CRPL-F 157 PART B

FOR OFFICIAL USE

PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
SEPTEMBER 1957

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

CRPL-F 157 PART B

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CENTRAL RADIO PROPAGATION LABORATORY
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INTRODUCTION

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

I DAILY SOLAR INDICES

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

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

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

Solar Flux Values, 2800 Mc -- The table also lists the daily values of solar flux at 2800 Mc recorded in watts/M^2/cycle/second bandwidth (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 $\overline{R}$ of 3.4 was reached.

II SOLAR CENTERS OF ACTIVITY

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

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

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

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

an Angstrom of the 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:

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

where N is the number of indices entering the summation.

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

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

III SOLAR FLARES

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

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

For each flare are listed the reporting observatory, the date, beginning and ending times, time of maximum phase, the heliographic coordinates in degrees, McMath serial number of the region, duration, the flare importance on the IAU scale of 1- to 3+, observing conditions where 1 means poor, 2 fair and 3 good, time of measurement for tabulated width of H 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 Angströms, 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.

Ionospheric Effects -- SID (and GID--gradual ionospheric disturbances) may be detected in a number of ways: short wave fadeouts, enhancement of low frequency atmospherics, increases in cosmic absorption, and so forth. The table lists events that have been recognized on field-strength recordings of distant high-frequency radio transmissions. Under a coordinated program, the staffs at the following ionospheric sounding stations contribute reports that are screened and synthesized at CRPL-Boulder: Puerto Rico, Ft. Belvoir, Va., and Anchorage, Alaska (CRPL Stations: PR, BE, AN); Huancayo, Peru, and College, Alaska (CRPL-Associated Laboratories: HU, CO); and White Sands, N. Mex., Adak,

Alaska, and Okinawa (U. S. Signal Corps Stations: WS, AD, OK). McMath-Hulbert Observatory (MC) also contributes such reports. In addition, reports are volunteered by RCA Communications Inc., Marconi Wireless, Netherlands Postal and Telecommunications Services, Swedish Telecommunications, and others; these usually specify times of SID and the radio paths involved.

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

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

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

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

IV SOLAR RADIO WAVES

2800 Mc Observations

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

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

Simple Burst

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

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

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

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

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

5 - Absorption following burst (negative post).

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

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

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

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

Great Burst

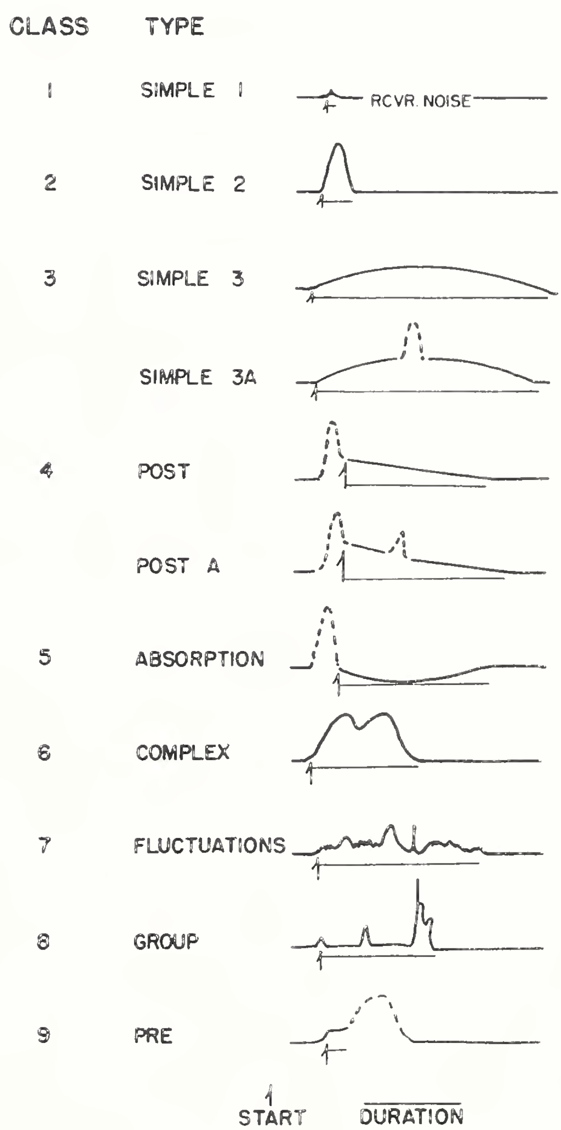
Infrequently occurring bursts of great intensity, often of complicated structure.

Letter "A"

Indicates that this event has another event superimposed upon it.

Letter "f"

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



200 Mc Observations

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

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

170 Mc and 450 Mc Observations

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

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

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

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

1 - The instantaneous flux made from one to ten excursions

outside the range described above.

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

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

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

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

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

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

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

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

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

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

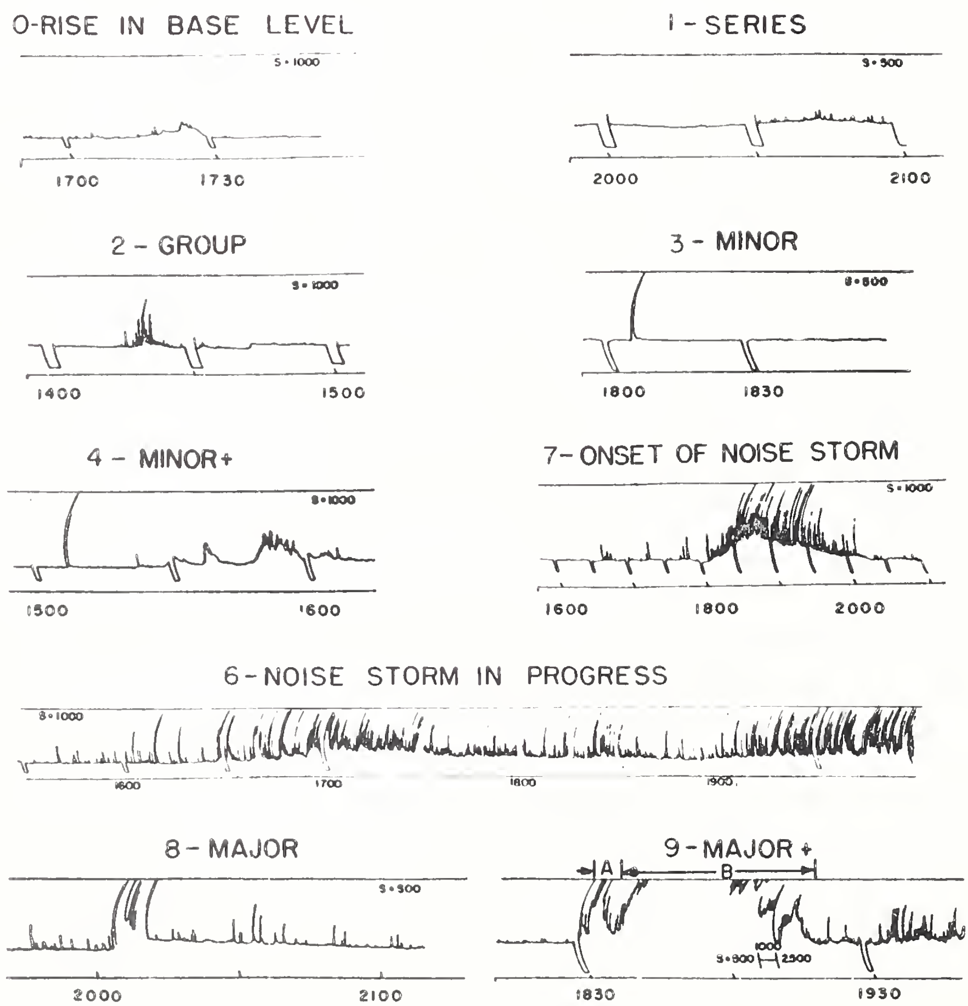
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

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

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

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

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



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

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

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

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

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

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

V GEOMAGNETIC ACTIVITY INDICES

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

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

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

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

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

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

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

VI RADIO PROPAGATION QUALITY INDICES

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

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

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

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

P - forecast quality equal to observed

S - forecast quality one grade different from observed

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

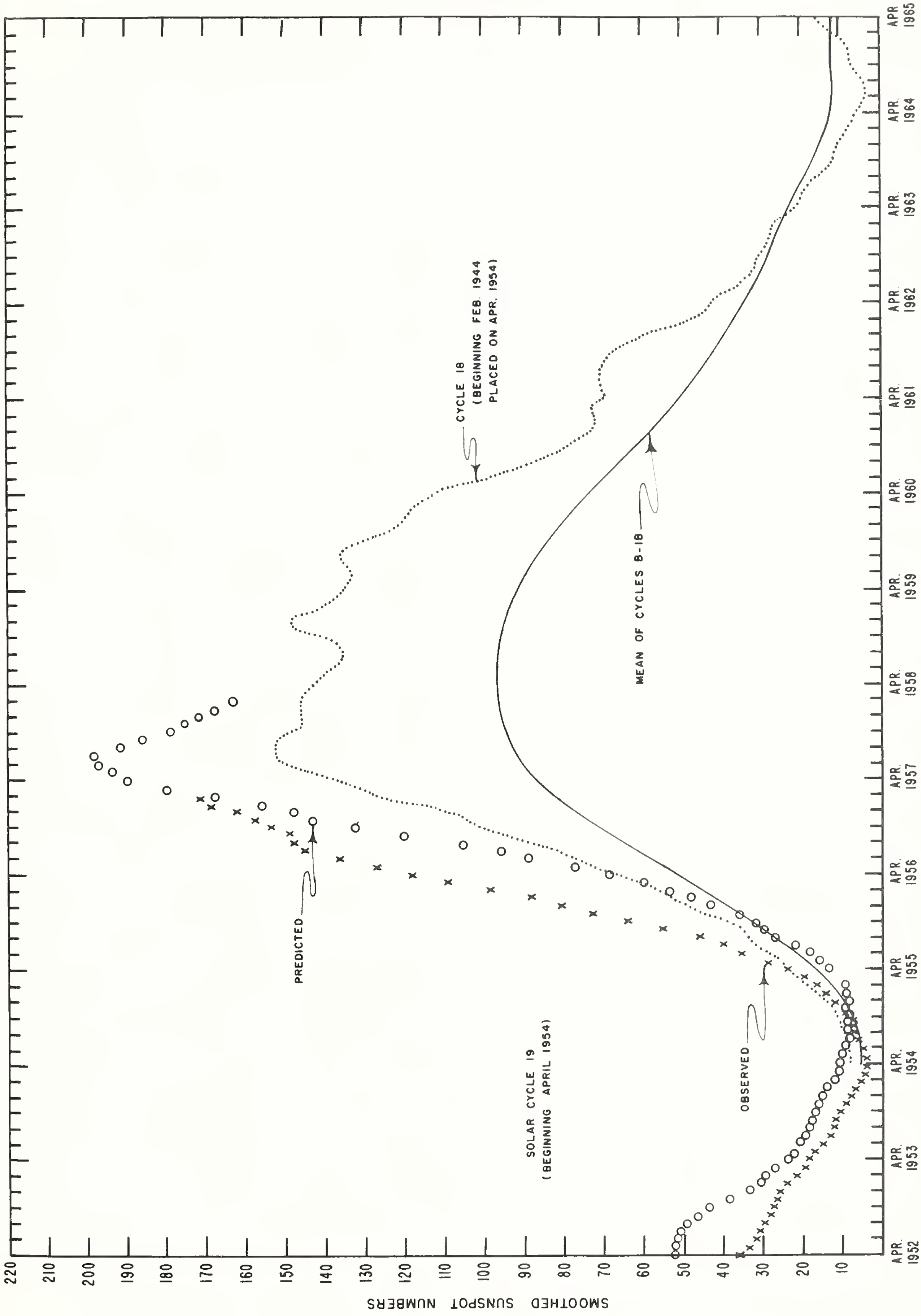
The chart compares the outcome of advance forecasts, on the same basis as the similar chart for the North Atlantic Radio Path.

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

DAILY SOLAR INDICES

July 1957	American Relative Sunspot Numbers R_A'
1	181
2	166
3	198
4	199
5	206
6	197
7	153
8	144
9	129
10	119
11	98
12	76
13	106
14	113
15	141
16	148
17	175
18	186
19	189
20	211
21	220
22	252
23	227
24	189
25	171
26	166
27	155
28	138
29	110
30	112
31	97
Mean:	160.4

Aug. 1957	Zurich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	150	203
2	148	200
3	178	198
4	166	194
5	147	187
6	162	187
7	167	185
8	141	181
9	121	175
10	88	169
11	95	173
12	118	177
13	120	172
14	135	182
15	170	183
16	198	197
17	189	216
18	197	216
19	185	214
20	170	199
21	144	194
22	147	185
23	114	197
24	104	199
25	138	210
26	164	219
27	182	222
28	222	238
29	244	238
30	255	263
31	282	294
Mean:	162.6	202.2



PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

AUGUST 1957

CMP Aug. 1957	Lat	McMath Plage Number	Return of Region	Calcium Plage Data CMP Values Area	Int.	History	Age	Sunspot Data CMP Values Area	Count	History
01.6	S29	4082	4044	6500	3.5	ℓ∧ℓ	3	1290	19	ℓ∧ℓ
02.1	S14	4088	4047	1500	1.5	b—ℓ	4	110	9	b↘d
02.1	N14	4092	New	(600)	(1.5)	b—ℓ	1	(31)	(1)	b—d
02.2	N22	4087	4046	1000	1.5	b∼ℓ	5			
04.2	N26	4083	4057	5000	3.5	ℓ—ℓ	2	630	21	ℓ—ℓ
04.2	N13	4084	4048	1200	2	ℓ↘ℓ	2	(20)	(2)	b—d
05.2	N16	4095	New	(500)	(1.5)	b↗ℓ	1	(60)	(5)	b—ℓ
05.9	N31	4096	New	(300)	(2)	b—ℓ	1	40	4	b↘d
06.5	S14	4102	*	(500)	(1.5)	b—ℓ	1			
07.1	N08	4089	New	1000	3	ℓ—ℓ	1	240	11	b—ℓ
07.5	N27	4085	4053	2100	2	ℓ∧ℓ	3	(10)	(1)	ℓ—d
09.6	S20	4090	+	3000	3	ℓ∧ℓ	1	110	5	ℓ↘d
09.8	N47	4109	New	(600)	(1.5)	b—ℓ	1			
10.8	N35	4091	New	900	1.5	ℓ/\/ℓ	1			
11.2	S15	4093	+	1900	2.5	ℓ_/ℓ	1	(40)	(3)	ℓ/\/ℓ
11.7	S32	4094	4061	2400	2.5	ℓ/⁀ℓ	2	(10)	(1)	ℓ↘d
13.0	S06	4097	*	(500)	(1)	ℓ↘d	1			
13.0	N16	4100	New	1000	3.5	b↗ℓ	1	370	14	b/\/ℓ
13.7	S29	4107	New	600	2	b—ℓ	1	120	2	b↘d
14.7	N13	4098	++	5000	3.5	ℓ∧ℓ	1	470	7	ℓ⁀d
15.2	N22	4115	New	600	3	b↗ℓ	1			
15.4	S11	4099	**	3000	3	ℓ∼ℓ	2	80	4	b↘d
15.6	N24	4110	4065	500	1.5	b↘d	3			
17.3	N25	4101	4065	900	1.5	ℓ∨ℓ	3	220	3	ℓ—ℓ
17.9	S39	4108	4067	1400	1.5	b—d	4			
18.4	S34	4106	4071	3500	2.5	ℓ∼ℓ	2	170	3	ℓ↘d
19.0	S22	4105	4070	6100	3.5	ℓ—ℓ	4	960	7	ℓ\/\d
19.2	N14	4104	4076	400	1.5	ℓ↘d	2			
19.3	N33	4103	4073	900	1.5	ℓ↘d	4	(20)	(2)	b—d
21.8	N33	4111	New	600	2	ℓ↘d	1	(70)	(2)	ℓ↘d
22.3	N14	4112	4075	1800	3.5	ℓ↘ℓ	4	1200	30	ℓ∧ℓ
23.5	S09	4127	New	(400)	(2.5)	b—ℓ	1			
23.6	N37	4113	*	(700)	(1.5)	ℓ↘d	1			
24.3	N12	4114	New	1500	2.5	ℓ⁀d	1	(20)	(2)	ℓ↘d
24.6	S20	4120	4079	1000	2	b—d	4			
25.8	S11	4116	4080	300	1.5	ℓ↘d	3			
27.2	N14	4118	4081	500	2	ℓ↘d	6			
27.4	S24	4117	4082	800	2.5	ℓ—ℓ	4	370	9	ℓ∧ℓ
28.2	S13	4121	+++	1200	2.5	b_/ℓ	1	450	6	b∧d
29.1	N12	4122	4092	2700	3.5	ℓ↗ℓ	2	610	19	b/\/ℓ
29.8	S29	4125	New	(6400)	(3)	ℓ—ℓ	1	760	11	ℓ∧ℓ
31.0	S18	4126	New	700	1	b↗ℓ	1	100	6	b_/ℓ
31.5	N22	4124	***	18,000	2	ℓ∼ℓ	3	2590	51	ℓ/‾ℓ

* New and ephemeral.
** 4066, 4072.
*** 4083, 4084.
+ New, in position of old 4058.
++ New, in position of old 4065.
+++ New, in position of old 4088.

CORONAL LINE EMISSION INDICES

AUGUST 1957

CMP Aug. 1957	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	x	x	x	x	x	x	x	x	192a	216a	20a	35a	x	x	21	35
2	x	x	x	x	x	x	x	x	85a	122a	18a	38a	105a	136a	18a	27a
3	x	x	x	x	x	x	x	x	99	140	x	x	141	177	x	x
4	183	250	40	60	124	155	13	24	82	92	--	--	167	300	35	54
5	137a	198a	41a	84a	106a	154a	11a	22a	124	158	15	22	153	195	76	160
6	125	210	47	84	107	124	18	30	98	123	--	--	131	158	26	44
7	103	186	x	x	103	135	12	20	119	144	x	x	93	130	x	x
8	133a	200a	31	52	198a	250a	18	53	100	117	x	x	63	101	x	x
9	x	x	x	x	x	x	x	x	169	224	44	83	96	148	21	24
10	100	185	x	x	145	205	x	x	151	188	35	81	x	x	22	33
11	x	x	x	x	x	x	x	x	166	218	40	76	97	137	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	120	240	27	47	151	200	54	110	x	x	x	x	x	x	x	x
15	194a	360a	33a	59a	193a	270a	24a	42a	x	x	x	x	x	x	x	x
16	109	130	36	76	154	225	25	44	165	220	17	22	97	170	18	24
17	98	170	x	x	120	133	x	x	228	302	42	92	164	227	30	60
18	136	180	50	76	195	234	47	71	240	306	32	54	137	256	35	48
19	148	196	53	80	185	238	54	86	x	x	x	x	x	x	x	x
20	172	202	31	49	164	194	43	65	x	x	x	x	x	x	x	x
21	212	252	x	x	116	153	x	x	x	x	x	x	x	x	x	x
22	254	325	77	130	95	134	x	x	x	x	x	x	x	x	x	x
23	184	288	58	90	72	100	23	38	x	x	x	x	x	x	x	x
24	94	160	25	38	58	78	15	33	62	77	x	x	66	99	x	x
25	100	137	19	22	57	87	17	33	109	204	24	36	68	104	16	21
26	x	x	x	x	x	x	x	x	103	150	20	36	97	100	12	20
27	x	x	x	x	x	x	x	x	120	156	17	24	114	142	18	42
28	x	x	x	x	x	x	x	x	160	216	35	45	96	130	60	84
29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
30	123	155	22	44	170	300	16	30	x	x	x	x	x	x	x	x
31	203	292	60	152	147	256	43	65	x	x	x	x	x	x	x	x

a = index computed from low weight data.
x = no observations.
-- = no observable emission.

Erratum: Legend for July 1957 table should read: ✲ = yellow line observed.

SOLAR FLARES

AUGUST 1957

Observatory	Date Aug 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat. Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
MITAKA	01	0119	0123 D		N11 W86	4075	4 D	1	2	0119	1.84	8.25	2.38		
MITAKA	01	0124	0134		S27 E15	4082	10	1	2	0124	.89	1.08	2.15	125	
MITAKA	01	0147	0158	0147	S12 E18	4088	11	1	2	0147	1.84	2.02	2.08	131	
MITAKA	01	0208	0228	0215	S34 E14	4082	20	1	2	0208	3.80	5.00	2.51	140	Slow S-SWF
MITAKA	01	0216	0242	0218	S27 E12	4082	26	1&	2	0221	3.80	4.60	2.67	176	
MITAKA	01	0253	0314 D		N34 W04	4086	21 D	1	1	0258	2.05	2.30	2.22	115	
MITAKA	01	0412	0424 D		N34 W03	4086	12 D	1	1	0417	1.84	2.08	1.70	96	
MITAKA	01	0424	0437 D		N11 W82	4075	13 D	1	1	0430	.89	3.56	2.45		
MITAKA	01	0509 E	0524		N11 W88	4075	15 D	1	1	0512	1.84	8.25			
SIMEIZ	01	0600			N35 W02	4086		2							
WENDEL	01	0604 E	0629	0607	N33 W06	4086	25 D	1&				7.00			
* SAN MIGUEL	01	0605	0625		N36 W02	4086	20	2							
MITAKA	01	0605	0625	0611	N34 W06	4086	20	2	1	0607	7.57	8.55	2.45	156	
TASHKENT	01	0605 E	0705	0608	N34 W05	4086	60 D	2&							
ABASTUMANI	01	0614 E			N34 W07	4086		2							
UCCLE	01	0808 E			N14 W87	4075			2						
CAPRI S	01	0819 E	0828 D		N10 W88	4075	9 D	1	3		.40	2.40			
UCCLE	01	0819	0849		S32 E12	4082	30	1							
UCCLE	01	0943	1038	0952	S31 E08	4082	55	1		0952		3.20			
CAPRI S	01	0951	1055		S30 E08	4082	64	2	2	1020	4.50	5.40			
CAPRI S	01	1033 E	1056 D		N09 W89	4075	23 D	1	2		.50	3.00			
ONDREJOV	01	1034 E	1037 D		N15 W85	4075	3 D	1	2	1035			3.20		
UCCLE	01	1131	1140	1134	N35 W06	4082	9	1		1134		3.10			
* CAPRI S	01	1131 E	1205 0		N36 W07	4086	34 D	1	2		3.20	3.80			
ONDREJOV	01	1134 E	1148 D	1140	N34 W06	4086	14 D	1&	2	1140			2.80		
OTTAWA	01	1259	1333	1304	N12 W81	4075	34	1	1	1321	.58	3.20			
SAC PEAK	01	1352	1437	1420	S35 E04	4082	45	1	2		3.00			15	
MEUDON	01	1629 E	1640 D		S35 E10	4082	11 D	2							
*MT WILSON	01	1748	1800		N25 E44	4083	12	1							
MT WILSON	01	1802	1807		S35 E10	4082	5	1							
HAWAII	02	0012	0020	0016	N23 E33	4083	8	1&	3		4.10	5.40			
MITAKA	02	0433	0438 D		S25 W12	4082	5 D	1	2	0433	1.84	2.02	2.10	102	
ONDREJOV	02	0459	0506	0502	S32 W01	4082	7	1	3	0502			2.80		
UCCLE	02	0905	0915	0907	S31 W02	4082	10	1							
*ONDREJOV	02	0954 E	0958 D		S30 W01	4082	4 D	1	2	0956			2.30		
*ONOREJOV	02	1328 E	1342		S30 W04	4082	14 D	1	1	1332			2.50		Slow S-SWF
* ONOREJOV	02	1328 E	1343		N32 W21	4086	15 D	1	1	1336			2.90		
OTTAWA	02	1330 E	1356	1332	N33 W21	4086	26 D	1	1	1332	1.97	2.38			Slow S-SWF
OTTAWA	02	1356		1404	N10 E57	4089		1	1	1404	1.16	2.17			
USNRL	02	1356	1413	1403	N08 E60	4089	17	1	2	1403	1.13	3.32		104	
R O EDIN	02	1358	1416	1404	N10 E60	4089	18	2	2	1402	3.00	6.00	5.22		S-SWF
R O HERST	02	1359	1408	1403	N09 E59	4089	9	1	2	1402	.50	1.00	6.60	240	
ONDREJOV	02	1359 E	1411	1407	N09 E55	4089	12 D	1&	2	1407			4.80		
UCCLE	02	1432	1445	1435	N25 E32	4083	13	2		1435		5.80			
* MC MATH	02	1436	1445		N26 E30	4083	9	1&							S-SWF
R O EDIN	02	1437 E	1446		N26 E34	4083	9 D	1	2	1440	1.50	1.90	5.36		
ONOREJOV	02	1438 E	1446 D		N25 E22	4083	8 D	2	3	1438			5.40		
UCCLE	02	1527	1532	1530	S32 W12	4082	5	1							
* MT WILSON	02	1530	1535		S35 E00	4082	5	1							
ONDREJOV	02	1531 E	1534		S32 W06	4082	3 D	1&	3	1531			3.20		
* UCCLE	02	1637	1653	1647	N36 W21	4086	16	1							
ONOREJOV	02	1654 E	1659 D		N34 W21	4086	5 D	1	1						G-SWF
* USNRL	02	1807	1826	1814	N07 E57	4089	19	1	2	1814	2.04	3.76		95	
MT WILSON	02	1815	1830		N09 E55	4089	15	1&							Slow S-SWF
HAWAII	02	2232	2252	2244	S30 W10	4082	20	1	1		4.10	5.40			
HAWAII	02	2344		2348	N15 E55	4089		1	1		5.10	9.60			
MITAKA	03	0221 E	0250 D	0234	S28 W13	4082	29 D	1	1	0221	.89	1.01	2.33	118	
MITAKA	03	0254	0310 D	0300	S30 W12	4082	16 D	1	1	0255	.89	1.12	1.87	93	
MITAKA	03	0318	0327 D	0322	S34 W09	4082	9 D	1	1	0322	.89	1.15	1.78	107	
MITAKA	03	0328	0350 D	0332	N09 E50	4089	22 D	1&	1	0332	3.80	5.82	1.62	120	
MITAKA	03	0450	0459		S34 W10	4082	9	1	1	0451	.89	1.15	2.54	102	
MITAKA	03	0455	0517 0	0459	S31 W10	4082	22 D	1	1	0459	1.34	1.68	2.85	134	
MITAKA	03	0458	0512	0459	S30 W13	4082	14	1	1	0501	.89	1.10	1.93	107	
MITAKA	03	0501	0520 D	0512	S28 W15	4082	19 0	1	1	0501	.89	1.09	1.93	107	
UCCLE	03	0608 E	0623	0615	N08 E49	4089	15 D	1	3	0615		4.00			
UCCLE	03	0804 E	0806 D		N27 E09	4083	2 D	1							
* ZURICH	03	0820 E	0854		S30 W14	4082	34 D	1	3	0820		5.00			
UCCLE	03	0820	0943 0	0833	S30 W17	4082	83 D	1&		0833		5.60			
ZURICH	03	0855	0905 0		N16 E21	4083	10 0	1	3	0855		1.00			
CAPRI S	03	0913 E	0933		S29 W15	4082	20 D	1	3		2.00	2.40			
UCCLE	03	0958	1003	1001	S23 W29	4082	5	1&		1001		5.20			
CAPRI S	03	1153	1246		S16 W14	4088	53	1&	3	1207	2.50	2.60			
* UCCLE	03	1155	1232	1200	S13 W14	4088	37	2&		1200		9.00			G-SWF

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

E = less than.
D = greater than.
U = uncertain.
F = Approximate.
& = plus.

SOLAR FLARES

AUGUST 1957

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max Phase UT	Approx. Position Lat. Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
MEUDON	03	1155	1300		S16 W10	4088	65	2							
UCCLE	03	1158	1204	1200	S19 W12	4088	6	1		1200		3.00			G-SWF
* CAPRI S	03	1208	1238		S29 W17	4082	30	1	3		2.00	2.40			
USNRL	03	1213 E	1242	1217	S29 W19	4082	29 D	1	1	1217	1.92	2.16		83	
OTTAWA	03	1312	1340	1316	N28 E11	4083	28	1	1	1316	3.83	4.24			
* UCCLE	03	1313	1340	1318	N29 E12	4083	27	1+		1318		5.30			Slow S-SWF
CAPRI S	03	1315	1339		N27 E12	4083	24	1	3		3.00	3.50			
* R O EDIN	03	1432	1442	1434	S32 W16	4082	10	1	1	1336	2.00	2.65	3.09		
CAPRI S	03	1524	1530		N10 E42	4089	6	1	3		1.80	2.70			
SAC PEAK	03	1545	1602	1557	S31 W21	4082	17	1	2		2.10			19	
UCCLE	03	1548	1600	1556	S29 W20	4082	12	1		1556		3.60			
CAPRI S	03	1550	1600		S28 W19	4082	10	1	3		1.80	2.10			
UCCLE	03	1611	1628		S31 W17	4082	17	1				2.80			
* UCCLE	03	1638	1643 D	1638	N29 E06	4083	5 D	1		1638		2.10			
MT WILSON	03	1638	1648		N26 E12	4083	10	1							
UCCLE	03	1721		1724	N27 E17	4083		1+		1724		4.60			
SAC PEAK	03	1722 E	1735	1722 E	N26 E17	4083	13 D	1	2					28	Slow S-SWF
MC MATH	03	1730 E	1734		N26 E10	4083	4 D	1							
* UCCLE	03	1726	1744 D	1729	S30 W20	4082	18 D	1		1729		3.20			
MC MATH	03	1734 E	1737 D		S29 W20	4082	3 D	1							
* HAWAII	03	1840	1856	1844	S29 W25	4082	16	1	1		1.70	2.20			
MT WILSON	03	1842	1852		S30 W14	4082	10	1							
UCCLE	04	0634	0705	0646	S02 E37	4089	31	1	2						
* UCCLE	04	0729	0742	0731	N27 E37	4085	13	1		0731		4.80			
CAPRI S	04	0730	0750		N22 E35	4089	20	1	3		1.50	2.00			G-SWF
UCCLE	04	0926	1029	0934	S26 E65	4090	63	1		0934		4.20			
UCCLE	04	1006	1036	1011	N09 E33	4089	30	1		1011		2.70			
* UCCLE	04	1021	1031	1024	N24 E12	4083	10	1		1024		2.70			
ZURICH	04	1120 E	1129		N08 E33	4089	9 D	1	3	1120		2.00			
MT WILSON	04	1542	1554		S36 W26	4082	12	1							
MT WILSON	04	1622			N26 W01	4083		1							
UCCLE	04	1639	1654	1644	N35 W01	4083	15	1		1644		4.30			G-SWF
WENDEL	04	1644 E	1653		N26 E02	4083	9 D	1+				7.00			
MT WILSON	04	1827			N26 W02	4083		1+							Slow S-SWF
* ONDREJOV	05	0807 E	0814		S28 W54	4082	7 D	1	3	0809			2.90		
ONDREJOV	05	0938 E	0944		S20 E64	4090	6 D	1	2	0942			2.80		
* ONDREJOV	05	1259	1308 D	1303	N22 W18	4083	9 D	1+	2	1303			2.50		
* UCCLE	05	1614 E	1621 D	1616	S23 W65	4082	7 D	1		1616		2.30			
ONDREJOV	05	1620 E	1624	1622	S26 W59	4082	4 D	1	3	1622			4.40		
USNRL	05	1902	1954	1905	N26 W11	4083	52	1	2	1905	2.60	2.81		102	
* MT WILSON	05	1905	1920		N26 W10	4083	15	1+							S-SWF
MC MATH	05	1905 E	1925 D		N27 W05	4083	20 D	1							
* ONDREJOV	06	0654	0703	0657	N24 W16	4083	9	1+	3	0657			6.00		
ONDREJOV	06	0715	0723	0717	N24 W22	4083	8	1+	3	0717			2.50		
CAPRI S	06	1053 E	1059		S30 W48	4082	6 D	1	3		1.50	2.60			
ONDREJOV	06	1057 E	1059		S32 W47	4082	2 D	1+	3	1057			1.60		
USNRL	06	1134	1145	1136	S39 E68	4094	11	1	2	1136	1.02	4.26			
* ONDREJOV	06	1136 E	1144		S34 E82	4094	8 D	1	3	1136			3.60		
CAPRI S	06	1136	1146		S37 E80	4094	10	1	3		.60	2.70			
* CAPRI S	06	1200 E	1210 D		S27 W55	4082	10 D	1	3		1.50	3.00			
MT WILSON	06	1354	1404		S37 E68	4094	10	1							
* CAPRI S	06	1354	1417		S37 E78	4094	23	1	3		.50	2.20			
OTTAWA	06	1355 E			S35 E67	4094		1	1	1401	.70	3.12			
MT WILSON	06	2323	2326		S37 E65	4094	3	1							
* KANZELHOHE	07	0714 E	0800 D		N25 W45	4083	46 D	2							
OTTAWA	07	1115		1119	N26 W37	4083		1	2	1136	1.68	2.23			
UCCLE	07	1119 E	1124		N27 W40	4083	5 D	1				2.50			
* UCCLE	07	1134	1204 D	1135	N27 W40	4083	30 D	1				2.20			
* CAPRI S	07	1602 E	1628		N25 W51	4083	26 D	1	3		1.50	2.80			
ZURICH	07	1606	1640 D		N26 W46	4083	34 D	1	3	1606		5.00			
MT WILSON	07	1642	1652		S20 E49	4093	10	1							
MT WILSON	07	2155	2200		N26 W46	4083	5	1							G-SWF
MT WILSON	07	2345	0024		N26 W47	4083	39	1+							G-SWF
ATHENS	08	0611	0634	0613	N13 W15	4089	23	1	4		3.40	3.50			
CANBERRA	08	0611	0634		N13 W15	4089	23	1							
CAPRI S	08	0611	0640		N12 W14	4089	29	1+	3	0619	4.00	4.20			
* UCCLE	08	0805	0817	0805	S15 E42	4093	12	2		0805		6.10			
UCCLE	08	1116	1121 D	1121	N30 W60	4083	5 D	1		1121		4.20			
ONDREJOV	08	1118 E	1201	1126	N27 W58	4083	43 D	2	2	1126			5.50		
KANZELHOHE	08	1120 E	1205 D		N25 W55	4083	45 D	2							Slow S-SWF

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max Phase UT	Approx. Position Lat.	Approx. Position Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
CAPRI S	08	1120 E	1216		N26	W62	4083	56 D	2B	3	1128	2.50	6.30			Slow S-SWF
SCHAUINS	08	1125 E	1227 D		N27	W60	4083	62 D	2							
WENDEL	08	1134 E	1153 D	1139	N28	W50	4083	19 D	2B				17.00			
R O HERST	08	1134 E	1157 D	1134 E	N28	W57	4083	20 D	1B	1	1137	2.40	4.40	2.10	92	
ZURICH	08	1146 E	1210 D		N28	W55	4083	24 D	1	2	1146		6.00			
USNRL	08	1152 E	1220	1156	N28	W58	4083	28 D	1	1	1156	2.60	5.00		82	
ABASTUMANI	09	0609	0739	0629	S09	E75	4099	90	2							
WENDEL	09	0617 E	0658	0637	S10	E78	4099	41 D	2				12.00			
ATHENS	09	0623	0648	0626	S09	E74	4099	25	1B	3		1.00	4.1			
CANBERRA	09	0623	0648		S09	E74	4099	25	1B							
CAPRI S	09	0624 E	0652		S08	E73	4099	28 D	1B	3	0628	1.20	4.80			S-SWF
SAN MIGUEL	09	0626	0640		S05	E75	4099	14	2							
MITAKA	09	0626	0640		S07	E78	4099	14	2	2	0626	3.80	1.51	3.43		
ZURICH	09	0636 E	0646 D		S10	E77	4099	10 D	1	3	0636		5.00			
ONDREJOV	09	0622	0642	0625	N10	E80	4098	20	1	3	0625			6.10		
ZURICH	09	0813 E	0819		N25	W66	4083	6 D	1	3	0813		2.00			
ONDREJOV	09	0836 E	0842		N11	E63	4098	6 D	1	3	0836			3.50		
CAPRI S	09	0913	0932 D		S08	E72	4099	19 D	1	2	0920	1.50	5.20			
SAC PEAK	09	1330	1442	1355	S33	W80	4082	72	1	1		2.10			14	Slow S-SWF
OTTAWA	09	1401 E			S33	W74	4082		1	1	1410	2.03	1.15 5	•		
* MT WILSON	09	1614	1619		S36	E31	4094	5	1							
ONDREJOV	09	1616 E	1621		S33	E22	4094	5 D	1	1	1617			2.50		
* MT WILSON	09	2149	2210		S11	E68	4099	21	1							
MT WILSON	09	2200	2210		S16	E39	4093	10	1							
MT WILSON	10	0125			N26	W71	4083		1							S-SWF
ATHENS	10	0641	0702	0643	N24	W81	4083	21	1B	3		.80	3.80			
CAPRI S	10	0642 E	0723 D		N21	W83	4083	41 D	1B	2	0646	1.50	6.80			Slow S-SWF
SIMEIZ	10	0703	0714	0709	S28	W90	4082	11	2							
CAPRI S	10	1059 E	1130		S11	E59	4099	31 D	2B	3	1101	3.50	7.30			
SIMEIZ	10	1102 E	1133		S10	E60	4099	31 D	2							S-SWF
ONDREJOV	10	1102 E	1133 D		S10	E60	4099	31 D	2	1						
CAPRI S	10	1133	1147		S07	E59	4099	14	1	3	1135	1.00	2.00			
* MT WILSON	10	1655	1710		S10	E00	4093	15	1							G-SWF
MT WILSON	10	1850	1855		S10	E01	4093	5	1							
MT WILSON	10	2042	2046		S30	W90	4082	4	1							
MT WILSON	10	2224	2235		S10	E03	4093	11	1							
UCCLE	11	0939	0955	0940	S22	E52	4099	16	1		0940		3.30			
* USNRL	11	1148	1202	1149	N28	W90	4083	14		2	1149	.34			45	
HAWAII	11	2148	2208	2152	S10	E38	4099	20	1	3		4.50	6.00			S-SWF
* MITAKA	11	2338 E	2354 D		N16	E25	4098	16 D	1	1	2343	1.78	2.00	1.60	87	
* MITAKA	12	0037	0046 D	0040	N16	E14	4098	9 D	1	1	0040	3.80	3.95	3.14	149	
HAWAII	12	0148	0208	0154	S31	E90	4106	20	1B	3		5.20				
* ATHENS	12	0702	0709	0704	N11	W71	4089	7	1	3		.90	2.50			
CAPRI S	12	1034 E	1047		S37	E73	4106	13 D	1	3	1038	1.00	4.50			
* CAPRI S	12	1235	1255		N20	E30	4098	20	1	3	1243	1.60	2.20			
MT WILSON	12	1500 E	1610		N20	E25	4098	70 D	1B							
CLIMAX	12	1514	1617 D	1531	N11	E26	4098	63 D	1		1531	2.90				
UCCLE	12	1516	1627 D	1532	N18	E26	4098	71 D	2B		1532		8.00			
SAC PEAK	12	1520	1627	1537	N14	E24	4098	7	1	2		2.90			18	
CAPRI S	12	1523	1625		N18	E23	4098	62	2	3	1558	4.30	5.10			
* MC MATH	12	1525 E	1617 D		N15	E25	4098	52 D	1B							
HUANCAYO	12	1525 E	1620	1530	N12	E29	4098	55 D	1B	2						
USNRL	12	1529 E	1628	1550	N16	E25	4098	59 D	1	1	1550	2.82	3.16		74	
ZURICH	12	1533 E	1608 D		N13	E22	4098	35 D	1	2	1533		6.00			
ARCETRI	12	1540 E	1616 D		N14	E26	4098	36 D	1	2	1603	2.50	2.90			
MT WILSON	13	0102			N13	E12	4098		1B							
USNRL	13	1241	1318	1250	S32	W20	4094	37	1	2	1250	1.81	2.55		90	
CAPRI S	13	1244	1312		S30	W17	4094	28	1	3	1250	2.00	2.80			G-SWF
OTTAWA	13	1245	1320	1252	S34	W18	4094	35	2	1	1252	4.41	6.14			
SAC PEAK	13	1255 E	1357	1255	S35	W21	4094	2 D	1	2		2.20			15	
* SAC PEAK	13	1355	1435	1400	N16	E05	4098	40	1	2		2.90			18	
OTTAWA	13	1357			N15	E04	4098		1	1	1409	3.94	4.02			
MC MATH	13	1400 E	1413 D		N15	E12	4098	13 D	1							
CLIMAX	13	1403 E	1430		N15	E05	4098	27 D	1		1403	2.50				
SAC PEAK	13	1455	1537	1457	N15	E04	4098	27	1	2		2.90			17	
*MC MATH	13	1850 E	1915 D		N15	E00	4098	25 D	1B							Slow S-SWF
SAC PEAK	13	2035	2100	2047	N11	E16	4098	25	1	2		2.90			13	G-SWF
*UCCLE	14	1208 E	1221	1212	N17	W08	4098	13 D	1B		1212		4.60			
SAC PEAK	14	1305 E	1345	1305 E	S26	E55	4105	40 D	1	2		2.10			15	

SOLAR FLARES

AUGUST 1957

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat. Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
* USNRL	14	1921	1936 D	1926	N15 W13	4098	15 D	1	1	1926	1.70	1.79		120	S-SWF
HAWAII	14	1922	1938	1922	N14 W12	4098	16	1	3		2.10	2.20			
* HAWAII	14	1944	1958	1950	N15 W10	4098	14	1	3		1.90	2.00			
USNRL	14	2008	2034	2009	N15 W14	4098	26	1	2	2009	2.04	2.13		99	Slow S-SWF
HAWAII	14	2008	2034	2016	N14 W16	4098	26	1	3		2.70	2.90			
MT WILSON	14	2237	2243		S34 E52	4106	6	1							
MT WILSON	15	0055	0103		S32 W16	4107	8	1							
ONDREJOV	15	0556 E	0605		S38 W39	4094	9 0	2	3	0559			2.90		
* ONDREJOV	15	0615 E	0625		N14 W17	4098	10 D	1	3	0618			2.50		
CAPRI S	15	0914	0932		N15 W16	4098	18	1	2	0921	2.50	2.70			
ONDREJOV	15	0916 E	0926	0919	N14 W18	4098	10 D	1&	3	0919			2.60		
ONDREJOV	15	1207 E	1215	1209	N14 W18	4098	8 D	1	2	1209			2.30		
OTTAWA	15	1210 E			N15 W22	4098		1	1	1214	2.78	3.05			
SAC PEAK	15	1727	1807	1735	S12 W56	4093	40	1	1		2.10			18	
USNRL	15	1730 E	1749 D	1734	S12 W56	4093	19 0	1	1	1734	1.70	3.51		89	Slow S-SWF
MT WILSON	15	1732	1742		S15 W47	4093	10	1							
MT WILSON	15	2020	2030		N10 E79	4112	10	1							
* LVOV	16	0719	0728		S16 W58	4093	9	1&							
CAPRI S	16	1000 E	1007		S12 W58	4093	7 0	1	3	1002	1.30	2.60			
OTTAWA	16	1438			N18 E71	4112		1	1	1442	1.04	3.13			
MT WILSON	16	2325	2330		S09 E21	4105	5	1							
OTTAWA	17	1230		1233	S21 E06	4105		1	2	1233	1.74	1.99			
CAPRI S	17	1231	1304		S22 E07	4105	33	1	3	1247	2.00	2.20			
MC MATH	17	1237 E	1316 0		S21 E03	4105	39 0	1							G-SWF
OTTAWA	17	1245	1316	1249	S21 E08	4105	31	1	2	1249	2.44	2.80			
* MT WILSON	17	1717	1737		N10 E53	4112	20	1							G-SWF
* MT WILSON	17	1930	1945		N10 E53	4112	15	1							G-SWF
MT WILSON	17	2002	2010		S22 E06	4105	8	1							
MT WILSON	17	2045	2055		N10 E90	4114	10	1							
* MT WILSON	17	2135	2150		S22 E10	4105	15	1							Slow S-SWF
MC MATH	17	2143 E	2153 D		S22 E00	4105	10 0	1							
SIMEIZ	18	0612 E	0630	0615	S16 W90	4093	18 D	1&							S-SWF
OTTAWA	18	1131		1133	N18 E46	4112		1	1	1133	1.80	2.61			
* OTTAWA	18	1323	1349	1326	S20 W07	4105	26	1	1	1326	2.09	2.37			
MT WILSON	18	1618	1625		S16 W90	4093	7	1							
MT WILSON	18	1925	1935		S23 E05	4105	10	1							
ATHENS	19	0548 E	0634		N11 W88	4100	46 D	1	3		.40	3.20			S-SWF
UCCLE	19	0929	0939	0932	N13 E45	4112	10	1	2	0932		3.30			
UCCLE	19	1100	1120 0	1105	N18 W28	4101	20 D	2		1105		6.10			
ARCETRI	19	1108 E			N18 W28	4101		1	2	1108	1.80	2.07			
MT WILSON	19	1530	1540		N16 W84	4100	10	1							G-SWF
MT WILSON	19	1930	1945		N30 E30	4111	15	1							
MT WILSON	19	2035	2045		N20 E29	4112	10	1							
MITAKA	20	0000 E	0015		S21 W15	4105	15 D	1	1	0005	1.84	2.08			
MITAKA	20	0229	0241	0233	S19 W28	4105	12	1	1	0229	.89	1.06	1.74	120	
CAPRI S	20	0956	1019		S22 W36	4105	23	1	3	1001	1.60	2.10			
ZURICH	20	0958	1022	1002	S21 W33	4105	24	1	3	1002		3.00			
ZURICH	20	1028	1037	1032	N21 E30	4112	9	1	3	1032		5.00			
CAPRI S	20	1029	1040		N25 E28	4112	11	1	3	1034	3.00	3.80			
HUANCAYO	20	1642	1653	1643	N12 E13	4112	11	1	1						
* MT WILSON	20	1645	1655		N09 E15	4112	10	1&							S-SWF
MC MATH	20	1648 E			N14 E10	4112		1							
MT WILSON	21	0157	0203		N20 E24	4112	6	1							
MITAKA	21	0517 E	0532 D	0522	S21 W42	4105	15 D	1	1	0519	3.80	5.55	1.87	107	
ARCETRI	21	0745	0839 D		N25 E19	4112	54 D	1&	1	0804	4.10	4.50			
SIMEIZ	21	0748	0839		N26 E24	4112	51	2							
KRASNAYA	21	0753	0844	0758	N21 E20	4112	51	2							
ATHENS	21	0754	0825	0759	N22 E19	4112	31	1	3		3.00	3.30			
CAPRI S	21	0800 E	0844		N25 E16	4112	44 D	2	3	0824	6.00	6.90			
CAPRI S	21	0844	0918 0		S27 W15	4106	24 D	1	3	0855	2.00	2.20			
UCCLE	21	1114 E	1150		S27 E87	4117	36 D	2	1						G-SWF
ONDREJOV	21	1145 E	1152 D		S26 E85	4117	7 D	1&	2	1149			4.30		
UCCLE	21	1126	1131		N17 E09	4112	5	1							
USNRL	21	1245	1308	1252	S25 E80	4117	23	1	2	1252	.45	2.48		53	G-SWF
USNRL	21	1321	1405	1331	S25 E80	4117	44	1	2	1331	.57	3.10		52	
* USNRL	21	1418	1446	1422	S26 E85	4117	28	1	2	1422	.93			68	G-SWF
HAWAII	21	1940	2030 D	1950	N20 W60	4101	50 D	1&	1		3.10	6.40			
UCCLE	22	1005	1029		N09 E90	4118	24								

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat. Mer. Diat.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
MT WILSON	22	1545	1550		S30 W31	4106	5	1							
CAPRI S	22	1609	1700 D		N29 E05	4112	51 D	1	3	1650	2.00	2.20			
ARCETRI	22	1612	1652 D		N26 E10	4112	40 D	2	2	1650	5.30	5.40			
USNRL	22	1612	1804	1651	N13 E08	4112	112	1	2	1651	2.60	2.84		72	
ONDREJOV	22	1614	1638 D		N14 E10	4112	24 D	1+	2	1623			2.80		Slow S-SWF
MT WILSON	22	1615	1650		N25 E09	4112	35	1+							
MC MATH	22	1625 E	1705 D		N14 E00	4112	40 D	1+							
SAC PEAK	22	1637 E	1640 D	1637 E	N27 E07	4112	3 D	1	1		2.60			17	
MITAKA	22	2224 E	2237 D		N22 W08	4112	13 D	1	1	2224	1.78	1.84	1.81	91	
MITAKA	23	0335	0350 D		N12 W14	4112	15 D	1	1	0340	3.80	3.88	1.60	107	
* MITAKA	23	0617 E	0629	0623	N18 W10	4112	12 D	1	1	0619	3.80	3.91	2.38	120	
* MITAKA	23	0628	0636		N18 W12	4112	8	1	1	0628	.89	.92	2.15	91	
UCCLE	23	0925	0928	0927	N09 E85	4122	3	1							
ZURICH	23	0927	0933		N11 E83	4122	6	1	3	0929		3.00			
OTTAWA	23	1145	1255	1152	N15 W14	4112	10	2	1	1152	5.92	6.18			
CAPRI S	23	1146	1300		N17 W19	4112	74	2	3	1156	6.00	5.60			
WENDEL	23	1147 E	1221 D		N17 W16	4112	34 D	2+				18.00			Slow S-SWF
ONDREJOV	23	1150 E	1208		N14 W15	4112	18 D	1+	3	1152			2.40		
UCCLE	23	1150 E	1228 D	1159	N15 W17	4112	38 D	3	1	1159		14.40			
MC MATH	23	1200 E	1230 D		N15 W19	4112	30 D	1+							
UCCLE	23	1202	1208	1203	N23 W82	4101	6	1							
* NEDERHORST	23	1402 E	1406		N19 W10	4112	4	1							S-SWF
ONDREJOV	23	1405 E	1409		N17 W14	4112	4 D	1+	3	1405			3.10		
MITAKA	24	0426	0434	0428	S22 W61	4105	8	1	1	0428			2.52	113	
UCCLE	24	0742 E	0800		N10 E70	4122	18 D	1	2	0747		2.10			
ATHENS	24	0747	0756		N13 E65	4122	9	1	3		.90	2.20			
UCCLE	24	0751	0801	0754	S34 E87	4125	10	1							
UCCLE	24	1113 E		1113	N23 W26	4112		1	2						
UCCLE	24	1202	1225	1208	S16 E50	4121	23	1	2	1208		3.00			
UCCLE	24	1239	1244 D	1244	N19 W26	4112	5 D	1	2	1244		2.30			
UCCLE	24	1608	1619		N20 W29	4112	11	1	1	1612		2.10			Slow S-SWF
* SCHAUINS	24	1635 E	1759		N11 E57	4122	84	2							
SCHAUINS	24	1652 E	1800		N20 E90	4124	68	2							
* CLIMAX	24	1732	1754	1740	N18 W27	4112	22	1		1740	2.10				
MT WILSON	24	1856	1900		N13 W29	4112	4	1							
* MT WILSON	24	1922	1930		N13 W29	4112	8	2							S-SWF
MT WILSON	24	2152	2200		N10 E55	4122	8	1							
SAC PEAK	24	2158 E	2216 D	2200	N11 E57	4122	18 D	1	2		2.10			15	
MT WILSON	25	0037	0046		N24 W39	4112	9	1+							
MITAKA	25	0038 E	0051	0039	N22 W37	4112	13 D	1+	1	0038	5.67	7.25	3.00	152	
MITAKA	25	0117	0131		N20 W33	4112	14	1	1	0117	2.78	3.36	2.58	113	
MITAKA	25	0245 E	0255 D	0247	N11 E48	4118	10 D	1	1	0245	1.84	2.96	1.86	120	S-SWF
ATHENS	25	0607	0612		N15 E90	4124	5	1+	3		.40	3.90			
UCCLE	25	0641	0646 D		N21 W37	4112	5 D	1	1						
CAPRI S	25	0914 E	0935		N22 W35	4112	21 D	1	3	0918	1.80	2.30			
ZURICH	25	0915 E	0939		N19 W37	4112	24 D	1	2	0915		5.00			S-SWF
ONDREJOV	25	0917 E	0937		N20 W37	4112	20 D	1+	3	0917			3.80		
ZURICH	25	0924	0930	0925	N10 E52	4122	6	1	2	0925		3.00			
* ZURICH	25	1010 E	1014		N23 W41	4112	4 D	1	2	1010		2.00			
UCCLE	25	1156	1202		N10 E49	4122	6	1	1						
UCCLE	25	1247 E	1309 D	1250	N10 E49	4122	22 D	1	2	1250		2.60			
UCCLE	25	1339	1400 D		N26 E90	4124	21 D	1							
CAPRI S	25	1339 E	1408 D		N29 E90	4124	29 D	1	3	1350	2.50				
* UCCLE	25	1456	1526	1506	N20 W41	4112	30	1	2	1506		2.30			
CAPRI S	25	1500	1528 D		N22 W38	4112	28 D	1	2	1510	2.00	2.80			
ONDREJOV	25	1501	1513 D	1504	N20 W40	4112	12 D	1	3	1504			3.20		
ARCETRI	25	1505	1532		N20 W37	4112	27	1	1						
MT WILSON	25	1506	1515		N17 W38	4112	9	1+							
MT WILSON	25	1532	1545		N10 E45	4122	13	1							
UCCLE	25	1558	1626 D	1621	N09 E47	4122	28 D	2	2	1621		10.20			
SAC PEAK	25	1752	1852	1806	N10 E46	4122	60	1	2		2.20			19	
MT WILSON	25	1802	1830		N10 E43	4122	28	1+							Slow S-SWF
SAC PEAK	25	2247	2307	2255	N10 E43	4112	20	1	2		2.10			19	
SAC PEAK	25	2342	2407 D	2407	S33 E63	4125	25 D	1+			4.90			20	S-SWF
MT WILSON	26	0045	0053		N11 E40	4122	8	1							
ATHENS	26	0558	0616		S28 E50	4125	18	2	3		3.50	7.00			
ATHENS	26	0655	0700		S30 E65	4125	5	1	3		.80	2.50			
UCCLE	26	0737	0742	0740	S13 E33	4121	5	1	1	0740		5.20			
ZURICH	26	0853	0908		N23 E66	4124	15	1	3	0853		2.00			
WENDEL	26	0906 E	0932 D		S10 E45	4126	26 D	1				4.00			
CAPRI S	26	0909	0930 D		S16 E43	4122	21 D	1	1	0914	2.50	3.50			

SOLAR FLARES

AUGUST 1957

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat.	Approx. Position Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
ZURICH	26	0912	0925	0914	S03	E46	4126	13	1	3	0914		6.00			
ONOREJOV	26	0915 E	0928		S12	E48	4126	13 D	1+	1						
ONOREJOV	26	0935 E	0939 D		N25	E67	4124	4 D	1+	1						
CAPRI S	26	1115 E	1123		S30	E63	4125	8 D	1	2	1119	1.00	2.80			
ONOREJOV	26	1234 E	1240 D	1236	S31	E64	4125	6 D	1	3	1236			3.10		
* ZURICH	26	1454	1502		N14	E36	4122	8	1	3	1454		3.00			
* OTTAWA	26	1806	1831	1810	N26	E65	4124	25	1	2	1810	.93	2.26			G-SWF
HUANCAYO	26	2110	2145 D	2115	S25	E06	4117	35 D	1	2						
SAC PEAK	26	2110	2150	2132	S26	W02	4117	40	1	3		4.60			15	
* HAWAII	26	2124	2246	2134	S36	E48	4125	22	1	1		1.70	3.10			
* OTTAWA	27	1338	1353	1340	S29	E50	4125	15	1	1	1340	1.04	2.13			
SAC PEAK	27	1712	1750	1720	S30	E49	4125	38	1	2		2.60			16	
MITAKA	27	2317	2329		S29	E38	4125	12	1	2	2319	.41	.64	1.98	107	
* MITAKA	27	2333	2350	2335	S26	E39	4125	17	1	2	2335	1.07	1.73	1.77	134	
SAC PEAK	27	2347	2405 D	2352	N24	W85	4112	18 D	2	2		6.10			18	S-SWF
MITAKA	27	2353 E	2359		N22	E44	4124	6 O	1	2	2356	.89	1.33	1.75	107	S-SWF
* MITAKA	28	0122	0154 D	0135	S26	E38	4125	32 O	2	1	0140	4.70	7.61	1.90	165	S-SWF
MITAKA	28	0425	0455	0425	S26	E36	4125	30	1	2	0425	2.78	4.50	2.32	115	
MITAKA	28	0428	0435		S28	E36	4125	7	1	2	0428	.89	1.44	2.08	118	
MITAKA	28	0432	0455	0432	S30	E41	4125	23	1	2	0439	1.84	3.27	1.92	131	G-SWF
MITAKA	28	0433	0458	0438	S31	E40	4125	25	1	2	0438	1.84	3.27	2.75	143	
MITAKA	28	0434	0439		S33	E40	4125	5	1	2	0435	.89	1.58	1.92	98	
MITAKA	28	0451 E	0516	0451	N22	E48	4124	25 D	1	2	0504	.89	1.47	1.98	131	
MITAKA	28	0452 E	0513	0452	N25	E49	4124	21 D	1	2	0452	.89	1.47	1.87	146	
MITAKA	28	0502	0514		S32	E42	4125	12	1	2	0502	.89	1.58	1.70	100	
MITAKA	28	0503	0514		S28	E39	4125	11	1	2	0503	.89	1.58	1.52	98	
SIMEIZ	28	0706	0735		S26	E38	4125	29	1+							
* CAPRI S	28	0707	0730		S25	E34	4125	23	1	3	0719	1.40	2.00			S-SWF
MITAKA	28	0711	0728 D	0717	S26	E35	4125	17 D	2	1	0718	3.80	6.15	2.46	176	
SIMEIZ	28	0810	0839		S30	E32	4125	29	3							
CAPRI S	28	0841 E	1353	1002	S30	E26	4125	312 O	3	3	1012	16.00	21.00			
R O HERST	28	0913	1215	0955 U	S30	E35	4125	182	3+	2	0949	17.00	25.00	3.60	170	
STOCKHOLM	28	0931 E			S30	E32	4125		3+							S-SWF
NEOERHORST	28	0950 E	1012		S30	E32	4125	22	3							
USNRL	28	1145	1404	1147	S35	E30	4125	19	2	2	1147	3.39	5.37		95	
CAPRI S	28	1545	1646 D		S29	E35	4125	61 D	2	1	1631	4.00	5.60			
USNRL	28	1546	1637	1602	S30	E36	4125	51	1	2	1602	1.24	1.90		103	
HUANCAYO	28	1547	1659 D	1601	S31	E39	4125	12 D	1+	2						S-SWF
* MT WILSON	28	1610	1645		S31	E38	4125	35	2							
ARCETRI	28	1625 E			S30	E35	4125		2+	2						
ARCETRI	28	1630	1640		S30	E35	4125	10	1	2						
ARCETRI	28	1635	1655		S30	E35	4125	20	1	2						
* MT WILSON	28	1848	1858		S13	W12	4121	10	1							
* MT WILSON	28	1903	1930		N26	E41	4124	27	1							Slow S-SWF
* MT WILSON	28	1915	1940		S28	E28	4125	25	1							
SAC PEAK	28	2010	2042	2020	S27	E28	4125	32	2+	2		11.20			28	
HUANCAYO	28	2015	2039 D	2020	S28	E33	4125	24 D	2	2						S-SWF
HAWAII	28	2032 E	2038	2032	S27	E31	4125	6 D	1	1		1.80	2.30			
SAC PEAK	28	2255	2405 D	2302	S32	E32	4125	10 O	1	2		2.90			18	
MT WILSON	28	2258			S28	E32	4125		1+							
HAWAII	28	2302 E	2310 D	2308	S32	E30	4125	8 D	1	1		2.10	2.20			
MITAKA	29	0545 E	0615	0547	N25	E33	4124	30 D	2+	1	0547	7.42	9.65	3.43	204	
TASHKENT	29	0550 E	0614	0555	N26	E33	4124	24 D	1+							S-SWF
ATHENS	29	0552 E	0715		N25	E34	4124	83 D	1+	4		3.10	3.90			
CAPRI S	29	0600 E	0648 D		N25	E34	4124	48 D	1	2	0626	1.80	2.30			
MITAKA	29	0636 E	0646		S34	W30	4117	10 D	1	1	0637	1.84	2.76	2.47	96	
MITAKA	29	0642 E	0655 D		N27	E38	4124	13 D	1	1	0642	.89	1.21	2.17	100	
SIMEIZ	29	0652 E			N23	E37	4124		1							
* MITAKA	29	0701 E	0726 D		N21	E31	4124	25 D	1	1	0714	1.84	2.30	1.68	115	
* ONOREJOV	29	0752 E	0816 D		N23	E35	4124	24 D	1	1						
UCCLE	29	0835	0853	0841	N23	E30	4124	18	1	2	0841	3.20	4.00			
ARCETRI	29	0845	0915		N20	E37	4124	30	2	1						
ARCETRI	29	0945	1030		N23	E37	4124	45	2	1						
* CAPRI S	29	0947	1035 D		N23	E39	4124	48 D	1	2	0950	2.00	2.80			
ZURICH	29	0949 E	1027		N21	E36	4124	38 D	2	3	0953		10.00			
* UCCLE	29	1018	1023	1019	S33	E19	4125	5	1	2	1019	3.20	4.50			
ZURICH	29	1021	1027		S30	E20	4125	6	1	3	1021		2.00			
UCCLE	29	1031	1049	1037	S20	E22	4125	18	2+	2	1037	4.40	5.60			
ARCETRI	29	1037 E	1052 D		S24	E22	4125	15	3	1						S-SWF
CAPRI S	29	1038 E	1053		S25	E16	4125	15 D	1+	3	1040	2.50	3.00			
ONDREJOV	29	1044 E	1052		S25	E24	4125	8 D	1+	2	1045			3.70		
CAPRI S	29	1221	1252 D		S31	E20	4125	31 D	1	2	1229	1.80	2.20			

Observatory	Date Aug 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat.	Approx. Position Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
* ONOREJOV	29	1228 E	1236		S31	E27	4125	8 D	1	1	1234			1.90		
ZURICH	29	1229 E	1245		S32	E21	4125	16 D	1	3	1231		7.00			
ONDREJOV	29	1333 E	1340		S36	E18	4125	7 D	2	2	1335			3.30		
CAPRI S	29	1335	1340 D		S29	E11	4125	5 D	1	3	1337	1.70	2.00			
* ZURICH	29	1351 E	1359		N22	E30	4124	8 D	1	3	1351		3.00			
* USNRL	29	1559	1608	1600	S26	E17	4125	9	1	2	1600	1.24	1.75		128	
HUANCAYO	29	1559	1609	1600	S26	E16	4125	10	1	2						Slow S-SWF
* OTTAWA	29	1652	1738	1708	S25	E18	4125	46	1	1	1708	1.97	2.47			
USNRL	29	1950	2031	1959	N27	E29	4124	41	1	2	1959	1.12	1.47		112	
* MC MATH	29	2110 E	2123 D		N24	E26	4124	13 D	1δ							
SAC PEAK	29	2110 E	2135 D	2110 E	N25	E27	4124	25 0	1δ	1		4.00			28	Slow S-SWF
MITAKA	30	0340 E	0410	0349	S26	E14	4125	30 D	1δ	1	0348	4.09	4.96	2.95	200	
NIZAMIAH	30	0348 E	0408		S27	E15	4125	20 D	1	2	0348	1.82	2.29	1.60		S-SWF
MITAKA	30	0356	0426 D		N23	E20	4124	30 0	1	1	0400	.89	1.00	2.43	96	
CAPRI S	30	0620	0706		N25	E22	4124	46	2	3	0642	5.00	6.00			
ATHENS	30	0622	0655		N26	E21	4124	33	1	4		1.90	2.10			S-SWF
ONDREJOV	30	0624 E	0642 D		N27	E22	4124	18 D	2	3	0624			3.00		
UCCLE	30	0914	0927	0918	N23	E24	4124	13	1	2	0918	2.00	2.10			
UCCLE	30	0926	0945	0938	S26	E08	4125	19	1	2	0938	2.00	2.20			
UCCLE	30	0944	0946	0945	N22	E13	4124	2	1	3	0945	2.00	2.10			
ZURICH	30	0953	1009	0954	S30	E11	4125	16	1	3	0954		5.00			
CAPRI S	30	0954	1010 D		S25	E10	4125	16 D	1	3	1002	2.00	2.20			
UCCLE	30	0954	1011	0958	S26	E08	4125	17	1	3	0958	2.00	2.20			
* UCCLE	30	1104	1118 D	1110	S25	E08	4125	14 D	1	3	1110	2.00	2.20			
CAPRI S	30	1150	1259 D		S35	E01	4125	69 D	1	3	1231	2.00	2.60			
UCCLE	30	1158	1202 0	1202	N25	E21	4124	4 D	1	3	1202	3.00	3.00			
ONOREJO'/	30	1309 E	1316 D	1312	N14	E13	4124	7 D	1	3	1312			2.60		
ZURICH	30	1337	1352	1342	N25	E18	4124	15	1	3	1342		6.00			
ZURICH	30	1337	1401	1341	N13	E11	4124	24	1	3	1341		4.00			
USNRL	30	1338	1414	1342	N12	E12	4124	36	1δ	2	1342	2.26	2.30		164	Slow S-SWF
CAPRI S	30	1338	1414		N14	E10	4124	36	1	3	1342	2.00	2.10			
ONDREJOV	30	1339	1401 D	1343	N15	E15	4124	22 D	2δ	2	1343			4.40		
R O HERST	30	1341	1400	1345	N13	E11	4124	19	1	2	1345	1.00	1.00	2.80	84	
MT WILSON	30	1513			N15	E05	4124		1							
OTTAWA	30	1512			N13	E11	4124		1	1	1516	2.26	2.33			
* SAC PEAK	30	1515	1550	1517	N12	E13	4124	35	1	1		3.10			15	
WENDEL	30	1516 E			N13	E15	4124		1				5.00			
ZURICH	30	1518 E	1531 D		N11	E12	4124	13 D	1	2	1518		5.00			
MT WILSON	30	1626	1640		N15	E05	4124	14	1							
* MT WILSON	30	1640	1650		N25	E12	4124	10	1							
WENDEL	30	1640	1720		S32	E09	4125	40	2				9.00			
SAC PEAK	30	1640	1725 D	1648 F	S32	E08	4125	45 D	2-	1		5.30			24	
OTTAWA	30	1640	1742	1647	S31	E12	4125	62	1δ	1	1647	3.07	4.02			Slow S-SWF
USNRL	30	1641	1729	1647	S30	E08	4125	48	1	2	1647	2.02	2.84		106	
HUANCAYO	30	1642 E	1650 D	1642	S31	E09	4125	8 0	1δ	3						
MT WILSON	30	1642	1730		S33	E10	4125	48	1δ							
* WENDEL	30	1708	1723		S24	W54	4117	15	1				3.00			
* MT WILSON	30	1709	1718		N25	E18	4124	9	1							
MT WILSON	30	1714	1724		S14	W68	4116	10	1							
OTTAWA	30	1714 E	1725		S26	W54	4117	11 D	1	1	1714	.99	2.13			
* MT WILSON	30	1731	1733		S27	E03	4125	2	1							
USNRL	30	1927	2005	1931	N27	E15	4124	38	1	2	1931	2.60	2.90		112	
SAC PEAK	30	1934 E	1950	1934 F	N18	E14	4124	16 D	2	1		8.20			24	S-SWF
MITAKA	31	0025 E	0037 D		N15	W02	4124	12 D	1	2	0025	1.84	1.88	1.70	113	S-SWF
MITAKA	31	0214	0221 D		N13	E05	4124	7 D	1	3	0214	1.34	1.35	2.03	102	
MITAKA	31	0215	0224		N12	E05	4124	9	1	3	0215	.89	.90	1.81	98	
MITAKA	31	0231 E	0238		N25	E16	4124	7 D	1	3	0231	.89	.97	1.81	105	
MITAKA	31	0244	0307	0250	N13	E04	4124	23	1δ	3	0250	5.67	5.76	2.62	122	
MITAKA	31	0244	0312	0253	N13	E05	4124	28	2	3	0253	7.57	7.65	3.11	169	Slow S-SWF
NIZAMIAH	31	0252 E	0312		N15	E04	4124	20 D	1	2	0252	3.04	3.08	2.10		
MITAKA	31	0422 E	0432		S25	W48	4117	10 D	1	3	0422	3.80	6.17		85	
MITAKA	31	0448 E	0457 0		N24	W02	4124	9 D	1	2	0454	.89	.93	1.60	107	
* NIZAMIAH	31	0548	0556 D	0551	N15	E04	4124	8 D	1	2	0551	2.43	2.46	1.60		
MITAKA	31	0552 E	0612	0552	N12	E03	4124	20 0	2	1	0552	7.57	7.65	1.63	159	S-SWF
* MITAKA	31	0622 E	0719	0626	S31	W08	4125	57 D	1δ	1	0622	7.57	9.46	2.66	134	
NIZAMIAH	31	0627 E	0653 D		S30	E00	4125	26 D	2	2	0627	6.08	7.66	2.00		S-SWF G-SWF
CAPRI S	31	0815 E	1019 0		S32	E00	4125	124 D	1	1	0841	4.00	4.80			
CAPRI S	31	0943 E	1019 D		S27	W48	4117	36 D	1	2	1012	1.50	2.50			
* ZURICH	31	0952	1008 D	0955	N13	E01	4124	16 D	1	3	0955		4.00			
WENOEL	31	0958	1013		S14	E01	4126	15	1				4.00			
ZURICH	31	1004	1008		N23	E09	4124	4		3	1004		1.00			
WENOEL	31	1030	1046		N12	W47	4122	16	1				4.00			
CAPRI S	31	1035 E	1102 D		N12	W02	4124	27 D	1	1	1047	1.80	1.80			

SOLAR FLARES

AUGUST 1957

Observatory	Date Aug. 1957	Time Observed Start UT	Time Observed End UT	Time Max. Phase UT	Approx. Position Lat. Mer. Dist.	McMath Plage Region Number	Duration Min.	Importance	Obs. Cond.	Time of Meas. UT	Meas. Max. Area Sq.Deg.	Corr. Max. Area Sq.Deg.	Max. Width Hα	Max. Int. %	Provis. Ionospheric Effect
{OTTAWA	31	1236	1345	1246	S31 W09	4125	9	1	1	1246	2.55	3.34			G-SWF
{USNRL	31	1240	1322	1246	S30 W10	4125	42	1	3	1246	1.47	2.06		86	
{USNRL	31	1257	1414	1313	N25 W03	4124	77	2&	3	1313	7.25	7.68		197	
{OTTAWA	31	1259			N26 W03	4124		3	1	1321	11.43	12.14			
{ONDREJOV	31	1321 E	1412 O		N24 W02	4124	51 D	3	2	1330			4.10		S-SWF
{CAPRI S	31	1322 E	1557		N22 E00	4124	155 D	3	1	1402	12.00	13.20			
{USNRL	31	1338	1414	1351	N11 W02	4124	36	2&	3	1351	5.08	5.15		230	
{OTTAWA	31	1338	1420	1354	N12 W02	4124	42	1	1	1354	4.06	4.11			
{ONDREJOV	31	1340	1402 O		N12 W02	4124	22 O	2&	2	1357			3.30		
{NEDERHORST	31	1350 E	1405		N14 W05	4124	15	2&							
MT WILSON	31	1539	1553		S25 E04	4125	14	2							Slow S-SWF
MT WILSON	31	2035	2051		N14 W11	4124	16	2							

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

ATHENS	01	0604	N33 W05
CAPRI S	01	0606E	N34 W04
CAPRI S	01	0735E	N10 W88
UCCLE	01	0808E	N35 W03
UCCLE	01	0808	S27 E08
WENDEL	01	0940E	N13 W85
R O HERST	01	1018E	S30 E07
OTTAWA	01	1108	S30 E05
OTTAWA	01	1114	N36 W04
OTTAWA	01	1129	N33 W08
USNRL	01	1130	N35 W09
UCCLE	01	1135	N26 E46
SAC PEAK	01	1307	N13 W89
USNRL	01	1313	N14 W90
SAC PEAK	01	1317	N13 W89
OTTAWA	01	1355	N33 W06
OTTAWA	01	1404	N27 E43
SAC PEAK	01	1430	N26 E44
UCCLE	01	1433	N27 E45
OTTAWA	01	1452	N27 E43
SAC PEAK	01	1452	N26 E44
SAC PEAK	01	1527	N26 E44
UCCLE	01	1605	N33 W08
UCCLE	01	1652	N27 W45
USNRL	01	1744	N26 E42
SAC PEAK	01	2047	N14 W
UCCLE	02	0858E	N34 W18
UCCLE	02	0859E	S24 W16
UCCLE	02	0927	S32 W06
ONDREJOV	02	0929E	N10 E58
UCCLE	02	0952	S31 W07
ONDREJOV	02	1006E	S32 W02
UCCLE	02	1111	S21 W22
UCCLE	02	1200	N08 E58
UCCLE	02	1201	N25 E33
OTTAWA	02	1203E	N27 E32
USNRL	02	1205E	N25 E32
OTTAWA	02	1212	S32 W01
OTTAWA	02	1250E	N25 W34
SAC PEAK	02	1325	S32 W02
OTTAWA	02	1326	S32 W01
USNRL	02	1326	S32 W04
R O EOIN	02	1327	S33 E00
USNRL	02	1329	N34 W22
SAC PEAK	02	1355	N09 E60
MC MATH	02	1405E	N30 W20
UCCLE	02	1418	N08 E60
USNRL	02	1436	N25 E31
SAC PEAK	02	1440E	N26 E31
WENDEL	02	1440E	N26 E31
ONDREJOV	02	1523E	N10 E53
SAC PEAK	02	1527	S33 W04
USNRL	02	1529	S32 W05
OTTAWA	02	1530	S32 W03
MC MATH	02	1647E	N30 W20
MC MATH	02	1813E	N08 E60
USNRL	02	1850	S32 W08
MC MATH	02	1920E	S29 W15
HAWAII	02	2228	N15 E55
HAWAII	03		N10 E42
ONDREJOV	03	0459E	N27 E10
UCCLE	03	0608E	S16 W05
UCCLE	03	0616E	S31 W13
UCCLE	03	0633	S31 W13
UCCLE	03	0646	S16 E75
CAPRI S	03	0821	S29 W15
UCCLE	03	0838	N29 E13
UCCLE	03	0843	N26 E12
CAPRI S	03	1002E	S27 W30
UCCLE	03	1007	N29 E13
UCCLE	03	1140E	N27 E07
MC MATH	03	1144E	N26 E16
UCCLE	03	1200	S12 W26
MC MATH	03	1200E	S16 W11
MC MATH	03	1213E	S29 W15
USNRL	03	1213E	S16 W15
USNRL	03	1257	N27 E05
OTTAWA	03	1258	N27 E04
USNRL	03	1311	N29 E12
SAC PEAK	03	1312	N29 E12
OTTAWA	03	1315	N29 E16
MC MATH	03	1317E	N26 E13
UCCLE	03	1338	N09 E45
UCCLE	03	1354E	S30 W20
OTTAWA	03	1354	S30 W18
USNRL	03	1429	S31 W20
UCCLE	03	1430	S31 W20
SAC PEAK	03	1430	S33 W18
CAPRI S	03	1432E	S31 W18
MC MATH	03	1434E	S29 W15
UCCLE	03	1435	N08 E47
UCCLE	03	1435E	S33 W16
UCCLE	03	1435	N35 W35
UCCLE	03	1453	N26 E19
SAC PEAK	03	1600	S30 W38
UCCLE	03	1603	S29 W39
SAC PEAK	03	1635	N27 E04
UCCLE	03	1717E	S34 W16
SAC PEAK	03	1732	S30 W20
UCCLE	03	1737	N34 W38
SAC PEAK	03	1840	S34 W20
SAC PEAK	03	1952E	N28 E04
ATHENS	04	0734E	N25 E36
UCCLE	04	0904	N07 E35
CAPRI S	04	1024	N23 E09
OTTAWA	04	1123	N26 E00
OTTAWA	04	1405	N33 W45
MC MATH	04	1413E	N33 W45
HAWAII	04	2316	N19 W39
UCCLE	05	0804	S27 W58
UCCLE	05	1037	S27 W50
UCCLE	05	1125	S11 E80
CAPRI S	05	1258E	N27 W20
MC MATH	05	1400E	N27 W05
SAC PEAK	05	1445	S26 W62
UCCLE	05	1446	S28 W60
OTTAWA	05	1451E	S27 W59
SAC PEAK	05	1615	S28 W63
USNRL	05	1616	S27 W64
SAC PEAK	05	1856	S26 W62
HAWAII	05	1900	N25 W10
ATHENS	06	0605	S29 W60
ATHENS	06	0611	S10 E06
ATHENS	06	0655	N21 W19
CAPRI S	06	0655	N23 W17
MC MATH	06	1143E	S34 E65
USNRL	06	1200	S28 W55
USNRL	06	1213	S28 W55
USNRL	06	1223	S28 W55
USNRL	06	1253	N28 W32
OTTAWA	06	1254E	N26 W33
USNRL	06	1311	N16 W19
SAC PEAK	06	1352	S38 E79
USNRL	06	1355	S39 E68
SAC PEAK	06	1550	S30 W57
USNRL	06	1820	S39 E68
SAC PEAK	06	1910	S30 W57
SAC PEAK	06	1942E	S16 E05
SAC PEAK	06	2033	S31 W65
ATHENS	07	0657	N27 W34
ATHENS	07	0657	N26 W37
ATHENS	07	0657	N29 W41
WENDEL	07	0659E	N30 W39
ATHENS	07	0704	N26 W44
OTTAWA	07	1108	N13 W03
OTTAWA	07	1134	S14 E54
USNRL	07	1135	N26 W40
CAPRI S	07	1135	N25 W41
OTTAWA	07	1152	N25 W43
USNRL	07	1153	N25 W45
UCCLE	07	1154	N26 W44
OTTAWA	07	1211	N25 W44
USNRL	07	1337	N14 W06
SAC PEAK	07	1400	N26 W47
USNRL	07	1542	S18 E54
USNRL	07	1601	N27 W47
USNRL	07	1612	N28 W45
SAC PEAK	07	1622E	N26 W47
SAC PEAK	07	1747	N27 W42
USNRL	07	1803	N27 W39
MC MATH	07	1805E	N26 W40
CAPRI S	08	0804	S14 E38
UCCLE	08	0813	S23 E20
UCCLE	08	0831	N27 W55
UCCLE	08	0832	S27 W88
CAPRI S	08	1318	N25 W62
SAC PEAK	08	1320	N25 W58
MC MATH	08	1844E	S20 E15
ATHENS	09	0644	S10 E79
WENDEL	09	0921E	N27 W75
WENDEL	09	1115E	N27 W76
SAC PEAK	09	1607	S35 E33
SAC PEAK	09	2007	S12 E16
SAC PEAK	09	2140	S09 E68
SAC PEAK	09	2200	N06 E55
SAC PEAK	09	2237	N24 W77
HAWAII	10	0014	S08 E01
OTTAWA	10	1205	S09 E61
HUANCAYO	10	1655	S13 E06
SAC PEAK	10	1655E	S12 E05
MC MATH	10	1923E	S20 W12
CAPRI S	11	1122	N24 W90
SAC PEAK	11	1400	N15 E30
OTTAWA	11	1406E	N17 E30
HAWAII	11	1840	S10 E38
SAC PEAK	11	1848E	S12 E39
HAWAII	11	2014	S12 E45
HAWAII	11	2330	N15 E15
HAWAII	11	2336	N17 E27
HAWAII	12	0040	N16 E15
HAWAII	12	0138	S20 W23
HAWAII	12	0154	N14 E13
ATHENS	12	0607	N15 E11
CAPRI S	12	0702E	N08 W69
UCCLE	12	0728	S20 W28
UCCLE	12	0753	S30 W19
UCCLE	12	0808	N15 E12
ONDREJOV	12	1032E	
OTTAWA	12	1129	S10 E29
CAPRI S	12	1133E	S12 E31
OTTAWA	12	1233	N15 E27
USNRL	12	1233	N14 E28
USNRL	12	1241E	N13 E31
MC MATH	12	1255E	N14 E28
USNRL	12	1258	S32 E15
SAC PEAK	12	1305E	N15 E28
SAC PEAK	12	1337	S12 E26
SAC PEAK	12	1455	N13 E26
R O HERST	12	1529E	N15 E26
SAC PEAK	12	1647	N15 E22
SAC PEAK	12	1702	S36 E87
SAC PEAK	12	1825	S12 E26
SAC PEAK	12	2300	S21 W36
HAWAII	13	0116E	N14 E12

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

CAPRI S	13	1017	N17 E06
OTTAWA	13	1141	S20 W47
USNRL	13	1357	N17 E03
SAC PEAK	13	1455	S41 E89
SAC PEAK	13	1557	N15 E04
SAC PEAK	13	1845	N15 E05
ATHENS	14	0554	S19 W65
ATHENS	14	0610	N15 W06
UCCLE	14	0819	N17 W08
UCCLE	14	1015E	N16 W18
UCCLE	14	1040E	S31 W10
CAPRI S	14	1045	S28 W13
CAPRI S	14	1202	N15 W10
USNRL	14	1216	N16 W09
SAC PEAK	14	1450	S33 E56
SAC PEAK	14	1500	S27 E68
SAC PEAK	14	1502	N16 W08
USNRL	14	1648	N18 W10
USNRL	14	1727	S44 W33
HUANCAYO	14	1924E	N13 W06
USNRL	14	1942	N15 W10
ATHENS	15	0610	N15 W15
ATHENS	16	0609	N17 W35
ATHENS	16	0700	S16 W60
OTTAWA	16	1313	S16 W60
CAPRI S	16	1317	S13 W65
OTTAWA	16	1343	N21 E72
OTTAWA	16	1405	S15 W62
HUANCAYO	16	1557E	S17 W60
SAC PEAK	16	1635	S17 W64
USNRL	16	1705	N20 E72
USNRL	16	1810	S19 W67
SAC PEAK	16	1812E	S17 W64
OTTAWA	17	1220	S20 E05
OTTAWA	17	1238	S17 E58
WENDEL	17	1434E	N17 E62
SAC PEAK	17	1719E	N18 E56
HAWAII	17	1930	N19 E55
MC MATH	17	1932E	N14 E60
HAWAII	17	2134	S21 E03
HAWAII	18	0136	S22 E13
USNRL	18	1205	S11 W90
USNRL	18	1251	S17 W90
USNRL	18	1309	S17 W90
USNRL	18	1322	S20 W08
OTTAWA	18	1338	N17 E45
USNRL	18	1342	S17 W90
CAPRI S	18	1448	N18 E44
OTTAWA	18	1502E	N23 E46
CAPRI S	18	1555	N20 E63
HAWAII	18	2246	S27 E04
HAWAII	18	2304E	S24 W08
UCCLE	19	1037	N13 E28
UCCLE	19	1038	N22 W56
UCCLE	19	1044	N30 E34
UCCLE	19	1044	N32 E37
UCCLE	19	1101	S21 W20
UCCLE	19	1102	S32 W11
UCCLE	19	1134E	N22 W56
SAC PEAK	19	1542	S21 W09
HUANCAYO	19	1926E	N20 E31
HUANCAYO	19	2024	S23 W06
WENOEL	20	1449E	N15 E21
WENOEL	20	1513E	N22 E27
SAC PEAK	20	1642E	N13 E12
USNRL	20	1648E	N13 E12
USNRL	21	1155E	N24 W52
SAC PEAK	21	1252E	N23 E11
SAC PEAK	21	1252E	S34 W16
SAC PEAK	21	1252E	N28 W41
SAC PEAK	21	1417	S28 E80
SAC PEAK	21	1709E	N15 E07
SAC PEAK	21	1710E	S33 W18
SAC PEAK	21	2211E	N12 E73
ATHENS	22	0652	N21 E01
UCCLE	22	0838	N22 E02
UCCLE	22	0852	N13 W04
UCCLE	22	0924	N22 E02
UCCLE	22	0943	S26 E68
CAPRI S	22	1412E	S27 E62
USNRL	22	1545	S44 W36
ATHENS	23	0616	N08 W10
ATHENS	23	0624	N08 W13
ATHENS	23	0752	N09 W11
UCCLE	23	0853	N19 W12
UCCLE	23	0926	S28 W44
OTTAWA	23	1137	N17 W13
WENOEL	23	1140E	N18 W14
OTTAWA	23	1307E	N18 W14
OTTAWA	23	1329	N17 W18
USNRL	23	1330	N18 W19
SAC PEAK	23	1330	N17 W19
ONOREJOV	23	1331	N16 W17
USNRL	23	1339	N19 W14
OTTAWA	23	1339	N19 W13
OTTAWA	23	1402	N19 W14
CAPRI S	23	1404E	N19 W14
USNRL	23	1404	N19 W14
MC MATH	23	1404E	N15 W19
WENOEL	23	1405E	N21 W13
SAC PEAK	23	1405E	N19 W13
USNRL	23	1604	S14 E60
SAC PEAK	23	1607E	S15 E62
MC MATH	23	1608E	S14 E65
SAC PEAK	23	1722	N19 W15
USNRL	23	1723	N20 W17
MC MATH	23	1724E	N15 W20
HAWAII	23	1850	N18 W15
HAWAII	23	1858	N18 W15
CLIMAX	23	1858	N20 W12
USNRL	23	1858	N19 W18
USNRL	23	1918	N21 W20
HAWAII	23	1922	N22 W19
SAC PEAK	23	1926E	N22 W19
SAC PEAK	23	2102E	N19 W19
HAWAII	23	2104	N19 W19
HAWAII	23	2312	N20 W19
ATHENS	24	0538E	N09 E56
ATHENS	24	0614E	S23 W68
ATHENS	24	0633	N19 W22
ONOREJOV	24	0653E	N15 W28
UCCLE	24	0822	N26 W16
UCCLE	24	0833	N20 W24
UCCLE	24	0848	N23 W28
UCCLE	24	0959	S28 E35
UCCLE	24	1000	S16 E51
UCCLE	24	1044	S20 W25
UCCLE	24	1102	S16 E51
UCCLE	24	1107	N24 W26
UCCLE	24	1112	N22 W30
UCCLE	24	1115	N35 W63
UCCLE	24	1139	N24 W26
SAC PEAK	24	1259	N19 W26
UCCLE	24	1302	N20 W26
USNRL	24	1330	N20 W18
UCCLE	24	1337	N20 W26
SAC PEAK	24	1340	N20 W27
UCCLE	24	1505	N10 E65
UCCLE	24	1519	S25 E28
SAC PEAK	24	1637	N11 E60
SAC PEAK	24	1715	N19 W29
SAC PEAK	24	1820	S33 E82
CLIMAX	24	1918	N18 W27
SAC PEAK	24	1920	N18 W29
ATHENS	25	0553E	N10 E50
WENOEL	25	1007E	N14 W21
UCCLE	25	1144	N10 E52
UCCLE	25	1145	S33 E80
ONOREJOV	25	1147E	S30 E71
UCCLE	25	1306	S33 E80
UCCLE	25	1309	S15 E35
UCCLE	25	1338	S26 E12
UCCLE	25	1351	S27 E21
SAC PEAK	25	1355E	N24 E
SAC PEAK	25	1452	N22 W40
SAC PEAK	25	1605E	N10 E48
SAC PEAK	25	2100	S33 E70
SAC PEAK	25	2137	S30 E70
SAC PEAK	25	2317	N24 E76
ATHENS	26	0655	S30 E49
ATHENS	26	0703	N24 E72
ATHENS	26	0722	N11 E38
WENOEL	26	1124E	N29 W48
USNRL	26	1321	N10 E37
SAC PEAK	26	1405	S30 E67
SAC PEAK	26	1452	N14 E37
SAC PEAK	26	1455	N23 E88
SAC PEAK	26	1642	N11 E34
SAC PEAK	26	1805	N25 E68
SAC PEAK	26	2122	S36 E46
MC MATH	26	2132E	S E
SAC PEAK	26	2142	N10 E32
HAWAII	26	2246	N17 E33
SAC PEAK	26	2307	N23 E88
ATHENS	27	0631	S32 E47
CAPRI S	27	1049E	N27 E53
USNRL	27	1303	S30 E37
SAC PEAK	27	1311E	S32 E41
SAC PEAK	27	1327	N22 E60
OTTAWA	27	1331	N23 E58
SAC PEAK	27	1337	S31 E50
SAC PEAK	27	1355E	S26 W05
OTTAWA	27	1404	N11 E18
SAC PEAK	27	1405	N10 E22
USNRL	27	1408	N10 E19
SAC PEAK	27	1500	N21 E54
SAC PEAK	27	1630	N25 E58
SAC PEAK	27	1817	N26 E51
SAC PEAK	27	1832	N10 E21
SAC PEAK	27	1832	S33 E38
SAC PEAK	27	1902	N10 E21
SAC PEAK	27	1950	S27 E43
SAC PEAK	27	2047E	S29 E46
SAC PEAK	27	2255	S18 E90
SAC PEAK	27	2330	N09 E13
SAC PEAK	27	2330	N24 E52
SAC PEAK	27	2330	S27 E40
HAWAII	28	0128	S29 E38
ATHENS	28	0707	S27 E36
CAPRI S	28	0748E	N25 E49
CAPRI S	28	0823	N16 E46
CAPRI S	28	1058E	S25 W15
CAPRI S	28	1451E	S29 E35
HUANCAYO	28	1525E	S27 E34
SAC PEAK	28	1602E	S30 E36
USNRL	28	1640	S32 E34
USNRL	28	1846	S14 W09
USNRL	28	1906	N24 E38
USNRL	28	1924	S26 E32
HAWAII	28	1928E	S27 E31

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

SAC PEAK	28	1930E	S26 E29
SAC PEAK	28	1930F	N24 E31
SAC PEAK	28	2007	N19 E44
SAC PEAK	28	2245	S34 E32
ATHENS	29	0632	S33 E24
ATHENS	29	0632	N11 W02
CAPRI S	29	0711E	N26 E36
ATHENS	29	0753	N18 E37
UCCLE	29	0943	N21 E37
UCCLE	29	1014	N14 W04
CAPRI S	29	1020	S31 E18
ONOREJOV	29	1021	N32 E23
UCCLE	29	1114	S32 E22
UCCLE	29	1121	N23 E26
USNRL	29	1219	S32 E22
CAPRI S	29	1408	N19 E34
SAC PEAK	29	1408E	N20 E34
USNRL	29	1408	N21 E34
OTTAWA	29	1525	S34 E14
CAPRI S	29	1600E	S28 E10
SAC PEAK	29	1601E	S29 E15
SAC PEAK	29	1627	S27 E17
SAC PEAK	29	1645	N23 W90
SAC PEAK	29	1652	S26 E17
OTTAWA	29	1718	S25 E15
SAC PEAK	29	1730	S15 W22
USNRL	29	1732	S16 W22
OTTAWA	29	1733	S14 W21
SAC PEAK	29	1852	S32 E22
USNRL	29	1852	S31 E18
SAC PEAK	29	1918E	N13 E15
SAC PEAK	29	2013E	N25 E30
HAWAII	29	2111E	N23 E26
SAC PEAK	29	2115	S14 W24
HAWAII	30	0002	S34 E07
ATHENS	30	0621	N22 E19
ATHENS	30	0634	N24 E20
ATHENS	30	0634	N23 E23
UCCLE	30	0855	S28 E04
UCCLE	30	0927	N13 E13
UCCLE	30	1022	S32 E12
CAPRI S	30	1103E	S24 E07
USNRL	30	1311	S30 E08
USNRL	30	1338	N26 E18
CAPRI S	30	1350	S27 E11
USNRL	30	1351	S30 E12
SAC PEAK	30	1400E	N13 E09
CAPRI S	30	1436	N22 E11
USNRL	30	1436	N22 E10
USNRL	30	1440	N26 E18
WENOEL	30	1506E	N14 E03
CAPRI S	30	1515	N12 E11
USNRL	30	1516	N12 E13
OTTAWA	30	1618	S28 E03
OTTAWA	30	1634	N23 E07
SAC PEAK	30	1635	N19 E06
HUANCAYO	30	1637	N23 E09
USNRL	30	1637	N22 E08
OTTAWA	30	1642	S30 E04
OTTAWA	30	1648E	N24 E06
OTTAWA	30	1702E	N27 E13
SAC PEAK	30	1705	S26 W55
SAC PEAK	30	1707	N23 E17
USNRL	30	1709	N22 E15
WENOEL	30	1713E	N24 E17
OTTAWA	30	1714E	N24 E16
OTTAWA	30	1732E	S26 E02
OTTAWA	30	1741E	S25 E04
WENOEL	30	1744E	N26 E33
USNRL	30	1931	N11 E11
SAC PEAK	30	1934E	N13 E08
ATHENS	31	0549E	N12 E03
ATHENS	31	0601	S25 W49
ATHENS	31	0601	S30 E02
ATHENS	31	0620	N12 E03
ATHENS	31	0625	S28 W05
ATHENS	31	0633	N12 W30
CAPRI S	31	0959E	N15 W01
WENDEL	31	1015E	S19 E10
WENOEL	31	1019E	N27 W04
OTTAWA	31	1207E	S30 W08
OTTAWA	31	1211E	N25 E06
OTTAWA	31	1219E	N12 W00
OTTAWA	31	1220	N27 E04
OTTAWA	31	1227	N16 E07
OTTAWA	31	1251	S27 W53
OTTAWA	31	1257	N25 E07
OTTAWA	31	1304	N18 W09
SAC PEAK	31	1516E	N26 W03
SAC PEAK	31	1522	S25 W61
HUANCAYO	31	1536E	N16 E02
SAC PEAK	31	1540	N14 W01
SAC PEAK	31	1647E	N10 W02
SAC PEAK	31	1647E	S30 W57

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

JULY 1957

July 1957	Start UT	End UT	Type	Wide spread Index	Impor- tance	Observation stations	Known Flare, UT CRPL-F 156B
1	0141	0211	S-SWF	1	1	TO	0144E
1	0358	0428	Slow S-SWF	5	1	OK, TO, CW+	0346
1	1502	1522	S-SWF	3	1+	MC, PR	
1	1710	1735	Slow S-SWF	5	2	AN, BE, HU, MC, PR, CR	
1	2000	2040	Slow S-SWF	5	2-	AN, BE, HU, MC, PR	1958E
2	0013	0100	Slow S-SWF	5	2	OK, TO, CW+	
2	0709	0726	S-SWF	5	1	OK, NE, PU	0710
2	1114	1127	S-SWF	4	1	PR, TO	
2	2240	2315	G-SWF	4	1	MC, OK, WS	
3	0729	0830	S-SWF	5	2+	AN, OK, PU	0714
3	0830	0914	S-SWF	5	3	OK, DA, KB, NE, SW, TH, TO, CW++, CW*****	0806E
3	1012	1022	Slow S-SWF	4	1-	PR, NE	
3	1720	1745	S-SWF	3	2-	AN, HU, MC	1728E
4	0721	0738	S-SWF	5	1+	OK, HH, PU	0713
4	1425	1445	Slow S-SWF	5	1	HU, PR, NE, PU	1425E
5	2202	2228	G-SWF	5	1	AN, MC, WS, TO	
7	0137	0154	G-SWF	3	1-	AN, TO	
7	1305	1332	Slow S-SWF	5	1	AN, BE, HU, MC, PR, NE	1302
8	0422	0437	S-SWF	5	1	AN, OK, TO	
8	0536	0600	S-SWF	5	1+	AN, OK, TO	0521
8	0932	0953	S-SWF	3	1	NE, PU	0925E
9	0621	0647	Slow S-SWF	4	1-	AN, OK	0640
9	1903	1930	Slow S-SWF	5	1	AN, BE, HU, MC, PR	
12	1449	1525	G-SWF	5	1	AN, BE, MC, PR, HH	1511
13	1507	1555	G-SWF	3	1-	HU, MC, PR	
14	1220	1230	S-SWF	3	1-	MC, PR	1223E
15	0101	0120	Slow S-SWF	1	1-	OK	
15	0310	0415	G-SWF	1	1+	OK	
15	0606	0635	S-SWF	1	1	OK	0617
15	2012	2230	Slow S-SWF	5	3-	BE, HU, MC, PR, WS, CR	
16	0412	0440	G-SWF	4	1	OK, TO	
16	0721	0820	Slow S-SWF	5	3	OK, DA, NE, PU, SW, TH, TO, CW*****	0732
16	1740	1925	Slow S-SWF	5	3	BE, HU, MC, PR, WS, NE, CW++, CW+	1740
18	1250	1320	G-SWF	4	1-	HU, MC, PR, PU	
19	1533	1555	Slow S-SWF	5	1	BE, HU, MC, PR, NE	
20	1406	1505	Slow S-SWF	5	2+	BE, HU, MC, PR, WS, NE, PU, SW, RCA*	1405
20	1740	1940	S-SWF	5	3-	BE, HU, MC, PR, WS, RCA*	
21	0007	0107	Slow S-SWF	5	3	AN, OK, WS, SY, TO, RCA+, CW+	0002
21	0647	0747	S-SWF	5	3	OK, NE, PU, TO CW**, CW***, CW++, CW+	0633
21	1335	1420	S-SWF	5	2+	BE, HU, MC, PR, WS, NE, SW, TO, RCA*, CW*****	1320

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

JULY 1957

July 1957	Start UT	End UT	Type	Wide spread Index	Impor-tance	Observation stations	Known Flare, UT CRPL-F 1956B
21	1957	2015	G-SWF	3	1-	MC, PR, WS	1948
21	2136	2205	S-SWF	5	1+	BE, HU, MC, PR, WS	2134
22	0200	0222	S-SWF	5	2	AN, OK, TO	
22	0618	0700	S-SWF	5	3-	AN, OK, HH, TO, CW+	0614
22	1307	1340	Slow S-SWF	5	1+	BE, HU, MC, PR, WS, NE, PU	1300E
22	2300	2320	Slow S-SWF	4	1	OK, TO	2306
22	2340	0015	S-SWF	5	1+	AN, OK, WS, TO	2338
23	0824	0850	S-SWF	1	1	NE	0820
23	0853	0928	G-SWF	3	1+	NE, PU	0850E
24	1440	1500	S-SWF	3	1	BE, HU, MC	1438
24	1625	1715	Slow S-SWF	5	1+	BE, HU, MC, PR	
24	1727	1750	Slow S-SWF	5	1	AN, BE, HU, MC, PR	1740E
24	1759	1920	S-SWF	5	3-	BE, HU, MC, PR, WS, NE, PU, CW***	1816E
25	0650	0710	S-SWF	5	1	OK, HH, PU	0700E
25	1250	1325	G-SWF	4	1-	AN, MC, PR, WS	1246
25	2050	2200	G-SWF	3	1	MC, WS	
27	0658	0720	S-SWF	4	1	OK, NE	0653
28	0521	0626	Slow S-SWF	5	2	AN, OK, TO	
28	1036	1103	S-SWF	3	2	NE, PU	1033
29	0500	0600	Slow S-SWF	4	2	OK, TO	0508E
31	0600	0644	Slow S-SWF	4	1	AN, OK	

CR = Cornell University, N. Y.
HH = Heinrich Hertz Institute, Berlin.
NE = Nederhorst den Berg, Netherlands.
PH = Pruhonice, Czech.
PU = Prague, Czech.
SW = Enkoping, Sweden.
TH = The Hague, Netherlands.
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.
RCA* = RCA Communications, Inc., Riverhead, N.Y.
RCA+ = RCA Communications, Inc., Pt. Reyes, Calif.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

AUGUST 1957

OTTAWA — 2800 MC

Aug. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:mins	Maximum Pesk Flux	Remarks
1	3 Simple 3A	14 00	8 30	indet.	25	
	8 Group (2)	14 07	56			
	3 Simple 3	14 07	18	14 12.5	21	
	3 Simple 3	14 38	24	14 48	18	
2	6 Complex	12 07	7	12 08.3	20	
2	6 Complex f	14 35.5	7	14 36	60	
2	1 Simple 1	18 49	2	18 50	5	
2	1 Simple 1	19 38.3	1	19 38.9	7	
2	1 Simple 1	20 50	3	20 51.5	4	
2	3 Simple 3	22 30	8	22 33	12	
3	1 Simple 1	11 38.8	1	11 39.1	7	
3	2 Simple 2	14 32	1	14 32.6	24	
	4 Post Increase		5		4	
3	1 Simple 1	15 55.8	1.2	15 56.1	7	
3	8 Group (2)	16 32.5	6.7			
	1 Simple 1	16 32.5	1	16 32.9	7	
	1 Simple 1	16 38.2	1	16 38.5	7	
3	6 Complex	17 20.5	6.5	17 21.1	90	
3	3 Simple 3	18 42	15	18 44.5	4	
3	2 Simple 2	23 40.5	3	23 42	28	
4	2 Simple 2	10 23	2	10 23.5	40	In sunrise osc.
4	2 Simple 2	16 23	4	16 23.6	15	
4	6 Complex	18 30.5	20	18 31.5	65	
4	3 Simple 3 f	20 55	20	20 58.5	7	
4	2 Simple 2	21 58.4	4	21 59.7	23	
5	1 Simple 1	12 55.8	1.5	12 56.3	7	
5	2 Simple 2	16 16	1	16 16.4	26	
5	1 Simple 1	16 57	2	16 57.5	3	
5	6 Complex	19 02	3.5	19 04.5	44	
	5 Absorption	19 05.5	40		-5	
6	1 Simple 1	10 55	2	10 55.3	6	
6	2 Simple 2 f	11 33.9	5	11 34.4	88	
	4 Post increase		10		7	
6	3 Simple 3 f	20 28	50	20 34	7	
7	1 Simple 1	12 29.5	1	12 29.7	3	
7	2 Simple 2	14 50	3	14 51	19	
7	8 Group (2)	16 06.5	8.3			
	2 Simple 2	16 06.5	2.5	16 07.5	16	
	2 Simple 2	16 13.8	1	16 14.3	24	
7	2 Simple 2	23 43	7	23 44	100	In sunset osc.
8	3 Simple 3 A	11 20	1	11 33	24	
	8 Group (5)	11 22.6	30			
	6 Complex	11 22.6	4.4	11 23.8	88	
	2 Simple 2	11 30	2	11 30.6	14	
	2 Simple 2	11 36	2	11 36.7	14	
	1 Simple 1	11 43.4	1	11 43.8	7	
	2 Simple 2	11 51.6	1	11 52	9	
8	2 Simple 2	13 17.3	5	13 18.5	15	
8	2 Simple 2 f	22 44.7	3	22 45.5	30	
9	3 Simple 3 A	13 04	11	15 15*	38	*Approx.
	8 Group (2)	14 53.5	26			
	3 Simple 3	14 53.5	13	14 58	16	
	2 Simple 2	15 17	2.5	15 18	16	
	1 Simple 1	20 52	1	20 52.5	7	
	8 Group (2)	21 48.6	6.4			
	1 Simple 1	21 48.6	1.5	21 49	7	
	1 Simple 1	21 52	3	21 53	5	
10	2 Simple 2	10 56.5	3.5	10 57.9	76	
	4 Post Increase		15		9	
10	6 Complex f	20 41	6	20 43	80	
11	2 Simple 2		1	11 33.9	50	
	4 Post Increase		2.5		6	
11	1 Simple 1	11 56.5	3	11 57	6	
11	2 Simple 2 f	17 19.7	2	17 20.5	20	
12	3 Simple 3	15 25	32	15 45	6	
12	1 Simple 1	16 48	3	16 49.5	4	
13	1 Simple 1	12 50	1.5	12 50.5	4	
13	2 Simple 2 f	18 14.3	8	18 16	32	
14	3 Simple 3 A	11 54.5	30	indet.	8	
	2 Simple 2	12 02.3	1.5	12 03.1	13	
14	1 Simple 1	16 48	1.5	16 48.8	5	
14	2 Simple 2	20 07.5	2	20 08	18	
15	6 Complex	17 28.5	4.5	17 30.2	18	
17	2 Simple 2	17 17.5	2	17 18	28	
	4 Post Increase		30		4	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

OTTAWA — AUGUST 1957 — 2800 MC

Aug. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
17	2 Simple 2	21 35	3	21 36	72	
	4 Post Increase		20		3	
18	1 Simple 1	13 23.5	3	13 24	3	
18	2 Simple 2	18 00	3	18 01	8	
18	1 Simple 1	22 48.5	3	22 49.8	7	
19	1 Simple 1	15 43.2	0.9	15 43.6	7	
19	3 Simple 3 A	19 30	12	19 32	9	
	2 Simple 2 f	19 31.2	0.5	19 31.5	24	
20	2 Simple 2 f	16 46	4	16 46.9	68	
	4 Post Increase		8		6	
21	3 Simple 3	17 08	25	17 08.7	8	
23	2 Simple 2	11 47	3	11 49	20	
	4 Post Increase		30		7	
23	1 Simple 1	13 28.3	6	13 31.5	7	
23	9 Precursor	14 01	2		6	
	6 Complex f	14 03	8	14 03.4	100	
23	8 Group (2)	16 51.2	4			
	2 Simple 2	16 51.2	2	16 51.5	8	
	2 Simple 2	16 53.2	2	16 53.9	9	
23	6 Complex f	17 21	6.5	17 22.1	30	
23	1 Simple 1	18 47.7	1.5	18 48	6	
23	8 Group (2)	18 57.5	36.7			
	2 Simple 2 f	18 57.5	4.5	18 58.2	63	
	2 Simple 2	19 02.2	7	19 03	120	
	5 Absorption	19 09.2	25		-5	
23	2 Simple 2	21 01.8	2	21 02.2	13	
24	1 Simple 1	16 11.5	3	16 12	5	
24	2 Simple 2	17 29.7	1	17 30	11	
24	8 Group (2)	17 48.6	4.8			
	2 Simple 2	17 48.6	0.3	17 48.7	11	
	1 Simple 1	17 51.4	2	17 52	4	
24	1 Simple 1	18 22	4	18 23.5	6	
24	1 Simple 1	18 44.2	1.5	18 44.8	6	
24	6 Complex	18 54.2	5.5	18 54.9	23	
24	6 Complex f	19 21.5	11	19 23.9	85	
25	8 Group (2)	15 01	6			
	1 Simple 1	15 01	1.5	15 01.5	6	
	1 Simple 1	15 05.5	1.5	15 06	5	
26	1 Simple 1	16 44.5	1.5	16 45	7	
26	2 Simple 2	18 06.2	1	18 06.5	14	
26	8 Group (2)	21 45	11			
	2 Simple 2	21 45	1	21 45.2	25	
	3 Simple 3	21 48	8	21 50	8	
27	3 Simple 3	17 15	50	17 19	7	
28	2 Simple 2	19 02.5	3	19 03	20	
28	2 Simple 2 f	20 17.7	5	20 19.5	760	
	4 Post increase		15		10	
29	3 Simple 3	12 18.5	8	12 21	8	
29	2 Simple 2	13 34.7	2.5	13 35	25	
29	3 Simple 3 A	21 02	1 5	21 16.5	7	
	1 Simple 1	21 08	6	21 09.2	7	
29	3 Simple 3 A	22 10	35	indet.	13	
	2 Simple 2	22 16	3	22 17.5	11	
30	6 Complex f	13 36.8	12	13 41.7	140	
	4 Post Increase		35		20	
30	1 Simple 1	14 35.8	2.5	14 36.2	7	
30	2 Simple 2	15 16	2	15 16.4	14	
30	6 Complex	16 41	12	16 42	70	
	4 Post Increase A		1		11	
	2 Simple 2	17 08.5	5	17 09.2	12	
30	2 Simple 2	19 26.6	10	19 27.2	225	
	4 Post Increase		50		15	
30	2 Simple 2 f	22 10	10	22 13.7	480	
	4 Post Increase f		40		30	
31	9 Precursor	12 56	5		13	
	2 Simple 2 f	13 01	1 5	13 15.5	3900	
	4 Post Increase f		3 25		35	
31	2 Simple 2	19 10.6	3	19 11.6	15	
31	3 Simple 3 f A	20 01	2 50	indet.	19	
	8 Group (2)	20 36	21.7			
	6 Complex	20 36	6	20 37.8	155	
	6 Complex f	20 51.7	6	20 52.5	90	

SOLAR RADIO EMISSION
DAILY DATA
AUGUST 1957

CORNELL 200 MC

Aug. 1957	Flux Density 10^{-22} W/m²/cps Hours UT			Variability 0 to 3 Hours UT			Observing Periods Hours UT
	12-15	15-18	18-21	12-15	15-18	18-21	
1				[2	1	0]	1240-2005
2				[1	0	0]	1230-2050
3				[1	2	1]	1250-2005
4				-	1	1]	1440-1445, 1455-2000
5				-	-	-	
6				-	-	-	
7	[22	16	17]	[1	1	1]	1225-2045
8	[16	16	18]	[1	1	1]	1245-2020
9	[26	14	14]	[1	1	1]	1245-2005
10	[16	18	18]	[1	1	1]	1305-2105
11	[22	21	22]	[1	1	1]	1240-2025
12	[68	76	59]	[1	2	1]	1240-2025
13	[21	17	19]	[1	1	1]	1240-2035
14	[14	14	14]	[0	0	0]	1240-1945
15	[13	13	14]	[0	0	0]	1255-2030
16	[14	13	14]	[1	0	1]	1245-2025
17	-	-	-	-	-	-	1220-2005
18	-	16	13]	-	2	1]	1505-2000
19	[13	13	13]	[0	0	0]	1245-1945
20	[12	13	13]	[0	1	0]	1255-2020
21	[[13	13	13]	[[1	0	L**]	1350-2035
22	[12	12	12]	[1	1	0]	1245-2015
23	[14	13	13]	[1	1	1]	1250-2040
24	[13	14	13]	[0	1	1]	1255-2000
25	[16	17	19]	[1	1	1]	1255-2025
26	[16	17	16]	[1	1	1]	1225-2050
27	[14	16	16]	[1	1	1]	1250-2025
28	[40	44	52]	[1	1	1]	1250-2030
29	[30	40	41]	[2	1	1]	1250-2015
30	[64	81	84]	[2	2	2]	1245-2015
31	[420	308	224]	[1	1	1]	1220-2005

[= first hour missing.
[[= first two hours missing
] = last two hours missing.
** = Lightning.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

AUGUST 1957

CORNELL 200 MC

Aug. 1957	Type Ap.J	Start UT	Time Max. UT	Dura- tion Min.	Type IAU	Max. Flux Density 10^{-22} W/m^2/cps Inst.	Smooth	Remarks
1	2	1748.5		5.5	ECD	>53	>34	
2	2	1435.5		5	ECD	>53	>32	off-scale 1436-37 UT
3	8	1720		8	ECD	>53	>27	off-scale 1721-22.5 1723.5-25 UT
4	2	1831		15	ECD	>53	>31	
7	3	1613.5		2	CA	>53	>28	off-scale 1614-14.5 UT
	3	1658	1658	.5	CA	>53	>29	
8	2	1318	1321	4	CA	>53	27	
9		1949.5	2028.5	>44	F			
13	8	1847	1849	4.5	ECD	>450	>450	
15	2	1606	1607.5	3.5	ECD	45	20	
18	7	1522		82	E			
	3	1739.5	1740.5	2	CA	53	24	
19	3	1728.5		.5	CD	>53	>32	
20	3	1258		<.5	CA	>53	>34	
	3	1414	1414	.5	CA	>53	25	
	3	1646		4	CD	>53	>32	off-scale
	3	1906.5	1906.5	1	CA	>53	>32	
21	2	1533.5		8.5	CD	>53	>32	
23	3	1402.5		4.5	ECA	>53	>31	off-scale 1403.5-04 UT
	2	1438		3	ECA	>53	>31	
	3	1651		1	ECA	>53	>32	off-scale 1651.5-52 UT
	8	1721.5		6	ECD	>53	>32	off-scale 1723-25 UT
	3	1813	1813.5	1.5	ECA	>53	>32	
	8	1857.5		13	ECD	>53	>32	off-scale 1858-58.5 1859.5 1902.5-04 UT
	3	2035		2	ECD	>53	>32	off-scale 2035-36 UT
24	2	1733		19.5	ECD	>53	>30	off-scale 1738-38.5 1746-46.5 UT
	3	1854.5	1845.5	.5	ECD	>53	>32	off-scale
	2	1921		7.5	ECD	>53	>32	off-scale 1923-24 1926.5-27 UT
28	2	2022	2024.5	5	ECD	>450	>450	
30	9	1338.5		8.5	ECA	>242	>97	
	9	1410		80	F			

SOLAR RADIO EMISSION

DAILY DATA

AUGUST 1957

BOULDER — 167 MC

Aug. 1957	Flux Density 10^{-22} w m^{-2} $(c/s)^{-1}$ Hours UT 0–3	12–15	15–18	18–21	21–24	Day	Variability 0 to 3 Hours UT 0–3	12–15	15–18	18–21	21–24	Day	Observing Periods Hours UT
1			22	13	13	16			2	2	1S	2	15.3-01.9
2		14	14	13	13	13	1S	2	1	1S	1S	1S	12.0-01.9
3		15	22	33	27	25	1S	1	3	3	2	2	12.0-01.9
4		17	17	16	14	16	2	3	3	2	2S	2	12.0-01.8
5		16			14	16	2	2	2	2	2S	2	12.0-01.8
6		39					2S	3			2S	2S	12.0-14.5, 22.5-01.8
7				13	12	13	2S	2	1S	2	1S	2S	16.8-01.8
8							2S				2	2	22.8-01.8
9		41	13	12	13	18	2	3	2S	1	2	2	12.1-16.2, 17.3-01.8
10		12			16	15	2	1			2	2	12.1-15.5, 20.4-01.8
11			18		29	25	2S	2	2		2	2	13.1-17.5, 20.7-01.8
12			137X	91X	45	97X	2	2	2	2	1S	2	13.8-23.3 N1
13				26	21	23			1	3	2	2	16.9-01.8
14		12	13	15	17	14	2	2	0	2	2	2	12.2-20.6, 21.3-01.7
15		11	12	12	11	12	0	0	2	1S	1S	1S	12.3-16.6, 17.3-01.7
16		10	11		11	11	1S	1	1		2	1	12.3-17.1, 21.3-01.6
17				14	11	13	0		2	2S	1S	1S	16.9-01.6
18			15	13	13	13	2	1	2	1	1S	1S	12.3-14.0, 16.3-01.6
19		12	11	11	10	11	1S	0S	0S	0S	0S	0S	12.3-01.6
20		10	10	11	10	10	0S	1	2	1	2	1	12.3-17.3, 18.4-01.5
21		12	11	11	11	11	0S	0S	1	1S	1S	1S	12.3-01.5
22		10	11	10	12	11	0S	1	2	2	2S	1	13.6-01.5
23			11	11	10	11	0S	2	3	3	2S	2	13.9-01.5
24			11	11	11	11	2	2	3	3	2	2	12.3-14.1, 15.6-01.4
25		19	22	30	43	30	2	1S	2	2S	2S	2S	13.3-01.4
26		24	21	16	13	18	2S	1	2	2	2S	2	12.4-01.4
27		11	13	12	13	12	0S	0S	2	2S	1S	1S	12.4-01.3
28		48	45	62	57	53	0S	2	2	3	3	2	12.4-01.3
29		29	43	49	62	47	2	3	3	3	3	3	12.4-01.3
30		79	119	121	187	131	2S	3	3	3	3	3	12.4-01.3
31		868	713	491	1020	765	2	2	2	2	2	2	12.4-01.3

Notes: 1. August 12, Antenna drifted off sun intermittently during day.

SOLAR RADIO EMISSION

DAILY DATA

AUGUST 1957

BOULDER 450 MC

August 1957	Flux Density $10^{-22} w\ m^{-2} (c/s)^{-1}$ Hours UT 0-3	12-15	15-18	18-21	21-24	Day	Variability 0 to 3 Hours UT 0-3	12-15	15-18	18-21	21-24	Day	Observing Periods Hours UT
1		75	62	59	59	62	0	1	1	0	0	1	11.9-01.9
2		60	53	52	51	54	OS	2	0	0	0	1	11.9-01.9
3		58	55	50	55	54	OS	0	1	0	0	1	12.0-01.9
4		64	52	51	57	55	OS	0	2	2	2	2	12.0-01.8
5		59	52	50	55	54	0	0	0	1	OS	1	12.0-22.5, 23.3-01.8
6		65	55	52	56	56	OS	0	0	1	0	1	12.0-01.8
7			57	56	57	57	OS	0	0	0	0	0	12.0-20.8, 22.5-01.8
8			53	53	57	55	0	0	0	0	1	1	12.1-01.8
9			53	53	55	53	OS	1	2	OS	0	1S	12.1-01.8
10		61	56	53	57	56	OS	0	0	2	1	1	12.1-01.8
11			54	53	58	55	1S	0	0	0	0	0	12.1-01.8
12			56	54	58	57	OS	0	0	0	0	0	12.2-01.8
13		56	52	51	58	54	OS	1	0	1	OS	1	12.2-01.8
14			56	54	51	54	OS	0	0	1	1	1	12.2-01.7
15		62	53	54	60	57	OS	0	0	0	0	0	12.2-01.7
16		63	66	61	65	64	OS	0	1	0	0	1	12.2-01.6
17				62	72	67	OS	1		OS	2	1	12.3-13.3, 16.9-01.6
18		73	63	58	66	64	OS	0	0	0	0	0	12.3-01.6
19				55X	62X	58X	OS	OS	OS	OS	0	OS	18.1-01.5
20		64		61	65	63	OS	OS	1S	OS	2	1S	12.3-16.1, 17.1-01.5
21			59	58	64	61	OS	0	0	0	0	0	12.3-01.5
22			58	59	59	59	OS	0	0	0	0	0	13.6-17.8, 18.4-01.5
23		70	60	64	63	64		1	OS	2	1	1	13.6-01.4
24			58	60	65	63	OS	0	1	1	1	1	13.2-01.4
25			72	71	66	71	OS	1	1	2	1	1	13.3-01.4
26			65	62	68	65	OS	0	0	0	0	0	13.5-01.4
27			69	64	66	67	OS	1	1	0	OS	1	13.5-01.3
28		80	67	67	72	71	OS	0	1	2	0	1	13.5-01.3
29		77	66	65	70	69	OS	2	2	0	OS	1	13.5-01.3
30			77	78	95	84	OS	1	OS	1	2	1	13.5-01.3
31		5000D	227	102	121	1000D	OS	2	1	2	0	1	13.0-01.3

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

BOULDER — AUGUST 1957 — 167 MC

Date 1957	Type Ap.J	Start UT	Time of Maximum	Duration Minutes	Type IAU	Max. Flux Density $10^{-22} w\ m^{-2}(c/s)^{-1}$ Inst.	Smooth	Remarks
Aug.								
1	6	1515 B	1548.1	75 D	CA	200	28	
1	8	1743.2	1749.3	7 X	ECD	4000 D	410	S
1	3	1828.0	1828.1	0.3	ESD	330		
1	2	2002 X	2008	48 X	F	37	12	S
1	3	2218.7	2219.0	0.5	ESD	1700		May be S
2	1	1200 B	2051.9	533 D	MD	12		S
2	8	1434.5	1436.2	5.5	CD	5600 D	1900	
3	1	1232	1643.4	208	MD	350		
3	6	1600	1749.8	595 D	CA	1100	27	
3	8	1720	1721.2X	6 X	ECD	5700 D	2200	
4	8	0100.5	0101.2	1.2	CD	600	270	
4	1	1200 B	1456.3	830 D	MD	690		
4	8	1352.2	1352.4	1	ESD	6500 D		
4	8	1622.9	1623.9	7	ECD	1700	160	
5	1	1200 B	1700.5	830 D	MCA	3100 D		Large burst 1342.3
5	8	1901.8	1904.4X	6 X	ECD	7000 D	2800 D	
6	6	1200 B	0020	830 D	CA	2100 X		I 1430-2230, Max. Aug. 7, N3 N4
7	3	1942.1	1942.2	0.2	ESD	7000 D		
8	3	0005.6	0006.8	1.7	ESD	180	90	
8	3	0013.2	0013.3	0.5	ESD	2100		
8	6	2349 B	0042	121 D	CA	490	8	Max. Aug. 9
8	8	2353.2	2353.8	3 X	ECD	1200	370	
9	6	1205 B	1309.1	825 D	CA	1900 X	22	I 1609-1715
9	8	2128.1	2128.7	0.9	ECD	2200		
10	3	0008.7	0009.2	0.7	ESD	440		
10	8	0127.1	0127.9	9 X	ECD	1200	560	
10	1	2023 B	2243.3	327 D	MCA	360		
11	1	1303 B	1633.7	267 I	MCA	430		N5
11	6	2042 B	0003.3	303 D	CA	500	22	Max. Aug. 12
12	6	1343 B	1758.4	577 D	CA	1300	130	N6
13	6	1654 B	1900 X	531 D	CA		17	
13	8	1846.9	1848.2	4.3	ECD	3400 D	1500	Large burst 2308.6
14	2	1223	1229.3	18	FCD	89		Large burst 0009.6, Aug. 15
14	2	1950.9	1951.2	4.9	FD	490	110	
14	8	2338	2340.5	7	CD	150	90	

Notes: 1. Interference may occasionally obscure or be mistaken for solar events.
2. Receiver saturated at a flux level of approximately 7000 during August.
3. August 6, also a group of bursts at 0135. Large burst at 1329.4.
4. August 7, large bursts at 0018, 1229.7, 1259.3.
5. August 11, other large bursts at 0104.9, 0138.8 and 1319.0.
6. August 12, other bursts at 0128.4, large bursts at 1630.9 and 1640.6.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

BOULDER — AUGUST 1957 — 167 MC

Date 1957	Type Ap.J	Start UT	Time of Maximum	Duration Minutes	Type IAU	Max. Flux Density $10^{-22} w\ m^{-2} (c/s)^{-1}$ Inst.	Smooth	Remarks
Aug.								
15	2	1606.6	1607	2.4	CD	300	93	
16	3	1344.6	1344.8	0.5	ESD	360		
16	3	1625.6	1626.0	1.2	ECD	680		
16	1	2115 B	2135	260 D	MD	6200 D		N7
17	1	1657 B	1937	518 D	MCA	860		S
18	1	1620 B	1708.0	130	MCA	140		N8
20	1	1215 B	2105	631 I	MCD	1000		I 1718-1825 Burst 1906.6
20	8	1646	1646.8	2	ECD	3000	550	Large burst 2248.4
21	2	1703.3	1703.8	1.0	ECD	290		
22	2	1609	1612.0	9 X	F	2900	87	
22	3	2208.5	2208.6	0.5	ECD	6500 D		
23	1	1357 B	2307.5	693 D	MSD	1400		Probable burst at 1318.4
23	8	1403	1403.2	2	ESD	6500 D	1500	
23	3	1650.9	1650.9	0.9	ESD	1700		
23	2	1721	1721.4	5	CD	3300 D	310	
23	8	1857.4	1857.5	2.2	ECD	3500 D	740	Other burst at 1808.9
23	8	1901.9	1901.9	2 X	ESD	6200 D	2500	
24	3	1243.3	1244.3	1.8	ECD	1100	340	Other burst at 0012.5
24	8	1729.7	1729.8	0.8	ECD	7000 D		
24	8	1736.6	1736.8	2.3	ESD	4400 D	980	
24	8	1745.7	1746.2	3.0	ECD	7200 D	980	
24	8	1922.5	1926.7	6	ECD	5400 D	890	
24	2	2224	2234.7I	13 I	FCD	260	61	S
25	6	1318 B	2200 X	727 D	CA		33	
26	6	1225 B	1634.8	425	CA	290	16	
26	2	1955.6	1956.4	3.3	ECD	780	180	
26	2	2058	2059.8	7	CD	850	250	
28	6	1225 B	2154	775 D	CA	960	55	
28	8	2021	2023.6	4 X	ECD	5700 D	1800	
29	6	1225 B	2300 X	775 D	CA		52	
29	8	1334.5	1335.4	1.0	ESD	5200 D		
29	8	1559	1600.7	3	ECD	5400 D	680	
29	2	2341.2	2348.9	3.4	FCA	410	12	
30	6	1225 B	2400 X	770 D	CA		180	N10
30	8	1339.7	1340.9	3.6	CD	3100 D	830	
30	8	1514.9	1516.1	2.1	ECD	4700 D	890	
30	9A	2213.7	2215.2	8	ECD	5000 D	2100	
30	9B	2223	2233.0	17 X	CD	810	470	
31	6	1225	1400 X	770 D	CA		1000	
31	8	2034 B	2037.4	7	CD	4700 D	2400	
31	8	2114.4	2107	4.5	ECD	4600 D	2900 D	

Notes: 7. August 16, large bursts at 2136.1, other bursts at 2324.8, 2336.0, Type 8 or ECD at 1302-1309, no calibration.
8. August 18, other bursts at 0115.9, 0116.9 and 0129.4.
9. August 30, large bursts at 1608, 1730.1, 1827, 2123.5.
10. August 31, numerous bursts greater than saturation flux of 4700 during the day.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
AUGUST 1957

BOULDER 450 MC

Date Aug.	Type Ap.J	Start UT	Time of Maximum	Duration Minutes	Type IAU	Max. Flux Density $10^{-22} w\ m^{-2}\ (c/s)^{-1}$ Inst.	Smooth	Remarks
1	1	1350	1355.7	240	MD	220 S		
1	0	1441.5 X	1455.7	22 X	SD	150 S	47	
2	2	1435.4	1435.9	3 X	ECD	2800	130	Burst 1207.9
3	2	1720.9	1722.9	5 X	ECD	340	88	
4	1	1322	2000.7	518	MD	160		
4	8	1623	1628.3	17 I	ECD	5000 D	490	
4	8	1830.1	1831	15	ECD	1500	290	
4	8	2158.3	2159.6	1.7	ESD	13000 D	9500 D	Very Intense
5	2	1903	1905	5	ECD	250	33	
6	3	1859	1859	0.1	ESD	150		
8	3	1706.1	1706.1	0.1	ESD	130		
9	3	1354.5	1354.9	0.4	ESD	170		
9	3	1517.0	1517.3	1.0	ECD	4100 D		
10	4	2040.8	2040.9	27 X	CD	270	27	
13	2	1848.1	1848.3	1.3	F	190		
14	3	1950.7	1951.0	0.7	ECD	640		
14	3	2235.0	2235.0	0.3	ESD	1000		
16	3	1502.0	1502.0	0.1	ESD	2200 X		
17	3	1231.6	1231.7	0.2	ESD	340 X		
17	3	1235.3	1235.8	0.8	ECD	4300 D		
17	6	2151	0000 X	224 D	CA		10	S
20	2	1704.9	1705.0	1.2	CD	880		
20	6	2130 X	2212.9	240 D	CA	200	11	S
20	3	2238.7	2238.8	0.2	ESD	880		

Notes: 1. Interference may occasionally obscure or be mistaken for solar events.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
AUGUST 1957

BOULDER — 450 MC

Date Aug.	Type Ap.J	Start UT	Time of Maximum	Duration Minutes	Type IAU	Max. Flux Density $10^{-22} w\ m^{-2}\ (c/s)^{-1}$ Inst.	Smooth	Remarks
22	3	2208.5	2208.7	0.4	ECD	200		
23	3	1339.1	1339.1	0.1	ESD	300		
23	3	1857.7	1857.8	1.0	ESD	920		
23	3	1901.8	1903.0	7.0X	ECD	3600 D	150	
23	3	2312.5	2312.5	0.1	ESD	420		
24	1	1751	1925.7	335	M	480		
25	6	1318 B	1800 X	727 D	CA		19	N2
25	3	1707.3	1707.4	0.2	ESD	350		
25	2	2023.0	2023.0	3.0	ECD	1500	190	
26	6	1332 B	2300 X	713 D	CA		13	S
27	6	1332 B	1627	708 D	CA	200	14	
28	6	1332 B	1621.3	708 D	CA	400	16	Burst 1922.2
28	8	2017.4	2017.9	4 X	ECD	7100 D	990	
29	6	1334 B	1500	708 D	ECD		17	
29	3	1334.6	1335.0	1.0	ECD	8500 D		
29	2	1558.9	1559.0	3.4	FD	4700 D	410	
30	6	1332 B	2100 X	520	ECD		34	
30	2	1338.9	1340.9	4 X	ECD	500	180	
30	2	1938.6	1938.9	1.5	FD	300	75	
30	9A	2211.9	2214.6	8	ECD	1900	440	
30	9B	2220	2234.5	175 X	CD	420	32	
31	9	1300 B	1338 X	180 X	CA	14000 D	8500 D	N3
31	6	1600	1630 X	555 X	CA	140	75	
31	8	2036.4	2037.8	4 X	ECD	5700 D	820	N4

Notes: 2. August 25, bursts 1348, 1505.9, 1753.5, 2341.5.

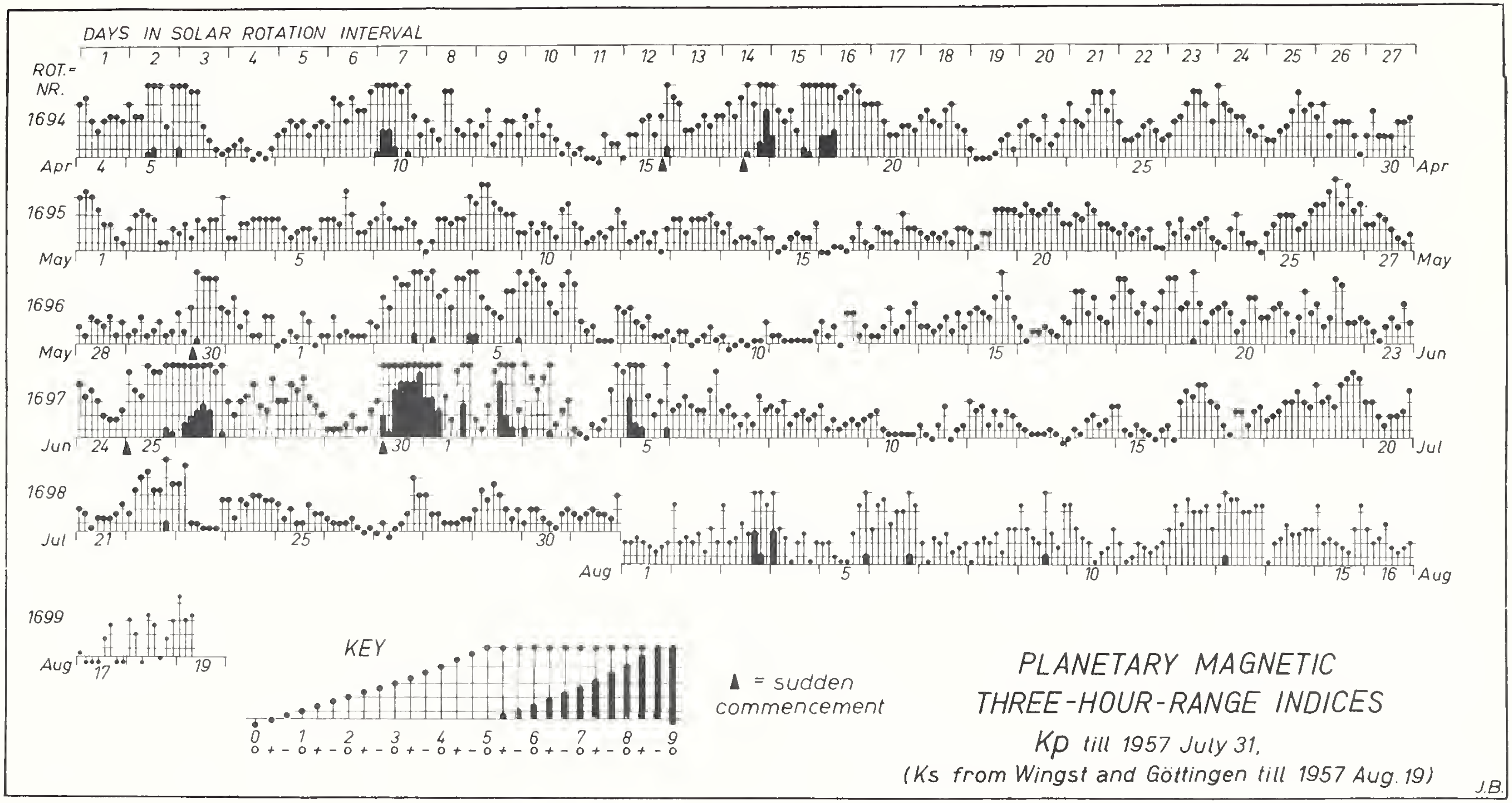
3. August 31, an outburst of extremely large energy content. Flux exceeded 8500 for approximately thirty minutes during period 1300 - 1415.

4. August 31, bursts, 2052.5, 2058.6, Sept. 1, 0009.9.

GEOMAGNETIC ACTIVITY INDICES

JULY 1957

July 1957	C	Values Kp Three hour Gr. interval 1	2	3	4	5	6	7	8	Sum	Ap	Final Selected Days
1	1.8	7+	7+	7-	3+	2-	5-	7o	5o	43o	83	Five
2	1.5	2-	1o	3-	5-	8o	6+	6-	2+	32+	55	Quiet
3	1.2	6-	4+	4-	4+	5+	1+	2+	3o	30o	30	
4	0.8	1o	1-	0+	1+	1o	2-	4-	5o	15-	12	10
5	1.6	5-	7+	6o	6-	3+	2o	3o	6-	38-	56	11 13
6	0.9	2+	3-	3+	3-	2+	2+	4-	5-	24o	16	15
7	0.4	2+	3-	2o	1+	2o	1+	3+	2+	17+	9	26
8	0.6	3-	2+	3o	1+	2o	2+	2-	2o	17+	9	
9	0.2	3-	1o	2-	1o	1+	2-	1+	2-	12+	6	
10	0.1	2o	2+	1o	1-	1-	1-	1-	1-	9-	4	
11	0.3	1+	1-	0+	1+	3-	0+	1o	1+	9o	5	Five
12	0.5	3o	2+	3-	1+	2+	1+	2+	2o	17+	9	Disturbed
13	0.0	1+	1o	1-	1-	1-	1o	1-	0o	6o	3	
14	0.2	0+	1o	1-	2-	2o	1+	2-	3-	11+	6	1
15	0.1	3-	1o	1-	1+	1o	1-	0+	1o	9-	5	2 3
16	0.9	1+	0+	3o	4-	3+	4o	4o	3o	23-	16	5
17	0.6	3-	1+	1-	2+	2+	1+	2+	3-	16-	8	10
18	0.8	2-	2o	2+	3o	3o	4-	3o	3-	21+	13	19
19	1.1	4o	3o	3+	3-	4o	4+	5-	4+	30+	25	
20	0.7	3o	3o	2o	1+	2o	2o	2+	4-	19+	11	
21	0.2	2o	2-	1-	1+	1+	1+	2-	2+	12+	6	Ten
22	1.1	2-	3+	4o	4+	3+	3+	6-	4-	29+	26	Quiet
23	0.7	4-	5-	1o	1o	1-	1-	1-	3-	15o	11	
24	0.7	3-	1+	3-	2+	3o	3o	3-	3-	20+	12	9
25	0.4	2+	1+	2o	1o	1o	2+	2-	2-	13+	6	10 11
26	0.1	1+	1o	1o	1o	1+	1-	0+	1-	7+	4	13
27	0.6	0+	1o	0o	1-	1o	2-	4o	3o	12-	8	14
28	0.2	3o	2-	2-	1o	1o	1o	1+	1+	12o	6	15
29	0.8	2o	3+	3-	4-	3o	2o	1+	2o	20o	12	21
30	0.2	1o	2o	2o	1+	1o	1-	2-	2o	12-	5	26
31	0.3	2-	1+	2-	2o	2-	2-	1+	3o	14+	7	28 30
Mean:	0.63									Mean:	16	


DAYS IN SOLAR ROTATION INTERVAL
ROT.= NR.
1694
1695
1696
1697
1698
1699
Apr
May
Jun
Jul
Aug
KEY
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1957 July 31,
(Ks from Wingst and Göttingen till 1957 Aug. 19)
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

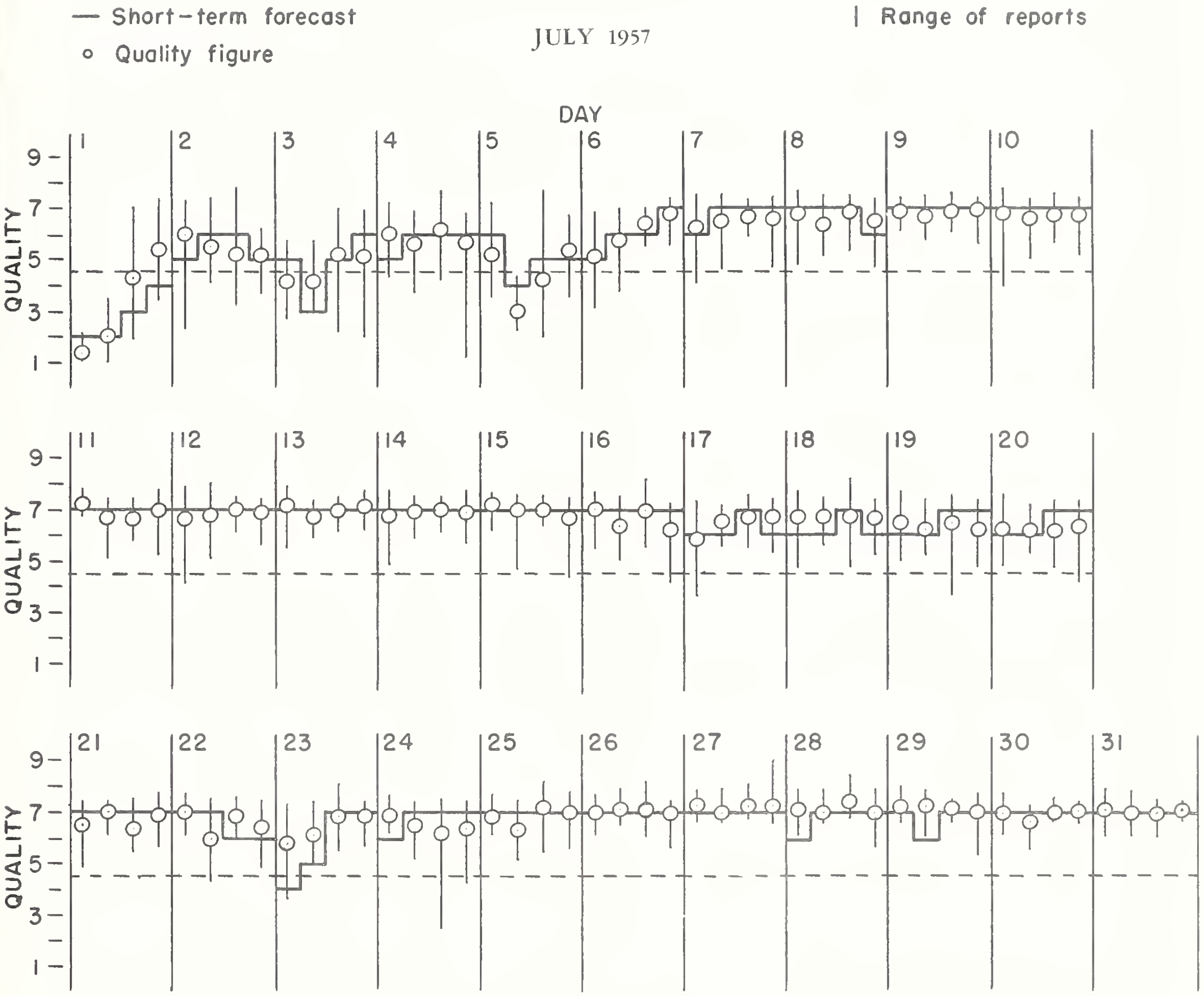
JULY 1957

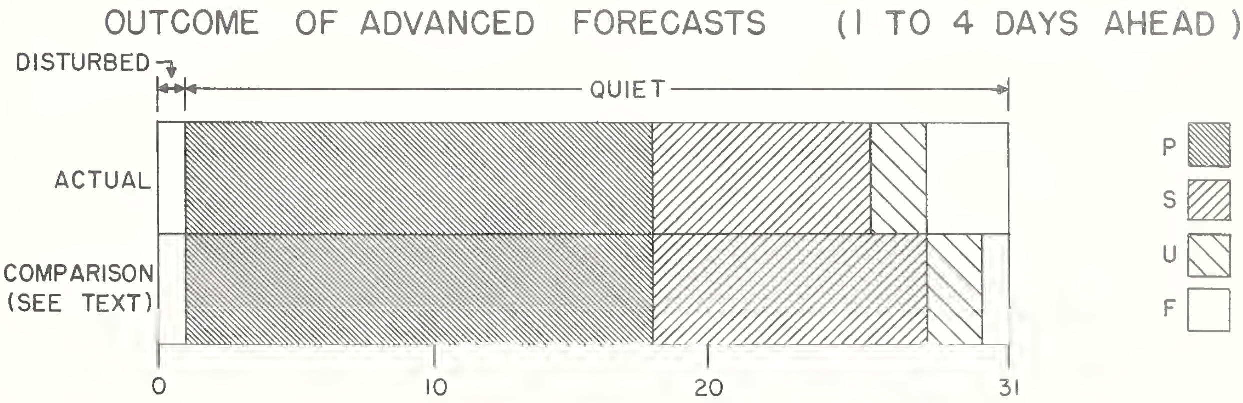
July 1957	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomagnetic K_{Fr}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-4 days	4-7 days	8-25 days	Half Day (1)	Half Day (2)
1	1+	2o	4+	5+	2	2	3	4	(3o)	7	7		(6)	(5)
2	6o	6-	6-	6-	5	6	6	5	6-	4	7		3	(5)
3	5-	5-	6-	6-	5	3	5	6	5o	5	7		(4)	3
4	7-	6o	7-	6+	5	6	6	6	6+	6	7		1	3
5	6-	3+	5-	6o	6	4	5	5	5-	5	7		(6)	3
6	6-	6+	7o	7-	5	6	6	7	6+	5	7		3	3
7	6+	7-	7-	7-	6	7	7	7	7-	6	7		2	2
8	7-	6+	7o	7-	7	7	7	6	7-	7	7		2	2
9	7o	7-	7o	7o	7	7	7	7	7o	6	7		2	2
10	7-	7-	7-	7-	7	7	7	7	7-	6	7		2	1
11	7+	7-	7-	7o	7	7	7	7	7-	7	7		1	1
12	7-	7-	7o	7o	7	7	7	7	7-	7	7		3	2
13	7o	7-	7o	7o	7	7	7	7	7o	7	7		1	1
14	7-	7o	7o	7o	7	7	7	7	7o	7	7		1	2
15	7o	7o	7o	7-	7	7	7	7	7o	7	7		1	1
16	7o	6+	7o	6+	7	7	7	7	7-	7	7		2	3
17	6-	7-	7-	7-	6	6	7	6	6+	7	7		2	2
18	7-	7-	7-	7-	6	6	7	6	7-	7	7		3	2
19	7-	6+	7-	6+	6	6	7	7	6+	6	7		3	(4)
20	6+	6o	6o	6+	6	6	7	7	6+	6	7		2	2
21	7-	7o	6+	7o	7	7	7	7	7-	6	6		2	2
22	7o	6o	7-	6+	7	7	6	6	7-	7	6		3	3
23	6+	6o	7-	7-	4	5	7	7	6+	4	7		3	3
24	7o	7-	6+	6+	6	7	7	7	7-	4	7		2	3
25	7o	6+	7o	7o	7	7	7	7	7-	6	7		2	2
26	7o	7o	7o	7o	7	7	7	7	7o	6	7		2	1
27	7+	7o	7+	7+	7	7	7	7	7+	5	7		1	3
28	7o	7o	7+	7o	6	7	7	7	7o	5	7		2	2
29	7+	7+	7o	7o	7	6	7	7	7o	7	7		3	2
30	7o	7-	7o	7o	7	7	7	7	7o	7	7		2	2
31	7o	7o	7o	7+	7	7	7	7	7o	7	7		1	2
Score:	Quiet Periods			P	22	20	23	21		17	19			
				S	6	8	7	10		8	9			
				U	1	1	0	0		2	2			
				F	1	0	0	0		3	0			
	Disturbed Periods			P	0	1	0	0		0	0			
				S	1	1	1	0		0	0			
				U	0	0	0	0		0	0			
				F	0	0	0	0		1	1			

( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS
NORTH ATLANTIC

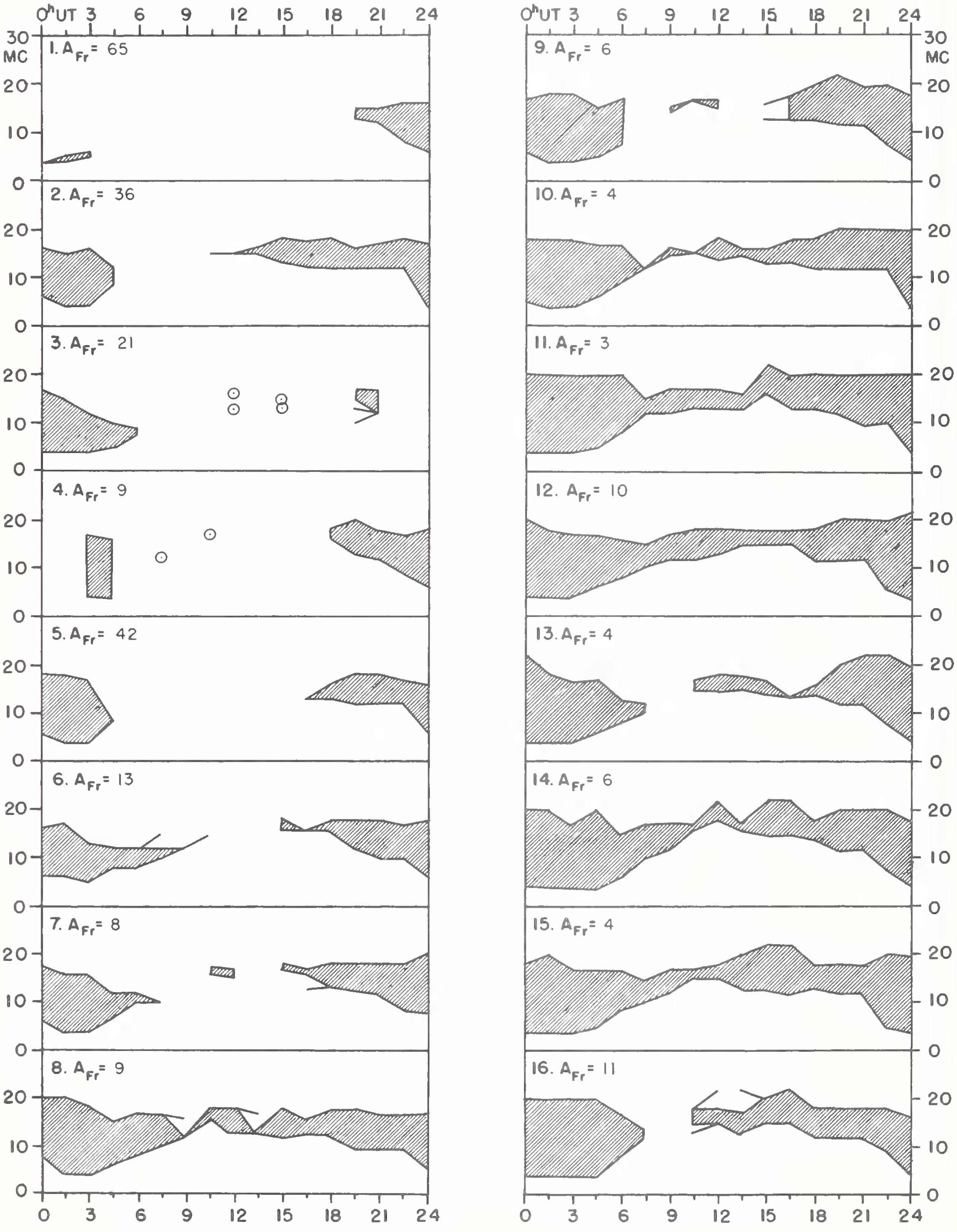
JULY 1957



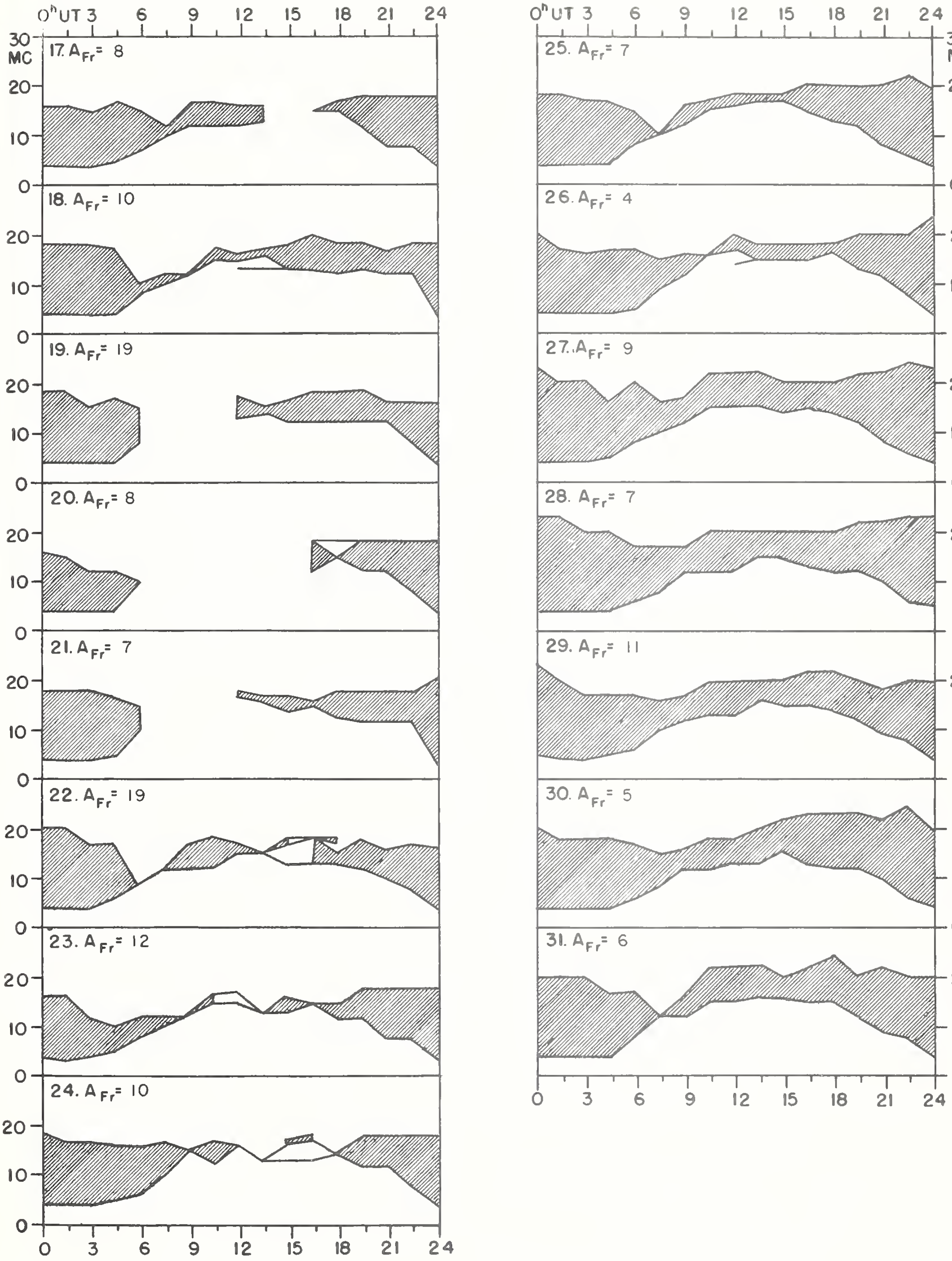


USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

JULY 1957



JULY 1957



Adapted from Observations by Deutsches Bundespost

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

JULY 1957

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

Score:			02	10	18	1-4 days	4-7 days
	Quiet Periods	P	18	18	13	15	12
		S	8	11	15	13	13
		U	1	0	0	1	0
		F	2	0	1	0	4
	Disturbed Periods	P	1	0	0	1	0
		S	1	1	1	0	0
		U	0	0	0	0	0
		F	0	1	1	1	2

( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

JULY 1957

OUTCOME OF ADVANCED FORECASTS (1 TO 4 DAYS AHEAD)