CRPL-F 160 PART B

FOR OFFICIAL USE

PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
DECEMBER 1957

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

CRPL-F 160
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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, $\bar{R}$, is used throughout, the data being final R_Z numbers except for the current year. Predictions shown are those made for one year after the latest available datum by the method of A. G. McNish and J. V. Lincoln (Trans. Am. Geophys. Union, 30, 673-685, 1949) modified by the use of regression coefficients and mean cycle values recomputed for Cycles 8 through 18. Cycle 19 began April 1954, when the minimum $\bar{R}$ of 3.4 was reached.

II SOLAR CENTERS OF ACTIVITY

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

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

Calcium plage data are available through the cooperation of the McMath-Hulbert Observatory of the University of Michigan 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:

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

where N is the number of indices entering the summation.

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

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

III SOLAR FLARES

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

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

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

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

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

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

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

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

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

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

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

IV SOLAR RADIO WAVES

2800 Mc Observations

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

Simple Burst

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

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

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

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

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

5 - Absorption following burst (negative post).

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

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

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

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

Great Burst

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

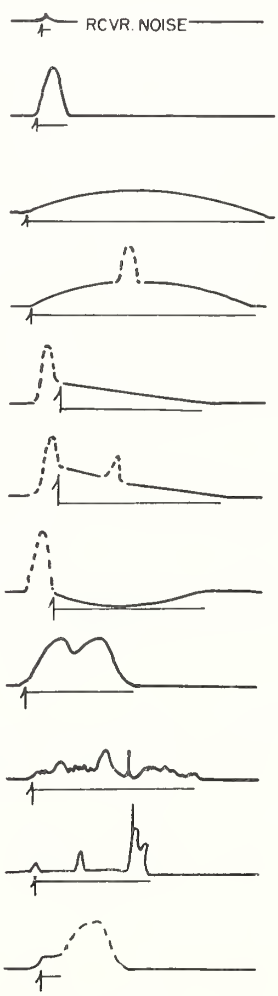
Letter "A"

Indicates that this event has another event superimposed upon it.

Letter "f"

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

CLASS	TYPE
1	SIMPLE 1
2	SIMPLE 2
3	SIMPLE 3
	SIMPLE 3A
4	POST
	POST A
5	ABSORPTION
6	COMPLEX
7	FLUCTUATIONS
8	GROUP
9	PRE



START DURATION

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 (R.S. Lawrence) 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 dash 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.

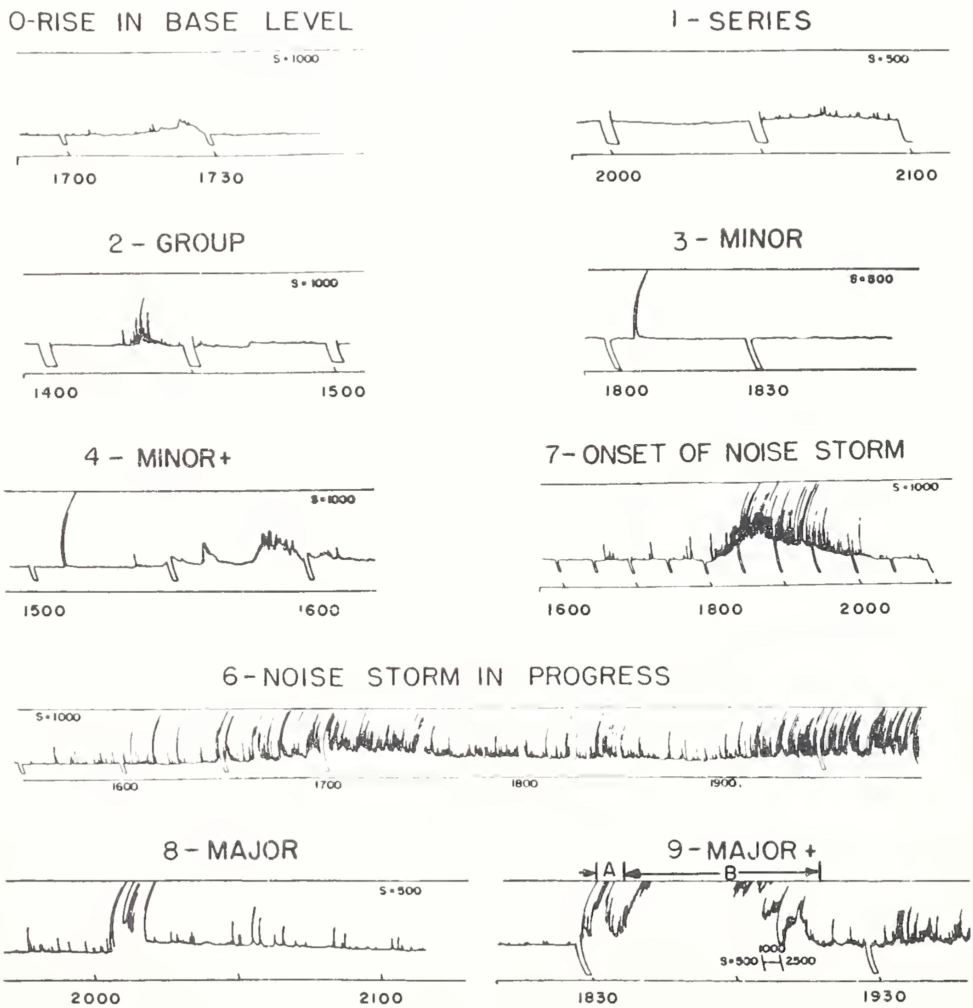
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

6 - <u>Noise storm</u> -- 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 - <u>Noise storm begins</u> -- The onset of a noise storm occurs at some time during the observing period.

8 - <u>Major burst</u> -- 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 - <u>Major burst and second part or large event without distinct first and second parts</u> -- 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 dash indicates missing or insignificant data. Observations are interrupted during the period from 26 to 29 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.

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

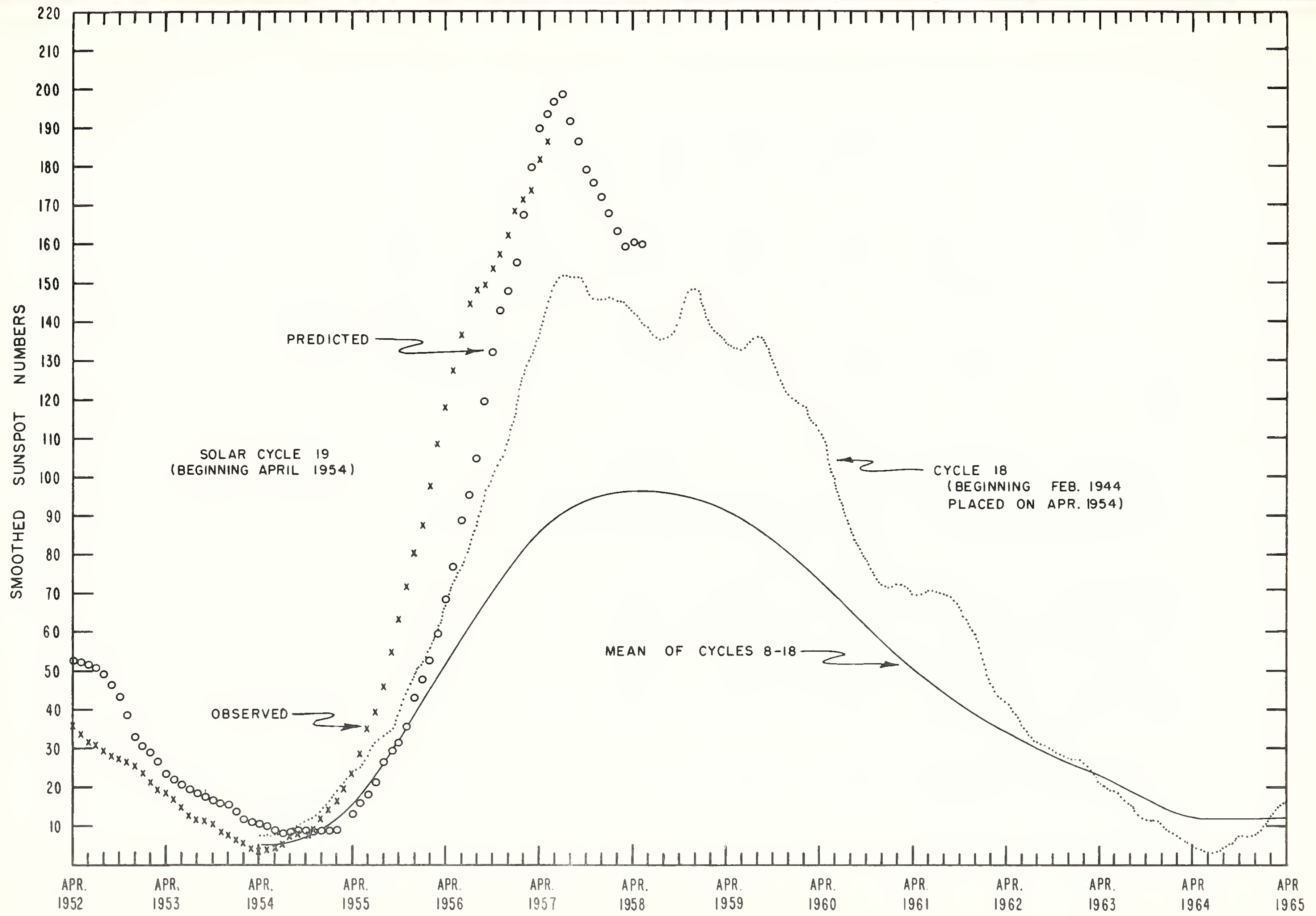
VII ALERT PERIODS AND SPECIAL WORLD INTERVALS

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

DAILY SOLAR INDICES

Oct. 1957	American Relative Sunspot Numbers R_A'
1	219
2	245
3	225
4	223
5	221
6	196
7	226
8	257
9	216
10	201
11	219
12	245
13	245
14	190
15	207
16	212
17	186
18	161
19	191
20	194
21	203
22	228
23	223
24	263
25	259
26	265
27	277
28	276
29	283
30	317
31	234
Mean:	229.2

Nov. 1957	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	265	300
2	256	289
3	230	266
4	210	236
5	200	240
6	180	239
7	175	243
8	155	235
9	190	230
10	230	232
11	224	246
12	220	257
13	185	250
14	180	248
15	177	242
16	180	242
17	191	228
18	225	247
19	183	251
20	208	261
21	235	274
22	275	294
23	250	280
24	236	285
25	200	271
26	198	259
27	171	258
28	235	255
29	192	247
30	162	278
Mean:	207.3	256.1



PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

NOVEMBER 1957

CMP Nov. 1957	Lat	McMath Plage Number	Return of Region	Calcium Plage Data CMP Values Area	Int.	History, Age		Sunspot Data CMP Values Area	Count	History
02.0	N08	4217	New	900	2.5	b⌞ℓ	1			
02.5	S14	4222	New	900	2	b—ℓ	1			
03.8	N11	4211	4172	1800	2	ℓ⌞ℓ	2	200	2	ℓ—ℓ
04.0	S16	4210	4176	600	2	ℓ⌞d	5	80	1	b—d
05.2	N41	4212	4171	3800	3	ℓ⌞ℓ	2	20	1	b—d
05.9	S40	4219	4173	1000	1.5	ℓ—d	2			
06.1	S17	4218	4177	3200	3.5	ℓ—ℓ	3	600	4	ℓ—ℓ
07.0	N16	4231	4179?	500	1.5	b⌐ℓ	2?			
07.6	N33	4220	4179?	1500	2.5	ℓ—ℓ	2?	130	4	ℓ—ℓ
07.9	N23	4229	4179?	600	2	b—ℓ	2?	50	1	ℓ—d
09.0	S28	4224	4187	1300	1.5	ℓ—ℓ	7			
09.2	N23	4221	4182?	2400	2.5	ℓ⌞ℓ	2?	50	1	ℓ╲d
09.7	N14	4228	4180	2600	2	ℓ—ℓ	7	50	1	ℓ╲d
10.8	S33	4225	New	2100	2	ℓ—ℓ	1	100	1	ℓ∧d
11.1	S18	4240	4185	2000	2	ℓ—ℓ	2			
11.4	S11	4227	4185	800	2	ℓ⌞d	2			
11.9	S24	4226	4185	1000	1	ℓ—d	2	50	1	ℓ╲d
12.2	N18	4230	New	7800	4	ℓ∨ℓ	1	820	11	ℓ¬ℓ
13.1	S22	4236	4189	6000	3	ℓ⌐ℓ	3	740	12	b∧ℓ**
13.6	N19	4235	4188	1800	3.5	ℓ¬d	7	220	4	b—ℓ
14.2	N06	4233	New	2100	2.5	ℓ—ℓ	1	340	13	b╱ℓ
14.9	S21	4237	4189	6500	3	ℓ—ℓ	3	70	2	ℓ╲d
14.9	N26	4234	4188	1500	2.5	ℓ⌞ℓ	7			
16.2	S15	4238	4191	700	2	ℓ⌞ℓ	4			
17.9	N16	4242	New	2800	2.5	ℓ_╱ℓ	1	390	8	b—ℓ
18.2	S10	4243	New	6300	3	ℓ—ℓ	1	160	4	ℓ—ℓ
18.6	S25	4245	4193	(900)	(2)	ℓ⌐ℓ	2	(370)	(8)	b—ℓ
19.5	N12	4252	4196	1000	1.5	ℓ—ℓ	6	100	2	b—d
20.3	N25	4246	4196	4300	3.5	ℓ⌐ℓ	6	300	7	ℓ╱ℓ
20.3	S16	4259	New	300	1	b—ℓ	1			
21.2	N13	4247	4197	3500	5	ℓ⌐ℓ	6	760	8	ℓ⌐ℓ
22.4	S26	4248	4201	5000	2	ℓ⌒ℓ	3			
23.1	S09	4256	4203	1400	3.5	ℓ⌐ℓ	2			
23.6	N20	4254	*	6000	3	ℓ⌞ℓ	4	(270)	(1)	ℓ—ℓ
23.8	S14	4255	4203	4000	3.5	ℓ—ℓ	2	(620)	(7)	ℓ¬ℓ
25.4	S15	4257	4214	5700	3	ℓ—ℓ	2	510	6	ℓ¬ℓ
26.2	N37	4266	4215?	400	1	ℓ—d	2			
26.2	S23	4264	4207	1000	1.5	ℓ¬d	#			
26.5	N22	4261	4205	900	1.5	ℓ—d	3			
26.8	N11	4262	4206	(400)	(1.5)	ℓ╲d	2			
27.1	S16	4263	4207	8800	4	ℓ—ℓ	#	610	12	ℓ∧ℓ
28.2	S15	4267	4207	800	1	ℓ⌞ℓ	#	40	3	b—d
28.3	N27	4268	4208	2800	2.5	ℓ—ℓ	2	70	4	b—d
28.5	S26	4265	4207	3200	3	ℓ—ℓ	#	150	1	ℓ╲d
29.7	S18	4269	4210	1200	3	ℓ╱ℓ	6	630	7	b⌐ℓ***
30.4	S08	4279	New	700	3	b—ℓ	1	50	3	b—ℓ
30.5	N15	4271	4211	2500	3	ℓ—ℓ	5			

*4202, 4213, and part of 4197.
**Spot group grew in rapidly.
***Spot group grew to maximum area of 2280 millionths.
McMath re-identifies region 4209 (CRPL-F159B) as a new region.
#Age 4,5.

CORONAL LINE EMISSION INDICES

NOVEMBER 1957

CMP Nov. 1957	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	x	x	x	x	x	x	x	x	175	300	98	156	122*	135	41	48
2	126	158	48	57	190	240	79	108	160*	206	46	57	171*	326	55	96
3	169	248	x	x	x	x	x	x	111	144	25a	46a	87	112	46a	68a
4	x	x	x	x	x	x	x	x	93	158	x	x	74	93	x	x
5	238	188	55	78	190	210	43	76	x	x	x	x	x	x	x	x
6	118	140	101	123	152*	212	45	58	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	242	376	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	118	202	47	68	143	208	53	78	x	x	x	x	x	x	x	x
11	159	231	82	147	159	216	80	108	x	x	x	x	x	x	x	x
12	178a	236a	83a	174a	x	x	48a	60a	x	x	x	x	x	x	x	x
13	109	130	x	x	111	126	x	x	x	x	x	x	x	x	x	x
14	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
15	139	269	41	65	x	x	63	91	110	144	31	56	93	108	11	24
16	120	152	39	52	221	400	74	135	117	135	40	93	99	136	17	39
17	191	249	26a	39a	164	200	53a	121a	x	x	x	x	x	x	x	x
18	96	132	x	x	124	167	x	x	120	143	x	x	159*	201	x	x
19	x	x	x	x	x	x	x	x	82	102	51	96	127*	152	40	58
20	x	x	x	x	x	x	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	x	x	x	x	x	x	x	x
23	x	x	x	x	x	x	x	x	127	202	65	99	104	140	54	82
24	x	x	x	x	x	x	x	x	154	352	54	90	110	176	26	33
25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
26	x	x	x	x	x	x	x	x	75	96	43	78	106	164	29	36
27	x	x	x	x	x	x	x	x	133	184	36	72	85	188	45	94
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	158	294	59	81	138	300	23	28	x	x	x	x	x	x	x	x
30	118	160	59	116	107	168	17	24	x	x	x	x	x	x	x	x

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

SOLAR FLARES

OBSERVATORY	DATE Nov. 1957	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg	MAX WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
MITAKA	01	0021 E	0026 D		N28	W06	4208	5 D	1	2	0021	.89	.98	1.31	134	
MITAKA	01	0439 E	0448		N22	W60	4202	9 D	1	1	0439	.89	1.73	2.10	107	
ZURICH	01	1104	1116		S18	E57	4218	12	1	3	1106		3.00			
ZURICH	01	1117	1143		S25	W03	4207	26	1	3	112C		3.00			
HUANCAYO	01	1700 E	1709	1704	S17	E53	4218	9 D	1	2						
HAWAII	01	2346	2358 D	2350	S18	W22	4207	12 D	1	3	235C	2.30	2.60			
ZURICH	02	1533	1539 D		S20	W19	4207	6 D	1	2	1533		7.00			
SAC PEAK	02	2050 E	2115 D	2052	S18	W24	4207	25 D	1	1		3.70			17	
MITAKA	02	2335	2344	2336	S24	W24	4207	9	1&	3	2336	4.45	5.34	2.21	134	
MITAKA	03	0112	0118		S18	W27	4207	6	1	2	0112	1.84	2.21	1.62	100	
WENDEL	03	0928	0942		S15	W35	4207	14	1				3.00			
WENDEL	03	1119	1131		N12	W82	4213	12	1				4.00			
SAC PEAK	03	1747	1940 D	1836	S20	W34	4207	113 D	1	2		4.90			17	
HAWAII	04	0058	0116	0102	S20	W42	4207	18	1	3	0102	1.60	2.30			
MITAKA	04	0106 E	0111 D		S21	W34	4207	5 D	1	1	0106	3.80	5.10	1.46	125	
ARCETRI	04	0937 E	0953 D		S10	W20	4222	16 D	1	3						
WENDEL	04	0937	1004		S13	W20	4222	27	1&				5.00			
WENDEL	04	1059	1115		S22	W39	4207	16	1&				6.00			
USNRL	04	1735	1750	1735	S27	W45	4207	15	1	1	1735	.85	1.40		113	
USNRL	04	1949	1959	1949	N23	W58	4208	10	1	1	1949	.34	.64		99	
UCCLE	05	1102 E	1109		N24	W68	4208	7 D	1	1						
UCCLE	05	1120	1132	1122	S34	E62	4225	12	1	3						
CAPRI S	05	1205 E	1223 D		S23	W54	4207	18 D	1	2	1215	1.20	2.40			S-SWF
USNRL	05	1231	1257	1237	S25	W58	4207	26	1	2	1237	1.13	2.41		87	
UCCLE	06	0835	0851	0841	S28	W73	4207	16	2	3	0841	9.10	15.00			
ATHENS	06	0839	0848	0843	S28	W63	4207	9	2	3		1.90	4.80			S-SWF
R O HERST	06	0842 E	0850	0842 E	S27	W67	4207	8 D	1	1	0842	1.00	1.80			
UCCLE	06	0854	0900	0857	S28	W73	4207	6	1	4	0857	2.30	4.10			
USNRL	06	1553	1608	1554	S28	W70	4207	15	1	2	1554	1.13	4.30		70	
OTTAWA	06	1555	1608	1557	S30	W68	4207	13	1&	1	1557	1.86	6.66			
USNRL	06	1728	1837	1736	S40	W10	4219	69	1	2	1736	1.70	2.34		67	
CLIMAX	06	1728	1927 D	1750	S41	W09	4219	119 D	1		1750	4.00				
SAC PEAK	06	1740	1837 U	1755	S42	W10	4219	57 D	1	2		2.50			14	
USNRL	06	1806 E	1902		S27	W80	4207	56 D	1	1	1806	.45	2.29		66	
HAWAII	06	2158	2204	2200	N09	E64	4232	6	1&	2	2200	3.30	7.60			
HAWAII	06	2228	2246	2228	S13	W16	4218	18	1	2	2228	2.60	2.80			
MITAKA	07	0229 E	0238 D		N19	E59	4230	9 D	1	1	0229	1.84	3.31	2.15	89	S-SWF
MITAKA	07	0253 E	0313 D	0255	S16	W14	4218	20 D	1	1	0254	2.73	3.00	2.37	149	
UCCLE	07	0848 E	0856		N20	E75	4235	8 D	1	1						
UCCLE	07	1016 E	1055		N30	W01	4220	39 D	1	2	1016	2.20	2.20			
UCCLE	07	1023	1046	1030	S35	E35	4225	23	1	2	1030	1.50	2.10			
UCCLE	07	1046 E	1115 D	1054	S35	E35	4225	29 D	2	2	1054	5.00	7.50	1.00		
WENDEL	07	1048 E	1118		S33	E34	4225	30 D	1&				6.00			
WENDEL	08	1014	1042 D	1017	S23	E86	4237	28 D	1&				6.00			
UCCLE	08	1042 E			S25	E70	4237		1	1						
UCCLE	08	1047 E			N17	E73	4235		1	1						

CAPRI S — ANACAPRI SWEDISH
KOOAIKNL — KOOAIKANAL
KRASNYA — KRASNAYA PAKHRA
R O EDIN — ROYAL OBSERVATORY, EOINBURGH
R O HERST — GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
SAC PEAK — SACRAMENTO PEAK
SCHAUINS — SCHAUINSLAND
USNRL — UNITEO STATES NAVAL RESEARCH LABORATORY

* RATEO AS IMPORTANCE 1- BY OTHER OBSERVATORIES.

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

E - LESS THAN
D - GREATER THAN
U - APPROXIMATE
& - PLUS
- - MINUS

SOLAR FLARES

OBSERVATORY	DATE Nov. 1957	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
HUANCAYO	08	1628 E	1641	1631	N19	E36	4230	13 D	1	2						
HUANCAYO	08	2003 E	2005 D	2003	S21	E72	4237	2 D	1	2						S-SWF
WENDEL	09	0740	0757 D		S14	E67	4237	17 D	1&				6.00			
OTTAWA	09	1510			S12	E65	4237		1	1	1512	1.04	2.76			
ATHENS	10	0653 E	0728 D	0655	S23	E63	4237	30 D	2	4		3.20	8.00			S-SWF
WENDEL	10	1005	1022 D		S21	E35	4236	17 D	1				3.00			
WENDEL	10	1205 E	1217 D		S25	E57	4237	12 D	1&				6.00			
USNRL	11	1410	1438	1420	S35	E45	4237	28	1&	3	1420	2.60	4.33		108	S-SWF
OTTAWA	11	1426 E			S23	E45	4237		1	1	1428	1.86	2.99			
CAPRI S	12	0833 E	0931 D		S21	E12	4236	58 D	1	3	0835	2.50	2.70			
CAPRI S	12	1217	1320		S21	E18	4236	63	1&	3	1220	3.00	3.30			
USNRL	12	1439	1449	1441	S19	W81	4218	10	1	2	1441	.73	3.71		72	
HUANCAYO	12	1619 E	1634	1621	S07	E78	4243	15 D	1	3						
USNRL	12	1619	1638	1622	S10	E85	4243	19	1	2	1622	.62	4.53		72	
USNRL	12	1925	1939	1927	S18	W85	4218	14	1	2	1927	.68	3.43		62	
USNRL	12	1926	1941	1929	N08	E13	4233	15	1	2	1929	.56	.58		127	
HAWAII	12	2104	2114	2106	S13	W27	4240	10	1	2	2106	2.10	2.40			
HAWAII	12	2216	2236	2218	S22	W03	4236	20	1	2	2218	2.60	2.80			
MITAKA	13	0058	0108 D		S25	E26	4237	10 D	1	2	0058	1.34	1.75	2.39	96	
MITAKA	13	0112	0122		S25	E26	4237	10	1	2	0114	1.84	2.41	2.56	125	
ARCETRI	13	0800 E	0900 D		N19	W16	4230	60 D	2	2						
ATHENS	13	0810	0903		N19	W20	4230	53	1	3		2.00	2.20			
ATHENS	13	0812	0917		N18	W13	4230	5	2	3		4.80	5.40			
CAPRI S	13	0815 E	0916 D		N20	W20	4230	61 D	1&	3	0838	3.50	3.90			
USNRL	13	1515 E	1548		S18	W08	4236	33 D	1	1	1518	2.26	2.45		97	
HUANCAYO	13	1932 E	2057	2000	N19	W23	4230	85 D	1&	2						
SAC PEAK	13	1935	2100 U	2015	N18	W24	4230	85 D	1	2		3.30			15	
USNRL	13	1940 E	2007 D		N19	W26	4230	27 D	1&	1	2003	2.48	2.86		118	
HUANCAYO	13	1955 E	2004 D	1955	S23	E17	4237	9 D	1	2						
WENDEL	14	1158	1208 D		S20	W14	4236	10 D	1				3.00			
HYDERABAD	15	0529	0605	0540	N18	W45	4230	36	1&	2	0540	3.65	5.34	2.00		
ATHENS	15	0735	0746		N08	W19	4233	11	1	3		2.00	2.10			
WENDEL	15	0902	0944		N20	W39	4230	42	2				8.00			
WENDEL	15	0902	0944		N19	W47	4230	42	1&				7.00			
CAPRI S	15	0908	0935 D		N17	W50	4230	27 D	1	3	0927	3.00	4.80			
UCCLE	15	1055 E			N08	W21	4233			1						
UCCLE	15	1057 E	1058 D		N19	W67				1						
WENDEL	16	0810 E	0816		N12	W33	4233	16 D	1&				6.00			
HYDERABAD	17	0539 E	0552	0542	N28	E36	4246	13 D	1&	2	0542	3.04	4.15	2.30		Slow S-SWF
ATHENS	17	0755	0819		S17	W55	4236	24	1	3		1.80	3.20			
CAPRI S	17	0759 E	0840		S17	W60	4236	41 D	1	3	0822	1.30	2.90			
WENDEL	17	0808 E	0840		S20	W54	4236	32 D	2&				9.00			
WENDEL	17	0829	0850		N27	E23	4246	21	1&				5.00			
WENDEL	17	1031	1049		N14	E06	4242	18	1				3.00			

SOLAR FLARES

OBSERVATORY	DATE Nov. 1957	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
WENDEL	17	1134	1228 D		N27	E31	4246	54 D	1				4.00			
WENDEL	17	1239	1254		N14	E05	4242	15	1				4.00			
WENDEL	17	1339	1359		N04	W44	4233	20	1+				5.00			
HAWAII	17	2048	2102	2054	N26	E26	4246	14	1	3	2054	3.30	3.80			
HAWAII	17	2226	2230	2228	N20	E25	4246	4	1	3	2228	2.30	2.60			
HAWAII	18	0126	0138	0132	N08	W54	4233	12	1	3	0132	1.80	3.30			
ATHENS	18	0725	0817		N30	E21	4246	52	1	2		2.70	3.20			
UCCLE	18	0853	0857	0854	N26	E22	4246	4	1	3	0854	3.20	3.80			
UCCLE	18	1007	1030	1013	S25	E60	4248	23	1+	3	1013	4.00	6.00			
UCCLE	18	1021	1106	1033	N07	W60	4233	45	1	3						
UCCLE	18	1114	1130	1116	N10	E40	4247	16	1	4	1116	3.20	4.00			
WENDEL	19	1320	1342		N18	E20	4247	22	1				4.00			
WENDEL	19	1347	1358		N30	E05	4246	11	1				3.00			
WENDEL	19	1352	1414 D		S15	E60	4255	22	2				9.00			
MITAKA	20	0314 E	0326 D		N25	W01	4246	14 D	1	1	0314	.89	.96	2.04	115	
MITAKA	20	0533 E	0548 D		N17	E09	4247	15 D	1	1	0533	.89	.93	1.72	85	
WENDEL	20	0845	0906 D		S07	E29	4256	21	1				4.00			
OTTAWA	20	1452	1507	1455	N14	W36	4242	15	1+	1	1455	1.86	2.36			
OTTAWA	20	1457	1520	1504	N27	W10	4246	23	1	1	1504	1.68	1.89			
USNRL	20	1742	1858	1746	S15	E75	4257	76	2	2	1746	1.47	7.10		68	
MITAKA	21	0406 E	0410 D		N17	W04	4247	4 D	1	1	0407	.89	.93	1.39	100	
MITAKA	21	0454	0517 D		N11	W44	4242	23 D	1	1	0505	5.52	7.50	2.03	96	
{SAC PEAK	21	1435 E	1531	1449 U	N15	W02	4247	56 D	1	3		3.30			18	
{OTTAWA	21	1436 E			N16	W09	4247		2	1	1502	7.31	7.66			Slow S-SWF
{USNRL	21	1437	1548	1507	N17	W09	4247	71	2	2	1507	5.86	6.18	1.00	100	
MITAKA	22	0409 E	0446	0409	N30	W29	4246	37 D	2+	1	0409	7.12	8.75	2.93	251	S-SWF
MITAKA	22	0536	0542 D		N27	W33	4246	6 D	1	1	0536	3.71	4.66	1.52	105	
MITAKA	22	0555	0602		N20	W17	4247	7	1	1	0559	1.84	1.99	1.69	96	
WENDEL	22	0822	0855		N19	W19	4247	33	1				4.00			
WENDEL	22	1314 E	1334 D	1317	N20	W22	4247	20 D	1+				5.00			
WENDEL	22	1329	1402		S13	E60	4263	33	1+				6.00			
WENDEL	22	1340	1430 D	1359	N12	E18	4254	50 D	2				9.00			
CLIMAX	22	1654	1700	1656	N21	W26	4247	6	1		1656	3.10				
MITAKA	22	2312 E	2338	2312	N28	W43	4246	26 D	1	3	2312	2.31	3.74	2.36	156	
MITAKA	22	2329 E	2337		S10	E48	4263	8 D	1	2	2332	7.57	11.58	2.22	96	
MITAKA	23	0044	0106	0048	N20	W27	4247	22	1	2	0046	3.71	4.20	2.51	134	
MITAKA	23	0330	0340 D	0332	S13	E09	4255	10 D	1	1	0330	1.84	1.95	2.93	118	
MITAKA	23	0403	0408 D		S10	E45	4263	5 D	1	1	0403	3.80	5.80	2.51	96	
{CAPRI S	23	0801 E	0842		N24	W51	4246	41 D	2	2	0808	4.50	8.10			
{WENDEL	23	0825	0904 D		N28	W52	4246	39 D	1				4.00			
WENDEL	23	0826	0845 D		N21	W32	4247	19 D	1				4.00			
{R O EDIN	23	1111 E	1125	1114	S13	E26	4257	14 D	1	2	1114	2.00	2.30	2.23		
{UCCLE	23	1112		1114	S15	E27	4257		1+	2	1114	4.40	5.20			
WENDEL	23	1302	1331 D		S15	E22	4257	29 D	1				4.00			
WENDEL	23	1319	1338 D		N16	W33	4247	19 D	1				4.00			
SAC PEAK	23	1515	1945	1550	S14	E46	4263	270	1	2		4.30			15	
HUANCAYO	23	1623	1640	1624	S09	E37	4263	17	1	1						

SOLAR FLARES

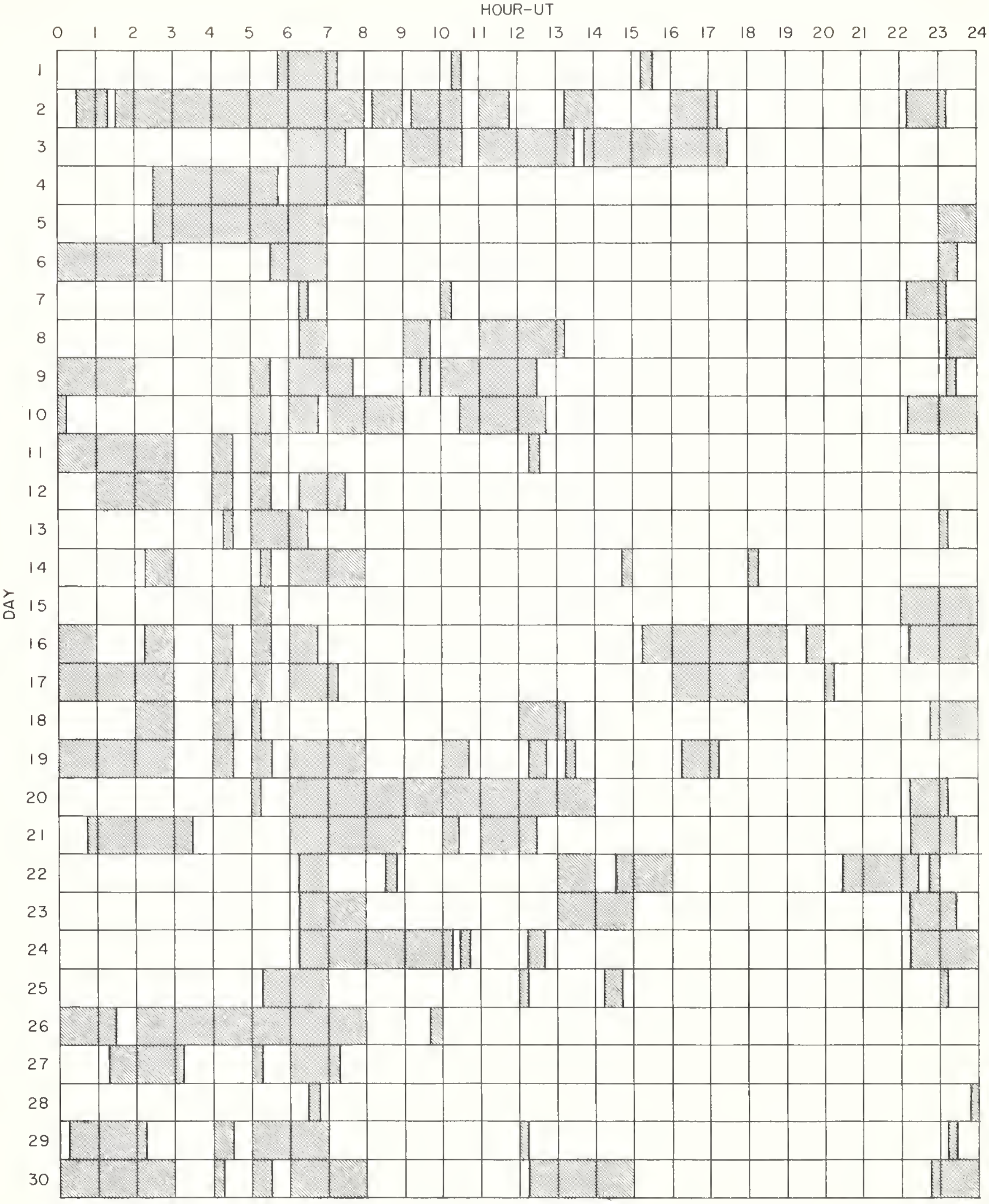
OBSERVATORY	DATE Nov. 1957	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
MITAKA	24	0159	0205 D		N20	W42	4247	6 D	1	2	0159	1.84	2.58	1.65	113	
MITAKA	24	0237 E	0240		N16	W40	4247	3 D	1&	2	0239	11.39	15.60		80	
MITAKA	24	0242 E	0249		S16	E56	4267	7 D	1	2	0245	4.70	10.00	1.75	87	
MITAKA	24	0457 E	0503		N19	W45	4247	6 D	1	1	0457	1.34	1.88	1.70	122	
MITAKA	24	0516	0531	0521	N20	W44	4247	15	1	1	0521	1.34	1.84	1.72	115	
WENDEL	24	0848	1140	0911	S15	E37	4263	172	3&				25.00			
WENDEL	24	0947 E	1109 D		S11	E46	4263	82 D	1&				7.00			
R O HERST	24	0954 E	1045	0954 E	S13	E35	4263	51 D	2	2	0954	7.40	9.80			
UCCLE	24	1006 E	1021	1007	S08	E48	4267	15 D	2	4	1007	5.60	7.80			
UCCLE	24	1006 E	1021	1008	S07	E46	4267	15 D	1&	4	1008	3.40	5.10			
UCCLE	24	1006 E	1021 D	1008	S10	E32	4263	15 D	1	2	1008	2.20	2.60			
UCCLE	24	1006 E	1038	1012	S17	E44	4267	32 D	1&	4	1012	3.60	4.90			
UCCLE	24	1006 E	1107	1006	S12	E40	4267	61 D	1&	4	1006	4.50	5.40			
UCCLE	24	1006 E	1138	1006	S16	E38	4263	92 D	2&	4	1006	7.30	9.10			
UCCLE	24	1038	1043	1039	N30	W50	4246	5	1&	3	1039	3.40	5.40			
UCCLE	24	1038 E	1051	1042	S12	E52	4267	13 D	1&	4	1042	3.40	5.20			
UCCLE	24	1054	1059	1056	S15	E29	4263	5	1	4	1056	2.20	2.40			
UCCLE	24	1059	1108	1103	S14	E29	4263	9	1	4	1103	2.20	2.50			
UCCLE	24	1102	1202 D	1109	S13	E35	4263	60 D	2	4	1109	6.80	8.20			
UCCLE	24	1103	1114	1104	S17	E12	4257	11	1&	4	1104	4.50	4.80			
UCCLE	24	1108	1136	1109	S14	E30	4263	28	1	4	1109	2.20	2.40			
UCCLE	24	1108	1201	1109	S12	E32	4263	53	2	4	1109	6.80	8.00			
UCCLE	24	1134	1147	1136	S14	E28	4263	13	1	4	1136	2.20				
UCCLE	24	1135	1138	1136	S16	E28	4263	3	1	4	1136	2.20				
UCCLE	24	1138	1143	1140	S28	E28	4264	5	1	4	1140	2.20	2.40			
UCCLE	24	1148	1202 D	1152	N20	W50	4247	14 D	1&	4	1152	4.00	6.00			
WENDEL	24	1151	1213 D		S20	W49	4259	22 D	1				3.00			
UCCLE	24	1200	1202 D	1201	S15	W12	4255	2 D	1	4	1201	2.20				
ZURICH	24	1252 E	1301		N24	W69	4246	9 D	1	2	1252		2.00			
ZURICH	24	1252 E	1325		N21	W50	4246	33 D	1	2	1255		3.00			
ZURICH	24	1303	1320		S13	E25	4263	17	1	2	1303		1.00			
ZURICH	24	1319	1327		S30	E50	4265	8	1	2	1319		3.00			
CLIMAX	24	1611	1622	1613	S15	E23	4263	11	1		1613	4.30				
HUANCAYO	24	1612	1621	1615	S12	E23	4263	9	1	1						
SAC PEAK	24	1612	1625	1615	S14	E23	4263	13	1	2		3.00			17	
CLIMAX	24	1909	2032	1927	S11	E15	4257	83	1		1927	2.70				
SAC PEAK	24	1930	2015 U	1932	S14	E06	4257	45	1&	2		5.60			18	
CLIMAX	24	1930	2032	1939	S12	E10	4257	62	2		1939	6.40				
MITAKA	25	0108 E	0116		N19	W56	4247	8 D	1&	2	0108	7.63	13.59	1.47	96	
MITAKA	25	0142 E	0146		N24	W79	4246	4 D	1	2	0142	.89	2.85	2.27		
MITAKA	25	0219	0236		N19	W57	4247	17	1	2	0226	1.84	3.28	1.65	96	
MITAKA	25	0226	0230		N24	W79	4246	4	1	2	0228	.89	2.85	1.41		
MITAKA	25	0301	0313		N23	W13	4254	12	1	1	0306	2.78	3.00	2.03	102	
MITAKA	25	0457 E	0509 D		N29	W71	4246	12 D	1&	1	0509	4.69	12.43	3.19		
ATHENS	25	0717	0743		N23	W55	4247	26	2&	4		5.30	9.70			
WENDEL	25	1021 E	1041 D		S12	W22	4255	20 D	1				3.00			
HUANCAYO	25	1550 E	1602	1551	S15	E00	4257	12 D	1	2						
HUANCAYO	25	1555 E	1631	1555	N16	W66	4247	36 D	1	2						
CLIMAX	25	1937	1959	1948	S32	E39	4265	22	1		1948	3.40				
HAWAII	25	1942	1954	1944	S38	E32	4265	12	1	1	1944	2.90	4.40			
SAC PEAK	25	1942	2010 U	1952	S32	E39	4267	28 D	1	2		3.30			17	
HUANCAYO	25	1943	2007	1944	S29	E39	4265	24	1	2						

SOLAR FLARES

OBSERVATORY	DATE Nov. 1957	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
WENDEL	26	0911	0926	0921	S33	E33	4265	15	1				3.00			Slow S-SWF
WENDEL	26	1030	1101		S16	W11	4257	31	1				4.00			
WENDEL	26	1130	1204		S15	E05	4263	34	1+				5.00			
CAPRI S	26	1132 E	1144 D		S16	E03	4263	12 D	1	3	1134	2.50	2.50			
WENDEL	26	1237	1255	1240	S18	E02	4263	18	1				4.00			
ZURICH	26	1347 E	1418		N23	W26	4254	31 D	1	2	1350		1.00			
OTTAWA	26	1447	1519		S14	W13	4257	32	1	2	1453	1.97	2.11			
HUANCAYO	26	1530 E	1540	1530	S14	E04	4263	10 D	1	2						
HUANCAYO	26	1530 E	1551	1530	S33	E29	4265	21 D	1	2						
OTTAWA	26	1702	1720		S18	W37	4255	18	1	2	1703	1.68	2.27			
HAWAII	26	2252	2302	2256	S17	W08	4257	10	1+	2	2256	4.70	5.00			
MITAKA	27	0435 E	0443 D		S17	W03	4263	8 D	1	1	0435	.89	.93	1.77	128	
USNRL	27	1249	1309	1250	S17	W29	4257	20	1	2	1250	2.26	2.72		95	
WENDEL	27	1258	1325 D		S13	W13	4263	27 D	1+				5.00			
USNRL	27	1259	1324	1307	S14	W15	4263	25	1	2	1307	.68	.72		142	
USNRL	27	1704	1721	1712	S15	W18	4263	17	1	2	1712	.68	.74		145	Slow S-SWF
CLIMAX	27	1902	1955	1925	S28	E09	4265	53	2		1925	5.40				
SAC PEAK	27	1902	1957	1910	S28	E09	4265	55	1	2		2.50			16	
CLIMAX	27	2006	2029	2014	S06	E71	4278	23	1		2014	2.40				
CLIMAX	27	2031	2051	2037	S13	W18	4263	20	1		2037	2.40				
HAWAII	27	2036	2054	2036	S11	W32	4257	18	1	2	2036	2.40	2.60			
MITAKA	27	2353 E	2404 D		S14	W12	4263	11 D	1+	2	2353	5.67	6.00	2.22	137	
HAWAII	28	0116	0126	0118	S15	E70	4288	10	1	2	0118	1.60	3.80			
MITAKA	28	0118 E	0126 D	0121	S06	E65	4278	8 D	1+	2	0118	3.80	9.50	1.87		
MITAKA	28	0510	0517	0511	S14	W22	4263	7	1	2	0512	1.84	2.02	1.87	134	
MITAKA	28	0536	0547		S17	E62	4272	11	1+	2	0539	2.78	6.95	2.20		
CAPRI S	28	1418 E	1445		S12	W27	4263	27 D	1	3	1428	2.00	2.30			Slow S-SWF
SAC PEAK	28	1440 E	1520 D	1440 E	S12	W27	4263	40 D	1	2		4.40			16	
HUANCAYO	28	2046 E	2053	2047	S21	E67	4272	7 D	1	2						
HUANCAYO	29	1544	1555	1544	S14	E50	4272	11	1	2						S-SWF
HUANCAYO	29	1636 E	1744	1636	S18	W03	4269	68 D	1+	2						
HUANCAYO	29	1716 E	1802	1722	S13	E45	4272	46 D	1	2						Slow S-SWF
UCCLE	30	0843 E	0846	0843	S19	W09	4269	3 D	1+	4	0843	4.50				
UCCLE	30	0843 E	0849	0843	S27	W25	4263	6 D	1	4	0843	3.20				
UCCLE	30	0843 E	0903	0843	S14	W50	4263	20 D	1	4	0843	2.20				
UCCLE	30	0843 E	0910	0850	N15	E05	4271	27 D	1+	4	0850	5.00				
UCCLE	30	0843 E	0913	0844	N05	E90	4287	30	1+	4	0844	3.40	6.00			
UCCLE	30	0843 E	0920	0903	S16	E48	4288	37 D	1	4	0903	2.20	3.30			
UCCLE	30	0902	0917	0910	S30	E88	4285	15	2	3	0910	6.80	12.00			
UCCLE	30	0944	0953 D	0949	S30	E88	4285	9 D	1+	3	0949	4.50	8.80			
UCCLE	30	1050	1207 D		N15	E04	4271	77 D	1+	4	1055	5.00				
UCCLE	30	1053	1107	1058	S13	W48	4263	14	1	4	1058	3.40	4.90			
UCCLE	30	1113	1132	1118	S20	E45	4288	19	2	4	1118	5.60	7.00			
UCCLE	30	1114	1147	1117	S23	W07	4269	33	1	4	1117	2.20				
UCCLE	30	1121	1207 D	1126	S18	W09	4269	46 D	1	4	1126	3.40				
UCCLE	30	1154	1207 D	1157	S20	W10	4269	13 D	1+	4	1157	4.50				
UCCLE	30	1157	1207 D	1203	S28	W25	4280	10 D	1	4	1203	3.40				
WENDEL	30	1258	1408	1312	S17	E45	4288	70	2				9.00			
HUANCAYO	30	1528 E	1620 D	1529	S03	E79	4286	52 D	1	2						
CLIMAX	30	1852	1923	1859	S06	E33	4276	31	1		1859	3.50				
SAC PEAK	30	1852	1930	1902	S06	E33	4276	38	1	2		2.10			16	
SAC PEAK	30	2112	2130	2117	S19	W14	4269	18	1	2		2.50			17	
CLIMAX	30	2227	2242	2231	S21	E20	4272	15	1		2231	2.70				

INTERVALS OF NO FLARE PATROL OBSERVATIONS

NOVEMBER 1957



Reporting Observatories

Anacapri S
Arcetri
Athens
Climax
Dunsink
Greenwich R. O., Herstmonceux
Hawaii
Huancayo
Mitaka
Nizamiah (Hyderabad)
Ottawa
Uccle
U.S. Naval Research Lab.
R. O. Edinburgh
Sacramento Peak
Zurich

SUBFLARES NOTED AS FOLLOWS, DATE - UNIVERSAL TIME - COORDINATES

OCTOBER 1957

ATHENS	01	0734		N13 W46
UCCLE	01	0846		S27 W40
UCCLE	01	0909		N24 W48
* CAPRI S	01	0938	E	N29 E17
UCCLE	01	1000	F	S24 E39
UCCLE	01	1008		S12 W01
UCCLE	01	1014		N23 W07
UCCLE	01	1018		S12 W01
UCCLE	01	1031		N16 W86
UCCLE	01	1046		N24 W49
UCCLE	01	1110		N23 W49
UCCLE	01	1126		N28 E20
UCCLE	01	1144		S27 W43
SAC PEAK	01	1420		N25 W55
R O HERST	01	1424	F	N23 W56
SAC PEAK	01	1520		N16 W41
SAC PEAK	01	1522		N18 W09
SAC PEAK	01	1557		N17 W10
SAC PEAK	01	1650		N17 W11
CLIMAX	01	1654	F	N18 W11
CLIMAX	01	1656		N22 W51
SAC PEAK	01	1705		S15 E61
CLIMAX	01	1708		N19 E64
SAC PEAK	01	1727		N30 E07
CLIMAX	01	1748		S30 E42
SAC PEAK	01	1750		S28 E42
HAWAII	01	1844		S42 W05
SAC PEAK	01	1950		S24 E36
* SAC PEAK	01	2127		S27 E33
* HAWAII	01	2128		S33 E28
SAC PEAK	01	2135		S32 E40
CLIMAX	01	2138	F	S28 E 2
SAC PEAK	01	2220		S24 E35
ONDREJOV	02	0700	E	N32 E58
* R O HERST	02	0850	E	N28 E04
ZURICH	02	0852	F	N17 W21
* UCCLE	02	1015		S26 E32
* WENDEL	02	1030	E	S28 E30
* WENDEL	02	1039	E	S24 E30
UCCLE	02	1052		N27 E02
WENDEL	02	1056	F	N27 E09
WENDEL	02	1106	F	N16 W18
USNRL	02	1254		N27 E02
USNRL	02	1256		N18 W22
* SAC PEAK	02	1435		S24 E25
SAC PEAK	02	1453		S26 W60
SAC PEAK	02	1520		N14 W90
SAC PEAK	02	1522		N26 W01
USNRL	02	1524		N28 W03
* SAC PEAK	02	1745		S37 E66
* SAC PEAK	02	1755		N27 W02
SAC PEAK	02	1757		S15 E43
* USNRL	02	1758		N28 W05
USNRL	02	1800		S15 E44
USNRL	02	1838		S22 E24
SAC PEAK	02	1840		S20 E15
SAC PEAK	02	2100		N27 W10
SAC PEAK	02	2107		N17 W04
SAC PEAK	02	2110		S22 E22
SAC PEAK	02	2152		S34 W47
SAC PEAK	02	2232		S16 E00
SAC PEAK	02	2205		N15 W76
ATHENS	03	0658		N22 W34
ATHENS	03	0658		N16 W35
ATHENS	03	0738		N18 W38
ATHENS	03	0739		S10 E27
* ATHENS	03	0739		S15 E37
ATHENS	03	0857		S16 E39
ONDREJOV	03	0931	E	S12 E33
OTTAWA	03	1232		S14 E35
OTTAWA	03	1301		S17 W10
MC MATH	03	1347	F	S27 W63
* SAC PEAK	03	1400		S26 E18
* OTTAWA	03	1402		S26 E19
SAC PEAK	03	1417		S14 E70
* SAC PEAK	03	1427		N30 W02
* OTTAWA	03	1429		N28 W03
* USNRL	03	1431		N30 W05
SAC PEAK	03	1522		S24 E13
* SAC PEAK	03	1532		S26 E17
* USNRL	03	1537		S27 E18
USNRL	03	1545		N15 W90
SAC PEAK	03	1645		S25 E14
USNRL	03	1645		S26 E13
CLIMAX	03	1647		S25 E12
SAC PEAK	03	1707		S19 E27
* USNRL	03	1725		N18 E20
USNRL	03	1728		S27 E15
* SAC PEAK	03	1730		N16 E19
CLIMAX	03	1828		S25 E12
SAC PEAK	03	1830	F	S24 E12
USNRL	03	1830		S25 E12
USNRL	03	1945		N27 W18
SAC PEAK	03	2022		S14 E25
SAC PEAK	03	2252		N29 W14
SAC PEAK	03	2257		S37 E51
ARCETRI	04	0846	E	S14 E13
ONDREJOV	04	1212		S15 W58
USNRL	04	1309		N29 W25
* USNRL	04	1337		S30 W88
USNRL	04	1341		N21 E52
* MC MATH	04	1344	F	S25 E05
* USNRL	04	1344		S27 E00
USNRL	04	1355		S42 E46
USNRL	04	1413		S27 E23
MC MATH	04	1426	E	S25 E05
USNRL	04	1437		S15 E22
* USNRL	04	1506		N18 E88
UCCLE	04	1535		S18 E16
USNRL	04	1627		N26 W28
* SAC PEAK	04	1645		N26 W27
* USNRL	04	1646		N26 W28
SAC PEAK	04	1650		S41 E44
SAC PEAK	04	1730	E	S41 E44
SAC PEAK	04	1802		N17 E89
SAC PEAK	04	1917		S42 E45
SAC PEAK	04	2012		S10 E21
* WENDEL	05	0805	F	S26 E02
WENDEL	05	0828	E	S18 E07
* UCCLE	05	0843		S17 E10
UCCLE	05	0856		S15 E05
WENDEL	05	0921	F	N17 E64
* WENDEL	05	1135	E	N26 W33
WENDEL	05	1213	F	S42 E33
* WENDEL	05	1240	E	S26 W01
* OTTAWA	05	1244	E	S27 W06
OTTAWA	05	1250	F	S39 E34
OTTAWA	05	1537		N25 W40
OTTAWA	05	1603		S18 E42
CLIMAX	05	1603		S24 E42
CLIMAX	05	1740		N13 W70
* HAWAII	05	1800	F	S16 E01
HAWAII	05	2100		S23 W19
HAWAII	05	2336		S20 W06
HAWAII	06	0048		S23 W25
* ATHENS	06	0750	F	N41 E01
ATHENS	06	0844	F	S26 W24
UCCLE	06	1018		S25 W27
UCCLE	06	1056		S25 W28
UCCLE	06	1059		S27 W21
CAPRI S	06	1214	F	N19 E67
HUANCAYO	06	1631	F	S13 E30
* HAWAII	06	2038		S19 W31
SAC PEAK	06	2225		N15 E12
UCCLE	07	1151		N39 W60
USNRL	07	1247		N14 E05
WENDEL	07	1249	F	N13 E05
WENDEL	07	1315	F	N41 W55
* WENDEL	07	1339	F	N07 E77
* SAC PEAK	07	1420		N15 E04
* SAC PEAK	07	1450		N09 E75
* WENDEL	07	1450	F	N07 E76
SAC PEAK	07	1650		N20 W04
SAC PEAK	07	1915		N25 W73
SAC PEAK	07	2030	E	N15 E01
SAC PEAK	07	2112		S38 W07
HAWAII	07	2118		S29 W09
* SAC PEAK	07	2140		S13 W70
CLIMAX	07	2337		N25 W69
ATHENS	08	0700		N34 W69
* ATHENS	08	0721		N40 W24
* ATHENS	08	0728		S38 W07
* ATHENS	08	0728		S39 W00
* WENDEL	08	0728	F	S37 W08
* WENDEL	08	0907	F	N20 W12
WENDEL	08	1035	E	N17 E35
WENDEL	08	1037	F	S27 W50
WENDEL	08	1049	F	N19 W09
UCCLE	08	1156		N19 W17
SAC PEAK	08	1432		N20 W16
SAC PEAK	08	1600		S18 E90
* SAC PEAK	08	1617		N07 E60
* CLIMAX	08	1620		N06 E63
* R O EDIN	08	1622	E	N08 E59
SAC PEAK	08	1640		S42 W08
* SAC PEAK	08	1642		N20 W18
SAC PEAK	08	1650		S17 W35
* SAC PEAK	08	1710		N19 W16
* CLIMAX	08	1712		N19 W17
* HUANCAYO	08	1712	E	N17 W15
HUANCAYO	08	1826	E	N35 W67
SAC PEAK	08	2205		N20 E27
SAC PEAK	08	2220	E	S18 E90
SAC PEAK	08	2240		N17 E21
HAWAII	08	2300		S25 E90
ATHENS	09	0728		N12 W19
* ATHENS	09	0741		N17 W26
* CAPRI S	09	0746	E	N17 W24
* WENDEL	09	0940	E	N17 W19
WENDEL	09	1021	E	N21 E38
ONDREJOV	09	1052	E	N38 W41
* WENDEL	09	1138	E	N17 W20
USNRL	09	1223		N26 E36
* USNRL	09	1313		N27 E37
USNRL	09	1353		N14 W22
USNRL	09	1401		S40 W20
SAC PEAK	09	1405	E	S42 W20
SAC PEAK	09	1405	E	N24 E36
USNRL	09	1405		N23 E90
SAC PEAK	09	1410		N22 E90
USNRL	09	1423		N25 E35
USNRL	09	1511		N14 W23
WENDEL	09	1511	E	N17 W21
USNRL	09	1631		N14 W22
USNRL	09	1645		N23 E90
USNRL	09	1817		N26 E31
HAWAII	09	1818		S22 E35
SAC PEAK	09	1821	E	N25 E34
USNRL	09	1823		N14 W26
* HAWAII	09	1842		S25 E75
USNRL	09	1845		N12 W28
* USNRL	09	1959		S17 E75
* HUANCAYO	09	2007	E	N13 W28
SAC PEAK	09	2131		S18 E90
HAWAII	09	2206		N08 E80
CAPRI S	10	0736	E	S18 E63
ATHENS	10	0804	E	S24 W80
USNRL	10	1224		S16 W25
USNRL	10	1239		N14 W39
WENDEL	10	1302	E	S11 W27
USNRL	10	1336		N18 E06
USNRL	10	1542		N24 E19
CLIMAX	10	1630		N24 E33
USNRL	10	1659	E	S26 E90
USNRL	10	1659	E	N42 W51
USNRL	10	1741		N23 E19
USNRL	10	1748		N28 E20
USNRL	10	1938		S15 W29
CLIMAX	10	2027	E	S16 W54
SAC PEAK	10	2040		S15 W65
CLIMAX	10	2049	E	N44 W50
SAC PEAK	10	2102		S17 E58
SAC PEAK	10	2105		N46 W58
CAPRI S	11	0708	E	S20 E53
ARCETRI	11	0840	E	S18 E50
WENDEL	11	1036	E	N18 E43
USNRL	11	1202		S29 W90
USNRL	11	1304		S26 E70
USNRL	11	1434		S15 W36
USNRL	11	1444		S18 E50
SAC PEAK	11	1505		S12 E32
SAC PEAK	11	1627		S22 W90
* SAC PEAK	11	1630		S16 E52
USNRL	11	1632	E	S23 W90
USNRL	11	1842		N13 W55
USNRL	11	1900		N09 E63
CLIMAX	11	1921		N09 E64
UCCLE	12	0950		N11 E57
WENDEL	12	1156	E	N14 W61
OTTAWA	12	1158	E	N13 W61
USNRL	12	1222		N07 E44
OTTAWA	12	1223		N08 E44
OTTAWA	12	1226		N13 W61
WENDEL	12	1227	E	N05 E43
* USNRL	12	1254		S15 W69
OTTAWA	12	1352		N11 W63
* OTTAWA	12	1353		S24 E67
USNRL	12	1515		N24 E31
OTTAWA	12	1517	E	N26 E30
OTTAWA	12	1530		S17 E58
USNRL	12	1531		S19 E58
USNRL	12	1555		S17 E40
ATHENS	13	0713		S25 E52
CAPRI S	13	0714	E	S22 E50
ATHENS	13	0728		N12 W55
ATHENS	13	0732	F	S26 E57
ATHENS	13	0808		N06 E35
WENDEL	13	0902	E	N11 E41
UCCLE	13	0930		N26 W17
UCCLE	13	1047		N05 E32
WENDEL	13	1109	E	S24 E51
* WENDEL	13	1132	E	S14 E25
* USNRL	13	1318		S23 E54
* OTTAWA	13	1322		S22 E53
* CAPRI S	13	1322		S23 E55
USNRL	13	1359		S32 E58
MC MATH	13	1400	E	S18 E23
USNRL	13	1433		S23 E54
SAC PEAK	13	1435	E	S22 E41
* CLIMAX	13	1455	E	N26 E48
* CAPRI S	13	1532		S23 E55
SAC PEAK	13	1611	E	S27 E53
SAC PEAK	13	1716		S27 E53
SAC PEAK	13	1947	E	S27 E51
SAC PEAK	13	2055	E	N28 E54
SAC PEAK	13	2115	E	S18 E21
SAC PEAK	13	2235	E	N26 E46
UCCLE	14	0851		S25 E38
UCCLE	14	1009		N24 W42
UCCLE	14	1025		S27 E47
WENDEL	14	1028	E	S25 E48
UCCLE	14	1104		S16 E05
WENDEL	14	1111	E	S15 E05
UCCLE	14	1116	E	N24 E08
UCCLE	14	1140	E	S26 E46
UCCLE	14	1145	E	S30 E44
* UCCLE	14	1155	E	S28 E39
* WENDEL	14	1155	E	S27 E42
WENDEL	14	1240	E	S27 E42
USNRL	14	1241		S28 E42
CAPRI S	14	1255	E	N40 W90
USNRL	14	1309		S23 E32
USNRL	14	1316		S23 E47
* USNRL	14	1319		N40 W90
USNRL	14	1323		N12 W79
WENDEL	14	1340	E	S26 E38
WENDEL	14	1421	E	S22 E36
WENDEL	14	1431	E	S15 E04
* MC MATH	14	1452	E	S18 E08
* SAC PEAK	14	1452	E	S20 E10
* USNRL	14	1453		S20 E12

SUBFLARES NOTED AS FOLLOWS, DATE - UNIVERSAL TIME - COORDINATES

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WENDEL	14	1521 E	S19 E13
* SAC PEAK	14	1527	S26 E36
* SAC PEAK	14	1532	S19 E10
* USNRL	14	1534	S20 E12
USNRL	14	1534	S27 E35
USNRL	14	1624	S15 E07
USNRL	14	1747	S29 E48
* SAC PEAK	14	1847	N20 E14
USNRL	14	1919	S27 W30
MITAKA	15	0327	S24 E24
* CAPRI S	15	0757 E	S21 E32
WENOEL	15	1138 E	N23 E05
OTTAWA	15	1214	N12 E41
WENOEL	15	1215 E	N10 E43
WENOEL	15	1227 E	N24 E06
WENOEL	15	1303 E	S23 E41
* USNRL	15	1335 E	S21 E31
* CAPRI S	15	1337 E	N12 E15
WENDEL	15	1350 E	N10 E42
OTTAWA	15	1350	N11 E40
USNRL	15	1351	N10 E41
OTTAWA	15	1452	S21 E35
USNRL	15	1537	S20 E30
USNRL	15	1618	S22 E22
HUANCAYO	15	1629 E	S24 E27
USNRL	15	1711	N23 E08
USNRL	15	1927	N10 W21
USNRL	15	1957	S26 E26
NIZAMIAH	16	0326	S26 E22
* CAPRI S	16	0654 E	S24 E18
ARCETRI	16	0805 E	S22 E17
* R O EOIN	16	1146 E	S14 W20
* CAPRI S	16	1148 E	S16 W19
USNRL	16	1324	S15 W23
CAPRI S	16	1338 E	S16 W19
USNRL	16	1347	S23 E08
SAC PEAK	16	1450	S26 E11
USNRL	16	1451	S26 E11
ATHENS	16	1453 E	S25 E11
SAC PEAK	16	1512	S15 W24
USNRL	16	1515	S14 W22
SAC PEAK	16	1552	S23 E06
USNRL	16	1633	S14 W22
SAC PEAK	16	1635 E	S14 W25
SAC PEAK	16	1745 E	S15 W25
USNRL	16	1827 E	S23 E18
NIZAMIAH	17	0427	S27 E09
* SAC PEAK	17	1402 E	S26 E06
SAC PEAK	17	1737 E	S23 W02
SAC PEAK	17	1815	S26 E06
SAC PEAK	17	1902 E	N24 W55
HUANCAYO	17	2202 E	S25 E07
UCCLE	18	1126	S25 W15
ONOREJOV	19	0703 E	N22 W68
* CAPRI S	19	0825 E	S24 W16
CAPRI S	19	0856 E	N25 W75
ONOREJOV	19	0957	S24 W26
* ONOREJOV	19	1019 E	S24 W26
ONOREJOV	19	1137	S25 W30
USNRL	19	1210	S25 W30
USNRL	19	1218	N21 W77
USNRL	19	1222	S18 W64
USNRL	19	1244	S26 W19
CAPRI S	19	1319	N08 W90
MC MATH	19	1324 E	N20 W90
USNRL	19	1350 E	S20 W19
USNRL	19	1418 E	N21 W77
USNRL	19	1525	N12 W81
UCCLE	20	0849	S20 W31
UCCLE	20	1023	N13 E83
UCCLE	20	1025	N32 W60
UCCLE	20	1036	N16 E26
UCCLE	20	1041	N25 E63
UCCLE	20	1045	N23 E45
UCCLE	20	1114	N22 E49
UCCLE	20	1122	S25 E26
UCCLE	20	1143	S28 W34
UCCLE	20	1158	S25 W34
USNRL	20	1227 E	S29 W33
USNRL	20	1433	S21 W51
USNRL	20	1433	S25 W40
USNRL	20	1502 E	S28 W33
USNRL	20	1521	S26 W41
USNRL	21	1523	N20 W80
USNRL	21	1535	N27 W48
CLIMAX	21	1536	N28 W50
* CLIMAX	21	1608	S13 E80
USNRL	21	1732	S35 W41
USNRL	21	1745	N24 W52
USNRL	21	1814	N22 E58
SAC PEAK	21	1820 E	S34 W45
USNRL	21	1820	S22 W45
CLIMAX	21	1826	S22 W44
USNRL	21	1830	N27 W49
USNRL	21	1926	N24 W49
USNRL	21	1926	N21 E57
USNRL	21	1926	N15 W87
MITAKA	22	0135	N27 W53
ATHENS	22	0725 E	S22 W51
ATHENS	22	0902	N23 W04
UCCLE	22	0905	N14 E54
R O EOIN	22	0958	N15 E00
ARCETRI	22	1013 E	N14 W01
* USNRL	22	1511	N16 W05
* SAC PEAK	22	1528 E	N16 W05
USNRL	22	1657	N37 W65
USNRL	22	1701	S20 W58
SAC PEAK	22	1702	S25 E45
SAC PEAK	22	1702 E	S21 W60
USNRL	22	1703	S23 E43
USNRL	22	1715	N27 W10
USNRL	22	1817	S23 E43
CAPRI S	23	0815 E	N22 E37
ONOREJOV	23	1002	N06 W62
CAPRI S	23	1020 E	S23 E37
* CAPRI S	23	1313 E	N19 W75
USNRL	23	1320	N17 E21
* SAC PEAK	23	1410	S29 W79
USNRL	23	1424	N14 E17
SAC PEAK	23	1425	N14 E16
USNRL	23	1522	N15 E33
* SAC PEAK	23	1532	N14 E15
CLIMAX	23	1659	N21 E27
* SAC PEAK	23	1700	N22 E36
* USNRL	23	1701	N22 E35
* SAC PEAK	23	1707	S24 W90
SAC PEAK	23	1742	N19 E05
* SAC PEAK	23	1757	N29 W80
* USNRL	23	1800	N28 W79
USNRL	23	1841	N10 E65
SAC PEAK	23	1842	N15 E19
USNRL	23	1842	N13 E13
SAC PEAK	23	1847	S23 W13
SAC PEAK	23	2132	N32 E90
SAC PEAK	23	2150	S30 W90
SAC PEAK	23	2220	N13 E29
UCCLE	24	1324	S26 E22
UCCLE	24	1324	S24 E18
* CAPRI S	24	1332 E	N16 W29
ZURICH	24	1336 E	S23 E17
* SAC PEAK	24	1532	N12 E15
SAC PEAK	24	2052 U	N13 E12
* CAPRI S	25	0948 E	N26 W45
ZURICH	25	1105	S12 E24
ZURICH	25	1123	N23 W22
ZURICH	25	1343 E	S26 E09
* CAPRI S	25	1501	N15 W00
* MC MATH	25	1615 E	N20 E03
USNRL	25	1647	S23 E05
SAC PEAK	25	1755	S10 E88
USNRL	25	1756	S19 E90
SAC PEAK	25	1820	N13 E01
USNRL	25	1821	N14 E02
USNRL	25	1937 E	S27 E05
USNRL	25	2013	N15 E00
SAC PEAK	25	2055	N23 E61
UCCLE	26	1102 E	N14 W59
UCCLE	26	1102 E	S24 W16
UCCLE	26	1103	S12 E18
UCCLE	26	1108 E	S30 W05
UCCLE	26	1109	N24 E54
UCCLE	26	1146	N24 E55
UCCLE	26	1150	N11 W11
UCCLE	26	1153	S11 E14
* USNRL	26	1240 E	N13 W24
OTTAWA	26	1327	S18 E69
SAC PEAK	26	1402 E	S24 W18
* SAC PEAK	26	1405	S26 E75
* SAC PEAK	26	1407	N24 E50
* OTTAWA	26	1409 E	N27 E48
SAC PEAK	26	1420	N24 E50
USNRL	26	1420	N26 E51
SAC PEAK	26	1505	S24 E17
* SAC PEAK	26	1510	S29 E80
CLIMAX	26	1512	S23 W19
* USNRL	26	1519	S28 E75
CLIMAX	26	1609	N21 E13
CLIMAX	26	1613	N25 E52
SAC PEAK	26	1622 E	N21 E13
* CLIMAX	26	1634	S21 E74
* SAC PEAK	26	1635	S22 E75
CLIMAX	26	1718	N12 W16
SAC PEAK	26	1720	N13 W16
SAC PEAK	26	1730	N12 W16
SAC PEAK	26	1825	S23 E68
CLIMAX	26	1842	N15 W26
SAC PEAK	26	1842	N14 W20
SAC PEAK	26	1955 E	N13 W16
SAC PEAK	26	2007	N17 W65
CLIMAX	26	2009	N14 W46
* SAC PEAK	26	2055	N14 W17
SAC PEAK	26	2117	S26 E17
CLIMAX	26	2118 E	S25 E73
CAPRI S	27	0815 E	N14 W24
CAPRI S	27	0915 E	N14 W24
CAPRI S	27	1000 E	S26 W23
USNRL	27	1209	N13 W36
* USNRL	27	1318	S23 E60
USNRL	27	1333	N13 W20
USNRL	27	1341	N14 W73
USNRL	27	1343	N28 E53
USNRL	27	1347	N21 W03
USNRL	27	1353	N21 W00
USNRL	27	1436	N15 W77
* USNRL	27	1453 E	N12 W29
USNRL	27	1517 E	N27 E56
USNRL	27	1520	S16 E57
CLIMAX	27	1534 E	S17 E56
USNRL	27	1552	S09 W04
CLIMAX	27	1622	S25 E56
SAC PEAK	27	2105	S24 W35
SAC PEAK	27	2152	N22 W06
SAC PEAK	27	2152	S10 W05
* CAPRI S	28	1143	S20 W37
USNRL	28	1224 E	S23 W36
USNRL	28	1240	N13 W90
USNRL	28	1248	N22 W15
USNRL	28	1254	S22 W37
USNRL	28	1256	N21 W15
OTTAWA	28	1320	N22 W07
ZURICH	28	1347 E	N22 W04
* USNRL	28	1350	S16 E11
SAC PEAK	28	1507	S22 W37
USNRL	28	1545	S23 W36
USNRL	28	1612	N10 W45
SAC PEAK	28	1625	N12 W45
SAC PEAK	28	1642	S22 W38
USNRL	28	1656	N22 W15
USNRL	28	1658	N12 W45
SAC PEAK	28	1705	N12 W45
SAC PEAK	28	1707	S21 W38
* SAC PEAK	28	1722	S25 E48
* USNRL	28	1724	S24 E49
USNRL	28	1820	N21 W19
USNRL	28	1904	N25 E21
SAC PEAK	28	1910	S16 E07
USNRL	28	1912 E	S16 E08
SAC PEAK	28	1937	S29 E45
USNRL	28	1948	N20 W20
* USNRL	28	2058	N21 W11
* SAC PEAK	28	2100 U	N21 W10
SAC PEAK	28	2147 E	S22 W04
ONOREJOV	29	0819	S20 E35
CAPRI S	29	0819	S18 E31
USNRL	29	1229 E	N18 W55
USNRL	29	1307	N18 E69
USNRL	29	1335	N28 E32
USNRL	29	1355	S22 W50
ZURICH	29	1448 E	S24 E33
USNRL	29	1511	N20 W30
* USNRL	29	1535 E	S19 E29
* USNRL	29	1535 E	N21 W30
USNRL	29	1649 E	N12 W12
CLIMAX	29	1729	N22 W31
USNRL	29	1731	N20 W32
USNRL	29	1820 E	S10 W29
CLIMAX	29	1847	N27 E31
CLIMAX	29	1848	N21 W24
USNRL	29	1853	N20 W25
* USNRL	29	1919	S23 W04
HAWAII	29	1922	S13 W07
* USNRL	29	2005	N22 W31
CLIMAX	29	2007	S21 E24
USNRL	29	2007	S21 E22
USNRL	29	2015	S18 E28
USNRL	29	2039	S13 W06
CLIMAX	29	2138	N15 W70
CLIMAX	29	2152	N11 W76
* CAPRI S	30	0815 E	S12 W40
ONOREJOV	30	0855 E	N16 E59
* CAPRI S	30	0856 E	S12 W40
* CAPRI S	30	0956 E	S12 W40
UCCLE	30	1032 E	S09 W44
UCCLE	30	1032 E	N24 E12
UCCLE	30	1033	N15 W87
UCCLE	30	1035	S20 E19
UCCLE	30	1036 E	N25 E21
* ONDREJOV	30	1039 E	N21 W35
UCCLE	30	1119 E	N17 W86
CAPRI S	30	1310 E	N33 E50
USNRL	30	1327 E	S22 E20
* SAC PEAK	30	1420	S20 E13
* SAC PEAK	30	1450	S11 W41
SAC PEAK	30	1457	S20 E12
SAC PEAK	30	1532	S10 W42
SAC PEAK	30	1802	S10 W43
SAC PEAK	30	1850	N39 E54
SAC PEAK	30	1915	S11 W44
* SAC PEAK	30	2100	N07 E30
CLIMAX	30	2212	N39 E54
SAC PEAK	30	2215	N38 E51
ZURICH	31	1437	N26 W23
ZURICH	31	1517	N24 E01

* Rated as flare of importance ≥1 by other observatories (See CRPL-F 159 Part B).

(SHORT-WAVE RADIO FADEOUTS)
OCTOBER 1957

Oct. 1957	Start UT	End UT	Type	Wide Spread Index	Impor-tance	Observation Stations	Known Flare, UT CRPL-F 159B
02	0235	0310	G-SWF	3	1	CA, TO	
02	1528	1556	Slow S-SWF	5	1	BE, HU, MC, PR, WS	1520E
02	2317	2340	Slow S-SWF	4	1-	AD, AN	
03	0040	0140	Slow S-SWF	5	1+	AD, CA, TO	0040E
03	0625	0715	G-SWF	1	2	NE	0625E
03	0727	0747	S-SWF	1	2	NE	0739E
03	1536	1604	Slow S-SWF	3	1	HU, MC, PR	1536E
04	1505	1610	G-SWF	3	1	CO, HU, PR	1508
05	0900	0909	S-SWF	1	1	NE	0901
05	2210	2254	Slow S-SWF	1	2	AD	2209
06	1232	1320	G-SWF	4	2	PR, PU	1228
06	1645	1707	G-SWF	4	1	HU, MC, PR	1625
08	0230	0254	Slow S-SWF	5	2-	AD, CA, OK	0240E
08	1056	1126	S-SWF	1	3	HH	1049
09	1905	1925	Slow S-SWF	4	1	HU, MC, PR, WS	1902
09	0340	0424	Slow S-SWF	5	1+	AN, CA, OK, TO	0340
10	0902	0914	S-SWF	1	3?	HH	0855
10	1607	1810	Slow S-SWF	5	3	AN, BE, CR, HU, MC, PR, WS, CW*	1659E
10	1810	1930	S-SWF	3	2	BE, MC, PR, WS	
11	1430	1502	G-SWF	3	1	HU, MC, PR	1420
11	1512	1527	S-SWF	2	1-	HU, MC	1515E
11	1632	1712	Slow S-SWF	5	1	AN, BE, CR, HU, MC, PR, WS	
12	0900	0916	S-SWF	1	3	HH	0859E
12	1013	1022	S-SWF	1	1	PU	1013
12	1358	1408	S-SWF	2	1-	HU, MC	1353
13	0541	0606	S-SWF	1	1	NE	0534E
13	1530	1615	S-SWF	5	2	BE, CR, HU, MC, NE, PR, WS	1523
13	1745	1820	Slow S-SWF	5	1	BE, CR, HU, MC, PR, WS	
14	0144	0223	S-SWF	4	2	AN, TO	
14	0412	0504	S-SWF	4	2	AN, TO	
14	1135	1200	Slow S-SWF	1	2.	NE	1158E
14	1324	1415	Slow S-SWF	5	1+	BE, CR, HU, MC, NE, PR, WS	1319
14	1712	1800	S-SWF	5	2+	AN, BE, CR, DA, HU, MC, PR, WS, RCA*	
15	0242	0317	S-SWF	5	2	AD, CA, OK, TO, CW+	0241E
15	2013	2030	Slow S-SWF	3	1	AN, HU, MC	
15	2150	2202	S-SWF	5	1+	AD, AN, BE, HU, MC, PR, TO, WS	
16	0050	0115	Slow S-SWF	1	2	CA	0045
16	0150	0210	S-SWF	5	2+	AD, AN, CA, OK, TO, CW+, RCA+	0152
16	0417	0447	Slow S-SWF	5	2	CA, NE, OK, TO, CW+	0415E
16	0534	0624	S-SWF	1	2	NE	0529E
17	1420	1510	Slow S-SWF	5	2	BE, CR, HH, HU, MC, NE, PR, WS, CW* ** ***	1415
17	1732	1753	Slow S-SWF	5	1	AN, BE, HU, MC, PR	
17	1830	1910	G-SWF	2	1	MC, PR	
18	0005	0135	S-SWF	3	2	AD, CA	
18	0247	0317	S-SWF	1	2	TO	
18	0820	0840	S-SWF	1	3?	HH	0816
18	2200	2235	S-SWF	5	2+	AD, AN, BE, HU, MC, TO, WS, RCA+	
19	0126	0146	Slow S-SWF	5	1+	AD, CA, OK, TO	0118
19	0406	0430	S-SWF	3	1	OK, CW+	0406E
19	0620	0715	Slow S-SWF	5	1+	OK, PU, CW+, CW**	0613E

(SHORT-WAVE RADIO FADEOUTS)

OCTOBER 1957

Oct. 1957	Start UT	End UT	Type	Wide Spread Index	Impor-tance	Observation Stations	Known Flare, UT CRPL-F 159B
19	0807	0851	S-SWF	1	2	PU	0757
19	1031	1138	Slow S-SWF	1	2	PU	1035E
19	1700	1840	G-SWF	3	1+	MC, PR	
19	1918	1955	S-SWF	5	2	AN, BE, CR, HU, MC, PR, TO, WS	1916
20	0149	0350	G-SWF	1	3	OK	
20	0242	0320	S-SWF	5	2+	AD, AN, TO, CW+++	
20	0945	1000	S-SWF	4	3	HH, NE, PU	0939
20	1639	1915	S-SWF	5	3+	BE, CR, DA, HU, MC, NE, PR, TO, WA, WS, CW***, RCA*+	1637
21	1215	1250	S-SWF	5	2	DA, HU, NE, PU	1212
21	1610	1635	Slow S-SWF	5	1	BE, MC, PR, WS	1610
21	1813	1852	G-SWF	3	1	MC, PR	
22	0400	0417	Slow S-SWF	1	1	OK	0406E
22	0500	0520	Slow S-SWF	1	1	OK	0503E
23	0227	0255	S-SWF	4	1+	OK, TO	0240E
23	0428	0447	S-SWF	1	1+	OK	
23	0620	0652	S-SWF	5	2	OK, CW+, CW**	0623E
23	2347	0007	S-SWF	5	1	AD, OK, TO	
24	0020	0033	S-SWF	4	1	AD, TO	
24	0705	0732	S-SWF	1	-	CW+	0703E
24	1420	1500	Slow S-SWF	5	1	BE, CR, HU, MC, PR	
24	1520	1700	Slow S-SWF	3	1	BE, MC, PR	1553E
24	2259	2308	S-SWF	5	1	AD, AN, TO	
25	0855	0910	S-SWF	1	3?	HH	0836
25	0948	1018	S-SWF	1	3?	HH	0943
25	1044	1104	S-SWF	3	2	HH, NE	1043
25	1502	1528	Slow S-SWF	5	2-	BE, HH, HU, MC, PR, WS	1500
25	1658	1715	Slow S-SWF	5	1	BE, HU, MC, PR	1649
25	1833	1940	Slow S-SWF	5	3-	BE, CR, HU, MC, PR, WS	1855E
25	2325	2345	Slow S-SWF	1	2	CA	
26	0135	0155	S-SWF	5	2	AN, CA, OK	
26	0758	0823	S-SWF	1	3?	HH	0755E
27	0037	0101	S-SWF	5	2-	AD, CA, OK, TO	
27	0130	0152	S-SWF	5	2	AD, CA, OK, TO, CW+	
27	1207	1222	S-SWF	3	2-	PR, PU	1207E
27	1228	1309	S-SWF	3	2-	PR, PU	1227
27	1933	1942	Slow S-SWF	3	1	MC, PR	
29	0420	0454	Slow S-SWF	4	1+	AN, OK	
29	0828	0843	S-SWF	1	2	PU	0819E
29	1047	1117	S-SWF	5	2	DA, HU, PU	1050E
29	1514	1525	Slow S-SWF	5	2	HH, HU, MC, PR	1515
29	1533	1555	Slow S-SWF	5	1+	BE, CR, HU, MC, PR, WS	1531
29	1730	1755	Slow S-SWF	3	1	MC, PR	
30	1427	1448	Slow S-SWF	4	1	HU, MC, PR	1427E
31	1720	1745	Slow S-SWF	5	2	BE, CR, HU, MC, PR, WS	1735E

CA = Canberra, Australia.
CR = Cornell University, N.Y.
DA = Darmstadt, G.F.R.
HH = Heinrich Hertz Institute, Berlin.
NE = Nederhorst den Berg, Netherlands.
PU = Prague, Czech.
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, Accra.
RCA+ = RCA Communications, Inc., Pt. Reyes, Calif.
RCA* = RCA Communications, Inc., Riverhead, N.Y.
WA = Watheroo.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

NOVEMBER 1957

OTTAWA

2800 MC

Nov. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
1	2 Simple 2	16 57.9	1.5	16 58.1	9	
2	3 Simple 3	14 01.5	12	14 06	13	
2	3 Simple 3	16 23	11	16 25	9	
2	1 Simple 1	17 54	4	17 55.5	7	
5	2 Simple 2 f	12 05	8	12 07.3	550	
	4 Post Increase		4 30		16	
7	2 Simple 2	17 18.7	1	17 19	11	
7	6 Complex f	19 41.3	12	19 46	163	
8	2 Simple 2	16 13.5	1.5	16 14	13	
8	8 Group (2)	20 01.2	5.7			
	2 Simple 2 f	20 01.2	3.5	20 02.6	14	
	2 Simple 2 f	20 05	1.9	20 05.8	31	
9	1 Simple 1	15 09	5	15 11.5	5	
10	7 Fluctuations	14 46	12	14 47.2	10	
10	6 Complex	16 10	3	16 10.8	9	
10	8 Group (4)	18 04.7	14.3			
	2 Simple 2	18 04.7	0.5	18 04.9	15	
	1 Simple 1	18 10	2	18 10.8	5	
	1 Simple 1	18 14.2	1	18 14.5	4	
	2 Simple 2	18 17	2	18 17.3	10	
10	1 Simple 1	19 36	4	19 37.5	6	
11	6 Complex f	14 12.2	17	14 18.8	167	
12	2 Simple 2	12 48	4	12 49.2	10	
12	8 Group (2)	13 53	5.5			
	1 Simple 1	13 53	2	13 54	6	
	1 Simple 1	13 57.5	1	13 57.8	5	
13	3 Simple 3 A f	19 32.5	>1 50	20 04.5	18	
	2 Simple 2	19 32.5	3	19 33.7	18	
14	1 Simple 1	19 07	2	19 08	7	
14	1 Simple 1	19 46.3	1.5	19 46.8	5	
15	6 Complex f	15 30.5	9	15 36.3	21	
15	1 Simple 1	16 29.8	1.5	19 30.5	5	
16	3 Simple 3	18 08	12	18 14	4	
17	1 Simple 1	13 59.5	1	14 00	4	
17	3 Simple 3 A	14 20	7.5	14 22	5	
	2 Simple 2	14 23.5	1.5	14 23.9	20	
17	2 Simple 2	14 40	6	14 42	10	
17	1 Simple 1	16 29.4	2	16 29.8	3	
20	8 Group (2)	14 38.4	1.8			
	1 Simple 1	14 38.4	0.5	14 38.6	6	
	1 Simple 1	14 39.7	0.5	14 40	4	
20	2 Simple 2	14 52	3.5	14 53	8	
20	3 Simple 3 A	17 15	4	19 05	22	
	1 Simple 1	17 30	1.5	17 30.5	7	
	2 Simple 2	18 19.8	2	18 20.4	10	
	2 Simple 2	18 58.8	2	18 59.3	17	

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

NOVEMBER 1957

OTTAWA 2800 MC

Nov. 1957	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
21	3 Simple 3 A	14 36	>6 30	15 12.5	22	
	1 Simple 1	14 59	2.5	15 00	6	
	1 Simple 1	16 32	6	16 35	7	
	3 Simple 3	16 48	20	16 56	7	
	2 Simple 2	18 33	6	18 34	35	
22	1 Simple 1	13 17.3	1	13 17.8	4	
22	8 Group (2)	13 24.5	5.8			
	2 Simple 2	13 24.5	2	13 25	8	
	2 Simple 2	13 27.3	3	13 28.2	32	
22	2 Simple 2	13 46.9	2	13 47.2	12	
22	2 Simple 2	18 00	1.5	18 00.2	29	
23	3 Simple 3 f A	15 02	3 30	15 47	26	
	1 Simple 1	16 10	2.5	16 10.8	7	
24	1 Simple 1	14 00.8	1	14 01	7	
24	3 Simple 3 f A	18 11	>3	18 55	38	
	2 Simple 2 f	19 31	3.5	19 32.6	27	
25	1 Simple 1	14 32.8	0.5	14 32.9	7	
25	3 Simple 3	15 50	20	15 56	7	
25	2 Simple 2	17 11.5	1	17 12	155	
25	8 Group (2)	18 56.8	2.9			
	1 Simple 1	18 56.8	1	18 57	5	
	2 Simple 2	18 58.2	1.5	18 58.9	8	
25	8 Group (3)	19 40.7	7.1			
	1 Simple 1	19 40.7	1	19 41	4	
	1 Simple 1	19 42.7	2.5	19 43.9	7	
	6 Complex	19 46.3	1.5	19 47	20	
26	6 Complex	14 46.7	6	19 47.4	10	
27	2 Simple 2	13 06	5	13 07.4	42	
27	3 Simple 3 A	19 03	1	19 23	10	
	2 Simple 2	19 03	8	19 06.5	17	
27	2 Simple 2	20 34.5	2	20 35.5	10	
28	3 Simple 3 A	14 11	6	indet.	19	
	2 Simple 2	14 21.7	1.5	14 22.2	15	
29	2 Simple 2	12 34.9	1	12 35.2	68	(In sunrise)
29	6 Complex	17 13	4.5	17 14.4	45	
	4 Post Increase		1 10		17	
29	2 Simple 2	20 32.3	0.5	20 32.6	10	
30	2 Simple 2	13 04.8	8	13 07	60	

SOLAR RADIO EMISSION

DAILY DATA

NOVEMBER 1957

CORNELL 200 MC

Nov. 1957	Flux Density $10^{-22}w\ m^{-2}(c/s)^{-1}$ 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	15	20	[[1	1	1	1340-2100
2	[[16	15	-	[[2	1	-	1335-1720
3	[[15	15	-	[[1	1	-	1330-1730
4	[124	23	14	[1	1	0	1330-2130
5	[[12	13	13	[[0	0	1	1335-1630, 1650-2100
6	[[21	19	15]	[[2	2	1]	1350-1940
7	[[12	12	12]]	[[1	1	1]]	1330-1915
8	[[12	13	13	[[0	1	1	1335-1530, 1610-2105
9	[[12	13]	-	[[0	1]	-	1330-1700
10	[[11	11]	-	[[1	0]	-	1340-1700
11	[[12	13	12]	[[1	0	0]	1345-2110
12	[[11	13	12	[[0	1	1	1350-2045
13	[13	13	13]	[[1	0	1]	1350-2005
14	[[14	[[13	12]	[[2	[[0	1]	1345-1450, 1645-1925
15	[[15	14	13]]	[[2	1	0]]	1335-2035
16	[[14	14]	-	[[0	1]	-	1335-1710
17	[[13	14]	-	[[1	1]	-	1340-1705
18	[[11	11	11]	[[0	0	0]	1335-2100
19	[[11	11	11]	[[1	0	0]	1335-1945
20	[[11	12	32]]	[[0	0	1]]	1340-1915
21	[[11	[12	11]	[[1	[0	1]	1335-1440, 1600-1940
22	[[13	13	13]	[[0	0	0]	1335-1435, 1450-1515,
23	[[26	25]	-	[[2	2]	-	1345-1700 1525-1925
24	[[42	60]	-	[[2	2]	-	1335-1700
25	[[117	104	49]	[[2	2	2]	1355-2110
26	[[31	25	26]	[[2	1	1]	1350-2045
27	[[28	27	22]	[[1	1	1]	1340-2045
28	-	-	-	-	-	-	
29	-	[54	180]	-	[2	1]	1340-2115
30	[[50	40]	-	[[2	2]	-	1335-1705

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

OUTSTANDING OCCURRENCES

NOVEMBER 1957

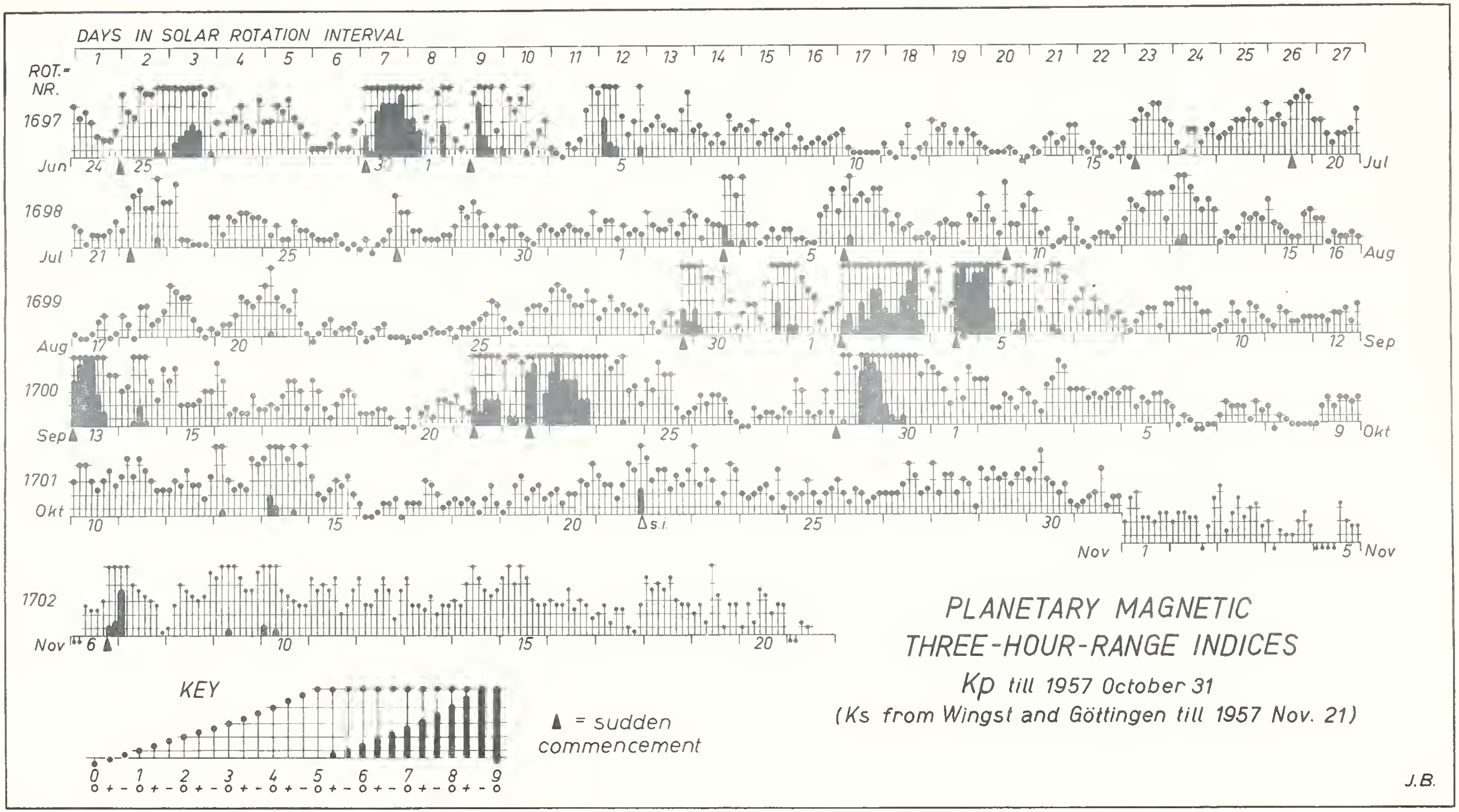
CORNELL 200 MC

Nov. 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
1	0	1441.5		106	CD	27	10	
	0	1837		96	SA	34	16	
	0	2021		>38	SA			
3	8	1651.5		5	ECD	>45	>23	off-scale 1652-53.5 UT
4	9	b1330	1343.5	>15	CD	>450	71	
	9	1346		131	M			
8	3	1745.5		2	ECD	>45	>26	
9	2	1643		1.5	ECD	>45	>27	off-scale 1643-43.5 UT
10	2	1453		3.5	ECD	>45	>28	
11	8	1413		17	ECD	>45	>27	off-scale 1418.5-21, 1421.5-22.5, 1424, 1427 UT
12	1	1712.5		44	E			
15	1	1341		63	E			
16	2	1534.5		3	ECD			
	2	1636		1	ECD			
	2	1639.5		1	ECD			
17	2	1418.5		11	ECD			off-scale 1424.5-25 UT
	2	1636		7	ECD			
	3	1650		1	ECD	>45	24	
18	3	1633		.5	ECD	>45	> 27	off-scale
	3	2056.5		1.5	ECD	>45	>28	
19	3	1358		.5	ECD	>45	>29	off-scale
	3	1422		.5	ECD	>45	>29	off-scale
20	3	1347		1	ECD	>45	27	
	0	1728.5		99	E	>45	17	off-scale 1746.5, 1747-1752.5, 1814.5-15 UT
21	3	1416	1416.5	1	ECD	>45	>28	
25	3	1711.5	1712	1.5	CA	>450	180	
	3	1858		2	ECD	>250	>91	
	3	2009.5	2010	1	CA	>250	110	
27	1	1342		96	F			
	2	1631.5		45	E			
	3	1843		1.5	ECA	>45	>21	
	3	1947.5		1.5	ECA	>45	> 22	off-scale 1948-48.5 UT
	3	2019		.5	ECA	>45	> 22	
29	0	1625		>288	E			

GEOMAGNETIC ACTIVITY INDICES

OCTOBER 1957

Oct. 1957	C	Values Kp Three hour Gr. interval 1	2	3	4	5	6	7	8	Sum	Ap	Final Selected Days
1	1.1	4+	4o	3o	2o	4-	2+	4+	4-	27+	21	Five Quiet
2	0.8	4-	4-	2-	2-	3-	2+	2-	3o	20+	12	
3	1.0	3-	2o	1+	3+	4-	5-	4+	3o	25o	19	
4	0.8	3o	3o	2+	3-	2+	3-	3o	3-	22-	12	6
5	0.7	3o	3o	2-	2+	2o	3-	3-	2o	19+	10	7
												8
6	0.1	2-	0+	1o	1-	0o	0o	0+	0+	4+	2	16
7	0.2	1o	2o	2-	2-	2-	1-	2o	1+	12o	6	18
8	0.0	2-	0o	1o	1-	0+	0+	0+	0+	5-	3	
9	0.5	0+	2-	2+	2-	2+	2+	2o	2+	15o	7	
10	1.0	3o	4o	4o	3o	2+	3o	4-	3-	26-	18	
11	1.1	3+	4+	3+	4+	4-	3o	2+	2+	27-	19	Five Disturbed
12	0.9	2+	3o	3-	4-	3-	3-	2-	3+	22o	13	
13	1.2	5o	5+	3o	2+	3-	2+	4+	4o	29o	26	
14	1.5	4+	6+	6-	5o	4+	5+	4o	5o	40o	50	1
15	0.8	3+	2o	2-	2+	3o	3-	3+	2o	20+	12	11
												13
16	0.1	1+	0+	0+	1-	1+	1+	2-	0+	7+	4	14
17	0.4	1+	1+	1+	3o	3-	2o	1o	1+	14o	7	21
18	0.2	2-	1+	2-	1+	1-	2-	3-	1+	12+	6	
19	0.5	1-	1+	3-	3+	2-	2+	3-	2-	16+	9	
20	0.7	2o	2+	1+	2o	2o	3o	3-	4o	19+	11	
21	1.3	3+	3-	3-	2-	3-	4o	4-	7-	27+	28	Ten Quiet
22	1.1	4+	3o	4-	4-	2+	3+	3-	4-	27-	19	
23	1.1	5o	3-	4-	3o	1+	2o	4o	4-	25+	20	
24	0.5	2o	2-	2o	2+	3-	2-	4-	1o	17o	9	6
25	0.4	2o	2-	2o	3o	2o	1+	2o	2+	16+	8	7
												8
26	0.4	3o	2o	1+	2+	2o	1+	2-	2o	16-	8	9
27	0.7	2o	2o	2o	3-	4o	3+	2o	2+	20+	12	16
28	0.7	4o	2o	3+	3+	2o	3o	3-	1o	21+	14	17
29	1.0	4-	3o	4-	3o	3+	3-	3+	4-	26+	18	18
30	0.9	3o	4-	5-	3o	3-	2o	3-	1+	23o	16	25
31	0.5	1o	1+	2-	2o	4-	1o	2-	2-	14o	8	26
												31
Mean:	0.72									Mean:	14	


DAYS IN SOLAR ROTATION INTERVAL
ROT.-NR.
1697
1698
1699
1700
1701
1702
Jun
Jul
Aug
Sep
Okt
Nov
s.i.
KEY
0 1 2 3 4 5 6 7 8 9
o + - o + - o + - o + - o + - o + - o + - o + - o + - o + - o
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1957 October 31
(Ks from Wingst and Göttingen till 1957 Nov. 21)
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

OCTOBER 1957

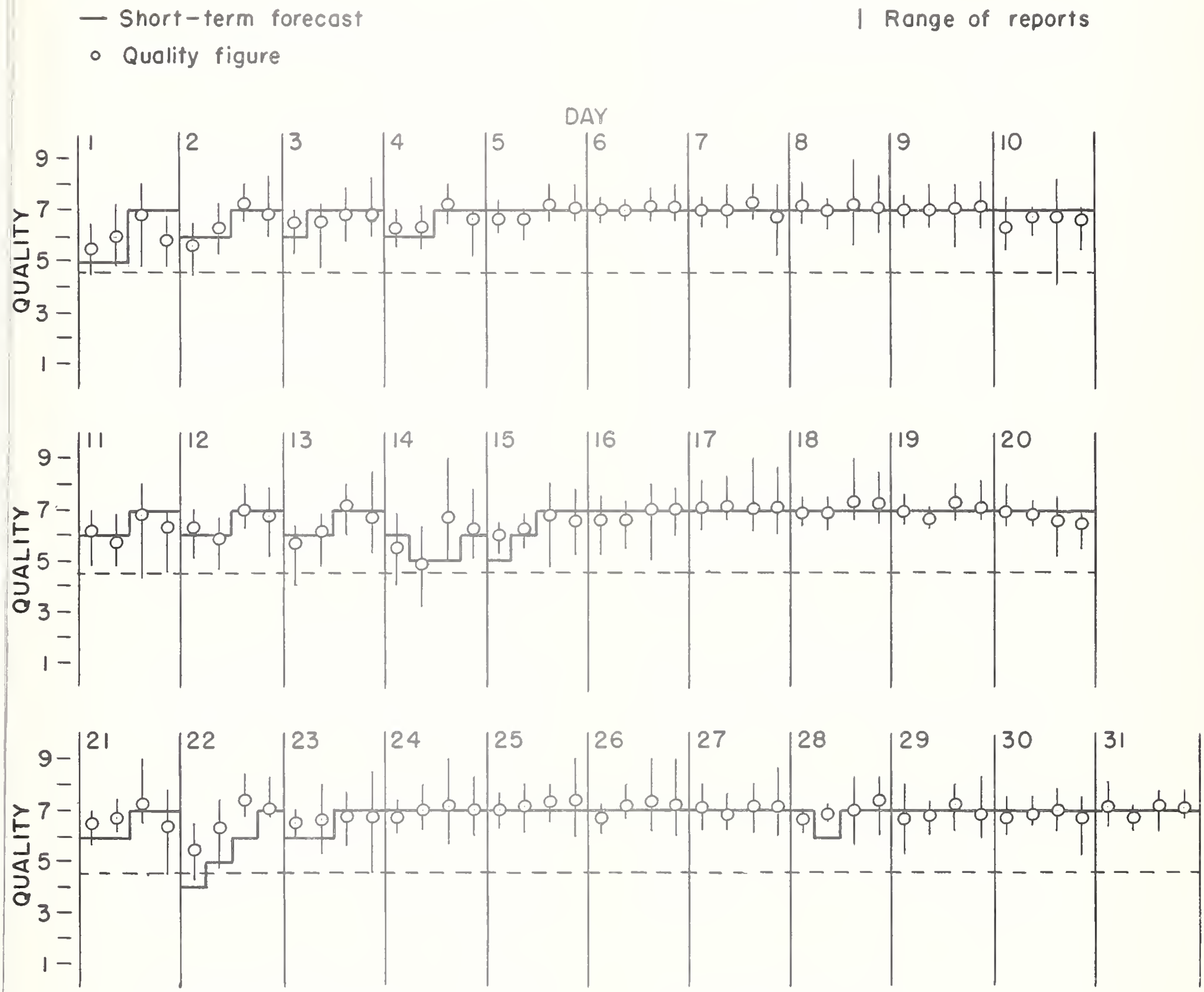
Oct. 1957	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:				Whole day index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomagnetic K_{Fr}	
	00 to 06	06 to 12	12 to 18	18 to 24	00	06	12	18		1-4 days	4-7 days	8-25 days	Half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

( ) represent disturbed values.

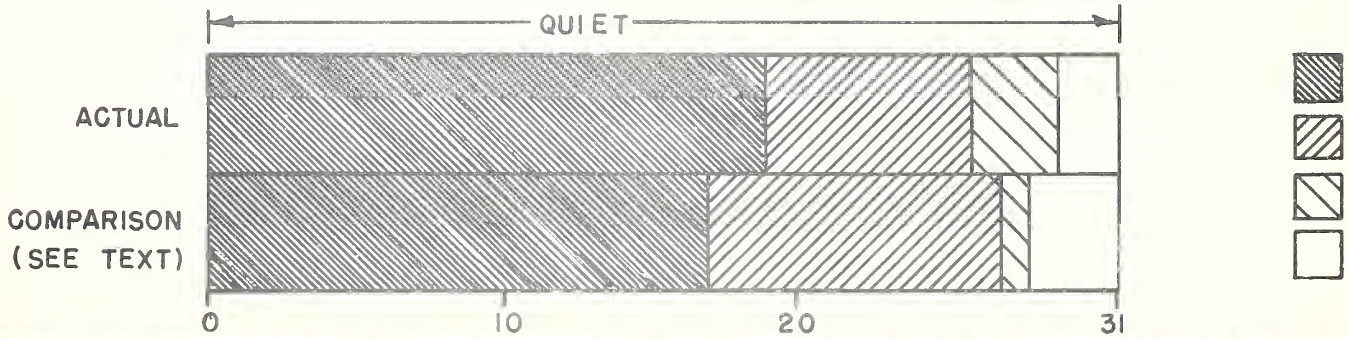
CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

OCTOBER 1957

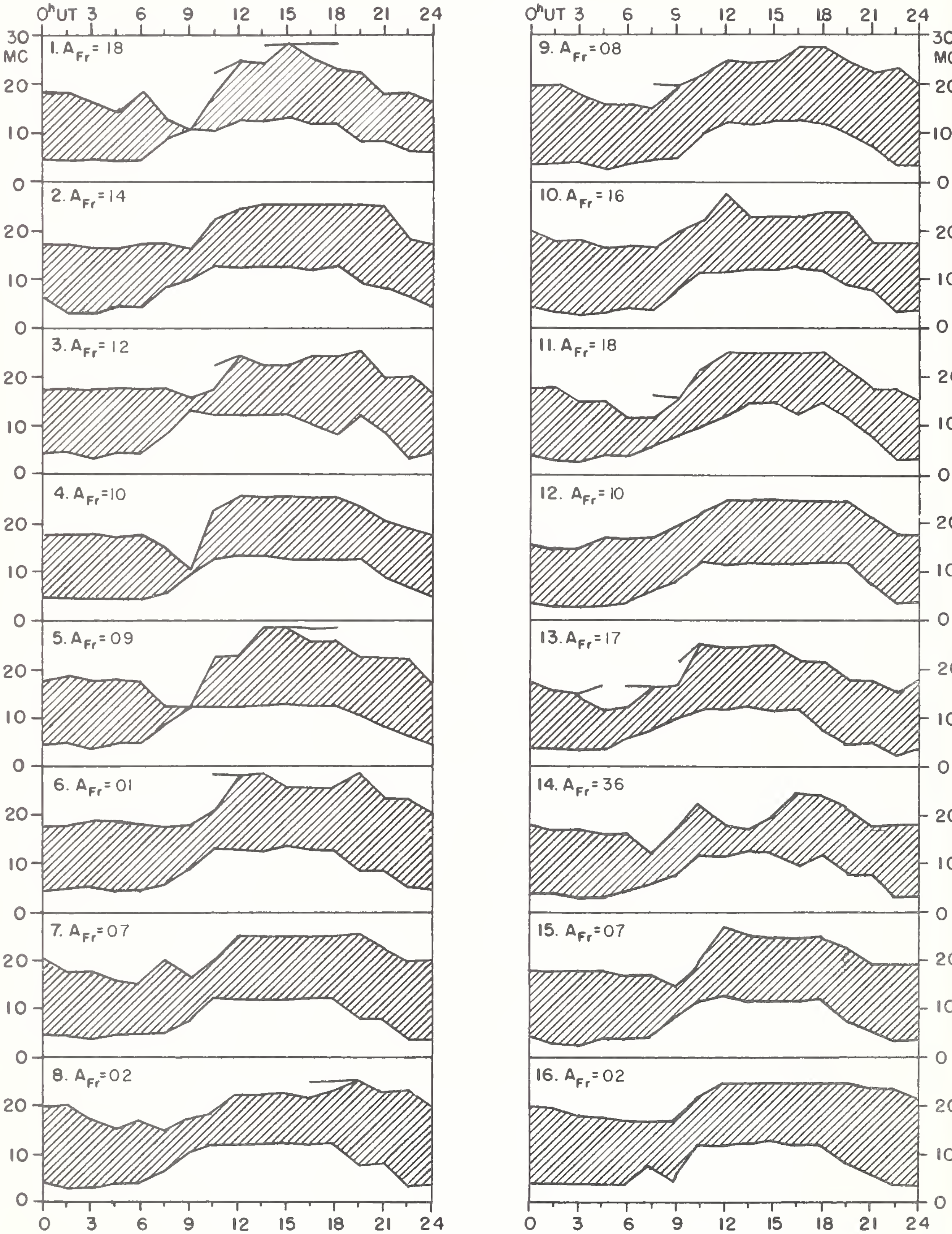


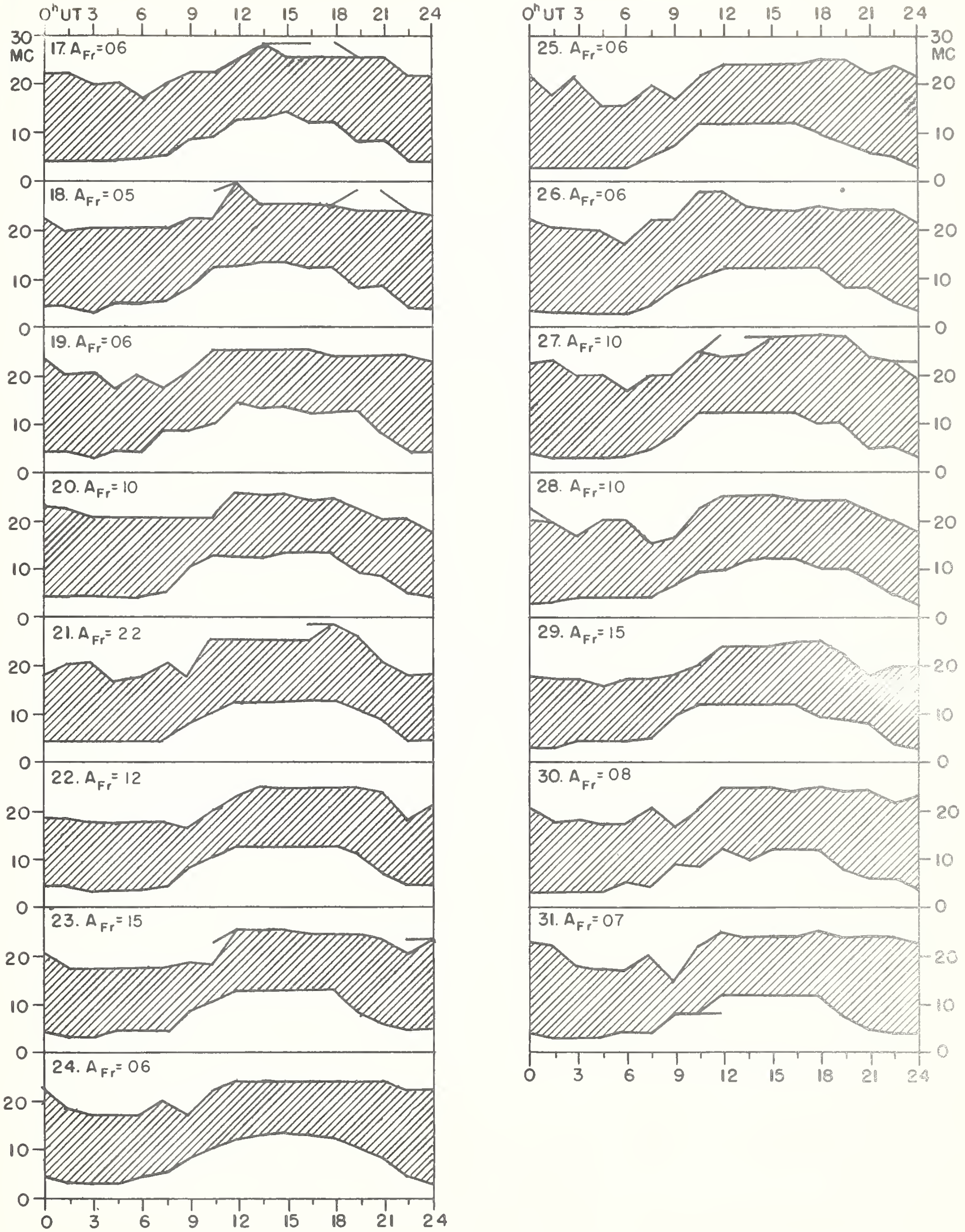
OUTCOME OF ADVANCE FORECASTS (1 TO 4 DAYS AHEAD) — OCTOBER, 1957



USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

OCTOBER 1957





Adapted from Observations by Deutsches Bundespost

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

OCTOBER 1957

Oct. 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	6	5	6	5	5	6	6	5	4		3	3
2	6	6	6	6	6	6	6	6	6		3	2
3	6	6	6	6	6	6	6	6	6		2	(4)
4	6	7	6	6	6	6	7	6	6		2	3
5	7	6	6	6	7	6	7	6	6		3	2
6	7	6	7	6	6	6	7	6	6		1	0
7	7	7	7	6	7	7	7	6	6		1	2
8	7	6	6	7	7	7	7	6	6		1	0
9	7	6	6	7	7	6	7	7	7		1	2
10	6	6	6	7	5	6	6	7	7		(4)	3
11	6	4	6	6	6	6	5	7	7		(4)	(4)
12	6	5	6	6	4	6	6	6	7		3	3
13	6	6	7	6	6	6	6	6	7		(4)	3
14	4	4	5	6	4	5	5	6	7		(6)	(5)
15	6	6	6	5	6	6	6	6	7		2	3
16	6	6	6	6	7	7	6	6	6		0	1
17	7	7	6	7	7	7	7	6	6		1	2
18	7	6	6	7	7	7	7	3	6		1	2
19	6	7	5	7	6	7	6	7	3		2	2
20	6	6	6	7	7	7	6	7	4		1	3
21	7	7	7	6	7	6	7	7	6		2	3
22	6	6	6	6	6	6	6	6	6		(4)	3
23	6	6	6	6	6	6	6	6	6		3	2
24	7	7	7	6	7	7	7	6	6		1	3
25	7	7	6	7	7	7	7	6	6		1	2
26	7	7	7	7	6	7	7	7	6		1	2
27	7	6	6	6	6	7	7	6	6		2	3
28	6	6	7	7	6	7	7	6	6		3	2
29	7	6	7	7	6	7	7	6	6		3	3
30	7	7	7	7	6	6	7	7	7		3	2
31	7	6	6	7	7	7	7	7	7		1	3

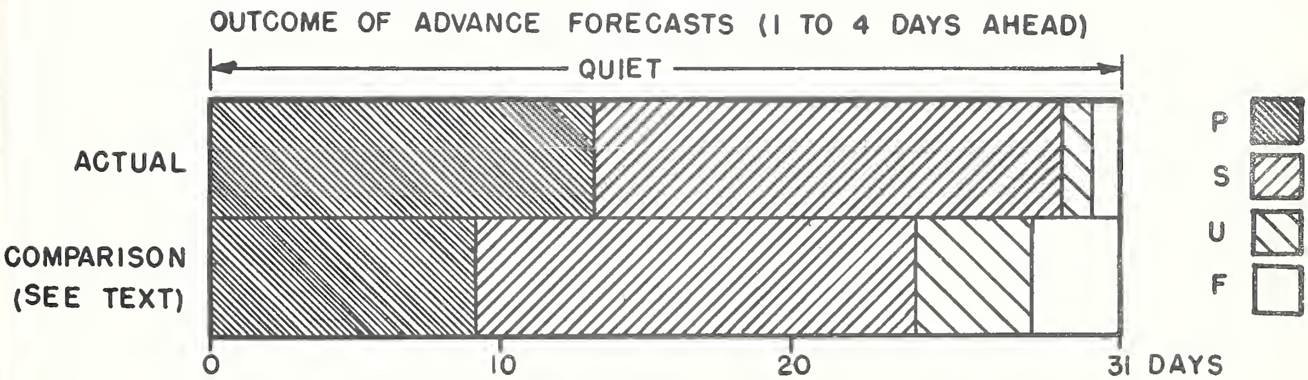
Score:								
Quiet Periods	P	18	16	18	13	8		
	S	12	13	12	16	18		
	U	0	0	1	1	2		
	F	0	0	0	1	3		
Disturbed Periods	P	0	1	0	0	0		
	S	0	0	0	0	0		
	U	0	0	0	0	0		
	F	1	1	0	0	0		

( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

OCTOBER 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
Nov 12-Nov 15		09-08-14-12	1-1-0-1
Nov 24-Nov 27	Nov 26-Nov 27	10-15-<u>35</u>-<u>28</u>	3-0-0-0