CRPL-F82

IONOSPHERIC DATA

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

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CONTENTS

SYMBOLS, TERMINOLOGY, CONVENTIONS

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

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

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

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

a. For all ionospheric characteristics:

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

b. For critical frequencies and virtual heights:

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

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

Values missing because of G are counted:

1. For foF2, as equal to or less than foF1.
2. For h'F2, as equal to or greater than the median.

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

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

c. For MUF factor (M-factors):

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

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

d. For sporadic E (Es):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Month	Predicted Sunspot Number						
	1951	1950	1949	1948	1947	1946	1945
December		86	108	114	126	85	38
November		87	112	115	124	83	36
October		90	114	116	119	81	23
September		91	115	117	121	79	22
August		96	111	123	122	77	20
July		101	108	125	116	73	
June		103	108	129	112	67	
May	68	102	108	130	109	67	
April	74	101	109	133	107	62	
March	78	103	111	133	105	51	
February	82	103	113	133	90	46	
January	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 41 and figures 1 to 82 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:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:
- Brisbane, Australia
- Canberra, Australia
- Hobart, Tasmania

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

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

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

The Royal Netherlands Meteorological Institute:
De Bilt, Holland

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, Florida, Bergen, Norway:
Tromso, Norway

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

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

United States Army Signal Corps:
Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
Baton Rouge, Louisiana (Louisiana State University)
Boston, Massachusetts (Harvard University)
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 42 to 53 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 54 presents ionosphere character figures for Washington, D. C., during May 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 55 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, April 1951, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

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

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

RELATIVE SUNSPOT NUMBERS

Table 56 lists the daily provisional Zürich 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 THE SOLAR CORONA

Tables 57 through 59 give the observations of the solar corona during May 1951 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 60 through 62 list the coronal observations obtained at Sacramento Peak, New Mexico, during May 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 57 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 58 gives similarly the intensities of the first red (6374A) coronal line; and table 59, the intensities of the second red (6702A) coronal line; all observed at Climax in May 1951.

Table 60 gives the intensities of the green (5303A) coronal line; table 61, the intensities of the first red (6374A) coronal line; and table 62, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in May 1951.

The following symbols are used in tables 57 through 62: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

OBSERVATIONS OF SOLAR FLARES

Table 63 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 Sacramento Peak, New Mexico. 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 Sacramento Peak, New Mexico, communicated by the High Altitude Observatory at 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 64 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 65, 66, 67, 68, 69, and 70 list respectively the sudden ionosphere disturbances observed at Ft. Belvoir, Virginia, May 1951; in England, April and May 1951; at Point Reyes, California, May 1951; at Riverhead, New York, May 1951; at Platanos, Argentina, March and April 1951; and in Barbados, British West Indies, April 1951.

Table 1

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.9						2.8
01	300	4.6						2.8
02	280	4.1						2.8
03	280	3.8						2.8
04	280	3.4						2.8
05	280	3.4	---	---	---	---	3.6	3.0
06	280	4.6	240	---	110	2.2	3.2	3.1
07	310	4.9	230	3.9	110	2.7	3.7	3.1
08	380	5.4	220	4.2	110	3.0	4.8	2.9
09	400	5.5	200	4.5	100	3.2	4.8	2.8
10	400	5.6	200	4.6	100	3.4	5.9	2.8
11	400	6.0	200	4.7	100	3.5		2.8
12	390	6.1	210	4.8	100	3.6		2.8
13	400	6.2	220	4.8	100	3.6	5.4	2.7
14	380	6.4	220	4.7	110	3.6	4.8	2.7
15	370	6.6	230	4.6	110	3.4		2.8
16	340	6.8	230	4.4	110	3.1		2.8
17	320	6.8	230	4.0	110	2.9		2.9
18	290	7.0	250	3.5	110	2.3		2.9
19	260	7.2			---	1.7	2.4	3.0
20	240	6.8						2.9
21	260	6.0						2.9
22	270	5.3						2.8
23	280	5.0						2.7

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

Table 2

Tromso, Norway (69.7°N, 19.0°E) April 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07	---	---	---	---	---	---		---
08	405	5.0	240	4.1	110	2.8	3.0	2.8
09	405	5.3	240	4.2	110	2.9	2.5	2.8
10	360	5.6	230	4.3	110	3.0	2.8	2.8
11	380	5.5	225	4.2	110	3.0		2.8
12	355	5.4	235	4.3	110	3.0		2.9
13	345	5.4	230	4.3	110	3.0	3.0	3.0
14	350	5.4	225	4.2	110	2.8	3.2	3.0
15	(340)	5.4	240	4.1	110	2.8	3.1	3.0
16	315	5.3	245	3.9	110	2.6	3.3	3.1
17	(285)	5.0	255	---	110	2.4	4.0	3.1
18	300	4.9	---	---	110	2.3	4.8	3.1
19	315	4.9	---	---	115	---	4.2	3.0
20	310	4.6			110	---	4.2	3.0
21	(320)	4.6			110	---	3.9	(2.9)
22	325	4.4			---	---	3.8	(2.9)
23	---	---						---

Time: 15.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 3

Oslo, Norway (60.0°N, 11.0°E) April 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.5					2.3	2.8
01	305	3.2					2.4	2.7
02	305	2.8					2.2	(2.7)
03	300	2.8					2.6	2.7
04	300	2.8			---	---	1.9	2.8
05	280	3.2	---	---	120	1.6	1.9	3.0
06	250	4.1	250	3.3	110	2.1	1.9	3.1
07	285	4.3	230	3.6	105	2.4		(3.1)
08	325	4.9	220	4.0	105	2.7	2.7	3.0
09	350	5.3	215	4.2	100	3.0		3.0
10	350	5.4	210	4.3	100	3.1		3.0
11	350	5.8	205	4.4	100	3.2		3.0
12	340	5.9	205	4.5	100	3.2	2.9	3.0
13	320	5.9	210	4.4	100	3.2		3.0
14	315	6.2	215	4.4	100	3.2		3.1
15	310	6.2	220	4.3	100	3.0		3.0
16	290	6.2	220	4.2	105	2.8		3.1
17	270	6.1	230	(4.0)	105	2.5		3.1
18	250	5.8	250	(3.3)	110	2.2	2.3	3.2
19	250	5.6	250	---	125	1.8		3.1
20	250	5.8			---	---		(3.1)
21	250	5.8			---	---		3.0
22	285	4.7						(3.0)
23	285	(3.8)					2.0	(2.8)

Time: 15.0°E.

Sweep: 1.3 Mc to 14.0 Mc in 8 minutes, automatic operation.

Table 4

De Bilt, Holland (52.1°N, 5.2°E) April 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.8						2.6
01	300	3.6					2.0	2.6
02	300	3.4					1.9	2.7
03	<300	3.2					1.9	2.8
04	290	3.0			---	E	2.2	2.8
05	275	3.9	---	---	---	1.6	2.8	3.0
06	250	4.5	230	---	105	2.3	3.0	3.1
07	290	5.0	226	4.0	100	2.7	3.3	3.1
08	320	5.4	215	4.4	100	3.0	3.3	3.0
09	320	5.9	210	4.5	100	3.2	3.4	2.9
10	300	6.2	210	4.6	100	3.3	4.0	3.1
11	320	6.5	205	4.6	100	3.4	3.9	3.0
12	300	6.6	200	4.7	100	3.4	4.3	3.1
13	300	6.6	210	4.7	100	3.3		3.1
14	300	6.9	220	4.6	100	3.2		3.1
15	300	7.1	220	4.4	100	3.1		3.0
16	280	7.2	225	4.0	100	2.8		3.1
17	270	7.2	245	3.6	100	2.4		3.1
18	240	7.4	---	---	130	1.8		3.1
19	230	6.8			---	E		3.0
20	240	6.1						3.0
21	240	5.2						2.9
22	270	4.4						2.8
23	300	4.0						2.7

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

Table 5

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	4.4						2.8
01	290	3.7						2.7
02	270	3.4						2.8
03	260	2.8						2.8
04	280	2.7						2.8
05	250	3.2			110	1.7		3.1
06	230	4.2	230	3.5	110	2.2		3.3
07	250	5.0	220	3.8	100	2.7		3.3
08	300	5.4	200	4.0	100	2.9		3.2
09	290	5.8	200	4.1	100	3.1		3.2
10	310	6.2	200	4.4	100	3.2		3.0
11	360	6.3	190	4.5	100	3.2		2.8
12	360	6.1	200	4.6	110	3.2		2.9
13	340	6.5	210	4.6	100	3.2		3.0
14	320	6.5	210	4.5	110	3.2		3.0
15	300	6.5	210	4.3	110	3.1		3.0
16	290	6.5	220	4.1	110	3.0		3.1
17	260	6.8	220	3.8	110	2.6		3.0
18	230	6.5	---	---	110	2.1		3.0
19	230	6.2			---	---		3.0
20	240	5.6						3.0
21	260	5.0						2.8
22	270	5.0						2.8
23	270	4.7						2.8

Time: 75.0oW.
Sweep: 0.8 Mc to 14.0 Mc in 1 minute.

Table 6

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	(4.4)						(2.7)
01	320	4.2						2.7
02	320	(4.0)						(2.7)
03	320	(4.0)						(2.7)
04	310	(3.9)						2.7
05	300	3.6						2.8
06	280	4.8	---	---	---	---		3.0
07	290	5.6	---	4.0	120	2.6		3.1
08	320	(6.5)	260	4.5	120	2.8	2.8	(2.9)
09	320	7.2	230	4.7	120	---		2.9
10	340	(7.0)	220	4.8	120	---		(2.8)
11	340	(7.1)	---	5.0	120	---		(2.7)
12	340	7.8	---	5.0	120	---	3.8	2.8
13	340	7.4	---	5.0	120	---		2.8
14	320	7.6	---	4.9	120	---		3.0
15	310	7.4	240	4.8	120	---		3.0
16	290	7.0	---	4.5	120	---		3.0
17	280	6.9	---	4.0	120	---		3.1
18	260	6.6						3.2
19	240	6.8						3.2
20	250	6.0						3.1
21	270	5.2						2.9
22	290	4.6						2.8
23	310	(4.5)						(2.7)

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

Table 7

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(300)	4.0						2.7
01	(300)	4.2						2.7
02	(300)	4.2						2.7
03	(280)	4.0						2.7
04	(280)	3.8						2.8
05	280	3.8						2.9
06	260	4.9	---	---	120	1.9		3.1
07	270	5.9	240	3.8	110	2.5		3.2
08	280	6.4	220	4.2	110	2.9		3.0
09	300	6.8	210	4.5	110	3.1		3.0
10	340	7.4	200	4.7	110	3.2	3.3	2.8
11	340	8.0	210	4.8	110	3.3	3.8	2.8
12	320	8.8	220	4.9	110	3.4	3.2	2.8
13	310	9.0	210	4.8	110	3.4		2.9
14	300	9.0	220	4.8	110	3.4		2.9
15	290	8.2	230	4.6	110	3.2		3.0
16	280	7.6	230	4.1	110	3.0		3.0
17	270	7.3	240	---	110	2.6		3.1
18	250	7.0	---	---	(120)	2.0		3.2
19	230	6.6					2.6	3.1
20	(240)	5.9					2.2	3.0
21	(250)	4.9					2.4	2.9
22	(290)	4.4						2.7
23	(300)	4.2						2.7

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 8

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	370	4.4						2.7
01	350	4.1						2.7
02	330	4.1						2.8
03	340	4.0						2.7
04	340	4.0						2.8
05	330	4.0						2.8
06	290	5.2	---	---				3.0
07	290	6.2	270	---	130	2.6		3.0
08	300	6.6	250	4.3	120	2.9		3.0
09	320	6.7	250	(4.5)	120	(3.2)		2.9
10	380	7.5	230	4.7	120	3.4		2.7
11	380	8.3	260	(4.8)	120	3.4		2.7
12	370	9.2	250	(5.0)	120	3.5		2.7
13	360	9.6	270	(4.9)	120	3.4		2.7
14	340	9.5	270	(4.8)	120	3.4		2.8
15	330	9.2	270	(4.6)	120	3.4		2.8
16	310	8.8	270	(4.3)	130	3.0		2.9
17	300	8.3	270	---	130	2.6		2.9
18	280	8.4	---	---				3.0
19	270	7.2						3.0
20	270	5.9						2.9
21	300	5.2						2.8
22	340	(4.5)						(2.7)
23	360	(4.5)						2.7

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

Table 9

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	7.5					3.2	2.8
01	270	7.6					2.2	2.9
02	230	7.3						3.1
03	240	6.0					1.8	2.9
04	260	5.0						2.8
05	260	4.4						2.9
06	240	6.0						3.2
07	240	7.5			110	(2.6)		3.2
08	260	8.7	240	---	110	3.1	4.0	3.2
09	270	10.0	220	---	110	3.4	3.8	3.0
10	290	10.9	220	---	110	(3.5)	4.4	2.9
11	320	11.9	220	---	110	(3.6)		2.8
12	310	13.5	(240)	---	110	(3.6)		2.9
13	300	14.2	230	---	(110)	(3.6)		3.0
14	290	14.2	230	---	(110)	(3.6)		3.0
15	280	13.8	230	---	110	(3.4)		3.0
16	270	13.1	240	---	110	3.0		3.0
17	260	12.9	240	---	110	2.4	2.1	3.1
18	250	12.6			(120)	---	3.2	3.1
19	240	10.8					3.0	3.2
20	240	8.6					3.1	2.9
21	(270)	(>8.0)					3.0	2.6
22	(320)	7.6					3.1	2.7
23	(310)	7.4					2.5	2.7

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

Table 10

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.0					3.6	2.8
01	280	6.2					3.0	2.8
02	270	5.7					2.2	2.9
03	270	4.4					1.9	2.8
04	300	4.2			---	---	3.2	2.7
05	300	4.0			---	---	1.6	2.7
06	280	4.7			---	---	2.0	2.9
07	250	7.0	---	---	120	2.3	2.8	3.2
08	260	8.1	230	---	120	2.8	4.4	3.0
09	280	9.2	220	4.7	120	3.1	5.4	2.8
10	320	10.2	220	5.0	120	(3.4)	5.4	2.6
11	330	11.3	220	5.1	120	3.6	4.7	2.7
12	330	12.9	240	(5.2)	120	3.7	4.8	2.8
13	320	13.2	240	5.1	120	(3.8)	4.4	2.9
14	310	13.6	240	5.0	120	3.6	4.7	2.9
15	300	14.0	230	4.8	120	3.5	4.8	2.9
16	290	12.9	240	(4.7)	120	3.2	5.3	3.0
17	280	12.3	240	---	120	2.8	5.4	3.0
18	260	12.2	---	---	120	2.0	5.2	3.1
19	240	11.8					4.8	3.2
20	230	8.7					5.2	3.0
21	260	7.4					5.0	2.7
22	310	6.8					4.9	2.6
23	310	6.2					4.0	2.7

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

Table 11

Trinidad, British West Indies (10.7°N, 61.6°W) April 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	9.2						3.0
01	240	8.4						3.0
02	240	7.8						3.1
03	240	6.8						3.0
04	250	5.8						3.1
05	240	5.0						3.2
06	250	5.3			---	---	2.6	3.1
07	230	7.0	---	---	100	2.5	3.4	3.2
08	250	8.4	220	4.6	110	3.0	3.7	3.1
09	260	9.7	220	4.7	110	3.5	4.0	3.0
10	280	10.6	220	5.0	100	3.7	4.2	3.0
11	300	11.3	210	5.2	100	3.8	4.3	3.0
12	300	12.0	210	5.3	100	3.9	4.6	3.0
13	290	12.3	210	5.2	100	3.9	4.8	3.0
14	280	12.3	220	5.2	100	3.7	4.6	2.0
15	280	12.3	220	5.0	100	3.6	4.4	3.0
16	270	12.4	220	4.6	110	3.2	4.4	3.0
17	250	11.6	220	3.8	100	2.5	4.2	3.2
18	240	11.0			---	---	3.6	3.0
19	240	9.9					3.5	2.9
20	270	9.8					3.2	2.8
21	270	9.4					3.0	2.9
22	270	9.4						2.9
23	260	9.2						2.9

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

Table 12

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	220	8.4					3.2	3.1
01	220	8.2					3.3	3.1
02	230	7.2					3.2	3.2
03	250	6.0					3.2	3.1
04	260	5.1					3.2	3.0
05	260	4.3					3.2	3.1
06	280	5.6			100	---	3.2	3.0
07	240	8.4			110	2.6	3.7	3.2
08	240	10.2	230	---	110	3.1	7.8	3.0
09	290	11.1	225	---	110	(3.2)	9.9	2.7
10	300	11.1	220	4.8	110	---	10.2	2.5
11	300	10.7	210	4.9	110	---	10.2	2.5
12	310	10.4	210	4.8	110	---	10.3	2.4
13	300	10.7	210	4.9	110	---	10.2	2.5
14	300	10.8	210	(4.6)	110	---	10.1	2.4
15	280	11.1	210	---	110	3.1	10.0	2.5
16	210	11.1	---	---	110	2.7	8.0	2.5
17	270	10.8			110	2.2	5.0	2.4
18	300	10.0			110	---	3.1	2.4
19	330	9.0					2.7	2.2
20	310	9.0					3.2	2.4
21	270	8.8					3.1	2.7
22	230	8.9					3.2	3.0
23	220	8.9					3.2	3.1

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

Table 13

Tromeo, Norway (69.7°N, 19.0°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
06								
06								
07								
08	(250)	4.8	240	---	130	2.2	3.2	3.1
09	280	5.3	240	3.6	120	2.5	3.0	3.1
10	280	5.4	230	3.8	115	2.6	2.7	3.0
11	300	5.8	225	3.8	110	2.6	2.9	3.1
12	280	5.9	230	(4.0)	120	2.5		3.1
13	275	6.8	235	3.8	125	2.6	3.1	3.2
14	265	5.8	235	3.8	120	2.4	3.3	3.2
16	260	5.4	230	3.5	120	2.3	5.0	3.2
16	245	5.0	---	---	120	2.0	4.6	3.2
17	255	4.4			---	1.8	4.5	3.1
18	275	(4.4)			---	---	4.3	(3.0)
19	285	(4.4)					4.4	(3.0)
20	(320)	(4.4)					4.2	(2.8)
21	---	---					3.6	---
22	---	---					(4.2)	---
23								

Time: 15.0°E.
Sweep: 0.6 Mc to 26.0 Mc in 6 minutos, automatic operation.

Table 14

Lindau/Harz, Germany (61.6°N, 10.1°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.3					2.2	2.7
01	290	3.2					2.0	2.7
02	295	3.2					2.2	2.7
03	290	3.0					2.4	2.7
04	290	3.0					2.2	2.8
05	280	2.6					2.0	2.8
06	260	2.8	---	---			2.4	2.9
07	235	4.3	---	---	---	E	2.8	3.2
08	230	5.7	220	---	100	2.2	3.3	3.2
09	270	5.8	210	3.8	100	2.6	3.2	3.1
10	280	6.7	200	4.0	100	2.8	3.6	3.1
11	270	7.0	200	4.2	100	2.9	3.6	3.1
12	260	7.1	200	4.2	100	3.0	3.6	3.1
13	270	7.1	200	4.3	100	3.0	3.5	3.1
14	270	7.2	200	4.2	100	2.9	3.7	3.1
16	260	7.2	210	4.7	100	2.8	3.4	3.1
16	250	7.1	210	---	100	2.5	3.2	3.2
17	230	6.8	220	---	100	2.1	3.7	3.2
18	230	6.8			---	E	2.7	3.1
19	220	6.4					2.3	3.1
20	210	5.8					2.7	3.0
21	230	4.7					2.2	2.9
22	260	3.8						2.9
23	290	3.4					2.0	2.8

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

Table 15

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	4.3						2.7
01	310	4.2						2.7
02	300	4.4						2.7
03	300	4.0						2.7
04	290	3.9						2.8
05	290	3.7						2.8
06	260	5.1			120	1.6		3.1
07	250	7.0	---	---	110	2.0		3.2
08	260	7.5	260	---	110	2.7		3.2
09	270	8.3	250	---	110	3.0		3.1
10	280	8.7	240	4.4	110	3.1		3.1
11	290	9.3	250	4.4	110	3.2		3.1
12	290	9.2	250	4.4	110	3.2		3.1
13	300	8.7	240	4.6	110	3.1		3.1
14	280	8.5	240	4.2	110	3.0		3.1
15	280	7.8	250	4.2	110	2.7		3.2
16	260	7.7	260	---	110	2.5		3.2
17	260	7.3	---	---	110	1.9		3.2
18	240	6.8						3.1
19	260	5.6						3.0
20	280	5.3						3.0
21	290	4.9						2.9
22	300	4.6						2.7
23	320	4.2						2.6

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

Table 16

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.5						2.9
01	270	4.4						2.9
02	260	4.4						3.0
03	240	4.3						3.0
04	240	3.8						3.0
05	260	3.6						3.0
06	220	4.8			140	1.8		3.3
07	220	7.1	---	---	110	2.2		3.5
08	220	8.2	220	---	110	2.6		3.4
09	240	8.6	220	---	110	3.0		3.3
10	250	9.2	220	4.5	110	3.2		3.2
11	260	10.2	220	---	110	---		3.2
12	250	10.2	220	---	110	3.1		3.2
13	260	9.9	240	---	110	3.4		3.3
14	250	9.1	220	---	110	3.3		3.3
15	250	8.8	220	---	110	3.0		3.3
16	240	8.2	220	---	110	2.7		3.3
17	230	8.0	---	---	110	2.0		3.4
18	220	7.0					2.4	3.4
19	220	5.8					2.4	3.2
20	240	5.0						3.0
21	250	4.7						3.0
22	270	4.7						2.9
23	280	4.6						2.8

Time: 135.0°E.
Sweep: 1.0 Mc to 17.0 Mc in 16 minutes, manual operation.

Table 17

Tokyo, Japan (35.7°N, 139.6°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.1					1.9	2.9
01	260	4.0					1.7	3.0
02	250	4.2					1.6	3.1
03	230	4.1					1.5	3.2
04	230	3.5						2.9
05	250	3.3					1.7	3.0
06	240	4.4			130	1.6		3.3
07	220	7.1			110	2.2		3.5
08	230	8.2	220	---	100	2.7		3.5
09	240	8.3	210	---	100	2.9		3.4
10	250	9.2	210	4.6	100	3.1		3.2
11	260	10.5	210	4.6	100	3.2		3.2
12	260	11.2	220	---	100	3.4	3.7	3.2
13	250	10.9	220	4.8	100	3.3	3.7	3.2
14	250	10.2	220	---	100	3.2		3.3
15	250	9.0	220	---	100	3.1		3.3
16	240	8.5	220	---	100	2.7		3.4
17	220	8.1	220	---	100	2.0	2.6	3.4
18	210	7.1					2.6	3.4
19	210	5.6					2.4	3.3
20	240	5.1					2.4	3.0
21	250	4.7					2.0	3.0
22	260	4.3					1.9	3.0
23	270	4.2						2.9

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

Table 18

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	4.5					2.0	2.8
01	290	4.4					1.8	3.0
02	270	4.2						3.0
03	260	4.2						3.1
04	250	3.8						3.1
05	280	3.2						2.9
06	290	3.1						2.8
07	240	6.4	---	---	120	1.9		3.3
08	250	7.6	---	---	110	2.5	3.0	3.3
09	250	8.4	220	---	110	2.8	3.2	3.3
10	270	9.3	220	---	100	3.2	3.9	3.1
11	300	10.6	230	---	110	3.3	4.4	3.0
12	290	11.9	220	---	110	3.4	4.3	3.1
13	290	12.5	230	4.7	110	3.4	4.2	3.1
14	280	12.1	230	---	110	3.4	3.9	3.2
15	280	11.0	230	4.4	110	3.2	3.9	3.2
16	260	10.1	230	---	110	3.0	3.9	3.2
17	260	9.0	240	---	110	2.5	3.7	3.2
18	250	8.4			110	1.8	3.0	3.3
19	220	7.6					2.8	3.3
20	220	6.3					2.4	3.3
21	260	6.2					2.6	3.0
22	280	4.8					2.2	2.9
23	300	4.6					2.4	2.9

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

Table 19

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	3.7						2.8
01	330	3.6						2.8
02	330	3.7						2.8
03	320	3.8						2.9
04	320	3.8						2.9
05	310	3.5						2.9
06	290	3.7						3.0
07	280	5.9	---	---				3.1
08	290	7.2	260	---	130	2.6		3.1
09	300	7.6	240	(4.1)	120	(3.0)		3.0
10	320	8.2	230	(4.6)	120	---		2.9
11	330	8.9	230	(4.7)	120	---		2.8
12	330	9.3	250	(4.9)	120	---		2.8
13	330	9.9	260	(4.7)	120	---		2.8
14	320	9.8	270	(4.6)	120	---		2.9
15	300	9.2	270	---	120	---		2.9
16	290	8.6	270	---	130	---		2.9
17	280	8.5	(280)	---	(140)	(2.4)		3.1
18	270	7.6						3.1
19	270	6.0						3.0
20	280	(4.5)						2.9
21	310	(4.0)						(2.9)
22	320	(4.0)						(2.8)
23	340	(3.9)						(2.8)

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

Table 20

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.8	---	---				3.2
01	280	6.8	---	---				3.3
02	260	6.6	---	---				3.5
03	250	5.4	---	---				3.7
04	275	3.7	---	---				3.5
05	305	3.6	---	---				3.2
06	300	3.9	---	---	---	---		3.3
07	220	6.8	---	---	110	3.0	3.0	3.8
08	240	8.8	215	4.4	100	3.0	3.4	3.5
09	260	9.6	210	4.6	100	3.2	3.8	3.4
10	275	11.4	210	4.8	100	3.3	4.2	3.4
11	280	13.1	200	4.8	100	3.5	4.2	3.2
12	290	14.2	200	5.0	90	3.6	4.3	3.2
13	280	14.4	210	5.0	100	3.3	4.2	3.3
14	280	14.4	210	5.0	100	3.4	4.2	3.4
15	260	14.3	200	4.6	100	3.2	3.9	3.4
16	250	13.5	200	4.5	100	3.0	3.9	3.5
17	240	12.8	220	4.1	100	3.0	3.6	3.6
18	240	11.0	---	---	90	2.6	3.0	3.5
19	215	9.9	---	---	100	---	2.8	3.6
20	220	9.6	---	---				3.5
21	225	8.4	---	---				3.4
22	275	7.3	---	---				3.2
23	280	7.2	---	---				3.2

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

Table 21

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	4.0					2.0	2.9
01	270	3.7					2.0	3.0
02	250	3.7						3.2
03	250	3.2						3.1
04	260	3.2						2.9
05	260	3.0					1.6	2.9
06	250	3.7			---	1.4		3.1
07	230	6.2	240	---	120	2.2		3.4
08	250	7.0	230	4.0	110	2.7	3.2	3.3
09	270	7.9	220	4.4	110	3.1	3.9	3.2
10	280	8.2	210	4.7	110	3.4	4.2	3.0
11	300	8.9	200	4.9	110	3.5	4.2	2.9
12	300	9.6	200	4.9	110	3.6	4.1	2.9
13	290	9.8	200	4.8	110	3.6	4.0	2.9
14	300	9.7	210	4.7	110	3.6	3.6	2.9
15	290	9.8	220	4.6	110	3.4	3.8	2.9
16	280	9.5	220	4.4	110	3.1	3.6	3.0
17	260	9.6	230	---	120	2.6	3.5	3.2
18	230	9.1	240	---	120	(2.0)	2.7	3.3
19	220	7.4					2.3	3.2
20	220	5.6					1.9	3.2
21	250	4.7						3.0
22	260	4.4						3.0
23	270	4.0					2.2	3.0

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

Table 22

Capetown, Union of S. Africa (34.3°S, 18.3°E) March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	3.6						2.9
01	270	3.5					1.9	2.9
02	270	3.4						2.9
03	260	3.4					1.5	3.0
04	250	3.1						3.0
05	260	3.0						2.9
06	260	3.0						2.9
07	240	4.9			140	1.7		3.3
08	250	6.3	240	3.6	120	2.4		3.3
09	270	7.2	230	4.1	110	2.8		3.2
10	280	7.8	220	4.4	110	3.1	3.6	3.1
11	300	8.7	210	4.6	110	3.4	3.7	2.9
12	300	9.5	200	4.8	110	(3.4)	4.0	2.9
13	300	9.5	200	4.8	110	3.5	3.5	2.9
14	300	9.4	210	4.6	110	3.4	3.6	2.9
15	300	9.5	220	4.6	110	3.3	3.2	2.9
16	290	9.2	230	4.4	110	3.1	3.2	3.0
17	270	9.1	230	4.0	120	2.8	3.2	3.1
18	250	8.8	240	3.5	120	2.3	2.9	3.2
19	230	7.7			(130)	1.8	2.1	3.3
20	230	5.9					2.0	3.2
21	240	4.9						3.1
22	260	4.4						3.0
23	260	3.8						3.0

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

Table 23

Tromso, Norway (69.7°N, 19.0°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07								---
08	250	3.9			---	---	2.9	3.2
09	250	4.7			---	---	3.0	3.2
10	250	5.4	---	---	---	---		3.3
11	245	5.9	---	---	---	2.2	2.5	3.3
12	245	6.1	---	---	---	2.1	2.7	3.3
13	245	5.9	---	---	---	2.1		3.3
14	240	5.5	---	---	---	---	3.1	3.4
15	245	5.0			---	1.6	3.2	3.3
16	235	4.4			---	1.5	3.2	3.4
17	240	(4.2)			---	---	3.2	(3.2)
18	250	(4.3)					4.2	(3.1)
19	(260)	(4.0)					5.2	(3.1)
20	(265)	(3.9)					5.3	(2.9)
21	---	---					4.0	---
22								
23								

Time: 15.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 24

Lindau/Harz, Germany (51.6°N, 10.1°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	2.8					2.1	2.7
01	300	2.9					2.0	2.8
02	300	2.8					2.2	2.7
03	300	2.5					2.1	2.7
04	300	2.2					2.6	2.8
05	300	1.9					2.0	2.8
06	290	1.8					2.0	2.9
07	280	2.6					2.2	2.9
08	230	4.8	---		---	1.6	2.9	3.2
09	220	5.9	220		100	2.2	3.7	3.3
10	230	6.5	210		100	2.4	3.4	3.3
11	240	7.0	210		100	2.7	3.4	3.3
12	230	7.2	210		100	2.8	2.9	3.2
13	240	7.3	210		100	2.8	3.4	3.2
14	230	7.2	210		100	2.7	3.4	3.2
15	220	7.2	220		100	2.6	3.4	3.2
16	220	7.2	---		100	2.2	3.4	3.3
17	210	6.6			110	1.6	3.2	3.3
18	210	5.4					2.6	3.2
19	220	4.9					2.4	3.1
20	240	4.0					2.0	3.0
21	280	3.2					2.0	2.9
22	290	3.0					2.0	2.8
23	300	2.9					2.2	2.7

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

Table 25

Watheroo, W. Australia (30.3°S, 115.9°E) February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.7					3.2	2.9
01	260	4.4					3.2	2.9
02	260	4.1					2.8	2.9
03	260	3.8					2.8	2.9
04	280	3.4					2.7	2.8
05	280	3.4					2.7	2.8
06	260	4.2	240	---		1.7	2.8	3.0
07	300	5.0	240	3.8		2.4	3.1	3.1
08	310	5.9	220	4.2		2.8	3.8	3.1
09	310	6.1	220	4.5		3.2	4.2	3.0
10	360	7.0	200	4.6		3.3	3.8	2.9
11	350	7.4	200	4.7		3.4	3.9	2.9
12	330	7.6	200	4.8		3.5	4.0	2.8
13	340	7.7	220	4.8		3.5	4.1	3.0
14	320	8.0	230	4.7		3.4	4.1	3.0
15	320	7.4	220	4.6		3.4	3.6	3.0
16	310	7.2	220	4.5		3.2	3.6	3.0
17	300	6.7	230	4.1		2.7	3.3	3.1
18	260	6.7	240	3.2		2.1	3.2	3.1
19	240	6.6					2.7	3.1
20	240	5.8					2.5	2.9
21	260	5.3					2.5	2.9
22	270	5.0					2.5	2.8
23	270	4.8					2.8	2.8

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

Table 26

Tromso, Norway (69.7°N, 19.0°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07								
08	(270)	2.2					2.6	(3.1)
09	250	3.1			---	---	1.8	3.2
10	240	4.3			---	---	2.5	3.2
11	230	5.2			---	---	2.9	3.4
12	225	5.8			---	---	2.5	3.4
13	225	5.0			---	---	2.9	3.4
14	230	4.7			---	---	3.1	3.4
15	245	4.0			---	---	3.2	3.4
16	245	(2.7)					3.5	(3.2)
17	(275)	(2.3)					3.2	(3.1)
18	(295)	2.5					4.4	(3.2)
19	---	(2.5)					4.4	(3.2)
20	---	(3.9)					6.0	---
21	---	---					5.5	---
22								
23								

Time: 15.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 27

Rarotonga I. (21.3°S, 159.8°W) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	7.2					4.0	3.0
01	(260)	(6.3)					4.4	(3.1)
02	(300)	(5.8)					(3.8)	(2.9)
03	(300)	(5.7)						(2.9)
04	(260)	(5.1)					(3.7)	(2.9)
05	(250)	(5.7)					(3.9)	(3.1)
06	(250)	(6.1)					(5.0)	(3.2)
07	300	7.7	250	4.8	110	2.6	4.3	3.0
08	300	8.5	250	4.9	110	3.2	4.9	3.0
09	350	9.1	220	5.2	110	3.5	5.0	2.8
10	350	11.0	230	5.2	110	3.6	5.1	2.8
11	350	12.2	230	5.2	110	3.8	5.0	2.8
12	350	11.8	220	5.4	110	3.7	5.1	2.8
13	340	12.4	240	5.1	110	3.8	5.0	2.9
14	320	12.8	250	5.4	110	3.8	5.0	2.9
15	310	12.0	250	5.0	110	3.5	4.9	3.0
16	310	10.8	250	4.9	110	3.2	4.9	3.0
17	300	9.9	250	5.2	---	---	4.8	3.0
18	260	9.5					4.7	2.9
19	300	8.7					4.7	2.9
20	310	7.6					4.4	2.9
21	310	7.6					3.8	2.8
22	310	7.4					3.7	2.7
23	290	7.2					3.5	2.8

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

Table 28

Christchurch, New Zealand (43.5°S, 172.7°E) January 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.0					3.3	2.8
01	270	5.5					3.1	2.8
02	270	4.6					2.8	2.8
03	270	4.3					3.0	2.9
04	280	3.7					3.1	2.9
05	260	4.0				1.4	3.0	3.0
06	270	4.9	260	3.6		2.3	3.4	3.1
07	320	5.5	250	4.2		2.7	3.2	3.0
08	320	6.0	230	4.5		3.0	6.0	3.0
09	330	6.8	240	4.6		3.3	6.2	3.0
10	320	7.2	220	4.8		3.4	5.1	3.0
11	320	7.3	220	4.8		3.4	5.1	3.0
12	320	7.1	220	4.8		3.6	5.4	3.0
13	340	6.6	230	4.8		3.5	4.7	3.0
14	340	6.6	220	4.7		3.5	4.5	2.9
15	340	6.8	230	4.7		3.3	3.8	2.9
16	330	7.0	220	4.5		3.2	4.0	2.9
17	310	7.0	240	4.2		2.8	3.2	3.0
18	290	6.8	250	3.8		2.4	2.9	3.0
19	280	6.8	270	3.0		1.6	2.7	3.0
20	260	7.3				---	3.4	2.9
21	270	7.4					3.9	2.8
22	280	7.0					3.5	2.7
23	280	6.5					3.0	2.8

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

Table 29

Delhi, India (28.6°N, 77.1°E) December 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00	320	2.7						3.2
01	330	2.6						
02	---	---						
03	(300)	(3.6)						
04	290	3.0						3.5
05	300	2.8						
06	280	3.2						
07	250	5.9						
08	250	7.2						3.7
09	260	8.4						
10	250	9.1						
11	270	9.2						
12	260	9.4						3.3
13	260	9.4						
14	280	9.8						
15	270	8.9						
16	260	8.7						3.6
17	260	7.6						
18	260	5.9						
19	280	4.8						
20	260	4.2						3.6
21	260	3.4						
22	280	3.1						
23	300	2.8						

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 30

Bombay, India (19.0°N, 73.0°E) December 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2**
00								
01								
02								
03								
04								
05								
06								
07	270	6.8						
08	300	9.5						3.2
09	300	9.8						
10	330	10.5						
11	330	11.0						
12	360	11.8						2.9
13	360	12.1						
14	360	12.9						
15	360	13.1						
18	360	13.2						2.9
17	360	12.7						
18	330	12.2						
19	330	11.6						
20	300	10.2						3.2
21	300	8.7						
22	270	8.0						3.2
23	280	8.6						

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 31

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

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	360	7.6						
08	360	8.7						2.8
09	390	9.8						
10	420	10.2						
11	420	10.6						
12	450	10.5						2.5
13	480	10.6						
14	480	10.7						
16	480	10.8						
16	480	10.8						2.4
17	480	10.7						
18	480	10.8						
19	480	10.5						
20	450	10.1						2.5
21	390	(9.9)						
22	(360)	(9.6)						
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 32

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

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05	---	---						
06	330	(5.5)						
07	360	7.0						
08	420	9.0						2.7
09	480	9.4						
10	480	9.3						
11	510	9.5						
12	640	9.7						2.4
13	520	9.7						
14	510	10.0						
16	540	9.8						
16	510	9.8						2.4
17	480	9.9						
18	480	9.6						
19	440	9.2						
20	420	8.8						2.6
21	360	8.4						
22	360	8.2						2.5
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 33

Delhi, India (28.6°N, 77.1°E) — November 1950

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00	340	2.8						3.7
01	340	2.7						
02	---	---						
03	---	---						
04	300	2.9						3.5
05	280	3.2						
06	270	3.6						
07	240	6.5						
08	250	8.8						3.6
09	260	9.6						
10	260	10.7						
11	280	10.4						
12	280	10.4						3.3
13	280	11.4						
14	280	12.0						
16	270	12.0						
16	260	10.3						3.6
17	250	8.9						
18	250	7.0						
19	260	5.8						
20	260	4.2						3.6
21	280	3.5						
22	300	3.1						3.2
23	320	2.8						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 6 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 34

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

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	300	8.5						
08	330	10.2						3.1
09	330	10.8						
10	390	11.5						
11	390	12.1						
12	420	13.2						2.6
13	420	13.7						
14	420	14.2						
15	420	(14.7)						
16	390	(14.7)						2.8
17	380	(14.9)						
18	360	(14.7)						
19	420	13.8						
20	390	12.8						2.8
21	390	11.2						
22	360	9.8						3.1
23	360	10.6						

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 35

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

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06								
07	360	7.8						
08	360	8.8						2.7
09	390	9.8						
10	420	10.4						
11	420	10.7						
12	420	10.8						2.6
13	450	10.9						
14	480	11.2						
15	480	11.6						
16	480	11.8						2.6
17	480	11.8						
18	480	11.3						
19	480	10.8						
20	460	10.2						2.7
21	420	9.8						
22	(390)	9.6						
23	---	---						

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 6 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 36

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

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2 **
00								
01								
02								
03								
04								
05								
06	---	---						
07	360	7.8						
08	420	9.8						2.7
09	450	10.0						
10	480	10.0						
11	510	10.2						
12	540	10.2						2.4
13	540	10.3						
14	540	10.4						
15	510	10.4						
16	510	10.4						2.4
17	480	10.3						
18	480	10.2						
19	480	10.0						
20	450	9.8						2.5
21	420	9.4						
22	420	9.0						
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 37

Brisbane, Australia (27.5°S, 153.0°E) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	7.5					3.6	2.9
01	240	6.4					4.0	3.0
02	260	6.9					3.9	2.8
03	260	5.6					3.0	2.9
04	260	5.3						2.9
05	250	5.4	---	---	140	1.7	1.3	3.1
06	250	6.0	240	4.0	100	2.3		3.2
07	270	6.6	220	4.4	100	2.9		3.0
08	300	7.4	220	4.5	100	3.2	3.6	3.0
09	300	8.4	200	4.8	100	3.4	4.0	2.9
10	300	8.8	200	4.9	100	3.5	4.2	2.9
11	300	9.4	200	5.0	100	3.5	4.7	2.9
12	300	9.3	200	5.0	100	3.7	3.8	2.9
13	300	9.4	210	4.9	100	3.7	4.0	2.9
14	300	9.0	220	4.7	100	3.5		3.0
15	290	8.9	220	4.5	100	3.3		3.0
16	280	8.4	230	4.3	100	3.0		3.0
17	250	8.0	240	3.8	110	2.6		3.0
18	250	7.7			---	E	4.2	3.0
19	260	7.5					4.0	2.9
20	290	7.5					3.8	2.8
21	300	7.4					4.0	2.8
22	290	7.6					4.1	2.8
23	280	7.4					3.9	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 38

Canberra, Australia (35.3°S, 149.0°E) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	(6.0)					5.4	(2.9)
01	250	(6.9)					4.4	3.0
02	250	5.0					4.0	3.0
03	260	(4.7)					3.0	(3.0)
04	260	(4.0)					3.1	3.0
05	250	4.1	---	---	---	1.4	2.7	3.1
06	240	6.0	235	---	110	2.3	2.5	3.1
07	360	6.5	230	4.2	100	2.8	3.6	2.9
08	330	6.2	220	4.5	100	3.1	4.8	3.0
09	320	7.0	210	4.6	100	3.4	5.4	3.0
10	300	7.5	210	4.5	100	3.4	5.5	3.1
11	310	7.7	205	4.6	100	3.4	5.4	3.0
12	310	7.7	200	4.7	100	3.4	6.6	3.0
13	300	7.5	190	4.6	100	(3.5)	5.5	3.0
14	300	7.5	220	4.6	100	3.6	4.2	3.0
15	300	7.6	215	4.5	100	3.4		3.0
16	290	7.5	225	4.4	100	3.1		3.1
17	260	7.2	230	(3.8)	110	2.7		3.1
18	250	7.1			120	(2.0)	3.9	3.1
19	250	7.2					3.6	3.0
20	250	6.9					5.6	2.9
21	260	(6.5)					3.8	(2.9)
22	280	6.7					5.9	2.8
23	280	6.2					5.0	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 39

Hobart, Tasmania (42.8°S, 147.4°E) November 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	4.8						2.9
01	250	4.6						3.0
02	250	4.0						3.0
03	250	3.5						2.9
04	260	3.0			---	---		2.9
05	250	3.8	---	---	130	1.7	2.0	3.1
06	230	4.6	---	---	100	2.3		3.2
07	240	4.8	220	4.4	100	2.8		3.2
08	340	6.5	210	4.5	100	3.1		3.0
09	340	6.0	200	4.5	100	3.3		3.0
10	330	6.5	200	4.6	100	3.4		3.0
11	340	7.0	200	4.7	90	3.5		2.9
12	350	6.8	200	4.7	90	3.5		2.9
13	340	7.0	200	4.7	90	3.5		2.9
14	320	7.0	200	4.6	90	3.4		3.0
15	320	6.8	200	4.5	90	3.4		3.0
16	300	7.0	200	4.4	100	3.0		3.1
17	270	7.0	220	4.0	100	2.7		3.1
18	250	7.0	240	3.3	100	2.2		3.1
19	240	7.2			130	1.5		3.1
20	240	7.0					3.5	3.0
21	240	6.5					3.8	2.9
22	250	6.0					3.6	2.9
23	250	5.5					3.3	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 40

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.2					2.8	2.8
01	265	4.5					2.8	2.9
02	265	4.3					2.8	2.8
03	270	4.2					3.0	2.9
04	270	4.2	---	---	---	2.0	3.0	2.9
05	250	4.4	210	---	100	1.8	3.0	3.1
06	260	5.4	210	---	100	2.1	3.2	3.2
07	280	6.1	200	---	100	2.6	4.3	3.2
08	285	(6.2)	---	---	100	3.0	4.4	(3.1)
09	295	6.5	200	---	100	3.1	5.0	3.1
10	300	6.0	200	---	100	3.2	4.5	(3.2)
11	305	6.4	200	4.6	100	3.3	4.5	(3.1)
12	300	6.2	200	4.8	100	3.3	3.8	3.0
13	320	6.2	200	4.8	100	3.2		3.0
14	300	6.4	200	4.7	100	3.2	3.8	3.0
15	300	6.5	200	---	100	3.2	3.2	3.0
16	300	6.4	200	---	100	2.7	4.0	3.1
17	280	6.5	210	---	100	2.3	3.9	3.1
18	260	6.8	220	---	100	2.1	3.8	3.1
19	240	7.0	210	---	100	1.8	3.3	3.3
20	230	6.9			---	---	3.0	3.0
21	240	6.2					2.9	3.0
22	250	5.6					2.8	2.9
23	260	5.4					2.8	2.9

Time: 0.0°.
Sweep: 1.6 Mc to 16.0 Mc in 1 minute 30 seconds.

Table 41

Poitiers, France (46.6°N, 0.3°E) August 1950

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	5.4						2.8
01	320	6.0						2.8
02	325	4.8						(2.8)
03	330	4.4						(2.7)
04	320	4.2						(2.3)
05	300	4.3						(3.0)
06	280	5.4	250	---			3.6	(3.2)
07	230	6.0	230	4.0			4.4	3.2
08	220	6.4	230	4.3			4.8	3.2
09	300	6.2	220	4.5			6.2	(3.2)
10	300	6.4	220	4.5			5.3	3.2
11	300	6.4	220	4.7			5.0	3.0
12	330	6.5	220	4.8			4.9	3.0
13	330	6.7	225	4.8			4.8	3.0
14	320	6.6	225	4.6			4.1	3.0
15	300	6.8	225	4.5			4.2	3.1
16	300	6.8	230	4.2			3.4	3.1
17	280	6.9	230	---			3.2	3.1
18	280	7.0	250	---				3.0
19	250	7.6					4.2	(3.0)
20	260	7.6						3.1
21	260	6.7						3.0
22	280	6.1						2.8
23	280	5.8						2.8

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

Form adopted June 1946

TABLE 42

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

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(280)S	(320)A	320	310	260	300	310	290	400	400	380	450	500K	420K	370K	340K	320K	290K	350K	330K	250HK	240K	290K	400K
2	BK	BK	BK	BK	BK	(310)BK	250HK	H[350]LK	500K	GK	GK	GK	GK	GK	570K	540HK	460K	420K	320K	260K	270K	280K	250K	(280)SK
3	300K	300K	(280)SK	BK	BK	280K	230K	(320)LK	300HK	GK	400HK	450K	340K	320HK	400K	310K	300K	300K	270K	250K	260K	270K	280K	280K
4	270K	250K	H230SK	270K	300K	300K	250K	[320]LK	400K	450HK	450K	460K	480K	500K	430K	390K	330K	300K	280K	250K	230K	260K	280K	300K
5	300K	[300]KS	300HK	(300)AK	(300)SK	(280)A	240	270	280	290	320	300	320	320	310	300	300	280	260	250	(230)A	(250)HA	250	(260)HA
6	300	310	310	300	270	260	260	310	410	410	[480]L	550H	360	350	330	320	330	290H	280	240	230	240	260	270
7	270	270S	280	260	230	230	280	310H	360	370H	400	410	430	360	550H	400	360	(350)A	300	260	230	240	270	270
8	270	280	260	260	270	270	280	310H	330	360	290H	350	340	350	320	320	310	290	270	240	220	250	(280)A	280
9	270	260	280	290	280	280	280	300H	420	360	360	380	390	430	400	400	320	340K	300K	270K	230K	260K	260K	300K
10	330K	350K	(400)KS	330K	CK	CK	CK	GK	GK	GK	GK	GK	540K	660K	500K	460K	460K	340K	340K	270K	240	260	260	280
11	300	280	280	250	260	260	230	270	330	350H	390H	400H	390	480	430	350	330	320	280	260	250	250	280	280
12	260	270	270H	300	280	280	300	320	300	370H	420	350	350	400	380	350	320	300	280	250	230	240	(270)A	[280]A
13	280	260	280	(280)S	270	260	280H	(270)HL	300	300	330	360	370	350	320	320	310	290	270	(250)A	250	250	250	280
14	300	290	250S	250	(280)S	260	300	280H	270	280H	360	350	390	370	360	350	340	340	270	260	230	240	240	240
15	280	320	330	300	300	290	400	370	410	480	390	390H	380	400H	390	430	270	310	320	250	240	240	300	300
16	320	320	250	240H	290	280	240	490	470H	480H	500HK	500HK	620HK	600K	500K	410K	410K	380K	330K	260K	220K	280K	280K	330K
17	290K	310K	(300)SK	280K	270K	270K	230K	520HK	510K	660K	550K	GK	680K	GK	510K	560K	490K	450K	330K	260K	260K	290K	310K	290K
18	(280)A	300	300	290	290	(300)HA	(280)B	(420)L	430	490	530	470	520	460	420	450	360	350	290H	270	280	280	280	310
19	(280)S	(300)S	300	280	300	280	300	320	300	360	390	(360)L	410	390	360	370	340	330	280	250	240	240	260	270H
20	300	(300)S	300	280	280	260	270	310	350	400	400	390	380	380	360	(360)B	340	310	(300)A	250	(270)A	280	[300]A	(300)A
21	(330)A	270	(300)A	280	260	250	290	(270)A	390	420	560	400	430	470	450	410	370	330	270	270	(220)A	260	270	280
22	280	280	270	270	280	270	260	290	330	[370]C	410	410	440	430	370	370	360	340	290	270	240	270	260	280
23	240	300	280	270	260	250	250	380	370	370	440	380	390	380	360	410	380	310	290	250	220	230	290	(310)A
24	270	300	290	270H	(320)S	310	(330)L	G	G	G	400	500	G	520	390	410	400	340	280	260	250	260	270	290
25	270	280	300	(340)A	A	L	270	290	AH	A	350	(420)H	360	320	320	320	330	310	280	260	220	220	250	280
26	270	280	(300)S	(280)S	280	290	[290]L	(300)H	(300)A	380K	320K	330K	330K	350K	350K	330K	330K	300K	250K	260K	260K	270K	300K	300HK
27	310K	290K	220K	320HK	310HK	300K	280K	GK	GK	430HK	GK	AK	GK	510K	400K	370K	340K	310K	300K	280K	250K	260	290	300
28	300	300	280	280	300	280	A	A	(350)L	350	360	390	370	350	350	320	310	310	280	240	230	230	270	280
29	290	300	300	290	260	230	300	270	380	410	370	390	330	320	300	320	320	320	310	260	(240)A	230	240	260
30	260	[260]S	(270)S	(300)S	(270)S	(280)S	340	400	380	460	400	450	390	480	480	410	350	340	300	260	(260)A	280	270	(300)A
31	(290)A	290	(290)A	(350)A	A	A	A	300	G	350	450H	G	350H	330	360	370	380	320	300	[290]A	(280)A	(270)A	A	A
Median	280	300	280	280	280	280	280	310	380	400	400	400	390	400	380	370	340	320	290	260	240	260	270	280
Count	30	30	30	29	26	28	28	30	30	30	31	30	31	31	31	31	31	31	31	31	31	31	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 793510

(Characteristic) , MC (Unit) , May (Month) 1951

Observed at Washington, D. C.

Lat 38.7°N , Long 77.1°W

IONOSPHERIC DATA

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

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: W.A.P. , McC

Calculated by: E.R.R. , W.A.P.

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	5.6	4.7	4.0F	3.9F	[3.1]F	(3.3)F	(4.3)F	4.3F	4.6	5.4	5.5	5.4	5.8K	6.8K	8.4K	9.1K	10.0K	10.0K	8.6ZK	8.2JK	K(7.2)FH	K(6.8)SF	K(4.2)SF	K(4.2)BS
2	BK	BK	BK	BK	BK	2.5BK	K3.9SH	4.0HK	4.3K	<4.1GK	<4.2GK	<4.2GK	<4.2GK	<4.2GK	4.6K	K4.6HS	4.8K	5.1K	5.6SK	5.4SK	5.9K	K4.7SF	K4.2JS	K3.3FS
3	3.0FK	2.5FK	2.4FK	BK	BK	2.6FK	3.8K	4.4K	4.7HK	<4.8GK	5.4HK	5.6K	6.4K	6.8HK	6.5K	7.8K	7.0K	6.7K	7.1K	7.2K	7.2FK	6.5SK	5.9K	6.3K
4	5.7K	5.2K	K3.8FH	2.8K	2.1BK	2.7FK	3.9K	4.3K	4.8K	4.7HK	4.9K	4.9K	5.0K	5.0K	5.4K	5.6K	6.0K	5.8K	5.5SK	5.5K	5.2K	K4.2JS	3.9K	K3.4JS
5	3.1K	(3.0)SK	2.8HK	2.7K	K2.3JS	3.1	4.9	6.0	6.3	6.5	6.8	7.2	7.0	7.0	7.2	7.6	7.2	7.5	7.4	7.8	7.4	6.3H	(5.6)AS	4.5HS
6	3.9S	3.8F	3.8F	3.8YF	(3.6)FS	3.6	4.2	4.5	4.6	4.9	5.0	5.1	6.0	6.3	6.4	6.3	6.1	6.4H	6.1	6.2	5.8	5.1	4.4	4.1
7	4.0	3.6	3.5	3.4F	2.9	3.2	4.1	4.9H	5.5	5.4H	5.2	5.3HB	5.3B	5.3	5.1H	5.3	5.5	5.4	5.5	6.2F	6.2F	(5.2)SF	4.9FS	(4.6)SF
8	4.2FS	4.0F	3.6F	3.2F	2.9F	3.0F	4.3	4.9H	5.4H	5.5	6.1H	6.0	6.2	6.1	6.4	6.5	6.8	7.2	7.4	(7.8)JS	(6.8)SF	(5.6)SF	5.2F	4.7F
9	4.7F	4.3F	3.9	3.3	3.1F	(3.6)S	4.6	4.7H	4.8H	5.6V	5.2	5.7	5.6	5.8	6.2	6.6	7.1	7.4K	9.2K	9.0K	7.8K	6.7K	4.8K	4.3K
10	3.5K	2.7K	K(2.1)BS	2.4K	CK	CK	CK	<3.6GK	<3.9GK	<4.2GK	<4.2GK	<4.3GK	4.8K	5.1K	5.1K	5.1K	5.2K	5.6K	5.2K	5.7K	5.5F	5.0	4.3S	4.1S
11	3.8	3.7	3.6F	3.5F	3.2	3.5	5.6	5.5F	(5.8)H	6.1H	(6.2)SH	(6.0)H	6.1	5.8	5.9	6.7	6.9	6.4	7.0	7.2	6.6	5.8	5.6	5.3
12	5.0	4.7	4.2J	(4.0)S	4.1	3.4	4.7	5.6	5.6	(5.2)H	5.8	6.6	6.4	6.2	6.8	7.0	7.4	7.0	7.0	(7.4)S	6.8	5.8	5.2	5.0
13	5.0	4.8	4.3	3.8	3.5	4.1	5.4H	5.8H	6.0	6.3	6.8	6.4	6.6	7.0	7.3	7.5	7.7	7.4	7.6	7.4S	7.7	7.0	6.4	5.8
14	5.4	5.4	5.4V	4.7	4.1	4.3	5.6	6.2H	7.0	7.0	6.8	6.8	7.0	7.5	7.8	7.4	7.4	7.8	8.2	8.1	8.1	6.6	6.4	5.8Z
15	4.5J	3.5	3.3	3.1	2.8	3.2JS	4.2	5.4	5.4	5.8	6.7	6.4H	6.7	6.6ZH	6.8	6.8	7.1	7.4	8.0	8.1	7.1	5.8	5.6	5.4
16	5.2	5.0	(4.8)S	(4.0)PH	3.3F	3.4F	3.6F	4.5	5.3H	5.2H	(5.4)HK	5.4HK	5.5HK	5.5K	5.6K	6.2K	6.3K	6.6K	7.0K	7.6SK	K6.4FS	6.4K	(6.0)SK	5.6K
17	5.7K	5.4K	K4.2JS	K4.4SF	K3.8JS	K3.8JS	K4.2FJ	K(4.5)FH	4.8K	4.7K	5.3K	<4.7GK	4.9K	<4.9GK	5.6K	5.4K	5.6K	(6.0)SK	6.9SK	6.5SK	5.6SK	K5.4SF	K4.9SF	5.8ZK
18	5.2SF	4.2	4.1F	3.4F	3.0F	4.7JH	4.9	5.2	5.8	5.8	5.6	5.8	5.7	6.1	5.9	6.1	6.4	6.4	6.2	6.2	6.4	6.0	5.7	5.3
19	5.0	4.7	4.5	4.2	3.7	4.2	5.3	5.9	6.4	6.2	6.5	6.6	6.9	7.2	7.5	7.6	7.8	7.6	8.2	8.2	7.7	7.1	6.4	5.7H
20	5.6	5.0	5.2	4.8	4.3	4.9	5.5	5.6	5.8	5.9	6.5	7.0	7.2	7.3	7.7	(7.7)B	7.8	7.8	7.6	7.6	6.8	6.6	[6.1]A	6.0
21	5.8	5.4F	5.0	4.7F	4.3	4.4	5.4	5.6	5.5	5.8	5.6F	6.4	6.0	6.0	6.3	6.4	6.6	6.8	6.6	7.1S	6.8S	6.8S	6.2S	6.0S
22	5.8S	5.7	5.4S	4.8F	4.5S	5.0F	5.6	5.8	5.9	[6.1]C	6.3	6.3	6.4	6.5	6.9	6.6	6.5	6.8	6.9	6.8S	6.7S	6.7S	6.0	5.8
23	5.4	5.3	5.2JS	4.9	4.7	4.4	5.2	5.4	6.1	6.0	6.0	6.4	6.6	6.9	7.0	6.8	7.8	8.0	7.6	7.2	6.4V	5.6	5.3	5.3
24	4.6	4.3	4.3JS	3.7FH	3.0	3.3	3.9	<3.9G	<4.1G	<4.3G	5.6	5.5	<4.9G	5.6	6.0	5.7	5.8	6.2	6.0	5.9	5.7	5.5	5.3	5.0
25	4.8	4.2F	4.0S	3.9	3.4F	4.0V	4.8	5.5	(5.5)H	(5.5)H	6.1	6.5H	7.2	7.6	7.2	7.4	7.0	7.2JS	7.6	8.6	7.5	6.5	5.8	5.8
26	5.2	4.6	4.4F	4.2	4.2S	4.2	4.7V	5.6	6.2	6.0JK	6.9K	7.4K	8.0K	8.2K	8.4K	9.0K	10.0K	9.2K	9.8SK	9.0K	8.0K	7.6SK	6.4VK	6.3HK
27	5.1K	5.2K	K5.0JS	K2.8JH	(2.9)HK	3.2FK	3.8FK	<4.0GK	<4.1GK	(5.1)HK	<4.4GK	AK	<4.6GK	5.3K	5.6K	5.7FK	6.0K	6.0FK	6.0FK	6.2FK	5.8FK	5.3F	5.2JS	5.0S
28	4.6JF	4.6JF	4.1SJ	(3.1)JF	(2.8)JS	3.4F	4.3J	4.7	5.6	5.8	5.8	6.3	6.6	6.8	7.1	7.0	7.0	7.2	7.6	7.6S	7.6S	6.4S	5.3F	5.0F
29	4.6F	4.5F	4.0SF	3.8F	3.6SF	4.1	5.0	5.4	5.3	5.2	5.8	6.2	6.8	6.8	6.4	6.4	6.6	6.9S	7.5	8.4	8.0JS	6.4	5.6	4.7
30	4.2	(3.9)S	(3.5)S	(3.3)S	3.2F	(3.3)F	4.2S	4.4JF	4.8	5.0	5.0	5.1	5.3	5.0S	5.2	5.5	6.0	5.8	6.2	6.8	6.0F	5.6F	5.0F	4.8F
31	(4.6)SF	4.4F	4.2F	4.0F	3.8	A	A	4.5	<4.2G	5.2	5.0	<4.6G	6.0H	6.0	5.5	5.6	5.6	6.0	6.0	[6.2]A	(6.4)A	(5.3)AF	(4.8)A	[4.7]A
Median	4.9	4.6	4.1	3.8	3.4	3.4	4.6	4.9	5.4	5.5	5.6	6.0	6.1	6.2	6.4	6.6	6.8	6.8	7.0	7.2	6.8	6.0	5.3	5.0
Count	30	30	30	29	28	29	29	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31

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.

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

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	[5.3]C	4.1JA	3.9F	(3.1)FH	(2.3)F	(3.3)F	4.4F	4.3	4.7	6.0	5.4	5.7	6.3K	7.2K	8.7K	10.0K	10.2VK	9.8ZK	K8.5JH	(8.2)SK	7.4FK	K(6.0)SF	K4.4JH	BK
2	BK	(2.6)BK	BK	BK	K(3.3)BF	3.3FK	4.1HK	4.3K	<4.1GK	<4.2GK	<4.2GK	<4.2GK	<4.2GK	<4.2GK	4.8K	4.8K	5.0K	5.4SK	5.5K	K5.2SF	(5.2)SK	K4.5JS	3.6FK	K3.2JS
3	2.9FK	2.5FK	2.4FK	BK	BFK	3.5K	K4.2JS	4.5K	4.7K	5.2K	(5.5)HK	6.1K	6.5K	6.6K	7.2K	7.5K	6.9K	6.9K	7.3K	7.2K	6.9SK	6.4K	6.1K	5.9K
4	5.4K	4.6K	3.3K	2.5SK	(2.0)SK	3.4SK	4.2K	4.4K	5.2K	4.7K	4.8K	5.0HK	5.0K	5.2K	5.5K	5.7SK	5.9K	5.6HK	5.6K	5.4K	(4.7)SK	(4.0)SK	3.7K	3.3K
5	K(3.0)JS	K2.9HS	(2.7)SK	2.5K	(2.4)SK	4.3H	5.4	6.2	6.4	6.4	7.0	7.0	6.9	7.2	7.8	7.2	7.3	7.6	7.6	7.6	(7.2)A	6.0	5.2F	(4.1)FS
6	3.9F	3.6	(3.5)SF	3.7F	3.6F	3.7	4.3	4.5H	4.7	4.9B	5.0	5.3	6.2	6.4	6.5	6.1	6.3H	6.1	6.2	6.0	5.4	4.6	4.2	4.1
7	3.9	3.5	3.5	3.2	2.5S	3.8	4.7	5.3	5.5V	5.5	5.2B	5.4	5.3	5.1	5.3	5.3	5.5	5.4	5.8F	6.3F	6.0F	(5.2)SF	4.7FS	4.4SF
8	4.2F	3.8F	3.4F	3.0F	2.7F	2.9F	4.3	5.0	5.6H	5.9	5.8	6.0	6.2	6.4	6.4	6.4F	6.8	7.4J	7.6	7.5S	(6.1)SF	5.2F	5.0F	4.8F
9	4.8	4.0	3.5F	3.2	2.6	3.8	4.5	4.8H	5.2H	[5.4]M	5.4	5.6H	5.6	6.1	6.2	7.2	7.2	8.2K	9.0K	8.5K	7.2K	6.0K	[illegible]	3.9K
10	3.1K	K(2.0)BS	K(2.4)BS	BK	CK	CK	CK	<3.8GK	<4.1GK	<4.2GK	<4.2GK	<4.5GK	5.2K	(5.0)BK	5.2K	5.1K	5.5K	5.4K	5.4K	5.8K	5.2F	4.7FS	[illegible]	3.8F
11	3.8F	3.6F	3.5F	3.3	2.9	4.4	5.8F	5.6	6.0	6.4H	6.2H	5.8S	6.0	5.6S	6.4	6.6	6.7	6.8	7.0	6.8	6.4	5.5	5.2	5.1
12	4.9	4.6	4.2JS	3.9	3.5	3.8V	4.9HV	6.0	5.4JS	5.6HJ	6.2	6.4	6.3	6.6	6.8	7.2	7.2	6.8	7.1	7.4	6.4	5.4	5.0S	5.0
13	4.9	4.5	4.2JS	3.6	3.8	4.7H	5.6	6.1	6.5H	6.2	6.4	6.8	6.8	7.3	7.4	7.8	7.4	7.5	7.4	7.6	7.6	6.8	6.0	5.5
14	5.4S	5.4	5.1	4.5	4.1	4.9H	6.0	7.0	6.9	7.1V	6.8	6.9	7.2	7.6	7.8	7.1	7.5	8.0	8.2	8.2	7.2	6.2	6.0	5.5Z
15	4.0	3.4	3.3J	2.9	2.7F	3.8	4.7	5.1	5.6	6.4	6.6H	6.8	6.6	6.5	6.5	7.0	7.5	7.2	8.7	8.0	6.4	5.6	5.6	5.2JS
16	6.0F	(4.9)JS	(4.4)FS	3.4F	3.2	3.5F	4.2J	5.2H	5.2H	5.2H	5.3HK	5.4HK	5.5K	5.6K	5.8SK	6.2K	6.5K	6.8K	7.4A	7.5SK	6.2K	6.2K	5.6SK	5.5SK
17	5.0K	5.0K	4.8K	K4.4JS	3.3K	4.2K	4.8FK	4.8FK	4.8K	4.8K	4.8K	<4.8GK	5.0K	5.1K	5.4K	5.4K	K5.8BJ	6.2K	7.0K	6.1K	5.6K	5.2SK	K(5.4)JS	K5.6SH
18	4.4SF	4.0F	4.0SF	3.1F	3.1	4.3	5.2	5.4	5.8	5.8	5.6	5.6JB	5.8	5.8H	6.1	6.3	6.2	6.3	6.4V	6.2	(6.2)S	5.9	5.4	5.3
19	4.9	4.7	4.3	4.0	3.8	4.8	5.6	6.2	6.2	6.4H	6.8	6.9	7.0	7.4	7.2	7.6	7.8	8.1	8.1	8.0	7.4	6.7S	6.1	5.6
20	5.4	5.0	5.0	4.7	4.6	5.2	5.5	5.6	5.9	6.3	6.6	7.0	7.2	7.6	7.6	7.6	8.0	(7.6)A	7.8	7.2	7.8	6.4SF	(6.0)A	5.8
21	5.6Z	5.0H	4.7F	4.4	4.2	4.8	5.6	5.6	5.6	5.6	6.0	6.4	6.0	6.2	6.5	6.6	6.6	6.8	6.8S	7.1S	6.7SF	6.4S	6.1	6.0
22	5.6S	5.6	5.4	4.7	4.6F	5.5S	5.7	5.9	C	C	6.2	6.4	6.3	7.0	6.8	6.7	6.6	7.0	7.0	6.9S	6.8S	6.6S	5.9S	5.7
23	5.4	5.3	5.2S	4.7	4.3	5.0	5.6H	6.4	5.8	[5.9]FH	F(6.0)JH	6.4	6.8	6.9	7.1	7.5	8.2	8.2	7.6	6.6F	6.0JS	5.6S	5.0	5.0
24	4.5	4.0	3.9JS	3.2V	3.2	3.5	4.2JS	<3.9G	<4.2G	5.7	5.4	<4.8G	<4.8G	5.7P	6.0	5.7	6.0	6.2	6.8	5.8	5.5	5.4	5.0	5.0
25	4.5V	3.9	4.0	3.9JS	(3.4)JS	4.5	4.9	5.7	(5.5)A	6.1	6.6	6.8	7.2	7.4	7.3	6.9	7.0	7.4	8.0S	8.4	7.0	6.0	5.6	5.2
26	(4.8)H	4.5	4.3	(4.1)JS	3.7	4.3	5.4H	5.6	6.2JH	6.2K	K7.0JH	7.7K	8.2K	8.2K	9.0K	9.2K	9.8K	9.6K	9.4K	8.8K	8.2K	7.0K	6.4K	6.0HK
27	5.4VK	K5.2JS	K3.4JF	K2.5JS	(2.7)SK	3.6HK	<3.6GK	4.5FK	5.0K	5.0K	AK	AK	<4.7GK	5.6K	K5.8JS	5.7FK	6.0K	(6.3)AK	6.2K	6.0K	5.6FK	(5.0)FS	5.2JS	5.2JF
28	4.4JF	(4.6)FJ	(3.5)JF	(3.2)JF	(2.8)JS	3.9	4.5	5.1	5.6	6.0	6.1	6.3	6.6	7.0	7.0	7.0	7.0	7.4	7.6S	7.6	6.8	(5.8)S	5.1F	4.8F
29	4.5F	4.5F	3.9	3.8F	(3.8)S	4.2	5.4	4.9	5.6	5.8	5.8	(6.6)A	6.6V	6.8	6.8	6.4H	6.8	7.1JS	8.0	8.2	7.2	6.0	5.0	4.5
30	4.1JS	3.8S	3.5	3.3	(3.2)JA	3.8	4.5F	(4.8)JH	<4.2G	5.0	5.0JS	5.3	<4.5G	5.2	5.4	5.7	6.0	5.8	[illegible]	6.6S	5.8F	5.6F	5.0F	4.8F
31	4.5F	(4.3)F	4.0F	A3.9JS	A	A	(4.7)A	4.6	5.0	5.0	5.4	[5.8]A	6.1	[5.6]M	5.5	5.6	5.8	6.0	[6.3]A	6.6	(5.9)A	(5.6)A	(4.5)A	[4.4]A
Median	4.6	4.3	3.9	3.5	3.2	3.9	4.8	5.1	5.5	5.8	5.8	6.0	6.2	6.4	6.5	6.6	6.8	6.9	7.3	7.2	6.4	5.8	5.2	5.0
Count	30	31	30	28	29	29	30	31	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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Form adopted June 1946

TABLE 45

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

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), May (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: W. A. P., McC.

Calculated by: McC., W. A. P.

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							220	220	230	200	190	200	210 K	220 K	250 K	240 K	230 K	240 K	290 K					
2							Q K	240 K	230 K	220 K	220 K	200 K	200 K	(200) A K	210 K	220 K	250 K	250 K	260 K					
3							Q K	230 K	190 H K	200 H K	200 H K	190 H K	200 K	200 H K	220 H K	230 K	230 K	230 K	240 K					
4							Q K	220 K	220 K	200 K	200 K	180 K	190 H K	[200] A K	200 H K	210 K	220 B K	220 K	220 K					
5							Q	220	210	190 H	200	180 H	190	200	A	A	A	220	240					
6							220	210	220	200	200	200	200 H	A	A	220	220	240	A					
7							230	230	220	210	220	210	220	230	A	A	A	A	250					
8							240	210	230	240	210	200	240	210	(200) A	220	230	230	250					
9							Q	220	200 H	190 H	200	(220) B	220	(240) A H	230	230	230	250 K	260 K					
10							C K	250 K	220 K	200 H K	220 K	200 K	190 H K	230 K	240 K	240 K	220 K	240 K	250 K					
11							240	230	220	200	200 H	220	230	220	220	230	230	230	260					
12							250	230	230	200	200	200	220	210	220	250	250	250	A					
13							230	240	[240] A	(250) H A	220	200	200	220	240	230	220	230	A					
14							250	230	230	230	200 H	200	200	240	230	220	220	230	280					
15							270	260	230	260	230	220	230	220	(220) A	200 H	230	[240] A	250					
16							Q	250 H	220	210	190 K	220 K	220 K	200 K	220 K	250 K	250 K	230 K	250 K					
17							Q K	210 H K	200 K	220 K	220 H K	220 K	210 K	230 K	220 H K	220 K	220 K	(260) B K	270 K					
18							Q	280	270	230	200	230	240	230	210	230	260	230	250					
19							240	230	210 H	210	200	220	200	220	210	[230] B	250	250	260					
20							250	230	(230) A	200	200	210	230	220	230	[230] B	230	A	A					
21							250	250	190 H	260	230 A	200 H	220	230	260	240	240	230	Q					
22							230	220	210	[220] C	230	230 H	220	230	230	230	230	230	260					
23							Q	250	(240) A	220	200	200	200	[210] A	(220) A	220	240	250	A					
24						290	260	230	230	220	240	240	220	(230) A	(230) A	230	250	[250] A	(250) A					
25						270	250	250	A	A	A	A	A	A	A	230 A	210	220	250					
26						280	230	220	[210] A	200 K	200 K	200 H K	210 H K	K [210] A H	210 K	240 K	230 K	230 K	210 K					
27							250 K	230 K	250 K	200 K	200 K	[210] A K	(220) A K	200 K	[210] A K	220 K	220 K	A K	A K					
28							A	A	(240) A	(220) A	(210) A	200	190	230	250	(240) A	(230) A	230	A					
29							230	230	200	200	220	A	A	A	220 H	210	210	230	240 A					
30							230	[220] A	(200) A	200 H	210	200	190	200 H	210 H	210	(230) B	(230) A	A					
31							A	(220) A	(220) A H	200	220	(250) A	A	A	270	[250] A	230	A	A					
Median						—	240	230	220	200	200	200	210	220	220	230	230	230	250					
Count						3	19	30	30	30	30	29	28	27	27	29	29	27	21					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 46

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

IONOSPHERIC DATA

foF1 (Characteristic), Mc (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.2	3.4	4.1	4.2	4.5	4.7	4.8^{K}	4.6^{K}	4.5^{K}	4.4^{K}	4.1^{K}	3.7^{K}	3.1^{K}					
2							Q^{K}	L^{K}	4.0^{K}	4.1^{K}	4.2^{K}	4.2^{K}	4.2^{K}	4.2^{K}	4.2^{K}	4.1^{K}	4.0^{K}	3.7^{K}	L^{K}					
3							Q^{K}	L^{K}	3.8^{HK}	4.8^{HK}	4.7^{HK}	4.7^{HK}	4.6^{K}	4.8^{HK}	4.7^{HK}	4.4^{K}	4.2^{K}	L^{K}	L^{K}					
4							Q^{K}	L^{K}	4.1^{K}	4.2^{K}	4.3^{K}	4.3^{K}	4.4^{HK}	4.4^{K}	4.3^{K}	4.1^{K}	4.0^{K}	3.8^{K}	L^{K}					
5							Q	L	4.1	4.2^{H}	4.5	4.6^{H}	4.7	4.7	4.6	A	A	L	L					
6							2.5	3.7	4.1	4.2	[4.4]^{L}	4.5	4.5^{H}	4.5	4.4	4.4	4.1	L	A					
7							L	3.7	4.2	4.3	4.3	4.4	4.5	4.4	(4.4)^{A}	A	A	A	A					
8							L	L	4.1	4.4	4.5	4.6	4.7	4.7	4.6	4.4	4.2	4.0	L					
9							Q	3.7	4.2^{H}	4.3^{H}	4.5	4.5	4.6	4.6^{H}	4.5	4.4	4.2	3.9^{K}	L^{K}					
10							C^{K}	3.6^{K}	3.9^{K}	4.2^{K}	4.2^{K}	4.3^{K}	4.4^{HK}	4.4^{K}	4.4^{K}	4.4^{K}	4.2^{K}	3.9^{K}	3.7^{K}					
11							L	L	L	4.5	4.7	4.8	4.8	4.7	4.7	4.6	4.3	4.0	L					
12							L	L	4.3	4.7	4.7	4.9	5.0	4.9	4.9	4.7	4.5	4.0	A					
13							L	L	4.4	4.5^{H}	5.0	5.1	5.0	5.0	4.9	4.7	4.4	L	A					
14							L	L	L	4.3	5.0^{H}	4.8	5.0	5.1	5.0	4.7	4.7	4.4	L					
15							3.4	4.1	4.5	4.8	4.8	5.0	5.2	[illegible]	5.0	4.8^{H}	4.5	[4.0]^{L}	3.5					
16							Q	4.1^{H}	4.4	4.5	4.6^{K}	4.7^{K}	4.9^{K}	4.9^{K}	5.0^{K}	4.6^{K}	4.6^{K}	4.2^{K}	L^{K}					
17							Q^{K}	4.2^{HK}	4.3^{K}	4.5^{K}	4.5^{K}	4.7^{K}	4.7^{K}	4.9^{K}	4.6^{HK}	4.5^{K}	4.3^{K}	4.1^{K}	3.5^{K}					
18							Q	4.3	4.6	4.9	5.0	5.0	5.0	5.0	4.8	5.1	4.5	4.2	L					
19							L	4.2	4.3^{H}	4.9	5.1	[5.2]^{L}	5.3	5.1	5.0	[4.9]^{B}	4.8	L	L					
20							L	L	4.5	4.9	5.0	5.1	5.2	5.1	5.0	[4.9]^{B}	4.8	A	A					
21							L	4.3	(4.6)^{H}	4.7	(4.9)^{A}	4.9^{H}	4.9	5.0	5.1	4.8	4.4	L	Q					
22							L	L	4.7^{P}	[4.8]^{C}	4.9	5.0^{H}	5.0	5.0	5.0	4.9	4.6	4.5	L					
23							Q	L	4.5	4.8	4.9	5.0	5.0	[5.0]^{A}	4.9	4.8	4.4	4.1	L					
24						L	L	3.9	4.1	(4.3)^{S}	4.6	4.7	4.9	4.7	4.8	4.7	4.4	4.3	L					
25						L	L	4.1	A	A	(4.9)^{A}	(5.0)^{A}	A	A	A	4.7	4.5	4.1	L					
26						L	L	L	A	4.9^{K}	(4.8)^{HK}	5.0^{HK}	5.0^{HK}	5.1^{HK}	4.8^{K}	4.6^{K}	4.5^{K}	(4.3)^{LK}	3.1^{K}					
27							L^{K}	4.0^{K}	4.1^{K}	4.3^{K}	4.4^{K}	[4.5]^{AK}	4.6^{K}	4.6^{K}	4.6^{K}	4.5^{K}	4.3^{K}	A^{K}	L^{K}					
28							A	A	L	4.5	4.6	4.8	4.8	4.9	4.8	4.5	4.4	4.1	A					
29							L	3.9	4.4	4.6	4.7	4.8	A	A	(4.7)^{H}	4.6	(4.2)^{A}	4.0	L					
30							3.4	3.8^{S}	4.1	4.3^{H}	4.4	4.5	4.5	4.4^{H}	4.3^{H}	4.3	4.2	4.0	3.6					
31							A	3.8	4.2^{H}	4.3	4.5	4.6	[4.6]^{A}	4.6	4.5	4.4	4.1	4.0	A					
Median						—	—	3.9	4.2	4.5	4.6	4.7	4.8	4.8	4.7	4.6	4.4	4.0	3.5					
Count							4	17	26	30	31	31	29	29	30	29	29	22	6					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 47

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

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), May (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: W. A. P., McC.

Calculated by: McC., W. A. P.

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							110	110	110	100	(100)A	(100)A	110K	110K	110K	110K	110K	110K	120BK	BK				
2							120K	110K	110K	110K	110K	110K	110K	110K	110K	110K	110K	120K	120K					
3							(110)SK	110K	100K	110K	100K	100K	100K	100K	100K	100K	110K	110K	110K					
4							110K	110K	110K	110K	100K	100K	110K	100K	100K	100K	110K	110K	120K					
5							130	110	110	100	100	110	100	100	110	110	110	110	120H					
6							130	110	100	100	100	110H	110	110	110	110	110	110	(120)B					
7							120	110	100	100	110	110	110	110	110	110	110	110	120					
8							120	110	110	110	110	[110]B	110	110	110	100	100	110	120					
9							110	110	110	110	110	100	100	110	110	110	110	110K	120K					
10							CK	110K	100K	100K	100K	100K	100K	100K	100K	100K	100K	110K	120K	140K				
11							120	110	100	100	100	100	100	100	100	110	110	110	110					
12							110	110	110	100	100	100	100A	100A	(110)A	100	100	110	110A					
13							110	100	100	100	100	100	100	100	100	100	100	100	110					
14							100	100	100	100	100	110	100	110	110	110	110	110	110					
15							120	110	110	110	110	110	110	100	110	110	110	110	110					
16							(110)A	110	100	110	110K	100K	110K	110K	100K	110K	110K	110K	120K	SK				
17							110K	110K	110K	110K	110K	110K	110K	110K	110K	110K	110K	[110]BK	120K	(130)SK				
18							(120)B	120	120	110	110	110	110	100	110	[110]B	110	110	120					
19							110	110	110	[110]B	110	110	110	110	100	[110]B	110	110	120	130				
20						100	110	110	100	100	110	110	110	110	100	[110]B	110	110	110					
21						110	(110)A	110	110	120	110	110	120	120	110	110	110	110	110					
22							110	110	110	[110]C	110	100	100	100	110	110	110	110	110					
23							120	110	100	100	100	110	110	100	100	100	110	110	110	130				
24						130	110	110	110	100	100	100	100	100	100	100	110	100	120					
25							110	110	110	110	110	110	100	(100)A	(100)A	(100)A	100	110	110H					
26							110	100	100	100K	100K	100K	100K	(100)AK	110K	110K	110K	110K	110K					
27							110K	110K	120K	100K	100K	100K	100K	100K	110K	100K	110K	110K	110K					
28							120	110	100	100	100	100	100	100	110	100	(100)A	100	110					
29							110	110	100	100	100	100	100	[100]A	110	110	110	110	110					
30							110	100	100	100	100	100	100	100	100	100	[100]B	(110)B	110					
31							110	100	100	100	100	[100]B	100	120	110	110	110	110	110					
Median						—	110	110	110	100	100	100	100	100	110	110	110	110	110	—				
Count*						3	30	31	31	31	31	31	31	31	31	31	31	31	31	4				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 48

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

Form adopted June 1946

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

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							1.9	2.4	2.9^{P}	(3.1)^{A}	3.2	[3.4]^{A}	3.5^{K}	3.4^{K}	3.3^{K}	3.2^{K}	3.0^{K}	2.6^{K}	2.1^{K}	1.9^{K}						
2							2.0^{K}	2.4^{K}	2.7^{K}	2.9^{K}	3.2^{K}	3.3^{K}	A^{K}	A^{K}	(3.1)$^{A}_{K}$	3.0^{K}	3.0^{K}	2.5^{K}	2.1^{K}							
3							1.9$^{P}_{K}$	2.4^{K}	2.8^{K}	3.0^{K}	3.2^{K}	3.3^{K}	3.3$^{P}_{K}$	3.4^{K}	3.4^{K}	3.2^{K}	2.9^{K}	2.5^{K}	2.1^{K}							
4							2.0$^{P}_{K}$	2.5^{K}	2.8^{K}	3.0^{K}	3.1^{K}	3.2$^{P}_{K}$	3.3^{K}	3.2^{K}	3.1^{K}	3.1^{K}	2.8^{K}	2.4^{K}	2.1^{K}							
5							2.0	2.5	2.8	3.0	3.1	3.2	A	B	A	3.0	2.7	2.5	2.2^{H}							
6							2.0	2.5	2.8	3.1	3.2	3.3^{H}	3.4^{P}	[3.4]^{A}	3.3	3.2	3.0	2.6	A							
7							B	2.6	2.8	3.1	3.3	3.3	3.4	3.4	3.3^{P}	3.2	3.0	2.6	2.1							
8							2.0	2.6	3.0	[3.2]^{B}	3.4	B	B	3.6	[3.4]^{A}	3.1	3.0	2.7	2.2							
9							A	2.5	3.0	A	A	B	A	A	A	3.3	3.1	2.6^{K}	2.2^{K}							
10							C^{K}	2.7^{K}	3.0^{K}	3.3^{K}	3.4^{K}	3.5^{K}	3.6^{K}	3.6^{K}	3.6^{K}	3.4^{K}	3.1^{K}	2.8^{K}	2.4^{K}	1.8^{K}						
11							2.2	2.9	3.0	3.3	3.5	3.5	3.6	A	S	3.5	(3.1)^{S}	2.9	(2.3)^{S}							
12							2.2	2.8	3.1	3.3	3.5	3.5^{P}	A	A	3.6	3.5	3.3	2.9	(2.3)^{A}							
13							2.2	2.7	3.2	3.3	3.4	3.6	3.7	3.7	3.6	3.4	3.2	2.9	2.2							
14							2.1	2.8	3.1	3.3	3.4	3.5	3.5	3.8	[3.7]^{A}	3.6	3.2	3.0	2.5							
15							2.2^{P}	3.1	3.2^{P}	3.3^{P}	3.3^{P}	A	A	3.8	3.7	3.6	[3.4]^{A}	3.1	2.4							
16							A	2.7	3.1	A	A^{K}	A^{K}	A^{K}	3.7$^{P}_{K}$	3.6^{K}	3.5^{K}	3.2^{K}	2.9^{K}	2.4^{K}	1.6^{K}						
17							2.3$^{P}_{K}$	A^{K}	A^{K}	A^{K}	A^{K}	B^{K}	B^{K}	3.7$^{P}_{K}$	3.6^{A}	3.5^{K}	3.2^{K}	[2.8]$^{B}_{K}$	2.5^{K}	1.7^{K}						
18							(2.8)^{B}	3.4	[3.5]^{A}	(3.6)^{A}	(3.7)^{A}	[3.8]^{A}	(3.8)^{P}	(3.8)^{A}	3.7	[3.6]^{B}	3.5^{P}	3.0	2.5							
19							2.4	2.9	3.1	[3.4]^{B}	3.6	3.7	3.7	3.7	3.6	[3.5]^{B}	3.3	3.0	2.5	1.6						
20						1.4	2.3	2.9	3.1	[3.3]^{A}	3.6	3.8^{P}	3.8	3.8	3.8	[3.7]^{B}	3.6	3.2	2.5							
21						S	A	3.0	3.4	3.5	(3.7)^{P}	[3.8]^{A}	3.9^{P}	4.0	4.0	(3.8)^{P}	3.6	3.1	2.6							
22							2.5	3.1^{P}	3.4	[3.7]^{C}	4.0	4.0	4.0	(3.8)^{P}	[3.7]^{A}	3.5	(3.3)^{P}	3.0	2.6							
23							2.6	3.0	3.3	3.5	3.6	3.7	3.7	[3.6]^{A}	(3.5)^{A}	(3.4)^{S}	3.3	2.9	2.4	1.7						
24						1.7	2.3	2.8	3.1	3.3	3.4	3.5	3.5	A	A	3.4	3.3	2.8	2.3							
25							2.3^{P}	2.8^{P}	3.2	3.4	3.5^{P}	(3.5)^{P}	A	A	A	A	3.3	2.9	2.5^{H}							
26							(2.2)^{A}	2.6	3.0	3.2^{K}	3.5^{K}	3.5^{K}	(3.5)$^{P}_{K}$	A^{K}	A^{K}	3.4^{K}	3.1^{K}	2.9^{K}	2.3^{K}							
27						1.6^{K}	2.2^{K}	2.6^{K}	3.0^{K}	3.2^{K}	3.3^{K}	(3.5)$^{A}_{K}$	3.6^{K}	[3.6]$^{A}_{K}$	3.5^{K}	3.3^{K}	3.1^{K}	2.8^{K}	2.5^{K}							
28							2.3	2.6	3.0	(3.2)^{P}	(3.3)^{P}	[3.5]^{A}	3.6	3.6	A	A	A	2.8	2.4							
29							2.2	2.7	3.0^{P}	3.2	3.3	3.4	(3.4)^{A}	[3.4]^{A}	3.3	3.2^{P}	[3.1]^{A}	(2.9)^{A}	2.3							
30							2.1	2.5	2.9	3.0	[3.2]^{B}	3.4^{B}	(3.4)^{P}	3.4	(3.4)^{P}	3.3	[3.1]^{P}	2.9	2.3							
31							2.2	2.4	2.7	[3.0]^{A}	3.2	3.4	3.5	3.6	3.5	3.2	3.1	2.7	A							
Median						—	2.2	2.7	3.0	3.2	3.4	3.5	3.6	3.6	3.6	3.4	3.1	2.9	2.3	1.7						
Count						3	26	30	30	28	28	26	22	23	24	29	31	31	29	6						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 49

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

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit), May (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., W.A.P.

Calculated by: W.A.P., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	24/100	53/100	70/130	E	E	62/110	98/130	G	G	42/120	6.8/100	52/100	8.4Y/110	G	G	G	G	G	G	G	E	E	E	E
2	5.1/120	B	66Y/30	B	B	6.6/110	G	9.4/120	G	G	8.0/120	92/120	20.0/110	3.6/110	4.1/120	G	7.6/130	G	G	E	E	E	E	E
3	E	E	E	B	B	E	G	G	7.2Y/120	9.4Y/120	G	G	G	G	G	G	G	G	G	E	E	E	E	E
4	E	E	E	E	E	70Y/130	38/100	9.6Y/110	70/120	11.8Y/110	9.0Y/120	G	G	48/110	G	G	G	G	G	E	E	E	E	E
5	E	E	E	28/130	E	35/130	90Y/120	37/120	130/110	3.9/110	G	4.9/110	4.8/110	G	6.4/110	6.4/110	5.0/110	G	G	36/120	7.4/110	7.4/110	6.8/110	5.0/110
6	E	E	E	E	E	1.3/120	G	G	G	G	G	G	G	58/120	5.0/130	G	G	G	3.8/130	3.3/120	E	E	E	E
7	E	E	27Y/120	31/120	E	2.7/120	7.6/140	G	G	G	68/140	G	6.0/110	68/110	54/120	5.4/120	5.2/120	74/120	4.9/120	3.6/110	E	13.5/110	E	E
8	E	E	E	E	E	3.0Y/120	G	G	G	G	G	G	G	G	80/110	G	G	G	34/120	1.8/110	28/110	2.4/110	32/100	E
9	E	E	E	E	E	E	3.0Y/120	36/120	G	34/100	36/110	G	58/120	7.0/110	8.8Y/110	G	G	G	G	E	E	E	E	E
10	E	E	E	E	C	C	C	7.1Y/110	G	G	G	6.8/100	64Y/100	G	G	44/120	G	G	G	E	E	E	E	E
11	33/120	E	E	E	2.5/130	3.6/120	G	7.4/120	G	G	84/120	G	G	45/100	G	G	G	G	G	E	E	E	E	E
12	E	E	E	E	E	E	G	G	16.5Y/120	G	G	G	8.8/100	7.6/100	98Y/100	10.0Y/100	7.2/130	45/120	4.3/120	3.5S/110	E	E	7.4/110	50/100
13	36/100	3.7/100	38/100	E	2.3/130	71Y/130	G	4.7Y/110	5.0/120	5.4/120	6.4Y/100	G	G	G	G	G	G	G	6.6Y/110	4.2/110	4.3Y/110	E	E	E
14	E	E	E	E	E	E	34/130	G	4.3/110	4.8/110	G	56Y/100	58/120	5.0Y/120	4.8/110	11.0/100	4.8Y/120	G	G	20/140	E	E	E	E
15	E	E	E	38Y/120	E	11.0/100	32/140	12.2Y/130	G	4.8Y/120	50Y/120	66/110	58Y/110	8.8Y/100	4.2/130	G	62/120	50/120	3.7/120	4.8/110	46/120	3.3/120	3.0/140	E
16	E	36Y/110	E	24/120	31Y/120	E	5.2Y/120	3.7Y/110	65/110	65Y/110	6.9/120	66Y/110	4.5Y/110	9.0/100	G	44/130	10.2Y/100	G	G	E	E	E	E	E
17	24/140	E	24Y/120	E	E	6.4/130	G	180Y/100	50/120	5.0/110	9.0/120	G	G	G	G	7.4Y/100	G	G	G	E	E	E	E	2.2/150
18	34/130	39/120	E	52Y/120	3.0/120	3.9/120	10.2/120	68Y/120	48Y/120	8.0Y/120	72Y/110	68Y/110	G	56Y/100	G	B	G	G	G	E	50/110	32/110	E	E
19	E	E	E	E	E	3.7Y/140	G	G	8.6Y/120	98Y/130	G	G	G	6.7Y/110	G	G	G	G	G	G	2.9/120	E	E	E
20	E	E	E	E	E	E	45/140	G	48/110	68/110	7.2Y/110	G	G	6.3/130	61/100	B	G	60/120	74/110	5.6/110	10.0/110	4.0/110	7.4/120	88/110
21	5.2/110	88/110	5.0Y/110	30Y/120	E	E	3.7/110	6.0/120	G	G	64/120	72/120	G	G	5.4/120	4.3/130	G	G	4.4/120	6.2/110	8.6Y/110	3.1/110	33/100	E
22	E	E	E	E	E	6.4Y/140	G	G	43Y/120	C	G	G	G	G	7.8Y/120	G	G	G	G	2.4/120	3.1Y/120	E	E	E
23	4.3/110	E	E	E	E	E	G	G	4.2/120	58Y/120	88Y/130	4.8Y/120	G	6.0Y/110	5.3/120	G	G	G	40/110	G	E	E	E	33/110
24	25/100	E	E	88/110	40/130	5.4Y/130	3.3/130	G	G	G	48Y/130	G	G	9.2/110	4.8/130	G	G	6.9/130	38Y/130	3.8/120	38/120	2.4/130	E	E
25	37/100	85Y/120	E	6.7/100	4.8Y/110	39Y/120	G	4.7Y/120	6.8/110	53Y/120	5.9/110	8.8Y/110	9.0/100	96Y/100	9.8/100	54/100	G	G	G	3.4Y/110	2.5Y/110	E	E	E
26	E	E	E	E	E	E	36/110	56Y/110	4.9/110	6.4Y/110	53/130	G	4.9/100	66/100	8.1Y/110	G	G	G	G	E	E	E	E	E
27	E	E	E	56Y/120	E	E	G	5.7Y/120	64/110	64Y/120	8.2/120	9.0/100	6.0/130	6.4Y/130	7.2/120	90Y/110	G	6.4/100	5.0/110	64Y/110	80/110	E	E	E
28	3.7/130	4.9Y/110	3.8Y/110	43/130	27/120	56Y/120	44/140	49/140	7.6/110	48/130	4.4/110	48/110	G	G	45Y/110	48/100	7.8Y/110	G	45/110	3.9S/110	E	2.9Y/110	40/110	6.0/110
29	3.7/100	E	30/130	E	E	96/100	96/100	G	6.8/110	5.8/120	52/120	5.8/120	11.0/110	11.4/110	54S/110	3.5S/130	4.4/110	36Y/110	4.5S/120	45Y/120	3.7S/110	2.9/110	E	E
30	E	25/100	E	E	E	51Y/110	3.3/110	4.4/100	4.3Y/100	G	8.0/130	G	G	G	G	G	G	5.8/110	4.6/110	43/100	7.2/110	6.2/110	2.7/110	40/100
31	4.6/100	33/100	40/100	7.5/100	98Y/100	84/110	78/110	56Y/110	5.6/100	86/100	70/100	47/100F	7.6/100	5.4Y/120	4.8Y/130	98/120	G	4.7/110	5.0/110	99/120	9.0/110	6.8Y/120	73/120	7.2/110
Median	**	**	**	**	**	3.6	32	37	4.8	4.8	59	**	**	54	4.8	**	**	**	**	2.4	**	**	**	**
Count	31	30	31	29	28	30	30	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 50

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

Form adopted June 1946

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ____ (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

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	1.8	1.7 F	1.7 F	F	(1.7) F	(2.0) F	2.1 F	1.9	1.8	1.9	1.7	1.6 K	1.7 K	1.8 K	1.8 K	1.7 K	1.8 K	1.7 ZK	(1.8) JK	K (1.8) FH	K (2.0) SF	K (1.8) SF	K (1.5) BJ
2	B K	B K	B K	B K	B K	1.9 BK	K 2.1 SH	2.1 HK	1.6 K	G K	G K	G K	G K	G K	1.6 K	K 1.5 HS	1.7 K	1.7 K	1.9 SK	2.0 SK	2.0 K	K 1.9 SF	K (2.0) JS	K 1.8 FS
3	1.8 FK	1.8 FK	1.8 FK	B K	B K	2.0 FK	2.2 K	2.1 K	2.1 HK	G K	1.9 HK	1.7 K	2.0 K	2.0 HK	1.8 K	2.0 K	2.0 K	2.1 K	2.0 K	2.0 K	1.9 FK	1.9 SK	1.7 K	1.9 K
4	1.9 K	2.1 K	2.0 FK	F 2.0 KH	1.9 BK	2.0 FK	2.1 K	1.9 K	1.9 K	1.7 HK	1.8 K	1.7 K	1.7 K	1.6 K	1.7 K	1.9 K	2.0 K	2.0 K	2.0 SK	2.1 K	2.1 K	K (2.0) JS	1.9 K	K (1.8) JS
5	1.9 K	(1.8) SK	1.9 HK	2.0 K	K (2.0) JS	2.1	2.3	2.3	2.2	2.2	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.0 H	(2.0) AS	1.9 HS
6	1.8 S	1.8 F	1.8 F	1.8 VF	(2.1) FS	2.1	2.1	2.2	1.9	1.9	1.9	1.6	2.0	2.0	2.1	2.1	2.0	2.1 H	2.1	2.2	2.0	2.0	1.9	1.9
7	1.9	1.9	2.0	2.2 F	2.2	2.3	2.1	2.1 H	1.9	1.8 H	1.9	1.9 HB	1.8 B	2.1	1.6 H	1.9	2.0	1.9	2.0	2.1 F	2.1 F	(2.1) SF	1.9 FS	(1.9) SF
8	2.0 FS	1.9 F	1.9 F	1.9 F	2.0 F	2.1 F	2.3	2.1 H	2.1 H	2.0	2.3 H	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.1	(2.2) JS	(2.1) SF	(1.9) SF	1.9 F	1.9 F
9	1.9 F	2.0 F	1.9	1.8	1.9 F	(2.1) S	1.9	2.1 H	1.8 H	1.9 V	1.9	1.9	1.9	1.8	1.8	1.7	2.0	1.8 K	1.9 K	1.9 K	1.9 K	1.9 K	1.7 K	1.7 K
10	1.7 K	1.6 K	K (1.6) BS	1.8 K	C K	C K	C K	G K	G K	G K	G K	G K	1.6 K	1.4 K	1.6 K	1.7 K	1.7 K	2.0 K	1.9 K	2.1 K	2.0 F	1.9	1.9 S	1.9 S
11	1.9	1.9	1.9 F	2.0 F	2.0	2.2	2.4	2.1 F	(1.9) JH	2.0 H	(1.9) SH	(1.8) H	1.9	1.9	1.8	2.0	2.0	1.9	2.0	1.9	1.8	1.9	1.9	1.9
12	1.9	1.9	(1.9) J	(1.9) S	1.9	2.0	2.2	2.0	2.2	(2.1) H	1.9	2.0	1.9	1.8	1.9	1.9	2.0	2.0	2.0	(2.0) S	2.0	1.9	1.9	1.8
13	1.9	1.9	1.9	1.8	1.8	2.1	2.1 H	1.8 H	2.2	2.0	2.1	1.9	1.9	2.0	2.0	1.9	1.9	2.0	2.0	2.0 S	1.9	2.1	1.9	1.7
14	1.7	1.8	1.8 V	1.9	1.8	1.9	2.1	2.2 H	2.1	2.1	1.8	1.7	1.8	1.9	2.0	1.9	1.9	1.9	2.0	2.0	2.1	1.9	1.8	1.7 Z
15	(1.8) J	1.7	1.6	1.7	1.8	(1.9) JS	1.9	1.9	1.9	1.7	1.9	1.8 H	1.9	1.8 ZH	1.8	1.7	1.8	1.9	1.9	2.0	1.9	1.8	1.6	1.7
16	1.7	1.7	(1.8) S	(1.9) PH	1.9 F	2.0 F	2.2 F	1.7	1.7 H	1.7 H	(1.7) HK	1.5 HK	1.5 HK	1.5 K	1.6 K	1.8 K	1.7 K	1.7 K	1.8 K	1.9 SK	K 1.9 FS	1.8 K	(1.7) SK	1.7 K
17	1.7 K	1.7 K	K (1.6) JS	K 1.7 SF	K (1.9) JS	K (2.0) JS	K (2.1) FJ	K (1.8) FH	1.6 K	1.5 K	1.6 K	G K	1.4 K	G K	1.6 K	1.5 K	1.6 K	(1.6) SK	1.8 SK	1.9 SK	1.8 SK	K 1.8 SF	K 1.7 SF	1.8 ZK
18	2.0 SF	1.8	1.8 F	1.9 F	1.8 F	(1.9) JH	1.9	1.8	1.8	1.7	1.6	1.7	1.7	1.6	1.8	1.7	1.9	1.9	1.9	2.0	1.9 S	1.9	1.9	1.7
19	1.7	1.6	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.0	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.9	2.0	1.9	1.9	1.8	1.8 H
20	1.8	1.7	1.8	1.8	1.9	2.2	2.3	2.1	2.0	1.8	1.8	1.9	1.9	1.8	1.8	(1.9) B	1.9	2.0	2.0	2.0	1.9	1.8	A	1.8
21	1.9	1.9 F	1.8	1.9 F	1.9	2.0	2.0	2.2	1.9	1.8	1.6 F	1.9	1.8	1.7	1.7	1.8	1.8	1.9	1.8	2.0 S	1.9 S	1.9 S	1.9 S	1.8 S
22	1.8 S	1.9	1.9 S	1.9 F	1.9 S	2.1 F	1.8	2.1	2.0	C	1.8	1.9	1.7	1.7	1.9	1.9	1.9	1.9	2.0	2.0 S	1.9 S	1.9 S	1.9	1.9
23	1.8	1.8	(1.9) JS	1.9	1.9	2.1	2.0	1.9	1.9	2.0	1.8	2.0	1.9	1.9	1.9	1.7	1.7	1.9	1.9	2.0	1.9 V	1.8	1.8	1.8
24	1.7	1.7	(1.8) JS	1.8 FH	1.7	2.0	2.0	G	G	G	1.9	1.7	G	1.6	1.9	1.9	1.8	2.0	2.1	2.1	1.9	1.9	1.9	1.9
25	2.0	1.9 F	1.9 S	1.8	1.8 F	1.9 V	2.2	2.3	(1.7) H	(2.1) A	2.0	1.6 H	2.0	2.0	2.0	1.9	1.9	(2.0) JS	2.0	2.0	2.0	1.9	1.8	1.9
26	1.9	1.8	1.8 F	1.9	2.0 S	2.1	2.1 V	2.0	2.1	(1.9) JK	1.9 K	2.0 K	1.8 K	1.7 K	1.7 K	1.8 K	1.8 K	1.8 K	2.0 SK	1.8 K	1.8 K	1.8 SK	1.7 VK	1.7 HK
27	1.8 K	1.9 K	K (1.9) JS	K (1.8) JH	(1.8) HK	1.9 FK	1.9 FK	G K	G K	(1.7) HK	G K	A K	G K	1.7 K	1.8 K	1.9 FK	2.0 K	2.0 FK	2.0 FK	2.1 FK	1.9 FK	1.8 F	(1.8) JS	1.9 S
28	(1.9) JF	(1.9) JF	(1.9) JS	(2.0) JF	(1.9) JS	2.1 F	(2.1) J	2.2	2.0	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	2.0 S	2.1 S	2.0 S	1.9 F	2.0 F
29	1.9 F	1.9 F	1.8 SF	1.8 F	1.9 SF	2.0	2.2	2.2	1.9	1.9	1.9	1.9	2.0	2.1	2.2	2.1	2.0	2.0 S	1.9	2.0	(2.1) JS	2.0	2.0	1.9
30	1.9	(1.9) S	(1.9) S	(1.8) S	2.0 F	(2.2) FA	2.0 S	(1.9) JF	2.0	1.7	1.9	1.8	2.0	1.8 S	1.7	1.8	2.0	1.9	2.0	2.1	2.0 F	1.9 F	2.0 F	1.8 F
31	(1.9) SF	1.9 F	2.0 F	2.0 F	1.8	A	A	1.8	G	2.1	1.8	G	2.0 H	2.0	1.9	2.0	1.9	2.1	2.0	A	(2.0) A	(2.0) AF	(2.0) A	A
Median	1.9	1.8	1.8	1.9	1.9	2.0	2.1	2.1	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.9	2.0	2.0	1.9	1.9	1.9	1.8
Count	30	30	30	29	27	29	29	31	31	30	31	30	31	31	31	31	31	31	31	30	31	31	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 51

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

Form adopted June 1946

(M3000)F2 (Characteristic), ____ (Unit), May (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., W.A.P.

Calculated by: W.A.P., McC.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.8	2.7	2.6 F	2.6 F	F	(2.6) F	(3.0) F	3.1 F	2.9	2.8	2.9	2.6	2.4 K	2.6 K	2.7 K	2.7 K	2.6 K	2.7 K	2.6 ZK	(2.7) JK	K(2.7) FH	K(3.0) SF	K(2.7) SF	K(2.3) BJ
2	B K	B K	B K	B K	B K	2.9 BK	K3.1 SH	3.1 HK	2.5 K	G K	G K	G K	G K	G K	2.4 K	K2.3 HS	2.6 K	2.6 K	2.8 SK	3.0 SK	2.9 K	K2.9 SF	K(3.0) JS	K2.8 FS
3	2.8 FK	2.7 FK	2.7 FK	B K	B K	3.0 FK	3.2 K	3.1 K	3.1 HK	G K	2.8 HK	2.6 K	3.0 K	3.0 HK	2.7 K	3.0 K	3.0 K	3.0 K	3.0 K	3.0 K	2.8 FK	2.8 SK	2.6 K	2.8 K
4	2.8 K	3.1 K	K3.0 FH	2.9 K	2.8 BK	3.0 FK	3.1 K	2.9 K	2.9 K	2.6 HK	2.7 K	2.6 K	2.6 K	2.5 K	2.6 K	2.8 K	3.0 K	3.0 K	3.0 SK	3.1 K	3.1 K	K(3.0) JS	2.9 K	K(2.7) JS
5	2.8 K	(2.7) SK	2.8 HK	3.0 K	K(3.0) JS	3.2	3.4	3.3	3.2	3.2	3.0	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.0 H	(3.0) AS	1.9 HS
6	2.8 S	2.7 F	2.7 F	2.8 VF	(3.1) FS	3.1	3.1	3.2	2.8	2.8	2.8	2.4	3.0	3.0	3.1	3.1	3.0	3.1 H	3.1	3.2	3.0	3.0	2.9	2.8
7	2.9	2.9	3.0	3.2 F	3.2	3.4	3.1	3.1 H	2.9	2.7 H	2.9	2.8 HB	2.7 B	3.1	2.4 H	2.8	2.9	2.9	3.0	3.1 F	3.1 F	(3.1) SF	2.9 FS	(2.9) SF
8	2.9 FS	2.9 F	2.9 F	2.8 F	2.9 F	3.1 F	3.3	3.1 H	3.1 H	3.0	3.4 H	3.0	3.0	2.9	3.0	3.0	3.0	3.0	3.1	(3.2) JS	(3.1) SF	(2.9) SF	2.8 F	2.8 F
9	2.9 F	3.0 F	2.9	2.7	2.8 F	(3.1) S	2.9	3.1 H	2.7 H	2.8 V	2.8	2.8	2.8	2.7	2.7	2.6	2.9	2.7 K	2.8 K	2.8 K	2.8 K	2.8 K	2.6 K	2.6 K
10	2.6 K	2.5 K	K(2.4) BS	2.7 K	C K	C K	C K	G K	G K	G K	G K	G K	2.5 K	2.1 K	2.5 K	2.6 K	2.6 K	2.9 K	2.8 K	3.1 K	2.9 F	2.8	2.9 S	2.8 S
11	2.9	2.8	2.8 F	3.0 F	3.0	3.2	3.4	3.1 F	(2.8) JH	3.0 H	(2.8) SH	(2.7) H	2.8	2.9	2.7	3.0	3.0	2.9	3.0	2.9	2.8	2.8	2.8	2.8
12	2.8	2.8	(2.8) J	(2.8) S	2.9	3.0	3.2	2.9	3.2	(3.1) H	2.8	3.0	2.9	2.8	2.8	2.8	3.0	2.9	3.0	(3.0) S	3.0	2.9	2.8	2.7
13	2.8	2.9	2.9	2.8	2.8	3.1	3.1 H	2.7 H	3.2	3.0	3.1	2.9	2.8	2.9	2.9	2.9	2.9	3.0	3.0	2.9 S	2.9	3.1	2.9	2.6
14	2.6	2.7	2.8 V	2.8	2.7	2.9	3.0	3.2 H	3.1	3.1	2.7	2.6	2.7	2.9	2.9	2.9	2.8	2.8	2.9	2.9	3.1	2.9	2.7	2.6 Z
15	(2.7) J	2.6	2.5	2.6	2.7	(2.8) JS	2.8	2.8	2.9	2.6	2.8	2.8 H	2.8	2.7 ZH	2.7	2.6	2.7	2.8	2.8	3.0	2.8	2.8	2.5	2.6
16	2.6	2.6	(2.7) S	(2.9) BH	2.8 F	3.0 F	3.2 F	2.6	2.6 H	2.6 H	(2.6) HK	2.2 HK	2.3 HK	2.3 K	2.5 K	2.7 K	2.6 K	2.6 K	2.7 K	2.9 SK	K2.9 FS	2.7 K	(2.6) SK	2.5 K
17	2.6 K	2.6 K	K(2.5) JS	K2.6 SF	K(2.8) JS	K(3.0) JS	K(3.1) FS	K(2.7) FH	2.5 K	2.2 K	2.4 K	G K	2.2 K	G K	2.4 K	2.3 K	2.5 K	(2.5) SK	2.7 SK	2.9 SK	2.7 SK	K2.7 SF	K2.5 SF	2.7 ZK
18	3.0 SF	2.8	2.8 F	2.9 F	2.7 F	(2.9) JH	2.8	2.7	2.7	2.6	2.5	2.6	2.6	2.5	2.7	2.6	2.9	2.8	2.9	2.9	2.8 S	2.8	2.8	2.6
19	2.6	2.5	2.6	2.7	2.7	2.8	3.0	3.0	3.1	3.0	2.8	2.7	2.7	2.7	2.9	2.8	2.8	2.7	2.9	2.9	2.9	2.9	2.8	2.7 H
20	2.7	2.6	2.7	2.7	2.8	3.2	3.3	3.1	2.9	2.8	2.7	2.8	2.8	2.7	2.7	(2.8) B	2.8	2.9	3.0	3.0	2.8	2.7	A	2.7
21	2.8	2.8 F	2.7	2.8 F	2.9	3.0	3.0	3.2	2.8	2.7	2.4 F	2.8	2.7	2.7	2.7	2.7	2.7	2.8	2.8	3.0 S	2.8 S	2.8 S	2.8 S	2.7 S
22	2.7 S	2.8	2.9 S	2.8 F	2.8 S	3.1 F	2.7	3.1	2.9	C	2.8	2.8	2.6	2.6	2.8	2.8	2.8	2.8	3.0	3.0 S	2.8 S	2.9 S	2.9	2.8
23	2.7	2.7	(2.8) JS	2.8	2.9	3.1	2.9	2.8	2.9	3.0	2.8	2.9	2.8	2.8	2.8	2.6	2.6	2.8	2.9	3.0	2.8 V	2.7	2.7	2.8
24	2.6	2.6	(2.7) JS	2.7 FH	2.6	3.0	3.0	G	G	G	2.9	2.6	G	2.4	2.9	2.8	2.7	3.0	3.1	3.1	2.9	2.8	2.8	2.8
25	2.9	2.8 F	2.8 S	2.7	2.8 F	2.9 V	3.2	3.4	(2.7) H	(3.0) A	3.0	2.5 H	2.9	3.0	3.0	2.9	2.9	(3.0) JS	2.9	3.0	3.0	2.9	2.8	2.8
26	2.8	2.7	2.7 F	2.8	2.9 S	3.1	3.1 V	2.9	3.1	(2.8) JK	2.9 K	2.9 K	2.8 K	2.6 K	2.6 K	2.7 K	2.8 K	2.8 K	3.0 SK	2.7 K	2.7 K	2.8 SK	2.6 VK	2.5 HK
27	2.7 K	2.8 K	K(2.8) JS	K(2.7) JH	(2.7) HK	2.9 FK	2.8 FK	G K	G K	(2.6) HK	G K	A K	G K	2.5 K	2.7 K	2.9 FK	3.0 K	3.0 FK	2.9 FK	3.1 FK	2.8 FK	2.8 F	(2.8) JS	2.8 S
28	(2.8) JF	(2.8) JF	(2.9) JS	(3.0) JF	(2.8) JS	3.1 F	(3.1) J	3.2	3.0	3.0	3.0	2.9	2.8	2.9	2.9	3.0	3.0	3.0	2.9	3.0 S	3.1 S	3.0 S	2.9 F	2.9 F
29	2.8 F	2.8 F	2.7 SF	2.8 F	2.8 SF	3.0	3.2	3.2	2.9	2.9	2.9	2.8	3.0	3.1	3.2	3.1	3.0	3.0 S	2.9	3.0	(3.1) JS	3.0	3.0	2.8
30	2.9	(2.9) S	(2.9) S	(2.8) S	3.0 F	(3.2) FA	3.0 S	(2.9) JF	3.0	2.6	2.8	2.8	3.0	2.7 S	2.6	2.7	2.8	2.8	3.0	3.1	2.9 F	2.8 F	3.0 F	2.7 F
31	(2.8) SF	2.9 F	3.0 F	2.9 F	2.7	A	A	2.8	G	3.1	2.8	G	3.0 H	3.0	2.8	3.0	2.8	3.1	3.0	A	(3.0) A	(2.9) AF	(2.9) A	A
Median	2.8	2.8	2.8	2.8	2.8	3.0	3.1	3.1	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.8	2.8	2.9	2.9	3.0	2.9	2.9	2.8	2.7
Count	30	30	30	29	27	29	29	31	31	30	31	30	31	31	31	31	31	31	31	30	31	31	30	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 52

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

IONOSPHERIC DATA

Form adopted June 1946

(M3000)F1 (Characteristic), ______ (Unit), May (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: W.A.P., McC.

Calculated by: McC., W.A.P.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							3.3	4.0	3.4	3.8	3.6	3.4	3.5K	3.6K	3.5K	3.4K	3.4K	3.5K	3.2K					
2							QK	LK	3.8K	4.1K	4.0K	4.0K	3.95K	3.8K	3.6K	3.6K	3.4K	3.3K	LK					
3							QK	LK	3.9HK	3.4K	3.6HK	3.5HK	3.5K	3.6HK	3.5HK	3.5K	3.6K	LK	LK					
4							QK	LK	3.7K	3.8K	3.8K	4.0K	3.8HK	3.4K	3.6K	3.7K	3.6K	3.5K	LK					
5							Q	L	3.7	4.0H	3.6	3.9H	3.6	3.7	A	A	A	L	L					
6							4.0	3.6	3.7	3.9	L	3.9	3.9H	3.6	3.8	3.6	3.6	L	A					
7							L	3.6	3.5	3.6	3.7	3.9	3.9	3.8	A	A	A	A	A					
8							L	L	3.6	3.7	3.8	3.9	3.7	3.7	3.7	3.5	3.6	3.5	L					
9							Q	3.6	3.7H	3.8H	4.0	3.8	3.7	3.8H	3.6	3.5	3.5	3.4K	LK					
10							CK	3.6K	3.7K	3.7K	3.9K	4.0K	3.9HK	3.7K	3.7K	3.5K	3.7K	3.5K	3.4K					
11							L	L	L	3.7	3.7	3.5	3.8	4.0	3.1	3.5	3.5	3.8	L					
12							L	L	3.6	3.7	3.7	3.7	3.5	3.7	3.6	3.4	3.5	3.7	A					
13							L	L	3.5	3.5H	3.5	3.6	3.6	3.6	3.6	3.5	3.6	L	A					
14							L	L	L	3.8	3.9H	3.7	3.5	3.4	3.5	3.6	3.5	3.2	L					
15							3.2	3.5	3.5	3.3	3.6	3.5	3.3	3.7	3.5	3.6H	3.4	L	3.4					
16							Q	3.5H	3.8	3.8	4.2K	3.7K	3.9K	3.7K	3.4K	3.4K	3.2K	3.5K	LK					
17							QK	3.4HK	3.7K	3.9K	4.2K	3.7K	3.9K	3.5K	3.7HK	3.7K	3.5K	3.4K	3.4K					
18							Q	3.3	3.4	3.6	3.5	3.7	3.6	3.6	3.8	3.5	3.5	3.3	L					
19							L	3.5	3.7H	3.5	3.5	L	3.5	3.6	3.5	B	3.4	L	L					
20							L	L	3.5	3.6	3.7	3.6	3.5	3.5	3.4	B	3.6	A	A					
21							L	3.4	(3.5)H	3.6	(3.7)A	3.7	3.9	3.7	3.4	3.5	3.6	L	Q					
22							L	L	3.3P	C	3.7	3.6H	3.7	3.5	3.4	3.6	3.5	3.3	L					
23							Q	L	3.6	3.4	3.7	4.0	3.8	A	3.7	3.6	3.5	3.5	L					
24						L	L	3.5	3.6	(3.7)S	3.7	3.7	3.7	3.8	3.7	3.5	3.4	A	L					
25						L	L	3.5	A	A	A	A	A	A	A	3.6	3.5	3.6	L					
26						L	L	L	A	3.3K	(3.7)HK	4.0HK	3.6HK	3.4HK	3.5K	3.4K	3.2K	(3.6)LK	4.0K					
27							LK	3.3K	3.5K	3.9K	3.6K	AK	3.8K	4.0K	AK	3.5K	3.5K	AK	LK					
28							A	A	L	3.8	3.7	3.7	3.8	3.5	3.5	3.6	3.5	3.6	A					
29							L	3.6	3.4	3.5	3.7	A	A	A	(4.2)H	3.6	(4.1)A	3.6	L					
30							3.5	3.6S	4.0	3.7H	3.9	3.9	4.1	4.0H	3.8H	3.6	3.6	3.5	3.6					
31							A	3.7	3.3H	3.8	3.8	3.6	A	A	3.2	A	3.4	3.4	A					
Median						—	—	3.5	3.6	3.7	3.7	3.7	3.7	3.7	3.6	3.5	3.5	3.5	3.4					
Count							4	17	26	29	29	27	28	27	27	26	29	20	6					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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TABLE 53

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

Form adopted June 1946

IONOSPHERIC DATA

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

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Scaled by: W.A.P., McC.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

Calculated by: McC., W.A.P.

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							4.3	4.1	4.0P	(4.1)A	4.2	A	4.1K	4.2K	4.2K	4.2K	4.2K	4.1K	3.7K	BK					
2							4.0K	4.2K	4.3K	4.3K	4.2K	4.2K	AK	AK	(4.3)AK	4.1K	4.1K	4.2K	4.1K						
3							3.9PK	4.2K	4.1K	4.3K	4.2K	4.1K	4.1PK	4.3K	4.5K	4.2K	4.2K	4.3K	4.0K						
4							4.0PK	4.1K	4.2K	4.1K	4.2K	4.2PK	4.2K	4.3K	4.3K	4.0K	4.1K	4.1K	4.1K						
5							4.3	4.1	4.2	4.4	4.4	4.4	A	B	A	4.5	4.5	4.3	3.9H						
6							4.3	4.1	4.1	4.1	4.2	4.2H	4.3P	A	4.3	4.3	4.3	4.0	A						
7							B	4.1	4.3	4.4	4.5	4.2	4.4	4.2	4.3P	4.1	4.1	4.2	4.2						
8							4.1	4.2	4.2	B	4.3	B	B	4.4	A	4.3	4.2	4.1	4.2						
9							A	4.2	4.2	A	A	B	A	A	A	4.4	4.2	4.3K	4.0K						
10							CK	4.0K	4.2K	4.4K	4.5K	4.3K	4.1K	4.1K	4.1K	4.2K	4.3K	4.2K	4.2K	4.0K					
11							4.2	4.2	4.3	4.5	4.4	4.5	4.3	A	S	4.4	(4.2)S	4.2	(4.2)S						
12							4.0	4.1	4.3	4.4	4.4	4.1P	A	A	4.1	4.0	4.2	4.2	(4.2)A						
13							3.9	4.2	4.3	4.3	4.4	4.4	4.1	4.1	4.3	4.3	4.4	4.2	4.4						
14							4.3	4.4	4.3	4.5	4.2	4.3	4.4	4.2	A	4.3	4.2	4.2	3.9						
15							4.0P	4.1	4.2P	4.3P	4.3P	A	A	4.2	4.1	4.0	A	4.2	4.0						
16							A	4.2	4.3	A	AK	AK	AK	4.2PK	4.1K	4.0K	4.1K	4.1K	4.0K	SK					
17							4.4PK	AK	AK	AK	AK	BK	BK	4.2PK	4.0K	4.0K	4.2K	BK	4.0K	4.1K					
18							(4.0)S	4.0	A	(4.2)A	(4.2)A	A	(4.1)P	(4.4)A	4.3	B	4.1P	4.0	4.1						
19							3.9	4.1	4.1	B	4.4	4.4	4.3	4.2	4.1	B	4.0	4.1	4.0	4.2					
20						4.1	4.2	4.1	4.2	A	4.3	4.3P	4.2	4.1	4.0	B	4.1	4.1	4.3						
21						S	A	3.9	4.1	4.3	(4.3)P	A	4.2P	4.2	4.1	(4.2)P	4.1	4.2	4.0						
22							4.2	4.3P	4.2	C	4.4	4.3	4.2	(4.2)P	A	4.2	(4.5)P	4.5	4.2						
23							4.1	4.4	4.1	4.1	4.2	4.3	4.3	A	(4.3)A	(4.3)S	4.2	4.3	4.2	4.0					
24						4.3	4.3	4.2	4.3	4.4	4.4	4.3	4.5	A	A	4.3	4.2	4.2	4.2						
25							4.2P	4.3P	4.3	4.4	4.4P	(4.4)P	A	A	A	A	4.2	4.3	4.1H						
26							(4.2)A	4.1	4.2	4.2K	4.2K	4.2K	(4.3)K	AK	AK	4.3K	4.2K	4.4K	4.3K						
27						3.7K	4.2K	4.1K	4.2K	4.1K	4.3K	AK	4.1K	AK	4.3K	4.3K	4.3K	4.3K	4.0K						
28							4.1	4.3	4.5	(4.5)P	(4.3)P	A	4.2	4.0	A	A	A	4.0	4.4						
29							3.9	4.3	4.3P	4.3	4.3	4.1	(4.2)A	A	4.5	4.4P	A	(4.6)A	4.3						
30							4.4	4.4	4.5	4.6	B	4.4B	(4.3)P	4.5	(4.3)P	4.0	BP	4.3	4.2						
31							4.5	4.5	4.4	A	4.4	4.3	4.3	4.4	4.2	4.4	4.1	4.3	A						
Median						—	4.2	4.2	4.2	4.3	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2	4.1	—					
Count						3	26	30	29	28	27	21	22	19	21	26	27	30	29	4					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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Table 54

Ionospheric Storminess at Washington, D. C.

May 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	2	4	1700	----	5	4
2	6	6	----	----	4	5
3	4	2	----	----	4	4
4	4	4	----	----	4	3
5	4	3	----	1000	2	2
6	2	2			3	2
7	2	3			2	2
8	1	3			1	2
9	1	2	2200	----	3	4
10	4	5	----	----	4	4
11	2	2	----	0100	3	4
12	1	1			4	3
13	1	1			2	1
14	1	2			3	3
15	2	1			4	3
16	2	4	1500	----	4	2
17	4	5	----	----	4	3
18	2	3	----	0500	4	2
19	2	2			2	2
20	2	3			2	2
21	1	3			1	0
22	0	1			1	3
23	2	0			3	3
24	2	3			3	3
25	2	3			2	3
26	1	4	1400	----	2	5
27	2	4	----	----	4	1
28	2	1	----	0200	2	2
29	2	1			2	3
30	2	3			3	2
31	3	3			3	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.

Table 55

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

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

Score:	Warning N.A.	Warning N.P.	Forecast N.A.	Forecast N.P.
H	36	13	26	8
(M)	1	0	0	0
M	1	0	8	3
G	20	21	20	25
O	2	26	6	24

*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 56

Zürich Provisional Relative Sunspot Numbers

May 1951

Date	R_Z*	Date	R_Z*
1	62	17	220
2	56	18	229
3	78	19	204
4	51	20	180
5	46	21	180
6	20	22	154
7	26	23	140
8	17	24	117
9	32	25	114
10	84	26	93
11	102	27	87
12	125	28	81
13	155	29	51
14	170	30	48
15	184	31	46
16	212	Mean:	108.5

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

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

Table 57a

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																																					
May 3.6	-	-	-	-	-	-	-	-	-	-	2	2	3	5	5	5	3	3	3	2	2	3	3	3	3	3	3	3	3	3	2	2	-	-	-	-	-
8.7	X	X	X	-	-	-	-	-	-	3	3	3	5	8	12	12	8	15	25	12	20	15	5	5	3	-	-	-	-	-	-	-	-	-	-	-	-
10.6	-	-	-	-	-	3	3	3	3	3	3	3	3	5	15	25	20	25	20	10	8	8	5	3	3	2	2	2	2	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	2	3	5	15	22	25	28	12	8	8	10	8	3	3	-	-	-	-	-	-	-	-	-	-	-	-
19.9a	-	-	-	-	-	-	-	-	-	-	3	5	3	3	5	5	10	8	12	15	15	15	12	10	10	10	5	3	-	-	-	-	-	-	-	-	-
23.6	X	X	X	-	-	-	-	-	-	-	-	-	-	-	3	3	8	8	5	3	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X
27.6	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
31.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-

Note: Yellow line (5694A): May 10.6 at N05-N15, intensity 3.

Table 58a

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																																					
May 3.6	3	3	2	2	2	2	2	2	3	3	5	3	3	3	3	3	3	2	5	3	3	2	2	2	2	3	3	2	2	2	3	3	2	3	3	2	2
8.7	X	X	X	-	-	-	2	2	2	-	-	-	2	2	2	5	12	10	3	3	5	2	2	2	2	2	2	3	3	2	-	-	-	-	-	-	-
10.6	-	-	-	-	-	2	2	3	3	3	2	3	2	12	15	8	12	10	8	2	2	8	5	5	8	10	8	3	3	3	2	2	2	2	2	2	3
11.7	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	8	10	8	2	2	2	2	3	3	5	5	5	3	2	2	2	2	2	2	2	2
19.9a	2	2	2	2	2	2	2	2	2	2	3	3	5	3	10	8	8	8	5	5	3	3	8	15	3	2	2	3	5	3	3	2	2	2	-	-	-
23.6	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	5	2	2	2	2	2	2	2	X	X	X	X	X	X	X	X	X	X	X
27.6	2	-	-	-	2	2	2	2	2	3	5	5	5	3	3	3	10	5	5	3	2	2	3	3	5	5	5	5	5	3	5	3	3	3	3	3	3
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	2	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
31.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	10	5	3	2	2	2	3	3	2	2	2	-	-	-	-	-	-	-	-

Table 59a

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																																					
May 3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-
8.7	X	X	X	-	-	-	-	-	-	-	-	2	2	3	3	3	3	3	5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.6	-	-	-	-	-	-	-	-	-	-	-	2	2	3	8	10	8	8	8	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
11.7	-	-	-	2	2	2	2	2	2	2	2	2	3	3	8	5	5	3	3	3	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
19.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
23.6	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X
27.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 57b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	12	15	10	12	12	15	15	15	15	5	5	5	5	3	-	-	-	-	-	-	-
8.7a	-	-	X	X	X	X	X	X	X	X	X	X	5	5	8	5	3	3	3	5	8	8	10	5	3	3	3	-	-	-	-	-	-	X	X	X	X
10.6	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	5	5	10	15	20	28	15	5	5	5	5	5	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	10	8	8	8	12	12	15	8	3	3	3	3	3	-	-	-	-	-	-	-	-
19.9a	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	5	10	8	8	3	12	8	5	3	3	3	3	3	3	5	5	3	3	-	-	-	-
23.6	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	X	X	X
27.6	-	-	-	-	-	3	3	3	3	3	3	5	8	10	12	12	15	10	10	10	10	10	12	10	12	8	3	3	3	-	-	-	-	-	-	-	-
30.6	-	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	X	-
31.7a	-	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	X	-

Table 58b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 3.6	2	2	2	3	3	3	5	8	8	8	5	5	8	8	5	10	5	3	10	12	8	10	15	8	2	-	-	3	8	5	3	3	3	3	3	3	3
8.7a	-	-	X	X	X	X	X	X	X	X	X	X	2	10	8	3	5	5	5	2	3	10	5	3	-	-	-	-	-	-	-	-	-	X	X	X	X
10.6	3	3	2	2	2	2	2	2	2	3	3	5	10	10	10	8	5	5	5	10	15	8	3	-	2	-	-	-	-	-	-	-	-	-	-	-	-
11.7	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	3	8	5	5	5	2	2	2	3	2	2	-	-	-	-	-	-	-	-
19.9a	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	10	2	2	12	5	2	2	2	2	-	-	-	-	-	-	-	-	2	2	2	2
23.6	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	X	X	X
27.6	3	3	3	3	3	2	2	3	2	8	8	3	3	2	2	3	8	15	3	2	5	3	5	3	2	4	2	2	2	3	2	2	2	2	2	2	2
30.6	-	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	X	-
31.7a	-	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	X	-

Table 59b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-
8.7a	-	-	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	2	2	3	3	3	3	3	2	2	2	2	-	-	-	-	X	X	X	X
10.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	5	3	2	2	2	2	3	2	2	2	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
19.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
23.6	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	X	X	X
27.6	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-
30.6	-	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	X	-
31.7a	-	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	X	-

Table 60a

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

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	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																																					
May 2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	5	10	12	8	5	5	5	5	3	3	3	3	3	-	-	-	-	-
3.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	5	5	5	5	8	8	5	5	5	5	5	5	5	5	5	5	3	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	3	3	3	3	5	5	8	5	8	8	5	5	5	5	5	5	8	8	8	5	3	3	3	-	-	-	-	-
8.8a	-	-	-	-	-	-	-	-	3	3	3	5	8	10	15	28	15	15	18	15	15	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-	-	-	3	5	8	10	25	20	15	20	25	15	12	8	8	5	3	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	3	3	8	8	8	12	15	20	20	15	10	10	10	8	5	5	3	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	3	5	8	10	10	12	12	12	15	8	10	10	12	12	12	10	8	5	-	-	-	-	-	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	3	5	8	12	15	25	22	15	12	12	12	15	20	15	13	10	5	-	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	-	3	3	5	8	12	15	15	15	15	12	10	8	8	8	5	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7a	-	-	-	-	-	-	-	-	5	8	12	12	20	28	33	35	28	25	15	18	20	18	15	10	8	5	5	-	-	-	-	-	-	-	-	-	-
18.6	-	-	-	-	-	-	-	-	-	-	-	5	8	10	10	12	15	20	15	25	20	15	15	12	8	8	3	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	3	3	3	3	5	8	10	10	8	8	8	12	18	18	12	12	10	8	8	8	3	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	5	5	8	8	8	8	10	10	12	5	3	3	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	5	8	8	8	8	8	10	10	12	15	17	8	8	8	8	8	12	12	12	10	8	3	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	3	5	5	3	5	8	8	10	12	22	25	28	10	8	8	5	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	3	3	5	5	5	5	5	8	8	12	12	8	5	5	5	5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	3	3	3	3	3	5	5	5	8	8	5	5	5	5	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	3	8	8	5	5	10	5	5	8	5	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	12	5	5	5	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-
31.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	8	8	8	8	8	5	5	5	3	-	-	-	-	-	-	-	-	-	-	-

Note: Yellow line (5694A): May 9.6 at N08 - N15, intensity 3.

Table 61a

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

Date GCT	Degrees north of the solar equator																		0°	Degrees south of the solar equator																	
	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																																					
May 2.7a	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	3	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2
3.7	3	3	3	3	2	3	2	2	2	3	5	5	3	3	3	3	3	3	5	5	5	3	3	2	3	3	2	2	2	2	2	3	2	3	3	3	3
4.6	3	2	2	2	2	2	2	2	2	2	3	3	2	3	2	3	3	3	8	10	10	5	3	5	5	2	2	3	2	2	3	2	2	2	3	2	3
8.8a	-	-	-	-	-	-	-	2	2	2	-	-	-	-	2	3	2	10	5	2	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2	2	5	10	3	-	-	-	2	3	2	2	2	-	-	-	-	-	-	-	-	-
12.7	2	2	2	2	2	-	-	-	-	-	2	2	2	3	2	3	5	15	5	3	2	3	3	2	2	2	2	3	2	2	2	2	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	2	2	2	10	5	10	2	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	5	5	2	2	2	8	5	2	12	2	-	-	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7a	2	3	2	2	2	2	2	2	2	2	2	-	-	2	5	12	5	8	3	12	5	5	3	3	5	2	3	3	3	3	3	2	2	2	2	2	2
18.6	2	2	2	2	2	2	2	2	2	2	2	2	2	12	5	8	3	3	3	12	3	3	3	5	3	3	3	3	3	3	3	3	2	2	2	2	2
19.6	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	5	8	8	5	10	8	5	10	12	3	2	2	3	3	3	3	2	2	2	2	2	2
21.7	-	-	-	-	-	-	-	-	2	2	2	-	-	2	2	2	5	5	2	2	2	3	10	5	2	2	2	2	-	-	-	-	-	-	-	-	-
22.7	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	2	10	3	2	2	2	3	15	8	2	3	3	3	2	2	2	2	2	2	2	2	2
24.7	2	2	2	2	2	2	2	-	-	-	-	-	-	2	2	10	15	15	5	3	3	3	3	10	5	3	2	2	2	2	2	2	-	-	-	-	-
25.6	2	2	2	2	2	-	-	-	-	-	-	-	-	2	5	12	15	12	5	2	2	2	3	3	3	3	5	3	3	2	2	2	2	2	2	-	-
26.7	2	2	2	2	2	2	2	2	2	2	2	2	4	3	2	3	5	14	13	8	8	3	3	2	3	3	3	3	3	2	2	2	2	2	2	2	2
27.7	2	3	3	2	2	2	2	2	2	3	3	5	5	3	3	3	4	8	3	2	3	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2
28.7	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2	3	3	2	2	2	2	2	-	-	-	-	2	2	2	2	2
31.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	5	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-

Table 60b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 2.7a	-	-	-	3	5	8	8	8	8	3	3	5	5	5	8	10	22	31	18	20	25	31	27	25	18	15	12	10	5	3	-	-	-	-	-	-	-
3.7	-	3	3	5	5	4	3	-	-	-	-	-	3	3	5	10	31	33	22	22	31	31	31	28	31	15	12	12	10	3	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	8	15	20	23	15	15	15	18	20	22	12	8	8	5	3	-	-	-	-	-	-	-
8.8	-	-	-	-	-	-	-	-	-	-	-	5	8	10	12	12	12	10	10	12	15	20	22	15	10	8	5	-	-	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-	-	3	3	5	8	10	10	12	12	12	8	10	15	28	38	12	8	5	5	5	5	5	3	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	8	8	10	10	10	12	10	10	8	5	3	3	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	5	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	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	X	-
16.9	-	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	X	-
17.7a	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	10	12	10	5	5	5	5	5	5	5	5	5	5	5	8	8	5	5	3	-	-	-
18.6	-	-	-	-	-	-	-	3	3	5	8	10	8	8	8	8	12	15	8	5	5	8	8	8	8	5	5	8	8	8	10	10	5	3	-	-	-
19.6	-	-	-	-	-	-	-	3	3	5	5	5	5	5	5	8	12	18	12	10	12	15	12	15	12	10	10	8	8	10	12	10	3	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	8	12	8	10	10	8	8	8	8	8	5	5	5	5	5	3	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	10	12	12	15	15	18	15	15	20	15	3	-	3	5	8	12	8	3	3	-	-
24.7	-	-	-	-	-	-	-	-	-	3	3	3	3	5	8	8	10	10	12	15	20	38	35	10	8	10	5	3	3	5	5	5	3	3	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	5	5	8	10	10	12	12	13	22	38	15	15	10	10	3	2	2	3	3	3	3	3	3	3	-
26.7	-	-	-	-	-	-	-	-	-	-	-	3	3	5	5	10	13	12	12	12	15	20	17	14	12	10	5	3	3	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	3	5	5	5	8	8	10	12	15	15	12	12	12	15	18	15	12	15	12	5	3	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	3	3	5	8	12	15	28	20	15	12	15	20	22	15	20	12	8	5	-	-	-	-	-	-	-	-	-
31.8	-	-	-	-	-	-	-	-	-	-	5	5	5	5	8	10	12	12	13	10	10	12	15	15	15	10	5	3	-	-	-	-	-	-	-	-	-

Table 61b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 2.7a	2	3	3	2	2	2	2	2	2	8	8	8	8	10	10	10	5	10	12	8	8	5	12	10	3	2	2	3	3	3	2	2	3	2	2	2	2
3.7	3	3	3	3	3	3	3	3	8	8	8	8	8	10	10	12	10	8	12	10	5	12	15	12	8	2	-	3	3	2	2	2	3	3	2	2	3
4.6	3	3	2	2	2	2	3	3	3	3	3	3	5	3	3	8	5	8	15	8	12	15	12	12	5	3	2	3	3	2	2	2	2	2	3	2	3
8.8	-	-	-	-	-	-	-	-	-	-	-	-	2	3	8	5	2	3	3	3	5	10	3	2	-	-	-	-	-	-	-	-	2	2	2	2	-
9.6	-	-	-	-	-	-	-	-	2	2	2	2	2	3	12	10	2	-	-	2	3	13	10	5	-	-	-	-	-	-	-	2	2	2	2	-	-
12.7	-	-	-	-	-	-	2	3	3	3	2	2	2	2	2	2	2	2	3	3	3	3	5	2	3	3	2	2	2	-	-	-	-	-	-	-	2
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	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	X	-
16.9	-	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	X	-
17.7a	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	5	5	5	4	4	2	2	2	2	2	2	-	-	-	-	-	-	2	2	2
18.6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	10	8	8	8	5	3	2	2	-	-	-	-	-	2	2	2	2	2	2	2
19.6	2	2	2	-	-	-	-	-	-	-	2	2	2	2	2	3	3	13	3	12	10	2	2	2	2	-	-	-	-	-	-	-	-	-	3	3	2
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	12	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	2	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	5	8	2	5	2	2	-	-	-	-	-	-	-	-	2	2	2	2
24.7	-	-	-	-	-	2	2	2	2	2	3	5	8	3	2	-	-	-	2	8	14	10	5	3	2	2	3	3	2	2	3	2	2	2	2	2	2
25.6	-	-	-	-	-	-	-	-	2	3	5	5	5	3	2	2	2	2	2	3	8	10	3	8	3	3	2	2	-	-	-	-	2	2	2	2	2
26.7	2	2	2	-	-	-	-	2	2	3	5	3	3	3	3	3	10	5	2	5	8	8	5	3	2	3	3	2	2	2	2	2	2	2	2	2	2
27.7	2	2	2	2	2	2	3	2	3	5	4	3	3	2	2	10	12	5	2	2	3	5	8	3	3	3	2	3	3	2	2	2	2	2	2	2	2
28.7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	5	8	25	8	3	3	3	8	12	5	3	2	2	-	-	-	-	2	2	2	2	2
31.8	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	3	3	3	2	3	5	10	5	3	-	-	-	-	-	2	2	2	2	2	2

Table 62a

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

Date GCT	90 N	85 N	80 N	75 N	70 N	65 N	60 N	55 N	50 N	45 N	40 N	35 N	30 N	25 N	20 N	15 N	10 N	5 N	0°	5 S	10 S	15 S	20 S	25 S	30 S	35 S	40 S	45 S	50 S	55 S	60 S	65 S	70 S	75 S	80 S	85 S	90 S
1951																																					
May 2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.8a	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	4	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	2	2	2	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
16.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7a	-	-	-	-	-	-	-	-	-	-	-	2	3	3	4	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.6	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	4	4	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31.8	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	X	X	X

Table 62b

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

Date GCT	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
	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																																					
May 2.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	2	-	-	-	-	-	-	-	-	-	-
8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2.	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.8	-	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	X	-
16.9	-	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	X	-
17.7a	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
21.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	3	3	3	3	3	5	5	3	3	3	3	3	3	3	3	2	-	-	-
22.7	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	5	3	5	3	3	3	5	3	2	2	2	2	2	2	2	-	-	-	-	-
24.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	3	3	5	3	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	3	3	3	5	3	3	2	2	2	2	2	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	-	-	-	-	-
31.8	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	X	X	X

Table 63

Outstanding Solar Flares, April 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
Sacramento Peak	Apr. 2	1706	1900	114	274	W69	N08	1718	30	1	2	Yes
"	" 2	2345	--	--	137	E22	S17	2350	15	2		
"	" 3	1725	1915	110	174	E06	S18	1812	12	3		
"	" 11	2000	2020	20	78	E78**	S09**	2007	15	7		
"	" 11	2030	2055	25	33	E78**	S11**	2040	10	10		
Schauinsland	" 12	0736		10		E70	S10					Yes
Sacramento Peak	" 12	1420	1426	6	44	E63	S04	1422	7	7		
"	" 12	2010	2300	170	110	E76	N14	2032	20	4		Yes
"	" 12	2105	2315	130	33	E74	N24	2125	8	7		
"	" 12	2221	2240	19	44	W36	S10	2225	20	8		
Wendelstein	" 13	0545	0614	--	291	E55	S06	0600			1	
"	" 13	0654	0727	--	339	E55	S06	0709			1 +	
Sacramento Peak	" 13	1425	1504	39	45	E83**	N10**	1445	8	10		
"	" 13	1430	1500	30	56	E48	S05	1440	10	5		
"	" 13	1535	1655	80	169	E50	S07	1559	25	3	1	Yes
Wendelstein	" 13	1559	1624	--	339	E50	S08	1604			2 -	Yes
Sacramento Peak	" 13.	1705	1755	50	113	E48	S05	1726	15	7		
"	" 13	1758	1840	42	79	E46	S05	1807	10	4		
"	" 13	1845	1918	33	45	E48	S05	1855	10	10		
"	" 13	2220	2325	65	22	E44	S06	2241	10	10		
"	" 14	1520	--	--	67	E33	S04	1525	13	8		
"	" 14	1655	1720	25	100	E39	S05	1704	18	5		
"	" 14	1800	1850	50	56	E52	N12	1818	10	5		
"	" 14	1850	1910	20	22	E34	S04	1902	7	9		
"	" 14	2000	2015	15	22	E51	N12	2003	7	7		
Meudon	" 15	0715		--		E25	S05				1	
Sacramento Peak	" 15	1500	1530	30	51	E36	S06	1509	10	4		
"	" 15	1620	1640	20	32	E49	N19	1629	8	8		
"	" 15	2101	2155	54	45	E22	S04	2114	15	9		
"	" 15	2110	2205	55	55	E17	S04	2123	10	6		
"	" 16	1400	1540	100	56	E42	N11	1430	12	6		
"	" 16	1625	1655	30	62	E19	N13	1629	18	8		
"	" 16	2000	2030	30	34	E16	N14	2009	13	4		
"	" 16	2045	2250	125	135	E35	N10	2058	10	4		
"	" 16	2118	2124	6	34	E19	N09	2121	8	8		
Meudon	" 17	1030		--		E15	N15				1	
Sacramento Peak	" 17	2015	2050	35	67	E09	N11	2029	10	7		Yes
"	" 17	2120	2240	80	132	E10	N12	2140	12	2		
"	" 17	2255	--	>79	750	E26**	N15**	2318	20	1		
"	" 17	2320	--	>54	130	E08	N11	2326	20	3		Yes
"	" 18	1350	1430	40	97	W03	N10	1404	8	2		
"	" 18	1630	1650	20	54	W04	N10	1639	6	10		Yes
"	" 18	1940	2040	60	108	E02	N11	1951	6	10		
"	" 18	2045	2315	150	875	W05	N10	2117	30	1		Yes
"	" 18	2100	2230	90	216	W04	N20	2114	15	3		Yes
"	" 18	2230	2340	70	292	W04	N20	2305	12	3		
"	" 18	2340	--	--	562	0	N15	2355	20	2		Yes

Table 63 (Continued)

Outstanding Solar Flares, April 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
Wendelstein	" 19	0900	0906	--	291	W14	N11				1 +	
Sacramento Peak	" 19	--	--	--	178	W12	N08	1534	15	2		Yes
McMath	" 20	2011				E55*	S13*				1 -	
Sacramento Peak	" 21	1430	1510	40	89	E39	S13	1439	10	4		
"	" 21	1745	1910	85	100	E42	S17	1815	6	10		
"	" 21	2135	2250	75	111	W52	S08	2143	15	3		
"	" 21	2305	--	--	907	W36	N09	2316	25	2		
"	" 22	1440	1515	35	39	W57	N12	1450	8	6		
"	" 22	1805	1835	30	145	W57	N12	1812	10	7		
"	" 22	1840	1905	25	39	E51	N20	1853	10	9		
"	" 22	1925	1955	30	112	E47	N18	1934	10	3		
"	" 22	2025	2105	40	50	W59	N10	2032	8	10		
"	" 22	2328	--	--	106	W57	N14	2334	15	4		
Schauinsland	" 23	0600				E20	S20					
"	" 23	0640				W60	N20					
"	" 23	0700				E20	S10					
Sacramento Peak	" 23	1515	1545	30	111	W63	N18	1531	10	3		
"	" 23	1545	1635	50	144	W64	N17	1555	12	5		
"	" 23	1603	1712	69	77	W70	N08	1621	12	2		
"	" 23	1700	1815	75	133	W68	N14	1721	20	2		Yes
"	" 23	1810	2050	160	188	W70	N08	1852	12	1		
"	" 23	1950	2005	15	66	W83**	N09**	1959	10	2		
"	" 23	2055	2104	9	44	E08	S13	2101	12	8		
"	" 23	2101	2120	19	33	W67	N20	2113	10	10		
"	" 23	2140	2200	20	55	W69	N13	2150	15	4		
"	" 24	2225	2231	6	50	E17	N17	2230	6	8		
"	" 24	2400	2411	11	22	W77	N17	2404	8	10		
Wendelstein	" 25	0703	0734	31	1067	W90	N13	0721			3	Yes
"	" 25	0853	0918	--	873	W89	N12	0900			1	Yes
"	" 25	0929	0939	--	776	W90	N12	0936			1	
Sacramento Peak	" 25	1440	1525	45	55	E11	N15	1450	8	6		
"	" 25	1725	1810	45	105	W14	S13	1735	8	2		
"	" 25	2050	2105	15	55	W21	S14	2056	15	4		
"	" 26	1900	1940	40	89	E34	S04	1906	12	2		
"	" 27	1450	1508	18	16	E66	N16	1460	8	10		
"	" 27	1525	--	--	93	E57	S13	1536	15	4		
McMath	" 27	1540				E59*	S15			1 -		
Sacramento Peak	" 27	1920	2010	50	55	E55	S12	1931	15	6		
McMath	" 27	1930				E59*	S15*			1 -		
Sacramento Peak	" 27	1945	2005	20	88	W22	N15	1950	15	5		
McMath	" 27	1951				W16*	N17*			1		
Sacramento Peak	" 27	2220	2229	9	27	W39	S14	2226	10	3		
"	" 29	1515	1535	20	33	W69	S17	1524	8	5		
"	" 29	1745	1815	30	49	W75	S14	1803	10	4		
"	" 29	2005	--	--	110	W75	S16	2023	12	6		

*Longitude and latitude of plage or spot group in which solar flare was observed.

**Unusually active prominence or high-speed dark filament also observed near this position.

Table 64

Indices of Geomagnetic Activity for April 1951

Preliminary values of mean K-indices, Kw, from 38 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	2.0 1.1 1.1 2.2 0.8 1.2 1.9 3.1	13.4	0.4	2+1+1+2+ 0+1o2-3o	13+	Five
2	3.0 2.9 2.9 2.2 3.7 4.6 4.3 4.3	27.9	1.3	4-4-4-2+ 4o5o5o5o	32+	Quiet
3	4.7 4.1 3.5 4.1 3.8 5.2 4.7 4.3	34.4	1.5	5+5o4+5- 5-6o6-5o	41-	
4	4.0 4.1 3.9 3.5 4.4 5.2 3.3 4.4	32.8	1.5	5-5+5+4o 5o6o3+5o	39-	1
5	4.6 4.6 3.7 4.2 4.2 3.5 3.9 4.1	32.8	1.3	6-6+5-5o 5+4o4+4+	40-	15 16
6	3.5 4.2 3.9 3.5 4.1 4.2 4.7 4.9	33.0	1.4	4o5+5o4o 5-5o5+6o	39+	28
7	4.6 4.0 3.1 3.3 3.6 3.9 4.1 4.0	30.6	1.2	5o6-4-4- 4o4+4+4+	35o	30
8	4.0 3.3 3.5 2.7 2.9 3.1 3.6 3.8	26.9	1.0	5-4+4+3o 3o3o4-4+	30+	
9	2.8 3.0 3.5 3.3 3.6 3.1 3.4 2.8	25.5	1.0	3+4o4o4- 4o3+4-3-	29-	
10	4.2 2.7 2.9 2.6 3.3 1.9 3.5 2.9	24.0	1.0	5o3o4-3+ 4-2o3+3o	27o	
11	3.2 2.6 2.5 1.6 2.6 2.1 1.1 3.6	19.3	0.7	3+3+3o2o 3-2o1o4+	22-	Five
12	3.7 2.3 2.3 2.3 2.6 2.7 2.5 4.9	23.3	1.0	4o3o3-2o 2+3o3-5+	25o	Dist.
13	4.9 3.8 3.0 4.5 4.9 3.4 2.9 4.3	31.7	1.4	6-5o3o5o 6o4o3+5o	37o	
14	3.8 3.0 2.9 3.3 2.5 2.2 2.3 2.6	22.6	0.8	5-4-4-4o 3o3-2+3-	27-	3
15	2.2 1.6 1.3 2.4 2.3 2.6 2.1 1.9	16.4	0.5	2+2o1+2+ 3o3-2+2-	18-	4 6
16	2.1 1.0 0.9 0.7 1.1 1.4 1.1 3.4	11.7	0.3	2+1+1-0+ 1-1+1o4-	11+	13
17	3.2 2.1 2.1 2.0 2.4 1.7 1.9 1.0	16.4	0.5	4-3-3-2+ 3-2-2o1-	18+	18
18	0.9 1.3 3.9 6.2 6.2 5.2 4.5 4.7	32.9	1.7	1o1o4+7o 8-6o5o5o	37o	
19	4.6 2.3 2.5 2.9 2.1 2.1 1.7 3.9	22.1	1.0	5o3-3-3+ 2o2o2-4o	23+	
20	2.9 3.1 2.7 2.6 3.2 4.7 5.1 5.2	29.5	1.4	3o4-3o3- 3+5+6+6+	34-	Ten Quiet
21	4.9 4.5 3.6 4.4 4.0 3.5 2.3 3.9	31.1	1.4	6-5+4+5+ 5-4o2+4+	36o	
22	4.1 4.2 3.7 3.7 4.0 3.8 4.2 2.9	30.6	1.3	5+5+5-5- 5o4+5o3+	38-	1
23	3.2 4.2 2.6 1.4 2.2 1.7 0.9 2.2	18.4	0.7	4-5o3+2- 3-2o1-3-	22-	11
24	1.5 3.0 4.1 3.6 4.7 4.5 4.3 4.1	29.8	1.3	2-4o5o4+ 6o5o5+4+	36-	15
25	4.3 4.3 3.8 3.9 3.4 4.4 3.7 3.5	31.3	1.3	6-6-5-4+ 4-5o5-4o	38-	16 17
26	4.6 2.2 1.8 1.7 1.5 2.5 1.8 0.4	16.5	0.8	6-3-2o2- 1+3-2-0o	18-	23
27	0.7 1.2 1.9 1.9 2.8 3.4 2.6 3.0	17.5	0.7	1-1+2+2- 3o3+3o3o	18+	27
28	2.9 1.5 1.6 1.9 1.7 2.0 2.0 1.7	15.3	0.5	3+2-2-2+ 1+2+2o2-	16+	28
29	3.0 2.8 1.9 2.3 2.8 3.3 2.0 1.2	19.3	0.7	4o4-2+2+ 3+3+2o1o	22o	29
30	0.6 1.1 1.2 1.2 1.5 0.9 0.6 1.8	8.9	0.1	1-1o1+1o 1+1-1-2-	8+	30
Mean	3.29 2.87 2.74 2.87 3.10 3.13 2.90 3.29	3.02	0.99			

Table 65

Sudden Ionosphere Disturbances Observed at Washington, D. C.

May 1951

1951 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
May 8	1506	1530	Ohio, D. C., Colombia, England	0.0	Solar flare*** 1505 Solar flare**** 1505
8	1550	1620	Ohio, D. C., England	0.2	Solar flare**** 1540
13	1249	1300	Ohio, D. C.	0.05	
13	1315	1340	Ohio, D. C.	0.1	Solar flare*** 1314
14	1133	1210	Ohio, D. C., England	0.1	Terr.mag.pulse** 1134-1140
15	1128	1220	Ohio, D. C., England	0.0	Solar flare*** 1150
16	1705	1740	Ohio, D. C., Colombia, New Brunswick	0.0	Solar flare*** 1701 Solar flare**** 1705
17	1450	1520	Ohio, D. C., Colombia	0.0	Solar flare***** 1442 Solar flare**** 1500
17	1530	1610	Ohio, D. C., Colombia	0.1	Solar flare**** 1525, 1530
17	1637	1700	Ohio, D. C.	0.0	Solar flare**** 1650
18	1040	1200	Ohio, D. C., England	0.0	
18	1955	2040	Ohio, D. C., Colombia, England	0.0	Terr.mag.pulse** 2000-2110 Solar flare*** 1948, 1959 Solar flare**** 1959
May 19	1343	1410	Ohio, D. C., Colombia, England	0.0	Solar flare*** 1347 Solar flare**** 1350
19	1445	1500	Ohio, D. C., Colombia	0.1	Solar flare*** 1443 Solar flare**** 1435
19	1950	2110	Ohio, D. C., Colombia, England	0.0	Solar flare*** 1950 Solar flare**** 1945, 2002
20	1738	1805	Ohio, D. C., England	0.1	Solar flare**** 1735
20	1935	2105	Ohio, D. C., England	0.0	Solar flare*** 1932, 1957 Solar flare**** 1935, 1955
20	2113	2135	Ohio, D. C.	0.05	Solar flare**** 2110
21	1610	1630	Ohio, D. C., Colombia, England, New Brunswick	0.05	Solar flare**** 1610
22	1325	1440	Ohio, D. C., England	0.0	Solar flare**** 1358
29	1750	1810	Ohio, D. C., Colombia	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.
**As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.
***Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.
****Time of observation at Sacramento Peak, New Mexico.
*****Time of observation at Meudon Observatory, France.

Table 66

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

1951 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters	Other phenomena
April 25	0720	0740	Brentwood	Afghanistan, Austria, Bahrein I., Belgian Congo, India, Kenya, Palestine, Southern Rhodesia, Switzerland, Syria, Trans-Jordan, Turkey	Solar flare* 0703
25	0723	0740	Somerton	Australia, Ceylon, India	Solar flare* 0703
25	0845	0920	Brentwood	Austria, Barbados, Belgian Congo, Bulgaria, Canary Is., Eritrea, Greece, India, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar	Solar flare* 0850
25	0842	0920	Somerton	Aden, Argentina, Australia, Ceylon, China, Cyprus, Egypt, Gold Coast, India, Union of S. Africa	Solar flare* 0850
May 8	1510	1530	Brentwood	Bahrein I., Barbados, Belgian Congo, Canary Is., Chile, Colombia, Eritrea, France, French Equatorial Africa, Greece, Kenya, Malta, Palestine, Portugal, Spain, Syria, Thailand, Trans-Jordan, Uruguay, U.S.S.R., Venezuela, Yugoslavia, Zanzibar	Solar flare** 1505 Solar flare*** 1505
8	1508	1530	Somerton	Argentina, Australia, Brazil, Canada, Ceylon, Cyprus, Egypt, Gold Coast, India, New York, Union of S. Africa	Solar flare** 1505 Solar flare*** 1505
10	0959	1020	Brentwood	Austria, Bahrein I., Barbados, Belgian Congo, Canary Is., Eritrea, Greece, India, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar	
10	1000	1020	Somerton	Aden, Argentina, Australia, Barbados, Brazil, Canada, Ceylon, China, Egypt, Gold Coast, India, New York, Union of S. Africa	
14	1133	1140	Brentwood	Afghanistan, Austria, Bahrein I., Bulgaria, Greece, India, Iran, Kenya, Palestine, Portugal, Spain, Switzerland, Turkey, U.S.S.R., Yugoslavia	Terr.mag. pulse**** 1134-1140
14	1135	1145	Somerton	Argentina, China, Cyprus, Malay States, Union of S. Africa	Terr.mag. pulse**** 1134-1140
May 15	1125	1205	Brentwood	Austria, Bahrein I., Barbados, Belgian Congo, Bulgaria, Canary Is., Chile, Colombia, Greece, India, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Trans-Jordan, Turkey, Uruguay, U.S.S.R., Venezuela, Yugoslavia, Zanzibar	Solar flare** 1150
15	1128	1210	Somerton	Argentina, Brazil, Canada, Ceylon, Cyprus, Egypt, Gold Coast, India, Madagascar, New York, Union of S. Africa	Solar flare** 1150
18	1027	1245	Brentwood	Afghanistan, Austria, Bahrein I., Barbados, Belgian Congo, Canary Is., Chile, Colombia, Eritrea, Greece, India, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Trans-Jordan, Turkey, Uruguay, U.S.S.R., Yugoslavia, Zanzibar	
18	1025	1300	Somerton	Aden, Argentina, Brazil, Ceylon, China, Cyprus, Egypt, Gold Coast, India, Union of S. Africa	
19	1353	1410	Brentwood	Austria, Barbados, Belgian Congo, Bulgaria, Canary Is., Chile, Eritrea, Greece, Portugal, Spain, Switzerland, Thailand, Yugoslavia, Zanzibar	Solar flare** 1347 Solar flare*** 1350
20	0809	0830	Brentwood	Afghanistan, Eritrea, India, Iran, Southern Rhodesia, Switzerland, Trans-Jordan	
22	0910	0945	Brentwood	Belgian Congo, Bulgaria, Canary Is., Eritrea, India, Iran, Kenya, Madagascar, Portugal, Southern Rhodesia, Spain, Syria, Thailand, Trans-Jordan, Turkey, Yugoslavia	
22	0910	0930	Somerton	Aden, Argentina, Australia, Ceylon, China, Egypt, India, Union of S. Africa	
22	1345	1500	Brentwood	Barbados, Chile, Colombia, Uruguay, Venezuela	Solar flare*** 1358
23	1040	1135	Brentwood	Afghanistan, Austria, Bahrein I., Belgian Congo, Canary Is., Greece, Iran, Kenya, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Trans-Jordan, Turkey, Yugoslavia, Zanzibar	
23	1040	1135	Somerton	Aden, Argentina, Brazil, Canada, Ceylon, China, Cyprus, Egypt, Formosa, Gold Coast, India, New York, Union of S. Africa	

*Time of observation at Wendelstein Observatory, Germany.
**Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.
***Time of observation at Sacramento Peak, New Mexico.
****As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 67

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.,

as Observed at Point Reyes, California

1951 Day	GCT Beginning	GCT End	Location of transmitters
May			
21	0017	0100	Australia, China, Japan, Okinawa, Philippine Is.
21	0148	0230	Australia, China, Japan, Philippine Is.
22	0050	0215	Australia, China, Hawaii, Japan, Java, Korea, Okinawa, New York, Philippine Is., Thailand
23	0120	0250	Australia, China, Hawaii, Japan, Java, Korea, Okinawa, Philippine Is.
25	0030	0330	Australia, China, Hawaii, Japan, Philippine Is.

Table 68

Sudden Ionosphere Disturbances Reported by RCA Communications, Inc.,

as Observed at Riverhead, New York

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
May				
8	1510	1535	Argentina, Canada, England, France, Italy, Panama, Tangier, Union of S. Africa	Solar flare* 1505 Solar flare** 1505
10	1003	1100	Argentina, Canada, England, Italy, Switzerland, Tangier	
15	1132	1315	England, France, Italy, Switzerland, Tangier	Solar flare* 1150
18	1030	1430	Canada, England, France, Italy, Poland, Switzerland, Tangier	
23	1045	1135	Argentina, England, Italy, Switzerland, Tangier	

*Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.
**Time of observation at Sacramento Peak, New Mexico.

Table 69

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

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
March				
24	1135	1210	Belgium, Denmark, Germany, Italy, Netherlands	Solar flare* 1135
April				
2	1712	1800	Brazil, Chile, Colombia, Cuba, Denmark, England, France, Germany, Netherlands, New York, Spain, Venezuela	Solar flare** 1706
19	1436	1700	Belgium, Bolivia, Brazil, Chile, Colombia, Cuba, France, Germany, Netherlands, New York, Venezuela	
20	1455	1525	England, France, New York, Portugal	
30	1725	1740	Bolivia, Brazil, Chile, Cuba, Denmark, England, Germany, Netherlands, New York, Peru, Spain, Venezuela	Terr.mag.pulse*** 1720-1740

*Time of observation at Edinburgh Observatory, Scotland.
**Time of observation at Sacramento Peak, New Mexico.
***As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.

Table 70

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

1951 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
April				
2	1717	1800	British Guiana, Grenada, St. Lucia, St. Vincent, Trinidad	Solar flare* 1706
30	1725	1740	England, Peru	Terr.mag.pulse** 1720-1740

*Time of observation at Sacramento Peak, New Mexico.
**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.

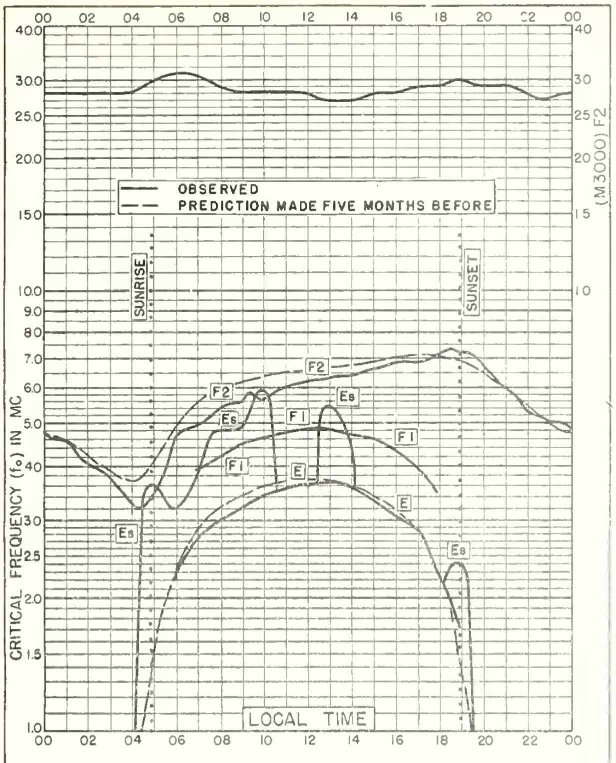

Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W MAY 1951

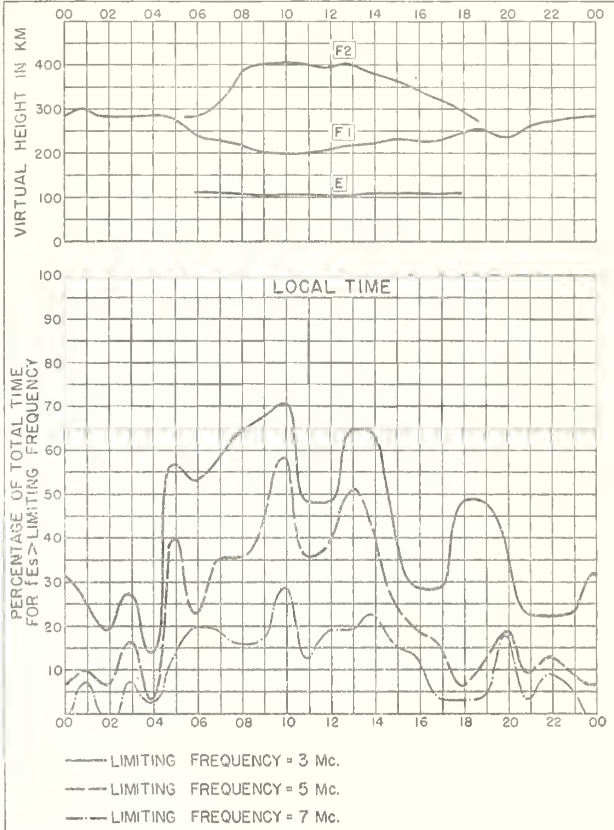

Fig. 2. WASHINGTON, D. C. MAY 1951

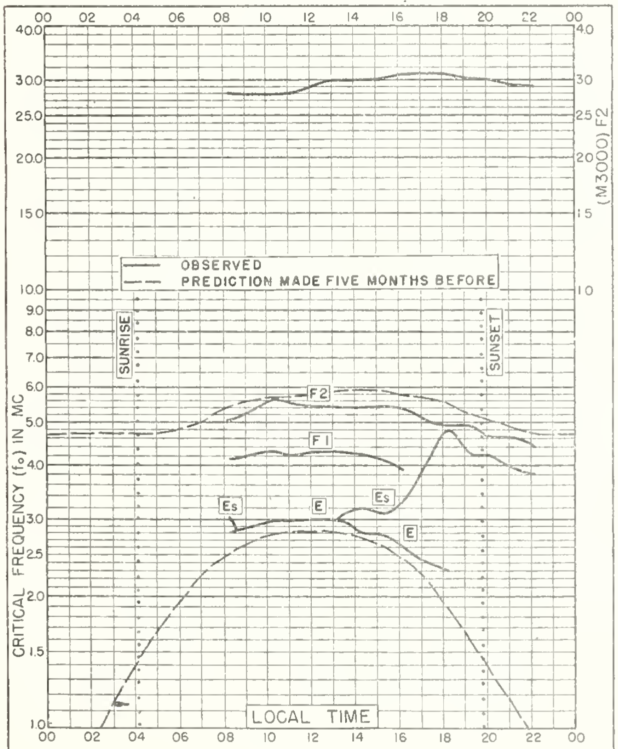

Fig. 3. TROMSO, NORWAY
69.7°N, 19.0°E APRIL 1951

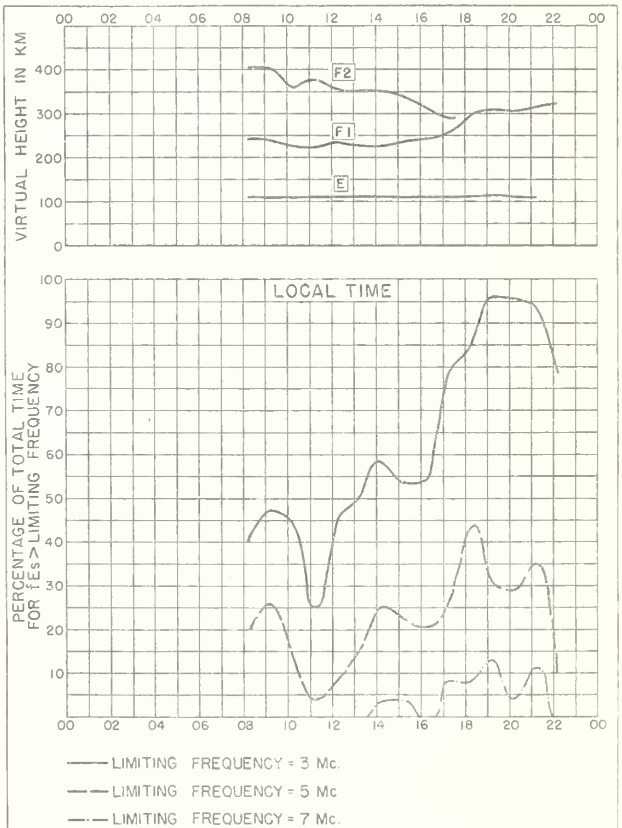

Fig. 4. TROMSO, NORWAY APRIL 1951

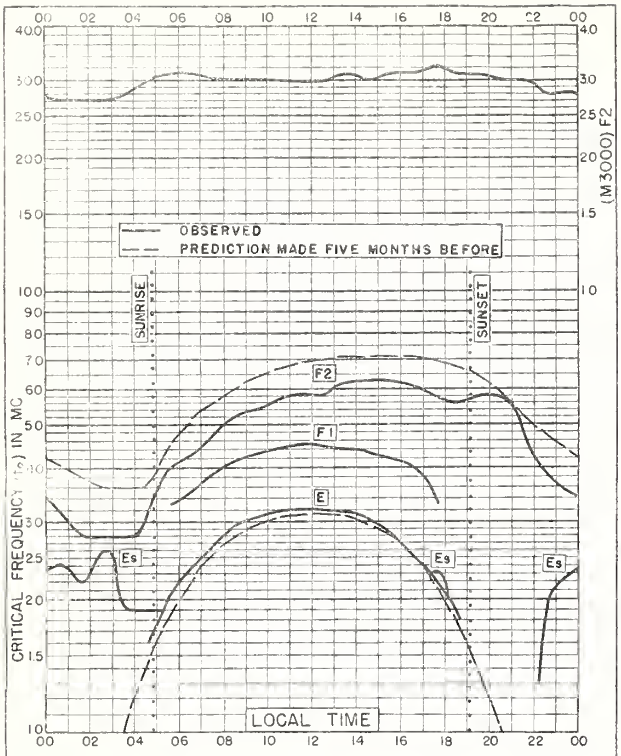

Fig. 5. OSLO, NORWAY
60.0°N, 11.0°E APRIL 1951

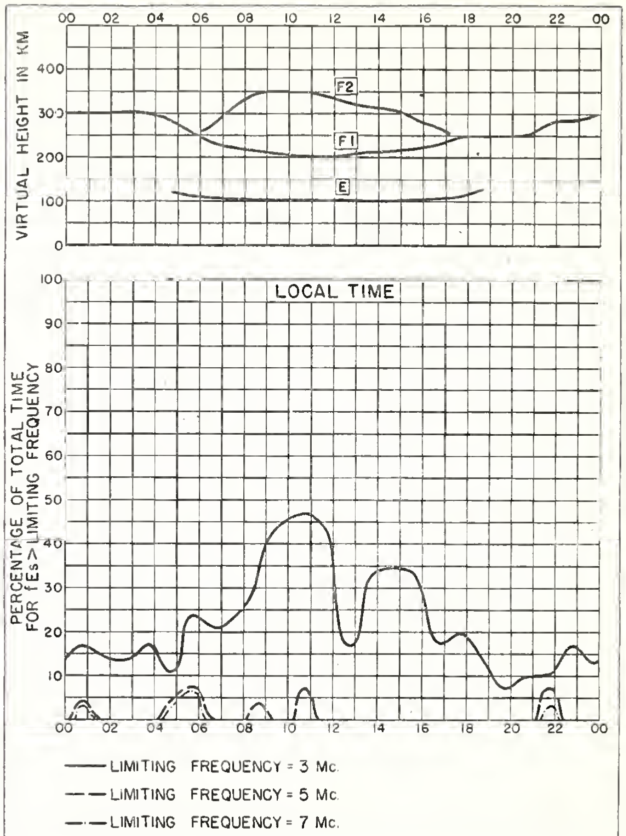

Fig. 6. OSLO, NORWAY APRIL 1951

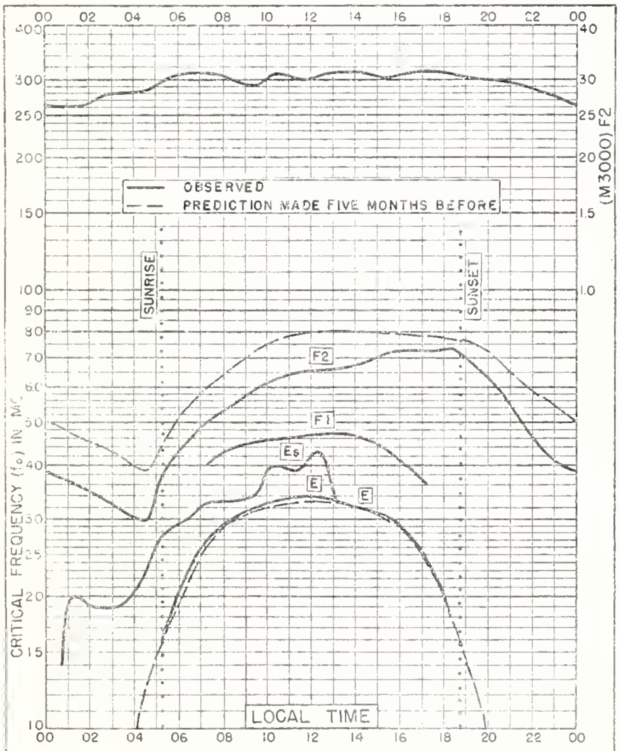

Fig. 7. De BILT, HOLLAND
52.1°N, 5.2°E APRIL 1951

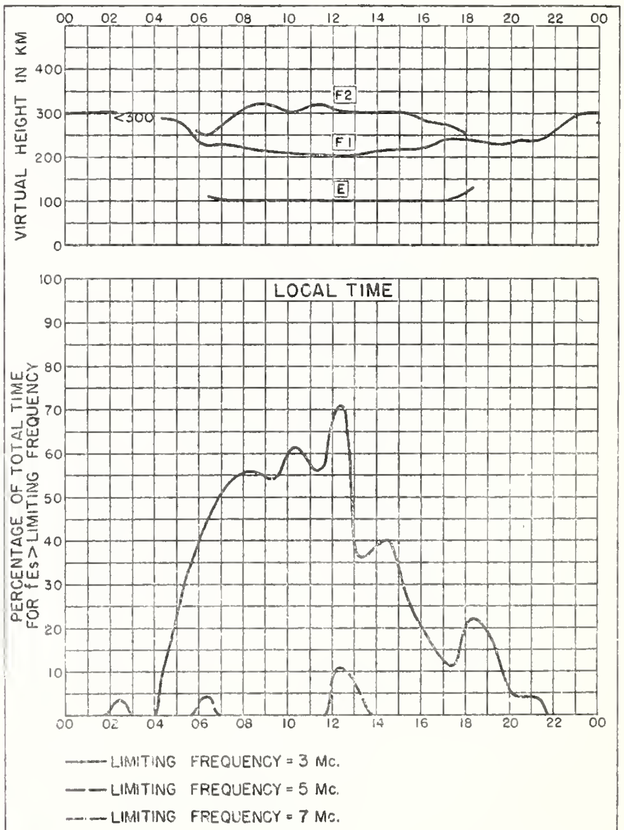

Fig. 8. De BILT, HOLLAND APRIL 1951

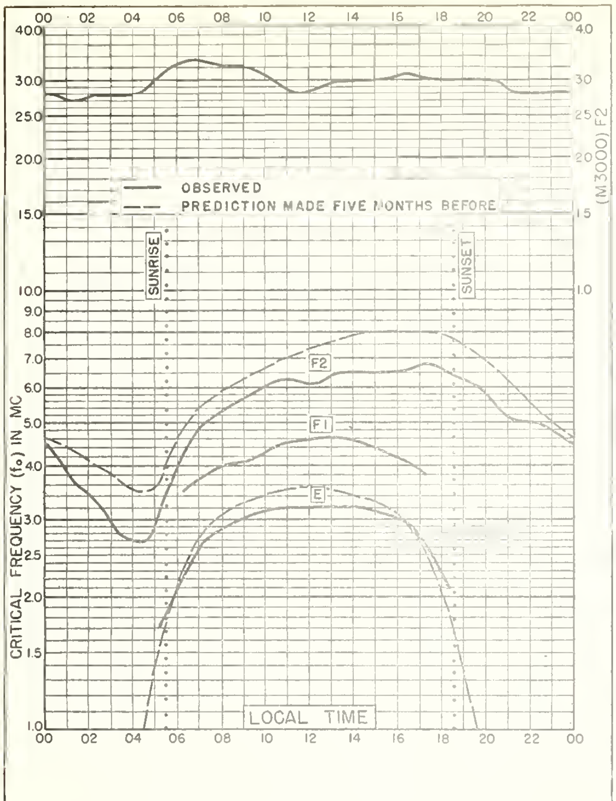

Fig. 9. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W APRIL 1951

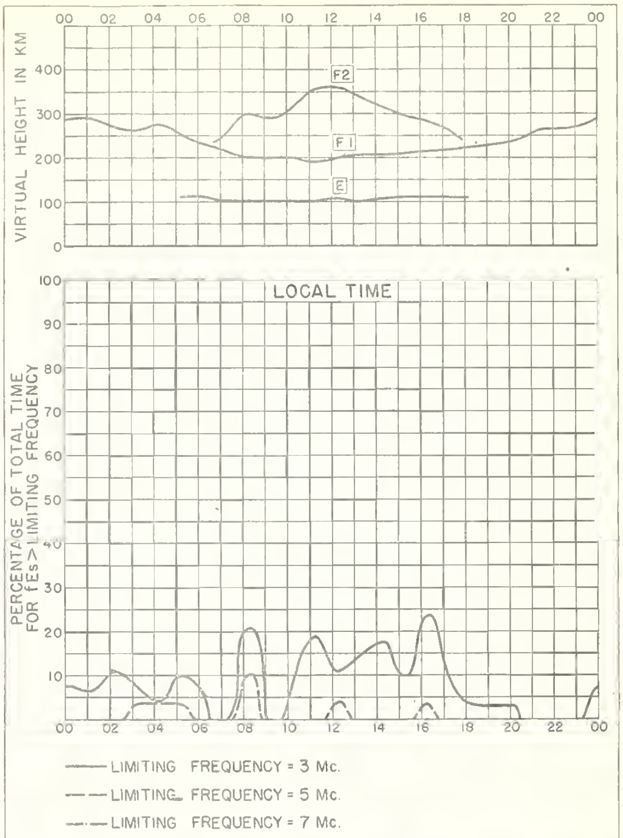

Fig. 10. BOSTON, MASSACHUSETTS APRIL 1951

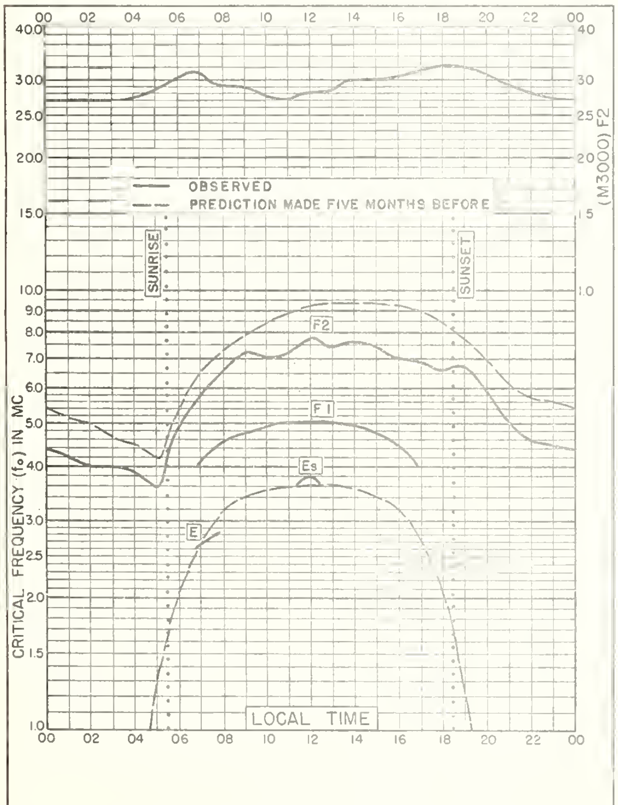

Fig. 11. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W APRIL 1951

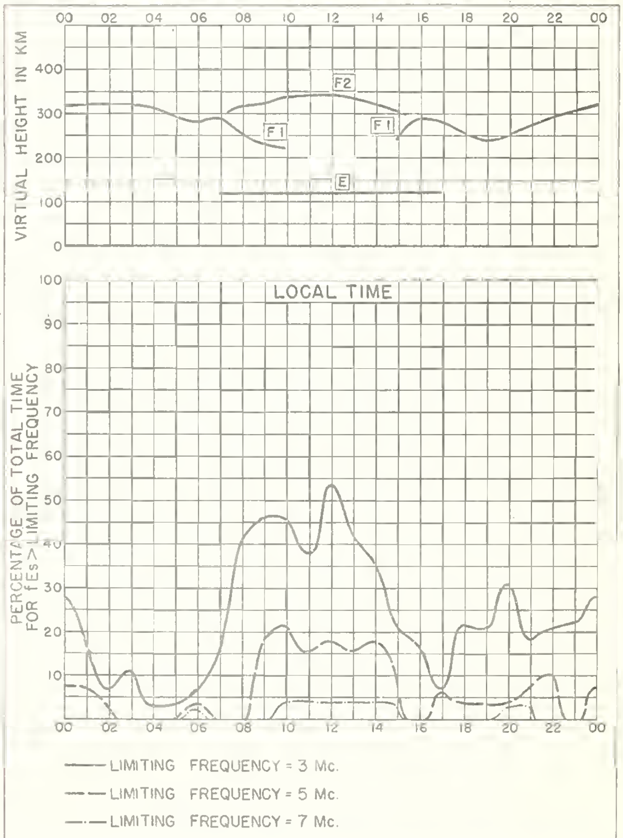

Fig. 12. SAN FRANCISCO, CALIFORNIA APRIL 1951

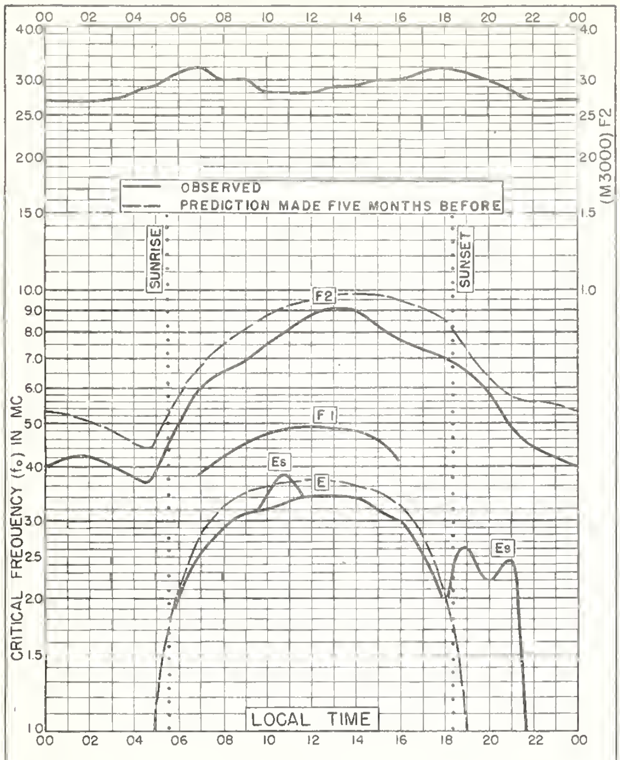

Fig. 13. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W APRIL 1951

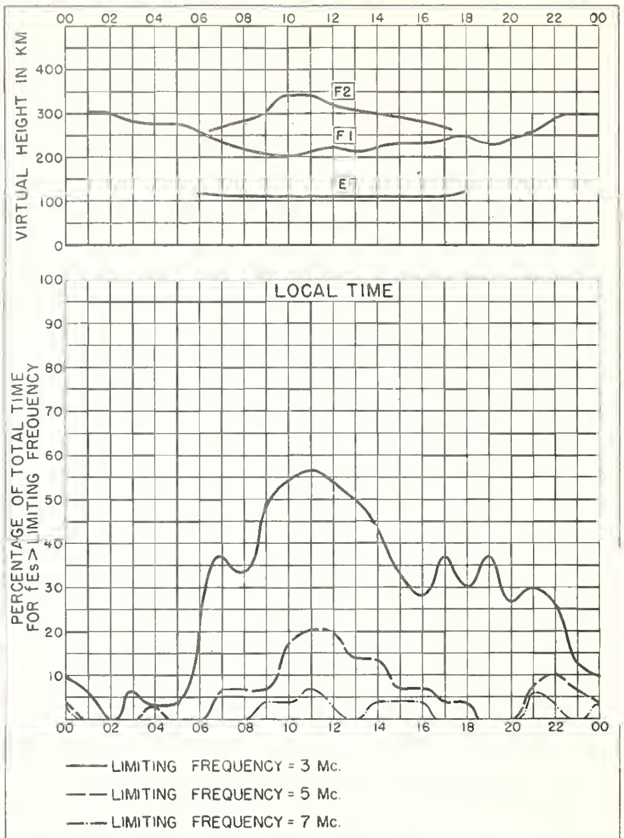

Fig. 14. WHITE SANDS, NEW MEXICO APRIL 1951

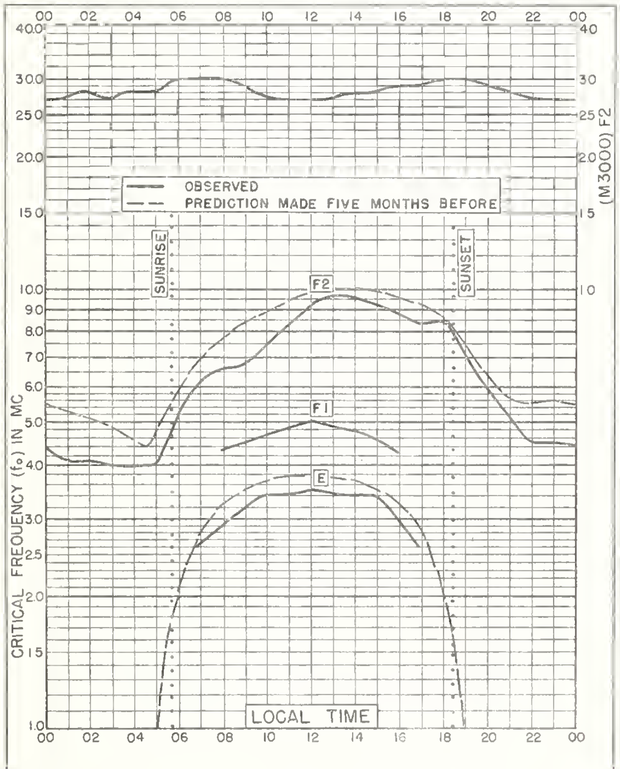

Fig. 15. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W APRIL 1951

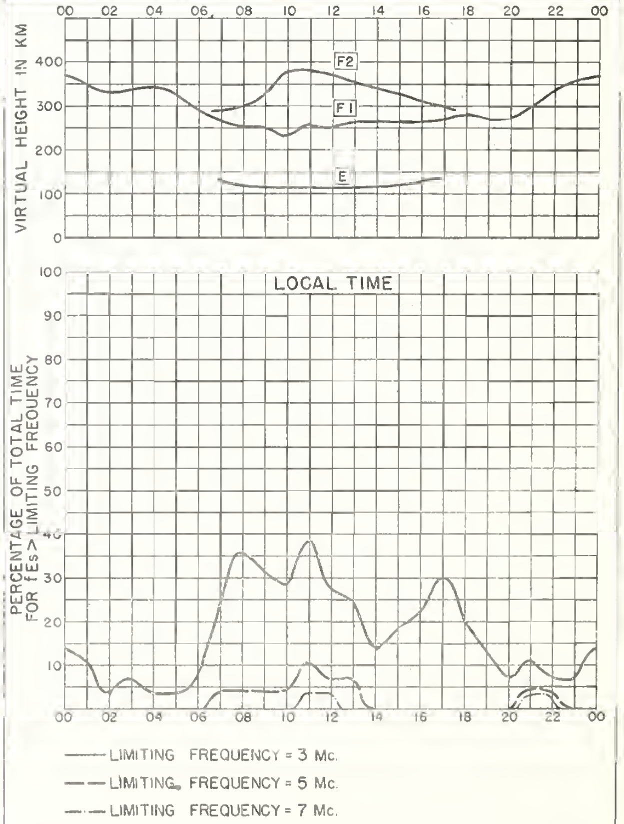

Fig. 16. BATON ROUGE, LOUISIANA APRIL 1951

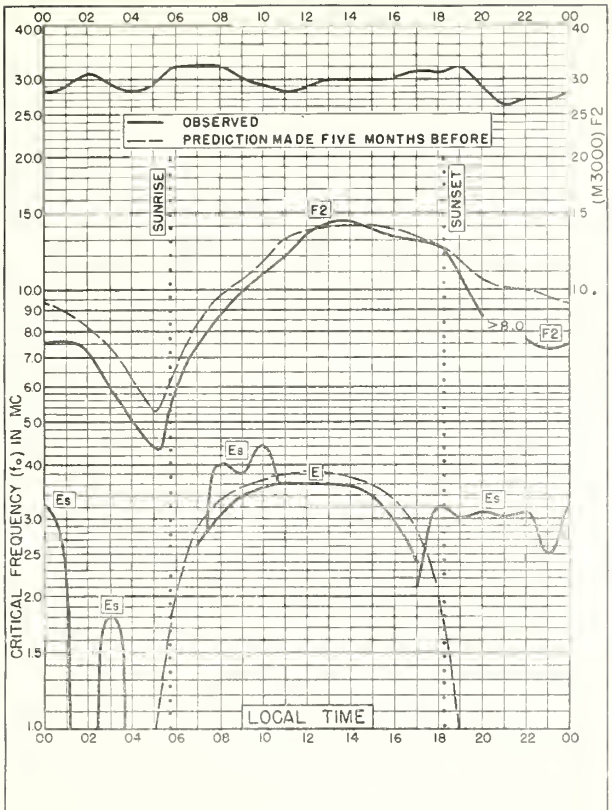

Fig. 17. OKINAWA I.
26.3°N, 127.8°E APRIL 1951

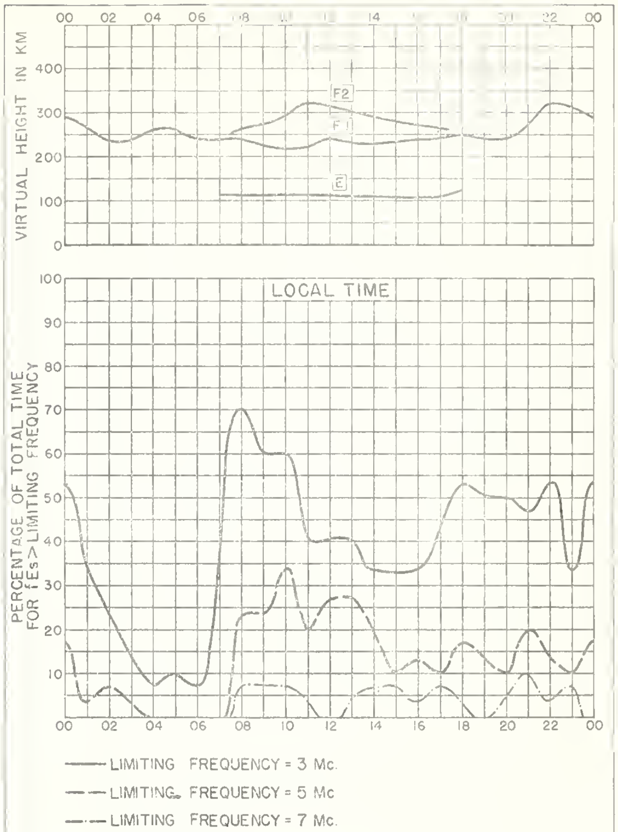

Fig. 18. OKINAWA I. APRIL 1951

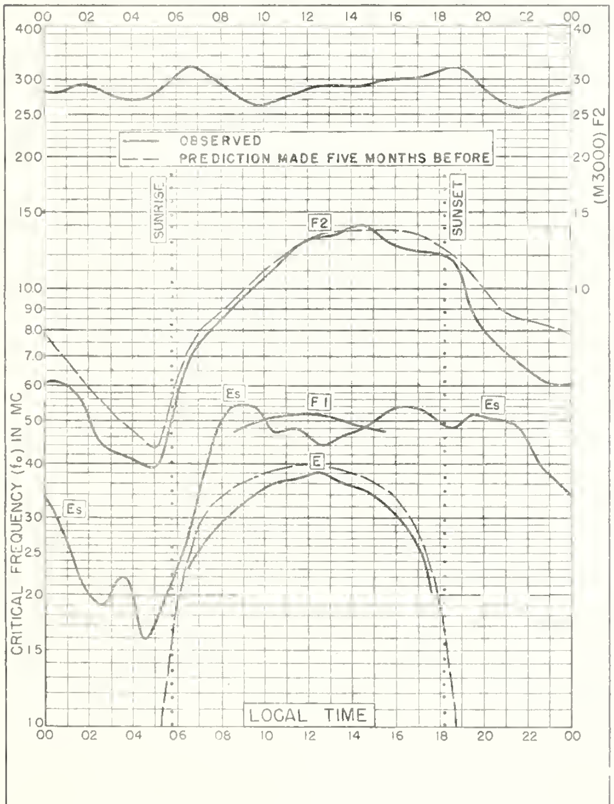

Fig. 19. MAUI, HAWAII
20.8°N, 156.5°W APRIL 1951

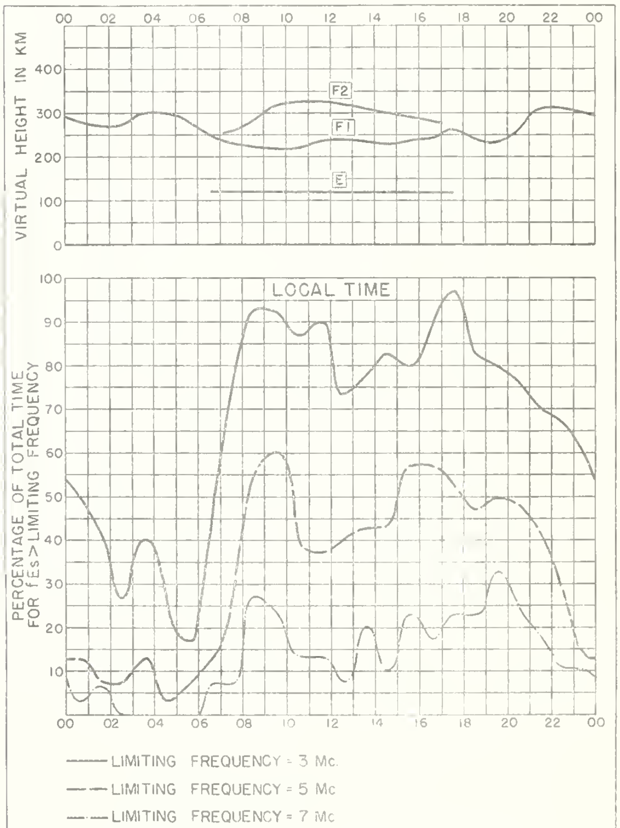

Fig. 20. MAUI, HAWAII APRIL 1951

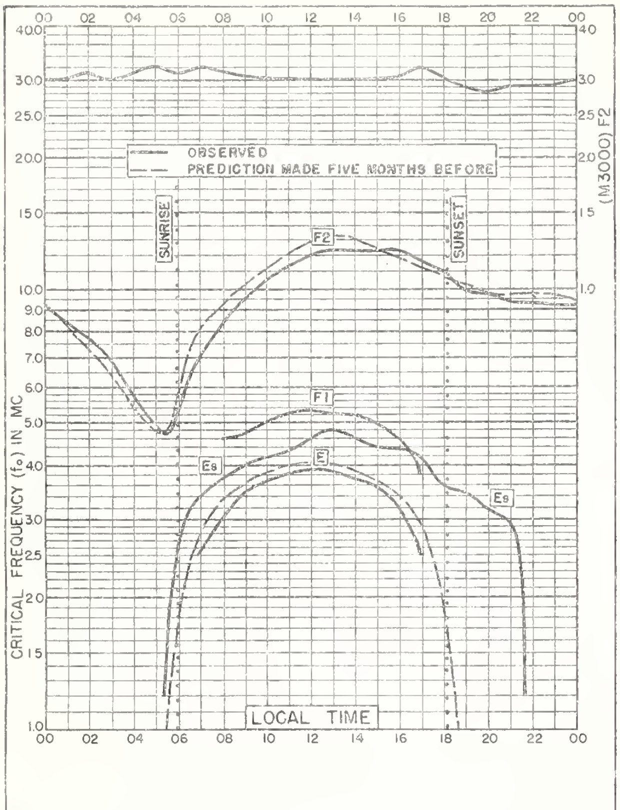

Fig. 21 TRINIDAD, BRIT. W. INDIES
10.7°N, 61.6°W APRIL 1951

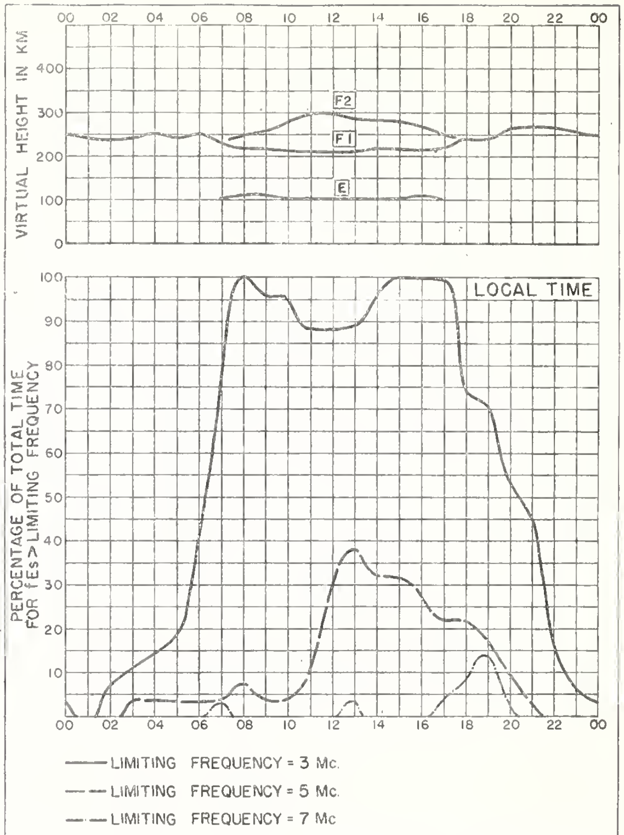

Fig. 22. TRINIDAD, BRIT. W. INDIES APRIL 1951

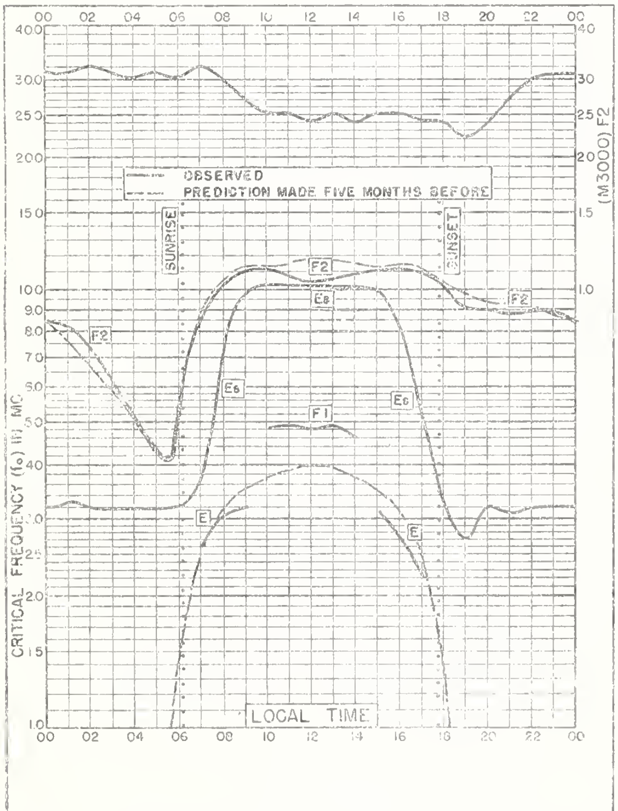

Fig. 23 HUANCAYO, PERU
12.0°S, 75.3°W APRIL 1951

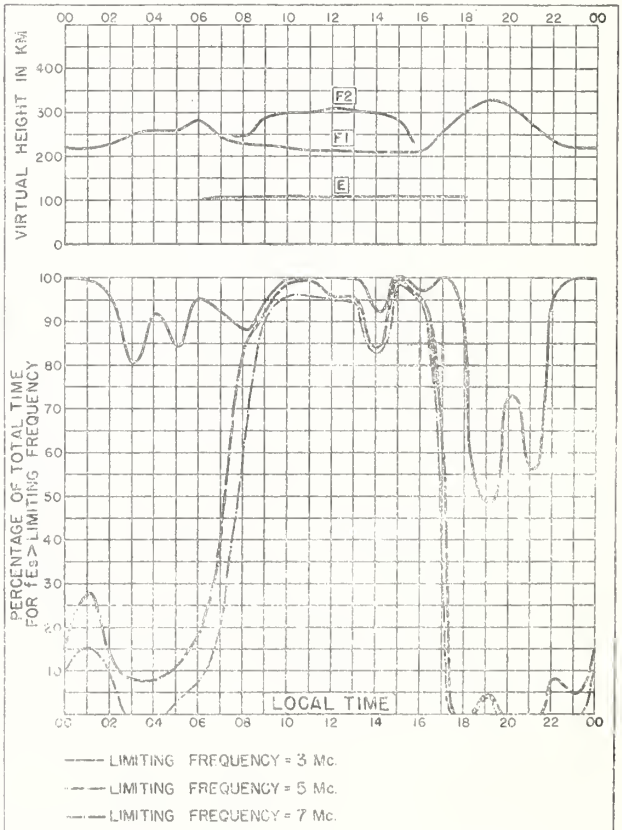

Fig. 24. HUANCAYO, PERU APRIL 1951

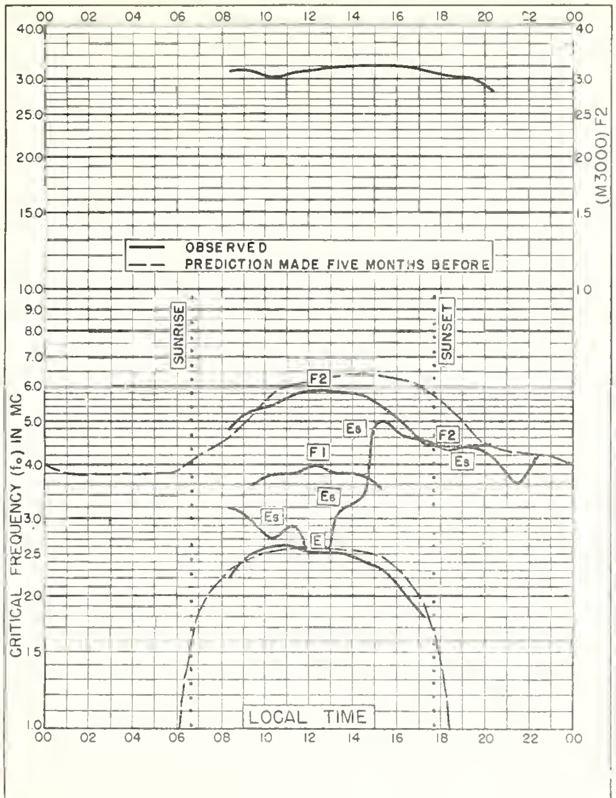

Fig. 25. TROMSO, NORWAY
69.7°N, 19.0°E MARCH 1951

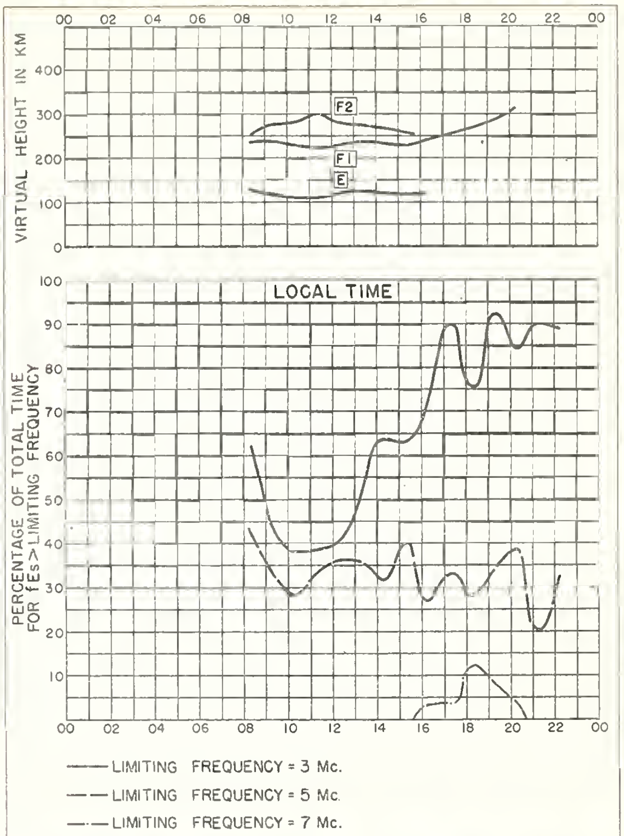

Fig. 26. TROMSO, NORWAY MARCH 1951

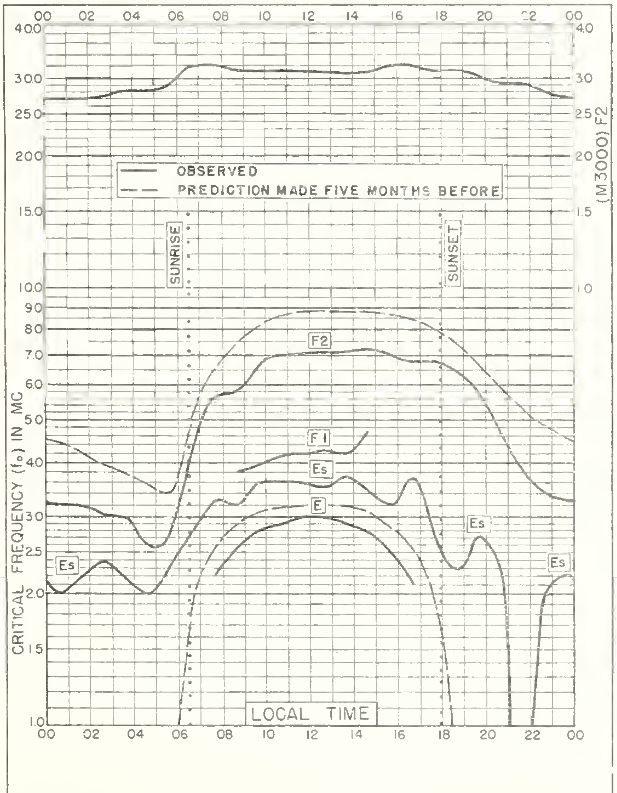

Fig. 27. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E MARCH 1951

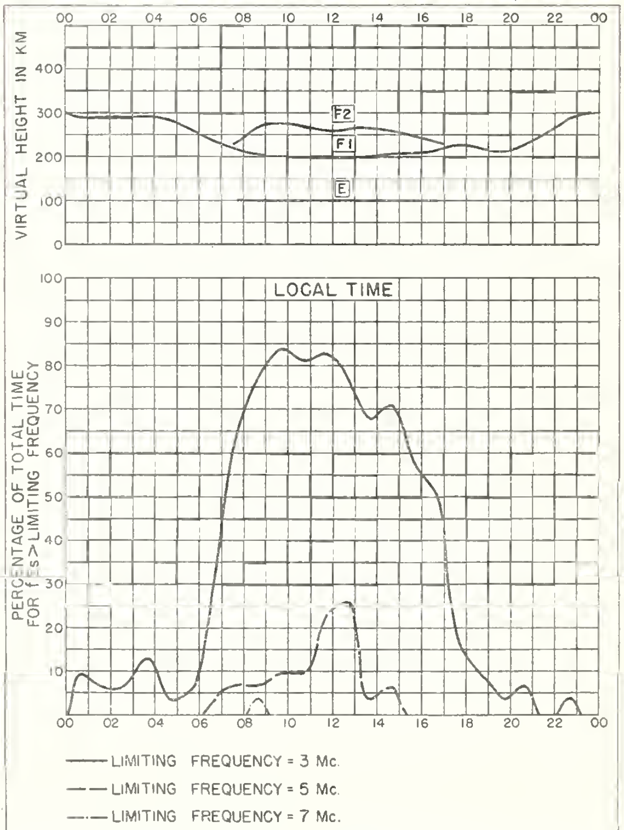

Fig. 28. LINDAU/HARZ, GERMANY MARCH 1951

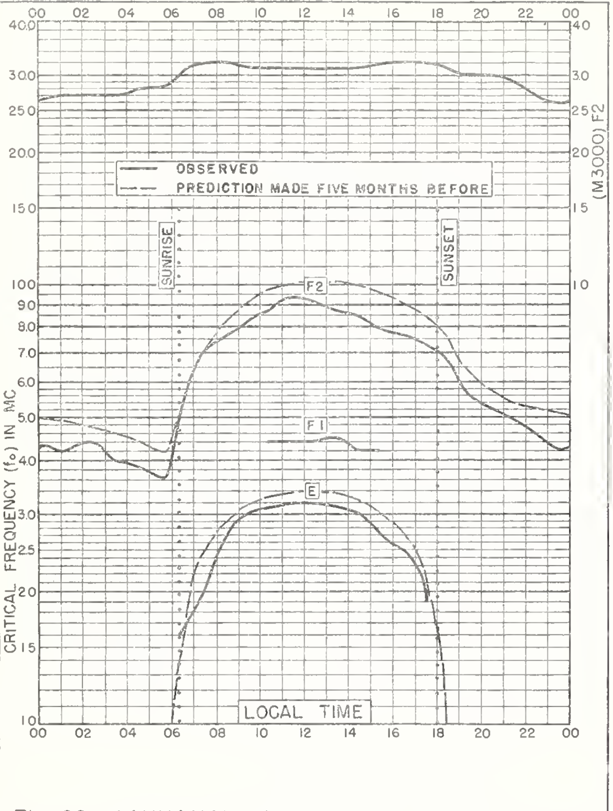

Fig. 29. WAKKANAI, JAPAN
45.4°N, 141.7°E MARCH 1951

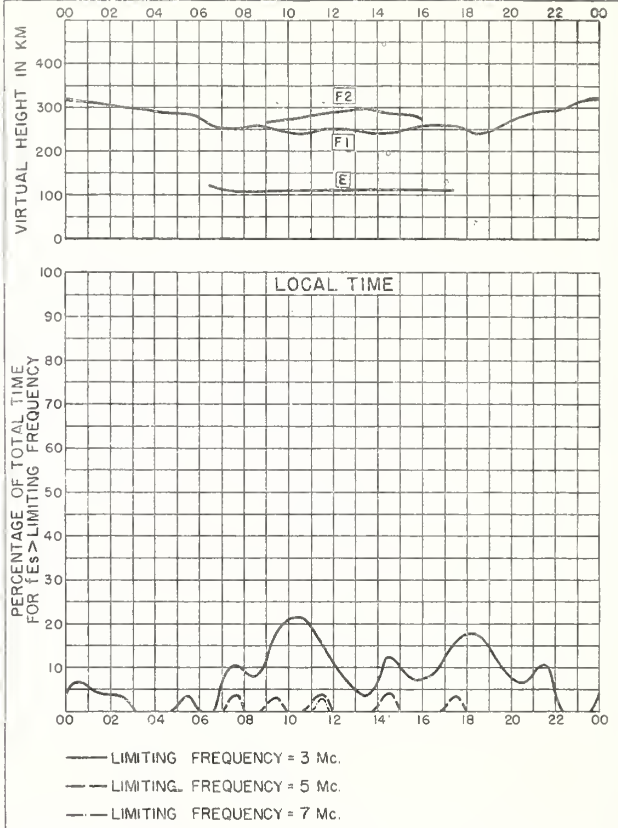

Fig. 30. WAKKANAI, JAPAN MARCH 1951

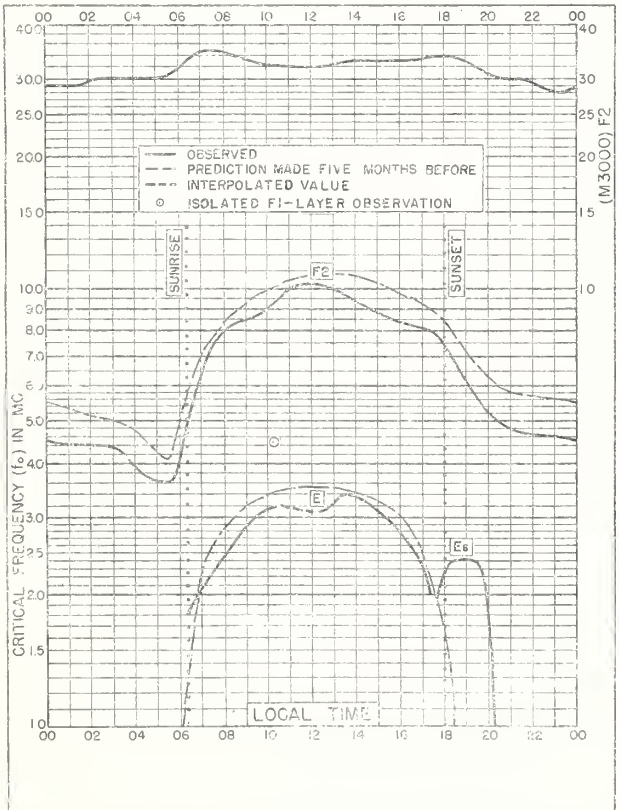

Fig. 31. AKITA, JAPAN
39.7°N, 140.1°E MARCH 1951

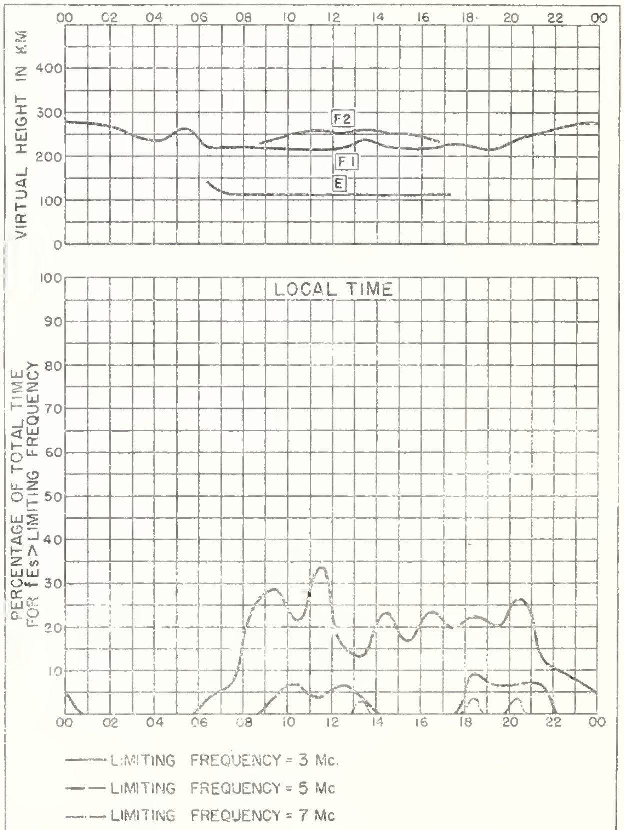

Fig. 32. AKITA, JAPAN MARCH 1951

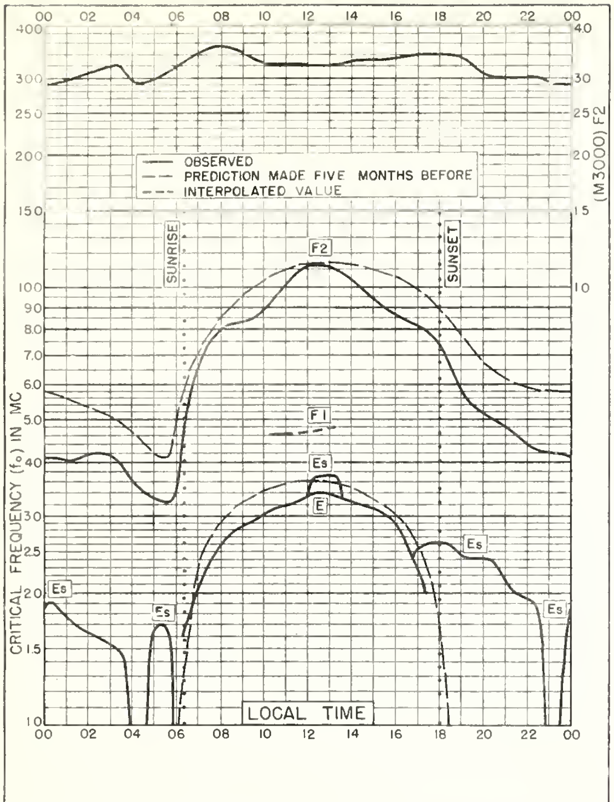

Fig 33. TOKYO, JAPAN
35.7°N, 139.5°E MARCH 1951

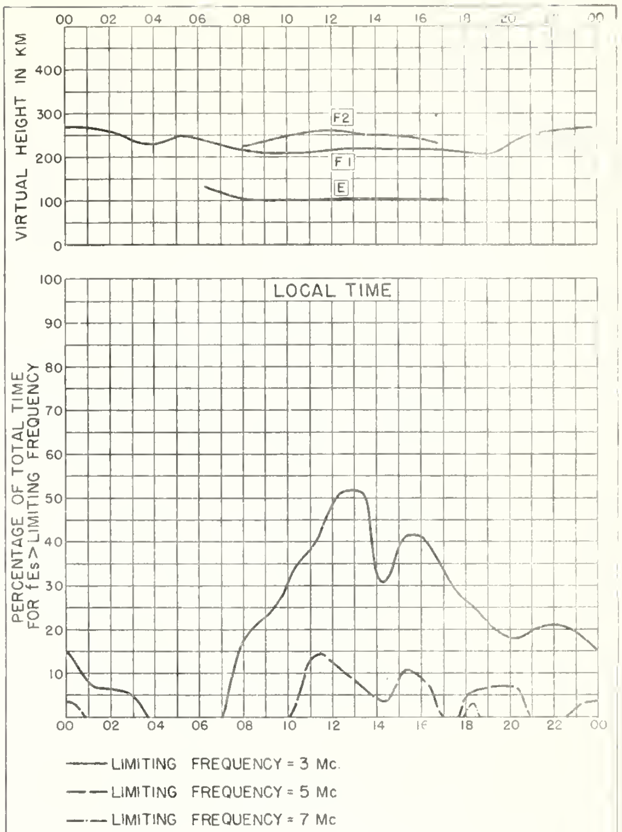

Fig. 34. TOKYO, JAPAN MARCH 1951

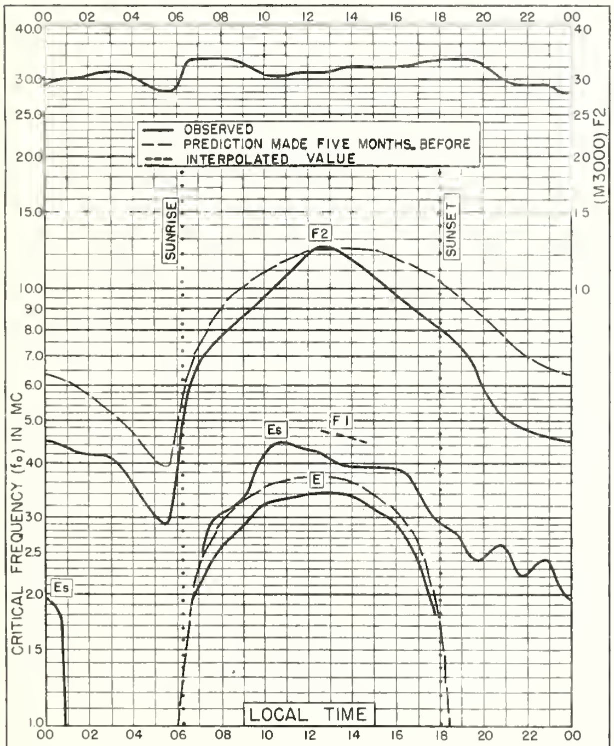

Fig. 35. YAMAGAWA, JAPAN
31.2°N, 130.6°E MARCH 1951

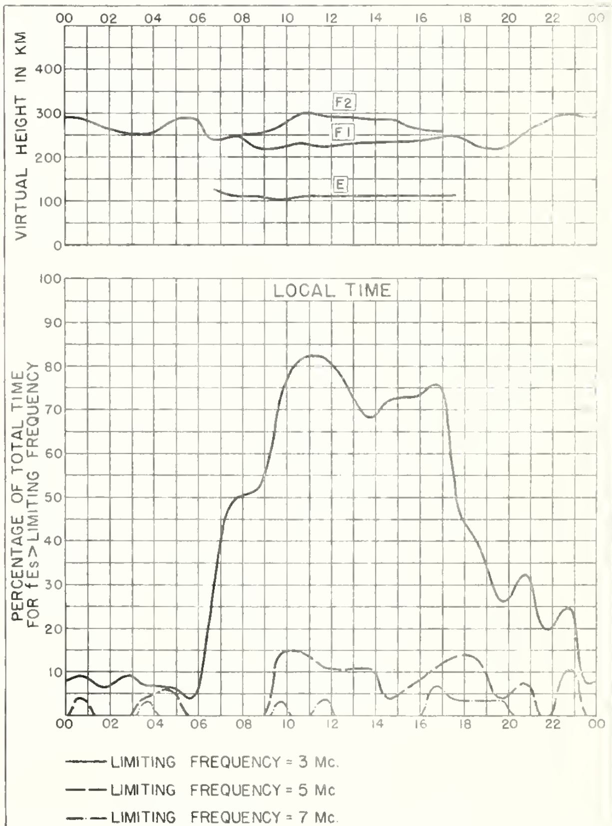

Fig. 36. YAMAGAWA, JAPAN MARCH 1951

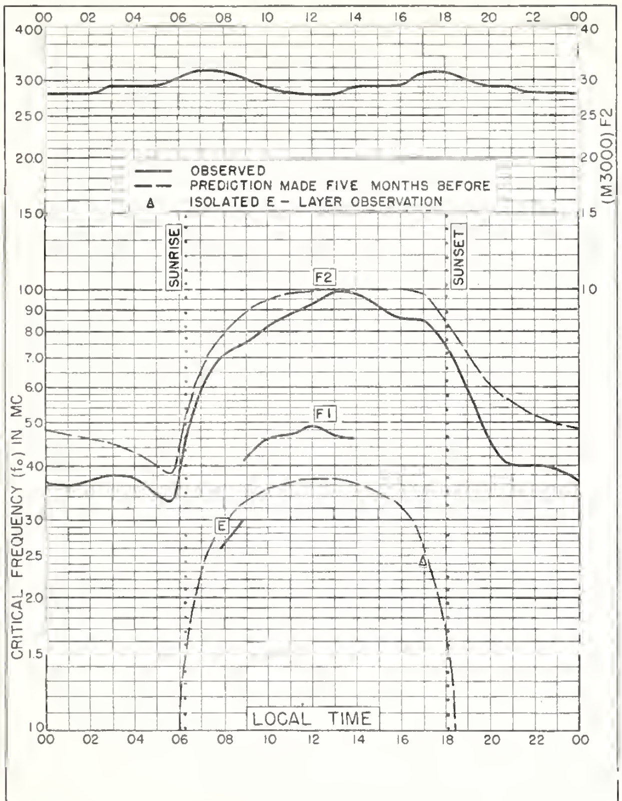

Fig. 37. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W MARCH 1951

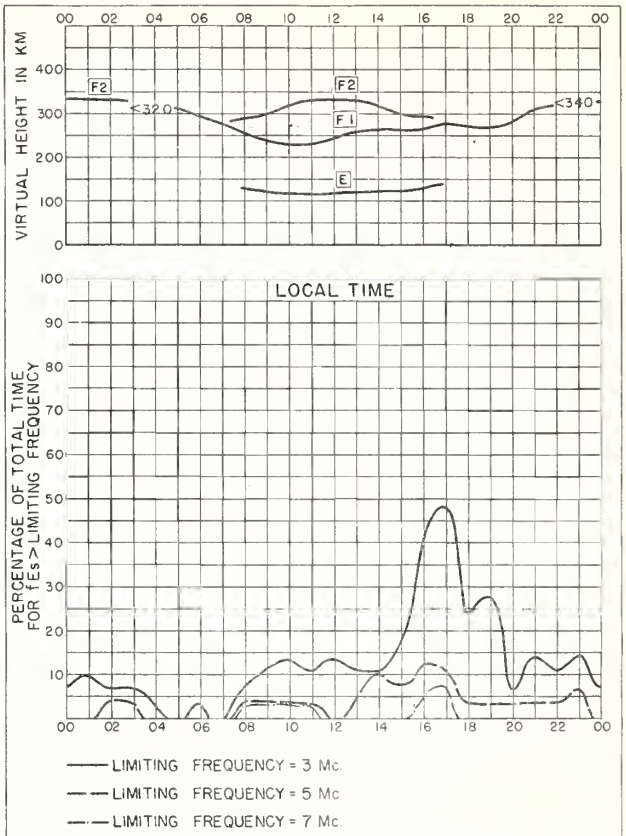

Fig. 38. BATON ROUGE, LOUISIANA MARCH 1951

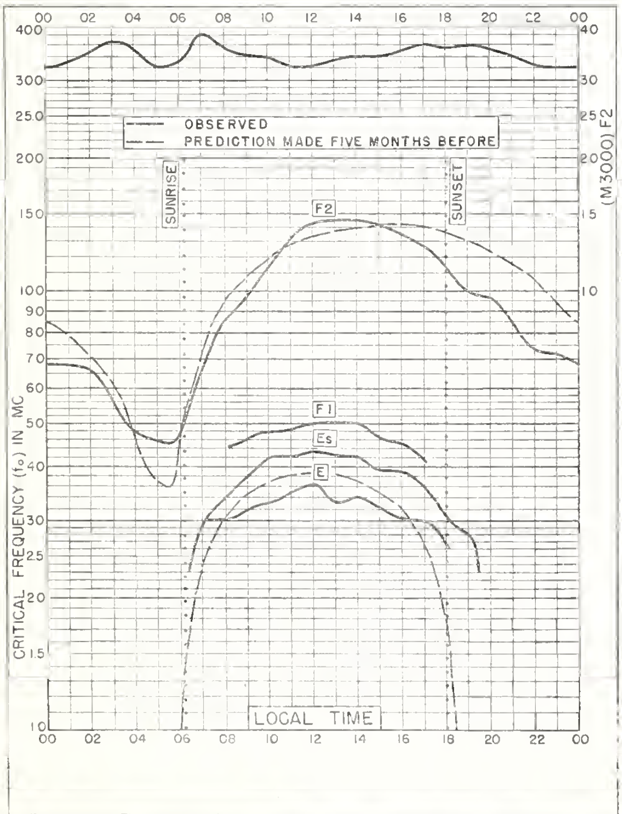

Fig. 39. FORMOSA, CHINA
25.0°N, 121.0°E MARCH 1951

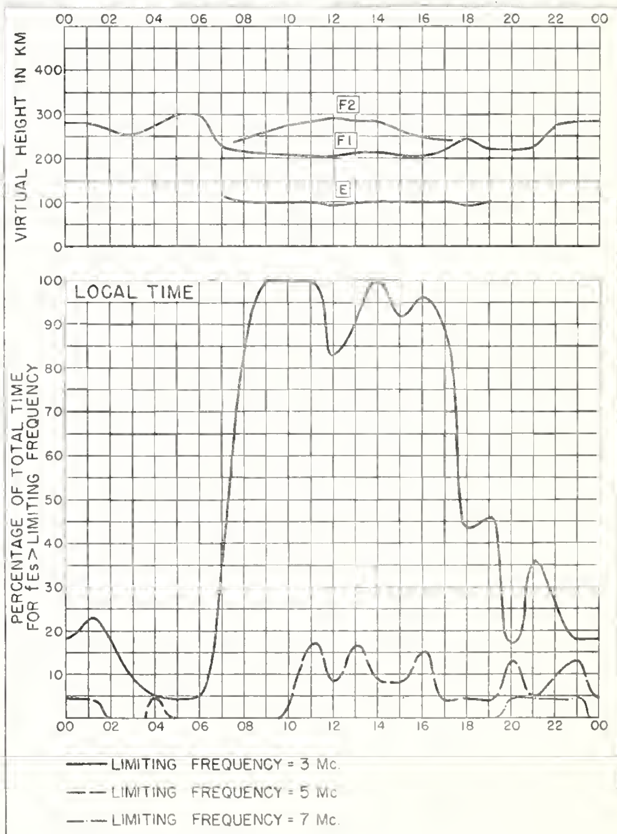

Fig. 40. FORMOSA, CHINA MARCH 1951

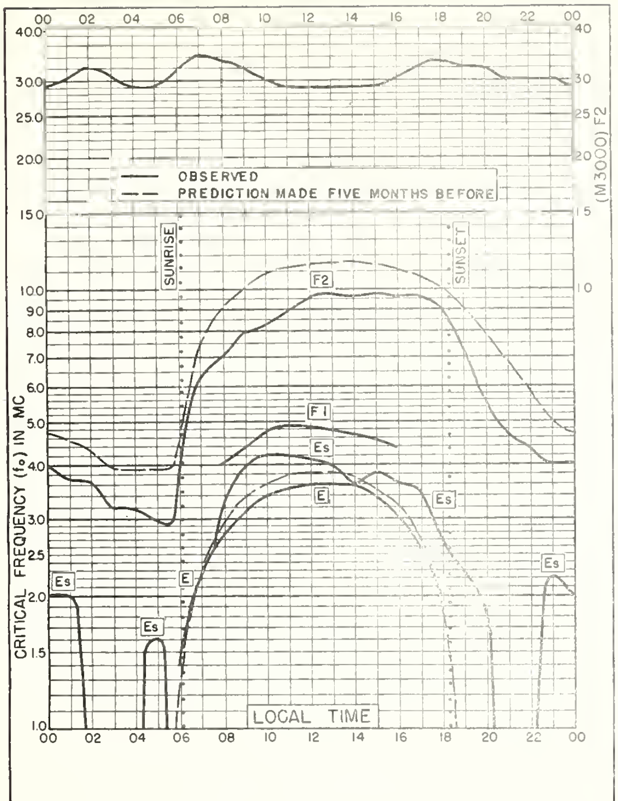

Fig. 41. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.1°E MARCH 1951

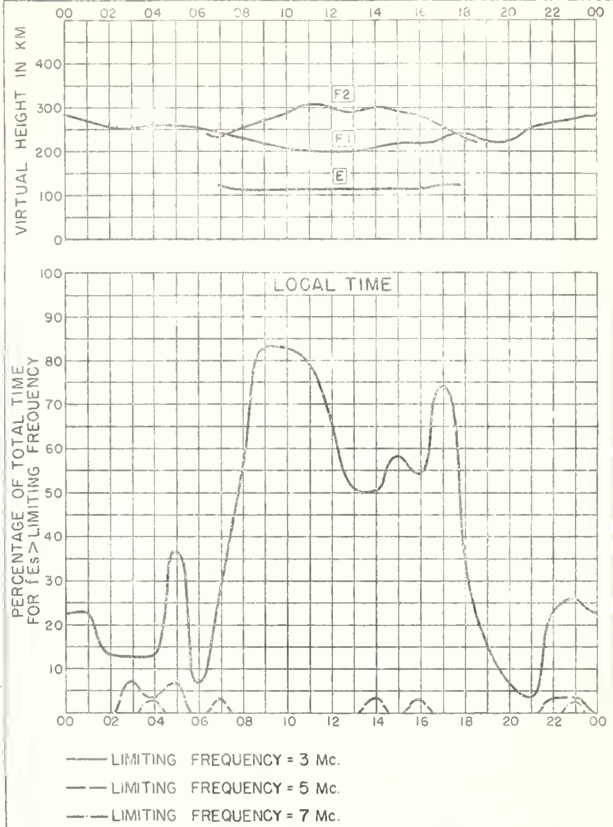

Fig. 42. JOHANNESBURG, U. OF S. AFRICA MARCH 1951

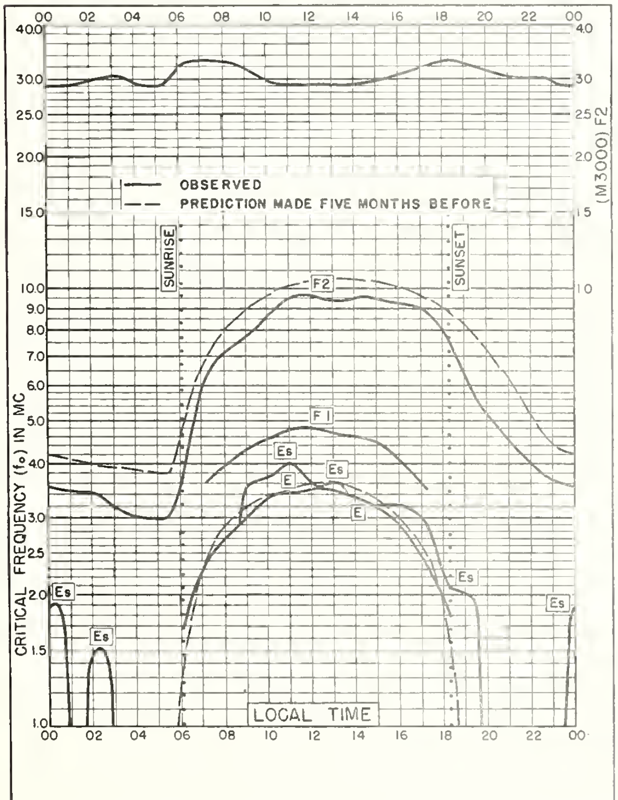

Fig. 43. CAPETOWN, U. OF S. AFRICA
34.2°S, 18.3°E MARCH 1951

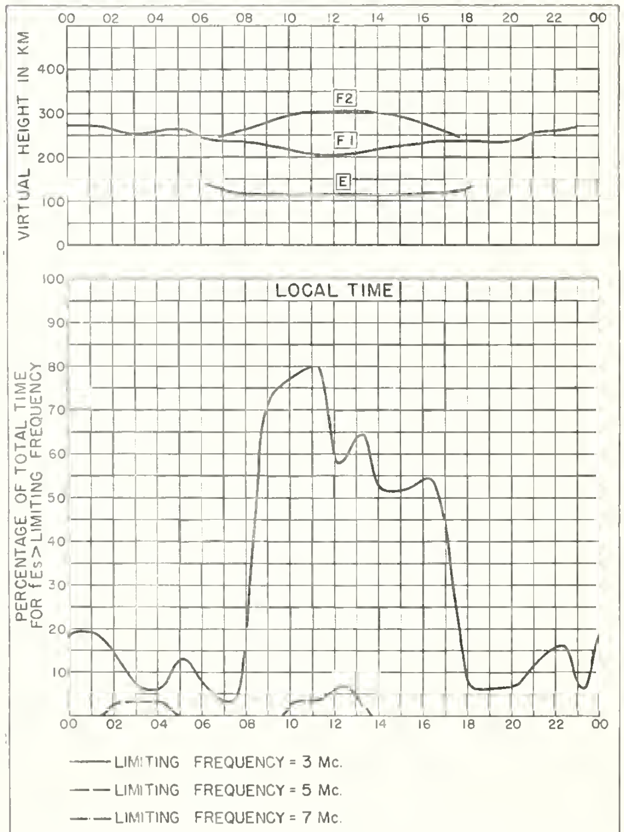

Fig. 44. CAPETOWN, U. OF S. AFRICA MARCH 1951

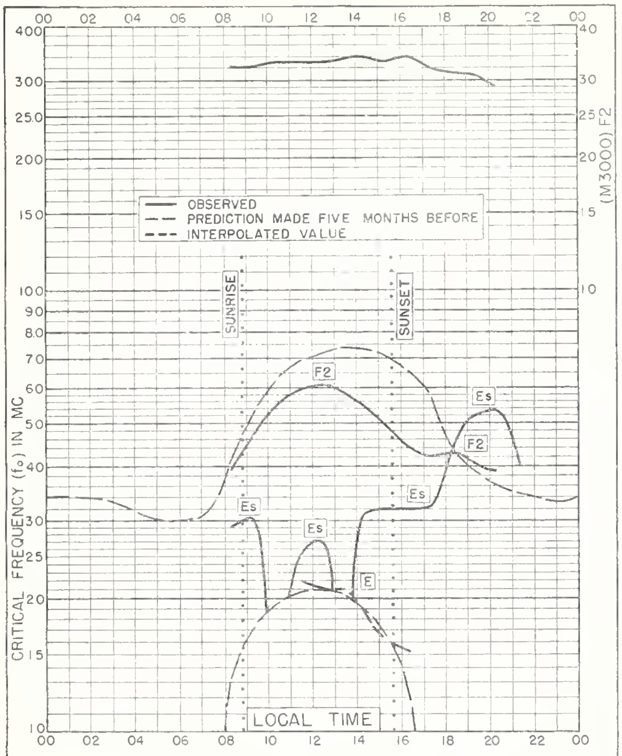

Fig. 45. TROMSO, NORWAY
69.7°N, 19.0°E FEBRUARY 1951

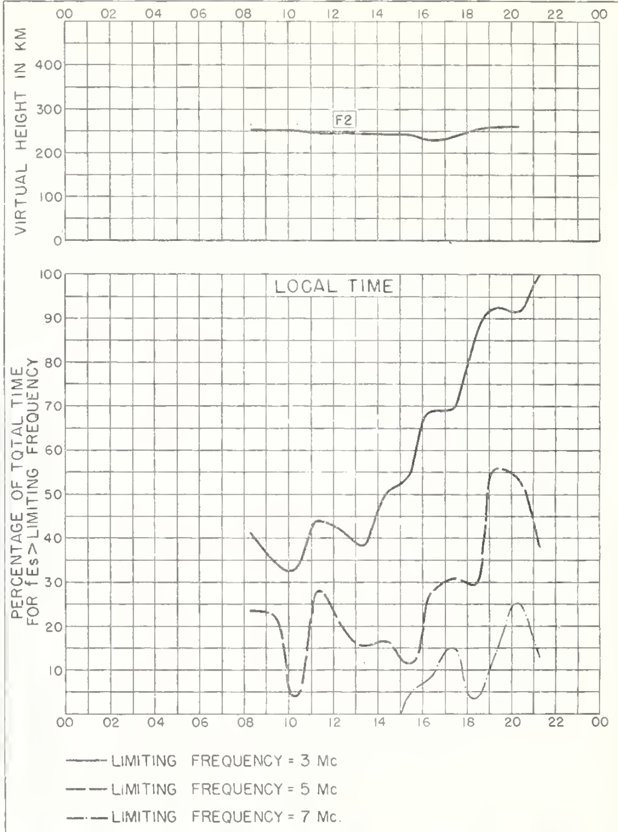

Fig. 46. TROMSO, NORWAY FEBRUARY 1951

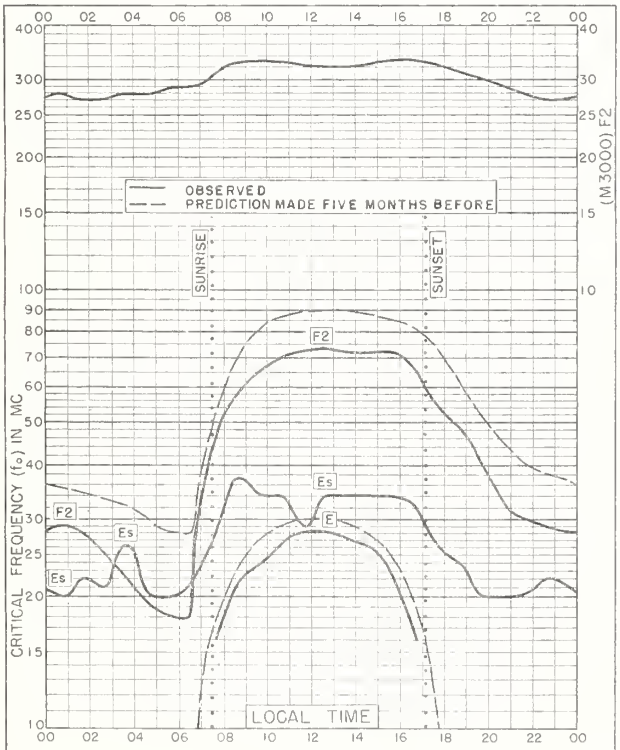

Fig. 47. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E FEBRUARY 1951

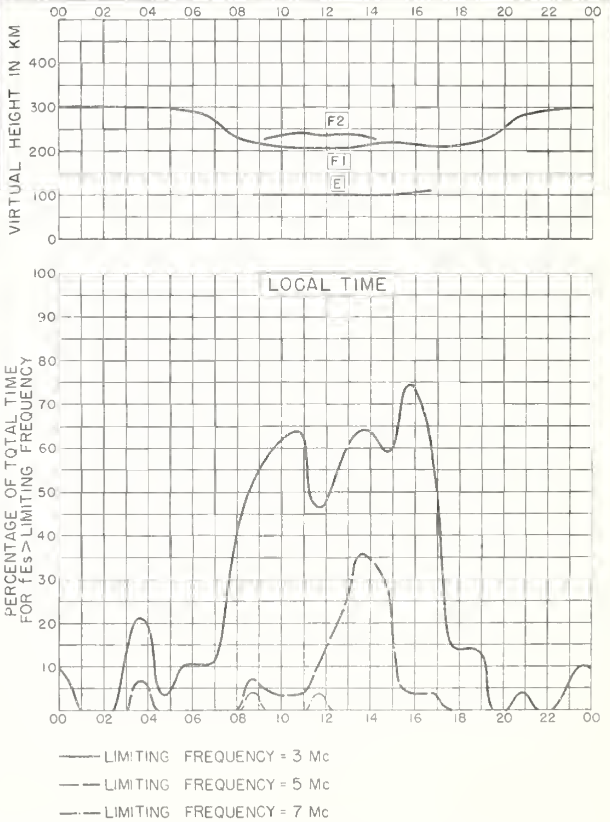

Fig. 48. LINDAU/HARZ, GERMANY FEBRUARY 1951

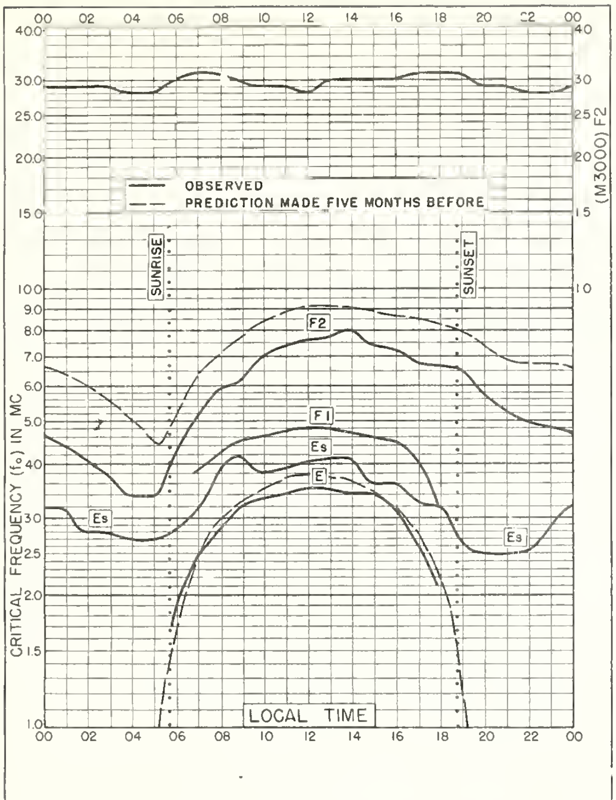

Fig. 49. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E FEBRUARY 1951

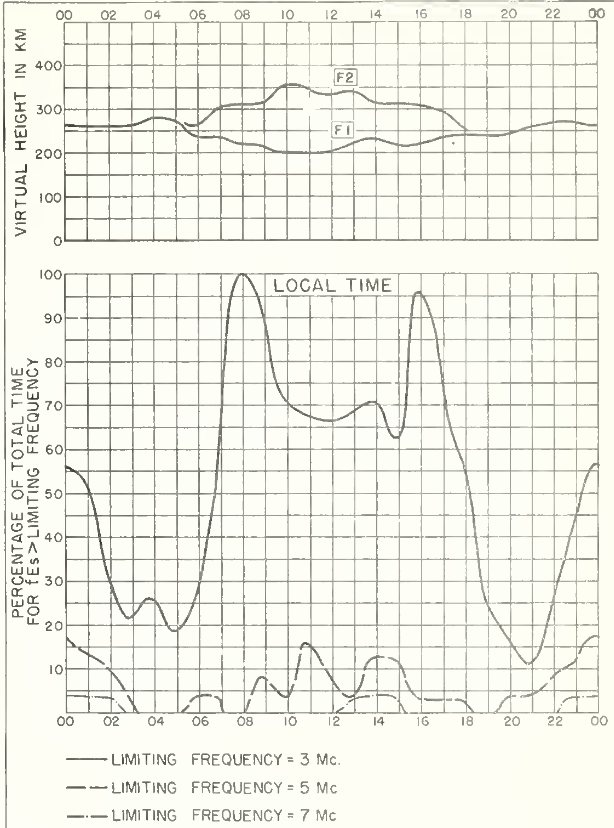

Fig. 50. WATHEROO, W. AUSTRALIA FEBRUARY 1951

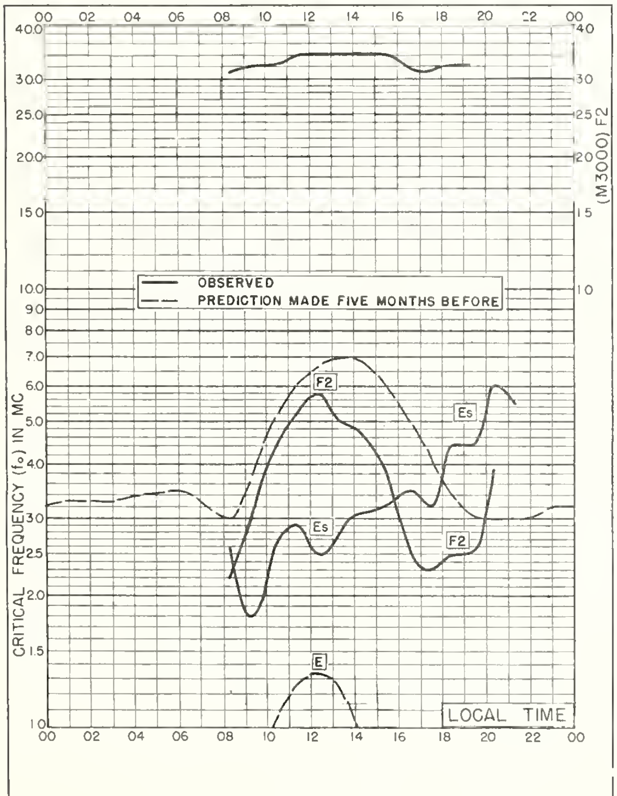

Fig. 51. TROMSO, NORWAY
69.7°N, 19.0°E JANUARY 1951

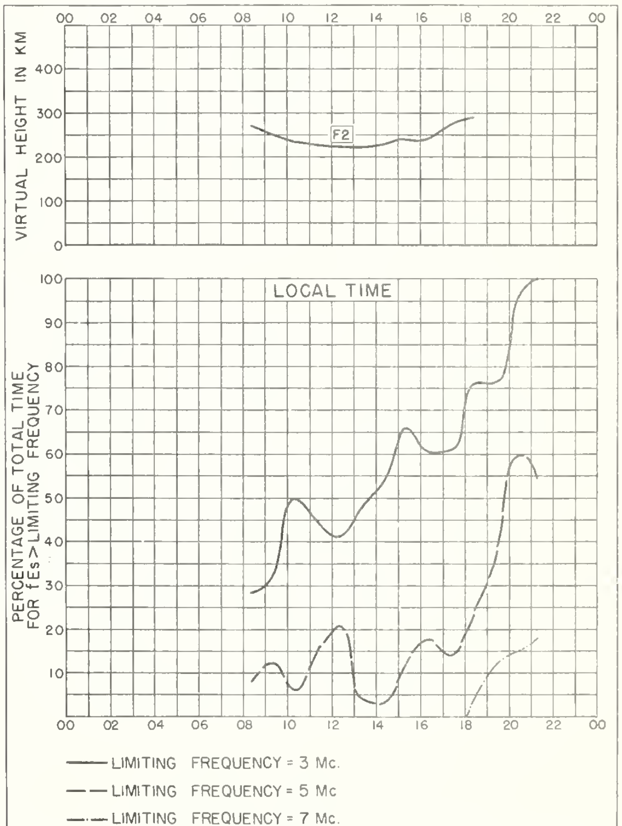

Fig. 52. TROMSO, NORWAY JANUARY 1951

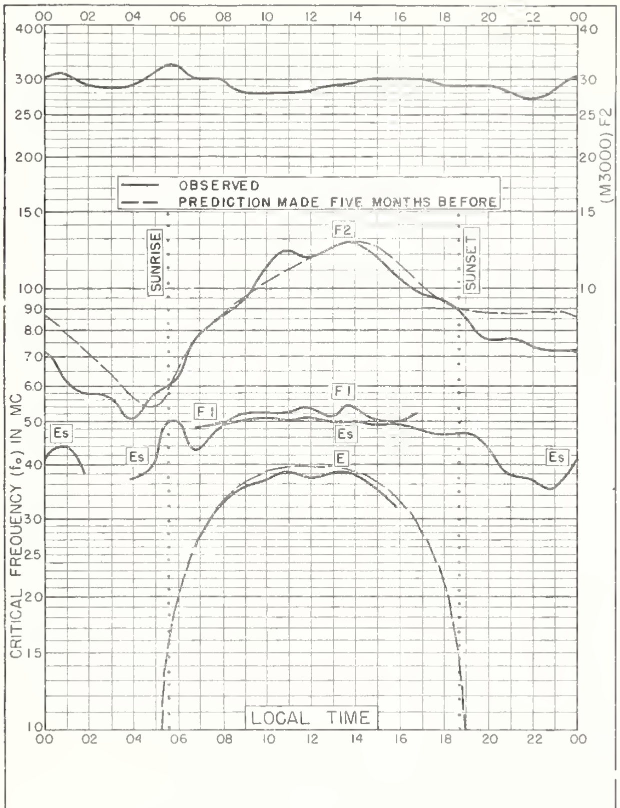

Fig. 53. RAROTONGA I.
21.3°S, 159.8°W JANUARY 1951

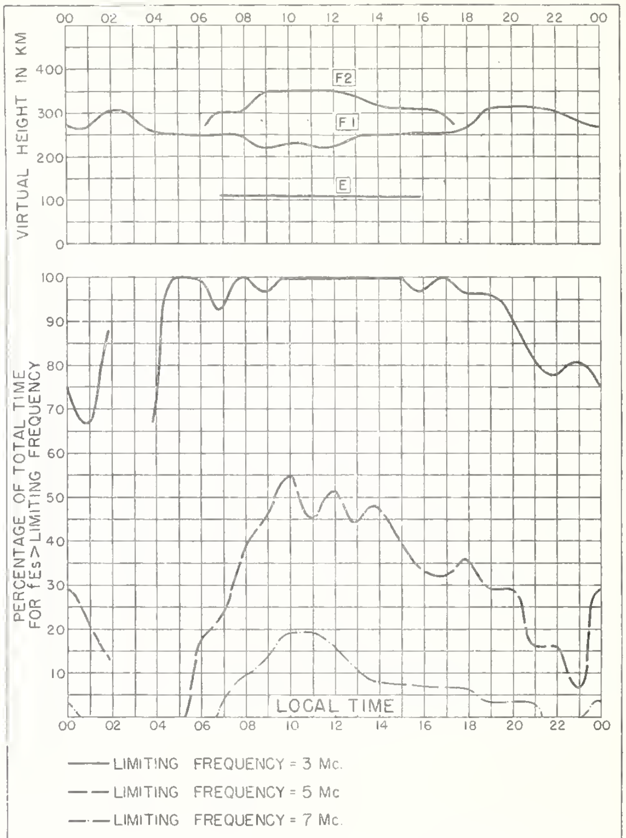

Fig. 54. RAROTONGA I. JANUARY 1951

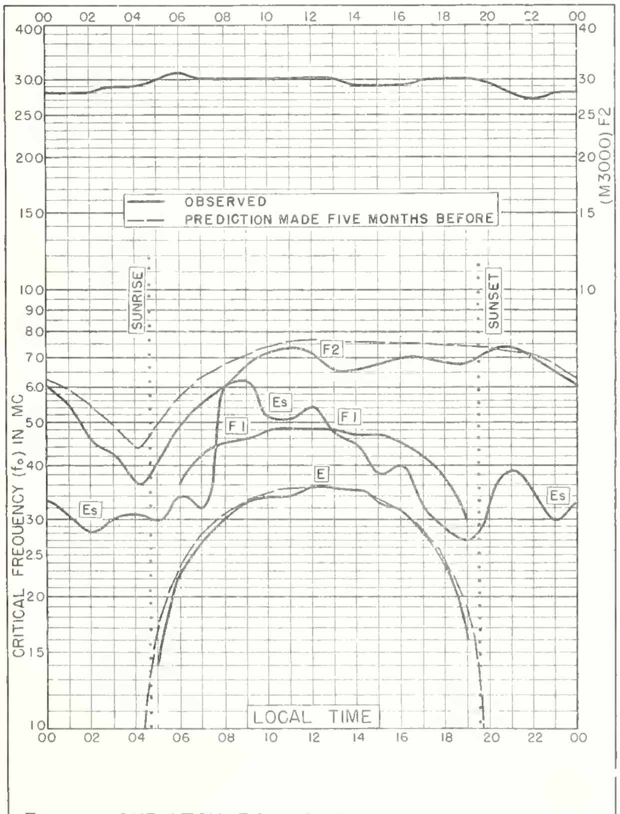

Fig. 55. CHRISTCHURCH, N. Z.
43.5°S, 172.7°E JANUARY 1951

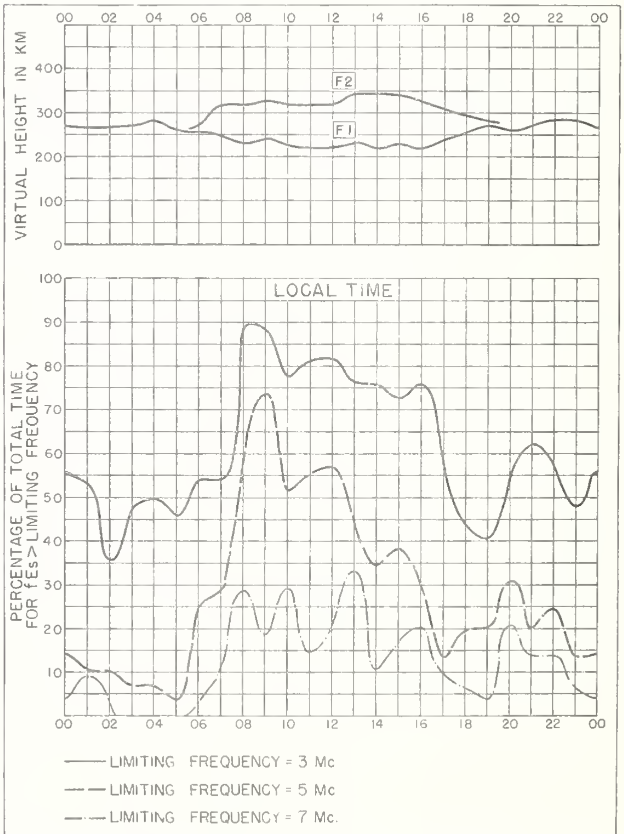

Fig. 56. CHRISTCHURCH, N. Z. JANUARY 1951

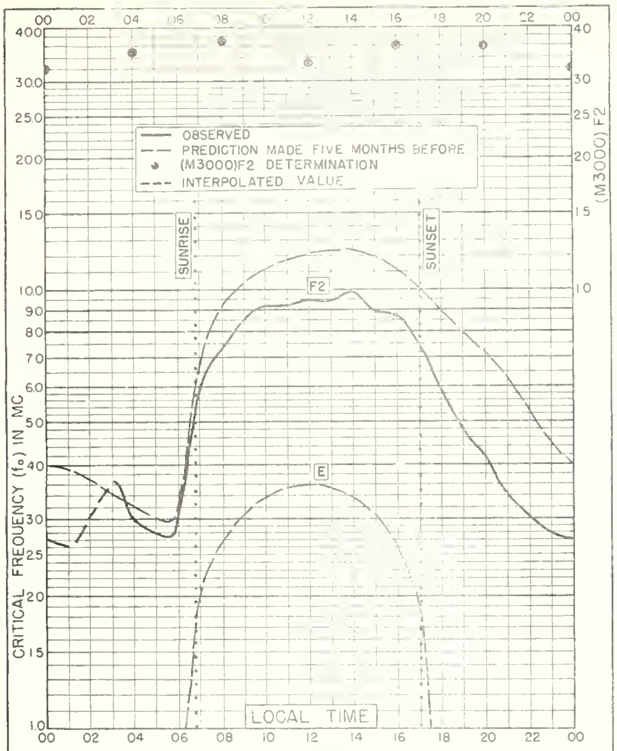

Fig. 57. DELHI, INDIA
28.6°N, 77.1°E DECEMBER 1950

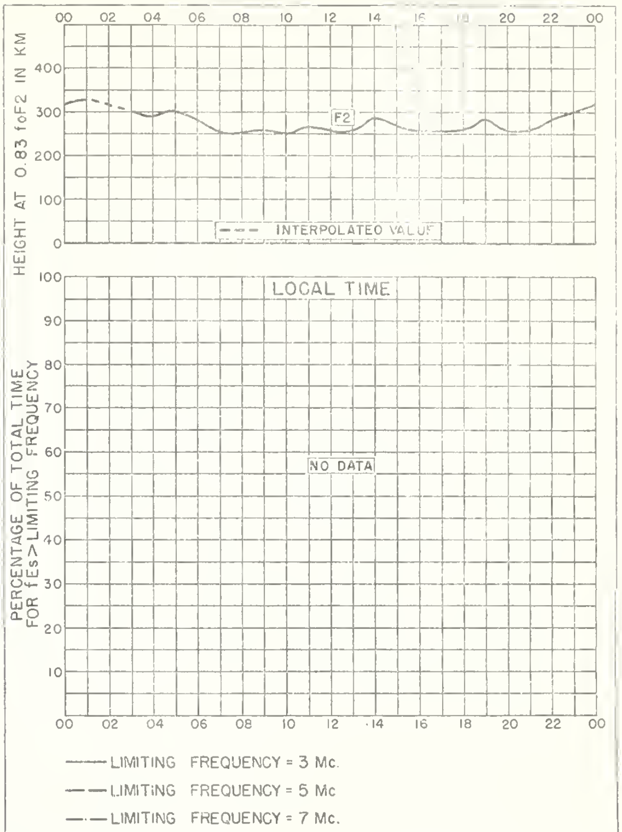

Fig. 58. DELHI, INDIA DECEMBER 1950

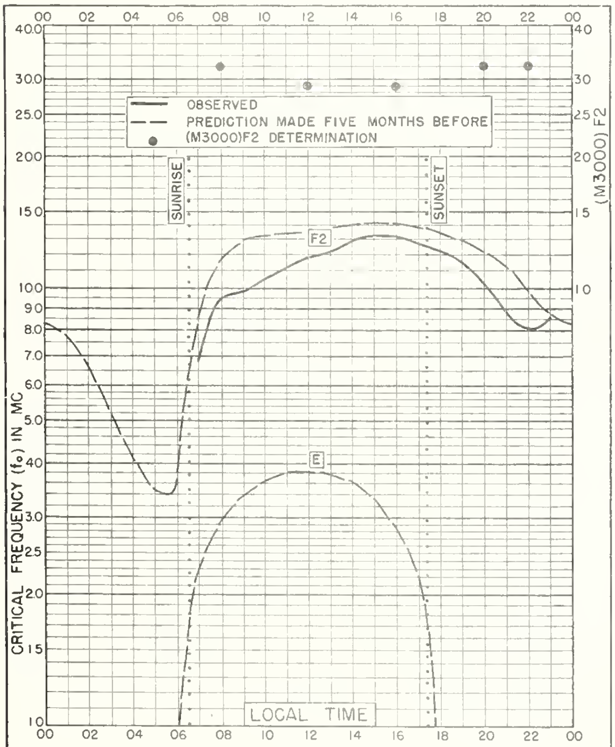

Fig. 59. BOMBAY, INDIA
19.0°N, 73.0°E DECEMBER 1950

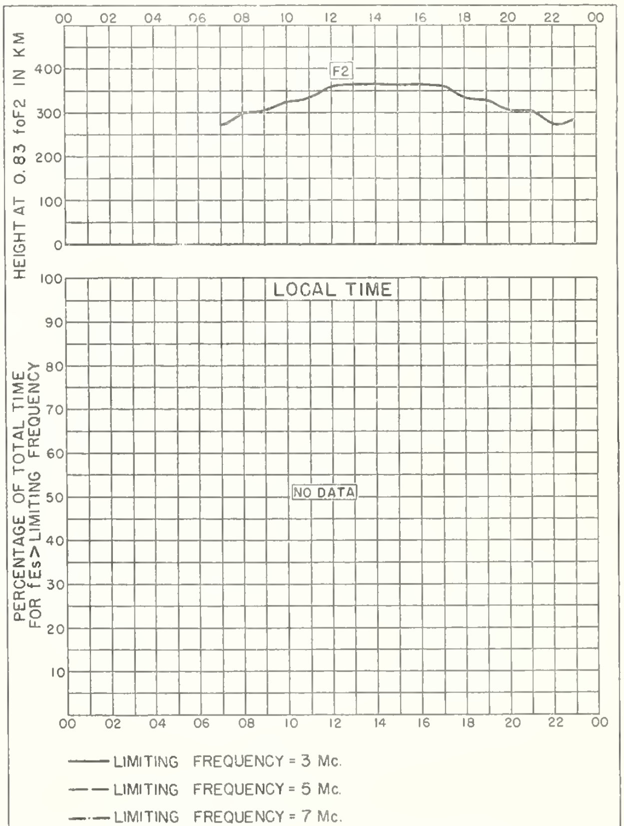

Fig. 60. BOMBAY, INDIA DECEMBER 1950

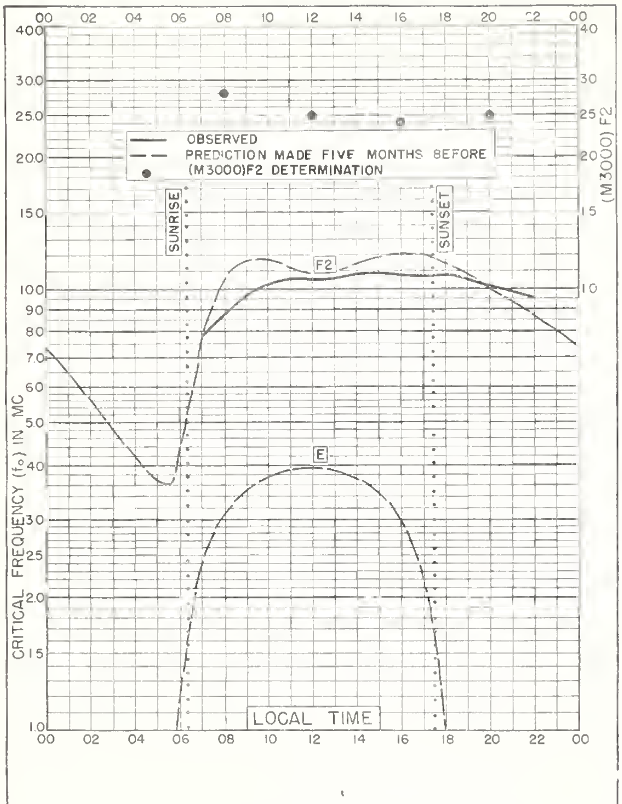

Fig. 61. MADRAS, INDIA
13. 0°N, 80. 2°E DECEMBER 1950

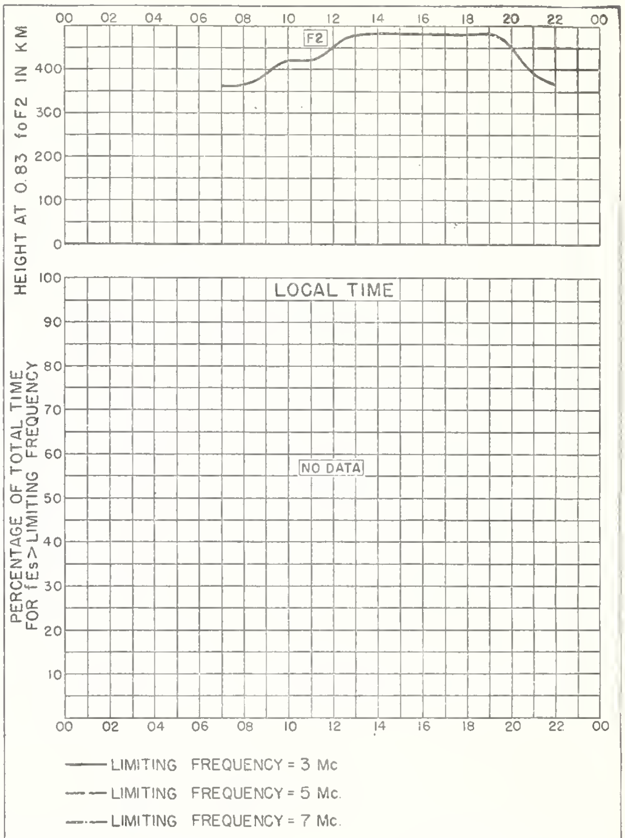

Fig. 62. MADRAS, INDIA DECEMBER 1950

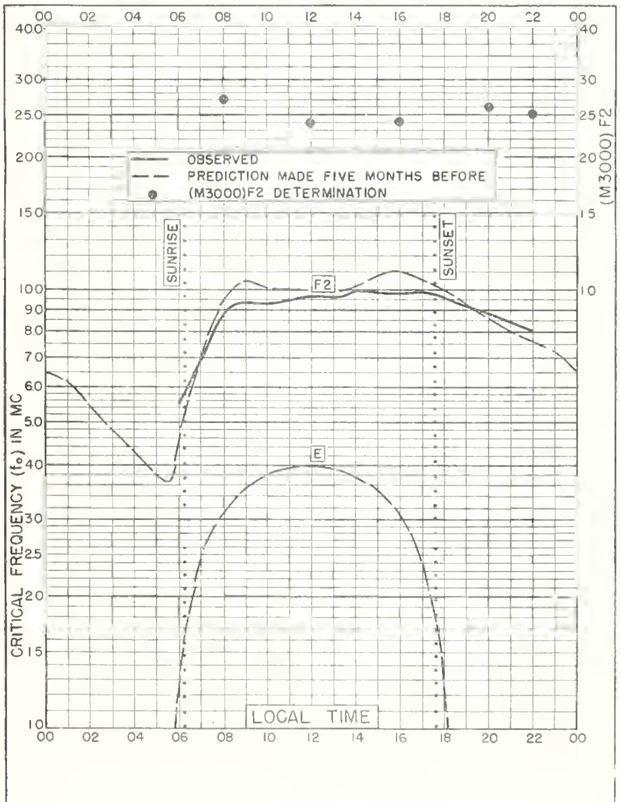

Fig. 63. TIRUCHY, INDIA
10. 8°N, 78. 8°E DECEMBER 1950

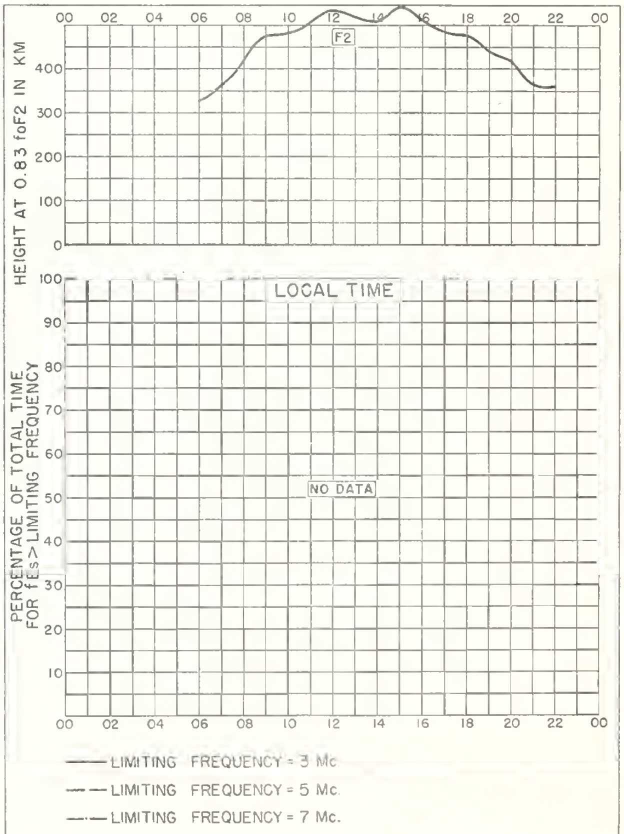

Fig. 64. TIRUCHY, INDIA DECEMBER 1950

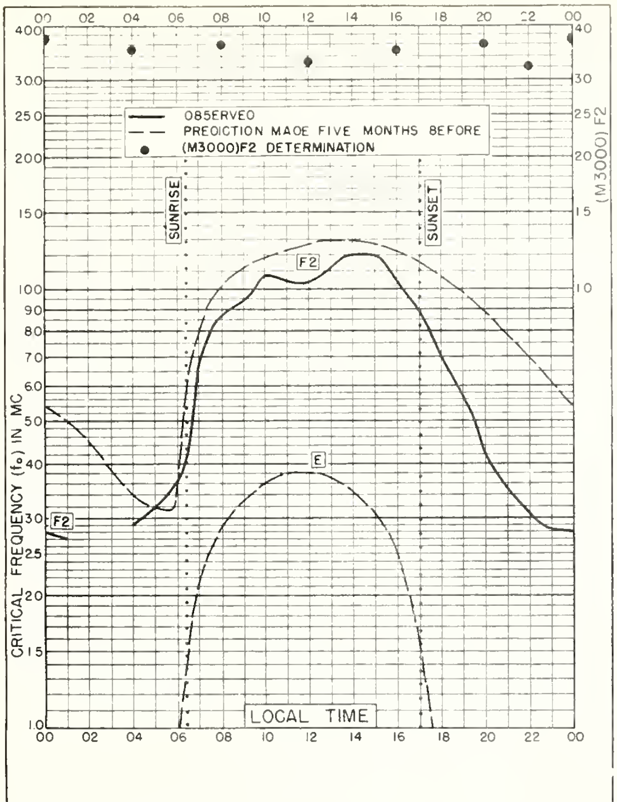

Fig. 65. DELHI, INDIA
28.6°N, 77.1°E NOVEMBER 1950

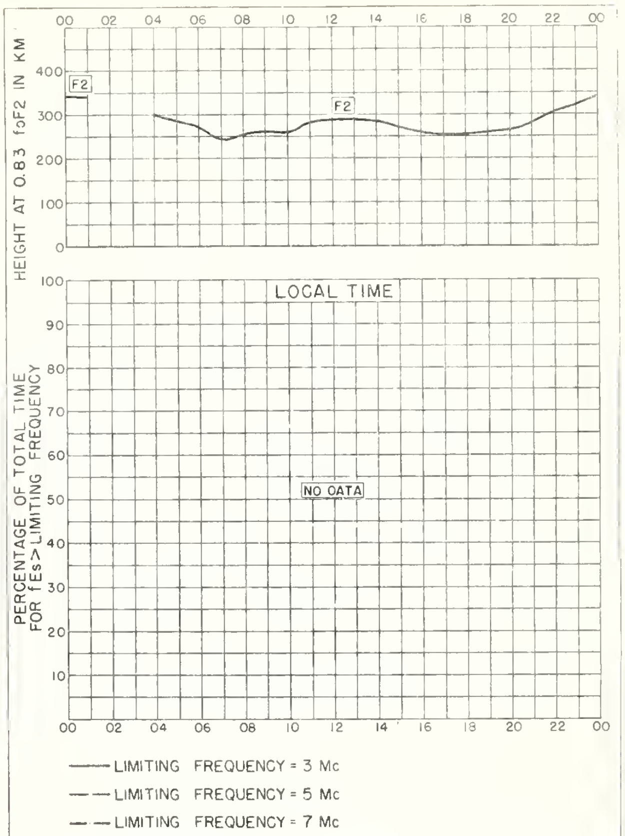

Fig. 66. DELHI, INDIA NOVEMBER 1950

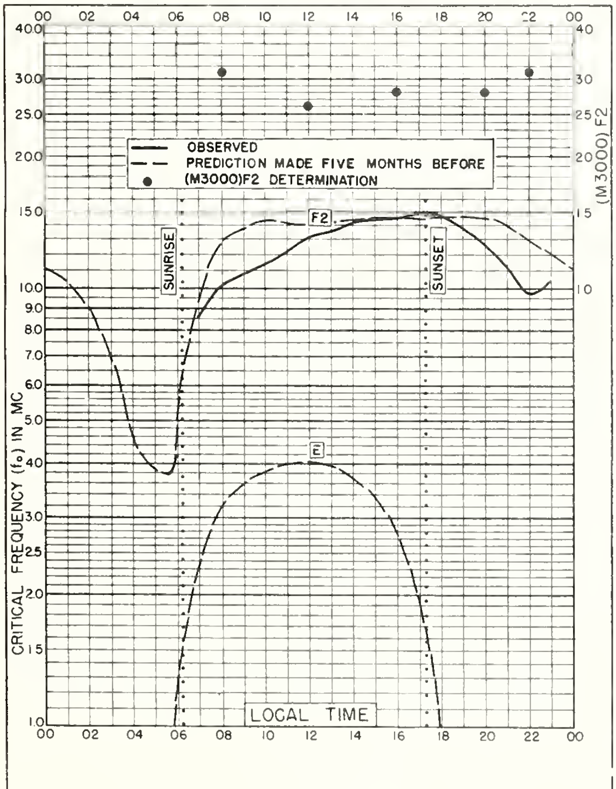

Fig. 67. BOMBAY, INDIA
19.0°N, 73.0°E NOVEMBER 1950

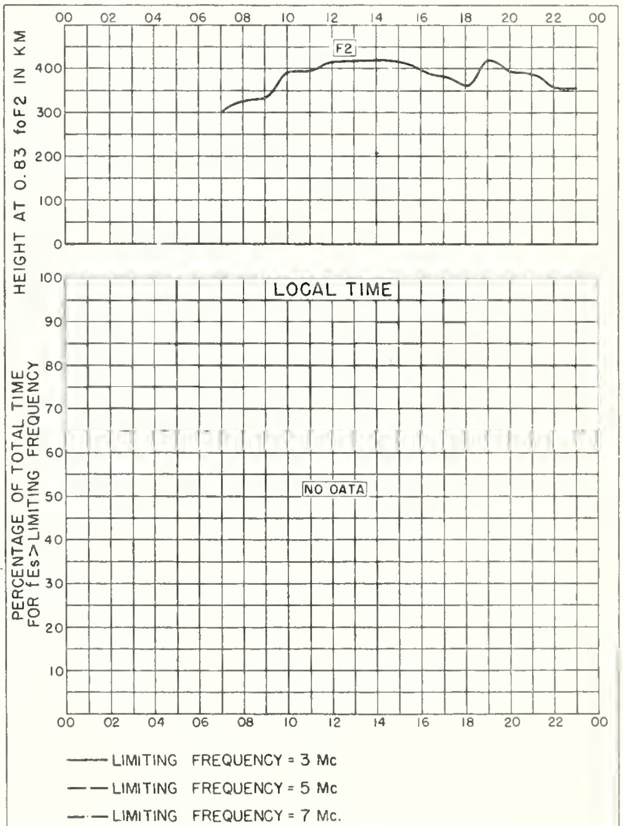

Fig. 68. BOMBAY, INDIA NOVEMBER 1950

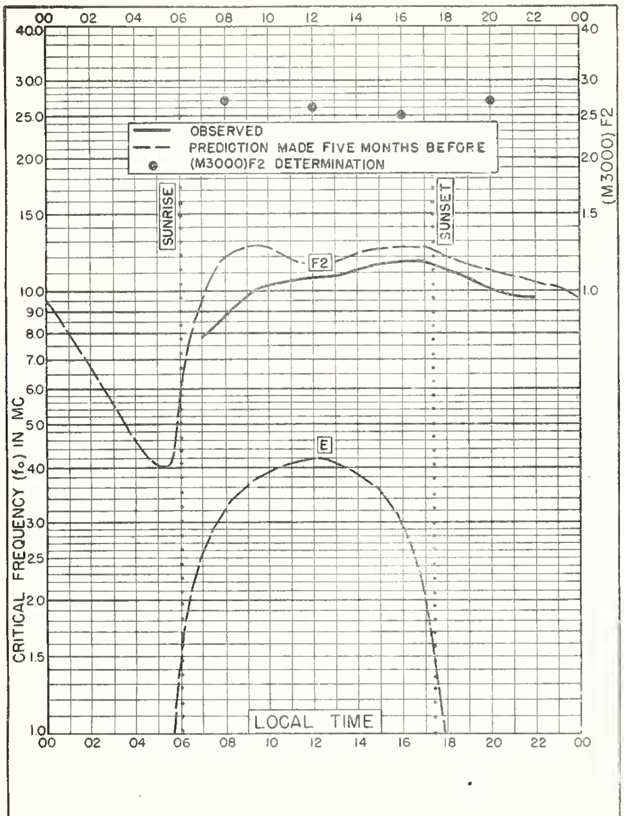

Fig. 69. MADRAS, INDIA
13. 0°N, 80. 2°E NOVEMBER 1950

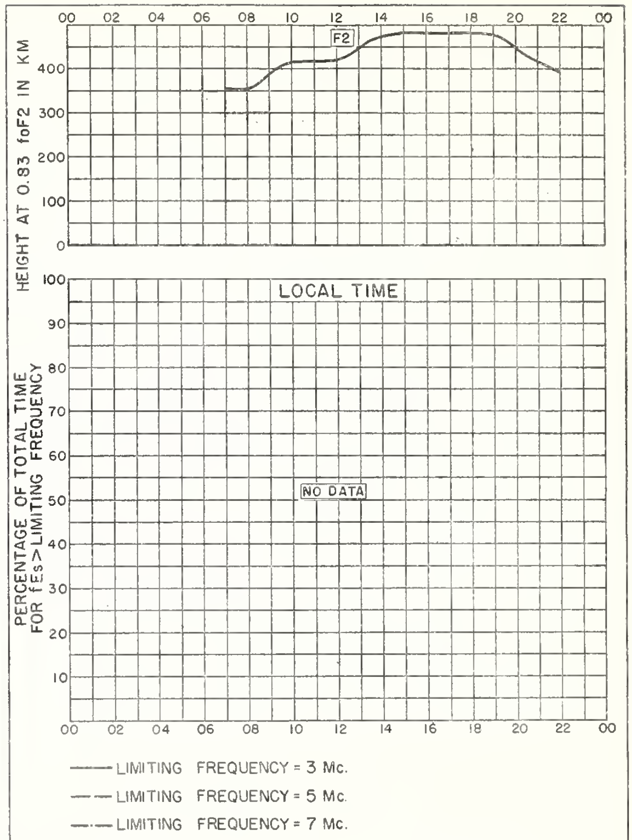

Fig. 70. MADRAS, INDIA NOVEMBER 1950

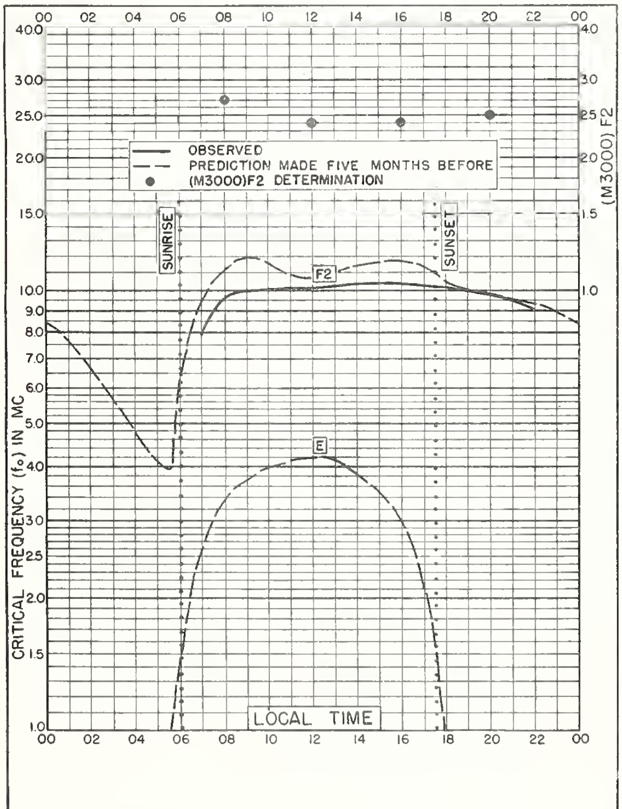

Fig. 71. TIRUCHY, INDIA
10. 8°N, 78. 8°E NOVEMBER 1950

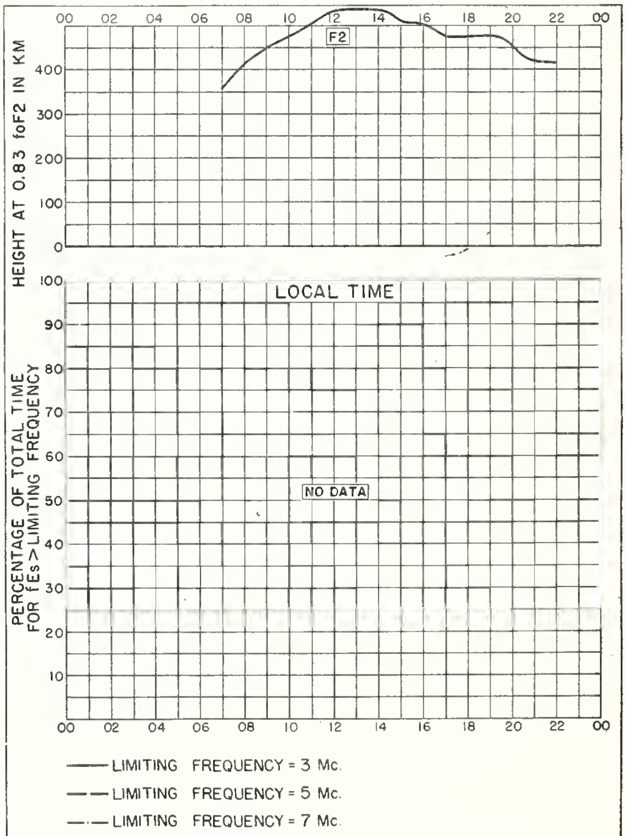

Fig. 72. TIRUCHY, INDIA NOVEMBER 1950

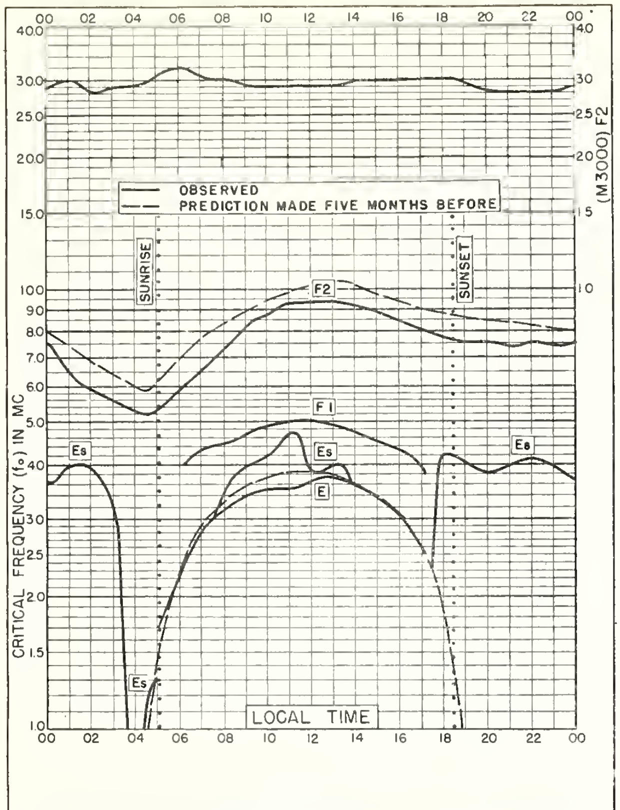

Fig. 73. BRISBANE, AUSTRALIA
27.5°S, 153.0°E NOVEMBER 1950

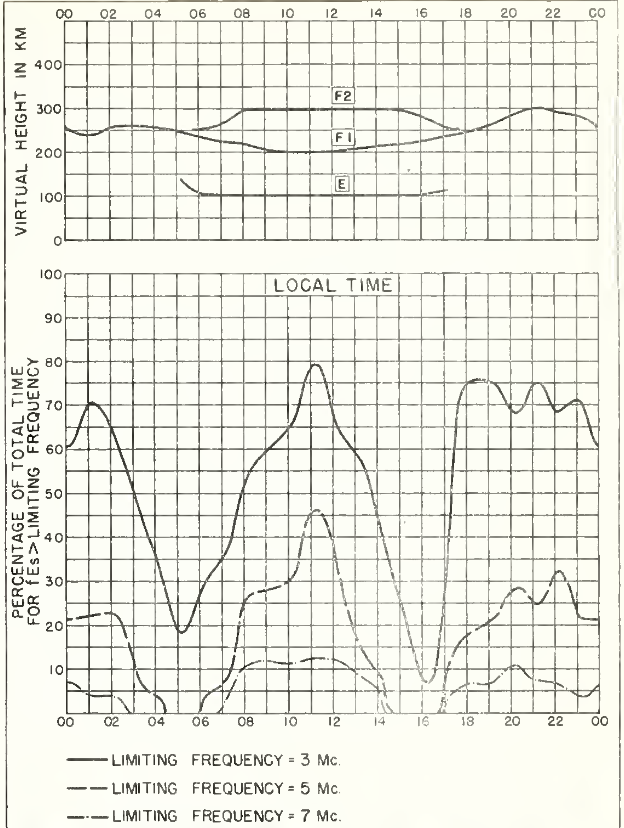

Fig. 74. BRISBANE, AUSTRALIA NOVEMBER 1950

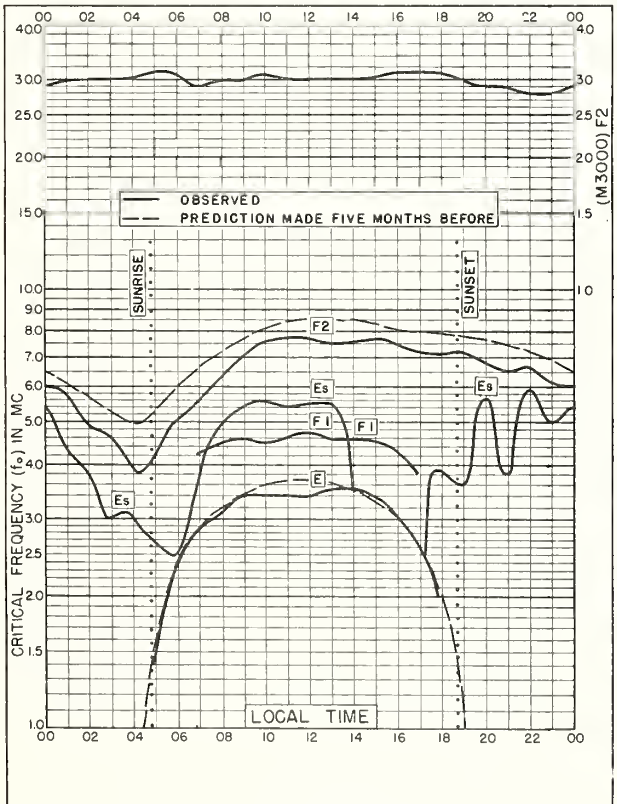

Fig. 75. CANBERRA, AUSTRALIA
35.3°S, 149.0°E NOVEMBER 1950

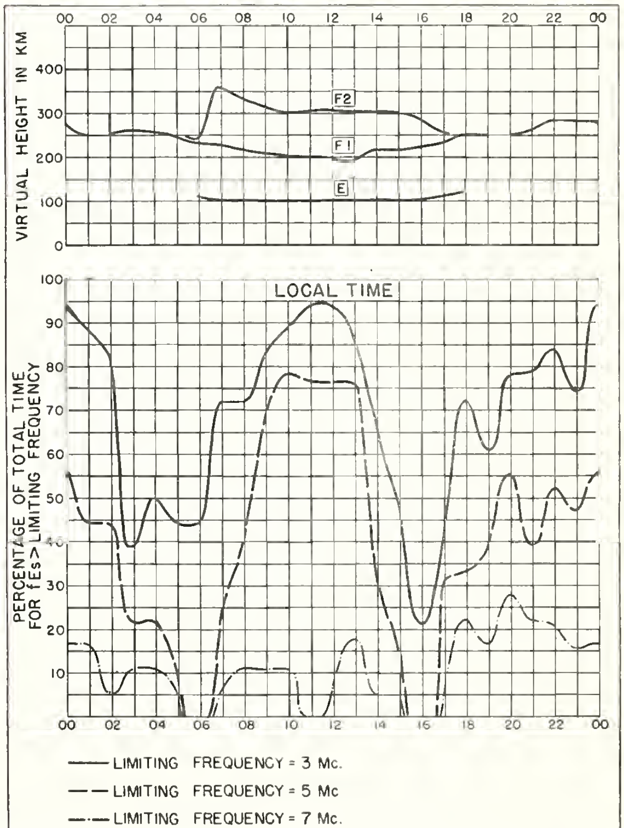

Fig. 76. CANBERRA, AUSTRALIA NOVEMBER 1950

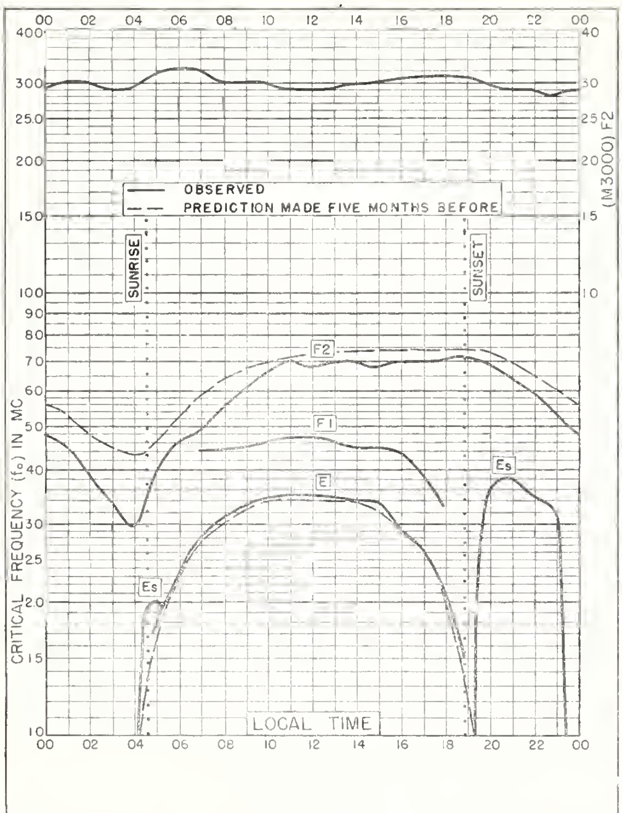

Fig. 77. HOBART, TASMANIA
42.8°S, 147.4°E NOVEMBER 1950

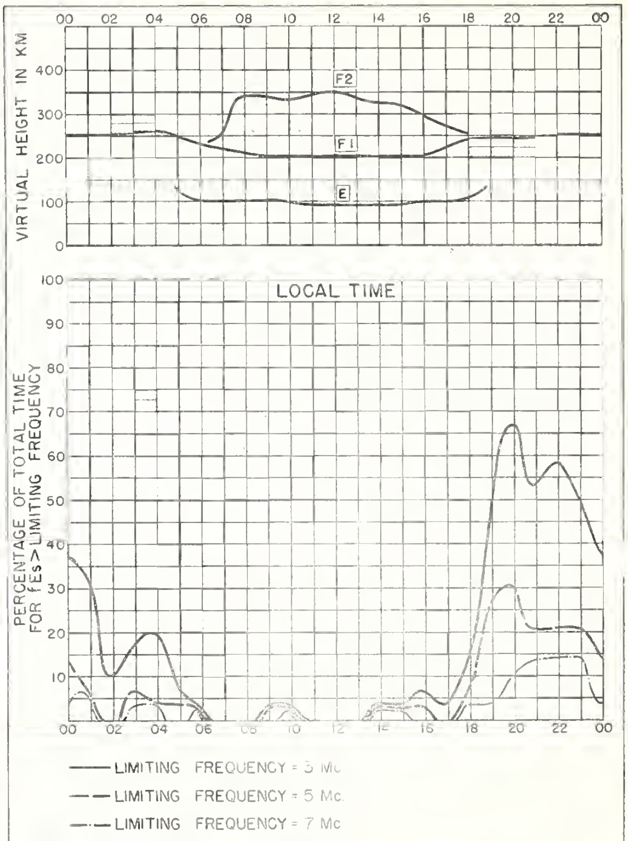

Fig. 78. HOBART, TASMANIA NOVEMBER 1950

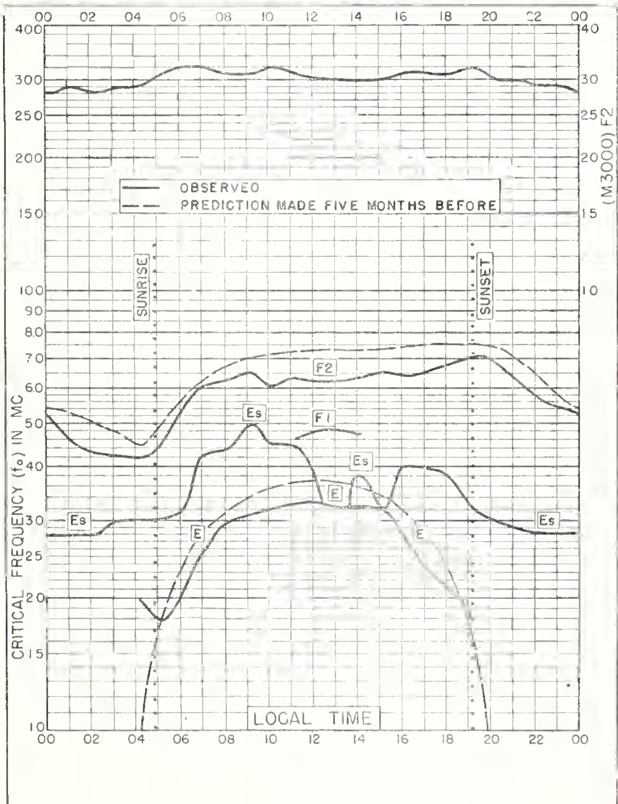

Fig. 79. DOMONT, FRANCE
49.0°N, 2.3°E AUGUST 1950

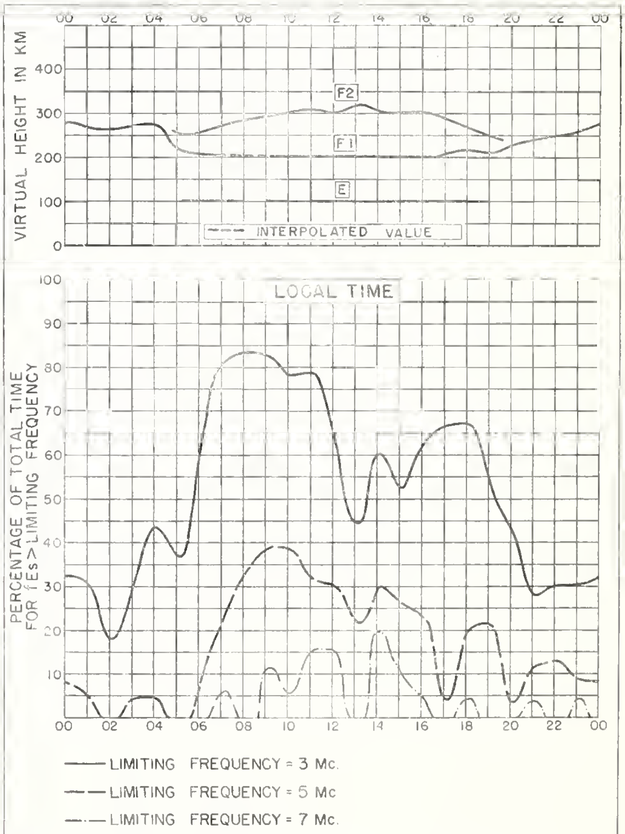

Fig. 80. DOMONT, FRANCE AUGUST 1950

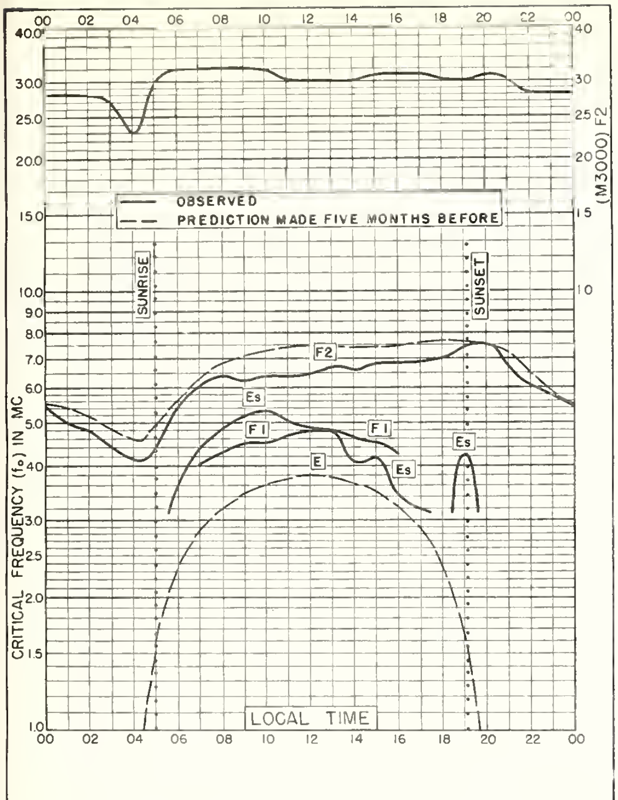

Fig. 81. POITIERS, FRANCE
46.6°N, 0.3°E AUGUST 1950

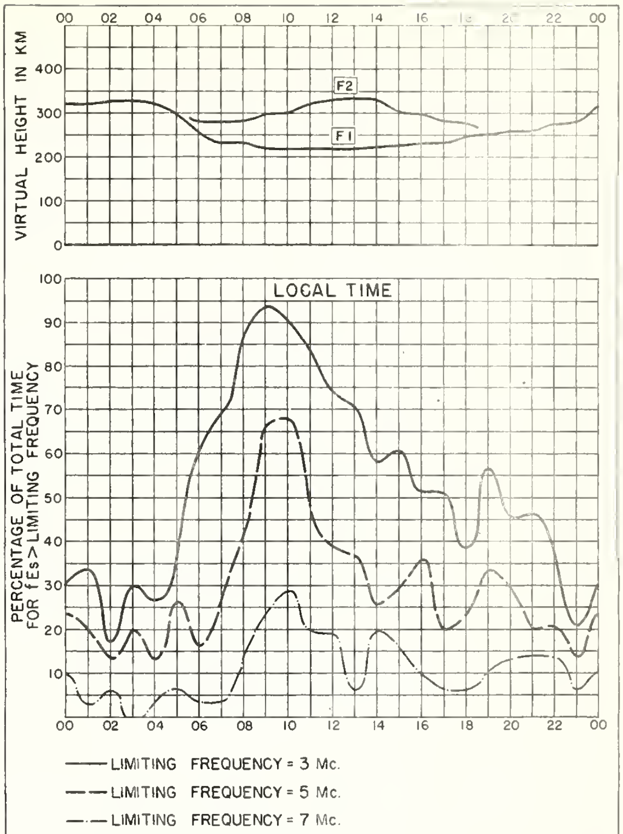

Fig. 82. POITIERS, FRANCE AUGUST 1950

Index of Tables and Graphs of Ionospheric Data

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CRPL and IRPL Reports

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

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

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

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

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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.
*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 F2-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.
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T1. Radar operation and weather. (Superseded by JANP 101.)
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