CRPL-F80

IONOSPHERIC DATA

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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D. C.

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CONTENTS

SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1949, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Fifth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Stockholm, 1948, and given in detail on pages 2 to 10 of the report CRPL-F53, "Ionospheric Data," issued January 1949.

For symbols and terminology used with data prior to January 1949, see report IRPL-C61, "Report of International Radio Propagation Conference, Washington, 17 April to 5 May, 1944," previous issues of the F series, in particular, IRPL-F5, CRPL-F24, F33, F50, and report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

Following the recommendations of the Washington (1944) and Stockholm (1948) conferences, beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

In addition to the conventions for the determination of medians given in Appendix 5 of Document No. 293 E of the Stockholm conference, which are listed on pages 9 and 10 of CRPL-F53, the following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given on pages 2-9 of CRPL-F53 (Appendixes 1-4 of Document No. 293 E referred to above).

a. For all ionospheric characteristics:

Values missing because of A, B, C, F, L, M, N, Q, R, S, or T (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of D are counted as equal to or greater than the upper limit of the recorder.

Values missing because of G are counted:
1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic. This practice represents a change from that listed in issues previous to CRPL-F78.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If only four values or less are available, the data are considered insufficient and no median value is computed.

2. For the F2 layer, if only five to nine values are available, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as there are at least five values, the median is not considered doubtful.

3. For all layers, if more than half of the values used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

a. Differences in scaling records when spread echoes are present.

b. Omission of values when foF2 is less than or equal to foF1, leading to erroneously high values of monthly averages or median values.

c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily, a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.

b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number						
	1951	1950	1949	1948	1947	1946	1945
December		86	108	114	126	85	38
November		87	112	115	124	83	36
October		90	114	116	119	81	23
September		91	115	117	121	79	22
August		96	111	123	122	77	20
July		101	108	125	116	73	
June		103	108	129	112	67	
May		102	108	130	109	67	
April		101	109	133	107	62	
March	78	103	111	133	105	51	
February	82	103	113	133	90	46	
January	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 23 and figures 1 to 46 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Radio Wave Research Laboratories, National Taiwan University, Taipeh, Formosa, China:
Formosa, China

National Laboratory of Radio-Electricity (French Ionospheric Bureau):
Domont, France
Poitiers, France

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
- Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:
- De Bilt, Holland

Radio Regulatory Commission, Tokyo, Japan:
- Akita, Japan
- Tokyo (Kokubunji), Japan
- Wakkanai, Japan
- Yamagawa, Japan

Norwegian Defense Research Establishment, Kjeller per Lillestrom, Norway:
- Oslo, Norway

South African Council for Scientific and Industrial Research:
- Capetown, Union of South Africa
- Johannesburg, Union of South Africa

United States Army Signal Corps:
- Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
- Baton Rouge, Louisiana (Louisiana State University)
- Boston, Massachusetts (Harvard University)
- Guam I.
- Huancayo, Peru (Instituto Geofisico de Huancayo)
- Maui, Hawaii
- San Francisco, California (Stanford University)
- Trinidad, British West Indies
- Washington, D. C.
- White Sands, New Mexico

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 24 to 35 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

IONOSPHERIC STORMINESS AT WASHINGTON, D. C.

Table 36 presents ionosphere character figures for Washington, D. C., during March 1951, as determined by the criteria given in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

RADIO PROPAGATION QUALITY FIGURES

Table 37 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, February 1951, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

The radio propagation quality figures are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner basically the same as that described in IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued February 1, 1946. The scale conversions for each report are revised for use with the data beginning January 1948, and statistical weighting replaces what was, in effect, subjective weighting. Separate master distribution curves of the type described in IRPL-R31 were derived for the part of 1946 covered by each report; data received only since 1946 are compared with the master curve for the period of the available data. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

These radio propagation quality figures give a consensus of opinion of actual radio propagation conditions as reported by the half day over the two general areas. It should be borne in mind, however, that though the quality may be disturbed according to the CRPL scale, the cause of the disturbance is not necessarily known. There are many variables that must be considered. In addition to ionospheric storminess itself as the cause, conditions may be reported as disturbed because of seasonal characteristics such as are particularly evident in the pronounced day and night contrast over North Pacific paths during the winter months, or because of improper frequency usage for the path and time of day in question. Insofar as possible, frequency usage is included in rating the reports. Where the actual frequency is not shown in the report to the CRPL, it has been assumed that the report is made on the use of optimum working frequencies for the path and time of day in question. Since there is a possibility that all disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

OBSERVATIONS OF THE SOLAR CORONA

Tables 38 through 40 give the observations of the solar corona during March 1951 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 41 through 43 list the coronal observations obtained at Sacramento Peak, New Mexico, during March 1951, derived by the High Altitude Observatory from spectrograms taken by Harvard University as a part of its performance of an Air Materiel Command research and development contract administered by the Air Force Cambridge Research Laboratories. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 38 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 39 gives similarly the intensities of the first red (6374A) coronal line; and table 40, the intensities of the second red (6702A) coronal line; all observed at Climax in March 1951.

Table 41 gives the intensities of the green (5303A) coronal line; table 42, the intensities of the first red (6374A) coronal line; and table 43, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in March 1951.

The following symbols are used in tables 38 through 43: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

RELATIVE SUNSPOT NUMBERS

Table 44 lists the daily provisional Zurich relative sunspot numbers, R_Z, as communicated by the Swiss Federal Observatory. The American sunspot numbers which in the past were included in this table are now being prepared on a slower schedule and therefore do not appear in this issue.

OBSERVATIONS OF SOLAR FLARES

Table 45 gives the preliminary record of solar flares reported to the CRPL. These reports are communicated on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete records are published later in the Quarterly Bulletin of Solar Activity, I.A.U., in various observatory publications, and elsewhere. The present listing serves to identify and roughly describe the phenomena observed. Details should be sought from the reporting observatory.

Reporting directly to the CRPL are the following observatories: Mt. Wilson, McMath-Hulbert, U.S. Naval, Wendelstein, Kanzel, and High Altitude at Boulder, Colorado. The remainder report to Meudon (Paris), and the data are taken from the Paris URSIgram broadcast, monitored fairly regularly by the CRPL. The data on solar flares reported from Boulder, Colorado are provided by Harvard University as the result of work undertaken on an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories.

The table lists for each flare the reporting observatory, date, times of beginning and ending of observation, duration (when known), total area (corrected for foreshortening), and heliographic coordinates. For the maximum phase of the flare is given the time, intensity, area relative to the total area, and the importance. The column "SID observed" is to indicate when a sudden ionosphere disturbance, noted elsewhere in these reports, occurred at the time of a flare. Times are in Universal Time (GCT).

INDICES OF GEOMAGNETIC ACTIVITY

Table 46 lists various indices of geomagnetic activity based on data from magnetic observatories widely distributed throughout the world. The indices are: (1) preliminary mean 3-hourly K-indices, Kw; (2) preliminary international character-figures, C; (3) geomagnetic planetary three-hour-range indices, Kp; (4) magnetically selected quiet and disturbed days.

Kw is the arithmetic mean of the K-indices from all reporting observatories for each three hours of the Greenwich day, on a scale 0 (very quiet) to 9 (extremely disturbed). 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). The magnetically quiet and disturbed days are selected by the international scheme outlined on pages 219-227 in the December 1943 issue of Terrestrial Magnetism and Atmospheric Electricity.

Kp is the mean standardized K-index from 11 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 to 9, 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," published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Tables of Kp for 1945-48 are in Bulletin 12b; for 1940-44 and 1949, in these CRPL-F reports, F65-67; for 1950, monthly in F68 and following issues. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

The Committee on Characterization of Magnetic Disturbance, ATME, IUGG, has kindly supplied this table. The Meteorological Office, De Bilt, Holland, collects the data and compiles Kw, C and selected days. The Chairman of the Committee computes the planetary index.

SUDDEN IONOSPHERE DISTURBANCES

Tables 47, 48, 49, and 50 list the sudden ionosphere disturbances observed at Fort Belvoir, Virginia, March 1951; at Riverhead, New York, April 1951; in Barbados, British West Indies, January and February 1951; and at Platanos, Argentina, February 1951, respectively.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (38.7°N, 77.1°W) — March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(290)	3.4						2.8
01	(300)	3.2						2.8
02	290	3.0						2.8
03	290	3.0						2.9
04	280	2.8						3.0
05	270	2.5						3.0
06	270	2.9						3.1
07	250	4.7	240	—	120	1.9		3.3
08	260	5.9	220	3.7	110	2.4		3.3
09	270	6.2	210	4.1	100	2.7		3.2
10	300	6.4	200	4.3	100	2.9		3.1
11	300	7.1	200	4.5	100	3.1		3.1
12	300	7.8	200	4.5	100	3.2		3.1
13	300	7.6	210	4.6	100	3.3		3.1
14	300	7.5	220	4.5	100	3.1		3.1
15	280	7.4	220	4.3	110	3.0		3.1
16	270	7.4	220	3.8	110	2.8		3.1
17	250	7.3	240	—	120	2.3		3.2
18	230	7.2	—	—	130	1.9		3.2
19	230	6.3						3.1
20	240	5.4						3.0
21	250	4.6						3.0
22	270	4.0						2.9
23	280	3.5						2.8

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Oslo, Norway (60.0°N, 11.0°E) — February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	2.0					2.2	(2.8)
01	335	(1.8)					2.2	(2.8)
02	340	1.8					2.6	(2.8)
03	330	2.2					2.7	(2.8)
04	320	2.3					2.3	(2.8)
05	300	2.2					2.4	(2.9)
06	300	2.2						3.0
07	270	2.3						3.1
08	250	3.7	---	---	---	1.8	2.3	3.3
09	235	5.0	230	—	115	2.0	2.1	3.4
10	230	6.6	220	3.2	110	2.3		3.4
11	235	6.3	220	3.4	120	2.4		3.4
12	246	6.2	220	3.5	120	2.5		3.4
13	240	6.8	220	3.5	120	2.6		3.4
14	230	6.8	220	3.3	120	2.4		3.4
15	225	6.7	225	2.7	125	2.2		3.4
18	220	6.2	---	---	130	1.9	1.8	3.4
17	220	5.8			---	1.7		3.4
18	215	4.4						3.2
19	235	3.7						3.1
20	260	3.0						3.2
21	300	2.9						3.1
22	300	2.3						3.0
23	330	2.2						2.9

Time: 16.0°E.
Sweep: 1.3 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 3

De Bilt, Netherlands (62.1°N, 5.2°E) — February 1961

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(295)	2.8					2.4	2.8
01	(300)	(2.7)					2.7	(2.8)
02	(<290)	(2.8)					2.8	(2.8)
03	---	(2.1)					2.9	(2.6)
04	---	1.9					2.8	(2.8)
05	---	1.8					2.8	(2.8)
06	---	2.2					2.4	2.7
07	250	3.9			---	1.6	2.8	3.2
08	220	5.6	210	3.0	100	2.0	2.8	3.3
09	230	5.9	210	3.6	106	2.4		3.2
10	250	6.8	210	3.8	100	2.7		3.2
11	260	6.8	206	4.0	105	2.8		3.3
12	255	7.0	210	4.0	106	2.8		3.2
13	250	7.2	210	4.0	105	2.7		3.3
14	240	7.2	210	3.6	105	2.6		3.3
15	226	7.0	216	3.2	105	2.3		3.3
18	210	7.0	---	---	105	2.0	2.1	3.4
17	205	5.9			---	1.6		3.4
18	206	6.6			---	E		3.1
19	225	4.4						3.1
20	250	3.3						3.0
21	270	2.9						2.9
22	(285)	2.8						2.8
23	(285)	2.7						2.8

Time: 0.0°.
Sweep: 1.4 Mc to 16.0 Mc in 7 minutes, automatic operation.

Table 4

Boston, Massachusetts (42.4°N, 71.2°W) — February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.4						3.0
01	280	3.2						3.0
02	270	3.0						3.0
03	260	2.7						3.0
04	260	2.7						3.1
06	240	2.7						3.2
06	250	2.7						3.2
07	220	4.6			110	2.1		3.4
08	210	6.0	200	---	110	2.3		3.6
09	220	8.9	200	3.8	110	2.7		3.6
10	230	7.6	200	4.0	110	2.9		3.4
11	240	7.9	200	4.0	110	3.0		3.4
12	240	8.4	200	4.2	110	3.1		3.4
13	240	8.4	200	4.1	110	3.1		3.3
14	230	8.3	200	4.0	110	3.0		3.4
16	220	8.4	200	3.8	110	2.7		3.4
16	210	8.0	---	---	110	2.4		3.3
17	210	7.6						3.4
18	210	6.9						3.3
19	220	6.0						3.3
20	220	6.1						3.2
21	240	4.2						3.2
22	260	3.7						3.2
23	280	3.3						3.1

Time: 75.0°W.
Sweep: 0.8 Mc to 15.0 Mc in 1 minute.

Table 5

San Francisco, California (37.4°N, 122.2°W) — February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.2						(2.8)
01	300	3.4						(2.9)
02	290	3.4						(3.0)
03	300	3.3						(2.9)
04	290	3.2						3.0
06	300	(3.1)						(2.8)
08	300	(3.3)						(2.9)
07	260	4.3						3.1
08	240	6.7			120	2.2		3.3
09	240	7.5	---	4.2	120	---		3.3
10	250	8.8	---	4.4	120	---		3.2
11	260	9.4	(220)	4.8	120	---		3.2
12	260	9.3	(220)	4.7	120	---		3.1
13	270	9.2	---	4.8	120	---		3.1
14	260	9.2	---	4.6	120	---		3.1
16	240	8.8	---	4.1	120	---		3.2
18	240	8.2			120	2.6		3.3
17	230	7.7			---	---		3.4
18	220	6.0						3.4
19	230	4.6						3.2
20	240	(3.4)						(3.2)
21	280	(3.1)						(3.1)
22	280	(3.6)						(2.9)
23	310	(3.6)						2.8

Time: 120.0°W.
Sweep: 1.3 Mc to 18.0 Mc in 4 minutes.

Table 6

White Sands, New Mexico (32.3°N, 106.6°W) — February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.6					2.8	2.9
01	260	3.6					2.8	3.0
02	260	3.6					2.4	3.0
03	260	3.4					2.4	3.0
04	260	3.3					2.4	3.0
06	280	3.0					2.5	3.0
06	270	3.0					2.6	3.0
07	240	4.9					2.6	3.2
08	240	6.9	220	---	120	2.4	3.0	3.2
09	260	7.7	220	---	110	2.8	4.0	3.2
10	270	8.6	220	---	110	3.1	4.0	3.1
11	280	9.4	220	4.7	110	3.3	4.4	3.1
12	280	9.9	220	4.8	110	3.4	5.0	3.1
13	280	9.6	220	4.7	110	3.4	3.9	3.1
14	280	9.6	220	4.6	110	3.3	4.2	3.1
15	260	9.4	230	---	110	3.0	3.6	3.2
16	250	8.8	230	---	110	(2.7)	3.9	3.2
17	230	7.9			110	2.2	3.4	3.3
18	220	6.7					3.0	3.3
19	220	5.0					2.8	3.2
20	240	3.6					2.8	3.1
21	260	2.9					2.4	3.0
22	280	3.2					2.5	2.8
23	280	3.4					2.4	2.9

Time: 105.0°W.
Sweep: 0.8 Mc to 14.0 Mc in 2 minutes.

Table 7

Okinawa I. (26.3°N, 127.7°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(250)	4.5						3.0
01	250	4.2						3.1
02	240	3.7						3.1
03	230	3.4						3.4
04	(220)	(2.5)						(3.0)
05	(300)	2.4						(2.8)
06	(290)	2.5						3.0
07	240	(5.9)			(130)	---		(3.3)
08	240	8.1	230	---	110	(2.5)		3.3
09	260	9.2	230	---	100	(3.0)		3.3
10	280	10.9	230	---	110	(3.2)		3.1
11	270	12.9	220	---	110	(3.3)	3.9	3.2
12	270	12.4	210	---	110	(3.4)	4.1	3.2
13	280	12.6	220	---	110	3.5	4.2	3.1
14	270	(11.8)	230	---	110	3.3	4.0	(3.1)
15	260	11.5	220	---	110	3.1	4.2	3.2
16	250	10.3	230	---	110	(2.7)	3.7	3.2
17	230	9.6	---	---	110	2.2	3.0	3.3
18	220	8.5					2.5	3.3
19	220	7.6					2.1	3.2
20	220	7.2						3.1
21	230	7.2						3.1
22	(230)	(5.1)						(3.0)
23	(270)	4.9						2.9

Time: 127.5°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 8

Maui, Hawaii (20.8°N, 156.5°W) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.5						3.0
01	250	3.8						3.1
02	250	3.4						3.2
03	240	3.0						3.3
04	240	2.4						3.3
05	260	2.1					1.8	2.9
06	310	2.1					1.9	2.9
07	260	4.3			170	1.6	1.9	3.1
08	240	7.1	230	---	120	2.4	2.8	3.2
09	270	8.5	220	---	110	2.8	4.4	3.1
10	280	10.0	220	4.6	110	3.2	5.5	3.0
11	290	10.9	210	4.8	110	3.3	4.7	2.9
12	310	11.8	210	4.8	110	3.4	4.7	3.0
13	300	13.0	210	4.9	110	3.4	4.2	3.0
14	280	13.2	220	4.8	110	3.4	5.0	3.0
15	280	12.6	220	4.6	110	3.3	4.2	3.1
16	260	12.0	220	4.1	110	2.9	3.2	3.1
17	250	11.8	240	---	110	2.4	3.2	3.3
18	230	10.0			140	---	3.8	3.4
19	210	6.8					3.0	3.3
20	230	5.0					2.8	3.1
21	240	4.8					2.0	2.9
22	250	4.4					2.4	3.0
23	260	4.0					1.5	2.8

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 9

Guam I. (13.6°N, 144.9°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	8.4					2.2	3.2
01	240	7.6					1.9	3.2
02	230	6.8						3.4
03	230	5.3						3.3
04	230	4.1					1.9	3.3
05	240	3.2					2.2	3.2
06	260	2.8					2.4	3.2
07	260	5.0			130	1.7	1.9	3.1
08	(280)	8.1	240	---	110	2.5	3.8	3.1
09	290	9.6	220	---	110	3.0	5.2	2.8
10	300	10.2	210	4.7	110	3.2	5.0	2.6
11	310	9.6	200	4.8	110	3.4	4.0	2.5
12	320	9.7	200	4.8	110	3.5		2.5
13	320	10.2	190	4.8	110	3.5		2.6
14	310	10.8	210	(4.7)	110	3.4		2.8
15	300	11.4	220	(4.6)	110	3.3	4.4	2.8
16	290	11.6	230	---	110	3.1	6.2	2.9
17	(270)	11.6	240	---	110	2.6	5.8	2.9
18	260	12.0			120	2.0	4.0	3.0
19	270	11.8					3.4	2.9
20	260	11.4					2.4	2.9
21	240	10.6					3.4	3.0
22	240	9.8					3.0	3.1
23	230	8.7					2.6	3.2

Time: 150.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 10

Trinidad, British West Indies (10.8°N, 61.2°W) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.4						3.0
01	250	4.8						3.1
02	240	4.7						3.3
03	250	4.1						3.2
04	270	3.7						3.0
05	290	3.4						2.9
06	270	3.5						3.0
07	230	6.1			100	2.1	3.0	3.4
08	240	8.4	220	4.0	110	2.8	3.6	3.4
09	250	10.0	220	4.5	110	3.2	3.8	3.4
10	260	10.4	200	4.8	110	3.5	4.2	3.3
11	260	10.2	200	4.9	110	3.6	4.3	3.2
12	280	10.7	200	5.0	110	3.7	4.6	3.2
13	270	10.9	200	5.0	110	3.7	4.4	3.2
14	270	10.6	210	5.0	110	3.6	4.9	3.1
15	270	10.6	210	4.8	110	3.4	4.6	3.1
16	260	10.4	220	4.4	110	3.1	4.4	3.1
17	240	10.5	220	3.8	110	2.8	3.8	3.2
18	220	9.8			---	---	3.2	3.2
19	210	8.4					3.2	3.3
20	220	6.6						3.1
21	270	5.2					2.4	2.9
22	280	4.9						3.0
23	270	4.8						3.0

Time: 60.0°W.
Sweep: 1.2 Mc to 19.5 Mc, manual operation.

Table 11

Huancayo, Peru (12.0°S, 75.3°W) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	(9.0)					3.2	(3.3)
01	260	7.1					3.3	3.2
02	260	6.0					3.2	3.2
03	280	5.3					3.2	3.2
04	280	4.6					3.1	3.3
05	260	4.6					3.2	3.3
06	270	5.0			100	---	3.2	3.1
07	230	8.0	---	---	110	2.5	3.5	3.2
08	290	9.8	220	---	110	3.0	7.4	3.0
09	300	10.4	220	4.8	110	(3.3)	10.5	2.7
10	320	10.5	210	4.9	110	(3.5)	10.8	2.5
11	330	9.3	210	4.9	110	---	10.7	2.4
12	340	9.0	210	4.9	110	---	10.7	2.4
13	330	9.0	200	4.8	110	---	10.6	2.4
14	320	9.2	200	4.8	110	---	10.6	2.5
15	310	9.6	200	4.6	110	(3.3)	10.6	2.5
16	300	10.0	210	---	110	3.0	8.0	2.5
17	240	10.7			110	2.6	7.7	2.6
18	280	10.3			110	(1.8)	3.3	2.6
19	310	10.0					2.7	2.6
20	320	9.2					2.6	2.4
21	300	9.3					2.7	(2.5)
22	280	(9.4)					3.2	(3.0)
23	280	(9.7)					3.2	(3.0)

Time: 75.0°W.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 12

Wakkanai, Japan (45.4°N, 141.7°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.4					1.6	2.8
01	300	3.4					1.5	2.8
02	300	3.2						2.9
03	280	3.4						2.9
04	280	3.3						2.9
05	280	3.1						2.9
06	280	2.9						3.0
07	270	4.2	---	---	110	1.8	2.1	3.1
08	230	6.4	---	---	110	2.0		3.3
09	240	7.6	220	---	110	2.4		3.3
10	250	7.6	220	---	110	2.8		3.3
11	250	8.0	230	---	110	2.8		3.3
12	260	7.4	230	---	110	2.9		3.3
13	250	7.3	230	---	110	2.8		3.2
14	240	7.0	250	---	110	2.8		3.4
15	240	6.4	---	---	110	2.2		3.3
16	230	5.4	---	---	110	1.8		3.3
17	230	4.7					1.8	3.1
18	230	4.3					1.8	3.2
19	250	3.4					2.4	3.1
20	280	3.0					2.0	3.0
21	300	3.3					2.0	2.9
22	300	3.2					1.3	2.8
23	310	3.2						2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 13

Akita, Japan (39.7°N, 140.1°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.3					1.8	2.9
01	280	3.4					2.0	3.0
02	260	3.4					1.4	3.0
03	260	3.5						3.1
04	240	3.2					1.9	3.2
05	260	3.0						3.0
06	250	3.0					2.1	3.1
07	230	4.2			---	1.6	2.2	3.3
08	220	6.3	---	---	120	2.3		3.5
09	230	8.0	230	---	110	2.6		3.4
10	240	8.9	220	---	110	2.8		3.4
11	240	8.6	220	---	110	3.0		3.4
12	240	7.6	220	---	110	3.0		3.4
13	250	7.2	220	---	110	3.0		3.4
14	240	7.3	220	---	110	2.8		3.4
15	230	7.3	---	---	110	2.4		3.4
16	220	5.8			110	1.9	2.2	3.5
17	220	5.0					2.2	3.3
18	220	4.4					2.4	3.3
19	220	3.9					1.8	3.4
20	230	3.4						3.2
21	290	3.0						3.0
22	290	3.2						2.9
23	300	3.2					1.6	2.9

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 14

Tokyo, Japan (35.7°N, 139.5°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.0					1.7	3.0
01	270	3.2					2.0	3.0
02	250	3.2					2.0	3.2
03	240	3.1					1.7	3.2
04	240	2.9					1.9	3.0
05	270	2.6					1.9	3.1
06	240	2.8					1.8	3.3
07	240	4.6	---	---	120	1.6	2.3	3.4
08	230	6.5	240	---	110	2.2		3.4
09	250	8.1	230	---	100	2.7		3.4
10	250	9.2	230	---	100	3.0		3.4
11	240	8.8	230	---	100	3.2		3.4
12	250	8.4	220	---	100	3.1		3.4
13	250	7.6	220	(4.2)	100	3.1		3.4
14	260	7.4	220	---	100	3.0		3.4
15	240	7.2	230	---	110	2.6		3.5
16	230	6.1	220	---	110	2.1		3.5
17	220	5.0					2.2	3.5
18	230	4.2					2.5	3.3
19	220	3.9					2.5	3.4
20	220	3.2					2.6	3.4
21	260	2.6					2.1	3.0
22	290	2.9					2.5	3.0
23	300	3.1					2.3	3.0

Time: 135.0°E.
Sweep: 1.0 Mc to 18.5 Mc in 2 minutes.

Table 15

Yamagawa, Japan (31.2°N, 130.6°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.0					1.9	2.9
01	290	3.1					2.0	2.9
02	270	3.3						3.0
03	250	3.2						3.1
04	240	3.1						3.0
05	300	2.6						2.8
06	290	2.9						2.9
07	270	3.5			---	E		3.1
08	240	6.2	---	---	120	2.0	2.6	3.4
09	250	7.7	240	---	110	2.6	3.5	3.4
10	250	8.8	230	---	110	3.0	3.9	3.3
11	270	9.8	220	---	100	3.2	3.9	3.2
12	260	10.0	220	4.6	110	3.4	4.2	3.3
13	270	9.0	220	---	110	3.3	4.0	3.3
14	280	8.9	220	---	110	3.2	4.2	3.3
15	260	8.6	230	---	100	3.0	4.0	3.3
16	250	7.8	230	---	110	2.6	3.6	3.4
17	230	6.4	220	---	110	2.0	3.0	3.4
18	220	5.2					2.8	3.3
19	240	4.7					2.6	3.2
20	230	4.4					2.0	3.3
21	240	3.4					2.4	3.1
22	280	2.9					2.0	3.0
23	300	3.1					2.0	2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 16

Baton Rouge, Louisiana (30.5°N, 91.2°W) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	3.6						2.9
01	320	3.7						2.9
02	300	4.0						3.0
03	290	3.9						3.0
04	290	4.0						3.0
05	300	3.5						2.9
06	320	3.5						3.0
07	280	4.7						3.1
08	270	6.5	---	---	---	---		3.3
09	270	6.7	250	---	130	(2.6)		3.2
10	290	7.5	250	---	120	2.9		3.0
11	300	9.0	250	---	120	---		3.0
12	300	8.6	260	---	120	---		3.0
13	300	8.8	260	---	120	3.3		3.0
14	300	8.4	260	---	120	(3.2)		3.0
15	290	8.1	250	---	130	(2.8)		3.0
16	280	7.6	260	---	120	(2.6)		3.1
17	270	7.0						3.2
18	240	5.7						3.2
19	270	4.1						3.1
20	290	3.2						3.0
21	300	3.2						2.9
22	340	3.2						2.8
23	330	3.5						2.8

Time: 90.0°W.
Sweep: 2.05 Mc to 14.3 Mc in 5 minutes, automatic operation.

Table 17

Okinawa I. (26.3°N, 127.8°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(260)	3.5						3.0
01	(250)	3.6						3.2
02	(240)	3.2						3.2
03	(230)	2.9						3.4
04	(270)	(2.2)						3.0
05	(290)	(2.2)						2.9
06	(270)	(2.5)						(3.0)
07	240	5.0			---	---		3.4
08	240	7.5	230	---	110	(2.5)	2.0	3.5
09	250	8.6	220	---	110	2.8	3.6	3.3
10	260	9.6	220	---	110	3.1	3.7	3.2
11	260	11.0	200	---	110	3.3	4.1	3.2
12	270	11.6	210	---	110	(3.4)	3.8	3.1
13	270	12.4	220	---	110	3.4	3.9	3.1
14	260	12.6	210	---	110	3.2	3.8	3.1
15	250	11.1	220	---	110	3.2	3.7	3.2
16	240	9.5	230	---	110	2.7	3.2	3.3
17	220	7.1	---	---	120	---	3.1	3.4
18	210	5.9					2.6	3.2
19	230	5.8					2.5	3.1
20	220	5.9						3.3
21	(220)	4.8						3.3
22	(250)	3.6						2.9
23	(270)	3.5						2.9

Time: 127.5°E.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 18

Formosa, China (25.0°N, 121.0°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	4.0						3.6
01	240	4.0	---	---				3.9
02	240	4.0	---	---	---	---		3.8
03	220	4.0	---	---	---	---		4.1
04	240	3.5	---	---	---	---		4.0
05	260	3.4	---	---	---	---		3.5
06	240	3.3	---	---	---	---		4.0
07	210	6.4	200	3.1	---	---	2.5	4.0
08	220	8.2	200	4.0	100	3.1	3.1	4.0
09	220	9.4	200	4.5	100	3.0	3.7	3.9
10	230	9.6	190	4.5	100	3.2	4.1	3.9
11	240	10.8	180	4.7	100	3.3	4.3	3.7
12	240	12.0	180	4.6	100	3.4	4.4	3.7
13	240	12.5	190	4.8	100	3.2	4.3	3.7
14	240	13.0	180	4.6	100	3.1	4.1	3.7
15	220	12.5	190	4.5	100	3.2	3.9	3.7
16	200	11.5	200	4.1	100	3.0	3.6	4.0
17	200	9.0	180	3.8	100	3.1	3.3	4.1
18	200	7.4	---	---	100	---	3.1	4.0
19	180	6.7	---	---	100	---	2.7	4.0
20	200	7.0	---	---	---	---	2.9	4.0
21	200	6.4	---	---	---	---	3.1	4.0
22	220	4.0	---	---				3.9
23	250	3.9						3.5

Time: 120.0°E.
Sweep: 2.3 Mc to 14.5 Mc in 15 minutes, manual operation.

Table 19

Johannesburg, Union of S. Africa (26.2°S, 28.1°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	5.0					2.4	2.9
01	260	4.7					2.2	3.0
02	250	4.1					2.0	3.0
03	260	3.6					1.9	3.0
04	270	3.3					2.2	3.0
05	270	3.2					1.9	3.0
06	250	4.9	240	---	120	1.9	2.4	3.2
07	(300)	5.9	230	4.0	110	2.6	3.3	3.0
08	330	6.8	220	4.6	110	3.1	3.9	2.8
09	340	7.5	210	4.6	110	3.4	4.2	2.8
10	350	8.0	200	4.8	110	3.6	4.4	2.8
11	340	9.0	200	4.9	110	3.7	4.0	2.8
12	340	9.1	200	4.9	110	3.8	4.0	2.8
13	330	9.2	200	4.8	110	3.8		2.8
14	330	9.0	200	4.8	110	3.7	4.0	2.8
15	310	8.8	210	4.7	110	3.5	4.0	2.9
16	300	8.0	220	4.5	110	3.3	3.8	3.0
17	290	7.5	220	4.1	110	2.9	3.6	3.0
18	260	6.8	230	3.4	110	2.4	3.1	3.1
19	250	6.6			---	---	2.4	3.0
20	250	6.6					2.0	2.9
21	260	6.2					2.4	3.0
22	260	5.0					2.0	2.9
23	280	5.0					1.9	2.8

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 20

Capetown, Union of S. Africa (34.2°S, 18.3°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.2					1.8	2.7
01	280	4.0					2.2	2.8
02	280	4.0					2.1	2.9
03	270	3.8					2.0	2.9
04	260	3.5					1.9	2.9
05	280	3.2						2.8
06	260	4.1	---	---	---	1.7		3.0
07	310	5.3	240	3.7	120	2.3		2.9
08	340	6.1	230	4.2	110	2.9	3.3	2.8
09	360	6.6	220	4.4	110	3.1	3.8	2.8
10	380	6.7	210	4.6	110	3.4	4.1	2.7
11	360	7.2	210	4.7	110	3.6	4.5	2.7
12	360	7.9	200	4.8	110	3.7	4.1	2.7
13	360	8.2	210	4.8	110	3.7	4.0	2.8
14	340	8.4	210	4.8	110	3.6	4.1	2.8
15	330	8.0	210	4.7	110	3.5	4.5	2.8
16	320	7.7	220	4.6	110	3.4	4.1	2.9
17	310	7.2	220	4.4	110	3.1	4.0	3.0
18	290	6.9	220	4.0	110	2.8	3.5	3.0
19	260	6.4	240	3.3	120	2.2	2.9	3.1
20	240	5.9			---	1.5	2.2	3.1
21	240	5.5					2.1	3.0
22	250	4.6					2.2	3.0
23	280	4.2					2.0	2.8

Time: 30.0°E.
Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 21

Lindau/Harz, Germany (51.6°N, 10.1°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.0					2.8	2.8
01	290	2.9					2.8	2.9
02	290	2.9					2.7	2.9
03	280	2.8					2.7	2.8
04	280	2.5					2.8	2.8
05	260	2.4					2.8	2.9
06	250	2.2					2.8	3.1
07	250	2.2					2.6	3.0
08	230	3.6					2.9	3.2
09	215	5.6			130	1.8	3.4	3.5
10	210	6.6			110	2.2	3.8	3.5
11	215	7.0			110	2.4	4.5	3.4
12	210	7.2			100	2.5	5.1	3.4
13	210	7.0			100	2.4	5.3	3.4
14	210	6.8			110	2.2	4.9	3.4
15	210	6.6			115	2.0	3.6	3.4
16	210	6.0			---	1.6	3.3	3.5
17	210	5.0					2.8	3.3
18	215	3.7					2.8	3.3
19	240	2.9					2.4	3.7
20	260	2.8					2.3	3.0
21	270	2.6					2.3	2.8
22	300	2.8					2.8	2.9
23	300	2.9					2.4	2.8

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 22

Domont, France (49.0°N, 2.3°E) May 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.5					2.5	2.6
01	290	6.2					2.4	2.6
02	280	8.0					2.4	2.6
03	290	5.6					2.6	2.7
04	300	5.4	280	(1.4)	---	E	2.3	2.8
05	270	6.0	240	(2.0)	110	1.8	2.4	2.9
06	270	6.5	230	---	100	2.6	3.1	2.9
07	300	6.6	220	---	100	3.0	4.0	2.9
08	300	7.2	210	4.8	100	3.3	4.4	3.0
09	330	7.6	210	5.0	100	3.3	4.4	2.9
10	320	8.2	200	5.1	100	3.4	4.4	2.8
11	340	8.0	200	5.2	100	3.4	4.2	2.8
12	330	8.3	200	5.2	100	3.4	4.4	2.8
13	320	8.3	200	5.1	100	3.6	3.8	2.6
14	310	8.2	210	5.0	100	3.4	3.8	2.9
15	310	8.0	220	4.9	100	3.3	3.7	2.9
16	300	8.2	220	4.3	100	3.2	3.6	3.0
17	290	8.3	230	---	100	3.0	4.0	2.9
18	270	8.6	220	---	100	2.3	3.9	3.0
19	240	8.6	---	---	100	1.8	3.5	3.0
20	240	8.0	---	---			3.0	2.9
21	240	7.7					2.7	2.8
22	260	7.3					2.7	2.7
23	260	7.0					2.3	2.6

Time: 0.0°.
Sweep: 1.5 Mc to 16.0 Mc in 1 minute 30 seconds.

Table 23

Poitiers, France (46.8°N, 0.3°E) May 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	6.8						2.6
01	330	6.6						2.8
02	325	6.4						2.6
03	330	5.9						2.6
04	320	5.8						2.8
05	290	6.1						2.8
06	290	6.4	230	---				3.0
07	300	6.9	230	---			4.5	2.9
08	300	7.2	230	4.7			4.7	2.8
09	310	7.5	225	4.8			5.0	2.9
10	330	8.0	220	5.0			5.2	2.8
11	330	8.2	220	5.2			4.8	2.8
12	350	8.4	220	5.2			4.3	2.8
13	350	8.7	230	5.4			4.8	2.8
14	340	8.5	230	5.0			4.8	2.8
15	325	8.4	230	4.9			4.7	2.8
16	315	8.5	230	---			4.2	2.9
17	300	8.4	240	---			4.0	2.9
18	285	8.7	260	---			4.0	2.9
19	270	8.9	260	---				3.0
20	260	8.4						2.9
21	275	8.0						2.8
22	290	7.5						2.7
23	310	7.0						2.6

Time: 0.0°.
Sweep: 3.1 Mc to 11.8 Mc in 1 minute 15 seconds.

TABLE 24

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

h'F2 (Characteristic), Km (Unit), March (Month), 1951

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: A. C. K., McC., L. H. E.

Calculated by: McC., A. C. K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(280)SK	270	290	270	230	(270)S	(300)S	250	250	290	300	300	300	310	280	280	270	240	220	220S	220S	(240)S	[260]S	(280)S
2	(300)S	300	(290)S	300	270	(270)S	(250)S	230	230	250	250	280	300	270	270	260	260	230	210	230	220	240	250	(270)S
3°	(280)S	(300)S	(310)S	(280)S	290	270	250	230	230	240	260	300	260	[270]L	280	270	250	240	210	220	(230)S	(230)S	(240)S	270
4	(280)S	(300)S	(310)S	(280)S	(250)S	(250)S	(240)S	230	220	240	250	280	280	260	280	260	250	230	230	220	(210)S	(230)S	(250)S	(270)S
5	(270)S	(280)S	300	300	(270)S	(260)S	(240)S	220	230	250	250	280	270	270	280	270	250	240	220	210	240	230	240	(260)S
6	300	(300)S	(300)S	290	280	280	240	230	240	240	260	330	280	M	M	M	250	250	230	(230)B	(240)B	B	B	[300]B
7	(300)S	(290)S	(270)S	(260)S	260	(270)S	(270)S	(260)SK	LK	LK	350K	370K	340K	370K	360K	330K	360K	310K	270K	250K	230	250	280	260
8	280	(300)S	330	320	310	(340)B	(310)S	240	270	300	280	320	300	300	300	270	260	250	220	220	230	250	260	280
9	280	280	290	290	260	280	250	230	260	280	280	280	280	280	270	270	270	240	250	250	260	(270)S	(260)S	(280)SK
10	(320)SK	(320)SK	(400)BK	(440)BK	(370)SK	(310)BK	[280]BK	260K	320K	[360]LK	400K	340K	340K	300K	320K	300K	270K	260K	230K	230K	240K	(280)SK	290K	290
11	(290)S	(290)S	(280)S	(300)B	B	B	B	250	230	260	300	300	310	T	T	T	270	260	240	220	240	260K	(290)SK	(340)SK
12	(380)SK	(420)SK	SK	SK	SK	BK	(330)SK	250	270	290	300	350	300	300	280	310	270	250	240	240	260	(260)S	(260)BK	(280)SK
13	(320)SK	[320]SK	(330)SK	300K	AK	AK	BK	250K	LK	LK	NK	420K	480K	410K	410K	430K	350K	330K	250K	250K	250K	AK	AK	BK
14	BK	(410)SK	(420)SK	(360)BK	270K	(260)BK	(250)S	230	260	240	340	280	290	290	300	230	280	280	250	(260)B	(260)B	260	(300)B	(310)B
15	A	A	A	A	A	A	(290)B	230B	230	270	250	290	260	270	270	260	250	240	220	230	220	230	[260]A	280
16	(310)B	(310)A	290S	280	280	(270)S	270S	260	300	300	300	330	310	300	300	300	280	260	220	220	220	250	280	(280)S
17	(290)S	(300)S	300	(300)S	B	B	270	250	270	280	330H	320	330	320	300	280	260	250	220	220	240	280	280	(300)B
18	(290)B	280	290	(290)S	B	B	300B	250	250	260	(250)L	290	310	300	300	290	270	240	(220)B	220	230	(270)B	(280)B	(300)B
19	(300)B	(280)B	300	(300)B	[300]B	(300)S	270	250	280	300	300	310	310	300	310	280	280	250	230	220	250	(270)B	(280)B	(310)B
20	290	290	280	280	270	260	240	220	270	260	290	320	320	290	300	280	270	250	230	210	230	240	(240)S	250
21	270	270	280	300	280	270	240	230	240	240H	[260]L	290	290	270	280	270	250	230	220	210	230	250	280	280
22	290	280	270	260	250	240	260	250	230	270	300	290	270	300	300	270	290	270	240	(240)S	(240)S	(230)S	(240)A	(280)S
23	(250)S	(240)S	(320)S	(290)S	(300)S	(330)B	300	260K	[360]LK	460K	380K	430K	360K	380K	350K	330K	340K	280K	250K	260	270	240	280	280S
24	(300)S	(300)A	(300)S	280	(300)A	(300)S	270	250	270	280	(300)H	320	330	310	300	320	280	280	260	230	220	270	250	300
25	310	(310)S	260	280	260	290B	270	250	310	290	280	280H	290	300	300	280	280	250	240	230	220	(250)S	280	290
26	300	290	280	300	(300)S	280	250	260	250	270	280	300	300	290	280	280	270	250	240	220	240	260	270	300
27	300	290	250	240	280	300	260	240	250	270	260	280	300	290	290	280	260	240	230	220	240	240	270	280
28	280	270	270	260	250	270	250	250	280	270	280	280	300	290	280	270	280	250	240	220	230	230	260	260
29	300	320	310	310	290	260	240	240	260	280	310	390	340	330	340	320	320	330	300	260	260	230	230	270
30	260	270	310	290	310	310	290	LK	LK	460K	500K	480K	410K	370K	330K	320K	320K	280K	270K	230	240	260	280	290
31	310	300	290	280	280	290	270	240	250	280	320	320	320	320	300	280	270	260	250	230	230	250	270	280
Median	(290)	(300)	290	290	280	270	270	250	260	270	300	300	300	300	300	280	270	250	230	230	240	250	270	280
Count	29	30	29	29	25	25	29	30	28	29	30	31	31	29	29	29	31	31	31	31	31	29	29	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 25

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L.H.E., McC., A.C.K.

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.8K	3.2F	3.2F	3.2F	3.1F	2.0JF	2.0	4.2F	5.2F	6.0F	6.2F	6.4F	6.2F	7.0	7.2GS	7.1	7.4	7.5	7.4	6.2	5.2	2.8	3.2	3.1
2	3.0	2.9	2.6F	2.6F	2.5F	(2.3)JF	(2.3)JF	5.0	6.0	6.5	6.8	7.2	7.9	8.4	8.8	8.5	8.0	7.7	7.2	6.0	5.7F	4.4F	(3.8)SF	3.3F
3	3.1F	3.1F	2.8F	2.9F	2.8F	2.8F	3.0F	4.7F	6.4	7.3	7.2H	7.2	8.1	9.0	8.4	8.6	8.0	8.1	7.5	6.3	5.2	4.5	3.8S	(3.4)S
4	3.3F	3.1F	3.0F	3.1F	3.1F	3.0F	3.1F	5.6	6.6	6.6	6.9	8.0	8.3	8.1	7.8	8.2	7.7	7.3S	7.3	7.4	5.6	4.3	3.7	3.4
5	3.1	3.0	2.9J	2.9JS	3.0J	3.0	3.3	5.8	6.1	6.7	6.9	7.3	8.2	7.8	7.5	7.9	8.0	7.3	6.1	5.8	5.4	5.5	4.0JS	3.5
6	3.4	3.4	3.3	3.3	3.3	3.3	3.6	5.4H	6.6Z	6.6	6.5	7.1	8.6	M	M	M	7.8	7.6	7.1	5.7	5.0	4.5	(3.8)JB	[3.6]B
7	3.4PS	3.4	3.3S	3.1JS	2.7JF	2.5JF	2.3F	3.9K	(4.5)HK	(4.7)HK	5.2FK	5.7FK	6.0FK	5.6FK	5.8K	5.8K	5.0K	(6.0)SK	K6.4SF	6.7SK	5.6SF	4.0SF	3.6F	3.5F
8	3.0F	2.7F	2.5SF	2.7F	2.3F	2.4F	2.4F	3.5F	4.4F	4.7F	5.2F	6.2	6.9	7.6	7.4	8.2	7.2	7.8	7.4	6.8	6.0SF	4.6F	4.3F	4.1
9	4.1JS	4.0VS	3.6	3.5V	3.2	3.0J	2.9	4.5	5.9	6.6	7.6	8.1	8.4	8.0	8.0	7.8	7.9	7.3	8.4	6.4SF	5.4S	4.5	4.3	3.7SK
10	2.8K	2.5K	K1.9JB	1.8JK	2.0K	K2.0JB	K1.9JB	3.5K	4.0K	4.1K	4.7K	5.6K	5.8K	6.2K	6.2K	6.5K	6.6K	6.4K	6.0K	5.6K	4.6K	3.3K	3.2K	3.2
11	3.1	3.0J	3.0	2.3	1.9JB	(1.5)JB	1.8	3.9	4.7	5.0F	6.4	7.0	7.8	T	T	T	7.6	6.8	5.8	5.3	4.0	3.2K	2.8JK	2.3FK
12	2.1K	1.8FK	1.6JK	K1.7JF	K1.5JS	BK	1.9K	4.5	5.4	5.4	6.0	6.0	7.0	7.0	6.7	6.5	6.9	6.2P	6.4	5.8S	4.9	4.2JF	K3.4SF	2.9FK
13	2.3FK	2.0FK	K1.9JF	1.9FK	AK	AK	K(2.5)BF	3.5K	4.0PK	4.2JK	[4.5]NK	4.7K	4.9K	4.9HK	5.1K	5.2K	5.6K	6.6FK	K7.4VJ	K5.7JS	4.4FK	K(2.7)JA	(2.3)AK	[2.4]BK
14	(2.4)BK	2.4FK	2.5K	K2.3JF	2.5FK	K2.3SF	2.4F	6.0F	6.2V	6.2	6.8	8.6V	8.0	7.8	7.0	7.0	7.2	7.1	7.8	6.8	5.2	4.5	3.8B	(3.3)B
15	[3.6]A	(3.3)A	3.1J	A	A	A	2.5	5.2J	6.4	7.3	7.3	8.3	7.8	8.0	7.8	7.4	7.3	7.2	6.8	6.2	5.4	5.4	3.8	3.3
16	3.1	3.0	3.0	2.9J	2.7J	2.5	2.7	4.5	4.9V	6.0V	5.4	5.8	6.3	6.6	6.8	6.7	7.0	7.2	6.8	6.0	4.8	3.9	3.5	3.3
17	3.1	2.9	2.3S	2.4F	B	B	(2.5)SF	4.0F	5.2F	5.2H	5.2	6.6	6.4	7.0	7.2	7.3	7.2	6.4F	6.1	5.0	4.5S	4.0	(3.9)BS	3.5
18	3.3	3.2	2.9	(2.6)SF	(2.0)B	[2.2]B	(2.5)B	4.8F	6.0	6.0	6.0	7.0	6.8	6.8	7.2	7.4	7.3	7.4	7.0	6.2	5.0	4.6	4.1	3.5
19	3.7	3.1	2.8	2.6JB	2.5JB	2.5	2.9J	4.3	5.3	5.8	5.6	6.0	6.2	6.4	6.4	6.6	6.5	7.0	6.5	6.0	5.1	4.4J	3.8J	3.4J
20	3.4	3.5	3.2	3.3	3.1	3.0	3.3	4.7F	5.8	6.0F	6.0F	6.4	7.0	7.4	7.4	6.9	7.2	7.6	7.4F	6.5F	6.0JS	(5.6)SJ	(5.2)SF	(4.6)JF
21	3.5F	3.9J	3.7J	3.7	3.6	3.5	3.9	5.3V	6.6	6.4	6.6	7.3	7.8	8.2	8.4	8.6	8.3	7.9	7.6	6.6	6.1	5.8	5.4	(5.0)S
22	4.8	4.8	4.7	4.6	4.0JS	3.4	3.2	4.6F	5.2	6.8	6.8	8.0	9.0	8.9	9.1	8.9F	8.0	8.6	8.5	7.5J	6.5	5.8J	4.8J	4.1J
23	4.0J	3.4JS	3.0	3.0	2.8J	2.4JF	2.9JS	4.1K	4.4FK	K4.7JS	5.2K	5.2FK	6.0K	5.8K	6.0K	6.0K	6.0K	6.0FK	5.7K	5.9	5.8	5.0	4.0F	3.8JS
24	(3.2)FS	(3.4)JS	(3.1)FJ	(2.5)F	(2.2)F	(2.3)F	3.4	5.4F	6.2	6.2	6.3F	7.2	7.2	7.6	8.0	7.0	7.4	7.2	7.2	7.4	6.0	5.0	4.4	4.0J
25	3.9	4.0JS	4.0JS	3.3F	2.9F	2.2F	3.0JS	4.8F	5.4F	7.0	7.6	7.5	7.6	7.4	7.8	7.4	7.4	7.2	7.1	6.8	5.4	(5.0)S	4.9	4.5S
26	4.2	4.2	4.1	3.7S	3.5	3.3	4.0	5.3	6.4	6.4	7.0	7.9	8.8	9.4	9.5	9.2	9.0	9.1	8.0	7.8	6.3	5.9	5.2	4.9
27	4.9	4.9	5.1	3.8	3.0	2.6	3.7	5.9	7.0	7.4	8.2	8.0	8.3	9.1	9.4	9.4	9.4	8.6	8.2	7.3	6.6	6.0	5.2	5.0
28	4.8S	4.3F	4.1F	3.6F	3.1	2.6F	3.7	5.7	6.8	7.3	7.5	7.4	8.0	8.9	8.6	8.2	8.1	8.0	7.9	7.8	6.8	6.1	5.3	4.9
29	4.5	4.0	3.6F	3.4F	2.8F	2.9F	4.0	5.2	6.3	6.6	6.4	7.0	8.0	8.2	8.6	7.9	[7.4]C	6.9	7.0	7.8	7.1	6.4	5.3	5.1
30	4.8	4.2	3.6V	2.8	2.4F	2.4	3.1	4.0K	4.2K	4.5K	4.7K	5.0K	5.4K	5.8K	6.1K	6.0K	6.1K	5.9K	6.0K	6.0	5.2	4.6SJ	4.0JS	(3.9)SJ
31	3.7	(3.0)SJ	(3.0)SJ	(3.1)SJ	(3.2)J	3.1JS	4.5	6.1	6.3H	6.4	6.6H	7.1	8.0	8.0	8.6	8.3	7.5	7.4	7.6	7.1	6.0	5.5	5.2	4.9
Median	3.4	3.2	3.0	3.0	2.8	2.5	2.9	4.7	5.9	6.2	6.4	7.1	7.8	7.6	7.5	7.4	7.4	7.3	7.2	6.3	5.4	4.6	4.0	3.5
Count	31	31	31	30	28	27	31	31	31	31	31	31	31	29	29	29	31	31	31	31	31	31	31	31

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 26

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), March (Month), 1951

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Long. 77.1°W

75°W Mean Time

Scaled by: L.H.E., McC., A.C.K.

Calculated by: A.C.K., McC.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	3.6 FK	3.2 F	3.2 F	3.2 F	2.4 F	1.9 F	3.0 F	5.1 F	5.8 F	5.9 F	6.2 F	6.6 F	6.6	7.2 JS	7.0	7.4 S	7.8	7.5	7.0	5.8	4.3	3.3	3.1	3.0
2	2.9	2.8	2.6 F	2.6 F	2.4	2.3 F	3.4	5.6	6.1	6.8 F	6.9	7.6	8.4	8.5	8.6	8.0	8.0	7.8	6.2	6.0 F	5.1 F	4.2	3.8	(3.2) FS
3	3.0 J	3.0 F	2.9 F	2.8 F	2.8 F	2.9 F	3.6 F	6.0	6.8	7.2	7.2	7.8	8.4	8.5	8.5	8.3	8.1	8.1	6.8	5.8	4.9	4.0 JS	3.6 JS	3.4 JS
4	3.1 F	3.1 F	3.1 F	3.1 F	3.1 F	3.0 F	4.1 F	6.4	6.5	6.7	7.0	8.6	8.5	8.0	7.9	7.8	7.4	7.4	7.4 JS	6.5	5.0	3.8	3.5	3.3
5	3.1	3.0	2.9	3.0	3.0	3.0 J	4.4	6.3	6.4	6.8	7.1	7.8	7.8	7.6	7.5	7.9	7.5	7.3	6.8	5.2	5.1	4.2	3.7	3.4 J
6	3.3	3.2	3.4	3.3	3.3 J	3.4 J	4.4	6.2	6.0 Z	6.3	6.9	8.3	M	M	M	M	7.4	7.7	6.5	5.4	4.7	(4.2) JB	[3.9] B	3.6
7	3.4 S	3.4 PS	3.2 JS	3.0 FS	2.7 F	(2.6) S	3.0 J	4.8 K	4.8 HK	5.0 FK	5.1 FK	6.0 FK	5.8 K	5.7 K	5.8 K	5.4 FK	5.6 FK	5.8 K	K 6.8 SF	6.4 SK	4.6 F	3.6 F	2.9 F	3.1 F
8	2.8 F	2.6 F	2.4 F	2.8 JP	2.4 F	2.4 F	2.8	4.0 F	4.3 F	5.0 F	5.6 F	6.5	7.1	7.4	8.2	8.0	7.2	8.0	7.8 S	6.8 SF	5.6 FS	4.5 F	4.3 F	4.1
9	4.3 V	3.9 F	3.5	3.3	3.2 VJ	3.0	3.8	5.0	6.4	7.2	8.0	8.5	8.2	8.0	7.8	7.4	8.0	7.4	7.4	5.0 F	4.3	4.3	4.0 SJ	3.2 JK
10	2.7 K	2.1 JK	[2.0] BK	1.8 JK	2.1 K	K 1.8 JB	2.7 K	3.9 K	4.0 K	4.5 K	5.1 K	5.8 K	6.4 K	6.0 K	6.6 K	6.8 K	6.4 K	6.2 K	6.0 K	5.2 K	K 3.9 JS	3.2 K	3.2 SK	3.1
11	3.2	3.1	2.5 F	2.1 JB	1.7 JB	[1.7] B	2.8	4.5	5.0 F	5.8	6.6	7.2 J	T	T	T	7.8	7.4	6.6	5.8	4.4	3.6 F	K 3.0 JF	2.4 FK	2.1 FK
12	2.4 K	K 1.6 JF	K 1.6 JF	K (1.8) JS	B K	B K	3.3 K	4.6 H	5.4	5.8	5.9	6.6	7.3	6.9	6.4	6.9	6.6	6.3	6.0 S	5.8 F	4.4 FS	3.8 F	3.2 FK	2.6 FK
13	K (2.0) JF	K 1.9 JF	1.9 FK	1.9 FK	A K	A K	3.0 JK	K 3.8 JS	4.1 GK	4.5 K	4.4 K	(4.8) JK	4.7 HK	5.2 K	5.2 K	5.7 K	(5.8) SK	6.6 HK	6.0 K	K 5.2 JV	3.4 K	K 2.4 JS	A K	B K
14	2.4 FK	1.9 K	K 1.7 JV	2.4 FK	K 2.3 JF	2.4 FK	4.0	5.2 H	6.8 Z	6.4 V	7.6	7.8	8.2	7.3	7.0	7.0	7.6	7.8	7.4	6.3	5.2 J	4.2	3.7	3.8
15	(3.3) A	(3.4) A	(2.8) JA	B	A	B A	4.1	5.6 HJ	6.6	7.2	7.4	8.7	7.8	7.6	7.4	7.2	7.4	7.3	6.6	5.9	5.0	4.0 JS	3.5	3.2
16	3.1	(3.1) S	3.1	2.8	2.7	2.4 B	3.7	5.0	5.5	5.5 V	5.6	6.0	6.8	6.4	6.9	6.6	7.0	7.3	6.1	5.4	4.3	3.8	3.5	3.2
17	2.9 JS	2.8	(2.5) S	(2.0) F	B	B	3.3	5.0	5.2	5.0	5.4	6.0	6.6	7.2	7.4	7.2	6.8	6.2	5.6	4.7	4.0 JS	3.9	3.6	3.6 JB
18	3.3	3.1	2.8 F	2.5	B	B	4.0	5.6 F	5.6 F	6.0	6.7	6.8	7.0	7.0	7.2	7.4	7.3	7.0	7.0	5.4	4.8	4.3	3.8	3.5 JB
19	3.4	3.0 J	2.5 J	2.4 JB	2.5 JS	2.8	3.6	4.9	5.5	5.8	5.8	6.1	6.2	6.5	6.6	6.4	6.9	6.7	6.6	5.6	4.9	4.0	3.5	3.3
20	3.3	3.3	3.3	3.2	3.1	3.0	4.2	5.4	6.4	6.0 F	6.4	6.5	7.6	7.2	7.0	7.2	7.4	7.4	7.4 F	6.0 J	6.0	5.4 JS	4.4 JS	[4.1] S
21	3.9 F	3.9 J	3.6 F	3.6	3.5	3.5 F	4.9	6.2	6.4	6.5	6.7 V	7.6	8.2	8.2	8.5	8.6	8.0	7.8	7.2 F	6.2	6.0	5.6	5.2	5.0
22	5.0	4.7	4.5	4.2	4.0	3.1	4.1	5.4	5.8	6.6 F	7.0 F	8.2	8.6	9.3	9.2	8.5 F	8.1	8.4	8.0	6.6	6.6	5.3	4.2	4.0 J
23	4.2	3.0 H	3.0 J	2.8	2.6 F	2.4 JS	3.6	4.3 K	4.5 K	5.2 K	5.2 K	5.5 K	6.0 K	6.2 K	6.2 K	6.0 K	6.0 FK	5.8 K	5.8 K	5.8	5.6	4.1 F	(3.7) SF	3.4
24	3.2 JS	2.7 F	2.4 F	2.7 F	2.3 F	2.7 F	4.8	6.0	6.0	6.2	6.0	7.3	7.5	7.8	7.6	7.4	7.3	7.3	7.4	7.0	5.6 F	5.2 JS	3.8 JS	4.0 JS
25	(4.0) S	4.1 JS	3.4 F	3.1 F	2.3 JS	2.1	4.1	5.4	6.2 JS	7.0 F	7.4	7.6 H	7.6	7.4	7.6	7.6	7.2	7.2	7.0	6.2	(5.6) S	(5.0) JS	4.6 S	4.4 J
26	4.2	4.1	3.7	3.6	3.4	3.3	4.4	5.6	6.4	6.8	7.4	8.4	9.2	9.6	9.3	8.9	9.2	8.3	8.4	6.9	6.1	5.4	5.0	4.9
27	4.9	5.0	4.6	3.3	2.8	2.6	5.2	6.4	7.2	8.2	8.2	8.0	9.0	9.3	9.2	9.4	9.2	8.3	7.8	6.9	6.3	5.5	4.8	4.9 FS
28	4.6 F	4.4 F	4.0 F	3.4 F	2.9	2.7	4.9	6.2	7.0	7.4	7.8	7.6	8.6	8.9	8.4	8.1	8.1	7.9	8.2	7.0	6.6	5.6	5.0	4.7
29	4.1	3.7	3.5 F	3.2 F	(3.0) F	3.1	4.7 F	5.5	6.3	6.8	6.8	7.6	8.1	8.2	8.1	7.9	7.3	6.6	7.6	7.5	6.9	6.3	5.1	5.1
30	4.2	3.6 F	3.2 F	2.6	2.5	2.5	3.6	4.0 K	4.3 K	4.4 GK	4.6 K	5.2 HK	5.5 K	6.0 K	6.0 K	6.0 K	6.0 K	5.8 K	6.0 K	5.6	4.8	(4.3) JS	4.2	3.8 S
31	(3.5) J	(3.0) JS	(3.2) JS	(3.2) JS	(3.2) JS	3.5	5.7	6.2	6.3	6.6	6.8 H	7.3	8.1	8.3	8.7	8.1	7.4	7.5	7.3	6.6	5.7	5.2	5.0	4.7
Median	3.3	3.1	3.1	2.9	2.8	2.7	4.0	5.4	6.0	6.3	6.7	7.3	7.6	7.4	7.5	7.4	7.4	7.3	7.0	5.9	5.0	4.2	3.8	3.6
Count	31	31	31	30	26	26	31	31	31	31	31	31	29	29	29	30	31	31	31	31	31	31	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 27

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), March (Month), 1951

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L. H. E., A. C. K., McC.

Calculated by: A. C. K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									230	230	210	200H	200	220	220	220	220H	230						
2									220	210	200	200	200	(220)B	220	240	B	Q						
3									Q	230	210	200	210	240	230	220	240	Q						
4									210	200	200H	180	190	210	210	240H	230	Q						
5									220	200	200	200	210	210H	210	210	(240)A	Q						
6									220	200	200	200	200	M	M	M	220	Q						
7									220K	200K	200K	200K	210K	210K	220K	(240)BK	240K	270K						
8									230	210	200	210H	190	230	200H	220	(220)B	Q						
9									230	200H	210	200	210	210	210	210	220	Q						
10									230K	200K	200HK	190K	210K	210HK	230K	220K	220K	250K						
11									Q	(210)B	210H	200	220	T	T	T	250	240						
12									230	200	200	200	200	220	[220]B	220	220	230						
13									(230)BK	220K	200K	190HK	200K	200K	220K	240K	230K	240HK						
14									220	210	210H	200	190H	210	220	220	(230)B	B						
15									Q	(220)A	190H	210	[220]A	230	210	220	220	230						
16								240	220	200	200	A	A	190H	220	210	220	240						
17								Q	220	200	200	190	200	200H	210	210	230	210						
18								(230)B	200H	190	190	180H	(220)B	(220)B	(210)B	(220)B	(220)B	230						
19								Q	(220)B	200	200	190	200	(210)A	230	210	220	240						
20								Q	220	210	200	200	200	210	200	200	210	230						
21								Q	220	200	200H	180	230H	210	200	200	230	220						
22								Q	Q	210H	200	190	210	(220)A	220	220	220	240						
23								QK	240K	220K	210K	200K	200K	200HK	220K	220K	200K	240K						
24								Q	230	200	200H	180H	(200)B	230	220	220	230	250						
25								Q	230	210	200H	200	200H	200	(200)B	240	230	240						
26								240	220	210	220	210	190	190	210H	220	230	240						
27								Q	230	210	210H	200	200	190	220	220	220	230						
28								Q	220	210	200	210	190	200	200	220	220	230						
29								220	220	230	190	200H	210	230	230	230	240	250	270					
30								250K	230K	200HK	200HK	180HK	200K	210HK	230K	220K	240K	250K	250K					
31								230	220	210	200	190	190	200H	230	220	220	240						
Median								240	220	210	200	200	200	210	220	220	220	240	–					
Count								6	27	31	31	30	30	29	29	29	30	23	2					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 28

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

foFl (Characteristic), Mc (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L. H. E., McC.

Calculated by: A. C. K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	4.3	4.5	4.5	4.5	4.4	4.2	L	L						
2									L	L	L	L	L	4.7	4.6	L	B	Q						
3									Q	L	L	L	4.4	[4.5]L	4.7	L	L	Q						
4									L	L	L	L	L	L	L	L	L	Q						
5									L	L	3.8P	4.3	[4.3]L	4.4	L	L	L	Q						
6									L	L	L	L	4.6	M	M	M	L	Q						
7									LK	LK	4.2K	4.2K	4.2K	4.2K	4.1K	4.0K	3.8K	LK						
8									3.2	3.6	3.8	4.4H	4.4	4.4	L	L	L	Q						
9									L	L	L	4.5	[4.5]L	4.5	4.4	L	L	Q						
10									3.5K	3.8K	3.9K	4.2K	4.3K	4.3K	4.4K	4.2K	3.8K	LK						
11									Q	L	L	4.4	4.4	T	T	T	3.7	L						
12									L	3.9	4.2	4.4	4.5	4.4	4.3	4.3	L	L						
13									3.7K	4.0JK	4.0K	4.2K	4.2K	4.2K	4.1K	3.9K	3.7K	3.3K						
14									L	L	4.5H	4.5	4.5H	4.4	4.4	4.3	L	L						
15									Q	L	L	4.8	4.3	4.7	L	L	L	L						
16								L	L	4.1	4.2	[4.4]A	(4.5)A	4.5	4.4	L	L	L						
17								Q	L	4.0	4.3V	4.4	4.6	4.5	4.3	4.3	L	L						
18								L	L	L	L	4.6	4.6	4.6	4.6	4.4	L	L						
19								Q	L	4.1	4.3	4.5	4.5	4.6	4.4	4.3	L	L						
20								Q	L	L	4.4	4.6	4.8	4.7	4.6	4.3	L	L						
21								Q	L	4.1	[4.2]L	4.4	4.7	4.6	4.7	(4.4)H	L	L						
22								Q	Q	L	4.5	4.7	4.8	4.7	4.5	4.4	L	L						
23								QK	LK	4.1K	4.3K	4.4K	4.5K	4.5K	4.5K	4.4K	LK	LK						
24								Q	L	4.3	(4.5)H	4.8	4.9	4.7	4.6	(4.4)L	L	L						
25								Q	4.1	4.3	(4.5)H	(4.8)H	4.8	4.7	L	L	L	L						
26								L	L	L	4.5	4.6	(4.8)L	4.7	4.7	L	L	L						
27								Q	L	L	L	4.6	4.9	4.8	4.8	4.4	L	L						
28								Q	L	4.3	4.6	4.7	4.8	4.8	4.7	4.3	L	L						
29								L	4.0H	4.4H	4.5	5.0	4.8	4.8	4.6H	4.4	3.9	3.6	L					
30								LK	LK	4.0K	4.2K	4.4K	4.4K	4.5K	4.4K	4.3K	4.1K	LK	LK					
31								L	L	L	4.6	4.6	4.7	4.7	4.6	4.3	L	L						
Median								—	3.7	4.1	4.3	4.5	4.5	4.6	4.5	4.3	3.8	—	—					
Count									5	14	22	27	29	28	24	19	6	2						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 29

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: A.C.K., L.H.E., McC.

Calculated by: A.C.K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									100	100	100	100	100	110	100	110	120	(120)^B						
2									120	110	100	100	100	(120)^B	110	110	[110]^B	120						
3									110	110	100	100	110	110	110	110	110	120						
4									110	100	110	100	110	120	100	110	110	120						
5								120	120	(100)^A	100	110	110	110	110	110	110	120						
6									120	110	110	100	110	M	M	M	110	B						
7								(130)^S_K	(120)^B_K	100^K	100^K	100^K	100^K	100^K	100^K	[100]^B_K	110^K	(130)^S_K						
8									120	120	110	110	100	110	(110)^B	110	B	B						
9								130	110	110	100	100	100	100	110	110	110	110						
10								120^K	110^K	120^K	100^K	(100)^A_K	100^K	100^K	100^K	B^K	B^K	110^K						
11								130	110	110	(110)^A	(100)^A	(100)^A	T	T	T	120	120						
12								130	(110)^A	100	100	100	100	(120)^B	[110]^B	110	110	120						
13								120^K	110^K	110^K	100^K	100^K	100^K	100^K	100^K	110^K	110^K	120^K	120^K					
14								120	110	110	100	100	100	100	100	(100)^B	B	B						
15								B	110	110	100	(100)^A	(100)^A	100	100	110	110	120						
16								B	B	100	100	(100)^A	(100)^A	[100]^B	(110)^B	110	110	110	(110)^A					
17								100	(100)^A	100	100	(100)^A	(100)^A	B	B	110	110	110	B					
18								B	110	100	100	(110)^B	[100]^B	(100)^B	B	B	(110)^B	(120)^B	B					
19								110	110	100	100	100	(100)^A	(100)^A	(100)^A	(100)^A	(100)^A	110	(110)^S					
20								130	100	100	100	100	100	(100)^B	[100]^B	100	100	120	130					
21								110	(110)^B	100	B	B	100	100	100	100	110	110						
22								(100)^A	100	100	100	100	(100)^A	(100)^A	100	100	100	(110)^B	(120)^S					
23								120^K	100^K	100^K	100^K	100^K	(100)^A_K	110^K	(100)^B_K	100^K	100^K	110^K	130^K					
24								120	100	100	100	100	[100]^B	100	(100)^A	100	110	100	140					
25								110	100	100	100	100	100	B	B	110	110	[120]^B	140					
26								120	100	100	100	(100)^B	100	110	110	110	110	110	130					
27								110	110	100	100	100	100	100	100	110	110	100	B					
28								110	100	100	110	110	110	110	100	110	110	110	120					
29								110	100	100	[100]^B	(100)^A	(100)^A	110	110	110	110	110	S					
30								110^K	110^K	100^K	100^K	100^K	100^K	110^K	110^K	110^K	110^K	110^K	B^K					
31								110	110	110	(110)^B	110	110	(110)^B	(110)^B	110^B	110	120	140					
Median								120	110	100	100	100	100	100	100	110	110	120	130					
Count								22	30	31	30	30	31	27	26	27	28	28	11					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 30

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L.H.E., A.C.K., McC.

Calculated by: A.C.K., McC

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									2.3	2.7	3.0	3.2	3.2	3.3	3.2	3.0	2.6	B						
2									2.4	2.8	3.0	3.1	3.1	(3.2)B	3.1	3.0P	[2.5]B	2.1						
3									2.4	2.8	3.1	3.2	3.3	3.3	3.2	3.0	2.6	2.3						
4									2.4	2.7	3.0	3.1	3.2	3.2	3.2	3.1	2.8	2.2						
5								1.7	2.3	(2.8)A	2.9	3.2	3.3	3.3	3.2	3.1	2.7	2.1						
6									2.2	2.8	[3.1]B	3.1	3.2	M	M	M	2.5	B						
7								1.8K	2.2K	2.6K	2.9K	3.1K	3.2K	3.1K	3.0K	[2.7]BK	2.4K	2.1PK						
8									2.2	2.6	2.8	(3.0)B	3.0	3.1	[3.0]B	(2.9)B	B	B						
9								1.9	2.5	2.6	2.9	[3.0]B	3.1	3.0	3.0	(2.8)B	2.5	2.0						
10								1.9K	2.3K	2.7K	2.9K	[3.0]AK	3.0K	3.1K	3.0K	BK	BK	BK						
11								1.7	2.3	[2.6]B	2.8	3.0	B	T	T	T	2.5	2.1						
12								1.8	[2.2]A	2.6	2.9	3.0	3.1	3.0	[2.9]B	2.9	2.5	2.2						
13								1.8K	2.2K	2.4K	2.7K	3.0K	3.1K	3.0K	2.9K	2.8K	2.5K	2.2K	1.9K					
14								1.9	2.2P	2.6P	2.9P	(3.0)P	3.2P	3.1	3.0	B	B	B						
15								B	B	2.7	2.7	A	A	3.1	3.0	3.0P	2.7P	2.2						
16								B	B	2.5	2.6	A	A	B	3.0	(2.9)B	2.7	2.2	A					
17								1.9P	[2.2]A	2.6	(3.0)B	B	A	B	B	(2.8)B	2.8	2.3	B					
18								B	(2.5)B	2.8	B	B	B	B	B	B	2.5	2.3	B					
19								B	2.3P	2.5	2.9	3.0	A	A	A	3.1	2.8	2.3	1.6					
20								2.1	2.5	2.7	2.9	3.1	3.2	3.1	[3.0]B	3.0	2.8	2.4	1.9					
21								1.9	2.5	2.7	B	B	(3.5)B	3.3	[3.2]A	3.1	2.8	2.3						
22								A	2.5	2.8	2.9	3.1	A	A	(3.1)P	3.0	2.8	2.3	1.8					
23								2.0K	2.5K	2.8K	2.9K	3.1K	[3.2]AK	3.3K	3.2K	3.0K	2.9K	2.4K	1.9K					
24								2.4	2.7	3.0	3.1	B	B	3.3	[3.1]A	(2.9)B	2.8	2.5	1.9					
25								2.3	2.5	2.9	3.2	[3.3]B	3.4	3.3	[3.2]B	3.1	2.9	[2.5]B	2.0					
26								2.1	A	A	3.1	[3.2]B	3.3	3.3B	3.3	3.1	2.9P	2.5	B					
27								2.2	2.7P	3.0B	3.2P	3.3	3.4	3.4	3.4	3.3	3.0	2.5	B					
28								B	(2.6)B	3.0	3.1	(3.3)B	3.4	3.4	3.3	3.2	3.0	2.5	B					
29								2.3	2.8	B	B	A	(3.5)B	3.5	3.3	3.1	2.9	2.5	B					
30								2.2K	2.6PK	(2.8)BK	[3.0]AK	3.2K	3.3K	3.3K	3.3K	3.2K	(2.9)BK	2.5K	BK					
31								2.2	2.7	(3.0)P	(3.1)B	(3.1)P	3.3	B	B	B	2.8	2.5	B					
Median								1.9	2.4	2.7	2.9	3.1	3.2	3.3	3.1	3.0	2.8	2.3	1.9					
Count								19	28	29	28	24	23	23	25	25	28	26	7					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 31

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

Es (Characteristic), Mc, Km (Unit), March (Month), 1951

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L. H. E., McC., A. C. K.

Calculated by: A. C. K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	E	2.4 100	E	2.3 100	2.1 100	E
2	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	B	G	E	E	E	E	E	E
3	E	66Y 120	E	E	E	E	E	E	G	69Y 130	48Y 130	G	G	G	G	G	G	G	E	E	E	E	E	E
4	E	E	E	31 110	E	4.2Y 110	3.0 100	E	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E
5	E	E	E	E	E	E	E	G	G	6.2 100	G	G	G	G	G	G	38 130	G	E	E	E	E	E	E
6	E	E	E	E	E	E	E	G	G	G	G	G	G	M	M	M	G	B	B	B	B	B	B	B
7	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	B	G	G	E	E	E	E	E	E
8	E	E	E	E	E	E	E	G	G	G	G	G	G	G	B	G	B	B	22 120	E	E	E	E	E
9	E	E	E	E	E	E	E	28 140	G	G	G	6.8Y 140	G	G	G	G	G	G	E	E	E	E	E	E
10	E	E	E	E	E	E	E	G	G	11.8 110	G	62 100	G	G	G	G	G	G	E	2.7 120	E	E	E	E
11	E	E	E	E	E	E	E	G	G	G	25 100	26 100	25 100	T	T	T	G	G	E	E	2.4 110	E	E	E
12	E	E	E	E	E	B	G	G	32Y 110	G	G	G	G	G	B	G	G	G	E	E	3.1Y 110	E	E	E
13	E	E	E	E	31 120	2.8 110	E	G	G	36 110	G	G	G	G	G	G	G	G	E	E	E	48 110	26Y 110	B
14	E	E	E	E	E	E	E	G	G	G	G	G	G	G	7.2 100	G	B	B	B	E	E	E	B	B
15	4.0 110	37 110	28Y 110	31 110	38Y 100	3.5Y 110	E	B	G	4.4Y 110	G	49 100	49 100	G	G	G	G	G	E	E	E	E	3.4 100	2.5 100
16	E	3.1Y 100	E	E	E	E	E	G	G	G	G	48 100	3.6 100	B	G	G	G	G	2.1 110	E	E	E	E	E
17	E	E	E	E	B	B	E	G	34 100	G	G	3.0 100	10.2Y 100	B	B	G	G	G	B	E	E	E	E	E
18	E	E	E	E	B	B	E	B	G	G	G	B	B	G	B	B	G	G	B	E	E	E	E	E
19	E	E	E	E	E	E	E	G	G	G	170Y 130	64Y 100	10.0 100	35 100	29 100	2.5 100	2.3 100	G	G	E	E	E	E	E
20	E	E	E	E	E	E	E	1.9 110	G	G	35Y 120	G	G	G	B	G	G	G	G	E	E	E	E	E
21	E	E	E	E	E	E	E	E	G	G	B	B	G	79Y 110	33 110	70Y 100	G	G	G	34 100	E	E	E	E
22	E	E	E	E	E	E	E	33 100	G	G	G	G	29 100	39Y 100	G	G	G	G	G	E	E	E	32Y 100	2.3 100
23	E	E	E	2.3 100	7.1Y 120	2.3Y 110	24 130	G	G	G	G	G	31 100	G	G	G	G	G	G	E	E	E	2.5 110	2.5 100
24	2.3 110	38 100	24 110	2.3 110	28 100	2.5 100	E	1.9 110	G	G	110 100	G	G	G	46 100	G	G	G	G	E	E	E	E	E
25	E	E	E	72Y 120	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	E	2.4 110	E	E
26	E	E	16.6 130	E	E	E	E	G	35 110	3.2 100	G	G	G	100Y 110	G	G	G	G	G	E	E	E	E	E
27	2.5 110	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	B	E	E	E	E	E
28	E	E	E	E	E	E	E	G	G	60 110	G	6.6Y 130	74Y 100	G	G	65 130	G	36 110	G	E	E	E	E	E
29	E	E	E	E	E	E	E	G	G	G	G	58 110	G	G	G	G	G	G	G	E	E	E	E	E
30	E	E	E	E	E	E	E	G	G	68Y 130	58Y 110	G	G	G	G	G	G	G	G	E	E	E	E	E
31	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	31	31	31	31	30	28	31	31	31	31	31	31	31	29	29	29	31	31	31	31	31	31	31	29

** MEDIAN fEs LESS THAN MEDIAN foE, OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 32

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

Form adopted June 1946

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ______ (Unit), March (Month), 1951

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L.H.E., McC., A.C.K.

Calculated by: A.C.K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.9K	1.9F	1.9F	2.1F	2.2F	(2.1)JF	2.0	2.2F	2.2F	2.2F	2.2F	2.1F	2.1F	2.1	(1.8)JS	2.1	2.2	2.3	2.3	2.2	2.2	2.0	2.0	2.0
2	1.9	1.9	2.0F	1.9F	2.1F	(2.0)JF	(2.2)JF	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.3	2.3	2.3	2.1	2.1F	2.2F	(2.0)SF	2.0F
3	2.0F	1.9F	1.8F	2.0F	2.0F	2.0F	2.3F	1.9F	2.4	2.3	2.2H	2.1	2.2	2.1	2.1	2.1	2.2	2.3	2.3	2.2	2.1	2.1	2.0S	(2.0)S
4	1.9F	1.9F	1.8F	1.9F	2.0F	2.0F	2.1F	2.4	2.4	2.3	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.2S	2.2	2.3	2.2	2.1	2.0	2.0
5	2.1	2.0	(2.0)J	(1.9)JS	(2.0)J	2.0	2.1	2.5	2.5	2.4	2.1	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.3	2.2	2.0	2.2	(2.1)JS	2.0
6	1.9	1.9	1.9	1.9	2.0	1.9	2.2	2.3H	2.4Z	2.5	2.0	2.0	2.1	M	M	M	2.3	2.3	2.3	2.2	2.2	2.1	(2.2)JB	B
7	2.0PS	1.9	2.0S	(2.1)JS	(2.1)JF	(2.1)JF	2.1F	2.1K	(2.1)HK	(2.2)HK	2.0FK	1.9FK	1.9FK	1.9FK	1.9K	2.0K	1.8K	(2.0)SK	S2.0FK	2.0SK	2.1SF	2.1SF	1.9F	1.9F
8	1.9F	1.9F	1.9SF	1.9F	2.0F	1.9F	1.8F	2.1F	2.2F	2.1F	2.1F	2.1	2.1	2.1	1.9	2.2	2.0	2.2	2.2	2.2	1.9SF	2.0F	2.0F	1.7
9	(1.9)JS	1.9VS	1.8	1.7V	1.9	(2.0)J	1.9	2.3	2.3	2.2	2.2	2.2	2.1	2.1	2.2	2.3	2.1	2.2	2.1	2.0SF	2.0S	1.9	1.9	1.9SK
10	1.8K	1.8K	J(1.6)BK	(1.6)JK	1.7KJ	J(1.9)BK	(1.9)BK	2.2K	2.2K	1.8K	1.7K	2.0K	2.0K	2.1K	2.0K	2.1K	2.2K	2.3K	2.2K	2.1K	2.0K	1.9K	1.9K	1.9
11	1.9	(1.9)J	2.0	1.9	(1.9)JB	B	1.9	2.2	2.3	2.2F	2.0	2.1	1.9	T	T	T	2.1	2.2	2.2	2.2	2.1	2.0K	(1.9)JK	1.9FK
12	1.7K	1.7FK	(1.8)JK	J(1.9)FK	J(1.8)SK	BK	2.0K	2.4	2.3	2.2	2.2	1.9	2.1	2.1	2.2	2.1	2.2	2.2P	2.2	2.2S	2.0	(1.9)JF	S2.0FK	2.0FK
13	1.9FK	1.9FK	J(1.8)FK	1.9FK	AK	AK	B(1.8)FK	2.2K	1.8PK	(1.7)JK	NK	1.8K	1.7K	1.9HK	1.8K	1.7K	1.8K	1.8FK	V(2.0)JK	J(1.9)SK	1.8FK	J(1.9)AK	(1.8)AK	BK
14	(1.7)BK	1.7FK	1.7K	J(1.8)FK	2.0FK	S1.9FK	2.2F	2.4F	2.3V	2.2	1.9	2.1V	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	1.9	2.0	1.8B	(1.8)B
15	A	(1.7)A	(1.7)J	A	A	A	2.1	(2.5)J	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.2	2.2	2.3	2.4	2.2	2.2	2.1	2.0	1.9
16	1.9	1.9	2.0	(2.0)J	(2.0)J	2.0	(2.1)J	2.3	2.2V	2.1V	2.1	2.0	2.1	2.1	2.1	2.0	2.1	2.3	2.3	2.2	2.0	2.0	1.9	1.9
17	2.0	1.9	1.9S	1.9F	B	B	(2.1)SF	2.0F	2.3F	2.2H	2.2	2.1	2.0	2.0	2.1	2.2	2.2	2.3F	2.4	2.1	2.0S	1.9	(1.9)BS	1.9
18	1.9	1.9	2.0	(2.0)SF	(2.0)B	B	(1.9)B	2.4F	2.4	2.2	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.4	2.2	2.0	1.9	1.9	1.9
19	1.9	1.9	1.9	(1.9)JB	(1.8)JB	1.9	(2.0)J	2.3	2.2	2.3	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.3	2.3	2.2	2.1	(2.0)J	(1.9)J	(1.9)J
20	1.9	1.9	1.9	1.9	2.0	2.0	2.2	2.4F	2.3	2.4F	2.2F	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.1F	2.2F	2.0JS	(2.0)SJ	(2.0)SJ	(2.1)JF
21	1.9F	(1.8)J	(1.8)J	1.9	2.0	1.9	2.1	2.3V	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.0	2.0	1.9	(1.9)S
22	1.8	1.9	1.9	2.0	(2.0)JS	2.1	2.1	2.3F	2.2	2.2	2.0	2.1	2.1	2.0	2.0	2.0F	2.0	2.0	2.1	(2.1)J	1.8	(1.9)J	(2.0)J	(1.8)J
23	(2.0)J	(2.1)JS	1.6	1.8	(1.9)J	(1.7)JF	(1.9)JS	2.0K	2.1FK	J(1.7)SK	1.9K	1.8FK	1.9K	1.8K	1.9K	2.0K	1.9K	2.0FK	2.0K	1.9	1.9	2.0	1.7F	(1.8)JS
24	(1.9)FS	(1.8)JS	(1.7)FJ	(1.9)F	(1.9)F	(1.9)J	2.0	2.3F	2.3	2.3	2.0F	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	1.9	1.9	(1.9)J
25	1.7	(1.8)JS	(2.0)JS	1.9F	2.1F	2.0F	(2.0)JS	2.0F	2.0F	2.1	2.2	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.0	(2.0)S	1.9	1.8S
26	1.8	1.8	1.9	1.8B	1.7	1.9	2.0	2.3	2.3	2.3	2.1	1.9	2.0	2.0	2.1	2.0	2.0	2.1	2.1	2.2	2.0	1.9	1.9	1.8
27	1.8	1.8	2.0	2.1	2.0	1.8	2.0	2.3	2.2	2.2	2.1	2.0	2.1	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0	2.0	1.9	1.9
28	2.0S	2.0F	2.0F	2.0F	2.0	2.1F	2.3	2.3	2.2	2.3	2.1	2.1	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.0	1.9
29	1.6	1.7	1.8F	1.8F	1.9F	2.0F	2.1	2.3	2.3	2.0	2.0	1.8	1.9	1.9	1.8	1.9	C	1.9	1.8	2.0	1.9	2.0	2.0	1.9
30	1.9	2.0	1.8V	2.0	1.8F	1.9	2.1	2.0K	1.9K	1.8K	1.7K	1.7K	1.9K	1.9K	2.1K	2.0K	2.1K	2.1K	2.1K	2.0	2.0	(2.0)SJ	(1.9)SJ	(1.9)SJ
31	1.9	(2.0)SJ	(2.0)SJ	(2.1)SJ	(2.1)J	(2.0)JS	2.0	2.3	2.1H	2.2	2.0H	2.0	2.0	1.9	2.1	2.1	2.1	2.1	2.2	2.1	2.0	1.9	2.0	1.9
Median	1.9	1.9	1.9	1.9	2.0	2.0	2.1	2.3	2.3	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.0	2.0	1.9	1.9
Count	30	31	31	30	28	25	31	31	31	31	30	31	31	29	29	29	30	31	31	31	31	31	31	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 33

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

IONOSPHERIC DATA

Form adopted June 1946

(M3000)F2 (Characteristic), ______ (Unit), March (Month), 1951

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Scaled by: L.H.E., McC., A.C.K.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

Calculated by: McC., A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.9K	2.9F	2.9F	3.1F	3.2F	(3.1)JF	3.0	3.2F	3.2F	3.2F	3.2F	3.1F	3.1F	3.1	(2.8)JS	3.2	3.2	3.3	3.3	3.2	3.2	3.0	2.9	3.0
2	2.9	2.9	2.9F	2.9F	3.1F	(3.0)JF	(3.2)JF	3.5	3.4	3.4	3.3	3.2	3.1	3.2	3.1	3.1	3.3	3.3	3.3	3.1	3.1F	3.2F	(3.0)SF	3.0F
3	3.0F	2.8F	2.7F	3.0F	2.9F	3.0F	3.3F	2.9F	3.4	3.4	3.2H	3.1	3.2	3.1	3.1	3.1	3.2	3.4	3.3	3.2	3.1	3.1	3.0S	(3.0)S
4	2.9F	2.8F	2.8F	2.9F	3.0F	3.0F	3.1F	3.5	3.5	3.3	3.2	3.1	3.2	3.2	3.1	3.3	3.2	3.3S	3.2	3.3	3.2	3.1	3.0	3.0
5	3.1	3.0	(3.0)J	(2.8)JS	(3.0)J	3.1	3.1	3.6	3.5	3.4	3.2	3.2	3.2	3.2	3.2	3.1	3.2	3.2	3.3	3.2	3.0	3.2	(3.1)JS	3.0
6	2.9	2.9	2.9	2.8	3.0	2.9	3.2	3.3H	3.4Z	3.6	3.0	3.0	3.1	M	M	M	3.3	3.3	3.4	3.2	3.2	3.1	(3.2)JB	B
7	2.9PS	2.9	3.0S	(3.1)JS	(3.2)JF	(3.1)JF	3.2F	3.1K	(3.0)HK	(3.2)HK	3.0FK	2.9FK	2.9FK	2.9FK	2.9K	3.0K	2.8K	(3.0)SK	K3.0SF	3.0SK	3.1SF	3.1SF	2.9F	2.9F
8	2.8F	2.8F	2.8SF	2.8F	3.0F	2.9F	2.7F	3.1F	3.2F	3.2F	3.1F	3.1	3.1	3.1	2.9	3.2	3.0	3.2	3.2	3.2	2.9SF	3.0F	3.0F	2.6
9	(2.8)JS	2.9VS	2.8	2.7V	2.9	(3.0)J	2.9	3.3	3.3	3.2	3.2	3.2	3.1	3.1	3.2	3.3	3.1	3.2	3.1	3.0SF	3.0S	2.8	2.8	2.8SK
10	2.7K	2.8K	K(2.5)JB	(2.5)JK	2.6K	K(2.9)JB	K(2.8)JB	3.2K	3.2K	2.8K	2.6K	3.0K	3.0K	3.1K	3.0K	3.1K	3.2K	3.3K	3.2K	3.1K	3.0K	2.8K	2.8K	2.8
11	2.9	(2.9)J	3.0	2.9	(2.9)JB	B	2.8	3.2	3.3	3.2F	3.0	3.1	2.9	T	T	T	3.1	3.2	3.2	3.2	3.1	3.0K	(2.9)JK	2.8FK
12	2.6K	2.6FK	(2.7)JK	K(2.8)JF	K(2.7)JS	BK	3.0K	3.5	3.3	3.2	3.2	2.9	3.0	3.1	3.2	3.1	3.2	3.2P	3.2	3.2S	3.0	(2.9)JF	K3.0SF	3.0FK
13	2.8FK	2.8FK	K(2.7)JF	2.9FK	AK	AK	K(2.7)BF	3.2K	2.7PK	(2.5)JK	NK	2.7K	2.6K	2.8HK	2.7K	2.6K	2.8K	2.7FK	K(3.0)VJ	K(2.9)JS	2.8FK	K(2.9)JA	(2.8)AK	BK
14	(2.6)B	2.6FK	2.6K	K(2.7)JF	3.0FK	K2.9SF	3.2F	3.4F	3.3V	3.3	2.9	3.1V	3.1	3.1	3.0	3.0	3.0	3.0	3.1	3.0	2.9	3.0	2.8B	(2.8)B
15	A	(2.6)A	(2.6)J	A	A	A	3.1	(3.5)J	3.4	3.2	3.2	3.2	3.2	3.4	3.3	3.2	3.2	3.3	3.4	3.2	3.2	3.1	3.0	2.9
16	2.8	2.9	3.0	(3.0)J	(3.0)J	3.0	(3.1)J	3.3	3.2V	3.1V	3.1	3.0	3.1	3.1	3.1	3.0	3.1	3.3	3.4	3.2	3.0	3.0	2.9	2.9
17	3.0	2.8	2.9S	2.9F	B	B	(3.1)SF	3.0F	3.3F	3.2H	3.2	3.1	3.0	3.0	3.1	3.2	3.2	3.4F	3.4	3.1	3.0S	2.8	(2.9)BS	2.9
18	2.9	2.9	3.0	(3.0)SF	(3.0)B	B	(2.8)B	3.4F	3.4	3.2	2.9	3.2	3.1	3.1	3.1	3.1	3.1	3.3	3.4	3.3	3.0	2.9	2.9	2.8
19	2.9	2.9	2.8	(2.9)JB	(2.7)JB	2.9	(3.0)J	3.4	3.2	3.3	3.2	3.2	3.1	3.1	3.1	3.1	3.1	3.3	3.3	3.2	3.1	(3.0)J	(2.9)J	(2.9)J
20	2.8	2.9	2.9	2.9	3.0	3.0	3.2	3.4F	3.3	3.4F	3.2F	3.1	3.1	3.2	3.2	3.1	3.1	3.1	3.1F	3.2F	(3.0)JS	(3.0)SJ	(3.0)SJ	(3.1)JF
21	2.9F	(2.8)J	(2.8)J	2.8	3.0	2.9	3.1	3.3V	3.4	3.4	3.2	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.2	3.1	3.0	3.0	2.9	(2.8)S
22	2.7	2.8	2.8	3.0	(3.0)JS	3.1	3.1	3.3F	3.2	3.2	3.0	3.1	3.0	3.0	3.0	3.0F	3.0	2.9	3.1	(3.1)J	2.8	(2.9)J	(3.0)J	(2.8)J
23	(3.0)J	(3.1)JS	2.6	2.7	(2.9)J	(2.7)JF	(2.9)JS	3.1K	3.0FK	K(2.6)JS	2.9K	2.7FK	2.9K	2.7K	2.9K	3.0K	2.8K	3.0FK	2.9K	2.8	2.8	2.9	2.6F	(2.7)JS
24	(2.8)FS	(2.8)JS	(2.6)FJ	(2.8)F	(2.8)F	(2.8)J	3.0	3.4F	3.3	3.3	3.0F	2.8	2.8	2.8	2.9	2.8	2.9	3.0	3.0	3.0	3.0	2.8	2.8	(2.8)J
25	2.6	(2.7)JS	(3.0)JS	2.9F	3.1F	3.0F	(3.0)JS	3.0F	2.9F	3.0	3.2	3.1	3.1	3.0	3.1	2.9	3.1	3.1	3.1	3.0	3.0	(3.0)S	2.9	2.8S
26	2.7	2.7	2.8	2.8S	2.6	2.9	3.0	3.3	3.4	3.3	3.1	2.9	3.0	3.0	3.1	3.0	3.0	3.1	3.1	3.2	2.9	2.8	2.8	2.7
27	2.7	2.7	3.0	3.1	2.9	2.7	3.0	3.3	3.2	3.2	3.1	2.9	3.1	3.0	3.0	3.0	3.1	3.1	3.2	3.1	3.0	3.0	2.8	2.8
28	2.9S	2.9F	2.9F	3.0F	3.0	3.1F	3.3	3.4	3.2	3.3	3.1	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.1	3.1	3.1	2.9	2.9
29	2.7	2.6	2.7F	2.7F	2.8F	3.0F	3.1	3.3	3.3	3.0	3.0	2.7	2.8	2.8	2.7	2.8	C	2.8	2.7	2.9	2.8	3.0	3.0	2.8
30	2.8	2.9	2.7V	2.9	2.7F	2.8	3.1	3.0K	2.8K	2.7K	2.6K	2.6K	2.8K	2.9K	3.1K	3.0K	3.1K	3.1K	3.1K	3.0	3.0	(2.9)JS	(2.8)JS	(2.8)JS
31	2.8	(3.0)JS	(3.0)JS	(3.1)JS	(3.1)J	(3.0)JS	2.9	3.3	3.1H	3.2	2.9H	3.0	3.0	2.9	3.0	3.1	3.1	3.1	3.2	3.1	3.0	2.8	2.9	2.9
Median	2.8	2.8	2.8	2.9	3.0	3.0	3.1	3.3	3.3	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.1	3.0	3.0	2.9	2.8
Count	30	31	31	30	28	25	31	31	31	31	30	31	31	29	29	29	30	31	31	31	31	31	31	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min.

Manual ☐ Automatic ☒

TABLE 34

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

Form adopted June 1946

(M3000)F1 (Characteristic), ______ (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L.H.E., McC., A.C.K

Calculated by: A.C.K.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									L	L	3.6	3.6	3.5	3.5	3.1	3.8	L	L						
2									L	L	L	L	L	3.6	3.7	L	B	Q						
3									Q	L	L	L	3.6	L	3.5	L	L	Q						
4									L	L	L	L	L	L	L	L	L	Q						
5									L	L	4.0^{P}	3.8	L	3.8	L	L	L	Q						
6									L	L	L	L	3.5	M	M	M	L	Q						
7									L^{K}	L^{K}	3.6^{K}	3.6^{K}	3.6^{K}	3.5^{K}	3.4^{K}	3.4^{K}	3.4^{K}	L^{K}						
8									3.5	3.8	3.9	3.5^{H}	3.5	3.6	L	L	L	Q						
9									L	L	L	3.5	L	3.7	3.6	L	L	Q						
10									3.5^{K}	3.6^{K}	3.9^{K}	3.7^{K}	3.5^{K}	3.5^{K}	3.4^{K}	3.5^{K}	3.6^{K}	L^{K}						
11									Q	L	L	3.4	3.5	T	T	T	3.4	L						
12									L	3.8	3.6	3.5	3.5	3.6	B	3.4-	L	L						
13									3.6^{K}	$(3.5)^{J}_{K}$	3.7^{K}	3.7^{K}	3.5^{K}	3.7^{K}	3.6^{K}	3.5^{K}	3.4^{K}	3.1^{K}						
14									L	L	3.5^{H}	3.5	3.6^{H}	3.6	3.5	3.3	L	L						
15									Q	L	L	3.5	3.8	3.5	L	L	L	L						
16								L	L	3.6	3.7	A	A	3.6	3.5	L	L	L						
17								Q	L	3.9	3.6^{V}	3.8	3.7	3.6	3.6	3.6	L	L						
18								L	L	L	L	3.5	3.5	3.5	3.5	3.6	L	L						
19								Q	L	3.7	3.8	3.7	3.8	3.4	3.6	3.7	L	L						
20								Q	L	L	3.6	3.5	3.4	3.6	3.7	3.7	L	L						
21								Q	L	4.0	L	4.0	3.7	3.7	3.7	$(3.8)^{H}$	L	L						
22								Q	Q	L	3.7	3.6	3.5	3.5	3.5	3.7	L	L						
23								Q^{K}	L^{K}	3.5^{K}	3.6^{K}	3.8^{K}	3.7^{K}	3.6^{K}	3.5^{K}	3.4^{K}	L^{K}	L^{K}						
24								Q	L	3.6	$(3.9)^{H}$	3.5	3.5	3.5	3.6	$(3.4)^{L}$	L	L						
25								Q	3.5	3.6	$(3.7)^{H}$	$(3.5)^{H}$	3.6	3.7	L	L	L	L						
26								L	L	L	3.8	3.7	$(3.5)^{L}$	3.8	3.7	L	L	L						
27								Q	L	L	L	3.9	3.7	3.6	3.7	3.7	L	L						
28								Q	L	3.8	3.8	3.9	3.7	3.7	3.7	3.8	L	L						
29								L	3.6^{H}	3.6^{H}	3.7	3.3	3.5	3.5	3.5^{H}	3.4	3.4	3.4	L					
30								L^{K}	L^{K}	4.0^{K}	4.0^{K}	3.8^{K}	3.7^{K}	3.6^{K}	3.6^{K}	3.5^{K}	3.5^{K}	L^{K}	L^{K}					
31								L	L	L	3.7	3.8	3.6	3.5	3.5	3.7	L	L						
Median								—	3.5	3.6	3.7	3.6	3.6	3.6	3.6	3.6	3.4	—	-					
Count									5	14	21	26	26	27	23	19	6	2						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 35

Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

(M1500)E (Characteristic), ____ (Unit), March (Month), 1951

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: L.H.E., McC.

Calculated by: A.C.K., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									4.2	4.1	4.1	4.1	4.2	4.2	4.3	4.3	4.4	B						
2									4.2	4.1	4.1	4.2	4.2	$(4.2)^{B}$	4.2	4.3^{P}	B	4.3						
3									4.0	3.9	4.0	4.1	4.1	4.1	4.2	4.4	4.6	4.5						
4									3.8	4.2	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.2						
5								4.1	4.3	$(4.2)^{A}$	4.6	4.2	4.2	4.3	4.2	4.1	4.4	4.4						
6									4.5	4.2	B	4.5	4.3	M	M	M	4.6	B						
7								4.2^{K}	4.3^{K}	4.2^{K}	4.2^{K}	4.4^{K}	4.3^{K}	4.3^{K}	4.3^{K}	B^{K}	4.2^{K}	4.1^{PK}						
8									4.3	4.2	4.3	$(4.7)^{B}$	4.4	4.1	B	$(4.2)^{B}$	B	B						
9								4.2	4.3	4.3	4.3	B	4.3	4.3	4.2	$(4.4)^{B}$	4.4	4.4						
10								4.1^{K}	4.3^{K}	4.2^{K}	4.3^{K}	A^{K}	4.3^{K}	4.4^{K}	4.3^{K}	B^{K}	B^{K}	B^{K}						
11								4.2	4.1	B	4.2	4.3	B	T	T	T	4.0	4.4						
12								4.2	A	4.1	4.3	4.4	4.4	4.3	B	4.2	4.3	3.8						
13								4.3^{K}	4.5^{K}	4.4^{K}	4.3^{K}	4.3^{K}	4.4^{K}	4.4^{K}	4.2^{K}	4.0^{K}	4.1^{K}	3.7^{K}	4.3^{K}					
14								4.2	4.3^{P}	4.3^{P}	4.1^{P}	$(4.5)^{P}$	4.3^{P}	4.2	4.3	B	B	B						
15								B	B	4.3	4.5	A	A	4.3	4.4	4.2^{P}	4.2^{P}	4.2						
16								B	B	4.4	4.5	A	A	B	4.2	$(4.3)^{B}$	4.2	4.2	A					
17								4.3^{P}	A	4.4	$(4.6)^{B}$	B	A	B	B	$(4.4)^{B}$	4.1	4.1	B					
18								B	$(4.5)^{B}$	4.4	B	B	B	B	B	B	4.5	4.1	B					
19								B	4.3^{P}	4.4	4.5	4.6	A	A	A	4.3	4.3	4.0	4.5					
20								4.3	4.1	4.4	4.4	4.3	4.2	4.3	B	4.3	4.3	4.2	4.2					
21								4.5	4.5	4.6	B	B	$(4.2)^{B}$	4.3	A	4.3	4.3	4.5						
22								A	4.3	4.3	4.5	4.5	A	A	$(4.5)^{P}$	4.3	4.5	4.2	4.1					
23								4.5^{K}	4.4^{K}	4.4^{K}	4.4^{K}	4.2^{K}	A^{K}	4.1^{K}	4.0^{K}	4.3^{K}	4.2^{K}	4.3^{K}	4.1^{K}					
24								4.2	4.3	4.5	4.4	B	B	4.2	A	$(4.4)^{B}$	4.2	4.3	4.0					
25								3.8	4.3	4.4	4.4	B	4.3	4.4	B	4.2	4.2	B	4.1					
26								4.2	A	A	4.2	B	4.3	4.3^{B}	4.3	4.2	4.1^{P}	4.1	B					
27								4.0	4.1^{P}	4.4^{B}	4.1^{P}	4.3	4.2	4.2	4.0	4.0	4.1	4.2	B					
28								B	$(4.3)^{B}$	4.3	4.3	$(4.3)^{B}$	4.2	4.2	4.2	4.1	4.1	4.3	B					
29								4.1	4.0	B	B	A	$(4.0)^{B}$	4.1	4.2	4.1	4.1	4.0	B^{S}					
30								4.1^{K}	4.2^{PK}	$(4.5)^{BK}$	A^{K}	4.3^{K}	4.3^{K}	4.2^{K}	4.2^{K}	4.0^{K}	$(4.0)^{BK}$	3.9^{K}	B^{K}					
31								4.2	4.2	$(4.3)^{P}$	$(4.3)^{B}$	$(4.3)^{P}$	4.2	B	B	B	4.1	4.2	B					
Median								4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.2	4.2	4.2	4.1					
Count								19	26	28	26	20	22	23	19	24	27	25	7					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 36

Ionospheric Storminess at Washington, D. C.

March 1951

Day	Ionospheric character* 00-12 GCT	Ionospheric character* 12-24 GCT	Principal storms Beginning GCT	Principal storms End GCT	Geomagnetic character** 00-12 GCT	Geomagnetic character** 12-24 GCT
1	3	3	###	0600	3	2
2	2	0			1	2
3	1	0			3	2
4	1	1			2	2
5	1	1			2	1
6	1	2			3	3
7	1	5	1200	----	3	4
8	2	2	----	0100	4	4
9	1	1			4	4
10	4	4	0400	----	4	3
11	3	1	----	0400	4	3
12	5	3	0200	1200	4	3
13	4	6	0300	----	4	5
14	5	1	----	1100	4	4
15	2	1			3	2
16	2	3			3	3
17	2	3			3	3
18	1	2			3	3
19	2	3			3	2
20	1	2			2	2
21	0	1			2	2
22	1	3			4	5
23	1	4	1200	2400	3	4
24	1	1			3	3
25	1	1			3	3
26	1	3			3	2
27	0	3			4	1
28	0	3			1	2
29	2	2			3	4
30	1	4	1200	2400	3	2
31	1	1			2	2

*Ionosphere character figure (I-figure) for ionospheric storminess at Washington, D. C., during 12-hour period, on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

** Average for 12 hours of Cheltenham, Maryland, geomagnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

---- Dashes indicate continuing storm.

Storm began at 0300 GCT on February 27, 1951.

Table 37

Provisional Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings and Forecasts)
February 1951

Day	North Atlantic quality figure, Half day GCT (1)	North Atlantic quality figure, Half day GCT (2)	CRPL* Warning, Half day GCT (1)	CRPL* Warning, Half day GCT (2)	CRPL Forecasts (J-reports)	North Pacific quality figure, Half day GCT (1)	North Pacific quality figure, Half day GCT (2)	Geomagnetic K_{Ch}, Half day GCT (1)	Geomagnetic K_{Ch}, Half day GCT (2)
1	(3)	5	W	U	X	6	6	(4)	2
2	5	6	U	U	X	(3)	5	1	1
3	6	6				5	5	1	1
4	6	5				(4)	6	1	2
5	5	6				5	6	2	(4)
6	(3)	5	W			(3)	6	(5)	2
7	(4)	5				(4)	5	3	2
8	(4)	5			X	5	(4)	2	3
9	(4)	(4)	W	W	X	(4)	(4)	3	(4)
10	(4)	(4)	W	U	X	(4)	5	(4)	3
11	(4)	(4)	U	U		5	5	(4)	3
12	(4)	(4)	W	W		5	(4)	(4)	3
13	(4)	(4)	W	U		5	7	(4)	3
14	(4)	5	W	U		(4)	5	2	2
15	(4)	5				5	6	1	1
16	5	5				5	6	0	0
17	5	5			X	5	5	0	1
18	6	5			X	5	7	2	2
19	5	5			X	7	7	2	2
20	5	6				5	6	2	1
21	5	6				(4)	6	3	3
22	(4)	5				(4)	(4)	(5)	(4)
23	(3)	(4)	W	U		(4)	(4)	(5)	(4)
24	(2)	(4)	W	U		(2)	(4)	(5)	3
25	(3)	5	W	U		(4)	5	3	3
26	5	5	U		X	(4)	5	3	3
27	(3)	(4)	W	W	X	(4)	5	(4)	(4)
28	(3)	(4)	W	W	X	(4)	5	(5)	3

Score:	Warning N.A.	Warning N.P.	Forecast N.A.	Forecast N.P.
H	27	20	10	8
(M)	0	1	0	0
M	4	6	16	13
G	24	22	18	21
O	1	7	12	14

*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast. ( ) broadcast for one-quarter day. Blanks signify N.

Scales:
Quality Figures
(1)- Useless
(2)- Very poor
(3)- Poor
(4)- Poor to fair
5 - Fair
6 - Fair to good
7 - Good
8 - Very good
9 - Excellent

Geomagnetic K_{Ch} - 0 to 9, 9 representing the greatest disturbance; $K_{Ch} \geq 4$ indicates significant disturbance, enclosed in ( ) for emphasis.

Symbols:
- W Disturbed conditions expected
- U Unstable conditions expected
- N No disturbance expected
- X Probable disturbed date

Scoring:
- H Storm ($Q \leq 4$) hit
- (M) Storm severer than predicted
- M Storm missed
- G Good day forecast
- O Overwarning

Scoring by half day according to following table:

	Quality Figure ≤ 3	4	5	≥ 6
W	H	H	O	O
U	(M)	H	H	O
N	M	M	G	G
X	H	H	O	O

Table 38a

Coronal observations at Climax, Colorado (5303A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	5	5	5	3	2	2	3	3	3	3	3	2	2	2	2	2	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	5	5	3	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	5	5	5	3	2	3	3	3	2	2	2	3	3	3	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	5	5	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	-	-	-	-
23.7	-	-	-	-	-	-	-	2	3	5	4	3	5	8	10	12	15	12	8	5	8	10	15	5	2	2	2	2	2	2	2	2	-	-	-	-	-
24.6a	-	-	-	-	-	-	-	2	5	5	8	8	10	15	20	20	15	8	10	10	12	13	5	3	2	-	-	-	-	-	-	-	-	-	-	-	-
25.7a	-	-	-	-	-	-	3	3	8	5	8	8	12	13	15	13	8	8	5	5	5	4	3	3	2	2	2	2	2	2	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	2	2	3	3	3	3	3	5	8	8	5	5	3	3	3	8	5	3	3	2	2	-	-	-	-	-	-	-	-	-	-

Table 39a

Coronal observations at Climax, Colorado (6374A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	3	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
8.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	5	3	3	3	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2
9.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
12.7	2	2	2	2	2	2	2	2	3	3	3	2	2	5	5	5	3	3	8	15	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23.7	2	2	2	2	2	2	2	2	3	3	2	2	3	8	18	28	28	12	5	5	12	8	15	8	5	3	3	3	5	3	3	3	3	2	2	2	3
24.6a	2	2	2	2	2	2	2	2	2	2	2	2	2	3	15	25	20	8	5	8	3	15	8	5	3	3	3	5	8	5	3	5	3	2	2	2	2
25.7a	3	3	3	3	3	3	3	3	2	2	2	2	5	12	15	12	5	3	3	10	8	10	5	3	3	3	3	5	5	3	3	3	3	3	3	3	3
29.7	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	5	8	12	10	10	12	5	3	3	3	3	2	2	2	2	2	2	2	2

Table 40a

Coronal observations at Climax, Colorado (6702A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	5	5	2	2	2	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
24.6a	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	5	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
25.7a	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 38b

Coronal observations at Climax, Colorado (5303A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	3	3	5	5	5	3	5	3	3	3	3	3	3	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	8	5	3	2	3	5	3	2	2	3	3	3	2	2	2	2	2	2	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	2	2	3	15	12	14	15	8	3	3	5	12	10	8	8	8	5	3	2	2	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	-	-	-	-	-
23.7	-	-	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	5	5	5	5	8	8	3	3	2	2	2	2	2	2	-	-	-	-	-	-
24.6	-	-	-	2	3	3	5	3	3	3	3	5	3	3	3	5	8	8	5	8	12	10	3	3	3	3	3	3	2	2	2	2	2	2	2	2	-
25.7	-	-	-	2	3	5	5	3	3	3	3	3	2	2	2	2	3	3	2	2	8	10	8	5	5	5	5	3	3	2	2	2	2	2	2	2	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	10	8	8	10	10	12	8	5	3	2	2	2	2	2	2	2	-	-	-	-

Table 39b

Coronal observations at Climax, Colorado (6374A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	2	2	-	-	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	12	10	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
8.7	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	3	2	2	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2
9.7	3	3	3	3	3	3	3	2	2	2	2	2	2	3	5	18	15	8	2	-	-	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	3	2	-	2	2	2	2	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2
23.7	3	2	3	2	2	2	2	3	-	-	-	-	-	2	2	2	2	2	2	5	12	12	2	2	-	-	-	-	2	2	2	2	2	2	2	2	2
24.6	2	2	2	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	12	3	8	15	2	-	-	-	2	3	2	2	2	2	2	2	2	2	2
25.7	3	2	2	3	3	2	2	2	2	2	2	2	2	-	-	-	-	2	5	3	5	10	2	-	-	-	-	-	2	2	2	2	2	3	3	3	3
29.7	2	2	2	2	3	3	3	3	3	3	5	3	5	5	3	5	10	5	2	3	12	10	5	3	3	2	2	2	2	2	2	3	3	3	3	3	3

Table 40b

Coronal observations at Climax, Colorado (6702A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
29.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	3	5	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-

Table 41a

Coronal observations at Sacramento Peak, New Mexico (5303A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	-	-	-	-	-	-	3	5	5	5	5	8	10	10	8	8	8	10	8	5	8	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-
4.8	-	-	-	-	-	3	3	3	3	3	3	3	3	5	12	15	18	20	15	12	5	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	2	3	3	3	3	3	5	12	15	20	22	20	12	3	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	10	12	15	15	5	3	3	5	8	12	8	5	3	3	-	-	-	-	-	-	-	-
8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	5	10	12	15	12	12	15	8	5	5	5	5	5	5	3	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	3	5	8	10	12	14	12	12	12	15	12	10	8	8	5	3	3	3	3	5	5	3	3	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	3	3	5	8	10	12	15	12	10	10	5	5	8	8	5	5	5	5	3	3	3	3	5	3	3	-	-	-
13.7	-	-	-	-	-	-	3	5	8	10	10	8	8	12	12	12	15	12	5	5	5	5	5	5	5	5	3	3	3	5	5	3	3	3	-	-	-
14.8	-	-	-	-	-	-	3	3	5	5	8	8	10	12	13	20	17	10	8	5	8	12	10	8	5	3	3	3	3	-	-	-	-	-	-	-	-
16.0	-	-	-	-	-	-	3	3	5	5	5	5	8	8	12	15	12	15	12	10	10	10	8	5	3	3	2	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	3	5	5	5	8	8	8	10	12	13	13	15	20	23	18	18	15	12	8	5	10	5	3	3	3	3	3	-	-	-	-	-
19.7	-	-	-	-	-	-	-	-	5	5	8	10	10	15	20	25	15	17	17	15	33	38	15	12	10	8	5	3	3	3	3	3	3	-	-	-	-
20.7	-	2	2	2	2	3	3	3	5	8	8	12	15	20	28	18	17	20	20	20	15	20	31	31	18	12	8	8	3	3	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	3	5	8	10	10	10	12	15	18	22	35	38	22	14	15	22	15	12	5	5	5	5	3	-	-	-	-	-	-	-	-
24.0	-	-	-	-	-	-	-	3	3	5	8	8	10	12	20	28	31	35	15	12	15	25	12	5	3	3	-	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	3	3	5	5	5	12	15	20	25	28	15	10	10	12	15	15	5	3	-	-	-	-	-	-	-	-	-	-	-	-
29.8a	-	-	-	-	-	-	-	3	3	3	3	5	5	5	5	8	10	12	8	5	8	15	12	5	3	3	3	3	3	3	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	12	12	10	8	8	8	10	8	5	3	3	3	-	-	-	-	-	-	-	-	-	-
31.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	8	10	12	8	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-

Table 42a

Coronal Observations at Sacramento Peak, New Mexico (6374A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	8	10	3	3	3	3	5	3	3	2	2	2	2	2	2	2	2	2	2	2	2
4.8	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	5	12	5	15	8	5	8	5	3	5	3	2	2	2	2	2	2	2	2	2	2	2
5.8	2	2	2	2	2	2	2	2	2	2	2	3	3	3	5	8	8	10	8	5	8	10	8	8	8	5	3	2	2	2	2	2	2	3	3	3	2
6.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	3	3	5	8	3	5	8	3	3	8	5	2	2	-	-	-	-	-	-	-	-	-
8.9	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3	3	3	5	8	5	8	5	3	3	3	3	2	2	2	2	2	2	2	2
11.7	3	3	3	3	2	2	2	2	2	3	3	3	2	2	2	5	3	2	5	8	3	2	3	3	2	3	3	2	2	2	2	2	2	2	2	2	2
12.8	2	2	2	2	2	2	2	2	2	5	3	3	3	3	5	3	5	2	5	10	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13.7	2	3	3	3	3	3	3	2	2	2	2	2	2	3	3	8	10	5	5	5	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2
14.8	3	3	3	3	2	2	2	2	2	2	2	2	2	2	5	12	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	2	8	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16.7	2	2	2	2	2	2	2	2	5	8	5	4	2	2	2	3	12	3	8	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2
19.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	10	3	5	5	10	18	20	5	12	5	3	3	5	5	5	3	3	2	2	3	3	2
20.7	2	2	2	2	2	2	2	2	2	2	2	2	3	3	15	3	2	10	8	15	12	20	18	8	5	3	3	5	3	3	2	2	2	2	2	2	2
22.7	2	2	2	2	2	2	2	2	2	2	2	2	3	3	8	12	10	15	13	5	12	10	12	5	3	3	3	5	5	5	3	3	3	2	2	2	2
24.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	12	20	15	10	3	8	3	8	12	3	2	3	2	2	2	2	2	2	2	2	2	2
24.6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	12	12	10	2	3	8	8	15	3	2	2	2	2	3	3	3	2	2	2	2	2	2
29.8a	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	5	10	12	10	10	5	3	2	2	2	2	2	2	2	2	2	2	2
30.6	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	5	5	12	8	5	5	3	5	3	3	3	2	2	2	2	2	2	3	3
31.7	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	5	3	5	5	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2

Table 43a

Coronal observations at Sacramento Peak, New Mexico (6702A), east limb

Date	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
19.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.0	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	5	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	5	5	5	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.8a	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	2	2	2	2	-	-	-
31.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 41b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	3	12	12	13	15	25	28	25	15	12	10	5	3	3	3	-	-	-	-	-	-
4.8	-	-	-	-	-	-	-	-	-	3	3	5	8	5	8	10	10	10	14	20	31	33	20	15	13	12	10	8	5	3	3	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	-	-	-	3	5	8	10	12	12	12	12	12	28	25	22	15	15	12	12	12	8	8	3	-	-	-	-	-	-	-
6.7	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
8.9	-	-	-	-	-	-	-	-	-	-	3	3	5	8	12	20	26	20	8	8	10	12	12	12	10	10	10	3	3	3	-	-	-	-	-	-	-
11.7	-	-	-	-	3	3	3	3	3	3	3	3	3	8	10	10	12	8	8	10	12	10	8	10	17	20	17	15	12	10	10	5	2	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	8	5	8	8	12	15	15	12	12	10	8	8	10	8	3	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	3	3	8	10	15	17	10	8	8	12	15	15	13	12	10	8	8	8	5	5	3	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	18	15	8	5	5	5	8	10	10	8	8	8	5	5	5	5	5	-	-	-	-	-
16.0	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	3	3	5	8	8	8	5	3	3	3	3	3	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	5	5	5	8	12	15	15	8	10	5	5	3	3	3	-	-	-	-	-	-	-
19.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	12	25	28	30	15	16	10	5	3	3	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	3	8	8	10	12	10	10	15	20	20	12	5	8	3	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	3	12	8	5	8	10	10	12	12	10	12	14	10	10	10	8	5	3	-	-	-	-	-	-	-	-	-	-	-	-
24.0	-	-	-	-	-	-	-	3	3	3	3	5	5	3	3	5	5	8	8	8	10	10	8	5	3	3	3	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	5	5	8	8	14	12	10	10	10	10	8	5	-	-	-	-	-	-	-	-	-
29.8	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	12	20	20	15	22	25	28	30	25	15	12	12	8	8	5	5	5	3	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	3	3	8	10	12	13	15	15	22	33	31	25	22	22	15	12	10	3	3	3	3	-	-	-	-	-
31.7	-	-	-	-	-	-	-	-	-	3	3	3	3	5	5	8	8	10	10	12	15	15	15	15	13	12	8	3	3	3	3	3	-	-	-	-	-

Table 42b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	3	5	8	8	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2
4.8	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	3	3	5	10	8	15	12	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5.8	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	3	12	12	8	3	3	3	2	2	2	-	-	-	-	-	2	2	2	2
6.7	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	2	2	2	2
8.9	2	2	2	2	2	2	2	2	2	-	-	-	-	-	2	5	15	10	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	3
11.7	2	2	2	2	2	2	2	3	3	4	2	2	2	2	2	8	14	3	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	3	3
12.8	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	5	5	2	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13.7	2	2	2	2	2	2	2	2	5	5	3	3	3	5	3	3	14	8	5	8	8	5	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
14.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	12	5	8	8	5	3	3	3	3	2	2	2	2	2	2	2	2	2	3	3	3
16.0	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5	3	3	3	3	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	2
16.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	5	2	5	3	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19.7	2	2	2	2	2	2	2	2	2	3	2	2	2	3	5	5	5	10	12	8	12	3	8	5	3	3	2	2	2	2	2	2	2	2	2	2	2
20.7	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	12	10	5	10	8	8	10	3	2	2	2	2	2	2	2	2	2	2	2	2
22.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	8	3	2	2	3	3	3	3	2	2	2	2	2	2	2	2
24.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24.6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	5	10	8	12	3	2	2	2	2	2	2	2	2	2	2	2	2	2
29.8	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	3	8	2	2	12	8	5	10	3	2	2	2	2	3	3	3	2	3	2	2	2
30.6	3	2	2	2	2	3	3	3	3	3	5	5	3	3	5	3	3	3	8	3	8	3	8	3	3	2	2	2	2	2	2	2	2	2	2	2	2
31.7	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	3	5	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2

Table 43b

Coronal observations at Sacramento Peak, New Mexico (6702A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951																																					
Mar. 1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
4.8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	3	5	5	3	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-
6.7	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-
8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
13.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.0	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
19.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.0	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	5	5	3	3	3	2	2	2	2	2	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	5	5	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-
31.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-

Table 44

Zürich Provisional Relative Sunspot Numbers

March 1951

Date	R_Z*	Date	R_Z*
1	74	17	26
2	62	18	26
3	50	19	38
4	45	20	49
5	38	21	59
6	50	22	60
7	55	23	83
8	54	24	110
9	33	25	108
10	26	26	97
11	40	27	84
12	61	28	74
13	43	29	70
14	36	30	65
15	26	31	52
16	31	Mean:	55.6

*Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Note: The American sunspot numbers for March will appear in a later issue of this bulletin.

Table 45

Outstanding Solar Flares, February 1951

Observatory	Date 1951	Time Observed Beginning (GCT)	Time Observed Ending (GCT)	Duration (Min)	Area (Mill) (of) (Visible) (Hemisph)	Position Longitude Diff (Deg)	Position Latitude (Deg)	Time of Maximum (GCT)	Int. of Maximum	Relative Area of Maximum (Tenths)	Importance	SID Observed
Sherborne	Feb. 24	1144				E05	N05				3	
Meudon	" 24	1435				E05	N05				1	Yes
Sherborne	" 25	1445				W05	N05				3	
Sacramento Peak	" 28	2015	2045	30	63	W61	N10	2020	10	8		
"	" 28	2150	2230	40	42	W49	N12	2155	8	7		
"	" 28	2300	2315	--	32	W56	N10	2310	20	9		

Table 46

Indices of Geomagnetic Activity for February 1951

Preliminary values of mean K-indices, Kw, from 37 observatories;
Preliminary values of international character-figures, C;
Geomagnetic planetary three-hour-range indices, Kp;
Magnetically selected quiet and disturbed days

Gr. Day 1951	Values Kw	Sum	C	Values Kp	Sum	Final Sel. Days
1	4.5 3.8 3.0 3.1 2.5 1.6 3.8 3.3	25.6	1.2	5o5-4o3o 2+1+4-4o	28o	Five
2	2.2 1.9 1.1 0.9 1.0 0.9 1.3 2.1	11.4	0.1	3-2+1o0+ 1-1o1o2+	11+	Quiet
3	1.3 0.7 1.1 0.8 0.6 1.2 2.2 2.0	9.9	0.0	2-1o1-0+ 0+1+2+2-	9+	
4	0.4 0.5 1.5 3.4 3.0 2.9 2.7 2.2	16.6	0.8	0+0o2o4o 3o3o3-2o	17o	2
5	1.2 2.6 2.6 2.8 3.8 3.2 4.3 3.9	24.4	1.2	1-3o3o3o 4o3+4+4-	25o	3 15
6	5.0 4.8 3.6 3.5 2.1 1.9 1.7 2.1	24.7	1.3	6o6o4+4o 2o2-1+2+	28-	16
7	2.9 2.4 1.8 1.4 1.4 1.9 2.7 2.1	16.6	0.5	3+3+2+1+ 1+3-2+3-	19+	20
8	2.5 1.7 1.9 2.5 2.3 4.6 4.8 3.9	24.2	1.1	3-2o2+3o 3-5-5+4o	27-	
9	2.6 3.0 3.0 2.8 3.9 4.1 4.2 4.2	27.8	1.1	3+4-4-3o 4+5-4o5-	31+	
10	3.4 3.2 3.4 2.6 2.6 2.2 3.7 4.6	25.7	1.2	4o4o4+3- 3o2+4-5o	29o	
11	4.1 3.1 2.4 2.6 2.4 4.0 3.8 4.3	26.7	1.2	5-4-3o3o 3-4o4-5-	29+	Five Dist.*
12	4.2 4.4 2.9 3.1 3.3 3.8 4.6 3.9	30.2	1.3	5+5+4o3+ 4-4o5+4+	35+	
13	3.4 3.0 2.6 3.3 3.4 3.0 3.3 3.4	25.4	0.9	4o4-3+4o 4o3o3+4-	29o	22
14	2.3 1.9 1.8 1.9 1.9 1.9 3.6 2.8	18.1	0.7	3o3-2+2+ 2o2o4-3o	21o	23
15	1.6 1.2 1.0 1.2 1.6 0.9 1.2 2.6	11.3	0.2	2o1o1+1+ 2-1-1o2+	11+	24 27
16	0.8 0.5 0.5 0.5 0.6 0.6 1.4 1.0	5.9	0.0	1-0+0+0+ 0+1o1+1o	5+	28
17	0.7 0.3 0.5 0.5 1.2 1.2 2.9 2.4	9.7	0.3	1-0o0+0+ 1o1o3-2+	8+	
18	2.9 1.3 1.7 2.8 2.7 2.5 3.1 2.1	19.1	0.6	3+2o2o3+ 3-3o3+2o	22-	Ten
19	1.2 2.0 1.8 3.2 2.5 2.2 2.1 3.2	18.2	0.6	1o2+2+4o 3-2+2o3o	20-	Quiet
20	2.3 1.7 0.9 1.8 1.3 0.5 0.9 0.9	10.3	0.2	2+2+1+2+ 1+1-1o1-	12o	
21	1.5 1.8 1.8 1.8 2.1 2.8 3.1 2.9	17.8	0.7	2o2+2+2o 3-3-3o3o	20o	2 3
22	3.7 3.4 4.1 3.9 4.4 4.6 4.5 4.6	33.2	1.5	4+4+5o5- 5o4+5-5+	38-	4
23	4.8 3.9 4.9 4.8 4.6 4.4 5.0 5.4	37.8	1.7	6-5-6+6- 5+5-6-6o	44o	7
24	4.4 3.7 3.9 3.8 3.7 4.6 3.6 3.2	30.9	1.4	5o5o5o4+ 4+5+4o4-	37-	15
25	3.4 2.8 1.8 2.8 2.3 2.7 2.4 4.3	22.5	1.0	4o3+2o3o 3-3o3-5-	25+	16 17
26	2.0 2.2 2.5 2.3 3.6 3.8 3.7 2.3	22.4	0.9	2+3+3o3- 4-4o4-2+	25o	18
27	6.0 4.4 3.9 3.2 3.7 4.0 3.9 4.1	33.2	1.6	7o6-5-3+ 4o4o5-5-	38o	20
28	4.4 5.9 5.6 4.3 3.7 3.1 3.4 3.5	33.9	1.6	5o7-7o5o 4+4-3+4o	39o	21
Mean	2.85 2.57 2.41 2.56 2.58 2.68 3.14 3.12	2.74	0.89			

*It should be noted that the fifth disturbed day for January 1951 was the 31st.

Table 47

Sudden Ionosphere Disturbances Observed at Washington, D. C.

March 1951

1951 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
March 2	2058	2130	Ohio, D. C., Colombia, England	0.01	Terr.mag.pulse** 2058-2105
3	1620	1640	Ohio, D. C., Colombia, England, New Brunswick	0.1	
25	1845	1950	Ohio, D. C., New Brunswick	0.03	
25	2155	2220	Ohio, D. C.	***	

*Ratio of received field intensity during SID to average field intensity before and after, for station KQ2XAU (formerly W8XAL), 6080 kilocycles, 600 kilometers distant.

**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

***Insufficient data.

Table 48

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.

as Observed at Riverhead, New York

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
April 2	1700	1815	Argentina, California, Canada, England, Greece, Italy, Morocco, Panama, Union of S. Africa	Solar flare* 1706

*Time of observation at Sacramento Peak, New Mexico.

Table 49

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief, Cable and Wireless, Ltd., as Observed in Barbados, B.W.I.

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
January 22	1625	1700	Canada, England, Florida, Grenada, Jamaica, Leeward Is., Peru, St. Lucio, St. Vincent, Trinidad	Terr.mag.pulse* 1625-1705
February 19	1410	1600	British Guiana, England, Grenada, Jamaica, Peru, St. Lucio, St. Vincent, Trinidad	

*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 50

Sudden Ionosphere Disturbances Reported by International Telephone and Telegraph Corporation, as Observed at Platanos, Argentina

1951 Day	GCT Beginning	GCT End	Location of transmitters
February 19	1409	1600	Bolivia, Brazil, Chile, Cuba, Denmark, England, France, Germany, Netherlands, New York, Peru, Portugal, Switzerland, Venezuela

Note: Observers are invited to send to the CRPL information on times of beginning and end of sudden ionosphere disturbances for publication as above. Address letters to the Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.

GRAPHS OF IONOSPHERIC DATA

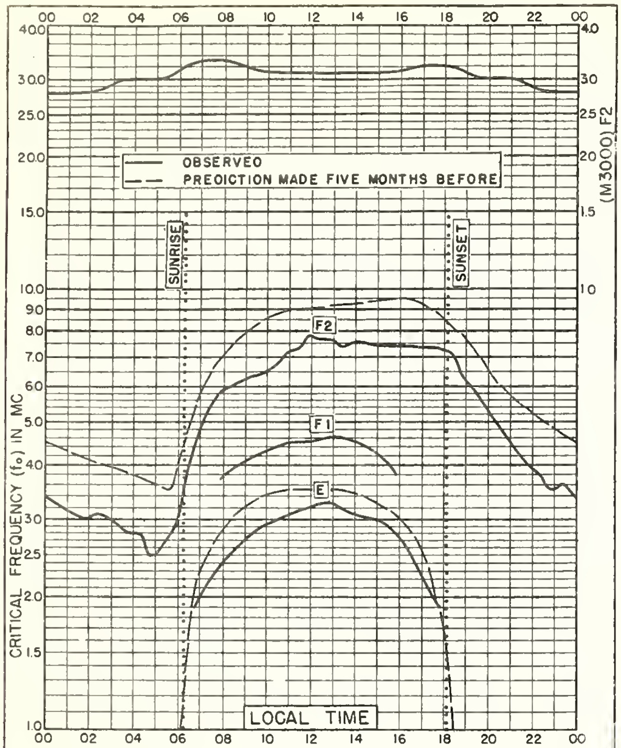

Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W MARCH 1951

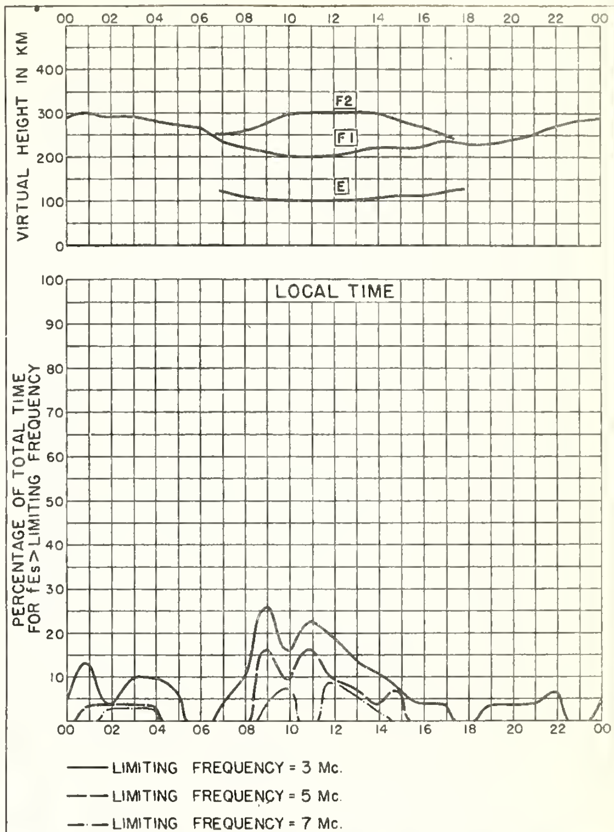

Fig. 2. WASHINGTON, D. C. MARCH 1951

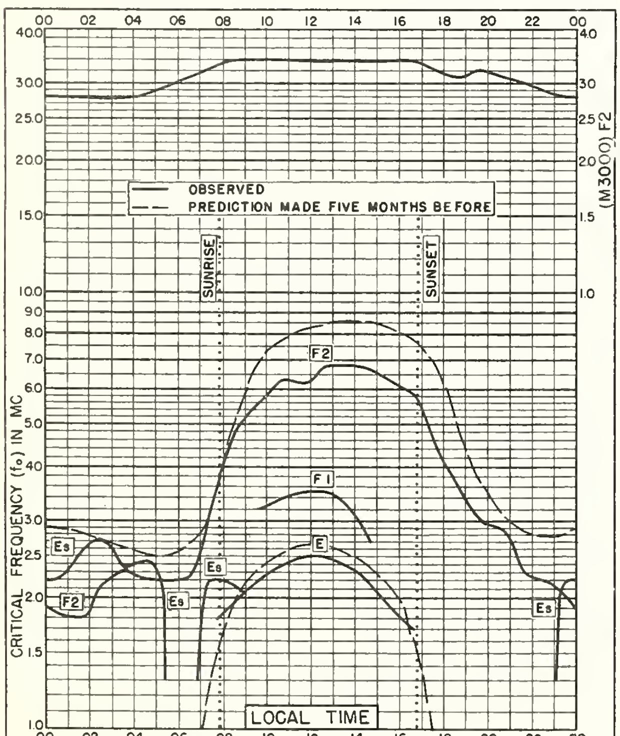

Fig. 3. OSLO, NORWAY
60.0°N, 11.0°E FEBRUARY 1951

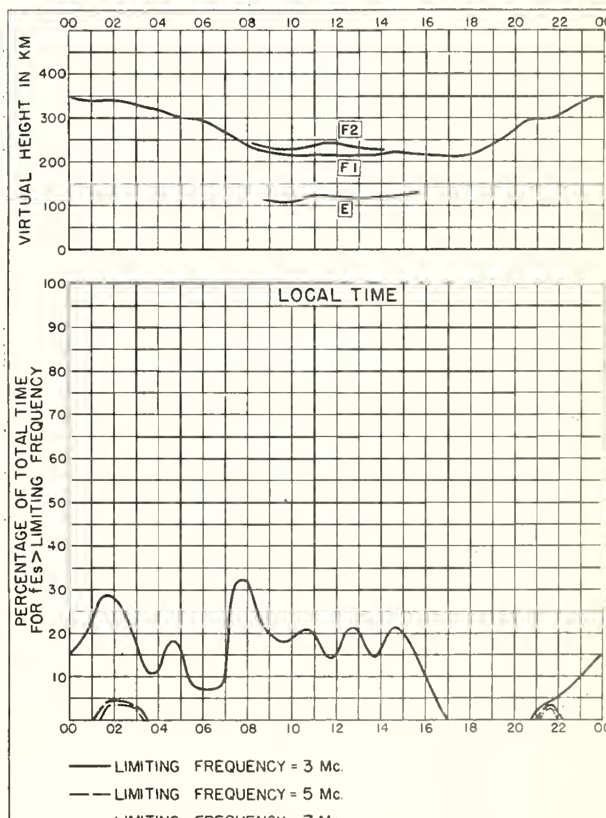

Fig. 4. OSLO, NORWAY FEBRUARY 1951

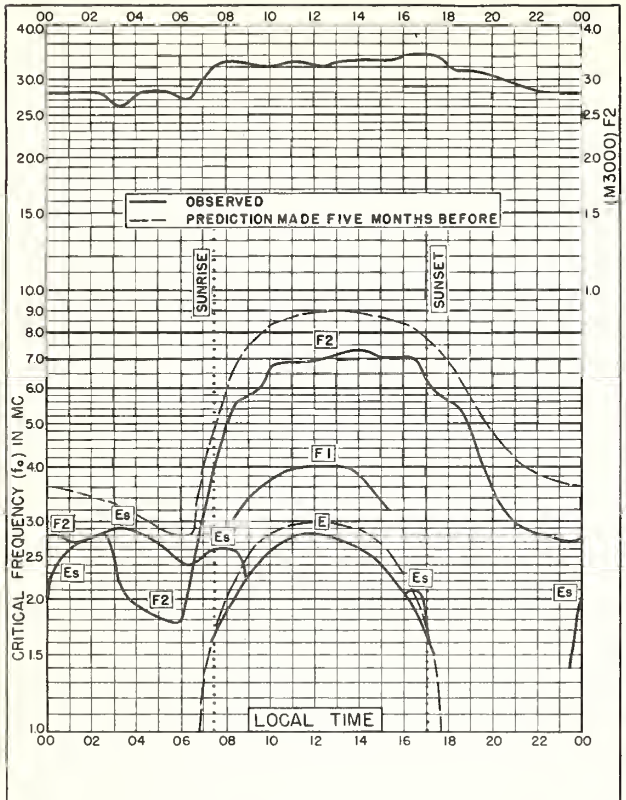

Fig. 5. De BILT, HOLLAND
52.1°N, 5.2°E FEBRUARY 1951

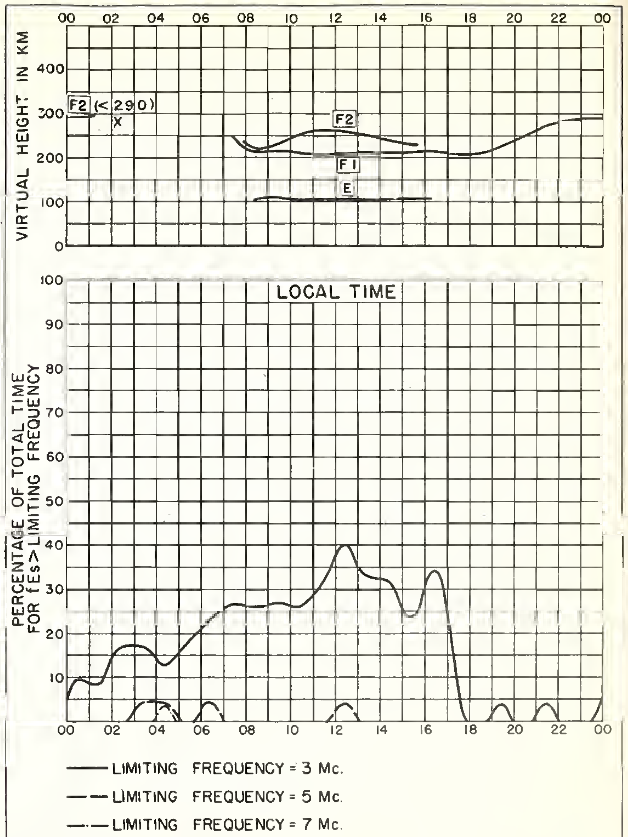

Fig. 6. De BILT, HOLLAND FEBRUARY 1951

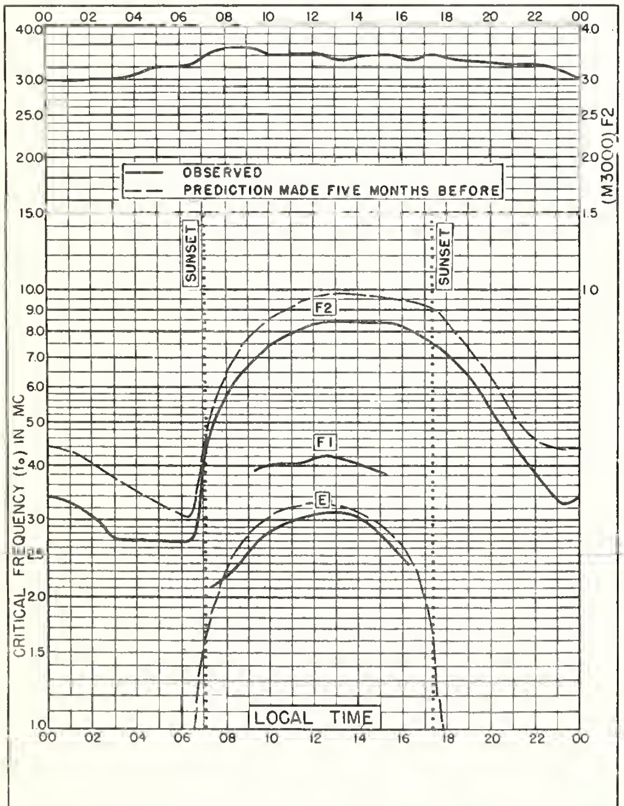

Fig. 7. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W FEBRUARY 1951

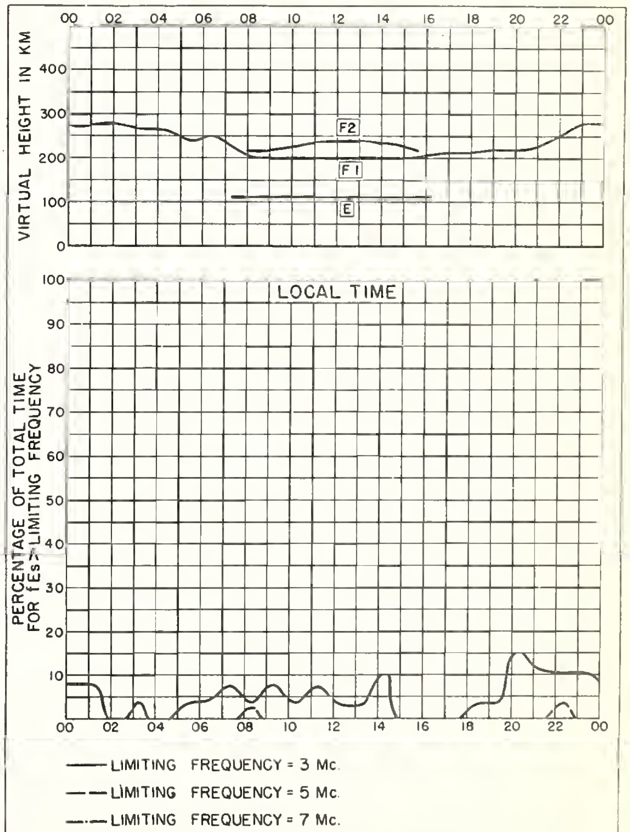

Fig. 8. BOSTON, MASSACHUSETTS FEBRUARY 1951

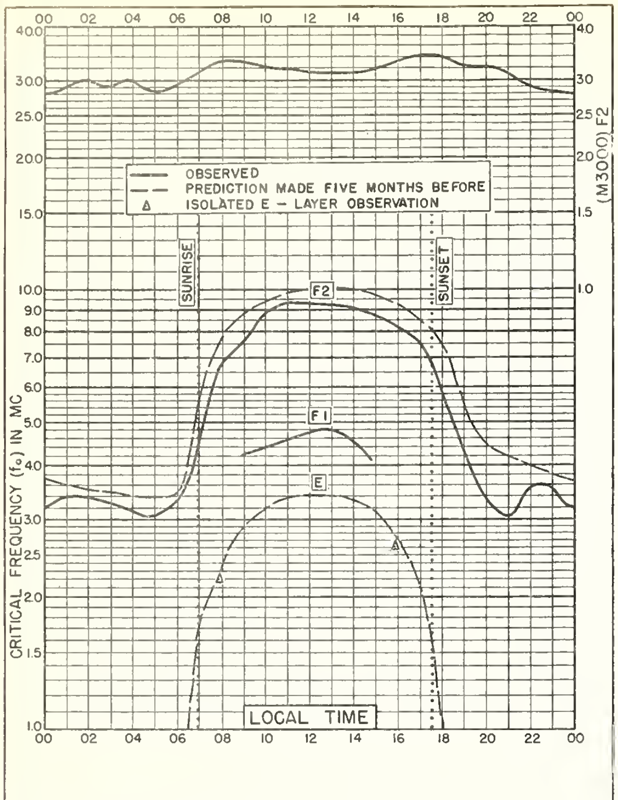

Fig. 9. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W FEBRUARY 1951

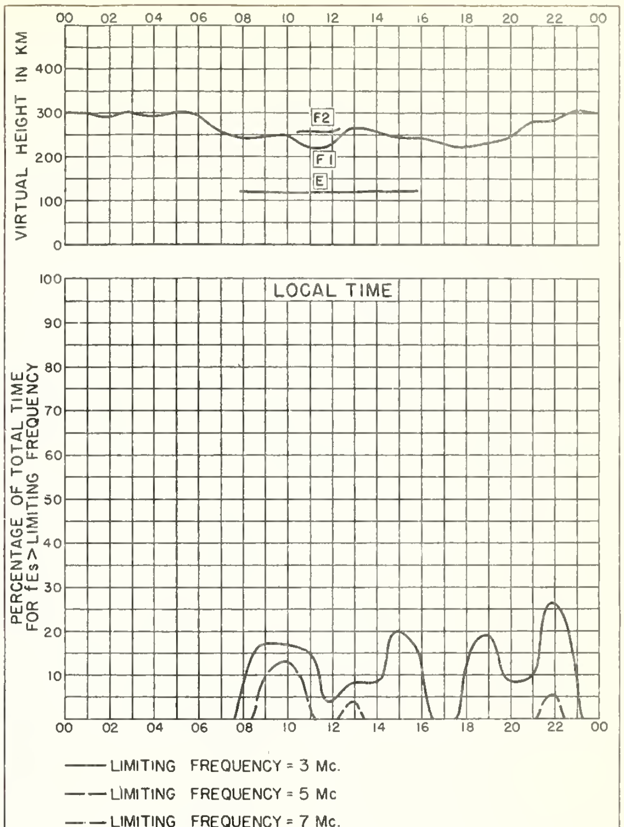

Fig. 10. SAN FRANCISCO, CALIFORNIA FEBRUARY 1951

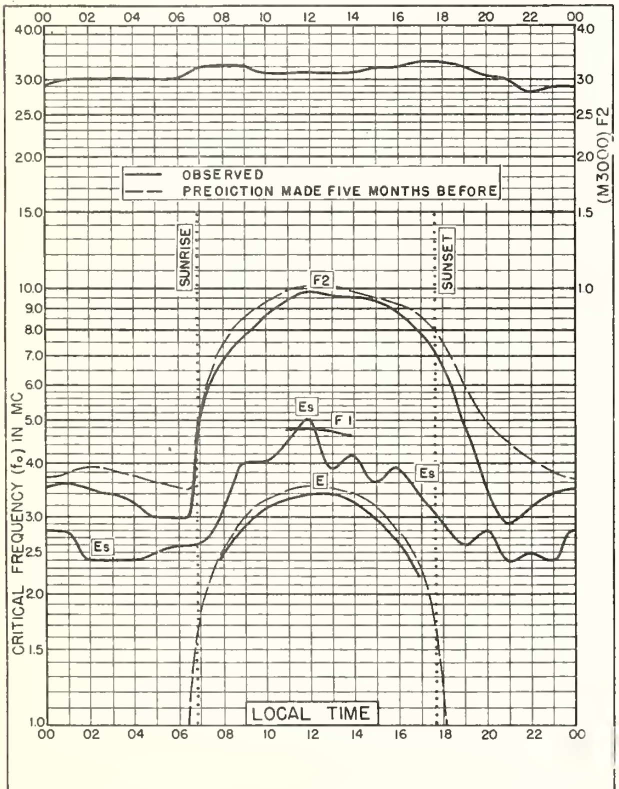

Fig. 11. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W FEBRUARY 1951

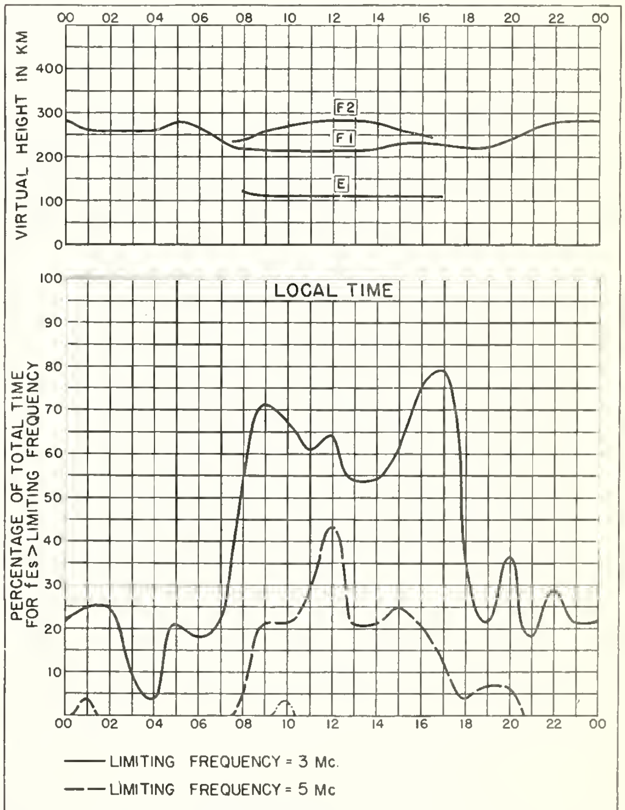

Fig. 12. WHITE SANDS, NEW MEXICO FEBRUARY 1951

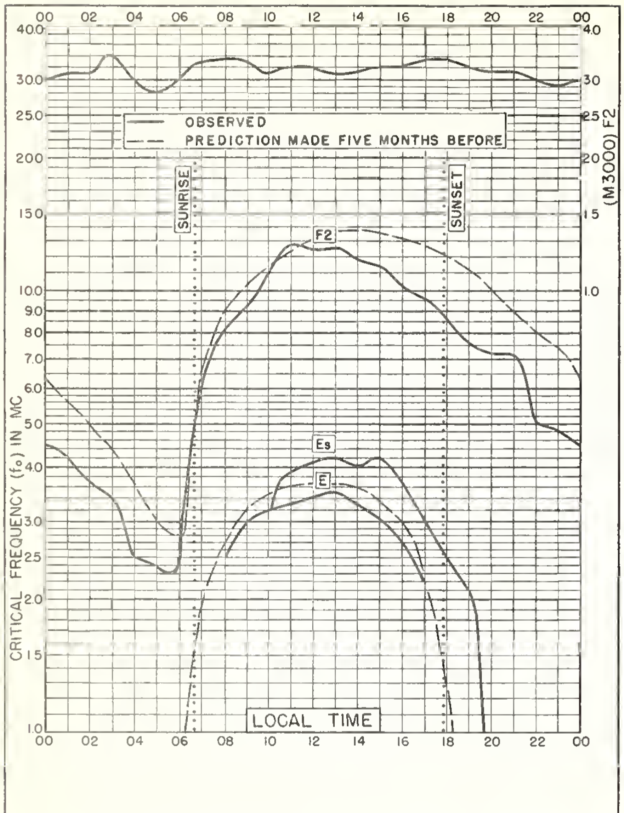

Fig. 13. OKINAWA I.
26.3°N, 127.7°E FEBRUARY 1951

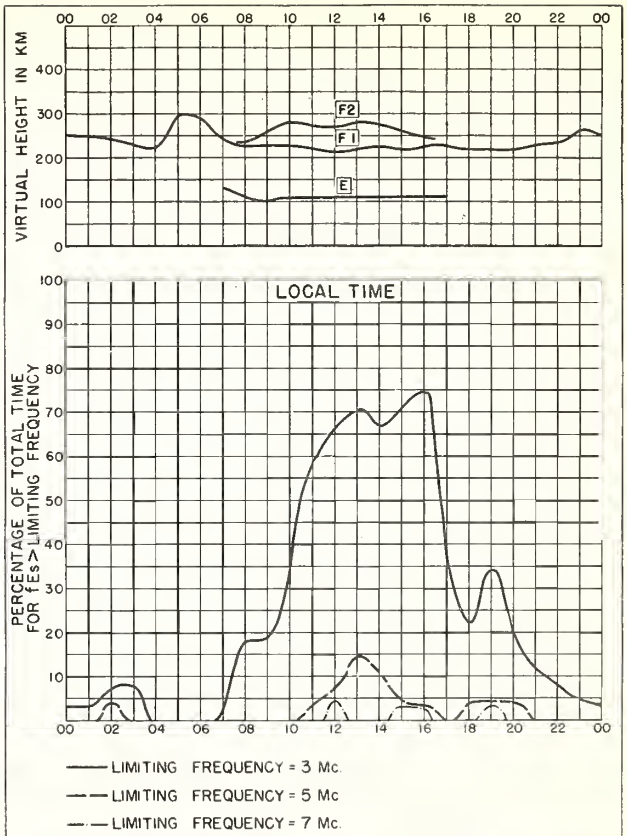

Fig. 14. OKINAWA I. FEBRUARY 1951

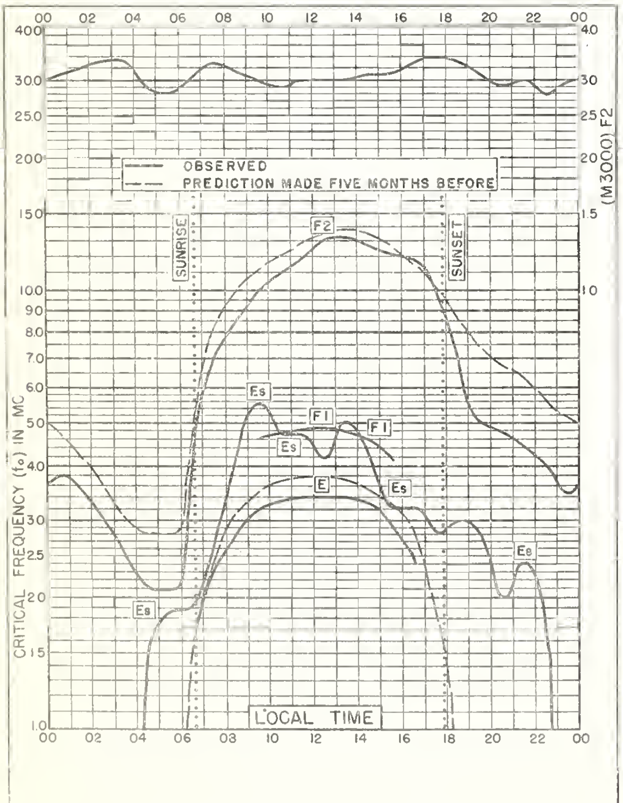

Fig. 15. MAUI, HAWAII
20.8°N, 156.5°W FEBRUARY 1951

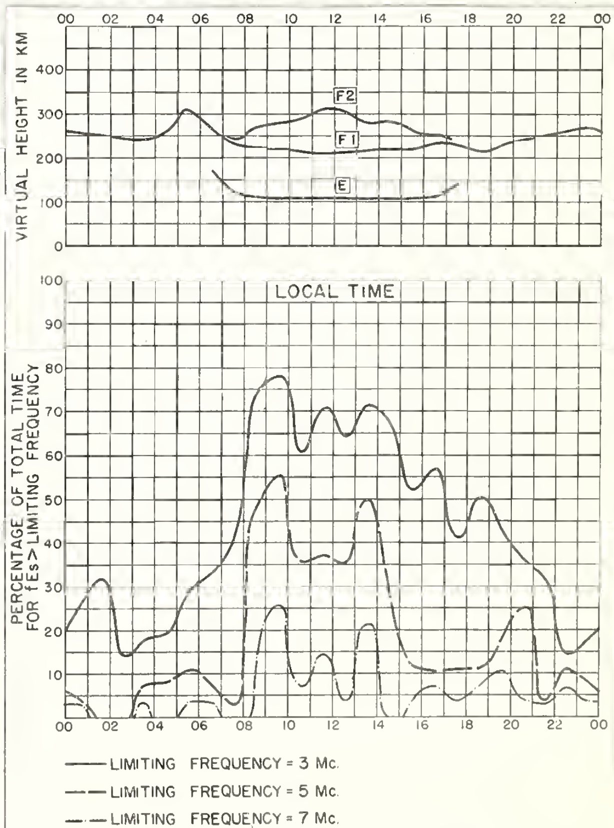

Fig. 16. MAUI, HAWAII FEBRUARY 1951

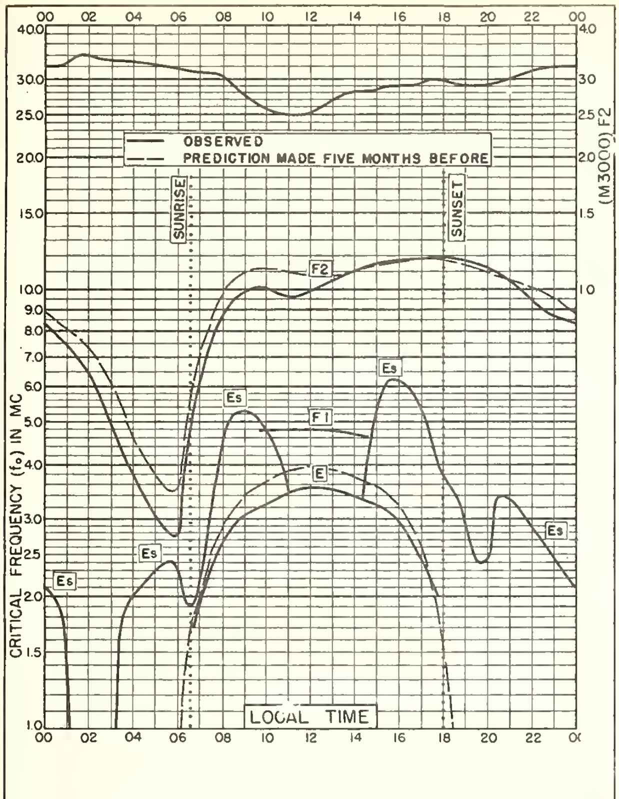

Fig. 17. GUAM I.
13. 6°N, 144.9°E FEBRUARY 1951

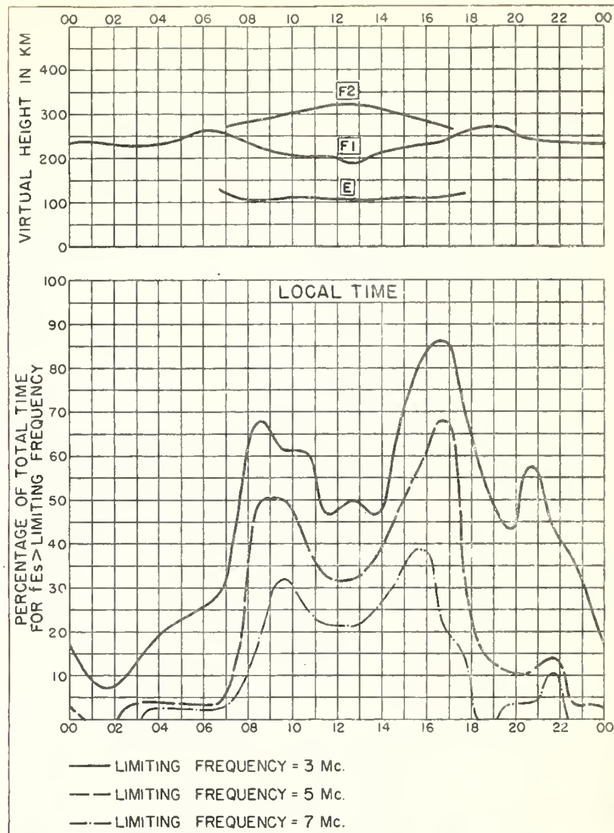

Fig. 18. GUAM I. FEBRUARY 1951

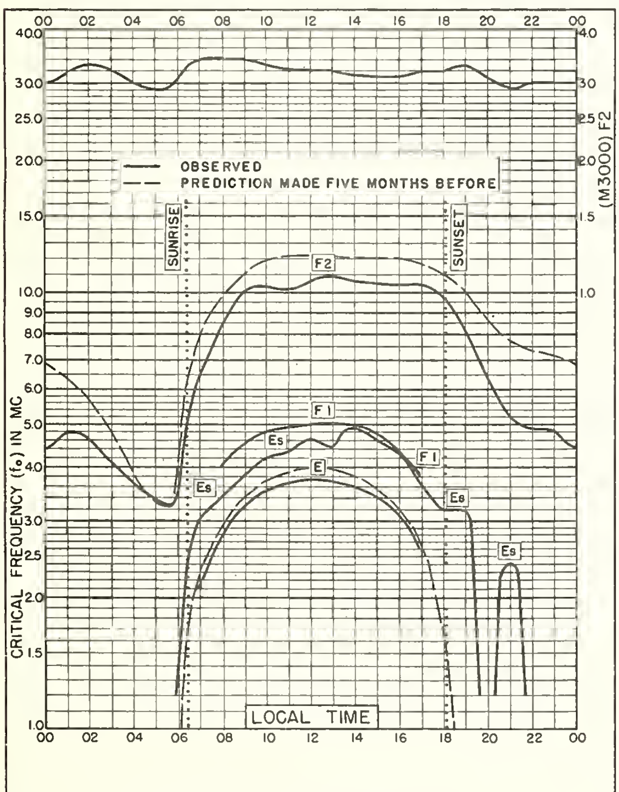

Fig. 19. TRINIDAD, BRIT. WEST INDIES
10.6°N, 61.2°W FEBRUARY 1951

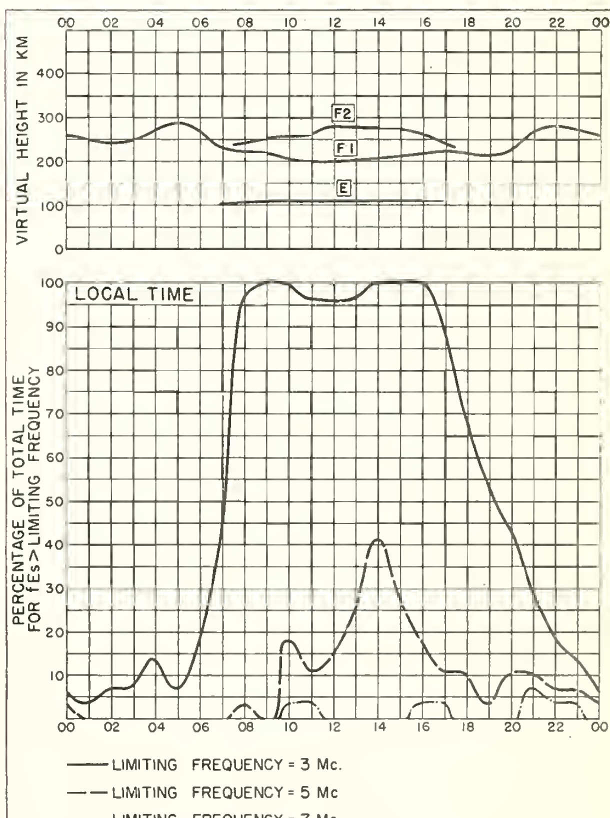

Fig. 20. TRINIDAD, BRIT. WEST INDIES FEBRUARY 1951

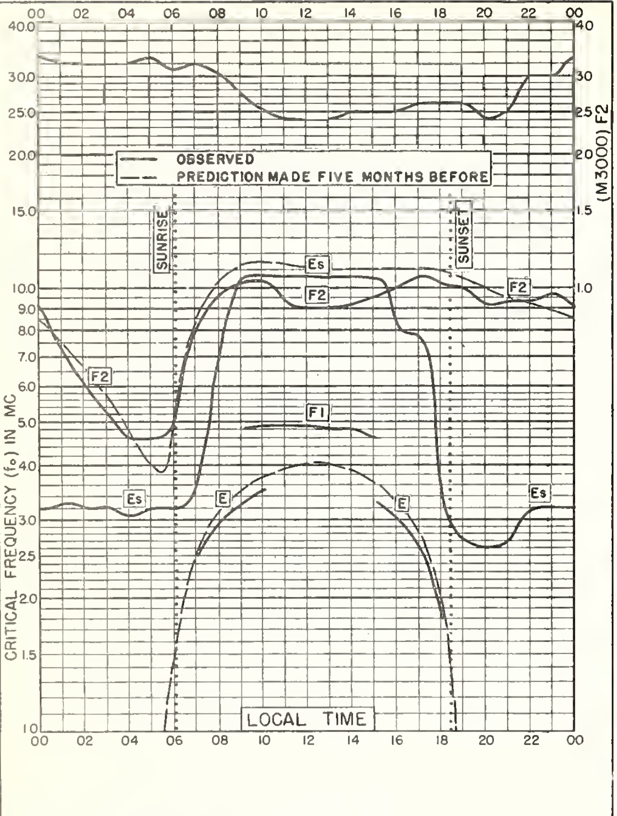

Fig. 21. HUANCAYO, PERU
12.0°S, 75.3°W FEBRUARY 1951

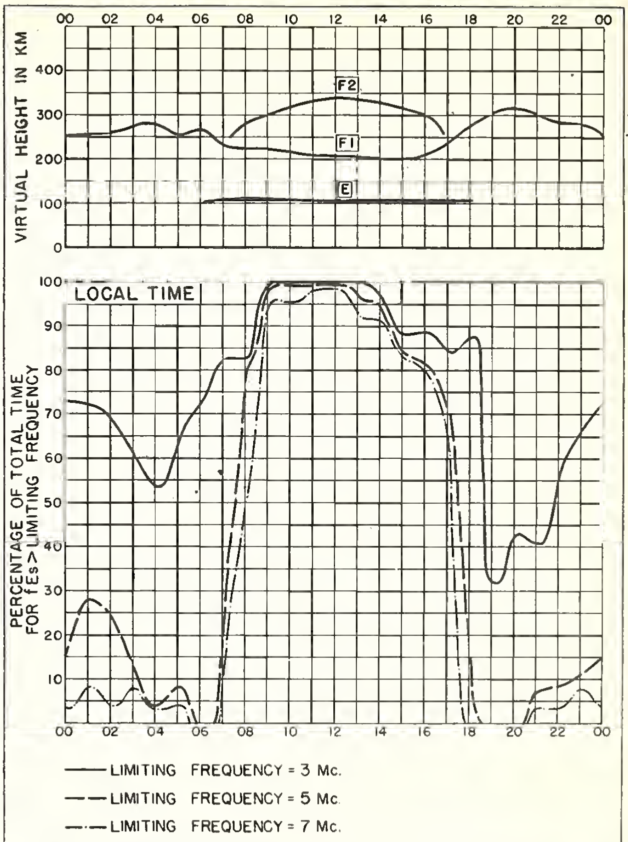

Fig. 22. HUANCAYO, PERU FEBRUARY 1951

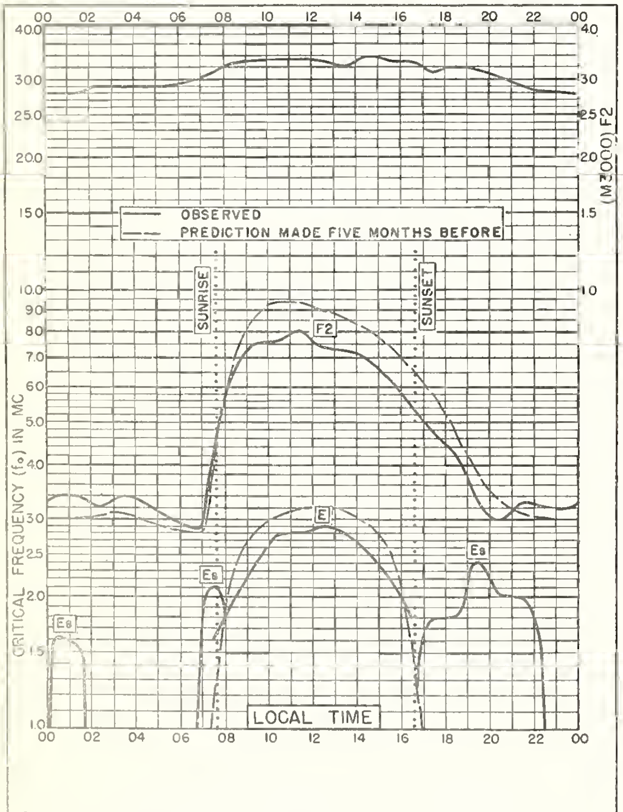

Fig. 23. WAKKANAI, JAPAN
45.4°N, 141.7°E JANUARY 1951

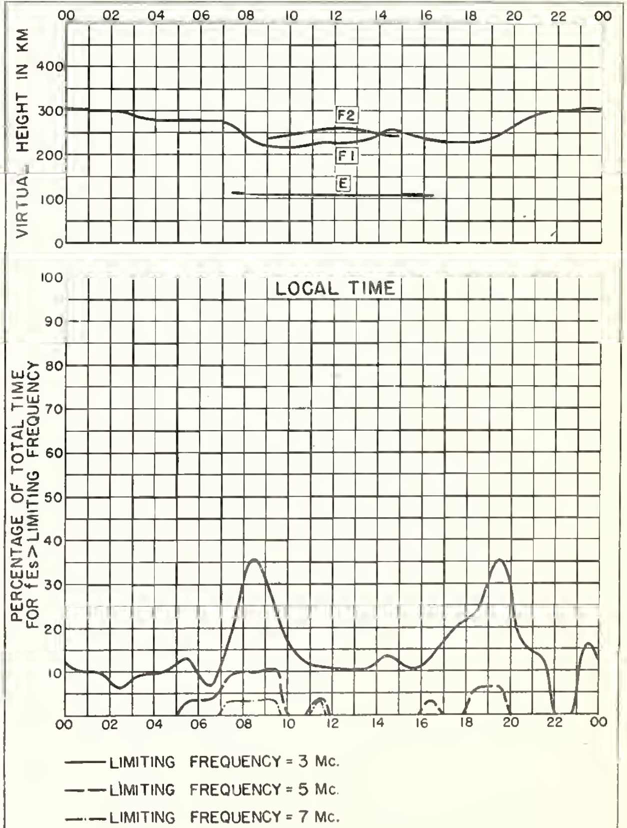

Fig. 24. WAKKANAI, JAPAN JANUARY 1951

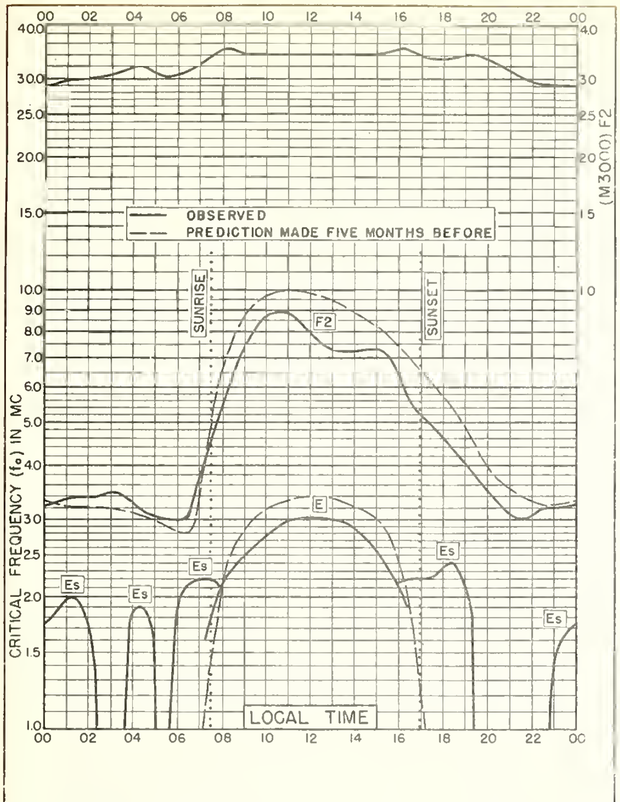

Fig. 25. AKITA, JAPAN
39.7°N, 140.1°E JANUARY 1951

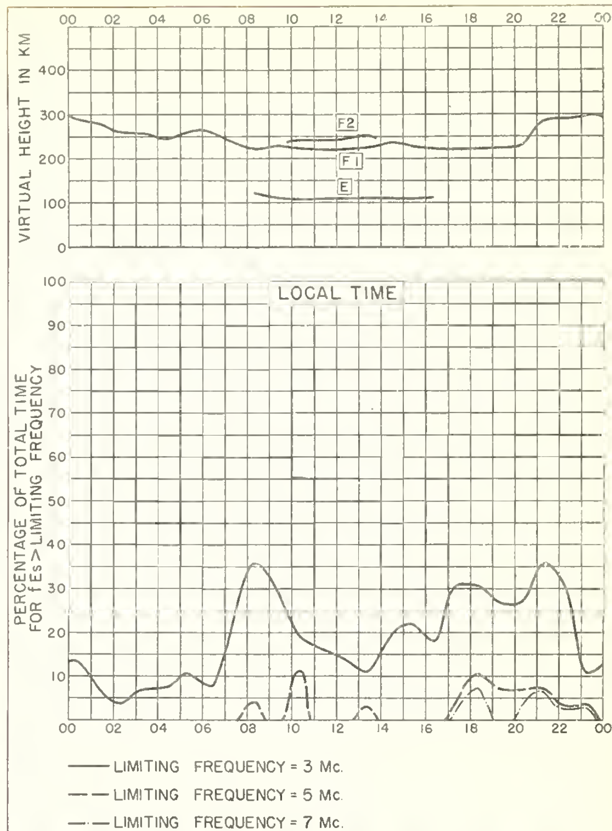

Fig. 26. AKITA, JAPAN JANUARY 1951

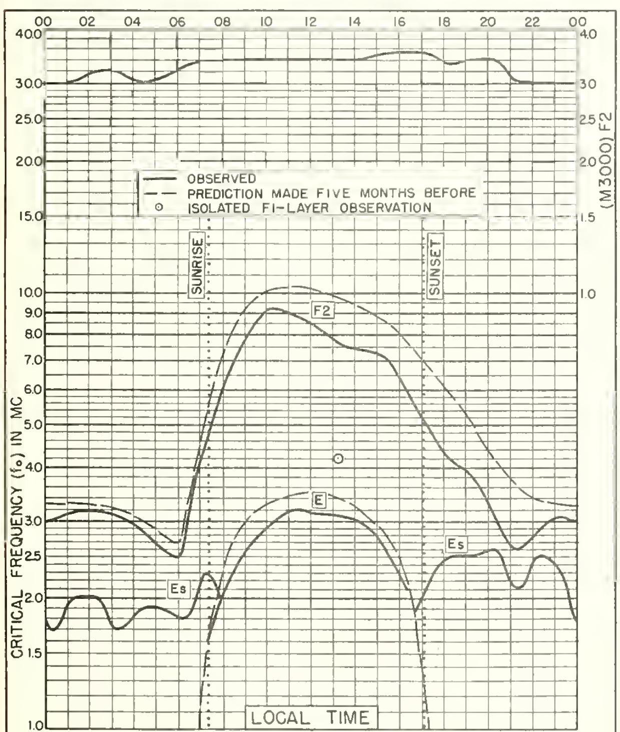

Fig. 27. TOKYO, JAPAN
35.7°N, 139.5°E JANUARY 1951

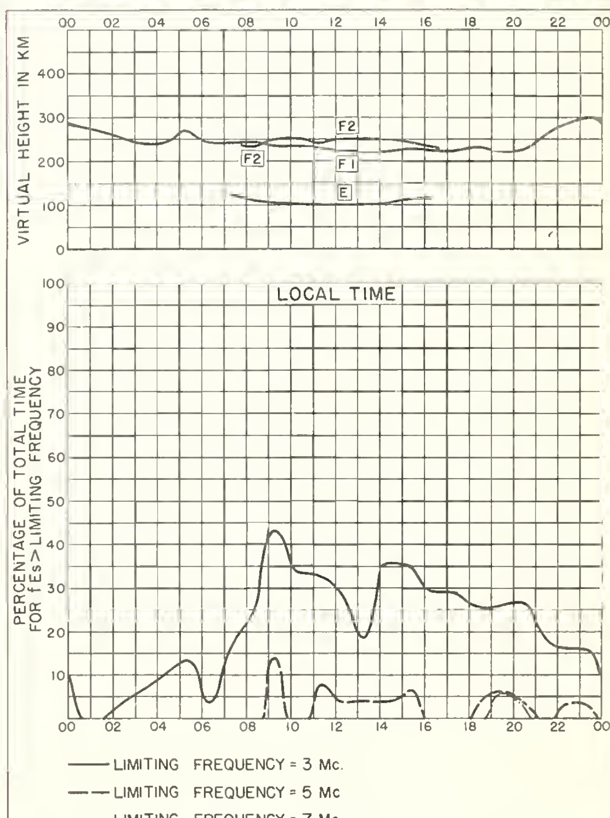

Fig. 28. TOKYO, JAPAN JANUARY 1951

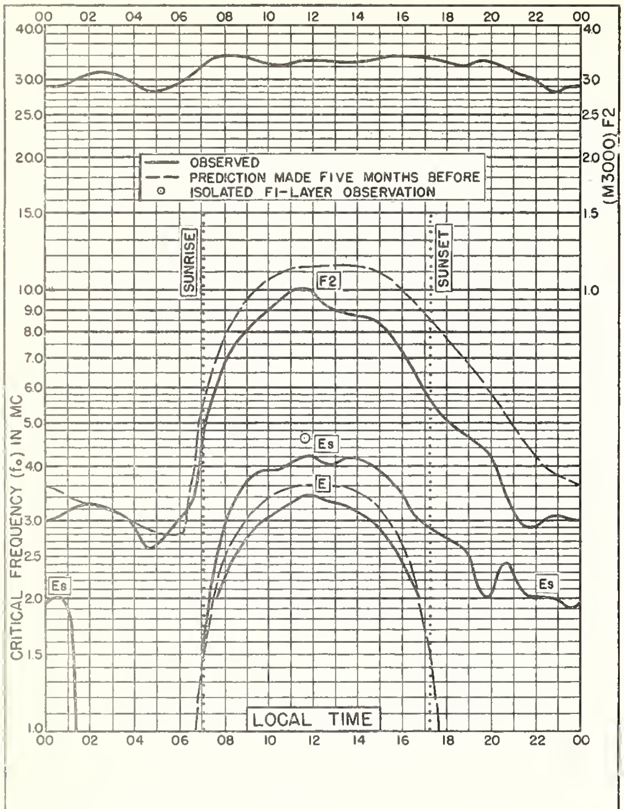

Fig. 29. YAMAGAWA, JAPAN
31.2°N, 130.6°E JANUARY 1951

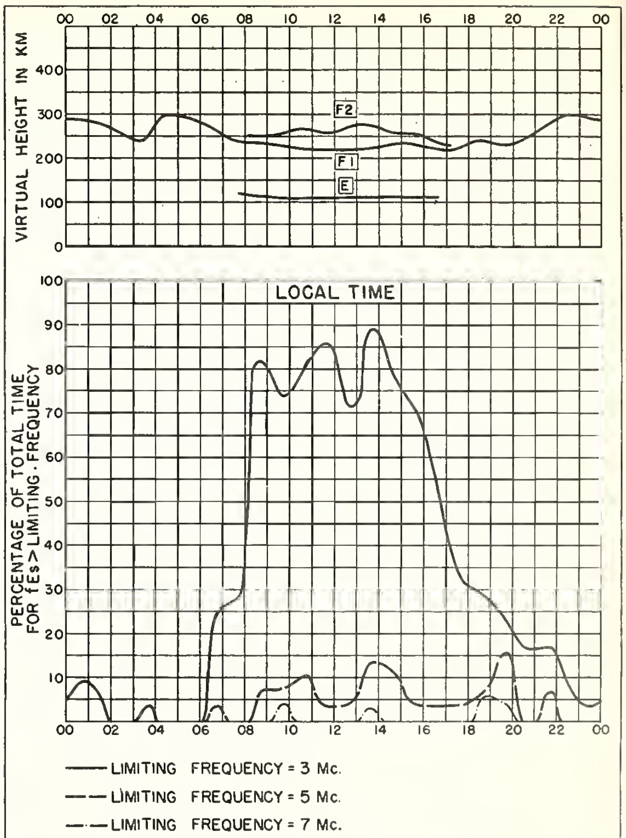

Fig. 30. YAMAGAWA, JAPAN JANUARY 1951

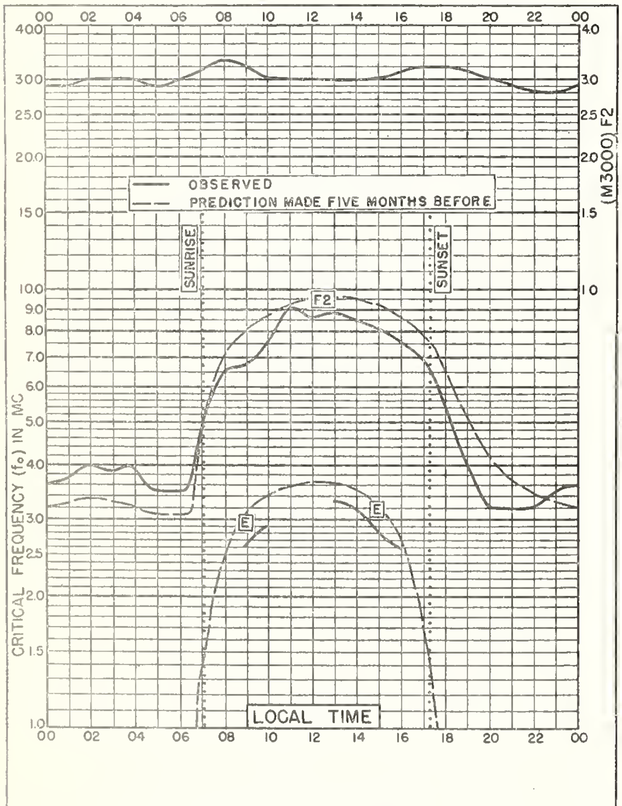

Fig. 31. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W JANUARY 1951

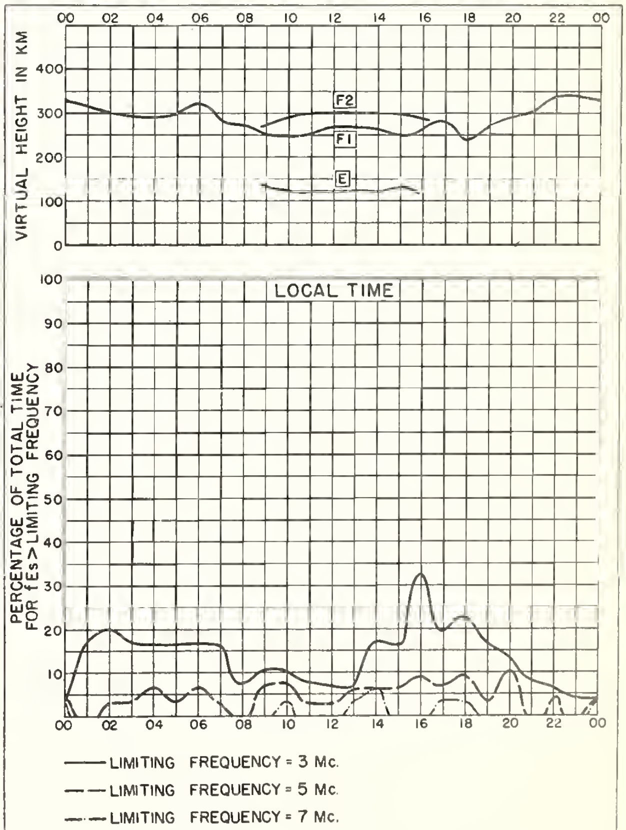

Fig. 32. BATON ROUGE, LOUISIANA JANUARY 1951

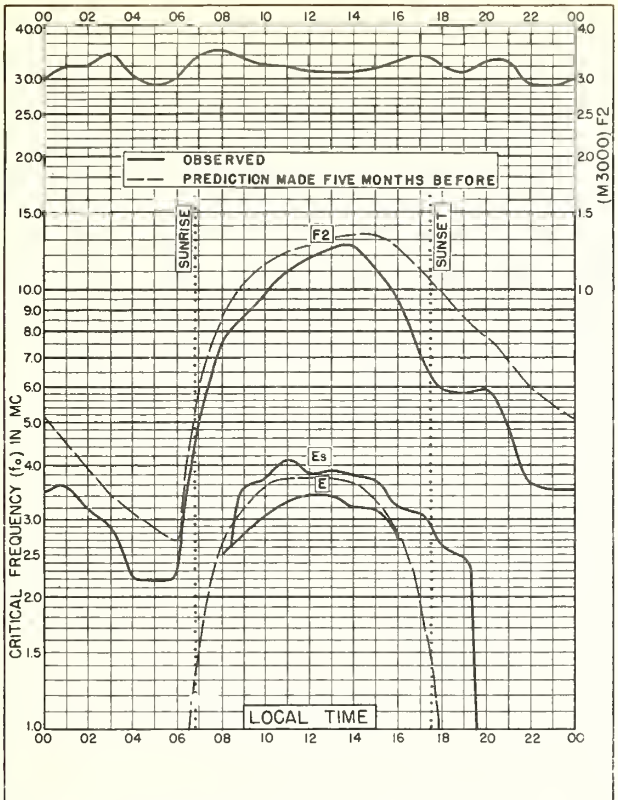

Fig. 33. OKINAWA I.
26.3°N, 127.7°E JANUARY 1951

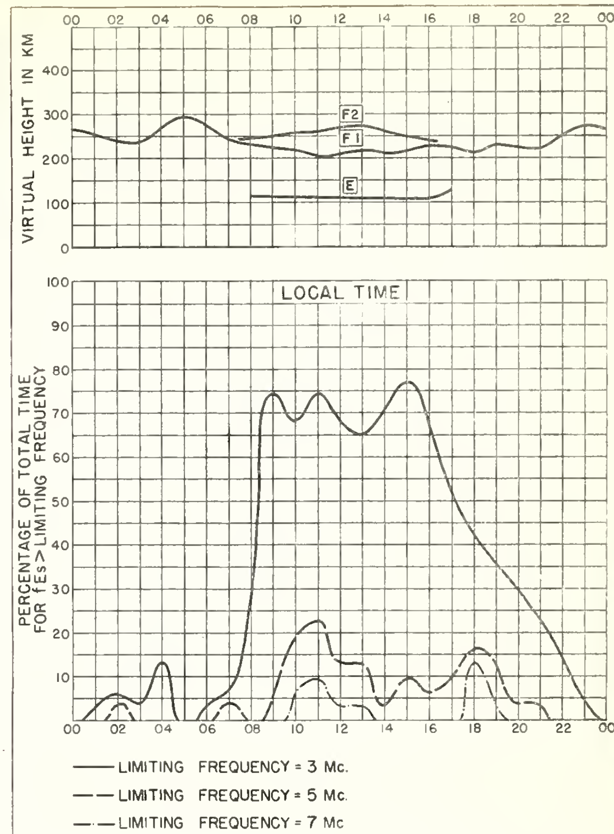

Fig. 34. OKINAWA I. JANUARY 1951

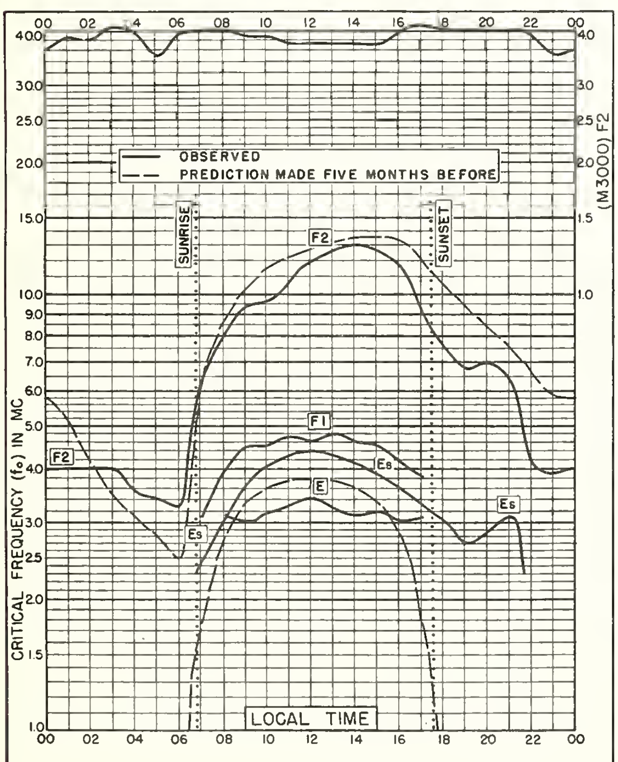

Fig. 35. FORMOSA, CHINA
25.0°N, 121.0°E JANUARY 1951

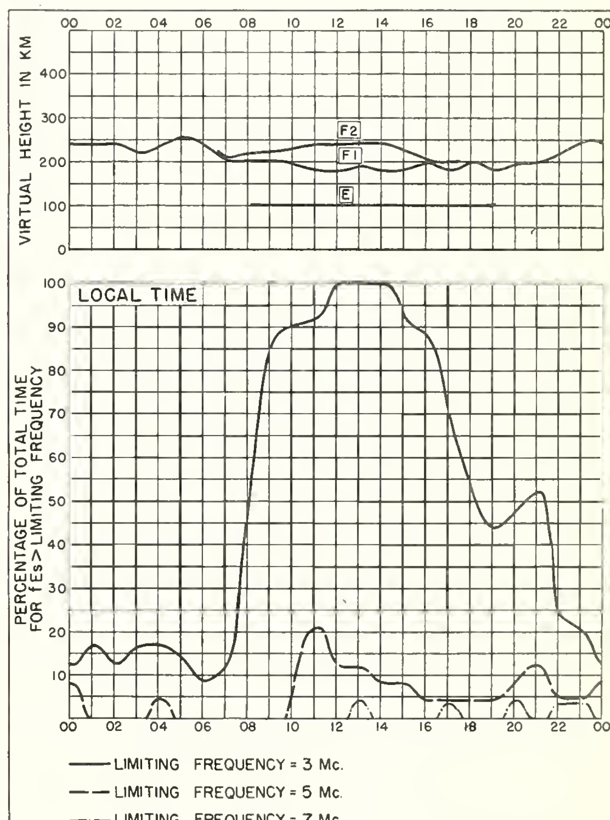

Fig. 36. FORMOSA, CHINA JANUARY 1951

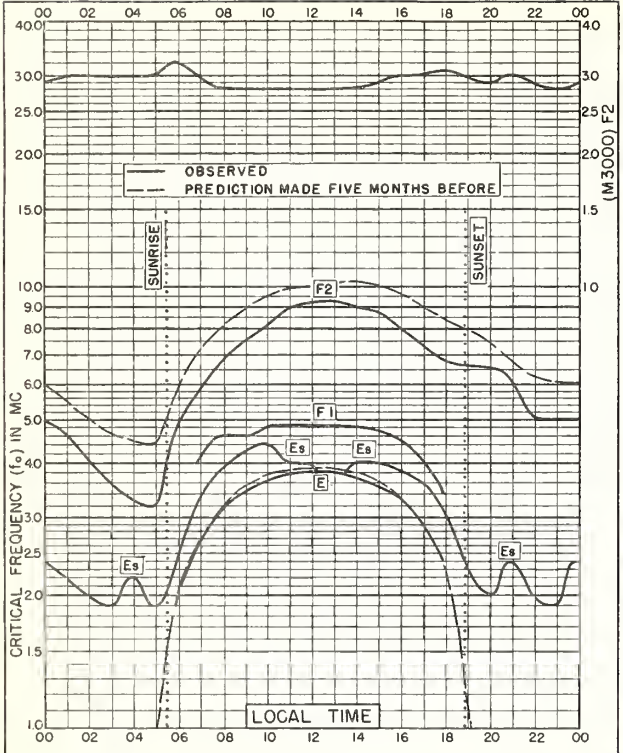

Fig. 37. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.1°E JANUARY 1951

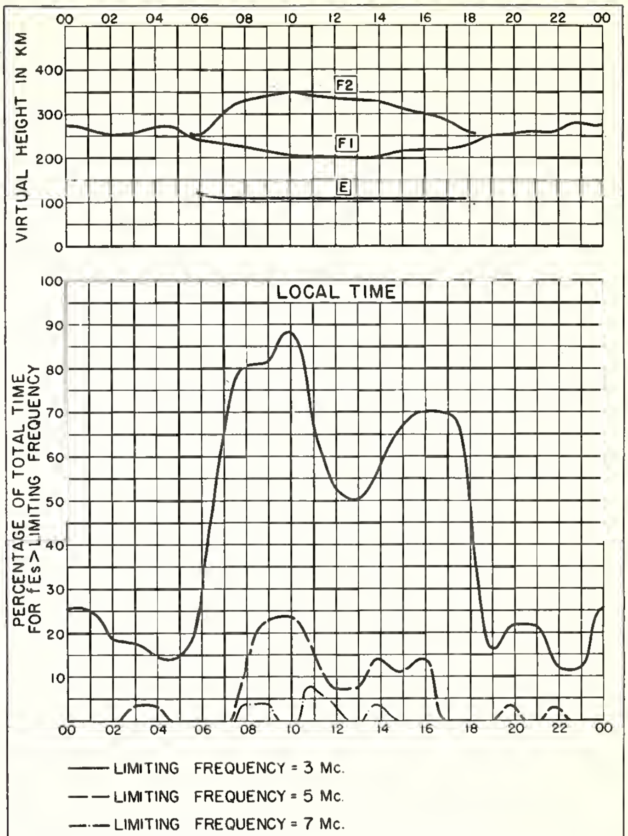

Fig. 38. JOHANNESBURG, U. OF S. AFRICA JANUARY 1951

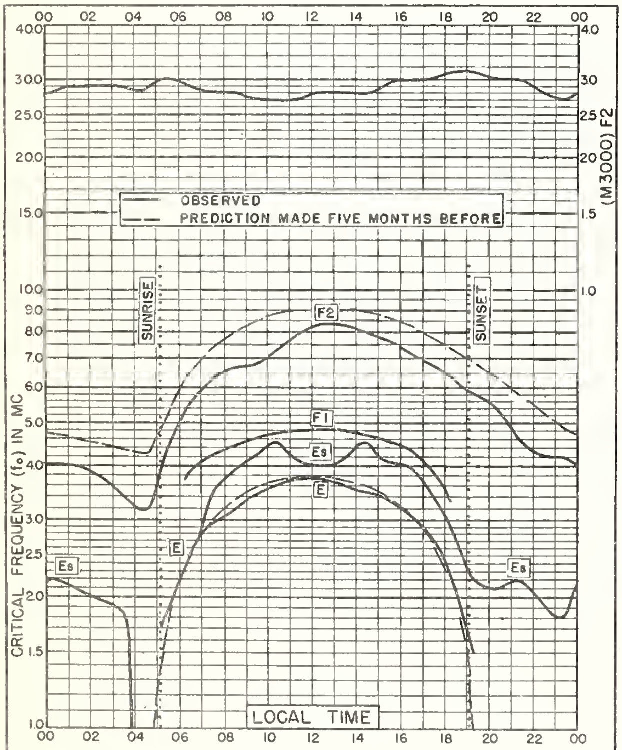

Fig. 39. CAPETOWN, U. OF S. AFRICA
34.2°S, 18.3°E JANUARY 1951

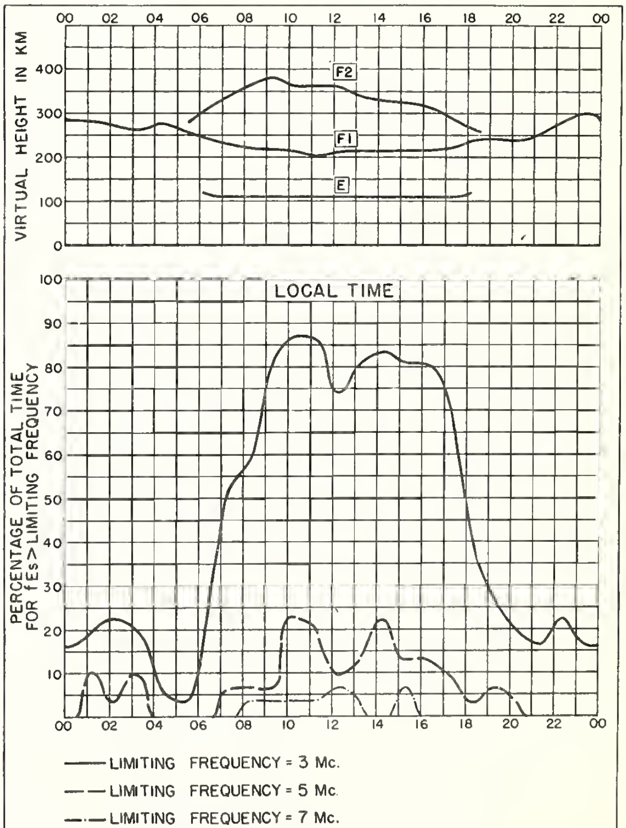

Fig. 40. CAPETOWN, U. OF S. AFRICA JANUARY 1951

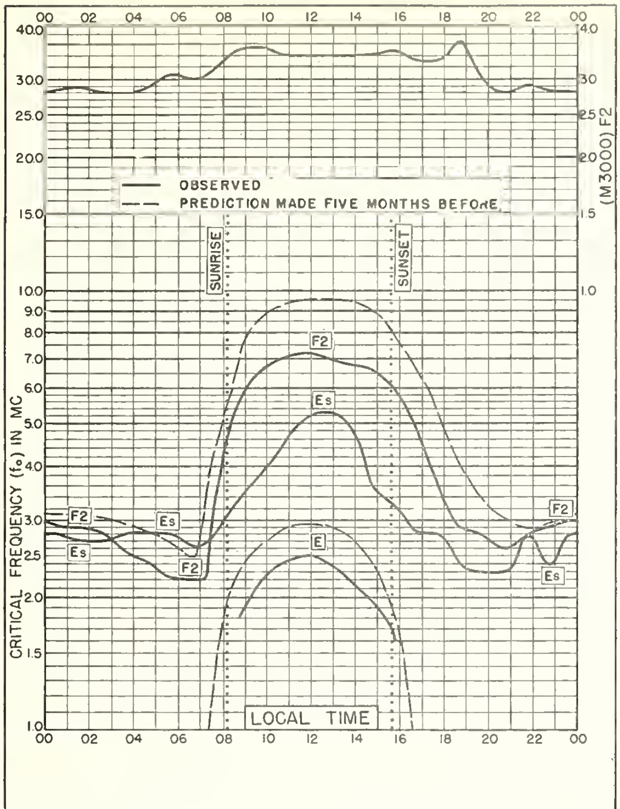

Fig. 41. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E DECEMBER 1950

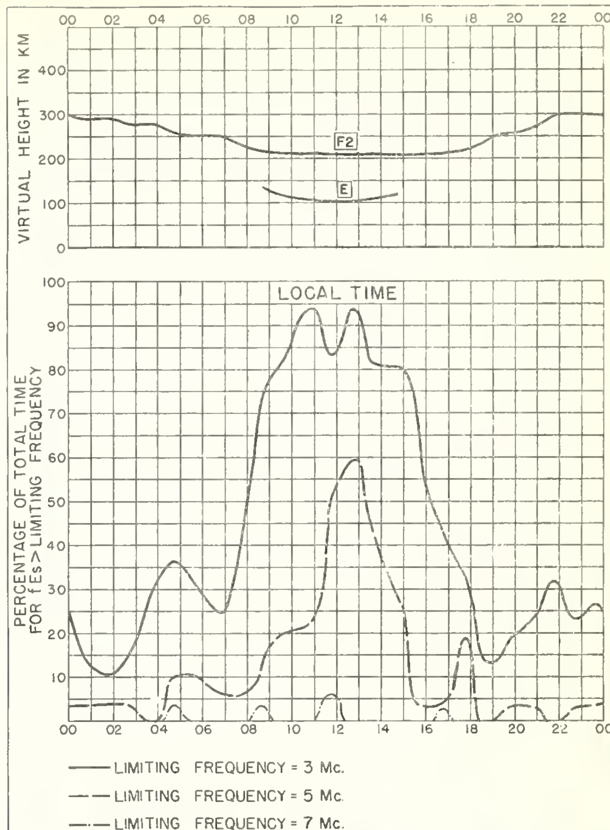

Fig. 42. LINDAU/HARZ, GERMANY DECEMBER 1950

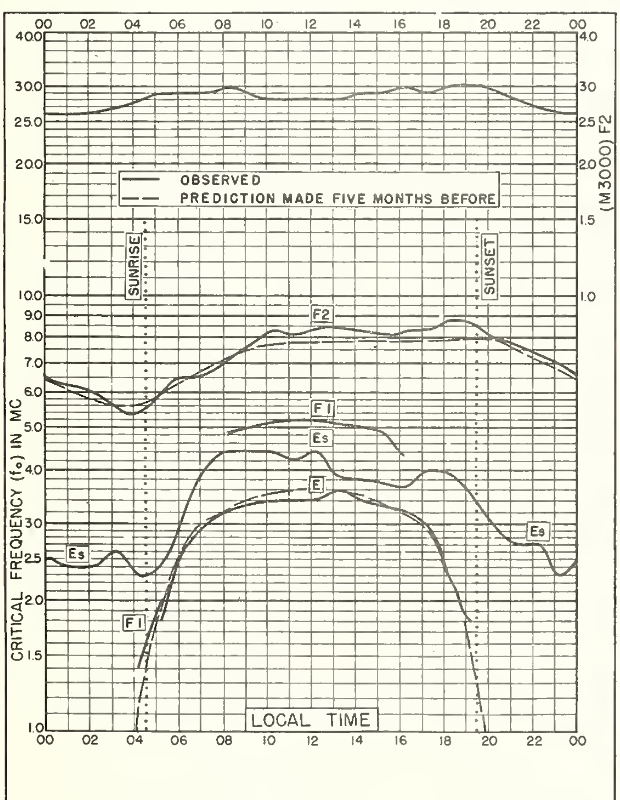

Fig. 43. DOMONT, FRANCE
49.0°N, 2.3°E MAY 1950

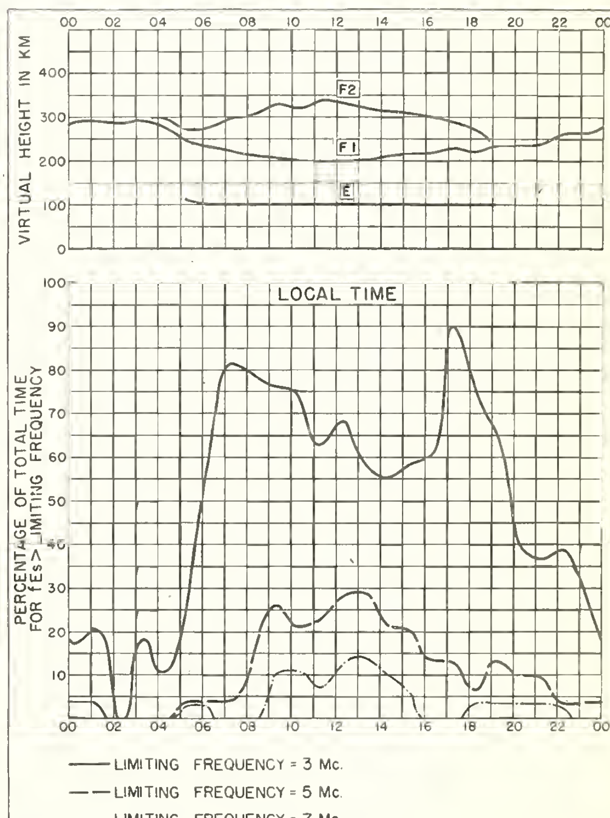

Fig. 44. DOMONT, FRANCE MAY 1950

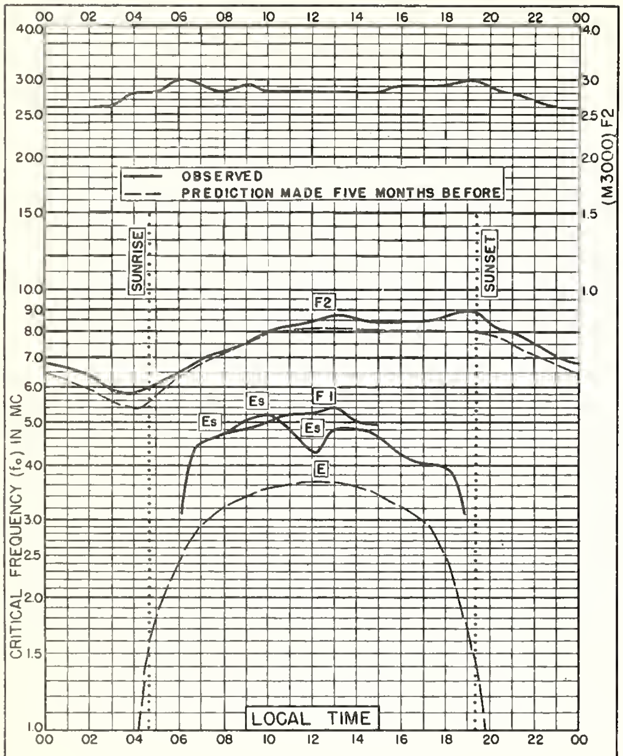

Fig. 45. POITIERS, FRANCE
46.6°N, 0.3°E MAY 1950

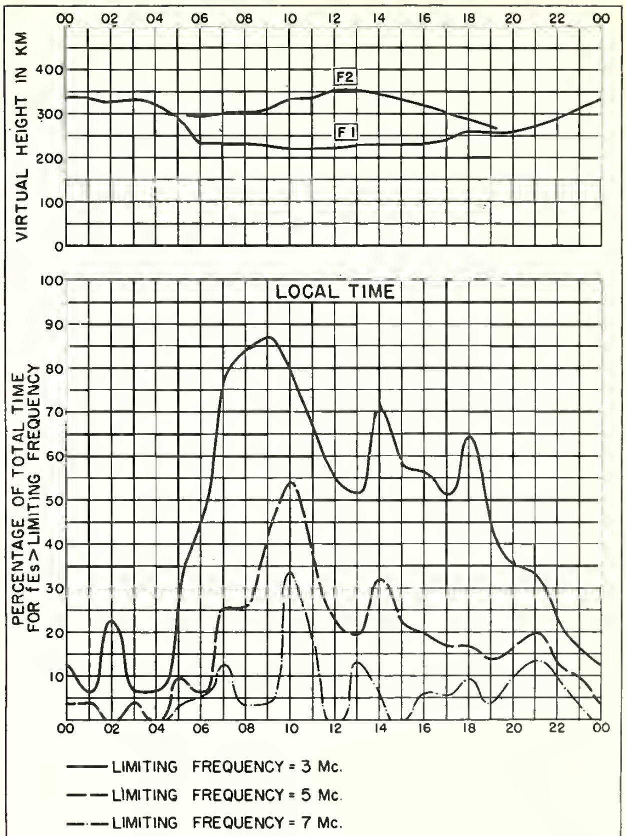

Fig. 46. POITIERS, FRANCE MAY 1950

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in CRPL-F80

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[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]

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Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

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CRPL–Ja. Semimonthly Frequency Revision Factors for CRPL Basic Radio Propagation Prediction Reports.

Monthly:
CRPL–D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11–499– , monthly supplements to TM 11–499; Dept. of the Navy, DNC 13 ( ) series.)
CRPL–F. Ionospheric Data.

Quarterly:
*IRPL–A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.
*IRPL–H. Frequency Guide for Operating Personnel.

Circulars of the National Bureau of Standards:
NBS Circular 462. Ionospheric Radio Propagation.
NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Reports issued in past:
IRPL–C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.
IRPL–G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.
IRPL–R. Nonscheduled reports:
R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.
R5. Criteria for Ionospheric Storminess.
**R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.
R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.
**R11. A Nomographic Method for Both Prediction and Observation Correlation of Ionosphere Characteristics.
**R12. Short Time Variations in Ionospheric Characteristics.
R14. A Graphical Method for Calculating Ground Reflection Coefficients.
**R15. Predicted Limits for *F*2-Layer Radio Transmission Throughout the Solar Cycle.
**R17. Japanese Ionospheric Data—1943.
R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.
**R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)
**R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.
R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.
**R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.
R26. The Ionosphere as a Measure of Solar Activity.
R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.
**R30. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Disturbance Reports to Replace T. D. Figures as Reported.
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**R33. Ionospheric Data on File at IRPL.
**R34. The Interpretation of Recorded Values of *fEs*.
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