CRPL-F79

IONOSPHERIC DATA

ISSUED
MARCH 1951

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

CRPL-F79

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
WASHINGTON, D.C.

Issued
26 Mar. 1951

IONOSPHERIC DATA

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 (no Es reflections observed, the equipment functioning normally otherwise) 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		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 33 and figures 1 to 66 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:

Australian Department of Supply and Shipping, Bureau of Mineral Resources, Geology and Geophysics:
Watheroo, Western Australia

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

French Ministry of Naval Armaments (Section for Scientific Research):
- Dakar, French West Africa
- Fribourg, Germany

All India Radio (Government of India), New Delhi, India:
- Bombay, India
- Delhi, India
- Madras, India
- Tiruchy (Tiruchirapalli), India

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

Christchurch, Geophysical Observatory, New Zealand Department of Scientific and Industrial Research:
- Christchurch, New Zealand
- Rarotonga, Cook Is.

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

Research Laboratory of Electronics, Chalmers University of Technology, Gothenburg, Sweden:
- Kiruna, Sweden

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 34 to 45 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 46 presents ionosphere character figures for Washington, D. C., during February 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 47 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, January 1951, compared with the CRPL daily radio disturbance [illegible]ings, which are primarily for the North Atlantic paths, the CRPL [illegible] radio propagation forecasts of probable disturbed periods, and the [illegible]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 48 through 50 give the observations of the solar corona during February 1951 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 51 through 53 list the coronal observations obtained at Sacramento Peak, New Mexico, during February 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 48 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 49 gives similarly the intensities of the first red (6374A) coronal line; and table 50, the intensities of the second red (6702A) coronal line; all observed at Climax in February 1951.

Table 51 gives the intensities of the green (5303A) coronal line; table 52, the intensities of the first red (6374A) coronal line; and table 53, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in February 1951.

The following symbols are used in tables 48 through 53: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

RELATIVE SUNSPOT NUMBERS

Table 54 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 55 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 56 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 57, 58, 59, and 60 list the sudden ionosphere disturbances observed at Fort Belvoir, Virginia, February 1951; at Riverhead, New York, February 1951; at Brentwood and Somerton, England, January and February 1951; and Point Reyes, California, February and March 1951, respectively.

TABLES OF IONOSPHERIC DATA

Table 1

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(280)	3.3						3.0
01	(280)	3.2						2.9
02	280	3.2						2.9
03	270	3.0						2.9
04	260	2.9						3.0
05	(260)	2.8						3.0
06	(270)	2.8						3.0
07	250	3.8			110	1.7		3.2
08	230	6.2	220	---	120	2.1		3.4
09	240	7.0	220	---	100	2.6		3.4
10	250	7.5	210	---	100	2.9		3.3
11	260	8.2	210	4.3	100	3.1		3.3
12	260	8.7	200	4.4	100	3.1		3.3
13	260	8.6	200	4.5	100	3.1		3.2
14	260	8.6	210	---	100	3.0		3.2
15	250	8.6	220	---	100	2.8		3.2
16	240	8.4	220	---	110	2.4		3.2
17	230	7.8	---	---	110	1.9		3.2
18	220	7.4						3.3
19	220	6.3						3.2
20	230	5.0						3.1
21	250	4.2						3.0
22	260	3.8						3.0
23	260	3.4						2.9

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) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	360	(2.0)					2.6	---
01	350	(1.9)					2.6	(2.9)
02	320	(1.7)					2.2	(3.0)
03	320	(1.6)					2.9	(3.0)
04	295	1.8					2.6	3.0
05	270	1.9					2.4	3.1
06	270	1.7						(3.1)
07	280	1.8						(3.2)
08	255	2.3						3.2
09	215	4.4			---	---	2.2	3.5
10	215	5.9			125	1.9	2.0	3.6
11	215	6.6	225	---	120	2.2	2.2	3.6
12	210	7.2	210	2.8	125	2.2	2.7	3.6
13	210	6.9	210	---	130	2.1	3.2	3.6
14	210	6.6	---	---	130	2.1	3.1	3.6
15	210	6.3	---	---	130	1.9	2.8	3.5
16	205	5.6			---	---	1.6	3.4
17	210	4.4						3.4
18	230	3.1						3.4
19	260	2.2						3.2
20	300	2.0						3.0
21	350	1.7						(3.1)
22	350	2.0						---
23	365	1.8						---

Time: 15.0°E.
Sweep: 1.3 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 3

Boston, Massachusetts (42.4°N, 71.2°W) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	2.6						3.0
01	270	2.4						3.0
02	280	2.4						3.0
03	250	2.5						3.1
04	230	2.6						3.3
05	230	2.7						3.2
06	250	2.6					2.6	3.0
07	220	3.4						3.3
08	200	5.9	---	---	120	2.2		3.5
09	210	6.6	180	---	110	2.5		3.5
10	220	7.5	200	3.8	110	2.8		3.5
11	220	8.2	200	3.9	110	2.9		3.4
12	220	8.4	200	4.0	110	2.9		3.4
13	230	8.2	200	3.9	110	2.9		3.4
14	220	8.4	200	3.7	110	2.7		3.4
15	210	7.8	200	3.0	110	2.4		3.4
16	210	7.0			---	---		3.4
17	200	6.9						3.4
18	210	6.3						3.4
19	210	5.1						3.4
20	220	4.2						3.2
21	240	3.6						3.2
22	250	3.0						3.1
23	260	2.6						3.2

Time: 75.0°W.
Sweep: 0.5 Mc to 18.0 Mc in 1 minute.

Table 4

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.6						(3.0)
01	280	3.6						3.1
02	280	(3.3)						(3.1)
03	280	(3.2)						(3.1)
04	270	3.2						3.0
05	280	(3.2)						(3.0)
06	290	3.2						3.0
07	260	(3.4)						3.2
08	230	5.8	---	---	(120)	E		3.5
09	240	6.7	---	---	120	2.5	2.4	3.4
10	240	8.0	---	---	120	---		3.2
11	240	9.0	220	4.4	120	---		3.2
12	250	8.5	220	4.3	120	---		3.3
13	250	8.2	220	4.2	120	---		3.3
14	240	7.8	---	---	120	---		3.2
15	240	7.7	---	---	120	2.8		3.3
16	230	6.9	---	---	120	2.3		3.4
17	220	6.1						3.5
18	220	4.4						3.3
19	240	3.7						3.4
20	260	2.5						3.1
21	290	2.7						3.0
22	300	2.8						3.0
23	300	3.2						2.9

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

Table 5

White Sands, New Mexico (32.3°N, 106.5°W) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.4					3.0	3.0
01	270	3.6					2.8	3.1
02	250	3.5					3.0	3.1
03	240	3.5					2.8	3.2
04	240	3.4					2.9	3.2
05	250	3.1					3.0	3.1
06	260	3.0					2.9	3.1
07	240	4.1					3.0	3.3
08	230	6.4	---	---	120	2.3	3.5	3.4
09	240	7.0	220	---	110	(2.7)	4.9	3.3
10	270	7.8	220	4.4	110	2.9	5.0	3.2
11	260	8.6	220	4.4	110	3.1	5.1	3.2
12	260	9.0	220	4.5	110	3.2	5.1	3.2
13	260	8.5	220	4.4	110	3.2	5.1	3.2
14	260	7.9	220	---	110	3.0	5.2	3.2
15	250	8.0	230	---	110	2.8	4.8	3.2
16	240	7.5	220	---	110	2.4	3.8	3.3
17	220	6.7			---	(1.9)	3.2	3.3
18	220	5.1					2.8	3.3
19	230	3.6					3.0	3.2
20	240	3.0					3.0	3.2
21	260	2.7					2.8	3.0
22	280	2.9					2.7	3.0
23	280	3.3					2.8	2.9

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

Table 6

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.3					1.7	2.8
01	250	4.3					2.0	3.1
02	230	3.8					1.6	3.4
03	240	3.0						3.2
04	250	1.9						3.0
05	300	1.9					2.0	3.0
06	290	2.1					2.5	2.9
07	260	3.9			160	1.4	2.2	3.1
08	240	7.2	230	---	110	2.2	4.1	3.5
09	260	9.2	220	4.4	110	2.8	4.9	3.4
10	260	9.9	200	4.5	110	3.1	6.0	3.3
11	290	10.4	200	4.9	100	3.3	5.4	3.0
12	310	12.3	200	4.9	100	3.4	5.8	2.9
13	290	12.8	200	4.8	100	3.3	5.8	3.1
14	270	13.2	210	4.7	110	3.3	5.9	3.1
15	260	12.4	220	4.4	110	3.1	4.7	3.2
16	250	11.2	220	4.1	110	2.8	4.1	3.2
17	230	9.2	230	---	110	2.2	4.1	3.5
18	220	6.2					4.6	3.6
19	220	4.4					4.4	3.2
20	250	4.3					4.4	3.1
21	240	4.6					4.4	3.1
22	230	4.4					2.7	3.0
23	260	4.3					2.1	2.8

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

Table 7

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	4.6					1.5	3.1
01	240	4.6					1.6	3.2
02	230	4.6					1.3	3.3
03	230	3.6						3.3
04	240	2.7					1.4	3.2
05	260	2.2					1.8	3.1
06	260	2.0					2.0	3.1
07	260	4.8			120	1.6	2.3	3.2
08	(270)	7.5	230	---	110	2.5	3.6	3.2
09	300	9.3	220	(4.4)	110	(3.0)	4.4	3.0
10	300	9.9	200	4.5	110	3.2	4.0	2.6
11	320	8.6	200	4.6	110	3.3	3.6	2.6
12	330	8.5	190	4.8	110	3.4	3.5	2.5
13	340	8.7	190	4.8	110	3.4	4.3	2.5
14	320	9.4	200	4.8	110	(3.3)	4.2	2.6
15	310	10.0	220	(4.6)	110	3.2	4.2	2.8
16	300	10.0	230	---	110	(3.0)	4.0	3.1
17	260	9.9	240	---	110	(2.5)	4.3	3.1
18	240	9.7			130	1.7	4.0	3.2
19	230	8.8					2.9	3.2
20	230	8.2					3.0	3.1
21	230	7.7					2.8	3.2
22	230	6.7					2.5	3.3
23	230	5.3					1.5	3.2

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

Table 8

Trinidad, Brit. West Indies (10.6°N, 61.2°W) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.0						3.3
01	250	4.3						3.2
02	240	4.0						3.4
03	240	3.5						3.3
04	280	3.2						3.0
05	270	3.2						3.0
06	250	3.7					2.2	3.2
07	220	6.1			120	2.1	2.8	3.6
08	240	7.5	220	4.1	120	2.7	3.4	3.5
09	250	8.8	210	4.4	120	3.2	4.0	3.5
10	250	9.6	210	4.7	120	3.4	4.4	3.6
11	260	8.2	200	4.9	120	3.6	4.4	3.4
12	270	8.8	200	5.0	120	3.6	4.8	3.3
13	280	9.1	200	4.9	120	3.6	5.0	3.2
14	270	9.2	220	4.7	120	3.6	4.9	3.3
15	270	8.0	220	4.6	120	3.4	4.7	3.3
16	260	7.9	220	4.2	120	3.2	4.2	3.3
17	240	8.2	220	3.8	120	2.6	3.8	3.3
18	220	8.0			---	---	3.4	3.5
19	220	6.2					3.5	3.4
20	230	5.1					3.0	3.3
21	250	4.4					2.0	3.1
22	250	4.4						3.2
23	260	4.0						3.0

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

Table 9

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.9					3.2	2.8
01	280	5.0					3.2	2.9
02	290	4.2					3.2	2.9
03	280	(3.8)					3.1	(3.1)
04	280	(2.9)					3.0	(3.2)
05	280	(2.7)					3.1	(3.0)
06	260	5.5			110	(1.8)	3.2	3.2
07	240	7.8	220	---	110	2.6	5.6	3.1
08	300	8.8	210	4.2	100	3.0	8.5	2.8
09	320	8.8	210	4.5	100	(3.1)	11.6	2.6
10	360	8.5	200	4.8	100	---	11.8	2.4
11	380	8.2	200	4.9	110	---	11.8	2.4
12	370	8.2	200	4.8	110	---	11.1	2.4
13	390	8.5	200	4.8	110	---	10.9	2.4
14	360	9.0	200	4.7	110	---	10.9	2.5
15	320	9.3	200	4.4	110	---	8.1	2.5
16	310	9.6	210	---	110	3.0	5.6	2.6
17	240	10.0			110	2.6	4.8	2.7
18	270	10.5			110	1.8	3.2	2.7
19	280	10.0					3.1	2.8
20	300	9.0					2.6	2.6
21	320	8.6					2.7	2.6
22	320	8.1					3.2	2.5
23	300	(7.2)					3.0	2.8

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

Table 10*

Kiruna, Sweden (67.8°N, 20.5°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(310)	(3.5)					3.6	
01	(305)	(4.0)					3.8	
02	(300)	(3.6)					2.6	
03	(280)	3.8					2.4	
04	(270)	(3.6)						
05	(280)	(2.9)						
06	(270)	(2.8)						
07	(260)	(2.6)						
08	(265)	(2.6)						
09	240	3.9						
10	230	4.8			---	---		
11	220	5.6			100	2.2		
12	220	5.7			100	2.3		
13	215	5.2			---	---		
14	220	5.0			---	---		
15	230	4.3						
16	240	3.4						
17	---	(2.6)						
18	---	(2.7)					2.8	
19	(270)	(3.4)					3.4	
20	---	(3.2)					3.8	
21	---	(2.8)					4.0	
22	---	(3.1)					4.4	
23	---	(3.4)					3.8	

Time: 15.0 E.
Sweep: 1.0 Mc to 16.0 Mc in 30 seconds.
*Data for 1 through 13 and 24 through 31.

Table 11

Wakkanai, Japan (45.4°N, 141.7°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	2.9						2.8
01	310	3.1						2.8
02	310	3.1					1.2	2.7
03	300	3.2					1.4	2.8
04	300	3.0					1.4	2.9
05	260	3.1						3.0
06	260	2.8						3.1
07	250	4.4	---	---	110	1.6		3.2
08	230	6.4	---	---	110	2.0		3.4
09	230	7.3	240	---	110	2.5		3.3
10	240	8.0	230	---	110	2.8		3.3
11	250	8.3	230	---	110	2.9		3.3
12	240	7.8	250	---	110	2.8		3.3
13	240	7.4	230	---	110	2.8		3.4
14	230	7.2	220	---	110	2.6		3.4
15	230	6.4	---	---	110	2.2		3.4
16	220	5.4	---	---	110	1.6	1.8	3.3
17	240	4.4					2.4	3.2
18	260	3.4					2.2	3.1
19	280	3.2					2.4	3.0
20	290	3.0					2.0	3.0
21	300	2.8					1.9	2.8
22	300	2.8						2.8
23	310	3.0						2.8

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

Table 12

Akita, Japan (39.7°N, 140.1°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.1					2.0	2.9
01	290	3.1					1.2	2.9
02	290	3.1						2.8
03	280	3.0						2.9
04	280	3.0					1.6	2.9
05	270	2.9					1.5	3.0
06	260	2.9						3.1
07	230	5.2	---	---	---	1.6		3.4
08	220	6.7	220	---	110	2.2		3.5
09	230	7.5	220	---	110	2.5		3.4
10	240	8.5	220	4.2	110	2.8		3.4
11	230	8.8	230	---	110	3.0		3.5
12	240	8.3	220	---	110	3.0		3.5
13	240	7.8	220	---	110	3.0		3.4
14	230	7.5	210	---	110	2.7		3.4
15	220	7.2	230	---	110	2.4		3.5
16	220	6.3	---	---	110	1.8	2.2	3.4
17	220	4.8					2.9	3.3
18	240	3.7					2.6	3.2
19	250	3.4					2.8	3.2
20	270	3.1					3.2	3.2
21	270	3.0					2.3	3.0
22	290	2.8					2.3	2.8
23	300	3.0					2.4	2.9

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

Table 13

Tokyo, Japan (35.7°N, 139.5°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	2.9					2.0	3.0
01	280	3.0					2.0	2.9
02	270	3.0					2.3	3.0
03	260	3.0					2.4	3.0
04	260	2.9					2.3	3.0
05	270	2.9					2.2	2.9
06	260	3.0					2.3	3.1
07	220	5.6	---	---	120	1.8		3.4
08	230	7.0	---	---	110	2.4		3.6
09	230	7.8	220	---	110	2.7		3.5
10	250	8.7	220	---	110	2.8		(3.4)
11	250	8.9	220	---	110	3.0		3.4
12	250	8.8	220	---	110	2.9		3.4
13	240	7.9	220	---	110	2.9		3.4
14	230	7.5	230	---	110	2.8		3.4
15	230	7.3	230	---	110	2.5		3.5
16	220	6.1	---	---	110	2.1	2.6	3.6
17	220	4.8					2.8	3.4
18	220	3.7					2.5	3.4
19	220	3.6					2.4	3.4
20	240	3.1					2.3	3.1
21	240	2.9					2.3	3.1
22	290	2.8					2.2	2.9
23	300	3.0					2.0	2.9

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

Table 14

Yamagawa, Japan (31.2°N, 130.6°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	2.9						2.9
01	290	2.9					1.4	2.8
02	280	3.0						3.0
03	280	3.0					1.4	3.0
04	270	2.9						3.0
05	280	2.8						2.8
06	290	2.8						2.8
07	260	4.0	---	---	---	1.2	2.0	3.1
08	240	6.7	240	---	120	2.1		3.4
09	250	7.8	230	---	110	2.6		3.4
10	250	8.7	220	---	110	3.0	3.7	3.4
11	250	9.4	230	4.4	110	3.2	4.0	3.4
12	260	9.8	220	---	110	3.2	4.2	3.4
13	260	9.8	220	4.5	110	3.1	4.2	3.3
14	250	8.8	220	---	110	3.1	4.0	3.3
15	250	8.7	230	---	110	2.8	3.6	3.4
16	240	7.9	230	---	110	2.4	3.0	3.4
17	220	6.6	---	---	110	1.9	2.6	3.5
18	210	5.5					2.8	3.4
19	230	4.6					2.6	3.3
20	240	4.2					2.3	3.3
21	240	4.1					1.8	3.2
22	250	3.5						3.1
23	280	3.0						2.9

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

Table 15

Baton Rouge, Louisiana (30.5°N, 91.2°W) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	3.7						2.9
01	300	3.8						2.9
02	290	4.0						3.0
03	290	3.8						3.1
04	290	3.6						3.0
05	320	(3.6)						2.9
06	300	(3.5)						3.0
07	270	5.3						3.2
08	260	7.2	---	---	(130)	(2.6)		3.2
09	270	8.0	260	---	130	(2.8)		3.2
10	280	(8.3)	250	---	130	(3.0)		(3.2)
11	280	8.2	250	---	120	(3.2)		3.1
12	300	(8.8)	240	---	120	3.3		3.0
13	290	9.0	250	---	120	(3.3)		3.0
14	290	(9.0)	260	---	120	(3.1)		3.1
15	280	(8.7)	270	---	120	(2.8)		3.1
16	260	(8.2)			120	(2.6)		(3.2)
17	250	(7.4)						3.2
18	250	5.2						3.3
19	(290)	3.6						3.1
20	300	(3.3)					2.7	3.0
21	320	3.3						3.0
22	330	3.5						2.9
23	320	3.6						3.0

Time: 90.0°W.
Sweep: 2.05 Mc to 14.1 Mc in 5 minutes, automatic operation.

Table 16

Formosa, China (25.0°N, 121.0°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07								
08	240	8.4	200	4.6	100	3.1	3.3	3.8
09	240	10.0	200	4.7	100	3.4	3.3	3.7
10	240	11.4	200	4.8	110	3.3	4.1	3.8
11	240	10.5	200	4.6	100	3.3	4.3	3.6
12	260	11.4	200	4.7	110	3.3	4.4	3.5
13	240	12.3	200	4.6	100	3.3	4.5	3.5
14	260	13.1	200	4.7	100	3.4	4.0	3.8
15	240	13.0	200	4.5	100	3.4	3.8	3.7
16	200	11.5	200	4.0	100	3.0	3.4	3.8
17	200	10.6	---	---	100	---	2.8	4.0
18	200	9.2	---	---	---	---		4.0
19	170	8.2	---	---	---	---		4.1
20								
21								
22								
23								

Time: 120.0°E.
Sweep: 2.5 Mc to 14.5 Mc in 15 minutes, manual operation.

Table 17

Johannesburg, Union of S. Africa (26.2°S, 28.1°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.2					1.6	2.9
01	260	5.2						3.0
02	250	4.7						3.0
03	250	3.9						2.9
04	260	3.8						2.9
05	270	3.8			---	---		3.0
06	260	5.2	240	---	120	2.2	2.4	3.2
07	280	6.1	230	4.0	110	(2.7)	3.2	3.0
08	320	6.9	220	4.5	110	(3.2)	3.6	2.9
09	330	8.0	210	4.8	110	3.4	3.7	2.8
10	340	8.6	210	4.8	110	3.6	4.0	2.8
11	350	8.7	200	4.9	110	(3.7)	4.0	2.8
12	350	8.8	200	4.9	110	3.8	4.1	2.8
13	340	8.8	210	4.9	110	(3.7)	4.0	2.8
14	340	8.8	210	4.8	110	3.6	4.0	2.8
15	320	8.6	210	4.7	110	3.4	4.2	2.8
16	310	8.6	220	4.6	110	(3.1)	3.6	2.9
17	290	8.4	220	4.1	110	2.7	3.1	3.0
18	270	8.0	240	---	120	2.2	2.3	3.0
19	250	7.8			---	---	1.8	3.0
20	240	7.2						3.0
21	250	6.6						3.0
22	260	6.8						2.9
23	270	5.5						2.8

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

Table 18

Watheroo, W. Australia (30.3°S, 115.9°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.6					4.8	2.8
01	280	5.4					5.3	2.8
02	270	4.8					4.7	2.8
03	280	4.4					4.3	2.7
04	280	4.0					4.8	2.8
05	270	4.2	---	---			3.2	2.9
06	270	5.0	250	3.4		2.2	3.1	3.1
07	310	5.4	240	4.2		2.6	3.4	3.0
08	340	5.8	240	4.4		3.1	4.2	3.0
09	390	6.0	230	4.6		3.3	4.8	2.8
10	380	6.2	220	4.6		3.5	5.0	2.8
11	390	7.1	235	4.8		3.5	5.5	2.8
12	370	7.2	225	4.8		3.6	5.2	2.8
13	340	7.8	230	4.8		3.6	4.6	2.8
14	340	7.9	240	4.8		3.5	4.2	2.8
15	340	7.2	240	4.6		3.4	4.8	2.9
16	330	7.2	240	4.5		3.2	4.2	2.9
17	310	7.4	240	4.2		2.8	4.1	3.0
18	285	7.2	250	3.5		2.2	3.6	3.0
19	250	7.2				---	3.2	3.0
20	260	6.8					2.9	2.9
21	260	6.4					3.1	2.8
22	280	6.1					4.0	2.8
23	285	6.0					4.4	2.8

Time: 120.0 E.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 19

Capetown, Union of S. Africa (34.2°S, 18.3°E) December 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(280)	4.8					1.8	2.9
01	(270)	4.5					1.6	2.8
02	(260)	4.6					1.8	2.9
03	(260)	4.1						2.9
04	(260)	3.9					1.7	2.9
05	280	3.7						2.8
06	260	4.7	250	---	120	2.0	1.7	3.0
07	300	5.9	230	3.8	110	2.6		2.9
08	320	6.6	220	4.2	110	(3.0)		2.8
09	350	7.3	220	4.6	110	(3.3)		2.7
10	360	8.0	220	4.7	110	(3.5)	3.8	2.7
11	350	8.1	210	4.8	110	(3.6)	4.0	2.7
12	350	8.3	210	4.9	110	(3.7)	4.1	2.7
13	350	8.2	210	5.0	110	(3.7)	4.2	2.7
14	350	8.1	210	4.8	110	(3.7)	3.9	2.8
15	340	8.0	210	4.8	110	(3.5)	4.0	2.8
16	320	8.0	210	4.7	110	(3.3)	3.6	2.8
17	310	7.7	220	4.4	110	(3.1)	3.6	2.9
18	280	7.6	220	4.0	110	(2.7)	3.0	2.9
19	260	7.2	240	---	110	2.1	2.4	3.0
20	240	6.9					2.0	3.0
21	230	6.2					2.0	3.0
22	(250)	5.4					2.1	2.9
23	(260)	5.0					1.7	2.9

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

Table 20

Watheroo, W. Australia (30.3°S, 115.9°E) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	5.3					3.6	2.8
01	260	5.2					[illegible]	2.9
02	265	4.5					3.1	[illegible]
03	290	4.0					3.1	[illegible]
04	300	3.7					[illegible]	[illegible]
05	280	4.1					2.5	[illegible]
06	260	5.0	235	3.3		2.2	2.8	3.2
07	300	5.6	220	4.0		2.7	3.4	3.2
08	310	6.0	220	4.4		3.2	3.8	[illegible]
09	370	6.3	225	4.6		3.3	4.2	2.8
10	340	7.0	220	4.8		3.3	4.4	2.9
11	330	7.9	210	4.9		3.5	4.5	2.9
12	330	8.4	---	4.9		3.5	4.8	2.9
13	325	8.4	220	5.0		3.5	4.8	2.9
14	320	8.5	220	4.8		3.4	4.0	2.9
15	310	7.9	220	4.7		3.3	3.8	3.0
16	300	8.0	220	4.5		3.0	3.8	3.0
17	285	7.4	230	4.0		2.6	3.2	3.0
18	250	7.2	---	---		2.0	2.6	3.1
19	240	7.2					2.5	3.0
20	240	6.5					2.6	3.0
21	270	5.8					2.7	2.8
22	290	5.4					3.	[illegible]
23	310	5.8					3.3	2.8

Time: 120.0°E.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 21

Christchurch, New Zealand (43.5°S, 172.7E) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.8					2.7	2.7
01	290	5.5					2.6	2.8
02	270	4.8					1.9	2.8
03	280	4.2					2.6	2.9
04	300	3.9				---	2.5	2.8
05	270	4.4	---	---		1.6	2.7	3.1
06	280	4.9	260	3.7		2.3	3.1	3.0
07	330	5.5	250	4.2		2.8	3.5	3.0
08	330	6.3	240	4.5		3.1	3.5	3.0
09	330	6.8	240	4.7		3.3	3.9	2.9
10	320	7.4	230	4.8		3.4	4.0	3.0
11	320	7.7	230	4.8		3.4	3.9	3.0
12	320	7.5	230	4.8		3.4	3.9	3.0
13	320	7.5	230	4.8		3.4	3.9	3.0
14	320	7.4	230	4.7		3.2	3.6	3.0
15	310	7.2	240	4.6		3.0	3.5	3.0
16	310	7.1	240	4.3		3.0	3.0	2.9
17	300	7.2	250	4.0		2.7	3.0	3.0
18	280	7.4	270	3.2		2.2	2.9	2.9
19	270	7.5				---	3.6	2.9
20	270	7.5					3.5	2.9
21	270	7.0					3.2	2.8
22	270	6.7					3.2	2.7
23	280	6.5					1.8	2.7

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 22

Rarotonga I. (21.3°S, 159.8°W) October 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.9						3.1
01	270	6.2						3.1
02	260	5.6						3.1
03	290	5.5						3.0
04	300	5.0						3.0
05	280	5.0						3.1
06	260	6.8					2.9	3.1
07	250	8.6	220	4.3	120	2.6	3.6	3.2
08	270	8.9	240	4.8	110	3.1	4.1	3.2
09	300	9.5	230	5.3	110	3.2	4.3	3.1
10	300	9.7	220	5.1	110	3.4	4.6	3.1
11	300	10.9	230	5.0	110	3.5	4.6	3.0
12	300	11.0	240	5.5	110	3.5	4.9	3.0
13	300	11.0	250	5.4	110	3.6	4.8	3.0
14	300	10.7	240	5.0	110	3.4	4.5	3.1
15	300	10.5	250	5.1	110	3.3	4.5	3.1
16	290	10.4	250	4.9	110	3.0	4.4	3.0
17	290	9.5	250	5.2	110	3.0	4.4	3.2
18	260	9.4					3.9	3.2
19	250	9.0					3.5	3.2
20	250	7.8					3.1	3.0
21	290	7.5					2.9	3.1
22	300	7.2						3.1
23	300	7.2					3.0	2.9

Time: 157.5°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 23

Christchurch, New Zealand (43.5°S, 172.7°E) October 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.0						2.7
01	290	4.5						2.8
02	270	3.9						2.6
03	260	2.9						2.8
04	280	2.6					1.7	2.8
05	300	3.2				1.4	2.3	3.0
06	270	4.3	250	---		1.8	2.4	3.1
07	290	5.0	250	3.9		2.4	2.9	3.1
08	310	5.6	240	4.2		2.8	3.4	3.1
09	330	6.2	230	4.5		3.1	3.7	3.1
10	330	6.8	230	4.6		3.2	3.5	3.0
11	320	7.3	230	4.6		3.3	3.5	3.1
12	320	7.3	230	4.7		3.3	3.5	3.0
13	310	7.4	230	4.7		3.3	3.5	3.0
14	310	7.4	230	4.5		3.2	3.4	3.0
15	310	7.0	240	4.4		3.0	3.3	3.0
16	280	7.2	240	4.0		2.7	2.8	3.1
17	270	7.3	250	3.6		2.3	2.6	3.0
18	270	7.4	---	---		1.5	2.0	3.0
19	250	7.2					1.6	2.8
20	270	6.5						2.8
21	270	6.1						2.8
22	290	5.6						2.7
23	290	5.2						2.7

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc.

Table 24

Delhi, India (28.6°N, 77.1°E) September** 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	4.6						3.0
01	310	4.2						
02	---	---						
03	---	---						
04	320	3.6						3.1
05	300	4.2						
06	280	5.4						
07	260	7.5						
08	250	8.5						3.2
09	260	8.5						
10	300	9.4						
11	300	10.7						
12	320	11.9						3.1
13	320	12.0						
14	300	12.3						
15	300	12.4						
16	280	12.1						3.1
17	280	11.6						
18	280	10.1						
19	260	8.2						
20	280	6.5						3.0
21	280	5.4						
22	300	5.0						2.9
23	300	5.0						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 25

Bombay, India (19.0°N, 73.0°E) — September 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	300	7.9						
08	360	9.2						2.8
09	390	9.8						
10	420	10.6						
11	480	11.8						
12	480	12.3						2.5
13	480	12.5						
14	480	13.0						
15	480	13.3						
16	480	13.6						2.5
17	480	13.4						
18	480	13.0						
19	420	12.8						
20	420	11.4						2.7
21	420	10.0						
22	390	9.0						2.6
23	390	8.5						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 26

Madras, India (13.0°N, 80.2°E) — September 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	360	8.1						
08	360	9.3						2.9
09	420	9.8						
10	420	9.3						
11	420	9.0						
12	480	9.2						2.5
13	480	9.5						
14	480	10.4						
15	480	11.2						
16	450	12.1						2.6
17	420	12.6						
18	420	12.6						
19	420	11.8						
20	390	11.3						2.7
21	390	(10.8)						
22	360	(10.2)						
23								

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 27

Tiruchy, India (10.8°N, 78.8°E) — September 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	360	7.5						
08	420	9.1						2.8
09	480	9.0						
10	480	8.9						
11	480	8.9						
12	500	9.0						2.6
13	480	9.1						
14	480	9.5						
15	(500)	(10.6)						
16	480	10.8						2.6
17	480	10.9						
18	480	10.8						
19	480	10.4						
20	450	10.0						2.5
21	450	10.2						
22	480	10.2						2.8
23								

Time: Local.
Sweep: 1.8 Mc to 15.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 28

Fribourg, Germany (48.1°N, 7.8°E) — June 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	275	5.8					2.4	2.7
01	280	5.5					2.8	2.7
02	290	5.4					2.4	2.6
03	280	5.9					2.5	2.7
04	300	5.6	290	---			2.8	2.8
05	315	5.2	250	3.4	122	2.0	3.4	2.9
06	345	6.5	240	4.3	109	2.5	4.0	2.9
07	320	7.1	235	4.5	107	3.0	4.5	2.9
08	310	7.2	230	4.7	105	3.2	5.1	2.9
09	325	7.4	220	5.0	103	3.4	5.2	3.0
10	340	7.4	205	5.1	103	3.5	4.5	2.9
11	350	7.4	208	5.1	103	3.5	5.4	2.8
12	370	7.1	215	5.2	103	3.5	5.7	2.8
13	370	7.2	220	5.1	105	3.5	4.9	2.8
14	360	7.3	220	5.1	105	3.5	5.0	2.8
15	350	7.4	225	5.0	105	3.4	4.4	2.8
16	320	7.2	220	4.8	105	3.2	4.7	3.0
17	318	7.3	235	4.5	109	3.0	4.8	2.9
18	300	7.6	260	4.2	111	2.5	4.5	2.9
19	280	8.0	260	---	117	2.0	4.3	2.9
20	260	8.0					4.2	3.0
21	255	7.9					3.0	2.9
22	270	7.6					2.9	2.8
23	275	7.0					2.5	2.8

Time: Local.
Sweep: 1.4 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 29

Dakar, French West Africa (14.5°N, 17.4°W) — June 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	---					3.2	
01	325	(4.5)					3.2	
02	340	---					3.2	
03	330	---					3.5	
04	290	(5.5)					3.2	
05	270	(5.7)					3.3	
06	(245)	6.8			---	1.8	4.1	
07	230	7.5	---	---	120	2.9	4.8	
08	270	8.0	215	---	115	3.5	5.4	
09	---	8.1	215	---	110	3.7	5.7	
10	365	9.2	205	5.4	---	---	8.1	
11	400	10.4	215	5.5	110	(4.0)	5.8	
12	375	11.7	200	5.5	105	4.1	4.3	
13	370	12.2	---	5.5	110	4.0	4.6	
14	380	12.5	210	5.4	110	3.9		
15	365	13.2	210	---	110	3.5	4.7	
16	(340)	13.5	225	---	110	3.3	5.2	
17	345	12.8	235	---	115	2.7	4.3	
18	250	11.9	250	---	---	1.8	3.8	
19	290	9.5					3.9	
20	380	7.0					2.3	
21	(380)	6.4					3.3	
22	370	8.0					1.7	
23	375	(5.3)					3.2	

Time: Local.
Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 30

Fribourg, Germany (48.1°N, 7.8°E) — May 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	5.5					2.2	2.6
01	310	6.3					2.2	2.5
02	310	5.9					2.4	2.6
03	300	5.8					2.2	2.5
04	295	5.5	---	---			2.2	2.5
05	270	6.0	275	---	129	1.8	2.4	2.8
06	265	6.4	248	4.1	111	2.5	3.4	2.9
07	320	7.0	235	4.4	109	2.9	4.1	2.9
08	320	7.0	235	4.9	105	3.2	4.5	2.9
09	330	7.4	228	5.1	105	3.4	5.5	2.9
10	365	7.8	220	5.1	104	3.6	4.8	2.8
11	342	8.1	212	5.2	105	3.5	4.6	2.8
12	360	8.2	220	5.4	107	3.5	4.4	2.8
13	345	8.4	215	5.4	105	3.7	4.5	2.8
14	340	8.3	230	5.3	109	3.5	4.4	2.8
15	340	8.3	230	5.1	105	3.5	4.0	2.9
16	310	8.2	230	5.0	109	3.3	4.2	2.9
17	302	8.3	240	4.5	111	3.0	4.2	2.9
18	280	8.5	255	---	114	2.5	4.4	2.9
19	260	8.4			130	1.8	3.5	3.0
20	252	8.2					3.6	3.0
21	265	(8.0)					3.2	2.8
22	270	7.3					2.4	2.7
23	290	6.9					2.2	2.6

Time: Local.
Sweep: 1.4 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 31

Dakar, French West Africa (14.6°N, 17.4°W) May 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	6.4					3.2	
01	340	6.2					2.5	
02	310	5.8					2.9	
03	285	(6.5)					2.6	
04	250	6.4					3.3	
05	250	5.4					3.0	
06	250	6.8			160	2.1	3.9	
07	240	8.1	---	---	115	2.9	4.0	
08	(260)	9.0	230	---	115	3.4	6.2	
09	(300)	10.0	222	---	112	3.8	4.5	
10	310	11.2	225	---	115	4.0	4.5	
11	355	12.2	215	5.5	115	4.1		
12	370	13.0	222	5.6	110	4.1		
13	395	14.4	220	5.6	110	4.1		
14	410	14.4	220	5.5	115	3.9	5.8	
15	(410)	14.8	220	---	115	3.6		
16	350	14.6	235	---	120	3.3	3.8	
17	300	14.2	250	---	120	2.8	4.1	
18	265	13.2	---	---	---	2.0	3.8	
19	305	11.4					3.0	
20	390	9.6						
21	400	8.0					1.8	
22	390	7.0						
23	350	6.4					1.7	

Time: Local.
Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 32

Fribourg, Germany (48.1°N, 7.8°E) April 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	6.4						2.6
01	292	6.2						2.6
02	290	5.6						2.6
03	285	5.2						2.6
04	280	5.0						2.6
05	270	5.0						2.8
06	250	6.2	---	---	121	2.1	2.6	3.1
07	245	6.8	240	4.2	111	2.7		3.0
08	290	7.7	220	4.7	109	3.0		3.0
09	310	8.0	218	4.8	109	3.2	3.4	2.9
10	320	9.0	210	5.1	107	3.4	3.2	2.9
11	300	9.7	210	5.2	107	3.5	3.8	2.9
12	310	9.9	212	5.5	108	3.6		2.9
13	310	9.9	220	5.2	109	3.6	3.8	2.8
14	308	10.0	225	5.2	109	3.5		2.8
15	280	9.8	230	5.0	109	3.4		2.9
16	280	9.6	235	4.4	109	3.1		2.9
17	255	9.6	240	---	113	2.7	3.4	(2.9)
18	250	(9.6)	---	---	120	2.1	3.0	(2.9)
19	245	(8.4)					2.4	(3.0)
20	240	(8.0)					2.4	(2.9)
21	250	7.2						2.8
22	270	6.5						2.8
23	300	6.4						2.6

Time: Local.
Sweep: 1.4 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 33

Dakar, French West Africa (14.6°N, 17.4°W) April 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	(10.6)					3.1	
01	250	(10.0)						
02	240	(9.6)					3.3	
03	250	7.8					2.8	
04	250	6.0					3.7	
05	255	5.0					3.8	
06	250	6.6			170	2.1	4.0	
07	245	9.3	---	---	125	2.8	4.2	
08	268	11.1	230	---	115	3.3	6.5	
09	275	12.7	230	---	110	3.7	6.4	
10	265	13.6	222	---	110	4.0		
11	332	14.6	215	---	110	4.2		
12	400	15.2	210	5.6	110	4.2		
13	(410)	15.6	215	---	110	4.0	4.5	
14	(370)	(>15.7)	220	---	115	4.0		
15	(370)	15.8	225	---	112	3.7	4.1	
16	(365)	15.2	230	---	115	3.2	3.8	
17	(300)	14.7	248	---	125	2.7	3.6	
18	270	>14.0	---	---	---	---	3.8	
19	360	14.0					3.2	
20	400	13.0						
21	380	12.8						
22	350	(11.6)						
23	320	(>12.5)						

Time: Local.
Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Form adopted June 1946

TABLE 34

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

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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	(290)S	(270)S	(260)S	260	(260)S	(250)S	(220)S	280	220	C	C	240	280	260	L	L	230	230	210	210	230	220	240	280
2	260	[260]S	270	260	240	240	240	240	210	[220]M	240	260	230	230	260	250	230	220	210	220	220	220	(230)S	[260]S
3	(300)S	(300)S	(280)S	280	250	230	(250)S	240	220	220	250	240	250	260	260	240	220	220	230	230	210	220	250	250
4	260	(270)S	(290)S	(280)S	270	270	240	230	230	230	[240]L	240	260	270	250	280	240	230	230	220	240	240	240	230
5	(260)S	S	A	290	280	(270)S	230	260	220	230	250	270	260	260	250	260	240	280	220	220	230	260	270	260
6	(320)S	(320)S	270	240	250	(280)S	(300)S	260	230	230	250	250	240	270	250	240	230	230	210	210	(230)S	(270)S	(290)S	(280)S
7	(290)S	(290)S	(270)S	250	240	250	(280)S	250	230	240	250	250	260	250	260	260	230	220	220	210	230	(250)S	(250)S	(270)S
8	260	260	(290)S	C	C	C	C	C	C	230	240	260	270	280	270	260	220	220	220	220	230	270	260	260
9	230	(260)S	(260)S	250	260	(260)S	(280)S	240	230	250	230	260	260	260	240	260	230	240H	220	220	230	220	230	250
10	(280)S	(280)S	280	290	250	260	(260)S	230	220	220	250	260	250	260	250	260	230	230	230	220	[230]M	240	240	[260]M
11	(280)S	[260]M	250	250	240	[270]M	(300)S	[260]M	(230)S	230	[240]M	240	[260]M	270	270	250	240	220	220	230	220	290	310	300S
12	290	270	270	260	260	250	(290)S	280	240	250	[250]L	250	230	260	240	250	240	230	220	210	220	230	280	240
13	270	270	270	260	250	250	290	250	250	240	250	260	260	250	260	260	250	230	220	220	220	(280)A	(270)A	[280]A
14	(290)S	(280)S	250	250	(280)B	(260)B	[240]S	230	210H	230	240	260	260	250	(250)L	250	240	220	220	210	220	(230)S	A	A
15	A	A	(300)S	(280)S	(270)S	(270)S	(240)S	220	220	230	240	250	260	260	260	250	250	230	(230)A	[230]A	(230)A	250	(240)A	(270)S
16	[270]A	(270)S	280	270	(270)S	(280)S	270	230	220	240	(260)L	250	260	260	260	260	250	220	210	210	220	240	230	(240)S
17	(270)S	(280)S	(290)S	280	270	(260)S	(250)S	220	220	240	250	250	240	270	260	270	250	220	220	230	230	220	230	(250)S
18	(260)S	(300)A	(280)S	(280)S	270	270	270	250	230	260	260	260	260	270	260F	250	250	230	220	210	240	250	250	250
19	280	280	(260)S	270	250	250	250	250	240	240	240	260	270	260	260	250	240	220	220	220	250	240	250	240
20	270	280	260	260	(270)S	(280)S	(270)S	240	230	250	250	280	260	270	250	250	240	230	210	230	(240)S	(250)S	(260)S	(260)S
21	(280)B	(270)S	(280)B	(280)B	260	(250)B	(280)S	250	260	250	250	260	270	260	280	(260)L	260	240	220	210	230	(300)B	(280)S	(300)S
22	(270)S	280	270	250	260	250	250	250	210	230	260	270	260	270	260	(260)L	260	260	230	230	230	(270)S	260	(300)S
23	(290)S	270	(300)F	(260)B	(430)F	(380)S	(300)S	260	230	230	230	290	290	270	260	270	270	230	250	250	270	(300)S	290	(280)S
24	(250)S	(290)S	320F	350F	450F	(400)F	(400)S	250	260	280	300	300	300	290	270	260	230	230	240	(250)A	(250)A	(250)S	(260)S	[280]A
25	(300)S	(290)S	(290)S	280	(300)S	(280)S	[260]B	250	230	250	(250)L	270	270	270	260	270	250	230	230	220	220	230	250	260
26	270	(300)S F	280	280	250	(240)S	(270)S	240	220	(260)L	260	270	270	260	260	250	250	230	220	220	250	320	370K	B K
27	B K	B K	B K	B K	B K	B K	B K	270K	260K	300K	310K	340K	350K	340K	330K	300K	300K	260K	250K	250K	260K	(280)K S	270K	(300)K S
28	340K	(350)K S	340K F	360K F	480K	(460)K S	[370]K S	280K	370K	380K	370K	350K	340K	M K	M K	M K	M K	250K	230K	230K	250K	(270)K S	260K	280K
29																								
30																								
31																								
Median	(280)	(280)	280	270	260	(260)	(270)	250	230	240	250	260	260	260	260	250	240	230	220	220	230	250	260	260
Count	26	25	26	26	26	26	26	27	27	27	27	28	28	27	26	26	27	28	28	28	28	28	27	26

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 35

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

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), February (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: McC., A.H.M., L.A.L., L.E.

Calculated by: McC., L.E.

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	4.7	4.3 FS	3.8 JZ	3.7	3.5 J	3.3 F	2.6 F	3.5	6.6 P	C	C	9.2	10.4	10.2	9.4	9.8	9.3	9.8 S	9.1	6.7	5.3	4.0	3.0	3.0
2	2.2	2.5 J	3.3 FJ	2.6 FJ	(2.7) F	(2.7) F	(2.9) F	3.9 F	6.8	[7.6] M	9.6	9.5	9.7	8.8	9.4	9.8	9.5	8.2	7.4 F	(5.6) FS	(5.4) FS	(4.5) FS	(3.1) FS	2.4 F
3	2.4 F	(2.3) FS	2.3 F	(2.4) FS	2.5 F	2.5 JS	2.3	3.6	6.2	7.0	9.0	8.6	9.0	8.6	9.6	9.0	8.5	7.6	(7.6) FS	(6.8) FS	(5.6) FS	(4.6) FS	(3.7) FS	3.4 FS
4	3.1 F	2.6 F	2.7 F	2.9 J	2.8 FJ	2.8 FJ	3.0 F	3.8 F	6.2	7.7	8.5	9.0 F	9.8	(10.0) FS	(10.0) S	9.7	8.5	7.1	7.0 F	5.7 F	4.6 F	4.2 F	(3.9) FS	3.1 F
5	2.4	2.1 JF	2.2 F	2.3 F	2.5 F	3.0 F	3.6	3.7 F	5.7	6.8	7.5	8.6	9.4	10.0	9.4	8.8	(9.0) S	9.3	8.8	7.4 S	6.2	6.0 F	5.8 F	4.9 FS
6	(3.6) FJ	(3.2) FJ	(4.0) FJ	(3.7) FJ	3.1 F	3.0	2.4 F	2.4 H	6.0	8.0	9.0	9.0	8.8	8.6	8.6	8.4	7.8 S	(7.8) S	7.0	5.4 F	4.2	3.5	3.3	3.2 F
7	3.2	3.4 F	3.4	3.4 F	3.2 F	2.8 HJ	2.6 VJ	3.3	5.5	7.2	8.2	8.6	8.4	8.8	8.8	8.8	7.8	7.5	7.1	7.0	4.3	3.8	3.4	3.4
8	3.5	2.8 F	2.4 F	C	C	C	C	C	C	6.8	7.6	8.0	8.6	8.6	9.8	(10.4) S	(9.2) S	(8.1) S	8.2	(6.1) FS	4.9	(4.7) FS	4.5 F	4.2 F
9	(3.8) FS	3.0 F	2.7 F	3.6 FZ	2.5 F	2.4 F	2.5 F	3.7	6.4	8.2	8.0	8.6	9.6	9.8	(10.2) S	9.2 J	8.6	8.2	(8.7) S	(7.2) S	5.8	(5.0) S	4.3 F	3.6
10	(3.3) Z	3.2 F	(3.6) JF	[3.9] M	3.9 SF	3.4	3.3 J	4.2	5.4 F	7.2	8.6	9.3	9.0	9.0	8.6	9.0	8.3	6.9	6.5	6.4	[5.6] M	(4.7) FS	(3.9) SF	3.0
11	3.2	M	M	2.9	M	M	(2.6) ZF	[4.3] M	6.0 F	[7.0] N	8.0	8.7	9.0	9.2	9.4	(10.2) JS	(9.8) S	8.5	7.2	5.4 F	(4.0) S	3.8	3.7	3.9 SF
12	(4.2) FJ	3.4 F	3.2 F	(3.0) F	3.2	3.2	2.4	3.7	6.2	7.2	7.5	8.0	9.0	8.4	8.0	8.5	8.1 F	7.5 F	7.3 F	6.7 F	4.6 F	3.8 JS	3.1 F	3.3
13	3.6	3.7	3.6	3.4 F	3.2 F	2.8 F	2.3 JF	3.2 F	5.6	6.5	7.3	7.5	8.2	8.4	8.3	8.4	8.3	8.0	7.8 JS	6.6	5.0	3.4	3.4	3.1 J
14	(3.2) S	3.3	3.0 J	2.8 F	2.6	2.3 J	2.3	3.9	5.8	8.3	8.2	8.3	8.8	7.8	8.2	8.6	8.5	7.6	7.4	6.0	5.0	4.2	3.0	2.5
15	(2.3) A	(2.4) A	2.7	2.5 JF	2.5 FS	2.7 F	3.0	4.2	5.8	7.0	7.8	8.2	9.0	8.2	8.0	7.6	8.4	7.8	7.3 F	6.0	4.3	3.7	3.1	2.9
16	2.8	2.7 J	3.0 V	2.5 F	2.5	2.8 F	3.1 F	4.8 F	6.4 F	7.3	7.4	7.6	8.0	7.7	7.8	7.6	8.2	7.0	6.6	5.9	4.6	3.9	3.8 JS	3.1
17	2.7	2.8 JS	2.5	2.9 J	2.9 F	3.0	3.3 F	4.4 F	6.5	7.2	7.4	8.4	8.2	8.2	8.0	8.6	8.5	8.0	7.8	(7.0) S	6.1 S	6.5	4.1 JS	3.8 S
18	3.4	3.3	3.6 F	3.7	3.6 F	3.3 F	3.2 F	2.9 F	5.4 F	6.6 HV	7.7	8.0	8.4	8.2	8.0	8.0	7.8	7.5	7.0 F	5.8 F	4.9 F	4.6 F	4.2	3.7 F
19	3.3 F	3.2 F	3.5 F	3.7 FH	3.7 F	3.3 F	2.9 F	4.3 F	6.6	7.0 F	6.9	8.0	8.5	8.6	7.6	7.9	8.1	7.0	6.8	6.4	5.3	4.8	4.5	4.0 J
20	3.7	3.5 P	3.6	3.4	3.3 F	3.2 P	3.3 P	4.6	6.5	7.0	7.2	7.6	8.1	8.1	8.2	7.6	7.4	7.0	6.0	5.4	4.4	3.7	3.5	3.5
21	3.4	3.4	3.4	3.3	3.6 V	3.4 V	3.4 FH	4.3 F	6.4	7.2	7.1 F	7.8	8.1	8.2	7.8	8.0	8.3	8.6	8.0	5.3	4.0	3.3	3.4	3.2 F
22	3.8 F	4.1	(3.8) SF	3.5 F	3.8 F	3.7 F	3.3 F	4.2 F	6.4	6.6 F	7.0 F	8.4 F	9.0	9.0 F	9.2	8.8	8.8	9.2	8.8	7.6	(6.2) FS	(4.2) SF	(5.2) SF	5.0 JF
23	4.6 FJ	4.4 JF	3.3 JF	(2.3) F	(2.4) F	(2.2) JF	2.9 J	3.5	5.0	5.8 F	6.6 F	7.9	8.6 F	8.6 F	9.0	8.4	8.8	8.8	8.0	5.8	3.9 F	4.5 JV	5.6 V	5.1 JF
24	4.2 F	3.8 F	2.9 JF	(2.0) JF	(2.0) F	(2.3) F	2.2 F	3.6 F	5.4	6.0	6.3 F	6.8	7.2 H	8.3	9.0	9.0	8.4	7.8	7.6 JS	6.4	5.1 F	4.0 F	3.7	3.2
25	3.3 F	3.3 F	3.1 F	2.9 F	2.7 F	1.8 F	1.7 F	4.2	6.4	7.1	7.4	8.0	8.4 F	8.5	8.2	8.3	8.1	8.0	7.8	6.8	6.2	4.8 F	(4.5) PF	4.4 F
26	3.9 F	3.5 F	3.6 F	3.3 F	3.5 F	3.1 F	2.4 F	4.6	6.2	7.5	8.5	8.6 F	10.0	10.0	9.9	9.8	9.1	8.9	7.7	6.2 F	5.2 JF	4.2	3.3 K	B K
27	B K	B K	B K	B K	B K	B K	B K	3.5 K	4.8 K	5.4 K	5.4 BK	5.7 K	5.8 K	6.2 K	6.2 K	6.2 K	6.2 K	5.8 FK	5.3 K	(5.0) SK	4.9 K	4.2 K	4.3 K	(3.8) SK
28	3.1 FK	K (2.9) JF	K (2.6) FJ	2.2 FK	K (2.4) FJ	K (1.6) FJ	K (1.8) SF	3.3 K	4.2 K	4.8 K	5.2 K	5.4 K	6.1 K	M K	M K	M K	M K	7.2 K	6.2 K	6.4 K	4.9 K	4.3 K	(4.2) SK	(4.1) SK
29																								
30																								
31																								
Median	3.3	3.2	3.2	3.0	2.9	2.8	2.8	3.8	6.2	7.0	7.5	8.2	8.7	8.6	8.6	8.6	8.4	7.8	7.4	6.3	5.0	4.2	3.8	3.4
Count	27	26	26	26	25	25	26	27	27	27	27	28	28	27	27	27	27	28	28	28	28	28	28	27

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 36

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

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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	4.6 F	3.9 JZ	3.8 F	3.7	3.6	3.0 JF	2.5 J	5.2 J	7.0	C	C	9.7	9.7 F	9.6	9.4	9.9	9.0	9.7 S	7.8	5.6	4.8	3.4 J	2.9	3.0
2	2.6	2.6 F	2.5 F	(2.5) F	2.7 F	(2.9) F	(2.8) F	5.8 F	7.1	8.2	9.0	10.2	9.0	9.0 F	9.3	9.8	[8.7]	7.6 F	6.2 F	(6.4) FS	5.0 F	(3.8) FS	2.7 F	2.4 F
3	(2.3) FS	2.3 F	2.4 F	2.4 F	2.6 F	2.4	2.1	6.2	6.6	8.0	9.2	9.0	8.6	9.0	9.8	9.0	8.2	(7.6) S	6.8 S	(6.6) S	(5.2) S	4.2	(3.4) FS	(3.1) FS
4	3.0	2.7 F	2.6	2.9 FJ	2.7 FJ	3.1 F	2.9 F	5.2 F	7.0	7.8	8.4 F	9.3	10.0	10.4	9.8 F	9.0	7.8	7.0 S	(6.2) FS	5.0 F	4.2 F	4.0 F	3.7 F	2.7 FJ
5	(2.4) S	2.1	2.1 F	2.3 F	2.6 F	3.3 F	3.1	5.1	6.6	6.8	7.9	9.0	9.9	10.0	9.2	9.2	9.2	(9.4) S	8.2 S	7.0 J	(6.2) S	5.2 F	5.6 F	4.0 F
6	3.2 F	4.0 FJ	(3.9) FJ	(3.2) F	2.8	2.5 F	2.5 F	4.9	7.4	8.5	8.8	9.2	8.2	8.8	8.6 S	8.1 S	7.6	7.6	6.6	4.8 F	3.6 S	3.3	3.2	3.2
7	3.3 F	3.3 F	3.4 F	3.3 F	3.0 F	2.7 J	2.3 H	4.8	6.4	7.7	8.5	8.8	8.7	9.0	8.8	8.2	7.6	7.4 J	6.8	5.0	4.0	3.5	3.5	3.5
8	3.1	2.8 F	C	C	C	C	C	C	6.2	7.4	7.8	8.3	8.8	9.0	9.8	10.0	8.6 S	8.0	(7.2) S	(5.5) S	4.6	4.7 F	4.4 F	4.0 FJ
9	3.3 F	(3.1) FS	3.6 F	(3.3) FS	2.5 F	2.4 F	2.6	5.0	7.0	8.6	8.3	9.0	9.8	10.1	9.0	9.2	8.2	9.4	8.2	(6.4) SF	(5.9) S	(4.9) S	(4.1) SF	(4.2) J
10	(3.8) SZ	3.2 JF	3.7 JF	(4.1) JF	3.6	3.4 J	[4.2] M	(5.0) SF	6.6	7.8	9.4	9.0	9.0	9.0	8.8	8.6	(7.2) S	(6.4) S	(6.8) S	(5.8) J	(4.8) PS	4.6 FS	[4.0] M	3.3
11	[3.4] M	(3.4) S	M	M	M	M	M	4.8 F	6.8	[7.5] M	8.2	8.4	9.2	9.4	9.9	(9.4) SJ	8.8	7.8	6.2	5.4 F	4.2	(3.8) JS	(3.8) FJ	(4.0) FJ
12	3.7 FJ	(3.3) FJ	(3.2) F	(2.9) F	3.2	2.6	2.5 JS	5.0	7.0 P	7.6	8.3	8.6 F	7.8	8.6	8.5 F	8.3	8.0 F	7.6 FJ	7.0 F	5.3 F	4.0 JF	3.6 F	3.5	3.8
13	3.8 F	3.7 F	3.3 F	3.3 F	3.0	2.6 F	2.4 F	4.6	6.6	6.8	7.4	8.0	8.6	8.5	8.5	8.2	8.1	8.0	7.0	6.0	4.1	3.5	3.1	3.2
14	3.2	3.3	3.0	2.7 F	2.5	2.4 JA	2.4	5.5	6.6 F	7.4 F	8.2 F	8.3	8.4	8.1	8.5	8.4	8.3	7.4	6.8	5.7	4.5	3.6	2.7	2.4
15	[2.4] A	(2.5) S	2.6 F	2.5 F	2.5 F	2.9 F	2.9	5.4	6.6	7.4	8.1	8.5	9.0	8.4	8.0	8.2	8.2	7.6	7.0	5.4 F	3.7 JF	3.6	3.0	2.7
16	2.8	2.5	2.5 F	2.5	2.6 F	2.9 F	3.3	5.8	7.0	7.1	7.4	8.0	7.8	7.8	7.7	8.0	7.2	7.0 F	6.4	5.3	4.2 J	3.9 JS	3.3	2.8
17	2.7	2.5 F	2.5 F	2.9	2.9 J	3.1 FS	3.4 F	5.8 SF	6.7	7.2	7.8	8.2	8.2	8.0	8.1	8.8	8.2	7.8	(7.0) S	6.6 S	5.9	5.0	3.9 PS	3.6
18	3.3 F	[3.5] A	3.7 J	3.7 F	3.4 F	3.2 F	2.9 F	5.0	5.8 H	6.8	8.0	8.6	8.2	7.8 F	8.0	7.9	7.6	7.2 SF	6.6 F	5.0 F	4.7 F	4.5 F	3.9 F	3.6 F
19	3.1 F	3.3 F	3.5 F	3.7 F	3.5 F	3.0 F	3.1 F	5.4 FS	7.2	7.0	7.6	8.1	8.9	8.1	7.8	7.8	7.6	6.8	7.0	6.0	4.9	[4.6] C	4.3	3.7
20	3.5	3.6	3.6 F	3.3 F	3.1 F	3.2 J	3.6	5.6	6.4	6.8	7.0	8.1	8.2	8.2	8.1	7.5	7.2	6.4	5.8	4.7	3.9	3.5 J	3.6	3.3
21	3.3	3.3	3.4	3.3 F	3.4 JV	3.3 VJ	3.3 F	5.4	6.2	7.0	7.4 F	8.0	8.3	7.8	8.0	8.2	8.4	8.2	6.6	4.7	3.3	3.3 J	3.3	3.4 F
22	4.1 V	4.3 F	3.9 F	3.8 F	3.7 F	3.4 F	3.3 F	5.8 F	6.6 FA	7.2	8.1	8.6 F	8.8 F	9.4 F	9.0	9.2	8.8	9.2	9.0	(7.0) S	(5.6) SF	(5.0) SH	4.6 F	5.0 FH
23	4.5 F	F 3.7 JH	3.1 F	2.4	2.4 F	2.9 J	3.0	4.4 FH	5.6 F	6.0 F	7.6 F	7.8 F	9.4 F	9.0 F	8.2 F	8.5	8.8	8.2	7.2 SF	4.8 H	(4.4) SF	4.7 F	5.6 JV	4.7 F
24	(3.8) JF	3.8 F	2.3 F	(1.9) JF	(2.4) F	(2.2) F	2.3 F	4.3 F	5.5 F	5.8 F	6.6 F	7.2	7.6	9.0	9.2	8.6	8.2	7.4	7.0	5.7	4.4 F	3.7 F	3.3 F	3.4
25	3.3 F	3.2 F	3.0 F	2.8 F	(2.3) FH	1.8	2.5 F	5.6	6.6 SF	7.2	8.0	8.0 F	8.4	8.3	8.0	8.3	8.0	7.3 F	7.4	6.7	4.3 F	4.6 F	4.3 F	4.2
26	3.8 F	3.7 F	3.5 F	3.4 F	3.2 F	2.7 F	2.9 F	5.4 JH	6.4 FH	7.6 F	8.6 F	9.2	10.2	10.0	9.8	9.4	9.0	8.5	6.2	5.9 F	4.7 P	3.9 F	3.0 JK	B K
27	B K	B K	B K	B K	B K	B K	2.6 JK	4.3 K	5.1 K	5.6 K	[5.6] CK	5.6 K	6.0 K	6.2 K	6.1 K	6.0 K	6.2 SK	5.7 SK	5.2 SK	5.0 SK	4.6 SK	4.2 K	K (4.0) JS	3.5 FK
28	K (3.0) SF	F K (2.4) JS	(2.3) FK	2.2 K	F K 2.3 JS	[2.4] FK	2.5 K	3.7 K	4.6 K	4.9 K	5.2 K	K 5.6 JH	6.5 K	M K	M K	M K	6.9 K	6.8 K	6.4 K	5.6 K	4.5 K	K 4.2 JS	K 4.1 JS	3.8 K
29																								
30																								
31																								
Median	3.3	3.3	3.2	2.9	2.8	2.9	2.8	5.2	6.6	7.2	8.0	8.4	8.6	9.0	8.6	8.5	8.2	7.6	6.8	5.6	4.5	4.0	3.6	3.5
Count	27	27	25	25	25	25	26	27	28	27	27	28	28	27	27	27	28	28	28	28	28	28	28	27

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 37

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

Form adopted June 1946

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

IONOSPHERIC DATA

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

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

Calculated by: McC., L.E.

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										C	C	210H	200	230	200	200	220							
2										M	200H	200	200H	200H	200	230H	Q							
3										200H	210H	230	200	190H	210	230	Q							
4										Q	210	210	210	220	200	220	Q							
5										Q	210	220	210	210	220	220	Q							
6									Q	220	210	200	200	200	210	210	220	Q						
7									Q	220	220	220	220	200	210	220	220	Q						
8									C	200	200H	210	210	200H	220	230	220	Q						
9									Q	230	220	210	200	200	210	200	230	Q						
10									Q	Q	200H	210	200	200	200	220	220	Q						
11									Q	220	200	210	M	M	210	M	M	Q						
12									230	230	210	200	200	200	[200]B	210	220	220						
13									Q	220	210	200	200	210	210	220	220	Q						
14									Q	200	200	210	200	200	220	220	230	Q						
15									220	220	210	210	210	220	220	210	230	Q						
16									Q	200	200	200H	200	200	200	200H	230	Q						
17									Q	220	210	190H	190H	220	220	230	210	Q						
18									220	200	200	210	200	200H	210	(200)B	230	Q						
19									Q	220	[240]B	(250)B	220	220	210	210	230	Q						
20									Q	200	210	200	190H	200H	230	220	200H	Q						
21									210	200	220	220	250	210	210	230	230	Q						
22									Q	Q	210	210	220	210	230	230	230	Q						
23									Q	Q	Q	220	210	200	220	220	230	Q						
24									240	220	210	220	220H	200	220	210	220	Q						
25									Q	210	210	200	200H	220	220	220	230	Q						
26									Q	200H	200	210	210	220	210	220	210H	Q						
27									QK	230K	230K	220K	210K	210AK	220K	230K	230K	250K						
28									270HK	240K	240K	180HK	240K	MK	MK	MK	MK	QK						
29																								
30																								
31																								
Median									220	220	210	210	200	200	210	220	220	—						
Count									6	21	26	28	27	26	27	26	22	2						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 38

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

IONOSPHERIC DATA

foFl (Characteristic), Mc (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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										C	C	L	L	L	L	L	L							
2										M	L	N	L	L	L	L	Q							
3										L	L	L	L	L	L	L	Q							
4										Q	L	L	L	L	L	L	Q							
5										Q	L	L	L	L	L	L	Q							
6									Q	L	L	L	L	L	L	L	L	Q						
7									Q	L	L	L	L	L	L	L	L	Q						
8									C	L	L	L	4.6J	L	L	L	L	Q						
9									Q	L	L	L	4.2	4.2	L	L	L	Q						
10									Q	Q	L	L	4.0	L	L	L	L	Q						
11									Q	L	L	M	M	L	L	M	M	Q						
12									L	L	L	L	4.3	L	L	L	L	L						
13									Q	L	L	L	L	L	L	L	L	Q						
14									Q	3.1	L	L	L	4.0	L	L	L	Q						
15									L	L	3.6	[4.0]L	(4.4)L	L	L	L	L	Q						
16									Q	L	L	L	(4.4)L	4.4	L	L	L	Q						
17									Q	L	L	L	L	L	L	L	L	Q						
18									L	L	4.2	4.4	4.5	(4.4)P	(4.3)P	L	L	Q						
19									Q	L	B	L	L	L	L	L	L	Q						
20									Q	L	L	L	L	L	L	L	L	Q						
21									L	L	L	L	L	L	L	L	L	Q						
22									Q	Q	L	L	L	4.7	L	L	L	Q						
23									Q	Q	Q	L	L	4.5	4.4	L	L	Q						
24									L	L	4.3	4.3	4.5	4.5	4.5	L	L	Q						
25									Q	L	L	L	L	4.7	L	L	L	Q						
26									Q	L	L	L	4.7P	L	L	L	L	Q						
27									QK	LK	LK	4.3K	4.5K	4.5K	4.5K	4.1K	LK	LK						
28									3.5PK	(3.8)PK	4.1K	4.4K	4.4K	MK	MK	MK	MK	QK						
29																								
30																								
31																								
Median									—	—	—	4.3	4.4	4.5	—	—	—	—						
Count									1	2	4	5	11	9	4	1								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 39

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

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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

Day	12	13	14	15	16	17	18	19	20	21	22	23
1	100	$(100)^{B}$	100	110	110	A						
2	100	110	100	100	100	A						
3	100	110	100	100	$[110]^{A}$	120						
4	100	$(110)^{B}$	110	$(110)^{B}$	$[120]^{A}$	120						
5	100	110	100	$(110)^{B}$	$(110)^{B}$							
6	110	110	110	110	110	110						
7	100	110	110	110	110	A						
8	110	110	100	$(100)^{A}$	100	$(100)^{S}$						
9	100	110	110	100	100	$(110)^{S}$						
10	100	100	100	100	100	100						
11	110	100	100	B	M	B						
12	100	110	B	B	110	110						
13	110	$(100)^{A}$	$(110)^{A}$	100	110	$(110)^{A}$						
14	100	100	100	100	100	$(130)^{A}$						
15	100	100	100	100	$(100)^{A}$	110						
16	100	100	100	100	120	130						
17	110	100	100	100	100	B						
18	100	100	B	B	B	B						
19	110	110	110	110	110	110						
20	110	110	100	100	100	$(120)^{A}$						
21	100	110	110	110	110	$(110)^{A}$						
22	100	100	100	$(110)^{A}$	110	B						
23	110	100	100	100	110	120						
24	100	100	100	$(100)^{A}$	110	130						
25	100	100	110	110	110	110						
26	100	100	100	110	110	120						
27	$(110)^{B}_{K}$	110^{K}	110^{K}	100^{K}	100^{K}	110^{K}						
28	100^{K}	M^{K}	M^{K}	M^{K}	M^{K}	120^{K}						
29												
30												
31												
Median	100	100	100	100	110	110						
Count	28	27	25	24	25	20						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 40

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

Form adopted June 1946

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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										C	C	3.0	3.1^{H}	3.1	3.0	2.7	2.5^{H}	A						
2									A	M	3.0	3.1	3.2	3.2	3.0	2.8	2.2	A						
3								A	$(2.3)^{A}$	2.6	3.0	3.1	3.1	3.1	3.0	$(2.6)^{A}$	$[2.2]^{A}$	1.8						
4									A	A	3.0	3.1	3.2	$(3.1)^{B}$	3.1	3.0	$[2.4]^{A}$	1.8						
5									A	2.5^{F}	3.0	3.1	3.2	3.0	3.0	2.7	2.3							
6									2.1	2.5	2.8	3.1	3.1	3.1	3.0	2.8	2.4^{H}	1.8						
7									2.1	2.6	3.0	3.1	3.1	3.0	2.9	2.7	2.3	A						
8									C	2.6	2.9	3.0	3.1	2.9	2.9	$[2.6]^{A}$	2.4	1.8						
9									2.1	2.6^{H}	2.9	3.0	3.1	3.1	3.0	2.8	2.4	1.7						
10								1.7	$[2.1]^{A}$	2.5	2.7	2.8	3.1	3.1	3.0	2.7	2.4	2.1						
11									M	2.6	2.9	3.0	3.2	3.2	3.1	B	M	B						
12									B	A	2.8	3.0	3.1	3.1	B	B	2.4	1.8						
13									1.9	2.7	2.9	3.1	3.1	A	A	2.9	2.5	1.8						
14									2.1	2.6	2.9	3.1	3.1	3.1	3.0	2.8	2.4	2.0						
15									2.1	2.6	2.9	3.1	3.1	3.1	2.9	2.8	2.6	1.8						
16									2.1	2.6	3.0	3.1	3.1	3.1	3.0^{P}	2.9	2.5	1.9						
17									2.1	2.7	2.9	3.1^{H}	3.1	3.1	$[3.0]^{B}$	2.8	B	B						
18									2.1	2.8	3.0	3.2	3.2	3.2^{P}	B	B	B	B						
19									1.7	2.5	$[3.0]^{B}$	3.4	3.3	3.2	3.0	2.7	A	A						
20									2.1	2.8	3.0	3.1	3.3	3.2	3.1	2.9	2.6	A						
21									2.1	2.7	3.1	3.1	3.3	3.2	3.2	3.0	2.6	A						
22								1.7	$[2.2]^{A}$	2.6	2.9	3.0	3.1	3.0	3.0	2.9	2.4	B						
23								1.8	2.1	2.5	2.9	3.0	3.1	3.1	3.0	$(2.8)^{B}$	2.3	2.1						
24								1.7	2.1	2.7	3.0	3.1	3.2	3.2	A	A	2.3	2.1						
25								A	2.2	2.7	$[2.8]^{B}$	3.0	3.2	3.2	3.1	3.0	2.7	2.2^{H}						
26								1.6	2.3	2.7	3.0	3.2	3.3	3.2	3.1	2.9	2.5	2.2						
27								1.9^{K}	2.4^{P}_{K}	2.8^{K}	2.9^{K}	3.0^{K}	3.1^{K}	$[3.1]^{S}_{K}$	3.1^{K}	2.9^{K}	2.5^{K}	2.2^{K}						
28								A^{K}	$(2.1)^{A}_{K}$	2.8^{K}	3.1^{K}	3.1^{K}	3.5^{K}	M^{K}	M^{K}	M^{K}	M^{K}	2.6^{K}						
29																								
30																								
31																								
Median								1.7	2.1	2.6	2.9	3.1	3.1	3.1	3.0	2.8	2.4	1.9						
Count								6	21	24	27	28	28	26	22	23	23	17						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 41

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

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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	E	C	C	G	G	G	G	G	G	3.0Y/100	E	E	E	E	E	2.6Y/100
2	E	29Y/110	E	E	E	E	E	E	2.3/100	M	3.3/100	G	G	G	G	G	G	4.0/100	E	E	E	E	E	E
3	E	E	E	E	E	E	96/130	(2.9)S/100	2.1/130	G	G	G	G	G	G	2.9/120	25/110	G	36Y/100	3.8/100	E	E	E	E
4	E	E	E	E	E	E	E	E	21/120	2.7F/130	94Y/110	G	G	G	G	G	25/120	G	E	E	E	E	3.5/110	68/100
5	3.9/100	30/100	2.7/100	E	E	E	E	E	22/110	G	G	G	G	G	G	G	G	E	E	E	E	E	E	E
6	E	E	E	E	24/120	E	E	E	G	G	G	G	G	G	G	G	G	G	E	2.7/100	24/100	E	E	E
7	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	G	28/110	2.3/110	32/110	E	20Y/110	E	E	E
8	E	E	E	C	C	C	C	C	C	G	G	G	G	G	3.3/110	4.5Y/100	G	G	E	E	E	E	E	E
9	E	E	E	98/100	E	E	E	2.5/120	32/100	G	G	90/100	G	G	G	G	G	G	E	E	E	E	E	E
10	E	E	E	E	E	E	E	26/100	24/100	52Y/130	G	G	G	G	G	G	G	G	26/100	E	M	E	E	E
11	E	M	E	E	4.3/100	M	E	2.4/120	M	G	G	G	G	30/100	G	G	M	G	E	E	E	E	E	E
12	E	E	E	E	E	E	E	E	G	25Y/100	G	G	G	G	G	G	G	G	E	E	E	E	E	E
13	E	E	E	E	E	E	E	E	G	G	G	G	G	3.1/100	35/110	G	G	17/110	E	E	25Y/110	2.7Y/100	4.3/100	29Y/100
14	E	E	E	E	E	25/100	3.3Y/100	E	G	G	2.6/100	G	G	G	G	G	G	1.8/100	E	E	E	3.1Y/100	3.5/100	45Y/100
15	68/100	4.2/100	2.7Y/100	(2.4)S/100	10.0Y/100	78/120	E	E	G	G	11.8/100	G	G	G	G	G	23/100	92/100	53/100	9.2/100	94/100	4.3/100	3.7/100	3.2/100
16	3.8/100	3.3Y/100	E	E	E	E	E	31/100	G	50Y/100	3.7Y/100	3.1/100	G	G	G	G	G	G	E	E	E	E	E	E
17	E	E	E	E	E	E	E	68Y/100	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E
18	E	5.0Y/100	3.2/100	26/100	2.6Y/100	31/100	E	E	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	25/100
19	32Y/100	26Y/100	E	24Y/100	E	E	E	E	2.3/110	G	G	G	G	G	G	G	37Y/110	2.5Y/110	E	E	E	E	E	E
20	E	E	E	E	E	E	E	2.6Y/110	G	G	G	G	G	G	G	G	G	30Y/120	E	2.7/110	E	2.3/100	E	21/100
21	E	E	E	E	E	E	E	E	G	G	G	G	G	G	G	40Y/120	G	21/110	E	E	E	E	E	E
22	E	E	E	E	E	E	E	26Y/110	29Y/110	G	G	G	G	G	G	29/110	G	G	E	E	E	E	E	E
23	E	E	2.3/120	E	E	E	E	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E	E
24	2.4/120	E	2.8/140	E	E	E	E	2.5Y/100	G	G	G	9.2Y/130	G	G	3.3/100	31/100	30/100	G	38/110	4.4/100	34/110	28/100	2.3/100	45/100
25	23/100	62/130	2.3Y/130	E	E	E	E	48/100	1.9/100	58/100	B	G	G	56Y/120	20/100	2.2/100	G	G	2.5/120	E	E	E	E	E
26	E	E	22/100	E	E	E	88Y/110	G	8.0Y/110	G	G	70/100	G	G	G	G	G	G	E	E	E	E	E	B
27	B	B	B	B	B	B	B	G	G	G	G	G	G	G	G	G	G	G	E	E	26/110	E	E	E
28	E	30/100	E	E	E	50Y/110	E	1.9/110	24/120	G	G	76/120	G	M	M	M	M	26/120	E	E	E	E	E	E
29																								
30																								
31																								
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	27	26	27	26	26	25	26	27	26	26	26	28	28	27	27	27	26	28	28	28	27	28	28	27

** 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 ☒

Form adopted June 1946

TABLE 42

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

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ____ (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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	1.8	1.9 ES	(1.9) JZ	1.9	(2.0) J	2.1 F	2.2 F	2.0	2.3 P	C	C	2.2	2.2	2.2	2.1	2.1	2.2	2.1 S	2.2	2.1	2.2	2.2	2.0	1.9
2	2.1	(1.9) J	(2.0) EJ	(2.1) EJ	(2.2) F	(2.2) F	(2.2) F	2.2 F	2.6	M	2.5	2.3	2.2	2.1	2.2	2.2	2.3	2.3	2.2 F	(2.2) FS	(2.2) SF	(2.4) SF	(2.2) SF	2.0 F
3	2.0 F	(1.9) EF	1.8 F	(2.0) SE	2.1 F	(2.3) JS	2.2	2.1	2.4	2.4	2.3	2.3	2.3	2.3	2.1	2.2	2.2	2.2	(2.2) SF	(2.1) SF	(2.1) SF	(2.2) SF	(2.1) SF	2.1 SF
4	2.0 F	2.0 F	1.9 F	(1.9) J	(2.2) JF	(1.9) JF	2.2 F	2.1 F	2.3	2.3	2.2	2.2 F	2.0	(2.1) SF	(2.1) S	2.2	2.2	2.2	2.2 F	2.1 F	2.0 F	2.1 F	(2.0) SF	2.1 F
5	2.1	(1.7) JF	1.6 F	1.8 F	1.9 F	1.9 F	2.3	2.1 F	2.4	2.4	2.2	2.1	2.1	2.1	2.1	2.0	(2.1) S	2.1	2.1	2.0 S	2.0	1.9 F	1.9 F	1.8 FS
6	(1.8) FJ	(1.8) FJ	(1.9) FJ	(2.0) FJ	2.0 F	1.9	1.9 F	2.0 H	2.3	2.2	2.3	2.3	2.3	2.2	2.2	2.3	2.2 S	(2.3) S	2.3	2.3 F	2.1	1.9	1.8	1.9 F
7	1.8	1.9 F	2.0	2.1 F	2.1 F	(2.0) HJ	(1.9) VJ	2.1	2.4	2.3	2.3	2.3	2.2	2.2	2.2	2.1	2.2	2.1	2.2	2.2	2.1	2.1	2.0	2.0
8	2.0	2.0 F	2.1 F	C	C	C	C	C	C	2.4	2.3	2.2	2.2	2.0	2.0	(2.1) S	(2.2) S	(2.2) S	2.3	(2.1) FS	2.0	(1.9) FS	2.0 F	2.0 F
9	(2.2) FS	2.0 F	2.0 F	2.0 FZ	2.0 F	2.1 F	2.0 F	2.0	2.3	2.4	2.2	2.2	2.2	2.1	(2.3) S	(2.2) J	2.1	1.9	M	(2.3) S	M	(2.2) S	2.2 F	M
10	(2.1) Z	2.0 F	(1.7) JF	M	2.0 SF	1.9	(2.0) J	2.3	M	2.3	2.3	2.3	2.4	2.2	2.2	2.2	2.3	2.3	M	2.0	M	(2.0) FS	(2.1) SF	M
11	1.9	M	M	2.1	M	M	M	M	2.4 F	N	M	2.4	M	M	2.1	(2.2) JS	(2.1) S	2.3	2.3	2.1 F	(2.1) S	1.8	1.8	1.9 SP
12	(1.9) FJ	1.9 F	2.0 F	(2.0) F	2.0	2.0	2.0	1.9	2.2	2.3	2.2	2.3	2.4	2.2	2.2	2.2	2.3 F	2.3 F	2.3 F	2.2 F	2.1 F	(2.2) JS	1.9 F	1.9
13	1.9	1.9	2.0	2.0 F	2.1 F	2.0 F	(2.0) JF	2.2 F	2.4	2.3	2.4	2.2	2.2	2.3	2.2	2.2	2.1	2.2	(2.3) JS	2.3	2.4	2.0	2.0	(1.9) J
14	(1.9) S	2.0	(2.0) J	2.0 F	2.1	(2.1) J	2.0	2.2	2.4	2.5	2.4	2.4	2.3	2.2	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.1	2.0
15	(1.9) A	(1.9) A	1.9	(2.1) JF	2.0 FS	2.0 F	2.3	2.3	2.4	2.5	2.4	2.3	2.3	2.3	2.2	2.3	2.3	2.3	2.3 F	2.3	2.3	2.1	2.2	2.0
16	2.0	(2.0) J	1.9 V	2.0 F	2.0	2.0 F	2.1 F	2.4 F	2.5 F	2.4	2.2	2.3	2.4	2.2	2.3	2.2	2.3	2.0	2.3	2.2	2.2	2.2	(2.3) JS	2.1
17	2.0	(2.0) JS	1.9	(1.9) J	2.1 F	2.0	2.1 F	2.3 F	2.5	2.5	2.4	2.4	2.2	2.3	2.2	2.2	2.2	2.2	2.2	(2.2) S	2.2 S	2.3	(2.2) JS	2.0 S
18	2.0	1.9	1.9 F	1.7	1.8 F	1.9 F	2.0 F	2.2 F	2.2 F	2.3 H	2.3	2.3	2.3	2.3	2.3	2.2	2.2	2.2	2.3 F	2.2 F	2.1 F	2.0 F	2.0	2.0 F
19	2.0 F	2.1 F	1.9 F	1.9 FH	2.0 F	2.1 F	2.0 F	2.1 F	2.3	2.4 F	2.2	2.3	2.1	1.9	1.8	2.3	2.3	2.3	2.1	2.3	2.2	2.0	2.1 '	(2.1) J
20	2.0	2.0 P	2.0	1.9	1.9 F	1.9 P	2.0 P	2.1	2.3	2.4	2.3	2.1	2.2	2.2	2.3	2.3	2.4	2.4	2.3	2.3	2.2	2.1	2.0	2.0
21	1.9	1.9	1.9	1.9	2.0 V	1.9 V	1.9 FH	2.2 F	2.4	2.5	2.4 F	2.3	2.3	2.3	2.1	2.1	2.1	2.2	2.4	2.3	2.2	1.9	1.9	1.9 F
22	1.9 F	1.9	(1.9) SF	2.0 F	1.9 F	2.0 F	2.1 F	2.1 F	2.4	2.4 F	2.0 F	2.1 F	2.1	2.1 F	2.1	2.0	2.1	2.1	2.1	2.1	(2.0) FS	(1.9) SF	(2.0) SF	(1.7) JF
23	(1.7) FJ	(1.9) JF	(1.9) JF	(1.7) F	(1.6) F	(1.7) JF	(1.9) J	2.1	2.4	2.2 F	2.0 F	2.1	2.0 F	2.1 F	2.2	2.0	1.9	2.2	2.1	1.9	1.9 F	(1.7) JY	1.8 V	(1.8) JF
24	2.0 F	1.8 F	(1.9) JF	(1.9) JF	(1.6) F	(1.6) F	1.8 F	2.2 F	2.2	2.1	2.0 F	2.1	2.1 H	2.1	2.0	2.1	2.3	2.3	(2.2) JS	2.1	2.1 F	2.0 F	2.0	1.9
25	1.9 F	1.9 F	1.9 F	1.9 F	1.9 F	2.0 F	1.9 F	2.2	2.5	2.3	2.3	2.2	2.2 F	2.3	2.2	2.1	2.2	2.2	2.2	2.0	2.2	2.0 F	(2.0) PF	2.0 F
26	2.0 F	1.8 F	1.9 F	1.9 F	2.0 F	2.1 F	2.0 F	2.3	2.3	2.3	2.3	2.1 F	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.1 F	(2.0) JF	1.8	1.6 K	B K
27	B K	B K	B K	B K	B K	B K	B K	2.2 K	2.2 K	2.2 K	2.2 BK	2.0 K	2.0 K	2.0 K	2.0 K	2.1 K	2.1 K	2.1 FK	2.1 K	(2.0) SK	1.9 K	1.9 K	1.9 K	(1.8) SK
28	1.7 FK	(1.6) JFK	(1.8) FJK	1.6 FK	(1.6) FSK	(1.7) FJK	(1.7) SFK	1.9 K	1.9 K	1.9 K	1.9 K	2.0 K	2.0 K	M K	M K	M K	M K	2.1 K	2.0 K	2.0 K	2.0 K	2.0 K	(1.9) SK	(1.9) SK
29																								
30																								
31																								
Median	2.0	1.9	1.9	1.9	2.0	2.0	2.0	2.2	2.4	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.0	2.0	2.0
Count	27	26	26	25	25	25	25	26	26	25	26	28	27	26	27	27	27	28	26	28	26	28	28	25

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 43

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

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F2 (Characteristic), ______ (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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	2.7	2.8 FS	(2.9) JZ	2.8	(3.0) J	3.0 F	3.2 F	2.9	3.3 P	C	C	3.2	3.3	3.2	3.1	3.1	3.2	3.1 S	3.2	3.1	3.2	3.2	3.0	2.8
2	3.1	(2.8) J	(3.0) FJ	(3.0) FJ	(3.2) F	(3.2) F	(3.2) F	3.2 F	36	M	35	33	3.3	31	3.2	3.2	3.3	3.3	3.2 F	(3.2) FS	(3.2) FS	(3.4) SF	(3.2) SF	3.0 F
3	30 F	(2.8) SF	27 F	(3.0) SF	3.1 F	(3.3) JS	3.1	31	34	34	33	3.3	33	3.3	3.1	33	3.2	33	(3.2) SF	(3.1) SF	(3.1) SF	(3.3) SF	(3.1) SF	31 SF
4	3.0 F	30 F	2.8 F	(2.9) J	(3.2) JF	(2.8) JF	3.2 F	31 F	3.3	34	33	32 F	3.0	(3.1) SF	(3.1) S	33	32	3.2	3.2 F	3.1 F	3.0 F	3.1 F	(3.0) SF	3.1 F
5	31	(2.6) JF	2.5 F	27 F	2.9 F	2.8 F	33	3.1 F	3.4	3.4	3.2	31	3.1	31	3.1	3.0	(31) S	3.1	31	3.0 S	3.0	2.9 F	2.9 F	2.7 FS
6	(2.7) FJ	(2.7) FJ	(2.8) FJ	(3.0) FJ	30 F	28	2.9 F	30 H	3.3	3.2	33	3.3	3.3	3.2	32	3.3	3.2 S	(3.3) S	3.3	3.3 F	3.1	2.9	2.8	2.9 F
7	27	29 F	30	3.1 F	31 F	(31) HJ	(2.9) VJ	31	3.4	33	33	3.3	33	3.2	32	31	3.2	3.1	3.2	32	31	3.1	3.0	3.0
8	30	30 F	3.1 F	C	C	C	C	C	C	34	34	32	32	30	3.0	(31) S	(3.2) S	(3.2) S	3.3	(31) FS	3.0	(2.9) FS	30 F	30 F
9	(3.2) FS	3.0 F	30 F	3.0 FZ	3.1 F	3.0 F	30 F	3.0	33	34	32	3.2	32	3.1	(3.4) S	(3.2) J	31	2.9	M	(3.3) S	M	(3.2) S	3.2 F	M
10	(3.1) Z	3.0 F	(2.6) JF	M	2.9 SF	2.8	(30) J	3.3	M	33	33	34	34	32	32	32	3.4	34	M	30	M	(3.0) FS	(3.1) SF	M
11	28	M	M	31	M	M	M	M	3.5 F	N	M	34	M	M	31	(3.2) JS	(31) S	3.3	33	31 F	(3.1) S	2.7	27	2.8 SP
12	(2.8) FJ	2.9 F	3.0 F	(30) F	30	2.9	2.9	2.9	3.2	33	32	3.3	3.4	3.2	32	3.3	33 F	33 F	33 F	32 F	31 F	(3.2) JS	2.9 F	2.8
13	2.9	2.9	30	30 F	3.0 F	30 F	(3.0) JF	3.2 F	34	33	34	33	32	3.3	32	3.2	31	32	(33) JS	33	34	30	3.0	(2.8) J
14	(2.9) S	2.9	(31) J	3.0 F	3.1	(31) J	30	32	34	36	34	35	33	3.2	32	3.2	3.3	32	3.3	3.2	34	33	3.1	3.0
15	(2.9) A	(2.9) A	2.9	(3.1) JF	30 FS	3.0 F	33	3.3	35	3.5	34	33	3.3	33	32	3.3	33	33	33 F	33	34	31	3.2	3.0
16	3.0	(30) J	28 V	3.0 F	3.0	30 F	3.1 F	34 F	36 F	35	3.2	3.3	34	32	33	33	34	33	33	3.2	3.3	32	(33) JS	3.1
17	3.0	(3.0) JS	2.9	(29) J	31 F	30	3.0 F	33 F	36	35	3.5	34	33	33	32	32	32	3.3	33	(32) S	3.2 S	33	(32) JS	3.0 S
18	3.0	29	29 F	2.6	2.8 F	29 F	30 F	3.2 F	3.2 F	34 H	33	3.3	33	33	33	32	3.2	3.2	33 F	3.2 F	31 F	3.0 F	3.0	3.0 F
19	3.0 F	31 F	29 F	2.8 FH	30 F	31 F	30 F	3.1 F	33	34 F	32	33	32	2.8	28	33	33	3.4	31	33	32	3.0	3.1	(31) J
20	30	30 P	29	2.9	2.9 F	2.8 P	2.9 P	3.1	3.3	34	34	31	33	3.2	3.4	3.3	3.4	3.4	33	3.3	3.2	3.1	3.0	29
21	29	29	2.8	2.8	3.0 V	2.9 V	29 FH	3.2 F	3.4	35	34 F	3.4	33	3.3	31	31	31	3.2	34	3.3	3.2	28	28	2.8 F
22	29 F	2.9	(29) FS	3.0 F	29 F	3.0 F	3.1 F	3.1 F	34	3.4 F	30 F	31 F	31	30 F	31	30	31	31	31	3.1	(3.0) FS	(29) SF	(30) SF	(2.6) JF
23	(2.6) FJ	(29) JF	(28) JF	(26) F	(2.4) F	(26) JF	(2.8) J	3.1	35	33 F	30 F	31	30 F	3.1 F	32	30	29	3.2	31	28	2.9 F	(26) JV	2.7 V	(2.8) JF
24	3.0 F	27 F	(2.9) JF	(2.9) JF	(2.4) F	(2.5) F	27 F	32 F	32	31	30 F	31	30 H	31	3.0	31	33	34	(3.3) JS	3.1	31 F	30 F	30	2.8
25	2.8 F	28 F	2.9 F	28 F	28 F	30 F	28 F	3.3	35	33	3.3	3.2	32 F	3.3	3.2	3.1	32	3.2	32	3.0	3.2	30 F	(3.0) FP	30 F
26	3.0 F	27 F	2.8 F	2.8 F	30 F	3.1 F	3.0 F	33	3.3	33	33	31 F	3.1	3.1	3.1	3.2	32	3.2	33	31 F	(3.0) JF	27	2.5 K	B K
27	B K	B K	B K	B K	B K	B K	B K	3.3 K	3.2 K	3.2 K	32 BK	3.0 K	3.0 K	30 K	30 K	3.1 K	3.1 K	3.1 FK	3.1 K	(3.0) SK	29 K	2.8 K	2.9 K	(2.7) SK
28	2.7 FK	K(2.4) JF	K(2.7) FJ	2.2 FK	K(2.4) FS	K(2.5) FJ	K(2.7) SF	2.9 K	29 K	2.8 K	29 K	3.0 K	30 K	M K	M K	M K	M K	3.1 K	3.0 K	3.0 K	3.0 K	3.0 K	(2.9) SK	(29) SK
29																								
30																								
31																								
Median	3.0	2.9	2.9	2.9	3.0	3.0	30	3.2	3.4	3.4	3.3	3.3	3.3	3.2	32	3.2	3.2	32	3.3	3.2	3.1	3.0	3.0	2.9
Count	27	26	26	25	25	25	25	26	26	25	26	28	27	26	27	27	27	28	26	28	26	28	28	25

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 44

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

IONOSPHERIC DATA

Form adopted June 1946

(M3000)F1 (Characteristic), ______ (Unit), February (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: McC., L.A.L., L.E., A.H.M.

Calculated by: McC., L.E.

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										C	C	L	L	L	L	L	L							
2										M	L	N	L	L	L	L	Q							
3										L	L	L	L	L	L	L	Q							
4										Q	L	L	L	L	L	L	Q							
5										Q	L	L	L	L	L	L	Q							
6									Q	L	L	L	L	L	L	L	L	Q						
7									Q	L	L	L	L	L	L	L	L	Q						
8									C	L	L	L	$(4.6)^{J}$	L	L	L	L	Q						
9									Q	L	L	L	3.8	3.9	L	L	L	Q						
10									Q	Q	L	L	4.0	L	L	L	L	Q						
11									Q	L	L	M	M	L	L	M	M	Q						
12									L	L	L	L	3.8	L	L	L	L	L						
13									Q	L	L	L	L	L	L	L	L	Q						
14									Q	4.2	L	L	L	3.9	L	L	L	Q						
15									L	L	4.2	L	$(3.8)^{L}$	L	L	L	L	Q						
16									Q	L	L	L	$(3.8)^{L}$	3.9	L	L	L	Q						
17									Q	L	L	L	L	L	L	L	L	Q						
18									L	L	3.8	3.8	3.8	$(3.6)^{P}$	$(3.6)^{P}$	L	L	Q						
19									Q	L	B	L	L	L	L	L	L	Q						
20									Q	L	L	L	L	L	L	L	L	Q						
21									L	L	L	L	L	L	L	L	L	Q						
22									Q	Q	L	L	L	3.6	L	L	L	Q						
23									Q	Q	Q	L	L	3.7	3.7	L	L	Q						
24									L	L	3.5	3.5	3.6	3.7	3.6	L	L	Q						
25									Q	L	L	L	L	3.6	L	L	L	Q						
26									Q	L	L	L	3.6^{P}	L	L	L	L	Q						
27									Q^{K}	L^{K}	L^{K}	3.6^{K}	3.5^{K}	3.5^{K}	3.5^{K}	3.5^{K}	L^{K}	L^{K}						
28									3.2^{P}_{K}	$(3.3)^{P}_{K}$	3.4^{K}	3.4^{K}	3.5^{K}	M^{K}	M^{K}	M^{K}	M^{K}	Q^{K}						
29																								
30																								
31																								
Median									–	–	–	–	3.8	3.7	–	–	–	–						
Count									1	2	4	4	11	9	4	1	–	–						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 45

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

IONOSPHERIC DATA

Form adopted June 1946

(M1500)E , ______ , February , 1951
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.

Lat. 38.7°N , Long. 77.1°W

75°W Mean Time

National Bureau of Standards
(Institution)

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

Calculated by: McC., L.E.

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										C	C	4.3	4.5^{H}	4.1	4.3	4.3	4.1^{H}	A						
2									A	M	4.3	4.3	4.3	4.3	4.5	4.3	4.5	A						
3								A	A	4.1	4.3	4.2	4.3	4.4	4.3	$(4.4)^{A}$	A	4.5						
4									A	A	4.1	4.2	4.2	$(4.3)^{B}$	4.2	4.4	A	4.0						
5									A	4.4^{F}	4.1	4.3	4.3	4.4	4.2	4.3	4.3							
6									4.2	4.2	4.2	4.2	4.2	4.2	4.3	4.3	4.2^{H}	4.3						
7									4.2	4.0	4.1	4.3	4.2	4.4	4.3	4.3	4.3	A						
8									C	4.3	4.2	4.3	4.2	4.5	4.4	A	4.4	4.1						
9									4.2	4.1^{H}	4.1	4.3	4.3	4.3	4.4	4.5	4.6	4.3						
10								4.5	A	4.4	4.4	4.4	4.4	4.3	4.4	4.5	4.3	4.0						
11									M	4.4	4.4	4.4	4.4	4.3	4.4	B	M	B						
12									B	A	4.3	4.3	4.3	4.3	B	B	4.5	4.6						
13									4.3	4.4	4.5	4.3	4.5	A	A	4.3	4.5	4.3						
14									4.1	4.1	4.2	4.2	4.3	4.3	4.3	4.4	4.4	4.2						
15									4.1	4.1	4.2	4.2	4.3	4.3	4.3	4.4	4.4	4.6						
16									4.1	4.1	4.0	4.4	4.3	4.4	4.1^{P}	4.3	4.1	4.0						
17									4.0	4.1	4.3	4.5	4.4	4.4	B	4.5	B	B						
18									4.3	4.0	4.2	4.2	4.3	4.4^{P}	B	B	B	B						
19									4.6	4.5	B	4.5	4.5	4.5	4.5	4.4	A	A						
20									4.3	4.0	4.3	4.6	4.4	4.3	4.4	4.3	4.3	A						
21									4.3	4.2	4.0	4.2	4.2	4.3	4.3	4.4	4.5	A						
22								4.5	A	4.3	4.4	4.3	4.5	4.3	4.4	4.4	4.4	B						
23								4.5	4.5	4.5	4.1	4.3	4.4	4.3	4.4	$(4.4)^{B}$	4.4	4.0						
24								4.4	4.5	4.0	4.3	4.4	4.4	4.4	A	A	4.5	4.2						
25								A	4.3	4.3	B	4.4	4.2	4.2	4.3	4.3	4.2	4.0^{H}						
26								4.4	4.3	4.3	4.2	4.2	4.2	4.4	4.5	4.6	4.5	4.3						
27								4.5^{K}	4.1^{P}_{K}	4.1^{K}	4.3^{K}	4.3^{K}	4.3^{K}	S^{K}	4.4^{K}	4.3^{K}	4.6^{K}	4.0^{K}						
28								A^{K}	$(4.6)^{A}_{K}$	4.4^{K}	4.2^{K}	4.2^{K}	4.1^{K}	M^{K}	M^{K}	M^{K}	M^{K}	4.1^{K}						
29																								
30																								
31																								
Median								4.5	4.3	4.2	4.2	4.3	4.3	4.3	4.4	4.4	4.4	4.2						
Count								6	18	24	25	29	28	25	22	22	21	17						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 46

Ionospheric Storminess at Washington, D. C.

February 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	1			4	2
2	1	1			1	1
3	3	1			1	1
4	2	1			1	2
5	2	2			2	4
6	1	2			5	2
7	2	2			3	2
8	2	2			2	3
9	1	1			3	4
10	2	1			4	3
11	1	1			4	3
12	2	2			4	3
13	1	2			4	3
14	1	2			2	2
15	3	2			1	1
16	2	2			0	0
17	2	2			0	1
18	2	2			2	2
19	1	2			2	2
20	1	2			2	1
21	1	3			3	3
22	1	1			5	4
23	2	2			5	4
24	2	3			5	3
25	2	2			3	3
26	2	2			3	3
27	#	5	0300	----	4	4
28	4	5	----	----	5	3

*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.

#No I-figure owing to insufficient data; conditions probably disturbed.

Table 47

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

Day	North Atlantic quality figure, Half day GCT (1)	(2)	CRPL* Warning, Half day GCT (1)	(2)	CRPL Forecasts (J-reports)	North Pacific quality figure, Half day GCT (1)	(2)	Geomagnetic K_{Ch}, Half day GCT (1)	(2)
1	6	6				5	5	2	2
2	6	5				(4)	5	3	3
3	5	5				(4)	(4)	3	2
4	6	6				(4)	5	2	1
5	6	6				5	6	2	2
6	6	6				5	(4)	2	1
7	5	5				5	5	1	1
8	6	5				(4)	5	2	2
9	6	6				(3)	5	3	1
10	6	5				5	6	1	3
11	5	6				(4)	6	3	3
12	(3)	5				5	6	(4)	3
13	(3)	(4)				(4)	6	(4)	2
14	(3)	(4)				5	6	3	3
15	(3)	(4)				5	6	3	3
16	(3)	(4)	U			5	6	2	3
17	(3)	(4)	U			(4)	6	3	1
18	(3)	5	U			6	6	1	1
19	(4)	(4)	W		X	(4)	5	2	3
20	(3)	6			X	(4)	5	2	1
21	(4)	5			X	5	(4)	1	(4)
22	(2)	(3)			X	(4)	(4)	(4)	(5)
23	(2)	(3)	W	U	X	5	5	(4)	3
24	(3)	(4)	U	(U)	X	(4)	6	2	2
25	(4)	5				(4)	5	2	1
26	(4)	5				(3)	6	2	3
27	(4)	5				5	6	(4)	3
28	5	5				5	5	3	3
29	5	5				5	5	3	2
30	5	5				6	6	2	3
31	(3)	5	W	W	X	(3)	(4)	(5)	3

Score:	Warning N.A.	Warning N.P.	Forecast N.A.	Forecast N.P.
H	4	7	11	8
(M)	5	0	0	0
M	17	15	15	12
G	35	37	33	36
O	1	3	3	6

*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 48a

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																																					
Feb. 1.9	-	-	-	-	-	3	5	8	5	5	5	5	5	5	8	10	5	3	3	3	8	10	10	5	3	-	-	-	-	-	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	3	5	8	13	15	20	15	10	12	12	8	5	3	3	3	3	3	3	3	3	3	3	3	3	3	-
9.9a	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	5	3	3	5	5	8	8	5	3	3	3	3	3	3	3	3	5	5	3	-	-	-
10.7a	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	3	3	5	8	3	2	2	2	2	2	2	2	2	2	2	2	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8a	-	-	-	-	-	-	3	3	3	3	3	3	5	5	5	5	5	3	3	3	3	3	3	3	3	3	-	-	2	3	3	3	2	-	-	-	-
15.8	-	-	-	-	-	3	3	3	3	3	3	3	3	5	5	5	5	2	2	3	8	12	8	5	3	3	3	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	3	3	3	5	5	8	10	12	15	17	12	15	12	12	17	12	8	8	5	3	-	-	-	-	-	-	-	-	-	-
17.8	-	-	-	3	3	3	3	3	3	5	5	8	8	15	18	20	25	25	20	20	15	15	12	10	10	8	3	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	2	2	3	3	5	8	10	8	8	8	8	10	13	15	10	8	3	3	3	2	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	2	2	2	2	2	2	3	3	2	2	3	3	3	8	10	12	8	5	2	2	2	2	2	-	-	-	-	-	-	-
23.0	X	X	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	10	12	5	3	2	-	-	-	-	-	-	-	-	-	-	-
23.7	-	-	-	-	-	-	-	2	2	3	3	5	5	3	3	3	5	3	5	8	10	18	20	8	3	3	1	1	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	2	2	3	3	3	2	2	3	8	8	8	3	2	2	2	2	5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-

Table 49a

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																																					
Feb. 1.9	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	5	5	3	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
7.7	3	3	3	3	2	2	2	2	2	2	3	2	3	3	15	8	15	20	12	3	15	8	5	5	3	5	3	2	2	3	3	3	2	2	3	3	5
9.9a	2	2	2	2	2	2	2	2	2	2	2	3	3	5	5	8	5	8	10	10	8	10	10	2	3	3	2	2	2	2	2	2	3	3	3	3	2
10.7a	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5	3	3	3	8	3	8	3	3	3	3	2	2	2	2	3	2	3	3	3	3
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8a	3	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	2	2	3	5	5	5	5	3	2	2	3	3	3	3	3	3	2	3	3	3
15.8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	8	8	8	5	5	12	8	3	3	3	3	2	2	2	2	2	2	3
16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	15	10	8	8	2	8	5	5	3	3	3	3	3	3	2	2	2	2	2	2	2
17.8	2	3	3	3	3	3	3	3	3	3	3	3	5	10	20	20	12	10	8	3	3	3	3	5	5	3	3	3	2	2	2	2	2	2	2	3	3
20.7	2	2	2	2	2	3	3	2	2	2	2	2	3	3	8	10	3	3	3	3	5	8	8	10	5	3	2	3	3	2	2	2	2	2	3	2	2
21.7	2	2	2	2	2	2	2	2	2	2	2	2	2	5	3	3	3	2	2	2	2	5	8	3	3	2	2	2	3	5	3	3	3	3	2	3	2
23.0	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	10	5	3	3	2	2	2	2	2	2	2	2	2	2	2	2
23.7	2	2	2	2.	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	8	20	20	10	8	8	2	2	2	2	3	2	2	2	2	2	3	-
26.7	2	2	2	2	2	2	-	-	-	-	-	-	2	2	2	2	2	2	3	5	8	8	10	5	3	3	3	3	3	3	3	2	2	2	3	2	2

Table 50a

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																																					
Feb. 1.9	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8a	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	3	5	2	2	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
17.8	-	-	-	-	-	-	-	-	2	2	2	2	2	2	3	5	8	8	5	5	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
23.0	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-

Table 48b

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																																					
Feb. 1.9	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	10	8	3	3	5	8	8	5	5	3	3	3	-	-	-	-	-	-	-	-
7.7a	-	-	-	-	-	-	2	2	2	3	3	5	8	12	15	20	25	20	15	12	12	15	17	20	25	15	15	12	8	-	-	-	-	-	-	-	-
9.9	-	-	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	X	X	X	X	-
10.7	-	-	-	-	3	3	3	3	3	3	3	3	5	5	5	12	25	20	8	5	5	8	12	15	15	14	12	12	10	10	10	3	3	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	10	10	8	8	8	10	10	10	10	8	5	5	5	5	3	3	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	5	3	3	3	3	5	5	5	3	3	3	3	3	3	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	8	5	5	3	3	8	10	8	5	3	3	3	-	-	-	-	-	-	-	-	-	-
17.8	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	5	3	3	8	12	20	20	12	8	5	3	3	3	3	3	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	10	12	12	10	8	5	3	3	3	3	3	2	-	-	-	-	-	-
21.7	-	-	-	-	-	-	2	2	2	2	2	-	-	-	2	2	3	5	3	8	5	8	8	5	3	3	3	2	2	2	-	-	-	-	-	-	-
23.0	-	-	-	-	-	-	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	X
23.7	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	5	8	8	5	5	5	5	5	5	3	3	2	2	2	2	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	3	2	2	5	3	3	3	2	3	3	2	2	2	2	2	3	3	2	-

Table 49b

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																																					
Feb. 1.9	2	2	2	3	3	3	3	3	3	3	2	2	3	3	3	5	8	12	5	5	3	3	3	2	2	2	2	2	2	-	-	-	-	-	-	-	-
7.7a	5	5	3	3	3	5	5	8	5	3	2	-	2	5	5	12	15	5	10	5	12	8	12	8	15	2	2	2	2	2	2	3	3	3	5	5	3
9.9	2	2	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	X	X	X	X	2
10.7	3	3	3	3	3	3	3	2	2	3	2	2	2	8	12	15	12	31	5	3	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	3
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	3	3	3	3	3	5	5	5	3	3	3	3	3	5	3	3	3	3	3	3	5	5	3	3	2	3	2	2	2	3	3	3	3	3	3	3	3
15.8	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	3	3	12	10	10	8	3	3	3	3	3	2	2	3	3	3	3	3	3	3
16.7	2	2	2	3	3	3	2	2	2	2	3	3	2	-	-	2	2	2	14	10	10	8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.8	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	3	8	10	28	17	18	20	10	3	3	3	3	3	3	3	3	3	3	3	3	5	2
20.7	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	5	5	8	2	8	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21.7	2	2	-	-	2	2	2	2	2	2	3	3	3	2	3	5	5	8	5	5	3	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23.0	2	2	2	2	2	2	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	X
23.7	3	2	-	-	-	-	-	-	-	-	-	-	-	2	3	8	10	2	2	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26.7	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Table 50b

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																																					
Feb. 1.9	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
7.7a	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	2	2	2	3	3	3	3	3	2	2	2	2	2	-	-	-	-	-	-
9.9	-	-	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	X	X	X	X	-
10.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	5	3	2	2	2	2	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-
13.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-
23.0	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	X	X
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 51a

Coronal observations at Sacramento Peak, New [illegible] ([illegible]), [illegible]

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																																					
Feb. 2.8a	-	-	-	-	-	5	5	5	5	8	8	8	8	8	8	8	8	10	3	5	10	12	10	8	8	8	8	-	-	-	-	-	-	-	-	-	-
4.7	-	-	-	-	-	-	5	5	8	8	5	5	5	5	8	8	8	22	3	8	8	8	8	10	10	5	-	-	-	-	-	-	-	-	-	-	-
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	10	8	8	5	5	5	5	5	5	5	5	5	5	-	-	-	-	-	-	-
7.8	-	-	-	-	-	-	-	-	-	-	3	3	3	5	10	15	20	22	12	12	12	12	10	5	3	-	-	-	-	-	-	-	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	-	-	3	3	8	10	12	13	15	17	8	12	15	22	15	8	5	8	8	3	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	3	3	5	8	10	10	10	8	8	8	15	25	25	20	5	5	8	8	5	5	5	5	5	3	3	3	-	-
10.7	-	-	-	-	-	-	-	3	3	3	5	8	8	8	10	12	10	12	10	12	15	25	15	10	8	8	8	5	5	5	5	5	5	5	3	-	-
11.7	-	-	-	-	-	-	-	-	-	3	5	8	8	10	12	12	15	15	13	13	15	15	12	10	8	8	5	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	3	5	8	10	8	8	10	12	13	15	8	10	10	8	8	8	5	3	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	3	5	8	10	10	12	12	12	14	15	14	14	8	10	15	20	15	12	10	8	8	3	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	3	5	8	10	12	12	12	15	15	20	25	35	31	20	33	31	22	15	12	10	5	3	-	-	-	-	-	-	-	-	-
18.8	-	-	-	-	-	-	-	3	3	5	8	10	12	15	15	17	25	35	38	25	20	17	15	12	12	8	8	3	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	3	5	8	8	10	10	12	12	12	12	12	12	15	17	22	22	12	10	8	3	3	-	-	-	-	-	-	-	-
22.9	-	-	-	-	-	-	-	5	5	5	8	8	8	10	8	8	10	8	8	10	15	31	31	17	10	5	5	5	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	3	5	8	8	8	12	15	15	20	20	12	10	5	5	8	5	3	3	3	3	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	3	5	8	8	10	10	12	13	15	15	10	10	8	5	8	8	8	5	5	3	3	3	-	-	-	-	-	-	-	-	-

Table 52a

Coronal observations at Sacramento Peak, New Mexico (0374A), 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																																					
Feb. 2.8a	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	5	3	3	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3
4.7	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	5	15	12	12	10	12	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	15	8	12	10	12	5	3	8	3	-	-	-	-	-	-	-	-	-	-	-	-
7.8	2	2	3	2	2	2	2	3	3	3	2	2	3	3	2	2	15	3	12	5	5	12	5	12	3	3	3	2	2	2	2	2	2	2	3	3	2
8.6	2	2	3	3	3	2	2	2	2	3	3	3	3	3	10	8	12	15	8	15	20	15	15	5	3	3	-	-	2	2	2	2	3	3	3	3	3
9.7	2	3	2	2	3	3	2	3	3	3	3	3	3	3	3	3	3	5	5	10	5	12	8	2	2	3	3	2	-	-	-	-	-	3	3	3	3
10.7	3	2	2	3	3	2	2	3	3	3	2	2	2	2	2	2	2	5	3	5	10	3	8	5	3	3	3	2	2	2	2	2	2	2	2	2	2
11.7	3	3	3	3	2	2	2	3	3	5	2	2	2	2	2	2	2	8	3	5	3	3	3	8	3	5	5	3	3	3	2	2	2	5	3	2	2
12.7	2	2	2	2	2	2	2	2	2	-	-	-	-	-	2	2	2	2	5	3	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2
15.7	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	2	2	8	5	5	8	10	12	10	5	3	3	3	3	3	3	3	2	2	2	2	2
16.8	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	2	8	15	12	8	8	3	8	5	3	3	5	3	3	3	3	3	3	2	2	2	2
18.8	2	2	2	2	2	2	2	2	2	-	-	2	3	3	3	2	8	15	12	2	2	8	3	3	5	3	3	-	-	-	-	-	2	2	2	2	2
20.7	3	2	2	2	2	2	2	2	2	2	2	2	3	8	8	5	8	5	3	5	5	5	8	8	3	3	3	5	8	5	3	2	2	3	3	3	2
22.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	12	15	12	8	3	2	2	2	2	2	2	2	2	2	2	2	2
26.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	5	8	8	8	5	3	3	2	2	2	2	2	2	2	2	2	2	2
28.7	2	2	2	2	2	2	2	2	2	-	-	-	-	-	2	3	8	6	8	3	5	3	3	3	3	3	3	2	2	2	2	2	3	3	3	3	3

Table 53a

Coronal observations at Sacramento Peak, New Mexico (0702A), 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																																					
Feb. 2.8a	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
7.8	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
18.8	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
22.9	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 51b

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																																					
Feb. 2.8	-	-	-	-	-	-	-	-	-	-	-	5	5	5	8	12	25	15	12	10	12	15	18	20	15	8	8	5	5	5	-	-	-	-	-	-	-
*4.7	-	-	-	-	-	-	-	-	-	-	-	-	3	8	12	15	25	22	25	30	35	35	25	18	12	8	5	3	-	-	-	-	-	-	-	-	-
5.7	-	-	-	-	-	-	-	-	-	-	-	5	5	8	10	12	12	10	12	15	15	12	13	13	10	8	8	X	X	X	X	X	X	X	X	X	X
7.8	-	-	-	-	-	-	-	-	-	3	3	5	8	12	15	20	38	35	18	15	18	22	33	35	38	22	20	8	5	5	3	3	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	3	3	8	10	12	14	17	20	28	25	12	10	10	15	20	22	31	25	17	12	10	10	8	5	-	-	-	-	-
9.7	-	-	-	-	3	3	3	3	3	3	5	8	10	12	12	18	31	31	10	12	12	15	15	20	22	22	15	8	8	8	5	3	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	3	5	8	10	10	8	8	25	14	15	10	12	15	20	25	25	25	15	12	12	12	10	5	3	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	12	20	15	10	15	20	35	38	28	17	12	10	12	12	12	8	3	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	5	8	8	10	15	17	25	28	17	14	10	8	3	10	10	3	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	3	5	8	8	10	10	10	8	8	10	12	12	12	12	8	8	8	8	5	3	3	-	-	-	-	-
16.8a	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	8	12	10	10	12	15	20	25	15	12	10	8	8	5	3	3	-	-	-	-	-	-
18.8	-	-	-	-	-	-	-	-	-	-	-	3	5	8	8	8	8	10	12	15	20	25	15	12	8	5	5	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	15	22	20	15	15	10	8	5	5	3	3	3	-	-	-	-	-	-	-
22.9	-	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	X	-	-	-	-	-
26.7	-	-	-	-	3	3	5	5	5	3	3	3	3	3	8	8	10	10	8	8	12	15	15	10	10	10	8	8	-	-	-	-	-	-	-	-	-
28.7	-	-	-	3	3	3	3	3	3	3	3	5	5	8	8	8	8	8	8	8	10	12	15	12	12	12	10	3	-	-	-	-	-	-	-	-	-

* Feb. 4.7 Yellow line intensity 3, 5° thru 15° N, west limb

Table 52b

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																																					
Feb. 2.8	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	12	10	8	3	3	5	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2
4.7	2	2	2	2	2	2	2	2	2	3	2	2	3	3	5	12	12	10	12	15	20	15	25	8	3	2	2	2	2	2	2	2	2	2	2	3	3
5.7	-	-	-	-	-	-	-	2	3	3	2	2	3	3	3	3	2	2	5	10	5	10	10	3	-	-	-	X	X	X	X	X	X	X	X	X	X
7.8	2	2	2	3	2	2	3	3	5	5	3	2	2	2	2	3	15	8	3	3	12	5	8	3	10	2	2	3	3	2	2	2	2	3	3	2	2
8.6	3	2	3	3	2	2	2	5	2	2	2	2	2	2	8	17	5	10	3	8	8	5	3	5	5	2	2	2	2	2	2	2	2	2	2	2	2
9.7	3	3	3	3	3	3	3	3	2	2	-	-	-	2	15	12	15	5	3	2	-	-	-	2	3	2	3	3	3	3	5	3	3	3	3	2	2
10.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	12	25	12	8	3	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	3
11.7	2	3	3	3	3	3	3	2	2	2	2	2	3	3	3	15	28	8	3	2	2	-	-	5	2	2	2	2	2	3	3	3	3	2	2	2	3
12.7	2	-	-	-	-	-	-	-	-	-	-	2	2	3	3	8	10	3	2	2	2	-	5	3	2	-	-	-	-	-	-	-	-	-	2	2	2
15.7	2	2	2	2	2	2	2	2	2	2	3	3	2	-	-	-	5	3	13	12	12	12	8	5	5	5	3	2	2	2	2	2	2	2	2	2	2
16.8a	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	2	2	8	15	14	22	20	10	5	3	2	2	-	-	-	-	2	2	2	2	2	2
18.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	20	12	12	15	12	3	-	-	-	-	-	2	2	2	2	2	2	2	2	2
20.7	2	2	2	2	2	2	3	3	3	3	3	2	2	3	3	5	5	5	8	8	12	2	8	2	2	2	2	2	2	2	2	2	2	2	3	3	3
22.9	2	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	X	2	2	2	2	2
26.7	2	2	2	2	2	2	2	2	3	2	3	3	3	2	2	2	2	3	3	3	2	2	3	2	2	2	8	8	5	3	3	3	3	3	2	2	2
28.7	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	2	2	-	-	-	-	-	-	-	2	2	2

Table 53b

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																																					
Feb. 2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	-	-
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	X	X	X	X	X	X	X	X	X	X
7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
8.6	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	2	2	2	2	2	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	3	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
18.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
22.9	-	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	X	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 54

Zürich Provisional Relative Sunspot Numbers

February 1951

Date	R_Z*	Date	R_Z*
1	97	16	54
2	84	17	50
3	62	18	38
4	53	19	36
5	40	20	41
6	35	21	44
7	43	22	51
8	53	23	55
9	60	24	61
10	69	25	67
11	74	26	72
12	66	27	80
13	62	28	65
14	59		
15	51	Mean:	57.9

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

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

Table 55

Outstanding Solar Flares, January 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
Boulder	Jan. 3*	1855	1905	10	50	E33	S06	1858	6	5		
"	" 3	1915	1928	13	50	E33	S06	1920	8	6		
"	" 6*	1800	1810	--	40	W08	S02	1801	6	9		
"	" 6*	1837	1847	--	50	W05	S03	1838	6	7		
"	" 6	1902	1950	48	120	W07	S01	1908	20	5		
"	" 6	2002	2120	--	100	W04	S03	2034	8	4		
"	" 7	1625	1700	35	150	W17	S01	1641	8	6		
"	" 7	2057	2125	--	50	W22	S06	2104	6	3		
"	" 10	2045	2108	--	100	W61	S10	2104	10	5		
"	" 18	1803	--	--	120	W03	N19	1815	8	5		
"	" 20	1825	1833	--	120	W42	N24	1830	10	3		
"	" 22**	1625	1700	35	--	E90	N12	--	--	5	–	Yes
Meudon	" 25	1028		--		E55	N05				1	
Schauinsland	" 26	1040		20		E60	N10					
Boulder	" 30	2055	2122	27	60	W27	N22	2109	8	8		

*The High Altitude Observatory reports that this event has some, but not all, of the typical characteristics of a flare.

**Brilliant limb event.

Table 56

Indices of Geomagnetic Activity for January 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	2.6 2.1 2.0 1.7 2.4 3.0 2.3 2.6	18.7	0.6	3o3-2+2- 3-3o3-3-	21-	Five
2	2.5 3.1 3.1 2.5 3.5 3.1 4.1 3.1	25.0	1.1	3o4o4-3- 4-3o4o3+	27+	Quiet
3	2.7 3.9 1.8 1.9 2.1 1.6 2.5 2.5	19.0	0.7	3+5o2+2o 2+2o3-3+	23o	
4	1.7 1.5 1.0 0.7 0.7 2.2 1.8 2.3	11.9	0.2	3-2+1-0+ 0+2o2-3-	13-	4
5	1.8 1.5 1.2 1.6 1.9 2.1 3.5 3.5	17.1	0.7	2o2o1+2- 2o2o4-4-	18+	6
						7
6	1.8 1.6 1.0 1.0 1.2 0.8 2.3 0.6	10.3	0.2	2o2o1o1o 1o1-2+0+	10+	9
7	0.6 1.1 1.4 1.0 0.8 1.0 1.1 1.4	8.4	0.0	0+2-2-1+ 1o1o1o1+	9+	18
8	1.8 0.8 2.1 2.3 2.7 2.4 1.8 1.0	14.9	0.5	2o1-3o3- 3o2+2-1-	16o	
9	1.4 1.8 1.9 2.0 1.8 1.3 0.5 0.9	11.6	0.2	1+2+2+2+ 2-1o0+1-	12o	
10	1.1 0.9 1.0 0.8 1.2 4.1 4.2 3.3	16.6	1.0	1o1o1+0o 1o4o4+3+	16o	
11	3.9 1.9 2.7 2.3 1.7 2.4 3.6 4.0	22.5	1.1	5o2o4-2+ 2-2+4-4o	25-	Five
12	3.6 2.9 3.1 3.5 2.6 2.6 2.4 1.9	22.6	0.9	4+4-4-4- 3o3o2+2o	26-	Dist.
13	2.9 3.2 3.2 2.2 1.6 1.3 3.9 3.0	21.3	0.8	3+4o4o2+ 2-1+4-3o	23+	
14	2.8 2.4 2.6 2.5 3.2 2.9 2.9 3.2	22.5	0.8	3+3o3o3o 3+3o3-3+	25-	2
15	3.5 3.3 2.4 2.4 3.0 2.4 3.3 3.9	24.2	1.0	4+4+3o2+ 3+3-3+4o	27+	21
						22
16	3.0 1.4 2.1 2.9 3.6 3.5 3.5 4.1	24.1	1.0	4-2-3-3+ 4o4-3+5-	27o	23
17	3.3 2.9 2.3 1.6 1.1 1.1 1.5 1.4	15.2	0.5	4o4-3o2o 1-1+1+1+	17+	
18	1.0 1.3 1.1 1.3 2.3 2.1 0.9 2.6	12.6	0.3	1o2-1o1o 2+2+1o3-	13o	
19	3.1 2.0 2.1 1.9 2.8 2.3 3.3 4.2	21.7	1.1	4-3-2+2o 3+2+3o4-	23o	
20	3.4 1.7 1.2 1.4 2.2 2.0 1.0 1.1	14.0	0.6	4o2o1o1+ 2+2+1-1-	14+	
						Ten
21	0.9 0.5 1.0 2.7 3.6 4.6 3.9 4.4	21.6	1.2	1o0o1-3o 4o5-4-5o	22o	Quiet
22	4.3 3.8 4.2 3.4 4.4 4.5 5.1 5.3	35.0	1.6	5+5o6-4+ 5o5o5+6o	42-	
23	3.9 2.3 2.9 3.2 3.1 3.2 3.8 3.2	25.6	1.2	5-3-4-4o 3+4-4-3+	29o	4
24	1.3 2.3 2.1 2.2 2.9 1.7 2.3 2.2	17.0	0.5	2-3o3-3- 3+2-2+2+	20-	6
25	1.3 1.4 1.7 1.8 2.3 1.2 2.4 2.0	14.1	0.3	2-2+2+2o 3-2-2+2-	17-	7
						8
26	0.8 1.4 1.6 1.9 2.4 4.0 4.3 3.3	19.7	1.2	1-1+2-2+ 2+4-4-4-	19+	9
27	2.6 3.5 3.1 2.2 2.3 3.0 3.2 3.1	23.0	0.8	3+5-4o3- 2+3o3o3+	26+	17
28	3.2 2.9 2.2 2.8 2.9 3.3 4.2 3.5	25.0	1.0	4-4-3-3+ 3+3+4+4-	28o	18
29	1.6 2.4 2.3 3.0 2.2 2.4 2.8 3.2	19.9	0.6	2o3o3o4- 2+3-3-4-	23o	20
30	2.6 2.1 2.6 2.2 1.9 3.4 3.3 3.9	22.0	0.9	3o2+3+3- 2o3+3o4o	24-	24
31	3.9 4.7 5.2 4.3 3.8 4.2 4.1 4.0	34.2	1.6	4+6-7-5+ 4o4+4+4+	39o	25
Mean	2.42 2.21 2.20 2.17 2.39 2.57 2.90 2.86	2.46	0.78			

Table 57

Sudden Ionosphere Disturbances Observed at Washington, D. C.

February 1951

1951 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
February					
19	1400	1620	Ohio, D. C., Colombia, England, New Brunswick	0.0	
24	1425	1455	Ohio, D. C., Colombia, England, New Brunswick	0.05	Solar flare** 1435
25	1400	1500	Ohio, D. C., Colombia, England, New Brunswick	0.05	

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

**Time of observation at Meudon Observatory, France.

Table 58

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc., as Observed at Riverhead, New York

1951 Day	GCT Beginning	GCT End	Location of transmitters
February 19	1412	1530	Argentina, California, Canada, England, Italy, Morocco, Panama

Table 59

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief, Cable and Wireless, Ltd., as Observed in England

1951 Day	GCT		Receiving station	Location of transmitters	Other phenomena
	Beginning	End			
January					
22	1630	1705	Brentwood	Barbados, Belgian Congo, Canary Is., Chile, Colombia, Portugal, Southern Rhodesia, Uruguay, Venezuela, Yugoslavia	Terr.mag.pulse* 1625-1705
22	1630	1650	Somerton	Argentina, Ascension I., Brazil, Canada, New York, Union of S. Africa	Terr.mag.pulse* 1625-1705
February					
19	1420	1520	Brentwood	Barbados, Belgian Congo, Canary Is., Chile, Eritrea, Kenya, New York, Portugal, Southern Rhodesia, Spain, Uruguay, Venezuela, Zanzibar	
19	1425	1505	Somerton	Argentina, Australia, Brazil, Canada, Gold Coast, New York, Union of S. Africa	

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

Table 60

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc., as Observed at Point Reyes, California

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
February				
25	2254	2310	Australia, China, Japan, New York, Philippine Is.	
26	0205	0300	Australia, China, Hawaii, Japan, Korea, Philippine Is.	
March				
2	2059	2130	Australia, China, Japan, Philippine Is.	Terr.mag.pulse* 2057-2105

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

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

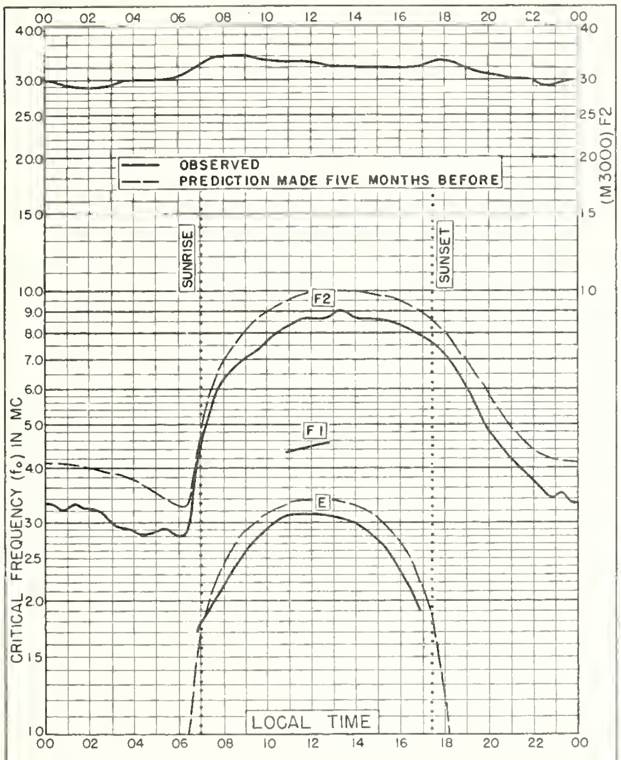

Fig. I. WASHINGTON, D. C.
38.7°N, 77.1°W FEBRUARY 1951

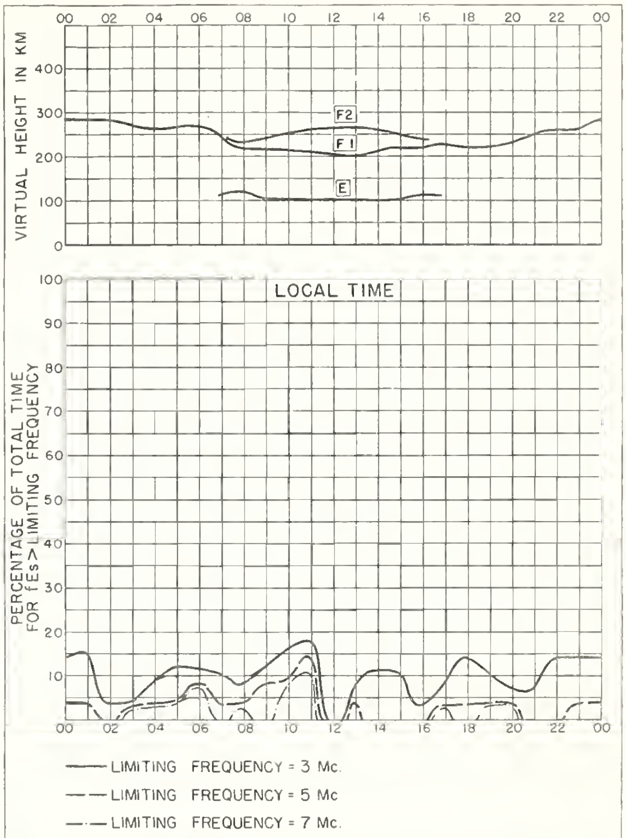

Fig 2. WASHINGTON, D. C. FEBRUARY 1951

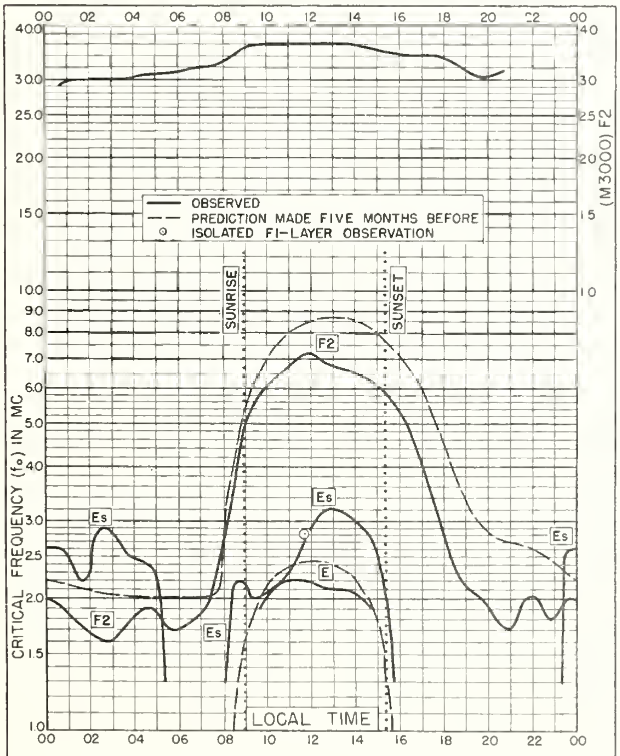

Fig. 3. OSLO, NORWAY
60.0°N, 11.0°E JANUARY 1951

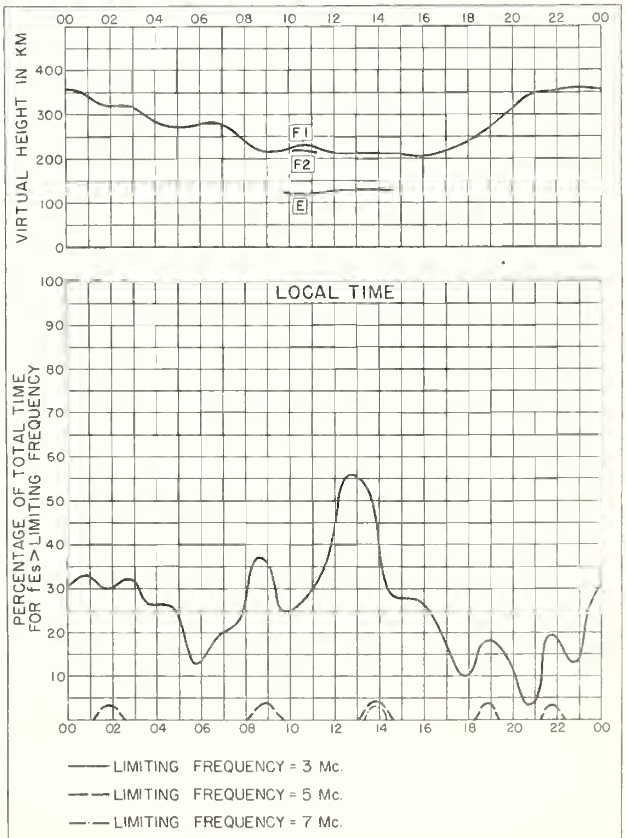

Fig. 4. OSLO, NORWAY JANUARY 1951

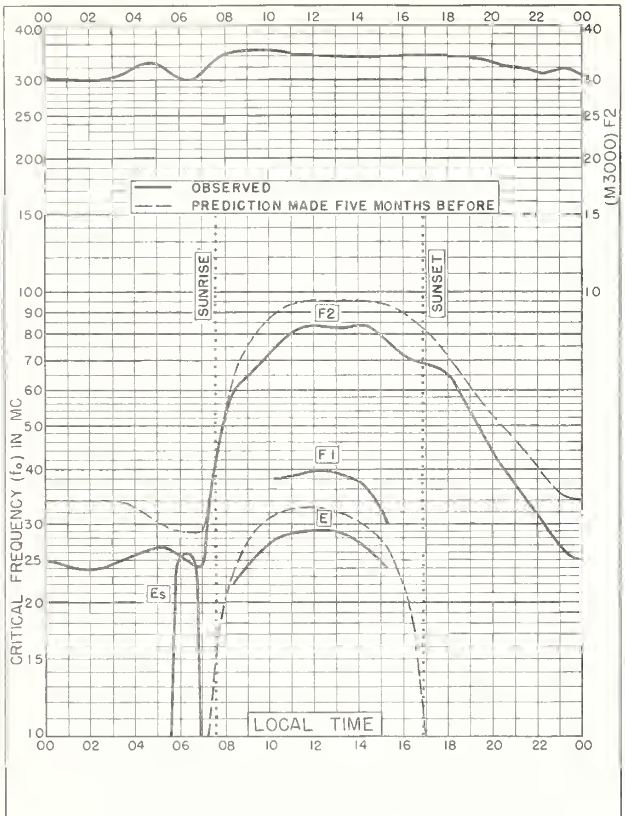

Fig. 5. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W JANUARY 1951

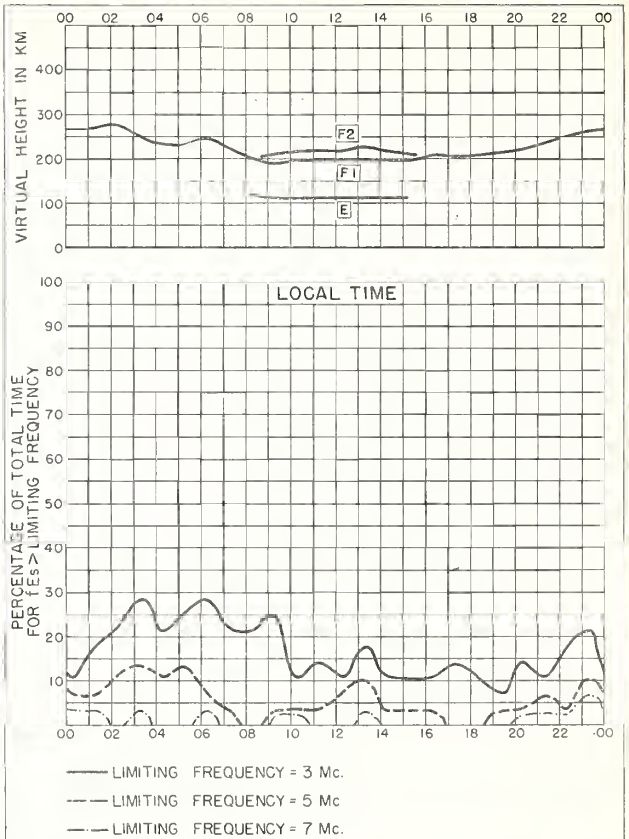

Fig. 6. BOSTON, MASSACHUSETTS JANUARY 1951

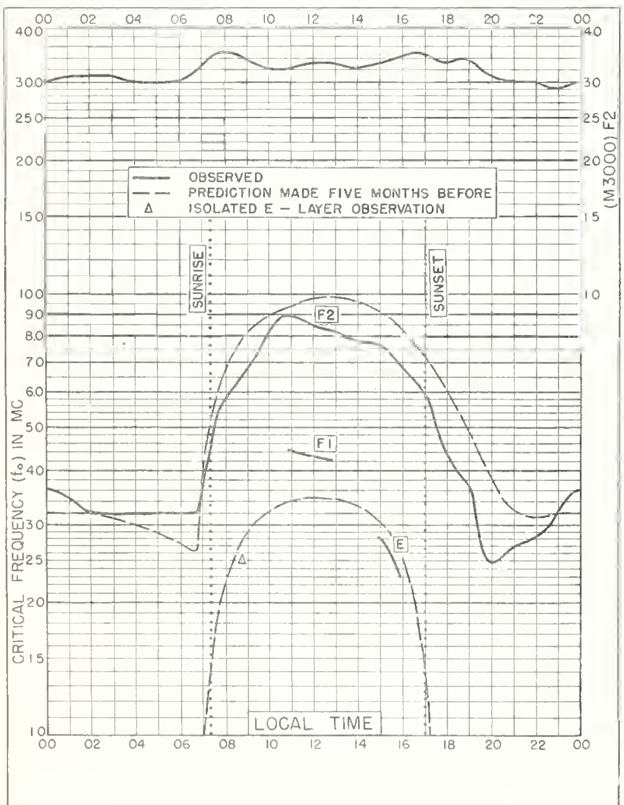

Fig. 7. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W JANUARY 1951

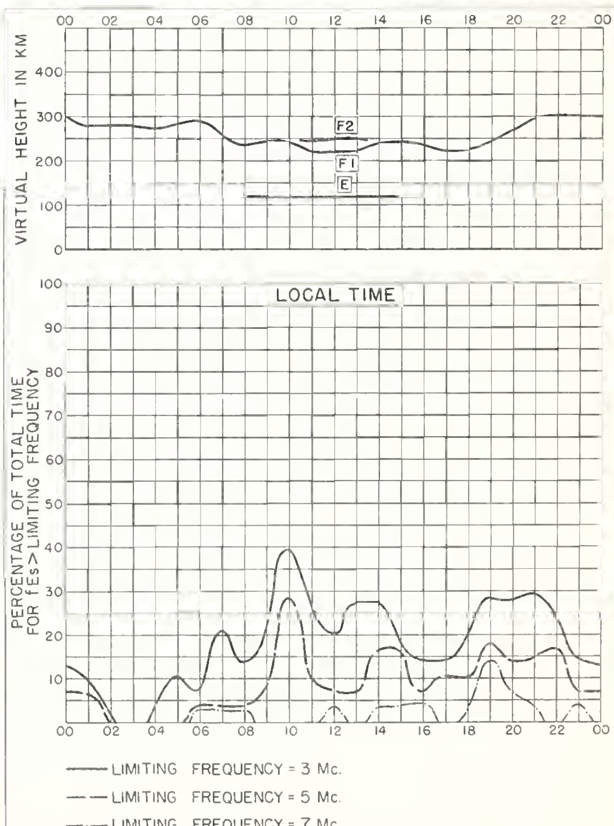

Fig. 8. SAN FRANCISCO, CALIFORNIA JANUARY 1951

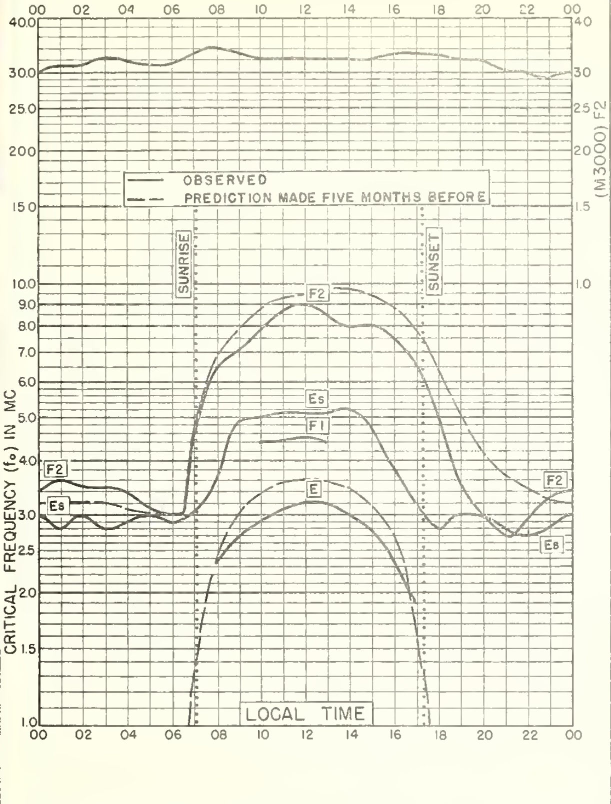

Fig. 9. WHITE SANDS, NEW MEXICO
32.3°N, 106.5° W JANUARY 1951

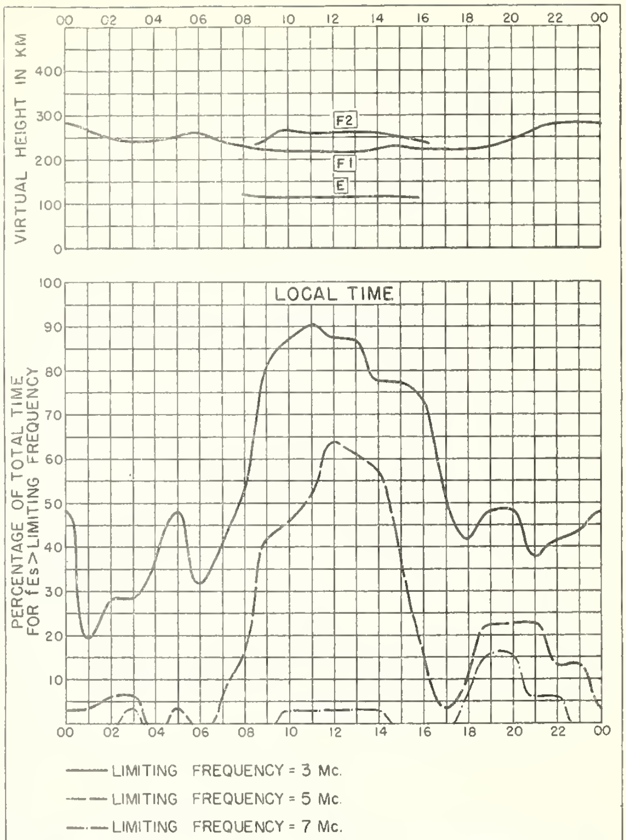

Fig. 10. WHITE SANDS, NEW MEXICO JANUARY 1951

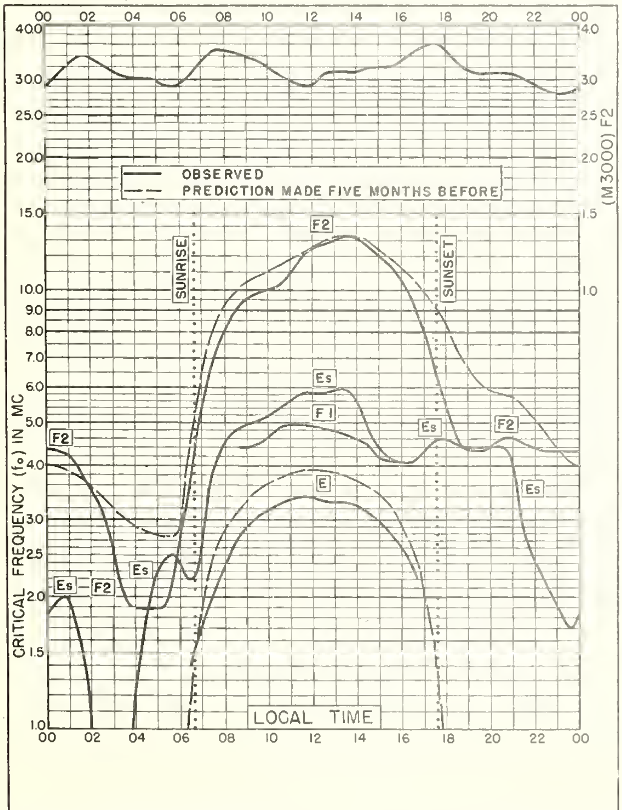

Fig. 11. MAUI, HAWAII
20.8°N, 156.5° W JANUARY 1951

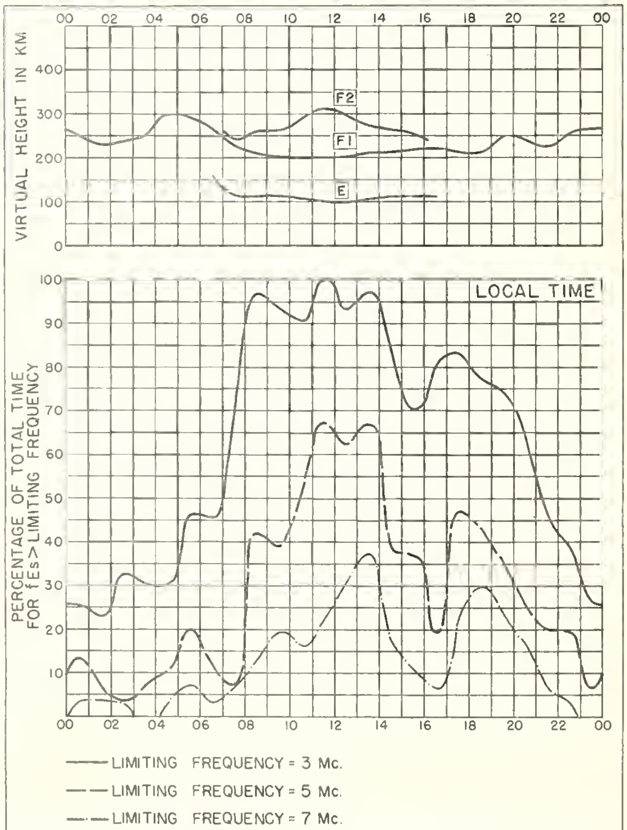

Fig. 12. MAUI, HAWAII JANUARY 1951

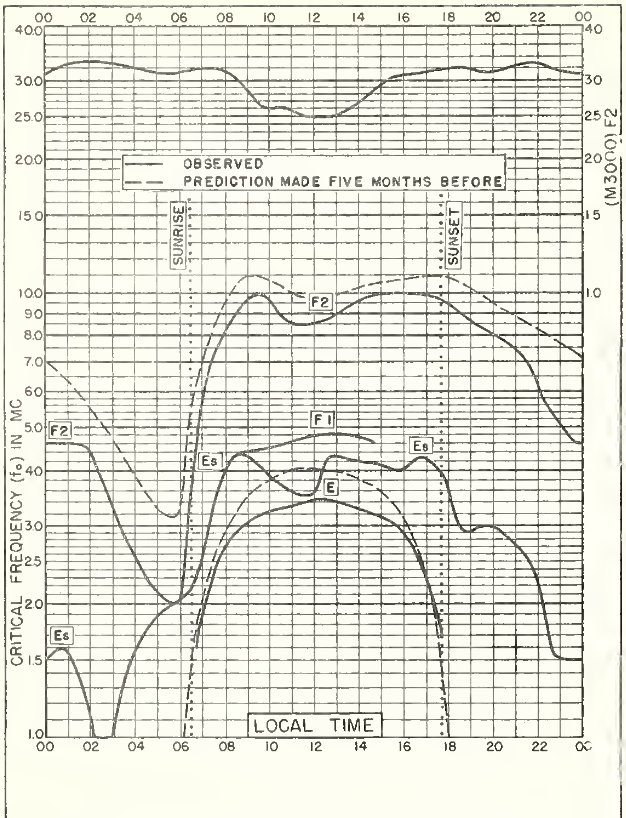

Fig. 13. GUAM I.
13.6°N, 144.9°E JANUARY 1951

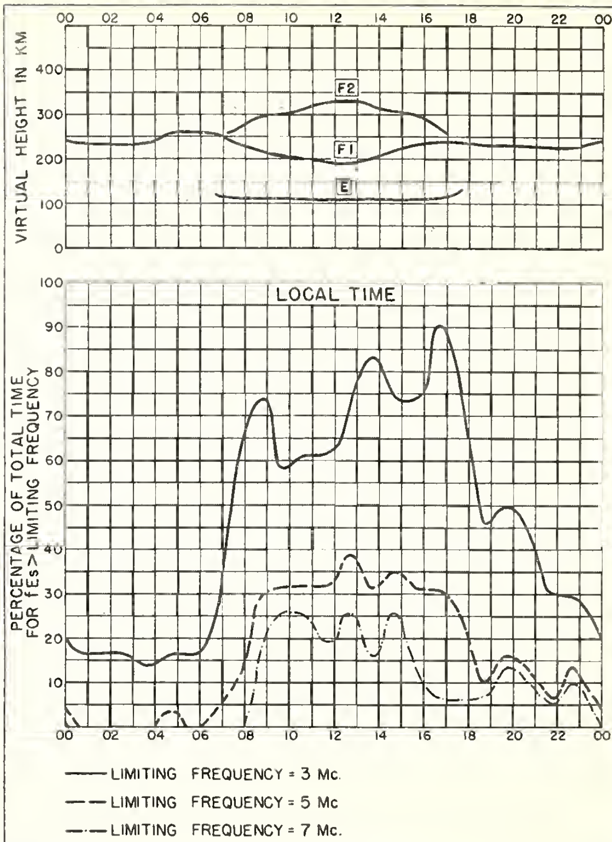

Fig. 14. GUAM I. JANUARY 1951

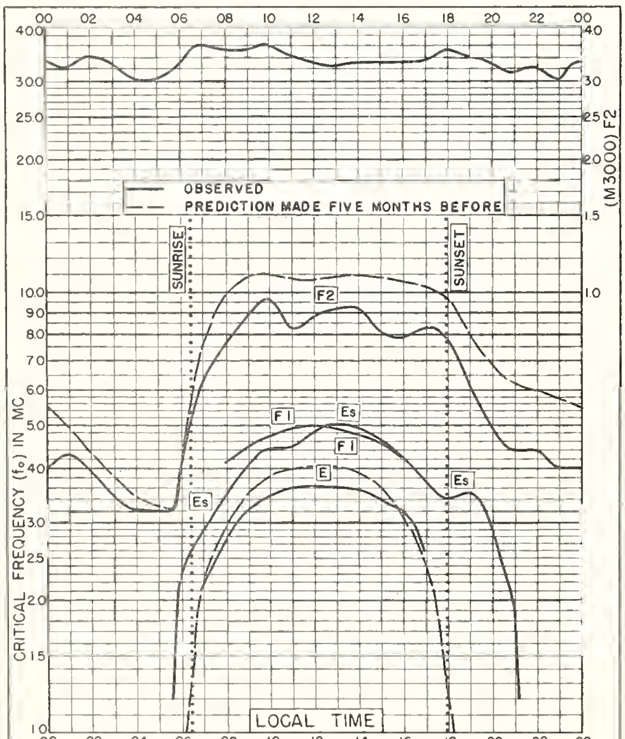

Fig. 15. TRINIDAD, BRIT. WEST INDIES
10.6°N, 61.2°W JANUARY 1951

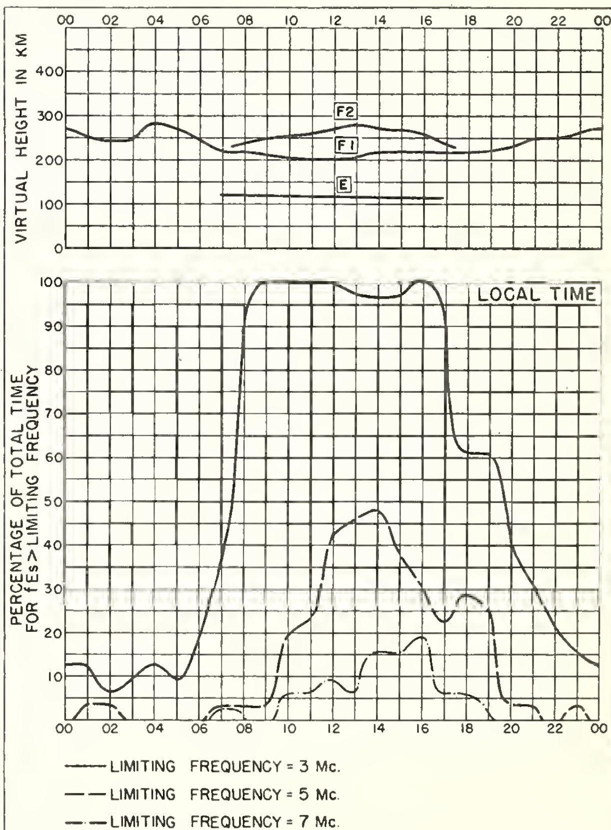

Fig. 16. TRINIDAD, BRIT. WEST INDIES JANUARY 1951

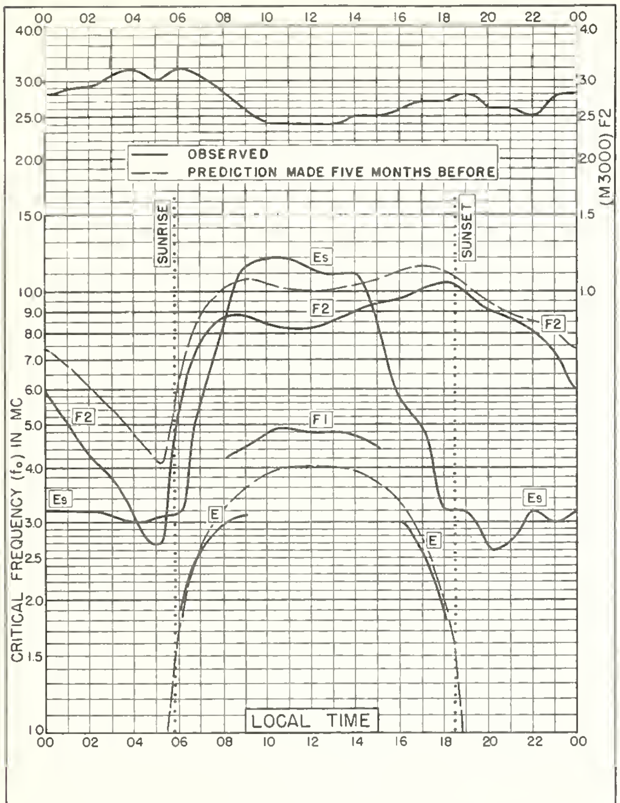

Fig. 17. HUANCAYO, PERU
12.0°S, 75.3°W JANUARY 1951

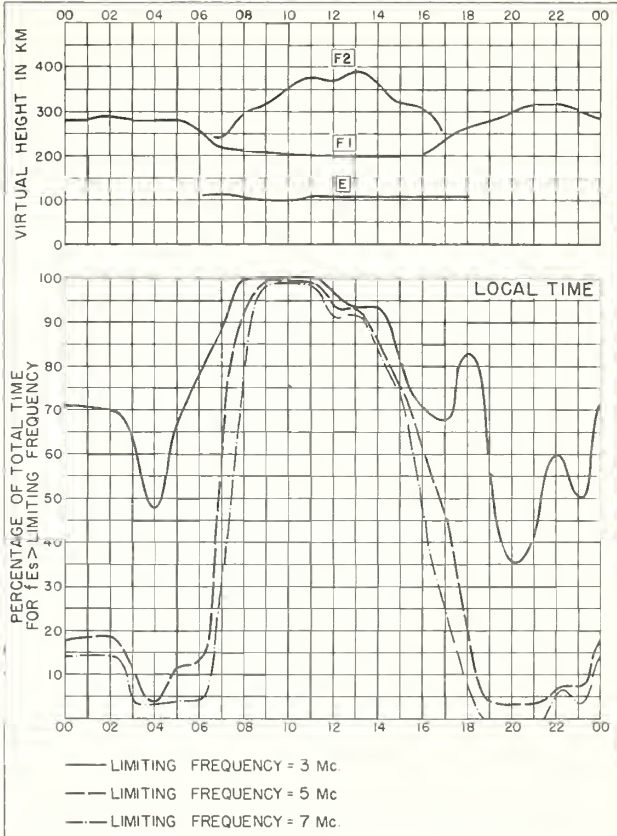

Fig. 18. HUANCAYO, PERU JANUARY 1951

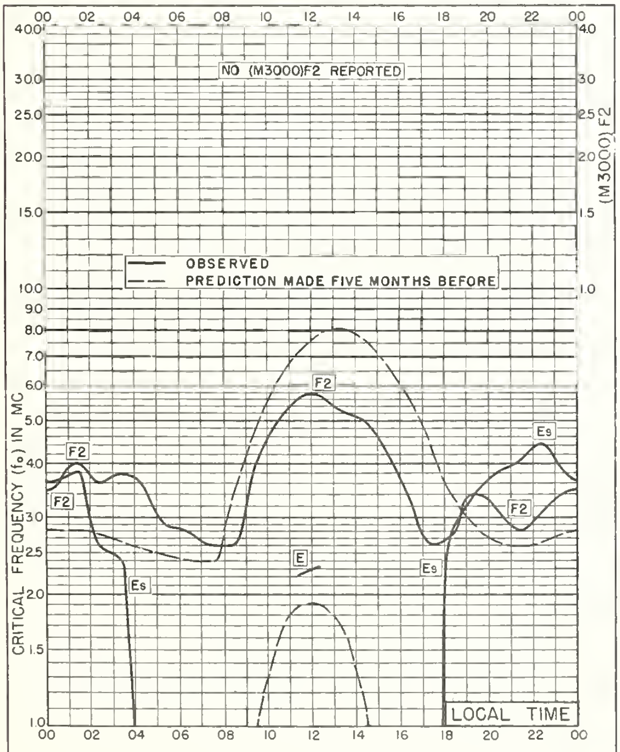

Fig. 19. KIRUNA, SWEDEN
67.8°N, 20.5°E DECEMBER 1950

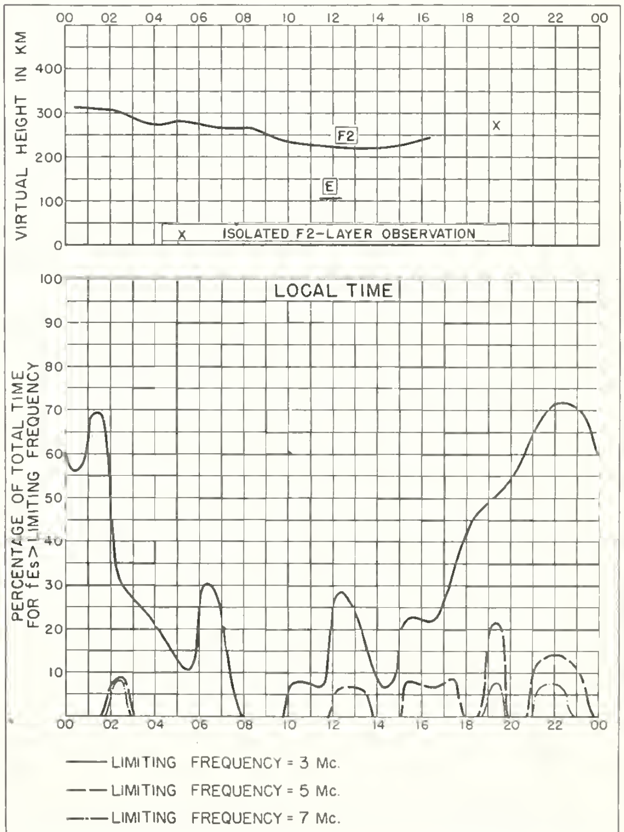

Fig. 20. KIRUNA, SWEDEN DECEMBER 1950

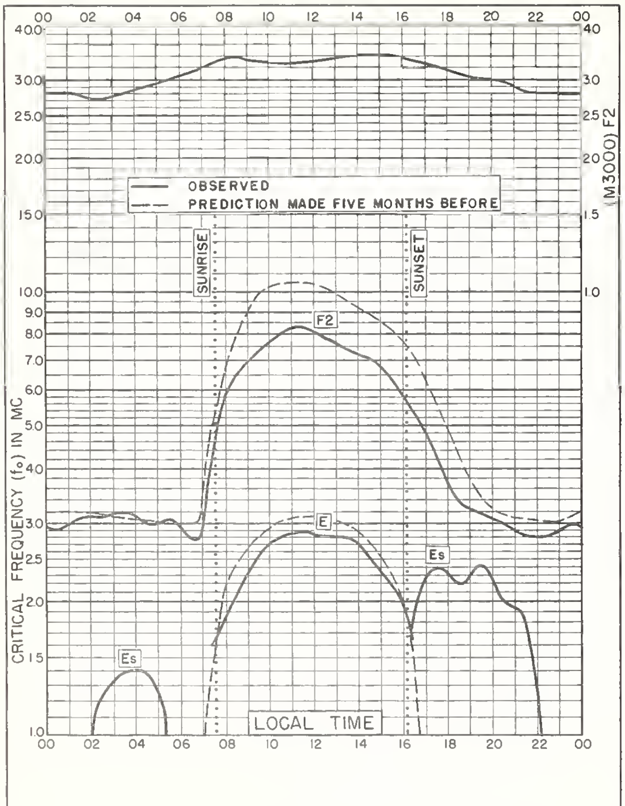

Fig. 21. WAKKANAI, JAPAN
45.4°N, 141.7°E DECEMBER 1950

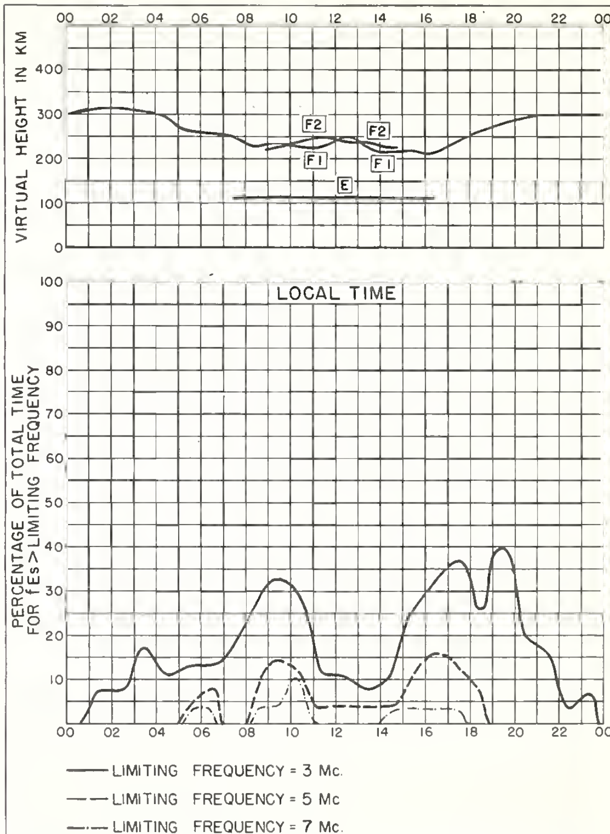

Fig. 22. WAKKANAI, JAPAN DECEMBER 1950

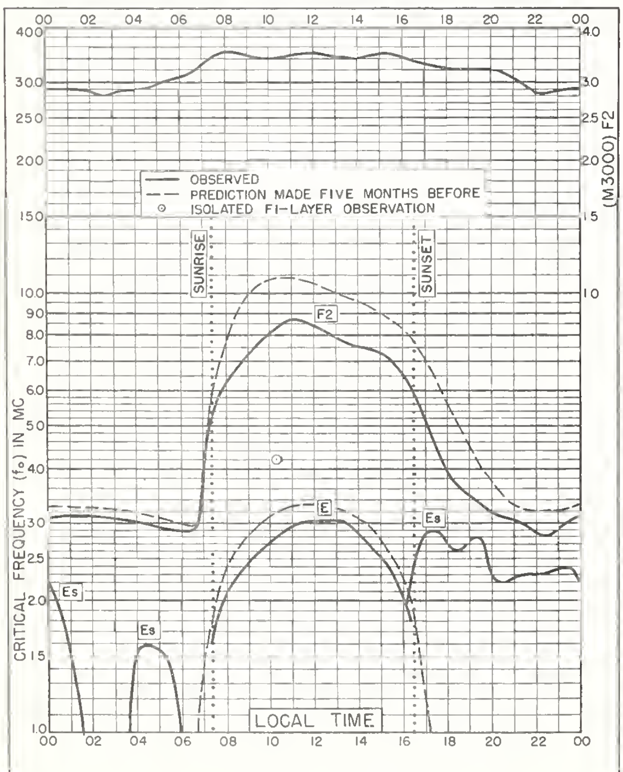

Fig. 23. AKITA, JAPAN
39.7°N, 140.1°E DECEMBER 1950

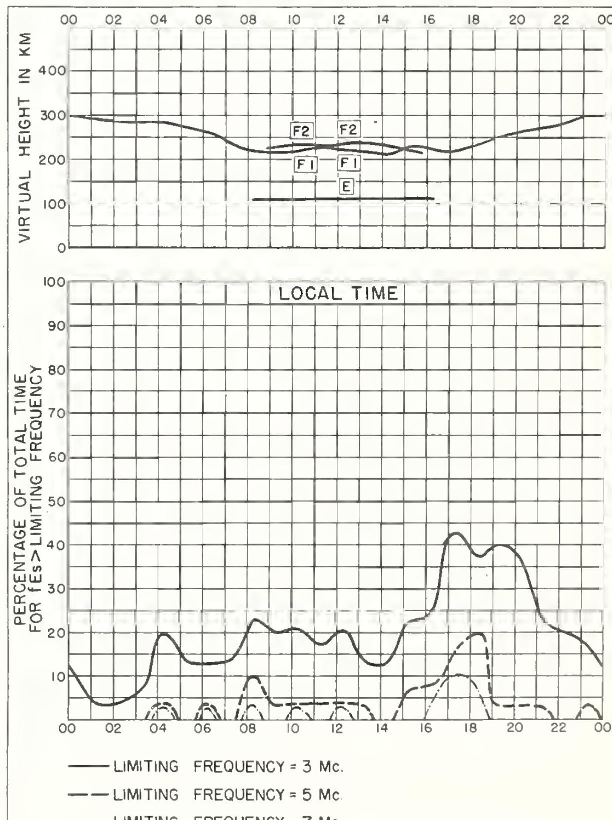

Fig. 24. AKITA, JAPAN DECEMBER 1950

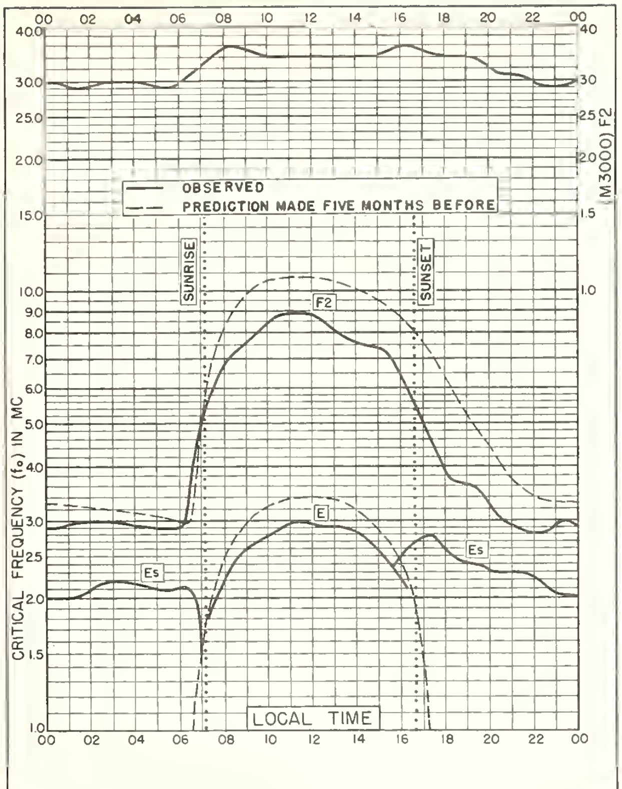

Fig. 25. TOKYO, JAPAN
35.7°N, 139.5°E DECEMBER 1950

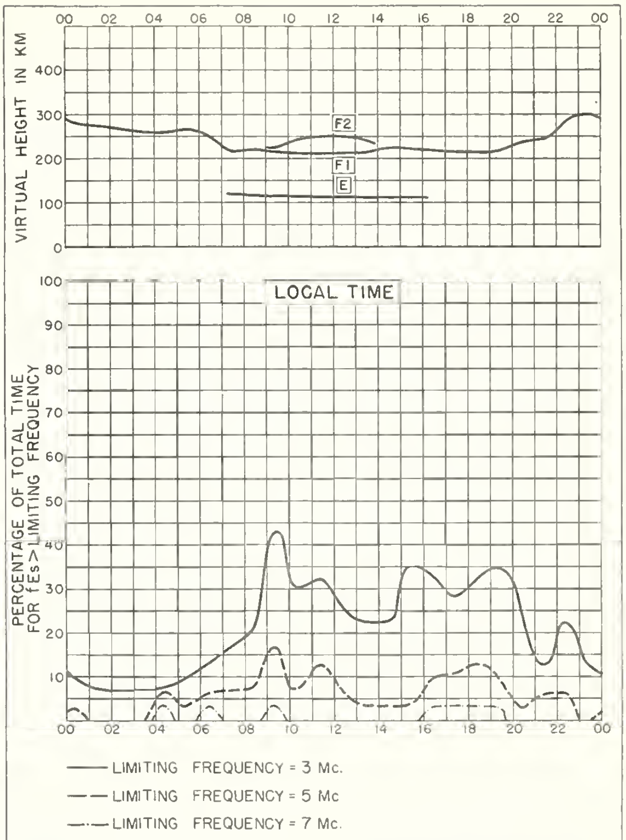

Fig. 26. TOKYO, JAPAN DECEMBER 1950

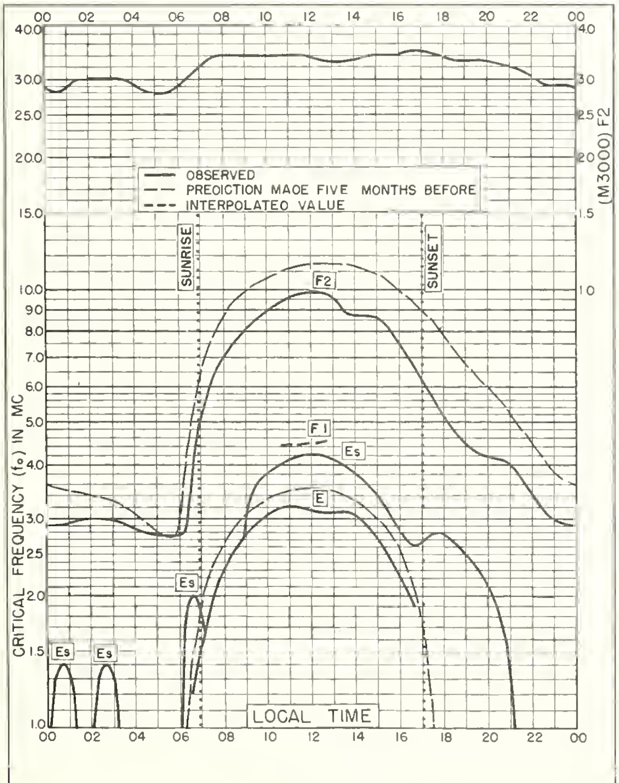

Fig. 27. YAMAGAWA, JAPAN
31.2°N, 130.6°E DECEMBER 1950

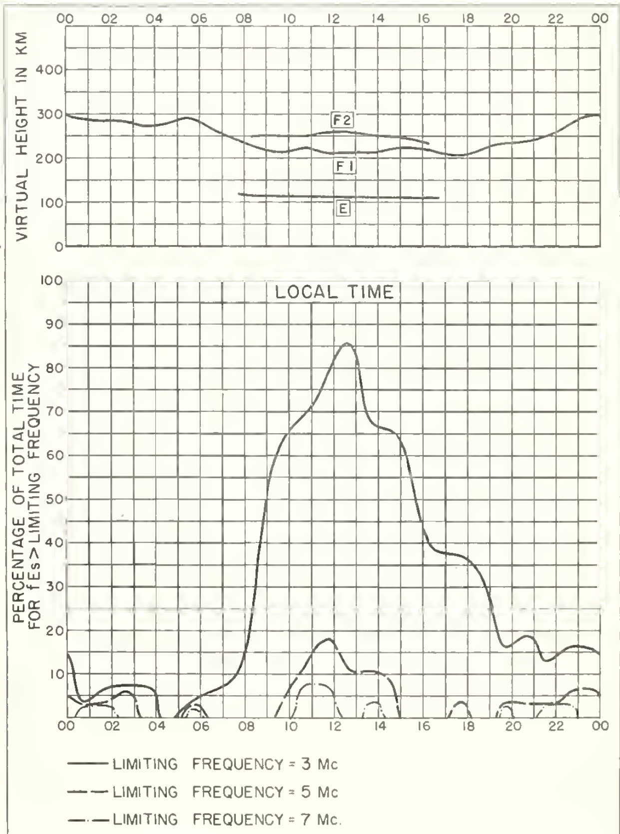

Fig. 28. YAMAGAWA, JAPAN DECEMBER 1950

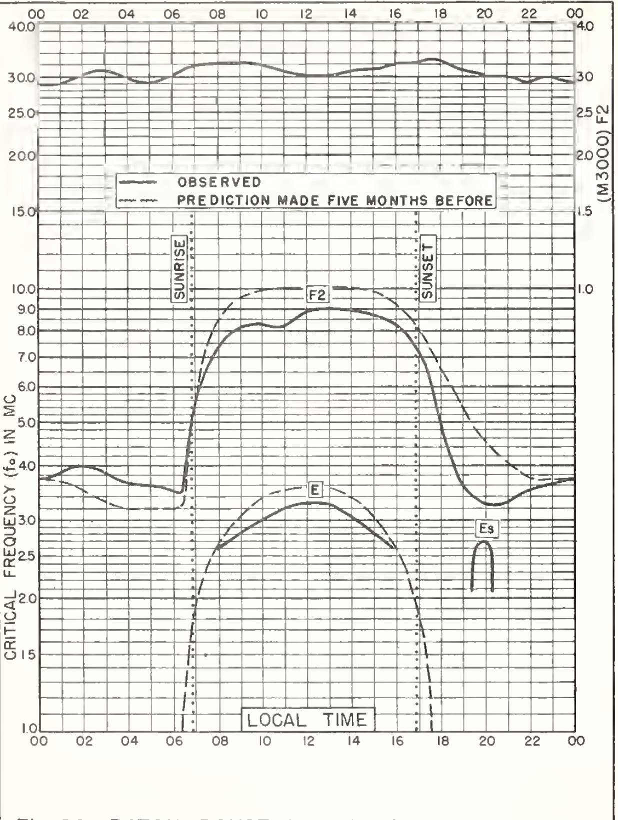

Fig. 29. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W DECEMBER 1950

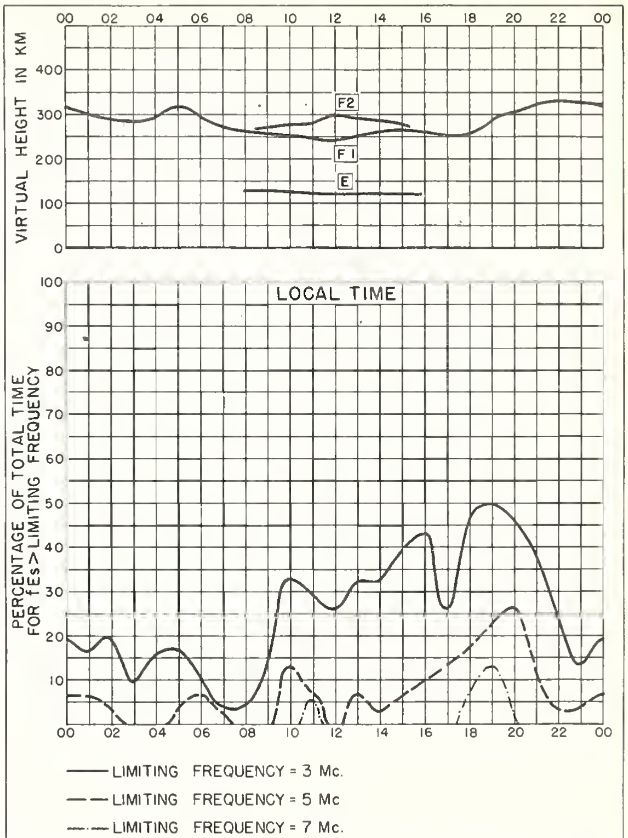

Fig. 30. BATON ROUGE, LOUISIANA DECEMBER 1950

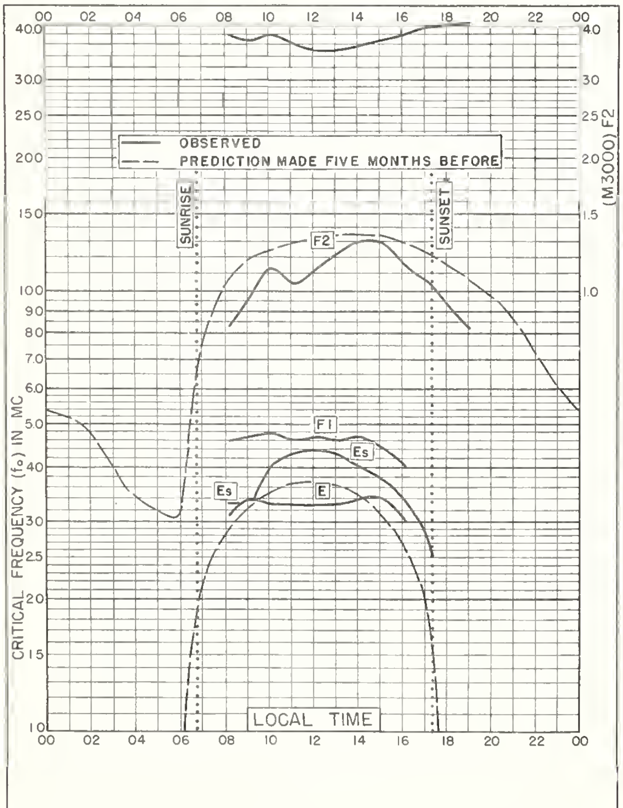

Fig. 31. FORMOSA, CHINA
25.0°N, 121.0°E DECEMBER 1950

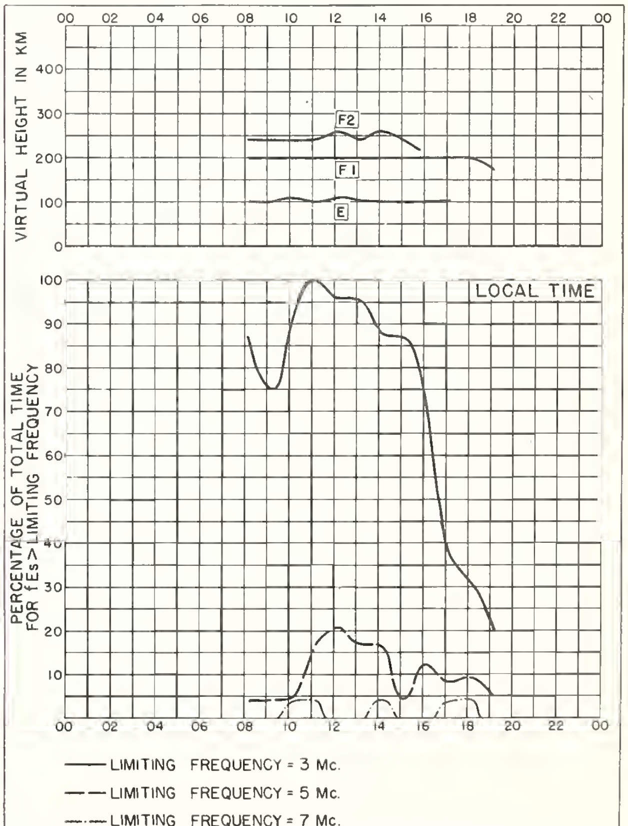

Fig. 32. FORMOSA, CHINA DECEMBER 1950

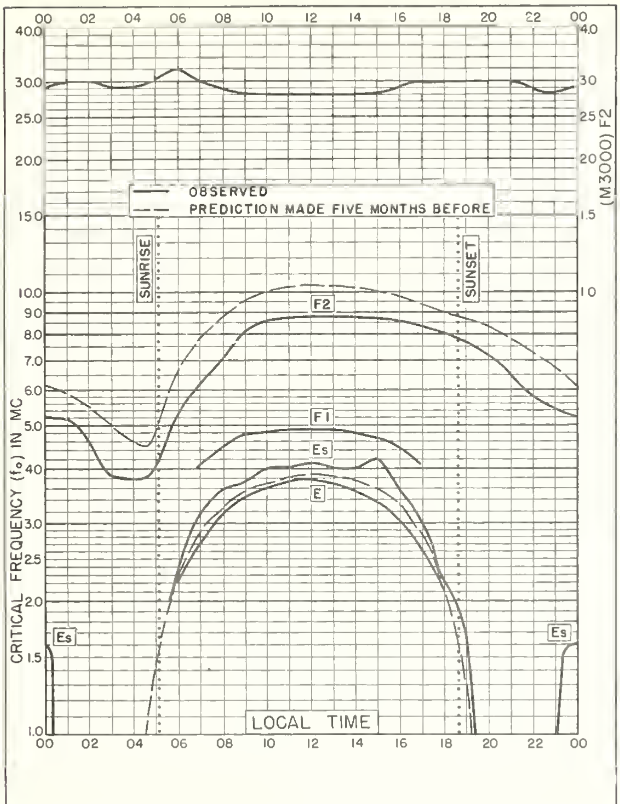

Fig. 33. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.1°E DECEMBER 1950

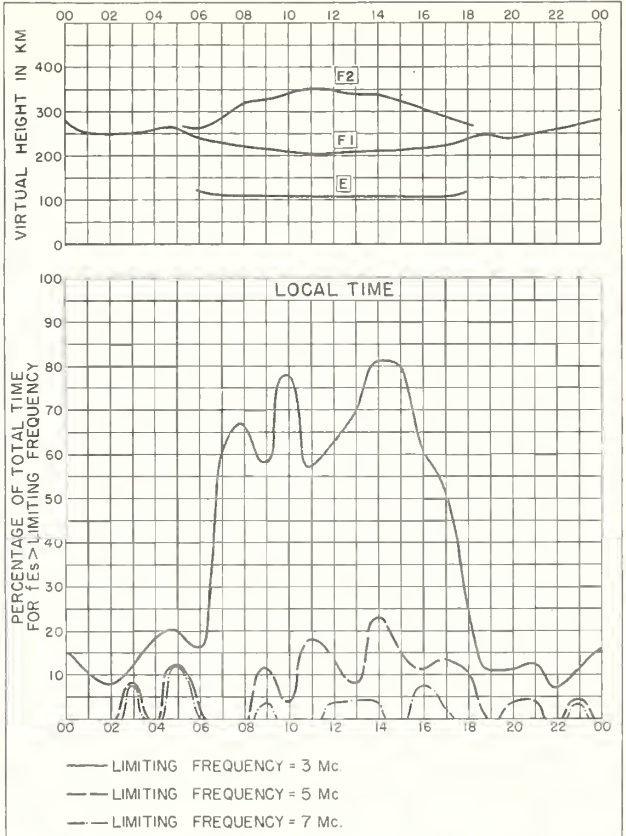

Fig. 34. JOHANNESBURG, U. OF S. AFRICA DECEMBER 1950

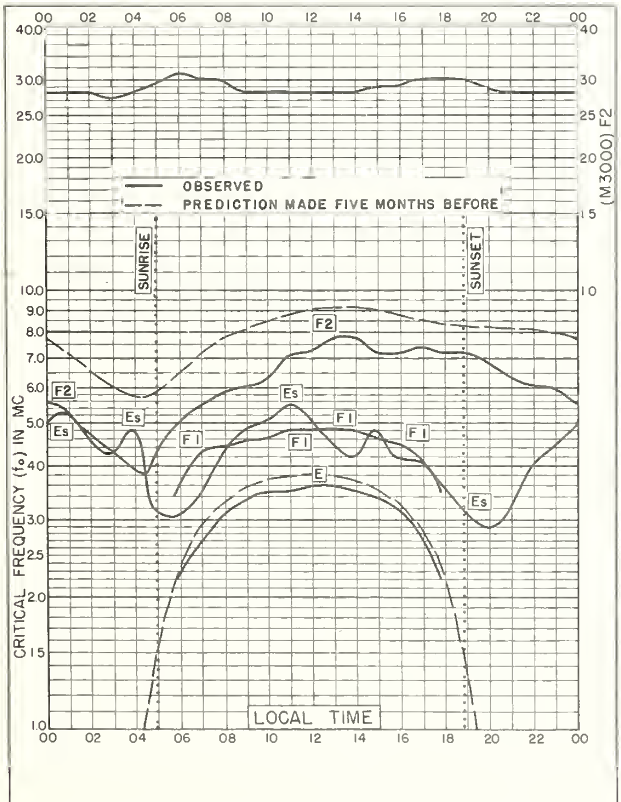

Fig. 35. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E DECEMBER 1950

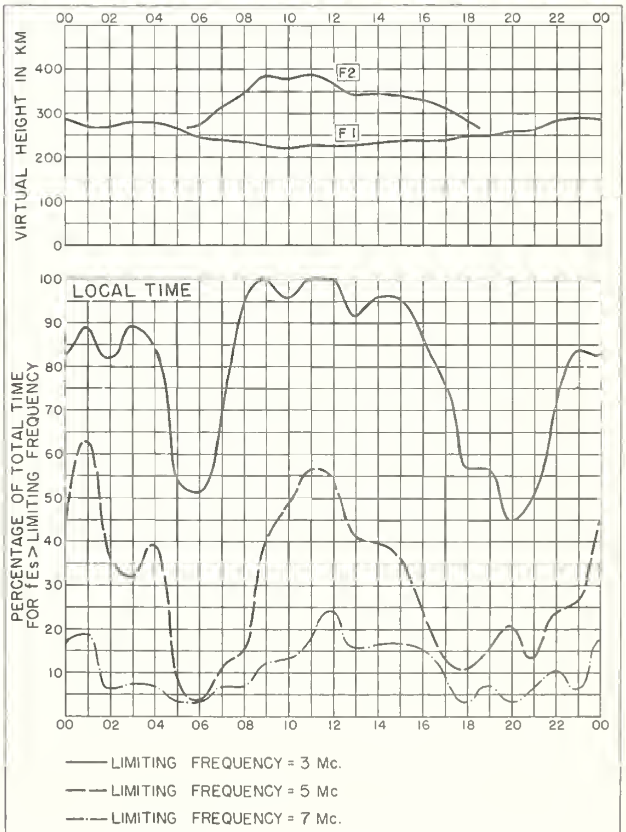

Fig. 36. WATHEROO, W. AUSTRALIA DECEMBER 1950

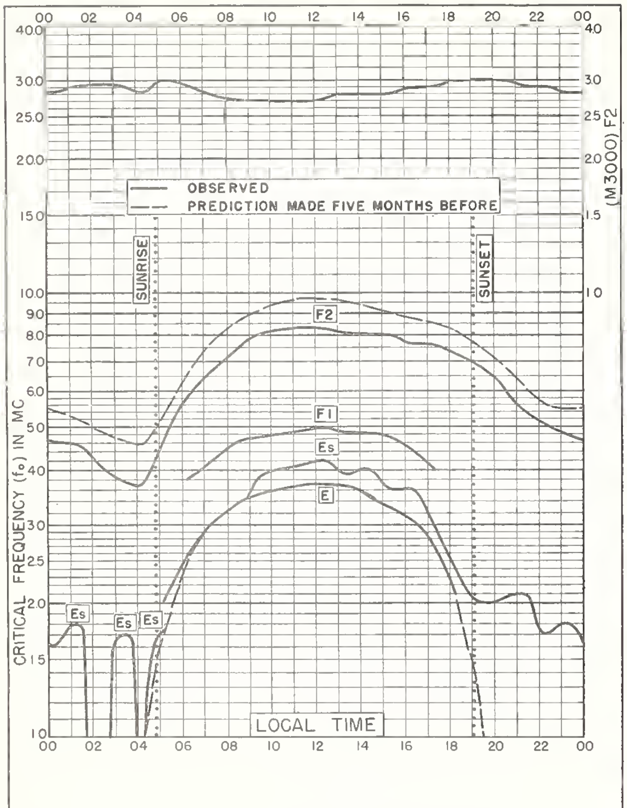

Fig. 37. CAPETOWN, U. OF S. AFRICA
34.2°S, 18.3°E DECEMBER 1950

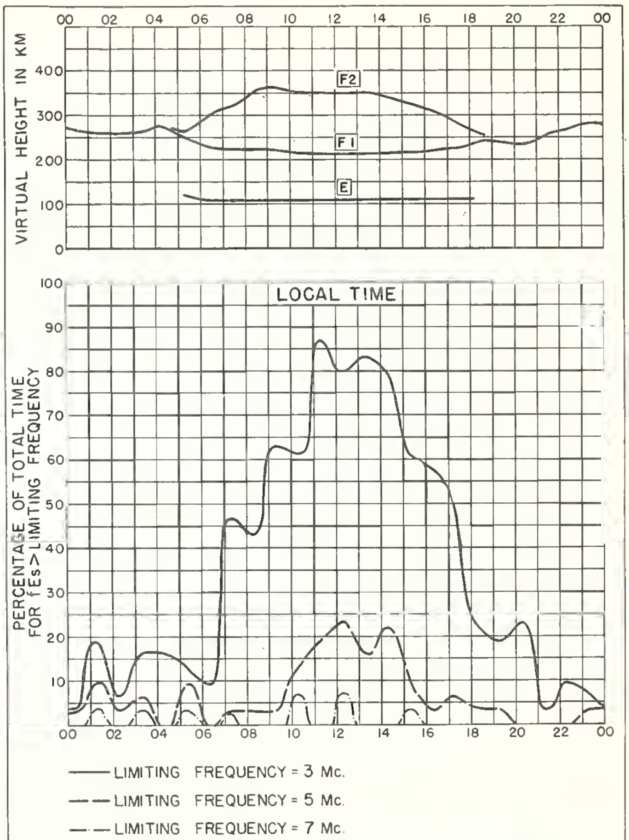

Fig. 38. CAPETOWN, U. OF S. AFRICA DECEMBER 1950

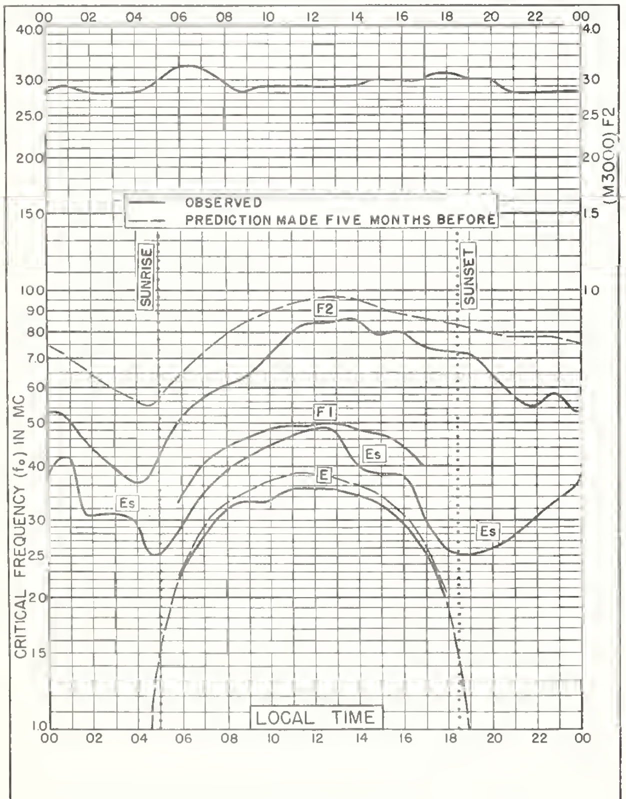

Fig. 39. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E NOVEMBER 1950

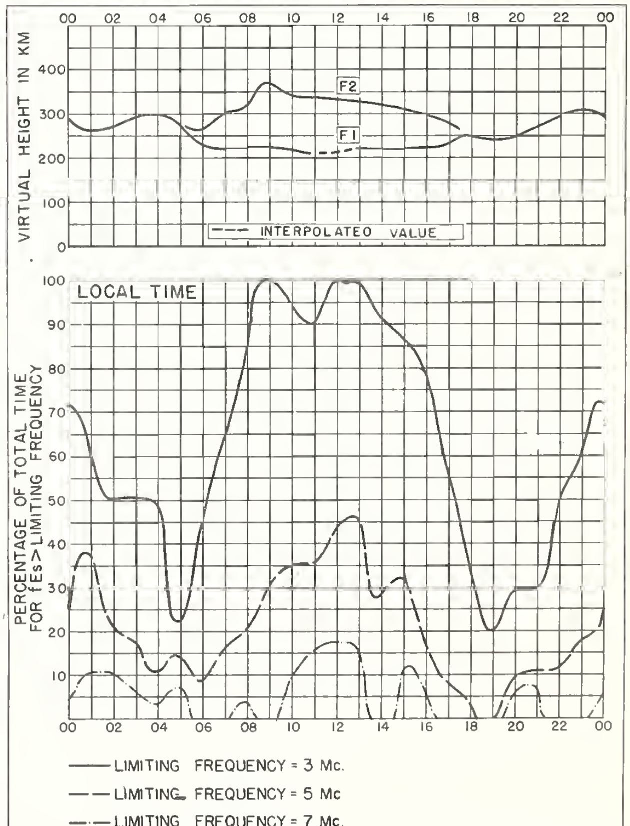

Fig. 40. WATHEROO, W. AUSTRALIA NOVEMBER 1950

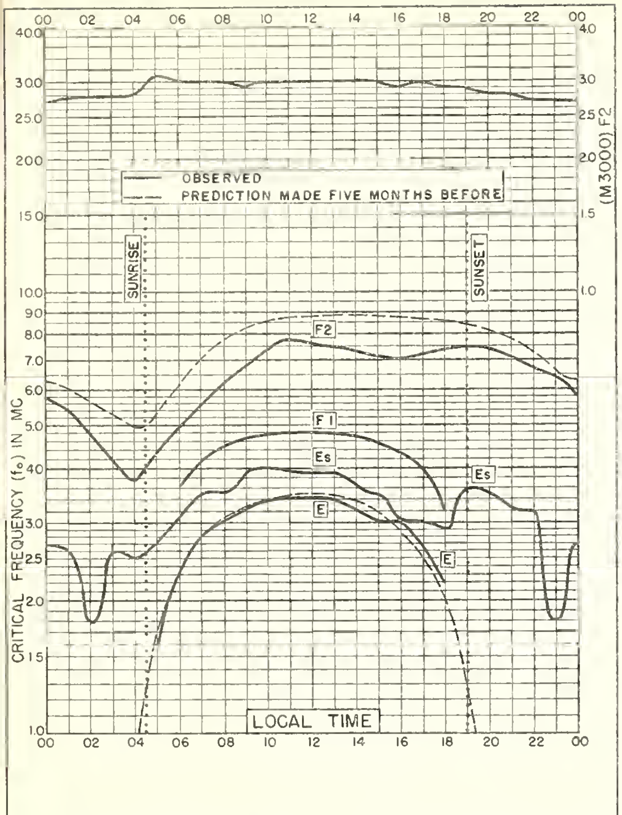

Fig. 41. CHRISTCHURCH, N. Z.
43.5°S, 172.7°E NOVEMBER 1950

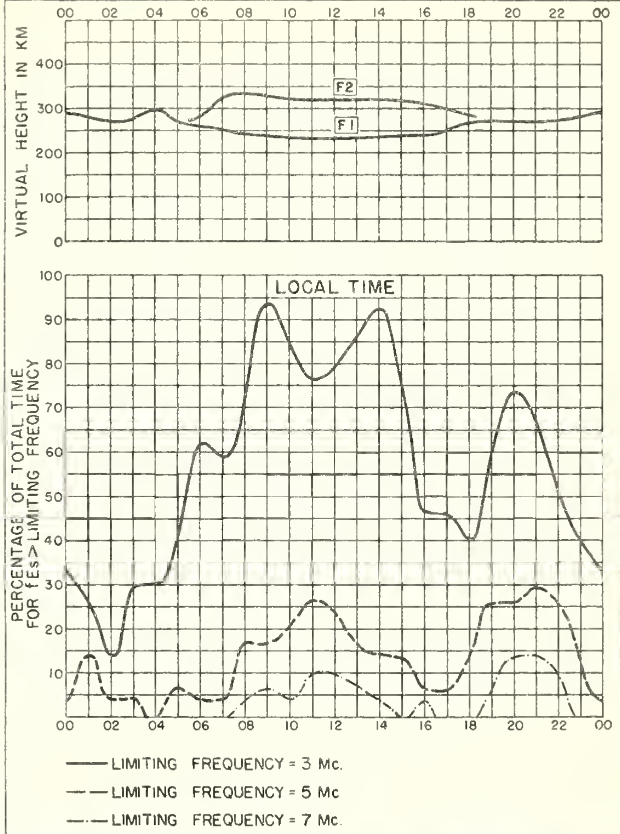

Fig. 42. CHRISTCHURCH, N. Z. NOVEMBER 1950

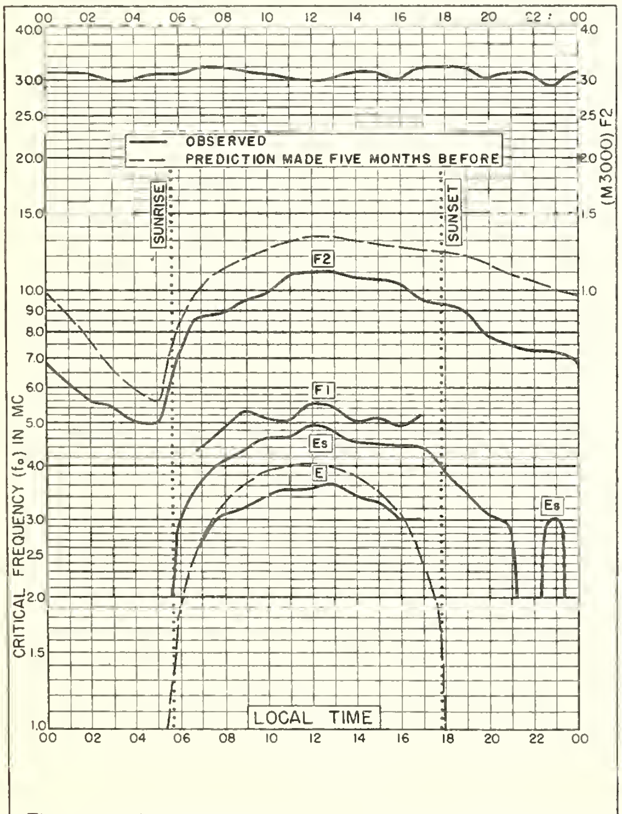

Fig. 43. RAROTONGA I.
21.3°S, 159.8°W OCTOBER 1950

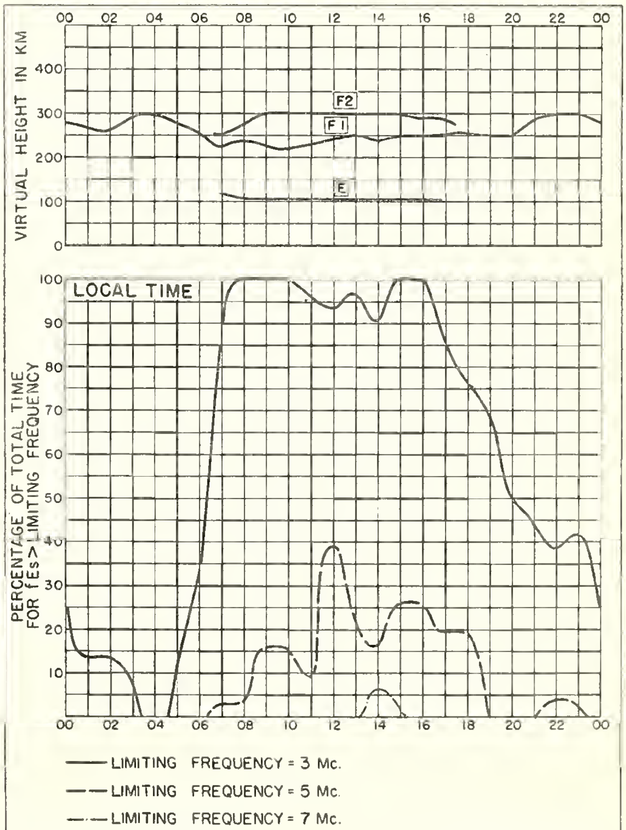

Fig. 44. RAROTONGA I. OCTOBER 1950

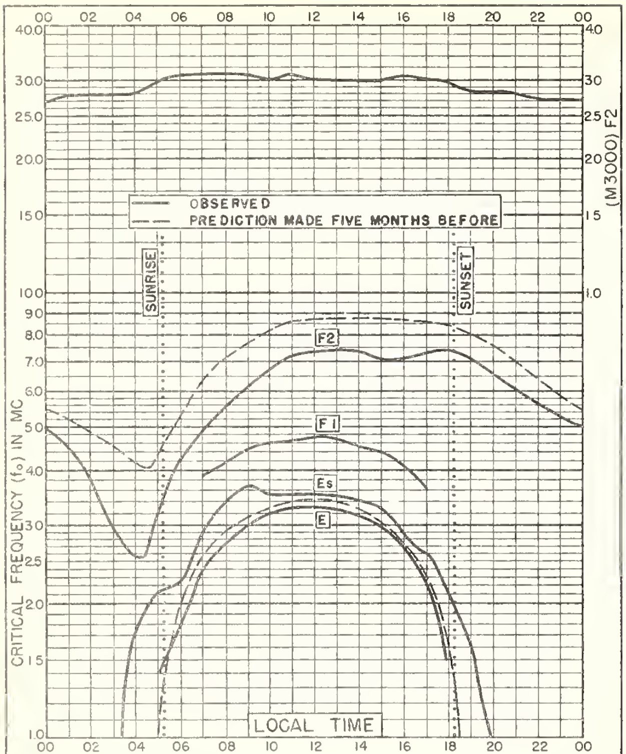

Fig. 45. CHRISTCHURCH, N. Z.
43.5°S, 172.7°E OCTOBER 1950

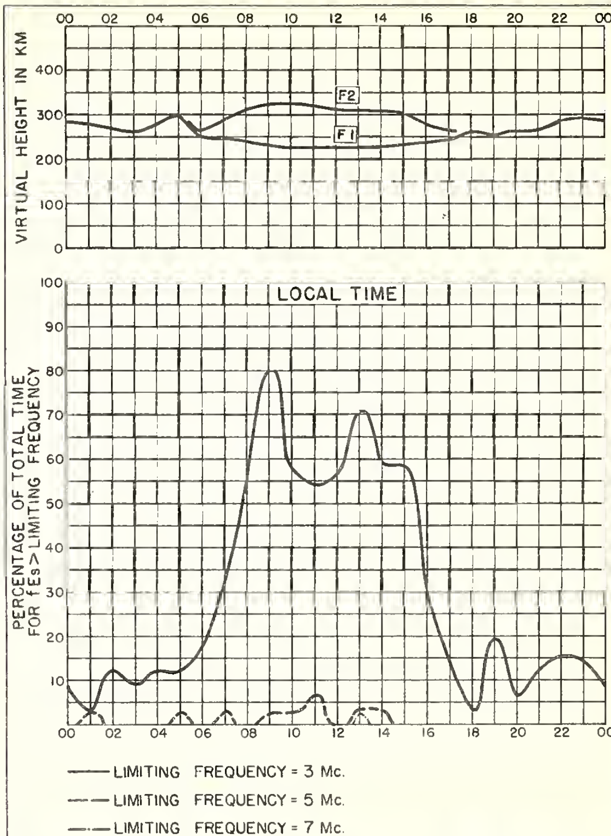

Fig. 46. CHRISTCHURCH, N. Z. OCTOBER 1950

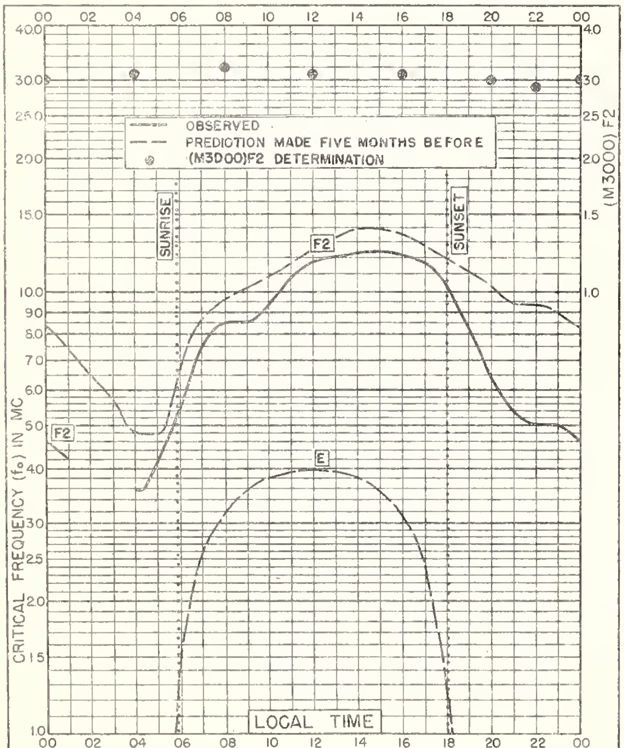

Fig. 47. DELHI, INDIA
28.6°N, 77.1°E SEPTEMBER 1950

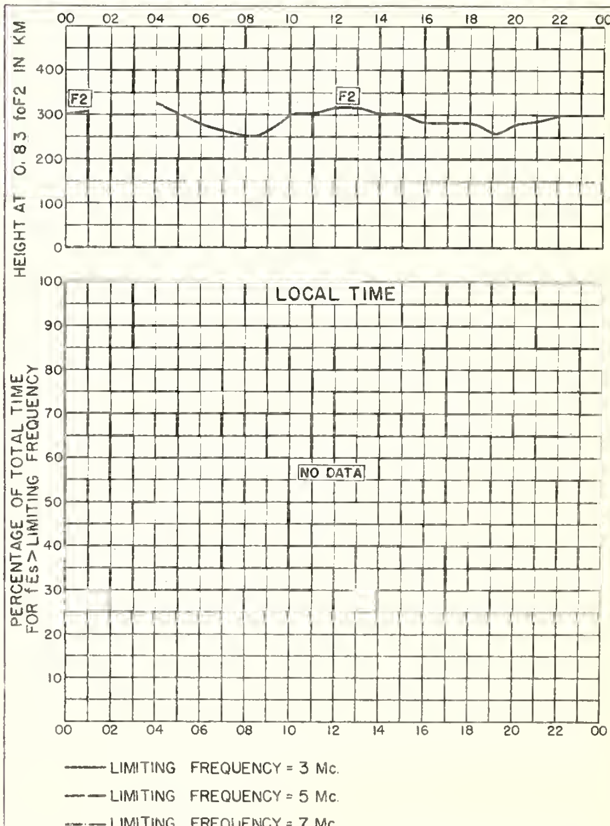

Fig. 48. DELHI, INDIA SEPTEMBER 1950

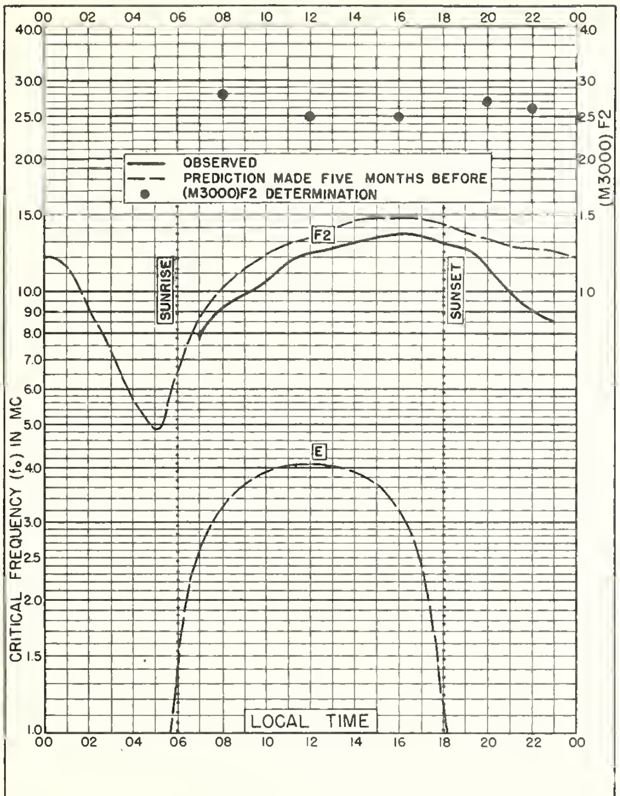

Fig. 49. BOMBAY, INDIA
19.0°N, 73.0°E SEPTEMBER 1950

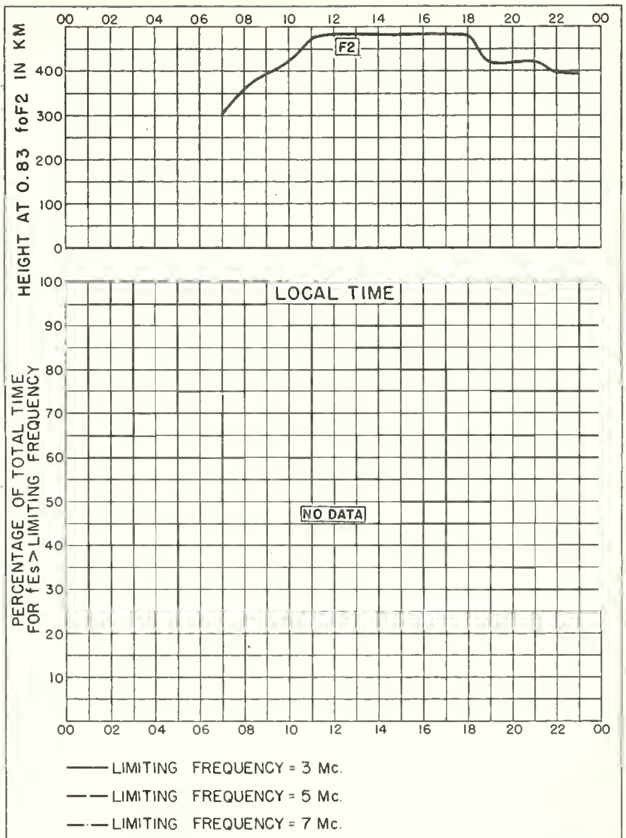

Fig. 50. BOMBAY, INDIA SEPTEMBER 1950

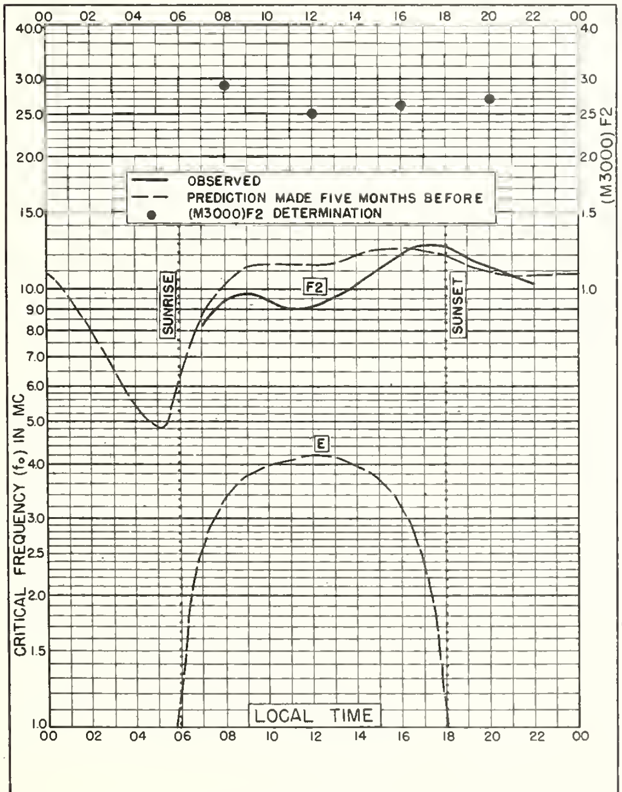

Fig. 51. MADRAS, INDIA
13.0°N, 80.2°E SEPTEMBER 1950

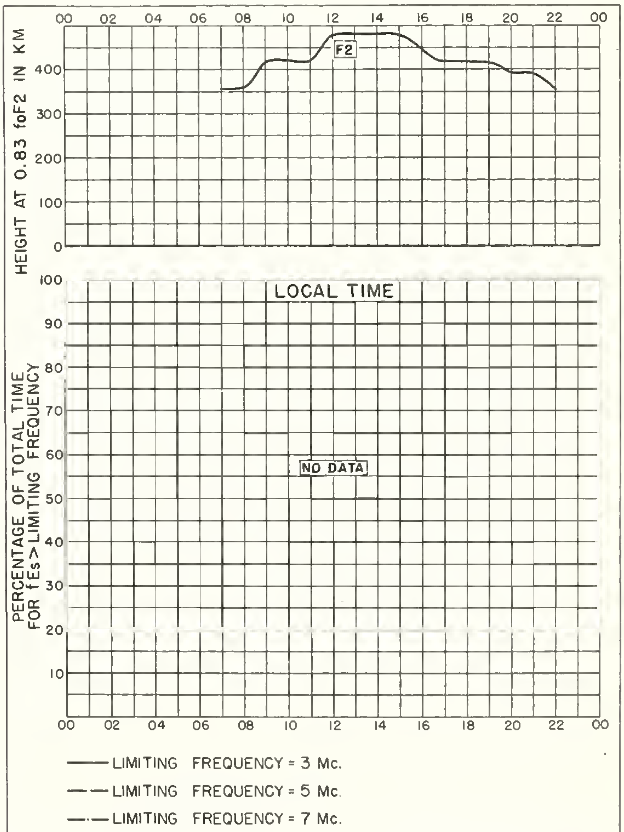

Fig. 52. MADRAS, INDIA SEPTEMBER 1950

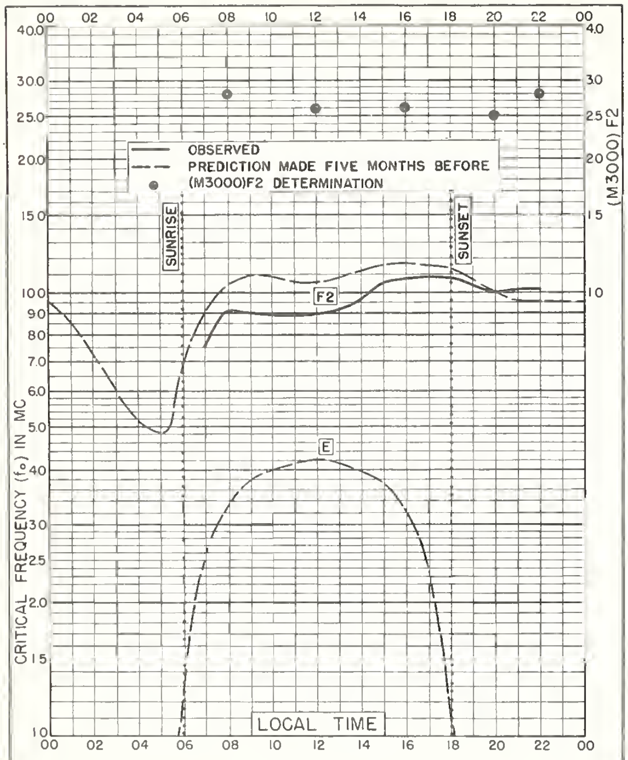

Fig. 53. TIRUCHY, INDIA
10.8°N, 78.8°E SEPTEMBER 1950

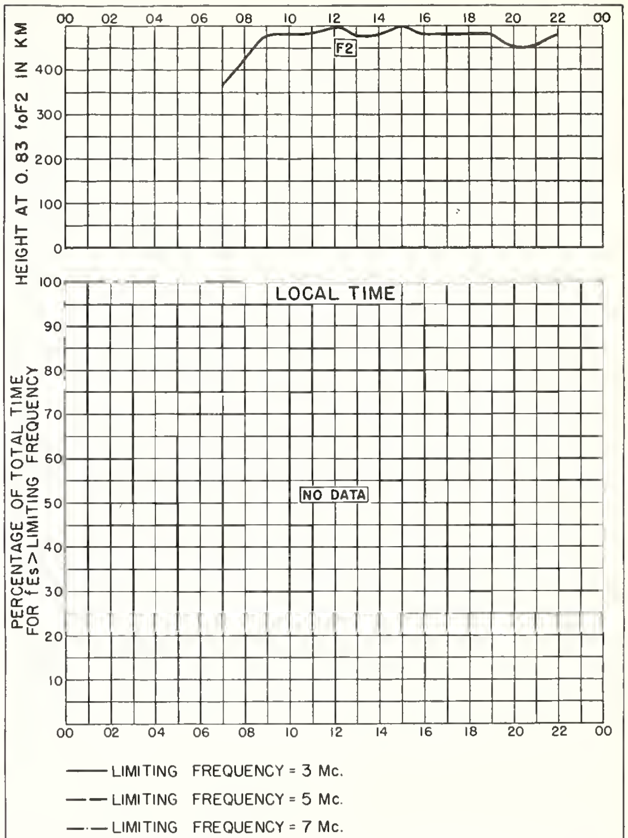

Fig. 54. TIRUCHY, INDIA SEPTEMBER 1950

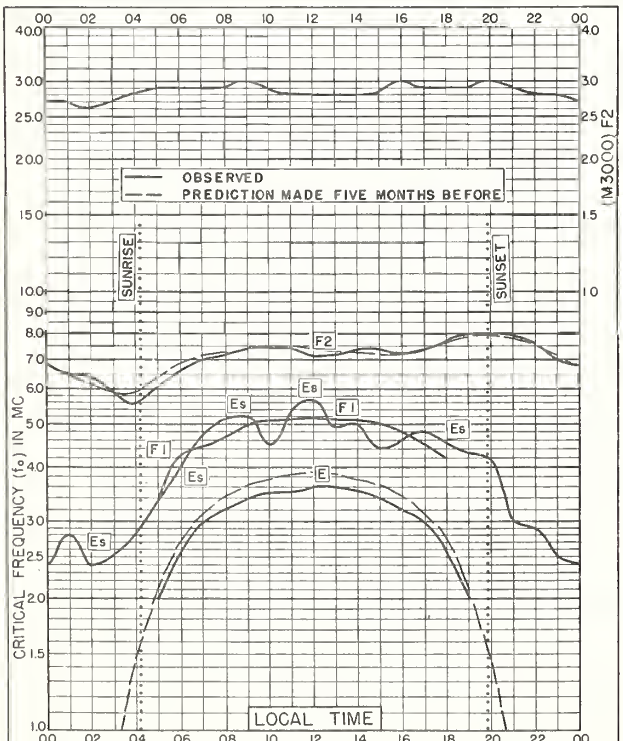

Fig. 55. FRIBOURG, GERMANY
48.1°N, 7.8°E JUNE 1950

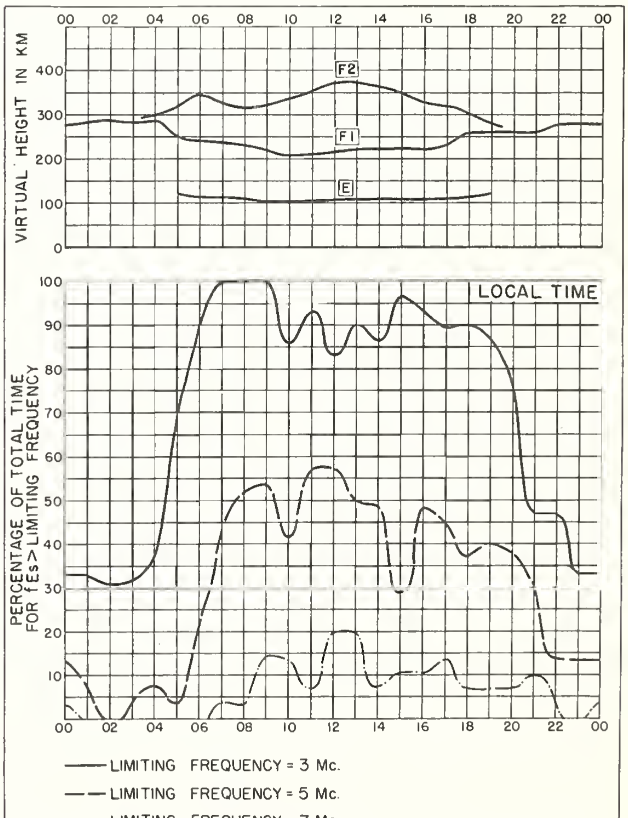

Fig. 56. FRIBOURG, GERMANY JUNE 1950

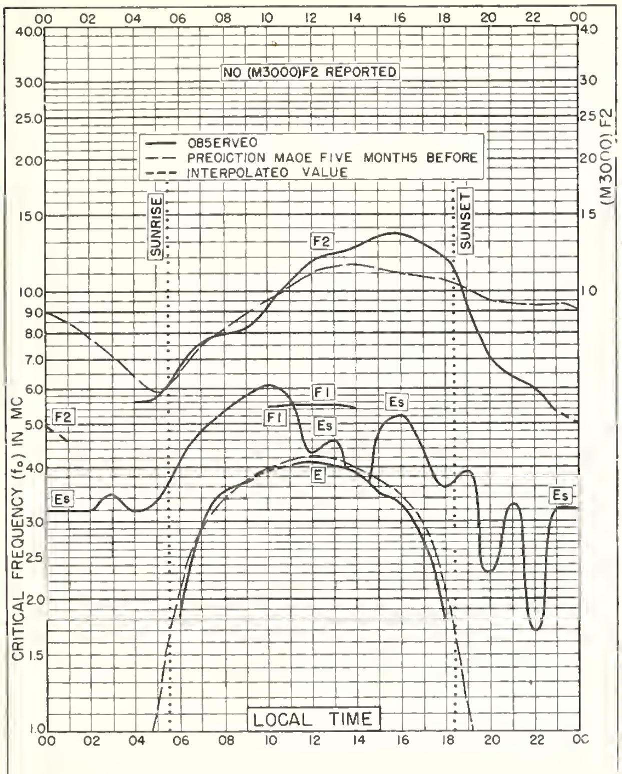

Fig. 57. DAKAR, FRENCH W. AFRICA
14.6°N, 17.4°W JUNE 1950

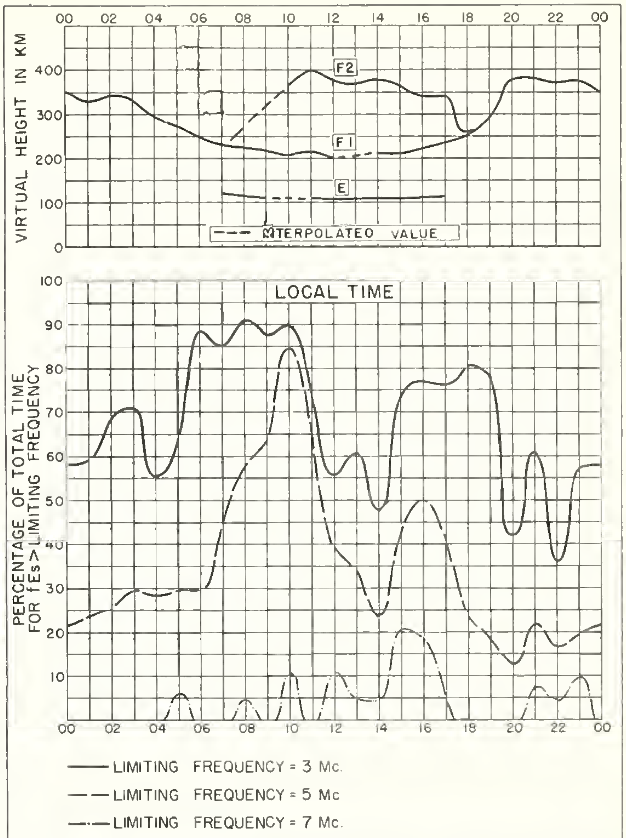

Fig. 58. DAKAR, FRENCH W. AFRICA JUNE 1950

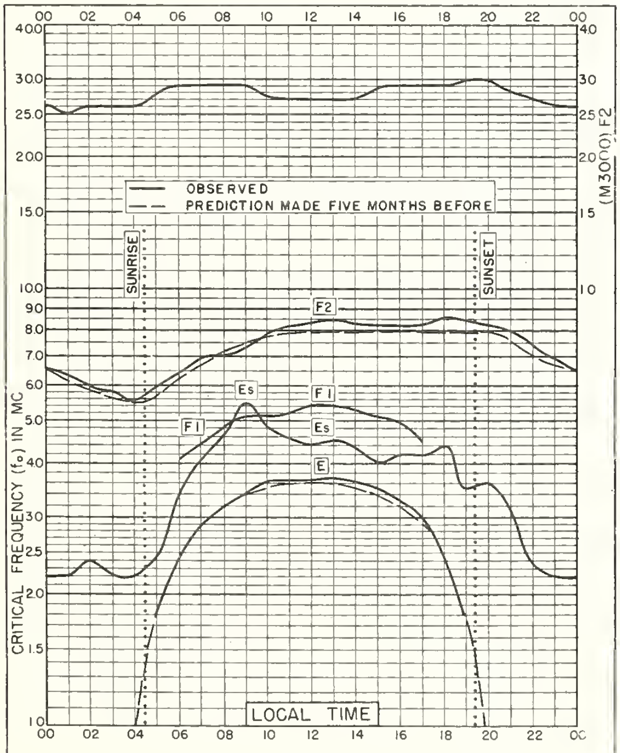

Fig. 59. FRIBOURG, GERMANY
48.1°N, 7.8°E MAY 1950

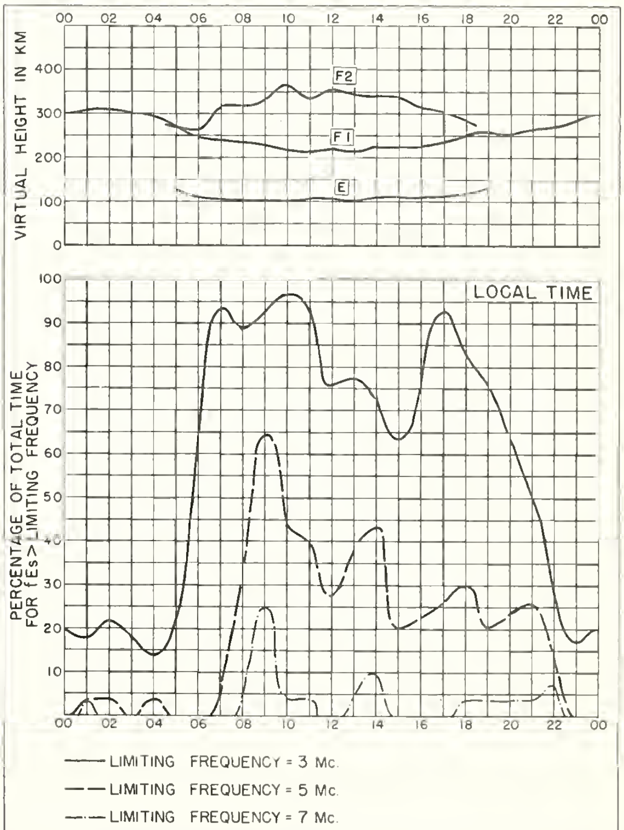

Fig. 60. FRIBOURG, GERMANY MAY 1950

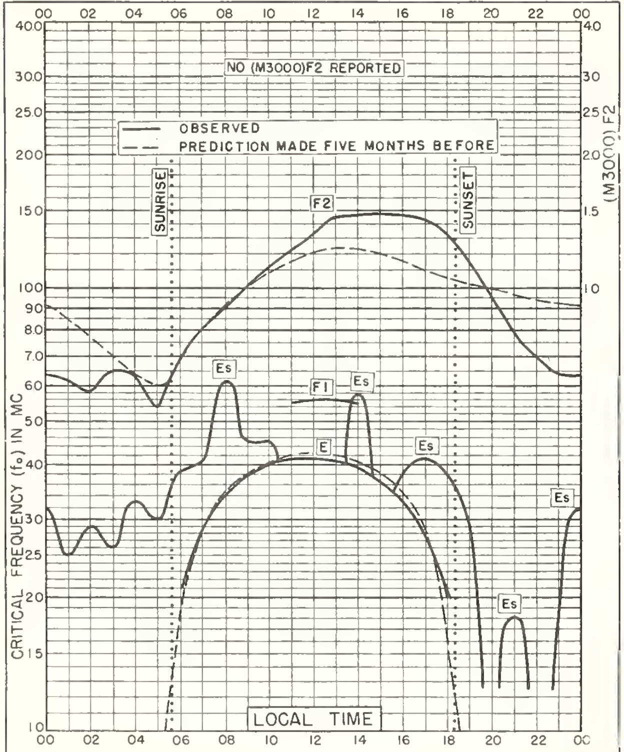

Fig. 61. DAKAR, FRENCH W. AFRICA
14.6°N, 17.4°W MAY 1950

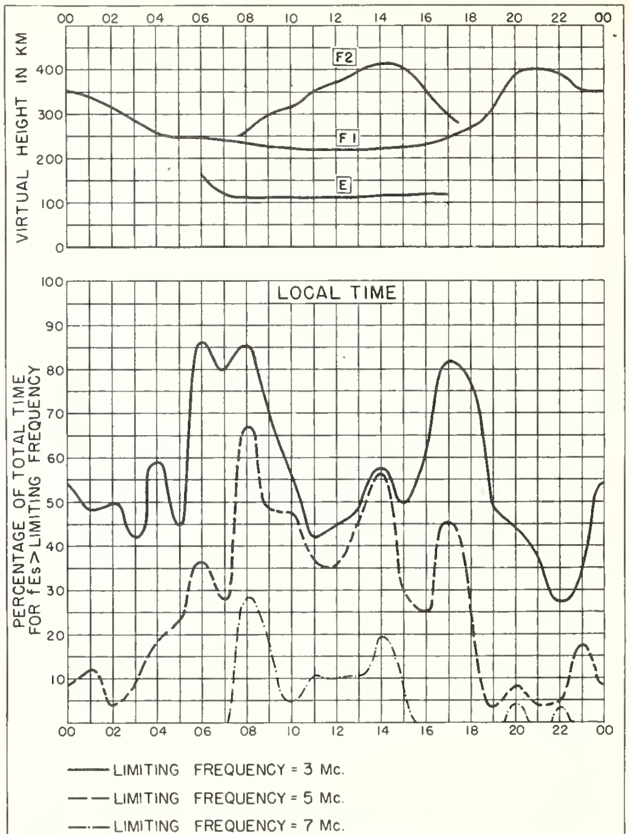

Fig. 62. DAKAR, FRENCH W. AFRICA MAY 1950

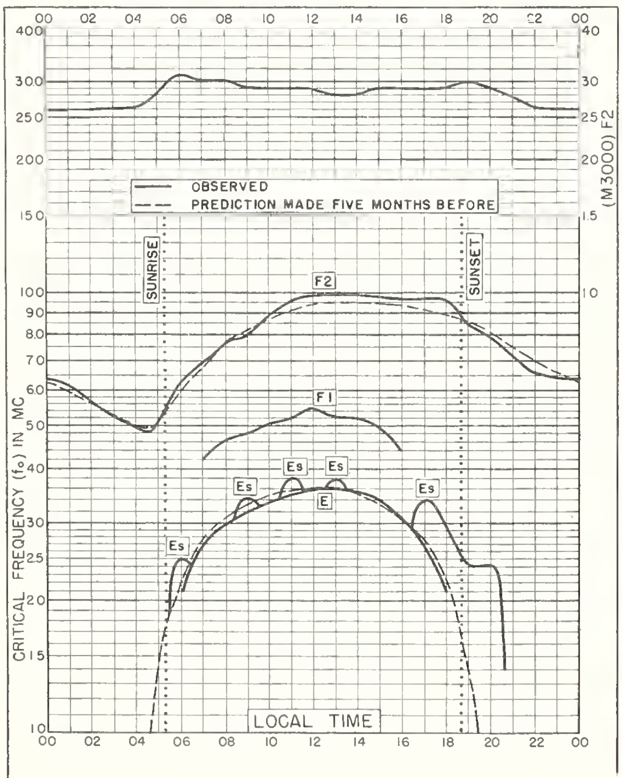

Fig. 63. FRIBOURG, GERMANY
48.1°N, 7.8°E APRIL 1950

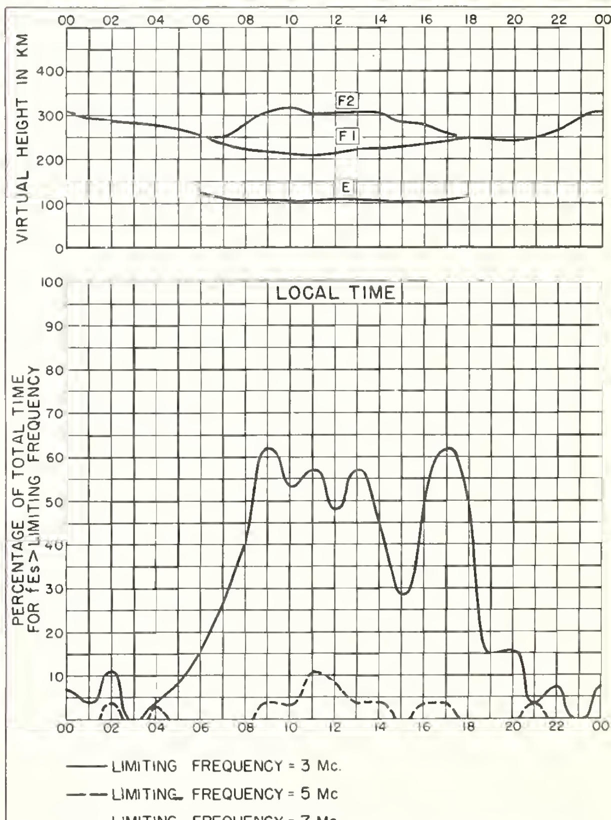

Fig. 64. FRIBOURG, GERMANY APRIL 1950

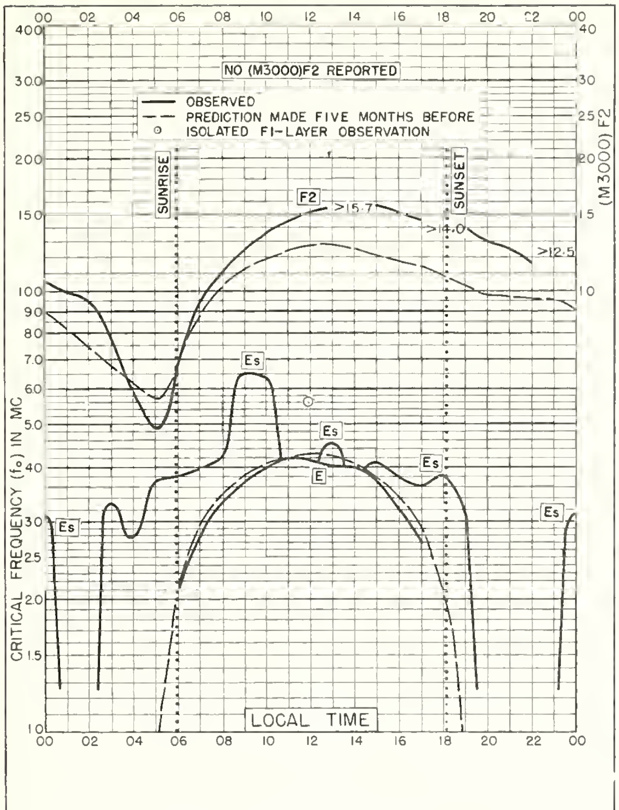

Fig. 65. DAKAR, FRENCH W. AFRICA
14.6°N, 17.4°W APRIL 1950

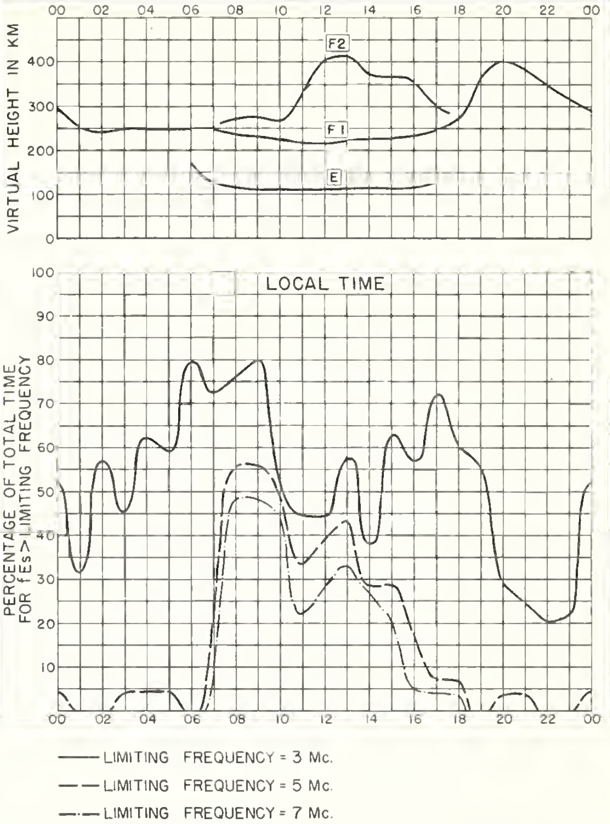

Fig. 66. DAKAR, FRENCH W. AFRICA APRIL 1950

Index of Tables and Graphs of Ionospheric Data

in CRPL-F79

Index (CRPL-F79, continued)

CRPL and IRPL Reports

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

Daily:

Radio disturbance warnings, every half hour from broadcast station WWV of the National Bureau of Standards.
Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

Weekly:

CRPL–J. Radio Propagation Forecast (of days most likely to be disturbed during following month).

Semimonthly:

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.
- R31. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.
- **R33. Ionospheric Data on File at IRPL.
- **R34. The Interpretation of Recorded Values of *fEs*.
- R35. Comparison of Percentage of Total Time of Second-Multiple *Es* Reflections and That of *fEs* in Excess of 3 Mc.

IRPL–T. Reports on tropospheric propagation:

- T1. Radar operation and weather. (Superseded by JANP 101.)
- T2. Radar coverage and weather. (Superseded by JANP 102.)

CRPL–T3. Tropospheric Propagation and Radio-Meteorology. (Reissue of Columbia Wave Propagation Group WPG–5.)

---

*Items bearing this symbol are distributed only by U. S. Navy. They are issued under one cover as the DNC 14 ( ) series.
**Out of print; information concerning cost of photostat or microfilm copies is available from CRPL upon request.