CRPL-F63

IONOSPHERIC DATA

ISSUED
NOVEMBER 1949

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 36 and figures 1 to 72 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

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

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

British Department of Scientific and Industrial Research, Radio Research Board:
- Lindau/Harz, Germany

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

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

Electrical Communications Laboratory, Ministry of Communications:
- Fukaura, Japan
- Shibata, Japan
- Tokyo (Kokubunji), Japan
- Wakkanai, Japan
- Yamakawa, Japan

New Zealand Department of Scientific and Industrial Research:
- Christchurch, New Zealand (Canterbury University College Observatory)
- Rarotonga I.

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

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

National Bureau of Standards (Central Radio Propagation Laboratory):
- Baton Rouge, Louisiana (Louisiana State University)
- Boston, Massachusetts (Harvard University)
- Guam I.
- Maui, Hawaii
- 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 or less than the corresponding values of foE. Blank spaces at the beginning and end of columns of h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 is usually the result of seasonal effects.

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

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

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

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

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

Month	Predicted Sunspot No.				
	1949	1948	1947	1946	1945
December		114	126	85	38
November		115	124	83	36
October	114	116	119	81	23
September	115	117	121	79	22
August	111	123	122	77	20
July	108	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 37 to 48 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." Beginning with September 1949, the data are taken at a new location, Ft. Belvoir, Virginia.

Table 49 presents ionosphere character figures for Washington, D. C., during October 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 50 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 November 1949.

Table 51 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Brentwood and Somerton, England, receiving stations of Cable and Wireless, Ltd., for various days in September and October 1949.

Table 52 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Riverhead, New York, receiving station of RCA Communications, Inc., for October 8, 11, 15, and 22, 1949.

Table 53 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, September 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.

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In tables 54a and 54b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during October 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 solar rotation 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 55a and 55b give similarly the intensities of the first red (6374A) coronal line; tables 56a and 56b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 54, 55, and 56: a, observation of low weight; -, corona not visible; and x, position angle not included in plate estimates.

AMERICAN AND ZURICH PROVISIONAL RELATIVE SUNSPOT NUMBERS

Table 57 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 all 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.

ERRATUM

CRPL-F62, p. 31, table 64: Time given in the table for the beginning and end of principal storms was stated in 75°W-meridian time. Add five hours to each time given to convert it to Greenwich civil time.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (38.7°N, 77.1°W) October 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	5.9						2.6
01	285	5.8						2.6
02	280	5.6						2.6
03	280	5.2						2.7
04	280	4.7						2.7
05	290	4.4						2.6
06	275	(4.6)			---	---		(2.8)
07	240	7.5			120	2.3		3.2
08	230	9.4	---	---	115	2.6		3.2
09	230	10.6	230	---	110	3.0		3.0
10	230	11.6	220	---	110	3.4		2.9
11	240	12.2	210	---	110	3.5		2.8
12	230	12.6	220	---	(110)	3.6		2.8
13	230	12.6	230	---	110	3.6		2.8
14	230	12.4	230	---	120	3.4		2.8
15	240	12.3	---	---	120	3.1		2.8
16	240	11.9	---	---	110	2.8		2.8
17	230	11.2	---	---	(120)	2.2		2.9
18	230	10.1			---	---		2.9
19	230	8.7						2.8
20	240	7.6						2.8
21	270	6.6						2.8
22	280	6.3						2.7
23	280	6.0						2.7

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

Table 2

Oslo, Norway (60.0°N, 11.0°E) September 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	4.8						
01	320	4.8						
02	330	4.6						
03	325	4.2						
04	308	3.8						
05	300	4.0						
06	260	5.0	---	---	150	1.9		
07	250	6.2	---	---	125	2.4		
08	250	6.7	---	---	115	2.6		
09	240	6.8	240	4.6	110	2.9	3.0	
10	240	7.0	232	4.7	105	3.1		
11	240	7.4	230	---	108	3.1		
12	240	6.9	220	4.8	105	3.3		
13	245	7.2	230	---	110	3.2		
14	240	7.5	230	---	108	3.2		
15	240	7.6	240	---	110	2.9		
16	245	7.0	240	---	110	2.8		
17	250	7.5	250	---	112	2.5		
18	250	7.2	---	---	130	2.1	2.3	
19	250	6.9			---	---	2.3	
20	250	6.9						
21	250	6.4						
22	255	5.4						
23	290	5.1						

Time: 15.0°E.
Sweep: 1.6 Mc to 10.0 Mc in 5 minutes, automatic operation.

Table 3

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	298	6.5						2.7
01	300	6.3						2.8
02	290	5.8						2.9
03	290	5.0						2.8
04	310	4.5						2.9
05	285	4.7						3.0
06	265	6.2			---	---		3.2
07	250	8.7			---	---		3.4
08	250	9.1	---	---	---	---		3.3
09	260	9.6	235	4.9	---	---		3.2
10	275	9.1	242	---	---	---		3.2
11	280	9.6	240	---	---	---		3.2
12	290	9.2	245	4.9	---	---		3.2
13	308	9.0	245	---	---	---		3.1
14	280	9.0	---	---	---	---		3.2
15	270	9.3	---	---	---	---		3.1
16	260	9.4	---	---	---	---		3.2
17	255	9.9						3.2
18	255	9.6						3.1
19	250	8.9						3.0
20	265	7.9						3.0
21	280	7.4						2.9
22	300	7.1						2.8
23	305	6.8						2.8

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) September 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	5.1						2.6
01	330	5.1						2.6
02	310	5.0						2.6
03	300	5.0					1.9	2.6
04	290	5.0					2.3	2.7
05	300	4.6					1.8	2.6
06	280	5.7	270	---	120	2.0	2.6	2.8
07	250	7.9	260	---	120	2.7		3.0
08	250	9.0	230	4.7	120	(3.2)		3.0
09	270	9.9	220	4.8	110	3.7		2.9
10	300	10.5	220	5.4	110	(3.8)		2.8
11	300	11.2	210	5.4	115	3.9		(2.7)
12	310	10.6	220	5.5	110	(3.9)		2.8
13	330	11.6	230	6.0	110	3.9		2.8
14	320	11.3	230	6.0	110	---		2.8
15	320	11.1	240	5.6	110	(3.8)		2.8
16	250	10.4	240	---	120	(3.0)		2.8
17	240	10.5	260	---	120	2.7		2.9
18	230	9.6	250	---	120	2.0		3.0
19	220	8.6					1.9	3.0
20	240	7.0					2.3	2.9
21	255	6.4					2.4	2.8
22	280	5.8					2.3	2.8
23	300	5.4					2.4	2.6

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

Table 5

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.0					2.2	2.5
01	300	5.7					2.2	2.5
02	300	5.6					2.1	2.5
03	280	5.4					2.4	2.5
04	280	5.3					2.4	2.5
05	280	5.2					2.8	2.6
06	270	6.5			115	(1.8)	3.8	2.7
07	240	9.2	---	---	110	2.6	4.3	3.0
08	240	10.4	---	---	110	3.2	4.7	3.0
09	230	10.4	---	---	110	3.5	4.9	2.8
10	220	11.0	220	---	110	3.7	4.5	2.7
11	295	11.4	220	5.5	110	3.9		2.6
12	320	12.0	220	5.9	110	3.9		2.6
13	300	12.1	220	6.3	110	3.9		2.6
14	300	12.0	230	---	110	3.8	4.4	2.6
15	255	12.0	230	---	110	3.6	4.4	2.7
16	240	11.6	---	---	110	3.2	4.2	2.7
17	240	11.2			110	2.6	3.8	2.8
18	240	10.6			110	2.0	2.8	2.8
19	220	8.7					2.5	2.8
20	240	7.2					2.5	2.7
21	250	6.6					2.2	2.6
22	270	6.3					2.5	2.6
23	300	6.0					2.3	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) September 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.1						2.8
01	300	6.0						2.8
02	310	5.7						2.8
03	305	5.3						2.8
04	300	5.4						2.8
05	300	5.0						2.8
06	290	6.9						3.1
07	270	9.2	260	---	120	2.7		3.1
08	270	10.0	240	---	120	3.1		3.1
09	290	10.2	230	---	120	3.4		3.0
10	320	10.4	230	---	120	3.6		(2.9)
11	330	10.6	---	---	120	3.7		2.9
12	350	10.8	(240)	---	110	3.7		2.8
13	350	10.9	240	---	120	3.6		2.8
14	340	11.0	240	---	120	3.7		2.9
15	330	11.0	250	---	120	3.5		2.9
16	300	10.8	260	---	120	3.2		2.9
17	280	10.8	270	---	130	2.7		3.0
18	260	10.1						3.0
19	240	8.8						3.0
20	270	7.4						2.9
21	290	6.6						2.9
22	300	6.4						2.9
23	300	6.4						2.8

Time: 90.0°W.
Sweep: 2.12 Mc to 15.3 Mc in 5 minutes, automatic operation.

Table 7

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	(8.8)						(2.9)
01	260	(8.6)						(2.9)
02	250	7.2						3.0
03	240	5.6						2.9
04	270	4.6						2.8
05	300	4.2						2.6
06	320	4.8			---	---		2.7
07	270	8.2			130	2.3		3.1
08	260	9.7	240	---	120	3.0	3.7	3.0
09	260	10.6	230	---	120	3.4		2.8
10	300	(11.6)	230	(6.7)	120	3.7		(2.7)
11	345	(12.6)	230	(6.4)	120	3.7		(2.7)
12	370	(13.6)	230	(6.4)	120	3.9		(2.7)
13	360	(14.3)	240	(6.3)	120	3.9		(2.7)
14	370	(14.6)	240	6.5	120	3.9		(2.8)
15	360	(14.6)	245	6.0	110	3.6	4.0	(2.8)
16	320	(14.5)	250	---	110	3.3	4.5	(2.9)
17	290	(14.3)	255	---	120	2.8	4.5	(2.9)
18	270	(13.6)			120	---	4.0	(3.0)
19	250	(13.2)					5.2	(2.9)
20	260	(13.2)					4.3	(2.8)
21	270	(12.0)					3.2	(2.8)
22	290	(11.0)					2.4	(2.8)
23	280	(10.7)						(2.9)

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

Table 8

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	8.6						2.8
01	260	8.4						2.9
02	250	7.8						2.9
03	240	6.1						2.8
04	(250)	5.4						2.8
05	---	5.4						2.8
06	270	6.0						2.8
07	230	8.8		3.5				3.1
08	250	9.6		5.0		3.1		3.0
09	270	10.5		---		3.6		2.9
10	300	11.5		---		3.7		2.8
11	310	12.0		---		3.7		2.7
12	330	12.5		6.2		4.0		2.6
13	325	(12.9)		---		---		(2.6)
14	330	12.5		---		(4.0)		2.7
15	320	12.6		5.4		3.8		2.6
16	290	12.4		---		3.5	4.7	2.7
17	270	11.8				3.1	3.8	2.7
18	250	11.0						2.8
19	250	9.9						2.8
20	260	9.0						2.7
21	270	9.0						2.7
22	290	8.8						2.6
23	280	8.8						2.7

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

Table 9

Guam I. (13.6°N, 144.9°E) September 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	---						---
01	240	11.6						(3.3)
02	220	9.9						---
03	225	8.2						(3.2)
04	235	6.6						3.2
05	220	5.9					3.2	3.2
06	220	(5.9)					3.6	3.1
07	240	8.3			---	---	3.5	3.3
08	230	9.8	220	---	110	3.3	4.7	2.9
09	240	(10.8)	200	3.9	100	---	5.0	(2.7)
10	250	(11.6)	216	---	100	---	6.6	(2.5)
11	300	(11.6)	210	(5.0)	100	---	5.5	(2.4)
12	310	(11.2)	210	(6.4)	100	---	6.6	(2.4)
13	380	(11.9)	210	(5.5)	100	---	5.4	(2.4)
14	360	(12.4)	220	(5.6)	110	---	6.3	(2.4)
15	370	(13.1)	225	---	110	---	5.3	(2.5)
16	270	---	230	---	110	---	6.5	---
17	250	---	---	---	110	---	5.8	---
18	270	---	---	---	---	---	4.4	---
19	330	---						---
20	350	---						---
21	300	---						---
22	255	---					3.0	---
23	250	---					2.6	---

Time: 150.0°E.
Sweep: 1.0 Mc to 26.0 Mc in 15 seconds.

Table 10

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	255	10.4						3.1
01	235	9.6						3.2
02	225	7.6						3.2
03	230	6.5						3.0
04	250	5.6						3.1
05	270	5.2						3.0
06	265	6.2			---	---	2.0	3.0
07	220	9.4			120	2.7	3.2	3.3
08	225	10.7	220	(4.7)	110	3.3	4.0	3.2
09	250	11.6	220	5.1	110	3.7	4.4	3.0
10	255	12.5	220	5.4	110	4.0	4.5	3.0
11	270	13.2	220	5.5	120	4.2	4.8	2.9
12	285	13.6	220	5.7	120	4.2	5.0	2.9
13	280	13.8	220	5.7	110	4.2	5.4	2.8
14	290	14.0	230	5.8	110	4.1	5.6	2.8
15	290	13.4	220	5.2	110	3.8	5.8	2.8
16	276	12.6	230	5.0	120	3.4	5.7	2.8
17	270	12.2	230	---	110	2.8	5.2	2.8
18	250	11.8			---	---	4.6	2.8
19	270	11.4					4.2	2.8
20	265	11.2					2.9	2.8
21	250	11.0					2.3	2.8
22	260	10.6						2.8
23	270	10.5						2.9

Time: 60.0°W.
Sweep: 1.5 Mc to 18.0 Mc, manual operation.

Table 11

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.8					2.9	
01	300	5.7					3.3	
02	300	5.0					3.0	
03	300	4.6					3.1	
04	280	4.5					3.1	
05	270	4.8			110	1.3	3.3	
06	250	5.5			110	2.1		
07	280	6.1	240	4.0	110	2.6	4.2	
08	300	6.9	240	4.4	110	3.0	4.5	
09	300	7.1	230	4.6	110	3.2		
10	310	7.6	220	4.9	110	3.4		
11	310	7.4	230	5.0	110	3.5		
12	320	7.3	220	5.2	110	3.6		
13	340	7.6	230	5.0	110	3.6		
14	310	7.7	240	4.9	110	3.6		
15	310	8.0	230	4.8	110	3.4		
16	310	7.6	230	4.7	110	3.2		
17	300	7.8	230	4.2	110	2.9	3.6	
18	270	7.8	250	3.9	110	2.5	4.5	
19	260	8.2			110	1.9	3.7	
20	250	8.0			120	1.6	4.0	
21	250	7.4					3.0	
22	250	6.6					3.2	
23	280	6.1					3.1	

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

Table 12

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(260)	3.1						2.9
01	(260)	3.1					1.4	2.9
02	(260)	3.3						2.9
03	(250)	3.3					1.6	3.1
04	(250)	3.0					1.7	2.9
05	(250)	2.9					1.6	3.0
06	(250)	3.2						2.9
07	230	6.6			115	2.1		3.4
08	230	8.5	230	---	110	(2.8)		3.3
09	250	9.4	220	3.6	110	(3.3)		3.2
10	270	10.1	210	4.6	110	(3.6)		3.1
11	270	10.5	210	4.8	110	(3.7)		3.1
12	270	10.2	200	4.9	110	3.8	3.7	2.9
13	280	10.7	210	---	110	(3.7)	4.0	2.9
14	280	10.7	220	---	110	3.5	3.9	2.9
16	270	10.4	220	---	110	3.4	3.6	2.9
16	250	10.3	230	---	110	(3.0)	3.0	2.9
17	240	10.1			110	2.6		3.0
18	220	9.6			---	---	1.8	3.1
19	220	7.4						3.1
20	220	6.3						3.2
21	230	4.6						3.2
22	(240)	3.3						3.0
23	(250)	3.2						2.9

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

Table 13

Watheroo, W. Australia (30.3°S, 115.9°E) August 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	4.2					2.9	2.8
01	270	4.2					2.9	2.8
02	270	4.0					2.9	2.9
03	250	4.2					2.9	2.9
04	250	3.7					2.8	2.9
05	260	3.6					2.8	2.9
06	260	3.5					2.8	2.9
07	250	5.8				1.9	2.7	3.3
08	250	8.2				2.5	3.3	3.4
09	260	8.8	240	4.3		3.0	3.3	3.2
10	270	9.4	240	4.9		3.2	3.3	3.2
11	270	9.9	240	4.8		3.4	3.5	3.1
12	280	9.8	230	5.0		3.3	3.8	3.0
13	290	9.9	230	4.9		3.3	3.8	3.0
14	280	9.8	230	4.8		3.3	3.5	3.0
15	270	9.6	240	4.4		3.2	3.3	2.9
16	250	9.3	240	3.8		2.9	3.3	3.0
17	250	9.1				2.1	3.0	3.0
18	230	8.3					2.8	3.1
19	230	6.7					2.6	3.1
20	240	5.4					3.6	3.0
21	250	5.1					2.7	3.0
22	260	4.8					2.7	2.9
23	260	4.4					2.9	2.8

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

Table 14

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	4.2					4.2	2.4
01	295	4.2					3.5	2.4
02	295	4.0					3.0	2.8
03	285	3.7					4.4	3.8
04	270	3.4					4.5	2.8
05	270	3.2					4.5	2.8
06	270	3.1					4.5	2.9
07	250	4.5				1.4	4.4	3.2
08	250	7.0	---	---		2.1	3.8	3.2
09	250	8.1	250	4.0		2.8	4.4	3.2
10	260	8.7	245	4.3		3.1	4.4	3.1
11	260	9.2	240	4.7		3.3	4.4	3.1
12	270	9.2	240	4.7		3.2	4.4	3.0
13	260	8.6	240	4.5		3.3	4.4	3.1
14	270	9.0	240	4.3		3.1	3.8	3.0
15	260	8.6	240	4.0		2.8	4.4	3.0
16	250	8.2	250	3.2		3.4	3.5	3.1
17	250	7.3				1.5	3.3	3.0
18	240	7.2					3.3	2.9
19	250	6.6					2.8	2.8
20	250	6.2					2.7	2.8
21	260	5.3					3.0	2.8
22	280	4.8					2.8	2.7
23	285	4.5					3.0	2.7

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

Table 15

Wakkanai, Japan (45.4°N, 141.7°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	6.9					3.4	2.7
01	300	6.6					3.3	2.7
02	300	6.5					2.4	2.6
03	290	6.4					2.2	2.7
04	290	6.3					2.6	2.7
05	290	6.7	260	---	100	2.2	3.3	2.8
06	320	7.6	280	4.3	100	2.6	4.2	2.7
07	320	7.9	270	4.6	100	3.2	5.4	2.6
08	340	7.4	350	4.8	100	3.4	6.0	2.6
09	360	8.0	230	5.0	100	3.4	7.2	(2.7)
10	370	7.4	210	5.0	100	3.4	6.3	(2.7)
11	380	7.0	270	5.1	105	(3.7)	5.8	(2.7)
12	385	7.2	240	5.2	100	3.9	6.0	(2.8)
13	385	7.0	255	5.0	100	3.7	4.7	2.7
14	380	7.3	230	5.0	100	---	5.1	2.8
15	360	7.2	250	4.8	100	3.5	5.0	2.7
16	335	7.0	245	4.6	105	3.4	4.2	2.8
17	330	6.9	250	---	110	3.0	5.4	2.8
18	300	7.0	260	---	100	2.4	5.5	2.9
19	295	7.1	---	---	---	---	5.8	2.8
20	290	7.3					5.8	2.8
21	290	7.2					4.1	2.7
22	295	7.4					3.8	2.8
23	300	7.3					3.6	2.6

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

Table 16

Fukaura, Japan (40.6°N, 139.9°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	7.8					3.8	2.7
01	300	7.6					4.4	2.7
02	290	7.5					3.6	2.8
03	290	6.8					3.6	2.8
04	290	6.8			---	---	3.0	2.8
05	270	7.2	230	---	---	(2.0)	3.0	2.8
06	290	8.4	250	4.2	110	2.7	4.0	2.8
07	290	9.3	240	4.8	110	3.2	5.0	2.9
08	300	9.0	---	5.2	110	3.4	6.6	2.9
09	320	8.6	---	5.2	110	3.6	6.8	2.8
10	340	8.4	---	(5.3)	110	---	6.6	2.7
11	370	8.6	---	(5.6)	110	---	6.1	3.7
12	370	9.0	---	5.5	110	---	6.0	2.7
13	350	9.1	---	5.4	110	---	6.7	2.7
14	350	8.9	240	5.3	110	---	5.7	2.8
15	340	8.8	230	5.2	110	---	5.2	2.8
16	320	8.3	240	4.2	110	3.3	5.2	2.9
17	300	8.1	250	4.4	110	3.0	5.0	2.9
18	290	8.0	270	---	120	2.4	5.1	2.9
19	280	8.1	---	---	---	---	5.1	2.9
20	270	8.1					5.4	2.8
21	290	8.0					5.4	2.7
22	290	8.0					4.2	2.7
23	300	7.8					3.3	2.7

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

Table 17

Shibata, Japan (37.9°N, 139.3°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	7.8					3.6	2.8
01	275	7.8					4.0	2.9
02	260	7.4					4.1	2.9
03	250	7.2					3.1	3.0
04	270	6.8					2.8	2.9
05	260	7.4	235	---	110	2.0	2.9	3.0
06	260	8.7	220	---	100	2.6	4.1	3.1
07	255	9.2	220	---	100	3.1	6.2	3.1
08	265	8.7	210	4.8	100	3.5	6.7	3.1
09	300	8.2	200	5.0	100	3.6	7.3	2.8
10	310	8.9	200	5.2	100	3.6	6.9	2.9
11	320	9.1	200	5.3	100	3.6	6.7	2.8
12	320	9.4	200	5.4	100	3.8	7.3	2.8
13	320	9.4	210	5.4	100	(3.8)	6.2	2.9
14	310	9.3	200	5.2	100	3.5	6.2	2.9
15	300	8.9	220	4.9	100	3.5	5.6	2.9
16	300	8.5	210	4.8	100	3.4	5.5	3.0
17	295	8.4	220	4.5	100	3.0	6.1	3.1
18	270	8.3	230	---	100	2.5	5.1	3.0
19	250	8.4	240	---	---	---	5.4	3.1
20	250	8.0					4.3	2.9
21	280	8.2					4.6	2.8
22	290	8.1					4.5	2.8
23	280	8.1					4.8	2.9

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

Table 18

Tokyo, Japan (35.7°N, 139.5°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	8.0					4.4	2.8
01	260	7.8					3.8	2.8
02	250	7.6					4.0	3.0
03	250	7.3					4.2	3.1
04	250	6.7					3.0	3.0
05	250	7.3	240	---	100	2.0	3.4	3.0
06	250	8.8	230	---	100	2.6	3.8	3.0
07	250	9.5	220	4.6	100	3.2	5.2	3.1
08	255	8.6	210	4.9	100	3.4	5.7	3.1
09	290	8.5	210	5.2	100	3.7	6.8	2.9
10	320	9.0	220	5.5	100	3.7	6.9	2.9
11	320	9.4	200	5.4	100	3.9	7.2	2.9
12	320	9.8	200	5.4	100	3.9	7.5	2.9
13	320	10.0	220	5.4	100	4.0	7.4	2.9
14	310	9.9	210	5.4	100	3.7	6.4	2.9
15	310	9.7	210	5.2	100	3.6	5.8	3.0
16	290	9.2	220	5.0	100	3.4	5.4	3.0
17	275	8.9	320	4.6	100	3.0	5.6	3.1
18	255	8.6	220	3.6	100	2.4	5.4	3.2
19	240	8.4	---	---	---	1.8	6.0	3.1
20	250	8.1					5.8	2.9
21	280	8.0					4.2	2.8
22	270	8.0					4.2	2.8
23	280	8.3					4.5	2.8

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

Table 19

Yamakawa, Japan (31.2°N, 130.6°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	9.1					4.7	2.7
01	300	8.7					4.2	2.8
02	280	8.7					4.2	2.8
03	270	8.3					3.8	2.8
04	280	7.4					3.8	2.8
05	280	7.3	255	---	---	---	3.6	2.9
06	260	7.6	240	---	110	2.1	3.2	3.0
07	260	8.5	230	---	100	2.8	4.2	3.1
08	280	8.7	230	---	100	(3.4)	4.8	3.0
09	300	8.6	240	5.0	100	3.6	5.2	2.7
10	320	8.7	220	5.4	100	3.8	5.7	2.7
11	375	9.5	220	5.9	100	---	6.1	2.6
12	380	10.0	220	5.6	100	---	6.4	2.6
13	380	10.2	220	5.6	100	4.0	6.0	2.6
14	365	10.0	220	5.6	100	(4.0)	5.4	2.7
15	350	11.2	220	5.4	100	3.8	5.4	2.7
16	340	10.9	235	5.0	100	---	5.4	2.7
17	315	10.1	235	4.8	100	3.2	5.4	2.8
18	300	10.3	250	---	110	2.8	5.0	2.9
19	270	9.6	245	---	---	---	4.6	3.0
20	280	9.0					4.6	2.9
21	295	8.2					4.0	2.7
22	300	8.5					4.2	2.7
23	300	8.9					3.8	2.7

Time: 135.0°E.
Sweep: 1.2 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 20

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	5.8					2.3	2.8
01	270	5.3					2.3	2.9
02	270	5.0						2.9
03	260	4.8					2.1	2.9
04	250	4.1					2.1	2.9
05	270	3.7					2.5	2.8
06	300	3.7			---	---	2.7	2.8
07	260	6.7	---	---	---	1.9	2.9	3.1
08	240	9.5	---	---	110	2.7	3.5	3.2
09	250	11.2	230	4.5	110	3.1	4.1	3.2
10	250	12.1	220	5.1	110	3.4	4.1	3.2
11	250	10.3	220	5.0	105	3.6	4.4	3.1
12	260	10.1	210	5.4	110	3.7	4.3	3.0
13	300	10.2	230	5.6	110	3.6	5.1	3.0
14	280	10.9	210	5.2	110	3.5	4.6	3.0
15	280	10.6	235	5.3	110	3.3	4.3	2.9
16	280	10.3	240	5.0	110	3.0	4.3	2.9
17	255	10.6	240	4.5	110	2.4	4.2	2.9
18	250	10.2	---	---	---	E	4.1	3.0
19	230	8.6					3.8	3.0
20	250	7.6					3.5	2.8
21	250	7.3					3.1	2.9
22	250	7.0					3.0	2.9
23	250	5.9					2.7	2.9

Time: 157.5°W.
Sweep: 2.0 Mc to 10.0 Mc, manual operation.

Table 21

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	4.4					3.0	2.8
01	270	4.5					2.6	2.8
02	270	4.6					3.0	2.8
03	260	4.7					2.8	2.9
04	240	4.5					2.5	2.9
05	240	4.1					3.0	3.0
06	245	4.0			---	(1.5)	2.4	2.9
07	240	6.6			150	2.2	1.7	3.3
08	240	8.0			110	2.8	2.2	3.3
09	250	9.0	230	4.4	110	3.2	3.4	3.3
10	250	9.7	230	4.6	100	3.4	3.7	3.3
11	250	9.0	220	4.7	100	3.5	4.0	3.3
12	250	8.8	210	4.7	100	3.5	3.9	3.1
13	250	8.9	210	4.8	100	3.5	4.4	3.1
14	250	8.9	210	4.4	100	3.4	4.0	3.1
15	250	8.7	220	4.2	105	3.2	4.0	3.2
16	240	8.5	---	---	110	2.6	4.0	3.2
17	230	8.0			140	1.8	4.0	3.2
18	220	6.6					3.6	3.1
19	235	5.6					3.0	3.0
20	250	6.2					2.8	3.0
21	250	5.0					2.6	2.9
22	250	4.8					2.6	2.9
23	250	4.5					2.9	2.8

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

Table 22

Watheroo, W. Australia (30.3°S, 115.9°E) July 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.8					3.2	2.8
01	280	3.8					3.0	2.8
02	260	3.8					3.1	2.9
03	260	4.0					3.1	2.9
04	250	4.0					3.0	3.0
05	240	3.6					3.2	3.0
06	250	3.2					3.2	3.0
07	240	4.9				1.8	2.9	3.2
08	240	7.3				2.4	3.2	3.4
09	250	8.2	260	---		3.0	3.2	3.4
10	250	8.7	230	4.5		3.2	3.3	3.3
11	265	8.8	230	4.8		3.3	3.6	3.2
12	270	8.9	230	4.8		3.3	3.8	3.2
13	280	8.8	240	4.6		3.3	3.6	3.2
14	270	9.0	240	4.5		3.2	3.8	3.1
15	260	9.0	240	4.2		3.0	3.8	3.0
16	250	8.8	---	---		2.7	3.3	3.1
17	240	8.2				1.9	3.3	3.2
18	220	7.0					3.3	3.2
19	230	5.0					3.2	3.0
20	230	4.3					3.3	3.1
21	250	3.6					3.0	2.9
22	260	3.6					3.0	2.8
23	280	3.6					3.2	2.7

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

Table 23

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	275	4.0					3.3	2.8
01	275	3.9					3.4	2.8
02	280	4.0					3.4	2.8
03	270	4.3					3.5	2.8
04	250	4.5					3.4	3.0
05	225	4.3					3.2	3.0
06	235	3.8					2.9	3.0
07	236	4.4			(200)	1.5	2.8	3.1
08	220	7.4			100	2.4	3.2	3.3
09	228	8.2	---	---	100	2.9	3.5	3.3
10	230	8.5	220	4.4	100	3.1	3.5	3.3
11	240	9.4	210	4.6	100	3.2	4.4	3.2
12	240	9.0	200	4.4	100	3.4	4.4	3.1
13	250	9.0	200	4.5	100	3.3	4.5	3.2
14	250	9.0	200	4.2	100	3.2	4.3	3.0
15	240	8.8	208	4.0	100	3.0	4.2	3.1
16	230	8.4	---	---	100	2.6	4.2	3.1
17	230	8.1			140	1.9	4.0	3.1
18	210	6.6					4.0	3.0
19	228	6.9					3.3	3.0
20	230	5.0					2.9	3.0
21	240	4.4					3.2	3.0
22	250	4.2					2.7	2.9
23	250	4.0					2.6	2.8

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 65 seconds.

Table 24

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	3.2					6.0	2.7
01	290	3.0					5.9	2.6
02	280	(3.1)					5.4	(2.7)
03	270	3.5					4.6	2.7
04	250	3.4					3.6	2.8
05	250	3.3					3.2	2.9
06	240	2.7					3.5	3.0
07	240	3.2				E	3.8	3.0
08	222	6.2				2.2	3.4	3.4
09	230	7.0				2.6	3.5	3.4
10	230	---				3.0	3.9	---
11	250	(9.3)				3.2	5.6	(3.2)
12	250	(9.8)				3.3	5.6	(3.2)
13	250	(9.8)				3.2	4.5	(3.0)
14	255	9.5				3.1	4.0	3.1
15	240	9.3				2.8	4.0	3.1
16	230	9.0				2.4	4.0	(3.1)
17	220	(7.9)				1.8	3.5	(3.1)
18	230	7.4					3.5	3.0
19	220	6.3					3.2	2.9
20	225	(5.3)					2.6	(2.9)
21	230	(4.0)					2.2	(2.7)
22	250	(3.5)					2.7	(2.8)
23	260	3.3					4.0	2.8

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

Table 25

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	305	3.5					4.4	2.5
01	300	3.5					4.1	2.5
02	300	3.5					4.4	2.6
03	290	3.5					4.4	2.7
04	270	3.6					3.2	2.9
05	270	3.3					3.8	2.9
06	270	2.8					4.4	2.9
07	260	3.4				---	3.3	3.0
08	240	5.5				1.5	3.2	3.3
09	240	7.8	---	---		2.5	3.2	3.2
10	250	8.6	---	---		2.8		3.2
11	250	9.7	240	4.4		3.0	4.4	3.2
12	255	9.3	235	(4.5)		3.1	4.4	3.1
13	260	9.7	240	(4.3)		3.0	5.0	3.1
14	250	9.1	240	4.2		2.9	4.5	3.1
15	250	9.0	230	3.6		2.5	4.4	3.1
16	250	8.2				2.2	4.4	3.1
17	240	7.0				1.5	3.8	3.0
18	250	5.2					3.4	2.9
19	250	5.4					3.0	2.9
20	265	4.8					2.8	3.0
21	270	4.2					2.9	2.8
22	280	3.9					3.0	2.7
23	285	3.6					3.2	2.7

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

Table 26

Delhi, India (28.5°N, 77.1°E) June 1949 **

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	445	8.8						2.5
01	470	9.0						
02	---	---						
03	---	8.5						
04	---	8.5						2.8
05	400	8.3						
06	400	8.8						
07	380	9.2						
08	400	9.7						2.5
09	410	9.9						
10	400	10.4						
11	440	10.8						
12	420	11.3						2.5
13	440	(11.5)						
14	420	(11.5)						
15	415	(11.6)						
16	430	11.7						2.6
17	410	11.5						
18	390	11.2						
19	400	10.5						
20	400	9.5						2.6
21	420	9.0						
22	440	9.0						2.4
23	450	9.0						

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

Table 27

Bombay, India (19.0°N, 73.0°E) June 1949 **

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07	330	8.1						
08	---	---						
09	450	9.7						
10	525	10.3						
11	540	11.4						
12	570	(12.3)						2.4
13	---	---						
14	---	(13.2)						
15	---	(13.4)						
16	---	(13.2)						
17	570	(13.4)						
18	510	12.5						
19	510	11.5						
20	540	10.4						2.4
21	555	9.5						
22	570	8.5						2.4
23	---	---						

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

Table 28

Madras, India (13.0°N, 80.2°W) June 1949 **

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06								
07	390	8.7						
08	420	10.2						2.4
09	450	10.5						
10	480	10.5						
11	495	10.6						
12	510	10.5						2.4
13	540	10.7						
14	540	10.8						
15	540	11.5						
16	540	12.0						2.5
17	510	12.0						
18	525	11.8						
19	525	(11.5)						
20	---	(10.6)						
21	---	(10.1)						
22	---	9.9						
23								

Time: Local.
Sweep: 1.8 Mc to 15.0 Mc in 6 minutes, manual operation.
*Height at 0.83 foF2.
**Average values; other columns, median values.

Table 29

Tiruchirapalli, India (10.8°N, 78.8°E) June 1949

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	---						
01								
02								
03								
04								
05								
06	360	8.5						
07	360	9.0						
08	420	10.6						
09	460	11.2						
10	510	11.4						
11	540	11.0						
12	570	10.8						
13	600	10.6						
14	540	10.8						
15	600	11.8						
16	615	11.9						
17	510	12.2						
18	500	12.0						
19	480	11.5						
20	590	11.4						
21	600	10.5						
22	620	9.8						
23								

Time: Local.
Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 30

Barotonga I. (21.3°S, 159.8°W) June 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	5.1						2.8
01	265	4.4						2.8
02	270	4.6						2.8
03	260	4.4						2.9
04	250	3.8						2.8
05	280	3.8					2.0	2.7
06	280	4.1			---	---	3.0	2.7
07	250	7.2			---	1.9	3.4	3.0
08	250	10.4	220	---	110	2.6	3.9	3.1
09	250	11.8	230	4.1	110	(3.2)	4.4	3.2
10	250	11.6	220	6.0	110	3.5	4.6	3.2
11	260	11.6	210	6.2	110	3.8	4.5	3.1
12	260	10.6	220	5.5	110	3.6	4.4	3.0
13	260	10.6	210	5.6	110	3.8	4.8	3.0
14	270	10.6	210	6.3	110	3.8	4.3	2.9
15	260	10.6	220	6.2	110	3.4	4.3	2.9
16	250	10.7	240	4.8	110	3.0	4.2	2.8
17	250	11.1			130	2.6	3.8	2.9
18	240	10.8			---	E	3.4	3.0
19	220	9.4			---	---	3.1	3.0
20	230	7.6					2.9	2.8
21	250	7.1					2.9	2.8
22	250	8.3					2.6	2.8
23	260	5.9					1.9	2.9

Time: 157.5°W.
Sweep: 2.0 Mc to 18.0 Mc, manual operation.

Table 31

Brisbane, Australia (27.5°S, 163.0°E) June 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	4.1					2.1	2.8
01	265	4.0					2.1	2.9
02	250	4.2					2.1	2.8
03	250	4.2					2.3	2.9
04	240	4.2					2.2	3.0
05	240	4.0					2.6	3.0
06	240	4.3			---	(1.5)	2.5	3.0
07	220	7.0			140	2.2		3.4
08	220	8.9			100	2.8		3.4
09	240	9.0	220	4.4	100	3.2		3.4
10	240	9.0	210	4.5	100	3.4		3.3
11	240	9.1	210	4.6	100	3.6		3.3
12	250	9.1	210	4.8	100	3.5		3.2
13	240	9.0	200	4.5	100	3.5		3.2
14	240	9.0	210	4.5	100	3.3	3.9	3.1
15	240	8.9	210	4.0	---	3.0	4.3	3.2
16	225	8.9			105	2.6	3.1	3.2
17	210	7.9			150	1.8	3.6	3.2
18	205	6.4					3.2	3.1
19	230	5.6					3.1	3.0
20	230	5.0					2.6	3.1
21	240	4.8					2.0	3.0
22	230	4.4						3.0
23	240	4.0						3.0

Time: 150.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 65 seconds.

Table 32

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	3.8					2.8	2.8
01	260	3.9					2.8	2.8
02	260	3.9					2.7	2.8
03	260	3.9					2.6	2.8
04	260	4.0					2.6	2.9
05	240	3.9					2.6	3.0
06	222	3.6					2.8	3.0
07	225	4.8			180	1.5	2.6	3.1
08	210	7.5			100	2.4	3.4	3.3
09	220	8.5	---	---	100	3.0	3.5	3.3
10	225	9.2	210	4.1	100	3.1	4.0	3.3
11	240	9.2	205	4.5	100	3.4	4.3	3.2
12	240	9.4	200	4.4	100	3.4	4.4	3.2
13	240	9.2	202	4.3	100	3.3	4.5	3.1
14	240	9.4	208	4.3	100	3.1	4.4	3.1
15	235	9.2	210	4.0	100	2.9	4.4	3.1
16	220	8.5			100	2.5	4.0	3.2
17	210	8.2			150	1.8	3.5	3.1
18	210	6.6					3.8	3.0
19	220	6.0					3.2	3.0
20	230	4.8					2.9	3.0
21	240	4.2					2.7	2.8
22	250	4.1					3.0	2.8
23	260	4.0					2.6	2.8

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

Table 33

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.1					3.5	2.7
01	280	3.1					4.0	2.7
02	280	3.1					5.4	2.7
03	280	3.1					4.1	2.7
04	270	3.3					3.6	2.8
05	250	3.0					3.0	2.9
06	240	2.8					3.5	2.9
07	280	3.2			---	E	2.8	3.1
08	250	6.0			---	2.0	2.1	3.4
09	240	---			---	2.6	3.8	---
10	240	---			100	2.8	4.0	---
11	(245)	---			---	3.0	(2.9)	---
12	(240)	---			---	---	(3.3)	---
13	240	---			---	3.1	4.1	---
14	230	(9.4)			---	2.9	4.0	(3.2)
15	230	(8.3)			---	2.6	4.0	(3.1)
16	220	(9.6)			---	2.1	3.0	(3.1)
17	(240)	---			---	---	(2.0)	---
18	---	---						---
19	(250)	---					(2.0)	---
20	(235)	---					2.0	---
21	250	(4.1)					2.5	(3.0)
22	250	(3.6)					2.1	(3.0)
23	250	3.3					2.2	2.9

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

Table 34

Bagneux, Franos (48.8°N, 2.3°E) May 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	---	---						---
01	---	---						---
02	---	---						---
03	---	---						---
04	---	---						---
05	---	---	---	---				---
06	300	7.7	240	(4.6)	110	2.8	3.6	2.9
07	300	8.4	225	(4.8)	110	3.1	3.8	2.9
08	300	8.4	225	---	100	3.4	4.0	3.0
09	338	8.6	225	5.6	100	3.6	5.2	2.8
10	350	9.0	218	5.3	100	3.7	4.6	2.8
11	350	9.4	226	5.6	100	3.8	4.2	2.8
12	350	9.4	238	(6.8)	100	3.8	5.0	2.8
13	350	9.2	250	5.7	100	3.8	4.4	2.8
14	350	8.8	225	5.7	100	3.6	4.4	2.8
15	350	8.8	226	5.6	106	3.4	4.8	2.8
16	325	8.9	225	---	100	3.2	4.1	2.9
17	300	9.0	250	---	110	2.8	4.4	2.9
18	300	9.1	250	---	100	2.4	3.8	2.9
19	275	9.1	250	---	---	E		3.0
20	250	9.0	---	---	---	E		3.0
21	250	8.8					2.6	2.8
22	262	8.2					2.6	2.8
23	---	---						---

Time: 0.0°.
Sweep: 2.2 Mo to 16.0 Mc in 1 minute 6 seconde.

Table 35

Poitiers, France (46.6°N, 0.3°E) May 1949

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	318	7.7						2.6
01	310	7.4						2.6
02	310	7.0						2.6
03	300	6.9						2.6
04	300	6.5			---	E		2.6
06	280	7.0	276	---	---	E		2.8
06	300	7.4	230	---	---	E	3.3	2.8
07	295	8.0	225	---	120	3.3	3.6	2.9
08	280	8.2	220	6.2	120	3.3	3.9	2.8
09	330	8.4	210	6.1	120	3.3	4.0	2.8
10	342	8.6	220	6.6	110	3.3	4.3	2.7
11	340	9.1	202	6.8	110	3.3	4.4	2.7
12	355	9.1	220	6.7	105	3.3	4.2	2.7
13	350	9.2	225	5.7	110	3.3	4.5	2.7
14	350	9.2	225	5.7	110	3.3	4.3	2.7
15	330	9.0	230	5.5	110	3.3	4.7	2.7
16	318	9.0	230	---	120	3.4	3.8	2.8
17	290	9.1	230	---	116	3.3	3.9	2.8
18	280	9.2	240	---	---	E	4.2	2.8
19	280	9.2	265	---	---	E	3.4	2.8
20	260	9.0			---	E		2.8
21	280	8.4						2.8
22	280	8.0						2.6
23	320	7.7						2.6

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

Table 36

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

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	8.5						2.9
01								
02								
03								
04								
06								
06	280	4.9			---	---		2.9
07	250	8.2			---	2.1		3.1
08	240	11.2			110	2.7	3.7	3.2
09	240	12.4	---	---	110	3.2	4.4	3.1
10	250	13.0	220	4.8	110	3.5	4.4	3.1
11	250	13.3	220	6.0	110	3.6	4.6	3.0
12	290	13.6	210	6.0	110	3.7	4.8	2.9
13	280	13.2	220	5.5	110	3.6	4.7	2.8
14	285	13.4	220	6.0	110	3.6	6.1	2.8
15	290	13.6	240	6.1	---	---	5.2	2.7
16	260	13.7	250	6.5	110	3.0	5.0	2.8
17	250	14.0	---	---	---	2.5	4.6	2.8
18	250	13.2			---	E	4.1	2.9
19	240	12.0					4.0	2.9
20	240	10.9					3.3	2.8
21	250	9.8					3.1	2.9
22	250	8.2					2.3	2.8
23	250	6.6						2.8

Time: 157.6°W.
Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Form adopted June 1946

TABLE 37

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

IONOSPHERIC DATA

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

Observed at Washington, D.C.

Lat. 38.7°N, Long. 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B., J.D.

Calculated by: B.E.B., J.C.

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	270	270	270	280	270	260	240	230	230	210	210	B	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	220	250	260	280	300	230	230	240	240	230	220	250	250	290	300
4	300	290	290	290	320	310	280	260	230	200	280	290	300	[260]C	230	270	270	240	240	220	240	270	280	300
5	300	290	280	290	(290)S	300	270	230	240	270	250	270	280	240	230	230	230	230	220	220	[240]A	270	270	280
6	290	290	280	260	270	290	280	230	230	230	240	[240]L	240	230	230	230	230	240	240	240	260	270	290	300
7	300	310	300	290	280	320	290	230	230	230	230	240	250	240	240	240	260	250K	250K	300K	350K	[330]SK	(310)SK	310K
8	270K	320K	250K	300K	[340]SK	(370)SK	310K	250K	230K	270K	[340]LK	400K	380K	380K	[310]LK	240K	260K	280K	240K	240K	270K	[300]AK	320K	370K
9	330K	310K	290K	280K	(290)SK	300K	280	240	230	260	290	280	220	210	240	240	240	230	230	230	240	240	250	260
10	260	280	270	270	250	270	240	230	240	220	210	230	220	230H	250	250	240	240	230	230	240	260	300	310
11	300	270	250	250	250	280	270	280	230	230	230	(240)B	220	230	230	240	[240]C	240	250	250	260	240	250	250
12	270	280	290	270	280	(300)S	300	270	250	230	230	220	230	230	230	250	[240]C	250	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	230	(230)A	A	A	240	230	250	[250]A	250	250	270	300	300	290K	270K
14	280K	[300]AK	310K	300K	360K	370K	320K	280K	300K	440K	540K	570K	640K	580K	510K	490K	380K	310K	370FK	NK	[380]NK	360K	320FK	400FK
15	390K	370K	370K	350K	310AK	NK	NFK	320K	280K	GK	GK	GK	[G]BK	690K	600K	590K	450KH	320K	410K	480FK	420FK	410K	400K	[360]AK
16	320K	300K	270FK	260K	300K	300K	280K	260	230	240	220	220	220	220	220	230	230	230	220	230	250	270	280	290
17	320	310	300	300	300	330	300	230	240	220	230	220	220	230	240	240	230	230	220	230	220	230	270	280
18	270	280	290	290	300	270	250	250	230	230	220	230	230	220	230	230	230	230	240	230	230	240	260	250
19	270	280	280	270	300	300	300	230	230	220	290	[280]C	270	230	280	250	240	250	230	270	[250]A	230	270	270
20	270	260	270	270	250	280	280	240	240	230	210	220	230	(220)A	[240]A	(260)A	(250)A	260	230	240	270	(270)A	250	290
21	290	290	(310)S	290	240	250	(270)B	230	230	220	220	270	220	(240)A	240	230	230	230	230	220	230	270	280	270
22	260	270	270	290	280	290	280	220	230	230	230	230	240	240	240	230	240	230	220	220	(270)A	270	270	280
23	280	270	270	240	270	260	260	250	240	220	220	210	280	270	230	250	240	220	210	220	230	250	320	(370)A
24	370	300	270	[270]A	270	(300)S	300	240	230	230	220	210	230	230	280	240	220	210	230	230	230	260	280	290
25	290	[280]A	(280)A	260	240	260	270	240	230	230	210	210	240	240	230	240	230	210	220	220	220	270	280	280
26	270	270	280	280	280	240	230	(230)A	220	230	230	240	230	230	240	240	240	230	220	230	240	240	270	280
27	280	300	300	280	260	240	250	[240]C	240	220	210	260	270	250	250	[260]C	260	220	250	C	C	C	C	C
28	C	C	C	C	C	C	C	C	250	250	260	270	230	220	230	240	240	230	220	240	240	270	270	280
29	270	A	A	A	280	280	270	230	250	210	270	270	230	230	230	220	230	220	220	210	220	230	230	240
30	270	280	290	290	280	260	240	230	220	220	200	220	220	220	220	230	220	230	210	220	220	240	270	[280]A
31	300	250	220	240	280	300	270	220	210	220	220	230	230	290	210	230	220	210	200	220	220	230	260	240
Median	280	285	280	280	280	290	275	240	230	230	230	240	230	230	230	240	240	230	230	230	240	270	280	280
Count	27	26	26	26	27	26	26	27	28	30	30	29	28	29	29	29	29	29	28	26	27	27	27	27

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1949 O - 702510

Form adopted June 1946

TABLE 38

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

IONOSPHERIC DATA

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

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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	(6.5)S	(6.0)SF	(5.4)SF	(5.1)SF	(4.9)SF	(4.8)JS	(5.4)JS	8.0F	9.6	10.4	10.9	11.4	B	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	9.8	10.6	10.1	10.4	11.3	11.1	11.0	11.1	11.0	(10.1)JS	(8.5)SP	7.5	6.6	(6.1)SP	(5.8)S
4	5.8F	5.8F	5.7F	(5.2)SF	5.0	(5.2)JS	(5.8)SP	8.0F	9.0	9.9	10.4	10.8	11.7	[11.2]C	10.6	10.1	10.5	10.1	(9.6)S	(8.7)S	(7.9)S	6.9	6.4F	(6.6)S
5	6.5	6.3	6.1	(5.2)JS	4.7	(4.9)JS	(6.3)S	(8.8)S	(10.2)JS	11.0	(11.7)JS	(12.1)JS	11.9	12.4	(12.5)P	(12.0)S	(11.5)PS	(11.5)S	(10.0)JS	8.4	7.3	6.6	(6.2)S	5.9
6	5.9	5.9	5.8F	[5.1]F	(4.4)JS	(4.4)JS	(5.2)SF	(7.6)JS	(9.1)S	[9.8]C	11.0	12.0	12.0	11.4	11.3	11.5	10.6	10.4	(10.0)JS	8.5	(7.7)JS	(7.1)S	(7.0)SF	7.0F
7	(7.1)SF	(6.8)SF	6.4	6.2	4.6F	3.1F	(4.6)SF	(7.2)S	(8.2)S	(8.6)S	10.1	10.7	11.2	11.1	11.2	11.5	11.7	12.8K	7.4FK	K(5.9)SF	5.7FK	4.3FK	(5.4)FK	6.0FK
8	6.1FK	5.5FK	4.8FK	4.5FK	[3.4]FK	2.3FK	K(4.3)FS	K(7.0)FS	K(7.9)FS	8.5FK	8.5FK	8.3FK	8.6FK	8.8FK	8.4K	8.6K	8.0K	7.9K	7.6K	6.8K	6.1K	5.3K	4.6FK	4.4FK
9	4.8FK	K(4.8)SF	4.3FK	K(4.0)SF	K(3.4)SF	K(3.2)SF	(4.7)SF	(7.8)S	9.4	(11.1)S	12.2	11.7	11.0	11.6	12.1	11.8	11.2	10.8	10.6	8.8	8.2	7.9	7.4	(7.0)JS
10	6.5	6.3	6.0	5.2	5.0	(4.7)JS	(5.5)S	8.0	(11.0)S	(11.7)JS	12.3	12.7	12.3	12.6	12.6	12.8	(12.6)S	12.0	10.7	(9.4)S	8.6	(8.1)S	7.2	(7.0)S
11	7.4	7.2	6.9	6.0	5.7	5.5	5.9	8.7	11.0	12.5	12.3	(12.7)JS	12.8	(12.9)S	(13.2)S	(12.6)S	[11.9]C	(11.2)S	(10.3)S	(9.3)S	(8.7)S	8.2	(7.1)S	(6.7)S
12	6.3	6.3	6.0	5.6	(5.1)S	4.9	(5.4)S	7.5	9.2	10.8	12.0	12.3	13.0	12.6	12.4	12.5	[12.4]C	11.7	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	11.7	12.7	(12.8)A	12.6	12.2	12.3	12.8	12.0	(11.2)SP	10.4	8.8	8.0	7.8	8.0K	7.6K
14	7.5K	7.3K	7.0K	6.3K	K(5.4)JF	K(5.2)JF	(5.4)FK	5.5FK	6.0FK	6.4K	6.5K	6.9K	(6.6)SK	(7.0)SK	7.6K	8.7K	K(10.7)SF	(9.4)SK	F K	N K	[2.8]NK	3.2FK	F K	F K
15	(3.8)FK	(3.6)FK	(3.2)FK	(4.0)FK	(4.7)FK	[3.6]NK	[3.5]NK	(4.2)FK	4.4FK	<4.7GK	<4.6GK	<4.7GK	K[<4.8]BG	5.5FK	5.2FK	6.0FK	8.2FK	6.3FK	K(5.8)SF	F SK	F K	(3.7)FK	(3.7)FK	(3.1)AK
16	3.9FK	(3.3)FK	F K	F K	(3.5)FK	K(3.2)FS	(3.5)FK	(7.1)F	9.3	11.5	12.4	(13.2)S	(13.1)S	13.2	(13.2)JS	13.4	(13.0)S	12.0	(10.6)JS	(8.7)S	7.6	6.1F	5.6	5.0F
17	4.8F	4.4F	(4.1)FS	(3.9)F	(3.0)F	(2.6)F	(3.8)F	7.0	9.6	11.4	12.2	12.4	13.2	(13.5)S	13.1	(13.5)S	12.9	12.3	10.8	(9.3)J	8.3	6.6	6.4	6.5
18	6.1F	5.8	5.4F	5.1F	4.9F	4.4F	4.4F	7.5	9.6	10.4	11.4	12.2	12.8	13.1	12.7	12.5	11.9	11.2	10.5	8.8	7.8	6.9	6.3	6.0
19	5.7	(5.3)V	5.5F	5.0F	4.3F	4.0F	[3.9]SF	6.2	8.6	8.2	9.8F	[10.6]C	11.0	10.6	11.0	10.5	10.5	(9.5)P	8.8	7.7	6.9	(6.6)JS	6.3	6.0
20	6.1	5.9	5.7	5.3	4.9	4.5	4.8	7.5	9.2	9.9	12.0	12.3	12.4	12.7	12.0	11.9	11.7	(11.5)S	(10.5)S	8.7	8.2	7.4	6.9	6.3
21	(6.1)S	5.7F	5.4F	5.7F	5.5	4.8F	4.2F	7.6F	9.5	11.4	12.0	12.7	13.1	12.9	12.9	13.3	12.3	(11.6)S	(10.7)S	(9.3)S	7.2F	6.9F	6.5F	6.5F
22	5.9F	5.4F	4.8F	4.5F	(4.6)SF	4.4F	4.6F	7.8	9.8F	11.4	11.9	12.7	13.0	13.2	12.9	12.8	12.5	12.0	10.5	9.1	8.7F	8.1	6.9	5.9
23	5.7	(6.2)S	6.3	5.8	5.0	5.0F	(5.0)JF	8.0	11.0	(11.9)S	12.7	(13.9)S	13.1	(13.7)S	(12.7)S	(13.2)S	(13.4)S	(13.4)S	(12.7)S	9.9	8.0	6.5	5.4	(5.0)F
24	(4.7)F	(5.1)F	4.9F	4.2F	3.6F	(3.4)JF	3.9	7.6	10.3	11.3	12.8	(13.2)S	13.3	(13.2)S	13.0	12.8	12.6	10.9	(10.0)S	(8.7)S	7.4	6.5	6.4	(6.1)S
25	(6.1)S	6.2	5.9	5.3	4.7F	4.0F	3.8F	7.4	10.1	11.3	12.1	12.3	(12.6)S	13.0	(13.0)S	13.4	(13.0)S	11.5	10.0	8.9	(7.2)S	(6.7)S	6.7	6.5
26	5.8	5.8F	5.4F	5.2F	5.1	(5.0)S	(4.9)S	7.8	(9.5)JS	11.3	11.4	12.8	13.2	12.6	(12.8)S	12.8	12.9	12.8	10.4	(8.8)P	8.0	(6.8)JS	6.2	5.8
27	5.8	5.4	5.6	5.8	(5.8)JS	4.8	4.3	[6.8]C	9.4	10.3	10.8	12.3	13.4	13.2	(13.1)S	[13.3]C	13.5	(13.9)S	12.8	C	C	C	C	C
28	C	C	C	C	C	C	C	C	8.2F	10.4	11.3	11.4	12.6	12.2	11.8	11.9	11.6	(11.2)SP	(9.3)S	(7.9)JS	(6.8)S	6.2	5.5	(5.2)JS
29	4.9	4.6	4.2	4.2	4.1	(3.8)S	(3.9)SJ	6.5	8.1	(9.2)JS	9.9	11.4	12.1	(12.2)JS	12.0	12.1	(11.2)S	10.5	9.6	8.6	7.4	6.3	5.6	5.0
30	4.5	4.5F	(4.4)JF	4.3F	4.3F	4.2F	4.2F	7.3F	8.4	9.4	11.3	12.3	(12.3)S	13.0	12.3	12.3	11.9	(11.2)SP	10.0	8.6	(6.7)JS	6.3	(6.0)JS	5.7
31	6.3F	6.3F	5.7F	4.8F	3.9F	3.6F	3.9	6.8	(9.3)JS	10.7	11.7	11.9	12.8	(12.1)S	(13.0)S	12.7	(12.4)S	11.4	(9.6)SP	8.5	(7.4)S	6.3	(6.1)SF	(5.6)SF
Median	5.9	5.8	5.6	5.2	4.7	4.4	(4.6)	7.5	9.4	10.6	11.6	12.2	12.6	12.6	12.4	12.3	11.9	11.2	10.1	8.7	7.6	6.6	6.3	6.0
Count	27	27	26	26	27	27	27	27	28	30	30	30	29	29	29	29	29	29	27	25	26	27	26	26

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 39

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

IONOSPHERIC DATA

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

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B., J.D.

Calculated by: B.E.B., J.C.

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)S	(6.0)FS	(5.4)FS	(4.9)FS	(4.4)SF	(4.5)FS	(6.5)FS	8.6	10.2	10.4	10.9	11.4	11.3	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	10.5	10.6	10.3	10.9	11.2	11.0	11.3	11.3	(10.5)S	(9.4)JS	8.0	7.1	(6.6)SP	(5.9)SP	5.8
4	6.0F	5.7F	5.5F	4.9F	5.1F	F(5.2)JS	(7.0)FS	8.6	9.1	10.3	11.1	11.5	C	C	10.3	10.5	(10.3)S	(9.7)JS	(9.2)S	(8.5)S	7.7	6.6	6.4F	6.6
5	6.5	6.2	(5.4)JS	5.0	(4.9)S	5.3	(7.9)S	10.3	10.4	11.1	12.5	12.3	12.3	(12.4)S	(11.2)	11.7	11.3	(10.9)S	9.4	7.8	6.7	(6.5)S	(5.8)S	(6.0)S
6	5.8	5.8F	[5.3]F	4.8F	J(4.5)FS	J(3.8)SF	(6.3)S	(8.6)S	9.5	10.1	11.4	12.4	11.8	11.5	11.6	11.0	(10.6)S	(10.5)S	(9.2)S	(8.1)S	(7.3)JS	(6.9)SF	[7.1]C	7.2F
7	7.0F	(6.7)S	6.3	(5.6)JS	(3.3)FS	3.3F	(6.3)FS	(7.4)S	(8.7)S	9.0F	10.2	10.9	11.4	10.9	11.5	10.8	(12.2)S	(11.2)SK	K(5.7)SF	5.2FK	(4.3)FK	4.9FK	5.5FK	6.2FK
8	K(6.3)JF	5.6FK	4.8FK	FK	FSK	(2.6)FK	K(6.0)FS	K(7.1)FS	8.2FK	8.1FK	8.5FK	8.8FK	8.9FK	8.9K	8.4K	8.4K	7.9K	7.9K	(7.1)SK	6.4K	5.4K	5.2K	K(4.5)FS	K(4.3)FS
9	4.4FK	4.8FK	K(4.3)FS	(3.5)FK	K(2.7)FS	K(3.5)FS	(6.2)SK	(8.9)S	9.9	(11.5)S	(12.0)S	11.3	11.6	11.8	11.8	11.7	11.0	10.4	9.4	8.6	8.1	7.6	7.2	6.7
10	6.4	6.2	5.7	(5.3)S	(4.8)JS	4.7	(6.8)S	(9.2)S	(11.4)S	12.2	(12.6)S	(12.5)S	12.8	12.2	12.8	12.8	(12.2)S	(11.2)S	10.0	9.0	(8.2)S	7.6	7.2	(7.5)S
11	7.4	7.1	6.5	5.8	5.5	5.4	7.2	10.0	11.9	12.6	12.6	(12.9)JS	[12.8]M	(13.2)S	(13.0)S	12.5	[11.8]C	(10.6)S	(9.7)S	(9.0)S	(8.6)S	(7.5)S	(6.8)JS	6.6
12	6.2	6.2	5.8	5.5	5.0	4.9	6.4	8.5	10.0	11.3	12.2	(12.9)S	12.9	12.1	12.3	12.2	11.4	(10.8)J	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	12.1	(12.9)S	12.7	12.1	12.2	(13.0)S	(12.5)S	11.5	10.7	9.4	8.1	(8.0)JS	7.8	7.9K	7.5K
14	K(7.4)JS	7.2K	7.6K	5.8K	K(5.3)JF	K(5.0)JF	4.9FK	(5.9)FK	5.7FK	6.6K	(6.5)SK	K(7.3)JS	6.9K	[7.3]CK	8.0K	KF(9.0)JS	(10.3)SK	(6.9)SF	[4.7]FK	K(2.5)SF	(3.4)FK	K(3.3)SF	FK	FK
15	(3.7)FK	(3.6)FK	(3.6)FK	[4.4]FK	(4.2)FK	3.1FK	[3.8]FK	4.5FK	4.6FK	4.8FK	<4.6GK	<4.8GK	<4.9GK	5.3FK	5.4FK	7.1FK	(8.1)FK	(5.3)FK	FSK	FK	FK	FK	(3.7)FK	[3.8]FK
16	(3.8)FK	[4.1]FK	(4.4)FK	(3.0)FK	(3.2)FK	[3.4]JK	(5.3)FK	7.8	10.3	11.5	12.5	13.2	13.3	(13.6)S	(13.2)JS	(13.2)B	(12.6)S	(11.7)S	(9.5)S	8.2	6.5F	5.4F	5.6F	4.9F
17	4.5F	(4.4)F	(4.0)JF	(3.9)F	(2.8)F	(2.8)F	(5.6)F	8.4	9.9	12.0	12.6	13.0	(13.2)S	(13.2)S	(13.1)S	13.2	12.5	11.4	10.0	8.8	7.3	6.5	6.4	6.5
18	5.8	5.7F	5.4F	5.1F	4.6F	4.2F	5.9F	8.3F	10.1	11.2	12.0	12.2	12.8	12.9	12.7	12.2	11.6	10.7	(9.4)JS	8.2	(7.0)S	6.5F	(6.1)S	5.8
19	5.4	5.3F	(5.0)SF	4.5F	4.0F	(3.0)F	5.4F	7.1F	8.6	9.0	10.4	10.9	10.9	10.8	[10.9]C	10.5	10.1	(9.6)P	8.1	7.1	6.6	6.4	6.2	6.2
20	6.1	5.7	5.6	5.1	4.7	4.3	(5.9)S	8.6	9.9	(10.9)JS	12.6	12.3	12.7	12.1	11.9	11.8	11.6	11.3	(9.3)JS	8.6	(7.5)S	7.1	6.4	(5.9)S
21	(5.9)S	5.6F	5.7F	5.7	5.3	(4.1)JF	6.0F	8.5	10.6	11.8	12.5	(13.0)S	12.9	12.8	12.9	(13.1)S	12.0	11.0	(9.9)S	8.3	7.0F	6.5F	6.6F	6.4F
22	5.6F	5.1F	4.8F	4.4F	4.4F	(4.3)SF	6.1F	9.0F	10.4	11.3	(12.5)S	[12.8]C	13.2	12.7	13.0	12.6	(12.6)S	12.0	(9.8)JS	8.6F	8.3	7.0	(6.3)JS	(5.9)JS
23	(6.0)VS	(6.3)S	6.1	5.3	(5.0)JS	4.8F	(6.3)JS	9.5	11.3	(12.1)S	13.0	13.4	(13.3)JS	(13.2)S	(12.9)S	12.7	(13.4)S	(13.7)S	10.4	8.8	7.2	5.8	4.9F	4.7F
24	5.0F	4.8F	4.4F	(3.9)JF	3.5F	3.4	5.7	9.2	11.4	12.6	12.8	(13.4)S	(13.6)S	(12.8)S	(13.0)S	12.9	11.8	(10.2)S	(9.3)JS	7.8	6.7	6.6	(6.2)JS	6.0
25	6.3	6.0	5.6	5.0	4.3	3.5F	5.3F	9.2	(10.9)JS	11.9	12.2	12.1	13.3	13.0	(13.5)S	(13.4)S	(12.4)S	(10.7)S	(9.2)S	(8.1)S	(7.0)S	(6.7)S	6.5	6.0F
26	6.0	5.6F	5.4F	5.2F	5.2	(4.8)JS	6.4	(9.1)S	(10.4)S	11.3	12.0	13.0	12.6	(12.8)JS	(13.0)S	(12.9)JS	12.8	11.0	9.2	8.2	(7.5)JS	6.6	6.1	5.8
27	5.4	5.4	5.7	5.7	5.4	4.2	5.7	[8.3]C	[9.9]C	11.0	11.9	13.4	(13.4)S	13.1	13.5	13.8	(13.3)S	12.3	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	9.6	11.0	10.9	12.0	12.2	(12.0)S	12.0	(11.5)S	(11.6)S	(11.2)S	8.8	(7.3)S	(6.0)JS	(5.7)S	5.4	5.1
29	4.6	4.3	4.3	4.2	4.1	(3.9)S	5.2	(6.9)JS	(8.8)JS	10.0	10.7	12.0	(12.4)S	12.3	(12.3)JS	(11.7)SP	10.9	(10.1)JS	(9.2)SP	7.9	(6.8)JS	(6.0)JS	5.4	4.5
30	4.5	4.5F	4.4F	4.3F	4.3	4.0F	5.2F	8.1F	(8.8)JS	10.2	11.9	12.2	13.1	(12.3)S	12.5	(12.3)S	(11.4)S	10.6	(9.4)S	7.5	6.5	6.1	5.7	6.0
31	6.4F	6.1F	5.2F	4.4F	3.6F	3.5	(5.0)JS	8.1	10.2	11.1	11.9	12.0	12.5	(12.9)S	(12.8)S	(12.5)SP	(12.2)JS	(10.6)JS	9.2	(8.0)S	(6.6)S	(6.0)JS	(6.0)SF	5.5F
Median	6.0	5.7	5.4	5.0	4.4	4.1	(6.0)	8.5	10.0	11.1	12.0	12.2	12.6	12.3	12.5	12.2	(11.6)	(10.7)	(9.4)	8.1	7.0	6.5	6.2	6.0
Count	27	27	27	26	26	27	27	27	28	30	30	30	29	28	29	29	29	29	26	26	26	26	26	26

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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TABLE 40

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

Form adopted June 1946

IONOSPHERIC DATA

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

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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							Q	Q	Q	Q	Q	Q	B	M	M	M	M	M	M					
2							M	M	M	M	M	M	M	M	M	M	M	M	M					
3							M	M	M	Q	210	200	210	230	Q	Q	Q	Q	Q					
4							Q	Q	Q	230	[220] B	210	220	C	A	A	Q	Q	Q					
5							Q	Q	Q	210	210	220	220	Q	Q	Q	Q	Q	Q					
6							Q	Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q					
7							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q K	Q K					
8							Q K	Q K	Q K	Q K	220 K	(220) K B	[220] K B	230 K	220 K	Q K	Q K	Q K	Q K					
9							Q	Q	Q	210	220	230	Q	Q	Q	Q	Q	Q	Q					
10							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
11							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	Q					
12							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	C					
13							C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
14							Q K	Q K	270 K	240 K H	250 K H	[260] K B	270 K	260 K	240 K	260 K	270 K	280 K	Q K					
15							N K	Q K	Q K	260 K	290 K	290 K	[280] K B	260 K	270 K	230 K	290 K	Q K	Q K					
16							Q K	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
17							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
18							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
19							Q	Q	Q	Q	230	[230] C	230	Q	230	Q	Q	Q	Q					
20							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
21							Q	Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q					
22							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
23							Q	Q	Q	Q	Q	Q	[illegible]	250	Q	Q	Q	Q	Q					
24							Q	Q	Q	Q	Q	Q	Q	Q	230	Q	Q	Q	Q					
25							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
26							Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q	Q					
27							Q	C	Q	Q	Q	210	[illegible]	Q	Q	C	Q	Q	Q					
28							C	C	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q					
29							Q	Q	210	Q	210	200	Q	Q	Q	Q	Q	Q	Q					
30							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
31							Q	Q	Q	Q	Q	Q	Q	210	Q	Q	Q	Q	Q					
Median									—	230	220	210	220	230	230	—	—	—						
Count									2	5	10	13	9	6	5	2	2	1						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 41

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

Form adopted June 1946

IONOSPHERIC DATA

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

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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							Q	Q	Q	Q	Q	Q	B	M	M	M	M	M	M					
2							M	M	M	M	M	M	M	M	M	M	M	M	M					
3							M	M	M	Q	L	L	L	L	Q	Q	Q	Q	Q					
4							Q	Q	Q	L	L	L	L	C	L	L	Q	Q	Q					
5							Q	Q	Q	L	L	L	L	Q	Q	Q	Q	Q	Q					
6							Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
7							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q^{K}	Q^{K}					
8							Q^{K}	Q^{K}	Q^{K}	Q^{K}	L^{K}	$(5.6)^{P}_{K}$	$(54)^{B}_{K}$	5.7^{K}	L^{K}	Q^{K}	Q^{K}	Q^{K}	Q^{K}					
9							Q	Q	Q	L	L	L	Q	Q	Q	Q	Q	Q	Q					
10							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
11							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	Q					
12							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	C					
13							C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
14							Q^{K}	Q^{K}	L^{K}	5.0^{K}	5.1^{K}	5.2^{K}	$(5.3)^{P}_{K}$	$(49)^{S}_{K}$	$(50)^{S}_{K}$	47^{K}	44^{K}	L^{K}	Q^{K}					
15							N^{K}	Q^{K}	Q^{K}	4.7^{K}	4.6^{F}_{K}	47^{F}_{K}	$[48]^{B}_{K}$	49^{F}_{K}	47^{F}_{K}	43^{F}_{K}	38^{K}	Q^{K}	Q^{K}					
16							Q^{K}	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
17							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
18							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
19							Q	Q	Q	Q	L	C	L	Q	L	Q	Q	Q	Q					
20							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
21							Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
22							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
23							Q	Q	Q	Q	Q	Q	L	L	Q	Q	Q	Q	Q					
24							Q	Q	Q	Q	Q	Q	Q	Q	L	Q	Q	Q	Q					
25							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
26							Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q	Q					
27							Q	C	Q	Q	Q	L	L	Q	Q	C	Q	Q	Q					
28							C	C	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
29							Q	Q	L	Q	L	L	Q	Q	Q	Q	Q	Q	Q					
30							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
31							Q	Q	Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q					
Median									—	—	—	—	—	—	—	—	—	—						
Count										2	2	3	3	3	2	2	2							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 42

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

Form adopted June 1946

IONOSPHERIC DATA

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

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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	130	120	110	120	B	M	M	M	M	M	M					
2							M	M	M	M	M	M	M	M	M	M	M	M	M					
3							M	M	M	110	100	110	110	120	120	120	120	120						
4								120	110	110	$(110)^{B}$	110	110	$[120]^{C}$	120	120	120	120						
5							100	$(110)^{A}$	$(120)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	120	120	120	120						
6								$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	130	120	110	120	120	110	$(120)^{A}$						
7								110	110	110	120	120	110	120	120	120	120	$(130)^{A}_{K}$	$(120)^{A}_{K}$					
8								$(110)^{A}_{K}$	$(110)^{A}_{K}$	$(120)^{A}_{K}$	$(110)^{A}_{K}$	$(110)^{A}_{K}$	$[110]^{B}_{K}$	110^{K}	110^{K}	110^{K}	$(110)^{A}_{K}$	120^{K}						
9								130	$(110)^{S}$	S	110	110	110	120	120	120	110	$(100)^{A}$						
10								110	110	110	110	120	110	110	120	120	120	130						
11								120	120	110	110	$[110]^{B}$	110	120	110	120	$[110]^{C}$	$(100)^{A}$						
12								130	$(120)^{A}$	$(130)^{A}$	110	110	$(110)^{A}$	130	120	$(110)^{A}$	C	S						
13							C	C	C	110	$(110)^{A}$	$(100)^{A}$	$(100)^{A}$	$(110)^{A}$	130	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$					
14								120^{A}	120^{K}	110^{K}	110^{K}	B^{K}	B^{A}	120^{K}	$(110)^{S}_{K}$	110^{A}	120^{A}	$(130)^{S}_{K}$						
15									120^{K}	110^{K}	110^{K}	110^{K}	$[120]^{B}_{A}$	120^{K}	120^{A}	120^{A}	110^{K}	B^{K}						
16									130	120	130	110	110	110	110	110	120	130						
17									120	120	120	B	B	110	120	120	120	$(140)^{B}$						
18								120	$(110)^{A}$	110	120	120	110	110	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$						
19								120	120	$(110)^{A}$	$(110)^{A}$	$[110]^{C}$	110	120	120	120	120	120						
20								120	110	110	[illegible]	$(110)^{A}$	$(110)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$					
21									110	$(110)^{A}$	[illegible]	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	$(120)^{A}$	120	B	B	B					
22								$(120)^{A}$	110	B	B	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	120	$(100)^{A}$	110	140						
23								$(120)^{A}$	$(110)^{A}$	$(110)^{A}$	$(110)^{A}$	[illegible]	$(110)^{A}$	120	120	120	120	B						
24									120	[illegible]	130	$(110)^{A}$	$(110)^{A}$	$(100)^{A}$	$(100)^{A}$	110	110	A						
25								120	120	[illegible]	[illegible]	[illegible]	[illegible]	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$	$(100)^{A}$							
26								A	120	[illegible]	[illegible]	[illegible]	120	120	[illegible]	$(110)^{A}$	$(130)^{A}$							
27								C	130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$[120]^{C}$	130	$[130]^{A}$						
28							C	C	[illegible]	[illegible]	[illegible]	[illegible]	$(100)^{A}$	[illegible]	120	$(120)^{S}$	[illegible]							
29								[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$(100)^{A}$	$(100)^{A}$						
30								110	[illegible]	$(100)^{A}$	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	110	$(100)^{A}$	$(100)^{A}$						
31								S	[illegible]	[illegible]	$(100)^{A}$	$(100)^{A}$	[illegible]	[illegible]	[illegible]	[illegible]	$(100)^{A}$	[illegible]						
Median							—	120	115	110	110	110	(110)	110	120	120	110	(120)	—					
Count							1	19	28	28	29	28	27	29	29	29	27	21	3					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 43

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

IONOSPHERIC DATA

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

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U S GOVERNMENT PRINTING OFFICE 1946 O - 702519

TABLE 44

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

Form adopted June 1946

IONOSPHERIC DATA

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

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B.E.B., J.D.

Calculated by: B.E.B., J.C.

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	2.7Y/120	G	G	1.8/110	2.1/110	6.4/110	7.4/110	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	9.0/120	G	G	G	G	G	3.7/120	3.1/110	2.2/100	3.7/100	G	3.3/110	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	47/120	G	G	1.8/110	G	G	G	G	1.9/110
5	G	G	G	G	G	G	G	17/110	2.5/110	30/110	4.2/110	2.9/110	4.4/110	31/110	2.7/110	G	G	G	G	1.8/110	4.3/110	1.8/110	G	G
6	G	G	G	G	G	G	G	2.2/110	3.3/110	49/120	6.2/110	40/110	G	G	G	G	G	2.3/120	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46/130	22/120	G	G	G	24/130	3.7/120
8	3.3Y/110	G	G	G	G	G	G	2.2/110	2.9/110	43/120	3.7/110	34/110	G	G	G	G	58/110	G	G	G	G	3.9/110	G	G
9	G	1.9/110	G	G	G	G	G	2.0/110	G	G	G	G	G	G	G	G	20/100	2.1/100	G	G	G	G	G	G
10	G	28/110	G	1.7/100	1.4/110	G	G	(5.8)S/110	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	76/100	G	G	G	G	G	G
12	G	G	G	G	G	G	G	1.7/110	2.3/110	2.8/110	G	G	40/110	32/110	G	31/110	C	2.2/110	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	G	11.8/110	150/100	48/100	32/110	27/100	6.3/100	56/100	4.3/100	3.5/100	2.0/100	2.0/100	3.7/120	3.8/120	G
14	G	47/110	5.1/110	G	1.8/120	G	G	G	G	G	30/100	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24/160	G	G	G	8.0/110
16	7.2/100	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	28/110	G	G	G	G	G	G	2.9/110	39Y/110	3.7Y/110	38/110	3.3/110	G	G	G	G
19	G	G	G	G	G	G	G	G	G	3.2/110	8.5Y/110	C	2.7/110	G	G	G	G	G	G	2.1/120	6.5/120	G	G	G
20	G	G	G	G	G	G	G	G	G	3.0/110	3.0/110	32/110	80/110	47/100	54/100	58/100	5.6/100	43/100	3.8/100	2.8/100	4.4/110	5.8/110	(3.5)S/10	2.4/110
21	2.0/110	G	16/110	G	G	G	G	G	G	28/110	2.9/110	3.5/110	2.7/110	3.5/110	34/120	G	G	G	G	G	G	G	2.6/110	23/110
22	2.0/110	2.0/110	2.1Y/110	G	G	G	G	18/120	G	G	3.1Y/120	36/110	26/110	2.8/110	G	23/100	G	G	G	G	4.0/110	43/110	G	G
23	G	G	G	G	G	G	G	2.1/120	2.1/110	2.8/110	3.0Y/110	G	25/110	G	G	G	G	G	G	2.3/120	G	4.8Y/120	3.2/110	42/120
24	G	G	20/110	29/100	1.9/110	G	G	G	G	20/110	2.6/110	2.8/110	24/110	23/100	22/100	G	G	26/120	20/100	G	G	G	G	G
25	3.3/100	40/100	45/100	4.2/100	G	G	2.1/100	G	G	G	G	24/110	2.6/110	2.5/100	2.2/100	25/100	1.9/100	G	2.0/100	G	G	G	G	G
26	G	20/110	2.2Y/110	G	G	G	G	64Y/110	G	G	G	G	G	G	19/100	2.3/100	G	G	20/120	G	20/110	2.0/120	38/110	38/110
27	G	35/120	G	G	1.5/110	G	G	C	G	G	G	G	G	30/110	G	C	G	2.3/130	G	C	C	C	C	C
28	C	C	C	C	C	C	C	C	G	G	G	G	68/100	G	G	G	G	G	G	G	2.0/100	G	3.3/100	3.2Y/100
29	2.0/100	3.8Y/100	3.8/100	37Y/100	1.9/100	G	G	18/120	6.6Y/110	G	3.4/100	4.0Y/100	6.0/100	3.2/100	2.8/100	(5.3)S/100	2.8/100	37Y/100	1.9/100	G	G	1.6/100	G	G
30	G	G	G	G	G	G	G	G	G	2.4/100	30/100	5.0/100	80/100	6.0/100	5.2/100	G	42/100	5.0/100	31/100	19/100	G	G	20/100	35Y/100
31	2.7/100	G	G	1.9/100	37Y/110	G	G	G	G	2.6/100	26/100	30/100	3.2/100	38Y/100	30/100	26/100	3.8/100	2.1/100	20/100	G	G	G	G	G
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	29	29	29	29	29	29	29	28	30	31	31	30	31	31	31	30	30	31	30	29	29	29	29	29

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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

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

National Bureau of Standards (Institution)

Observed at Washington, D. C.

Scaled by: B. E. B., J. D.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

Calculated by: B. E. B., J. C.

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)S	(1.7)SF	(1.7)SF	(1.7)SF	(1.8)SF	(1.7)SJ	(1.9)JS	2.1F	2.1	2.0	2.0	1.9	B	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	2.0	(1.9)JS	(2.0)SP	1.9	1.8	(1.8)SP	(1.7)S
4	1.7F	1.7F	1.7F	(1.7)SF	1.6	(1.6)SJ	(1.8)SP	2.1F	2.0	1.9	1.8	1.8	1.9	C	1.9	1.8	1.9	1.9	(1.8)S	(1.7)S	(1.9)S	1.7	1.6F	(1.6)S
5	1.6	1.6	1.7	(1.7)JS	1.6	(1.7)JS	(1.9)S	(2.2)S	(2.2)JS	2.0	(1.9)JS	(1.9)JS	1.9	1.8	(1.8)F	(1.8)S	(1.9)SP	(1.9)S	(2.0)JS	1.8	1.9	1.8	(1.9)S	1.7
6	1.7	1.8	1.8F	F	(1.6)JS	(1.7)JS	(1.7)SF	(2.1)JS	(2.0)S	C	1.9	1.8	1.8	2.0	1.9	1.9	1.8	1.8	(1.9)JS	1.8	(1.8)JS	(1.7)S	(1.7)SF	1.6F
7	(1.6)SF	(1.6)SF	1.6	1.7	1.5F	1.8F	(1.7)SF	(2.2)S	(2.1)S	(2.0)S	1.8	1.8	1.9	1.8	1.7	1.7	1.7K	1.8K	1.9FK	K(1.8)SF	1.4FK	1.6FK	(1.7)FK	1.8FK
8	1.8FK	1.8FK	1.9FK	1.8FK	FK	1.7FK	K(1.8)FS	K(2.1)SF	K(2.0)FS	1.9FK	1.7FK	1.6FK	1.7FK	1.7FK	1.7K	1.7K	1.8K	1.8K	1.8K	1.8K	1.8K	1.6K	1.7FK	1.5FK
9	1.5FK	K(1.6)SF	1.8FK	K(1.7)SF	K(1.7)SF	K(1.7)SF	K(1.9)FS	(2.2)S	2.1	(2.0)S	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.7	1.8	1.8	1.8	1.8	(1.9)JS
10	1.8	1.8	1.8	1.7	1.7	(1.9)JS	(1.9)S	2.2	(2.0)S	(1.9)JS	1.9	1.8	1.8	1.7	1.7	1.7	(1.7)S	1.8	1.9	(1.9)S	1.8	(1.7)S	1.6	(1.6)S
11	1.6	1.8	1.7	1.8	1.7	1.8	1.9	2.1	2.0	2.0	1.8	(1.8)JS	1.8	(1.8)S	(1.7)S	(1.7)S	C	(1.8)S	(1.8)S	(1.8)S	(1.8)S	1.8	(1.8)S	(1.8)S
12	1.7	1.7	1.7	1.6	(1.6)S	1.6	(1.8)S	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8	C	1.8	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	1.8	1.8	(1.8)A	1.8	1.7	1.8	1.7	1.8	(1.8)SP	1.8	1.7	1.7	1.8	1.8K	1.7K
14	1.7K	1.6K	1.7K	1.6K	K(1.5)JF	K(1.4)JF	FK	1.8FK	1.8FK	1.6K	1.5K	1.4K	(1.4)SK	(1.3)SK	1.4K	1.4K	K(1.5)SF	(1.6)SK	FK	NK	NK	1.6FK	FK	FK
15	(1.4)FK	(1.6)FK	(1.6)FK	(1.5)FK	(1.7)FK	NK	NFK	(1.7)FK	1.9FK	GK	GK	GK	BK	1.3FK	1.5FK	1.4FK	1.4FK	1.6FK	K(1.5)SF	FSK	FK	(1.5)FK	(1.6)FK	AK
16	(1.8)FK	1.7FK	FK	FK	(1.7)FK	K(1.7)FS	(1.6)FK	(2.1)FK	1.9	2.0	1.9	(1.8)S	(1.8)S	1.7	(1.8)JS	1.8	(1.8)S	1.9	(1.9)JS	(1.8)S	1.9	1.8F	1.7	1.7F
17	1.6F	1.6F	(1.7)FS	(1.7)F	(1.6)F	(1.7)F	(1.8)F	2.1	2.1	2.0	2.0	1.9	1.9	(1.8)S	1.8	(1.8)S	1.8	1.9	1.9	(1.9)J	1.9	1.7	1.7	1.7
18	1.8F	1.7	1.8F	1.8F	1.8F	1.9F	1.7F	2.2	2.1	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.8
19	1.8	(1.8)V	1.7F	1.8F	1.6F	1.7F	FS	1.9F	2.1	1.9	1.9F	C	1.8	1.8	1.8	1.8	1.8	(1.9)P	1.7	1.8	1.7	(1.8)JS	1.7	1.7
20	1.7	1.7	1.7	1.8	1.7	1.8	1.8	2.0	2.0	2.0	1.9	1.9	1.9	1.8	1.9	1.9	1.9	(1.9)S	(2.0)S	1.7	1.9	1.9	1.9	1.7
21	(1.8)S	1.7F	1.6F	1.8F	1.9	2.0F	1.7F	2.2F	2.2	2.0	1.9	2.0	1.9	1.9	1.8	1.9	1.9	(2.0)S	(1.9)S	(2.0)S	1.9F	1.9F	1.8F	1.8F
22	1.9F	1.9F	1.9F	1.8F	(1.7)SF	1.7F	1.9F	2.2	2.2F	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.9	1.9	2.0	1.9	1.8F	1.8	1.8	1.7
23	1.7	(1.7)S	1.9	1.9	1.8	1.8F	(2.0)JF	2.1	2.1	(2.0)S	2.0	(1.9)S	1.9	(1.9)S	(1.9)S	(1.9)S	(1.9)S	(1.8)S	(2.0)S	2.0	1.9	2.0	1.6	(1.5)F
24	(1.4)F	(1.6)F	1.7F	1.7F	1.9F	(1.7)JF	1.8	2.0	2.1	2.0	2.0	(1.8)S	1.9	(1.9)S	1.9	2.0	1.9	2.0	(1.9)S	(2.0)S	1.9	1.8	1.8	(1.8)S
25	(1.8)S	1.9	1.9	1.9	1.9F	1.9F	1.9F	2.3	2.2	2.0	2.0	2.1	(2.0)S	1.9	(1.9)S	1.9	(2.0)S	2.0	2.0	2.0	(1.8)S	(1.8)S	1.9	1.9
26	1.9	1.9F	1.9F	1.8F	1.8	(1.8)S	(2.0)S	2.1	(2.1)JS	2.1	2.0	2.1	1.9	1.9	(1.9)S	2.0	2.0	1.9	1.9	(2.0)P	1.9	(1.9)JS	1.9	1.9
27	1.8	1.7	1.7	1.7	(1.9)JS	2.1	1.9	C	2.1	2.0	1.9	1.9	2.0	1.8	(1.8)S	C	2.0	(1.9)S	1.8	C	C	C	C	C
28	C	C	C	C	C	C	C	C	2.1F	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	(2.0)PS	(2.0)S	(1.9)JS	(1.9)S	1.8	1.7	(1.9)JS
29	1.8	1.9	1.6	1.8	1.7	(1.8)S	(1.8)JS	2.1	2.3	(2.1)JS	2.0	1.9	1.9	(1.9)JS	1.9	1.9	(2.0)S	2.0	1.9	2.0	2.0	2.0	2.0	2.0
30	1.7	1.8F	(1.8)JF	1.8F	1.9F	1.9F	2.0F	2.3F	2.3	2.1	2.0	2.0	(1.9)S	2.0	1.9	1.9	1.9	(2.0)SP	2.0	2.0	(1.9)JS	1.9	(1.8)JS	1.7
31	1.7F	1.9F	2.0F	2.0F	2.0F	1.7F	1.8	2.3	(2.2)JS	2.1	2.1	1.9	2.0	(2.1)S	(2.0)S	2.0	(2.1)S	2.0	(2.0)SP	2.0	(1.9)S	1.9	(1.8)SF	(1.8)SF
Median	1.7	1.7	1.7	1.8	1.7	1.7	(1.8)	2.1	2.1	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.7
Count	27	27	26	25	26	26	24	26	28	29	30	29	28	28	29	28	27	29	27	25	25	27	26	25

Sweep 10 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

Form adopted June 1946

TABLE 46

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

IONOSPHERIC DATA

(M3000)F2 (Characteristic), ______ (Unit), October (Month), 1949

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(2.7)S	(2.7)SF	(2.6)SF	(2.6)SF	(2.7)SF	(2.6)JS	(2.7)JS	3.1F	3.1	3.0	3.0	2.9	B	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	3.0	2.9	2.9	2.9	2.7	2.7	2.8	2.7	2.9	(2.9)JS	(2.9)SP	2.9	2.8	(2.8)SP	(2.6)S
4	2.6F	2.6F	2.6F	(2.7)SF	2.4	(2.4)SJ	(2.8)SP	3.0F	3.1	2.9	2.8	2.8	2.9	C	2.8	2.8	2.9	2.9	(2.8)S	(2.7)S	(2.8)S	2.7	2.5F	(2.5)S
5	2.5	2.5	2.6	(2.6)JS	2.4	(2.6)JS	(2.9)S	(3.2)S	(3.2)JS	3.0	(2.8)JS	(2.8)JS	2.8	2.7	(2.8)P	(2.8)S	(2.8)SP	(2.9)S	(3.0)JS	2.8	2.8	2.8	(2.8)S	2.7
6	2.7	2.7	2.7F	F	(2.4)SJ	(2.5)JS	(2.5)SF	(3.2)JS	(3.1)S	C	2.9	2.8	2.7	3.0	3.0	2.8	2.8	2.8	(2.9)JS	2.8	(2.7)JS	(2.6)S	(2.6)SF	2.5F
7	(2.4)SF	(2.5)SF	2.5	2.6	2.3F	2.7F	(2.6)SF	(3.2)S	(3.1)S	(3.0)S	2.8	2.7	2.8	2.7	2.6	2.6	2.6	2.8K	3.0FK	K(2.7)SF	2.1FK	2.4FK	(2.6)FK	2.7FK
8	2.8FK	2.7FK	2.9FK	2.8FK	F K	2.4FK	K(2.7)SF	K(3.2)FS	K(3.0)FS	2.9FK	2.6FK	2.5FK	K2.6F	2.6FK	2.7K	2.6K	2.8K	2.8K	2.9K	2.7K	2.8K	2.6K	2.6FK	2.4FK
9	2.3FK	K(2.5)SF	2.7FK	K(2.7)SF	K(2.7)SF	K(2.6)SF	(2.9)SF	(3.2)S	3.2	(2.9)S	2.9	2.9	2.7	2.8	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.8	2.7	(2.8)JS
10	2.7	2.7	2.8	2.7	2.7	(2.8)JS	(2.9)S	3.1	(3.0)S	(2.9)JS	2.8	2.8	2.7	2.6	2.6	2.6	(2.7)S	2.7	2.8	(2.8)S	2.7	(2.7)S	2.5	(2.5)S
11	2.5	2.8	2.6	2.7	2.6	2.7	2.9	3.2	3.0	3.0	2.8	(2.8)JS	2.7	(2.7)S	(2.7)S	(2.7)S	C	(2.7)S	(2.8)S	(2.7)S	(2.6)S	2.7	(2.7)S	(2.7)S
12	2.6	2.6	2.6	2.5	(2.5)S	2.4	(2.7)S	2.9	3.0	2.9	2.8	2.8	2.7	2.7	2.7	2.6	C	2.7	C	C	C	C	C	C
13	C	C	C	C	C	C	C	C	C	2.9	2.8	(2.7)A	2.7	2.6	2.7	2.6	2.7	(2.7)PS	2.7	2.6	2.6	2.7	2.7K	2.6K
14	2.6K	2.7K	2.6K	2.4K	K(2.3)JF	K(2.2)JF	F K	2.7FK	2.8FK	2.5K	2.2K	2.1K	(2.0)SK	(2.0)SK	2.1K	2.1K	K(2.3)SF	(2.4)SK	F K	N K	N K	2.5FK	F K	F K
15	(2.2)FK	(2.4)FK	(2.4)FK	(2.4)FK	(2.7)FK	N K	N FK	(2.5)FK	2.8FK	G K	G K	G K	B K	2.0FK	2.2FK	2.0FK	2.1FK	2.5FK	K(2.3)FS	F SK	F K	(2.2)FK	(2.4)FK	A K
16	2.7FK	2.5FK	F K	F K	(2.4)FK	K(2.6)FS	(2.5)FK	(3.1)F	3.0	3.0	2.8	(2.9)S	(2.7)S	2.7	(2.8)JS	2.8	(2.7)S	2.9	(2.9)JS	(2.8)S	2.9	2.8F	2.6	2.6F
17	2.5F	2.5F	(2.5)FS	(2.6)F	(2.5)F	(2.6)F	(2.7)F	3.2	3.1	3.1	3.0	2.8	2.8	(2.7)S	2.7	(2.8)S	2.8	2.8	2.9	(3.0)J	2.9	2.7	2.7	2.7
18	2.8F	2.6	2.7F	2.7F	2.7F	2.8F	2.8F	3.2	3.1	3.0	2.9	2.8	2.7	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8
19	2.7	(2.8)V	2.6F	2.8F	2.5F	2.5F	S F	2.9F	3.3	2.8	2.9F	C	2.7	2.7	2.7	2.7	2.7	(2.9)P	2.6	2.6	2.6	(2.6)JS	2.7	2.7
20	2.6	2.6	2.6	2.7	2.7	2.7	2.7	3.1	3.2	3.0	2.9	2.8	2.8	2.8	2.8	2.8	2.9	(2.9)S	(2.9)S	2.6	2.8	2.8	2.9	2.7
21	(2.7)S	2.6F	2.5F	2.7F	2.9	2.9F	2.7F	3.3F	3.2	3.1	3.0	3.0	2.9	2.8	2.8	2.8	2.9	(3.0)S	(2.9)S	(3.0)S	2.9F	2.8F	2.7F	2.7F
22	2.9F	2.8F	2.9F	2.7F	(2.6)SF	2.5F	2.8F	3.3	3.2F	3.1	3.0	3.0	2.9	2.8	2.8	2.9	2.8	2.9	3.0	2.8	2.7F	2.8	2.7	2.6
23	2.6	(2.6)S	2.8	2.9	2.7	2.8F	(3.0)JF	3.1	3.2	(3.0)S	3.0	(2.9)S	2.9	(2.8)S	(2.8)S	(2.8)S	(2.8)S	(2.8)S	(2.9)S	3.0	2.8	2.9	2.5	(2.3)F
24	(2.2)F	(2.5)F	2.7F	2.6F	2.8F	(2.6)JF	2.8	3.0	3.2	3.1	3.0	(2.8)S	2.9	(2.9)S	2.9	3.0	2.9	3.0	(2.9)S	(3.0)S	3.0	2.8	2.8	(2.8)S
25	(2.8)S	2.8	2.9	2.9	2.9F	2.9F	2.9F	3.3	3.3	3.1	3.0	3.0	(3.0)S	2.9	(2.9)S	2.8	(2.9)S	3.0	3.0	3.0	(2.8)S	(2.8)S	2.8	2.9
26	2.9	2.9F	2.8F	2.8F	2.7	(2.8)S	(3.0)S	3.0	(3.2)JS	3.1	3.0	3.0	2.9	2.9	(2.9)S	3.0	3.0	2.8	2.9	(3.0)P	2.9	(2.9)JS	2.9	2.8
27	2.6	2.6	2.6	2.7	(2.9)JS	3.1	2.8	C	3.2	3.0	2.9	2.9	2.9	2.7	(2.8)S	C	2.9	(2.8)S	2.8	C	C	C	C	C
28	C	C	C	C	C	C	C	C	3.0F	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.0	(3.1)SP	(3.0)S	(2.9)JS	(2.9)S	2.8	2.7	(2.9)JS
29	2.8	2.8	2.5	2.7	2.6	(2.8)S	(2.8)JS	3.2	3.2	(3.2)JS	3.1	2.9	2.9	(2.9)JS	2.9	2.9	(3.0)S	3.1	3.0	3.1	3.0	3.0	3.0	3.0
30	2.6	2.8F	(2.6)JF	2.7F	2.8F	2.9F	3.0F	3.3F	3.4	3.2	3.0	3.1	(2.9)S	3.0	2.9	2.9	2.9	(3.0)SP	3.0	3.0	(2.9)JS	2.9	(2.8)JS	2.7
31	2.7F	2.9F	3.0F	3.0F	3.0F	2.7F	2.8	3.3	(3.3)JS	3.3	3.2	3.0	2.9	(3.1)S	(2.9)S	3.0	(3.1)S	3.0	(3.0)SP	3.0	(3.0)S	2.9	(2.8)SF	(2.8)SF
Median	2.6	2.6	2.6	2.7	2.7	2.6	(2.8)	3.2	3.2	3.0	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.9	2.9	2.8	2.8	2.8	2.7	2.7
Count	27	27	26	25	26	26	24	26	28	29	30	29	28	28	29	28	27	29	27	25	25	27	26	25

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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Form adopted June 1946

TABLE 47

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

IONOSPHERIC DATA

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

Observed at Washington, D. C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

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							Q	Q	Q	Q	Q	Q	B	M	M	M	M	M	M					
2							M	M	M	M	M	M	M	M	M	M	M	M	M					
3							M	M	M	Q	L	L	L	L	Q	Q	Q	Q	Q					
4							Q	Q	Q	L	L	L	L	C	L	L	Q	Q	Q					
5							Q	Q	Q	L	L	L	L	Q	Q	Q	Q	Q	Q					
6							Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
7							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q^{K}	Q^{K}					
8							Q^{K}	Q^{K}	Q^{K}	Q^{K}	L^{K}	$(29)^{P}_{K}$	B^{K}	3.2^{K}	L^{K}	Q^{K}	Q^{K}	Q^{K}	Q^{K}					
9							Q	Q	Q	L	L	L	Q	Q	Q	Q	Q	Q	Q					
10							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
11							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	Q					
12							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C	Q	C					
13							C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
14							Q^{K}	Q^{K}	L^{K}	31^{K}	3.1^{K}	3.0^{K}	$(31)^{P}_{K}$	$(3.3)^{S}_{K}$	$(3.2)^{S}_{K}$	30^{K}	30^{K}	L^{K}	Q^{K}					
15							N^{K}	Q^{K}	Q^{K}	30^{K}	30^{K}_{F}	29^{K}_{F}	B^{K}	28^{K}_{F}	2.8^{K}_{F}	28^{K}	30^{K}	Q^{K}	Q^{K}					
16							Q^{K}	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
17							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
18							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
19							Q	Q	Q	Q	L	C	L	Q	L	Q	Q	Q	Q					
20							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
21							Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
22							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
23							Q	Q	Q	Q	Q	Q	L	L	Q	Q	Q	Q	Q					
24							Q	Q	Q	Q	Q	Q	Q	Q	L	Q	Q	Q	Q					
25							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
26							Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q	Q					
27							Q	C	Q	Q	Q	L	L	Q	Q	C	Q	Q	Q					
28							C	C	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q					
29							Q	Q	L	Q	L	L	Q	Q	Q	Q	Q	Q	Q					
30							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q					
31							Q	Q	Q	Q	Q	Q	Q	L	Q	Q	Q	Q	Q					
Median									—	—	—	—	—	—	—	—	—	—						
Count										2	2	3	1	3	2	2	2							

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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TABLE 48

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

Form adopted June 1946

IONOSPHERIC DATA

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

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: B. E. B., J. D.

Calculated by: B. E. B., J. C.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								3.5	3.8	3.7	(4.0)B	3.9	B	M	M	M	M	M	M					
2							M	M	M	M	M	M	M	M	M	M	M	M	M					
3							M	M	M	3.9	4.0	4.1	3.8	3.8	3.9	3.8	3.8	4.0						
4								3.7	3.9	(4.1)S	B	3.8	3.8	C	3.9	3.8	4.1	3.9						
5							S	(3.6)S	(3.9)S	4.1	A	(3.6)B	A	(3.7)B	(3.9)B	3.7	3.7	3.6						
6								3.4	A	A	A	(4.1)A	3.8	3.6	3.7	3.9	(3.9)S	A						
7								3.5	3.8	4.0	4.0	3.9	4.0	(3.6)B	(3.7)B	3.9	4.0	A^{K}	A^{K}					
8								3.6^{K}	A^{K}	A^{K}	A^{K}	A^{K}	B^{K}	3.7^{K}	3.9^{K}	3.9^{K}	4.2^{K}	3.5^{K}						
9								3.7	3.5	3.7	3.8	B	B	3.8	3.7	4.1	3.9	4.0						
10								3.4	4.0	4.0	4.1	4.1	(4.2)B	4.1	3.8	3.9	3.8	(3.7)S						
11								3.7	(3.9)S	4.1	3.9	B	(3.8)B	3.9	3.7	3.9	C	(3.8)A						
12								3.9	3.7	3.9	4.1	4.3	A	3.7	3.9	3.9	C	S						
13							C	C	C	4.1	A	A	A	A	3.6	A	A	A	A					
14								3.8^{K}	S^{K}	4.0^{K}	B^{K}	B^{K}	B^{K}	3.9^{K}	3.7^{K}	3.9^{K}	3.8^{K}	3.3^{K}						
15									3.6^{K}	3.9^{K}	4.1^{K}	3.8^{K}	B^{K}	3.8^{K}	3.8^{K}	3.9^{K}	3.6^{K}	B^{K}						
16									4.0	3.9	B	(3.9)B	4.0	3.8	3.8	4.1	3.9	3.8						
17									3.9	4.2	3.8	B	B	3.9	3.8	3.9	3.8	3.8						
18								4.1	3.8	4.1	B	(3.7)B	(3.7)B	3.9	4.1	4.3	4.2	A						
19								4.1	4.1	A	4.0	C	3.8	3.7	3.7	3.9	4.0	B						
20								(4.1)S	4.0	4.2	A	(3.9)B	(3.8)A	A	A	A	A	A	A					
21									(4.2)B	A	B	(4.1)A	3.9	(3.8)A	(3.9)A	(4.0)S	B	B	B					
22								4.2	4.1	B	B	A	3.9	3.9	3.9	3.9	4.1	3.7						
23								A	(3.6)S	A	A	(4.1)B	3.7	3.9	4.2	4.1	(4.0)S	B						
24									4.0	3.9	(4.1)S	3.9	3.9	4.1	(3.9)S	3.9	3.8	A						
25								4.2	4.2	4.3	B	4.3	3.9	4.0	3.8	4.0	3.7							
26								A	4.2	4.2	4.3	(4.2)B	3.8	4.1	3.8	3.9	(4.2)S							
27								C	4.0	4.2	B	3.9	3.8	3.8	3.9	C	3.9	A						
28							C	C	3.9	4.2	(4.1)B	B	4.0	(4.1)S	4.0	(3.9)S	(3.9)S							
29								4.1	A	4.4	A	4.5	4.3	4.0	4.1	4.2	A	A						
30								(4.2)S	4.4	3.9	A	A	A	A	4.2	4.2	A	A						
31								3.7	4.2	4.0	3.9	3.6	A	4.2	4.3	4.2	(3.9)A							
Median							—	3.7	4.0	4.0	4.0	3.9	3.8	3.9	3.9	3.9	3.9	3.8						
Count								19	24	24	14	20	19	25	28	26	22	11						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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Table 49

Ionospheric Storminess at Washington, D. C.

October 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	1	***			2	2
2	***	***			2	1
3	***	2			1	1
4	2	2			3	3
5	2	2			3	2
6	1	2			2	3
7	2	4	2200	----	4	5
8	4	4	----	----	4	3
9	4	2	----	1100	3	2
10	1	2			1	2
11	1	1			2	3
12	1	2			2	1
13	***	4			1	3
14	4	7	0300	----	4	6
15	6	7	----	----	6	6
16	4	2	----	1200	6	3
17	3	1			3	2
18	2	2			2	1
19	1	2			2	2
20	1	2			2	3
21	2	1			2	1
22	1	1			2	2
23	1	0			2	3
24	3	1			3	1
25	2	1			2	0
26	1	1			1	1
27	2	2			2	4
28	***	1			4	2
29	2	2			3	2
30	2	2			2	2
31	1	1			3	1

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

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

***No readable record. Refer to table 38 for detailed explanation.

----Dashes indicate continuing storm.

Table 50

Sudden Ionosphere Disturbances Observed at Washington, D. C.

October 1949

1949 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
October					
1	1004	1020	England	0.0	
1	1407	1425	Ohio, D. C., Canal Zone, England	0.1	
1	1710	1750	Ohio, D. C., Canal Zone, England, New Brunswick	0.0	Terr.mag.pulse** 1709-1725
2	1359	1440	Ohio, D. C., Canal Zone	0.0	Terr.mag.pulse** 1402-1425
2	1823	1855	Ohio, D. C., England	0.0	
4	1320	1340	Ohio, D. C., England	0.1	
4	1620	1640	Ohio, D. C., England	0.1	
4	1902	1940	Ohio, D. C.	0.0	
6	1133	1200	England	0.2	
6	1322	1350	Ohio, D. C., Canal Zone, England	0.05	
8	1315	1410	Ohio, D. C., Canal Zone, England	0.01	
8	1510	1530	Ohio, D. C., Canal Zone, England	0.1	
8	1658	1740	Ohio, D. C., England, New Brunswick	0.0	
11	1144	1220	England	0.03	

Table 50 (continued)

Sudden Ionosphere Disturbances Observed at Washington, D. C.

October 1949

1949 Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
October 11	1517	1740	Ohio, D. C., Canal Zone, England, New Brunswick	0.0	
13	1141	1300	Canal Zone, England	0.0	
15	1350	1520	Ohio, D. C., England	0.01	
15	1635	1800	Ohio, D. C., England	0.0	
15	2059	2245	Ohio, D. C.	0.03	
17	1903	1950	Ohio, D. C.	0.03	
22	1355	1440	Ohio, D. C., Canal Zone, England	0.03	
29	1531	1605	Ohio, D. C., Canal Zone, England	0.1	Solar flare*** 1510 Solar flare**** 1525

*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 October 1 at 1004, on October 6 at 1133, on October 11 at 1144, and on October 13 at 1141.

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

***Time of observation at Meudon Observatory, France.

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

Table 51

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,

Cable and Wireless, Ltd., as Observed in England

1949 Day	GCT Beginning	End	Receiving station	Location of transmitters	Other phenomena
September					
12	0623	0645	Brentwood	Afghanistan, Bahrein I., Eritrea, India, Kenya, Southern Rhodesia, Syria, Trans-Jordan	Solar flare** 0620
12	0625	0655	Somerton	Aden, China, India, Union of South Africa	Solar flare** 0620
12	1317	1350	Brentwood	Belgian Congo, Bulgaria, Chile, Greece, India, Iran, Kenya, Malta, Portugal, Southern Rhodesia, Spain, Syria, Turkey, Uruguay, U.S.S.R., Yugoslavia, Zanzibar	Terr.mag. pulse* 1314-1320 Solar flare*** 1330
12	1317	1345	Somerton	Aden, Argentina, Australia, Barbados, Brazil, Canada, Ceylon, Gold Coast, India, Nigeria, New York, Union of S. Africa	Terr.mag. pulse* 1314-1320 Solar flare*** 1330
13	1048	1055	Brentwood	Bahrein I., Greece, Iran, Malta, Portugal, Southern Rhodesia, Spain, Switzerland, Turkey, Zanzibar	
13	1307	1340	Brentwood	Bahrein I., Barbados, Belgian Congo, Bulgaria, Canary Is., Chile, Greece, India, Iran, Kenya, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Turkey, Uruguay, U.S.S.R., Yugoslavia, Zanzibar	Terr.mag. pulse* 1305-1330
13	1307	1335	Somerton	Aden, Argentina, Australia, Brazil, Canada, Ceylon, China, Egypt, Gold Coast, India, Nigeria, New York, Union of S. Africa	Terr.mag. pulse* 1305-1330
14	1323	1340	Brentwood	Barbados, Greece, Portugal, Spain	Solar flare**** 1315
14	1323	1355	Somerton	Argentina, Brazil, Canada, China, New York	Solar flare**** 1315
17	1720	1750	Somerton	Argentina, Brazil, Canada, New York	Terr.mag. pulse* 1718-1735 Solar flare**** 1717
18	0905	0925	Brentwood	Austria, Bulgaria, Eritrea, India, Iran, Palestine, Southern Rhodesia, Spain, Syria, Turkey	
18	0945	1020	Brentwood	Austria, Barbados, Belgian Congo, India, Iran, Palestine, Spain, Syria, Turkey, U.S.S.R.	

Table 51 (Continued)

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

1949 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters	Other phenomena
September					
18	0945	1015	Somerton	Australia, Ceylon, China, Gold Coast, India, Union of S. Africa	
19	1128	1140	Brentwood	Bahrein I., Belgian Congo, Greece, Iran, Kenya, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Yugoslavia, Zanzibar	
19	1128	1145	Somerton	Argentina, Brazil, China, Gold Coast, Union of S. Africa	
22	0730	0745	Brentwood	Belgian Congo, Greece, India, Kenya, Portugal, Southern Rhodesia, Spain, Syria, Yugoslavia	
October					
1	1005	1025	Brentwood	Bahrein I., Barbados, Belgian Congo, Bulgaria, Canada, Greece, India, Iran, Kenya, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar	
1	1005	1025	Somerton	Aden, Argentina, Australia, Brazil, Ceylon, Egypt, Gold Coast, India, Union of S. Africa	
1	1712	1730	Brentwood	Barbados, Chile, Uruguay	Terr.mag. pulse* 1709-1725
1	1712	1725	Somerton	Argentina, Brazil, Canada, New York	
2	1406	1425	Brentwood	Bahrein I., Bulgaria, India, Iran, Palestine, Spain, Syria, Thailand, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia	Terr.mag. pulse* 1402-1405
2	1406	1425	Somerton	Canada, China, India, New York, Union of S. Africa	Terr.mag. pulse* 1402-1425
3	1205	1225	Brentwood	Bahrein I., Belgian Congo, Canada, Canary Is., Chile, Greece, India, Iran, Madagascar, Portugal, Southern Rhodesia, Spain, Switzerland, Uruguay, Yugoslavia	
3	1200	1220	Somerton	Argentina, Brazil, Gold Coast, India, Union of S. Africa	
4	1320	1325	Brentwood	Bulgaria, Canary Is., Chile, Colombia, India, Palestine, Southern Rhodesia, Spain, Switzerland, Thailand, Uruguay, U.S.S.R., Yugoslavia	
5	1125	1135	Brentwood	Belgian Congo, Canary Is., Chile, India, Iran, Kenya, Malta, Southern Rhodesia, Trans-Jordan, Uruguay, Zanzibar	

Table 51 (Continued)

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

1949 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters	Other phenomena
October					
5	1118	1150	Somerton	Argentina, Brazil, Union of S. Africa	
6	1140	1225	Brentwood	Belgian Congo, Greece, Kenya, Malta, Southern Rhodesia, Switzerland, Trans-Jordan, Zanzibar	
6	1328	1340	Brentwood	Barbados, Bulgaria, Canary Is., Chile, Colombia, Palestine, Southern Rhodesia, Spain, Thailand, Turkey, Uruguay	
6	1325	1355	Somerton	Argentina, Brazil, Union of S. Africa	
8	1318	1340	Brentwood	Barbados, Belgian Congo, Canary Is., Chile, Colombia, Greece, India, Iran, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Uruguay, U.S.S.R., Yugoslavia, Zanzibar	
8	1315	1335	Somerton	Argentina, Brazil, Canada, Gold Coast, New York, Union of S. Africa	
11	0800	0845	Brentwood	Bahrein I., Eritrea, India, Madagascar, Southern Rhodesia	
11	1150	1215	Brentwood	Afghanistan, Bahrein I., Barbados, Belgian Congo, Bulgaria, Canary Is., Colombia, Greece, India, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Trans-Jordan, Turkey, U.S.S.R., Uruguay, Yugoslavia, Zanzibar	
11	1147	1215	Somerton	Argentina, Australia, Brazil, Ceylon, Union of S. Africa	
11	1522	1540	Brentwood	Barbados, Belgian Congo, Canary Is., Chile, Colombia, Iran, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Venezuela, Yugoslavia, Zanzibar	
11	1521	1615	Somerton	Argentina, Brazil, Canada, China, Gold Coast, New York	
12	1135	1155	Brentwood	Belgian Congo, Iran, Portugal	
13	1146	1220	Brentwood	Afghanistan, Austria, Bahrein I., Barbados, Belgian Congo, Bulgaria, Canary Is., Chile, Greece, India, Iran, Kenya, Madagascar, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Thailand, Uruguay, U.S.S.R., Yugoslavia, Zanzibar	

Table 51 (Continued)

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

1949 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters	Other phenomena
October 13	1145	1225	Somerton	Aden, Argentina, Australia, Brazil, Ceylon, Gold Coast, New York, Union of S. Africa	

*As observed on Cheltenham magnetogram of the United States Coast and Geodetic Survey.
**Time of observation at Prague Observatory, Czechoslovakia.
***Time of observation at Meudon Observatory, France.
****Time of observation at McMath-Hulbert Observatory, Michigan.

Table 52

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

1949 Day	GCT Beginning	GCT End	Location of transmitters
October			
8	1323	1330	Argentina, Canada, England, Italy, Panama
8	1700	1730	Argentina, Panama
11	1522	1545	Argentina, Canada, England, Italy, Morocco, Panama
15	0900	1200	England, Italy, Netherlands
15	1643	1750	Argentina, Brazil, Canada, Colombia, Morocco, Panama
22	1400	1530	Argentina, Canada, England, Italy, Morocco, Panama, Sweden

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 53

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

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

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

**In addition to dates marked X, the following was designated as a probable disturbed day on forecasts more than eight days in advance of said date: September 1.

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 54a

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

Date	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
1949																		
Oct. 1.6	-	-	-	-	-	2	3	3	3	6	7	12	14	14	17	27	25	20
2.8	-	-	-	-	-	2	5	8	9	7	9	10	15	16	19	20	21	25
3.8	-	-	-	-	-	-	2	3	3	3	4	5	10	14	16	19	16	17
4.6	-	-	-	-	-	-	-	-	-	-	2	2	3	11	15	18	15	14
5.6	-	-	-	-	-	2	2	3	3	2	5	9	12	19	25	38	28	20
6.7	-	-	-	-	-	-	-	-	-	-	3	7	12	19	21	24	25	9
7.6	-	-	-	-	-	-	-	-	-	-	-	-	10	11	13	13	14	13
8.7	-	-	-	-	-	-	-	-	-	-	-	5	15	17	18	15	14	13
11.7	-	-	-	-	-	-	-	-	-	-	-	5	12	20	30	31	34	37
12.7	-	-	-	-	-	-	-	-	-	-	7	15	29	25	23	27	40	26
13.6	-	-	-	-	-	-	-	-	-	-	2	12	18	19	17	17	18	17
15.6	-	-	-	-	-	-	-	-	-	-	-	1	3	5	9	15	20	26
18.6	-	-	-	-	-	-	-	-	-	-	1	2	3	5	9	19	20	13
20.6	X	-	-	-	-	-	-	-	-	-	2	4	7	11	14	16	18	18
22.6	-	-	-	-	-	-	-	-	1	3	3	8	11	14	15	17	17	14
24.6	-	-	-	-	-	-	-	-	3	5	11	12	13	16	18	20	28	30
25.9	-	-	-	-	-	-	-	-	-	1	8	11	13	15	16	17	18	19
26.7	-	-	-	-	-	-	-	1	1	4	12	20	25	27	28	28	27	35

Date	0°	Degrees south of the solar equator																	
GCT		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																			
Oct. 1.6	13	10	18	22	20	16	14	11	9	-	-	-	-	-	-	-	-	X	X
2.8	18	14	13	15	13	14	17	11	8	3	3	4	4	4	3	2	-	-	-
3.8	11	10	6	5	6	9	11	10	7	4	2	-	-	-	-	-	-	-	-
4.6	12	12	11	8	9	12	13	8	3	-	-	-	-	-	-	-	-	-	-
5.6	18	19	19	17	14	15	20	18	6	2	-	-	-	-	-	-	-	-	-
6.7	12	20	21	21	18	15	16	15	8	-	-	-	-	-	-	-	-	-	-
7.6	12	13	13	15	17	16	10	8	5	5	-	-	-	-	-	-	-	-	-
8.7	13	14	14	14	14	13	4	-	-	-	-	-	-	-	-	-	-	-	X
11.7	23	23	22	30	35	35	38	20	13	10	5	4	4	4	4	-	-	-	-
12.7	25	27	35	42	38	35	30	25	11	5	3	3	3	1	-	-	-	-	-
13.6	16	18	25	30	31	31	27	20	13	7	2	2	2	-	-	-	-	-	-
15.6	24	30	28	28	30	27	23	20	6	3	3	3	2	2	-	-	-	-	-
18.6	14	14	14	15	17	17	20	9	8	5	1	-	-	-	-	-	-	-	-
20.6	16	14	16	14	10	6	7	8	8	7	3	3	3	3	-	-	-	-	-
22.6	14	15	15	14	13	11	11	10	9	5	5	5	6	6	4	-	-	-	-
24.6	25	22	20	18	19	19	17	12	8	9	9	9	4	5	5	3	-	-	-
25.9	19	20	20	16	18	18	16	13	8	8	7	3	3	4	4	4	-	-	-
26.7	33	31	31	28	25	20	15	13	8	8	8	8	7	6	3	-	-	-	-

Table 55a

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

Date	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
1949																		
Oct. 1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3
2.8	1	1	-	-	-	1	1	1	1	-	-	-	-	-	1	4	3	2
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	6	7	5
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	2
5.6	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	13	10	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	1	-
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
8.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	2	1	1	1	1	1	1	1	1	1	1	1	15	-	5	8	25	30
12.7	1	1	1	2	1	2	2	3	2	5	1	4	14	18	-	13	15	25
13.6	1	1	1	2	3	3	3	3	3	3	1	1	8	14	1	10	14	14
15.6	1	1	1	1	1	2	2	2	2	2	2	2	2	2	1	2	4	1
18.6	1	1	1	1	1	2	2	3	3	1	1	1	-	-	1	1	1	2
20.6	1	1	1	1	1	1	1	1	1	1	-	-	1	2	3	4	5	4
22.6	-	-	-	-	1	1	1	1	1	1	-	1	1	2	2	3	4	4
24.6	1	1	1	1	1	1	1	1	2	2	-	1	1	2	3	13	20	10
25.9	-	-	-	-	-	-	-	-	1	1	-	-	2	3	3	1	13	13
26.7	1	1	1	1	1	2	1	-	1	1	1	1	3	10	13	3	8	16

Date	0°	Degrees south of the solar equator																	
GCT		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1949																			
Oct. 1.6	1	-	1	10	13	14	8	1	1	2	2	1	-	-	-	-	-	X	X
2.8	2	1	1	1	8	13	16	4	4	3	7	8	2	1	1	2	2	2	2
3.8	1	1	3	7	6	2	9	8	3	3	4	5	5	3	3	3	1	1	1
4.6	2	2	2	-	1	2	2	2	3	3	3	3	-	-	-	-	-	-	-
5.6	1	13	10	1	-	-	1	1	1	2	2	2	2	2	1	1	1	1	1
6.7	-	2	14	10	1	1	-	1	7	5	3	3	2	2	2	-	-	-	-
7.6	1	1	5	10	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	1	3	5	2	4	-	-	1	1	1	1	1	-	-	-	-	-	X
11.7	2	4	10	40	38	13	16	20	13	8	9	8	8	6	6	6	6	1	1
12.7	2	2	2	22	22	13	14	18	12	6	7	7	3	1	1	1	1	2	2
13.6	9	2	10	15	15	13	-	1	7	10	8	8	8	3	3	4	4	2	2
15.6	-	10	13	8	11	13	1	5	4	3	3	3	3	3	2	1	1	1	1
18.6	2	5	14	16	3	1	4	4	3	3	3	3	3	2	2	1	-	1	1
20.6	-	18	20	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
22.6	3	1	8	9	10	10	1	-	-	-	-	1	1	1	1	1	1	1	1
24.6	10	11	11	18	2	3	1	-	-	-	-	-	-	1	1	1	1	1	1
25.9	10	10	13	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
26.7	17	10	10	20	12	10	2	1	-	-	-	1	1	1	1	1	1	1	1

Table 54b

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																																					
Oct. 1.6	X	X	X	-	-	-	2	2	2	3	9	13	21	20	20	25	28	19	22	25	27	15	14	13	10	-	-	-	-	-	-	-	-	-	-	-	-
2.8	-	-	-	-	2	2	2	3	3	4	9	20	23	25	26	33	33	32	31	33	40	35	15	13	11	7	-	-	-	-	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	2	2	2	2	3	5	25	20	20	23	25	25	29	25	32	40	18	11	7	4	-	-	-	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	2	2	2	2	6	12	15	18	18	20	19	18	19	19	22	18	8	5	2	-	-	-	-	-	-	-	-	-	-	-
5.6	-	-	-	-	-	-	-	1	2	1	-	-	2	10	13	12	12	11	12	13	14	15	8	3	2	2	-	-	-	-	-	-	-	-	-	-	-
6.7	-	-	-	-	-	-	-	-	2	3	3	3	6	9	11	17	17	14	11	13	13	13	14	5	-	-	-	-	-	-	-	-	-	-	-	-	-
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	11	10	10	10	10	10	10	10	3	-	-	-	-	-	-	-	-	-	-	-	-
8.7	X	X	X	X	X	X	X	X	X	X	X	5	8	9	10	11	12	12	12	12	13	13	13	13	12	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	2	2	3	4	6	9	12	20	28	30	25	19	18	20	21	22	22	24	26	22	15	12	8	5	6	5	2	-	-	-	-	-	-
12.7	-	-	-	-	1	1	2	2	2	3	5	8	12	18	31	30	28	26	30	32	28	27	27	30	20	14	18	2	1	1	1	-	-	-	-	-	-
13.6	-	-	-	-	1	1	2	2	2	2	4	8	10	13	22	25	27	27	26	26	32	33	33	34	27	15	8	8	3	2	1	-	-	-	-	-	-
15.6	-	-	-	-	2	1	-	1	2	4	8	10	10	10	4	9	14	15	13	20	21	22	22	22	24	15	10	7	1	1	1	1	-	-	-	-	-
18.6	-	-	-	-	-	-	1	2	3	2	12	18	19	20	16	15	21	20	15	18	19	25	28	35	20	14	12	8	5	8	8	6	1	-	-	-	-
20.6	-	-	-	-	-	-	-	2	3	4	10	15	17	18	28	31	31	30	25	20	18	22	27	27	25	15	8	8	4	5	8	X	X	X	X	X	X
22.6	-	-	-	-	-	-	2	3	4	6	9	11	13	14	14	15	25	20	12	14	15	28	27	28	25	20	15	4	2	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	2	7	10	14	19	21	25	24	24	24	23	17	22	20	18	14	13	11	5	6	6	2	2	2	-	-	-	-	-
25.9	-	-	-	-	-	-	-	-	-	-	-	3	13	17	21	19	19	18	18	18	19	19	12	10	10	10	9	3	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	1	2	2	20	25	28	25	15	20	19	18	20	25	17	10	11	10	8	5	2	-	-	-	-	-	-	-	-

Table 55b

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																																					
Oct. 1.6	X	X	X	-	-	1	1	1	1	1	-	-	-	1	4	8	10	5	1	1	1	14	2	-	-	1	1	1	1	1	1	1	1	1	1	-	-
2.8	2	2	2	3	3	3	3	3	3	3	2	1	-	1	3	1	5	14	14	13	-	14	10	-	-	1	1	1	1	2	2	2	2	1	1	1	1
3.8	1	1	-	1	1	1	2	2	2	2	2	1	7	2	3	3	11	12	10	-	5	7	-	-	1	1	1	1	1	1	2	2	1	1	1	-	-
4.6	-	-	1	1	1	1	1	1	1	2	2	1	9	9	2	2	8	10	11	11	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.6	1	1	1	1	1	1	1	1	-	-	1	1	1	2	2	5	10	9	8	7	1	-	1	1	1	-	-	-	-	-	-	2	1	1	1	1	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	5	11	13	-	-	-	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	1	-	-	-	4	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	1	1	1	1	1	1	1	1	1	1	1	3	4	1	10	18	18	18	27	27	15	2	8	8	1	1	1	2	-	2	3	3	3	3	3	3	2
12.7	2	1	1	1	1	1	2	2	3	2	1	2	5	11	13	17	13	14	14	28	11	10	9	9	2	1	1	2	2	1	2	3	3	3	3	1	1
13.6	2	2	1	-	-	1	2	2	2	3	-	2	1	18	20	17	17	10	13	16	10	11	11	16	1	2	1	1	1	1	1	2	2	2	2	2	1
15.6	1	1	1	1	2	2	2	3	3	3	1	3	1	10	11	5	4	4	5	10	9	2	3	14	8	9	-	-	-	-	1	1	1	1	1	1	1
18.6	1	1	1	1	1	1	1	3	3	1	16	15	-	-	-	1	10	1	-	-	13	11	9	9	-	-	-	-	-	-	-	-	1	1	1	1	1
20.6	2	2	2	2	2	3	3	3	3	2	1	10	-	-	-	1	13	14	3	-	-	16	16	1	-	-	-	-	-	-	-	1	1	1	1	1	1
22.6	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	8	20	10	1	4	1	4	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-
24.6	1	1	1	1	1	2	2	4	4	4	2	1	5	6	8	12	13	15	11	10	13	11	8	-	-	-	-	-	-	-	-	1	1	1	1	1	1
25.9	-	-	-	-	-	-	1	1	-	2	3	4	4	7	9	10	11	11	12	12	10	9	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	1	1	1	1	1	1	1	2	2	2	2	3	3	5	11	10	10	8	6	13	14	14	9	-	8	1	-	-	1	1	1	2	2	3	2	1	1

Table 56a

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																																					
Oct. 1.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	3	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X
2.8	-	-	-	-	-	-	-	-	-	1	1	1	1	2	2	2	2	2	1	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	1	1	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	X
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	4	4	4	1	1	3	4	3	3	2	1	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	3	4	4	3	2	1	-	-	-	-	-	-	-	-	-	-	-
13.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	2	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-
15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
18.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	3	2	2	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
25.9	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 56b

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																																					
Oct. 1.6	X	X	X	-	-	-	-	-	-	-	-	-	2	2	2	2	2	1	1	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2.8	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	3	3	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	2	2	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	1	1	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8.7	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11.7	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3	2	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
12.7	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	2	1	1	1	3	3	2	2	2	1	1	1	1	-	-	-	-	-	-	-	-	-
13.6	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	2	3	4	4	4	3	1	-	-	-	-	-	-	-	-	-	-	-
15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	3	3	2	1	-	-	-	-	-	-	-	-	-	-	-
18.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	2	2	2	2	2	3	3	3	2	1	1	-	-	-	-	-	-	-	-	-	-
20.6	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-
22.6	-	-	-	-	-	-	-	-	-	-	1	1	1	2	3	3	3	2	2	2	2	2	3	3	3	3	2	-	-	-	-	-	-	-	-	-	-
24.6	-	-	-	-	-	-	-	-	-	-	-	1	1	2	3	3	3	2	2	2	2	3	3	3	2	1	-	-	-	-	-	-	-	-	-	-	-
25.9	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 57

American and Zürich Provisional Relative Sunspot Numbers

October 1949

Date	R_A*	R_Z**	Date	R_A*	R_Z**
1	112	68	17	124	140
2	151	115	18	93	77
3	213	150	19	69	55
4	228	198	20	87	63
5	265	196	21	121	67
6	260	222	22	170	113
7	256	190	23	147	118
8	289	195	24	130	106
9	267	180	25	121	95
10	226	166	26	96	71
11	265	183	27	122	71
12	237	198	28	121	88
13	204	182	29	121	110
14	186	145	30	140	124
15	207	156	31	132	95
16	179	153	Mean:	172.2	131.9

*Combination of reports from 46 observers; see page 9.
**Dependent on observations at Zürich Observatory and its stations at Locarno and Arosa.

GRAPHS OF IONOSPHERIC DATA

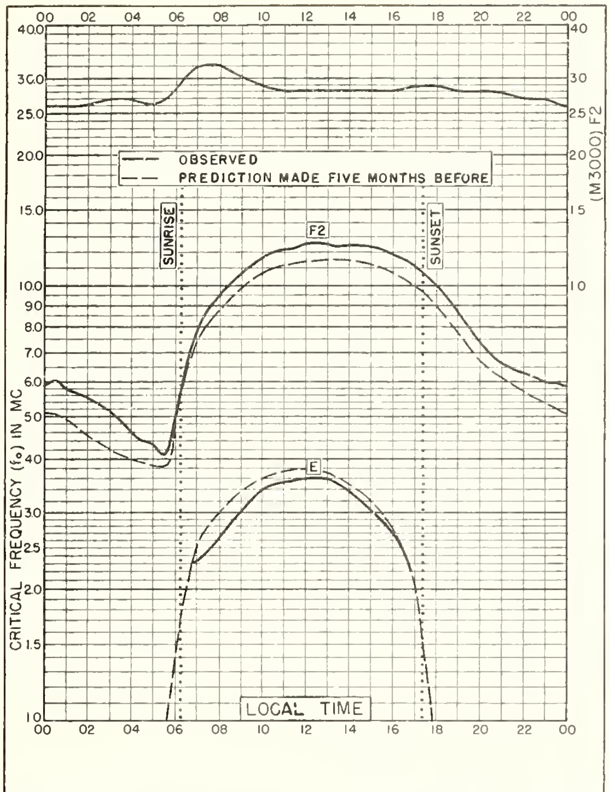


Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W OCTOBER 1949

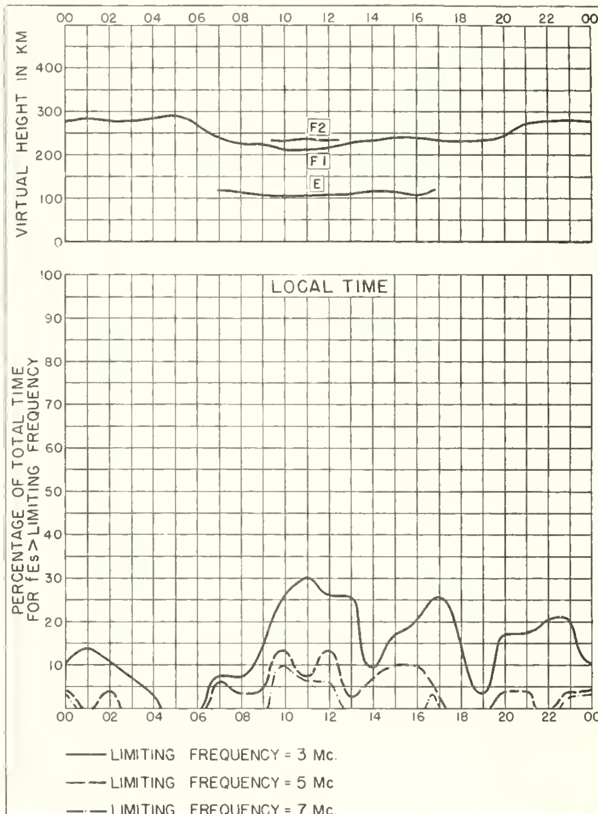


Fig. 2. WASHINGTON, D. C. OCTOBER 1949

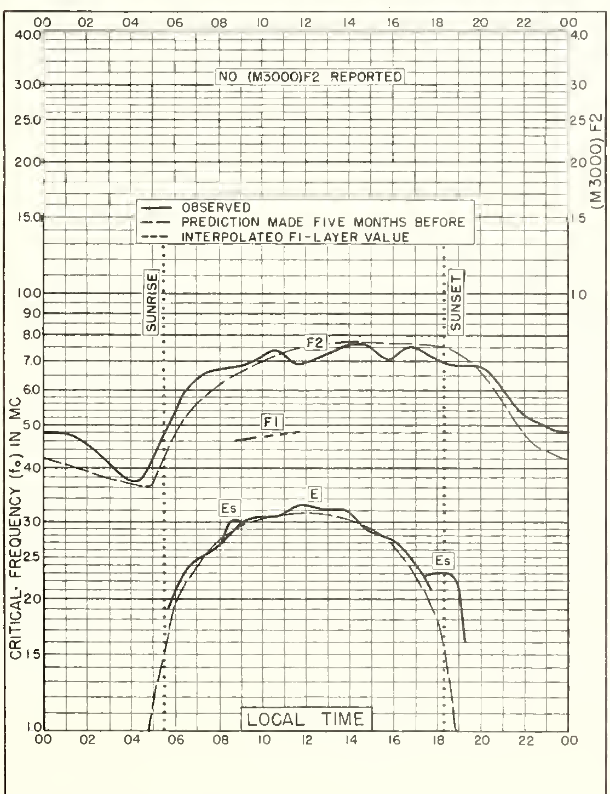


Fig. 3. OSLO, NORWAY
60.0°N, 11.0°E SEPTEMBER 1949

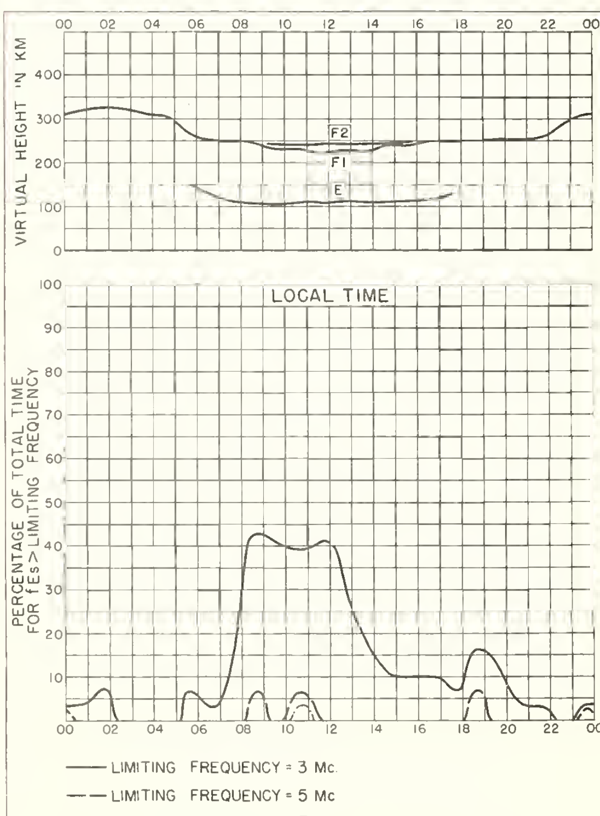


Fig. 4. OSLO, NORWAY SEPTEMBER 1949

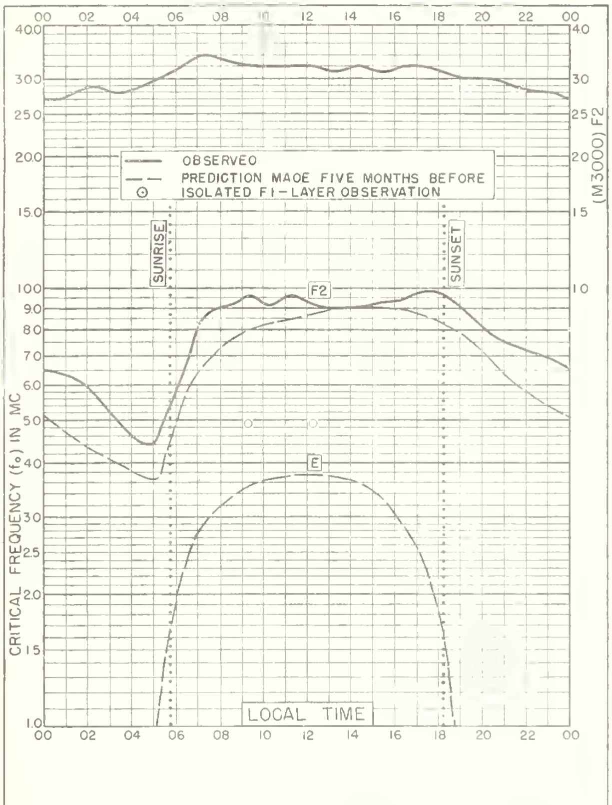


Fig. 5. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W SEPTEMBER 1949

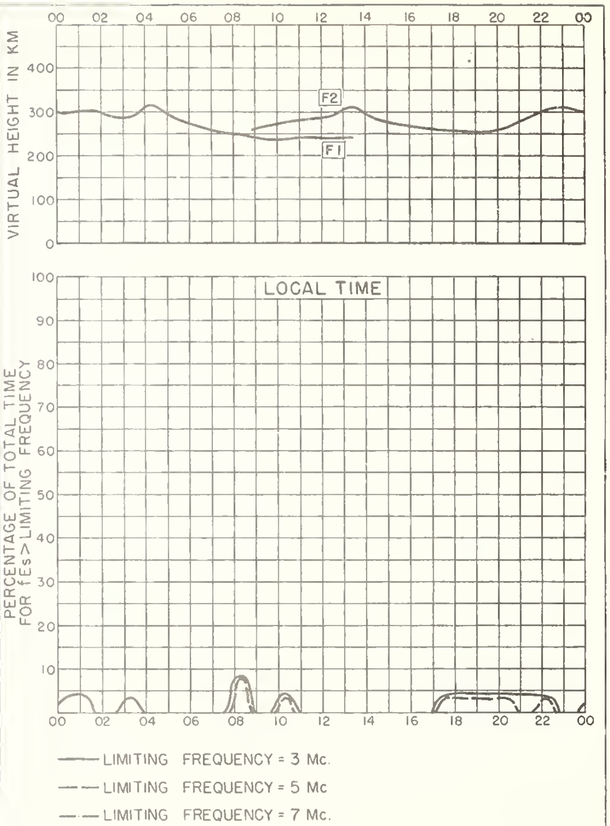


Fig. 6. BOSTON, MASSACHUSETTS SEPTEMBER 1949

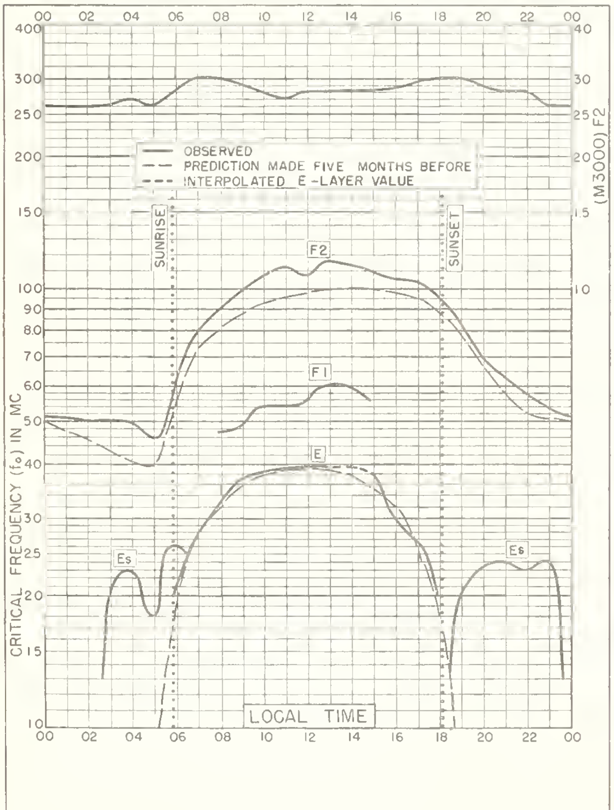


Fig. 7. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W SEPTEMBER 1949

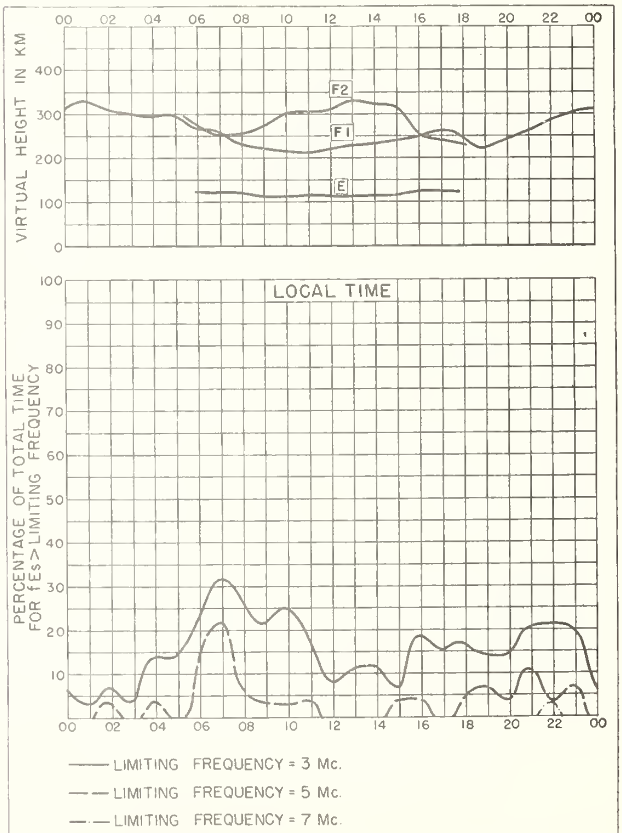


Fig. 8. SAN FRANCISCO, CALIFORNIA SEPTEMBER 1949

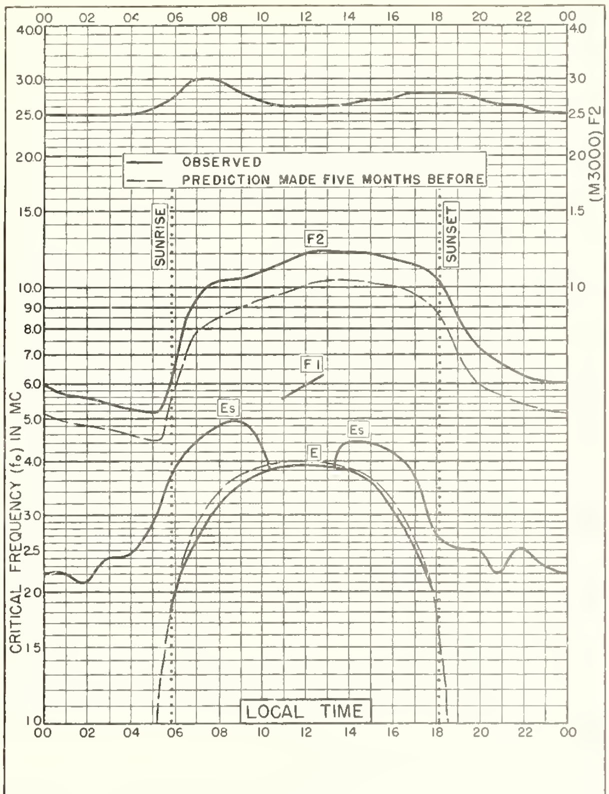


Fig. 9. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W SEPTEMBER 1949

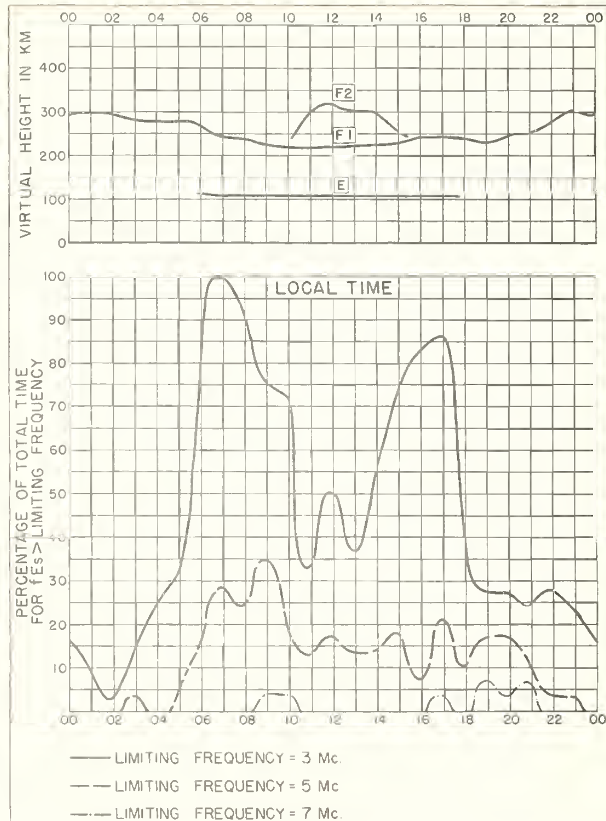


Fig. 10. WHITE SANDS, NEW MEXICO SEPTEMBER 1949

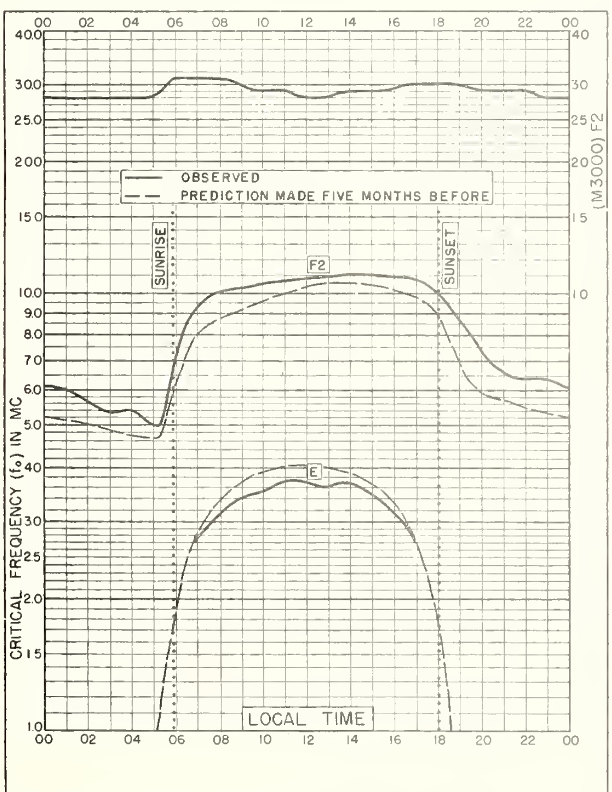


Fig. 11. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W SEPTEMBER 1949

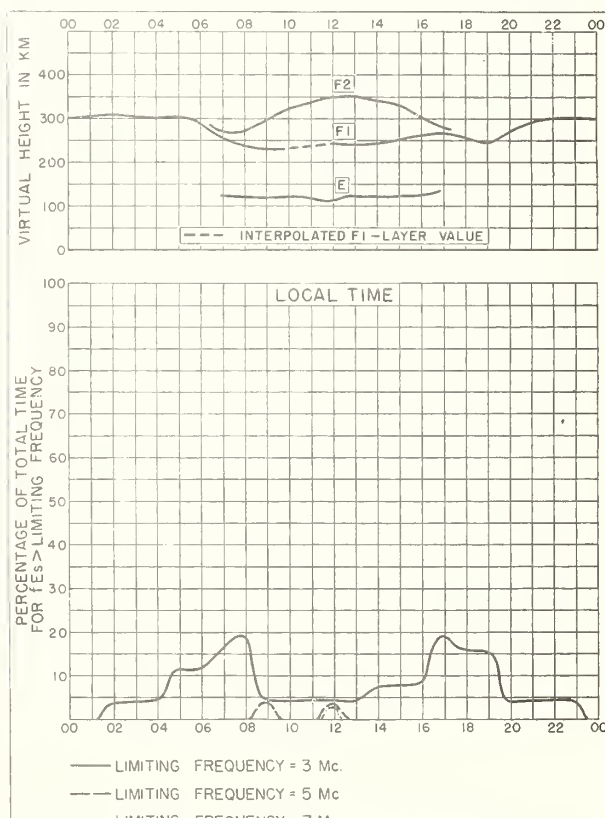


Fig. 12. BATON ROUGE, LOUISIANA SEPTEMBER 1949

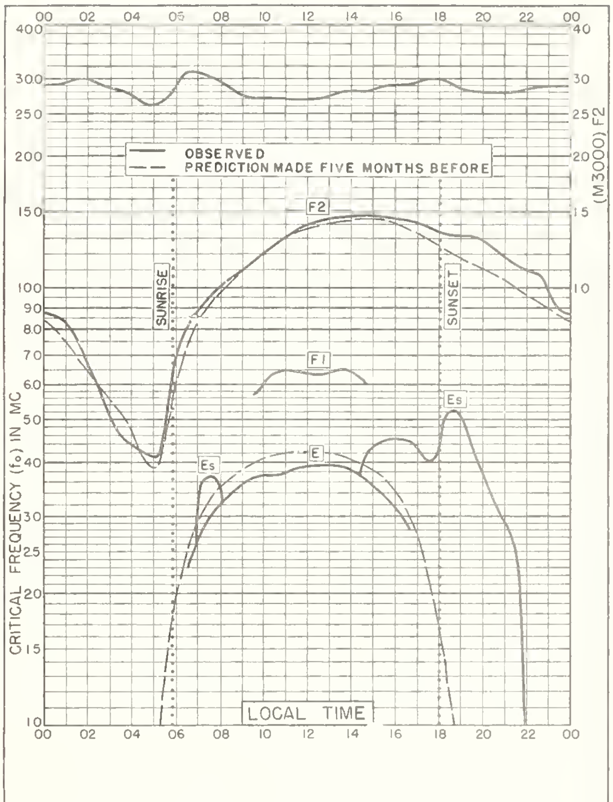


Fig. 13. MAUI, HAWAII
20.8°N, 156.5°W SEPTEMBER 1949

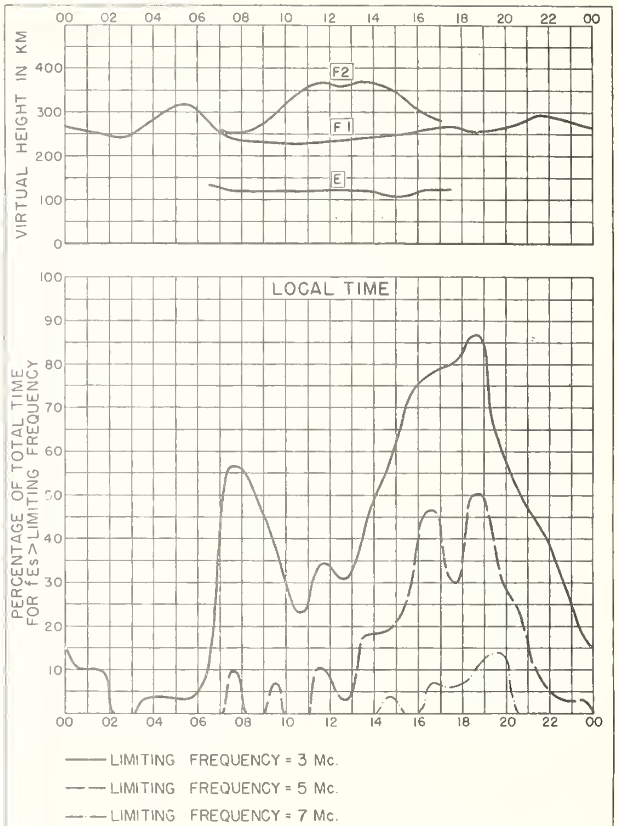


Fig. 14. MAUI, HAWAII SEPTEMBER 1949

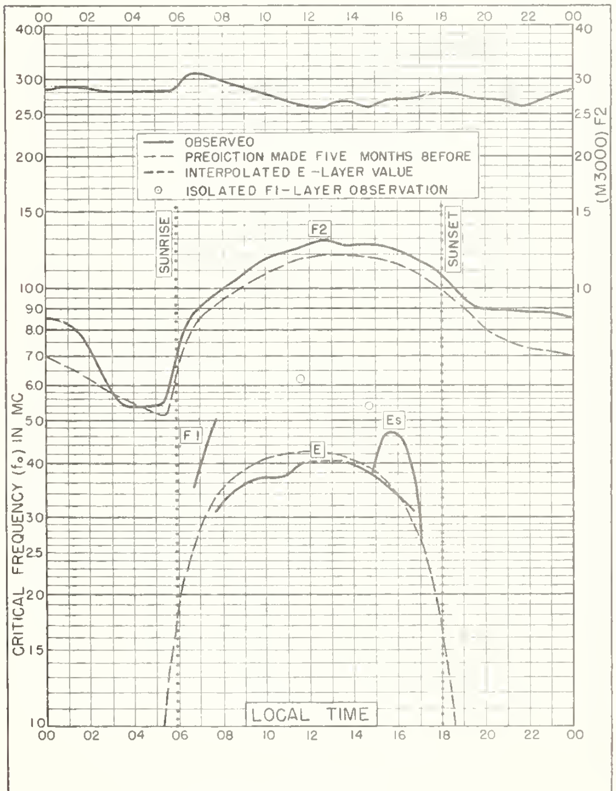


Fig. 15. SAN JUAN, PUERTO RICO
18.4°N, 66.1°W SEPTEMBER 1949

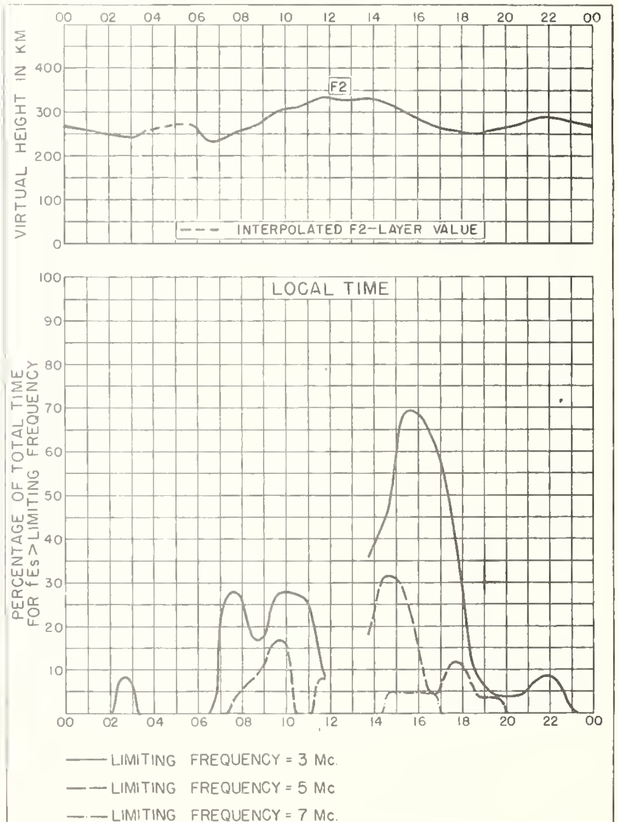


Fig. 16. SAN JUAN, PUERTO RICO SEPTEMBER 1949

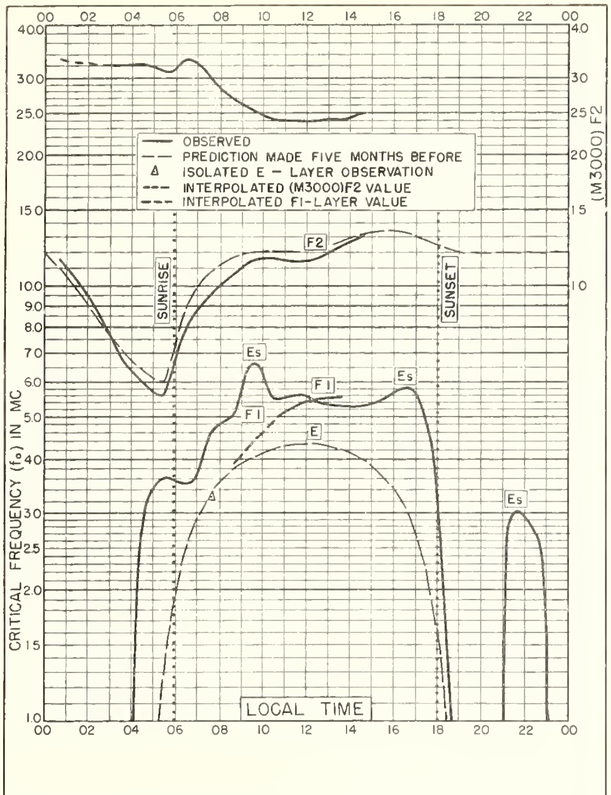


Fig. 17. GUAM I.
13.6°N, 144.9°E SEPTEMBER 1949

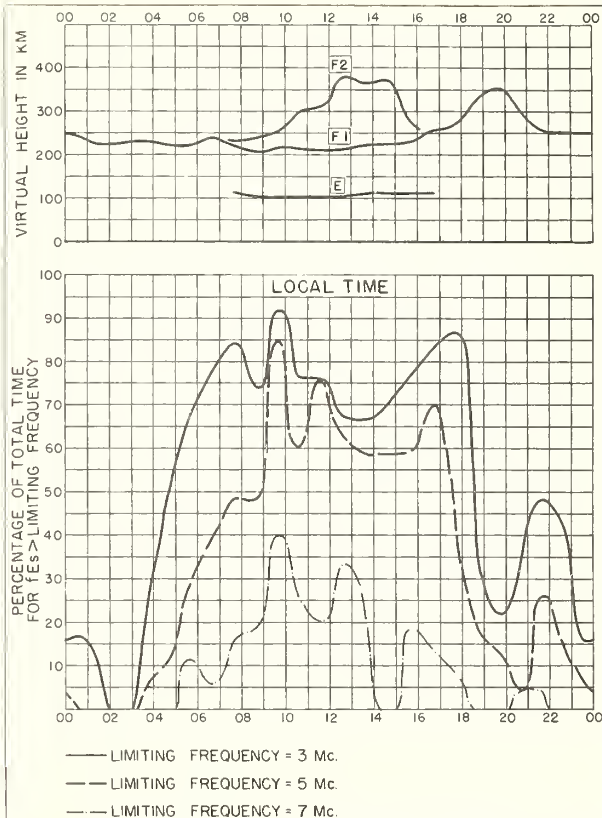
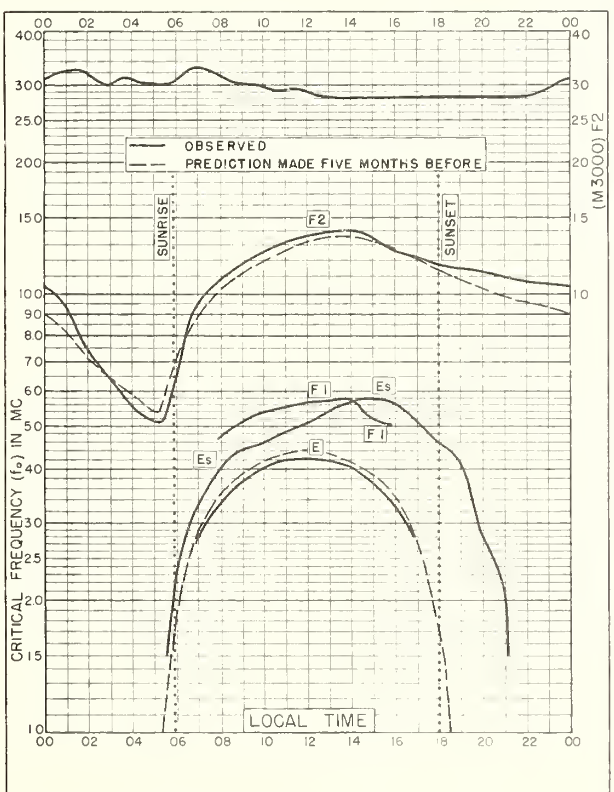


Fig. 18. GUAM I. SEPTEMBER 1949



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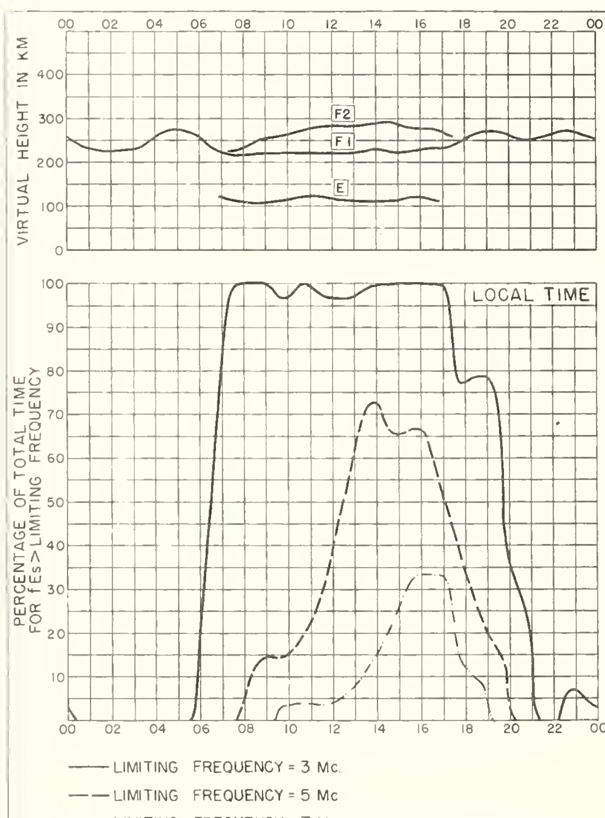

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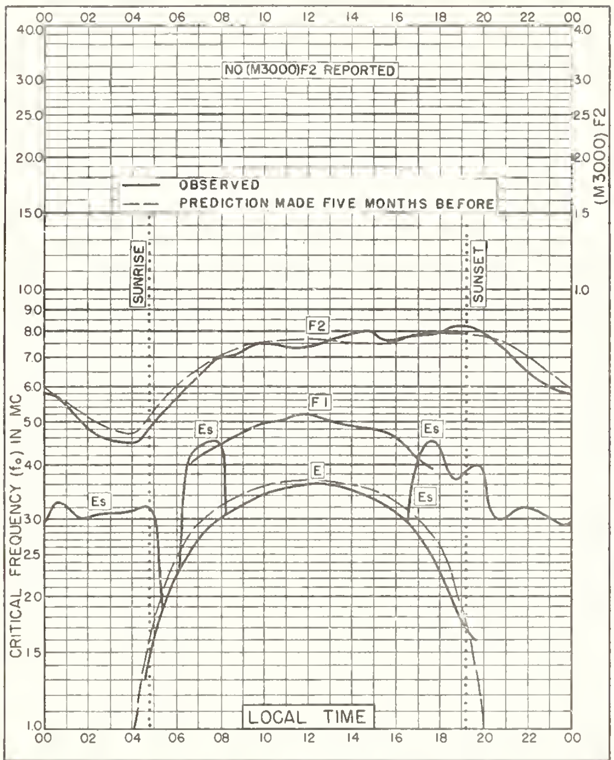

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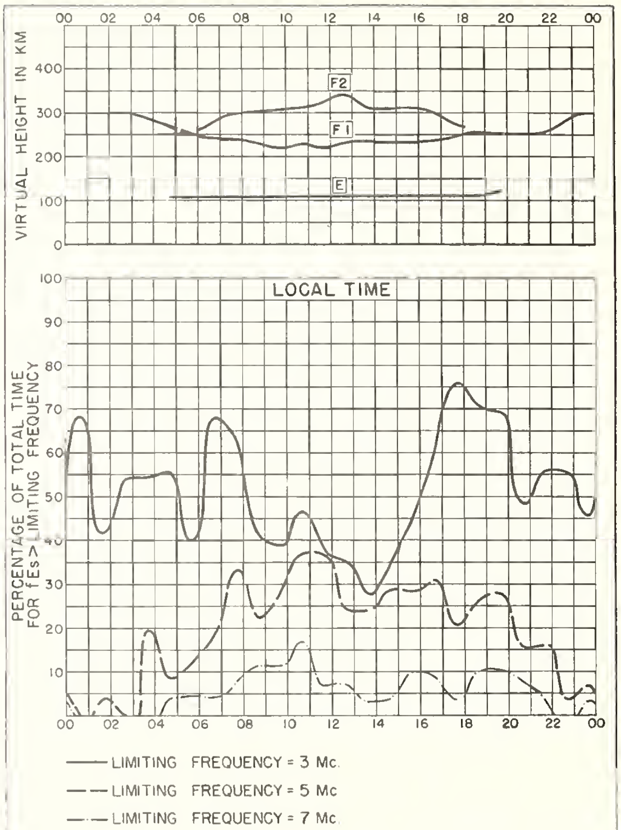

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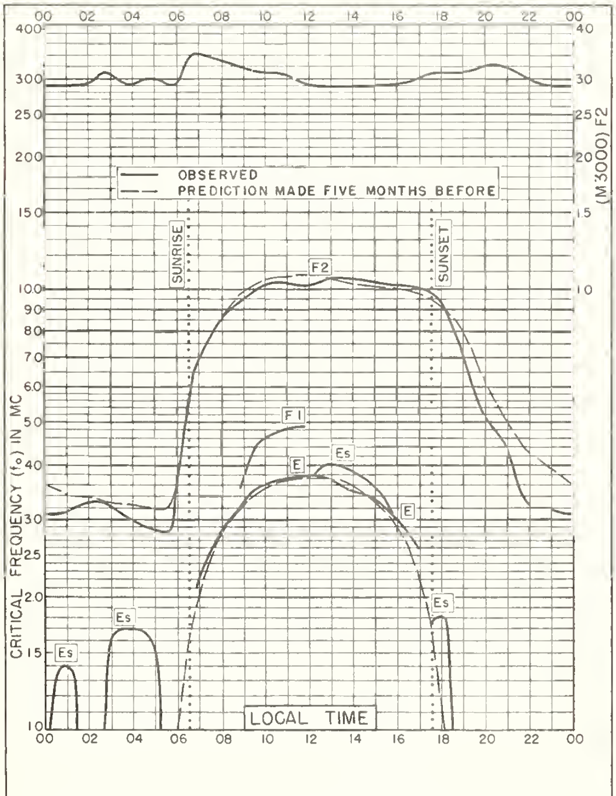

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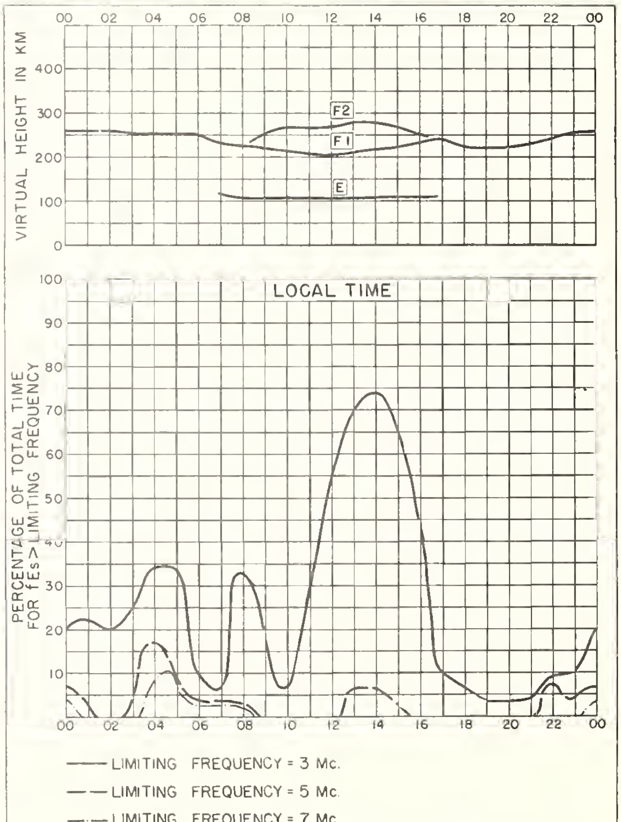

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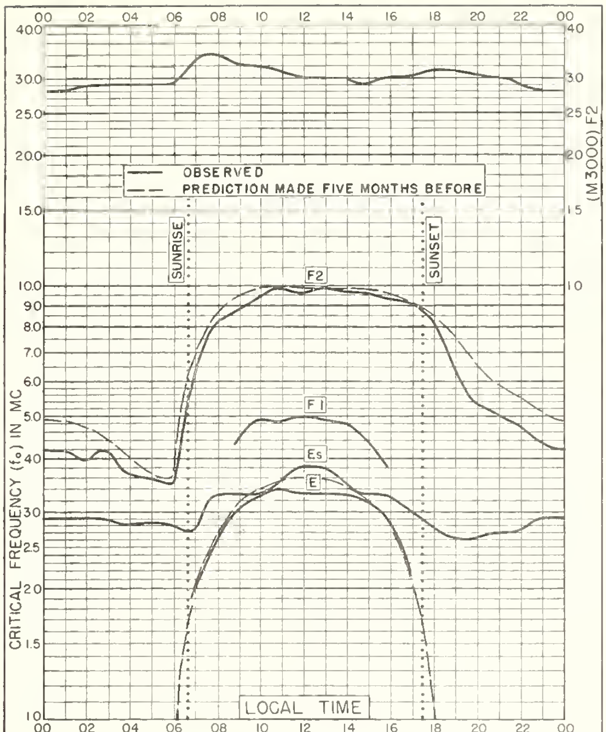

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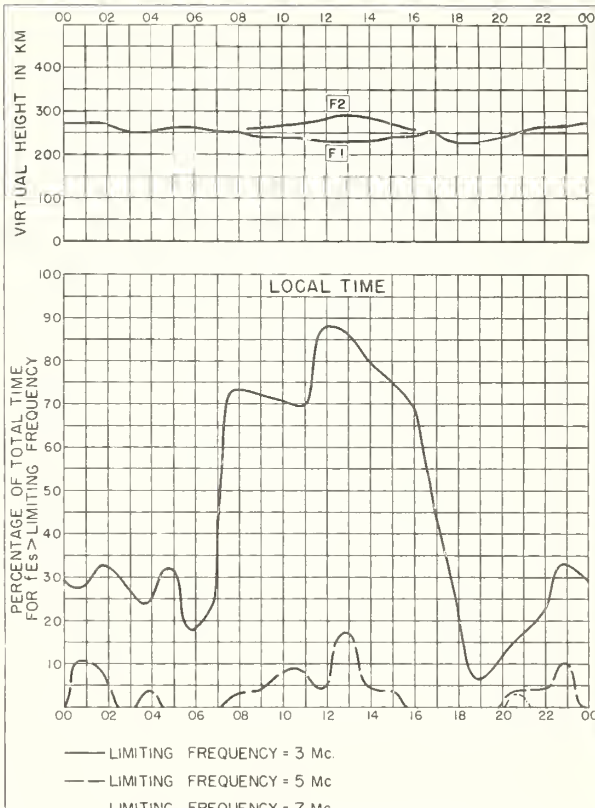

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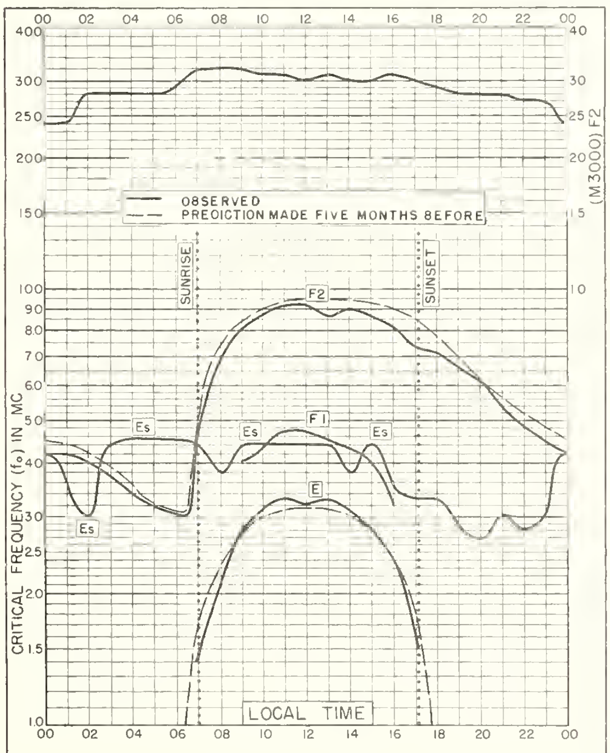

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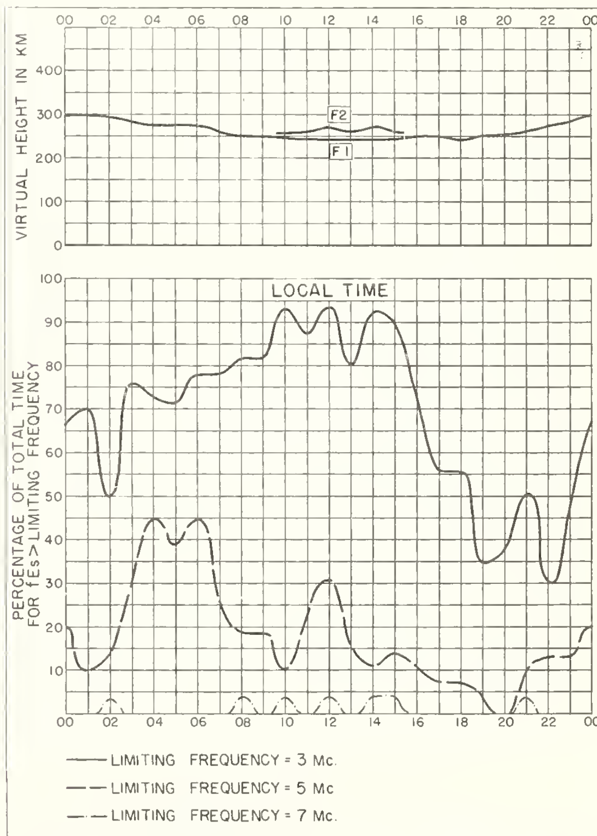

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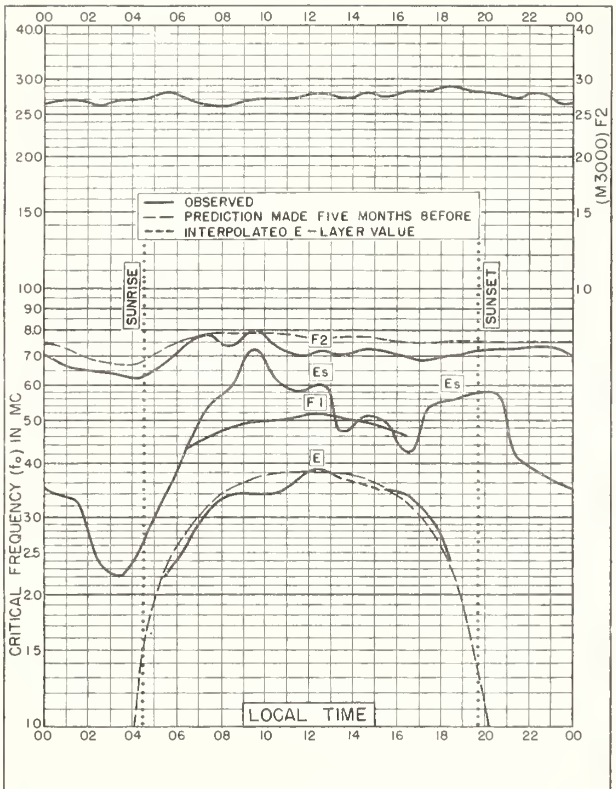

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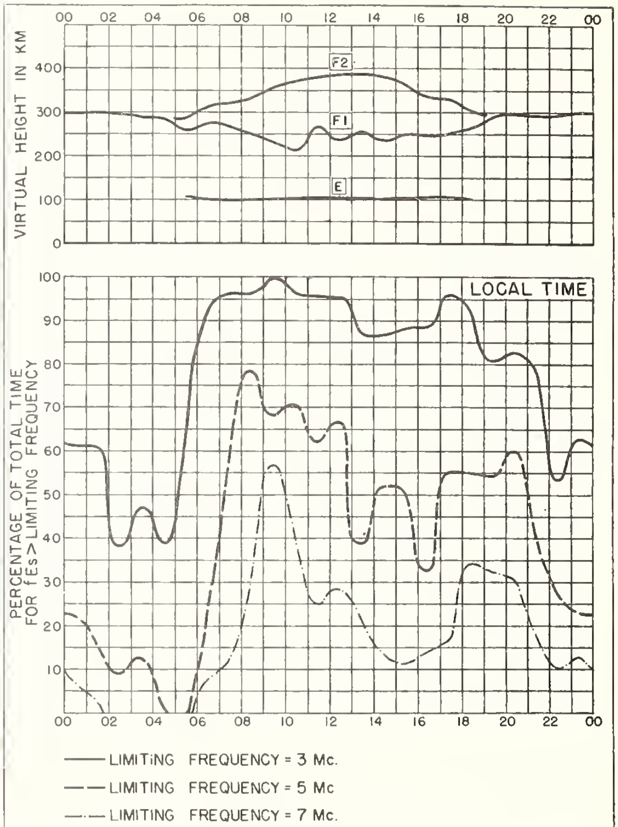

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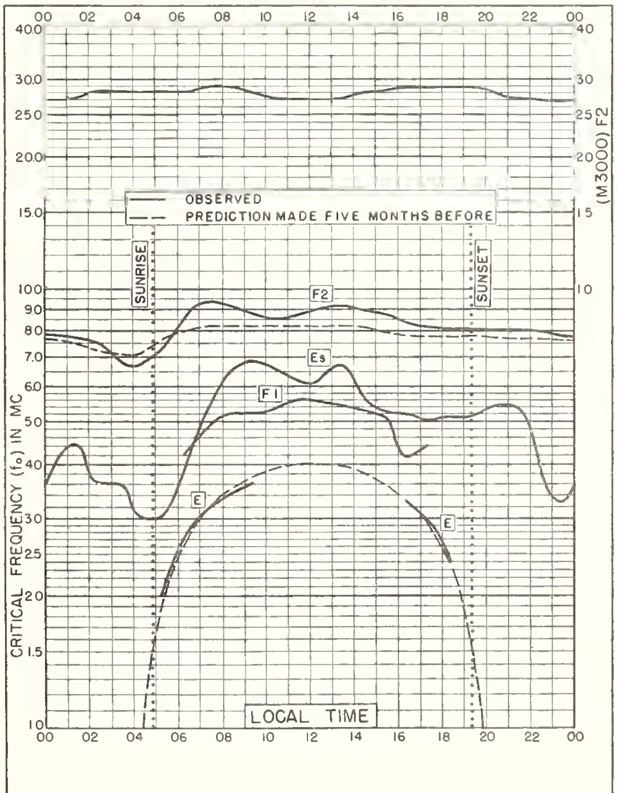

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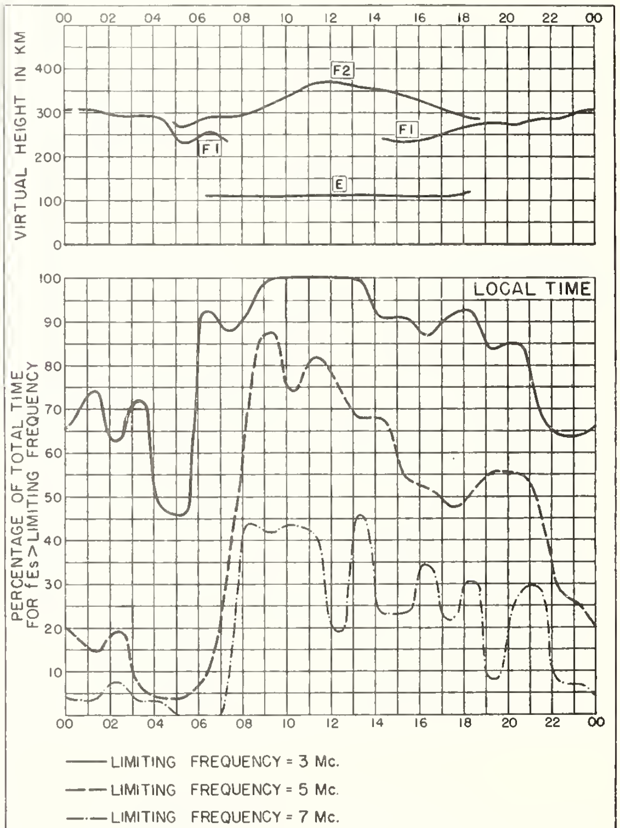

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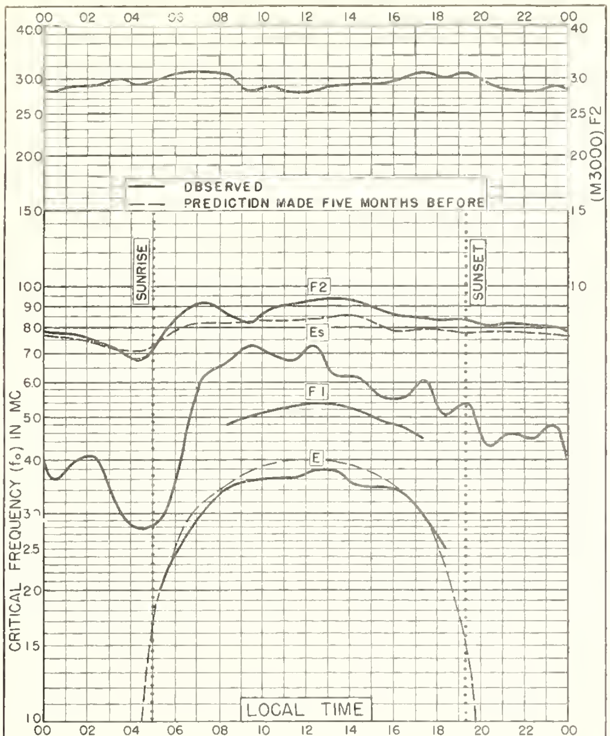

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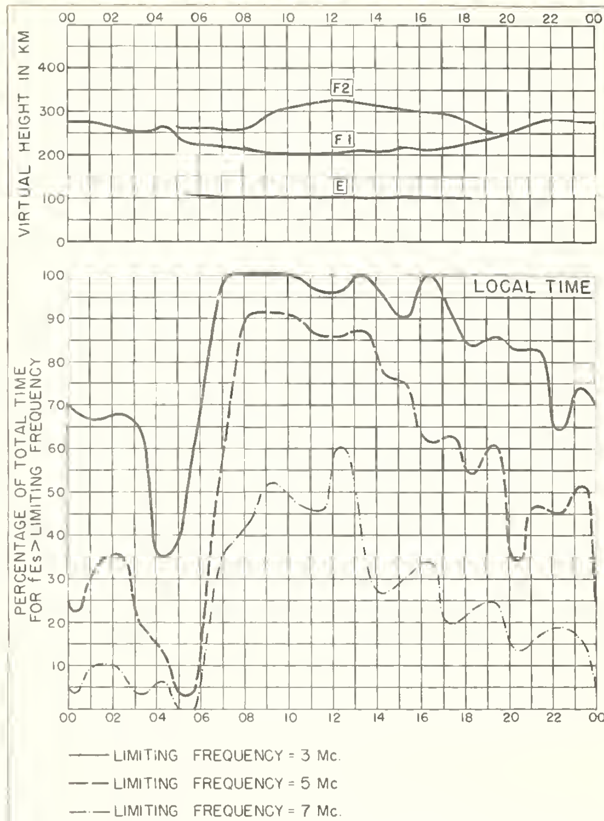

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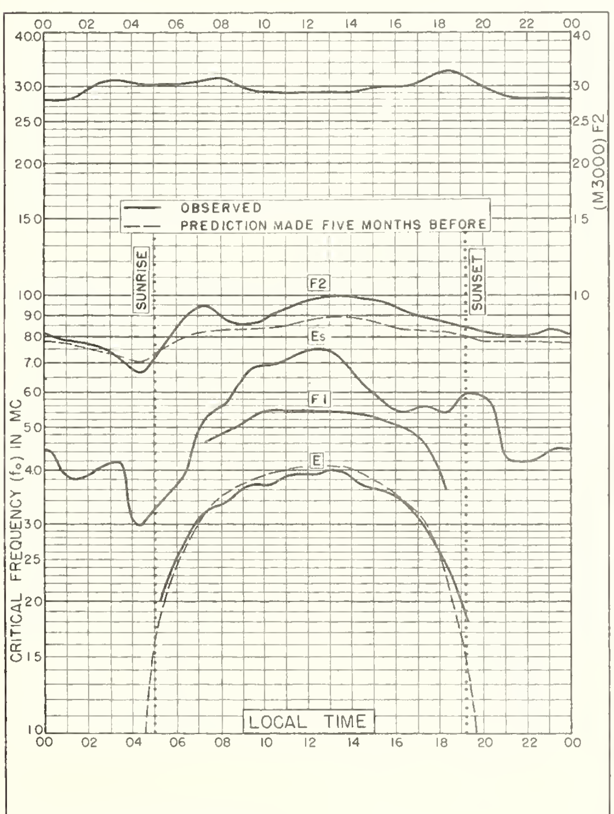

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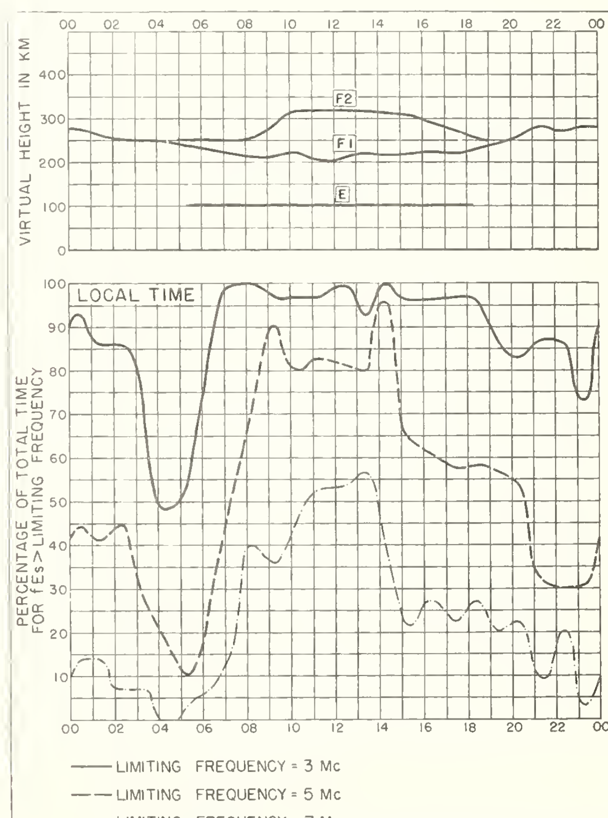

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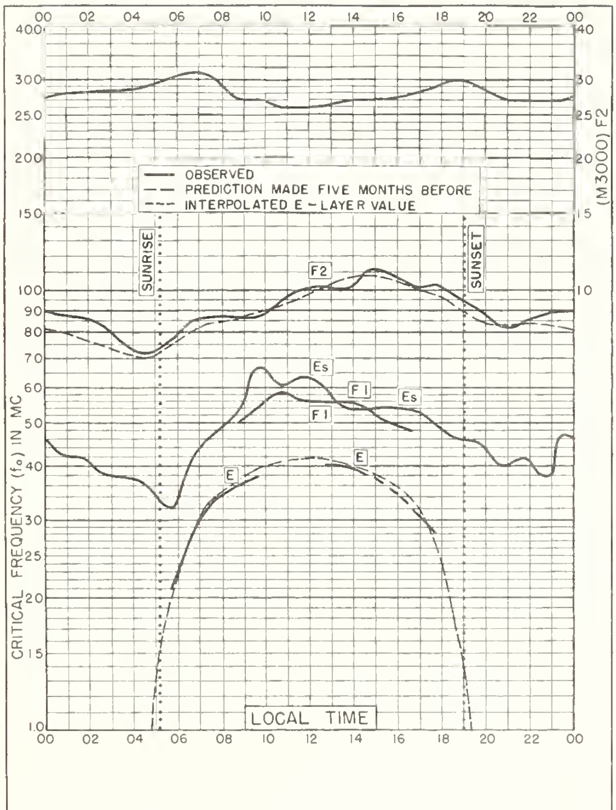

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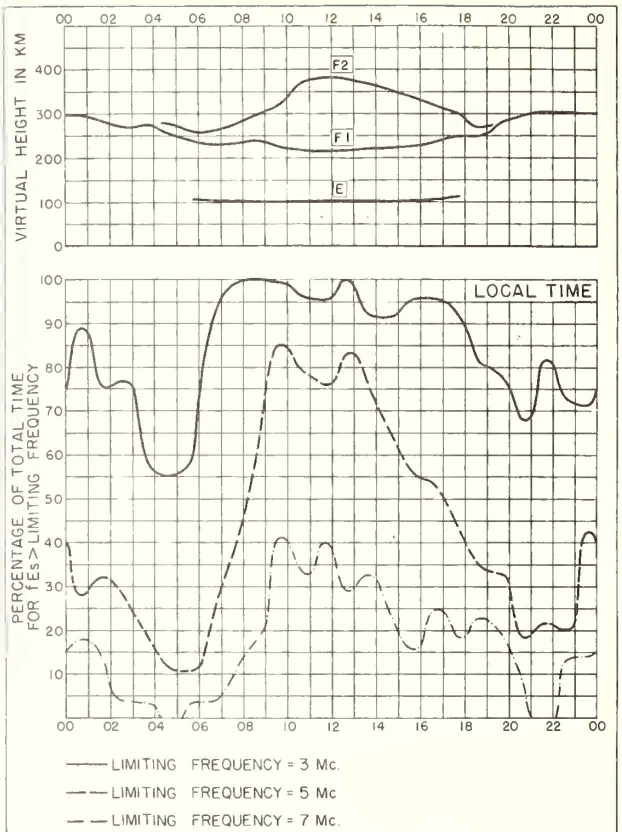

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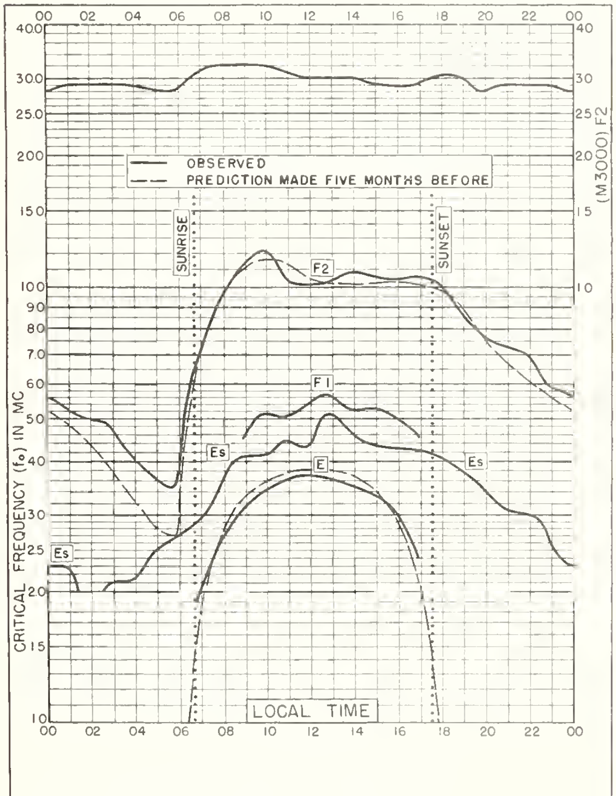

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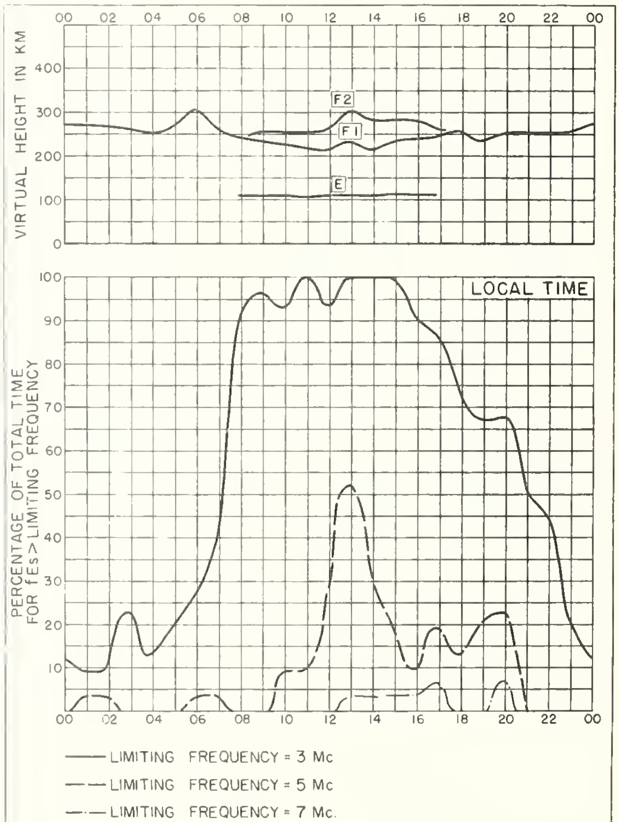

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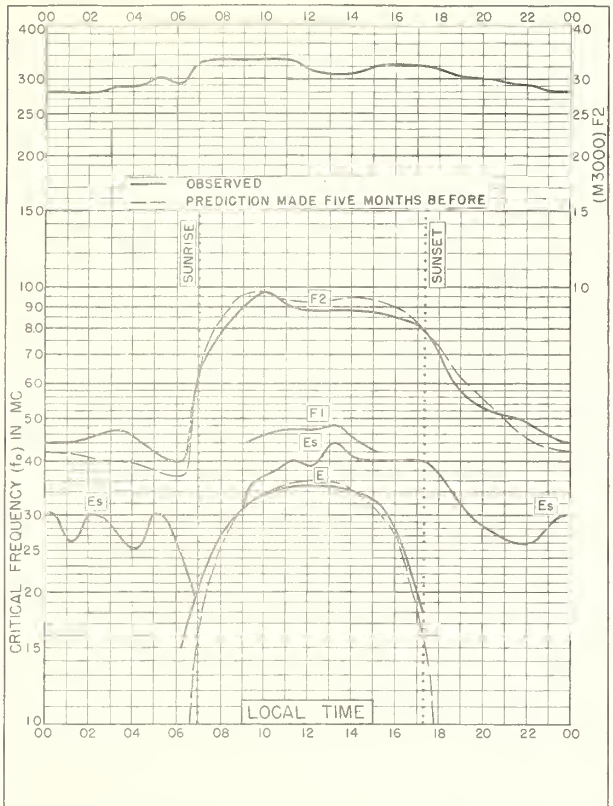

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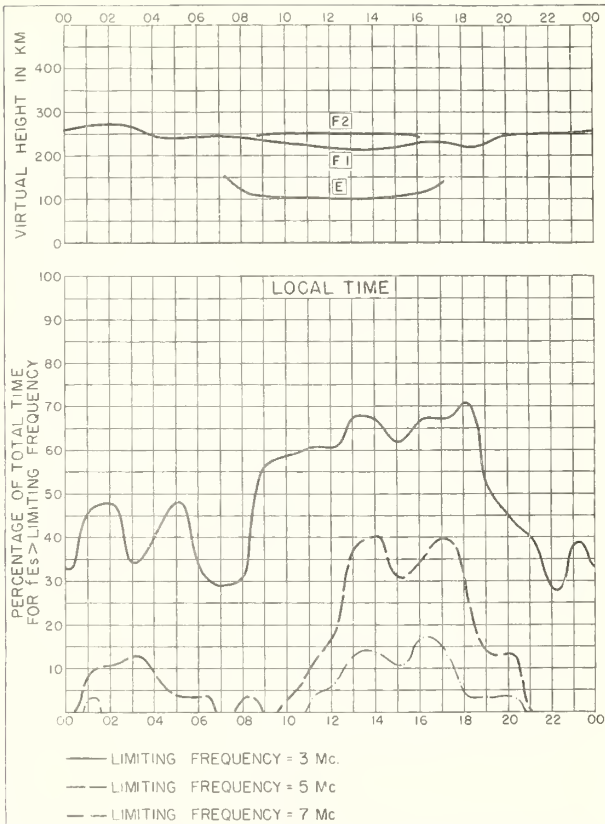

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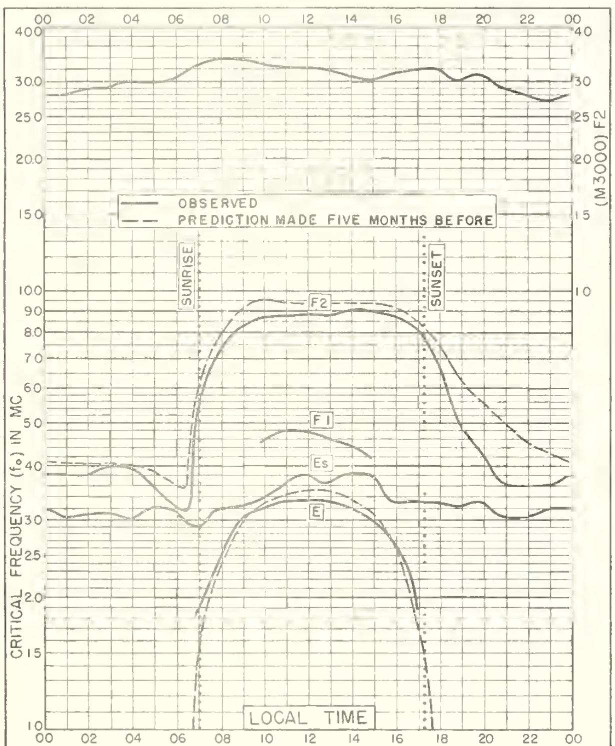

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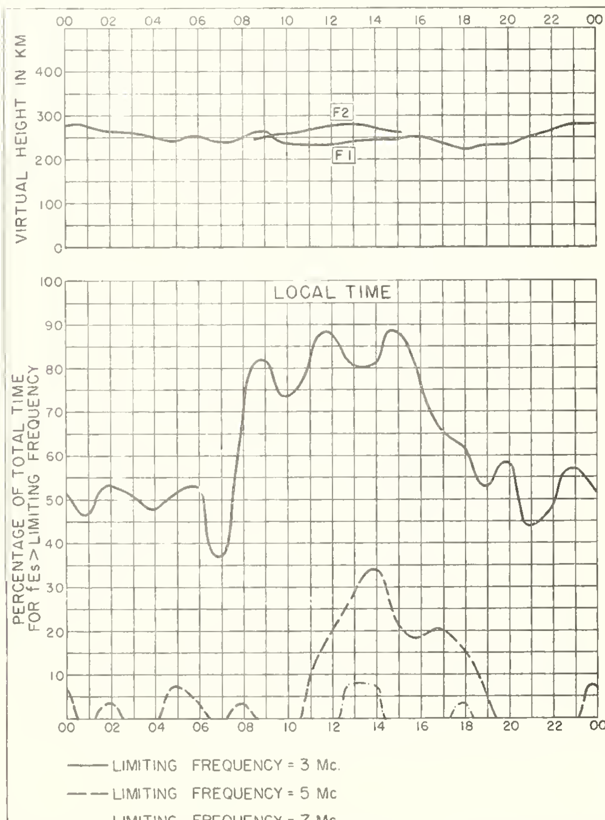

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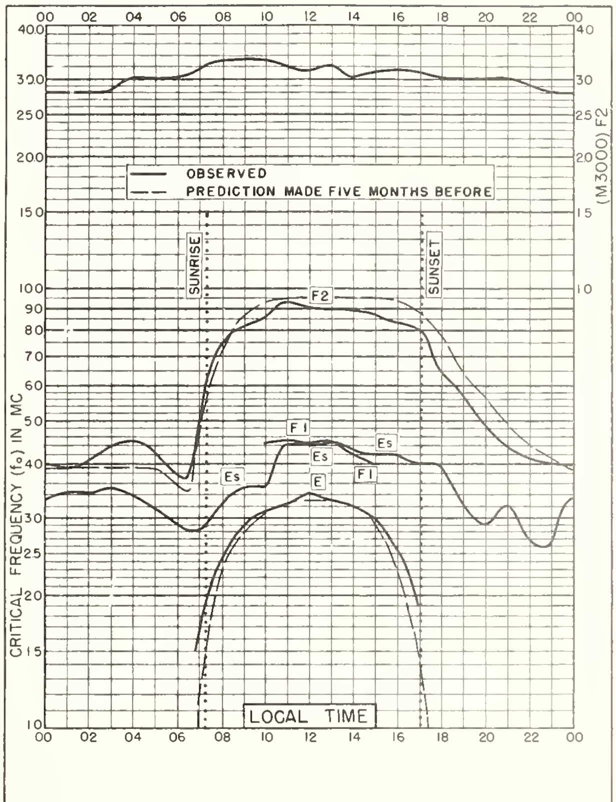

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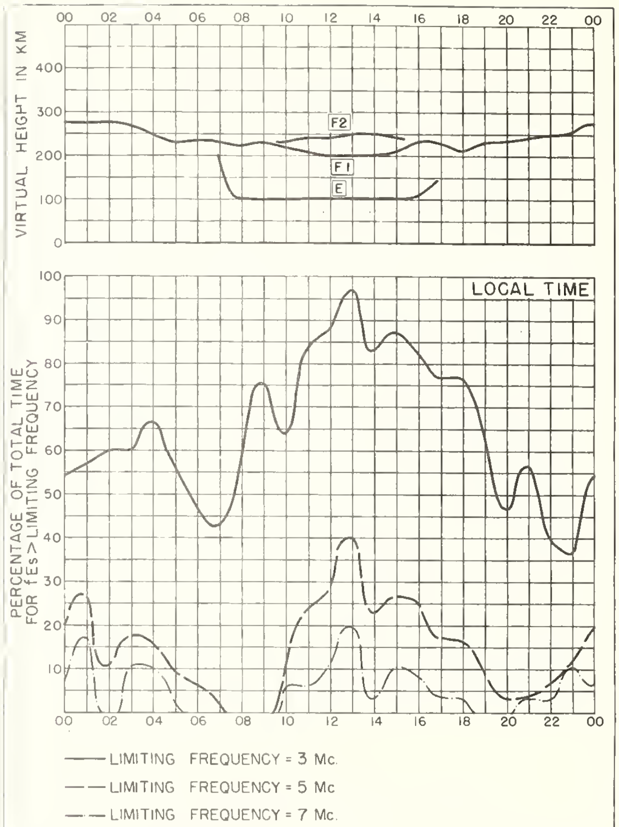

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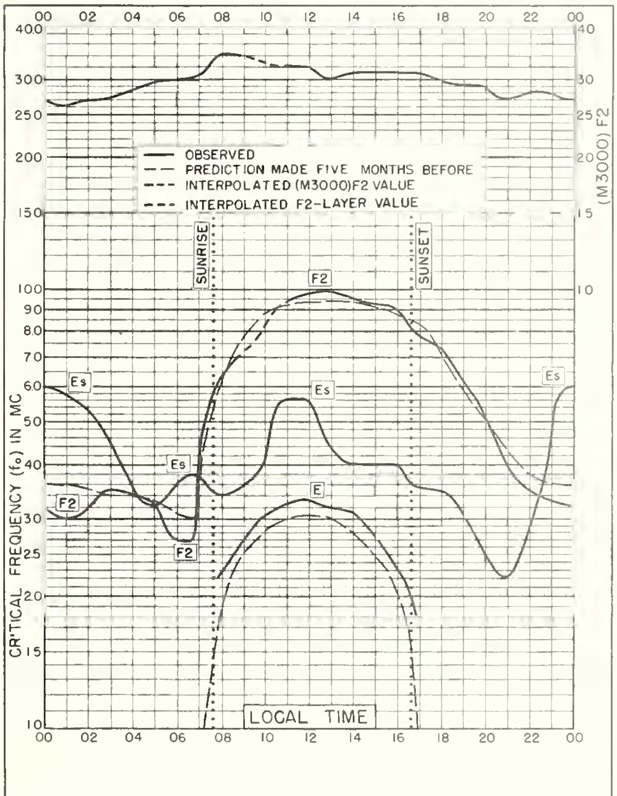

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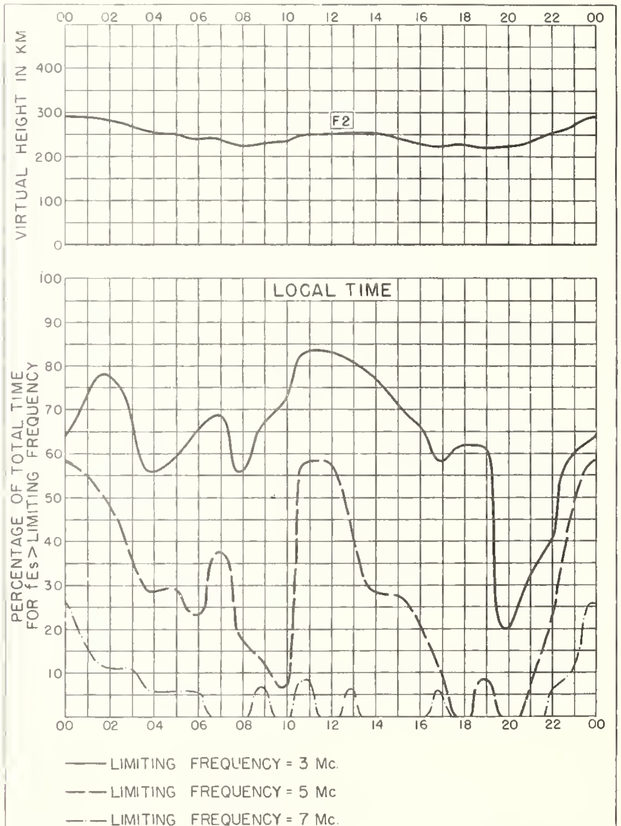

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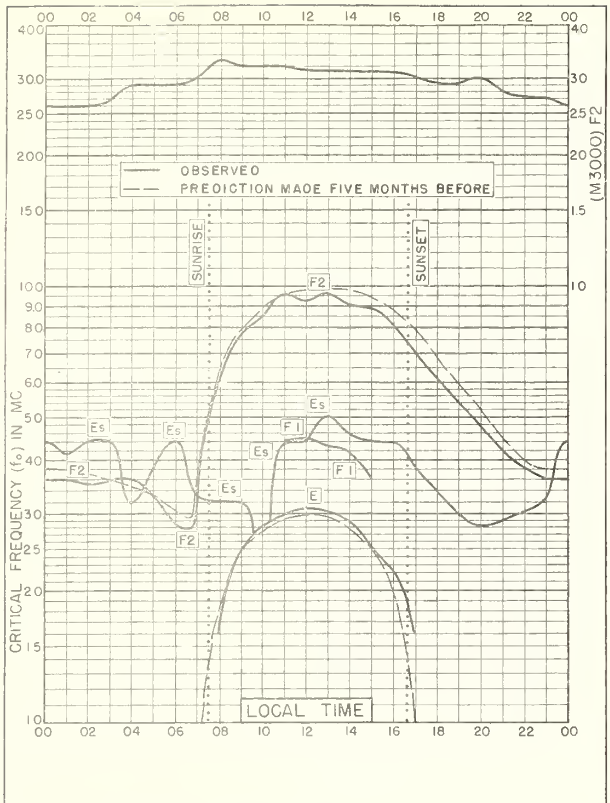

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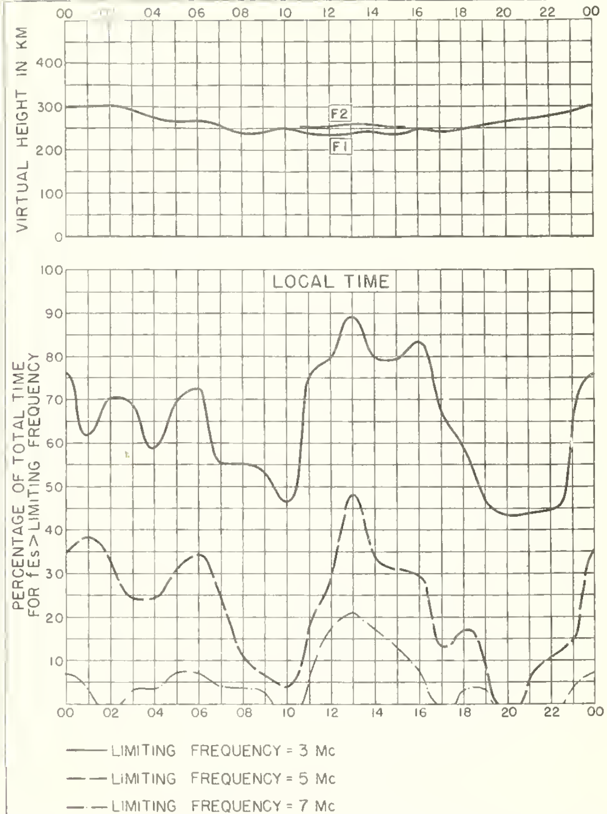

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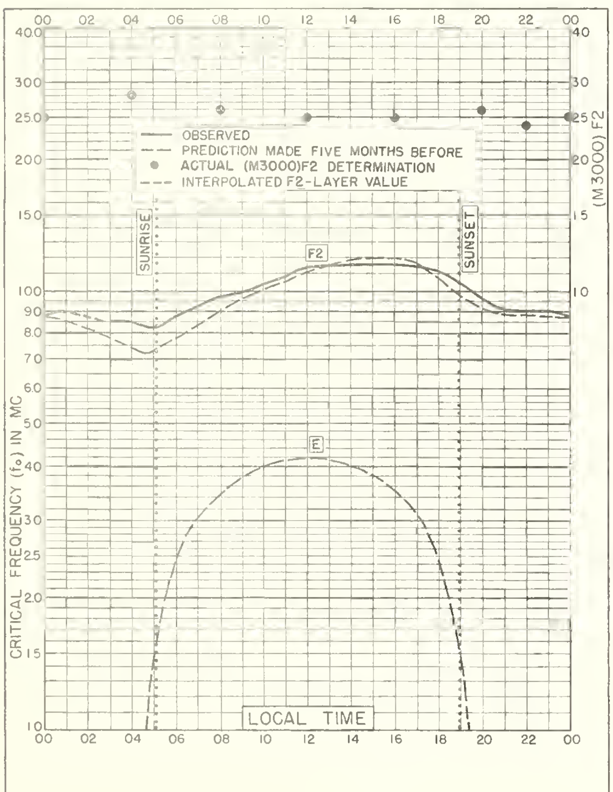

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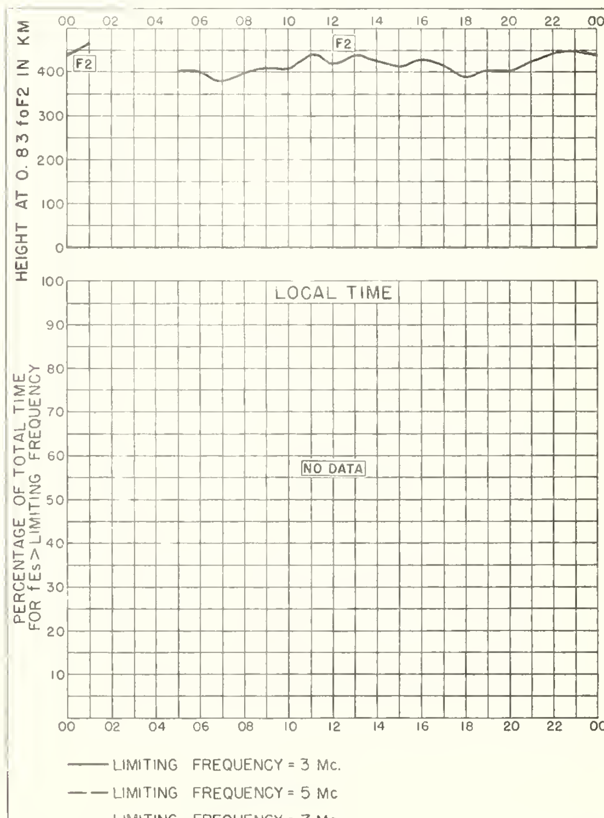

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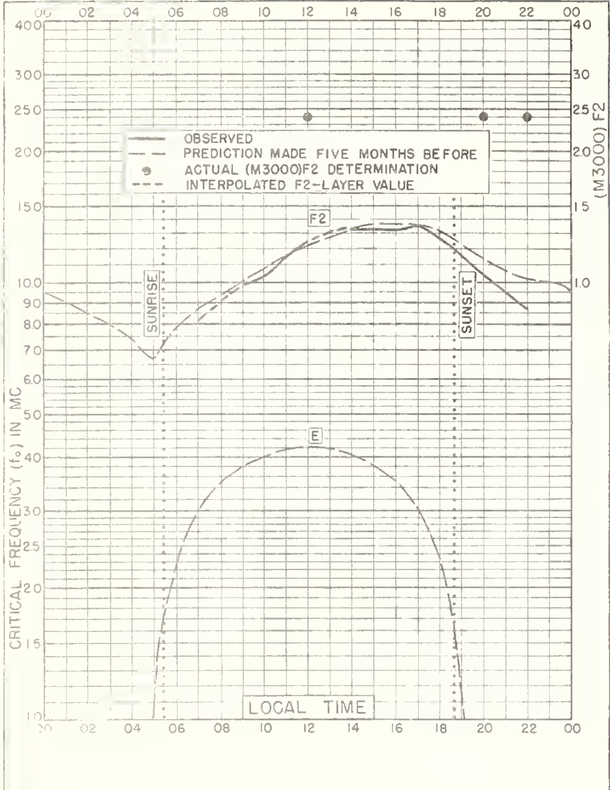

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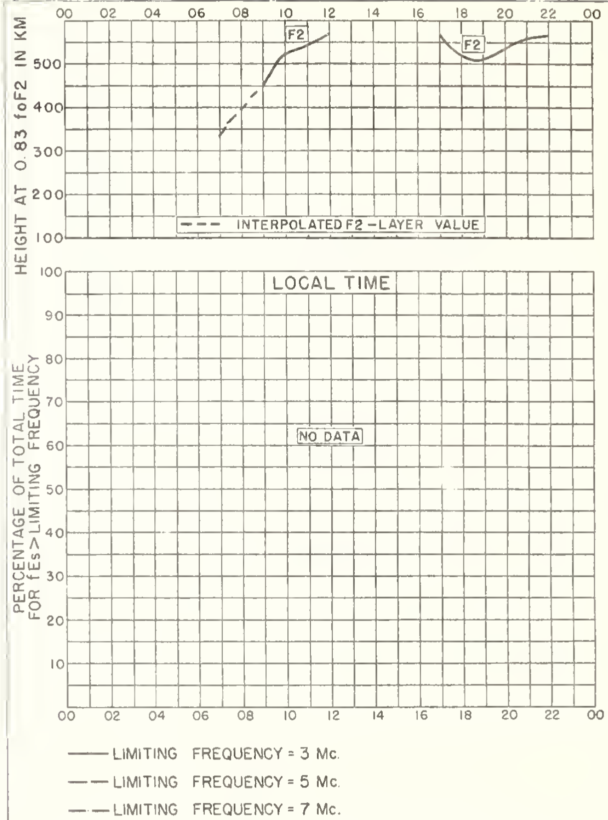

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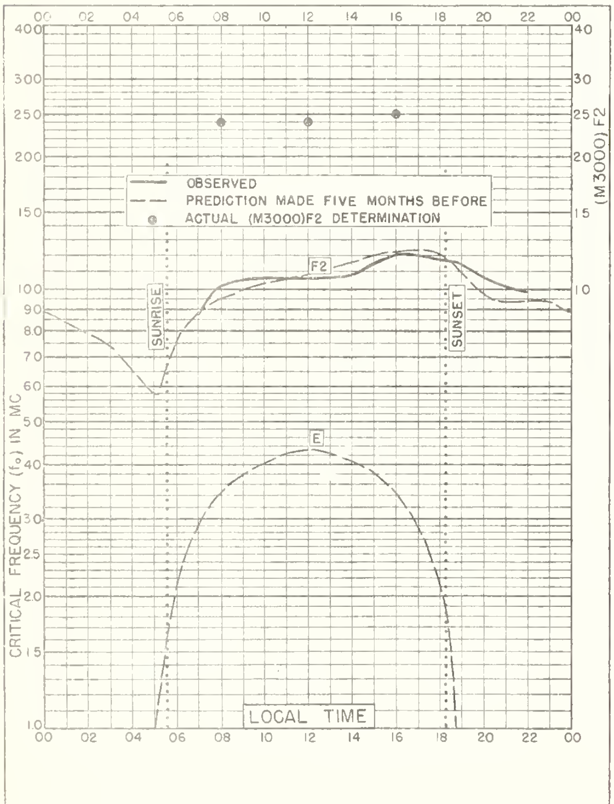

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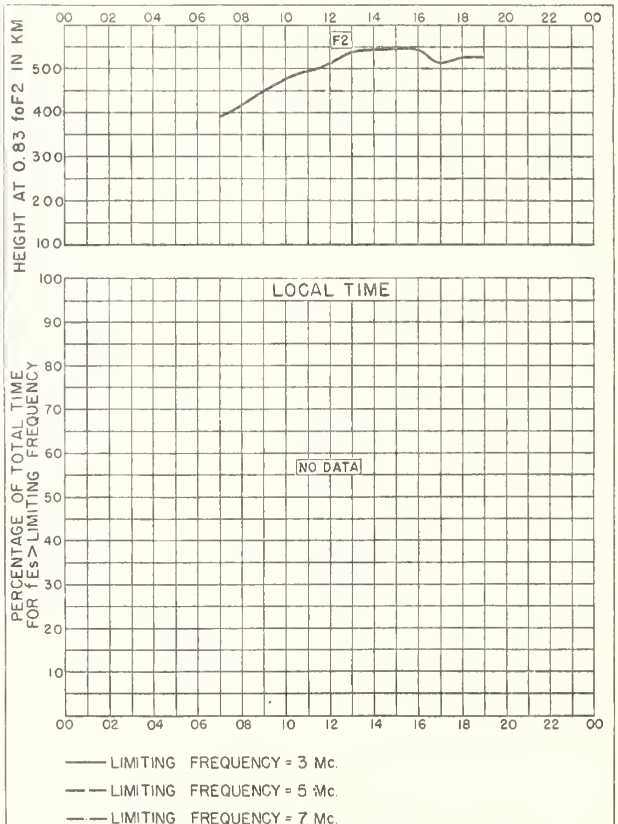

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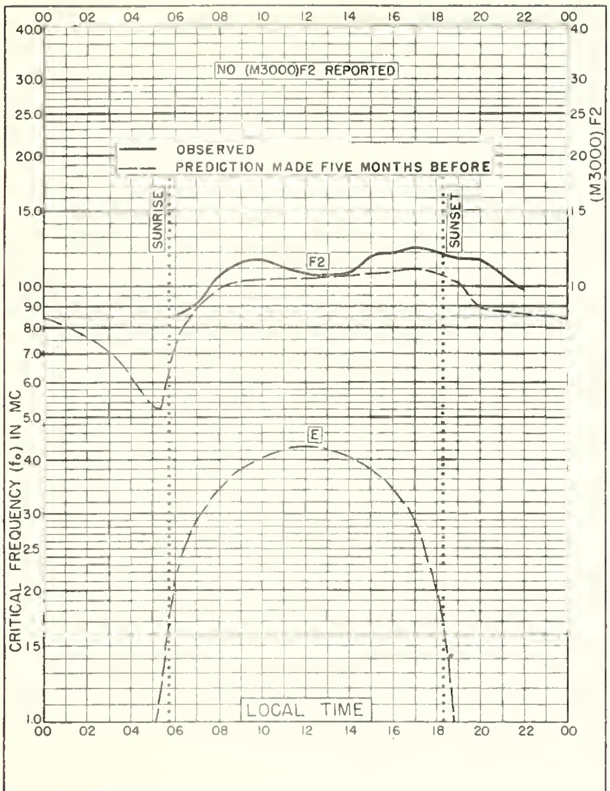

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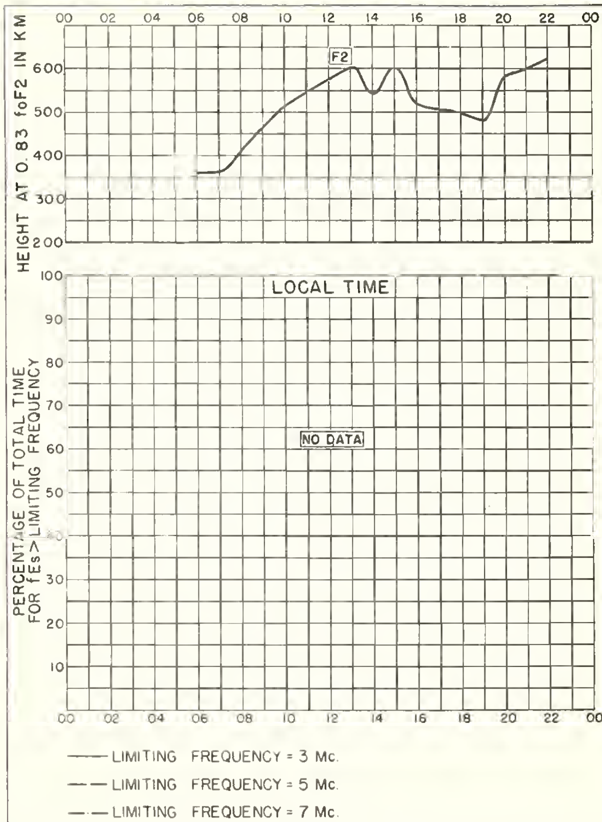

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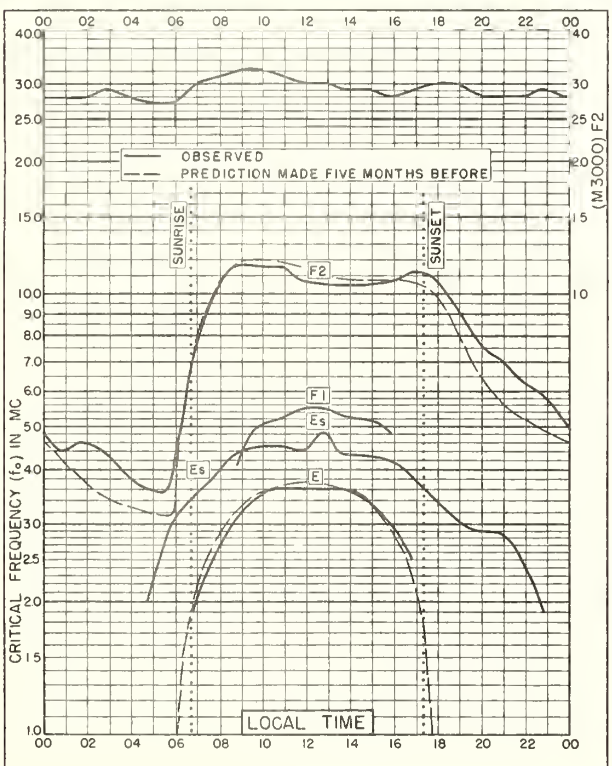

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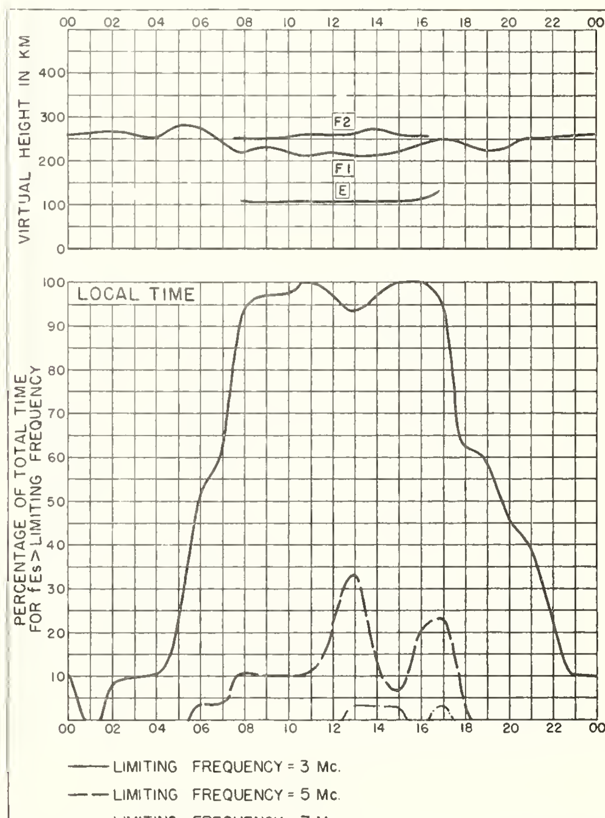

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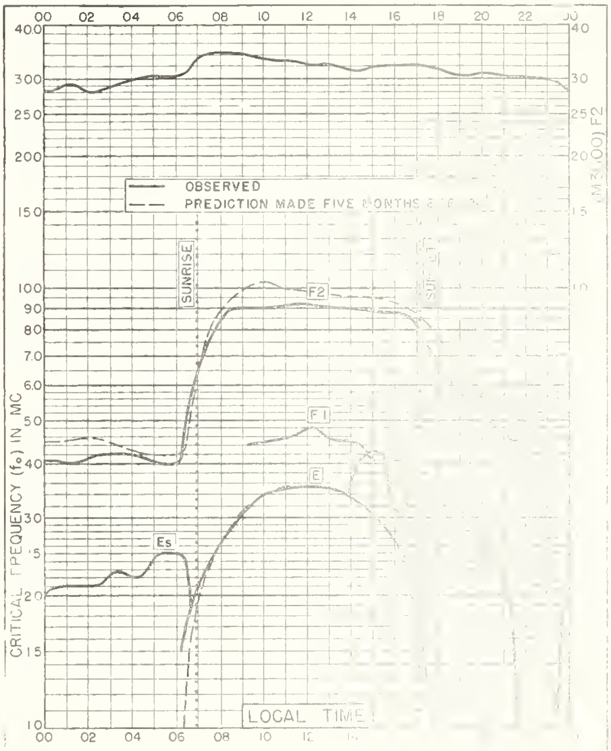

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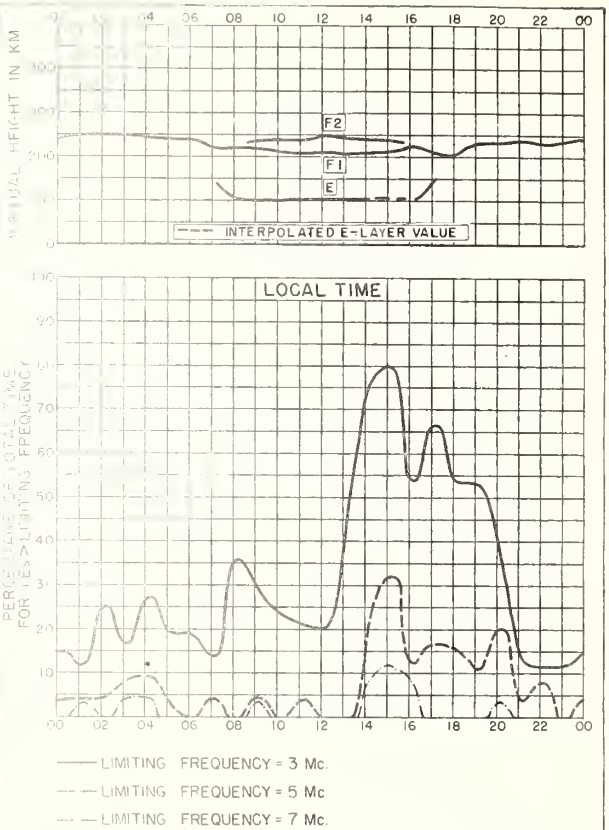

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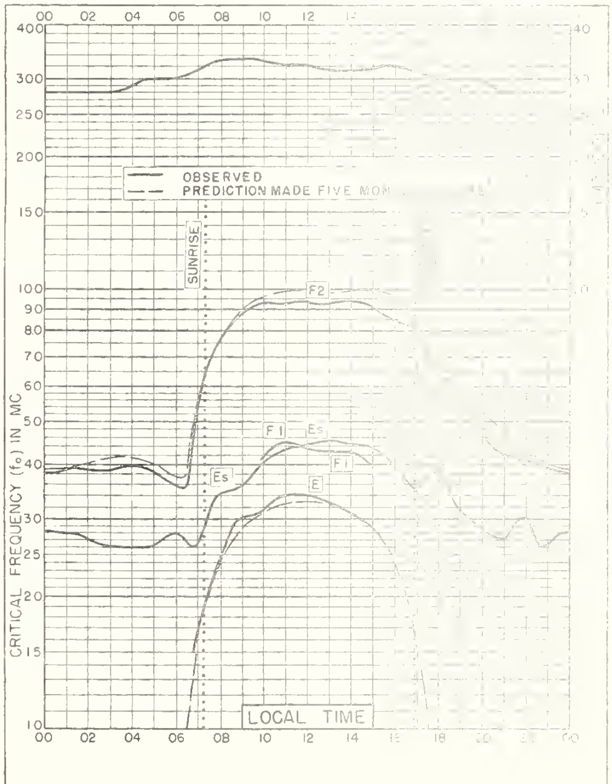

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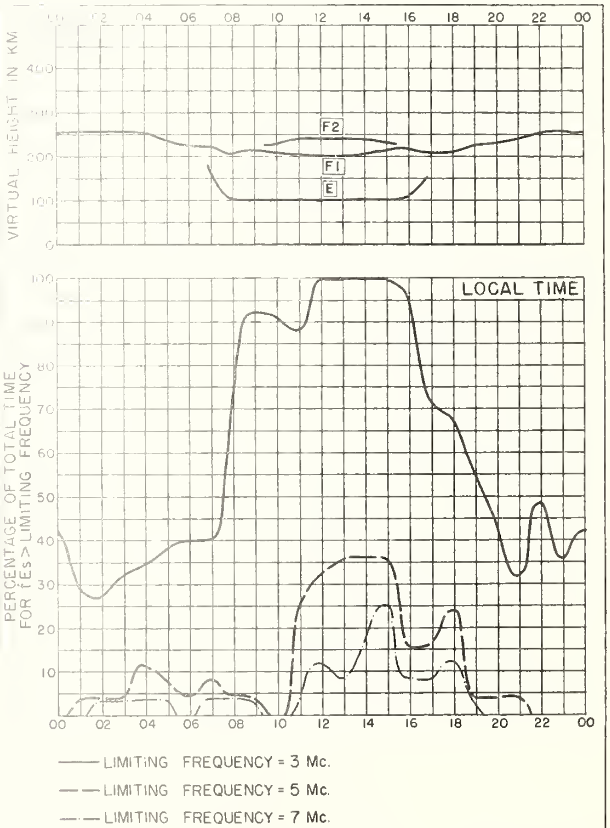

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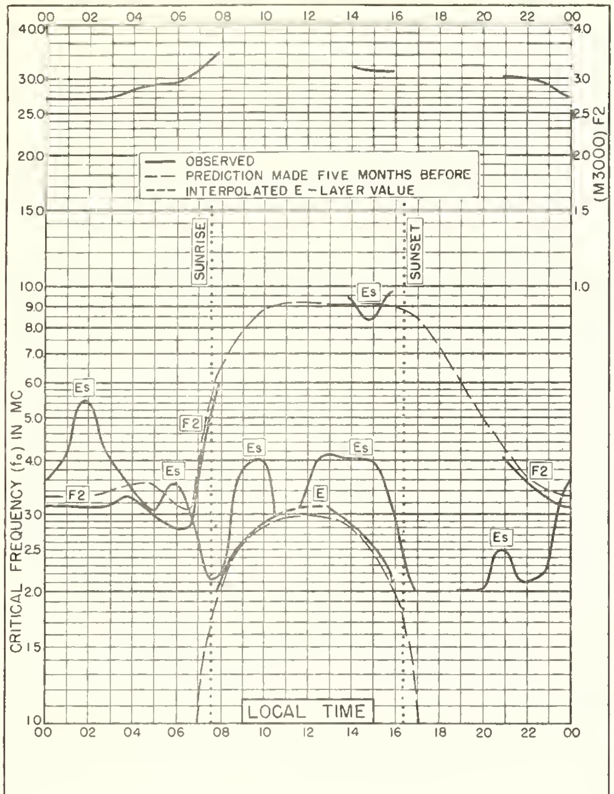

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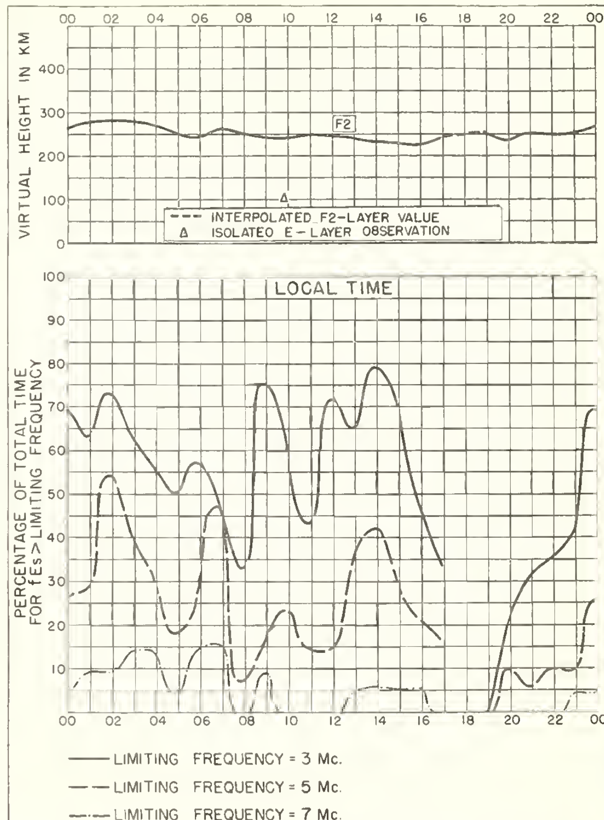

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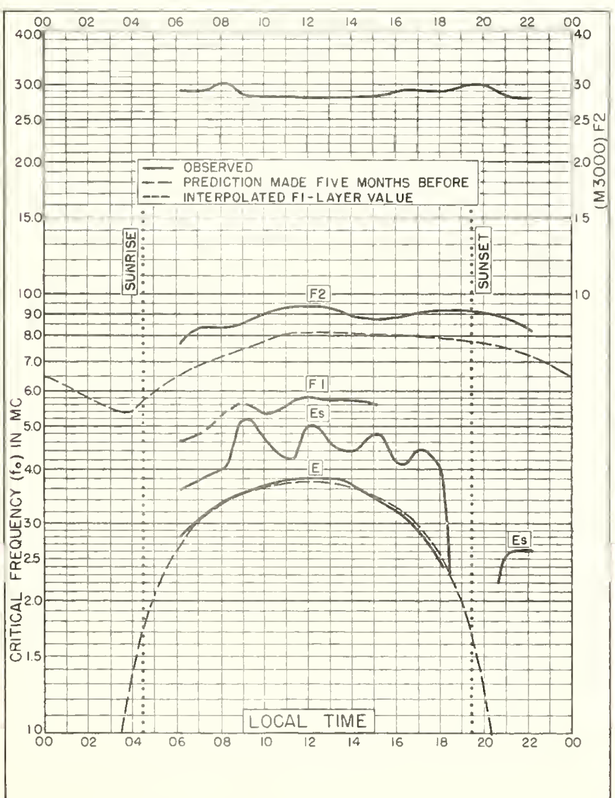

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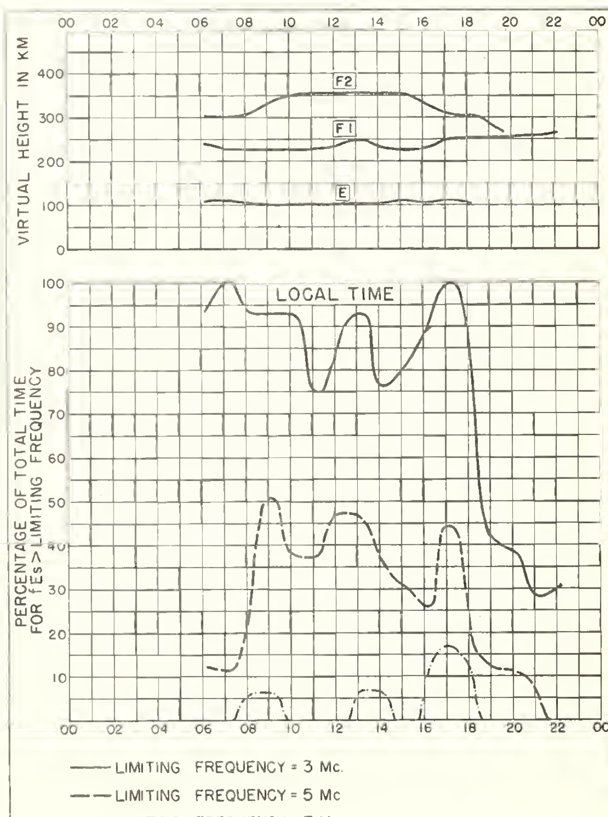

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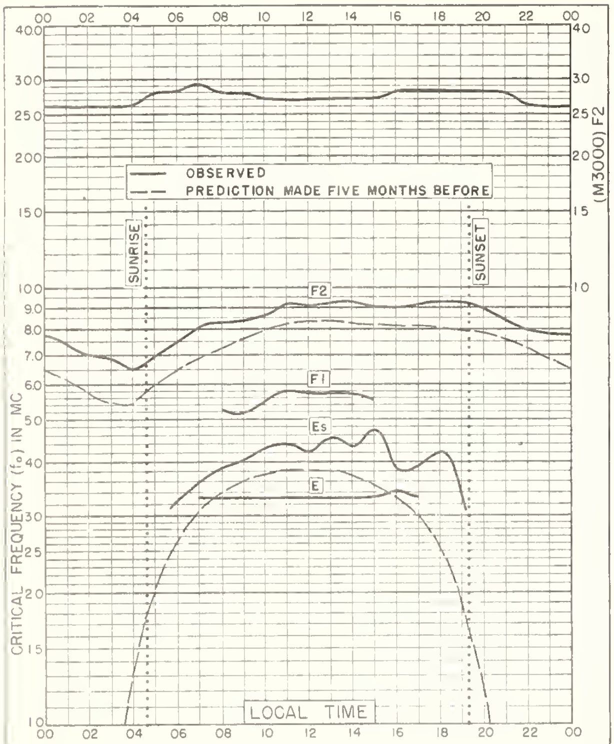

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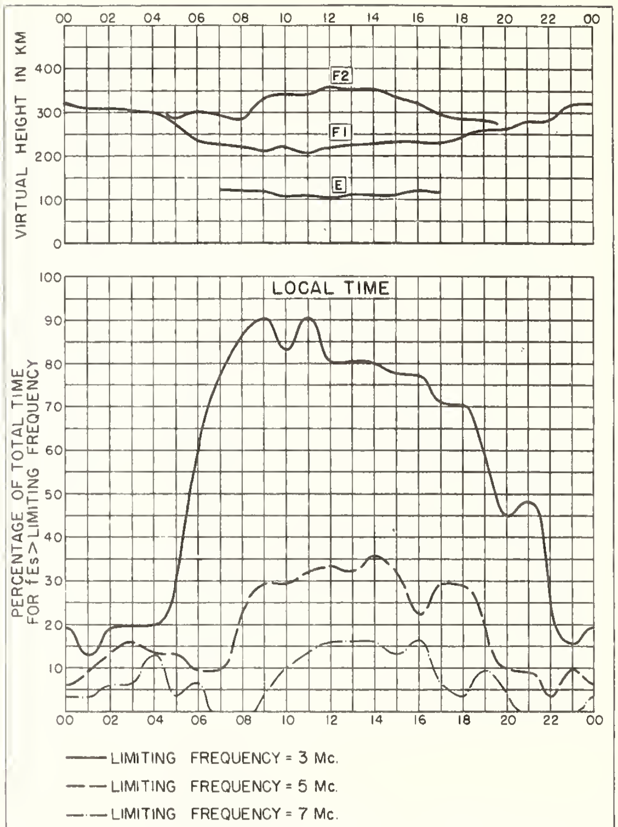

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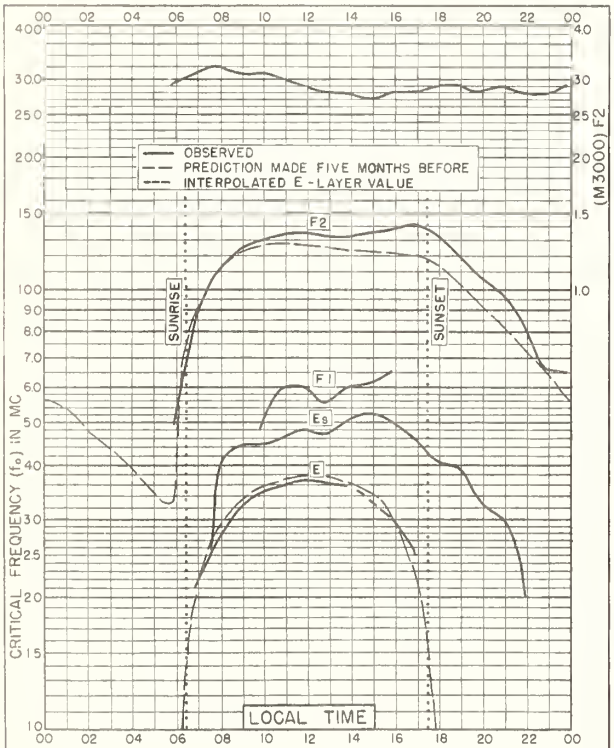

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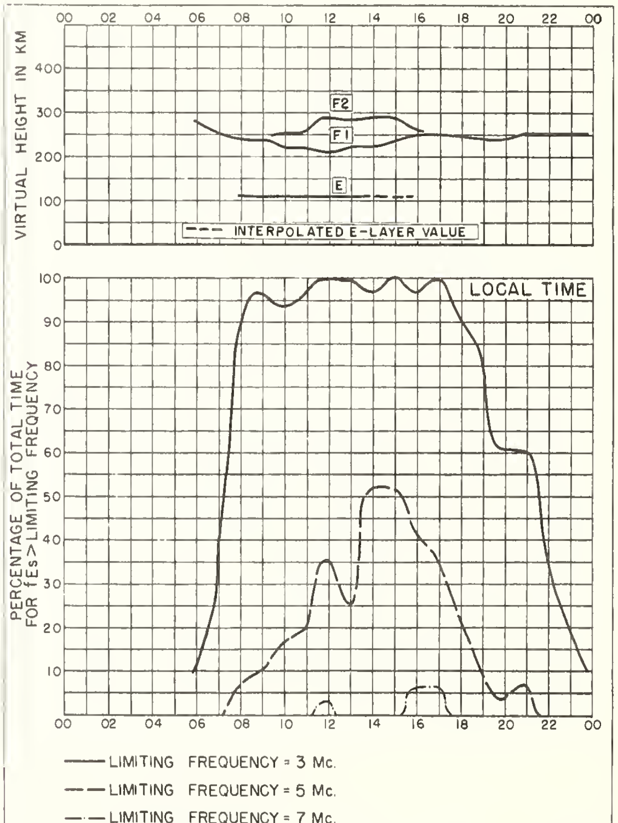

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[A list of CRPL Section Reports is available from the Central Radio Propagation Laboratory upon request]

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:
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R5. Criteria for Ionospheric Storminess.
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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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