PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
NOVEMBER 1957

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

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PART B

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INTRODUCTION

This monthly report series is intended to keep research workers abreast of the major particulars of solar activity and the associated ionospheric, radio propagation and other geophysical effects. It is made possible through the cooperation of many observatories, laboratories and agencies as recorded in the detailed description of the tables and graphs which follows. The report is 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 continum of the center of the solar disk (at the same wavelength as the line) that would contain the same energy as the observed coronal line. The indices have the following meanings:

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

R_6 = same for λ6374.

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

R_1 = same for λ6374.

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

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

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

where N is the number of indices entering the summation.

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

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

III SOLAR FLARES

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

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

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

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

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

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

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

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

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

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

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

IV SOLAR RADIO WAVES

2800 Mc Observations

The data on solar radio wave events made in Ottawa, Canada by the Radio and Electrical Engineering Division of the National Research Council (A. E. Covington) at 2800 Mc (10-cm emission) are presented. Near local noon (about 1700 UT) the sensitivity of the radiometer is determined and a mean flux for the whole day calculated. These values are given in a tabular form (see table I-1) in units of 10^{-22} watts/M^2/c/s. Burst phenomena are measured above this level and are given in terms especially suitable for the variations observed on this frequency. The basis for the classifications is described by Covington - J.R. Astro. Soc. Can. 45, 49, 1951 and Dodson, Hedeman and Covington, Ap. J. 119, 541, 1954. A modification in terminology with a view to simplification has been introduced and consists essentially of the omission of the descriptive word "Single" from the "Single-Simple" and "Single-Complex" classes; in designating the "Single", "Single-Simple" and "Rise and Fall" bursts into a single classification designated as "Simple Bursts" with an appropriate type number; in the addition of the letter "f" to indicate that the burst deviates from the basic pattern by the presence of one or more small fluctuations in intensity; and by the addition of the letter "A" to indicate that the event has another smaller duration event superimposed upon it.

Simple Burst

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

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

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

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

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

5 - Absorption following burst (negative post).

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

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

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

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

Great Burst

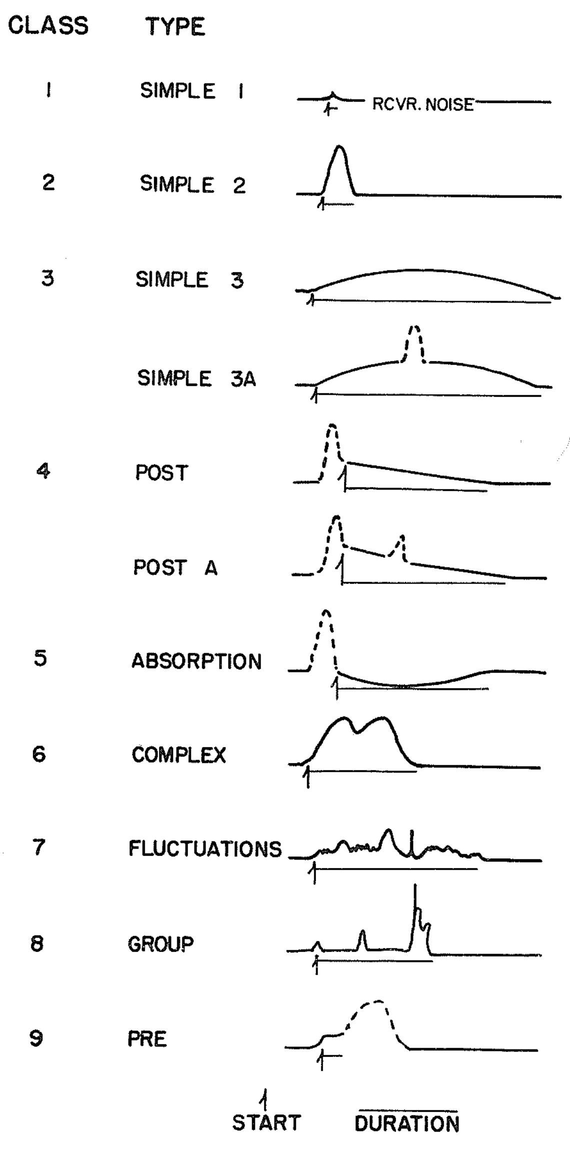
Infrequently occurring bursts of great intensity, often of complicated structure.

Letter "A"

Indicates that this event has another event superimposed upon it.

Letter "f"

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



200 Mc Observations

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

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

170 Mc and 450 Mc Observations

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

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

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

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

1 - The instantaneous flux made from one to ten excursions

outside the range described above.

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

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

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

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

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

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

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

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

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

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

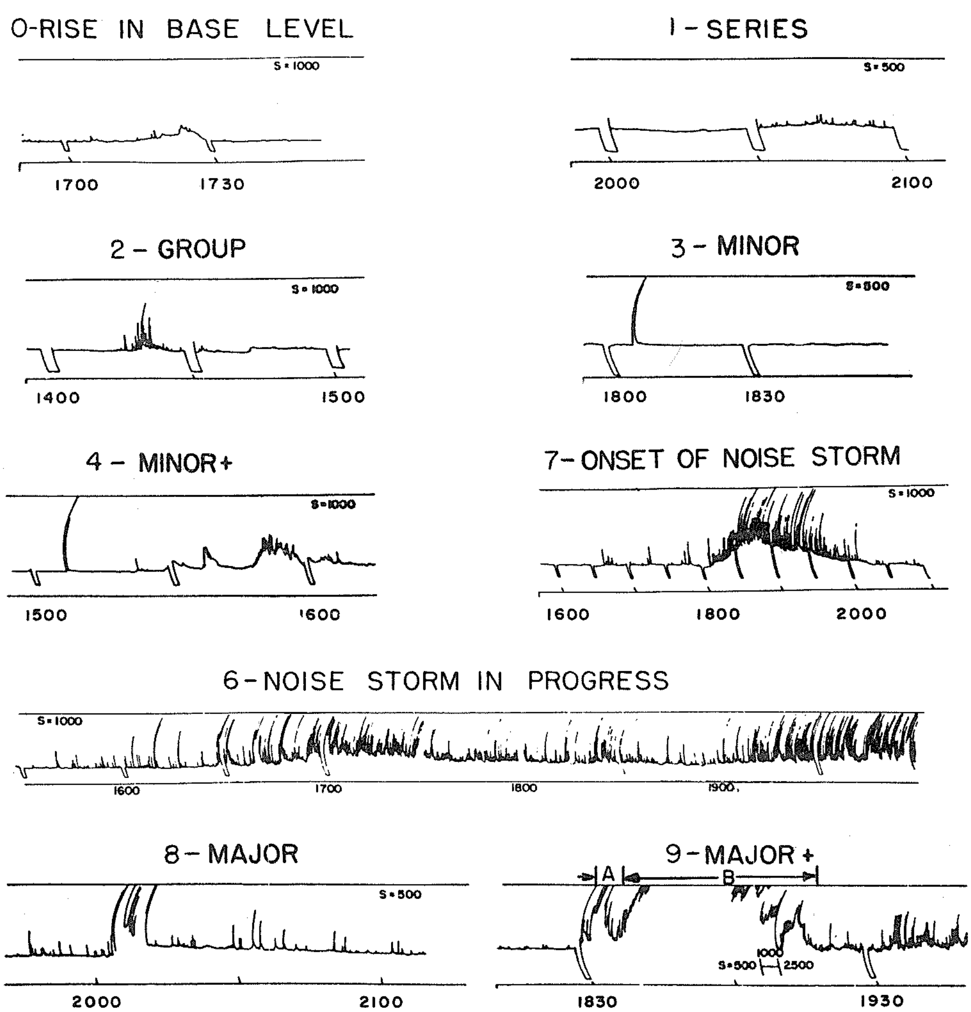
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

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

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

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

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



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

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

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

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

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

B - Event in progress before observations began.
D - Greater 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.

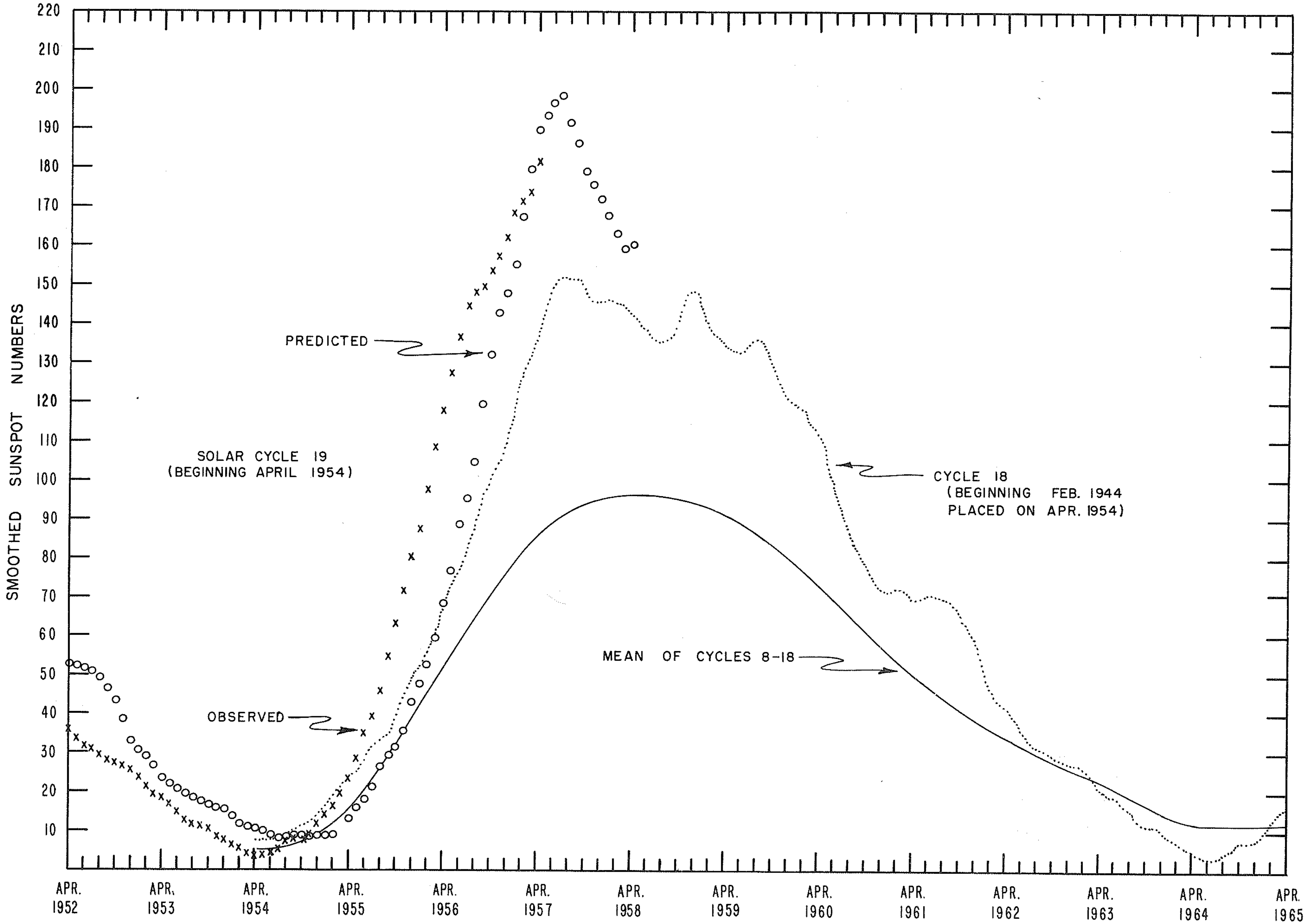
VII ALERT PERIODS AND SPECIAL WORLD INTERVALS

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

DAILY SOLAR INDICES

Sept. 1957	American Relative Sunspot Numbers R_A'
1	224
2	198
3	163
4	169
5	165
6	113
7	112
8	165
9	186
10	197
11	234
12	232
13	226
14	250
15	256
16	219
17	214
18	220
19	223
20	223
21	232
22	279
23	220
24	225
25	219
26	181
27	191
28	222
29	211
30	246
Mean:	207.2

Oct. 1957	Zurich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	244	268
2	240	252
3	249	265
4	233	237
5	230	245
6	239	250
7	224	253
8	250	261
9	274	275
10	270	275
11	220	278
12	260	284
13	246	281
14	258	289
15	250	277
16	289	289
17	268	272
18	228	294
19	223	291
20	235	303
21	250	282
22	255	274
23	260	295
24	285	280
25	247	259
26	310	266
27	286	296
28	340	323
29	350	342
30	330	344
31	306	318
Mean:	262.9	281.2



PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

OCTOBER 1957

CMP Oct. 1957	Lat	McMath Plage Number	Return of Region	Calcium Plage Data: CMP Values Area	Int.	History, Age		Sunspot Data: CMP Values Area	Count	History
01.2	N17	4162	4145	2700	3.5	ℓ∨ℓ	2	890	29	ℓ_ℓ
02.5	N28	4165	New	2100	3	ℓ—ℓ	1	1140	33	ℓ∧ℓ
02.8	S15	4166	4166	800	2	ℓ—ℓ	1	90	2	b—ℓ
04.8	S22	4167	4136	6500	3.5	ℓ—ℓ	2	1290	2	ℓ—ℓ
05.9	S13	4175	4133	2700	3.5	ℓ—ℓ	3	580	29	ℓ‾\ℓ
06.4	N40	4171	New	800	2.5	b/ℓ	1	70	7	b_/ℓ
07.2	S12	4176	4138	1100	2	ℓ—ℓ	4	20	3	b—d
07.7	N12	4172	4134	3900	3	ℓ/\/ℓ	3	411	23	ℓ_/ℓ
08.0	S40	4173	New	4900	2.5	ℓ—ℓ	1	340	8	ℓ∧ℓ
08.9	S18	4177	4141	2300	2.5	ℓ_ℓ	2	350	3	ℓ—ℓ
09.0	N31	4174	4139	300	1.5	ℓ\d	5	(50)	(1)	b—d
11.1	N18	4179	New	4000	3.5	ℓ—ℓ	1	1130	17	ℓ∧ℓ
12.5	N25	4182	New	2100	3	ℓ/‾ℓ	1	480	8	b∧ℓ
12.7	S23	4187	4143	1000	1	ℓ\ℓ	6	(40)	(2)	b—d
13.8	N11	4180	4148	1900	2.5	ℓ—ℓ	6	70	2	ℓ\d
14.6	S40	4184	*	1600	1	ℓ—d	*			
15.2	N21	4183	4148	800	2	ℓ\/ℓ	6	60	2	b/ℓ
15.2	N11	4192	New	600	1.5	b—ℓ	1	50	2	b—d
15.3	S18	4185	New	3200	3.5	ℓ—ℓ	1	980	12	ℓ∧ℓ
16.8	N25	4188	4151	7200	2.5	ℓ_ℓ	6	150	4	ℓ∨ℓ
17.1	N10	4186	4152	5400	2.5	ℓ\ℓ	3	60	1	ℓ\d
17.5	S25	4189	4155	13,100	4	ℓ—ℓ	2	3560	35	ℓ/‾ℓ
20.6	S19	4191	4157	1200	2	ℓ/ℓ	3	100	1	ℓ‾\d
22.0	N14	4195	4158	1000	2	ℓ/‾ℓ	4	190	6	b—ℓ
22.1	N25	4194	New	300	1	ℓ/‾ℓ	1	90	3	b∧ℓ
22.4	S25	4193	4163	700	1.5	ℓ—ℓ	2	100	5	b—d
23.9	N17	4196	4159	4500	3	ℓ/‾ℓ	5	410	11	ℓ/\/ℓ
24.0	S08	4204	New	1200	2.5	b—ℓ	1			
25.6	N19	4197	4159	9000	3	ℓ‾_ℓ	5	430	16	ℓ—ℓ
25.9	S23	4201	4161	7000	3	ℓ‾_ℓ	2	760	13	ℓ‾\ℓ
27.8	S13	4203	New	2300	3.5	ℓ_/ℓ	1	750	8	ℓ—ℓ
28.2	N38	4215	New	(600)	(1)	b—d	1			
28.3	N16	4202	4162	3200	3	ℓ_/ℓ	3	950	24	b/‾ℓ
28.7	N15	4213	4162	1500	2	b—ℓ	3	90	7	ℓ—ℓ
29.5	S13	4214	New	700	2	b—ℓ	1	110	4	b/‾ℓ
30.4	N29	4205	4165	1800	2.5	ℓ—ℓ	2	220	1	ℓ—ℓ
30.7	N15	4206	New	400	2	ℓ—ℓ	1	20	2	ℓ\d
31.5	N36	4216	4165	1200	2	b—d	2			
31.8	N13	4209	4169	1000	3	ℓ—ℓ	2	(60)	(3)	b—d
31.9	S18	4207	**	15,000	3	ℓ—ℓ	**	1890	25	ℓ‾\ℓ

* 4144, 4146; Ages 6,4 rotations.

** 4167,4175; Ages 3,4 rotations.

CORONAL LINE EMISSION INDICES

OCTOBER 1957

CMP Oct. 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	67	80	31	44	83	139	20	31	x	x	x	x	x	x	x	x
2	57	68	x	x	x	x	x	x	x	x	x	x	x	x	x	x
3	58	68	x	x	x	x	x	x	146	188	36	51	97	142	31	54
4	117	170	15	28	172	250	25	45	x	x	x	x	x	x	x	x
5	106	148	41	57	131	160	35	44	x	x	x	x	x	x	x	x
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
12	118	144	x	x	118	166	x	x	x	x	x	x	x	x	x	x
13	148	210	x	x	x	x	x	x	x	x	x	x	x	x	x	x
14	190	242	x	x	154	205	x	x	162	184	22	39	181	224	58	99
15	199a	256a	x	x	x	x	x	x	x	x	x	x	x	x	x	x
16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
17	227	400	67	116	204*	327	15	27	x	x	x	x	x	x	x	x
18	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
19	x	x	x	x	x	x	x	x	164	250	36	60	117	180	43	56
20	87	138	x	x	113	150	x	x	x	x	x	x	x	x	x	x
21	x	x	x	x	x	x	x	x	x*	x	x	x	x	x	x	x
22	x	x	x	x	x	x	x	x	137	200	54	108	228	324	51	90
23	x	x	x	x	x	x	x	x	155	188	67	124	263	408	70	93
24	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	133	188	x	x	100	125	x	x
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
27	x	x	x	x	x	x	x	x	135	151	37	57	169	268	39	72
28	162	216	39	70	206	276	32	72	145	170	46	98	157	224	42	70
29	x	x	x	x	x	x	x	x	132	193	x	x	111	149	x	x
30	x	x	x	x	x	x	x	x	136	173	x	x	120	150	x	x
31	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

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

SOLAR FLARES
OCTOBER 1957

Observatory	Date Oct. 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
MITAKA	01	0404 E	0428 D		N16	W05	4162	24 D	1	1	0413	1.34	1.37	1.92	107	
ATHENS	01	0700 E	0729		S15	W41	4161	29 D	1	4		1.70	2.40			
UCCLE	01	0834	0840	0835	N28	E11	4165	6	1	3	0835		3.80			
UCCLE	01	0844	0922	0854	N17	W08	4162	38	1	3	0854		3.50			
ATHENS	01	0847	0909		N27	E07	4165	22	1	4		2.70	2.80			
UCCLE	01	0850	0903	0900	S16	E20	4166	13	1	3	0900		3.80			
UCCLE	01	0900	0907	0903	N16	W56	4159	7	1	3	0903	2.00	3.00			
UCCLE	01	0910	0916		N26	W87	4158	6	1	3						
UCCLE	01	0911	0917	0913	N27	W58	4159	6	1	3	0913	2.00	3.00			
UCCLE	01	0922	0932		S41	E90	4173	10	1	3						
UCCLE	01	0932	1003	0934	N27	E17	4165	31	1&	3	0934	4.00	4.40			
ONDREJOV	01	1340 E	1346		S18	W44	4161	6 D	1	3	1340			2.20		
SAC PEAK	01	1615	1650	1620	N15	W60	4159	35	1	2		2.20			16	
SAC PEAK	01	2105	2122	2115	N27	E12	4165	17	1	2		2.60			15	
MT WILSON	01	2126	2138		S23	E31	4167	12	1							
HAWAII	01	2342	2354	2346	S21	E59	4167	12	1	1	2346	1.10	2.60			
NIZAMIAH	02	0343 E	0405	0348	N11	W49	4159	22 D	1	2	0348	2.43	3.68	1.60		
NIZAMIAH	02	0430 E	0451	0433	S16	E44	4167	21 D	1	2	0433	2.43	3.69	1.70		
WENDEL	02	0658 E	0725 D		S17	E44	4167	27 D	1				4.00			
WENDEL	02	0704	0715		S29	E55	4167	11	1				3.00			
UCCLE	02	0849	0903	0855	N29	E05	4165	14	2	4	0855		7.60			
ONDREJOV	02	0851	0900	0854	N29	E07	4165	9	1	3	0854			3.30		
ZURICH	02	0851 E	0910		N28	E05	4165	19 D	1	3	0851		3.00			
WENDEL	02	0855	0903		N27	E06	4165	8	1				4.00			
UCCLE	02	1032	1038	1033	S28	E31	4167	6	1	4	1033		3.40			
UCCLE	02	1056	1059	1057	S25	E30	4167	3	1	3	1057		3.20			
UCCLE	02	1059	1110 D	1106	N18	W22	4162	11 D	1	3	1106		3.10			
UCCLE	02	1107	1121	1114	S18	E50	4159	14	2	4	1114		5.80			
WENDEL	02	1143	1159 D		S44	E90	4173	D	1				4.00			
USNRL	02	1220	1242	1230	N14	W72	4159	22	1	1	1230	1.01	3.08		67	
ZURICH	02	1438 E	1447 D		S22	E25	4167	9 D	1	2	1438		3.00			
CAPRI S	02	1439 E	1455 D		S22	E27	4167	16 D	1	2	1440	1.80	2.20			
CAPRI S	02	1520 E	1528 D		N04	W90	4159	8 D	1	1	1526	2.00				
USNRL	02	1746	1822	1756	S37	E66	4173	36	1	2	1756	.90	2.90		63	
MT WILSON	02	1758	1808		N27	W00	4165	10	1							
MITAKA	03	0040 E	0046 D		N16	W75	4159	6 D	1	2	0040	.89	2.85	2.45	120	Slow S-SWF
MITAKA	03	0543 E	0556	0543	S14	E39	4175	13 D	1	2	0543	.89	1.26	3.13	134	
ONDREJOV	03	0625 E	0634		S21	E20	4167	9 D	1	3	0627			4.50		
MITAKA	03	0626	0631		S25	E16	4167	5	1	2	0626	2.78	3.48	1.81	110	G-SWF
MITAKA	03	0626	0635 D	0626	S20	E16	4167	9 D	1	2	0626	3.71	4.45	4.29	125	
ONDREJOV	03	0739 E	0752	0743	S11	E39	4175	13 D	1	3	0743			3.00		S-SWF
AROSA	03	0840 E	0845		S27	E17	4167	5 D	1							
ATHENS	03	0841	0858		S26	E19	4167	17	1	3		1.90	2.40			
ZURICH	03	1403	1420		S26	E23	4167	17	1	3	1403		2.00			
ZURICH	03	1428	1434		N31	W02	4165	6	1	3	1428		1.00			
MC MATH	03	1536 E	1615 D		S24	E16	4167	39 D	1							
CLIMAX	03	1726	1758	1731	N14	E21	4169	32	1		1731	3.50				
CLIMAX	03	1815	1858		N28	W13	4165	43	1		1826	3.40				
USNRL	03	1816	1912	1824	N27	W14	4165		1	2	1824	1.92	2.08		89	Slow S-SWF
SAC PEAK	03	1830 E	1832 D	1830 E	N27	W13	4165	2 D	1	2		2.20			15	
AROSA	04	0728 E	0736		N29	W13	4165	8 D	1							
ONDREJOV	04	0731 E	0740		N30	W19	4165	9 D	1	3	0733			2.30		
AROSA	04	0802 E	0814		N29	W19	4165	12 D	1							
AROSA	04	0824	0830 D		S13	E18	4175	6 D	1							
ZURICH	04	1033 E	1111 D		N20	E85	4179	38 D	1	2	1033		3.00			
ONDREJOV	04	1340 E	1350 D		S36	W75	4161	10 D	1	2	1345			3.10		
CAPRI S	04	1341 E	1347 D		S32	W78	4161	6 D	1	1	1342	.60	2.80			
ONDREJOV	04	1349 E	1350 D		S26	E01	4167	1 D	1	1	1349			2.10		
UCCLE	04	1415	1433	1418	S14	E21	4175	18	1&	2	1418	3.40	3.90			
UCCLE	04	1457	1556 D	1509	N18	E88	4159	59 D	2	2	1509	4.50	9.10			G-SWF
UCCLE	04	1508	1556 D	1533	S43	E45	4173	48 D	1	2	1533	2.80	4.50			
ONDREJOV	04	1512 E	1524		N09	E82	4179	12 D	1	2	I519			2.00		
HUANCAYO	04	1601 E	1635 D		S41	E47	4173	34 D	1	1						
MC MATH	04	1648 E	1655 D		N28	W22	4165	7 D	1							
ONDREJOV	05	0803	0816	0805	S27	W02	4167	13	1	3	0805			2.40		
UCCLE	05	0823 E	0824		S29	W05	4167	1 D	2	2	0823	5.20	5.30			
UCCLE	05	0832	0837	0834	S20	W13	4167	5	1	3	0834		2.10			
ONDREJOV	05	0847	0906	0850	S16	E12	4175	19	1	3	0850			2.60		
WENDEL	05	0901	0916		N19	E84	4179	15	1				4.00			S-SWF

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

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

SOLAR FLARES

OCTOBER 1957

Observatory	Date Oct. 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
SCHAUINS	05	0904	0910		N23 E77	4179	6	2							
ARCETRI	05	0907 E			N22 E79	4179		1&	2	0907	1.09	4.50			S-SWF
ONDREJOV	05	1012 E	1018	1013	N19 E76	4179	6 D	1	3	1013			3.30		
ONDREJOV	05	1136 E	1153	1139	N24 W35	4165	17 D	1	3	1139			2.10		
ONDREJOV	05	1215 E	1220		S31 E46	4173	5 D	1	3	1217			2.10		
ONDREJOV	05	1242	1254	1243	S27 W06	4167	12	1	3	1243			2.40		
MT WILSON	05	1759	1802		S16 E02	4175	3	1&							
CLIMAX	05	1801	1821	1812	S14 E04	4175	20	1		1812	2.70				
HAWAII	05	2050	2100	2052	S22 W18	4167	10	2	2	2052	6.20	7.50			
HAWAII	05	2140	2214	2142	S14 W03	4175	34	1	2	2142	2.90	3.10			
MT WILSON	05	2209 E	2242		S26 W19	4167	33 D	1							S-SWF
ONDREJOV	06	0753 E	0810		N40 E03	4171	17 D	1	2	0802			2.90		
AROSA	06	1040	1047 D		N13 E17	4172	7 D	1							
AROSA	06	1154	1157		N26 W46	4165	3	1							
AROSA	06	1217	1230		N13 E16	4172	13	1							
AROSA	06	1228	1249		S26 W21	4167	21	1							
CAPRI S	06	1229 E	1240		S25 W26	4167	11 D	1	1	1230	2.60	3.20			S-SWF
WENDEL	06	1231	1251		S26 W24	4167	20 D	1&				5.00			
HUANCAYO	06	1615	1651 D	1623	N19 E58	4179	36 D	1	3						
ZURICH	06	1618	1630		N19 E59	4179	12	1	3	1618		3.00			
HUANCAYO	06	1625	1651 D	1645	S23 W24	4167	26 D	1	3						
MT WILSON	06	1730 E	1752 D		N24 W56	4165	22 D	1							G-SWF
HUANCAYO	06	2037	2049	2038	S23 W27	4167	12	1	3						Slow S-SWF
MT WILSON	06	2037	2049		S22 E31	4177	12	1							
UCCLE	07	0843	1050	0848	S39 E04	4173	127	1	2	0848		1.50			
UCCLE	07	0947	0950		N38 W57	4165	3	1	3						
UCCLE	07	0950	1012	0951	N15 E05	4172	22	1	2						
UCCLE	07	1043	1105	1046	N09 E05	4172	22	1&	3	1046		5.10			
UCCLE	07	1116	1125	1118	N38 W57	4165	9	1&	2	1118	1.60	3.00			
AROSA	07	1338	1353		N09 E71	4180	15	1							
ONDREJOV	07	1341	1345		N09 E70	4180	4	1	2	1342			2.60		Slow S-SWF
ONDREJOV	07	1422 E	1429		N14 E07	4172	7 D	1	3	1424			2.10		
USNRL	07	1454	1507	1455	N11 E80	4180	13	1	2	1455	.45	2.26		62	
MT WILSON	07	2144	2151		S16 W71	4166	7	1							
MITAKA	08	0240 E	0245 D	0242	N14 W02	4172	5 D	2	1	0242	5.67	5.78	2.16	165	Slow S-SWF
ONDREJOV	08	0718	0721		N43 W22	4171	3	1	3	0718			2.10		
ONDREJOV	08	0728	0733	0731	S40 W01	4173	5	1	3	0731			2.70		
UCCLE	08	0909	0925	0910	N19 W14	4172	16	1	3	0910	2.80	2.90			
ONDREJOV	08	0912 E	0916	0913	S17 W12	4176	4 D	1	3	0913			2.30		
AROSA	08	1036	1044		S40 E00	4173	8	1							
UCCLE	08	1037	1043	1039	S38 W05	4173	6	1	2	1039	3.40	4.20			
CAPRI S	08	1049 E	1053 D		N10 E10	4172	4 D	1	1	1049	2.00	2.00			
UCCLE	08	1050 E	1051	1050	N15 E07	4172	1 D	1	2	1050	3.40	3.50			
WENDEL	08	1049	1124		N45 W17	4171	35	1&				5.00			
AROSA	08	1054	1124		N41 W24	4171	30	2							
UCCLE	08	1055	1135	1059	N44 W23	4171	40	2	2	1059	5.60	8.40			S-SWF
CAPRI S	08	1056 E	1125 D		N41 W27	4171	29 D	1	1	1105	1.50	2.30			
ONDREJOV	08	1057 E	1112	1059	N41 W23	4171	15 D	2	3	1059			3.00		
MT WILSON	08	1619			N07 E57	4180		1							G-SWF
CLIMAX	08	1644	1654	1647	N20 W18	4172	10	1		1647	2.20				
MT WILSON	08	1711	1717		N18 W17	4172	6	1							
MT WILSON	08	1902			N14 W13	4172		1							Slow S-SWF
NIZAMIAH	09	0340	0438	0353	S37 W16	4173	58	1&	2	0353	3.65	5.24	2.10		
SYDNEY	09	0345	0450		S42 W10	4173	65	2							
MITAKA	09	0348 E	0500 D	0357	S38 W11	4173	72 D	3	1	0351	16.10	22.20	2.71	227	Slow S-SWF
ONDREJOV	09	0747 E	0755		N13 W20	4172	8 D	1	3	0747			2.60		
ARCETRI	09	0811 E	0830 D		N22 E26	4182	19 D	1	4	0811	3.30	3.70			
1R35TRI	09	0856 E	0859 D		N23 E90	4183	3 D	1	2						
AROSA	09	0943 E	0948		N15 W18	4172	5 D	1							
ONDREJOV	09	0944 E	0948		N12 W16	4172	4 D	1	3	0945			2.70		
ONDREJOV	09	1138	1149	1140	N13 W20	4172	11	1&	3	1140			3.70		
ZURICH	09	1141 E	1144 D		N13 W23	4172	3 D	1	3	1141		3.00			
ONDREJOV	09	1315	1322	1319	N26 E36	4182	7	1	3	1319			2.50		
USNRL	09	1359	1425 D	1403	N25 E35	4182	26 D	1	1	1403	1.70	2.25			
USNRL	09	1623	1631	1625	S18 E77	4185	8	1	3	1625	.57	2.49		63	
USNRL	09	1653	1705	1655	N26 E34	4182	12	1	2	1655	2.37	3.01		90	
USNRL	09	1839	1847	1841	S17 E75	4185	8	1	2	1841	.34	1.50		102	
HUANCAYO	09	1925 E	2021 D	1925	N25 E33	4182	56 D	1&	3						
HUANCAYO	09	1925 E	2050 D	1945	S16 E74	4185	85 D	1&	3						

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MT WILSON	09	2008	2017		N14 W29	4172	9	1							
MT WILSON	09	2122			S14 E17	4181		1							
MITAKA	10	0021	0040	0030	N15 W26	4172	19	1	2	0031	2.31	2.54	1.79	110	
MITAKA	10	0437 E	0442		S29 W75	4167	5 D	1&	1	0437	3.80	1.22	2.33	120	
WENDEL	10	0855	0914	0859	S23 E60	4185	19	1				4.00			
CAPRI S	10	0857 E	0910 D		S18 E64	4185	13 D	1	3	0859	2.00	4.90			
ARCETRI	10	0859	0904		S19 E65	4185	5 D	1	3	0904	2.10	5.10			S-SWF
ARCETRI	10	0900 E	0918 D		S19 E65	4185	18 D	1	4						
ONDREJOV	10	0901 E	0923		S18 E65	4185	22 D	1	3	0902			3.30		
UCCLE	10	1017	1034	1018	N14 W38	4172	17	1	4	1018	2.30	2.80			
UCCLE	10	1020 E	1025	1021	N25 E22	4182	5 D	1	3	1021	2.40	2.60			
UCCLE	10	1047	1059 D		N25 E22	4182	12 D	1	2						
WENDEL	10	1059 E	1112 D		N22 E25	4182	13	1				3.00			
AROSA	10	1102	1117		N24 E23	4182	15	1							
ONDREJOV	10	1103	1110		N24 E21	4182	7	1	3	1105			2.10		
AROSA	10	1253	1300		N42 W51	4171	7	1							
AROSA	10	1343	1357 D		N42 W51	4171	14 D	1							
USNRL	10	1659 E	1731		N26 E42	4183	32 D	1&	1	1702	3.62	4.90			
CLIMAX	10	2254	2310	2257	N23 E17	4182	16	1		2257	4.10				
MITAKA	11	0244 E	0255 D		N11 W47	4172	11 D	1	1	0246	.89	1.05	2.27	96	
AROSA	11	0812 E	0822		S32 E90	4189	10 D	1							S-SWF
ONDREJOV	11	0814 E	0832		N13 W48	4172	18 D	1	3	0814			2.60		
ATHENS	11	0814	0852		N13 W46	4172	38	1	4		1.70	2.30			
AROSA	11	0815	0835		N15 W46	4172	20	1							
WENDEL	11	0815 E	0836		N14 W47	4172	21 D	1&				5.00			
AROSA	11	0913 E	0918		S14 W34	4177	5 D	1							
USNRL	11	1420	1510	1428	N43 W62	4171	50	1	2	1428	1.24	3.09		69	
OTTAWA	11	1421			N42 W64	4171		1&	1	1428	1.57	4.14			
ONDREJOV	11	1425 E	1432	1427	N42 W60	4171	7 D	1	3	1427			2.40		G-SWF
CAPRI S	11	1426 E	1458 D		N43 W57	4171	32 D	1&	3	1426	3.00	7.80			
WENDEL	11	1507	1521		S26 E70	4189	14	1				4.00			
CAPRI S	11	1508 E	1517 D		S20 E69	4189	9 D	1&	3	1514	2.00	6.80			
USNRL	11	1508	1522	1510	S25 E68	4189	14	1	3	1510	1.02	3.25		91	
ONDREJOV	11	1515 E	1519	1517	N24 E70	4188	4 D	1	3	1517			2.30		S-SWF
USNRL	11	1630	1652	1632	S16 E52	4185	22	1	2	1632	1.02	1.79		105	Slow S-SWF
USNRL	11	1950	2001 D	1956	S30 E83	4189	11 D	1	2	1956	1.70			59	
ARCETRI	12	0859 E			N12 W63	4172		1	3	0859	2.50	5.50			
NIZAMIAH	12	0903 E	0919	0906	N15 W66	4172	16 D	1&	2	0906	2.74	6.64	1.90		S-SWF
CAPRI S	12	0905 E	0925 D		S14 W70	4176	20 D	1	3	0910	2.00	6.80			
UCCLE	12	0927 E	0937	0931	S13 W75	4176	10 D	1	4	0931	2.20	4.40			
UCCLE	12	0927 E	0950	0931	N13 W65	4172	23 D	1&	4	0931	3.40	6.00			
ARCETRI	12	1004 E			N12 W63	4172		1	3	1004	1.60	4.20			
UCCLE	12	1013	1100	1015	N07 E47	4186	47	1&	2	1015	4.50	5.60			S-SWF
UCCLE	12	1013	1023	1015	S30 E75	4189	10	1	2	1015	2.20	4.00			
UCCLE	12	1030	1047	1034	S30 E75	4189	17	1	4	1034	2.10	4.00			
UCCLE	12	1100	1158	1118	N15 W65	4172	58	1	4	1118	2.20	4.00			
UCCLE	12	1101	1148	1105	N43 W80	4171	47	1	4	1105	2.20	4.50			
UCCLE	12	1115 E	1133 D	1119	S40 W55	4173	17 D	1&	4	1119	3.40	6.00			
WENDEL	12	1257 E	1330		S13 W73	4176	33 D	1&				6.00			
USNRL	12	1353	1409	1355	S25 E66	4189	16	1	2	1355	.79	2.25	1.50	74	S-SWF
MITAKA	13	0444 E	0449		N24 E22	4183	5 D	1	2	0444	2.53	2.86	1.98	118	
NIZAMIAH	13	0500 E	0521		S25 E59	4189	21 D	1&	2		3.34	7.75	2.20		
NIZAMIAH	13	0534 E	0556	0539	N13 E41	4186	22 D	2&	2	0539	4.25	5.62	2.50		S-SWF
MITAKA	13	0536	0641	0540	N11 E41	4186	5	2&	2	0540	17.00	23.10	2.53	169	
MITAKA	13	0559 E	0631		S25 E57	4189	32 D	1&	2	0559	3.80	8.30	2.68		
MITAKA	13	0647 E	0659 D		S25 E57	4189	12 D	1&	1	0647	2.78	6.06	2.32		
ATHENS	13	0732	0825		N11 W74	4172	53	2	4		1.60	5.30			
UCCLE	13	0829 E	1202 D	1150	S31 E58	4189	213 D	2		1150	3.00	5.30			
UCCLE	13	0901	0910	0904	S07 E42	4189	9	1	3	0904	2.20	2.70			
UCCLE	13	0926	0931	0927	S18 E25	4185	5	1	3	0927		2.70			
WENDEL	13	0929	1003		S23 E56	4189	34	1				4.00			
UCCLE	13	0949	0953	0950	S17 E22	4185	4	1	3	0950		3.60			
UCCLE	13	1016	1018		N45 W90	4171	2	1	3						
UCCLE	13	1018	1025	1021	S24 E65	4189	7	1&	3	1021	2.50	4.80			
UCCLE	13	1034	1039	1035	S24 E65	4189	5	1	3						
UCCLE	13	1121	1151 D	1135	S16 E24	4185	30	1&	2						
WENDEL	13	1244	1327		N21 E30	4188	43	2				11.00			
USNRL	13	1244	1338	1248	N20 E31	4188	54	1&	1	1248	3.62	4.35		79	
ONDREJOV	13	1246 E	1314	1248	N20 E31	4188	28 D	1&	3	1248			2.70		

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CAPRI S	13	1247 E	1320 D		N20 E31	4188	33 D	1&	3	1257	4.50	5.40			
OTTAWA	13	1300 E	1335		N20 E30	4188	35 D	1&	1	1301	3.36	3.97			
WENDEL	13	1323 E	1354 D		S23 E52	4189	31 D	1&				6.00			
USNRL	13	1411	1420	1413	N11 W82	4172	9	1	1	1413	.68	3.42		56	
WENDEL	13	1444	1501		N27 E59	4188	17	1				4.00			
OTTAWA	13	1444	1459	1447	N30 E55	4188	15	1	2	1447	1.62	3.04			
USNRL	13	1445	1503	1447	N28 E57	4188	18	1	1	1448	1.13	2.14		84	
ONDREJOV	13	1447 E	1457	1448	N27 E54	4188	10 D	1&	3	1448			3.70		
CLIMAX	13	1446 E	1511		S25 E54	4189	25 D	1		1446	2.50				
WENDEL	13	1523	1547 D		S27 E51	4189	24 D	1&				5.00			
USNRL	13	1524	1600 D	1532	S26 E50	4189	36 D	1&	1	1532	2.37	4.51		111	S-SWF
SYDNEY	13	2240 E	0045	2245	N10 E35	4186	125 D	2							
MITAKA	14	0602 E	0627		N26 E17	4183	25 D	1	1	0602	2.53	2.83	1.97	107	
UCCLE	14	0904	1130	1040	S24 E58	4189	146	1							
UCCLE	14	0921	0926 D	0922	S25 E50	4189	5 D	1	3	0922	1.60	3.40			
ARCETRI	14	0946 E	1018 D		N41 W90	4171	32 D	2	3						
USNRL	14	1158	1317	1212	N41 W90	4171	79	2	2	1212	2.15		2.00	35	S-SWF
USNRL	14	1158 E	1239	1200	S24 E42	4189	41 D	1	2	1200	1.24	2.00		80	
USNRL	14	1218	1237	1225	S18 W85	4177	15	1&	1	1225	2.15		1.00	48	
WENDEL	14	1219 E	1242 D		S17 W85	4177	23 D	1				4.00			
WENDEL	14	1303	1321 D		S26 E38	4189	18 D	1&				6.00			
USNRL	14	1305	1329	1309	S28 E39	4189	24	1	2	1309	1.92	2.95		74	S-SWF
CAPRI S	14	1319	1335		N38 W90	4171	16	1&	3	1328	2.50				
NEDERHORST	14	1320 E	1355		N50 W90	4171	35 D	2							Slow S-SWF
WENDEL	14	1451	1514		S19 E13	4185	23	1				3.00			
WENDEL	14	1521 E	1548 D		S26 E37	4189	27 D	1				3.00			
HUANCAYO	14	1532	1548	1534	S19 E13	4185	16	1	2						
HUANCAYO	14	1606 E	1613	1606	S28 E41	4189	7 D	1	2						
USNRL	14	1850	1940	1852	N20 E13	4188	50	1&	2	1852	3.74	3.94		100	
MITAKA	15	0241 E	0306	0254	S23 E39	4189	25 D	1&	1	0254	8.13	1.27	2.26	128	Slow S-SWF
NIZAMIAH	15	0252 E	0319		S24 E37	4189	27 D	1	2	0252	2.13	3.10	1.50		
MITAKA	15	0501	0529	0508	N08 E15	4186	28	1	1	0503	4.70	4.98	1.77	110	
WENDEL	15	0748 E	0808 D		S26 E31	4189	20 D	1				3.00			
WENDEL	15	1013	1028		N10 E15	4186	15	1				4.00			
WENDEL	15	1328	1406 D		N09 E04	4186	38 D	1&				6.00			
OTTAWA	15	1331	1355	1332	S20 E31	4189	24	1	3	1332	1.86	2.43			
WENDEL	15	1331	1355		S21 E29	4189	24	1				4.00			
OTTAWA	15	1335			N09 E18	4186		1&	3	1340	2.78	2.95			
USNRL	15	1336	1442	1343	N09 E18	4186	66	1&	1	1343	3.28	3.44		99	
WENDEL	15	1512	1540		S26 W40	4187	28	1				3.00			
USNRL	15	1513	1549	1517	S26 W41	4187	36	1	2	1517	1.81	2.87		71	
USNRL	15	1529	1741	1537	N09 E15	4186	12	1	1	1537	3.28	3.42	1.00	78	
USNRL	15	1819	1843	1821	S26 E33	4189	24	1	1	1821	1.58	2.22		72	
MITAKA	16	0045	0057 D		N23 E04	4188	12 D	1	1	0045	3.28	3.41	2.35	122	Slow S-SWF
MITAKA	16	0051 E	0058 D	0051	S25 E21	4189	7 D	1	1	0051	1.84	2.36	5.38	128	
MITAKA	16	0144	0155		N22 W56	4179	11	1	2	0144	2.78	4.73	2.04	91	S-SWF
MITAKA	16	0152	0202	0152	S25 E21	4189	10	3	2	0153	11.40	14.60	9.43	315	S-SWF
TASHKENT	16	0415 E	0500	0424	S27 E22	4189	45 D	2							
MITAKA	16	0416	0445	0424	S25 E19	4189	29	3	1	0424	24.90	31.90	6.32	183	
NIZAMIAH	16	0423 E			S26 E22	4189		1	1	0423	2.13	2.70	1.50		
NIZAMIAH	16	0529 E	0530 D		S26 E22	4189	1 D	1	1	0529	1.82	2.32	1.60		Slow S-SWF
MITAKA	16	0529 E	0537 D		S25 E19	4189	8 D	2	1	0529	11.40	14.60		128	S-SWF
MITAKA	16	0655 E	0702 D		S22 E13	4189	7 D	1	1	0700	.89	1.06	2.23	107	
UCCLE	16	1050	1124	1108	S26 E14	4189	34	1	4	1108	2.20	2.50			
UCCLE	16	1059	1109	1059	N29 W39	4182	10	1&	4	1059	3.40	4.70			
UCCLE	16	1120	1138	1126	S22 E25	4189	18	1	4	1126	3.50	4.20			
UCCLE	16	1145	1202 D	1150	S14 W22	4185	17 D	1&	4	1150	3.50	4.30			
ZURICH	16	1147	1210		S15 W20	4185	23	1	2	1147		2.00			
MT WILSON	16	1458			S17 E23	4189		1							
HUANCAYO	16	1544	1658 D	1600	S27 E25	4189	14 D	1	2						
USNRL	16	1637	1741 D	1649	S26 E22	4189	64 D	1	2	1649	1.59	2.04	1.00	74	
ZURICH	17	1323	1329	1324	N24 W75	4182	6	1	3	1324		2.00			
CAPRI S	17	1352	1405		S23 E05	4189	13	1	3	1354	1.80	2.00			
ZURICH	17	1353	1411	1355	S24 E08	4189	18	1	2	1355		3.00			
SAC PEAK	17	1415	1432 D	1432 U	S24 E06	4189	17 D	1	2		2.50			18	
CAPRI S	17	1416 E	1523 D		S22 E05	4189	67 D	1&	3	1448	4.00	4.50			
ARCETRI	17	1430 E	1513		S24 E08	4189	43 D	1&	3	1439	3.30	3.90			Slow S-SWF
ZURICH	17	1435 E	1454 D		S24 E08	4189	19 D	1	1	1435		6.00			
CAPRI S	18	0816 E	0910 D		S25 W07	4189	54	1	3	0821	2.00	2.20			S-SWF

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CAPRI S	18	1520 E	1557 D		S26 W09	4189	37 D	1	3	1535	1.80	2.00			G-SWF
SAC PEAK	18	1857	1922	1905	S26 W16	4189	25	1	2		2.60			17	G-SWF
MITAKA	18	2245	2305		S31 W10	4189	20	1	2	2245	.89	1.12	1.52	125	
MITAKA	18	2245	2313		S23 W23	4189	28	1	2	2245	2.78	3.42	1.65	128	
MITAKA	18	2302	2308		N23 W69	4183	6	1&	1	2302	5.67	15.30	2.23	96	
MITAKA	18	2336 E	2342	2336	N23 W70	4183	6 D	1&	1	2336	1.34	3.62	2.27	196	
MITAKA	19	0007	0016 D		N23 W70	4183	9 D	1	1	0009	3.80	1.02	2.40	102	
MITAKA	19	0012 E	0017	0012	S23 W24	4189	5 D	1&	1	0014	7.57	9.16	3.27	149	
MITAKA	19	0118	0205	0130	S25 W23	4189	47	1&	1	0157	3.80	4.67	2.52	165	Slow S-SWF
MITAKA	19	0118	0148	0130	S28 W19	4189	30	1&	1	0131	3.80	4.78	2.75	165	
MITAKA	19	0406 E	0415	0410	S28 W20	4189	9 D	1	1	0406	2.31	2.91	3.27	146	S-SWF
ONDREJOV	19	0613 E	0654		S27 W21	4189	41 D	2	3	0616			2.70		Slow S-SWF
{ CAPRI S	19	0641 E	0807 D		S26 W27	4189	86 D	3	3	0653	10.00	13.00			
TASHKENT	19	0648 E	0754		S23 W26	4189	66 D	2							
WENDEL	19	0700 E	0754		S23 W23	4189	54 D	3							
ONDREJOV	19	0721 E	0726		S26 W24	4189	5 D	1	3	0723			2.30		
ONDREJOV }	19	0725	0729	0727	S23 W24	4189	4	1	3	0727			3.10		
CAPRI S	19	0757 E	0916 D		N22 E88	4197	79 D	1	3	0806	.50	3.00			S-SWF
ONDREJOV	19	0830 E	0839		S26 W19	4189	9 D	1	1	0831			2.30		S-SWF
CAPRI S	19	1019 E	1027 D		S24 W28	4189	8 D	1	3	1023	1.80	2.30			
CAPRI S	19	1035 E	1155 D		S23 W18	4189	80 D	1	3	1055	2.50	2.90			Slow S-SWF
ONDREJOV	19	1126 E	1141		N12 W83	4180	15 D	1&	3	1127			3.60		G-SWF
USNRL	19	1258	1400	1302	S24 W28	4189	62	1&	2	1302	3.50	4.56		100	Slow S-SWF
HUANCAYO	19	1633 E	1652 D	1633	N22 W81	4183	19 D	1	2						G-SWF
{ MT WILSON	19	1916	2006		S25 W20	4189	50	2							S-SWF
MC MATH }	19	1918 E	1945		S25 W21	4189	27 D	2&							
UCCLE	20	0905 E	0913		N24 W87	4183	8 D	1	4						
UCCLE	20	0911	0917	0913	S22 W51	4189	6	1	4	0913	1.60	2.40			
UCCLE	20	0921	0934 D	0929	N21 E80	4197	13 D	1	3						S-SWF
{ UCCLE	20	0920	0928	0925	S22 W31	4189	8	1&	4	0925	3.30	4.10			
CAPRI S	20	0926 E	0930 D		S23 W32	4189	4 D	1	3	0928	2.00	2.60			
UCCLE	20	0939	1120 D	0941	S27 W32	4189	101 D	2	4	0941	7.40	9.20			S-SWF
CAPRI S	20	0940 E	1032 D		S28 W30	4189	52 D	1	2	1006	3.30	4.30			
CAPRI S	20	0940 E	1032 D		S28 W30	4189	52 D	1	2	1006	3.30	4.30			
KRASNAYA	20	0942 E	1002		S27 W35	4189	20 D	2							
UCCLE }	20	1004	1016	1006	S26 W40	4189	12	1	4	1006	1.70	2.20			
UCCLE	20	1024	1135 D	1045	N21 E80	4197	11	1	3						
UCCLE	20	1144	1149	1146	N20 E75	4197	5	1&	4	1146	2.00	4.00			
USNRL	20	1425	1453	1429	N12 W63	4186	28	2	2	1429	3.62	7.50		85	
{ MC MATH	20	1637	1715	1642	S25 W45	4189	38	3&							
MC MATH	20	1644	1804 D	1651	S26 W35	4189	80 D	3&							S-SWF
SAC PEAK }	20	1700 E	1712 D	1700 E	S29 W36	4189	12 D	3	2		21.30			30	
MITAKA	21	0447	0459 D	0452	S23 W38	4189	12 D	1	1	0447	1.34	1.98	1.52	115	
{ USNRL	21	1212	1300	1218	S26 W54	4189	48	1&	3	1218	2.14	4.20	2.00	113	S-SWF
OTTAWA }	21	1233 E			S26 W52	4189		1&	1	1241	2.44	4.87			
USNRL	21	1301	1314	1302	S28 W50	4189	13	1	2	1302	1.13	2.22		123	
USNRL	21	1610	1622	1615	S13 E85	4203	12	1	2	1615	.45	5.20		70	Slow S-SWF
USNRL	21	1850	1900 D	1853	N21 E57	4197	10 D	1	2	1853	.56	1.04		117	
MITAKA	22	0406 E	0429	0417	S26 W66	4189	23 D	1&	1	0406	2.53	6.32	2.52	152	Slow S-SWF
MITAKA	22	0412 E	0416		S19 W52	4189	4 D	1	1	0412	1.86	3.07	2.10	100	
MITAKA	22	0503 E	0522		S23 W60	4189	19 D	1&	1	0503	3.80	7.60	2.58	120	Slow S-SWF
ONDREJOV	22	0752 E	0805		N25 W05	4194	13 D	1	2	0755			2.60		
ONDREJOV	22	0752 E	0807		N26 W55	4188	15 D	1&	2	0754			4.50		
UCCLE	22	1022 E		1222	N16 E38	4197		1	2	1222	3.40	4.10			
{ ARCETRI	22	1015 E			N26 W60	4188		1	3	1015	1.00	2.10			
UCCLE }	22	1022 E			N30 W64	4188		1	2						
{ R O EDIN	22	1134	1145	1137	N25 W06	4194	11	1	2	1137	3.50	3.70	2.05		
ONDREJOV }	22	1135 E	1157		N25 W07	4194	22 D	1&	3	1137			2.60		
ONDREJOV	22	1253 E	1301		S15 E73	4203	8 D	1	3	1255			2.70		
{ OTTAWA	22	1512			N16 W06	4195		1	1	1527	2.26	2.33			
USNRL }	22	1522	1610	1525	N16 W05	4195	48	1	2	1525	2.26	3.01		79	
USNRL	22	1757	1823	1805	S28 W61	4189	26	1	2	1805	1.13	3.01		78	
USNRL	22	1854	1913	1859	N35 E90	4205	19	1	2	1859	1.35		2.00	51	
{ HUANCAYO	22	1933	2020 D	1934	S30 W68	4189	47 D	1	2						
USNRL }	22	1955	2022	2005	S28 W62	4189	27	1	2	2005	.90	2.41		76	
MITAKA	23	0002	0010		N28 W64	4188	8	1	1	0003	1.84	4.60	3.03	120	
MITAKA	23	0112	0126 D	0117	S29 W65	4189	14 D	1&	1	0117	3.80	1.10	2.16	134	
MITAKA	23	0240 E	0252		S23 W72	4189	12 D	1	1	0242	.89	2.85	3.97	134	S-SWF

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MITAKA	23	0623 E	0645		S26 W73	4189	22 D	3	1	0623	3.80	1.33	1.06		
{UCCLE	23	1041 E	1057		N21 E41	4197	16 D	1&	1						S-SWF
{ONDREJOV	23	1048 E	1052		N21 E40	4197	4 D	1	1	1050			3.30		
USNRL	23	1303	1337	1308	N21 W80	4188	34	1	3	1308	.79	3.49	1.00	57	G-SWF
USNRL	23	1410	1422	1412	S30 W75	4189	12	1	2	1412	.90	4.00		60.	
{MT WILSON	23	1535	1538		N14 E15	4197	3	1							
{ZURICH	23	1536	1542		N13 E17	4197	6	1	2	1536		2.00			
MT WILSON	23	1704 E	1709		N22 E30	4197	5 D	1							
USNRL	23	1706	1718	1710	S28 W90	4189	12	1	2	1710	1.36			54	
MT WILSON	23	1800	1812		N26 W78	4188	12	1							
{SAC PEAK	23	1850	1915	1900	S33 W68	4189	25	1	2		2.10			17	
{USNRL	23	1851	1912 D		S35 W70	4189	21 D	1	1	1906	.79	3.01		53	
CAPRI S	24	0703 E	0827 D		S22 W76	4191	84 D	1	2	0708	.40	2.00			S-SWF
UCCLE	24	1323 E	1345	1325	N15 W31	4195	22 D	2	3	1325	6.30	6.90			
{UCCLE	24	1323 E	1346	1342	N14 E02	4197	23 D	2	3	1342	5.10	5.10			
{ZURICH	24	1336 E	1353		N16 E04	4197	17 D	1	3	1341		2.00			
ZURICH	24	1336 E	1356		N16 W30	4195	20 D	1	3	1343		2.00			
ZURICH	24	1553 E	1601 D		N12 E15	4197	8 D	1	3	1553		2.00			
{SAC PEAK	24	1617	1640 U	1627	S28 W90	4189	23 D	1	2		3.60			20	
{MT WILSON	24	1626 E	1632		S29 W88	4189	6 D	1							
SAC PEAK	24	1732	1830	1735	N11 E15	4197	58	1	2		2.40			18	
MT WILSON	24	2115	2155		N12 E12	4197	40	1							
{SAC PEAK	24	2205	2230 D	2210	N15 E14	4197	25 D	1	2		3.60			22	
{MT WILSON	24	2205	2234		N12 E11	4197	29	1							
WENDEL	25	0832	0916		N14 E08	4197	44	1							
{WENDEL	25	0836	0938		S25 E10	4201	62	2&							
{CAPRI S	25	0844 E	0926 D		S23 E06	4201	42 D	1&	2	0905	3.00	3.30			S-SWF
{ARCETRI	25	0855 E	0933		S27 E11	4201	38 D	1&	2	0917	4.50	5.20			
{ARCETRI	25	0858 E			S27 E11	4201		1	2	0858	4.30	5.10			
WENDEL	25	0924	1012		N23 E02	4197	48	1							
{WENDEL	25	0943	1132		N24 W44	4194	109	1&							
{ARCETRI	25	0951 E			N26 W44	4194		1	2	0951	1.70	2.40			S-SWF
{ARCETRI	25	0952	1021 D		N26 W44	4194	29 D	1	2	1011	1.50	2.20			
{ARCETRI	25	1043 E	1107 D		N26 W44	4194	24 D	1	2						
{NEDERHORST	25	1047 E	1050		N27 W45	4194	3 D	2							S-SWF
{CAPRI S	25	1044 E	1115 D		N27 W46	4194	31 D	1	2	1048	1.50	2.40			
{ZURICH	25	1050 E	1135		N26 W45	4194	45 D	1	3	1050		7.00			
WENDEL	25	1105	1131		N17 W51	4195	26	1							
{WENDEL	25	1204	1224		N13 W43	4195	20	1							
{ZURICH	25	1210	1227		N16 W42	4195	17	1	3	1210		2.00			
WENDEL	25	1220	1253		S13 E32	4203	33	1							
WENDEL	25	1230	1250		N13 E08	4197	20	1							
ZURICH	25	1343 E	1354		S14 E29	4203	11 D	1	3	1343		3.00			
{USNRL	25	1500	1612	1505	N14 E03	4197	72	1	2	1505	2.37	2.39	1.00	102	
{SAC PEAK	25	1500	1530	1505	N13 E03	4197	30	1	1		2.50			18	
{WENDEL	25	1503	1536		N13 E08	4197	33	2							S-SWF
{MC MATH	25	1516 E			N12 E00	4197		1							
{ZURICH	25	1519 E	1546 D		N12 E00	4197	27 D	1	3	1519		4.00			
{SAC PEAK	25	1525	1600	1532	S18 W67	4191	35	1&	1		5.20			14	
{USNRL	25	1530	1604	1535	S19 W69	4191	34	2	2	1535	1.92	5.47		60	
{ZURICH	25	1533	1549 D		S13 W70	4191	16 D	1	3	1538		7.00			
{MC MATH	25	1540 E	1600 D		S17 W70	4191	20 D	1							
USNRL	25	1614	1636	1618	N21 W05	4197	22	1	2	1618	1.92	2.00		88	
USNRL	25	1649	1740	1659	N26 W50	4194	51	1	2	1659	2.60	4.33		80	Slow S-SWF
{MC MATH	25	1855 E			N24 W50	4194		1							
{SAC PEAK	25	1855	1900 D	1900 D	N27 W50	4194	5 D	1	1		3.00			20	
{USNRL	25	1855	1928	1859	N26 W50	4194	33	1	2	1859	2.71	4.53	1.00	82	
USNRL	25	1908	1932	1914	S21 W90	4191	24	1	2	1914	1.24			41	
ONDREJOV	26	0618 E	0637	0623	N25 E53	4205	19 D	1&	3	0623			3.70		
ONDREJOV	26	0735 E	0740		S21 E72	4207	5 D	1	2	0736			3.50		
{ARCETRI	26	0755 E	0833		N12 W12	4197	38 D	1&	3	0802	3.40	3.60			S-SWF
{ONDREJOV	26	0800 E	0829		N11 W08	4197	29 D	2	3	0804			3.60		
ONDREJOV	26	0813 E	0818		N22 E77	4208	5 D	1	3	0814			3.00		
UCCLE	26	0846 E	0847 D		N14 W12	4197	1 D	1&	1	0847	3.20	3.20			
UCCLE	26	0901 E	0903 D		S24 W15	4201	2 D	1&	1	0903	3.00	3.10			
UCCLE	26	1102 E			S20 E87	4207		1&	2						
UCCLE	26	1104	1111		N27 W63	4194	7	1	2						
ZURICH	26	1237	1248	1239	N13 W23	4197	11	1	3	1239		2.00			
ZURICH	26	1248	1304		S06 W34	4204	16	1	3	1248		3.00			
ZURICH	26	1250	1253		N26 E53	4205	3	1	3	1250		3.00			

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HUANCAYO	26	1409 E	1532 D	1409	N24 E50	4205	83 D	1	2						
HUANCAYO	26	1412 E	1509 D	1413	S24 E72	4207	57 D	1	2						
USNRL	26	1412	1429	1414	S25 E72	4207	17	1	2	1414	1.13	3.60		71	
HUANCAYO	26	1519 E	1523	1520	S26 E80	4207	4 D	1	2						
HUANCAYO	26	1639 E	1644	1639	S20 E75	4207	5 D	1	1						
CLIMAX	26	2055 E	2109	2057	N12 W17	4197	14 D	1		2057	2.20				
CAPRI S	27	0853	0928 D		N22 E03	4202	35 D	1	2	0902	2.00	2.20			
CAPRI S	27	1121 E	1145 D		N12 W47	4196	24 D	1	2	1127	2.00	3.00			
CAPRI S	27	1207 E	1225 D		S26 W27	4201	18 D	1	2	1207	1.50	2.20			
USNRL	27	1207 E	1225		S25 W29	4201	18 D	1&	2	1209	2.14	2.90		107	S-SWF
USNRL	27	1219	1303 D		N23 E02	4202	44 D	1	1	1239	1.81	1.93		76	
USNRL	27	1227	1351 D		N11 W27	4197	74 D	2	1	1240	5.78	6.70		89	
CAPRI S	27	1234 E	1319 D		N13 W28	4197	45 D	1	2	1240	2.50	2.90			S-SWF
USNRL	27	1239 E	1243 D		S23 E61	4207	4 D	1&	1	1239	2.04	4.74		71	
CAPRI S	27	1241 E	1255 D		S23 E56	4207	14 D	1&	2	1242	2.50	5.00			
ZURICH	27	1300 E	1310		N23 E01	4202	10 D	1	3	1300		2.00			
ZURICH	27	1300 E	1337		N13 W27	4197	37 D	1	3	1313		3.00			
ZURICH	27	1318	1325		S24 E57	4207	7	1	3	1318		3.00			
ZURICH	27	1449 E	1455		N12 W28	4197	6 D	1	3	1449		1.00			
MITAKA	28	0537 E	0559	0543	S21 E54	4207	22 D	1&	1	0537	3.80	6.76	3.23	149	
NIZAMIAH	28	0540 E			S E			1	1	0540	3.03		1.50		
CAPRI S	28	0800 E	0831 D		S25 E47	4207	31 D	1	2	0802	1.50	2.40			
ARCETRI	28	0925	0955		N14 W26	4197	30	1	3						
ZURICH	28	1121	1130		N21 W14	4202	9	1	2	1121		2.00			
ZURICH	28	1146	1152		N27 E47	4208	6	1	2	1146		2.00			
ZURICH	28	1154	1158 D		S21 W35	4201	4 D	1	2	1154		2.00			
USNRL	28	1343 E	1358		N22 W13	4202	15 D	1	2	1343	2.04	2.14		67	
ZURICH	28	1352	1406		S15 E13	4207	14	1	3	1352		2.00			
USNRL	28	1352	1430	1356	S25 W40	4201	38	1	2	1356	1.81	2.76		64	Slow S-SWF
ZURICH	28	1353	1407		S23 W41	4201	14	1	3	1401		3.00			
MC MATH	28	1725 E	1739 D		S19 E46	4207	14 D	1							
SAC PEAK	28	2007	2012 D	2012 D	S23 W40	4201	5 D	1	2		2.20			15	G-SWF
HUANCAYO	28	2057	2126	2101	N21 W06	4202	29	1	2						
CAPRI S	29	0819 E	0916 D		N22 W22	4202	57 D	1	2	0844	2.50	3.00			
ONDREJOV	29	0829	0852	0837	N21 W24	4202	23	1	3	0837			2.40		S-SWF
ARCETRI	29	0830	0900		N20 W23	4202	30	1	3	0836	2.00	2.30			
ONDREJOV	29	0857 E	0900		S06 W78	4204	3 D	1	3	0857			2.70		
CAPRI S	29	1050 E	1208 D		N22 W23	4202	78 D	1	2	1101	3.00	3.60			
ONDREJOV	29	1052 E			N21 W25	4202		1&	1						S-SWF
ZURICH	29	1107 E	1201		N22 W24	4202	54 D	1	3	1107		6.00			
CAPRI S	29	1117	1208 D		N23 W66	4196	51 D	1	2	1134	1.50	3.90			
ZURICH	29	1127 E	1202		N24 W72	4196	35 D	1	3	1127		3.00			
ZURICH	29	1134	1140		S20 E28	4207	6	1	3	1134		2.00			
ZURICH	29	1134	1154		N27 E13	4205	20	1	3	1134		3.00			
ZURICH	29	1215	1225		N21 W48	4197	10	1	3	1215		3.00			
USNRL	29	1307	1341	1320	N26 E12	4205	34	1	2	1320	2.26	2.46		77	
CAPRI S	29	1515 E	1530 D		N23 W66	4196	15 D	1	2	1518	1.70	4.90			
USNRL	29	1515	1525	1519	N12 E71	4211	10	2	2	1519	3.05	9.80		85	Slow S-SWF
ZURICH	29	1518 E	1530		N14 W72	4196	12 D	1	2	1518		3.00			
CLIMAX	29	1531	1553	1540	N22 W28	4202	22	1		1540	2.40				
ZURICH	29	1537 E	1550 D		N22 W27	4202	13 D	1	2	1537		5.00			S-SWF
MC MATH	29	1540 E	1555 D		N21 W27	4202	15 D	1							
CAPRI S	29	1542 E	1555 D		N22 W26	4202	13 D	1	1	1543	4.00	4.70			
CLIMAX	29	1534	1551	1541	S20 E32	4207	17	1		1541	4.10				
ZURICH	29	1537 E	1550 D		S17 E29	4207	13 D	1	2	1537		8.00			
MC MATH	29	1540 E	1555 D		S18 E33	4207	15 D	1							
CAPRI S	29	1542. E	1553 D		S18 E28	4207	11 D	1	1	1543	4.00	4.80			
CLIMAX	29	1915	1935	1927	S13 W05	4214	20	2		1927	6.00				
CLIMAX	29	1919	2003	1937	N15 W54	4197	44	1		1937	2.80				
USNRL	29	1921	2003	1929	N15 W57	4197	32	1	2	1929	2.82	5.06		83	
HAWAII	29	2008	2016	2008	N27 W28	4202	8	1	3	2008	2.50	3.00			
HAWAII	29	2012 E	2022	2012	S27 E15	4207	10 D	1	3	2012	1.90	2.20			
HAWAII	29	2140	2144	2142	N04 E72	4211	4	1&	3	2142	1.90	6.20			
CLIMAX	29	2159	2219 D	2205	N22 W30	4202	20	1		2205	3.80				
HAWAII	29	2200	2208 D	2202	N28 W28	4202	8 D	1&	3	2202	3.90	4.90			
HAWAII	29	2246	2258	2248	N17 E04	4205	12	1	3	2248	3.10	3.20			
ONDREJOV	30	0825 E	0829		S13 W34	4203	4 D	1	3	0826			2.80		
ARCETRI	30	0855 E	1000		S12 W36	4203	65 D	1	4	0902	1.60	2.10			
ONDREJOV	30	0857 E	0917		S13 W34	4203	20 D	1&	3	0857			3.30		

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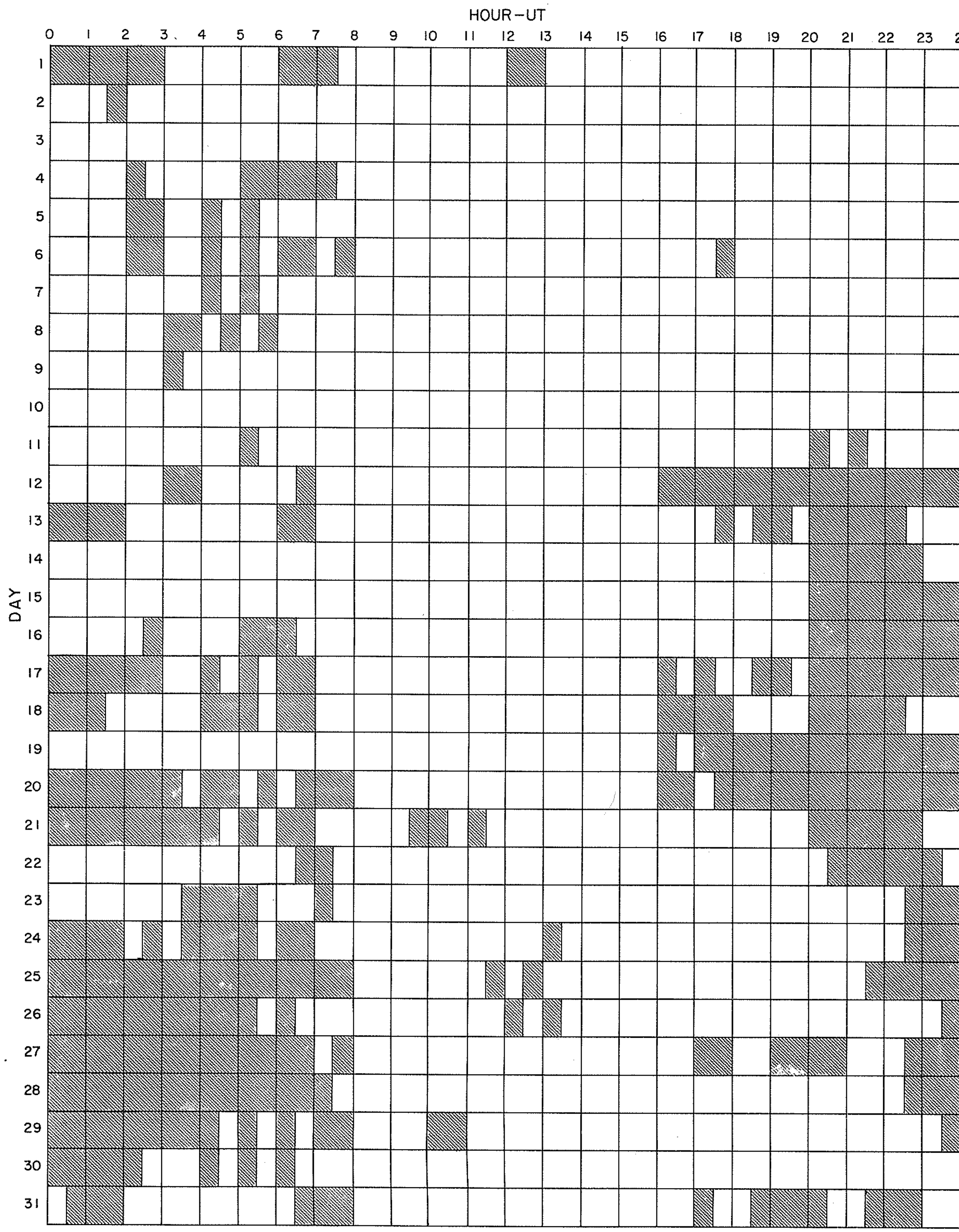
ONDREJOV	30	0948	1023		S10 W39	4203	35	1	3	1000			2.40		
ONDREJOV	30	1013 E	1023	1016	S22 W64	4201	10 D	1&	3	1016			5.90		
UCCLE	30	1035	1058 D	1038	N22 W37	4202	23 D	1	3	1038	2.10	2.60			
UCCLE	30	1119 E	1130		S18 E20	4207	21 D	1	3	1125	2.10	2.40			
UCCLE	30	1139 E	1200		N21 W39	4202	21 D	1&	3	1139	4.20	5.00			
UCCLE	30	1202 E	1215 D	1206	N15 W87	4196	13 D	1	3						
ZURICH	30	1357 E	1407		N25 W04	4205	10 D	1	3	1357		4.00			
{CAPRI S	30	1427 E	1511 D		S17 E09	4207	44 D	1	3	1435	2.00	2.10			
{ZURICH	30	1438 E	1515		S18 E13	4207	37 D	1	3	1438		7.00			Slow S-SWF
{CLIMAX	30	1439 E	1512		S19 E12	4207	33 D	1		1439	2.50				
ZURICH	30	1456	1545 D		S10 W40	4203	49 D	1	3	1456		4.00			Slow S-SWF
CLIMAX	30	2101	2109	2104	N07 E31	4217	8	1		2104	2.10				
MITAKA	31	0522 E	0545	0532	S17 E57	4210	23 D	1	1	0527	1.34	2.52	2.38	120	
ZURICH	31	1403 E	1408		S21 E72	4218	5 D	1	3	1403		3.00			
ZURICH	31	1446	1533		S21 E02	4207	47	1	3	1505		4.00			
{MC MATH	31	1735 E			N20 W55	4202		1&							S-SWF
{USNRL	31	1737 E	1755 D		N21 W55	4202	18 D	1	1	1741	2.50	4.34			
MITAKA	31	2342 E	2349 D		S19 W04	4207	7 D	1	2	2342	3.71	3.86	1.63	100	

Subflares for October 1957 will be published in next month's report.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

OCTOBER 1957



Stations included:

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

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

SEPTEMBER 1957

Sept. 1957	Start UT	End UT	Type	Wide Spread Index	Importance	Observation Stations	Known Flare, UT CRPL-F 158B
1	0204	0255	S-SWF	5	3	OK, TO, RCA+, CW+, CA	
1	0803	0820	S-SWF	3	2	HH, NE	0801
1	0950	1030	S-SWF	5	2	NE, PU, TO, CW$^{**}_{***}$	b0945
1	1257	1320	S-SWF	5	2+	BE, HU, MC, PR, WS, NE PU	1255
1	1722	1750	Slow S-SWF	4	1	HU, MC, PR	b1723
1	1835	1858	S-SWF	4	1+	HU, MC, PR	
1	1957	2025	S-SWF	5	2	AD, HU, MC, PR, WS, TO RCA+	1945
2	0400	0510	Slow S-SWF	4	1+	OK, TO	b0409
2	1020	1040	S-SWF	3	1+	NE, PU	1015
2	1259	1407	G-SWF	5	2-	HU, MC, PR, NE, PU, SW, TH, CW$^{**}_{***}$	b1258
2	2100	2113	S-SWF	3	1	AN, MC, CR, MA	2100
3	0040	0115	S-SWF	5	2+	AD, OK, TO, RCA+, CW+	0026
3	0753	0822	Slow S-SWF	5	2	OK, NE, TO	0754
3	1020	1102	S-SWF	5	2+	MA, NE, SW, TO, CW*****, CW+++	1022
3	1420	1603	S-SWF	5	3	BE, HU, MC, PR, WS, NE, SW, CW$^{*}_{***}$**, CW+++, RCA*	1412
3	2116	2148	Slow S-SWF	5	2	AD, BE, HU, MC, PR, CR	2110
4	1200	1255	Slow S-SWF	5	2-	BE, HU, MC, PR, MA, SW, CW$^{**}_{***}$, RCA*	b1156
4	1520	1555	G-SWF	3	1	HU, MC, CW***	
5	0000	0050	S-SWF	5	2	AD, AN, OK, WS, CA, TO	0010
5	0315	0348	Slow S-SWF	4	1	OK, TO	0319
5	1210	1225	G-SWF	5	1	MC, PR, CR, NE, LI, CW***	1206
5	1227	1253	G-SWF	5	2	HU, MC, PR, MA, SW, TH, CW**	
5	1303	1325	Slow S-SWF	4	1	HU, MC, PR	
5	1500	1530	Slow S-SWF	5	1+	BE, HU, PR, NE	
5	2051	2113	Slow S-SWF	4	1	AD, AN, MC, PR, TO	2100
6	0800	0900	Slow S-SWF	5	2-	OK, NE, PU, SW, TO CW$^{**}_{***}$	0751
6	1038	1100	S-SWF	5	2	DA, MA, NE, SW, TH, CW$^{**}_{***}$	
6	1333	1425	G-SWF	3	1	MC, PR	1332
6	1838	1915	G-SWF	3	1	HU, MC, TO	
7	0100	0150	S-SWF	5	2+	AD, AN, OK, CA, TO, CW+, RCA+	0110
7	0240	0310	S-SWF	3	1	OK, CA	
7	0528	0555	S-SWF	4	2-	AN, OK	
7	0806	0842	S-SWF	5	3	OK, CA, DA, HH, MA, NE,PU, SW, TH, TO, CW$^{+\,**}_{***}$	0810
7	1311	1345	Slow S-SWF	5	2	BE, HU, MC, NE, PR, WS, PU	
7	1717	1740	Slow S-SWF	3	1	AN, MC, PR	
7	2135	2220	Slow S-SWF	5	2	AD, AN, BE, HU, MC, PR, WS	2134
9	0132	0210	Slow S-SWF	5	1+	AD, AN, OK	0136
10	0308	0400	G-SWF	3	1+	AN, OK	
10	1728	1800	G-SWF	5	1	AN, BE, HU, MC, PR	b1656
11	0244	0424	Slow S-SWF	5	3	AD, OK, CA, TO, CW+	

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

SEPTEMBER 1957

Sept. 1957	Start UT	End UT	Type	Wide Spread Index	Impor- tance	Observation Stations	Known Flare, UT CRPL-F 158B
11	1523	1600	G-SWF	3	1	HU, MC, PR	1512
11	1820	1846	Slow S-SWF	3	1	HU, MC, PR, TO	1813
12	0702	0734	S-SWF	5	3-	OK, DA, NE, PU, TO, CW+	0708
12	1513	1552	S-SWF	5	2+	AN, BE, HU, MC, PR, WS, HH, NE, SW, TO, CW$^{*}_{***}$, RCA*	1510
12	1648	1720	S-SWF	5	2	BE, HU, MC, PR	1632
12	1837	1905	S-SWF	5	2-	AN, BE, HU, MC, NE	1837
12	1920	1950	G-SWF	5	1+	AD, AN, BE, HU, MC, PR, WS	1902
12	2142	2225	Slow S-SWF	5	2-	AD, AN, BE, HU, MC, OK, PR, WS, TO, RCA+	2148
13	0250	0315	S-SWF	5	2	OK, TO, CW+	
13	0604	0635	Slow S-SWF	5	2+	OK, HH, NE, CW+	
13	1300	1330	Slow S-SWF	5	1+	HU, MC, PR, CW$^{**}_{***}$	1313
13	1345	1404	S-SWF	4	1	HU, PR, NE, CW**	1343
13	1416	1450	S-SWF	5	3-	BE, HU, MC, PR, DA, MA, NE, SW, CW$^{*\,**}_{***}$	1411
13	1603	1627	Slow S-SWF	4	1	BE, HU, PR	1603
13	1840	1915	S-SWF	4	2	BE, HU, MC, PR	b1844
13	1950	2010	Slow S-SWF	4	1	BE, HU, MC, PR	1941
13	2047	2100	Slow S-SWF	3	1	BE, HU, PR	2052
14	0228	0303	S-SWF	5	3	AD, OK, CA, TO, CW+	0230
14	0720	0810	S-SWF	5	2+	OK, DA, HH, NE, CW$^{**}_{***}$, CW+	b0725
14	1720	1740	Slow S-SWF	4	1	BE, HU, MC, PR	
15	0327	0450	S-SWF	5	3	AD, AN, OK, CA, TO, CW‡+	b0336
15	1640	1720	Slow S-SWF	5	1	BE, HU, MC, PR, WS	
15	2040	2106	S-SWF	5	2-	AD, AN, BE, HU, MC, PR, WS TO, RCA+	2032
15	2222	2303	Slow S-SWF	5	1+	AD, AN, TO	2222
16	0307	0332	Slow S-SWF	5	1	AD, AN, OK, CA, TO	0309
16	0456	0536	S-SWF	5	1+	AN, OK, CA, TO	
16	1312	1343	G-SWF	3	1	MC, PR	b1306
16	1410	1433	Slow S-SWF	5	1+	BE, HU, MC, PR, PU	
16	1458	1520	Slow S-SWF	5	1+	BE, MC, PR, WS, CR	1451
16	1520	1558	S-SWF	5	2+	BE, HU, MC, PR, WS, NE, PU, CW$^{*}_{**}$, RCA*	1517
16	1623	1700	G-SWF	5	1+	BE, HU, MC, PR, WS	
16	1820	1835	Slow S-SWF	5	1	AN, BE, HU, MC, PR, WS	
16	2244	2308	S-SWF	5	2-	AD, AN, OK, CA, RCA+	2242
17	0411	0500	S-SWF	5	2+	OK, TO CW+	
17	0759	0844	S-SWF	3	2	PU, CW**	b0756
17	1042	1143	S-SWF	5	2+	NE, PU, SW, CW$^{**}_{***}$	b1039
17	1315	1330	Slow S-SWF	5	1	HU, MC, PR, PU	
17	1515	1540	S-SWF	5	2	BE, HU, MC, PR, WS, CR, NE, CW**	1512
17	1637	1657	S-SWF	5	1+	AN, HU, MC, PR, WS, CR	
17	1912	1935	S-SWF	4	1	MC, PR, WS	

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

SEPTEMBER 1957

Sept. 1957	Start UT	End UT	Type	Wide Spread Index	Importance	Observation Stations	Known Flare, UT CRPL-F 158B
17	1944	2015	S-SWF	5	2	AN, BE, HU, MC, PR	1944
17	2320	2400	S-SWF	5	2	AD, AN, OK, CA, TO	2315
18	0117	0133	Slow S-SWF	4	1	AD, OK, CA	0108
18	0422	0502	Slow S-SWF	4	2-	AN, TO, CW+	0425
18	0630	0650	S-SWF	5	1+	AN, OK, TO, CW$^{**}_{***}$, CW+	0624
18	1030	1214	G-SWF	5	3	NE, CW$^{**}_{***}$	1036
18	1245	1420	Slow S-SWF	5	3-	BE, HU, MC, PR, WS, MA, NE, SW, TO CW$^{*\,**}_{***}$	b1253
18	1512	1555	G-SWF	5	1	BE, HU, MC, PR	1511
18	1730	1813	S-SWF	5	3+	AN, BE, HU, MC, PR, NE TO, CW$^{*\,**}_{***}$, RCA*, RCA+	1722
18	1823	1920	Slow-SWF				1818
18	2145	2210	Slow S-SWF	5	1+	AD, AN, BE, MC, PR, TO	2145
19	0240	0343	Slow S-SWF	4	2	OK, TO	0246
19	0359	0453	Slow S-SWF	5	3	AD, OK, TO, CW‡+	0350
19	0800	0835	S-SWF	5	2	OK, HH, NE, SW, CW$^{**}_{***}$, CW+	0749
19	1114	1200	G-SWF	3	1	MC, NE	1110
19	1623	1650	G-SWF	3	1-	HU, MC	1623
19	1745	1821	S-SWF	5	2	AN, BE, HU, MC, PR, WS	1802
20	0348	0438	Slow S-SWF	5	2	AN, OK, CA, TO, CW+	0345
20	1213	1233	S-SWF	4	1+	PR, PU	1204
20	1620	1720	Slow S-SWF	4	1	MC, PR, WS, CR	
20	1807	1818	Slow S-SWF	3	1-	HU, MC, PR	
20	2120	2141	S-SWF	5	1+	AD, AN, BE, HU, MC, PR, WS, CA, TO, RCA+	2117
21	0020	0105	S-SWF	4	1+	AD, MC, OK, TO	
21	0410	0442	Slow S-SWF	5	3	OK, CA, TO, CW+	0405
21	0704	0738	S-SWF	5	1	OK, PU, CW$^{**}_{***}$	b0704
21	0933	1032	Slow S-SWF	5	2	NE, PU, CW$^{**}_{***}$	0938
21	1113	1132	S-SWF	5	2	BE, NE, CW$^{**}_{***}$	b1114
21	1207	1230	S SWF	5	2	MC, PU	
21	1330	1430	Slow S-SWF	5	3-	BE, HU, MC, PR, MA, NE, SW, CW$^{*\,**}_{***}$, RCA*	1325
21	1444	1545	S-SWF	5	2+	BE, HU, MC, NE, CW***	1440
21	1632	1648	Slow S-SWF	5	1	AN, BE, HU, MC	1630
21	1930	1950	S-SWF	4	1	BE, MC, PR	
21	1950	2030	Slow S-SWF	4	1-	BE, MC, PR	1950
22	0202	0230	S-SWF	4	1	OK, TO	
22	0746	0900	S-SWF	4	2+	NE, PU	0741
22	1252	1405	S-SWF	5	3-	BE, HU, MC, PR, HH, NE, PU, SW, CW$^{**}_{***}$, RCA*	1248
24	0256	0320	S-SWF	5	2	AN, OK, CA, TO, CW+	
24	2013	2033	Slow S-SWF	3	1	MC, PR, WS	2012
25	0842	0916	S-SWF	1	3	HH	0842
25	1533	1700	Slow S-SWF	5	1+	BE, HU, MC, PR, WS, CR	b1534

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

SEPTEMBER 1957

Sept. 1957	Start UT	End UT	Type	Wide Spread Index	Impor-tance	Observation Stations	Known Flare, UT CRPL-F 158B
26	1925	2105	S-SWF	5	2+	BE, HU, MC, PR, CR	1907
27	0530	0547	S-SWF	1	1-	OK	0523
27	2115	2140	Slow S-SWF	5	1+	AD, AN, BE, HU, MC, WS, TO	2116
28	0913	0943	Slow S-SWF	4	2+	HH, NE	b0913
28	1840	1925	Slow S-SWF	4	1	BE, HU, MC, WS	1840
29	1400	1455	G-SWF	3	1	BE, MC	
30	0210	0302	Slow S-SWF	5	2+	AD, OK, CA	0210
30	1700	1740	S-SWF	5	3	AN, BE, HU, MC, PR, WS, CR, CW$^{+}_{***}$, RCA*	1657
30	1957	2025	Slow S-SWF	4	1	AN, HU, MC, CR, WS	1955

CA = Canberra, Australia.
CR = Cornell University, N. Y.
DA = Darmstadt, G. F. R.
HH = Heinrich Hertz Institute, Berlin.
LI = Lindau, G. F. R.
MA = Madrid, Spain.
NE = Nederhorst den Berg, Netherlands.
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.
CW+++ = Accra.
RCA+ = RCA Communications, Inc., Pt. Reyes, Calif.
RCA* = RCA Communications, Inc., Riverhead, N. Y.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

OCTOBER 1957

OTTAWA | 2800 MC

Oct. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
1	2 Simple 2	13 30.5	2	13 31.6	13	
3	2 Simple 2	14 43.1	3	14 44.5	9	
3	1 Simple 1	14 56.5	3	14 58	4	
3	8 Group (2)	15 35	11			
	1 Simple 1	15 35	2	15 36	7	
	2 Simple 2	15 39	7	15 41.7	10	
5	1 Simple 1	17 39.5	1.5	17 40.1	4	
5	6 Complex	17 46.5	3	17 46.8	5	
5	2 Simple 2	17 59	4	18 00	42	
5	1 Simple 1	19 45	1	19 45.5	4	
5	1 Simple 1	20 51	1	20 51.4	7	
5	2 Simple 2	21 40.2	1.3	21 40.9	11	
6	1 Simple 1	12 29.5	1.8	12 30	7	
6	2 Simple 2	20 37.2	2	20 38.1	9	
7	3 Simple 3	18 57	1 40	indet.	10	
8	6 Complex	16 44	3	16 44.7	11	
8	2 Simple 2	17 10.5	1.5	17 10.9	14	
8	2 Simple 2 f	19 02	8	19 04	22	
9	3 Simple 3	13 50	1 45	14 42	10	
9	1 Simple 1	18 23.3	1	18 23.8	7	
9	1 Simple 1	18 45	1.5	18 45.3	7	
10	8 Group (2)	16 08	12.3			
	2 Simple 2	16 08	9.5	16 09.9	16	
	1 Simple 1	16 18.8	1.5	16 19.2	7	
10	2 Simple 2	16 55	13.5	17 03	37	
	4 Post Increase		3 20		18	
10	1 Simple 1	21 06	2.5	21 07	7	
11	3 Simple 3 A	14 21	40	indet.	7	
	2 Simple 2	14 36	8	14 37.5	9	
11	2 Simple 2	15 09.2	2.8	15 10.1	110	
11	8 Group (2)	15 21.7	5.8			
	1 Simple 1	15 21.7	1	15 22	6	
	2 Simple 2	15 25.5	2	15 26	11	
11	1 Simple 1	16 18.4	1	16 18.7	7	
11	6 Complex	16 27.5	6.5	16 28	65	
	4 Post Increase		15		7	
11	6 Complex	20 58.3	2.5	21 00	12	
12	2 Simple 2	15 29	3	15 29.3	30	
12	3 Simple 3	16 12	12	16 17.4	7	
12	1 Simple 1	17 25.7	1	17 26	7	
13	2 Simple 2	21 14	2	21 14.6	10	
14	6 Complex	14 51.5	4.5	14 54.4	19	
14	3 Simple 3 A	18 50	1 25	indet.	13	
	2 Simple 2	18 55.9	3	18 56.8	30	
15	3 Simple 3 A	13 25	4 20	indet.	21	
	2 Simple 2 f	13 30	4.5	13 32	180	
	2 Simple 2	14 51	2	14 52	21	
	4 Post Increase		5		7	
	2 Simple 2	16 17.7	2	16 18.2	14	
	2 Simple 2	17 10.8	1.5	17 11.5	30	
15	1 Simple 1	18 19.8	2	18 20.2	7	
15	1 Simple 1	19 06.5	2.5	19 07.5	7	
15	6 Complex	20 37.5	2.5	20 38.8	45	
15	2 Simple 2	21 50	>10	21 52.7	1000	In sunset osc.
16	1 Simple 1	16 34.5	3	16 35.5	5	
16	3 Simple 3	17 43.5	20	17 45.5	8	
17	2 Simple 2	13 52	8	13 53	24	
17	3 Simple 3 A	14 13	2 30	14 27	28	
	2 Simple 2	14 15	9	14 18.1	110	
17	1 Simple 1	18 02.5	3	18 03.5	7	
19	3 Simple 3 f	13 13	8	13 16.5	8	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

OCTOBER 1957

OTTAWA

2800 MC

Oct. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
19	1 Simple 1	14 54.9	3	14 55.1	6	
19	1 Simple 1	16 53.1	1.5	16 53.5	5	
20	9 Precursor	16 36	8		12	
	6 Complex f	16 44	51	16 50.8	4000	
	4 Post Increase		3 15		68	
20	2 Simple 2	21 45	> 5	21 45.8	230	In sunset osc.
21	2 Simple 2 f	13 01	5.5	13 01.5	155	
	4 Post Increase		20		8	
21	2 Simple 2	15 35.8	2.5	15 36.3	20	
21	6 Complex	18 31	4	18 31.5	23	
21	2 Simple 2	18 49.6	1.5	18 50	17	
22	2 Simple 2	12 53	1.5	12 53.7	14	
22	1 Simple 1	14 00	1	14 00.2	6	
22	1 Simple 1	17 29	5	17 31	5	
22	8 Group (2)	19 30.7	6.1			
	1 Simple 1	19 30.7	1	19 31.2	5	
	1 Simple 1	19 35.8	1	19 36	5	
22	6 Complex	19 52	2	19 52.7	9	
23	2 Simple 2	13 02	6	13 03.8	10	
23	1 Simple 1	15 37.5	1.5	15 38.7	7	
23	1 Simple 1	17 58.8	1	17 59	7	
23	2 Simple 2	18 42.6	0.8	18 43	50	
24	2 Simple 2	14 17	6	14 19	20	
24	8 Group (3)	16 18	20			
	1 Simple 1	16 18	1.5	16 18.9	5	
	1 Simple 1	16 20	3	16 21	7	
	3 Simple 3	16 26	12	16 30	7	
24	2 Simple 2 f	17 03.3	6	17 04.3	42	
24	1 Simple 1	18 27.5	1	18 27.8	3	
25	6 Complex f	15 02	7	15 03.8	48	
25	2 Simple 2	16 35.5	3	16 36	68	
25	6 Complex	18 31	14.5	18 41	129	
	4 Post Increase A		1 15		10	
	2 Simple 2	18 58.3	1.5	18 58.9	10	
26	8 Group (3)	13 25.6	13.4			
	2 Simple 2	13 25.6	1	13 25.8	17	
	1 Simple 1	13 28.5	1	13 28.9	4	
	2 Simple 2	13 36	3	13 37	23	
26	8 Group (2)	16 31.5	7.2			
	1 Simple 1	16 31.5	1	16 32	4	
	1 Simple 1	16 37.7	1	16 37.8	4	
26	1 Simple 1	17 29.5	1	17 30	4	
27	2 Simple 2	12 05.6	4	12 06.5	86	
27	3 Simple 3 A	19 33	1	19 36	13	
	2 Simple 2	19 38.2	1	19 38.5	10	
27	2 Simple 2	20 52.5	1	20 53	9	
27	2 Simple 2	21 07.5	2	21 08.2	14	
28	1 Simple 1	15 52.6	2.5	15 53.5	7	
29	2 Simple 2 f	15 14.5	2.5	15 15.9	10	
29	3 Simple 3	15 32.5	1	15 40	17	
29	7 Fluctuations	19 12	25	19 20.5	10	
29	8 Group (2)	20 06.5	7.5			
	1 Simple 1	20 06.5	4	20 07	6	
	2 Simple 2	20 10.5	3.5	20 12	13	
30	8 Group (2)	14 48	12			
	1 Simple 1	14 48	1.5	14 48.8	4	
	2 Simple 2	14 56	4	14 58	25	
31	1 Simple 1	13 46.7	1.5	13 47	6	
31	3 Simple 3	17 16	45	17 21.5	17	
31	1 Simple 1	18 07	1.5	18 07.5	5	

SOLAR RADIO EMISSION

DAILY DATA

OCTOBER 1957

CORNELL

200 MC

Oct. 1957	Flux Density $10^{-22}W/M^2/CPS$ Hours UT			Variability 0 to 3 Hours UT			Observing Periods Hours UT
	12 15	15 18	18 21	12 15	15 18	18 21	
1	[15	16	21]	[1	1	2]	1245-2030
2	[18	17	16]	[1	1	1]	1315-2035
3	-	20	27]	-	1	2]	1450-2030
4	[14	14	23]	[1	1	2]	1300-2130
5	[20	18	-	[2	1	-	1245-1730
6	[20	22	25]	[2	2	2]	1240-2025
7	[32	27	20]	[2	2	1]	1245-2025
8	[[25	23	18]	[[2	2	1]	1350-2040
9	[18	21	25]	[2	1	2]	1325-2010
10	[45	46	40]	[1	2	2]	1240-2030
11	[18	29	28]]	[1	2	2]	1240-1520, 1530-1840
12	[42	77	-	[2	3	-	1225-1725
13	[98	42]	-	[2	1]	-	1220-1630
14	[26	17	23]	[2	2	3]	1250-1440, 1505-2010
15	[18	18	19]				1245-1425, 1435-2010
16	[[12	13	12]]	[[1	1	1]]	1245-1855
17	[18	15	14]	[1	1	1]	1235-2030
18	[17	18	-	[2	2	-	1235-1805
19	[15	13]]	-	[1	1]]	-	1230-1610
20	[16	18]	-	[1	1]	-	1240-1630
21	[16	15	14]]	[2	1	1]]	1250-1900
22	[18	17	21]	[1	1	2]	1245-1450, 1505-2010
23	[14	13	18]	[1	1	1]	1250-1425, 1530-2040
24	[15	18	19]	[1	1	1]	1240-2005
25	-	-	-	-	-	-	
26	[16	16]]	-	[1	1]]	-	1245-1600
27	[16	14]	-	[1	1]	-	1335-1700
28	[[25	18	17	[[2	1	1	1345-2035
29	[[17	16	20	[[2	2	2	1430-2105
30	[[31	28	26	[[2	2	2	1340-2040
31	[[14	14	14	[[1	1	1	1335-2115

[= first hour missing.
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SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
OCTOBER 1957

CORNELL

200 MC

Oct. 1957	Type Ap.J	Start UT	Time Max. UT	Duration Min.	Type IAU	Max. Flux Density 10^{-22} W/m^2/cps Inst.	Smooth	Remarks
1	1	1749		144	F			
2	2	1644		8	F			
	3	1902	1903	2	CD	> 48	21	
	3	2007		2.5	ECD	> 48	> 26	off-scale 2007.5-08 UT
3	1	1734		65	E			
4	1	1823.5		>186	E			
5	2	1320.5		39	F			
	3	1436.5		1	CA	> 48	> 20	off-scale 1436.5-37 UT
	3	1438.5		1	CA	> 48	> 20	off-scale 1438.5-39 UT
11	3	1343.5		1	ECA	> 48	> 23	off-scale
	3	1510		1.5	CA	48	> 23	off-scale 1510.5-11 UT
	7	1532.5		>187	E			
12	7	b1225		>302	F			
	0	1523		124	E			
14	3	1437		1.5	CA	> 48	> 22	
	7	1723		>169	F			
18	2	1308		44	F			
	2	1529		12	E			
	2	1627		68	F			
20	3	1339.5		1	ECD	> 48	> 26	off-scale
	3	1432.5		1	ECD	> 48	> 23	off-scale
	3	1540		1	CA	> 48	> 22	off-scale 1540.5-41 UT
21	2	1302		6	ECA	> 48	> 23	off-scale 1302-02.5 UT
	3	1307.5		1	ECA	> 48	> 23	off-scale 1307.5-08 UT
	3	1831.5		1	ECA	> 48	> 28	off-scale 1832-32.5 UT
	2	1850.5		2	ECA	> 48	> 28	off-scale 1851.5-52 UT
22	1	1932.5		>35	E			
23	3	1257		1	ECD	> 48	> 26	off-scale
	3	1538		1.5	ECD	> 48	> 26	off-scale 1538.5-39 UT
	3	1558		.5	ECD	> 48	> 26	off-scale
	3	1842.5		1	ECD	> 48	> 24	off-scale
	2	2005		11	F			off-scale 2006-06.5, 2009.5-10, 2011 UT
24	3	1526		3.5	CA	> 48	> 23	off-scale 1528.5-29 UT
	3	1703		3	ECA	> 48	> 20	off-scale 1704-04.5 UT
	2	1814		3	ECA	> 48	> 19	
26	3	1325.5		1	ECD	> 48	> 26	off-scale
	3	1514.5		1.5	ECD	> 48	> 24	
29	2	2033		17	E	> 48	> 16	
30	1	1659		96	F			
31	4	1723	1723.5	1	ECA	> 48	> 27	
	4	1736.5		66	E			
	3	1843.5		2	ECA	> 48	> 23	off-scale 1844, 1844.5-45 UT

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
SEPTEMBER 1957

BOULDER **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
Sept								
1	6	1230 B	1700 X	765 D	CA	3300 D	150	Large bursts, 1511.3, 2014.2, N3
2	6	1230 B	1600 X	765 D	CA	3700 D	150	N4
2	9	1310 X	1323	55 X	CD	3000	700	
2	8	2058	2058.4	1	ECD	5000 D	--	
3	8	0038.7	0039.4	1.8	CD	4500 D	1100	
3	6	1230 B	1800 X	600 X	CA	--	52	S 1500-2230
3	8	1455.1	1455.2	0.8	ESD	3700 D	--	
3	2	2027.8	2028.7	1.2	ECD	1700	450	
4	1	1313	1313.7	469	M	1300	--	
5	6	1454	2200 X	616 D	CA	--	16	
5	2	1455.3	1456.2	1.6	ECD	720	170	
5	2	1602.9	1603.5	1.8	ECD	710	220	
5	8	2034 B	2034.0	2.5	ECD	2900	650	
6	3	0017.9	0018.0	0.2	ESD	3000	--	May be S
6	2	0044	0050.1	19	FD	2000 X	300 X	
6	6	1235 B	2200 X	755 D	CA	5000 D	52	S 1850-2115 N5
6	3	1334.7	1335.2	1	ESD	1500	--	
7	6	1235 B	1900 X	755 D	CA	3200 D	160	N6
8	6	1235 B	2200 X	750 D	CA	3500 D	60	Large bursts 1747.8, 1841.3
8	8	1634 B	1635.2	2.3	CD	980	320	
8	8	2243.6	2244.8	3	ECD	4700 D	1200	
9	6	1235 B	2400 X	750 D	CA	480	35	N7
9	3	1247.0	1247.0	0.1	SD	700 X	--	May be S
10	6	1235 B	1630 X	745 D	CA	960	63	Bursts 1621.3, 1627.8, 2256.2
11	2	0014	0015.5	2.9	FD	680	170	
11	3	0054.1	0054.8	1.2	ECD	1400 X	500 X	
11	6	1235 B	1413.4	745 D	CA	800	37	Other bursts 1348.7, 1537.0
12	9A	1514.6	1519.0	11	ECD	2400	770	
12	9B	1526	1536.0	184 X	CA	150	16	
12	1	1921	1921.8	66	M	1200	--	
12	9A	2148.7	2151.8	4	ECD	3200 D	920	
12	9B	2153	2321.3	142	CD	320	18	
13	9A	1417.0	1417.9	1.4	ECD	1700 X	300 X	

Notes:
1. Interference may occasionally obscure or be mistaken for solar events.
2. Receiver saturated at a varying flux level between 4000 and 5000 during September.
3. September 2, large bursts 0013.1, 0029.6, 0041.0, 0044.
4. September 2, large bursts 1401, 1423.5, 1428.2, 1547, 1855.5.
5. September 6, large bursts 1918, 1954.2, 2227.
6. September 7, large bursts 1501.1, 1825.0, 1844.6, 1903.0, 2103.6, and numerous others.
7. September 9, bursts 1329.6, 2319.2, 2328.8, 2342.9, 2355.3.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
SEPTEMBER 1957

BOULDER

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
Sept								
13	9B	1419	1757.6	636 D	CA	390	18	
14	6	1240 B	2159.0	735 D	CA	1500	17	Large bursts 2009.9, 2113.9
15	6	1240 B	2147	730 D	CA	910	21	N8
15	8	2044.7	2045.9	2.5	ECD	3000	540	
16	6	1245 B	1830 X	725 D	CA	3700 D	21	N9
16	8	1549.6	1550.1	1.3	ECD	3500 D	710	
16	3	2110.0	2110.1	0.3	ESD	4800 D	--	May be S
16	3	2140.0	2140.1	0.2	ESD	5000 D	--	May be S
16	8	2248.5	2249.4	2.7	ECD	3500 D	700	
17	6	1245 B	2000 X	725 D	CA	--	34	Large bursts 2140.9
17	3	1909.3	1910.3	1.3	ECD	4000 D	500	
17	2	1946.9	1957.6	22	FD	2200	200	
18	6	1245 B	1600 X	335	CA	3400 D	225	Numerous large bursts
18	6	1820	2100 X	390 D	CA	2000 X	550	N10
19	6	1506 B	2200 X	579 D	CA	3000	310	Numerous large bursts
20	6	1250 B	1400 X	715 D	CA	1000	34	Numerous bursts
20	2	1605.2	1607.3	2.7	FD	3500 D	500	
20	2	2120.2	2121.3	3.1	FD	3500 D	460	
21	6	1250 B	1300 X	40	CA	--	--	
21	9A	1330	1334 X	9	ECD	4000 D	2700	Receiver saturated
21	9B	1339	1409.0	661 D	CA	3500 D	115	N11
22	6	1250 B	1723	710 D	CA	3300 D	125	Numerous large bursts
23	6	1250 B	2000 X	710 D	CA	1600	255	Numerous bursts
24	6	1250 B	1400 X	640 D	CA	700	43	Peak burst 2046.8
25	1	1250 B	1713	705 D	M	350	--	
26	1	1341	1544	289	MD	930	--	
26	9A	1926.3	1926.8	0.8	ECD	2000	--	
26	9B	1927.1	2200 X	308 D	CA	4000 D	650	Numerous large bursts
27	1	1255 B	2206	695 D	M	450	--	N12
28	1	1255 B	2049	539	M	270	--	
28	9A	2154.0	2154.2	2.0	ECD	5000 D	1000	
28	9B	2156	2319.8	154 D	CA	820	15	Bursts 2158.1, Sept. 29, 0025.8
29	6	1255 B	1400 X	635 D	CA	340	14	Bursts 1916.2, 2106.9, 2108.4
30	1	1255 B	1657.5	389	MD	200	--	Other burst 1447.8
30	3	1924.9	1925.0	0.5	ESD	4000 D	--	

Notes:
8. September 15, large bursts 1913.8, 2041.2, 2211.2, 2317.7.
9. September 16, large bursts 1253.1, 1330.9, 1433.9, 1609.4, 1809.9, 1839.9, 1901.7, 2018.7, 2150.0, 2224.8, 2334.9.
10. September 18, bursts 1831.6, 1929.4, 2002.4, 2137.0, 2231.4, 2322.1.
11. September 21, large bursts 1405.9, 1517.5, 2003.4.
12. September 27, bursts or groups 1635.4, 1842, 2000.2, 2345.6, 2358.

IV 9

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

SEPTEMBER 1957

BOULDER 450 MC

Date Sept	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	3	1543.0	1543.1	0.2	ESD	590	-	
1	2	2018.7	2018.9	0.6	ECD	500	-	
1	8	2236.3	2236.4	3.8	ECD	380	90	
2	8	0041.3	0045.1	6	ECD	1200	410	
2	6	1245 B	1317	435	CA	360	76	
2	8	2058	2105.0	9	CD	2200	440	
3	8	0036	0036.0	5.9	ECD	4500 D	430	
3	8	1424	1428.0	7 D	CD	400	140	
4	1	1334 B	1741.9	696 D	M	3700 D	-	N2
5	0	1455.6	1457.2	4 X	CD	110	21	
5	0	2006	2009.3	30 X	CD	110	26	I 2030-2105
6	3	1334.8	1335.1	1.5	ECD	390	88	
7	1	1735	2124.6	285	M	1200	-	N3
8	3	1840.9	1841.3	0.6	CD	300	-	
8	2	2323.3	2326.7	3.4	CD	270	-	
9	6	1334 B	2300 X	691 D	CA	150	29	
10	6	1334 B	1634.6	686 D	CA	250	35	
11	6	1334 B	1412.9	686 D	CA	600	40	I 2054-2138
12	9	1515	1528.3	315 X	ECD	7500 D	4000 D	N4
12	6	2030 X	2148.1	255 D	CA	350	27	
12	2	2052	2055.2	12	FD	2200	190	
13	9	1427 B	1454 X	104 X	CD	6500 D	4000 D	N5
13	1	1611	1949.4	524 D	M	310	-	
13	2	2050.2	2051.0	1.2	ECD	3000 D	900	

Notes:
1. Interference may occasionally obscure or be mistaken for solar events.
2. September 4, large bursts, 1424.1, 1522.3, 2334.6. Other bursts 1343.9, 1350.0, 1351.8, 1400.8, 1459.1, 1655.6, 2239.8, 2344.0.
3. September 7, other bursts 2002.9, 2038.1, 2215.2. Large bursts 1906.1, 2124.6.
4. September 12, an outburst of extremely large energy content. Flux exceeded 2500 for more than four hours during the occurrence. Large bursts at 1516.9, 1825.2, both flux values greater than 7500.
5. September 13, this occurrence was similar to that occurring on September 12 but of less duration.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

SEPTEMBER 1957

BOULDER 450 MC

Date Sept	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
15	1	1240 B	1802.4	600	ESD	370	-	N6
15	2	2041	2041.9	15	ECD	800	22	
16	2	1520.2	1520.2	1.4	ECD	320	68	
17	2	2137.7	2138.0	1.9	ECD	740	94	
18	6	1348 B	1439.7	258	CA	140	33	
18	9A	1807	1822.8	63	CD	980	230	
18	9B	1910	1915.2	20	ECD	2000	500	
18	6	1930	1947.1	315 D	CA	220	37	
19	1	1245 B	2151.4	720 D	M	800	-	N7
20	1	1245 B	1457.1	720 D	M	2000	-	
20	2	1605.2	1605.9	2.4	CD	1600	420	
20	8	2119.0	2119.1	7	ECD	1000	190	
20	2	2220.0	2220.3	3.3	ECD	910	320	
21	9	1331	1336.3	15	CD	600	260	N8
21	6	1350	1424.3	650 D	M	160	-	
22	9A	1254.3	1255.3	2.0	ECD	540 X	280 X	
22	9B	1256.3	1302.7	11	CA	340 X	40 X	N9
22	1	1307	1627.9	693 D	M	300	-	
23	3	1354.6	1355.0	0.9	ESD	330	-	
23	3	2147.4	2147.5	0.4	ECD	3500 D	-	
25	3	2351.3	2351.3	1.0	ESD	520	-	
26	6	1915	2027.5	315 D	CA	450	90	
26	3	2351.2	2351.2	0.2	ESD	540	-	
27	2	2123.1	2125.1	2.3	CD	840	80	
28	3	1615.1	1615.1	0.1	ESD	900	-	N10
28	2	2153.7	2154.4	2.4	CD	1800	560	N11
30	2	1955.9	1957.0	1.4	ECD	520	300	

Notes:
6. September 15, other bursts 1545.9, 1752.8.
7. September 19, other bursts 1517.3, 1847.0, 2117.7, 2156.1.
8. September 21, other bursts 1350.1, 1445.1, 1517.5, 1557.0, 1825.0, 1924.8, 2003.8, 2102.6, 2201.7, 2344.2. Large bursts 1742.1, 1925.0.
9. September 22, other bursts 1539.0, 2243.8.
10. September 28, other bursts, 1722.0, 2309.5.
11. September 29, burst at 0018.6.

SOLAR RADIO EMISSION
DAILY DATA
OCTOBER 1957

BOULDER

167 MC

Oct 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	-	-	16	21	14	17	-	1	1S	2S	0S	1S	13.0-00.4
2	-	-	16	15	13	15	-	1	1	1	0S	1	13.0-00.4
3	-	-	14	16	13	15	-	1	1S	0S	0S	0S	13.0-17.6;19.5-00.3
4	-	-	-	-	-	-	-	-	-	-	-	-	- - - -
5	-	-	21	18	22	20	-	1	2	2S	1S	2S	13.0-00.3
6	-	-	20	22	16	20	-	1	1	1	1	1	13.0-00.3
7	-	-	28	20	21	24	-	2	2	2S	2S	2S	13.1-00.3
8	-	-	31	20	18	25	-	1	2	1S	1S	1S	13.9-18.4;19.4-00.3
9	-	-	25	31	35	30	-	1	2	1S	1S	1S	13.1-00.2
10	-	-	52	44	83	59	-	2	2S	2S	3	2S	13.1-00.2
11	-	-	23	36	28	28	-	1	2	2S	2S	2S	13.1-00.2
12	-	-	125	100	137	114	-	2	3	2S	2	2	13.2-00.2
13	-	485	138	37	31	144	-	1	2	2	1S	2	13.2-00.1
14	-	-	22	24	-	22	-	2	2S	2S	-	2S	13.2-21.5
15	-	-	-	23	26	24	-	-	1	2S	2S	2S	17.2-00.1
16	-	-	17	17	13	16	-	1	1	1	1S	1	13.3-24.0
17	-	-	17	17	17	18	-	2	1	1S	2S	1S	13.2-23.4
18	-	-	-	15	14	15	-	-	-	2	2	2	17.2-23.4
19	-	-	16	17	31	21	-	0	1	1	1S	1	13.3-24.0
20	-	-	234	77	40	107	-	2	3	2S	2S	2S	13.3-23.9
21	-	-	18	17	19	18	-	0	2	2	2	2	13.3-23.9
22	-	-	24	28	25	26	-	1S	1	2S	2S	2S	13.9-23.9
23	-	-	16	25	26	22	-	0	1	2S	3	2	13.3-23.8
24	-	-	29	28	-	28	-	1	2	2S	-	2S	13.3-20.6
25	-	-	-	-	28	-	-	-	-	-	2S	2S	21.5-23.4
26	-	-	19	19	21	20	-	0	1	2S	1S	1S	13.4-23.8
27	-	-	16	16	15	16	-	1S	1S	2	2	2	13.5-23.8
28	-	-	21	18	14	20	-	2	1S	1S	1S	1S	13.5-23.8
29	-	-	21	25	36	26	-	1	2	2S	2S	2S	13.5-23.8
30	-	-	39	27	-	33	-	2	2	2S	2S	2S	13.5-21.1;22.3-23.8
31	-	-	17	18	13	17	-	0	1	2	2S	2	13.5-23.8

SOLAR RADIO EMISSION
DAILY DATA
OCTOBER 1957

BOULDER **450 MC**

Oct. 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	-	70	69	72	66	69	-	0	0	1	OS	0	13.0-00.4
2	-	68	68	65	70	68	-	0	0	1	1S	1	13.0-00.3
3	-	76	75	94	78	81	-	0	0	1	1S	1	13.0-00.3
4	-	73	76	78	80	77	-	0	0	1	OS	0	13.0-00.3
5	-	75	71	71	73	72	-	0	0	0	1	0	13.0-00.3
6	-	71	70	80	73	74	-	0	0	0	OS	0	13.0-00.3
7	-	79	76	77	84	79	-	0	0	0	1S	0	13.1-00.3
8	-	73	72	72	70	72	-	0	0	0	OS	0	13.1-00.3
9	-	72	69	71	72	71	-	0	0	0	OS	0	13.1-00.2
10	-	75	79	81	78	78	-	0	0	0	OS	0	13.1-00.2
11	-	85	83	83	81	83	-	1	0	0	0	0	13.1-00.2
12	-	76	77	77	88	80	-	0	1	0	1	1	13.2-00.2
13	-	88	81	74	76	79	-	0	0	0	1S	0	13.2-00.1
14	-	85	78	79	88	82	-	1	1	2	1	1	13.2-00.1
15	-	-	85	82	86	84	-	1	1	1	2S	1	13.2-00.1
16	-	74	78	69	70	73	-	0	0	0	0	0	13.3-24.0
17	-	78	76	76	79	77	-	0	0	0	OS	0	13.3-23.4
18	-	79	87	75	77	80	-	0	0	1	OS	0	13.3-24.0
19	-	77	79	82	89	82	-	0	0	0	0	0	13.3-24.0
20	-	79	130	252	99	145	-	1	3	0	1	2	13.3-23.9
21	-	-	62	64	67	66	-	0	OS	OS	OS	OS	13.3-23.9
22	-	-	75	72	74	74	-	0	0	1	OS	OS	14.0-23.9
23	-	-	73	71	77	73	-	0	0	1	1S	1	13.3-23.8
24	-	-	72	-	74	72	-	0	0	0	1S	0	13.7-23.8
25	-	-	64	72	71	69	-	0	1	1	2S	1	13.5-23.8
26	-	-	75	67	67	70	-	0	1	0	0	0	13.5-23.8
27	-	-	73	70	68	71	-	1	0	2	0	1	13.5-23.8
28	-	-	-	-	-	-	-	-	-	-	-	-	13.5-16.8 Note 1
29	-	-	-	-	-	-	-	-	-	-	-	-	13.5-23.8
30	-	-	-	-	-	-	-	-	-	-	-	-	13.5-17.3
31	-	-	-	-	-	-	-	-	-	-	-	-	20.9-23.8

Note 1. Receiver unstable, medians not measurable October 28 thru 31, 1957.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

OCTOBER 1957

BOULDER

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
Oct								
1	1	1300 B	1749.5	685 D	MF	290	-	
2	3	2007.1	2007.8	1.0	CD	3100 D	640	
3	2	1350.6	1353.5	3.3	CD	280	150	
3	3	1429 B	1429.2	1 I	CD	1400	-	I 1426-1429
5	1	1300 B	1858.4	675 D	M	700	-	
5	2	1729.3	1732.4	4.2	CD	430	63	N4
6	1	1300 B	2250.5	675 D	M	550	-	
6	3	2229.2	2229.4	0.6	CD	1500	-	
7	2	0011.3	0012.1	1.2	CD	700 X	200 X	
7	6	1300 B	1601	190 X	CA	890	20	N5
7	1	1610	1711.9	485 D	MF	640	-	
7	2	2119.6	2120.5	1.3	CD	4700 D	500	
7	2	2337.7	2338.5	1.2	CD	4000 D	500	
8	6	1355 B	1510.4	266 D	CA	500	18	I 1821-1922
8	2	1710.2	1710.3	2.5	CD	1100	300	
9	6	1338	2113	632 D	CA	780	20	N6
10	6	1305 B	2246.5	665 D	CA	3500 D	70	N7
11	1	1305 B	1521.5	198	MF	2500	-	N8
11	6	1623	1750.9	467 D	CA	2200	26	
11	3	1509.7	1510.1	1.2	CD	1700	-	
12	6	1310 B	1646.4	660 D	CA	3700 D	130	Numerous large bursts
13	6	1310 B	1415.9	655 D	CA	3500 D	380	Large bursts 1415.9,1603.9
13	2	1936.1	1937.2	2.2	CD	720	220	
13	8	2353	2354.1	6	ECD	640 X	80 X	
14	1	1310 B	1329	500 D	MF	800	-	
14	3	1436.8	1437.3	0.9	CD	1400	-	
15	6	1710 B	2140.0	415 D	CA	900	10	Large bursts 2051.1,2107.2
16	3	1745.0	1745.1	1.5	ECD	3400 D	600	
17	2	1422	1434.8	19 I	CD	610	40	Group of bursts 1323
17	3	1830.4	1830.2	0.9	ECD	950	-	
17	8	2218.7	2219.2	2.8	ECD	3700 D	930	
18	1	1710 B	2142.5	375 D	M	940	-	
19	2	1736.1	1737.0	0.9	CD	500	-	

Notes:
1. Interference may occasionally obscure or be mistaken for solar events. Relatively small events not reported.
2. Beginning October 1, 1957 the three minute interruption of observations occurs at 26 to 29 minutes after each hour.
3. Receiver saturated at a varying flux level between 3500 and 4000 during October, 1957.
4. October 5, large bursts 1752.4, 1950.1, 0018.9, October 6, 1957.
5. October 7, large bursts 1548.0, 2250.1, 2350.0, other bursts 1415.1, 1423.1, 1430.9.
6. October 9, large bursts 1503.1, 1608.3, 1635.8.
7. October 10, large bursts 2248.4, 2322.8, 2204.9.
8. October 11, large bursts 1617.0, 1625.1, 1934.4.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
OCTOBER 1957

BOULDER — 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
Oct								
20	3	1432.2	1432.9	1.7	ECD	3500 D	-	
20	3	1539.8	1540.1	0.9	ECD	3200 D	-	
20	3	1600.6	1601.0	0.5	ECD	2000	-	
20	9	1646	1700 X	89 X	ECD	3700 D	650	
20	6	1815 X	2108.5	340 D	CA	880	380	Large bursts 1941.6,2244.1
20	3	2018.1	2018.9	1.0	ECD	3500 D	-	
21	1	1320 B	2122	635 D	MF	380	-	
21	2	1535	1531.4	6.0	ECD	2400	200	
21	3	1831.0	1831.5	1.3	CD	3300 D	180	
21	3	1850.7	1851.2	1.3	CD	3400 D	250	
22	6	1355 B	1807.3	600 D	CA	370	14	
22	3	1952.3	1952.9	0.6	ECD	3300 D	-	
22	3	2257.4	2257.9	0.9	CD	2500	-	
23	4	1842.4	1842.9	308 D	MF	3300 D	10	
23	3	2149.1	2149.2	0.8	ECD	2300	-	
23	8	2212.1	2213.7	25.4	ECD	1600	80	
24	1	1320 B	1356.1	176	MF	660	-	
24	6	1616	1939.3	259 D	CA	1300	17	
24	3	1805.0	1805.1	1.4	ECD	1600	-	
24	3	1921.3	1921.6	0.3	ESD	2200	-	
24	2	2151.3	-	4.5	CA	-	-	N9
25	6	2130 B	2254.5	115 D	CA	1400	18	
25	3	2134.9	2136.5	2.8	CD	1400	220	
25	3	2259.4	2259.4	0.6	ECD	900	-	
26	1	1325 B	2008.4	625 D	M	680	-	
26	2	1515.0	1516.6	2.3	ECD	800	280	Large burst 2141.4
27	1	1330 B	2002.9	615 D	M	700	-	Large burst 1804.5
28	6	1330 B	1401.5	150	CA	270	17	
28	8	1331	1333.6	3	CD	1800 X	350 X	
28	1	1600	2209.1	465 D	M	180	-	
29	6	1330	1521.9	615 D	MF	720	18	
29	2	2010.9	2012.2	2.0	CD	2000	420	
29	3	2132.3	2132.4	0.2	ESD	2300	-	Large burst 2333.2
30	6	1330 B	1724.3	615 D	CA	2800 D	27	I 2106-2215 N10
31	1	1330 B	1843.4	540	M	500	-	
31	3	2119.1	2120.0	1.5	ECD	2800 D	480	

Notes: 9. Not measurable because of S.
10. October 30, large bursts 1321.0, 1548.1, 1638.5, 1726.5, 2057.2.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES
OCTOBER 1957

BOULDER 450 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
Oct								
1	3	1831.1	1831.1	0.1	ESD	220	-	
1	3	2022.3	2022.3	0.1	ESD	240	-	
2	2	1958.3	1958.7	0.8	ECD	200	-	
2	2	2311	2312.8	4	FD	250	65	
3	6	1720	1920.4	280	CA	290	30	
3	3	2344.4	2344.8	0.8	ESD	600	-	
5	3	2212.2	2212.3	0.2	ESD	270	-	
6	4	2228.2	2229.3	8	ECD	550	40	
7	3	2119.8	2119.8	0.1	ESD	450	-	
11	4	1421	1421.6	590 D	ECA	310	20	
12	8	1529 B	1529 X	2.6	ECD	4000 D	600	I 1526-1529
12	3	2318.7	2318.8	0.2	ESD	280	-	
13	6	1310 B	1445.2	170	CA	160	20	
13	1	2045	2144.4	60	M	220	-	
14	6	1310 B	2300 X	655 D	CA	270	20	
14	2	1336	1339.9	6	F	260	50	
14	3	1748.2	1748.3	0.2	ESD	900	-	
14	8	1856.0	1856.4	1.1	ECD	4800 D	1700	
15	6	1310 B	2300 X	655 D	CA	240	20	
15	8	1330.1	1331.7	2.4	ECD	3700 D	340	
15	8	2151.7	2152.1	1.0	ECD	5200 D	3400 D	
18	6	1435	1808.3	240	CA	440	20	
19	0	2000	-	240 D	SA	-	16	
20	3	1432.6	1433.1	1.0	ECD	1800	370	
20	9	1647	1656	43 X	CD	14000 D	7000 D	Very intense
20	6	1835 X	1915 X	215	CA	1000	330	
20	3	2144.9	2145.0	0.5	ECD	1300	-	
22	0	1650 X	-	100 X	CA	-	13	
23	3	1842.6	1842.6	0.1	ESD	1400	-	
23	3	2217.1	2217.8	1.3	ECD	1100	420	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

OCTOBER 1957

BOULDER

450 MC

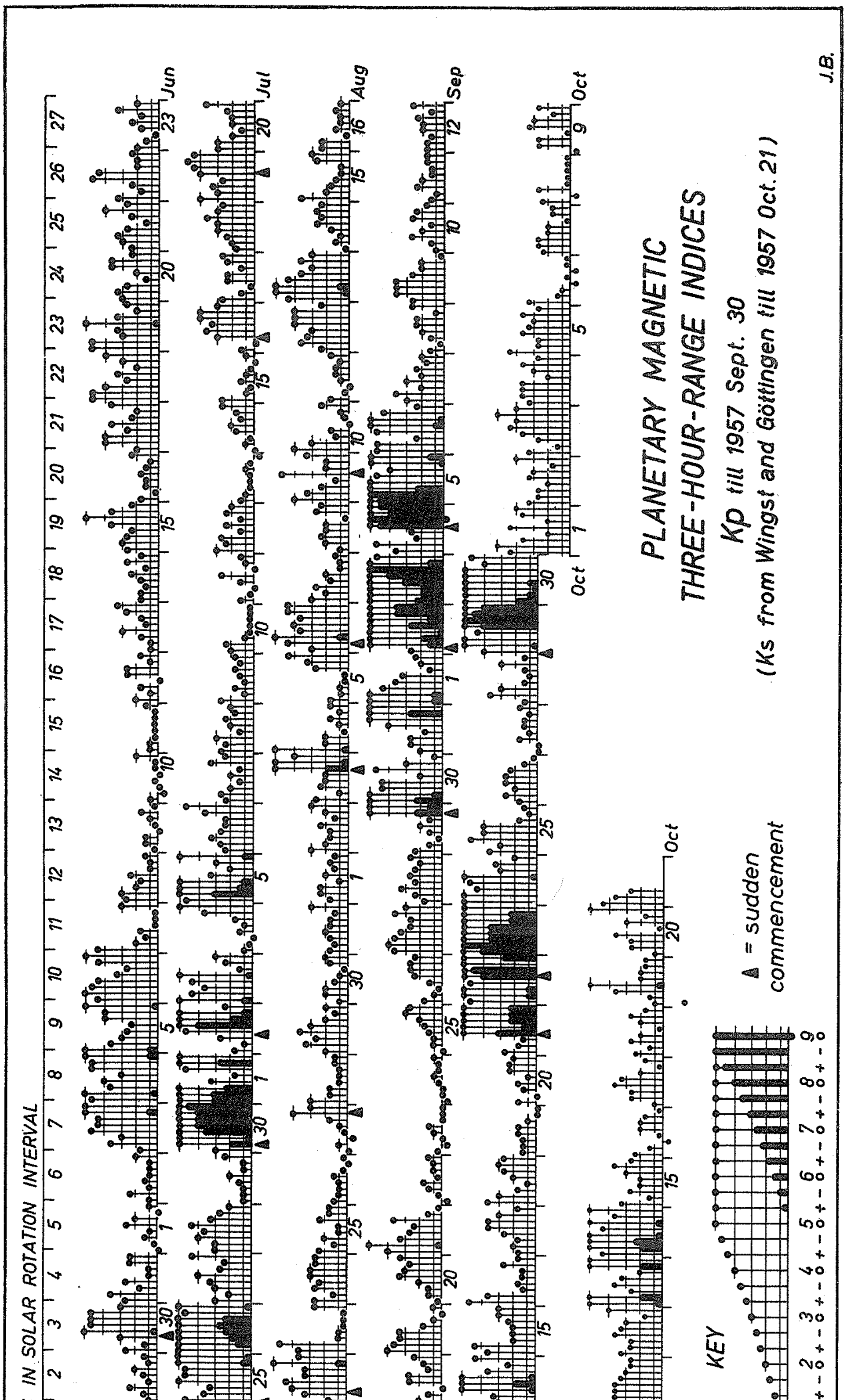
Date 1957	Type Ap.J	Start UT	Time of Maximum	Duration Minutes	Type IAU	Max. Flux Density $10^{-22} w\ m^{-2}\ (c/s)^{-1}$ Inst.	Smooth	Remarks
24	3	2145.6	2145.9	1.2	CD	440	190	
25	3	1503	1503.6	1.2	CD	570	180	
25	3	2136.7	2136.9	0.4	CD	850	-	
25	3	2254.3	2254.3	0.1	ESD	2200	-	
27	3	1434.6	1434.6	0.1	ESD	3400 D	-	
27	3	2052.7	2052.8	0.5	ESD	6200 D	-	N3

Notes:
1. Interference may occasionally obscure or be mistaken for solar events. Relatively small events not reported.
2. Beginning October 1, 1957 the three minute interruption of observations occurs at 26 to 29 minutes after each hour.
3. On October 28 thru 31 the receiver was unstable but no outstanding occurrences were observed.

GEOMAGNETIC ACTIVITY INDICES

SEPTEMBER 1957

Sept 1957	C	Values Kp Three hour Gr. interval 1	2	3	4	5	6	7	8	Sum	Ap	Final Selected Days
1	1.2	6-	6-	4+	4-	3+	1+	2o	2+	28+	28	Five
2	1.8	3-	6o	6+	5+	7o	6o	8-	8-	49-	102	Quiet
3	1.9	7-	6+	6+	7+	8o	9-	6o	5-	54o	135	
4	1.9	4-	5-	2+	3-	8+	9o	8o	8+	47o	145	8
5	1.9	8+	9-	7-	5o	5-	4o	5+	6o	49-	112	11
												19
6	1.3	5-	5-	2+	5-	6-	5+	4+	2+	34o	36	20
7	0.7	3o	4-	2o	3o	2o	2+	2-	2o	20-	11	27
8	0.3	1+	1-	1+	2o	2+	2+	1o	3-	14-	7	
9	0.6	3-	4-	4-	4-	3-	2o	2o	1-	21o	13	
10	0.4	1o	1+	3-	2o	1+	3-	2+	2-	15o	8	
11	0.2	1+	1o	2+	2o	1+	1+	2-	2-	13-	6	Five
12	0.4	2-	2-	1+	2o	2o	2+	1+	3-	15o	7	Disturbed
13	2.0	8-	8+	9-	9-	7o	6o	4o	4o	54+	160	
14	1.3	3o	3+	5+	6+	5+	4-	2+	4+	34-	38	3
15	0.8	4-	4+	2o	2o	2o	2+	3o	3o	22+	14	4
												13
16	0.7	5-	4-	1+	2-	1+	1+	3-	2-	18+	12	23
17	0.8	2-	2o	2-	3-	4-	4-	3o	2-	20o	12	29
18	0.5	4-	3o	2-	1o	2o	3-	3o	3-	20-	12	
19	0.1	1+	1+	1+	2-	2-	1o	0+	0+	9o	4	
20	0.3	2-	0+	1+	2-	1o	2+	2+	2o	13-	6	
21	1.7	3-	2-	1+	7+	6o	7-	7-	7-	39o	74	Ten
22	1.9	5-	6-	6-	5-	8o	8+	5o	7o	49o	104	Quiet
23	2.0	8o	9-	8-	8-	8-	7-	7-	5o	58o	164	
24	1.2	5o	5o	4+	5-	5+	3o	3+	2o	33-	33	7
25	1.0	4-	3o	5-	4o	4o	2-	1o	1+	23+	18	8
												10
26	0.4	2-	3-	2o	3-	3-	2+	1+	1-	16o	8	11
27	0.2	0+	0+	2-	1o	1+	1+	1o	2-	9-	4	12
28	0.3	1+	4-	3o	1+	1o	1+	3o	1+	16o	10	19
29	2.0	4o	5+	5o	4+	8o	9-	8+	8o	52-	139	20
30	1.7	6+	6-	5+	6-	5o	5o	4o	5-	42-	56	26
												27
												28
Mean:	1.0									Mean:	49	


PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1957 Sept. 30
(Ks from Wingst and Göttingen till 1957 Oct. 21)
DAYS IN SOLAR ROTATION INTERVAL
ROT.-NR.
1696
1697
1698
1699
1700
1701
KEY
▲ = sudden commencement
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

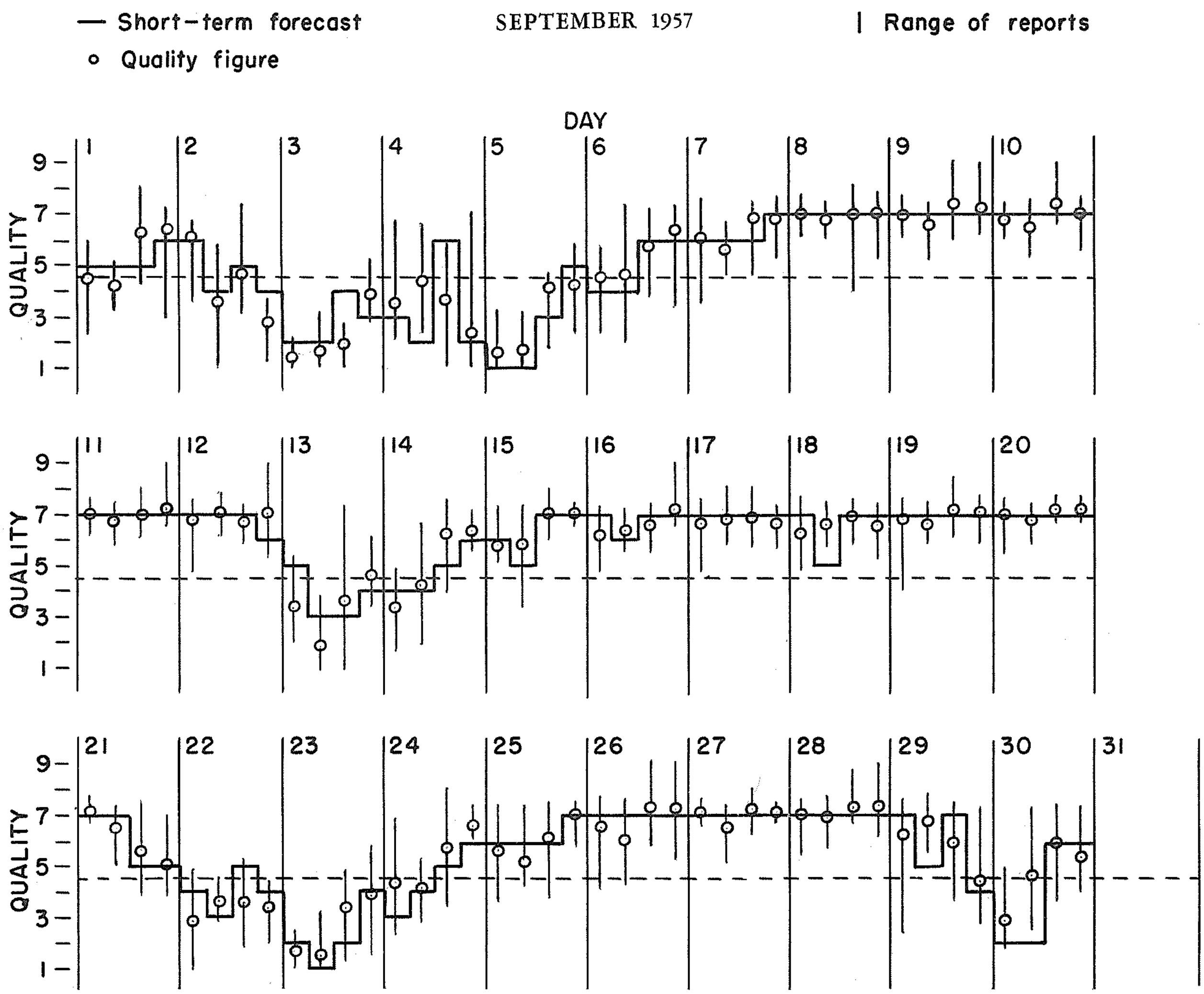
SEPTEMBER 1957

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

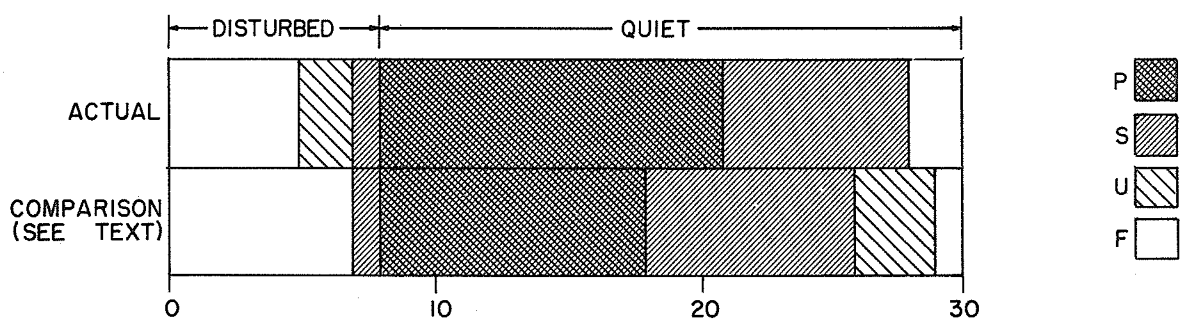
( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS
NORTH ATLANTIC

SEPTEMBER 1957

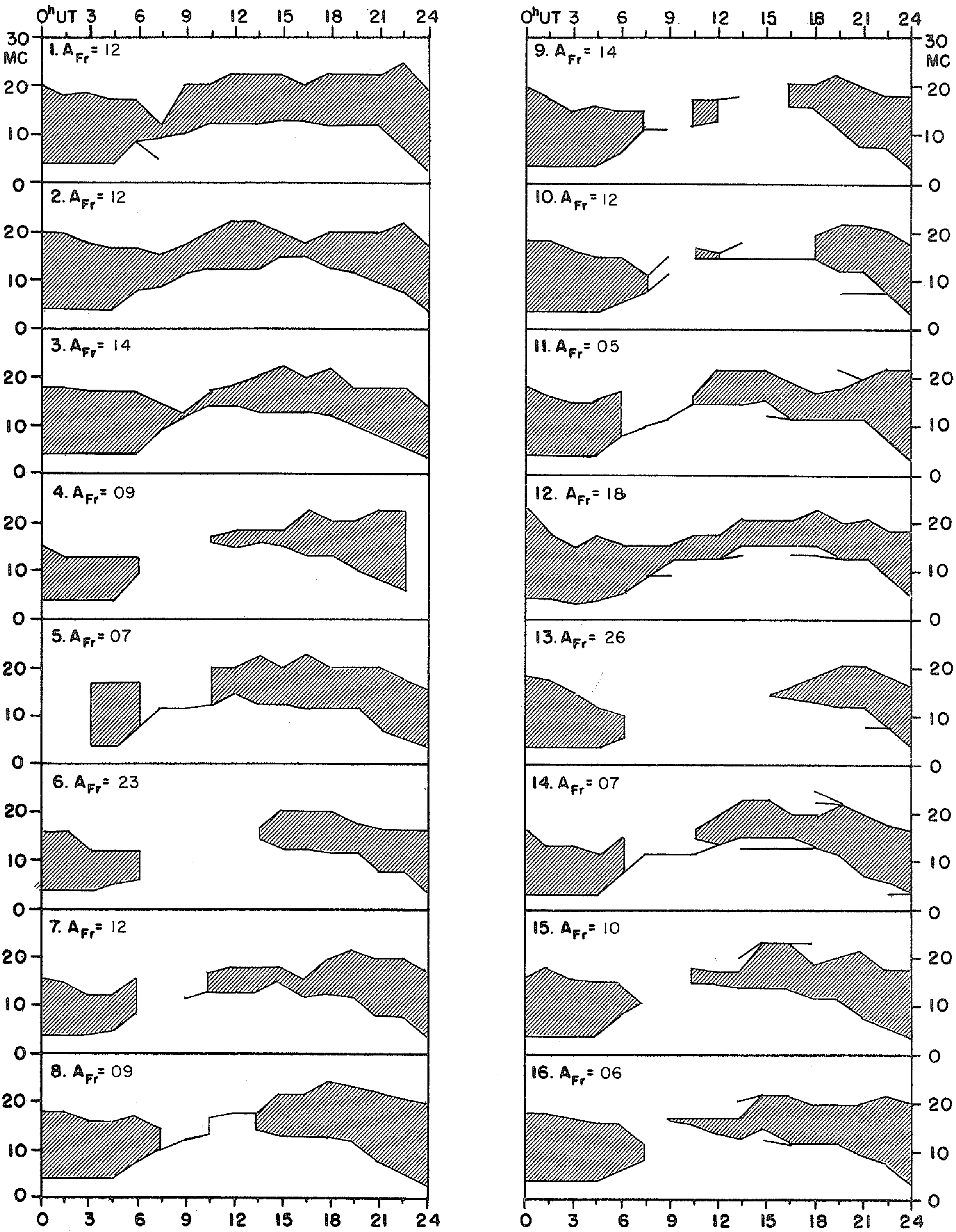


OUTCOME OF ADVANCED FORECASTS (1 TO 4 DAYS AHEAD)

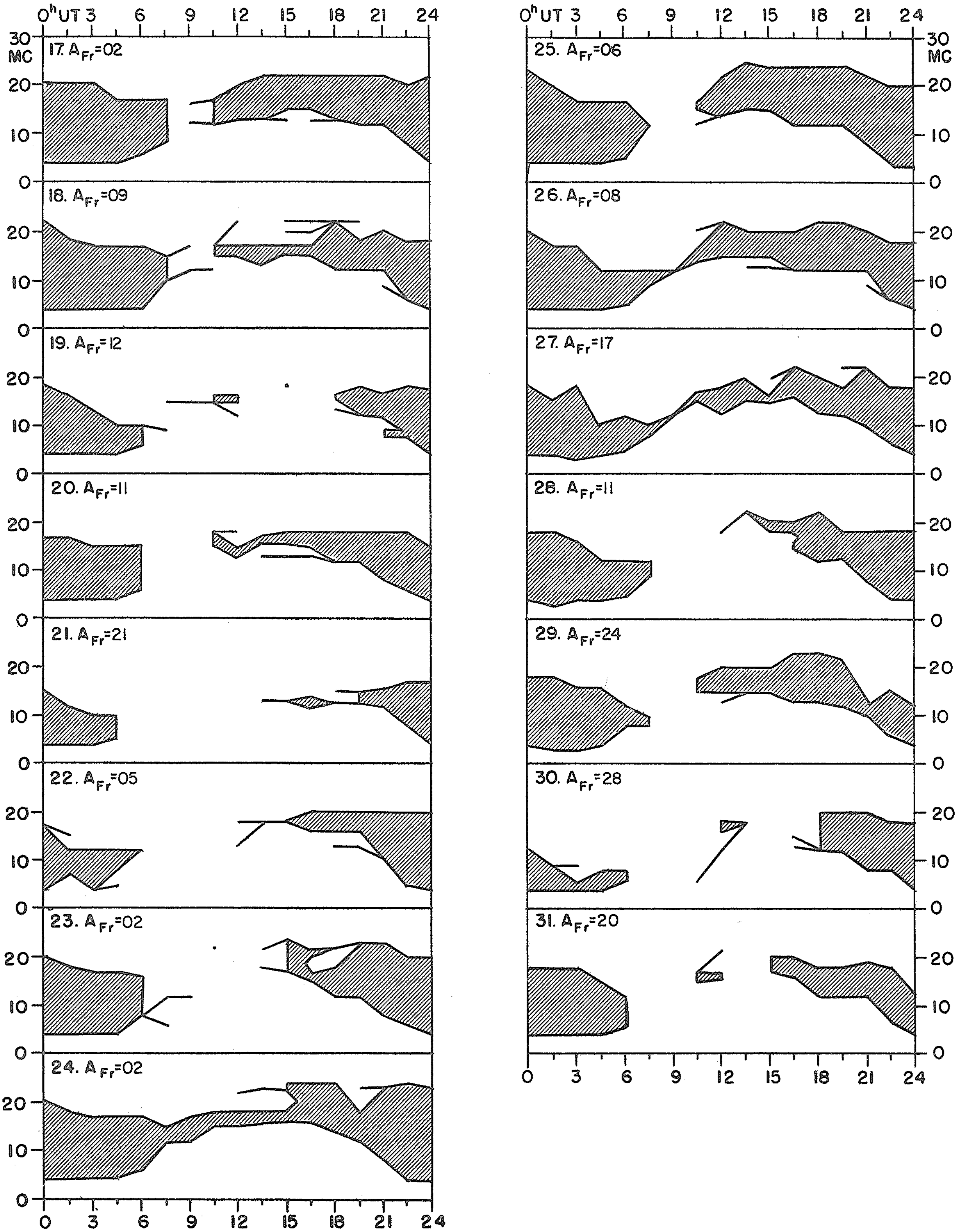


USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

AUGUST 1957



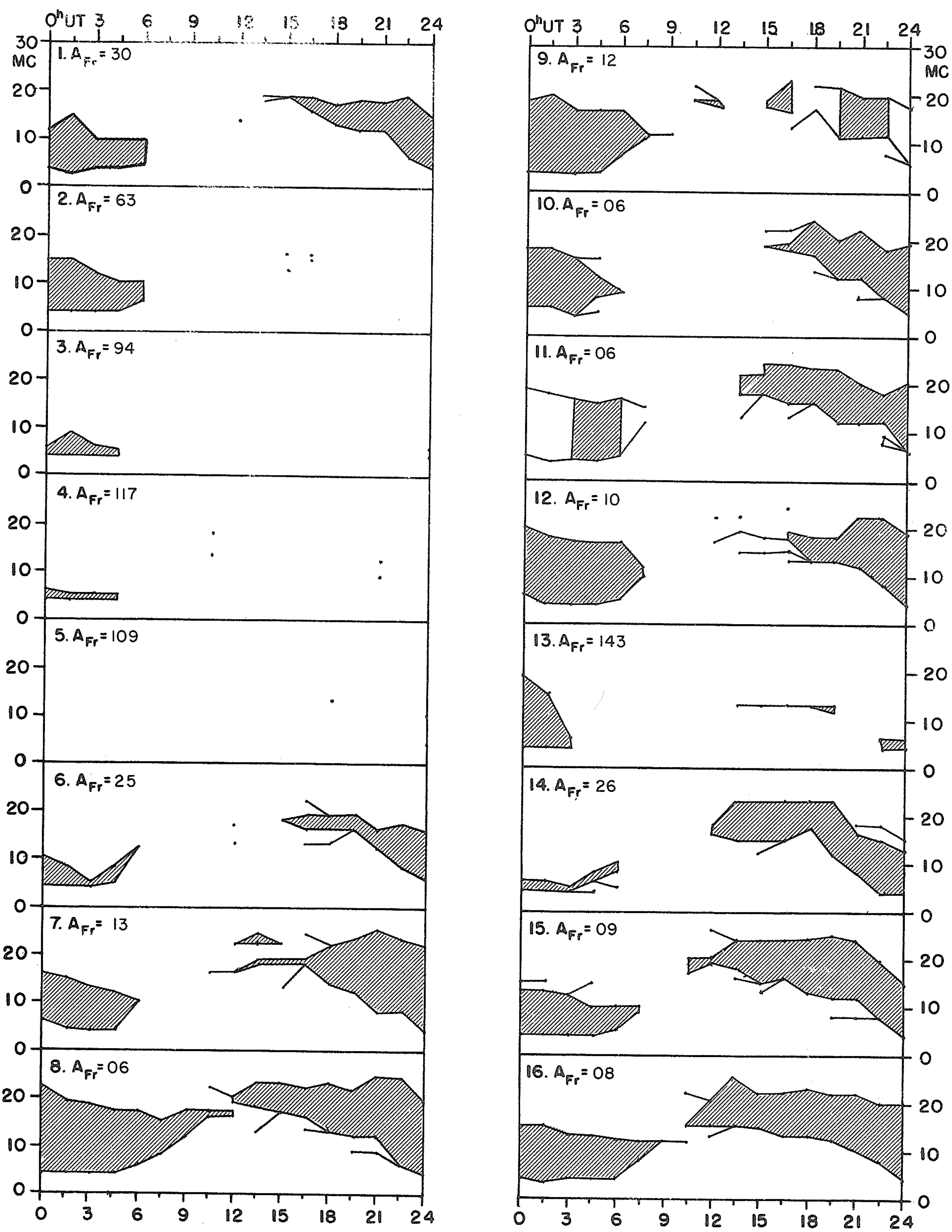
AUGUST 1957



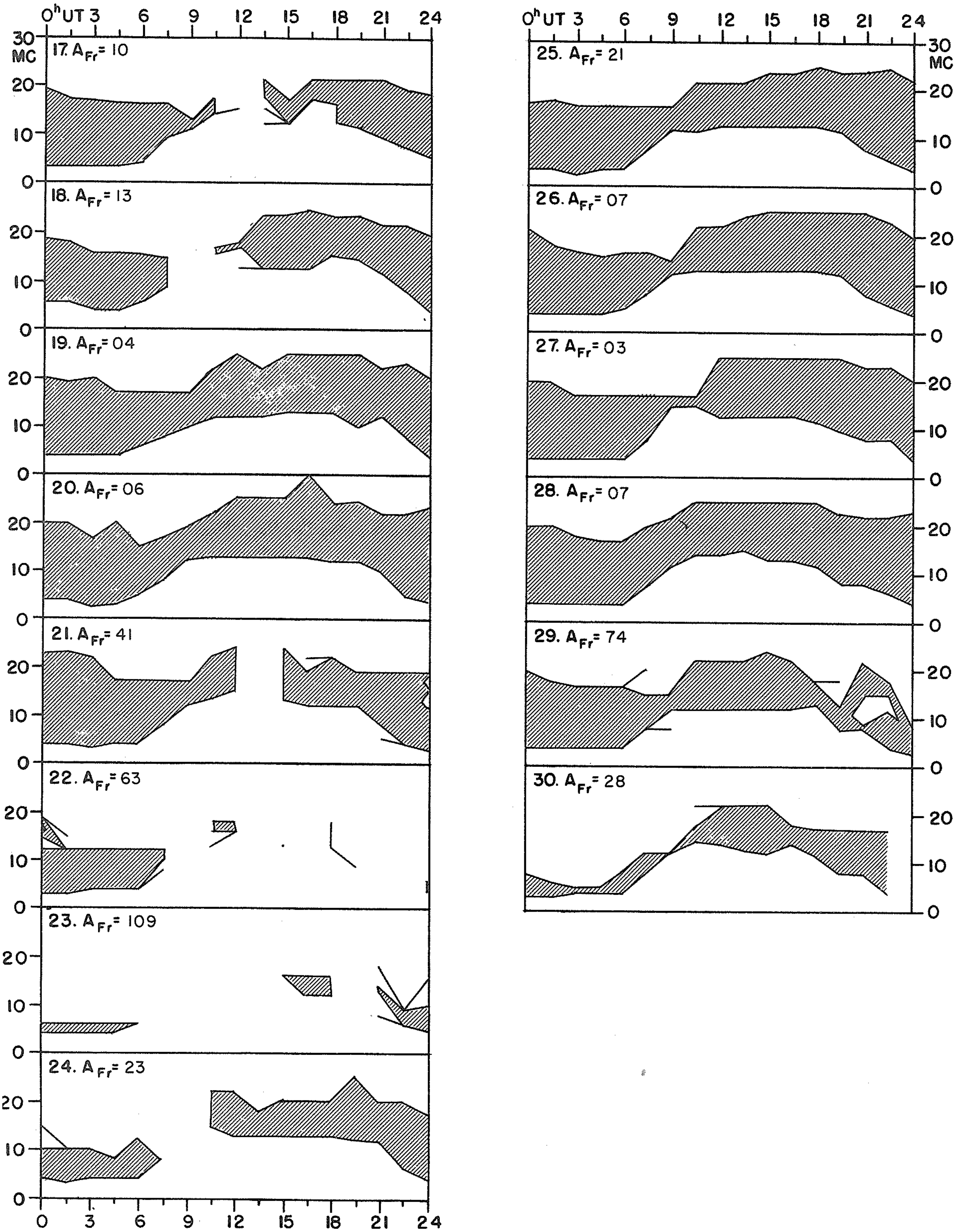
Adapted from Observations by Deutsches Bundespost

USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

SEPTEMBER 1957



SEPTEMBER 1957



Adapted from Observations by Deutsches Bundespost

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

SEPTEMBER 1957

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

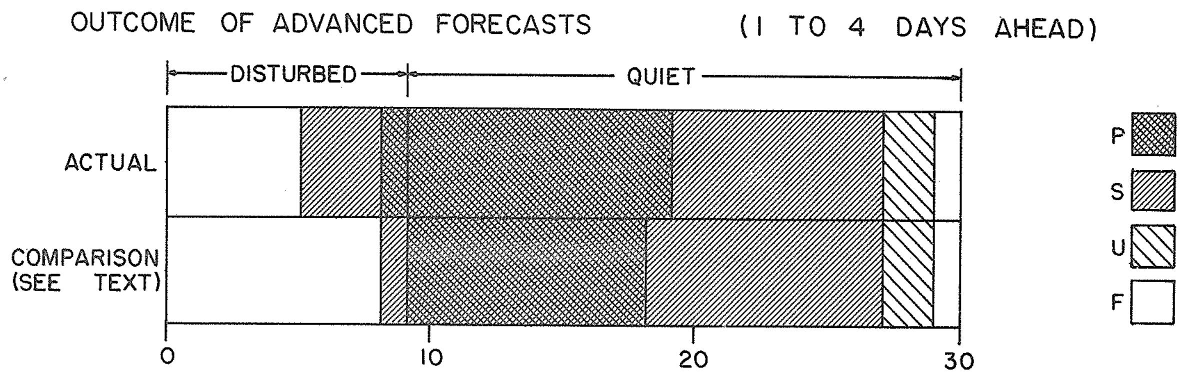
Score:		02	10	18	1-4 days	4-7 days
Quiet Periods	P	13	10	12	10	12
	S	7	7	9	8	6
	U	0	1	1	2	3
	F	2	2	2	1	0
Disturbed Periods	P	4	5	3	1	1
	S	3	2	1	3	0
	U	1	1	2	0	1
	F	0	2	0	5	7

( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

SEPTEMBER 1957



ALERT PERIODS AND SPECIAL WORLD INTERVALS

Alert	SWI	A_{Be} On Days of Alert Period (SWI Underlined)	Number of Flares of IMP 2 Reported Promptly on Days of Alert Period
Oct 14-Oct 19		36-08-04-05-08-08	1-1-4-0-0-4
Oct 21-Oct 22	Oct 21-Oct 22	<u>15</u>-<u>12</u>	1-0