# PART B

# SOLAR - GEOPHYSICAL DATA

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

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PART B

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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 prepared in the Radio Warning Services Section, edited by Miss J.V. Lincoln and Mr. Dale B. Bucknam.

## 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, these reports, 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, $\ell$ = 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. The sunspot data are compiled from reports from the U. S. Naval 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 $\lambda$5303) and red (Fe X at $\lambda$6374) 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 continuum of the center of the solar disk (at the same wavelength as the line) that would contain the same energy as the observed coronal line. The indices have the following meanings:

$G_6$ = mean of six highest line intensities in quadrant for $\lambda 5303$.

$R_6$ = same for $\lambda 6374$.

$G_1$ = highest value of intensity in quadrant, for $\lambda 5303$.

$R_1$ = same for $\lambda 6374$.

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 H$\alpha$ 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)-4961.

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 | & = 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, sudden ionospheric disturbances (and GID--gradual ionospheric disturbances) may be detected in a number of ways: short wave fadeouts (SWF), enhancement of low frequency atmospherics (SEA), increases in cosmic absorption (SCNA), and so forth.

A table lists SWF 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 (CRPL-Associated Laboratory: HU); and Ft. Monmouth, N.J., White Sands, N. Mex., Adak, Alaska, and Okinawa (U.S. Signal Corps Stations: FM, 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 SWF and the radio paths involved. Through the URSIgrams, reports are available from still other stations as given monthly in the footnotes.

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 either drop-out or recovery or both. |

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.

A second table lists sudden ionospheric disturbances which have been recognized on recorders for detecting cosmic absorption at about 18 Mc (SCNA) or on recorders for detecting enhancements of low frequency atmospherics at about 27 kc (SEA) together with solar radio bursts at 18 Mc as identified on the SCNA records.

Reports are received either directly or through the IGY World Data Center for Solar Activity at the High Altitude Observatory, Boulder, Colo. The following observatories report SCNA: Rensselaer Polytechnic Institute Observatory, Grafton, N.Y. (RE); McMath-Hulbert

Observatory (MC); Sacramento Peak, N.Mex. (SP); High Altitude Observatory, Boulder, Colo. (BO); University of Hawaii, Makapuu Pt., Hawaii (HA); and the Royal Observatory Edinburgh (ED). All of these except the Royal Observatory Edinburgh also report solar noise bursts observed at 18 Mc. The SEA reports come from the following: Department of Terrestrial Magnetism, Carnegie Institution of Washington, Station at Derwood, Md. (DE); Dunsink Observatory, Ireland (DU); Royal Observatory Edinburgh (ED); three stations operated by the Netherlands PTT at Hollandia, Dutch West Indies (HO), Nederhorst den Berg, Netherland (NE), and Paramaribo, New Guinea (PA); Panska Ves Observatory near Prague, Czech. (PU); High Altitude Observatory, Boulder, Colo. (BO); Sacramento Peak, N.Mex. (SP); McMath-Hulbert Observatory (MC); University of Hawaii (HA); Neustrelitz (NU); Kuhlungsborn (KU); and a group of American Association of Variable Star Observers located at Brooklyn, N.Y. (A1), Pittsburgh, Pa. (A2), Paterson, N.J. (A3), Powell, Ohio (A4), Ramsey, N.J. (A5), Oshkosh, Wis. (A6), China Lake, Calif. (A7), and Manhattan, Kansas (A8).

These reports are coordinated at CRPL-Boulder. 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. Some phenomena are listed, if noted at only one location, if there has been a flare or another type of flare-associated effect reported for that time.

In the table under the type of event the importance of the event is given on a scale of 1 minus to 3 plus. Next there is the index of widespread certainty ranging from 1 (possible) to 5 (definite). The time of beginning, maximum and end of the event in UT is given as reported by the station underlined in the group of observing stations. If the event is an SCNA, a percent absorption figure is given. This absorption is calculated by

$$\text{SCNA } \% = \frac{I_n - I_f}{I_n} \times 100$$

where $I_n$ = noise diode current required to give a recorder deflection equal to that which would have occurred in the absence of a flare, i.e. a value extrapolated from cosmic noise level trend before and after a flare. The previous day's record may be considered if necessary.

and $I_f$ = noise diode current required to give a recorder deflection equal to the level at the time of maximum absorption.

# 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

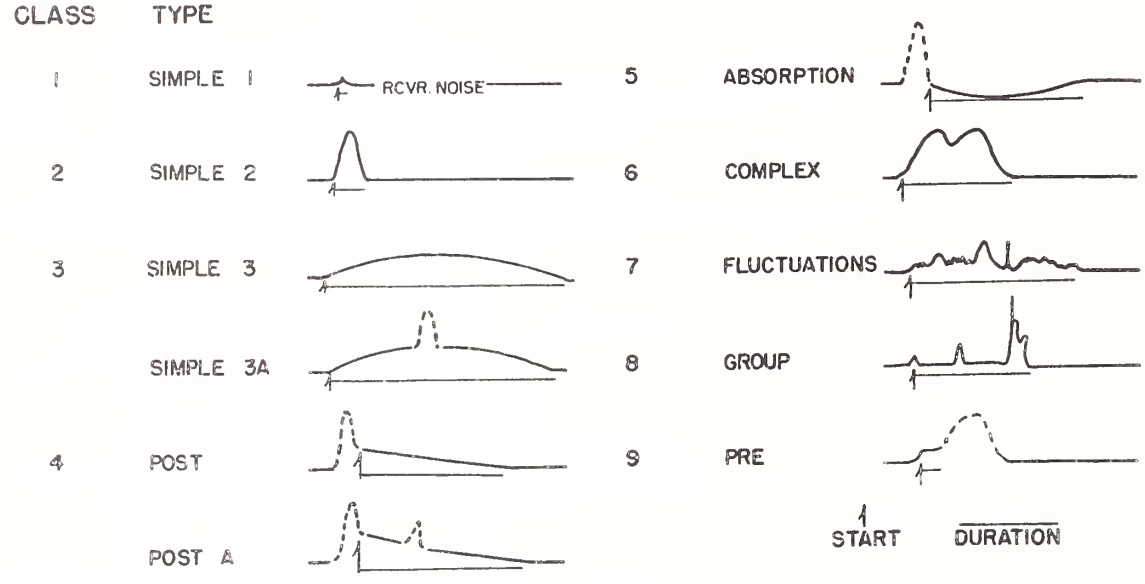
Infrequently occurring bursts of great intensity, often of complicated structure.

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 emission on 200 Mc recorded by the University of Hawaii (I. Miyake) at Makapuu Pt., Hawaii, are presented. The outstanding occurrences are reported as described under 170 Mc Observations with the exception that no intensity measurements are given.

170 Mc Observations

Data on solar radio emission at the nominal frequency of 170 Mc recorded at the Gunbarrel Hill (Boulder) station of the National Bureau of Standards (C.G. Little) 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). Observations are interrupted during the period from 26 to 29 minutes after each hour for calibrations.

Beginning January 1, 1959 the method of reducing the records has been changed. The 3-hourly and daily flux density and variability are no longer determined. The outstanding occurrences are reported. However, instead of giving the intensity to the nearest unit of $10^{-22}$ watts meter$^{-2}$(c/s)$^{-1}$, a scale of 1 to 3 is now used where for the estimate of smoothed maximum flux:

1 signifies $<100 \times 10^{-22}$ wm$^{-2}$(c/s)$^{-1}$

2 signifies $>100$ $<1000 \times 10^{-22}$ wm$^{-2}$(c/s)$^{-1}$

3 signifies $>1000 \times 10^{-22}$ wm$^{-2}$(c/s)$^{-1}$.

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. The following qualifying symbols are used:

E = Event in progress before observations began.
D = Event continues after observations cease.
I = Event apparently continued during an interruption of the observations. The period of the interruption may be given in the remarks.
S = Measurement may be influenced by interference or atmospherics.

The types of the outstanding occurrences follow the classification described by Dodson, Hedeman and Owren (Ap J. 118, 169, 1953), in which the types are identified by numbers which describe the character of the trace, but not 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.

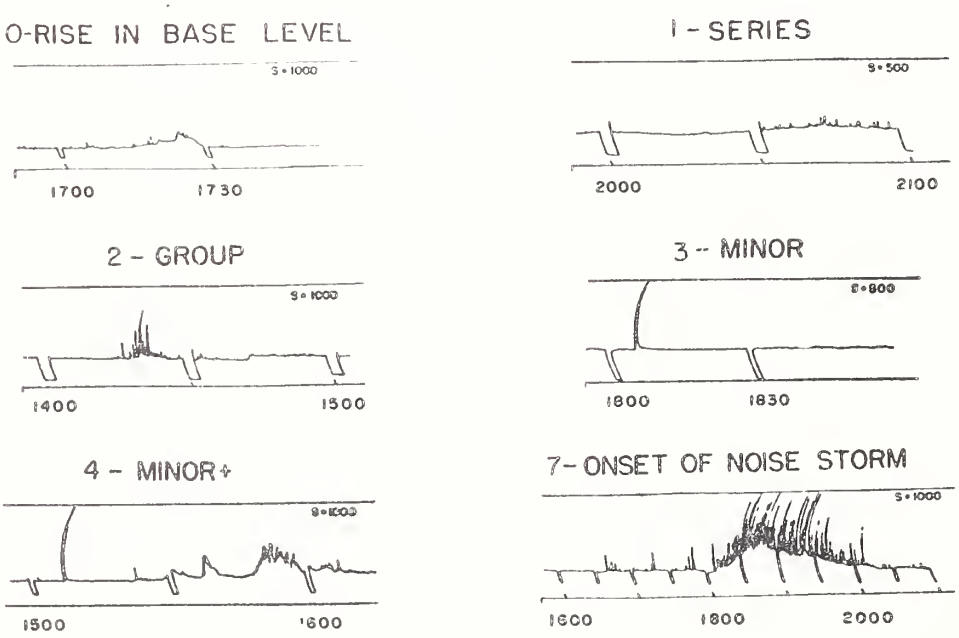
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

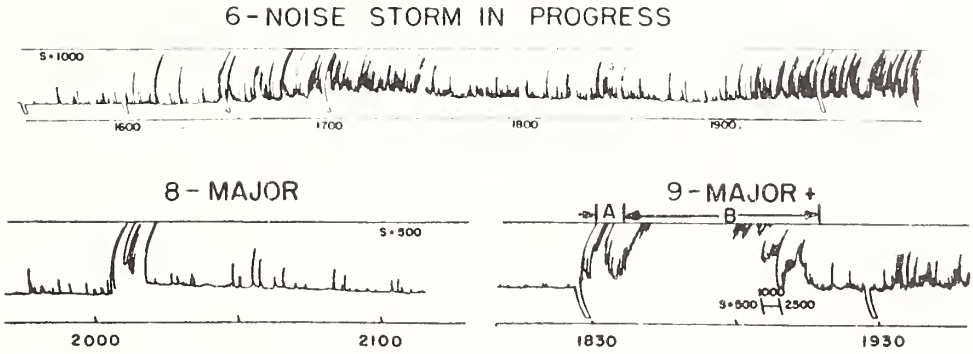
6 - Noise storm -- A temporary increase in radiation characterized by numerous closely spaced bursts, by an increase in the continuum, or by both. Duration is of the order of hours or days.

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.






Note: In the present table, the type classifications 0 and 1 are not used; they have been included above only for information.

## 169 Mc Interferometric Observations

The 169 Mc interferometric observations are recorded around local noon at Nançay (Cher), France, ($N47^{\circ}23'$, $E8^{m}47^{s}$) the field station of the Meudon Observatory.

The main lobes are parallel to the meridian plane: the half-power width is 3.8 minutes in the East-West direction and much larger than the solar diameter in the North-South direction. The main lobes are about 2° apart (Ann. Astrophys. 20, 155, 1957). The records give the strip intensity distribution from the center of the disk to 30' to the West and East.

These daily distributions are plotted on the same chart giving diagrams of evolution (C.R. 244, 1460, 1957). Points of intensity 0.5 - 0.75 - 1.0 - 1.5 and 2.0 times $10^{-22}$ watts/$m^2$/c/s are joined day after day in the form of isophotes. Black dots give the position of the center of the radio spots for each day; a line indicates the width of the recorded lobe pattern when it can be measured with certainty. For each radio spot the smoothed intensity around noon is given in $10^{-22}$ watts/$m^2$/c/s.

Note that the isophotes cannot be measured when a radio spot of large intensity is on the disk.

# 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 Disturbances 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, Gottingen.

## 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 transmittal 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 (CRPL-J) are issued once a week and are applicable 1 to 7 days ahead. They are modified as necessary by the Special Disturbance Warning (CRPL-SDW) applicable 1 to 3 days ahead, which may be followed by a supplementary forecast (CRPL-Js) applicable to days remaining until next CRPL-J forecast. The forecast entitled "final" consists of the most recent of the above forms and is scored against the whole-day quality index.

(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 the final advance forecasts 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 Fermeldetechnischen Zentralamtes, Darmstadt, Germany, being observations every one and a half hours of selected transmitters located in the eastern portion of North America. Since January 6, 1958 the transmitters monitored are restricted to those located north of 39° latitude. 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:

| | | | |
|---|---|---|---|
| 07-18 hours UT | 5.33 | 00-24 hours UT | 5.67 |
| 19-06 | 6.00 | | |

The 12-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 12-hourly quality figures; whole day quality figures; short-term forecasts issued by NPRWS twice daily at $06^h$ and $18^h$ UT, applicable to the stated 12-hour periods; advance forecasts issued weekly by NPRWS (CRPL-Jp report) modified as necessary by Special Disturbance Warnings (CRPL-SDW) and supplementary forecasts (CRPL-Jps); and half-day averages of geomagnetic K indices from Sitka.

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

Note: Beginning with March 15, 1959 the short-term forecast schedule was changed from three times daily to twice daily. The North Pacific quality figures used for evaluation are now 12-hourly rather than 8-hourly.

## VII ALERT PERIODS AND SPECIAL WORLD INTERVALS

This table gives the Advance Geophysical Alerts as initiated by the Western Hemisphere Regional Warning Center at Ft. Belvoir, Va., and also the Worldwide Geophysical Alerts and Special World Intervals as designated by the World Warning Agency, Ft. Belvoir, Va.

Advance Alerts are of four types, defined as follows:

1 - Solar Flare Alert -- this warning is issued whenever a solar flare of median importance 2 plus or greater has been reported. There will be only one alert issued per flare and only one a day at most.
2 - Magnetic Storm Alert -- this warning is issued whenever a significant magnetic storm, K figure 5 or greater at a middle latitude station has begun.
3 - Cosmic Ray Alert -- this warning is issued whenever a very outstanding change in cosmic ray flux has been observed -- increase or decrease.
4 - Aurora Alert -- this warning is issued whenever a magnetic storm in middle latitudes has reached K figure 7 intensity or whenever selected auroral stations report the presence of outstanding aurora.

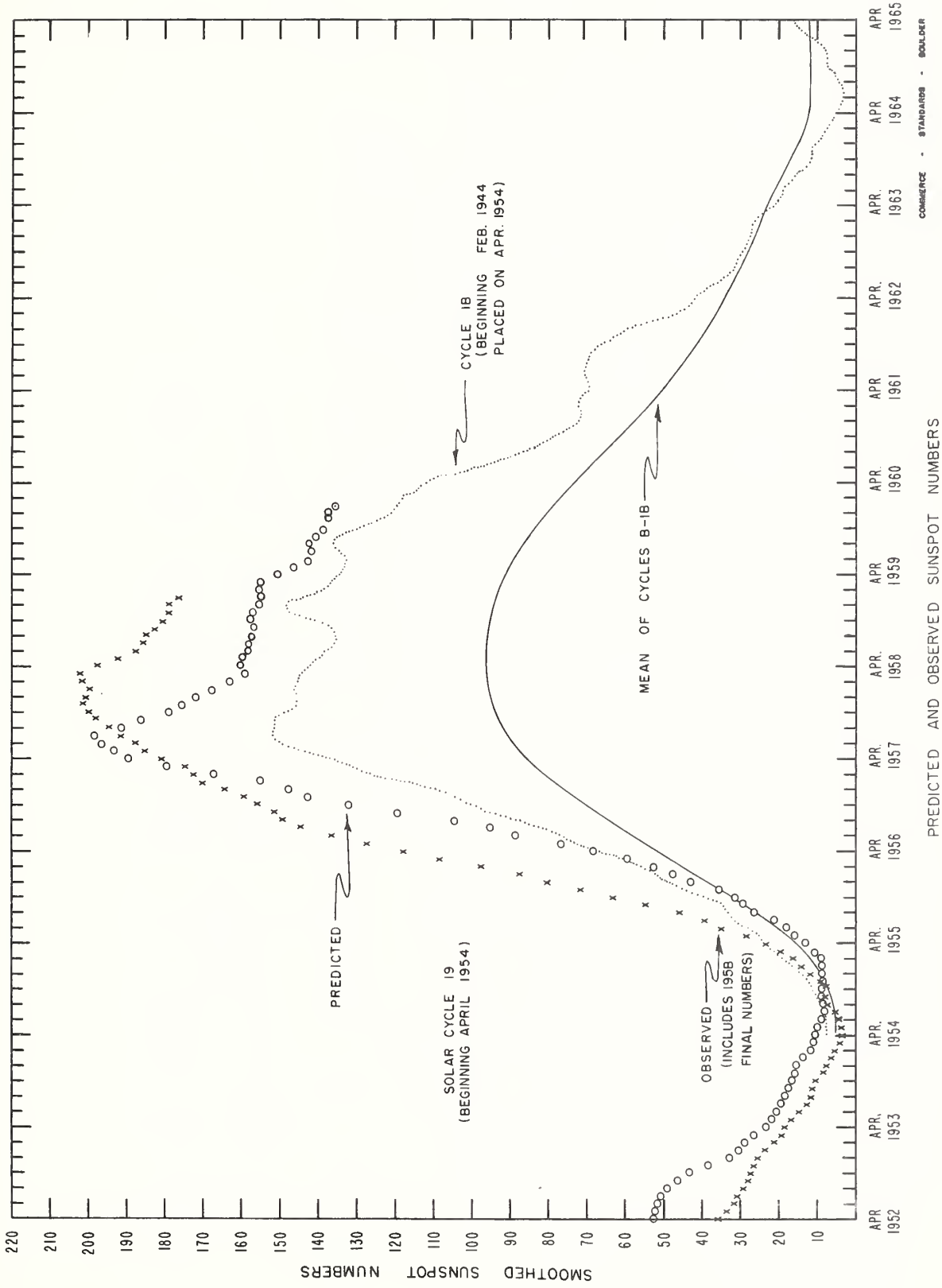
Worldwide Alerts are of the same types as the Advance Alerts, except that the Solar Flare Alert and Cosmic Ray Decrease Alert are omitted. Alert announcements include the event and time of event upon which the alert is based, and, in the case of the Advance Alerts, the station reporting the event.

The World Alerts and Special World Intervals are issued by the World Warning Agency on decisions based on Advance Alerts, advice received from Regional Warning Centers and overall policy.

# DAILY SOLAR INDICES

| June 1959 | American Relative Sunspot Numbers $R_{A'}$ |
|---|---|
| 1 | 130 |
| 2 | 137 |
| 3 | 148 |
| 4 | 162 |
| 5 | 146 |
| 6 | 148 |
| 7 | 146 |
| 8 | 156 |
| 9 | 169 |
| 10 | 152 |
| 11 | 168 |
| 12 | 164 |
| 13 | 163 |
| 14 | 164 |
| 15 | 152 |
| 16 | 162 |
| 17 | 137 |
| 18 | 168 |
| 19 | 111 |
| 20 | 115 |
| 21 | 138 |
| 22 | 129 |
| 23 | 181 |
| 24 | 163 |
| 25 | 169 |
| 26 | 148 |
| 27 | 169 |
| 28 | 156 |
| 29 | 135 |
| 30 | 134 |
| Mean: | 150.7 |

| July 1959 | Zürich Provisional Relative Sunspot Numbers $R_Z$ | Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux |
|---|---|---|
| 1 | 142 | 188 |
| 2 | 118 | 174 |
| 3 | 138 | 171 |
| 4 | 158 | 177 |
| 5 | 136 | 176 |
| 6 | 127 | 188 |
| 7 | 110 | 192 |
| 8 | 131 | 185 |
| 9 | 129 | 185 |
| 10 | 127 | 201 |
| 11 | 133 | 194 |
| 12 | 135 | 234 |
| 13 | 160 | 243 |
| 14 | 180 | 264 |
| 15 | 185 | 245 |
| 16 | 190 | 261 |
| 17 | 193 | 240 |
| 18 | 195 | 231 |
| 19 | 184 | 222 |
| 20 | 160 | 208 |
| 21 | 132 | 189 |
| 22 | 94 | 178 |
| 23 | 113 | 178 |
| 24 | 105 | 181 |
| 25 | 118 | 182 |
| 26 | 134 | 182 |
| 27 | 156 | 200 |
| 28 | 181 | 205 |
| 29 | 182 | 207 |
| 30 | 193 | 204 |
| 31 | 190 | 208 |
| Mean: | 149.3 | 203.0 |




PREDICTED AND OBSERVED SUNSPOT NUMBERS

# CALCIUM PLAGE AND SUNSPOT REGIONS

JULY 1959

| CMP July 1959 | Lat | McMath Plage Number | Return of Region | Calcium Plage Data | | | | Sunspot Data | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CMP Values | | History, Age | | CMP Values | | |
| | | | | Area | Int. | | | Area | Count | History |
| 01.3 | S20 | 5239 | New | 1200 | 3.5 | ℓ — ℓ | 1 | 120 | 1 | b ∧ d |
| 01.5 | S11 | 5234 | 5179 | 7500 | 3 | ℓ — ℓ | 2 | | | |
| 01.5 | N10 | 5240 | 5180 | 300 | 1 | ℓ \ ℓ | 7 | | | |
| 02.4 | N30 | 5241 | 5189 | 2000 | 2.5 | ℓ \ ℓ | 2 | 170 | 1 | ℓ — ℓ |
| 02.7 | N06 | 5245 | 5180 | 200 | 1 | ℓ — ℓ | 7 | | | |
| 03.7 | N09 | 5249 | 5180 | 600 | 2 | ℓ / ℓ | 7 | | | |
| 04.1 | N18 | 5246 | 5185 | 500 | 2 | ℓ / ℓ | 7 | | | |
| 04.3 | S04 | 5261 | New | (200) | (1.5) | b ⌜ ℓ | 1 | | | |
| 04.6 | N12 | 5244 | 5185 | 2700 | 3 | ℓ — ℓ | 7 | 780 | 11 | b / ℓ |
| 05.4 | N26 | 5247 | 5190 | 1400 | 2.5 | ℓ — ℓ | 5 | | | |
| 05.9 | S08 | 5262 | New | 200 | 1.5 | b ⌜ ℓ | 1 | | | |
| 06.5 | N30 | 5253 | 5190 | 1500 | 2 | ℓ — ℓ | 5 | | | |
| 06.6 | N13 | 5248 | 5195 | 2400 | 3 | ℓ — ℓ | 8 | 70 | 2 | ℓ — ℓ |
| 07.4 | S24 | 5250 | 5194 | 1600 | 3 | ℓ — ℓ | 3 | | | |
| 07.6 | S12 | 5251 | 5207 | 400 | 1 | ℓ \ ℓ | 2 | | | |
| 07.9 | N07 | 5271 | New | (600) | (2.5) | b / ℓ | 1 | | | |
| 08.4 | N20 | 5252 | 5196 | 1600 | 2.5 | ℓ — ℓ | 4 | | | |
| 08.4 | S26 | 5254 | 5194 | 1800 | 2.5 | ℓ — ℓ | 3 | | | |
| 08.7 | S17 | 5275 | New | (200) | (2) | b ⌜ ℓ | 1 | | | |
| 09.1 | N09 | 5255 | 5201 | 700 | 1.5 | ℓ \ ℓ | 2 | | | |
| 09.6 | N26 | 5256 | 5200 | 800 | 1.5 | ℓ \ ℓ | 8 | | | |
| 09.6 | S12 | 5259 | New | 600 | 2.5 | ℓ — ℓ | 1 | | | |
| 10.3 | N16 | 5260 | 5197 | 2000 | 2.5 | ℓ — ℓ | 4 | | | |
| 10.8 | S01 | 5257 | New | 800 | 2.5 | ℓ — ℓ | 1 | | | |
| 11.6 | N03 | 5263 | New | 200 | 1.5 | ℓ — ℓ | 1 | | | |
| 12.3 | S11 | 5264 | 5202 | 2000 | 3.5 | ℓ / ℓ | 5 | 240 | 13 | b ⌜ ℓ |
| 13.3 | S16 | 5267 | 5202 | 500 | 1.5 | ℓ \ d | 5 | | | |
| 13.4 | S05 | 5266 | 5202 | 1200 | 2 | ℓ — ℓ | 5 | | | |
| 13.7 | N16 | 5265 | * | 12,000 | 3.5 | ℓ — ℓ | 4,2 | 1430 | 13 | ℓ — ℓ |
| 14.7 | N16 | 5269 | ** | 1500 | 1 | ℓ \ d | | | | |
| 15.6 | N25 | 5270 | 5212 | 2600 | 2.5 | ℓ — ℓ | 4 | | | |
| 15.6 | S19 | 5279 | 5209 | 300 | 1 | b ∧ d | 3 | | | |
| 16.1 | N06 | 5272 | 5211 | 2000 | 3 | ℓ — ℓ | 5 | 280 | 9 | ℓ ⌝ \ d |
| 16.7 | S09 | 5276 | 5232 | 600 | 2 | ℓ / ℓ | 2 | | | |
| 17.6 | S24 | 5273 | 5242 | 2500 | 3 | ℓ — ℓ | 2 | | | |
| 17.6 | N14 | 5274 | 5216 | 5000 | 2.5 | ℓ — ℓ | 9 | 270 | 5 | ℓ \ ℓ |
| 19.5 | N30 | 5277 | 5217 | 3000 | 3 | ℓ — ℓ | 3 | 500 | 23 | ℓ — ℓ |
| 19.8 | N12 | 5280 | 5219 | 8000 | 3 | ℓ — ℓ | 3 | 530 | 3 | ℓ \ ℓ |
| 20.2 | S17 | 5281 | *** | 2700 | 2 | ℓ — ℓ | 3 | | | |
| 21.6 | N27 | 5283 | 5237 | 2500 | 3 | ℓ — ℓ | 2 | 40 | 3 | b ∧ d |
| 22.2 | N10 | 5284 | 5225 | 2000 | 2.5 | ℓ — ℓ | 2 | 50 | 1 | b ∧ d |
| 23.9 | N14 | 5285 | 5227 | 1000 | 1 | ℓ — ℓ | 2 | | | |
| 24.5 | S07 | 5296 | New | (200) | (3.5) | b / ℓ | 1 | | | |
| 25.0 | N26 | 5286 | **** | 3000 | 2 | ℓ — ℓ | 2,3 | 320 | 2 | ℓ \ ℓ |
| 25.0 | S18 | 5287 | 5230 | 2000 | 2 | ℓ — ℓ | 2 | | | |
| 27.2 | N07 | 5302 | New | (200) | (2.5) | b / ℓ | 1 | | | |
| 28.0 | N38 | 5295 | ++ | 200 | 1.5 | b ∧ d | | | | |
| 28.2 | N37 | 5290 | New | 300 | 1.5 | ℓ ⌝ \ d | 1 | | | |
| 28.4 | S16 | 5289 | + | 4500 | 2.5 | ℓ — ℓ | 3,2 | 100 | 1 | ℓ ⌝ \ d |
| 29.6 | N25 | 5291 | 5241 | 3500 | 2.5 | ℓ — ℓ | 3 | 290 | 2 | ℓ — ℓ |
| 30.0 | N14 | 5298 | New | 200 | 1 | b ⌜ ℓ | 1 | | | |
| 30.9 | N25 | 5293 | New | 1000 | 2.5 | ℓ \ ℓ | 1 | 50 | 2 | ℓ ⌝ \ d |
| 31.7 | N35 | 5292 | New | 1400 | 3.5 | ℓ — ℓ | 1 | 140 | 2 | ℓ \ d |
| 31.7 | N12 | 5294 | New | 12,000 | 3.5 | ℓ — ℓ | 1 | 2090 | 14 | ℓ — ℓ |

COMMERCE - STANDARDS - BOULDER

* 5204, 5218
** Merged with 5265
*** 5220, 5223
**** 5228, 5233, 5231
\+ 5234, 5239
++ Same as 5290

# CORONAL LINE EMISSION INDICES

## JULY 1959

| CMP July 1959 | 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 | 119 | 176 | 11 | 15 | 169 | 332 | 17 | 30 | x | x | x | x | x | x | x | x |
| 2 | 138 | 228 | 36 | 70 | 145 | 250 | 15 | 18 | x | x | x | x | x | x | x | x |
| 3 | 147 | 190 | 42 | 91 | 128 | 200 | 14 | 24 | 94 | 120 | x | x | 129 | 180 | x | x |
| 4 | x | x | x | x | x | x | x | x | x | x | 50a | 96a | x | x | 55a | 89a |
| 5 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 6 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 7 | x | x | x | x | x | x | x | x | 102 | 128 | 20 | 43 | 190 | 270 | 30 | 73 |
| 8 | 124a | 203a | 20a | 45a | 63a | 104a | 20a | 30a | x | x | x | x | x | x | x | x |
| 9 | x | x | x | x | x | x | x | x | 63 | 111 | x | x | 146 | 217 | x | x |
| 10 | 228 | 340 | x | x | 66 | 114 | x | x | x | x | x | x | x | x | x | x |
| 11 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 12 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 13 | 85a | 121a | x | x | 56a | 130a | x | x | x | x | x | x | x | x | x | x |
| 14 | 96 | 165 | x | x | 76 | 84 | x | x | 59 | 68 | 24 | 30 | 142 | 220 | 36 | 60 |
| 15 | x | x | x | x | x | x | x | x | 90 | 120 | x | x | 125 | 148 | x | x |
| 16 | x | x | x | x | x | x | x | x | 55 | 75 | x | x | 107 | 150 | x | x |
| 17 | 209 | 295 | 101a | 200a | 130 | 157 | 64a | 150a | x | x | x | x | x | x | x | x |
| 18 | x | x | x | x | x | x | 47a | 56a | x | x | x | x | x | x | x | x |
| 19 | x | x | x | x | x | x | x | x | 135 | 188 | x | x | 180 | 208 | x | x |
| 20 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 21 | 197 | 276 | 40 | 66 | 142 | 204 | 21 | 42 | 83 | 102 | x | x | 164 | 204 | x | x |
| 22 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| 23 | x | x | x | x | 215a | 253a | x | x | 88 | 140 | 44 | 74 | 74 | 98 | 45 | 72 |
| 24 | x | x | x | x | x | x | x | x | 102a | 194a | 64a | 120a | 81a | 96a | 24a | 27a |
| 25 | x | x | x | x | x | x | x | x | 73 | 108 | x | x | 100 | 112 | x | x |
| 26 | x | x | x | x | 105 | 150 | x | x | 97 | 116 | 16 | 18 | 117 | 132 | 13 | 18 |
| 27 | x | x | x | x | x | x | x | x | 90 | 124 | x | x | 85 | 106 | x | x |
| 28 | 74 | 108 | 18 | 21 | 88 | 164 | 41 | 60 | 161 | 302 | x | x | 191 | 290 | x | x |
| 29 | 100 | 150 | x | x | 126 | 186 | x | x | x | x | x | x | x | x | x | x |
| 30 | 94a | 172a | x | x | 92a | 141a | x | x | x | x | x | x | x | x | x | x |
| 31 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

COMMERCE - STANDARDS - BOULDER

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

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STOCKHOLM | 01 | 1015 E | 1035 | | N16 | E69 | 5248 | 20 D | 1 | 1 | 1027 | 1.20 | 3.30 | | | |
| MCMATH | 01 | 1138 | 1149 D | | N17 | W65 | 5227 | 11 D | 1 | 1 | 1145 | | 2.00 | | | |
| SAC PEAK | 01 | 1916 | 1934 | 1920 | N16 | W67 | 5227 | 18 | 1 | 2 | | | 2.50 | | 15 | |
| MCMATH | 01 | 1919 E | 1930 D | | N17 | W68 | 5227 | 11 D | 1 | 1 | 1924 | | 2.50 | | | |
| MCMATH | 01 | 2204 | 2220 D | | N17 | W60 | 5227 | 16 D | 1 | 1 | 2212 | | 2.50 | | | |
| SAC PEAK | 01 | 2204 | 2310 | 2216 | N15 | W62 | 5227 | 66 | 1 | 2 | | | 3.00 | | 15 | |
| HAWAII | 01 | 2212 E | 2220 D | | N16 | W61 | 5227 | 8 D | 1 | 2 | 2212 | 3.10 | 5.20 | | | |
| SAC PEAK | 01 | 2248 | 2334 | 2302 | N15 | E62 | 5248 | 46 | 1 | 2 | | | 4.05 | | 20 | |
| CLIMAX | 01 | 2252 | 2356 | 2313 U | N16 | E61 | 5248 | 64 | 1 | | 2313 | 3.70 | | | | |
| HAWAII | 02 | 0030 | 0038 | 0032 | S17 | W02 | 5234 | 8 | 1 | 3 | 0032 | 2.70 | 2.90 | | | |
| ARCETRI | 02 | 0942 E | 0954 D | | N16 | W73 | 5227 | 12 D | 1 | 3 | | | | | | |
| MCMATH | 02 | 1432 | 1520 | 1446 | N13 | E32 | 5244 | 48 | 1 | 1 | 1446 | | 2.00 | | | |
| LOCARNO | 02 | 1435 | 1500 | | N13 | E30 | 5244 | 25 | 1 | 3 | | | | | | |
| HUANCAYO | 02 | 1437 | 1458 | 1442 | N13 | E33 | 5244 | 21 | 1& | 2 | 1442 | 4.60 | 5.50 | 3.20 | | |
| SAC PEAK | 02 | 1438 | 1502 | 1446 | N13 | E31 | 5244 | 24 | 1 | 2 | | | 2.95 | | 16 | |
| CAPRI S | 02 | 1439 E | 1501 D | | N15 | E33 | 5244 | 22 D | 1 | 2 | 1442 | 2.00 | 2.50 | | | |
| ZURICH | 02 | 1441 | 1456 | | N13 | E31 | 5244 | 15 | 1 | 2 | 1441 | | 5.00 | | | |
| CAPRI G | 02 | 1458 E | 1515 D | | N12 | E29 | 5244 | 17 D | 1 | | | | 5.00 | | | |
| CAPRI G | 02 | 1458 E | 1515 D | | N18 | E53 | 5248 | 17 D | 1 | | | | 4.00 | | | |
| LOCARNO | 02 | 1620 | 1650 | | S20 | E52 | 5250 | 30 | 1 | 3 | | | | | | |
| HUANCAYO | 02 | 1622 E | 1653 D | 1622 | S35 | E65 | 5254 | 31 D | 1 | 2 | 1622 | 1.00 | 2.60 | 1.80 | | |
| LOCARNO | 03 | 0855 E | 0940 | | N11 | E18 | 5244 | | 1& | 2 | | | | | | |
| MCMATH | 03 | 1214 | 1235 | 1220 | N16 | E42 | 5248 | 21 | 1 | 1 | 1220 | | 2.10 | | | |
| MCMATH | 03 | 1952 E | 2040 D | | N11 | E13 | 5244 | 48 D | 1 | 1 | 1952 | | 3.50 | | | |
| LOCARNO | 04 | 0625 E | 0640 | | N09 | E08 | 5244 | 15 D | 1& | 2 | 0625 | | 2.00 | | | |
| LOCARNO | 04 | 1540 | 1609 | 1545 | N00 | E78 | 5257 | 29 | 1& | 1 | 1545 | | 4.00 | | | |
| MCMATH | 04 | 1810 | 1835 | 1815 | N10 | W04 | 5244 | 25 | 1 | 1 | 1825 | | 2.00 | | | Slow S-SWF |
| MCMATH | 04 | 1902 | 1955 | 1908 | N10 | W04 | 5244 | 53 | 1 | 1 | 1908 | | 2.00 | | | |
| HAWAII | 05 | 0000 | 0102 | 0008 | S22 | W45 | 5239 | 62 | 2 | 3 | 0008 | 6.10 | 9.20 | | | |
| LOCKHEED | 05 | 0001 | 0100 | 0006 | S23 | W43 | 5239 | 59 | 1 | 2 | | 2.40 | | | | |
| CAPRI G | 05 | 0720 E | 0727 D | | N10 | E54 | 5255 | 7 D | 1 | | | | 3.00 | | | |
| CAPRI G | 05 | 0800 E | 0815 | | S12 | W50 | 5234 | 15 D | 1 | | | | 2.50 | | | |
| WENDEL | 05 | 0950 E | 1009 D | | N23 | W02 | 5247 | 19 D | 1& | | | | 4.00 | | | |
| CAPRI G | 05 | 0952 E | 1003 | | N20 | W01 | 5247 | 11 D | 1 | | | | 4.00 | | | |
| WENDEL | 05 | 1053 E | 1124 D | | N08 | W14 | 5244 | 31 D | 1 | | | | 3.00 | | | |
| LOCARNO | 05 | 1310 | 1350 | | N07 | W17 | 5244 | 40 | 1& | 2 | | | | | | |
| WENDEL | 05 | 1431 E | 1453 D | | N08 | W17 | 5244 | 22 D | 1 | | | | 3.00 | | | |
| WENDEL | 05 | 1536 E | 1702 D | | N09 | W17 | 5244 | 86 D | 2 | | | | 12.00 | | | |
| SAC PEAK | 05 | 1543 | 1551 D | 1549 | N08 | W20 | 5244 | 8 D | 1 | 1 | | | 3.05 | | 17 | |
| LOCARNO | 05 | 1545 | 1600 | | N07 | W18 | 5244 | 15 | 1& | 2 | | | | | | |
| CLIMAX | 05 | 1546 | 1608 | 1551 U | N07 | W22 | 5244 | 22 | 1 | | 1551 | 2.70 | | | | |
| CAPRI G | 05 | 1546 | 1650 D | | N10 | W17 | 5244 | 64 D | 2 | | | | 8.00 | | | |
| CAPRI S | 05 | 1548 E | 1628 D | | N09 | W17 | 5244 | 40 D | 2 | 3 | 1617 | 4.60 | 4.80 | | | |
| CLIMAX | 05 | 1619 | 1653 D | 1641 U | N10 | W16 | 5244 | 34 D | 1 | | 1641 | 4.80 | | | | |
| MCMATH | 05 | 1625 E | 1730 D | | N10 | W17 | 5244 | 65 D | 1 | 1 | 1635 | | 2.00 | | | |
| SAC PEAK | 05 | 1900 E | 1921 | 1905 | N10 | W20 | 5244 | 21 D | 1 | 1 | | | 2.25 | | 15 | |
| MITAKA | 05 | 2330 | 2350 D | 2345 | N08 | W24 | 5244 | 20 D | 1 | 1 | 2345 | 1.03 | 1.10 | 1.60 | 115 | S-SWF |
| ZURICH | 06 | 0655 E | 0710 | | N08 | W27 | 5244 | 15 D | 1 | 3 | 0655 | | 5.00 | | | |

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ARCETRI | 06 | 0815 E | 0818 D | | N16 | W22 | 5244 | 3 D | 1 | 3 | | | | | | |
| MCMATH | 06 | 1305 E | 1345 D | | N11 | W26 | 5244 | 40 D | 1 | 1 | 1330 | | 2.00 | | | |
| MCMATH | 06 | 1740 | 1800 D | | N10 | W30 | 5244 | 20 D | 1 | 1 | 1743 | | 2.00 | | | |
| MCMATH | 06 | 1922 | 1945 D | 1934 | N10 | W30 | 5244 | 23 D | 1 | 1 | 1934 | | 2.00 | | | |
| NIZAMIAH | 07 | 0425 E | 0427 D | | N11 | W39 | 5244 | 2 D | 1 | 2 | 0425 | 1.82 | 2.34 | 1.30 | | |
| MITAKA | 07 | 0527 | 0535 | 0528 | N10 | W40 | 5244 | 8 | 1 | 1 | 0528 | .82 | 1.03 | 2.45 | 149 | |
| CAPRI G | 07 | 0532 E | 0543 D | | N09 | W41 | 5244 | 11 D | 1 | | | | 2.00 | | | |
| SIMEIZ | 07 | 0718 E | 0734 D | 0720 U | N16 | E42 | 5260 | 16 D | 1 | 1 | 0720 | | | 1.90 | | |
| CAPRI G | 07 | 0723 E | 0726 D | | N17 | E40 | 5260 | 3 D | 1 | | | | 2.50 | | | |
| ZURICH | 07 | 1023 | 1036 | | N17 | W11 | 5248 | 13 | 1 | 2 | 1023 | | 2.00 | | | |
| CAPRI G | 07 | 1025 E | 1042 | | N17 | W10 | 5248 | 17 D | 1 | | | | 4.00 | | | |
| CAPRI G | 07 | 1027 E | 1042 | | N11 | W36 | 5244 | 15 D | 1 | | | | 3.00 | | | |
| ZURICH | 07 | 1249 | 1254 D | | N11 | W36 | 5244 | 5 D | 1 | 2 | 1249 | | 1.00 | | | |
| CAPRI G | 07 | 1303 E | 1318 | | N15 | E90 | 5265 | 15 D | 1 | | | | | | | |
| LOCARNO | 07 | 1545 | 1555 | | N12 | W35 | 5244 | 10 | 1 | 1 | 1550 | | 1.00 | | | |
| MITAKA | 08 | 0521 E | 0528 D | | N12 | W47 | 5244 | 7 | 1 | 1 | 0521 | 1.23 | 1.70 | | | |
| WENDEL | 08 | 0620 E | 0633 | | N12 | W51 | 5244 | 13 D | 1 | | | | 3.00 | | | |
| WENDEL | 08 | 0729 E | 0746 | | N09 | W47 | 5244 | 17 D | 1& | | | | 5.00 | | | |
| KRASNYA | 08 | 0818 | 0843 D | 0829 | N10 | W48 | 5244 | 25 D | 2 | | | | | | | |
| ARCETRI | 08 | 0820 | 0927 | | N09 | W52 | 5244 | 69 | 2 | 3 | 0837 | 6.60 | 10.70 | | | |
| CAPRI G | 08 | 0821 | 0940 | | N11 | W47 | 5244 | 79 | 2 | | 0830 | | 9.00 | | | |
| CAPRI S | 08 | 0822 | 0937 | | N11 | W50 | 5244 | 75 | 2 | 3 | 0844 | 6.50 | 10.10 | | | |
| WENDEL | 08 | 0822 E | 0946 | | N10 | W47 | 5244 | 84 D | 2 | | | | 9.00 | | | Slow S-SWF |
| ZURICH | 08 | 0823 | 0937 | | N10 | W52 | 5244 | 14 | 2 | 3 | 0841 | | 9.00 | | | |
| ATHENS | 08 | 0824 E | 0910 D | | N10 | W50 | 5244 | 46 D | 3& | | | | | | | |
| UTRECHT | 08 | 0826 E | 0831 | | N12 | W48 | 5244 | 5 D | 2 | | | | | | | |
| WENDEL | 08 | 0827 E | 0939 | | N13 | W53 | 5244 | 72 D | 1& | | | | 7.00 | | | |
| R O HERST | 08 | 0855 E | 0922 | 0901 | N12 | W55 | 5244 | 27 D | 1 | 2 | 0901 | 1.20 | 1.90 | | | |
| STOCKHOLM | 08 | 0908 E | 0950 | | N15 | W49 | 5244 | 42 D | 1 | 3 | 0910 | 2.00 | 3.40 | | | |
| MCMATH | 08 | 1044 E | 1130 D | | N13 | W50 | 5244 | 46 D | 1 | 1 | 1055 | | 2.10 | | | |
| HUANCAYO | 08 | 1445 E | 1453 | 1447 | N18 | E77 | 5265 | 8 D | 1 | 2 | 1447 | .70 | 3.50 | 2.70 | | G-SWF |
| HUANCAYO | 08 | 1548 E | 1606 | 1549 | N16 | E71 | 5265 | 18 D | 1 | 2 | 1549 | 1.60 | 5.00 | 2.20 | | |
| ZURICH | 08 | 1625 | 1630 | | N17 | E80 | 5265 | 5 | 1 | 3 | 1625 | | 4.00 | | | |
| HUANCAYO | 08 | 2025 E | 2055 | 2037 | N16 | E75 | 5265 | 30 D | 1 | 2 | 2037 | 1.40 | 4.90 | 3.10 | | |
| MITAKA | 08 | 2359 E | 2413 D | 2400 | N09 | W61 | 5244 | 14 D | 1 | 1 | 2359 | .77 | 1.50 | 1.98 | 113 | |
| MITAKA | 09 | 0314 | 0327 | 0317 | N08 | W60 | 5244 | 13 | 1 | 1 | 0325 | 1.54 | 3.20 | 1.57 | 103 | |
| SIMEIZ | 09 | 0642 E | 0715 D | 0647 U | N05 | W70 | 5244 | 33 D | 1 | 1 | 0649 | | 2.50 | 1.50 | 72 | |
| ZURICH | 09 | 0645 | 0655 | | N05 | W68 | 5244 | 10 | 1 | 3 | 0645 | | 2.00 | | | |
| CAPRI G | 09 | 0645 E | 0700 | | N06 | W69 | 5244 | 15 D | 1 | | | | | | | |
| SIMEIZ | 09 | 0710 | 0720 | 0713 | N16 | W46 | 5248 | 10 | 1 | 1 | 0713 | | 2.80 | | 64 | |
| ZURICH | 09 | 0712 | 0720 | | N17 | W44 | 5248 | 8 | 1 | 3 | 0712 | | 1.00 | | | |
| CAPRI G | 09 | 0713 E | 0719 | | N16 | W43 | 5248 | 6 D | 1 | | | | 2.00 | | | |
| CAPRI G | 09 | 0713 E | 0720 D | | N16 | E70 | 5269 | 7 D | 1 | | | | | | | |
| ARCETRI | 09 | 0804 E | 0913 D | | N16 | E71 | 5269 | 69 D | 1& | 3 | 0850 | 1.70 | 5.10 | | | G-SWF |
| CAPRI G | 09 | 0828 E | 0850 | | N15 | E70 | 5269 | 22 D | 1 | | | | 4.00 | | | |
| CAPRI G | 09 | 0835 E | 0842 | | N16 | W00 | 5260 | 7 D | 1 | | | | 2.00 | | | |
| ZURICH | 09 | 0929 | 0936 | | N17 | E68 | 5269 | 7 | 1 | 3 | 0929 | | 5.00 | | | |
| MCMATH | 09 | 1150 E | 1230 D | | N12 | W66 | 5244 | 40 D | 1 | 1 | 1205 | | 2.10 | | | |
| WENDEL | 09 | 1250 E | 1306 D | | N19 | W46 | 5248 | 16 D | 1 | | | | 3.00 | | | |
| CAPRI G | 09 | 1254 E | 1302 | | N17 | W45 | 5248 | 8 D | 1 | | | | 2.00 | | | |

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Hα | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WENDEL | 09 | 1413 E | 1429 | | N17 | E68 | 5269 | 16 D | 1 | | | | 3.00 | | | |
| LOCARNO | 09 | 1413 | 1458 | | N17 | E66 | 5269 | 45 | 1& | 1 | 1426 | | 3.00 | | | |
| WENDEL | 09 | 1734 E | 1749 D | | N12 | W64 | 5244 | 12 D | 1& | | | | 5.00 | | | |
| MCMATH | 09 | 1750 E | 1810 D | | N10 | W71 | 5244 | 20 D | 1 | 1 | 1758 | | 2.10 | | | |
| MCMATH | 09 | 1810 | 1830 D | 1815 | N14 | E67 | 5269 | 20 D | 1 | 1 | 1815 | | 3.50 | | | S-SWF |
| MCMATH | 09 | 1840 | 1930 D | 1856 | N14 | E67 | 5269 | 50 D | 1 | 1 | 1856 | | 2.00 | | | |
| MCMATH | 09 | 1930 | 2320 D | 1940 | N14 | E67 | 5269 | 230 D | 2 | 1 | 1955 | | 5.00 | | | |
| LOCKHEED | 09 | 1933 | 2010 D | 1956 | N19 | E70 | 5269 | 37 D | 1& | 2 | | 2.40 | | | | |
| HAWAII | 09 | 1937 E | 2122 | 1959 | N19 | E67 | 5269 | 105 D | 2& | 3 | 1959 | 10.30 | 23.70 | | | S-SWF |
| HUANCAYO | 09 | 1944 E | 2104 | 2001 | N21 | E65 | 5269 | 80 D | 2 | 2 | 2001 | 4.70 | 11.10 | 5.40 | | |
| SAC PEAK | 09 | 2024 E | 2250 D | 2025 | N18 | E67 | 5269 | 146 D | 1 | 2 | | | 3.15 | | 20 | S-SWF |
| HAWAII | 09 | 2226 | 2232 | 2228 | N18 | E65 | 5269 | 6 | 1 | 3 | 2228 | 2.10 | 4.70 | | | |
| MCMATH | 09 | 2115 E | 2155 D | 2130 | N19 | E48 | 5265 | 40 D | 1 | 1 | 2130 | | 2.00 | | | |
| MCMATH | 09 | 2155 | 2320 D | 2230 | N21 | E55 | 5265 | 85 D | 1 | 1 | 2230 | | 3.00 | | | |
| SYDNEY | 10 | 0210 E | 0510 D | 0240 | N22 | E70 | 5265 | 180 D | 3& | | | | | | | Slow S-SWF |
| TASHKENT | 10 | 0216 E | | | N18 | E61 | 5265 | | 3& | | | | | | | |
| CAPRI G | 10 | 0514 E | 0600 | | N08 | W79 | 5244 | 46 D | 1& | | | | | | | |
| CAPRI G | 10 | 0514 E | 0730 | | N16 | E59 | 5265 | 136 D | 3& | | | | 32.00 | | | |
| SIMEIZ | 10 | 0539 E | 0908 D | 0908 U | N21 | E60 | 5265 | 209 D | 3 | 1 | 0555 | | 65.00 | 1.80 | 128 | |
| LOCARNO | 10 | 0555 E | 0900 | | N15 | E60 | 5265 | 185 D | 3 | 1 | 0710 | | 18.00 | | | G-SWF |
| CAPRI S | 10 | 0600 E | 0710 D | | N20 | E53 | 5265 | 70 D | 3 | 3 | 0638 | 12.00 | 22.00 | | | |
| WENDEL | 10 | 0604 E | | | N18 | E54 | 5265 | | 2 | | | | 10.00 | | | |
| ARCETRI | 10 | 0827 E | 0836 D | | N18 | E50 | 5265 | 9 D | 1 | 3 | 0836 | 3.30 | 5.00 | | | |
| MCMATH | 10 | 1049 E | 1200 D | | N16 | E48 | 5265 | 71 D | 1 | 1 | 1100 | | 2.00 | | | |
| ZURICH | 10 | 1319 | 1325 | | N18 | E58 | 5265 | 6 | 1 | 3 | 1319 | | 2.00 | | | |
| WENDEL | 10 | 1356 E | 1434 D | | N12 | W74 | 5244 | 38 D | 1 | | | | 3.00 | | | |
| WENDEL | 11 | 0555 E | 0734 D | | N14 | E46 | 5265 | 99 D | 1& | | | | 6.00 | | | |
| ARCETRI | 11 | 0810 E | 0955 D | | S14 | E16 | 5264 | 105 D | 2 | 3 | 0842 | 5.00 | 5.50 | | | |
| LOCARNO | 11 | 0825 E | 0925 | | S14 | E15 | 5264 | 60 D | 2- | 1 | 0830 | | 4.00 | | | |
| ZURICH | 11 | 0838 E | 0924 D | | S14 | E17 | 5264 | 46 D | 2 | 1 | 0838 | | 7.00 | | | |
| STOCKHOLM | 11 | 0902 E | 1010 | | S14 | E16 | 5264 | 68 D | 1 | 2 | 0914 | 2.50 | 2.70 | | | |
| ARCETRI | 11 | 0840 E | 0853 D | | N13 | W90 | 5244 | 13 D | 1 | 3 | 0853 | .60 | | | | |
| LOCARNO | 11 | 0850 E | 0908 | | N17 | E45 | 5265 | 18 D | 1 | 1 | 0850 | | 1.00 | | | |
| STOCKHOLM | 11 | 0902 E | 0945 | | N15 | E44 | 5265 | 43 D | 1 | 2 | 0920 | 3.00 | 4.50 | | | |
| ZURICH | 11 | 0923 E | 0924 D | | N16 | E42 | 5265 | 1 D | 1 | 1 | 0923 | | 1.00 | | | |
| LOCARNO | 11 | 0925 | 0950 | 0933 | N17 | E44 | 5265 | 25 | 1 | 1 | 0933 | | 1.00 | | | |
| LOCARNO | 11 | 0928 | 1032 | 0940 | S14 | E14 | 5264 | 64 | 2- | 1 | 0940 | | 6.00 | | | |
| CAPRI S | 11 | 0932 E | 1004 D | | S14 | E16 | 5264 | 32 | 1 | 3 | 0939 | 2.00 | 2.20 | | | |
| LOCARNO | 11 | 0938 | 1006 | | S25 | E78 | 5273 | 28 | 1& | 1 | | | | | | |
| WENDEL | 11 | 1056 E | 1105 D | | N16 | E43 | 5265 | 9 D | 1& | | | | 5.00 | | | |
| MCMATH | 11 | 1630 | 1730 D | 1702 | N16 | E45 | 5265 | 60 D | 1 | 1 | 1702 | | 2.10 | | | |
| MCMATH | 11 | 1905 E | 1950 D | | N08 | W57 | 5271 | 45 D | 1 | 1 | 1925 | | 3.00 | | | |
| MCMATH | 11 | 2019 E | 2029 D | | N16 | E40 | 5265 | 10 D | 1 | 1 | 2022 | | 4.00 | | | |
| CLIMAX | 11 | 2058 | 2130 | 2107 U | N14 | E38 | 5265 | 32 | 1 | | 2107 | 5.10 | | | | |
| MCMATH | 11 | 2101 | 2150 D | 2111 | N15 | E40 | 5265 | 49 D | 1 | 2 | 2111 | | 3.00 | | | |
| MCMATH | 11 | 2206 | 2255 | 2208 | N15 | E40 | 5265 | 49 | 1 | 2 | 2208 | | 3.00 | | | |
| CAPRI G | 12 | 0512 E | 0525 | | N06 | W58 | 5271 | 13 D | 1 | | | | 2.00 | | | |
| CAPRI G | 12 | 0512 E | 0535 | | S26 | E70 | 5273 | 23 D | 1 | | | | 5.00 | | | |
| CAPRI G | 12 | 0512 E | 0540 | | N19 | E27 | 5265 | 28 D | 2 | | | | 10.00 | | | S-SWF |
| CAPRI G | 12 | 0534 | 0544 | | N26 | E90 | 5277 | 10 | 1 | | | | | | | |

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEASUREMENTS MEAS. AREA Sq. Deg. | MEASUREMENTS CORR. AREA Sq. Deg. | MEASUREMENTS MAX. WIDTH Ha | MEASUREMENTS MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIMEIZ | 12 | 0623 | 0647 D | 0625 U | N06 | W60 | 5271 | 24 D | 1 | 1 | 0630 | | 2.50 | 2.30 | 100 | S-SWF |
| CAPRI G | 12 | 0628 E | 0640 D | | N06 | W58 | 5271 | 12 D | 1 | | | | 2.00 | | | |
| SIMEIZ | 12 | 0623 E | 0650 D | 0640 U | N20 | E35 | 5265 | 27 D | 1& | 1 | 0637 | | 11.70 | 3.60 | 140 | |
| CAPRI G | 12 | 0636 E | 0655 | | N18 | E35 | 5265 | 19 D | 1 | | | | 3.00 | | | |
| ATHENS | 12 | 0636 E | 0656 | | N18 | E35 | 5265 | 20 D | 2 | | | | | | | S-SWF |
| WENDEL | 12 | 0640 E | 0656 | | N15 | E33 | 5265 | 16 D | 1& | | | | 5.00 | | | |
| SIMEIZ | 12 | 0640 E | 0650 D | 0642 U | N16 | E89 | 5274 | 10 D | 1& | 1 | 0642 | | 7.00 | | 88 | |
| MITAKA | 12 | 0642 E | 0656 | | N16 | E32 | 5265 | 14 D | 1 | 1 | 0642 | 1.53 | 1.94 | 1.86 | 120 | |
| MITAKA | 12 | 0642 E | 0647 | | N16 | W89 | 5248 | 5 D | 1 | 1 | 0642 | 1.03 | | | | |
| SIMEIZ | 12 | 0835 | 0850 | 0844 | N07 | W62 | 5271 | 15 D | 1 | 1 | 0844 | | 4.00 | | 96 | |
| ARCETRI | 12 | 0843 E | 1000 D | | S14 | E02 | 5264 | 77 D | 1 | 3 | | | | | | |
| ARCETRI | 12 | 0907 E | 1000 D | | N17 | E33 | 5265 | 53 D | 1 | 3 | | | | | | |
| LOCARNO | 12 | 0950 E | 1012 | | N16 | E29 | 5265 | 22 D | 1& | 2 | 0950 | | 2.00 | | | |
| WENDEL | 12 | 0923 E | 1002 | | N16 | E31 | 5265 | 39 D | 1& | | | | 6.00 | | | |
| CAPRI G | 12 | 0915 E | 0920 | | S26 | E65 | 5273 | 5 D | 1 | | | | 3.00 | | | |
| CAPRI S | 12 | 0936 | 1000 D | | S11 | E01 | 5264 | 24 D | 1 | 3 | 0943 | 2.20 | 2.20 | | | |
| WENDEL | 12 | 0936 E | 1004 | | S13 | E01 | 5264 | 28 D | 1& | | | | 7.00 | | | |
| CAPRI G | 12 | 0944 E | 1005 | | S13 | E02 | 5264 | 21 D | 1 | | | | 3.50 | | | |
| LOCARNO | 12 | 0950 E | 1008 | | S13 | E02 | 5264 | 18 D | 2- | 2 | 0950 | | 4.00 | | | |
| CAPRI G | 12 | 1006 | 1010 | | N26 | E90 | 5277 | 4 | 1 | | | | | | | |
| LOCARNO | 12 | 1050 | 1110 | 1055 | N06 | W62 | 5271 | 20 | 1 | 2 | 1055 | | 1.00 | | | |
| CAPRI G | 12 | 1058 E | 1105 | | N06 | W60 | 5271 | 7 | 1 | | | | 2.00 | | | |
| CAPRI G | 12 | 1148 E | 1155 D | | N10 | E90 | 5280 | 7 | 1 | | | | | | | |
| MCMATH | 12 | 1148 E | 1300 D | | S15 | W01 | 5264 | 72 D | 1 | 2 | 1157 | | 2.00 | | | |
| MCMATH | 12 | 1148 E | 1330 D | | N16 | E30 | 5265 | 102 D | 1 | 2 | 1157 | | 3.00 | | | |
| LOCARNO | 12 | 1215 E | 1320 D | | N16 | E28 | 5265 | 65 D | 1 | 2 | 1220 | | 3.00 | | | |
| LOCARNO | 12 | 1250 | 1302 | 1255 | N07 | W64 | 5271 | 12 D | 1 | 2 | 1255 | | 1.00 | | | |
| CAPRI G | 12 | 1258 E | 1340 D | | N17 | E30 | 5265 | 42 D | 1 | | | | 4.00 | | | |
| CAPRI S | 12 | 1300 E | 1340 D | | N18 | E30 | 5265 | 40 D | 1 | 2 | 1336 | 1.70 | 2.00 | | | |
| MCMATH | 12 | 1410 E | 1515 | 1425 | N16 | E30 | 5265 | 65 D | 2 | 1 | 1425 | | 6.00 | | | |
| MCMATH | 12 | 1419 E | 1540 D | 1451 | S15 | W01 | 5264 | 81 D | 1 | 1 | 1451 | | 2.50 | | | |
| AROSA | 12 | 1455 E | 1510 D | | S13 | W01 | 5264 | 15 D | 1 | | | | | | | |
| MCMATH | 12 | 1629 | 1700 D | 1633 | S14 | W03 | 5264 | 31 D | 1 | 1 | 1633 | | 3.00 | | | |
| CAPRI G | 12 | 1637 E | | | N26 | E90 | 5277 | | 1 | | | | | | | |
| MCMATH | 12 | 2006 | 2105 | 2015 | N08 | W70 | 5271 | 59 | 1 | 2 | 2015 | | 2.00 | | | S-SWF |
| MCMATH | 12 | 2020 | 2200 | 2105 | S14 | W06 | 5264 | 100 | 2 | 2 | 2105 | | 5.00 | | | |
| HAWAII | 12 | 2105 E | 2124 | 2105 | S12 | W11 | 5264 | 19 D | 1 | 3 | 2105 | 3.10 | 3.30 | | | |
| SAC PEAK | 12 | 2152 | 2334 D | 2230 U | N18 | E26 | 5265 | 102 D | 2 | 1 | | | 12.35 | | 18 | |
| MCMATH | 12 | 2154 | 2245 D | 2240 | N17 | E25 | 5265 | 51 D | 3 | 2 | 2240 | | 13.00 | | | |
| LOCKHEED | 12 | 2154 | 2335 | 2230 | N20 | E23 | 5265 | 101 | 2 | 2 | | 7.30 | | | | G-SWF |
| HAWAII | 12 | 2220 | 2254 | 2230 | N18 | E26 | 5265 | 34 | 2 | 3 | 2230 | 11.50 | 13.30 | | | |
| SAC PEAK | 12 | 2246 | 2256 | 2250 | S23 | E58 | 5273 | 10 | 1 | 1 | | | 2.15 | | 14 | |
| CLIMAX | 12 | 2315 E | 2353 D | | N19 | E25 | 5265 | 38 D | 2 | | 2331 | 6.70 | | | | |
| WENDEL | 13 | 0626 | 0704 D | | N14 | E20 | 5265 | 38 D | 1& | | | | 5.00 | | | Slow S-SWF |
| LOCARNO | 13 | 0914 | 0925 | 0920 | N16 | E16 | 5265 | 11 | 1 | 2 | 0920 | | 2.00 | | | |
| LOCARNO | 13 | 0955 E | 1010 D | | N16 | E16 | 5265 | 15 D | 1& | 2 | 1000 | | 4.00 | | | |
| ZURICH | 13 | 0956 | 1006 D | | N15 | E16 | 5265 | 10 D | 1 | 2 | 0956 | | 3.00 | | | |
| NIZAMIAH | 13 | 0957 E | 1004 D | | N15 | E16 | 5265 | 7 D | 1& | 1 | 0957 | 2.43 | 2.56 | 1.70 | | |
| ARCETRI | 13 | 1004 E | 1011 D | | N16 | E20 | 5265 | 7 D | 1 | 3 | | | | | | |
| CAPRI G | 13 | 1006 E | 1009 | | N16 | E16 | 5265 | 3 D | 1 | | | | 2.00 | | | |
| AROSA | 13 | 1029 | 1040 D | | N05 | W77 | 5271 | 11 D | 1 | | | | | | | |
| CAPRI S | 13 | 1031 E | 1108 D | | N05 | W73 | 5271 | 37 D | 1 | 3 | 1035 | 1.00 | 3.70 | | | |

COMMERCE - STANDARDS - BOULDER

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEASUREMENTS MEAS. AREA Sq. Deg. | MEASUREMENTS CORR. AREA Sq. Deg. | MEASUREMENTS MAX. WIDTH Ha | MEASUREMENTS MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPRI G | 13 | 1032 E | 1043 | | N06 | E74 | 5280 | 11 D | 1 | | | | | | | |
| CAPRI G | 13 | 1035 E | 1113 D | | N17 | E18 | 5265 | 38 D | 1 | | | | 3.00 | | | |
| WENDEL | 13 | 1050 E | 1118 D | | N19 | E21 | 5265 | 28 D | 1 | | | | 4.00 | | | |
| MCMATH | 13 | 1050 E | 1230 | | N16 | E17 | 5265 | 100 D | 1& | 1 | 1055 | | 4.00 | | | |
| WENDEL | 13 | 1050 E | 1056 D | | N07 | W78 | 5271 | 6 D | 1 | | | | 4.00 | | | |
| CAPRI G | 13 | 1106 E | 1120 D | | N06 | E74 | 5280 | 14 D | 1 | | | | | | | |
| MCMATH | 13 | 1200 | 1225 | 1208 | S26 | E55 | 5273 | 25 | 1 | 2 | 1208 | | 2.00 | | | |
| LOCARNO | 13 | 1255 E | 1355 | 1320 | N16 | E15 | 5265 | 60 D | 1& | 2 | 1320 | | 5.00 | | | |
| MCMATH | 13 | 1258 | 1430 | 1309 | N16 | E15 | 5265 | 92 | 1 | 1 | 1309 | | 2.00 | | | |
| ZURICH | 13 | 1300 E | 1338 D | | N17 | E14 | 5265 | 38 D | 1 | 2 | 1323 | | 3.00 | | | |
| CAPRI G | 13 | 1309 E | 1350 D | | N17 | E16 | 5265 | 41 D | 1 | | | | 5.00 | | | |
| LOCARNO | 13 | 1320 | 1340 | 1325 | N13 | E79 | 5280 | 20 | 1 | 2 | 1325 | | 2.00 | | | |
| ZURICH | 13 | 1325 | 1338 D | | N13 | E80 | 5280 | 13 D | 1 | 2 | 1325 | | 2.00 | | | |
| MCMATH | 13 | 1450 | 1550 | 1510 | N16 | E15 | 5265 | 60 | 1 | 1 | 1510 | | 2.10 | | | |
| MCMATH | 13 | 1825 | 1850 D | | S27 | E50 | 5273 | 25 D | 1 | 1 | 1840 | | 2.00 | | | |
| MCMATH | 13 | 1901 E | 2303 D | 2000 | S25 | E48 | 5273 | 242 D | 2 | 1 | 2000 | | 6.00 | | | |
| SAC PEAK | 13 | 1920 | 2130 D | 2016 U | S24 | E47 | 5273 | 130 D | 2 | 2 | | | 5.70 | | 18 | |
| LOCKHEED | 13 | 1930 | 2210 | 2015 | S15 | E50 | 5273 | 160 | 1 | 3 | | 2.70 | | | | Slow S-SWF |
| CLIMAX | 13 | 2012 E | 2044 D | | S23 | E45 | 5273 | 32 D | 2 | | 2044 | 5.20 | | | | |
| HUANCAYO | 13 | 2014 E | 2112 D | 2044 | S21 | E39 | 5273 | 58 D | 2& | 2 | 2044 | 9.40 | 13.50 | 2.50 | | |
| NIZAMIAH | 14 | 0325 E | 0444 D | | N17 | E06 | 5265 | 79 D | 3 | 1 | 0340 | 18.23 | 18.77 | 3.30 | | |
| TASHKENT | 14 | 0342 E | 0434 D | 0349 | N16 | E07 | 5265 | 52 D | 3& | | | | | | | |
| ONDREJOV | 14 | 0425 E | 0545 | | N16 | E05 | 5265 | 80 D | 3 | | | | | | | |
| LOCARNO | 14 | 0445 E | 0810 D | | N17 | E06 | 5265 | 205 D | 3& | 2 | 0610 | | 28.00 | | | |
| CAPRI G | 14 | 0452 E | 0720 | | N15 | E00 | 5265 | 148 D | 3& | | 0530 | | 30.00 | | | S-SWF |
| WENDEL | 14 | 0520 E | 0936 D | | N26 | E13 | 5270 | 256 D | 1& | | | | 7.00 | | | |
| WENDEL | 14 | 0520 E | 1121 D | 0527 | N15 | E01 | 5265 | 361 D | 3& | | | | 72.00 | | | |
| SIMEIZ | 14 | 0553 E | 0945 D | 0945 U | N17 | E02 | 5265 | 232 D | 3 | 2 | 0553 | | 50.00 | 2.00 | 148 | |
| AROSA | 14 | 0555 E | 0600 D | | N19 | E01 | 5265 | 5 D | 3 | | | | | | | |
| CAPRI S | 14 | 0600 E | 0730 D | | N13 | E00 | 5265 | 90 D | 2 | 3 | 0608 | 12.00 | 12.50 | | | |
| SCHAUINS | 14 | 0640 E | 0901 | | N18 | W01 | 5265 | 141 D | 3 | | | | | | | |
| ZURICH | 14 | 0716 E | 0730 | | N12 | E05 | 5265 | 14 D | 1 | 3 | 0716 | | 2.00 | | | |
| ZURICH | 14 | 0716 E | 0740 | | N23 | E04 | 5270 | 24 D | 1 | 3 | 0716 | | 1.00 | | | |
| ZURICH | 14 | 0748 | 0818 | | N23 | E04 | 5270 | 30 | 1 | 3 | 0748 | | 1.00 | | | |
| ARCETRI | 14 | 0840 E | 0846 D | | N26 | E13 | 5270 | 6 D | 1 | 3 | 0840 | 2.10 | 2.30 | | | |
| ARCETRI | 14 | 0840 E | 0958 D | | N17 | E03 | 5265 | 78 D | 1 | 3 | 0840 | 4.00 | 4.00 | | | |
| WENDEL | 14 | 0922 E | 0936 D | | N30 | E65 | 5277 | 14 D | 1 | | | | 3.00 | | | |
| LOCARNO | 14 | 1140 E | 1145 D | | N11 | E07 | 5265 | 5 D | 1& | 2 | 1140 | | 3.00 | | | |
| WENDEL | 14 | 1145 E | 1148 D | | N12 | E10 | 5265 | 3 D | 1 | | | | 4.00 | | | |
| CAPRI G | 14 | 1146 E | 1158 | | N13 | E05 | 5265 | 12 D | 1 | | | | 2.00 | | | |
| MCMATH | 14 | 1230 | 1320 | 1236 | N15 | E01 | 5265 | 50 | 1 | 2 | 1236 | | 2.00 | | | |
| ZURICH | 14 | 1333 | 1337 | | N15 | W00 | 5265 | 4 | 1 | 3 | 1333 | | 1.00 | | | |
| MCMATH | 14 | 1332 | 1350 D | 1337 | N03 | E25 | 5272 | 18 D | 1 | 1 | 1337 | | 2.20 | | | |
| ZURICH | 14 | 1333 | 1352 | | N03 | E24 | 5272 | 19 | 1& | 3 | 1333 | | 5.00 | | | |
| CAPRI S | 14 | 1334 | 1350 | | N04 | E24 | 5272 | 16 | 1 | 3 | 1340 | 2.80 | 3.10 | | | |
| CAPRI G | 14 | 1338 E | 1350 | | N04 | E24 | 5272 | 12 D | 1& | | | | 5.00 | | | |
| SAC PEAK | 14 | 1344 E | 1348 D | 1344 E | N03 | E25 | 5272 | 4 D | 1 | 2 | | | 3.65 | | 15 | |
| CLIMAX | 14 | 1400 | 1558 | 1442 U | S28 | E36 | 5273 | 118 | 3 | | 1442 | 14.40 | | | | |
| CAPRI S | 14 | 1400 | 1605 D | | S23 | E40 | 5273 | 125 D | 3 | 3 | 1454 | 15.00 | 22.00 | | | |
| CAPRI G | 14 | 1405 E | 1615 | | S27 | E38 | 5273 | 130 D | 2 | | | | 10.00 | | | |
| R O HERST | 14 | 1408 E | 1543 | 1426 | S25 | E35 | 5273 | 95 D | 2 | 2 | 1426 | 3.60 | 5.30 | | | |
| MCMATH | 14 | 1420 E | 1730 | | S26 | E37 | 5273 | 190 D | 3 | 2 | 1435 | | 13.00 | | | Slow S-SWF |



SOLAR FLARES

# SOLAR FLARES

## JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HUANCAYO | 14 | 1425 E | 1700 D | 1500 | S21 | E36 | 5273 | 155 D | 3 | 2 | 1500 | 20.50 | 28.20 | 2.40 | | |
| NEDERHORST | 14 | 1447 E | 1525 | | S25 | E37 | 5273 | 38 D | 2 | | | | | | | |
| WENDEL | 14 | 1451 E | | | S22 | E31 | 5273 | | 3b | | | | 25.00 | | | |
| LOCKHEED | 14 | 1527 E | 1630 | | S26 | E35 | 5273 | 63 D | 2 | 2 | 1540 | 7.50 | | | | |
| SAC PEAK | 14 | 1548 E | 1636 U | 1548 E | S25 | E36 | 5273 | 48 D | 2 | 2 | | | 7.15 | | 15 | |
| MCMATH | 14 | 1730 | 1750 D | 1737 | N13 | E02 | 5265 | 20 D | 1 | 2 | 1737 | | 2.20 | | | S-SWF |
| SAC PEAK | 14 | 1730 | 1756 | 1738 | N12 | E02 | 5265 | 26 | 1 | 2 | | | | | 18 | |
| MCMATH | 14 | 2203 | 2255 | 2230 | N13 | W01 | 5265 | 52 | 1 | 3 | 2230 | | 2.50 | | | G-SWF |
| LOCKHEED | 14 | 2205 | 2256 | 2228 | N13 | W02 | 5265 | 51 | 1 | 2 | | 3.50 | | | | |
| SIMEIZ | 15 | 0640 E | 0713 D | 0657 U | N13 | W06 | 5265 | 33 D | 1 | 1 | 0657 | | 5.00 | | 120 | |
| CAPRI G | 15 | 0641 E | 0710 | | N12 | W05 | 5265 | 29 D | 1 | | | | 3.00 | | | |
| CAPRI S | 15 | 0648 E | 0712 D | | N12 | W05 | 5265 | 24 D | 1 | 3 | 0653 | 2.00 | 2.00 | | | |
| CAPRI G | 15 | 1024 E | 1120 | | N16 | W08 | 5265 | 56 D | 2 | | | | 6.00 | | | |
| CAPRI S | 15 | 1251 | 1333 | | N16 | W11 | 5265 | 42 | 1 | 2 | 1307 | 2.50 | 2.60 | | | |
| MCMATH | 15 | 1300 | 1445 | 1312 | N15 | W15 | 5265 | 105 | 2b | 2 | 1312 | | 9.00 | | | |
| SAC PEAK | 15 | 1302 E | 1346 | 1312 | N15 | W14 | 5265 | 44 D | 1b | 2 | | | 5.10 | | 18 | S-SWF |
| CAPRI G | 15 | 1305 E | 1350 | | N16 | W10 | 5265 | 45 D | 2 | | | | 6.00 | | | |
| CAPRI G | 15 | 1409 E | 1425 | | N11 | W09 | 5265 | 16 D | 1 | | | | 3.00 | | | |
| MCMATH | 15 | 1800 E | 1825 D | | N18 | W17 | 5265 | 25 D | 1 | 1 | 1805 | | 2.50 | | | |
| HAWAII | 15 | 1802 E | 1804 D | | N19 | W17 | 5265 | 2 D | 1 | 1 | 1802 | 3.40 | 3.70 | | | |
| MCMATH | 15 | 1902 E | 1932 D | | S30 | E20 | 5273 | 30 D | 1 | 1 | 1911 | | 2.20 | | | |
| HAWAII | 15 | 1908 E | 1914 D | | S28 | E18 | 5273 | 6 D | 1 | 1 | 1908 | 3.10 | 3.90 | | | |
| LOCKHEED | 15 | 1923 | 1951 | 1927 | N05 | W14 | 5265 | 28 | 1b | 2 | | 4.30 | | | | |
| CLIMAX | 15 | 1924 | 1938 D | | N11 | W13 | 5265 | 14 D | 1 | | 1926 | 4.00 | | | | S-SWF |
| MCMATH | 15 | 1929 E | 1945 D | | N12 | W19 | 5265 | 16 D | 1b | 1 | 1929 | | 4.00 | | | |
| MCMATH | 15 | 2135 E | 2220 D | | N17 | W18 | 5265 | 45 D | 2 | 1 | 2155 | | 6.00 | | | |
| LOCKHEED | 15 | 2234 | 2256 | 2245 | N16 | W19 | 5265 | 22 | 1 | 2 | | 3.20 | | | | G-SWF |
| MCMATH | 15 | 2238 | 2255 D | 2245 | N16 | W19 | 5265 | 17 D | 2 | 1 | 2245 | | 6.00 | | | |
| HAWAII | 15 | 2318 | 2352 D | 2324 | N15 | W22 | 5265 | 34 D | 1 | 3 | 2324 | 2.20 | 2.40 | | | |
| SAC PEAK | 15 | 2334 E | 2352 | 2334 E | N14 | W21 | 5265 | 18 D | 1 | 2 | | | 3.45 | | 14 | |
| HAWAII | 15 | 2358 | 0010 | | N19 | W21 | 5265 | 12 | 1 | 2 | 2402 | 2.10 | 2.30 | | | |
| MITAKA | 16 | 0419 E | 0428 | 0425 | N15 | W21 | 5265 | 9 D | 1 | 1 | 0422 | 5.14 | 5.50 | 1.52 | 100 | |
| MITAKA | 16 | 0549 | 0554 | | N15 | W25 | 5265 | 5 | 1 | 1 | 0549 | 3.08 | 3.36 | 2.93 | 107 | |
| LOCARNO | 16 | 0555 E | 0610 D | | N15 | W24 | 5265 | 15 D | 1b | 4 | | | | | | |
| MITAKA | 16 | 0602 E | 0616 D | | N14 | W26 | 5265 | 14 D | 1 | 1 | 0607 | 1.03 | 1.13 | 1.89 | 98 | |
| SIMEIZ | 16 | 0636 E | | | N17 | W23 | 5265 | | 1b | 1 | 0637 | | 8.10 | 3.00 | 80 | |
| CAPRI G | 16 | 0636 | 0735 | | N15 | W21 | 5265 | 59 | 2 | | | | 5.00 | | | |
| MITAKA | 16 | 0639 | 0742 | | N15 | W19 | 5265 | 63 | 2 | 1 | 0639 | 6.17 | 6.66 | 2.08 | 165 | |
| CAPRI S | 16 | 0640 E | 0740 D | | N15 | W19 | 5265 | 60 D | 1b | 2 | 0709 | 4.00 | 4.40 | | | |
| LOCARNO | 16 | 0640 E | 0800 | | N15 | W20 | 5265 | 80 D | 2- | 3 | 0640 | | 7.00 | | | |
| STOCKHOLM | 16 | 0929 | 0945 | | N17 | W23 | 5265 | 16 | 2 | 3 | 0934 | 5.00 | 6.00 | | | |
| STOCKHOLM | 16 | 1036 | 1110 | | N17 | W23 | 5265 | 34 | 1 | 3 | 1042 | 3.00 | 3.60 | | | |
| SAC PEAK | 16 | 1308 | 1320 | 1314 | N17 | W31 | 5265 | 12 | 1 | 3 | | | 2.33 | | 15 | |
| MCMATH | 16 | 1309 E | 1350 D | | N16 | W27 | 5265 | 41 D | 1 | 1 | 1311 | | 4.00 | | | |
| MEUDON | 16 | 1336 | 1519 | 1407 | N23 | W20 | 5265 | 103 | 2 | | | | | | | |
| LOCARNO | 16 | 1343 | 1345 | 1400 | N20 | W23 | 5265 | 2 | 2b | 3 | 1400 | | 6.00 | | | |
| R O HERST | 16 | 1352 | 1413 | 1401 | N18 | W26 | 5265 | 21 | 1 | 2 | 1401 | 1.80 | 2.10 | | | |
| SAC PEAK | 16 | 1352 | 1416 | 1358 | N22 | W27 | 5265 | 24 | 2 | 3 | | | 6.10 | | 17 | |
| MCMATH | 16 | 1352 | 1500 D | 1358 | N18 | W28 | 5265 | 68 D | 2 | 1 | 1358 | | 10.00 | | | |
| CAPRI S | 16 | 1358 E | 1422 D | | N23 | W24 | 5265 | 24 D | 1 | 2 | 1404 | 3.00 | 3.60 | | | |
| CAPRI G | 16 | 1405 E | 1425 | | N22 | W24 | 5265 | 20 D | 1 | | | | 5.00 | | | |

# SOLAR FLARES

## JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEASUREMENTS MEAS. AREA Sq. Deg. | MEASUREMENTS CORR. AREA Sq. Deg. | MEASUREMENTS MAX. WIDTH Ha | MEASUREMENTS MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCARNO | 16 | 1525 | 1600 | | N15 | W29 | 5265 | 35 | 1 | 3 | | | | | | |
| MCMATH | 16 | 1555 | 1622 D | 1618 | N15 | W30 | 5265 | 27 D | 3 | 1 | 1618 | | 14.00 | | | |
| SAC PEAK | 16 | 1604 U | 1640 | 1616 | N13 | W33 | 5265 | 36 U | 3 | 3 | | | 13.25 | | 24 | |
| MEUDON | 16 | 1604 | 1645 | 1615 | N15 | W20 | 5265 | 41 | 2 | | | | | | | |
| LOCKHEED | 16 | 1607 | 1637 | 1615 | N12 | W25 | 5265 | 30 | 2 | 2 | | 7.50 | | | | S-SWF |
| LOCARNO | 16 | 1607 | 1715 | | N10 | W27 | 5265 | 68 | 2& | 3 | 1610 | | 6.00 | | | |
| CAPRI G | 16 | 1608 | 1630 | | N11 | W27 | 5265 | 22 | 2 | | | | 6.00 | | | |
| CLIMAX | 16 | 1608 | 1642 D | 1615 U | N13 | W24 | 5265 | 34 D | 2 | | 1615 | 7.80 | | | | |
| CAPRI G | 16 | 1630 E | 1650 D | | N14 | W28 | 5265 | 20 D | 1 | | | | 2.00 | | | |
| MCMATH | 16 | 1725 E | 1750 D | | N21 | W28 | 5265 | 25 D | 1 | 1 | 1726 | | 2.00 | | | |
| CLIMAX | 16 | 2114 | 2237 D | 2131 U | N11 | W30 | 5265 | 83 D | 3 | | 2131 | 21.80 | | | | |
| LOCKHEED | 16 | 2115 | 2430 | 2129 | N16 | W29 | 5265 | 195 | 3 | 2 | | 22.20 | | | | S-SWF |
| MCMATH | 16 | 2118 | 2320 D | 2125 | N17 | W30 | 5265 | 122 D | 3& | 1 | 2135 | | 40.00 | | | |
| SIMEIZ | 17 | 0607 E | 0838 | | N19 | W44 | 5265 | 151 D | 1 | | | | 2.50 | | 148 | |
| LOCARNO | 17 | 0620 | 0645 | | N15 | W35 | 5265 | 20 | 1 | 2 | 0630 | | 2.00 | | | |
| SIMEIZ | 17 | 0620 | 0659 | 0627 | N16 | W39 | 5265 | 39 | 1 | 2 | 0626 | | 1.70 | 2.00 | 220 | |
| CAPRI G | 17 | 1222 E | 1228 | | N21 | W51 | 5265 | 6 D | 1 | | | | 2.50 | | | |
| CAPRI G | 17 | 1222 E | 1235 | | N21 | W36 | 5265 | 13 D | 1 | | | | 4.00 | | | |
| MCMATH | 17 | 1239 E | 1330 D | | N18 | W42 | 5265 | 51 D | 1 | 1 | 1241 | | 2.00 | | | |
| ZURICH | 17 | 1245 E | 1253 | | N16 | W42 | 5265 | 8 D | 1 | 2 | 1245 | | 2.00 | | | |
| ZURICH | 17 | 1245 E | 1254 | | N23 | W35 | 5265 | 9 D | 1 | 2 | 1245 | | 2.00 | | | |
| LOCARNO | 17 | 1255 | 1310 | | N15 | W38 | 5265 | 15 | 1 | 2 | 1230 | | 2.00 | | | |
| ZURICH | 17 | 1302 | 1311 | | N16 | W42 | 5265 | 9 | 1 | 2 | 1302 | | 1.00 | | | |
| ZURICH | 17 | 1339 | 1403 | | N10 | W39 | 5265 | 24 | 1 | 2 | 1339 | | 3.00 | | | |
| CLIMAX | 17 | 1340 | 1356 | 1341 U | N12 | W38 | 5265 | 16 | 1 | | 1341 | 2.10 | | | | |
| LOCARNO | 17 | 1340 | 1415 | 1350 | N15 | W38 | 5265 | 35 | 1& | 2 | 1350 | | 3.00 | | | |
| CAPRI S | 17 | 1341 | 1404 | | N12 | W36 | 5265 | 13 | 1 | 3 | 1345 | 2.00 | 2.50 | | | |
| MCMATH | 17 | 1341 E | 1415 | 1345 | N12 | W40 | 5265 | 34 D | 1& | 1 | 1352 | | 4.00 | | | |
| CAPRI G | 17 | 1344 E | 1405 | | N13 | W38 | 5265 | 21 D | 1 | | | | 4.00 | | | |
| LOCARNO | 17 | 1615 | 1640 | | N15 | W38 | 5265 | 25 | 1 | 2 | 1620 | | 1.00 | | | |
| LOCARNO | 17 | 1705 E | 1710 D | | N10 | E28 | 5280 | 5 D | 1 | 2 | | | | | | |
| ZURICH | 17 | 1706 | 1718 | | N08 | E28 | 5280 | 12 | 1 | 2 | 1706 | | 1.00 | | | |
| ZURICH | 17 | 1722 | 1732 | | N16 | W43 | 5265 | 10 | 1 | 2 | 1722 | | 2.00 | | | |
| HAWAII | 17 | 1828 | 1840 D | 1830 | N19 | W41 | 5265 | 12 D | 1 | 2 | 1830 | 3.30 | 4.60 | | | |
| LOCKHEED | 17 | 1939 | 2005 | 1948 | N21 | W42 | 5265 | 26 | 1 | 2 | | 2.60 | | | | |
| SIMEIZ | 18 | 0620 | 0630 | 0624 | N10 | W63 | 5265 | 10 D | 1& | 2 | 0623 | | 8.40 | 2.60 | 156 | |
| CAPRI S | 18 | 0623 | 0630 D | | N20 | W60 | 5265 | 7 D | 1 | 3 | 0624 | 2.00 | 4.40 | | | |
| ZURICH | 18 | 0721 E | 0728 | | N24 | W61 | 5265 | 7 D | 1 | 3 | 0721 | | 1.00 | | | |
| ZURICH | 18 | 0724 | 0728 | | N16 | E24 | 5280 | 4 | 1 | 3 | 0724 | | 2.00 | | | |
| SIMEIZ | 18 | 0739 | 0812 | 0743 | N20 | W62 | 5265 | 33 D | 1& | | | | 5.60 | | 92 | |
| SIMEIZ | 18 | 0843 | 0849 | 0846 | N14 | W55 | 5265 | 6 | 1 | | | | 3.06 | | 156 | |
| ARCETRI | 18 | 0852 | 0908 | | N15 | E24 | 5280 | 16 | 1 | 3 | 0901 | 2.50 | 2.70 | | | |
| CAPRI G | 18 | 0856 E | 0905 | | N13 | E23 | 5280 | 9 D | 1 | | | | 2.50 | | | |
| SCHAUINS | 18 | 0858 E | 0913 | | N13 | E23 | 5280 | 15 D | 2 | | | | | | | |
| SIMEIZ | 18 | 0859 | 0912 | 0855 | N15 | E25 | 5280 | 13 D | 1 | | | | 3.00 | | 156 | |
| DUNSINK | 18 | 0901 E | 0906 | 0901 | N12 | E23 | 5280 | 5 D | 1 | 1 | 0901 | 3.75 | 4.07 | 1.65 | | |
| ZURICH | 18 | 0932 | 0956 | | N24 | E08 | 5277 | 24 | 1 | 3 | 0932 | | 1.00 | | | |
| ZURICH | 18 | 1105 E | 1120 | | N20 | W51 | 5265 | 15 D | 1 | 3 | 1105 | | 3.00 | | | |
| STOCKHOLM | 18 | 1144 | 1205 | | N32 | W85 | 5265 | 21 | 2 | 3 | 1145 | 1.50 | 10.10 | | | |
| LOCARNO | 18 | 1237 | 1245 | 1230 | N20 | W65 | 5265 | 8 | 1 | 2 | 1230 | | 2.00 | | | |
| LOCARNO | 18 | 1537 | 1545 | | N16 | E20 | 5280 | 8 | 1 | 2 | 1540 | | 2.00 | | | |

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Hα | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAPRI G | 18 | 1540 E | 1550 | | N18 | W68 | 5265 | 10 D | 1 | | | | 3.00 | | | |
| HAWAII | 18 | 1800 E | 1844 | 1802 | N15 | W58 | 5265 | 44 D | 1 | 3 | 1802 | 2.90 | 5.50 | | | S-SWF |
| LOCKHEED | 18 | 2212 | 2240 | 2218 | N13 | E20 | 5280 | 28 | 1 | 2 | | 2.40 | | | | |
| HAWAII | 18 | 2216 | 2240 | 2224 | N13 | E19 | 5280 | 24 | 1 | 3 | 2224 | 2.60 | 2.80 | | | |
| LOCKHEED | 19 | 0032 | 0130 | 0049 | N13 | E18 | 5280 | 58 | 1 | 2 | | 3.60 | | | | |
| HAWAII | 19 | 0040 | 0200 D | 0103 | N11 | W17 | 5274 | 80 D | 2& | 3 | 0103 | 16.50 | 17.30 | | | |
| CAPRI G | 19 | 0511 E | 0522 D | | N32 | E04 | 5277 | 11 D | 1 | | | | 3.00 | | | |
| SIMEIZ | 19 | 0650 E | 0710 D | | N29 | E35 | 5283 | 20 D | 1 | 1 | | | 3.50 | | 88 | |
| LOCARNO | 19 | 0700 E | 0720 | | N28 | E32 | 5283 | 20 D | 1 | 3 | 0700 | | 1.00 | | | |
| SIMEIZ | 19 | 0840 E | 0850 D | 0842 U | N20 | E80 | 5286 | 10 D | 1 | | | | 4.00 | | 92 | |
| MITAKA | 20 | 0411 | 0445 D | 0414 | S28 | W39 | 5273 | 34 D | 1 | 1 | 0414 | 1.54 | 2.25 | 1.78 | 100 | |
| MITAKA | 20 | 0412 | 0445 D | 0414 | S23 | W42 | 5273 | 33 D | 1 | 1 | 0429 | 2.06 | 2.93 | 1.60 | 100 | |
| CAPRI G | 20 | 0604 E | 0615 | | N18 | W90 | 5265 | 11 D | 1 | | | | | | | |
| SIMEIZ | 20 | 0605 E | 0612 D | | N22 | W90 | 5265 | 7 D | 1 | 1 | | | | | 116 | |
| MITAKA | 20 | 0609 | 0621 | | N23 | W88 | 5265 | 12 | 1 | 1 | 0611 | 4.11 | | 3.68 | 134 | |
| SIMEIZ | 20 | 0759 E | 0809 D | 0805 U | N21 | W90 | 5265 | 10 D | 1 | | | | | | 88 | |
| ZURICH | 20 | 0840 | 0853 | | N14 | W06 | 5280 | 13 | 1 | 3 | 0840 | | 3.00 | | | |
| ZURICH | 20 | 1349 | 1350 D | | S15 | E66 | 5287 | 1 D | 1 | 1 | 1349 | | 1.00 | | | |
| LOCARNO | 20 | 1350 | 1405 | | S15 | E63 | 5287 | 15 | 1 | 3 | | | | | | |
| SAC PEAK | 20 | 1524 | 1700 U | 1600 | N14 | W46 | 5274 | 96 U | 2 | 2 | | | 6.85 | | 17 | |
| LOCARNO | 20 | 1525 | 1600 D | 1545 | N15 | W44 | 5274 | 35 D | 2& | 4 | | | | | | |
| CLIMAX | 20 | 1526 | 1620 D | | N12 | W47 | 5274 | 54 D | 1 | | 1608 | 4.10 | | | | |
| MEUDON | 20 | 1526 | 1715 | | N17 | W40 | 5274 | 109 | 2 | | | | | | | |
| HUANCAYO | 20 | 1527 E | 1646 | 1530 | N21 | W40 | 5274 | 79 D | 1 | 2 | 1530 | 3.30 | 4.40 | 2.40 | | |
| CAPRI G | 20 | 1534 E | 1555 | | N17 | W80 | 5265 | 21 D | 1 | | | | | | | |
| CAPRI G | 20 | 1534 E | 1620 | | N18 | W44 | 5274 | 46 D | 2 | | | | 7.00 | | | |
| CAPRI S | 20 | 1534 E | 1635 D | | N13 | W45 | 5274 | 61 D | 2 | 3 | 1620 | 5.00 | 7.20 | | | |
| CAPRI G | 20 | 1610 E | 1635 D | | N12 | W41 | 5274 | 25 D | 1 | | | | 4.00 | | | |
| WENDEL | 20 | 1619 | 1653 D | | N11 | W44 | 5274 | 34 D | 1& | | | | 5.00 | | | |
| CAPRI G | 21 | 0539 E | 0555 | | N20 | W90 | 5265 | 16 D | 1 | | | | 1.00 | | | |
| SIMEIZ | 21 | 0656 E | | | N20 | W85 | 5265 | | 1 | 1 | | | | | | Slow S-SWF |
| CAPRI G | 21 | 0658 E | | | N20 | W82 | 5265 | | 1 | | | | | | | |
| CAPRI G | 21 | 1020 E | 1035 | | S10 | E90 | 5289 | 15 D | 1 | | | | | | | |
| CAPRI G | 21 | 1020 E | 1100 D | | S13 | E50 | 5287 | 40 D | 1& | | | | 5.00 | | | |
| ZURICH | 21 | 1021 | 1050 | | S16 | E53 | 5287 | 29 | 1 | 3 | 1021 | | 4.00 | | | |
| ARCETRI | 21 | 1028 E | 1046 D | | S16 | E55 | 5287 | 18 D | 1 | 3 | | | | | | |
| LOCARNO | 21 | 1035 E | 1100 D | | S15 | E54 | 5287 | 25 D | 1 | 2 | | | | | | |
| WENDEL | 21 | 1609 E | 1632 D | | S16 | E50 | 5287 | 23 D | 1 | | | | 3.00 | | | S-SWF |
| HAWAII | 21 | 1940 | 2002 | 1944 | S17 | E90 | 5289 | 22 | 1& | 3 | 1944 | 2.10 | | | | |
| MCMATH | 21 | 1949 E | 2014 D | | S20 | E90 | 5291 | 25 D | 1 | 1 | | | | | | |
| CAPRI G | 22 | 1106 E | 1125 | | N24 | W90 | 5265 | 19 D | 1 | | | | 1.00 | | | |
| MCMATH | 22 | 1223 | 1345 | | N19 | W56 | 5274 | 82 | 1 | 1 | 1246 | | 3.00 | | | |
| ZURICH | 22 | 1225 E | 1310 | 1242 | N16 | W57 | 5274 | 45 D | 2 | 2 | 1242 | | 8.00 | | | |
| CAPRI S | 22 | 1227 | 1307 D | | N15 | W52 | 5274 | 40 D | 1 | 3 | 1257 | 2.00 | 3.50 | | | |
| WENDEL | 22 | 1226 E | 1340 D | | N15 | W43 | 5280 | 74 D | 1& | | | | 6.00 | | | |
| CAPRI G | 22 | 1242 E | 1345 | | N15 | W51 | 5280 | 63 D | 1& | | | | 6.00 | | | |
| LOCARNO | 22 | 1250 E | 1320 | | N22 | W53 | 5280 | 30 D | 1& | 2 | | | | | | |
| WENDEL | 22 | 1526 E | 1654 | | S09 | E85 | 5289 | 88 D | 2 | | | | 9.00 | | | G-SWF |
| MCMATH | 22 | 1528 | 1550 | 1536 | S18 | E85 | 5289 | 22 | 1 | 1 | 1536 | | 2.00 | | | |

# SOLAR FLARES

## JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEASUREMENTS MEAS. AREA Sq. Deg. | MEASUREMENTS CORR. AREA Sq. Deg. | MEASUREMENTS MAX. WIDTH Ha | MEASUREMENTS MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCARNO | 22 | 1530 | 1553 | | S15 | E74 | 5289 | 23 | 1 | 2 | | | | | | |
| CAPRI G | 22 | 1545 E | 1550 D | | S17 | E77 | 5289 | 5 D | 1 | | | | | | | |
| HAWAII | 22 | 2026 | 2106 | 2036 | S20 | E31 | 5287 | 40 | 1 | 3 | 2036 | 2.70 | 3.50 | | | |
| HAWAII | 22 | 2354 | 2358 D | 2354 | N17 | W37 | 5280 | 4 D | 1 | 2 | 2354 | 2.50 | 3.10 | | | Slow S-SWF |
| ARCETRI | 24 | 0825 E | 0827 D | | N12 | E90 | 5294 | 2 D | 1 | 3 | 0825 | .80 | | | | |
| ARCETRI | 24 | 0851 E | 0903 D | | N11 | E90 | 5294 | 12 D | 1 | 3 | 0903 | .70 | | | | |
| ARCETRI | 24 | 0953 E | 1001 D | | N12 | E90 | 5294 | 8 D | 1 | 3 | | | | | | |
| MCMATH | 24 | 2225 E | 2255 D | | N10 | E90 | 5294 | 30 D | 1 | 1 | 2229 | | 2.50 | | | |
| MITAKA | 25 | 0316 E | 0335 D | 0323 | S20 | E47 | 5289 | 19 D | 1& | 1 | 0316 | 7.20 | 11.70 | 2.14 | 146 | Slow S-SWF |
| LOCARNO | 25 | 0450 E | 1000 | | N12 | E90 | 5294 | 310 D | 1& | 2 | | | | | | |
| SIMEIZ | 25 | 0556 E | | | N12 | E90 | 5294 | | 1 | 2 | 0600 | | | 2.60 | | |
| LOCARNO | 25 | 0625 E | 0635 | | N15 | E75 | 5294 | 10 D | 1 | 2 | | | | | | |
| SIMEIZ | 25 | 0723 E | | 0900 U | N21 | E90 | 5294 | | 1 | | 0727 | | | 3.30 | | |
| ZURICH | 25 | 0724 | 0740 | | N10 | E87 | 5294 | 16 | 1 | 3 | 0724 | | 4.00 | | | |
| CAPRI G | 25 | 0725 E | 0745 D | | N14 | E88 | 5294 | 20 D | 1 | | | | 3.00 | | | |
| ARCETRI | 25 | 0815 E | 0831 D | | N12 | E90 | 5294 | 16 D | 1 | 3 | | | | | | |
| CAPRI G | 25 | 0820 E | 0836 | | N14 | E85 | 5294 | 16 D | 1 | | | | 4.00 | | | |
| CAPRI G | 25 | 0911 | 0920 D | | S18 | E46 | 5289 | 9 D | 1 | | | | 5.00 | | | |
| MCMATH | 25 | 2025 E | 2035 D | | N10 | E80 | 5294 | 10 D | 1 | 1 | 2033 | | 2.00 | | | |
| HAWAII | 26 | 0042 | 0110 | 0046 | N25 | E47 | 5291 | 28 | 1 | 3 | 0046 | 2.70 | 4.10 | | | |
| ZURICH | 26 | 0657 | 0704 | | N10 | E73 | 5294 | 7 | 1 | 3 | 0657 | | 2.00 | | | |
| LOCARNO | 26 | 0700 | 0725 | | N14 | E79 | 5294 | 25 | 1 | 2 | | | | | | |
| ZURICH | 26 | 0801 | 0805 | | N13 | E61 | 5294 | 4 | 1 | 3 | 0801 | | 1.00 | | | |
| ZURICH | 26 | 0811 E | 0816 | | N24 | E47 | 5291 | 5 D | 1 | 3 | 0811 | | 1.00 | | | |
| LOCARNO | 26 | 0827 | 0845 | | N36 | E68 | 5292 | 18 | 1 | 2 | | | | | | |
| LOCARNO | 26 | 0827 | 0905 | 0845 | N10 | E74 | 5294 | 38 | 1& | 2 | 0845 | | 9.00 | | | |
| CAPRI S | 26 | 0832 E | 0905 D | | N12 | E71 | 5294 | 33 D | 1 | 3 | 0850 | 1.50 | 4.80 | | | |
| SIMEIZ | 26 | 0833 E | 0906 D | 0843 U | N13 | E74 | 5294 | 33 D | 1& | 1 | 0843 | | 7.60 | 2.80 | 92 | |
| CAPRJ G | 26 | 0844 E | 0857 D | | N12 | E69 | 5294 | 13 D | 1 | | | | 4.00 | | | |
| ARCETRI | 26 | 0849 E | 0908 D | | N10 | E73 | 5294 | 19 D | 1& | 3 | | | | | | |
| SIMEIZ | 26 | 0850 E | 0906 D | 0853 U | N11 | E78 | 5294 | 16 D | 1 | | 0853 | | 3.00 | 4.00 | 112 | |
| LOCARNO | 26 | 1400 | 1410 | | N35 | E60 | 5292 | 10 | 1 | 2 | | | | | | |
| MITAKA | 27 | 0217 E | 0229 | | N24 | E33 | 5291 | 12 D | 1 | 1 | 0217 | .82 | 1.05 | 1.52 | 96 | |
| SIMEIZ | 27 | 0634 | 0639 | 0636 | N11 | E52 | 5294 | 5 | 1 | 2 | 0638 | | .80 | 2.30 | 68 | |
| ZURICH | 27 | 0713 E | 0733 D | | S06 | W35 | 5296 | 20 D | 1 | 3 | 0713 | | 6.00 | | | |
| ZURICH | 27 | 0726 | 0731 | | N13 | E48 | 5294 | 5 | 1 | 3 | 0726 | | 1.00 | | | |
| ZURICH | 27 | 0759 E | 0817 | | S07 | W36 | 5296 | 18 D | 1 | 3 | 0759 | | 1.00 | | | |
| SIMEIZ | 27 | 0833 | 0843 | 0835 | N07 | E59 | 5294 | 10 | 1 | | 0838 | | .90 | 3.20 | 80 | |
| SIMEIZ | 27 | 0851 | 0900 | 0855 | N07 | E59 | 5294 | 9 | 1 | | 0854 | | .90 | 2.20 | 76 | |
| ZURICH | 27 | 1032 | 1050 | | N24 | E32 | 5291 | 18 | 1 | 3 | 1032 | | 4.00 | | | |
| ARCETRI | 27 | 1037 E | 1044 D | | N24 | E32 | 5291 | 7 D | 1 | 3 | | | | | | |
| WENDEL | 27 | 1037 E | 1126 | | N24 | E31 | 5291 | 49 D | 1& | | | | 7.00 | | | |
| WENDEL | 27 | 1123 E | 1147 D | | N38 | E46 | 5292 | 24 D | 1& | | | | 5.00 | | | |
| WENDEL | 27 | 1222 | 1257 | 1229 | N14 | E50 | 5294 | 35 | 2 | | | | 12.00 | | | |
| LOCARNO | 27 | 1225 | 1250 | 1234 | N15 | E50 | 5294 | 25 | 2 | 2 | 1234 | | 6.00 | | | |
| MCMATH | 27 | 1225 | 1340 | 1229 | N12 | E50 | 5294 | 75 | 2 | 1 | 1229 | | 5.00 | | | |
| ZURICH | 27 | 1226 | 1250 | | N14 | E49 | 5294 | 24 | 2& | 3 | 1226 | | 7.00 | | | S-SWF |
| MCMATH | 27 | 1227 E | | | N13 | E50 | 5294 | | 2 | | | | | | | |
| CAPRI S | 27 | 1228 E | 1245 | | N14 | E52 | 5294 | 17 D | 1 | 3 | 1231 | 2.30 | 3.70 | | | |



SOLAR FLARES

# SOLAR FLARES

JULY 1959

| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Hα | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ONDREJOV | 27 | 1230 E | 1251 | | N14 | E52 | 5294 | 21 D | 2 | | | | | | | |
| CAPRI G | 27 | 1232 E | 1254 | | N13 | E51 | 5294 | 22 D | 2 | | | | 7.00 | | | |
| WENDEL | 27 | 1449 E | 1512 D | | N12 | E42 | 5294 | 23 D | 1& | | | | 6.00 | | | |
| LOCARNO | 27 | 1452 | 1505 | | N11 | E39 | 5294 | 13 | 1& | 2 | | | | | | |
| CAPRI G | 27 | 1453 | 1504 | | N10 | E41 | 5294 | 11 | 1 | | | | 4.00 | | | G-SWF |
| ARCETRI | 27 | 1455 E | | | N11 | E42 | 5294 | | 1 | 3 | | | | | | |
| ZURICH | 27 | 1502 E | 1505 | | N10 | E41 | 5294 | 3 D | 1 | 2 | 1502 | | 2.00 | | | |
| LOCKHEED | 27 | 1702 | 1726 | 1709 | N25 | E27 | 5291 | 24 | 1 | 2 | | 2.40 | | | | |
| WENDEL | 27 | 1703 | 1742 | | N23 | E27 | 5291 | 39 | 1& | | | | 6.00 | | | |
| WENDEL | 27 | 1739 | 1758 | | N09 | E49 | 5294 | 19 | 1 | | | | 3.00 | | | |
| MCMATH | 27 | 1802 | 1822 | 1807 | N07 | E48 | 5294 | 20 | 1 | 1 | 1807 | | 2.00 | | | S-SWF |
| WENDEL | 27 | 1804 | 1808 D | | N10 | E47 | 5294 | 4 D | 1& | | | | 4.00 | | | |
| LOCKHEED | 27 | 2001 | 2100 | 2017 | N26 | E42 | 5291 | 59 | 1 | 3 | | 2.40 | | | | |
| SAC PEAK | 27 | 2004 | 2100 U | 2018 U | N25 | E41 | 5291 | 56 U | 1 | 2 | | | 2.40 | | 18 | |
| LOCKHEED | 27 | 2050 | 2250 | 2115 | N26 | E25 | 5291 | 120 | 3 | 3 | | 17.00 | | | | |
| MCMATH | 27 | 2055 | 2240 | 2112 | N28 | E26 | 5291 | 105 | 2& | 1 | 2112 | | 8.00 | | | |
| HUANCAYO | 27 | 2108 | 2220 | 2112 | N25 | E25 | 5291 | 72 | 2& | 2 | 2112 | 13.70 | 15.20 | 3.10 | | Slow S-SWF |
| HAWAII | 27 | 2117 E | 2119 | 2118 | N28 | E26 | 5291 | 2 D | 3 | 2 | 2118 | 1.70 | 2.10 | | | |
| MCMATH | 27 | 2120 E | 2145 D | | N24 | E25 | 5291 | 25 D | 2 | | | | | | | |
| CLIMAX | 27 | 2146 E | 2210 | | N27 | E28 | 5291 | 24 D | 1 | | 2151 | 4.50 | | | | |
| MCMATH | 27 | 2211 E | 2245 D | 2215 | N09 | E50 | 5294 | 34 D | 1 | 1 | 2215 | | 2.00 | | | |
| MITAKA | 28 | 0028 E | 0039 | | N10 | E39 | 5294 | 11 D | 1 | 1 | 0031 | 2.06 | 2.62 | 1.70 | 85 | |
| SIMEIZ | 28 | 0631 | 0702 | 0636 | N12 | E45 | 5294 | 31 | 1 | | 0631 | | 2.60 | 2.20 | 88 | |
| SIMEIZ | 28 | 0655 | 0744 | 0726 | N13 | E63 | 5299 | 49 | 1& | | 0726 | | 7.50 | 2.70 | 92 | |
| CAPRI G | 28 | 0724 | 0736 | | N13 | E66 | 5299 | 12 | 1 | | | | 3.00 | | | |
| SIMEIZ | 28 | 0829 | 0919 | 0846 | N38 | E37 | 5292 | 50 | 1 | 2 | 0845 | | 3.40 | 2.20 | 76 | |
| ZURICH | 28 | 1215 | 1222 | | N14 | E32 | 5294 | 7 | 1 | 2 | 1215 | | 1.00 | | | |
| ZURICH | 28 | 1245 | 1258 | | N22 | E17 | 5291 | 13 | 1 | 2 | 1245 | | 1.00 | | | |
| ZURICH | 28 | 1250 | 1302 D | | N09 | E35 | 5294 | 12 D | 1 | 2 | 1250 | | 2.00 | | | |
| WENDEL | 28 | 1251 E | 1307 | | N08 | E35 | 5294 | 16 D | 1& | | | | 7.00 | | | |
| CAPRI G | 28 | 1253 | 1303 | | N10 | E38 | 5294 | 10 | 1 | | | | 3.00 | | | |
| MCMATH | 28 | 1430 E | 1455 D | | N07 | E36 | 5294 | 25 D | 1 | 1 | 1440 | | 3.00 | | | |
| WENDEL | 28 | 1624 E | 1637 D | | N12 | E36 | 5294 | 13 D | 1 | | | | 3.00 | | | |
| LOCARNO | 28 | 1630 | 1650 D | | N13 | E33 | 5294 | 20 D | 1 | 3 | | | | | | |
| SIMEIZ | 29 | 0629 E | 0830 D | | N07 | W67 | 5285 | 121 D | 1 | 1 | 0631 | | 4.60 | 1.90 | | |
| CAPRI G | 29 | 0710 | 0751 | | N11 | E30 | 5294 | 41 | 2 | | | | 5.00 | | | |
| SIMEIZ | 29 | 0711 E | 0823 D | | N12 | E29 | 5294 | 72 D | 1& | | 0712 | | 5.20 | 3.50 | | |
| CAPRI S | 29 | 0712 E | 0754 D | | N11 | E28 | 5294 | 42 D | 1 | 3 | 0741 | 2.00 | 2.00 | | | |
| SIMEIZ | 29 | 0725 E | 0830 D | | N15 | E36 | 5294 | 65 D | 1 | | 0737 | | 1.80 | 2.70 | | |
| CAPRI S | 29 | 1205 | 1303 | | N10 | E25 | 5294 | 58 | 1 | 3 | 1212 | 4.50 | 4.90 | | | |
| CAPRI G | 29 | 1213 | 1306 | | N13 | E28 | 5294 | 53 | 2 | | | | 8.00 | | | |
| ZURICH | 29 | 1228 E | 1350 | | N10 | E26 | 5294 | 82 D | 2 | 1 | 1228 | | 8.00 | | | Slow S-SWF |
| MCMATH | 29 | 1233 E | 1321 D | | N09 | E25 | 5294 | 48 D | 1& | 1 | 1233 | | 4.00 | | | |
| LOCARNO | 29 | 1240 E | 1345 D | | N13 | E28 | 5294 | 65 D | 1& | 3 | | | | | | |
| R O HERST | 29 | 1243 E | 1244 D | 1243 D | N11 | E28 | 5294 | 1 D | 1 | 1 | 1243 | 1.90 | 2.10 | | | |
| ZURICH | 29 | 1351 | 1408 D | | N11 | E23 | 5294 | 17 D | 2 | 1 | 1351 | | 6.00 | | | |
| ZURICH | 29 | 1439 | 1443 | | N06 | E28 | 5294 | 4 | 1 | 1 | 1439 | | 1.00 | | | |
| SAC PEAK | 29 | 1534 | 1558 | 1536 | N10 | E18 | 5294 | 24 | 1 | 2 | | | 3.05 | | 24 | |
| CAPRI S | 29 | 1535 E | 1552 D | | N11 | E22 | 5294 | 17 D | 1 | 3 | 1536 | 2.80 | 3.10 | | | |
| CAPRI G | 29 | 1537 | 1558 | | N11 | E25 | 5294 | 21 | 1 | | | | 3.00 | | | |
| MCMATH | 29 | 2020 | 2117 D | 2031 | N10 | E22 | 5294 | 57 D | 2 | 2 | 2047 | | 5.50 | | | |

# SOLAR FLARES

JULY 1959



| OBSERVATORY | DATE JULY 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCKHEED | 29 | 2020 | 2119 | 2047 | N12 | E20 | 5294 | 59 | 2 | 3 | | 5.20 | | | | |
| HAWAII | 29 | 2022 | 2234 D | 2032 | N14 | E22 | 5294 | 12 D | 3 | 3 | 2120 | 19.60 | 21.40 | | | Slow S-SWF |
| MCMATH | 29 | 2025 E | 2050 D | | N12 | E25 | 5294 | 25 D | 2 | | | | | | | |
| MCMATH | 29 | 2105 | 2145 | | N05 | E65 | 5300 | 40 | 1 | 1 | 2120 | | 2.00 | | | |
| MCMATH | 29 | 2117 | 2240 | 2120 | N14 | E25 | 5294 | 83 | 2& | 2 | 2120 | | 10.00 | | | |
| LOCKHEED | 29 | 2117 | 2243 | 2120 | N16 | E18 | 5294 | 86 | 2& | 3 | | 12.20 | | | | S-SWF |
| HAWAII | 29 | 2214 | 2218 | 2216 | N09 | E23 | 5294 | 4 | 1 | 3 | 2216 | 2.50 | 2.70 | | | |
| LOCKHEED | 30 | 0000 | 0117 | 0016 | N13 | E36 | 5299 | 77 | 2 | 3 | | 5.80 | | | | G-SWF |
| HAWAII | 30 | 0027 E | 0028 D | | N11 | E33 | 5299 | 1 D | 2& | 1 | 0028 | 10.30 | 11.90 | | | |
| MITAKA | 30 | 0255 E | 0303 | | N21 | W68 | 5286 | 8 D | 1& | 1 | 0255 | 2.57 | 5.80 | 2.08 | 107 | |
| MITAKA | 30 | 0303 E | 0315 | 0310 | N08 | E19 | 5294 | 12 D | 1 | 1 | 0310 | 1.54 | 1.62 | 2.74 | 143 | |
| MITAKA | 30 | 0339 E | 0405 | | N11 | E12 | 5294 | 26 D | 1 | 1 | 0339 | 4.11 | 4.23 | 2.26 | 149 | S-SWF |
| MITAKA | 30 | 0514 | 0522 | | N08 | E18 | 5294 | 8 | 1 | 1 | 0514 | 2.06 | 2.16 | 1.52 | 120 | |
| CAPRI G | 30 | 0940 E | 0947 | | N16 | E07 | 5294 | 7 D | 1 | | | | 3.00 | | | |
| ARCETRI | 30 | 1044 E | 1059 D | | S07 | W80 | 5296 | 15 D | 1 | 4 | 1044 | .40 | 2.30 | | | |
| ARCETRI | 30 | 1048 E | 1153 D | | N12 | E35 | 5299 | 65 D | 1 | 4 | 1048 | 1.70 | 2.10 | | | |
| MCMATH | 30 | 1648 | 1850 D | 1716 | N28 | W11 | 5291 | 122 D | 2 | 1 | 1716 | | 5.00 | | | |
| LOCKHEED | 30 | 1652 | 1735 | 1715 | N29 | W12 | 5291 | 43 | 1 | 2 | | 3.70 | | | | |
| SAC PEAK | 30 | 1710 E | 1722 D | 1714 E | N29 | W11 | 5291 | 12 D | 2 | 2 | | | 6.40 | | 14 | |
| LOCKHEED | 30 | 2018 | 2055 | 2029 | N26 | W16 | 5291 | 37 | 1 | 3 | | 2.70 | | | | |
| SAC PEAK | 30 | 2018 | 2112 | 2032 | N26 | W16 | 5291 | 54 | 2 | 1 | | | 4.65 | | 20 | |
| MCMATH | 30 | 2022 E | 2130 | 2027 | N25 | W16 | 5291 | 68 D | 1& | 1 | 2027 | | 4.00 | | | |
| LOCKHEED | 31 | 0105 | 0125 | 0111 | N14 | E08 | 5294 | 20 | 1 | 1 | | 2.40 | | | | |
| MITAKA | 31 | 0106 | 0120 | 0106 | N15 | E07 | 5294 | 14 | 1 | 1 | 0106 | 3.08 | 3.14 | 2.04 | 134 | |
| MITAKA | 31 | 0107 | 0120 | 0107 | N15 | E09 | 5294 | 13 | 1 | 1 | 0107 | 2.06 | 2.10 | 1.72 | 122 | |
| SIMEIZ | 31 | 0648 E | 0708 D | 0650 U | N12 | E23 | 5299 | 20 D | 1 | | | | 2.50 | | | |
| SIMEIZ | 31 | 0654 E | 0724 D | 0657 U | N11 | E07 | 5294 | 30 D | 1 | | 0717 | | 1.80 | 2.00 | | |
| SIMEIZ | 31 | 0732 E | 0737 D | 0734 U | N04 | E41 | 5300 | 5 D | 1 | | | | 2.90 | | | |
| ARCETRI | 31 | 0800 E | 0825 D | | N12 | E06 | 5294 | 25 D | 1& | 3 | | | | | | |
| SIMEIZ | 31 | 0801 E | 0807 D | 0804 U | N13 | E04 | 5294 | 6 D | 1& | | 0804 | | 5.40 | 2.20 | | |
| CAPRI G | 31 | 0809 E | 0827 | | N13 | E05 | 5294 | 18 D | 1& | | | | 4.00 | | | |
| LOCARNO | 31 | 1236 | 1242 | | N13 | E15 | 5299 | 6 | 1 | 2 | | | | | | |
| LOCARNO | 31 | 1255 E | 1300 | | N18 | W05 | 5294 | 5 | 1 | 2 | | | | | | |
| CAPRI G | 31 | 1459 E | 1515 | | N14 | W23 | 5298 | 16 D | 1 | | | | 3.00 | | | |
| LOCKHEED | 31 | 1555 | 1609 | 1559 | N10 | W08 | 5294 | 14 | 1 | 2 | 1605 | 2.40 | | | | |
| LOCARNO | 31 | 1650 | 1720 | | S12 | E43 | 5301 | 30 | 1 | 2 | | | | | | |
| LOCKHEED | 31 | 1725 | 1745 | 1727 | N11 | E10 | 5294 | 20 | 1 | 3 | | 2.10 | | | | |
| LOCKHEED | 31 | 2228 | 2250 | 2237 | N11 | E10 | 5294 | 22 | 1 | 3 | | 2.10 | | | | |
| HAWAII | 31 | 2230 E | 2254 D | | N13 | E08 | 5294 | 24 D | 2 | 2 | 2242 | 6.60 | 6.70 | | | |
| MCMATH | 31 | 2230 E | 2300 D | | N11 | E08 | 5294 | 60 D | 1 | 1 | 2241 | | 2.50 | | | |
| SAC PEAK | 31 | 2245 E | 2245 D | 2245 U | N12 | E08 | 5294 | | 1 | 1 | | | | | 16 | |

CAPRI G — ANACAPRI - GERMAN
CAPRI S — ANACAPRI - SWEDISH
GOOD HOPE — ROYAL OBSERVATORY, CAPE OF GOOD HOPE
KIEV* — KIEV UNIVERSITY
KODAIKNAL — KODAIKANAL
KRASNYA — KRASNAYA PAKHRA
LOCKHEED — LOS ANGELES
MOSCOW-G — MOSCOW - GAISH
R O EDIN — ROYAL OBSERVATORY, EDINBURGH
R O HERST — GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
SAC PEAK — SACRAMENTO PEAK
SCHAUINS — SCHAUINSLAND
USNRL — UNITED STATES NAVAL RESEARCH LABORATORY

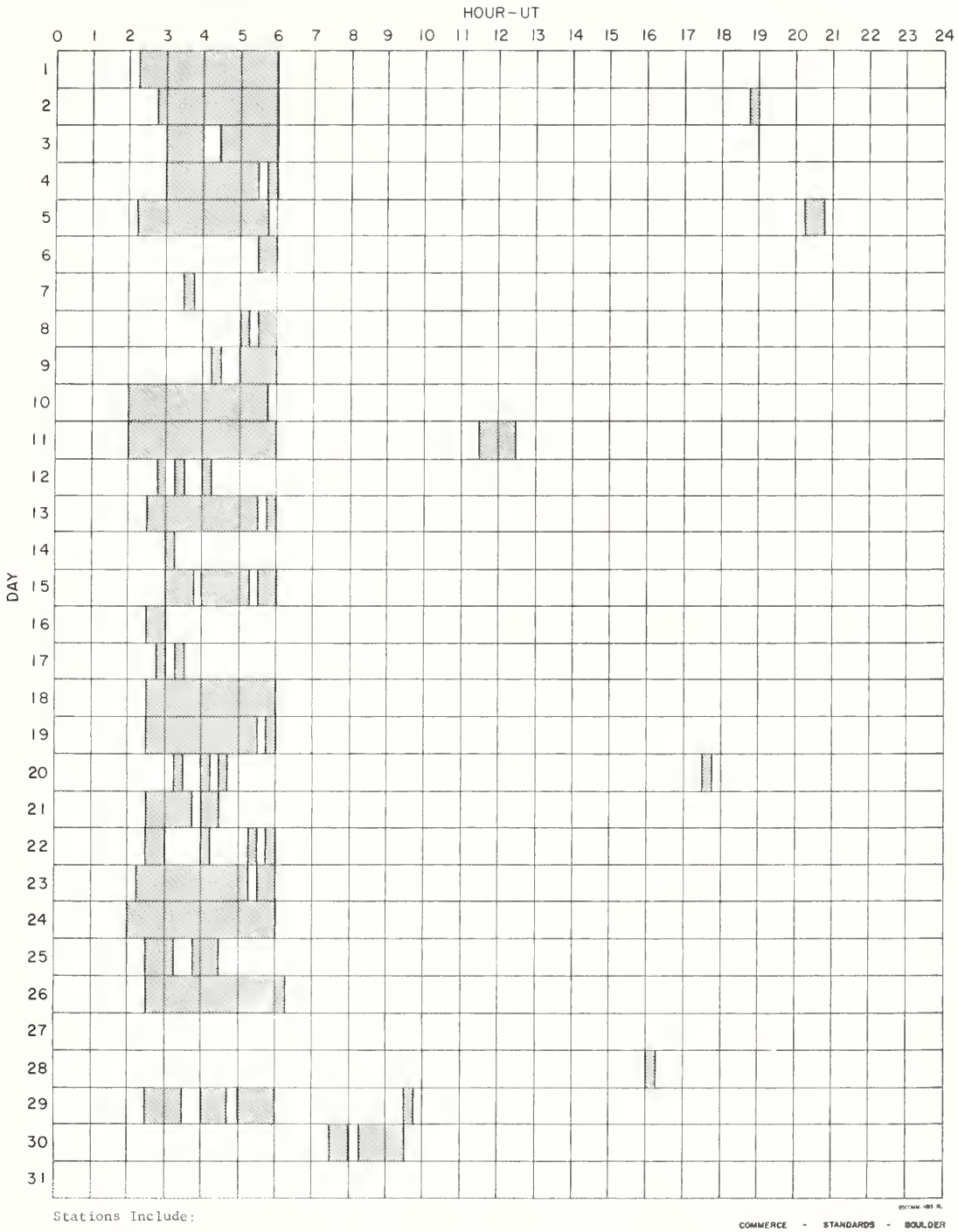
SAC PEAK: ALL VALUES IN MAX. INT. COLUMN ARE ARBITRARY UNITS (0-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

E - LESS THAN
D - GREATER THAN
U - APPROXIMATE
& - PLUS
\- - MINUS
□ - NOT REPORTED

COMMERCE - STANDARDS - BOULDER

# INTERVALS OF NO FLARE PATROL OBSERVATIONS

JULY 1959




Stations Include:

Anacapri (Swedish)
Arcetri
Arosa
Climax
Dunsink
Hawaii
Huancayo
Locarno
Lockheed
Mitaka
Nizamiah
Royal Greenwich Observatory
Herstmonceux
Sacramento Peak
Simeiz
Zurich

# SUBFLARES

## Noted as follows: Date-Universal Time-Coordinates

### JUNE 1959

| | | | | |
|---|---|---|---|---|
| | ARCETRI | 01 | 0843 E | S13 E36 |
| | SAC PEAK | 01 | 1350 | S13 E37 |
| | SAC PEAK | 01 | 1352 | N10 W27 |
| * | HUANCAYO | 01 | 1419 | N05 E65 |
| | ARCETRI | 01 | 1429 E | S13 E36 |
| | SAC PEAK | 01 | 1514 | S13 E35 |
| | SAC PEAK | 01 | 1550 | S15 E32 |
| | SAC PEAK | 01 | 1610 | S12 E39 |
| * | SAC PEAK | 01 | 1656 | S15 E32 |
| | SAC PEAK | 01 | 1712 | N14 W48 |
| | SAC PEAK | 01 | 1810 | S13 E38 |
| | SAC PEAK | 01 | 1840 | S14 E33 |
| | SAC PEAK | 01 | 1922 | N15 W48 |
| | SAC PEAK | 01 | 1958 | S13 E32 |
| | SAC PEAK | 01 | 2240 | N08 E59 |
| | | | | |
| | HAWAII | 02 | 0052 | S14 E34 |
| | CAPRI-S | 02 | 0600 E | S12 E30 |
| | MCMATH | 02 | 1119 | N25 W69 |
| | MCMATH | 02 | 1413 E | N11 W40 |
| * | BOULDER | 02 | 1442 | S12 E37 |
| | MCMATH | 02 | 1445 | N14 E52 |
| * | CAPRI-S | 02 | 1445 E | S15 E33 |
| | SAC PEAK | 02 | 1528 | S13 E28 |
| | LOCARNO | 02 | 1535 | N12 E65 |
| | LOCARNO | 02 | 1545 | S15 E46 |
| | SAC PEAK | 02 | 1608 E | S17 E46 |
| | LOCARNO | 02 | 1625 | S10 E24 |
| | SAC PEAK | 02 | 1826 | S15 E46 |
| | MCMATH | 02 | 1915 E | N10 W44 |
| * | CLIMAX | 02 | 2002 E | S13 E42 |
| | | | | |
| | LOCARNO | 03 | 0600 E | S12 E14 |
| | LOCARNO | 03 | 0600 E | N09 E64 |
| | LOCARNO | 03 | 1105 E | S13 E09 |
| | MCMATH | 03 | 1120 E | N09 W54 |
| | MCMATH | 03 | 1318 | S15 W31 |
| | MCMATH | 03 | 1458 | N14 W58 |
| | SAC PEAK | 03 | 1600 | N10 E49 |
| | WENDEL | 03 | 1640 E | N08 W52 |
| | SAC PEAK | 03 | 1650 | S14 E12 |
| | MCMATH | 03 | 1916 | N12 W57 |
| | MCMATH | 03 | 1930 E | N11 E47 |
| | HAWAII | 03 | 2014 | N16 E07 |
| | | | | |
| * | WENDEL | 04 | 0545 E | N14 E38 |
| | LOCARNO | 04 | 1044 | N04 W49 |
| | MCMATH | 04 | 1135 E | N19 W76 |
| | MCMATH | 04 | 1145 E | S13 E27 |
| | LOCARNO | 04 | 1247 | S21 E69 |
| | LOCARNO | 04 | 1259 | S09 E00 |
| | MCMATH | 04 | 1347 | S15 E24 |
| | SAC PEAK | 04 | 1348 | S14 E23 |
| | SAC PEAK | 04 | 1404 | S13 E02 |
| | MCMATH | 04 | 1405 | S12 E02 |
| | MCMATH | 04 | 1501 | S15 E19 |
| | MCMATH | 04 | 1733 | N34 W47 |
| | MCMATH | 04 | 1733 E | N17 W83 |
| | MCMATH | 04 | 1820 E | N35 W50 |
| | SAC PEAK | 04 | 1834 | S08 W05 |
| | HAWAII | 04 | 1834 | S09 W07 |
| | MCMATH | 04 | 1836 | S08 W06 |
| | MCMATH | 04 | 1921 | N35 W48 |
| | SAC PEAK | 04 | 1922 | N34 W48 |
| * | SAC PEAK | 04 | 2046 | N34 W55 |
| | MCMATH | 04 | 2135 | N35 W52 |
| | SAC PEAK | 04 | 2138 | N34 W55 |
| | MCMATH | 04 | 2230 E | S10 W05 |
| | | | | |
| | WENDEL | 05 | 0721 E | N05 E12 |
| | BOULDER | 05 | 0915 | S12 W11 |
| | CAPRI-S | 05 | 0920 E | S13 W11 |
| | MCMATH | 05 | 1129 E | N14 W61 |
| | MCMATH | 05 | 1130 | S18 E57 |
| | MCMATH | 05 | 1300 | S19 E55 |
| | SAC PEAK | 05 | 1306 | S20 E53 |
| | SAC PEAK | 05 | 1310 | N13 E22 |
| | MCMATH | 05 | 1323 | N05 W67 |
| | WENDEL | 05 | 1429 E | N16 |
| | SAC PEAK | 05 | 1550 | N10 E30 |
| | WENDEL | 05 | 1656 E | S09 W13 |
| | WENDEL | 05 | 1723 E | S09 W17 |
| * | WENDEL | 05 | 1746 E | S11 W14 |
| * | CLIMAX | 05 | 1750 | S07 W09 |
| * | HAWAII | 05 | 1828 | S07 W17 |
| * | CLIMAX | 05 | 1832 | S07 W18 |
| | HAWAII | 05 | 2256 | S09 W18 |
| | HAWAII | 05 | 2316 | S06 W20 |
| | | | | |
| | HAWAII | 06 | 0002 E | S06 W20 |
| * | CAPRI-S | 06 | 0612 | S07 W24 |
| | WENDEL | 06 | 0623 E | N33 W71 |
| | ARCETRI | 06 | 0824 E | N33 W73 |
| | ARCETRI | 06 | 0835 E | N10 E90 |
| | WENDEL | 06 | 0836 E | N33 W70 |
| | WENDEL | 06 | 0922 E | N33 W66 |
| | WENDEL | 06 | 0926 E | N33 W68 |
| * | CAPRI-S | 06 | 0928 E | N08 W05 |
| * | STOCKHOLM | 06 | 0942 | N33 W72 |
| | LOCARNO | 06 | 1258 | S10 W23 |
| | MCMATH | 06 | 1259 | N10 E90 |
| * | LOCARNO | 06 | 1416 | S11 W28 |
| | MCMATH | 06 | 1435 E | N35 W78 |
| * | CAPRI-S | 06 | 1455 E | S08 W27 |
| | MCMATH | 06 | 1935 | N34 W85 |
| | HAWAII | 06 | 2120 | N13 E02 |
| | MCMATH | 06 | 2220 E | N34 W85 |
| | HAWAII | 06 | 2300 | N13 E09 |
| | HAWAII | 06 | 2322 | S12 W33 |
| | | | | |
| | WENDEL | 07 | 0546 E | S09 W36 |
| | WENDEL | 07 | 0601 E | S07 W38 |
| | WENDEL | 07 | 0606 E | S13 W38 |
| | ARCETRI | 07 | 1000 E | S13 W38 |
| | MCMATH | 07 | 1235 E | N14 W31 |
| | WENDEL | 07 | 1251 E | N23 W06 |
| | WENDEL | 07 | 1251 E | N13 W29 |
| | WENDEL | 07 | 1336 E | S18 W42 |
| | LOCARNO | 07 | 1347 | N14 W32 |
| | SAC PEAK | 07 | 1406 | N07 W23 |
| | WENDEL | 07 | 1412 E | N08 W21 |
| | WENDEL | 07 | 1412 E | N13 W30 |
| | SAC PEAK | 07 | 1450 | S23 E32 |
| | MCMATH | 07 | 1510 E | N19 E75 |
| | MCMATH | 07 | 1510 E | S24 E33 |
| | MCMATH | 07 | 1525 E | N06 W23 |
| * | SAC PEAK | 07 | 1538 | S08 W47 |
| | MCMATH | 07 | 1542 | N19 E77 |
| | SAC PEAK | 07 | 1558 | N15 W34 |
| | SAC PEAK | 07 | 1600 | N06 W23 |
| | MCMATH | 07 | 1600 | N06 W23 |
| | SAC PEAK | 07 | 1614 | N07 W24 |
| | MCMATH | 07 | 1645 E | N14 W35 |
| | MCMATH | 07 | 1646 | N08 W23 |
| | SAC PEAK | 07 | 1646 | N08 W24 |
| | MCMATH | 07 | 1652 E | N26 E19 |
| | SAC PEAK | 07 | 1652 | N27 E18 |
| | SAC PEAK | 07 | 1818 | N05 W25 |
| | SAC PEAK | 07 | 1832 | N05 W24 |
| | SAC PEAK | 07 | 1908 | S15 W39 |
| | | | | |
| | HAWAII | 08 | 0020 | N13 W25 |
| * | MEUDON | 08 | 1220 | N28 E55 |
| | SAC PEAK | 08 | 1416 | N09 W12 |
| * | MEUDON | 08 | 1436 | N10 W10 |
| | SAC PEAK | 08 | 1610 | N12 W19 |
| | SAC PEAK | 08 | 1856 E | N12 E54 |
| | SAC PEAK | 08 | 1936 | S08 W59 |
| | HAWAII | 08 | 1938 | S07 W58 |
| | HUANCAYO | 08 | 1943 | S11 W55 |
| | SAC PEAK | 08 | 2006 | S08 W67 |
| | SAC PEAK | 08 | 2246 | N13 E52 |
| | SAC PEAK | 08 | 2312 | N12 W22 |
| | HAWAII | 08 | 2312 | N13 W22 |
| | | | | |
| | HAWAII | 09 | 0040 | N15 E55 |
| | CAPRI-S | 09 | 0835 E | S30 E12 |
| | MCMATH | 09 | 1230 E | N11 E45 |
| * | CAPRI-S | 09 | 1527 | N11 W31 |
| | MCMATH | 09 | 1529 | N11 W52 |
| | MCMATH | 09 | 1608 | S20 E00 |
| * | SAC PEAK | 09 | 1732 E | N18 E90 |
| * | SAC PEAK | 09 | 1900 | N10 W28 |
| * | MCMATH | 09 | 1903 E | N11 W27 |
| | SAC PEAK | 09 | 2014 | S08 W78 |
| | MCMATH | 09 | 2038 | N10 W55 |
| | SAC PEAK | 09 | 2038 | N09 W54 |
| | MCMATH | 09 | 2134 | N10 W55 |
| | SAC PEAK | 09 | 2246 | N12 E38 |
| | | | | |
| * | MCMATH | 10 | 1422 | N13 E33 |
| | SAC PEAK | 10 | 1541 | N15 W50 |
| * | SAC PEAK | 10 | 1558 | N05 E10 |
| * | ARCETRI | 10 | 1602 E | N07 E13 |
| | SAC PEAK | 10 | 1604 | N18 E90 |
| * | HUANCAYO | 10 | 1604 E | N06 E13 |
| | SAC PEAK | 10 | 1630 | N13 E30 |
| | HUANCAYO | 10 | 1631 | N14 E32 |
| | SAC PEAK | 10 | 1650 | N12 E25 |
| | SAC PEAK | 10 | 1736 | N18 E90 |
| | HAWAII | 10 | 1820 | N05 E10 |
| | MCMATH | 10 | 1845 E | N06 E07 |
| | MCMATH | 10 | 1925 E | N06 E05 |
| | SAC PEAK | 10 | 1926 | S11 W80 |
| | HAWAII | 10 | 1928 | S10 W80 |
| | HAWAII | 10 | 1930 | N06 E09 |
| | SAC PEAK | 10 | 1930 | N06 E07 |
| | MCMATH | 10 | 1932 E | S08 W85 |
| | MCMATH | 10 | 2034 | N13 E25 |
| | HAWAII | 10 | 2058 | N06 E09 |
| | SAC PEAK | 10 | 2107 E | N06 E06 |
| | SAC PEAK | 10 | 2334 | N12 E23 |
| | | | | |
| * | MEUDON | 11 | 0827 | N13 E85 |
| | SAC PEAK | 11 | 1420 | N12 E17 |
| | MCMATH | 11 | 1420 | N11 E18 |
| | HUANCAYO | 11 | 1423 E | N15 E18 |
| * | SAC PEAK | 11 | 1434 | N14 E79 |
| * | MEUDON | 11 | 1500 | N10 E00 |
| | SAC PEAK | 11 | 1522 | N16 E81 |
| | SAC PEAK | 11 | 1710 | N12 E15 |
| | SAC PEAK | 11 | 1722 | N21 E18 |
| * | CLIMAX | 11 | 1806 | N17 E78 |
| | SAC PEAK | 11 | 2010 | N12 E13 |
| | HAWAII | 11 | 2010 | N12 E12 |
| | SAC PEAK | 11 | 2048 | N06 W07 |
| | HAWAII | 11 | 2138 | N12 E11 |
| | SAC PEAK | 11 | 2138 | N12 E12 |
| | HUANCAYO | 11 | 2140 | N12 E13 |
| | SAC PEAK | 11 | 2208 | N15 E80 |
| | SAC PEAK | 11 | 2318 | N12 E11 |
| | HAWAII | 11 | 2322 E | N09 E14 |
| | | | | |
| | CAPRI-S | 12 | 0750 E | N15 E13 |
| * | SAC PEAK | 12 | 1308 | N17 E67 |
| | SAC PEAK | 12 | 1322 | S04 E85 |
| | SAC PEAK | 12 | 1524 | S18 W41 |
| | MCMATH | 12 | 1525 E | S20 W42 |
| | HUANCAYO | 12 | 1531 E | S17 W35 |
| * | SAC PEAK | 12 | 1606 | N18 E66 |
| | SAC PEAK | 12 | 1656 | N22 E61 |
| | SAC PEAK | 12 | 1716 | N16 E63 |
| | SAC PEAK | 12 | 1726 | N14 E63 |
| | SAC PEAK | 12 | 1734 | N07 W06 |
| | SAC PEAK | 12 | 1754 | S03 E81 |
| | SAC PEAK | 12 | 1848 | N16 W01 |
| * | SAC PEAK | 12 | 1944 | N15 E03 |
| * | HAWAII | 12 | 2000 | N16 E03 |
| | HUANCAYO | 12 | 2046 | S22 W47 |
| | HAWAII | 12 | 2310 | N16 E03 |
| | HAWAII | 12 | 2342 | N18 E56 |
| | | | | |
| | MEUDON | 13 | 0816 | N22 E45 |
| | MEUDON | 13 | 0848 | N15 E60 |
| | MEUDON | 13 | 1010 | N15 E60 |
| | MCMATH | 13 | 1306 | S09 W37 |
| | MCMATH | 13 | 1310 | S16 W57 |
| | SAC PEAK | 13 | 1314 | S11 W37 |
| | SAC PEAK | 13 | 1320 | N16 E54 |
| | SAC PEAK | 13 | 1336 | N15 E52 |
| | SAC PEAK | 13 | 1350 | N23 E39 |
| | SAC PEAK | 13 | 1420 | N17 E55 |
| | MEUDON | 13 | 1420 | N18 E63 |
| | SAC PEAK | 13 | 1730 E | N11 W15 |
| | HAWAII | 13 | 1800 E | N25 E47 |
| | SAC PEAK | 13 | 1802 E | N22 E44 |
| | SAC PEAK | 13 | 1902 | N22 E36 |
| | MCMATH | 13 | 2000 | N13 E47 |
| | SAC PEAK | 13 | 2054 | N19 E47 |
| | | | | |
| | MCMATH | 14 | 1238 | N13 E39 |
| | MCMATH | 14 | 1308 | N13 E39 |
| | CAPRI-S | 14 | 1310 E | N16 E40 |
| | MCMATH | 14 | 1415 E | N13 E39 |
| | SAC PEAK | 14 | 1418 | N15 E41 |
| | MCMATH | 14 | 1453 | N13 E38 |
| | HUANCAYO | 14 | 1501 E | N16 E35 |
| | MCMATH | 14 | 1826 | S15 W68 |
| | MCMATH | 14 | 2105 E | N18 E36 |
| | MCMATH | 14 | 2232 | N17 E34 |
| | | | | |
| | LOCARNO | 15 | 0747 | S03 E00 |
| | MEUDON | 15 | 0915 | N25 W90 |
| * | MEUDON | 15 | 0959 | N22 E90 |
| | MCMATH | 15 | 1045 E | N15 W85 |
| * | MEUDON | 15 | 1428 | N15 E30 |
| | MCMATH | 15 | 1859 | N13 E23 |
| | SAC PEAK | 15 | 1900 | N14 E24 |
| | HAWAII | 15 | 1902 | N15 E24 |
| | MCMATH | 15 | 2103 | N29 W42 |
| | MCMATH | 15 | 2230 E | N13 E25 |
| | | | | |
| | LOCARNO | 16 | 1135 | N15 E15 |
| | MCMATH | 16 | 1135 E | N12 E15 |
| | MCMATH | 16 | 1147 E | N14 W53 |
| | MCMATH | 16 | 1317 | N16 E14 |
| * | SAC PEAK | 16 | 2006 E | N15 E12 |
| | MCMATH | 16 | 2113 | N11 W53 |
| | SAC PEAK | 16 | 2116 | N12 E11 |
| | HUANCAYO | 16 | 2119 | N10 W51 |
| | HAWAII | 16 | 2202 | N15 E10 |
| | MCMATH | 16 | 2212 | N05 E31 |
| | HAWAII | 16 | 2330 | N15 E10 |
| | | | | |
| | HAWAII | 17 | 0046 | N15 E10 |
| | WENDEL | 17 | 0806 E | N19 W07 |
| * | ARCETRI | 17 | 1009 E | N16 E05 |
| | MEUDON | 17 | 1035 | N05 W05 |
| * | MEUDON | 17 | 1130 | N15 W55 |
| | MCMATH | 17 | 1240 | N04 E74 |
| | MCMATH | 17 | 1342 | N14 E67 |
| | MCMATH | 17 | 1419 | N26 W68 |
| | WENDEL | 17 | 1718 E | N17 W05 |
| | HAWAII | 17 | 1836 | N21 W03 |
| * | SAC PEAK | 17 | 2050 | N17 W07 |
| * | HAWAII | 17 | 2052 | N19 W07 |
| | | | | |
| * | HAWAII | 18 | 0100 | N18 W09 |
| | MCMATH | 18 | 1142 | N19 E47 |
| * | CLIMAX | 18 | 1234 E | N07 E57 |
| | MCMATH | 18 | 1517 | S05 W45 |
| * | SAC PEAK | 18 | 1808 | N06 E52 |
| | MCMATH | 18 | 1815 E | S05 W45 |
| * | CLIMAX | 18 | 1921 | N17 W17 |
| | MCMATH | 18 | 1959 | N08 E55 |
| * | SAC PEAK | 18 | 2019 E | N09 E57 |
| | MCMATH | 18 | 2024 E | N16 W90 |
| * | SAC PEAK | 18 | 2052 E | N07 E54 |
| | MCMATH | 18 | 2245 E | N22 W23 |
| | | | | |
| | HAWAII | 19 | 0024 | N15 W17 |
| * | CAPRI-S | 19 | 0756 E | N15 W23 |
| * | MEUDON | 19 | 1046 | N22 E30 |
| * | MCMATH | 19 | 1217 | N06 E46 |
| | SAC PEAK | 19 | 1338 | N19 W30 |
| | MCMATH | 19 | 1345 | N20 W28 |
| * | SAC PEAK | 19 | 1356 | N10 E48 |
| * | HUANCAYO | 19 | 1358 E | N10 E45 |
| * | MCMATH | 19 | 1358 E | N10 E47 |
| | LOCARNO | 19 | 1400 E | N11 E85 |
| | MCMATH | 19 | 1405 | N07 E90 |
| | LOCARNO | 19 | 1410 | N23 W40 |
| | MCMATH | 19 | 1415 | N25 W39 |
| * | MCMATH | 19 | 1415 | N06 E44 |
| | SAC PEAK | 19 | 1440 | N18 W29 |
| | MCMATH | 19 | 1442 | N30 W58 |
| | HUANCAYO | 19 | 1451 E | N18 W26 |
| * | SAC PEAK | 19 | 1454 | N15 W28 |
| | SAC PEAK | 19 | 1458 | N24 E53 |
| * | MCMATH | 19 | 1459 | N16 W28 |
| | MCMATH | 19 | 1500 | N23 E53 |
| * | SAC PEAK | 19 | 1520 | N18 W32 |
| * | MCMATH | 19 | 1522 | N20 W29 |
| | WENDEL | 19 | 1621 E | N17 E02 |
| | MCMATH | 19 | 1656 | N08 E36 |
| | MCMATH | 19 | 1918 E | N09 W06 |
| | MCMATH | 19 | 2107 | N19 W28 |
| * | HAWAII | 19 | 2140 | N16 W31 |
| * | MCMATH | 19 | 2218 | N08 E37 |
| | HAWAII | 19 | 2308 | N07 W08 |
| | | | | |
| | MCMATH | 20 | 1140 | N13 E28 |
| | SAC PEAK | 20 | 1249 U | N16 W38 |
| | MCMATH | 20 | 1318 | N21 W38 |
| | SAC PEAK | 20 | 1322 | N19 W37 |
| | SAC PEAK | 20 | 1414 | N16 W38 |
| | MCMATH | 20 | 1414 | N18 W39 |
| | MCMATH | 20 | 1423 | N01 W39 |
| | SAC PEAK | 20 | 1506 | N16 W38 |
| | SAC PEAK | 20 | 1554 | N13 E25 |
| | MCMATH | 20 | 1556 | N12 E26 |
| | HUANCAYO | 20 | 1557 E | N14 E23 |
| | SAC PEAK | 20 | 1610 E | N16 W39 |
| | SAC PEAK | 20 | 1626 | N15 W41 |
| | HUANCAYO | 20 | 1627 E | N16 W36 |
| | MCMATH | 20 | 1635 E | N17 W40 |
| * | SAC PEAK | 20 | 1648 | N13 E24 |
| * | MCMATH | 20 | 1651 E | N12 E26 |
| | MCMATH | 20 | 1752 | N13 E25 |
| | MCMATH | 20 | 1844 | N17 W40 |
| | MCMATH | 20 | 1935 E | N26 W47 |
| | MCMATH | 20 | 2114 | N26 W22 |
| | MCMATH | 20 | 2135 E | N20 W46 |
| | MCMATH | 20 | 2150 | N08 W22 |
| | SAC PEAK | 20 | 2226 | N13 E21 |
| | MCMATH | 20 | 2243 E | N12 W24 |
| | SAC PEAK | 20 | 2246 | N07 E22 |
| | | | | |
| | MCMATH | 21 | 1046 | N18 E90 |
| | WENDEL | 21 | 1110 E | N17 W55 |
| * | MCMATH | 21 | 1155 | N17 W55 |
| | MCMATH | 21 | 1251 | N22 W63 |
| | MCMATH | 21 | 1318 | N22 W63 |
| | MCMATH | 21 | 1414 | N19 W57 |
| | CAPRI-S | 21 | 1525 E | N21 E80 |
| | SAC PEAK | 21 | 1528 | N16 W57 |
| | MCMATH | 21 | 1528 | N17 W56 |
| | MCMATH | 21 | 1544 | N19 W57 |
| | MCMATH | 21 | 1556 | N17 W56 |
| | HUANCAYO | 21 | 1558 | N16 W54 |
| | SAC PEAK | 21 | 1558 | N17 W57 |
| | MCMATH | 21 | 1604 | N15 E11 |
| | SAC PEAK | 21 | 1606 | N14 E12 |
| | HUANCAYO | 21 | 1607 | N15 E11 |
| | MCMATH | 21 | 1628 | N18 W58 |
| | SAC PEAK | 21 | 1628 | N18 W57 |
| | SAC PEAK | 21 | 1658 | N17 W54 |
| | SAC PEAK | 21 | 1736 | S18 E25 |
| | MCMATH | 21 | 1820 | N19 W58 |
| * | SAC PEAK | 21 | 1924 | N20 W59 |
| | SAC PEAK | 21 | 1950 | N16 W56 |
| | SAC PEAK | 21 | 2030 | N15 E08 |
| | HAWAII | 21 | 2032 | N16 E10 |
| | HAWAII | 21 | 2142 | S08 E60 |
| | MCMATH | 21 | 2142 | N18 W65 |
| | MCMATH | 21 | 2144 E | S08 E60 |
| * | MCMATH | 21 | 2149 | N10 E08 |

# SUBFLARES

## Noted as follows: Date - Universal Time - Coordinates

## JUNE 1959

| | | | | | |
|---|---|---|---|---|---|
| | MEUDON | 22 | 0844 | N13 | W45 |
| * | NIZAMIAH | 22 | 0949 | N18 | W40 |
| * | CAPRI-S | 22 | 0957 E | N16 | W38 |
| | SAC PEAK | 22 | 1434 | N09 | E01 |
| | ARCETRI | 22 | 1440 E | N09 | E01 |
| * | SAC PEAK | 22 | 1450 | N15 | W02 |
| | SAC PEAK | 22 | 1514 | N08 | E02 |
| | SAC PEAK | 22 | 1550 E | N14 | E02 |
| | SAC PEAK | 22 | 1758 | N09 | W01 |
| | SAC PEAK | 22 | 1838 | N10 | W49 |
| * | CLIMAX | 22 | 1856 | N12 | W01 |
| * | CLIMAX | 22 | 1952 E | N18 | E73 |
| | SAC PEAK | 22 | 2002 | N17 | W47 |
| | SAC PEAK | 22 | 2042 | N11 | W26 |
| | MEUDON | 23 | 1102 | N22 | E05 |
| | STOCKHOLM | 23 | 1104 E | N14 | W11 |
| | MEUDON | 23 | 1107 | N15 | W15 |
| | STOCKHOLM | 23 | 1110 | N21 | E05 |
| * | CLIMAX | 23 | 1347 | N09 | E40 |
| * | SAC PEAK | 23 | 1350 E | N11 | E40 |
| * | CAPRI-S | 23 | 1353 E | N10 | E39 |
| | SAC PEAK | 23 | 1412 | N08 | E28 |
| | CAPRI-S | 23 | 1425 E | N08 | E29 |
| | SAC PEAK | 23 | 1454 | N23 | E01 |
| * | SAC PEAK | 23 | 1528 | N13 | W09 |
| | SAC PEAK | 23 | 1610 | N17 | W88 |
| | SAC PEAK | 23 | 1630 | S19 | W02 |
| | MCMATH | 23 | 1630 E | S19 | W02 |
| * | CLIMAX | 23 | 1647 | N23 | W02 |
| | SAC PEAK | 23 | 1712 | N16 | W62 |
| | SAC PEAK | 23 | 1808 | S20 | W02 |
| | MCMATH | 23 | 1812 E | S19 | W02 |
| | SAC PEAK | 23 | 1846 | N11 | W40 |
| | HUANCAYO | 23 | 1958 E | N08 | W13 |
| | HUANCAYO | 23 | 2023 E | N11 | W15 |
| * | HAWAII | 23 | 2130 | N24 | W02 |
| | MCMATH | 23 | 2130 E | N09 | E22 |
| | MCMATH | 23 | 2200 E | S08 | E32 |
| | WENDEL | 24 | 0619 E | N07 | W32 |
| | WENDEL | 24 | 0620 E | N25 | W08 |
| | STOCKHOLM | 24 | 1224 E | S21 | W08 |
| | LOCARNO | 24 | 1512 | N18 | W25 |
| * | MCMATH | 24 | 1527 | N27 | E90 |
| | WENDEL | 24 | 1603 E | N25 | W13 |
| | SAC PEAK | 24 | 1640 | N21 | W37 |
| | SAC PEAK | 24 | 1642 | N16 | W78 |
| | SAC PEAK | 24 | 1702 | N14 | W77 |
| | SAC PEAK | 24 | 1736 | N13 | E26 |
| | SAC PEAK | 24 | 2008 E | N37 | E63 |
| | HAWAII | 24 | 2240 | N14 | W28 |
| | HAWAII | 25 | 0014 | N36 | E56 |
| | SAC PEAK | 25 | 1456 | S07 | E07 |
| | MCMATH | 25 | 1512 | N07 | W40 |
| | SAC PEAK | 25 | 1512 | N06 | W41 |
| * | SAC PEAK | 25 | 1558 | S17 | E36 |
| * | CLIMAX | 25 | 1601 | S17 | E38 |
| * | MCMATH | 25 | 1603 E | S16 | E36 |
| | SAC PEAK | 25 | 1612 | N24 | W28 |
| | SAC PEAK | 25 | 1634 | N11 | W02 |
| | SAC PEAK | 25 | 1702 | N24 | W28 |
| * | SAC PEAK | 25 | 1732 | S17 | E35 |
| * | HAWAII | 25 | 1800 E | S15 | E34 |
| | HAWAII | 25 | 1854 | N24 | W29 |
| | MCMATH | 25 | 1925 E | N29 | W18 |
| | HAWAII | 25 | 2102 | S08 | E05 |
| | SAC PEAK | 25 | 2114 E | S09 | E06 |
| | SAC PEAK | 25 | 2114 | N25 | W32 |
| * | SAC PEAK | 25 | 2122 | N09 | W04 |
| | WENDEL | 26 | 0654 E | N17 | W48 |
| | CLIMAX | 26 | 1436 | S08 | W67 |
| | CLIMAX | 26 | 1450 | N15 | W53 |
| | CAPRI-S | 26 | 1451 E | N15 | W48 |
| | SAC PEAK | 26 | 1548 E | N25 | W40 |
| | SAC PEAK | 26 | 1558 | N10 | W17 |
| | SAC PEAK | 26 | 1654 | N26 | E65 |
| | SAC PEAK | 26 | 1726 | S26 | E66 |
| | SAC PEAK | 26 | 1830 | N28 | E65 |
| | SAC PEAK | 26 | 1844 | N19 | E09 |
| | HAWAII | 26 | 1846 | N18 | E08 |
| | MCMATH | 26 | 1852 E | N18 | E09 |
| | SAC PEAK | 26 | 1922 | N30 | E63 |
| | MCMATH | 26 | 1923 E | N28 | E65 |
| | MCMATH | 26 | 1923 E | N10 | W19 |
| | MCMATH | 26 | 1925 | S07 | W68 |
| | MCMATH | 26 | 1938 | N15 | W60 |
| | SAC PEAK | 26 | 2036 | N18 | E08 |
| | HAWAII | 26 | 2040 | N19 | E08 |
| | SAC PEAK | 26 | 2244 | N29 | E63 |
| | SAC PEAK | 26 | 2258 | N20 | E07 |
| | STOCKHOLM | 27 | 1023 | N20 | E05 |
| | STOCKHOLM | 27 | 1024 | N22 | E57 |
| | SAC PEAK | 27 | 1310 E | N26 | E55 |
| | LOCARNO | 27 | 1420 | N07 | W27 |
| | LOCARNO | 27 | 1423 | N27 | E54 |
| | LOCARNO | 27 | 1440 | N22 | E00 |
| | SAC PEAK | 27 | 1446 | N26 | E55 |
| | LOCARNO | 27 | 1450 | N27 | E54 |
| | MCMATH | 27 | 1451 | N24 | E55 |
| * | SAC PEAK | 27 | 1554 | N26 | E55 |
| | SAC PEAK | 27 | 1636 | N26 | E55 |
| | MCMATH | 27 | 1643 | N25 | E54 |
| | SAC PEAK | 27 | 1732 | N18 | W04 |
| | MCMATH | 27 | 1732 E | N18 | W03 |
| | MCMATH | 27 | 1915 E | S18 | E50 |
| | SAC PEAK | 27 | 1920 | S18 | E54 |
| | MCMATH | 27 | 1926 E | N18 | W05 |
| | HAWAII | 27 | 1928 | N19 | W05 |
| | MCMATH | 27 | 1942 E | N26 | W55 |
| | MCMATH | 27 | 1948 E | N26 | E53 |
| | SAC PEAK | 27 | 1958 | N06 | W30 |
| | SAC PEAK | 27 | 2102 | N10 | W36 |
| | HAWAII | 27 | 2106 | N09 | W33 |
| | SAC PEAK | 27 | 2108 | N19 | W06 |
| | SAC PEAK | 27 | 2146 | N25 | E50 |
| | HAWAII | 27 | 2150 | N25 | E51 |
| * | SAC PEAK | 27 | 2202 | N19 | W06 |
| | SAC PEAK | 27 | 2320 | N19 | W06 |
| | HAWAII | 27 | 2322 | N18 | W07 |
| | HAWAII | 28 | 0116 | N15 | W11 |
| | SAC PEAK | 28 | 1314 | N26 | E42 |
| | SAC PEAK | 28 | 1314 | N15 | W16 |
| * | SAC PEAK | 28 | 1320 | N08 | W80 |
| | SAC PEAK | 28 | 1346 | N08 | E43 |
| | SAC PEAK | 28 | 1354 | N03 | W77 |
| | MCMATH | 28 | 1354 | N10 | W80 |
| | SAC PEAK | 28 | 1436 | N10 | W85 |
| | SAC PEAK | 28 | 1510 | N27 | W18 |
| | SAC PEAK | 28 | 1552 | N12 | E90 |
| | MCMATH | 28 | 1554 | N10 | E90 |
| | MCMATH | 28 | 1623 | N24 | E09 |
| | SAC PEAK | 28 | 1628 | N36 | E09 |
| | SAC PEAK | 28 | 1640 | N35 | E07 |
| | MCMATH | 28 | 1642 E | N33 | E07 |
| | MCMATH | 28 | 1655 E | N17 | W13 |
| | SAC PEAK | 28 | 1732 | N10 | W46 |
| | SAC PEAK | 28 | 1756 | N05 | W80 |
| | SAC PEAK | 28 | 1818 | N05 | W78 |
| * | HAWAII | 28 | 1910 | S06 | E43 |
| | MCMATH | 28 | 1951 | N08 | E23 |
| | SAC PEAK | 28 | 1956 E | N10 | E24 |
| | SAC PEAK | 28 | 2152 | N05 | W90 |
| | MCMATH | 28 | 2200 E | N13 | W46 |
| | MCMATH | 28 | 2238 E | N18 | W17 |
| | SAC PEAK | 28 | 2252 E | N06 | W86 |
| | HAWAII | 28 | 2336 E | N10 | W49 |
| | MCMATH | 29 | 1258 E | N12 | W54 |
| | HAWAII | 29 | 2244 E | S16 | W22 |
| | HAWAII | 29 | 2330 E | N10 | W63 |
| | MCMATH | 30 | 1832 E | N06 | E40 |
| | SAC PEAK | 30 | 1834 E | S14 | W36 |

*Rated as flare of importance ≥ 1 by other observatories (see CRPL 179 Part B).

COMMERCE · STANDARDS · BOULDER

# SOLAR FLARES

APRIL 1959

| OBSERVATORY | DATE APR 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TASHKENT | 01 | 0502 | 0520 | 0506 | N26 | W18 | 5068 | 18 | 2 | 3 | 0507 | | 10.00 | 4.00 | 100 | Slow S-SWF |
| ABASTUMANI | 01 | 0505 E | 0522 D | 0509 U | N28 | W18 | 5068 | 17 D | 2& | 1 | 0508 | | 28.30 | 3.30 | | |
| ZURICH | 01 | 1018 | 1021 | | N23 | W20 | 5068 | 3 | 1 | 3 | 1018 | | 1.00 | | | |
| MOSCOW-G | 01 | 1019 E | 1021 D | | N23 | W23 | 5068 | | □ | | | | | | | |
| KIEV | 01 | 1340 E | 1404 | 1350 | N28 | W29 | 5068 | 24 D | 1 | 2 | 1349 | | .66 | | 90 | |
| LOCKHEED | 01 | 2129 | 2210 | 2134 | N14 | W11 | 5071 | 41 | 1 | 1 | 2134 | 3.50 | | | | |
| VOROSHILOV | 01 | 2227 | 2301 | 2234 | N16 | W09 | 5071 | 34 | 1& | 2 | 2234 | | 2.20 | | 82 | |
| LOCKHEED | 01 | 2228 | 2305 | 2233 | N18 | W10 | 5071 | 37 | 1 | 1 | | 2.60 | | | | |
| SIMEIZ | 02 | 0609 E | 0640 D | | N16 | W14 | 5071 | 31 D | 1 | 1 | 0609 | | 2.20 | 2.30 | 80 | |
| GOOD HOPE | 02 | 0740 | 0757 | 0742 | N16 | W23 | 5071 | 17 | 1 | | 0742 | 2.00 | 2.30 | | | |
| SCHAUINS | 02 | 0800 E | 0820 | | N13 | W19 | 5071 | 20 D | 1 | 2 | | | 2.00 | 1.80 | | |
| SCHAUINS | 02 | 0800 E | 0820 | | N06 | W24 | 5079 | 20 D | 1 | 2 | | | 2.00 | 1.70 | | |
| ZURICH | 02 | 0814 E | 0823 D | | N03 | W24 | 5079 | 9 D | 1 | 3 | 0814 | | 2.00 | | | |
| SCHAUINS | 02 | 0815 | 0825 | | N03 | W25 | 5079 | 10 | 1 | 2 | | | 3.00 | 1.90 | | |
| LOCARNO | 02 | 0815 E | 0827 | | N04 | W24 | 5079 | 12 D | 1 | 3 | 0815 | | 1.00 | | | |
| GOOD HOPE | 02 | 0817 E | 0830 | | N06 | W26 | 5079 | 13 D | 1 | | 0817 | 2.50 | 2.80 | | | |
| GOOD HOPE | 02 | 1200 | 1223 | 1212 | S08 | W87 | 5063 | 23 D | 1 | | 1212 | .30 | | | | |
| AROSA | 02 | 1417 | 1430 | | N09 | E55 | 5080 | 13 | 1 | | | | | | | |
| LOCARNO | 02 | 1550 E | 1615 | | N13 | E21 | 5076 | 25 D | 1 | 2 | 1550 | | 2.00 | | | |
| MEUDON | 02 | 1553 | 1625 | 1600 | N15 | E30 | 5076 | 32 | 1 | | | | 4.00 | | | |
| ZURICH | 02 | 1601 E | 1611 D | | N16 | E22 | 5071 | 10 D | 1 | 3 | 1601 | | 1.00 | | | |
| SYDNEY | 03 | 0255 | 0330 | 0305 | N14 | W27 | 5071 | 35 | 2 | 2 | 0305 | 4.00 | 5.00 | | | |
| SCHAUINS | 03 | 0942 E | 0955 | | N16 | W27 | 5071 | 13 D | 1 | 2 | | | 2.00 | 2.00 | | |
| NEDERHORST | 03 | 1245 | 1258 D | | N14 | W32 | 5071 | 13 D | 2 | 3 | | | | | | |
| AROSA | 03 | 1245 E | 1330 | | N15 | W36 | 5071 | 45 D | 2 | | | | | | | S-SWF |
| SCHAUINS | 03 | 1252 E | 1327 D | | N15 | W28 | 5071 | 35 D | 2 | 2 | | | 7.00 | 1.90 | | |
| LOCARNO | 03 | 1300 E | 1320 | | N16 | W32 | 5071 | 20 D | 2 | 2 | 1300 | | 8.00 | | | |
| SCHAUINS | 03 | 1400 E | 1520 D | | N13 | E37 | 5071 | 80 D | 1 | 2 | | | 4.00 | 1.70 | | |
| LOCARNO | 03 | 1530 | 1544 | | N31 | W35 | 5073 | 14 | 1 | 2 | 1530 | | 1.00 | | | |
| SIMEIZ | 04 | 0640 E | 0800 D | | N17 | W45 | 5071 | 80 D | 2& | 1 | 0800 | | 25.00 | 3.10 | | |
| ZURICH | 04 | 0737 E | 0752 | | N13 | E83 | 5083 | 15 D | 1 | 3 | 0737 | | 3.00 | | | |
| MEUDON | 04 | 0750 | 0930 | | N13 | W50 | 5068 | 100 | 2& | | | | 15.00 | | | |
| ZURICH | 04 | 0737 E | 0755 D | | N16 | W45 | 5071 | 18 D | 2 | 3 | 0742 | | 7.00 | | | |
| LOCARNO | 04 | 0740 E | 0915 | | N16 | W46 | 5071 | 95 D | 2& | 2 | 0740 | | 15.00 | | | S-SWF |
| AROSA | 04 | 0800 E | 0900 D | | N15 | W44 | 5071 | 60 D | 2 | | | | | | | |
| LOCARNO | 04 | 0827 | 0855 | 0830 | N20 | W63 | 5068 | 28 | 1& | 2 | | | 4.00 | | | |
| MEUDON | 04 | 0827 | 0900 | 0830 | N20 | W60 | 5068 | 33 | 1& | | | | 5.00 | | | |
| AROSA | 04 | 0830 E | 0850 | | N20 | W62 | 5068 | 20 D | 2 | | | | | | | |
| SIMEIZ | 04 | 0833 E | 0855 D | | N22 | W60 | 5068 | 22 D | 1& | 1 | 0833 | | 7.40 | 2.70 | | |
| SCHAUINS | 04 | 0848 E | 0905 | | N18 | W42 | 5071 | 17 D | 2 | 2 | | | 6.00 | 1.60 | | |
| LOCARNO | 04 | 0910 | 0958 | 0920 | N10 | W50 | 5071 | 48 | 1& | 2 | | | 4.00 | | | |
| GOOD HOPE | 04 | 0939 E | 1005 | | N13 | W45 | 5071 | 26 D | 2 | | 0939 | 5.00 | 7.50 | | | |
| GOOD HOPE | 04 | 0939 E | 1010 | 0950 | N13 | E90 | 5083 | 31 D | 1 | | 0950 | .80 | | | | |
| GOOD HOPE | 04 | 1157 | 1218 D | 1202 | N15 | W53 | 5071 | 21 D | 1 | | 1202 | 1.20 | 2.10 | | | |
| SCHAUINS | 04 | 1200 E | 1215 | | N14 | W52 | 5071 | 15 D | 1& | 1 | | | 3.00 | 2.00 | | S-SWF |
| AROSA | 04 | 1205 E | 1215 | | N13 | W53 | 5071 | 10 D | 1 | | | | | | | |
| MEUDON | 04 | 1256 | 1345 | 1320 | N17 | E08 | 5080 | 49 | 1 | | | | 3.00 | | | |
| LOCARNO | 04 | 1255 | 1350 | 1310 | N14 | W02 | 5076 | 55 | 1& | 2 | | | 3.00 | | | |
| LOCARNO | 04 | 1610 E | 1625 | | N13 | W58 | 5071 | 15 D | 1 | 2 | 1610 | | 2.00 | | | |
| SYDNEY | 05 | 0122 | 0138 | 0130 | N21 | W70 | 5068 | 16 | 1 | 2 | 0130 | .50 | 2.00 | | | |

# SOLAR FLARES

APRIL 1959

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SYDNEY | 05 | 0154 | 0213 D | 0200 | N16 | W55 | 5071 | 19 D | 1 | 2 | 0200 | 1.50 | 3.00 | | | |
| SYDNEY | 05 | 0205 | 0211 | 0209 | N22 | W75 | 5068 | 6 | 2 | 2 | 0209 | 1.00 | 5.00 | | | |
| SYDNEY | 05 | 0353 | 0425 | 0406 | N12 | W56 | 5071 | 32 | 2 | 2 | 0406 | 3.00 | 7.00 | | | S-SWF |
| KRASNYA | 05 | 0839 | 0852 | 0843 | N18 | W60 | 5071 | 13 | 1 | 2 | 0843 | | 1.30 | | 98 | |
| LOCARNO | 05 | 0840 E | 0905 | | N11 | W57 | 5071 | 25 D | 1 | 2 | 0840 | | 1.00 | | | |
| KRASNYA | 05 | 0935 | 0945 | 0938 U | N19 | W62 | 5071 | 10 | 1& | 2 | 0938 | | 5.20 | | 138 | |
| LOCARNO | 05 | 0935 | 0950 | 0938 | N11 | W57 | 5071 | 15 | 1 | 2 | | | 1.00 | | | |
| GOOD HOPE | 05 | 1150 E | 1200 | | N15 | W61 | 5071 | 10 D | 1 | | 1150 | 1.60 | 3.60 | | | |
| GOOD HOPE | 05 | 1401 | 1420 | 1409 | N15 | W66 | 5071 | 19 | 1 | | 1409 | 1.10 | 2.80 | | | |
| LOCARNO | 05 | 1550 E | 1616 | | N16 | W61 | 5071 | 26 D | 1 | 2 | 1550 | | 2.00 | | | |
| SCHAUINS | 05 | 1602 E | 1607 | | N18 | W55 | 5071 | 5 D | 1 | 1 | | | 3.00 | 1.70 | | |
| SCHAUINS | 05 | 1645 E | 1657 | | N17 | W85 | 5068 | 12 D | 1& | 1 | | | 5.00 | 2.80 | | S-SWF |
| VOROSHILOV | 05 | 2316 | 0119 | 2325 | N15 | W68 | 5071 | 123 | 2& | 2 | 2325 | | 23.21 | | 118 | S-SWF |
| SYDNEY | 05 | 2320 E | 0037 D | 2330 | N16 | W68 | 5071 | 77 D | 3& | 2 | 2330 | 21.00 | | | | |
| SYDNEY | 06 | 0453 | 0458 | 0455 | N25 | W67 | 5071 | 5 | 1 | 2 | 0455 | 1.00 | 3.00 | | | |
| ABASTUMANI | 06 | 0528 E | 0816 D | 0544 U | S25 | E49 | 5088 | 168 D | 2 | 1 | 0544 | | 2.80 | | 66 | |
| ABASTUMANI | 06 | 0649 E | 0705 D | 0654 | N13 | E61 | 5083 | 16 D | 1 | 1 | 0654 | | 4.70 | | 70 | |
| ABASTUMANI | 06 | 0531 E | 0736 D | 0726 U | N14 | W75 | 5071 | 125 D | 1 | 1 | 0726 | | 4.50 | | 16 | |
| KRASNYA | 06 | 0720 | 0736 | 0729 U | N17 | W70 | 5071 | 16 | 1 | 2 | 0729 | | 1.80 | | 80 | |
| KRASNYA | 06 | 0738 | 0752 | 0744 U | N18 | W70 | 5071 | 14 | 1& | 2 | 0744 | | 3.60 | | 135 | |
| GOOD HOPE | 06 | 0738 | 0755 | 0744 | N18 | W72 | 5071 | 17 | 1 | | 0744 | 1.30 | 4.70 | | | |
| ABASTUMANI | 06 | 0742 E | 0816 D | 0758 | N12 | E67 | 5083 | 34 D | 1 | 1 | 0758 | | 4.80 | | 52 | |
| GOOD HOPE | 06 | 0747 | 0825 | 0805 | N12 | E68 | 5083 | 38 | 1 | | 0805 | 1.40 | 4.10 | | | |
| LOCARNO | 06 | 0750 E | 0940 | | N15 | E63 | 5083 | 110 D | 2 | 2 | 0750 | | 5.00 | | | |
| KRASNYA | 06 | 0839 | 0948 | 0943 U | N21 | W79 | 5071 | 9 | 1 | 2 | 0943 | | 4.00 | | 65 | |
| GOOD HOPE | 06 | 0941 | 1000 | 0945 | N18 | W75 | 5071 | 19 | 1 | | 0945 | 1.10 | 4.90 | | | |
| LOCARNO | 06 | 1040 | 1110 | | N18 | W02 | 5088 | 30 | 1& | 2 | 1040 | | 4.00 | | | |
| GOOD HOPE | 06 | 1051 E | 1112 | | N19 | W04 | 5080 | 21 D | 1 | | 1056 | 2.70 | 3.00 | | | |
| GOOD HOPE | 06 | 1243 E | 1305 D | | N17 | W76 | 5071 | 22 D | 2 | | 1243 | 2.20 | 9.80 | | | |
| ZURICH | 06 | 1250 E | 1259 D | | S24 | E45 | 5088 | 9 D | 1 | 2 | 1250 | | 1.00 | | | |
| LOCARNO | 06 | 1450 E | 1510 | | N13 | W04 | 5080 | 20 D | 1 | 3 | 1450 | | | | | |
| ZURICH | 06 | 1454 E | 1503 D | | N13 | W04 | 5080 | 9 D | 1 | 2 | 1454 | | 2.00 | | | |
| SYDNEY | 07 | 0256 | 0355 | 0311 | N12 | E53 | 5083 | 59 | 1 | 2 | 0311 | 2.00 | 3.00 | | | |
| SYDNEY | 07 | 0350 | 0405 | 0352 | N12 | E49 | 5083 | 15 | 1 | 2 | 0352 | 2.00 | 3.00 | | | |
| SYDNEY | 07 | 0320 | 0333 | 0324 | N28 | W72 | 5071 | 13 | 1 | 2 | 0324 | 1.00 | 4.00 | | | |
| SYDNEY | 07 | 0321 | 0400 | 0340 | N13 | W12 | 5080 | 39 | 1 | 2 | 0340 | 3.00 | 3.00 | | | |
| SYDNEY | 07 | 0405 | 0440 | 0408 | N25 | E51 | 5085 | 35 | 1 | 2 | 0408 | 2.00 | 4.00 | | | S-SWF |
| SYDNEY | 07 | 0426 | 0436 | 0431 | N17 | W88 | 5071 | 10 | □ | 2 | 0431 | .50 | | | | |
| SYDNEY | 07 | 0426 E | 0448 | 0429 | N14 | E51 | 5083 | 22 D | 2 | 2 | 0429 | 3.00 | 5.00 | | | |
| SYDNEY | 07 | 0426 E | 0456 | 0433 | S21 | E36 | 5088 | 30 D | 1 | 2 | 0433 | 3.00 | 4.00 | | | |
| SYDNEY | 07 | 0445 | 0528 | 0512 | N10 | E87 | 5090 | 43 | 1 | 2 | 0512 | 1.50 | | | | |
| SYDNEY | 07 | 0457 | 0512 | 0507 | S14 | E89 | 5089 | 15 | 1 | 2 | 0507 | 1.00 | | | | |
| LOCARNO | 07 | 1355 | 1500 | | N10 | E86 | 5090 | 65 | 2& | 4 | 1355 | | | | | G-SWF |
| LOCARNO | 07 | 1520 | 1530 | | N25 | E55 | 5085 | 10 | 1 | 4 | 1520 | | | | | |
| SYDNEY | 08 | 0025 E | 0038 | 0027 | S17 | E80 | 5089 | 13 D | 1 | 2 | 0027 | 1.50 | | | | |
| SYDNEY | 08 | 0153 E | 0205 | 0156 | N13 | E37 | 5083 | 12 D | 1 | 2 | 0156 | 3.00 | 4.00 | | | |
| SYDNEY | 08 | 0213 | 0248 | 0222 | S17 | E79 | 5089 | 35 | 1 | 2 | 0222 | 1.50 | | | | |
| ABASTUMANI | 08 | 0608 E | 0807 D | 0616 U | S15 | E88 | 5089 | 119 D | 1& | 1 | 0616 | | 15.30 | | | |
| ABASTUMANI | 08 | 0631 E | 0735 D | 0712 | S20 | E20 | 5088 | 64 D | 1& | 1 | 0712 | | 5.50 | | 66 | |
| ABASTUMANI | 08 | 0638 E | 0750 D | 0740 | N14 | E28 | 5083 | 72 D | 1 | 1 | 0740 | | 1.30 | | 55 | |

# SOLAR FLARES

APRIL 1959

| OBSERVATORY | DATE APR 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCARNO | 08 | 0905 | 1000 | | N25 | E90 | 5093 | 55 | 2& | 2 | 0905 | | | | | |
| GOOD HOPE | 08 | 0916 E | 0941 D | | N27 | E85 | 5093 | 25 D | 3 | | 0916 | 5.00 | | | | S-SWF |
| AROSA | 08 | 0924 E | 0935 | | N28 | E85 | 5093 | 11 D | 1 | | | | | | | |
| TASHKENT | 08 | 0932 E | 0934 | | N28 | E86 | 5093 | 2 D | 1& | 1 | | | | | | |
| ZURICH | 08 | 1220 | 1225 | | N12 | E25 | 5083 | 5 | 1 | 2 | 1220 | | 1.00 | | | |
| AROSA | 08 | 1313 | 1327 | | N12 | E24 | 5083 | 14 | 1 | | | | | | | |
| ZURICH | 08 | 1313 | 1331 D | | N10 | E24 | 5083 | 18 D | 1 | 2 | 1313 | | 2.00 | | | |
| LOCARNO | 08 | 1315 | 1330 | | N10 | E26 | 5083 | 15 | 1 | 2 | 1315 | | | | | |
| AROSA | 08 | 1324 | 1330 | | S22 | E11 | 5088 | 6 | 1 | | | | | | | |
| ZURICH | 08 | 1324 | 1333 | | S23 | E09 | 5088 | 9 | 1 | 2 | 1324 | | 1.00 | | | |
| LOCARNO | 08 | 1325 | 1332 | | S22 | E11 | 5088 | 7 | 1 | 2 | 1325 | | | | | |
| ZURICH | 08 | 1344 | 1354 | | N24 | W07 | 5082 | 10 | 1 | 2 | 1344 | | 1.00 | | | |
| LOCARNO | 08 | 1425 | 1455 | | N09 | E71 | 5090 | 30 | 1& | 2 | 1425 | | | | | Slow S-SWF |
| AROSA | 08 | 1445 E | 1500 D | | N10 | E73 | 5090 | 15 D | 1 | | | | | | | |
| LOCKHEED | 08 | 2040 | 2106 | 2046 | N28 | E78 | 5093 | 26 | 1 | 1 | | 2.30 | | | | Slow S-SWF |
| SYDNEY | 09 | 0007 | 0032 | 0024 | N15 | W58 | 5080 | 25 | 1 | 2 | 0024 | 1.00 | 2.00 | | | |
| SYDNEY | 09 | 0106 | 0149 | 0122 | N14 | W60 | 5080 | 43 | 1 | 1 | 0122 | 2.00 | 3.00 | | | |
| SYDNEY | 09 | 0236 | 0242 | 0239 | S16 | E65 | 5089 | 6 | 1 | 2 | 0239 | 1.00 | 2.00 | | | |
| SYDNEY | 09 | 0319 E | 0349 | 0334 | N14 | W61 | 5080 | 30 D | 1 | 2 | 0334 | 2.00 | 3.00 | | | S-SWF |
| SYDNEY | 09 | 0444 E | 0505 D | | N14 | W61 | 5080 | 21 D | 2 | 2 | 0444 | 2.00 | 5.00 | | | |
| ABASTUMANI | 09 | 0455 E | 0807 | 0457 | N18 | W62 | 5080 | 192 D | 1 | 2 | 0614 | | 4.50 | 2.00 | 83 | |
| ABASTUMANI | 09 | 0532 | 0537 | 0534 | N01 | E49 | 5092 | 5 | 1 | 2 | 0534 | | 3.40 | | 70 | |
| ABASTUMANI | 09 | 0556 | 0807 | 0703 | N12 | E17 | 5083 | 131 | 1 | 2 | 0706 | | 2.90 | 1.60 | 66 | |
| SIMEIZ | 09 | 0610 E | 0635 D | 0612 | N18 | W62 | 5080 | 25 D | 1 | 3 | 0612 | | 2.00 | | 80 | |
| ABASTUMANI | 09 | 0621 | 0729 | 0634 | N08 | E57 | 5090 | 68 | 2 | 2 | 0634 | | 15.90 | 2.10 | 70 | |
| SIMEIZ | 09 | 0624 | 0725 D | 0632 U | N11 | E58 | 5090 | 61 D | 1& | 3 | 0634 | | 8.00 | 1.70 | 76 | |
| GOOD HOPE | 09 | 0641 E | 0707 D | | N10 | E59 | 5090 | 26 D | 1 | | 0641 | 2.60 | 5.00 | | | |
| SIMEIZ | 09 | 0700 | 0710 D | 0703 | N12 | E15 | 5083 | 10 D | 1 | 3 | 0705 | | 1.50 | 1.60 | 76 | |
| GOOD HOPE | 09 | 0703 | 0707 D | 0704 | N12 | E16 | 5083 | 4 D | 1 | | 0704 | 2.00 | 2.20 | | | |
| SIMEIZ | 09 | 0829 E | 0850 | 0843 | N19 | W62 | 5080 | 21 D | 1 | 3 | 0840 | | 2.00 | 2.70 | 80 | |
| SIMEIZ | 09 | 0847 E | 0920 D | 0859 | N12 | E14 | 5083 | 33 D | 1 | 3 | 0901 | | 1.00 | 2.20 | 80 | |
| SIMEIZ | 09 | 0858 E | 0925 D | 0900 U | N18 | W62 | 5080 | 27 D | 1 | 3 | 0859 | | 3.00 | 2.40 | 72 | |
| KHARKOV | 09 | 0900 E | 0934 | | N17 | W60 | 5080 | 34 D | 1 | 1 | 0905 | | | 1.70 | | |
| MEUDON | 09 | 1315 | 1342 | | N14 | E20 | 5083 | 27 | 1 | | | | 2.00 | | | |
| LOCKHEED | 09 | 2337 | 0028 | 2346 | S11 | E53 | 5089 | 51 | 1 | 1 | | 2.10 | | | | |
| SYDNEY | 09 | 2343 | 0009 | 2350 | N19 | E52 | 5090 | 26 | 2 | 2 | 2350 | 4.00 | 6.00 | | | |
| SYDNEY | 10 | 0154 | 0200 | 0156 | N16 | W72 | 5080 | 6 | 1 | 2 | 0156 | .50 | 2.00 | | | |
| SYDNEY | 10 | 0239 | 0248 | 0241 | N12 | E07 | 5083 | 9 | 1 | 2 | 0241 | 2.00 | 2.00 | | | |
| SYDNEY | 10 | 0236 | 0256 | 0239 | N27 | E61 | 5093 | 20 | 1 | 2 | 0239 | 1.50 | 4.00 | | | |
| TASHKENT | 10 | 0407 E | 0513 | | N08 | E45 | 5090 | 66 D | 1& | 2 | 0409 | | 11.00 | 1.60 | 60 | |
| ABASTUMANI | 10 | 0511 E | 0818 D | 0632 U | N17 | W79 | 5080 | 187 D | 1& | 3 | 0805 | | 7.00 | 3.10 | 63 | |
| SIMEIZ | 10 | 0617 E | 0740 D | 0634 | N18 | W79 | 5080 | 83 D | 1& | 2 | 0636 | | 7.70 | 4.80 | 88 | |
| AROSA | 10 | 0625 E | 0653 | | N16 | W77 | 5080 | 28 D | 1 | | | | | | | |
| GOOD HOPE | 10 | 0637 E | 0740 | | N18 | W75 | 5080 | 63 D | 2 | | 0637 | 1.40 | 6.20 | | | |
| GOOD HOPE | 10 | 0805 | 0816 | 0808 | N19 | W78 | 5080 | 11 | 1 | | 0808 | .50 | 2.40 | | | |
| ABASTUMANI | 10 | 0737 E | 0818 D | 0809 | N24 | E59 | 5093 | 41 D | 1& | 3 | 0809 | | 7.60 | 3.00 | 62 | |
| GOOD HOPE | 10 | 0804 | 0830 | 0810 | N26 | E57 | 5093 | 26 | 1 | | 0810 | 1.60 | 3.30 | | | |
| AROSA | 10 | 0805 E | 0820 | | N25 | E55 | 5093 | 15 D | 1 | | | | | | | |
| GOOD HOPE | 10 | 1036 | 1110 | 1040 | N26 | E56 | 5093 | 34 | 2& | | 1040 | 7.50 | 16.00 | | | S-SWF |
| KRASNYA | 10 | 1105 E | 1128 D | 1107 U | N18 | W72 | 5080 | 23 | 2 | 2 | 1107 | | 8.10 | | 113 | |
| KIEV | 10 | 1249 | 1256 | 1250 | N15 | W89 | 5080 | 7 | 1 | 2 | 1250 | | 4.75 | | 42 | |



SOLAR FLARES

# SOLAR FLARES

APRIL 1959

| OBSERVATORY | DATE APR 1959 | OBSERVED UNIVERSAL TIME START | OBSERVED UNIVERSAL TIME END | OBSERVED UNIVERSAL TIME MAX. PHASE | LOCATION APPROX. LAT. | LOCATION APPROX. MER. DIST. | LOCATION McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEASUREMENTS MEAS. AREA Sq. Deg. | MEASUREMENTS CORR. AREA Sq. Deg. | MEASUREMENTS MAX. WIDTH Hα | MEASUREMENTS MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOOD HOPE | 10 | 1250 | 1302 | 1253 | N18 | W80 | 5080 | 12 | 1 | | 1253 | .40 | 2.90 | | | |
| LOCARNO | 10 | 1630 E | 1720 D | | N17 | W80 | 5080 | 50 D | 1& | 3 | 1630 | | | | | |
| LOCARNO | 10 | 1646 | 1715 | | N24 | E47 | 5093 | 29 | 1& | 3 | 1646 | | | | | |
| ABASTUMANI | 11 | 0550 E | 0613 D | 0814 U | N12 | W13 | 5083 | 23 D | 1 | 3 | 0626 | | 3.80 | 3.30 | 90 | |
| ABASTUMANI | 11 | 0615 E | 0653 D | 0631 U | N09 | E36 | 5090 | 38 D | 1& | 3 | 0622 | | 7.40 | 2.00 | 76 | |
| KRASNYA | 11 | 0731 | 0750 | 0736 U | N13 | W14 | 5083 | 19 | 1 | 2 | 0736 | | .90 | | 75 | |
| KRASNYA | 11 | 0807 | 0835 | 0813 U | N21 | W90 | 5080 | 28 | 1 | 2 | 0813 | | .50 | | 100 | |
| MOSCOW-G | 11 | 0807 E | 0933 D | 0838 | N29 | E45 | 5093 | 86 D | 2 | 1 | 0838 | | 9.60 | 4.80 | 200 | |
| PIRCULI | 11 | 0828 E | 0900 D | | N23 | E50 | 5093 | 32 D | 2 | 2 | 0840 | | 9.10 | | 64 | |
| SIMEIZ | 11 | 0830 E | 0905 D | 0845 U | N28 | E47 | 5093 | 35 D | 1& | 1 | 0841 | | 5.80 | 3.20 | 128 | S-SWF |
| MEUDON | 11 | 0831 | 0856 | | N27 | E40 | 5093 | 25 | 1 | | | | 5.00 | | | |
| KRASNYA | 11 | 0833 E | 0839 D | 0837 U | N24 | E48 | 5093 | 6 D | 1& | 2 | 0837 | | 3.40 | | 86 | |
| AROSA | 11 | 0835 E | 0852 D | | N27 | E44 | 5093 | 17 D | 2 | | | | | | | |
| LOCARNO | 11 | 1010 | 1030 | | N16 | W90 | 5080 | 20 | 1 | 2 | 1010 | | | | | |
| LOCARNO | 11 | 1446 | 1625 D | 1610 | N27 | E40 | 5093 | 99 D | 2 | 2 | | | 8.00 | | | |
| MEUDON | 11 | 1447 | 1607 | 1514 | N20 | E45 | 5093 | 80 | 2 | | | | 6.00 | | | Slow S-SWF |
| AROSA | 11 | 1545 E | 1600 D | | N28 | E37 | 5093 | 15 D | 1 | | | | | | | |
| MEUDON | 11 | 1621 | 1640 | | N12 | W10 | 5083 | 19 | 1 | | | | | | | |
| LOCARNO | 11 | 1622 | 1625 D | | N14 | W14 | 5083 | 3 | 1& | 2 | 1622 | | | | | |
| LOCARNO | 11 | 1652 E | 1725 D | | N14 | W14 | 5083 | 33 D | 1& | 2 | 1622 | | | | | |
| TASHKENT | 12 | 0422 | 0444 | 0428 | S14 | E22 | 5089 | 22 | 1 | 2 | 0426 | | 3.00 | 1.90 | 60 | |
| ABASTUMANI | 12 | 0729 E | 0744 D | 0731 U | S14 | E26 | 5089 | 15 D | 1 | 1 | 0731 | | 1.00 | | | |
| GOOD HOPE | 12 | 1005 E | 1105 | 1024 | N08 | E18 | 5090 | 60 D | 1 | | 1024 | 1.60 | 1.70 | | | |
| AROSA | 12 | 1013 | 1122 | 1030 | N08 | E17 | 5090 | 69 | 1 | | | | | | | |
| KHARKOV | 12 | 1024 | 1119 | 1031 | N07 | E16 | 5090 | 55 | 1& | 2 | 1034 | | 6.30 | 1.70 | | |
| LOCARNO | 12 | 1040 E | 1105 | | N06 | E20 | 5090 | 25 D | 1 | 2 | 1040 | | | | | |
| KHARKOV | 12 | 1041 | 1056 D | 1043 | N20 | E52 | 5095 | 15 D | 1& | 2 | 1046 | | 11.40 | 1.90 | | |
| GOOD HOPE | 12 | 1043 | 1053 | 1045 | N19 | E62 | 5095 | 10 | 1 | | 1045 | .90 | 2.30 | | | |
| AROSA | 12 | 1044 | 1048 | | N20 | E60 | 5095 | 4 | 1 | | | | | | | |
| KHARKOV | 12 | 1104 | 1209 | 1113 | N28 | E27 | 5093 | 65 | 3 | 2 | 1113 | | 30.30 | 5.00 | | |
| MEUDON | 12 | 1105 | 1135 | 1110 | N28 | E35 | 5093 | 30 | 2 | | | | 10.00 | | | |
| LOCARNO | 12 | 1105 | 1215 | 1130 | N26 | E29 | 5093 | 70 | 2& | 2 | | | 9.00 | | | |
| GOOD HOPE | 12 | 1108 | 1225 | 1114 | N28 | E32 | 5093 | 77 | 2 | | 1114 | 8.30 | 11.90 | | | Slow S-SWF |
| AROSA | 12 | 1110 | 1215 | | N26 | E27 | 5093 | 65 | 2 | | | | | | | |
| ZURICH | 12 | 1118 E | 1218 D | | N28 | E29 | 5093 | 60 D | 2 | 2 | 1118 | | 9.00 | | | |
| PIRCULI | 12 | 1120 E | 1143 D | | N25 | E30 | 5093 | 23 D | 2 | 2 | 1120 | | 15.29 | | 48 | |
| ZURICH | 12 | 1210 E | 1220 D | | N12 | W31 | 5083 | 10 D | 1 | 2 | 1210 | | 1.00 | | | |
| KHARKOV | 12 | 1215 | 1219 | 1216 | N15 | W33 | 5083 | 4 | 1 | 2 | 1216 | | 4.60 | 1.70 | | |
| AROSA | 12 | 1329 | 1332 | | N12 | W31 | 5083 | 3 | 1 | | | | | | | |
| LOCARNO | 12 | 1640 | 1653 | | N11 | W29 | 5083 | 13 | 1 | 2 | 1640 | | | | | |
| SYDNEY | 13 | 0050 E | 0054 | | N30 | E23 | 5093 | 4 D | 1 | 2 | 0050 | 1.50 | 2.00 | | | |
| SYDNEY | 13 | 0056 | 0109 D | 0102 | N30 | E21 | 5093 | 13 | 1 | 2 | 0102 | 2.00 | 3.00 | | | |
| TASHKENT | 13 | 0503 | 0600 D | 0506 | N29 | E22 | 5093 | 57 D | 1& | 2 | 0506 | | 7.00 | 2.80 | 150 | |
| ABASTUMANI | 13 | 0503 | 0614 D | 0506 | N27 | E24 | 5093 | 71 D | 1& | 3 | 0513 | | 8.60 | 2.30 | 73 | |
| KODAIKNL | 13 | 0510 E | 0525 D | 0515 | N27 | E22 | 5093 | 15 D | 1 | 2 | 0510 | 2.00 | 2.50 | 1.40 | 121 | |
| GOOD HOPE | 13 | 0724 | 0750 | 0730 | N15 | W46 | 5083 | 26 | 1 | | 0730 | 2.20 | 3.40 | | | |
| KRASNYA | 13 | 0727 | 0742 | 0729 | N17 | W48 | 5083 | 15 | 1 | 2 | 0729 | | 1.90 | | 85 | |
| ABASTUMANI | 13 | 0725 E | 0744 D | 0729 U | N18 | W47 | 5085 | 19 D | 1 | 3 | 0733 | | 2.70 | 1.40 | 58 | |
| MEUDON | 13 | 0823 | 0916 | 0836 | N28 | E21 | 5093 | 53 | 2& | | | | 15.00 | | | |
| MEUDON | 13 | 0828 | 0850 | 0836 | N35 | E45 | 5093 | 22 | 1 | | | | 3.00 | | | |

# SOLAR FLARES

APRIL 1959

| OBSERVATORY | DATE APR 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GOOD HOPE | 13 | 0830 | 0930 | 0840 | N28 | E20 | 5093 | 60 | 3 | | 0841 | 13.00 | 17.00 | | | |
| KRASNYA | 13 | 0831 | 0927 | 0839 | N28 | E20 | 5093 | 56 | 2 | 2 | 0839 | | 2.10 | | 240 | |
| AROSA | 13 | 0832 | 0915 | | N28 | E17 | 5093 | 43 | 2 | | | | | | | S-SWF |
| ZURICH | 13 | 0832 | 0928 | | N27 | E17 | 5093 | 56 | 2& | 3 | 0832 | | 9.00 | | | |
| NEDERHORST | 13 | 0834 E | 0900 D | | N28 | E20 | 5093 | 26 D | 2 | 3 | | | | | | |
| UTRECHT | 13 | 0836 | 0844 | | □ | | | 8 | 2 | 2 | | | | | | |
| LOCARNO | 13 | 0840 E | 0935 | | N26 | E18 | 5093 | 55 D | 2& | 2 | 0840 | | 6.00 | | | |
| SCHAUINS | 13 | 0842 E | 0906 | | N25 | E18 | 5093 | 24 D | 2 | 2 | | | 9.00 | 4.00 | | |
| MOSCOW-G | 13 | 0854 | 0931 | | N29 | E18 | 5093 | 37 D | 1& | 2 | 0901 | | 8.90 | 2.40 | 110 | |
| ZURICH | 13 | 1303 | 1312 D | | N14 | W38 | 5083 | 9 D | 1 | 3 | 1303 | | 2.00 | | | |
| VOROSHILOV | 13 | 2306 | 2316 | 2313 | N29 | E12 | 5093 | 10 | 1 | 2 | 2313 | | 2.39 | | 75 | |
| LOCKHEED | 13 | 2337 | 0015 | 2341 | N29 | E11 | 5093 | 38 | 1 | 2 | | 2.60 | | | | |
| VOROSHILOV | 13 | 2338 | 0009 | 2342 | N28 | E12 | 5093 | 31 | 1& | 2 | 2342 | | 2.46 | | 99 | |
| VOROSHILOV | 14 | 0133 | 0225 D | 0135 | N29 | E11 | 5093 | 52 D | 1& | 2 | 0135 | | 3.24 | | 95 | |
| TASHKENT | 14 | 0504 | 0515 | 0506 | N28 | E08 | 5093 | 11 | 1 | 2 | 0505 | | 5.00 | 2.70 | 65 | |
| AROSA | 14 | 0603 | 0615 D | | N28 | E06 | 5093 | 12 D | 1 | | | | | | | |
| KRASNYA | 14 | 0932 | 0943 | 0934 U | S21 | W64 | 5088 | 11 | 1& | 1 | 0934 | | 2.00 | | 82 | |
| AROSA | 14 | 0933 | 0943 | | S21 | W67 | 5088 | 10 | 1 | | | | | | | |
| GOOD HOPE | 14 | 0933 | 0948 | 0936 | S20 | W67 | 5088 | 15 | 1 | | 0936 | 1.00 | 2.60 | | | |
| ZURICH | 14 | 1048 | 1103 | | S14 | W05 | 5089 | 15 | 1 | 3 | 1100 | | 1.00 | | | |
| SCHAUINS | 14 | 1222 E | 1236 | | N27 | E07 | 5093 | 14 D | 2 | 2 | | | 6.00 | 3.40 | | |
| MEUDON | 14 | 1223 E | 1245 | | N29 | E05 | 5093 | 22 D | 1& | | | | 15.00 | | | |
| ZURICH | 14 | 1225 E | 1300 D | | N27 | E01 | 5093 | 35 D | 2 | 1 | 1225 | | 6.00 | | | S-SWF |
| MEUDON | 14 | 1236 | 1251 | | N15 | E45 | 5095 | 15 | 1 | | | | 4.00 | | | |
| SCHAUINS | 14 | 1257 E | 1303 | | N28 | E12 | 5093 | 6 D | 1 | 2 | | | 5.00 | 1.40 | | |
| AROSA | 14 | 1315 E | 1330 D | | S15 | W03 | 5089 | 15 D | 1 | | | | | | | |
| MEUDON | 14 | 1432 | 1510 | | S15 | W10 | 5089 | 38 | 1 | | | | 3.00 | | | |
| ZURICH | 14 | 1444 | 1450 D | | S16 | W08 | 5089 | 6 D | 1 | 1 | 1444 | | 3.00 | | | |
| ZURICH | 14 | 1438 | 1444 | | N27 | E03 | 5093 | 6 | 1 | 1 | 1438 | | 2.00 | | | |
| ZURICH | 14 | 1621 | 1624 | | N14 | E32 | 5095 | 3 | 1 | 2 | 1621 | | 3.00 | | | |
| SYDNEY | 15 | 0010 | 0035 | 0014 | N16 | E48 | 5100 | 25 | 1 | 2 | 0014 | 2.00 | 2.00 | | | |
| LOCARNO | 15 | 0833 | 0847 | 0835 | N26 | W06 | 5093 | 14 | 2 | 3 | | | 6.00 | | | S-SWF |
| SCHAUINS | 15 | 0835 E | 0845 | | N28 | W04 | 5093 | 10 D | 2 | 2 | | | 6.00 | 2.70 | | |
| LOCARNO | 15 | 0836 | 0847 | | N33 | E15 | 5093 | 11 | 1 | 3 | 0836 | | 2.00 | | | |
| ZURICH | 15 | 0926 E | 0936 | | N00 | W36 | 5092 | 10 D | 1 | 3 | 0926 | | 2.00 | | | |
| AROSA | 15 | 0929 | 0933 | | S01 | W39 | 5092 | 4 | 1 | | | | | | | |
| ZURICH | 15 | 1050 E | 1129 | | S18 | W79 | 5088 | 39 D | 1& | 3 | 1050 | | 5.00 | | | |
| GOOD HOPE | 15 | 1053 | 1125 | 1057 | S17 | W76 | 5088 | 32 | 2 | | 1057 | 1.70 | 8.90 | | | |
| AROSA | 15 | 1435 E | 1457 | | N27 | W11 | 5093 | 22 D | 1 | | | | | | | |
| GOOD HOPE | 16 | 1153 | 1217 | 1157 | N28 | W27 | 5093 | 24 | 1 | | 1157 | 2.40 | 3.20 | | | |
| ABASTUMANI | 17 | 0456 E | 0810 D | 0512 U | N18 | E79 | 5102 | 194 D | 1& | 1 | | | 11.00 | | | |
| GOOD HOPE | 17 | 0751 | 0824 | 0801 | N11 | W50 | 5090 | 33 | 1 | | 0801 | 1.50 | 2.40 | | | |
| GOOD HOPE | 17 | 0947 | 1057 | 0952 | N11 | W51 | 5090 | 70 | 1 | | 0952 | 1.20 | 2.00 | | | |
| KRASNYA | 17 | 1006 | 1034 | 1008 | N15 | W50 | 5090 | 28 | 1 | 2 | 1008 | | 2.00 | | 60 | |
| LOCARNO | 17 | 1635 E | 1655 D | | N09 | W55 | 5090 | 20 D | 1 | 3 | 1635 | | 2.00 | | | |
| VOROSHILOV | 18 | 0135 | 0141 | 0136 | S10 | W80 | 5092 | 6 | 2 | 3 | 0136 | | 6.04 | | 114 | |
| ABASTUMANI | 18 | 0528 | 0746 D | 0741 U | N08 | W74 | 5090 | 138 D | 1& | 2 | | | 9.70 | | 60 | |
| ABASTUMANI | 18 | 0546 E | 0603 D | 0556 | S14 | W57 | 5089 | 17 D | 1& | 2 | | | 2.70 | | 70 | |



SOLAR FLARES

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APRIL 1959

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIMEIZ | 18 | 0610 E | 0625 D | 0610 | N00 | W78 | 5092 | 15 D | 1 | 2 | 0619 | | 3.30 | 1.80 | 68 | |
| KRASNYA | 18 | 0738 | 0751 | 0741 | N05 | W78 | 5092 | 13 | 1& | 2 | 0741 | | 5.40 | | 85 | |
| SIMEIZ | 18 | 0740 E | 0810 D | 0744 U | N00 | W78 | 5092 | 30 D | 1 | 2 | 0744 | | 3.30 | | 80 | |
| KRASNYA | 18 | 0805 | 0833 | 0809 | N31 | W45 | 5093 | 28 | 2 | 2 | 0809 | | 3.10 | | 120 | |
| SIMEIZ | 18 | 0805 | 0850 | 0809 | N28 | W48 | 5093 | 45 | 2 | 2 | 0808 | | 5.20 | 4.30 | 128 | S-SWF |
| UTRECHT | 18 | 0806 | | | ¤ | | | | 2& | 2 | | | | | | |
| LOCARNO | 18 | 0810 E | 0830 D | | N27 | W44 | 5093 | 20 D | 1 | 3 | 0810 | | 2.00 | | | |
| LOCARNO | 18 | 0913 | 0947 | 0920 | N21 | E03 | 5100 | 34 | 1& | 3 | | | 2.00 | | | |
| KRASNYA | 18 | 0915 | 0933 | 0919 | N09 | E05 | 5098 | 18 | 1 | 2 | 0919 | | 2.00 | | 65 | |
| KRASNYA | 18 | 0940 | 0956 | 0945 | N05 | W78 | 5092 | 16 | 1& | 2 | 0745 | | 10.80 | | 75 | |
| LOCARNO | 18 | 0945 | 1004 | 0952 | S01 | W74 | 5092 | 19 | 1 | 3 | | | | | | |
| LOCARNO | 18 | 1445 | 1525 | | N21 | E86 | 5105 | 40 | 1 | 2 | 1445 | | | | | |
| VOROSHILOV | 18 | 2328 | 0011 | 2335 | N29 | W55 | 5093 | 43 | 1& | 2 | 2335 | | 2.44 | | 100 | |
| MOSCOW-G | 19 | 0823 E | 0858 | | N30 | W62 | 5093 | 35 D | 1 | 1 | 0829 | | 3.00 | 3.60 | 120 | |
| LOCARNO | 19 | 0825 | 0859 | 0835 | N30 | W59 | 5093 | 34 | 2- | 3 | | | 6.00 | | | S-SWF |
| GOOD HOPE | 19 | 0830 E | 0844 D | | N30 | W61 | 5093 | 14 D | 2 | | 0830 | 2.00 | 5.30 | | | |
| LOCARNO | 19 | 1515 E | 1545 | | N18 | W12 | 5100 | 30 D | 1 | 3 | 1515 | | | | | |
| SYDNEY | 20 | 0303 | 0313 | 0306 | N20 | E61 | 5105 | 10 | 1 | 2 | 0306 | 1.00 | 3.00 | | | |
| ABASTUMANI | 20 | 0740 E | 0812 D | 0745 U | S13 | W65 | 5094 | 32 D | 1 | 1 | 0748 | | 2.70 | 2.20 | | |
| SIMEIZ | 20 | 0741 E | 0820 D | 0749 U | S10 | W68 | 5094 | 39 D | 1 | 2 | 0754 | | 4.40 | 2.10 | 72 | |
| LOCARNO | 20 | 0745 | 0820 | 0750 | S07 | W68 | 5094 | 35 | 1 | 2 | | | 2.00 | | | |
| LOCARNO | 20 | 1005 E | 1040 | | S01 | E47 | 5104 | 35 D | 1 | 2 | 1005 | | 1.00 | | | S-SWF |
| LOCARNO | 20 | 1250 E | 1305 | | N17 | W38 | 5095 | 15 D | 1 | 2 | 1250 | | 1.00 | | | |
| LOCARNO | 20 | 1448 | 1515 | | N27 | W90 | 5093 | 27 | 1 | 2 | 1448 | | | | | |
| SYDNEY | 21 | 0006 | 0112 | 0029 | N32 | W21 | 5097 | 66 | 2 | 2 | 0029 | 6.00 | 8.00 | | | |
| LOCKHEED | 21 | 0006 | 0130 | | N32 | W22 | 5097 | 84 | 1 | 2 | 0034 | 4.60 | | | | |
| ABASTUMANI | 21 | 0735 E | 0747 D | 0737 U | N11 | W45 | 5095 | 12 D | 1 | 2 | | | 1.80 | | | |
| LOCARNO | 21 | 1020 E | 1035 | | N16 | W37 | 5100 | 15 D | 1 | 2 | 1020 | | | | | |
| LOCARNO | 21 | 1225 | 1235 | | N07 | W17 | 5106 | 10 | 1 | 2 | 1225 | | 1.00 | | | |
| ZURICH | 21 | 1229 E | 1234 | | N08 | W18 | 5106 | 5 D | 1 | 2 | 1229 | | 2.00 | | | |
| ZURICH | 21 | 1326 E | 1330 D | | N09 | E62 | 5108 | 4 D | 1 | 1 | 1326 | | 1.00 | | | |
| MEUDON | 21 | 1456 | 1530 | 1500 | N20 | W44 | 5100 | 34 | 1& | | | | 7.00 | | | |
| ZURICH | 21 | 1511 E | 1524 D | | N20 | W47 | 5100 | 13 D | 1 | 1 | 1511 | | 1.00 | | | |
| LOCARNO | 22 | 0727 | 0755 | | N14 | E44 | 5108 | 28 | 1 | 2 | 0727 | | 1.00 | | | |
| ZURICH | 22 | 0730 | 0801 | | N16 | E42 | 5108 | 31 | 1 | 3 | 0750 | | 2.00 | | | |
| ZURICH | 22 | 0735 E | 0804 D | | N17 | W16 | 5098 | 29 D | 1& | 3 | 0735 | | 3.00 | | | |
| ZURICH | 22 | 0740 E | 0801 D | | N18 | E29 | 5105 | 21 D | 1 | 3 | 0740 | | 1.00 | | | |
| ZURICH | 22 | 1248 | 1255 | | N17 | W18 | 5098 | 7 | 1& | 3 | 1248 | | 4.00 | | | |
| GOOD HOPE | 23 | 0825 | 0833 | 0829 | N19 | W69 | 5100 | 8 | 1 | | 0829 | 1.70 | 5.00 | | | |
| SIMEIZ | 23 | 0826 E | 0837 D | 0828 U | N19 | W69 | 5100 | 11 D | 1 | 2 | 0828 | | 2.50 | | 92 | |
| ZURICH | 23 | 0828 | 0830 | | N18 | W64 | 5100 | 2 | 1 | 3 | 0828 | | 1.00 | | | |
| SCHAUINS | 23 | 0830 E | 0935 D | | N17 | W60 | 5100 | 65 D | 1 | 2 | | | 5.00 | 2.00 | | |
| MOSCOW-G | 23 | 0832 E | 0916 D | | N18 | W69 | 5100 | 44 D | 1& | 1 | 0848 | | 6.00 | 3.00 | 100 | |
| GOOD HOPE | 23 | 0842 | 0915 | 0849 | N19 | W69 | 5100 | 33 | 1 | | 0849 | 1.30 | 3.80 | | | |
| LOCARNO | 23 | 0850 E | 0910 | | S12 | W08 | 5103 | 20 D | 1 | 2 | 0850 | | | | | |
| ZURICH | 23 | 0855 | 0900 | | S11 | W08 | 5103 | 5 | 1 | 3 | 0855 | | 1.00 | | | |
| GOOD HOPE | 23 | 0957 | 1006 | 0959 | N19 | W70 | 5100 | 9 | 1 | | 0959 | .90 | 2.80 | | | |
| GOOD HOPE | 23 | 1112 | 1126 | 1115 | N19 | W69 | 5100 | 14 | 1 | | 1115 | .80 | 2.30 | | | |

# SOLAR FLARES

APRIL 1959

| OBSERVATORY | DATE | OBSERVED UNIVERSAL TIME | | | LOCATION | | | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS | | | | | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | START | END | MAX. PHASE | APPROX. LAT. | APPROX. MER. DIST. | McMATH PLAGE REGION | | | | TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | |
| | APR 1959 | | | | | | | | | | | | | | | |
| ZURICH | 23 | 1206 | 1211 | | N16 | W33 | 5098 | 5 | 1 | 3 | 1206 | | 1.00 | | | |
| ZURICH | 23 | 1304 | 1306 | | N16 | W33 | 5098 | 2 | 1 | 3 | 1304 | | 1.00 | | | |
| ZURICH | 23 | 1315 | 1321 | | N16 | W33 | 5098 | 6 | 1 | 3 | 1315 | | 1.00 | | | |
| ZURICH | 23 | 1338 | 1340 | | N15 | W70 | 5100 | 2 | 1 | 3 | 1338 | | 1.00 | | | |
| ZURICH | 23 | 1411 | 1417 | | N15 | W70 | 5100 | 6 | 1 | 3 | 1411 | | 1.00 | | | |
| SCHAUINS | 23 | 1428 E | 1455 D | | N17 | W62 | 5100 | 27 D | 1 | 1 | | | 4.00 | 2.60 | | |
| ZURICH | 23 | 1429 | 1436 | | N15 | W70 | 5100 | 7 | 1 | 3 | 1429 | | 1.00 | | | |
| LOCARNO | 23 | 1623 | 1655 | | N17 | W67 | 5100 | 32 | 1 | 2 | 1623 | | | | | |
| ZURICH | 23 | 1645 | 1648 | | S06 | W07 | 5103 | 3 | 1 | 3 | 1645 | | 1.00 | | | |
| TASHKENT | 24 | 0508 | 0540 | 0515 | N16 | E95 | 5122 | 32 | 1 | 3 | 0515 | | | 4.60 | 70 | |
| LOCARNO | 24 | 0750 | 0830 | | N13 | E90 | 5122 | 40 | 2 | 2 | 0750 | | | | | |
| GOOD HOPE | 24 | 0757 | 0841 | 0806 | N12 | E90 | 5122 | 44 | 2 | | 0806 | 1.10 | | | | |
| MEUDON | 24 | 0807 E | 0908 | | N20 | E90 | 5122 | 61 D | 1 | | | | | | | |
| LOCARNO | 24 | 1125 | 1145 | | S09 | W08 | 5103 | 20 | 1 | 2 | 1125 | | 1.00 | | | |
| LOCARNO | 24 | 1158 | 1215 | | N17 | W42 | 5098 | 17 | 1 | 2 | 1158 | | | | | |
| LOCARNO | 24 | 1530 | 1545 | | N11 | E59 | 5120 | 15 | 1 | 2 | 1530 | | | | | |
| ZURICH | 24 | 1533 | 1547 | | N11 | E58 | 5120 | 14 | 1 | 2 | 1533 | | 2.00 | | | |
| VOROSHILOV | 24 | 2255 | 2314 D | 2306 | N31 | E70 | 5119 | | 1 | 2 | 2306 | | 4.00 | | 68 | |
| TASHKENT | 25 | 0356 E | 0453 | 0407 | N16 | E85 | 5122 | 57 D | 1& | 2 | 0409 | | 11.00 | 7.30 | 100 | |
| TASHKENT | 25 | 0433 E | 0456 | 0434 | N31 | E67 | 5119 | 23 D | 1 | 2 | 0436 | | 4.00 | 3.00 | 65 | |
| ZURICH | 25 | 0745 | 0756 | | N17 | W55 | 5098 | 11 | 1 | 3 | 0745 | | 5.00 | | | |
| KRASNYA | 25 | 0745 | 0758 | 0749 | N18 | W52 | 5098 | 13 | 1 | 1 | 0749 | | 2.10 | | 75 | |
| LOCARNO | 25 | 0745 E | 0820 | | N16 | W51 | 5098 | 35 D | 1& | 2 | 0745 | | 3.00 | | | |
| LOCARNO | 25 | 0756 | 0807 | | N18 | W31 | 5098 | 11 | 1 | 2 | 0756 | | | | | |
| ZURICH | 25 | 0756 | 0803 | | N14 | E56 | 5120 | 7 | 1 | 3 | 0756 | | 1.00 | | | |
| KRASNYA | 25 | 0756 | 0800 | 0758 | N20 | W32 | 5102 | 4 | 1 | 1 | 0758 | | 2.20 | | 70 | |
| ZURICH | 25 | 0756 | 0802 | | N22 | W35 | 5102 | 6 | 1 | 3 | 0756 | | 2.00 | | | |
| LOCARNO | 25 | 0945 | 1330 | | N32 | W90 | 5093 | 225 | 1 | 2 | 0945 | | | | | |
| LOCARNO | 25 | 1205 | 1345 | | N16 | W54 | 5098 | 100 | 1 | 2 | 1205 | | 3.00 | | | |
| LOCARNO | 25 | 1350 | 1450 | | N16 | W54 | 5098 | 60 | 1 | 2 | 1350 | | 2.00 | | | |
| LOCARNO | 25 | 1315 | 1345 | | N15 | E71 | 5122 | 30 | 1 | 2 | 1315 | | | | | |
| LOCARNO | 25 | 1348 | 1415 | | N05 | E06 | 5108 | 27 | 1 | 2 | 1348 | | 2.00 | | | |
| LOCARNO | 25 | 1430 | 1440 | | S08 | W23 | 5103 | 10 | 1 | 2 | 1430 | | | | | |
| LOCARNO | 25 | 1442 | 1500 | | N15 | E71 | 5122 | 18 | 1 | 2 | 1442 | | | | | |
| LOCARNO | 25 | 1555 | 1614 | | N06 | E05 | 5108 | 19 | 1 | 2 | 1555 | | 2.00 | | | |
| SYDNEY | 26 | 0143 | 0155 | 0146 | N12 | E68 | 5122 | 12 | 1 | 2 | 0146 | .75 | 3.00 | | | |
| ZURICH | 26 | 0843 E | 0850 D | | S12 | W49 | 5103 | 7 D | 1 | 1 | 0843 | | 2.00 | | | |
| ZURICH | 26 | 0850 E | 0920 D | | N30 | E49 | 5123 | 30 D | 2 | 1 | 0850 | | 6.00 | | | |
| KRASNYA | 26 | 0854 | 0920 | | N25 | E49 | 5123 | 26 | 1 | 1 | 0902 | | 1.70 | | 70 | |
| GOOD HOPE | 26 | 0855 | 0925 | 0858 | N27 | E49 | 5123 | 30 | 1 | | 0858 | 2.60 | 4.50 | | | |
| SYDNEY | 27 | 0319 | 0325 | 0321 | S06 | E59 | 5124 | 6 | 1 | 2 | 0321 | .75 | 2.00 | | | |
| SYDNEY | 27 | 0354 | 0429 | 0401 | N15 | E31 | 5120 | 35 | 1 | 2 | 0401 | 2.00 | 2.00 | | | |
| TASHKENT | 27 | 0354 | 0429 | 0402 | N15 | E31 | 5120 | 35 | 1 | 2 | 0401 | | 2.00 | 2.00 | 65 | |
| ALMA-ATA | 27 | 0359 E | 0421 D | 0406 | N18 | E32 | 5120 | 22 D | 1 | 2 | 0406 | | 4.00 | | 71 | |
| ALMA-ATA | 27 | 0359 E | 0421 D | 0408 | N16 | E33 | 5120 | 22 D | 1 | 2 | 0408 | | 3.50 | | 70 | |
| KHARKOV | 27 | 0855 E | 0959 D | | N15 | E21 | 5117 | 64 D | 1& | 2 | 0856 | | 9.80 | 3.70 | | S-SWF |
| KHARKOV | 27 | 0857 E | 0959 D | | N10 | E14 | 5117 | 62 D | 1 | 2 | 0900 | | 2.40 | 2.40 | | |
| KIEV | 27 | 1255 | 1314 D | 1259 | S06 | W49 | 5103 | 19 D | 1 | 2 | 1259 | | 4.10 | | 50 | |
| ZURICH | 27 | 1258 | 1307 D | | S08 | W51 | 5103 | 9 D | 1 | 1 | 1258 | | 2.00 | | | |



SOLAR FLARES

# SOLAR FLARES

APRIL 1959

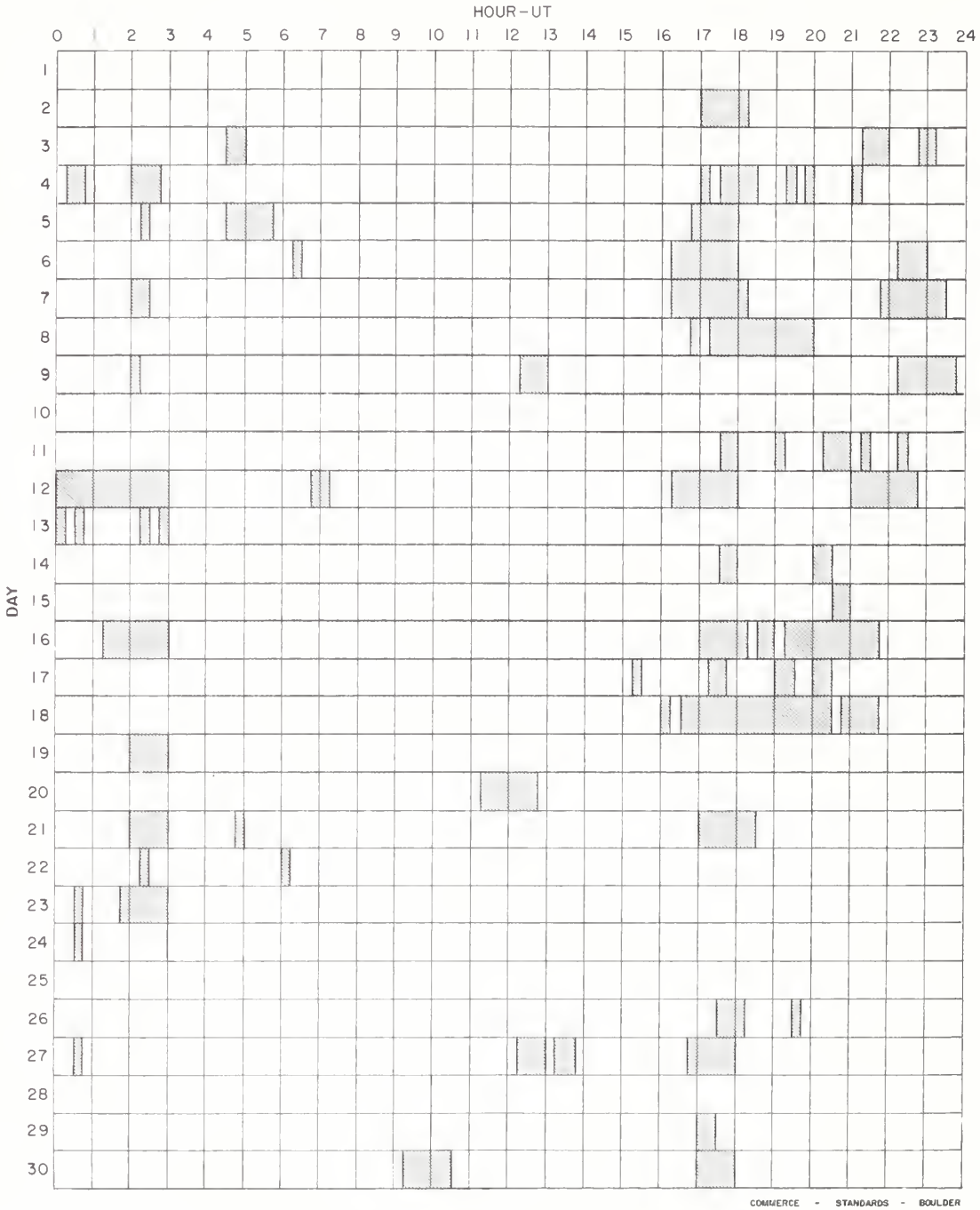
| OBSERVATORY | DATE APR 1959 | OBSERVED UNIVERSAL TIME START | END | MAX. PHASE | LOCATION APPROX. LAT. | MER. DIST. | McMATH PLAGE REGION | DURATION — MINUTES | IMPORTANCE | OBS. COND. | MEASUREMENTS TIME — U T | MEAS. AREA Sq. Deg. | CORR. AREA Sq. Deg. | MAX. WIDTH Ha | MAX. INT. % | PROVISIONAL IONOSPHERIC EFFECT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZURICH | 27 | 1354 | 1417 D | | S09 | E56 | 5124 | 23 D | 1 | 1 | 1354 | | 3.00 | | | |
| ZURICH | 27 | 1526 | 1532 D | | S09 | E55 | 5124 | 6 D | 1 | 1 | 1526 | | 3.00 | | | |
| ZURICH | 27 | 1635 | 1642 D | | N06 | W22 | 5108 | 7 D | 1 | 1 | 1635 | | 1.00 | | | |
| VOROSHILOV | 28 | 0037 | 0150 D | 0108 | S07 | W60 | 5103 | 73 | 1& | 3 | 0108 | | 2.55 | | 150 | Slow S-SWF |
| SYDNEY | 28 | 0059 | 0123 | 0108 | S08 | W61 | 5103 | 24 | 1 | 2 | 0108 | 1.00 | 2.00 | | | |
| SIMEIZ | 28 | 0555 E | 0604 D | 0555 U | S08 | E45 | 5124 | 9 D | 1 | 2 | 0555 | | 1.40 | | 104 | |
| SIMEIZ | 28 | 0629 E | 0650 D | 0632 U | S04 | W71 | 5103 | 21 D | 1 | 2 | 0632 | | 2.00 | | 64 | |
| SIMEIZ | 28 | 0638 E | 0645 D | 0640 U | S08 | E47 | 5124 | 7 D | 1 | 2 | 0640 | | 1.40 | | 84 | |
| SIMEIZ | 28 | 0724 E | 0825 D | 0750 U | S06 | W68 | 5103 | 61 D | 1& | 2 | 0728 | | 8.90 | 2.60 | 92 | |
| KRASNYA | 28 | 0728 | 0758 D | | S05 | W68 | 5103 | 30 D | 1 | 1 | 0733 | | 2.60 | | 70 | |
| ZURICH | 28 | 0800 E | 0814 D | | S08 | W64 | 5103 | 14 D | 1& | 1 | 0800 | | 6.00 | | | |
| SIMEIZ | 28 | 0855 E | 0901 D | 0858 U | S05 | W70 | 5103 | 6 D | 1 | 2 | 0858 | | 3.00 | | 76 | |
| ZURICH | 28 | 1545 | 1547 | | S05 | W78 | 5103 | 2 | 1 | 1 | 1545 | | 1.00 | | | |
| SYDNEY | 29 | 0119 | 0144 | 0123 | N21 | E11 | 5123 | 25 | 1 | 2 | 0123 | 2.00 | 2.00 | | | |
| ZURICH | 29 | 0803 | 0804 | | N10 | W04 | 5117 | 1 | 1 | 1 | 0803 | | 2.00 | | | |
| KIEV | 30 | 1130 | 1200 | 1146 | N13 | W28 | 5117 | 30 | 1 | 3 | 1145 | | 4.20 | | 50 | |

COMMERCE - STANDARDS - BOULDER

These flare reports are addenda to the April 1959 flares published in CRPL-F 177B, May 1959.

# INTERVALS OF NO FLARE PATROL OBSERVATIONS

APRIL 1959




Stations Include:

Abastumani
Alma-Ata
Anacapri (Swedish)
Arcetri
Arosa
Cape Town
Dunsink
Hawaii
Huancayo
Kharkov
Kiev GAO
Kodaikanal
Krasnaya Pakhra
Locarno
Lockheed
Mitaka
Meudon
Moscow University
Nederhorst
Nizamiah
Ondrejov
Ottawa
Pirculi
Royal Greenwich Observatory
Herstmonceux
Sacramento Peak
Simeiz
Sydney
Tashkent
Uccle
Utrecht
Voroshilov
Zurich

Errata:

1. Two solar flares for March 16, 1959 reported by Kodaikanal and published in the CRPL-F 176 B had the co-ordinates interchanged and should be corrected as follows:

| Date | Start | Latitude | Meridian Distance |
|---|---|---|---|
| 16 | 0402 E | N 29 | E 37 |
| 16 | 0926 E | N 11 | E 20 |

2. Some flares for May 1959 (CRPL-F 178B) and for June 1959 (CRPL-F 179B) were incorrectly identified as Boulder. They should have been listed as R.O Herst (observations from Greenwich Royal Observatory, Herstmonceux).

# IONOSPHERIC EFFECTS OF SOLAR FLARES

(Sudden Cosmic Noise Absorption
Sudden Enhancements Of Atmospherics
Solar Noise Bursts At 18 Mc.)

JANUARY 1959

| Jan. 1959 | CLASS SCNA | CLASS SEA | CLASS Burst | WIDESPREAD INDEX | TIME (UNIVERSAL TIME) BEGIN | TIME (UNIVERSAL TIME) MAX. | TIME (UNIVERSAL TIME) END | PERCENT ABSORPTION SCNA | OBSERVATION STATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | 3 | | 3 | 0854 | 0907 | 0947 | | DU, ED, NE |
| 2 | | 2 | | 1 | 0915 | | 0951 | | NE |
| 3 | | 2 | | 5 | 1600 | 1618 | 1642 | | A5, BO, DU, ED |
| 3 | 2 | | | 5 | 1601 | 1613 | 1642 | | BO, MC, RE, SP |
| 3 | | 1 | | 1 | 1652 | 1655 | 1708 | | MC |
| 3 | 1 | | | 4 | 1653 | 1700 | 1735 | 20 | BO, RE, SP |
| 4 | | 1 | | 1 | 0308 | 0321 | | | HA |
| 4 | 1 | | | 1 | 0308 | 0316 | 0336 | 5 | HA |
| 4 | | 1+ | | 5 | 2056 | 2104 | 2209 | | A1, BO, HA, PA |
| 4 | 1 | | | 5 | 2057 | 2104 | 2120 | 17 | BO, HA |
| 8 | | 2 | | 1 | 1624 | | 1710 | | PA |
| 11 | | 1+ | | 5 | 1948 | 2000 | 2106 | | A7, BO, HA, PA |
| 11 | 1+ | | | 5 | 1949 | 1953 | 2045 | 20 | BO, HA |
| 14 | | 2+ | | 5 | 1407 | 1416 | 1445 | | DU, ED, NE, ON, PA |
| 14 | 2 | | | 1 | 2348 | 2353 | 0035 | 60 | HA |
| 14 | | 2 | | 1 | 2350 | 0002 | 0055 | | HA |
| 15 | | 1 | | 1 | 0428 | | 0500 | | HO |
| 18 | | 2 | | 1 | 0014 | 0037 | 0118 | | HA |
| 18 | 1 | | | 1 | 0030 | 0034 | 0110 | 14 | HA |
| 19 | | 1 | | 1 | 1725 | 1740 | 1744 | | BO |
| 19 | 1- | | | 1 | 1725 | 1740 | 1749 | 10 | BO |
| 20 | | 1+ | | 3 | 1113 | | 1207 | | ON, NE |
| 21 | | 1 | | 1 | 0338 | | | | HO |
| 21 | | 2+ | | 3 | 1550 | 1555 | 1630 | | A1, A2, A5 |
| 21 | | 2+ | | 5 | 1701 | 1711 | 1739 | | A1, A3, A5, A6, ED, PA, SP |
| 21 | 2+ | | | 5 | 1701 | 1711 | 1742 | 75 | BO, MC, RE, SP |
| 21 | | | 2 | 4 | 1838 | | 1844 | | BO, RE |
| 21 | 1 | | | 5 | 2224 | 2227 | 2241 | 20 | BO, HA |
| 21 | | 1 | | 5 | 2226 | 2234 | 2323 | | A7, BO, HA, HO |
| 22 | | 2 | | 5 | 1126 | 1129 | 1151 | | ED, NE, ON, PA |
| 22 | | 2+ | | 3 | 1307 | 1320 | 1400 | | A1, A3, A5 |
| 22 | 1- | | | 5 | 2030 | 2034 | 2043 | | BO, HA |
| 22 | | 1- | | 1 | 2031 | 2036 | 2045 | 8 | BO |
| 23 | | 1 | | 5 | 1118 | | 1143 | | NE, PA |
| 24 | | 1 | | 1 | 1538 | | 1600 | | NE |
| 25 | | 1 | | 1 | 0210 | | 0230 | | HO |
| 25 | | 1+ | | 3 | 1228 | 1238 | 1302 | | A3, A5 |
| 25 | | 2+ | | 5 | 1410 | 1420 | 1525 | | A5, DU, NE, ON, PA |
| 25 | 1 | | | 5 | 2004 | 2007 | 2033 | 11 | BO, HA |
| 25 | | 1- | | 5 | 2005 | 2017 | 2041 | | A5, A7, BO, HA |
| 26 | | 2 | | 4 | 0847 | 0859 | 0924 | | DU, ED, NE, ON |
| 26 | | 1+ | | 5 | 1052 | | 1112 | | NE, ON, PA |
| 26 | 2 | | | 1 | 1200 | 1228 | 1300 | 60 | RE |
| 26 | | 1 | | 3 | 1216 | | 1230 | | NE, ON |
| 26 | | 1 | | 1 | 1414 | | 1430 | | NE |
| 27 | | 1 | | 4 | 0933 | 0937 | 1012 | | DU, ED, NE |
| 27 | 2 | | | 1 | 1427 | 1433 | 1448 | 65 | RE |
| 27 | | 2+ | | 5 | 1427 | 1433 | 1524 | | A3,DU,ED,NE,ON,PA,SW |
| 27 | | 1 | | 1 | 1751 | | 1830 | | NE |
| 27 | 1 | | | 1 | 1943 | 1948 | 2008 | 13 | HA |
| 27 | | 2 | | 1 | 1947 | 2000 | 2045 | | A7 |
| 29 | 1 | | | 1 | 2111 | 2115 | 2130 | 13 | HA |
| 29 | | 1 | | 1 | 2111 | 2120 | 2200 | | HA |
| 30 | | 1 | | 1 | 2340 | 2354 | 0030 | | HA |
| 30 | 1 | | | 1 | 2343 | 2349 | 0011 | 13 | HA |
| 31 | | 1 | | 1 | 0451 | | 0530 | | HO |

COMMERCE - STANDARDS - BOULDER

ON = Ondrejov, Czechoslovakia

# IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

JUNE 1959

| June 1959 | Start UT | End UT | Type | Wide Spread Index | Importance | Observation Stations | Known Flare, UT CRPL-F 179 |
|---|---|---|---|---|---|---|---|
| 1 | 0100 | 0144 | G-SWF | 3 | 1 | AD, AN | 0100 |
| 1 | 0416 | 0432 | S-SWF | 4 | 1 | AD, OK | * |
| 2 | 1312 | 1320 | S-SWF | 5 | 1 | JU, MC, NE, PR, PU | 1248E |
| 2 | 1818 | 1842 | S-SWF | 5 | 2 | BE, FM, HU, LA, MC, NE, PR, WS | 1808 |
| 2 | 2005 | 2012 | S-SWF | 4 | 1- | AD, AN, BE, MC | 2000 |
| 3 | 0802 | 0822 | S-SWF | 1 | 1 | PR | 0755 |
| 6 | 1455 | 1515 | G-SWF | 4 | 1 | BE, MC, PR, WS | 1453 |
| 7 | 0335 | 0405 | S-SWF | 5 | 1+ | AD, AN, OK, CW+ | 0400E |
| 7 | 0808 | 0828 | S-SWF | 5 | 2 | NE, OK. PU | 0805 |
| 7 | 1142 | 1227 | Slow S-SWF | 5 | 1 | MC, NE, PU | 1156E |
| 7 | 1353 | 1418 | S-SWF | 5 | 2- | AD, AN, BE, FM, HU, MC, NE, PR, PU, WS | 1340 |
| 9 | 1635 | 1935 | S-SWF | 5 | 3+ | AD,AN,BE,FM,HU,LA,MC,NE,PA,PR.SW,WS,RCA+ CW*** | 1800E |
| 10 | 1148 | 1205 | G-SWF | 5 | 1 | MC, NE, PR, PU | * |
| 10 | 1422 | 1448 | Slow S-SWF | 3 | 1 | BE, WS | 1422 |
| 10 | 1750 | 1825 | S-SWF | 5 | 2 | AD,AN,BE,FM,HU,LA,MC,NE,PR,WS,CW* | 1750 |
| 11 | 0607 | 0635 | S-SWF | 5 | 2+ | AD,BR,CA,DA,NE,SW,TO,CW++, CW*** | 0610E |
| 11 | 1803 | 2005 | Slow S-SWF | 5 | 2+ | AD, AN, BE, FM, HU, LA, MC, PR, WS | 1802 |
| 11 | 2103 | 2132 | Slow S-SWF | 4 | 1 | AD, BE, MC, PR, WS | 1802 |
| 12 | 0755 | 0918 | G-SWF | 5 | 1+ | DA, LI, OK | 0740E |
| 13 | 0358 | 0418 | S-SWF | 5 | 1 | AD, NE, OK, CW++ | 0340E |
| 14 | 0628 | 0640 | S-SWF | 5 | 1 | AN, JU | 0632 |
| 15 | 0130 | 0220 | G-SWF | 4 | 1+ | AD, CA, CW+ | 0110 |
| 15 | 0235 | 0310 | Slow S-SWF | 1 | 2 | CA | 0230 |
| 15 | 0335 | 0415 | G-SWF | 3 | 2+ | OK, CW++ | 0230 |
| 15 | 1105 | 1140 | G-SWF | 5 | 1 | MC, NE, PR, CW***, RCA+ | 1050 |
| 15 | 1624 | 1658 | S-SWF | 5 | 1+ | BE, FM, HU, LA, MC, NE, PR, WS | 1622 |
| 16 | 0623 | 0657 | S-SWF | 5 | 2 | AD, BR, CA, JU, OK, SW, TO, CW++, CW*** | 0618 |
| 16 | 1012 | 1027 | S-SWF | 1 | 2 | PU | 1010 |
| 17 | 1430 | 1515 | Slow S-SWF | 5 | 2+ | BE, FM, HU, MC, PR, WS | 1421 |
| 18 | 1138 | 1200 | S-SWF | 5 | 2+ | BE, DA, LI, MC, NE, PR, SW, CW*** | 1104E |
| 18 | 1232 | 1300 | Slow S-SWF | 4 | 1+ | JU, MC | 1224 |
| 19 | 1636 | 1705 | S-SWF | 5 | 2 | AD, AN, BE, FM, HU, MC, PR, PU, WS | 1606 |
| 20 | 2338 | 0025 | S-SWF | 4 | 2- | AD, OK | |
| 21 | 1925 | 1940 | S-SWF | 4 | 1 | AD, BE, FM, MC, PR, WS | 1919 |
| 21 | 2227 | 2240 | G-SWF | 3 | 1- | AD, MC, PR, WS | 2224 |
| 22 | 1028 | 1058 | S-SWF | 5 | 2 | MC, NE, SW, CW*** | 1010 |
| 22 | 1855 | 1915 | G-SWF | 3 | 1 | MC, WS | 1854 |
| 23 | 1109 | 1130 | S-SWF | 5 | 2 | BR, MC, NE | |
| 23 | 1618 | 1635 | S-SWF | 5 | 1 | BE, FM, HU, LA, MC, PR, WS | |
| 23 | 1651 | 1715 | S-SWF | 5 | 1 | BE, FM, HU, MC, PR, WS | 1648 |
| 27 | 1525 | 1550 | G-SWF | 3 | 1- | MC, PR | 1523 |
| 27 | 1557 | 1626 | Slow S-SWF | 3 | 1 | BE, PR, WS | 1600E |
| 27 | 1645 | 1708 | S-SWF | 5 | 1 | FM, HU, MC, PR, WS | 1644 |
| 28 | 2332 | 0000 | Slow S-SWF | 4 | 1 | OK, WS | |

* No known flare patrol

BR = Breisach, G.F.R.
CA = Canberra, Australia
DA = Darmstadt, G.F.R.
JU = Juhlesruh, G.D.R.
LA = Los Angeles, Calif.
LI = Lindau, G.F.R.
NE = Nederhorst den Berg, Netherlands
PA = Paramaribo, Dutch Guiana
PU = Prague, Czechoslovakia
SW = Enkoping, Sweden
TO = Hiraiso Radio Wave Observatory, Japan
CW* = Cable and Wireless, Barbadoes
CW** = Cable and Wireless, Somerton, England
CW*** = Cable and Wireless, Brentwood, England
CW+ = Cable and Wireless, Hong Kong
CW++ = Cable and Wireless, Singapore
RCA+ = RCA Communications, Inc., Pt. Reyes, Calif.

# SOLAR RADIO EMISSION

## OUTSTANDING OCCURRENCES

JULY 1959

**Ottawa** **2800 Mc.**

| July 1959 | Type* | Start UT | Duration Hrs:Min: | Max. | | Marks |
|---|---|---|---|---|---|---|
| | | | | Time UT | Peak Flux | |
| 1 | 6 Complex | 1725 | 40 | 1735 | 39 | |
| 3 | 6 Complex | 2356 | 6 | 2357.5 | 10 | |
| 5 | 2 Simple 2 | 1144 | 35 | 1150 | 40 | |
| 9 | 1 Simple 1 | 1441 | 5 | 1442.5 | 7 | |
| 9 | 3 Simple 3 A f | 1810 * | >6 | 2110 | 50 | *In interference |
| | 8 Group (3) | 2042 | 1 54 | | | |
| | 2 Simple 2 f | 2042 | 20 | 2045.5 | 475 | |
| | 2 Simple 2 f | 2112 | 56 | 2128.5 | 490 | |
| | 2 Simple 2 | 2218 | 18 | 2227 | 30 | |
| 10 | 6 Complex | 1235.5 | 10 | 1237.5 | 10 | |
| 11 | 3 Simple 3 A | 2313.5 | 45 | Indet. | 15 | |
| | 2 Simple 2 | 2315.5 | 4 | 2316.5 | 25 | |
| 12 | 6 Complex | 1313 | 17 | 1316 | 9 | |
| 12 | 3 Simple 3 | 1406 | 55 | 1414 | 12 | |
| 12 | 6 Complex | 2008 | 12 | 2013 | 30 | |
| 12 | 3 Simple 3 A | 2207 | 2 | Indet. | 30 | |
| | 8 Group (2) | 2224 | 29 | | | |
| | 2 Simple 2 f | 2224 | 16 | 2228 | 80 | |
| | 2 Simple 2 f | 2248 | 5 | 2249.5 | 18 | |
| 13 | 3 Simple 3 A | 1935 | 2 05 | 2006.5 | 25 | |
| | 8 Group (2) | 1940.5 | 15.5 | | | |
| | 2 Simple 2 | 1940.5 | 5 | 1943 | 9 | |
| | 2 Simple 2 | 1946 | 10 | 1948.5 | 15 | |
| 14 | 2 Simple 2 | 1146.5 | 3 | 1147.5 | 12 | |
| 14 | 2 Simple 2 | 1443 | 30 | 1445.5 | 85 | |
| 14 | 2 Simple 2 | 1734 | 10 | 1736.3 | 85 | In interference |
| 4 | 6 Complex f | 2224 | 6 | 2227.5 | 120 | |
| | 4 Post Increase | | 10 | | 12 | |
| 15 | 2 Simple 2 | 1327.5 | 2.5 | 1328.5 | 9 | |
| 15 | 6 Complex f | 1924.5 | 7 | 1926.3 | 290 | |
| | 4 Post Increase | | >30 | | 10 | In interference |
| 16 | 3 Simple 3 | 1351 | 50 | 1400 | 12 | |
| 16 | 3 Simple 3 A | 1610 | 35 | Indet. | 14 | |
| | 2 Simple 2 f | 1612.5 | 9 | 1614.8 | 350 | |
| 16 | - Great Burst f | 2118 | >3 | 2154 | 6500 | |
| 17 | 2 Simple 2 | 1340 | 8 | 1344.5 | 18 | |
| | 4 Post Increase | | 35 | | 6 | |
| 18 | 3 Simple 3 A | 1750 | 45 | Indet | 7 | |
| | 8 Group (2) | 1754.5 | 19.5 | | | |
| | 2 Simple 2 f | 1754.5 | 6 | 1756.7 | 110 | |
| | 2 Simple 2 | 1811 | 3 | 1811.8 | 13 | |
| 22 | 2 Simple 2 | 2356.5 | 3 | 2357.5 | 10 | |
| 24 | 2 Simple 2 | 1437.5 | 3 | 1438 | 28 | |
| 25 | 1 Simple 1 | 1728 | 2 | 1728.5 | 5 | |
| 27 | 2 Simple 2 f | 1225 | 16 | 1228.5 | 1025 | |
| | 4 Post Increase | | 1 | | 18 | |
| 27 | 2 Simple 2 | 1706 | 5 | 1707.5 | 10 | |
| 27 | 6 Complex | 1802.5 | 14 | 1804 | 17 | |
| 27 | 3 Simple 3 A | 2100 | 1 50 | 2128 | 20 | |
| | 2 Simple 2 f | 2107 | 10 | 2111 | 75 | |
| 29 | 2 Simple 2 f | 1158 | 20 | 1209 | 325 | |
| | 4 Post Increase A | | 4 30 | | 55 | |
| | 2 Simple 2 f | 1534.5 | 6 | Indet. | >27 | |
| 29 | 3 Simple 3 | 2028 | 11 | 2030.5 | 15 | |
| 29 | 2 Simple 2 f | 2117.5 | 10 | 2119.3 | 790 | |
| | 4 Post Increase A | | 55 | | 25 | |
| | 2 Simple 2 f | 2128.5 | 4 | 2129.5 | 40 | |
| | 2 Simple 2 | 2214.5 | 2 | 2215 | 20 | |
| 30 | 2 Simple 2 | 1243.8 | 1 | 1244.2 | 10 | |
| 30 | 2 Simple 2 | 1314.7 | 1.5 | 1315.5 | 8 | |
| 30 | 1 Simple 1 | 1705.5 | 1.5 | 1706 | 5 | |
| 30 | 1 Simple 1 | 1828.5 | 2 | 1829.5 | 5 | |
| 30 | 2 Simple 2 | 2019 | 5 | 2021 | 25 | |
| | 4 Post Increase | | 10 | | 5 | |
| 31 | 2 Simple 2 | 2230.5 | 1.5 | 2231 | 23 | |

COMMERCE - STANDARDS - BOULDER

# OUTSTANDING OCCURRENCES
## JUNE 1959

HAWAII

200 MC

| June 1959 | Type | Start UT | Time of Maximum UT | Duration Minutes | Remarks |
|---|---|---|---|---|---|
| 1 | 6 | 0027 | | 143 | |
| 2 | 3 | 0056.5 | 0057.0 | 0.5 | |
| 2 | 3 | 0157.9 | 0157.9 | 0.1 | |
| 2 | 3 | 2000.5 | 2000.6 | 1.0 | |
| 2 | 3 | 2006.0 | 2007.3 | 1.5 | |
| 3 | 3 | 2208.2 | 2208.4 | 0.5 | |
| 4 | 3 | 1844.5 | 1844.7 | 0.3 | |
| 4 | 3 | 2023.0 | 2024.0 | 1.0 | |
| 4 | 3 | 2035.0 | 2035.0 | 0.2 | |
| 4 | 3 | 2236.0 | 2236.2 | 0.2 | |
| 5 | 3 | 0026.2 | 0026.2 | 0.3 | |
| 5 | 3 | 0133.3 | 0133.4 | 0.2 | |
| 5 | 3 | 0200.3 | 0200.3 | 0.2 | |
| 5 | 3 | 0212.7 | 0212.8 | 0.2 | |
| 5 | 7 | 0243 | 0305.7 | 64 D | |
| 8 | 3 | 0218.2 | 0218.3 | 0.2 | |
| 9 | 3 | 0005.2 | 0005.3 | 0.1 | |
| 9 | 3 | 0032.5 | 0032.6 | 0.2 | |
| 10 | 8 | 0248.0 | 0249.0 | 2.0 | |
| 10 | 3 | 1917.2 | 1917.3 | 0.1 | |
| 10 | 3 | 1949 | 1949.5 | 0.6 | |
| 11 | 3 | 0110.5 | 0110.8 | 0.5 | |
| 11 | 3 | 0112.5 | 0112.6 | 0.5 | |
| 11 | 3 | 0254.8 | 0255.5 | 1.0 | |
| 11 | 2 | 2053 | 2057.4 | 18.0 | |
| 12 | 3 | 0331.0 | 0331.3 | 0.6 | |
| 12 | 3 | 0335.0 | 0335.1 | 0.1 | |
| 13 | 3 | 2036.2 | 2036.5 | 0.5 | |
| 14 | 3 | 0052.8 | 0053.3 | 1.2 | |
| 15 | 3 | 1952.0 | 1952.1 | 0.2 | |
| 16 | 3 | 1816.3 | 1816.4 | 0.2 | |
| 16 | 3 | 2057.8 | 2058.0 | 0.5 | |
| 16 | 3 | 2245.8 | 2246.0 | 0.5 | |
| 16 | 3 | 2328.4 | 2328.4 | 0.2 | |
| 17 | 3 | 0229.5 | 0229.8 | 0.5 | |
| 17 | 3 | 0231.5 | 0231.8 | 0.5 | |
| 17 | 3 | 0321.5 | 0321.6 | 0.2 | |
| 18 | 3 | 2035.8 | 2035.9 | 0.2 | |
| 19 | 3 | 0017.4 | 0017.5 | 0.6 | |
| 19 | 3 | 1917.5 | 1917.5 | 0.2 | |
| 19 | 8 | 2108.2 | 2110.2 | 2.5 | Off scale |
| 19 | 2 | 2306.0 | | 2.0 | Note 1 |
| 19 | 3 | 2331.5 | 2331.5 | 0.2 | Off scale |
| 20 | 3 | 0015.1 | 0015.4 | 0.7 | Off scale |
| 20 | 3 | 0027.8 | 0028.0 | 0.3 | |
| 20 | 3 | 0047.4 | 0047.5 | 0.2 | |
| 20 | 3 | 0153.0 | 0153.1 | 0.2 | Off scale |
| 20 | 3 | 1819.3 | 1819.5 | 0.3 | |
| 20 | 2 | 2226.8 | 2227.7 | 1.2 | |
| 21 | 3 | 0047.5 | 0047.6 | 0.5 | Off scale |
| 21 | 3 | 0121.3 | 0122.8 | 1.8 | Off scale |
| 21 | 3 | 0212.8 | 0213.0 | 1.3 | Off scale |
| 21 | 8 | 2028.2 | 2030.6 | 4.0 | |
| 21 | 2 | 2305.6 | 2310.0 | 5.8 | |
| 21 | 2 | 2330.2 | 2331.6 | 4.0 | |
| 22 | 3 | 0032.3 | 0032.5 | 0.7 | |
| 22 | 2 | 0120.4 | 0121.5 | 1.6 | |
| 22 | 3 | 0308.3 | 0309.2 | 1.0 | |
| 22 | 3 | 2002.6 | 2002.7 | 0.4 | |
| 22 | 3 | 2206.8 | 2206.9 | 0.2 | |
| 23 | 7 | 1843.5 | 1847.6 | 31.8 | |
| 23 | 6 | 1930 | | 500 D | Note 2 |
| 24 | 6 | 0000 E | | 230 D | Note 3 |
| 26 | 3 | 1923.0 | 1923.6 | 1.3 | |
| 26 | 3 | 2251.6 | 2251.7 | 0.3 | |
| 27 | 7 | 0022.1 | 0022.1 | 57.9 | |
| 27 | 6 | 1835 E | | 554 D | Note 4 |
| 27 | 3 | 2349.7 | 2351.0 | 1.5 | |
| 28 | 6 | 0000 E | | 229 D | |
| 28 | 3 | 0205.0 | 0205.2 | 1.6 | |
| 28 | 3 | 0215.8 | 0215.9 | 0.2 | |
| 28 | 3 | 1905.4 | 1905.5 | 1.7 | |
| 29 | 3 | 1847.0 | 1847.1 | 0.2 | |
| 29 | 3 | 1851.9 | 1852.3 | 0.5 | |
| 29 | 3 | 2333.6 | 2333.7 | 0.2 | |
| 30 | 3 | 2109.3 | 2109.4 | 0.7 | |
| 30 | 3 | 2145.0 | 2145.6 | 1.3 | |

Notes 1. Off scale 2307.7, 2308.3, 2308.6.
2. Burst peaks at 2115.8, 2235.9, June 24 at 0105, 0109.
3. Burst peaks at 0105, 0109.
4. Storm of small amplitude. No records on June 7, 1959.

COMMERCE - STANDARDS - BOULDER

# SOLAR RADIO EMISSION

## OUTSTANDING OCCURRENCES

### JUNE 1959

BOULDER

167 MC

| June 1959 | Type | Start UT | Time of Maximum UT | Duration Minutes | Intensity |
|---|---|---|---|---|---|
| 1 | 3 | 1212.0 | 1212.0 | 0.3 | 2 * |
| 1 | 3 | 1550.0 | 1550.4 | 1.2 | 2 |
| 1 | 3 | 1659.2 | 1659.2 | 0.3 | 2 |
| 1 | 3 | 2307.0 | 2307.3 | 1.3 | 1 |
| 2 | 3 | 1327.2 | 1327.8 | 0.8 | 2 |
| 2 | 3 | 2001.0 | 2001.2 | 2.0 | 1 U |
| 2 | 3 | 2006.5 | 2007.5 | 2.5 | 2 U |
| 2 | 3 | 2114.0 | 2114.2 | 0.3 | 2 |
| 3 | 3 | 1807.0 | 1807.2 | 0.5 | 2 |
| 3 | 3 | 2151.5 | 2151.8 | 1.1 | 1 |
| 3 | 3 | 2255.2 | 2255.2 | 0.3 | 1 |
| 4 | 7 | 1236 | | 482 | 2 |
| 5 | 3 | 0026.0 | 0026.0 | 0.5 | 2 |
| 5 | 3 | 0032.5 | 0032.5 | 0.5 | 1 |
| 5 | 3 | 0116.8 | 0116.9 | 0.5 | 2 ** |
| 5 | 3 | 0133.4 | 0133.4 | 0.3 | 3 ** |
| 5 | 3 | 0200.1 | 0200.1 | 0.5 | 3 ** |
| 5 | 3 | 1505.0 | 1505.0 | 0.1 | 2 |
| 6 | 7 | 0007 | | 125 D | 2 |
| 6 | 3 | 1248.2 | 1248.2 | 0.3 | 2 * |
| 6 | 3 | 1544.3 | 1544.6 | 0.6 | 2 |
| 7 | 3 | 1407.8 | 1407.8 | 0.2 | 1 |
| 7 | 3 | 1456.0 | 1456.5 | 1.0 | 1 |
| 7 | 3 | 1534.6 | 1534.6 | 0.3 | 1 |
| 7 | 3 | 1614.9 | 1615.0 | 0.6 | 3 |
| 7 | 3 | 1646.8 | 1647.0 | 1.2 | 2 |
| 7 | 3 | 1720.3 | 1720.8 | 0.7 | 2 |
| 7 | 2 | 1758.7 | 1759.2 | 1.7 | 2 |
| 7 | 3 | 1814.5 | 1814.5 | 0.4 | 2 |
| 7 | 3 | 1822.9 | 1823.0 | 0.7 | 2 |
| 7 | 3 | 2235.8 | 2235.8 | 0.3 | 2 S |
| 9 | 3 | 1148.8 | 1148.8 | 0.4 | 2 * |
| 9 | 3 | 1332.8 | 1332.8 | 0.2 | 1 |
| 9 | 3 | 1535.0 | 1535.8 | 1.0 | 2 |
| 9 | 3 | 1554.8 | 1554.8 | 0.2 | 1 |
| 9 | 9A | 1651.1 | 1655.7 | 6.0 | 2 |
| 9 | 9B | 1657.0 | 1704.6 | 64.0 | 1 |
| 10 | 3 | 1153.0 | 1153.5 | 0.9 | 3 * |
| 10 | 3 | 1256.3 | 1256.3 | 0.5 | 3 |
| 10 | 3 | 1346.8 | 1346.9 | 0.2 | 2 |
| 10 | 3 | 1452.0 | 1452.5 | 0.5 | 2 |
| 10 | 3 | 1747.0 | 1747.2 | 0.2 | 2 |
| 10 | 3 | 2125.4 | 2125.5 | 0.4 | 2 |
| 10 | 3 | 2330.6 | 2330.6 | 0.3 | 2 |
| 10 | 2 | 2338.0 | 2338.7 | 1.8 | 1 |
| 11 | 3 | 0119.5 | 0120.3 | 3.5 | 2 ** |
| 11 | 3 | 0122.0 | 0122.1 | 2.5 | 2 ** |
| 11 | 2 | 0141.0 | 0147.0 | 9.0 | 2 ** |
| 11 | 2 | 0153.0 | 0154.0 | 2.0 | 2 ** |
| 11 | 3 | 1322.5 | 1322.8 | 1.5 | 3 |
| 11 | 3 | 1431.6 | 1431.6 | 0.2 | 2 |
| 11 | 3 | 1506.6 | 1506.6 | 0.4 | 2 |
| 11 | 3 | 1524.3 | 1524.5 | 0.6 | 3 |
| 11 | 2 | 1643.1 | 1643.3 | 1.9 | 2 |
| 11 | 3 | 1735.9 | 1736.0 | 0.5 | 2 |
| 11 | 3 | 1803.1 | 1803.7 | 1.5 | 2 |
| 11 | 3 | 1806.9 | 1807.0 | 0.3 | 3 |
| 11 | 2 | 1808.0 | 1809.8 | 2.3 | 2 |
| 11 | 2 | 2052.0 | 2057.8 | 23.0 | 2 |
| 11 | 3 | 2356.8 | 2357.0 | 0.6 | 1 |
| 12 | 3 | 0210.8 | 0211.0 | 0.4 | 3 ** |
| 12 | 3 | 1246.8 | 1246.8 | 0.2 | 2 * |
| 12 | 3 | 1301.3 | 1301.3 | 0.2 | 1 |
| 12 | 2 | 1621.5 | 1623.0 | 2.1 | 2 |
| 12 | 2 | 1624.8 | 1626.0 | 1.2 | 2 |
| 13 | 3 | 1253.1 | 1253.1 | 0.2 | 1 |
| 14 | 3 | 1322.0 | 1322.0 | 0.2 | 2 |
| 14 | 3 | 1453.8 | 1454.0 | 0.2 | 1 |
| 14 | 3 | 1659.2 | 1659.2 | 0.6 | 2 |
| 14 | 3 | 2002.0 | 2002.0 | 1.0 | 2 S |
| 15 | 3 | 0158.2 | 0158.2 | 0.6 | 2 S** |
| 15 | 3 | 1349.0 | 1349.2 | 0.4 | 2 |
| 16 | 3 | 0033.8 | 0034.0 | 0.6 | 1 S |
| 16 | 2 | 1327.4 | 1327.6 | 1.2 | 2 |
| 16 | 3 | 1337.0 | 1337.0 | 1.0 | 2 |
| 16 | 3 | 1453.2 | 1453.3 | 0.2 | 1 |
| 16 | 3 | 1457.8 | 1457.9 | 0.2 | 1 |
| 16 | 3 | 1513.0 | 1513.8 | 1.8 | 2 |
| 16 | 3 | 1815.0 | 1815.1 | 1.0 | 2 |
| 16 | 3 | 1820.1 | 1821.2 | 1.2 | 2 |
| 16 | 3 | 2056.7 | 2056.8 | 1.1 | 2 S |
| 17 | 3 | 0153.0 | 0153.2 | 1.1 | 2 ** |
| 17 | 3 | 1746.3 | 1746.3 | 0.7 | 2 |
| 18 | 2 | 1733.0 | 1735.0 | 2.0 | 2 |
| 18 | 3 | 1802.0 | 1802.1 | 1.0 | 2 S |
| 19 | 3 | 0109.8 | 0109.8 | 0.2 | 2 ** |
| 19 | 3 | 1320.4 | 1320.4 | 0.2 | 2 S |
| 19 | 3 | 1407.2 | 1407.4 | 0.7 | 2 S |
| 19 | 3 | 1444.5 | 1444.5 | 0.5 | 2 S |
| 19 | 3 | 1625.0 | 1625.5 | 1.0 | 2 |
| 19 | 3 | 1916.7 | 1917 | 0.3 | 2 |
| 19 | 3 | 1933.9 | 1933.9 | 0.1 | 2 S |
| 19 | 2 | 2003.0 | 2003.2 | 1.0 | 2 S |
| 19 | 3 | 2107.6 | 2107.8 | 0.2 | 2 S |
| 19 | 3 | 2109.0 | 2109.0 | 0.2 | 2 S |
| 19 | 3 | 2303.2 | 2303.2 | 0.8 | 2 S |
| 19 | 2 | 2306.3 | 2307.1 | 1.9 | 2 S |
| 19 | 3 | 2330.9 | 2331.0 | 0.1 | 3 S |
| 20 | 3 | 0131.0 | 0131.0 | 0.4 | 2 ** |
| 20 | 3 | 0152.6 | 0152.6 | 0.7 | 2 ** |
| 20 | 3 | 1141.8 | 1141.8 | 0.2 | 2 * |
| 20 | 3 | 1143.6 | 1144.0 | 0.4 | 2 * |
| 20 | 3 | 1147.3 | 1147.3 | 0.2 | 2 * |
| 20 | 3 | 1555.5 | 1555.9 | 0.5 | 2 |
| 20 | 3 | 1648.4 | 1648.6 | 0.6 | 2 |
| 20 | 2 | 1752.0 | 1752.4 | 2.0 | 2 |
| 20 | 3 | 1755.4 | 1755.6 | 0.6 | 3 |
| 20 | 3 | 1824.4 | 1824.5 | 0.2 | 2 S |
| 21 | 3 | 0052.5 | 0052.8 | 0.5 | 2 |
| 21 | 3 | 0217.8 | 0218.0 | 1.3 | 2 ** |
| 21 | 3 | 1223.0 | 1223.0 | 0.5 | 2 * |
| 21 | 3 | 1242.0 | 1242.0 | 1.0 | 2 * |
| 21 | 3 | 1319.4 | 1319.4 | 0.2 | 2 |
| 21 | 3 | 1424.4 | 1424.4 | 0.1 | 2 |
| 21 | 9 | 1429.0 | 1450.8 | 52.5 | 2 |
| 21 | 9A | 1601.2 | 1602.4 | 4.8 | 2 |
| 21 | 9B | 1606.0 | 1608.0 | 5.0 | 3 |
| 21 | 2 | 2029.0 | 2032.0 | 4.0 | 3 S |
| 21 | 3 | 2305.6 | 2305.8 | 0.6 | 2 |
| 21 | 3 | 2334.5 | 2334.5 | 0.4 | 1 |
| 22 | 2 | 0024.2 | 0024.8 | 1.7 | 2 |
| 22 | 2 | 0027.0 | 0027.0 | 0.8 | 2 |
| 22 | 3 | 1408.0 | 1409.0 | 1.0 | 2 S |
| 22 | 3 | 1836.6 | 1836.6 | 0.2 | 1 S |
| 23 | 7 | 1524 | | 656 D | 2 |
| 24 | 3 | 1204.5 | 1204.5 | 0.2 | 2 * |
| 24 | 3 | 1208.4 | 1208.4 | 0.2 | 2 * |
| 24 | 3 | 1416.8 | 1416.9 | 0.2 | 2 |
| 24 | 3 | 1514.0 | 1514.0 | 0.2 | 2 |
| 25 | 7 | 1240 | | 125 | 2 |
| 25 | 3 | 2317.0 | 2317.2 | 0.2 | 2 |
| 26 | 2 | 1158.2 | 1159.5 | 0.8 | 2 S* |
| 26 | 3 | 1214.0 | 1214.0 | 0.2 | 1 S* |
| 26 | 3 | 1256.2 | 1256.2 | 0.2 | 1 S |
| 26 | 3 | 1347.0 | 1347.0 | 0.4 | 2 |
| 26 | 3 | 1558.5 | 1559.2 | 1.5 | 2 |
| 26 | 3 | 1640.0 | 1640.0 | 0.2 | 2 |
| 26 | 3 | 1701.7 | 1701.7 | 0.2 | 2 |
| 26 | 3 | 1922.9 | 1923.5 | 1.1 | 3 S |
| 26 | 3 | 2250.5 | 2250.5 | 0.7 | 3 |
| 27 | 3 | 0008.5 | 0008.5 | 0.2 | 2 |
| 27 | 3 | 0020.9 | 0021.0 | 0.4 | 2 |
| 27 | 3 | 0117.0 | 0117.8 | 1.5 | 2 ** |
| 27 | 3 | 0150.0 | 0150.0 | 0.2 | 2 ** |
| 27 | 3 | 0152.0 | 0152.9 | 1.3 | 2 ** |
| 27 | 6 | 1130 E | | 951 D | 2 I<br>I 1246-1306 |
| 28 | 6 | 1130 E | | 950 D | 2 I<br>I 1240-1254 |
| 28 | 8 | 1905.5 | 1905.8 | 3.5 | 3 |
| 29 | 6 | 1132 E | | 948 D | 2 S<br>S 2024-0220 |
| 30 | 3 | 1516.8 | 1517.0 | 0.4 | 1 |
| 30 | 3 | 1522.5 | 1522.5 | 0.2 | 1 |

* On sunrise pattern.
** On sunset pattern.

COMMERCE - STANDARDS - BOULDER

# SOLAR RADIO EMISSION

## OUTSTANDING OCCURRENCES
## JULY 1959

BOULDER

167 MC

| July 1959 | Type | Start UT | Time of Maximum UT | Duration Minutes | Intensity |
|---|---|---|---|---|---|
| 1 | 3 | 1801.0 | 1801.0 | 0.2 | 2 |
| | 3 | 1843.5 | 1843.5 | 0.5 | 2 |
| | 3 | 1923.0 | 1923.0 | 0.1 | 2 |
| | 2 | 2311.0 | 2312.5 | 2.0 | 2 S |
| 3 | 3 | 0133.9 | 0134.0 | 0.6 | 2 ** |
| | 3 | 1919.8 | 1920.0 | 1.0 | 2 |
| | 2 | 2252.9 | 2253.2 | 0.4 | 1 S |
| | 2 | 2356.0 | 2357.1 | 2.0 | 2 S |
| 4 | 3 | 1355.5 | 1356.4 | 1.5 | 2 |
| 5 | 3 | 0033.5 | 0033.8 | 0.3 | 1 S |
| | 3 | 0205.6 | 0205.6 | 0.2 | 3 S |
| | 3 | 1149.5 | 1149.5 | 0.5 | 1 * |
| | 3 | 1152.0 | 1152.0 | 0.2 | 1 * |
| | 3 | 1203.0 | 1203.0 | 0.4 | 2 * |
| | 3 | 1214.5 | 1214.5 | 0.3 | 1 * |
| | 3 | 1312.0 | 1312.0 | 0.2 | 1 |
| | 3 | 1541.2 | 1541.5 | 0.3 | 1 |
| | 3 | 2034.0 | 2034.0 | 0.2 | 1 S |
| | 8 | 2337.5 | 2338.1 | 5.5 | 2 S |
| 6 | 3 | 0051.0 | 0051.0 | 0.2 | 1 |
| | 3 | 0119.0 | 0119.0 | 0.3 | 2 |
| | 3 | 1248.3 | 1248.8 | 0.7 | 2 |
| | 3 | 1353.3 | 1354.0 | 1.6 | 2 |
| | 2 | 1443.0 | 1443.2 | 2.4 | 2 |
| | 3 | 1452.8 | 1452.8 | 0.4 | 2 |
| | 3 | 1515.0 | 1515.7 | 1.0 | 2 |
| 7 | 3 | 0027.0 | 0027.0 | 0.3 | 1 |
| | 3 | 0031.7 | 0032.2 | 0.5 | 2 |
| | 3 | 0149.0 | 0149.0 | 0.3 | 2 ** |
| | 2 | 0203.6 | 0204.0 | 1.4 | 1 ** |
| | 3 | 1642.5 | 1642.5 | 0.2 | 1 |
| | 3 | 1656.8 | 1657.0 | 0.2 | 2 |
| 8 | 3 | 1339.2 | 1340.1 | 1.8 | 3 |
| | 3 | 1343.0 | 1343.4 | 2.0 | 2 |
| | 3 | 1620.0 | 1620.0 | 0.4 | 2 |
| 9 | 3 | 1736.6 | 1736.9 | 0.6 | 2 |
| | 3 | 1810.5 | 1810.5 | 0.2 | 2 |
| | 3 | 1816.2 | 1816.2 | 0.5 | 2 |
| | 9A | 1946.0 | 1957.6 | 21.0 | 2 |
| | 9B | 2018.0 | 2138.0 to 2206.5 | 306. | 3 |
| 10 | 8 | 0210.0 | 0210.0 | 5.0D | 3 ** |
| | 3 | 2333.0 | 2333.3 | 1.0 | 3 S |
| 11 | 2 | 1313.0 | 1317.8 | 9.0 | 1 |
| 12 | 6 | 1139 E | | 871 D | 2 |
| 13 | 2 | 1243.5 | 1247.5 | 10.5 | 2 * |
| | 9 | 1938.0 | 1951.0 | 35.0 | 2 S |
| 14 | 2 | 0008.0 | 0009.9 | 2.2 | 2 S |
| | 6 | 1135 E | | 877 D | 2 |
| 15 | 3 | 1203.9 | 1203.9 | 0.2 | 1 * |
| | 3 | 1242.0 | 1242.5 | 0.5 | 1 |
| | 3 | 1454.5 | 1455.0 | 0.5 | 1 S |
| | 3 | 1633.0 | 1633.0 | 0.1 | 2 S |
| | 3 | 1810.5 | 1811.0 | 0.5 | 2 S |
| | 3 | 2338.0 | 2338.2 | 1.0 | 2 S |
| 16 | 2 | 0000.0 | 0001.1 | 2.5 | 2 S |
| | 8 | 1616.0 | 1619.0 | 4.9 | 3 |
| | 9A | 2121.0 | 2121.6 | 2.0 | 3 |
| | 9B | 2123.0 | 2123.8 | 287 D | 3 |
| 18 | 2 | 1202.0 | 1204.2 | 2.5 | 2 * |
| | 3 | 1207.6 | 1207.6 | 0.2 | 2 * |
| | 3 | 1237.5 | 1237.5 | 0.2 | 2 * |
| | 3 | 1259.4 | 1259.4 | 0.2 | 2 * |
| | 3 | 1300.1 | 1300.1 | 0.2 | 2 * |
| | 3 | 1338.2 | 1338.2 | 0.2 | 2 |
| | 3 | 1341.3 | 1341.3 | 0.2 | 1 |
| | 2 | 1641.4 | 1642.0 | 1.1 | 1 |
| | 2 | 1656.3 | 1656.8 | 1.0 | 2 |
| 19 | 3 | 0054.9 | 0055.8 | 0.9 | 2 |
| | 2 | 0155.0 | 0205.4 | 10. D | 2 ** |
| | 2 | 1209.0 | 1209.2 | 6.8 | 2 * |
| 20 | 2 | 1616.0 | 1618.5 | 3.6 | 2 |
| 21 | 3 | 1326.0 | 1326.1 | 0.4 | 1 |
| | 1 | 1530.1 | 1530.7 | 1.1 | 2 |
| 22 | 3 | 0130.0 | 0130.1 | 0.5 | 1 ** |
| | 3 | 1448.0 | 1448.0 | 0.2 | 2 |
| 23 | 2 | 1536.2 | 1536.9 | 1.0 | 1 |
| 24 | 2 | 0055.7 | 0055.7 | 1.8 | 3 S |
| | 3 | 1633.0 | 1633.6 | 1.0 | 1 |
| | 3 | 1734.5 | 1734.5 | 0.2 | 2 |
| | 3 | 1745.1 | 1745.6 | 0.9 | 2 |
| | 3 | 1801.5 | 1802 | 0.5 | 2 |
| | 3 | 2033.8 | 2033.8 | 0.2 | 2 |
| 25 | 3 | 1223.8 | 1223.8 | 0.2 | 2 * |
| | 3 | 2025.8 | 2025.8 | 0.2 | 2 |
| 26 | 3 | 1709.5 | 1710.5 | 1.0 | 2 |
| | 2 | 1711.5 | 1712.4 | 1.5 | 1 |
| | 3 | 1713.8 | 1714.0 | 0.6 | 2 |
| 27 | 9A | 1225.0 | 1227.8 | 3.8 | 3 * |
| | 9B | 1228.8 | 1229.5 | 8.2 | 3 * |
| | 9A | 2107.0 | 2110.2 | 8.0 | 3 |
| | 9B | 2115.0 | 2118.4 | 32.0 | 3 |
| | 2 | 2332.8 | 2333.3 | 0.7 | 2 |
| 28 | 2 | 0030.0 | 0031.0 | 3.0 | 2 |
| | 3 | 0147.0 | 0147.0 | 0.2 | 1 ** |
| 29 | 8 | 1208.0 | 1221.3 | 27.0 | 2 * |
| | 9A | 2117.0 | 2119.0 | 3.0 | 3 |
| | 9B | 2120.0 | 2121.0 | 6.0 | 2 |
| 30 | 2 | 0000.0 | 0004.9 | 6.5 | 1 |
| | 6 | 1200 E | | 837 D | 2 |
| 31 | 6 | 1158 E | | 837 D | 2 |

* On sunrise pattern.
** On sunset pattern.

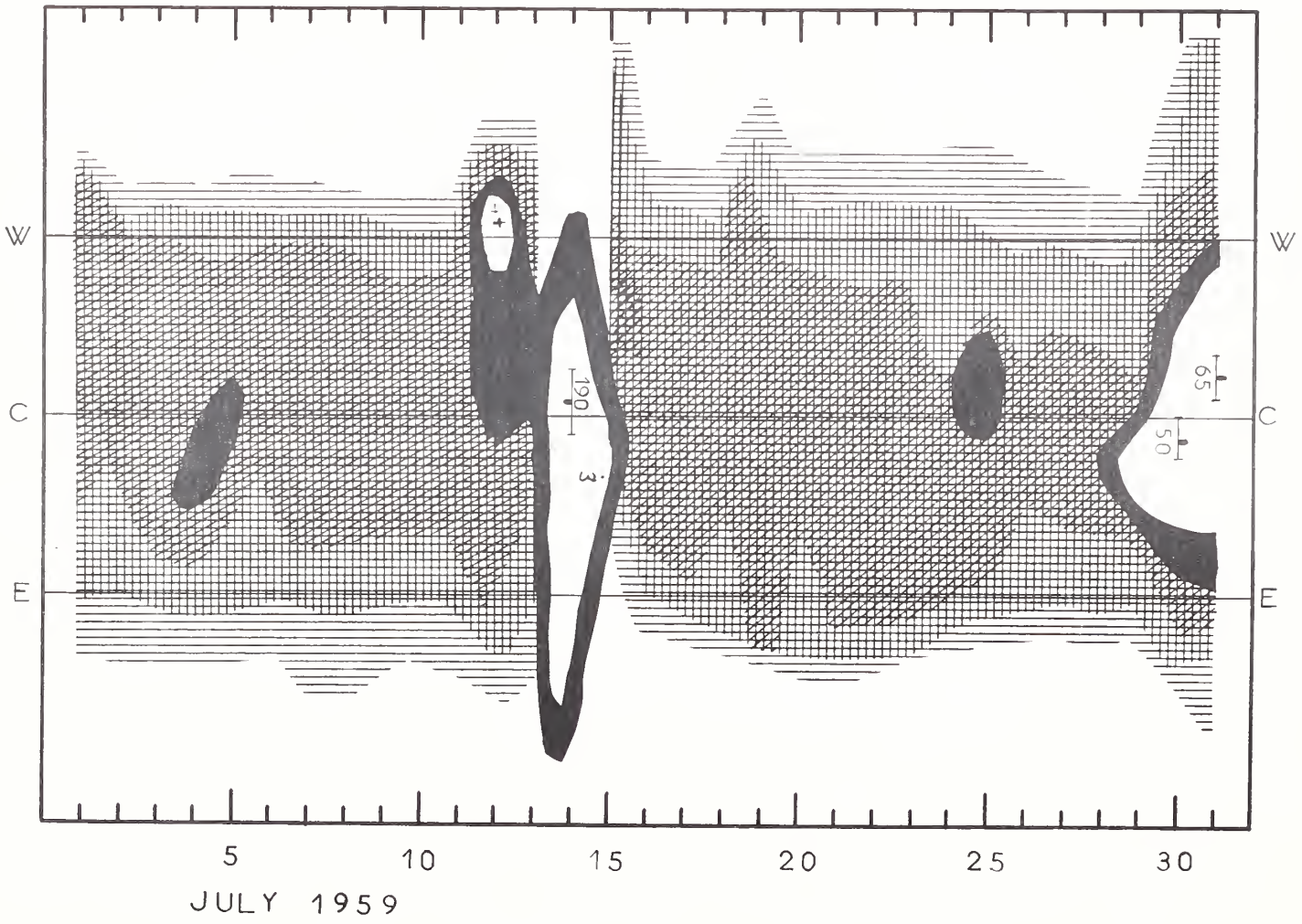
COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

JULY 1959

Nançay

169 Mc

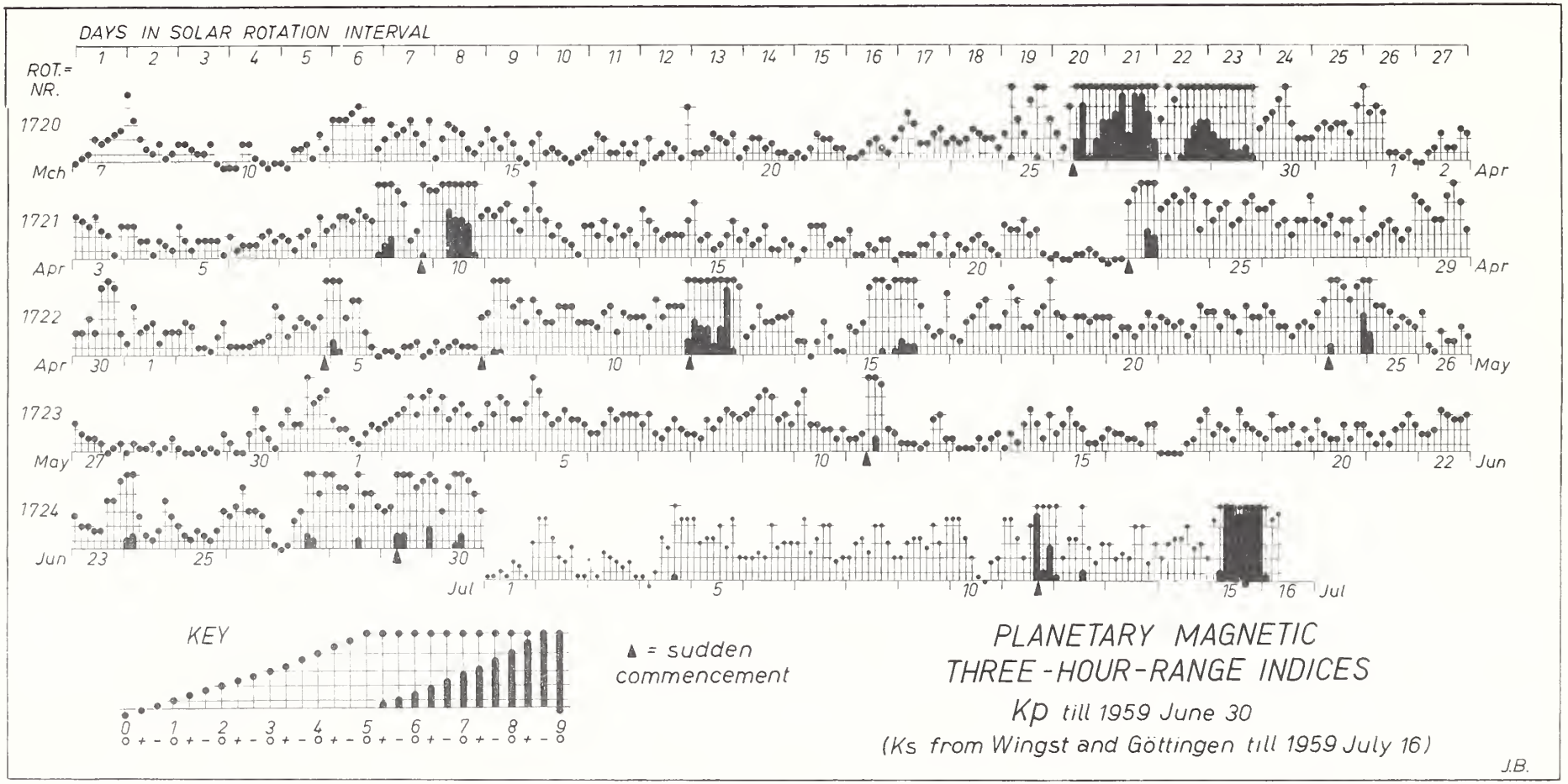



COMMERCE - STANDARDS - BOULDER

# GEOMAGNETIC ACTIVITY INDICES

JUNE 1959

| June 1959 | C | Values Kp Three hour Gr. interval 1 2 3 4 | 5 6 7 8 | Sum | Ap | Final Selected Days |
|---|---|---|---|---|---|---|
| 1 | 0.3 | 3- 2o 2o 1+ | 1o 2- 2+ 2o | 15o | 7 | Five |
| 2 | 1.0 | 2+ 3- 3o 3+ | 4o 3o 4o 4+ | 27- | 19 | Quiet |
| 3 | 1.0 | 3+ 4o 3- 3+ | 4- 3o 2o 2+ | 24+ | 16 | |
| 4 | 1.1 | 4- 3o 4o 4- | 3- 3- 4- 5o | 28+ | 22 | 12 |
| 5 | 0.8 | 4+ 3o 2+ 3- | 3+ 3- 3- 2+ | 23+ | 15 | 13 |
| | | | | | | 16 |
| 6 | 0.7 | 2- 2- 2+ 3+ | 3- 3o 3o 3o | 21- | 12 | 17 |
| 7 | 0.5 | 2+ 3o 2- 1+ | 2o 3- 2o 2- | 17- | 8 | 25 |
| 8 | 0.7 | 2- 1+ 3- 2o | 3- 3+ 3o 3- | 19+ | 11 | |
| 9 | 1.0 | 3o 3+ 4o 4+ | 4o 3- 3o 2+ | 27- | 19 | |
| 10 | 0.7 | 4- 4+ 2+ 2+ | 2o 2o 1+ 2o | 20o | 12 | |
| 11 | 1.1 | 1+ 1+ 2- 5o | 6o 5- 2o 2- | 24- | 24 | Five |
| 12 | 0.2 | 1o 1o 1o 1- | 1o 3- 3o 1+ | 12- | 6 | Disturbed |
| 13 | 0.1 | 1+ 1- 1- 1- | 1+ 1- 1+ 2- | 8+ | 4 | |
| 14 | 0.4 | 1- 2- 1o 2+ | 3+ 2+ 1+ 3o | 16- | 9 | 4 |
| 15 | 0.4 | 2- 2+ 3+ 2+ | 2o 1o 1o 1+ | 15o | 8 | 27 |
| | | | | | | 28 |
| 16 | 0.2 | 2o 2- 2- 1+ | 1+ 1o 2+ 2+ | 14- | 6 | 29 |
| 17 | 0.3 | 0+ 0+ 0+ 0+ | 1o 1+ 3- 3+ | 10- | 6 | 30 |
| 18 | 0.6 | 2- 2+ 2o 1+ | 3+ 2+ 2o 2- | 17- | 8 | |
| 19 | 1.4 | 1+ 3o 2o 2o | 2+ 1o 2o 1+ | 15o | 7 | |
| 20 | 0.4 | 3- 2- 1+ 1+ | 2+ 1+ 2+ 2+ | 15+ | 8 | |
| 21 | 0.4 | 2- 1o 2- 1o | 2o 2+ 3o 2+ | 15o | 8 | Ten |
| 22 | 0.8 | 2- 2- 2o 3+ | 3o 3- 3- 3o | 20o | 11 | Quiet |
| 23 | 0.9 | 3- 2o 2o 2- | 2- 4- 4- 5- | 22o | 15 | |
| 24 | 1.1 | 6- 6o 3- 1+ | 1o 2- 4- 3- | 25- | 26 | 1 |
| 25 | 0.4 | 2o 1+ 1o 2- | 1+ 1o 2- 3o | 13o | 6 | 12 |
| | | | | | | 13 |
| 26 | 0.8 | 3- 3+ 4+ 3o | 3o 3- 2- 1- | 21+ | 14 | 15 |
| 27 | 1.3 | 0+ 1- 2+ 3o | 6o 6- 4o 5o | 27o | 31 | 16 |
| 28 | 1.3 | 5o 4+ 4+ 3+ | 6- 4o 4o 3+ | 34o | 34 | 17 |
| 29 | 1.5 | 3o 3+ 6o 6o | 5o 4+ 5- 6+ | 39- | 51 | 19 |
| 30 | 1.4 | 5- 3o 4+ 5+ | 6o 5- 4o 3o | 35o | 38 | 20 |
| | | | | | | 21 |
| | | | | | | 25 |
| Mean: | 0.76 | | | Mean: | 15 | |




COMMERCE - STANDARDS - BOULDER

# CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

## NORTH ATLANTIC

JUNE 1959

| June 1959 | 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 | | 1-7 days Final | 1-7 days Js | 1-7 days SDW | 1-7 days J | Half (1) | Day (2) |
| 1 | 7- | 6o | 7- | 7o | 6 | 6 | 7 | 6 | 7- | 7 | | | 7 | 2 | 2 |
| 2 | 7o | 6o | 7- | 7- | 7 | 7 | 7 | 7 | 7- | 7 | | | 7 | 3 | 3 |
| 3 | 6+ | 6+ | 6+ | 7- | 6 | 5 | 7 | 7 | 6+ | 7 | | | 7 | (4) | 3 |
| 4 | 7- | 6o | 6o | 6+ | 7 | 6 | 6 | 7 | 6+ | 6 | | | 6 | (4) | 3 |
| 5 | 6+ | 6- | 7- | 6+ | 6 | 6 | 6 | 7 | 6+ | 6 | | | 6 | 3 | 3 |
| 6 | 7o | 7- | 7o | 7- | 6 | 6 | 7 | 7 | 7- | 7 | | | 7 | 2 | 2 |
| 7 | 7o | 7- | 7- | 7o | 7 | 7 | 7 | 6 | 7- | 7 | | | 7 | 2 | 2 |
| 8 | 8- | 7- | 7- | 7o | 7 | 7 | 7 | 7 | 7o | 7 | | | 7 | 2 | 3 |
| 9 | 7+ | 6- | 5+ | 6o | 7 | 7 | 6 | 6 | 6o | 7 | | | 7 | (4) | 3 |
| 10 | 7- | 6o | 6+ | 7- | 6 | 5 | 6 | 6 | 6+ | 5 | | 5 | 7 | 3 | 2 |
| 11 | 7- | 6+ | 6+ | 7- | 7 | 6 | 6 | 6 | 7- | 4 | | 3 | 4 | 2 | (4) |
| 12 | 7o | 7- | 7o | 7o | 6 | 6 | 6 | 7 | 7o | 4 | | 4 | 4 | 1 | 2 |
| 13 | 7o | 7- | 7+ | 7o | 7 | 7 | 7 | 7 | 7o | 6 | | | 6 | 0 | 2 |
| 14 | 7+ | 7- | 7- | 7o | 7 | 7 | 7 | 7 | 7o | 6 | | | 6 | 1 | 2 |
| 15 | 7+ | 7- | 7- | 7o | 7 | 7 | 7 | 7 | 7o | 7 | | | 7 | 2 | 2 |
| 16 | 7+ | 6+ | 7- | 7- | 7 | 7 | 7 | 7 | 7- | 7 | | | 7 | 2 | 2 |
| 17 | 7+ | 7o | 7- | 7o | 7 | 7 | 7 | 7 | 7o | 7 | | | 7 | 0 | 2 |
| 18 | 7+ | 7- | 7o | 7o | 7 | 7 | 7 | 7 | 7o | 6 | | | 6 | 2 | 3 |
| 19 | 7o | 7- | 7o | 7+ | 7 | 7 | 6 | 7 | 7o | 5 | | | 5 | 2 | 1 |
| 20 | 7+ | 7o | 7+ | 7o | 7 | 7 | 7 | 7 | 7o | 6 | | | 6 | 2 | 2 |
| 21 | 7o | 7o | 7o | 7o | 7 | 7 | 7 | 7 | 7o | 7 | | | 7 | 2 | 3 |
| 22 | 7o | 7o | 7o | 7- | 7 | 7 | 6 | 7 | 7o | 7 | | | 7 | 3 | 3 |
| 23 | 7- | 6+ | 7o | 6+ | 6 | 7 | 7 | 7 | 7- | 7 | | | 7 | 2 | 3 |
| 24 | 5+ | 6- | 7- | 7- | 4 | 4 | 6 | 6 | 6o | 7 | | | 7 | (4) | 2 |
| 25 | 7o | 6+ | 7o | 7- | 7 | 7 | 7 | 7 | 7- | 7 | | | 7 | 2 | 2 |
| 26 | 7- | 6- | 7- | 7- | 7 | 6 | 7 | 7 | 6+ | 7 | | | 7 | (4) | 2 |
| 27 | 7o | 7- | 7- | 7- | 7 | 6 | 7 | 6 | 7- | 7 | | | 7 | 2 | (4) |
| 28 | 6- | 3+ | 6- | 6o | 6 | 5 | 6 | 6 | 5- | 7 | | | 7 | (4) | 3 |
| 29 | 7- | 4- | 6- | 5o | 5 | 5 | 5 | 5 | 5o | 7 | | | 7 | (4) | (5) |
| 30 | 5- | 4+ | 6- | 6o | 3 | 4 | 6 | 5 | 5o | 7 | | | 7 | (4) | (4) |

| Score: | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quiet Periods | P | 21 | 16 | 22 | 20 | | | | 15 | | | 15 | |
| | S | 7 | 10 | 8 | 10 | | | | 9 | | | 9 | |
| | U | 2 | 0 | 0 | 0 | | | | 4 | | | 4 | |
| | F | 0 | 1 | 0 | 0 | | | | 2 | | | 2 | |
| Disturbed Periods | P | 0 | 1 | 0 | 0 | | | | 0 | | | 0 | |
| | S | 0 | 1 | 0 | 0 | | | | 0 | | | 0 | |
| | U | 0 | 1 | 0 | 0 | | | | 0 | | | 0 | |
| | F | 0 | 0 | 0 | 0 | | | | 0 | | | 0 | |

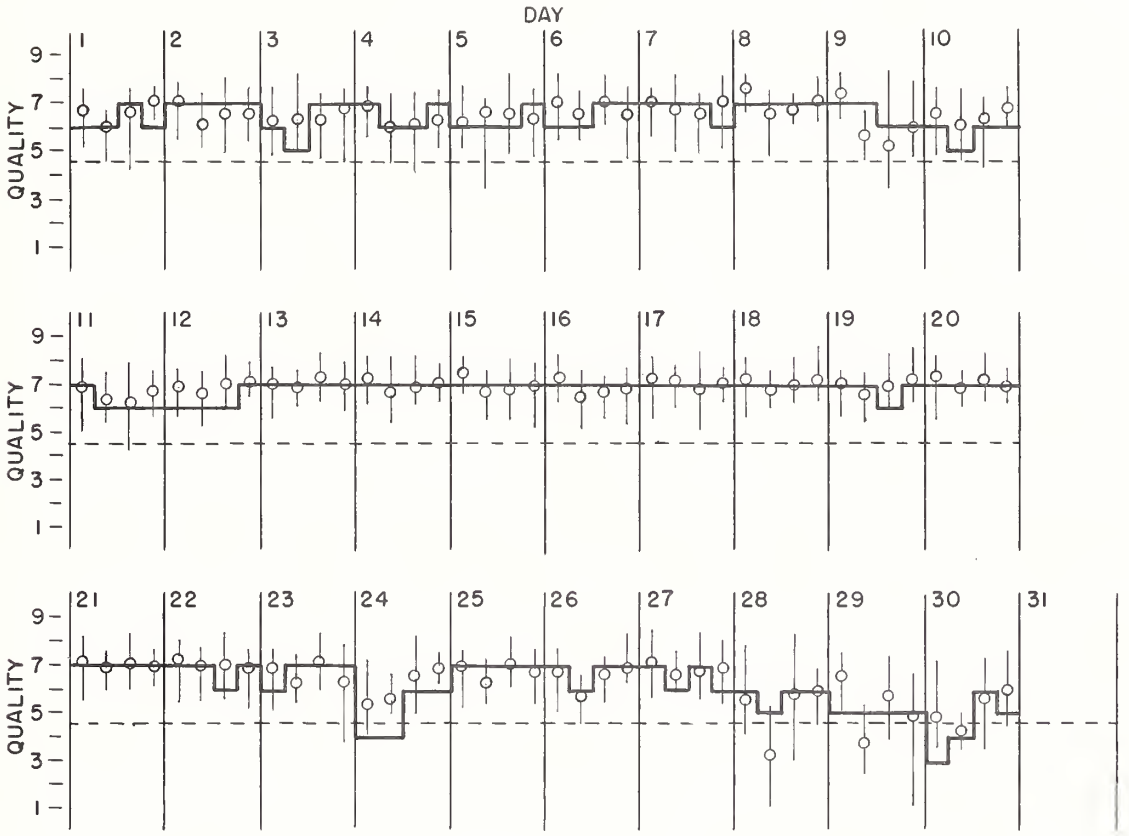
( ) represent disturbed values.

# CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS
## NORTH ATLANTIC

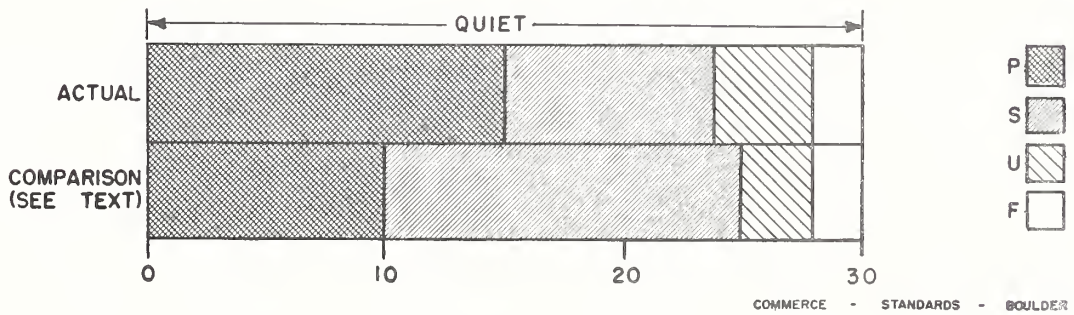
— Short-term forecast
o Quality figure

JUNE 1959

| Range of reports

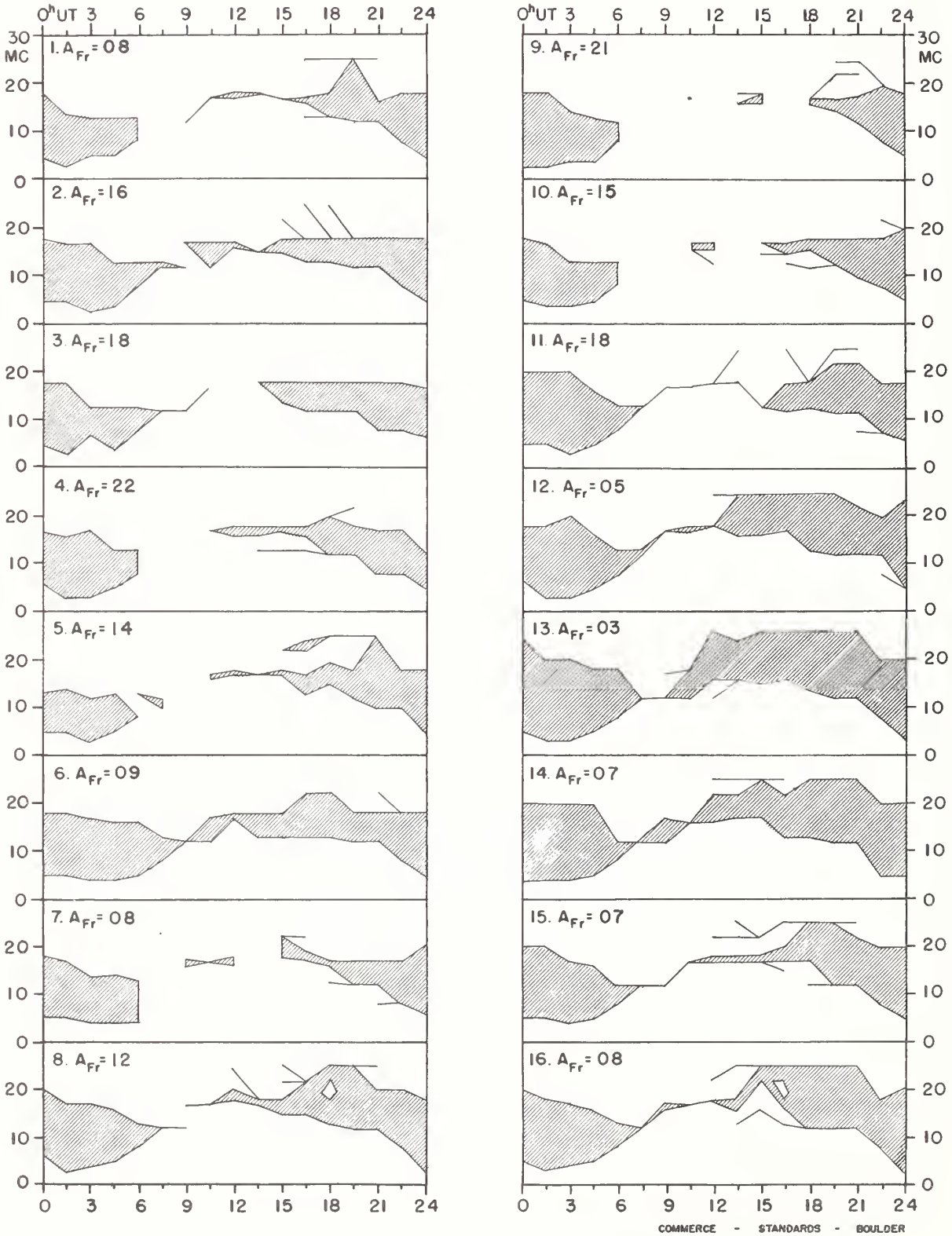



OUTCOME OF ADVANCED FORECASTS FINAL ESTIMATE

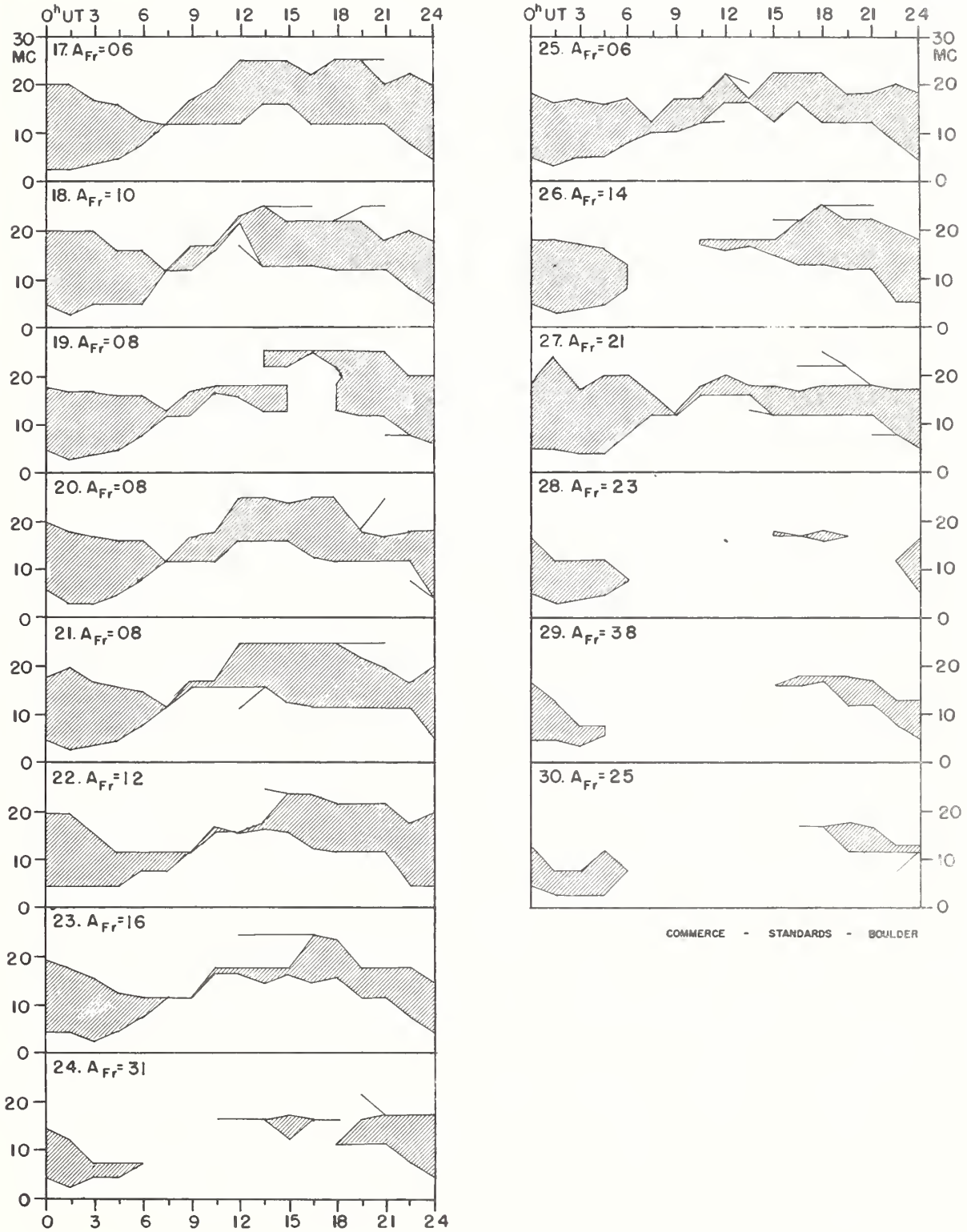


# USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

JUNE 1959



JUNE, 1959




Adapted from Observations by Deutsches Bundespost

# CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

## NORTH PACIFIC

JUNE 1959

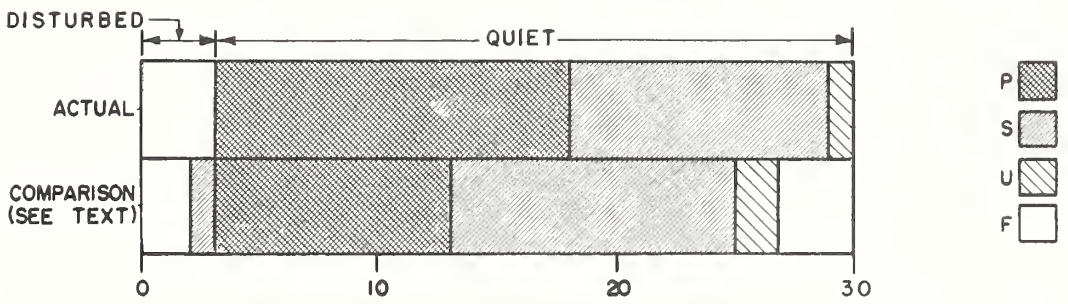
| June 1959 | North Pacific 12-hourly quality figures | | Short-term forecasts issued at | | Whole day index | Advance forecasts (Jp reports) for whole day; issued in advance by: | | | | Geomagnetic $K_{Si}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0700 to 1900 | 1900 to 0700 | 0600 | 1800 | | 1-7 days Final | 1-7 days Jps | 1-7 days SDW | 1-7 days Jp | Half (1) | Day (2) |
| 1 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 2 | 6 | 5 | 6 | 6 | 6 | 6 | | 6 | | 3 | 3 |
| 3 | 6 | 6 | 5 | 5 | 6 | 6 | | 6 | | 3 | 2 |
| 4 | 6 | 6 | 5 | 6 | 6 | 5 | | 5 | | (4) | 3 |
| 5 | 6 | 6 | 6 | 6 | 6 | 5 | | 5 | | 3 | 2 |
| 6 | 7 | 6 | 6 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 7 | 6 | 5 | 6 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 8 | 5 | 5 | 6 | 5 | 5 | 6 | | 6 | | 2 | 2 |
| 9 | 4 | 5 | 5 | 5 | 5 | 6 | | 6 | | (4) | 3 |
| 10 | 5 | 6 | 5 | 5 | 6 | 6 | | 6 | | (4) | 2 |
| 11 | 5 | 6 | 6 | 6 | 5 | 5 | | 5 | | 3 | 3 |
| 12 | 6 | 6 | 6 | 6 | 7 | 5 | | 5 | | 0 | 2 |
| 13 | 7 | 6 | 6 | 6 | 7 | 6 | | 6 | | 0 | 2 |
| 14 | 7 | 6 | 6 | 6 | 7 | 6 | | 6 | | 1 | 2 |
| 15 | 6 | 7 | 7 | 6 | 6 | 6 | | 6 | | 2 | 1 |
| 16 | 6 | 6 | 7 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 17 | 7 | 8 | 7 | 6 | 7 | 6 | | 6 | | 0 | 2 |
| 18 | 6 | 6 | 7 | 7 | 6 | 6 | | 6 | | 2 | 2 |
| 19 | 6 | 5 | 6 | 6 | 6 | 5 | | 5 | | 2 | 2 |
| 20 | 5 | 6 | 6 | 6 | 6 | 5 | | 5 | | 1 | 2 |
| 21 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 22 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 | | 3 | 3 |
| 23 | 6 | 5 | 6 | 6 | 6 | 6 | | 6 | | 2 | 3 |
| 24 | 6 | 5 | 4 | 6 | 6 | 6 | | 6 | | (4) | 2 |
| 25 | 6 | 6 | 6 | 6 | 6 | 6 | | 6 | | 2 | 2 |
| 26 | 5 | 5 | 5 | 5 | 5 | 6 | | 6 | | (4) | 2 |
| 27 | 5 | 5 | 6 | 4 | 5 | 6 | | 6 | | 2 | (4) |
| 28 | 3 | 5 | 5 | 5 | (4) | 6 | | 6 | | (6) | (5) |
| 29 | 4 | 4 | 5 | 5 | (3) | 6 | | 6 | | (5) | (5) |
| 30 | 3 | 5 | 4 | 4 | (3) | 6 | | 6 | | (5) | (5) |

| Score: | | | | | | |
|---|---|---|---|---|---|---|
| Quiet Periods | P | 13 | 17 | | 15 | |
| | S | 12 | 11 | | 11 | |
| | U | 0 | 1 | | 1 | |
| | F | 1 | 0 | | 0 | |
| Disturbed Periods | P | 0 | 0 | | 0 | |
| | S | 3 | 1 | | 0 | |
| | U | 1 | 0 | | 0 | |
| | F | 0 | 0 | | 3 | |

( ) represent disturbed values.

NORTH PACIFIC
JUNE 1959

OUTCOME OF ADVANCED FORECASTS FINAL ESTIMATE



# ALERT PERIODS AND SPECIAL WORLD INTERVALS

INTERNATIONAL GEOPHYSICAL COOPERATION 1959
JULY 1959

| Issued Day/Time UT July 1959 | Advance Geophysical Alert | No. | Worldwide Geophysical Alert | Special World Interval |
|---|---|---|---|---|
| 10/1300 | Hawaii Solar Flare 09/1937Z | | | |
| 11/1800 | Ft. Belvoir Magnetic Storm 11/1623Z | | | |
| 12/1600 | | 18 | Magnetic Storm 11/1623Z | |
| 15/1030 | Ft. Belvoir Aurora Inferred Magnetic Storm 15/0802Z | | | |
| 15/1600 | | 19 | Aurora Inferred Magnetic Storm 15/0802Z | Start Special World Interval |
| 16/1600 | | 20 | | Finish Special World Interval |
| 16/2000 | Climax Solar Flare 16/1607Z | | | |
| 17/1730 | Ft. Belvoir Aurora Inferred Magnetic Storm 17/1638Z | | | |
| 18/1600 | | 21 | Aurora Inferred Magnetic Storm 17/1638Z | |
| 30/1340 | Burbank Solar Flare 29/2117Z | | | |

COMMERCE - STANDARDS - BOULDER