PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
OCTOBER 1957

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 158
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INTRODUCTION

This monthly report series is intended to keep research workers abreast of the major particulars of solar activity and the associated ionospheric, radio propagation and other geophysical effects. It is made possible through the cooperation of many observatories, laboratories and agencies as recorded in the detailed description of the tables and graphs which follows. The report is edited by Miss J. V. Lincoln of the Sun-Earth Relationships Section.

I DAILY SOLAR INDICES

Relative Sunspot Numbers -- The table includes (1) the daily American relative sunspot numbers, R_A^*, as compiled by the Solar Division of the American Association of Variable Star Observers, and (2) the provisional daily Zürich relative sunspot numbers, R_Z, as communicated by the Swiss Federal Observatory. Because of the time required to collect and reduce the observations, R_A^* will normally appear one month later than R_Z.

The relative sunspot number is an index of the activity of the entire visible disk. It is determined each day without reference to preceding days. Each isolated cluster of sunspots is termed a sunspot group and it may consist of one or a large number of distinct spots whose size can range from 10 or more square degrees of the solar surface down to the limit of resolution (e.g. 1/8 square degrees). The relative sunspot number is defined as $R=K(10g+s)$, where g is the number of sunspot groups and s is the total number of distinct spots. The scale factor K (usually less than unity) depends on the observer and is intended to effect the conversion to the scale originated by Wolf. The observations for sunspot numbers are made by a rather small group of extraordinarily faithful observers, many of them amateurs, each with many years of experience. The counts are made visually with small, suitably protected telescopes.

Final values of R_Z appear in the IAU Quarterly Bulletin on Solar Activity, the Journal of Geophysical Research and elsewhere. They usually differ slightly from the provisional values. The American numbers, R_A^*, are not revised.

Solar Flux Values, 2800 Mc -- The table also lists the daily values of solar flux at 2800 Mc recorded in watts/M^2/cycle/second bandwidth ($\times 10^{-22}$) in two polarizations by the National Research Council at Ottawa, Canada. These solar radio noise indices are being published in accordance with CCIR Report 25 that a basic solar index for ionospheric propagation should be measured objectively and "preferably refer to a property of the sun such as radiation flux which has direct physical relationship to the ionosphere."

Graph of Sunspot Cycle -- The graph illustrates the recent trend of Cycle 19 of the 11-year sunspot cycle and some predictions of the future level of activity. The customary "12-month" smoothed index, R, is used throughout, the data being final R_Z numbers except for the current year. Predictions shown are those made for one year after the latest available datum by the method of A. G. McNish and J. V. Lincoln (Trans. Am. Geophys. Union, 30, 673-685, 1949) modified by the use of regression coefficients and mean cycle values recomputed for Cycles 8 through 18. Cycle 19 began April 1954, when the minimum $\overline{R}$ of 3.4 was reached.

II SOLAR CENTERS OF ACTIVITY

Calcium Plage and Sunspot Regions -- The table gives particulars of the centers of activity visible on the solar disk during the preceding month. These are based on estimates made and reported on the day of observation and are therefore of limited reliability.

The table gives the heliographic coordinates of each center (taken as the calcium plage unless two or more significantly and individually active sunspot groups are included in an extended plage) in terms of the Greenwich date of passage of the sun's central meridian (CMP) and the latitude; the serial number of the plage as assigned by McMath-Hulbert Observatory; the serial number of the center in the previous solar rotation, if it is a persisting region; particulars of the plage at CMP: area, central intensity; a summary of the development of the plage during the current transit of the disk, where b = born on disk, ℓ = passed to or from invisible hemisphere, d = died on disk, and / = increasing, - = stable, \ = decreasing; and age in solar rotations; particulars of the associated sunspot group, if any, at CMP: area and spot count and the summary of development during the current disk transit, similar to the above. The unit of area is a millionth of the area of a solar hemisphere; the central intensity of calcium plages is roughly estimated on a scale of 1 = faint to 5 = very bright.

Calcium plage data are available through the cooperation of the McMath-Hulbert Observatory of the University of Michigan and the Mt. Wilson Observatory. The sunspot data are compiled from reports from the U. S. Naval Observatory, Mt. Wilson Observatory, and from reports from Europe and Japan received through the daily Ursigram messages.

Coronal Line Emission Indices -- In the table are summarized solar coronal emission intensity indices for the green (Fe XIV at λ5303) and red (Fe X at λ6374) coronal lines. The indices are based on measurements made at 5° intervals around the periphery of the solar disk by the High Altitude Observatory at Climax, Colorado, and by Harvard University observers at Sacramento Peak (The USAF Upper Air Research Observatory at Sunspot, New Mexico, under contract AF 19(604)-146). The measurements are expressed as the number of millionths of

an Angstrom of the continum of the center of the solar disk (at the same wavelength as the line) that would contain the same energy as the observed ccronal line. The indices have the following meanings:

G_6 = mean of six highest line intensities in quadrant for λ5303.

R_6 = same for λ6374.

G_1 = highest value of intensity in quadrant, for λ5303.

R_1 = same for λ6374.

The dates given in the table correspond to the approximate time of CMP of the longitude zone represented by the indices. The actual observations were made for the North East and South East quadrants 7 days before; for the South West and North West quadrants 7 days after the CMP date given.

To obtain rough measures of the integrated emission of the entire solar disk in either of the lines, assuming the coronal changes to be small in a half solar rotation, it is satisfactory to perform the following type of summation given in example for 15 October:

$$\left(\begin{matrix}\text{MEAN DISK EMISSION}\\ \text{IN } \lambda 5303\end{matrix}\right)_{15\ \text{OCT}} = \frac{1}{N}\left[\sum_{15\ \text{OCT}}^{22\ \text{OCT}}\left\{(G_6)_{NE}+(G_6)_{SE}\right\}+\sum_{8\ \text{OCT}}^{14\ \text{OCT}}\left\{(G_6)_{SW}+(G_6)_{NW}\right\}\right]$$

where N is the number of indices entering the summation.

Such integrated disk indices as well as integrated whole-sun indices are computed for each day and are published quarterly in the "Solar Activity Summary" issued by the High Altitude Observatory at Boulder, Colorado. In the same reports are given maps of the intensity distribution of coronal emission derived from all available Climax and Sacramento Peak observations, as well as other information on solar activity, such as maps made from daily limb prominence surveys in Hα and notes regarding the history of active regions on the solar disk.

Preliminary summaries of solar activity, prepared on a fast schedule, are issued Friday of each week from High Altitude Observatory in conjunction with CRPL and include solar activity through the preceding day. These are useful to groups needing information on the current status of activity on the visible solar disk, but are not recommended for research uses unless such a prompt schedule of reporting is essential. The same information is included in the subsequent quarterly reports, with extensive additions, corrections and evaluations.

III SOLAR FLARES

Optical Observations -- The table presents the preliminary record of solar flares as reported to the CRPL on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete data are published later in the Quarterly Bulletin on Solar Activity, I.A.U., in various observatory publications and elsewhere. The present listing serves to identify and roughly describe the phenomena observed.

Reporting directly to the CRPL are the following observatories: McMath-Hulbert, Wendelstein, Sacramento Peak, Mitaka and Swedish Astrophysical Station on Capri. The remainder report through the URSIgram centers or are available through the IGY World Data Center for Solar Activity in Boulder. Observations are in the light of the center of the H-alpha line unless noted otherwise. The reports from Sacramento Peak, New Mexico (communicated to CRPL by the High Altitude Observatory at Boulder) are from observations at the USAF Upper Air Research Observatory at Sunspot, New Mexico, by Harvard University observers, under contract AF 19(604)-146.

For each flare are listed the reporting observatory, the date, beginning and ending times, time of maximum phase, the heliographic coordinates in degrees, McMath serial number of the region, duration, the flare importance on the IAU scale of 1- to 3+, observing conditions where 1 means poor, 2 fair and 3 good, time of measurement for tabulated width of Hα or tabulated area, measured (i.e. projected) maximum area in square degrees, corrected maximum area in square degrees which equals measured area times secant h where h is the heliocentric angle, maximum effective line-width in Hα expressed in Angstroms, and maximum intensity of Hα expressed in per cent of the continuous spectrum. The following symbols are used in the table:

D = Greater than	F = Approximately
E = Less than	G = Plus

A final column lists provisionally the occurrence of simultaneous ionospheric effects as observed on selected field-strength recordings of distant high-frequency radio transmissions; a more nearly definitive list of these ionospheric effects, including particulars, appears in these reports after the lapse of a month (see below). All times are Universal Time (UT or GCT). Subflares (importance 1-) are listed by date, time of beginning and their heliographic coordinates. A graph presents intervals for which there were no patrols for flare observations from the observatories whose complete data are published in the table.

Ionospheric Effects -- SID (and GID--gradual ionospheric disturbances) may be detected in a number of ways: short wave fadeouts, enhancement of low frequency atmospherics, increases in cosmic absorption, and so forth. The table lists events that have been recognized on field-strength recordings of distant high-frequency radio transmissions.

Under a coordinated program, the staffs at the following ionospheric sounding stations contribute reports that are screened and synthesized at CRPL-Boulder: Puerto Rico, Ft. Belvoir, Va., and Anchorage, Alaska (CRPL Stations: PR, BE, AN); Huancayo, Peru, and College, Alaska (CRPL-Associated Laboratories: HU, CO); and White Sands, N. Mex., Adak, Alaska, and Okinawa (U.S. Signal Corps Stations: WS, AD, OK). McMath-Hulbert Observatory (MC) also contributes such reports. In addition, reports are volunteered by RCA Communications Inc., Marconi Wireless, Netherlands Postal and Telecommunications Services, Swedish Telecommunications, and others; these usually specify times of SID and the radio paths involved.

In the coordinated program, the abnormal fades of field strength not obviously ascribable to other causes, are described as short wave fadeouts with the following further classification:

S-SWF:	sudden drop-out and gradual recovery
Slow S-SWF:	drop-out taking 5 to 15 minutes and gradual recovery
G-SWF:	gradual disturbance; fade irregular in both drop-out and recovery.

When there is agreement among the various reporting stations on the time (UT) of an event, it is accepted as a widespread phenomenon and listed in the table.

The degree of confidence in identifying the event, a subjective estimate, is reported by the stations and this is summarized in an index of certainty that the event is widespread, ranging from 1 (possible) to 5 (definite). The times given in the table for the event are from the report of a station (underlined in table) that identified it with high confidence. The criteria for the subjective importance rating assigned by each station on a scale of 1- to 3+ include amplitude of the fade, duration and confidence; greater consideration is given to reports on paths near the subsolar point in arriving at the summary importance rating given in the table.
Note: The tables of SID observed at Washington included in CRPL F-reports prior to F-135 were restricted to events classed here as S-SWF.

IV SOLAR RADIO WAVES

2800 Mc Observations

The data on solar radio wave events made in Ottawa, Canada by the Radio and Electrical Engineering Division of the National Research Council (A. E. Covington) at 2800 Mc (10-cm emission) are presented. Near local noon (about 1700 UT) the sensitivity of the radiometer is determined and a mean flux for the whole day calculated. These values are given in a tabular form (see table I-1) in units of 10^{-22} watts/M^2/c/s. Burst phenomena are measured above this level and are given in terms especially suitable for the variations

observed on this frequency. The basis for the classifications is described by Covington - J.R. Astro. Soc. Can. 45, 49, 1951 and Dodson, Hedeman and Covington, Ap. J. 119, 541, 1954. A modification in terminology with a view to simplification has been introduced and consists essentially of the omission of the descriptive word "Single" from the "Single-Simple" and "Single-Complex" classes; in designating the "Single", "Single-Simple" and "Rise and Fall" bursts into a single classification designated as "Simple Bursts" with an appropriate type number; in the addition of the letter "f" to indicate that the burst deviates from the basic pattern by the presence of one or more small fluctuations in intensity; and by the addition of the letter "A" to indicate that the event has another smaller duration event superimposed upon it.

Simple Burst

Any single burst which rises to one maximum and then decreases to the pre-burst level.

1 - Simple 1 -- Simple burst, type 1 (formerly "single"). Bursts of intensity less than 7 1/2 flux units and duration less than 7 1/2 minutes.

2 - Simple 2 -- Simple burst, type 2 (formerly "single-simple"). Bursts of impulsive nature with intensity greater than 7 1/2 flux units.

3 - Simple 3 -- Simple burst, type 3 (formerly "rise and fall"). Bursts of moderate intensity with duration greater than 7 1/2 minutes.

4 - Post-burst increase -- Postburst level is greater than the preburst level. The gradual return to normal flux may require as long as several hours.

5 - Absorption following burst (negative post).

6 - Complex -- (formerly "single-complex"). A single burst which shows two or more comparable maxima before the activity has declined to zero.

7 - Period of irregular activity or fluctuations -- Series of overlapping bursts of moderate intensity and duration.

8 - Group -- Series of single isolated bursts occurring in succession with intensity between the events equal to the level before and after the group.

9 - Precursor -- A small increase of intensity occurring before a larger increase.

Great Burst

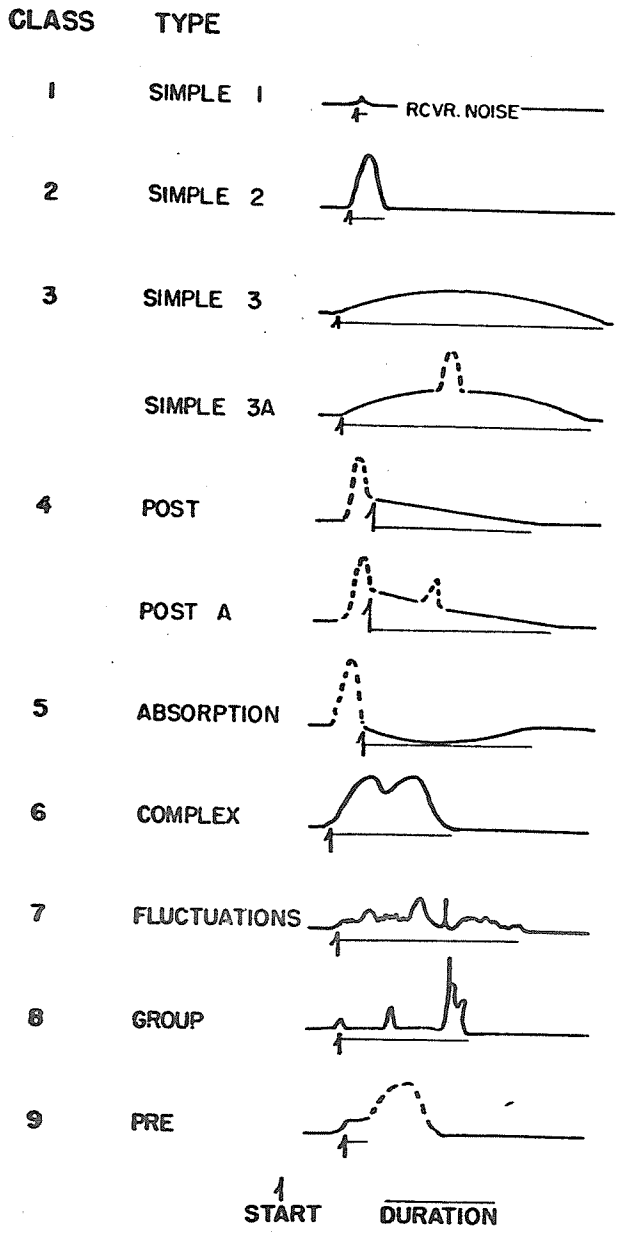
Infrequently occurring bursts of great intensity, often of complicated structure.

Letter "A"

Indicates that this event has another event superimposed upon it.

Letter "f"

Indicates that the basic form of the event is modified by secondary fluctuations.



200 Mc Observations

Data on solar radio waves made at Cornell University, Ithaca, N.Y. (Marshall Cohen) on 201.5 Mc are presented. All times are in Universal Time (UT or GCT). The antenna is linearly polarized and has a pattern appreciably broader than the solar disk. Flux is reported in units of 10^{-22} watts/m^2/cps and the tabulated numbers are twice the values observed in the one linear component.

Tables of flux and outstanding occurrences are given in general according to the systems used for the NBS 170 Mc and 450 Mc data.

170 Mc and 450 Mc Observations

Data on solar radio emission at the nominal frequencies of 170 Mc and 450 Mc recorded at the Gunbarrel Hill (Boulder) station of the National Bureau of Standards (O. D. Remmler) are presented. The half width of the antenna lobe is appreciably greater than the solar disk. Polarization is not determined, but the dipole is oriented E-W. All times are in Universal Time (UT or GCT).

3-Hourly and Daily Flux Density and Variability -- Flux density is given in power units. These units are approximately 10^{-22} watts meter^{-2}(c/s)$^{-1}$ for both polarizations together. They will be subject to a correction factor when gain measurements of the antenna have been made. The median flux is measured for every one-hour period having at least thirty minutes of usable record and an applicable gain calibration. A three-hour value of flux is obtained by averaging the available one-hour medians (at least two required). A daily value of flux is obtained by averaging all available one-hour medians (at least four required). A blank indicates that insufficient measurements were made to meet the above requirements or that the records were not of usable quality. Flux values may be followed by the qualifying symbols D, S, and X defined subsequently.

The variability index, given for each three-hour interval, is on a scale 0 to 3 defined as follows:

0 - The instantaneous flux did not drop below one-half the median level or exceed twice the median level at any time.

1 - The instantaneous flux made from one to ten excursions

outside the range described above.

2 - The instantaneous flux made from ten to one hundred excursions outside the range described above.

3 - The instantaneous flux made more than one hundred excursions outside the range described above.

For the purpose of the variability index, an excursion whose maximum intensity is M times the median level is counted as M excursions. The variability index is omitted if measurements were made for less than one hour during the period. The variability for the day is the mean of the three-hourly values. The letter S follows variability indices which are in doubt because of atmospherics or local interference.

The observing periods are given in U. T. to the nearest 1/10 hour and they usually extend into the next Greenwich day.

Outstanding Occurrences -- A separate table lists the occurrences which are not adequately described by the three-hourly values of flux density and variability. Two classifications are given: (1) A system in general accord with that described and illustrated by Dodson, Hedeman, and Owren (Ap. J. 118, 169, 1953) and (2) the system described in the IGY Solar Activity Instruction Manual, prepared by the Radio Emission editor of the I.A.U. Quarterly Bulletin on Solar Activity.

In system (1) the occurrences are identified by numbers which do not necessarily indicate the magnitude of the event, as follows:

0 - Rise in base level -- A temporary increase in the continuum with duration of the order of tens of minutes to an hour.

1 - Series of bursts -- Bursts or groups of bursts, occurring intermittently over an interval of time of the order of minutes or hours. Such series of bursts are assigned as distinctive events only when they occur on a smooth record or show as a distinct change in the activity.

2 - Groups of bursts -- A cluster of bursts occurring in an interval of time of the order of minutes.

3 - Minor burst -- A burst of moderate or small amplitude, and duration of the order of one or two minutes.

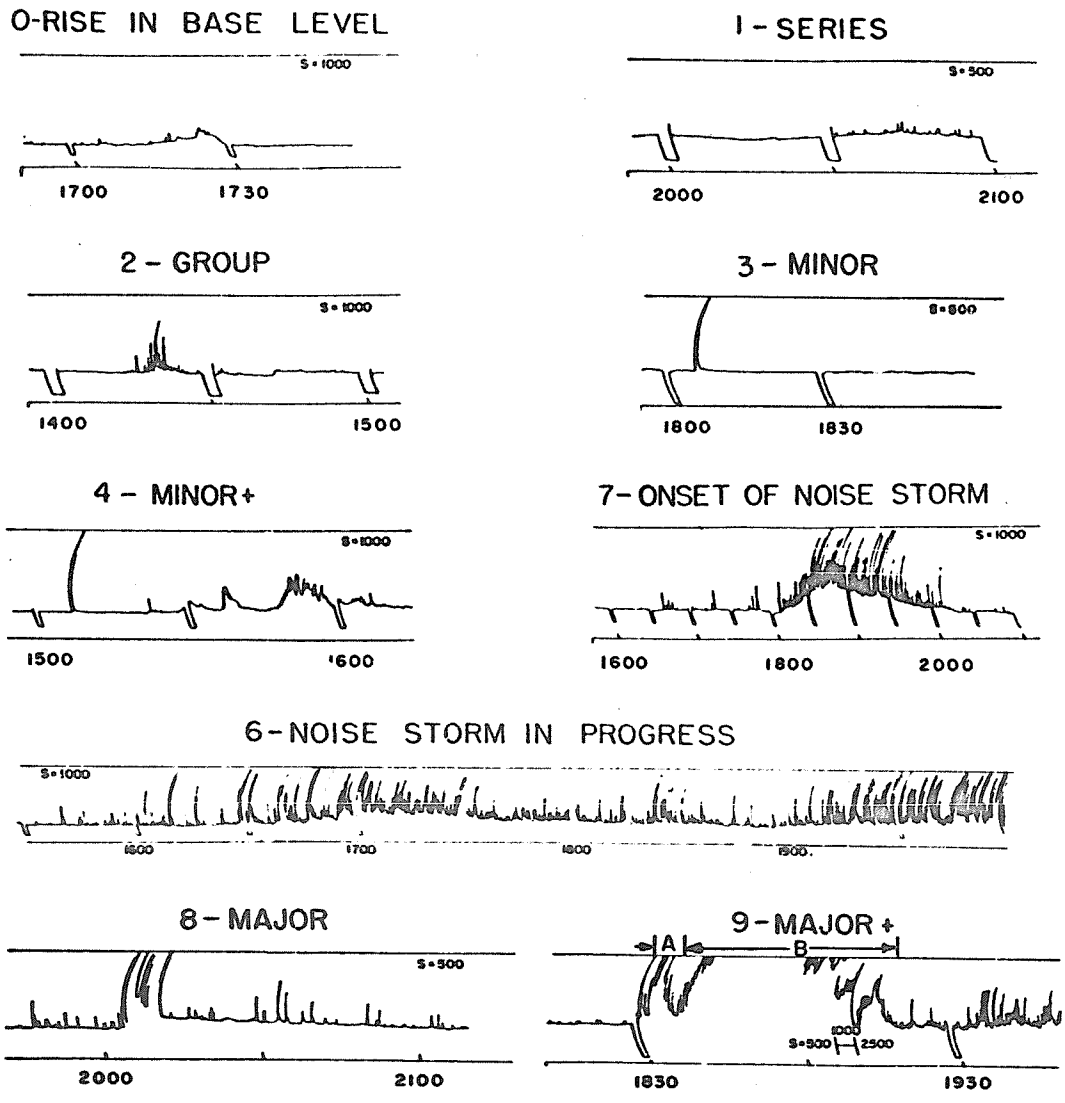
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

6 - Noise storm -- A temporary increase in radiation characterized by numerous closely spaced bursts, by an increase in the continuum, or by both. Duration is of the order of hours or days.

7 - Noise storm begins -- The onset of a noise storm occurs at some time during the observing period.

8 - Major burst -- An outburst, or other burst of large amplitude and more than average duration. A major burst is usually complex, with a duration of the order of one to ten minutes.

9A, 9B, or 9 - Major burst and second part or large event without distinct first and second parts -- If there is a double rise in flux, the first part, a major burst, is listed as 9A and the second part as 9B. The second part may consist of a rise in base level, a group or series of bursts, a noise storm. A major increase in flux with duration greater than ten minutes but without distinct first and second parts, is listed simply as 9.



In system (2) combinations of the following letters are used to describe some distinctive characteristics of the recorded disturbances:

S = simple rise and fall of intensity,
C = complex variation of intensity,
A = appears to be part of general activity,
D = distinct from (i.e. apparently superimposed upon) the general background,
M = multiple peaks separated by relatively long periods of quietness,
F = multiple peaks separated by relatively short periods of quietness,
E = sudden commencement or rise of activity.

Starting and maximum times are read to the nearest 1/10 minute if they are very definite and otherwise to the nearest minute. If the duration is less than five minutes, it is given to the nearest 1/10 minute; otherwise to the nearest minute (see also qualifying symbols below).

Maximum flux densities are given in units of 10^{-22} watts meter^{-2}(c/s)$^{-1}$. The instantaneous maximum flux density is the highest peak in the disturbance measured above the sky level. The smoothed maximum flux density is the maximum value of a smooth curve drawn through the outstanding occurrence with a smoothing period of 20 to 50 percent of the total duration; it is measured above the estimated level in the absence of the disturbance. The intention is that (smoothed maximum) x (duration) should give a measure of the energy radiated in the disturbance.

A blank indicates missing or insignificant data. Observations are interrupted during the period from 31 to 34 minutes after each hour for calibrations. Observing periods are given in the Daily Data tables. The following qualifying symbols are used:

B - Event in progress before observations began.
D - Greater [illegible].
I - Event apparently continued during an interruption of the observations. The period of the interruption may be given in the remarks.
N - See footnotes.
X - Measurement is uncertain or doubtful.
S - Measurement may be influenced by interference or atmospherics.

V GEOMAGNETIC ACTIVITY INDICES

C, Kp, Ap, and Selected Quiet and Disturbed Days -- The data in the table are: (1) preliminary international character figures, C; (2) geomagnetic planetary three-hour range indices, Kp; (3) daily "equivalent amplitude," Ap; (4) magnetically selected quiet and disturbed days.

This table is made available by the Committee on Characterization of Magnetic Disturbance of IAGA, IUGG. The Meteorological Office, De Bilt, Holland collects the data from magnetic observatories distributed throughout the world, and compiles C and selected days. The Chairman of the Committee computes the planetary and equivalent amplitude indices. The same data are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

The C-figure is the arithmetic mean of the subjective classification by all observatories of each day's magnetic activity on a scale of 0 (quiet) to 2 (storm).

Kp is the mean standardized K-index from 12 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 (very quiet) to 9 (extremely disturbed), expressed in thirds of a unit, e.g. 5- is 4 2/3, 5o is 5 0/3, and 5+ is 5 1/3. This planetary index is designed to measure solar particle-radiation by its magnetic effects, specifically to meet the needs of research workers in the ionospheric field. A complete description of Kp has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948" of the Association of Terrestrial Magnetism and Electricity (IATME), International Union of Geodesy and Geophysics.

Ap is a daily index of magnetic activity on a linear scale rather than on the quasi-logarithmic scale of the K-indices. It is the average of the eight values of an intermediate 3-hourly index "ap," defined as one-half the average gamma range of the most disturbed of the three force components, in the three-hour interval at standard stations; in practice, ap is computed from the Kp for the 3-hour interval. The extreme range of the scale of Ap is 0 to 400. The method is described in IATME Bulletin No. 12h (for 1953) p. viii f. Values of Ap (like Kp and Cp) have been published for the Polar Year 1932/33 and for the years 1937 onwards.

The magnetically quiet and disturbed days are selected in accordance with the general outline in Terr. Mag. (predecessor to J. Geophys. Res.) 48, pp 219-227, December 1943. The method in current use calls for ranking the days of a month by their geomagnetic activity as determined from the following three criteria with equal weight: (1) the sum of the eight Kp's; (2) the sum of the squares of the eight Kp's; and (3) the greatest Kp.

Chart of Kp by Solar Rotations -- The graph of Kp by solar rotations is furnished through the courtesy of Dr. J. Bartels, Geophysikalisches Institute, Göttingen.

VI RADIO PROPAGATION QUALITY INDICES

One can take as the definition of a radio propagation quality index: the measure of the efficiency of a medium-powered radio circuit operated under ideal conditions in all respects, except for the variable effect of the ionosphere on the propagation of the transmitted signal. The indices given here are derived from monitoring and circuit performance reports, and are the nearest practical approximation to the ideal index of propagation quality.

Quality indices are usually expressed on a scale that ranges from one to nine. Indices of four or less are generally taken to represent significant disturbance. (Note that for geomagnetic K-indices, disturbance is represented by higher numbers.) The adjectival equivalents of the integral quality indices are as follows:

1 = useless	4 = poor-to-fair	7 = good
2 = very poor	5 = fair	8 = very good
3 = poor	6 = fair-to-good	9 = excellent

CRPL forecasts are expressed on the same scale. The tables summarizing the outcome of forecasts include categories P-Perfect; S-Satisfactory; U-Unsatisfactory; F-Failure. The following conventions apply:

P - forecast quality equal to observed

S - forecast quality one grade different from observed

U - forecast quality two or more grades different from observed when both forecast and observed were > 5, or both < 5

F - other times when forecast quality two or more grades different from observed

Full discussion of the reliability of forecasts requires consideration of many factors besides the over-simplified summary given.

The quality figures represent a consensus of experience with radio propagation conditions. Since they are based entirely on monitoring or traffic reports, the reasons for low quality are not necessarily known and may not be limited to ionospheric storminess. For instance, low quality may result from improper frequency usage for the path and time of day. Although, wherever it is reported, frequency usage is included in the rating of reports, it must often

be an assumption that the reports refer to optimum working frequencies. It is more difficult to eliminate from the indices conditions of low quality for reasons such as multipath or interference. These considerations should be taken into account in interpreting research correlations between the Q-figures and solar, auroral, geomagnetic or similar indices.

North Atlantic Radio Path -- The CRPL quality figures, Qa, are compiled by the North Atlantic Radio Warning Service (NARWS), the CRPL forecasting center at Ft. Belvoir, Virginia, from radio traffic data for North Atlantic transmission paths closely approximating New York-to-London. These are reported to CRPL by the Canadian Defense Research Board, Canadian Broadcasting Corporation, and the following agencies of the U. S. Government:--Coast Guard, Navy, Army Signal Corps, U. S. Information Agency. Supplementing these data are CRPL monitoring, direction-finding observations and field-strength measurements of North Atlantic transmissions made at Belvoir.

The original reports are submitted on various scales and for various time intervals. The observations for each 6-hour interval are averaged on the original scale. These 6-hour indices are then adjusted to the 1 to 9 quality-figure scale by a conversion table prepared by comparing the distribution of these indices for at least four months, usually a year, with a master distribution determined from analysis of the reports originally made on the 1 to 9 quality-figure scale. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. The 6-hourly quality figure is the mean of the reports available for that period.

The 6-hourly quality figures are given in this table to the nearest one-third of a unit, e.g. 5o is 5 and 0/3; 5- is 4 and 2/3; 5+ is 5 and 1/3. Other data included are:

(a) Whole-day radio quality indices, which are weighted averages of the four 6-hourly indices, with half weight given to quality grades 5 and 6. This procedure tends to give whole-day indices suitable for comparison with whole-day advance forecasts which seek to designate the days of significant disturbance or unusually quiet conditions.

(b) Short-term forecasts, issued every six hours by the North Atlantic Radio Warning Service. These are issued one hour before 00^h, 06^h, 12^h, 18^h, UT and are applicable to the period 1 to 7 hours ahead.

(c) Advance forecasts, issued twice weekly by the NARWS (CRPL-J reports) and applicable 1 to 3 or 4 days ahead, 4 or 5 to 7 days ahead, and 8 to 25 days ahead. These forecasts are scored against the whole-day quality indices.

(d) Half-day averages of the geomagnetic K indices measured by the Fredericksburg Magnetic Observatory of the U. S. Coast and Geodetic Survey.

A chart compares the short-term forecasts with Qa-figures. A second chart compares the outcome of advance forecasts (1 to 3 or 4 days ahead) with a type of "blind" forecast. For the latter, the frequency for each quality grade, as determined from the distribution of quality grades in the four most recent months of the current season, is partitioned among the grades observed in the current month in proportion to the frequencies observed in the current month.

Ranges of useful frequencies on the North Atlantic radio path are shown in a series of diagrams, one for each day. The shaded area indicates the range of frequencies for which transmissions of quality 5 or greater were observed. The blacker the diagram, the quieter the day has been; a narrow strip indicates either high LUHF, low MUF, or both. These diagrams are based on data reported to CRPL by the German Post Office through the Fernmeldetechnischen Zentralamtes, Darmstadt, Germany, being observations every one and a half hours of selected transmitters located in the eastern portion of North America. The magnetic activity index, A_{Fr}, from Fredericksburg, Va., is also given for each day.

Note: Beginning with data for September 1955, Qa has been determined from reports that are available within a few hours or at most within a few days, including for the first time, the CRPL observations. Therefore these are the indices by which the forecasters assess every day the conditions in the recent past. Over a period of several years, they have closely paralleled the former Qa indices which excluded CRPL observations and included three additional reports received after a considerable lag. Qa was first published to the nearest one-third of a unit at the same time.

North Pacific Radio Path -- The CRPL quality figures, Qp, are compiled by the North Pacific Radio Warning Service (NPRWS), the CRPL forecasting center at Anchorage, Alaska, from radio traffic data for moderately long transmission paths in the North Pacific equivalent to Seattle-to-Anchorage or Anchorage-to-Tokyo. These include reports to CRPL by the Alaska Communications System, Aeronautical Radio, Inc., U. S. Air Force and Civil Aeronautical Administration. In addition, there are CRPL monitoring, direction finder observations and field strength measurements of suitable transmissions.

The original reports are on various scales and for various time intervals. The observations for each 8 hours or 24 hour period are averaged on the original scale. This average is compared with reports for the same period in the preceding two months and expressed

as a deviation from the 3-month mean. The deviations are put on the 1 to 9 scale of quality which is assumed to have a standard deviation of 1.25 and a mean for the various periods as follows:

03-10 hours UT	5.33
11-18	5.33
19-02	6.00
00-24	5.67

The 8-hour and 24-hour indices Qp are determined separately. Each index is a weighted mean where the CRPL observations have unit weight and the others are weighted by the correlation coefficient with the CRPL observations.

The table, analagous to that for Qa, includes the 8-hourly quality figures; whole day quality figures; short-term forecasts issued by NPRWS three times daily at 02^h, 10^h, and 18^h UT, applicable to the stated 8-hour periods; advance forecasts issued twice weekly by NPRWS (CRPL-Jp report); and half-day averages of geomagnetic K indices from Sitka.

The chart compares the outcome of advance forecasts, on the same basis as the similar chart for the North Atlantic Radio Path.

Note: Beginning with November 1956 the short-term forecast formerly made at 0900 UT was changed to 1000 UT. The North Pacific quality figures used for evaluation are now 8-hourly rather than 9-hourly.

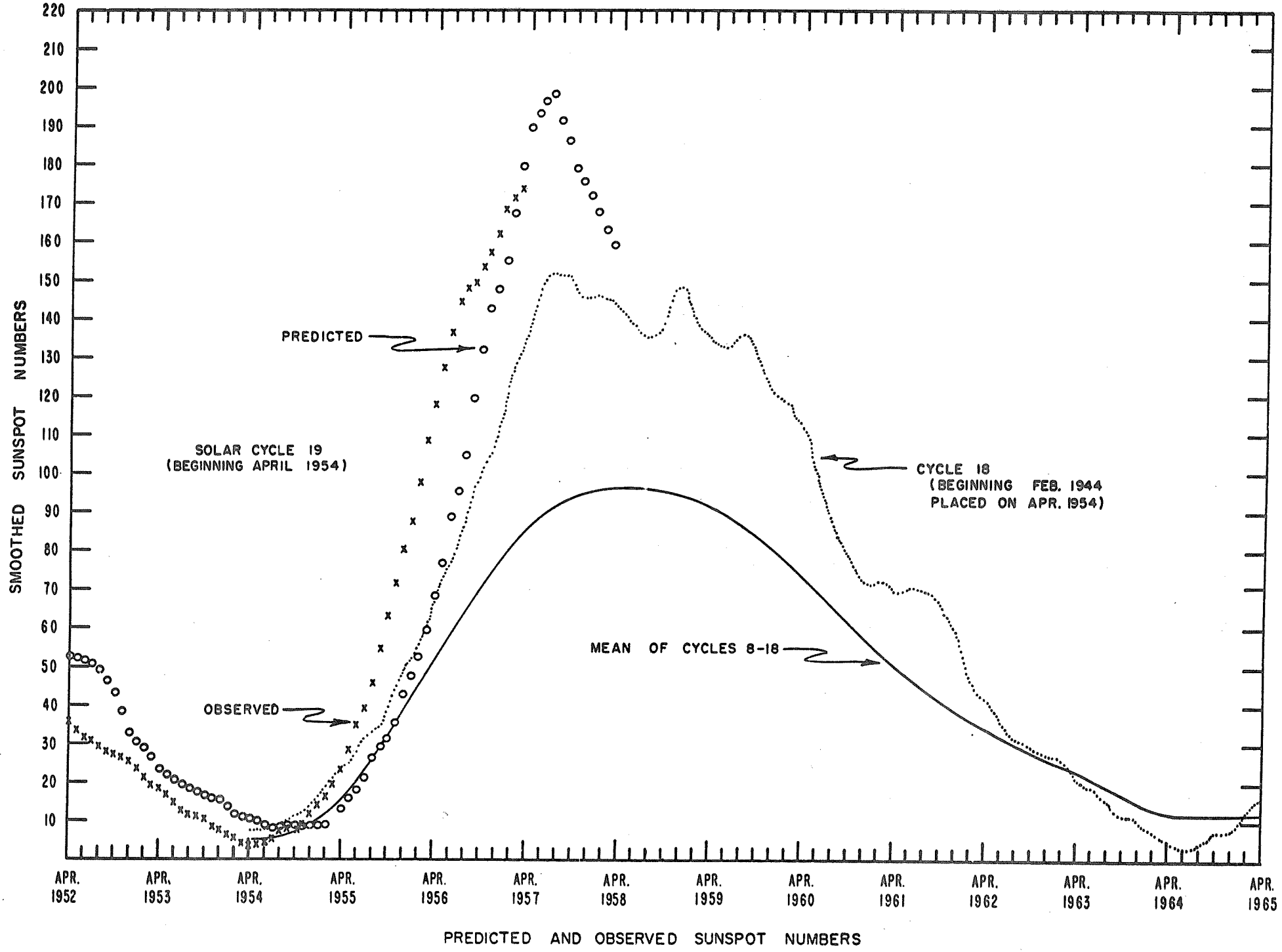
VII ALERT PERIODS AND SPECIAL WORLD INTERVALS

A table gives the Alert Periods and Special World Intervals (SWI) as designated by the IGY World Warning Agency at Ft. Belvoir, Va. For each day of the Alert or SWI are given the number of flares of importance two or greater reported promptly to the IGY World Warning Agency and the magnetic activity index A_{Be} observed at the IGY World Warning Agency.

DAILY SOLAR INDICES

Aug. 1957	American Relative Sunspot Numbers R_A.
1	102
2	126
3	132
4	126
5	116
6	142
7	125
8	126
9	114
10	90
11	97
12	95
13	109
14	133
15	163
16	173
17	175
18	175
19	173
20	125
21	112
22	95
23	86
24	99
25	145
26	144
27	167
28	191
29	210
30	236
31	228
Mean:	139.7.

Sept. 1957	Zurich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	257	275
2	230	268
3	201	273
4	166	247
5	184	237
6	160	223
7	137	222
8	175	227
9	250	233
10	265	245
11	255	268
12	264	277
13	260	268
14	263	259
15	265	255
16	283	264
17	258	271
18	295	275
19	317	301
20	294	302
21	334	327
22	302	328
23	268	294
24	239	285
25	234	261
26	220	270
27	227	259
28	249	259
29	249	256
30	229	262
Mean:	244.3	266.4


SMOOTHED SUNSPOT NUMBERS
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
PREDICTED
SOLAR CYCLE 19
(BEGINNING APRIL 1954)
CYCLE 18
(BEGINNING FEB. 1944
PLACED ON APR. 1954)
MEAN OF CYCLES 8-18
OBSERVED
APR. 1952
APR. 1953
APR. 1954
APR. 1955
APR. 1956
APR. 1957
APR. 1958
APR. 1959
APR. 1960
APR. 1961
APR. 1962
APR. 1963
APR. 1964
APR. 1965
PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

SEPTEMBER 1957

CMP Sept. 1957	Lat	McMath Plage Number	Return of Region	Calcium Plage Data				Sunspot Data		
				CMP Values Area	Int.	History, Age		CMP Values Area	Count	History
04.2	S16	4137	New	200	2.5	b–d	1	20	1	b–d
07.4	S27	4136	New	2600	3	b⌐ℓ	1	660	40	b⌐d
08.1	N32	4135	New	300	2	b–d	1	40	5	b–d
08.2	S14	4133	4093	1800	2	ℓ–ℓ	2	40	1	b¬d
09.1	N12	4134	*	7600	3.5	ℓ–ℓ	2	1540	54	ℓ∧d
09.7	S07	4147	New	200	2	b/ℓ	1	(410)	(8)	b⌐ℓ
10.6	S12	4138	4099	2900	3.5	ℓ⌐ℓ	3	810	26	ℓ∧d
11.7	S09	4140	4099	300	1.5	ℓ\ℓ	3			
11.7	S17	4141	New	1500	3.5	b⌐ℓ	1	980	12	b⌐ℓ
12.5	N26	4139	4101	400	1.5	ℓ\d	4			
14.3	S22	4143	4105	1000	1	ℓ–ℓ	5	190	1	ℓ–ℓ
14.4	N24	4142	4101	1400	2.5	ℓ⌐ℓ	4	120	6	b/ℓ
15.2	S43	4144	4108	2400	2	ℓ–ℓ	5	530	3	ℓ¬ℓ
15.6	S35	4146	4106	700	1.5	ℓ–ℓ	3			
16.1	S26	4149	4105	1700	2	ℓ⌐ℓ	5			
16.1	N40	4153	New	700	1	b\d	1	10	2	b\d
16.4	S08	4154	New	500	2.5	b/ℓ	1	(50)	(2)	b–ℓ
17.3	N16	4148	4112	3900	2.5	ℓ⌐ℓ	5	620	20	ℓ⌐ℓ
18.2	S24	4150	New	500	1	ℓ–d	1	50	1	b¬d
18.9	N11	4152	4114	3500	3	ℓ⌐ℓ	2	(1050)	(15)	ℓ⌐ℓ
19.1	N20	4151	4112	8000	4	ℓ⌐ℓ	5	2260	34	ℓ⌐ℓ
20.2	S22	4155	4120	1300	2.5	ℓ⌐ℓ	5	(390)	19	b/ℓ
23.9	S25	4156	4117	600	1	ℓ⌐ℓ	5			
24.6	S18	4157	4121	(3200)	(2.5)	ℓ⌐ℓ	2	100	6	ℓ–ℓ
24.9	N14	4158	4122	1100	2	ℓ–d	3			
25.4	S28	4163	New	1600	1.5	b∧ℓ	1			
27.0	S21	4160	New	1000	2	b–d	1			
27.8	N22	4159	4124	22,000	3	ℓ–ℓ	4	1660	51	ℓ–ℓ
28.6	S26	4161	New	3900	2.5	ℓ∧ℓ	1	640	12	ℓ∧ℓ

* 4100, 4098.

CORONAL LINE EMISSION INDICES

SEPTEMBER 1957

CMP Sept. 1957	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	207	252	40	86	157	191	19	33	116	180	13	18	186	268	36	50
2	x	x	x	x	x	x	x	x	82	92	13	30	102	144	31	48
3	x	x	x	x	x	x	x	x	90	128	20	42	113	200	36	64
4	x	x	x	x	x	x	x	x	133	212	16	24	104	238	27	54
5	x	x	x	x	x	x	x	x	84	122	48	66	35	44	25	30
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	59	88	x	x	116	132	x	x	121	168	36	54	53	72	25	54
8	123	196	23	39	201	240	30	52	143*	246	47	87	39	124	27	39
9	112	198	29	57	155	208	25	42	148	238	39	66	107	187	59	88
10	99	164	30	48	121	170	18	28	188a	255a	x	x	162a	234a	x	x
11	123	138	36	51	104	156	19	30	x	x	35a	50a	91a	150a	61a	150a
12	x	x	x	x	x	x	x	x	115	153	21	33	90	148	32	66
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
15	121	189	55	120	194	252	20	24	258	360	33	74	70	80	23	62
16	121	140	18	28	151	175	21	34	200	230	30	78	125	174	36	96
17	145	180	18	24	128	175	31	45	83	94	22	36	161	232	24	37
18	218*	352	21	28	101	119	22	30	x	x	x	x	x	x	x	x
19	106	176	36	54	71	98	29	42	x	x	x	x	x	x	x	x
20	x	x	x	x	x	x	x	x	141	185	18	42	149	248	50	86
21	67	88	26	44	71	96	26	30	97	120	20	30	73	105	x	x
22	95	120	23	34	66	78	27	38	x	x	x	x	x	x	x	x
23	108	133	28	44	62	72	35	60	x	x	x	x	x	x	x	x
24	182a	248a	x	x	155a	200a	x	x	x	x	x	x	x	x	x	x
25	160	212	40	60	121	172	34	66	x	x	x	x	x	x	x	x
26	108	128	x	x	86	117	x	x	x	x	x	x	x	x	x	x
27	163	228	x	x	143	200	x	x	x	x	x	x	x	x	x	x
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	182	320	56	66	107	222	15	24	x	x	x	x	x	x	x	x
30	161	250	48	60	124	209	10	17	98	152	x	x	x	x	x	x

* = yellow line observed.
a = index computed from low weight data.
x = no observations.

SOLAR FLARES

SEPTEMBER 1957

Observatory	Date Sept. 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat.	Approx. Position Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
*CAPRI S	01	0622 E	0637		N13	W09	4124	15 D	1	3	0623	2.00	2.10			
*ATHENS	01	0656	0720		S31	W19	4125	24	1	3		1.90	2.50			
CAPRI S	01	0801	0824 D		N14	W11	4124	23 D	1	3	0811	3.00	3.30			
MEUDON	01	0805 E	0810 D		N15	W15	4124	05 D	1				3.00			
MEUDON	01	0906	1000		S15	W55	4121	54	1b				9.00			S-SWF
ARCETRI	01	0945 E	1015		N13	W10	4124	30 D	2	2						
MEUDON	01	0946	1030	0950	N13	W15	4124	44	2				11.00			
CAPRI S	01	0949	1008		N13	W11	4124	19	1b	3	0956	3.50	3.80			S-SWF
OTTAWA	01	1255	1330	1302	N15	W16	4124	35	2b	2	1302	8.24	8.70			
SCHAUINS	01	1256 E	1350		N15	W13	4124	54 D	2							
CAPRI S	01	1256	1420		N16	W15	4124	84	2b	3	1304	7.00	7.50			
ONDREJOV	01	1259 E	1318 D		N10	W15	4124	19 D	2b	2	1301			5.30		S-SWF
MC MATH	01	1301 E	1325 D		N16	W14	4124	24 D	1b							
ONDREJOV	01	1322	1402		N12	W20	4124	30	1b	2	1323			3.00		
*USNRL	01	1322 E	1437		N15	W21	4124	75 D	1	1	1322	2.26	2.41		98	
R O EDIN	01	1330 E	1345 D		N13	W26	4124	15 D	1	1	1330	4.00	4.20			
*ONDREJOV	01	1341	1353		N14	W08	4124	12	1	1						
*MC MATH	01	1723 E	1735 D		N16	W14	4124	12 D	1							
*OTTAWA	01	1919 E	1937		S32	W14	4125	18 D	1	1	1920	1.74	2.34			Slow-S-SWF
OTTAWA	01	1945		2000	N25	W17	4124		2	1	2000	5.62	6.22			
SAC PEAK	01	1945	2036	2002	N26	W15	4124	51	2	2		5.70				S-SWF
MC MATH	01	2005 E	2005 D		N20	W10	4124		1b							
SAC PEAK	01	2105	2140	2112	N14	W21	4124	35	1	2		2.90				
SAC PEAK	01	2350	2400 D	2400 F	N15	W26	4124	10 D	1	2		2.10				
TASHKENT	02	0409 E	0445		N15	W25	4124	36 D	1b							
NIZAMIAH	02	0434 E	0445		N14	W24	4124	11 D	1	2	0434	2.13	2.34	1.00		G-SWF
MEUDON	02	0801	0812		S28	W28	4125	11	1				4.00			
ABASTUMANI	02	0802	0815		S30	W25	4125	13	2							
CAPRI S	02	1015	1053		N13	W29	4124	38	1	3	1025	2.00	2.40			S-SWF
ARCETRI	02	1045			S27	W30	4125		1	2						
CAPRI S	02	1046	1610		S30	W33	4125	324	2b	3	1331	10.00	13.00			
R O HERST	02	1258 E	1322	1301	N12	W25	4124	24 D	1	1	1301	3.10	3.40			
CAPRI S	02	1259	1335		N10	W26	4124	36	2	3	1326	7.00	7.70			
USNRL	02	1312 E	1346	1313	N11	W28	4124	34 D	1	2	1313	1.36	1.55		129	S-SWF
USNRL	02	1313	1408	1316	S32	W36	4125	55	2	2	1316	4.63	8.10	1.00	96	
CLIMAX	02	1346 E	1507 D		S34	W37	4125	81 D	2		4125	6.00				
SAC PEAK	02	1338 E	1830 F	1425 F	S35	W36	4125	292 D	3	3		15.90				S-SWF
*SAC PEAK	02	1415	1505 F	1427	N12	W28	4124	50 D	1	3		2.50				G-SWF
MT WILSON	02	1509	1513		N20	W17	4124	04	1							
CAPRI S	02	1535 E	1608		N27	W28	4124	33 D	1	3	1550	2.00	2.60			
MT WILSON	02	1547	1604		N24	W24	4124	17	1							
HUANCAYO	02	1550 E	1603	1556	N26	W22	4124	13 D	1	2						
ARCETRI	02	1600	1611		N20	W25	4124	11	1	3						
MT WILSON	02	1554	1606		N20	W30	4124	12	1							
CAPRI S	02	1554	1609		N10	W29	4124	15	1	3	1600	2.80	3.20			
HUANCAYO	02	1557	1611	1558	N12	W23	4124	14	1	2						
MT WILSON	02	1806 E			N12	W37	4124		1							
*USNRL	02	1810 E	1858	1812	N14	W36	4124	48 D	1	2	1812	1.13	1.51		133	Slow S-SWF
MT WILSON	02	1814	1831		N12	W38	4124	17	1							
*HUANCAYO	02	2100	2112	2101	S28	W30	4125	12	1	2						
SAC PEAK	02	2130	2300	2147	S32	W43	4125	90	1	3		2.30				S-SWF
*SAC PEAK	02	2212	2250	2221	N14	W37	4124	38	1	3		2.25				S-SWF
MT WILSON	02	2218	2220		N12	W40	4124	02	1							
MT WILSON	02	2323	2335		N24	W30	4124	12	1							
MT WILSON	03	0026	0033		N24	W27	4124	07	1							
MT WILSON	03	0101			N24	W29	4124		1							S-SWF
ABASTUMANI	03	0754	0841		N14	W38	4124	47	2b							
ATHENS	03	0755	0818		N14	W39	4124	23	1	4		2.00	2.40			
R O EDIN	03	1022	1103	1023	N15	W38	4124	41	2	3	1023	5.00	6.10	9.27		Slow S-SWF
NIZAMIAH	03	1024 E	1052 D	1028 U	N17	W42	4124	28 D	2	2	1028	5.47	7.37	2.60		
ONDREJOV	03	1026 E	1050 D		N15	W39	4124	24 D	2b	2	1034			4.40		S-SWF
STOCKHOLM	03	1041 E	1045 D		N15	W40	4124	4 D	2	2						
*CAPRI S	03	1124 E	1133 D		N22	W27	4124	9 D	2	2	1132	4.40	5.70			
*ONDREJOV	03	1320	1323 D		N23	W44	4124	03 D	1	1						S-SWF
*OTTAWA	03	1339			S14	E67	4133		1	1	1341	1.04	3.50			S-SWF
SAC PEAK	03	1412	1630	1431	N25	W30	4124	138	3	3		20.60				Slow S-SWF
CAPRI S	03	1417	1604 D		N22	W29	4124	107 D	3	2	1435	14.00	16.20			
R O EDIN	03	1417	1727	1425 U	N24	W29	4124	190	3	2	1425	15.00	17.70	6.38		
CLIMAX	03	1418	1656	1426	N24	W30	4124	158	2		1426	8.50				
MC MATH	03	1428 E	1536 D		N20	W30	4124	68 D	2b							S-SWF
OTTAWA	03	1422 E			N23	W30	4124		2b	1	1428	11.25	13.56			

Capri S. = Anacapri (Swedish).
Krasnya = Krasnaya Pakhra.
RO Edin = Royal Observatory, Edinburgh.
RO Herst = Greenwich Royal Observatory, Herstmonceux.
Sac Peak = Sacramento Peak.
Schauins = Schauinsland.
USNRL = United States Naval Research Laboratory.
Wendel = Wendelstein
* Rated as importance 1- by other observatory (ies).
Sac Peak: All values in Max. Int. column are arbitrary units (0-40), not percent of continuous spectrum.

E = less than.
D = greater than.
U = uncertain.
F = approximate.
b = plus.

Observatory	Date Sept. 1957	Time Observed Start UT		End UT		Time Max. Phase UT		Approx. Position Lat.	Mer. Dist.	McMath Plage Region Number	Duration Min.		Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
MT WILSON	03	1422	E					N12	W40	4124			3							
USNRL	03	1449	E	1634		1459		N26	W32	4124	105	D	2	1	1459	6.90	9.06		108	
R O HERST	03	1521	E	1605		1521	E	N22	W31	4124	44	D	2	2	1521	6.00	7.00	1.80	58	
HUANCAYO	03	1525	E	1559	D	1525	U	N24	W29	4124	29	D	1&	2						
*HUANCAYO	03	1615		1647	D	1616		N24	W48	4124	32	D	1	2						
SAC PEAK	03	1855		1955		1945		N15	W45	4124	60		1	3		2.25				S-SWF
SAC PEAK	03	2035		2045		2040	F	N15	W90	4122	10		1	3		2.40				
MT WILSON	03	2040		2044				N14	W86	4122	04		1							
MT WILSON	03	2040		2043				N25	W47	4124	03		1							G-SWF
SAC PEAK	03	2110		2210		2120		N15	W47	4124	60		2	3		5.50				
HAWAII	03	2114		2142		2118		N16	W46	4124	28		1&	1	0610	3.10	5.40			
MC MATH	03	2115	E	2142	D			N20	W50	4124	27	D	1&							
MT WILSON	03	2116		2147				N15	W47	4124	31		1							Slow S-SWF
SAC PEAK	03	2217		2240		2220		N15	W49	4124	23		1	3		2.10				
*MT WILSON	03	2254		2323				S25	W48	4125	19		1							
MITAKA	04	0435	E	0445				N15	W49	4124	10	D	1	1	0437	2.78	4.06	1.12	81	G-SWF
MITAKA	04	0531		0538	D			N13	W51	4124	07	D	1	1	0533	1.84	2.76	1.77	98	
NIZAMIAH	04	0541		0555		0545	U	N13	W49	4124	14		1	2	0545	2.13	3.24	1.80		
MITAKA	04	0555		0600	D			N13	W51	4124	05	D	1	1	0555	2.78	4.17	2.05	85	
*MITAKA	04	0707	E	0719	D	0711	U	N25	W39	4124	12	D	1	1	0716	1.84	2.34	2.56	107	
ONDREJOV	04	0715	E	0724				N23	W42	4124	09	D	1	3	0715			3.30		
ONDREJOV	04	0839	E	0856		0850		N24	W42	4124	17	D	1	3	0850			2.80		
STOCKHOLM	04	0913	E	0924	D			N18	W40	4124	11	D	1	1						
CAPRI S	04	1029		1052	D			N23	W43	4124	23	D	1	2	1036	3.00	4.50			
WENDEL	04	1030	E	1052	D			N26	W41	4124	22	D	1&				7.00			
WENDEL	04	1156	E	1234	D			N17	W44	4124	38	D	1				3.00			
WENDEL	04	1156	E	1236	D			N15	W54	4124	40	D	2				10.00			
CAPRI S	04	1157		1210	D			N14	W53	4124	13	D	1&	3	1206	3.50	5.60			
ONDREJOV	04	1200	E	1246				N12	W52	4124	46	D	1&	3	1200			4.10		S-SWF
SAC PEAK	04	1317	E	1412		1325		N16	W54	4124	55	D	1	3		3.00				
MT WILSON	04	1805		1845				N15	W59	4124	40		1							S-SWF
*MT WILSON	04	2245		2300				N15	W63	4124	15		1							G-SWF
MITAKA	04	2320		2337	D	2325	U	N13	W61	4124	17	D	1	1	2320	1.84	3.91	2.16	107	
MT WILSON	04	2320		2439				N15	W64	4124	79		1&							
*MT WILSON	04	2340		2350				N15	E81	4134	10		1							
MITAKA	05	0010		0028		0014	U	N14	W63	4124	18		2	1	0010	7.57	16.10	2.27	118	Slow S-SWF
MT WILSON	05	0145		0200				N15	W65	4124	15		1							
TASHKENT	05	0319		0321				N12	W68	4124	02		1&							
ONDREJOV	05	0702		0717		0710		N15	W67	4124	15		1	3	0710			2.50		Slow S-SWF
WENDEL	05	0910	E	0926	D			N09	E75	4138	16	D	1				5.00			
CAPRI S	05	1206		1320				N15	W73	4124	74		1&	2	1223	2.00	5.20			S-SWF
WENDEL	05	1211	E	1233	D			N18	W59	4124	22	D	1				2.00			
WENDEL	05	1211	E	1312	D			N16	W68	4124	61	D	1&				7.00			
ONDREJOV	05	1210		1226		1215		N13	W68	4124	16		1&	3	1215			3.90		Slow S-SWF
ONDREJOV	05	1230		1303				N12	W70	4124	33		1&	2	1231			3.80		
R O HERST	05	1231		1300		1240	F	N14	W70	4124	29		1	3	1234	.90	2.10	2.80	77	
KIEV	05	1234						N12	W69	4124			2							
MC MATH	05	1235	E	1305	D			N20	W60	4124	30	D	1&							
SAC PEAK	05	1327		1500		1332		S25	E16	4136	93		1	2		2.25				
*ONDREJOV	05	1330	E	1344				S25	E17	4136	14	D	1&	3	1331			2.90		
* SAC PEAK	05	1532		1547		1535		S31	W90	4125	15		1	2		2.30				
* USNRL	05	1656		1709		1659		N05	E86	4134	13		1	2	1659	.68	3.46		71	
* SAC PEAK	05	1823	E	1847	D	1835	E	S25	E14	4136	24	D	1	1		2.06				
HUANCAYO	05	1942		2009		1955		S10	W90	4125	27		1	2						
HAWAII	05	1948		1956		1950		N09	E70	4134	8		1	2	0530	1.20	2.50			
MT WILSON	05	1949		1957				N14	E66	4134	08		1							
HUANCAYO	05	1950	E	2017	D	1951	U	N12	E70	4134	27	D	1&	2						Slow S-SWF
* MT WILSON	05	2039		2106				N16	E54	4134	27		1							
HAWAII	05	2042		2050		2042		N09	E70	4134	8		1&	2	0530	2.60	3.20			Slow S-SWF
MT WILSON	05	2100		2101				N13	E64	4134	G1		1							
MT WILSON	05	2116		2200				N13	E75	4134	44		1&							
MT WILSON	05	2116		2200				N09	E70	4134	44		1&							
HAWAII	05	2120		2150		2128		N04	E75	4134	30		2	2	0530	3.30	6.60			
HAWAII	06	0006		0018		0006		N14	W72	4124	12		1	2	0530	1.40	2.90			
SIMFEROPOL	06	0506	E					N15	W80	4124			2							
ATHENS	06	0536	E	0620				N11	W86	4124	44	D	1	3		.30	2.10			
KRASHAYA	06	0615	E					S25	E10	4136			2							
SIMEIZ	06	0751		0849				N25	W65	4124	58		2&							
R O HERST	06	0753		0840	D	0805	F	N21	W61	4124	47	D	2	1	0802	2.70	6.00			G-SWF
CAPRI S	06	0755		0835				N28	W61	4124	40		2	3	0803	7.00	14.70			

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SIMEIZ	06	0815	0900		N12	E65	4134	45	1&							
* CAPRI S	06	0816 E	0909 D		N09	E62	4134	53 D	1	3	0831	1.50	3.20			
STOCKHOLM	06	0842 E	0853 D		N10	E60	4134	11 D	2	2						
STOCKHOLM	06	0842 E	0853 D		N20	W70	4124	11 D	1&	2						
SAC PEAK	06	1332	1402	1340	S28	W90	4125	30	1	2		2.70				G-SWF
* HUANCAYO	06	1618 E	1627	1618 U	S29	W41	4129	9 D	1	1						Slow S-SWF
* MT WILSON	06	1907	1934		N14	E52	4134	27	1							
MT WILSON	06	1923	1928		S28	W90	4125	05	1							
SAC PEAK	06	1947 E	2012	1947 E	N26	W72	4124	25 D	1	1		3.30				
* MT WILSON	06	2225	2235		S25	E00	4136	10	1							
* MT WILSON	06	2310	2320		S28	W90	4125	10	1							
MT WILSON	07	0045	0050		S28	W90	4125	05	1							
MT WILSON	07	0110	0125		N16	W90	4124	15	1							G-SWF
* WENDEL	07	0748	0808		N28	W85	4124	20	1				8.00			S-SWF
WENDEL	07	0810	0833		N19	W88	4124	23	2				12.00			
* ONDREJOV	07	0811 E	0831	0823	N15	W85	4124	20 D	2	2	0823			5.80		
ARCETRI	07	0815 E			N13	W88	4124		1&	2						S-SWF
SIMEIZ	07	0817	0829		N13	W90	4124	12	1&							
CAPRI S	07	0818	0830 D		N10	W90	4124	12 D	1	3	0818	2.00				
STOCKHOLM	07	0835	0845 D		N10	E50	4134	41 D	1	1						
ZURICH	07	1043	1045		N16	E47	4134	02 D	1	3	1043		1.00			
ONDREJOV	07	1355	1405	1356	N14	E55	4139	10	1	3	1356			2.20		
WENDEL	07	1418	1439		N10	E46	4134	21	1				4.00			
* ONDREJOV	07	1421 E	1455	1432	N17	E56	4134	34 D	1	3	1432			2.40		
WENDEL	07	1424	1506		N10	E50	4134	42	1				3.00			Slow S-SWF
R O EDIN	07	1433 E	1440 D		N11	E47	4134	7 D	1	1	1437	5.00	7.50	1.76		
MT WILSON	07	1913	1940		S25	W06	4136	27	1							
MT WILSON	07	1916	1940		N07	E49	4134	24	1							
HAWAII	07	2134	2210	2144	N10	E43	4134	36	2	3	0545	4.10	5.80			
MT WILSON	07	2136	2219		N14	E39	4134	43	1							
MC MATH	07	2138 E	2138 D		N15	E40	4134		2							G-SWF
SAC PEAK	07	2147 E	2252 F	2159 F	N12	E46	4134	65 D	2&	1		12.20				
SAC PEAK	07	2314	2405 D	2405 D	S24	W17	4133	51 D	1	1		3.00				
MITAKA	08	0126	0145 D	0131 U	S23	W18	4136	19 D	1&	1	0133	5.67	6.75	2.33	149	
ZURICH	08	0919	0932		N08	E37	4134	13	1	3	0923		3.00			
WENDEL	08	0920	0934		N07	E42	4134	14	1				4.00			
ZURICH	08	0923	0936	0931 U	S41	E63	4144	13	1	3	0931		4.00			
WENDEL	08	0928	0936		S43	E66	4146	8	1&				7.00			
* ZURICH	08	0936	0942		N12	E37	4134	06	1	3	0937		2.00			
ZURICH	08	1013 E	1030		S12	E31	4140	17 D	1	3	1013		2.00			
* CAPRI S	08	1308 E	1320		S41	E75	4144	12 D	1	3	1316	.80	3.00			
SAC PEAK	08	1717	1730	1722	S50	E90	4144	13	1	2		2.06				G-SWF
MT WILSON	08	1720	1727		S43	E90	4144	07	1							
MT WILSON	08	1828 E	1830		S18	E21	4138	02 D	1							G-SWF
* MT WILSON	08	1828 E	1915		N13	E25	4134	47 D	1							
SAC PEAK	08	2242	2322	2247	N05	E30	4134	40	1&	2		3.80				
MT WILSON	08	2256 E	2304		N02	E31	4134	08 D	1							
HAWAII	09	0136	0200 D	0150	S17	E22	4138	24 D	1	2	0600	2.10	2.40			
MT WILSON	09	0137	0150		S13	E19	4138	13	1							G-SWF
ONDREJOV	09	0759 E	0828	0813	N11	E21	4134	29 D	2	3	0813			2.60		
SIMEIZ	09	0801	0838		N14	E24	4134	37	2							
R O HERST	09	0801 E	0840	0812	N13	E20	4134	39 D	1&	3	0817	3.70	4.00	2.90	110	
CAPRI S	09	0801 E	0851 D		N14	E19	4134	50 D	2	3	0813	6.00	6.60			G-SWF
ONDREJOV	09	0802	0829	0810	N17	E29	4134	27	1&	3	0810			2.30		
ARCETRI	09	0810 E	0823 D		N10	E20	4134	13 D	1&	2	0823	12.00	13.00			
ARCETRI	09	0810 E	0825		N12	E25	4134	15 D	2	3						
* ONDREJOV	09	1334 E	1337 D		S11	E13	4138	03 D	1	2	1334			3.00		
SAC PEAK	09	1447	1510	1452	S48	E48	4144	23	1	2		3.45				
* MT WILSON	09	1704	1718		S22	E70	4143	14	1							
ZURICH	09	1705 E	1707 D		S23	E63	4143	02 D	1	1	1705		3.00			
MT WILSON	09	1715	1740		N05	E35	4134	25	1							
MT WILSON	09	1848	1852		S17	E22	4138	04	1							
MT WILSON	10	0015	0030		S43	E47	4144	15	1							
* MT WILSON	10	0045	0105		N12	E10	4134	20	1							
WENDEL	10	0812	0914		S17	E17	4141	62	1&				8.00			
SIMEIZ	10	0814	0915		S18	E15	4141	61	1&							
* CAPRI S	10	0819 E	0910 D		S14	E14	4141	51 D	1	2	0830	2.00	2.20			
ARCETRI	10	0822 E			S18	E16	4141		1	2	0843	6.00	7.00			
ONDREJOV	10	0834 E	0852	0850	S17	E15	4141	18 D	1	3	0850			3.30		

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ARCETRI	10	0855 E			S18	E16	4141		1							
WENDEL	10	0928	0937		S07	W15	4147	9	1	2	0923	2.00	2.00			
WENDEL	10	1044	1054		S17	E31	4141	10	1				3.00			
WENDEL	10	1135 E	1151 D		S21	W44	4136	16 D	1				3.00			
WENDEL	10	1324	1350		S18	E13	4138	26	1				6.00			
WENDEL	10	1357	1434		N10	E04	4134	37	2				4.00			
*ONDREJOV	10	1501 E	1503 D		S17	E13	4141	02 D	1	1			11.00			G-SWF
HUANCAYO	10	1636	1725	1657 U	S16	E11	4141	49	1	1						G-SWF
MT WILSON	10	1645	1656		S17	E13	4141	11	1							
SAC PEAK	10	1647 E	1840	1655	S23	W55	4136	113 D	1	2		2.06				
*MT WILSON	10	1654	1663		S22	W48	4136	09	1							
HUANCAYO	10	1656 E	1730 D	1719 U	S20	W51	4136	34 D	1	1						Slow S-SWF
MT WILSON	10	1656	1703		S12	E13	4141	07	1							
*MT WILSON	10	1735	1757		S22	W49	4136	22	1							
HAWAII	10	1746 E	1814 D		S19	W58	4133	28 D	1	1	0800	2.00	4.50			
MT WILSON	10	1815	1821		S17	E12	4141	06	1							
MT WILSON	10	1853	1910		S17	E38	4143	17	1							
HAWAII	10	1903	1916	1903	N13	E90	4148	13	1	3	0800	2.10				
MT WILSON	10	1903	1928		N15	E90	4148	25	1							G-SWF
SAC PEAK	10	1905	1952	1912	S21	W47	4136	47	2	2		7.95				
* HAWAII	10	1936	1946	1940	S14	W02	4138	10	1	3	0800	2.60	2.80			
*HAWAII	10	1958	2052	2008	N12	W00	4134	54	1	3	0800	2.50	2.50			
MT WILSON	10	2009	2031		N12	E07	4134	22	1							
*HAWAII	10	2032	2054	2038	N13	E90	4148	22	1	3	0800	2.10				
MT WILSON	10	2035	2055		N15	E90	4148	20	1							
* MT WILSON	10	2310	2317		S15	E08	4141	07	1							
MT WILSON	11	0035	0100		S17	E07	4141	25	1							
HAWAII	11	0056	0114	0058	S15	W07	4141	18	1	3	0800	2.70	2.90			G-SWF
MT WILSON	11	0110	0120		S20	W08	4138	10	1							
MT WILSON	11	0120	0200		S20	W04	4138	40	1							
HAWAII	11	0140	0200	0142	N13	E90	4148	20	1	3	0800	2.10				
MT WILSON	11	0143	0148		N16	E90	4148	05	1							
SYDNEY	11	0245 E	0303		N17	E05	4134	18 D	3							Slow S-SWF
ABASTUMANI	11	0449 E			N13	W01	4134		2							S-SWF
CAPRI S	11	0856	0914 D		S23	W61	4136	18 D	1	2	0859	1.70	3.70			
CAPRI S	11	1142	1228 D		S17	W01	4141	46 D	1	2	1205	2.00	2.10			G-SWF
SAC PEAK	11	1512	1605	1522	S15	W15	4138	53	1	3		3.90				Slow S-SWF
*HUANCAYO	11	1654	1705 D	1654 U	S06	W32	4147	11 D	1	2						
CLIMAX	11	1813	1853	1823	S15	W13	4138	40	2		1823	9.00				
SAC PEAK	11	1812	1855	1825	S15	W15	4138	43	2	3		8.50				
USNRL	11	1815	1851 D	1824	S13	W17	4138	36 D	1	2	1824	2.15	2.42		105	Slow S-SWF
MT WILSON	11	1819	1838		S20	W18	4138	19	1							
USNRL	11	1834	1944	1842	S43	E39	4144	70	2	2	1842	4.30	8.39		83	
SAC PEAK	11	1835	1935	1845	S43	E36	4144	60	1	3		3.45				
MT WILSON	11	1839	1900		S43	E24	4144	21	1							
*MT WILSON	11	2032	2049		S10	W30	4138	17	1							
SAC PEAK	11	2135	2205	2140	S19	W02	4141	30	1	3		4.75				S-SWF
CLIMAX	11	2138 E	2212	2138	S19	W01	4141	34 D	1		2138	4.50				
*MT WILSON	11	2355	2405		N25	E32	4142	10	1							G-SWF
*MT WILSON	12	0020	0040		N10	W10	4134	20	1							
ATHENS	12	0708	0724	0713	N08	W14	4134	16	1	3		2.40	2.40			Slow S-SWF
SIMFEROPOL	12	0709	0731		N12	W15	4134	22	2							
CAPRI S	12	0709	0736 D		N10	W20	4134	27 D	1	1	0711	3.50	3.80			S-SWF
THE HAGUE	12	0710	0735		N09	W14	4134	25	1							
ONDREJOV	12	0710 E	0719		S19	W07	4141	09 D	2	2	0712			3.40		
*ONDREJOV	12	1029 E	1040		S23	E25	4143	11 D	1	2	1034			2.40		
ONDREJOV	12	1029 E	1041		S17	W13	4138	12 D	1	2	1032			2.20		
CAPRI S	12	1030 E	1107 D		S14	W13	4138	37 D	1	1	1035	1.90	2.00			
ONDREJOV	12	1130	1143	1135	S18	W12	4141	13	1	2	1135			2.60		
ONDREJOV	12	1213 E	1217 D		S18	W07	4141	04 D	1	2	1213			3.20		G-SWF
ONDREJOV	12	1409 E	1422 D		N10	W17	4134	13 D	1	1	1421			2.10		
*ONDREJOV	12	1444	1451	1448	S17	W15	4141	07	1	3	1448			2.20		
SAC PEAK	12	1510	1550	1517	N11	W19	4134	40	2	3		8.15				
CLIMAX	12	1510	1610	1520	N11	W18	4134	60	1		1520	3.90				
MEUDON	12	1511	1522 D		N12	W15	4134	11 D	1							
R O HERST	12	1512	1539	1516	N10	W20	4134	27	1	2	1516	3.30	3.50	5.10	150	S-SWF
ONDREJOV	12	1514	1536 D	1516	N10	W18	4134	22 D	3	2	1516			6.80		
ZURICH	12	1514	1550		N10	W17	4134	36	2	3	1514			8.00		
USNRL	12	1517 E	1638		N11	W18	4134	81 D	2	1	1520	4.52	4.85		180	
*SAC PEAK	12	1535	1622	1543	S16	W15	4141	47	1	3		2.90				
*USNRL	12	1547	1622	1602	S17	W17	4141	35	1	2	1602	1.81	2.04		88	Slow S-SWF

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SAC PEAK	12	1632	1642	1635	S16	W15	4141	10	1	3						
ONDREJOV	12	1635 E	1640 D		S17	W16	4141	05 D	1b	3		3.00				
*CAPRI S	12	1657 E	1705 D		S14	W15	4138	8 D	1	2	1635			2.90		
SAC PEAK	12	1837	1917	1840	S16	W16	4141	40	1b	1	1657	2.50	2.60			
USNRL	12	1839	1915	1841	S18	W18	4141	36	1b	3		2.75				S-SWF
HAWAII	12	1838	1912	1840	S04	W20	4140	34	1b	2	1841	1.81	2.08	2.00	146	S-SWF
SAC PEAK	12	1902	1927	1910	S12	W31	4138	25	1	3	0500	5.20	6.00			
USNRL	12	1903	1929	1908	S15	W28	4138	26	1	3		2.15				
CLIMAX	12	1924	2000	1928	S15	W16	4141	36	1	2	1908	1.70	2.06			
SAC PEAK	12	2100	2112	2107	S15	W20	4141	12	1		1928	2.80			88	Slow S-SWF
*HAWAII	12	2148	2222	2154	S22	W80	4136	34	1	3		2.35				
ONDREJOV	13	0531 E	0537		S17	W26	4141	06 D	1	3	0500	1.20				Slow S-SWF
*ONDREJOV	13	0622	0633 D	0623	S18	W25	4141	11 D	2	3	0533					
CAPRI S	13	0642 E	0707		S13	W25	4141	25 D	1	2	0623			2.60		
ONDREJOV	13	0751 E	0755		S44	E11	4146	04 D	1	3	0644	2.20	2.50	7.40		
ONDREJOV	13	0801 E	0805 D		S18	W26	4141	04 D	1	2	0753			2.50		
USNRL	13	1214	1345	1220	N22	E77	4151	91	1	2	0802			3.10		
ZURICH	13	1244	1258		S16	W27	4141	14	1	1	1220	.56	2.48	1.00	79	
USNRL	13	1313	1341		S18	W25	4141	28	1	3	1244		2.00			
CAPRI S	13	1313 E	1342		S14	W23	4141	29 D	2	1	1322	2.94	3.56		84	
R O HERST	13	1317 E			S15	W25	4141		1	2	1316	5.00	5.50			
*CAPRI S	13	1343	1429		S12	W28	4141	46	1b	1	1317	3.10	3.70			Slow S-SWF
R O HERST	13	1348	1420	1350	S15	W30	4141	32	1	2	1414	2.40	2.60			
MEUDON	13	1348 E	1510		S17	W25	4141	22 D	1	1	1353	1.00	1.30	2.50	115	S-SWF
MEUDON	13	1411	1418 D		N10	W32	4134	07 D	1b							
USNRL	13	1413	1508	1420	N08	W32	4134	55	1b	2	1420	3.39	4.05	2.00	159	
R O HERST	13	1415	1450	1422	N10	W32	4134	35	1b	3	1423	1.90	2.30	4.30	185	S-SWF
CAPRI S	13	1415	1500		N09	W30	4134	45	2	2	1422	4.00	4.80			
MT WILSON	13	1424	1452		N09	W33	4134	28	1							
*ONDREJOV	13	1508 E	1518		S17	W31	4141	10 D	1	2	1518			2.60		
ONDREJOV	13	1552 E	1559		S30	E58	4150	07 D	1	2	1552			2.80		
ONDREJOV	13	1556 E	1601		S16	W30	4138	05 D	1	3	1557			2.00		
*ONDREJOV	13	1603	1610 D		S16	W31	4138	07 D	1	2	1606			1.80		
*USNRL	13	1729	1817 D	1735	N22	E74	4151	48 D	1	2	1735	1.35	4.35		83	Slow S-SWF
HAWAII	13	1844 E	1922		S17	W32	4138	38 D	1	2	0615	3.10	4.10			
MT WILSON	13	1845	1901		S17	W32	4138	16	1							
USNRL	13	1846 E	1933		S16	W32	4138	47 D	1	1	1846	1.70	2.35		108	S-SWF
USNRL	13	1941	2027 D	1955	S19	W28	4141	46 D	1	1	1955	2.60	3.34		111	
*MT WILSON	13	1942	2002		S15	W23	4141	20	1b							
HAWAII	13	1942 E	2008	1946	S18	W28	4141	26 D	1	3	0615	2.60	3.40			Slow S-SWF
*MT WILSON	13	2005	2015		N24	E10	4142	10	1							
*MT WILSON	13	2052	2100		S17	W32	4138	08	1							
HAWAII	13	2052	2104	2052	S17	W32	4138	12	1	3	0615	3.10	4.10			Slow S-SWF
*MT WILSON	13	2130	2142		S15	W33	4138	12	1							
*MT WILSON	14	0151	0200													Slow S-SWF
MITAKA	14	0154 E	0201 D		S17	W29	4141	09	1							
TASHKENT	14	0230	0300		S22	W36	4141	07 D	1	1	0157	3.80	4.87	1.99		Slow S-SWF
SYDNEY	14	0240	0315		N11	W40	4134	30	2b							
*ONDREJOV	14	0620 E	0643	0635	N10	W38	4134	35	2							
ATHENS	14	0722	0731		N23	E63	4151	23 D	1	2	0635			3.60		
ONDREJOV	14	0725 E	0729 D	0726	N10	E87	4152	9	2	4		.80	7.50			S-SWF
SIMEIZ	14	0725	0810		N10	E82	4152	04 D	1	3	0726			4.20		
OTTAWA	14	1215	1317	1224	N08	W81	4135	51	2							
USNRL	14	1218	1326	1227	S25	E02	4143	02	2	1	1224	5.28	6.27			
CAPRI S	14	1222 E	1301		S25	E02	4143	68	1	2	1227	2.82	3.30		94	Slow S-SWF
USNRL	14	1336	1357	1338	S22	W06	4143	39 D	2	1	1222	6.00	6.60			
*USNRL	14	1348	1400	1354	N06	E85	4152	21	2	2	1338	1.47	7.40		76	Slow S-SWF
MC MATH	14	1350 E	1405 D		S18	W40	4141	12	1	2	1354	1.81	2.54		73	
*USNRL	14	1402	1434	1408	S16	W40	4141	15 D	1							
NIZAMIAH	15	0336 E	0349 D		S16	W40	4141	32	1	2	1408	2.03	3.00		83	
TASHKENT	15	0426	0450		N01	E18	4148	13 D	1	1	0339	1.52	4.63	1.80		G-SWF
*SAC PEAK	15	1927	2017	1947	N12	W53	4134	24	2							S-SWF
SAC PEAK	15	2030	2107	2042	N18	E45	4151	50	1	2		5.20				
HAWAII	15	2032	2044	2040	N11	W63	4134	37	1b	2		3.85				Slow S-SWF
HAWAII	15	2040	2110	2042	N07	E56	4152	12	1b	3	0615	5.20	8.60			S-SWF
*SAC PEAK	15	2110	2200	2117	N13	W64	4134	30	2	3	0615	6.20	10.40			
SAC PEAK	15	2222	2255	2230	N22	E46	4151	50	1b	2		5.10				
HAWAII	15	2224	2252	2228	N06	E58	4152	33	1b	2		5.10				
					N03	E57	4152	28	1b	3	0615	4.70	8.60			G-SWF
NIZAMIAH	16	0309	0321	0312	N25	E38	4151	12	1	3	0312	2.43	3.18	1.40		Slow S-SWF

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CAPRI S	16	0737 E	0802 D		N24	E42	4151	25 D	1	3	0753	1.40	2.10			
ONDREJOV	16	1250 E	1257		N24	E48	4151	07 D	1	2	1252			3.10		S-SWF
[illegible]	16	1305	1405	1307	N08	E48	4152	60	1	2	1307	1.47	2.22		111	S-SWF
[illegible] S	16	1306 E	1332 D		N08	E45	4152	26 D	1	3	1309	1.50	2.10			
[illegible]ELHOHE	16	1307	1324		N07	E53	4152	17	2							Slow S-SWF
[illegible]DREJOV	16	1310 E	1329 D		N06	E50	4152	19 D	1	1	1313			2.70		
USNRL	16	1451	1649	1458	N08	E48	4152	58	1&	2	1458	1.36	2.06	1.00	133	
SAC PEAK	16	1452	1542	1500	N07	E48	4152	50	1	2		3.25				
CAPRI S	16	1454 E	1515 D		N08	E43	4152	21 D	1&	3	1456	3.00	4.20			
MT WILSON	16	1455	1515		N09	E43	4152	20	1							S-SWF
ONDREJOV	16	1500 E	1518 D		N06	E50	4152	15 D	1	1	1514			2.50		
MC MATH	16	1500 E	1521 D		N08	E48	4152	21 D	2							
SAC PEAK	16	1517	1645	1522	N11	E47	4152	88	2	2		7.90				
ONDREJOV	16	1520 E	1541 D		N09	E47	4152	21 D	2&	2	1523			4.90		
CLIMAX	16	1520	1544	1522	N10	E47	4152	24	2		1522	6.50				
USNRL	16	1520	1709	1522	N12	E47	4152	109	2&	2	1522	1.74	5.85	1.00	174	
CAPRI S	16	1521 E	1621		N10	E50	4152	60 D	2&	3	1521	7.00	10.50			
MT WILSON	16	1525 E	1602		N09	E43	4152	37 D	2							
KANZELHOHE	16	1528 E	1543		N12	E47	4152	15	2							
HAWAII	16	1840	1846	1842	N23	E43	4151	6	1	2	0545	2.50	3.10			
HAWAII	16	2022	2032	2026	N12	W75	4134	10	1	2	0545	1.50	3.90			
SAC PEAK	16	2242	2300	2245	N09	W78	4134	18	1	2		2.06				
HAWAII	16	2244	2304	2246	N15	W80	4134	20	1&	2	0545	2.70	6.70			S-SWF
MT WILSON	16	2252	2310		N08	W75	4134	18	1							
SAC PEAK	16	2307	2345	2325	N23	E36	4151	38	1	2		2.90				
MT WILSON	16	2310	2345		N23	E35	4151	35	1							
MT WILSON	17	0005	0034		N09	E39	4151	29	1							
CAPRI S	17	0756 E	0945 D		N22	E29	4151	109 D	2	3	0830	4.00	5.00			
* ARCETRI	17	0806 E			N23	E26	4151		1&	2						
ONDREJOV	17	0808 E	0823		N22	E29	4151	15 D	2&	1	0809			2.80		S-SWF
MEUDON	17	0845 E			N25	E25	4151		1							
* ONDREJOV	17	1039 E	1050		N24	E29	4151	11 D	1&	1	1048			3.40		
ONDREJOV	17	1057 E	1107 D		N24	E27	4151	10 D	1	1	1058			3.10		
* CAPRI S	17	1145	1206 D		N25	W40	4142	21 D	1	3	1151	1.80	2.70			
OTTAWA	17	1145 E	1210	1150	N25	W39	4142	25 D	1	1	1150	2.03	2.74			S-SWF
OTTAWA	17	1148		1201	N23	E23	4151		1	1	1201	1.97	2.23			
SAC PEAK	17	1512	1535	1515	N24	E25	4151	23	1	2		3.45				
CAPRI S	17	1513 E	1531 D		N24	E27	4151	18 D	1	2	1515	2.00	2.20			S-SWF
MC MATH	17	1515 E	1530 D		N18	E22	4151	15 D	2							
* ZURICH	17	1525 E	1625		N22	E21	4151	60 D	1	2	1525		3.00			
* ZURICH	17	1545	1621		N11	E36	4152	36	1	2	1545		3.00			
* MC MATH	17	1605 E	1700 D		N18	E22	4151	55 D	1&							
SAC PEAK	17	1637	1725	1642	N23	E21	4151	48	1&	2		4.50				
HAWAII	17	1944	2000	1946	N22	E22	4151	16	2	1	0530	5.80	6.50			S-SWF
MC MATH	17	1945 E	2000 D		N18	E20	4151	15 D	1&							S-SWF
SAC PEAK	17	2225 E	2257	2225 U	N24	E19	4151	32 D	1	2		2.95				
* CLIMAX	17	2250	2254	2252	N19	E20	4151	4	1		2252	2.70				G-SWF
SYDNEY	17	2315	2400		N21	E20	4151	45	2							
SAC PEAK	17	2315	2400 D	2322	N23	E18	4151	45 D	2	2		5.90				S-SWF
MITAKA	18	0006 E	0027	0011 U	N24	E16	4151	21 D	1	1	0006	1.84	2.00	2.04	122	
MITAKA	18	0038	0114	0052 U	N25	E19	4151	36	1	2	0052	1.34	1.50	2.40	115	
HAWAII	18	0108	0124 D	0108	N07	E32	4152	16 D	1&	1	0530	4.50	5.50			
MITAKA	18	0110	0133	0110 U	N13	E25	4152	23	1	2	0112	2.78	3.00	2.21	140	
MITAKA	18	0117	0134		N13	E34	4152	17	1	2	0127	2.78	3.20	2.22	118	S-SWF
NIZAMIAH	18	0425	0442	0428 U	N22	E15	4151	17	1	3	0428	2.43	2.61	1.20		
MITAKA	18	0539 E	0549		N17	E09	4151	10 D	1&	1	0539	5.64	5.85	1.62	107	Slow S-SWF
SIMEIZ	18	0624	0708		N23	E14	4151	44	2&							
ATHENS	18	0629	0655	0635	N23	E13	4151	26	1	4		2.30	2.50			
CAPRI S	18	0630 E	0716 D		N23	E12	4151	46 D	1&	1	0633	3.00	3.30			
ONDREJOV	18	0638 E	0656		N25	E17	4151	18 D	2	2	0638			2.80		S-SWF
ZURICH	18	0821 E	0852 D		N22	E12	4151	31 D	1	3	0833		2.00			
ONDREJOV	18	0916 E	0920 D		N20	E14	4151	04 D	1	2	0917			3.50		
ONDREJOV	18	1036	1048	1040 U	N24	E13	4151	12	1&	3	1040			2.50		G-SWF
CAPRI S	18	1037	1207		N23	E10	4151	90	2&	2	1143	7.00	7.70			
ZURICH	18	1048 E	1600 D		N22	E10	4151	312 D	2	3			10.00			
ONDREJOV	18	1100 E	1125		N23	E11	4151	25 D	1&	3	1101			3.50		
OTTAWA	18	1150 E			N22	E10	4151		2&	1	1150	12.35	13.04			
MC MATH	18	1253 E	1545 D		N22	E11	4151	172 D	3							
ONDREJOV	18	1303	1313	1306	N23	E06	4151	10 D	1	3	1306			3.20		
CAPRI S	18	1305	1457		N22	E09	4151	112	3	3	1359	11.00	12.10			
ZAGREB	18	1312			N22	E10	4151		2							Slow S-SWF

SOLAR FLARES

SEPTEMBER 1957

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R O HERST	18	1312 E	1418	1325 U	N23	E13	4151	6	D	1+	2	1323	4.20	4.40	2.50	100	
ONDREJOV	18	1315	1404	1319	N23	E06	4151	49		2	2	1319			3.20		
CLIMAX	18	1353 E	1353 D		N23	E12	4151		D	2		1353					
SAC PEAK	18	1354 E	1515 F	1354 U	N22	E09	4151	81	D	2+	2		5.60				
USNRL	18	1451 E	1538 D		N22	E06	4151	47	D	3	1	1513	13.35				
*USNRL	18	1511	1613 D	1528	N23	E11	4151	62	D	1	2	1528	11.98	12.50		95	
CLIMAX	18	1658 E	1800 D	1702	N22	E09	4151	62	D	2		1702	2.60	2.78		79	G-SWF
SAC PEAK	18	1722	1742 D	1742	N23	E08	4151	20	D	2+	2		5.40				
OTTAWA	18	1725		1740	N23	E08	4151			2	1	1740	12.05				
MT WILSON	18	1725	1935		N22	E05	4151	170		3			10.15	10.72			
MC MATH	18	1727 E	1955 D		N25	E17	4151	148	D	3							
HAWAII	18	1735	1800	1738	N23	E09	4151	25		2	3	1007	9.70	10.20			Slow S-SWF
HAWAII	18	1818	2040	1840	N21	E03	4151	142		3+	3	1007	31.00	32.00			
SAC PEAK	18	1840 E	2110 F	1840	N21	E04	4151	150	D	3+	2		24.55				
CLIMAX	18	1845 E	1944 D	1846	N18	E03	4151	59	D	3+		1846	33.00				
SAC PEAK	18	2145	2215	2155	N23	E06	4151	30		1	2		2.60				
HAWAII	18	2146	2156	2148	N23	E08	4151	10		1	3	1007	4.10	4.30			
MT WILSON	18	2218	2224		S23	E15	4155	06		1							
SYDNEY	18	2315	2400		N21	E20	4151	45		2							
SAC PEAK	18	2332	2400 D	2337	N16	E08	4151	28	D	1	2		4.00				
MITAKA	18	2333	2352	2336 U	N14	E07	4151	19		1+	2	2334	5.67	5.78	2.38	134	
MITAKA	18	2347	2424 D	2351 U	N14	E04	4151	37	D	1	2	2351	2.60	2.65	2.16	134	
MITAKA	19	0006 E	0014 D		S21	E16	4155	08	D	1	2	0006	.89	1.05	1.47	107	
MITAKA	19	0037	0047 D		N21	F02	4151	10	D	1	2	0042	1.84	1.91	1.60	96	
MITAKA	19	0246	0327 D	0301 U	N23	E03	4151	41	D	1+	2	0302	5.67	5.90	2.50	134	
NIZAMIAH	19	0250 E	0320		N24	E02	4151	40	D	2	2	0250	7.29	7.61	1.60		
NIZAMIAH	19	0350 E	0536	0355 U	N24	E02	4151	106	D	3	2	0355	12.15	12.69	2.60		S-SWF
SYDNEY	19	0400	0500		N24	W10	4151	60		3							
MITAKA	19	0400 E	0545	0400 U	N23	E03	4151	105	D	3	2	0405	18.70	19.40	3.70	232	
TASHKENT	19	0402	0515		N21	E02	4151	113		3							
ALMA-ATA	19	0749	0858		N24	W00	4151	69		2+							
CAPRI S	19	0749	0859 D		N22	E00	4151	10	D	1+	3	0824	4.00	4.30			S-SWF
MOSCOW	19	0750	0926		N22	E01	4151	136		2+							
ATHENS	19	0751	0826		N25	E00	4151	35		2	4		5.00	5.20			
WENDEL	19	0808 E	0856 D		N24	E01	4151	48	D	2+				16.00			
MEUDON	19	0809 E	0854		N26	E10	4151	45	D	1							
ZURICH	19	0826 E	1200	1025 U	N21	W01	4151	214	D	2	3			16.00			
ZURICH	19	0826 E	0858		N07	E06	4152	32	D	1	3	0843		2.00			
*ZURICH	19	0836	0855		S23	E08	4155	19		1	3	0836		2.00			
ZURICH	19	0922	0941		S23	E08	4155	19		1	3	0922		2.00			
WENDEL	19	0943 E	1025		N25	W12	4151	42	D	1				3.00			
CAPRI S	19	1002 E	1027 D		N22	W02	4151	25	D	1	3	1006	2.00	2.20			
R O EDIN	19	1003	1029	1006 U	N22	E00	4151	26		1	3	1006	2.50	2.60	2.28		
WENDEL	19	1005	1025		N23	E02	4151	20		1+				6.00			
R O EDIN	19	1110	1140	1112 U	N23	W05	4151	30		1	3	1112	5.00	5.20	3.64		
WENDEL	19	1110	1147 D		N26	E05	4151	37	D	2+				14.00			G-SWF
WENDEL	19	1111	1159 D		N27	W08	4151	48	D	1+				6.00			
CAPRI S	19	1112 E	1135 D		N22	W04	4151	23	D	1	3	1116	2.50	2.70			
*ZURICH	19	1216	1245		N07	E04	4152	29		1	3	1217		2.00			
*WENDEL	19	1332	1404		N23	W00	4151	32		1				3.00			
ZURICH	19	1344 E	1358		N23	W05	4151	14	D	1	3	1346		4.00			
*WENDEL	19	1623	1640 D		N23	W03	4151	17	D	1+				7.00			
OTTAWA	19	1625		1628	N23	W01	4151			1	1	1628	2.78	2.92			
MT WILSON	19	1625	1640		N25	E03	4151	15		1							G-SWF
*MT WILSON	19	1718	1725		N26	E03	4151	07		1							
*CLIMAX	19	1802	1812	1806	N24	W03	4151	10		1		1806	2.60				
HAWAII	19	1806	1810	1808	N24	W01	4151	4		1	1	0500	2.30	2.40			
MT WILSON	19	2210	2330		N25	E01	4151	80		1							
SYDNEY	20	0345	0450		N23	W08	4151	105		2							
NIZAMIAH	20	0347	0434	0355 U	N23	W13	4151	47		1+	2	0355	4.25	4.54	1.60		Slow S-SWF
NIZAMIAH	20	0443 E	0501	0448 U	S22	W03	4155	18	D	1	2	0448	2.43	2.79	1.50		
SYDNEY	20	0445 E	0510		S23	E00	4155	25	D	1+							
NIZAMIAH	20	0529 E	0552 D	0533 U	N23	W13	4151	23	D	1	2	0533	2.13	2.27	1.30		
ZURICH	20	0725 E	0830		N07	W06	4152	65	D	1	3	0725		3.00			S-SWF
ZURICH	20	0725 E	0835		N23	W11	4151	70	D	1	3	0725		7.00			
WENDEL	20	1021 E	1040 D		N13	E85	4159	19	D	1				4.00			
USNRL	20	1204	1208 D		N23	W15	4151	4	D	1	1	1208	3.38	3.68		102	S-SWF
MEUDON	20	1237	1430		S45	W45	4149	113		1+							
*ZURICH	20	1318 E	1343		N07	W10	4152	25	D	1	3	1326		3.00			
ZURICH	20	1326	1338		N24	W09	4151	12			3	1326		1.00			
*ZURICH	20	1336	1352	1340 U	S24	W08	4155	16		1	3	1340		1.00			

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WENDEL	20	1430 E	1455 D		N25	W25	4151	25 D	1				4.00			
*ATHENS	20	1432 E	1455 D		N24	W28	4151	23 D	1	4		2.00	2.30			
ZURICH	20	1440 E	1447 D		N24	W16	4151	07 D	1	2	1440		3.00			S-SWF
SAC PEAK	20	2030	2120	2040	N21	W23	4151	50	1	2		3.95				
HAWAII	20	2032	2044	2036	N22	W22	4151	12	1	2	0600	3.50	3.90			
CLIMAX	20	2032	2100	2034	N18	W22	4151	28	1		2034	2.10				G-SWF
SAC PEAK	20	2117	2222	2123	N07	W16	4152	65	2	2		5.90				
CLIMAX	20	2120	2135 D	2123	N06	W14	4152	15 D	1		2123	3.40				
HAWAII	20	2120 E	2146	2122	N07	W15	4152	26 D	2	2	0600	6.20	6.40			S-SWF
SAC PEAK	20	2205	2230	2215	N15	E90	4159	25	1&	2		4.90				
SAC PEAK	20	2220	2250	2222	N23	W24	4151	30	1	2		3.30				S-SWF
CLIMAX	20	2224 E	2230 D	2224	N21	W16	4151	6 D	1		2224	2.50				
MITAKA	21	0030 E	0105 D	0044 U	N21	W20	4151	35 D	1	1	0030	1.84	1.99	2.38	165	S-SWF
MITAKA	21	0341	0355	0344 U	N06	W21	4152	14	1	2	0342	1.84	1.95	2.21	115	S-SWF
MITAKA	21	0405	0433 D	0420 U	N24	W17	4151	28 D	2	1	0427	11.00	11.90	2.86	149	
TASHKENT	21	0410 E	0427		N23	W24	4151	017 D	2							
TASHKENT	21	0420	0528					068	2&							
NIZAMIAH	21	0423 E	0456		N22	W28	4151	33 D	1&	2	0423	4.25	4.96	1.80		Slow S-SWF
ATHENS	21	0602	0626		N22	W25	4151	24	1&	4		3.80	4.20			
ATHENS	21	0656	0709		N16	E85	4159	13	1	4		.40	3.50			Slow S-SWF
*ONDREJOV	21	0704 E	0711		N09	W01	4152	07 D	1&	2	0705			3.70		S-SWF
WENDEL	21	0739 E	0755 D		N17	E77	4159	16 D	1				3.00			
ZURICH	21	0746	0753		N19	E76	4159	07	1	3	0746		2.00			
ZURICH	21	0740 E	1152		N10	W02	4152	252 D	2	3	0740		8.00			
ONDREJOV	21	0808 E	0819	0813	N08	W03	4152	11 D	1	3	0813			2.60		
ZURICH	21	0813	0855	0828 U	N07	W21	4152	42	1	3	0828.		5.00			
ZURICH	21	0827	0830		N23	W22	4151	03	1	3	0827		1.00			
CAPRI S	21	0908 E	0935 D		N11	W09	4152	27 D	1	2	0911	2.00	2.00			
ONDREJOV	21	0938	0946	0942	N09	W02	4152	08	1&	3	0942			4.10		
WENDEL	21	0938	1004 D		N07	W00	4152	26 D	1&				5.00			Slow S-SWF
ONDREJOV	21	0948	1003	0952	N09	W02	4152	15	2	3	0952			4.80		
ONDREJOV	21	1006 E	1016	1009	N12	E85	4159	10 D	1	3	1009			5.00		
WENDEL	21	1006	1024 D		N11	E84	4159	18 D	1				3.00			
WENDEL	21	1012	1033 D		N23	W24	4151	21 D	1				4.00			
ONDREJOV	21	1013 E	1023		N22	W27	4151	10 D	1&	3	1013			2.80		S-SWF
ZURICH	21	1018 E	1136		N22	W26	4151	78 D	2	3	1045		10.00			
ONDREJOV	21	1114 E	1123	1116	N22	W26	4151	09 D	1&	3	1116			4.30		S-SWF
ONDREJOV	21	1134 E	1140		N07	W04	4152	06 D	1	3	1134			3.40		
*ONDREJOV	21	1230 E	1235		N07	W21	4152	05 D	1	3	1332			2.60		S-SWF
ONDREJOV	21	1325	1337 E		N22	W30	4151	12 D	1	3	1330			2.40		
ONDREJOV	21	1319 E	1329		N05	W23	4152	10 D	1	3	1320			2.40		
CAPRI S	21	1332 E	1440 D		N10	W10	4152	68 D	2&	2	1345	5.50	5.50			
WENDEL	21	1332	1447		N13	W08	4152	75	3				20.00			Slow S-SWF
ONDREJOV	21	1333 E	1433	1335	N12	W05	4152	60 D	2	3	1335			7.20		
USNRL	21	1334 E	1342 D		N10	W11	4152	8 D	2&	1	1340	5.08	5.21		230	
SAC PEAK	21	1340 E	1510	1340 E	N10	W08	4152	90 D	3	2		13.45				
R O HERST	21	1342 E	1406 D	1342 E	N08	W25	4152	24 D	1&	1		3.80	4.10			
SHAUINS	21	1348 E	1424		N10	W04	4152	36	2							
SAC PEAK	21	1400	1555	1455	N07	W24	4152	115	2	2		7.25				
ARCETRI	21	1420 E	1450		N09	W01	4152	30 D	1&	3						
SAC PEAK	21	1410	1430	1417	N15	E85	4159	20	1	2		2.40				
ONDREJOV	21	1418	1424 D		N12	E83	4159	06 D	1	3	1418			2.80		
MT WILSON	21	1430	1441		N22	W21	4151	011	1							
ONDREJOV	21	1440	1535	1505	N05	W23	4152	55	1&	3	1505			3.80		
WENDEL	21	1442 E	1538		N08	W17	4152	56 D	2				12.00			
USNRL	21	1443 E	1559		N05	W23	4152	76 D	1&	1	1500	1.47	1.61		220	S-SWF
ARCETRI	21	1445	1525		N10	W16	4152	40	1&	3						
R O HERST	21	1451 E	1517 D	1451 E	N10	W07	4152	26 D	1	1		2.10	2.10			
MEUDON	21	1501 E			N05	W25	4152		1							
SAC PEAK	21	1510	1630	1540	N08	W07	4152	80	1&	2		5.20				
USNRL	21	1539 E	1601 D		N08	W08	4152	22 D	1	1	1549	2.92	3.04		110	
ONDREJOV	21	1542 E	1600		N08	W06	4152	18 D	2	3	1543			2.60		
ARCETRI	21	1515	1540		N23	W26	4151	25	1	3						
ONDREJOV	21	1517	1522	1519	N22	W30	4151	05	1	3	1519			2.70		
SAC PEAK	21	1630	1850	1730	N09	W08	4152	140	1&	2		7.25				Slow S-SWF
SAC PEAK	21	1950	2002 D	1955	N24	W33	4151	12 D	1	2		4.15				Slow S-SWF
MT WILSON	21	1952	2001		N24	W31	4151	09	1							
MT WILSON	21	2120	2145		N08	W10	4152	025	1&							
SAC PEAK	21	2322	2345 D	2327	N08	W13	4152	23 D	1	2		2.80				
HAWAII	21	2324	2342	2328	N08	W12	4152	18	1	3	0740	2.30	2.30			
MT WILSON	21	2354	2358		N15	E68	4159	04	1							
*MT WILSON	22	0031	0042		N24	W34	4151	11	1							

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CAPRI S	22	0623 E	0713		N11	W14	4152	50 D	1	3	0632	5.00	5.20			
CAPRI S	22	0644	0732		N08	W33	4152	48	1	3	0649	2.00	2.40			
ATHENS	22	0658	0709		N08	W35	4152	11	1	4		2.00	2.40			
ATHENS	22	0741	0832		N23	W37	4151	51	1&	4		3.70	4.70			
CAPRI S	22	0746 E	0828		N26	W36	4151	42 D	2	3	0801	4.50	6.30			S-SWF
ARCETRI	22	0800 E	0825		N23	W40	4151	25 D	1	2						
CAPRI S	22	0929	0950 D		N12	W21	4152	21 D	1	3	0944	2.50	2.70			
CAPRI S	22	1000	1020		S17	W40	4155	20	1	3	1008	3.20	4.20			S-SWF
CAPRI S	22	1248	1418		N07	W35	4152	90	2&	3	1259	6.00	7.80			
USNRL	22	1355 E	1458		N07	W38	4152	63 D	1	1	1355	3.05	3.82		79	Slow S-SWF
ONDREJOV	22	1455 E	1459		N25	W41	4151	04 D	1	2	1455			2.50		
CAPRI S	22	1455 E	1504 D		N27	W40	4151	9 D	1	3	1458	1.80	2.70			
USNRL	22	1457	1511	1459	N24	W40	4151	14	1	2	1459	1.24	1.73		82	
*ZURICH	22	1539	1543	1540 U	N08	W44	4152	04	1	2	1540		2.00			G-SWF
ZURICH	22	1546	1608	1550 U	N24	W41	4151	22	1	2	1550		5.00			
*HAWAII	22	1834	1842	1840	N16	E65	4159	8	1	3	0600	1.20	2.90			
HAWAII	22	2006	2014	2008	N16	E59	4159	8	2	3	0600	4.50	8.60			
SAC PEAK	22	2322	2347 D	2330	N19	W58	4151	25 D	1&	1		5.20				
CLIMAX	22	2325	2350 D	2330	N18	W56	4151	25 D	1		2330	3.40				
HAWAII	22	2326	2350	2328	N23	W56	4151	24	2	3	0600	5.80	11.00			
SIMFEROPOL	23	0503 E			N24	W25	4152		2							
MT WILSON	23	1458	1514		N10	W63	4151	16	1							
*CAPRI S	23	1546	1604 D		N22	W60	4151	18 D	1	1	1546	1.20	2.40			Slow S-SWF
HAWAII	23	2142	2232	2158	N14	W57	4151	50	1	3	0500	1.60	2.70			Slow S-SWF
HUANCAYO	23	2143	2149 D	2144	N09	W54	4151	6 D	1	2						
ONDREJOV	24	0602 E	0629	0604	N18	E87	4162	27 D	1	3	0604					
ATHENS	24	0720	0729	0723	N17	E90	4162	09	1	4				4.90		
WENDEL	24	0751 E	0820 D		N13	E88	4162	29 D	1&			.30	3.30			
ATHENS	24	0753	0811	0802	N17	E88	4162	18	2	4			4.00			
CAPRI S	24	0935 E	0947 D		S32	E90	4164	12 D	1	1	0935	.70	6.60			
OTTAWA	24	1313 E		1320	N23	W69	4151		1	1	1320	2.50				
USNRL	24	1314	1340	1320	N22	W68	4151	26	1	2	1320	1.57	3.97			
USNRL	24	1344	1352	1348	N25	W72	4151	8	1	2	1348	1.70	4.80		75	
USNRL	24	1350	1456	1354	N08	W67	4152	66	1	2	1354	.68	2.17		68	
USNRL	24	1418	1440	1426	S23	W68	4155	22	1	2	1426	.80	1.97		82	
*MT WILSON	24	1520	1520		N09	W72	4151		1			.91	2.94		80	
MT WILSON	24	2012	2018		N12	W54	4152	06	1							S-SWF
HAWAII	24	2012	2034	2018	N16	W54	4152	22	1	1	0530	2.70	4.50			Slow S-SWF
HAWAII	25	0132 E	0138 D	0132	N24	W85	4151	6 D	1	1	0530	1.90				
ATHENS	25	0842	0915		N25	E45	4159	33	1	5		1.20	2.10			Slow S-SWF
CAPRI S	25	0843 E	0916 D		S25	E43	4161	33 D	1	3	0847	2.00	3.10			S-SWF
*ONDREJOV	25	1342	1350	1342	N09	W80	4152	08	1	3	1342			4.70		
HUANCAYO	25	1534 E	1624	1541 U	S27	E41	4161	50 D	1&	2						G-SWF
MC MATH	25	1537 E	1621 D		S27	E40	4161	54 D	1							
MT WILSON	25	1538	1545		S42	W45	4161	07	1							
*HAWAII	25	1922	1948	1922	N21	E27	4159	26	1	1	0445	4.10	4.80			
HAWAII	25	2042	2046	2042	N14	W65	4152	4	1	1	0445	1.30	3.10			
*HAWAII	25	2340	0010	2352	S30	E34	4161	30	1	1	0445	1.40	2.40			
MT WILSON	25	2449	2455		N11	W65	4152	06	1							
CLIMAX	26	1527 E	1555 D	1533	N14	E60	4162	28 D	1		1533	2.30				
MT WILSON	26	1535	1605		N15	E56	4162	30	1							
SAC PEAK	26	1832	1850	1836	S26	E29	4161	18	1	2		2.50				G-SWF
MT WILSON	26	1837	1848		S26	E27	4161	11	1							
SAC PEAK	26	1907	2345 D	1952 F	N26	E15	4159	278 D	3	2		23.55				Slow S-SWF
MC MATH	26	1920 E	2103 D		N20	E15	4159	103 D	3							
HUANCAYO	26	1926 E	1957 D	1926 U	N25	E20	4159	31 D	2&	2						
HAWAII	26	2020 E	2110		N24	E16	4159	50 D	3	1	0700	17.50	19.00			S-SWF
CLIMAX	26	2039 E	2116 D		N24	E16	4159	37 D	3		2039	22.20				
NIZAMIAH	27	0523	0544 D	0528 U	S24	E22	4161	21 D	1	2	0528	2.43	3.07	2.20		
CAPRI S	27	0855 E	0900 D		S20	W90	4155	5 D	1	3		2.00				
*ONDREJOV	27	1212 E	1219		N16	E04	4159	07 D	1	2	1212			2.30		
*MT WILSON	27	1520	1528		N11	E13	4159	08	1							
*USNRL	27	1738	1748	1738	N10	E08	4159	10	1	2	1738	1.92	1.94		87	
USNRL	27	1826	1922	1830	N18	W05	4159	56	1	2	1830	1.92	1.96		86	
MT WILSON	27	1958	2010		S13	W48	4157	12	1							
MC MATH	27	2000 E	2014 D		S13	W40	4157	14 D	1							
CLIMAX	27	2037	2043 D		S15	W45	4157	6 D	1		2041	3.60				G-SWF
HAWAII	27	2116	2136 D	2124	N18	W03	4159	20 D	2	1	0700	7.40	7.60			

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HUANCAYO	27	2117	2158	2119	N16	W01	4159	41		2	2						Slow S-SWF
CLIMAX	27	2212 E	2310	2214	N18	W02	4159	58	D	1		2214	3.90				
ZURICH	28	0845 E	0911	0851 U	N12	W14	4159	26	D	1	2	0851		4.00			
NIZAMIAH	28	0913 E	0933	0916 U	N20	W17	4159	20	D	1&	2	0916	4.25	4.56	2.60		
ZURICH	28	0913	0941	0920 U	N16	W11	4159	28		1	2	0920		7.00			
ARCETRI	28	0927 E	0939	D	N15	W11	4159	12	D	1&	2	0927	4.95	5.09			Slow S-SWF
ZURICH	28	1112	1115		N15	E33	4162	03			2	1112		1.00			
CLIMAX	28	1840	1914	1846	N16	W17	4159	34		1		1846	2.30				
MC MATH	28	1850 E	1908	D	N20	W10	4159	18	D	1							Slow S-SWF
CLIMAX	28	2025 E	2049	D	N25	W13	4159	24	D	1		2025	2.40				
CLIMAX	28	2025 E	2049	D	N20	W30	4159	24	D	1		2025	2.30				
HAWAII	28	2148	2201	D	N20	W31	4159	13	D	1	1	0330	4.50	5.20			
HAWAII	28	2152	2215	D	N26	W11	4159	23	D	1&	1	0330	6.20	6.80			
SAC PEAK	28	2207 E	2225	2207 E	N17	W32	4159	18	D	1	1		2.20				
SAC PEAK	28	2207 E	2240	2207 E	N26	W14	4159	33	D	2	1		6.65				
TASHKENT	29	0408	0457		N12	W06	4159	49		1&							
ATHENS	29	0649 E	0703		S27	W04	4161	14	D	1	4		1.80	2.20			
TASHKENT	29	0704 E	0713		N23	W22	4159	09	D	1&							
WENDEL	29	0705 E	0731		N25	W21	4159	26	D	1&				6.00			
ATHENS	29	0705	0731		N22	W21	4159	26		1	4		2.30	2.60			
CAPRI S	29	0712 E	0724	D	N22	W26	4159	12	D	1	1	0712	3.00	3.60			
ATHENS	29	0739	0817		N14	W23	4159	38		1&	4		3.50	3.80			
TASHKENT	29	0748	0805		N15	W25	4159	017		1&							
WENDEL	29	0901	0914		S28	E24	4164	13		1				3.00			
WENDEL	29	0936	1000		S25	E68	4167	24		1				3.00			
*MT WILSON	29	1548 E	1548		N21	W30	4159			1							
SYDNEY	30	0210	0310		N23	W30	4159	60		2							
SIMEIZ	30	0748	0814		S18	E85	4167	26		1&							Slow S-SWF
ONDREJOV	30	1027 E	1035	D	N15	W52	4159	08	D	1&	1	1030					
CAPRI S	30	1027 E	1038	D	N17	W52	4159	11	D	1&	2	1027	4.50	6.30			
ONDREJOV	30	1102 E	1119	D	N17	W42	4159	17	D	1&	2	1104			2.50		
ONDREJOV	30	1219 E	1222		N14	W36	4159	03	D	1	2	1220			3.00		
ONDREJOV	30	1221	1237	1224	N17	W51	4159	16		2	3	1224			5.80		
R O EDIN	30	1224 E	1246		N17	W50	4159	22	D	1&	2	1224	6.00	8.20	4.44		
CAPRI S	30	1224 E	1250	D	N17	W52	4159	26	D	1&	2	1225	5.00	7.00			S-SWF
OTTAWA	30	1227 E	1245		N16	W52	4159	17	D	1	2	1228	2.90	4.72			
CAPRI S	30	1455	1547	D	N20	W36	4159	52	D	1	3	1459	1.40	1.80			
*MT WILSON	30	1505 E	1505		N20	W38	4159			1							
HUANCAYO	30	1520 E	1533	1520 U	N19	W38	4159	13	D	1	1						
*HUANCAYO	30	1535 E	1616	1536 U	S15	E73	4167	41	D	1	1						
*HUANCAYO	30	1651	1705	1654	S20	E56	4167	14		1	1						
SAC PEAK	30	1657	1750	1707	N26	W37	4159	53		2	2		11.30				
MC MATH	30	1700	1730		N22	W37	4159	30		3							
HUANCAYO	30	1700 E	1733	1702	N25	W33	4159	33	D	3	1						S-SWF
*MT WILSON	30	1746	1800		S16	E50	4167	14		1							
*MT WILSON	30	1955	2002		N20	W40	4159	07		1&							
HUANCAYO	30	1959 E	2005	D	1959 U	N16	W35	4159	6	D	1	2					Slow S-SWF

Subflares noted as follows (Date, time (UT), coordinates):

ATHENS	01	0623	N10 W09
CAPRI S	01	0558E	S27 W19
ATHENS	01	0706	S27 W70
OTTAWA	01	1131	S29 W16
OTTAWA	01	1145	S30 W14
OTTAWA	01	1200	N14 W13
OTTAWA	01	1240	N14 W16
OTTAWA	01	1258	N24 W12
OTTAWA	01	1300	N14 W04
OTTAWA	01	1305	N24 W19
OTTAWA	01	1316	N15 W21
OTTAWA	01	1325	S29 W22
CAPRI S	01	1326	S31 W10
OTTAWA	01	1338	N15 W08
OTTAWA	01	1441	N12 W13
WENDEL	01	1444	N12 E13
OTTAWA	01	1502	N25 W10
SAC PEAK	01	1537	N25 W20
OTTAWA	01	1539	N23 W21
SAC PEAK	01	1540	S29 W19
CAPRI S	01	1540	N24 W19
OTTAWA	01	1541	S28 W18
SAC PEAK	01	1657	N10 W16
SAC PEAK	01	1702	S34 W15
SAC PEAK	01	1717	N15 W15
OTTAWA	01	1721	N15 W15
SAC PEAK	01	1742	N11 W15
OTTAWA	01	1745	N10 W16
SAC PEAK	01	1835E	N12 W15
OTTAWA	01	1843E	N11 W16
SAC PEAK	01	1915	S11 E89
SAC PEAK	01	1917	S32 W15
SAC PEAK	01	2025	S30 W24
SAC PEAK	01	2140	N15 W16
SAC PEAK	01	2210	S30 W16
SAC PEAK	01	2222	S28 W25
SAC PEAK	01	2340	S30 W25
ATHENS	02	0732	N25 W16
SAC PEAK	02	1353	N15 W64
USNRL	02	1420	N11 W30
CLIMAX	02	1426	N11 W27
SAC PEAK	02	1452	S16 W37
SAC PEAK	02	1507	N25 W17
SAC PEAK	02	1512	N15 W26
SAC PEAK	02	1527	N25 W25
USNRL	02	1554	N26 W27
USNRL	02	1554	N12 W28
SAC PEAK	02	1600	N12 W26
SAC PEAK	02	1657	N14 W33
SAC PEAK	02	1732E	N14 W35
SAC PEAK	02	1755	N25 W25
SAC PEAK	02	1755F	S17 W38
SAC PEAK	02	1755F	N14 W35
SAC PEAK	02	1812F	N15 W37
HUANCAYO	02	2027	N26 W15
CLIMAX	02	2028	N26 W11
SAC PEAK	02	2036E	S16 W42
SAC PEAK	02	2045E	S28 W86
SAC PEAK	02	2045E	S16 W41
SAC PEAK	02	2045E	N14 W35
SAC PEAK	02	2045E	N25 W28
CLIMAX	02	2056	S28 W32
SAC PEAK	02	2100E	S28 W35
SAC PEAK	02	2103F	S16 W44
SAC PEAK	02	2105	N25 W36
SAC PEAK	02	2127	N25 W37
SAC PEAK	02	2137	S15 W44
SAC PEAK	02	2200	N15 W68
SAC PEAK	02	2225	S15 W44
SAC PEAK	02	2245	N16 W34
SAC PEAK	02	2322	N25 W37
SAC PEAK	02	2322	N25 W31
CLIMAX	02	2323	N25 W37
SAC PEAK	02	2325	S12 E65
SAC PEAK	02	2330	S16 W45
SAC PEAK	02	2332	N11 W34
SAC PEAK	02	2347	N13 W33

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ONDREJOV	03	1121E	N22	W30
OTTAWA	03	1236	S32	W39
SAC PEAK	03	1317	S38	W15
USNRL	03	1317	N25	W45
OTTAWA	03	1318	N23	W44
OTTAWA	03	1320	N24	W39
SAC PEAK	03	1337	S16	E70
SAC PEAK	03	1412	S32	W43
OTTAWA	03	1423	N18	W38
SAC PEAK	03	1436	S32	W43
SAC PEAK	03	1445	S33	W41
OTTAWA	03	1447E	N20	W29
SAC PEAK	03	1450	N15	W43
OTTAWA	03	1514E	N13	W45
SAC PEAK	03	1530	S16	W55
SAC PEAK	03	1557	S17	E68
SAC PEAK	03	1610	N25	W46
CLIMAX	03	1615	N15	W47
MC MATH	03	1620E	N24	W40
SAC PEAK	03	1710	N25	W47
SAC PEAK	03	1715	N16	W44
SAC PEAK	03	1750	N24	W53
SAC PEAK	03	1805	N15	W47
SAC PEAK	03	1810	N25	W47
SAC PEAK	03	1810	S32	W54
SAC PEAK	03	1950	S27	W46
SAC PEAK	03	2025	S12	E52
SAC PEAK	03	2027	N14	W45
SAC PEAK	03	2035	N25	W50
HAWAII	03	2038	N25	W50
MC MATH	03	2040E	N20	W40
SAC PEAK	03	2050	N11	W85
SAC PEAK	03	2127	N24	W48
SAC PEAK	03	2225	S16	W58
SAC PEAK	03	2252	S27	W48
SAC PEAK	03	2337	S27	W48
ATHENS	04	0633	N11	W54
ATHENS	04	0709	N23	W42
WENDEL	04	1054E	N15	W66
SAC PEAK	04	1317	S29	W56
SAC PEAK	04	1330E	S28	W56
SAC PEAK	04	1335	N16	W59
SAC PEAK	04	1342	N10	E88
SAC PEAK	04	1350	S28	W56
SAC PEAK	04	1420	N11	E84
SAC PEAK	04	1425	N12	W54
SAC PEAK	04	1447	N13	W59
SAC PEAK	04	1450	S30	W62
SAC PEAK	04	1500	N14	W58
SAC PEAK	04	1515	N14	W90
SAC PEAK	04	1535E	N18	W53
SAC PEAK	04	1545E	S30	W20
SAC PEAK	04	1557	S34	W62
SAC PEAK	04	1632	N18	W53
SAC PEAK	04	1907E	N11	W59
SAC PEAK	04	1937E	S30	W67
SAC PEAK	04	2057	N11	E76
SAC PEAK	04	2100	N15	W63
SAC PEAK	04	2240	N15	W63
SAC PEAK	04	2330	N09	E79
SAC PEAK	04	2342	N14	W63
SAC PEAK	04	2355	N15	W65
USNRL	05	1207	N12	W70
SAC PEAK	05	1304E	N13	W70
SAC PEAK	05	1322	N10	E80
CAPRI S	05	1330	S23	E21
USNRL	05	1331	S25	W18
SAC PEAK	05	1332	N14	W74
SAC PEAK	05	1335	N05	E80
SAC PEAK	05	1405	N12	E70
SAC PEAK	05	1415	S20	E21
SAC PEAK	05	1455	N14	W76
USNRL	05	1501	N14	W80
SAC PEAK	05	1515	N10	E70
CAPRI S	05	1531	S29	W73
HUANCAYO	05	1532	S26	W73
CLIMAX	05	1540	S30	W90
SAC PEAK	05	1605	N14	W73
SAC PEAK	05	1650	N05	E80
HUANCAYO	05	1657E	N07	E74
USNRL	05	1817	S25	E14
SAC PEAK	05	1823E	N12	W69
CLIMAX	05	1843E	S21	E14
USNRL	05	1948	N12	E68
SAC PEAK	05	2037	N16	W72
SAC PEAK	05	2037	N11	E68
SAC PEAK	05	2037E	N15	E57
SAC PEAK	05	2142E	N06	E75
SAC PEAK	05	2202	N10	E66
SAC PEAK	05	2203E	N14	W73
ARCETRI	06	0813E	N15	W75
ARCETRI	06	0818	N10	E62
CAPRI S	06	1224	S23	W88
OTTAWA	06	1249E	N17	W75
SAC PEAK	06	1320	N13	W88
SAC PEAK	06	1325	N16	E47
SAC PEAK	06	1407	S29	W88
SAC PEAK	06	1450	N17	W78
SAC PEAK	06	1510	N24	E78
SAC PEAK	06	1542	N27	W77
SAC PEAK	06	1615	S29	W46
USNRL	06	1910	N11	E57
SAC PEAK	06	2215	S26	E04
SAC PEAK	06	2250	S24	W90
SAC PEAK	06	2307	S27	W90
WENDEL	07	0718E	S24	W06
ONDREJOV	07	0755E	N28	W85
MEUDON	07	0813	N15	W85
MEUDON	07	0817	N13	W90
WENDEL	07	0911E	S24	W11
WENDEL	07	0947E	N10	E46
WENDEL	07	0957E	S25	W10
WENDEL	07	1043E	N13	E47
WENDEL	07	1107E	S13	E40
OTTAWA	07	1149E	S24	W08
OTTAWA	07	1149E	S13	E40
WENDEL	07	1201E	S13	E39
OTTAWA	07	1253E	N13	E45
WENDEL	07	1255E	S14	E38
ONDREJOV	07	1328	S14	E42
WENDEL	07	1334E	S14	E37
OTTAWA	07	1352E	N14	E49
CAPRI S	07	1353	N20	E47
WENDEL	07	1359E	S11	E50
MC MATH	07	1425E	N12	E32
SAC PEAK	07	1425E	N16	E53
OTTAWA	07	1449E	N17	E51
SAC PEAK	07	2148E	S24	W16
WENDEL	08	0750E	S23	W22
WENDEL	08	0805E	S22	W23
WENDEL	08	0854E	N10	E41
WENDEL	08	0901E	S23	W22
WENDEL	08	0902E	N10	E41
CAPRI S	08	0926E	S41	E77
WENDEL	08	0929E	N10	E41
WENDEL	08	1128E	S11	W14
WENDEL	08	1148E	S14	E36
WENDEL	08	1316E	S42	E63
SAC PEAK	08	1422	S15	E25
SAC PEAK	08	1442	S42	E68
SAC PEAK	08	1505	S24	E80
SAC PEAK	08	1535	S15	E31
ONDREJOV	08	1543	S14	E28
WENDEL	08	1544E	S16	E31
SAC PEAK	08	1610	S42	E68
CLIMAX	08	1634	S13	E25
SAC PEAK	08	1642	N12	E26
SAC PEAK	08	1807	N12	E27
CLIMAX	08	1816E	N08	E30
HAWAII	08	1830E	N10	E27
SAC PEAK	08	1915	N11	E26
HAWAII	08	1942	S17	E22
SAC PEAK	08	2022	S11	E22
SAC PEAK	08	2040	S25	E79
SAC PEAK	08	2107	S24	E72
SAC PEAK	08	2140	S19	E24
SAC PEAK	08	2240	S11	E20
SAC PEAK	08	2337	S12	E23
SAC PEAK	08	2347	S24	E70
ONDREJOV	09	0617E	N11	E17
ONDREJOV	09	0628E	S12	E21
CAPRI S	09	1330	S09	E14
OTTAWA	09	1331	S10	E14
SAC PEAK	09	1336E	S11	E16
OTTAWA	09	1450	S11	E16
SAC PEAK	09	1452	S14	E15
SAC PEAK	09	1505	S15	E11
SAC PEAK	09	1555	S11	E14
SAC PEAK	09	1700	S25	E65
SAC PEAK	09	1700	N08	E19
SAC PEAK	09	1745	S42	E63
SAC PEAK	09	1825	S14	E12
CLIMAX	09	1842	S10	E12
SAC PEAK	09	1845	S11	E12
SAC PEAK	09	1912	S15	E09
SAC PEAK	09	1952	N12	E21
CLIMAX	09	2317	S22	W42
HAWAII	10	0014	S29	E61
HAWAII	10	0050E	N11	E16
WENDEL	10	0650E	S17	E14
WENDEL	10	0728E	S17	E18
WENDEL	10	0750E	S29	E57
WENDEL	10	0754E	S28	E44
ARCETRI	10	0815	S18	E15
MEUDON	10	0827E	S17	E15
CAPRI S	10	0932E	S14	E13
WENDEL	10	1035E	S18	E14
WENDEL	10	1100E	S18	E12
WENDEL	10	1102E	S10	E02
WENDEL	10	1128E	S17	E12
WENDEL	10	1143E	S18	E17
WENDEL	10	1520E	S17	E14
HUANCAYO	10	1622	S17	E16
SAC PEAK	10	1647E	N14	E08
SAC PEAK	10	1647E	S07	W18
SAC PEAK	10	1647	S17	E10
USNRL	10	1651	S24	W55
USNRL	10	1652	S15	E10
SAC PEAK	10	1727	S27	E49
USNRL	10	1735	S22	W56
HAWAII	10	1848	S22	E10
SAC PEAK	10	1850	S20	E12
USNRL	10	1853	S17	E13
SAC PEAK	10	1900	N16	E90
HAWAII	10	1906	S13	W47
SAC PEAK	10	1930	S14	W05
SAC PEAK	10	1955	N12	E00
USNRL	10	1957	N12	W00
SAC PEAK	10	2035E	S16	E07
SAC PEAK	10	2035E	N17	E90
SAC PEAK	10	2125	S18	W06
HAWAII	10	2306	S18	E08
CAPRI S	11	0748E	S15	E02
CAPRI S	11	0829E	S15	E00
CAPRI S	11	1300E	N11	W06
SAC PEAK	11	1347E	S18	W67
SAC PEAK	11	1347	S06	W33
SAC PEAK	11	1350	S14	W13
SAC PEAK	11	1415	S25	E34
SAC PEAK	11	1427	S15	W06
SAC PEAK	11	1455E	S17	W02
SAC PEAK	11	1505	S24	W64
SAC PEAK	11	1525	S25	E34
SAC PEAK	11	1530	S06	W32
SAC PEAK	11	1532	S18	W02
CLIMAX	11	1552	S12	W17
CLIMAX	11	1650	S06	W35
SAC PEAK	11	1652	S06	W34
CLIMAX	11	1700	S25	W65
SAC PEAK	11	1705	S24	W65
SAC PEAK	11	1725	S05	W24
SAC PEAK	11	1735	S16	W02
SAC PEAK	11	1757	S25	W63
USNRL	11	1800	S16	W02
USNRL	11	1800	S26	W60
SAC PEAK	11	1805	S16	W03
USNRL	11	1810	S16	W04
SAC PEAK	11	1817	S06	W33
USNRL	11	1819	S07	W34
CLIMAX	11	1836	S43	E38
SAC PEAK	11	1842	S25	W60
USNRL	11	1844	S32	W67
SAC PEAK	11	1850	N24	E36
SAC PEAK	11	1855	N14	E70
USNRL	11	1855	N17	E80
USNRL	11	1902	S07	W33
SAC PEAK	11	1902	S25	E31
USNRL	11	1904	S24	E31
USNRL	11	1918	S07	W34
SAC PEAK	11	1920	S06	W34
SAC PEAK	11	1922	S24	W68
SAC PEAK	11	1950	S15	W09
USNRL	11	1954	S15	W09
SAC PEAK	11	2007	S17	W05
SAC PEAK	11	2025	S14	W10
SAC PEAK	11	2027	S06	W35
SAC PEAK	11	2102	S25	W63
SAC PEAK	11	2135	S06	W36
SAC PEAK	11	2137	S15	W11
SAC PEAK	11	2230	S26	W64
SAC PEAK	11	2232	S18	W06
SAC PEAK	11	2232	S15	W11

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SAC PEAK	11	2237	S06	W38
SAC PEAK	11	2325	S15	W11
SAC PEAK	11	2327	N10	E80
SAC PEAK	11	2352	N24	E35
SAC PEAK	11	2352	S16	W05
CLIMAX	12	0014	N08	W11
CAPRI S	12	1026E	S21	E18
SAC PEAK	12	1347E	N13	W17
SAC PEAK	12	1347E	S15	W15
SAC PEAK	12	1407	S03	W44
SAC PEAK	12	1440	S15	W16
USNRL	12	1538	S17	W11
SAC PEAK	12	1555	S14	W23
CLIMAX	12	1558	S15	W12
USNRL	12	1624	S17	W13
SAC PEAK	12	1627	N05	E68
SAC PEAK	12	1637	S12	W73
SAC PEAK	12	1645	S15	W18
USNRL	12	1650	S16	W16
SAC PEAK	12	1717	S16	W15
SAC PEAK	12	1722	S13	W24
CLIMAX	12	1724	S17	W13
USNRL	12	1724	S15	W22
CLIMAX	12	1738E	S15	W12
SAC PEAK	12	1745	S16	W15
CLIMAX	12	1758	S15	W16
SAC PEAK	12	1805	S12	W24
HAWAII	12	1812	S25	E12
SAC PEAK	12	1812	S26	E16
USNRL	12	1814	S24	E19
SAC PEAK	12	1822	S16	W15
USNRL	12	1827	S18	W12
CLIMAX	12	1858	S23	E19
HAWAII	12	1906	S12	W30
SAC PEAK	12	1920	N02	E90
USNRL	12	1922	S10	E90
CLIMAX	12	1940	S13	W27
SAC PEAK	12	2000	S15	W16
SAC PEAK	12	2025	N11	E66
SAC PEAK	12	2050	N10	W22
SAC PEAK	12	2055	S13	W26
CLIMAX	12	2108	N16	E65
SAC PEAK	12	2127	S16	W17
SAC PEAK	12	2142	S20	W80
SAC PEAK	12	2145	S12	W73
SAC PEAK	12	2200	S05	W48
HAWAII	12	2201	S06	W48
SAC PEAK	12	2205	S15	W20
SAC PEAK	12	2212	S04	W49
SAC PEAK	12	2230	S15	W19
SAC PEAK	12	2330	N10	W33
SAC PEAK	12	2332	S03	W55
SAC PEAK	12	2337	N17	E90
ATHENS	13	0555	S17	W24
ONDREJOV	13	0607E	S07	W57
ATHENS	13	0621	S17	W25
CAPRI S	13	0815E	N14	E12
ONDREJOV	13	0820E	N23	E16
ONDREJOV	13	0824E	N10	W28
USNRL	13	1226	S16	W29
USNRL	13	1245	S16	W29
USNRL	13	1355	S16	W28
SAC PEAK	13	1500E	N11	W32
SAC PEAK	13	1500E	S16	W32
USNRL	13	1504	S17	W31
SAC PEAK	13	1547	S27	E66
SAC PEAK	13	1607E	S16	W28
SAC PEAK	13	1655E	N22	E72
CLIMAX	13	1725E	N24	E75
USNRL	13	1727	S17	W32
CLIMAX	13	1729E	S14	W32
SAC PEAK	13	1729E	S16	W33
SAC PEAK	13	1737E	N19	E72
USNRL	13	1745	S23	E05
USNRL	13	1801	N10	E90
SAC PEAK	13	1837	S16	W32
SAC PEAK	13	1842	S17	W28
SAC PEAK	13	1945E	S18	W27
SAC PEAK	13	2000E	N27	E07
USNRL	13	2001	N26	E06
SAC PEAK	13	2052E	S15	W32
SAC PEAK	13	2132	N24	E83
SAC PEAK	13	2132E	S16	W34
HAWAII	14	0158E	S12	W38
ATHENS	14	0630	N23	E68
ATHENS	14	0632	N23	E65
ONDREJOV	14	0649E	S18	W43
OTTAWA	14	1203	N40	E22
OTTAWA	14	1338	N09	W45
SAC PEAK	14	1344E	S25	W07
SAC PEAK	14	1344E	N07	E79
SAC PEAK	14	1347	N22	E66
SAC PEAK	14	1347	S17	W38
OTTAWA	14	1348	S18	W36
OTTAWA	14	1406	S18	W36
SAC PEAK	14	1407	S17	W39
USNRL	14	1449E	S17	W40
SAC PEAK	14	1522	S17	W39
SAC PEAK	14	1610	N18	E80
SAC PEAK	14	1622	S17	W48
SAC PEAK	14	1655	S17	W48
SAC PEAK	14	1712	S18	W39
SAC PEAK	14	1715	N11	W49
MC MATH	14	1733E	N12	W50
SAC PEAK	14	1800	S18	W39
SAC PEAK	14	1805	N08	E83
CLIMAX	14	1944	S17	W40
SAC PEAK	14	1952	S18	W42
SAC PEAK	14	2127	N10	W50
CLIMAX	14	2130	N16	E50
CLIMAX	14	2132	N24	E61
SAC PEAK	14	2200	S14	W48
SAC PEAK	14	2215	N21	E59
CLIMAX	14	2216	N21	E59
CLIMAX	14	2324	N07	E75
SAC PEAK	14	2325	N07	E71
SAC PEAK	14	2342	S14	W48
ATHENS	15	0720	N10	E30
CAPRI S	15	1056	N22	E54
USNRL	15	1325	N10	E60
SAC PEAK	15	1435	N08	E60
SAC PEAK	15	1450	S16	W54
USNRL	15	1451	S18	W56
CLIMAX	15	1508	N22	E48
SAC PEAK	15	1510	N23	E50
USNRL	15	1511	N25	E53
CLIMAX	15	1512	N25	E52
SAC PEAK	15	1537	N07	E57
CLIMAX	15	1538	N09	E59
SAC PEAK	15	1632	S16	W56
CLIMAX	15	1640	N06	E64
CLIMAX	15	1640	N22	E50
SAC PEAK	15	1640	N22	E48
SAC PEAK	15	1640	N06	E62
SAC PEAK	15	1722	N17	E50
CLIMAX	15	1744	N09	E59
SAC PEAK	15	1852	N09	E56
SAC PEAK	15	1855	N16	W66
SAC PEAK	15	1927	S15	W58
HAWAII	15	1932	N17	E47
SAC PEAK	15	2005	N10	E55
CLIMAX	15	2006	N09	E55
SAC PEAK	15	2012	N10	E24
CLIMAX	15	2020	N09	E55
CLIMAX	15	2022	N19	E41
SAC PEAK	15	2022	N20	E44
CLIMAX	15	2038	N11	W64
CLIMAX	15	2100	N09	E55
CLIMAX	15	2106	N22	E48
SAC PEAK	15	2205	N09	E55
SAC PEAK	15	2305	N09	E54
HAWAII	16	0014	N07	E21
USNRL	16	1202E	N24	E39
SAC PEAK	16	1405	N10	W74
USNRL	16	1405	N23	E37
USNRL	16	1405	N10	E76
SAC PEAK	16	1410	N24	E38
CLIMAX	16	1506E	N05	E57
SAC PEAK	16	1520	N24	E36
USNRL	16	1522	N22	E34
SAC PEAK	16	1537	N13	E16
USNRL	16	1621	N22	E34
SAC PEAK	16	1837	N26	E42
SAC PEAK	16	1957	N25	E31
SAC PEAK	16	1957	N08	W76
SAC PEAK	16	2022	N08	W76
SAC PEAK	16	2040	N22	E34
SAC PEAK	16	2157	S15	W80
SAC PEAK	16	2215	N09	W79
SAC PEAK	16	2245	N24	E29
SAC PEAK	16	2250	N07	E44
SAC PEAK	16	2345	N21	E29
NIZAMIAH	17	0416E	N23	E28
CAPRI S	17	0652E	N08	E40
CAPRI S	17	0705	N25	E30
ATHENS	17	0756	N20	E27
ATHENS	17	0807	N22	E25
CAPRI S	17	1040E	N23	E28
OTTAWA	17	1336	N20	E27
OTTAWA	17	1410	N22	E18
OTTAWA	17	1415	N26	E25
SAC PEAK	17	1417	N22	E24
SAC PEAK	17	1540	N24	E23
SAC PEAK	17	1542	N11	E33
SAC PEAK	17	1547	N13	E40
SAC PEAK	17	1602	N12	E32
SAC PEAK	17	1605	N20	E16
SAC PEAK	17	1610	N08	E36
SAC PEAK	17	1627	N08	E36
SAC PEAK	17	1910	N18	E19
SAC PEAK	17	1915	N10	E21
SAC PEAK	17	1930	N22	E24
SAC PEAK	17	2225	N21	E15
SAC PEAK	17	2257	N11	E25
SAC PEAK	17	2300	S19	E29
SAC PEAK	17	2322	N11	E29
ONDREJOV	18	1015	S25	E22
ONDREJOV	18	1121E	N18	E15
OTTAWA	18	1232	N11	E27
SAC PEAK	18	1432	S19	E90
SAC PEAK	18	1502	S16	W45
SAC PEAK	18	1505	N11	E21
ATHENS	18	1509	N23	E09
SAC PEAK	18	1510	N24	E08
SAC PEAK	18	1620	N09	E13
SAC PEAK	18	1622	N07	E03
SAC PEAK	18	1637	N12	W12
SAC PEAK	18	1842	S21	E90
SAC PEAK	18	2035	N22	E05
SAC PEAK	18	2130	N11	E08
SAC PEAK	18	2202	S25	E15
SAC PEAK	18	2205	S50	W68
SAC PEAK	18	2310	N06	E60
SAC PEAK	18	2322	S26	W61
CAPRI S	19	0756E	S25	E10
WENDEL	19	0845E	S23	E05
WENDEL	19	0850E	N10	E04
CAPRI S	19	1048E	N23	W01
MEUDON	19	1109	S42	W70
WENDEL	19	1203E	N06	E06
CAPRI S	19	1225E	N07	E01
OTTAWA	19	1233E	N07	E04
WENDEL	19	1235E	N06	E06
WENDEL	19	1306E	N23	W05
WENDEL	19	1317E	S15	W56
WENDEL	19	1325E	N22	W03
USNRL	19	1334E	N22	W04
OTTAWA	19	1343E	N26	W02
CLIMAX	19	1622	N25	E01
USNRL	19	1624	N24	W01
USNRL	19	1714	N24	W02
CLIMAX	19	1718	N25	E01
USNRL	19	1718	N18	W11
OTTAWA	19	1719	N18	W08
CLIMAX	19	1722	N19	W09
USNRL	19	1807	N23	W05
USNRL	19	1850	S22	E05
HAWAII	19	2110	N24	W05
HAWAII	19	2156	S23	E00
SAC PEAK	19	2325	N07	W03
CAPRI S	20	0808E	N08	W10
WENDEL	20	0813E	N08	W06
WENDEL	20	1134E	S14	W67
WENDEL	20	1201E	S22	W06
MEUDON	20	1317	N11	W11
SAC PEAK	20	1343E	S22	W11
SAC PEAK	20	1427	N24	W27
CAPRI S	20	1430E	N22	W29
SAC PEAK	20	1605	S22	W10
SAC PEAK	20	1625	S22	W12
WENDEL	20	1642E	S23	W11
SAC PEAK	20	1842	N19	E90
SAC PEAK	20	1937	S23	W09
HAWAII	20	1946	S21	W08
SAC PEAK	20	2345	S21	W16
ATHENS	21	0613	N10	E00
ATHENS	21	0703	N09	E00
CAPRI S	21	0703E	N15	E84
ATHENS	21	0726	N10	E01
CAPRI S	21	0728E	N11	W02

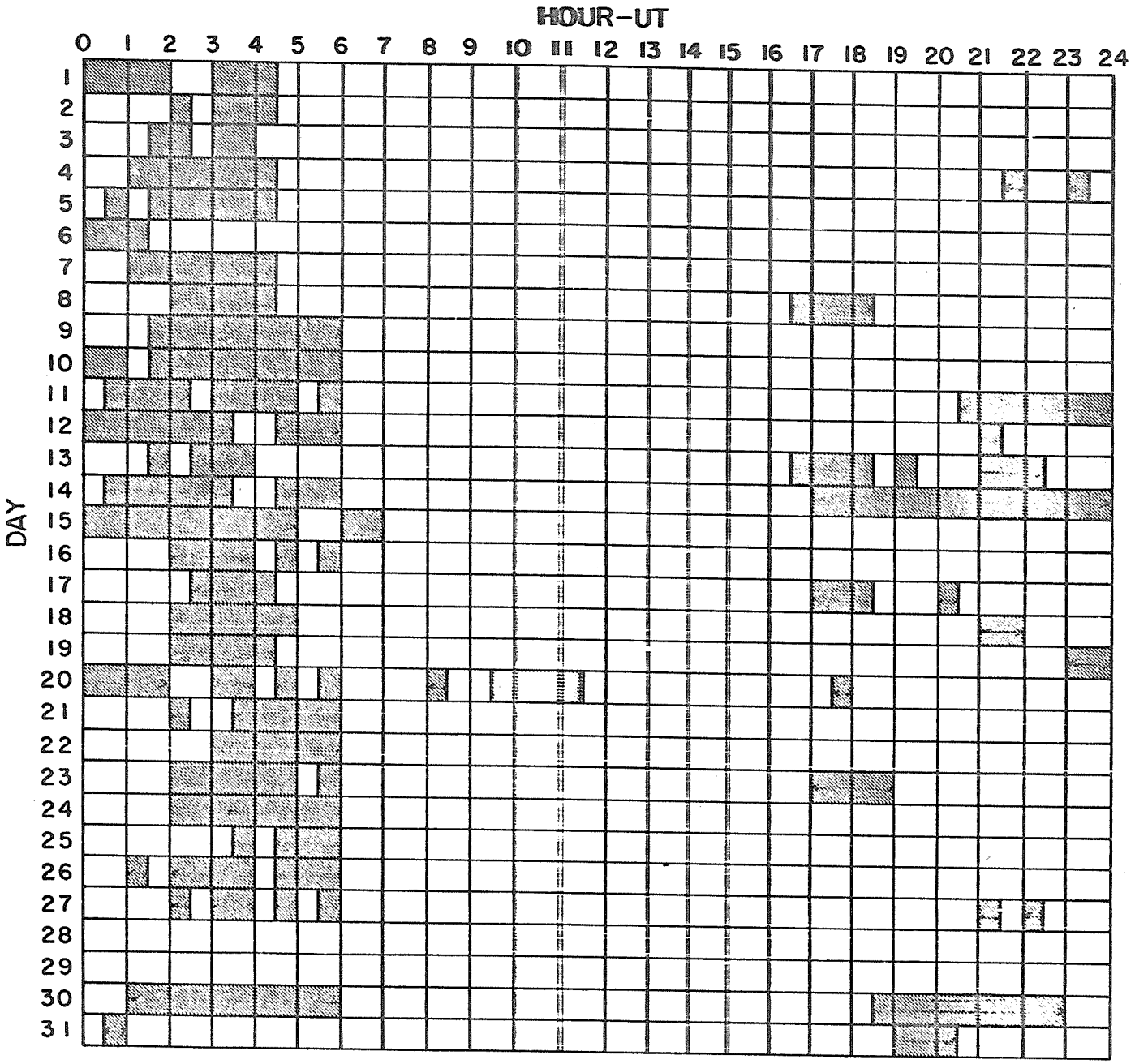
SOLAR FLARES

SEPTEMBER 1957

ONDREJOV	21	0932	N09	W02
ONDREJOV	21	1045	N22	W22
WENDEL	21	1216E	N10	W83
USNRL	21	1227	N08	W23
USNRL	21	1227	N10	W08
ONDREJOV	21	1346E	N21	W29
ONDREJOV	21	1422E	N05	W23
SAC PEAK	21	1440	S17	E43
SAC PEAK	21	1445	N14	E85
SAC PEAK	21	1510	N26	W28
SAC PEAK	21	1600	N17	W30
SAC PEAK	21	1630	N24	W27
USNRL	21	1631	N24	W28
SAC PEAK	21	2125	N25	W30
SAC PEAK	21	2325	N28	E90
SAC PEAK	21	2330	N16	W43
HAWAII	21	2346	N09	W10
HAWAII	21	2356	N15	E78
HAWAII	22	0028	N24	W36
ATHENS	22	0731	N15	E69
ATHENS	22	0737	N07	W31
ATHENS	22	0743	N08	W39
USNRL	22	1409	S24	W33
USNRL	22	1451	N12	W24
CLIMAX	22	1536	N06	W42
CLIMAX	22	1620	N20	E65
SAC PEAK	22	1740	N14	E68
CLIMAX	22	1742	N20	W39
SAC PEAK	22	1745	N23	W42
SAC PEAK	22	1832	N19	E63
CLIMAX	22	2017	N11	E61
HAWAII	22	2132	N11	W21
SAC PEAK	22	2200	N25	W47
SAC PEAK	22	2245	N09	W25
CLIMAX	22	2252E	N11	W25
CLIMAX	22	2300	N25	W40
SAC PEAK	22	2307	N16	E67
SAC PEAK	22	2330	N08	W47
OTTAWA	23	1355E	N23	W54
OTTAWA	23	1356E	N13	E47
OTTAWA	23	1419	N12	W37
SAC PEAK	23	1452	N23	W57
SAC PEAK	23	1452	N12	E48
CAPRI S	23	1457E	N22	W60
SAC PEAK	23	1520	N13	W38
SAC PEAK	23	1522	N12	E48
CLIMAX	23	1530E	N13	E52
CLIMAX	23	1532	N13	W37
CLIMAX	23	1544	N23	W57
SAC PEAK	23	1545	N23	W58
CLIMAX	23	1640	N14	E49
SAC PEAK	23	1652E	N15	E48
CLIMAX	23	1756	N23	W48
HAWAII	23	1808	N28	W53
SAC PEAK	23	1857E	N16	E90
SAC PEAK	23	1956E	N09	W58
CLIMAX	23	2136	N08	W57
SAC PEAK	23	2140E	S23	W61
SAC PEAK	23	2147E	N09	W58
SAC PEAK	23	2155	S18	E12
HAWAII	23	2156	S18	E08
CLIMAX	23	2256 E	N18	E52
SAC PEAK	23	2327E	N16	E90
WENDEL	24	0739E	S18	W65
ATHENS	24	0901	N17	E88
ATHENS	24	0901	N17	E88
CAPRI S	24	1034E	N16	E36
USNRL	24	1159	N11	W50
OTTAWA	24	1209	N18	E36
OTTAWA	24	1209	S18	W64
USNRL	24	1210	S18	W67
USNRL	24	1210	N18	E37
OTTAWA	24	1210	N14	E43
OTTAWA	24	1212	N25	W70
USNRL	24	1212	N25	W71
OTTAWA	24	1219	S23	W63
USNRL	24	1238	N17	E90
USNRL	24	1240	N07	W68
USNRL	24	1400	N12	E60
USNRL	24	1516	N08	W67
USNRL	24	1542	S24	W61
USNRL	24	1542	N16	E85
USNRL	24	1542	N16	E85
CLIMAX	24	1620	N12	W49
USNRL	24	1622	N10	W49
USNRL	24	1624	N22	W70
USNRL	24	1806	S30	E90
CLIMAX	24	1928	N25	W72
HAWAII	24	1936	N28	W70
USNRL	24	1942	S26	E53
USNRL	24	1942	N11	W55
CLIMAX	24	2000	N13	W55
MC MATH	24	2025E	N10	W45
HAWAII	24	2314	N28	W71
USNRL	25	1239	N08	W67
USNRL	25	1247	S26	E43
USNRL	25	1333	N07	W83
SAC PEAK	25	1343E	N09	W80
USNRL	25	1407	N16	E24
ATHENS	25	1409	N16	E23
ONDREJOV	25	1410	N16	E24
SAC PEAK	25	1422	N26	E31
SAC PEAK	25	1432	S25	E41
SAC PEAK	25	1512	S22	E90
SAC PEAK	25	1530	S26	E40
USNRL	25	1531	S26	E41
CAPRI S	25	1536E	S25	E40
USNRL	25	1649	N16	E14
SAC PEAK	25	1650	N15	E13
HUANCAYO	25	1653	N18	E14
USNRL	25	1811	N18	E69
SAC PEAK	25	1915	N15	E27
USNRL	25	1919	N24	E26
SAC PEAK	25	1920	N24	E26
SAC PEAK	25	1955	N15	E63
SAC PEAK	25	2005	N26	E29
OTTAWA	25	2013E	N27	E27
SAC PEAK	25	2050	S27	E40
SAC PEAK	25	2105	N17	E10
SAC PEAK	25	2135	N08	W85
SAC PEAK	25	2150	S13	W20
SAC PEAK	25	2205	N16	E67
SAC PEAK	25	2230	N07	W90
SAC PEAK	25	2320	N16	E67
SAC PEAK	25	2332	N10	W65
HAWAII	25	2334	N14	W65
SAC PEAK	25	2337	S26	E39
HAWAII	25	2352	N16	E10
CAPRI S	26	1219E	S26	E29
OTTAWA	26	1221E	S26	E32
OTTAWA	26	1246E	S25	E32
SAC PEAK	26	1350E	S26	W90
SAC PEAK	26	1352	S25	E90
USNRL	26	1438	N15	E55
SAC PEAK	26	1440	N14	E55
SAC PEAK	26	1442	N15	E58
OTTAWA	26	1451E	N16	E55
SAC PEAK	26	1507	N16	E08
OTTAWA	26	1508	N16	E07
USNRL	26	1508	N16	E08
SAC PEAK	26	1515	S26	E32
USNRL	26	1518	S26	E31
SAC PEAK	26	1532	N16	E58
USNRL	26	1538	N17	E57
USNRL	26	1800	N18	E57
SAC PEAK	26	1800E	N16	E56
CLIMAX	26	1802	N17	E60
SAC PEAK	26	1825	N16	E55
SAC PEAK	26	1845	N17	E10
SAC PEAK	26	1925	N12	E15
SAC PEAK	26	2007	N16	E54
SAC PEAK	26	2045	S32	E59
SAC PEAK	26	2045	N16	E48
SAC PEAK	26	2127	N17	E55
SAC PEAK	26	2137	S22	E90
SAC PEAK	26	2140	N15	E49
SAC PEAK	26	2145	N17	E55
SAC PEAK	26	2147	S24	W90
SAC PEAK	26	2242	S27	E26
SAC PEAK	26	2300	N12	E03
SAC PEAK	26	2310	N16	E04
ATHENS	27	0721	N15	E47
MEUDON	27	0955	N15	E45
MEUDON	27	1122E	N11	E15
MEUDON	27	1155E	N20	E07
USNRL	27	1204E	N19	E03
SAC PEAK	27	1415	N16	W01
MEUDON	27	1516	N11	E15
SAC PEAK	27	1517	N10	W10
CLIMAX	27	1518	N09	E10
USNRL	27	1518	N10	E09
USNRL	27	1526	N27	E69
HUANCAYO	27	1555E	N09	W85
SAC PEAK	27	1738E	N10	E08
CLIMAX	27	1822	N15	W02
HUANCAYO	27	2022E	S16	W41
HUANCAYO	27	2052	N12	W08
WENDEL	28	1152E	N26	E59
OTTAWA	28	1221	N15	W15
OTTAWA	28	1237	N16	W13
SAC PEAK	28	1355E	S26	E04
SAC PEAK	28	1505	N26	W12
CLIMAX	28	1507	N25	W12
CLIMAX	28	1617	N17	E31
HUANCAYO	28	1650	N18	E31
CLIMAX	28	2147E	N17	W30
SAC PEAK	28	2235	N17	W32
ATHENS	29	0700	N13	W36
ATHENS	29	0743	N13	W28
ATHENS	29	0811	N11	W26
ATHENS	29	0828	N14	W21
WENDEL	29	0833E	N17	W23
WENDEL	29	1036E	N12	W12
WENDEL	29	1059E	N17	W25
WENDEL	29	1153E	S26	E43
OTTAWA	29	1216	N16	W24
OTTAWA	29	1335	S30	W08
OTTAWA	29	1440	N16	W39
SAC PEAK	29	1440	N17	W39
SAC PEAK	29	1537	S17	E90
SAC PEAK	29	1545	N20	W26
SAC PEAK	29	1607	S17	E90
SAC PEAK	29	1635	S17	E90
CLIMAX	29	1635	S16	E90
SAC PEAK	29	1657	S15	E70
CLIMAX	29	1658	S16	E75
SAC PEAK	29	1710	N27	E42
CLIMAX	29	1713	N28	E41
SAC PEAK	29	1715	N41	E90
SAC PEAK	29	1720	S17	E90
SAC PEAK	29	1727	S17	E69
SAC PEAK	29	1742	N18	W31
SAC PEAK	29	1857	S32	E22
CLIMAX	29	1859	S32	E23
SAC PEAK	29	1900	S17	E40
CLIMAX	29	1902	S19	E44
SAC PEAK	29	2017	S17	E39
SAC PEAK	29	2105	S14	E42
ATHENS	30	0710	S22	E58
OTTAWA	30	1250	N16	W51
OTTAWA	30	1301	N15	E04
OTTAWA	30	1326	N27	E28
OTTAWA	30	1349E	N16	W45
OTTAWA	30	1405	N28	E28
SAC PEAK	30	1455	N20	W40
SAC PEAK	30	1510	N28	E21
MC MATH	30	1512E	N20	W36
SAC PEAK	30	1532	S17	E75
SAC PEAK	30	1540	N27	E22
SAC PEAK	30	1552	S17	E80
SAC PEAK	30	1652	S22	E54
SAC PEAK	30	1740	S16	E56
SAC PEAK	30	1840	N20	E14
SAC PEAK	30	1945	S17	E72
SAC PEAK	30	1955	N27	E19
SAC PEAK	30	1955	N15	W41
SAC PEAK	30	2200	S15	E75

INTERVALS OF NO FLARE PATROL OBSERVATIONS

JULY 1957

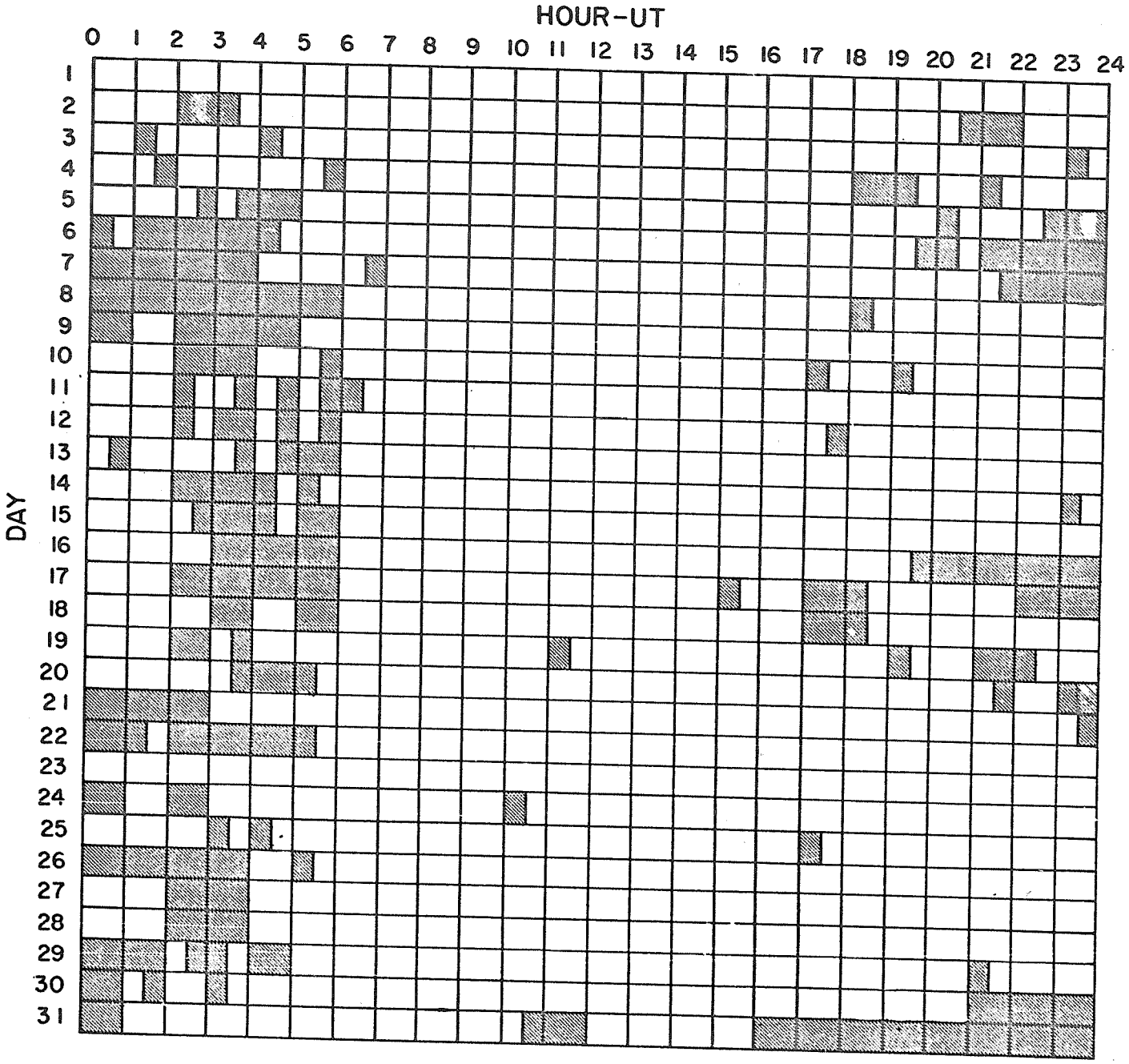


Stations included:

Anacapri (Swedish)
Arcetri
Greenwich Royal Observatory, Herstmonceux
Hawaii
Kodaikanal
Meudon
Mitaka
Ondrejov
Ottawa
Royal Observatory, Edinburgh
Sacramento Peak
Simeis
Uccle
U.S. Naval Research Laboratory

INTERVALS OF NO FLARE PATROL OBSERVATIONS

AUGUST 1957

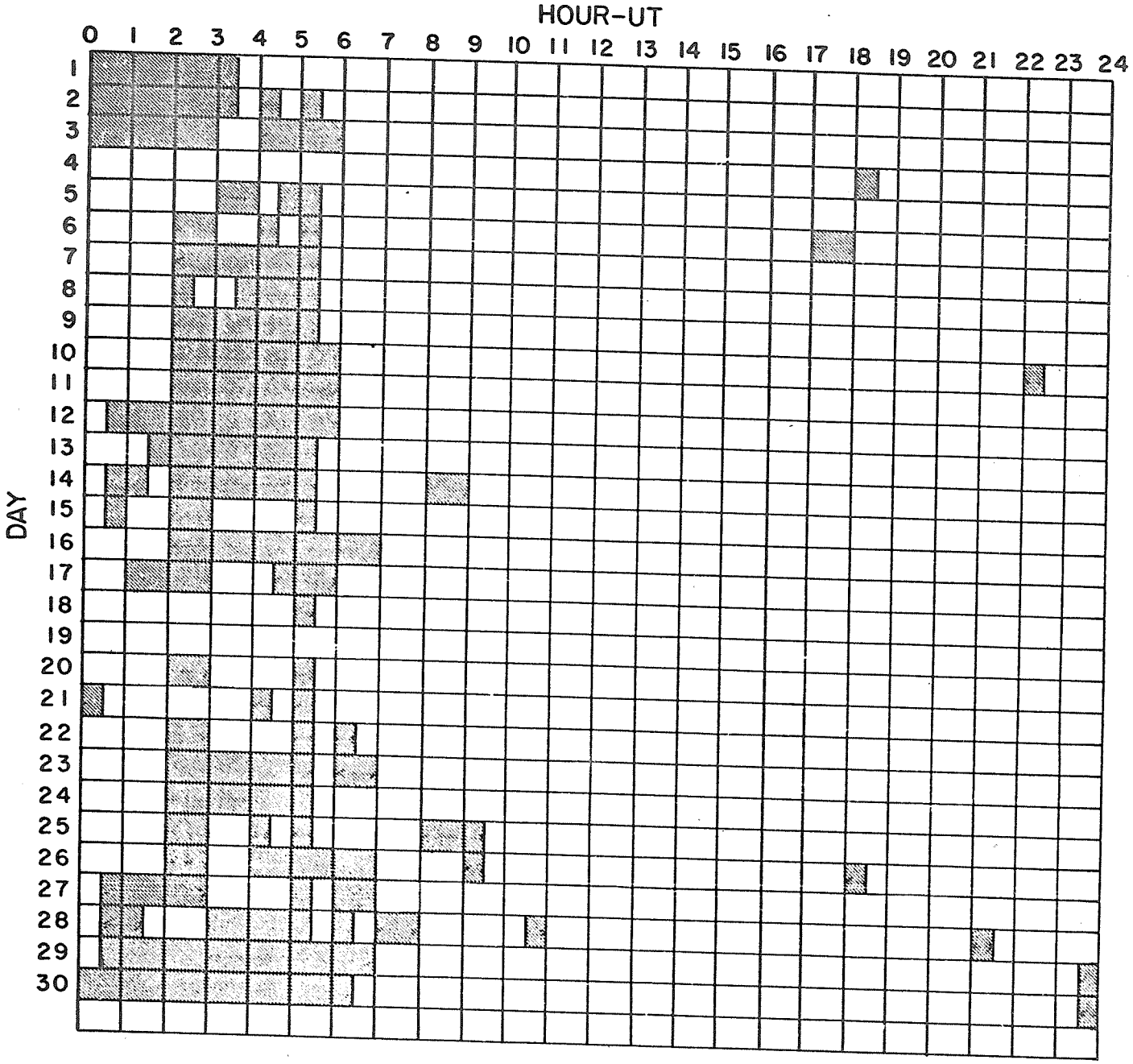


Stations included:

Anacapri (Swedish)
Arcetri
Athens (Aug. 16-31)
Climax
Dunsink
Greenwich Royal Observatory, Herstmonceux
Hawaii
Huancayo
Hyderabad
Kodaikanal
Mitaka
Ondrejov
Ottawa
Royal Observatory, Edinburgh
Sacramento Peak
Uccle
U.S. Naval Research Laboratory
Zürich

INTERVALS OF NO FLARE PATROL OBSERVATIONS

SEPTEMBER 1957



Stations included:

Anacapri (Swedish)
Arcetri
Athens
Climax
Greenwich Royal Observatory, Herstmonceux
Hawaii
Huancayo
Meudon
Mitaka
Ondrejov
Ottawa
Royal Observatory, Edinburgh
Sacramento Peak
U.S. Naval Research Laboratory
Zurich

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

AUGUST 1957

Aug. 1957	Start UT	End UT	Type	Wide Spread Index	Importance	Observation Stations	Known Flare, UT CRPL-F 157B
24	1927	1937	S-SWF	5	1	BE, HU, MC, PR	1922
25	0240	0252	S-SWF	1	1	OK	0245E
25	0915	0955	S-SWF	5	2	PR, HH, PU	0914E
25	1802	1825	Slow S-SWF	4	1	HU, MC, PR, WS	1752
25	2340	0005	S-SWF	4	1	AN, OK, TO	2342
26	1808	1820	Slow S-SWF	3	1-	HU, MC, PR	1806
27	0430	0500	S-SWF	1	2-	OK	
28	0137	0150	S-SWF	1	1	OK	0122
28	0418	0520	G-SWF	1	1+	OK	0425
28	0710	0722	S-SWF	5	2	AN, OK, HH, PU	0706
28	0917	1135	S-SWF	5	3	MA, NE, PU, SW, CW***	0913
28	1605	1655	S-SWF	5	2+	BE, HU, MC, PR, WS, CR NE, LI	
28	1900	1925	Slow S-SWF	5	2	AN, BE, HU, MC, PR, CR, TO	1903
28	2020	2038	S-SWF	5	2+	AN, BE, HU, MC, WS, CR, TO RCA+	2010
29	0542	0630	S-SWF	5	3-	OK, HH, PU, TO CW+	0545E
29	1039	1055	S-SWF	4	1+	MA, NE, PU	1031
29	1600	1612	S-SWF	3	1-	MC, PR	1559
29	2105	2150	Slow S-SWF	5	2+	AN, BE, HU, MC, PR, WS, CR, TO RCA+	2110E
30	0020	0050	S-SWF	1	1+	OK	
30	0340	0440	S-SWF	5	2+	OK, TO	0340E
30	0620	0700	S-SWF	5	2	OK, PU, TO	0620
30	1343	1415	S-SWF	5	1+	BE, HU, MC, PR, PU	1337
30	1640	1725	Slow S-SWF	5	2+	BE, HU, MC, PR, WS, NE	1640
30	1927	2000	S-SWF	5	2+	AN, BE, HU, MC, PR, WS, TO	1927
30	2215	2240	Slow-S-SWF	5	2	AN, BE, HU, MC, OK, PR, WS, TO, RCA+	
31	0240	0320	S-SWF	1	1	OK	0244
31	0544	0700	S-SWF	5	3	AN, OK, HH *	0548
31	1303	1607	S-SWF	5	3+	BE, HU, MC, PR, NE TH, MA, SW, RCA+, CW** CW***	1257
31	1820	1855	Slow S-SWF	5	1	HU, MC, PR, WS	
31	2033	2105	Slow S-SWF	5	2	BE, HU, MC, PR, WS	2035

LI = Lindau, G.F.R.
CR = Cornell University, N. Y.
HH = Heinrich Hertz Institute, Berlin.
NE = Nederhorst den Berg, Netherlands.
PU = Prague, Czech.
SW = Enkoping, Sweden.
TO = Hiraiso Radio Wave Observatory, Japan.
TH = The Hague, Netherlands.
MA = Madrid, Spain.
CA = Canberra, Australia.

CW* = Cable and Wireless, Barbadoes.
CW** = Cable and Wireless, Somerton, England.
CW***= Cable and Wireless, Brentwood, England.
CW+ = Cable and Wireless, Hongkong.
CW++ = Cable and Wireless, Singapore.
RCA+ = RCA Communications, Inc., Pt. Reyes, Calif.
RCA* = RCA Communications, Inc., Riverhead, N. Y.

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

AUGUST 1957

Aug. 1957	Start UT	End UT	Type	Wide Spread Index	Importance	Observation Stations	Known Flare, UT CRPL-F 157B
1	0200	0246	Slow S-SWF	5	2	AN, OK, TO	0208
2	0055	0120	S-SWF	4	1	OK, TO	
2	1401	1420	S-SWF	5	2-	BE, HU, MC, PR, WS, HH, PU, CR	1356
2	1435	1450	S-SWF	5	2-	BE, HU, MC, PR, CR, HH, PU	1432
2	1620	1720	G-SWF	3	1	HU, MC, WS	1637
2	1811	1830	Slow S-SWF	5	1+	AN, BE, HU, MC, WS, CR	1807
3	0000	0020	S-SWF	5	1	OK, TO	
3	1720	1800	S-SWF	5	2	BE, HU, MC, PR, WS, NE, PU	1721
4	1623	1710	G-SWF	3	1	HU, MC, PR	1622
4	1832	1852	Slow S-SWF	5	1	BE, HU, MC, PR, WS, CR	1827
5	1904	1920	S-SWF	5	1+	BE, HU, MC, PR, WS, CR	1902
7	1034	1115	G-SWF	3	2	MC, HH	
7	2340	0045	Slow S-SWF	5	2-	HU, OK, WS, TO	2345
8	1119	1210	Slow S-SWF	5	2	BE, HU, MC, PR, HH, MA, NE, SW, CW***	1116
9	0153	0240	S-SWF	5	3-	AN, OK, CA, TO, RCA+, CW+	
9	0615	0650	Slow S-SWF	5	3-	OK, NE, PU, TO	0609
9	1340	1700	Slow S-SWF	5	3	BE, HU, MC, PR, WS, CR	1330
10	0100	0200	Slow S-SWF	5	3	AN, OK, WS, CA, TO, RCA+ CW+‡	0125
10	0636	0700	Slow S-SWF	1	1	OK	0641
10	0708	0740	Slow S-SWF	5	2	OK, PU	0703
10	1100	1115	S-SWF	4	1	BE, PU	1102E
11	1716	1738	Slow S-SWF	4	1	HU, MC, PR, WS	
11	2040	2115	G-SWF	3	1-	AN, HU, MC, WS	
12	1530	1610	G-SWF	3	1	HU, MC, PR, NE	1514
13	1818	1900	Slow-S-SWF	5	1+	BE, HU, MC, PR, WS, CR, TO	1850E
14	1925	1940	S-SWF	5	1	BE, HU, MC, PR	1921
14	2007	2025	Slow S-SWF	5	1	BE, HU, MC, PR, WS	2008
15	1730	1805	Slow S-SWF	3	1	BE, HU, MC	1727
17	1715	1750	G-SWF	3	1	HU, MC, PR	1717
17	2132	2144	S-SWF	5	1+	AN, BE, HU, MC, PR, WS, TO	2135
20	1648	1700	S-SWF	5	1	BE, HU, MC, PR, WS	1642
23	1405	1415	S-SWF	5	1+	BE, HU, MC, PR, WS, CR, HH, NE, PU	1402E
23	1722	1731	S-SWF	5	1	BE, HU, MC, PR	
23	1902	1920	S-SWF	5	1	BE, HU, MC, PR, WS, CR	
24	1815	1840	G-SWF	4	1	HU, MC, PR, WS	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

SEPTEMBER 1957

OTTAWA — 2800 MC

Sept. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
1	8 Group (3)	12 56	33.7			
	6 Complex	12 56	13	13 00.5	204	
	2 Simple 2	13 10.5	8	13 12.7	51	
	2 Simple 2	13 21.7	8	13 23	117	
1	2 Simple 2	17 19.5	12	17 21	18	
1	6 Complex	18 33.5	6.5	18 34.7	20	
1	2 Simple 2 f	19 53	18	19 59.2	110	
	4 Post Increase		1 50		18	
2	3 Simple 3 f A	12 47	4 10	13 30	105	
	2 Simple 2	12 58	6	12 59.7	56	
	8 Group (2)	13 17.3	9.5			
	2 Simple 2	13 17.3	4	13 19	30	
	2 Simple 2	13 21.3	5.5	13 24	40	
2	2 Simple 2	16 31	2	16 32	14	
2	6 Complex	18 10	6	18 14	9	
2	8 Group (2)	20 58.5	11.5			
	6 Complex	20 58.5	5	21 00.3	16	
	2 Simple 2	21 05	5	21 06.5	16	
3	1 Simple 1	13 18	3	13 19	6	
3	2 Simple 2 f	14 17	25	14 24	1350	
	4 Post Increase		2 10		70	
3	6 Complex	20 35.5	5.5	20 36	17	
3	2 Simple 2	21 13	7	21 17	48	
	4 Post Increase A		13		12	
3	2 Simple 2	21 30	1.5	21 30.3	12	
4	3 Simple 3 A	11 56	4 25	12 55	18	
	6 Complex	11 58	16	12 00	22	
	2 Simple 2	12 43	7	12 45.5	14	
4	1 Simple 1	17 41.5	1.5	17 41.8	6	
4	6 Complex	18 16	3	18 17.3	16	
5	2 Simple 2	12 07.2	5	12 10	42	
5	2 Simple 2	12 33.3	7	12 36.5	20	
5	2 Simple 2	12 48	3	12 49	10	
5	6 Complex	14 55.5	8	14 57	25	
5	3 Simple 3 A	20 55	2	21 30	17	
	2 Simple 2	21 16	13	21 20.5	47	
6	2 Simple 2	13 34.7	3	13 35	47	
	4 Post Increase		6		8	
6	3 Simple 3	18 50	55	19 15	8	
6	2 Simple 2	20 36.5	7	20 38	8	
7	2 Simple 2	13 52.2	2.5	13 53.5	9	
7	6 Complex	18 37	9	18 43	25	
	4 Post Increase A		55		8	
	6 Complex	19 01	6	19 05	9	
7	3 Simple 3 A	21 33	1 30	21 51	25	
	8 Group (3)	21 35	29			
	2 Simple 2	21 35	5	21 37	16	
	2 Simple 2	21 43	2	21 44	11	
	2 Simple 2	21 55	9	21 58	26	
8	3 Simple 3	18 14	40	18 22	7	
8	3 Simple 3	22 13	10	22 17	7	
8	2 Simple 2	22 44.3	2	22 45.5	16	
10	3 Simple 3	13 55	50	14 03.5	18	
10	2 Simple 2	17 30	2	17 30.8	15	
10	3 Simple 3	22 08	35	indet.	7	
11	1 Simple 1	13 26.2	3	13 27.6	6	
11	1 Simple 1	14 13	1	14 13.2	6	
12	2 Simple 2	12 38	4	12 39	13	
12	2 Simple 2 f	15 14.3	18	15 15.3	850	
12	2 Simple 2	18 38	7.5	18 38.9	73	
12	8 Group (2)	21 45	18			

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
SEPTEMBER 1957

OTTAWA

2800 MC

Sept. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
	6 Complex	21 45	15	21 53.8	105	
	2 Simple 2	22 00	3	22 01.8	20	
13	1 Simple 1	12 45	1	12 45.5	5	
13	2 Simple 2	13 13	4	13 14.1	28	
13	3 Simple 3 A	13 47.5	1 35	14 29	24	
13	8 Group (4)	13 48	47			
	2 Simple 2	13 48	8	13 49.1	50	
	2 Simple 2	14 03	8	14 05.8	18	
	2 Simple 2 f	14 14.5	13	14 18	235	
	6 Complex	14 31	4	14 31.6	6	
13	3 Simple 3	17 29.5	8	17 32	10	
13	2 Simple 2	18 43.4	4	18 44	96	
13	6 Complex	20 51	12	20 51.7	15	
14	2 Simple 2	13 34.2	3.5	13 35.9	16	
14	1 Simple 1	17 18.3	5	17 19	7	
14	3 Simple 3	21 41	10	21 44.5	12	
15	2 Simple 2	13 27.2	2	13 27.8	11	
15	1 Simple 1	17 52.8	1	17 53	7	
15	2 Simple 2	20 40.5	5	20 41.8	365	
	4 Post Increase f		25		35	
15	2 Simple 2	22 27.5	2.5	22 28.1	30	
16	2 Simple 2	13 06	3	13 06.8	28	
16	2 Simple 2	14 09	2.5	14 09.5	17	
15	2 Simple 2 f	15 19	6	15 20.6	260	
	4 Post Increase A		1 45		16	
	2 Simple 2	15 35	1	15 35.3	8	
16	2 Simple 2	22 43.8	5	22 45	425	
	4 Post Increase		>15		25	In sunset osc.
18	1 Simple 1	12 38	3	12 39.5	6	
18	3 Simple 3 A	12 58	3 50	13 30	34	
	2 Simple 2	13 33	1.5	13 33.5	9	
18	3 Simple 3 A	18 05	3 10	indet.	92	
	6 Complex f	18 20.5	40	18 24.7	275	
19	2 Simple 2	11 12.3	3	11 13	120	In sunrise osc.
19	2 Sinple 2	12 26.1	1.5	12 26.4	17	
19	3 Simple 3 A	17 18	1 10	indet.	20	
	2 Simple 2	17 44	6	17 46.7	22	
	2 Simple 2	18 09.4	3	18 09.8	22	
20	2 Simple 2	12 39.4	3	12 39.8	72	
20	2 Simple 2	13 45	9	13 47.5	24	
20	2 Simple 2	14 29.4	2.5	14 30.2	45	
20	2 Simple 2	14 57	1	14 57.3	13	
20	6 Complex	19 42.8	3.5	19 43.2	11	
20	2 Simple 2	20 30.5	13	20 33.5	24	
20	6 Complex f	21 19	8	21 20.5	185	
	4 Post Increase A		>1 20		18	
	8 Group (4)	22 11	22.1			
	2 Simple 2	22 11	2	22 11.7	43)	
	2 Simple 2	22 23.8	1.5	22 24.1	70)	Near sunset oscillation
	2 Simple 2	22 29.2	1	22 29.7	50)	
	2 Simple 2	22 32.1	1	22 32.5	80)	
21	2 Simple 2	13 05	1.5	13 05.8	9	
21	6 Complex f	13 30	14.5	13 37	785	
	4 Post Increase		25		15	
21	2 Simple 2	14 23.6	1	14 24	24	
21	2 Simple 2 f	14 40	7	14 45.3	120	
	4 Post Increase		22		17	
21	8 Group (3)	19 18.5	11.5			
	2 Simple 2	19 18.5	0.8	19 18.9	17	
	2 Simple 2	19 24.5	1.5	19 24.9	9	
	2 Simple 2	19 28.5	1.5	19 29	11	
21	3 Simple 3	19 48	30	19 56	18	
22	2 Simple 2	12 22.5	1	12 22.7	16	
22	9 Precursor	12 48.3	5		9	
	6 Complex f	12 53.3	15	12 56	275	
	4 Post Increase A		1 30		18	
	1 Simple 1	13 23	3	13 24.2	5	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

SEPTEMBER 1957

OTTAWA — **2800 MC**

Sept. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
22	2 Simple 2	20 06	4.5	20 06.7	30	
23	2 Simple 2	12 51.9	1	12 52.1	130	
23	2 Simple 2	14 53.8	3	14 54.3	17	
	4 Post Inc		10		6	
23	1 Simple 1	15 45.5	6	15 47	7	
23	3 Simple 3	18 55	15	18 56.5	9	
23	2 Simple 2 f	21 43	8	21 45.3	27	
24	1 Simple 1	14 19	1	14 19.2	5	
24	8 Group (2)	20 14	4.4			
	2 Simple 2	20 14	1	20 14.4	26	
	1 Simple 1	20 17.4	1	20 17.7	6	
25	1 Simple 1	13 08.9	1	13 09.1	7	
25	1 Simple 1	16 10.9	1	16 11.1	6	
25	1 Simple 1	19 20	3	19 21.7	7	
25	1 Simple 1	19 38.5	1.5	19 39	7	
26	6 Complex f	13 48.3	8	13 50.3	43	
26	3 Simple 3 A	18 35.9	>4	indet.	57	
	8 Group (2)	18 35.9	7.6			
	6 Complex	18 35.9	5	18 36.1	22	
	1 Simple 1	18 43	0.5	18 43.2	7	
	6 Complex f	19 27.8	1	19 38.5	67	
	6 Complex	21 34.7	4	21 37	45	
	4 Post Increase		10		8	
27	3 Simple 3	13 43	25	13 51	7	
27	8 Group (2)	17 11.8	1.8			
	2 Simple 2	17 11.8	1	17 11.9	9	
	2 Simple 2	17 12.8	0.8	17 13.1	24	
27	2 Simple 2	17 37	1	17 37.3	23	
27	3 Simple 3	18 26	40	18 32	10	
27	3 Simple 3 A	19 54	>2 40	indet.	18	
	2 Simple 2 f	19 56.5	4	19 57.5	13	
	3 Simple 3	20 40	25	20 45	9	
	2 Simple 2	21 15.5	6	21 17.2	87	
	4 Post Increase		45		18	
	2 Simple 2	22 15	2	22 15.8	15	
28	2 Simple 2	15 07	1.5	15 07.5	15	
28	2 Simple 2	18 43	4	18 45	63	
	4 Post Increase		40		12	
28	3 Simple 3	21 48	30	indet.	20	In sunset osc.
29	1 Simple 1	20 34	3	20 35	7	
30	8 Group (2)	12 16.2	10.7			
	2 Simple 2	12 16.2	1.5	12 16.5	40	
	6 Complex f	12 19.4	7.5	12 23.4	235	
30	3 Simple 3 A	16 58	1 10	17 10	30	
	8 Group (3)	16 58	10.5			
	2 Simple 2	16 58	1	16 58.4	18	
	6 Complex	16 59.5	6	17 01.5	77	
	2 Simple 2 f	17 05.5	3	17 06.3	120	
30	2 Simple 2	19 56.7	1.5	19 57	26	

SOLAR RADIO EMISSION

OTTAWA

2800 MC

HOURS OF OBSERVATIONS: JULY, AUGUST, SEPTEMBER 1957

OBSERVING PERIOD:					
	July	1010 UT	- 2420 UT		(approx.)
	Aug.	1030	- 2330		(approx.)
	Sept.	1100	- 2245		(approx.)

with the following exceptions:

(1) Variations in time of start of observations:

July 1	1720
6	1625
7	1640
29	1240
Aug. 18	1145
Sept. 3	1205
10	1145
24	1150

(2) Variations in time of end of observations:

July 5	2210

(3) Records obscured by interference:

July 3	1920 - 1935
11	1355 - 1545
	1930 - 1955
12	1445 - 1540
	1800 - 1820
17	1140 - 1215
	1910 - 1945
23	1535 - 1625
26	1310 - 1355
29	1820 - 1845
31	1435 - 1545
Aug. 7	1515 - 1550
	1655 - 1835
8	1450 - 1510
	1920 - 1950
14	1920 - 2000
	2010 - 2020
15	1100 - 1145
22	1900 - 1920
28	1935 - 1955
Sept. 5	1925 - 1950
11	2015 - 2045
17	1330 - 1400
	1930 - 2005
25	2035 - 2055
27	1155 - 1205

SOLAR RADIO EMISSION

DAILY DATA
SEPTEMBER 1957

CORNELL — **200 MC**

Sept. 1957	Flux Density 10^{-22} W/M^2/cps — Hours UT			Variability 0 to 3 — Hours UT			Observing Periods — Hours UT
	12 15	15 18	18 21	12 15	15 18	18 21	
1	[97	89	49]	[1	2	1]	1220-2005
2	[229	112	84]]	[1	2	1]]	1230-1835
3	[26	40	39]	[2	2	2]	1240-2025
4	[14	12	12]	[1	1	1]	1240-2015
5	[18	18	19]	[1	1	1]	1240-2100
6	[32	27	35]	[2	2	2]	1245-2035
7	[52	55	98]	[2	2	2]	1240-2235
8	[28	28	32]	[2	2	2]	1240-2050
9	[34	33	28]	[2	2	2]	1245-2020
10	[76	64	32]	[2	2	1]	1235-2035
11	[36	26	19]	[1	1	1]	1225-2015
12	[18	115	18]	[1	1	1]	1235-2010
13	[18	23	24]	[2	2	2]	1245-2005
14	[22	19	20]	[1	1	2]	1240-2010
15	[17	20	22]	[2	2	2]	1240-2030
16	[22	25	27]	[2	2	2]	1245-2025
17	[20	20	24]	[1	1	2]	1245-2035
18	[66	74	214]	[2	1	1]	1240-2200
19	[79	98	90]	[2	2	2]	1245-2220
20	[34	29	24]	[2	2	1]	1245-2050
21	-	-	-	-	-	-	
22	-	-	-	-	-	-	
23	[98	81	88]	[2	2	2]	1240-1855, 1930-2120
24	[30	29	26]	[2	2	2]	1340-2005
25	[15	14	13]	[1	1	1]	1335-2030
26	[12	12	32]	[1	1	2]	1240-2045
27	-	18	18]	-	1	1]	1500-2010
28	-	-	-	-	-	-	
29	-	-	-	-	-	-	
30	[16	15	14]	[1	1	2]	1250-2030

[= first hour missing.
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SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

SEPTEMBER 1957

CORNELL — **200 MC**

Sept. 1957	Type Ap.J.	Start UT	Time Max. UT	Duration Min.	Type IAU	Max. Flux Density 10^{-22} W/m^2/cps		Remarks
						Inst.	Smooth	
5	0	1255	1310.5	63	CA	27	3	
	9	1452.5		11.5	ECD	>52	>29	off-scale 1454-58 UT
	9	1512		55	F	>52	>24	off-scale 1540, 1603.5, 1604-4.5 UT
	0	2002		>58	E	>52	>25	off-scale 2025.5-26, 2027-29, 2033.5-36 UT
10	7	b1236.5		>256	E			
	2	1903		14	ECA			
12	0	1514.5		133	ECD	440	64	
13	3	1417.5		1.5	CA	>52	>25	off-scale 1418-18.5 UT
	7	1612		198	E			
18	0	1808		>293	E	356	178	
20	3	1942.5	1943.5	1.5	CD	>224	>138	off-scale 1943.5 UT
26	3	1514	1514.5	.5	CD	>52	>30	off-scale 1514.5 UT
	0	1920		>87	ECD	>384	97	
27	1	1604.5		63	F			
	3	1759	1759.5	.5	CA	>52	22	
	3	1824.5		1	CA	>52	>27	
30	1	1922		>65	F			

SOLAR RADIO EMISSION

DAILY DATA

SEPTEMBER 1957

BOULDER 167 MC

Sept. 1957	Flux Density 10^{-22} w m^{-2}(c/s)$^{-1}$ Hours UT 0 3	12 15	15 18	18 21	21 24	Day	Variability 0 to 3 Hours UT 0 3	12 15	15 18	18 21	21 24	Day	Observing Periods Hours UT
1	-	85	71	68	71	73	-	0	1	1	2	1	13.4-25.3
2	-	143	115	85	73	101	-	0	0	0	2	1	12.8-25.3
3	-	81	66	60	62	66	-	1	0	0	0S	0	13.6-25.3
4	-	72	59	55	61	61	-	2S	2	0	1	1	13.6-25.2
5	-	69	57	67	68	65	-	0	0	0	0	0	13.6-20.5,21.1-25.2
6	-	70	65	67	70	67	-	1	0	0	0	0	13.6-25.2
7	-	-	77	74	74	75	-	0S	1	1	1	1	13.1-14.5,15.1-25.1
8	-	-	72	71	73	73	-	0S	1	1	1	1	13.1-25.1
9	-	86	80	80	90	84	-	0	0	0	0	0	13.6-25.1
10	-	91	96	82	83	88	-	0	0	0	0S	0	13.6-25.0
11	-	105	89	83	79	87	-	1	0	0	0	0	13.6-20.9,21.7-25.0
12	-	83	4000D	2100	84	1700D	-	0	0	2	1S	1	12.6-24.9
13	-	-	1030	76	80	895	-	0	1	1	0	0	12.7-13.5,14.4-24.9
14	-	-	71	72	73	72	-	0	0	0	0	0	12.7-24.9
15	-	-	72	68	70	71	-	0	1	1	0	0	12.7-24.8
16	-	-	17	66	71	70	-	0	1	0	1S	1	12.7-24.8
17	-	-	68	65	68	68	-	0	0	0	1S	0	12.8-24.8
18	-	-	79	148	95	107	-	0	0	2	0	0	13.8-24.8
19	-	-	78	71	77	76	-	0	1	1	1S	1	12.8-24.8
20	-	-	74	77	82	77	-	1	1	0	2S	1	12.8-24.8
21	-	-	79	79	85	82	-	1S	1	1	1	1	12.8-24.7
22	-	90	86	78	83	84	-	1	1	0	1	1	12.8-24.7
23	-	84	78	72	70	75	-	1	0	0	1	1	12.8-24.6
24	-	76	72	68	69	71	-	0	0	0	0	0	12.8-24.6
25	-	71	69	61	64	66	-	0	0	0	1S	0	12.8-21.6,23.2-24.6
26	-	68	66	108	121	93	-	0	0	1S	1	1	12.8-24.5
27	-	68	69	66	66	67	-	0	0	0S	1S	0	12.9-24.5
28	-	70	70	65	69	69	-	0	1	0	2	1	12.9-24.5
29	-	-	67	62	63	65	-	0	0	0	0	0	12.9-24.4
30	-	69	66	64	62	65	-	0	0	1	1S	1	12.9-24.4

SOLAR RADIO EMISSION
DAILY DATA
SEPTEMBER 1957

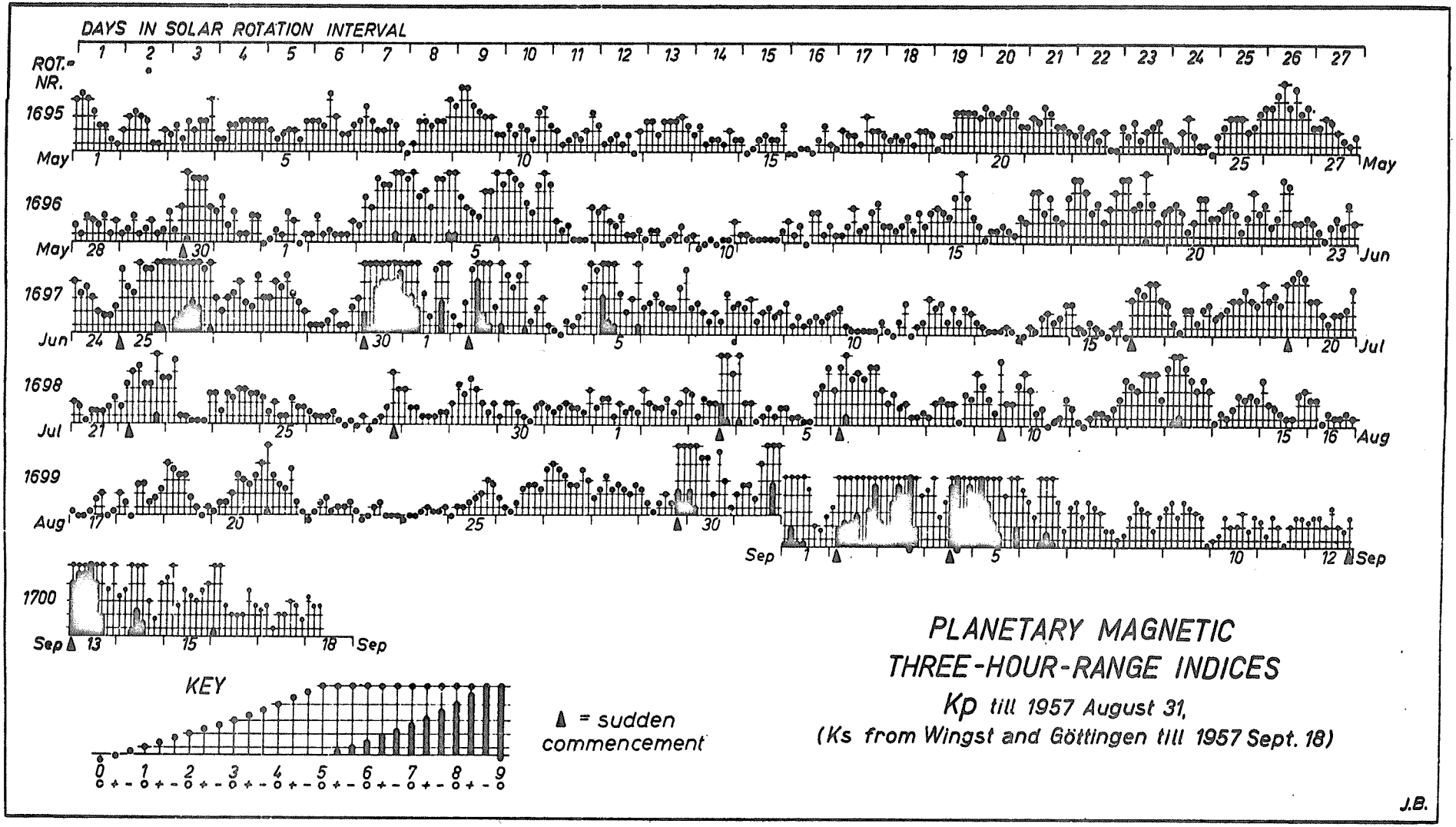
BOULDER **450 MC**

Sept. 1957	Flux Density 10^{-22} w m^{-2}(c/s)$^{-1}$ Hours UT 0 3	12 15	15 18	18 21	21 24	Day	Variability 0 to 3 Hours UT 0 3	12 15	15 18	18 21	21 24	Day	Observing Periods Hours UT
1	-	105	177	102	93	120	-	0	1	1	1S	1	12.5-25.3
2	-	517	153	96	54	177	-	0S	1S	1S	2S	1S	12.5-25.3
3	-	24	55	49	18	38	-	1	1S	1S	0S	1S	12.5-25.2
4	-	11	11	11	10	11	-	2	2S	2	1S	1S	12.5-25.2
5	-	14	19	21	27	21	-	2	2S	2S	2S	2S	12.5-25.2
6	-	36	51	44	66	51	-	1	1	1S	1S	1	12.6-25.2
7	-	43	95	190	60	102	-	2	2S	2	2	2	12.6-25.2
8	-	51	51	-	69	59	-	1	2S	1	1S	1	12.6-17.3,20.8-25.1
9	-	29	39	33	40	36	-	1	0S	1	1S	1	12.6-25.1
10	-	60	78	40	50	57	-	1	2S	0S	2S	1S	12.6-25.0
11	-	58	35	20	20	31	-	1	1S	1S	2S	1S	12.6-25.0
12	-	18	30	20	25	24	-	1	2S	2	2S	2S	12.7-25.0
13	-	-	26	22	20	22	-	2S	1S	1S	2S	1S	12.7-13.8,14.7-24.9
14	-	-	18	20	28	21	-	1	1	2	2	2	12.7-24.9
15	-	-	19	29	28	25	-	1	2	2S	2S	2S	12.7-24.8
16	-	-	31	28	20	27	-	1	2	2	2S	2	12.8-24.8
17	-	-	27	39	43	35	-	1S	1S	2S	2S	1S	12.8-24.8
18	-	-	218	520	510	390	-	1S	2S	0S	0S	0S	13.8-24.8
19	-	-	-	-	321	305	-	-	2	1	1	1	15.1-24.8
20	-	-	42	30	17	32	-	1	2	1S	1S	1S	12.8-24.8
21	-	-	79	115	127	115	-	1S	1	1	1	1	12.8-24.7
22	-	138	132	78	46	95	-	1	2	1	0S	1	12.8-24.7
23	-	-	188	266	249	234	-	1	1S	1	1	1	12.8-24.7
24	-	59	49	40	29	43	-	1	1S	1	1S	1	12.8-23.5
25	-	18	15	13	11	14	-	1S	1	0S	1S	1S	12.8-24.6
26	-	14	13	203	611	228	-	1	1S	1S	2S	1S	12.9-24.6
27	-	21	16	20	16	18	-	1	1	1S	1S	1S	12.9-24.5
28	-	19	17	18	23	19	-	1	1S	0S	2S	1S	12.9-24.5
29	-	29	22	21	17	22	-	1S	1S	2	2S	1S	12.9-23.5
30	-	20	15	15	12	15	-	1	1S	1S	0S	1S	12.9-19.5,21.5-24.4

GEOMAGNETIC ACTIVITY INDICES

AUGUST 1957

Aug. 1957	C	Values Kp — Three hour Gr interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.3	2- 2+ 2+ 1o	2o 1+ 2- 1+	14-	6	Five
2	0.7	3o 2o 2- 2-	2+ 1+ 2o 3o	17o	9	Quiet
3	1.2	3- 1o 2+ 2o	2o 6+ 5+ 4o	26-	27	
4	0.9	5+ 2o 2o 1-	1o 2- 1o 2-	15+	12	11
5	0.6	2- 1o 1o 1-	1- 3- 3+ 4+	15+	10	17
						22
6	1.3	3o 4+ 6- 4-	4o 4- 4+ 4+	33o	31	23
7	0.4	3o 2o 3- 2-	2o 1o 1o 1+	15-	8	24
8	0.4	1o 2o 2+ 2o	2o 1- 3- 2+	15o	7	
9	0.9	4o 3+ 2+ 1+	4o 3+ 2+ 1+	23o	16	
10	0.5	4o 3o 1+ 2-	0+ 1- 1o 2+	14+	9	
11	0.2	2- 1- 0+ 1o	1+ 1+ 1o 2-	9o	4	Five
12	1.1	2+ 4- 3+ 3o	4o 4o 4o 2+	27-	19	Disturbed
13	1.2	4+ 5+ 6- 4+	4- 3o 4- 3o	33o	33	
14	0.5	1- 1+ 1o 2-	3- 2+ 3- 2+	15-	8	3
15	0.5	4- 2o 2- 1+	1o 1o 3- 3o	16+	9	6
						13
16	0.2	2+ 2+ 1- 1+	1o 1o 1+ 1o	11o	5	30
17	0.2	1- 0+ 0+ 1-	2- 2o 0+ 1-	7-	4	31
18	0.5	2o 1+ 0+ 3-	3- 1+ 2- 2+	14+	7	
19	0.5	4o 4- 3+ 3+	2- 1o 0+ 1o	18+	13	
20	0.7	1- 1+ 1+ 2o	3+ 3o 3- 3+	18-	10	
21	0.9	4o 4+ 3+ 3-	2+ 4- 1+ 1-	23+	19	Ten
22	0.2	0o 1- 1+ 2-	1- 1o 1o 1+	8-	4	Quiet
23	0.1	1- 0o 0+ 1o	1+ 0+ 0+ 0+	4+	2	
24	0.0	0o 0+ 0+ 1-	1o 1- 1- 1o	5-	3	1
25	0.3	0+ 1o 1o 1+	2- 2o 3o 3-	13o	7	11
						16
26	0.4	2- 1o 1- 1+	2+ 3- 3- 2+	15-	8	17
27	1.0	4- 4o 4- 3+	3- 3- 4- 3o	27-	19	18
28	0.6	2- 2+ 3+ 2+	3- 2+ 2o 3-	19+	10	22
29	1.2	2+ 1+ 1- 1+	2o 1+ 7- 6o	22-	28	23
30	1.3	7- 6- 4+ 4+	2o 5- 3o 1o	32-	38	24
31	1.3	2o 3- 3- 2-	4o 5o 7o 5o	30o	36	25
						26
Mean:	0.65			Mean:	14	


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ROT.-NR.
1695
May 1 5 10 15 20 25 27 May
1696
May 28 30 1 5 10 15 20 23 Jun
1697
Jun 24 25 30 1 5 10 15 20 Jul
1698
Jul 21 25 30 1 5 10 15 16 Aug
1699
Aug 17 20 25 30
Sep 1 5 10 12 Sep
1700
Sep 13 15 18 Sep
KEY
0 1 2 3 4 5 6 7 8 9
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1957 August 31,
(Ks from Wingst and Göttingen till 1957 Sept. 18)
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

MAY 1957

May 1957	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomagnetic K_{Fr}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-4 days	4-7 days	8-25 days	Half (1)	Day (2)
1	7-	6o	6o	7-	7	7	7	6	6+	7	7		(4)	2
2	7-	6+	7o	7-	7	7	7	7	7-	7	7		3	2
3	7o	7-	7-	7-	7	7	7	6	7-	7	7		2	3
4	7o	7-	7-	7-	7	7	7	6	7-	7	7		2	3
5	7-	6+	7-	7o	7	6	6	6	7-	7	7		2	2
6	7-	7-	7-	7-	7	7	7	7	7-	7	7		3	2
7	7o	7o	7-	7o	7	7	7	7	7o	7	7		3	2
8	7-	7-	7o	7o	7	7	7	7	7o	7	7		2	3
9	6o	5+	7-	7o	7	6	6	7	6+	7	7		3	3
10	7o	7o	7-	7+	6	7	7	7	7o	6	7		2	3
11	7o	7o	7-	7-	7	7	7	7	7-	6	7		2	2
12	7o	7-	6+	7+	7	7	7	7	7-	6	7		1	2
13	7o	7-	6+	7-	7	7	6	7	7-	6	7		2	2
14	7o	7-	7o	7-	7	7	6	7	7-	7	7		2	2
15	7o	7o	7-	7-	7	7	7	7	7o	7	7		1	2
16	7-	7o	7-	6+	7	7	7	7	7-	7	7		1	1
17	7+	7o	7+	7o	7	7	7	7	7o	7	7		2	2
18	7-	7o	7o	7-	7	7	7	7	7-	6	7		2	2
19	7o	7-	7o	7o	7	7	7	7	7o	5	5		1	3
20	7-	6+	7-	7-	7	6	6	6	7-	5	5		(4)	3
21	7o	6+	7o	7o	6	7	7	7	7-	7	6		3	2
22	7o	7o	7-	7o	7	7	7	7	7o	7	6		2	2
23	7-	7o	7o	7o	7	7	7	7	7o	7	6		2	2
24	7+	7+	7-	7o	7	7	7	7	7o	7	7		2	2
25	7o	7-	7o	7o	7	7	7	7	7o	7	7		3	3
26	7-	6-	7-	7-	7	6	6	6	6+	7	7		(4)	(4)
27	7-	6+	7-	7o	6	7	7	7	7-	7	7		3	2
28	7-	7-	7o	7o	7	7	7	7	7-	7	7		2	2
29	7o	7o	7o	7+	7	7	7	7	7o	7	7		2	2
30	7o	7o	7-	7-	7	7	7	6	7-	7	7		3	(4)
31	6o	6+	7o	7o	6	5	6	6	7-	5	7		3	2

Score:									
Quiet Periods	P	27	25	23	22	20	23		
	S	4	6	8	9	8	6		
	U	0	0	0	0	3	2		
	F	0	0	0	0	0	0		
Disturbed Periods	P	0	0	0	0	0	0		
	S	0	0	0	0	0	0		
	U	0	0	0	0	0	0		
	F	0	0	0	0	0	0		

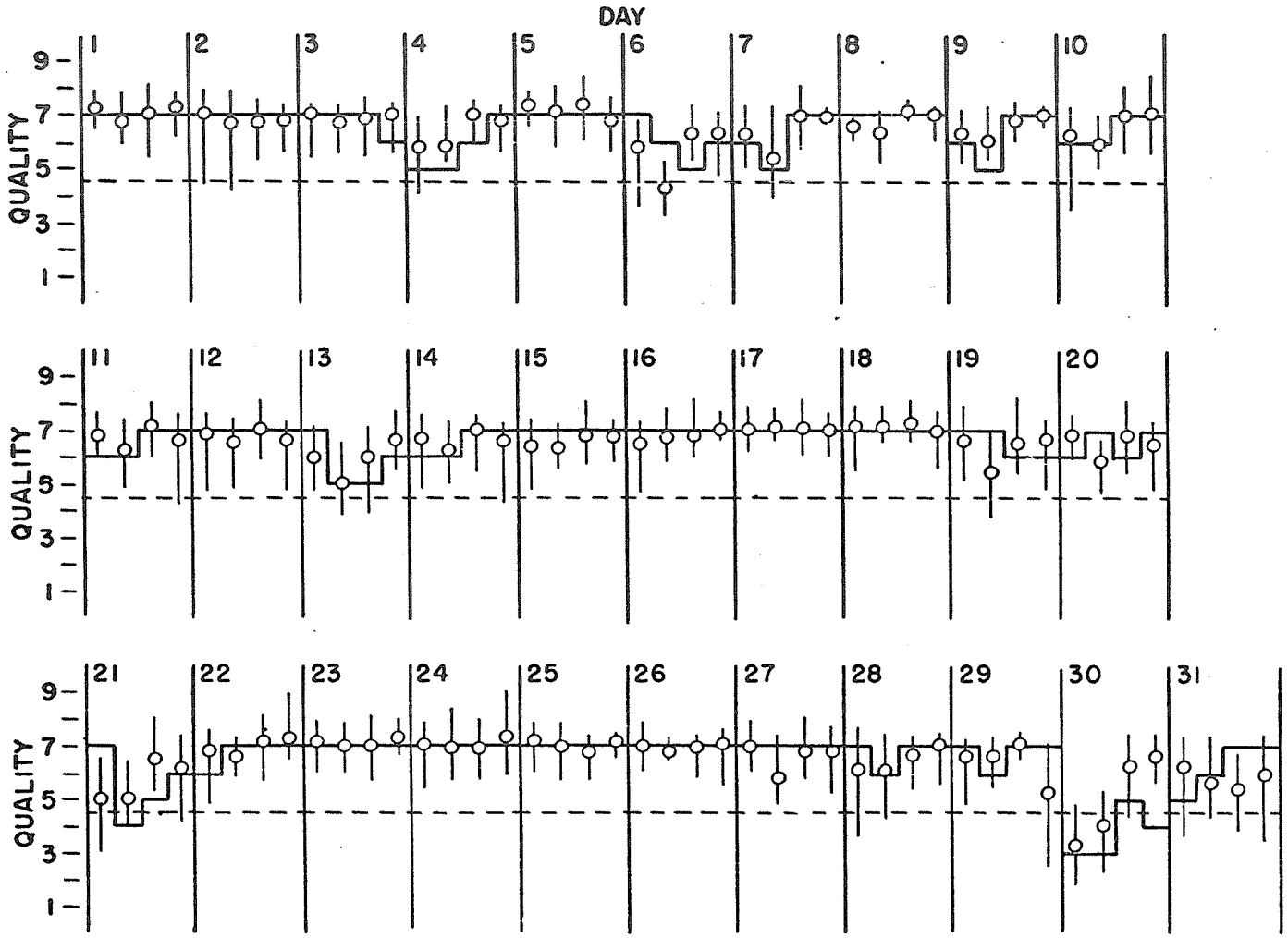
( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS
NORTH ATLANTIC

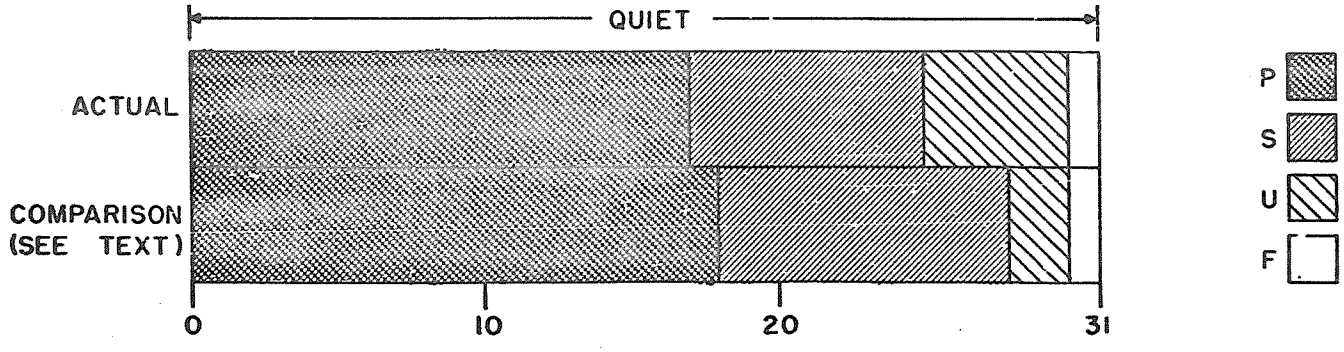
— Short-term forecast
o Quality figure

AUGUST 1957

| Range of reports



OUTCOME OF ADVANCED FORECASTS (1 TO 4 DAYS AHEAD)



CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

AUGUST 1957

Aug 1957	North Pacific 8-hourly quality figures			Short-term forecasts issued at			Whole day index	Advance forecasts (Jp reports) for whole day; issued in advance by:		Geomagnetic K_{Si}	
	03 to 11	11 to 19	19 to 03	02	10	18		1-4 days	4-7 days	8-25 days	Half Day (1) (2)
1	7	7	6	7	7	6	7	6	6		3 2
2	6	6	6	6	6	6	6	6	6		2 2
3	6	6	6	5	6	5	6	6	6		2 4
4	6	5	6	5	6	6	6	6	7		3 2
5	6	7	6	6	6	6	6	(4)	7		1 2
6	4	3	5	6	3	3	(4)	(4)	7		5 4
7	5	6	5	4	5	6	5	(4)	6		3 1
8	6	7	6	5	6	6	6	5	6		2 2
9	5	6	5	5	6	6	5	5	6		3 2
10	6	6	6	5	6	6	6	5	(4)		3 1
11	6	6	6	5	6	6	6	5	(4)		1 2
12	6	7	7	6	6	5	6	6	5		3 3
13	4	5	6	6	4	6	5	6	5		6 4
14	6	6	6	6	7	6	6	5	6		1 2
15	6	6	6	6	7	6	6	5	6		2 2
16	6	6	6	6	7	6	6	5	6		2 1
17	6	5	6	6	6	5	6	6	6		0 1
18	6	6	6	6	6	7	6	6	6		2 2
19	6	6	6	6	6	6	6	6	6		4 1
20	6	6	6	6	6	6	6	7	6		2 3
21	5	6	6	6	6	5	6	6	7		4 2
22	6	6	6	5	6	6	6	5	7		1 1
23	6	7	7	6	7	7	7	(3)	5		0 0
24	6	6	6	7	7	7	6	6	(3)		0 1
25	6	6	6	7	7	6	6	6	6		1 2
26	6	6	6	5	6	6	6	6	6		1 3
27	6	6	6	6	6	6	6	6	6		4 3
28	6		6	6	7	6	6	6	6		2 2
29	6		6	6	7	6	6	6	6		1 4
30	4		6	4	4	5	5	6	6		6 3
31	6		5	6	6	5	6	5	6		2 4

Score:			02	10	18	1-4 days	4-7 days
Quiet Periods	P	17	14	21	15	17
	S	11	16	8	13	9
	U	0	0	2	1	1
	F	0	0	0	1	3
Disturbed Periods	P	1	1	0	1	0
	S	0	0	0	0	0
	U	0	0	0	0	0
	F	2	0	0	0	1

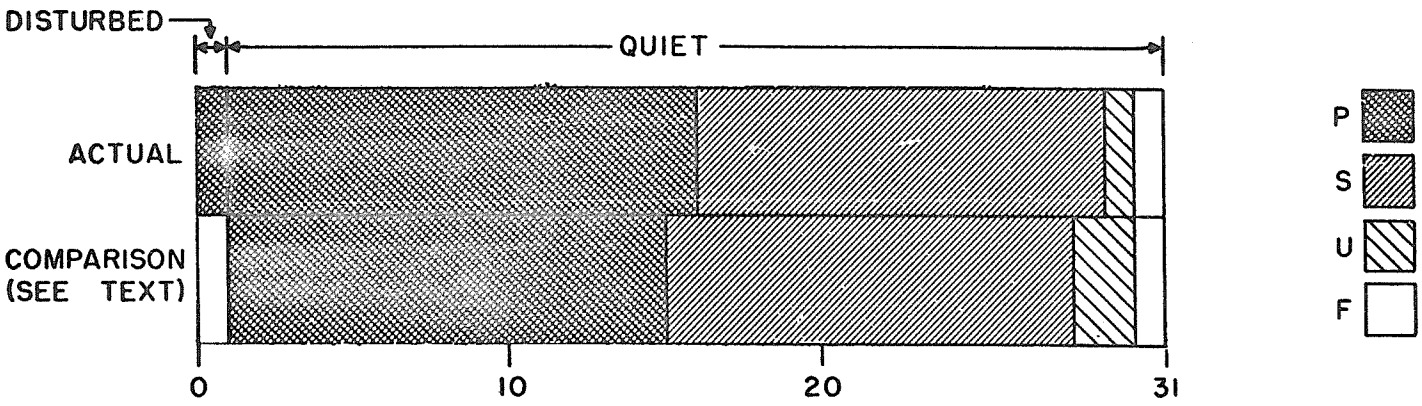
( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

AUGUST 1957

OUTCOME OF ADVANCED FORECASTS (1 TO 4 DAYS AHEAD)



ALERT PERIODS AND SPECIAL WORLD INTERVALS

Alert	SWI	A_{Be} On Days of Alert Period (SWI Underlined)	Number of Flares of IMP 2 Reported Promptly of Days on Alert Period
Jun 28-Jul 06	Jun 29-Jul 03	20-12-80-61-37-30-11-47-16	4-0-4-2-3-2-2-1-0
Jul 16-Jul 20		15-15-20-20-11	3-3-1-0-3
Jul 21-Jul 24		08-20-16-17	6-4-1-2
Jul 25-Jul 27		11-10-10	0-0-2
Aug 02-Aug 07		14-23-18-10-33-14	2-1-0-0-0-0
Aug 23-Aug 25	Aug 23-Aug 24	04-05-07	1-3-4
Aug 28-Sept 05	Aug 28-Aug 30 Sept 01-Sept 04	09-20-25-21-32-62-95-66-96	7-5-3-4-2-4-3-1-2
Sept 09-Sept 15	Sept 11-Sept 14	10-08-09-11-137-26-09	1-3-3-3-3-3-3
Sept 18-Sept 23		13-03-04-30-43-124	7-3-2-6-2-1
Sept 27-Oct 02		06-10-63-30-17-13	1-1-0-3-0-2