	-235	-493	-218	-92	-187	-87	-329	-504	-57	-88	-434	-337	-73	-162	-217	-244
		375	592	765	585	529	433	379	140	140	346	621	351	187	290	170	419	571	151	169	567	455	226	285	372	380
4		265	174	145	118	103	145	144	95	131	90	91	84	233	148	87	66	164	124	64	134	148	143	141	278	138
		-483	-223	-138	-47	-83	-75	-110	-57	-209	-89	-102	-438	-582	-154	-148	-196	-182	-80	-169	-200	-560	-237	-209	-349	-213
		748	397	284	166	187	221	255	153	341	180	194	523	816	303	236	263	346	205	234	335	709	382	351	627	352
5		163	78	111	186	168	119	148	53	85	120	130	122	112	134	60	35	52	67	121	82	131	163	124	127	112
		-69	-45	-81	-281	-282	-115	-139	-74	-157	-285	-307	-277	-275	-176	-19	-102	-221	-96	-241	-139	-100	-57	-58	-18	-151
		232	124	193	468	452	235	288	127	243	406	438	400	387	311	80	137	274	163	363	221	233	222	183	145	264
6		87	98	111	118	121	157	112	139	104	113	73	92	70	90	121	128	55	61	74	73	50	66	69	90	95
		-72	-159	-213	-43	-45	-122	-43	-68	-113	-127	-153	-263	-289	-263	-276	-145	-120	-99	-405	-87	-32	-36	-141	-29	-139
		160	258	325	162	167	280	156	208	217	241	227	357	360	354	398	275	176	161	480	161	83	102	210	120	235
7		73	72	101	158	199	203	132	64	87	161	179	101	62	57	60	88	91	92	142	118	166	162	119	84	115
		-13	-34	-86	-202	-76	-50	-18	0	-45	-486	-383	-44	-33	-31	-147	-575	-576	-258	-175	-68	-413	-384	-138	-97	-181
		87	106	189	361	276	254	150	63	133	648	563	146	96	89	208	664	669	350	318	186	580	547	258	182	297
8		75	97	106	110	88	82	69	71	60	79	82	46	38	87	24	108	91	83	131	174	139	81	92	171	91
		-80	-127	-85	-72	-14	2	-45	-70	-45	-124	-51	-29	-16	-120	-272	-322	-250	-166	-300	-288	-253	-125	-199	-305	-140
		156	225	192	183	102	80	115	142	106	203	134	75	56	209	297	431	341	249	432	463	393	207	293	477	232
9		160	131	155	169	125	106	81	96	118	168	110	105	98	136	96	81	69	47	39	62	86	42	71	78	101
		-199	-98	-234	-114	-107	-128	-17	-80	-152	-127	-103	-109	-504	-246	-41	-223	-250	-27	-34	-127	-87	-36	-72	-240	-140
		361	230	390	284	233	235	99	176	271	295	213	215	603	382	137	305	320	75	73	190	174	80	143	319	242
10		119	128	127	103	131	148	299	306	303	244	175	192	115	104	72	73	29	30	34	37	28	35	33	39	121
		-205	-71	-46	-136	-139	-90	-500	-419	-282	-213	-285	-296	-128	-66	-15	-20	-28	-21	-8	-2	0	0	-11	-19	-125
		325	200	174	239	271	239	799	727	587	457	460	489	244	171	87	94	58	52	42	39	28	35	44	59	247
11		32	36	34	73	40	36	37	28	42	117	81	168	119	256	209	206	165	236	214	172	97	121	211	152	120
		-10	-11	-6	-15	1	-1	1	-24	-282	-290	-176	-420	-692	-870	-443	-282	-46	-226	-373	-222	-222	-161	-123	-184	-212
		43	49	41	89	38	38	35	52	325	407	258	589	813	1126	653	488	212	464	588	395	321	284	335	337	333
12		101	80	75	68	70	141	96	99	52	50	68	61	49	38	47	42	51	32	30	30	23	32	37	35	59
		-101	-149	-236	-71	-147	-136	-162	-46	-15	-45	-185	-95	-53	-57	-69	-291	-80	-111	-164	-130	-205	-88	-21	-7	-111
		203	230	312	140	218	277	259	146	68	96	254	157	103	97	117	334	133	145	194	160	229	122	59	43	171
13		42	57	55	44	48	57	49	70	88	46	63	57	53	58	49	59	119	57	48	48	69	56	159	279	72
		-4	-32	-25	-19	-11	-13	-57	-36	-12	9	-5	-145	-178	-14	-7	-77	-460	-160	-40	-96	-63	-67	-353	-343	-92
		47	90	81	64	61	71	107	107	100	36	69	203	232	73	57	137	580	218	89	145	133	124	513	622	165
14		156	255	238	158	143	236	240	143	103	111	104	158	113	84	88	96	80	109	113	94	93	187	140	115	140
		-137	-264	-72	-9	-124	-271	-118	-72	-79	-214	-322	-185	-131	-84	-127	-20	-41	-461	-375	-137	-239	-167	-269	-177	-171
		294	521	310	168	267	507	358	215	183	326	427	344	245	169	215	118	123	572	488	232	334	355	411	293	311
15		165	148	62	65	115	101	75	78	59	56	76	60	44	38	47	60	105	89	64	67	62	72	62	39	75
		-170	-77	0	-33	-54	-127	-106	-56	-26	-33	-352	-220	-74	-18	-103	-188	-542	-307	-72	-68	-50	-54	-265	-45	-127
		337	227	61	98	170	229	183	136	86	90	429	281	119	57	151	249	648	397	137	136	114	127	328	85	203

16	40	40	82	107	129	83	83	54	43	38	39	38	33	50	27	26	49	46	35	57	43	41	89	71	56
	-28	-48	-212	-249	-65	-54	-3	-2	-2	1	-3	-31	-24	-82	-214	-341	-251	-104	-107	-23	-50	-115	-94	-133	-93
	70	89	295	357	196	137	86	57	46	36	42	70	58	133	243	368	300	151	143	81	93	157	184	205	150
17	53	69	60	46	66	92	94	140	157	127	125	226	142	125	85	51	35	53	60	66	88	95	65	44	90
	-152	-54	-44	-17	-28	-159	-367	-110	-80	-93	-266	-214	-75	-111	-81	-67	-39	-102	-138	-139	-103	-62	-15	-7	-105
	206	124	106	64	95	251	463	251	238	221	392	441	218	237	167	119	75	156	198	207	192	158	81	52	196
18	54	55	89	84	62	31	24	38	55	71	68	92	49	31	67	88	123	103	66	64	109	111	158	213	79
	-30	-13	-17	-32	9	3	0	-9	-96	-164	-133	-130	-108	-177	-100	-131	-241	-261	-87	-60	-126	-364	-272	-174	-113
	85	69	107	117	53	27	24	48	152	235	202	223	158	210	167	219	364	365	154	125	236	476	431	388	193
19	177	84	177	122	95	70	46	97	172	120	100	84	46	84	39	24	51	89	92	160	190	130	91	45	99
	-207	-236	-123	-230	-69	-16	-11	-72	-231	-210	-84	-71	-29	-156	-167	-208	-56	-67	-175	-273	-283	-348	-75	-30	-143
	384	320	300	353	164	87	58	170	405	331	185	156	76	242	207	233	108	156	267	435	474	479	167	76	243
20	65	52	58	35	30	23	25	34	67	38	42	156	87	54	210	162	39	36	25	34	27	23	28	29	57
	-55	-37	-16	-13	-17	-13	-31	-33	-57	-102	-45	-254	-79	-287	-439	-193	-31	-101	-55	-3	-5	-2	-12	-35	-80
	121	90	76	49	48	37	57	68	125	141	88	411	167	342	649	356	71	139	80	38	32	26	41	65	138
21	27	26	36	39	67	73	40	33	25	28	29	62	39	48	22	23	17	18	24	22	19	23	21	20	33
	-138	-32	-93	-241	-212	-58	-13	-25	-11	-51	-95	-284	-102	-89	-118	-159	-82	-75	-4	-34	-52	-30	-54	-27	-87
	167	60	130	281	280	132	53	59	37	79	125	347	142	138	141	184	101	94	28	56	71	54	77	48	120
22	22	31	45	44	45	71	78	73	88	42	48	49	53	43	52	61	45	32	24	36	65	87	82	81	54
	-16	-19	-29	-39	-93	-127	-74	-101	-166	-59	-57	-39	-103	-71	-37	-40	-28	-69	-70	-3	-109	-248	-148	-152	-79
	39	52	76	85	139	199	152	175	255	102	106	90	158	115	90	102	74	101	96	39	175	336	231	235	134
23	90	135	85	51	39	25	16	18	21	18	18	19	17	20	37	28	21	16	18	19	34	58	24	46	36
	-94	-72	-3	4	4	1	0	0	-1	0	1	0	-5	-13	-61	-35	-22	-28	-37	-21	-27	-19	-27	-30	-20
	186	208	90	46	34	24	16	17	22	18	16	21	23	35	99	64	44	45	56	41	61	78	51	76	57
24	36	38	53	80	112	146	177	152	168	139	111	168	91	81	31	76	94	79	163	109	44	35	34	28	93
	-18	0	-1	-18	-41	-69	-78	-108	-109	-208	-335	-394	-107	-114	-139	-227	-155	-174	-239	-316	-42	-21	-12	-1	-122
	54	38	54	99	154	215	256	260	278	347	447	563	199	195	171	304	249	253	403	426	86	56	47	30	216
25	27	29	29	27	28	26	27	35	48	45	57	71	65	148	209	189	231	153	98	155	167	86	46	125	88
	1	2	6	4	6	6	10	12	14	12	-2	-37	-194	-768	-410	-295	-412	-242	-224	-567	-248	-60	-156	-412	-164
	25	26	22	22	20	18	15	22	33	33	59	109	259	917	619	484	644	395	323	722	417	147	204	538	253
26	22	109	151	108	116	130	122	53	49	55	51	58	53	43	19	43	38	49	72	84	60	80	54	41	69
	-599	-455	-206	-16	-72	-192	-300	-85	-45	-34	-154	-414	-414	-215	-176	-242	-376	-168	-241	-249	-102	-196	-117	-100	-215
	622	565	358	124	189	323	423	139	95	91	206	473	468	259	195	285	414	218	314	334	163	277	173	142	285
27	45	37	43	62	71	54	59	68	74	55	67	72	117	133	63	39	41	51	57	44	47	82	49	37	61
	-42	-7	-4	-121	-245	-145	-128	-215	-161	-64	-206	-379	-285	-191	-91	-224	-174	-107	-196	-90	-107	-178	-32	-2	-141
	89	44	48	184	317	200	187	285	236	119	274	452	403	324	154	263	216	158	254	135	155	262	82	39	203
28	36	39	45	73	91	77	85	33	52	78	87	62	73	58	37	59	44	35	31	22	26	27	28	30	51
	-1	-17	-46	-207	-167	-32	-57	-44	-44	-164	-171	-175	-153	-67	-58	-48	-32	-31	-23	-84	-102	-15	-8	-12	-73
	38	57	92	281	259	110	142	77	97	243	259	238	227	126	96	108	77	67	54	106	128	43	37	43	125
29	32	38	31	34	37	37	46	23	35	30	25	22	13	20	22	24	19	20	27	24	28	24	48	70	30
	-24	-26	0	-3	-6	-27	-134	-122	-59	-43	-65	-42	-33	-19	-12	-29	-44	-62	-30	-19	-94	-103	-100	-176	-53
	56	65	31	38	44	65	181	145	94	73	90	65	48	40	35	55	65	84	57	44	122	127	148	247	84
30	42	139	101	94	146	175	116	66	68	56	90	75	102	142	91	63	54	67	81	69	87	79	90	154	94
	-46	-89	-102	-70	-271	-231	-60	-52	-87	-132	-198	-236	-232	-279	-163	-140	-92	-69	-39	-35	8	-27	-49	-398	-129
	89	229	203	165	417	407	177	119	156	189	290	311	335	423	254	204	147	137	120	105	77	107	140	554	223
31	291	304	207	147	249	188	392	440	331	162	173	158	197	86	170	197	176	161	172	153	235	14	20	113	197
	-424	-139	-191	-312	-344	-425	-294	-219	-420	-742	-356	-581	-491	-277	-361	-373	-330	-86	-428	-791	-497	-766	-686	-343	-411
	717	444	399	459	594	615	688	660	752	905	529	740	689	364	532	571	507	247	601	944	733	780	707	457	610

Provisional Hourly Values (nT) of AU, AL and AE Indices FEBRUARY 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	98	154	150	131	180	118	182	244	220	222	208	145	81	77	37	124	133	177	157	140	144	130	117	98	144
	AL	-182	-167	-255	-68	-131	-124	-125	-509	-358	-280	-356	-327	-162	-308	-229	-515	-585	-243	-269	-273	-76	-232	-395	-268	-268
	AE	281	323	406	200	312	242	307	755	579	503	565	472	244	386	267	640	719	420	427	414	222	364	513	367	414
2		98	134	109	148	155	151	86	82	57	34	48	58	34	48	35	60	41	54	50	94	66	62	43	39	74
		-329	-336	-237	-357	-240	-250	-194	-99	-64	-24	-116	-319	-72	-68	-66	-208	-317	-211	-136	-386	-348	-28	-69	-37	-188
		428	471	348	507	396	401	281	182	122	60	165	378	107	118	102	269	358	265	187	481	415	90	113	77	263
3		60	37	54	56	81	106	69	76	69	61	54	34	21	28	28	24	19	19	62	113	92	183	156	171	70
		-45	-29	-47	-107	-137	-83	-12	-55	-75	-72	-27	-14	-27	-13	-20	-44	-37	-38	-305	-447	-210	-94	-207	-268	-101
		106	67	102	164	220	189	82	133	146	134	83	49	49	41	49	69	57	58	368	561	303	278	364	440	171
4		142	87	83	87	133	167	150	88	43	51	48	64	35	27	25	23	27	59	66	53	93	98	58	75	74
		-141	-21	-36	-59	-95	-41	-15	-5	-25	-36	-54	-158	-87	-8	-16	-19	-169	-287	-219	-112	-179	-60	-68	-88	-83
		284	109	120	146	228	209	166	95	69	88	104	223	123	36	42	42	197	347	285	166	274	159	126	164	158
5		90	65	36	56	80	98	98	162	175	86	72	29	25	27	21	18	17	34	20	27	44	87	62	41	61
		-65	-34	-5	-10	-24	-61	-44	-50	-110	-122	-24	-6	-10	-13	-12	-21	-159	-134	-50	-39	-24	-75	-173	-21	-54
		156	100	42	66	105	159	143	212	286	209	98	36	36	40	33	40	177	169	71	66	68	163	236	63	116
6		24	28	39	72	79	93	90	69	54	31	29	18	33	36	28	20	19	16	18	41	69	48	32	33	42
		-7	-5	-1	-17	-101	-48	-5	-4	-7	-6	-11	-47	-90	-71	-50	-15	-13	-16	-8	-30	-123	-98	-33	-48	-36
		32	33	41	89	181	141	96	74	62	39	42	66	123	108	79	36	33	33	27	71	193	147	66	82	79
7		54	66	86	110	160	180	129	97	120	124	130	81	42	67	44	38	74	166	146	262	231	260	225	154	127
		-31	-19	-29	-93	-238	-78	8	-13	-160	-413	-96	-40	-19	-10	-18	-42	-45	-134	-186	-295	-383	-490	-276	-181	-137
		86	85	116	204	399	259	121	111	280	538	226	123	63	78	62	81	120	301	334	557	615	752	501	336	265
8		120	102	136	355	216	234	172	127	117	110	106	80	78	97	103	71	159	136	117	143	171	164	194	243	148
		-397	-290	-282	-566	-413	-80	-179	-197	-274	-363	-263	-135	-170	-345	-83	-65	-756	-476	-307	-337	-322	-151	-238	-437	-297
		518	392	419	922	629	315	352	325	392	473	370	216	249	442	187	137	916	612	425	481	495	317	434	680	446
9		171	158	118	179	115	119	138	97	66	80	121	108	101	79	112	85	142	122	162	121	114	129	184	130	123
		-265	-307	-202	-267	-381	-183	-61	-17	-18	-205	-596	-430	-227	-279	-460	-367	-302	-292	-239	-264	-361	-154	-161	-164	-258
		436	467	321	447	497	303	200	114	86	286	717	539	329	359	572	453	445	415	402	386	477	284	347	295	382
10		70	52	81	124	97	88	98	134	71	69	82	72	102	79	106	90	92	56	134	175	86	63	50	46	88
		-112	-48	-31	-85	-70	-35	-31	-74	-43	-54	-80	-340	-407	-342	-447	-234	-8	-97	-310	-507	-90	-57	-20	-54	-149
		183	101	113	210	167	125	130	208	115	125	163	413	509	422	554	324	101	154	445	684	177	121	71	101	238
11		68	78	121	143	134	138	149	178	185	147	61	36	51	36	45	51	55	81	105	115	85	78	85	129	98
		-98	-246	-426	-196	-143	-131	-146	-130	-150	-89	-18	-42	-138	-363	-254	-131	-324	-262	-232	-284	-169	-21	-138	-580	-196
		168	326	548	340	277	270	296	308	336	237	80	79	189	399	299	183	380	343	337	400	256	100	225	710	295
12		111	51	40	71	95	103	99	124	97	97	64	95	88	131	105	39	34	35	23	26	34	35	41	63	71
		-165	-20	-12	-13	-36	-160	-55	-43	-33	-87	-80	-274	-220	-173	-58	-21	-15	-36	-17	-53	-50	-27	-30	-178	-77
		277	72	52	85	132	264	155	168	131	186	145	369	310	306	163	61	50	71	41	80	84	63	72	243	149
13		118	107	100	80	61	73	58	78	88	111	76	81	114	129	86	58	43	46	24	30	48	78	83	73	77
		-317	-123	-32	-68	-43	-50	-43	-144	-223	-103	-88	-54	-115	-274	-46	-58	-82	-67	-15	-19	-48	-229	-190	-85	-105
		436	231	133	148	104	125	102	224	313	215	165	136	230	404	132	116	125	113	39	50	97	309	274	160	183
14		101	80	99	79	83	68	71	105	97	99	64	31	35	33	31	22	11	30	70	57	32	29	26	26	57
		-109	-61	-31	-65	-100	-28	-10	-31	-58	-68	-10	-21	-13	-20	-19	-36	-82	-92	-52	-71	-41	-30	-22	-21	-45
		211	141	131	144	183	97	81	137	156	168	76	53	49	53	51	58	94	123	122	130	74	60	49	48	104
15		24	36	54	50	64	62	50	44	49	66	91	52	50	62	42	37	49	34	32	34	21	21	16	15	44
		-18	-33	-81	-103	-30	-2	-5	-5	-4	-21	-152	-133	-204	-61	-17	-6	-6	-84	-43	-15	-40	-10	-6	-11	-45
		43	71	136	153	94	64	56	51	55	89	244	186	255	125	60	44	56	120	77	50	62	32	23	27	90

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)

FEBRUARY 1993

16	17	24	35	35	31	42	76	63	48	40	81	197	174	114	57	29	33	32	40	31	28	21	21	18	54
	-13	-11	-5	-8	-13	-92	-174	-46	-23	-129	-245	-283	-261	-171	-117	-52	-33	-37	-39	-46	-19	-16	-6	-9	-77
	32	37	41	44	44	136	251	111	73	171	327	481	435	286	176	82	68	70	81	79	49	38	28	28	132
17	20	22	25	73	44	46	44	48	84	121	171	84	132	234	173	180	92	121	51	52	19	10	8	13	78
	-10	-8	-4	-20	-24	-23	-25	-24	-45	-330	-237	-69	-460	-975	-853	-623	-211	-191	-31	-55	-37	-39	-39	-55	-183
	31	32	30	94	68	69	70	73	130	452	409	153	592	1210	1027	805	304	313	83	107	56	50	48	69	261
18	18	21	25	22	31	26	19	16	23	15	33	42	76	50	27	32	51	78	114	132	127	157	146	99	57
	-92	-89	-78	-38	-35	-26	-16	-25	-28	-233	-130	-166	-493	-143	-27	-82	-333	-478	-363	-257	-312	-326	-245	-332	-181
	111	110	104	61	66	53	36	42	52	250	164	208	569	195	55	114	385	556	478	390	440	484	392	431	239
19	141	89	40	34	28	28	38	65	33	33	14	11	15	21	33	17	14	23	21	23	29	20	19	22	34
	-212	-78	-24	-12	-10	-13	-15	-53	-250	-112	-16	-12	-16	-18	-16	-18	-29	-103	-62	-9	-35	-23	-27	-20	-49
	354	168	65	47	38	42	54	120	285	146	31	24	32	41	49	35	44	127	84	33	65	44	47	43	84
20	32	56	60	158	177	207	299	250	233	216	176	100	136	60	75	58	72	107	114	148	105	85	135	94	131
	-23	-20	-146	-371	-289	-181	-371	-295	-175	-186	-206	-111	-200	-265	-211	-102	-50	-63	-270	-242	-72	-57	-416	-314	-193
	56	77	207	531	468	389	671	546	409	402	383	211	337	326	287	161	124	170	386	391	179	143	552	409	326
21	56	47	45	43	36	54	66	86	84	98	108	108	83	92	76	64	147	282	117	151	145	80	79	78	93
	-52	-39	-36	-33	-21	-41	-102	-167	-147	-332	-407	-154	-239	-304	-135	-155	-283	-632	-174	-146	-430	-281	-135	-38	-187
	109	87	82	77	57	96	169	253	232	431	516	262	322	397	212	220	432	915	292	298	576	362	215	117	280
22	101	97	116	135	103	106	100	119	200	227	141	77	88	74	69	100	97	113	87	116	109	157	147	90	115
	-287	-311	-392	-213	-185	-142	-159	-320	-678	-330	-226	-243	-482	-518	-279	-244	-254	-501	-319	-278	-147	-367	-269	-207	-306
	389	409	509	349	289	248	260	439	879	557	368	320	570	592	349	346	352	615	408	396	257	526	418	299	423
23	76	60	63	72	76	67	32	37	40	86	34	38	43	23	23	39	39	53	36	30	32	25	19	21	44
	-121	-58	-119	-293	-262	-33	-18	-58	-97	-160	-176	-100	-156	-101	-233	-175	-233	-163	-29	-67	-36	-29	-4	-10	-114
	197	119	182	366	338	101	51	97	138	248	211	139	199	125	256	215	274	216	66	98	70	55	24	32	159
24	26	33	47	37	33	34	34	27	21	25	32	21	59	55	50	59	39	24	20	14	17	25	30	21	33
	-12	-23	-77	-59	-53	-25	-33	-27	-40	-63	-126	-81	-122	-143	-52	-14	-15	-24	-35	-76	-22	-11	-25	-16	-49
	40	57	125	96	87	59	67	55	62	90	160	103	182	199	102	74	54	48	56	90	40	37	56	38	82
25	24	33	37	44	53	74	55	61	49	42	33	34	27	27	19	62	62	33	22	21	18	15	18	24	37
	-14	-20	-30	-51	-228	-174	-120	-18	-43	-21	-54	-131	-35	-18	-107	-303	-53	-15	-12	-9	-25	-7	-10	-11	-63
	40	54	67	95	281	248	175	81	94	65	88	166	63	46	127	366	116	49	36	32	45	24	29	36	101
26	36	41	37	32	30	29	41	52	31	33	27	21	20	39	22	29	17	22	26	18	20	28	22	24	29
	-9	-15	-12	-37	-24	-34	-97	-88	-11	-15	-17	-11	-61	-133	-94	-64	-123	-138	-11	-16	-5	-22	-33	-16	-45
	47	58	50	69	54	64	140	141	42	50	46	33	81	173	117	93	140	161	38	35	26	50	56	41	75
27	33	34	31	23	36	36	25	31	26	26	17	14	11	10	20	17	14	14	13	10	14	19	48	71	25
	-7	-10	-9	-10	-8	-16	-24	-49	-17	-13	-22	-48	-58	-94	-40	-26	-30	-18	-11	-16	-30	-14	-91	-167	-35
	40	45	42	35	45	52	50	81	44	40	40	63	71	105	61	43	44	32	25	27	45	33	140	239	60
28	189	100	104	165	150	186	94	78	114	53	17	68	190	154	141	102	50	39	16	22	26	26	24	24	89
	-341	-306	-344	-245	-315	-307	-54	-35	-174	-627	-600	-497	-492	-464	-344	-173	-38	-31	-38	-39	-19	-34	-33	-13	-232
	532	407	449	411	466	493	148	114	288	681	618	566	682	620	487	276	89	71	55	62	46	61	59	38	322

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES (continued)

MARCH 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices MARCH 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	42	35	35	29	29	36	78	71	98	90	48	70	65	116	142	159	200	232	139	138	177	187	155	80	102
	AL	-17	-28	-35	-22	-15	-30	-57	-49	-72	-177	-119	-49	-73	-652	-502	-302	-162	-278	-152	-182	-181	-191	-32	-37	-142
	AE	61	65	71	52	45	68	136	122	172	268	168	120	140	769	645	462	362	511	292	320	359	379	188	118	246
2		70	57	67	77	122	118	104	148	248	117	48	89	55	83	70	94	176	200	214	187	192	177	183	130	126
		-90	-121	-145	-188	-232	-199	-255	-355	-439	-69	-24	-82	-50	-93	-86	-127	-594	-673	-307	-382	-209	-206	-170	-233	-222
		161	179	214	266	355	317	360	504	689	188	73	173	106	178	157	221	771	874	522	570	402	384	353	364	349
3		191	208	156	116	303	222	168	138	205	298	193	172	185	231	158	114	105	276	198	196	257	187	187	259	197
		-200	-200	-317	-242	-280	-206	-298	-364	-318	-255	-143	-197	-483	-403	-257	-100	-20	-542	-469	-380	-368	-378	-274	-269	-290
		391	408	474	360	585	429	468	504	524	554	337	370	668	634	415	215	126	818	668	578	625	566	461	529	488
4		182	134	291	219	197	162	92	137	109	123	78	42	49	55	43	51	78	127	52	50	50	38	29	37	101
		-188	-413	-610	-354	-162	-55	-19	-110	-108	-171	-81	-18	-17	-16	-18	-27	-164	-201	-179	-41	-9	-7	-32	-32	-126
		371	548	902	574	360	218	112	249	219	296	161	61	68	73	62	79	243	329	232	91	59	46	62	71	229
5		63	81	114	116	119	76	140	97	53	68	86	39	28	34	29	42	43	44	62	58	33	37	59	55	66
		-121	-284	-232	-77	-74	0	-34	-94	-137	-66	-77	-18	-17	-19	-25	-28	-53	-172	-207	-106	-36	-17	-24	-124	-85
		185	366	348	194	193	75	174	192	191	136	165	59	47	55	55	71	98	218	270	165	69	54	84	180	152
6		50	36	42	56	58	63	105	112	165	177	126	117	56	98	74	71	52	95	193	335	234	188	141	79	113
		-97	-34	-28	-33	-18	-6	-29	-57	-150	-94	-124	-29	-14	-29	-83	-159	-108	-145	-183	-306	-116	-53	-62	-20	-82
		148	71	71	90	76	69	135	170	316	272	252	148	72	129	158	231	161	242	376	642	351	241	205	100	197
7		62	66	114	182	220	294	246	293	224	55	39	30	30	43	35	33	109	99	102	158	283	164	214	310	142
		-13	-17	-210	-589	-510	-327	-305	-352	-145	-68	-42	-16	-18	-20	-21	-26	-112	-115	-234	-276	-294	-235	-417	-197	-190
		76	83	325	772	731	623	552	646	369	124	82	47	49	64	57	63	222	215	337	435	577	400	632	508	333
8		204	165	163	146	144	140	184	207	151	135	98	93	140	151	201	312	288	285	239	153	89	142	188	126	173
		-246	-342	-280	-58	-67	-191	-195	-194	-118	-63	-122	-147	-198	-220	-360	-409	-507	-379	-283	-74	0	-95	-138	-172	-202
		451	508	444	205	212	333	380	403	270	200	221	240	338	371	561	721	795	664	523	229	88	238	327	299	376
9		171	182	330	196	270	360	203	197	195	177	222	73	114	79	148	128	138	123	102	81	109	213	204	144	173
		-553	-303	-162	-206	-46	-258	-434	-272	-554	-752	-297	-70	-167	-219	-595	-501	-399	-209	-35	-116	-109	-498	-316	-355	-309
		725	486	493	403	317	620	638	470	750	930	520	144	283	298	744	630	538	334	138	198	220	712	520	499	484
10		84	180	167	112	123	177	151	99	77	83	64	62	45	81	108	81	34	25	27	37	28	36	73	109	86
		-239	-429	-171	-132	-206	-57	-31	-41	-21	-51	-36	-44	-24	-91	-170	-98	-40	-24	-23	-45	-19	-25	-76	-116	-92
		323	611	338	245	330	235	184	141	99	136	101	108	70	172	278	181	76	51	51	83	48	62	149	226	179
11		171	123	71	45	40	64	149	221	114	194	205	69	183	134	228	248	81	28	78	159	167	230	230	102	139
		-97	-16	-16	-10	-14	-20	-208	-116	-18	-154	-455	-288	-431	-452	-580	-934	-1164	-923	-575	-328	-81	-436	-507	-433	-344
		269	140	89	56	55	84	358	338	133	349	662	359	615	588	808	1183	1246	952	654	487	249	667	738	535	484
12		104	126	146	150	91	85	114	120	145	124	126	131	183	115	83	154	166	208	248	205	181	124	123	126	141
		-200	-688	-561	-121	-65	-77	-67	-206	-257	-188	-299	-281	-263	-360	-336	-267	-419	-557	-596	-442	-404	-224	-175	-241	-304
		305	816	707	272	157	163	182	328	404	314	426	414	448	476	419	421	586	766	845	648	586	348	299	368	446
13		196	157	210	197	181	216	180	121	99	149	128	127	99	108	72	116	259	171	138	213	162	155	129	86	153
		-432	-513	-265	-419	-163	-165	-183	-78	-58	-243	-244	-331	-200	-213	-20	-157	-631	-1014	-825	-473	-111	-123	-74	-103	-293
		629	672	476	617	345	382	364	201	158	393	373	459	300	322	92	274	890	1185	963	686	274	280	204	190	447
14		79	69	63	87	86	86	79	99	131	107	178	142	110	204	172	85	194	146	268	229	107	113	113	150	129
		-179	-76	-13	-39	-90	-83	-184	-232	-140	-61	-228	-267	-249	-474	-376	-115	-450	-447	-439	-413	-92	-93	-204	-604	-231
		259	146	78	127	177	170	265	332	273	169	408	410	361	679	549	200	645	593	708	643	199	206	318	755	361
15		107	91	84	71	145	187	209	250	238	68	156	166	257	290	333	325	235	243	244	202	109	197	178	97	187
		-239	-41	-42	-44	-95	-403	-586	-753	-480	-740	-973	-776	-579	-678	-365	-288	-450	-472	-265	-191	-11	-36	-645	-654	-409
		347	133	128	116	241	592	795	1004	719	810	1130	943	837	968	698	614	686	715	510	394	121	233	824	752	596

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)

MARCH 1993

16	257	147	252	170	80	151	366	146	163	181	99	230	102	77	71	52	154	213	160	135	77	55	61	107	146
	-353	-307	-250	-56	-32	-238	-466	-165	-195	-251	-153	-136	-46	-30	-66	-70	-235	-765	-639	-163	-18	-8	-39	-131	-200
	611	455	503	228	113	391	833	312	359	434	254	367	149	107	138	123	389	978	799	298	96	64	101	238	347
17	115	85	146	106	94	100	81	167	162	121	227	139	151	165	79	63	51	92	108	150	173	213	165	116	128
	-412	-149	-115	-208	-126	-66	-40	-139	-203	-252	-472	-225	-423	-173	-21	-47	-61	-182	-303	-191	-342	-370	-301	-543	-223
	528	235	262	316	221	167	123	307	367	375	700	365	575	339	101	112	113	275	412	343	515	584	467	660	352
18	204	189	133	103	128	119	134	188	109	109	157	70	131	93	66	25	41	30	32	40	32	39	30	32	93
	-399	-278	-120	-122	-248	-232	-191	-374	-164	-165	-244	-108	-174	-73	-29	-54	-19	-34	-27	-115	-19	-18	-56	-48	-138
	604	468	254	226	377	353	326	563	274	275	402	179	306	167	96	79	61	65	61	155	51	57	87	81	232
19	35	37	46	39	40	42	79	68	74	93	166	122	76	40	71	157	100	72	105	73	85	93	60	46	76
	-35	-8	-5	-17	-38	-29	-110	-200	-188	-130	-264	-173	-61	-26	-77	-415	-270	-135	-94	-196	-77	-57	-23	-12	-110
	71	47	52	57	79	72	190	269	264	224	432	297	138	67	149	573	372	208	200	270	162	150	84	59	187
20	54	68	135	144	131	245	207	126	127	100	172	143	139	119	76	109	134	157	112	62	63	53	49	58	116
	-18	-63	-242	-322	-246	-104	-159	-24	-9	-12	-101	-381	-243	-279	-145	-200	-163	-418	-232	-41	-3	-35	-30	-171	-152
	73	132	379	468	379	350	368	151	138	114	274	526	382	399	221	309	298	576	345	104	66	89	80	230	269
21	50	96	82	106	176	198	121	66	78	76	192	81	28	92	188	214	114	103	122	127	120	68	124	123	114
	-169	-136	-45	-117	-300	-217	-191	-24	-41	-29	-154	-559	-458	-179	-256	-353	-198	-108	-126	-129	-157	-51	-169	-309	-186
	220	233	129	224	476	416	313	92	120	106	346	641	488	272	445	567	313	212	248	256	278	120	294	433	302
22	99	77	102	130	97	137	87	111	207	226	198	286	104	57	50	48	101	177	173	120	147	136	111	94	128
	-186	-189	-404	-156	-124	-292	-228	-269	-362	-324	-273	-480	-276	-41	-20	-48	-300	-444	-296	-96	-342	-368	-189	-340	-252
	286	267	507	287	221	430	316	381	569	551	472	767	381	100	72	97	402	621	470	216	491	504	302	434	381
23	61	63	62	53	40	32	54	53	63	32	59	63	71	79	45	42	47	51	52	39	53	43	122	164	60
	-83	-12	-39	-96	-45	-7	-26	-38	-20	-11	-17	-95	-157	-186	-35	-54	-56	-30	-133	-51	-23	-40	-286	-378	-80
	146	76	102	149	85	40	81	91	84	45	78	159	229	267	81	97	104	82	186	90	77	84	408	543	141
24	147	168	238	301	264	277	230	329	226	201	86	86	71	128	111	88	161	274	278	244	239	236	281	269	206
	-144	-209	-489	-351	-320	-846	-984	-763	-770	-350	-87	-101	-127	-401	-438	-237	-285	-330	-464	-353	-223	-306	-428	-320	-389
	292	378	728	653	585	1125	1215	1093	997	553	174	191	199	530	550	326	446	605	744	597	463	543	710	590	595
25	216	86	56	40	84	170	68	74	111	94	138	168	216	182	148	147	172	98	78	76	91	70	67	50	112
	-20	-20	-20	-26	-50	-253	-298	-42	-78	-42	-121	-391	-472	-314	-226	-273	-386	-183	-172	-46	-53	-50	-80	-25	-152
	236	107	77	67	135	425	367	117	190	137	261	559	689	497	376	421	559	282	251	123	144	121	148	76	265
26	42	44	39	38	73	48	50	50	73	54	68	46	37	53	47	46	39	42	29	50	93	104	101	58	55
	-14	-10	-14	-36	-180	-68	-58	-13	-49	-66	-187	-167	-66	-22	-47	-30	-43	-19	-20	-168	-199	-335	-118	-63	-83
	58	55	54	75	254	116	109	64	123	122	256	214	105	76	95	77	83	61	51	218	293	439	220	121	139
27	61	72	80	94	77	101	101	145	80	74	40	38	32	41	57	65	138	250	216	213	149	163	202	270	115
	-121	-280	-90	-106	-119	-147	-306	-184	-62	-12	-7	-14	-20	-32	-26	-57	-261	-370	-421	-261	-121	-83	-167	-349	-151
	184	353	171	200	197	249	408	330	143	88	49	54	54	75	84	123	399	621	639	476	271	247	370	620	267
28	213	141	119	129	205	214	117	208	127	121	121	144	238	206	126	151	247	340	349	320	266	237	162	147	194
	-180	-133	-219	-398	-251	-122	-180	-181	-123	-230	-137	-138	-195	-175	-188	-227	-553	-384	-588	-433	-198	-290	-487	-460	-270
	394	275	339	528	457	337	299	391	251	353	259	283	434	382	315	379	801	724	938	755	464	528	650	608	464
29	182	124	153	200	286	297	140	179	138	66	27	23	34	42	39	41	39	40	39	41	39	41	93	81	99
	-89	-58	-264	-626	-660	-570	-188	-442	-216	-18	-9	-18	-17	-21	-17	-19	-19	-9	0	7	5	1	-36	-36	-138
	271	183	418	827	948	868	330	622	355	85	37	42	51	64	57	61	59	50	39	33	34	40	129	118	238
30	101	97	76	84	160	232	317	307	248	194	144	87	133	229	163	310	301	278	165	142	100	107	94	142	175
	-94	-38	-20	-38	-90	-203	-309	-331	-156	-57	-31	-25	-152	-336	-155	-408	-596	-354	-125	-72	-30	-75	-103	-112	-163
	196	135	98	123	252	435	628	639	405	253	176	114	286	566	319	718	897	633	292	215	131	183	197	254	339
31	122	76	152	118	147	130	80	76	58	54	42	51	118	129	85	98	95	46	74	116	154	159	190	140	105
	-147	-345	-97	-42	-73	-82	-23	-49	-55	-25	-14	-25	-66	-188	-182	-286	-150	-11	-85	-221	-146	-354	-236	-131	-126
	271	422	250	161	220	212	103	126	114	81	58	77	185	318	268	385	246	58	160	338	301	513	427	271	232

Provisional Hourly Values (nT) of AU, AL and AE Indices APRIL 1993

DAYUT	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1 AU	67	48	57	95	151	168	202	103	92	132	75	22	25	64	29	28	68	60	87	72	100	174	131	65	88
AL	-59	-33	-36	-144	-243	-275	-235	-97	-161	-169	-69	-29	-23	-100	-80	-30	-99	-235	-128	-149	-115	-352	-198	-35	-129
AE	128	82	94	239	395	443	438	201	253	303	145	52	49	166	109	58	168	295	217	223	217	527	331	101	218
2	50	33	23	30	46	83	52	39	50	108	122	74	25	12	19	7	5	13	20	16	26	22	27	32	39
	-30	-22	-21	-39	-76	-154	-85	-65	-93	-97	-134	-124	-39	-26	-25	-33	-34	-29	-22	-19	-50	-39	-24	-34	-55
	81	56	45	69	122	238	138	104	144	206	257	200	65	38	45	42	40	44	43	36	77	62	51	66	95
3	24	20	35	42	38	39	29	18	13	18	15	9	10	12	9	11	22	26	14	15	26	34	29	35	23
	-62	-57	-76	-88	-32	-26	-23	-24	-27	-34	-37	-33	-32	-34	-35	-41	-47	-83	-54	-34	-19	-100	-31	-27	-44
	87	78	112	131	71	66	54	43	41	52	52	43	44	47	46	53	70	110	70	50	47	134	61	62	68
4	30	24	52	53	53	52	58	52	51	35	76	63	45	37	105	249	156	99	217	201	194	213	98	141	98
	-15	-31	-52	-42	-24	-27	-43	-66	-29	-29	-70	-145	-69	-35	-279	-1373	-1060	-732	-553	-493	-394	-131	-414	-889	-291
	46	55	105	96	77	80	103	120	81	64	147	209	115	73	385	1623	1216	833	772	695	589	345	513	1031	391
5	183	177	219	190	142	180	59	190	240	130	186	243	326	324	327	331	456	317	269	122	57	45	47	20	199
	-322	-327	-743	-612	-505	-654	-691	-452	-572	-620	-741	-422	-498	-792	-854	-551	-661	-413	-552	-117	-28	-57	-96	-141	-476
	505	505	964	803	648	835	751	643	813	751	928	666	826	1118	1183	883	1118	730	822	239	85	103	143	162	676
6	5	9	11	15	10	6	13	3	4	13	31	43	52	23	62	31	52	35	26	75	129	128	188	241	50
	-72	-71	-92	-41	-29	-30	-39	-43	-41	-84	-45	-38	-50	-47	-137	-140	-134	-144	-61	-39	-232	-209	-322	-278	-101
	78	81	104	57	41	38	53	47	46	98	77	82	103	71	200	173	187	179	88	115	362	338	510	520	152
7	104	76	86	59	141	58	33	36	55	74	104	48	118	143	94	64	99	173	242	211	188	239	246	200	120
	-71	-62	-46	-100	-238	-130	-154	-27	-94	-191	-133	-55	-168	-210	-190	-92	-167	-330	-427	-254	-123	-188	-210	-222	-162
	176	138	134	161	379	188	188	64	151	266	239	104	288	354	284	157	267	504	670	466	312	428	457	423	283
8	96	42	27	68	78	143	123	74	178	237	133	149	130	119	71	227	272	271	245	231	157	98	145	235	148
	-68	-30	-27	-45	-42	-114	-210	-123	-242	-537	-288	-159	-149	-174	-129	-433	-472	-544	-383	-262	-59	-159	-259	-401	-221
	165	73	55	114	121	258	334	198	421	775	423	310	280	294	202	661	745	816	629	494	217	259	405	636	370
9	235	127	83	72	48	55	61	47	50	33	18	14	19	38	85	107	186	362	306	307	173	153	327	313	134
	-487	-218	-132	-189	-186	-76	-68	-122	-297	-38	-44	-27	-30	-37	-128	-240	-407	-680	-434	-535	-117	-91	-433	-490	-229
	723	347	216	263	235	132	130	170	347	72	62	41	50	75	213	348	594	1043	741	843	291	245	760	804	364
10	105	177	119	103	140	140	179	140	169	96	76	30	60	90	138	133	120	74	143	106	110	142	70	55	113
	-88	-218	-404	-214	-203	-413	-286	-242	-407	-199	-122	-128	-195	-378	-396	-392	-257	-130	-308	-356	-75	-206	-137	-35	-241
	193	395	524	319	344	554	466	383	577	297	198	160	257	470	535	526	378	205	452	463	186	348	208	92	355
11	71	75	55	98	124	65	74	65	40	25	35	53	122	64	33	36	14	19	19	42	58	97	107	148	64
	-47	-45	-42	-132	-194	-134	-40	-28	-38	-38	-43	-50	-129	-126	-21	-36	-36	-33	-31	-28	-28	-78	-158	-254	-74
	118	120	98	231	319	200	116	94	79	64	78	104	252	192	55	74	52	53	52	71	86	177	266	403	140
12	177	192	140	206	205	119	67	79	92	42	44	30	23	22	34	28	19	23	33	34	59	45	30	33	74
	-592	-320	-442	-681	-418	-78	-37	-53	-134	-77	-18	-14	-15	-23	-21	-26	-29	-23	-25	-35	-24	-27	-24	-25	-132
	770	513	583	888	624	198	104	132	227	120	62	45	39	47	57	56	49	48	59	70	84	73	56	59	207
13	30	31	46	37	116	222	188	181	231	97	160	242	141	124	269	339	217	231	217	145	121	108	112	54	152
	-20	-17	-5	-51	-46	-591	-496	-214	-325	-536	-807	-382	-191	-202	-343	-479	-237	-357	-243	-72	-251	-150	-64	-63	-256
	50	48	51	89	163	815	684	395	557	635	969	625	333	327	614	820	455	589	461	219	373	259	177	118	409
14	105	183	149	249	200	329	228	164	135	159	75	37	41	29	10	68	88	186	97	47	86	123	159	130	128
	-97	-377	-517	-273	-251	-330	-277	-401	-200	-303	-139	-16	-24	-20	-34	-77	-155	-510	-193	-70	-107	-342	-414	-235	-223
	203	561	667	523	453	661	506	565	336	463	216	54	65	51	45	146	244	698	290	118	194	466	574	365	353
15	116	157	97	152	206	169	219	231	176	146	162	61	49	26	25	48	38	31	30	137	258	205	112	63	121
	-425	-441	-147	-229	-540	-381	-512	-468	-430	-332	-307	-209	-29	-35	-70	-44	-67	-60	-26	-242	-726	-803	-173	-81	-282
	541	599	245	382	746	550	731	700	607	480	470	271	80	63	96	93	106	92	57	380	985	1008	286	145	405

16	100	77	88	113	274	209	168	85	149	98	69	69	57	53	68	36	99	123	104	85	87	96	80	73	102
	-96	-266	-231	-220	-365	-313	-256	-102	-118	-123	-37	-31	-115	-131	-64	-32	-224	-347	-266	-175	-118	-184	-103	-184	-171
	197	345	320	334	640	522	424	187	267	222	108	101	173	185	133	68	324	471	371	262	207	280	184	258	274
17	82	60	54	44	42	88	86	92	97	97	141	63	38	75	70	61	105	237	154	78	39	35	47	33	80
	-150	-113	-111	-83	-45	-194	-284	-183	-134	-349	-262	-61	-51	-109	-186	-128	-108	-318	-180	-23	-1	-7	-36	-24	-131
	233	173	166	128	88	283	372	276	231	446	404	126	89	185	257	190	215	556	336	103	41	43	84	57	212
18	45	85	126	118	150	198	85	82	150	114	88	207	80	34	63	131	73	114	89	83	39	36	22	33	93
	-11	-67	-480	-479	-272	-252	-193	-69	-105	-303	-113	-448	-195	-37	-53	-153	-207	-229	-46	-54	-16	-18	-7	-21	-160
	56	153	607	597	423	451	278	151	256	417	203	657	276	72	117	286	281	344	136	138	56	55	30	55	254
19	68	98	98	48	38	24	32	34	48	99	93	90	47	78	103	139	171	146	37	22	40	93	113	45	75
	-34	-201	-249	-88	-26	-43	-32	-34	-32	-44	-228	-149	-79	-115	-505	-470	-317	-395	-109	-12	-11	-52	-98	-103	-143
	103	299	348	137	64	68	64	70	80	143	322	240	126	193	609	611	490	542	147	35	52	146	211	149	219
20	68	101	196	238	283	254	71	145	190	138	113	165	143	160	238	156	168	107	170	110	51	100	77	142	149
	-68	-83	-390	-537	-464	-432	-72	-86	-214	-236	-183	-555	-282	-259	-526	-278	-237	-88	-105	-51	-36	-86	-141	-181	-233
	136	186	587	776	749	688	144	232	405	375	298	722	426	421	765	436	407	196	275	163	88	186	219	324	383
21	212	164	229	187	231	106	136	181	208	175	115	196	89	99	118	336	242	226	236	243	197	184	140	172	184
	-353	-601	-558	-283	-124	-47	-177	-293	-562	-470	-211	-496	-160	-125	-166	-720	-563	-387	-271	-532	-300	-201	-306	-492	-350
	565	766	788	471	356	154	313	475	771	646	328	693	250	224	286	1056	806	615	508	776	498	385	447	665	535
22	185	165	130	115	91	47	61	98	66	75	64	87	81	58	58	43	85	194	235	161	188	134	80	52	106
	-530	-266	-260	-198	-248	-47	-248	-193	-41	-59	-88	-63	-55	-52	-44	-41	-54	-326	-500	-173	-109	-265	-123	-24	-167
	716	432	391	314	341	96	311	292	108	134	152	150	137	110	103	85	140	522	736	335	298	400	204	78	274
23	46	37	54	42	55	35	30	27	35	46	51	33	23	17	23	36	56	148	184	149	65	49	52	182	62
	-24	-11	-24	-124	-93	-30	-35	-42	-26	-85	-102	-125	-23	-18	-27	-29	-112	-356	-346	-210	-144	-31	-27	-302	-98
	71	49	79	167	149	67	67	70	62	131	154	158	47	36	51	67	169	504	531	361	210	80	80	485	160
24	86	69	41	41	25	23	56	54	38	40	73	52	68	56	69	61	55	83	80	63	40	38	53	52	55
	-243	-161	-103	-53	-36	-36	-19	-38	-113	-53	-31	-49	-52	-24	-146	-101	-40	-75	-18	-13	-12	-18	-21	-34	-62
	330	230	145	95	62	60	77	93	152	94	105	102	122	81	216	164	97	159	99	77	53	58	76	88	118
25	104	104	133	98	77	114	122	103	116	199	172	114	61	40	28	21	25	29	43	52	105	120	84	74	89
	-108	-114	-92	-64	-114	-176	-326	-142	-100	-456	-355	-226	-35	-24	-20	-12	-4	-4	-34	-21	-66	-123	-153	-65	-118
	212	219	226	163	192	291	449	246	216	656	528	340	97	65	49	34	30	35	78	74	173	244	238	140	208
26	56	32	23	29	24	47	72	52	45	52	48	46	55	38	28	26	26	42	48	31	25	22	27	33	39
	-21	-19	-17	-27	-30	-19	-74	-157	-96	-34	-26	-41	-64	-21	-17	-17	-12	-4	-13	-22	-22	-28	-34	-34	-35
	78	52	40	57	55	68	148	210	142	88	74	88	121	60	46	44	39	47	62	55	49	52	62	67	75
27	39	36	45	56	52	43	83	102	61	39	47	76	52	67	30	41	65	73	54	38	33	61	66	75	56
	-29	-28	-22	-50	-48	-28	-88	-109	-35	-29	-36	-62	-62	-65	-79	-81	-149	-104	-36	-23	-29	-112	-76	-70	-60
	69	65	68	107	100	73	172	213	97	68	83	139	114	132	109	122	215	178	91	63	64	174	143	145	117
28	38	35	53	45	25	25	31	23	23	25	46	52	63	49	45	39	36	51	49	43	31	25	24	28	38
	-35	-29	-23	-42	-27	-33	-21	-32	-23	-25	-23	-32	-106	-116	-34	-20	-34	-49	-17	-17	-18	-13	-19	-20	-34
	75	65	76	88	52	58	53	56	47	51	70	85	170	165	80	60	71	101	67	61	50	40	45	49	72
29	33	36	31	32	33	35	38	35	33	34	40	48	33	37	75	81	97	84	177	164	248	334	266	249	95
	-21	-11	-8	-26	-31	-23	-24	-26	-25	-25	-27	-23	-26	-20	-42	-91	-146	-263	-273	-89	-111	-296	-319	-279	-93
	54	47	39	59	64	58	63	61	59	59	67	72	59	58	118	173	245	348	450	254	360	631	586	529	188
30	237	230	96	121	113	179	89	85	67	83	96	84	164	119	73	64	117	130	97	71	94	73	82	115	112
	-300	-203	-57	-51	-24	-171	-69	-55	-46	-73	-79	-24	-129	-125	-36	-43	-199	-134	-63	-23	-86	-116	-158	-103	-99
	537	434	154	173	138	351	159	140	114	157	177	109	295	246	110	108	318	265	161	95	182	190	241	220	211

Provisional Hourly Values (nT) of AU, AL and AE Indices MAY 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	145	139	126	256	264	241	198	102	159	147	195	175	80	29	15	11	10	11	16	14	18	14	10	12	99
	AL	-208	-244	-366	-294	-264	-181	-128	-68	-60	-181	-160	-69	-111	-99	-37	-18	-18	-23	-20	-20	-19	-16	-14	-17	-110
	AE	353	384	492	551	529	423	328	171	220	328	355	246	192	128	53	29	28	35	37	35	38	30	24	29	210
2		12	6	6	29	62	100	133	78	45	39	58	93	91	43	35	16	27	26	73	105	152	85	78	54	60
		-21	-29	-24	-51	-60	-117	-63	-52	-24	-26	-26	-135	-125	-56	-23	-32	-24	-19	-49	-67	-224	-105	-43	-25	-59
		34	35	31	80	123	218	198	130	69	66	85	229	218	101	59	48	51	45	122	173	376	190	122	80	120
3		61	67	36	15	25	58	106	135	100	140	224	201	153	149	132	45	54	37	45	64	45	42	56	41	85
		-29	-149	-117	-27	-20	-22	-89	-206	-93	-38	-201	-374	-417	-323	-266	-95	-23	-14	-19	-9	-15	-30	-34	-21	-110
		90	217	155	43	46	81	196	342	194	180	426	577	571	473	399	142	78	51	65	74	62	73	91	63	195
4		50	39	21	12	18	20	38	75	49	35	23	22	18	53	54	54	20	33	30	21	16	34	16	27	32
		-26	-20	-20	-38	-31	-28	-26	-87	-40	-25	-20	-21	-19	-40	-78	-85	-65	-88	-19	-24	-27	-56	-41	-30	-40
		77	60	42	50	50	48	65	163	90	62	44	44	37	95	133	141	86	122	50	45	44	91	58	58	73
5		24	50	69	62	47	53	86	120	132	111	116	129	171	61	12	15	15	23	24	21	19	27	25	34	60
		-23	-30	-74	-74	-61	-36	-150	-130	-165	-59	-41	-70	-233	-190	-52	-26	-30	-17	-15	-22	-31	-34	-36	-36	-68
		47	81	143	136	108	90	236	251	298	172	157	200	405	252	64	42	45	41	40	44	50	61	61	70	129
6		49	94	133	95	138	57	39	72	71	111	82	72	84	96	110	188	189	183	226	237	157	171	177	141	124
		-36	-96	-200	-118	-95	-97	-22	-22	-36	-60	-252	-75	-87	-92	-216	-401	-286	-311	-296	-270	-104	-70	-128	-126	-146
		86	191	333	214	234	155	61	96	108	172	335	148	172	188	327	590	477	496	522	508	262	241	306	269	270
7		119	63	75	74	97	90	58	26	90	116	98	110	53	117	154	142	216	220	235	386	261	271	277	230	149
		-60	-31	-63	-201	-219	-216	-52	-33	-48	-141	-107	-178	-55	-130	-281	-280	-256	-78	-53	-264	-196	-108	-114	-423	-149
		180	95	138	275	317	308	111	60	139	258	206	288	110	249	436	423	473	299	289	651	457	380	393	654	299
8		269	301	218	129	83	136	189	235	132	330	215	189	237	155	89	133	134	184	129	161	260	228	219	145	188
		-873	-790	-477	-58	-23	-78	-162	-519	-573	-426	-221	-449	-646	-362	-223	-190	-161	-200	-143	-167	-331	-382	-382	-185	-334
		1143	1093	696	188	107	215	352	756	707	757	436	638	884	518	313	323	296	385	273	328	592	611	601	331	523
9		212	248	219	395	150	167	140	267	219	94	114	165	81	140	168	182	175	167	158	278	292	270	314	180	200
		-360	-551	-586	-812	-463	-204	-168	-483	-673	-93	-124	-392	-258	-409	-486	-283	-395	-442	-281	-426	-465	-236	-559	-710	-411
		572	800	806	1209	614	372	309	752	894	188	240	558	340	549	655	466	571	610	440	706	758	507	874	891	612
10		180	233	341	289	272	371	307	241	210	114	154	188	225	186	93	58	47	111	149	183	216	218	183	78	194
		-527	-582	-665	-830	-634	-650	-638	-578	-629	-698	-683	-571	-609	-323	-100	-48	-34	-76	-193	-294	-137	-244	-238	-94	-420
		709	817	1008	1120	907	1022	947	820	840	812	838	759	835	509	194	107	82	188	343	477	354	464	422	174	615
11		51	42	37	22	16	21	21	20	34	51	68	52	41	15	22	30	37	38	38	36	30	49	41	34	35
		-33	-57	-86	-46	-47	-41	-44	-41	-29	-29	-59	-51	-32	-31	-44	-42	-80	-29	-25	-7	-38	-57	-61	-37	-44
		85	101	124	70	63	62	65	62	64	81	128	104	74	47	67	72	119	68	63	44	68	107	102	72	80
12		46	39	83	185	200	179	96	75	140	133	90	194	165	286	297	220	181	113	174	297	319	280	242	226	177
		-29	-43	-92	-198	-196	-162	-211	-85	-118	-123	-94	-215	-498	-502	-571	-512	-494	-346	-343	-370	-493	-278	-225	-453	-277
		76	84	175	384	398	342	309	161	259	258	186	410	665	789	869	733	676	460	517	668	814	559	467	680	456
13		225	175	207	125	133	52	22	8	7	12	34	49	54	49	83	44	35	45	84	164	232	156	132	138	94
		-394	-333	-422	-237	-143	-54	-32	-27	-37	-37	-34	-25	-25	-25	-42	-96	-45	-20	-47	-73	-302	-194	-126	-129	-121
		619	509	630	362	278	107	55	37	45	51	69	75	81	76	125	141	80	65	131	238	534	351	258	268	216
14		107	68	74	109	137	84	82	40	127	165	87	214	223	156	47	38	32	40	30	34	39	74	93	54	90
		-93	-82	-97	-236	-259	-126	-166	-68	-94	-306	-148	-279	-631	-282	-59	-75	-40	-50	-33	-9	-24	-46	-72	-36	-138
		201	152	171	347	398	211	248	109	222	471	237	495	854	440	107	114	73	91	64	43	64	121	166	90	229
15		37	26	38	39	42	33	39	92	139	77	48	57	93	85	71	71	54	95	226	184	84	70	110	98	80
		-30	-30	-25	-43	-41	-39	-26	-38	-111	-236	-50	-29	-79	-88	-175	-116	-100	-71	-316	-282	-21	-33	-126	-174	-95
		68	57	64	83	84	72	66	131	251	315	100	87	173	173	248	189	154	168	543	466	106	103	237	273	175

16	117	45	119	226	132	93	52	36	23	22	84	86	77	119	82	64	44	40	33	56	83	97	140	150	84
	-221	-137	-127	-442	-291	-134	-30	-22	-24	-31	-46	-71	-92	-216	-202	-103	-45	-54	-14	-23	-60	-145	-141	-345	-126
	339	182	246	669	423	228	83	59	48	54	132	158	170	335	285	167	90	95	48	79	144	243	282	497	211
17	110	76	181	203	214	220	80	35	43	105	105	94	100	90	88	131	76	68	60	120	223	186	54	58	113
	-212	-85	-211	-437	-329	-248	-109	-34	-28	-83	-114	-56	-54	-119	-109	-195	-63	-53	-33	-65	-447	-368	-15	-21	-145
	323	161	393	641	544	469	189	69	72	189	220	151	156	210	198	326	141	122	94	186	672	554	70	80	260
18	35	23	15	14	12	43	20	20	35	53	78	41	35	37	93	60	61	58	45	64	78	167	173	88	56
	-31	-27	-17	-26	-31	-32	-39	-32	-22	-36	-46	-100	-37	-81	-32	-38	-25	-116	-70	-36	-50	-82	-386	-111	-63
	67	51	33	40	43	76	60	52	58	90	126	143	74	119	126	99	86	175	116	100	129	251	560	200	120
19	47	31	70	113	106	112	148	143	97	99	70	67	46	94	84	82	33	63	184	220	119	82	75	50	93
	-40	-35	-74	-185	-144	-122	-113	-305	-325	-214	-122	-36	-31	-164	-224	-210	-65	-78	-198	-367	-110	-93	-71	-101	-143
	88	67	144	299	252	235	263	450	423	314	193	104	78	258	310	294	99	142	382	588	230	176	147	152	237
20	47	40	40	106	68	131	186	234	94	223	146	76	103	65	55	25	26	30	38	35	28	28	23	25	78
	-71	-81	-63	-116	-157	-239	-480	-370	-152	-330	-124	-101	-160	-161	-167	-98	-83	-27	-20	-37	-22	-20	-24	-24	-130
	119	122	104	223	226	371	667	606	248	554	272	177	264	227	224	123	110	58	58	73	50	49	48	49	209
21	18	22	41	35	17	20	15	20	36	40	32	38	25	20	18	12	21	26	43	37	27	35	25	35	27
	-19	-23	-44	-41	-34	-31	-35	-33	-35	-45	-42	-40	-35	-27	-45	-26	-24	-21	-34	-22	-54	-68	-45	-25	-35
	38	46	86	77	52	52	51	53	72	86	76	80	61	49	64	39	46	48	78	60	82	104	71	62	64
22	32	25	35	62	31	30	35	19	30	37	134	100	55	39	45	32	39	47	42	48	41	30	25	23	43
	-23	-27	-25	-116	-45	-27	-25	-27	-26	-35	-65	-62	-54	-37	-27	-32	-27	-16	-11	-10	-52	-33	-23	-20	-35
	55	52	60	178	77	57	61	48	58	73	201	163	110	78	73	65	67	64	54	60	94	64	48	44	79
23	26	23	16	12	8	6	13	28	61	37	52	62	48	81	74	27	11	29	49	56	53	34	29	22	36
	-22	-22	-18	-24	-29	-35	-37	-27	-59	-40	-40	-36	-39	-94	-107	-92	-76	-39	-33	-56	-73	-54	-39	-32	-47
	49	46	35	36	37	42	50	56	120	78	93	100	88	176	183	120	88	70	83	113	126	89	68	55	83
24	24	24	47	50	47	45	92	85	87	53	47	62	60	68	41	16	10	27	37	34	26	26	22	20	44
	-27	-19	-39	-31	-38	-27	-37	-92	-168	-40	-25	-30	-60	-127	-85	-43	-29	-25	-25	-33	-29	-31	-34	-31	-47
	52	44	87	81	85	73	129	178	257	94	74	93	122	196	128	60	40	52	62	67	55	58	57	51	91
25	15	15	23	22	24	26	22	15	20	21	26	42	30	24	24	21	16	23	32	38	33	34	28	30	25
	-27	-23	-20	-29	-31	-31	-39	-38	-30	-27	-25	-25	-23	-21	-9	-21	-15	-15	-15	-13	-19	-28	-27	-19	-24
	43	39	44	52	55	58	61	54	51	48	52	68	54	45	34	43	31	39	48	52	53	62	56	51	50
26	27	27	28	45	34	24	44	60	75	78	94	118	88	67	54	39	39	52	61	53	52	44	38	52	54
	-22	-21	-19	-29	-41	-37	-30	-32	-49	-39	-38	-84	-94	-62	-48	-59	-81	-73	-20	-20	-21	-26	-24	-22	-41
	51	49	48	74	75	61	74	92	124	117	133	203	183	130	103	100	121	126	82	74	74	71	62	75	96
27	57	55	58	121	256	353	390	296	99	59	117	204	215	201	97	74	69	86	93	129	113	145	169	118	149
	-19	-16	-5	-34	-186	-379	-468	-274	-52	-14	-28	-91	-374	-210	-77	-28	-50	-10	-39	-26	-33	-65	-99	-117	-112
	77	72	64	155	442	734	860	572	153	74	146	296	590	411	175	103	119	96	133	156	146	211	269	236	262
28	138	199	185	305	127	119	91	90	113	197	145	99	116	89	44	101	315	325	289	174	98	58	134	226	157
	-100	-104	-284	-383	-121	-108	-48	-42	-63	-76	-232	-207	-134	-130	-144	-81	-252	-215	-206	-168	-51	-49	-121	-334	-152
	240	303	470	688	248	229	140	133	176	274	378	306	251	220	189	183	567	540	495	343	150	108	256	562	310
29	183	225	183	76	55	32	60	67	93	122	158	45	12	22	43	43	43	35	31	53	35	54	64	51	74
	-289	-409	-465	-161	-130	-67	-47	-136	-124	-155	-442	-184	-53	-26	-31	-33	-61	-80	-53	-73	-35	-42	-72	-61	-135
	473	635	648	238	186	99	108	204	218	277	602	231	66	49	74	77	104	116	84	127	71	97	136	112	210
30	37	26	33	45	85	66	68	54	47	33	44	51	104	82	46	22	17	61	41	31	29	23	34	23	46
	-23	-17	-19	-47	-99	-93	-61	-39	-48	-49	-30	-37	-131	-113	-54	-53	-51	-75	-80	-37	-21	-19	-36	-31	-53
	61	43	52	93	186	160	130	93	97	84	75	90	237	197	102	76	69	138	122	68	50	43	71	54	100
31	20	45	27	23	15	8	7	14	28	23	37	79	77	118	55	17	21	31	24	51	41	33	27	25	35
	-27	-36	-16	-37	-45	-49	-60	-52	-45	-40	-59	-58	-150	-170	-176	-95	-85	-35	-39	-53	-49	-48	-25	-20	-61
	48	81	44	60	61	57	68	66	73	63	97	138	229	289	232	113	107	67	64	105	90	81	52	46	97

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)

JUNE 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices JUNE 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	20	23	73	30	24	21	22	50	58	45	34	44	57	99	134	58	45	59	51	52	48	38	25	27	47
	AL	-16	-13	-59	-54	-33	-34	-26	-50	-38	-34	-32	-28	-40	-49	-192	-131	-127	-92	-69	-85	-78	-61	-23	-17	-57
	AE	38	37	134	86	59	57	49	101	97	81	67	73	98	149	326	190	173	152	120	137	126	99	48	45	106
2		45	72	104	102	106	80	70	80	87	118	184	161	128	146	94	62	53	54	76	92	66	58	37	33	88
		-12	-41	-81	-56	-56	-34	-22	-28	-131	-72	-90	-124	-109	-146	-184	-99	-69	-102	-162	-104	-12	-23	-3	-7	-74
		59	115	187	159	164	115	93	110	219	191	274	286	238	293	279	162	122	156	239	196	78	82	41	42	163
3		39	86	136	127	108	169	164	219	210	209	302	319	151	112	89	70	146	143	153	94	114	125	143	191	151
		-16	-39	-198	-142	-129	-115	-99	-256	-262	-396	-459	-381	-130	-165	-144	-168	-244	-275	-164	-30	-42	-67	-140	-144	-175
		56	127	335	271	238	286	265	476	474	606	762	702	281	277	233	238	391	418	317	125	157	193	284	336	327
4		270	155	197	337	266	257	288	451	264	106	295	165	215	241	172	168	224	161	202	413	337	178	239	288	245
		-195	-303	-304	-382	-516	-489	-527	-422	-276	-620	-621	-273	-282	-355	-385	-407	-305	-108	-189	-511	-512	-264	-250	-434	-372
		467	460	503	721	783	747	816	874	542	727	918	439	498	596	557	576	531	270	392	924	849	443	491	724	619
5		209	252	397	307	296	282	177	149	178	195	186	230	187	102	79	125	168	201	187	118	81	92	174	169	189
		-448	-336	-456	-434	-454	-457	-189	-161	-369	-368	-311	-640	-245	-74	-76	-247	-342	-469	-254	-83	-14	-86	-349	-339	-300
		658	590	854	743	751	740	367	312	548	564	498	870	432	177	156	373	511	670	442	203	96	179	524	510	490
6		202	169	248	175	92	62	198	183	140	104	68	90	53	49	100	97	55	76	68	167	290	121	195	120	130
		-292	-323	-291	-288	-161	-98	-317	-485	-408	-168	-104	-204	-101	-99	-160	-146	-75	-119	-100	-211	-558	-179	-228	-237	-223
		495	493	541	465	254	162	516	669	549	273	173	294	154	149	261	244	131	195	169	378	848	301	425	359	354
7		184	143	76	39	114	87	67	161	188	168	112	101	190	138	101	63	103	170	125	60	111	208	235	131	128
		-410	-218	-66	-39	-79	-129	-71	-272	-452	-345	-102	-115	-544	-463	-154	-57	-227	-389	-155	-22	-77	-301	-333	-153	-215
		595	363	143	80	194	217	139	433	640	514	215	217	734	602	255	120	331	560	280	83	189	510	569	285	345
8		182	175	142	140	179	87	41	66	171	163	73	51	43	115	94	42	48	103	139	218	141	66	44	24	106
		-219	-333	-162	-214	-377	-148	-48	-67	-241	-212	-90	-42	-61	-151	-213	-53	-61	-176	-175	-385	-211	-90	-49	-41	-159
		403	509	305	356	558	237	91	135	414	376	164	94	105	266	307	96	110	279	315	603	353	157	95	66	266
9		57	118	142	108	125	86	56	22	64	99	110	78	77	57	39	22	35	43	29	30	46	60	74	44	68
		-65	-262	-284	-232	-204	-71	-40	-32	-27	-136	-266	-260	-209	-128	-111	-109	-141	-56	-70	-68	-68	-74	-68	-42	-126
		124	382	427	342	331	158	98	55	93	235	376	338	286	185	151	132	177	100	100	98	114	134	142	87	194
10		24	16	13	6	5	33	97	98	105	140	103	80	35	48	40	24	24	62	88	80	179	263	104	295	82
		-36	-28	-18	-28	-33	-42	-56	-187	-198	-104	-99	-128	-54	-19	-16	-37	-36	-34	-38	-61	-125	-164	-525	-686	-115
		62	46	32	35	40	76	155	286	304	245	202	209	89	69	58	62	61	96	127	141	305	427	630	982	197
11		157	148	99	52	43	39	71	56	43	51	98	83	74	59	49	55	61	106	107	71	73	67	53	54	74
		-139	-109	-71	-81	-60	-72	-75	-57	-22	-32	-35	-76	-122	-27	-42	-13	-49	-135	-144	-27	-29	-31	-53	-76	-66
		297	258	172	135	105	113	147	114	66	84	133	160	196	87	92	70	111	241	252	98	103	99	108	131	140
12		53	47	63	28	80	163	146	203	135	140	294	169	62	57	47	52	61	102	83	70	73	183	270	245	118
		-26	-20	-20	-34	-38	-68	-264	-202	-137	-58	-256	-332	-75	-68	-33	-44	-36	-177	-181	-77	-55	-100	-362	-314	-124
		81	68	85	63	119	233	412	406	273	199	551	502	138	125	81	97	97	280	265	147	128	285	634	561	243
13		170	82	134	95	108	176	132	175	172	90	103	173	123	111	61	36	43	67	87	89	116	157	80	48	109
		-174	-84	-96	-202	-227	-221	-139	-201	-431	-111	-72	-166	-298	-254	-58	-52	-39	-65	-115	-87	-74	-214	-147	-62	-150
		346	167	232	298	336	398	273	378	605	202	176	339	421	365	120	88	83	132	202	177	191	373	228	111	260
14		34	24	34	69	189	129	143	109	136	170	151	99	83	51	33	14	36	59	38	38	68	66	124	131	84
		-34	-22	-28	-63	-271	-266	-113	-75	-92	-404	-340	-153	-73	-73	-64	-80	-95	-80	-37	-33	-55	-45	-136	-220	-119
		69	48	63	133	461	397	257	186	229	575	491	253	157	125	99	94	132	139	75	71	123	111	262	352	204
15		127	105	149	136	66	162	168	112	74	30	31	41	43	83	42	29	29	24	30	33	26	17	24	26	67
		-143	-94	-199	-204	-120	-222	-337	-161	-72	-40	-28	-21	-21	-102	-75	-28	-22	-22	-17	-19	-29	-14	-18	-23	-85
		271	200	350	341	188	386	507	274	147	71	60	64	65	185	118	58	53	47	49	53	57	32	44	50	153

PROVISIONAL HOURLY VALUES OF **AU**, **AL**, AND **AE** INDICES
(continued)

JUNE 1993

16	24	22	23	26	21	25	62	84	71	66	66	107	77	54	27	23	23	35	34	31	28	27	34	27	42
	-23	-19	-14	-21	-33	-34	-31	-91	-94	-28	-15	-121	-101	-66	-32	-19	-13	-20	-14	-13	-14	-12	-16	-12	-36
	48	43	38	49	56	61	95	176	166	96	83	228	179	120	60	42	37	56	49	45	43	40	51	41	79
17	29	40	31	28	27	71	91	101	101	47	49	20	23	21	25	36	51	51	90	91	109	113	70	41	56
	-14	-13	-17	-29	-27	-51	-102	-28	-16	-77	-32	-33	-28	-22	-20	-26	-55	-129	-142	-102	-146	-186	-105	-45	-60
	44	54	49	59	56	124	194	130	119	125	82	55	52	44	46	63	106	180	233	193	255	300	176	86	118
18	35	20	19	17	17	17	13	15	14	25	37	20	30	41	36	55	55	32	26	24	23	21	21	21	26
	-21	-25	-22	-24	-26	-33	-41	-37	-32	-30	-32	-30	-31	-24	-38	-108	-182	-66	-21	-9	-18	-29	-34	-29	-39
	57	46	42	42	44	51	56	53	47	56	71	51	62	66	76	163	237	99	48	34	41	50	55	51	67
19	24	29	24	55	78	100	143	202	151	82	108	104	124	127	96	89	71	61	109	111	141	127	98	110	99
	-19	-11	-10	-40	-47	-69	-80	-157	-112	-33	-50	-44	-186	-234	-250	-177	-129	-105	-81	-35	-62	-163	-138	-98	-97
	45	41	35	97	126	170	224	361	264	116	159	148	311	361	346	267	201	167	191	147	204	291	237	209	197
20	50	25	18	23	63	109	127	127	131	90	118	128	97	80	57	50	47	44	60	58	44	35	35	35	69
	-22	-18	-21	-30	-29	-44	-193	-159	-156	-49	-23	-81	-99	-102	-38	-13	-31	-41	-104	-84	-31	-22	-28	-30	-60
	74	45	41	55	93	155	321	287	288	140	141	210	196	182	95	64	79	86	165	143	76	58	64	66	130
21	19	27	19	10	10	11	10	10	12	17	30	24	25	22	30	26	20	24	36	40	47	43	46	52	25
	-23	-20	-10	-13	-22	-29	-33	-34	-38	-45	-35	-26	-24	-20	-14	-13	-16	-21	-28	-25	-67	-57	-46	-33	-29
	44	48	30	25	33	40	44	46	52	63	66	51	51	43	45	40	37	45	65	66	114	100	93	85	55
22	84	90	87	63	48	58	46	43	56	42	32	18	18	20	47	60	53	69	64	52	82	112	132	163	64
	-28	-35	-63	-42	-27	-31	-37	-39	-24	-41	-55	-35	-31	-30	-43	-75	-101	-174	-145	-42	-87	-106	-73	-94	-61
	114	126	152	106	76	90	85	84	82	85	89	54	51	51	91	135	154	245	209	95	169	219	205	258	210
23	167	182	209	198	149	61	24	55	48	51	68	62	79	103	79	82	82	74	127	368	232	153	106	112	120
	-126	-116	-129	-170	-64	-19	-23	-18	-33	-39	-29	-33	-36	-22	-6	-16	1	-5	-23	-143	-131	-64	-20	-53	-55
	294	299	339	370	214	81	48	74	82	91	98	96	116	127	87	99	82	80	151	512	364	218	128	166	176
24	146	146	216	233	218	86	265	246	179	140	227	168	112	154	251	209	95	88	95	98	112	112	184	217	167
	-41	-185	-220	-288	-225	-91	-236	-556	-314	-156	-235	-219	-92	-209	-600	-296	-129	-53	-71	-122	-62	-191	-208	-290	-212
	188	332	438	522	445	179	502	803	494	298	464	388	205	364	851	506	225	142	166	221	175	303	394	509	380
25	138	114	145	101	137	191	129	94	306	274	221	126	124	170	138	85	85	91	108	91	54	120	124	118	137
	-196	-40	-140	-134	-209	-309	-106	-57	-298	-493	-202	-232	-147	-375	-328	-141	-181	-142	-110	-68	-64	-137	-159	-92	-182
	335	156	286	236	347	501	237	153	605	768	424	359	272	545	467	226	266	234	219	160	119	258	284	211	320
26	189	136	115	108	103	57	51	54	42	39	45	62	43	30	39	44	39	50	32	34	42	95	97	100	69
	-190	-264	-186	-85	-207	-41	-38	-31	-39	-37	-39	-45	-45	-22	-21	-50	-76	-148	-100	-41	-18	-69	-136	-103	-85
	380	401	303	195	311	100	91	86	82	77	85	108	89	53	61	95	116	198	133	77	61	165	233	205	154
27	113	56	87	51	32	38	33	99	173	96	101	156	52	59	61	70	69	53	42	43	40	51	61	40	70
	-80	-89	-135	-123	-37	-34	-33	-53	-160	-183	-75	-138	-55	-63	-22	-34	-105	-106	-32	-44	-72	-74	-31	-33	-75
	195	146	224	176	70	73	67	153	334	279	176	295	108	122	84	106	175	159	74	88	112	126	93	74	146
28	29	32	49	43	33	47	32	53	63	60	50	52	59	71	36	27	25	21	25	26	27	30	29	20	39
	-23	-17	-21	-34	-43	-50	-46	-37	-29	-68	-124	-47	-70	-37	-27	-30	-22	-25	-30	-26	-30	-37	-39	-37	-40
	54	51	71	78	77	99	79	91	94	129	175	100	129	109	65	58	48	46	55	52	58	68	69	58	80
29	24	31	33	35	62	48	81	105	39	35	139	224	207	142	48	48	48	36	42	57	77	92	94	99	77
	-37	-23	-19	-27	-55	-74	-78	-93	-74	-60	-69	-328	-289	-222	-84	-64	-58	-74	-30	-33	-32	-44	-43	-87	-83
	63	56	53	63	118	124	160	199	115	96	210	553	497	364	133	113	107	111	72	90	109	136	138	188	161
30	175	280	227	198	221	224	165	155	81	26	22	17	33	61	64	78	78	50	48	92	57	60	107	111	110
	-151	-252	-273	-210	-242	-219	-278	-259	-80	-39	-30	-44	-32	-76	-112	-234	-216	-53	-28	-49	-24	-57	-60	-140	-131
	328	533	501	409	464	445	444	415	162	66	52	61	66	137	176	312	294	104	77	142	81	117	168	252	242

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES (continued)

JULY 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices JULY 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	130	215	241	252	222	169	168	213	217	130	51	255	88	171	171	81	28	58	125	167	182	324	310	292	178
	AL	-176	-267	-338	-585	-271	-76	-107	-277	-342	-65	-22	-154	-300	-503	-327	-104	-47	-40	-66	-104	-295	-342	-361	-347	-230
	AE	306	482	580	838	495	247	276	491	559	196	74	411	389	675	499	186	75	99	192	272	478	667	672	640	408
2		276	166	230	159	187	81	56	86	114	121	186	188	151	280	337	396	429	454	400	338	312	305	297	301	244
		-238	-172	-465	-223	-243	-102	-28	-43	-59	-154	-284	-268	-183	-457	-531	-621	-739	-674	-536	-533	-311	-269	-245	-617	-333
		514	339	696	383	431	185	85	131	174	276	472	458	335	738	869	1019	1169	1129	937	871	624	575	543	919	578
3		223	231	411	403	367	272	153	141	69	62	74	58	38	71	61	43	45	31	46	38	44	36	66	94	128
		-542	-910	-649	-578	-477	-334	-233	-22	-12	-23	-146	-35	-20	-38	-55	-56	-24	-16	-11	-23	-34	-41	-48	-56	-183
		765	1141	1061	981	846	607	386	164	82	86	221	94	59	111	117	100	70	48	58	62	80	78	115	151	312
4		142	156	75	55	38	51	126	112	104	156	192	90	66	31	38	21	26	67	34	20	18	32	24	44	72
		-160	-186	-196	-33	-45	-17	-58	-144	-127	-181	-190	-82	-79	-47	-33	-33	-59	-73	-33	-32	-35	-48	-35	-36	-82
		303	343	272	89	84	69	186	258	232	339	383	172	146	80	71	54	86	140	68	54	54	81	61	81	154
5		82	46	83	137	82	114	35	13	17	9	5	11	17	20	19	33	37	48	54	36	32	37	21	22	42
		-66	-25	-29	-243	-146	-111	-74	-35	-29	-35	-38	-32	-24	-26	-26	-42	-151	-116	-75	-37	-65	-35	-24	-26	-63
		148	72	114	381	228	226	110	49	47	45	44	44	41	46	45	77	190	165	130	73	97	73	46	50	106
6		14	13	9	9	9	18	42	77	67	69	75	23	31	51	17	8	19	25	38	47	45	44	48	61	36
		-26	-22	-15	-8	-13	-19	-22	-60	-29	-88	-174	-151	-79	-126	-103	-59	-34	-27	-43	-34	-20	-11	-25	-26	-51
		42	37	26	18	23	38	65	138	97	158	249	175	111	179	121	68	53	52	81	82	66	57	75	88	87
7		96	99	165	138	110	67	45	23	36	28	33	20	28	24	18	36	34	25	29	39	28	26	41	28	51
		-164	-187	-151	-203	-88	-70	-27	-23	-29	-35	-37	-30	-21	-13	-15	-11	-12	-26	-26	-38	-38	-19	-17	-18	-54
		260	287	318	342	200	138	74	46	65	63	70	51	49	38	34	47	47	52	55	77	66	46	59	48	105
8		27	27	113	167	186	115	93	112	108	108	103	135	188	186	152	217	197	130	75	62	71	47	56	42	113
		-20	-13	-53	-228	-199	-23	-24	-47	-60	-319	-280	-219	-206	-226	-312	-272	-252	-121	-36	-5	-10	0	-10	-21	-123
		48	41	167	396	386	138	118	161	170	428	385	355	394	412	465	491	450	251	112	68	82	47	67	64	237
9		45	60	130	209	238	161	131	98	61	35	59	70	58	154	206	251	259	326	181	95	58	64	77	76	129
		-60	-22	-73	-380	-333	-200	-118	-33	-46	-79	-56	-199	-81	-132	-209	-183	-243	-209	-173	-61	-12	-31	-170	-81	-133
		107	83	204	591	572	362	251	132	108	115	116	271	140	287	416	436	503	535	354	157	70	95	247	157	263
10		66	157	146	93	84	69	95	118	106	103	183	129	167	121	64	59	51	42	83	170	210	160	89	106	111
		-67	-182	-295	-129	-93	-71	-122	-240	-214	-213	-440	-239	-248	-100	-21	-16	0	-22	-16	-67	-244	-95	-119	-94	-139
		134	341	442	223	179	142	218	359	322	318	624	369	416	222	86	77	51	64	100	237	455	256	209	200	252
11		89	107	145	213	112	203	249	188	314	104	210	179	113	38	66	88	99	95	124	87	60	46	35	40	125
		-114	-199	-335	-587	-423	-320	-498	-377	-528	-215	-296	-293	-249	-52	-96	-167	-256	-39	-105	-35	-200	-20	-13	-22	-227
		204	307	480	801	535	523	748	566	844	321	508	473	363	92	164	256	356	135	229	122	261	67	49	63	353
12		59	60	64	48	30	29	56	80	86	53	40	65	23	31	43	78	39	44	31	21	49	58	88	105	53
		-97	-56	-49	-63	-31	-55	-86	-210	-302	-167	-125	-106	-56	-10	-23	-94	-43	-32	-26	-15	-30	-116	-116	-103	-84
		157	116	114	111	61	85	143	292	389	221	165	173	80	42	66	173	84	77	57	37	80	174	204	208	138
13		92	86	148	186	131	74	98	93	124	154	70	38	59	123	67	58	71	61	96	100	44	33	55	43	88
		-139	-181	-220	-371	-256	-92	-153	-163	-393	-380	-134	-99	-80	-347	-192	-47	-36	-179	-168	-95	-34	-24	-56	-87	-164
		232	268	370	558	388	167	253	256	518	535	204	138	140	472	260	105	108	241	265	196	79	58	112	131	252
14		23	17	8	10	22	33	25	34	23	33	39	23	25	28	21	23	24	17	38	52	36	23	30	27	26
		-16	-12	-16	-13	-24	-37	-37	-48	-29	-30	-31	-33	-71	-44	-42	-56	-48	-11	-9	-58	-47	-18	-30	-35	-33
		39	31	25	24	47	70	62	83	53	63	70	56	97	73	64	80	74	29	47	111	84	42	61	63	60
15		45	65	58	49	86	93	117	141	93	70	18	30	50	97	71	35	48	77	80	66	71	82	44	84	70
		-31	-23	-21	-10	-9	-139	-65	-62	-61	-56	-20	-22	-26	-37	-106	-34	-16	-87	-42	-34	-57	-51	-14	-29	-44
		76	89	81	59	96	234	183	204	155	128	39	53	76	134	179	70	65	164	123	100	129	134	59	113	114

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
JULY 1993

16	43	33	48	42	32	23	6	5	15	24	26	15	21	23	28	32	39	32	28	32	28	44	51	64	31
	-28	-30	-19	-19	-16	-11	-23	-23	-30	-40	-38	-24	-21	-21	-23	-24	-58	-65	-55	-28	-22	-39	-38	-66	-32
	72	64	68	61	49	34	30	28	45	65	64	40	43	46	53	58	98	98	83	60	51	84	90	131	63
17	35	36	19	15	15	14	27	25	44	46	25	25	32	33	42	52	38	17	19	15	17	21	46	69	30
	-17	-8	-3	-5	-8	-18	-27	-28	-24	-37	-31	-26	-27	-20	-22	-36	-25	-35	-25	-47	-35	-32	-32	-29	-25
	53	45	23	21	24	32	55	53	68	84	56	52	60	54	65	89	64	53	45	63	53	54	78	99	56
18	53	32	23	27	28	36	45	100	84	98	56	44	38	34	35	51	43	33	36	38	40	37	38	47	46
	-32	-20	-4	-2	-5	-15	-19	-89	-155	-247	-96	-32	-42	-15	-27	-29	-23	-18	-87	-76	-21	-24	-28	-28	-47
	85	52	29	29	33	52	65	189	239	346	154	77	81	50	63	81	67	51	124	115	62	62	67	77	94
19	52	77	107	116	131	125	86	36	36	36	40	63	71	47	39	32	25	24	27	30	37	66	87	65	61
	-32	-38	-50	-179	-157	-90	-43	-41	-33	-49	-46	-87	-52	-21	-33	-30	-20	-14	-14	-16	-26	-41	-55	-43	-50
	85	116	159	296	290	217	130	78	69	85	87	151	124	69	73	62	46	38	41	47	64	107	143	108	112
20	79	67	86	99	170	227	285	177	161	177	206	190	121	74	61	51	75	175	275	358	189	175	269	179	164
	-37	-46	-11	-16	-108	-151	-275	-103	-44	-61	-326	-172	-23	-11	-3	-10	-45	-133	-287	-180	-63	-160	-376	-235	-120
	116	113	98	116	279	379	561	281	205	239	534	363	145	86	64	61	121	309	562	539	253	336	646	414	284
21	199	94	54	134	179	145	145	120	134	211	238	154	145	127	108	103	137	162	125	170	109	113	59	107	136
	-308	-153	-50	-91	-287	-457	-280	-176	-205	-329	-251	-192	-204	-346	-259	-194	-115	-255	-147	-151	-88	-115	-99	-125	-203
	508	248	106	227	467	602	426	298	340	542	491	347	350	474	368	298	254	419	273	321	197	229	158	233	341
22	145	160	142	128	117	70	112	125	103	135	137	151	166	63	40	35	35	38	37	82	101	129	67	56	99
	-305	-315	-218	-193	-154	-85	-205	-153	-174	-299	-312	-243	-275	-125	-16	-43	-49	-58	-51	-70	-51	-282	-105	-20	-158
	451	477	361	322	272	156	319	280	279	435	450	394	442	189	57	79	86	96	89	153	152	412	172	77	258
23	62	81	102	83	61	57	97	114	67	86	44	56	86	66	61	52	40	24	23	28	29	27	29	44	59
	-26	-79	-244	-223	-68	-21	-70	-233	-247	-122	-69	-68	-151	-127	-60	-100	-34	-6	-6	-11	-9	-15	-20	-25	-85
	89	161	346	306	130	79	169	348	315	209	113	124	238	194	122	154	75	31	30	40	39	43	50	69	145
24	45	45	21	23	17	19	46	93	76	58	51	66	59	65	37	52	68	72	62	62	40	35	34	30	49
	-29	-28	-26	-19	-22	-34	-38	-73	-139	-175	-99	-93	-88	-68	-20	-29	-82	-296	-205	-44	-8	-9	-13	-17	-69
	75	74	48	42	39	54	85	166	216	234	151	159	148	134	58	82	151	368	268	106	48	46	48	48	119
25	50	84	61	93	112	77	41	75	68	93	71	55	41	16	22	21	19	23	36	42	46	30	38	54	53
	-25	-96	-51	-135	-192	-35	-35	-24	-134	-144	-101	-148	-102	-34	-34	-87	-36	-8	-77	-104	-26	-22	-31	-23	-71
	75	181	114	229	306	112	77	100	203	237	173	203	144	52	57	109	56	32	114	146	73	53	69	78	125
26	71	66	66	74	91	70	52	34	16	20	41	36	59	72	60	40	32	41	34	38	39	33	27	32	48
	-44	-55	-73	-65	-175	-58	-30	-29	-37	-39	-40	-63	-43	-90	-101	-46	-67	-7	-6	-7	-14	-35	-20	-15	-48
	116	121	140	139	267	129	82	64	54	60	81	100	103	163	162	88	100	48	41	46	54	68	49	48	97
27	56	98	80	60	34	21	22	47	50	44	31	29	35	39	56	54	51	68	79	112	154	97	65	46	59
	-11	-78	-66	-31	-14	-16	-26	-28	-36	-60	-81	-35	-19	-25	-25	-76	-211	-233	-112	-72	-39	-65	-61	-18	-60
	67	176	147	92	50	37	48	75	86	105	114	65	54	65	83	131	263	302	192	185	193	162	127	65	120
28	48	63	91	70	42	122	140	133	92	23	24	21	18	30	22	35	45	57	83	122	149	132	106	144	76
	-31	-103	-127	-49	-15	-35	-89	-173	-64	-30	-27	-30	-21	-10	-6	-15	-36	-104	-165	-76	-92	-98	-70	-95	-65
	79	166	219	120	58	158	231	308	157	54	52	52	40	40	29	51	81	162	249	199	242	231	177	240	141
29	218	174	162	126	84	38	50	103	86	83	80	185	209	136	106	200	125	117	215	187	153	189	207	202	143
	-252	-208	-138	-112	-57	-21	-18	-33	-173	-90	-61	-121	-309	-153	-140	-371	-169	-23	-300	-316	-229	-174	-134	-45	-152
	471	383	301	239	141	59	70	138	260	173	141	307	519	290	247	572	296	141	515	503	383	364	342	247	296
30	138	123	195	179	118	130	41	35	19	24	24	36	28	71	90	57	30	45	48	28	23	19	14	35	65
	-37	-111	-294	-126	-25	-36	-29	-18	-21	-30	-32	-32	-28	-50	-106	-65	-104	-133	-74	-42	-46	-49	-48	-36	-66
	176	235	491	306	144	168	70	53	41	54	57	69	56	123	198	123	136	179	123	70	69	68	63	72	131
31	75	105	110	89	106	94	54	31	31	19	14	26	35	62	46	41	29	48	38	23	51	31	43	50	52
	-85	-186	-160	-60	-157	-97	-21	-19	-23	-22	-30	-41	-49	-115	-73	-37	-33	-67	-50	-48	-122	-102	-40	-31	-70
	161	292	272	150	265	192	76	50	55	42	45	67	85	178	121	79	62	116	89	72	174	133	83	82	122

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES (continued)

AUGUST 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices AUGUST 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	53	27	19	12	7	6	12	19	17	16	17	19	18	24	26	24	33	45	57	50	42	30	27	28	26
	AL	-64	-26	-11	-6	-12	-16	-22	-18	-21	-20	-20	-19	-24	-23	-29	-33	-33	-25	-36	-61	-53	-29	-30	-26	-27
	AE	119	55	32	19	20	24	34	38	39	38	37	38	43	48	57	59	67	72	93	112	96	59	58	55	55
2		28	27	23	31	39	48	52	49	43	38	32	26	39	39	28	21	20	31	37	42	53	54	51	45	37
		-20	-19	-13	-10	-17	-23	-62	-77	-56	-16	-23	-66	-43	-69	-37	-8	-13	-18	-20	-15	-19	-64	-68	-21	-33
		48	47	37	42	57	71	115	127	100	55	57	94	83	109	66	30	34	50	59	59	73	119	119	66	72
3		61	82	60	63	68	54	66	71	50	47	23	24	43	33	73	60	51	42	95	95	56	71	62	46	58
		-17	-105	-61	-43	-32	-18	-29	-47	-77	-36	-24	-28	-37	-38	-88	-158	-163	-118	-204	-87	-31	-40	-38	-20	-64
		78	188	122	108	101	73	95	119	127	84	48	54	81	72	162	219	214	160	300	183	87	111	101	67	123
4		47	38	33	28	76	125	141	82	99	109	254	379	196	284	441	513	415	488	413	220	144	150	235	113	209
		-3	-6	-1	-14	-12	-122	-152	-38	-99	-195	-199	-314	-522	-449	-428	-598	-494	-381	-231	-114	-180	-65	-216	-511	-223
		51	44	35	43	89	249	294	121	200	306	454	695	720	734	869	1112	910	869	644	335	324	216	451	625	433
5		210	269	216	231	252	67	109	88	136	95	35	47	106	104	90	83	54	100	121	63	43	47	58	41	111
		-647	-326	-352	-300	-332	-47	-46	-77	-215	-202	-82	-92	-288	-167	-53	-58	-47	-80	-248	-51	-18	-34	-39	-26	-160
		858	596	569	533	585	115	156	167	353	299	119	140	394	272	144	142	102	181	369	114	62	82	98	68	272
6		31	37	27	59	74	173	182	75	201	89	21	36	115	143	121	155	181	256	129	112	73	45	31	39	100
		-28	-25	-19	-29	-52	-160	-384	-275	-334	-391	-80	-21	-126	-355	-175	-262	-233	-186	-187	-173	-11	-14	-16	-49	-149
		59	63	48	89	128	335	567	351	536	481	102	59	241	499	297	418	415	443	317	285	84	60	48	88	251
7		51	102	169	169	178	178	105	92	92	174	228	352	295	57	58	111	111	145	152	138	173	168	243	109	152
		-56	-179	-382	-515	-264	-156	-397	-224	-208	-474	-385	-485	-416	-145	-38	-95	-137	-161	-143	-122	-271	-171	-340	-161	-247
		107	281	552	685	444	335	504	317	301	649	614	838	713	204	97	208	249	307	296	260	445	340	584	270	400
8		88	47	53	46	117	177	141	97	57	66	111	49	41	44	54	37	62	48	34	29	21	24	30	31	63
		-43	-16	-22	-95	-176	-414	-417	-235	-156	-53	-291	-124	-62	-16	-36	-33	-82	-89	-39	-17	-28	-32	-29	-27	-105
		131	64	76	141	294	592	559	333	215	120	403	174	104	62	92	71	145	138	73	47	50	57	59	58	169
9		90	151	204	136	101	83	115	64	84	96	147	78	59	127	91	63	36	85	131	158	66	40	39	25	95
		-135	-351	-453	-327	-95	-132	-124	-193	-210	-123	-380	-155	-12	-117	-129	-104	-63	-81	-160	-334	-72	-22	-24	-23	-159
		226	502	658	465	197	217	240	258	296	220	528	235	72	246	221	169	100	166	291	492	138	62	63	49	255
10		23	43	39	27	31	21	26	52	38	62	133	108	65	42	45	30	36	45	96	123	151	130	121	74	65
		-20	-58	-59	-70	-35	-14	-13	-80	-44	-69	-372	-331	-178	-62	-43	-30	-76	-125	-111	-70	-108	-148	-176	-128	-101
		44	103	99	98	66	35	40	133	83	132	507	440	244	106	89	62	113	171	208	194	259	279	298	203	167
11		106	45	24	57	30	24	71	80	44	28	24	40	28	28	17	18	12	15	16	20	20	14	22	43	34
		-198	-17	-17	-24	-29	-45	-58	-104	-167	-165	-58	-110	-47	-60	-60	-35	-23	-23	-28	-29	-33	-26	-35	-35	-59
		304	62	42	81	59	70	130	186	212	194	82	151	77	90	78	53	36	39	45	49	54	40	58	79	95
12		30	23	20	13	102	155	118	85	71	32	87	97	80	61	86	80	52	45	42	27	24	26	52	111	63
		-36	-15	-14	0	-33	-340	-369	-133	-61	-84	-111	-132	-127	-43	-135	-210	-108	-7	-6	-10	-11	-13	-45	-123	-90
		66	38	35	14	136	496	487	219	133	117	199	230	209	106	222	291	161	52	48	37	36	40	98	235	154
13		116	99	78	110	142	135	89	51	28	16	32	24	32	45	46	26	41	34	30	32	22	24	38	32	55
		-128	-71	-39	-105	-197	-229	-93	-20	-21	-26	-29	-25	-24	-49	-77	-65	-33	-69	-77	-34	-34	-31	-35	-36	-64
		245	172	118	216	341	366	184	72	51	44	63	50	57	95	125	91	74	104	107	67	56	55	74	70	121
14		17	13	7	6	6	12	13	9	12	12	7	9	8	10	12	17	19	20	13	18	18	21	22	27	14
		-14	-8	-4	-4	-5	-8	-16	-19	-15	-17	-27	-34	-30	-27	-19	-15	-15	-17	-32	-35	-41	-35	-29	-21	-20
		32	21	12	11	13	21	29	28	28	30	35	45	40	38	32	34	35	39	47	54	59	57	51	48	35
15		25	24	19	15	15	16	16	16	25	30	29	47	88	76	70	106	135	140	190	183	242	334	283	204	97
		-7	-1	3	-3	-3	-4	-9	-9	-9	-7	-10	-21	-110	-142	-83	-123	-196	-130	-211	-430	-306	-236	-288	-285	-109
		32	25	16	18	19	21	25	26	35	39	41	69	199	219	154	230	332	271	402	613	548	570	571	489	207

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
AUGUST 1993

16	212	311	165	109	222	355	238	233	206	186	150	186	184	153	412	252	169	292	373	250	254	284	241	210	235
	-106	-320	-201	-61	-174	-587	-489	-454	-500	-519	-167	-213	-698	-491	-619	-361	-279	-359	-659	-619	-427	-471	-602	-573	-415
	320	632	368	171	397	943	729	688	707	706	319	400	882	646	1032	613	449	651	1033	870	681	755	844	784	651
17	281	281	364	204	216	261	174	79	39	24	23	27	36	46	24	26	29	23	17	22	41	36	45	37	98
	-683	-806	-629	-342	-378	-364	-207	-199	-75	-22	-21	-24	-26	-40	-27	-28	-40	-58	-35	-36	-44	-33	-55	-77	-177
	966	1088	994	547	596	626	382	279	114	47	44	51	63	87	53	55	69	82	53	60	86	70	100	115	276
18	75	56	82	101	170	161	193	150	101	127	91	153	171	156	208	116	177	214	151	123	100	83	81	64	129
	-113	-203	-113	-101	-326	-414	-300	-192	-300	-413	-338	-413	-488	-432	-529	-243	-210	-178	-180	-96	-146	-182	-216	-253	-266
	190	259	196	203	497	576	495	344	402	541	429	567	660	589	737	361	387	392	331	219	247	265	299	318	396
19	50	64	105	96	139	108	108	45	61	25	122	102	85	81	36	41	32	32	68	126	159	97	86	49	80
	-114	-112	-327	-201	-289	-191	-134	-219	-73	-61	-351	-232	-158	-85	-24	-41	-51	-100	-197	-137	-319	-132	-116	-74	-156
	164	177	432	298	430	301	243	265	135	87	474	336	244	167	61	83	83	132	266	264	479	230	203	123	237
20	40	76	83	83	55	65	90	72	41	41	41	93	140	81	38	32	34	24	41	43	28	27	18	23	54
	-37	-164	-235	-151	-89	-133	-196	-195	-82	-237	-191	-156	-231	-152	-57	-49	-83	-55	-60	-90	-22	-20	-18	-16	-113
	78	240	320	235	144	200	287	269	124	279	233	251	372	234	96	82	117	80	101	133	51	47	36	39	169
21	35	20	13	9	49	70	82	57	17	41	15	49	68	94	85	46	20	20	26	45	37	39	30	49	42
	-86	-46	-20	-11	-72	-117	-284	-122	-222	-143	-59	-63	-62	-63	-155	-82	-59	-44	-160	-101	-13	-11	-11	-24	-85
	122	67	34	20	122	187	367	180	241	185	75	113	132	158	242	129	80	65	187	146	51	51	42	75	128
22	53	39	44	58	68	97	106	118	55	46	77	51	25	20	18	20	19	19	29	19	24	57	73	69	50
	-81	-122	-131	-144	-125	-86	-23	-22	-103	-57	-278	-149	-23	-20	-20	-24	-48	-72	-41	-27	-24	-108	-192	-152	-86
	135	162	176	202	195	184	129	141	160	104	356	201	49	41	38	44	67	91	71	47	49	165	265	222	137
23	48	35	37	31	26	15	25	22	21	30	13	5	6	5	7	9	9	10	21	19	16	14	19	19	19
	-62	-19	-69	-35	-67	-34	-21	-64	-34	-31	-91	-70	-47	-38	-29	-30	-32	-23	-28	-34	-45	-26	-30	-28	-41
	112	55	107	66	94	50	46	87	56	63	105	77	54	44	36	40	42	33	50	54	62	40	49	48	61
24	16	13	14	18	29	45	43	42	55	71	83	48	25	33	20	5	5	9	15	18	31	40	53	69	33
	-20	-13	-6	-8	-13	-22	-30	-35	-21	-36	-186	-104	-24	-43	-71	-38	-19	-15	-13	-15	-22	-35	-32	-56	-37
	37	27	21	27	42	67	73	78	78	108	270	153	50	77	92	44	25	25	29	33	54	76	86	126	71
25	70	53	40	21	13	12	14	12	19	27	18	20	10	15	23	18	9	25	11	9	10	27	62	66	25
	-29	-35	-48	-10	-5	-16	-19	-20	-26	-36	-54	-39	-37	-36	-20	-29	-18	-39	-15	-21	-25	-29	-63	-46	-30
	101	89	89	32	18	28	33	32	45	65	73	61	48	53	45	49	27	65	28	30	36	56	126	112	56
26	59	36	35	31	24	12	24	38	30	25	15	55	73	99	33	79	33	22	25	33	45	48	49	58	41
	-58	-34	-125	-30	-4	-7	-7	-21	-22	-54	-37	-63	-117	-161	-216	-117	-63	-18	-11	-27	-27	-68	-41	-39	-57
	118	71	162	63	30	20	32	60	53	80	53	119	191	262	251	197	97	41	37	61	72	117	90	98	99
27	72	41	15	12	17	42	43	67	79	94	161	178	111	319	216	462	358	351	325	343	306	216	151	63	168
	-101	-117	-16	-5	-8	-21	-25	-151	-235	-224	-251	-187	-292	-572	-405	-677	-1108	-874	-834	-484	-76	-251	-80	-16	-292
	174	159	32	18	26	64	69	220	316	320	413	365	404	892	621	1140	1467	1225	1159	827	382	468	232	80	461
28	41	37	38	8	8	14	22	40	16	29	72	55	127	79	107	24	47	112	110	77	67	101	133	161	64
	-21	-22	-22	-27	-21	-19	-22	-28	-38	-32	-67	-32	-180	-115	-106	-48	-78	-172	-205	-80	-29	-83	-226	-172	-77
	62	61	61	36	30	35	45	69	55	63	141	89	308	195	214	73	125	284	316	158	97	184	359	334	141
29	217	146	181	128	159	84	98	53	63	55	60	114	120	75	31	11	12	28	21	16	8	46	125	70	80
	-161	-155	-248	-104	-151	-101	-99	-123	-229	-55	-48	-48	-97	-65	-12	-19	-25	-46	-52	-28	-23	-42	-268	-132	-97
	378	302	430	232	311	186	198	178	293	112	110	164	218	141	45	31	37	74	74	45	32	89	393	202	178
30	39	47	32	58	60	61	85	21	22	15	12	2	5	0	0	0	8	7	5	13	27	16	24	58	26
	-28	-39	-41	-68	-65	-43	-51	-177	-41	-24	-28	-48	-36	-26	-32	-32	-27	-21	-29	-39	-45	-44	-24	-23	-43
	69	88	74	128	126	105	137	199	64	40	40	51	43	27	31	31	35	28	34	53	73	61	48	82	70
31	57	32	25	32	43	33	22	20	15	9	16	8	19	43	58	12	21	21	28	35	62	56	66	33	32
	-76	-20	-55	-92	-15	-18	-23	-22	-22	-23	-29	-32	-56	-54	-108	-79	-18	-17	-23	-60	-206	-91	-47	-15	-50
	134	53	80	126	59	51	46	43	38	34	46	41	77	98	168	92	40	39	52	96	268	147	113	49	83

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
SEPTEMBER 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices SEPTEMBER 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	28	26	49	40	37	23	27	32	30	27	28	25	24	23	22	19	16	33	26	31	33	32	31	28	29
	AL	-6	-9	-30	-9	-9	-13	-16	-16	-22	-24	-25	-26	-22	-20	-24	-22	-16	-24	-24	-23	-80	-35	-17	-5	-21
	AE	35	36	80	50	47	36	44	48	53	51	53	52	46	44	48	42	34	59	52	55	114	68	49	35	51
2		27	30	36	58	55	47	41	45	42	65	81	119	87	50	27	25	26	47	112	146	83	82	105	93	64
		0	1	-4	-55	-25	3	-1	-8	-15	-23	-135	-204	-147	-21	-13	-23	-14	-125	-249	-283	-123	-58	-89	-134	-73
		28	29	41	113	80	43	43	53	58	89	218	325	236	72	41	49	42	173	362	431	207	141	195	229	137
3		112	137	120	97	109	80	89	142	176	235	186	108	172	158	107	81	131	299	317	375	159	122	191	177	162
		-112	-103	-194	-376	-214	-48	-163	-218	-209	-418	-235	-69	-285	-490	-171	-133	-151	-394	-219	-405	-99	-57	-167	-789	-238
		225	240	315	474	323	128	253	361	386	654	422	179	459	649	279	215	282	694	538	781	260	181	359	966	401
4		113	109	166	133	107	228	195	132	148	101	83	111	122	112	78	153	128	96	86	69	63	89	143	180	123
		-567	-421	-266	-177	-227	-385	-277	-416	-288	-293	-110	-338	-439	-218	-92	-496	-244	-110	-81	-66	-64	-212	-465	-548	-283
		681	531	433	312	336	613	472	549	437	395	194	451	563	332	172	649	372	207	168	136	128	302	610	729	407
5		123	93	59	58	28	33	25	35	65	65	44	79	82	84	81	83	37	44	48	48	57	118	115	78	66
		-603	-134	-13	-126	-159	-110	-112	-183	-212	-276	-118	-143	-115	-43	-170	-51	-24	-78	-107	-36	-82	-178	-234	-110	-142
		727	228	73	184	189	144	139	220	278	343	164	224	199	128	253	135	63	122	156	85	140	297	350	189	210
6		88	69	67	68	17	39	39	36	36	27	65	123	125	98	71	61	84	85	97	122	132	99	92	116	77
		-257	-151	-70	-129	-241	-90	-14	-39	-297	-218	-139	-241	-313	-142	-81	-116	-80	-73	-137	-116	-259	-208	-163	-86	-152
		346	222	137	197	259	130	53	76	334	246	205	366	439	241	154	179	165	159	235	239	392	307	256	203	231
7		136	72	99	61	25	77	57	49	46	30	16	14	20	52	66	75	36	27	18	17	49	91	66	64	53
		-137	-47	-81	-133	-347	-364	-144	-127	-173	-10	-32	-22	-23	-28	-100	-125	-10	-14	-22	-24	-35	-140	-127	-10	-95
		275	121	180	195	373	442	202	178	221	41	48	37	45	80	167	202	47	43	41	42	85	232	194	74	149
8		125	138	77	88	70	99	48	97	65	47	33	36	26	21	21	20	24	32	30	30	60	52	70	86	58
		-130	-313	-146	-82	-105	-201	-205	-130	-100	-67	-24	-18	-13	-16	-10	-38	-48	-66	-81	-16	-62	-84	-60	-277	-96
		257	452	224	171	176	301	255	228	166	115	59	56	41	39	32	59	73	99	112	47	123	137	132	364	155
9		69	23	26	16	23	29	48	53	43	40	25	34	100	108	41	36	26	28	25	51	55	42	27	27	41
		-80	-9	-3	-3	-6	-7	-19	-70	-25	-148	-75	-36	-126	-182	-83	-55	-42	-16	-14	-27	-126	-69	-8	-12	-52
		149	34	30	21	30	37	68	124	69	189	101	71	227	291	126	93	69	46	39	80	182	112	37	40	94
10		27	44	59	52	45	43	62	49	40	52	46	36	109	115	70	41	20	29	30	29	31	40	57	38	48
		-10	-9	-40	-95	-99	-43	-30	-20	-147	-90	-35	-52	-122	-151	-129	-109	-48	-3	-13	-44	-29	-3	-12	-24	-57
		38	54	99	148	145	87	92	69	188	143	82	89	233	267	200	151	69	32	45	73	61	44	70	64	106
11		60	92	99	108	90	68	45	53	46	52	49	33	40	25	16	22	25	35	56	54	58	106	68	43	56
		-66	-242	-141	-118	-41	-15	-14	-16	-15	-51	-141	-48	-88	-37	-19	-11	-5	-27	-170	-112	-29	-138	-64	2	-67
		127	335	240	227	132	84	60	70	62	104	192	82	129	64	36	34	31	63	226	168	88	246	133	41	124
12		69	92	48	24	22	24	62	61	56	40	37	50	106	142	90	105	110	239	344	360	315	296	240	238	132
		-20	-91	-30	-1	-4	-9	-39	-163	-90	-25	-12	-73	-144	-156	-274	-206	-150	-301	-626	-375	-355	-327	-468	-410	-181
		89	185	78	26	26	34	102	225	147	67	50	124	252	299	366	311	261	541	972	737	670	624	709	649	314
13		203	158	189	299	122	133	279	185	35	95	138	125	58	388	308	319	286	242	247	303	256	141	123	151	199
		-248	-96	-240	-905	-945	-650	-305	-681	-930	-506	-631	-196	-96	-471	-749	-811	-603	-384	-408	-473	-251	-151	-348	-240	-472
		451	255	430	1204	1067	784	585	867	966	602	770	322	155	860	1058	1131	890	628	656	777	509	293	471	392	672
14		109	135	55	71	75	80	70	181	167	199	220	150	123	141	92	146	121	76	131	113	110	135	148	100	123
		-752	-312	-190	-125	-208	-42	-249	-632	-411	-594	-391	-400	-479	-533	-356	-443	-311	-97	-268	-407	-248	-209	-301	-296	-344
		862	448	246	197	284	122	319	814	579	795	612	552	603	675	449	590	433	174	400	522	360	346	450	397	468
15		140	149	152	84	125	106	60	73	114	56	109	103	72	44	103	59	52	88	113	140	160	109	76	47	97
		-171	-425	-406	-230	-185	-417	-192	-336	-430	-226	-229	-189	-90	-42	-174	-76	-64	-242	-345	-161	-156	-133	-26	-15	-207
		311	575	560	315	311	525	254	410	546	283	340	293	163	86	277	136	118	331	459	302	318	243	103	64	305

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)

SEPTEMBER 1993

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PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES (continued)

OCTOBER 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices OCTOBER 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	169	188	231	127	168	112	74	99	72	100	134	213	166	65	77	70	91	85	129	89	78	57	47	36	112
	AL	-253	-512	-565	-532	-212	-118	-97	-300	-408	-304	-657	-485	-284	-139	-46	-144	-260	-163	-220	-48	-181	-103	-6	-1	-252
	AE	424	701	797	660	381	230	172	399	481	405	793	699	451	205	124	215	352	250	350	139	260	162	54	38	364
2		31	31	25	26	28	35	56	23	27	65	42	41	60	64	86	55	30	36	57	46	39	59	51	43	44
		-6	-32	-24	-37	-20	-64	-174	-109	-41	-315	-124	-110	-94	-125	-115	-231	-134	-33	-201	-335	-118	-103	-68	-9	-109
		38	63	50	63	48	99	230	132	69	382	168	153	155	190	202	286	165	69	259	382	157	163	121	53	154
3		25	19	15	21	35	41	73	42	48	13	25	15	45	86	84	64	27	24	51	77	68	44	36	43	43
		-5	-4	-2	-3	-14	-60	-122	-153	-83	-40	-15	-16	-40	-56	-122	-91	-110	-138	-138	-265	-343	-52	-9	-6	-79
		32	24	19	25	50	102	196	196	131	54	41	32	87	144	208	157	137	162	189	342	411	97	46	50	122
4		35	26	24	18	28	29	27	50	42	29	33	54	56	37	57	40	42	43	65	134	30	34	29	34	41
		0	0	0	1	0	0	-1	-46	-62	-47	-85	-191	-213	-63	-45	-50	-78	-62	-40	-249	-106	-6	-10	-46	-58
		35	26	23	16	28	30	28	97	105	77	119	246	270	102	103	91	121	106	106	383	137	41	41	81	100
5		33	37	50	37	34	31	37	29	31	29	25	22	23	20	18	20	36	71	121	118	95	104	71	46	47
		-104	-28	-36	-43	-42	1	1	4	1	0	-8	-14	-20	-21	-23	-25	-45	-182	-421	-257	-30	-150	-29	-4	-61
		138	66	86	81	76	29	36	24	28	29	33	37	44	42	42	47	82	254	543	377	127	256	101	50	110
6		42	74	115	94	121	120	195	270	137	42	26	28	20	20	17	18	17	19	21	42	74	117	186	106	80
		-7	-32	-291	-465	-264	-142	-169	-139	-32	-9	-14	-50	-12	-13	-16	-16	-12	-21	-22	-86	-80	-84	-121	-25	-88
		50	107	407	559	386	263	366	409	169	52	41	79	33	34	34	35	30	41	45	128	155	201	308	133	169
7		58	39	43	41	37	27	27	24	20	16	14	15	21	11	13	11	14	21	20	24	23	24	20	22	24
		-14	-3	-2	-1	2	-1	-2	-4	-5	-8	-11	-15	-21	-22	-21	-19	-18	-12	-10	-5	-3	-2	-3	-5	-8
		74	43	45	42	34	28	29	28	26	24	26	30	43	34	34	32	34	34	32	30	27	27	24	28	34
8		16	40	80	61	33	26	51	153	255	197	177	77	156	71	59	32	27	25	47	31	63	54	47	47	76
		0	-6	-20	6	-1	-37	-151	-383	-576	-390	-183	-333	-575	-367	-224	-33	-12	-5	-108	-133	-51	-176	-78	-59	-162
		16	47	100	54	34	63	202	537	832	588	362	411	732	439	284	66	40	30	156	164	115	231	126	107	239
9		56	84	72	64	180	381	309	331	251	105	164	154	108	102	66	53	49	82	94	43	62	108	61	94	128
		-239	-317	-216	-210	-234	-297	-802	-595	-349	-375	-1044	-613	-316	-361	-121	-172	-70	-77	-310	-21	-81	-582	-845	-376	-359
		296	402	288	275	415	678	1112	927	601	481	1208	767	425	464	188	226	120	161	404	64	144	691	906	472	488
10		90	109	94	71	139	127	132	74	65	166	70	42	62	127	111	49	50	73	143	132	124	184	78	45	98
		-286	-457	-177	-301	-438	-528	-273	-90	-79	-444	-182	-46	-152	-650	-436	-103	-60	-168	-341	-443	-434	-649	-127	-9	-286
		377	567	272	372	578	656	405	165	144	612	253	90	215	778	549	153	112	241	485	577	560	834	207	55	386
11		54	60	75	40	64	60	81	75	71	102	58	132	158	90	101	155	120	111	49	43	50	47	72	169	85
		-57	-338	-341	-325	-298	-306	-280	-192	-251	-327	-140	-765	-361	-159	-252	-586	-243	-137	-41	-68	-91	-134	-197	-608	-271
		112	399	416	365	363	367	362	268	323	431	200	898	521	250	354	742	364	249	90	113	143	182	271	777	357
12		95	86	33	38	48	71	47	57	76	43	38	30	105	80	85	69	64	43	38	34	35	27	32	47	55
		-524	-339	-172	-232	-296	-200	-96	-92	-256	-91	-24	-51	-331	-305	-392	-127	-34	-186	-213	-113	-155	-95	-38	-105	-186
		620	426	205	271	344	272	144	150	333	135	63	83	437	385	477	197	100	230	251	148	190	123	72	153	242
13		60	56	56	47	37	86	110	81	116	76	42	40	53	71	88	50	30	39	31	37	40	47	32	48	57
		-328	-264	-140	-259	-375	-372	-356	-237	-231	-146	-81	-63	-56	-41	-77	-5	-11	-48	-66	-55	-221	-146	-22	-22	-151
		388	321	197	307	412	459	467	319	347	224	124	105	111	113	167	57	42	87	98	93	263	195	55	71	209
14		61	60	100	78	76	82	59	58	57	21	32	38	73	86	87	75	26	23	14	12	11	13	24	35	50
		-158	-340	-219	-76	-94	-61	-20	-22	-24	-56	-25	-31	-82	-108	-155	-74	-81	-137	-96	-82	-107	-57	-69	-51	-93
		220	400	320	155	170	143	80	80	82	77	59	70	157	195	243	151	108	160	111	94	119	71	94	88	144
15		32	35	38	50	40	50	43	33	30	22	22	39	33	25	26	22	28	19	23	22	22	20	20	16	30
		-24	-38	-77	-24	-13	-54	-33	-7	-5	-16	-24	-83	-117	-66	-27	-55	-72	-88	-87	-37	-22	-5	-3	-2	-41
		57	74	115	75	54	104	76	41	36	38	47	124	151	93	54	77	101	108	111	59	45	26	24	19	71

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
OCTOBER 1993

16	24	29	26	34	35	44	56	44	50	44	54	87	104	59	30	34	55	20	15	20	32	49	58	55	44
	-4	-28	-13	-20	-6	-12	-53	-38	-97	-163	-108	-100	-69	-48	-30	-76	-191	-63	-27	-12	-43	-180	-81	-77	-64
	29	58	39	54	42	57	109	83	147	208	164	189	174	109	61	110	246	84	43	32	76	229	140	134	109
17	51	54	53	125	169	91	44	27	26	26	23	26	43	44	37	27	23	27	31	24	32	70	74	67	51
	-68	-119	-261	-213	-107	-46	-46	-25	-6	-4	-11	-26	-70	-23	-28	-26	-26	-75	-187	-67	-88	-269	-182	-108	-87
	120	173	315	338	276	137	90	53	33	32	35	53	115	69	66	54	49	103	218	91	121	339	257	177	138
18	80	106	64	48	73	84	97	111	67	62	102	150	105	100	115	146	145	128	87	64	51	37	37	42	88
	-59	-99	-147	-116	-212	-102	-82	-92	-113	-153	-204	-236	-263	-257	-250	-251	-179	-228	-159	-80	-16	-76	-56	-45	-145
	140	206	211	165	285	186	180	203	181	217	307	387	369	358	366	398	324	357	247	144	68	115	94	88	233
19	56	70	68	75	81	151	141	119	82	111	97	144	138	90	27	15	45	25	29	43	81	70	56	38	77
	-90	-201	-193	-100	-174	-148	-119	-145	-126	-126	-204	-234	-175	-114	-37	-46	-91	-84	-26	-15	-288	-126	-70	-108	-127
	146	272	262	176	256	300	260	265	208	238	303	380	314	206	65	61	136	110	56	59	369	196	128	147	205
20	36	28	35	31	34	26	37	32	22	64	29	20	12	12	28	22	28	53	107	87	53	37	46	40	38
	-96	-12	-9	-14	-40	-11	-29	-29	-152	-74	-9	-7	-12	-16	-27	-84	-177	-264	-213	-103	-28	-50	-133	-115	-71
	133	42	44	45	75	37	67	62	174	138	39	28	25	30	56	107	206	317	321	191	82	88	179	157	110
21	41	39	42	42	52	77	58	54	93	46	64	128	204	128	76	34	34	21	23	18	22	32	37	27	58
	-72	-46	-83	-145	-154	-125	-114	-126	-146	-104	-143	-300	-279	-157	-80	-37	-12	-5	-12	-14	-9	-4	-30	0	-91
	113	86	126	188	207	202	173	181	240	151	208	429	484	287	158	73	47	27	35	32	31	37	68	26	150
22	36	49	54	104	81	61	80	101	98	56	35	41	45	65	38	41	32	41	123	60	65	70	114	121	67
	3	-40	-232	-241	-31	-14	-189	-364	-127	-13	-9	-67	-60	-39	-12	-35	-11	-24	-238	-80	-25	-29	-196	-115	-91
	33	90	286	345	113	75	270	465	226	70	46	110	107	106	52	76	44	66	362	141	91	101	310	237	159
23	71	61	24	48	83	118	98	116	75	75	33	29	61	68	44	25	31	30	42	72	117	56	43	69	62
	-10	-7	-2	-8	-84	-322	-283	-221	-270	-41	-15	-6	-21	-36	-112	-49	-34	-34	-64	-68	-161	-16	-24	-43	-81
	82	69	27	57	167	441	381	338	346	116	50	36	84	106	158	76	66	65	107	141	279	73	68	114	144
24	71	83	153	75	26	26	27	36	19	28	15	19	21	17	27	19	34	36	33	27	34	24	29	26	38
	-61	-291	-183	-20	-10	-7	-15	-16	-13	-27	-27	-84	-22	-37	-51	-45	-158	-205	-14	-19	-109	-74	0	6	-62
	134	375	336	96	37	34	43	53	33	56	43	104	44	56	79	65	193	242	49	48	144	99	29	19	100
25	26	36	47	62	39	46	94	178	139	108	107	71	146	103	193	299	194	229	150	68	29	54	35	48	104
	0	-8	-15	-33	0	-10	-47	-158	-205	-49	-406	-1017	-325	-244	-970	-994	-605	-309	-116	-87	-147	-163	-204	-148	-261
	25	44	63	94	39	56	142	336	344	158	514	1089	473	348	1164	1294	800	540	267	156	178	218	240	198	366
26	29	24	27	16	13	21	32	46	45	30	26	24	29	39	34	64	223	308	148	132	54	79	125	100	69
	-40	-25	-32	-13	-15	-26	-56	-127	-24	-46	-90	-81	-26	-10	-51	-205	-590	-703	-310	-151	-55	-67	-226	-326	-137
	70	50	60	30	29	48	89	173	69	77	117	106	55	50	87	270	815	1013	460	284	110	147	352	427	208
27	124	121	116	160	152	171	203	332	253	272	215	96	102	94	168	231	248	226	116	99	116	177	180	122	171
	-88	-123	-380	-462	-274	-524	-576	-569	-749	-576	-293	-314	-894	-490	-389	-734	-668	-416	-451	-140	-222	-374	-392	-380	-437
	213	246	496	622	426	695	779	901	1004	850	509	411	997	585	558	966	918	643	567	240	339	553	573	504	608
28	111	124	96	81	102	93	70	93	74	83	84	105	140	73	58	34	29	52	64	80	44	79	142	157	86
	-305	-156	-106	-136	-136	-232	-98	-221	-102	-99	-58	-562	-246	-139	-285	-196	-223	-237	-203	-208	-63	-172	-638	-460	-220
	417	281	202	218	239	325	168	315	178	184	143	669	387	214	344	231	252	290	269	289	109	253	781	618	307
29	118	88	125	101	84	106	50	39	37	31	21	29	56	84	127	176	137	87	52	40	26	65	99	104	78
	-203	-221	-309	-120	-125	-67	-45	-44	-58	-38	-25	-87	-179	-356	-351	-331	-155	-122	-79	-21	-7	-74	-255	-53	-139
	322	311	434	221	209	173	96	84	96	70	48	117	236	441	479	507	293	209	132	61	33	139	355	158	218
30	114	62	43	31	30	36	22	30	23	21	15	13	14	13	19	13	9	7	6	6	8	10	14	18	24
	-120	-91	-16	2	-3	-10	-6	-7	-4	-3	-6	-11	-16	-16	-19	-18	-18	-12	-10	-11	-9	-5	-4	-1	-17
	235	154	60	28	34	47	29	37	28	25	22	25	31	31	40	32	28	19	17	18	18	16	19	20	42
31	15	19	14	15	15	17	27	30	36	38	72	115	124	40	34	64	63	130	152	172	251	183	52	35	71
	0	0	-3	0	1	1	-3	-146	-195	-226	-208	-205	-156	-175	-159	-130	-198	-304	-249	-277	-223	-103	-27	-1	-124
	14	20	17	15	13	15	30	176	232	265	281	321	282	217	194	195	262	434	401	451	475	286	80	36	196

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
NOVEMBER 1993

Provisional Hourly Values (nT) of AU, AL and AE Indices NOVEMBER 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	30	100	117	64	70	27	37	37	62	46	74	52	53	95	55	22	84	52	44	25	68	52	39	44	56
	AL	-20	-64	-105	-9	0	-4	-8	-13	-31	-74	-100	-59	-39	-84	-34	-26	-258	-197	-38	-29	-130	-103	-45	-44	-63
	AE	51	165	224	74	71	32	46	51	94	122	175	112	93	180	89	49	343	250	82	55	199	155	84	88	120
2		38	46	39	33	53	32	50	38	40	40	28	29	27	35	38	28	22	10	12	13	11	12	10	14	29
		-41	-98	-18	-5	-12	-28	-48	-56	-8	-9	-10	-13	-22	-27	-32	-52	-34	-15	-13	-59	-21	-10	-5	-10	-27
		80	145	58	38	65	61	100	96	48	50	38	44	51	63	71	80	57	27	26	73	33	22	16	25	57
3		16	23	27	19	20	28	28	57	41	35	30	29	31	31	31	31	33	41	116	143	52	45	104	62	45
		-5	-6	-6	-6	-4	-5	-11	-11	-6	-4	-7	-11	-14	-12	-12	-13	-18	-26	-180	-238	-34	-23	-317	-786	-73
		23	30	35	26	25	34	39	70	48	40	38	41	46	44	45	45	53	69	296	383	88	69	423	849	119
4		50	242	142	343	314	356	389	308	213	63	203	213	227	181	188	204	165	154	148	150	106	141	155	117	199
		-725	-438	-267	-428	-514	-568	-506	-381	-324	-655	-1026	-661	-1057	-1329	-1224	-1204	-1436	-988	-641	-416	-190	-342	-330	-259	-663
		775	680	409	771	829	924	896	690	538	719	1230	874	1285	1511	1412	1409	1602	1144	790	566	297	484	487	377	863
5		86	88	69	113	78	97	149	207	121	112	123	100	155	86	96	83	120	103	105	134	122	110	100	77	110
		-280	-152	-105	-234	-284	-267	-394	-386	-379	-387	-593	-562	-246	-246	-463	-193	-386	-468	-230	-559	-533	-330	-408	-55	-339
		367	241	175	348	363	365	544	594	501	500	716	663	403	334	560	277	507	573	337	694	656	441	509	132	450
6		86	89	101	135	75	83	78	115	100	84	145	111	79	141	74	96	107	66	123	118	115	138	129	110	104
		-106	-249	-275	-165	-151	-164	-128	-409	-476	-627	-631	-506	-526	-458	-258	-384	-266	-99	-247	-658	-433	-352	-319	-283	-340
		193	339	377	300	226	248	207	526	577	711	777	618	606	600	333	481	373	165	372	777	548	491	449	394	445
7		125	77	108	83	87	54	72	89	98	73	58	75	80	80	63	92	70	46	69	93	98	138	169	163	90
		-327	-132	-186	-139	-157	-85	-211	-332	-164	-267	-394	-405	-381	-337	-329	-592	-238	-117	-124	-246	-330	-666	-419	-371	-290
		453	210	294	222	245	140	284	423	263	342	453	481	463	418	393	685	308	164	194	340	429	805	589	535	381
8		165	133	94	109	100	61	67	27	25	38	45	39	57	49	62	59	102	62	96	98	41	62	63	75	72
		-408	-179	-196	-180	-96	-61	-85	-156	-91	-100	-205	-441	-144	-172	-294	-331	-346	-264	-344	-470	-65	-150	-353	-262	-225
		574	313	291	290	197	123	152	185	117	139	252	481	202	222	356	390	448	327	441	569	107	213	416	338	298
9		57	62	79	86	74	51	39	55	76	35	36	36	60	37	29	52	25	21	19	26	33	34	42	47	46
		-125	-69	-140	-248	-142	-84	-47	-21	-118	-147	-209	-152	-85	-54	-53	-87	-47	-62	-88	-205	-241	-217	-104	-250	-125
		183	132	220	335	216	136	87	77	195	183	247	189	147	92	83	139	72	84	109	232	274	252	147	297	172
10		50	60	56	67	107	106	84	97	98	40	35	60	71	44	67	22	17	56	122	55	18	12	21	31	58
		-135	-66	-228	-216	-151	-106	-201	-363	-143	-139	-109	-159	-414	-436	-150	-20	-64	-229	-253	-166	-46	-28	-21	-9	-160
		185	127	285	284	259	213	286	461	242	180	146	220	487	480	218	44	82	287	376	222	65	41	43	42	220
11		29	35	30	53	80	82	97	110	69	47	23	24	25	22	20	7	19	15	3	3	5	8	10	13	35
		-9	-17	-39	-171	-140	-80	-123	-116	-103	-77	-72	-52	-27	-25	-68	-100	-65	-39	-25	-21	-26	-18	-14	-11	-60
		40	53	70	225	221	163	220	228	174	125	96	77	53	48	89	108	85	54	29	25	32	27	25	25	95
12		14	15	19	18	38	36	35	22	27	25	23	21	31	31	14	15	10	11	5	9	11	11	13	13	19
		-7	-13	-45	-48	-98	-68	-32	-41	-68	-56	-57	-179	-94	-15	-13	-47	-18	-14	-14	-28	-27	-10	-2	-1	-42
		22	29	65	67	137	106	69	64	96	82	81	201	126	47	27	64	29	26	20	38	40	23	17	16	62
13		7	7	12	13	20	42	63	88	58	20	18	88	40	146	55	156	105	110	174	118	92	49	47	37	65
		-7	-6	-27	-21	-32	-78	-124	-22	-27	-17	-50	-255	-355	-293	-78	-143	-209	-236	-332	-186	-87	-69	-101	-33	-116
		15	15	40	34	52	121	188	110	86	38	69	344	396	440	135	301	315	347	508	305	181	120	149	71	183
14		36	27	33	30	35	63	33	54	34	15	58	90	66	100	193	227	142	215	212	199	142	138	115	102	98
		-38	-46	-70	-76	-96	-113	-224	-188	-30	-14	-71	-232	-595	-531	-340	-561	-358	-314	-257	-126	-158	-286	-286	-329	-222
		75	73	104	107	131	176	258	244	66	29	130	324	662	633	534	789	501	529	470	325	301	425	402	432	322
15		97	125	115	86	63	91	80	42	30	23	30	26	20	20	17	15	14	12	48	129	76	163	144	45	63
		-398	-246	-181	-137	-88	-69	-47	-16	-5	-9	-5	-14	-16	-13	-23	-25	-47	-29	-142	-343	-209	-475	-234	-37	-117
		496	372	297	223	152	161	129	59	36	33	36	41	37	34	42	41	63	42	191	473	286	639	379	83	181

PROVISIONAL HOURLY VALUES OF AU, AL, AND AE INDICES
(continued)
NOVEMBER 1993

16	46	81	64	73	74	62	75	96	83	50	72	104	80	35	56	77	109	77	129	145	146	153	182	129	92
	-37	-209	-264	-171	-137	-72	-181	-213	-254	-246	-220	-179	-94	-61	-292	-352	-260	-171	-181	-133	-149	-230	-259	-128	-187
	84	291	329	246	211	135	258	310	339	297	294	285	175	97	349	430	370	249	311	279	296	384	443	258	280
17	89	48	40	24	19	15	9	15	11	8	6	6	4	4	13	17	8	0	6	34	104	60	51	48	27
	-77	-33	-20	-1	-9	-7	-10	-11	-15	-22	-22	-15	-16	-21	-21	-78	-92	-64	-22	-67	-437	-192	-62	-21	-56
	166	82	61	26	29	23	21	28	27	31	29	22	21	26	35	95	101	64	29	103	542	253	114	69	83
18	35	27	25	25	34	42	43	37	40	34	30	24	52	78	246	231	325	223	248	137	202	156	113	47	102
	-24	-12	-12	-17	-13	-14	-46	-74	-32	-47	-31	-9	-37	-390	-862	-577	-376	-760	-286	-384	-562	-166	-35	-293	-211
	59	40	38	43	48	57	90	113	73	83	62	35	90	469	1109	810	703	984	536	523	766	324	148	341	314
19	103	136	114	171	161	95	39	26	26	38	44	52	42	68	108	176	151	116	123	75	97	102	124	127	97
	-310	-149	-147	-511	-563	-89	-37	-30	-42	-53	-65	-87	-217	-307	-459	-460	-221	-315	-383	-157	-82	-61	-412	-376	-231
	414	286	262	683	725	184	77	57	70	93	110	141	260	377	568	637	372	431	507	234	180	164	537	504	328
20	156	110	84	98	143	118	80	32	19	24	36	33	25	13	14	13	18	21	31	65	71	36	55	69	57
	-308	-167	-80	-112	-271	-80	-46	-35	-32	-29	-79	-58	-51	-51	-24	-38	-66	-79	-65	-40	-56	-20	-111	-101	-83
	466	278	165	211	415	199	128	68	53	55	116	93	77	65	39	52	85	101	97	106	128	57	167	172	141
21	65	76	64	60	55	82	76	61	69	61	46	33	22	41	36	34	30	19	13	19	27	17	25	26	44
	-31	-27	-53	-126	-62	-41	-53	-10	-36	-60	-83	-71	-38	-69	-121	-19	-17	-48	-180	-93	-42	-18	-37	-107	-60
	97	104	117	187	118	124	131	72	106	122	130	105	60	110	158	53	48	68	195	114	71	36	63	133	105
22	39	81	80	31	34	18	16	32	22	19	24	25	31	12	14	15	7	13	21	47	25	39	37	52	31
	-101	-146	-62	-17	-19	-21	-9	-10	-19	-35	-20	-48	-120	-41	-13	-23	-24	-31	-41	-63	-35	-50	-23	-17	-41
	140	228	142	49	54	40	26	44	41	55	45	74	151	54	28	39	33	45	63	110	60	90	62	70	73
23	30	33	53	73	46	70	65	58	53	46	44	45	47	32	30	42	27	47	37	37	23	23	17	20	42
	-8	-5	-30	-41	-10	-11	-37	-73	-54	-35	-28	-81	-212	-47	-11	-14	-27	-80	-155	-107	-18	-18	-15	-22	-47
	38	39	84	115	57	82	102	132	108	83	73	127	260	80	42	56	54	128	193	145	42	41	33	43	90
24	28	22	26	36	52	75	38	40	29	20	28	29	9	9	19	32	12	24	20	18	21	19	52	33	29
	-13	-6	-21	-42	-36	-3	1	0	-2	-8	-22	-41	-21	-18	-19	-29	-75	-95	-34	-18	-20	-24	-82	-34	-28
	42	29	48	79	90	78	36	41	31	30	51	72	31	28	38	62	87	120	54	37	42	44	136	68	57
25	24	32	30	54	47	40	47	45	29	32	36	21	23	51	55	54	24	78	38	47	33	29	52	72	41
	-7	-2	-9	-21	2	1	-8	-10	-13	-19	-27	-19	-15	-13	-10	-30	-67	-183	-106	-6	0	-18	-40	-99	-30
	32	35	40	75	44	37	56	55	44	52	65	41	40	65	66	84	92	262	144	54	33	48	93	172	72
26	94	48	47	44	54	82	90	49	36	31	44	25	37	34	74	60	40	134	174	130	73	83	68	94	69
	-150	-36	-12	-35	-79	-96	-45	-17	-24	-38	-56	-18	-53	-46	-132	-155	-66	-481	-631	-150	-50	-50	-82	-173	-111
	246	84	60	80	133	179	135	67	61	70	101	44	92	82	207	215	107	616	805	280	124	134	151	268	181
27	79	97	83	70	43	34	28	34	23	16	25	32	34	26	29	23	14	12	33	16	37	75	41	33	39
	-163	-200	-113	-52	-30	-55	-13	-10	-10	-8	-12	-11	-24	-29	-37	-159	-166	-130	-50	-24	-51	-171	-21	-1	-64
	243	298	197	122	74	90	42	46	35	25	39	44	59	57	68	182	181	143	84	41	89	247	62	35	104
28	58	62	43	20	17	21	10	26	22	21	18	18	23	14	17	48	38	11	11	11	17	21	25	39	25
	-1	-2	-2	0	-3	-10	-9	-17	-20	-47	-54	-12	-13	-15	-66	-235	-98	-23	-28	-20	-30	-74	-49	-4	-35
	60	65	47	19	20	32	20	44	43	69	73	31	36	30	83	284	136	35	40	32	48	96	75	44	61
29	99	79	158	142	85	46	82	56	54	76	57	59	88	59	59	110	67	40	92	73	44	31	33	57	73
	-98	-320	-193	-113	-13	-3	-12	-7	-105	-53	-8	-33	-64	-177	-220	-234	-147	-43	-211	-255	-25	-38	-65	-148	-108
	197	400	351	256	98	50	96	64	160	130	66	94	154	237	281	344	215	83	304	328	69	70	98	206	181
30	37	56	40	30	25	27	30	31	29	35	25	19	10	36	16	23	13	25	15	16	17	27	56	56	29
	-109	-22	-1	1	-3	-10	-4	-7	-1	-5	-5	-13	-23	-120	-24	-34	-53	-131	-50	-28	-6	-23	-72	-76	-34
	147	80	41	28	28	37	35	39	31	42	32	33	34	157	42	58	67	156	65	45	24	51	129	133	64

Provisional Hourly Values (nT) of AU, AL and AE Indices DECEMBER 1993

DAYUT		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	MEAN
1	AU	45	82	51	60	76	65	63	51	40	48	89	105	77	265	252	183	310	219	66	82	85	168	108	145	114
	AL	-41	-34	-1	-4	1	5	7	7	3	-19	-283	-589	-796	-607	-413	-426	-409	-210	-62	-80	-191	-744	-144	-287	-221
	AE	86	117	52	65	74	58	55	43	37	68	373	695	874	874	666	610	720	431	129	163	277	914	253	432	336
2		97	174	217	247	250	221	137	151	101	110	205	86	146	255	128	195	85	154	256	209	-53	-2	71	78	147
		-208	-204	-284	-406	-319	-239	-295	-310	-138	-259	-603	-631	-596	-682	-370	-593	-330	-372	-734	-499	-543	-533	-632	-664	-435
		306	378	502	654	571	462	434	463	241	371	810	719	743	938	500	789	417	527	991	709	490	530	704	743	583
3		117	186	160	237	119	192	149	146	187	129	110	95	90	63	21	28	37	27	14	69	69	61	11	37	98
		-574	-500	-396	-246	-180	-343	-283	-595	-533	-731	-829	-860	-606	-295	-217	-114	-108	-137	-96	-310	-538	-234	-137	-105	-374
		692	687	557	483	301	536	433	742	721	861	940	957	697	359	240	143	145	165	111	379	608	297	149	143	473
4		22	24	28	25	16	10	7	11	14	18	18	30	39	18	17	14	11	14	12	20	97	32	28	20	23
		-71	-50	-31	-22	-20	-18	-26	-35	-41	-35	-48	-86	-159	-46	-23	-19	-28	-92	-50	-60	-262	-104	-18	-17	-57
		94	75	59	48	37	29	34	47	57	54	68	117	200	65	41	33	40	107	63	81	360	137	47	38	80
5		21	20	22	19	18	16	33	40	86	36	48	44	27	44	89	119	53	35	37	53	44	38	42	52	43
		-17	-14	-19	-13	-15	-18	-41	-87	-65	-30	-61	-158	-437	-428	-225	-442	-101	-69	-348	-478	-139	-106	-61	-136	-146
		39	35	42	32	33	35	75	129	151	67	110	203	465	473	315	562	155	104	386	531	183	144	104	188	190
6		62	32	33	27	32	41	45	37	44	22	26	21	49	25	51	11	19	13	20	22	37	26	33	39	32
		-13	-9	-18	-25	-24	-28	-27	-43	-47	-58	-141	-183	-223	-129	-100	-30	-45	-185	-173	-142	-168	-158	-100	-122	-91
		76	41	52	53	56	70	72	81	91	81	168	206	273	155	152	43	64	198	194	165	206	185	133	162	124
7		54	67	41	35	37	34	36	38	50	44	50	38	43	131	312	325	271	82	66	121	108	127	157	126	100
		-187	-111	-21	-57	-30	-46	-29	-15	-46	-85	-157	-161	-496	-824	-983	-656	-327	-98	-150	-239	-487	-429	-211	-309	-256
		241	180	63	93	68	81	67	54	98	131	208	201	540	956	1297	983	599	181	217	361	596	558	369	436	357
8		119	89	184	111	231	298	225	285	178	97	96	195	89	140	150	228	198	205	242	146	46	58	50	38	154
		-977	-735	-368	-440	-611	-461	-308	-493	-422	-369	-632	-669	-244	-556	-973	-879	-455	-511	-399	-103	-18	-24	-44	-41	-447
		1096	824	552	552	843	760	534	779	601	467	729	866	333	697	1125	1109	655	718	642	250	64	83	94	79	602
9		25	20	8	11	11	7	7	9	7	8	4	10	8	11	12	16	17	32	35	40	36	22	24	20	17
		-30	-30	-42	-23	-18	-14	-18	-20	-17	-17	-14	-14	-16	-20	-23	-16	-15	-11	-20	-14	-16	-11	-19	-44	-20
		56	51	51	35	29	22	25	29	26	25	18	25	24	32	36	32	32	44	56	55	53	35	44	65	38
10		34	40	27	28	25	45	72	72	27	48	35	58	31	30	32	37	25	10	68	93	49	43	33	39	42
		-125	-50	-33	-33	-15	-109	-147	-74	-32	-47	-201	-285	-107	-138	-185	-105	-135	-105	-231	-246	-122	-97	-29	-75	-114
		160	91	61	62	40	155	220	146	60	96	237	344	139	169	219	143	161	115	300	340	171	141	62	115	156
11		58	58	79	50	26	52	34	49	73	75	37	32	21	24	53	28	36	24	51	24	23	36	23	25	41
		-213	-193	-119	-74	-11	-17	-58	-162	-279	-84	-87	-199	-145	-93	-152	-127	-155	-209	-124	-201	-80	-39	-23	-28	-120
		272	252	198	125	38	70	92	212	354	160	126	232	168	118	207	156	192	235	177	226	103	76	46	54	162
12		26	32	32	32	26	28	39	32	59	70	63	41	17	33	13	39	22	30	13	11	17	15	19	25	31
		-60	-93	-81	-56	-12	-13	-41	-107	-109	-299	-121	-39	-57	-142	-245	-257	-99	-82	-41	-71	-28	-87	-20	-31	-91
		87	126	113	89	39	41	80	140	170	370	185	80	76	176	260	297	122	112	55	82	46	103	40	57	123
13		22	19	18	34	34	39	52	46	40	54	68	79	68	42	30	34	23	24	14	9	11	15	22	19	34
		-68	-18	-11	-43	-28	-3	-20	-70	-84	-157	-132	-114	-109	-72	-57	-58	-60	-27	-68	-81	-41	-14	-23	-36	-58
		91	38	31	78	63	43	73	117	126	213	202	194	178	116	88	94	85	52	83	91	52	30	45	56	93
14		23	29	31	34	29	44	33	17	22	16	12	48	57	39	26	6	8	10	13	21	18	17	15	22	25
		-29	-8	-8	-15	-48	-29	-16	-20	-13	-60	-82	-153	-122	-103	-83	-95	-98	-41	-24	-32	-55	-73	-68	-43	-55
		52	38	40	50	78	73	49	38	36	77	95	202	180	144	111	103	108	51	37	53	74	91	84	66	80
15		23	23	45	68	119	164	117	101	159	86	42	25	49	24	113	64	41	25	23	20	26	20	20	27	59
		-25	-39	-154	-94	-180	-141	-125	-253	-212	-37	-27	-57	-79	-392	-164	-9	-11	-13	-21	-18	-35	-38	-22	-15	-90
		49	63	199	163	300	306	244	355	371	123	70	84	129	417	279	73	53	38	44	39	62	58	42	42	150

16	27	37	21	49	57	97	208	104	46	80	156	113	72	64	206	124	62	54	40	144	95	151	151	179	97
	-12	-22	-19	-18	-26	-198	-102	-6	-4	-63	-299	-280	-48	-214	-543	-385	-62	-32	-71	-250	-421	-304	-44	-256	-153
	40	60	41	67	83	297	312	111	50	144	456	394	122	279	750	511	125	87	112	395	518	456	195	437	252
17	157	104	92	91	135	82	84	51	74	65	71	132	112	73	53	50	68	77	45	66	195	140	88	75	91
	-250	-50	-90	-189	-215	-73	-55	-110	-108	-169	-172	-398	-630	-437	-231	-239	-421	-353	-159	-232	-427	-269	-62	-125	-228
	407	154	183	281	351	156	139	161	182	236	244	531	744	511	285	290	489	431	205	299	622	410	151	201	319
18	72	86	77	80	73	70	110	137	89	108	68	69	39	41	68	63	48	75	109	99	47	42	87	107	78
	-122	-79	-30	-49	-31	-139	-198	-204	-79	-231	-210	-92	-43	-88	-236	-32	-174	-476	-535	-24	-15	-37	-219	-256	-150
	195	166	108	131	105	210	309	342	169	340	280	162	84	130	305	96	223	552	645	124	62	79	307	364	229
19	121	115	176	120	61	64	83	54	74	80	40	59	60	54	44	25	41	55	58	53	47	29	47	75	68
	-255	-113	-158	-28	-5	-12	-55	-172	-144	-49	-34	-142	-90	-56	-49	-162	-234	-197	-109	-112	-79	-31	-30	-149	-103
	377	229	335	148	65	77	139	227	220	130	75	203	152	111	93	187	275	253	168	165	127	61	77	224	172
20	111	157	165	133	143	99	69	36	59	47	54	63	71	63	134	95	35	62	50	81	101	110	67	89	87
	-198	-185	-194	-66	-46	-36	0	0	-25	-42	-170	-240	-128	-80	-199	-138	-90	-281	-152	-90	-59	-141	-152	-148	-119
	311	343	360	200	190	135	69	36	85	90	226	304	201	144	335	234	127	343	203	172	161	252	219	237	207
21	146	110	101	60	89	57	86	80	97	88	82	117	101	64	56	44	87	97	167	115	134	168	189	79	101
	-115	-107	-56	-34	-37	-45	-61	-227	-103	-112	-187	-344	-211	-113	-343	-227	-379	-392	-58	-54	-264	-328	-88	-20	-163
	262	218	157	95	127	103	148	309	201	202	271	462	313	178	400	273	467	490	225	170	399	497	278	99	264
22	94	71	54	72	54	49	87	70	70	69	87	133	147	107	48	48	44	32	29	33	34	62	43	61	67
	-99	-33	-30	-12	0	-8	-60	-84	-61	-24	-95	-522	-170	-31	-21	-32	-40	-11	-20	-28	-45	-134	-100	-101	-73
	193	106	84	84	54	57	147	155	131	94	183	656	318	139	70	81	85	43	50	62	80	197	144	163	141
23	64	64	69	101	107	154	121	83	75	67	86	80	62	50	51	43	73	85	86	98	85	107	142	131	87
	-57	-66	-17	-30	-78	-2	2	-1	-8	-139	-302	-162	-53	-18	-10	-77	-52	-259	-271	-43	-92	-130	-438	-87	-100
	122	130	88	132	186	156	118	85	83	207	390	244	115	69	61	121	126	345	359	142	178	238	581	219	187
24	122	69	85	61	57	64	47	73	67	81	140	104	55	49	34	73	62	58	119	108	108	127	98	69	80
	-39	-33	-3	3	0	-26	-31	-78	-69	-87	-131	-126	-73	-34	-130	-287	-120	-228	-236	-116	-59	-186	-163	-32	-95
	161	102	88	57	57	91	79	152	137	169	272	232	129	84	166	361	184	287	355	225	169	314	262	102	176
25	63	61	61	69	58	87	84	62	75	77	90	90	54	56	51	63	37	18	19	50	82	43	45	44	60
	-33	-30	-17	-105	-121	-8	-15	-1	-12	-100	-181	-61	-38	-65	-142	-41	-14	-30	-71	-79	-81	-138	-66	-34	-62
	96	91	79	175	180	96	100	64	88	178	273	152	93	123	195	104	51	49	90	130	164	181	112	79	123
26	43	50	92	58	35	23	25	43	46	39	73	46	45	37	54	59	60	31	23	22	80	135	130	50	54
	-78	-45	-6	2	1	-8	-25	-8	-23	-72	-66	-41	-60	-160	-226	-179	-35	-14	-10	-14	-133	-383	-135	-50	-74
	122	96	99	55	33	32	51	52	69	112	140	87	106	198	281	239	96	45	34	36	214	519	266	101	128
27	43	45	46	77	77	66	63	79	66	49	37	38	95	105	51	68	60	88	47	34	30	26	21	21	56
	-24	-17	-9	-12	-32	-94	-25	-2	-51	-2	-23	-79	-135	-191	-173	-138	-96	-284	-64	-15	-5	-13	-11	-11	-63
	67	63	56	90	111	161	90	82	118	51	62	119	231	298	226	207	157	372	113	50	36	39	33	32	119
28	25	25	27	41	57	47	47	48	34	39	53	18	7	9	27	16	15	14	20	16	28	31	33	39	30
	-7	-8	-7	-6	-1	0	-4	-5	-12	-28	-2	-2	-8	-8	-47	-98	-47	-87	-99	-120	-58	-18	-4	3	-28
	32	34	35	47	58	45	51	54	46	68	55	21	16	19	76	115	63	102	120	137	87	49	37	35	58
29	32	26	24	32	35	71	56	50	42	26	23	19	22	17	15	14	14	14	14	12	15	14	16	16	26
	2	1	0	-2	-1	-27	-19	0	-3	3	0	0	-1	-5	-9	-6	-8	-6	-1	-20	3	3	0	-2	-4
	29	24	25	34	36	98	76	49	46	23	22	19	24	23	25	20	22	21	16	32	11	10	15	19	30
30	29	38	52	80	85	87	66	49	70	34	27	21	34	32	56	30	27	23	18	13	14	14	12	16	39
	-12	-8	-18	-7	3	0	-9	-19	-206	-51	0	-6	-97	-108	-129	-29	-10	-10	-7	0	0	0	0	-2	-30
	42	47	72	88	81	87	76	69	277	86	28	28	132	141	187	59	37	33	26	13	13	12	11	19	69
31	14	27	50	30	55	103	158	237	295	133	84	42	28	16	13	18	59	91	91	45	57	62	91	80	78
	-5	-72	-52	7	-50	-166	-470	-536	-391	-231	-185	-134	-123	-290	-97	-88	-275	-301	-177	-64	-112	-314	-305	-154	-191
	20	100	102	22	106	270	629	775	687	365	270	177	153	307	112	107	334	394	269	110	170	377	397	234	270

MONTHLY and YEARLY **AE** 1957 - 1993

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
1957							159	145	311	156	168	217	
1958	193	255	301	263	231	273	270	201	185	175	132	183	221.9
1959	184	256	205	193	208	206	274	225	270	217	246	236	226.8
1960	171	162	183	317	207	235	225	211	212	324	277	255	231.6
1961	156	168	141	166	154	163	252	145	149	143	129	149	159.7
1962	90	95	100	160	110	131	140	172	198	221	152	155	143.6
1963	132	95	94	109	124	142	137	156	229	153	130	115	134.6
1964	116	122	133	149	124	95	99	88	137	142	97	71	114.4
1965	83	121	113	93	94	178	132	130	143	89	87	101	113.6
1966	108	130	152	145	162	146	180	176	223	152	148	157	156.5
1967	135	139	121	168	278	205	177	172	204	123	161	196	173.4
1968	187	227	256	231	268	302	213	203	206	184	198	163	219.9
1969	132	169	227	255	268	225	172	175	198	161	152	110	187.1
1970	118	104	210	233	199	243	276	222	203	194	192	135	194.1
1971	188	177	194	245	241	230	189	195	213	189	155	153	197.5
1972	192	156	203	203	193	238	177	259	196	202	180	133	194.3
1973	221	262	315	337	241	273	232	223	225	261	192	183	247.1
1974	201	226	324	309	297	278	322	307	306	326	248	245	282.3
1975	198	246	283	227	238	542	240	220	188	197	244	180	250.3
1976													
1977													
1978	192	238	244	293	311	308	214	240	246	193	215	177	239.2
1979	213	196	248	298	253	255	224	255	217	189	153	158	221.7
1980	150	165	123	182	184	262	204	181	166	196	199	151	180.2
1981	148	196	239	325	320	219	280	280	207	253	218	159	237.0
1982	179	387	221	305	291	368	373	319	347	276	255	278	299.9
1983	219	321	318	382	292	284	262	265	230	264	283	238	279.8
1984	214	254	301	330	315	284	280	261	311	302	247	255	279.6
1985	226	235	176	271	183	220	265	224	202	204	200	186	216.0
1986	187	273	208	138	203	188	172	232	217	161	188	138	192.2
1987	123	155	164	115	167	160	195	255	271	254	201	147	183.9
1988	180	215	218	233	196	234							
1989													
1990	181	298	296	363	292	249	215	289	220	204	132	108	237.3
1991	120	151	275	270	304	477	364	389	320	332	319	206	294.1
1992	193	290	213	192	281	283	196	238	306	247	228	202	239.1
1993	229	211	326	260	216	216	191	194	211	209	203	203	222.5

Unit: nT

Note: The definitive indices for July 1988 to December1989 were not available at the date of publication of this Bulletin. The values for 1990 to 1993 correspond to provisional indices (see IAGA Bulletins 32u, 32v, 32w, and this Bulletin, page 21)

SECTION 4

CLASSIFICATION OF DAYS

CLASSIFICATION OF DAYS

Quiet days 1993

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	. . .	. . .	. . .	. . .	K K .	C C *	. . .	C C *	C C *	. . .	. . .	. . .
2	. . .	. . .	. . .	C C *	C C .	C K .	. . .	C C *	C K .	. . .	C K *	. . .
3	. . .	. . .	. . .	C C *	. . .	. . .	. . .	C C .	. . .	C K .	. . .	. . .
4	. . .	. . .	. . .	. . .	C K .	. . .	. . .	. . .	. . .	K K .	. . .	. . .
5	. . .	C C .	C . *	. . .	K K .	. . .	K K .	. . .	. . .	C . .	. . .	. . .
6	. . .	C . *	. . *	. . .	. . .	. . .	K K .	. . .	. . .	. . .	. . .	C . .
7	. . .	. . .	. . .	. . .	. . .	. . .	C . .	. . .	. . .	C . *	. . .	. . .
8	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. K .	. . .	. . .	. . .
9	. . .	. . .	. . .	. . .	. . .	C . .	. . .	. . .	C C .	. . .	. . .	C . *
10	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	C C *	. . .	. . .	. . .
11	. . .	. . .	. . .	. . .	C . .	. . .	. . .	C C .	C C .	. . .	C K .	C . .
12	. . .	. . .	. . .	. . .	. . .	. . .	. . .	C C .	. . .	. . .	C C *	C C .
13	. . .	. . .	. . .	. . .	. . .	. . .	. . .	C C .	. . .	. . .	. . .	C C *
14	. . .	C C .	. . .	. . .	. . .	. . .	C K *	C C *	. . .	. . .	. . .	C K *
15	. . .	C C *	. . .	. . .	. . .	C C .	C C .	. . .	. . .	C C *	. . .	. . .
16	. . .	C . *	. . .	. . .	. . .	C C *	C C *	. . .	C C .	C K *	. . .	. . .
17	. . .	. . .	. . .	. . .	. . .	C C .	C C *	. . .	C C *	. . .	. . .	. . .
18	. . .	. . .	. . .	. . .	K . .	C C *	C C .	. . .	C C *	C . .	. . .	. . .
19	. . .	C . .	. . *	. . .	. . .	C C .	C K .	. . .	C K *	. K .	. . .	. . .
20	. . .	. . .	. . .	. . .	. . .	C C .	. . .	. . .	. . .	C C *	. . .	. . .
21	. . *	. . .	. . .	. . .	C C *	C C *	. . .	C C .	. . .	C . .	. C .	. . .
22	K K *	. . .	. . .	. . .	C C *	C C .	. . .	K C .	C K .	. . .	C C .	. . .
23	C K *	. . .	. . .	. . .	C C *	. . .	C K .	C C *	. . .	. . .	C C .	. . .
24	. . .	C C .	. . .	. . .	C C *	. . .	C C *	C C .	. . .	. . .	C C *	. . .
25	. . .	K C .	. . .	. . .	C C *	. . .	C C .	C C *	. . .	. . .	. . .	. . .
26	. . .	C K *	. . *	C C *	C K .	C . .	C C *	C C .	. . .	. . .	. . .	. . .
27	. . .	K . *	. . .	C C *	. . .	C C .	. . .	. . .	. . .	. . .	. . .	. . .
28	C C *	. . .	. . .	C C *	. . .	C K *	C . .	. . .	. . .	. . .	C . *	C C *
29	C K *		. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	C C *
30	. . .		. . .	. . .	C C .	. . .	C . .	C C .	. . .	C K *	C . *	C . .
31	. . .		. . *		C C .		C C .	C C .		. . .		. . .

C: indicates very quiet period
K: indicates quiet period
This characterization is deduced from aa values - see text p.13.
The first column is relative to the U.T.day,
the second column to the 48 hour interval centered on U.T.day.

An asterisk in the third column indicates that the U.T. day is one of
the five quietest days of the month - according to Kp, see text p.22

CLASSIFICATION OF DAYS (continued)

JANUARY 1993

Five international quietest days (from Kp)		:	21 22 23 28 29
24-hours quiet intervals (from aa)	C – very quiet	:	23 28 29
	K – quiet	:	22
48-hours quiet intervals (from aa)	C – very quiet	:	28
	K – quiet	:	22 23 29

FEBRUARY 1993

Five international quietest days (from Kp)		:	6 15 16 26 27
24-hours quiet intervals (from aa)	C – very quiet	:	5 6 14 15 16 19 24 26
	K – quiet	:	25 27
48-hours quiet intervals (from aa)	C – very quiet	:	5 14 15 24 25
	K – quiet	:	26

MARCH 1993

Five international quietest days (from Kp)		:	5 6 19 26 31
24-hours quiet intervals (from aa)	C – very quiet	:	5
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	NONE
	K – quiet	:	NONE

APRIL 1993

Five international quietest days (from Kp)		:	2 3 26 27 28
24-hours quiet intervals (from aa)	C – very quiet	:	2 3 26 27 28
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	23 26 27 28
	K – quiet	:	NONE

MAY 1993

Five international quietest days (from Kp)		:	21 22 23 24 25
24-hours quiet intervals (from aa)	C – very quiet	:	2 4 11 21 22 23 24 25 26 30 31
	K – quiet	:	1 5 18
48-hours quiet intervals (from aa)	C – very quiet	:	2 21 22 23 24 25 30 31
	K – quiet	:	1 4 5 26

JUNE 1993

Five international quietest days (from Kp)		:	1 16 18 21 28
24-hours quiet intervals (from aa)	C – very quiet	:	1 2 9 15 16 17 18 19 20 21 22 26 27 28
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	1 15 16 17 18 19 20 21 22 27
	K – quiet	:	2 28

CLASSIFICATION OF DAYS (continued)

JULY 1993

Five international quietest days (from Kp)		:	14 16 17 24 26
24-hours quiet intervals (from aa)	C – very quiet	:	7 14 15 16 17 18 19 23 24 25 26 28 30 31
	K – quiet	:	5 6
48-hours quiet intervals (from aa)	C – very quiet	:	15 16 17 18 24 25 26 31
	K – quiet	:	5 6 14 19 23

AUGUST 1993

Five international quietest days (from Kp)		:	1 2 14 23 25
24-hours quiet intervals (from aa)	C – very quiet	:	1 2 3 11 12 13 14 21 23 24 25 26 30 31
	K – quiet	:	22
48-hours quiet intervals (from aa)	C – very quiet	:	1 2 3 11 12 13 14 21 22 23 24 25 26 30 31
	K – quiet	:	NONE

SEPTEMBER 1993

Five international quietest days (from Kp)		:	1 10 17 18 19
24-hours quiet intervals (from aa)	C – very quiet	:	1 2 9 10 11 16 17 18 19 22
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	1 9 10 11 16 17 18
	K – quiet	:	2 8 19 22

OCTOBER 1993

Five international quietest days (from Kp)		:	7 15 16 20 30
24-hours quiet intervals (from aa)	C – very quiet	:	3 5 7 15 16 18 20 21 30
	K – quiet	:	4
48-hours quiet intervals (from aa)	C – very quiet	:	15 20
	K – quiet	:	3 4 16 19 30

NOVEMBER 1993

Five international quietest days (from Kp)		:	2 12 24 28 30
24-hours quiet intervals (from aa)	C – very quiet	:	2 11 12 22 23 24 28 30
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	12 21 22 23 24
	K – quiet	:	2 11

DECEMBER 1993

Five international quietest days (from Kp)		:	9 13 14 28 29
24-hours quiet intervals (from aa)	C – very quiet	:	6 9 11 12 13 14 28 29 30
	K – quiet	:	NONE
48-hours quiet intervals (from aa)	C – very quiet	:	12 13 28 29
	K – quiet	:	14

CLASSIFICATION OF DAYS 1993 (continued)

INTERNATIONAL QUIET AND DISTURBED DAYS 1993

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

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

VERY QUIET INTERVALS, 1993

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

First..... Eighth			last..... Eighth		Duration Eighths
Jan	28	E6	29	E7	9
Feb	26	E7	27	E8	9
Apr	26	E6	27	E7	10
May	01	E6	02	E6	9
	20	E7	26	E7	49
	30	E3	31	E4	10
Jun	15	E4	17	E6	19
	20	E6	22	E6	17
Jul	05	E3	06	E3	8
	14	E1	15	E1	9
	16	E7	18	E3	13
	23	E6	24	E5	8

First..... Eighth			last..... Eighth		Duration Eighths
Jul	25	E3	26	E5	11
	31	E6	Aug 03	E4	23
Aug	13	E3	15	E4	17
	21	E4	22	E3	8
	23	E2	24	E3	10
	31	E3	Sep 02	E3	17
Oct	14	E7	16	E5	15
	30	E2	31	E2	9
Nov	02	E3	03	E5	11
Dec	08	E8	09	E7	8
	12	E7	13	E7	9
	27	E7	28	E1	11

LIST OF MAGNETIC STORMS, 1993

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

Beginning			s.c. d.	GMT	Duration Eighths	Number of 7-	7o	7+	Eighths with 8-	8o	8+	Kp = 9-	9o
Feb	17	E4		-	3	1	.	.	.	.	.	.	.
Mar	08	E8	08	21.37	6	2	.	.	.	.	.	.	.
	11	E4		-	6	1	.	.	.	.	.	.	.
	15	E3	15	05.26	4	.	.	.	.	.	.	.	.
Apr	04	E5	04	14.34	11	.	2	1	1	.	.	.	.
Jun	10	E7	10	17 27	2	.	1	.	.	.	.	.	.
Aug	15	E8		-	11	1	1	.	.	.	.	.	.
Nov	03	E8		-	9	1	.	.	.	.	.	.	.
	18	E5	18	12.12	3	.	.	.	.	.	.	.	.

SECTION 5

RAPID VARIATIONS

5.1 List of ssc 1993 141

5.2 List of sfe 1993 145

SECTION 5

5.1 List of ssc 1993

STORM SUDDEN COMMENCEMENTS (**ssc**) 1993

Sudden commencements followed by a storm or a period of storminess, as selected from the monthly reports of the 42 observatories listed below by their three letter code. The name of observatories together with their geographical coordinates and operation dates are given on section 2 (pages29-35). The alternative codes used by some observatories are given in brackets:

SOD DOB NUR LER ESK WNG NGK VAL HAD DOU BDV CLF HRB NAG GCK MMB AQU EBR COI BJI SPT FRD PEG (PEN) KAK HTY KNY QUE SZT (TEN) LNP HYB ETT LUA PMG TAN MPO GNA HER CNB AMS CZT PAF (KGL) DRV (DUM).

Events are checked with the records of HON and EBR. Measurements of quality, duration and amplitude are from copies provided by the five low-latitude observatories: MBO, FUQ, HON, PMG, ABG.

JANUARY 1993										
1901	1022	22222	4.5	27	7A	6B	5C		3si	(1018-1024)

FEBRUARY 1993										
1702	0301	22222	3.5	46	25A	13B	2C			(0300-0303)
2002	0029	22222	5.9	11	1A	4B	8C			(0024-0030)
2702	2220	-2222	4.7	17	3A	11B	13C			(2217-2222)

MARCH 1993										
0803	2137	22222	5.2	46	21A	11B	1C	1-		(2133-2139)
1103	0640	22222	3.2	15	5A	15B	9C	1-		(0638-0641)
1503	0526	22222	3.3	18	8A	15B	7C	1-	2si	(0521-0528)
2303	2155	222-2	4.3	33	16A	15B	3C	2-	1sfe	(2153-2158)
2703	1338	22212	6.6	16		2B	1C	1si	1sfe	(1338-1338)

APRIL 1993										
0404	1434	22222	4.7	39	24A	13B	1C	1-	1sfe	(1429-1436)
2904	1145	-1111	2.7	9	5A	4B				(1143-1147)
3004	0204	12212	5.5	25		2B	1C	2si		(0203-0205)

MAY 1993										
2605	2300	22211	6.5	13	1A	6B	10C		1sfe	(2258-2303)

STORM SUDDEN COMMENCEMENTS (**ssc**) 1993 (continued)

JUNE 1993										
1006	1727	22222	5.4	16	7A	22B	6C		1sfe	(1721-1731)

JULY 1993
none

AUGUST 1993										
1508	1514	110-1	5.3	7	1A	3B	10C			(1514-1515)

SEPTEMBER 1993										
2309	1231	22222	5.6	23	15A	8B	5C	1-		(1230-1233)

OCTOBER 1993										
0710	1211	211-1	6.6	9		2B	3C		2sfe	(1210-1211)
2210	1224	111-2	5.2	9	1A	5B	5C	2-	1sfe	(1219-1225)

NOVEMBER 1993										
0311	1727	11111	6.4	15	1A	5B	3C		1sfe	(1725-1729)
		reversed								
0311	1755	22112	3.3	18	4A	17B	4C	3-		(1754-1757)
1811	1212	22223	7.1	29	16A	15B	4C	4-		(1208-1215)

DECEMBER 1993										
0712	1201	22222	8.4	14	5A	21B	7C	4-		(1200-1205)

SECTION 5

5.2 List of sfe 1993

Solar-flare effects 1993

Summary list 147

Extended list 148

Doubtful solar-flare effects 1993

Summary list 151

Extended list 152

SOLAR FLARE EFFECTS (**sfe**) – Summary list 1993

JANUARY
none

FEBRUARY		
C	10/02	08:52
C	14/02	12:52

MARCH		
C	30/03	01:02

APRIL		
C	01/04	12:12
C	22/04	14:08
C	25/04	08:36
C	26/04	12:49

MAY
none

JUNE		
C	27/06	04:31

JULY
none

AUGUST
none

SEPTEMBER
none

OCTOBER		
C	14/10	08:22

NOVEMBER
none

DECEMBER		
C	20/12	08:37
	25/12	13:00

SOLAR FLARE EFFECTS (**sfe**) 1993

Times of commencements of solar-flare effects (*sfe*) selected from the monthly lists sent by 42 observatories, as reported in the list of *ssc* and checked by the following 30 observatories, identified by their IAGA three letter code (see section 2, pages 29-35):

LER ESK WNG NGK VAL HAD BDV CLF HRB NAG SUA MMB SOF AQU EBR COI SPT PEN KAK HTY KNY QUE TEN LNP API MPO GNA HER CNB EYR

JANUARY

none

FEBRUARY **C** **10/02** **08:52**

A	WNG2	VAL3	HRB0	SUA3	SOF3	COI2	SPT1	PEN2	LNP3	MPO2
B	LER2	ESK2	HAD2	CLF3	NAG1	AQU1	TEN2			
C	NGK0	BDV1	(MMB1)	(KAK1)	(HTY2)	(KNY1)	QUE1	[API0]	GNA1	HER0
	(CNB1)	(EYR1)								
D										
E										
X	EBR									

FEBRUARY **C** **14/02** **12:52**

A	SOF3	TEN3								
B	WNG2	SUA2	SPT1	MPO2						
C	LER3	ESK3	NGK2	VAL1	HAD3	CLF1	HRB1	NAG1	[MMB0]	AQU1
	PEN2	[KAK0]	[HTY2]	[KNY0]						
D	BDV	EBR	COI	QUE	HER					
E										
X										

MARCH **C** **30/03** **01:02**

A										
B	[ESK0]	[WNG0]	MMB1	KNY1	LNP2					
C	[LER0]	[VAL0]	[HAD0]	[HRB1]	[NAG0]	[AQU1]	[SPT1]	KAK1	HTY3	[TEN1]
	EYR2									
D	GNA	CNB								
E										
X	[SOF]	API								

APRIL **C** **01/04** **12:12**

A										
B	LER3	ESK3	WNG2	SPT1						
C	NGK2	VAL1	HAD3	BDV2	CLF1	HRB2	NAG1	SUA2	AQU1	[KAK0]
	[KNY0]	TEN1	[EYR0]							
D	SOF	EBR	COI	PEN	QUE	MPO	HER			
E										
X	[API]									

APRIL **C** **22/04** **14:08**

A	SOF3									
B	WNG2	HRB1	NAG0							
C	LER3	ESK3	NGK2	VAL0	HAD3	BDV2	SUA0	[MMB0]	AQU1	EBR0
	SPT1	[KAK0]	[HTY2]	(QUE0)	TEN1					
D	CLF	COI	MPO	HER						
E	PEN									
X	[API]									

SOLAR FLARE EFFECTS (sfe) 1993 (continued)

APRIL **C** **25/04** **08:36**

A	WNG2	HRB1	SUA3	PEN2	QUE2	LNP3	MPO3			
B	LER3	ESK3	NGK2	VAL2	HAD3	NAG1	MMB1	AQU1	SPT1	KAK1
	KNY1	GNA2	HER0							
C	BDV1	CLF1	EBR0	HTY0	(CNB1)	[EYR0]				
D	SOF	COI	TEN							
E										
X	[API]									

APRIL **C** **26/04** **12:49**

A	LER3	ESK3	WNG2	HAD3	HRB2	SUA3	[LNP3]			
B	NAG2	EBR0	SPT1	PEN2	[KNY0]	QUE1	TEN2			
C	NGK2	VAL2	BDV1	[MMB0]	AQU1	[KAK0]	[HTY0]	[GNA1]	HER0	[CNB0]
D	CLF	SOF	COI							
E										
X	[API]	MPO								

MAY

none

JUNE **C** **27/06** **04:31**

A	LNP3									
B	WNG2									
C	NGK0	VAL0	MMB1	(SPT1)	KAK2	HTY2	KNY2	QUE1		
D	LER	ESK	HAD	BDV	CLF	HRB	NAG	SUA	AQU	EBR
	PEN	CNB	EYR							
E										
X	SOF	API	GNA							

JULY

none

AUGUST

none

SEPTEMBER

none

OCTOBER **C** **14/10** **08:22**

A	WNG2	SUA2	EBR2	SPT1	MPO3					
B	VAL2	HRB2	NAG1	PEN2	GNA2	HER0				
C	LER2	ESK2	NGK1	HAD2	CLF0	(MMB0)	AQU1	(KAK0)	(HTY0)	KNY0
	TEN2	LNP1	CNB1	(EYR1)						
D	BDV	COI								
E										
X	SOF	QUE								

NOVEMBER

none

SOLAR FLARE EFFECTS (**sfe**) 1993 (continued)

DECEMBER **C** **20/12** **08:37**

A	WNG2	NAG2	MPO3							
B	(VAL2)	CLF2	HRB1	SUA2	SPT1	TEN2	LNP2	CNB1		
C	(LER2)	(ESK2)	NGK2	HAD2	BDV1	[MMB1]	AQU1	PEN1	(KAK1)	(HTY2)
	(KNY1)	[API0]	GNA1							
D	QUE	HER								
E	EBR	COI								
X	SOF									

DECEMBER **25/12** **13:00**

A	WNG2	NAG2	SUA3	COI2	TEN3					
B	NGK2	VAL2	HAD1	CLF1	HRB1	AQU2	EBR0	SPT1	PEN3	(QUE0)
	(GNA2)									
C	LER1	ESK1	[KNY0]	[LNP1]	[API0]	HER0	[CNB0]	[EYR0]		
D	BDV									
E										
X	SOF	MPO								

DOUBTFUL SOLAR FLARE EFFECTS – Summary list 1993

JANUARY
none

FEBRUARY		
C	18/02	02:59

MARCH		
C	20/03	07:10

APRIL		
C	06/04	23:43
C	10/04	23:33
C	11/04	06:12
C	19/04	06:38
C	20/04	12:51
	24/04	07:24

MAY
none

JUNE		
C	07/06	14:10
C	24/06	07:28

JULY
none

AUGUST		
	22/08	23:22

SEPTEMBER		
	17/09	06:40
C	27/09	12:08
C	28/09	12:44

OCTOBER		
C	07/10	12:10

NOVEMBER
none

DECEMBER
none

DOUBTFUL SOLAR FLARE EFFECTS (sfe) 1993

JANUARY

none

FEBRUARY **C** **18/02** **02:59**

A	EYR2									
B	[WNG0]	KAK1	HTY2	QUE1	CNB2					
C	[NGK0]	MMB1	[AQU1]	KNY0						
D	LNP	API	GNA							
E										
X	[SOF](MPO)									

MARCH **C** **20/03** **07:10**

A	HRB1	SUA2	PEN3	HTY2	QUE2	TEN2	LNP3	MPO3		
B	WNG2	NGK2	VAL2	CLF2	NAG2	MMB0	EBR0	SPT1	KAK0	KNY0
	GNA2	HER0	CNB1							
C	LER0	ESK0	HAD0	AQU1	(EYR1)					
D	SOF									
E	BDV	COI								
X	[API]									

APRIL **C** **06/04** **23:43**

A	[WNG0]	[SUA2]			
B	[NGK0]	[VAL0]	MMB2	KAK2	HTY3
C	KNY2	LNP2			
D	GNA	CNB	EYR		
E	[LER]	[ESK]			
X	[SOF]	API			

APRIL **C** **10/04** **23:33**

A										
B	[WNG0]	[NGK0]								
C	[ESK0]	[VAL1]	[NAG1]	MMB2	[AQU0]	KAK2	HTY2	KNY1	LNP2	GNA1
	[HER0]	EYR1								
D	API	CNB								
E										
X										

APRIL **C** **11/04** **06:12**

A	SOF3									
B	MMB2	KAK1	KNY2	LNP2						
C	LER0	WNG1	VAL1	SUA2	AQU1	EBR0	SPT0	HTY2	(TEN1)	HER0
D	ESK	NGK	HAD	BDV	CLF	HRB	NAG	COI	PEN	QUE
	MPO	GNA	CNB							
E										
X										

APRIL **C** **19/04** **06:38**

A	LNP3									
B	WNG2	MPO2								
C	LER0	ESK0	NGK2	VAL1	HAD0	HRB1	SUA2	MMB1	SOF2	AQU1
	SPT0	KAK1	HTY1	KNY1	QUE1	(TEN1)	HER0	(EYR1)		
D	BDV	CLF	COI	PEN	GNA	CNB				
E	EBR									
X	NAG	[API]								

DOUBTFUL SOLAR FLARE EFFECTS (**sfe**) 1993 (continued)

APRIL **C** **20/04** **12:51**

A	SOF3									
B	WNG3	VAL0	NAG0	[LNP2]						
C	NGK1	HAD0	BDV2	CLF1	SUA3	[MMB0]	AQU1	EBR0	SPT1	[KAK0]
	[HTY2]	[KNY0]	TEN1	HER0	[CNB0]	[EYR0]				
D	LER	ESK	COI	QUE	MPO					
E	HRB	PEN								
X	[API]									

APRIL **24/04** **07:24**

A										
B	WNG2	MMB1	SPT1	PEN1	KNY0	QUE1	GNA1	[EYR1]		
C	LER1	ESK1	NGK2	VAL2	HAD1	HRB1	NAG0	AQU1	EBR0	KAK0
	HTY1	HER0	CNB1							
D	BDV	CLF	SUA	SOF	COI	TEN	LNP			
E										
X	[API]	MPO								

MAY

none

JUNE **C** **07/06** **14:10**

A	HRB1								
B	WNG3	NGK0	CLF0	NAG0	EBR0	SPT1			
C	ESK1	VAL0	HAD1	AQU1	PEN2	QUE1	TEN1	[LNP1]	[GNA1]
D	LER	SUA	COI	MPO	HER				
E	BDV								
X	SOF	[API]							

JUNE **C** **24/06** **07:28**

A	NAG0	SUA3	(CNB3)					
B	WNG2	MMB1	KNY1	QUE1	TEN2	LNP2		
C	LER0	VAL1	HAD0	AQU1	SPT0	KAK1	HTY0	HER0
D	ESK	NGK	COI					
E	BDV	CLF	HRB	EBR	PEN	[EYR]		
X	SOF	[API]	MPO	GNA				

JULY

none

AUGUST **22/08** **23:22**

A	GNA2	CNB1								
B	[WNG0]	[CLF0]	MMB0	KNY0	[MPO2]	EYR1				
C	(LER0)	[ESK0]	[NGK1]	[VAL0]	[HAD0]	[HRB2]	[NAG1]	[SUA1]	[AQU0]	[PEN2]
	KAK0	HTY1	[QUE0]	LNP1	API1					
D										
E										
X	[SOF]									

DOUBTFUL SOLAR FLARE EFFECTS (**sfe**) 1993 (continued)

SEPTEMBER **17/09** **06:40**

A	WNG2									
B	LER1	ESK1	HAD1	SUA1	COI1	SPT0				
C	NGK2	VAL1	BDV1	CLF0	NAG0	MMB0	AQU1	KAK0	HTY0	KNY0
	QUE1	(TEN1)	LNP1	GNA1	CNB1					
D	HRB	EBR	PEN	HER						
E										
X	SOF	MPO								

SEPTEMBER **C** **27/09** **12:08**

A										
B	WNG2	NAG0	SPT0	PEN2	TEN2	[LNP2]				
C	LER2	ESK2	NGK2	VAL0	HAD2	BDV2	SUA2	AQU1	EBR0	[HTY2]
	QUE0									
D	CLF	HRB	COI	MPO	HER					
E										
X	SOF									

SEPTEMBER **C** **28/09** **12:44**

A	HRB1	SUA3	EBR0	SPT0	PEN3	QUE1	TEN3	[LNP3]	
B	WNG2	NGK2	CLF1	NAG1	[MMB0]	AQU1	[KNY0]		
C	ESK0	VAL2	HAD1	BDV1	[KAK0]	[HTY1]	MPO2	HER0	[CNB1]
D	LER	COI							
E									
X	SOF								

OCTOBER **C** **07/10** **12:10**

A	WNG2	SUA2	EBR0	SPT1	[LNP3]					
B	ESK3	HAD3	CLF3	NAG1	[MMB0]	[KNY0]	QUE1	TEN2	[API0]	[CNB1]
C	LER3	NGK3	VAL2	BDV1	AQU1	PEN1	[KAK0]	[HTY1]	[GNA2]	HER0
	[EYR0]									
D	HRB	COI								
E										
X	SOF	MPO								

NOVEMBER

none

DECEMBER

none

TRANSACTIONS OF IAGA MEETINGS

	Bulletin
Transactions of the Rome Meeting, 1922	No. 3
Transactions of the Madrid Meeting, 1924	No. 5
Comptes rendus de l'Assemblée de Stockholm, 1930	No. 8
Transactions of the Oslo Meeting, 1948	No. 13
Transactions of the Brussels Meeting, 1951	No. 14
Le Noyau Terrestre, Rome, 1954	No. 15a
Problèmes de la Physique de la haute atmosphère, 1954	No. 15b
Transactions of the Toronto Meeting, 1957	No. 16
Paléomagnétisme et Variation Séculaire, Toronto, 1957	No. 16a
Aéronomie, Toronto, 1957	No. 16b
Rapid Magnetic Variations, Utrecht, 1959	No. 16c
Transactions of the Helsinki and Berkeley Meetings 1960/1963	No. 19
Atlas of Indices K (Vol. 1 : Text ; Vol. 2 : Figures)	No. 21
Programme and Abstracts of the St Gall Meeting, 1957	No. 24
Transactions of the St Gall Meeting, 1967	No. 25
Programme and abstracts of the General Scientific Assembly, Madrid, 1969	No. 26
Transactions of the General Scientific Assembly, Madrid, 1969	No. 27
The World Magnetic Survey, 1957-1969	No. 28
Grid values for the IGRF 1965	No. 29
Transactions of the XV General Assembly, Moscow, 1971	No. 31
Programme and abstracts for the Second General Scientific Assembly, Kyoto, 197	No. 34
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Programme and Abstracts of the XVI General Assembly, Grenoble, 1975	No. 36
Transactions of the XVI General Assembly, Grenoble, 1975	No. 37
Grid values and charts of the IGRF 1975	No. 38
Transactions of the III General Scientific Assembly, Seattle, 1977	No. 41
Transactions of the XVII General Assembly, Canberra, 1979	No. 44
Program and abstracts of the IV General Scientific Assembly, Edimbourg, 1981	No. 45
Transactions of the IV General Scientific Assembly, Edimbourg, 1981	No. 46
Program and abstracts of the XVIII General Assembly, Hambourg, 1983	No. 48a
Program and abstracts of the IAGA/IAMAT Joint symposium on middle atmospheric sciences Hambourg, 1983	No. 48b
Transactions of the XVIII General Assembly, Hambourg, (1983-1985)	No. 49
Program and abstracts of the V Scientific Assembly, Prague, 1985	No. 50
Transactions of the V Scientific Assembly, Prague, 1985	No. 51
Grid-Point Values and Charts for the IGRF 1985	No. 52
Program and abstracts of the VI Scientific Assembly, Exeter, 1989	No. 53
Tables and Maps of the DGRF 1985 and IGRF 1990	No. 54

PROCEEDINGS OF IAGA SYMPOSIA

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

Users Information Indices 1993 on Diskette ("README")

The included diskette contains files of IAGA indices presented following the same formats as those of the tables published in the IAGA Bulletin n°32x for 1993, and a software for visualizing the tables. The software (interaa.exe) is installed at the root level on a: , and the data files used are in the directory a:\ind93.

The names of the files for indices aa, an(3Kn), as(3Ks), am(3Km), Kp(ap), Dst and AE are:

- ...93.dat for hourly or three hourly, and daily values
- ...93.mya for monthly and yearly values since the inception of the series
- ...93.dmv for daily and monthly values (only Dst)

You can use the visualization software in two ways :

1 - Directly from the diskette :
Hit the command : INTERAA, then give the current year : 1993

2 - Installation on a drive of your computer
Hit INSTAL <drive>: , then ENTER (Example : INSTAL C:)
Hit the command : INTERAA, then give the current year : 1993

If you have diskettes for previous years (1982 to 1992 are available), you can use the same software (interaa.exe), provided that the data files for the corresponding years are on the directories <drive>:\indAA (AA for 82 to 92 years, respectively)

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Geomagnetic Indices and Geomagnetic Data

	Bulletin
Geomagnetic Indices, K and C, 1940-1946	No. 12
Geomagnetic Indices, K and C, 1947	No. 12a
Geomagnetic Indices, K and C, 1948	No. 12b
Geomagnetic Indices, K and C, 1949	No. 12c
Geomagnetic K-Indices, International Polar Year, August 1932 to 1933	No. 12d
Geomagnetic Indices, K and C, 1950	No. 12e
Geomagnetic Indices, K and C, 1951	No. 12f
Geomagnetic Indices, K and C, 1952	No. 12g
Geomagnetic Indices, K and C, 1953	No. 12h
Geomagnetic Indices, K and C, 1954	No. 12i
Geomagnetic Indices, K and C, 1955	No. 12j
Geomagnetic Indices, K and C, 1956	No. 12k
Geomagnetic Data, 1957, Indices K and C,Rapid Variations	No. 12l
Geomagnetic Data, 1958, Indices K and C No. 12m1, Rapid Variations	No. 12m2
Geomagnetic Data, 1959, Indices K and C No. 12n1, Rapid Variations	No. 12n2
Geomagnetic Data, 1960, Indices K and C No. 12o1, Rapid Variations	No. 12o2
Geomagnetic Data, 1961, Indices K and C No. 12p1, Rapid Variations	No. 12p2
Geomagnetic Data, 1962, Indices K and C No. 12q1, Rapid Variations	No. 12q2
Geomagnetic Data, 1963, Indices K and C No. 12r1, Rapid Variations	No. 12r2
Geomagnetic Data, 1964, Indices K and C No. 12s1, Rapid Variations	No. 12s2
Geomagnetic Data, 1965, Indices K and C No. 12t1, Rapid Variations	No. 12t2
Geomagnetic Data, 1966, Indices K and C No. 12u1, Rapid Variations	No. 12u2
Geomagnetic Data, 1967, Indices K and C No. 12v1, Rapid Variations	No. 12v2
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Atlas of K Indices (Vol. 1 : Text ; Vol. 2 : Figures)	No. 21
Geomagnetic Data, 1970, Indices, Rapid Variations, Magnetic Storms	No. 32a
Geomagnetic Data, 1971, Indices, Rapid Variations, Special Intervals	No. 32b
Geomagnetic Data, 1972, Indices, Rapid Variations, Special Intervals	No. 32c
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Geomagnetic Data, 1981, IAGA indices : aa, Am, Kp, Dst, AE, Rapid Variations	No. 32l
Geomagnetic Data, 1982, IAGA indices : aa, Am, Kp, Dst, AE	No. 32m
Geomagnetic Data, 1983, IAGA indices : aa, Am, Kp, Dst, AE	No. 32n
Geomagnetic Data, 1984, IAGA indices : aa, Am, Kp, Dst, AE	No. 32o
Geomagnetic Data, 1985, IAGA indices : aa, Am, Kp, Dst, AE, Rapid Variations	No. 32p
Geomagnetic Data, 1986, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32q
Geomagnetic Data, 1987, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32r
Geomagnetic Data, 1988, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32s
Geomagnetic Data, 1989, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32t
Geomagnetic Data, 1990, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32u
Geomagnetic Data, 1991, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32v
Geomagnetic Data, 1992, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32w
Geomagnetic Data, 1993, IAGA indices : aa, am, Kp, Dst, AE, Rapid Variations	No. 32x
A hundred year series of Geomagnetic Data 1868-1967	No. 33
Supplementary Geomagnetic Data, 1957-1975	No. 39
Dst Equatorial Index 1957-1986	No. 40