CRPL-F183 PART B FOR OFFICIAL USE

PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
NOVEMBER 1959

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

CRPL-F 183
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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 (x 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 $\bar{R}$ of 3.4 was reached.

II SOLAR CENTERS OF ACTIVITY

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

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

Calcium plage data are available through the cooperation of the McMath-Hulbert Observatory of the University of Michigan. 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 λ5303) and red (Fe X at λ6374) coronal lines. The indices are based on measurements made at 5° intervals around the periphery of the solar disk by the High Altitude Observatory at Climax, Colorado, and by Harvard University observers at Sacramento Peak (The USAF Upper Air Research Observatory at Sunspot, New Mexico, under contract AF 19(604)-146). The measurements are expressed as the number of millionths of an Angstrom of the 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 λ5303.

R_6 = same for λ6374.

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

R_1 = same for λ6374.

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

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

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

where N is the number of indices entering the summation.

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

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

III SOLAR FLARES

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

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

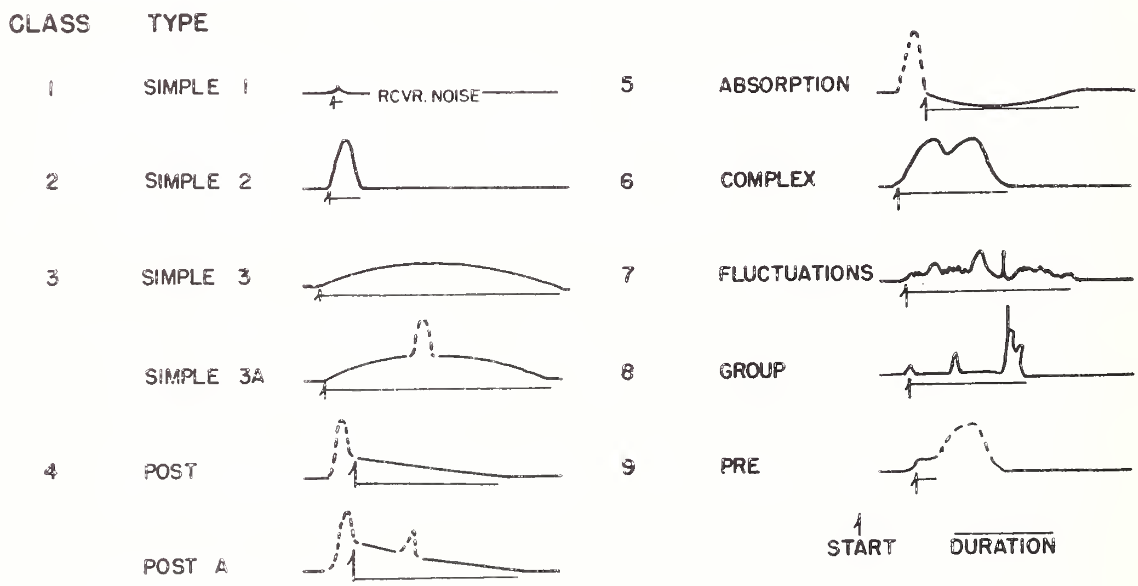
Infrequently occurring bursts of great intensity, often of complicated structure.

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.

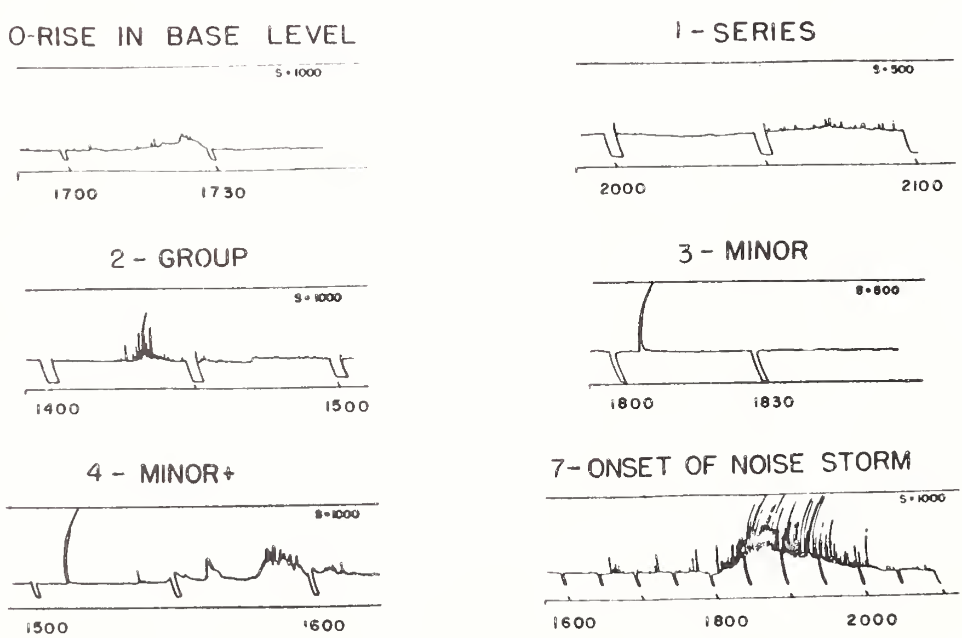
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

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.

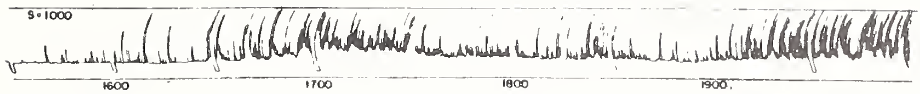
7 - Noise storm begins -- The onset of a noise storm occurs at some time during the observing period.

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.

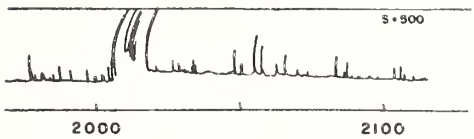
9A, 9B, or 9 -- Major burst and second part or large event without distinct first and second parts -- If there is a double rise in flux, the first part, a major burst, is listed as 9A and the second part as 9B. The second part may consist of a rise in base level, a group or series of bursts, a noise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



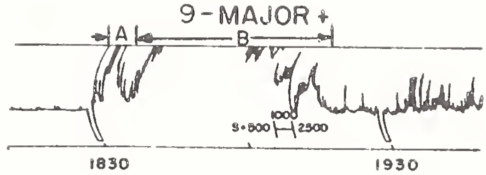
6-NOISE STORM IN PROGRESS



8-MAJOR



9-MAJOR+



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°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.

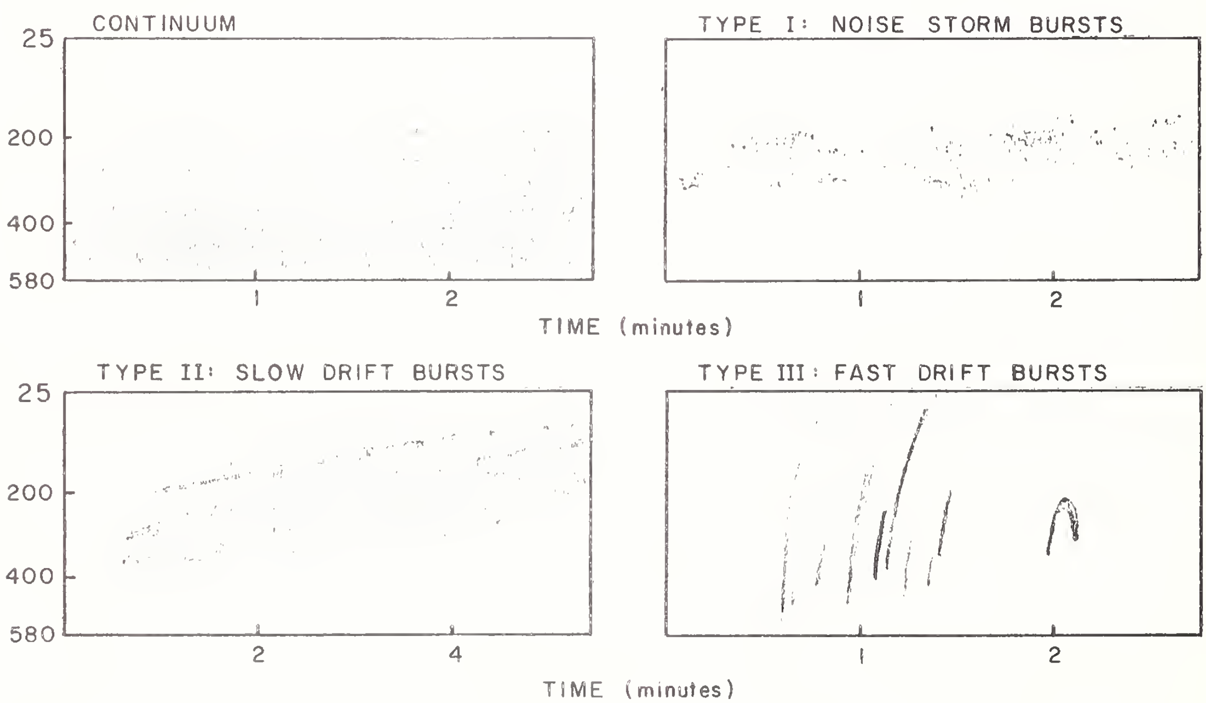
Note that the isophotes cannot be measured when a radio spot of large intensity is on the disk.

Spectrum Observations

Data on solar radio emission in the spectral range 25-580 Mc/s recorded at the Radio Astronomy Station of Harvard College Observatory, Fort Davis, Texas, are presented. The research program is supported by financial assistance from the Air Force Cambridge Research Center, through the offices of Sacramento Peak Observatory.

The receiving equipment consists of five separate sweep frequency receivers covering the bands 25-50, 50-100, 100-180, 170-320, 300-580 Mc/s. The 25-50 and 50-100 Mc/s receivers are each connected to broad band dipoles which are cross polarised and mounted over a reflecting screen. The other three receivers are attached to separate broad band feeds mounted coaxially at the primary focus of an 8.55 meter diameter paraboloid, the 170-320 Mc/s feed being cross polarised with the other two feeds. The effective collecting area of the antenna is 40 sq. meters at 100 Mc/s and 45 sq. meters at 500 Mc/s.

The four types of recognized spectral activity are idealized below:



The large scale examples of continuum, sometimes called Type IV, are listed as "Cont. IV" in the tables. Photographic examples of the bursts have been published by Maxwell, Swarup, and Thompson (Proc. IRE 46, 142, 1958), and Maxwell (Sky and Telescope 17, 388, 1958; 18, 544, and 556, 1959). A few remaining solar radio bursts are tabulated as unclassified.

The symbols used in the tables are:

b = single burst
g = small group (<10) of bursts
G = large group ($\geq$10) of bursts
⟶ = Arrows indicate continuity of solar activity between two Greenwich days.

The minimum detectable level of solar activity is a function of frequency: approximately 5×10^{-22} watts meter $^{-2}$ $(c/s)^{-1}$ at 500 Mc/s. The equipment records signals over an intensity range of approximately 10,000:1. There are three classes of intensity given in the tables. For 100 Mc/s they are:

1 = Faint, 5 to 40×10^{-22} watts meter^{-2} $(c/s)^{-1}$.

2 = Moderate, 30 to 200×10^{-22}.

3 = Strong, $>200 \times 10^{-22}$.

The times are Universal Time (U. T.). The accuracy is to the nearest half minute, except in the case of major outbursts which are specified to the nearest 0.1 minute.

Details of the frequency ranges of activity may be obtained on request to the Radio Astronomy Station, Ft. Davis, Texas.

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, Göttingen.

VI RADIO PROPAGATION QUALITY INDICES

One can take as the definition of a radio propagation quality index: the measure of the efficiency of a medium-powered radio circuit operated under ideal conditions in all respects, except for the variable effect of the ionosphere on the propagation of the 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 Army Command and Administrative Network, U. S. Air Force and Federal 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.

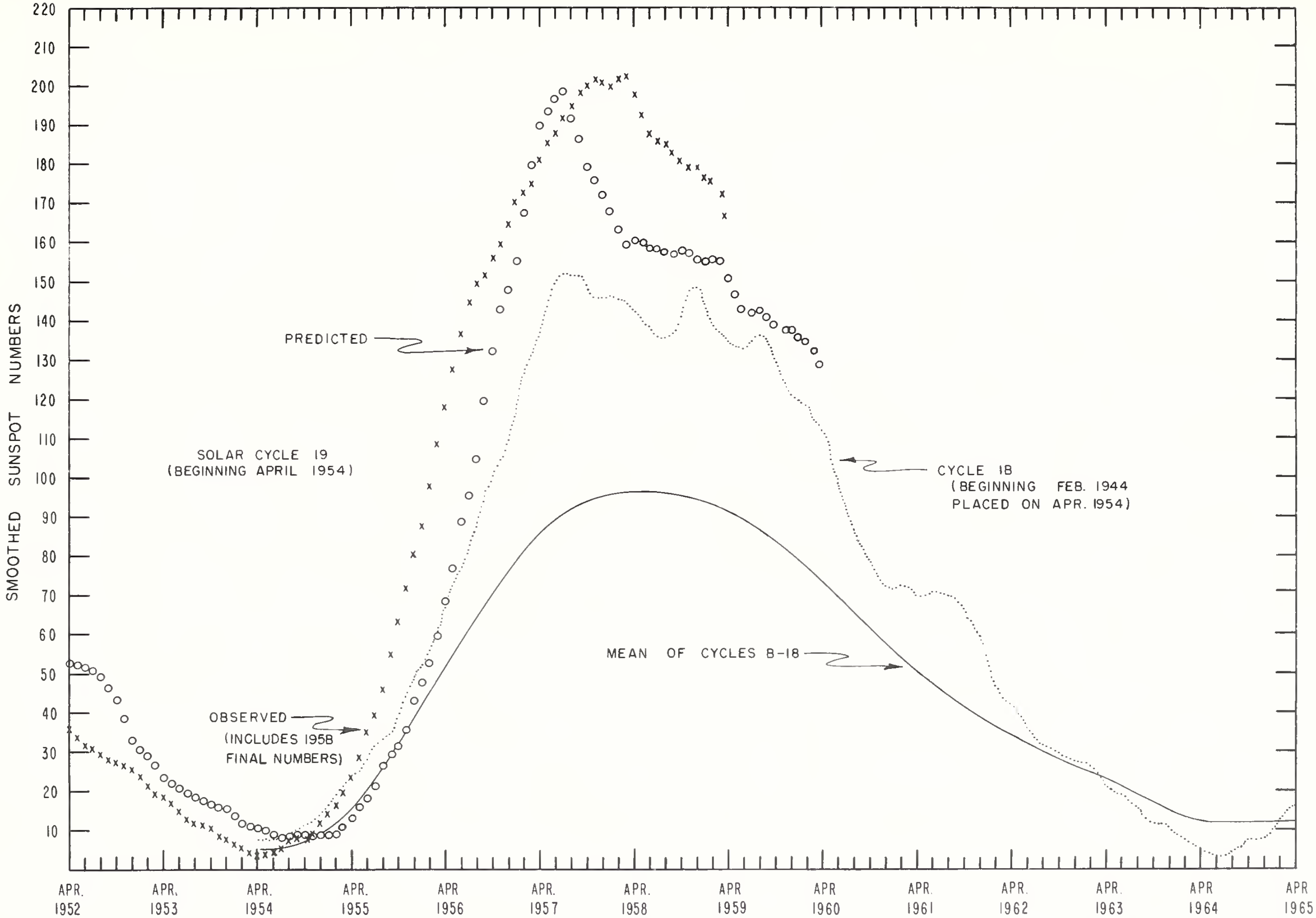
DAILY SOLAR INDICES

Sept. 1959	American Relative Sunspot Numbers R_A'
1	287
2	236
3	193
4	160
5	151
6	162
7	161
8	140
9	132
10	141
11	136
12	153
13	162
14	158
15	146
16	111
17	81
18	105
19	123
20	127
21	126
22	129
23	96
24	114
25	101
26	96
27	86
28	91
29	99
30	90
Mean:	136.4

Oct. 1959	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	54	150
2	72	145
3	81	144
4	97	148
5	115	155
6	128	174
7	130	169
8	115	155
9	103	153
10	91	149
11	78	147
12	81	154
13	70	155
14	102	153
15	96	160
16	116	167
17	107	169
18	116	171
19	84	173
20	99	175
21	111	175
22	129	187
23	135	183
24	143	181
25	137	186
26	126	190
27	112	*
28	110	*
29	115	*
30	117	*
31	130	161
Mean:	106.5	164.0

*No observations - equipment breakdown

COMMERCE - STANDARDS - BOULDER



PREDICTED AND OBSERVED SUNSPOT NUMBERS

COMMERCE - STANDARDS - BOULDER

CALCIUM PLAGE AND SUNSPOT REGIONS

OCTOBER 1959

CMP Oct 1959	Lat	McMath Plage Number	Return of Region	Calcium Plage Data: CMP Values Area	Int.	History	Age	Sunspot Data: CMP Values Area	Count	History
01.5	S19	5403	New	(300)	(2)	b ∧ d	1			
01.6	N07	5396	New	300	1.5	b /‾ ℓ	1			
02.1	N14	5393	5354	600	2.5	ℓ \ d	5	20	3	ℓ — ℓ
02.3	S11	5392	5353	1000	1.5	ℓ — ℓ	3	(20)	(2)	b /‾ ℓ
03.2	N15	5394	5355	400	1.5	ℓ \ ℓ	5	(100)	(1)	b /‾ ℓ
03.6	N26	5395	5355	400	1.5	ℓ — ℓ	5			
05.4	S14	5397	New	200	1	ℓ ‾\ d	1			
05.7	N17	5398	5356	800	2.5	ℓ \ ℓ	5			
06.8	N30	5399	5374	1500	2.5	ℓ — ℓ	2	(10)	(1)	ℓ ‾\ d
06.9	S14	5401	5367	4500	3	ℓ — ℓ	2	360	2	ℓ — ℓ
07.2	N15	5404	5359	200	1.5	ℓ — ℓ	6			
08.6	N04	5405	5360	2500	3	ℓ / ℓ	6	810	17	ℓ — ℓ
08.7	S16	5407	5361	500	1.5	ℓ ‾\ d	3	550	7	ℓ ‾\ d
09.5	N20	5406	5360	1000	1.5	ℓ — ℓ	6			
09.7	N03	5422	New	(1000)	(2)	b /‾ ℓ	1	(40)	(1)	b /‾ ℓ
10.4	N16	5410	5362	100	1	ℓ ‾\ d	6			
11.2	S07	5423	New	(200)	(1.5)	b /‾ ℓ	1			
11.7	N30	5408	New	1000	2.5	ℓ / ℓ	1	110	5	ℓ — ℓ
12.2	N08	5411	5366	500	1.5	ℓ — ℓ	3			
12.3	S13	5413	5365	400	1	ℓ ‾\ d	2			
12.4	N23	5409	5364	200	1.5	ℓ ‾\ d	2			
14.0	N22	5414	5364	700	1	ℓ / ℓ	2	(20)	(3)	b /‾ ℓ
14.0	N09	5415		300	1	ℓ — ℓ				
14.2	S08	5424	New	200	2	b / ℓ	1	40	2	b ∧ d
14.3	S21	5417	5368	400	1.5	ℓ — ℓ	3			
15.5	S24	5416	5375	1700	2	ℓ — ℓ	2	(100)	(4)	b /‾ ℓ
16.5	N12	5419	5373	900	2.5	ℓ \ ℓ	2			
16.8	S16	5418	New	3800	3	ℓ — ℓ	1	360	15	ℓ — ℓ
17.8	N07	5420	New	2600	3	ℓ — ℓ	1	300	2	ℓ — ℓ
18.1	N20	5421	5377	1600	2.5	ℓ — ℓ	3			
19.6	N17	5434	New	(500)	(1.5)	b /‾ ℓ	1			
19.8	S06	5425	New	900	3	ℓ — ℓ	1	80	4	b /‾ ℓ
21.1	N07	5430	5379	800	2.5	ℓ /‾ ℓ	4	20	1	b ∧ d
21.6	N28	5426	5379	1200	2.5	ℓ — ℓ	4			
21.6	N00	5427	*	5000	3.5	ℓ — ℓ	1	560	20	ℓ — ℓ
21.9	S12	5431	5381	4500	3	ℓ / ℓ	3	10	1	b ∧ d
22.1	N20	5428	5379	1800	2.5	ℓ — ℓ	4			
22.5	N11	5429	5384	1100	2.5	ℓ — ℓ	4	10	1	ℓ ‾\ d
23.4	S15	5435	New	500	1.5	b /‾ ℓ	1			
24.1	N09	5432	5386	900	2	ℓ — ℓ	3			
24.9	S20	5436	New	400	2	ℓ — ℓ	1	40	2	b ∧ d
26.0	N10	5433	5389	(6200)	(3)	ℓ — ℓ	3	1490	15	ℓ — ℓ
28.2	N12	5437	5396	1800	3	ℓ / ℓ	2	210	4	b /‾ ℓ
28.7	S11	5438	New	6000	3	ℓ — ℓ	1	610	17	ℓ \ d
30.3	N18	5439	5394	1100	3	ℓ / ℓ	6	240	8	b / ℓ
30.6	N33	5440	New	900	3	ℓ \ ℓ	1	210	2	b ∧ d

*New and 5400

The following are corrections to the Plage Report for September 1959.

McMath Number	Return of Region	Age
5353	5317	2
5358	5327	2
5361	5338	2
5376	New	1

CORONAL LINE EMISSION INDICES

SEPTEMBER 1959

CMP Sept 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	x	x	x	x	x	x	x	x	114a	148a	36a	54a	191a	372a	x	x
2	x	x	x	x	x	x	x	x	89	134	15a	20a	127	168	26a	45a
3	206	250	40	60	131	203	20	30	113	163	18	30	126	155	17	21
4	159	200	44	66	140	190	30	40	x	x	x	x	x	x	x	x
5	212	270	29	50	176a	218a	26a	30a	90	150	x	x	171	232	x	x
6	143	200	21	45	63*	80	43	60	43	52	5	6	152	208	17	40
7	143	216	10	15	62	79	26	30	62	92	14	18	173	246	45	96
8	126	248	x	x	48	90	x	x	81	116	x	x	124	168	x	x
9	135	191	x	x	75	100	x	x	90	116	11	18	128	138	14	36
10	145	183	29	60	86	120	20	56	51	68	15	27	78	112	29	45
11	152	214	18	25	113	156	13	30	x	x	x	x	x	x	x	x
12	188	300	26	45	95	134	12	25	53	85	10	15	124	168	26	48
13	219	296	38a	45a	82	96	13a	20a	x	x	x	x	x	x	x	x
14	153	204	52	90	102	196	28	45	x	x	x	x	x	x	x	x
15	114a	140a	48a	83a	68a	104a	57a	70a	98	200	x	x	168	250	x	x
16	114	180	74	120	95	128	53	115	74	110	27	60	102	184	15	33
17	91	137	13	34	100	144	39	84	x	x	x	x	x	x	x	x
18	x	x	x	x	x	x	x	x	74	132	x	x	88	104	x	x
19	123	186	x	x	88	108	x	x	102	186	x	x	122	168	x	x
20	131	209	20a	25a	61	82	7a	8a	72	87	x	x	112	122	x	x
21	196	262	42	81	72	92	26	30	96	118	x	x	180	218	x	x
22	173	260	x	x	59	68	x	x	x	x	x	x	x	x	x	x
23	169	216	22	40	105	144	17	35	x	x	x	x	x	x	x	x
24	77a	98a	27	40	59a	80a	20	36	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
26	109	143	43	84	92	148	47	86	x	x	x	x	x	x	x	x
27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
28	x	x	x	x	x	x	x	x	50	65	27	45	90	117	34	81
29	182a	250a	x	x	170a	200a	x	x	x	x	x	x	x	x	x	x
30	150	197	33	58	126	224	14	29	x	x	x	x	x	x	x	x

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

CORONAL LINE EMISSION INDICES

OCTOBER 1959

CMP Oct 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	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	127	188	x	x	95	232	x	x	x	x	x	x	x	x	x	x
3	146	200	x	x	81	112	x	x	x	x	x	x	x	x	x	x
4	137	175	x	x	57	84	x	x	52	84	18	24	78	138	26	45
5	184	278	x	x	74	128	x	x	114a	151a	x	x	104a	184a	x	x
6	x	x	x	x	x	x	x	x	153	270	33	50	165	300	31	43
7	x	x	x	x	x	x	x	x	72	116	27	40	101	110	24	40
8	x	x	x	x	x	x	x	x	64	84	17	39	90	97	36	119
9	x	x	x	x	x	x	x	x	59	80	19	40	132	160	10	15
10	x	x	x	x	x	x	x	x	56	85	26	34	148	225	39	72
11	x	x	x	x	x	x	x	x	42	66	13	21	133*	183	18	42
12	86	134	30	86	68	83	25	35	64	76	14	18	104	140	16	22
13	x	x	x	x	x	x	x	x	60	92	24	50	88	110	46	104
14	x	x	x	x	x	x	x	x	136	180	21	42	94	142	24	53
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
16	x	x	x	x	x	x	x	x	87	117	20	25	89	150	15	30
17	x	x	x	x	x	x	x	x	x	x	25	60	x	x	15	21
18	95	124	12	19	52	69	17	30	42	82	11a	16a	51	71	10a	18a
19	123	148	x	x	115	227	x	x	93	145	32	70	91	106	44	52
20	140	155	44	83	132	250	56	79	x	x	58	119	x	x	51	103
21	111	130	28	40	98*	175	24	35	x	x	x	x	x	x	x	x
22	126	146	51	65	117	200	35	85	x	x	x	x	x	x	x	x
23	134*	147	20	25	100	130	20	35	x	x	x	x	x	x	x	x
24	116	140	20	37	88	148	x	x	59	72	17	23	99	144	36	79
25	98	144	x	x	51	90	x	x	108a	169a	22a	27a	177a	256a	20a	31a
26	107	190	15	33	73	98	9	15	43	68	17	27	101	134	17	39
27	98	133	22a	30a	71	102	25a	44a	88	118	20	32	65	97	12	21
28	112	200	22	43	112	138	25	77	62	106	21	40	69	90	10	12
29	x	x	x	x	x	x	x	x	55	66	18	24	73*	104	12	18
30	72	92	18	26	73	98	15	24	45	60	12	26	49	52	16	24
31	x	x	17	32	x	x	15	40	66	99	x	x	89	169	23	43

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

SOLAR FLARES

OCTOBER 1959

OBSERVATORY	DATE OCT 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	01	1119	1140 D		S17	E58	5401	21 D	1				4.00			
WENDEL	04	1140 E	1147 D		S17	E20	5401	7 D	1				3.00			
WENDEL	04	1203 E	1219		S10	E26	5401	16 D	1				4.00			
HAWAII	04	2302	2322	2304	S18	E05	5397	20	1	3	2304	2.40	2.70			
ARCETRI	05	0925			S10	E51	5407		1							
WENDEL	05	1556	1609 D	1558	N02	E36	5405	13 D	1				4.00			
WENDEL	05	1610 E	1629 D		S10	W51	5392	19 D	1-				5.00			
HAWAII	06	0156	0200 D		S15	W02	5401	4 D	1	3	0200	2.80	3.00			
WENDEL	06	0602 E	0634 D		N05	E31	5405	32 D	1-				7.00			
WENDEL	06	0712	0730 D		N05	E30	5405	18 D	1-				6.00			
WENDEL	06	0831 E	0843 D		N05	E30	5405	12 D	1				3.00			
WENDEL	06	1008 E	1028 D		N07	W65	5396	20 D	1				3.00			
WENDEL	06	1416 E	1447 D		N30	E65	5408	31 D	2				9.00			S-SWF
R O HERST	06	1423 E	1445	1425 U	N30	E66	5408	22 D	1	2	1430	.60	1.40	2.90	85	
WENDEL	06	1557	1630		N07	E27	5405	33	1-				8.00			
LOCKHEED	06	1558 E	1650	1605	N06	E26	5405	52 D	1	2	1605	2.5				
LOCKHEED	06	1716	1810	1726	N06	E25	5405	54	1-	3	1726	3.6				
SAC PEAK	06	1720	1758	1724	N07	E25	5405	38	1	2		2.25			18	
SAC PEAK	06	1954	2050	2014	N29	E62	5408	56	1	2		1.85			22	S-SWF
LOCKHEED	06	2007	2050	2015	N31	E63	5408	43	1	3	2015	2.3				
WENDEL	07	0745 E	0757 D		N30	E54	5408	12 D	1				3.00			
WENDEL	07	0818	0827 D		S18	E00	5401	9 D	1				3.00			
ARCETRI	07	0910	0924		N29	E54	5408	14 D	1	3	0922	2.20	4.00			
WENDEL	07	1331 E	1412 D		N31	E50	5408	41 D	1-				7.00			S-SWF
WENDEL	07	1423	1456 D		N32	E50	5408	33 D	1-				5.00			S-SWF
WENDEL	07	1501 E	1540 D		N31	E50	5408	39 D	1-				6.00			S-SWF
LOCKHEED	07	2043	2107	2045	N06	E03	5405	24	1	3	2045	2.1				
SAC PEAK	07	2044	2056	2046	N05	E04	5405	12	1	3		3.00			22	
HAWAII	07	2050 E	2100 D		N00	E03	5405	10 D	1-	1	2050	5.20	5.20			
MITAKA	07	2359 E	2407	2359	N30	E47	5408	8 D	1	2	2400	1.51	2.26	1.95	156	
MITAKA	08	0032 E	0044		N30	E47	5408	12 D	1	2	0033	1.01	1.52	2.65	120	
WENDEL	08	0714 E	0737 D		N08	E08	5405	23 D	1				3.00			
WENDEL	08	1056 E	1123 D		N03	W04	5405	27 D	1				4.00			
SAC PEAK	08	1426	1506	1432	N02	W07	5405	40	2	2		5.32			18	
WENDEL	08	1430	1453 D	1435	N03	W07	5405	23 D	2				12.00			
R O HERST	08	1433 E	1445	1433 U	N03	W05	5405	12 D	1	2	1434	2.20	2.20			
HAWAII	09	1904	1910	1906	N10	W12	5405	6	1	3	1906	2.30	2.30			
LOCKHEED	09	2229	2332	2240	N06	W21	5405	63	1	1	2315	2.2				
HAWAII	09	2234	2334	2244	N12	W19	5405	60	1-	3	2244	4.70	5.00			
HAWAII	10	0008	0022 D	0016	N28	E24	5408	14 D	1	2	0016	2.90	3.30			
NIZAMIAH	10	0247	0257	0250	S18	W38	5401	10	1	2	0250	1.52	2.13	1.60		
NIZAMIAH	10	0442 E	0447 D		S18	W38	5401	5 D	1	2	0442	1.82	2.56	1.50		
NIZAMIAH	10	0457 E	0503 D		S18	W50	5401	6 D	1	2	0457	1.82	3.18	1.60		
ARCETRI	10	0826	0831		S10	E82	5418	5 D	1	3	0826	.70	5.00			
ARCETRI	10	0903	0918		S10	E82	5418	15 D	1	3	0903	1.00	7.00			
WENDEL	10	1054 E	1126 D		S21	W50	5401	32 D	1				3.00			

SOLAR FLARES

OCTOBER 1959

OBSERVATORY	DATE OCT 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	10	1241	1252		S17	W45	5401	11	1+				5.00			
LOCKHEED	10	1806 D	1940	1835 U	N02	W30	[illegible]	94 E	1	1	1835	2.5				
MCMATH	10	1822	1922	1831	N03	W29	5405	60	1	2	1831		2.00			
SAC PEAK	10	1824	1908	1830	N02	W30	5405	44	1	3		3.20			20	
HAWAII	11	2258	2314	2300	S09	W80	5401	16	1+	2	2300	3.70	11.70			
HAWAII	11	2302	2312	2304	S03	E80	5418	10	1	3	2304	2.60				
WENDEL	12	0920	0949 D		N33	W05	5408	29 D	1				3.00			
ARCETRI	12	0929			N33	W01	5408		1	3						
SAC PEAK	12	1424	1450	1426	S15	W90	5401	26	1	2		3.00			14	
ARCETRI	13	0830	0914		S18	W85	5401	44 D	1+	3	0845	.40	4.60			
WENDEL	15	1006 E	1017 D		S06	E04	5418	11 D	1				3.00			
WENDEL	15	1234 E	1255 D		N30	W49	5408	21 D	1				4.00			
NIZAMIAH	16	0320	0333	0325	N14	E89	5429	13	1	3	0325	.15	3.24	1.50		
WENDEL	16	1004 E	1013 D		S08	W32	5424	9 D	1				3.00			
WENDEL	16	1032 E	1115 D		S06	W08	5418	43 D	1+				5.00			
NIZAMIAH	17	0547	0553	0550	N24	W72	5408	6	1	2	0550	.61	2.25	1.30		
WENDEL	17	0623 E	0700 D		N03	W70	5411	37 D	1				4.00			
LOCKHEED	17	2127	2325	2145	S07	E51	5427	118	2	2	2145	5.6				
SAC PEAK	17	2128	2230 D	2138	S07	E50	5427	62 D	1+	3		4.68			24	
HAWAII	17	2300 E	2310 D		S07	E58	5427	10 D	1	2	2300	4.10	7.80			
HAWAII	17	2130	2332	2200	S21	E64	5431	122	2	2	2200	5.40	9.00			
LOCKHEED	17	2335	2420	2340	N10	E47	5430	45	1	2	2340	1.9				
HAWAII	17	2336	2340 D	2340	N00	E46	5427	4 D	1+	2	2340	4.60	6.50			
LOCKHEED	18	2203	2300	2210	N07	E35	5430	57	1	2	2210	2.1				
LOCKHEED	18	2245	2304	2246	S00	E48	5427	19	1	2	2255	1.8				
LOCKHEED	19	0032	0100 U	0040	S04	E34	5427	28 U	1	1	0040	2.1				
HAWAII	19	0036	0116 D	0036	S10	E32	5431	40 D	1	3	0036	2.70	3.40			
WENDEL	19	1025 E	1034 D		S06	W47	5418	9 D	1				3.00			
MCMATH	19	1317	1415	1345	S04	E26	5427	58	1	3	1345		2.00			
MCMATH	20	1248 E	1430		N08	E80	5433	102 D	1	3						
MCMATH	20	1325	1415 D	1335	S03	E14	5427	50 D	1	3	1335		2.00			
LOCKHEED	20	2126	2205	2137	S10	W70	5418	39	1+	2	2137	4.2				
SAC PEAK	20	2128	2156	2138	S10	W69	5418	28	1	2		2.92			20	
LOCKHEED	20	2135	2151	2140	S03	E03	5427	16	1	2	2140	2.4				
ARCETRI	21	0839	0854		S03	E03	5427	15 D	1	3	0839	1.80	1.80			
LOCKHEED	21	1818 U	1830 D	1825 U	S09	W86	5418	12 D	1	1	1825	2.0				
HAWAII	21	1826 E	1834		S03	W90	5418	8 D	1	3	1826	3.10				
LOCKHEED	21	2057	2140	2110	S12	W69	5418	43	2	1	2110	5.4				
HAWAII	21	2058	2118	2106	S04	W70	5418	20	2	3	2106	3.70	11.80			
MITAKA	22	0603	0623		S10	E87	5438	20	1	1	0609	3.62		5.06		
ARCETRI	22	0812	1005		S10	E90	5438	113 D	1	3						
LOCKHEED	23	1744	1807	1752	N03	W28	5427	23	1	2	1752	1.9				

SOLAR FLARES

OCTOBER 1959

OBSERVATORY	DATE OCT 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	24	1120 E			N08	E48	5437		1				4.00			
WENDEL	24	1225	1242		S09	W47	5431	17	1				3.00			
NIZAMIAH	25	0309	0321	0313	N10	E09	5433	12	1	2	0313	2.13	2.16	1.60		
WENDEL	26	1046 E	1057 D		N06	W05	5433	11 D	1				3.00			
HAWAII	26	1958	2036	2006	N07	W05	5433	38	1&	3	2006	4.00	4.00			
{SAC PEAK	27	2120	2144	2128	N05	W18	5433	24	1	2		3.45			17	
{HAWAII	27	2130 E	2130 D		N10	W18	5433		1	1	2130	2.10	2.20			
NIZAMIAH	28	0315 E	0340 D		S11	E07	5438	25 D	2	1	0328	8.51	8.87	2.40		S-SWF
LOCKHEED	29	0015 U	0045 D	0035 U	S09	W01	5438	30 U	1	1	0035	3.8				
NIZAMIAH	29	0342	0352	0346	S12	W04	5438	10	1	3	0346	2.43	2.53	1.50		
MCMATH	30	1623 E	1650 D		S09	W30	5438	27 D	1	1	1630		2.00			
LOCKHEED	31	1757	1835	1810	N15	W80	5433	38	2	2	1810	5.0				

COMMERCE - STANDARDS - BOULDER

*Lockheed observations: All values in the maximum intensity column are arbitrary units on a scale of 1 to 4 - not percent of the continuous spectrum.

All Arectri flares should have beginning times followed by "E" and the ending times followed by "D".

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

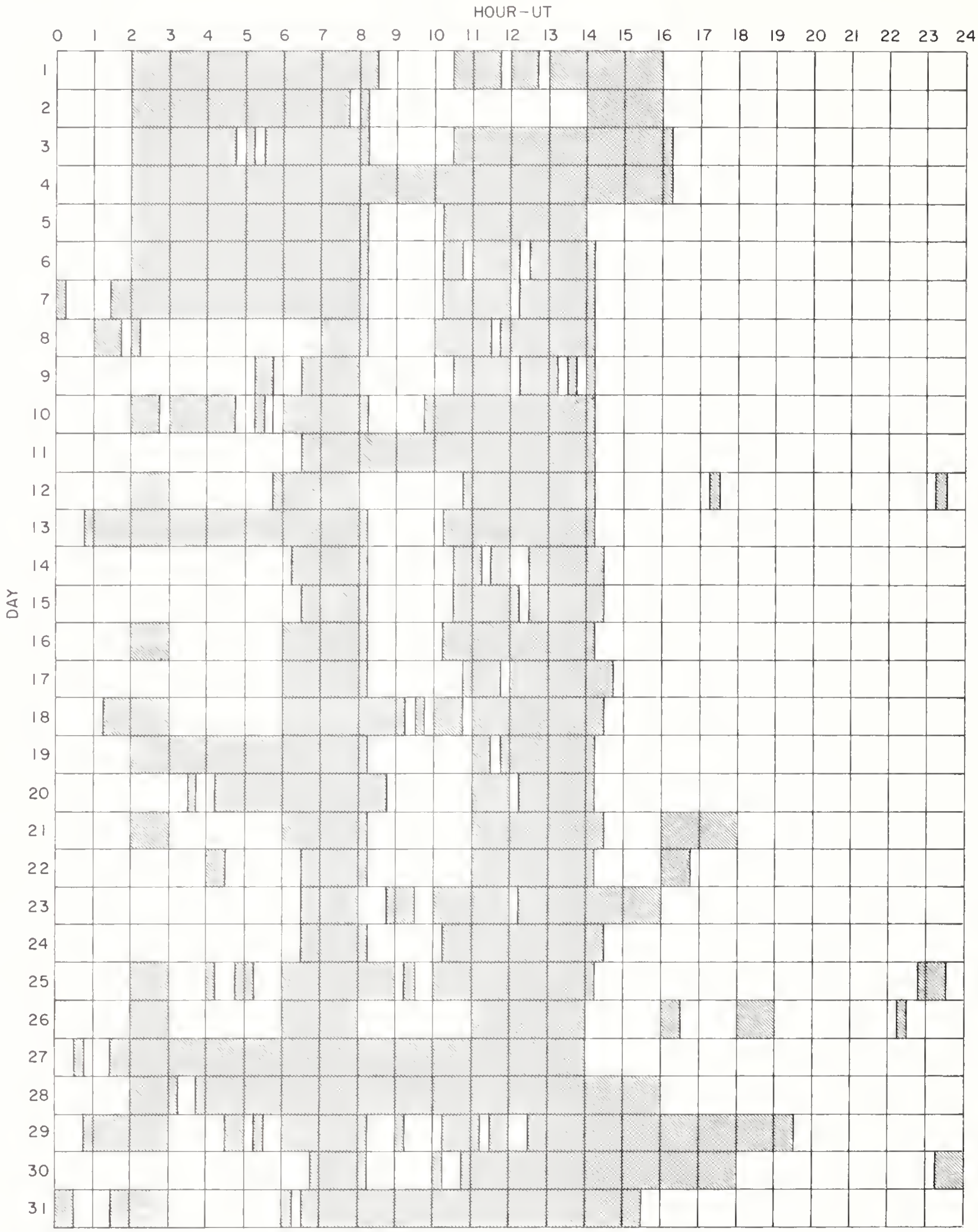
MOSCOW-G — MOSCOW - GAISH
R O EDIN — ROYAL OBSERVATORY, EDINBURGH
R O HERST — GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
SAC PEAK — SACRAMENTO PEAK
SCHAUINS — SCHAUINSLAND
USNRL — UNITED STATES NAVAL RESEARCH LABORATORY

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

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

INTERVALS OF NO FLARE PATROL OBSERVATIONS

OCTOBER 1959



Stations Include:

COMMERCE - STANDARDS - BOULDER

Arcetri	Mitaka
Climax	Nizamiah
Dunsink	Royal Creenwich Observatory
Hawaii	Herstmonceux
Lockheed	Sacramento Peak

SUBFLARES

Noted as follows: Date - Universal Time - Coordinates

SEPTEMBER 1959

	LOCKHEED	01	0041	N17 W85
	HAWAII	01	0050	S13 E60
	LOCKHEED	01	0105	N10 W04
	CAPRI S	01	0718	N13 W03
*	MEUDON	01	0805 E	N09 E13
	MEUDON	01	0915	N20 W90
	CAPRI S	01	1045 E	S13 W47
*	MEUDON	01	1111	N13 W10
	MEUDON	01	1422	N20 W70
*	MCMATH	01	1424 E	N11 W68
	SAC PEAK	01	1528	S08 W56
	MCMATH	01	1532 E	S12 W52
	SAC PEAK	01	1612	S12 W54
*	SAC PEAK	01	1644	N10 W11
*	LOCKHEED	01	1645	N10 W11
*	MCMATH	01	1650 E	N09 W13
	SAC PEAK	01	1706	N15 E21
	LOCKHEED	01	1707	N14 E20
	SAC PEAK	01	1804	N10 W13
	LOCKHEED	01	1806	N10 W15
	MCMATH	01	1815 E	N09 W13
	LOCKHEED	01	1842	N27 W72
	LOCKHEED	01	1846	S13 W15
	LOCKHEED	01	1855	N24 W67
	SAC PEAK	01	1855	N25 W65
	SAC PEAK	01	2003	S11 W53
	LOCKHEED	01	2003	S11 W55
	SAC PEAK	01	2048 E	N18 W90
	LOCKHEED	01	2136	S11 W58
	SAC PEAK	01	2136 E	S14 W57
*	SAC PEAK	01	2200	S07 W57
*	LOCKHEED	01	2201	S09 W58
	SAC PEAK	01	2204	N20 W27
*	SAC PEAK	01	2218	N10 W16
*	LOCKHEED	01	2227	N09 W17
*	SAC PEAK	01	2234	S07 W57
	SAC PEAK	01	2332	N26 W64
	LOCKHEED	02	0139	N09 W19
	LOCKHEED	02	0140	N12 00
	SIMEIZ	02	0727 E	N10 W21
*	MEUDON	02	0930	N10 W17
*	MCMATH	02	1434 E	N28 W80
*	MEUDON	02	1434 E	N25 W70
*	MCMATH	02	1434 E	N09 W24
*	SAC PEAK	02	1443 E	N30 W85
*	MCMATH	02	1448 E	N14 E05
*	CLIMAX	02	1448	N15 E07
*	MEUDON	02	1450	N15 E13
*	SAC PEAK	02	1452	S13 E32
	SAC PEAK	02	1512	N31 W78
	SAC PEAK	02	1520	N09 W23
*	MEUDON	02	1613	N20 W90
*	MCMATH	02	1735 E	S10 W68
	SAC PEAK	02	1748	N09 W27
	SAC PEAK	02	1830	N12 E00
	LOCKHEED	02	2004	S13 E28
	HAWAII	02	2006	S14 E27
	SAC PEAK	02	2006	S12 E28
	MCMATH	02	2012 E	S12 E25
	HAWAII	02	2024	S08 W67
	SAC PEAK	02	2024	S09 W66
	LOCKHEED	02	2024	S10 W65
	MCMATH	02	2029 E	S09 W64
	SAC PEAK	02	2036	N27 W85
	LOCKHEED	02	2037	N26 W89
	MCMATH	02	2040 E	N26 W80
	MCMATH	02	2059 E	N12 W71
	MCMATH	02	2104 E	S09 W66
	SAC PEAK	02	2104	S10 W68
	LOCKHEED	02	2136	N11 E71
	SAC PEAK	02	2148	N10 W28
	LOCKHEED	02	2149	N09 W27
	HAWAII	02	2152 E	N10 W28
	SAC PEAK	02	2208	N16 E03
	LOCKHEED	02	2224	S14 W78
	SAC PEAK	02	2320	N09 W28
	LOCKHEED	02	2321	N13 W27
	LOCKHEED	03	0007	N12 W27
*	SIMEIZ	03	0709 E	N08 W33
*	SIMEIZ	03	0833 E	N08 W33
*	STOCKHOLM	03	0944	N14 W18
	MCMATH	03	1345	N08 W36
*	MCMATH	03	1440 E	N11 W19
	SAC PEAK	03	1656 E	S10 E25
	LOCKHEED	03	1720	N14 E82
	SAC PEAK	03	1728	N24 W90
	SAC PEAK	03	1738	N09 W39
	SAC PEAK	03	1754	N15 W31
	MCMATH	03	1830	S10 W85
	SAC PEAK	03	1910	N10 W39
	LOCKHEED	03	1952	S09 W70
	LOCKHEED	03	2024	S05 W41
	MCMATH	03	2025	S05 W41
	MCMATH	03	2055 E	N15 E90
	LOCKHEED	03	2102	S12 E10
	LOCKHEED	03	2115	N16 E57
	CLIMAX	03	2117	N13 E57
	LOCKHEED	03	2131	N13 W09
	LOCKHEED	03	2146	S03 E14
	LOCKHEED	03	2339	N18 W12
	LOCKHEED	04	0033	S12 E15
*	ARCETRI	04	0818	N07 W48
	SIMEIZ	04	0828	S14 E18
*	SIMEIZ	04	0846 E	S14 E18
	SIMEIZ	04	0858 E	S20 E06
	ARCETRI	04	0928	N07 W47
	MCMATH	04	1125 E	N09 W48
*	MCMATH	04	1125 E	S12 E14
	MCMATH	04	1320 E	N11 W42
	SAC PEAK	04	1414	N14 E85
*	SAC PEAK	04	1414	N20 W17
*	MEUDON	04	1416	N24 W14
*	MCMATH	04	1419	N19 W17
*	MCMATH	04	1500	S11 E12
	MCMATH	04	1600	S11 E12
	SAC PEAK	04	1602	S14 E12
	LOCKHEED	04	1634	N09 W52
	SAC PEAK	04	1658	S14 E12
	MCMATH	04	1700	S11 E08
	LOCKHEED	04	1702	S12 E11
	MCMATH	04	1719	N14 E85
	CLIMAX	04	1720 E	N12 E88
	SAC PEAK	04	1720	N15 E85
	LOCKHEED	04	1814	S12 E11
	LOCKHEED	04	1902	N21 W20
	SAC PEAK	04	2004	S11 E10
	LOCKHEED	04	2007	S12 E10
	LOCKHEED	04	2007	N20 W20
	MCMATH	04	2007 E	S12 E08
	LOCKHEED	04	2041	N09 W56
	LOCKHEED	04	2052	N15 E45
	LOCKHEED	04	2135	N15 E41
	LOCKHEED	04	2151	N20 W17
	LOCKHEED	04	2309	N17 E80
	LOCKHEED	04	2322	N12 W43
	LOCKHEED	05	0009	N20 W22
	LOCKHEED	05	0010	N15 E44
	LOCKHEED	05	0121	N08 W56
	MCMATH	05	1240 E	N10 W64
*	CLIMAX	05	1556	N14 W52
	SAC PEAK	05	1648	N10 E85
	MCMATH	05	1709 E	N09 W65
	MCMATH	05	1725	N13 E63
	LOCKHEED	05	1842	N14 E63
	SAC PEAK	05	1902	N13 E63
	MCMATH	05	1903	N13 E62
	LOCKHEED	05	1904	N14 E63
	LOCKHEED	05	2059	N12 E87
	SAC PEAK	05	2102	N10 E90
	LOCKHEED	05	2109	N10 E88
	SAC PEAK	05	2154	S20 E79
	SAC PEAK	05	2256	S20 E78
	LOCKHEED	05	2257	S19 E75
*	LOCKHEED	05	2332	N04 E74
	LOCKHEED	06	0037	N16 E63
	LOCARNO	06	0924	N06 E67
	SAC PEAK	06	1411 E	N14 W43
	MCMATH	06	1640 E	N04 E64
	SAC PEAK	06	1652	N16 W60
	LOCKHEED	06	1653 E	N15 W64
	MCMATH	06	1655 E	N16 W60
	LOCKHEED	06	1900	S11 W20
	SAC PEAK	06	1924	S12 W19
	LOCKHEED	06	2202	N05 E62
	LOCKHEED	06	2305	N27 W31
	LOCKHEED	06	2325	N31 E07
	LOCKHEED	07	0107	N17 E51
*	MEUDON	07	0831	N13 W50
	ARCETRI	07	0845	S21 W57
*	LOCARNO	07	1010	N16 W50
	ARCETRI	07	1058	S21 W57
	SAC PEAK	07	1414	N22 W57
	SAC PEAK	07	1418	N25 E49
	SAC PEAK	07	1438	N17 W56
	SAC PEAK	07	1448	S11 W30
	LOCARNO	07	1515	N08 E51
	SAC PEAK	07	1518	N06 E52
	LOCKHEED	07	2017	N05 E48
	LOCKHEED	07	2051	S19 W59
	HAWAII	07	2052	S18 W57
	LOCKHEED	07	2127	N06 E47
	LOCKHEED	08	0025	S15 E90
	LOCKHEED	08	0039	S19 W61
	HAWAII	08	0040	S15 W60
	LOCKHEED	08	0043	S21 W44
	LOCKHEED	08	0049	S19 W61
*	MEUDON	08	0839	N17 W40
*	STOCKHOLM	08	0848	N16 W52
	MCMATH	08	1148 E	N04 E40
	SAC PEAK	08	1408	S11 W46
	MCMATH	08	1434	N19 W15
	SAC PEAK	08	1434	N20 W16
	SAC PEAK	08	1532	S19 W70
	SAC PEAK	08	1612	N04 E39
	SAC PEAK	08	1622	N16 W69
	SAC PEAK	08	1820	N05 E40
	SAC PEAK	08	1856	N05 E38
	SAC PEAK	08	1920	N15 E23
	SAC PEAK	08	1938	S19 W75
	MCMATH	08	1940	N03 E34
	SAC PEAK	08	1940	N04 E34
	HAWAII	08	1942	N03 E36
	LOCKHEED	08	2034	N07 E37
	SAC PEAK	08	2036	N06 E37
	LOCKHEED	08	2044	S09 W46
	LOCKHEED	08	2122 E	N12 E38
*	LOCKHEED	08	2134	N05 E38
	SAC PEAK	08	2136	N15 W73
	CLIMAX	08	2137	N15 W77
	LOCKHEED	08	2138	N15 W73
	LOCKHEED	08	2205	N15 W73
	LOCKHEED	08	2352	N21 W74
	SAC PEAK	08	2352	N22 W73
	LOCKHEED	09	0039	S13 W52
	LOCKHEED	09	0113	N07 E37
*	MCMATH	09	1330	N04 E25
	MCMATH	09	1401	N15 W23
	MCMATH	09	1451	N05 E29
	SAC PEAK	09	1544	N03 W64
*	CLIMAX	09	1555	N04 E26
*	SAC PEAK	09	1612	N12 E27
*	LOCARNO	09	1615	N12 E27
	MCMATH	09	1755 E	N04 E25
	LOCKHEED	09	1757	N05 E24
	SAC PEAK	09	1800	N05 E24
	LOCKHEED	09	1830	N15 W27
	HAWAII	10	0016	N06 E21
	HAWAII	10	0118	N04 E23
	LOCKHEED	10	0145	N07 E21
	HAWAII	10	0146	N06 E21
*	MEUDON	10	0743	N25 W90
	STOCKHOLM	10	0945	S18 E56
*	CAPRI S	10	1005	N09 E14
	DUNSINK	10	1006 E	S05 E03
	LOCARNO	10	1420	S17 W06
*	MCMATH	10	1440 E	N05 E14
*	CAPRI S	10	1444	N06 E16
	SAC PEAK	10	1530	N05 E13
	SAC PEAK	10	1544	N03 W85
	MCMATH	10	1600 E	N07 E07
	SAC PEAK	10	1606 E	N05 E13
	SAC PEAK	10	1606 E	N16 E32
*	MEUDON	10	1610	N20 E40
*	MCMATH	10	1618 E	N15 E33
	CLIMAX	10	1722	N04 E72
	MCMATH	10	1723	N02 E68
	MCMATH	10	1809 E	N07 E11
	HAWAII	10	1822	N07 E09
	MCMATH	10	1910 E	S16 E55
	LOCKHEED	10	1957	N23 W90
	LOCKHEED	10	2013	N13 E15
	MCMATH	10	2052 E	N06 E09
	LOCKHEED	10	2100	S14 E55
	SAC PEAK	10	2154	N20 E68
	SAC PEAK	10	2220	N05 E09
	LOCKHEED	10	2335	N12 E10
	CAPRI G	11	0707	N12 E06
	CAPRI G	11	0901	N07 E02
	MCMATH	11	2036 E	S15 E25
	SAC PEAK	11	2052 E	S16 W25
	HAWAII	11	2056	S15 W25
	SAC PEAK	11	2058	N04 W08
	MCMATH	11	2100 E	N05 W08
	MCMATH	11	2106 E	S16 W25
	MCMATH	11	2157	N13 E01
	SAC PEAK	11	2206 E	N14 E01
	CAPRI G	12	0702 E	N13 W08
	CAPRI G	12	0917	N12 W21
	MCMATH	12	1136	N21 E38
	CAPRI G	12	1139	N19 E33
	MCMATH	12	1156	S15 W34
	MCMATH	12	1245	N06 W15
*	LOCARNO	12	1325	N03 E53
	MCMATH	12	1353	S13 W17
	MCMATH	12	1508	S16 W17
	SAC PEAK	12	1508	S16 W20
	SAC PEAK	12	1846	S16 W20
	MCMATH	12	1848	S14 W19
	MCMATH	12	1943	N05 W17
	SAC PEAK	12	2002	S16 W20
	MCMATH	12	2005	S14 W20
	MCMATH	12	2027	S15 W40
	SAC PEAK	12	2038	N13 W11
	MCMATH	12	2039	N13 W11
	HAWAII	12	2045 E	N15 W09
	MCMATH	12	2105	N05 W18
	SAC PEAK	12	2220	N13 E90
	SAC PEAK	12	2242	N06 W21
	SAC PEAK	12	2254	S03 E30
	SAC PEAK	12	2250	N13 E90
	SAC PEAK	12	2326	N03 W23
	SAC PEAK	12	2342	N13 E90
	LOCARNO	13	0705	S22 W22
	LOCARNO	13	0742	N05 E44
	CAPRI S	13	0844	S15 W42
	MCMATH	13	1300	N06 W27
	CLIMAX	13	1349 E	N13 E83
	SAC PEAK	13	1356 E	N15 E85
*	SAC PEAK	13	1412	N14 E85
*	MCMATH	13	1414	N12 E87
*	SAC PEAK	13	1444	N14 E85
	SAC PEAK	13	1650	N12 E80
	CLIMAX	13	1651	N12 E82
	MCMATH	13	1657 E	S12 W33
	SAC PEAK	13	1726	S12 W32
	MCMATH	13	1736 E	S14 W54
*	SAC PEAK	13	1940	N02 E37
	SAC PEAK	13	2048	N06 W32
	SAC PEAK	13	2126	N15 E85
	HAWAII	13	2128	N12 E81
	SAC PEAK	13	2154	N28 W69
	SAC PEAK	13	2230	S14 W54
	SAC PEAK	13	2230	N27 W70
	SAC PEAK	13	2248	S17 W53
	SAC PEAK	13	2250	N12 E77
	SAC PEAK	13	2328	N27 W71
	HAWAII	13	2332	N30 W70
	HAWAII	14	0058	N31 W72
	STOCKHOLM	14	0825 E	S14 W60
	STOCKHOLM	14	0855	N33 W72
	MCMATH	14	1137 E	N07 W40
	MCMATH	14	1145 E	N12 E68
	MCMATH	14	1256	S17 W62
	MCMATH	14	1330 E	N12 E66
	MCMATH	14	1349	S17 W62
	MCMATH	14	1409	N06 W39
	MCMATH	14	1417 E	S16 W61
	MCMATH	14	1417 E	N14 E68
	MCMATH	14	1501	S15 E59
*	SAC PEAK	14	1602	S16 W67
	MCMATH	14	1750 E	S16 W62
*	SAC PEAK	14	1750	N13 E67
*	SAC PEAK	14	1810	N13 E66
	MCMATH	14	1818 E	N26 W82
	SAC PEAK	14	1822	N05 W43
	MCMATH	14	1822	N06 W46
	SAC PEAK	14	1844	N13 E67
	SAC PEAK	14	1900	N14 W40
	MCMATH	14	1907 E	N13 W40
	SAC PEAK	14	1908	N13 E67
	MCMATH	14	1910 E	N14 E66
	MCMATH	14	2114	S15 W71
	SAC PEAK	14	2116	S15 W70
	SAC PEAK	14	2122	N13 E66
	SAC PEAK	14	2154	N13 E65
	HAWAII	14	2156	N10 E64
	LOCKHEED	14	2315	N17 E67
	SAC PEAK	14	2326	N15 E67
	LOCKHEED	14	2347	N15 E63
	LOCKHEED	15	0010	N27 W90
	HAWAII	15	0048	N11 E66
	LOCKHEED	15	0050	N14 E66
	LOCKHEED	15	0120	S17 W69
*	HAWAII	15	0142	N16 E65
*	MEUDON	15	1035 E	N13 E55
*	SAC PEAK	15	1400	N14 E55
	MEUDON	15	1428	S10 W80
	SAC PEAK	15	1432	S17 W80
	SAC PEAK	15	1600	S17 W77
	LOCKHEED	15	1617	N15 E62
*	SAC PEAK	15	1636	S18 W80
*	LOCKHEED	15	1636	S18 W79
	LOCKHEED	15	1650	N16 E57
	SAC PEAK	15	1650	S17 W10
	LOCKHEED	15	1651	S17 W11
	SAC PEAK	15	1702	N15 E56
	LOCKHEED	15	1702	N16 E57
	LOCKHEED	15	1711	S17 E37
	SAC PEAK	15	1712	S17 E38
	LOCKHEED	15	1750	S19 W88
	SAC PEAK	15	1754	S18 W80
	SAC PEAK	15	1816	S18 W80
	LOCKHEED	15	1829	S19 W88
	SAC PEAK	15	2006	S28 W80
	LOCKHEED	15	2020	S16 E38
	LOCKHEED	15	2032	N15 E59
	SAC PEAK	15	2034	N14 E58
	SAC PEAK	15	2034	S16 E38
	HAWAII	15	2036	N11 E59
	LOCKHEED	15	2104	S15 W61
	SAC PEAK	15	2110	S15 W64
	HAWAII	15	2114	S10 W64
	SAC PEAK	15	2224	S15 E37
	LOCKHEED	15	2224	S15 E38
	LOCKHEED	15	2305	S15 E38
	LOCKHEED	15	2336	S18 W88
	SAC PEAK	15	2342	S18 W15
	LOCKHEED	15	2343	S18 W16
	HAWAII	15	2344 E	S17 W16
	MCMATH	16	1221	S18 W21
*	MCMATH	16	1432	N02 W74
*	SAC PEAK	16	1432	N02 W74
	MCMATH	16	1453	N15 E67
	SAC PEAK	16	1454	N17 E66
	SAC PEAK	16	1530	N03 W70
*	SAC PEAK	16	1550	N03 W70
*	SAC PEAK	16	1604	S17 W26
*	CAPRI S	16	1611	S15 W27
	SAC PEAK	16	1830	N01 W76
	SAC PEAK	16	2112	N01 W77
	SAC PEAK	16	2340	N02 W74
	SAC PEAK	17	1546	N19 E27
	MCMATH	17	1902 E	N18 E80
	SAC PEAK	17	1906 E	S17 E12
	SAC PEAK	17	1950 E	N19 E85
	SAC PEAK	17	2224	N18 E78
	SAC PEAK	17	2248	N14 E27

SUBFLARES

Noted as follows: Date-Universal Time-Coordinates

SEPTEMBER 1959

	Observatory	Date	Time	Coordinates
	SAC PEAK	17	2258	N20 E80
	SAC PEAK	17	2304	S14 E05
	HAWAII	17	2306	S14 W00
	HAWAII	18	0014	N14 E80
	HAWAII	18	0152	N13 E22
	MEUDON	18	1034	N20 E70
	LOCARNO	18	1040 E	N23 E70
	MCMATH	18	1203 E	S20 E41
	SAC PEAK	18	1444	S10 E20
	SAC PEAK	18	1518	S10 E90
	SAC PEAK	18	1522	S13 E24
	MCMATH	18	1522	S12 E21
	MCMATH	18	1542	S21 E39
	SAC PEAK	18	1702	S14 W03
	SAC PEAK	18	1754	N43 E58
	SAC PEAK	18	1836	N21 E68
	MCMATH	18	1840 E	N19 E65
	SAC PEAK	18	1914	N18 E73
	SAC PEAK	18	1922	N14 E10
	MCMATH	18	1925	S22 E38
	HAWAII	18	2014	S13 E16
	SAC PEAK	18	2220	N16 E66
*	ARCETRI	19	0820	S16 W10
	CAPRI G	19	0922	S15 W13
*	CAPRI S	19	1247 E	S13 W13
	LOCKHEED	19	1617	S23 E01
	SAC PEAK	19	1618	S13 E01
	LOCKHEED	19	1623	S07 E61
	SAC PEAK	19	1716	N12 E17
	MCMATH	19	1733	S11 E61
	SAC PEAK	19	1744	S10 E60
	MCMATH	19	1744	S10 E63
	SAC PEAK	19	1920	S10 E60
	MCMATH	19	1923 E	S10 E60
	HAWAII	19	2024	S14 E57
	CLIMAX	19	2025	S09 E60
	LOCKHEED	19	2207	N12 E14
	HAWAII	19	2208	N09 E15
	HAWAII	20	0030	S20 E24
	SIMEIZ	20	0607 E	N28 E63
	LOCARNO	20	829	N20 E41
*	MEUDON	20	1414	N17 E22
*	MCMATH	2	1416	N16 E24
	SAC PEAK	20	1444	S08 E54
	SAC PEAK	20	1504	S18 E77
*	CAPRI S	20	1525 E	S10 E49
*	MEUDON	20	1525	S10 E48
*	SAC PEAK	20	1528	S09 E48
*	SAC PEAK	20	1554	N05 W54
	SAC PEAK	20	1616	S08 E53
	WENDEL	20	1625 E	S06 E56
	LOCKHEED	20	1649	N14 W56
	LOCKHEED	20	1805 E	S14 W31
	SAC PEAK	20	1806	S15 W31
	LOCKHEED	20	1951	N18 E28
	HAWAII	20	1952	N14 E30
	SAC PEAK	20	2030	S12 E54
	SAC PEAK	20	2108	N01 E20
	LOCKHEED	20	2139	N09 E90
	SAC PEAK	20	2140	N08 E90
*	SAC PEAK	20	2246	S12 E60
	CLIMAX	21	0007	N04 W60
	HAWAII	21	0126	S14 E44
	WENDEL	21	0952 E	N16 W24
*	MEUDON	21	1100	S13 E50
*	ATHENS	21	1105 E	S10 E48
*	MEUDON	21	1340	S12 E55
*	MCMATH	21	1340	S13 E45
*	MEUDON	21	1340	S17 E48
*	CAPRI S	21	1344 E	S07 E44
	SAC PEAK	21	1524	S10 E47
	SAC PEAK	21	1534	S10 W22
	SAC PEAK	21	1636	S08 E41
	LOCKHEED	21	1647	S08 E40
	SAC PEAK	21	1648	S08 E40
	LOCKHEED	21	1704	S12 W22
	SAC PEAK	21	1716	S09 W23
	LOCKHEED	21	1720	N28 E31
	MCMATH	21	1915	N22 E32
	SAC PEAK	21	1916	N24 E32
	SAC PEAK	21	1932	S08 E38
	MCMATH	21	1933	S08 E38
	SAC PEAK	21	1950	S08 E39
*	MCMATH	21	2030 E	N23 E31
	LOCKHEED	21	2350	N28 E32
	WENDEL	22	1311 E	N02 W05
	SAC PEAK	22	1526	N30 E27
	SAC PEAK	22	1632	N28 E24
	MCMATH	22	1634 E	N27 E26
	SAC PEAK	22	1710	N28 E25
	MCMATH	22	1715 E	N27 E26
	SAC PEAK	22	1752	N04 W88
	SAC PEAK	22	1804	N29 E22
	HAWAII	22	1854	N24 E28
	SAC PEAK	22	1854	N28 E24
	HAWAII	22	1926	N23 E27
	SAC PEAK	22	1930	S08 E32
	HAWAII	22	1930	S11 E28
	SAC PEAK	22	2012	N29 E23
	HAWAII	22	2024	S14 W41
	SAC PEAK	22	2134	N15 W46
	SAC PEAK	22	2204	N28 E22
	HAWAII	22	2224	N24 E25
	HAWAII	22	2232	S08 E18
	SAC PEAK	22	2236	S07 E20
	HAWAII	22	2244	S10 E13
	HAWAII	22	2314 E	N27 E23
	HAWAII	22	2346 E	N19 W44
	HAWAII	23	0106	N26 W46
	HAWAII	23	0132	S10 E13
*	SIMEIZ	23	0736 E	N29 E12
	ATHENS	23	0757	S10 E12
	LOCARNO	23	1219	N29 E10
*	WENDEL	23	1240 E	S07 E07
*	MCMATH	23	1241	S07 E08
	MCMATH	23	1312	S07 E09
	CAPRI G	23	1444 E	N28 E09
	LOCARNO	23	1515	N29 E08
	MCMATH	23	1516	N28 E09
	SAC PEAK	23	1516	N28 E07
	MCMATH	23	1716	S08 E05
	MCMATH	23	1756	S07 E09
	CLIMAX	23	1757	S07 E09
	LOCKHEED	23	1807 E	N29 E05
	SAC PEAK	23	1818	S08 E06
	MCMATH	23	1855	N12 W57
	LOCKHEED	23	1937 E	N30 E04
	MCMATH	23	1942 E	N28 E08
	HAWAII	23	2028	N16 W59
	MCMATH	23	2029	N12 W57
	LOCKHEED	23	2120	N30 E03
	LOCKHEED	23	2125	S11 E18
	HAWAII	23	2128	S12 E16
	LOCKHEED	23	2142	N03 W22
*	LOCKHEED	23	2320	N22 W16
*	SAC PEAK	23	2340	N02 W22
	HAWAII	24	0006 E	S15 E48
*	LOCKHEED	24	0045	N03 W23
	ATHENS	24	0748 E	S07 E00
	STOCKHOLM	24	1100 E	S08 W57
*	SAC PEAK	24	1452 E	S07 W06
	LOCKHEED	24	1629	N27 W04
	LOCKHEED	24	1815	N21 W27
	SAC PEAK	24	2014	N27 W04
	LOCKHEED	24	2015 E	N28 W05
	LOCKHEED	24	2030	S07 W07
	LOCKHEED	24	2045	S10 W03
	MCMATH	24	2049	S10 W03
	MCMATH	24	2115 E	S07 W10
	LOCKHEED	24	2150	N18 E88
	LOCKHEED	24	2215	N18 E88
	LOCKHEED	24	2310	N23 W26
	LOCKHEED	24	2315	S06 W11
	SAC PEAK	24	2326	N23 W26
	SAC PEAK	24	2326	S08 W08
*	WENDEL	25	0732 E	S11 W03
*	CAPRI S	25	1101	S11 W12
	SAC PEAK	25	1354 E	S07 W20
	MCMATH	25	1355 E	S07 W19
	SAC PEAK	25	1410	S07 W20
*	SAC PEAK	25	1434	S07 W20
	WENDEL	25	1520 E	S06 W14
	WENDEL	25	1523 E	S03 W13
	LOCKHEED	25	1818	N33 W38
	SAC PEAK	25	1820	N32 W37
	HAWAII	25	1822	N35 W36
	LOCKHEED	25	1856	N31 W23
	LOCKHEED	29	1904	N14 W19
	LOCKHEED	25	1927	N20 W27
	MCMATH	25	1957	N27 W11
	LOCKHEED	25	2040	S11 W09
	LOCKHEED	25	2108	N27 W15
	LOCKHEED	25	2216	S07 W25
	LOCKHEED	26	0017	N26 W13
	WENDEL	26	0653 E	N29 W21
*	CAPRI S	26	0902	N25 W16
*	CAPRI S	26	1352 E	S14 W28
	SAC PEAK	26	1452	S14 W24
	MCMATH	26	1545 E	S11 W40
	LOCKHEED	26	1851	N26 W25
	LOCKHEED	26	2005	N08 W18
	SAC PEAK	26	2008	N06 W20
	LOCKHEED	26	2025	S16 W13
	SAC PEAK	26	2028	S18 W12
	HAWAII	26	2030	S23 W18
	LOCKHEED	26	2045	N28 W28
	LOCKHEED	26	2137	N17 E59
	LOCKHEED	26	2155	S13 W28
	LOCKHEED	26	2246	N07 W09
	LOCKHEED	26	2300	N09 E13
	LOCKHEED	26	2307	N33 W89
	SAC PEAK	27	1444	N29 W41
	SAC PEAK	27	1542	S15 W42
	SAC PEAK	27	2206	S07 W35
	SAC PEAK	27	2216	S17 W26
*	LOCKHEED	27	2230	S11 W41
*	HAWAII	27	2250 E	S06 W42
	LOCKHEED	28	0030	S12 W43
	STOCKHOLM	28	0825 E	N30 W68
	STOCKHOLM	28	0825 E	S09 E22
	STOCKHOLM	28	0948 E	S09 W50
	SAC PEAK	28	1514	S10 W50
	SAC PEAK	28	1658	N26 W53
	SAC PEAK	28	2014	S11 W52
	LOCKHEED	28	2151 E	S19 W15
	LOCKHEED	28	2212	N16 E43
	LOCKHEED	28	2215	S07 W51
	LOCKHEED	29	1640	S06 W63
	LOCKHEED	29	1700	N08 W17
*	SAC PEAK	29	1904	S07 W30
	SAC PEAK	29	2006	S05 W62
	LOCKHEED	29	2031	N16 E32
	SAC PEAK	29	2032	N15 E32
	LOCKHEED	29	2043	S17 W71
	SAC PEAK	29	2050 E	S15 W70
	SAC PEAK	29	2110	S05 W63
	LOCKHEED	29	2123	N27 W65
	SAC PEAK	29	2126	N28 W65
	LOCKHEED	29	2135	S03 W68
	SAC PEAK	29	2142	S02 W68
	LOCKHEED	29	2220	S05 E03
	LOCKHEED	29	2220	S07 W63
	SAC PEAK	29	2224 E	S07 E05
	LOCKHEED	29	2258	S13 W69
	STOCKHOLM	30	1039	N28 E80
	MEUDON	30	1414	N20 W90
	SAC PEAK	30	1932	N13 E18
	LOCKHEED	30	1938 E	N13 E18
	SAC PEAK	30	1940	S08 W78
	LOCKHEED	30	1940	S07 W77
	LOCKHEED	30	2030	N15 E01
	LOCKHEED	30	2125	N28 E73
	SAC PEAK	30	2142 E	N27 W80
	LOCKHEED	30	2205	N15 00
	LOCKHEED	30	2242	S04 W79

*Rated as flare of Importance ≥ 1 by other observatories (see CRPL 182 Part B)

COMMERCE - STANDARDS BOULDER

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
SYDNEY	01	0100	0110	0102	N27	E77	5250	10	1	2	0102	1.00	4.00			
KRASNYA	01	0650 E	0835 D		N17	E73	5248	105 D	1	2	0700		4.30		65	
KRASNYA	01	0757	0806	0759 U	S16	W43	5230	9	1	2	0759		1.80		65	
KRASNYA	01	0941	0958	0950	S17	W43	5230	17	1&	2	0950		.90		130	
KHARKOV	01	0945	1009	0954	S17	W42	5230	24	1	2	0950		1.60	1.70		
MOSCOW G	01	0909 E	1140 D		N17	E72	5248	151 D	2	2	0929		14.20	2.80	150	
MOSCOW G	01	1144 E	1156 D		N16	W66	5227	12 D	1	2	1153		7.10	1.70	130	
GOOD HOPE	01	1144	1205	1147	S17	W85	5238	21	1		1147	.50				
KHARKOV	01	1146	1212	1200	S21	W80	5238	26	1&	2	1205		11.40	1.80		
KRASNYA	02	0802	0904	0805 U	N17	E58	5248	62	1	1	0805		2.00		60	
GOOD HOPE	02	0941	1007	0943	N16	W75	5227	26	1		0943	1.00	3.90			
KHARKOV	02	0945	0959	0950	N16	W76	5227	14	1&	2	0946		6.80	1.80		
KHARKOV	03	0900 E	0950 D		N12	E22	5244	50 D	1	2	0913		3.70	1.20		
KHARKOV	03	0900 E	0950 D		N08	E13	5244	50 D	1	2	0913		5.70	1.20		
PIRCULI	05	0929 E	1005 D	0955	N13	W16	5244	36 D	1	3	0955		4.24			
PIRCULI	05	0931 E	0947 D	0940	N09	W15	5244	16 D	1	3	0940		10.40			
PIRCULI	05	0950 E	1002 D	0958	S08	E03	5251	12 D	1	3	0958		3.60			
ONDREJOV	05	1545	1600	1548	N07	W22	5244	15	1	3	1548			2.40		
ABASTUMANI	06	0633	0710	0646	N07	W28	5244	37	1	3	0646		2.10			
GOOD HOPE	06	1155	1219	1200	N10	W32	5244	24	1		1200	2.40	2.90			
PIRCULI	06	1158 E	1220 D	1209	N11	W39	5244	22 D	1	2	1209		6.45			
ABASTUMANI	07	0716	0726	0721	N18	E42	5260	10	1	2	0721		1.80		80	
MEUDON	07	0727	0807	0741	N19	W85	5240	40	1							
MEUDON	07	0756	0832	0802	S12	W85	5234	36	1							
MEUDON	07	1027	1108	1036	S12	W87	5234	41	1							
ONDREJOV	08	0520	0528	0522	N13	W48	5244	8	1	3	0522			3.10		
KRASNYA	08	0703	0740	0706	N16	E88	5265	37	1&	2	0706		8.30		65	
KRASNYA	08	0728	0739	0735 U	N11	W46	5244	11	1&	2	0735		3.10		110	
GOOD HOPE	08	0730	0800	0733	N11	W51	5244	30	1		0733	1.80	2.80			
KRASNYA	08	0819	0839 D	0829	N12	W48	5244	20	2&	2	0829		7.40		180	
GOOD HOPE	08	0819	0945	0827	N11	W51	5244	86	2		0827	6.50	10.10			Slow S-SWF
ONDREJOV	08	0824 E	0924		N10	W53	5244	60 D	1&	3	0825			2.50		
UTRECHT	08	0826		0829	¤			3	2							
MEUDON	08	0916	0954		N12	E50	5265	38 D	1&				5.00			
GOOD HOPE	08	1027	1105	1029	N12	W50	5244	38	1		1029	1.40	2.20			
PIRCULI	09	0645 E	0706 D	0700	N08	W74	5244	21 D	1	2	0700		9.03			
KRASNYA	09	0711 E	0716		N07	W66	5244	5 D	1&	2	0714		3.20		80	
MEUDON	09	0708	1000		N17	E70	5269	172	1							
KRASNYA	09	0711 E	0720	0713 U	N15	W47	5248	9 D	1	2	0713		1.80		80	
KRASNYA	09	0711 E	0813	0714 U	N20	E73	5269	62 D	2	2	0714		9.60		100	
KRASNYA	09	0747	0844	0747 U	N07	W66	5244	57	1&	2	0747		4.20		105	
KRASNYA	09	0819	0939 D	0822	N20	E73	5269	80 D	1&	2	0822		3.60		85	G-SWF
GOOD HOPE	09	0922	0944	0930	N19	E67	5269	22	1		0930	.90	2.40			
GOOD HOPE	09	1200	1203 D	1203	N10	W68	5244	3 D	1		1203	1.30	3.50			
GOOD HOPE	09	1251	1304	1254	N18	W48	5248	13	1		1245	1.50	2.20			
KIEV	09	1252	1301	1255	N20	W48	5248	9	1	2	1254		4.48		51	

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SYDNEY	10	0206	0505 D	0236	N20	E63	5265	179 D	3+	3	0255	35.00	70.00			
TASHKENT	10	0215 E	0400 D	0222	N21	E64	5265	105 D	3+	2	0306		37.00	2.90	225	Slow S-SWF
ALMA-ATA	10	0257 E	0538 D	0308	N20	E60	5265	161 D	3+	3	0308		73.80		144	
ONDREJOV	10	0515 E	0532		N10	W80	5244	17 D	1	3	1519			4.30		
KRASNYA	10	0653 E	1000		N20	E51	5265	187 D	1+	2	0653		2.90		100	G-SWF
MEUDON	10	1226	1302		S10	E90	5276	36	1+							
ALMA-ATA	11	0310	0530	0338	S15	E20	5264	140	1	2	0338		4.90		74	
ALMA-ATA	11	0432	0530	0452	N16	E47	5265	58	1	2	0452		4.90		61	
KRASNYA	11	0706 E	0957	0707 U	N17	E45	5265	171 D	1+	2	0707		4.40		90	
KRASNYA	11	0706 E	0719	0708 U	N15	W88	5244	13 D	1	2	0708		5.40		70	
KRASNYA	11	0706 E	0810	0707 U	N10	W48	5271	64 D	1	2	0707		2.20		70	
KRASNYA	11	0706 E	0903	0707 U	S13	E14	5264	117 D	1	2	0707		2.30		70	
ONDREJOV	11	0817 E	0837	0832	S14	E16	5264	20 D	1	3	0832			2.20		
GOOD HOPE	11	0830	0901		N15	W90	5244	31	1		0852	.40				
KRASNYA	11	0842	0903	0851 U	N15	W88	5244	21	1	2	0851		3.60		75	
KRASNYA	11	0929	1001 D	0933	S14	E16	5264	32 D	1+	2	0933		2.60		110	
GOOD HOPE	11	0933	0953	0937	S14	E16	5264	20	1		0937	3.00	3.20			
GOOD HOPE	11	1137	1146 D	1144	N14	W90	5244	9 D	1		1144	.50				
ONDREJOV	11	1248 E	1257		N16	W90	5244	9 D	1	3	1248			5.80		
SYDNEY	12	0140	0143	0141	N18	W91	5248	3	□	3	0141	.25				
SYDNEY	12	0303	0335	0318	N25	E65	5277	32	1	3	0318	2.00	5.00			
ALMA-ATA	12	0308 E	0344 D	0524	S15	E03	5264	36 D	1+	2	0524		6.10		62	
ALMA-ATA	12	0308 E	0540	0514	N16	E34	5265	152 D	1	2	0514		3.10		56	
SYDNEY	12	0424	0500 D	0431	N20	E35	5265	36 D	1	2	0431	3.00	4.00			
TASHKENT	12	0424	0534	0429	N20	E35	5265	70	1	2	0428		4.00	2.30	65	
ALMA-ATA	12	0424	0535	0437	N20	E34	5265	71	1+	2	0437		7.20		62	
ABASTUMANI	12	0508	0536	0514	S29	E74	5273	28	2+	2	0514		12.10		100	S-SWF
ALMA-ATA	12	0512	0535	0519	S26	E74	5273	23	1	2	0519		4.90		53	
ABASTUMANI	12	0621	0636	0626	N11	W57	5271	15	1+	2	0627		3.40	1.60	90	
ABASTUMANI	12	0629	0652	0636	N14	E34	5265	23	1+	2	0635		2.40	2.00	86	
KRASNYA	12	0630 E	0653		N18	E34	5265	23 D	1	1	0630		2.50		70	S-SWF
ONDREJOV	12	0632	0647	0636	N17	E32	5265	15	1	3	0636			3.30		
KRASNYA	12	0641	0646	0642	N15	W88	5248	5	1	1	0642		2.30		70	S-SWF
ONDREJOV	12	0642 E			N13	W90	5248		1	3						
KRASNYA	12	0923	0947	0927 U	N18	E34	5265	24	1	1	0927		2.00		70	
ONDREJOV	12	0935	0947	0941	S13	E01	5264	12	1	3	0941			3.20		
KHARKOV	12	0936 E	0952	0939	S12	W02	5264	16 D	1	2	0937		2.30	1.80		
KRASNYA	12	0941 E	0950 D		S13	E03	5264	9 D	1+	1	0941		4.30		105	
KHARKOV	12	0945	1011 D		S13	E04	5264	26 D	1	2	0949		2.30			
MOSCOW G	12	1105 E	1126 D		S28	E70	5273	21 D	1+	1	1113		20.69	1.60	90	
VOROSHILOV	12	2109 E	2146	2113	S12	W06	5264	37 D	1	3	2113		3.37		60	
VOROSHILOV	12	2134	0019	2231	N20	E23	5265	165	2+	3	2231		21.00		82	G-SWF
VOROSHILOV	12	2311	2315	2312	N26	E90	5277	4	1+	2	2312		6.80		74	
VOROSHILOV	12	2319	2331	2321	S13	W06	5264	12	1	2	2321		2.08		76	
SYDNEY	13	0023	0031	0026	N09	E62	5274	8	1	3	0026	2.00	3.00			
ALMA-ATA	13	0255 E	0605 D	0410	N15	E18	5265	190 D	1	2	0410		4.70		56	
SYDNEY	13	0238	0325	0306	S22	E68	5273	47	2	2	0306	3.00	7.00			
ALMA-ATA	13	0300	0316	0312	S24	E57	5273	16	1	2	0312		4.70		53	
ALMA-ATA	13	0302	0322	0312	S29	E59	5273	20	1+	2	0312		5.80		51	
ABASTUMANI	13	0716	0719	0718	N26	E17	5270	3	1	3	0718		2.20		76	

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KRASNYA	13	0804	0810	0805	N06	W78	5271	6	1&	2	0805		7.50		95	
KRASNYA	13	0811	0815	0813	N05	W80	5271	4	1&	2	0813		7.40		95	
KRASNYA	13	0833	0838	0834	N05	W80	5271	5	1	2	0834		2.70		95	
KRASNYA	13	0845	0902	0846	N05	W80	5271	17	1	2	0846		7.90		80	
ONDREJOV	13	1000 E	1009		N15	E15	5265	9 D	1	3	1004			3.10		
ONDREJOV	13	1032	1038	1033	N08	W76	5271	6	1	3	1033			2.40		
ONDREJOV	13	1045 E	1054 D		N18	E21	5265	9 D	1	3	1047			2.60		
ONDREJOV	13	1050 E	1057 D		N08	W76	5271	7 D	1	3	1051			2.50		
VOROSHILOV	13	2254	2256	2255	N06	W80	5271	2	1	1	2255		2.54		68	
VOROSHILOV	13	2337	2344	2341	N06	W87	5271	7	1&	1	2341		4.85		80	
ALMA-ATA	14	0319	0630 D	0342	N18	E10	5265	191 D	3&	2	0342		46.40		179	
SYDNEY	14	0332 E	0418 D		N17	E07	5265	46 D	3&	1	0413	32.00	34.00			
TASHKENT	14	0342 E	0431 D	0349	N17	E07	5265	49 D	3&	2	0348		38.00	5.50	400	
ONDREJOV	14	0425 E	0545 D		N16	E05	5265	80 D	3	3	0457			2.50		
ABASTUMANI	14	0506 E	0805 D		N18	E08	5265	179 D	3&	3	0548		59.60	2.10	82	S-SWF
KODAIKNL	14	0523 E	0527 D		N15	E05	5265	4 D	3&	1		27.00	27.00			
KRASNYA	14	0650 E	0828		N20	E03	5265	98 D	2	2	0652		8.00		85	
GOOD HOPE	14	0706 E	0855		N19	E01	5265	109 D	2		0709	6.30	6.50			
GOOD HOPE	14	0711	0727	0715	N16	W90	5252	16	1		0715	.40				
ABASTUMANI	14	0717	0724	0720	N13	E07	5265	7	1	3	0720		2.00		73	
KRASNYA	14	0718	0729	0721	N12	E08	5265	11	1	2	0721		.90		75	
KHARKOV	14	0941 E			N20	E03	5265		1&	2	0941		9.20			
KHARKOV	14	1136 E	1159 D		N20	E03	5265	23 D	1&	2	1136		4.60	1.70		
KIEV	14	1333	1343	1338	N04	E24	5272	10	1	2	1338		.97		84	
KIEV	14	1400	1541 D	1448	S26	E38	5273	101 D	2&	2	1448		25.93		65	Slow S-SWF
ONDREJOV	14	1402 E	1637 D		S25	E36	5273	155 D	2&	2	1408			3.10		
ONDREJOV	14	1600	1609		N13	E03	5265	9	1	3	1601			2.90		
ABASTUMANI	15	0641 E	0710	0653 U	N13	W04	5265	29 D	1		0653			2.00		
KRASNYA	15	0644 E	0707		N12	W06	5265	23 D	1	1	0644		1.40		75	
MOSCOW G	15	0652 E	0831 D		N11	W05	5265	99 D	1	1	0659		5.89	1.50	100	
KRASNYA	15	0821	0857	0827 U	N17	W07	5265	36	1	1	0827		.80		65	
KHARKOV	15	1019	1130	1024	N18	W08	5265	71	1	3	1024		2.30	2.00		
KHARKOV	15	1019 E	1130 D	1024	N13	W13	5265	71 D	1	3	1024		4.60	2.00		
GOOD HOPE	15	1020	1125	1025	N16	W11	5265	5	1		1025	3.50	3.70			
KIEV	15	1251	1347	1312	N16	W13	5265	46	1&	3	1312		2.78		81	S-SWF
GOOD HOPE	15	1300	1319 D	1307	N16	W13	5265	19 D	1		1307	3.00	3.10			
VOROSHILOV	15	2240	2248	2242	N15	W18	5265	8	1	2	2242		2.92		78	G-SWF
KHARKOV	16	0650 E	0703 D		N15	W22	5265	13 D	1&	1	0703		12.20	1.80		
KRASNYA .	16	0701 E	0829		N19	W19	5265	88 D	1&	1	0702		2.70		98	
GOOD HOPE	16	0729 E	0820		N17	W22	5265	51 D	2		0731	5.50	6.10			
KHARKOV	16	0913	0951 D	0925	N15	W21	5265	38 D	1&	2	0938		14.80	1.80		
GOOD HOPE	16	0922	0947	0929	N19	W25	5265	25	1		0929	3.00	3.40			
KHARKOV	16	1054	1107		N14	W24	5265	13 D	1	1	1058		11.20	1.40		
GOOD HOPE	16	1055	1106	1056	N17	W27	5265	11	1		1056	2.20	2.50			
MEUDON	16	1336	1519	1407	N23	W20	5265	103	2				15.00			
KIEV	16	1352	1411	1358	N22	W27	5265	19	1&	2	1358		5.30		61	
MEUDON	16	1604	1645	1615	N15	W20	5265	41	2				10.00			S-SWF
MEUDON	16	1609	1625	1616	N17	W32	5265	16	1				3.00			
SYDNEY	17	0043 E	0121 D		N18	W36	5265	38 D	1	1	0016	3.00	4.00			

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ABASTUMANI	17	0520	0656	0626	N16	W40	5265	96	1+	2	0630		2.04	1.70	92	
KRASNYA	17	0912	0916	0914	N21	W49	5265	4	1	2	0914		.70		90	
KRASNYA	17	0919	0926	0921	N16	W40	5265	7	1	2	0921		.60		80	
KIEV	17	1223 E	1306	1225	N21	W48	5265	43 D	1	2	1225		3.30		58	
KIEV	17	1340	1408 D	1346	N13	W39	5265	28 D	1	2	1346		3.40		78	
MEUDON	17	1341	1402	1346	N12	W40	5265	21	1				4.00			
ABASTUMANI	18	0539	0750	0624	N15	W55	5265	131	1+	2	0637		25.00	3.40	84	
GOOD HOPE	18	0718	0736	0722	N23	W62	5265	18	1		0722	1.00	2.20			
KRASNYA	18	0721 E	0730		N24	W60	5265	9 D	1	2	0722		2.00		100	
GOOD HOPE	18	0742	0757	0746	N21	W62	5265	15	1		0746	1.80	3.80			
KRASNYA	18	0754	0800		N24	W60	5265	6	1	2	0759		1.60		90	
MEUDON	18	0854	0906		N15	W28	5265	12	1				5.00			
KRASNYA	18	0854	0909	0856	N15	E25	5280	15	1+	2	0856		3.40		115	
GOOD HOPE	18	0855	0913	0900	N16	E22	5280	18	1		0900	3.30	3.60			
KRASNYA	18	0858	0903	0900	N21	E27	5283	5	1	2	0900		.50		85	
GOOD HOPE	18	1102 E	1120		N21	W52	5265	18 D	1		1102	1.30	2.20			
GOOD HOPE	18	1139	1231 D	1147	N28	W88	5265	52 D	1		1147	1.00				
SYDNEY	19	0039	0220 D	0106	N13	E15	5280	141 D	2	2	0106	5.00	5.00			
SYDNEY	19	0039	0220 D	0200	N14	E24	5280	141 D	1	2	0200	3.00	3.00			
SYDNEY	19	0039	0220 D	0059	N18	E21	5280	141 D	1	2	0059	3.00	4.00			
VOROSHILOV	19	0044	0206 D		N10	E16	5280	82 D	1+	1	0104		6.60		65	
SYDNEY	19	0409	0430	0412	N30	E06	5277	21	1	3	0412	1.50	2.00			
ABASTUMANI	19	0551	0603	0555	N24	W74	5265	12	1	2	0555		4.69		55	
GOOD HOPE	19	0842	0900	0844	N19	W80	5265	18	1		0844	1.00				
KRASNYA	19	0913 E	0922 D		N20	E85	5286	9 D	1	1	0921		6.90		80	
GOOD HOPE	19	1325	1345	1328	N21	W81	5265	20	1		1328	1.00				
VOROSHILOV	19	2141	2142	2141	N20	W90	5265	1	1+	1	2141		3.09		91	
VOROSHILOV	19	2229	2234	2231	N12	W71	5265	5	1	1	2231		4.84		65	
TASHKENT	20	0559	0607 D	0603	N19	W80	5265	8 D	1	2	0603		12.00		75	
ABASTUMANI	20	0601 E	0616 D	0606 U	N20	W89	5265	15 D	3	1	0606		32.70			
KRASNYA	20	0839	0847	0841 U	N17	W07	5280	8	1	2	0841		1.20		80	
GOOD HOPE	20	1153	1212	1156	N21	W90	5265	19	1		1156	.40				
MEUDON	20	1526	1715	1619	N17	W40	5274	109	2				18.00			
MEUDON	20	1539	1600		N10	W80	5265	21	1							
MEUDON	21	0654	0740		N20	W89	5265	46	1							Slow S-SWF
KRASNYA	21	0658 E	0705		N19	W87	5265	7 D	1	2	0658		4.60		75	
KRASNYA	21	0808	0813		N21	W50	5274	5	1	2	0809		3.20		70	
MEUDON	21	1020	1120	1035	S16	E56	5287	60	1+				7.00			
KHARKOV	21	1025 E	1051	1029	S21	E56	5287	26 D	1+	3	1029		11.40	1.80		
GOOD HOPE	22	1057	1123	1105	N23	W90	5270	26	1		1105	.50				
GOOD HOPE	22	1224	1241 D	1233	N15	W53	5274	17 D	1+		1233	2.90	4.90			
MEUDON	22	1225	1325		N20	W55	5274	60	1							
KIEV	22	1226	1330	1247	N17	W58	5274	64	1+	3	1247		9.64		58	
MEUDON	22	1530	1550		N25	E90	5291	20	1							G-SWF
SYDNEY	22	2352	0013 D	2355	N17	W38	5280	21 D	1	2	2355	2.00	2.00			Slow S-SWF
KHARKOV	24	0615 E	0618 D		N12	E87	5294	3 D	1	2	0618					
VOROSHILOV	25	0028	0031 D		N10	W80	5280	3 D	1+	2	0029		6.63		69	

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TASHKENT	25	0310	0400	0316	S20	E49	5289	50	1	3	0323		6.00	1.90	65	
ALMA-ATA	25	0328 E	0340	0332	S21	E54	5289	12 D	1	2	0332		3.00		54	
ALMA-ATA	25	0328 E	0340	0334	S20	E48	5289	12 D	1	2	0334		4.90		52	Slow S-SWF
ALMA-ATA	25	0328 E	0346	0331	S23	E50	5289	18 D	1	2	0331		5.00		55	
TASHKENT	25	0259 E	0603 D		N12	E90	5294	184 D	1	3					70	
KRASNYA	25	0658 E	0752		N11	E90	5294	54 D	1+	2	0658		6.40		115	
KRASNYA	25	0724	0745	0729 U	N09	E90	5294	21	1+	2	0729		7.30		160	
KRASNYA	25	0758	0804	0800	N11	E90	5294	6	1+	2	0800		4.60		115	
KRASNYA	25	0815	0844	0818 U	N11	E90	5294	29	1+	2	0818		6.00		140	
GOOD HOPE	25	0815	0845	0822	N12	E89	5294	30	1		0822	.50				
KRASNYA	25	0924 E	0926 D		N11	E90	5294	2 D	1+	1	0925		5.50		85	
GOOD HOPE	25	1326	1346	1330	N25	E52	5291	20	1		1330	1.30	2.20			
VOROSHILOV	25	2205	2214	2208	N08	E69	5294	9	1	1	2208		2.49		78	
VOROSHILOV	25	2323	2330	2327	N10	E87	5294	7	1+	1	2327		4.33		120	
ABASTUMANI	26	0619	0622	0620	N08	E73	5294	3	1	3	0620		3.10		76	
GOOD HOPE	26	0658	0723	0701	N10	E80	5294	25	1		0701	.60				
ABASTUMANI	26	0658	0724	0708	N08	E78	5294	26	1+	3	0704		6.58	3.30	80	
KRASNYA	26	0700 E	0722 D		N10	E81	5294	22 D	1+	2	0711		2.30		120	
KRASNYA	26	0728	0739	0731 U	S07	W21	5296	11	1	2	0731		1.70		85	
KRASNYA	26	0753	0804	0755	S07	W21	5296	11	1	2	0755		.50		90	
KRASNYA	26	0831	0844 D	0839 U	N16	E82	5294	13 D	□	2	0839				215	
ONDREJOV	26	0831	0858		N14	E73	5294	27	1	3	0840			2.30		
GOOD HOPE	26	0831 E	0915	0840	N13	E75	5294	44 D	2		0840	2.20	8.50			
GOOD HOPE	26	0848	0910	0853	N10	E79	5294	22	1		0853	1.00				
ONDREJOV	26	0852	0858	0852	N09	E76	5294	6	1	3	0852			2.80		
KRASNYA	26	0917 E	1001 D	0917 U	S07	W21	5296	44 D	1	1	0917		1.70		75	
KRASNYA	26	0956	1002 D	0957 U	N09	E82	5294	6 D	1	1	0857		3.70		110	
GOOD HOPE	26	0956	1009	0959	N10	E79	5294	13	1		0959	1.00				
KHARKOV	26	1000 E	1015 D	1003	N07	E62	5294	15 D	1	1	1012		3.80	1.50		
KHARKOV	26	1030	1125 D		N32	E67	5292	55 D	1	1	1054		5.60	1.20		
SYDNEY	27	0145	0253	0214	N26	E35	5291	68	1	2	0214	1.50	2.00			
KRASNYA	27	0655 E	0719 D	0703 U	S07	W37	5296	24 D	1	2	0703		.50		100	
ONDREJOV	27	1034	1048 D	1037	N22	E31	5291	14 D	1	2	1037			2.60		
GOOD HOPE	27	1224	1258	1229	N14	E50	5294	34	2		1229	5.30	8.40			S-SWF
ONDREJOV	27	1228	1251		N14	E49	5294	23	2	3	1231			5.70		
VOROSHILOV	27	2142 E	2226	2155	N28	E26	5291	44 D	2	3	2155		7.46		85	Slow S-SWF
VOROSHILOV	27	2208	2308	2217	N12	E51	5294	60	1+	3	2217		4.22		85	
SYDNEY	28	0006	0028	0012	N12	E64	5299	22	1	3	0012	2.00	4.00			
VOROSHILOV	28	0008	0029	0012	N11	E66	5299	21	1+	3	0012		6.68		71	
KRASNYA	28	0658 E	0712		N07	E45	5294	14 D	1	2	0707		1.30		80	
ABASTUMANI	28	0707	0740	0727	N10	E60	5299	33	1+	1	0730		11.40	2.00		
KRASNYA	28	0711	0716	0712	N06	E66	5299	5	1	2	0712		2.30		90	
KRASNYA	28	0723	0744	0725 U	N11	E62	5299	21	1	2	0725		2.10		105	
ONDREJOV	28	0727 E	0740		N13	E60	5299	13 D	1	3	0728			2.60		
ONDREJOV	28	1629	1645	1631	N11	E34	5294	16	1	2	1633			2.30		
KRASNYA	29	0711	0746	0734	N11	E33	5294	35	1+	2	0734		1.60		160	
GOOD HOPE	29	0713 E	0812	•0735	N11	E29	5294	59 D	2		0735	5.10	5.90			
ABASTUMANI	29	0718 E	0753 D	0739 U	N12	E31	5294	35 D	1+	1	0745		7.76	2.10		
KRASNYA	29	0731	0810	0733 U	N14	E38	5294	39	1	2	0733		.70		95	

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
PIRCULI	29	0738 E	0748 D	0738	N11	E27	5294	10 D	3	1	0738		20.16		6	
KRASNYA	29	0834	0911	0840 U	N27	E07	5291	37	1	2	0840		1.30		110	
GOOD HOPE	29	0834	0920	0839	N26	E05	5291	46	1		0839	2.70	2.90			
KRASNYA	29	0912	0921	0917	N10	E24	5294	9	1	2	0917		.60		95	
GOOD HOPE	29	1202	1324 D	1213 U	N10	E26	5294	82 D	2		1213	6.30	7.00			Slow S-SWF
KIEV	29	1308 E	1405 D	1309 U	N10	E30	5294	57 D	1&	1	1309		2.96		99	
VOROSHILOV	29	2145 E	2229		N15	E20	5294	44 D	1	2	2157		3.18		68	Slow S-SWF
VOROSHILOV	29	2145 E	2231		N14	E36	5294	46 D	1&	2	2158		6.92		60	S-SWF
VOROSHILOV	30	0003	0108	0010	N10	E34	5299	65	2	2	0010		7.50		83	G-SWF
TASHKENT	30	0338	0350	0339	N13	E14	5294	12	1&	3	0341		2.00	2.80	110	S-SWF
ABASTUMANI	30	0514 E	0521	0516 U	N09	E19	5294	7 D	1	1	0516		1.85			
GOOD HOPE	30	0845	0904	0846	N14	E31	5299	19	1		0846	2.00	2.40			
KRASNYA	30	0845	0904	0846 U	N12	E30	[illegible]	19	1	1	0846		1.10		85	
KRASNYA	30	0857	0907	0858 U	N08	E12	5294	10	1	1	0858		.60		85	
KRASNYA	30	0853	0906	0856	S23	W78	5287	13	1&	1	0856		6.00		120	
GOOD HOPE	30	0854	0914	0859	S07	W85	5296	20	1		0859	1.10				
KRASNYA	30	0908	0916	0911	N07	E18	5294	8	1	1	0911		.50		70	
KRASNYA	30	0938	0943	0940	N16	E12	5294	5	1	1	0940		.70		115	
PIRCULI	30	0940 E	0950 D	0945	N11	E10	5294	10 D	3	1	0945		17.34		5	
KHARKOV	30	0942	0949	0944	N15	E10	5294	7	1	1	0944			1.80		
KRASNYA	30	0952	1002	0957	N11	E38	5299	10	1	1	0957		.80		120	
KHARKOV	30	0954	1015 D	0957	N12	E36	5299	21 D	1	1	1008		1.30	1.30		
KHARKOV	30	1037 E	1046	1042	N12	E36	5299	9 D	1	1	1042		1.30	1.50		
KHARKOV	30	1042 E	1110 D	1049	N11	E12	5294	28 D	1	1	1106			1.50		
GOOD HOPE	30	1313	1329	1317	N18	W78	5286	16	1&		1317	2.00				
VOROSHILOV	31	0048	0110	0052	N09	E42	5300	22	1	2	0052		2.83		63	
PIRCULI	31	0659 E	0710 D	0705	N15	E05	5294	11 D	4	1	0705		7.00		4	
KRASNYA	31	0758	0824	0803	N12	E06	5294	26	1	2	0803		1.10		85	
GOOD HOPE	31	0801	0834	0806	N12	E05	5294	33	1		0806	2.30	2.30			
MEUDON	31	0802	0840	0806	N14	E02	5294	38	1				2.00			
ONDREJOV	31	0807 E	0818 D		N10	E06	5294	11 D	1	1	0809			2.20		
PIRCULI	31	0810 E	0825 D	0810	N13	E04	5294	15 D	4	2	0810		30.00		8	
GOOD HOPE	31	1210	1250	1220	N28	W24	5291	40	1		1220	2.90	3.30			

These flare reports are addenda to the July 1959 flares published in CRPL-F 180 Part B, August, 1959.

COMMERCE - STANDARDS - BOULDER

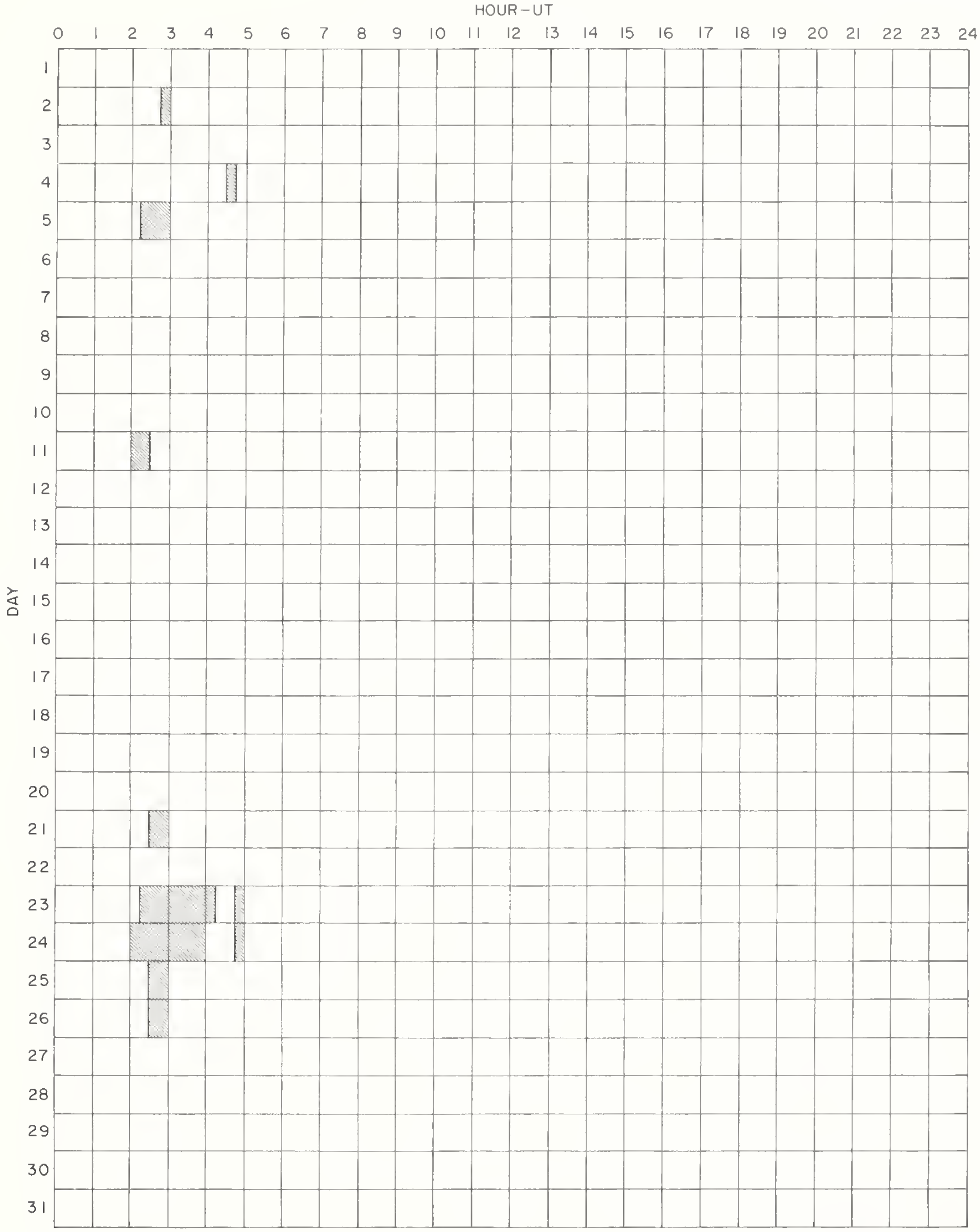
CAPRI G — ANACAPRI - GERMAN
CAPRI S — ANACAPRI - SWEDISH
GOOD HOPE — ROYAL OBSERVATORY, CAPE OF GOOD HOPE
KIEV* — KIEV UNIVERSITY
KODAIKNAL — KODAIKANAL
KRASNYA — KRASNAYA PAKHRA
LOCKHEED — LOS ANGELES

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   & - PLUS
D - GREATER THAN   - - MINUS
U - APPROXIMATE   ▢ - NOT REPORTED

JULY 1959



Stations Include:

COMMERCE - STANDARDS - BOULDER

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

IONOSPHERIC EFFECTS OF SOLAR FLARES

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

APRIL 1959

Apr. 1959	CLASS SCNA	SEA	Burst	WIDESPREAD INDEX	TIME (UNIVERSAL TIME) BEGIN	MAX.	END	PERCENT ABSORPTION SCNA	OBSERVATION STATIONS
3		1+		5	1242		1321		KU,NE,PA
4		1		3	0751		0826		KU,NE
4		1		5	1203		1228		KU,PA
4			1	5	1939		1941		BO,HA
4		1+		5	1940	1941	2230		A3,A5,A7,A9,DE
5		1		1	1640		1700		KU
5			2	5	1640	1645	1646		BO,MC,RE
5			1	4	1731	1732	1734		BO,RE
5	1			1	1917	1924	1947	11	BO
5		1		5	1920	1930	2000		A5,A7
5	3			5	2320	2324	0032	70	BO,HA,SP
5		1		5	2324	2347	0022		A6,A7,A9,BO,HA,HO
6	1			4	1738	1751	1759	30	BO,RE
6		2		1	1745	1800	1830		A7
7		1-		1	0651		0716		KU
7		□		1	1357	1410	1527		DU
8		1		4	0913	0922	0941		DU,KU
8	1+			4	1432	1440	1510	17	BO,RE
8		2		5	1432	1447	1610		A1,A2,A5,A6,BO,DU,NE,PA
8			1	4	1506	1509	1510		BO,RE
8			2	5	1721	1726	1740		BO,RE,SP
8			1+	5	2045	2046	2048		BO,HA,MC,RE,SP
8		2		5	2047	2102	2122		A1,A5,BO,MC
8	1			5	2048	2051	2107	5	BO,MC,RE
9	3-			5	1647	1654	1725	60	BO,MC,RE,SP
9		1		5	1648	1658	1735		A3,A5,A7,BO,DU,KU,MC,NE,PA
9			1	5	1649		1652		BO,MC,RE,SP
9			1	5	1758	1804	1806		BO,MC,RE,SP
9			2+	5	1923	1928	1930		BO,HA,MC,RE,SP
9			1	5	2004		2005		BO,HA
10		1		4	1041	1052	1108		DU,KU
10			1	5	1648	1650	1651		MC,RE,SP
10		1-		1	1650	1700	1710		MC
10	1-			1	1651	1655	1710	5	MC
11		1+		3	0833		0854		KU,NE
11			1+	3	1453	1455	1456		MC,RE
11		2		5	1454	1525	1555		A1,A3,A5,A6,A7,DU,KU,MC,NE,PA
11	2+			3	1503	1525	1545	60	MC,RE
11		1		4	1625	1630	1700		BO,RE
11	1			1	1625	1627	1716	11	BO
11		1		4	1820	1828	1850		A3,A5,A7
11		1+		5	2339	0001	0031		A6,HA
12		2-		5	1111	1121	1129		DU,KU,NE,PA,A3
12		2		5	1129	1146	1244		DU,KU,NE,PA
12		1+		4	1853		1855		BO,RE
12		1+		4	1859		1901		BO,RE
13		1		4	0835	0842	0929		DU,KU,NE
13	1			5	1946	1951	2007	15	HA,MC,RE
13		1		5	1947	2002	2030		A5,A6,HA
14		1		5	1222		1250		A5,KU,NE,PA
14	2			1	1821	1837	1955	29	BO
14		1		5	1822	1848	2000		A2,A7,BO
15		1		3	0835		0855		KU,NE
18		1+		5	0808	0817	0837		DU,HO,KU,NE
19		1-		1	0825		0900		KU

IONOSPHERIC EFFECTS OF SOLAR FLARES

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

APRIL 1959

Apr. 1959	CLASS			WIDESPREAD INDEX	TIME (UNIVERSAL TIME)			PERCENT ABSORPTION SCNA	OBSERVATION STATIONS
	SCNA	SEA	Burst		BEGIN	MAX.	END		
19		2-		3	1714	1730	1755		A1,A5
20		1		1	0953		1023		KU
20		1		4	1935	1945	2007		BO,MC
20	1			5	1936	1938	1950	15	BO,HA,MC
21		1-		1	1458		1523		KU
21			1+	5	1830	1831	1832		BO,MC,SP
21			1+	5	1850	1851	1853		BO,HA,MC,SP
22		2		5	1115	1127	1215		A1,A3,A5,DU,KU,NE,PA
22	1-			1	1120	1135	1150	10	RE
26			1	3	1532	1535	1536		MC,RE
26			1	4	1927		1929		BO,MC
27		1		4	0855	0907	0943		DU,KU,NE
27			1	5	1938	1940	1941		BO,MC,RE
28	1			1	0106	0112	0145	17	HA
28	1			1	0213	0218	0321	16	HA
28		1		1	0214	0234	0305		HA
29			1	5	1923		1926		BO,HA
30			1	4	1907	1908	1909		BO,MC
30			1+	5	2136	2138	2140		BO,HA,MC

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

SEPTEMBER 1959

Sept 1959	Start UT	End UT	Type	Wide Spread Index	Importance	Observation Stations	Known Flare, UT CRPL-F 182
1	1114	1124	S-SWF	1	1	KU	1116
1	1423	1444	S-SWF	5	1	HU, MC, PR, PU	1419
1	1655	1822	S-SWF	5	3-	AN, BE, FM, HU, JU, LA, MC, NE, PR, SW, CW*, CW**	1650
1	1945	2058	Slow S-SWF	5	2	BE, HU, MC, PR	1947
2	0725	0838	Slow S-SWF	5	2	NE, OK	0721
2	1302	1320	Slow S-SWF	5	1	FM, HU, JU, KU, MC, PU	
2	1605	1631	S-SWF	5	2	AN, BE, FM, HU, LA, MC, NE, PR, CW*, CW**, CW***	1602
2	1733	1800	S-SWF	5	1+	BE, HU, MC, PR	1730
3	0422	0442	S-SWF	5	3	CA, NE, OK, TO, CW+, CW++	*
3	1757	1900	S-SWF	5	2	AN, MC, PR	1802
5	1558	1625	Slow S-SWF	3	1	MC, PR	1556
9	0650	0755	Slow S-SWF	5	1+	NE, OK	0645
9	1555	1640	Slow S-SWF	5	2+	AN, BE, FM, HU, MC, NE, PR, WS	1525E
13	0025	0100	Slow S-SWF	4	1+	AN, OK	*
14	0746	0814	S-SWF	3	2	NE, PU	0742E
16	1850	1903	Slow S-SWF	4	1-	HU, MC, PR	1844
20	1537	1600	S-SWF	3	1-	MC, PR	1520
21	0100	0130	Slow S-SWF	1	1	OK	0056
22	0613	0633	S-SWF	4	1	KO, OK	
23	0423	0445	Slow S-SWF	5	1	CA, KO, OK	*

* No known flare patrol.

CA = Canberra, Australia
JU = Juhlesruh, G.D.R.
KO = Kodaikanal, India
KU = Kuhlungsborn, G.D.R.
LA = Los Angeles, Calif.
NE = Nederhorst den Berg, Netherlands
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, HongKong
CW++ = Cable and Wireless, Singapore

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

OCTOBER 1959

Ottawa **2800 Mc.**

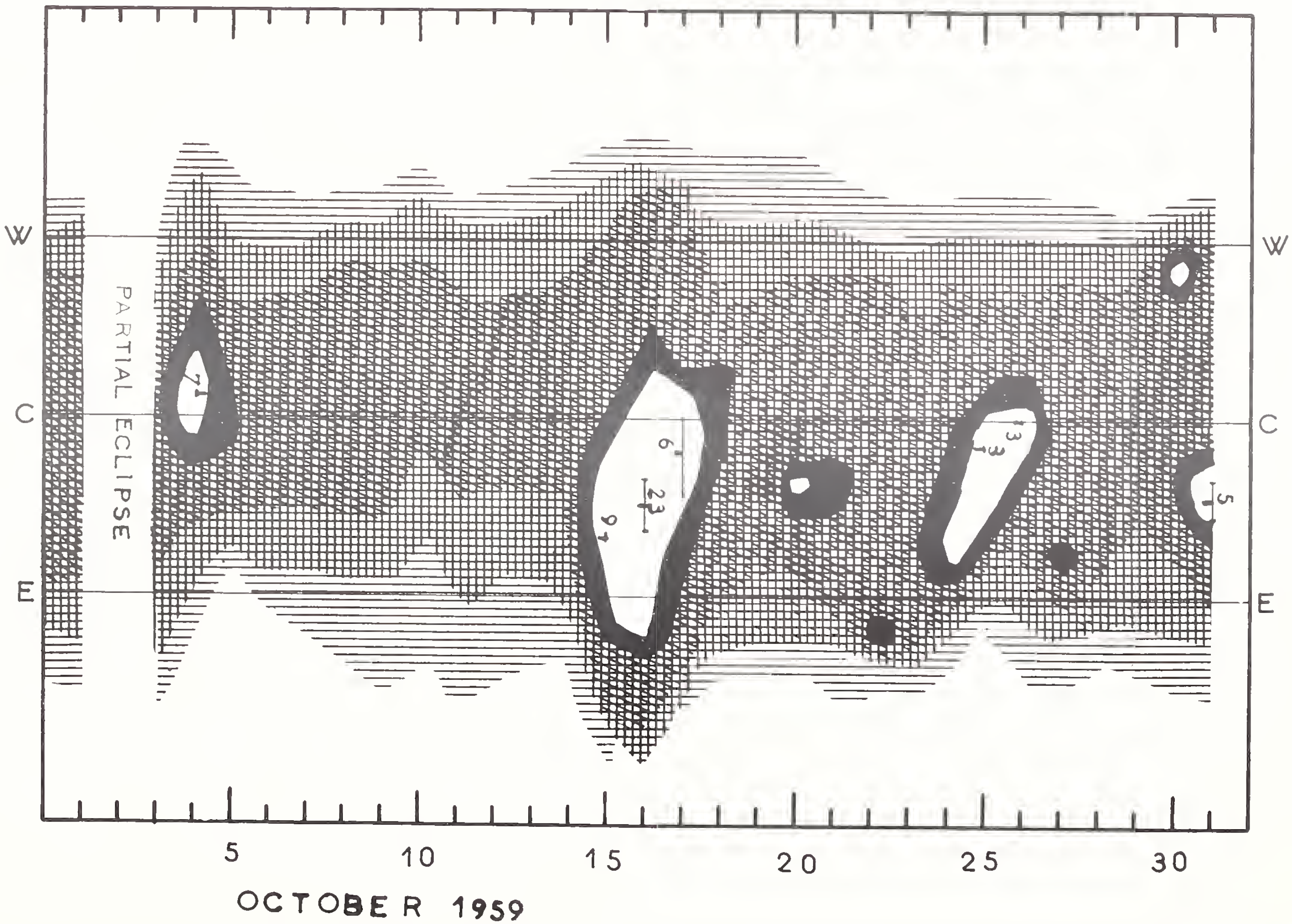
Oct. 1959	Type	Start UT	Duration Hrs:Mins	Maximum		Remarks
				Time UT	Peak Flux	
5	1 Simple 1	1556.8	1	1557	6	
6	3 Simple 3	1720	40	1723	5	
6	8 Group (2)	2012	8			
	6 Complex f	2012	4.5	2013.3	55	
	1 Simple 1	2019	1	2019.3	4	
7	2 Simple 2	1427.7	2	1428	20	
7	8 Group (2)	2044.5	3.2			
	2 Simple 2	2044.5	1.5	2045	29	
	1 Simple 1	2046.7	1	2047	4	
8	3 Simple 3	1428	35	1442	6	
10	1 Simple 1	1829	2	1829.8	7	
11	1 Simple 1	1358	2	1358.5	5	
17	2 Simple 2	2110	1.5	2110.3	11	
18	2 Simple 2	1748	1.5	1748.8	8	
22	2 Simple 2	1909	1	1909.5	8	
23	2 Simple 2	1518	5	1519	13	

COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

OCTOBER 1959

Nançay 169 Mc



OUTSTANDING OCCURRENCES

OCTOBER 1959

BOULDER 167 MC

Oct. 1959	Type	Start UT	Time of Maximum UT	Duration Minutes	Intensity
2	9a	1748.0	1748.2	2.0	2
2	9b	1752.0	1754.0	4.0	2
2	3	1839.3	1839.3	0.8	2
2	3	2240.4	2240.4	0.8	2
4	3	1435.4	1435.4	0.6	1
4	3	1505.1	1505.3	0.8	2
4	2	1757.0	1801.6	6	1
4	3	1822.3	1822.3	0.2	1
4	3	2001.8	2002.0	0.2	1
4	3	2246.8	2246.8	0.2	2
4	2	2341.0	2342.5	8	2
7	2	1519.0	1519.1	2.8	2
7	2	1704.4	1704.9	2.6	2
7	2	1811.2	1811.8	1.6	2
7	2	2129.0	2136.9	17	1
7	3	2157.0	2157.0	0.2	1
7	2	2317.0	2318.5	5	1
8	3	1556.3	1556.5	0.8	1
8	3	1607.2	1607.8	0.8	2
14	2	1423.9	1425.1	1.9	2
14	7	2057.0	2114.0	190 D	2
15	3	1330.0	1332.4	1.1	1*
15	2	1415.0	1418.1	10	1
15	2	1453.8	1454.0	1.1	2
15	3	1512.7	1513.1	1.0	3
15	2	1542.1	1550.6	29	1
15	2	1722.0	1723.0	0.1	2
15	2	1914.0	2019.0	8	1
15	7	2215.1	2352.5	113 D	2
16	6	1312 E	1904	654 D	2
17	6	1312 E	1407	289 D	1
17	2	1506.2	1506.2	2.2	1
17	3	1512.9	1512.9	0.2	2
17	2	1547.8	1549.9	2.1	1
17	2	1700.0	1702.0	3.5	1
17	3	2141.5	2142.8	3.0	2
18	3	1737.6	1737.6	0.5	2
18	3	1747.9	1747.9	0.1	2
18	2	1800.0	1805.5	15	1
18	3	1830.0	1830.0	0.8	3
18	2	2147.8	2150.0	6	2
18	3	2320.0	2320.0	0.1	2
18	2	2353.9	2355.0	6	2**
19	3	1320.9	1321.5	1.0	2*
19	3	1555.5	1556.0	1.6	2
19	2	1700.6	1702.0	2.5	1
19	3	2333.3	2333.6	1.0	2
20	3	1420.0	1420.9	1.1	2
20	2	1518.5	1520.9	14	1
20	3	1652.6	1652.8	0.5	2
20	3	1710.7	1710.7	0.6	1
20	3	1838.0	1838.0	0.2	2
20	2	2030.0	2032.0	14	2
20	3	2101.8	2102.0	1.1	2
20	2	2106.0	2107.5	2.0	1
20	2	2119.9	2123.5	2.5	1
20	2	2132.9	2134.0	2.5	2
20	3	2201.9	2201.9	0.1	2
20	2	2236.0	2240.9	11	2
20	3	2318.4	2318.4	1.0	2
21	2	1737.0	1738.0	2.9	1
21	3	1938.5	1938.5	0.1	1
21	3	2111.0	2111.3	1.0	1
22	3	1330.0	1330.5	0.8	1*
22	3	1616.9	1616.9	0.1	2
23	3	1336.9	1337.0	0.3	2*
23	3	1857.0	1857.0	1.0	2
24	3	1538.0	1538.5	0.6	2
24	3	1543.0	1543.1	0.5	3
25	2	1326.8	1335.5	10	1*
25	3	1413.0	1413.0	0.1	1
25	3	1513.0	1513.0	0.1	1
25	3	1941.0	1941.0	0.6	2
25	3	2256.9	2256.9	0.1	1
26	2	1406.5	1407.4	1.3	1
26	2	1520.8	1522.0	3.8	2
26	3	1555.6	1555.6	0.7	1
26	3	2000.7	2001.0	0.3	3
26	8	2004.2	2005.9	6	3
27	2	1332.8	1333.3	1.5	1*
27	2	1356.9	1357.0	1.5	2
27	3	1522.0	1522.0	1.0	2
27	3	1735.0	1735.0	0.1	1
27	3	1755.5	1756.5	1.8	3
27	2	1831.5	1831.6	2.0	2
27	3	1920.0	1920.0	0.1	1
27	2	2002.5	2007.0	8	2
27	3	2120.9	2121.0	1.5	2
27	3	2125.0	2125.6	1.0	2
29	3	1458.3	1459.6	1.7	2
29	2	1950.2	1951.9	3.3	1
30	2	1522.0	1535.9	24	1
31	2	1329.0	1331.9	17	1*
31	2	1401.9	1402.2	23	1
31	3	1440.1	1440.1	0.1	2
31	3	1540.0	1540.0	0.1	2
31	2	1729.0	1744.7	27	2
31	3	1806.3	1806.3	0.1	2

*On sunrise pattern
**On sunset pattern

COMMERCE - STANDARDS - BOULDER

TIMES OF OBSERVATIONS

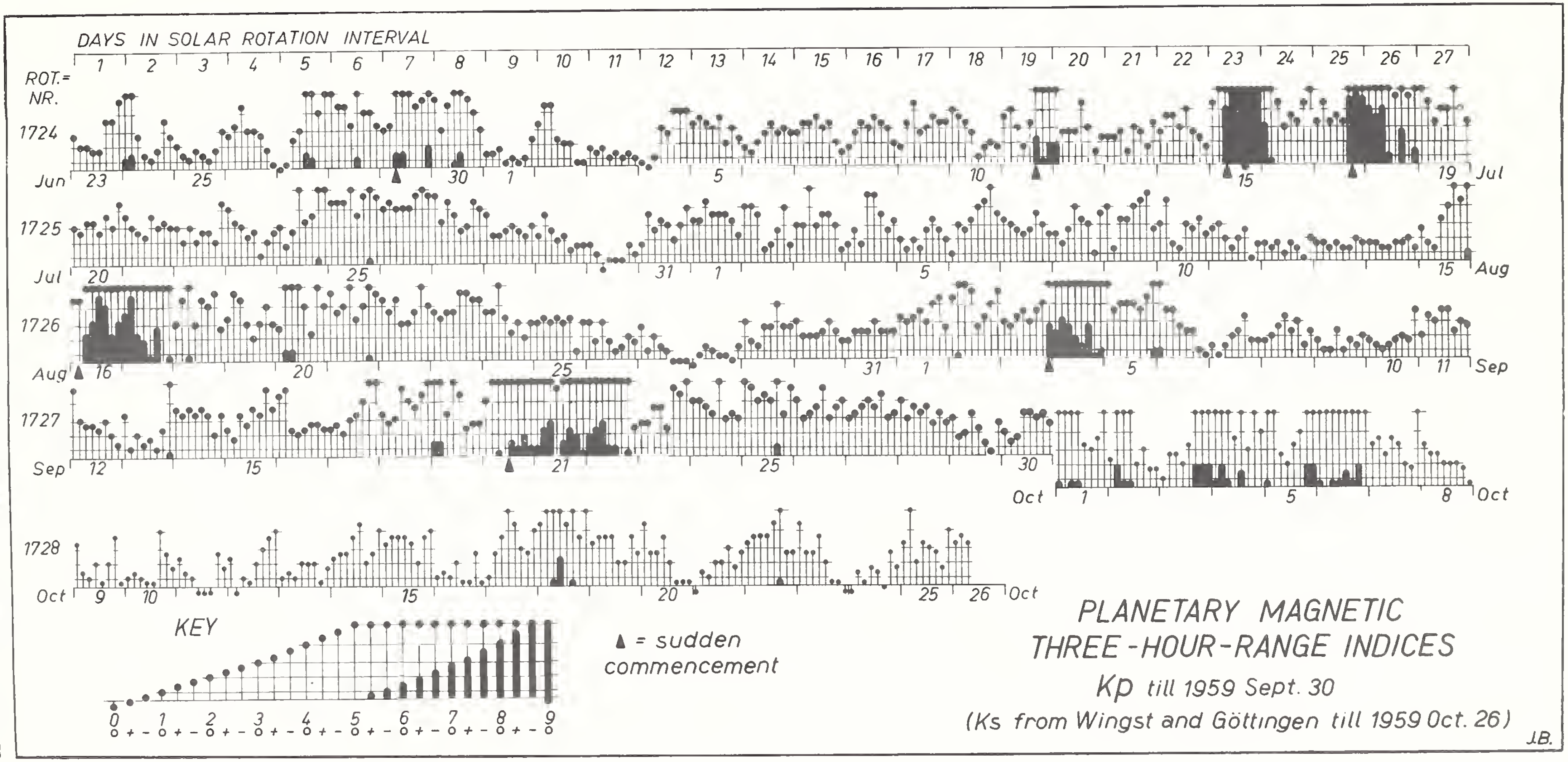
Oct. 1959	U.T.	Oct. 1959	U.T.
1	*		
2	1730-0023	17	1312-0006
3	1503-2042	18	1313-0003
4	1257-0022	19	1315-1950
5	1302-0021		2145-0002
6	1303-0019	20	1316-0001
7	1302-0017	21	1316-0000
8	1305-1738	22	1315-0000
	1830-0015	23	1319-2359
9	1304-0016	24	1320-2356
10	1305-0015	25	1323-2354
11	1306-0012	26	1323-2353
12	1307-0009**	27	1322-2354
13	1308-0010	28	1645-2352
14	1311-0007	29	1325-2351
15	1310-0008	30	1326-2331
16	1312-0006	31	1327-2125

* Equipment failure.
** Interference from atmospherics throughout day

GEOMAGNETIC ACTIVITY INDICES

SEPTEMBER 1959

Sept 1959	C	Values Kp Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	1.1	3+ 3o 3+ 4-	3o 4o 4+ 3-	27+	20	Five
2	1.2	4+ 5+ 5o 5-	3- 3+ 4o 5-	34o	34	Quiet
3	1.4	3o 3- 3+ 4-	3o 4- 4o 7o	30+	33	
4	1.8	7- 7+ 7o 6+	6o 7o 5+ 6-	51+	103	7
5	1.3	5o 4- 4o 4o	4o 4- 4+ 6-	34+	34	8
						9
6	0.9	6- 4- 4- 3-	2+ 2+ 1o 1-	22o	18	10
7	0.4	1+ 1- 1+ 2o	2+ 3+ 2- 2-	14+	7	29
8	0.6	2- 2o 3- 3+	2+ 3o 1+ 2+	19-	10	
9	0.2	2- 1o 1o 2+	1o 2- 1+ 2o	12o	6	
10	0.4	2- 1+ 1o 1+	2- 2o 2- 4-	14+	8	
11	0.9	2o 3+ 3o 4-	4- 2+ 3o 3-	24-	15	Five
12	0.8	5- 3o 3- 3-	2+ 3o 2o 1+	22-	14	Disturbed
13	0.7	3+ 1o 2o 1+	2- 1o 2+ 5+	18o	14	
14	1.1	4- 3+ 4- 3+	4- 3+ 2o 3+	26+	18	4
15	1.1	2+ 2- 3+ 3-	4- 3+ 5- 4-	25+	18	20
						21
16	0.9	4+ 5- 2+ 2o	2+ 3- 3- 2+	23+	16	22
17	1.2	2+ 3- 2o 3o	3+ 4o 5o 5o	27+	23	25
18	1.2	3+ 3- 3o 5-	4o 4- 4+ 5o	31-	27	
19	1.2	6o 6o 3+ 5o	4+ 2+ 3- 3-	32+	36	
20	1.6	4o 5o 5+ 5o	6o 6- 6+ 6-	43o	61	
21	1.9	6- 7- 7o 5-	6o 7- 6+ 5+	48+	86	Ten
22	1.7	6+ 7- 7o 6-	6- 5o 5+ 2+	44o	73	Quiet
23	1.2	3- 3- 4- 4-	2+ 5- 4+ 5o	29o	24	
24	1.2	4o 4o 4- 3+	5o 3o 3+ 3o	29+	24	7
25	1.2	5o 5- 4o 4+	4o 6- 3+ 5-	36-	37	8
						9
26	1.2	4o 3o 3+ 4-	5- 3o 4- 4o	29+	23	10
27	1.1	3o 3+ 4- 4o	4- 4+ 3o 3+	28+	21	11
28	0.9	4o 3o 4- 3+	4- 3- 3+ 3-	26+	18	12
29	0.5	3o 2- 2o 3+	2+ 1+ 1- 3-	17o	9	13
30	0.9	2o 1+ 2- 3+	3+ 3o 3+ 3-	21-	12	16
						29
						30
Mean:	1.06			Mean:	28	


DAYS IN SOLAR ROTATION INTERVAL
ROT.= NR.
1724
1725
1726
1727
1728
KEY
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1959 Sept. 30
(Ks from Wingst and Göttingen till 1959 Oct. 26)
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

SEPTEMBER 1959

Sept 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-	4o	6-	6-	7	6	6	7	5+	7			7	(4)	3
2	4-	3-	6-	5+	6	4	5	6	(4o)	7			7	(5)	3
3	5-	4o	5+	5o	5	4	6	6	5-	5			5	3	(4)
4	2+	2-	5o	5-	2	1	3	4	(3o)	5			5	(6)	(5)
5	3+	3-	6-	6-	3	2	5	6	(4-)	4	4		6	(4)	(4)
6	4+	4-	7-	7-	4	3	6	6	5o	4	4		6	(4)	2
7	7-	6o	7-	7+	6	5	7	7	7-	6	6		6	1	2
8	7o	7-	7o	7+	7	6	7	7	7o	6	6		6	2	2
9	7-	6o	7o	7+	7	7	7	7	7-	6	6		6	1	2
10	7-	7-	7o	7o	7	6	7	7	7o	7			7	1	2
11	7o	6+	7o	7+	7	6	7	7	7o	7			7	3	3
12	6+	6o	7+	7o	7	6	7	7	7-	6			6	3	2
13	7-	7-	7+	7-	7	6	7	7	7-	6			6	2	2
14	6+	6o	7-	7-	7	6	7	7	6+	6			6	3	3
15	7-	6o	7o	7o	6	6	7	7	7-	6			6	3	(4)
16	6+	6+	7+	7o	7	6	7	7	7-	5			5	3	2
17	7-	7-	7o	7-	7	6	7	7	7-	7			7	2	(4)
18	7-	6o	7-	7o	6	6	7	7	7-	7			7	3	(4)
19	6-	5o	7-	7o	7	4	6	7	6o	7			7	(4)	3
20	6o	3o	6-	5o	7	6	5	5	(4+)	7			7	(5)	(5)
21	2o	3o	5+	5-	4	2	5	6	(3+)	7			7	(5)	(5)
22	4o	3o	6-	6o	4	3	5	6	(4+)	4	4		7	(6)	3
23	5+	5-	7-	6o	5	5	6	6	6-	5	5		7	3	3
24	5+	5o	7-	6-	6	5	7	7	6-	6			6	3	3
25	4o	4+	5+	4+	6	4	6	6	(4+)	6			6	(4)	(4)
26	5-	4o	6+	7-	4	5	6	6	5+	7			7	3	3
27	6o	5o	7-	6+	6	5	7	7	6o	7			7	(4)	3
28	5+	5-	7-	6+	6	5	6	6	6-	7			7	3	3
29	6o	5o	7-	7o	6	5	7	7	6+	6			6	2	1
30	7-	6-	7-	6+	6	6	7	7	6+	6			6	2	2
Score: Quiet Periods				P	11	12	19	19		9			9		
				S	12	7	10	10		11			11		
				U	0	0	1	0		3			3		
				F	0	0	0	0		0			0		
Disturbed Periods				P	4	3	0	0		2			0		
				S	0	6	0	0		0			0		
				U	1	0	0	0		1			1		
				F	2	2	0	1		4			6		

( ) represent disturbed values.

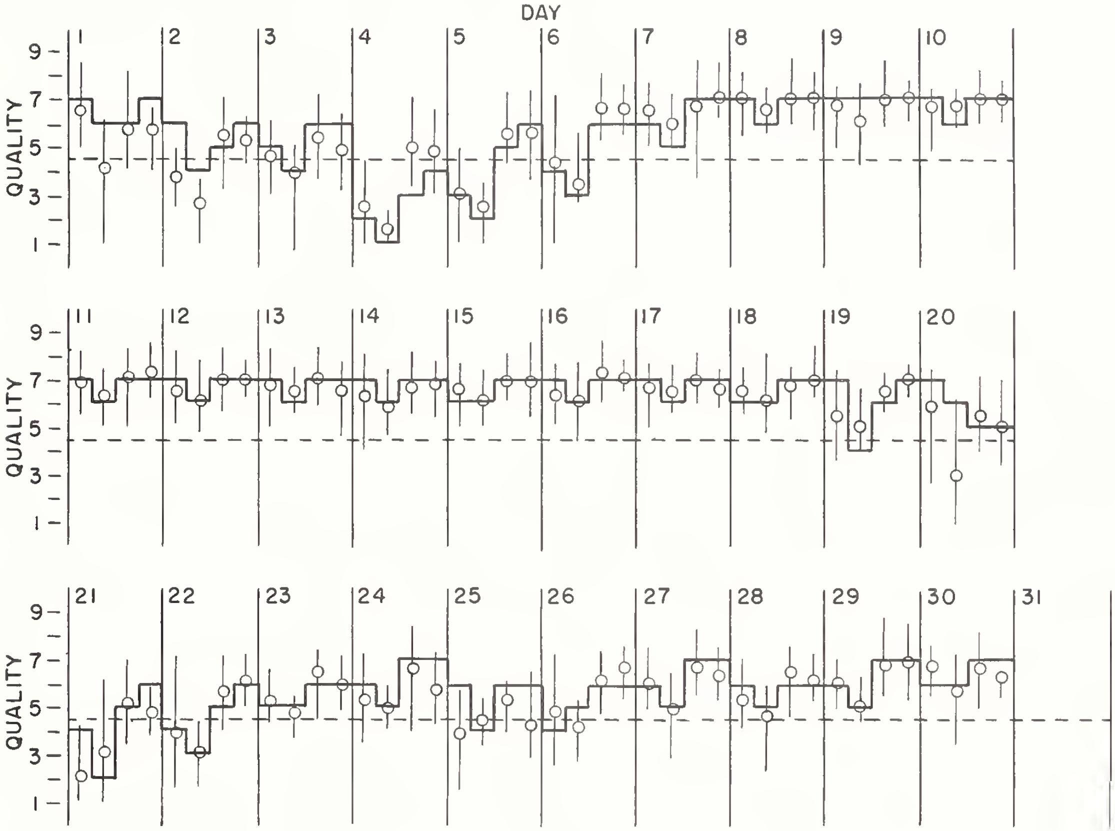
NORTH ATLANTIC

— Short-term forecast

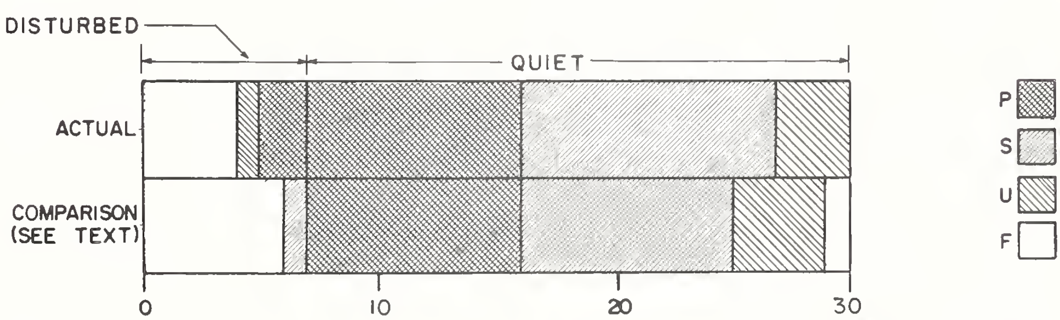
SEPTEMBER 1959

| Range of reports

o Quality figure

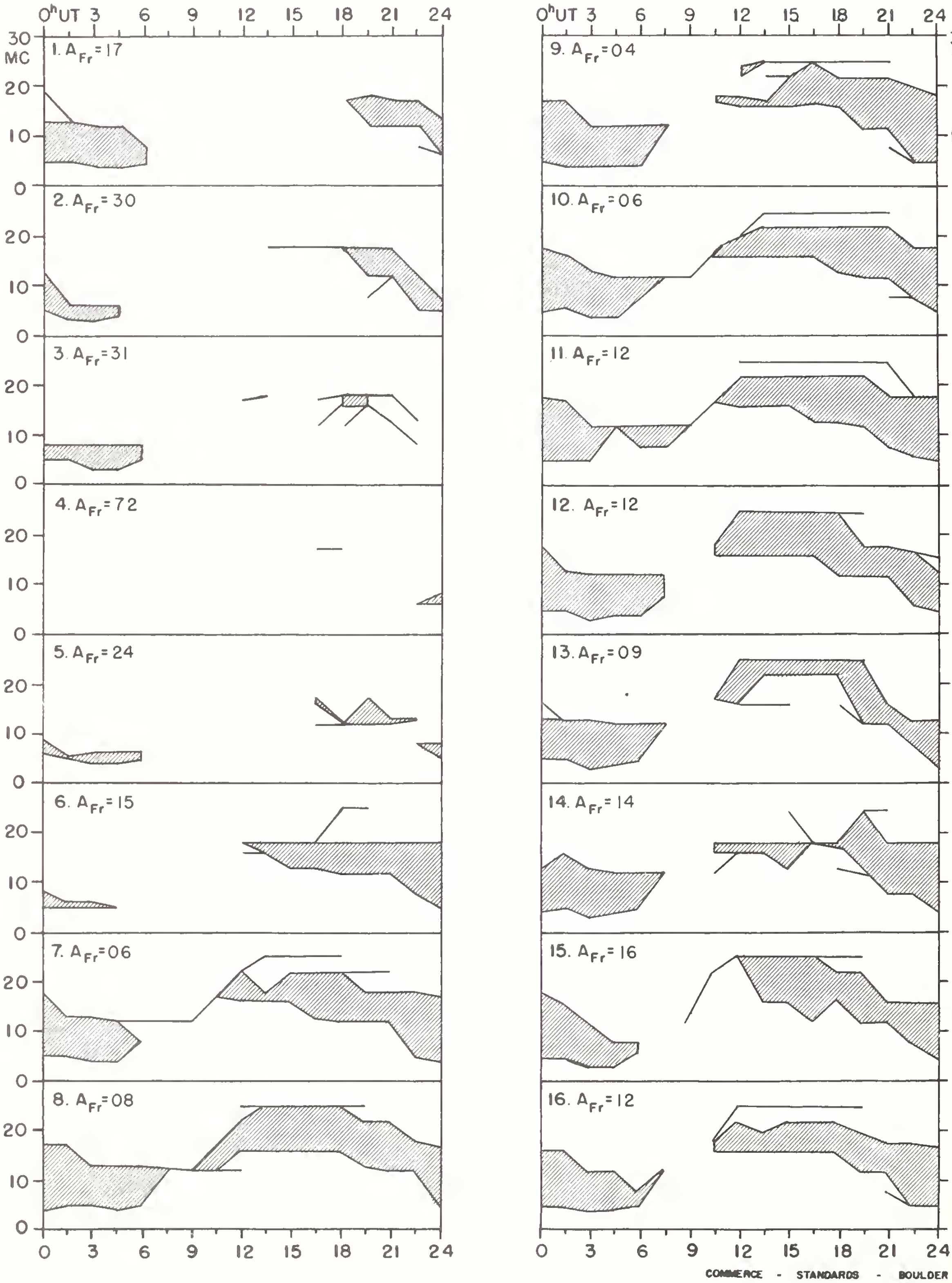


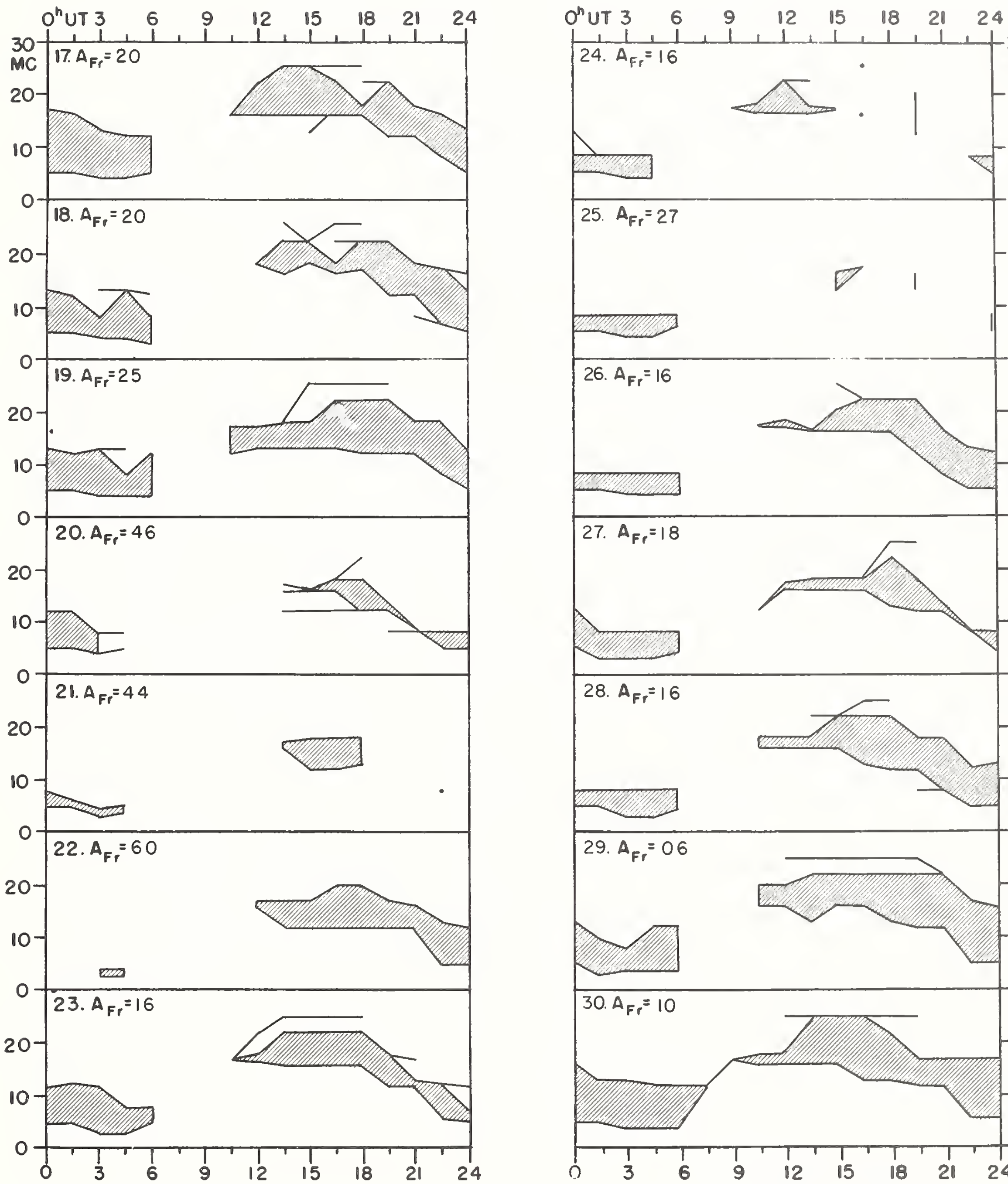
OUTCOME OF ADVANCED FORECASTS FINAL ESTIMATE



USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

SEPTEMBER 1959





Adapted from Observations by Deutsches Bundespost

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

SEPTEMBER 1959

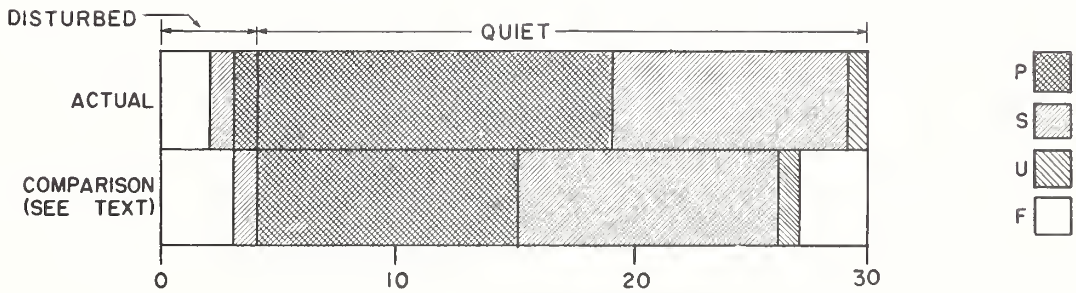
Sept 1959	North Pacific 12-hourly quality figures		Short-term forecasts issued at		Whole day index	Advance forecasts (Jp reports) for whole day; issued in advance by:				Geomagnetic K_{Si}	
	0700 to 1900	1900 to 0700	0600	1800		1-7 days Final	1-7 days Jps	1-7 days SDW	1-7 days Jp	Half Day (1)	(2)
1	5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

( ) represent disturbed values.

NORTH PACIFIC

SEPTEMBER 1959

OUTCOME OF ADVANCED FORECASTS FINAL ESTIMATE



INTERNATIONAL GEOPHYSICAL COOPERATION 1959
OCTOBER 1959

Issued Day/Time UT Oct 1959	Advance Geophysical Alert	No.	Worldwide Geophysical Alert	Special World Interval
01/1245	Ft. Belvoir, Magnetic Storm 01/0430Z			
01/0430		31	Magnetic Storm 01/0430Z	
04/0040	Ft. Belvoir, Magnetic Storm 03/2020Z			
04/1600		32	Aurora Inferred Magnetic Storm 03/17XXZ	
18/1600		33	Magnetic Storm 18/01XXZ	
30/1600		34	Magnetic Storm 29/2347Z	