CRPL-F59

IONOSPHERIC DATA

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

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CONTENTS

SYMBOLS AND TERMINOLOGY; CONVENTIONS FOR DETERMINING MEDIAN VALUES

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

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

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

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

a. For all ionospheric characteristics:

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

b. For critical frequencies and virtual heights:

Values of foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count. See CRPL-F38, page 9.

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.

Values missing because of W are counted:
1. For foF2, as equal to or less than the median when it is apparent that h'F2 is unusually high; otherwise, values missing because of W are omitted from the median count.
2. For h'F2, as equal to or greater than the median.

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 G (no Es reflections observed, the equipment functioning normally otherwise) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

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

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

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

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

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

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

MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD-WIDE IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 40 and figures 1 to 79 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Australian Council for Scientific and Industrial Research,
Radio Research Board:
- Brisbane, Australia
- Canberra, Australia
- Hobart, Tasmania

British Department of Scientific and Industrial Research,
Radio Research Board:
- Falkland Is.
- Fraserburgh, Scotland
- Lindau/Harz, Germany
- Singapore, British Malaya
- Slough, England

Radio Wave Research Laboratory, Central Broadcasting Administration:
- Chungking, China
- Lanchow, China

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

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

Indian Council for Scientific and Industrial Research,
Radio Research Committee:
- Calcutta, India

New Zealand Radio Research Committee:
- Christchurch, New Zealand
- Rarotonga I.

National Bureau of Standards (Central Radio Propagation Laboratory):
- Baton Rouge, Louisiana (Louisiana State University)
- Boston, Massachusetts (Harvard University)
- Huancayo, Peru (Instituto Geofisico de Huancayo)
- Maui, Hawaii
- Palmyra I.

National Bureau of Standards (continued):
San Francisco, California (Stanford University)
San Juan, Puerto Rico (University of Puerto Rico)
Trinidad, British West Indies
Washington, D. C.
White Sands, New Mexico

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

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

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

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

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

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

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

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

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

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

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

Month	Predicted Sunspot No.				
	1949	1948	1947	1946	1945
December		114	126	85	38
November		115	124	83	36
October		116	119	81	23
September		117	121	79	22
August		123	122	77	20
July		125	116	73	
June	108	129	112	67	
May	108	130	109	67	
April	109	133	107	62	
March	111	133	105	51	
February	113	133	90	46	
January	112	130	88	42	

IONOSPHERIC DATA FOR EVERY DAY AND HOUR AT WASHINGTON, D. C.

The data given in tables 41 to 52 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 and Terminology; Conventions for Determining Median Values."

IONOSPHERE DISTURBANCES

Table 53 presents ionosphere character figures for Washington, D. C., during June 1949, as determined by the criteria presented in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

Table 54 lists for the stations whose locations are given the sudden ionosphere disturbances observed on the continuous field intensity recordings made at the Sterling Radio Propagation Laboratory during June 1949.

Table 55 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Platanos, Argentina, receiving station of the International Telephone and Telegraph Corporation for various days in May 1949.

Table 56 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Point Reyes, California, receiving station of RCA Communications, Inc., for June 6 and 21, 1949.

Table 57 and the paragraph following it give corrections in dates of SID listed in previously published Point Reyes, California, tables.

Table 58 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, May 1949, 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 the 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.

AMERICAN AND ZURICH PROVISIONAL RELATIVE SUNSPOT NUMBERS

Table 59 presents the daily American relative sunspot number, R_A, computed from observations communicated to CRPL by observers in America and abroad. Beginning with the observations for January 1948, a new method of reduction of observations is employed such that each observer is assigned a scale-determining "observatory coefficient," ultimately referred to Zürich observations in a standard period, December 1944 to September 1945, and a statistical weight, the reciprocal of the variance of the observatory coefficient. The daily numbers listed in the table are the weighted means of <u>all</u> observations received for each day. Details of the procedure are given in the Publication of the Astronomical Society of the Pacific, issued February 1949, in an article entitled "Reduction of Sunspot-Number Observations." The American relative sunspot number computed in this way is designated R_A. It is noted that a number of observatories abroad, including the Zürich observatory, are included in R_A. The scale of R_A was referred specifically to that of the Zürich relative sunspot numbers in the standard comparison period; since that time, R_A is influenced by the Zürich observations only in that Zürich proves to be a consistent observer and receives a high statistical weight. In addition, this table lists the daily provisional Zürich sunspot numbers, R_Z.

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In tables 60a and 60b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during June 1949 by the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colorado, for east and west limbs, respectively, at 5-degree intervals of position angle north and south of the solar equator at the limb. Beginning January 11, 1949, the actual measurements are on <u>solar</u> <u>rotation</u> coordinates rather than astronomical coordinates; thus values of the correction P given in previous coronal tables are omitted. The time of observation is given to the nearest tenth of a day, GCT. The tables of coronal observations in CRPL-F29 to F41 listed the data on astronomical coordinates; the present format on solar rotation coordinates is in conformity with the tables of CRPL-1-4, "Observations of the Solar Corona at Climax, 1944-46."

Tables 61a and 61b give similarly the intensities of the first red (6374A) coronal line; tables 62a and 62b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 60, 61, and 62: a, observation of low weight; -, corona not visible; and x, position angle not included in plate estimates.

Table 63 gives details of the Climax observations from January 1949 through June 1949. The first column lists the Greenwich date of observation; the next six columns give the threshold or lowest observable intensity of 5303A for each spectrum plate centered at astronomical position angles 45°, 90°, 135°, 225°, 270°, and 315°, respectively; the last two columns indicate the observer and the person responsible for the intensity estimates of the observation. This table is a continuation of table 1 of CRPL-1-4 and appears regularly at intervals of six months.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D.C. (39.0°N, 77.5°W) June 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	6.5						2.7
01	280	6.0					3.1	2.7
02	280	5.4					2.4	2.8
03	280	5.3					2.4	2.7
04	280	4.6						2.8
05	270	4.6	---	---	---	---	1.9	2.9
06	270	5.6	240	---	110	2.4	3.7	3.0
07	340	6.0	230	4.4	105	3.0	4.8	2.7
08	375	6.6	210	4.9	100	3.3	4.6	2.8
09	370	6.7	205	5.0	100	3.5	4.3	2.8
10	380	6.8	200	5.1	100	3.6	4.2	2.8
11	400	6.9	200	5.3	100	3.7	4.2	2.7
12	405	7.0	200	5.3	100	3.8	4.2	2.7
13	420	7.1	210	5.3	100	3.8	4.6	2.7
14	400	7.0	220	5.2	100	3.8	4.1	2.7
15	395	7.0	220	5.1	100	3.7	4.2	2.6
16	380	7.1	220	4.9	100	3.4	4.2	2.7
17	350	7.2	220	4.6	100	3.1	3.8	2.8
18	300	7.7	240	---	110	2.6	4.3	2.8
19	270	8.0	---	---	120	1.9	4.3	2.8
20	250	7.9					3.8	2.8
21	250	7.4					3.8	2.8
22	270	7.1					3.2	2.7
23	280	6.8					3.2	2.7

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

Table 2

Lindau/Harz, Germany (51.6°N, 10.1°E) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.8					2.2	
01	300	6.7					2.0	
02	300	6.4					2.0	
03	300	6.1					1.9	
04	300	5.9					2.3	
05	290	6.5			100	1.8	2.0	
06	295	7.0	250	4.0	100	2.4	2.2	
07	300	7.5	240	4.3	100	2.8	2.8	
08	300	7.7	240	4.8	100	3.1	3.5	
09	330	8.0	220	5.0	100	3.4	3.9	
10	330	8.5	210	5.2	100	3.5	4.8	
11	350	8.7	220	5.4	100	3.6	4.6	
12	350	8.7	210	5.4	100	3.8	4.8	
13	350	8.6	210	5.3	100	3.6	4.5	
14	340	8.7	220	5.4	100	3.6	4.5	
15	330	8.5	220	5.2	100	3.4	3.7	
16	320	8.4	230	4.9	100	3.3	3.8	
17	300	8.5	240	4.5	100	3.0	3.9	
18	260	8.7			100	2.8	3.8	
19	260	8.7			100	2.0	3.5	
20	270	8.8			100	1.7	3.0	
21	260	8.3					2.8	
22	270	7.8					2.9	
23	290	7.2					2.0	

Time: 15.0°E.
Sweep: 1.4 Mc to 16.0 Mc in 7 minutes.

Table 3

Boston, Massachusetts (42.4°N, 71.2°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	6.7						2.6
01	275	8.2						2.6
02	275	6.2						2.6
03	260	5.9						2.6
04	265	5.5			---	---	1.2	2.7
05	285	5.8	---	---	---	---		2.8
06	272	6.7	---	---	---	---		2.8
07	300	7.4	258	5.2	---	---		2.8
08	350	7.3	245	5.0	---	---		2.8
09	365	7.4	240	5.0	---	---		2.7
10	358	7.5	220	5.0	---	---		2.8
11	360	7.6	220	5.1	---	---		2.7
12	370	7.5	220	5.1	---	---		2.8
13	398	7.2	232	5.1	---	---		2.7
14	375	7.5	250	5.2	---	---		2.7
15	360	7.6	250	5.1	---	---		2.7
16	350	7.6	260	5.0	---	---		2.8
17	285	8.2	---	---	---	---		2.8
18	282	8.9	---	---	---	---		2.8
19	265	8.5						2.8
20	268	8.2						2.7
21	260	7.9						2.7
22	280	7.4						2.6
23	285	7.2						2.6

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

Table 4

San Francisco, California (37.4°N, 122.2°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.2					3.0	2.4
01	300	6.0					2.7	2.4
02	280	5.9					2.4	2.4
03	290	5.6					2.5	2.4
04	300	5.3					2.4	2.4
05	290	5.2					2.7	2.4
06	280	6.5	240	---	120	2.4	2.6	2.6
07	290	7.4	240	4.8	120	3.0	3.8	2.6
08	310	8.2	230	5.2	120	3.3	4.9	2.5
09	360	9.2	220	5.4	120	3.6	4.9	2.5
10	360	9.3	220	5.4	120	3.8	4.6	2.5
11	360	9.7	220	5.6	120	3.8	5.2	2.5
12	370	9.9	220	5.6	120	3.9	4.4	2.4
13	360	9.8	220	5.6	120	3.9		2.5
14	360	9.8	220	5.5	120	3.8		2.5
15	345	9.6	220	5.4	120	3.6	4.1	2.5
16	330	9.3	230	5.2	120	3.4	4.0	2.6
17	300	9.0	240	4.7	120	3.1	3.9	2.7
18	260	8.8	---	---	120	2.5	3.8	2.7
19	260	8.0			---	---	3.6	2.8
20	255	7.6					3.1	2.6
21	260	7.2					2.7	2.6
22	280	6.5					3.2	2.4
23	300	6.2					2.6	2.4

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

Table 5

White Sands, New Mexico (32.3°N, 106.5°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	320	6.8					3.3	2.5
01	300	6.7					3.0	2.6
02	280	6.6					3.2	2.8
03	290	6.2					2.7	2.6
04	280	5.7					2.7	2.6
05	300	5.6	---	---	115	(1.7)	2.9	2.6
06	260	6.8	---	---	120	2.3	4.6	2.8
07	240	8.1	240	4.4	110	2.8	5.0	2.7
08	320	8.7	230	5.3	110	3.3	5.1	2.6
09	330	9.5	220	5.4	110	3.5	5.4	2.6
10	380	9.8	220	5.5	110	3.7	5.5	2.5
11	380	10.2	220	5.6	110	3.8	5.3	2.5
12	380	10.5	220	5.7	110	3.8	5.2	2.5
13	370	10.6	220	5.5	120	3.8	4.8	2.5
14	360	10.7	230	5.6	110	3.8	5.0	2.6
15	360	10.5	230	5.3	110	3.6	5.1	2.8
16	340	10.2	230	5.1	110	3.3	5.3	2.6
17	300	10.0	240	4.8	110	2.9	5.0	2.7
18	260	9.8	---	---	110	2.3	4.1	2.7
19	260	9.0			---	---	3.3	2.8
20	260	8.2					3.3	2.7
21	280	7.4					3.4	2.6
22	300	7.0					3.3	2.5
23	320	6.9					3.4	2.5

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

Table 6

Baton Rouge, Louisiana (30.5°N, 91.2°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	7.0						2.8
01	290	7.0						2.8
02	285	7.0						2.9
03	280	6.5						2.9
04	290	6.0						2.9
05	290	6.0						2.9
06	270	7.0	240	---	130	2.4		3.1
07	290	7.6	240	4.3	120	3.0	4.3	3.0
08	310	9.2	240	(5.3)	120	3.4	4.3	2.8
09	330	9.9	220	5.4	120	3.6		2.8
10	370	9.9	220	5.8	---	(3.7)		2.7
11	370	10.1	---	6.0	---	(3.7)		2.7
12	390	10.2	---	(5.8)	---	(3.7)		2.7
13	370	10.5	---	5.6	(120)	(3.7)		2.7
14	370	10.5	230	5.6	120	(3.7)		2.7
15	350	10.6	230	5.4	120	3.6		2.7
16	330	10.1	230	5.0	120	3.4		2.8
17	320	10.1	250	4.6	120	2.9	4.3	2.8
18	280	9.4	240	---	120	2.5	3.4	2.9
19	260	9.0						3.0
20	260	7.8					3.2	2.9
21	270	7.4					2.9	2.9
22	290	7.2					2.9	2.8
23	295	7.1						2.7

Time: 90.0°W.
Sweep: 2.12 Mc to 15.3 Mc in 8 minutes 30 seconds, automatic operation.

Table 7

Maui, Hawaii (20.8°N, 156.5°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	320	10.0						2.6
01	300	9.9						2.6
02	300	8.6						2.6
03	310	8.0						2.6
04	315	7.4						2.6
05	300	7.1						2.4
06	285	7.2			---	---		2.6
07	250	8.0	---	---	120	2.8		2.7
08	250	9.0	250	---	110	3.3		2.4
09	320	9.9	240	5.9	110	3.4		2.2
10	410	10.9	240	6.2	105	3.5		2.2
11	390	11.8	240	6.1	100	3.4		2.3
12	415	12.6	240	6.0	---	---		2.4
13	410	13.4	---	5.9	---	---		2.4
14	400	14.0	230	(5.7)	110	---		2.4
15	400	14.2	240	5.8	100	3.5	3.4	2.4
16	370	14.5	250	5.5	110	3.4	3.6	2.5
17	320	14.2	250	---	110	3.1	4.4	2.6
18	290	13.6	---	---	110	2.9	4.0	2.6
19	280	13.0			---	---	3.4	2.6
20	300	12.0					3.2	2.6
21	310	11.1					3.0	(2.5)
22	320	10.4						2.5
23	330	10.0						2.5

Time: 150.0°W.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute; above 16.0 Mc, manual operation.

Table 8

San Juan, Puerto Rico (18.4°N, 66.1°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		10.9						2.8
01		10.3						2.8
02		9.3						2.8
03		8.7						2.8
04		8.0						2.8
05		7.2						2.8
06		7.5						2.9
07	240	8.8		---				3.0
08	250	9.3		4.5		3.2		2.8
09	285	10.5		5.3		3.7		2.8
10	310	11.0		5.8		3.9		2.7
11	320	12.0		(6.1)		---		2.6
12	330	12.4		6.4		---		2.6
13	340	13.0		6.5		---	4.2	2.6
14	340	13.0		6.1		4.0	4.5	2.6
15	320	13.0		5.9		3.8	4.2	2.7
16	310	12.8		5.0		3.6	4.6	2.6
17	290	12.3		---		3.1	4.3	2.7
18	260	11.6		---				2.8
19	260	10.8		---				2.8
20		10.7						2.7
21		10.7						2.7
22		10.8						2.7
23		10.7						2.8

Time: 60.0°W.
Sweep: 2.8 Mc to 13.0 Mc in 9 minutes, supplemented by manual operation.

Table 9

Trinidad, Brit. West Indies (10.6°N, 61.2°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	11.4						3.0
01	250	10.4						2.9
02	250	9.6						3.0
03	250	8.8						3.0
04	250	8.0						2.9
05	260	7.0						2.8
06	260	7.8			---	---	2.4	2.9
07	240	9.1			120	2.8	3.4	3.0
08	250	10.0	225	4.4	120	3.3	3.9	2.9
09	260	11.0	220	5.0	120	3.6	4.2	2.8
10	280	11.9	220	5.3	120	3.9	4.4	2.7
11	300	12.7	220	5.5	120	4.0	4.6	2.7
12	320	13.2	220	5.8	120	4.1	4.8	2.7
13	320	13.8	220	5.7	120	4.1	5.0	2.8
14	330	13.7	220	5.6	120	3.9	5.2	2.7
15	320	13.5	220	5.4	120	3.7	4.8	2.8
16	280	12.9	230	4.8	120	3.4	4.8	2.8
17	260	12.4	235	4.3	120	2.9	4.3	2.7
18	260	11.7			100	2.1	3.9	2.7
19	280	11.6					3.6	2.6
20	310	11.7					2.5	2.6
21	300	12.2					2.2	2.7
22	280	12.1					2.2	2.9
23	270	12.0						2.9

Time: 60.0°W.
Sweep: 1.2 Mc to 18.0 Mc, manual operation.

Table 10

Palmyra I. (5.9°N, 162.1°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	13.1					2.0	2.9
01	250	11.0					1.9	(2.8)
02	250	11.2					1.5	(2.8)
03	250	10.4					1.6	3.0
04	250	8.5					1.3	2.9
05	250	6.4					1.6	2.9
06	290	6.1					2.1	2.8
07	270	8.0			130	2.7	3.2	2.7
08	250	9.9			120	3.3	3.7	2.6
09	240	10.6	240	---	120	3.7	3.9	2.4
10	270	10.5	(230)	---	130	3.9		2.3
11	(280)	11.4	---	---	130	---		2.3
12	(280)	11.9	---	---	125	---		2.2
13	(270)	12.0	---	---	130	---		2.2
14	(280)	12.1	(235)	---	130	---		2.2
15	270	12.2	220	---	130	3.8		2.2
16	250	12.4	230	---	120	3.4	3.8	2.2
17	250	12.2			130	2.9	4.0	2.3
18	290	11.7			140	2.2	3.8	2.3
19	350	11.0					3.2	(2.2)
20	390	11.1					1.9	2.2
21	350	12.1					2.0	2.4
22	300	13.1					2.2	2.6
23	270	13.6					2.1	2.8

Time: 157.5°W.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 36 seconds, automatic operation; 13.0 Mc to 18.0 Mc, manual operation.

Table 11

Huancayo, Peru (12.0°S, 75.3°W) May 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	225	7.4						3.0
01	230	7.4						3.1
02	230	6.4						3.1
03	240	5.4						3.1
04	240	5.0						3.2
05	230	4.5						3.1
06	275	5.5				1.6	2.8	2.9
07	250	8.8				2.5	4.5	3.0
08	230	10.8				3.2	7.2	2.8
09	(290)	11.4	220	5.4		3.6	10.4	2.6
10	(280)	11.3	210	5.4		3.8	10.5	2.4
11	---	11.0	210	---		3.9	10.6	2.4
12	(290)	10.6	210	5.4		3.9	10.6	2.4
13	---	10.6	205	---		3.9	10.6	2.3
14	---	10.9	210	---		3.8	10.6	2.2
15	---	10.9	220	---		3.4	10.5	2.3
16	230	10.6				3.0	10.3	2.3
17	260	10.3				2.2	4.9	2.3
18	320	9.9				1.0		2.2
19	360	9.2						2.2
20	310	9.2						2.4
21	250	9.2						2.6
22	240	8.9						2.8
23	230	8.0						2.9

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

Table 12

Chungking, China (29.4°N, 106.8°E) April 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	230	14.0						2.7
01	230	11.8						2.8
02	220	9.9						2.8
03	220	8.4						2.8
04	225	7.8			---	---		2.8
05	230	7.4			---	---		2.7
06	240	9.3	---	---	---	---		2.9
07	220	11.3	220	---	100	2.8	3.9	3.0
08	220	12.3	200	---	100	3.4	4.3	3.0
09	240	13.0	200	---	100	3.7	4.5	2.8
10	260	14.6	200	(7.0)	---	---	4.5	2.7
11	270	15.7	200	(7.0)	100	4.4	4.5	2.7
12	280	16.3	200	7.2	---	---	4.4	2.6
13	310	17.5	200	7.4	100	4.3	4.6	2.5
14	320	17.0	200	7.0	100	4.0	4.8	2.6
15	280	17.0	200	6.7	80	3.8	4.0	2.7
16	260	17.1	200	6.5	80	3.6	4.2	2.7
17	240	16.0	200	---	80	3.0	4.4	2.9
18	250	17.0	240	---	---	---	4.2	2.6
19	230	16.0			---	---	3.6	2.8
20	220	15.3					3.1	2.7
21	220	15.5					2.5	2.7
22	230	14.5					2.0	2.7
23	230	14.1						2.8

Time: 105.0°E.
Sweep: 1.5 Mc to 20.0 Mc in 15 minutes, manual operatio .

Table 13

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) April 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	5.5					1.8	2.9
01	250	5.0					1.8	2.8
02	260	4.8					1.7	2.8
03	250	4.4					1.8	3.0
04	250	4.0						2.9
05	260	3.8						2.9
06	250	4.6						2.8
07	230	8.7			110	2.4		3.2
08	230	11.4	---	---	110	3.0		3.2
09	240	12.6	220	---	110	3.4		3.1
10	250	13.3	220	---	100	3.7	4.0	3.0
11	270	13.5	210	---	100	3.8	4.2	2.9
12	295	13.5	210	---	100	3.9	4.3	2.8
13	300	13.8	220	---	100	3.9	4.2	2.8
14	300	13.8	225	---	100	3.8	4.1	2.7
15	300	13.7	230	---	110	3.6	4.0	2.7
16	(290)	13.4	240	---	110	3.1	3.9	2.7
17	240	13.0	240	---	100	2.5	3.1	2.8
18	230	12.6			100	---	2.3	2.9
19	230	11.2					2.2	2.9
20	230	10.3					2.0	3.0
21	230	9.3					2.2	3.1
22	230	7.5					2.0	3.0
23	235	6.4					1.7	3.0

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

Table 14

Capetown, Union of S. Africa (34.2°S, 18.3°E) April 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	(250)	4.7						2.9
01	(260)	4.1						2.9
02	(280)	4.0						2.8
03	(280)	4.0						2.8
04	(270)	4.0						2.9
05	(250)	3.6						2.9
06	(260)	3.5						2.9
07	260	5.2			---	---		3.0
08	230	9.2			120	2.4		3.3
09	240	11.3	230	---	110	3.0		3.1
10	250	12.7	220	---	110	3.3		3.1
11	260	13.3	---	---	110	---		2.9
12	270	13.7	---	---	110	---		(2.9)
13	290	(14.2)	---	---	110	---		(2.8)
14	290	(14.2)	---	---	110	---		(2.8)
15	280	(14.3)	240	---	110	---		(2.8)
16	270	(14.0)	240	---	110	3.2		(2.8)
17	250	(13.7)	240	---	110	2.9		(2.8)
18	240	13.4			110	(2.0)		2.9
19	220	12.2			100	---		2.9
20	230	10.8						3.0
21	230	9.5						3.1
22	220	7.2						3.2
23	230	5.6						3.1

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

Table 15

Lanchow, China (36.1°N, 103.8°E) March 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	360	7.0						2.3
01	(360)	(7.0)						(2.3)
02	(360)	(6.4)						(2.4)
03	(360)	(6.0)						(2.5)
04	(380)	(5.9)						(2.5)
05	(345)	(5.4)						(2.5)
06	(355)	(6.2)						(2.3)
07	360	8.9	315	---				2.5
08	360	11.7	320	---	150	3.0	3.5	2.6
09	360	12.8	300	---	160	3.5	3.8	2.4
10	360	14.4	320	---	---	---	4.0	2.4
11	360	14.4	320	---	---	---	4.2	2.5
12	360	14.5	310	---	---	---	(4.2)	2.4
13	385	14.2	300	---	---	---	(3.9)	2.3
14	390	14.0	280	---	---	---	(4.4)	2.3
15	380	14.0	300	---	---	---	4.4	2.3
16	360	13.4	300	---	---	---	3.9	2.3
17	360	12.8	315	---	150	2.9	3.6	2.3
18	360	12.5	320	---			3.1	2.4
19	320	11.5						2.4
20	340	10.4						2.4
21	340	(9.4)						(2.3)
22	340	9.0						2.3
23	380	8.2						2.3

Time: 105.0°E.
Sweep: 2.4 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 16

Brisbane, Australia (27.5°S, 153.0°E) March 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	295	8.2					3.0	2.6
01	290	8.0					2.6	2.6
02	270	7.7					2.5	2.6
03	270	7.4					2.2	2.6
04	270	6.8					1.2	2.5
05	280	6.8			---	---		2.6
06	250	7.8	---	---	140	2.0		2.9
07	240	9.9	---	---	110	2.8		3.0
08	240	11.4	240	5.8	110	3.3		3.0
09	250	11.8	230	5.2	110	3.5	4.0	2.8
10	280	12.2	230	5.8	110	3.9	3.8	2.8
11	290	12.3	230	6.3	110	4.0	4.2	2.8
12	300	12.2	230	7.0	110	4.0		2.7
13	310	12.1	230	7.0	110	4.0		2.6
14	310	12.1	230	6.5	110	4.0		2.7
15	300	12.0	240	6.0	110	3.6		2.7
16	250	11.6	245	5.5	110	3.3		2.7
17	250	11.0	---	---	110	2.8		2.7
18	250	10.0			---	---	3.5	2.8
19	250	9.0			---	---	3.2	2.7
20	290	9.0					2.8	2.6
21	300	8.8					3.0	2.6
22	300	8.5					2.8	2.6
23	290	8.5					2.4	2.6

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

Table 17

Canberra, Australia (35.3°S, 149.0°E) March 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	7.4					2.9	2.5
01	280	7.2					2.6	2.5
02	260	6.9					2.8	2.6
03	275	6.5					2.6	2.5
04	275	6.2					2.8	2.5
05	265	6.0					2.0	2.5
06	250	6.5	---	---	115	1.5	2.9	2.9
07	240	8.2	---	---	100	2.5	3.8	3.0
08	230	9.4	---	---	100	3.0	4.1	3.0
09	240	10.5	210	4.8	100	3.4	4.0	3.0
10	250	11.1	205	5.1	100	3.6	3.8	2.9
11	250	11.2	205	5.0	100	3.8	4.2	2.8
12	300	11.2	210	5.7	100	3.9	4.2	2.8
13	300	11.0	210	5.9	100	3.9	4.0	2.7
14	300	11.0	215	6.1	100	3.8	4.0	2.7
15	265	11.0	225	5.4	100	3.6	3.8	2.7
18	240	10.6	240	5.5	100	3.3	3.3	2.8
17	250	10.0	---	---	100	2.8	3.8	2.8
18	250	10.0			110	1.8	3.4	2.9
19	250	9.0			---	(1.5)	2.8	2.7
20	250	8.4					2.6	2.6
21	260	8.0					3.0	2.6
22	270	7.6					2.9	2.5
23	290	7.5					3.2	2.6

Time: 150.0°E.
Sweep: 1.0 Mc to 18.0 Mc in 1 minute 55 seconds.

Table 18

Hobart, Tasmania (42.8°S, 147.4°E) March 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.2					3.3	(2.5)
01	275	6.3					3.7	(2.5)
02	(275)	6.2					2.1	(2.5)
03	280	5.9					2.4	(2.6)
04	255	5.5					2.7	(2.6)
05	260	(5.5)					2.6	(2.6)
06	250	5.4			---	---	3.0	2.8
07	250	7.2			100	2.5		3.1
08	240	8.0	---	---	100	3.0		3.2
09	250	8.5	210	---	100	3.3		3.1
10	260	9.6	210	5.0	100	3.5	3.7	3.0
11	280	10.0	210	5.7	100	3.8		3.0
12	300	10.0	220	5.6	100	3.8		2.9
13	300	10.2	220	6.0	100	3.8		2.8
14	312	10.2	220	6.0	100	3.6	4.0	2.8
15	270	9.5	220	5.4	100	3.4		2.8
16	255	9.7	230	5.5	100	3.3	3.4	2.8
17	250	9.6	---	---	100	2.8		2.8
18	260	8.7			100	2.3		2.9
19	260	8.8			---	---	3.0	3.0
20	255	8.4					2.1	2.9
21	250	7.6						2.8
22	260	6.8					2.8	2.6
23	270	(6.6)					2.6	(2.6)

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

Table 19

Christchurch, New Zealand (43.5°S, 172.7°E) March 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	7.2					2.8	2.4
01	300	7.1					3.0	2.4
02	300	6.6					2.7	2.4
03	290	6.3					2.8	2.5
04	295	6.0					2.8	2.5
05	285	5.5					3.0	2.6
06	275	5.5				1.4	3.2	2.8
07	250	7.4	---	---		2.3	3.5	3.0
08	250	8.1	240	(4.6)		2.9	4.4	3.0
09	255	8.9	240	5.0		3.3	4.4	2.9
10	285	8.8	240	5.4		3.5	4.4	2.8
11	270	9.8	240	5.5		3.7	4.4	2.8
12	285	10.2	240	5.8		3.7	5.5	2.7
13	270	10.8	240	5.9		3.6		2.7
14	250	10.8	240	5.7		3.5		2.7
15	250	10.4	240	5.3		3.4	4.4	2.7
16	250	10.4	---	---		3.1	4.0	2.7
17	260	10.5				2.6	3.5	2.7
18	260	10.3				2.0	3.2	2.7
19	260	9.6				1.3	3.0	2.6
20	270	9.0					3.0	2.6
21	280	8.4					3.0	2.5
22	300	7.8					2.9	2.4
23	300	7.4					2.9	2.5

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

Table 20

Rarotonga I. (21.3°S, 159.8°W) February 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	290	9.2			---	(1.4)	2.7	2.8
07	250	10.9			120	2.5	3.6	3.0
08	240	10.9	---	---	110	3.2	4.0	2.9
09	240	11.8	---	---	110	3.6	5.1	2.6
10	260	13.1	230	---	110	3.8	5.0	2.6
11	355	14.2	---	---	110	4.0	5.5	2.6
12	370	15.2	250	7.3	110	4.1	5.0	2.6
13	370	16.0	230	6.9	110	4.1	3.6	2.6
14	360	18.1	240	6.8	110	4.0	4.9	2.6
15	385	15.3	240	6.6	110	4.0	4.8	2.6
16	360	14.6	250	6.4	110	3.7	4.8	2.6
17	350	13.7	250	6.4	110	3.2	5.0	2.6
18	275	13.1	---	---	115	2.7	4.5	2.6
19	290	12.8			---	(1.7)	4.2	2.5
20	310	11.3					3.5	2.4
21	320	11.4					3.5	2.5
22								
23								

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

Table 21

Brisbane, Australia (27.5°S, 153.0°E) February 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	9.0					2.6	2.7
01	280	9.0					2.6	2.7
02	280	6.0					2.7	2.6
03	275	7.3					2.2	2.6
04	275	7.0					2.0	2.6
05	270	7.0			---	E	1.3	2.7
06	250	7.6	---	---	120	2.2	1.7	2.9
07	250	6.6	---	---	115	3.0		3.0
08	240	9.5	240	5.2	110	3.6		2.8
09	300	10.5	230	5.7	110	3.6		2.8
10	340	10.9	220	6.2	120	4.1	3.6	2.6
11	350	11.0	220	6.0	120	4.1	3.6	2.6
12	370	11.3	230	6.3	120	4.1		2.6
13	350	11.5	230	6.3	120	4.2		2.6
14	350	11.3	225	6.2	106	4.0		2.6
15	340	11.0	225	5.9	110	3.9		2.6
16	310	10.6	240	6.5	110	3.6		2.6
17	250	9.9	---	---	115	3.0		2.7
18	260	9.4	---	---	120	(2.3)	2.5	2.6
19	260	9.0			---	(1.5)	2.6	2.6
20	295	6.6					2.5	2.6
21	300	9.0					1.6	2.6
22	300	6.9						2.6
23	300	9.0					2.4	2.6

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

Table 22

Canberra, Australia (35.3°S, 149.0°E) February 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	7.6					3.5	2.5
01	290	7.6					3.4	2.6
02	270	7.2					3.2	2.6
03	280	6.6					2.9	2.5
04	260	6.4					2.7	2.6
05	260	6.0			---	E	2.3	2.6
06	250	6.4	---	---	100	1.9	2.8	2.9
07	240	7.2	230	(4.0)	100	2.9	3.6	3.0
08	250	7.9	222	(4.9)	100	3.4	4.7	2.9
09	326	8.1	210	5.5	100	3.7	5.6	2.8
10	340	9.0	220	6.0	100	3.9	4.4	2.7
11	340	9.7	205	6.0	100	4.0	6.3	2.7
12	350	9.9	202	5.9	100	4.0	5.2	2.6
13	355	9.6	210	6.0	100	4.0	4.0	2.6
14	350	10.0	220	6.0	100	4.0	4.0	2.6
15	350	10.0	220	5.9	100	3.9	3.5	2.6
16	335	9.6	220	5.4	100	3.5		2.7
17	240	9.2	230	4.6	100	3.2	3.5	2.7
18	250	9.0	250	(4.0)	100	2.6	3.4	2.6
19	250	6.6			100	1.6	3.0	2.7
20	250	6.2			---	(1.6)	3.0	2.6
21	280	6.0					3.3	2.6
22	295	6.0					3.5	2.6
23	290	6.0					4.0	2.6

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

Table 23

Hobart, Tasmania (42.6°S, 147.4°E) February 1949*

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	6.7					2.1	2.4
01	285	6.4					2.9	2.5
02	290	(6.0)					2.4	(2.5)
03	(270)	(5.7)					(2.6)	(2.4)
04	275	(5.3)					2.6	(2.6)
05	(270)	(6.0)					(2.7)	(2.6)
06	(260)	(6.5)	---	---	---	---	2.6	(2.9)
07	(250)	(6.6)	---	---	100	2.6	4.0	(2.9)
08	320	(6.6)	220	4.9	100	3.2	2.7	2.9
09	380	(6.7)	220	6.0	100	3.6	4.0	(2.6)
10	305	(6.2)	215	5.3	---	---	6.0	(2.6)
11	(445)	---	---	5.4	---	---	(4.0)	---
12	(520)	(6.9)	216	5.5	---	4.0	(4.4)	(2.6)
13	410	(6.1)	210	5.5	---	---	6.5	2.6
14	(350)	(9.5)	---	6.6	---	3.6	(6.5)	(2.6)
15	360	9.4	235	5.4	---	3.6	5.2	2.7
16	330	9.3	230	5.3	---	3.6	3.3	2.6
17	325	9.4	240	5.0	100	3.2		2.6
18	256	9.4	---	---	100	2.7	2.1	2.6
19	(290)	(6.5)					(3.5)	(2.6)
20	(250)	(6.7)					(2.6)	(2.9)
21	(270)	(6.2)					(3.3)	(2.6)
22	(270)	(7.6)					(3.0)	(2.7)
23	275	(6.6)					2.9	(2.5)

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.
*Data taken February 1, and 14 through 28, only.

Table 24*

Fraserburgh, Scotland (57.6°N, 2.1°W) January 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	390	2.2						2.6
01	400	2.0						2.4
02	400	2.1						2.3
03	390	2.2						2.4
04	370	2.4						2.4
05	350	2.6						2.7
06	350	2.6						2.6
07	330	2.6						2.8
08	270	4.0						2.9
09	240	6.6	320‡	3.4‡	140‡	2.3‡		2.9
10	240	6.6	300‡	3.3‡	140	2.4		3.2
11	240	9.5			140	2.5		3.2
12	240	10.0	290‡	3.9‡	140	2.6		3.0
13	240	9.6	270‡	3.7‡	130	2.7		3.0
14	240	10.2			130	2.5		3.2
15	230	9.7			90‡	2.4‡		2.9
16	240	6.7						2.9
17	230	7.5						3.0
18	230	6.0						2.9
19	290	4.6						2.9
20	310	3.5						2.6
21	350	3.0						2.7
22	360	2.3						2.5
23	390	2.2						2.5

Time: Local.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute.
*Average values except foF2, which are median values.
‡One or two observations only.

Table 25*

Slough, England (51.5°N, 0.6°W) January 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	313	3.0					2.6	2.6
01	311	3.1					2.6	2.5
02	310	2.7					2.8	2.5
03	300	2.5					2.6	2.8
04	289	2.6					2.6	2.7
05	268	2.6					2.6	2.7
06	280	2.5					3.4	2.7
07	266	3.0			---	1.4ǂ	3.0	2.8
08	227	5.8			133	1.8	3.6	3.2
09	227	9.0	275ǂ	3.5ǂ	123	2.3	4.4	3.3
10	227	10.4	213ǂ	4.7ǂ	122	2.6	4.0	3.2
11	233	10.4	233	4.1	122	2.9	3.2	3.2
12	229	10.9	240	4.3	121	3.0	3.6	3.2
13	231	10.4	225	4.4	123	2.9	4.2	3.2
14	232	10.7	240ǂ	4.5ǂ	124	2.7	4.4	3.1
15	224	9.9	280ǂ	3.7ǂ	127	2.4	3.8	3.2
16	219	9.0			130	2.0	2.6	3.1
17	218	8.2			150ǂ	1.7ǂ	2.6	3.1
18	221	6.2					2.8	2.0
19	230	4.8					1.5	3.0
20	268	3.9						2.8
21	288	3.4					2.6	2.7
22	317	3.0					2.4	2.5
23	332	3.1					2.6	2.5

Time: Local.
Sweep: 0.55 Mc to 16.5 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.
ǂOne or two observations only.

Table 26*

Singapore, British Malaya (1.3°N, 103.8°E) January 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	255	9.8						2.6
01	260	9.8						2.8
02	280	9.5						3.0
03	245	8.0						2.9
04	245	6.9						3.0
05	250	5.8						3.0
06	265	4.8						2.6
07	250	8.0			105	2.6	2.3	2.9
08	240	9.5			105	3.3	3.8	2.7
09	250	10.1	250ǂ	5.5ǂ	110	3.7	4.1	3.2
10	400	(10.8)	200ǂ	4.9ǂ	105	4.0		2.0
11	440	(10.3)	240ǂ	5.7ǂ	110	4.0		1.9
12	330	10.6	230ǂ	6.4ǂ	105	4.3		2.0
13	340	(11.4)	210ǂ	6.7ǂ	110	4.2		2.1
14	450	(11.0)	235ǂ	5.8ǂ	110	4.0		2.0
15	380	(11.0)	240ǂ	5.4ǂ	110	3.8		2.0
16	350	(11.1)	260ǂ	4.8ǂ	105	3.4	4.0	2.1
17	255	(10.8)	270ǂ	---	105	2.9	2.8	(2.3)
18	275	(11.2)			---	2.3	2.9	(2.4)
19	335	(11.1)						(2.0)
20	365	(10.7)						(2.2)
21	315	(10.4)						(2.3)
22	265	9.9						2.5
23	250	(9.4)						(2.8)

Time: 112.5°E.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute.
*Average values except foF2 and fEs, which are median values.
ǂOne or two observations only.

Table 27

Hobart, Tasmania (42.8°S, 147.4°E) January 1949

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	8.5					3.2	2.8
01	280	6.0					3.6	2.6
02	285	5.8					3.4	(2.7)
03	300	5.3					3.0	(2.7)
04	272	4.7			---	---	2.3	2.7
05	270	(4.5)	---	---	---	---	3.1	(2.8)
06	245	5.4	---	---	---	2.4	3.8	(2.9)
07	260	5.8	245	4.5	100	3.0	3.6	2.8
08	370	6.2	220	4.8	100	3.3		(2.8)
09	400	6.8	210	5.0	100	3.5		(2.7)
10	400	6.7	210	5.2	100	3.8		(2.6)
11	420	7.2	---	5.3	100	3.9		(2.8)
12	490	7.0	---	5.3	100	3.9		(2.5)
13	455	7.3	210	5.6	100	3.9		2.6
14	435	7.5	210	5.4	100	3.9		2.6
15	400	7.5	230	5.5	100	3.8		2.6
16	390	7.5	220	5.2	100	3.5		2.6
17	350	7.5	235	5.0	100	3.2		2.7
18	300	7.5	250	4.2	100	2.8		2.9
19	255	7.5	---	---	100	2.2	2.4	2.9
20	275	7.4			---	---	3.5	2.9
21	280	7.4					2.5	2.8
22	290	7.2					4.6	2.7
23	270	6.8					4.0	2.7

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

Table 28*

Fraserburgh, Scotland (57.6°N, 2.1°W) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	400	1.8						
01	390	2.0						
02	370	2.2						
03	360	2.4						2.6
04	350	2.4						2.4ǂ
05	320	2.6	(250)ǂ	(3.8)ǂ				2.8ǂ
06	310	2.8						
07	320	2.8						
08	270	4.0	(300)ǂ	(3.9)ǂ				2.8
09	230	7.0						3.0
10	240	9.2			(150)	2.3		3.1
11	230	10.4			150	2.4		3.0
12	230	10.6			140	2.5		3.0
13	220	10.7			130	2.4		3.2
14	220	11.0			(150)	2.3		3.0ǂ
15	220	9.7						3.2
16	230	8.8						3.2
17	250	7.1	(260)ǂ	(4.4)ǂ				
18	260	5.6						
19	300	3.6						
20	320	2.8						2.8ǂ
21	350	2.4						
22	360	2.2						
23	380	1.7						2.2ǂ

Time: Local.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute.
*Average values except foF2, which are median values.
ǂOne or two observations only.

Table 29*

Slough, England (51.5°N, 0.6°W) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	305	3.2					2.6	2.5
01	302	3.2					2.6	2.5
02	299	2.9					2.6	2.6
03	287	2.8					2.6	2.6
04	271	2.6					2.8	2.7
05	269	2.7					2.6	2.7
06	273	2.5					2.6	2.7
07	268	3.0					3.4	2.7
08	227	5.9			138	1.6	3.5	3.1
09	218	8.3			128	2.1	3.9	3.2
10	220	10.7			124	2.5	3.9	3.2
11	221	11.5			124	2.8	2.6	3.2
12	220	11.8			125	2.8	2.6	3.2
13	219	11.6			124	2.8	3.5	3.2
14	223	11.3			125	2.6	3.9	3.2
15	218	10.8			128	2.1	3.5	3.2
16	214	9.1			135	1.7	3.5	3.2
17	216	7.4					2.6	3.2
18	229	5.9					2.6	3.2
19	233	4.3						3.0
20	259	3.4					2.1	2.8
21	288	3.0					2.5	2.7
22	306	3.0					2.4	2.8
23	317	3.0					2.6	2.5

Time: Local.
Sweep: 0.5 Mc to 16.5 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 30

Poitiers, France (46.6°N, 2.0°W) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02		3.8						2.7
03		3.6						2.8
04		3.4						
05		3.2						
06		3.2						
07		4.2						2.8
08	230	7.5						3.4
09	230	9.6						3.4
10	230	11.0						3.4
11	225	D						
12	230	D						
13	225	11.0						3.3
14	225	10.7						3.3
15	230	10.4						3.3
16	230	9.6						3.4
17	230	7.4						3.2
18	240	6.1						3.2
19	250	5.0						3.2
20	255	4.0						3.0
21		3.6						2.8
22		3.6						2.7
23		3.7						2.6

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

Table 31

Calcutta, India (22.6°N, 88.4°E) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E*	fEs	F2-M3000
00		(8.2)				1.7		
01		(7.2)				1.6		
02		(7.0)				1.8		
03	(300)	6.2				1.4		(2.8)
04		5.8				1.3		
05		5.5				1.2		
06	(270)	5.8				1.3		(3.0)
07		8.0				2.0		
08		10.8				2.6		
09	(300)	12.4				3.2		(3.0)
10		13.0				3.4		
11		13.0				3.7		
12	300	13.1				3.6		2.8
13		13.2				3.6		
14		13.2				4.0		
15	(300)	13.1				3.5		2.8
16		13.1				3.2		
17		13.1				3.1		
18	(300)	13.0				2.8		(2.8)
19		12.8				2.4		
20		13.0				2.0		
21	(270)	(12.8)				2.0		(2.9)
22		11.8				1.8		
23		9.9				1.4		

Time: Local.
*Probably includes fEs observations.

Table 32*

Singapore, British Malaya (1.3°N, 103.8°E) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270							2.9
01	275							2.8
02	280							3.1
03	250							3.0
04	255							3.0
05	255							3.2
06	290							2.8
07	235#							2.9
08	230	9.2					4.5	2.6
09	220	10.0					4.6	2.2
10	220	10.3			110#	4.2#	4.7	2.0
11	210	10.[illegible]				4.5#	4.6	1.9
12	210	11.1			110#	4.5		2.0
13	220#							(2.3)
14	210	11.9				4.2#		2.1
15	225	12.1					4.2	2.1
16	235	12.0						2.1
17	290	(12.1)					(5.9)	2.2
18	315	(11.6)						2.2
19	360#							(2.2)
20	340#							(2.3)
21	290#							(2.5)
22	270	(11.0)						2.7
23	260	(10.1)						2.7

Time: Local.
Sweep: 4.0 Mc to 15.0 Mc in 15 minutes, manual operation.
*Average values except foF2 and fEs, which are median values.
#One or two observations only.

Table 33*

Falkland Is. (51.7°S, 57.8°W) December 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	334						(3.4)	
01	328						(4.2)	
02	318						(3.1)	
03	313						(2.5)	
04	330		285#	4.1#	150#	2.0#	(3.6)	
05	361		265	4.6#	114		(4.1)	
06	369		254	5.2	110	2.6#	(4.6)	
07	352		254	5.0#	109	3.3#	(6.1)	2.3#
08	349		242#	5.8#	106	3.4	4.9	
09	373	(11.2)	238#	5.9#	106	3.6#	(4.8)	2.3#
10	393	(11.2)	256	5.8	106	3.7#	(5.2)	2.4#
11	381	(10.6)	248	6.0	104		5.6	2.4#
12	406	(8.7)	240	6.0	104		(4.2)	2.5#
13	391	(9.5)	243	5.8	103	3.9#	4.0	2.4#
14	386	(8.6)	248	5.6	106	3.6	(4.5)	2.5
15	365	(8.2)	248#	5.5#	109	3.6	(6.8)	2.5#
16	350	(8.5)		4.8#	110	3.4	(7.0)	2.5#
17	324	(8.5)	260#	5.2#	113	3.1	4.8	
18	306	(8.6)			120#	2.7#	4.8	2.7#
19	297	(8.0)					4.6	2.5#
20	320						4.9	
21	325						3.5	
22	337						4.5	
23	342						(3.3)	

Time: Local.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute.
*Average values except foF2 and fEs, which are median values.
#One or two observations only.

Table 34

Bagneux, France (48.8°N, 2.3°E) November 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	305							
07			260					
08			250					
09			250					
10			250					
11			255					
12			250					
13			270					
14			265					
15			255					
16			250					
17			290					
18	255							
19	310							
20	365							
21	380							
22	385							
23								

Time: 0.0°.
Sweep: 3.9 Mc to 9.2 Mc in 12 minutes, manual operation.

Table 35

Poitiers, France (46.6°N, 2.0°W) November 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02		4.3						2.6
03		4.0						2.8
04		4.0						2.9
05		3.6						(2.9)
06		3.2						
07	240	6.0						3.2
08	230	9.0	225					3.4
09	230	10.4	220					3.4
10	230	D	220					3.3
11	232	D	220					
12	230	D	222			3.4		
13	235	D	230					
14	240	D	230					
15	232	D	230					
16	230	10.6	225					3.2
17	225	9.4						3.1
18	230	8.0						3.1
19	240	6.4						3.1
20	260	5.0						2.9
21	(285)	4.7						2.8
22		4.6						2.6
23		4.4						2.6

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

Table 36

Calcutta, India (22.6°N, 88.4°E) November 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E*	fEs	F2-M3000
00	330	9.6				1.8		2.8
01		8.2				1.8		
02		7.4				1.7		
03	330	6.4				1.5		2.8
04		5.8				1.7		
05		6.2				1.8		
06	300	6.8				2.0		3.0
07		8.9				2.5		
08		10.8				2.8		
09	300	11.7				3.0		3.0
10		12.6				3.2		
11		13.0				3.5		
12	330	13.0				3.5		2.8
13		13.1						
14		13.1						
15	330	13.0						2.8
16		13.0				3.6		
17		12.8				3.1		
18	(330)	12.6				3.0		2.8
19		12.4				2.8		
20		12.8				2.2		
21	285	12.6				1.9		3.0
22		11.2				2.0		
23		10.5				2.0		

Time: Local.
*Probably includes fEs observations.

Table 37*

Falkland Is. (51.7°S, 57.8°W) November 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	323	(8.9)					2.5	2.5
01	321	(8.8)						2.5
02	320	8.6						2.4
03	334	8.6						2.4
04	302	(8.9)	260#	4.2#	126	1.7		2.4
05	316	9.5	261	6.2	122	2.3		2.3
06	324	9.9	254	5.6	118	2.8		2.4
07	318	(10.0)	242	6.7	113	3.2		2.5
08	349	10.3	240	5.7	111	3.4	4.8	2.4
09	348	11.0	232	5.8	110	3.6	4.3	2.5
10	360	11.0	235	5.6	109	3.7	4.8	2.5
11	346	11.0	233	5.8	110	3.6	4.2	2.5
12	348	11.0	230	5.8	109	3.6		2.5
13	347	10.8	233	5.7	110	3.7		2.5
14	338	10.3	244	5.5	110	3.6		2.7
15	318	9.7	248	6.0	112	3.4		2.8
16	293	9.5	251	5.3#	114	3.1		2.6
17	275	9.0	250#		119	2.8		2.7
18	279	(8.8)			126	2.4	3.5	2.6
19	280	(8.7)					2.5	2.7
20	296	(8.6)					2.6	2.6
21	317	(8.8)					4.0	2.6
22	332	(8.9)					3.1	2.4
23	333	(9.0)					2.5	2.4

Time: Local.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute.
*Average values except foF2 and fEs, which are median values.
#One or two observations only.

Table 38

Fribourg, Germany (48.1°N, 7.8°E) September 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	310	5.9					2.2	2.6
01	310	5.9					2.2	2.5
02	306	6.6					2.2	2.5
03	310	5.4					2.2	2.5
04	310	5.0						2.5
05	270	4.6					2.2	2.7
06	262	6.0				1.8	3.2	3.0
07	240	7.6	240		120	2.5	3.1	(3.0)
08	260	(8.7)	240	(4.3)	110	3.0	4.0	3.0
09	260	8.6	226	4.8	110	3.3	4.4	2.9
10	260	8.9	220	4.8	110	3.6	4.3	2.8
11	290	9.6	210	5.0	110	3.6	4.3	2.8
12	280	9.6	220	(4.9)	110	3.6	4.2	2.8
13	310	(10.0)	225	5.4	110	3.6	4.0	(2.7)
14	300	9.9	225	5.0	110	3.4	3.9	2.8
15	280	9.9	230	4.8	110	3.3	3.8	2.8
16	272	10.0	240		110	3.0	3.6	2.8
17	260	10.1	240		110	2.4	3.8	(2.8)
18	250	(10.0)			130	E	3.3	2.8
19	240	(8.8)					3.2	(2.8)
20	240	(7.8)					2.2	(2.8)
21	250	7.1					2.8	2.7
22	260	6.3					2.6	(2.6)
23	300	6.0					2.3	2.6

Time: Local.
Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

Table 39

Fribourg, Germany (48.1°N, 7.8°E) August 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	(6.6)					2.7	2.6
01	300	6.0					2.6	2.6
02	300	(5.8)					2.4	(2.6)
03	290	5.5					2.4	2.5
04	290	5.2					2.6	(2.7)
06	270	5.7			---	E	3.2	2.8
08	250	6.4	250		110	2.3	3.8	2.9
07	300	7.4	230	4.4	110	2.8	4.5	2.9
08	290	8.0	230	4.8	100	3.2	4.6	(3.0)
09	290	8.2	225	5.0	100	3.4	6.4	2.9
10	310	8.1	220	(5.4)	100	3.6	5.6	2.9
11	360	8.4	220	5.5	100	3.7	5.4	(2.7)
12	330	8.3	210	5.6	102	3.8	6.4	2.7
13	350	8.4	220	5.6	100	3.7	4.8	2.8
14	340	8.4	230	5.7	105	3.7	4.8	2.8
16	320	8.2	220	6.3	105	3.6	4.1	2.8
16	310	8.2	230	(4.8)	100	3.4	4.3	(2.9)
17	290	(8.3)	240		108	3.0	4.8	(2.8)
18	272	8.5	245		110	2.4	3.9	2.8
19	260	(8.8)			130	(1.7)	4.2	(2.9)
20	255	(8.4)					3.4	(2.9)
21	260	7.6					3.6	2.7
22	280	(7.0)					3.4	(2.7)
23	290	(6.6)					3.2	2.6

Time: Local.
Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

Table 40

Fribourg, Germany (48.1°N, 7.8°E) July 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	308	7.6					3.1	2.6
01	305	7.0					2.8	2.6
02	310	6.6					2.8	2.6
03	300	6.3					2.5	2.6
04	300	6.2					2.7	(2.5)
05	320	6.6	270	3.6	120	2.1	3.4	2.7
06	330	7.2	250	4.4	110	2.6	4.2	2.6
07	390	7.6	240	(6.0)	110	3.1	4.6	2.6
08	350	(7.7)	230	(6.2)	106	3.4	5.0	(2.8)
09	370	8.0	225	(6.4)	100	3.6	5.8	2.6
10	385	8.2	240	6.5	100	3.7	6.6	2.6
11	390	8.4	222	6.7	100	3.8	6.0	2.6
12	390	8.4	230	6.6	100	3.8	5.6	2.6
13	390	8.2	230	5.7	105	3.8	5.4	2.6
14	380	8.0	230	5.5	100	3.8	5.8	2.6
16	380	(7.8)	230	6.4	105	3.6	5.0	2.6
16	370	(7.9)	240	6.2	106	3.4	4.5	2.6
17	(330)	7.8	240	4.8	106	3.2	4.4	(2.7)
18	310	8.3	250		110	2.8	4.1	2.8
19	270	8.3	270		115	2.2	4.0	2.9
20	270	8.1					3.6	2.8
21	270	(7.7)					3.3	(2.6)
22	(285)	(7.7)					3.4	(2.6)
23	300	(7.6)					3.4	(2.6)

Time: Local.
Sweep: 1.6 Mc to 17.6 Mc in 10 minutes, automatic operation.

TABLE 41

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

Form adopted June 1946

IONOSPHERIC DATA

h'F2 (Characteristic), Km (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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	(270)S	270	280	280	290	250F	270F	430F	380	490	N	470	500	500	540	480	440	380	320	270	270	270	280	270
2	260	250	250	250	300	270	230	300H	340	310	400	400	460	400	420	380	370	(340)A	(240)A	270	250	250	250	270
3	270	280	300	270	270	250H	250	350	340	400	350	480	430	430	400	(390)S	380	340	310	280	250	310	290K	240K
4	270K	250K	300K	370K	300K	300K	370K	LK	GK	GK	GK	540K	BK	BK	430K	570K	500K	460K	270K	280K	280K	270K	270K	300K
5	340K	320K	370K	(380)BK	380K	330K	300K	250K	GK	GK	480K	GK	450K	AK	GK	GK	600K	460K	350K	300K	240K	270K	AK	250K
6	330K	300K	370FK	350K	(400)SK	350K	270K	GK	GK	GK	GK	GK	GK	BK	GK	310K	470K	470K	350	300	260	260	280	300
7	280	270	270	280	280	280	250	230	340	300	410	450	360	(440)S	360	370	370	320	280	270	240	250	270	(280)A
8	300	(340)A	310	270	270	270	330	370	360	350	(370)S	450	430	440	420	430	430	360	320	280	270	A	320	300
9	280	280	280	270	260	270	250	300	290	320	330	350	350	350	340	350	350	(330)A	280	(280)A	250	270	260	250
10	270	250	250	270	270	280	330	320	310	310	380	380	370	380	350	340	340	330	300	260	250	250	290	280
11	300	280	270	280	280	270	230	(280)A	290	280	330	350	370	410	380	360	340	320	290	280	250	250	(250)S	270
12	280	280	260	270	270	270K	380K	550K	520K	500K	560K	(530)BK	(580)BK	(570)BK	470K	450K	400K	370K	330K	270K	260K	240K	300HK	300K
13	300K	310FK	310K	310K	330K	330K	(300)HK	GK	GK	AK	AK	AK	AK	AK	AK	AK	390K	500K	350	260	270	270	270	280
14	300	300	300	(280)A	270	280	240	400	A	A	400	450	B	A	390	(370)A	380	380	300	280	280	240	250	260
15	280	300	280	280	250	270	240	250	350	370	370	350	B	T	T	T	350	330	300	260	250	250	270	270
16	250	270	270	280	270	250	240	280	330	290	350	380	390	350	400	360	350	330	A	A	(310)A	280	240	240
17	240	280	(260)S	270	290	250	300	230	300	430	430	400	400	420	360	390	360	350	280	270	240	C	C	300
18	(350)A	270	290	C	C	C	C	C	C	C	440	450	480	480	440	(450)A	A	360F	330	(290)A	300	300	250	280
19	280	240	270	250	280	350	(250)S	(400)A	500	410	360	600	450	500	450	490	450	370	330	(270)A	(250)A	250	280	270
20	280	280	290	300	300	280	320	320	A	290	340	350	370	380	380	380	380	350	A	300	250	250	250	260
21	270	270	270	290	250	A	370	[380]L	380	450	400	400	410	370	380	A	350	370	300	260	(250)A	250	270	280
22	A	300	300	300	280	250	350	A	400	330	(400)S	350	380	430	380	400	410	340	290	260	280	280	300	280
23	280	(260)S	260	280	250	240	300	330	380H	A	400	430	460	430	430	450	400	330	(330)A	250	270	250	(350)A	(350)A
24	270	290	250	240	260	250	250H	350	330	300	380	350	370	370	400	380	330	330	300	A	260	280	320	280
25	250	250	280	280	310F	(310)A	A	380	490	480	A	520	490	480	480	470	400	450	300	270	250	270	(300)A	A
26	300	(320)A	280	260	270	(330)A	(290)A	340	A	420H	370	A	400	370	390	400	380	350	260	270	250	250	270	300
27	280	280	270	250	280	260	230	340	380	370	340	380	390	420	410	A	400	370	330	280	250	250	260	230
28	270	250	250	270	280	280	230	L	370	340	310	380	480	400	400	420	370	350	330	270	260	250F	230	270
29	250	290	280	250	280	250	400	380	350	370	350	A	400	410	380	340	400	330	300	280	250	(300)A	270	300
30	260	270	270	290	270	260	(240)A	220	470	380	400	400	400	450	450	450	400	360	300	(280)A	(240)A	240	270	(270)S
31																								
Median	280	280	280	280	280	270	270	340	375	370	380	400	405	420	400	395	380	350	300	270	250	250	270	280
Count	29	30	30	29	29	28	28	26	26	26	27	27	26	24	28	26	29	30	28	28	30	28	28	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE. 1946 O - 703519

Form adopted June 1946

TABLE 42

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

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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	6.6	5.7	5.3F	(4.5)JF	3.9F	4.6F	5.4F	5.5F	5.8HF	5.7F	5.5	6.0	6.0	6.1	6.0	5.9	6.2	6.6	6.9	6.7	6.6	7.1	7.0	6.7
2	6.6F	6.0F	5.3F	4.7F	3.9F	4.6F	5.6F	6.5	7.0	7.1F	6.9	(7.3)J	7.0	7.0	7.2	7.3	7.5	7.5	8.0	8.2	8.2	8.0	7.7	6.9
3	6.5	6.2	5.8	5.3	(4.5)JS	4.7	5.5	6.0	6.0	6.3	6.8	6.7	6.9	6.9	7.3	(7.2)JS	7.2	7.1	7.7	8.0	7.7	7.7	8.0K	7.3K
4	6.6K	(5.4)FK	4.2K	2.6FK	4.0K	4.0K	5.0K	(5.0)PK	<4.5GK	<4.8GK	<4.8GK	5.8K	BK	BK	6.0K	5.6K	5.8K	5.8K	6.2K	6.4K	6.7K	7.0K	6.8K	(5.8)JK
5	5.6K	5.3K	2.4FK	2.2FK	2.8FK	3.4FK	3.6K	4.5K	<4.2GK	<4.4GK	5.4K	<4.8GK	6.0K	AK	<4.8GK	<4.7GK	5.3K	6.7K	7.7FK	8.4K	8.0K	(7.5)JS	6.3K	6.2K
6	(5.1)JK	4.0FK	3.7FK	3.1FK	2.1FK	3.6K	(4.3)SK	<4.3GK	<4.6GK	<4.5GK	<4.6GK	<4.8GK	<4.9GK	BK	<5.0GK	5.3K	5.6	5.5K	6.4	6.6	6.5	6.2	6.0	5.8
7	5.7	5.3	4.9	4.5	4.0	4.6	6.0	6.2	7.1	7.7	6.8	7.2	7.7	7.2	7.8	7.6	7.6	8.0	8.0	8.7	8.5	7.4	7.0	6.4
8	5.7	5.5	5.4	4.8	4.6	(4.5)P	5.4	6.0	6.7	6.5	[6.6]S	6.4	6.6	6.5	6.5	6.5	6.6	6.9	7.2	7.6	7.1	6.9	6.6	6.6
9	6.6	6.4	6.0	5.5	4.8	5.1	5.6	7.1	7.4	(7.4)JS	7.9	7.7	8.1	8.2	8.3	8.1	8.0	8.3	8.0	8.0	(7.8)SP	(7.8)SP	(7.4)J	6.9
10	6.5	(6.2)J	5.8	5.4	4.5	4.8	6.2	7.3	8.2	(8.3)JH	7.5H	7.8	(8.0)SP	8.0	8.0	8.1	8.0	8.0	8.1	8.4	(8.2)JP	7.5	(7.2)SP	6.6
11	(6.4)P	(6.2)P	(5.5)J	5.3	(5.2)JP	5.3	6.3	7.8	8.2	8.0H	7.6	7.8	7.8	7.9	8.5	8.3	8.3	8.5	8.5	8.9	8.7	(8.0)J	(7.7)J	(7.1)P
12	7.5	7.1	(5.9)P	5.7	5.0	4.9K	5.2K	5.3K	5.5K	5.4K	5.7K	(5.8)BK	(6.2)BK	(6.3)BK	6.4K	6.7K	7.1K	7.8K	9.1K	8.8FK	(9.0)PK	(7.0)V	6.5VK	4.6K
13	4.3HK	3.9FK	3.5FK	3.1FK	2.5FK	3.7K	4.2HK	<4.3GK	<4.4GH	AK	AK	AK	AK	AK	AK	AK	5.9K	5.9K	5.8	6.2	6.5	6.6	[6.4]S	(5.7)P
14	5.7	5.2	4.8	(4.3)P	3.5	4.1	4.9	5.4	A	A	6.2	6.3	B	A	6.7	6.7	6.8	7.1	7.4	7.9	8.2	7.4	6.7F	6.5F
15	5.5F	5.3F	5.3	5.0F	(4.2)JF	4.4	5.0	5.5	6.5	6.3	7.1	(7.1)P	B	T	T	T	7.5	7.8	8.1	8.2	8.3	7.2	7.1	7.1
16	6.6	5.8	5.3	5.3F	4.8	5.4	6.1	7.2	7.4	7.5	8.0	7.5	7.7	7.6	7.6	8.0	8.3	8.7	A	A	8.9	8.7	7.9	7.1H
17	6.0	5.7	5.1	4.8F	4.9F	5.4	6.4	6.7	7.0	6.7	6.7	7.0	7.0	6.9	7.0	7.2	7.1	7.8	8.6	8.0	7.6	C	C	6.4
18	5.8	5.8	4.9F	C	C	C	C	C	C	C	5.9	5.8F	6.2	6.4	6.6	6.5	6.7	6.7	7.0	7.0	7.1	7.2	7.0	6.9
19	6.9	6.1	(5.7)J	5.3	4.5	4.5	4.8	4.9	5.3	5.7	5.9	5.7	5.8	5.9	5.9	5.8	6.1	6.3	6.6	6.5	6.7	6.6	6.5	6.3
20	6.0	5.7	5.3F	4.9F	4.6F	4.7	5.6	6.4	7.2	7.1	6.8	6.5	7.1	7.1	7.2	7.1	7.2	7.1	7.4	8.0	8.4	8.0	7.4	7.0F
21	6.5G	6.1F	5.3	5.3	4.9	4.6	5.6	5.9	6.2	6.3	6.5	(6.9)SP	6.7	7.1	6.9	[6.9]A	7.1	7.0	7.3	7.3	7.5	7.3	7.1	7.1
22	6.8	6.5	5.8	5.5	5.0	4.5F	5.3	6.2	(7.0)J	7.2	7.3	(8.1)J	7.5	7.6	7.3	6.9	7.2	8.0	8.5	8.5	8.5	7.7	7.2	7.1
23	6.9	6.8	6.6	6.5	5.4	5.2F	5.9	6.2	6.4	[6.6]A	6.9	6.1	6.4	6.5	6.2	6.2	6.6	6.6	6.7	7.2	7.2	6.6	6.4	6.5
24	6.3	6.4	6.0	5.3	4.6	4.5	5.9	6.7	7.3	7.7	7.4	7.2	7.4	7.1	6.9	7.4	7.2	7.1	8.2	[7.9]A	7.5	7.3	7.2	7.7
25	7.4	6.8	4.8F	4.8F	4.3F	4.3	4.8	5.4	5.4	5.8	[5.8]A	5.9	5.9	6.2	6.2	6.3	6.8	7.2	6.9F	7.0F	6.5	6.9	(6.6)J	(6.7)JS
26	6.8	6.3	6.0	5.3	4.3F	4.3F	5.4F	6.0F	7.1	7.0	7.7	7.8	7.9	7.8	7.4	7.5	7.5	7.9	8.2	8.7	9.0	8.9	8.0	8.2
27	7.3	6.6	6.5	6.0	5.4	5.2	5.7	6.4	6.7	7.6	8.0	7.4	7.5	7.1	7.2	7.1	7.0	7.2	7.5	7.9	8.1	8.2	7.8	6.7F
28	6.5	6.3	5.7	4.9	5.0	4.7	5.8H	5.7H	6.6	7.0	7.2	6.8	7.0	7.4	7.5	7.2	7.3	7.5	7.7	8.5	8.8	7.8F	7.3	7.3
29	6.4	6.0	6.0	5.3	4.8	4.7	5.8	6.5	7.3	7.6	7.4	(7.3)A	7.7	8.0	8.3	8.3	7.8	8.5	8.4	8.3	8.0	7.5	7.0	7.0
30	6.3	6.1	5.7	5.5	5.1	5.1	5.7	6.5	6.3	6.5	7.2	7.3	(7.1)J	(7.0)S	(7.0)J	6.8	7.0	7.6	8.1	8.0	7.5	7.0	(7.1)J	6.8
31																								
Median	6.5	6.0	5.4	5.3	4.6	4.6	5.6	6.0	6.6	6.7	6.8	6.9	7.0	7.1	7.0	7.0	7.1	7.2	7.7	8.0	7.9	7.4	7.1	6.8
Count	30	30	30	29	29	29	29	29	28	27	29	29	26	24	28	28	30	30	29	29	30	29	24	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 43

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

Form adopted June 1946

IONOSPHERIC DATA

foF2 (Characteristic), Mc (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

National Bureau of Standards (Institution)

Scaled by: E. J. W., J. J. S., J. M. C.

Calculated by L. A. L., J. J. S., B. E. B.

75°W Mean Time

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	6.4	5.0F	4.9F	4.0F	4.0F	5.4	5.5F	5.8F	5.6F	5.6F	5.9	5.9	6.0	6.1	5.9	6.2	6.4	6.8	7.0	(6.5)S	6.8	6.9	7.0	(6.7)S
2	6.3F	5.8F	5.4F	4.1F	4.1F	5.3F	(5.8)JS	6.6F	7.1	(7.1)H	7.1	7.1	7.0	7.1	7.1	7.1	7.7	7.8	8.3	8.4	8.3	7.8	7.1	6.7
3	6.4	5.7	(5.3)SP	4.9	(4.5)JS	4.9	5.6H	6.1F	(6.0)JS	6.3	6.4	6.8	6.9	7.1	7.7	7.2	7.2	7.3	8.1	8.0	7.9	(8.2)SP	8.3K	6.7K
4	6.3K	5.2K	3.8K	3.3FK	3.8K	4.3HK	5.4K	4.9K	<4.5GK	5.3K	6.2K	BK	BK	6.0K	<4.9GK	5.6K	6.0K	5.8K	6.2K	6.7K	7.0K	7.0K	(6.0)JK	5.8K
5	5.7K	2.6FK	2.3FK	3.3FK	3.0FK	3.6FK	4.2K	<3.8GK	<4.3GK	<4.4GK	5.5K	5.4K	AK	AK	<4.7GK	<4.7KG	6.1K	7.2K	7.7FK	8.9FA	7.5K	6.6K	6.7K	K(7.7)JS
6	K(7.7)JS	3.7FK	K(3.3)JS	2.1FK	2.5FK	(4.1)SK	4.3K	4.9K	<4.4GK	<4.5GK	<4.9GK	<4.9GK	BK	<4.8GK	<4.8GK	5.5K	5.8K	5.8K	6.2	6.7	6.2	(6.0)J	5.6	5.8
7	5.5	4.9	4.7	4.4	4.2	5.5	6.2	7.0	7.7	(7.0)J	7.0	7.5	7.3	7.4	7.6	7.4	7.8	8.0	8.6	9.2	7.8	7.2	6.7	(6.0)J
8	S	5.4	5.2	4.6	4.0	5.0	5.8	6.2	6.4	6.7	6.4	6.3	6.5	6.7	6.6	6.6	[6.8]S	7.0	7.2	7.6	7.1	6.6	6.5	6.5
9	6.5	6.1	5.6	5.3	4.8	5.6	6.9	7.2	7.2	(7.9)J	7.8	7.8	8.2	8.2	8.1	7.9	8.1	8.3	8.0	8.0	(7.8)SP	7.6	7.3	6.7
10	6.5	(5.9)SP	5.5	5.0	4.6	5.5	6.7	7.7	8.3	7.8	(7.5)J	8.0	7.9	8.1	8.1	8.0	7.9	8.0	8.4	8.5	8.0	(7.4)F	6.9	6.4
11	(6.2)P	(6.1)SP	5.5	(5.4)S	4.9	6.1	7.1	8.2	8.4	7.7	7.4	7.7	7.9	8.3	8.3	8.0	8.2	8.6	8.7	8.7	8.3	8.0	(7.7)P	7.8
12	7.3	[6.6]C	5.9	5.4	4.9	4.8K	5.0K	5.4K	5.2K	5.7K	[5.7]CK	[6.0]BK	6.3K	6.6K	6.5K	7.1K	7.7K	8.7K	9.3K	9.0K	K(7.6)JF	K(6.0)JV	5.5K	4.6K
13	K(4.1)JS	(3.5)FK	3.3FK	2.4FK	3.1FK	4.1K	<4.3GK	<4.3GK	<4.3GK	AK	AK	AK	AK	5.5K	5.6K	5.8K	5.6K	5.9K	5.9	6.3	(6.7)P	(6.5)JS	6.3	(5.7)JP
14	5.3	4.9	4.5	(4.1)J	3.7	4.4	5.3	5.5	(5.8)A	6.1H	(6.7)S	[6.6]B	[6.4]C	6.7	6.8	[6.8]A	(6.9)J	7.3	7.9	8.0	(8.0)JF	(7.3)JF	6.7F	6.3
15	5.4F	5.3	5.1F	(4.5)JF	4.3	(4.5)JS	5.3	6.0	6.6	6.9	7.1B	B	T	T	T	T	7.5	8.0	8.1	8.3	7.7	6.7	7.0	7.0
16	6.0	5.6	4.7	5.2F	4.9	5.6	6.7	7.1	7.6	(7.7)JS	7.7	7.4	7.8	7.7	7.8	8.3	8.5	8.8	A	A	(8.6)JS	8.5	7.5	6.9
17	5.6F	5.4F	5.0	4.8	4.9	6.1	6.7	7.1	6.5	6.5	6.5	7.0	7.0	7.0	7.1	7.1	7.4	8.2	8.5	[7.9]C	C	C	C	6.3
18	5.9F	5.2F	C	C	C	C	C	C	C	C	6.0	5.5F	6.5	6.5F	6.5	6.6	6.7	6.8	7.3	6.9	7.1	7.3	6.6	6.7
19	6.6	6.1	5.9	4.7	4.1	4.6	5.4	5.1	5.5	5.7	(5.9)P	5.9	5.7	5.9	B	5.9	6.3	6.6	(6.7)A	6.5	6.7	6.6	6.6	6.2
20	5.7	5.5F	5.4F	4.6F	4.3F	5.3	5.6	[6.6]A	7.3	6.9F	7.0	6.9	7.0	7.2	7.1	7.0	7.2	7.1	7.9	8.2	8.2	7.7	7.3	6.6F
21	6.4	5.9	5.4	4.9	4.3	4.8	5.9	5.8H	6.2	6.5	6.9	6.7	6.9	6.9	6.8	7.0	7.0	7.1	7.3	7.4	(7.7)S	7.4	7.3	7.0
22	6.6	6.0	6.4F	5.4	4.7	4.9	5.9	6.6	6.9	[7.2]C	8.0	7.6	7.5	7.5	7.1	6.9	7.7	8.3	8.7	8.3	7.7	7.5	7.1	(6.9)JS
23	6.9	6.7	6.3	5.7	5.4	5.5	6.1	(6.5)JS	[6.6]A	6.8	6.8	6.5	6.5	6.4	6.2	6.4	6.7	6.6	7.2	7.2	6.5	6.5	6.3	6.3
24	6.4	6.3	5.6	4.7	4.2	5.4	6.3	7.1	7.1	7.4	7.3	7.4	7.2	7.0	7.0	7.4	7.2	7.3	8.3	7.5	7.2	7.1	(7.2)J	7.3
25	7.1	6.9	4.8F	4.5F	4.2	4.5	[5.1]A	5.2F	5.7	A	A	6.5	6.2	6.0	6.2	6.7	6.9	7.3	6.9	6.9	6.5F	(6.8)JF	6.4F	6.6
26	6.3	5.9	5.4F	4.9F	4.1F	5.1F	5.8F	6.7	6.8	7.2	8.0	7.9	7.7	7.4	7.5	7.4	7.7	8.1	8.2	9.0	8.9	8.6	7.9	8.5
27	(6.5)J	6.6	6.3	5.6	5.2	5.5	(6.0)JS	6.4	7.0	7.5	7.2	7.5	(7.4)J	7.3	7.2	7.1	7.1	7.3	7.7	8.0	8.2	7.9	7.5	6.8
28	6.6	5.7	5.5	5.0	(4.5)P	5.4	5.6H	5.9H	[6.8]C	7.1	(7.3)P	[6.9]S	7.4	7.3	7.2	7.4	7.4	7.7	7.7	8.3	7.7	7.8	(7.1)JF	(7.2)S
29	6.0	6.0	5.8	4.9	4.6	4.8	5.9	7.3	7.3	7.7	7.7	(7.2)P	(7.6)JS	8.5	8.7	8.2	8.4	8.4	8.2	8.2	7.9	7.4	6.8	6.7
30	6.5	5.9	5.7	5.3	4.9	5.7	6.0	(6.1)S	6.8	(6.6)S	(6.8)S	6.9	(6.9)S	7.1	6.8	[6.9]C	7.2	7.8	7.8	7.8	7.2	7.0	7.0	6.9
31																								
Median	6.4	5.8	5.4	4.8	4.3	5.1	5.8	6.2	6.6	6.9	7.0	6.9	7.0	7.0	7.0	7.0	7.2	7.3	7.9	8.0	7.7	7.3	7.0	6.7
Count	29	30	29	29	29	29	29	29	29	27	28	27	25	28	28	29	30	30	29	29	29	29	29	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1946 O - 703319

Form adopted June 1946

TABLE 44

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

IONOSPHERIC DATA

h'F1 (Characteristic), Km (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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							220H	230F	210H	200	200	240	S	230	220	210	240	A	(240)A					
2							Q	210	200	200	A	220H	200H	200	240	230	A	A	Q					
3							Q	210	200	200	230	230	200	230	(250)S	230	230	220	240					
4							260K	240K	210K	270K	230K	200K	BK	BK	BK	230K	230K	220K	230K					
5							QK	QK	220K	200K	200K	200K	AK	AK	240K	240K	230K	230K	250K					
6							QK	200K	200K	200K	220K	200K	250K	BK	210K	210K	230K	230K	250	270				
7							Q	Q	230	220	200	210	200	220	220	(200)S	230	A	A					
8							250	230	230	230	S	A	200	220	200	A	A	A	210					
9							Q	230	220	200	200	200	200	200	200	210	220	A	Q					
10							260	A	A	(230)S	200	S	S	(250)S	B	B	230	230	230H					
11							Q	Q	220	200	200	200	(200)A	250	220	220	220	230	230					
12							230K	200K	AK	230K	230K	SK	250K	200K	230K	230K	220K	230K	260K					
13							220K	210K	200K	AK	AK	AK	AK	AK	AK	AK	230K	AK	(250)A					
14							Q	240	A	A	200	250	B	A	A	A	A	230	A					
15							Q	Q	A	230	230	B	B	T	T	T	220	220	230H					
16							Q	A	A	220	200H	200	250	210	(230)H	220	250	A	A					
17							220	Q	220	200	200	200	A	A	230	250	A	220H	A					
18							C	C	C	C	220	(200)A	210	A	230	A	A	A	A					
19						240	Q	(260)A	200	210	(230)A	230	200	200	210	220	210	220	A					
20							A	A	A	220	200	(200)A	200	A	A	(250)A	(230)A	230	A					
21							230	200	A	200	200	A	(220)S	200	200	A	200	220	250					
22							260	A	A	(220)A	(210)A	180	(200)A	230	230	230	A	A	A					
23							A	230	A	A	(220)A	220	220	(200)A	200	220	210	220	A					
24							Q	230	(230)A	200	A	(220)A	A	A	(240)A	200H	230	220	A					
25							Q	A	A	A	A	A	230	210	200	210H	220	220	A					
26							Q	220	A	A	A	A	(200)A	(200)A	210	200	A	220	Q					
27							Q	(230)A	A	220	A	220	200	(240)A	230	A	220	230	250					
28							Q	210	200	200	200	250	S	200	200	210	210	210	250					
29							250	230	(210)A	(230)A	A	A	A	210	220	(230)A	210	220	240					
30							Q	Q	(250)A	200	200	200	230	(220)A	(220)A	200	220	210	A					
31																								
Median						-	240	230	210	205	200	200	200	210	220	220	220	220	240	-				
Count						1	10	18	17	24	22	21	19	20	24	22	23	21	15	1				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE : 1946 O - 702519

Form adopted June 1946

TABLE 45

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

IONOSPHERIC DATA

foFl (Characteristic), Mc (Unit), June (Month), 1949

Observed at Washington, D. C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	4.9F	5.0H	5.0	4.9	5.3	5.1	5.2H	5.2	4.9	4.8	4.7	L					
2							Q	4.9H	4.9H	(4.8)S	[5.2]A	(5.5)H	5.5H	5.1	[5.2]S	5.4	5.1	A	Q					
3							Q	4.3	4.7	5.0	(5.1)F	5.5H	5.4	[5.3]S	5.2	4.9	4.9	4.7	L					
4							3.9K	4.2K	4.5K	4.8K	4.8K	4.9K	BK	BK	BK	4.8K	4.7K	4.5HK	4.0K					
5							QK	QK	4.2K	4.4K	4.7K	4.8K	AK	AK	4.8K	4.7K	4.6K	4.5K	4.3K					
6							QK	4.3K	4.6HK	4.5K	4.6K	4.8K	4.9K	[5.0]BK	(5.0)BK	4.5K	4.7K	(4.6)PK	4.0	L				
7							Q	Q	5.0	5.3	5.6	5.4	5.4	5.4	5.4	5.4	5.2H	A	L					
8							L	4.5	4.9	5.0	5.1	5.5	5.3	[5.2]S	5.1	5.2	A	A	L					
9							Q	L	(5.0)P	5.5H	5.1	5.5	5.5	5.1H	5.3	5.3	4.9	A	Q					
10							L	A	4.9	5.0	5.6	5.5	(5.5)S	5.5	B	B	L	L	L					
11							Q	Q	L	4.9	5.3	5.5	5.2H	(5.3)P	5.5	5.4	5.0	L	L					
12							LF	4.3HK	(4.5)A	4.8K	4.8K	5.1K	(5.1)BK	(4.9)BK	5.0K	4.9K	4.7K	4.7K	LK					
13							3.9K	4.3HK	4.4K	AK	AK	AK	AK	AK	AK	AK	4.8K	AK	L					
14							Q	4.3	A	A	4.9	S	B	A	A	A	4.9	L	A					
15							Q	Q	L	5.0	5.0	B	B	T	T	T	5.0	4.3	L					
16							Q	L	L	4.9	5.4	5.5	5.5	5.3	5.5	5.4	5.3	A	A					
17							L	Q	4.7	5.3	5.1H	(4.9)S	[5.2]A	5.4	5.0	5.0	(4.8)A	4.5	L					
18							C	C	C	C	5.0	5.0	5.0	5.2	5.0	A	A	L	A					
19						L	Q	4.4	4.5	4.7	4.9	4.9	5.1	5.0	4.9	4.9	4.8	4.5	L					
20							L	L	A	5.1	5.3	(4.9)S	5.4	A	A	5.1	4.7	4.8	A					
21							4.1	L	L	5.1	5.0	5.7	5.3H	5.0	5.1	[4.8]A	(4.5)P	5.0	L					
22							L	A	5.0	5.0H	(5.1)S	4.8H	5.3	5.5	5.7	5.2	A	A	A					
23							L	4.4	4.7H	[5.0]A	5.2	5.2	5.2	4.9	5.1	5.0	5.0	4.6	A					
24							Q	(4.9)P	4.9	4.9H	5.4	5.5H	A	A	5.3	5.1	4.7	L	A					
25							Q	A	A	4.6	A	A	5.1	5.1	5.0	5.0	4.8	4.5H	A					
26							Q	4.8	A	A	A	A	5.5	5.3	5.6	5.3H	5.1	4.8	Q					
27							Q	4.6	5.1	5.2	5.4	5.3	5.3	5.5H	5.5	[5.4]A	5.3	4.7	L					
28							Q	(4.9)S	5.0H	5.1	4.9	5.4H	5.5	5.7	5.5	5.5	4.9F	4.5	L					
29							4.3	4.9	5.1	(5.3)S	5.3	[5.4]A	5.4	(5.3)S	(5.3)S	5.2	(5.0)S	4.9	L					
30							Q	Q	5.3	4.9	(5.0)S	5.3	5.7H	5.5	5.4	5.3	5.2	5.0	L					
31																								
Median						-	-	4.4	4.9	5.0	5.1	5.3	5.3	5.3	5.2	5.1	4.9	4.6	-	-				
Count							4	16	21	26	27	25	24	23	24	25	26	18	3					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE

TABLE 46

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

Form adopted June 1946

IONOSPHERIC DATA

h'E (Characteristic), Km (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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							120	110	100	100	100	100	100	100	100	100	100	100	120	130				
2							110	110	100	110	100	100	100	100	100	100	100	110	110					
3							120	100	100	100	100	100	100	110	100	100	110	100	110	120				
4							110^{K}	110^{K}	110^{K}	100^{K}	100^{K}	100^{K}	B^{K}	B^{K}	B^{K}	100^{K}	110^{K}	110^{K}	110^{K}	$(120)^{P}_{K}$				
5							110^{K}	120^{K}	A^{K}	A^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	110^{K}	$(150)^{K}$				
6							110^{K}	100^{K}	110^{K}	110^{K}	100^{K}	110^{K}	100^{K}	B^{K}	110^{K}	A^{K}	100^{K}	110^{K}	A	130				
7							110	110	100	100	100	100	120	100	100	100	100	$(130)^{A}$	110					
8							110	110	110	110	100	100	110	100	100	100	100	110	120	130				
9							110	100	100	100	100	100	100	100	100	100	100	110	110					
10							120	110	100	100	100	100	100	B	B	100	100	100	110					
11							$(120)^{A}$	100	100	100	100	100	100	100	100	100	100	110	110	120				
12							110^{K}	110^{K}	100^{K}	100^{K}	100^{K}	100^{K}	110^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	110^{K}	130^{K}				
13							$(130)^{A}_{K}$	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	120^{K}	100^{K}	110^{K}	110^{K}	110^{K}	110					
14							110	110	100	100	100	110	B	A	A	A	100	100	110	120				
15							120	110	100	100	100	100	B	T	T	T	100	120	100	120				
16							110	100	100	100	100	100	100	100	100	100	$(110)^{A}$	100	110					
17							$(100)^{A}$	100	100	100	100	100	100	100	100	100	100	100	100					
18							C	C	C	C	100	100	100	100	100	100	100	100	100					
19							120	100	100	100	100	100	100	100	100	100	100	100	110	A				
20							100	100	100	100	100	100	100	100	100	100	100	100	110					
21							110	100	100	100	100	100	100	100	100	100	100	100	110	120				
22							110	110	100	100	100	100	100	110	100	100	100	100	120	A				
23							120	100	100	100	100	100	A	100	100	100	100	100	110	A				
24							A	A	100	100	100	100	100	100	100	100	100	100	110	A				
25							A	100	100	100	$(100)^{A}$	$(100)^{A}$	100	100	100	100	100	110	120					
26							110	110	100	100	100	100	$(100)^{A}$	$(100)^{A}$	100	110	110	110	110					
27							$(120)^{A}$	110	110	100	100	100	100	100	100	110	100	110	110	120				
28						130	110	100	100	100	100	100	100	100	100	110	A	A	110	120				
29						130	100	100	100	100	100	100	100	100	100	100	110	100	110	120				
30							110	110	100	100	100	100	100	100	100	110	100	100	110					
31																								
Median						—	110	105	100	100	100	100	100	100	100	100	100	100	110	120				
Count						2	27	28	28	28	30	30	26	26	26	27	29	29	29	14				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ · Automatic ☒

Form adopted June 1946

TABLE 47

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

IONOSPHERIC DATA

foE (Characteristic), Mc (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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							(2.4)A	3.0F	3.5	[3.6]A	3.6	(4.0)P	4.0	A	A	3.7	3.4H	3.0	2.5	2.0H				
2							(2.4)H	3.0	3.2	3.5	(3.7)P	3.9	3.8	3.8	3.9	3.9F	3.6	3.1	2.6					
3							2.4	3.0	3.3	[3.5]A	3.7	3.8	(4.0)S	3.9	[3.8]A	3.7	3.4	3.1	2.5	1.9				
4							2.2K	[2.7]AK	3.2K	3.4K	(3.7)BK	3.7K	BK	BK	BK	3.7K	3.5K	3.4K	2.7K	(1.9)AK				
5							2.3K	3.0K	AK	AK	AK	3.5K	AK	AK	3.5K	3.5K	3.4HK	3.1K	2.7K	2.1K				
6							2.4K	3.0K	[3.2]AK	3.4K	3.6K	3.8K	3.5K	[3.6]BK	3.8K	3.7K	3.7K	3.2K	(2.7)A	2.1				
7							2.4	3.1	3.2	3.2	[3.5]A	3.8	3.8	3.9	3.9	[3.6]A	3.4	(3.2)A	2.5					
8							2.6	3.0	3.3	3.5	A	A	3.7	[3.7]A	3.7H	A	A	3.1	2.7	1.9				
9							2.3	2.9	3.3H	3.6	(3.7)A	(3.7)A	A	A	A	3.7	3.6	(3.2)P	A					
10							2.5	3.0	3.3	3.5	3.6	(3.6)S	(3.6)P	B	B	(3.5)P	3.4	3.3	(2.5)A					
11							2.5H	(3.0)A	A	A	A	(3.9)P	[3.9]A	3.9H	[3.8]A	3.8	3.4	3.1H	(2.5)A	A				
12							2.5K	3.1HK	[3.3]AK	3.5K	3.7K	3.7K	(3.9)BK	3.8K	(3.7)PK	(3.7)PK	3.4K	3.0K	2.5HK	2.1K				
13							2.4HK	AK	AK	AK	3.6K	3.7K	3.7K	3.6K	3.6K	3.5K	3.3K	3.0K	2.4					
14							2.3F	3.0F	3.1	(3.2)A	[3.4]A	3.6	B	A	A	A	(3.4)A	3.1	2.5	1.9				
15							2.4	3.0	3.2	3.4	3.5	(3.6)B	B	T	T	T	3.3	3.1	2.6	1.9				
16							A	A	A	A	A	A	(3.7)P	3.7	3.8	3.7	3.6	3.1	2.6					
17							2.3	(3.0)A	[3.4]A	3.8	A	A	(4.1)P	[3.8]A	(3.6)A	3.6	3.2	3.0	2.5					
18							C	C	C	C	A	A	A	A	4.0	A	A	3.1	2.5					
19							2.4	2.9	3.2	3.3	3.5	[3.7]A	3.9	3.8	3.7	(3.8)A	[3.4]A	3.1	2.6	A				
20							2.4	2.9	3.3	3.4	3.5	3.6	A	A	A	A	A	3.1	2.6					
21							(2.6)A	(3.0)A	3.3	(3.3)P	3.7	3.9	3.9	3.9	3.9	3.7	3.4	[3.0]A	2.6	A				
22							(2.3)A	A	A	A	A	A	A	A	(3.9)A	[3.7]A	(3.5)A	3.2	2.8	A				
23							2.4	3.1	(3.2)A	3.3	(3.4)A	3.5	A	A	3.8	3.6	3.3	3.1	2.5	A				
24							A	A	A	A	(3.5)A	[3.6]A	(3.7)A	3.8	A	3.7	3.4	3.1	2.6	A				
25							A	A	(3.2)A	3.5	A	A	(3.7)P	[3.8]A	3.8	3.6	3.5	3.2	(2.5)A					
26							2.4	2.9	3.2	3.5	3.5	3.5	A	A	4.0	3.9	3.7	(3.3)A	2.7					
27							A	(3.1)A	(3.3)A	3.7	3.7	A	A	A	A	A	A	3.3	2.9H	A				
28						1.9	(2.5)A	3.1	3.5	3.8	3.9	A	S	4.0	3.9	3.7	(3.5)A	3.2	3.0	(1.9)A				
29						1.8H	2.5H	3.1	3.5	3.7	3.8	3.9	[3.8]A	3.6	A	A	A	3.0	2.7	(2.1)A				
30							A	A	3.3	3.7	3.9	3.9	4.0H	A	A	A	(3.5)A	2.9	2.8					
31																								
Median						-	2.4	3.0	3.3	3.5	3.6	3.7	3.8	3.8	3.8	3.7	3.4	3.1	2.6	1.9				
Count						2	24	23	23	23	22	22	18	16	19	22	26	30	29	11				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O 702510

Form adopted June 1946

TABLE 48

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

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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	G	G	G	G	G	G	3.2 120	4.2 130	G	3.8 120	40 110	G	G	43 110	43 110	5.6Y 120	5.0 120	66 120	6.8Y 130	G	G	G	2.6 120	G
2	G	2.6Y 130	3.4 120	4.1 130	G	G	3.2Y 120	G	G	G	5.6 130	4.4 130	4.4 130	11.5Y 120	6.5 130	G	6.0 130	6.2 120	4.0 120	2.2 110	G	G	G	G
3	G	2.2 130	G	G	G	G	4.3Y 100	3.7 120	43 110	43 100	40 120	G	G	G	44 100	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	24 130	36 110	G	G	G	G	B	B	G	G	G	37 130	3.4 120	3.5 120	G	2.3 120	G	G
5	G	G	G	G	G	G	G	2.6 110	32 100	3.7 100	3.9 110	G	7.0 100	6.8 110	41 110	41 120	G	G	3.3 130	G	G	G	4.1 130	3.6 130
6	2.5 130	3.5 110	4.4 110	4.3 110	3.7 110	3.7 110	3.7 110	G	3.2 110	G	G	G	38 110	36 110	G	42 100	G	G	3.4Y 110	G	G	G	G	G
7	G	G	2.4 130	G	G	30Y 130	36 130	4.1 120	4.6 120	39 110	40 100	G	32 100	G	G	38 100	3.8 140	5.4 100	4.2 120	4.4Y 110	3.7 110	24 110	3.2 100	31 100
8	4.1 100	5.0 100	3.6 100	G	G	19 130	G	4.2 120	4.9 120	4.0 120	4.0 110	4.3 110	4.0 110	3.7 120	G	47 100	7.6 110	7.6 110	41 130	5.2 120	4.3 120	58 120	54 110	4.3 100
9	G	G	G	G	G	3.0Y 130	4.5 120	6.1 120	G	4.2 120	39 110	4.0 110	4.2 110	3.8 110	4.0 110	G	G	74 120	50 120	5.6 120	34 120	3.2 120	G	36 100
10	3.7 120	G	G	G	G	G	39 130	5.3 120	52 120	5.3 120	3.8 120	41 120	43 110	41 120	46 120	5.5 120	4.2 120	3.5 140	41 120	3.5 110	3.2 110	33 120	4.4 100	42 100
11	4.2 110	3.9 100	36 100	3.6 100	37 100	2.7Y 100	3.6 110	49 110	4.3Y 120	4.1 110	42 110	39 110	41 100	G	39 100	G	5.7 130	G	G	35 130	3.4 130	G	G	G
12	G	G	G	G	G	1.8 130	G	G	5.2 120	G	41 120	42 110	39 120	G	G	G	G	G	G	G	G	G	G	G
13	G	34Y 130	G	G	G	G	3.7Y 110	4.2 110	44 100	54 130	5.1 120	96 120	100 100	5.0 130	74 130	49 130	38 130	52 120	3.1 130	3.1Y 120	5.6 110	53Y 110	G	G
14	24 110	G	3.1 100	24 100	G	G	G	3.1 130	8.0 120	11.0 110	3.8 110	G	4.0 100	6.7 100	64 100	53 110	5.2 130	38 130	8.8 120	6.3 120	78 120	38 130	G	G
15	G	G	G	3.6 100	G	G	31 130	G	G	52Y 120	40 120	4.2 110	40 110	T	T	T	2.9 100	24 100	G	38 120	38 120	33 110	2.3 120	2.1 120
16	3.1 100	3.3 110	2.5Y 100	G	3.1 100	2.8Y 100	3.3 1,0	48 100	7.0 100	5.4 100	50 100	4.6Y 100	G	40 120	G	43 130	26Y 100	6.8 120	10.6 120	113 110	11.5 100	7.0 100	86 100	34 100
17	3.1 110	38 100	3.6 100	36 100	4.0 100	5.4 100	6.2 110	48 120	51Y 110	4.5 110	42 100	48 100	6.2 150	54 100	46 100	39 130	5.3 120	37Y 100	48 120	110Y 110	G	C	C	36 120
18	9.2 120	76 100	3.7 100	C	C	C	C	C	C	C	5.6 110	6.9 100	5.2 100	52 100	G	79 120	86 110	6.2 120	74 120	54 100	4.5 100	42 100	34 100	3.4 100
19	G	5.6 160	G	G	G	1.5 130	5.6 130	5.6 120	43 120	46 110	5.6 110	4.0 100	G	4.1 110	4.2 120	54 120	41 120	G	44 130	7.0 110	67 120	56 110	33 120	2.3 120
20	3.2 120	3.4 110	4.8 100	5.4 100	4.1 120	4.0 120	5.3 120	10.6 120	12.0 110	53 110	4.0 100	4.2 100	3.6 100	7.2 100	73 100	5.4 100	4.5 120	38 120	8.8 120	94 110	34 110	2.6 120	2.3 110	G
21	G	2.9Y 120	2.4 110	2.9Y 100	2.9 130	5.0 120	36 130	8.7Y 130	5.0 120	40 120	3.9 130	7.0 130	4.4 130	43 130	41 150	89 120	68 130	42 100	46Y 130	4.2 120	38 110	55Y 120	46 120	49 120
22	5.6 120	6.2 100	6.6 110	8.0 110	6.6 100	42 100	4.2 110	6.5 110	56 100	56 110	47Y 100	4.1 120	50 100	4.4 110	41 130	4.2 110	70 120	70 120	5.0 120	12.0 110	67 110	56 110	84 110	33 110
23	G	3.5 110	G	7.0 120	5.4 120	8.2 120	42 130	44 100	85Y 120	10.5 110	56 100	49 100	94 110	6.3 100	4.0 100	4.3 120	4.0 130	43 120	69 130	3.6 100	96 120	7.7 120	7.0 110	6.0 100
24	4.8 100	4.2 100	3.7 100	3.5Y 100	3.0 110	2.0 110	6.6 100	43 100	4.5 100	4.3 100	5.4 110	76 110	11.0 110	94 120	10.0 120	4.0 130	4.7 130	3.8 110	6.0 120	13.0 110	88 110	56 120	56Y 120	3.3 110
25	3.8 120	3.7 120	6.2 120	10.5Y 100	6.6 100	6.2 110	9.2 100	11.0 100	58 120	52 120	11.5 110	7.2 110	4.2 110	48Y 110	40 130	50 130	41 120	42 120	62 130	13.5 110	10.8 120	54 110	6.2 100	6.7 110
26	4.8 100	4.3 100	5.4 100	4.2 100	4.0 100	5.1 100	54 110	12.4Y 120	90 110	94 110	12.0Y 100	92 100	6.6Y 100	66 100	G	G	53 130	44 120	44 130	11.4Y 120	78 110	4.2 110	6.6 110	58 110
27	4.6 110	5.4 100	2.6 100	25Y 100	4.2 100	G	3.8 120	7.6 110	64 120	6.7Y 120	66 110	7.0 110	44 110	52 100	43 100	67 100	43 100	G	G	49 120	45 100	4.2 100	40 100	G
28	G	G	G	2.0 100	G	G	4.2Y 110	5.8Y 110	G	G	G	40 100	38 100	40 110	G	G	4.4 100	3.8Y 110	G	3.7 130	72 110	38 110	22 120	4.0Y 100
29	G	G	G	G	G	G	35Y 100	5.8Y 100	56 120	5.5 120	60 120	7.1 110	60 100	64 110	80 110	70 110	45Y 110	G	39 130	38 100	42 120	5.7 120	37 120	43 110
30	3.3 110	G	G	3.5 120	2.3Y 120	28Y 120	66 110	5.8 120	38 100	3.9 130	4.2 130	41 120	4.0 110	49 120	52Y 110	38 120	41 130	G	51 120	46 110	39 110	G	G	G
31																								
Median	**	3.1	2.4	2.4	**	19	3.7	4.8	4.6	43	42	42	4.2	4.6	41	42	42	38	43	43	38	38	3.2	32
Count	30	30	30	29	29	29	29	29	29	29	30	30	29	28	29	29	30	30	30	30	30	29	29	30

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE

Form adopted June 1946

TABLE 49

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

IONOSPHERIC DATA

(M1500)F2 (Characteristic), ______ (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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	1.7	1.8	1.7 F	(1.8) JF	1.8 F	1.9 F	2.0 F	1.8 F	1.8 HF	1.7 F	N	1.7	1.6	1.7	1.6	1.7	1.7	1.8	1.9	1.9	1.8	1.7	1.8	1.8		
2	1.8 F	1.8 F	1.9 F	1.9 F	1.7 F	1.8 F	1.9 F	1.8	2.0	1.9 F	1.8	(1.8) J	1.7	1.8	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.8		
3	1.8	1.8	1.8	1.8	(1.9) JS	1.9	2.1	2.0	2.0	1.8	2.0	1.6	1.7	1.8	1.8	(1.8) JS	1.8	1.9	1.8	1.9	1.7	1.6	1.8 K	2.1 K		
4	1.8 K	K (1.9) FS	1.8 K	1.9 FK	1.6 K	1.8 K	1.9 K	(1.7) PK	G K	G K	G K	1.6 K	B K	B K	1.8 K	1.5 K	1.6 K	1.7 K	1.7 K	1.9 K	1.8 K	1.7 K	1.9 K	(1.7) JK		
5	1.6 K	1.7 K	1.8 FK	1.6 FK	1.6 FK	1.8 FK	2.2 K	2.3 K	G K	G K	1.7 K	G K	1.8 K	A K	G K	G K	1.5 K	1.5 K	1.6 FK	1.7 K	2.0 K	K (1.7) JS	1.6 K	2.0 K		
6	(1.7) JK	1.8 FK	1.8 FK	1.7 FK	1.8 FK	1.9 K	(1.9) SK	G K	G K	G K	G K	G K	G K	B K	G K	1.6 K	1.8 K	1.7 K	1.8	1.8	1.8	1.7	1.8	1.8		
7	1.8	1.7	1.8	1.8	1.7	1.9	2.0	2.1	2.0	2.1	1.8	1.7	1.9	1.7	1.9	1.8	1.8	2.0	1.9	1.9	2.1	1.8	1.8	1.8		
8	1.8	1.8	1.7	1.7	1.8	(1.9) P	1.9	1.8	1.9	1.9	S	1.7	1.8	1.7	1.8	1.7	1.8	1.8	1.9	2.0	1.9	1.8	1.7	1.7		
9	1.8	1.9	1.8	1.8	1.8	2.0	2.1	1.8	2.1	(2.0) JS	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2.0	1.9	(1.9) SP	(1.9) SP	(1.9) J	1.9		
10	1.8	(1.9) J	1.8	1.9	1.9	1.8	1.9	2.0	2.0	(2.0) JH	1.8 H	1.8	(1.9) SP	1.8	1.9	1.9	1.8	1.9	1.9	2.0	(2.1) JP	1.9	(1.9) SP	1.9		
11	(1.8) P	(2.0) P	(1.9) J	1.8	(1.9) JP	2.1	1.9	2.1	2.0	1.8 H	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	(2.0) J	(2.0) J	(1.8) P		
12	1.7	1.8	(2.0) P	1.7	1.7	1.9 K	1.8 K	1.5 K	1.6 K	1.7 K	1.6 K	(1.6) BK	(1.5) BK	(1.5) BK	1.7 K	1.6 K	1.7 K	1.7 K	1.8 K	1.7 FK	(2.0) PK	2.1 K	1.7 VK	1.8 K		
13	1.7 HK	1.7 FK	1.6 FK	1.7 FK	1.8 FK	1.9 K	2.0 HK	G K	G K	A K	A K	A K	A K	A K	A K	A K	1.9 K	1.8 K	1.9	1.9	1.8	1.8	S	(1.8) P		
14	1.7	1.8	1.9	(2.0) P	2.0	2.0	1.9	1.8	A	A	1.9	1.8	B	A	1.9	1.9	1.9	1.8	1.9	1.8	1.9	2.0	1.9 F	1.7 F		
15	1.9 F	1.8 F	1.8	1.8 F	(2.0) JF	2.1	2.0	2.1	1.9	1.8	1.8	(2.0) P	B	T	T	T	1.8	1.9	1.9	1.9	1.9	1.9	1.8	1.8		
16	1.9	1.8	1.8	1.8 F	1.9	2.0	2.0	2.1	1.9	2.0	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.9	A	A	1.9	2.0	1.9	2.0 H		
17	1.9	1.8	1.8	1.8 F	1.8 F	2.0	2.0	1.9	2.1	1.7	1.7	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.9	1.8	1.8	C	C	1.7		
18	1.8	1.8	1.8 F	C	C	C	C	C	C	C	1.7	1.8 F	1.6	1.7	1.7	1.6	1.8	1.7	1.9	1.9	1.8	1.8	1.7	1.8		
19	1.8	1.7	(1.8) J	[illegible]	1.8	1.9	2.1	1.8	1.7	1.9	2.0	1.5	1.8	1.7	1.8	1.7	1.8	1.7	1.9	1.9	1.8	1.8	1.8	1.7		
20	1.8	1.8	1.8 F	1.8 F	1.9 F	1.9	2.1	2.0	1.8	2.1	1.9	2.0	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.9	1.9	1.9	1.8 F		
21	1.8 F	1.8 F	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.7	1.9	(1.9) SP	1.8	2.0	1.8	A	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9		
22	1.9	1.8	1.9	1.7	1.9	2.1 F	2.0	1.8	(1.7) J	2.0	1.9	(1.9) J	1.9	1.7	1.8	1.8	1.7	1.8	1.9	1.9	2.0	1.8	1.8	1.8		
23	1.7	1.8	1.8	1.9	1.8	2.1 F	2.0	1.8	1.8	A	1.8	1.7	1.7	1.7	1.8	1.7	1.8	2.0	1.9	2.1	2.0	1.8	1.8	1.8		
24	1.7	1.8	2.0	2.0	2.0	1.8	2.0	1.8	2.0	2.1	1.9	2.0	1.9	2.0	1.7	1.8	1.9	2.0	1.9	A	1.7	1.8	1.8	1.9		
25	1.9	2.0	1.7 F	1.8 F	1.9 F	1.9	1.8	1.8	1.6	1.7	A	1.7	1.7	1.7	1.7	1.7	1.8	1.8	2.0 F	1.9 F	1.9	1.8	(1.8) J	(1.9) JS		
26	1.8	1.7	2.0	1.9	2.0 F	2.1 F	2.0 F	1.9 F	1.9	1.7	1.8	1.7	1.8	1.9	1.8	1.8	1.8	1.9	1.8	1.8	1.9	1.9	1.8	1.8		
27	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.9	2.0	1.8	1.8	1.8	1.7	1.7	1.8	1.8	1.9	1.9	2.0	1.8	1.8	1.7 F		
28	1.8	1.9	1.8	1.8	1.8	1.9	2.1 H	1.8 H	1.8	1.9	1.8	1.9	1.6	1.8	1.7	1.8	1.8	1.9	1.8	1.8	1.9	1.7 F	1.9	1.6		
29	1.8	1.8	1.8	1.7	1.7	1.9	1.8	1.8	1.8	1.9	1.8	(2.0) A	1.7	1.7	1.7	1.8	1.7	1.8	1.8	1.9	2.0	1.9	1.8	1.8		
30	1.7	1.8	1.8	1.8	1.8	1.9	2.1	1.8	1.7	1.9	1.8	1.8	(1.6) JS	(1.7) S	(1.7) JS	1.7	1.7	1.9	1.9	2.0	1.9	1.8	(1.9) J	1.8		
31																										
Median	1.8	1.8	1.8	1.8	1.8	1.9	2.0	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8	1.8		
Count	30	30	30	29	29	29	29	29	28	26	26	29	26	24	28	27	30	30	29	28	30	29	28	30		

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1945 O - 702510

TABLE 50

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

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F2 (Characteristic), ____ (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

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	2.6	2.6	2.7F	(2.7)JF	2.8F	2.9F	3.0F	2.7F	2.7HF	2.5F	N	2.6	2.5	2.5	2.4	2.5	2.6	2.7	2.7	2.8	2.7	2.5	2.7	2.8
2	2.8F	2.8F	2.8F	2.8F	2.6F	2.7F	2.8F	2.7	2.9	2.8F	2.7	(2.7)J	2.5	2.7	2.6	2.7	2.8	2.7	2.8	2.8	2.8	2.7	2.8	2.7
3	2.7	2.7	2.8	2.8	(2.8)JS	2.9	3.1	3.0	3.1	2.7	2.9	2.5	2.6	2.7	2.7	(2.7)JS	2.8	2.8	2.8	2.9	2.6	2.4	2.7K	3.0K
4	2.7K	K(2.7)FS	2.7K	2.7FK	2.6K	2.7K	2.9K	(2.6)PK	G K	G K	G K	2.5K	B K	B K	2.7K	2.4K	2.8K	2.5K	2.6K	2.8K	2.7K	2.6K	2.8K	(2.6)J
5	2.4K	2.6K	2.6FK	2.4FK	2.4FK	2.6FK	3.3K	3.4K	G K	G K	2.6K	G K	2.7K	A K	G K	G K	2.2K	2.3	2.5FK	2.6K	3.0K	K(2.6)JS	2.4K	2.9K
6	(2.5)JK	2.6FK	2.6FK	2.7FK	2.7FK	2.9K	(2.8)SK	G K	G K	G K	G K	G K	G K	B K	G K	2.4K	2.6K	2.6	2.8	2.8	2.8	2.6	2.7	2.7
7	2.6	2.6	2.7	2.7	2.6	2.8	3.0	3.0	3.0	3.1	2.7	2.5	2.9	2.5	2.8	2.8	2.8	2.9	2.9	2.9	3.1	2.7	2.7	2.7
8	2.7	2.7	2.7	2.7	2.7	(2.9)P	2.9	2.7	2.8	2.9	S	2.7	2.7	2.6	2.8	2.6	2.7	2.8	2.9	2.9	2.9	2.7	2.6	2.6
9	2.7	2.8	2.8	2.7	2.8	2.9	3.1	2.8	3.1	(2.9)JS	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.9	3.0	2.9	(2.8)SP	(2.8)SP	(2.9)J	2.8
10	2.8	(2.9)J	2.8	2.7	2.8	2.8	2.9	3.0	2.9	(3.0)JH	2.8H	2.7	(2.8)SP	2.8	2.8	2.8	2.8	2.8	2.8	2.9	(3.0)JP	2.9	(2.9)SP	2.9
11	(2.7)P	(2.9)P	(2.9)J	2.8	(2.8)JP	2.9	2.9	3.0	2.9	2.8H	2.9	2.8	2.8	2.7	2.7	2.8	2.7	2.7	2.7	2.8	2.8	(2.9)J	(2.7)J	(2.8)P
12	2.7	2.7	(3.0)P	2.7	2.8	2.9K	2.9K	2.3K	2.4K	2.6K	2.4K	(2.4)BK	(2.3)BK	(2.3)BK	2.5K	2.5K	2.6K	2.6K	2.6K	2.6FK	(2.9)PK	3.0K	2.6VK	2.7K
13	2.6HK	2.6FK	2.5FK	2.8FK	2.6FK	2.9K	2.9HK	G K	G K	A K	A K	A K	A K	A K	A K	A K	2.8K	2.7K	2.8	2.8	2.8	2.8	S	(2.8)P
14	2.6	2.8	2.9	(3.0)P	2.9	2.9	2.9	2.7	A	A	2.7	2.8	B	A	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3.0	2.8F	2.6F
15	2.8F	2.7F	2.7	2.8F	(3.0)JF	3.2	2.8	3.1	2.9	2.7	2.8	(3.0)P	B	T	T	T	2.7	2.8	2.9	2.9	2.9	2.8	2.7	2.8
16	2.9	2.8	2.8	2.7F	2.9	2.9	3.0	3.1	[illegible]	3.1	2.8	2.8	2.7	2.8	2.7	2.7	2.7	2.8	A	A	2.8	3.0	2.9	3.0H
17	2.8	2.7	2.8	2.8F	2.8F	2.9	3.0	2.8	3.2	2.6	2.6	2.7	2.7	2.6	2.8	2.6	2.7	2.7	2.8	2.8	2.8	C	C	2.6
18	2.7	2.7	2.7F	C	C	C	C	C	C	C	2.5	2.7F	2.5	2.5	2.6	2.5	2.7	2.6	2.9	2.9	2.8	2.8	2.5	2.6
19	2.7	2.6	(2.7)J	2.8	2.7	2.9	3.1	2.9	2.5	2.9	3.0	2.3	2.7	2.5	2.7	2.6	2.6	2.8	2.8	2.9	2.8	2.8	2.8	2.6
20	2.8	2.7	2.7	2.7F	2.8F	2.9	3.1	2.8	2.7	3.1	2.9	3.0	2.8	2.9	2.9	2.8	2.8	2.8	2.7	2.8	2.9	2.8	2.9	2.8F
21	2.6F	2.8F	2.7	2.8	2.9	2.7	2.8	2.8	2.8	2.5	2.8	(2.9)SF	2.7	3.0	2.8	A	2.8	2.8	2.9	2.9	2.9	2.8	2.8	2.8
22	2.8	2.8	2.8	2.7	2.9	3.0F	3.0	2.7	(2.6)J	3.0	2.8	(2.8)J	2.8	2.6	2.7	2.7	2.6	2.8	2.8	2.8	2.9	2.8	2.7	2.7
23	2.6	2.8	2.8	2.9	2.8	3.0F	3.0	2.7	2.7	A	2.8	2.6	2.5	2.7	2.7	2.6	2.7	3.0	2.8	3.1	3.0	2.7	2.7	2.8
24	2.7	2.8	3.0	2.9	2.9	2.7	3.0	2.7	3.0	3.1	2.9	3.0	2.9	2.9	2.6	2.7	2.8	3.0	2.9	A	2.5	2.7	2.6	2.8
25	2.9	2.9	2.5F	2.6F	2.7F	2.8	2.7	2.7	2.5	2.6	A	2.5	2.6	2.5	2.5	2.6	2.7	2.8	2.9F	2.9F	2.8	2.7	(2.7)J	(2.8)JS
26	2.8	2.6	2.9	2.8	3.0F	3.1F	3.0F	2.8F	2.9	2.6	2.8	2.6	2.8	2.8	2.7	2.7	2.7	2.8	2.7	2.7	2.8	2.9	2.7	2.7
27	2.6	2.7	2.8	2.8	2.7	2.8	2.9	2.9	2.7	2.8	2.9	2.7	2.8	2.7	2.6	2.5	2.7	2.7	2.8	2.8	2.9	2.8	2.7	2.7F
28	2.6	2.9	2.6	2.7	2.8	2.8	3.1H	2.6H	2.8	2.9	2.7	2.9	2.5	2.7	2.7	2.6	2.7	2.8	2.7	2.6	2.8	2.6F	2.8	2.5
29	2.7	2.6	2.8	2.7	2.6	2.8	2.8	2.7	2.7	2.9	2.7	(3.0)A	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.8	2.9	2.8	2.7	2.7
30	2.6	2.7	2.6	2.7	2.8	2.8	3.0	2.7	2.5	2.9	2.8	2.7	(2.5)JS	(2.6)S	(2.6)JS	2.5	2.7	2.7	2.8	2.9	2.9	2.8	(2.9)J	2.6
31																								
Median	2.7	2.7	2.8	2.7	2.8	2.9	3.0	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.7	2.6	2.7	2.8	2.8	2.8	2.8	2.8	2.7	2.7
Count	30	30	30	29	29	29	29	29	28	26	26	29	26	24	28	27	30	30	29	28	30	29	28	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 51

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

Form adopted June 1946

IONOSPHERIC DATA

(M3000)F1 (Characteristic), ____ (Unit), June (Month), 1949

Observed at Washington, D. C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							L	31^{F}	38^{H}	38	39	38	41	38^{H}	37	34	35	32	L					
2							Q	34^{H}	35^{H}	$(40)^{S}$	A	$(36)^{H}$	38^{H}	38	S	34	A	A	Q					
3							Q	35	34	36	$(37)^{P}$	35^{H}	37	S	31	38	37	33	L					
4							31^{K}	35^{K}	36^{K}	35^{K}	37^{K}	37^{K}	B^{K}	B^{K}	B^{K}	38^{K}	36^{K}	34^{H}_{K}	20^{K}					
5							Q^{K}	Q^{K}	37^{K}	39^{K}	38^{K}	36^{K}	A^{K}	A^{K}	36^{K}	36^{K}	35^{K}	32^{K}	32^{K}					
6							Q^{K}	34^{K}	36^{H}_{K}	42^{K}	41^{K}	42^{K}	37^{K}	B^{K}	$(40)^{B}_{K}$	40^{K}	34^{K}	$(35)^{P}_{K}$	3.2	L				
7							Q	Q	33	33	32	33	33	36	34	35	36^{H}	A	L					
8							L	34	35	36	36	34	38	S	35	35	A	A	L					
9							Q	L	$(34)^{P}$	35^{H}	37	36	37	39^{H}	35	35	35	A	Q					
10							L	A	34	38	34	34	$(34)^{S}$	33	B	B	L	L	L					
11							Q	Q	L	40	38	35	37^{H}	$(36)^{P}$	35	31	33	L	L					
12							L^{K}	34^{H}_{K}	$(33)^{A}_{K}$	35^{K}	38^{K}	33^{K}	$(35)^{B}_{K}$	$(38)^{B}_{K}$	36^{K}	36^{K}	34^{K}	31^{K}	L^{K}					
13							31^{K}	35_{K}	40^{K}	A^{K}	A^{K}	A^{K}	A^{K}	A^{K}	A^{K}	A^{K}	33^{K}	A^{K}	L					
14							Q	34	A	A	37	S	B	A	A	A	33	L	A					
15							Q	Q	L	36	37	B	B	T	T	T	32	37	L					
16							Q	L	L	37	35	36	34	34	33	33	32	A	A					
17							L	Q	34	34	38^{H}	$(39)^{S}$	A	32	36	34	$(31)^{A}$	34	L					
18							C	C	C	C	36	38	36	35	36	A	A	A^{L}	A					
19						L	Q	33	35	36	36	39	38	36	39	38	35	33	L					
20							L	L	A	35	37	$(40)^{S}$	37	A	A	34	34	32	A					
21							33	L	L	35	36	32	35^{H}	40	37	A	$(38)^{P}$	32	L					
22							L	A	34	38^{H}	$(40)^{J}$	41^{H}	38	34	33	33	A	A	A					
23							L	35	36^{H}	A	37	37	37	39	35	34	32	33	A					
24							Q	$(32)^{P}$	34	37^{H}	34	35^{H}	A	A	34	35	36	L	A					
25							Q	A	A	38	A	A	35	38	36	36	33	36^{H}	A					
26							Q	34	A	A	A	A	38	36	36	37^{H}	34	33	Q					
27							Q	34	31	33	30	38	38	36^{H}	35	A	32	33	L					
28							Q	$(31)^{J}$	34^{H}	35	39	35^{H}	32	34	35	33	36^{F}	36	L					
29							32	31	35	$(34)^{S}$	34	A	35	$(37)^{S}$	$(38)^{S}$	35	$(36)^{S}$	32	L					
30							Q	Q	32	39	$(40)^{S}$	38	35^{H}	35	36	34	34	32	A^{L}					
31																								
Median						—	—	34	34	36	37	36	37	36	36	35	34	33	—					
Count						0	4	16	21	25	26	24	23	20	23	23	25	18	3					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U S GOVERNMENT PRINTING OFFICE 1946 O - 710319

TABLE 52

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

Form adopted June 1946

IONOSPHERIC DATA

(M1500)E (Characteristic), ____ (Unit), June (Month), 1949

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: E.J.W., J.J.S., J.M.C.

Calculated by: L.A.L., J.J.S., B.E.B.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							(4.4)A	4.2F	4.3	A	4.4	(4.3)P	4.3	A	A	4.3	4.6H	4.0	4.2	4.2H				
2							(4.2)H	4.0	4.2	4.3	(4.2)P	4.1	3.9	4.1	3.8	4.0F	4.2	4.3	4.4					
3							4.3	4.1	4.5	A	4.3	4.2	(4.0)S	4.1	A	4.1	4.4	4.1	4.3	3.7				
4							4.3K	AK	4.6K	4.6K	(4.6)BK	4.4K	BK	BK	BK	4.3K	4.3K	4.4K	4.1K	(4.2)K				
5							4.3K	4.2K	AK	AK	AK	4.6K	AK	AK	4.3K	4.0K	4.1HK	3.9K	3.9K	3.3K				
6							4.5K	4.0K	AK	4.8K	4.4K	4.3K	4.4K	BK	4.5K	3.9K	3.8K	4.3K	(4.4)A	3.7				
7							4.4	4.2	4.2	4.7	A	4.2	4.2	4.1	4.2	A	4.4	(4.3)A	4.4					
8							4.1	4.1	4.2	4.3	A	A	4.3	A	4.3H	A	A	4.5	4.0	4.2				
9							4.5	4.1	4.3H	4.2	(4.3)A	(4.2)A	A	A	A	4.4	4.3	(3.9)P	A					
10							4.0	4.0	4.2	4.3	4.3	(4.2)S	(4.4)P	B	B	(4.2)F	4.1	3.9	(4.3)A					
11							4.0H	(4.0)A	A	A	A	(4.1)P	A	4.4H	A	4.2	4.4	4.0H	(4.2)A	A				
12							4.2K	4.0HK	AK	4.2K	4.1K	4.3K	(4.2)BK	4.0K	(4.1)PK	(4.1)PK	4.3K	4.1K	4.2HK	3.8K				
13							4.2HK	AK	AK	AK	4.4K	4.3K	4.3K	3.9K	3.9K	4.0K	3.9K	4.0K	4.2					
14							4.4F	4.3F	4.2	(4.4)A	A	4.2	B	A	A	A	(4.1)A	4.2	4.2	4.2				
15							4.2	3.9	4.1	4.1	4.3	(4.4)B	B	T	T	T	4.2	3.9	4.0	4.2				
16							A	A	A	A	A	A	(4.3)P	4.1	3.9	4.1	3.9	4.2	4.4					
17							4.3	(4.3)A	A	4.4	A	A	(4.1)P	A	(4.4)A	4.3	4.4	4.0	4.2					
18							C	C	C	C	A	A	A	A	4.2	A	A	4.2	4.3					
19							4.2	4.1	4.2	4.5	4.3	A	4.1	4.2	4.3	(4.1)A	A	4.2	4.2	A				
20							4.2	4.1	3.9	4.4	4.5	4.2	A	A	A	A	A	4.0	4.2					
21							(4.2)A	(3.9)A	3.9	(4.4)P	4.1	3.8	4.1	4.1	4.0	4.1	4.2	A	4.2	A				
22							(4.3)A	A	A	A	A	A	A	A	(4.4)A	A	(4.3)A	4.2	4.3	A				
23							4.2	3.9	(4.4)A	4.5	(4.4)A	4.3	A	A	4.3	4.2	4.2	4.2	4.2	A				
24							A	A	A	A	(4.5)A	A	(4.3)A	4.2	A	4.1	4.1	4.1	4.1	A				
25							A	A	(4.4)A	4.3	A	A	(4.1)P	A	4.2	4.2	4.0	4.0	(4.3)A					
26							4.2	4.1	4.4	4.3	4.5	4.3	A	A	4.2	4.1	4.0	(4.2)A	4.2					
27							A	(4.2)A	(4.5)A	4.3	4.3	A	A	A	A	A	A	4.1	4.1H	A				
28						4.1	(4.2)A	3.9	4.0	3.9	4.2	A	S	4.0	4.2	4.1	(4.3)A	4.1	3.9	(4.2)A				
29						4.0H	4.3H	4.1	4.2	4.1	4.2	4.1	A	4.2	A	A	A	4.4	4.4	(4.0)A				
30							A	A	4.0	4.1	4.0	4.1	4.0H	A	A	A	(4.3)A	4.3	4.3					
31																								
Median						—	4.2	4.1	4.2	4.3	4.3	4.2	4.2	4.1	4.2	4.1	4.2	4.1	4.2	4.2				
Count						2	24	22	20	21	20	20	16	12	17	20	24	29	29	11				

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Table 53

Ionospheric Storminess at Washington, D. C.

June 1949

Day	Ionospheric character* 00-12 GCT	Ionospheric character* 12-24 GCT	Principal storms Beginning GCT	Principal storms End GCT	Geomagnetic character** 00-12 GCT	Geomagnetic character** 12-24 GCT
1	2	3			4	2
2	1	2			2	2
3	2	3			3	2
4	4	5	0300	----	4	5
5	5	6	----	----	4	5
6	4	5	----	2300	3	3
7	2	1			3	2
8	3	3			2	2
9	2	3			2	2
10	0	2			1	1
11	2	3			0	2
12	1	4	1000	----	4	4
13	4	***	----	2300	3	2
14	2	1			1	2
15	2	2			3	3
16	1	1			3	2
17	1	1			1	3
18	3	3			3	3
19	1	3			3	2
20	2	2			2	1
21	1	1			1	2
22	2	1			2	3
23	1	3			1	1
24	2	2			1	2
25	2	3			3	2
26	2	1			1	2
27	1	2			3	2
28	1	3			2	3
29	1	0			2	3
30	2	3			2	2

*Ionospheric 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.

***No readable record. Refer to table 42 for detailed explanation.

----Dashes indicate continuing storm.

Table 54

Sudden Ionosphere Disturbances Observed at Washington, D. C.

June 1949

1949 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
June 4	1613	1920	Ohio, D.C., England	0.0	Solar flare*** 1613
6	1723	1835	Ohio, D.C.	0.02	
10	1810	1925	Ohio, D.C., Canal Zone, England, New Brunswick	0.02	Terr.mag.pulse** 1810-1830
16	1208	1230	England	0.3	
19	1917	2030	Ohio, D.C.	0.0	
22	1705	1925	Ohio, D.C., New Brunswick	0.01	Solar flare*** 1709
24	0928	0935	England	0.1	

*Ratio of received field intensity during SID to average field intensity before and after, for station W8XAL, 6080 kilocycles, 600 kilometers distant, for all SID except the following: Station GLH, 13525 kilocycles, received in New York, 5340 kilometers distant, was used for the SID on June 16; station GLH, received in Washington, 5800 kilometers distant, was used for the SID on June 24.

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

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

Table 55

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

1949 Day	GCT Beginning	GCT End	Location of transmitters	Other phenomena
May 8	1540	1640	Bolivia, Brazil, Chile, Cuba, Denmark, Germany, New York, Peru, Spain, Venezuela	Solar flare* 1528
10	2014	2040	Bolivia, Cuba, New York, Peru, Venezuela	Terr.mag. pulse** 2003-2045 Solar flare* 2002
30	1845	1910	Bolivia, Brazil, Chile, Cuba, Denmark, England, France, Germany, New York, Peru, Spain, Switzerland, Venezuela	

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

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

Table 56

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

1949 Day	GCT Beginning	GCT End	Location of transmitters
June 6	0000	0400	Australia, China, Chosen, Hawaii, Japan, Java, Philippine Is.
21	0120	0200	Australia, Hawaii, Japan, New York, Philippine Is.

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.

Table 57

Corrections in Dates Previously Published in Point Reyes, California, SID Tables

One day should be added to the dates of each sudden ionosphere disturbance (SID) listed below:

CRPL No.	Page	Table	Day (Add one day to date given)	GCT Beginning
F44	41	78	March 18, 1948	0300
F45	39	74	April 7, 1948	0310
F45	39	74	April 10, 1948	0129
F46	40	76	May 15, 1948	0502
F50	33	53	August 4, 1948	0222
F50	33	53	August 8, 1948	0220
F50	33	53	August 16, 1948	0655
F50	33	53	September 22, 1948	0150
F51	33	51	October 18, 1948	0040
F51	33	51	October 18, 1948	0515
F54	35	64	January 14, 1949	0430
F55	32	46	February 9, 1949	0230
F55	32	46	February 13, 1949	0125
F57	32	48	April 6, 1949	0030

In addition to the changes indicated above, the SID reported in table 46 of CRPL-F55, p.32, as beginning at 0005 on February 6, 1949, actually began at 2350 February 6 and ended at 0100 February 7, 1949.

Table 58

Provisional Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings and CRPL Probable Disturbed Period Forecasts)
May 1949

Day	North Atlantic: Quality figure 01-12 GCT	North Atlantic: Quality figure 13-24 GCT	North Atlantic: CRPL* Warning 01-12 GCT	North Atlantic: CRPL* Warning 13-24 GCT	North Atlantic: CRPL** Forecast of probable disturbed periods	North Atlantic: Geomagnetic K_{Ch} 01-12 GCT	North Atlantic: Geomagnetic K_{Ch} 13-24 GCT	North Pacific: Quality figure 01-12 GCT	North Pacific: Quality figure 13-24 GCT	North Pacific: CRPL* Warning 01-12 GCT	North Pacific: CRPL* Warning 13-24 GCT	North Pacific: CRPL** Forecast of probable disturbed periods	North Pacific: Geomagnetic K_{Ch} 01-12 GCT	North Pacific: Geomagnetic K_{Ch} 13-24 GCT
1	7	6				0	1	5	6				0	1
2	6	6				2	3	5	5				2	3
3	6	6				2	2	6	7				2	2
4	(4)	6		X		4	2	6	6		X		4	2
5	6	5	X			1	3	6	6	X			1	3
6	5	6				3	2	5	6				3	2
7	6	6				2	2	6	6				2	2
8	6	6				2	2	5	6				2	2
9	6	5				3	3	5	6				3	3
10	6	6				2	3	6	6				2	3
11	5	6				4	2	5	5				4	2
12	(3)	(3)		X	X	5	8	(3)	(3)		X	X	5	8
13	(3)	(4)	X	X	X	5	2	6	6	X	X	X	5	2
14	(4)	5	X	X	X	3	3	5	5	X	X	X	3	3
15	6	5	X			3	2	6	6	X			3	2
16	5	5				3	3	6	6				3	3
17	5	6				2	2	5	6				2	2
18	7	6				1	2	6	7				1	2
19	6	6				1	2	6	7				1	2
20	7	6				1	1	6	7				1	1
21	7	5				2	2	5	7				2	2
22	6	6				2	2	5	6				2	2
23	6	6				2	3	5	6				2	3
24	6	6				2	1	6	7				2	1
25	7	6				1	2	7	7				1	2
26	6	6				1	2	5	6				1	2
27	6	6				1	2	6	7				1	2
28	7	6				2	1	6	7				2	1
29	6	6				1	1	5	6				1	1
30	7	5				1	5	5	7				1	5
31	(4)	6	X	X		4	4	5	5	X	X		4	4
Score:														
H			4		3					1		1		
M			1		2					0		0		
G			24		26					24		28		
(S)			0		0					2		1		
S			2		0					4		1		

*Broadcast on WWV, Washington, D.C. Times of warnings recorded to nearest half day as broadcast.

**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 5-9.

Quality Figure Scale:
1 - Useless
2 - Very poor
3 - Poor
4 - Poor to fair
5 - Fair
6 - Fair to good
7 - Good
8 - Very good
9 - Excellent

Symbols:

X Warning given or probable disturbed date

H Quality 4 or worse on day or half day of warning

M Quality 4 or worse on day or half day of no warning

G Quality 5 or better on day of no warning

(S) Quality 5 on day of warning

S Quality 6 or better on day of warning

( ) Quality 4 or worse (disturbed)

Geomagnetic K_{Ch} on the standard scale of 0 to 9, 9 representing the greatest disturbance.

Table 59

American and Zürich Provisional Relative Sunspot Numbers

June 1949

Date	R_A*	R_Z**	Date	R_A*	R_Z**
1	177	116	17	97	86
2	178	114	18	115	85
3	165	116	19	114	90
4	175	119	20	117	83
5	160	107	21	133	92
6	145	134	22	137	115
7	112	108	23	166	139
8	115	109	24	175	137
9	98	83	25	169	116
10	89	85	26	258	164
11	104	102	27	255	203
12	120	86	28	298	233
13	143	119	29	264	237
14	97	122	30	260	218
15	102	85			
16	123	103	Mean	154.5	123.5

*Combination of reports from 53 observers; see page 8.
**Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

Table 60a

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	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																																					
June 2.6	-	-	-	-	-	-	-	5	6	5	4	-	5	7	11	15	12	8	6	3	-	-	3	4	5	3	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	4	6	9	11	12	13	12	12	13	13	12	10	5	3	-	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	3	4	6	8	11	14	15	15	9	10	11	13	12	4	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	X	-	-	-	-	-	-	-	-	-	-	-	-	4	5	10	14	15	13	10	11	12	11	5	3	-	-	-	-	-	-	-	-	-	-	-	-
13.9	X	X	X	X	X	X	X	X	X	X	-	3	5	8	10	11	13	13	8	7	7	8	8	9	9	4	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	4	7	9	12	12	5	2	-	-	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	6	7	9	9	8	7	5	3	-	-	-	3	4	6	4	3	-	-	-	-	-	-	-	-	-	-
16.8	X	-	-	-	-	-	-	-	-	-	-	-	-	6	7	7	7	3	3	3	4	4	3	4	6	6	-	-	-	-	-	-	-	-	-	-	-
17.7	-	-	-	-	-	-	-	-	-	-	-	3	5	7	12	13	10	10	11	12	15	11	8	7	6	5	4	4	4	4	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	6	8	9	12	18	27	18	13	13	12	10	11	8	10	9	6	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	3	11	12	18	20	19	13	12	10	8	8	9	10	10	6	-	-	-	-	-	-	-	-	-	-
21.6	-	-	-	-	-	-	-	-	2	3	4	6	12	19	18	19	19	18	16	20	15	12	12	10	12	14	13	8	3	2	-	-	2	2	-	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	3	6	12	14	13	11	10	7	12	13	13	6	-	5	9	8	3	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	9	14	19	23	24	25	8	7	7	10	10	7	5	3	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	2	3	4	7	11	14	16	22	15	11	12	13	14	13	12	10	7	3	-	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	2	4	11	14	13	18	15	11	11	13	22	21	14	11	8	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	4	13	11	13	14	12	6	7	10	15	12	12	11	7	5	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	3	3	3	3	-	-	12	15	20	14	7	6	7	9	12	14	13	12	10	9	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	3	8	10	15	13	9	8	7	6	6	10	10	9	8	2	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	4	4	5	7	9	10	10	9	6	-	-	6	9	9	7	3	-	-	-	-	-	-	-	-	-	-

Table 61a

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	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																																					
June 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6	1	-	-	-	-	1	2	1	1	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	6	7	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	1	1	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
13.9	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-
17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	1	-	1	10	1	1	1	2	2	1	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	8	12	5	8	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	8	11	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.6	1	1	1	1	1	1	1	1	1	-	-	3	5	15	8	-	10	10	1	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	1	4	7	7	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	16	12	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	18	9	15	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	1	2	7	14	10	8	1	-	-	1	2	3	3	1	1	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	1	1	5	11	12	-	-	-	-	3	4	2	1	1	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	1	1	1	1	13	13	10	-	-	-	1	1	5	2	3	2	1	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	3	1	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 62a

Coronal observations at Climax, Colorado (6704A), 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
1949																																					
June 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.9	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17.7	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	2	2	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
21.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	2	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	2	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	2	2	1	1	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 60b

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

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																																					
June 2.6	-	-	-	-	-	-	-	-	-	-	-	3	4	5	5	3	-	-	3	3	4	5	6	5	3	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	3	3	4	5	6	8	8	7	9	11	12	14	15	14	3	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	3	4	4	5	6	6	5	4	8	13	13	15	14	14	3	-	-	-	-	-	-	-	-	-	-	-
12.6	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.9	-	-	-	-	-	-	-	-	-	-	-	-	2	9	10	9	6	4	3	5	7	8	10	6	3	3	3	-	-	-	-	-	-	-	-	-	X
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	6	8	7	5	3	-	-	4	7	10	8	3	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	4	5	6	5	5	6	-	-	-	10	14	12	9	6	4	3	3	3	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	4	5	6	5	4	4	4	3	3	4	7	8	8	7	5	3	3	X	X	X	X	X	X	X	X	X
17.7	-	-	-	-	-	-	-	-	-	3	4	4	5	4	4	3	3	4	3	5	10	10	7	6	5	4	6	6	3	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	6	9	11	11	13	11	11	12	12	11	13	15	20	18	12	10	7	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21.6	-	-	-	-	-	1	2	2	1	-	-	-	3	13	14	13	15	17	19	22	15	10	15	27	20	16	14	6	5	4	3	2	1	1	1	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	4	6	8	9	14	13	10	13	12	11	10	9	14	13	10	5	-	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	11	12	10	10	13	13	12	14	10	9	8	6	3	3	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	3	3	4	4	7	8	6	10	11	12	14	16	18	13	18	14	12	10	7	4	2	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	3	4	4	4	4	4	5	5	4	5	9	11	10	11	14	13	13	15	10	13	9	5	4	3	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	4	4	4	5	5	7	9	6	12	13	13	13	14	13	12	8	4	3	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	3	3	3	3	3	4	5	5	4	3	8	10	10	11	12	11	5	2	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	3	3	4	4	5	7	8	9	9	10	10	5	7	13	11	8	3	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	3	4	5	4	5	9	8	8	7	9	9	11	11	7	6	3	-	-	-	-	-	-	-	-	-	-

Table 61b

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

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																																					
June 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	3	4	4	4	3	1	1	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8	7	5	2	1	-	-	-	-	-	-	-	-	-	-	-	-
12.6	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	1	4	3	1	1	1	-	-	-	-	-	-	-	-	-	-	-	X
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	4	2	2	2	2	2	1	1	-	-	X	X	X	X	X	X	X	X	X
17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6	7	7	6	5	3	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	3	3	1	1	-	1	3	5	1	-	-	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	3	5	9	10	10	9	10	11	10	9	10	12	13	15	12	7	3	-	-	-	-	-	-	-	-	-
21.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	10	6	7	8	2	3	1	1	1	4	4	-	1	-	-	-	-	-	-	-	-	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	8	9	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	7	1	-	-	1	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	1	-	-	-	1	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 62b

Coronal observations at Climax, Colorado (6704A), west limb

Date	Degrees south of the solar equator																		0°	Degrees north of the solar equator																	
GCT	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																																					
June 2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12.6	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X
17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	1	2	-	5	1	-	-	-	-	-	-	-	-	-	-	-	-
21.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
22.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 63

Particulars of Observations, Climax, Colorado
January-June 1949

Date GCT	Green line threshold intensity at 45°	90°	135°	225°	270°	315°	Obs.	Meas.
1949								
Jan. 6.8	9	7	7	4	5	-	J	E
7.8	8	5	5	5	4	7	J	E
11.9	4	4	5	7	3	-	J	E
12.8	5	5	4	5	6	4	J	E
13.8	4	3	4	4	4	6	J	E
17.8	7	8	6	6	5	6	J/F	E
19.7	7	9	7	9	4	4	F	E
21.7	3	3	4	4	3	3	F	E
25.8	9	3	4	7	5	5	J/F	E
29.8	7	8	6	9	9	8	F	E
Feb. 1.7	4	5	4	4	4	7	F/J	E
3.8	5	6	3	4	4	3	F	E
6.7	6	6	5	6	6	7	F	E
10.7	13	10	9	-	-	-	F	E
11.7	6	6	7	11	8	9	F	E
17.8	5	6	12	7	5	3	J/F	E
18.7	4	4	4	6	6	5	J	E
19.7	8	7	7	8	7	7	F	E
21.9	-	6	6	8	5	9	F	E
22.8	7	7	5	6	6	7	F	E
23.9	5	6	7	5	6	7	F	E
25.7	4	5	5	12	-	-	F/J	E
27.6	6	8	5	8	7	6	F	E
28.8	7	7	8	8	11	-	F	E
Mar. 2.7	7	7	7	5	5	5	F	E
3.6	9	7	9	9	9	8	F	E
4.8	-	-	10	-	-	-	F/J	E
5.6	6	6	5	5	4	-	F	E
6.7	7	5	6	6	5	6	F	E
9.8	9	8	7	7	9	7	J	E
12.9	10	11	-	-	-	-	F	E
14.0	8	7	9	8	9	-	F	E
14.8	10	8	-	-	-	-	F/J	E
16.8	9	7	-	-	7	-	J/F	E
18.0	12	11	-	11	9	-	F/J	E
21.8	9	7	7	7	8	6	J	E
Apr. 4.7	7	9	9	8	9	9	F	E
5.6	8	8	7	7	7	6	J	E
6.7	10	11	9	13	11	9	F	E
7.9	10	11	8	7	6	10	J	E
9.9	-	10	-	-	-	-	F	E
11.7	12	10	9	8	8	8	F	E
12.9	11	-	-	-	-	-	F	E
15.6	7	4	3	5	7	7	J	E
16.6	4	3	5	5	5	6	F	E
17.7	10	13	7	10	12	12	J	E
Apr. 19.6	5	4	4	5	6	6	F	E
21.6	7	6	9	8	7	6	J	E
22.6	8	7	-	-	-	-	F	E
23.6	6	8	7	6	7	7	J	E
24.6	7	6	7	6	8	9	J	E
28.6	6	5	6	6	6	5	F	E
29.9	13	9	9	6	4	4	J	E
30.6	-	-	7	9	8	-	F	E
May 2.0	11	13	10	15	15	-	J	E
2.7	11	8	8	7	8	6	F	E
3.6	7	5	6	8	7	7	J	E
4.6	8	9	7	8	8	8	F	E
7.8	-	5	-	-	-	-	J	E
9.7	9	10	11	-	-	-	J	E
14.6	7	7	7	7	5	6	F	E
15.7	10	11	10	-	-	-	J	E
16.6	6	5	6	5	5	7	J	E
19.6	5	5	5	5	4	6	J	E
22.9	8	7	8	-	8	-	F	E
23.7	7	8	9	9	9	-	F	E
24.7	-	13*	-	-	-	-	F	E
25.6	9	8	9	8	8	9	J	E
26.6	8	9	9	9	9	-	F	E
30.6	10	10	10	13	12	11	F	E
31.6	9	9	10	10	13	15	J	E
June 2.6	8	7	7	7	6	6	J	E
10.7	7	8	9	6	8	7	F	E
11.8	8	8	13	8	7	7	F	E
12.6	7	7	15	-	-	-	F	E
13.9	-	8	9	8	9	8	F	E
14.7	9	10	12	11	11	12	F	E
15.7	10	9	12	12	14	11	F	E
16.8	11	12	14	13	13	-	F	E
17.7	11	12	13	12	13	12	F	E
19.6	15	15	13	>15	15	10	F	E
20.6	12	12	12	13	12	12	F	E
21.6	4	4	3	2	2	2	J	E
22.8	10	9	9	9	13	13	F	E
24.8	7	8	7	9	8	10	F	E
25.6	5	8	8	8	6	6	J	E
26.6	7	8	7	9	9	8	F	E
27.7	11	11	10	10	8	7	J	E
28.7	8	9	10	9	9	7	F	E
29.6	8	8	6	7	6	7	J	E
30.6	12	13	11	8	13	12	F	E

E = J.W. Evans
F = W. Fleming
J = D. Johnson
* = Value at 100° ±5°

GRAPHS OF IONOSPHERIC DATA

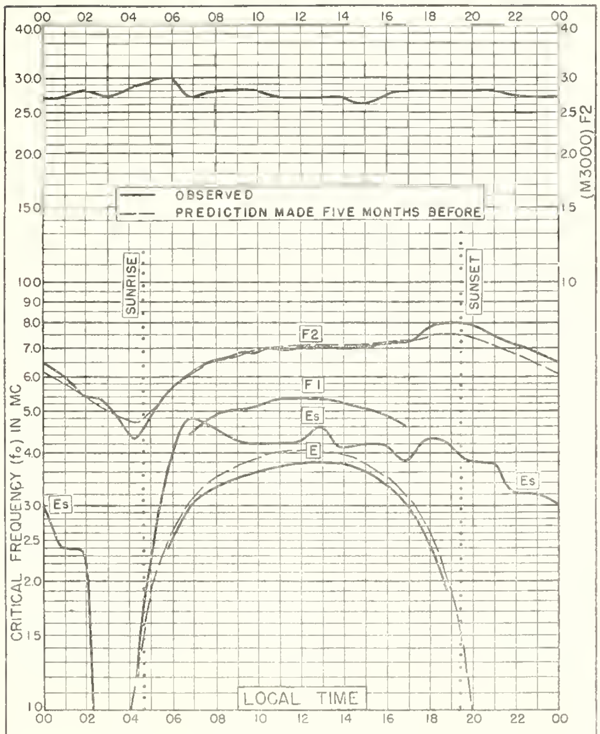

Fig. 1. WASHINGTON, D.C.
39.0°N, 77.5°W JUNE 1949

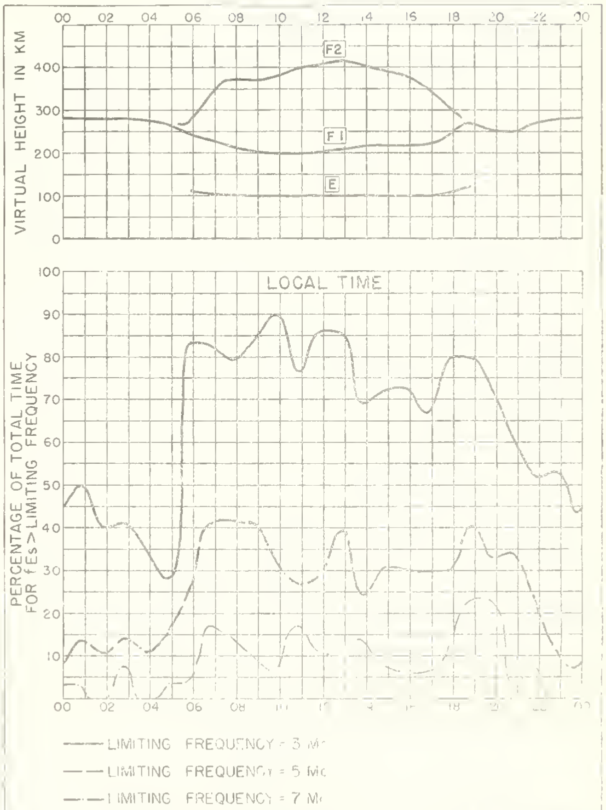

Fig. 2. WASHINGTON, D.C. JUNE 1949

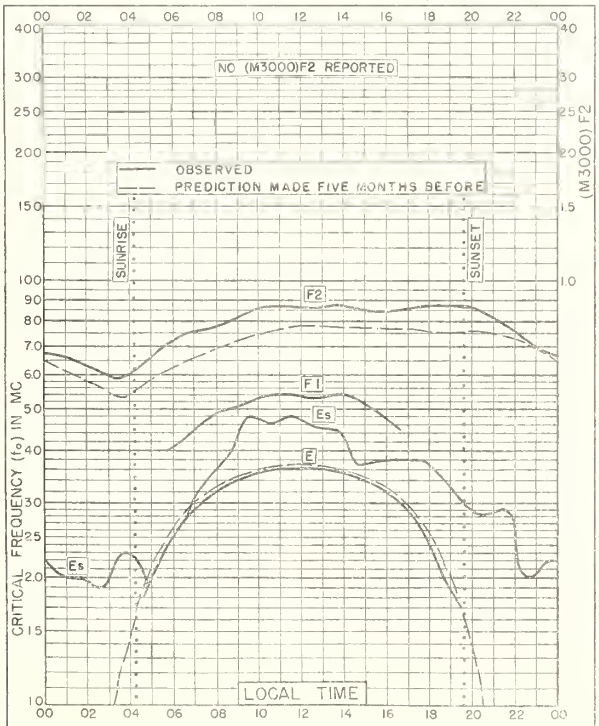

Fig. 3. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E MAY 1949

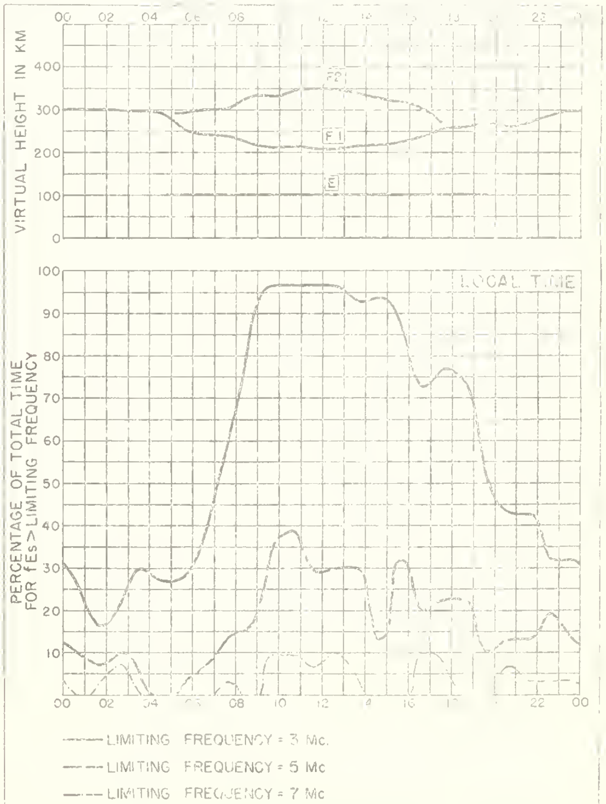

Fig. 4. LINDAU/HARZ, GERMANY MAY 1949

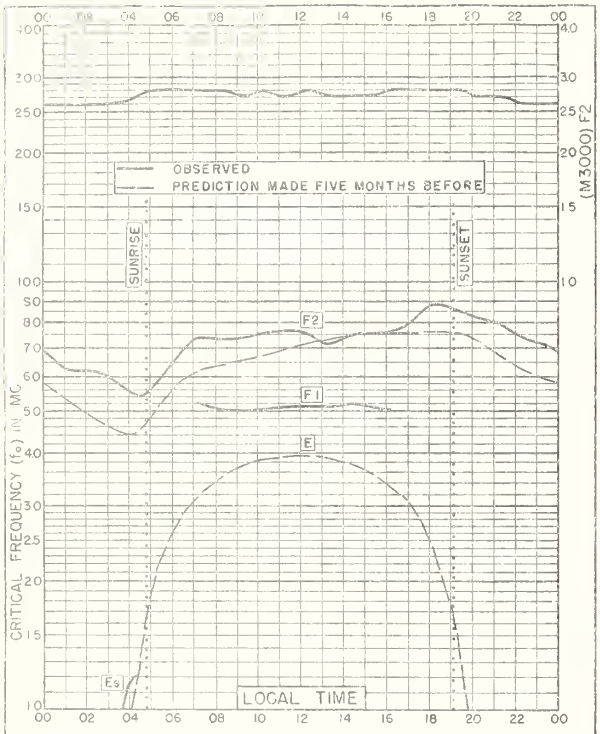

Fig. 5. BOSTON, MASSACHUSETTS
42 4°N, 71. 2°W MAY 1949

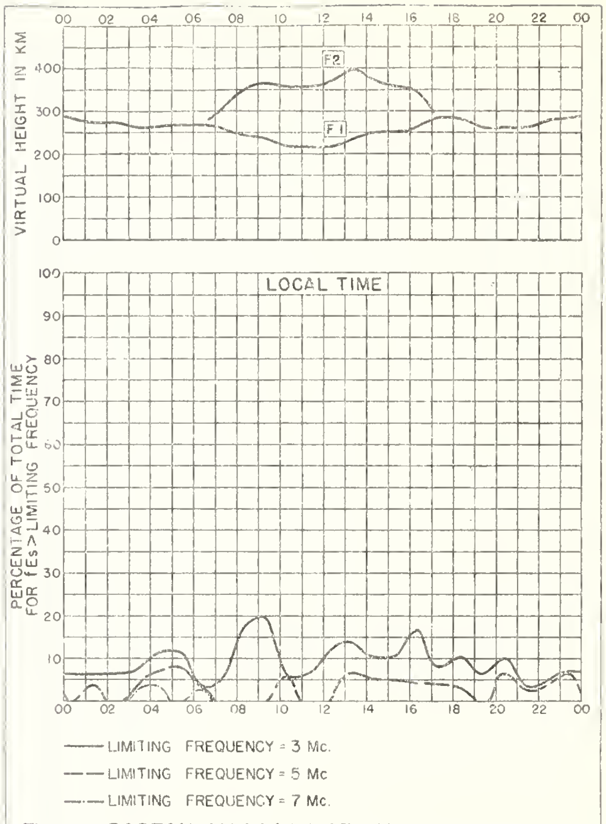

Fig. 6. BOSTON, MASSACHUSETTS MAY 1949

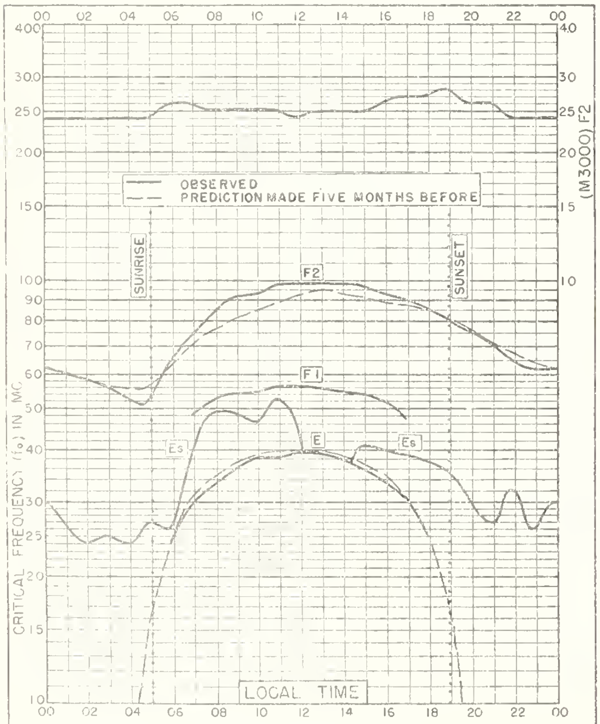

Fig. 7. SAN FRANCISCO, CALIFORNIA
37.4°N, 122. 2°W MAY 1949

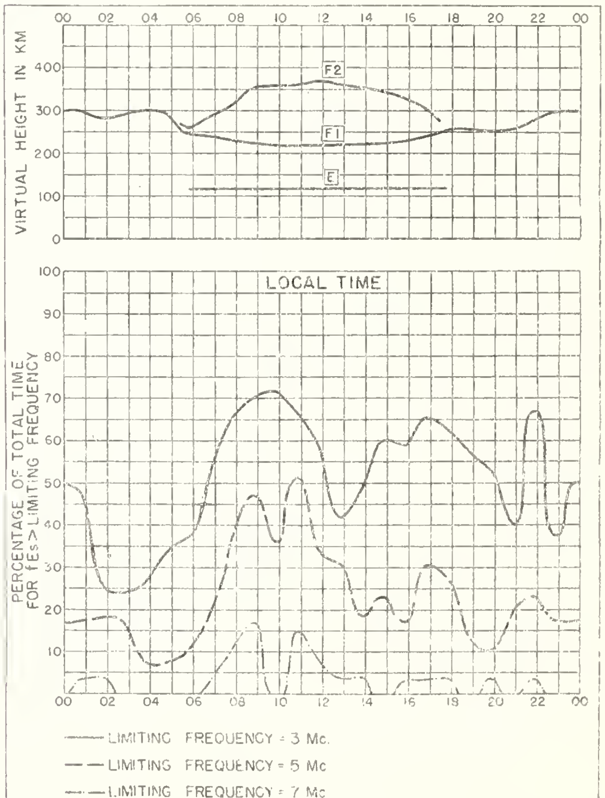

Fig. 8. SAN FRANCISCO, CALIFORNIA MAY 1949

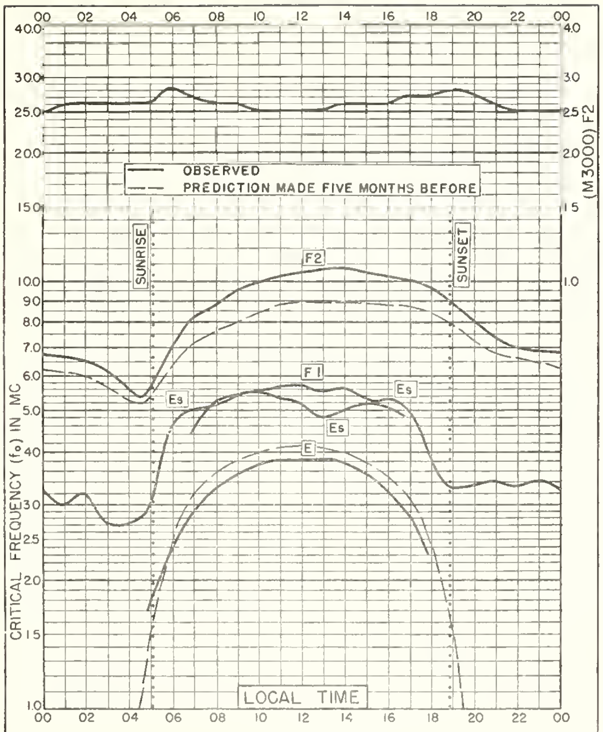

Fig. 9. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W MAY 1949

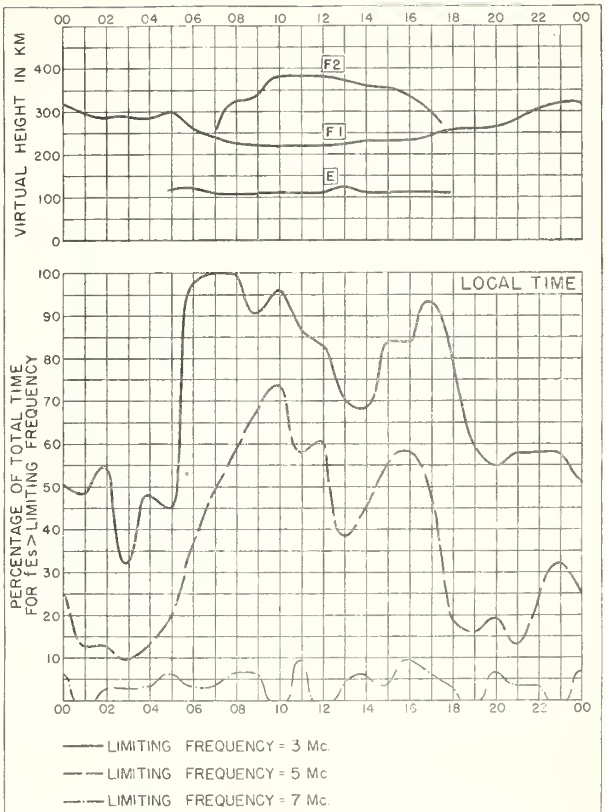

Fig. 10. WHITE SANDS, NEW MEXICO MAY 1949

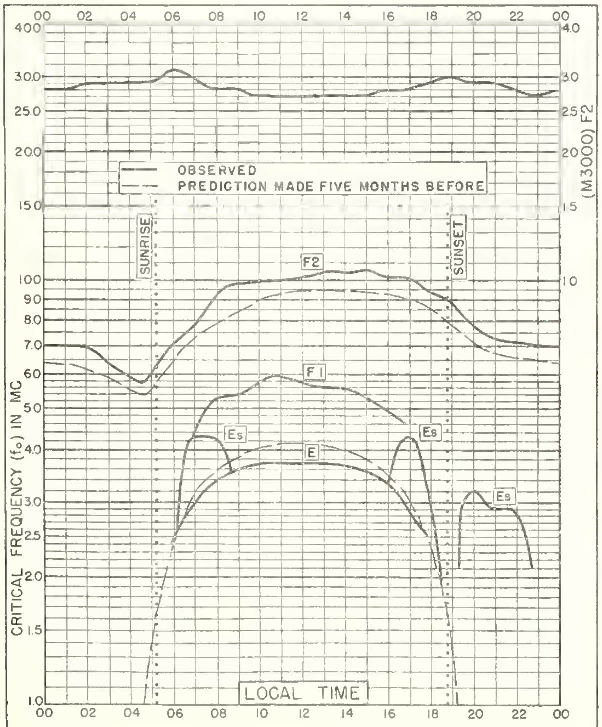

Fig. 11. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W MAY 1949

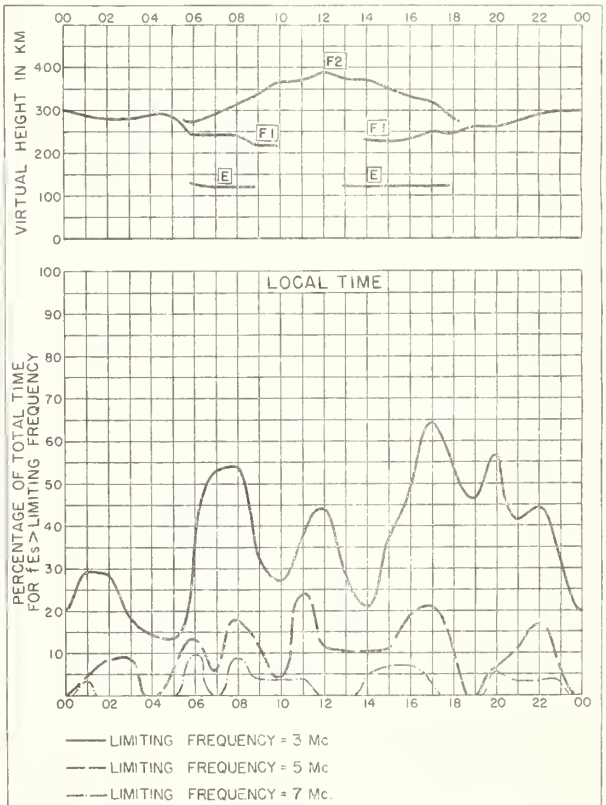

Fig. 12. BATON ROUGE, LOUISIANA MAY 1949

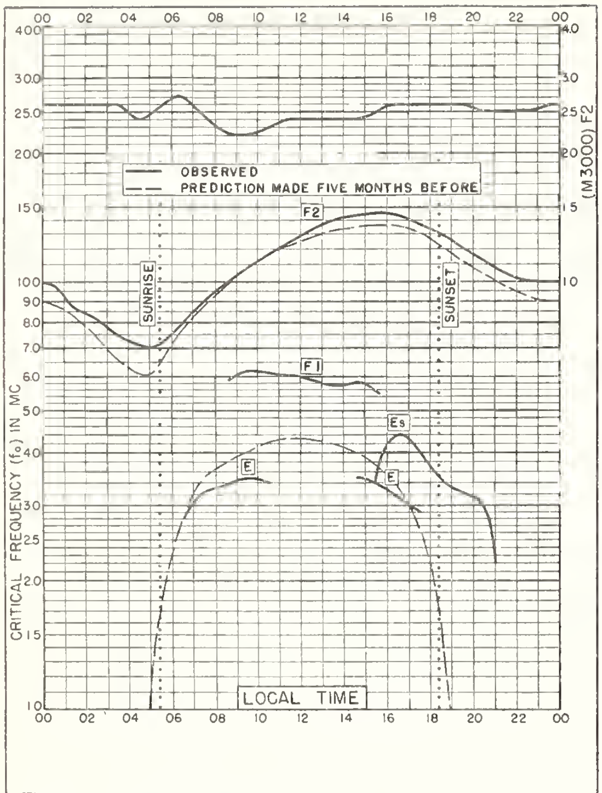

Fig. 13. MAUI, HAWAII
20.8°N, 156.5°W MAY 1949

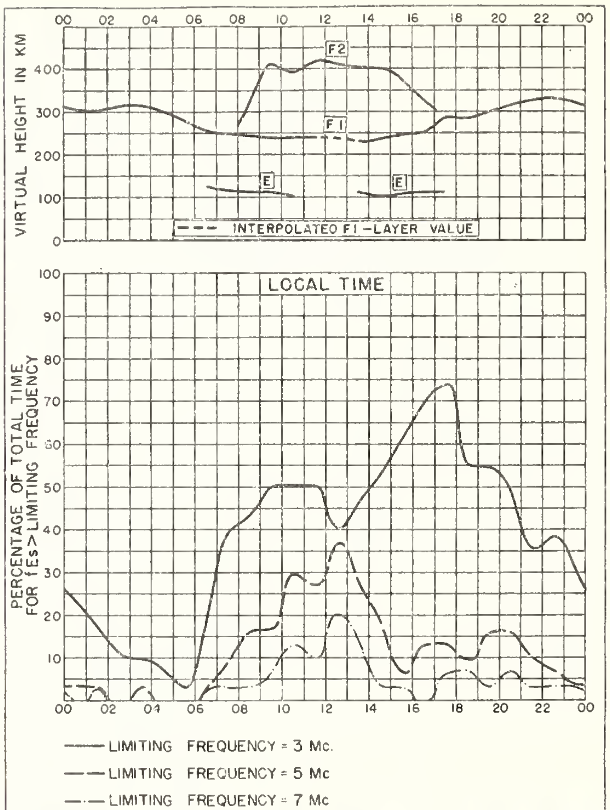

Fig. 14. MAUI, HAWAII MAY 1949

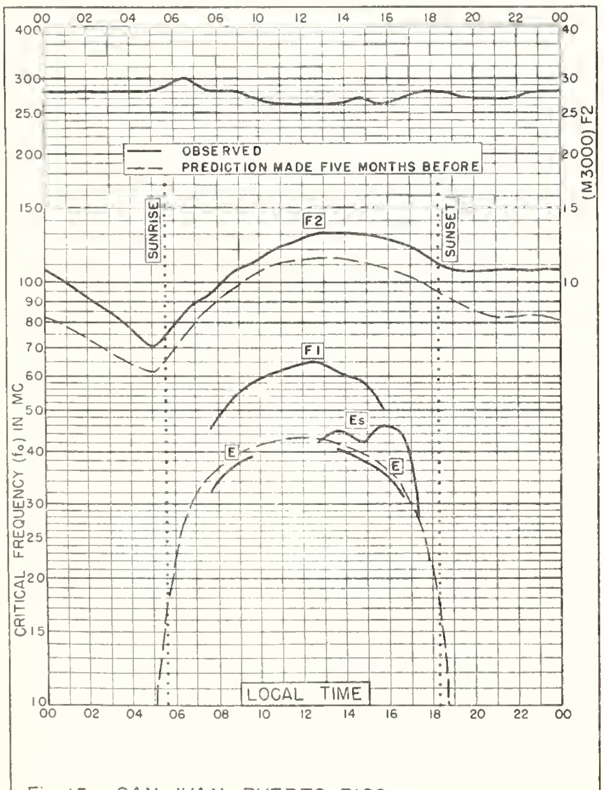

Fig. 15. SAN JUAN, PUERTO RICO
18.4°N, 66.1°W MAY 1949

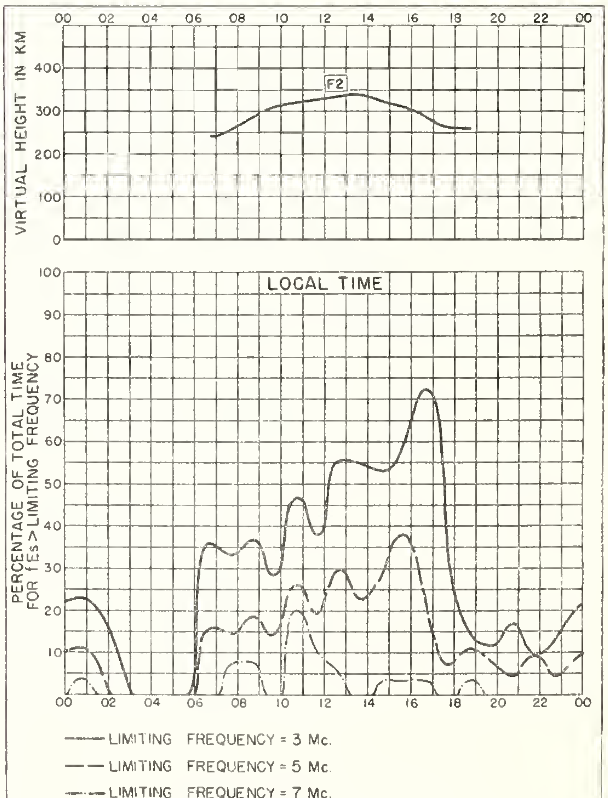

Fig. 16. SAN JUAN, PUERTO RICO MAY 1949

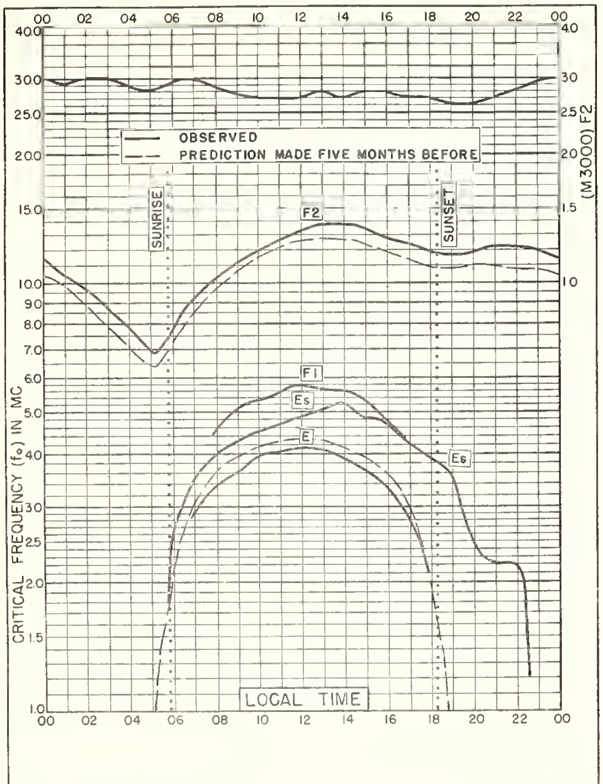

Fig. 17. TRINIDAD, BRIT. WEST INDIES
10.6°N, 61.2°W MAY 1949

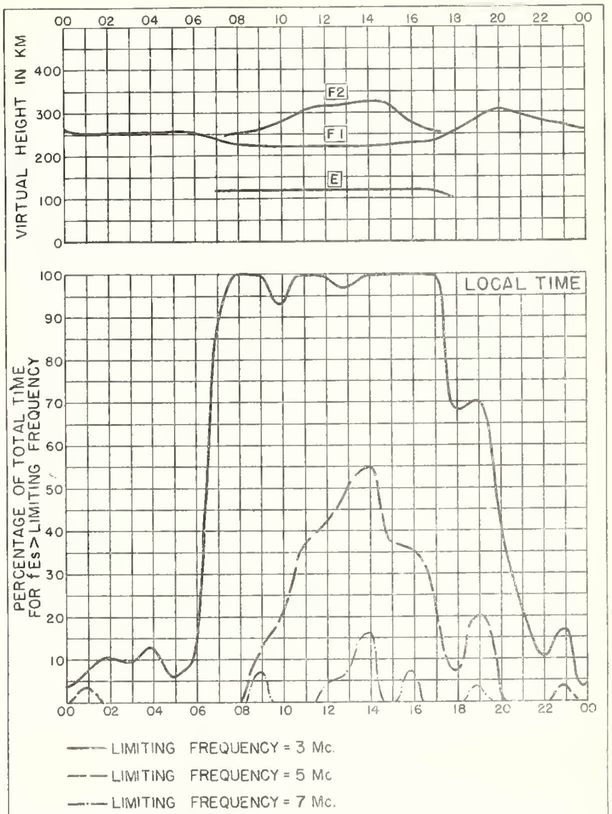

Fig. 18. TRINIDAD, BRIT. WEST INDIES MAY 1949

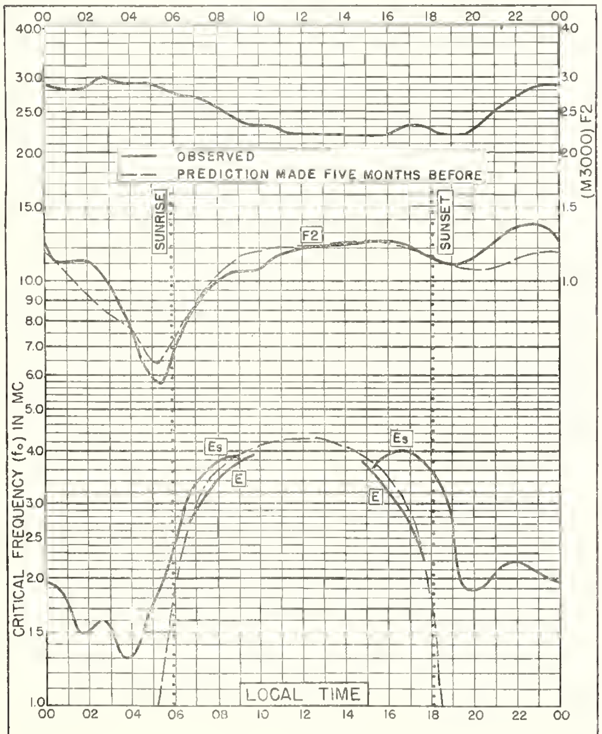

Fig. 19. PALMYRA I.
5.9°N, 162.1°W MAY 1949

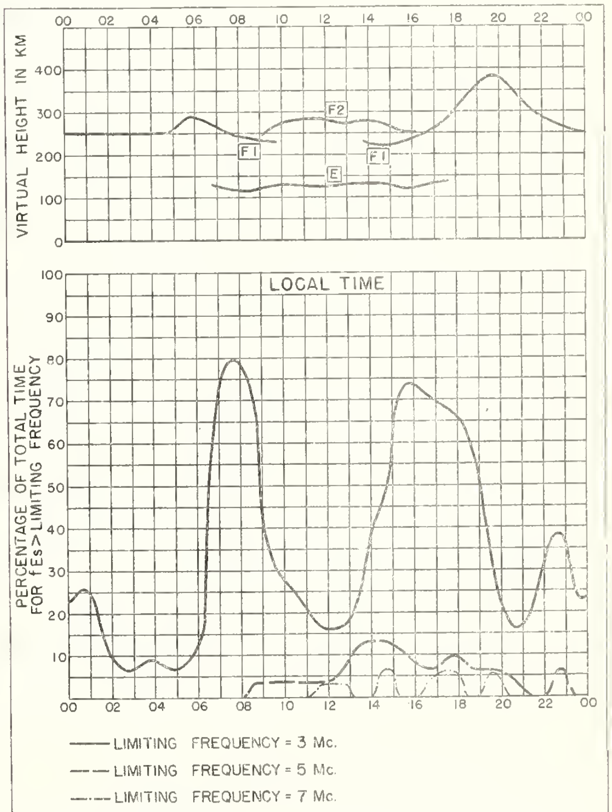

Fig. 20. PALMYRA I. MAY 1949

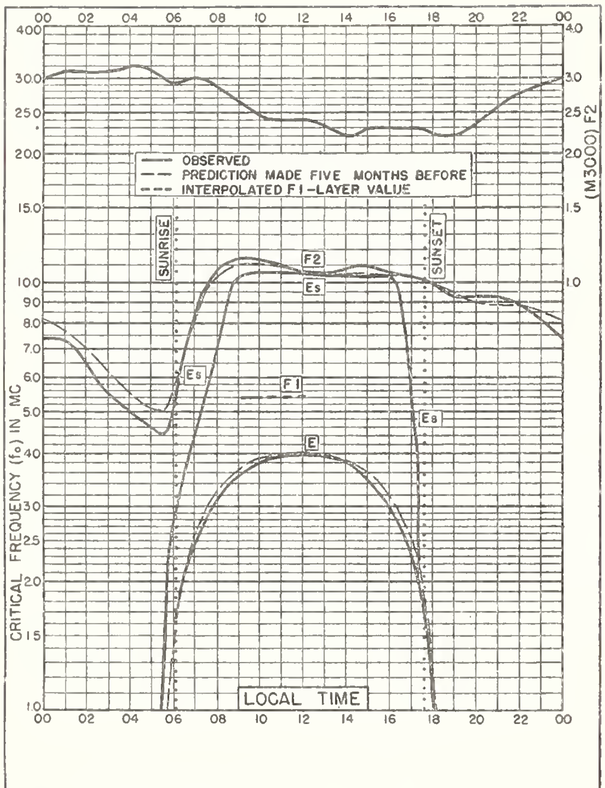

Fig. 21. HUANCAYO, PERU
12. 0°S, 75.3°W MAY 1949

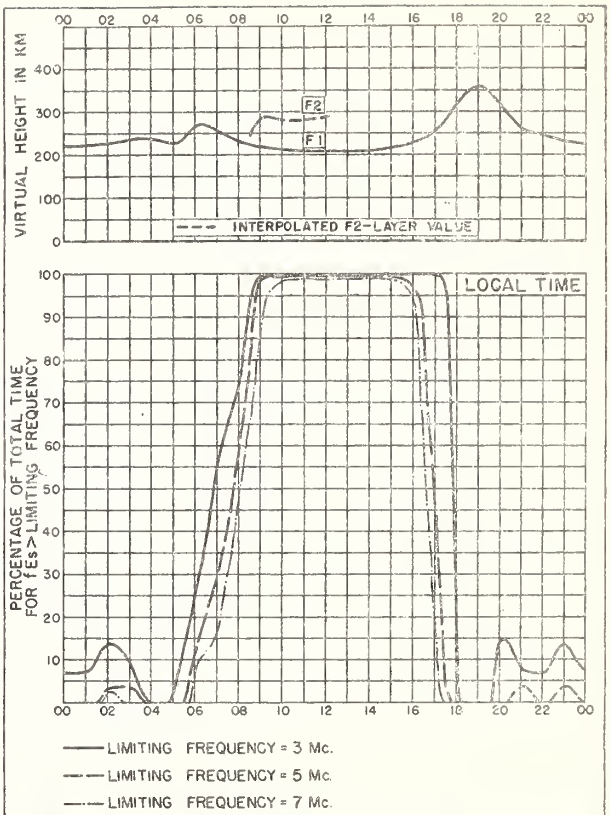

Fig. 22. HUANCAYO, PERU MAY 1949

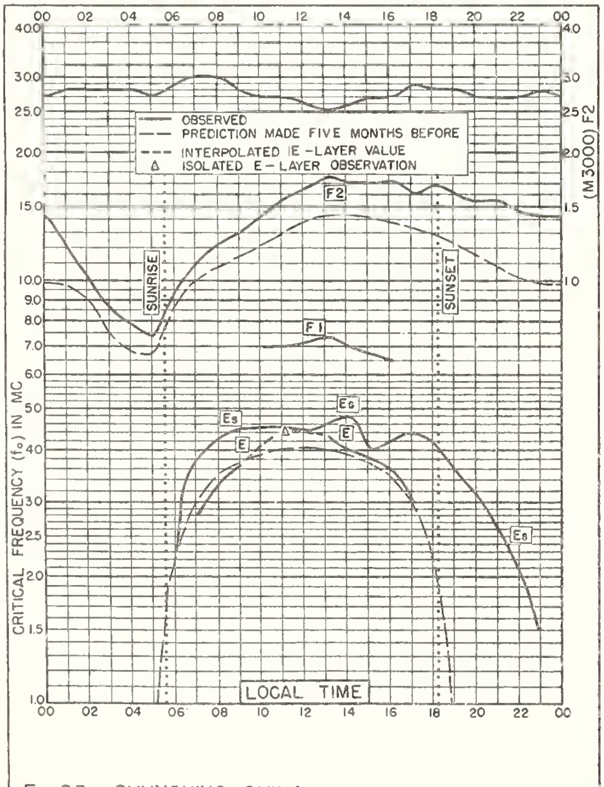

Fig. 23. CHUNGKING, CHINA
29.4°N, 106. 8°E APRIL 1949

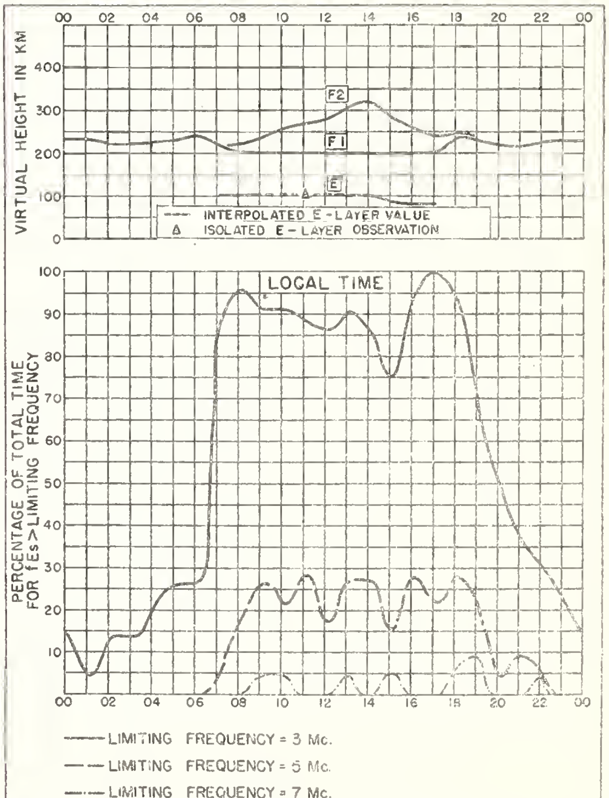

Fig. 24. CHUNGKING, CHINA APRIL 1949

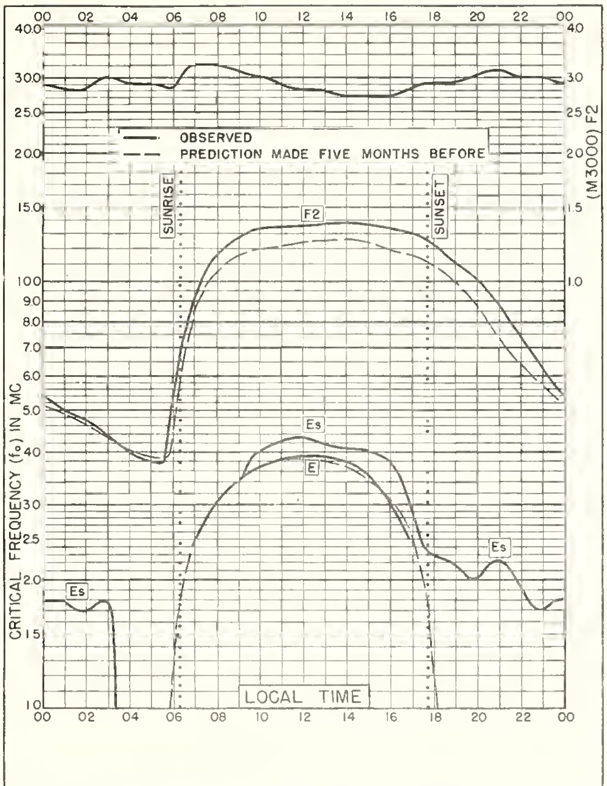

Fig. 25. JOHANNESBURG, U. OF S. AFRICA
26. 2°S, 28. 0°E APRIL 1949

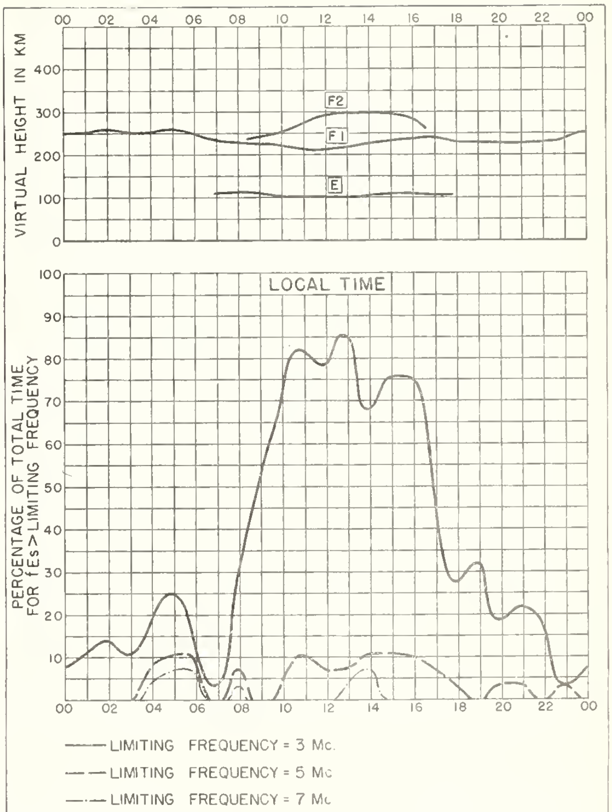

Fig. 26. JOHANNESBURG, U. OF S. AFRICA APRIL 1949

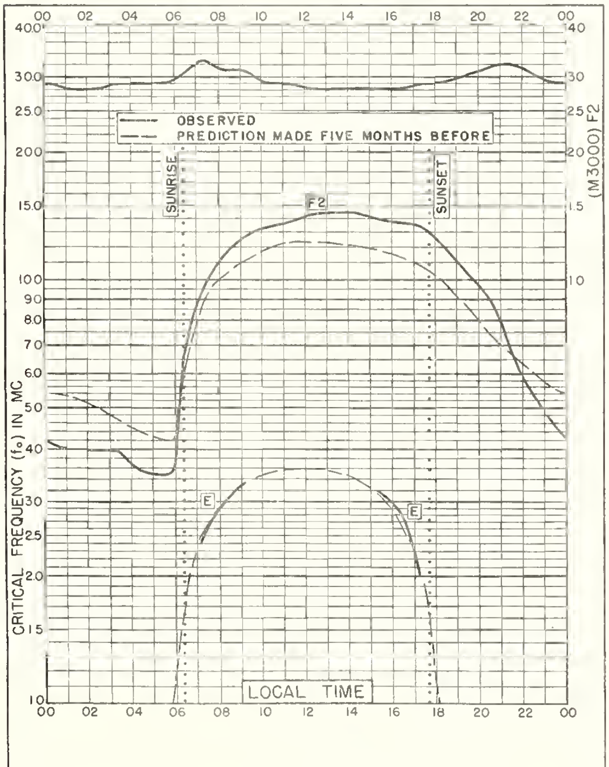

Fig. 27. CAPETOWN, U. OF S. AFRICA
34. 2°S, 18. 3°E APRIL 1949

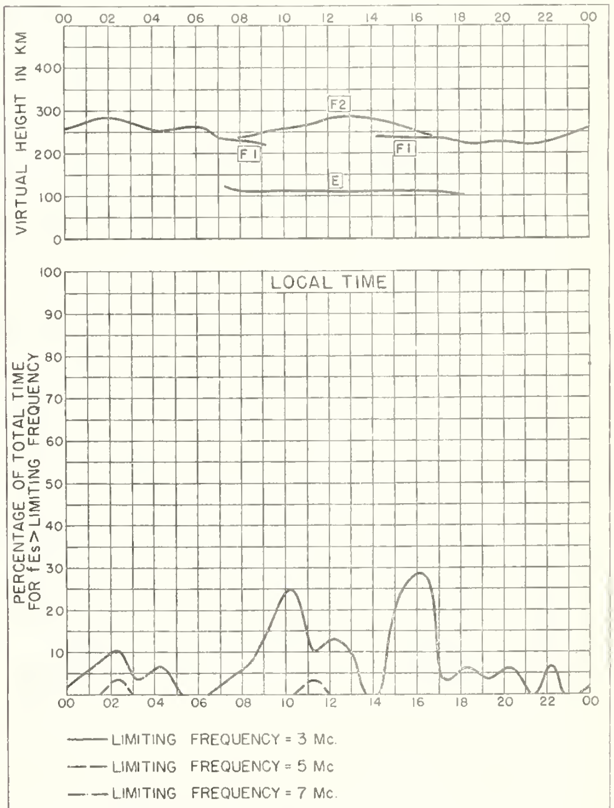

Fig. 28. CAPETOWN, U. OF S. AFRICA APRIL 1949

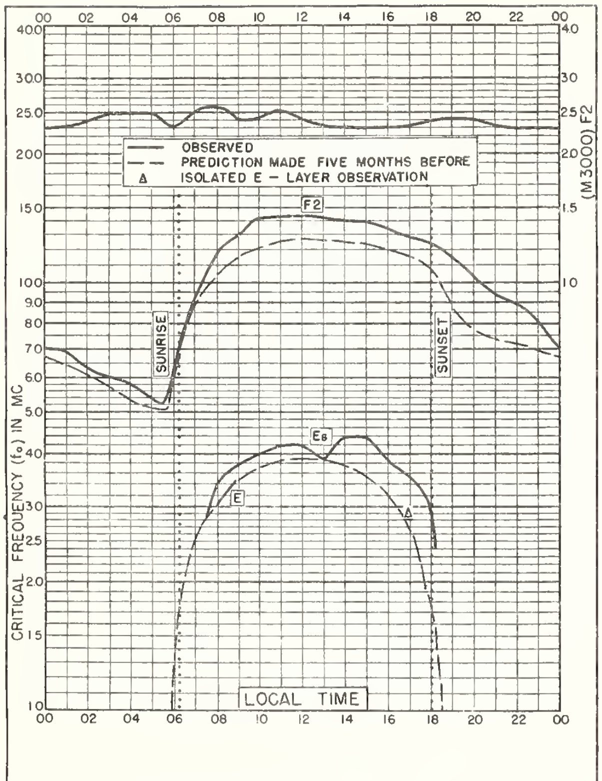

Fig. 29. LANCHOW, CHINA
36.1°N, 103.8°E MARCH 1949

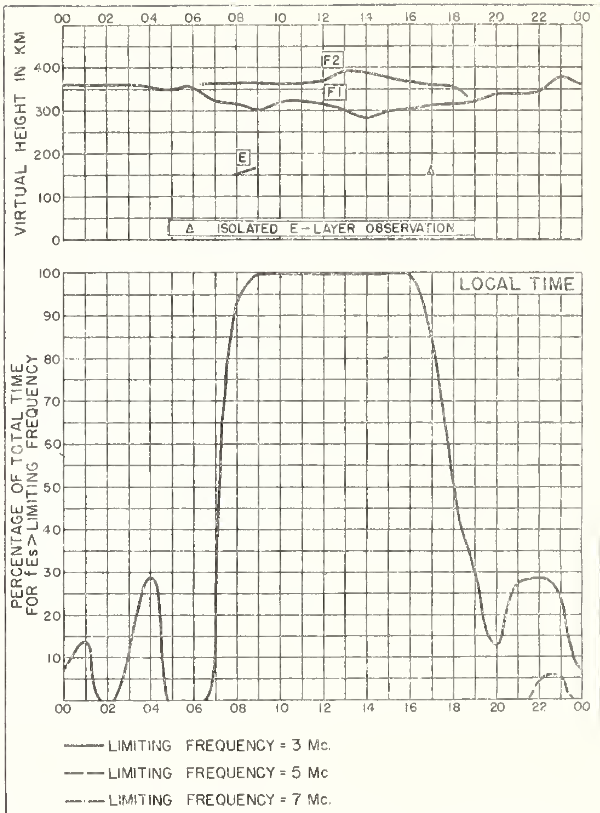

Fig. 30. LANCHOW, CHINA MARCH 1949

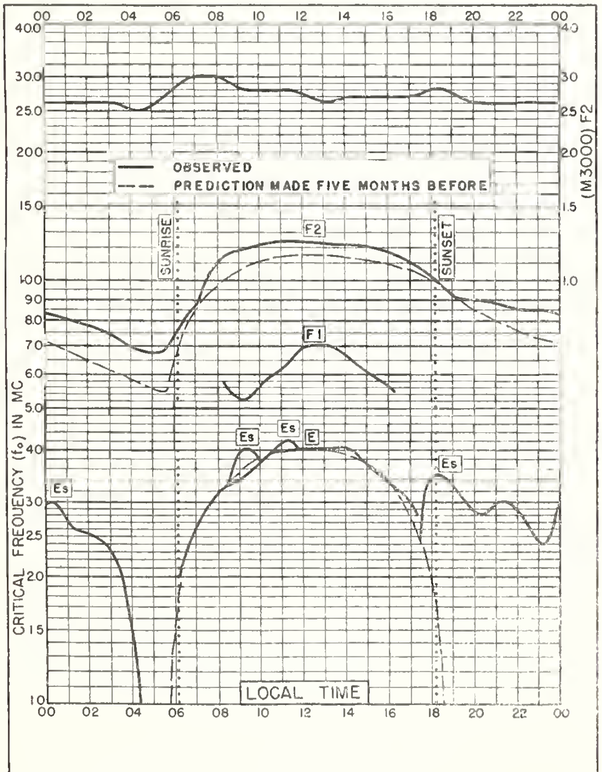

Fig. 31. BRISBANE, AUSTRALIA
27.5°S, 153.0°E MARCH 1949

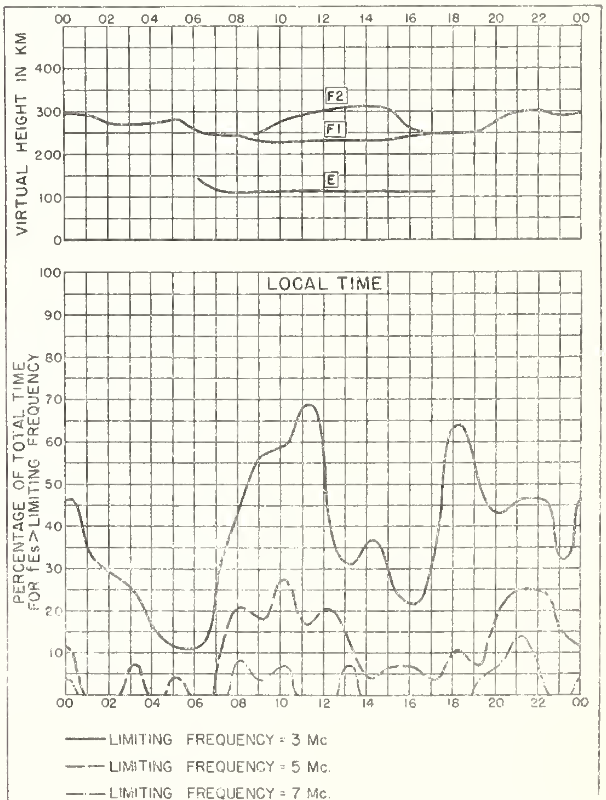

Fig. 32. BRISBANE, AUSTRALIA MARCH 1949

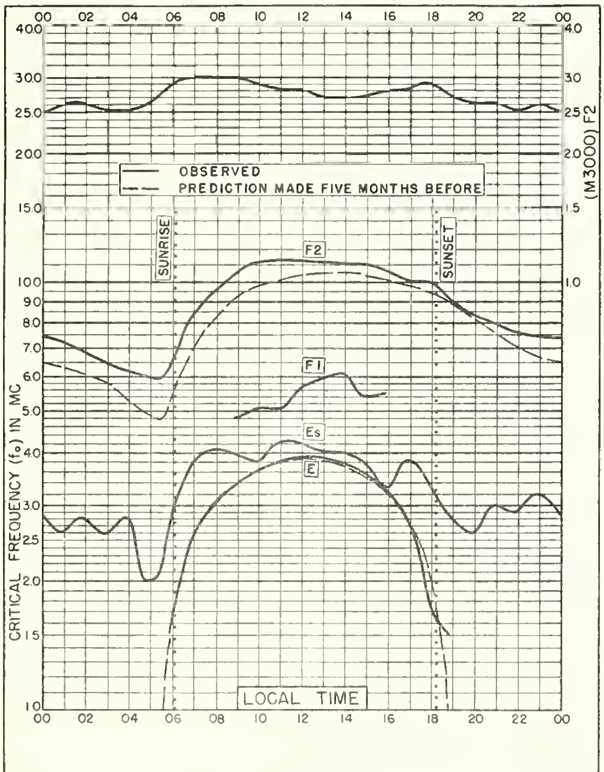

Fig. 33. CANBERRA, AUSTRALIA
35.3°S, 149.0°E MARCH 1949

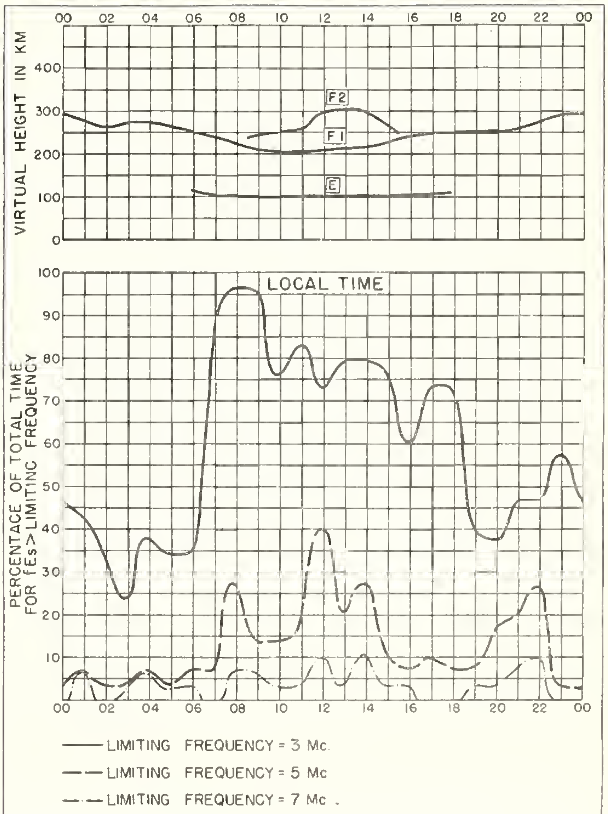

Fig. 34. CANBERRA, AUSTRALIA MARCH 1949

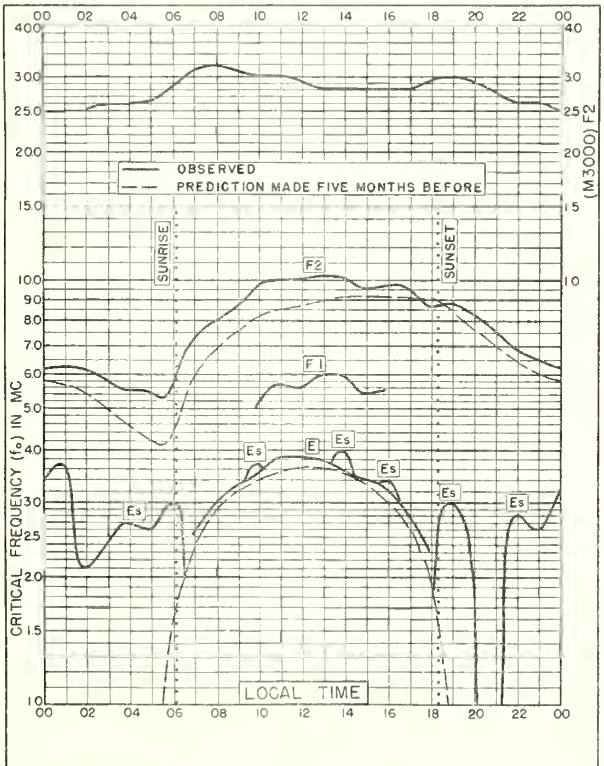

Fig. 35. HOBART, TASMANIA
42.8°S, 147.4°E MARCH 1949

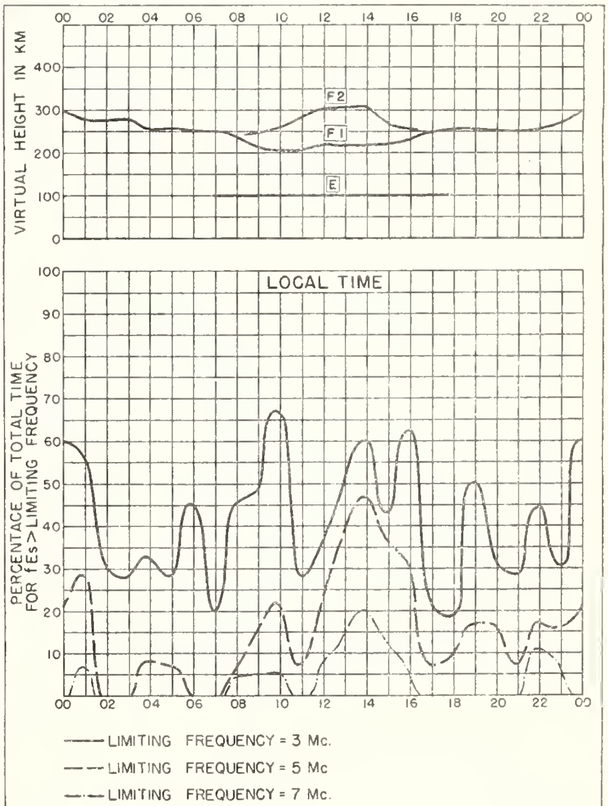

Fig. 36. HOBART, TASMANIA MARCH 1949

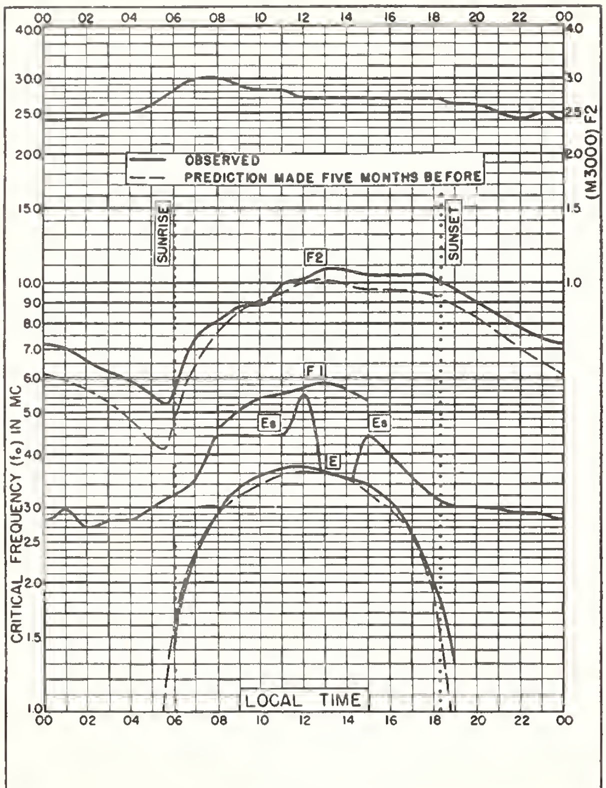

Fig. 37. CHRISTCHURCH, N. Z.
43.5°S, 172.7°E MARCH 1949

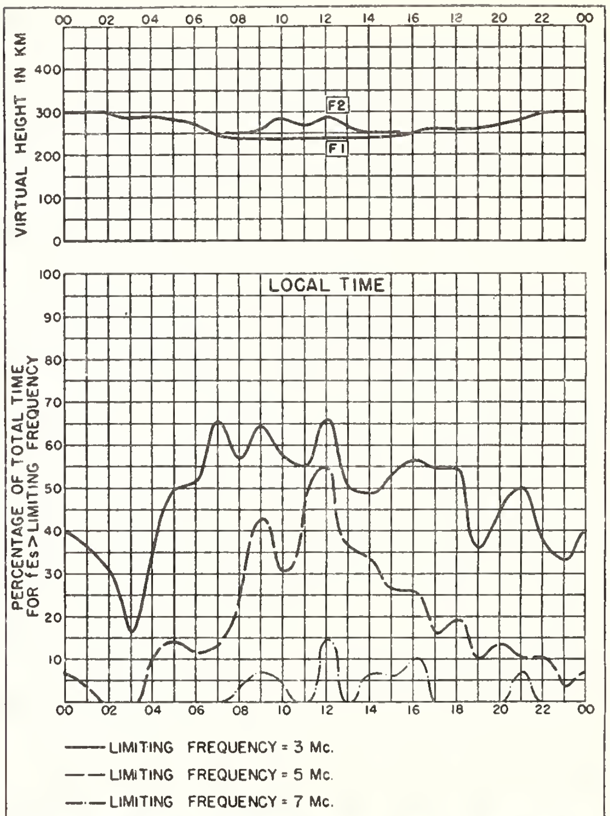

Fig. 38. CHRISTCHURCH, N. Z. MARCH 1949

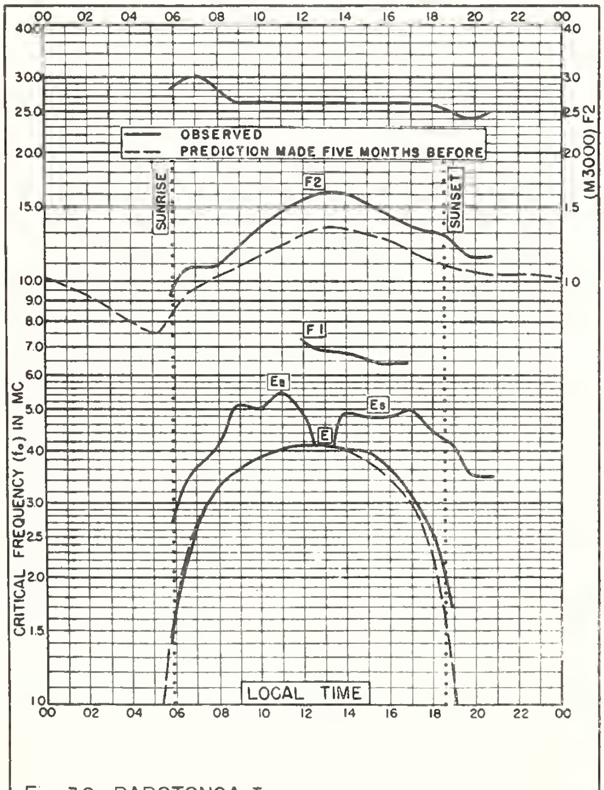

Fig. 39. RAROTONGA I.
21.3°S, 159.8°W FEBRUARY 1949

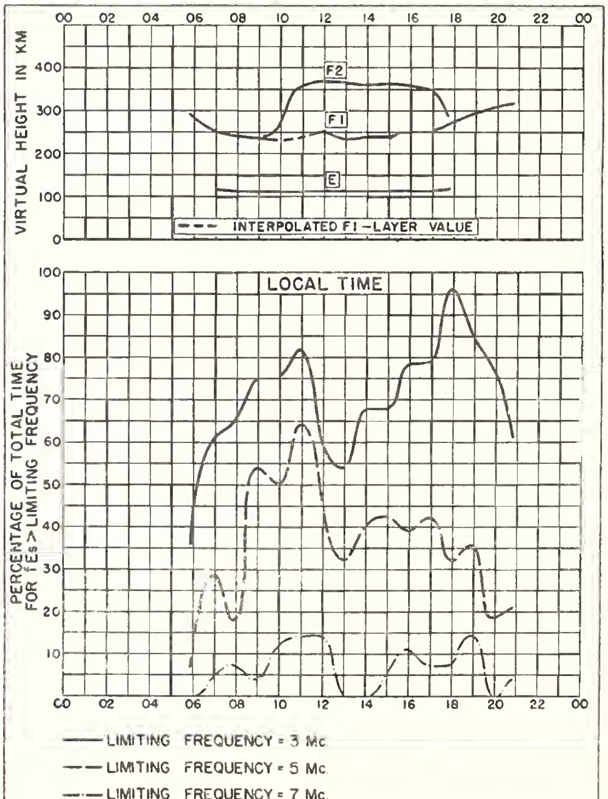

Fig. 40. RAROTONGA I. FEBRUARY 1949

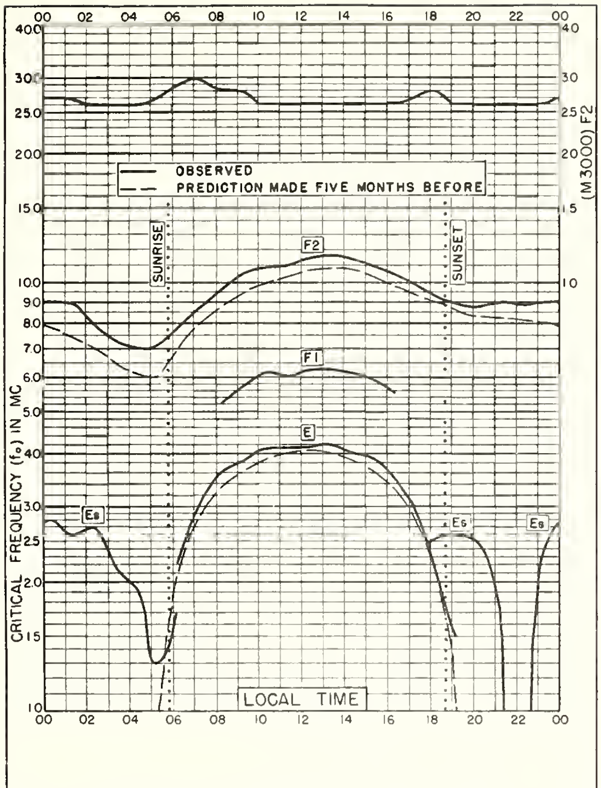

Fig. 41. BRISBANE, AUSTRALIA
27.5°S, 153. 0°E FEBRUARY 1949

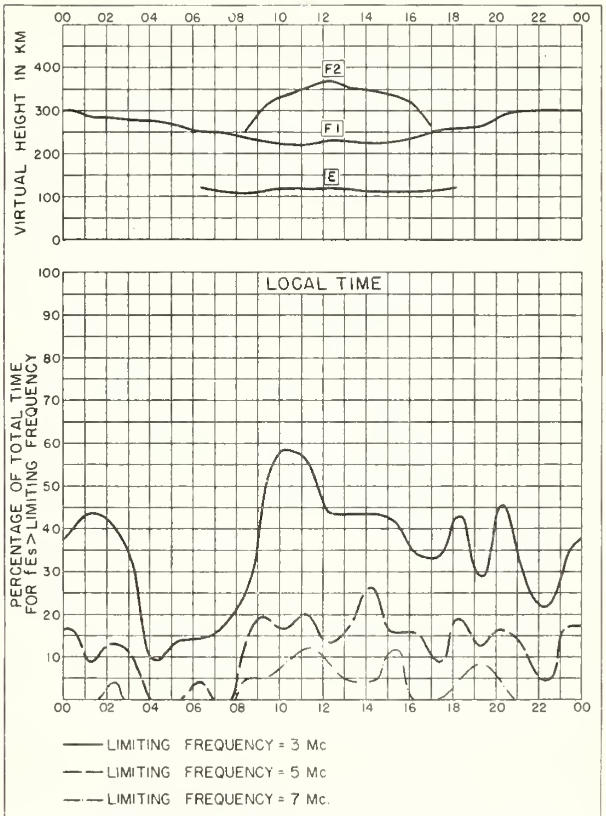

Fig. 42. BRISBANE, AUSTRALIA FEBRUARY 1949

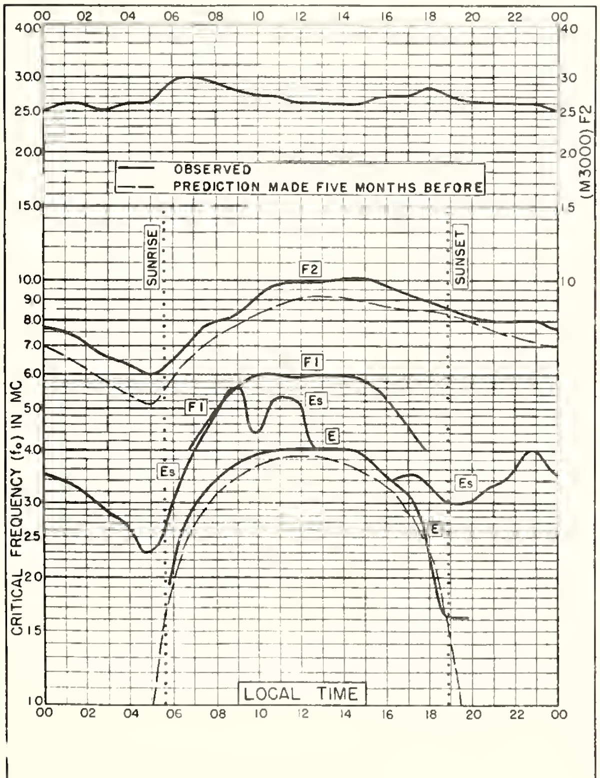

Fig. 43. CANBERRA, AUSTRALIA
35. 3°S, 149. 0°E FEBRUARY 1949

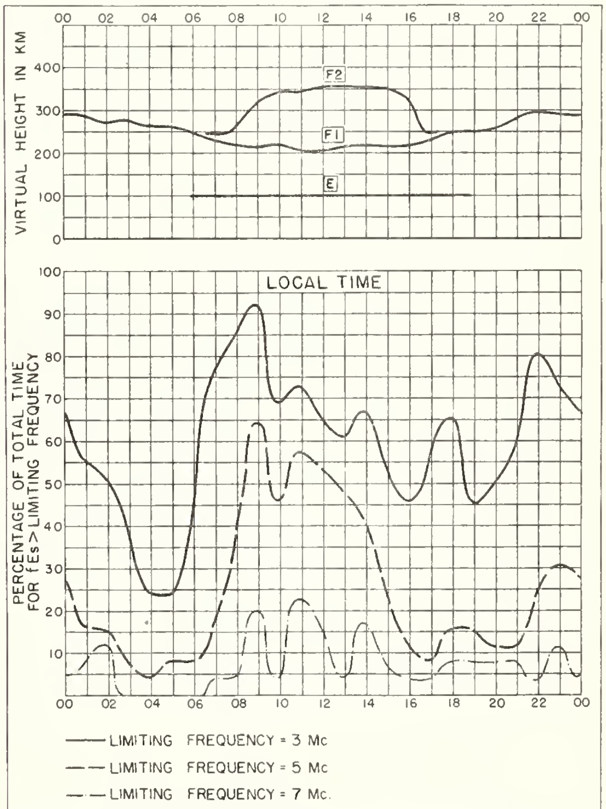

Fig. 44. CANBERRA, AUSTRALIA FEBRUARY 1949

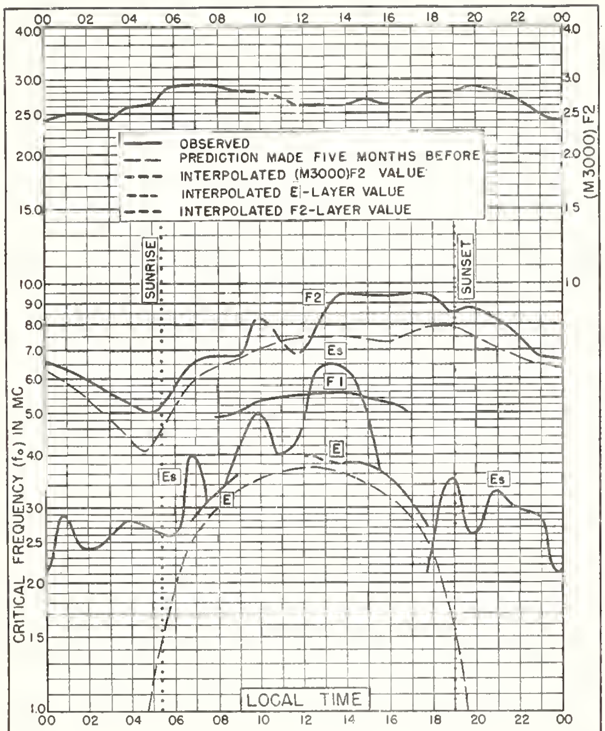

Fig. 45. HOBART, TASMANIA
42. 8°S, 147. 4°E FEBRUARY 1949

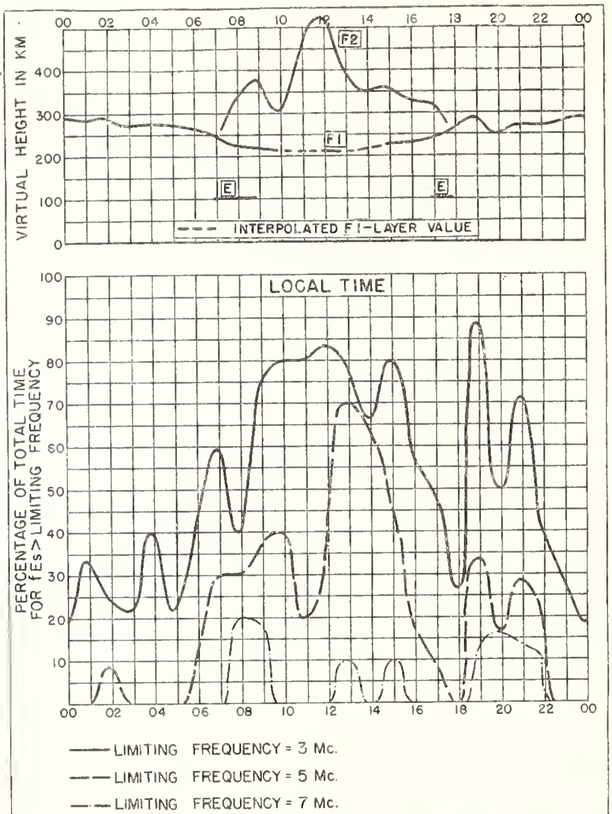

Fig. 46. HOBART, TASMANIA FEBRUARY 1949

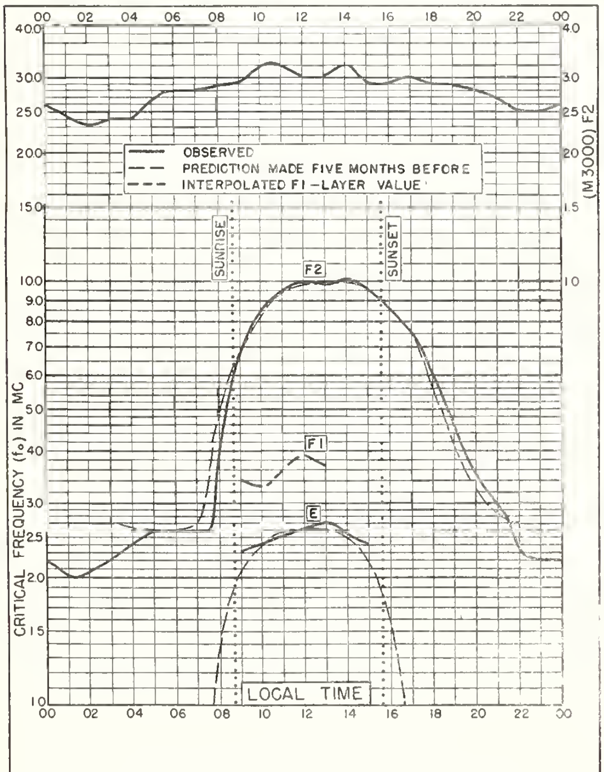

Fig. 47. FRASERBURGH, SCOTLAND
57.6°N, 2.1°W JANUARY 1949

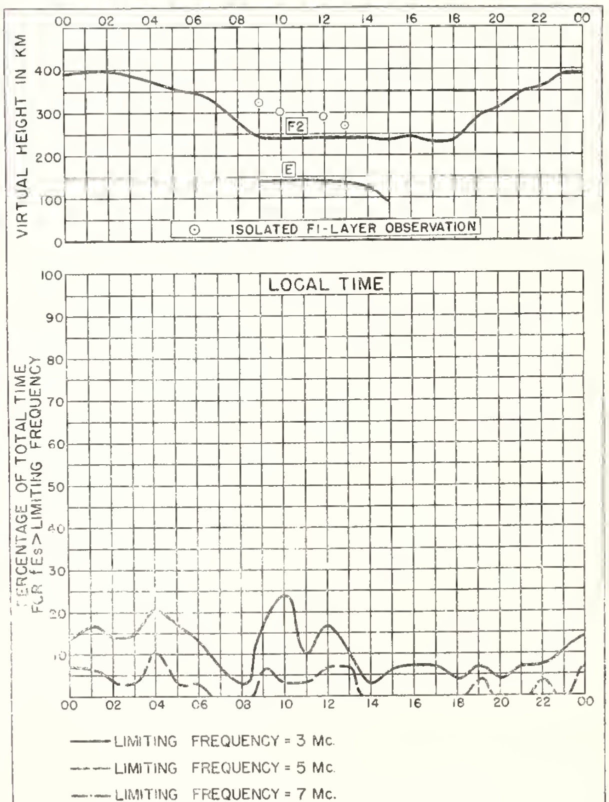

Fig. 48. FRASERBURGH, SCOTLAND JANUARY 1949

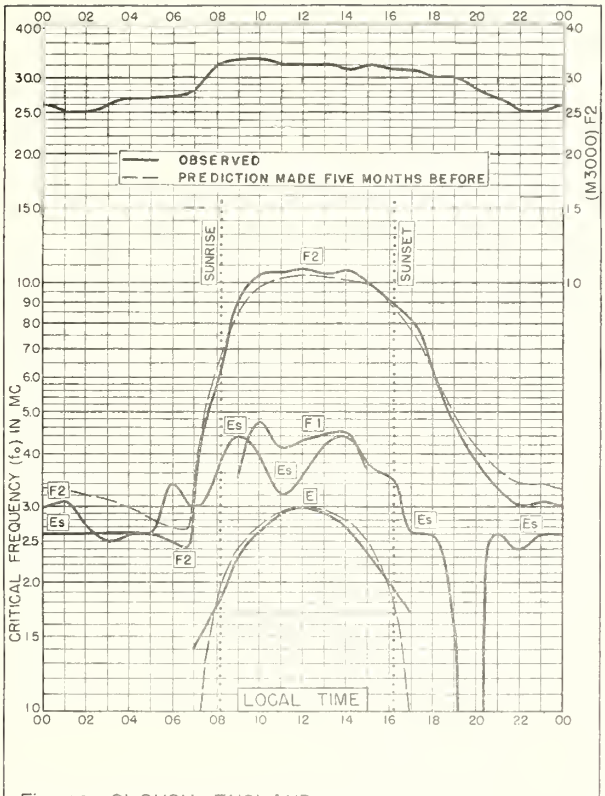

Fig. 49. SLOUGH, ENGLAND
51.5°N, 0.6°W JANUARY 1949

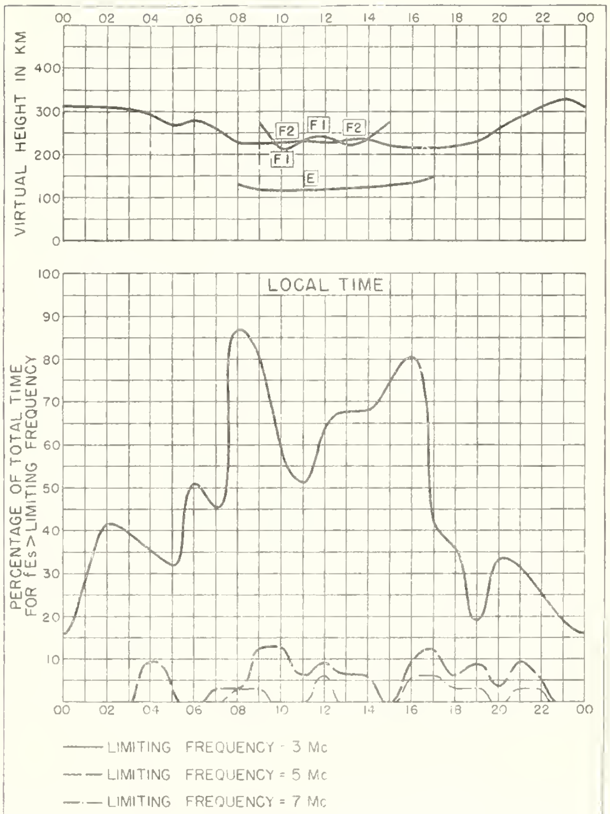

Fig. 50. SLOUGH, ENGLAND JANUARY 1949

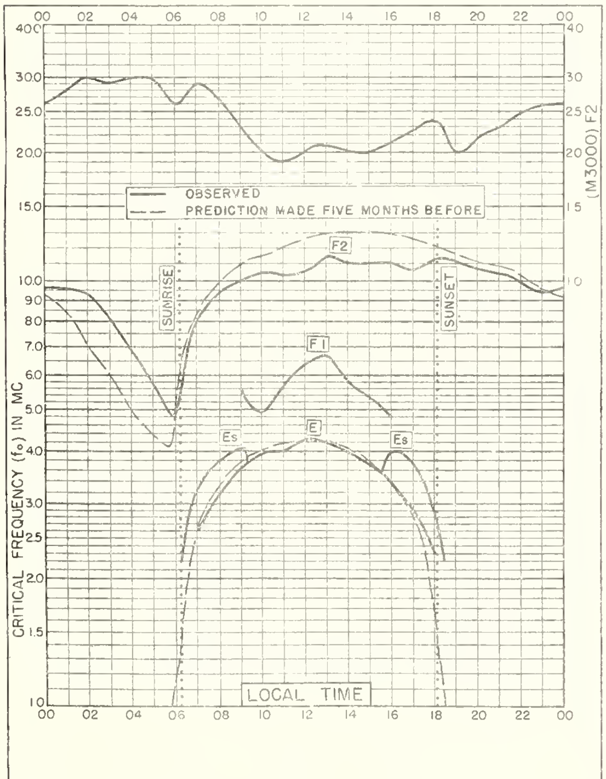

Fig. 51. SINGAPORE, BRITISH MALAYA
1.3°N, 103.8°E JANUARY 1949

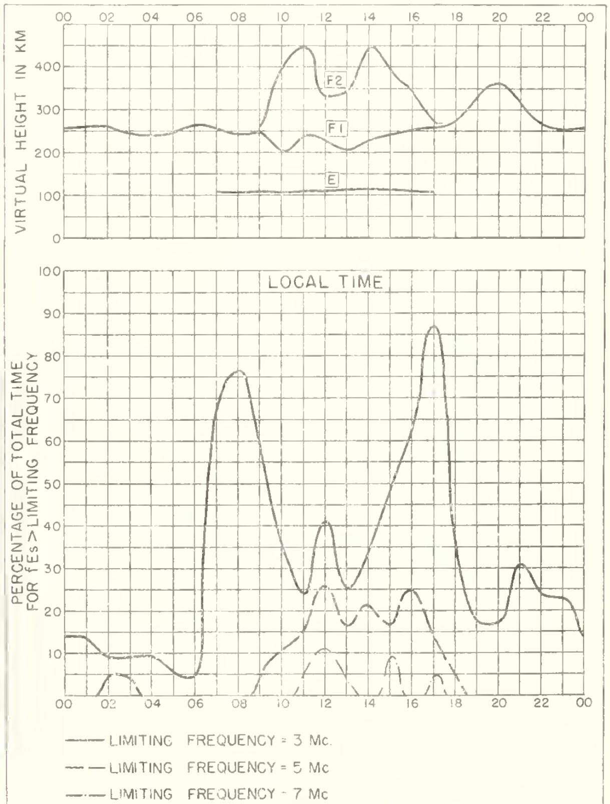

Fig. 52. SINGAPORE, BRITISH MALAYA JANUARY 1949

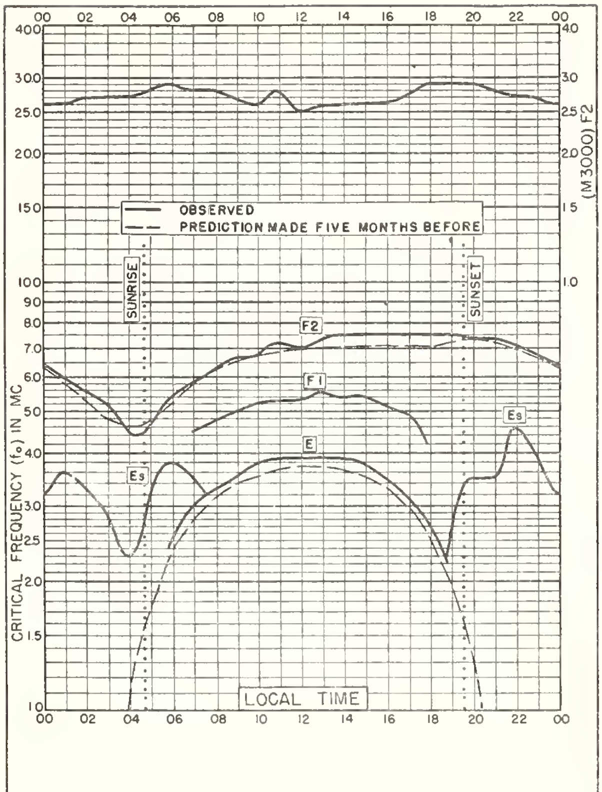

Fig. 53. HOBART, TASMANIA
42.8°S, 147.4°E JANUARY 1949

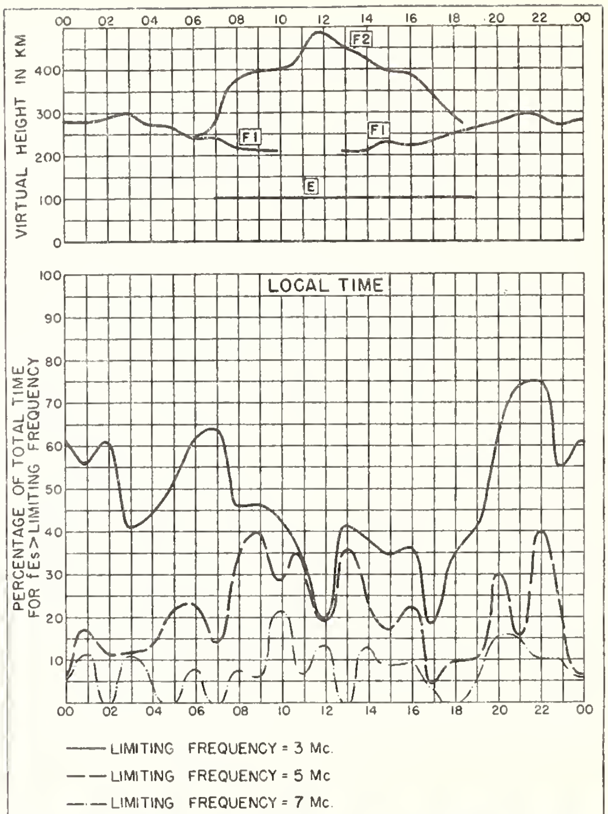

Fig. 54. HOBART, TASMANIA JANUARY 1949

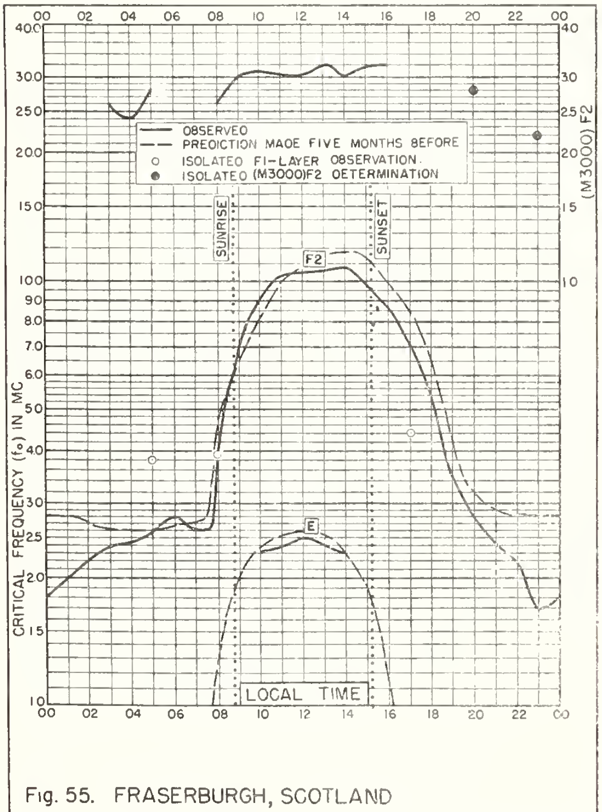

Fig. 55. FRASERBURGH, SCOTLAND
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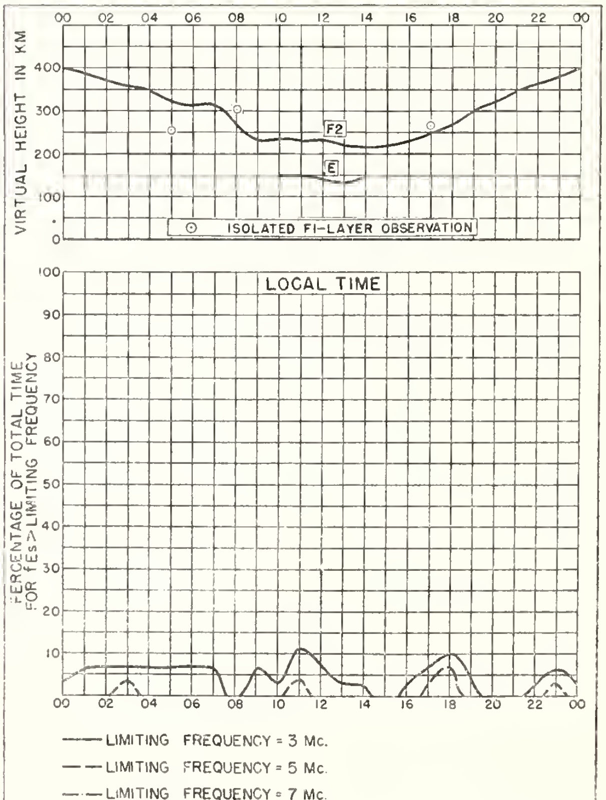

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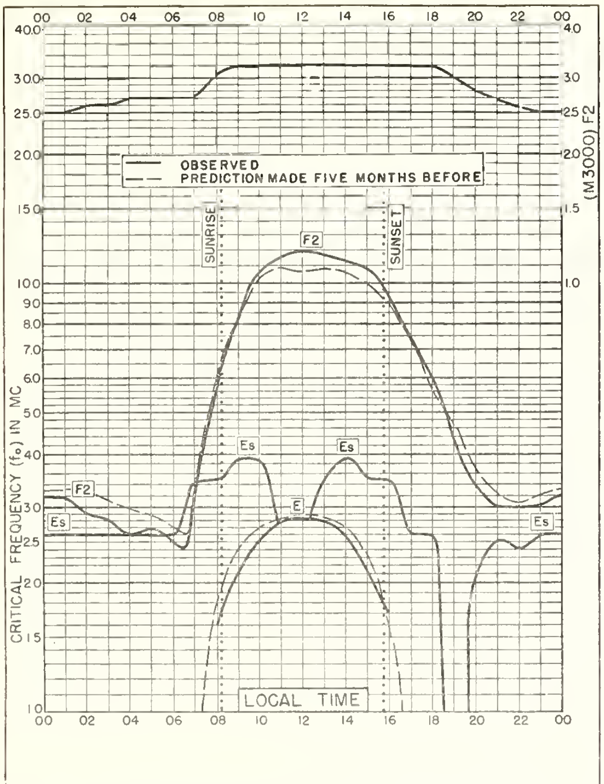

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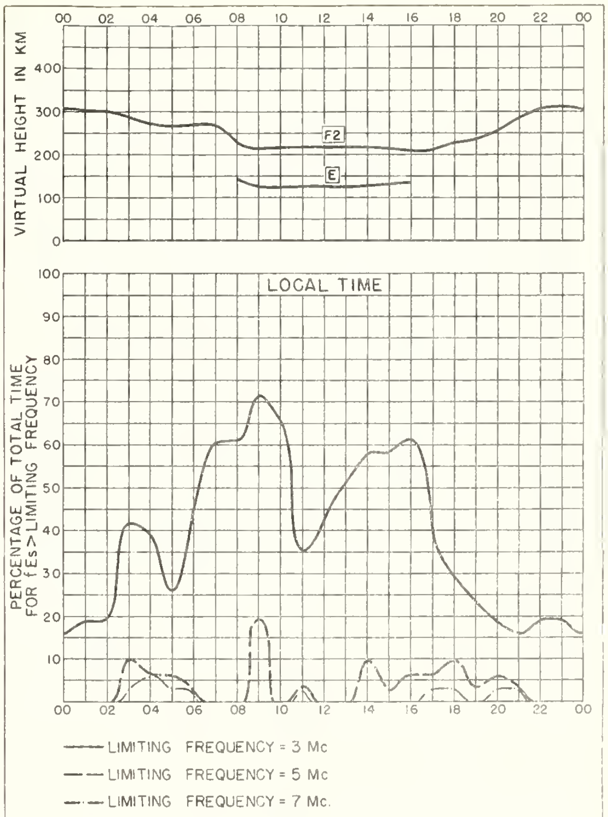
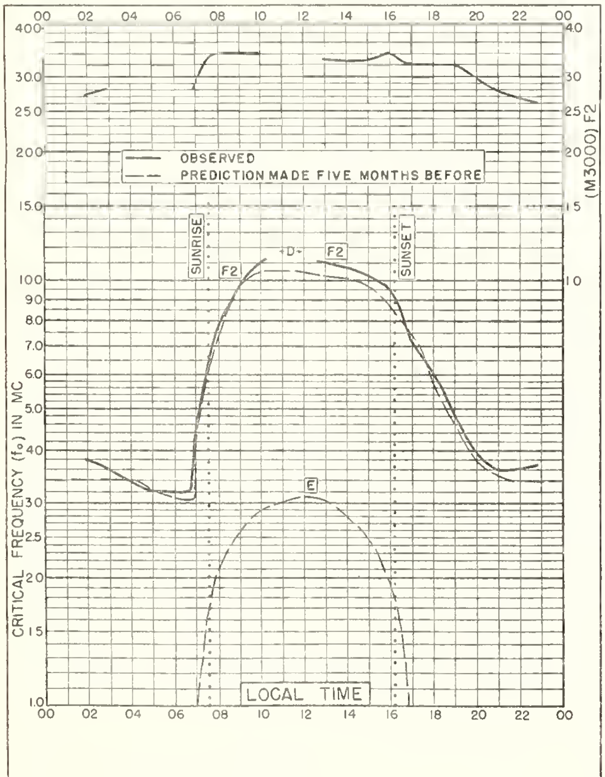


Fig. 58. SLOUGH, ENGLAND DECEMBER 1948



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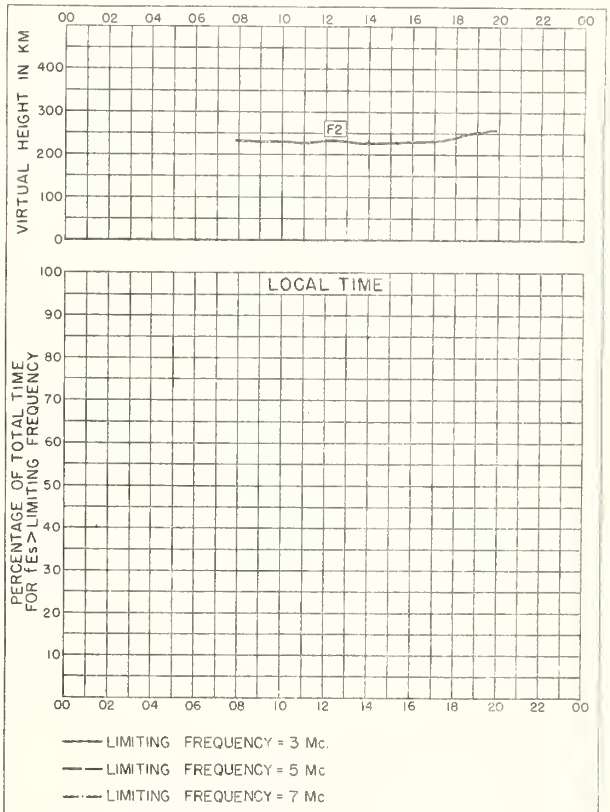

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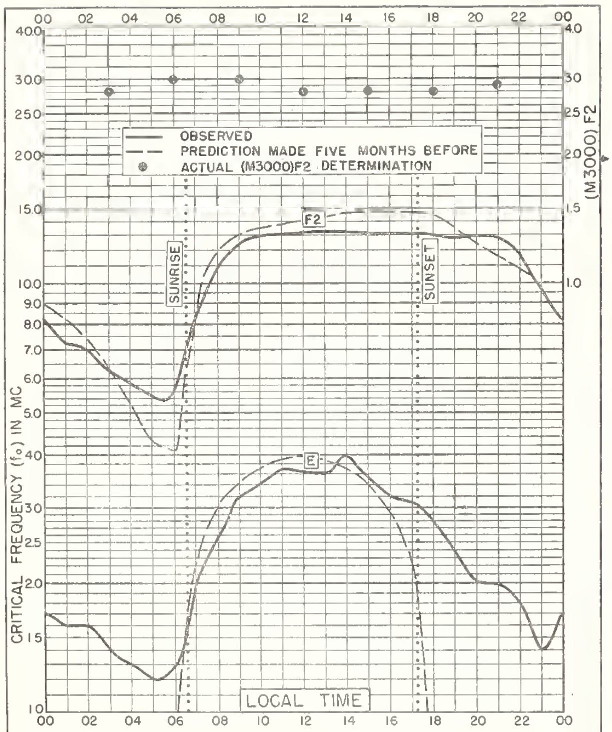

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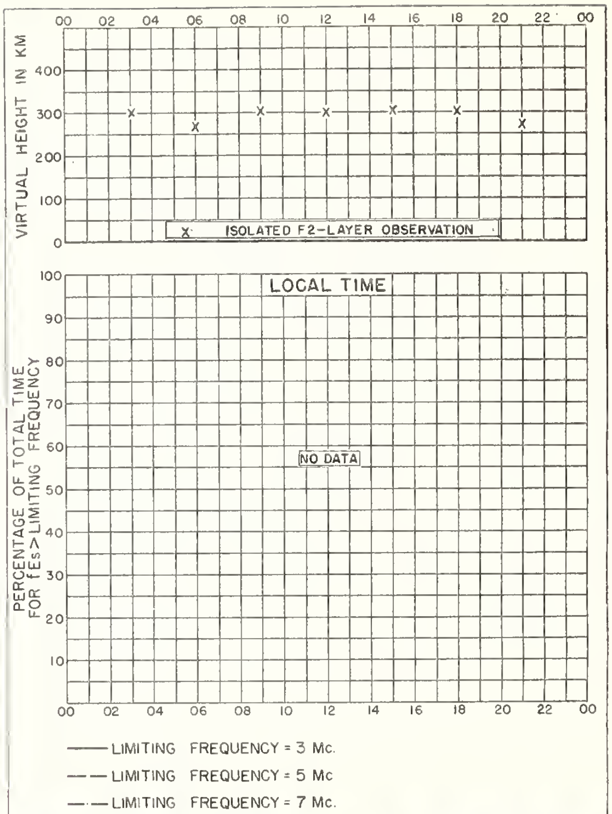

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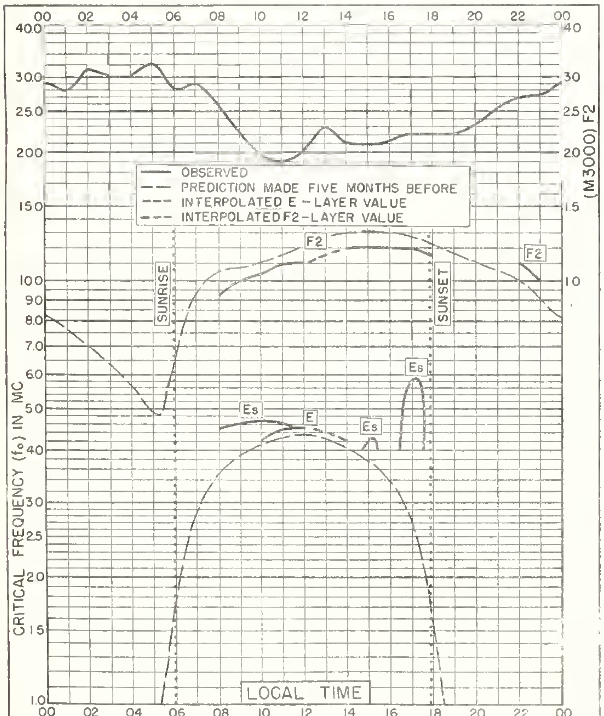

Fig. 63. SINGAPORE, BRITISH MALAYA
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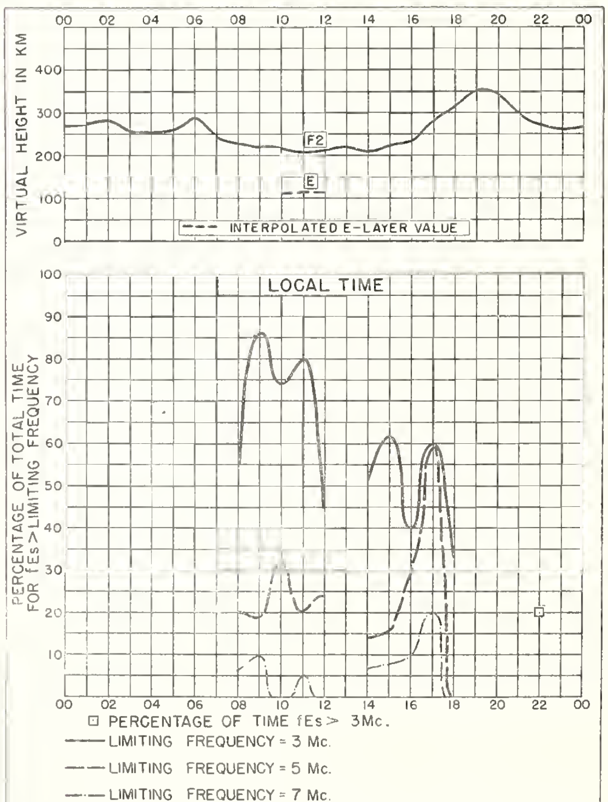

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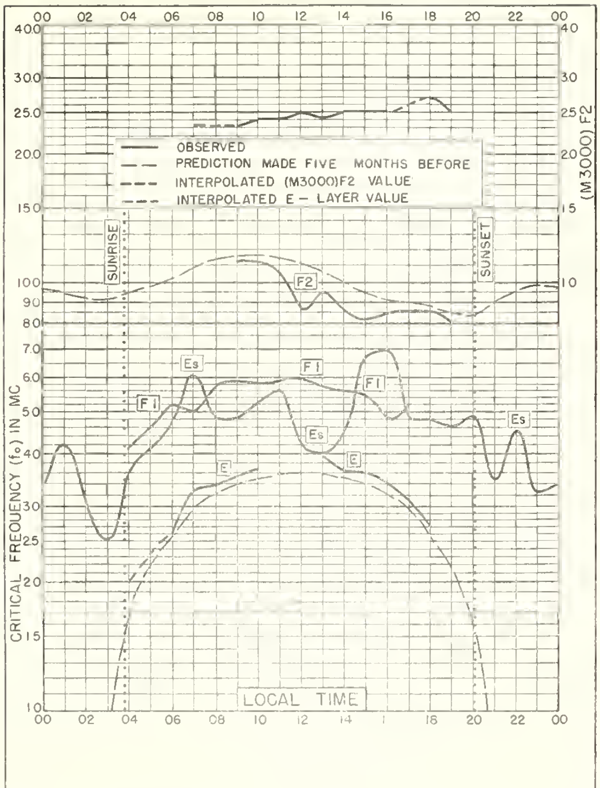

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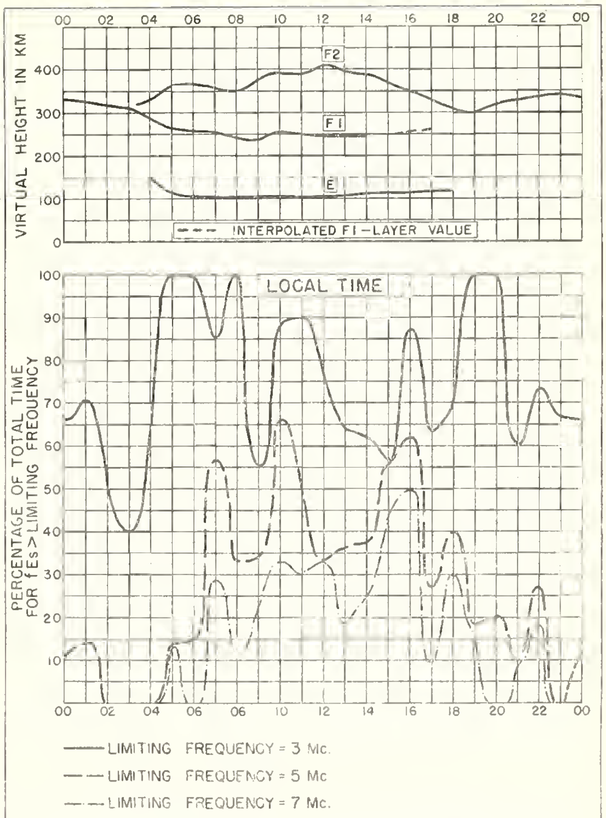

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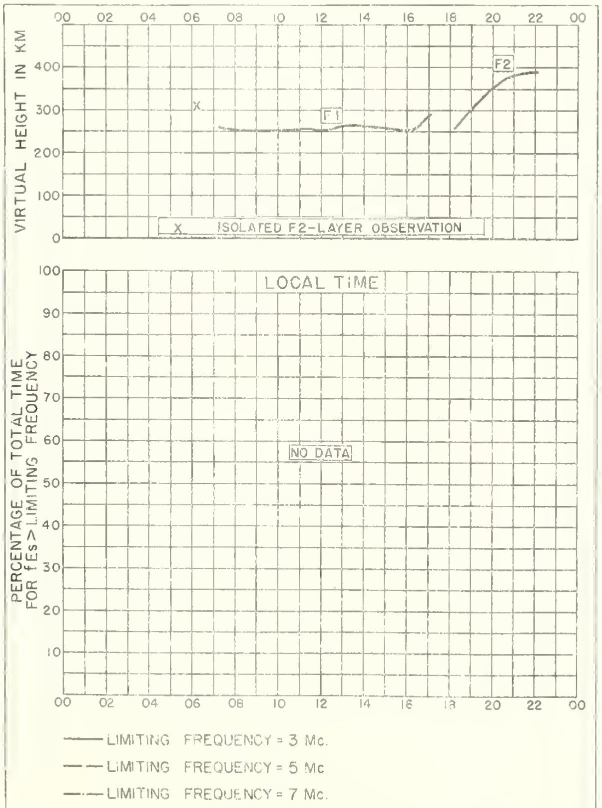

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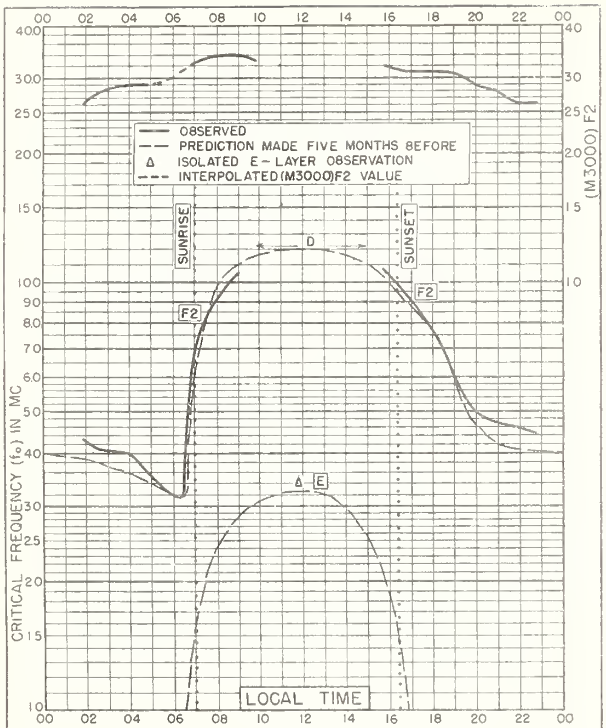

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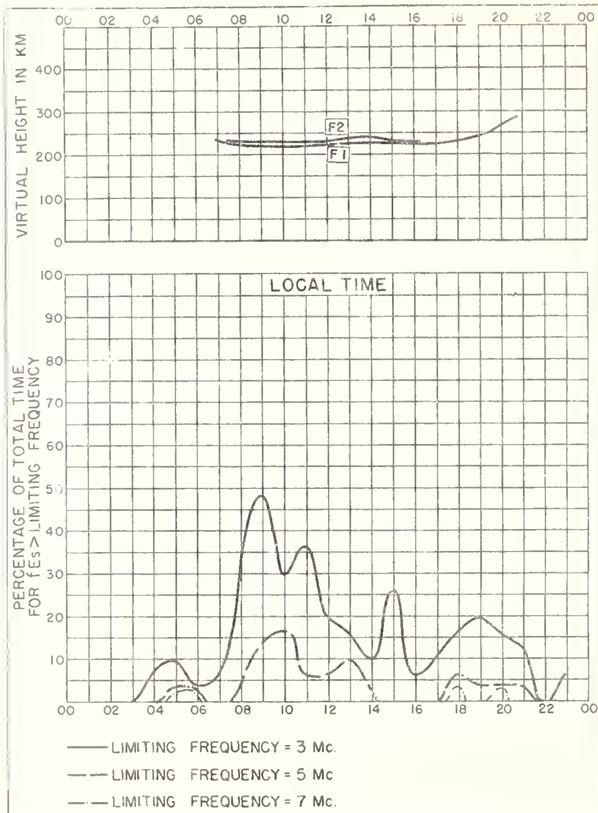

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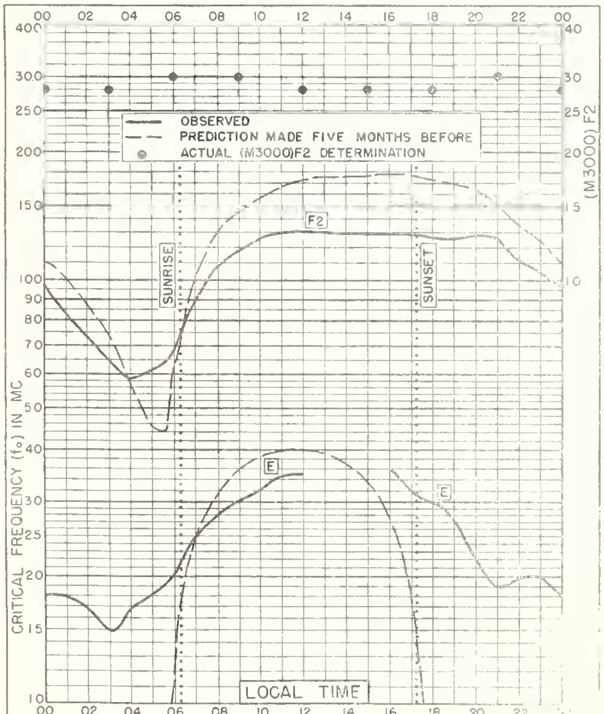

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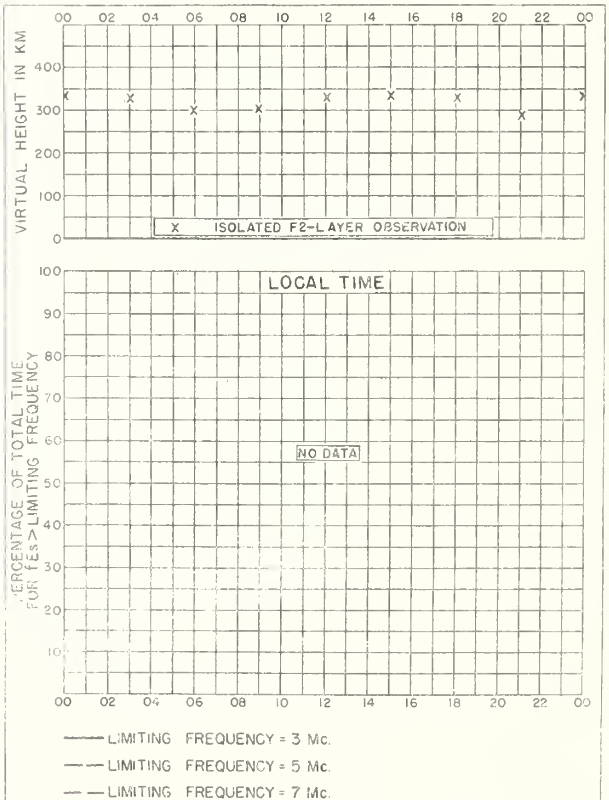

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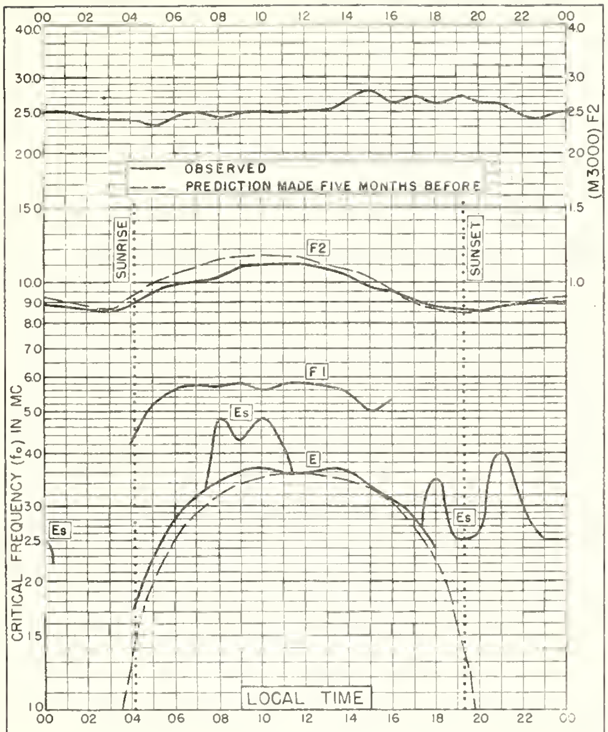

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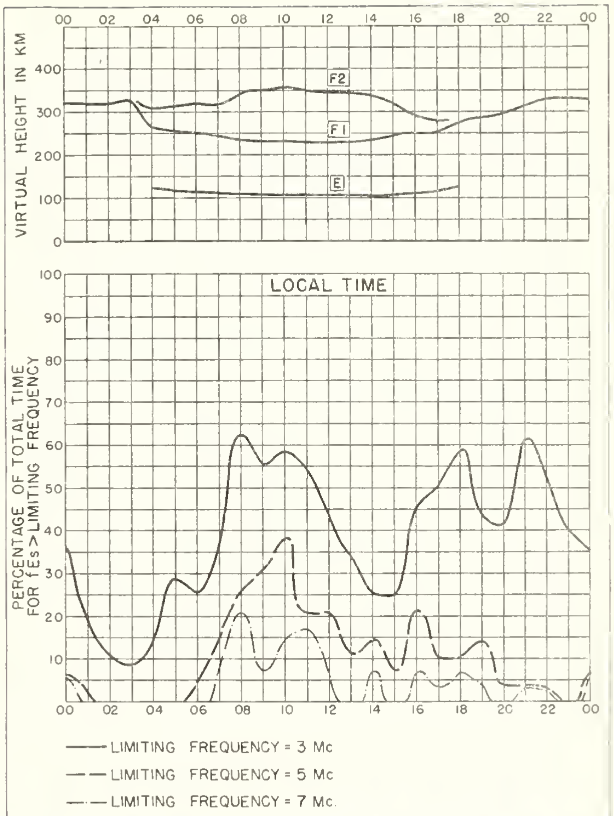

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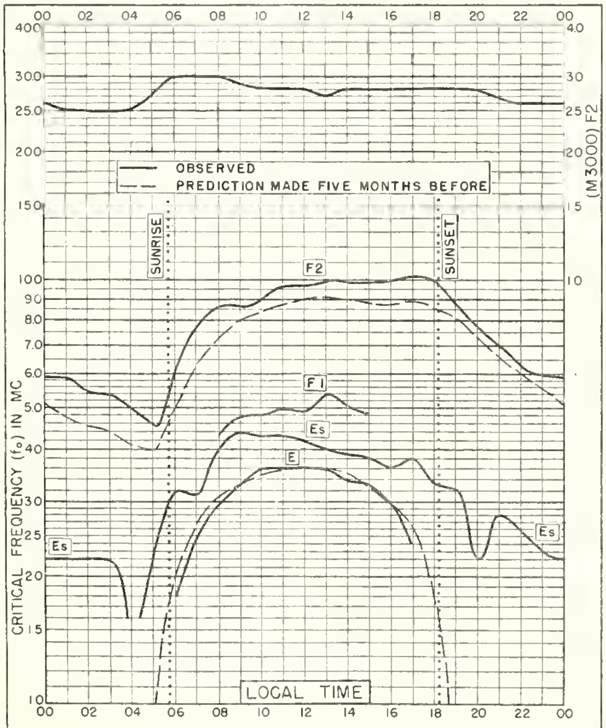

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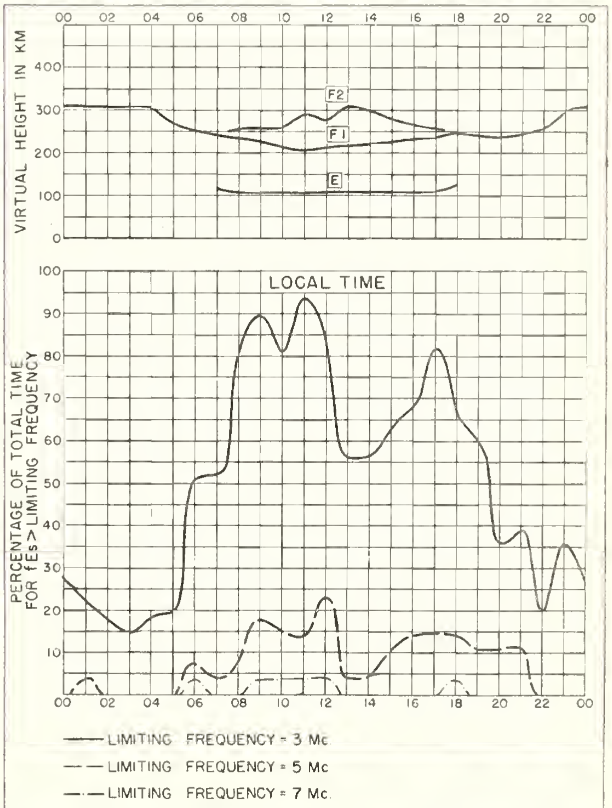

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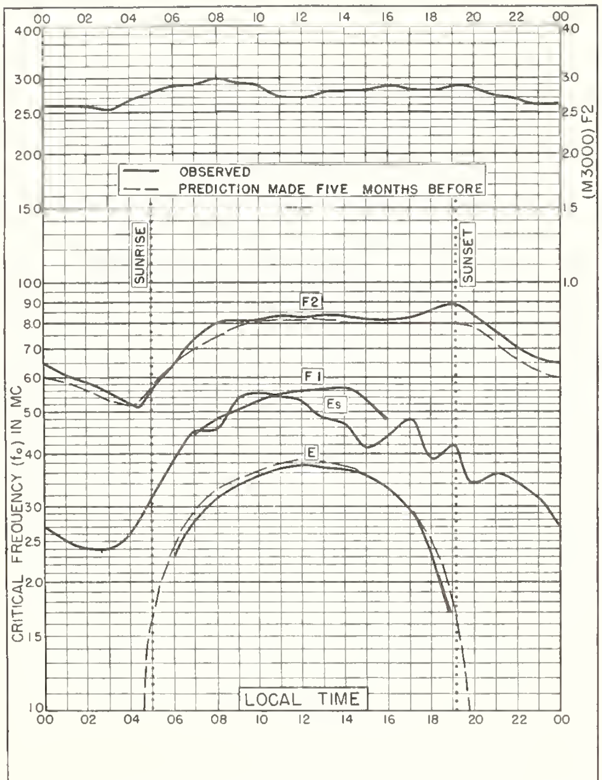

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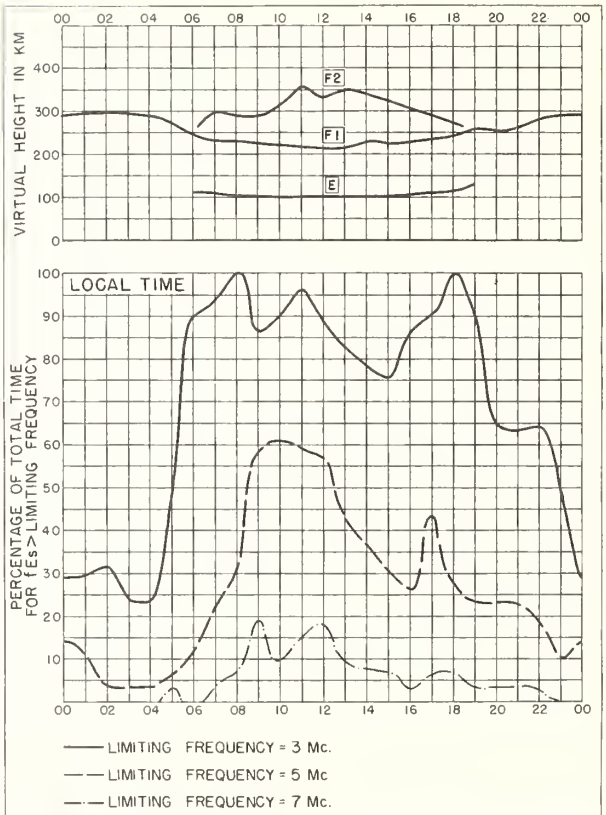

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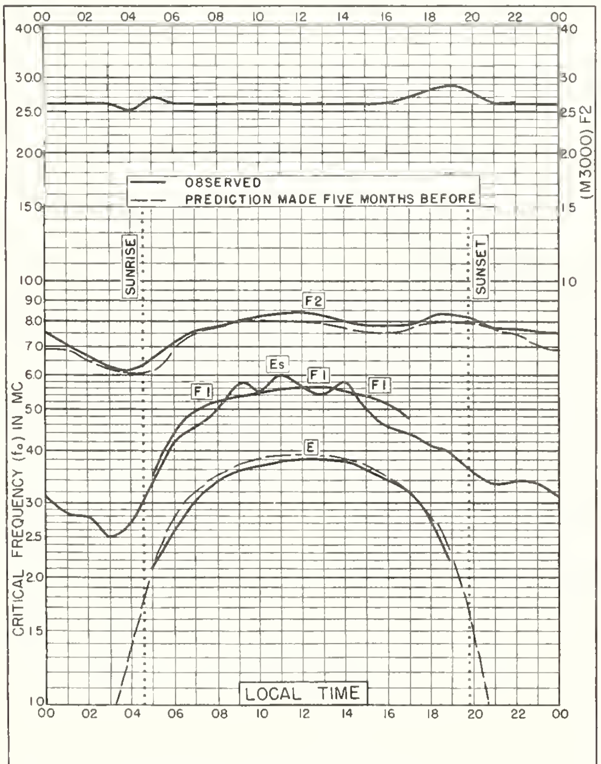

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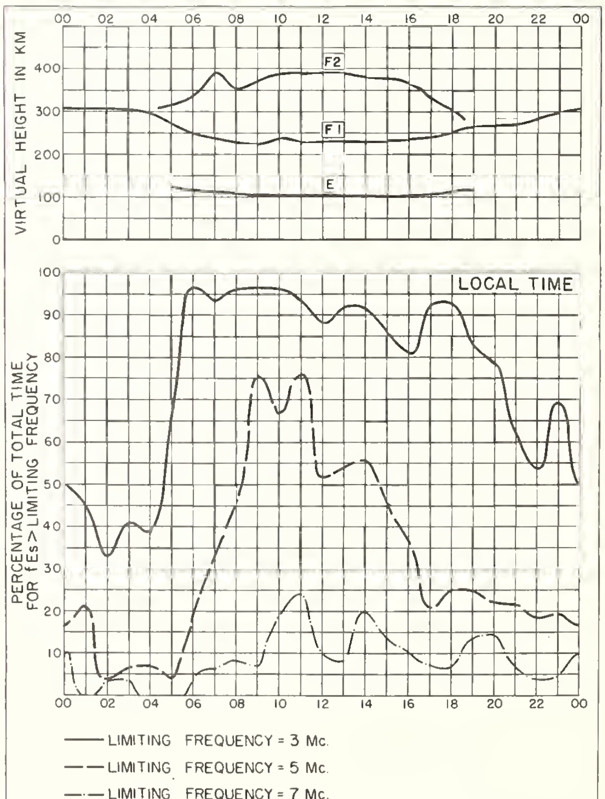

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CRPL and IRPL Reports

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

Daily:

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

Weekly:

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

Semimonthly:

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

Monthly:

CRPL–D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11–499–, monthly supplements to TM 11–499; Dept. of the Navy, DNC–13–1 ( ), monthly supplements to DNC–13–1.)
CRPL–F. Ionospheric Data.

Quarterly:

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

Circulars of the National Bureau of Standards:

NBS Circular 462. Ionospheric Radio Propagation.
NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions.

Reports issued in past:

IRPL–C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.
IRPL–G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.
IRPL–R. Nonscheduled reports:
- R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.
- R5. Criteria for Ionospheric Storminess.
- R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
- R7. Second Report on Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
- R9. An Automatic Instantaneous Indicator of Skip Distance and MUF.
- R10. A Proposal for the Use of Rockets for the Study of the Ionosphere.
- R11. A Nomographic Method for Both Prediction and Observation Correlation of Ionosphere Characteristics.
- R12. Short Time Variations in Ionospheric Characteristics.
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- R17. Japanese Ionospheric Data—1943.
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IRPL–T. Reports on tropospheric propagation:
- T1. Radar operation and weather. (Superseded by JANP 101.)
- T2. Radar coverage and weather. (Superseded by JANP 102.)

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

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