

CRPL-F83

DO NOT CIRCULATE
THIS PUBLICATION
TO BE
TAKEN FROM THE LIBRARY.

IONOSPHERIC DATA

ISSUED
JULY 1951

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

IONOSPHERIC DATA

CONTENTS

	<u>Page</u>
Symbols, Terminology, Conventions	2
World-Wide Sources of Ionospheric Data	5
Hourly Ionospheric Data at Washington, D. C.	7, 12, 22, 56
Ionospheric Storminess at Washington, D. C.	7, 34
Radio Propagation Quality Figures	7, 35
Observations of the Solar Corona	8, 36
Observations of Solar Flares	10, 46
Relative Sunspot Numbers	10, 48
Indices of Geomagnetic Activity	11, 49
Sudden Ionosphere Disturbances	11, 50
Tables of Ionospheric Data	12
Graphs of Ionospheric Data	56
Index of Tables and Graphs of Ionospheric Data in CRPL-F83	86

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 (Appendices 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 f_{cF2} is less than or equal to f_{oF1} , 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 f_{Es} 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 f_{oE} . Blank spaces at the beginning and end of columns of $h'F1$, f_{oF1} , $h'E$, and f_{oE} are usually the result of diurnal variation in these characteristics. Complete absence of medians of $h'F1$ and f_{oF1} 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 Zurich sunspot numbers were used in constructing the contour charts:

<u>Month</u>	<u>Predicted Sunspot Number</u>						
	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	63	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 60 and figures 1 to 120 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

Defence Research Board, Canada:

Baker Lake, Canada
Churchill, Canada
Fort Chimo, Canada
Ottawa, Canada
Portage la Prairie, Canada
Prince Rupert, Canada
Resolute Bay, Canada
St. John's, Newfoundland
Winnipeg, Canada

French Ministry of Naval Armaments (Section for Scientific Research):

Dakar, French West Africa
Fribourg, Germany

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

Icelandic Post and Telegraph Administration:
Reykjavik, Iceland

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

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

Post, Telephone and Telegraph Administration, Berne, Switzerland:
Schwarzenburg, Switzerland

United States Army Signal Corps:
Adak, Alaska
Okinawa I.

National Bureau of Standards (Central Radio Propagation Laboratory):
Anchorage, Alaska
Fairbanks, Alaska
Guam I.
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
Narsarssuak, Greenland
Point Barrow, Alaska
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 61 to 72 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 73 presents ionosphere character figures for Washington, D. C., during June 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 74 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, May 1951, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths; the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

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

of the departure from linearity. The half-daily radio propagation quality figure, beginning January 1948, is the weighted mean of the reports received for that period.

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

OBSERVATIONS OF THE SOLAR CORONA

Tables 75 through 77 give the observations of the solar corona during June 1951 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 78 through 80 list the coronal observations obtained at Sacramento Peak, New Mexico, during June 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 75 gives the intensities of the green (5303 Å) line of the emission spectrum of the solar corona; table 76 gives similarly the intensities of the first red (6374 Å) coronal line; and table 77, the intensities of the second red (6702 Å) coronal line; all observed at Climax in June 1951.

Table 78 gives the intensities of the green (5303A) coronal line; table 79, the intensities of the first red (6374A) coronal line; and table 80, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in June 1951.

The following symbols are used in tables 75 through 80: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

Tables 81 and 82 give details of the Climax and Sacramento Peak observations, respectively, from January 1951 through June 1951. The first column lists the Greenwich date of observation; the following columns give the threshold or lowest observable intensity of 5303A for each spectrum plate centered at the astronomical position angle indicated; the last two columns indicate the observer and the person responsible for the intensity estimates of the observation. These tables continue the presentation of coronal data in the manner of table 1 of CRPL-1-4 and appear in the F series regularly at intervals of six months.

OBSERVATIONS OF SOLAR FLARES

Table 83 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).

RELATIVE SUNSPOT NUMBERS

Table 84 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.

INDICES OF GEOMAGNETIC ACTIVITY

Table 85 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, K_w ; (2) preliminary international character-figures, C; (3) geomagnetic planetary three-hour-range indices, K_p ; (4) magnetically selected quiet and disturbed days.

K_w 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.

K_p 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 $4\frac{2}{3}$, 5c is $5\frac{0}{3}$, and 5+ is $5\frac{1}{3}$. 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 K_p 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 K_p 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 K_w , C and selected days. The Chairman of the Committee computes the planetary index.

SUDDEN IONOSPHERE DISTURBANCES

Tables 86, 87, 88, 89, 90, 91, 92, and 93 list respectively the sudden ionosphere disturbances observed at Ft. Belvoir, Virginia, June 1951; in England, June 1951; at Lindau, Harz, Germany, April and May 1951; in Barbados, British West Indies, May 1951; at Colombo, Ceylon, April 1951; at Platanos, Argentina, May 1951; at Point Reyes, California, June 1951; and at Riverhead, New York, June 1951.

TABLES OF IONOSPHERIC DATA

Washington, D. C. (38.7°N, 77.1°W)

Table 1

Time	Juno 1951					
	h'F2	foF2	h'F1	foF1	h'E	foE
00	280	5.0			3.2	2.8
01	280	4.5			3.1	2.9
02	290	4.0			3.1	2.8
03	290	3.7			2.2	2.9
04	280	3.3			3.2	(2.8)
05	270	3.5	—	—	3.3	3.0
06	300	4.4	240	3.5	110	2.4
07	350	5.0	230	4.0	110	3.0
08	390	5.1	220	4.3	100	3.1
09	390	6.2	220	4.5	100	3.6
10	400	5.8	210	4.6	100	3.4
11	390	6.0	210	4.7	100	3.6
12	370	6.0	220	4.8	100	3.6
13	380	6.1	220	4.7	100	3.5
14	360	6.1	210	4.7	100	3.4
15	370	6.2	220	4.6	110	3.4
16	340	6.4	220	4.5	100	3.2
17	320	6.6	230	4.1	100	3.0
18	300	6.8	240	3.6	110	2.5
19	260	6.8	—	—	120	1.9
20	250	6.6				3.4
21	260	6.6				3.4
22	260	6.0				2.9
23	270	5.4				2.8

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 3

Tromso, Norway (69.7°N, 19.0°E)

Time	May 1951					
	h'F2	foF2	h'F1	foF1	h'E	foE
00						
01						
02						
03						
04						
05						
06						
07	(400)	6.0	240	4.4	—	(3.2)
08	390	6.2	240	4.2	110	2.9
09	380	5.5	230	4.4	105	3.0
10	390	5.7	230	4.4	105	3.1
11	370	5.8	220	4.4	110	3.2
12	365	6.0	230	4.5	105	3.2
13	360	5.6	230	4.4	110	3.2
14	370	5.4	230	4.3	110	3.0
15	375	5.5	230	4.3	110	3.0
16	355	5.6	240	4.1	110	2.8
17	330	5.3	240	4.0	110	2.6
18	335	5.2	250	3.8	110	2.5
19	315	5.2	255	—	110	2.4
20	340	5.1	265	—	110	—
21	325	5.1	—	—	110	4.5
22	330	4.9	—	—	110	4.0
23	—	4.6	—	—	(5.5)	2.8

Time: 15.0°E.

Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 5

Oslo, Norway (60.0°N, 11.0°E)

Time	May 1951					
	h'F2	foF2	h'F1	foF1	h'E	foE
00	275	4.8				2.6
01	280	4.4			2.7	2.8
02	280	3.9				2.8
03	280	3.6	—	—	E	1.5
04	270	3.9	270	2.7	135	1.6
05	280	4.4	250	3.1	120	2.0
06	325	4.6	240	3.6	110	2.4
07	370	5.0	226	3.9	105	2.6
08	370	5.3	220	4.2	100	2.9
09	370	5.7	215	4.2	100	3.1
10	350	6.0	210	4.4	100	3.2
11	350	6.3	210	4.5	100	3.3
12	355	6.2	210	4.6	100	3.3
13	350	6.1	210	4.5	100	3.5
14	350	6.1	210	4.4	100	3.2
15	350	6.0	215	4.4	100	3.3
16	330	6.1	220	4.2	100	3.0
17	300	6.2	230	4.1	106	2.8
18	290	6.0	240	3.8	110	2.5
19	265	6.0	250	3.4	115	2.2
20	255	3.9	250	—	125	1.8
21	250	5.8	—	—	—	2.1
22	260	5.6				2.8
23	270	5.1				2.8

Time: 16.0°E.

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

TABLES OF IONOSPHERIC DATA

Table 2

Point Barrow, Alaska (71.3°N, 156.8°W)

May 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	(4.6)					7.8	3.0
01	290	(4.8)					6.8	(3.0)
02	290	(4.7)					4.3	(3.0)
03	300	(4.4)	—	—	—	—	4.4	(2.9)
04	340	4.3	270	(3.5)	110	2.4	3.6	2.9
05	410	(4.3)	250	3.5	110	2.4	3.3	(3.8)
06	460	(4.3)	240	3.7	100	2.6	4.2	(2.8)
07	460	(4.6)	240	3.9	100	2.9	4.3	(2.6)
08	460	5.0	240	4.2	100	3.2	4.4	2.6
09	450	5.0	240	4.2	100	2.9	4.6	2.7
10	460	6.0	220	4.2	100	2.9	4.3	2.6
11	460	5.0	220	4.2	100	3.0	4.0	2.6
12	470	5.0	220	4.3	100	3.1	4.1	2.6
13	460	5.2	220	4.3	100	3.4	2.7	
14	440	5.3	230	4.3	100	3.2	2.7	
15	390	5.3	230	4.3	100	3.2	2.8	
16	400	5.4	240	4.2	100	3.3	3.0	
17	370	5.4	240	4.0	100	2.9	2.8	
18	380	5.0	250	(3.8)	110	2.8	2.8	
19	350	4.8	260	(3.8)	110	—	3.0	
20	320	4.6	—	—	110	—	4.1	3.0
21	300	4.5	—	—	—	—	4.4	3.0
22	300	(4.3)	—	—	—	—	4.9	(3.0)
23	310	(4.4)	—	—	—	—	5.8	(3.0)

Time: 150.0°W.

Sweep: 1.0 Mc to 26.0 Mc in 15 seconds.

Table 4

Anchorage, Alaska (61.2°N, 149.9°W)

Time	May 1951						
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	330	3.6					2.8
01	350	3.4					2.7
02	350	3.3					2.7
03	350	3.7	—	—	—	—	1.9
04	390	4.4	300	3.1	—	—	2.7
05	410	4.7	260	3.5	—	—	2.7
06	400	5.0	250	3.8	110	2.6	2.7
07	430	5.2	230	4.0	110	2.8	2.7
08	440	5.4	230	4.2	110	3.0	2.6
09	440	5.4	230	4.3	100	3.1	2.7
10	460	5.3	220	4.3	100	3.2	2.6
11	460	5.4	220	4.4	100	3.3	2.7
12	450	5.4	230	4.5	100	3.1	2.7
13	450	5.4	220	4.4	100	3.1	2.7
14	370	6.2	230	4.2	110	3.3	2.7
15	380	6.0	240	4.0	110	2.8	3.8
16	380	6.2	230	4.2	110	3.3	2.6
17	370	6.0	220	4.4	110	3.3	2.7
18	370	6.3	220	4.6	110	3.5	4.8
19	400	6.1	220	4.6	110	3.6	4.6
20	400	6.0	220	4.6	110	3.6	4.6
21	370	6.3	220	4.5	110	3.4	4.3
22	370	6.4	220	4.4	110	3.3	3.7
23	350	6.2	230	4.4	110	3.1	3.7

Time: 180.0°W.

Sweep: 1.0 Mc to 26.0 Mc in 18 seconds.

Table 6

Adak, Alaska (51.9°N, 176.6°W)

Time	May 1951						
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	290	(4.8)					(2.6)
01	300	4.4					2.6
02	300	4.3					2.6
03	300	4.1					1.9
04	330	4.2	290	—	110	—	2.2
05	370	4.8	260	3.4	110	2.2	2.4
06	360	5.6	240	3.8	110	3.5	3.0
07	380	6.0	240	4.0	110	2.8	3.8
08	380	6.2	230	4.2	110	3.3	4.2
09	370	6.0	220	4.4	110	3.4	4.7
10	380	6.2	220	4.5	110	(3.4)	4.9
11	400	6.1	220	4.6	110	3.5	4.8
12	400	6.0	220	4.6	110	3.6	4.6
13	370	6.3	220	4.5	110	3.4	4.3
14	370	6.4	220	4.4	110	3.3	3.7
15	350	6.2	230	4.4	110	3.1	3.7
16	340	6.1	240	4.1	110	—	3.4
17	310	6.0	250	—	110	2.6	3.9
18	290	6.2	260	—	110	2.4	3.8
19	270	6.4	260	—	130	1.8	3.6
20	260	6.6	—	—	—	—	3.2
21	260	6.3	—	—	—	—	2.8
22	260	6.0	—	—	—	—	2.7
23	260	5.4	—	—	—	—	2.7

Time: 180.0°W.

Sweep: 1.0 Mc to 26.0 Mc in 18 seconds.</div

Table 7

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

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	(330)	4.6				3.0	2.7	
01	(300)	(4.6)				2.8	(2.7)	
02	(300)	4.6				2.3	(2.7)	
03	300	4.2				2.6		
04	(300)	4.0				2.3	2.7	
05	300	4.2				3.0	2.8	
06	340	5.3	250	(3.7)	120	(2.3)	3.2	2.9
07	340	5.7	---	4.2	120	(2.8)	3.6	2.9
08	380	6.2	---	(4.6)	120	---	3.7	2.7
09	390	6.4	220	(4.7)	120	---	4.0	2.7
10	400	(6.8)	---	(4.8)	120	---	4.5	2.8
11	370	6.6	---	(4.9)	---	---	2.7	
12	380	6.8	---	5.0	---	---	4.8	2.8
13	380	7.0	---	(5.0)	120	---	3.9	2.8
14	340	7.4	---	4.9	---	---	2.8	
15	340	7.0	---	4.7	120	---	2.9	
16	330	7.0	---	4.6	120	---	2.9	
17	310	7.0	---	4.2	120	(2.9)	3.0	3.0
18	280	6.8	---	3.7	120	(2.3)	2.8	3.1
19	260	6.8				3.2	3.1	
20	250	6.6				3.4	3.0	
21	250	6.0				3.3	3.0	
22	260	5.3				2.8	2.8	
23	(300)	4.8				2.8	2.7	

Time: 120.0°W .

Sweep: 1.3 Mc to 18.0 Mc in 4 minutes.

Table 8

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

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	(300)	4.8						2.6
01	300	4.7						2.3
02	290	4.6						2.3
03	280	4.4						2.4
04	290	4.0						2.8
05	280	4.0	300	---	110	---	2.5	2.9
06	280	5.1	250	3.6	120	2.2	3.3	3.0
07	320	5.7	230	4.1	110	2.7	3.9	3.0
08	330	6.3	220	4.4	110	3.1	4.5	2.9
09	370	6.4	220	4.8	110	3.2	4.0	2.6
10	380	6.7	220	4.8	100	3.4	4.5	2.6
11	390	7.2	220	4.8	110	3.5	4.2	2.7
12	380	7.8	220	4.8	110	3.6	3.4	2.7
13	370	8.0	220	4.8	110	3.6	3.3	2.7
14	350	8.3	230	4.8	110	3.5	2.7	2.7
15	330	8.1	230	4.6	110	3.3	2.7	2.8
16	310	8.1	240	4.4	110	3.1	3.9	2.9
17	300	7.8	240	4.0	110	2.7	3.3	3.0
18	280	7.4	250	---	120	2.1	3.6	3.0
19	240	7.2					3.0	3.1
20	(240)	6.4					2.8	3.0
21	(250)	5.6					2.7	2.8
22	(280)	5.0					2.7	2.7
23	(300)	5.0					2.8	2.7

Time: 105.0°W .

Sweep: 1.0 Mc to 18.0 Mc in 4 minutes.

Table 9

Okinawa I. (26.3°N , 127.8°E)

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	300	9.4				4.9	2.8	
01	270	8.0				4.1	2.9	
02	250	8.1				3.9	3.1	
03	250	(6.9)				3.2	(3.0)	
04	260	6.2				3.0	3.0	
05	260	5.7				2.4	3.0	
06	240	6.8			110	(2.2)	3.8	3.2
07	240	6.9	230	---	110	(2.8)	4.7	3.1
08	270	7.7	230	---	110	(3.2)	5.6	3.0
09	310	8.2	220	(5.1)	110	3.5	5.7	2.8
10	340	9.1	(250)	(6.0)	110	3.5	6.0	2.7
11	340	10.2	230	(6.0)	110	3.6	4.8	2.7
12	330	11.2	230	(5.1)	110	(3.7)	5.4	2.9
13	330	11.4	(250)	(5.2)	110	(3.6)	5.0	2.8
14	330	12.2	240	(5.0)	110	(3.6)	5.0	2.9
15	310	12.8	240	---	110	(3.4)	5.0	3.0
16	290	12.9	250	---	110	3.3	5.6	3.0
17	270	12.8	250	---	110	2.9	5.1	3.0
18	250	11.8	---	---	(120)	---	5.3	3.1
19	260	9.9				4.5	3.1	
20	(270)	8.9				5.5	2.7	
21	300	8.5				4.8	2.6	
22	310	8.3				4.8	2.6	
23	(310)	(8.0)				6.6	(2.7)	

Time: 127.5°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 10

Maui, Hawaii (20.8°N , 156.5°W)

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	300	7.0						2.7
01	280	7.2						2.4
02	280	7.0						3.2
03	280	6.1						2.8
04	280	5.9						2.2
05	280	5.3						2.0
06	270	5.6	---	---	130	1.7	2.5	2.9
07	260	6.7	230	---	120	2.4	4.0	2.9
08	290	7.9	230	4.2	110	3.0	4.5	2.8
09	320	8.0	220	4.8	110	3.4	6.6	2.6
10	330	9.0	220	5.0	110	3.5	6.6	2.5
11	380	10.1	220	5.1	110	3.6	6.2	2.6
12	360	10.9	220	5.2	110	3.7	5.5	2.7
13	350	11.5	220	5.1	110	3.8	5.1	2.7
14	330	12.1	220	5.0	110	3.7	4.5	2.8
15	320	12.3	230	4.8	110	3.5	4.8	2.9
16	300	12.2	230	4.6	110	3.3	5.3	3.0
17	290	12.1	240	(4.3)	120	2.9	4.4	3.0
18	270	11.7	260	---	120	2.2	4.0	3.1
19	240	11.0					3.9	3.1
20	240	8.9					4.3	2.9
21	270	8.3					3.5	2.7
22	280	8.2					2.2	2.7
23	290	7.5					2.4	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)

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	260	9.7				3.0		
01	250	8.8				3.1		
02	240	8.0				3.1		
03	230	7.2				3.2		
04	230	6.8				3.2		
05	250	5.4				3.1		
06	250	5.5		---	2.4	3.1		
07	230	6.8	220	---	110	2.6	3.2	
08	270	7.6	220	4.7	110	3.1	3.0	
09	280	8.8	220	5.0	110	3.5	4.3	
10	310	9.7	210	5.1	100	3.7	4.4	2.8
11	320	10.7	220	5.3	110	3.8	4.4	2.8
12	330	11.8	220	5.2	110	3.9	4.4	2.8
13	320	12.5	210	5.1	110	3.8	4.5	2.9
14	300	12.8	220	5.0	110	3.8	5.3	3.0
15	300	12.3	220	4.8	100	3.6	5.4	3.0
16	290	12.2	220	4.6	100	3.3	4.5	2.9
17	250	11.6	220	4.0	110	2.6	4.4	3.0
18	250	11.2	---	---	3.8	3.0		
19	250	10.3				3.6	2.9	
20	270	10.0				3.1	2.8	
21	270	10.1				2.1	2.8	
22	270	9.7				2.8		
23	260	9.6				3.0		

Time: 60.0°W .

Sweep: 1.2 Mc to 19.5 Mc, manual operation.

Table 12

Huancayo, Peru (12.0°S , 75.3°W)

May 1951

Time	$\text{h}^{\circ}\text{F2}$	foF2	$\text{h}^{\circ}\text{F1}$	foF1	h°E	foE	fEs	(M3000)F2
00	220	7.1						3.2
01	230	6.2						3.2

Table 13

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	260	4.5					3.0	
01	270	4.5					3.0	
02	270	4.8					3.0	
03	270	4.4					3.0	
04	280	4.1					3.0	
05	280	4.0	---	---			3.1	
06	290	4.2	3.5				3.0	
07	280	4.6	250	3.4			3.0	
08	340	4.5	240	3.7			2.9	
09	310	4.6	230	3.7	---	---	3.0	
10	370	4.9	220	3.9	---	---	3.0	
11	350	5.0	220	3.9	---	---	2.8	
12	360	5.2	220	3.9	---	---	2.8	
13	380	4.9	220	3.9	---	---	2.8	
14	380	4.8	220	3.9	---	---	2.9	
15	350	5.3	230	3.8	---	---	2.8	
16	350	5.0	230	3.8	---	---	2.8	
17	340	5.0	220	3.8	---	---	3.0	
18	300	4.8	230	3.7			3.0	
19	270	4.6	240	---			2.9	
20	270	4.8	---	---			3.0	
21	270	4.8					3.0	
22	270	4.8					3.0	
23	270	4.6					3.0	

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 15

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	---	---					6.6	---
01	---	---					5.0	---
02	---	---					6.0	---
03	---	---					5.4	---
04	(350)	(4.0)					5.0	(2.9)
05	(380)	(4.1)	---	---			4.2	(2.9)
06	(400)	4.4	---	(3.4)			2.9	
07	(390)	(4.6)	---	3.8			(3.0)	
08	(390)	4.9	---	4.0	---		3.0	
09	(400)	5.2	230	4.0	---		(2.9)	
10	420	5.2	220	(4.2)	---		3.0	
11	400	5.4	240	(4.2)	---		2.9	
12	390	5.6	220	(4.2)	120	---	3.0	
13	370	5.4	220	(4.2)	---		3.1	
14	400	5.3	240	(4.2)	---		3.0	
15	(350)	6.0	(240)	---	---		3.1	
16	(310)	(5.9)	---	---	---		3.1	
17	(280)	5.4	---	---	---		3.3	
18	270	5.2	---	---			3.2	
19	260	4.8	---	---			3.3	
20	260	5.0					3.2	
21	(270)	4.2					4.3	3.2
22	(280)	---					5.0	---
23	---	---					5.0	---

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 17

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	<330	---					4.3	---
01	(360)	(3.3)					4.1	(2.4)
02	(420)	---					4.5	---
03	(370)	---					4.4	---
04	---	(3.2)					4.4	(2.6)
05	(300)	(3.8)					4.9	(2.8)
06	(280)	(4.2)	---	---			3.9	(2.8)
07	(310)	(4.4)	---	---	(120)	---	4.2	(2.9)
08	370	(4.8)	260	3.9	120	---	2.9	2.7
09	380	(5.1)	250	4.1	(120)	---	2.8	
10	<420	5.0	240	4.2	120	3.0	2.6	
11	<420	5.2	240	(4.2)	110	3.1	2.6	
12	400	5.3	240	4.3	(120)	(3.1)	2.6	
13	420	5.4	(240)	(4.2)	(120)	3.1	2.7	
14	400	5.4	250	(4.1)	120	---	2.7	
15	370	(5.2)	240	4.1	120	3.0	(2.7)	
16	360	5.2	250	4.0	120	2.6	2.7	
17	350	(5.2)	260	---	120	2.4	2.8	(2.8)
18	310	(5.1)	280	---	(120)	---	3.8	(2.8)
19	320	5.0			(130)	---	4.2	(2.8)
20	310	(4.2)					5.9	(2.7)
21	280	(4.4)					5.6	(2.8)
22	310	(4.6)					5.4	---
23	320	(4.0)					4.8	(2.6)

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 18

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	290	4.0					---	---
01	290	4.0					4.4	2.9
02	280	3.2					4.0	2.8
03	330	(3.0)					2.2	4.5
04	320	3.5					120	4.2
05	330	(3.6)	---	---			110	2.5
06	300	(3.9)	---	---			110	2.9
07	300	---	240	4.0	110	3.0	---	2.6
08	300	4.7	210	4.0	110	3.0	3.0	3.0
09	(370)	(5.5)	220	4.2	100	3.0	3.0	2.8
10	(370)	5.7	230	4.3	100	3.3	2.6	
11	360	5.2	220	4.3	110	3.3	2.8	
12	400	5.6	220	4.3	100	3.2	2.6	
13	400	5.6	230	4.3	110	3.1	2.7	
14	420	5.7	220	4.3	100	3.0	2.6	
15	400	5.8	230	4.1	100	3.0	2.6	
16	370	6.0	240	4.0	100	2.8	2.6	
17	340	5.8	250	4.0	110	2.8	2.8	
18	300	5.1	260	3.5	110	2.6	2.8	
19	300	5.0	---	---	110	2.4	5.9	2.8
20	280	4.6					120	6.8
21	280	4.0					120	5.4
22	310	(4.6)					110	6.2
23	280	4.0					6.5	2.8

Table 14

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	300	(3.9)					4.9	(3.0)
01	300	(3.9)					7.3	(3.0)
02	290	(4.0)					4.4	(2.9)
03	300	(3.7)					4.0	(3.0)
04	300	(3.8)	---	---			3.4	(3.0)
05	(310)	(3.6)	---	---			4.1	(2.9)
06	(370)	(3.8)	280	3.3	110	2.6	3.0	(2.7)
07	(370)	(4.1)	250	3.6	100	2.6	3.9	(2.9)
08	370	(4.6)	260	(3.8)	---	---	4.4	(2.9)
09	(440)	4.7	230	4.0	100	2.4	4.4	2.7
10	390	5.0	230	4.0	100	2.4	4.4	2.7
11	440	4.9	<230	4.1	100	3.0	3.5	2.7
12	460	4.9	220	4.2	100	3.1	2.6	
13	420	5.1	230	4.2	100	3.1	2.6	
14	440	5.2	240	4.2	100	3.1	2.7	
15	380	5.1	250	4.1	100	2.9	2.9	
16	350	5.2	240	4.0	100	2.9	2.9	
17	340	(4.8)	<260	(3.9)	100	2.6	3.0	
18	(300)	(4.7)	260	---	110	(2.6)	3.2	3.0
19	280	(4.5)	---	---	---	---	4.1	3.1
20	280	(4.4)	---	---	---	---	4.2	(3.1)
21	300	(4.0)	---	---	---	---	5.0	(3.1)
22	300	(3.9)	---	---	---	---	5.9	(3.0)
23	300	(3.9)	---	---	---	---	4.2	(3.0)

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

Time	$h^{\circ}F2$	$fo^{\circ}F2$	$h^{\circ}F1$	$fo^{\circ}F1$	$h^{\circ}E$	$fo^{\circ}E$	$f^{\circ}Es$	(M3000) $F2$
00	330	3.2					---	3.0
01	350	3.1					---	2.8
02	340	3.1					---	2.8
03	340	3.4					---	2.8
04	340	3.5					---	2.9
05	340	3.8	280	---	---	---	---	3.0
06	380	4.1	250	3.6	120	2.1	2.8	
07	400	4.4	230	3.7	120	2.6	2.9	
08	400	5.0	230	4.0	110	3.0	2.9	
09	420	5.0	220	4.0	110	3.0	2.8	
10	420	5.2	220	4.3	110	3.2	2.8	
11	380	5.7	220	4.3	110	3.3	3.0	
12	400	5.7	220	4.3	110	3.3	3.0	
13	400	5.6	230	4.3	110	3.1	2.7	
14	420	5.7	220	4.3	100	3.0	2.6	
15	400	5.8	230	4.1	100	3.0	2.6	
16	370	6.0	240	4.0	100	2.8	2.6	
17	340	5.8	250	4.0	110	2.8	2.8	
18	300	5.1	260	3.5	110	2.6	2.8	

Table 19

Prince Rupert, Canada (54.3°N, 130.3°W)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	280	3.0						3.0	
01	310	2.9						2.8	
02	330	2.3						1.7	2.9
03	320	2.5						2.4	2.8
04	340	2.3						1.2	2.9
05	320	2.8						1.7	2.8
06	280	3.4	260	3.0	100	1.9	1.7	2.8	
07	390	4.0	260	3.5	110	2.3		2.8	
08	420	4.5	240	3.9	100	2.5		2.8	
09	430	4.5	220	4.0	100	3.0		2.7	
10	410	4.7	210	4.2	100	3.1		2.7	
11	470	5.0	210	4.2	100	3.2		2.5	
12	460	5.2	200	4.4	100	3.2		2.6	
13	400	5.4	210	4.4	100	3.3		2.8	
14	390	5.3	220	4.5	100	3.2		2.8	
15	360	5.5	220	4.5	100	3.0		2.9	
16	340	5.6	230	4.2	100	3.0		2.9	
17	300	5.3	230	3.8	110	2.8		3.0	
18	270	5.6	250	3.7	110	2.4		3.0	
19	260	5.2	---	---	120	2.0		3.0	
20	260	5.0	---	---				3.0	
21	260	4.8	---	---				3.0	
22	250	4.1	---	---				3.0	
23	280	3.6	---	---				3.0	

Time: 120.0°W.

Sweep: 0.5 Mc to 15.0 Mc in 15 seconds.

Table 21

Winnipeg, Canada (49.9°N, 97.4°W)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	320	3.0						3.0	
01	320	3.0						3.0	
02	320	3.0						3.0	
03	360	3.3						2.8	
04	320	3.0						3.0	
05	300	3.0						---	
06	280	3.8	---	---	---	---		3.0	
07	340	4.3	250	---	---	---		2.9	
08	380	(5.0)	240	4.0	110	(2.8)		2.9	
09	420	5.0	230	4.1	120	3.0		2.8	
10	420	5.2	220	4.4	110	3.1		2.8	
11	430	5.4	220	4.5	---	---		---	
12	430	5.8	210	4.5	---	3.5		2.5	
13	390	5.0	220	4.5	110	(3.5)		2.8	
14	390	5.1	230	4.7	110	3.4		2.8	
15	380	5.0	230	4.6	110	3.2		2.8	
16	380	6.0	230	4.3	110	3.0		2.8	
17	340	5.0	240	4.1	120	2.8		2.8	
18	310	6.0	250	---	120	2.6		2.9	
19	270	5.1	---	---				---	
20	260	5.8						---	
21	260	5.6						---	
22	270	4.5						---	
23	300	4.0						---	

Time: 90.0°W.

Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 23

Schwarzenburg, Switzerland (46.8°N, 7.3°E)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	360	4.3							
01	360	4.2							
02	350	3.8							
03	340	3.8						1.8	
04	325	3.5							
05	330	3.5							
06	300	4.2							
07	295	5.2							
08	280	5.4	270	4.0	110	2.7			
09	310	5.0	250	4.4	110	2.9			
10	350	5.5	250	4.5	110	3.1			
11	340	5.7	240	4.6	110	3.3			
12	360	7.1	230	4.8	110	3.2			
13	350	7.5	230	5.0	110	3.3			
14	330	7.5	250	5.0	110	3.2			
15	325	7.4	255	4.4	110	3.1			
16	280	7.5	255	4.6	110	3.0			
17	300	7.8							
18	300	7.8							
19	300	7.8							
20	260	6.5							
21	280	5.4							
22	300	5.0							
23	320	4.4							

Time: 15.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 20

Adak, Alaska (51.9°N, 175.6°W)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	300	4.0							2.6
01	320	3.7							2.5
02	320	3.4							2.5
03	310	2.4							2.6
04	300	3.2							2.7
05	280	3.7	300	---	---	---	---		2.3
06	260	4.4	260	3.4	120	2.2			3.0
07	280	5.0	240	4.0	120	2.4	2.8		3.1
08	310	5.3	230	4.0	110	2.9	3.1		3.0
09	330	5.1	230	4.2	110	3.1	3.2		3.0
10	320	5.5	220	4.3	110	3.1	3.2		3.0
11	320	5.8	220	4.3	110	3.3	3.3		3.0
12	300	7.1	220	4.4	110	3.4	3.3		3.0
13	300	7.4	230	4.6	110	3.5	3.3		3.0
14	300	7.5	250	4.6	110	3.5	3.3		3.0
15	290	6.9	240	4.4	120	2.7			3.1
16	250	5.7	250	4.4	110	2.4			3.1
17	250	5.8	220	4.4	110	2.4			3.0
18	250	5.8	---	---	140	---	1.8		3.1
19	250	6.7	---	---					1.7
20	260	5.3	---	---					3.0
21	260	5.9	---	---					3.0
22	260	5.1	---	---					2.8
23	270	4.5	---	---					2.8

Time: 180.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 22

St. John's, Newfoundland (47.6°N, 52.7°W)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	300	4.0							2.8
01	300	3.2							2.7
02	300	3.0							2.8
03	280	3.0							2.9
04	290	2.5							2.9
05	220	3.2	---	---	100	1.8			2.9
06	260	4.1	250	3.4	110	2.4			3.1
07	300	4.5	240	4.0	100	2.7			3.1
08	360	4.8	230	4.2	100	3.0			2.9
09	440	5.0	220	4.2	100	3.2			2.7
10	440	5.3	210	4.4	100	3.3			2.8
11	400	5.4	210	4.4	100	3.4			2.8
12	400	5.8	220	4.5	100	3.4			2.8
13	390	6.2	220	4.5	100	3.3			2.7
14	370	5.4	230	4.4	100	3.2			2.8
15	350	5.6	240	4.2	100	3.0			2.8
16	320	6.5	250	4.0	100	2.8			2.8
17	290	6.4	260	3.6	110	2.4			2.9
18	270	5.7	---	---	140	(2.4)			2.9
19	270	5.8	---	---					2.8
20	260	5.0	---	---					2.8
21	290	3.6	---	---					2.7
22	290	3.7	---	---					2.7
23	290	3.8	---	---					2.7

Time: 60.0°W.

Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 24

Ottawa, Canada (45.4°N, 75.7°W)								April 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	310	3.1							2.7
01	300	3.4							2.7
02	300	3.2							2.7
03	300	2.8							2.7
04	310	2.7							

Table 25

Wakkanui, Japan (46.4°N, 141.7°E)								April 1961
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	5.8					2.6	
01	300	5.6					2.6	
02	310	5.3					2.6	
03	300	5.0					2.7	
04	300	4.4					2.8	
05	290	5.0					2.8	
06	280	5.9	300	3.8	120	2.2	3.0	
07	300	6.5	270	4.0	110	2.6	3.1	
09	300	6.5	260	4.3	110	3.1	3.0	
10	310	7.3	260	4.5	110	3.1	3.0	
11	310	7.5	250	4.8	110	3.4	2.9	
12	300	7.9	250	4.8	110	3.3	2.9	
13	310	8.3	260	4.9	110	3.3	4.0	
14	300	8.8	260	4.6	110	---	3.0	
15	300	8.0	280	4.4	110	2.9	3.0	
16	290	7.8	280	4.1	110	2.7	3.1	
17	290	7.6	260	---	110	2.4	3.1	
18	270	7.4				2.0	3.0	
19	270	7.4				1.6	2.9	
20	280	7.0					2.8	
21	290	6.6					2.7	
22	300	6.3					2.7	
23	310	5.8					2.6	

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 16 minutes, manual operation.

Table 27

Tokyo, Japan (35.7°N, 139.5°E)								April 1951
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.9					1.8	2.8
01	280	6.0					1.6	2.8
02	250	6.0					1.9	2.9
03	230	5.3					1.6	2.9
04	270	4.7					2.8	
05	260	5.0					2.9	
06	220	6.5					3.4	
07	230	7.2	220	---	100	2.6	3.4	
08	240	8.0	220	---	100	3.0	3.3	
09	260	8.7	210	---	100	3.1	4.2	
10	260	9.8	200	4.8	100	3.3	3.0	
11	280	10.4	210	---	100	3.4	3.0	
12	270	11.0	210	---	100	3.5	3.1	
13	270	10.3	220	---	100	3.3	3.1	
14	260	10.5	220	4.8	100	3.3	3.1	
15	250	10.0	220	---	100	3.1	3.6	
16	240	9.3	220	---	100	2.9	3.6	
17	230	8.8	---	---	100	2.4	3.6	
18	230	8.8					3.6	3.2
19	230	7.8					3.4	3.2
20	220	6.8					3.1	3.0
21	270	6.2					2.6	2.8
22	280	6.1					2.1	2.7
23	280	6.0					2.2	2.8

Time: 135.0°E.

Sweep: 1.0 Mc to 18.5 Mc in 2 minutes.

Table 29

Guam I. (13.6°N, 144.9°E)								April 1951
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	10.7					2.8	
01	270	10.0					3.1	
02	230	8.4					3.3	
03	230	7.2					3.2	
04	240	6.4					3.3	
05	240	4.6				2.3	3.3	
06	260	4.3				3.6	5.0	
07	250	7.5	---	---	120	2.2	3.3	3.3
08	250	8.8	230	---	120	2.7	3.2	3.0
09	(280)	10.0	220	---	110	3.1	2.7	
10	(300)	10.6	220	(4.8)	110	3.3	3.5	2.6
11	(310)	10.6	200	(4.9)	110	(3.4)	3.6	2.4
12	(320)	10.9	200	(5.0)	110	(3.5)	2.4	
13	(320)	11.5	200	4.9	110	(3.4)	2.5	
14	320	12.2	200	(4.8)	110	3.4	2.6	
15	(300)	13.0	230	---	110	(3.3)	2.7	
16	300	13.8	240	---	110	3.1	2.8	
17	(280)	14.0	250	---	120	2.7	3.4	2.8
18	260	15.9	---	---	130	(2.0)	3.8	2.9
19	280	13.2				2.6	2.8	
20	300	12.1				2.2	2.7	
21	300	11.4					2.7	
22	300	10.6					2.7	
23	300	10.2					2.7	

Time: 150.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 26

Akita, Japan (39.7°N, 140.1°E)								April 1961
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.1						2.7
01	280	6.2						2.8
02	270	5.8						2.8
03	250	6.4						3.0
04	260	5.0						2.9
05	270	6.3						3.0
06	230	6.6				---	1.2	3.0
07	240	7.2	220	---	110	2.7		3.3
08	260	7.9	230	---	110	3.0		3.2
09	270	8.7	220	---	110	3.2		3.1
10	280	9.0	220	4.7	110	3.2		3.1
11	280	9.5	220	4.8	110	3.4		3.1
12	280	9.7	230	5.0	110	---		3.1
13	280	9.4	230	5.0	110	---		3.1
14	280	9.8	230	4.8	110	3.4		3.1
15	270	9.5	230	4.6	110	3.3		3.2
16	250	8.9	230	---	110	2.9		3.2
17	250	8.7	230	---	110	2.6		3.2
18	240	8.6				120	1.9	3.0
19	230	8.0						2.8
20	240	6.7						2.6
21	280	6.1						2.2
22	280	6.3						1.8
23	290	8.1						2.8

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 15 minutes, manual operation.

Table 28

Yamagawa, Japan (31.2°N, 130.6°E)								April 1951
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.0						2.4
01	290	6.0						2.5
02	280	6.4						2.0
03	250	5.6						2.3
04	290	4.9						2.9
05	300	4.8						2.2
06	270	5.8						2.8
07	240	7.2	---	---	110	2.3	2.4	3.3
08	260	7.8	240	---	110	2.9	3.6	3.2
09	270	8.6	230	---	110	3.3	3.4	3.2
10	290	9.6	240	---	110	3.4	4.7	3.0
11	300	11.1	230	---	100	3.6	4.8	2.9
12	300	12.0	220	---	100	3.6	4.8	3.0
13	300	12.3	230	---	100	3.5	4.2	3.0
14	300	12.3	240	---	110	3.4	4.1	3.0
15	290	11.8	240	---	100	3.2	4.0	3.0
16	280	11.4	250	---	100	3.1	4.2	3.1
17	280	10.8	250	---	100	2.8	3.8	3.1
18	260	10.0	---	---	110	2.0	3.4	3.2
19	250	9.4						3.2
20	230	8.0						3.3
21	250	6.4						3.0
22	300	5.9						2.5
23	310	6.1						2.7

Time: 135.0°E.

Sweep: 1.0 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 30

Resolute Bay, Canada (74.7°N, 94.9°W)								March 1961
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.4						2.9
01	260	4.2						2.9
02	260	4.2						2.9
03	270	3.8						2.9
04	270	3.9						2.9
05	260	4.2						3.0
06	250	4.0						3.1
07	260	4.1						3.0
08	250	3.8	---	---				3.1
09	260	4.4	230	---				3.0
10	260	4.9	220	3.4				3.0
11	280	5.0	230	---				3.0
12	300	4.8	230	(3.6)				3.0
13	300	4.9	250	3.7				3.0
14	290	5.0	230	3.6	---	---	---	2.9
15	300	4.7	240	3.6	---	---	---	3.0
16	280	4.8	230	3.2	---	---	---	3.0
17	260							

Table 31

Baker Lake, Canada (64.3°N, 96.0°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	300	3.6					2.9		
01	300	3.8					2.8		
02	310	3.3					2.7		
03	320	3.4					3.0	2.9	
04	330	3.0					2.8		
05	340	(2.9)					(2.8)		
06	340	3.2	---	---	130	2.4	3.8	(2.8)	
07	310	3.8	---	---	150	2.6	2.9		
08	300	4.0	300	---	130	2.5	2.9		
09	300	4.0	---	---	130	2.8	3.0		
10	390	4.8	280	4.0	120	3.0	2.9		
11	500	4.9	290	4.0	120	3.0	2.8		
12	480	4.9	300	3.9	120	3.1	2.8		
13	400	5.3	290	3.8	130	3.0	2.8		
14	420	5.8	290	3.8	120	2.9	2.8		
15	400	5.4	290	3.3	120	2.8	2.8		
16	380	5.5	300	3.6	120	2.8	2.8		
17	310	5.2	290	3.2	130	2.7	2.9		
18	310	5.0	---	---	150	2.2	2.9		
19	300	4.8			140	2.3	3.0		
20	300	4.5	---	---	1.9	2.0	2.8		
21	300	4.4	---	---	---	3.8	(2.8)		
22	300	3.6				3.8	2.9		
23	300	3.9					2.8		

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16 seconds.

Table 33

Churchill, Canada (58.8°N, 94.2°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	340	(3.0)			---	---	7.0	(3.0)	
01	(300)	(3.4)			---	6.4	(2.8)		
02	300	3.0			---	4.3	(3.0)		
03	(300)	(3.8)			120	3.0	4.2	(2.8)	
04	(310)	(2.7)			120	2.5	4.0	(3.0)	
05	(320)	---			120	3.0	3.4	---	
06	---	(4.0)			120	3.2	3.8	(2.9)	
07	(300)	(4.9)			110	3.9	(2.8)		
08	300	4.2	---	---	110	3.0	3.0		
09	310	4.7	230	3.7	110	3.1	2.9		
10	320	5.0	230	4.0	110	3.0	2.8		
11	370	5.0	220	4.0	110	3.0	2.8		
12	340	6.0	220	4.1	110	3.0	2.8		
13	370	6.0	230	4.0	110	3.1	2.8		
14	360	6.0	230	4.0	110	2.8	2.8		
15	360	5.4	230	4.0	110	2.6	2.8		
16	300	6.0	230	3.7	110	2.5	2.9		
17	290	5.8	240	3.5	120	2.3	2.9		
18	280	5.3	230	---	110	2.7	3.0		
19	280	5.3	---	---	110	3.0	3.2	2.9	
20	280	4.6	---	---	110	2.9	6.0	(2.8)	
21	320	4.0	---	---	120	2.4	6.3	2.8	
22	280	3.7	---	---	130	2.8	7.4	2.9	
23	280	4.0	---	---	120	2.4	6.1	3.0	

Time: 90.0°W.

Sweep: 2.0 Mc to 16.0 Mc in 1 minute.

Table 35

Prince Rupert, Canada (54.3°N, 130.3°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	290	2.2			160	---		2.9	
01	310	2.1			---	1.2		3.0	
02	320	1.9			---	---	2.0	2.8	
03	310	2.2			---	---	2.0	2.8	
04	330	2.3			---	---		2.8	
05	310	2.1			---	---		3.0	
06	300	2.4			---	---		3.0	
07	270	3.2			110	1.9		3.1	
08	250	4.1	240	3.5	110	2.1		3.1	
09	300	4.8	230	3.7	110	2.5		3.0	
10	340	5.4	220	3.9	110	2.8		3.0	
11	340	6.0	210	4.0	110	3.0		3.0	
12	330	6.2	210	4.2	110	3.0		2.9	
13	320	6.4	220	4.2	100	3.0		3.0	
14	300	6.5	220	4.0	110	3.0		3.0	
15	300	6.8	230	4.0	110	2.9		3.1	
16	280	6.8	220	3.6	110	2.6		3.1	
17	240	6.4	230	3.4	110	2.6		3.2	
18	240	6.1			120	2.0		3.3	
19	230	5.3	---	---			3.3		
20	230	4.4	---	---			3.2		
21	240	3.6	---	---			3.1		
22	240	2.6	---	---			3.2		
23	270	2.2					3.0		

Time: 120.0°W.

Sweep: 0.6 Mc to 15.0 Mc in 16 seconds.

Table 32

Narsaqeek, Greenland (61.2°N, 45.4°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	(340)	(3.4)			---	---	---	5.0	(2.7)
01	(340)	(3.2)			---	---	---	4.2	---
02	(350)	(3.4)			---	---	---	4.1	(2.8)
03	---	(3.2)			---	---	---	4.4	(2.7)
04	---	---			---	---	---	4.5	(2.7)
05	---	---			---	---	---	4.4	---
06	290	(3.4)			---	---	---	4.3	(3.0)
07	300	4.0			---	---	(110)	3.8	3.1
08	290	4.4			---	---	(120)	---	3.0
09	320	4.9	240	---	---	---	(120)	---	3.0
10	340	5.2	230	(3.9)	(120)	(2.8)			
11	340	5.7	230	(4.0)	(110)	---			
12	360	5.9	240	(4.1)	(120)	---			
13	340	5.7	<250	4.1	(110)	3.0			
14	320	5.6	240	(3.8)	(110)	(2.8)			
15	320	5.7	240	3.7	(120)	(2.8)			
16	300	5.5	250	---	(120)	(2.4)	2.8	3.0	
17	280	6.3	250	---	(120)	2.2	2.8	3.0	
18	300	(4.8)	---	---	130	1.7	3.8	(2.9)	
19	300	(4.3)	---	---	---	---		5.2	(3.0)
20	(320)	(3.9)	---	---	---	---		7.4	(2.8)
21	340	(4.0)	---	---	---	---		6.2	(2.7)
22	320	(3.6)	---	---	---	---		5.4	(2.7)
23	(300)	(3.3)	---	---	---	---		4.0	(2.6)

Time: 46.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16 seconds.

Table 34

Fort Chimo, Canada (58.1°N, 68.3°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	(340)	---			---	---	---	4.8	---
01	(340)	---			---	---	---	4.7	---
02	340	(3.7)			---	---	---	4.1	---
03	---	---			---	---	130	4.0	---
04	---	---			---	---	---	4.3	---
05	---	---			---	---	---	4.8	---
06	(310)	(3.7)			---	---	---	4.0	---
07	320	4.6			---	---	---	4.0	3.0
08	300	4.3	260	3.8	110	2.0	2.9		
09	300	5.0	260	4.0	120	---	---		
10	380	5.2	250	4.0	120	---	---		
11	370	5.6	250	4.0	120	---	---		
12	400	5.8	250	4.0	120	---	---		
13	370	5.7	260	4.0	120	---	---		
14	350	6.2	260	3.8	120	2.8	2.8		
15	340	5.8	260	3.8	120	2.7	2.7		
16	300	6.0	280	3.5	130	2.7	2.8		
17	300	5.0	---	---	130	2.3	2.8		
18	300	4.9	---	---	130	3.0	4.0	2.7	
19	300	(3.6)	---	---	130	2.6	4.5	2.8	
20	290	4.1	---	---	---	---	4.4	---	
21	300	(3.8)	---	---	---	---	5.0	---	
22	320	(3.2)	---	---	---	---	6.0	---	
23	(300)	---	---	---	---	---	4.8	---	

Time: 76.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 36

Adak, Alaska (61.9°N, 176.6°W)								March 1951	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	300	3.2			---	---	---	2.7	

Table 37

Portage la Prairie, Canada (49.9°N, 98.3°W)

March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(290)	2.4						(2.9)
01	(320)	2.0				1.8		(2.8)
02	320	1.8				2.2		3.0
03	(300)	(1.8)				1.8		---
04	(310)	(1.7)				---		
05	(310)	(1.6)				1.9		---
06	(370)	(2.3)				---	2.4	---
07	(260)	(3.0)			---	---		(3.0)
08	250	4.0	---	---	120	2.0		(3.2)
09	(270)	4.8	220	---	120	2.6		3.2
10	320	5.0	220	4.0	110	2.7		3.0
11	330	5.2	220	4.1	120	3.0		3.1
12	310	6.1	210	4.1	120	3.0		3.0
13	300	6.5	220	4.2	110	3.1		3.0
14	300	6.4	220	4.1	120	3.0		3.1
15	300	6.4	220	4.0	110	2.9		3.1
16	280	6.7	230	---	120	2.8		3.2
17	230	6.3	---	---	120	2.3		3.2
18	240	5.9			130	2.0		3.2
19	230	5.7						3.1
20	230	5.0						3.2
21	260	3.8						3.0
22	250	3.3						(3.0)
23	(280)	2.9						(2.8)

Time: 90.0°W.

Sweep: 1.0 Mc to 16.0 Mc in 2 minutes 30 seconds.

Table 39

Schwarzenburg, Switzerland (46.8°N, 7.3°E)

March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	340	3.3						
01	340	3.5						
02	330	3.3						
03	320	3.4						
04	305	3.2						
05	305	3.1						
06	300	3.1						
07	280	4.2						
08	260	5.5			115	2.1		
09	250	6.0	---	---	110	2.5		
10	250	7.0	240	4.3	110	2.8		
11	255	7.0	230	4.2	110	2.9		
12	300	7.6	220	4.4	110	3.0		
13	3'0	7.4	220	4.5	110	3.0		
14	250	7.4	235	4.4	110	3.0		
15	260	7.0	235	4.2	110	2.8		
16	260	7.5	---	---	110	2.6		
17	270	7.4			115	2.3		
18	280	7.0			130	1.9		
19	260	7.0				---		
20	260	5.3				---		
21	275	4.6				---		
22	300	3.8				---		
23	315	3.7				---		

Time: 15.0°E.

Sweep: 1.0 Mc to 25.0 Mc, automatic operation.

Table 41

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

March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.2				2.6		2.9
01	260	4.0				3.0		2.8
02	260	3.7				3.1		2.9
03	240	3.3				2.9		3.0
04	250	3.2				2.6		2.9
05	260	3.1				2.4		2.7
06	260	3.6	---	---	1.4	2.4		3.0
07	240	5.2	230	3.3		2.1		3.4
08	250	6.6	220	4.0		2.6		3.5
09	270	7.0	220	4.4		3.0		3.3
10	280	7.4	210	4.5		3.1		3.2
11	290	7.8	210	4.9		3.2		3.1
12	310	8.0	210	4.8		3.3		3.0
13	300	8.5	230	4.8		3.3		3.2
14	290	8.4	230	4.7		3.3		3.1
15	290	8.3	230	4.5		3.2		3.2
16	270	7.6	230	4.2		2.9		3.2
17	280	7.2	230	3.5		2.5		3.3
18	230	6.6			1.8	2.9		3.3
19	210	6.0				2.8		3.2
20	230	5.4				2.8		3.0
21	260	4.8				2.5		2.9
22	280	4.2				2.9		2.8
23	280	4.0				2.4		2.9

Time: 120.0°E.

Sweep: 1.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 38

St. John's, Newfoundland (47.6°N, 52.7°W)

March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		280			3.2			
01		300			2.8			
02		300			2.6			
03	(300)				2.3			
04	(280)				2.2			
05		300			2.4			
06		260			3.4			
07		250			4.7	---	---	
08		280			5.1	220	3.7	110
09		320			5.3	210	4.0	110
10		320			5.8	210	4.2	110
11		340			5.8	210	4.2	110
12		320			6.0	220	4.2	110
13		320			6.3	220	4.3	100
14		300			6.3	220	4.1	110
15		300			6.4	230	4.0	110
16		260			6.6	260	3.6	110
17		260			6.6	---	3.0	120
18		250			6.6	---	---	---
19		240						
20		250						
21		260						
22		300						
23		280						

Time: 60.0°W.

Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 40

Ottawa, Canada (45.4°N, 75.7°W)

March 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		300			2.9			
01		300			2.5			
02		300			2.3			
03		300			2.4			
04		290			2.4			
05	(290)				2.4			
06		270			2.9			
07		250			4.0	---	---	---
08		250			5.0	220	3.8	110
09		290			5.4	210	3.9	110
10		320			5.8	200	4.2	110
11		310			6.0	200	4.4	110
12		320			6.0	310	4.4	110
13		310			6.3	220	4.4	110
14		300			6.4	220	4.3	110
15		290			6.5	220	4.2	110
16		280			6.7	230	3.9	110
17		250			6.8	230	---	120
18		240						
19		230						
20		240						
21		250						
22		270						
23		290						

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 42

Resolute Bay, Canada (74.7°N, 94.9°W)

February 1951

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		260			3.6			
01		260			3.6			
02		260			3.6			
03		260			3.7			
04		280			3.7			
05		290			3.0			
06		280			3.4			
07		290			3.3			
08		280			3.7			
09		250			4.0			
10		240			4.2			
11		240			4.6			
12		240			4.8			
13		250			4.8			
14		250			5.2			
15		230			5.0			
16		230			4.5			
17		240			4.2			
18		260			4.3			
19		250			4.6			
20		260			4.1			
21		250			4.3			
22		260			3.8			
23		260			3.8			

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 43

Narsaq, Greenland (61.2°N, 45.4°W)

February 1951

Time	h'F2	foF2	h'F1	foF1	h'Z	foZ	fEs	(M3000)F2
00	<350	(3.1)			5.0	(2.7)		
01	340	(3.4)			5.2	(2.8)		
02	---				6.8	---		
03	---				4.5	---		
04	---				4.3	---		
05	---				4.3	---		
06	(340)	(3.1)			3.8	(2.9)		
07	320	(2.8)			3.4	(3.0)		
08	290	3.8				(3.2)		
09	270	5.0	---	---		3.1		
10	270	5.4	---	---		3.2		
11	300	5.8	250	---		3.1		
12	290	6.0	250	---		3.0		
13	280	6.3	240	---		3.1		
14	280	6.0	250	---		3.1		
15	290	5.6	260	---		3.0		
16	320	4.9			(130)	(2.7)		
17	340	(4.4)				3.7	(2.8)	
18	340	(4.5)				6.0	(2.8)	
19	(370)	(4.4)				6.8	(2.8)	
20	(340)	(4.5)				6.1	(2.7)	
21	(360)	(4.2)				4.9	(2.6)	
22	(330)	(3.6)				6.8	(2.7)	
23	340	(3.2)				6.4	(2.8)	

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 45

Narsaq, Greenland (61.2°N, 45.4°W)

January 1951

Time	h'F2	foF2	h'F1	foF1	h'Z	foZ	fEs	(M3000)F2
00	---	---			5.2	---		
01	---	---			4.2	---		
02	---	---			5.2	---		
03	(350)	(3.4)			4.4	(2.7)		
04	330	(3.5)			5.1	(2.9)		
05	310	(2.8)			4.0	(3.0)		
06	300	(2.7)			2.9	3.0		
07	(290)	(2.4)			3.5	(3.0)		
08	260	(2.5)				(3.0)		
09	250	4.6			120	2.1	(3.3)	
10	240	5.8	---	---		3.3		
11	250	6.6	---	---		3.3		
12	250	6.6	---	---		3.3		
13	250	6.7	260	---		3.2		
14	250	6.2	---	(130)		3.2		
15	240	5.4		(130)		3.2		
16	260	(4.9)		---		2.8	(3.0)	
17	300	(4.2)		---		2.6	(3.0)	
18	(340)	(3.8)		---		5.1	(3.0)	
19	320	(3.6)		---		6.9	(2.7)	
20	(300)	(4.1)		---		7.3	(2.8)	
21	(300)	(3.4)		---		6.6	(2.9)	
22	330	(3.2)		---		6.8	(2.7)	
23	---	---		---		7.4	(2.8)	

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 47

Fribourg, Germany (48.1°N, 7.8°E)

December 1950

Time	h'F2	foF2	h'F1	foF1	h'Z	foZ	fEs	(M3000)F2
00	290	3.4			2.1	3.7		
01	280	3.3				2.8		
02	290	3.4				2.7		
03	295	3.3				2.7		
04	280	2.9				2.8		
05	270	2.8				2.9		
06	260	2.8				3.0		
07	250	2.9				3.0		
08	230	5.6				3.3		
09	230	6.3	210	2.9	E	2.4		
10	240	7.3	230	3.2	125	2.4	3.3	
11	240	(7.4)	230	3.2	125	2.7	2.1	3.4
12	240	7.4	220	3.2	128	2.6	2.3	3.4
13	242	7.4	240	3.4	128	2.6		3.3
14	240	7.2	230	2.9	129	2.4		3.3
15	240	7.0	245	2.8	131	2.0	2.4	3.3
16	225	6.1	---	---		2.0	3.3	
17	220	4.8	---	---		2.6	3.2	
18	240	3.9	---	---		3.1	3.1	
19	260	3.3	---	---		2.5	3.0	
20	270	3.1	---	---		2.4	2.9	
21	280	3.0	---	---		2.4	2.8	
22	300	3.2	---	---			2.7	
23	300	3.4	---	---			2.7	

Time: Local.

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

Table 44

Fort Chimo, Canada (58.1°N, 68.3°W)

February 1951

Time	h'F2	foF2	h'F1	foF1	h'Z	foZ	fEs	(M3000)F2
00	325	(3.0)				---	5.9	---
01	(290)	---				---	4.3	---
02	---	---				120	3.6	4.0
03	---	---				125	3.2	3.8
04	---	---				120	3.2	4.0
05	---	---	(3.8)			120	3.7	4.1
06	---	---	---			120	4.0	---
07	300	(3.8)				---	---	(2.9)
08	280	4.8				---	---	2.9
09	280	5.2	---	---		125	2.8	2.9
10	300	5.6	---	---		---	---	2.9
11	320	6.1	270	---		---	---	2.8
12	300	6.4	260	3.9		---	---	2.7
13	300	6.5	260	---		125	---	2.8
14	300	7.0	290	---		140	---	2.8
15	290	5.2	---	---		---	---	2.8
16	300	5.0	---	---		130	2.6	2.8
17	320	3.9	---	---		130	4.2	(2.6)
18	310	3.9	---	---		130	2.7	4.2
19	380	3.6	---	---		130	3.0	4.3
20	330	(3.8)	---	---		---	4.7	---
21	(300)	(3.9)	---	---		---	4.1	---
22	(310)	---	---	---		---	5.0	---
23	325	(3.4)	---	---		---	5.4	---

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 47

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

December 1950

Time	h'F2	foF2	h'F1	foF1	h'Z	foZ	fEs	(M3000)F2
00	230	>8.4						
01	245	>9.2						
02	230	>7.8						
03	225	5.5						
04	235	4.1						
05	240	3.4						2.0
06	250	3.8						1.8
07	240	7.3						
08	258	10.2	220	---		118	2.1	2.6
09	255	11.4	208	4.6	105	3.1	4.2	
10	270	11.9	200	4.6	100	3.4	6.0	
11	280	12.8	200	4.8	100	3.6	6.0	
12	295	12.8	200	4.8	100	3.6	6.2	
13	290	13.0	200	4.6	100	3.5	4.6	
14	285	12.9	210	4.7	100	3.5	6.1	
15	280	12.2	218	---	100	3.1	4.7	
16	270	12.2	230	---	105	2.7	3.9	
17	250	12.7	---	---	---	2.0	4.0	
18	250	12.3	---	---	---	---	3.8	
19	250	11.5	---	---	---	---	3.4	
20	250	11.8	---	---	---	---	3.0	
21	250	11.6	---	---	---	---	2.8	
22	250	11.6	---	---	---	---	5.0	
23	240	10.7	---	---	---	---	---	

Time: Local.

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

Table 49

Time	December 1950						f _{RS} (M3000)F2
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	250	7.4				4.0	2.9
01	240	7.1				4.0	3.0
02	240	5.9				3.9	2.9
03	250	5.4				3.5	2.8
04	250	4.8				2.8	2.9
05	250	4.7	---	---	E	1.7	3.1
06	240	5.8	240	4.0	110	2.4	3.2
07	300	6.6	230	4.4	105	2.9	3.8
08	300	7.0	220	4.5	100	3.2	4.1
09	300	7.8	200	4.8	100	3.6	4.2
10	320	8.4	200	4.9	100	3.5	4.4
11	330	8.4	200	4.9	110	3.6	4.4
12	330	8.4	200	4.9	110	3.7	4.2
13	320	8.5	200	4.8	100	3.7	4.0
14	310	8.6	220	4.7	105	3.6	4.0
15	300	8.2	220	4.7	100	3.4	2.9
16	300	8.2	220	4.5	100	3.1	3.0
17	270	7.6	230	4.0	110	2.7	3.0
18	250	7.4	---	---	E	4.0	2.9
19	260	7.4				2.7	2.8
20	280	7.3				3.2	2.7
21	300	7.5				4.1	2.7
22	290	7.6				4.4	2.8
23	270	7.6				4.7	2.8

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 51

Time	December 1950						f _{RS} (M3000)F2
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	250	6.0					2.9
01	250	5.5					2.9
02	240	4.4					3.0
03	250	3.8					3.0
04	250	3.5					3.0
05	250	4.0	---	---	E	1.9	3.2
06	230	4.6	220	3.9	100	2.4	3.2
07	320	5.0	200	4.0	90	2.8	3.4
08	350	5.5	200	4.5	90	3.1	3.0
09	350	5.6	200	4.6	90	3.4	4.0
10	330	6.5	200	4.6	90	3.5	4.1
11	340	6.5	200	4.9	90	3.5	4.5
12	340	6.8	200	4.9	90	3.5	3.0
13	330	6.6	200	4.7	90	3.5	3.0
14	350	6.5	200	4.9	90	3.4	2.9
15	320	6.5	200	4.5	90	3.4	3.0
16	300	6.7	200	4.5	90	3.2	3.0
17	290	6.6	210	4.3	90	3.0	3.0
18	260	6.6	210	3.7	100	2.5	2.8
19	240	7.0			100	2.0	3.1
20	240	7.0				3.5	3.1
21	240	7.0				3.4	2.9
22	250	6.5				3.5	2.9
23	250	6.1					2.9

Time: 150.0°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 52

Time	November 1950						f _{RS} (M3000)F2
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	>240	10.0					
01	240	(9.6)					
02	222	(8.9)					
03	210	4.9					
04	235	4.0					
05	262	3.2					
06	260	4.6	---	---	1.3	2.1	
07	242	8.6	---	---	110	2.3	
08	250	11.2	220	---	110	(2.9)	4.0
09	265	12.9	208	---	105	3.2	5.4
10	265	13.7	200	4.5	105	3.5	4.4
11	>272	14.0	200	4.6	105	3.6	4.8
12	285	14.0	200	4.8	100	3.6	4.7
13	280	14.0	200	4.0	105	(3.6)	4.6
14	280	13.5	205	4.1	105	3.3	5.4
15	(275)	13.5	225	---	105	3.0	5.1
16	258	13.9	230	---	---	2.7	4.4
17	250	14.0	---	---	130	1.9	4.0
18	258	13.6				3.8	
19	260	13.4				3.3	
20	>240	11.9				3.0	
21	250	12.6				2.9	
22	250	11.7					
23	250	(10.3)					

Time: Local.

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

Table 53

Time	December 1950						f _{RS} (M3000)F2
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	250	6.5					4.0
01	240	6.4					3.5
02	240	5.6					3.2
03	260	4.7					3.3
04	250	4.1					3.0
05	250	4.3	---	---	E	---	2.8
06	235	5.3	---	---	110	2.4	2.5
07	295	5.7	230	4.4	100	2.9	4.0
08	320	6.6	210	4.5	100	3.3	5.0
09	340	6.9	210	4.8	100	3.5	5.2
10	320	7.0	205	4.8	100	3.6	5.5
11	340	7.1	200	5.0	100	3.5	5.5
12	340	7.2	200	4.8	100	(3.5)	5.2
13	340	7.3	215	4.6	100	3.5	3.0
14	310	7.3	210	4.8	100	3.5	4.7
15	310	7.3	215	4.6	100	3.3	3.0
16	310	7.0	210	4.5	100	3.3	3.0
17	290	7.0	220	4.2	100	2.9	3.1
18	260	6.7	240	---	110	2.4	4.1
19	250	7.0	---	---	(1.8)	3.3	2.9
20	270	7.1	---	---	---	3.5	2.9
21	280	7.0	---	---	---	3.8	2.8
22	285	7.0	---	---	---	4.0	2.8
23	280	7.0	---	---	---	3.7	2.8

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

Table 54

Time	October 1950						f _{RS} (M3000)F2
	h'F2	foF2	h'F1	foF1	h'E	foE	
00	265	(12.2)					
01	250	(11.4)					
02	225	(7.2)					
03	240	6.3					
04	270	4.1					
05	262	3.7					
06	250	6.0	---	---	---	---	
07	250	9.5	235	---	115	2.4	
08	255	11.2	232	---	110	3.1	
09	275	12.6	225	---	110	3.4	
10	275	13.8	210	---	110	3.6	
11	295	13.8	210	---	110	3.8	
12	305	14.1	---	---	110	---	
13	305	14.8	---	---	110	---	3.9
14	295	15.3	205	---	110	3.5	
15	300	15.2	225	---	110	3.2	
16	---	15.1	240	---	110	2.8	3.2
17	250	14.6	250	---	120	2.0	
18	270	14.4					3.2
19	300	14.3					
20	265	14.0					
21	260	(13.8)					
22	275	(12.8)					
23	275	(13.2)					

Time: Local.

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

Table 55

Time	September 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	260	3.7					2.8
01	255	3.5					2.9
02	275	3.4					2.9
03	270	3.4				2.5	2.8
04	250	3.2				2.7	3.0
05	245	3.0	210	—	—	F	2.5
06	230	4.0	210	—	100	1.5	2.8
07	230	4.5	200	—	100	2.1	3.0
08	240	5.3	200	3.9	100	2.7	3.2
09	280	5.5	200	4.2	100	2.8	3.2
10	280	5.1	190	4.2	100	3.0	3.4
11	270	5.3	190	4.5	100	3.1	3.2
12	270	6.2	190	4.4	100	3.2	3.2
13	260	5.3	190	4.4	90	3.1	3.2
14	260	5.3	200	4.3	100	3.0	3.2
15	250	5.2	200	—	90	2.8	3.2
16	250	6.4	210	—	100	2.5	2.8
17	250	5.5	210	—	100	2.0	2.8
18	220	7.0	220	—	100	1.6	3.0
19	210	7.2	—	—	E	3.0	3.2
20	200	6.5				2.8	3.2
21	210	5.3				2.4	3.2
22	235	4.3					3.0
23	270	3.7					2.9

Time: 0.0°.

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

Table 57

Time	September 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	310	5.7					
01	290	6.3					2.4
02	250	4.5					2.2
03	250	4.5					2.0
04	250	3.4					
05	250	3.3					1.8
06	240	5.5					
07	240	7.2	225	—	120	2.5	2.5
08	265	7.8	220	—	118	3.0	
09	290	8.5	225	—	115	3.4	
10	310	10.2	215	5.1	110	3.6	
11	315	12.0	200	5.2	110	—	
12	330	12.7	—	5.2	110	3.8	
13	345	13.8	—	5.3	110	3.7	
14	330	14.4	—	4.9	115	3.5	
15	315	15.7	220	—	115	3.3	
16	295	15.3	230	—	115	3.0	
17	265	14.0	240	—	120	2.5	3.1
18	250	13.6					3.4
19	270	11.5					3.1
20	285	9.9					
21	305	7.8					
22	330	5.8					
23	330	5.2					

Time: Local.

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

Table 59

Time	February 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	390	5.6				4.4	2.4
01	380	5.2				4.4	2.5
02	370	(5.7)				4.4	2.5
03	350	5.0				3.9	2.5
04	360	4.8				2.7	2.5
05	340	4.8				1.4	2.5
06	300	4.8					2.7
07	300	3.9					2.7
08	290	4.2					2.9
09	260	5.6	—	—		3.1	
10	250	6.5	—	—		3.1	
11	260	7.5	—	—		3.1	
12	260	8.0	250	—		3.1	
13	270	8.2	260	—		3.0	
14	260	8.5	260	—		3.0	
15	260	8.1	—	—		3.0	
16	260	7.8	—	—		3.0	
17	260	7.4				3.0	
18	280	5.2			1.8	2.8	
19	310	(6.0)			1.9	2.7	
20	320	5.2			3.5	2.6	
21	350	5.4			3.9	2.6	
22	360	5.8			3.8	2.5	
23	370	5.4			3.8	2.6	

Time: 15.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 56

Time	September 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	300	3.7					2.3
01	305	3.6					2.4
02	312	3.5					2.4
03	300	3.5					2.1
04	290	3.4					2.3
05	270	3.2					2.5
06	250	4.2	—	—	—	129	1.8
07	252	4.8	228	—	3.5	119	2.2
08	278	6.5	225	4.0	112	2.6	3.5
09	302	5.0	225	4.3	111	2.9	3.1
10	295	5.7	220	4.5	110	3.1	3.1
11	290	5.2	210	4.5	111	3.2	4.0
12	305	5.6	210	4.7	109	3.2	4.1
13	300	5.5	210	4.6	111	3.2	3.8
14	300	5.5	220	4.5	109	3.1	3.1
15	295	5.5	225	4.2	110	2.9	2.8
16	280	5.5	240	3.8	113	2.5	2.5
17	258	6.5	260	—	—	121	2.3
18	260	7.3					3.2
19	250	5.9					3.0
20	246	(5.7)					2.4
21	245	5.5					2.4
22	255	4.1					2.4
23	290	3.9					2.3

Time: Local.

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

Table 58

Time	July 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	350	4.5					1.7
01	350	—					2.4
02	350	(4.1)					2.4
03	350	—					2.2
04	325	(4.5)					2.4
05	256	5.9	—	—	—	1.8	4.1
06	(250)	7.0	245	—	—	—	4.3
07	282	7.5	235	—	—	—	4.5
08	(350)	7.8	220	—	—	—	4.7
09	(350)	9.0	—	5.5	—	—	6.0
10	(350)	10.2	—	5.4	—	—	5.1
11	375	10.2	—	5.5	—	—	4.9
12	418	10.8	—	5.5	—	—	4.9
13	385	11.9	—	5.6	—	—	5.0
14	385	12.9	—	5.2	—	—	5.2
15	365	13.5	210	6.1	118	—	5.0
16	350	13.0	245	—	120	3.3	4.0
17	330	12.8	250	—	121	2.8	4.0
18	275	12.4	255	—	130	2.2	3.5
19	280	10.5					3.0
20	342	7.4					2.2
21	390	6.2					2.5
22	380	5.4					1.7
23	360	6.5					1.8

Time: Local.

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

Table 60

Time	January 1950						
	h'F2	foF2	h'F1	foF1	h'E	foE	fEs (M3000)F2
00	390	4.5					4.9 (2.5)
01	360	5.0					4.7 (2.6)
02	400	(4.6)					5.0 (2.6)
03	380	5.0					4.5 (2.5)
04	340	5.0					4.4 (2.5)
05	320	5.1					3.8 (2.5)
06	300	4.5					3.2 (2.8)
07	290	4.0					1.7 (2.8)
08	250	4.3					2.9
09	260	5.2					3.0
10	250	7.8					3.1
11	250	8.5					3.2
12	250	9.3					3.2
13	250	8.8					3.1
14	240	7.8					3.1
15	260	5.5					3.0
16	290	5.4					2.0 (2.8)
17	300	5.4					3.5 (2.8)
18	310	4.8					4.5 (2.7)
19	310	4.8					4.5 (2.5)
20	340	(4.9)					4.5 (2.5)
21	350	5.3					4.5 (2.5)
22	360	4.9					4.4 (2.6)
23	370	(5.1)					4.6 (2.5)

Time: 15.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

TABLE 6
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

hF_2 , Km June, 1951
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.

Lat. 38°7'N, Long. 77°10'W

Day	75°W Mean Time																								
	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	330A	280	(330) ^A	(290) ^S	(260) ^S	250	G	400	390	A	A	370	340	[360] ^A	390	400	370	370	300	[360] ^B	230	A	A		
2	300A	310	320	250	(280) ^S	(290) ^S	270	L	G	350	400	340	330	[350] ^A	370	340	350	330	300	270	270	230 ^H	270		
3	280	280	270	(300) ^S	(290) ^S	230	A	A	A	350	[280] ^A	410	[400] ^A	380	360	400	350	330	300	290	230	230	280		
4	300	280	280	270	A	A	340	420	270	370	360	360	370	360	370	360	370	360	370	240	230	250	240		
5	250	260	260	290	280	260	(280) ^S	310	350	[360] ^A	360	340	370	330	320	310	[280] ^A	[280] ^A	[280] ^A	270	260	250	270A		
6	290	(310)A	(300) ^A	300	K	290	280	K	G	K	A	K	A	K	A	K	460K	390K	340K	330K	270K	260K	270	A	
7	310	(300)A	300	280	270	270	270	270	270	380	380	430	420	370	400H	430	440	440	350	320	260	250	280	280	290
8	280	260	250	240	250	220	H	270	290	450	[240] ^A	380H	410H	480H	M	M	M	M	M	M	M	M	M	M	
9	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
10	1580M	280	270	M	M	M	M	M	M	390	380	M	M	M	M	M	M	M	M	M	M	M	M		
11	290	320	300	280	290	300	280	280	280	(300) ^A	(300) ^A	A	A	400	440	360	350	350	320	260	250	280	280	290	
12	280	(270) ^S	270	(270) ^A	280	(300) ^A	420	460	G	450	[440] ^A	420	430	470	370	(360)H	340	270	270	280	280	280	280	250	
13	A	A	270	290	290	A	L	380	410H	420H	430H	310	360	340	250	350	340	300	(330)A	260	260	280	280	280	
14	(270)A	(320)A	(320)A	(270)A	(270)A	(270)A	420	260	230	330	370H	370H	370H	360	360	420	330	330	350	350	330	260	260	220	
15	240	290	330	330	(310)S	310	430	A	G	G	G	G	G	G	G	460	380	400	420	420	340	A	270	270	
16	30	A	A	A	A	A	A	A	A	G	A	A	A	A	A	A	A	A	A	A	270	270	A		
17	260	280	290	(300)E	(290)A	(290) ^A	300	310H	370H	370H	370	340	400	400K	370K	320K	320K	320K	300K	300K	300K	300K	300K	300K	
18	360K	K	3400K	3400K	3400K	3400K	360K	K	350H	350K	350K	350K	350K	350K	350K	G	K	450K	450K	450K	390K	390K	A	K	
19	(340)K	320K	320K	320K	(310)K	(310)K	320K	G	K	G	K	G	K	G	K	G	K	530K	A	K	A	K	(300)A	(300)A	
20	(350)A	(320)A	(320)A	(320)A	(320)A	(320)A	400	[320] ^A	410	[380]A	350	[350]A	360	330	330	330	330	(380)A	290	290	270	270	270	270	240
21	250	260	260	290	270	290	270	270	270	300	300	250	350	450	370	370	330	330	300	250	250	250	250	230	
22	(300)A	250	260	260	230	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	230	
23	250	260	260	260	280	240H	240H	240H	330H	330H	330H	330H	330H	330H	330H	330H	330H	330H	330H	330H	330H	330H	260		
24	270	250	250	270	260	240	A	L	280	300	300	380	360	A	A	340	310	290	270	(270)A	(270)A	(270)A	250		
25	250	(250)A	(250)A	(280) ^A	(300)A	(300)A	300	(330)H	520	600	500	[440]A	(370)A	430	H	G	510	390	400	350	350	350	350	280	
26	(300)A	330	340	280	280	290	A	G	G	G	G	G	G	G	G	490H	470	390	(420)H	450	430	420	400	320	
27	280	280	280	280	280	280	280	280	280	420	420	400H	400H	370	370	370	370	370	370	370	370	370	370		
28	280	290	290	290	270	270	270	270	270	410H	400	320	350	440	370	330	330	330	330	330	330	330	240		
29	A	(300)A	(300)A	(300)A	(300)A	(300)A	350	310	270	250	250	300	A	A	A	340	350	380	350	320	260	260	A		
30	270 ^H	250	(280) ^S	(250)S	(280)S	260	290	270	270	360	360	390	A	500H	[440]A	390	[400]B	400	340	340	320	320	320		
31																									

Manual □ Automatic □

Sweep 10 sec Mc 10 sec Min 0.25 sec

TABLE 62
Centro! Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

(Characteristic)	Day	McC. (Unit)												June, 1951 (Month)																			
		Washington, D.C.				Lot 38.7°N., Long. 77.1°W.				75W				Mean Time				A.H.M.				McC.											
1	(4.6)A	(4.4)S	(4.1)F	(4.0)A	(3.5)J	(3.3)F	(3.1)S	(2.9)J	(2.7)A	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	
2	4.1	3.5F	3.9V	3.8	3.0	3.2	[3.8]A	(3.6)F	5.0	5.7	[5.8]A	[5.6]F	6.0	6.3	5.8F	5.5	6.0	6.3	5.7	5.5	6.0	6.4	6.8	6.2F	6.6	6.2J	(5.4)A	(4.6)S					
3	4.2	3.6S	3.5	2.7J	2.4J	3.2	4.1J	<4.3G	5.0	[5.3]A	5.5	5.6	6.0	5.8	5.8	6.2	6.4	6.7	6.95	7.5F	7.4	7.6	7.63	(7.4)F	5.2J	4.6	5.2F	5.4					
4	4.8J	(4.4)S	3.9J	3.4E	(3.0)A	(3.3)A	4.2	5.0	5.1	5.8J	5.8	6.2	6.1	6.5	6.7	6.9	6.8	7.0	7.0	7.2	6.8	6.6	6.4	6.45	(6.8)J	(5.3)F	(5.4)S						
5	4.7	3.9	3.1J	2.8J	2.7	3.5	4.7	5.5	5.6	[6.2]A	6.2	6.4	6.3	7.0	7.0	6.8	6.7	6.7	6.4	7.4	7.2	7.4	7.4	7.2	7.4	6.8	6.6F	6.8					
6	5.2F	4.5F	3.7J	3.0E	K2.2J	K2.7J	<3.3G	<3.8G	<4.0E	<4.3E	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
7	5.6F	4.5F	4.7F	4.4E	4.0	4.2	[4.5]F	(5.0)F	5.6	6.1	5.8	6.2	6.0J	6.0F	5.8H	5.7	5.4	5.5	5.6	5.6	6.0	6.2	6.2	6.2	6.0	6.0	5.8	5.8	5.8				
8	5.4	5.3	5.0	4.2	3.7J	3.5H	4.0H	4.8	5.3	[5.6]A	6.0H	[5.6]F	6.7H	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M					
9	M	5.2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M					
10	5.2	4.8	4.8	M	M	M	5.7	[6.2]M	7.0	7.4	7.5	7.4	7.2	7.2	7.4	7.5	7.8	7.8	8.2	7.6	7.4	6.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4				
11	4.8	4.9	4.6J	4.2	4.5E	5.4J	5.7	6.1	6.2	[6.6]A	6.8	6.4	7.4	7.1	7.7	[7.2]A	[7.3]A	7.4	7.6	7.6	7.0	6.1	5.9	5.9	5.9	5.9	5.9	5.9	5.9				
12	6.0	5.5P	5.0V	3.7P	3.2	4.5Z	4.5F	5.1	4.4S	5.6	[5.6]A	5.6H	6.1	6.1	6.7	6.7	6.8	6.8	6.8	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8			
13	5.3	4.9F	(4.4)F	4.1	(3.9)F	(4.0)F	4.9	5.6	(5.8)H	6.2H	6.8H	8.0	7.2	7.4	7.0F	7.4	7.8F	7.5	7.6	7.3H	7.2J	6.6F	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6		
14	6.0	5.2F	(5.2)F	4.8F	(4.5)S	4.4F	(5.4)S	6.4	6.8	6.4H	7.0	7.4H	7.6	7.4	7.6	7.2	7.8	8.4	8.8	9.0	9.0	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8		
15	5.2	4.5	3.7	3.4	3.3S	3.5	4.3	5.1	<4.4G	<4.4G	<4.4G	<4.6G	<4.6G	<4.7G	6.1	6.1	6.0	6.4	6.4	6.1	6.0	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4		
16	5.0	4.4P	[3.4]A	A	3.2	4.6	[5.2]A	<4.8G	<4.8G	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17	5.6	5.0F	4.4F	4.0	3.7F	4.4	5.3	6.2	6.2H	5.8	6.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0				
18	K(2.8)F	J(K2.7)H	K(2.4)F	K(2.4)F	K(2.5)F	3.3E	K(4.0)F	K(4.0)F	H	<4.2G	5.1	5.5	5.6	<4.6E	<4.6E	5.2K	<4.7G	5.5H	5.7K	5.6K	6.0K	6.0K	6.0K	6.0K	6.0K	6.0K	6.0K	6.0K	6.0K				
19	4.0K	3.5S	K2.9F	K2.9F	K2.6F	3.4E	3.2E	3.2E	<3.4E	<3.8E	<4.0E	5.3	5.6	5.6	<4.4G	<4.4G	<4.6E	<4.6E	5.0K	A	A	A	A	A	A	A	A	A	A	A			
20	5.0	[4.6]A	(4.1)S	(3.8)A	(3.4)A	3.7J	3.0J	3.5J	3.5J	3.5J	3.5J	4.0	4.6	5.0	[5.4]A	[5.4]A	[6.2]A	6.0	6.6	6.8	7.0	7.3	8.0S	8.2	7.6	7.2	7.2	7.2	7.2	7.2			
21	(5.1)S	4.9	4.2	3.9F	3.8S	4.0	4.6	5.0	5.6	5.6H	5.2H	6.0	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.4	6.8S	7.0S	7.0S	(7.2)S	7.0S	7.0S	7.0S	7.0S	7.0S	7.0S	7.0S	7.0S	7.0S
22	5.1F	5.4	5.0	4.3E	4.4	(4.8)F	(5.8)F	[6.3]M	6.8H	7.0	(7.0)H	7.1H	6.4F	6.4	6.5	6.6	7.2	7.4	7.6	6.6F	6.6F	6.6P	6.6	6.3F	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
23	5.2S	4.9F	[4.2]S	3.3S	3.3S	3.7F	3.9H	4.8	5.1H	5.8	5.9	5.6	5.6	6.1H	6.0F	5.6F	5.6H	6.0	6.4	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8		
24	4.5S	4.3J	3.8S	3.5S	3.5S	3.8	4.2	5.8	5.7P	6.7Y	[6.8]A	6.3	6.2	6.5	6.8	7.0	7.9	8.0	7.6P	7.2	(7.0)A	6.4	6.2S	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
25	5.6S	5.0	4.0F	3.6E	3.5	3.4	(3.0)H	4.1A	(4.5)F	4.9	[5.2]A	5.4	5.4	5.4	(4.5)H	<4.5G	5.0	5.2	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
26	(4.2)S	3.6F	3.6F	(3.2)S	(3.2)S	3.1F	3.3G	<3.7G	<4.1G	(4.0)H	5.0	5.2	5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4			
27	4.2	3.9	3.6	3.1F	(3.1)S	3.4J	3.0F	4.0	4.5	[4.7]H	[4.9]H	5.1	[5.2]A	[5.3]A	[5.3]A	[5.3]A	[5.3]A	[5.3]A	5.4	5.4	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6		
28	(4.1)S	3.9	(3.6)S	(3.7)S	(3.7)S	(3.4)S	4.2J	(4.6)A	4.8F	5.4H	5.7	6.0	5.8	5.6	5.7	6.1	6.2B	6.4	6.2	6.2	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	
29	A.	(4.6)S	[4.6]A	(3.4)S	(3.3)S	3.7	4.5	(5.1)A	5.2	6.2	A	A	5.6	5.8	5.8	5.8	6.0	6.6	6.8	7.2H	7.2F	7.2N	(5.2)A	4.4E	(4.3)S	(4.3)F	(4.3)S	(4.3)F	(4.3)A				
30	4.5S	(4.5)H	3.8Z	3.9F	(2.6)S	3.1H	4.0	4.5	5.0	5.0F	5.2H	5.2	5.2	5.2	5.2	5.2	5.2	5.2	6.6	7.0	6.8	6.6	5.6	5.3	5.3	5.3	5.3	5.3	5.3	5.3			
31																																	
Median	5.0	4.5	4.0	3.7	3.3	3.5	4.4	5.0	5.1	5.6	5.8	6.0	6.0	6.0	6.1	6.1	6.2	6.4	6.6	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6		
Count	38	30	29	27	27	18	29	29	29	26	27	28	27	27	27	27	27	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	

Manual Automatic

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

For copy dated June 1946

TABLE 64
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

h'FI Km June
(Characteristic) (unit) (Month)
Observed at Lat. 38°7'N, Long. 77.1°W

Day	75°W												Mean Time						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			
25																			
26																			
27																			
28																			
29																			
30																			
31																			
Median	—	240	230	220	210	210	220	220	220	220	210	220	220	220	220	220	220	220	—
Count	1	19	22	24	18	17	20	24	23	21	23	21	18	15	2	—	—	—	—

Sweep 1.0 Mc to 25.0 Mc in 0.25 min
Manual Automatic

TABLE 65
IONOSPHERIC DATA
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

$f_{0.1}$, Mc
(Characteristic)
Mc
(Units)
June
(Month)
Washington, D.C.
Observed at

Lat. 38.7°N, Long. 77.1°W

Day	75°W Mean Time												75°W Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Median	-	3.5	4.0	4.3	4.5	4.6	4.7	4.8	4.9	4.7	4.6	4.5	4.7	4.6	4.5	4.6	4.5	4.7	4.6	4.5	4.6	4.5	4.6	4.5	
Count		12	24	24	25	25	21	23	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27

National Bureau of Standards
Scaled by: MCC., W.A.P., A.H.M.

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min
Manual Automatic

TABLE 66
IONOSPHERIC DATA

National Bureau of Standards
 (Institution)

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

Calculated by: A.H.M., McC.

$h^{\prime}E$, Km (Unit)
 (Characteristic) June, 1951
 Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								

Manual Automatic

Sweep 1.0—Mc to 25.0—Mc in 5.25-min

Median

Count

TABLE 67
Ionosphere, National Bureau of Standards,
IONOSPHERIC DATA

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

fo E		Mc (Characteristic)		June (Month)		1951	
Observed at		Washington, D.C.		Lat 38.7°N, Long 77.1°W			
Doy	00	01	02	03	04	05	06
1						A	
2						2 1	
3						2 2	
4						2 1	
5						2 5	
6						2 3	
7						A	
8						A	
9						M	
10						M	
11						A	2.5
12						A	
13						A	
14						2 5	H
15						2 5	
16						A	
17						2 4	
18						(2.5)P	
19						2 4	K
20						A	
21						2 5	
22						2 5	
23						2 4	
24						A	
25						2 3	
26						2 1	
27						A	
28						2 2	
29						2 2	
30						A	
31							

EEP 1.0 Mc to 25.0 Mc in 0.25 min
Manual Automatic

TABLE 68**IONOSPHERIC DATA**

Es, Mc, Km June, 1951

(Characteristic) (Unit)

Observed at Washington, D. C.

Lat. 38.7°N, Long. 77.1°W

National Bureau of Standards

(Institution)

Scaled by: MCC., W.A.P., A.H.M.

Calculated by: A.H.M., W.A.P.

		75°W Mean Time																										
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	5.3 Y/10	37.1/20	11/10	4.2/2.0	6.2 Y/10	11/10	37.1/20	6.2 Y/10	G	5.5 Y/10	20.0/10	9.6 Y/10	5.7 Y/20	6.8 Y/10	8.2 Y/10	10.4 Y/10	4.0 Y/10	4.9 Y/10	8.0 Y/10	3.2 Y/20	9.6 Y/20	11/2 Y/10	2.6 Y/100					
2	8.5 Y/10	E	E	E	E	E	6.2 Y/10	5.2 Y/20	4.2 Y/10	8.2 Y/10	7.8 Y/10	9.0 Y/10	9.0 Y/10	7.5 Y/10	G	G	G	3.3 Y/10	3.3 Y/20	E	E	E	E					
3	E	E	E	E	E	E	5.8 Y/100	5.0 Y/30	6.0 Y/10	8.8 Y/10	10.4 Y/10	7.0 Y/100	G	G	G	4.6 Y/20	3.6 Y/20	3.3 Y/20	E	3.2 Y/10	3.3 Y/10	3.1 Y/10						
4	3.2 Y/100	3.1 Y/10	2.3 Y/10	3.8 Y/10	3.0 Y/10	6.8 Y/10	11/10	6.8 Y/10	4.3 Y/20	4.7 Y/20	4.1 Y/10	4.3 Y/10	9.8 Y/10	G	G	G	3.9 Y/20	E	E	2.5 Y/10	E	3.6 Y/100						
5	3.1 Y/100	3.2 Y/100	3.2 Y/100	E	2.1 Y/20	E	G	6.8 Y/10	4.6 Y/10	7.4 Y/10	5.1 Y/10	11/0	G	5.0 Y/100	5.4 Y/100	5.3 Y/10	11/0	8.0 Y/10	7.6 Y/20	8.2 Y/10	9.6 Y/100	9.8 Y/100	9.0 Y/100	6.0 Y/100				
6	9.6 Y/100	5.6 Y/100	5.6 Y/100	5.8 Y/20	5.5 Y/35	5.0 Y/100	E	5.8 Y/10	6.6 Y/100	3.6 Y/100	5.2 Y/20	5.0 Y/100	7.6 Y/10	11/0	11/0	5.9 Y/100	5.7 Y/100	4.7 Y/100	G	4.5 Y/100	3.6 Y/10	5.3 Y/10	6.4 Y/100					
7	6.0 Y/100	3.6 Y/100	3.7 Y/100	E	5.0 Y/100	3.7 Y/100	4.1 Y/10	4.7 Y/20	4.6 Y/20	5.8 Y/10	8.8 Y/10	11/0	4.8 Y/100	5.3 Y/100	6.4 Y/100	10.2 Y/100	G	G	G	E	E	E	E	E				
8	E	E	E	E	E	E	8.2 Y/30	3.1 Y/10	3.8 Y/10	7.2 Y/20	8.4 Y/10	6.4 Y/10	7.4 Y/100	G	M	M	M	M	M	M	M	M	M	M				
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M					
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	G	6.2 Y/100	5.4 Y/100	3.7 Y/100	3.6 Y/100	4.0 Y/100	2.9 Y/100	E	E				
11	E	E	E	3.2 Y/20	2.1 Y/10	E	8.8 Y/100	3.9 Y/100	5.8 Y/100	5.4 Y/20	6.8 Y/100	3.6 Y/100	4.7 Y/100	5.9 Y/100	5.5 Y/100	5.5 Y/100	11/0	11/0	10.3 Y/100	9.0 Y/100	6.6 Y/100	E	E	E				
12	E	E	3.2 Y/20	10.4 Y/20	6.0 Y/20	3.7 Y/120	2.2 Y/120	4.0 Y/10	4.3 Y/120	9.8 Y/10	5.0 Y/120	9.1 Y/10	8.6 Y/110	5.8 Y/110	5.2 Y/110	10.5 Y/110	G	G	4.2 Y/140	3.6 Y/130	4.1 Y/120	4.2 Y/120	2.7 Y/120	E				
13	4.8 Y/100	4.4 Y/100	3.6 Y/100	4.1 Y/100	3.8 Y/100	4.4 Y/110	6.3 Y/120	6.3 Y/120	G	G	G	G	5.4 Y/120	5.6 Y/120	5.1 Y/120	G	G	7.0 Y/110	3.9 Y/120	3.1 Y/120	4.4 Y/110	4.1 Y/110	4.2 Y/110					
14	4.0 Y/100	5.3 Y/110	2.6 Y/110	4.0 Y/100	3.5 Y/100	E	G	G	G	G	G	G	5.8 Y/100	G	3.2 Y/120	G	1.9 Y/130	E	E	E	E	E	E	E				
15	E	E	E	E	E	E	1.9 Y/130	G	7.8 Y/110	5.0 Y/120	G	G	G	G	G	G	4.7 Y/120	9.0 Y/120	5.0 Y/120	E	5.8 Y/120	4.3 Y/120						
16	10.0 Y/120	7.2 Y/110	9.0 Y/110	10.0 Y/100	6.1 Y/10	4.1 Y/120	7.9 Y/120	2.2 Y/120	4.0 Y/10	4.3 Y/120	9.8 Y/120	5.0 Y/120	9.4 Y/120	8.2 Y/120	7.6 Y/120	9.8 Y/120	6.2 Y/120	10.2 Y/120	4.5 Y/120	5.0 Y/110	4.5 Y/110	5.4 Y/110	E					
17	E	E	E	E	E	E	2.3 Y/100	3.2 Y/100	5.8 Y/100	6.2 Y/20	6.2 Y/10	G	G	G	G	G	G	G	4.2 Y/140	3.6 Y/130	4.1 Y/120	4.2 Y/120	2.7 Y/120	E				
18	E	E	E	E	E	E	E	E	E	E	E	E	9.8 Y/100	G	G	G	G	5.6 Y/120	7.4 Y/120	6.5 Y/110	5.4 Y/110	6.0 Y/110	E	E				
19	4.4 Y/100	E	E	E	E	E	6.0 Y/100	8.0 Y/100	G	5.6 Y/120	8.2 Y/120	4.6 Y/100	11/0	3.6 Y/110	G	G	4.5 Y/130	10.6 Y/110	12.5 Y/110	12.5 Y/110	11/0	5.5 Y/110	8.6 Y/110	7.2 Y/110				
20	7.2 Y/100	8.6 Y/100	6.8 Y/100	6.2 Y/100	7.6 Y/100	6.4 Y/100	3.7 Y/120	2.0 Y/120	5.6 Y/120	4.6 Y/120	5.4 Y/120	10.0 Y/120	9.4 Y/120	8.2 Y/120	7.6 Y/120	9.8 Y/120	10.2 Y/120	8.0 Y/100	6.4 Y/100	5.0 Y/100	4.5 Y/100	5.4 Y/100	E					
21	E	E	E	E	E	E	G	3.0 Y/100	4.6 Y/100	6.6 Y/100	6.6 Y/10	7.8 Y/10	4.1 Y/100	G	G	G	G	G	G	G	E	E	B					
22	4.0 Y/100	3.2 Y/100	6.4 Y/190	E	1.6 Y/100	2.4 Y/100	3.8 Y/120	4.6 Y/120	5.1 Y/110	G	5.4 Y/100	5.8 Y/100	B	G	G	G	G	1.8 Y/100	3.9 Y/100	5.6 Y/100	7.4 Y/100	4.4 Y/100	E					
23	E	E	E	E	E	E	5.2 Y/20	3.1 Y/110	5.8 Y/110	3.4 Y/110	1.8 Y/110	4.3 Y/110	G	4.7 Y/100	3.9 Y/100	6.4 Y/100	6.8 Y/100	8.4 Y/100	G	5.6 Y/110	5.3 Y/110	3.8 Y/110	6.8 Y/110	2.7 Y/110	E			
24	E	E	E	E	E	E	E	E	E	E	E	E	5.0 Y/100	7.0 Y/100	10/0	10/0	11/10	12/10	10/0	10/0	3.5 Y/100	8/1 Y/10	12/4 Y/100	5.8 Y/100	4.0 Y/100	4.9 Y/110		
25	7.4 Y/100	6.2 Y/100	4.0 Y/100	7.0 Y/100	8.0 Y/100	2.1 Y/100	3.5 Y/100	4.6 Y/100	6.4 Y/100	8.4 Y/100	8/1 Y/100	G	G	G	G	G	3.8 Y/130	2/1 Y/120	27/1 Y/110	E	E	E						
26	3/1 Y/130	3/1 Y/120	5/3 Y/100	E	E	E	5.6 Y/110	7.4 Y/100	3/6 Y/100	G	G	G	G	6.4 Y/120	G	8/2 Y/110	4/3 Y/110	10/0	3.3 Y/110	3.8 Y/110	3/0 Y/110	E	E	E				
27	4.0 Y/110	3/1 Y/100	3/4 Y/100	3/2 Y/110	3/1 Y/110	5/2 Y/100	5/6 Y/100	3/6 Y/100	1/0	M	6.0 Y/100	7.0 Y/100	5/8 Y/100	5/3 Y/100	5/1 Y/100	G	G	5.8 Y/110	7.4 Y/110	8.2 Y/110	5.4 Y/110	3/6 Y/110	E					
28	E	E	E	E	E	E	E	E	E	E	E	E	2.9 Y/100	5.2 Y/100	5.4 Y/100	4.6 Y/100	7.0 Y/100	4/1 Y/100	G	B	G	5.5 Y/110	3/9 Y/110	6/4 Y/110	9.8 Y/110	13.5 Y/100	E	
29	10.6 Y/100	6.4 Y/100	6.0 Y/100	3.6 Y/100	3.2 Y/100	G	3.6 Y/110	5.4 Y/110	4.4 Y/100	13.6 Y/100	9.2 Y/100	6.2 Y/100	5.0 Y/100	G	G	G	5.8 Y/100	5.8 Y/100	3.9 Y/100	8.2 Y/100	5.6 Y/100	4.0 Y/100	E					
30	2.1 Y/10	E	E	E	E	E	E	E	E	E	E	E	3.0 Y/100	G	5.6 Y/110	5.0 Y/110	5.3 Y/100	5.8 Y/100	4.6 Y/100	G	4.2 Y/100	G	3.0 Y/120	3/7 Y/100	5.6 Y/100	7.6 Y/100	1.0 Y/100	E
31																												
Median	3.2	3/1	3/1	2.2	3.2	3.3	3.8	4.4	4.7	5.6	6.5	5.6	4.0	**	**	4.5	3.6	4.5	3.8	3.4	3.4	3.6	**					
Count	28	28	28	28	28	28	28	27	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	27				

** MEDIAN IF LESS THAN MEDIAN f0E, OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

*** MEDIAN f0E, OR LESS THAN f0E, f0F, f0G, f0H, f0I, f0J, f0K, f0L, f0M, f0N, f0O, f0P, f0Q, f0R, f0S, f0T, f0U, f0V, f0W, f0X, f0Y, f0Z.

Manual Automatic

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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

TABLE 69
IONOSPHERIC DATA

(M1500)F2
(Characteristic)
Observed at Washington, D.C.

June, 1951

(Month)

Lat 38°N Long 77.1°W

75°W Mean Time

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)A	(2.0)J	(1.9)J	(2.0)J	(2.0)J	(2.0)J	(2.0)J	(2.0)J	G	1.9	A	(1.8)J	2.0	A	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	(1.9)J	(1.9)A		
2	2.0	1.8	F	1.8	V	2.0	1.8	J	A	1.8	F	2.0	2.0	F	(1.8)A	1.9	2.0	2.0	1.9	2.0	S	(2.0)S	(1.9)J			
3	1.9	2.0	S	2.0	(1.8)J	(1.9)S	(1.9)J	(1.9)S	G	2.1	A	(1.9)J	1.9	A	1.8	2.0	1.9	1.9	1.9	2.0	N	2.0	2.0	1.9		
4	(1.9)J	(1.9)S	(1.9)J	(1.9)S	(1.9)J	(1.9)S	(1.9)J	(1.9)S	A	1.9	J	(1.9)S	1.9	A	1.8	2.0	1.9	1.9	1.9	2.0	M	(2.0)S	(1.9)J			
5	1.9	2.0	S	2.0	1.9	J	(1.8)J	(1.9)J	A	2.1	2.2	1.9	A	2.0	2.0	1.9	1.9	1.9	2.0	N	2.0	2.0	2.0			
6	2.0	S	1.9	F	1.8	F	1.9	K	K	(1.6)J	K	(1.6)J	K	G	K	G	K	G	K	A	K	A	K	1.9		
7	1.9	F	2.3	F	1.9	F	1.9	F	N	(1.9)J	1.9	1.8	(1.9)J	1.9	H	1.8	1.8	1.8	1.8	1.8	2.0	2.0	2.0	2.0	1.9	
8	1.8	1.9	F	1.9	J	(2.0)S	2.0	H	2.0	M	1.9	A	1.8	H	(2.0)J	1.9	H	1.5	M	M	M	M	M	M		
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
10	2.0	1.8	L	1.8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
11	1.8	1.8	1.9	1.9	(2.0)J	1.9	2.0	F	(2.0)J	2.1	1.9	A	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	
12	1.8	1.9	V	1.9	P	1.8	2.0	F	2.0	J	1.8	F	1.8	H	1.8	H	1.8	H	1.9	1.9	1.9	1.9	1.9	1.9	1.8	
13	1.8	1.9	F	(1.9)S	1.8	J	(1.9)J	(1.9)J	G	1.9	H	(1.8)H	1.9	H	2.1	1.9	1.9	2.0	1.9	2.0	1.9	2.0	1.9	1.9	1.9	
14	1.9	F	1.8	(1.8)F	1.9	F	(2.0)S	(2.0)F	J	(2.0)J	2.0	1.9	(2.0)J	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9
15	1.9	1.8	1.6	1.6	1.7	H	1.6	1.7	1.8	1.8	1.9	A	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	
16	1.9	2.0	A	A	A	A	A	A	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	1.9		
17	2.0	1.9	F	1.9	F	1.9	J	1.7	F	1.9	2.0	J	1.8	H	1.8	H	1.8	K	1.6	K	1.7	K	1.7	K	1.7	
18	K	(1.9)J	(1.9)F	(1.9)K	(1.9)E	(1.9)K	(1.9)E	(1.9)J	(1.9)S	(1.7)S	(1.7)F	(1.8)J	(1.6)J	G	K	G	K	G	K	G	K	G	K	G	K	
19	1.7	K	S	K	K	J	K	K	J	K	(1.8)J	K	(1.6)J	K	G	K	G	K	G	K	G	K	G	K	1.9	
20	1.9	1.8	T	(1.7)J	F	(1.6)K	J	K	(1.8)S	2.0	F	G	G	G	G	G	G	G	G	G	G	G	G	G		
21	1.9	A	(4.8)S	(1.8)J	A	(2.0)J	(2.0)J	(2.0)J	G	2.1	N	A	(2.0)J	A	1.9	A	2.0	1.9	1.9	2.0	2.1	2.1	1.9	1.8		
22	1.7	F	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
23	1.9	S	2.0	F	S	1.9	2.0	N	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		
24	1.20	1.1	S	1.20	P	2.0	F	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0		
25	1.9	F	2.0	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9		
26	(1.8)S	1.8	F	1.9	S	(1.9)S	(1.9)J	(1.9)S	A	G	G	(1.8)J	G	G	G	G	G	G	G	G	G	G	G	G		
27	1.9	2.0	J	1.9	J	(2.0)S	(2.0)J	(2.0)J	G	1.9	N	A	(2.0)J	A	1.9	A	2.0	1.9	2.0	1.9	2.1	2.1	2.0	2.0		
28	1.9	S	(1.9)J	(1.9)S	(1.9)S	(1.9)J	(1.9)S	(1.9)J																		
29	A	(2.1)J	A	(1.9)A	(1.9)A	(2.0)S	(2.0)J																			
30	(1.9)J																									
31																										

Calculated by: **McC.**, **W.A.P.**, **A.H.M.**

Mean Time

75°W

TABLE 70
IONOSPHERIC DATA

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

(M3000)F2, (Unit) June, 1951
 Observed at Washington, D.C.

Lot 387°N, Long 77.1°W

Doy	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	75°W Mean Time						
1	(2.9) ^A	(3.0) ^S	(2.9) ^A	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S				
2	3.0	2.7 ^F	2.8 ^V	3.0	2.8	3.1	A	3.1	2.7 ^F	3.0	3.0 ^F	3.0 ^F	(2.7) ^A	2.8 ^F	2.9	2.8	2.9	2.8	2.9	2.8	2.9	2.8	2.9	2.8	2.9	2.8	2.9	2.9			
3	2.8	3.0 ^S	3.0	(2.7) ^S	(2.8) ^S	2.8	(3.2) ^S	G	3.1	A	2.8	A	2.7	3.0	2.8	2.9	2.9	3.0	3.1	3.0 ^S	3.2 ^H	3.0 ^F	(2.9) ^S	2.9	(3.1) ^H	(3.1) ^S	(3.0) ^S	(2.8) ^S			
4	(2.9) ^S	(2.9) ^S	(2.9) ^S	(2.8) ^S	A	(2.8) ^A	2.9	3.1	2.7	(2.9) ^S	2.9	2.9	2.9	2.8	2.9	2.9	3.1	3.1	3.2 ^H	3.0 ^S	3.0 ^F	(2.9) ^S	2.9	(3.1) ^S	(3.1) ^S	(3.0) ^S	(2.8) ^S				
5	2.8	3.0	(2.9) ^S	(2.8) ^S	3.4	3.2	2.8	3.1	2.9	A	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	3.2 ^H	3.0 ^F	3.0 ^S	3.0 ^S	3.0	3.0	3.0	3.0	3.0			
6	2.9 ^S	2.8 ^F	2.7 ^F	2.9 ^K	(2.5) ^S	(3.0) ^S	G	K	G	K	A	K	A	K	A	K	A	K	2.6 ^K	2.9 ^K	3.1 ^K	3.1 ^K	3.1 ^K	3.0 ^K	2.9 ^K	2.8 ^P	2.9 ^F	(2.9) ^P			
7	2.8 ^F	3.3 ^F	2.8 ^F	(2.7) ^F	2.9	3.0	N	(3.3) ^P	2.9	2.7	2.7	2.7	(2.8) ^J	2.9 ^H	2.8	2.7	2.7	2.7	2.7	2.9	2.9	2.9 ^S	2.9	2.9	2.8	2.8 ^S	2.8 ^S	2.7	2.7		
8	2.7	2.9	2.9	2.9	(3.0) ^S	3.0 ^H	3.2 ^H	2.9	2.8	A	2.7 ^H	(3.1) ^H	2.6 ^H	2.4	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
9	M	2.7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
10	3.0	2.7	2.7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
11	2.7	2.7	2.8	(3.0) ^S	2.8	3.0 ^F	(3.2) ^F	3.1	3.1	2.9	A	2.7	2.5	2.8	2.8	2.9	(2.9) ^A	2.9	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
12	2.8	2.8 ^P	2.9 ^V	2.8 ^F	2.8	3.0	3.2 ^F	(2.8) ^J	2.7	G	2.7 ^H	A	2.7 ^H	2.8	2.7	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9		
13	2.8	2.8 ^F	(2.8) ^S	2.7	(2.8) ^J	(2.9) ^J	2.8	3.0	(2.8) ^H	2.8 ^H	2.6 ^H	3.0	2.9	2.9	2.8 ^F	2.9	2.8	2.9 ^F	2.9	3.0	2.9 ^H	(2.9) ^J	2.9 ^F								
14	2.8 ^F	2.7 ^F	(2.8) ^S	2.9 ^F	(3.0) ^S	3.2 ^F	(3.1) ^S	3.0	3.0	2.8 ^H	3.0	2.8 ^H	2.8	2.8	2.8	2.5	2.7	2.6	2.6	2.6	3.0	2.8	2.9	(2.9) ^S	2.9 ^S	2.9 ^S	2.9 ^S	2.9 ^S	2.9 ^S		
15	2.9	2.7	2.5	2.5	2.5	2.6 ^S	2.7	2.7	2.8	G	G	G	G	G	G	G	G	2.6	2.8	2.9	2.7	2.6	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
16	2.9	3.0 ^P	A	A	A	2.7	3.0	A	G	G	A	A	A	A	A	A	A	A	2.7	2.7	2.9	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.7	2.7	2.7
17	2.9	2.8 ^F	2.8 ^F	2.8	2.7 ^F	2.9	3.1	3.0	2.7 ^H	2.9	2.8	2.8	3.0	2.8	2.7 ^K	2.7 ^K	2.8 ^K	2.7 ^K	2.5 ^K												
18	(2.5) ^F	(2.6) ^F	K(2.5) ^S	K(2.4) ^J	K(2.6) ^S	K(2.8) ^F	K(2.5) ^H	2.6 ^K	G	K	2.6 ^K	G	K	G	K	2.6 ^K	2.7 ^K														
19	1.5 ^K	2.7 ^K	K(2.5) ^F	K(2.5) ^S	K(2.5) ^J	K(2.5) ^H	K(2.5) ^S	3.0 ^K	G	K	G	K	G	K	G	K	G	K	2.4 ^K	A	K	2.9 ^K	2.8 ^K								
20	2.8	A	(2.7) ^S	(2.7) ^S	A	(3.0) ^S	(3.0) ^S	3.1 ^H	A	2.9	A	2.8	A	(3.0) ^A	A	2.8	2.9	3.0	2.8	2.8	2.9	3.1	2.8 ^S	2.9 ^S							
21	(3.0) ^S	2.9	2.7	2.7 ^S	2.8 ^S	2.9	3.2	3.0	3.0 ^H	3.0	2.6	3.0	3.0	2.7	3.0	3.0	2.9 ^F	3.0	3.0 ^S	3.0 ^S	3.0 ^S	(2.9) ^S	2.9 ^S	(2.9) ^S	(2.9) ^S	(2.9) ^S	(2.9) ^S	(2.9) ^S	(2.9) ^S	(2.9) ^S	
22	2.6 ^F	2.9	2.7	2.9 ^S	2.9	(2.9) ^F	(2.9) ^H	N	(2.9) ^H	(3.2) ^J	3.0	(2.9) ^H	2.9 ^H	3.0	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
23	2.9 ^S	3.0 ^F	5	2.9 ^S	2.9 ^F	3.0 ^H	3.0	2.9 ^H	3.2	3.3	3.0	3.0 ^H	2.9	2.8 ^F	2.7 ^H	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
24	(3.1) ^S	3.0 ^F	2.9 ^S	2.9 ^S	3.1	3.1	3.1 ^P	3.1	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
25	2.8 ^S	3.0	2.8 ^S	2.7 ^S	2.8	2.8	(2.2) ^H	(2.4) ^A	2.5	A	2.9	2.7	(2.8) ^N	G	2.5	2.9	2.7	(3.0) ^S	3.0	3.0 ^S	3.0	3.1	(2.9) ^S	(2.8) ^S							
26	(2.8) ^S	2.8 ^S	2.8 ^S	(2.8) ^S	(2.8) ^S	A	G	G	(2.7) ^H	2.7	3.0	2.9	2.4	2.6 ^P	(2.6) ^P	2.7	2.8	2.9	3.0 ^H	3.0	3.0 ^H	3.0	3.0 ^S								
27	2.8	2.8	3.0	2.9 ^S	(3.0) ^S	(3.0) ^S	(3.0) ^S	(3.2) ^J	(2.9) ^H	M	2.8	A	(3.1) ^H	3.0	2.7	(3.0) ^S	3.0	2.9	3.0 ^F	3.0	3.0 ^F	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
28	(2.9) ^S	2.9	(2.9) ^S	(2.9) ^S	(2.8) ^S	(2.8) ^S	(2.8) ^S	(2.7) ^J	(3.4) ^A	2.8 ^H	2.7	3.1	2.9	2.7	3.0	2.9	2.9	2.9 ^P	3.2	3.0 ^H											
29	A	(3.1) ^S	A	(2.9) ^S	(3.0) ^S	3.1	(3.0) ^A	3.0	3.1	A	A	3.2	3.1	3.0	2.8	2.9	2.9	3.0 ^H													
30	(2.8) ^H	(3.0) ^H	2.8 ^Z	3.0 ^F	(2.9) ^J	3.1 ^H	3.4	3.0	3.0	(2.7) ^J	G	2.6 ^H	2.9 ^A	B	2.7	2.9	3.0	3.0	3.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1		
31																															
Median	2.8	2.9	2.8	2.9	(2.8)	3.0	3.0	2.9	2.8	2.7	2.9	2.8	2.7	2.8	2.8	2.8	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Count	29	26	27	25	27	29	26	26	27	26	26	27	26	26	27	27	27	27	28	26	27	28	27	29	27	29	27	29	27	29	

Sweep 1:0 Mc to 25.0 Mc in 0.25 min

Manual □ Automatic □

National Bureau of Standards
 (Institution)

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

Calculated by:

TABLE 71
 IONOSPHERIC DATA

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

(M3000)FI
 (Characteristic)
 June
 (Month)
 Observed at Washington, D. C.
 Lot 387°N, Long 77.1°W

June 1951
 (Month)

75°W Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								

Sweep 1.0 Mc to 25.0 Mc in 0.25 min
 Manual Automatic

TABLE 72
IONOSPHERIC DATA
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

(M 1500)E, (Unit) Washington, D.C.
(Characteristic) June (Month)
Observed at Lat. 38°7'N, Long 77.1°W

**TABLE 72
IONOSPHERIC DATA**

Day	75°W												Mean Time														
	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	A	A	A	A	4.3	4.3	A	A	A	A	4.3	4.4	(4.3)P	B	A	A	4.4	4.4	4.4	4.4	4.4	4.4	4.4	A			
2					4.1	4.2	4.3	4.2	(4.2)A	A	A	4.1	4.1	B	4.1	4.1	4.2	4.2	4.2	4.2	4.2	4.2					
3					4.0	4.3	4.1	4.2	4.3	A	A	4.0	4.0	P	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	A				
4					4.1	4.3	4.3	4.2	4.2	P	(3.1)P	A	A	4.0	P	4.3	(4.6)P	A	(4.7)P	A	(4.7)S	4.5	B				
5					4.2	4.2	4.4	4.4	A	4.5	4.5	4.5	4.5	P	B	A	B	B	4.0	4.0	4.0	4.0					
6					4.4	4.4	4.4	4.3	A	4.1	4.6	N	A	4.4	(4.3)R	4.2	P	A	B	K	4.2	K	4.2				
7					A	(4.2)P	4.4	4.4	4.5	A	A	A	B	4.1	P	M	M	M	M	M	M	M	M				
8					A	4.3	4.1	4.3	4.2	P	4.2	4.2	P	(4.1)P	M	M	M	M	M	M	M	M	M	M			
9					M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
10					M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
11					A	4.2	4.3	4.2	4.3	4.2	4.2	P	B	(4.3)P	4.2	P	(4.3)P	4.2	P	4.3	(4.3)B	4.2	4.2	4.2	4.2	5	
12					A	4.1	P	4.1	4.2	4.2	4.3	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
13					A	4.5	4.3	4.4	4.4	B	4.3	4.2	P	B	B	B	B	B	B	B	B	B	B	B	B	B	
14					4.0	H	4.2	4.3	4.6	4.6	4.6	4.6	B	4.3	P	A	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
15					4.1	4.3	4.8	4.9	4.3	B	4.3	(4.3)P	B	B	4.1	(4.1)B	A	A	A	A	A	A	A	A	A	A	
16					A	4.4	4.3	7	(4.5)A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	
17					4/	A	A	4.3	P	4.1	H	(4.2)P	B	B	4.1	K	4.4	P	B	K	4.3	K	4.2	K	3.5	K	
18					(4.2)R	4.2	K	4.2	K	4.2	K	4.2	K	(4.4)B	4.3	K	B	K	4.3	P	4.3	K	4.2	K	4.2	K	
19					4.0	K	3.9	K	4.2	R	4.2	K	4.2	K	4.3	N	A	4.5	K	A	K	4.4	K	4.3	K	4.1	K
20					A	4.2	4.4	4.4	4.3	P	(4.3)P	B	B	4.4	P	B	4.3	4.3	4.2	A	A	A	A	A	A	A	
21					4.2	A	4.4	4.4	4.5	P	4.5	P	4.5	P	4.5	4.3	(4.3)P	4.3	4.4	4.3	4.2	4.3	4.2	4.3	4.2	4.4	
22					4.1	4.6	4.5	4.5	4.3	P	4.3	4.4	P	(4.4)B	S	B	B	B	B	B	B	B	B	B	B	B	
23					4.4	4.4	4.3	4.4	4.5	4.5	4.5	4.3	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
24					A	A	A	4.4	P	4.4	P	4.4	P	4.4	P	A	B	B	B	B	B	B	B	B	B	B	B
25					4.4	A	4.3	4.3	P	4.3	B	4.2	P	4.4	P	4.3	P	B	B	4.3	4.3	P	4.3	4.3	4.3	4.3	
26					4.5	4.5	4.5	4.3	4.4	P	4.3	4.5	4.5	P	4.3	P	(4.2)P	4.1	2	4.3	4.3	4.2	4.2	4.2	4.2		
27					A	A	M	4.2	P	A	(4.4)A	A	A	B	S	S	S	B	4.4	(4.5)B							
28					4.4	4.5	4.3	(4.4)A	(4.3)A	A	A	4.7	P	4.5	B	B	B	B	B	B	B	B	B	B	B	B	
29					4.6	A	4.5	4.4	P	A	A	A	A	4.4	P	4.4	P	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
30					A	4.1	4.1	4.1	4.3	4.5	4.3	4.3	A	(4.3)P	4.2	A	(4.3)P	4.2	A	4.3	4.1	P	4.3	4.3	4.3	4.3	4.3
31																											
Median	-	4.2	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
Count	1	18	21	25	24	20	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

Sweep I.O. Mc 10 25.0 Mc in 0.25 min
Manual □ Automatic □

Table 73

Ionospheric Storminess at Washington, D. C.June 1951

Day	Ionospheric character*		Principal storms		Geomagnetic character*	
	00-12 GCT	12-24 GCT	Beginning GCT	End GCT	00-12 GCT	12-24 GCT
1	3	2			3	4
2	3	3			3	4
3	2	2			3	2
4	2	1			3	2
5	1	2			3	3
6	2	5	0800	-----	4	3
7	2	3	-----	0200	3	3
8	1	2			4	3
9	2	2			3	2
10	1	3			2	2
11	2	3			2	3
12	1	3			3	3
13	1	3			3	3
14	1	3			4	4
15	3	3			4	4
16	2	4			3	3
17	1	3	1900	-----	2	4
18	5	4	-----	-----	6	3
19	4	5	-----	-----	5	3
20	3	1	-----	0200	2	2
21	1	1			3	2
22	1	2			2	2
23	0	1			2	2
24	1	2			3	2
25	1	3			4	4
26	3	3			3	3
27	2	2			2	3
28	2	2			3	3
29	2	2			2	3
30	1	3			3	2

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

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

----Dashes indicate continuing storm.

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

Table 74

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

Day	North Atlantic quality figure		CRPL*	CRPL**	North Pacific quality figure	Geo- mag- netic K_{Ch}	<u>Scales:</u> 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
	Half day GCT (1)	Half day GCT (2)	Half day GCT (1)	Half day GCT (2)	Half day GCT (1)	Half day GCT (2)	
1	6	5	(W)	X	6 (4)	(5) (4)	
2	(2)	(4)	W W	X	(3) (4)	(4) (5)	
3	(3)	(4)	W W	X	7 5	(4) (4)	
4	5	(4)	W W	X	5 (4)	(4) 3	
5	6	5	U U	X	7 6	2 2	
6	6	6		X	7 5	3 2	
7	6	5		X	7 6	2 2	
8	6	5			8 7	1 2	
9	6	5			6 6	3 (4)	
10	(3)	(4)	W W		6 (4)	(4) (4)	
11	(3)	(4)	W (W)		6 (4)	3 (4)	
12	(4)	5			7 6	(4) 3	
13	6	6			7 7	2 1	
14	7	6			6 7	3 3	
15	5	5	U U	X	7 7	(4) 3	
16	5	5		X	6 7	(4) 2	
17	(4)	5	W	X	5 (4)	(4) 3	
18	(4)	5	W U	X	6 6	(4) 2	
19	7	5		X	6 7	2 2	
20	6	?			7 5	2 2	
21	7	5			6 6	1 0	
22	7	5		X	5 6	1 3	
23	7	5	(W)		(4) 5	3 3	
24	(4)	6	W U		6 5	3 3	
25	6	6			(4) 6	2 3	
26	7	5	(W)		8 7	2 (5)	
27	(4)	5	W W		7 6	(4) 1	
28	7	6	U	X	6 7	2 2	
29	6	6		X	7 5	2 3	
30	6	6			6 6	3 2	
31	6	6			8 6	3 3	
Score:		Warning N.A. N.P.		Forecast N.A. N.P.			
H		16 8		7 5			
(M)		0 0		0 0			
M		2 2		7 4			
G		35 35		25 28			
O		9 17		23 25			

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

**In addition to dates marked X, the following were designated as probable disturbed days on forecasts more than eight days in advance of said dates: May 23, 30 and 31.

Table 75a

Coronal observations at Climax, Colorado (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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90			
1951																																					
Jun 4.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5	3	8	5	3	5	8	10	8	5	3	3	2	-	-	-	-	X	X	X	X	X
4.6	-	-	-	-	-	3	3	8	3	3	3	5	10	12	15	12	14	12	14	15	13	12	10	5	3	3	3	2	2	3	3	2	2	-			
5.6	-	-	-	-	-	3	3	3	3	3	5	8	17	15	15	15	13	18	15	15	8	8	5	3	3	3	2	2	3	3	-	-	-				
6.6a	X	-	-	-	-	-	-	-	-	-	3	5	12	12	12	15	13	12	10	8	4	3	3	-	-	-	-	-	-	-	-	-	-	-			
*7.8	-	-	-	-	-	-	-	-	-	-	2	3	3	5	5	5	8	12	15	12	8	3	2	2	2	3	3	-	-	-	-	-	-	-			
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
9.6	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	10	10	12	12	10	5	5	3	3	5	3	3	3	3	3	-	-	-	-			
10.7	-	-	-	-	-	-	-	-	-	-	3	3	3	5	8	13	15	12	10	8	5	5	3	3	5	3	3	3	3	3	-	-	-	-			
12.6	-	-	-	-	-	-	-	-	-	-	3	3	5	8	10	12	25	33	25	18	15	10	12	15	13	13	14	5	3	2	2	3	3	3			
16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
16.6	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	14	8	3	3	5	8	10	8	5	3	2	-	-	-	-	-	-	-		
17.6	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	10	5	5	3	3	3	5	5	3	3	3	-	-	-	-	-	-	-		
18.8	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	5	8	10	5	3	3	3	5	5	12	10	3	-	-	X	X	X	X	X	X		
19.6	-	-	-	-	-	-	-	-	-	-	3	3	3	3	10	8	5	3	3	3	5	5	5	5	3	3	3	3	3	3	-	-	-	-	-		
21.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X		
23.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
28.6	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	5	5	3	3	5	15	18	20	5	3	3	-	-	-	-	-	-	-		
30.6	-	-	-	-	-	-	-	-	-	-	3	3	5	3	2	2	2	3	3	5	8	8	8	10	8	8	12	5	3	3	3	3	3	3	-	-	-

Table 76a

Coronal observations at Climax, Colorado (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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		
1951																																				
Jun 4.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	2	2	8	2	2	2	2	-	-	-	-	-	-	X	X	X	X	X	
4.6	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	2	3	10	10	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	
5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	
6.6a	X	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	3	3	3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	
*7.8	2	2	2	2	2	2	2	2	3	3	3	3	2	2	3	10	10	5	-	-	-	2	3	3	3	2	2	2	2	2	2	2	2	2		
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9.6	-	-	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2		
10.7	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	2	5	5	3	2	2	2	2	2	2	2	2	2	2	2
12.6	3	3	3	3	3	3	3	5	5	5	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
16.0	2	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	10	12	10	12	10	2	3	4	3	3	3	3	3	3	3	3	3	3		
16.6	3	3	3	2	2	2	2	2	2	3	2	15	10	12	10	3	3	3	2	3	5	2	2	3	3	3	3	3	3	3	3	3	3			
17.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	8	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19.6	-	-	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
21.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	
23.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	8	5	8	2	2	2	2	2	2	2	2	2	3	3	3	2	2

Table 77a

Coronal observations at Climax, Colorado (6702A), 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
</tbl

Table 75b

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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90			
1951																																					
Jun 4.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4.6	-	-	-	-	-	-	3	3	3	3	5	5	5	5	10	5	10	5	3	3	3	9	6	5	3	3	3	3	3	-	-	-					
5.6	-	-	-	-	-	-	3	3	3	3	5	8	8	8	12	10	8	8	8	10	15	18	12	8	5	3	3	5	5	3	3	-	-				
6.6a	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	3	5	5	8	10	12	12	5	3	2	-	X	X	X	X	X				
7.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	10	8	5	5	3	3	3	3	3	3	3	3	-	-	-			
8.7	-	-	-	-	-	-	3	3	3	2	2	3	3	3	3	3	3	3	3	8	5	5	3	3	3	3	3	3	3	3	-	-	-				
9.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	10	8	5	5	3	3	3	3	3	3	3	3	-	-	-		
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-		
12.6	-	-	-	-	-	-	3	3	3	3	3	3	3	3	5	8	12	15	10	5	5	5	5	5	3	3	3	3	3	3	-	-	-				
16.0	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5	8	10	12	10	5	5	5	5	5	3	3	3	3	3	3	X	X	X			
16.6	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	10	8	12	13	12	10	8	10	10	10	15	10	5	3	3	3	3	-	-			
17.6	-	-	-	-	-	-	-	-	-	-	3	3	5	5	10	10	12	12	10	10	10	10	10	15	10	5	3	3	3	3	3	3	-	-			
18.8	-	3	3	3	3	5	5	5	3	5	8	10	8	10	12	12	10	20	18	18	20	25	12	8	8	5	5	5	5	5	5	X	X	X			
19.6	-	-	-	-	-	-	-	-	-	-	3	3	3	8	10	12	10	10	12	10	8	10	10	12	10	8	10	12	10	8	3	3	3	3	-	-	
21.6	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
27.9	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
30.6	-	-	-	-	-	-	-	-	-	-	3	3	3	8	13	15	8	3	3	5	8	10	15	15	10	6	5	3	3	3	3	3	-	-	-	-	-

Table 76b

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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90				
1951																																						
Jun 4.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
4.6	2	2	2	2	3	3	3	2	-	-	-	-	-	-	-	2	12	8	5	3	3	3	5	2	2	2	2	2	2	2	2	2	3					
5.6	-	-	-	-	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	3	5	5	3	3	-	-	-	-	-	-	-	-	-					
6.6a	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
7.8a	2	2	2	2	2	2	3	4	4	3	3	3	3	3	2	2	3	3	10	3	5	2	2	2	2	2	2	2	2	2	2	2	2					
8.7	2	2	2	2	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	8	5	8	5	3	3	2	2	2	2	2	2	2	-	-	-			
9.6a	-	-	-	-	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2	4	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-		
10.7	-	-	-	-	-	2	2	2	2	2	3	3	3	4	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-		
12.6	3	3	3	3	5	5	5	3	8	8	5	5	10	8	11	12	22	15	10	10	5	3	3	8	5	8	2	2	2	2	2	2	3	3	3	3		
16.0	2	2	2	2	2	2	3	4	3	3	2	2	2	2	2	2	2	2	2	8	12	10	12	8	2	2	2	2	2	2	2	2	2	2	2	2		
16.6	2	2	2	2	2	2	3	5	3	3	2	2	2	2	2	2	2	2	2	8	3	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
17.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
23.0	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.9	-	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.6	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 77b

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

Date GCT	Degrees south of the solar equator															0°	Degrees north of														

Table 78a

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		5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	
1951	-	-	-	3	3	8	8	10	12	10	10	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
Jun. 2.7	-	-	-	3	3	5	5	5	5	5	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
3.9	-	-	-	-	-	3	5	5	5	5	8	8	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
5.7	-	-	-	-	-	3	5	8	5	5	8	8	8	15	33	25	23	23	18	28	20	12	8	12	8	8	8	8	8	8	8	8	
6.7	-	-	-	-	-	-	-	3	3	3	5	8	12	22	18	15	25	35	38	23	12	10	5	5	3	3	3	3	3	3	3	3	
7.7	-	-	-	3	3	3	3	3	3	8	12	14	12	12	25	20	15	8	8	8	5	5	5	5	5	5	5	5	5	5	5		
8.7	-	-	-	-	-	3	3	3	5	5	8	10	10	12	15	19	17	13	12	10	8	5	3	3	3	3	3	3	3	3	3		
9.7	-	-	-	-	-	3	5	5	5	8	12	15	14	14	15	15	13	12	10	10	8	10	10	10	10	10	10	10	10	10			
10.8	-	-	-	-	-	-	-	3	3	5	8	10	12	14	17	17	15	13	10	10	10	12	8	8	10	5	5	3	-	-	-		
11.7	-	-	-	-	-	-	-	3	3	5	8	12	15	20	33	31	15	13	10	8	10	10	12	12	10	5	3	3	-	-	-		
15.8	-	-	-	-	-	-	-	-	-	-	3	3	12	10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
16.8	-	-	-	-	-	-	-	3	3	3	3	3	5	10	15	8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
17.8	-	-	-	-	-	-	-	-	-	-	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
19.7	-	-	-	-	-	3	3	3	3	3	3	5	8	10	15	13	10	5	5	5	5	5	5	5	5	5	5	5	5	5			
20.8	-	-	-	-	-	-	-	-	-	-	3	3	5	8	10	15	12	8	8	8	8	5	-	-	-	-	-	-	X	X	X		
21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
22.6	-	-	-	-	-	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
23.7	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
24.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
25.8	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	5	5	5	8	8	5	3	-	-	-	-	-	-	-	-	-		
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	12	15	17	12	10	5	3	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	3	3	5	5	5	5	3	3	3	3	5	8	18	27	20	10	5	3	3	-	-	-	-	-	-	-	-	-

Table 79a

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		5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1951	-	-	-	-	-	-	-	-	-	-	-	-	2	2	3	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2
Jun. 2.7	3	3	3	3	3	3	2	2	2	2	-	-	-	-	2	10	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2
3.9	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	3	3	3	2	2	2	-	-	-	-	-	-	-	-	-	-
5.7	3	3	3	3	3	3	-	-	1	-	2	5	2	5	10	8	8	10	3	2	2	2	2	2	2	2	2	2	2	2	2	
6.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	8	12	5	5	3	2	2	2	2	2	2	2	2	2	2	2	2	
7.7	3	3	3	2	2	2	2	2	3	3	2	2	3	2	3	14	10	2	-	1	-	-	3	5	3	2	2	2	2	2	2	
8.7	3	3	3	3	3	3	4	4	4	4	5	5	5	5	2	2	2	2	2	1	1	5	2	2	3	2	2	2	2	2	2	
9.7	2	2	2	2	2	2	3	3	5	5	5	5	3	3	2	2	3	2	1	2	2	8	2	2	5	3	2	2	2	2	2	
10.8	2	2	2	2	2	3	3	3	5	5	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
11.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	5	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15.8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
16.8	2	2	2	2	3	2	2	2	2	2	2	2	2	3	3	10	5	13	5	3	2	2	2	2	2	2	2	2	2	2	2	
17.8	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19.7	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20.8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21.8	2	2	2	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
22.6	3	3	3	2	2	2	2	2	2	2	2	2	2	3	3	5	5	8	5	5	8	5	5	5	5	3	2	2	2	2	2	
23.7	2	3	3	2	2	2	2	2	2	2	2	2	2	3	2	3	3	3	3	5	8	5	5	5	5	3	2	2	2	2	2	
24.8	2	2	2	2	2	2	-	-	-	-	-	-	3	3	3	12	10	10	10	10	10	10	8	5	3	3	3	3	2	2	2	
25.8	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	3	3	3	13	10	8	10	15	5	8	3	2	2	2	2	
26.7	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	5	2	3	10	8	10	15	12	3	2	2	2	2	2		
27.7	2	2	2	2	2	2	2	2	2	2	-	-	2	3	3	3	5	3	2	10	15	12	2	3	3	2	2	2	2	2	2	

Table 78b

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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90											
1951	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-												
Jun. 2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	10	12	15	18	15	15	15	12	10	10	10	10	10	10	8	8	5	5	3	3	3	-	-	-				
3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	8	8	8	12	12	8	8	5	5	5	5	5	5	5	-	-	-	-	-	-	-	-	-					
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	5	8	8	12	10	12	10	8	10	10	15	25	27	15	10	8	8	8	5	3	-	-	-				
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	5	5	8	8	5	5	8	10	15	20	22	25	12	10	8	5	5	8	8	5	3	3	-	-			
7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	10	10	15	25	8	15	12	10	5	3	5	8	10	5	3	-	-			
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	5	5	5	10	10	8	8	12	15	12	12	10	8	5	5	5	8	10	5	3	-	-	-				
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	12	12	5	5	5	8	9	5	3	5	5	5	8	8	8	5	3	5	-	-	-	-	-					
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	5	8	10	10	5	5	5	5	5	5	5	3	3	3	-	-	-	-	-					
15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	5	10	12	12	12	15	8	8	8	8	5	5	5	5	5	5	5	3	3	3	-	-			
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	10	8	12	15	12	12	10	12	13	5	3	3	3	3	3	3	3	3	3	3	-	-			
17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	8	12	12	15	17	17	15	15	17	17	12	8	5	5	5	8	8	5	3	3	-	-			
19.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	8	10	10	12	20	28	25	22	17	17	15	12	8	8	5	5	5	8	10	8	-	-	-			
20.8	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	-	-	-							
21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
22.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	3	3	5	5	8	12	15	10	12	13	15	15	12	12	8	10	8	5	5	3	3	3	-	-			
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	5	3	3	8	8	9	12	33	28	17	15	12	13	13	15	16	12	8	8	5	5	3	3	3	-	-	
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	15	12	18	33	22	15	14	14	15	15	18	15	8	5	5	3	3	-	-	-	-	-				
25.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	10	17	15	20	26	25	15	10	12	13	15	17	14	12	8	5	5	3	-	-	-	-	-	-	
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	10	13	15	22	28	17	10	12	10	20	22	15	12	12	8	5	5	-	-	-	-	-	-	-	
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8	8	8	12	13	15	16	15	12	12	15	22	15	13	12	10	8	8	5	3	-	-	-	-	-	-

Table 79b

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

Note: Yellow line (5694A): June 25.8 at S00-S05 west limb, intensity 3; June 26.7 at S05 west limb, intensity 3.

Table 80a

Coronal observations at Sacramento Peak, New Mexico (6702A), 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		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90					
1951	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	-	
Jun. 24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	-	-	-
5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	3	3	3	5	5	5	5	5	5	3	3	2	2	2	2	2	-	-	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	3	3	3	3	5	6	4	3	3	3	3	3	3	2	2	2	2	2	-	-	-
7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	2	2	4	4	4	3	3	3	3	3	3	2	2	2	2	2	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	-	-	-	-
9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	3	3	3	3	2	2	2	3	3	3	3	2	2	2	2	2	-	-	-
15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
19.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
20.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	X	X	X
21.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	2	2	2	2	2	-	-	-
22.6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
25.8	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	2	2	2	2	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	2	2	-	-	-

Table 80b

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

Table 81

Particulars of Observations, Climax, Colorado
January-June 1951

Date GCT	Greenline threshold intensity at 45° 90° 135° 225° 270° 315°							Obs.	Meas.	Date GCT	Green line threshold intensity at 45° 90° 135° 225° 270° 315°							Obs.	Meas.
	>15	>15	13	15	>15	14	D	W			Apr. 16.6	4	5	7	5	5	8	A	J
1951											21.9	4	4	-	-	-	-		
Jan. 2.9	>15	>15	13	15	>15	14	A	W	25.6	7	6	6	5	5	6				
6.9	5	6	5	4	4	5	At	W	27.7	-	11	-	-	-	-			At/A	
7.7	4	3	3	5	7	5	D	W	28.6	3	3	3	8	4	7			J	
9.7	15	10	5	9	12	11	A	W	30.6	4	4	4	3	6	5			A	
10.7	4	2	2	4	4	5	At	W	32.6	13	12	12	>15	13	>15			At	
12.7	13	6	7	13	13	9	D	W	34.7	8	7	8	10	8	13			J	
13.7	6	5	11	6	8	9	At	W	36.6	10	12	11	6	6	6			A	
20.8	>15	15	>15	>15	15	14	At	W	38.6	11	11	13	15	12	12			A	
21.7	5	5	5	15	5	6	D	W	40.5	12	9	15	11	9	13			J	
23.8	5	13	7	5	7	5	A	W	42.5	10	12	11	6	6	6			A	
25.7	9	8	7	5	5	7	At	W	43.6	15	>15	-	-	-	-			J	
26.7	6	5	12	11	13	12	D	W	45.6	11	11	13	15	12	12			J	
Feb. 1.9	7	7	15	7	9	8	A	W	47.6	15	14	14	-	-	-			A	
2.7	?	5	5	5	5	5	At	W	49.6	>15	15	15	-	>15	-			J	
9.3	5	6	5	-	-	-	A	W	51.6	-	-	12	-	-	-			A	
10.7	4	4	6	3	3	3	At	W	53.6	11	11	11	15	13	>15			J	
13.3	>15	>15	>15	11	14	13	A	W	55.6	13	12	11	13	13	14			At	
14.8	5	7	5	6	6	6	At	W	56.6	14	14	13	-	14	-			A	
15.8	5	5	6	5	5	5	A	W	57.6	7	10	8	10	10	8			J/At	
16.7	12	7	12	8	13	>15	At	W	58.7	15	12	9	12	9	15			At	
17.8	6	6	7	6	7	6	A	W	59.6	8	7	11	7	7	8			A	
20.7	5	5	6	10	7	9	At	W	60.7	12	12	11	11	12	12			J	
21.7	4	4	5	5	4	5	A	W	62.6	7	6	5	6	6	6			A	
23.0	8	9	12	-	-	-	A	W	64.0	9	11	15	-	12	-			At	
23.7	8	9	8	7	8	7	At/J	W	65.6	7	8	8	12	8	10			J	
26.7	9	4	6	7	10	8	J	W	67.6	11	11	11	11	11	12			At	
Mar. 6.9	10	3	10	5	3	10	A	W	68.6	9	10	-	14	10	-			A	
8.7	7	7	8	8	7	9	J	W	69.6	11	12	11	9	10	13			At	
9.7	9	6	7	7	8	6	At	W	71.6	11	13	13	13	13	14			A	
12.7	6	5	8	6	9	7	A	W	73.0	15	14	-	-	-	-			A	
23.7	2	3	3	3	2	3	J	W	73.9	10	10	9	9	9	13			A	
24.6	4	4	4	3	4	4	At	W	74.6	10	8	9	9	9	9			At	
25.7	2	2	3	2	2	3	A	W	75.7	12	11	11	12	12	13			At	
29.7	4	4	5	2	5	4	J	W	76.7	10	10	10	11	10	10			A	
Apr. 2.6	3	3	4	6	3	5	At	W	77.9	14	>15	-	-	14	>15			At	
3.8	3	4	3	4	3	3	A	W	78.6	8	7	8	13	8	9			At	
13.8	3	3	4	5	4	5	J	W	80.6	12	11	9	10	8	11			A	
14.7	13	11	10	12	7	14	At	W											

A - Allen
 At - Athay
 D - Dolder
 J - Johnson
 W - I. Witte

Table 81 (continued)

Table complete on preceding page.

Table 82

Particulars of Observations, Sacramento Peak, New Mexico
January - June 1951

Date GCT	Green line threshold intensity at										Obs.	Meas.	Date GCT	Green line threshold intensity at										Obs.	Meas.						
	0° 45° 90° 135° 180°					225° 270° 315°									0° 45° 90° 135° 180°					225° 270° 315°											
1951																															
Jan.	4.8	8	8	9	10	10	9	9	9	9	R	W	Mar.	12.8	7	7	8	8	10	10	9	9	R	W							
	5.7	9	8	8	8	8	9	9	10		C	W		13.7	4	6	6	7	7	7	7	R	W								
	6.8	10	11	11	13	11	12	12	13		R	W		14.8	10	11	13	12	13	12	11	R	W								
	7.7	9	9	9	10	10	10	10	10		R	W		16.0	5	6	5	7	-	-	7	7	C	V							
	8.7	11	10	10	11	11	14	13	10		R	W		16.7	6	7	7	8	7	7	8	15	C	V							
	9.7	10	10	10	11	10	10	11			R	W		19.7	5	6	6	7	7	7	7	7	R	V							
	16.8	11	11	11	11	11	12	11	12		R	W		20.7	8	8	9	9	9	9	10	9	R	V							
	17.7	11	11	11	11	11	12	12	12		R	W		22.7	7	8	7	8	9	9	8	8	R	V							
	18.7	8	8	8	9	10	9	9	10		R	W		24.0	10	11	11	13	13	13	13	15	C	V							
	19.7	8	8	8	9	9	9	10	11		C	W		24.7	11	13	11	12	8	14	13	15	R	V							
	20.7	8	7	8	8	8	8	8	8		R	W		29.8	6	7	7	8	7	8	7	8	R	V							
	21.7	8	7	8	9	9	9	10	10		R	W		30.6	8	8	8	9	9	8	8	9	R	V							
	23.0	7	7	7	7	7	14	9	8		R	W		31.7	12	12	12	13	13	13	13	10	R	V							
	24.9	10	10	11	11	11	12	11	11		R	W		Apr.	1.7	8	8	8	9	9	10	10	8	C	V						
	25.9	12	11	11	12	12	12	12	11		R	W			2.8	9	10	10	11	13	13	13	13	C	V						
	26.7	14	12	10	10	9	9	9	9		R	W			3.8	5	6	6	7	6	6	6	6	C	V						
	27.9	10	9	11	11	13	11	10	10		R	W			5.9	8	9	15	15	13	11	15	15	C	V						
	29.7	7	7	7	8	7	8	7	8		R	W			8.7	6	6	7	6	7	6	7	7	C	V						
Feb.	2.8	10	11	11	12	12	12	12	13		R	W			9.8	11	11	11	11	>15	>15	15	>15	C	V						
	4.7	8	7	7	7	7	9	9	8		R	W			10.7	5	5	5	5	4	6	-	-	C	V						
	5.7	9	10	7	7	8	9	9	11	-	Hu	W			11.8	6	6	8	8	7	8	8	8	C	V						
	7.8	5	5	5	7	5	5	6	6	-	R	W			12.8	5	7	7	7	6	7	7	7	C	V						
	8.6	4	4	3	5	5	5	5	5	-	R	W			13.7	5	5	5	5	12	6	7	7	D	V						
	9.7	5	5	5	5	5	6	6	6	-	R	W			14.8	6	6	7	8	9	9	7	8	Ha/D	V						
	10.7	5	5	5	5	6	6	6	6	-	R	W			16.8	11	12	14	14	13	12	11	12	D	V						
	11.7	7	6	6	6	7	7	8	7	-	R	W			18.7	12	14	14	13	14	12	14	14	C	V						
	12.7	9	10	10	10	10	11	11	10	-	R	W			21.7	5	4	3	3	3	5	5	5	O	V						
	15.7	6	6	6	7	7	6	6	6	-	R	W			22.7	2	4	3	3	3	5	5	5	O	V						
	16.8	5	5	5	7	6	6	6	6	-	R	W			23.6	7	7	7	8	7	8	8	7	O	V						
	18.8	8	9	9	10	10	10	10	10	-	R	W			25.7	5	4	4	4	5	5	5	5	C	V						
	20.7	8	8	9	9	8	8	8	9	-	R	W			27.9	6	5	5	5	5	6	6	6	R	V						
	22.9	10	10	9	11	-	-	-	-	-	R	W			29.6	4	4	4	4	5	6	6	6	R	V						
	26.7	6	11	8	9	8	8	8	9	-	R	W			30.6	8	8	8	8	9	8	10	8	R	V						
	28.7	10	9	9	10	8	9	9	11	-	R	W			May	2.7	6	5	5	6	6	6	6	6	R	V					
Mar.	1.8	11	11	11	13	13	13	14	11	-	R	W			3.7	2	3	3	3	3	3	3	3	R	V						
	4.8	8	8	8	8	11	9	8	8	-	R	W			4.6	3	3	3	3	3	3	3	3	R	V						
	5.8	8	8	9	9	10	11	10	13	-	R	W			8.8	9	9	10	10	11	12	9	9	R	V						
	6.7	9	10	11	>15	-	-	-	-	-	R	W			9.6	6	7	6	6	7	8	7	7	R	V						
	8.9	6	9	7	9	11	10	11	10	-	R	W			12.7	8	9	9	8	11	11	10	9	R	V						
	11.7	7	7	7	8	8	9	9	7	-	R	W			14.8	9	11	15	12	>15	>15	>15	>15	R	V						

Table 82 (Continued)

Date GCT ^a	Green line threshold intensity at							Obs.	Meas.	Date GCT	Green line threshold intensity at							Obs.	Meas.				
	0°	45°	90°	135°	180°	225°	270°				0°	45°	90°	135°	180°	225°	270°	315°					
1951																							
May	15.8	10	10	12	13	-	-	-	-	R	W	Jun.	7.7	5	5	6	5	5	5	C	W		
	16.9	12	12	13	14	-	-	-	-	C	W		8.7	9	8	9	8	9	9	R	W		
	17.7	8	7	8	9	8	8	7	7	R	W		9.7	8	7	8	10	10	9	R	W		
	18.6	7	7	5	6	7	8	8	7	R	W		10.8	14	12	12	13	15	11	R	W		
	19.6	6	7	7	7	8	8	8	7	R	W		11.7	10	9	10	11	11	10	R	W		
	21.7	13	14	14	15	>15	>15	>15	>15	R	W		15.8	11	10	11	11	12	14	>15	>15		
	22.7	10	10	9	8	12	12	12	11	R	W		16.8	12	12	12	14	15	15	15	R	W	
	24.7	11	10	10	10	10	10	7	7	R	W		17.8	15	15	13	11	12	12	14	R	W	
	25.6	9	10	11	10	12	11	11	10	R	W		19.7	11	8	11	12	10	8	9	R	W	
	26.7	8	8	8	8	9	10	10	7	R	W		20.8	13	11	13	15	-	-	-	R	W	
	27.7	7	8	7	7	9	9	9	8	R	W		21.8	13	12	14	13	>15	>15	>15	R	W	
	28.7	11	10	9	9	12	12	11	11	R	W		22.6	7	5	7	8	7	7	7	R	W	
	31.8	15	>15	>15	>15	13	15	15	>15	R	W		23.7	7	5	7	8	6	8	7	R	W	
Jun.	2.7	7	10	8	8	11	9	9	8	R	W		24.8	12	10	12	12	12	11	12	R	W	
	3.9	13	13	12	13	15	15	15	>15	R	W		25.8	13	11	12	15	13	12	12	R	W	
	5.7	9	9	8	7	9	10	8	8	C	W		26.7	9	9	10	11	11	10	11	R	W	
	6.7	8	8	8	7	8	9	8	8	R	W		27.7	10	8	9	9	9	8	9	10	R	W

C - Cook
D - Dolder
Ha - Hanson
Hu - Huston
R - Ramsey
W - I. Witte

Table 83

Solar Flares, May 1951

Observatory	Date	Time Observed		Duration (Min)	Area (Mill) (of) (Visible) (Hemisph)	Position		Time of Maxi- mum (GCT)	Int. of Maxi- mum	Rela- tive Area of Maxi- mum (Tenths)	Import- ance	SID Obser- ved	
		Begin- ning (GCT)	End- ing (GCT)			Long- itude Diff (Deg)	Latitude (Deg)						
	1951												
Sac.Peak	May 2	2225	2255	30	111	W23	S19	2230:30	8	8			
"	" 4	1505	1610	65	110	W48	S17	1518	12	6			
McMath	" 1	1515	1515	--	--	W13	S16	--	--	--	1		
Sac.Peak	" 8	1505	1520	15	278	E89	N12	1508	35	3			
McMath	" 8	1505	1505	--	--	E90	N10	--	--	--	2	"	
Sac.Peak	" 8	1540	1600	20	134	E89	N11	1547:15	20	6			Yes
"	" 9	1515	1524	9	33	E81	N16	1519:30	10	10			
"	" 9	1530	1547	17	55	E81	N16	1535:30	20	5			
"	" 9	1635	1648	13	33	E74	N15	1639	10	5			
"	" 9	1945	2015	30	66	E74	N15	1950:45	15	3			
"	" 10	2325	2410	45	45	E71	N09	2339	12	4			
"	" 11	--	1450	--	166	E62	N11	1400:45	12	2			
"	" 11	1446	1501	15	111	E78	N09	1453	15	7			
"	" 11	1605	1620	15	55	E54	N10	1609	10	4			
"	" 11	1620	1716	56	133	E61	N10	1633	15	3			
"	" 11	1716	1845	89	99	E61	N10	1735	12	5			
"	" 11	1825	1920	55	77	E67	N01	1835	12	4			
"	" 11	1925	--	--	122	E72	N08	1941	10	6			
"	" 11	2115	--	--	66	E66	S01	2148	12	7			
"	" 12	--	1524	--	66	W33	S15	1510	8	10			
"	" 12	1515	1540	25	22	E57	N05	1522	8	8			
"	" 12	1545	1620	35	66	E56	N02	1553	10	5			
"	" 12	1730	1800	30	122	E53	N01	1736	15	4			
"	" 12	1750	1905	75	55	E49	N16	1801	10	8			
"	" 12	1915	1935	20	55	E43	N08	1923	10	6			
"	" 12	1935	2005	30	66	E51	N00	1950	8	7			
"	" 12	1950	2010	20	66	E43	N14	1954	10	7			
"	" 12	2110	2132	22	22	E39	N16	2122	8	8			
"	" 12	2131	2140	9	55	E37	N13	2134	10	8			
"	" 12	2150	2225	35	33	W37	S14	2210	6	10			
McMath	" 13	(1314)	1345	--	--	E35	N10	--	--	--	2		Yes
Sac.Peak	" 14	1500	1521	21	28	W15	N10	1513	8	8			
"	" 14	1900	1930	30	66	E23	N16	1911	12	5			
"	" 14	1920	2000	40	110	E01	N08	1928	15	2			
McMath	" 14	1926	--	--	--	E04	N08	--	--	--	1	+	
"	" 14	2102	--	--	--	E20	N16	--	--	--	1	-	
"	" 14	2102	--	--	--	W15	N07	--	--	--	1	-	
Sac.Peak	" 14	2105	2115	10	22	E18	N09	2111	6	10			
"	" 14	2155	2350	115	500	E26	N09	2224	18	1			
McMath	" 15	1150	--	--	--	E17	N12	--	--	--	2		Yes
"	" 15	1255	1315	--	--	E42**	N10**	1308	--	--	2		
Sac.Peak	" 15	1300	1317	17	122	E40	N12	1307	10	2			
McMath	" 15	1318	1335	--	--	E10	N16	1325	--	--	1	+	
Sac.Peak	" 15	1325	1400	35	78	E10	N18	1330	12	5			
McMath	" 15	1505	--	--	--	E11	N16	--	--	--	1	-	
"	" 15	1551	--	--	--	E08	N12	--	--	--	1	-	
"	" 15	1727	--	--	--	E16	N12	--	--	--	1	-	
Sac.Peak	" 15	1815	1830	15	55	E06	N10	1820	6	9			
McMath	" 15	1923	--	--	--	E08	N12	--	--	--	1	-	
Sac.Peak	" 15	2335	--	--	33	E01	N09	2357	8	9			
McMath	" 16	1317	--	--	--	E30	N11	--	--	--	1		
Sac.Peak	" 16	--	1427	--	44	E33	N11	1319	8	10			
"	" 16	1410	1503	53	55	W02	N17	1418	10	10			
"	" 16	1450	1605	75	155	E27	N11	1510	12	4			
"	" 16	1600	--	--	210	E06	N11	1618	12	1			
McMath	" 16	1608	--	--	--	E05	N10	--	--	--	1		
"	" 16	1701	--	--	144	W05	N15	--	--	--	2		Yes
Sac.Peak	" 16	--	--	--	144	W07	N14	1706	12	4			
"	" 16	1820	1915	55	99	E80	S16	1840	15	5			
"	" 16	2015	2030	15	55	W06	N12	2021	15	8			
"	" 16	2045	2100	15	88	W22	N10	2052	12	10			
"	" 16	2110	2231	81	144	E23	N11	2129	15	5			
"	" 16	2200	2231	31	166	W08	N17	2219	15	6			
Wendelst.	" 17	0947	1005	18	727	E19	N10	0952	--	--	1	-	
Meudon	" 17	1842	--	--	--	W15	N15	--	--	--	1		Yes
Sac.Peak	" 17	--	1620	--	212	W17	N18	1502	12	1			
"	" 17	1525	1605	40	146	W19	N14	1533	15	2			Yes
"	" 17	1530	1550	20	17	E63	N19	1534	8	10			
"	" 17	--	1730	--	146	W24	N18	1652	12	2			Yes
"	" 17	1710	1819	69	87	W24	N23	1719	10	6			
"	" 17	--	1912	--	372	W09	N11	1805	15	2			
"	" 17	--	1930	--	100	W13	N14	1910	12	2			

Table 83 (Continued)

Solar Flares, May 1951

Observatory	Date	Time Observed		Duration (Min.)	Area (Mill.) (of) (Visible) (Hemisphere)	Position		Time of Maximum (GCT)	Int. of Maximum	Relative Area of Maximum (Tenths)	Importance	SID Observed
		Beginning (CCT)	Ending (GCT)			Longitude (Deg.)	Latitude (Deg.)					
	1951											
McMath	May 18	(1155)	1330	--	--	W30**	N11**	--	--	--	2	Yes
"	" 18	1300		--	--	E04**	N12**	--	--	--	1+	
Sac.Peak	" 18	1545	1600	15	39	W40	N14	1551	11	5		
"	" 18	1725	1815	50	41	E51	S13	1734	6	9		
McMath	" 18	1735		--	--	E55	N17	--	--	--	1	
"	" 18	1948		--	--	E04	N12	--	--	--	1-	
Sac.Peak	" 18	1959	2110	71	254	W35	N16	2002:30	22	1		Yes
McMath	" 18	1959	2043	--	--	W35**	N17**	--	--	--	2+	"
"	" 19	1305		--	--	E41	N19	--	--	--	1	
"	" 19	1347		--	--	W43	N12	--	--	--	2	Yes
Sac.Peak	" 19	1443		--	--	E51	N18	--	--	--	1+	Yes
"	" 19	1945	2115	90	700	W42	N09	2005	25	1		Yes
McMath	" 19	1950	(2027)	--	--	W13*	N12*	--	--	--	3-	Yes
Sac.Peak	" 19	2002	2050	43	80	W48	N21	2011	12	5		Yes
"	" 20	--	2050	--	--	W90	S03	--	--	--		
"	" 20	1435	1515	40	103	W70	N17	1452	10	2		
"	" 20	1645	1720	35	103	E27	S16	1659	15	1		
"	" 20	1735	1810	35	148	E26	S14	1738	18	3		
"	" 20	1800	1815	15	80	E10	S16	1807	12	7		Yes
McMath	" 20	1829		--	--	E25	S15	--	--	--	1+	
Sac.Peak	" 20	1900	1915	15	34	W70	N16	1906	12	6		
McMath	" 20	1932		--	--	E25	S15	--	--	--	1+	
Sac.Peak	" 20	1935	2045	70	230	E23	S15	1949	12	4		Yes
"	" 20	1955	2115	80	80	W60	N13	2000	18	5		Yes
McMath	" 20	1957		--	--	W60	N12	--	--	--	2--	Yes
Sac.Peak	" 20	2110	2210	60	183	E24	S15	2117	15	3		Yes
"	" 21	1610	1635	25	29	W79	N09	1617	10	6		Yes
"	" 21	1755	1820	25	69	W76	N18	1805	10	2.		
"	" 22	--	1522	--	160	E07	N17	1406	15	3		Yes
"	" 22	1510	1524	14	23	W90	N15	1515	8	10		
"	" 22	1530	--	--	525	W89	N18	1546:45	10	1		
"	" 22	1820	1910	50	137	W00	S14	1827	12	3		
"	" 22	1910	1955	45	103	W00	S14	1915	8	5		
"	" 22	2155	2225	50	119	W90	N06	2205	10	5		
"	" 23	--	1454	--	80	W11	E17	1426	12	5		
"	" 23	1522	1540	18	46	W21	N20	1530	8	5		
"	" 24	2030	2130	60	149	W29	N21	2040	10	2		
"	" 25	1645	1705	20	34	E35	S24	1647	7	8		
"	" 25	1834	1859	5	23	W23	S18	1837	12	9		
"	" 27	1840	1905	25	45	W67	N20	1846	8	3		
"	" 28	1605	1630	25	32	W81	E24	1608	8	7		
"	" 31	1804	1844	40	126	W43	S33	1807:30	15	2		
"	" 31	1830	1945	75	34	W06	E11	1840	5	7		

*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.

Sac.Peak = Sacramento Peak; Wendelst. = Wendelstein.

Table 84

Zurich Provisional Relative Sunspot Numbers

June 1951

Date	R _Z *	Date	R _Z *
1	58	17	152
2	58	18	157
3	57	19	146
4	26	20	138
5	65	21	134
	103	22	123
	115	23	93
	130	24	63
9	138	25	60
	137	26	63
12	133	27	40
	147	28	45
	159	29	45
	163	30	18
	166		
	147	Mean:	100.6

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

Note: The American sunspot numbers for June will appear in the next issue of this bulletin.

Table 85

Indices of Geomagnetic Activity for May 1951

Preliminary values of mean K-indices, Kw, from 36 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	3.5 3.9 4.0 3.9 2.9 4.1 5.4 6.0	33.7	1.6	4-5-5+6- 305-7-7+	41-	Five
2	5.8 2.4 3.6 4.2 4.5 4.7 4.8 4.8	34.8	1.6	7+2+4+5+ 605+6060	43-	Quiet
3	3.8 2.1 2.9 3.0 3.2 4.1 4.3 4.0	27.4	1.2	5-2+4-3+ 4-5-505+	33-	
4	4.5 3.3 2.8 3.6 3.5 3.5 3.6 2.4	27.2	1.1	5+4-3+4+ 4+40403-	32-	8
5	1.2 2.0 1.9 2.0 1.3 1.5 1.7 3.1	14.7	0.5	103-2+20 101+203+	16-	13
						20
6	3.3 3.0 3.5 1.4 2.2 2.3 3.0 1.8	20.5	0.6	3+3+401+ 2+2+3020	22-	21
7	1.8 1.9 2.2 2.0 2.6 1.7 2.2 1.9	16.3	0.4	202+2+2- 3-202-20	17-	22
8	1.1 0.7 0.9 1.1 1.8 1.8 2.2 1.1	10.7	0.2	101-0+10 2-1+2010	90	
9	1.7 1.8 2.8 2.8 2.7 3.6 4.3 6.1	25.8	1.4	2-203+3+ 304-5-7+	290	
10	3.3 3.9 4.3 4.2 5.4 4.8 3.5 2.2	31.6	1.4	3+505+50 7-5+402+	370	
11	2.5 2.4 3.0 3.6 4.0 2.9 2.8 3.3	24.5	1.0	303-4-4+ 5-303+40	29-	Five
12	3.4 2.9 2.6 1.9 2.2 4.1 3.4 1.4	21.9	1.0	403+3020 204+401+	240	Dist.
13	1.4 0.9 1.3 1.6 0.9 1.1 1.5 2.3	11.0	0.2	1+102-2- 0+1-1020	10-	
14	2.8 3.0 2.4 2.1 1.0 2.2 3.1 3.9	20.5	0.8	304-3-3- 1-3-4-4+	23+	1
15	3.9 3.1 2.4 2.5 2.8 2.7 2.7 2.7	22.8	0.9	5-3+3-2+ 30303+3+	26-	2
						9
16	3.8 3.8 2.7 3.1 2.6 2.5 2.5 2.9	23.9	0.9	4+4+303+ 2+3-3-30	26-	10
17	3.7 3.8 3.1 3.5 3.4 3.5 3.1 3.3	27.4	1.1	405-4+4+ 40404-40	330	26
18	3.8 3.7 2.3 2.8 1.9 2.4 1.8 2.4	21.1	0.9	5-4+2+30 2-202+3-	230	
19	2.7 2.5 2.3 1.8 2.4 1.6 1.6 1.9	16.8	0.4	3-3+2+2- 3+1+2-2+	17+	
20	1.8 2.0 1.7 1.6 2.0 1.1 1.7 1.3	13.2	0.2	20202-1+ 201-2-1+	13-	
						Ten
21	1.0 0.9 0.9 1.1 1.1 1.0 1.4 1.6	9.0	0.1	1010101- 101-1+1+	80	Quiet
22	2.4 1.3 0.6 1.1 2.3 2.3 1.3 1.0	12.3	0.3	3-2-1-10 2+2+1+1+	13+	
23	2.3 2.1 2.2 3.8 3.6 2.9 5.0 4.1	26.0	1.2	2+2+2040 403+605-	29-	5
24	3.8 2.5 2.0 2.4 2.7 3.4 2.3 2.6	21.7	0.8	4+302+3- 30403-3-	25-	7
25	1.7 1.9 2.3 1.8 2.1 1.6 2.8 3.5	17.7	0.6	2-203020 201+3+4-	190	8
						13
26	3.3 1.9 1.8 3.0 3.3 5.2 4.6 5.6	28.7	1.5	3+202030 4-6-6-70	32+	19
27	4.8 4.6 2.6 3.2 1.7 1.6 1.3 1.8	21.6	1.2	5+5+3-3+ 2-101-2-	22-	20
28	2.0 2.6 2.1 1.8 1.6 1.6 0.9 0.4	13.0	0.3	203-202- 2-1+1-0+	12+	21
29	0.9 1.5 3.3 2.4 3.1 2.7 1.7 3.2	18.8	0.7	1-1+403- 4-2+2-3+	20-	22
30	1.4 1.0 2.4 3.8 3.6 2.1 1.8 2.3	18.4	0.8	1+1-3050 4+202-2+	20+	28
31	2.1 2.3 1.4 3.0 1.9 1.2 2.4 2.9	17.2	0.6	2+3-2-3- 2-1-3-30	17+	31
Mean	2.76 2.40 2.59 2.73 2.44 2.58 2.64 2.83	2.62*	0.82			

*Erratum: On page 41 of CRPL-F81 the mean Kw for March 1951 is 2.77, not 22.15.

Table 86

Sudden Ionosphere Disturbances Observed at Washington, D. C.June 1951

1951 Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
June 5	1947	2025	Ohio, D. C., Colombia, England, Mexico	0.0	Solar flare 1955** 1930 and 2000***
7	1820	1850	Ohio, D. C., Colombia, England	0.2	Solar flare** 1828
8	1505	1540	Ohio, D. C., Colombia, England, Mexico	0.05	Solar flare** 1503
11	2010	2140	Ohio, D. C., Colombia, Mexico	0.05	Solar flare** 2022
16	1435	1505	Ohio, D. C., Colombia	---	Solar flare 1435** 1450*** 1420****
18	1635	1655	Ohio, D. C., Colombia, England	---	
19	1301	1330	Ohio, D. C., Colombia	---	Solar flare*** 1305
19	1622	1700	Ohio, D. C., Colombia, England, Mexico	0.0	Solar flare** 1620
19	1750	1810	Ohio, D. C., Colombia	---	Solar flare** 1745
19-20	2342	0010	Ohio, Colombia, Mexico	0.1	Solar flare** 2340
20	1710	1740	Ohio, D. C., Colombia, England, Mexico	0.0	
21	2100	2130	Ohio, D. C., Colombia, England, Mexico	0.05	
22	1700	1750	Ohio, Colombia	---	Solar flare** 1650
24	1405	1450	Ohio, D. C., Colombia, England, Mexico	0.0	Solar flare** 1402
24	2125	2230	Ohio, D. C., Colombia, England, Mexico	0.0	Solar flare** 2125
25	1945	2010	Ohio, D. C., Colombia, England	0.1	
26	1550	1650	Ohio, D. C., England, Mexico	0.05	

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

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

***Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.

****Time of observation at Schauinsland Observatory, Germany.

---Insufficient data.

Table 87Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,Cable and Wireless, Ltd., as Observed in England

951 Day	GCT		Receiving station	Location of transmitters	Other phenomena
	Beginning	End			
June 8	1505	1520	Brentwood	Bahrein I., Barbados, Colombia, France, Greece, Portugal, Spain	Solar flare* 1505
11	0830	0850	Brentwood	Bahrein I., Greece	
11	0828	0905	Somerton	Aden, Ceylon, Formosa, India	
13	0600	0805	Brentwood	Afghanistan, Austria, Bahrein I., Belgian Congo, Bulgaria, Eritrea, Greece, India, Iran, Kenya, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Trans-Jordan, U.S.S.R., Yugoslavia	
13	0600	0800	Somerton	Aden, Australia, Ceylon, China, Cyprus, Formosa, India, Union of S. Africa	

*Time of observation at Sacramento Peak, New Mexico.

Table 88

Sudden Ionosphere Disturbances Reported by Institut für Ionosphärenforschung,
as Observed at Lindau, Harz, Germany

1951 Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena	
	Beginning	End				
April	12	0705	0720	Wiesbaden I**, Wiesbaden II***, München#	0.2	
	12	0730	0830	Wiesbaden I**, Wiesbaden II***, München#	0.15	
	15	0905	1020	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.0	
	16	1227	1240	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.6	
	17	1230	1242	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.4	
	19	0854	0927	Wiesbaden I**, München#, Lindau##	0.45	
	21	1004	1010	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.4	
	23	1150	1208	München#, Lindau##	0.5	
	23	1352	1400	München#, Lindau##	0.5	
	25	0716	0739	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.25	
	25	0842	1010	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.0	
	30	0644	0651	Wiesbaden I**, Wiesbaden II***, München#, Lindau##	0.02	
	30	1725	1732	München#, Lindau##	0.3	
	May 8	1505	1525	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.17	Terr. mag. pulse## 1515-1545
	10	0959	1035	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.13	Terr. mag. pulse## 0951-1020
	13	1120	1145	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.26	Terr. mag. pulse## 1115-1145
	13	1250	1338	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.2	

Table 88 (continued)

1951 Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
May 14	1130	1200	München**, Wiesbaden I#, Wiesbaden II##	0.1	
15	1115	1225	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.0	
16	1125	1130	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.33	
17	0730	0735	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.11	
18	1020	1310	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.0	Terr.mag.pulse## 1025-1130
19	0905	0915	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.25	
19	1350	1410	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.3	
20	0752	0844	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.0	
21	1212	1222	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.3	
21	1315	1340	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.3	
22	0904	0941	Lindau***, München**, Wiesbaden I#, Wiesbaden II##	< 0.1	
22	1155	1205	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.25	
22	1331	1438	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.3	Terr.mag.pulse## 1330-1410
23	1038	1230	München**, Lindau***, Wiesbaden I#, Wiesbaden II##	0.015	Terr.mag.pulse## 1125-1150

*Ratio of received field intensity during SID to average field intensity before and after, for station München, 6160 kilocycles, 400 kilometers distant.

**Station München, 6160 kilocycles.

***Station Lindau, 1780 kilocycles, pulse, transmitter and receiver at Lindau.

#Station Wiesbaden I, 2985 kilocycles.

##Station Wiesbaden II, 4760 kilocycles.

##As observed at Lindau.

Table 89Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,Cable and Wireless, Ltd., as Observed in Barbados, B.W.I.

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
May 8	1508	1530	British Guiana, England, Grenada, Jamaica, St. Lucia, St. Vincent, Trinidad	Solar flare* 1505 Solar flare** 1505 Solar flare* 1150
15	1125	1215	England	
18	1110	1210	England	

*Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.

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

Table 90Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,Cable and Wireless, Ltd., as Observed at Colombo, Ceylon

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
April 19	0540	0700	China, India, Japan	
25	0720	0800	China, England, India, Japan	Solar flare* 0703

*Time of observation at Wendelstein Observatory, Germany.

Table 91Sudden Ionosphere Disturbances Reported by International Telephoneand Telegraph Corporation, as Observed at Platanos, Argentina

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
May 15	1128	1300	Belgium, Denmark, Germany, Italy, Netherlands	Solar flare* 1150
23	1045	1125	Brazil, Denmark, Germany, Italy	

*Time of observation at McMath-Hulbert Observatory, Pontiac,
Michigan.

Table 92

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

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
June 24	2130	2200	Australia, China, Formosa, Hawaii, Japan, Korea, Phil- ippine Is.	Solar flare* 2125
26	0018	0200	Australia, China, Formosa, Hawaii, Japan, Java, Phil- ippine Is.	

*Time of observation at Sacramento Peak, New Mexico.

Table 93

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

1951 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
June 16	1443	1500	Argentina, Canada, England, Italy, Panama, Tangier, Switzerland	Solar flare 1420* 1435** 1450***
19	1305	1345	Argentina, California, Canada, England, Italy, Panama, Tangier	Solar flare*** 1305

*Time of observation at Schauinsland Observatory, Germany.

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

***Time of observation at McMath-Hulbert Observatory, Pontiac, Michigan.

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.

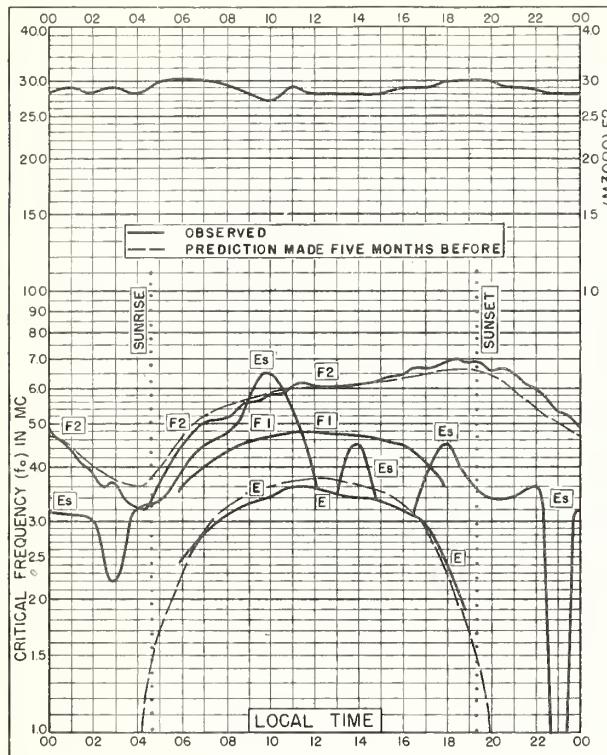


Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W

JUNE 1951

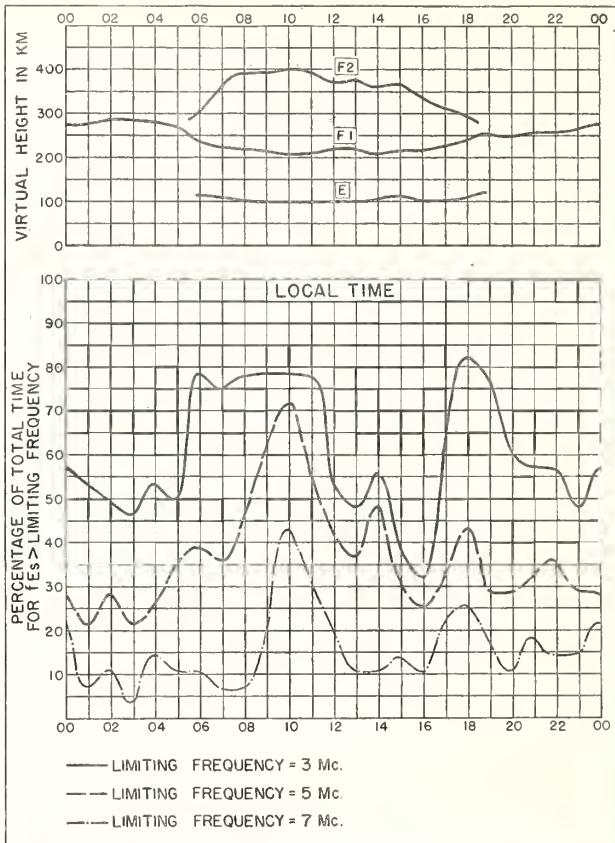


Fig. 2. WASHINGTON, D. C.

JUNE 1951

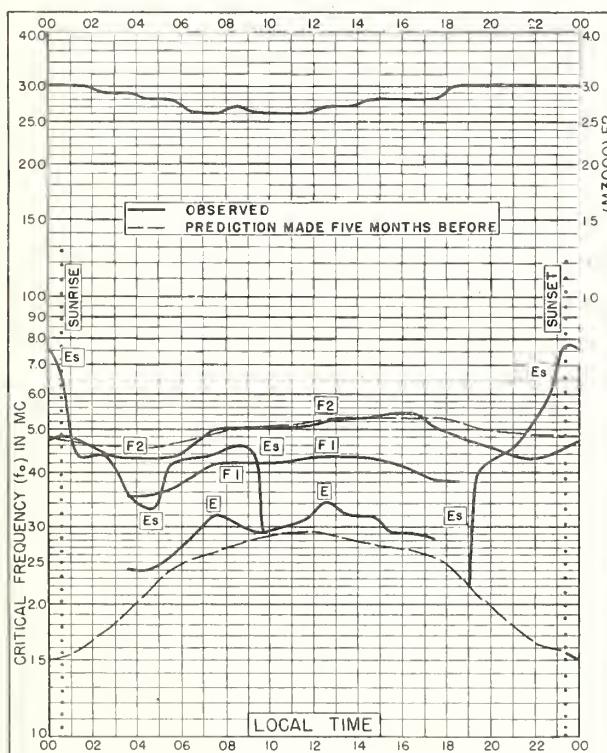


Fig. 3 POINT BARROW, ALASKA
71.3°N, 156.8°W

MAY 1951

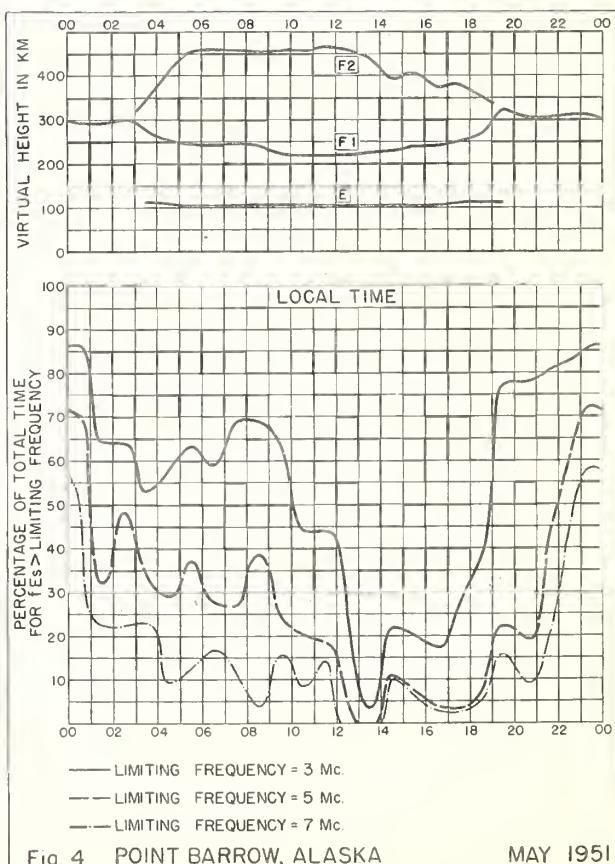


Fig. 4. POINT BARROW, ALASKA

MAY 1951

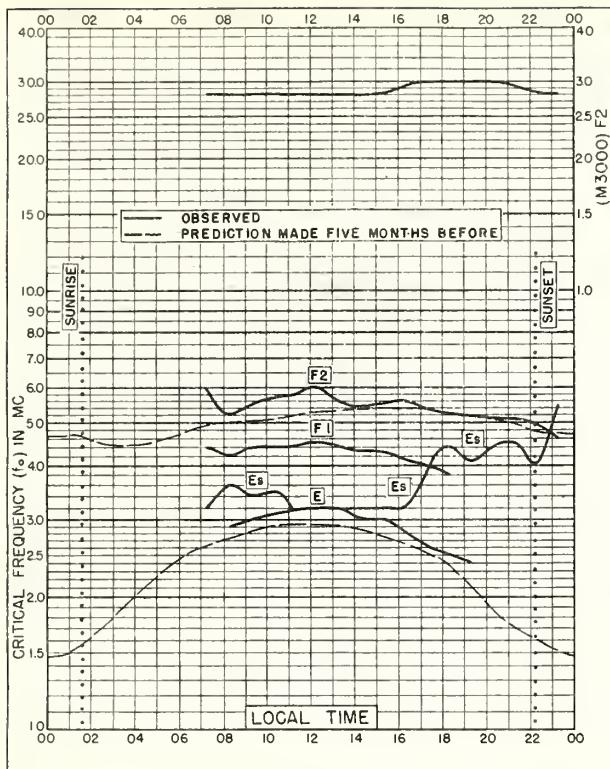


Fig. 5. TROMSO, NORWAY
69.7°N, 19.0°E MAY 1951

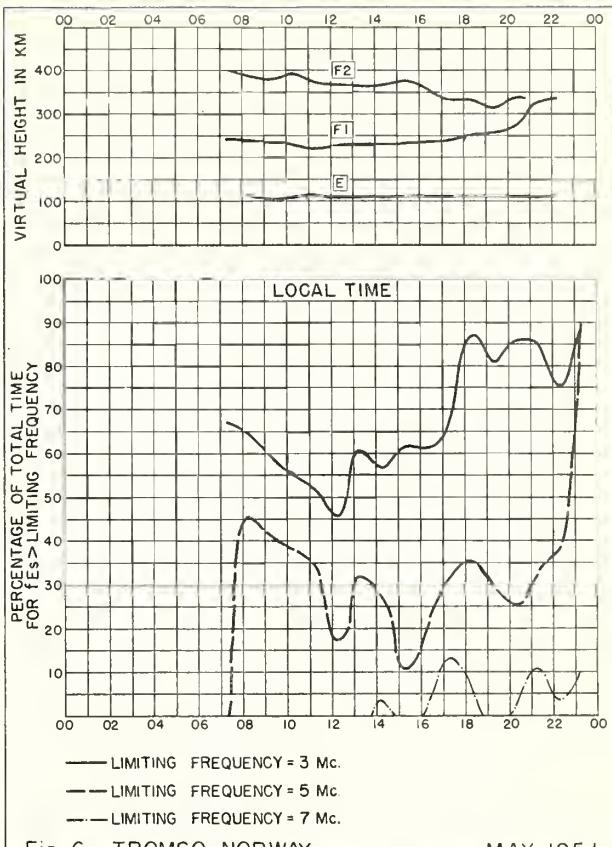


Fig. 6. TROMSO, NORWAY MAY 1951

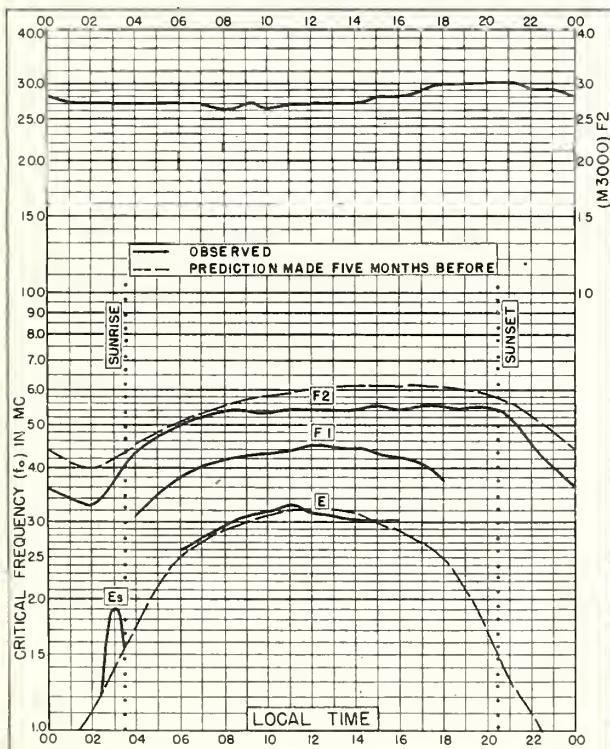


Fig. 7. ANCHORAGE, ALASKA
61.2°N, 149.9°W MAY 1951

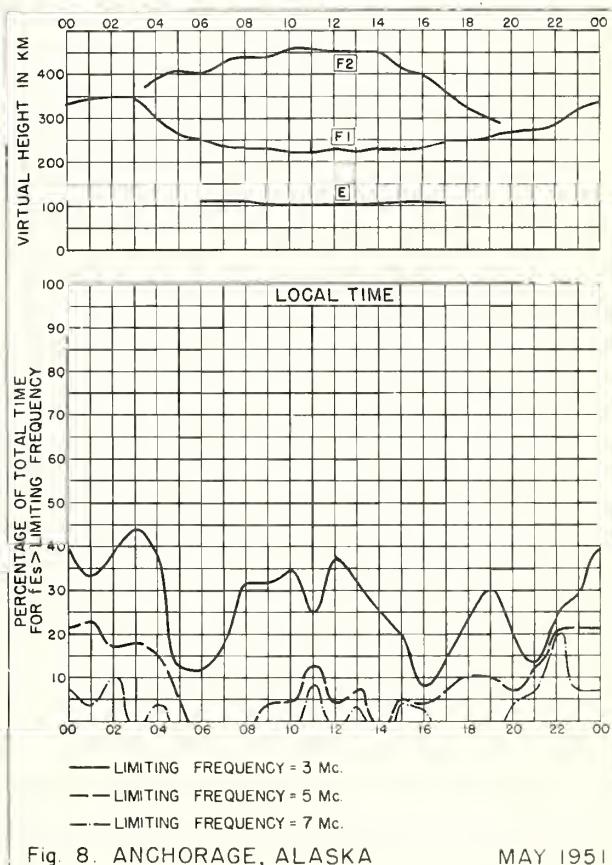


Fig. 8. ANCHORAGE, ALASKA MAY 1951

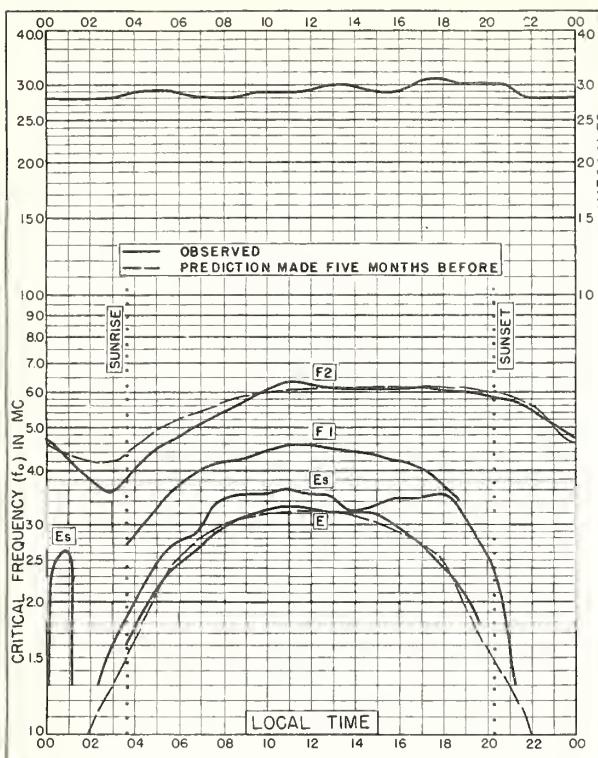


Fig. 9. OSLO, NORWAY
60.0°N, 11.0°E

MAY 1951

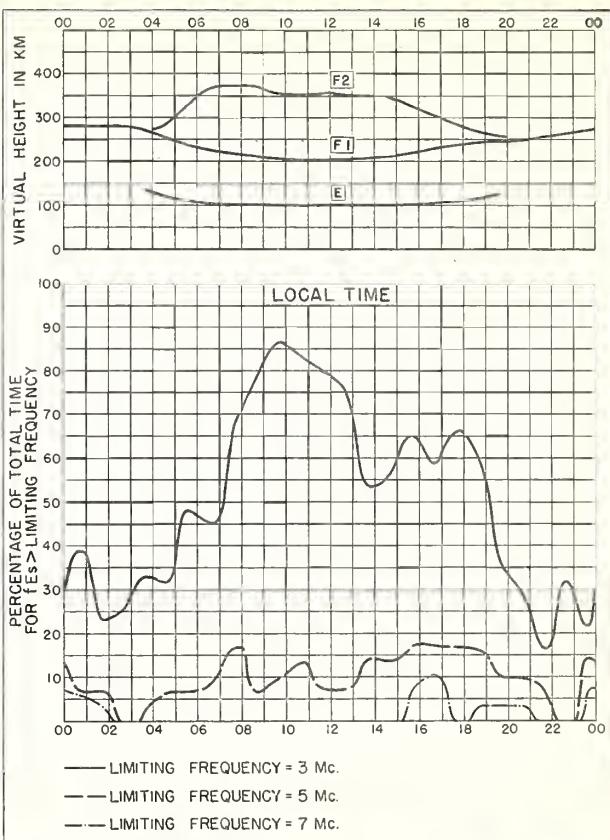


Fig. 10. OSLO, NORWAY

MAY 1951

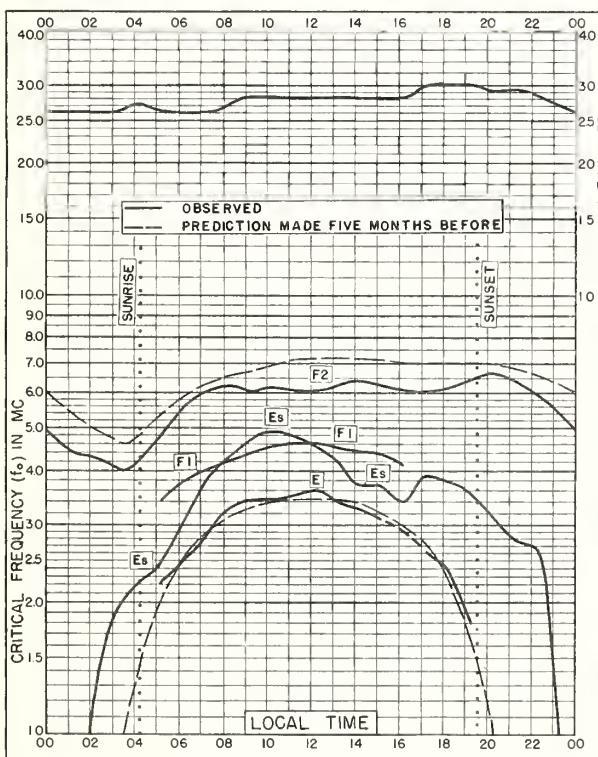


Fig. 11. ADAK, ALASKA
51.9°N, 176.6°W

MAY 1951

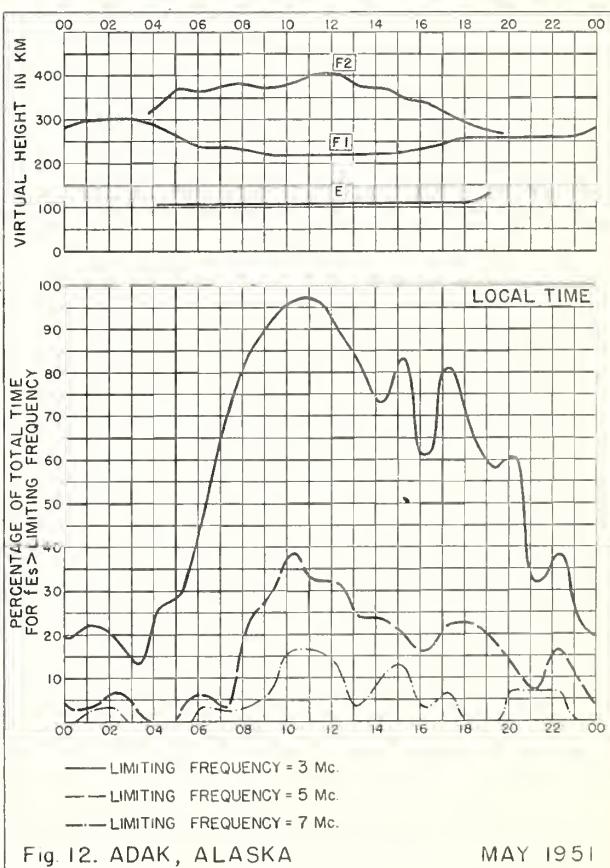


Fig. 12. ADAK, ALASKA

MAY 1951

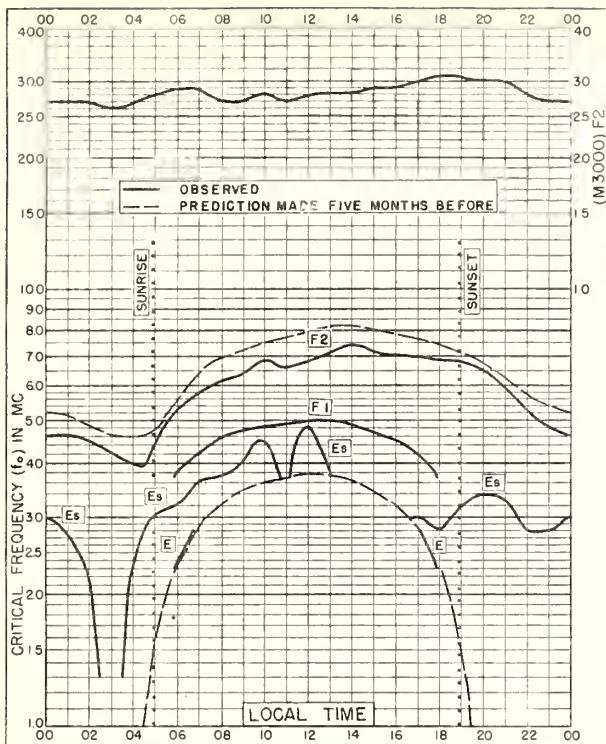


Fig. 13. SAN FRANCISCO, CALIFORNIA

37.4°N, 122.2°W MAY 1951

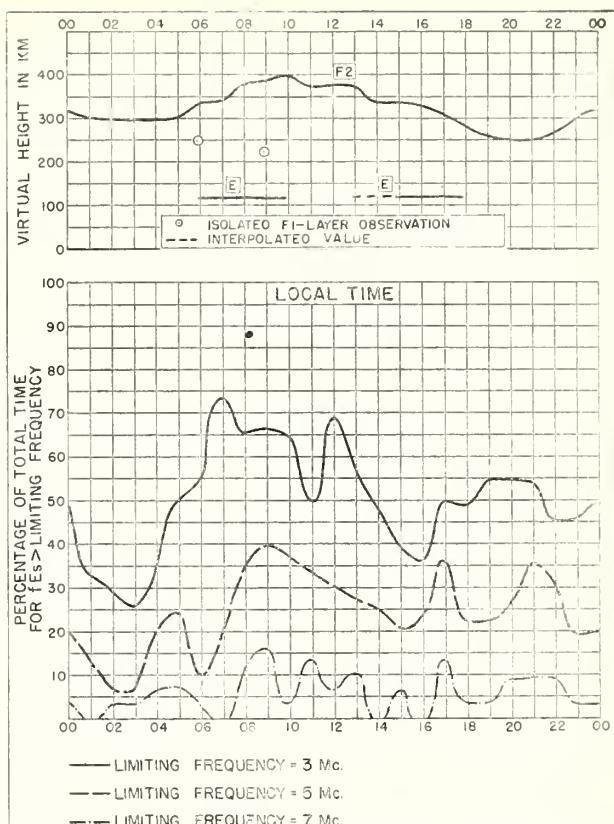


Fig. 14. SAN FRANCISCO, CALIFORNIA

MAY 1951

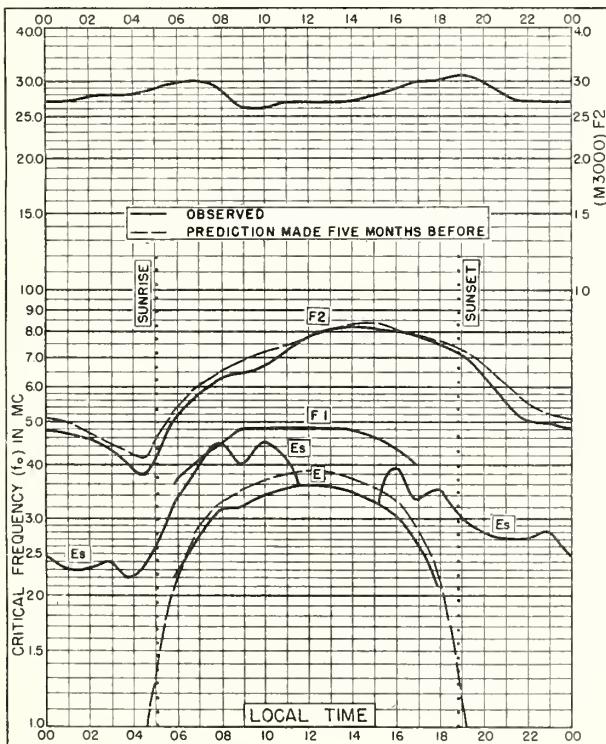


Fig. 15. WHITE SANDS, NEW MEXICO

32.3°N, 106.5°W MAY 1951

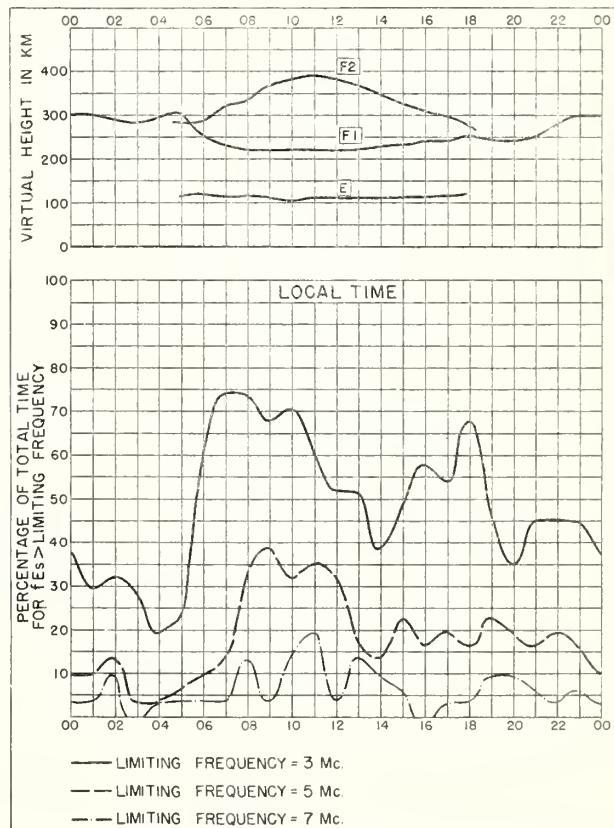
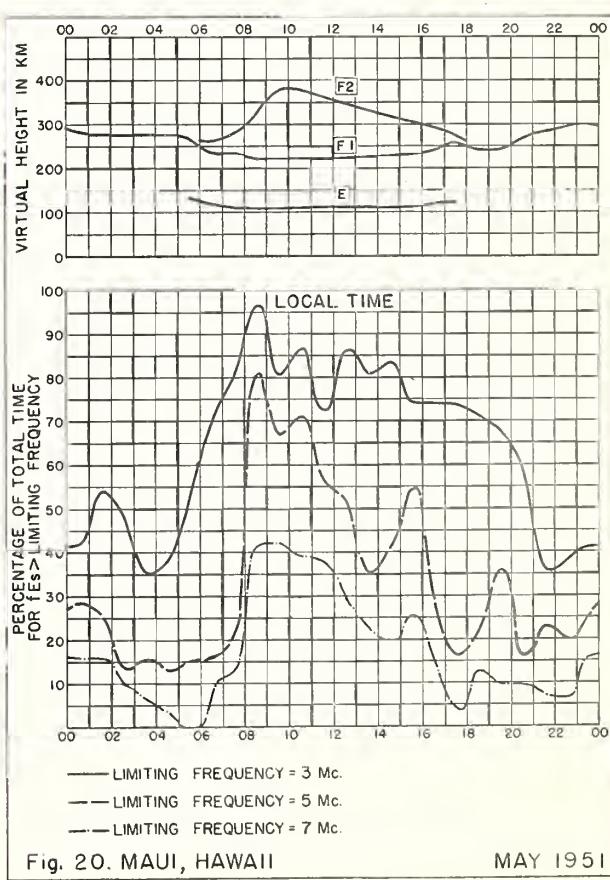
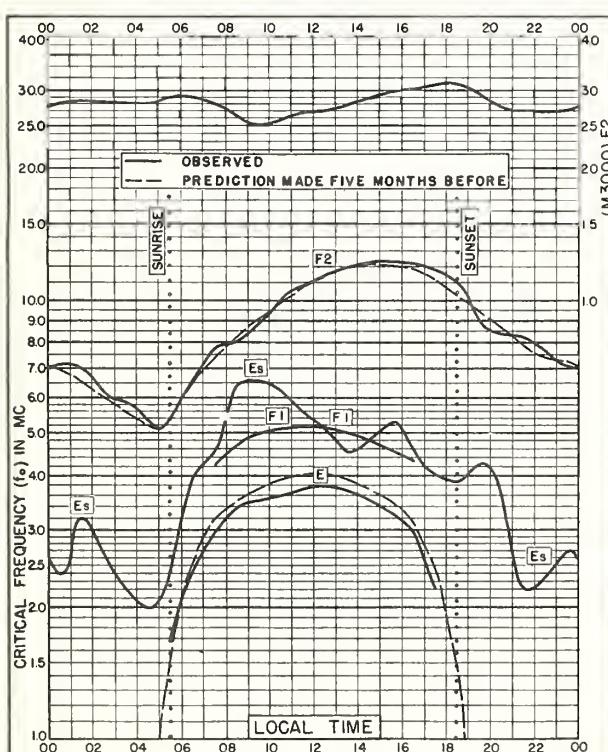
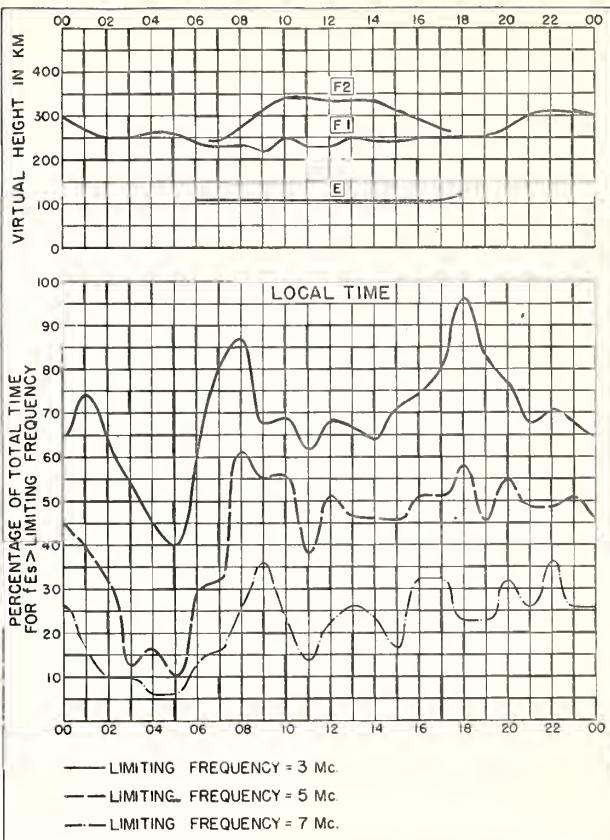
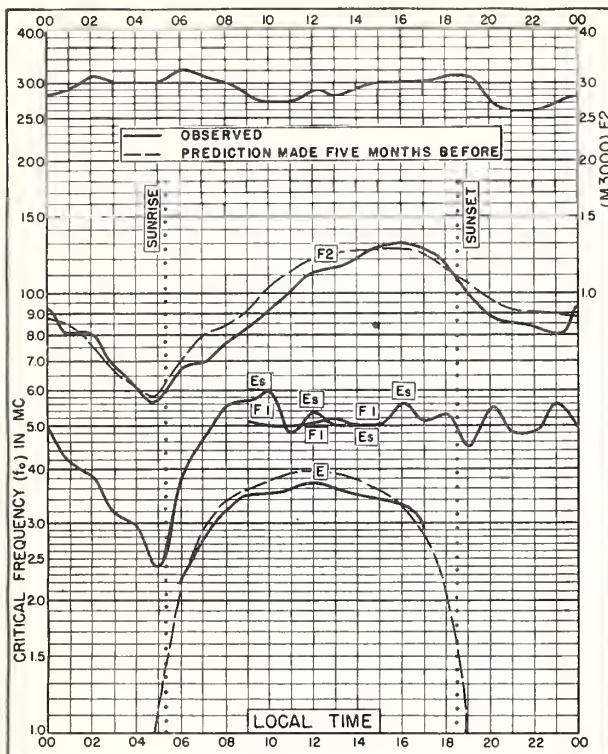
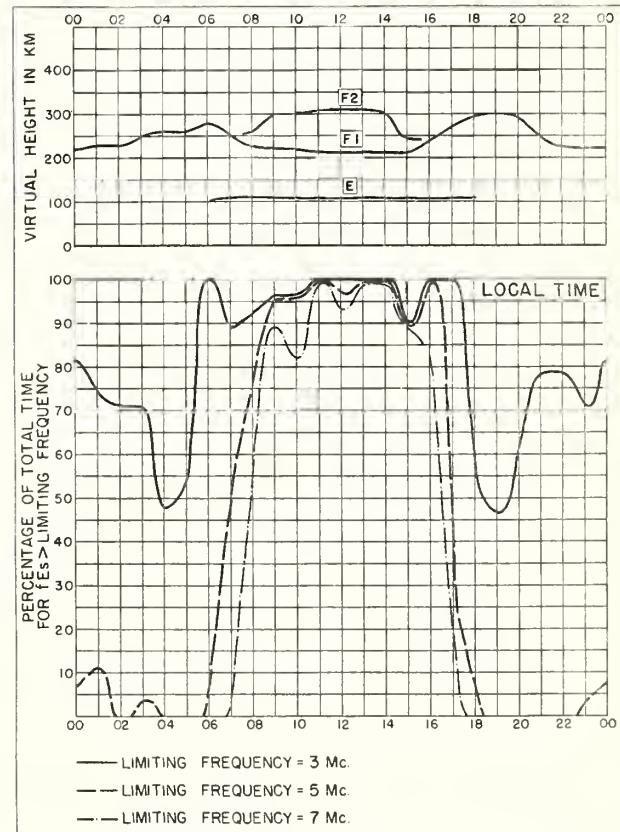
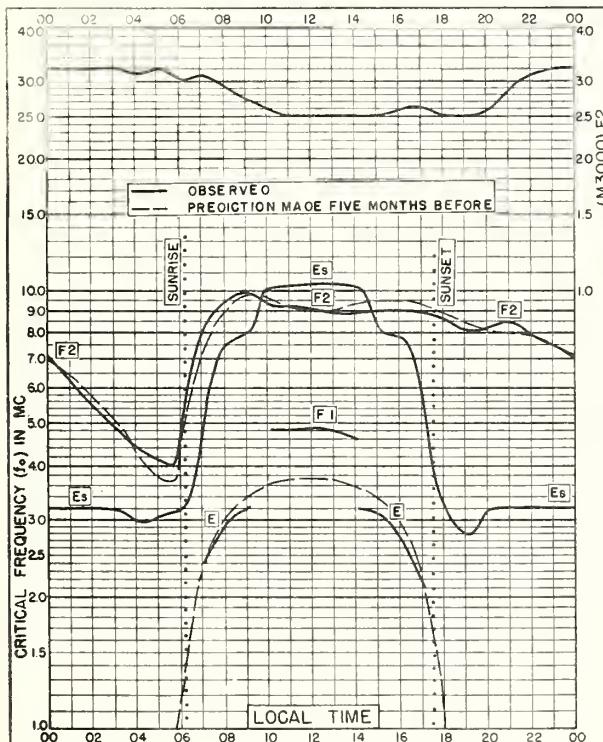
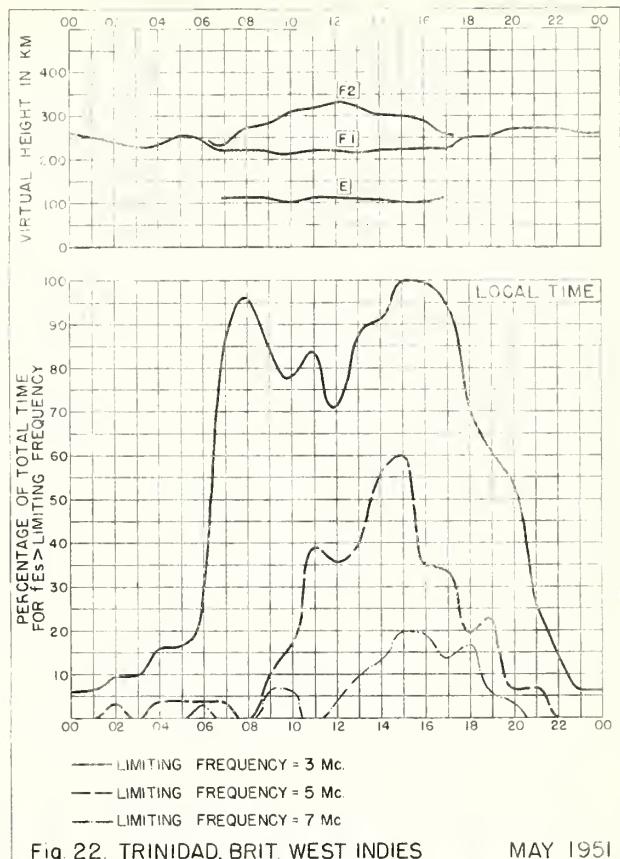
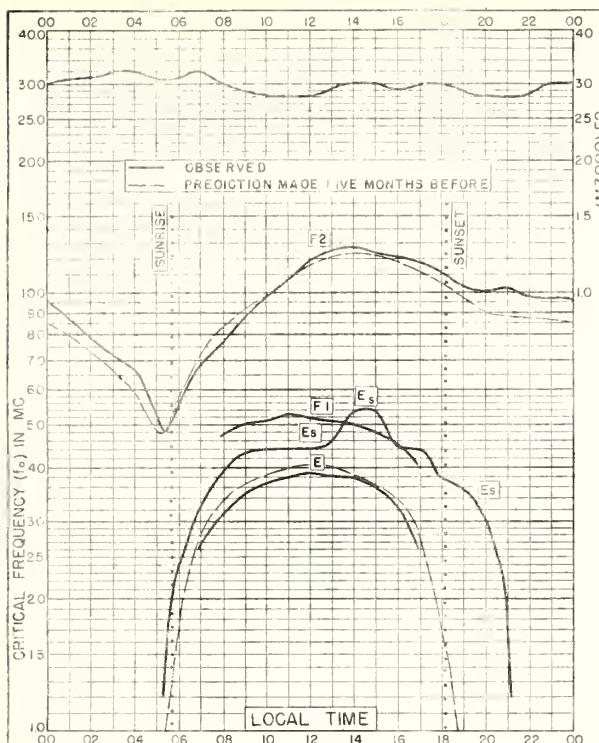
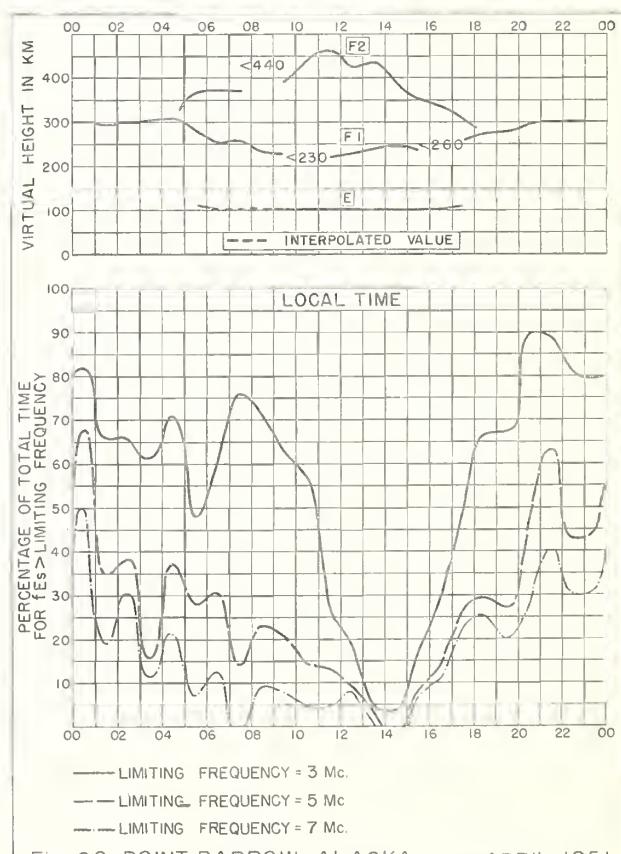
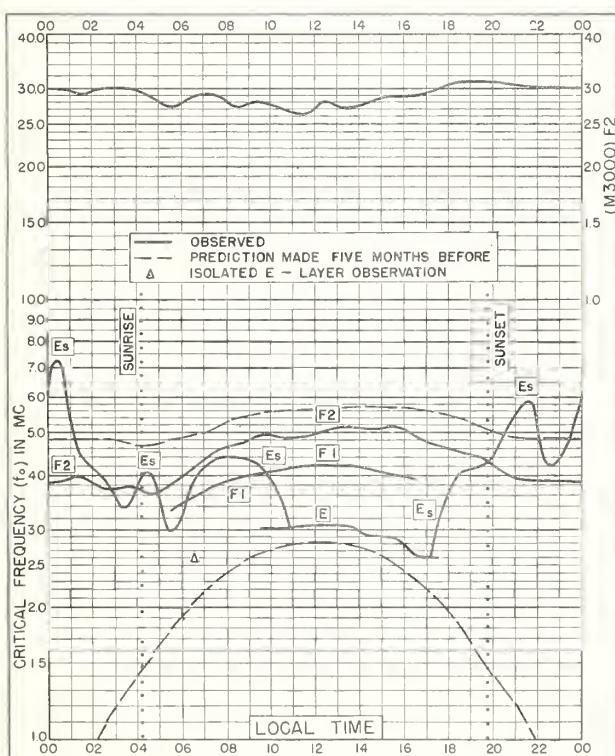
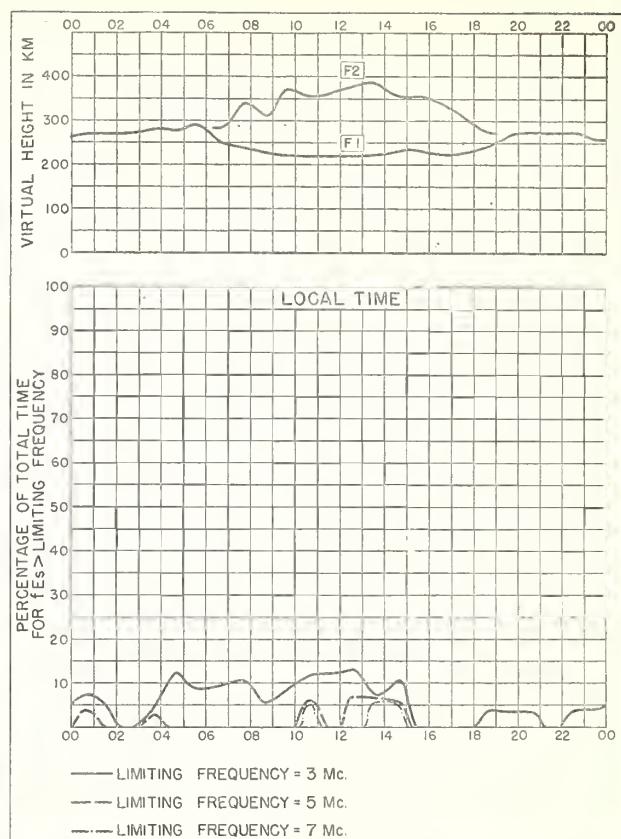
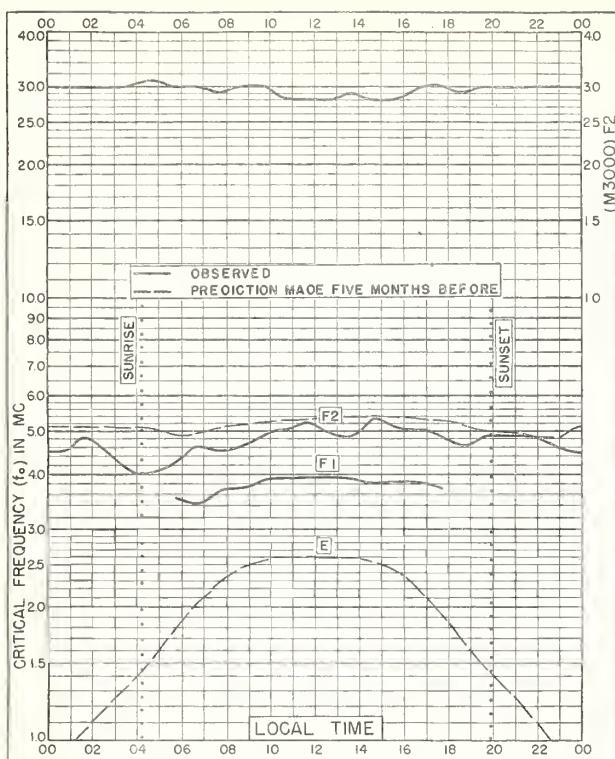


Fig. 16. WHITE SANDS, NEW MEXICO

MAY 1951







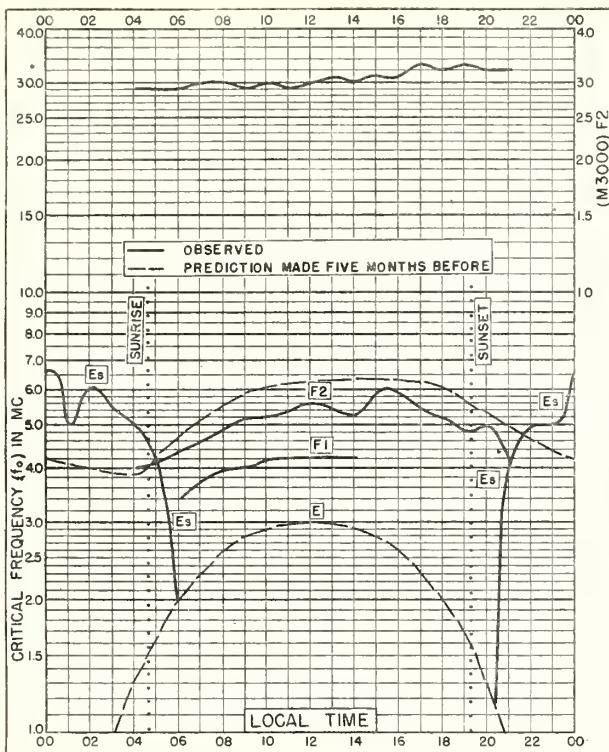


Fig. 29. FAIRBANKS, ALASKA
64. 9°N, 147. 8°W

APRIL 1951

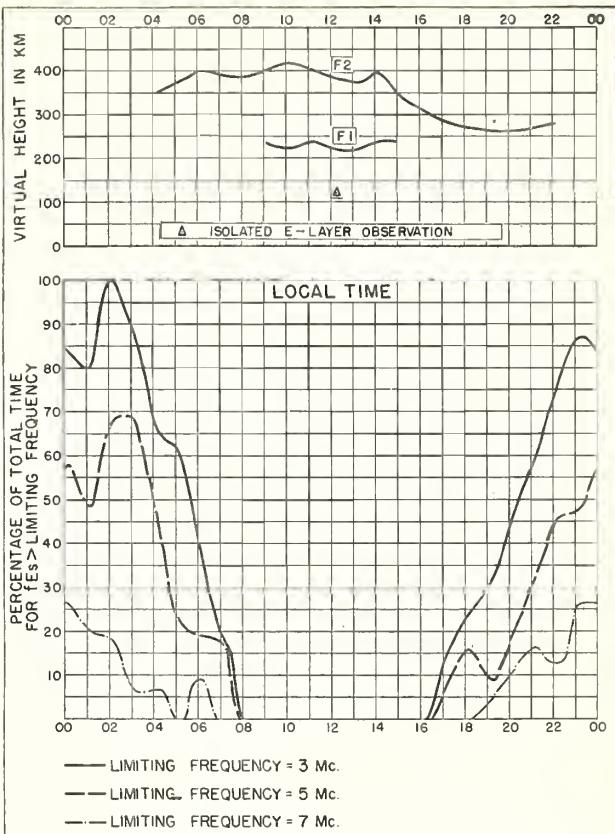


Fig. 30. FAIRBANKS, ALASKA

APRIL 1951

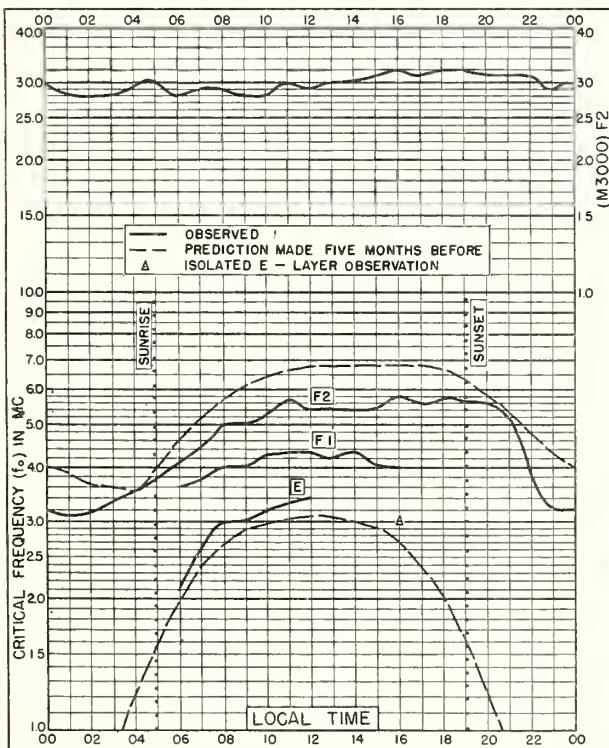


Fig. 31. ANCHORAGE, ALASKA
61. 2°N, 149. 9°W

APRIL 1951

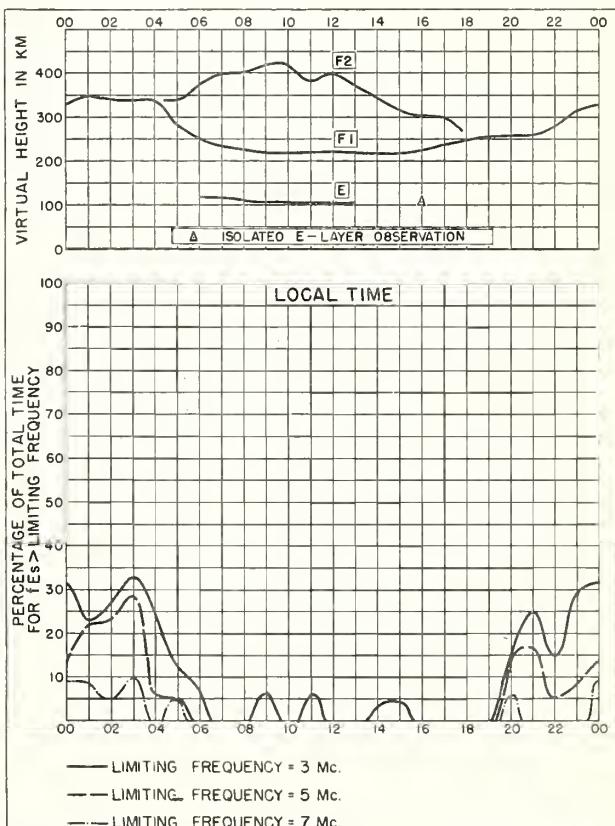
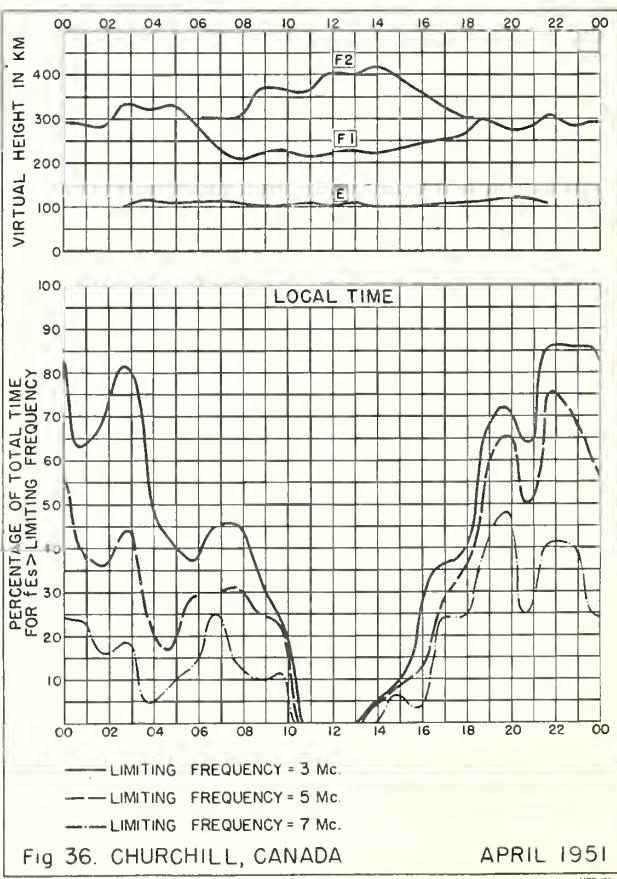
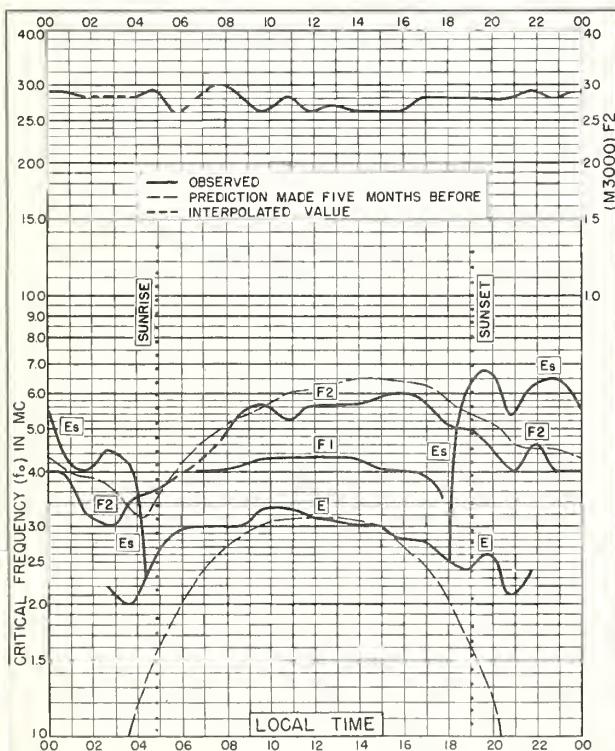
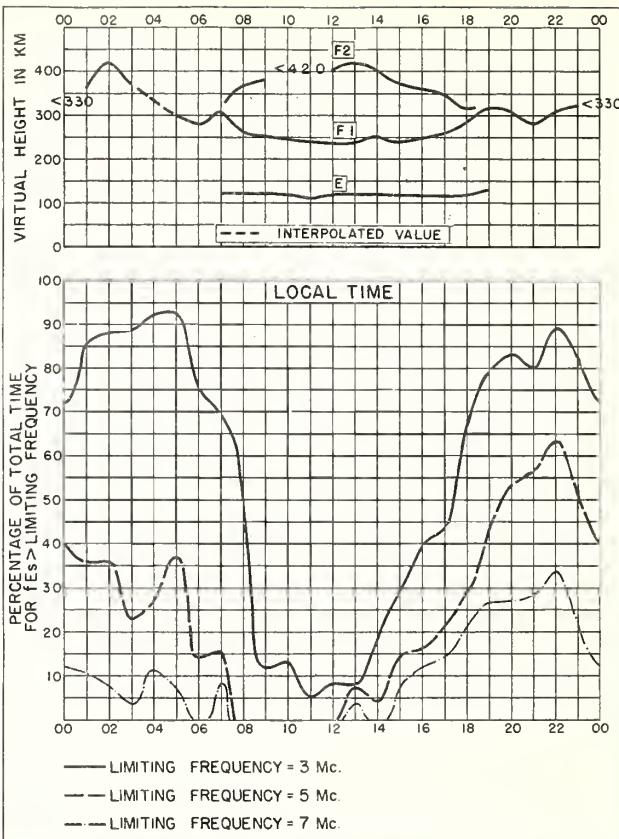
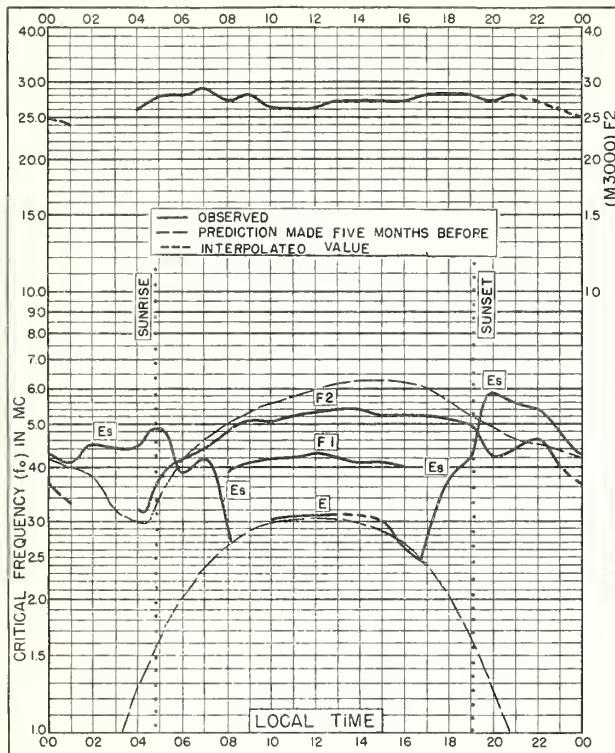


Fig. 32. ANCHORAGE, ALASKA

APRIL 1951



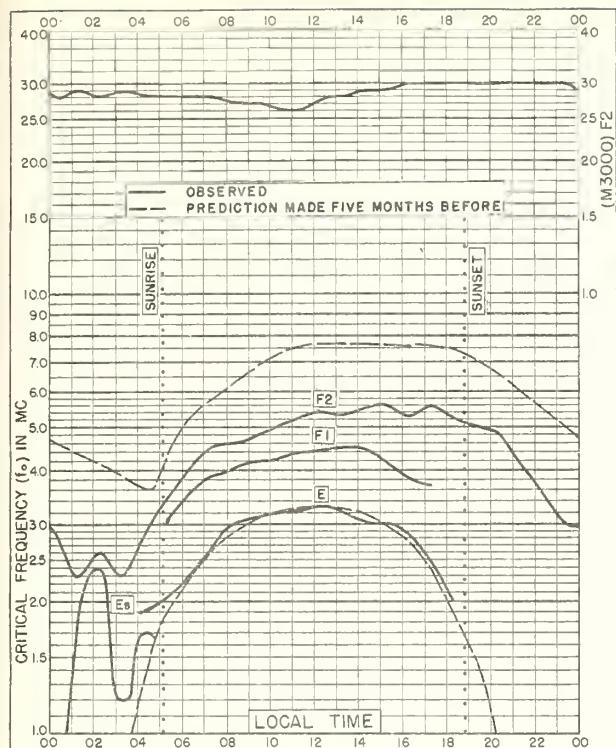


Fig. 37. PRINCE RUPERT, CANADA
54. 3°N, 130. 3°W

APRIL 1951

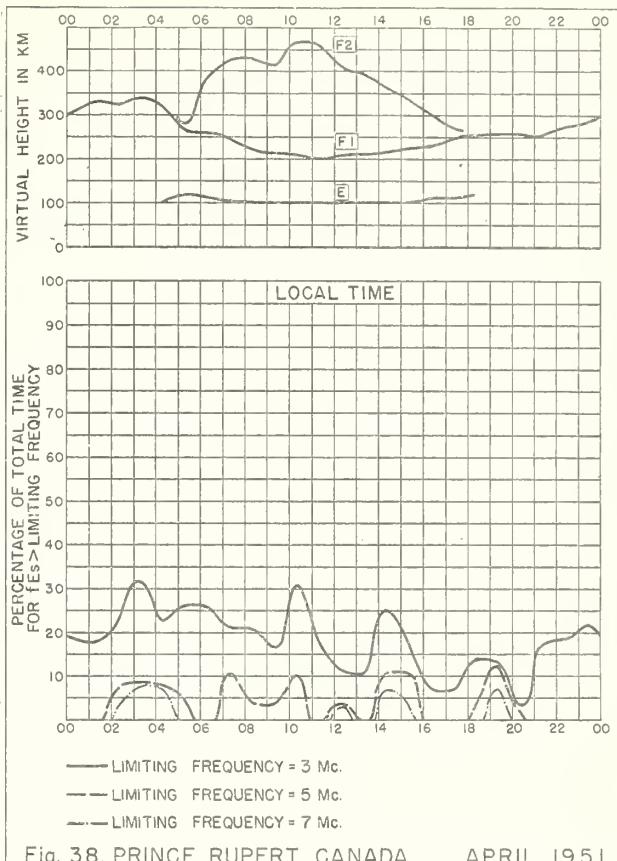


Fig. 38. PRINCE RUPERT, CANADA APRIL 1951

100

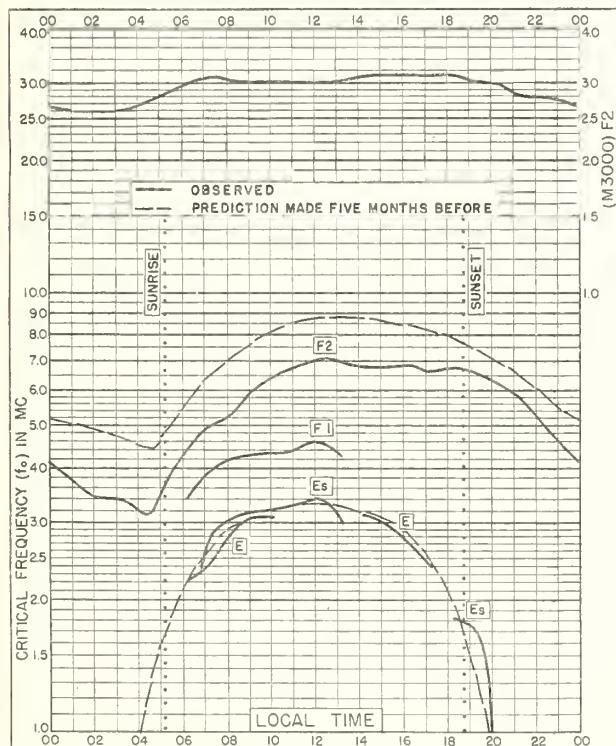


Fig. 39. ADAK, ALASKA
51. 9°N. 176. 6°W.

APRIL 1951

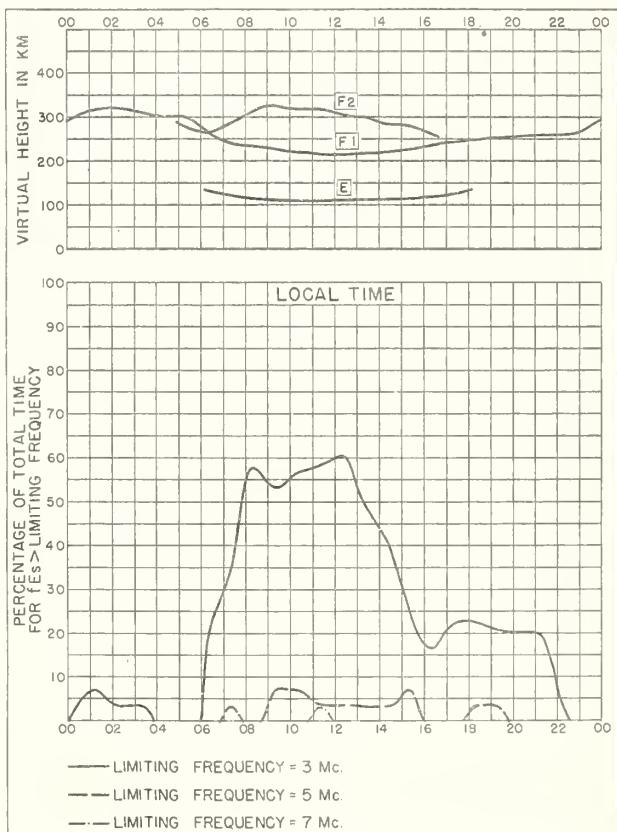


Fig. 40. ADAK, ALASKA

APRIL 1951

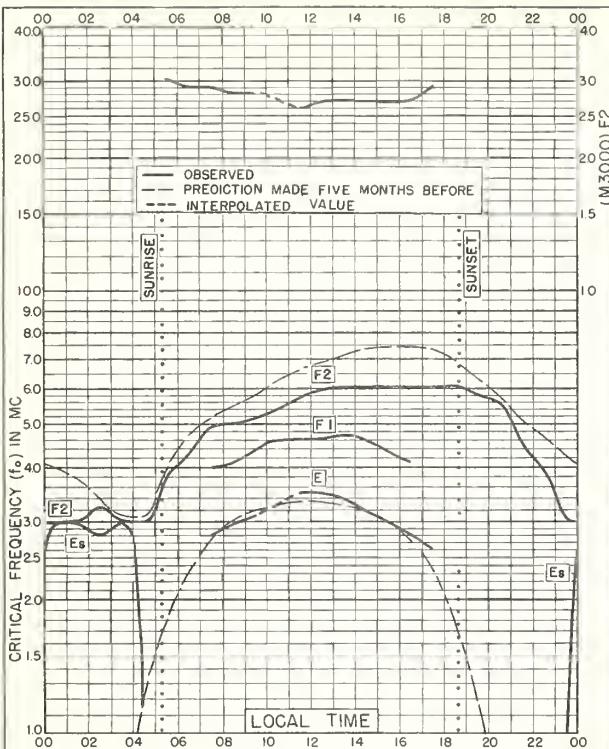


Fig. 41. WINNIPEG, CANADA

49.9°N, 97.4°W

APRIL 1951

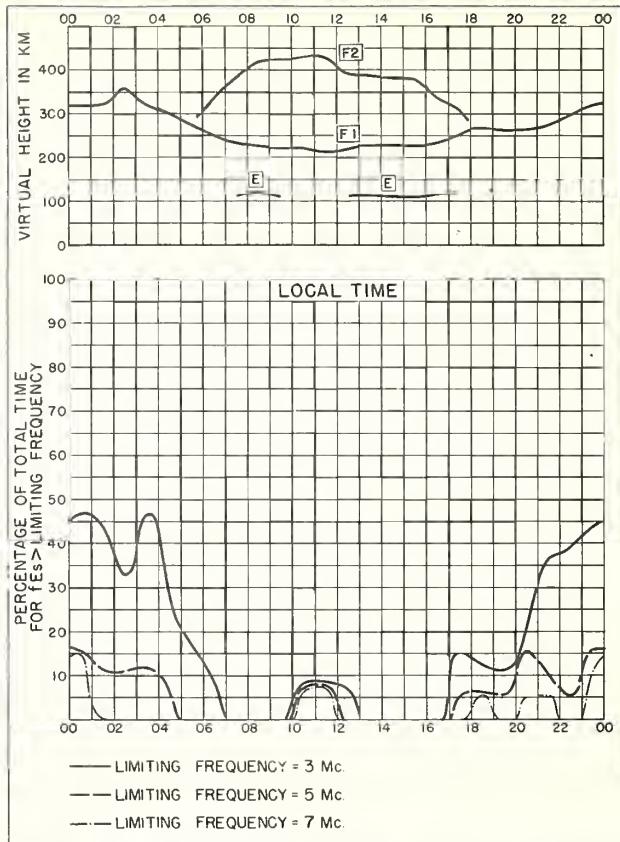


Fig. 42. WINNIPEG, CANADA

APRIL 1951

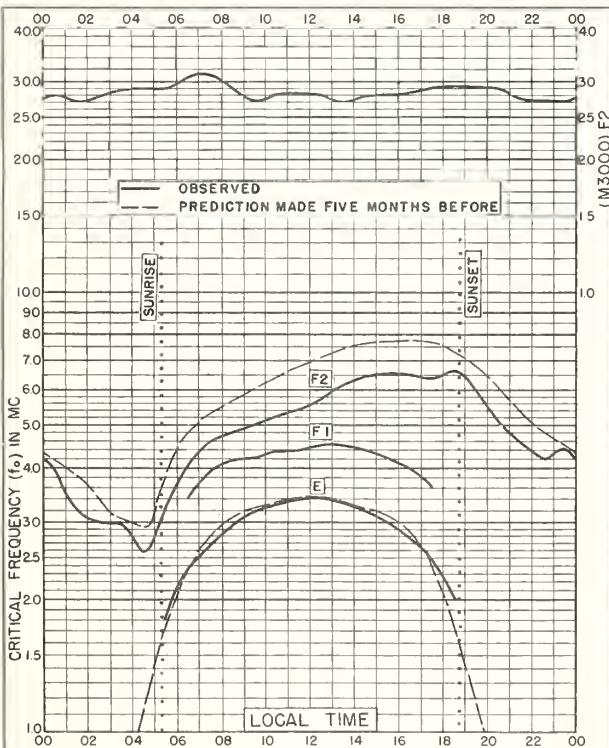


Fig. 43. ST. JOHN'S, NEWFOUNDLAND

47.6°N, 52.7°W

APRIL 1951

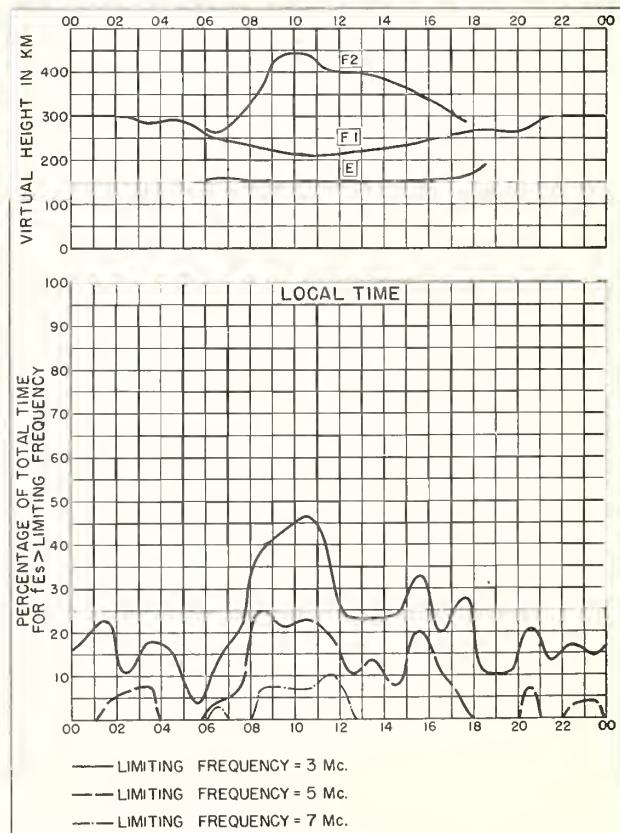
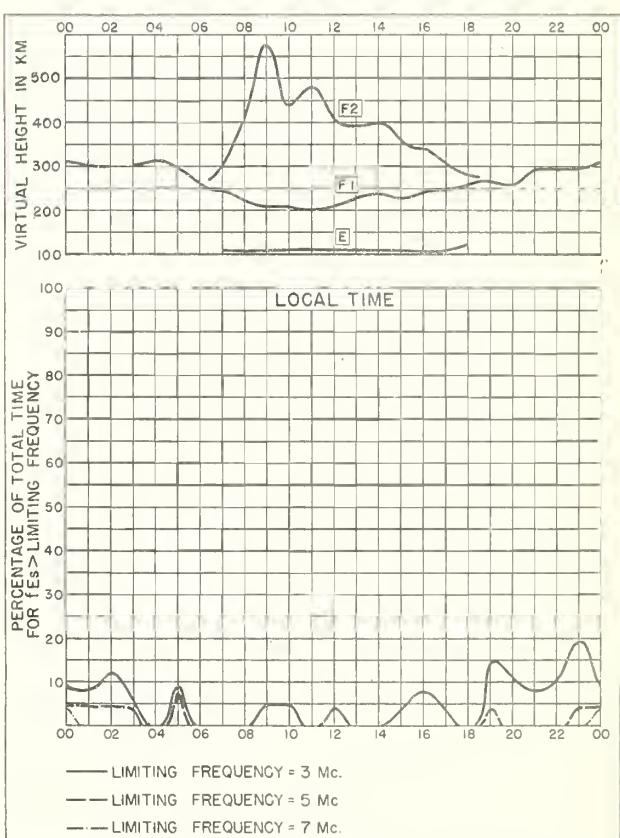
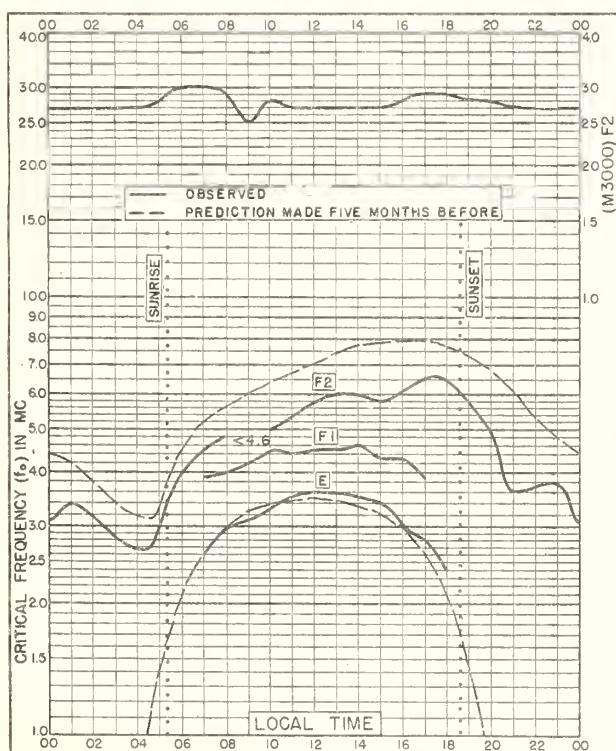
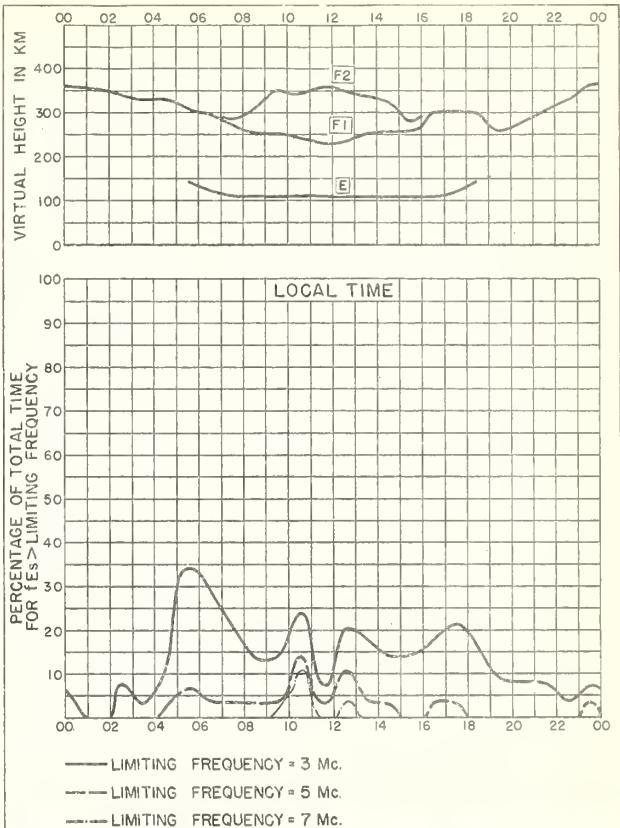
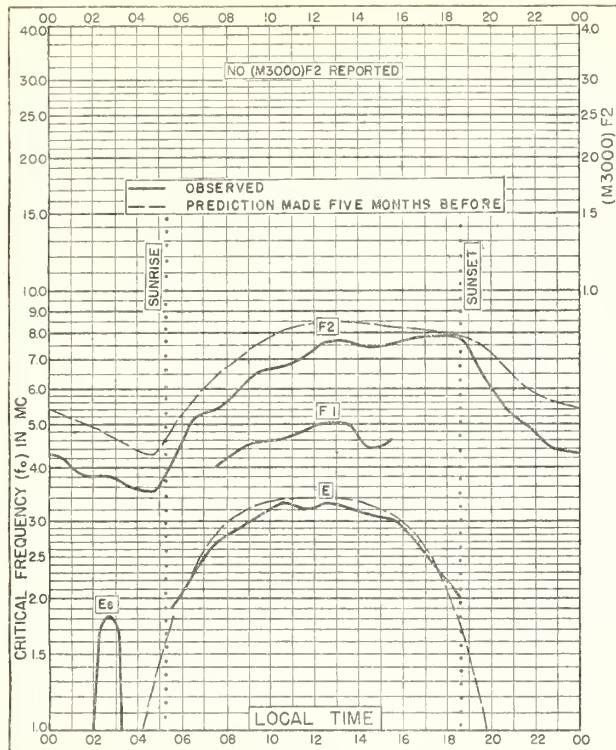


Fig. 44. ST. JOHN'S, NEWFOUNDLAND APRIL 1951

NBS 48



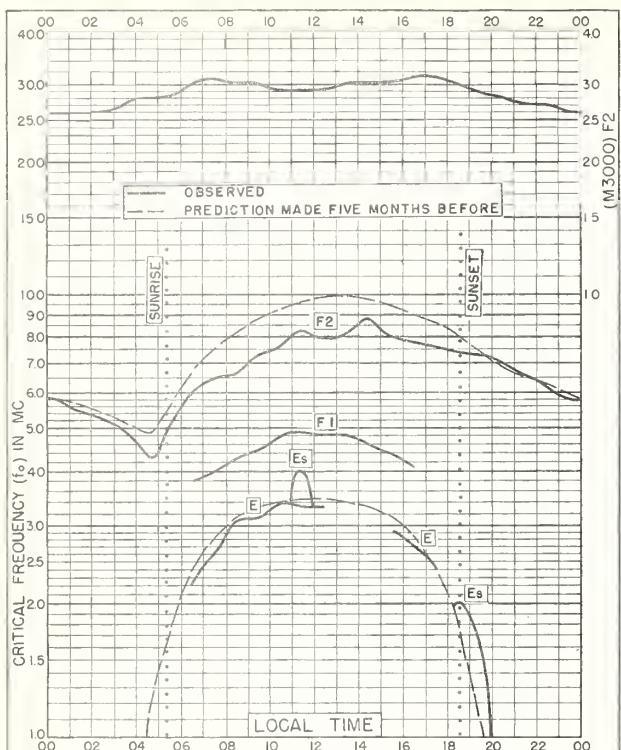


Fig. 49. WAKKANAI, JAPAN
 45.4°N, 141.7°E APRIL 1951

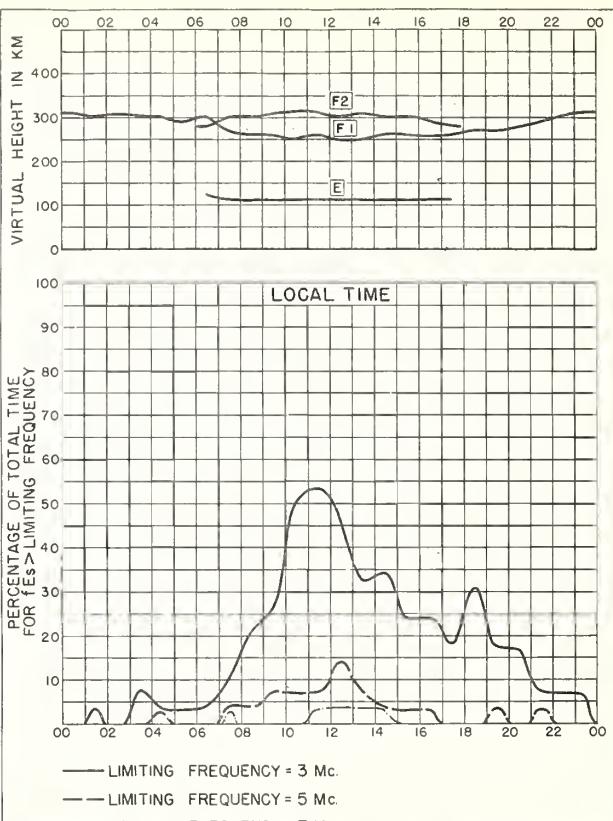


Fig. 50. WAKKANAI, JAPAN APRIL 1951

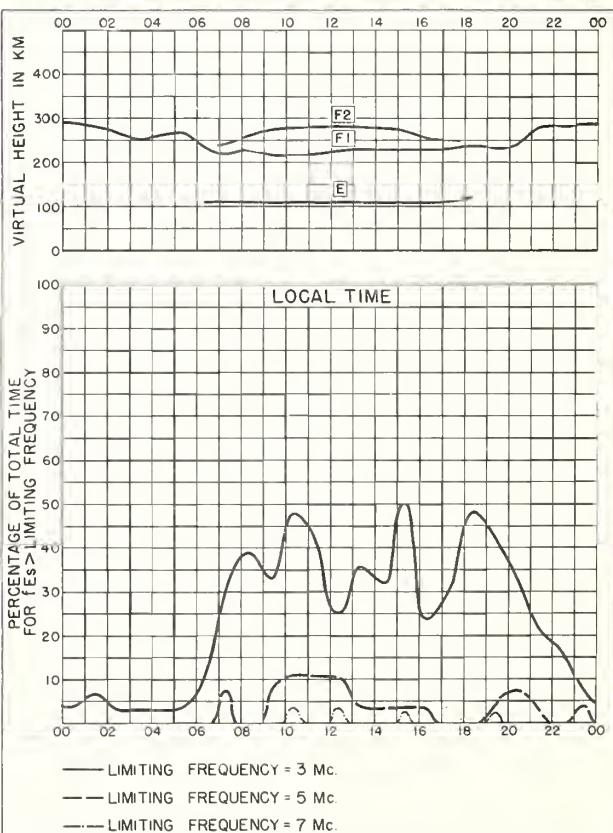
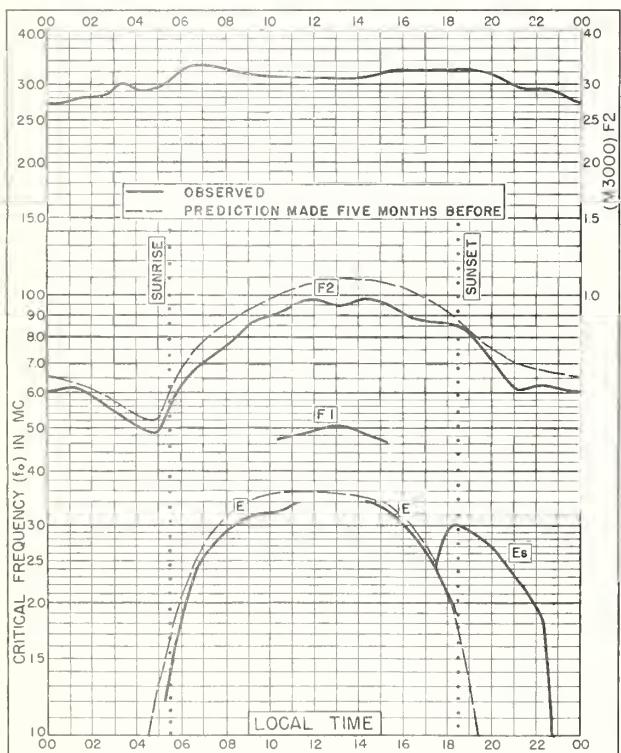
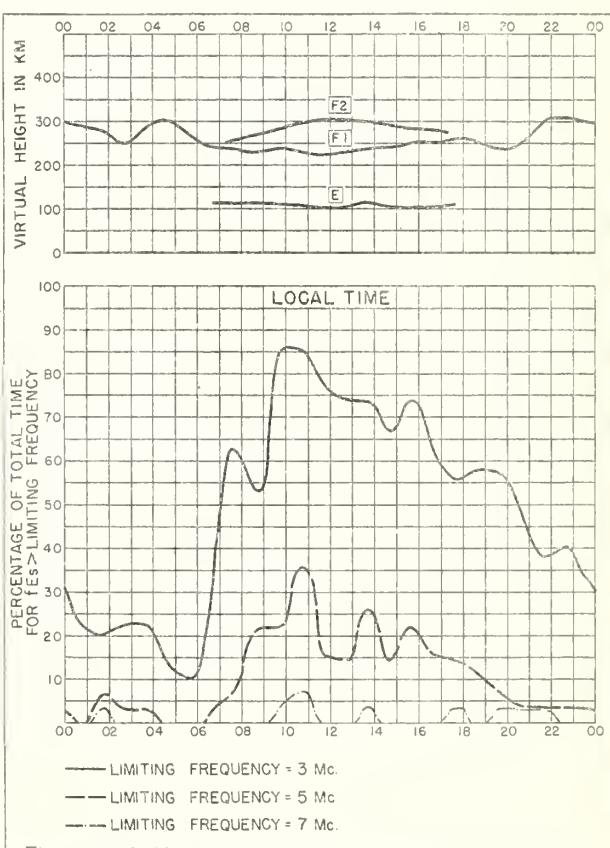
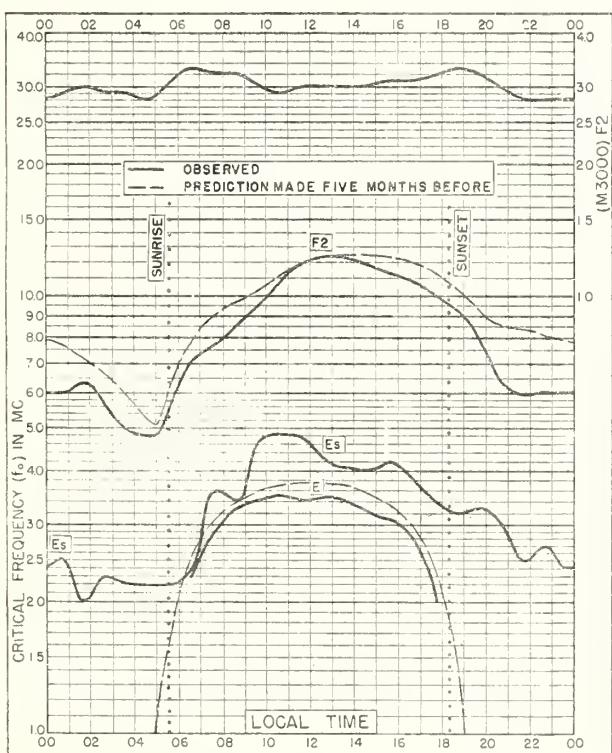
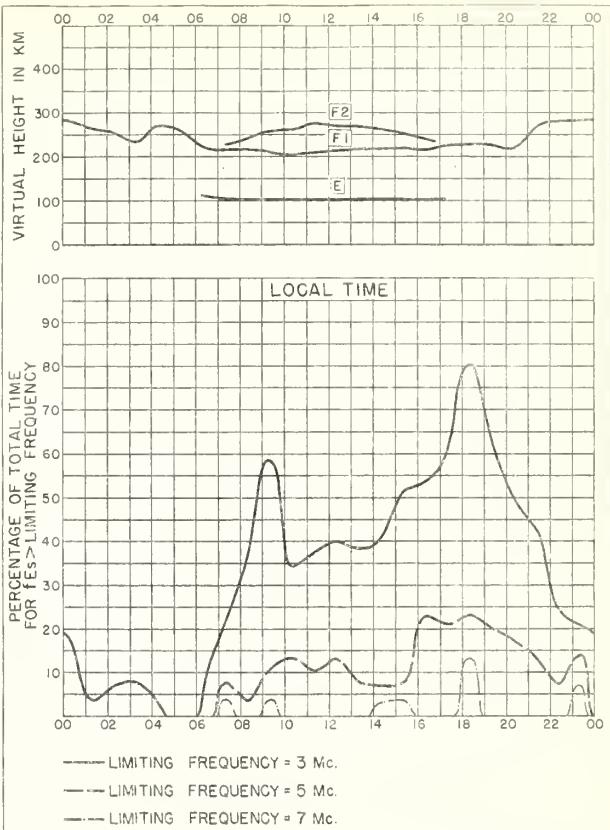
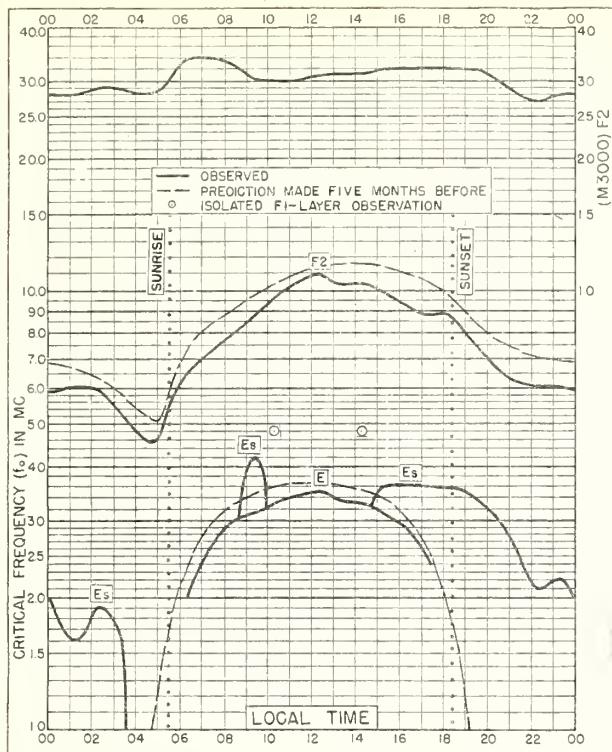
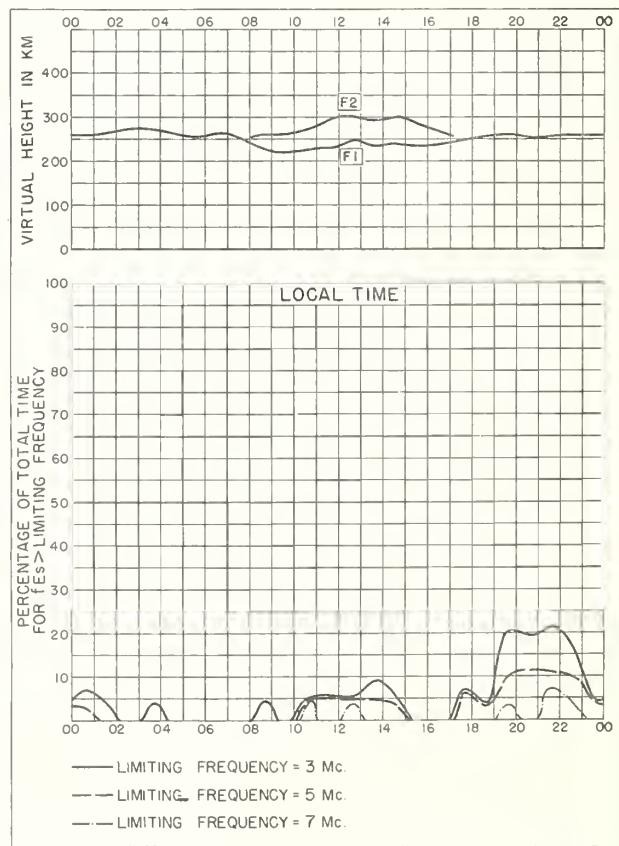
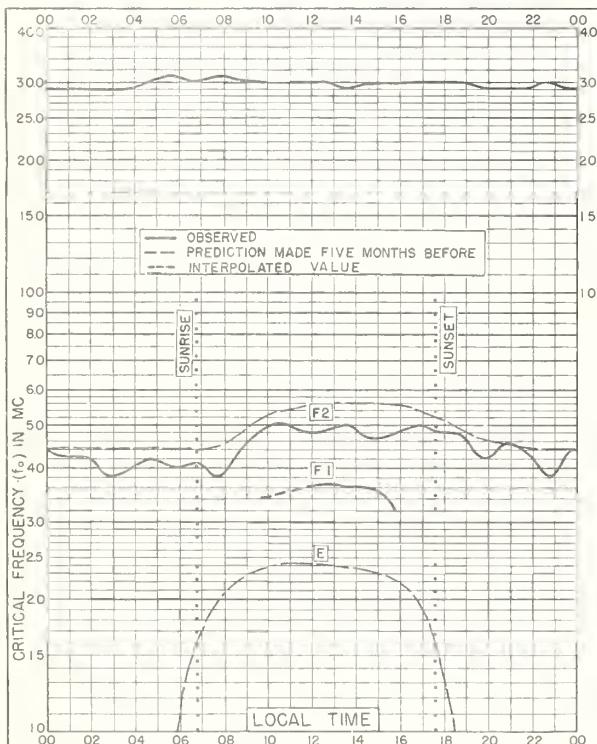
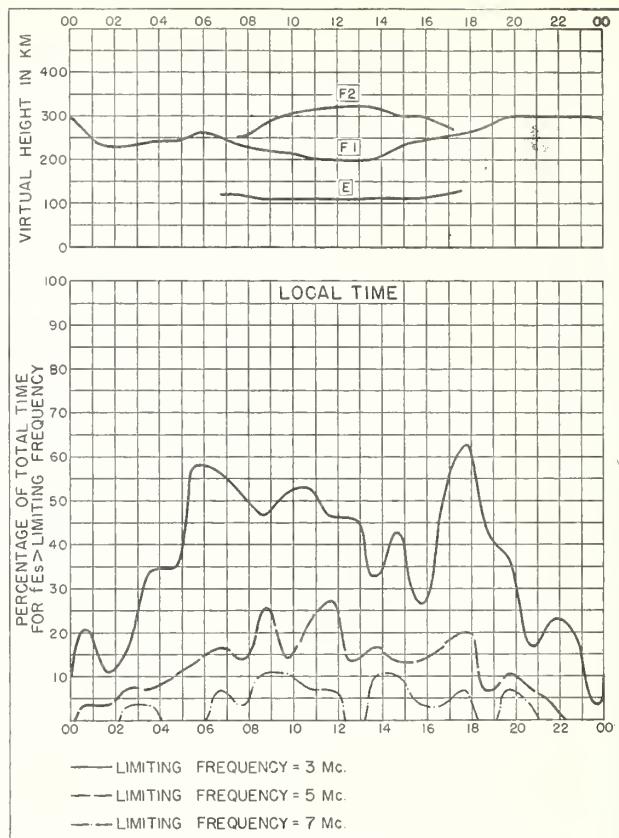
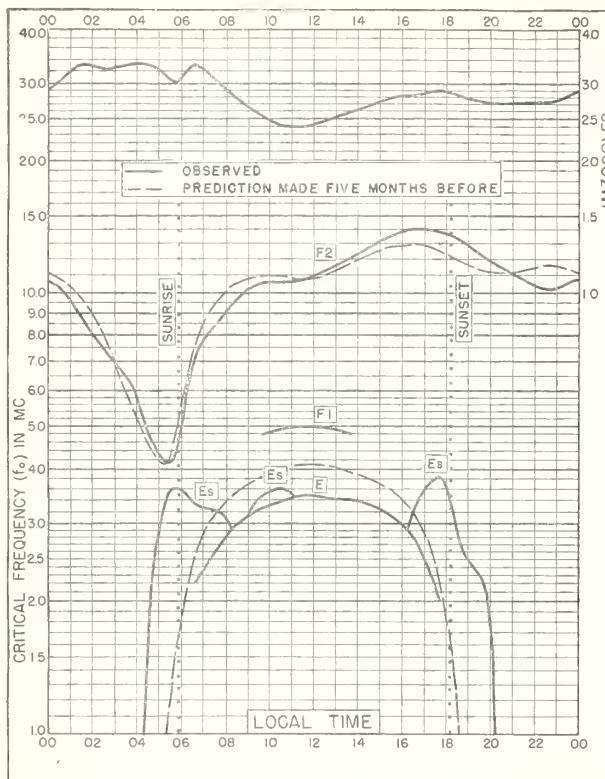


Fig. 52. AKITA, JAPAN APRIL 1951





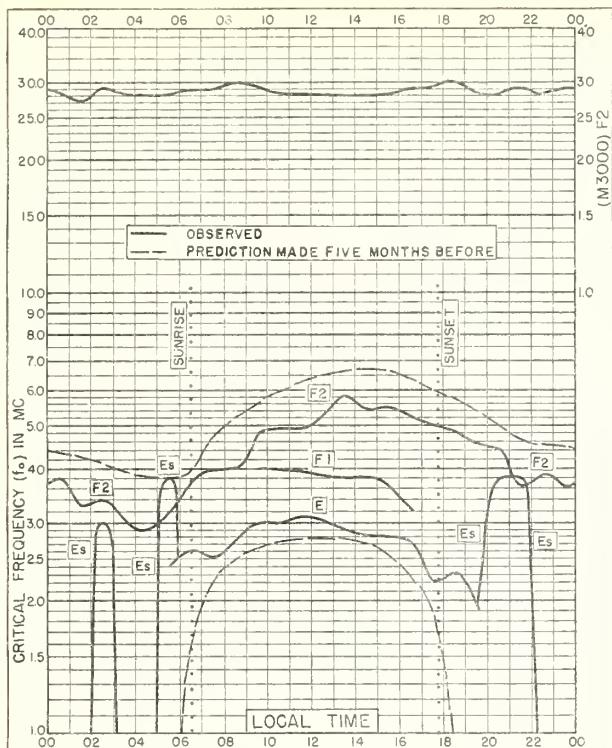


Fig. 61. BAKER LAKE, CANADA
64.3°N, 96.0°W

MARCH 1951

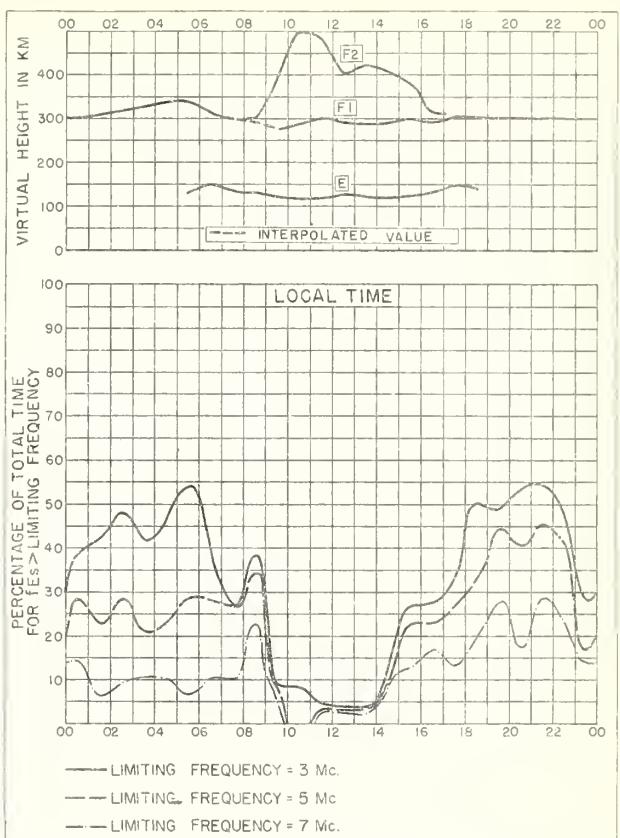


Fig. 62. BAKER LAKE, CANADA

MARCH 1951

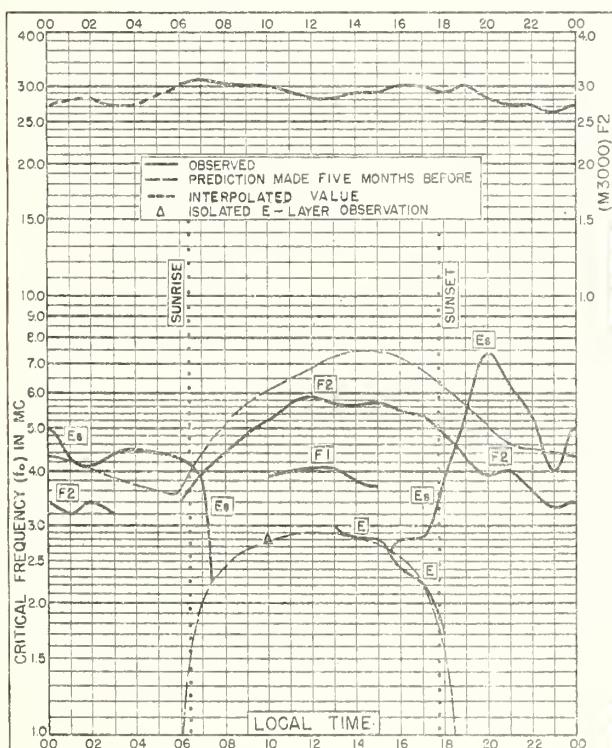


Fig. 63. NARSARSSUAK, GREENLAND
61.2°N, 45.4°W

MARCH 1951

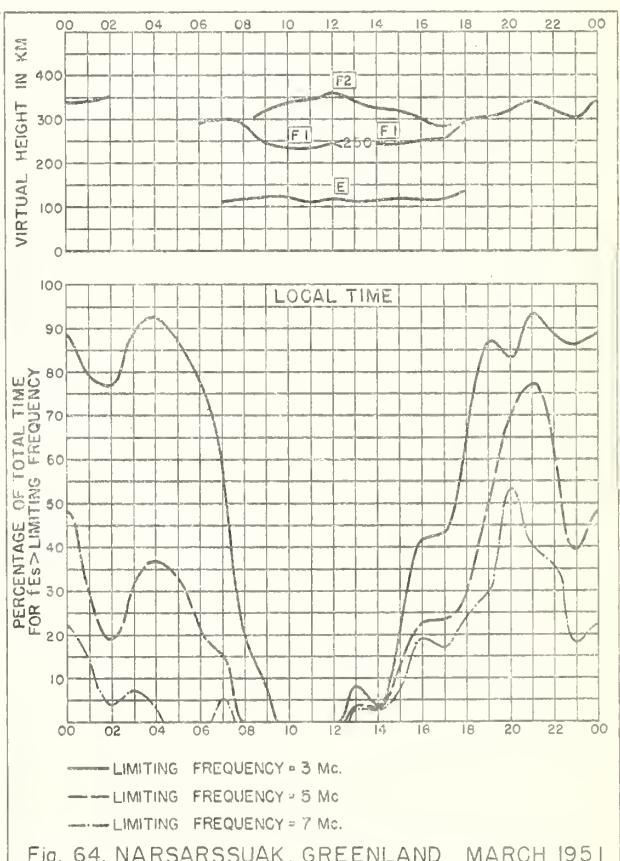
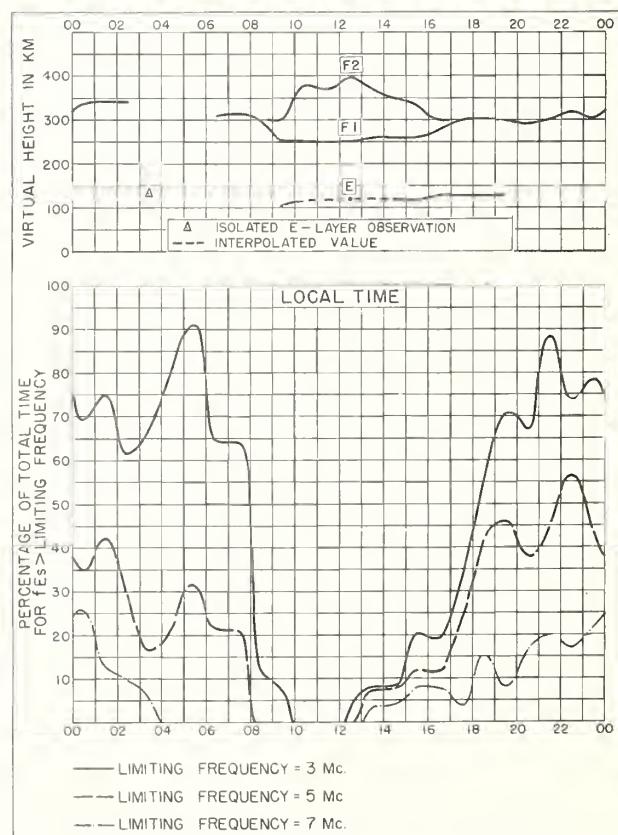
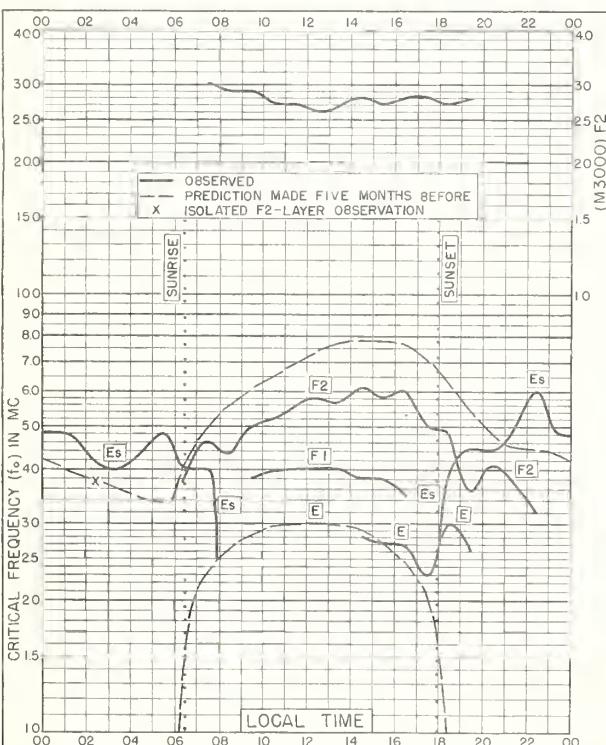
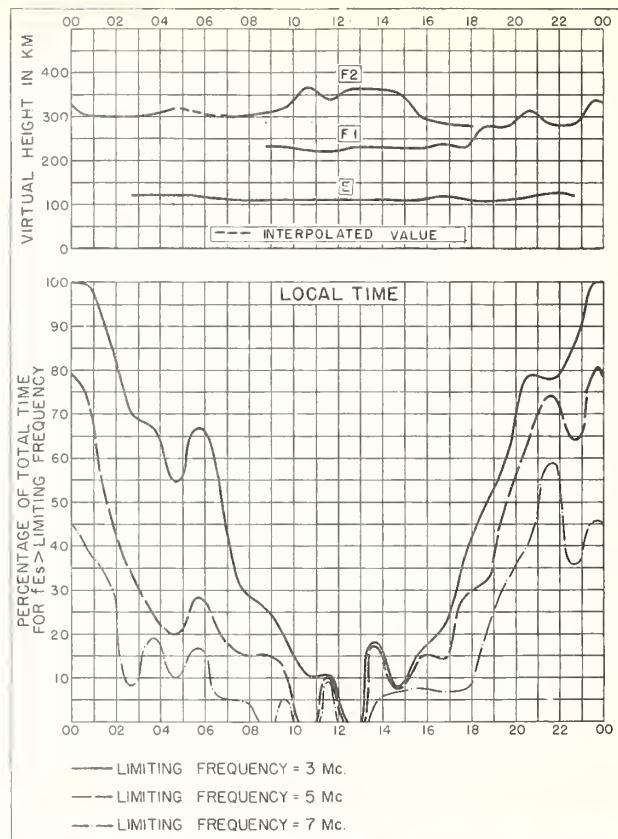
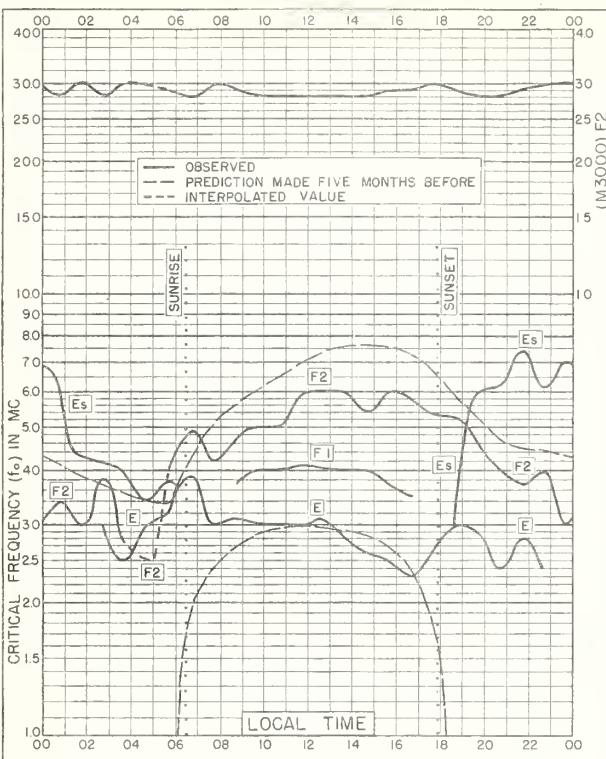


Fig. 64. NARSARSSUAK, GREENLAND MARCH 1951

NBS 480



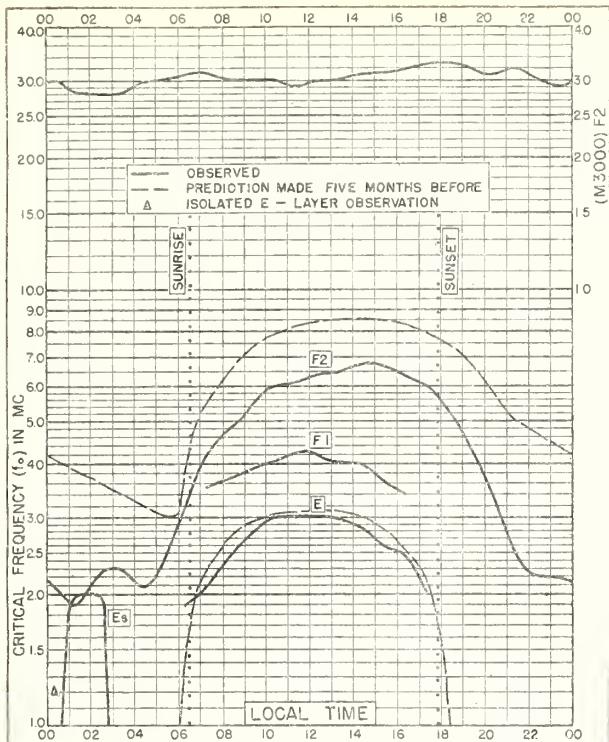


Fig. 69. PRINCE RUPERT, CANADA
54.3°N, 130.3°W MARCH 1951

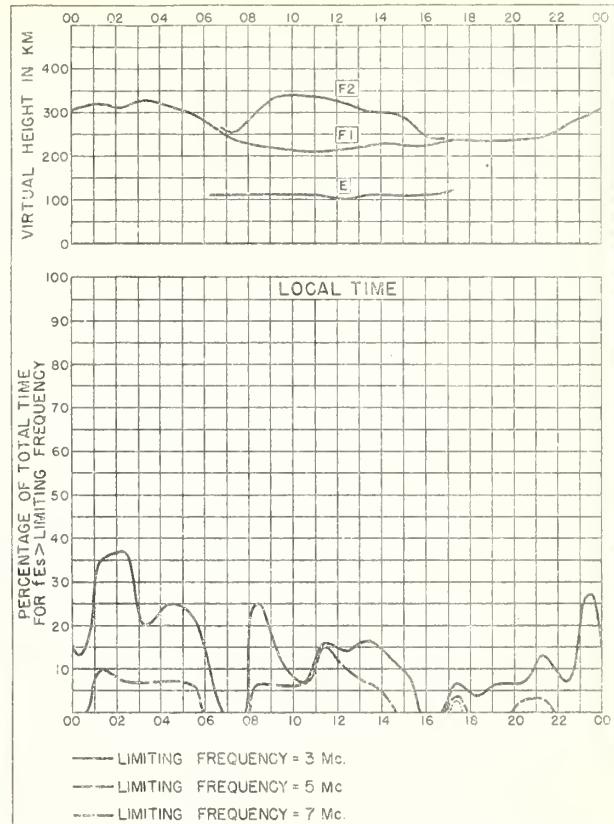


Fig. 70. PRINCE RUPERT, CANADA MARCH 1951

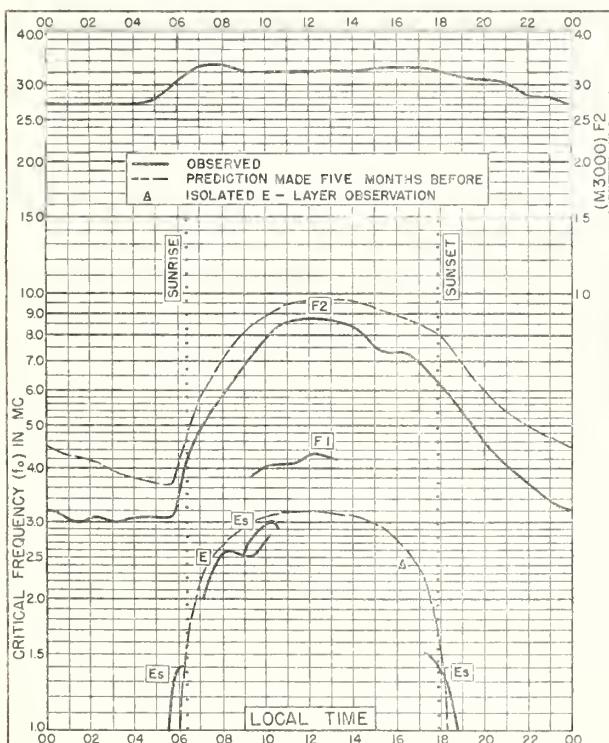


Fig. 71. ADAK, ALASKA
51.9°N, 176.6°W MARCH 1951

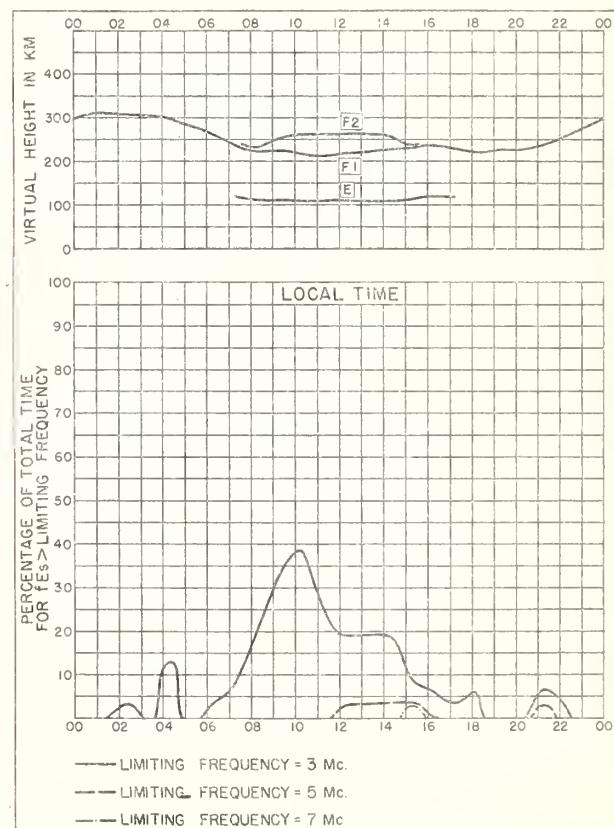


Fig. 72. ADAK, ALASKA MARCH 1951

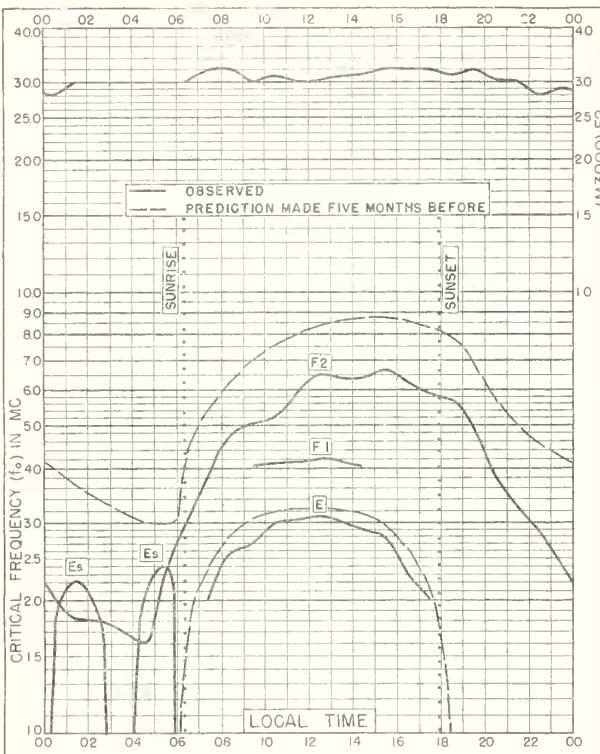


Fig. 73. PORTAGE la PRAIRIE, CANADA

49° 9' N, 98° 3' W

MARCH 1951

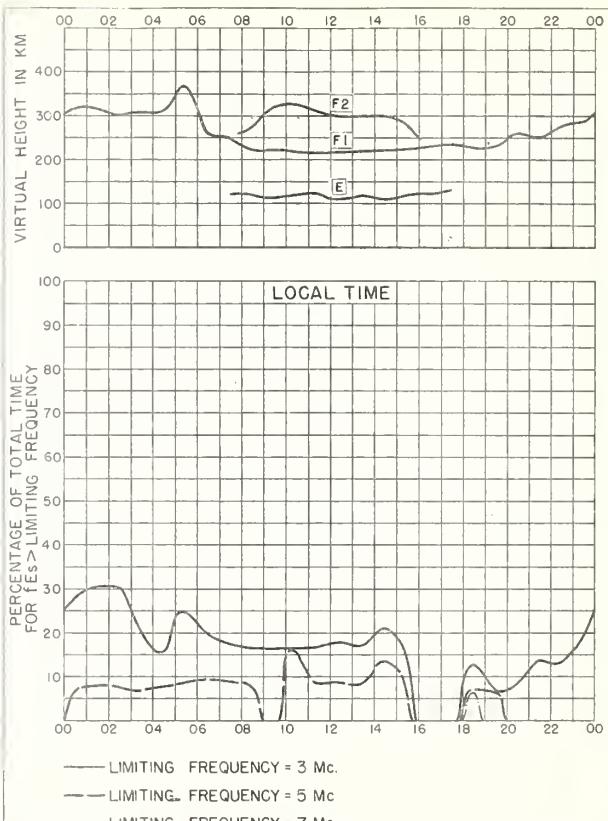


Fig. 74. PORTAGE la PRAIRIE, CANADA MARCH 1951

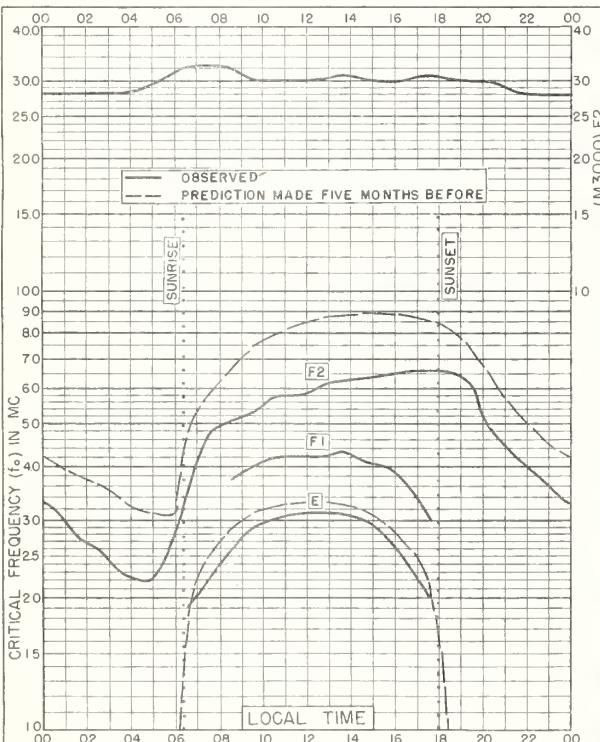


Fig. 75. ST. JOHN'S, NEWFOUNDLAND

47° 6' N, 52° 7' W

MARCH 1951

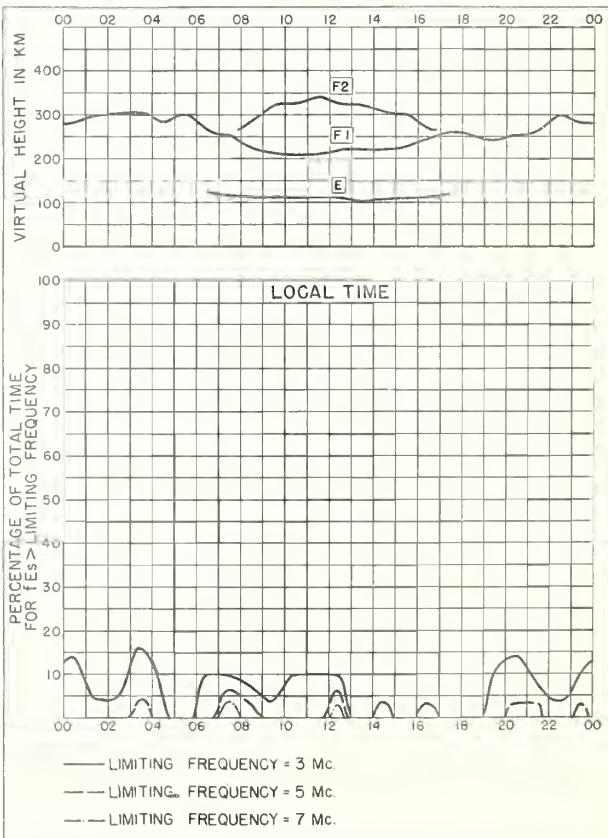


Fig. 76. ST. JOHN'S, NEWFOUNDLAND MARCH 1951

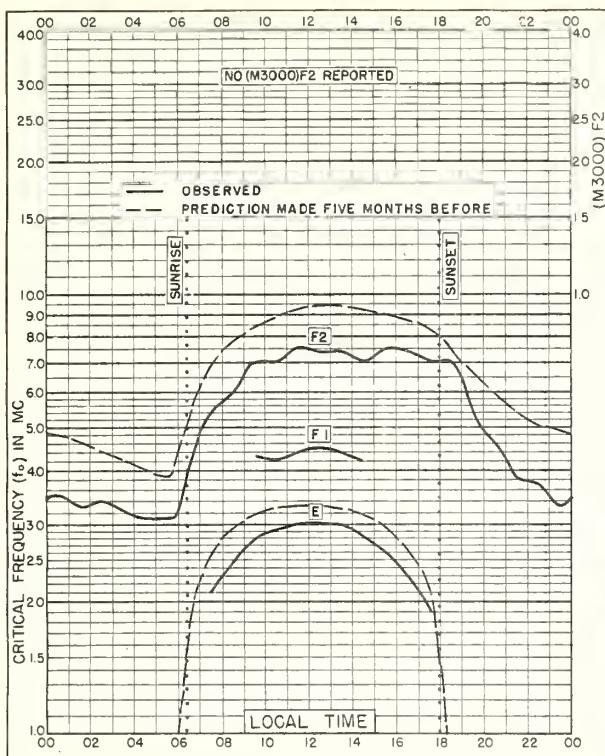


Fig. 77. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E MARCH 1951

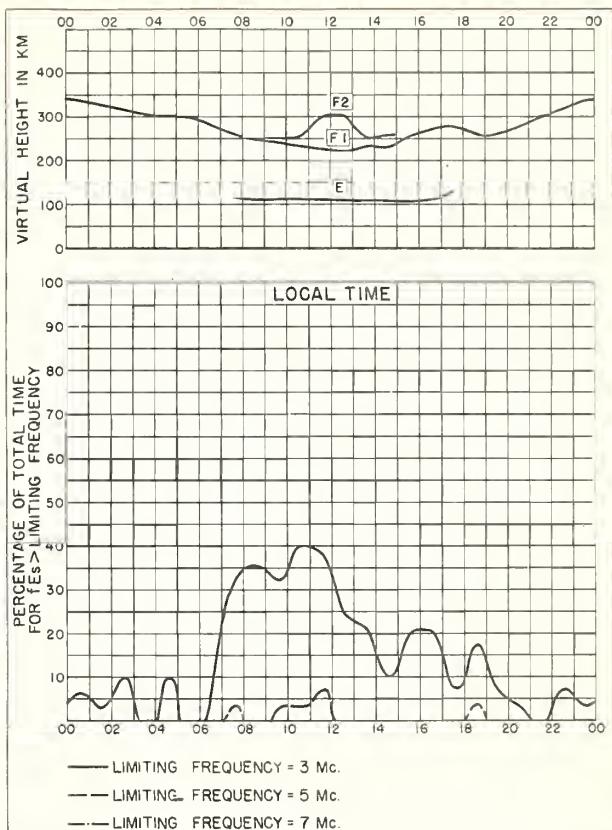


Fig. 78. SCHWARZENBURG, SWITZERLAND MARCH 1951

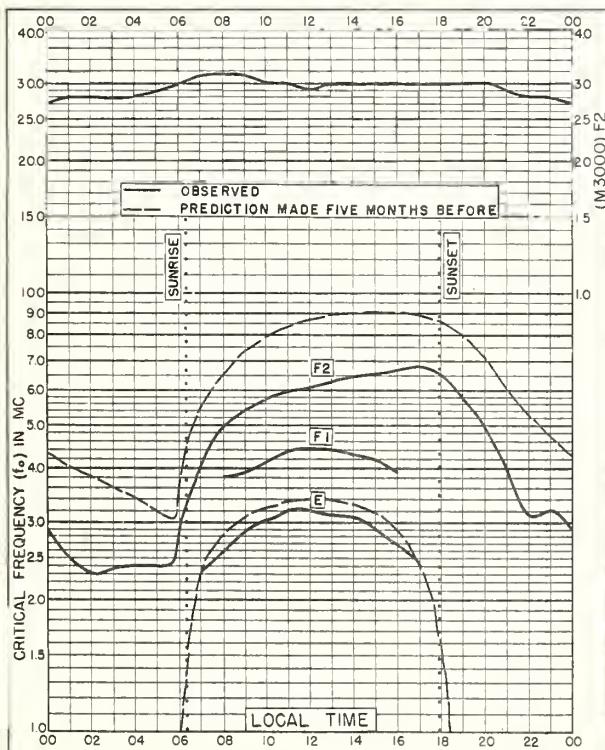


Fig. 79. OTTAWA, CANADA
45.4°N, 75.7°W MARCH 1951

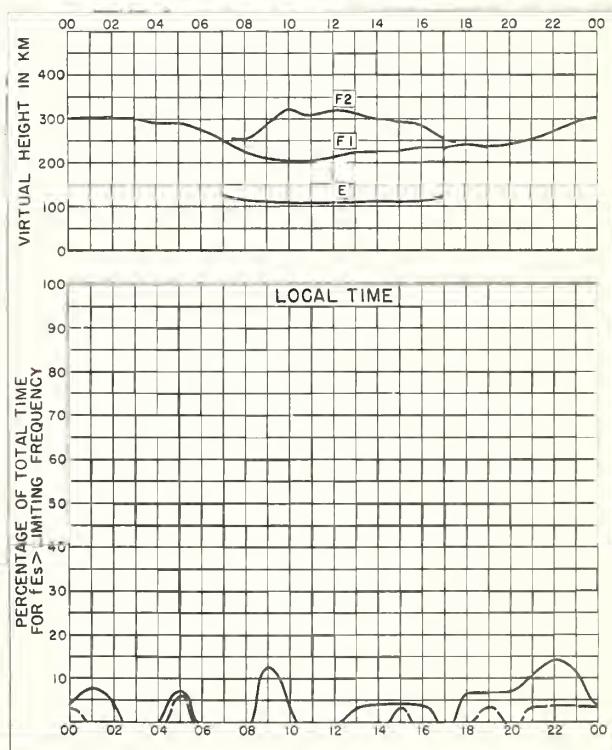


Fig. 80. OTTAWA, CANADA MARCH 1951

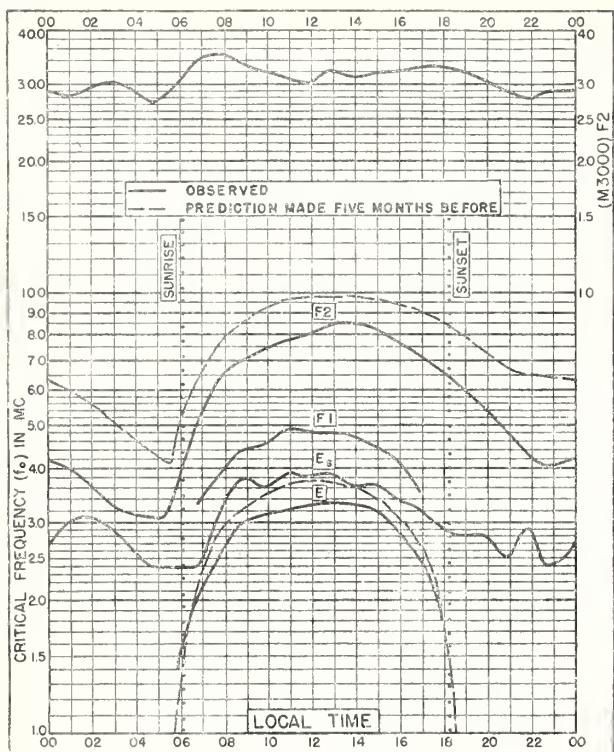


Fig. 81. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E MARCH 1951

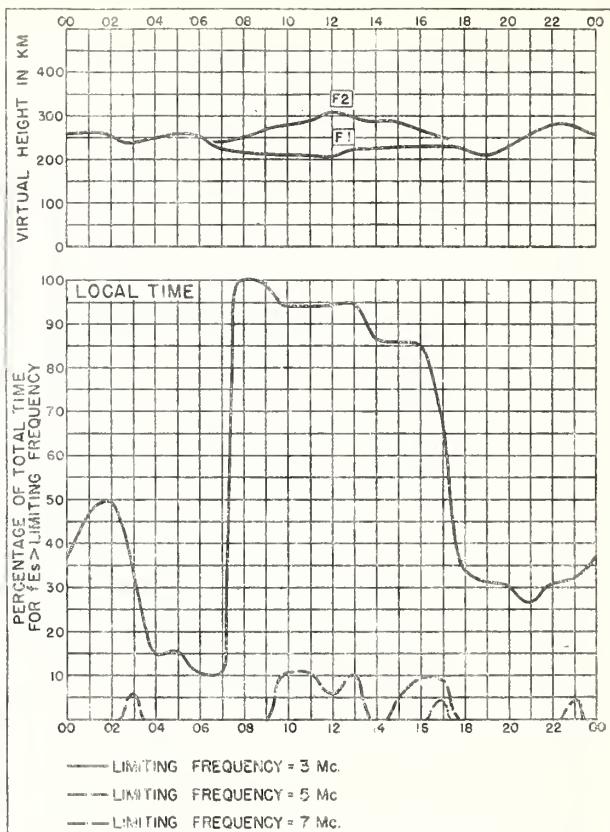


Fig. 82. WATHEROO, W. AUSTRALIA MARCH 1951

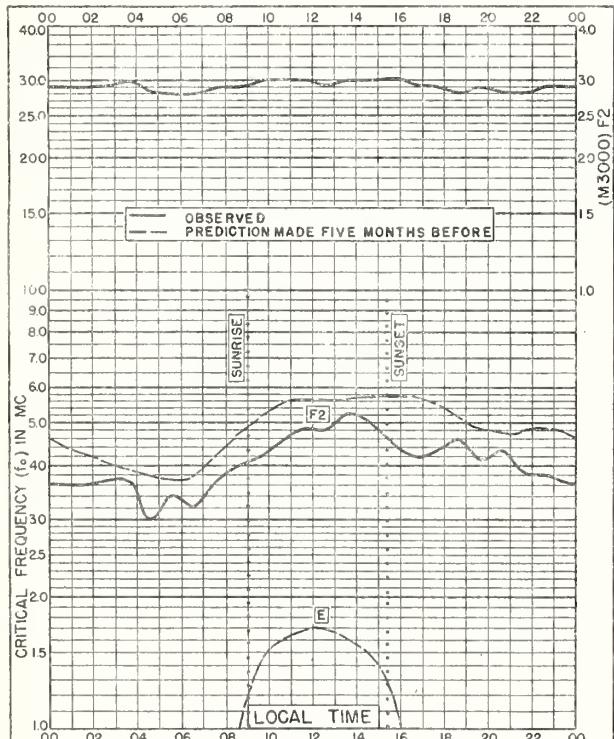


Fig. 83. RESOLUTE BAY, CANADA
74.7°N, 94.9°W FEBRUARY 1951

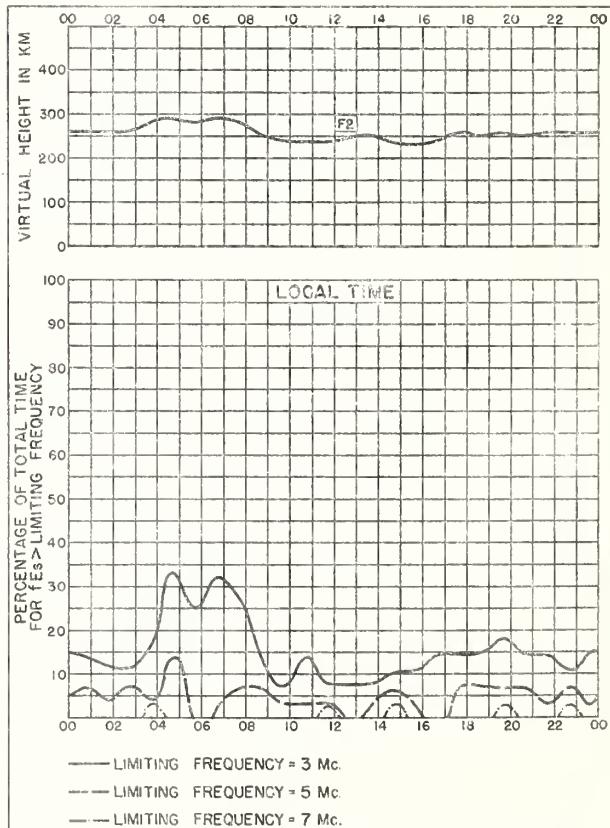
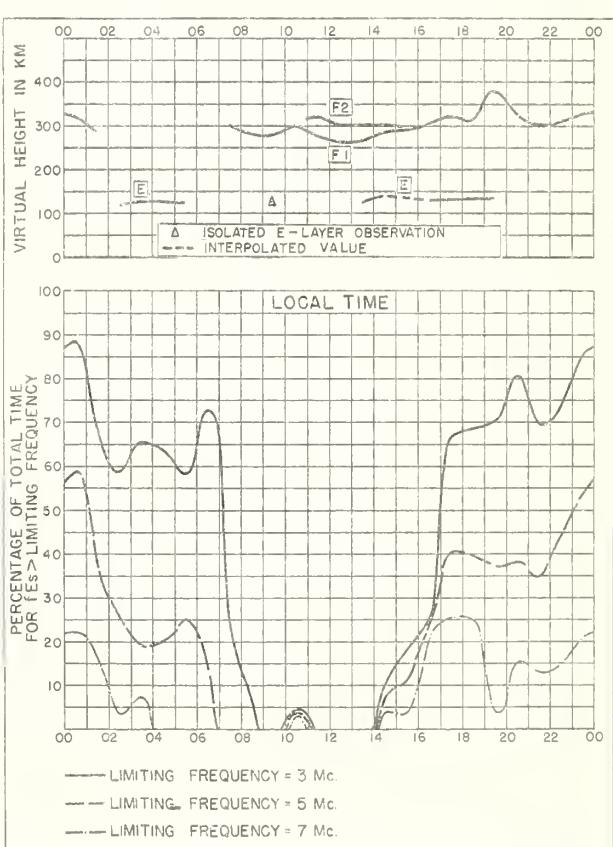
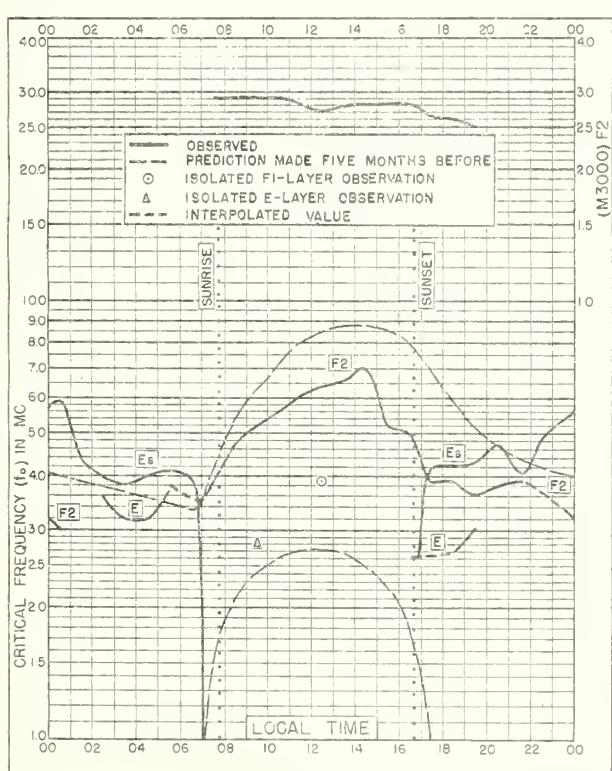
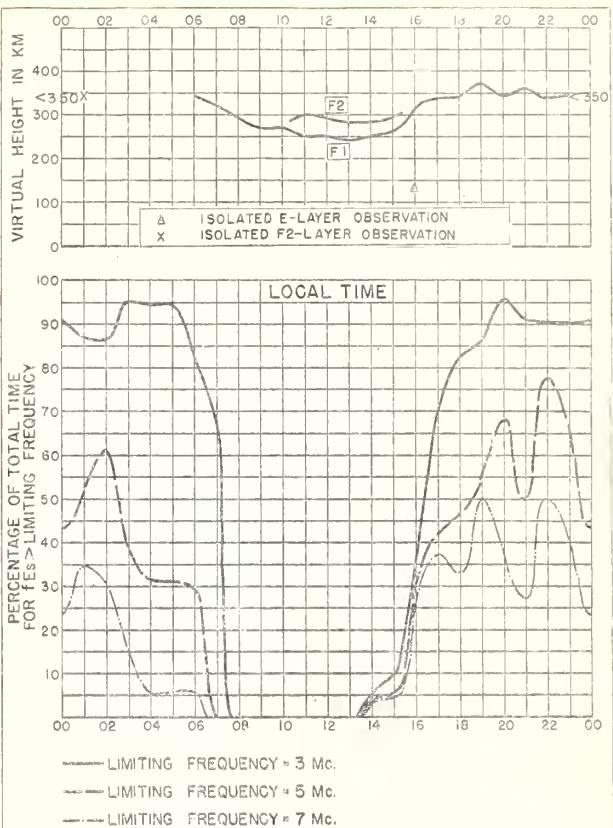
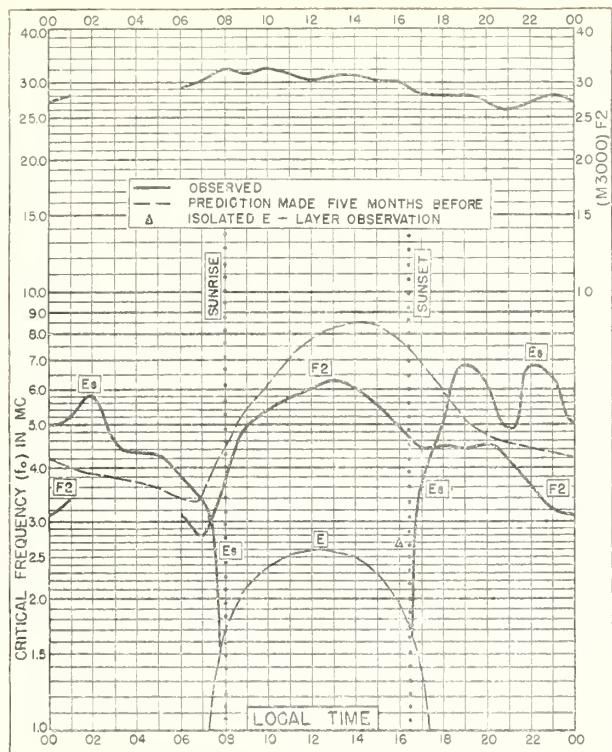


Fig. 84. RESOLUTE BAY, CANADA FEBRUARY 1951



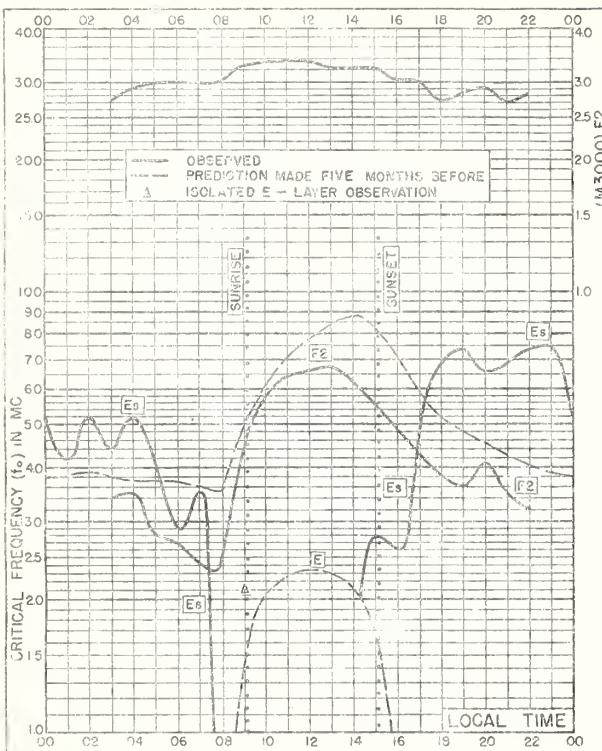


Fig. 89. NARSARSSUAK, GREENLAND
61.2°N, 45.4°W JANUARY 1951

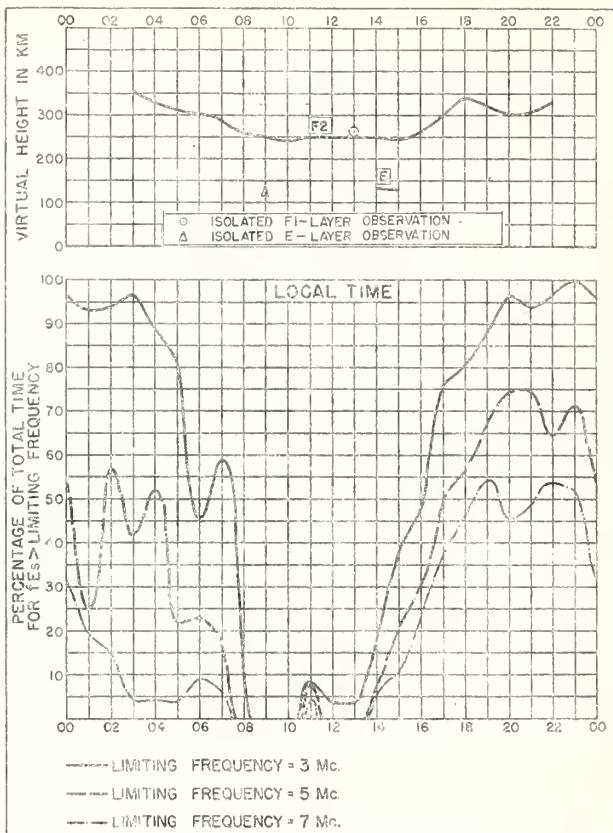


Fig. 90. NARSARSSUAK, GREENLAND JANUARY 1951

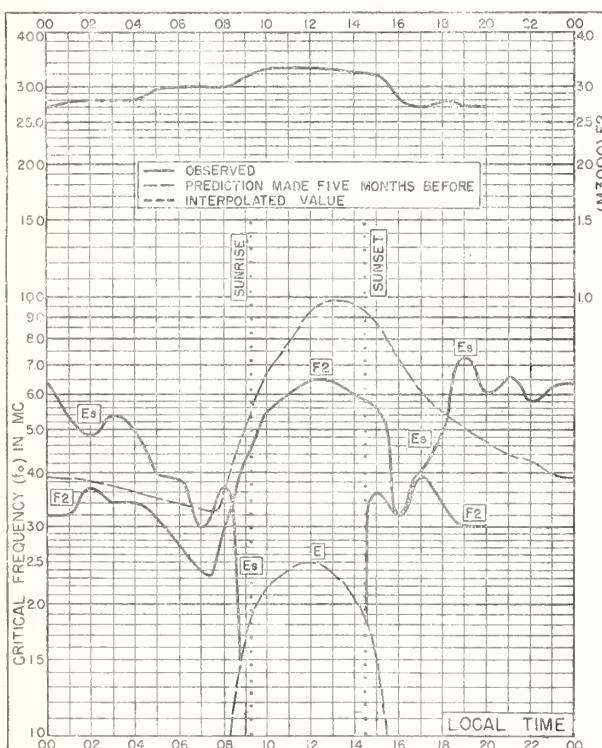


Fig. 91. NARSARSSUAK, GREENLAND
61.2°N, 45.4°W DECEMBER 1950

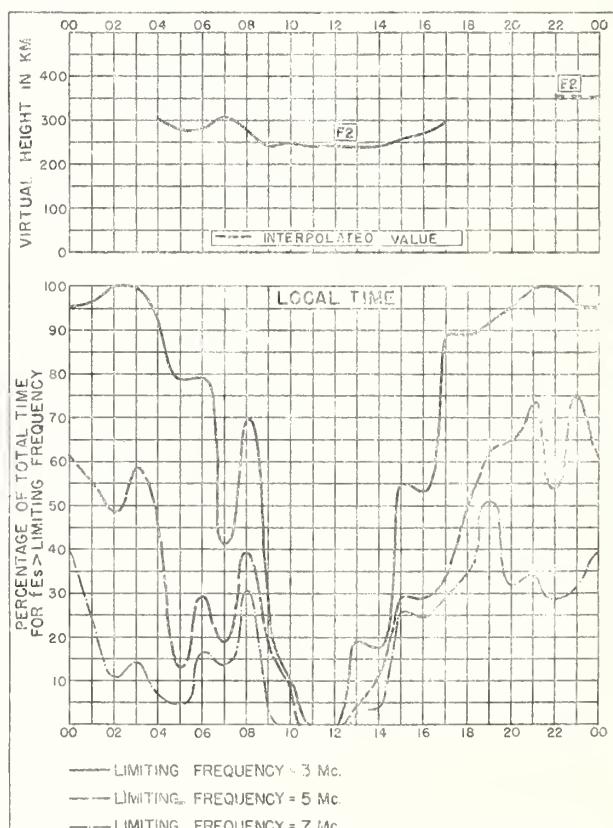
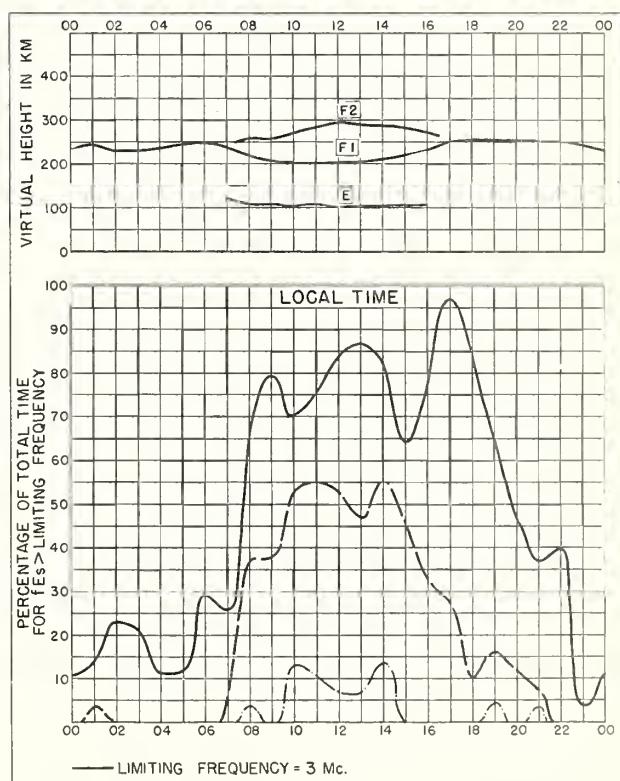
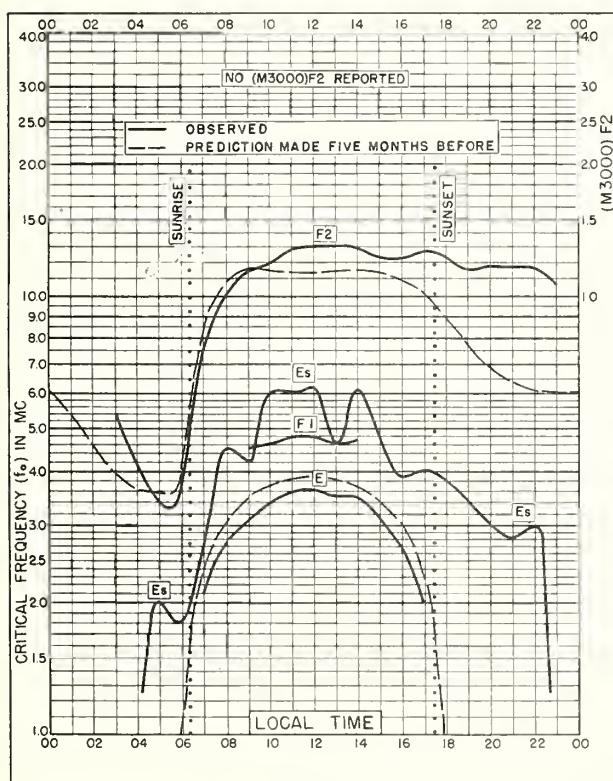
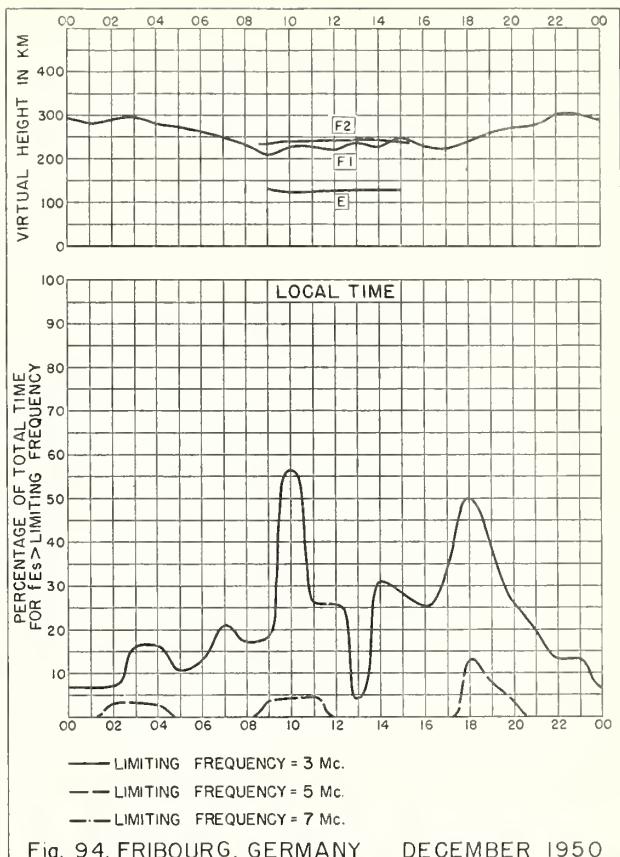
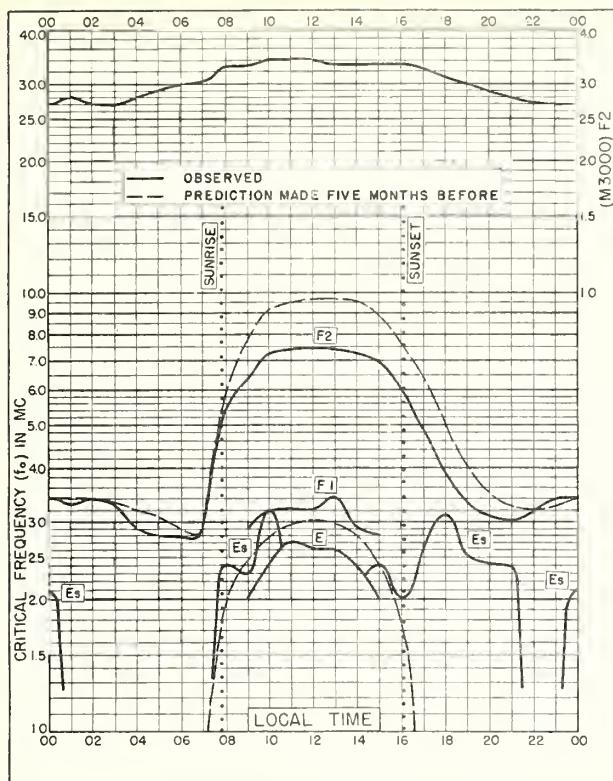


Fig. 92. NARSARSSUAK, GREENLAND DECEMBER 1950



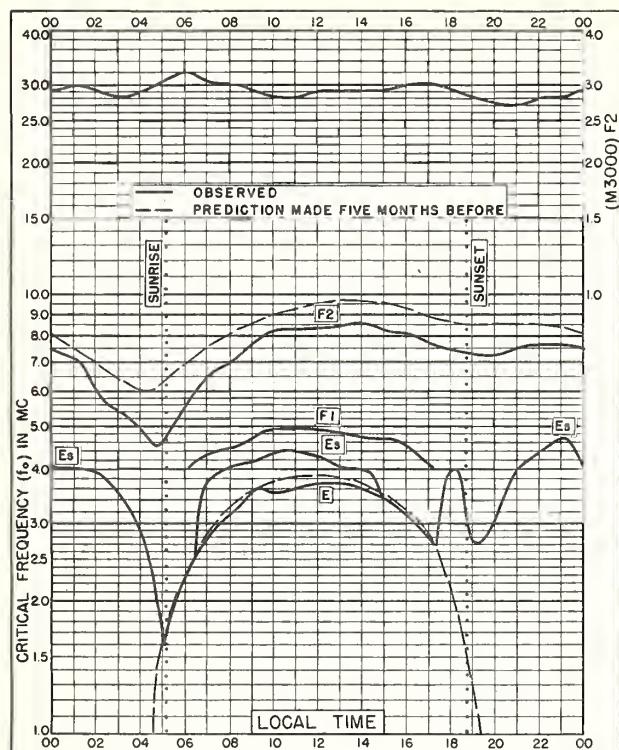


Fig. 97. BRISBANE, AUSTRALIA
27.5°S, 153.0°E DECEMBER 1950

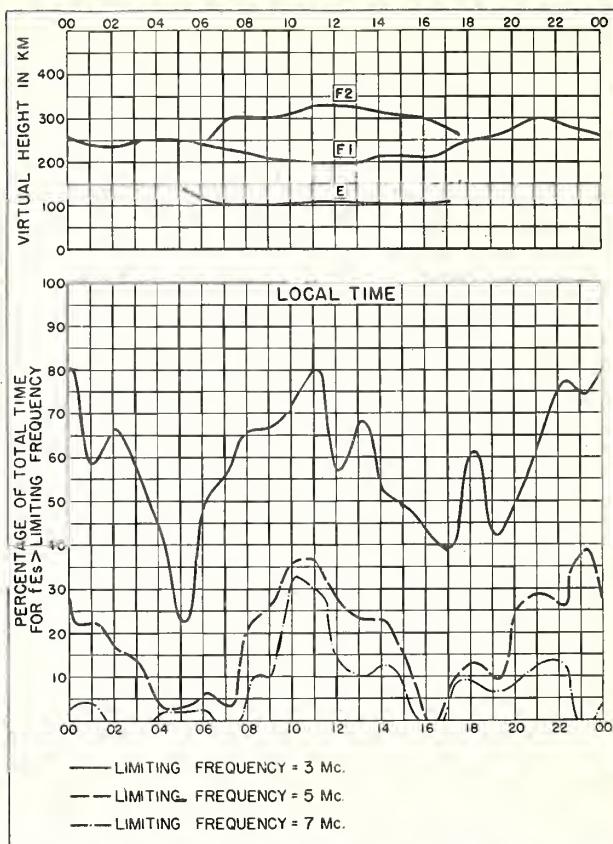


Fig. 98. BRISBANE, AUSTRALIA DECEMBER 1950

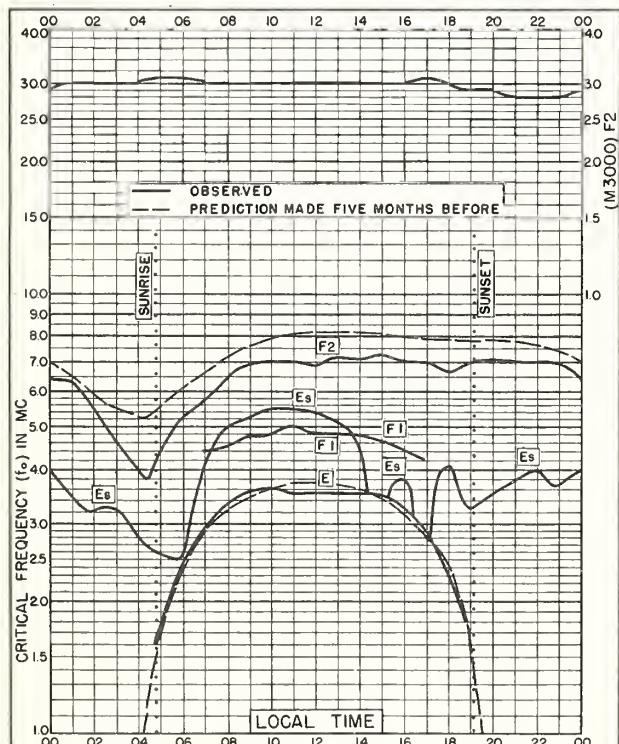


Fig. 99. CANBERRA, AUSTRALIA
35.3°S, 149.0°E DECEMBER 1950

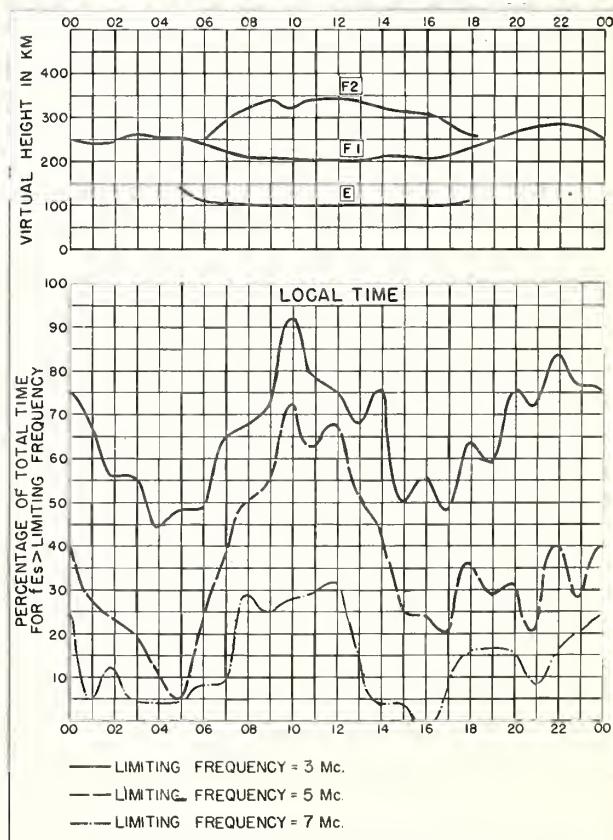


Fig. 100. CANBERRA, AUSTRALIA DECEMBER 1950

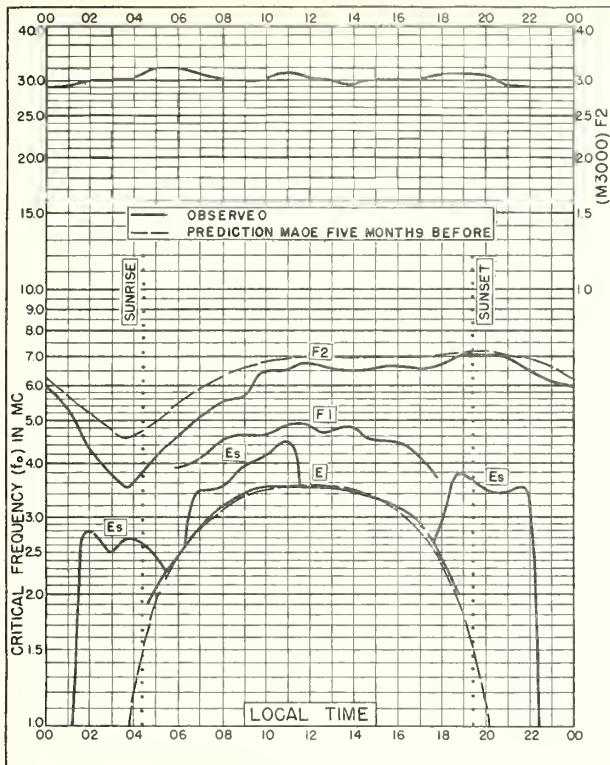


Fig. 101. HOBART, TASMANIA
42. 8°S, 147.4°E DECEMBER 1950

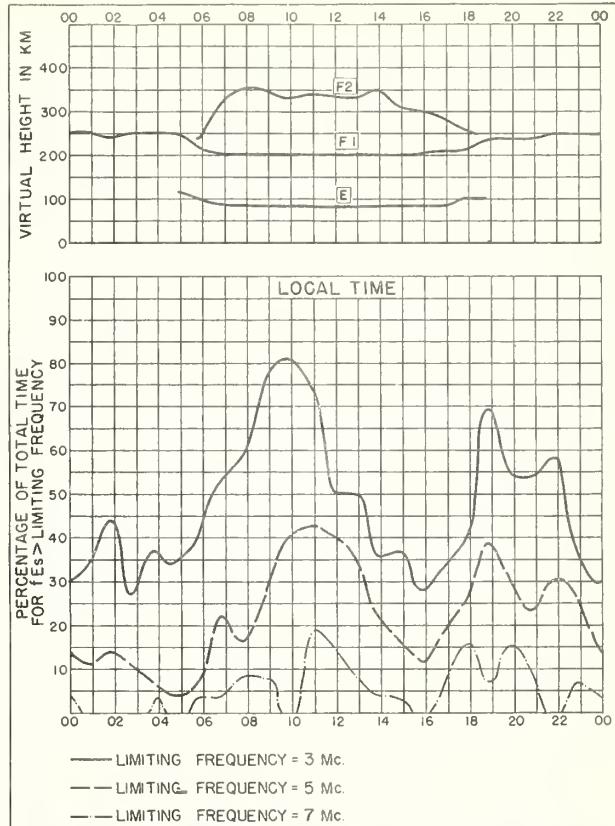


Fig. 102. HOBART, TASMANIA DECEMBER 1950

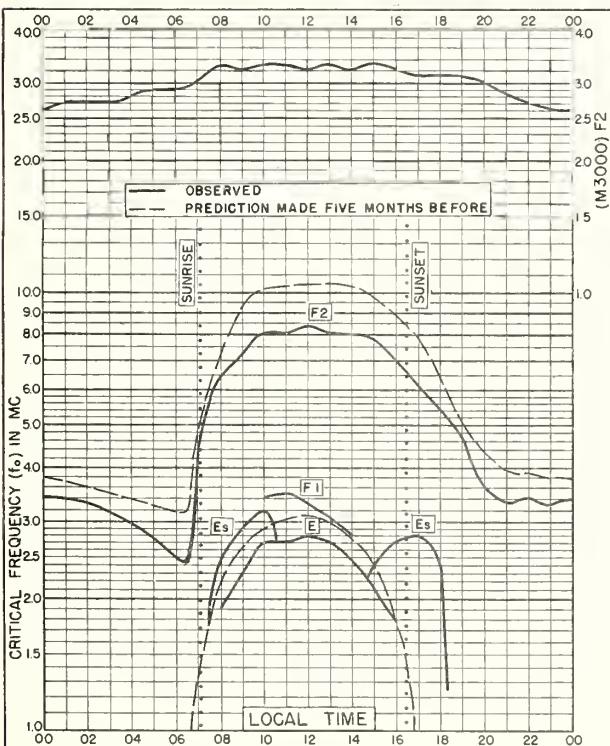


Fig. 103. FRIBOURG, GERMANY
48. 1°N, 7. 8°E NOVEMBER 1950

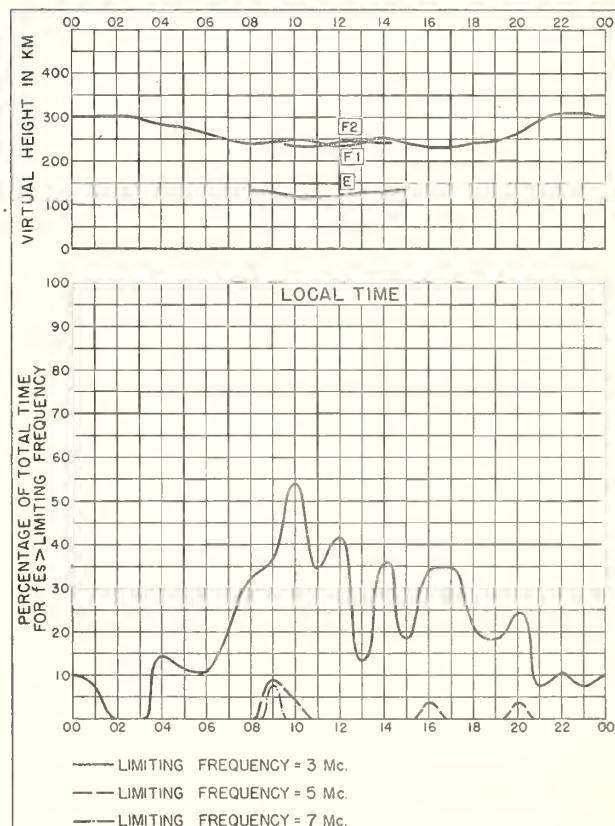


Fig. 104. FRIBOURG, GERMANY NOVEMBER 1950

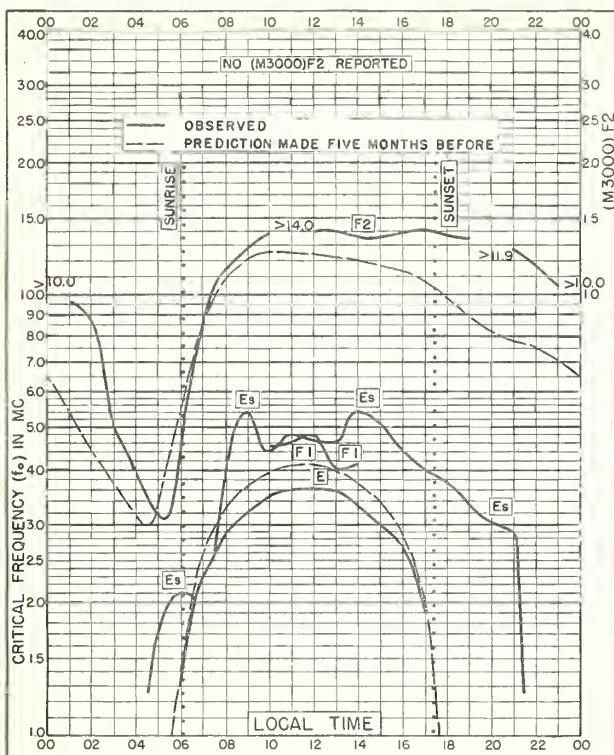


Fig. 105. DAKAR, FRENCH W. AFRICA
14. 6°N, 17. 4°W NOVEMBER 1950

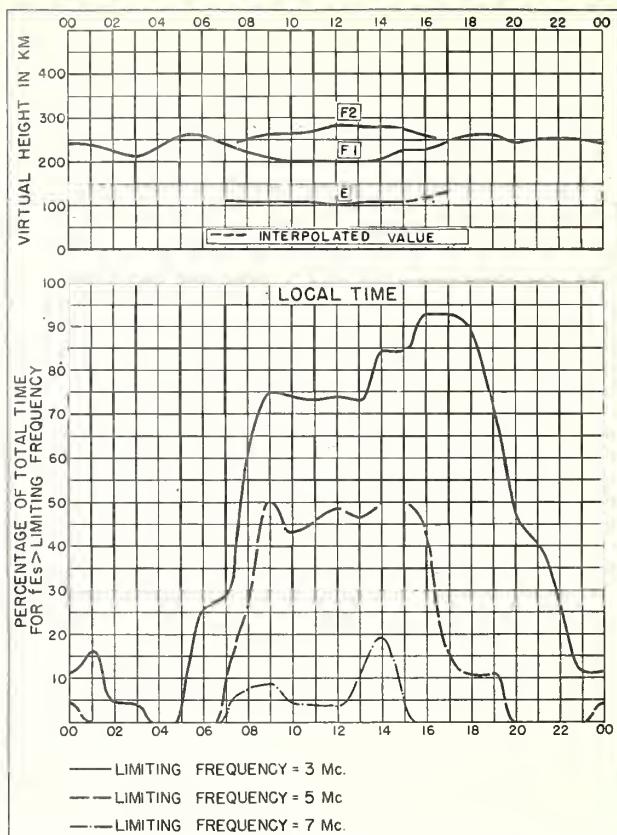


Fig. 106. DAKAR, FRENCH W. AFRICA NOVEMBER 1950

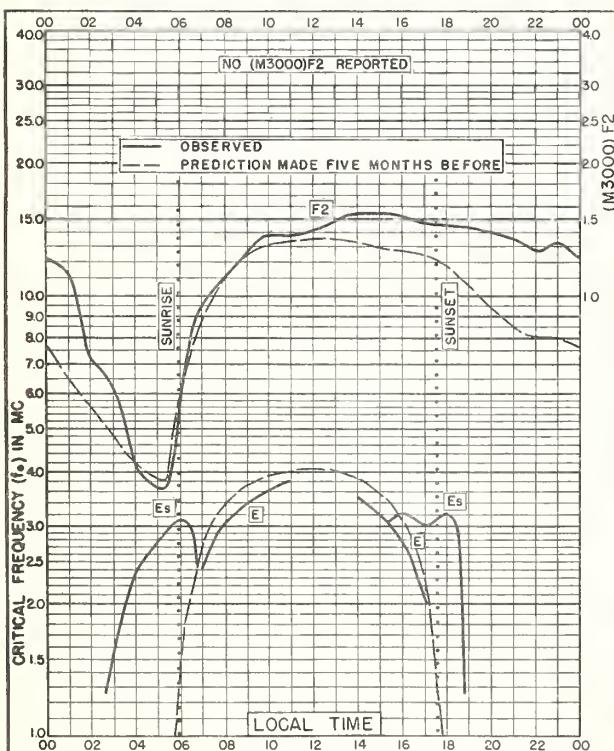


Fig. 107. DAKAR, FRENCH W. AFRICA
14. 6°N, 17. 4°W OCTOBER 1950

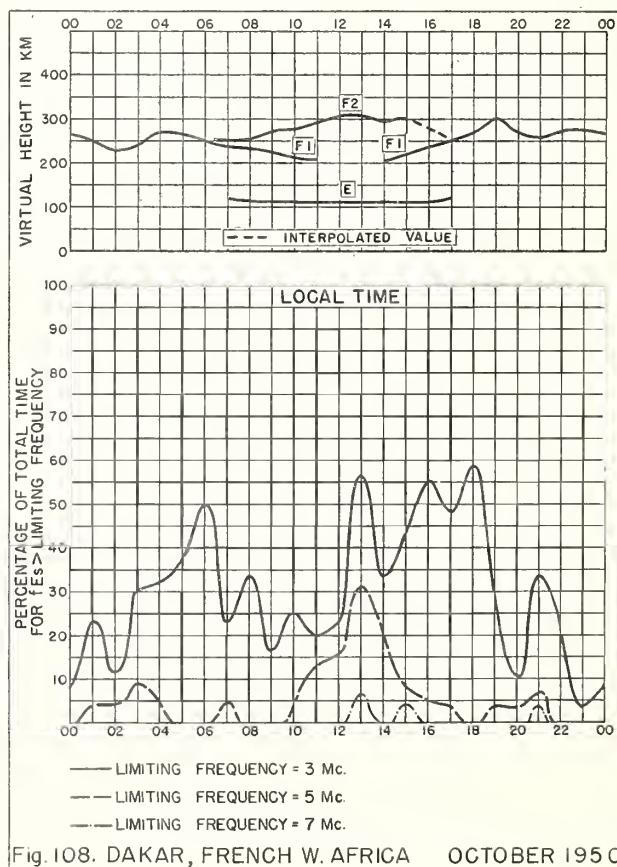


Fig. 108. DAKAR, FRENCH W. AFRICA OCTOBER 1950

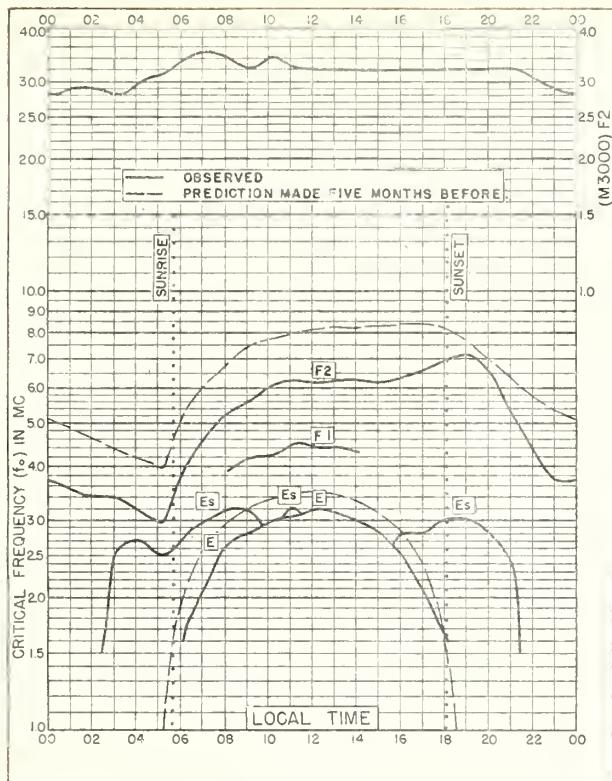


Fig. 109. DOMONT, FRANCE
49. 0°N, 2. 3°E SEPTEMBER 1950

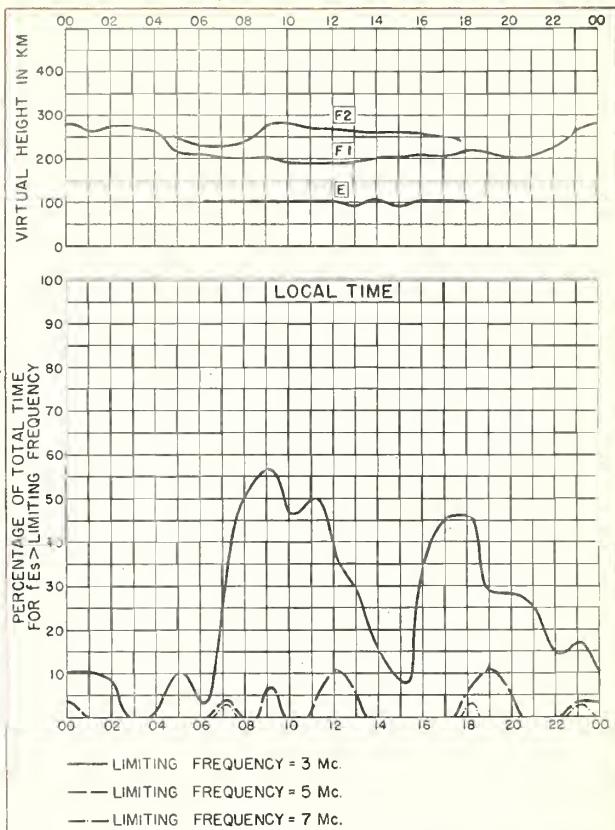


Fig. 110. DOMONT, FRANCE SEPTEMBER 1950

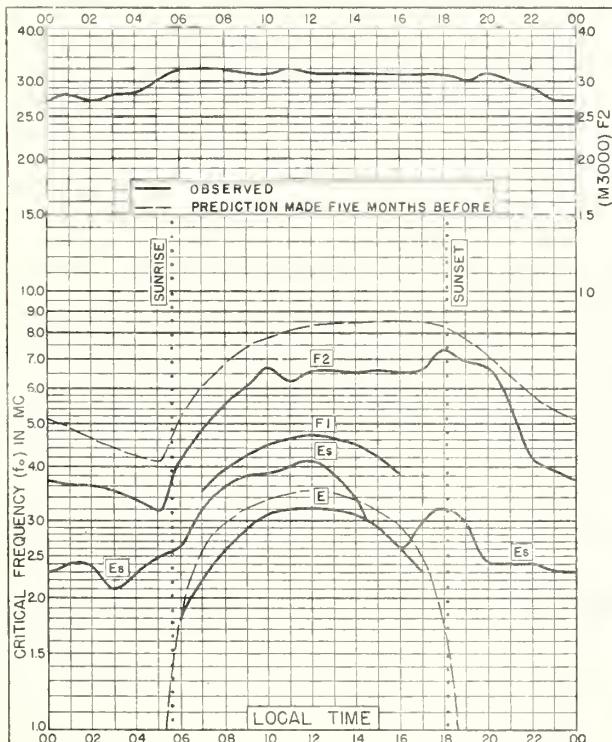


Fig. III. Fribourg, Germany
48. 1°N, 7. 8°E SEPTEMBER 1950

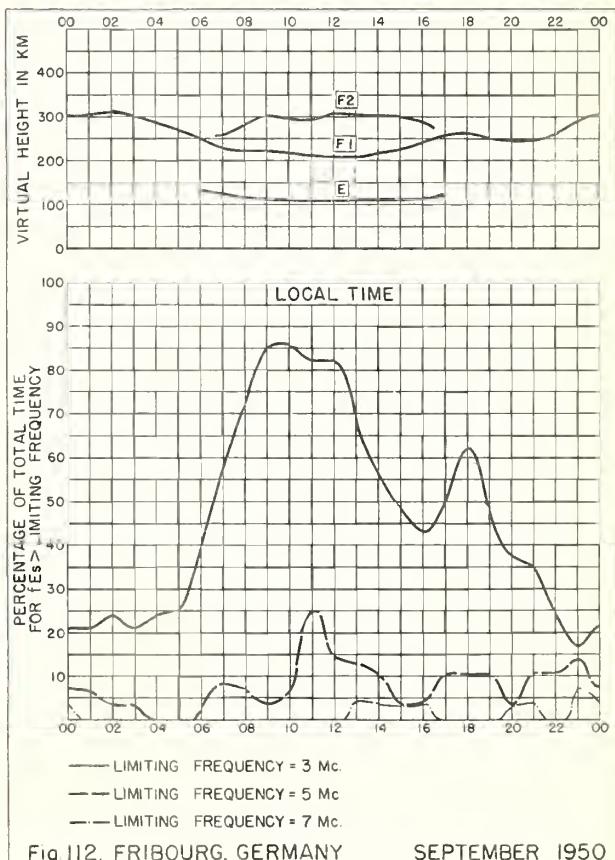
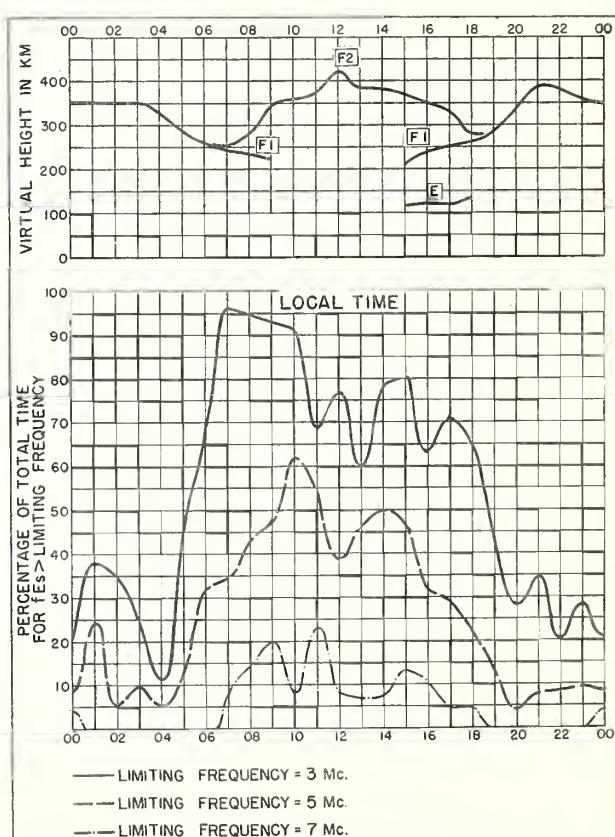
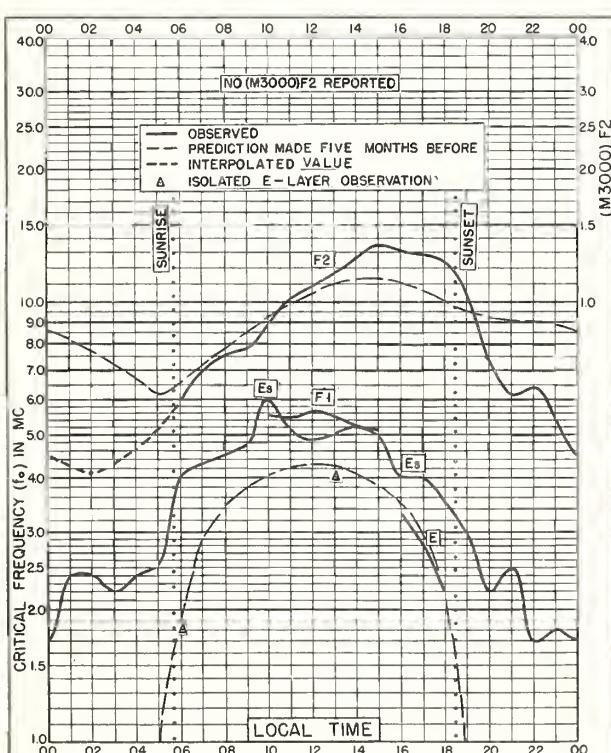
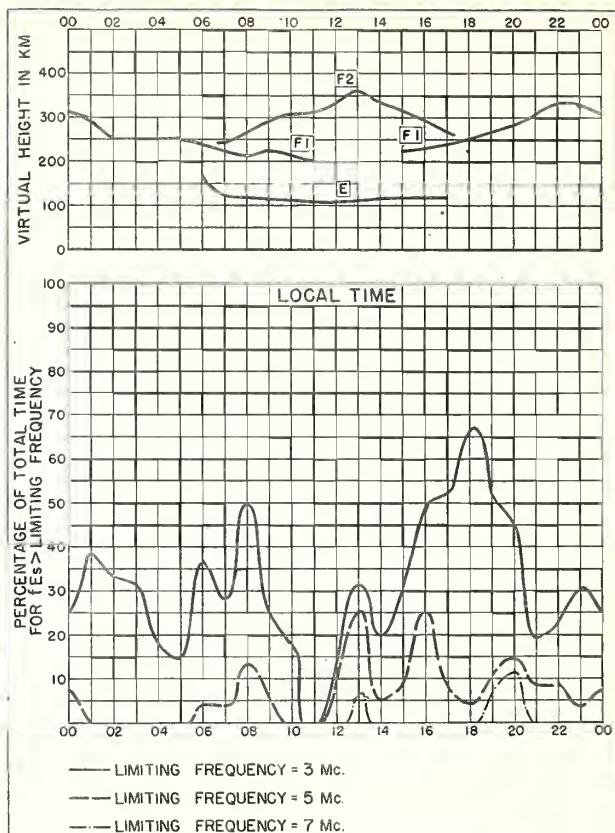
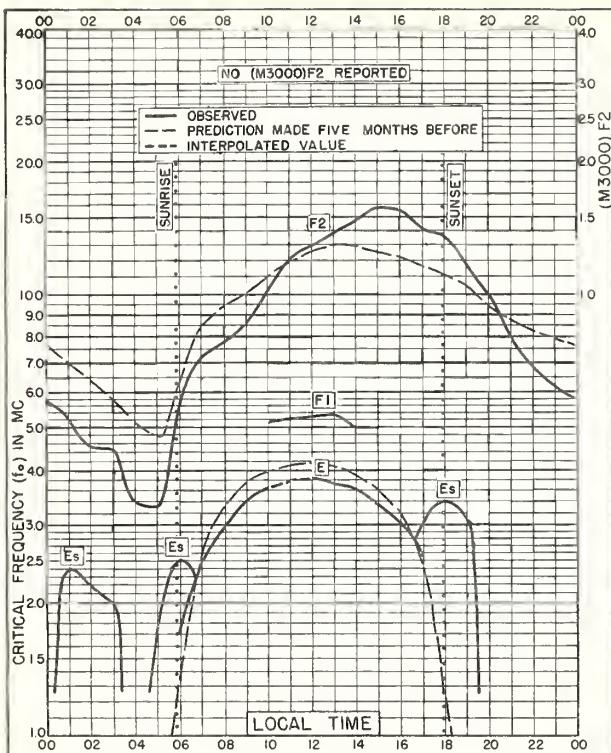


Fig. 112. Fribourg, Germany SEPTEMBER 1950



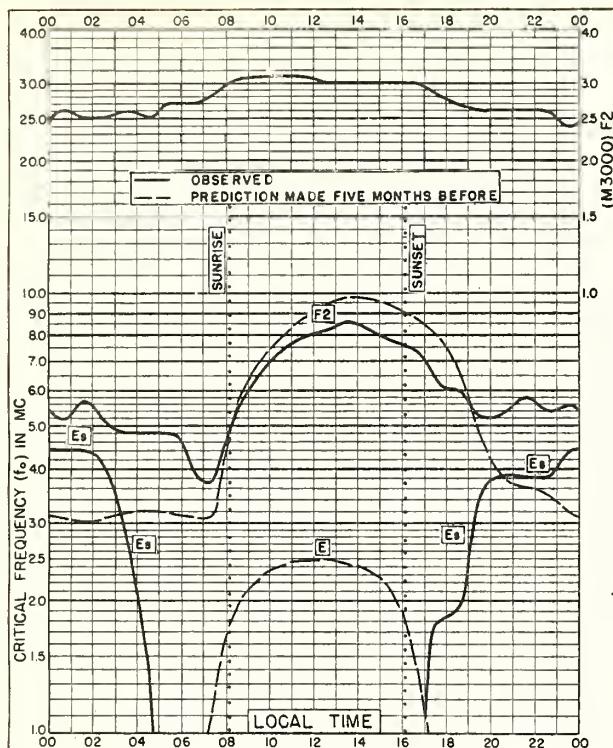


Fig. 117. REYKJAVIK, ICELAND
64.1°N, 21.8°W FEBRUARY 1950

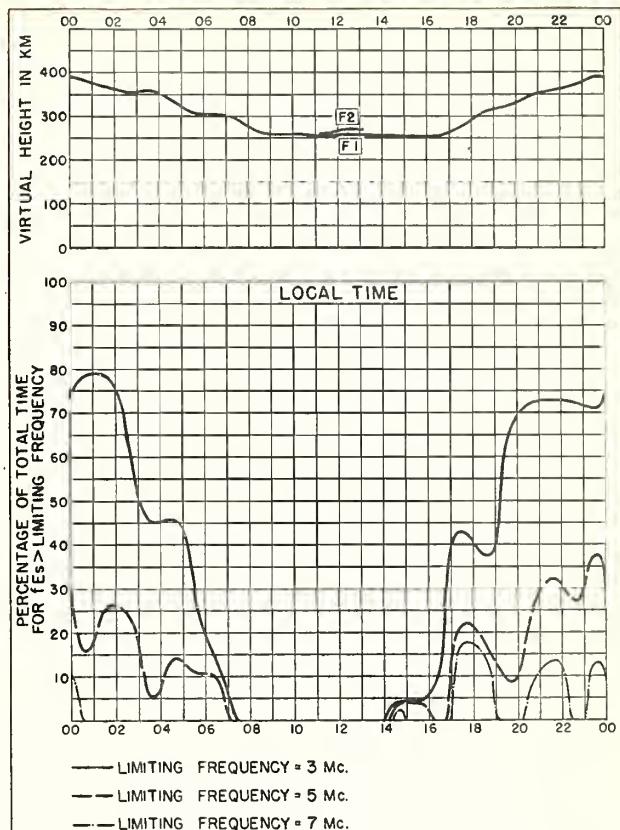


Fig. 118. REYKJAVIK, ICELAND FEBRUARY 1950

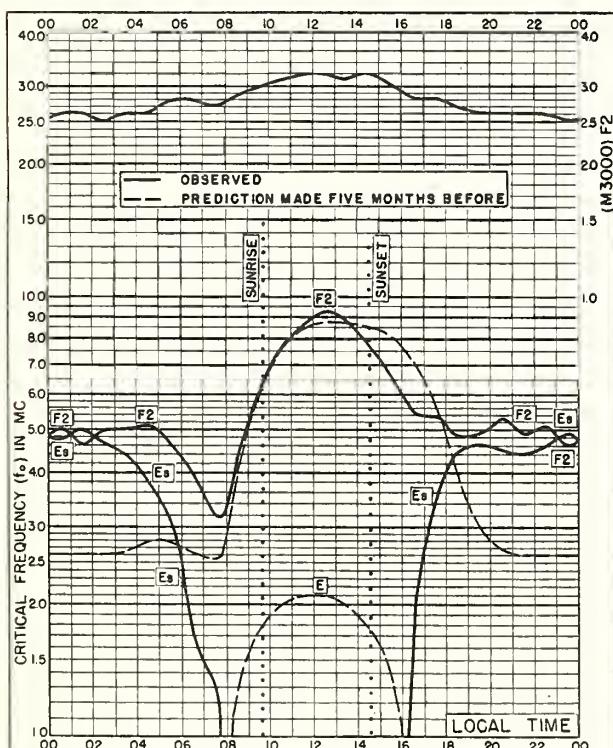


Fig. 119. REYKJAVIK, ICELAND
64.1°N, 21.8°W JANUARY 1950

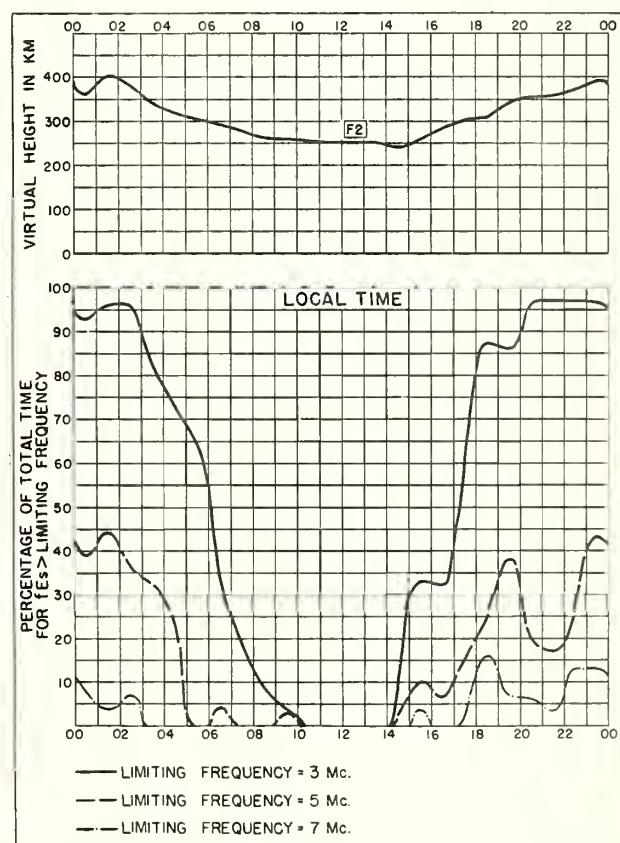


Fig. 120. REYKJAVIK, ICELAND JANUARY 1950

Index of Tables and Graphs of Ionospheric Data

in CRPL-F83

	<u>Table page</u>	<u>Figure page</u>
Adak, Alaska		
May 1951	12	58
April 1951	15	65
March 1951	17	73
Akita, Japan		
April 1951	16	68
Anchorage, Alaska		
May 1951	12	57
April 1951	14	63
Baker Lake, Canada		
March 1951	17	71
Brisbane, Australia		
December 1950	20	80
Canberra, Australia		
December 1950	20	80
Churchill, Canada		
April 1951	14	64
March 1951	17	72
Dakar, French West Africa		
December 1950	19	79
November 1950	20	82
October 1950	20	82
September 1950	21	84
July 1950	21	84
Domont, France		
September 1950	21	83
Fairbanks, Alaska		
April 1951	14	63
Fort Chimo, Canada		
March 1951	17	72
February 1951	19	77
Fribourg, Germany		
December 1950	19	79
November 1950	20	81
September 1950	21	83
Guam I.		
April 1951	16	70
Hobart, Tasmania		
December 1950	20	81
Huancayo, Peru		
May 1951	13	61
Maui, Hawaii		
May 1951	13	60
Narsarsuaq, Greenland		
April 1951	14	64
March 1951	17	71
February 1951	19	77
January 1951	19	78
December 1950	19	78

Index (CRPL-F83, continued)

	<u>Table page</u>	<u>Figure page</u>
Okinawa I.		
May 1951	13	60
Oslo, Norway		
May 1951	12	58
Ottawa, Canada		
April 1951	15	67
March 1951	18	75
Point Barrow, Alaska		
May 1951	12	56
April 1951	14	62
Portage la Prairie, Canada		
March 1951	18	74
Prince Rupert, Canada		
April 1951	15	65
March 1951	17	73
Resolute Bay, Canada		
April 1951	14	62
March 1951	16	70
February 1951	18	76
Reykjavik, Iceland		
February 1950.	21	85
January 1950	21	85
St. John's, Newfoundland		
April 1951	15	66
March 1951	18	74
San Francisco, California		
May 1951	13	59
Schwarzenburg, Switzerland		
April 1951	15	67
March 1951	18	75
Tokyo, Japan		
April 1951	16	69
Trinidad, British West Indies		
May 1951	13	61
Tromso, Norway		
May 1951	12	57
Wakkanai, Japan		
April 1951	16	68
Washington, D. C.		
June 1951.	12	56
Watheroo, Western Australia		
March 1951	18	76
White Sands, New Mexico		
May 1951	13	59
Winnipeg, Canada		
April 1951	15	66
Yamagawa, Japan		
April 1951	16	69



Out of print; information concerning cost of photocopies or microfilm copies is available from CRPL upon request.

**Items bearing this symbol are distributed only by U. S. Navy. They are issued under one cover as the DNG 14() Series.

WPG-5.)

CRPL-T3. Tropospheric Propagation and Radar coverage and weather. (Superseded by JANP 102.)

T2. Radar operation and weather. (Superseded by JANP 101.)

IRPL-T. Reports on tropospheric propagation of Second-Multiple Es Refractions and That of Es in Excess of 8 Mc.

R85. Comparison of Prediction of Total Time of Second-Multiple Es Refractions and That of Es in Excess of Es.

**R84. The Interpretation of Recorded Values of Es.

**R83. Ionospheric Data on File at IRPL.

R81. North Atlantic Radio Propagation Disturbances, October 1943 Through October 1945.

turbulence Reports to Replace T. D. Figures as Reported.

**R80. Disturbance Rating in Values of IRPL Quality-Figure Scale from A. T. & T. Co. Transmission Dis-

Grouped by Distance From Center of Dis-

R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots

R26. The Ionosphere as a Measure of Solar Activity.

**R25. The Prediction of Solar Activity as a Basis for the Prediction of Pulses in the Loran System.

**R24. Relationships Between Band Width, Pulse Shape and Usabilities of Pulses in the Loran System.

**R23. Solar-Cycle Data for Correlation of Radio Propagation Phenomena.

R22. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)

**R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. 1943 Through May 1945.

R18. Comparison of Geometric Records and North Atlantic Radio Propagation Quality Figures—October 1943.

**R17. Ionospheric Data—1943.

**R16. Predicted Limits for 2-Layer Radio Transmission Throughout the Solar Cycle.

R14. A Graphical Method for Calculating Ground Reflection Coefficients.

**R12. Short Time Variations in Ionospheric Characteristics.

**R11. A Nomographic Method for Both Radio Propagation and Observation of Ionosphere Characteristics.

R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.

R9. An Automatic Instantaneous Indicator of Skip-Distance and MUF.

R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

**R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.

R5. Criteria for Ionospheric Storminess.

R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Fre-

quencies.

IRPL-R. Nonstandard reports.

IRPL-G1. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.

Reports issued in past:

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Circulairs of the National Bureau of Standards:

*IRPL-H. Frequency Guide for Operating Personnel.

*IRPL-A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.

CRPL-F. Ionospheric Monthly Supplements to TM 11-499; Dep't. of the Navy, DNG 13() series.)

CRPL-D. Basic Radio Propagation Predictions—Three months in advance. (Dep't. of the Army, TB 11-499-.

Semimonthly:

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

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

Weekly:

Radio disturbance warnings, every half hour broadcast station WW of the National Bureau of Standards.

Daily:

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

CRPL and IRPL Reports

