PART B

SOLAR - GEOPHYSICAL DATA

ISSUED
APRIL 1958

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

CRPL-F 164
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
30 Apr. 1958

SOLAR - GEOPHYSICAL DATA

CONTENTS

SOLAR - GEOPHYSICAL DATA

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 ($\times 10^{-22}$) in two polarizations by the National Research Council at Ottawa, Canada. These solar radio noise indices are being published in accordance with CCIR Report 25 that a basic solar index for ionospheric propagation should be measured objectively and "preferably refer to a property of the sun such as radiation flux which has direct physical relationship to the ionosphere."

Graph of Sunspot Cycle -- The graph illustrates the recent trend of Cycle 19 of the 11-year sunspot cycle and some predictions of the future level of activity. The customary "12-month" smoothed index, R, is used throughout, the data being final R_Z numbers except for the current year. Predictions shown are those made for one year after the latest available datum by the method of A. G. McNish and J. V. Lincoln (Trans. Am. Geophys. Union, 30, 673-685, 1949) modified by the use of regression coefficients and mean cycle values recomputed for Cycles 8 through 18. Cycle 19 began April 1954, when the minimum $\overline{R}$ of 3.4 was reached.

II SOLAR CENTERS OF ACTIVITY

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

The table gives the heliographic coordinates of each center (taken as the calcium plage unless two or more significantly and individually active sunspot groups are included in an extended plage) in terms of the Greenwich date of passage of the sun's central meridian (CMP) and the latitude; the serial number of the plage as assigned by McMath-Hulbert Observatory; the serial number of the center in the previous solar rotation, if it is a persisting region; particulars of the plage at CMP: area, central intensity; a summary of the development of the plage during the current transit of the disk, where b = born on disk, 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

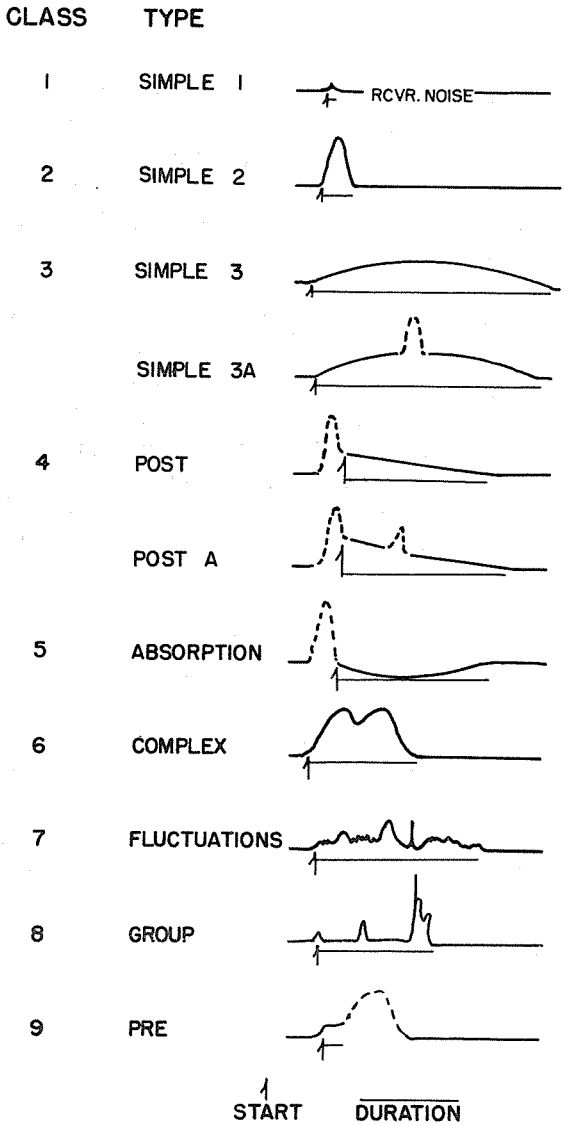
Infrequently occurring bursts of great intensity, often of complicated structure.

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 (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.

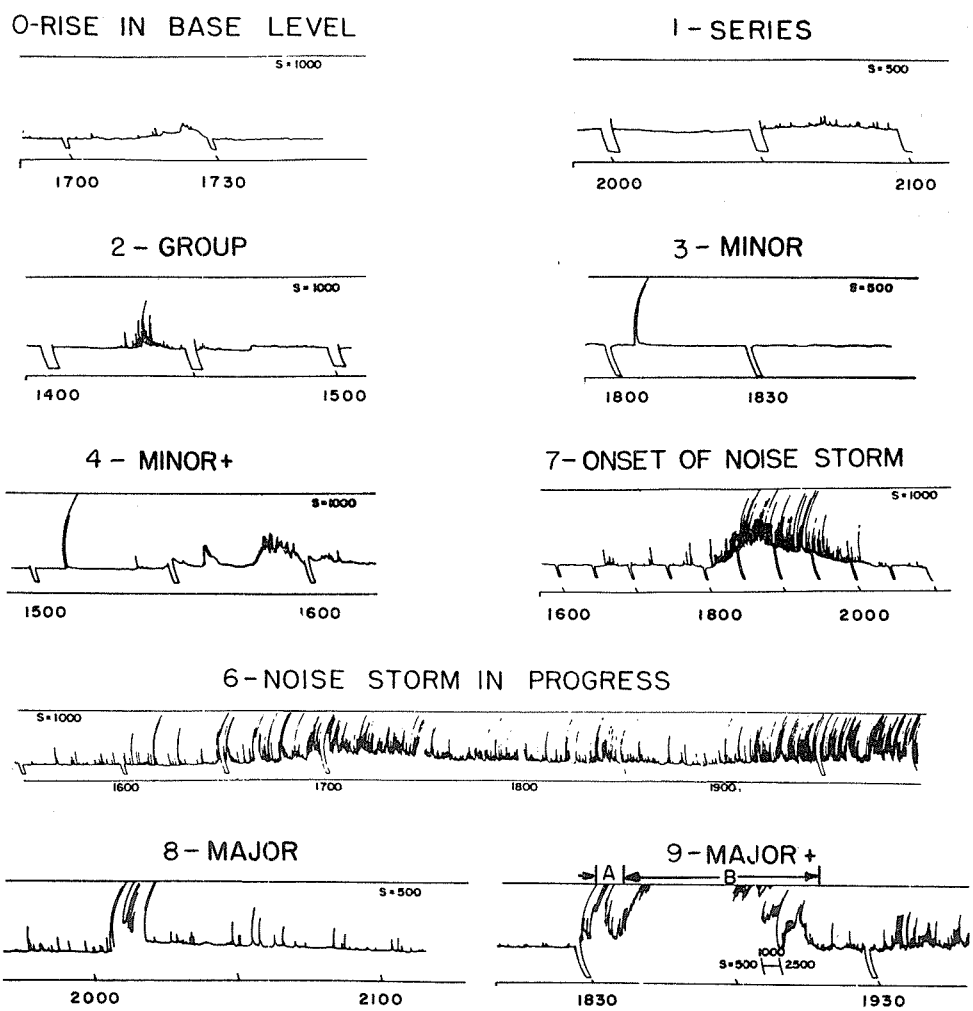
4 - Minor burst and second part -- A double rise in flux in which the early rise is a minor burst.

6 - 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 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 Fermeldetechnischen Zentralamtes, Darmstadt, Germany, being observations every one and a half hours of selected transmitters located in the eastern portion of North America. Since January 6, 1958 the transmitters monitored are restricted to those located north of 39° latitude. The magnetic activity index, A_{Fr}, from Fredericksburg, Va., is also given for each day.

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

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

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

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

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

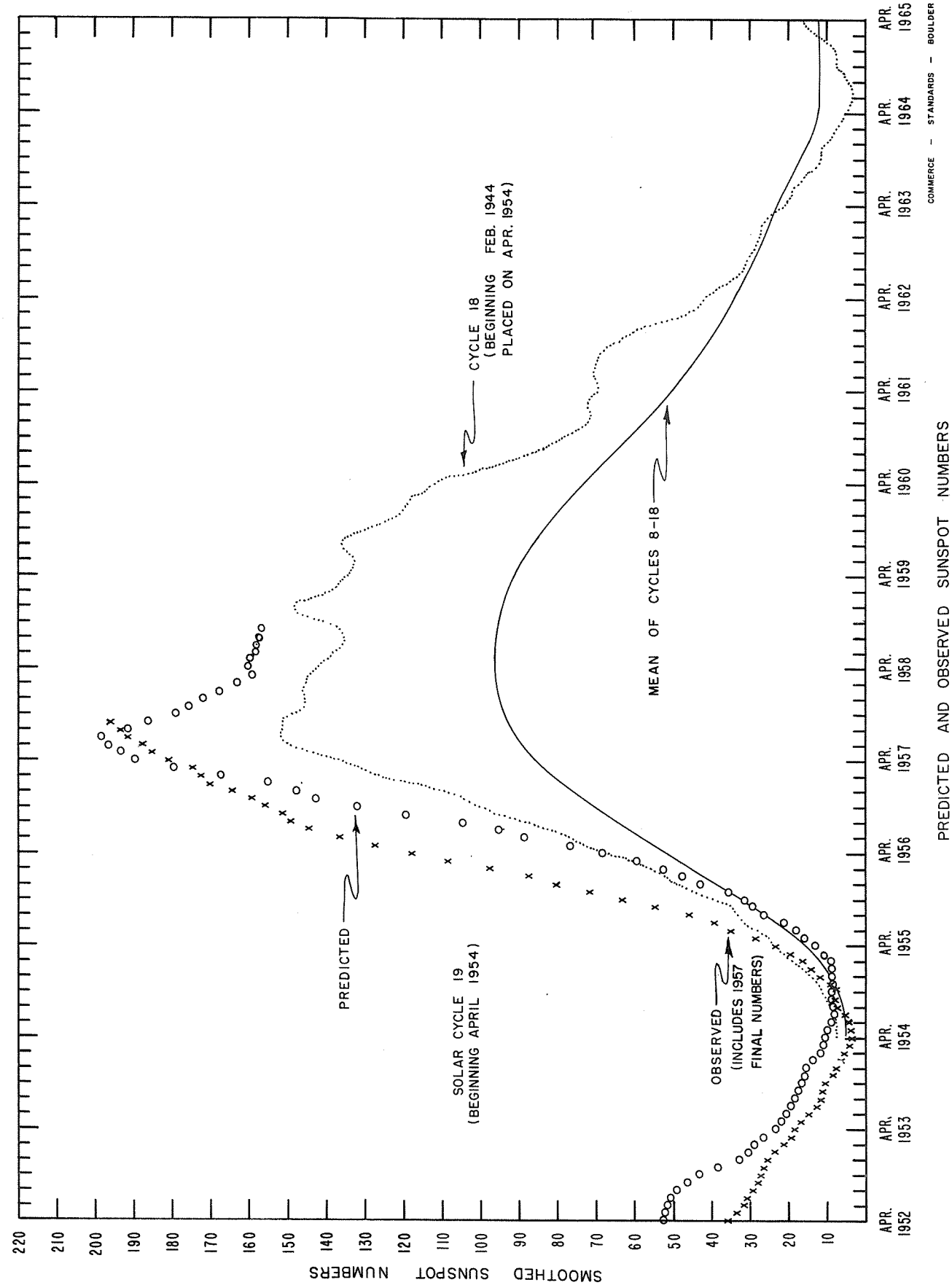
A table gives the Alert Periods and Special World Intervals (SWI) as designated by the IGY World Warning Agency at Ft. Belvoir, Va. For each day of the Alert or SWI are given the number of flares of importance two or greater reported promptly to the IGY World Warning Agency and the magnetic activity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

DAILY SOLAR INDICES

Feb. 1958	American Relative Sunspot Numbers $R_{A'}$
1	154
2	143
3	158
4	159
5	176
6	119
7	160
8	131
9	155
10	117
11	160
12	143
13	128
14	130
15	143
16	162
17	145
18	121
19	103
20	156
21	159
22	171
23	129
24	156
25	163
26	139
27	108
28	85
Mean:	141.9

Mar. 1958	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux
1	109	195
2	90	209
3	140	223
4	185	232
5	203	233
6	215	251
7	220	256
8	187	251
9	177	255
10	181	242
11	168	235
12	156	232
13	145	238
14	158	227
15	165	217
16	155	214
17	164	208
18	162	210
19	155	220
20	154	232
21	156	224
22	163	266
23	187	268
24	204	274
25	180	258
26	194	284
27	226	302
28	292	295
29	302	332
30	338	344
31	342	338
Mean:	189.4	250.5

COMMERCE - STANDARDS - BOULDER



PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS
MARCH 1958

CMP Mar. 1958	Lat	McMath Plage Number	Return of Region	Calcium Plage Data				Sunspot Data		
				CMP Values Area	Int.	History, Age		CMP Values Area	Count	History
01.6	S12	4442	*	(5000)	(3)	ℓ — ℓ	5	70	3	b ⟋ ℓ
06.2	N24	4443	4399	1800	3	ℓ — ℓ	2	660	20	b ⟋ ℓ
07.3	N32	4444	New	2500	3	ℓ — ℓ	1	820	16	ℓ ⟋ ℓ
07.7	S15	4445	4400	8000	2.5	ℓ — ℓ	5	2210	24	ℓ ⟍ ℓ
08.8	N21	4446	4405	4000	2.5	ℓ ⟍ ℓ	3	70	2	ℓ — ℓ
09.7	S23	4447	4400	1300	2	ℓ ⟍ ℓ	5			
10.5	N25	4450	4411	1000	1.5	ℓ — ℓ	3			
10.6	N10	4448	4412	1000	2	ℓ ⟍ ℓ	2			
11.9	N14	4449	4410	8300	3	ℓ — ℓ	3	1060	12	ℓ ⟍ ℓ
12.2	S12	**	New	600	2.5	b ⟋ ℓ	1			
12.5	N41	4454	New	200	2	b — d	1			
13.4	N25	4452	4410	1000	2	ℓ ⟋ ℓ	3	50	2	b — d
13.5	N14	4453	New	2300	3	ℓ ⟍ ℓ	1	850	6	ℓ ⟋ ℓ
15.6	S26	4455	4414	500	1.5	ℓ ⟋ d	8			
16.7	N08	4462	New	300	1.5	b — d	1			
17.6	N27	4468	+	400	1	b ⟋ ℓ	1			
17.7	S20	4457	4422	900	1.5	ℓ — ℓ	5			
18.2	N13	4456	New	6200	3	ℓ — ℓ	1	880	20	ℓ — ℓ
19.1	S04	4472	New	500	1	b — ℓ	1			
20.5	N36	4460	New	1500	3	ℓ ⟍ ℓ	1	200	7	ℓ — ℓ
20.7	N20	4461	4424	400	1	ℓ ⟍ d	4	(10)	(1)	ℓ ⟋ d
20.8	N08	4463	4430	400	1.5	ℓ ⟍ d	2			
21.0	S18	4459	++	2200	2.5	ℓ ⟍ ℓ	3	140	1	ℓ — ℓ
22.3	S06	4466	New	300	1	ℓ ⟋ d	1			
22.4	S20	4473	4427	1100	1	ℓ ⟍ ℓ	3			
22.6	N22	4465	New	4000	3	ℓ ⟋ ℓ	1	1440	20	ℓ — ℓ
23.7	N11	4467	New	1200	2.5	ℓ — ℓ	1	170	9	ℓ — ℓ
24.2	S18	4470	4428	2000	2	ℓ ⟍ ℓ	4			
24.9	N26	4469	New	2200	3	ℓ ⟋ ℓ	1	600	27	ℓ — ℓ
26.6	N18	4474	New	2300	3.5	ℓ — ℓ	1	200	2	ℓ ⟍ ℓ
28.2	S24	4479	New	800	2	b — ℓ	1			
28.3	N20	4475	New	1600	3	ℓ ⟋ ℓ	1	190	10	ℓ ⟍ d
28.5	S12	4476	New	12,000	3.5	ℓ — ℓ	1	2090	37	ℓ — ℓ
28.9	N31	4477	4435	500	2.5	ℓ ⟍ ℓ	2			
29.1	N09	4482	New	700	2.5	b — ℓ	1	80	4	b — d
30.2	S22	4478	4438	2400	2.5	ℓ ⟍ ℓ	2	1720	11	ℓ ⟍ ℓ
30.5	N06	4491	New	(200)	(1.5)	b — d	1			

* 4393 and 4394.
** 4451 (4458).
\+ In position of 4417.
++ 4431 and 4426.

COMMERCE - STANDARDS - BOULDER

CORONAL LINE EMISSION INDICES

MARCH 1958

CMP Mar. 1958	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)			
	G6	G1	R6	R1	G6	G1	R6	R1	G6	G1	R6	R1	G6	G1	R6	R1
1	117	147	42	109	106	140	17	30	83	108	x	x	87	116	x	x
2	81	100	x	x	76	93	x	x	x	x	x	x	x	x	x	x
3	x	x	x	x	x	x	x	x	45	59	20	32	79	104	19	42
4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	x	x	x	x	x	x	x	x	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	147	205	42	68	93	118	21	32	79	96	x	x	176	222	x	x
11	111	136	x	x	68	84	x	x	x	x	x	x	x	x	x	x
12	123	178	30	50	53	70	12	14	x	x	x	x	x	x	x	x
13	103	128	x	x	44	52	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	81	96	x	x	37	44	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	123	169	18	32	63	84	23	42	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	x	x	x	x	x	x	x	x
20	x	x	x	x	x	x	x	x	106a	139a	57a	150a	102a	108a	10a	12a
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	x	x	x	x	x	x	x	x
24	125	238	20	30	135	216	x	x	x	x	x	x	x	x	x	x
25	x	x	x	x	x	x	x	x	84	92	18	36	129	194	31	42
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	174	260	x	x	169	230	38	90
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
29	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
30	x	x	x	x	x	x	x	x	97	118	x	x	59	72	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

MARCH 1958

OBSERVATORY	DATE Mar. 1958	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
WENDEL	01	0911	0938		S09	W48	4436	27	3&				34.00			
SIMEIZ	01	0912	1007		S10	W46	4436	55	3							
SCHAUINS	01	0916	0950		S12	W42	4436	34	3							S-SWF
ONDREJOV	01	0918 E	0922		S13	W45	4436	4 D	1&	3	0918			4.10		
WENDEL	01	0925	0938		S16	W80	4428	13	1				3.00			S-SWF
ONDREJOV	01	0929 E	0933		S17	E78	4445	4 D	1&	3	0929			5.00		
WENDEL	01	1007	1036		S19	W80	4428	29	1				3.00			
ZURICH	01	1346 E	1348		S16	E77	4445	2 D	1	2	1346		2.00			
ZURICH	01	1408	1412		N15	W31	4434	4	1	2	1408		1.00			
AROSA	01	1527	1539		S12	W56	4436	12	1							
UCCLE	02	0820 E	0838 D		N32	W22	4435	18 D	1	1	0820	3.40				
CAPRI S	03	1008 E	1042 D		S14	E59	4445	34 D	2&	2	1026	5.00	10.00			
NIZAMIAH	03	1013 E	1048	1018	S19	E60	4445	35 D	3	2	1018	9.72	18.93	3.60		
ARCETRI	03	1015 E	1100		S12	E58	4445	45 D	2	1						S-SWF
R O HERST	03	1016 E	1115	1022	S17	E62	4445	59 D	3&	3	1021	7.10	14.80	6.70	250	
STOCKHOLM	03	1031 E	1036 D		S17	E63	4445	5 D	2							
KODAIKNL	03	1040 E			S15	E54	4445		2	1	1040			2.00		
CAPRI S	03	1206 E	1407 D		S18	E65	4445	121 D	1&	3	1209	2.00	4.40			
USNRL	03	1229 E	1411		S20	E61	4445	131 D	1	1	1231	1.47	3.11		72	
CLIMAX	03	1812	1832 D	1825	S21	E70	4445	20 D	1		1825	2.50				
HAWAII	03	2340	2356	2346	S14	E40	4445	16	1	2	2346	1.90	2.40			
USNRL	04	1320	1410	1322	S25	W45	4445	50	1	2	1322	1.13	1.59	1.00	106	
USNRL	04	1724 E	1750	1725	S17	E40	4445	26 D	1	1	1725	2.60	3.30			
HUANCAYO	04	2208	2225 D	2215	S17	E33	4445	17 D	1	2						
ZURICH	05	0908 E	0923		S17	E29	4445	15 D	1&	3	908		4.00			
ONDREJOV	05	0956 E	1018		S22	E28	4445	22 D	1	3	1007			2.30		
ZURICH	05	1001	1018		S19	E25	4445	17	1	3	1001		3.00			
WENDEL	05	1004 E	1135		S21	E27	4445	91 D	1				4.00			
ONDREJOV	05	1021	1037	1022	S22	E30	4445	16	1	3	1022			2.50		
AROSA	05	1024	1035		S21	E28	4445	11	1							
WENDEL	05	1307 E	1333 D		S18	E29	4445	26 D	1&				6.00			
ZURICH	05	1313	1335		S17	E26	4445	22	1	3	1313		4.00			S-SWF
AROSA	05	1315 E	1330		S19	E28	4445	15 D	1&							
ONDREJOV	05	1322 E	1342 D		S18	E28	4445	20 D	1&	1	1327			2.20		
USNRL	05	1413 E	2019 D		S10	W54	4442	366 D	1	1	1414	1.92	3.19	1.00	71	
USNRL	05	1635	1721		S20	E28	4445	46	1	1	1642	2.94	3.40			
OTTAWA	05	1647 E	1710	1656	N24	W58	4435	23 D	1	2	1656	4.52	11.03			
USNRL	05	1649 E	1720		N32	W65	4435	31 D	2	1	1649	1.70	5.45		102	
USNRL	05	1702	1858	1703	N24	E06	4443	116	1	1	1703	2.50	2.94	1.00	63	
MT WILSON	05	1720	1728		S14	E30	4445	8	1							
USNRL	05	1721	1730	1723	S15	E28	4445	9	1	1	1723	.90	1.03		108	
OTTAWA	05	1721	1740		S13	E29	4445	19	1	1	1724	3.36	3.86			
SAC PEAK	05	1820	1842	1822	S15	E29	4445	12	1	3		3.60			18	
USNRL	05	1902	2100 D	1902	S08	W57	4442	118 D	1	1	1902	2.60	4.54	1.00	70	
USNRL	05	2047	2100 D	2051	S19	E23	4445	13 D	1	2	2051	1.13	1.22		107	
CLIMAX	05	2311 E	2341	2328	S09	E15	4445	30 D	1		2328	4.90				
ARCETRI	06	0820 E	0844 D		S20	W63	4441	24 D	1	3	0820	1.30	2.80			
ARCETRI	06	0846 E			S17	E19	4445		1	3	0846	2.50	2.70			
UCCLE	06	0931 E			N24	W05	4443		1&							

COMMERCE — STANDARDS — BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE Mar. 1958	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX. PHASE	LOCATION APPROX. LAT.	LOCATION APPROX. MER. DIST.	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
CAPRI S	06	1246 E	1330 D		S14	W61	4442	44 D	1	3	1246	1.00	22.0			
AROSA	06	1511	1519		S20	E12	4445	8	1							
AROSA	06	1538	1547		S20	E12	4445	9	1							
CLIMAX	06	2018	2030 D		S22	E13	4445	12 D	1		2023	5.00				
USNRL	06	2050	2107 D		S08	W71	4442	17 D	1	1	2050	1.02	2.78	1.00	78	
MITAKA	07	0525 E	0537 D		N22	E23	4446	12 D	1&	1	0530	5.67	7.06	1.58	149	
UCCLE	07	0828	0900	0829	N11	E85	4449	32	1&	2	0829	2.00	4.00			
UCCLE	07	1024			N11	E86	4449		1	2	1024	1.50	3.40			
CAPRI S	07	1030	1156		N14	E72	4449	86	2	2	1054	2.00	6.80			
R O HERST	07	1043 E	1050 D	1043 E	N10	E72	4449	7 D	1	1	1043	.60	2.40			
STOCKHOLM	07	1100 E	1140 D		N10	E70	4449	40 D	2							S-SWF
NEDERHORST	07	1105 E	1200		N10	E72	4449	55 D	2							
MEUDON	07	1110 E			N12	E68	4449		1							
UCCLE	07		1140	1115	N11	E86	4449		3	2	1115	6.00	13.00			
ONDREJOV	07	1203 E	1212 D		N08	E69	4449	9 D	1	2	1208			2.50		
USNRL	07	1239 E	1319		N06	E70	4449	40 D	1&	1	1242	1.59	5.71		65	
USNRL	07	1235 E	1307		S18	E01	4445	32 D	1&	1	1246	3.56	3.64		116	
USNRL	07	1326	1338	1330	S18	W01	4445	12	1	3	1330	1.57	1.61		117	
USNRL	07	1453	1536	1455	N08	E65	4449	43	1	3	1455	1.24	3.40		68	
USNRL	07	1815	1845	1815	S18	W03	4445	30	1	3	1815	1.81	1.83	1.00	103	Slow S-SWF
HUANCAYO	07	1947 E	2024	2001	S15	W80	4442	37 D	1	1						
HUANCAYO	07	2033	2110 D	2033	S15	W80	4442	37 D	1	1						
MITAKA	08	0530 E	0542		N25	W22	4443	12 D	1	1	0534	1.84	2.26	1.46	96	
MITAKA	08	0557 E	0631 D		N12	E56	4449	34 D	1	1	0602	1.84	3.92	2.27	120	
ATHENS	08	0653	0735		S21	W31	4445	42	1&	4		3.30	3.80			
ATHENS	08	0851	0858		S13	W90	4442	7	2	4		.40	5.40			
AROSA	08	0914	0922		N32	W08	4444	8	1							
AROSA	08	1051	1059		S18	W14	4445	8	1							
SAC PEAK	08	1720	1755	1727	N34	W19	4444	35	2	2		6.60			30	
MCMATH	08	1740 E			N33	W17	4444		2							S-SWF
HAWAII	08	2158	2215 D	2208	N12	E52	4449	17 D	1	1	2208	1.60	3.00			
CLIMAX	08	2159	2249		N05	E54	4449	50	1		2209	2.20				
SAC PEAK	08	2200	2217	2202	N32	W20	4444	17	1	2		2.50			20	
CLIMAX	08	2336	2348 D	2340	N17	E47	4449	12 D	1		2340	2.20				
HAWAII	08	2336	2352 D	2344	N12	E52	4449	16 D	1	1	2344	2.70	4.90			S-SWF
MITAKA	08	2337 E	2358 D	2337	N09	E48	4449	21 D	2&	1	2337	7.57	16.20	4.86	183	
MITAKA	09	0210 E	0221	0216	N24	W35	4443	11 D	1&	1	0216	7.57	11.20	1.78	122	G-SWF
MITAKA	09	0443 E	0514		N32	W23	4444	31 D	1	1	0444	1.84	1.93	2.11	113	
MITAKA	09	0452 E	0505 D		S15	W19	4445	13 D	1	1	0453	1.84	2.47	1.74	100	
MITAKA	09	0621 E	0628 D		N10	E42	4449	7 D	1&	1	0621	3.71	5.68	2.36	115	
WENDEL	09	0737 E	0804		N09	E45	4449	27 D	1&				6.00			
UCCLE	09	0900	0927	0920	N32	W28	4444	27	1&	2	0920	3.40	4.90			
UCCLE	09	0902	0937	0922	N14	E60	4453	35	1	2	0922	2.20	3.00			
UCCLE	09	0933	0946	0938	N22	W50	4443	13	1&	1	0938	3.40	5.10			
UCCLE	09	0946	1032	0956	N14	E60	4453	46	2	4	0956	4.50	5.80			
UCCLE	09	0955	1025	1004	N34	W34	4444	30	1	4	1004	2.20	2.40			
UCCLE	09	1031	1038	1033	N12	E50	4449	7	1&	4	1033	3.40	5.10			
ONDREJOV	09	1033 E	1038		N09	E44	4449	5 D	1	3	1034			2.20		
UCCLE	09	1056		1059	N12	E45	4449		1&	2	1059	4.00	4.40			
ONDREJOV	09	1057 E	1104	1059	N11	E40	4449	7 D	1	3	1059			4.70		
ONDREJOV	09	1120 E	1135	1122	N12	E51	4453	15 D	1&	3	1122			3.60		
														PAGE	2	

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. MER. DIST.	McMATH PLAGE REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
	Mar. 1958							MINUTES								
ONDREJOV	09	1145 E	1154 D		N13	E49	4453	9 D	1	3	1145			2.40		S-SWF
USNRL	09	1217 E	1341		N15	E55	4453	84 D	1	2	1341	1.58	2.76		80	
SAC PEAK	09	1447	1507	1455	S21	W35	4445	20	1	2		2.30			16	
OTTAWA	09	1454	1500	1455	S19	W35	4445	6	1	1	1455	1.91	2.37			
SAC PEAK	09	1540	1740 U	1547	N34	W32	4444	120 D	2	2		6.80			25	
OTTAWA	09	1542	1709		N32	W32	4444	87	2	2	1648	6.38	10.00			
USNRL	09	1543	1642 D	1645	N35	W30	4444	59 D	1&	2	1645	2.71	4.33	1.00	145	S-SWF
SAC PEAK	09	1957	2030	2007	N11	E37	4449	33	1	2		2.50			18	S-SWF
MITAKA	10	0007 E	0031	0026	N32	W38	4444	24 D	1	2	0013	1.84	2.98	2.45	134	
MITAKA	10	0111 E	0131		N23	W13	4446	20 D	1	1	0113	5.67	6.73	1.91	87	
MITAKA	10	0134 E	0140 D		N32	W39	4444	6 D	1	1	0134	.89	1.44	1.81	100	
MITAKA	10	0148 E	0155		N33	W33	4444	7 D	1	1	0154	1.84	2.87	1.99	128	
MITAKA	10	0208	0241 D	0214	N12	E38	4453	33 D	1&	1	0212	5.67	8.04	2.22	149	G-SWF
KODAIKNL	10	0210 E	0217 D	0213	N11	E35	4453	7 D	1	3	0213	3.90	4.40	2.00	154	
ATHENS	10	0709 E	0743		N34	W36	4444	34 D	1&	3		1.80	3.30			Slow S-SWF
CAPRI S	10	1316 E	1350 D		N08	E24	4449	34 D	1	1	1316	2.00	2.20			G-SWF
NEDERHORST	10	1335	1345		N37	W35	4444	10	2							
OTTAWA	10	1408			N31	W41	4444		1	1	1411	1.39	2.45			
ONDREJOV	10	1411 E	1420 D	1412	N33	W42	4444	9 D	1&	3	1412			4.50		S-SWF
OTTAWA	10	1710	1718	1714	N32	W42	4444	8	1	3	1714	1.16	2.12			G-SWF
CLIMAX	10	1955	2006	2001	N34	W46	4444	11	1		2001	2.10				
CLIMAX	10	2024	2128	2040	S11	W50	4445	64	2		2040	7.00				
HAWAII	10	2026	2052	2032	S14	W50	4445	26	2	2	2032	4.30	6.70			
USNRL	10	2028	2128 D	2030	S12	W48	4445	60 D	1&	2	2030	3.06	4.50	1.00	104	G-SWF
SAC PEAK	10	2040 E	2041 D		S10	W50	4445	1 D	1	2		3.90			20	
HAWAII	11	0030 E	0042 D	0034	N11	E02	4449	12 D	1	1	0034	3.30	3.50			
UCCLE	11		0837		N29	W85	4443		2	3	0833	4.00	8.00			G-SWF
UCCLE	11	0902	0906	0902	N35	W55	4444	4	1	3	0902	1.50	3.00			
UCCLE	11	0918	0927 D	0923	N10	E20	4453	9	1	3	0923	2.00	2.20			
ONDREJOV	11	0918	0929 D		N09	E18	4453	11 D	1	2	0923			2.60		
MITAKA	11	2352 E	2400		S19	W62	4445	8 D	1&	2	2358	2.78	5.93	1.35		
MITAKA	12	0024	0233	0037	N08	E02	4449	129	2&	2	0044	7.63	7.95	2.29	227	
MITAKA	12	0027 E	0032 D		N10	W04	4449	5 D	1	2	0029	.89	.93		115	G-SWF
MITAKA	12	0043 E	0128 D		N10	W04	4449	45 D	1	2	0044	4.70	4.89	1.90	120	
UCCLE	12	0914	0930	0916	N14	E18	4453	16	1&	4	0916	4.00				
UCCLE	12	0943 E	0947	0944	N15	E70	4456	4 D	1&	4	0944	3.40	4.70			
UCCLE	12	0943	0959	0945	N12	E15	4453	16	2	4	0945	5.60				
UCCLE	12	1110	1122	1113	N15	E03	4449	12	1	4	1113	2.20				
UCCLE	12	1127	1159	1131	N15	E70	4456	32	1&	4	1131	3.40	5.10			
UCCLE	12	1128	1200	1158	N32	W80	4444	32	2	4	1158	5.60	8.90			
UCCLE	12	1132	1157	1137	N23	W50	4446	25	2	4	1137	4.50	5.60			
UCCLE	12	1138	1200 D	1148	N12	E15	4453	22	1	4	1148	3.40				
USNRL	12	1436 E	1531	1441	S20	W69	4445	55 D	2&	2	1441	2.04	5.50	2.00	162	
MCMATH	12	1440 E			S15	W65	4445		2							Slow S-SWF
MITAKA	13	0018 E	0034 D		N10	E78	4456	16 D	1	1	0034	.89	1.22	3.23		
HAWAII	13	0020	0032 D		N00	E90	4461	12 D	1	1	0020	1.00				Slow S-SWF
ONDREJOV	13	1053 E	1058		N12	E02	4453	5 D	1	3	1055			2.40		
HAWAII	13	2216	2300	2220	N19	W01	4453	44	1	1	2220	4.00	4.50			
MITAKA	14	0246 E	0320		N10	W08	4453	34 D	1	1	0251	2.78	2.89	2.10	107	

COMMERCE — STANDARDS — BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. MER. DIST.	McMATH PLAGE REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
NIZAMIAH	Mar. 1958 14	0442	0458	0446	N09	W11	4453	16	1	3	0446	3.04	3.22	1.60		
MITAKA	14	0456 E	0512	0500	N11	W12	4453	16 D	1&	1	0502	11.40	11.80	1.84	131	
AROSA	14	0846	0910		N08	W18	4449	24	1							
AROSA	14	0920	0941		N08	W19	4449	21	2							
ZURICH	14	0948 E	1100 D		N11	W13	4453	72 D	2	1	948		7.00			
UCCLE	14	1000 E	1029	1018	N10	W25	4449	29	1	4	1018	2.20				
AROSA	14	1013	1036		N06	W26	4449	23	1							
UCCLE	14	1013	1100	1021	N10	W15	4453	47	1&	3	1021	4.50				
AROSA	14	1023	1043		N08	W20	4449	20	1							
UCCLE	14	1136	1200 D	1143	N10	W15	4453	24	1	3	1143	2.20				
ZURICH	14	1301 E	1325 D		N11	W15	4453	24 D	2	1	1320		6.00			
R O HERST	14	1504 E	1530	1507	N11	W90	4446	26 D	1	2	1507	.50				Slow S-SWF
ONDREJOV	14	1518 E	1541 D		S23	W80	4445	23 D	3	1	1518			2.20		
UCCLE	15	0822	0850	0831	N12	W25	4453	28	1&	4	0831	4.00	4.40			
UCCLE	15	0834	0841	0835	N37	E58	4460	7	1	4	0835	1.00	2.00			
ZURICH	15	1010 E	1028		N10	W25	4453	18 D	1	2	1010		3.00			
UCCLE	15	1030	1033	1030	N12	W25	4453	3	1	4	1030	2.00	2.00			
UCCLE	15	1208	1235	1219	N36	E65	4460	27	1	2						
UCCLE	15	1342	1347	1344	N13	W27	4453	5	1	4	1344	3.50	3.70			
ZURICH	15	1345	1346		N10	W25	4453	1	1	2	1345		1.00			
ONDREJOV	15	1541 E	1547		N11	W27	4453	6 D	1	2	1541			2.20		Slow S-SWF
UCCLE	15	1542 E	1547	1542	N13	W27	4453	5	1	2	1542	2.00	2.30			
UCCLE	16	0839	0850	0841	N13	W41	4453	11	2	4	0841	4.50	6.30			
UCCLE	16	0840	0848	0842	N14	E32	4456	8	1&	4	0842	3.60	4.50			
ZURICH	16	0840 E	0905		N17	E56	4461	25 D	1	2	840		2.00			
UCCLE	16	0851	0930	0918	N15	E30	4456	39	1&	4	0918	4.50	5.60			
ZURICH	16	0857	0902		N13	E29	4456	5	1	2	857		2.00			
AROSA	16	0950	0955		N27	W90	4446	5	1							
AROSA	16	1358	1412		N12	E25	4456	14	1							
NIZAMIAH	17	0438	0453	0444	N10	E18	4456	15	1&	3	0444	4.86	5.34	2.00		
ZURICH	17	0804 E	0817		N15	W71	4449	13 D	1	2	804		2.00			
ZURICH	17	0804 E	0909 D		N20	E71	4465	65 D	2	2	804		6.00			
UCCLE	17	0819 E	0825		N25	E85	4465	6 D	1&	3						
R O HERST	17	0938 E	0948 D	0938 E	N23	E70	4465	10 D	1	1	0938	.60	2.10			
WENDEL	17	1006 E	1116 D		N23	E77	4465	70 D	1				3.00			
WENDEL	17	1008	1054		N10	E15	4456	46	1&				7.00			
AROSA	17	1008	1120		N10	E16	4456	72	2							
UCCLE	17	1011	1144	1025	N11	E15	4456	33	1&	4	1025	6.00	6.00			
NIZAMIAH	17	1027 E	1043	1030	N10	E18	4456	16 D	1	3	1030	3.65	4.00	1.80		
WENDEL	17	1153 E	1220		N23	E77	4465	27 D	1				4.00			
WENDEL	17	1215	1238		N35	E32	4460	23	1&				5.00			
WENDEL	17	1314	1336 D		N23	E73	4465	22 D	1				3.00			
UCCLE	17	1515 E	1535	1515	N23	E80	4465	20 D	1	3	1515	1.50	3.50			
OTTAWA	17	1516			N22	E68	4465		1	1	1517	.64	2.14			
USNRL	17	1516	1559	1518	N23	E70	4465	43	1	2	1518	.51	1.81	1.00	102	
USNRL	17	1516 E	1550		N13	E10	4456	34 D	1	1	1518	1.02	1.09	1.00	109	
UCCLE	18	0804	1125	0835	N22	E60	4465	201	2	4	0835	6.80				
UCCLE	18	0805	0824 D	0810	N18	E35	4465	19 D	1&	4	0810	3.40	4.20			
UCCLE	18	0810	0834	0825	N09	W70	4453	24	1	4	0825	2.80				
UCCLE	18	0922	0930	0927	N13	W80	4453	8	1	4	0927	2.20				

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE Mar. 1958	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX. PHASE	LOCATION APPROX. LAT.	LOCATION APPROX. MER. DIST.	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
UCCLE	18	1145	1201 D	1155	N22	E60	4465	16 D	1&	4	1155	3.40				
HUANCAYO	18	1905 E	1955 D	1948	N22	E53	4465	50 D	1&	2						G-SWF
MITAKA	19	0300 E	0332 D	0309	N23	E48	4465	32 D	1&	1	0321	13.40	25.90	2.09	120	
ATHENS	19	0730 E	0750 D		N48	W60		20 D	1	3		.60	2.40			
UCCLE	19	0956 E			N24	E48	4465			1						
UCCLE	19	0956 E			N14	W13	4456			1						
MEUDON	19	1022	1140		N12	W13	4456	78	1				4.00			
UCCLE	19	1027 E	1032 D		N12	W11	4456	5 D	1	1	1028	2.10	2.10			
CAPRI S	19	1045 E	1125 D		N11	W12	4456	40 D	1	2	1050	2.40	2.50			
AROSA	19	1114 E	1120		N24	E39	4465	6 D	1							
AROSA	19	1114 E	1140		N12	W15	4456	26 D	2							
UCCLE	19	1117 E	1135 D		N12	W11	4456	18 D	1&	1	1125	4.50	4.50			
MT WILSON	19	1910	1931		N14	W18	4456	21	1							
MT WILSON	19	2137	2152		N22	E40	4465	15	1							
ONDREJOV	20	0656 E	0706		N24	E56	4469	10 D	1	2	0700			2.00		S-SWF
UCCLE	20	0723	0802	0752	N22	E35	4465	39	2	4	0752	7.90				
UCCLE	20	0758	0801	0759	N21	E32	4465	3	2	3	0759	5.10	5.40			
UCCLE	20	0723	0955	0726	N25	E65	4469	152	1	4	0726	2.80	3.40			
UCCLE	20	0726	0737	0730	N13	W28	4456	11	1	4	0730	2.20				
UCCLE	20	0825	0848	0828	N40	W88	4453	23	1&	3	0828	3.40	5.80			
UCCLE	20	0828	0900	0838	N22	E35	4465	32	2	4	0838	5.60				
UCCLE	20	0850	0920	0855	N20	E25	4465	30	1	4	0855	2.20				
MEUDON	20	0905	0955		N25	E25	4465	50	1							
UCCLE	20	0907	0957	0920	N23	E35	4465	50	1&	4	0920	6.20				
MEUDON	20	0959	1030		N23	E43	4469	31	1&							
UCCLE	20	1127 E	1144 D		N23	E35	4465	17 D	1	2		3.40				
MEUDON	20	1259	1330		N25	E28	4465	31	2							G-SWF
NEDERHORST	20	1305 E	1320		N23	E29	4465	15 D	2							
MEUDON	20	1314	1344		N18	W30	4456	30	1							
UCCLE	20	1324 E	1356		N23	E35	4465	32 D	1&	3		4.50				
UCCLE	20	1324 E	1356	1325	N20	W32	4456	32 D	1	2		2.20				
SAC PEAK	20	1445	1545	1457	N22	E26	4465	60	1&	2		4.10			24	
MEUDON	20	1452	1550		N25	E28	4465	58	1&							
MCMATH	20	1455 E			N24	E29	4465		2							S-SWF
R O EDIN	20	1510 E	1552 D		N23	E29	4465	42 D	2	1	1517	5.00	6.70	1.71		
UCCLE	20	1535 E	1538 D		N23	E33	4465	3 D	1&	2		4.50				
SAC PEAK	20	1825	1930	1915	N23	E25	4465	65	1	2		2.70			15	
SAC PEAK	20	2025	2130	2045	N22	E23	4465	65	2	2		5.40			24	S-SWF
SAC PEAK	20	2230	2315 D	2255	N22	E22	4465	45 D	1	2		3.80			16	
UCCLE	21	1019	1050	1022	N17	E21	4465	31	2	2	1022	5.50	5.50			
KODAIKNL	21	1021 E	1040 D	1022	N20	E20	4465	19 D	1&	2	1030	3.90	4.70	4.00	154	
R O EDIN	21	1027 E	1044		N22	E17	4465	17 D	2	1	1031	6.00	7.20	2.00		S-SWF
NIZAMIAH	21	1040 E			N	E	4465		1	1				1.80		
CAPRI S	21	1413	1432 D		N23	E14	4465	19 D	1	1	1415	2.00	2.20			S-SWF
SAC PEAK	21	1850	1937 D	1857	N22	E12	4465	47 D	1&	2		4.10			24	
HAWAII	21	1852	1920	1902	N23	E07	4465	28	1&	3	1902	4.10	4.80			Slow S-SWF
MCMATH	21	1900 E	1925		N22	E12	4465	25 D	2							
UCCLE	22	0925 E	1129	0944	N18	W60	4456	124 D	1	2	0944	2.20	2.60			
UCCLE	22	1123 E	1155	1130	N22	E05	4465	32 D	1&	2	1130	4.50				G-SWF
MEUDON	22	1125	1150		N20	E07	4465	25	1							

PAGE 5

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
					APPROX.		McMATH									
	Mar. 1958	START	END	MAX. PHASE	LAT.	MER. DIST.	PLAGE REGION	— MINUTES			TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
MEUDON	22	1147	1201		S20	E90	4478	14	1							
MEUDON	22	1210	1230		S12	E90	4476	20	1							
WENDEL	23	0844	0857		N13	W68	4456	13	1				3.00			
UCCLE	23	0950	1200 D	1005	S15	E80	4476	130 D	3&	4	1005	29.00	64.00			
CAPRI S	23	0950	1211		S14	E75	4476	141	3&	3	1028	8.00	32.00			
WENDEL	23	0950	1358 D		S14	E76	4476	248 D	3&				25.00			
MOSCOW	23	0951 E	1102 D	1010	S25	E67	4476	71 D	3&							
SCHAUINS	23	0957 E	1137 D		S13	E78	4476	100 D	3&							S-SWF
ZURICH	23	1005	1055		S12	E76	4476	50	3	2						
MEUDON	23	1009 E	1119		S09	E80	4476	70	3							
UCCLE	23	1012	1200 D	1016	S12	E85	4476	108 D	2	4						
NIZAMIAH	23	1016 E	1027 D	1018	S18	E60	4476	11 D	2	1	1018	5.47	10.61	3.60		
WENDEL	23	1056	1329		S16	E73	4476	153	1&				5.00			
AROSA	23	1105 E	1200 D		S14	E83	4476	55 D	2							
ZURICH	23	1215 E	1319 D		S14	E73	4476	64 D	2&	1	1215		10.00			
USNRL	23	1216 E	1227		S13	E75	4476	11 D	2	2	1218	2.04	6.51	2.00	85	
ZURICH	23	1227	1252		N23	W12	4465	25	1	1	1227		2.00			
NEDERHORST	23	1258 E	1415		S20	E88	4478	77 D	2							
NEDERHORST	23	1258 E	1415		S12	E90	4476	77 D	2							
HAWAII	23	1826	1838	1828	N12	W85	4456	12	1	2	1828	1.50	3.10			S-SWF
HAWAII	24	0048	0052 D	0048	N23	W01	4469	4 D	1	1	0048	2.10	2.40			
AROSA	24	0655 E	0703		N17	W26	4465	8 D	1							
AROSA	24	0713	0726		N17	W26	4465	13	1							
UCCLE	24	0717	0731	0720	N20	W26	4465	14	1	4	0720	2.20				
UCCLE	24	0731	0740	0734	S17	E72	4476	9	1	4	0734	2.20	3.10			
UCCLE	24	0745	0756	0746	S17	E72	4476	11	1&	4	0746	3.40	4.80			
UCCLE	24	0748	0823	0759	N21	W27	4465	35	1	4	0759	3.40				
WENDEL	24	0749	0827		N20	W25	4465	38	1				3.00			
ZURICH	24	0758 E	0825		N20	W26	4465	27 D	1&	2	758		3.00			S-SWF
UCCLE	24	0756	0803	0758	S22	E88	4478	7	2	4	0758	3.40	6.80			
ZURICH	24	0758 E	0834		S16	E65	4476	36 D	1	2	758		4.00			
AROSA	24	0800 E	0817		N17	W27	4465	17 D	1							
WENDEL	24	0810	0831		S17	E66	4476	21	1				4.00			
UCCLE	24	0811	0830	0822	S17	E72	4476	19	1	4	0822	2.20	3.00			
AROSA	24	0813	0828		S16	E66	4476	15	1							
UCCLE	24	0917	0925		S17	E72	4476	8	1	4		2.20	3.00			
ZURICH	24	0953	1020		S16	E64	4476	27	1	2	953		4.00			
WENDEL	24	0954 E	1014 D		S17	E64	4476	20 D	1				3.00			
UCCLE	24	0955	1007		S17	E72	4476	12	1	4		2.20	3.00			
UCCLE	24	1045	1056	1047	S22	E88	4478	11	2	4	1047	3.40	6.80			
ONDREJOV	24	1051 E	1055		S21	E81	4478	4 D	1	2	1052			2.20		
ONDREJOV	24	1110	1119 D		S16	E57	4476	9 D	1	2	1114			2.50		
AROSA	24	1110 E	1124		S16	E55	4476	14 D	1							
WENDEL	24	1110 E	1140		S15	E57	4476	30 D	1				3.00			
UCCLE	24	1111	1122	1117	S15	E61	4476	11	1&	4	1117	3.40	4.30			
UCCLE	24	1138	1200	1145	N20	W30	4465	22	1	4	1145	2.20				
WENDEL	24	1139	1157		N19	W27	4465	18	1				3.00			
AROSA	24	1238	1242 D		N17	W29	4465	4 D	1							
WENDEL	24	1311 E	1338 D		N19	W28	4465	27 D	1				2.00			
AROSA	24	1313	1322		N17	W30	4465	9	1							
UCCLE	24	1355	1404	1400	S22	E80	4478	9	1	4	1400	1.20	2.40			
WENDEL	24	1607 E	1632 D		S17	E60	4476	25 D	1				4.00			G-SWF

JIII

COMMERCE — STANDARDS — BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. MER. DIST.	McMATH PLAGE REGION				TIME U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
MT WILSON	24	1614 E			S13	E56	4476		1							
UCCLE	24	1635	1643	1638	S15	E55	4476	8	1b	4	1638	3.40	4.10			
SAC PEAK	24	1734 E	1737	1734 E	N20	W32	4465	3 D	1	2		3.00				
HAWAII	24	2012	2028	2016	S14	E58	4476	16	1	2	2016	1.80	3.30		15	G-SWF
HAWAII	24	2208	2224	2210	N25	W16	4465	16	1	3	2210	3.30	4.00			G-SWF
HAWAII	24	2306	0006	2320	S18	E60	4476	60	1b	2	2320	3.10	5.90			
NIZAMIAH	25	0347	0354	0349	S13	E51	4476	7	1	2	0349	1.52	2.38	1.60		Slow S-SWF
NIZAMIAH	25	0529 E	0555	0530	N18	E22	4474	26 D	2	2	0530	7.29	8.74	2.30		
KODAIKNL	25	0538 E	0547 D		N15	E25	4474	9 D	1b	1	0538	5.50	6.60	2.00	154	S-SWF
NIZAMIAH	25	0557 E	0626	0603	S13	E51	4476	29 D	2	2	0603	4.86	7.62	2.50		
ONDREJOV	25	0605 E	0622		S18	E50	4476	17 D	2	3	0605			2.60		S-SWF
ONDREJOV	25	0823	0828	0825	N20	W40	4465	5	1	3	0825			2.20		
WENDEL	25	0823	0841		N18	W37	4465	18	1							
ZURICH	25	0830 E	0841		N20	W41	4465	11 D	1	1	830		3.00			
AROSA	25	0835 E	0844		N17	W39	4465	9 D	1				1.00			
ONDREJOV	25	0848	0851		S24	E60	4478	3	1	3	0850			2.60		
AROSA	25	0848	0853		S25	E60	4478	5	1	1	859		1.00			
ZURICH	25	0859	0905		S25	E63	4478	6	1							
AROSA	25	0905	0912		S12	E52	4476	7	1							
ROME	25	1032	1045		S15	E43	4476	13	1							
UCCLE	25	1048	1101		N40	W90	4460	13	1	3			3.00			
WENDEL	25	1056 E	1118		S09	E49	4476	22 D	1				3.00			
WENDEL	25	1056 E	1122		N23	W09	4469	26 D	1							
ONDREJOV	25	1124 E	1127		S18	E63	4478	3 D	1	3	1125			2.20		
WENDEL	25	1151	1252		N37	W68	4460	62	1b				7.00			
UCCLE	25	1202	1214 D		N35	W85	4460	12 D	1	2						
WENDEL	25	1411	1435 D		N19	W42	4465	24 D	1b				5.00			
UCCLE	25	1414	1428	1415	N21	W44	4465	14	1	2	1415	2.00	2.80			
OTTAWA	25	1418 E			N19	W42	4465		1b	1	1418	1.80	2.66			G-SWF
ONDREJOV	25	1418 E	1430		N19	W42	4465	12 D	1	3	1420			2.20		
WENDEL	25	1449	1556		S15	E49	4476	67	1b				6.00			
OTTAWA	25	1454	1605		S14	E46	4476	71	1b	1	1503	1.91	2.78			
ONDREJOV	25	1457 E	1538		S15	E47	4476	42 D	1b	3	1458			2.40		
NEDERHORST	25	1502 E	1600		S13	E46	4476	58 D	2							
CAPRI S	25	1509 E	1522 D		S14	E47	4476	13 D	1	1	1510	1.80	3.20			Slow S-SWF
UCCLE	25	1513 E	1533 D	1520	S15	E50	4476	20	2	2	1520	5.00	7.00			
SAC PEAK	25	1519 E	1605 U	1519 E	S15	E47	4476	46 D	1	2		2.20				
ROME	25	1708	1725		S15	E44	4476	17	1						19	
SAC PEAK	25	1715 E			S17	E47	4476		1b	2		3.30			17	Slow S-SWF
ROME	25	1818	1830		N37	W75	4460	12	1							G-SWF
HAWAII	26	0036 E	0040 D	0036	N21	W50	4465	4 D	1	1	0036	2.10	3.90			
AROSA	26	0750 E	0755 D		N22	E12	4474	5 D	1							
MT WILSON	26	1652	1712		N18	E00	4474	20	1							
MT WILSON	26	1742	1755		S19	E32	4476	13	1							
MT WILSON	26	1754	1805		S08	E06	4476	11	1							
MT WILSON	26	1815	1827		N10	W48	4467	12	1							G-SWF
OTTAWA	26	1930		1945	S29	W01	4476		1							
OTTAWA	26	2046	2106	2049	S05	E31	4476	20	1	4	1945	1.80	1.96			
OTTAWA	26	2142			S17	E28	4476		1	3	2049	2.26	2.66			
SAC PEAK	26	2327	2410 D	2339	S18	E29	4476	43 D	2	3	2155	1.80	2.08			
HAWAII	26	2330	0020	2340	S18	E28	4476	50	2	2		10.20				
NIZAMIAH	27	0537 E	0549	0542	N24	W58	4465	12 D	1	2	2340	5.40	6.20		25	S-SWF
										2	0542	1.22	2.79	1.70	7	

PAGE

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. MER. DIST.	McMATH PLAGE REGION				TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
ZURICH	Mar. 27 1958	0823	0850		S19	E25	4476	27	1	2	823		2.00			
AROSA	27	0835 E	0843		N22	W67	4465	8 D	1							
ZURICH	27	0835	0846		N23	W54	4465	11	1	2	835		.20			
WENDEL	27	0905	0917	0908	S24	E43	4478	12	1				4.00			
WENDEL	27	0907	0920 D		S30	E34	4478	13 D	1				3.00			
WENDEL	27	1016 E	1026		N22	W65	4465	10 D	1				4.00			
UCCLE	27	1029 E	1040	1033	N16	W09	4474	11 D	1	4	1033	1.50	1.50			
WENDEL	27	1030	1044		N15	W07	4474	14	1				3.00			
ONDREJOV	27	1031	1035		N24	W41	4469	4	1	3	1032			2.10		
ONDREJOV	27	1037 E	1047		N15	W09	4474	10	1	3	1040			2.10		
WENDEL	27	1042	1116		N23	W69	4465	34	2&				14.00			
AROSA	27	1045	1108		N22	W69	4465	23	1							
UCCLE	27	1045	1113		N25	W80	4465	28	2	4		3.00	6.40			
ONDREJOV	27	1046 E	1107	1054	N22	W62	4465	21 D	1&	3	1054			3.30		
UCCLE	27	1104 E	1109		N22	W72	4465	5 D	1&	3		2.20	4.40			
ONDREJOV	27	1110	1115		S14	E80	4480	5	1	3	1112			2.00		
WENDEL	27	1159	1212		S23	W56	4470	13	1				4.00			
NEDERHORST	27	1201 E	1210		N23	W57	4465	9 D	1							
ONDREJOV	27	1201	1211	1202	N24	W58	4465	10	1&	3	1202			4.20		S-SWF
OTTAWA	27	1318	1335	1322	S18	E22	4476	17	1&	3	1322	3.31	3.65			
ONDREJOV	27	1319	1326	1321	S18	E23	4476	7	1	3	1321			2.10		
WENDEL	27	1319	1332		S18	E21	4476	13	1				4.00			
ONDREJOV	27	1417	1428	1419	N23	W66	4465	11	1	3	1419			2.00		
ONDREJOV	27	1510 E	1515 D		S23	E38	4478	5 D	1	3						
ONDREJOV	27	1510 E	1517		S28	E29	4478	7 D	1	3	1512			1.90		
SAC PEAK	27	1535	1705	1557 U	S16	E22	4476	90	2&	2		10.20			2&	
OTTAWA	27	1536	1710		S17	E23	4476	94	2	3	1555	4.47	4.93			S-SWF
ONDREJOV	27	1537	1620 D	1552	S15	E23	4476	53 D	2	3	1552			3.00		
ONDREJOV	27	1545 E	1616		S19	E30	4476	31 D	2	3	1547			2.60		
OTTAWA	27	1702	1726	1705	S23	E37	4478	24	1&	3	1705	2.32	3.01			S-SWF
SAC PEAK	27	1937	1945	1940	N22	W79	4465	8	1	2		2.50			1&	
OTTAWA	27	1938		1941	N19	W75	4465		1&	3	1941	2.32				
SAC PEAK	27	2147	2212	2157 U	N27	W78	4465	25	2	2		7.50			17	
HAWAII	27	2150	2210	2156	N28	W85	4465	20	2&	1	2156	8.70				
AROSA	28	0645 E	0700		S07	W06	4476	15 D	1							
UCCLE	28	0805 E	0817	0814	S25	E31	4478	12 D	2	2	0805	5.10	5.60			
AROSA	28	0807	0819		S24	E25	4478	12	1							
ZURICH	28	0809	0832		S25	E30	4478	23	1	3	809		2.00			
WENDEL	28	0812 E	0833		S23	E27	4478	21 D	1&				5.00			
ZURICH	28	0842	0903		S24	E23	4478	21	1	3	842		3.00			
ZURICH	28	0843	0906		S22	E29	4478	23	1	3	843		1.00			
AROSA	28	0845 E	0855		S24	E25	4478	10 D	1							
UCCLE	28	0916 E	0940 D	0921	N20	W88	4465	24 D	2	4	0921	3.40	6.80			
WENDEL	28	0919 E	0934 D		N22	W80	4465	15 D	1&				6.00			
AROSA	28	0955 E	1015		S14	E13	4476	20 D	1							
AROSA	28	1000	1020		N22	W84	4465	20	1							S-SWF
UCCLE	28	1012 E	1035	1016	S15	E13	4476	23 D	1	2	1016	3.40				
UCCLE	28	1012 E	1100 D	1043	S25	E25	4478	48 D	2	2	1043	6.80				
AROSA	28	1032	1106		S25	E24	4478	34	2							
STOCKHOLM	28	1033	1114		S22	E28	4478	41	2&							
UCCLE	28	1034 E	1052	1038	S25	E30	4478	18 D	2	2	1038	7.90				S-SWF
CAPRI S	28	1035 E	1055 D		S23	E24	4478	20 D	1&	2	1052	3.80	4.60			
ZURICH	28	1045 E	1114 D		S24	E20	4478	29 D	2	3	1045		6.00			

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE Mar. 1958	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	APPROX. 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
ZURICH	28	1045 E	1114 D		S24	E28	4478	29 D	1	3	1045		3.00			
WENDEL	28	1145 E	1155		N27	W58	4469	10 D	1				3.00			
AROSA	28	1151	1237		S14	E12	4476	46	1							
UCCLE	28	1153	1226	1211	S15	E10	4476	33	2	2	1211	5.60				S-SWF
WENDEL	28	1156	1220		S15	E13	4476	24	1				4.00			
UCCLE	28	1200	1233 D	1218	S20	E20	4478	33 D	1	2	1218	3.40				
USNRL	28	1224 E	1437		S15	E12	4476	13 D	1&	2	1227	3.96	4.10	1.00	106	
AROSA	28	1304	1312 D		N32	E90	4484	8 D	1							
UCCLE	28	1428	1437	1430	N20	W88	4465	9	1&	3	1430	2.20	4.40			
WENDEL	28	1429	1439		N22	W85	4465	10	1				3.00			
SAC PEAK	28	1510	1535	1517	N27	W90	4465	25	1	2		2.30			14	
USNRL	28	1547	1622	1548	S06	W12	4476	35	1	2	1548	1.13	1.16	1.00	115	
MCMATH	28	1550 E	1610		S04	W15	4476	20 D	2							G-SWF
WENDEL	28	1552 E	1608		S07	W11	4476	16 D	1				4.00			
OTTAWA	28	1707 E		1715	S15	E10	4476		2&	3	1715	7.37	7.59			
USNRL	28	1709 E	1822	1714	S15	E08	4476	73 D	2&	2	1714	5.20	5.33	2.00	143	S-SWF
USNRL	28	1722	1904	1724	S15	E08	4476	102	1&	2	1724	3.17	3.26		124	
OTTAWA	28	1725	1820	1740	N15	W25	4474	55	1&	3	1738	4.18	5.03			
MCMATH	28	1735 E			N20	W20	4474		1							
USNRL	28	1736	1813	1737	N15	W27	4474	37	1	2	1737	2.26	2.76	1.00	80	
MCMATH	28	1735			S15	E10	4476		3							
OTTAWA	28	1833	1916	1838	N19	W80	4465	43	1	2	1838	1.62				S-SWF
USNRL	28	1834	1922	1838	N21	W90	4465	48	2	2	1838	1.58		2.00	102	
OTTAWA	28	2042	2131	2049	S22	E20	4478	49	2	4	2049	5.68	6.37			S-SWF
USNRL	28	2044	2120 D	2045	S23	E23	4478	36 D	1&	2	2045	3.39	5.05	2.00	106	
SAC PEAK	28	2054 E	2055 D	2054 E	S25	E20	4478	1 D	2	1		5.30			25	
SAC PEAK	28	2227	2245	2240	N24	W90	4465	18	1	1		2.70			20	
SAC PEAK	28	2237	2308	2242	S14	E03	4476	31	1	1		2.50			20	
MITAKA	29	0208	0215 D	0208	S14	E01	4476	7 D	1	1	0208	2.78	2.81	2.36	149	
MITAKA	29	0244 E	0250 D		N21	W90	4469	6 D	1	1	0244	1.86		3.75		
AROSA	29	0640 E	0652		N33	E90	4484	12 D	1							
AROSA	29	0648	0703		S15	E58	4480	15	1							
AROSA	29	0652	0708		N24	W48	4469	16	1							
WENDEL	29	0730	0736 D		N25	W58	4469	6 D	1&				5.00			
MEUDON	29	0735 E	0748		N27	W60	4469	13 D	1&				10.00			
ZURICH	29	0755 E	0806		S09	W24	4476	11 D	1	2	755		2.00			
ZURICH	29	0755 E	0812		S22	E18	4478	17 D	1	2	755		2.00			
ZURICH	29	0759	0816 D		N25	W67	4469	17 D	1&	2	759		4.00			
ZURICH	29	0853 E	0909		S17	W03	4476	16 D	1	2	853		1.00			
AROSA	29	0912	1012	0923	N22	W30	4474	60	2							
MEUDON	29	0915	1010		N19	W30	4474	55	1&				6.00			
WENDEL	29	0919	1008 D		N22	W30	4474	49 D	1&				7.00			
ZURICH	29	0920 E	1018 D		N18	W31	4474	58 D	2	2	922		6.00			
CAPRI S	29	0921 E	0955 D		N21	W29	4474	34 D	1	2	0941	2.50	3.00			
UCCLE	29	0921	1001	0934	N25	W30	4474	40	1&	3	0934	4.00	5.20			
STOCKHOLM	29	0950 E	1019 D		N20	W30	4474	29 D	1							
ONDREJOV	29	0953 E	1028 D		N19	W30	4474	35 D	1	2	1001			2.50		
AROSA	29	1031	1043		S06	W04	4476	12	1							
UCCLE	29	1032	1040		S06	W02	4476	8	1	2		2.00	2.00			
ONDREJOV	29	1033 E	1040	1035	S10	W03	4476	7 D	1	3	1035			2.70		
WENDEL	29	1034	1047		S06	E00	4476	13	1				4.00			
AROSA	29	1055	1100		N33	E70	4484	5	1							
ONDREJOV	29	1217 E	1227		S25	E19	4478	10 D	1	3	1222			2.80		S-SWF
														PAGE	9	

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE	OBSERVED UNIVERSAL TIME			LOCATION			DURATION	IMPORTANCE	OBS. COND.	MEASUREMENTS					PROVISIONAL IONOSPHERIC EFFECT
		START	END	MAX. PHASE	APPROX. LAT.	APPROX. MER. DIST.	McMATH PLAGE REGION	MINUTES			TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	
	Mar. 1958															
WENDEL	29	1218	1235		S23	E15	4478	17	1				3.00			
OTTAWA	29	1339	1405	1343	N38	E76	4484	26	1&	3	1343	2.38				
ONDREJOV	29	1340 E	1357	1346	N36	E73	4484	17 D	2&	3	1346			11.20		S-SWF
WENDEL	29	1340	1400		N33	E80	4484	20	1&				6.00			
NEDERHORST	29	1343 E	1407		N32	E78	4484	24 D	2							
WENDEL	29	1345	1421 D		S19	E90	4483	36 D	1&				5.00			
OTTAWA	29	1353	1408	1357	S17	E82	4483	15	1	3	1357	1.57				
ONDREJOV	29	1356 E	1404	1357	S16	E83	4483	8 D	1&	3	1357			4.00		
SAC PEAK	29	1401 E	1420	1401 E	S18	E85	4483	19 D	1	1		2.50			20	
OTTAWA	29	1406	1421	1409	S14	E55	4480	15	1	3	1409	1.22	2.16			
WENDEL	29	1407	1421 D		S15	E59	4480	14 D	1				3.00			
ONDREJOV	29	1410	1416	1413	S16	E59	4480	6	1	3	1413			3.50		
ONDREJOV	29	1439 E	1444		S15	W00	4476	5 D	1	3	1440			2.20		
OTTAWA	29	1448 E	1502		N25	W67	4469	14 D	1	1	1448	1.62				
USNRL	29	1449	1507	1450	N27	W70	4469	18	1	2	1450	.79	2.83		95	S-SWF
MCMATH	29	1450 E			N27	W60	4469		1							
ONDREJOV	29	1450 E	1458		N23	W72	4469	8 D	1	3	1451			3.00		
ONDREJOV	29	1507 E	1512		S10	W09	4476	5 D	1	3	1510			2.00		
SAC PEAK	29	1547	1637	1607	S17	W11	4476	50	1	1		2.40			16	
USNRL	29	1547	1640	1557	S15	W10	4476	53	1	2	1557	2.04	2.11		98	
ONDREJOV	29	1552 E	1617 D		S15	W07	4476	25 D	1	3	1554			2.50		
SAC PEAK	29	1820	1910	1822	S23	E08	4478	50	1&	1		3.90			30	
HAWAII	29	1822	1840	1822	S32	E05	4478	18	1	1	1822	2.50	2.70			S-SWF
MCMATH	29	1825 E			S11	W05	4476		2							
HAWAII	29	2132 E	2134 D	2134	N38	E87	4484	2	1&	1	2134	2.50	5.00			S-SWF
SAC PEAK	29	2133 E	2150	2133	N36	E85	4484	17 D	1&	1		3.60			32	
MITAKA	30	0021 E	0046	0022	S08	W13	4476	25 D	1	1	0029	.97	1.00	3.47	165	Slow S-SWF
MITAKA	30	0102 E	0109 D		N36	E67	4484	7 D	2	1	0109		8.00			S-SWF
MITAKA	30	0149	0200 D		S08	W14	4476	11 D	1	1	0150	1.84	1.90	1.97	115	
MITAKA	30	0152 E	0203	0156	N36	E66	4484	11 D	1&	1	0156	1.84	5.88	2.75	165	
MITAKA	30	0215 E	0229	0217	N36	E66	4484	14 D	1&	1	0216	.89	2.85	2.87	183	
MITAKA	30	0221	0235 D		S06	W11	4476	14 D	1	1	0225	3.71	3.78	1.74	110	
MITAKA	30	0401 E	0415 D	0408	S08	W07	4476	14 D	1&	1	0408	1.84	2.76	1.87	183	
MITAKA	30	0456 E	0509 D	0458	N36	E65	4484	13 D	1&	1	0459	1.84	5.88	4.73	165	S-SWF
ATHENS	30	0606	0628		N36	E62	4484	22	1	3		1.00	3.50			
AROSA	30	0655	0702		N34	E67	4484	7	1							
ATHENS	30	0656	0718		N36	E62	4484	22	1	3		.60	2.10			
AROSA	30	0755 E	0806		N14	W47	4474	11 D	1							
WENDEL	30	0755 E	0812		N14	W47	4474	17 D	1				4.00			
UCCLE	30	0811 E	0827	0815	S18	E43	4480	16 D	1	4	0815	2.80	3.10			
MOSCOW	30	0817 E	0846 D	0846	N30	E60	4484	29 D	2&							
AROSA	30	0820	0830		S15	W10	4476	10	1							
WENDEL	30	0842	0851		N34	E69	4484	9	1&				5.00			
UCCLE	30	0842	0853	0844	N35	E80	4484	11	2	4	0844	4.50	7.60			S-SWF
AROSA	30	0843	0850		N34	E66	4484	7	1							
UCCLE	30	0850	1000	0915	S23	W12	4478	70	2	4	0915	5.60				
SCHAUINS	30	0915 E	1330		S14	W21	4476	255 D	2							
ZURICH	30	0938 E	0958		N36	E69	4484	20 D	1	3	938		4.00			
ZURICH	30	0941	0944	0941	N23	W68	4469	3	1	3	941		2.00			
WENDEL	30	0944	1106		S12	W16	4476	82	1&				8.00			
WENDEL	30	0944	1230		S16	W19	4476	166	2&				14.00			
ZURICH	30	0945	1042	0959	S18	W20	4476	57	1	3	959		5.00			
UCCLE	30	0945	1421	0957	S17	W22	4476	276	2&	4	0957	6.80				S-SWF

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

MARCH 1958

OBSERVATORY	DATE Mar. 1958	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
ZURICH	30	0952	1042	1002	S11	W18	4476	50	1	3	1002		3•00			
AROSA	30	1000 E	1100		S18	W21	4476	60 D	2							
UCCLE	30	1007	1054	1020	S12	W20	4476	47	2	4	1020	5•60				
CAPRI S	30	1010 E	1032 D		S17	W19	4476	22 D	1	1	1015	2•20	2•40			
STOCKHOLM	30	1011 E	1020 D		S13	W15	4476	9 D	2							
MEUDON	30	1017 E	1030 D		S20	W20	4476	13 D	1&				2•00			
MEUDON	30	1017 E	1030 D		S10	W20	4476	13 D	1				6•00			
WENDEL	30	1042	1100		S13	W13	4476	18	1				3•00			
UCCLE	30	1113	1118	1115	S25	E04	4478	5	1	4	1115	2•20				
UCCLE	30	1114	1134	1121	N36	E80	4484	20	1	4	1121	2•20	3•70			
CAPRI S	30	1120 E	1205 D		S18	W21	4476	45 D	1	1	1155	2•20	2•40			
MEUDON	30	1148 E	1210 D		S20	W20	4476	22 D	1							
UCCLE	30	1249	1316	1250	N23	W90	4469	27	1&	4	1250	2•20	4•50			
MEUDON	30	1300 E	1351 D		S20	W20	4476	51 D	1							
UCCLE	30	1422	1429	1425	S08	W16	4476	7	1	4	1425	2•20				
UCCLE	30	1455	1504	1457	S20	W07	4478	9	1	4	1457	2•20				
UCCLE	30	1533	1621 D	1544	N36	E80	4484	48 D	2	2	1544	3•40	5•80			
WENDEL	30	1537	1602		N33	E61	4484	25	1				4•00			
CAPRI S	30	1540 E	1557 D		N35	E65	4484	17 D	1	2	1546	•80	2•30			S-SWF
WENDEL	30	1614 E	1626		N34	E65	4484	12 D	1				4•00			
OTTAWA	30	1623 E			N38	E60	4484		1	1	1624	•99	3•15			
SAC PEAK	30	1740	1827 U	1755 U	S16	E37	4480	47 D	1	2		3•60			16	G-SWF
SAC PEAK	30	1747	1800	1755	N35	E64	4484	13	1	2		2•40			16	
SAC PEAK	30	2007	2117 U	2022 U	N23	W51	4474	70 D	1&	2		5•10			17	
HAWAII	30	2010	2112	2016	N20	W50	4474	62	2	1	2016	3•50	6•40			
HAWAII	30	2036 E	2040	2036	S07	W21	4476	4 D	1	1	2036	2•00	2•10			
SCHAUINS	30	2114 E	0129		S15	E09	4476	255 D	2							
HAWAII	30	2150 E	2208		N37	E60	4484	18 D	1&	1	2158	2•60	6•40			
HAWAII	30	2304	2320	2308	S07	W22	4476	16	1&	1	2308	4•50	5•00			S-SWF
MITAKA	30	2347	2353		S08	W31	4476	6	1&	1	2351	9•43	11•40	1•83	146	
SYDNEY	31	0005	0025	0015	S15	W20	4476	20	1							
MITAKA	31	0008 E	0036	0012	S13	W24	4476	28 D	2&	1	0008	8•56	9•33	3•34	227	S-SWF
HAWAII	31	0014 E	0020		S16	W27	4476	6 D	2	1	0016	7•20	8•10			
HAWAII	31	0028	0032 D	0032	N38	E65	4484	4 D	1&	1	0032	2•70	6•70			
MITAKA	31	0028 E	0038	0030	N35	E54	4484	10 D	1&	1	0031	3•80	8•60	7•65	149	
SYDNEY	31	0040	0110	0053	S08	W22	4476	30	1							
MITAKA	31	0049 E	0113	0049	S07	W24	4476	24 D	2&	1	0052	9•43	10•00	4•32	278	
HAWAII	31	0050 E	0106 D	0052	S17	W25	4476	16 D	2	1	0052	6•00	6•50			
MITAKA	31	0119 E	0124 D		S07	W52	4476	5 D	1	1	0120	1•84	2•95	2•99	120	
MITAKA	31	0146 E	0200	0147	S15	W21	4476	14 D	1	1	0149	1•86	1•99	2•37	149	
MITAKA	31	0231 E	0244		N35	E53	4484	13 D	1&	1	0233	3•80	8•60	3•00	125	
SYDNEY	31	0314	0345	0320	S05	W50	4476	31	1							
MITAKA	31	0423 E	0427 D		N23	W74	4469	4 D	1	1	0423	2•78	9•73	2•93	96	
MITAKA	31	0535	0555 D		N23	W75	4469	20 D	1	1	0545	•89	3•12	2•29		
ATHENS	31	0650	0704		N25	W72	4469	14	1	3		•80	3•70			
NIZAMIAH	31	0856 E	0904		S19	E28	4480	8 D	1	3	0856	2•43	2•81	1•60		
STOCKHOLM	31	0901 E	0914 D		S18	E27	4480	13 D	1							
AROSA	31	1015 E	1025		N20	E61	4485	10 D	1							
AROSA	31	1026	1032		S09	W27	4476	6	1							
UCCLE	31	1119	1140		N23	W90	4469	21	1	2						
UCCLE	31	1120	1131		N22	E66	4485	11	1	2						
UCCLE	31	1143 E	1146 D	1146	S18	E27	4480	3 D	1	2	1146	2•10	2•30			
UCCLE	31	1444	1448	1445	S07	W69	4476	4	1	4	1445	2•00	4•00			
UCCLE	31	1525	1534	1528	S14	W41	4476	9	1	4	1528	1•70	2•00			
AROSA	31	1525 E	1535 D		S15	W40	4476	10 D	1							
SAC PEAK	31	1710	1725	1720	S12	W40	4476	15	1	3		3•30			20	
SAC PEAK	31	1932	1952	1940	S12	W42	4476	20	1	3		2•50			27	Slow S-SWF
SAC PEAK	31	2305 E	2332 D	2305 U	S21	E52	4483	27 D	1	1		2•50			18	

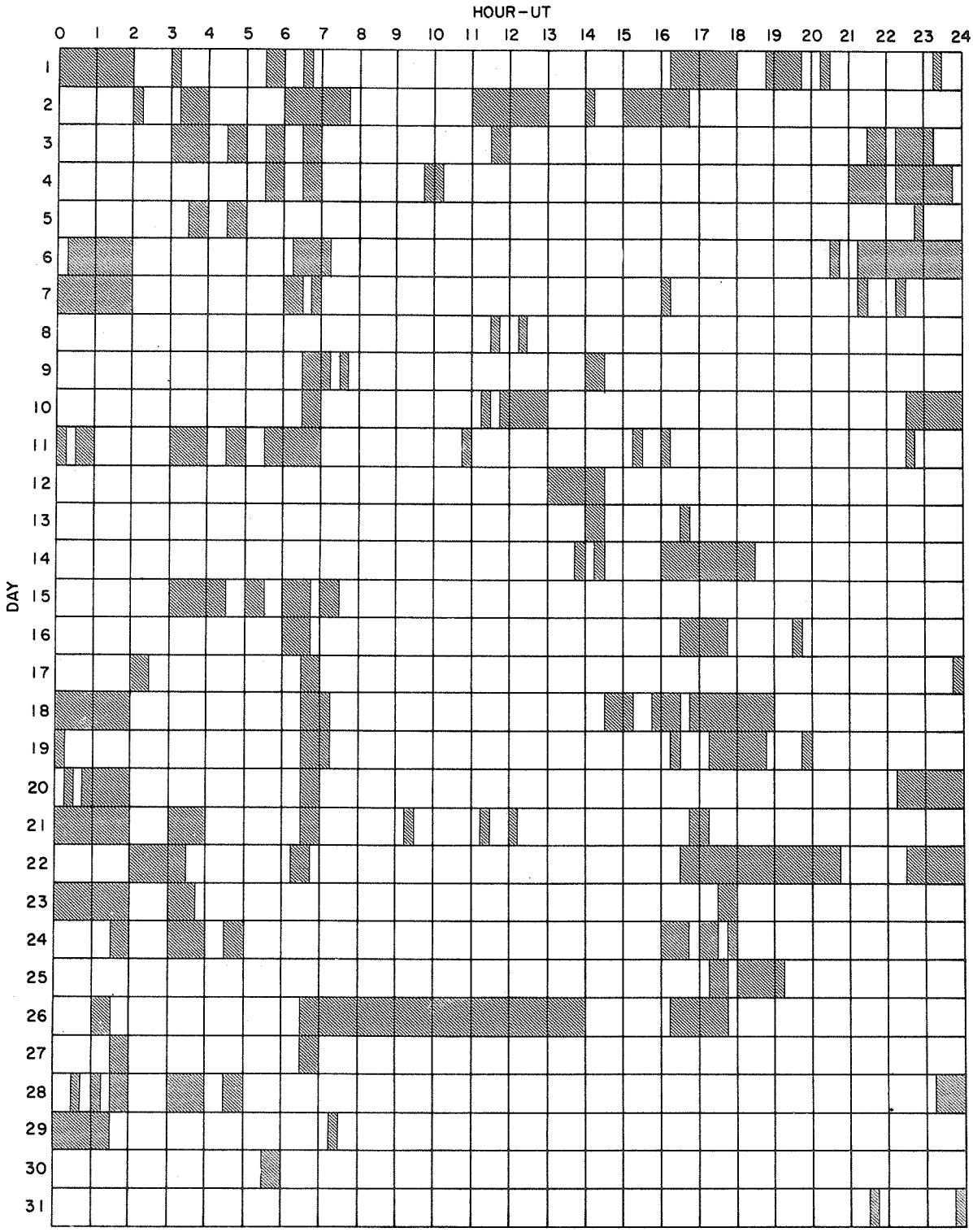
CAPRI S — ANACAPRI SWEDISH
KODAIKNL — KODAIKANAL
KRASNYA — KRASNAYA PAKHRA
R O EDIN — ROYAL OBSERVATORY, EDINBURGH
R O HERST — GREENWICH ROYAL OBSERVATORY, HERSTMONCEUX
SAC PEAK — SACRAMENTO PEAK
SCHAUINS — SCHAUINSLAND
USNRL — UNITED STATES NAVAL RESEARCH LABORATORY

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

E – LESS THAN.
D – GREATER THAN.
U – APPROXIMATE.
& – PLUS.
– – MINUS.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

MARCH 1958



COMMERCE – STANDARDS – BOULDER

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

SUBFLARES NOTED AS FOLLOWS, DATE - UNIVERSAL TIME - COORDINATES

FEBRUARY 1958

	WENDEL	01	0848 E	S06 W03
	UCCLE	01	0901	S09 E67
	UCCLE	01	0914	S31 E20
	WENDEL	01	0945 E	S06 W02
	UCCLE	01	0959	S30 W55
	WENDEL	01	1042 E	S30 W51
	SAC PEAK	01	1935	N27 W33
	SAC PEAK	01	2140	S21 E90
	SAC PEAK	01	2217	S21 E90
	ATHENS	02	0808 E	S05 W14
	WENDEL	02	1212 E	S06 W18
	WENDEL	02	1245 E	S06 W18
	USNRL	02	1444	S19 W90
	SAC PEAK	02	1612	S12 E77
	SAC PEAK	02	1615	S06 W24
	SAC PEAK	02	1640	S12 E74
	SAC PEAK	02	1855	S13 E74
	CLIMAX	02	1856	S11 E76
	ATHENS	03	0729	S12 E33
	UCCLE	03	1007	S12 E34
	UCCLE	03	1042	S12 E33
	UCCLE	03	1103	S12 E34
	UCCLE	03	1111	S20 E85
*	R O HERST	03	1207 E	S11 E31
	UCCLE	03	1248	S27 W85
	UCCLE	03	1251	S12 E34
	UCCLE	03	1303	S11 E70
	UCCLE	03	1311	S17 E82
	UCCLE	03	1437 E	S12 E32
	CAPRI S	03	1449 E	S12 E33
*	SAC PEAK	03	1530	S20 E78
	SAC PEAK	03	1540	S10 E58
	SAC PEAK	03	1540	S28 W80
	SAC PEAK	03	1648	S11 E28
	CLIMAX	03	1850	S12 E63
*	CLIMAX	03	1855	S22 E79
*	SAC PEAK	03	1856 E	S20 E77
	SAC PEAK	03	2015	S20 E77
*	SAC PEAK	03	2039	S12 E28
	SAC PEAK	03	2200 U	N19 E57
	SAC PEAK	03	2230 E	S12 E25
	SAC PEAK	03	2230	N24 W58
*	CAPRI S	04	0855 E	S11 E51
*	USNRL	04	1324	S11 E16
	USNRL	04	1337	S10 E18
	USNRL	04	1425	N13 E05
	USNRL	04	1429	S09 E15
	USNRL	04	1457	S10 E16
	SAC PEAK	04	1510 E	S13 E14
	USNRL	04	1512	S11 E15
	USNRL	04	1518	N06 W10
	SAC PEAK	04	1617	S14 E67
	SAC PEAK	04	1712	S13 E13
	CLIMAX	04	1721	S13 E14
	SAC PEAK	04	1725	S15 E19
	CLIMAX	04	1852	N19 E44
	USNRL	04	1853	N21 E45
	CLIMAX	04	1942	S12 E44
	ATHENS	05	0714	N19 E37
	ATHENS	05	0721	S12 E05
	OTTAWA	05	1517 E	S07 E34
	CLIMAX	05	1819	S19 E29
	CLIMAX	05	1903	S10 W28
	CLIMAX	05	1932	S19 E27
	CLIMAX	05	1946	S13 E19
	ATHENS	06	0840 E	S12 W08
*	CAPRI S	06	1153 E	S10 W10
*	R O EDIN	06	1154	S11 W14
	OTTAWA	06	1447 E	S10 W11
	SAC PEAK	06	1640	S16 E22
	OTTAWA	06	1641 E	S16 E22
	SAC PEAK	06	1650	S13 W08
*	SAC PEAK	06	1652	N30 W90
	OTTAWA	06	1652 E	S13 W07
	USNRL	06	1725 E	S18 E37
	OTTAWA	06	1746 E	S18 E29
	SAC PEAK	06	1802	S11 W12
	USNRL	06	1803	S11 W12
	OTTAWA	06	1803 E	S11 W11
	SAC PEAK	06	2100	S10 W13
	SAC PEAK	07	1502 E	S21 E23
	SAC PEAK	07	1502	N30 W90
	SAC PEAK	07	1700	N30 W90
	SAC PEAK	07	1710	S21 E26
	SAC PEAK	07	1710	S10 W26
	SAC PEAK	07	1815	S21 E26
	SAC PEAK	07	1837	N17 E90
	SAC PEAK	07	1905	S11 W28
	SAC PEAK	07	1925	N15 E71
	SAC PEAK	07	1925	S21 E26
	SAC PEAK	07	1945	S14 E18
	HUANCAYO	07	2000	S13 E16
	SAC PEAK	07	2150	S21 E25
	SAC PEAK	07	2225 E	S10 W31
	HAWAII	07	2336 E	S20 E32
	HAWAII	07	2336 E	S10 W31
	HAWAII	08	0114	S12 W34
	ATHENS	08	0722	S11 W36
	ATHENS	08	0839	S13 E10
	UCCLE	08	0936	S21 E19
	USNRL	08	1338	S20 E16
	USNRL	08	1407	S12 W42
	CLIMAX	08	1625	S19 E18
	USNRL	08	1628	S20 E13
	SAC PEAK	08	1650 E	S21 E11
	CLIMAX	08	1738	S18 E10
	MC MATH	08	1745	S18 E08
	SAC PEAK	08	1927	S12 W45
	SAC PEAK	08	2042 E	S19 E07
*	ATHENS	09	0700 E	S11 W48
*	ATHENS	09	0753	S11 W51
	UCCLE	09	0857	N08 W72
	UCCLE	09	0905 E	S17 W14
	SAC PEAK	09	1515 U	S15 E08
	ZURICH	09	1530 E	S13 E07
	SAC PEAK	09	1710	S14 W56
	HAWAII	09	2054	S17 W58
	HAWAII	09	2118	S17 E07
	SAC PEAK	09	2142	N19 E09
	HAWAII	09	2144	N20 E02
	SAC PEAK	09	2157	S12 W54
	HAWAII	09	2200	S17 W57
	WENDEL	10	0834 E	S22 W08
	UCCLE	10	0908 E	S16 W00
	UCCLE	10	0917	S13 W69
	UCCLE	10	1012	N14 E35
*	MEUDON	10	1129 E	S14 W60
	WENDEL	10	1205 E	S16 W01
	UCCLE	10	1205	S20 W37
	UCCLE	10	1256	S21 W11
	OTTAWA	10	1433 E	S16 W03
	USNRL	10	1443 E	S17 W05
	SAC PEAK	10	1450 E	S14 W03
	USNRL	10	1509	N17 E42
	SAC PEAK	10	1510	N15 E43
*	SAC PEAK	10	1540	S21 W13
	UCCLE	10	1541 E	N08 E35
	USNRL	10	1542	S22 W13
	SAC PEAK	10	1900	S16 W23
	USNRL	10	1901	S18 W23
*	HAWAII	10	1904	S16 W65
	HAWAII	10	2326	S23 W18
	ATHENS	11	0745	S21 W18
*	ATHENS	11	0749	S18 W27
	ATHENS	11	0753	N11 E08
	ATHENS	11	0824	S16 W39
	UCCLE	11	0952 E	S20 W48
	USNRL	11	1319	S23 W25
	USNRL	11	1615	N12 E20
	CLIMAX	11	1620 E	N12 E18
	USNRL	11	1658	N22 E18
	USNRL	11	1753	N12 E18
	USNRL	11	1834 E	S22 W44
	HUANCAYO	11	1855	S19 W42
	USNRL	11	1900	S22 W45
*	HUANCAYO	11	1940	S19 W23
	ATHENS	12	0637 E	S15 W28
	WENDEL	12	1113 E	S12 W62
	WENDEL	12	1127 E	S16 W47
	CAPRI S	12	1211 E	N12 E18
	SAC PEAK	12	1550	N11 E05
	USNRL	12	1551	N11 E07
	USNRL	12	1600	N10 E05
	SAC PEAK	12	1632	N14 E04
	CLIMAX	12	1633	N14 E03
	CLIMAX	12	1645	N09 E03
	SAC PEAK	12	1645	N08 E03
	USNRL	12	1646	N09 E05
	USNRL	12	1719	N25 E05
	CLIMAX	12	1737	N11 E03
	SAC PEAK	12	1745	N10 E05
	USNRL	12	1748	N11 E04
	USNRL	12	1753	S10 W90
	USNRL	12	1757	S10 W60
	USNRL	12	1851	S12 W90
	SAC PEAK	12	2127	N07 E07
	SAC PEAK	12	2127	N22 E69
	UCCLE	13	0946	N09 W05
	UCCLE	13	1017	N15 W06
	ZURICH	13	1446	N07 W08
	USNRL	13	1830	N24 E01
	UCCLE	14	0942	N25 W65
	UCCLE	14	1130	N13 W17
	CAPRI S	14	1259 E	N11 W13
	SAC PEAK	14	1642	N17 W12
	USNRL	14	1644	N17 W12
	SAC PEAK	14	1737	N11 W24
	ATHENS	15	0713	S26 W72
	UCCLE	15	0923	S16 W75
	WENDEL	15	1347 E	S12 W33
	SAC PEAK	15	1742	N12 W37
	SAC PEAK	15	1807	N13 W35
	SAC PEAK	15	1920	N12 W37
	SAC PEAK	16	1515 E	N25 W43
	SAC PEAK	16	1610	N25 W46
	HAWAII	16	2020	S12 E20
	HAWAII	16	2302	N09 W80
	HAWAII	16	2326	S27 W06
	UCCLE	17	1052	S15 E44
	UCCLE	17	1055	S17 E44
	UCCLE	17	1139	N12 W63
	SAC PEAK	17	1600	N13 W57
	SAC PEAK	17	1637	N12 W58
	SAC PEAK	17	1855	N07 W80
	SAC PEAK	17	2150	N09 W61
	SAC PEAK	17	2225	S25 E60
	UCCLE	18	1219	S12 W09
	UCCLE	18	1414 E	S25 W25
	MC MATH	18	1438	N07 W02
	MC MATH	18	1540	S22 W32
	SAC PEAK	18	1542	S10 E54
	SAC PEAK	18	1542	S26 W27
*	USNRL	18	1621	S15 W05
	CLIMAX	18	1624	S12 W02
	SAC PEAK	18	1922	S28 W23
	UCCLE	19	1259	N11 W16
	SAC PEAK	19	1507 E	N10 W18
	SAC PEAK	19	1555	N10 W89
	SAC PEAK	19	1620	N21 W90
	USNRL	19	1622	N20 W90
	USNRL	19	1843	N09 W22
	SAC PEAK	19	1900	N21 W90
	USNRL	19	1901	N19 W90
*	SAC PEAK	19	1912	S15 W21
*	HAWAII	19	2010 E	N21 E10
	USNRL	19	2012	N20 W90
	CLIMAX	20	1822	N11 E21
	USNRL	20	1851	S24 E10
	USNRL	20	1908	S12 E16
	USNRL	20	1954	S15 W09
	ATHENS	21	0738	S25 E02
	ATHENS	21	0853	N11 E13
	CAPRI S	21	1453 E	S22 W01
	CLIMAX	21	1533	S15 E09
	USNRL	21	1535	S13 E09
	CLIMAX	21	1607	S13 E04
	USNRL	21	1608	S13 E05
*	USNRL	21	1646	S13 E05
	USNRL	21	1710	S04 W20
	USNRL	21	1846	S12 E02
	USNRL	21	2046	S12 E02
	ATHENS	23	0645 E	N20 W32
*	CLIMAX	23	2049	S11 W04
	ATHENS	24	0723	N04 W54
	ATHENS	24	0727	N13 E16
	ATHENS	24	0730	S34 E80
	USNRL	24	1227 E	S19 W26
	USNRL	24	1256 E	S13 E12
	USNRL	24	1306	S25 W11
	USNRL	24	1323	S05 W60
	USNRL	24	1346	S20 W43
	USNRL	24	1446	S22 W41
	USNRL	24	1842	S06 E38
	SAC PEAK	24	1845	S04 E38
	USNRL	24	1901	S05 E08
	USNRL	24	1905	S16 W36
	USNRL	24	1906	N15 E39
	SAC PEAK	24	1912	N13 E39
	SAC PEAK	24	1945 U	S15 E07
	USNRL	24	1948 E	S14 E08
	WENDEL	25	1123 E	S07 W34
	WENDEL	25	1127 E	S11 E01
	WENDEL	25	1138 E	S24 E66
	USNRL	25	1317	S24 W49
	USNRL	25	1434	S18 W48
*	SAC PEAK	25	1630	S12 W52
	MC MATH	25	2119	S22 W60
	USNRL	25	2120	S23 W60
	UCCLE	26	1439 E	S27 W48
	SAC PEAK	26	2100	S12 W16
	R O HERST	27	1226 E	S12 W21
	SAC PEAK	27	1637	S14 W26
*	SAC PEAK	27	1745 E	S11 W28
	SAC PEAK	27	1925	N12 W32
	SAC PEAK	27	1935	S21 W80
	SAC PEAK	27	1955	N34 E15
	SAC PEAK	27	2025	S13 W27
	SAC PEAK	27	2107	S22 E90
	SAC PEAK	27	2137	S14 W28
	SAC PEAK	27	2200	S13 W29
	SAC PEAK	27	2245	S14 W29
	SAC PEAK	28	1730	S13 W38
	SAC PEAK	28	1820	S16 E90
	SAC PEAK	28	2040	S16 E90
	SAC PEAK	28	2130	S14 W38
	SAC PEAK	28	2250	S10 W44

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

COMMERCE - STANDARDS - BOULDER

IONOSPHERIC EFFECTS OF SOLAR FLARES

(SHORT-WAVE RADIO FADEOUTS)

FEBRUARY 1958

Feb. 1958	Start UT	End UT	Type	Wide Spread Index	Impor-tance	Observation Stations	Known Flare, UT CRPL-F 163 B
2	1707	1745	Slow S-SWF	5	2+	BE, CR, HU, MC, PR, WS	
3	1527	1550	Slow S-SWF	2	1+	HU, PR	1522
5	1035	1125	Slow S-SWF	5	2+	HU, JU	
6	0053	0105	S-SWF	3	1	AD, CA	
6	1658	1718	G-SWF	4	1+	AN, HU, MC, PR	1652E
6	1724	1752	Slow S-SWF	5	2-	BE, CR, HU, MC, PR, WS, CW*	
8	0406	0425	S-SWF	4	1+	CA, OK, TO, CW+	*
8	1112	1130	S-SWF	3	2	KU, NE, PU	*
8	1755	1850	G-SWF	4	3-	BE, HU, MC, PR, WS	1740
9	0210	0235	Slow S-SWF	5	2	AD, CA, OK, TO	0207
9	0558	0610	S-SWF	1	1+	KO	0548E
9	0654	0739	S-SWF	4	3	KO, NE	0658
9	0843	0902	S-SWF	4	2	KO, KU	0837E
9	1332	1418	S-SWF	5	3	BE, HU, MC, NE, PR, PU	1330
9	1421	1436	S-SWF	5	2	BE, HU, MC, NE, PR, PU	1415
9	1935	1957	G-SWF	3	1+	HU, MC, PR	
9	2124	2144	Slow S-SWF	5	1	CA, HU, TO, WS	2108
10	1325	1400	S-SWF	5	3	BE, DA, HU, MC, NE, PR, PU	1323
10	1903	1950	S-SWF	4	3	BE, HU, MC, PR, WS	1900
11	0809	0837	S-SWF	5	3	JU, KO, ND, PU	0820
11	1322	1335	S-SWF	5	1	HU, KU	1319E
11	1345	1410	S-SWF	5	3	HU, JU, PR	1342
12	1750	1840	G-SWF	4	3-	BE, CR, HU, WS	
12	1840	1930	S-SWF	4	3-	BE CR, HU, PR, WS	1839
15	1628	1740	G-SWF	4	1+	AN, BE, MC, WS	
15	1955	2023	G-SWF	4	2	HU, MC, PR, WS	1957
17	1218	1255	S-SWF	2	1+	BE, PR	*
19	1630	1715	G-SWF	3	2	HU, PR	1630
25	0505	0541	S-SWF	1	1	OK	0445
25	2008	2040	Slow S-SWF	4	2	BE, MC, PR, WS	1954
26	0432	0508	G-SWF	3	2+	KO, OK, TO	0449E
26	0540	0636	Slow S-SWF	4	2+	KO, OK, TO, CW+	0547
27	0318	0415	Slow S-SWF	3	1+	AD, OK	*
27	1153	1307	S-SWF	1	3	PU	1155
27	1420	1501	G-SWF	4	2-	HU, MC, PR, WS	

* No known flare patrol at this time.

CA = Canberra, Australia.
CR = Cornell University, N.Y.
DA = Darmstadt, G.F.R.
HH = Heinrich Hertz Institute, Berlin.
JU = Juhlesruh, G.D.R.
KO = Kodaikanal.
KU = Kuhlungsborn
NE = Nederhorst den Berg, Netherlands.
PU = Prague, Czech.
SW = Enkoping, Sweden.
TO = Hiraiso Radio Wave Observatory, Japan.
ZU = Zurich, Switzerland.
CW* = Barbadoes.
CW+ = Hong Kong

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

OTTAWA — MARCH 1958 — 2800 MC

Mar. 1958	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
3	1 Simple 1 f	21 47	1	21 47.8	5	
4	1 Simple 1	15 32.5	4	15 33.5	6	
4	2 Simple 2	16 04.5	2.5	16 05.5	28	
4	1 Simple 1 f	17 23	5	17 24.5	6	
5	3 Simple 3 A	16 36	35	indet.	9	
	8 Group (2)	16 44.2	4.2			
	1 Simple 1	16 44.2	2	16 44.9	6	
	1 Simple 1	16 48.2	0.2	16 48.3	6	
5	1 Simple 1	17 20.5	1.5	17 21	3	
5	1 Simple 1	20 57.5	4	20 59.5	6	
6	2 Simple 2	22 28.8	2	22 29.3	16	
7	6 Complex	18 14	2.5	18 15	90	
8	6 Complex f	13 26	5	13 26.8	88	
8	3 Simple 3 A	17 22	1 40	17 43	13	
	8 Group (2)	17 22.4	9.6			
	2 Simple 2	17 22.4	2.5	17 23.4	26	
	1 Simple 1	17 28	4	17 29.5	7	
	6 Complex	18 00	6	18 02.4	11	
	6 Complex	18 55	5.5	18 56.3	7	
8	2 Simple 2	20 59.2	2.5	21 01	9	
9	2 Simple 2	15 43	8	15 45.9	85	
	4 Post Increase A		5 15		22	
	2 Simple 2	20 07.3	2	20 07.9	9	
10	6 Complex	13 15.2	9	13 16.1	51	
10	1 Simple 1	18 25.2	1.8	18 25.8	6	
10	3 Simple 3 A	20 24	1 30	20 35	10	
	6 Complex f	20 28	7	20 32.5	72	
	2 Simple 2	21 31.8	1.4	21 32.4	13	
11	3 Simple 3 A	15 00	>7 35	indet.	13	
	6 Complex	15 12.6	10	15 16.6	50	
12	3 Simple 3 A	14 28	47	14 43	9	
	2 Simple 2	14 37	2.5	14 38	33	
12	2 Simple 2	17 02.4	1.3	17 02.8	10	
12	1 Simple 1	20 42.5	1.5	20 43.1	6	
13	6 Complex	13 10.5	4	13 13	6	
13	1 Simple 1	16 20.3	1	16 20.8	6	
13	2 Simple 2	22 16.5	4	22 17.2	10	
14	9 Precursor	14 53	5.5		13	
	6 Complex	14 58.5	13	15 01	210	
	4 Post Increase		2 45		40	
15	2 Simple 2	18 19.8	1.5	18 20.3	9	
15	1 Simple 1	19 07.5	4	19 09	6	
15	1 Simple 1	21 11.5	1	21 12	6	
16	1 Simple 1	14 10	2.5	14 11.2	3	
16	1 Simple 1	15 33	3	15 34.5	2	
19	2 Simple 2	17 27.5	2.5	17 28.5	13	
19	2 Simple 2	19 09.5	5	19 11	37	
	4 Post Increase		35		6	
19	2 Simple 2 f	21 07	9	21 09.5	14	
	4 Post Increase		30			
20	8 Group (2)	13 04	16.5			
	2 Simple 2	13 04	5	13 04.7	350	
	2 Simple 2	13 17	3.5	13 18.2	14	
20	3 Simple 3 A	14 54	40	14 59	16	
	2 Simple 2	14 54.6	2.5	14 55.2	32	
20	3 Simple 3	18 50	45	19 02	7	
20	3 Simple 3 f	20 47	15	20 52	7	
20	1 Simple 1	21 41.5	2.5	21 42.5	3	
21	1 Simple 1	13 11	1.5	13 11.7	7	
21	3 Simple 3 f	18 55	40	18 59.3	18	
21	3 Simple 3 f	21 15	35	21 17.2	8	
22	2 Simple 2	12 07	1.5	12 07.4	12	
22	3 Simple 3 f A	18 04	3	18 23	26	
	2 Simple 2 f	18 42.2	15	18 44	160	
23	3 Simple 3 A	b11 15	>9	indet.	45*	*estimated
	7 Period Irreg. Activity	b11 15	>4 35	11 34	300*	(in sunrise)
	2 Simple 2	18 26.2	4	18 27.2	20	
24	2 Simple 2	11 38.5	1.5	11 39	30	

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

OTTAWA — MARCH 1958 — 2800 MC

Mar. 1958	Type*	Start UT Hrs:Mins	Duration Hrs:Mins	Maximum Time UT Hrs:Mins	Maximum Peak Flux	Remarks
25	2 Simple 2	14 13.7	2	14 14.3	46	
25	3 Simple 3 f	14 53.5	40	14 58.5	7	
25	1 Simple 1 f	18 17.3	1	18 17.8	6	
26	2 Simple 2	12 55	2.5	12 55.8	30	
26	2 Simple 2	13 28.5	4	13 29	100	
27	2 Simple 2	11 59.8	14	12 00.6	470	
27	8 Group (2)	13 20	5			
	1 Simple 1	13 20	1	13 20.3	5	
	2 Simple 2	13 24	1	13 24.5	11	
27	2 Simple 2 f	15 05	2	15 06	85	
27	6 Complex	15 43.8	11	15 46.4	220	
	4 Post Increase A		3 10		50	
	6 Complex f	17 01	6	17 03	162	
	4 Post Increase		25		12	
27	1 Simple 1	19 38	3	19 38.5	7	
27	1 Simple 1	21 04.8	1	21 05.1	6	
27	2 Simple 2	21 48.8	6	21 49.7	93	
27	2 Simple 2	23 04	3	23 05	60	In sunset osc.
28	7 Period Irreg. Activity	11 47	40	11 58.5	16	
28	8 Group (2)	15 46.5	10.5			
	2 Simple 2	15 46.5	3	15 47.9	9	
	1 Simple 1	15 52	5	15 54.5	4	
28	9 Precursor f	17 02.5	6		7	
	2 Simple 2 f	17 08.5	14	17 11.5	575	
	4 Post Increase A		2 20		60	
	2 Simple 2	18 35	3.5	18 35.7	100	
28	2 Simple 2 f	20 23.3	5	20 25	9	
28	6 Complex	20 43	33	20 45.1	520	
28	3 Simple 3 f	21 25	>1 40	indet.	24	
29	7 Period Irreg. Activity	12 05	35	12 22.9	53	
29	1 Simple 1	13 02	1	13 02.5	6	
29	2 Simple 2 f	13 40.5	10	13 42	310	
29	2 Simple 2	14 08.6	2.5	14 09	38	
29	1 Simple 1	14 34.4	0.3	14 34.5	7	
29	6 Complex	14 47.1	4	14 49.1	42	
29	1 Simple 1	15 29.5	1	15 30	4	
29	3 Simple 3 A	15 36	1 10	15 56	22	
	1 Simple 1	16 27	3	16 28.5	7	
29	1 Simple 1	16 52	1	16 52.5	7	
29	2 Simple 2	18 20.5	12.5	18 21.8	1400	
	4 Post Increase		1 30		34	
29	8 Group (4)	21 17.5	20.4			
	1 Simple 1	21 17.5	1	21 17.9	7	
	1 Simple 1	21 24.8	2	21 25.7	6	
	6 Complex	21 29.2	3.5	21 31.4	220	
	2 Simple 2	21 36.4	1.5	21 36.8	12	
30	1 Simple 1	12 16.5	5	12 18.5	6	
30	8 Group (2)	14 22.2	6.3			
	2 Simple 2	14 22.2	1	14 22.4	9	
	2 Simple 2	14 26	2.5	14 26.8	52	
30	3 Simple 3	14 57	30	15 01	7	
30	2 Simple 2	15 39.3	2	15 40	58	
30	6 Complex	15 50.5	2.5	15 51.8	12	
30	2 Simple 2	15 59	3	16 00.5	18	
30	1 Simple 1	17 12.2	0.7	17 12.4	7	
30	2 Simple 2	17 20.4	1.5	17 20.8	24	
30	3 Simple 3 A f	17 45	1 45	indet.	17	
	8 Group (4)	17 49	23.8			
	2 Simple 2	17 49	3	17 49.5	44	
	2 Simple 2	17 55.3	3.5	17 56.2	71	
	6 Complex	18 03	1.5	18 04	20	
	1 Simple 1	18 10.8	2	18 11.1	7	
	2 Simple 2	18 59	1.5	18 59.5	8	
	2 Simple 2	19 08	1.5	19 08.3	22	
30	3 Simple 3 f A	19 55	1 25	indet.	15	
	Simple 2	20 57.3	2	20 57.8	23	
30	2 Simple 2 f	21 57.5	5	21 58.3	22	
31	1 Simple 1	12 56	1.5	12 56.5	7	
31	2 Simple 2	14 40.5	2	14 41	42	
31	2 Simple 2	16 51.8	1.5	16 52.2	23	
31	2 Simple 2	17 29.2	1.5	17 29.6	14	
31	7 Period Irreg. Activity	19 30	45	19 43	10	

OTTAWA

2800 MC

HOURS OF OBSERVATIONS: JANUARY, FEBRUARY, MARCH 1958

OBSERVING PERIOD: January 1300 UT - 2120 UT (approx.)
February 1250 UT - 2200 UT (approx.)
March 1155 UT - 2245 UT (approx.)

with the following exceptions:

(1) Records obscured by interference:-

Jan. 6	1535 - 1545	1710 - 1800	1815 - 1840
9	2000 - 2050		
10	1950 - 2020		
Feb. 4	1815 - 1845		
6	2055 - 2100		
15	1930 - 2005		
23	1555 - 1620	1640 - 1700	
26	2010 - 2025		
Mar. 10	1840 - 1850		
12	1940 - 1950	2100 - 2110	
13	1835 - 1850	1910 - 1920	2050 - 2115
14	1925 - 2000	2020 - 2025	
16	1835 - 1855		
17	1840 - 1850	1915 - 1940	2000 - 2020
18	1720 - 1730		
22	1630 - 1640		
23	1730 - 1745	1755 - 1810	
24	1630 - 1700		
25	1830 - 1845		
28	1800 - 1815		
31	1750 - 1820		

(2) No observations:

Jan. 30	1600 - 1615	1630 - 1645	
Feb. 3	1705 - 1720		
5	1600 - 1615		
6	1520 - 1530		
7	1505 - 1525	1550 - 1600	1610 - 1625
20	1635 - 1645	1830 - 1850	
21	1605 - 1620		
22	1650 - 1715		
23	1625 - 1640		
24	1605 - 1620		
28	1450 - 1910		
Mar. 1	1605 - 1615		
21	1620 - 1635		

SOLAR RADIO EMISSION

DAILY DATA

MARCH 1958

CORNELL 200 MC

Mar. 1958	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	[[26	22]	--	[[2	2]	-	1355-1700
2	[[14	14]	--	[[0	0]	-	1335-1715
3	[[62	36	18	[[1	1	0	1350-2100
4	[[13	15	15	[[0	1	1	1335-2110
5	[[14	14	15	[[1	0	1	1340-2100
6	[[16	19	19	[[1	1	1	1340-2100
7	[[24	25	27	[[1	2	3	1340-2100
8	[[36	40]	--	[[2	2]	-	1340-1700
9	[[44	48]	--	[[2	1]	-	1310-1700
10	[[54	61	46	[[1	1	1	1340-2100
11	[[24	27	35	[[1	1	2	1330-2105
12	[[35	40	36	[[2	2	1	1335-2100
13	[[19	22	22	[[1	1	2	1330-2100
14	[[12	13	12	[[1	1	1	1345-2100
15	[[14	14]	--	[[0	0]	-	1315-1700
16	[[12	12]	--	[[0	0]	-	1330-1700
17	[[12	13	13	[[1	0	0	1345-2105
18	[[16	13	13	[[1	0	0	1345-1450, 1520-2100
19	[[12	21	17	[[3	3	2	1340-2100
20	[[64	90	111	[[3	3	3	1330-2105
21	[[60	47	39	[[1	2	2	1335-2110
22	[[23	25	22	[[2	2	2	1345-2045
23	[[34	28]	--	[[2	1]	-	1325-1700
24	--	16	17	-	1	1	1520-2105
25	[[32	33	34	[[1	1	1	1345-2100
26	[[35	40	45	[[1	1	1	1350-1625, 1740-2100
27	[[46	54	53	[[1	1	1	1330-2130
28	[[52	44	42	[[1	1	1	1405-2100
29	[[52	54]	--	[[3	3]	-	1300-1715
30	[[58	100]	--	[[3	3]	-	1255-1700
31	[[20	21	24	[[2	1	2	1340-2105

COMMERCE – STANDARDS – BOULDER

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

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

CORNELL — MARCH 1958 — 200 MC

Mar. 1958	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
3	0	1404		146	F			
	2	1754		1	CD	110	58	
	3	1803.5		.5	CD	>204	>142	
5	8	1732.5		2.5	CD	> 51	> 34	off-scale 1733-33.5, 1734-34.5 UT
	3	1843		.5	CD	> 51	> 32	
7	7	1558			E			
	8	1606		2	CA	> 58	> 26	off-scale 1607.5-08 UT
10	0	1517.5		50	SA			
	3	1642.5		.5	CD	>224	>104	off-scale
	3	2019.5		.5	CD	>204	>110	
11	2	1726.5		3	CA	> 54	> 18	
	2	1948		14	CA	> 54	> 16	
12	3	1906.5		1.5	CA	>233	>135	off-scale 1907.5 UT
13	0	1510		70	CA			
	0	1832		91	F			
14	8	1457		20	ECD	> 54	> 40	off-scale 1504.5 UT
	8	1940.5		10	ECD	> 52	> 37	off-scale 1945, 1946, 1948-50 UT
21	8	1750		2.5	CA	>217	>115	off-scale 1750-50.5 UT
	8	1940		5.5	CD	>224	>132	off-scale 1941-41.5, 1942-42.5, 1943, 1944.5 1945 UT
	2	2045		15	F			
22	0	1602		69	F	78	39	
24	8	1635		6	ECD	>190	>146	off-scale 1637-39 UT
	2	1722		12	E			
25	8	1413.5		2	ECD	>204	>109	off-scale
	3	1418.5		2.5	CD	>204	>115	off-scale 1419-19.5 UT
	3	1423	1423.5	1	CD	156	86	
	8	1817		1	CD	>196	>106	off-scale 1817.5-18 UT
	3	2008		2	CD	200	121	
26	3	1528		.5	CD	>204	>121	
28	7,4	1736.5		92	E			
	8	1836.5		3.5	CD	>240	> 84	off-scale
	2	2023		5.5	F			
	3	2023	2023.5	1.5	CD	>240	>134	
29	8	1631.5		2	ECA	>204	>104	
30	7	1318		92	F			
	0	1524.5		107.5	E			
31	7	1935		93	E			

SOLAR RADIO EMISSION

DAILY DATA

FEBRUARY 1958

BOULDER 167 MC

Feb. 1958	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	-	-	-	-	18	-	-	-	-	0	1S	0	19.8-24.1
2	-	-	20	19	19	20	-	-	1	0	0	0	14.2-24.1
3	-	-	22	19	19	20	-	-	2	1S	1S	1S	14.2-24.1
4	-	-	21	20	25	22	-	-	2	2	2	2	14.2-24.2
5	-	-	39	39	56	43	-	-	3	2	3	3	14.2-16.4,16.8-24.2
6	-	-	141	224	205	188	-	-	1	1S	2	1S	14.7-24.2
7	-	-	769	754	579	716	-	-	1	2	2S	2	14.1-24.2
8	-	-	584	448	349	474	-	-	1	0	1S	1	14.1-24.2
9	-	-	103	63	903	288	-	-	1	1	2	1	14.1-24.3
10	-	-	147	38	30	76	-	-	1S	2S	2S	2S	14.0-24.3
11	-	-	19	18	18	19	-	-	1	1S	1S	1S	14.0-24.3
12	-	-	15	18	55	26	-	-	2	1S	2S	2S	14.0-24.3
13	-	-	23	24	24	24	-	-	1S	2	2S	2S	14.0-24.3
14	-	-	21	22	20	21	-	-	2	2S	2	2	13.9-24.3
15	-	-	17	17	18	17	-	-	1S	0S	0S	0S	13.9-24.3
16	-	-	17	18	19	18	-	-	1	1	2S	1	14.3-24.3
17	-	-	20	19	19	19	-	-	1S	1S	0S	1S	13.9-24.3
18	-	-	20	18	20	19	-	-	2S	2S	2S	2S	13.8-23.3
19	-	-	17	17	23	19	-	-	2S	2S	2S	2S	14.2-24.4
20	-	-	19	23	18	20	-	-	2S	2S	2S	2S	13.8-24.4
21	-	-	18	18	18	18	-	-	1S	0S	0S	0S	13.8-24.5
22	-	-	25	24	21	23	-	-	2S	1S	2S	2S	13.8-24.5
23	-	-	53	32	45	43	-	-	3	2S	2S	2S	13.8-24.5
24	-	-	108	109	106	108	-	-	2S	2	2S	2S	13.8-24.5
25	-	-	187	252	273	237	-	-	2S	2	2	2	13.7-24.5
26	-	-	457	431	326	405	-	-	2	2	2S	2	13.7-24.5
27	-	-	321	348	315	328	-	-	2	2	2	2	14.3-24.6
28	-	-	222	174	136	177	-	-	1	1S	2S	1S	13.6-24.6

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

FEBRUARY 1958

BOULDER 167 MC

Feb. 1958	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	2	2334	2338.3	06 D	CD	120	-	B2258.9,2323.8
2	1	1742	1748	13	MF	37	-	
3	1	1410 B	1448.4	595 D	CD	520 D	-	
3	3	1643.3	1643.3	01	ECD	500 D	-	
3	3	1723.1	1723.4	00.6	ECD	440 D	-	B(groups)1939,2253
4	1	1410 B	1449	400 D	MF	1500 D	-	B1423.7,1434.4,1532.4
4	2	1509.9	1514.9	05.3	CD	1500 D	450 D	
4	2	1710.7	1714.1	14.8	ECD	1300 D	140	
4	6	2050	2308.9	200 D	CD	640 D	7	I 1626-1648
5	6	1410 B	1720	600 D	CD	1400 D	34	LB1706,1750,1923.7
5	3	1931.4	1931.9	00.9	CD	1000 D	-	N2
6	6	1440 B	2102.2	570 D	CD	1800 D	210	B1950.4,LB2336.0
7	6	1405 B	1711.5	605 D	CD	1800 D	790	N3
8	6	1405 B	1637.0	605 D	CD	1000 D	570	N4
9	6	1405 B	1431.0	430 D	CD	1100 D	100	
9	9	2115	I	175 D	CD	1900 D	910 D	N5,I 2215-2231
10	6	1400 B	2405.2	615 D	CD	1200 D	130	LB1415.6,B1437.1,1520.4
10	8	1910	1912.2	03	ECD	1700 D	750 D	
10	2	2336	2336.9	02	CD	920 D	540 D	B2344,LB2414.5
11	1	1400 B	1449.2	615 D	F	280	-	S, B1408,1509.6
12	3	1751.8	1752.0	00.8	ESD	830 D	-	B1555.1
12	1	1756	1758.5	264 D	F	120	-	
12	9	2220	2331.8	120 I	CD	1600 D	600 D	
13	1	1400 B	1712.5	620 D	MF	430 D	-	B(groups)2012,2318
14	6	1430	1803.8	590 D	CD	830 D	5	

Notes: 1. Interference may obscure or be mistaken for solar events. Relatively small events are not reported.
2. February 5, Bursts 1950.0, 2151.2, 2156.2, 2338.3, 2404.1.
3. February 7, Bursts 1905.4, 2003.8, Large Bursts 2153.2, 2316.7, 2336.9.
4. February 8, Bursts 1433.0, 2152.8, 2307.1, 2341.3, Large Bursts 1638.4, 2144.0.
5. February 9, Group of large bursts 1414-1420, Bursts 1708.3, 1852.9.

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

BOULDER — FEBRUARY 1958 — 167 MC

Feb. 1958	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
14	3	1436.4	1436.4	00.3	ESD	1100 D	-	
14	3	2130.2	2130.2	00.7	ESD	680 D	-	B2121.8,2319.6,LB2341.8
16	1	1420 B	2019.4	600 D	MF	93	-	
16	3	2248.8	2249.2	01.1	ECD	200	-	
17	1	1355 B	1801.8	625 D	MF	73	-	S
18	1	1350 B	2102.1	567 D	MF	750 D	-	S, B1403.4,1409.0,2112.3
18	8	1538	1539.9	04	ECD	340	100	
18	8	1619	1622.9	07 I	ECD	250	49	
19	1	1410 B	1633.2	410 D	MF	170	-	S, B2038.2,2133.5,2333.6
19	6	2100	2253	205 D	CD	310	8	
20	1	1350 B	1521.0	190 D	MF	200	-	S
20	6	1700	2118.5	445 D	CD	500 D	9	S, LB1907.0
21	1	1345 B	1721.9	645 D	MF	110	-	S
22	6	1345 B	1437.8	645 D	CD	210	8	S, B1708.6
23	6	1345 B	1355.1	645 D	CD	770 D	36	N6
24	6	1345 B	-	645 D	CD	1200 D	110	N7
25	6	1340 B	1800 X	650 D	CD	1300 D	270	
26	6	1340 B	1600 X	650 D	CD	1200 D	440	
27	6	1415 B	2100 X	620 D	CD	1200 D	340	
28	6	1335 B	1420.9	660 D	CD	950 D	200	

COMMERCE — STANDARDS — BOULDER

Notes: 6. February 23, Large bursts 1357, 1426.4, 1550.8, 1555.4, 1642.1.

7. February 24, Two large bursts occurred at 1914.0, 1941.8, either of which could be considered the maximum. Other large bursts 1749.9, 1916.6.

SOLAR RADIO EMISSION

DAILY DATA
FEBRUARY 1958

BOULDER 470 MC

Feb. 1958	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	-	-	88	88	95	90	-	-	0	0	0	0	14.2-24.1
2	-	-	81	80	80	80	-	-	0	0	0	0	14.2-24.1
3	-	-	81	80	80	80	-	-	0	0	0S	0	14.2-24.1
4	-	-	80	80	81	81	-	-	1	0	0	0	14.2-24.2
5	-	-	81	81	82	81	-	-	0	1	1	1	14.2-24.2
6	-	-	82	82	82	82	-	-	0	0	0S	0	14.9-24.2
7	-	-	82	82	82	82	-	-	0	1	2	1	14.1-24.2
8	-	-	81	81	81	81	-	-	2	0	0	1	14.1-24.2
9	-	-	81	81	161	101	-	-	0	0	3	2	14.1-24.3
10	-	-	81	81	81	81	-	-	0	2	1	1	14.1-24.3
11	-	-	81	81	81	81	-	-	0	0	0	0	14.0-24.3
12	-	-	80	80	81	80	-	-	0	0	0	0	14.0-24.3
13	-	-	81	81	81	81	-	-	0S	0	0S	0S	14.0-24.3
14	-	-	80	81	81	81	-	-	0	0	0	0	13.9-24.3
15	-	-	81	81	81	81	-	-	0	0	0	0	13.9-24.3
16	-	-	80	81	80	80	-	-	0	0	0	0	14.4-24.3
17	-	-	80	80	80	80	-	-	0	0	0	0	13.9-24.4
18	-	-	81	80	80	80	-	-	0	0	0	0	13.8-24.4
19	-	-	81	80	-	81	-	-	0	0S	0S	0S	13.8-24.4
20	-	-	-	80	80	80	-	-	0S	0S	0S	0S	13.8-21.0,21.5-24.4
21	-	-	81	80	81	81	-	-	0S	0S	0S	0S	13.8-24.5
22	-	-	81	80	81	81	-	-	0S	0S	0S	0S	13.8-24.5
23	-	-	81	81	81	81	-	-	0	0S	0	0	13.8-24.5
24	-	-	81	81	81	81	-	-	0S	0S	0S	0S	13.8-24.5
25	-	-	81	-	81	81	-	-	0S	-	0S	0S	13.7-16.9,22.0-24.5
26	-	-	81	81	81	81	-	-	0S	0S	0S	0S	13.7-24.5
27	-	-	81	81	81	81	-	-	0	0S	1S	0S	13.7-15.1,16.2-24.5
28	-	-	81	81	81	81	-	-	0S	0S	0S	0S	13.6-24.5

COMMERCE — STANDARDS — BOULDER

SOLAR RADIO EMISSION

OUTSTANDING OCCURRENCES

BOULDER — FEBRUARY 1958 — 470 MC

Feb. 1958	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
4	1	1410 B	1514.9	595 D	MF	200	-	N2,N3
5	1	1410 B	2308.1	595 D	MF	270	-	
5	2	1929 B	1929.4	0.6 I	CD	970	-	
6	1	1453 B	1803.4	557 D	F	150	-	
7	1	1405 B	2007.8	605 D	MF	560	-	N4
7	2	2102.1	2102.6	02.2	ECD	980	120	
7	3	2331.7	2331.8	00.2	ECD	440	-	
8	2	1632	1638.6	08	CD	810	90	N5
9	1	1405 B	1419.9	427 D	MF	590	-	
9	9	2112	2204.3	133	CD	2300 D	230	
10	3	1859.4	1859.5	00.5	ECD	2500 D	-	
10	8	1904	1906.5	21	CD	280	10	
10	1	2115	2242.4	105	MF	130	-	
10	8	2200	2202.2	03.7	ECD	210	100	
12	0	2229 B	2238.4	15 I	CD	130	-	
24	1	1345 B	2155.8	645 D	MF	170	-	S, N6
27	2	2200.6	2205.7	05.2	CD	490	-	

COMMERCE — STANDARDS — BOULDER

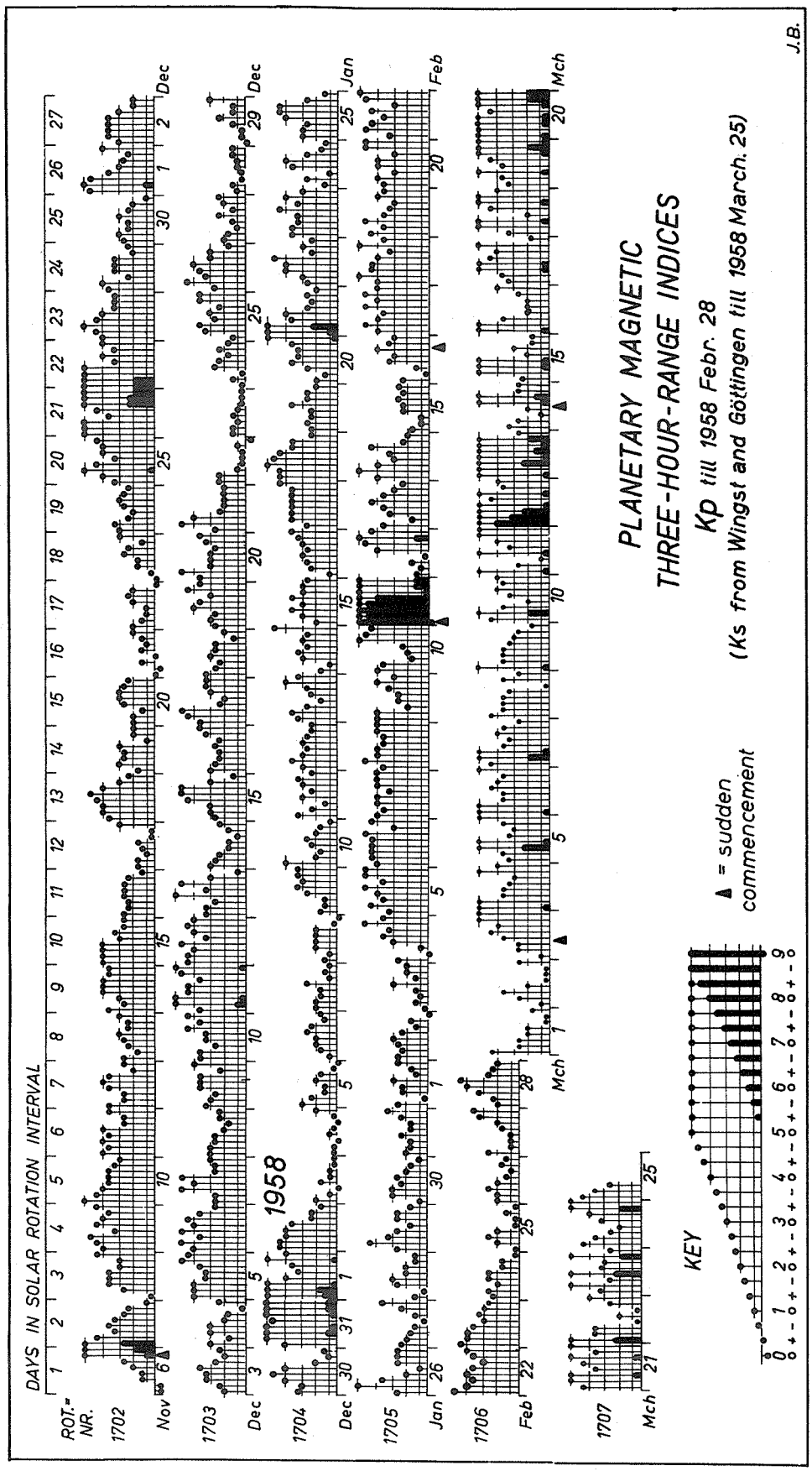
Notes:
1. Interference may occasionally obscure or be mistaken for solar events.
2. February 3, small burst at 1648.7.
3. February 4, burst at 1434.3.
4. February 7, small groups of bursts at 2253 and 2336.
5. February 8, large burst 1414.3.
6. February 25, Probable type "1" or "MF" all day

GEOMAGNETIC ACTIVITY INDICES

FEBRUARY 1958

Feb. 1958	C	Values Kp — Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.4	3- 1- 2+ 2+	3o 1+ 2- 3-	17-	9	Five
2	0.4	3- 2+ 3- 3o	2+ 1+ 2- 0+	16+	9	Quiet
3	0.2	1- 1+ 1o 1+	3o 1+ 2o 2o	13-	6	
4	1.1	3- 0+ 1o 3o	4- 3+ 5- 4-	22+	17	3
5	1.4	3+ 4+ 4- 4o	5- 4- 5- 5-	33o	30	15
						24
6	1.3	4o 4+ 4+ 4+	4+ 5- 3o 4+	33+	30	25
7	1.2	4o 4- 4o 4o	3+ 4o 4o 4o	31o	25	26
8	1.2	4- 5- 4o 4o	4- 4- 4o 4o	32-	27	
9	1.0	4o 4o 2o 3-	3- 3+ 4o 3o	26-	18	
10	1.2	4o 4- 2- 2o	2+ 5o 5- 4+	28-	24	
11	2.0	9o 8+ 9- 8+	8o 5+ 6o 6o	60-	199	Five
12	1.8	6o 6- 6+ 5+	4o 5- 6o 4+	42+	59	Disturbed
13	1.0	4- 2- 3+ 4-	4+ 4- 3o 2+	26-	18	
14	1.2	4o 5o 4o 3o	3+ 4+ 2+ 2o	28o	23	6
15	0.5	2- 1o 1o 2+	2+ 3- 2+ 3-	16o	8	11
						12
16	0.9	2+ 1- 1+ 3+	3o 4o 3+ 3o	21o	14	17
17	1.3	4o 5- 4o 4-	5- 4o 5- 4o	34-	31	18
18	1.3	4o 5o 4+ 4+	4o 3+ 5o 4-	34-	32	
19	1.1	4+ 4- 5- 4-	3+ 3o 4o 4-	30+	25	
20	1.2	4- 4o 3o 4o	4o 3o 5- 5-	31o	26	
21	1.3	3+ 5- 4+ 4-	4+ 3o 5- 5o	33o	31	Ten
22	1.1	5- 4o 4- 4o	4- 3o 4- 4o	31-	25	Quiet
23	0.9	4+ 4o 4o 4-	3o 3+ 3o 3-	28o	21	
24	0.3	2+ 3- 2o 3-	3- 2- 2- 1-	16+	8	1
25	0.2	1- 2o 3- 2o	1- 1- 1+ 1-	11-	5	2
						3
26	0.2	2o 2o 3- 2o	1+ 1o 2- 1+	14o	7	15
27	0.5	3- 1o 1o 1o	2- 2o 3+ 4-	16+	10	16
28	0.8	2o 2+ 3+ 4o	4+ 3- 2+ 2o	23o	15	24
						25
						26
						27
						28
Mean:	0.96			Mean:	27	

COMMERCE - STANDARDS - BOULDER


DAYS IN SOLAR ROTATION INTERVAL
ROT.-NR.
1958
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1958 Febr. 28
(Ks from Wingst and Göttingen till 1958 March. 25)
▲ = sudden commencement
KEY
J.B.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

FEBRUARY 1958

Feb. 1958	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 (1)	Day (2)
1	7-	7-	7o	7o	7	7	7	7	7o	7	7		2	2
2	6+	7-	7o	7o	7	7	7	7	7-	7	7		3	1
3	7o	7-	7o	7+	7	7	7	7	7o	7	7		1	2
4	7o	7-	7o	6o	7	7	7	7	7-	7	7		2	3
5	5+	5o	7o	6o	6	5	6	6	6-	7	7		(4)	(4)
6	6-	6-	7-	6o	6	6	7	6	6o	7	7		(4)	(4)
7	6o	6-	7-	6o	6	6	7	6	6+	6	7		3	3
8	6+	7-	7-	6+	6	6	7	7	7-	6	7		(4)	(4)
9	6+	6+	7-	6o	6	7	7	7	6+	6	7		3	3
10	7-	7-	6+	5-	7	7	7	6	6o	6	7		3	3
11	3-	1+	3o	3+	6	2	3	3	(3-)	6	6		(9)	(6)
12	3+	4o	6+	6-	3	2	5	5	(4+)	5	7		(5)	(5)
13	6+	6+	7-	6+	5	6	7	6	6+	4	7		3	3
14	6+	6+	7-	6+	6	6	6	6	6+	6	4		3	2
15	6+	7-	7o	7-	6	6	6	6	7-	6	6		1	2
16	7-	7-	7-	7o	6	6	7	6	7-	6	6		1	3
17	7-	6+	7-	6-	6	6	6	6	6+	7	6		(4)	(4)
18	5+	5o	6+	6-	5	5	6	5	6-	6	7		(4)	3
19	6o	6o	7-	6+	5	6	6	6	6+	6	7		(4)	3
20	6-	6+	7o	6+	6	6	6	6	6+	6	7		3	3
21	6-	6o	7o	6o	6	5	6	6	6+	6	6		(4)	3
22	6-	6+	7o	6+	6	5	7	6	6+	6	6		3	3
23	6-	6o	7o	7-	6	6	7	6	6+	6	6		(4)	3
24	6o	7-	7o	7o	6	6	7	7	7-	6	6		2	2
25	7o	7-	7+	7+	7	7	7	7	7o	7	6		2	1
26	7o	7o	7o	7o	7	7	7	7	7o	7	6		2	2
27	7o	7o	7o	7o	7	7	7	7	7o	7	6		1	3
28	7-	7-	7o	7o	7	7	7	7	7-	7	7		3	3

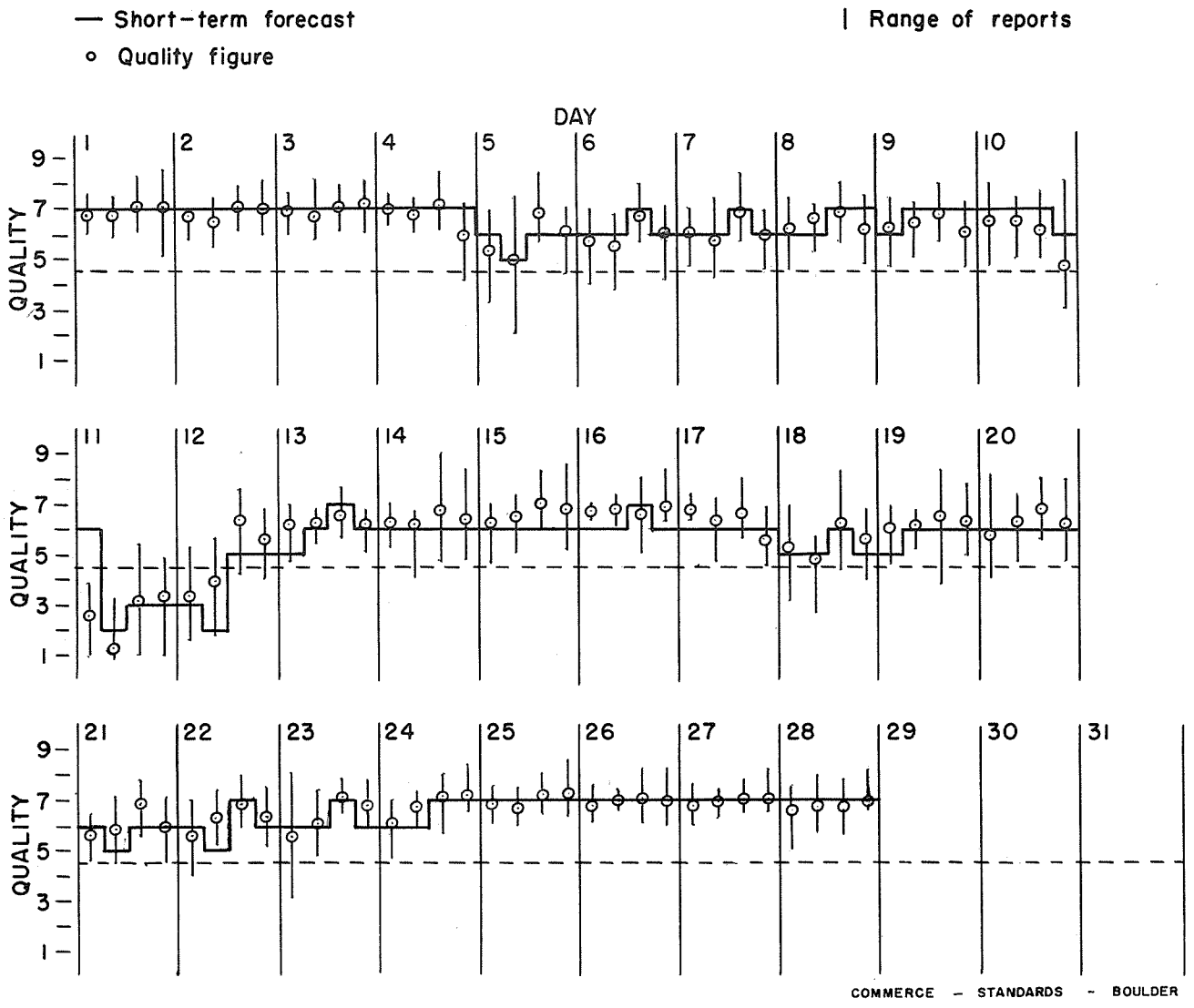
Score:										
Quiet Periods	P	20	19	18	18			18	10	
	S	6	7	9	9			7	15	
	U	0	0	0	0			0	0	
	F	0	0	0	0			1	1	
Disturbed Periods	P	1	0	1	1			0	0	
	S	0	1	0	0			1	0	
	U	0	1	0	0			0	0	
	F	1	0	0	0			1	2	

( ) represent disturbed values.

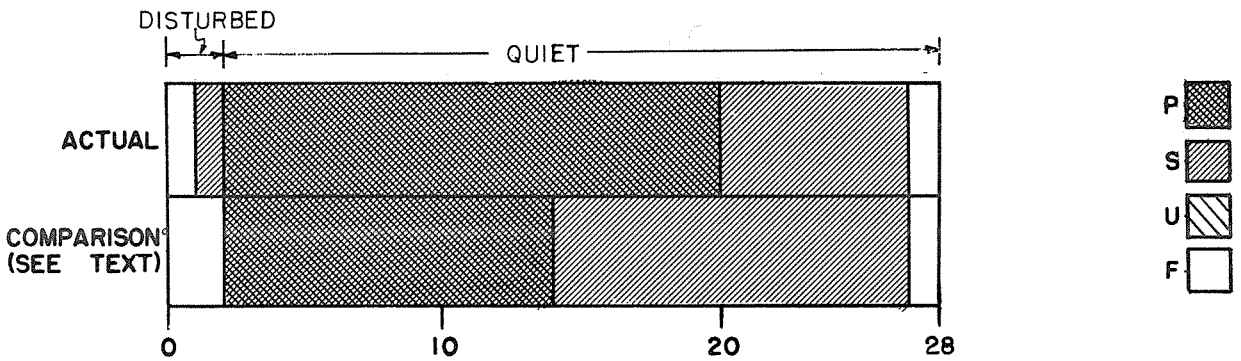
CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH ATLANTIC

FEBRUARY 1958

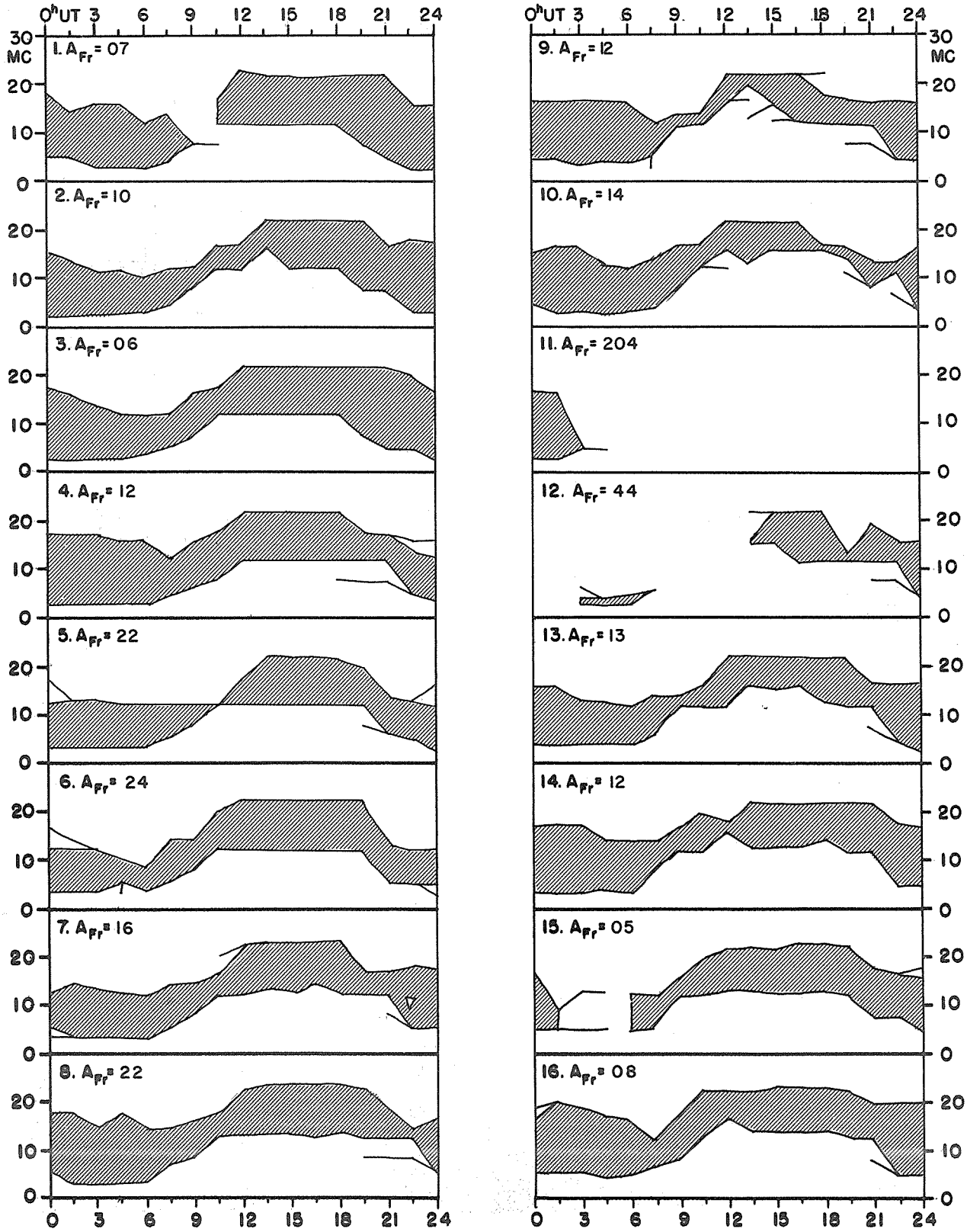


OUTCOME OF ADVANCED FORECASTS 1 TO 4 DAYS AHEAD



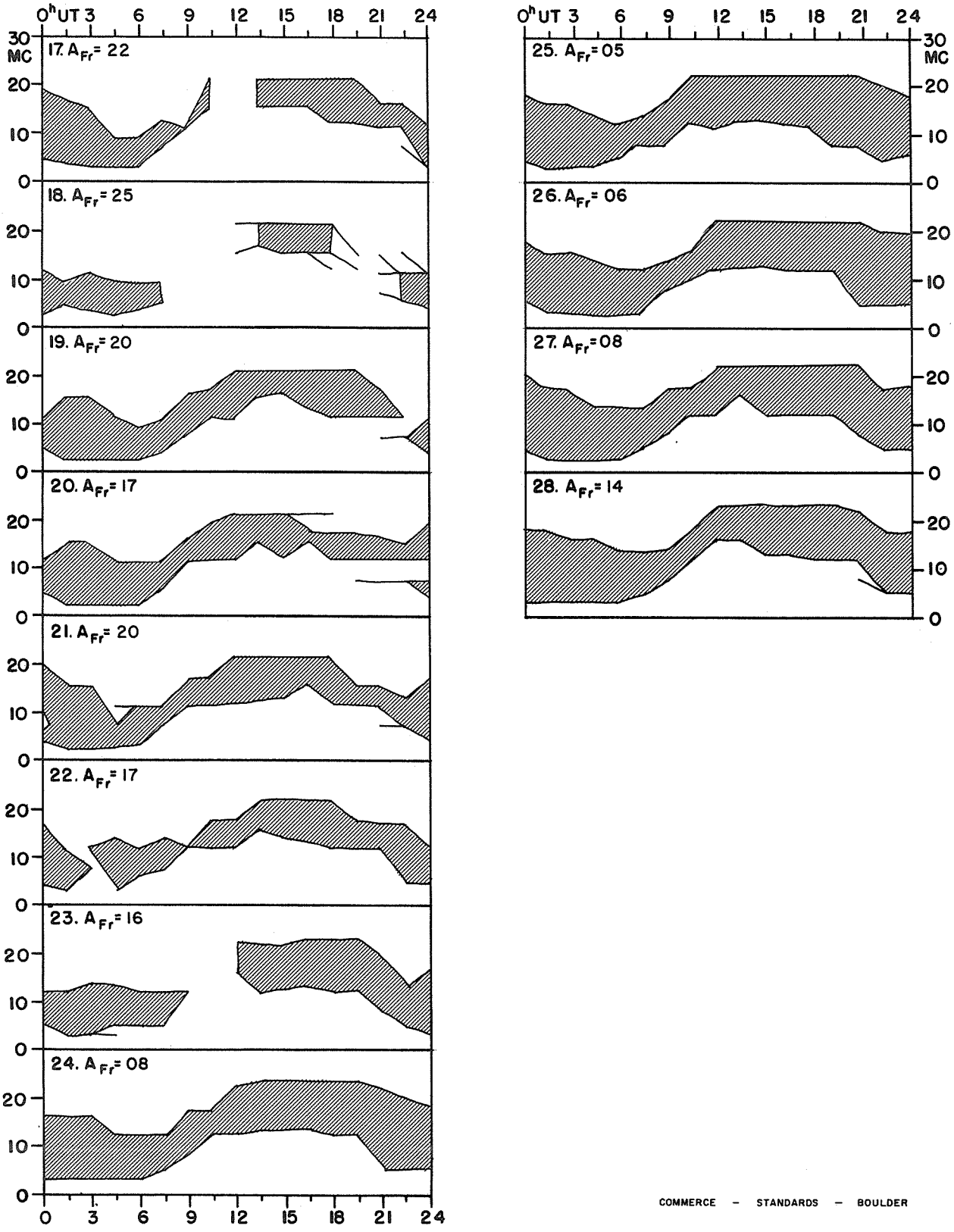
USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

FEBRUARY 1958



COMMERCE – STANDARDS – BOULDER

FEBRUARY 1958



COMMERCE – STANDARDS – BOULDER

Adapted from Observations by Deutsches Bundespost

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NORTH PACIFIC

FEBRUARY 1958

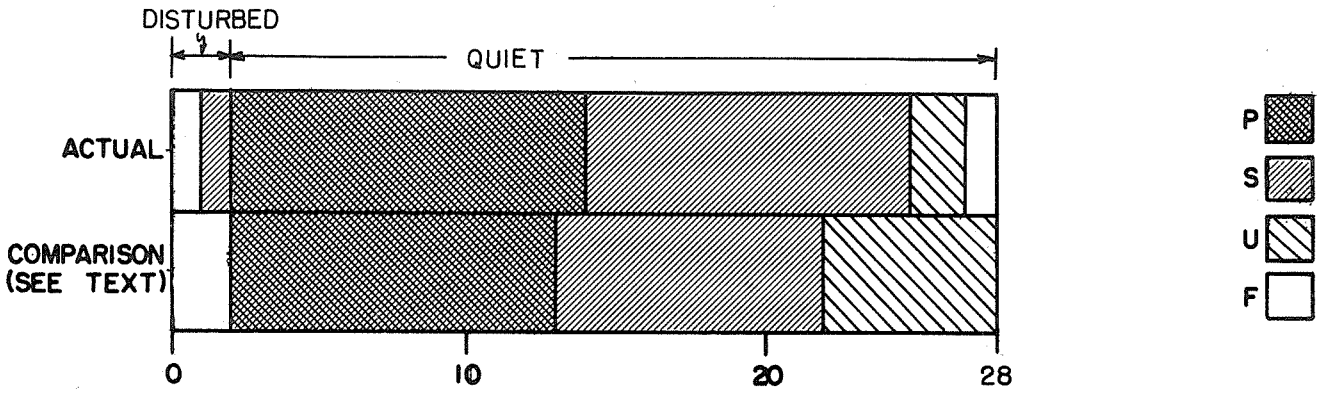
Feb. 1958	North Pacific 8-hourly quality figures			Short-term forecasts issued at			Whole day index	Advance forecasts (Jp reports) for whole day; issued in advance by:			Geomagnetic K_{S1}	
	03 to 11	11 to 19	19 to 03	02	10	18		1-4 days	4-7 days	8-25 days	Half Day (1)	Day (2)
1	6	5	6	6	7	6	6	7	7		2	2
2	6	6	7	6	6	6	7	6	7		2	2
3	6	6	7	7	6	6	6	6	7		0	2
4	6	5	7	6	7	6	6	7	7		1	3
5	6	5	6	6	5	6	6	6	7		(4)	(5)
6	6	5	5	6	5	6	5	6	7		(4)	(4)
7	6	6	6	5	5	5	6	6	7		(4)	(4)
8	5	5	6	6	5	6	5	5	6		(4)	(4)
9	5	6	5	6	6	6	5	5	6		2	3
10	5	5	4	5	5	5	5	6	6		2	(4)
11	2	2	4	3	2	3	(2)	6	6		(9)	(6)
12	3	4	6	3	4	3	(4)	3	6		(6)	(5)
13	6	5	7	5	5	6	6	4	6		3	(4)
14	6	5	6	6	6	6	6	6	6		(4)	3
15	5	6	6	6	5	6	6	6	6		1	2
16	6	5	6	6	6	6	6	6	6		2	3
17	7	4	6	6	6	5	5	7	6		(4)	(4)
18	5	5	5	6	6	6	5	7	6		(4)	(4)
19	6	6	6	5	5	6	6	5	7		(4)	(4)
20	6	6	6	5	6	6	6	6	7		3	(4)
21	6	5	6	6	6	6	6	6	7		(4)	(4)
22	6	5	6	5	5	6	6	5	7		(4)	3
23	5	5	6	6	4	6	6	5	7		(4)	2
24	5	5	6	6	5	6	6	5	7		2	2
25	6	6	7	6	6	7	6	6	7		1	1
26	6	6	8	6	6	7	7	6	6		1	2
27	7	6	6	6	7	7	7	6	6		0	2
28	6	6	7	6	6	6	6	6	6		3	3

Score:								
Quiet Periods	P	12	14	13	12	6		
	S	14	9	12	11	19		
	U	0	2	0	2	1		
	F	0	0	1	1	0		
Disturbed Periods	P	1	2	0	0	0		
	S	1	0	2	1	0		
	U	0	0	0	0	0		
	F	0	1	0	1	2		

( ) represent disturbed values.

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS
NORTH PACIFIC
FEBRUARY 1958

OUTCOME OF ADVANCED FORECASTS 1 TO 4 DAYS AHEAD



COMMERCE – STANDARDS — BOULDER

ALERT PERIODS AND SPECIAL WORLD INTERVALS

Alert Issued 1600 UT	Alert Ends 1600 UT	SWI Issued 0001 UT	SWI Ends 2400 UT	A_{Be} On Days of Alert Period (SWI Underlined)	Number of Flares of IMP ≥ 2 Reported Promptly on Days of Alert Period
1958					
Mar 02	Mar 07	Mar 05	Mar 05	09-21-27-<u>31</u>-31-20	0-1-0-0-0-1
Mar 12	Mar 13			44-38	2-0
Mar 14	Mar 16	Mar 15	Mar 15	16-<u>24</u>-19	1-0-0
Mar 20	Apr 01	Mar 23	Mar 25	23-33-22-<u>16</u>-<u>16</u>-<u>24</u>-18-	8-3-0-3-2-7-1-
		Mar 30	Mar 31	-16-12-10-<u>27</u>-<u>14</u>-20	-6-9-2-9-2-1

COMMERCE — STANDARDS — BOULDER