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IONOSPHERIC DATA

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PREPARED BY CENTRAL RADIO PROPAGATION LABORATORY
National Bureau of Standards
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IONOSPHERIC DATA

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TERMINOLOGY AND SCALING PRACTICES

The symbols and terminology used in this report are those adopted by the International Radio Propagation Conference, and given in detail on pages 24 to 26 of the report IRPL-C61, "Report of International Radio Propagation Conference," and in the section on "Terminology" in report IRPL-F5.

Beginning with IRPL-F14 the symbol L, defined as follows, is used in detailed tabulations of hourly values of ionosphere characteristics observed at Washington:

L or l = critical frequency, muf, or muf factor for F1 layer omitted because no definite and abrupt change in slope of the h^f curve occurs either for the first reflection or for any of the multiples.

In the past, ionospheric conditions were summarized on a monthly basis by using average or mean values for each hour of the day for each month. However, following the recommendations of the International Radio Propagation Conference, held in Washington April 17 to May 5, 1944, beginning with data for January 1, 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.

The monthly median values used here are the values equaled or exceeded on half the days of the month at the given hour. 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 in the report referred to above, IRPL-C61.

a. For all ionospheric characteristics:

Values missing because of A, B, C, or F (see terminology referred to above) are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of f^oF2 (and f^oE 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 f^oF2 , as equal to or less than f^oF1 .

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 factors (M-factors):

Values missing because of G 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 no Es reflections appeared, the equipment functioning normally otherwise, are counted as equal to or less than the median $f^{\circ}E$, or equal to or less than the lower frequency count of the recorder.

Values of fEs missing for any other reason, and values of hEs 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.

Beginning with CRPL-F33, an additional group of symbols is used in recording the Washington, D. C., data. The list of additional symbols and their meanings follows:

N - unable to make logical interpretation.

P - trace extrapolated to a critical frequency.

Q - the F1 layer not present as a distinct layer.

R - curve becomes incoherent near the F2 critical frequency.

S - no observation obtainable because of interference.

V - forked record (previously denoted by U. This change should also be made in CRPL-7-1).

Z - triple split near critical frequency.

For a more detailed explanation of the meaning and use of these symbols, see the report CRPL-7-1, "Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records."

MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD-WIDE IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 38 and figures 1 to 75 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL predictions of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Australian Department of Supply and Shipping, Bureau of
Mineral Resources, Geophysical Section:
Watheroo, W. Australia

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

Canadian Radio Wave Propagation Committee:
Ottawa, Canada
St. John's Newfoundland

New Zealand Radio Research Committee:
Christchurch, New Zealand (Canterbury University College Observatory)
Rarotonga I.

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

Japanese Physical Institute for Radio Waves (under supervision of
Supreme Commander, Allied Powers):
Fukaura, Japan
Shibata, Japan
Tokyo (Kokobunji), Japan
Wakkanai, Japan
Yamakawa, Japan

United States Army Signal Corps:
Okinawa I.

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

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

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

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

Philippine Republic, Radio Control Division, Department of Commerce
and Industry:
Leyte, Philippine Is.

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 these errors are due to:

- a. Differences in scaling records when spread echoes are present.
- b. Omission of values when f^oF2 is less than or equal to f^oFl , 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.

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.			
	1948	1947	1946	1945
December	126	85	38	
November	124	83	36	
October	119	81	23	
September	117	121	79	22
August	123	122	77	20
July	125	116	73	
June	129	112	67	
May	130	109	67	
April	133	107	62	
March	133	105	51	
February	133	90	46	
January	130	88	42	

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

The data given in tables 39 to 50 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 "Terminology and Scaling Practices."

IONOSPHERE DISTURBANCES

Table 51 presents ionosphere character figures for Washington, D. C., during September 1948, 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 52 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 September 1948.

Table 53 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Point Reyes, California, receiving station of RCA Communications, Inc., for August 4, 8, and 16, and September 22 and 26, 1948.

Table 54 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 July 29 and 30, August 30, and September 12, 16, 17, 19, 20, and 22, 1948.

Table 55 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Platanos, Argentina, receiving station of the International Telephone and Telegraph Corporation for July 6, 1948.

Table 56 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, August 1948, compared with the CRPL daily radio disturbance warnings, which are primarily for the North Atlantic paths, the CRPL weekly radio propagation forecasts of probable disturbed periods, and the half-day Cheltenham, Maryland, geomagnetic K-figures.

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

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

that all the disturbance shown by the quality figures is not due to ionospheric storminess alone, care should be taken in using the quality figures in research correlations with solar, auroral, geomagnetic, or other data. Nevertheless, these quality figures do reflect a consensus of opinion of actual radio propagation conditions as found on any one half day in either of the two general areas.

AMERICAN AND ZÜRICH 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 will be published shortly. The American relative sunspot number computed in this way is designated R_A . It is noted that a number of observatories abroad, including the Zürich observatory, are included in R_A . The scale of R_A was referred specifically to that of the Zürich relative sunspot numbers in the standard comparison period; since that time, R_A is influenced by the Zürich observations only in that Zürich proves to be a consistent observer and receives a high statistical weight. In addition, this table lists the daily provisional Zürich sunspot numbers, R_Z .

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In tables 58a and 58b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during September 1948 by the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colorado, for east and west limbs, respectively, at 5° intervals of position angle north and south of the solar equator at the limb computed to the nearest 5° . A correction, P , as listed, has been applied to the position angles of the actual observations which were on astronomical coordinates. 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 59a and 59b give similarly the intensities of the first red (6374A) coronal line; tables 60a and 60b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 58, 59 and 60: a, observation of low weight; -, corona not visible; and x, position angle not included in plate estimates.

ERRATUM

1. CRPL-F47, p. 19, table 34: The f^oF2 column should read (13.0) at 2100.

TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (39.0°N, 77.5°W)

September 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	260	5.6						2.8
01	270	5.2						2.8
02	270	5.1						2.7
03	270	5.0						2.8
04	260	4.5						2.8
05	260	4.1						2.8
06	250	5.4						3.2
07	230	7.2						3.3
08	240	8.1	220		100	3.0		3.3
09	260	8.8	210		100	3.3		3.2
10	270	9.2	200	5.2	100	(3.6)		3.1
11	300	9.1	200	5.1	100	3.7		3.0
12	300	9.1	200		100	(3.8)		2.9
13	300	9.6	210	5.2	100	3.7		2.9
14	300	9.6	220	5.0	100	3.6		2.9
15	290	9.6	220		100	3.4		2.9
16	240	9.3	220		100	3.1		3.0
17	240	9.2	230		110	2.5		3.0
18	240	9.1			110	2.0		3.1
19	230	8.6						3.1
20	230	7.5						3.0
21	240	(6.7)						(2.9)
22	250	(6.2)						(2.9)
23	260	5.9						(2.8)

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 2

Lindau/Harz, Germany (51.6°N, 10.1°E)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	300	5.9						3.4
01	300	5.7						3.3
02	300	5.4						3.4
03	300	4.9						3.4
04	300	4.7						3.2
05	300	4.9						3.4
06	280	6.0	230					3.5
07	270	6.7	220					4.7
08	300	7.4	210	4.6	105	3.0	4.9	
09	300	7.8	205	5.0	105	3.4	5.2	
10	320	8.0	205	5.3	100	3.5	4.8	
11	380	8.1	205	5.3	100	3.6	4.8	
12	380	8.2	210	5.3	100	3.6	4.7	
13	380	8.1	205	5.3	100	3.6	4.7	
14	315	7.9	210	5.4	100	3.6	4.1	
15	310	8.0	205	5.0	100	3.5	4.2	
16	310	7.7	210	4.8	100	3.4	4.4	
17	300	7.9	215		105	3.0	4.3	
18	280	8.2			105	2.6	4.1	
19	260	8.2						4.0
20	280	8.0						4.7
21	270	7.6						3.6
22	280	7.0						3.4
23	300	6.2						3.3

Time: 15.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 12 minutes.

Table 3

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

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	275	3.8				2.4		2.9
01	280	3.8				2.2		2.9
02	300	3.8				2.2		2.9
03	300	3.5				2.0		2.9
04	270	3.5				1.6		3.0
05	265	4.4				1.6		3.0
06	255	5.2	230	3.7	110	2.2		3.0
07	270	6.0	230	4.0	110	2.7		3.0
08	310	6.2	230	4.6	100	3.1	3.4	2.9
09	330	6.8	220	5.0	100	3.4	4.0	2.9
10	340	6.6	220	5.2	100	3.6	4.2	2.9
11	390	6.9	220	5.3	100	3.7	3.9	2.8
12	375	6.8	210	5.4	100	3.9	2.8	
13	410	7.0	220	5.4	110	3.8	3.9	2.8
14	380	7.0	220	5.2	105	3.7	2.8	
15	365	7.2	220	5.1	110	3.5	3.2	2.7
16	350	7.6	230	5.0	110	3.4	2.8	
17	320	7.8	230	4.7	110	3.1	2.8	
18	275	7.8	250	4.0	110	2.6	2.7	2.8
19	260	8.0			120	2.2	2.5	2.8
20	240	7.8				2.4	2.8	
21	250	6.8				1.8	2.8	
22	250	5.8				1.6	2.8	
23	260	5.6				1.7	2.9	

Time: 52.5°W.

Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 4

Ottawa, Canada (45.5°N, 75.8°W)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	320	4.6						2.7
01	320	4.3						2.8
02	320	4.0						2.9
03	330	3.8						2.9
04	320	3.8						2.9
05	300	4.0						2.9
06	280	5.2	260					2.9
07	280	5.6	235	4.4	110	2.6		2.9
08	338	6.2	225	4.7	110	3.1		2.8
09	390	6.5	220	4.9	110	3.4	4.8	2.7
10	410	6.6	210	5.2	110	3.5	4.9	2.6
11	430	6.6	210	5.2	110	3.6		2.6
12	450	6.8	210	5.3	110	3.7		2.5
13	460	7.0	220	5.2	110	3.7		2.5
14	460	6.8	230	5.2	110	3.7		2.5
15	450	6.9	220	5.1	110	3.6		2.5
16	410	6.9	240	4.9	110	3.3		2.6
17	360	7.0	260	4.6	110	3.0		2.6
18	280	7.1	250	4.0	120	2.4		2.7
19	280	7.2						2.7
20	270	7.0						2.7
21	275	6.5						2.8
22	290	5.6						2.7
23	300	4.9						2.7

Time: 75.0°W.

Sweep: 1.7 Mc to 18.0 Mc, manual operation.

Table 5

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

August 1948

Time	$\text{h}^{\circ}\text{F2}$	$\text{f}^{\circ}\text{F2}$	$\text{h}^{\circ}\text{F1}$	$\text{f}^{\circ}\text{F1}$	h°E	f°E	$\text{f}^{\circ}\text{Es}$	F2-NM3000
00	305	5.6				2.6		
01	300	5.2				2.5		
02	300	4.9				2.6		
03	310	4.7				2.5		
04	295	4.4				2.6		
05	290	4.7				2.7		
06	295	5.5				2.9		
07	300	6.0				2.8		
08	305	6.4	250	4.6		2.7		
09	350	6.8	240	4.8		2.6		
10	330	6.7	240	5.0		2.6		
11	475	7.0				2.5		
12	490	7.1				2.4		
13	470	7.0	245	5.1		2.4		
14	380	6.8	245	4.9		2.5		
15	395	6.9	275	4.8		2.6		
16	355	6.7	275	4.8		2.6		
17	340	7.0				2.7		
18	300	6.8				2.7		
19	290	7.0				2.7		
20	290	6.9				2.6		
21	295	6.6				2.5		
22	280	6.1				2.6		
23	295	5.8				2.6		

Time: 75.0°W .

Sweep: 0.8 Mc to 14.0 Mc in 1 minute.

Table 6

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

August 1948

Time	$\text{h}^{\circ}\text{F2}$	$\text{f}^{\circ}\text{F2}$	$\text{h}^{\circ}\text{F1}$	$\text{f}^{\circ}\text{F1}$	h°E	f°E	$\text{f}^{\circ}\text{Es}$	F2-NM3000
00	320	5.1						2.6
01	320	4.9						2.5
02	320	4.9						2.5
03	320	4.9						2.5
04	300	4.7						2.5
05	310	4.3						2.5
06	260	5.5					130	2.1
07	240	6.4	240	4.3	120	2.7		2.7
08	390	7.3	230	4.8	120	3.1	4.0	2.6
09	340	8.0	220	5.2	120	3.4	4.3	2.6
10	360	8.2	220	5.3	120	3.6		2.6
11	380	8.4	220	5.4	120	3.8		2.5
12	360	8.8	220	5.4	120	3.9		2.6
13	360	8.9	220	5.4	120	4.0		2.6
14	360	8.7	220	5.4	120	3.9		2.6
15	360	8.4	230	5.3	120	3.7		2.6
16	340	8.1	240	5.0	120	3.3		2.7
17	280	7.8	240	4.6	120	3.0	3.9	2.7
18	260	7.9			120	2.4	3.1	2.8
19	260	7.6						3.0
20	250	6.8						3.1
21	260	6.2						2.8
22	280	5.6						2.6
23	300	5.3						2.6

Time: 120.0°W .

Sweep: 1.3 Mc to 18.5 Mc in 4 minutes 30 seconds.

Table 7

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

August 1948

Time	$\text{h}^{\circ}\text{F2}$	$\text{f}^{\circ}\text{F2}$	$\text{h}^{\circ}\text{F1}$	$\text{f}^{\circ}\text{F1}$	h°E	f°E	$\text{f}^{\circ}\text{Es}$	F2-NM3000
00	305	5.5				3.2	2.5	
01	300	5.2				2.4	2.5	
02	300	5.2				2.2	2.5	
03	280	5.1				2.2	2.6	
04	290	4.8				2.3	2.6	
05	280	4.4				3.2	2.6	
06	265	5.9			120	2.2	2.8	
07	255	7.2	230	4.2	120	2.7	4.4	2.8
08	325	8.3	220	5.0	110	3.3	5.0	2.7
09	350	9.1	215	5.4	110	3.5	5.1	2.6
10	380	9.2	210	5.6	110	3.8	5.0	2.5
11	375	9.8	220	5.5	120	3.9	5.1	2.5
12	380	10.0	220	5.6	120	4.0	4.6	2.5
13	375	10.0	220	5.7	120	4.0	4.5	2.5
14	370	9.8	220	5.6	120	3.9	4.8	2.5
15	360	9.6	220	5.4	120	3.7	4.6	2.6
16	350	9.2	225	5.1	120	3.4	4.7	2.7
17	290	9.1	240	4.6	110	3.0	4.4	2.7
18	280	8.8			120	2.3	3.8	2.8
19	255	8.2				3.3	2.8	
20	255	7.2				3.2	2.7	
21	260	6.5				3.6	2.7	
22	280	5.7				3.1	2.6	
23	300	5.6				2.4	2.5	

Time: 105.0°W .

Sweep: 0.79 Mc to 14.0 Mc in 2 minutes.

Table 8

Wuchow, China (30.6°N , 114.4°E)

August 1948

Time	$\text{h}^{\circ}\text{F2}$	$\text{f}^{\circ}\text{F2}$	$\text{h}^{\circ}\text{F1}$	$\text{f}^{\circ}\text{F1}$	h°E	f°E	$\text{f}^{\circ}\text{Es}$	F2-NM3000
00	280	8.8						3.8
01	285	8.6						2.8
02	265	7.8						3.0
03	255	7.4						2.9
04	245	6.8						2.9
05	250	6.0						2.8
06	250	7.0						2.8
07	235	8.5					110	2.2
08	232	8.6	220		100	3.1	4.6	3.2
09	248	9.0	220		100	3.5	5.2	3.1
10	298	9.8	222		100	3.8	5.6	2.8
11	320	10.3	228		100	3.9	5.4	2.8
12	325	11.3	230		100	4.0	5.6	2.7
13	320	12.0	230		100	4.0	5.6	2.8
14	330	11.8	230		100	4.0	5.2	2.8
15	320	12.4	228		100	3.7	5.0	2.8
16	308	12.0	232		100	3.5	4.4	2.9
17	285	11.5	235		100	3.2	4.6	3.0
18	260	11.2					110	2.6
19	255	10.5						4.4
20	255	9.4						4.2
21	270	9.2						3.8
22	288	9.3						3.4
23	282	9.0						2.8

Time: 120.0°E .

Sweep: 1.2 Mc to 19.0 Mc in 15 minutes, automatic operation.

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

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-N3000
00	300	6.1						2.8
01	300	5.8						2.9
02	290	5.6						2.9
03	290	5.5						2.9
04	290	5.0						2.9
05	290	5.0						2.9
06	270	6.3			120	2.2		3.1
07	290	7.4	230	4.2	120	3.0		3.1
08	300	8.0	220	(5.0)	110	3.4		3.0
09	310	8.5	210	5.2	110	3.7		3.0
10	330	8.9	210	(5.7)	120	3.8		3.9
11	340	9.5			110	3.8		2.8
12	350	9.6			110	3.8		2.8
13	340	9.6			110	(3.8)		2.8
14	340	9.5		(5.4)	120	3.7		2.9
15	330	9.4	220	(5.4)	120	3.7		2.9
16	320	8.8	220	(5.2)	120	3.5		2.9
17	300	8.6	230	(4.7)	120	3.1		3.0
18	280	8.5			120	2.6	3.6	3.0
19	250	8.4					2.7	3.1
20	240	7.4					2.4	3.0
21	260	6.8						3.0
22	280	6.2						2.9
23	295	6.1						2.8

Time: 90.0°W.

Sweep: 2.12 Mc to 15.3 Mc in 5 minutes, automatic operation.

Table 11

Maui, Hawaii (20.8°N, 156.5°W)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-N3000
00	240	8.4						3.0
01	250	7.7						3.0
02	240	7.3						2.9
03	225	7.6						3.2
04	240	6.4						3.2
05	230	5.9						3.1
06	240	5.7						3.1
07	220	7.0			110	2.6		3.4
08	200	8.0			110	3.0	3.9	3.3
09	260	9.2	200	5.9	110	3.4	4.5	2.9
10	300	10.4	200	5.8	100	3.7	5.0	2.7
11	310	11.4	200	5.7	110	4.0	4.7	2.8
12	310	12.0	200	6.0	110	4.0	4.8	2.9
13	300	12.6	200	5.7	110	4.1	4.9	2.9
14	300	12.8	200	5.6	100	4.0	5.0	3.0
15	290	13.2	200	5.4	100	3.8	4.8	3.0
16	270	12.6	200		100	3.6	4.8	3.1
17	250	12.4	200		100	3.1	4.8	3.2
18	220	12.0			100	2.5	4.4	3.2
19	210	11.2					3.4	3.2
20	220	10.4					3.3	3.1
21	220	10.1						3.0
22	240	9.8						3.0
23	250	9.0						3.1

Time: 150.0°W.

Sweep: 2.2 Mc to 16.0 Mc in 1 minute.

Table 9

Okinawa I. (26.3°N, 127.7°E)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-N3000
00								3.8
01								2.8
02								3.5
03								3.0
04								3.2
05								2.8
06								3.6
07								3.4
08								3.0
09								3.2
10								3.0
11								2.7
12								5.2
13								2.8
14								5.0
15								2.9
16								5.0
17								2.8
18								4.9
19								2.8
20								4.1
21								2.8
22								3.6
23								(2.7)

Time: 135.0°E.

Sweep: 2.0 Mc to 18.0 Mc in 15 minutes, manual operation.

Table 12

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

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-N3000
00								2.7
01								2.8
02								2.9
03								2.9
04								2.9
05								3.0
06								3.1
07		235						3.1
08		240						3.0
09		280						2.8
10		335						2.6
11		350	10.1					2.5
12		350	11.0					2.6
13		350	11.2					2.6
14		350	11.2					2.6
15		340	11.0					2.6
16		330	11.1					2.7
17		300	10.3					2.7
18		270	10.0					2.8
19		270	9.6					2.7
20								2.7
21								2.7
22								2.7
23								2.7

Time: 60.0°W.

Sweep: 2.8 Mc to 13.0 Mc in 9 minutes; supplemented by manual operation.

Table 13

Huam I. (13.6°N. 144.9°E)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	fEs	$F2-N^{\circ}2000$
00	310	(10.7)				2.3	(2.7)	
01	(260)							
02	(230)							
03	(260)							
04								
05	(220)							
06	(245)	(5.9)						
07	245	8.4						
08	230	9.6						
09	220	10.3						
10	205	10.9						
11	220	11.4	(220)					
12	210	12.0	210	6.1				
13	215	12.6		6.2				
14	385	13.1	205	6.2				
15	390	13.7	220	6.1				
16	380	13.6	225	6.1				
17	250	14.0	240					
18	260	13.6						
19	310	12.8						
20	375	(11.0)						
21	335	(10.7)						
22	315							
23	315	(10.7)						

Time: 150.0°E.

Sweep: 1.25 Mc to 19.0 Mc in 12 minutes, manual operation.

Table 15

Huancayo, Peru (12.0°S. 75.3°W)

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	fEs	$F2-N^{\circ}2000$
00	250	8.1						2.8
01	240	7.8						3.0
02	250	7.0						3.0
03	250	6.0						2.9
04	270	5.0						2.9
05	270	4.5						2.9
06	300	5.6						2.9
07	270	8.6						2.9
08	250	10.4						2.9
09	245	11.2	240	5.5				2.9
10	235	11.2	230	5.5				2.9
11	330	10.9	220	5.4				2.9
12	230	10.9	220	5.4				2.9
13	230	10.7	220	5.4				2.9
14	220	10.4						2.9
15	230	10.0						2.9
16	240	9.7						2.9
17	280	9.6						2.9
18	320	9.6						2.9
19	380	8.7						2.9
20	350	8.8						2.9
21	300	8.5						2.9
22	260	8.4						2.9
23	250	7.9						2.9

Time: 75.0°W.

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

Table 14

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

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	fEs	$F2-N^{\circ}2000$
00	280	9.8						2.8
01	260	9.0						2.9
02	270	8.4						2.8
03	260	8.0						2.8
04	250	7.4						2.9
05	250	6.8						2.9
06	260	7.0						3.0
07	250	7.8						3.2
08	250	8.4	230	4.6	120	3.2	3.8	3.0
09	280	9.2	220	5.1	120	3.6	4.4	2.8
10	330	10.0	220	5.5	120	3.8	4.4	2.6
11	360	11.0	220	5.9	120	4.1	4.6	2.6
12	360	11.8	220	5.8	120	4.1	4.8	2.6
13	350	12.2	220	5.9	120	4.1	4.7	2.7
14	360	12.3	220	5.9	120	4.1	5.0	2.7
15	340	12.0	230	5.5	120	3.8	4.9	2.7
16	320	11.2	240	5.2	120	3.4	4.8	2.7
17	300	11.0	240	5.0	120	2.9	4.7	2.6
18	270	10.9						2.7
19	280	10.3						2.6
20	300	10.4						2.6
21	290	10.6						2.7
22	280	10.0						2.7
23	280	9.8						2.7

Time: 60.0°W.

Sweep: 1.2 Mc to 18.0 Mc in 18 minutes, manual operation.

Table 16

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

August 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	fEs	$F2-N^{\circ}2000$
00	(265)	3.3						2.9
01	(285)	3.2						2.9
02	(270)	3.3						2.9
03	(250)	3.3						2.9
04	(270)	3.1						2.8
05	(270)	3.1						2.9
06	(260)	3.5						2.9
07	230	6.9						3.3
08	230	0.1	230		110	2.1		3.3
09	250	10.2	220		110	3.4		3.1
10	260	11.3	220	5.0	110	3.6		3.1
11	260	11.5	210	5.0	110	3.8		3.0
12	270	11.4	210	5.0	110	3.9		2.9
13	270	11.3	210	5.0	110	3.8		2.9
14	290	11.3	210	4.7	110	3.6	3.7	2.8
15	270	11.1	210	4.5	110	3.4	3.6	2.9
16	250	10.9	230		110	3.1		2.9
17	240	10.4	230		100	2.5		2.9
18	230	10.1			100	(1.7)		3.0
19	220	8.5					1.8	3.1
20	220	6.9						3.2
21	230	5.1						3.2
22	(250)	4.2						3.0
23	(250)	3.6						3.0

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 17

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

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	280	6.6						2.7
01	280	5.7						2.7
02	280	5.2						2.8
03	280	4.6						2.8
04	270	4.8				1.7		2.9
05	260	5.2	250	3.3	120	2.2	2.3	2.9
06	270	5.8	230	4.0	110	2.6	2.7	2.9
07	305	6.0	225	4.6	110	3.0	4.1	2.9
08	330	6.3	220	4.9	100	3.4	4.4	2.9
09	390	6.6	210	5.1	100	3.6	4.4	2.8
10	385	6.6	210	5.3	100	3.7	4.4	2.8
11	380	6.6	210	5.4	100	3.9	4.4	2.7
12	410	6.9	210	5.5	100	4.0	4.5	2.8
13	450	6.6	210	5.5	100	3.9	4.4	2.7
14	420	6.8	200	5.4	100	3.9	4.1	2.7
15	410	7.0	210	5.4	100	3.7	3.8	2.7
16	385	7.0	210	5.2	100	3.6	3.5	2.7
17	360	7.1	230	4.9	110	3.3	3.8	2.7
18	310	7.4	230	4.4	110	2.8	4.2	2.8
19	270	7.5	235	3.4	110	2.4	3.7	2.8
20	260	7.7			105	2.0	2.2	2.8
21	250	7.8					2.2	2.7
22	270	7.5					1.4	2.7
23	270	7.2					1.5	2.7

Time: 52.5°W.

Sweep: 1.2 Mc to 20.0 Mc, manual operation.

Table 18

Ottawa, Canada (45.5°N, 75.8°W)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00					310	6.0		2.6
01					300	5.4		2.7
02					320	5.1		2.7
03					315	4.7		2.7
04					300	4.4		2.7
05					280	4.9		2.7
06					270	5.6	255	4.1
07					370	6.0	240	4.6
08					360	6.6	230	4.9
09					430	6.6	220	5.2
10					465	7.2	220	5.4
11					480	6.8	210	5.3
12					466	6.8	220	5.4
13					470	6.9	210	5.3
14					450	7.0	220	5.3
15					445	7.1	230	5.3
16					420	7.0	240	6.1
17					370	7.4	240	4.9
18					326	7.3	250	4.3
19					280	7.4		130
20					280	7.6		
21					280	7.6		
22					290	7.0		
23					300	6.6		

Time: 75.0°W.

Sweep: 1.7 Mc to 18.0 Mc, manual operation.

Table 19

Wakkanai, Japan (45.4°N, 141.7°E)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00	280	8.1				3.3		2.7
01	280	8.0				3.2		2.7
02	280	7.4				3.3		2.7
03	280	7.2				3.0		2.7
04	290	7.2				3.1		2.7
05	280	7.9	220		100	2.4	3.5	2.8
06	285	8.5	210	4.2	100	2.9	3.8	2.8
07	300	8.6	210	4.6	100	3.2	5.0	2.9
08	300	8.1			100	3.6	6.0	2.9
09	360	7.8	200	5.2		6.7		2.8
10	385	7.6	200	5.3		6.6		2.7
11	380	8.0	200	5.6		6.5		2.7
12	390	8.0	200	5.6		5.8		2.7
13	390	7.9	200	5.5	100	5.8		2.8
14	380	7.7	200	5.4		5.5		2.8
15	365	7.6	200	5.1		5.4		2.8
16	320	7.6	200	4.9	100	3.5	5.3	2.9
17	310	7.5	210	4.6	100	3.3	4.8	2.9
18	300	7.9			100	2.7	5.6	2.9
19	280	7.9				5.3		2.8
20	270	7.9				4.4		2.8
21	270	8.2				5.0		2.7
22	280	8.2				4.4		2.7
23	280	8.1				3.4		2.7

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc, manual operation.

Table 20

Fukaura, Japan (40.6°N, 139.9°E)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	F2-M3000
00		310	8.3					4.0
01		300	8.0					2.6
02		295	7.9					3.8
03		300	7.4					2.6
04		300	7.8					3.2
05		285	8.1	250		120	2.2	2.7
06		280	8.8	240		110	2.7	2.8
07		300	9.3			110	3.1	2.9
08		320	8.9			110	3.6	2.8
09		370	8.5			110	6.0	2.7
10		390	8.4			110	6.4	2.6
11		(395)	8.4			110	7.6	2.6
12		395	8.9					7.5
13		380	8.6					6.8
14		385	8.6					6.2
15		370	8.2					5.8
16		365	8.0			110	3.6	2.7
17		340	7.9			110	3.2	2.8
18		300	8.2	245		110	2.5	4.8
19		290	8.3					5.6
20		300	7.8					5.8
21		300	8.0					5.6
22		310	8.2					4.0
23		310	8.3					4.7

Time: 135.0°E.

Sweep: 1.0 Mc to 17.0 Mc, manual operation.

Table 21Pingding, China (39.9°N , 116.4°E)

July 1948

Time	$h^{\circ}\text{F2}$	$f^{\circ}\text{F2}$	$h^{\circ}\text{F1}$	$f^{\circ}\text{F1}$	$h^{\circ}\text{E}$	$f^{\circ}\text{E}$	$f^{\circ}\text{Es}$	$F2-\text{M}3000$
00								
01								
02	8.0							
03	8.2							
04	8.2							
05	8.4							
06	8.8							
07	7.6							
08								
09								
10	11.3							
11	11.6							
12	11.5							
13	11.2							
14	11.1							
15	11.3							
16								
17								
18	10.6							
19	10.0							
20	9.4							
21	8.9							
22	8.5							
23	8.4							

Time: 120.0°E .

Sweep: 2.3 Mc to 14.5 Mc in 15 minutes, manual operation.

Table 22Shibata, Japan (37.9°N , 139.3°E)

July 1948

Time	$h^{\circ}\text{F2}$	$f^{\circ}\text{F2}$	$h^{\circ}\text{F1}$	$f^{\circ}\text{F1}$	$h^{\circ}\text{E}$	$f^{\circ}\text{E}$	$f^{\circ}\text{Es}$	$F2-\text{M}3000$
00	280	8.4						3.5 2.8
01	270	8.3						3.8 2.8
02	270	7.9						3.2 2.8
03	270	7.7						2.9 2.8
04	280	7.5	240					3.1 2.8
05	250	8.0	235		110	2.0	3.0	2.9
06	240	9.2	215		100	2.8	3.6	3.0
07	270	9.4	220		100	3.3	4.6	3.0
08	295	9.0	215	5.0	100	3.6	5.7	2.9
09	300	9.0	210	5.4	100	3.7	6.3	2.8
10	345	9.0	200	5.6	100	3.9	8.0	2.7
11	380	9.1	190	5.8	100	4.0	8.2	2.7
12	350	9.7	200	5.6	100	4.1	8.0	2.8
13	330	9.8	200	5.7	100		7.4	2.8
14	330	9.6	200	5.6	100	4.0	7.0	2.9
15	330	9.0	205	5.5	100	3.9	6.7	2.9
16	320	8.7	200	5.2	100	3.7	5.4	2.9
17	300	8.4	210		100	3.2	6.5	3.0
18	270	8.7	220		100	2.7	5.1	3.0
19	250	8.7					5.2	3.0
20	260	8.1					4.5	2.8
21	280	8.4					4.8	2.8
22	280	8.2					4.4	2.7
23	290	8.7					3.7	2.7

Time: 135.0°E .

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

Table 23Tokyo, Japan (35.7°N , 139.5°E)

July 1948

Time	$h^{\circ}\text{F2}$	$f^{\circ}\text{F2}$	$h^{\circ}\text{F1}$	$f^{\circ}\text{F1}$	$h^{\circ}\text{E}$	$f^{\circ}\text{E}$	$f^{\circ}\text{Es}$	$F2-\text{M}3000$
00	320	8.6			4.0	2.6		
01	310	8.2			3.5	2.6		
02	300	7.9			3.4	2.6		
03	310	7.6			3.1	2.6		
04	310	7.4	E		3.0	2.7		
05	290	8.0	270		2.0	3.4	2.8	
06	280	8.7	250	100	2.7	3.8	2.8	
07	290	9.4	240	100	3.3	5.2	2.8	
08	310	9.8	240	110	3.6	6.0	2.6	
09	360	8.6	230	100	3.8	6.2	2.6	
10	395	8.8	230	110	4.0	7.0	2.6	
11	410	9.3		110	4.3	7.6	2.5	
12	420	9.6		100	(4.2)	7.2	2.5	
13	400	10.4	6.0	100	4.0	7.0	2.6	
14	390	9.9		105		6.8	2.6	
15	370	9.2	235	100		5.6	2.6	
16	340	8.8	240	5.3	100	3.6	5.4	2.7
17	320	8.8	235	5.0	100	3.2	5.1	2.7
18	305	8.6	260		110	2.6	5.4	2.8
19	290	8.3				4.5	2.8	
20	290	7.9				5.6	2.6	
21	330	8.0				5.7	2.5	
22	330	8.1				4.6	2.5	
23	330	8.3				5.4	2.5	

Time: 135.0°E .

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

Table 24Yamakawa, Japan (31.2°N , 130.6°E)

July 1948

Time	$h^{\circ}\text{F2}$	$f^{\circ}\text{F2}$	$h^{\circ}\text{F1}$	$f^{\circ}\text{F1}$	$h^{\circ}\text{E}$	$f^{\circ}\text{E}$	$f^{\circ}\text{Es}$	$F2-\text{M}3000$
00	300	9.3						4.2 2.6
01	300	9.0						4.6 2.7
02	290	8.9						4.2 2.7
03	290	8.3						3.4 2.6
04	300	7.9						3.8 2.6
05	290	7.8						3.4 2.8
06	270	8.4	240				(2.0) 3.4	2.9
07	265	9.1	230			110	2.8	3.0
08	280	8.6	240			110	3.4	5.6 2.9
09	340	8.5	230			110	3.8	5.3 2.7
10	375	8.7	240			110	6.2	2.6
11	410	9.3	220		5.4	(4.2) 6.2	2.4	
12	400	10.4	210		5.6		6.6	2.5
13	390	10.8	235		5.8	110	5.9	2.6
14	370	10.6	230		5.6		5.8	2.6
15	285	10.6	230		5.4	(4.0) 5.3	2.6	
16	360	10.3	230		5.2	110	3.8	5.2 2.7
17	370	9.9	230		4.8	110	3.4	5.3 2.7
18	300	9.8	230			110	2.8	5.0 2.8
19	285	9.4	240				2.0 5.5	2.8
20	285	8.6						4.2 2.7
21	320	8.7						4.0 2.5
22	320	8.8						3.7 2.6
23	(310)	9.0						4.9 2.5

Time: 135.0°E .

Sweep: 0.6 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 25

Chungking, China (29.4°N, 106.8°E)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	F_{Es}	$F2-N3000$
00	320	9.6				4.0	2.5	
01	310	9.6				3.8	2.6	
02	290	9.0				4.0	2.7	
03	285	8.0				4.2	2.6	
04	290	7.3				4.0	2.6	
05	285	7.4				3.2	2.6	
06	260	8.2	260		110	3.5	4.7	2.8
07	280	9.0	250		110	3.1	5.6	2.9
08	280	9.0	240				7.2	2.6
09	340	9.1	240	5.8	100	3.8	8.0	2.5
10	390	9.6	250	6.4	100	4.0	8.3	2.4
11	400	10.6	260	6.4	105	4.3	8.2	2.4
12	400	11.7	250	6.2	115	4.5	8.0	2.4
13	400	12.4	240	6.0	110	4.4	6.4	2.4
14	390	12.5	240	6.0	120	4.3	5.9	2.5
15	360	13.0	230	5.6	120	4.0	4.8	2.6
16	340	12.5	260	5.5	110	3.6	5.2	2.6
17	320	12.5	240	5.0	100	3.2	5.7	2.6
18	300	12.0	260				4.9	2.6
19	280	10.5					4.5	2.6
20	300	9.6					4.2	2.5
21	310	9.4					3.0	2.5
22	320	9.8					4.6	2.5
23	300	9.8					5.0	2.5

Time: 105.0°E.

Sweep: 1.7 Mc to 20.0 Mc in 15 minutes, manual operation.

Table 26

Okinawa I. (26.3°N, 127.7°E)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	F_{Es}	$F2-N3000$
00						9.4		4.4
01						9.5		3.9
02						8.8		3.2
03						8.4		2.9
04						7.9		2.8
05						7.4		2.9
06						7.9		3.0
07						8.6		3.1
08						8.2		3.1
09						8.4		2.8
10						8.7	(6.0)	2.6
11						10.0	6.0	2.5
12						10.8	6.0	2.6
13						11.2	5.8	2.7
14						11.2	6.0	2.7
15						11.4	5.8	2.6
16						10.8	6.1	2.7
17						11.2		5.8
18						11.2		2.8
19						10.2		2.9
20						9.4		2.7
21						9.2		2.5
22						9.0		2.6
23						9.3		2.7

Time: 135.0°E.

Sweep: 2.0 Mc to 18.0 Mc in 15 minutes, manual operation.

Table 27

Leyte, Philippine Is. (11.0°N, 125.0°E)

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	F_{Es}	$F2-N3000$
00		8.8				2.8	2.7	
01		8.4				2.0	2.8	
02		8.4				2.9		
03		7.6				3.0		
04		6.4				3.1		
05		5.6				1.9	3.1	
06		7.9		2.5		3.4	3.0	
07		9.3		3.6		4.6	2.8	
08		10.2		3.7		5.0	2.5	
09		10.6		4.2		5.1	2.3	
10		10.6		4.6		5.2	2.2	
11		10.6		4.7		5.5	2.2	
12		10.6		4.8		5.5	2.2	
13		10.6		4.6		5.7	2.2	
14		11.2		4.4		5.3	2.1	
15		11.4		4.0		5.0	2.2	
16		11.5		3.7		5.0	2.3	
17		11.5		2.9		4.5	2.3	
18		11.1				3.6	2.3	
19		10.3				3.2	2.2	
20		9.0				2.0	2.2	
21		8.8				2.0	2.2	
22		9.0				2.0	2.4	
23		8.8				2.8	2.6	

Time: 120.0°E.

Sweep: 1.6 Mc to 16.0 Mc, manual operation.

Table 28

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

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	F_{Es}	$F2-N3000$
00		(290)				2.9		2.8
01		285				3.0		2.8
02		275				3.0		2.9
03		(260)				3.1		3.0
04		(250)				2.9		2.9
05		265				2.7		1.9
06		250				2.8		2.3
07		230				5.8		3.2
08		230				8.3		3.3
09		250			230	(3.8)	110	2.7
10		250			220	4.8	110	3.5
11		260			210		110	3.6
12		270			210	5.1	110	3.8
13		280			210	5.2	110	3.7
14		275			220	(5.0)	110	3.6
15		270			230	(5.0)	100	3.4
16		250			230	4.9	100	3.0
17		240				10.5		2.6
18		220				8.5		2.4
19		210				6.1		3.1
20		230				5.0		1.6
21		240				3.8		3.2
22		(250)				3.0		1.6
23		(250)				2.9		3.0

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 29

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

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-N^{\circ}000$
00	268	4.1				3.1	2.8	
01	265	4.1				3.1	2.8	
02	260	4.2				3.1	2.8	
03	258	4.0				3.1	2.8	
04	255	4.0				3.1	2.8	
05	248	3.8				3.1	2.8	
06	240	3.5				3.2	2.9	
07	240	5.5			1.8	3.1	3.2	
08	240	9.2				2.5	3.2	3.3
09	242	9.5				3.0	3.2	
10	255	10.3	230	4.9		3.2	3.6	3.2
11	250	10.4	235	4.9		3.4	3.8	3.0
12	250	10.5	230	4.8		3.6	4.0	3.0
13	270	10.5	232	4.8		3.3	3.8	2.9
14	268	10.5	230	4.8		3.3	4.4	2.9
15	250	10.4	230			3.2	4.0	2.9
16	245	10.0				2.8	3.2	2.9
17	240	9.7				2.0	3.2	
18	220	8.8					3.2	
19	215	6.7					3.2	
20	230	5.6					3.2	
21	242	4.8					3.2	
22	250	4.4					3.2	
23	260	4.2					3.0	

Time: 120.0° E.

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

Table 30

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

July 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-N^{\circ}000$
00		310			4.6			3.2
01		300			4.7			3.4
02		300			4.5			4.3
03		290			4.3			3.5
04		270			4.1			2.8
05		260			3.8			3.3
06		260			3.2			3.0
07		260			3.9			2.7
08		230			7.3		1.7	3.0
09		230			9.5		2.5	4.1
10		240			10.3		2.8	4.4
11		250			11.1	230	4.8	3.1
12		250			11.4	230	3.2	4.8
13		250			11.4	240	3.1	4.8
14		250			10.7	240	2.8	4.0
15		240			10.2		2.5	4.4
16		240			9.8		2.1	4.4
17		240			8.7		(1.3)	3.4
18		250			7.6			3.0
19		250			6.6			2.8
20		260			5.7			2.9
21		275			5.2			2.8
22		290			4.8			2.8
23		300			4.7			3.1

Time: 172.5° E.

Sweep: 1.0 Mc to 13.0 Mc.

Table 31*

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

June 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-N^{\circ}000$
00	305	7.3				2.4		
01	310	(7.1)				2.4		
02	310	6.8				2.3#		
03	315	6.7				2.5		
04	310	7.0	290	3.2		2.4		
05	300	7.0	245	4.0	130	2.4	2.8	2.6
06	300	7.3	235	4.6	110	2.6	4.0	2.6
07	340	7.2	225	4.9	105	3.2	4.4	2.6
08	330	7.5	220	5.1	100	3.4	4.5	2.6
09	345	7.4	220	5.4	100	3.6	4.2	2.6
10	365	7.6	220	5.5	100	3.7	4.5	2.7
11	390	7.2	220	5.6	105	3.8	4.5	2.7#
12	390	(7.5)	220	5.7	100	3.8	4.2	2.6
13	410	7.3	220	5.6	100	3.8	4.3	2.4#
14	395	7.2	215	5.6	105	3.8	4.4	2.5
15	370	7.2	215	5.5	105	3.7	4.4	2.5
16	350	(7.4)	220	5.4	105	3.6	4.2	2.6
17	300	7.7	230	5.2	105	3.3	4.1	2.7
18	260	7.8	245	4.8	110	3.0	4.2	2.7
19	260	7.9			125	2.5	3.6	2.7
20	265	7.8				2.2#	3.1	2.8
21	275	(7.8)					2.6#	
22	285	(8.1)					2.6#	
23	310	7.8					2.5	

Time: Local.

Sweep: 2.2 Mc to 16.0 Mc in 1 minute.

*Average values except for $f^{\circ}F2$ and $f^{\circ}Es$, which are median values.

#One or two observations only.

Table 32

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

June 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}Fl$	$f^{\circ}Fl$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-N^{\circ}000$
00		300			8.0			3.4
01		300			7.6			3.3
02		300			7.1			3.4
03		300			6.9			3.3
04		300			6.9			3.7
05		290			7.4			4.7
06		300			8.2	220	4.6	110
07		305			8.4	220	5.0	105
08		320			8.7	220	5.3	105
09		360			8.8	215	5.5	100
10		390			8.5	210	5.8	100
11		400			8.5	215	5.8	100
12		400			8.5	200	5.7	100
13		400			8.0	210	5.9	100
14		410			8.1	215	5.8	100
15		405			7.9	220	5.7	100
16		400			7.7	220	5.4	100
17		390			7.8	230	5.0	105
18		300			8.1	220		105
19		280			8.2			110
20		300			8.2			
21		290			8.2			
22		290			8.1			
23		300			8.0			

Time: 15.0° E.

Sweep: 1.0 Mc to 16.0 Mc in 12 minutes.

Table 33*

Slough, England (51.5°N , 0.6°W)

June 1948

Time	h'F2	f°F2	h'Fl	f°F1	h'E	f°E	fEs	F2-M3000
00	291	8.2				2.6	2.5	
01	294	7.6				2.6	2.5	
02	296	7.3				2.9	2.4	
03	309	7.0			158	1.3	2.6	2.4
04	309	7.0	295	3.5	124	1.7	3.8	2.5
05	320	7.6	252	4.3	116	2.4	4.3	2.5
06	334	7.9	239	4.7	113	2.9	4.8	2.6
07	332	8.2	232	5.2	110	3.2	6.6	2.6
08	352	8.3	229	5.5	109	3.5	7.0	2.6
09	360	8.4	227	5.8	109	3.7	6.8	2.6
10	373	8.6	227	5.8	110	3.9	7.2	2.5
11	374	8.5	223	5.8	109	3.9	6.9	2.5
12	389	8.2	219	5.9	108	4.0	8.7	2.5
13	394	8.1	220	5.8	109	3.9	7.0	2.6
14	398	8.0	220	5.8	109	3.9	6.9	2.6
15	380	8.0	232	5.7	110	3.8	5.1	2.6
16	369	8.0	239	5.6	110	3.6	5.0	2.6
17	345	8.1	236	5.4	110	3.3	4.9	2.6
18	289	8.4	245	4.7	119	2.9		2.7
19	270	8.5	245	4.0	118	2.3	4.3	2.7
20	268	8.6		140	1.8	3.7		2.7
21	270	8.4				3.1		2.6
22	281	8.5				3.5		2.5
23	285	8.2				2.6		2.5

Time: Local.

Sweep: 0.5 Mc to 16.5 Mc in 5 minutes.

*Average values except for f°F2 and fEs, which are median values.

Table 34

Lanchow, China (36.1°N , 103.8°E)

June 1948

Time	h'F2	f°F2	h'Fl	f°F1	h'E	f°E	fEs	F2-M3000
00		400						4.4
01		400						4.0
02		400						4.0
03		400						4.0
04		400						2.2
05		400						2.2
06		350						2.2
07	360	10.0	320			150	3.4	2.3
08	400	11.6	310					2.2
09	440	11.0	320					2.2
10	480	11.5	320					2.2
11	495	11.5	320					2.2
12	520	11.8	330					2.1
13	500	12.1	320					2.1
14	480	12.0	320					2.2
15	480	11.7	290					2.2
16	480	11.6	280			140	3.8	2.2
17	440	11.5	310			150	3.6	2.2
18	400	11.0	320			150	3.0	2.3
19	360	10.5						2.2
20	400	10.0						2.2
21	(400)	(11.0)						(2.2)
22	400	10.0						2.2
23	400	9.6						2.1

Time: 105.0°E .

Sweep: 2.4 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 35

Nanking, China (32.1°N , 119.0°E)

June 1948

Time	h'F2	f°F2	h'Fl	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04	300	8.0				3.7	2.6	
05	280	7.9				2.9	2.6	
06	260	8.4		140	2.9	3.7	2.8	
07	300	9.1	230			5.5	2.7	
08	320	9.4	260			6.4	2.6	
09	360	9.8	240			8.6	2.5	
10	360	10.2	240	6.2		8.8	2.4	
11	400	10.4	260	6.3		7.5	2.5	
12	400	10.8	240	6.2		7.0	2.5	
13	420	11.2	255	6.0		6.2	2.5	
14	400	11.2	240	6.0		6.4	2.5	
15	400	11.4	240	6.0		6.2	2.5	
16	380	11.0	220	5.6		5.6	2.6	
17	360	11.0	240	5.6	4.0	5.0	2.6	
18	320	10.5				5.8	2.6	
19	300	10.0				5.3	2.6	
20	300	9.4				5.8	2.5	
21	320	9.8				4.4	2.4	
22								
23								

Time: 120.0°E .

Sweep: 1.7 Mc to 15.0 Mc in 15 minutes, manual operation.

Table 36

Rarotonga I. (21.3°S , 159.8°W)

June 1948

Time	h'F2	f°F2	h'Fl	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06								
07								
08	250	11.6				115	2.6	3.1
09	250	13.0				110	3.2	3.1
10	250	13.1				105	3.5	4.2
11	250	12.1	250	(7.2)	105	3.7	5.0	3.0
12	250	11.8	225	6.8	105	3.8		2.9
13	300	12.1	240	(6.7)	105	3.8	4.7	2.8
14	300	11.9	250	6.0	110	3.6	4.0	2.7
15	250	11.8	250	6.0	110	3.4	4.2	2.7
16	250	11.8	250	5.4	110	3.1	3.6	2.8
17	260	11.6				120	2.5	3.7
18								
19								
20								
21								
22								
23								

Time: 157.5°W .

Sweep: 2.0 Mc to 16.0 Mc, manual operation.

Table 37

Falkland Is. (51.7°S, 57.8°W)

May 1948

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-M3000$
00	385	3.8				2.3		
01	383	3.9				2.4		
02	385	4.0				2.3		
03	399	4.1				2.4		
04	379	3.9				2.4		
05	362	3.8				2.5		
06	337	3.3				2.6		
07	267	5.8				2.4		
08	237	9.3				2.6		
09	235	11.2				3.1		
10	236	11.8				3.2		
11	231	12.9				3.2		
12	238	12.3				3.3#		
13	240	11.3				3.1#		
14	239	10.6				140#		
15	241	10.4				2.8#		
16	235	8.3				120#		
17	248	7.0				2.5		
18	247	5.8						
19	264	4.7						
20	302	3.8						
21	335	3.8						
22	364	4.0						
23	381	3.9						

Time: Local.

Sweep: 2.2 Mc to 16.0 Mc in 1 minute.

*Average values except for $f^{\circ}F2$, which are median values.

#One or two observations only.

Table 38

Bagnoux, France (48.8°N, 2.3°E)

December 1947

Time	$h^{\circ}F2$	$f^{\circ}F2$	$h^{\circ}F1$	$f^{\circ}F1$	$h^{\circ}E$	$f^{\circ}E$	$f^{\circ}Es$	$F2-M3000$
00								
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								

Time: 0.0°.

Sweep: 4.0 Mc to 11.2 Mc in 12 minutes.

TABLE 39
IONOSPHERIC DATA

National Bureau Of Standards

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

Calculated by: K.L.B. A.G.J., J.J.S.

hf2 km September, 1948
 (Characteristic) (Mean) (Month)
 Observed at Washington, D.C.
 Lat 39.0° N, Long 77.5° W

75°W Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	270	280	280	250	250	300	300	300	370	400	400	400	600	600	600	600	550	550	480	480	350	350	250	250		
2	360	K	350	K	300	K	270	K	270	K	320	K	350	K	390	K	340	K	C	K	C	K	C	K	K	
3	C	K	C	K	C	K	290	K	(320)	F	260	220	260	340	330	300	320	310	290	280	260	230	240	230	240	
4	300	300	300	280	300	300	230	230	270	300	300	300	300	300	300	300	280	280	260	260	240	240	230	230		
5	250	250	260	260	[270]	A	280	260	230	240	250	250	240	260	290	300	300	290	290	270	270	260	260	250	250	
6	250	250	250	260	260	250	240	240	240	240	250	250	250	250	250	280	300	[29]	C	280	280	280	280	280	280	
7	240	240	240	290	160	260	220	220	220	220	220	210	210	250	250	270	270	(30)	C	290	290	290	290	290	290	
8	270	270	260	(300)	C	270	260	260	240	(250)	300	290	290	290	290	290	290	290	290	290	290	290	290	290		
9	240	250	270	270	250	260	260	250	230	280	280	290	290	300	300	300	300	300	300	280	280	280	280	280	280	
10	260	280	270	270	270	250	250	240	230	240	240	240	240	270	270	270	270	270	270	280	280	280	280	280	280	
11	250	280	290	280	270	260	260	260	260	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	
12	310	280	280	250	240	250	240	230	220	240	260	260	280	320	320	320	320	320	320	320	320	320	320	320	320	
13	270	280	280	300	300	300	300	300	300	260	250	270	270	290	320	320	320	320	320	320	320	320	320	320	320	
14	270	330	310	270	250	250	250	250	230	260	270	270	270	280	310	320	320	320	320	320	320	320	320	320	320	
15	280	290	260	260	250	250	260	260	270	270	270	270	300	330	350	330	330	330	330	340	340	340	340	340	340	
16	300	280	300	270	300	290	290	290	290	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	
17	260	260	260	270	300	[290]	A	280	240	230	270	270	290	290	320	320	320	320	320	320	320	320	320	320	320	320
18	[260]	C	270	270	260	250	250	240	230	230	270	270	280	330	340	320	320	320	320	320	320	320	320	320	320	320
19	260	260	260	270	270	260	260	260	260	260	270	270	270	270	270	300	300	300	300	300	300	300	300	300	300	
20	270	270	270	260	260	250	250	250	250	260	270	270	270	270	270	300	300	300	300	300	300	300	300	300	300	
21	250	250	270	270	260	250	260	260	260	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	
22	250	250	240	240	250	250	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	
23	270	250	250	260	270	270	270	270	270	270	270	270	270	270	270	(240)	250	250	250	250	250	250	250	250	250	
24	290	270	270	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	
25	250	250	260	260	260	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	
26	270	280	280	250	300	F	260	230	220	220	250	260	260	280	280	260	260	260	260	260	260	260	260	260	260	
27	250	250	280	A	A	A	A	A	A	A	230	220	240	240	260	260	260	260	260	260	260	260	260	260	260	
28	250	250	250	250	250	250	250	250	250	250	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	
29	300	270	280	280	280	290	290	290	290	290	310	K	310	K	300	K	290	290	290	290	290	290	290	290	290	
30	250	250	250	300	300	[280]	A	250	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	
31																										
Median	270	270	270	260	260	250	250	240	240	240	260	270	300	300	300	300	290	290	290	290	290	290	290	290	290	
Count	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	

Sweep 10 Mc to 25 Q Mc in 0.25 min

Manual □ Automatic ■

U. S. GOVERNMENT PRINTING OFFICE 1946 O-102519

TABLE 40
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

f·F2 Mc September, 1948
(Characteristic) (Mn¹) Observed at Washington, D.C.

Lat 39°0'N, Long 77.5°W

National Bureau Of Standards
(Institution)
J.W. J.M.C.

Calculated by: K.L.B. A.G.J.

Day	75°W Mean Time												75°W Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	(6.1) ^J	5.4 ^J	5.2 ^J	5.0 ^J	4.2 ^K	3.1 ^K	4.1 ^K	4.8 ^K	5.5 ^K	4.8 ^K	5.2 ^K	<4.9 ^K	5.3 ^K	<4.9 ^K	5.4 ^K	5.2 ^F	5.9 ^K	5.9 ^K	5.9 ^F	4.5 ^F	3.3 ^F	3.0 ^K			
2	K	2.9 ^F	(3.1) ^J	(3.0) ^J	(2.5) ^J	(2.4) ^F	(2.9) ^K	5.0 ^K	5.7 ^K	6.3 ^{KK}	6.9 ^J	(6.9) ^J	(5.6) ^K	5.9 ^K	6.7 ^K	(6.5) ^J	(6.6) ^J	C	K	C	K	C	K		
3	C	K	C	K	C	K	2.9 ^F	4.9 ^K	2.8 ^K	(2.4) ^J	(5.9) ^P	7.3	8.2	7	8.1	8.5	8.5	7.5	7.7	7.5	7.5	7.4	7.2		
4	4.2	4.2 ^F	4.1 ^F	3.9	3.2	[4.0] ^J	[4.0] ^F	(4.8) ^J	(6.7) ^J	7.8	7.8	8.5	8.7	8.7	8.7	8.5	8.6	8.7	8.6	8.2	7.2	[4.3] ^J	4.4		
5	5.4	5.0	4.8	4.6 ^F	4.1 ^F	3.8 ^F	5.4	7.4	8.5	9.4	9	8.5	8.7	8.8	9.4	9.7	9.5	8.9	8.7	8.7	7.4	7.4	[5.6] ^J	5.3	
6	5.5 ^F	5.3 ^F	4.9 ^F	4.9	4.7 ^F	4.7	5.6	6.8	7.4	7.9	8.4	9.0	9.2	9.5	9.6	[9.2] ^J	8.7	8.5	8.5	7.9	7.4	6.3	[6.1] ^J		
7	(5.4) ^J	5.1	5.1	5.3	4.9	5.7	(6.8) ^J	8.2	(9.3) ^J	9.6	8.9	8.9	8.4	(8.7) ^J	8.6	(8.7) ^C	(8.2) ^J	8.6	(7.7) ^C	(6.5) ^J	(5.7) ^J	(5.7) ^J			
8	5.7	(5.1) ^C	(4.9) ^C	4.5	3.9	3.8	4.5	5.7	6.3	6.7	7.2	7.4	8.1	8.2	8.0	8.4	8.4	8.5	8.0	7.6	7.0	(6.4) ^J	6.3	(6.1) ^J	
9	5.5	4.9	4.6	4.3	4.1	3.9	5.0	5.8	6.5	(6.9) ^J	7.3	7.5	7.7	7.8	8.2	9.0	7.7	7.8	7.6	7.3	(6.5) ^C	(5.9) ^J	5.7		
10	5.0	4.7	4.5	4.3	4.1	3.9	5.4	7.2	7.8	8.6	8.5	9.2	9.0	9.4	9.8	9.5	9.0	9.2	9.3	9.0	7.5	6.9	6.1	(5.9) ^J	
11	5.7	5.1 ^F	4.9	4.6 ^F	4.3	4.3	5.0	5.7	7.1	7.6	7.5	7.6	8.3	8.8	8.7	8.7	8.6	8.4	8.7	7.1	(6.0) ^J	5.1	4.7		
12	4.9	5.1	5.3	4.9	4.6	3.7	5.3	7.3	8.0	8.6	8.2	8.2	8.1	8.2	8.0	8.4	8.4	8.5	8.3	8.3	8.7	8.7	8.7	(5.7) ^S	
13	5.3	5.0	4.2	4.2	4.2	4.2	4.2	5.5	7.3	8.1	8.5	8.4	8.3	8.7	8.7	8.9	8.3	9.6	9.5	9.3	9.3	8.8	(6.3) ^J	(6.1) ^J	
14	5.6	5.1	4.7	4.7	5.1	5.2	5.1	4.7	5.5	7.2	8.6	9.0	9.1	9.6	9.5	9.7	9.6	9.5	9.5	9.5	9.3	9.4	6.3	(6.0) ^J	
15	(5.5) ^J	5.4	5.5	5.2	4.8	4.3	4.3	5.5	7.5	8.1	8.3	8.5	8.7	8.7	8.9	8.7	8.7	8.6	8.7	7.1	(6.0) ^J	5.1	4.9		
16	7.2	(6.9) ^J	(6.5) ^J	6.1	5.6	5.3 ^K	5.5 ^K	5.9 ^K	(6.3) ^J	(6.3) ^K	6.3 ^K	(6.9) ^J	[7.4] ^J	[7.4] ^K	7.9 ^K	8.3 ^K	8.5 ^K	8.4 ^K	8.5	8.5	8.9	(6.9) ^J	(6.1) ^J	(6.1) ^J	
17	5.3	4.9	4.5	4.1	(3.7) ^J	4.9	(6.5) ^J	8.1	9.2	9.6	9.9	9.9	(9.8) ^C	9.5	9.6	9.3	9.0	9.0	8.9	8.9	8.1	(7.0) ^J	6.0	5.9	
18	(6.0) ^C	6.1	7.1	5.7	5.3	5.2	4.7 ^F	5.9	7.9	9.3	9.8	10.4	10.6	11.0	10.6	10.2	(10.4) ^J	(10.0) ^J	(10.0) ^J	9.3	9.3	7.9	7.7	(6.7) ^J	
19	6.7	6.3	(6.2) ^J	5.9	5.7	5.0	5.7	7.8	8.9	10.0	10.4	11.0	11.3	11.0	10.7	10.4	10.5	10.2	10.2	9.7	8.8	8.0	7.5	(6.4) ^J	
20	6.4	(6.1) ^J	5.8	5.5	5.1	5.2	6.3	8.0	9.4	9.9	10.5	10.8	(10.7) ^J	10.8	10.4	10.9	(9.8) ^J	(10.5) ^J	(9.1) ^J	8.4	8.4	8.4	8.3	(7.8) ^J	
21	7.2	(6.5) ^J	(6.4) ^J	5.7	5.6	5.5	(6.4) ^J	9.9	(9.9) ^J	10.3	11.2	11.6	11.5	11.6	11.5	11.6	11.6	11.0	(11.0) ^J	(10.5) ^J	(10.0) ^J	(8.0) ^J	(7.3) ^C		
22	7.5	7.3	6.3	6.0	(5.9) ^J	5.5	6.2	8.4	(9.6) ^J	(16.5) ^J	10.7	11.3	11.5	(11.5) ^C	(11.3) ^J	11.3	10.8	10.6	(10.6) ^J	(9.3) ^J	8.3	7.8	7.5	7.3	
23	7.3	6.7	(6.5) ^J	5.7	5.5	5.3	5.8	7.6	(9.9) ^J	10.1	11.5	11.0	(10.6) ^C	11.0	11.3	11.2	(9.7) ^J	(10.7) ^J	10.7	10.2	10.2	8.5	7.7	(6.1) ^J	(7.0) ^J
24	6.8	6.9	(6.8) ^J	(5.5) ^J	4.7	(4.1) ^J	4.7	6.7	7.7	8.3	8.7	9.0	(9.6) ^J	9.3	9.8	9.7	8.9	8.9	(7.8) ^J	7.5	(6.7) ^J	(6.7) ^J	(6.4) ^J		
25	(6.3) ^J	5.7	4.7	(4.5) ^J	4.5	(4.1) ^J	(6.0) ^J	8.6	9.6	9.7	9.8	(11.3) ^J	11.8	11.5	10.8	10.2	9.8	(4.9) ^J	(9.8) ^J	(9.3) ^J	7.7	(6.9) ^J	(5.9) ^J		
26	5.5 ^F	5.1	5.3	5.0	4.5	4.7 ^F	4.7 ^F	9.2	10.0	10.3	11.5	11.0	11.4	11.6	11.3	11.3	11.4	(10.6) ^J	(9.8) ^J	(8.9) ^J	7.1 ^F	(6.3) ^J	5.7 ^F		
27	5.4 ^F	5.2 ^F	4.7 ^J	(4.8) ^J	(4.9) ^J	8.0	(3.3) ^A	(4.9) ^J	8.0	9.4	10.0	10.8	10.7	11.0	11.5	11.6	(10.7) ^J	(10.3) ^J	(9.8) ^J	7.2	(6.4) ^J	(6.5) ^J	(6.3) ^J		
28	(6.1) ^J	5.7	5.3	4.4	4.4	4.3	5.2	7.5	9.1	9.8	(9.9) ^J	(9.8) ^J	10.8	10.8	10.7	11.0	(10.6) ^J	(10.1) ^J	(9.6) ^J	(8.4) ^J	7.3	7.0	(6.2) ^J		
29	(5.9) ^J	(5.2) ^J	5.1	4.6 ^J	4.6 ^J	3.9 ^J	4.0 ^F	6.0 ^F	6.1 ^K	7.3 ^K	7.5 ^K	7.9 ^K	8.1 ^K	8.1 ^K	8.8	8.4	8.0	7.1	(6.6) ^J	(6.0) ^J	(5.7) ^J				
30	5.4	5.1	4.7	4.1	3.9	(3.9) ^J	(4.9) ^J	7.6	8.8	9.7	10.8	11.0	(10.0) ^J	11.1	(11.1) ^J	11.3	P(11.0) ^J	P(11.0) ^J	P(11.0) ^J	8.9	7.5	(6.7) ^J	(6.1) ^J		
31																									
Median	5.2	5.1	5.0	4.5	4.1	5.4	7.2	8.1	8.8	9.2	9.1	9.1	9.6	9.6	9.3	9.2	9.1	8.6	7.5	(6.7)	(6.2)	5.9			
Count	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	21	21	21	29		

TABLE 41
IONOSPHERIC DATA

Mc
September, 1948
(Characteristic)
Washington, D.C.

Observed at Lat 39.0° N. Long 77.5° W

National Bureau Of Standards
 (Institution) J.J.S., J.M.C.

Scaled by E.J.W. Calculated by K.L.B. A.G.U. I.U.S.

75° W Mean Time

75° W

1130 1230 1330 1430 1530 1630 1730 1830 1930 2030 2130 2230 2330

Doy	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330		
1	(5.5) ^a	(5.3) ^a	5.2	5.1	3.5 ^b	3.5 ^b	4.6 ^c	5.2 ^c	(5.0) ^d	G ^e	G ^e	G ^e	G ^e	5.3 ^e	(5.2) ^e	4.9 ^f	5.6 ^f	5.8 ^f	5.1 ^f	(5.5) ^f	3.8 ^f	3.2 ^f	(2.8) ^f			
2	(3.0) ^b	(3.1) ^b	(3.0) ^b	(2.4) ^b	2.6 ^b	4.5 ^b	5.3 ^b	(6.0) ^b	7.1 ^b	(6.0) ^b	[6.2] ^b	6.3 ^b	6.7 ^b	(6.5) ^b	6.8 ^b	C ^b	C ^b	C ^b	C ^b	C ^b	C ^b	C ^b	C ^b			
3	C ^b	C ^b	C ^b	(2.9) ^b	2.3 ^b	3.1 ^b	5.2	(6.8) ^b	8.1	7.8	8.1	8.7	8.1	7.5	7.5	7.5	7.5	7.5	7.4	6.8	(5.7) ^b	4.7	4.5			
4	4.3	4.1	4.0	3.7 ^b	2.3 ^b	3.7 ^b	7.3	7.6	8.5	8.1	8.5	8.4	8.9	8.6	8.7	8.6	8.5	8.5	8.5	(7.9) ^b	6.9	(5.9) ^b	5.7	5.4 ^b		
5	J.1	4.9	4.7	4.5 ^b	3.9 ^b	4.1 ^b	6.6	8.4	8.7	9.6	9.3	9.7	9.3	9.6	9.6	9.2	8.9	8.9	8.3	7.7	7.0	(6.1) ^b	(6.0) ^b	5.7 ^b		
6	5.4 ^b	5.3 ^b	5.0 ^b	4.9	4.6 ^b	4.7 ^b	(6.1) ^b	(6.8) ^b	7.7	8.0	8.6	9.0	(9.5) ^b	9.6	[9.4] ^b	9.3	8.7	8.7	8.9	8.3	7.6	(6.6) ^b	(6.0) ^b	5.5 ^b		
7	5.3	4.9	4.9	5.0	5.2	5.0	6.5	(6.1) ^b	8.6	S	C	8.6	8.8	(8.7) ^b	8.5	8.9	(8.9) ^b	(9.2) ^b	(7.9) ^b	7.3	(6.1) ^b	(5.7) ^b	5.5			
8	5.4	5.2	(4.7) ^b	[4.2] ^b	3.9	3.9	(4.9) ^b	[5.7] ^b	7.3	7.2	7.2	7.8	8.0	8.1	8.3	8.4	8.6	8.2	7.8	7.3	6.6	(6.1) ^b	(5.7) ^b	5.5		
9	5.2	4.7	4.6	4.1	3.9	4.1	5.7	(6.1) ^b	(6.4) ^b	7.3	7.3	7.3	7.8	8.2	7.9	8.1	7.8	7.6	7.5	7.0	[6.2] ^b	[5.7] ^b	[5.3] ^b	5.1		
10	4.7	(4.4) ^b	4.3	4.3	3.8	4.2	6.4	7.6	8.6	(7.9) ^b	8.7	(9.4) ^b	8.7	(9.2) ^b	8.7	(9.2) ^b	(9.3) ^b	8.7	8.7	8.9	8.3	7.6	(6.6) ^b	(6.0) ^b	5.8	
11	5.3 ^b	5.0	4.8	4.6	4.3	4.5	5.7	(6.5) ^b	7.6	7.5	7.8	7.8	8.5	9.0	9.0	8.7	8.8	8.2	8.4	8.3	8.2	8.3	8.2	8.2	8.3	8.2
12	5.2	5.3	5.0 ^b	4.6	4.1	3.9	6.2	7.7	8.4	9.0	9.5	9.6	10.5	10.5	9.3	9.4	9.2	9.3	9.2	9.3	8.9	8.5	8.5	8.5	8.5	
13	5.3	4.9	4.7	4.3	4.2	4.4	6.3	7.9	8.7	8.8	8.8	8.8	8.8	8.8	8.7	8.8	9.4	9.4	9.5	9.0	8.2	7.0	6.7	5.9	5.7	
14	5.1	5.1	5.3	5.2	4.9	4.6	6.5	8.0	8.7	9.7	(9.7) ^b	9.7	9.7	9.7	9.7	9.8	9.5	9.5	9.6	(9.3) ^b	7.9	7.0	(6.0) ^b	5.7	5.8	
15	5.5	5.5	5.3	4.9	4.7	4.7	6.9	7.6	8.2	8.4	8.8	8.6	8.9	8.9	8.7	8.7	C	[9.4] ^b	(9.3) ^b	(7.9) ^b	7.9	7.3	7.3			
16	7.3	(6.7) ^b	(6.3) ^b	5.6	[5.4] ^b	5.6	(5.3) ^b	5.7	5.7	5.9	(6.6) ^b	7.0	7.9	8.3 ^b	8.5 ^b	8.6 ^b	8.1 ^b	(8.2) ^b	7.5	(7.1) ^b	6.7	(6.5) ^b	5.7	5.4		
17	5.2	4.8	4.7	(4.1) ^b	3.9	(4.8) ^b	5.7	5.7	8.7	9.4	10.0	10.0	9.7	9.6	9.7	9.4	9.2	9.1	9.2	8.0	7.3	(6.5) ^b	(6.1) ^b	(6.1) ^b		
18	5.7	5.7	5.3	5.3	4.9	4.9	6.7	9.2	9.3	9.7	10.9	(10.9) ^b	10.7	10.6	10.5	10.5	(9.8) ^b	(9.8) ^b	(9.3) ^b	8.6	7.9	(7.9) ^b	7.3	6.8		
19	(6.7) ^b	6.5	(5.9) ^b	5.7	5.3	4.5	6.8	8.3	9.6	10.5	11.0	10.8	10.8	10.5	10.4	10.4	10.5	(9.8) ^b	(10.0) ^b	(9.3) ^b	7.9	7.9	(6.9) ^b	6.4		
20	(6.4) ^b	(6.0) ^b	(5.7)	5.4	5.1	5.3	7.1	8.7	9.8	10.5	10.7	10.7	10.7	10.7	(10.7) ^b	(10.7) ^b	(10.7) ^b	(10.7) ^b	(10.4) ^b	(9.3) ^b	8.9	8.3	7.9	7.4		
21	6.9	6.4	6.1	5.6	5.5	5.6	7.8	9.5	10.2 ^b	10.7	11.6	11.6	11.5	11.5	11.1	11.4	(11.9) ^b	11.1	10.8	[9.7] ^b	8.7	8.6	7.9	7.8	(7.9) ^b	
22	(7.3) ^b	7.1	(6.2) ^b	(6.1) ^b	5.7	5.7	6.1	7.3	9.0	10.0	(10.6) ^b	11.0	11.6	(11.3) ^b	11.5	11.4	11.0	(11.0) ^b	11.1	10.5	(9.8) ^b	8.4	(8.5) ^b	(8.5) ^b		
23	7.3	6.5	(6.1) ^b	5.7	5.3	5.3	6.3	(8.1) ^b	(10.1) ^b	11.5	11.4	11.4	10.7	11.3	(11.0) ^b	11.3	(10.0) ^b	10.2	[8.9] ^b	7.9	(7.1) ^b	7.0	(7.0) ^b	(6.4) ^b		
24	(6.7) ^b	6.8	(6.1) ^b	4.9	(4.5) ^b	4.9	5.5	7.0	8.3	8.3	8.8	8.8	9.2	(9.5) ^b	9.6	9.6	8.8	8.8	8.3	7.5	(6.6) ^b	(6.6) ^b	(6.4) ^b	(6.4) ^b		
25	(5.9) ^b	4.9	4.5	4.3	4.3	(4.7) ^b	7.3	7.9	9.6	(10.0) ^b	10.5	10.5	(11.5) ^b	11.6	11.6	(11.2) ^b	10.8	9.8	(9.8) ^b	(8.7) ^b	8.9	7.1	(6.0) ^b	(6.2) ^b	5.6	
26	5.3	5.2	5.1	4.9	(4.1) ^b	3.7	5.6	7.0	9.0	10.3	(11.0) ^b	[1.0] ^b	11.5	(11.5) ^b	11.5	11.0	11.2	(10.5) ^b	[10.5] ^b	(9.8) ^b	(9.8) ^b	(9.8) ^b	(6.7) ^b	[6.4] ^b	5.6 ^b	
27	5.4 ^b	5.0 ^b	4.6 ^b	4.2	3.8	3.4	(6.5) ^b	(8.4) ^b	10.0	(10.5) ^b	10.7	(10.7) ^b	10.7	(11.0) ^b	(11.5) ^b	11.6	(10.7) ^b	(10.7) ^b	(9.8) ^b	[8.8] ^b	[8.8] ^b	[8.8] ^b	[8.8] ^b	6.3		
28	(5.5) ^b	5.2	4.7	4.3	4.1	[6.4] ^b	8.5	9.1	(9.8) ^b	10.2 ^b	10.6	10.8	(10.8) ^b	10.9	10.9	10.8	[10.2] ^b	P(9.7) ^b	S ^b (9.7) ^b	7.6	7.0	(6.7) ^b	5.9	(5.7) ^b		
29	5.7 ^b	5.3 ^b	4.9 ^b	4.1 ^b	3.6 ^b	(5.6) ^b	(5.5) ^b	6.6 ^b	7.4 ^b	7.6 ^b	8.1 ^b	8.5 ^b	8.9 ^b	8.8	8.8	8.5	7.9	7.6	(6.8) ^b	(6.3) ^b	(5.9) ^b	5.7 ^b	5.7 ^b			
30	5.3	4.9	(4.5) ^b	3.8 ^b	4.0	(6.2) ^b	8.9	9.4	(10.2) ^b	10.7	(11.2) ^b	(11.0) ^b	11.0	(10.7) ^b	(10.3) ^b	(10.3) ^b	(10.3) ^b	(10.3) ^b	(8.9) ^b	8.4	7.3	(6.8) ^b	5.6	(6.1) ^b		
31																										
Median	5.4	5.2	5.0	4.6	4.2	4.4	6.3	7.8	8.6	9.0	9.3	9.4	9.4	9.4	9.4	9.4	9.2	9.0	(8.9) ^b	7.9	7.1	(6.5) ^b	6.0	5.7		
Count	29	29	30	30	30	30	30	30	30	29	29	29	30	30	30	29	29	29	29	29	29	29	29	29	29	

Sweep [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.
IONOSPHERIC DATA

$h' F_1$, km
(Characteristic)
Observed at Washington, D. C.

September, 1948
(Month)

Lat 39.0°N, Long 77.5°W

National Bureau Of Standards
J.J.S. [Institution] J.M.C.
Scaled by: E.J.W. Calculated by: K.L.B. A.G.J. J.J.S.

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

Sweep 10 Mc to 350 Mc in 0.25 min
Manual Automatic

TABLE 43
IONOSPHERIC DATA

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

f₀F₁, Mc
(Characteristic)
September, 1948
(Month)

Observed at Washington, D. C.

Lat 39.0° N., Long 77.5° W

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

Sweep 0 Mc to 25.0 Mc in 0.25 min
Manual Automatic f₀F₁

h' E, km **September, 1948**
 (Characteristic) (Unit)
 Observed at **Washington, D.C.**
 Lat **39.0°N**, Long **77.5°W**

TABLE 44
 Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.
IONOSPHERIC DATA

Form adopted June 1948
National Bureau Of Standards
 (Institution) **J.M.G.**
 Searched by: **E.J.W.** Calculated by: **K.L.B.**
J.S. **A.G.J.** **J.S.**

Day	75°W Mean Time											
	00	01	02	03	04	05	06	07	08	09	10	11
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Median Count												
	115	100	100	100	100	100	100	100	100	100	100	100
	14	30	30	30	30	29	29	29	29	29	29	29

Sweep 10 Mc 1025 Q Mc 1025 min
 Manual Automatic

TABLE 45
IONOSPHERIC DATA
September, 1948
(Month)

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

Washington, D.C.

Observed at Lat. 39.0° N., Long. 77.5° W

National Bureau Of Standards
(Institution)
J.S.S., J.M.C.
Scaled by: E.J.W.
Calculated by: K.L.B., A.G.J., J.S.S.

Day	75° W Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	
1	C	K	2.1	K	(2.7)A	3.6	K	(3.9)K	3.7	K	3.3	K	
2	(1.9)K	A	K	A	K	3.3	K	(3.7)K	3.7	K	3.5	K	
3	(1.9)K	2.0	[2.6]A	3.3	3.6	3.9	3.8	(3.7)C	(3.4)C	3.3	C	C	
4	1.9	2.6	3.0	H	[3.3]A	(3.6)C	3.7	(3.7)C	[3.7]C	(3.4)C	3.1	2.5	2.1
5		2.5	2.7	A	A	(3.6)C	(3.5)C	[3.4]C	[3.4]C	3.2	3.0	2.5	1.9 H
6		2.1	2.7	3.1	[3.5]C	(3.9)C	3.9	(3.7)C	(3.7)C	C	A	2.6 H	2.1 H
7	(2.0)S	(2.4)S	(2.7)A	(3.3)C	(3.5)C	(3.7)C	[3.6]C	(3.6)C	[3.6]C	3.2	3.1	2.5	(2.1)C
8	C	3.0	[3.2]A	(3.5)C	2.0	C	C	C	(3.7)C	3.3	3.0	2.6	A
9	2.6 H	3.1 H	2.9	C	C	(3.7)C	[3.6]C	(3.6)C	(3.5)C	[3.3]C	(3.1)C	(2.2)C	
10	1.8	2.3	3.1 H	3.6	(3.7)C	3.6	[3.7]C	3.8	(3.4)C	3.5	3.1	2.6	(2.1)C
11	(1.6)C	2.5 H	3.2	(3.2)S	(3.4)A	3.6	[3.7]C	3.8	3.5	3.5	3.1	2.3	A
12	(1.9)C	2.6 H	3.0	3.4	(3.6)C	3.7	A	A	3.7	3.5	3.3	2.6	1.7
13	2.1	2.5 H	3.1	[3.4]A	(3.7)C	(3.8)C	(3.9)C	3.9	(3.9)C	(3.6)C	3.2	2.6	C
14	1.9	2.5 H	3.1	2.9	3.8	C	C	C	3.7	3.6	3.3	2.5	A
15	A	A	3.1 F	[3.3]C	3.5 F	3.8	3.8	3.7	3.7	3.5	3.1	2.7	(1.7)S
16	1.9 K	2.5 K	3.1 K	3.6 K	(3.7)K	(3.9)B	(3.9)B	B	K	3.4 K	3.1	(3.5)A	(1.9)H
17	(2.3)B	2.6	3.1	3.5	3.7	3.9	3.9	[3.7]A	3.5	3.5	3.2	2.6	(2.1)C
18	A	2.6	3.3	3.3	3.8	3.9	3.9	(3.7)B	(3.5)B	(3.5)B	3.3	3.1	
19	1.7	2.7 H	3.2	(3.6)H	3.8	3.9	3.9	3.9	3.7	3.7	3.3	A	A
20		2.6	3.1	3.6	3.8	3.9	3.9	4.0	(3.9)C	3.6	3.3	(3.6)C	(1.8)C
21	1.9	2.5 H	3.1	3.4	(3.8)C	4.0	(3.9)C	4.0	3.9	3.6	(3.2)C	2.5	
22	1.9	2.5	3.4	3.6	(3.9)C	(4.1)C	B	C	B	3.5	3.1	2.3	
23	(2.5)H	3.1	3.5	3.5	B	B	B	B	B	3.7	3.1	(3.6)C	1.7 H
24	1.8	(2.4)A	3.0	3.2	3.6	(3.7)B	(4.0)B	3.7	3.4	3.4	2.9	2.5	
25		2.3	2.9	3.4	[3.5]B	3.6	[3.6]B	(3.7)B	3.3	3.1	2.9	2.4	1.7
26	(2.3)B	2.9 H	3.2	3.3	[3.5]B	3.7	3.5	3.2	[3.3]B	3.1	2.3		
27		2.3	2.9	3.3	(3.6)C	(3.5)C	3.5	3.4	3.2	[3.7]A	3.0	2.2	
28		2.3	2.9	3.3	(3.5)B	3.7	3.5	(3.7)C	3.3	2.9	2.1		
29		2.3 H	3.1 H	(3.3)K	(3.3)K	(3.4)K	(3.4)K	3.5	3.5	3.1	2.5	2.1	
30		2.3	2.9	3.3	(3.5)F	(3.5)C	(3.4)C	(3.4)C	3.1	3.1	2.7	2.1	
31													
Median	1.9	2.5	3.0	3.3	(3.0)C	3.7	(3.8)C	3.7	3.6	3.4	3.1	2.5	2.0
Count	15	27	29	29	28	27	25	23	26	27	27	27	14

Sweep LO Mc to 25.0 Mc in 0.25 min
Manual Automatic

TABLE 46
IONOSPHERIC DATAE S Mc, km September, 1948
(Characteristic)
Observed at Washington, D.C.
(Month)

Lat 39.0°N, Long 77.5°W

National Bureau Of Standards
(Institution)
J.W.S.Scaled by
E. J.W.
J.W.S.Calculated by
K.L.B.
J.J.S.

75° W Mean Time											
Day	00	01	02	03	04	05	06	07	08	09	10
1											
2											
3	C	C	C								
4	2.6/100	3.0/100	3.0/100								
5											
6	3.1/100										
7											
8											
9											
10	3.1/100										
11											
12	3.1/20										
13	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100	1.7/100
14											
15											
16	2.3/100	3.1/100	2.3/100	2.3/100	2.3/100	2.3/100	2.3/100	2.3/100	2.3/100	2.3/100	2.3/100
17											
18	C										
19											
20											
21											
22											
23											
24	2.5/100										
25											
26											
27	3.1/100	6.3/100	5.8/100	5.6/100	5.1/100	2.0/100					
28											
29											
30											
31											

* * MEDIAN FEES LESS THAN MEDIAN F_E, OR LESS THAN
LOWER LIMIT OF RECORDERSwept O Mc to 25.0 Mc in 0.25 min
Manual □ Automatic ☒N 7
1948-10-10 11:30 A.M. (EST) 1948-10-10 11:30 A.M. (EST)

TABLE 47
 Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
 September, 1948
 (Month)
 Observed at Washington, D.C.
 Lat 39.0° N, Long 77.5° W

75° W Mean Time														
IONOSPHERIC DATA														
National Bureau Of Standards														
Scaled by <u>E. J. W.</u> <u>J. J. S.</u> <u>J. M. C.</u>										Calculated by <u>K. L. B.</u> <u>A. G. J.</u> <u>J. J. S.</u>				
Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	(1.6) ^J	1.7	1.8	1.9	2.0 ^F	1.8 ^K	1.7 ^K	1.6 ^K	1.5 ^K	1.6 ^K	1.5 ^K	1.7 ^K	1.5 ^K	1.6 ^K
2	1.6 ^K	(1.7) ^J	(1.8) ^J	(1.9) ^J	(2.0) ^F	(1.6) ^K	(2.2) ^K	(2.3) ^J	(2.0) ^K	1.6 ^K	1.9 ^K	(1.8) ^J	1.9 ^J	1.6 ^K
3	C	C	C	C	C	1.7 ^K	1.6 ^K	1.7 ^K	2.1 ^P	2.1	2.1	2.1	2.1	C
4	1.8	1.8	1.9	F	1.6	N	F	(2.3) ^J	(2.3) ^J	3.4	3.2	3.1	3.0	C
5	1.9	1.9	1.9	F	1.9	F	1.9	2.3	2.3	2.3	2.4	2.2	2.1	C
6	1.9 ^F	2.0	F	2.0	1.9	1.9	2.1	2.4	2.5	2.4	2.3	2.1	2.0	(2.0) ^J
7	(2.0) ^S	1.8	1.8	1.9	2.0	2.2	2.4	(2.0)	2.2	2.2	2.3	2.0	2.0	(2.0) ^J
8	2.0	(1.9) ^C	(1.9) ^C	1.9	1.9	1.9	2.4	2.2	2.2	2.2	2.2	2.1	2.0	(1.9) ^J
9	2.0	1.9	1.8	2.0	1.9	2.0	2.2	2.2	2.2	2.2	2.2	2.1	2.0	(2.0) ^J
10	1.9	1.8 ^F	1.8	1.9	2.0	2.0	2.2	2.2	2.4	2.3	2.0	1.8	2.0	(1.9) ^J
11	1.9	1.8 ^F	1.8	1.8 ^F	1.8	1.9	2.1	2.1	2.2	2.1	1.9	1.9	2.0	(1.9) ^J
12	1.7	1.8	1.8	1.9	1.8	2.0	2.2	2.3	2.2	2.2	2.0	2.0	2.0	(1.8) ^S
13	1.8	1.8	1.7	1.7	1.6	1.8	2.0	2.3	2.2	2.2	2.1	2.0	2.0	2.0
14	1.8	1.6	1.7	1.8	1.9	2.0	2.2	2.2	2.2	2.1	2.0	2.0	2.0	1.9
15	(1.9) ^J	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.2	2.0	2.0	1.8	2.0	2.0
16	1.6	(1.7) ^J	(1.7) ^J	1.7	1.7	1.7	1.9 ^K	2.0 ^K	(2.0) ^J	1.9 ^K	1.9 ^K	1.8 ^K	1.9 ^K	(1.8) ^J
17	1.8	1.8	1.8	1.7	1.7	(1.7) ^F	1.6	(2.0) ^J	2.1	2.0	2.0	1.9	1.9	(1.8) ^J
18	C	1.7	F	1.8	1.9	1.9	2.2	2.2	2.1	2.0	1.9	1.7	1.8	1.8
19	1.8	1.8	1.8	1.8	1.7	1.7	1.8	2.0	2.3	2.0	2.1	2.0	2.0	1.7
20	1.9	(1.9) ^P	1.9	1.9	1.8	1.8	2.1	2.2	2.2	2.1	2.0	1.9	1.9	2.0
21	1.9	(1.9) ^J	(1.9) ^J	1.9	1.8	1.8	1.9	(2.1) ^J	(2.3) ^J	2.2	2.0	1.9	1.9	2.0
22	2.0	2.1	1.9	1.7	(1.9) ^J	1.9	2.0	2.1	(2.3) ^J	(2.1) ^J	2.1	2.0	2.0	1.9
23	1.8	1.8	(1.8) ^J	1.8	1.7	1.8	2.0	2.0	(2.0) ^J	2.1	2.0	1.9	1.8	(1.8) ^J
24	1.7	1.8	(1.9) ^J	(1.9) ^J	1.7	(1.7) ^J	1.9	2.0	2.1	2.0	2.0	1.9	1.9	(1.9) ^J
25	(1.9) ^J	1.9	(1.7) ^J	1.6	(1.8) ^J	(2.1) ^J	2.3	2.3	2.1	1.9 ^P	2.1	2.0	2.0	2.0
26	1.7	1.7	1.7	1.8	1.9	1.8	2.1	F	2.2	2.0	2.0	2.0	2.0	1.9
27	1.9	1.9	F	1.9	(2.1) ^J	A	(1.8) ^A	(2.2) ^J	2.4	2.2	2.1	1.9	2.0	(1.8) ^J
28	(2.0) ^J	(2.0) ^J	2.0	2.0	2.0	2.0	2.1	2.3	2.2	2.1	2.1	2.0	2.0	(2.0) ^J
29	(1.8) ^J	(1.8) ^J	(1.8) ^F	1.8	1.7	1.7	1.8	1.8	2.1	2.1	2.1	2.0	2.0	(1.8) ^J
30	1.9	1.9	1.8	1.8	1.8	1.8	1.8	(1.8) ^J	(2.2) ^J	2.3	2.3	2.1	2.1	(1.9) ^J
31														
Median	1.9	1.8	1.9	1.8	1.8	2.1	2.2	2.2	2.1	2.0	2.0	1.9	2.0	(1.9)
Count	28	29	30	29	28	30	30	30	30	29	30	30	29	29

1948-1949-1950

Automatic

Manual

Sweep10 Mc/min

Mc/min

25 min

F2 - M3000, September, 1948
(Chromatic) (W.M.)
Observed at Washington, D. C.

TABLE 48
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.
September, 1948
(Month)
IONOSPHERIC DATA

National Bureau Of Standards
(Invention) J.M.C.

Scaled by: E. JW

J.J.S.

Calculated by: K.L.B.

A.G.J.

J.J.S.

Form adopted June 1946

Day	75°W Mean Time																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	(2.7) ^F	2.6	2.7	2.8	2.9 ^K	2.7 ^K	3.0 ^K	2.8 ^K	3.0 ^K	2.3 ^K	G ^K	2.3 ^K	G ^K	2.6 ^K	2.3 ^K	2.3 ^K	3.1 ^K	3.1 ^K	2.5 ^K	2.5 ^K	2.5 ^K	2.6 ^K						
2	K 2.4 F (2.6) ^I	K (2.7) ^I	(3.0) ^I	(2.6) ^I	F ^K	3.2 ^K	3.3 ^K	3.7 ^K	(3.5) ^I	(3.0) ^I	2.4 ^K	2.8 ^K	(2.8) ^I	(2.8) ^I	C ^K													
3	C ^K	C ^K	C ^K	C ^K	2.5 ^K	2.5 ^K	(2.8) ^f	3/	(3.1) ^f	3.3	3.3	3.2	2.8	2.9	2.9	3.0	3/	3.2	3.0	3.2	3.1	(3.0) ^I	(3.1) ^I	2.8				
4	2.7	2.8	2.8	2.8	2.4	N ^F	(3.4) ^T	3.3) ^T	3.5	3.2	3.2	3.0	2.9	2.9	3.0	2.9	3.0	3/	3.2	3.2	3.2	(3.1) ^I	3.0	2.8				
5	2.8	2.8	2.9	2.9	3.0 ^F	2.8 ^T	3.3	3.4	3.5	3.3	3.2	3.1	3.0	3/	3.0	3/	3.2	3.2	3.2	3.1	3.1	3.1	(3.0) ^I	(3.0) ^I				
6	2.9 ^F	2.9 ^F	2.9 ^F	2.9 ^F	2.9 ^F	3.2	3.4	3.5	3.6	3.4	3.5	3/	3.0	3.0	3/	C	3.2	3.0	3/	3.1	3.1	3.0	(3.0) ^I	(3.0) ^I				
7	(3.0) ^s	2.7	2.7	2.8	3.0	3.2	3.5	(3.0) ^s	3.3	(3.4) ^s	3.2	3.1	3.0	(3.1) ^s	(3.1) ^s	(3.0) ^s	(3.2) ^s	(2.9) ^c	(2.9) ^c									
8	(2.8) ^c	(2.9) ^c	2.9	2.8	2.8	3.5	3.2	3.2	3.3	3.2	3.0	3.2	3.1	3/	3.0	3/	2.9	2.9	3/	3/	3/	3/	3/	3/	(3.0) ^T			
9	3.0	2.9	2.8	2.7	2.8	2.9	3.2	3.3	3.3	(3.3) ^T	3/	3/	3.1	3/	3.0	3/	3/	3.2	3/	3/	(3.0) ^c	(2.9) ^c	2.7	2.8				
10	2.9	2.7	2.8	2.8	2.9	2.8	3.2	3.4	3.2	3/	3.0	3/	3.0	3/	3.0	3/	3.0	3/	3.2	3/	3/	3.0	3/	3/	(2.9) ^T			
11	2.8	2.7 ^T	2.7	2.7 ^T	2.8	2.8	3.2	3/	3.1	3.3	3.3	3/	3.0	2/	2.8	2.8	2.9	2.9	3/	3/	3/	3/	3/	3/	(2.8) ^T	2.7	2.5	
12	2.6	2.6	2.7	2.9	2.8	2.9	2.9	3.2	3/	3.4	3.3	3/	3.2	3/	2.9	2.9	2.9	2.9	3/	3/	3/	3/	3/	3/	(2.7) ^S			
13	2.7	2.8	2.6	2.6	2.5	2.6	2.7	3.0	3/	3.4	3.2	3/	3.1	2/	2.9	2/	2.9	3/	3/	3/	3/	3/	3/	3/	(2.8) ^T			
14	2.8	2.5	2.6	2.7	2.8	2.8	3.0	3/	3.4	3.2	3/	3.2	3/	3.2	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(2.8) ^T	2.8		
15	(2.8) ^T	2.8	2.8	2.8	2.8	2.9	3/	3.3	3/	3.2	3/	3.0	3/	3/	2.9	2/	2.8	2/	2.7	2/	2.7	(3.2) ^S	2.8	2.8	(2.8) ^T	2.8		
16	2.5	(2.6) ^T	(2.6) ^T	2.6	2.5	(2.5) ^F	2.9	3.0 ^K	(3.0) ^T	2.7 ^K	(3.4) ^T	B ^K	2.8 ^K	(2.9) ^I	2.8 ^K	(3.4) ^T	(2.8) ^T	2.8										
17	2.8	2.8	2.7	2.6	2.5	(2.5) ^F	2.9	3.0 ^K	(3.0) ^T	(2.9) ^T	3.9	3/	3.0	3/	3.0	2/	2.9	(2.9) ^T	2.8	2/	2.7	2/	2.7	2/	(3.2) ^S	(2.9) ^T	(2.7) ^T	
18	C	2.6 ^F	2.7	2.8	2.8	2.9 ^F	3/	3.3	3/	3.3	2/	2.9	2/	2.8	2/	2.8	2/	2.8	2/	2.9	2/	2.9	2/	2.9	2/	C	2.8	2.8
19	2.6	2.7	(2.7) ^T	2.8	2.6	2.5	2.5	2.7	3/	3.4	3/	3.0	3/	3.1	3/	3.0	3/	2/	2.9	2/	2.9	2/	2.9	2/	(2.9) ^T	(2.7) ^T	(2.7) ^T	
20	2.8	(2.8) ^P	2.8	2.8	2.7	2.8	3.2	3/	3.2	3/	3.4	3/	3.2	3/	3.1	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(2.9) ^T	(2.7) ^T	3.0
21	2.9	(2.9) ^T	(2.9) ^T	2.9	2.7	2.7	2.9	(3.1) ^T	3/	3/	3/	3.4	(3.4) ^P	3/	3.2	2/	2.9	2/	2.8	2/	2.9	2/	2.9	2/	(3.1) ^T	(2.8) ^C	2.9	
22	3.0	2.8	2.8	2.7	2.7	2.9	3/	3.0	3/	(3.3) ^P	(3.1) ^C	3/	2/	2.9	(2.8) ^C	(2.8) ^P	2/	2.9	2/	2.9	2/	2.9	2/	(2.8) ^P	2.8	2.7		
23	2.7	2.8	(2.7) ^T	2.9	2.6	2.7	3/	3/	(3.2) ^P	3/	3/	2/	2.9	(3.0) ^C	2/	2.8	2/	2.9	2/	2.9	2/	2.9	2/	(2.8) ^T	(2.7) ^T	(2.7) ^T		
24	2.6	2.7	(2.8) ^T	2.8	2.6	(2.5) ^I	2.9	3/	3/	3/	3/	3/	2/	(2.9) ^P	2/	2.6	2/	2.9	2/	2.9	2/	2.9	2/	(2.7) ^T	(3.0) ^T	(2.8) ^T		
25	(2.9) ^T	2.8	2.8	(2.5) ^T	2.4	(2.7) ^T	(3.2) ^T	3.5	3/	3/	3/	3/	2/	(2.8) ^P	3/	3/	3/	(3.0) ^C	(3.0) ^P	2/	2/	2/	2/	2/	(2.9) ^T	(2.7) ^T	3.0	
26	2.7 ^F	2.6	2.6	2.7	2.8	2.6 ^F	3/	3.3	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(2.8) ^T	(2.7) ^T	2.9	
27	2.8 ^F	2.9 ^F	2.9 ^F	(3.2) ^T	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(3.0) ^E	(3.0) ^E		
28	(3.0) ^E	3.0	3.0	2.9	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(3.1) ^E	(3.1) ^E		
29	(2.7) ^T	(2.7) ^F	2.5 ^F	2.6	2.7 ^F	2.7 ^I	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(2.9) ^E	(2.8) ^E		
30	2.8	2.9	2.7	2.7	2.6	2.6	(3.3) ^T	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	(2.9) ^E	(2.9) ^E		
31																												
Median	2.8	2.8	2.7	2.8	2.8	3.2	3.3	3.2	3.1	3.0	3.0	3/	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.0	3.0	3.0	(2.9)	(2.9)	(2.8)		
Count	29	29	30	29	28	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29

Swept-O-Mic to 25.0 Mc in 0.25 min
Manual □ Automatic □

1 - INSTRUMENTATION DIVISION, NATIONAL BUREAU OF STANDARDS, WASHINGTON 25, D. C.

TABLE 49
IONOSPHERIC DATA
 F1-W3000, — September, 1948
 (Characteristic) (Unit)
 Observed at: Washington, D. C.
 Lat 39.0°N, Long 77.5°W

Day	75° W Mean Time												Calculated by:	K.L.B.	A.G.J.	J.J.S.							
	00	01	02	03	04	05	06	07	08	09	10	11											
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
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13																							
14																							
15																							
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23																							
24																							
25																							
26																							
27																							
28																							
29																							
30																							
31																							
Median																							
Count																							

© GOODYEAR TIRE & RUBBER CO., INC.

1948 - 1949

Manual Automatic

Sweep I.O. Mc 0.250 Mc in 0.26 min

TABLE 50
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.
Observed at Washington D. C., Lat 39°0' N, Long 77°5' W
E-M1500, September, 1948
(Characteristic) (Ultraviolet) (Month)

Day	IONOSPHERIC DATA												IONOSPHERIC DATA											
	75° W						Mean Time						75° W						Mean Time					
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
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26																								
27																								
28																								
29																								
30																								
31																								
Median	4.2	4.3	4.3	4.3	(4.3)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
Count	13	27	28	24	26	25	18	20	24	25	24	25	24	25	24	25	24	25	24	25	24	25	24	

U. S. GOVERNMENT PRINTING OFFICE: 1946 O-102519

Manual □ Automatic ■

Sweep 10 Mc in 0.25 min

Table 51

Ionospheric Storminess at Washington, D. C.September 1948

Day	Ionospheric character*		Principal storms		Geomagnetic character**	
	00-12 GCT	12-24 GCT	Beginning GCT	End GCT	00-12 GCT	12-24 GCT
1	4	6	0900	----	3	4
2	5	5	----	----	5	2
3	***	2	----	1000	2	3
4	3	2			3	3
5	1	1			3	1
6	1	2			2	2
7	1	2			3	2
8	2	3			2	2
9	1	2			2	2
10	1	1			1	3
11	1	3			3	2
12	2	1			3	4
13	2	1			2	2
14	2	1			2	1
15	2	2			2	3
16	1	4	1000	2100	3	3
17	1	2			2	2
18	1	1			1	3
19	1	2			3	2
20	1	1			1	2
21	1	1			2	2
22	0	2			2	3
23	1	0			3	3
24	1	3			3	3
25	2	1			4	4
26	1	0			4	3
27	1	1			1	1
28	1	2			0	0
29	2	4	1000	1900	4	3
30	1	1			3	3

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

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

***No readable record. Refer to table 40 for detailed explanation.

----Dashes indicate continuing storm.

Table 52Sudden Ionosphere Disturbances Observed at Washington D. C.September 1948

Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
13	2125	2150	Ohio, D.C.	0.2	
16	1557	1615	Ohio, D.C., England, New Brunswick	0.0	Terr. mag. pulse** 1600-1610
16	1956	2020	Ohio	0.2	
18	1958	2050	Ohio, D.C.	0.3	
19	2000	2035	Ohio, D.C.	0.0	
21	1818	1850	Ohio	0.1	
22	1608	1630	Ohio, D.C., England, New Brunswick	0.0	
22	1752	1810	Ohio, England	0.2	
26	1959	2040	Ohio, D.C.	0.05	Terr. mag. pulse** 2000-2040

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

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

Table 53
Sudden Ionosphere Disturbances Reported by
RCA Communications, Inc., as Observed
at Point Reyes, California

1948 Day	GCT		Location of transmitters
	Beginning	End	
August 4	0222	0249	Australia, China, Chosen, Hawaii, Japan, Philippine Is.
8	0220	0520	Australia, China, Chosen, Japan, Philippine Is.
16	0655	0725	China, Hawaii, Philippine Is.
September 22	0150	0230	Australia, China, Japan, Java, Philippine Is.
26	1810	1900	Australia, China, Hawaii, Japan, Philippine Is.

Table 54Sudden Ionosphere Disturbances Reported by Engineer-in-Chief.Cable and Wireless, Ltd., as Observed in England

1948 Day	GCT		Receiving station	Location of transmitters
	Beginning	End		
July 29	0745	0830	Brentwood	Austria, Bahrein I., Belgian Congo, Eritrea, France, Greece, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Switzerland, Thailand, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar
	0743	0800	Somerton	Ceylon, China, India
	1250	1330	Brentwood	Austria, Bahrein I., Belgian Congo, Canary Is., Chile, Colombia, France, Greece, India, Iran, Kenya, Madagascar, Malta, Palestine, Portugal, Spain, Switzerland, Syria, Trans-Jordan, Turkey, Yugoslavia
	1253	1305	Somerton	Argentina, Brazil, New York, Union of S. Africa
	0800	0820	Brentwood	Austria, Bahrein I., Belgian Congo, Eritrea, France, Greece, India, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Syria, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar
	0803	0813	Somerton	Ceylon, China, Gold Coast, India, Union of S. Africa
August 30	1000	1020	Brentwood	Canary Is., Kenya, Portugal, Switzerland
September 12	0940	1015	Brentwood	Bahrein I., Madagascar, Southern Rhodesia, Zanzibar
	1600	1615	Brentwood	Barbados, Canary Is., Malta, Spain
	1600	1615	Somerton	Argentina, Brazil, Canada, Gold Coast, New York, Union of S. Africa
	1127	1140	Brentwood	Austria, Bahrein I., Belgian Congo, Canary Is., Greece, Iran, Kenya, Malta, Palestine, Portugal, Spain, Switzerland, Zanzibar

Table 54 (Continued)

1948 Day	GCT		Receiving station	Location of transmitters
	Beginning	End		
September	17	1125	1140	Somerton
				Argentina, Brazil, Gold Coast
	19	0648	0720	Brentwood
				Afghanistan, Bahrein I., Belgian Congo, Eritrea, India, Iran, Kenya, Palestine, Thailand, U.S.S.R., Zanzibar
	19	0645	0720	Somerton
				China, Union of S. Africa
	20	0720	0900	Brentwood
				Austria, Bahrein I., Belgian Congo, Eritrea, French Equatorial Africa, Greece, India, Iran, Kenya, Madagascar, Southern Rhodesia, Syria, Trans-Jordan, Turkey, U.S.S.R., Yugoslavia, Zanzibar
	20	0720	0900	Somerton
				Ceylon, China, Union of S. Africa
	22	0604	0620	Brentwood
				Bahrein I., Greece, India, Iran, Kenya, Southern Rhodesia, Syria, U.S.S.R., Zanzibar
	22	1615	1625	Somerton
				Argentina, Brazil, Canada

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 55

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

1948 Day	GCT		Location of transmitters
	Beginning	End	
July 6	1525	1600	Bolivia, France, Netherlands, New York, Switzerland

Table 56

Provisional Radio Propagation Quality Figures
 (Including Comparisons with CRPL Warnings and CRPL Probable Disturbed Period Forecasts)
August 1948

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

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

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

**In addition to date marked X, the following was designated as a probable disturbed day on forecasts more than eight days in advance of said date: August 28.

Table 57
American and Zürich Provisional Relative Sunspot Numbers
September 1948

Date	R _A *	R _Z **		Date	R _A *	R _Z **
1	148	138		16	209	181
2	169	142		17	242	208
3	152	123		18	250	228
4	153	113		19	265	222
5	123	103		20	250	213
6	89	82		21	243	203
7	65	50		22	258	237
8	72	75		23	267	221
9	82	68		24	255	216
10	92	56		25	186	170
11	127	73		26	183	159
12	160	95		27	177	115
13	194	114		28	153	148
14	189	132		29	155	130
15	190	134		30	139	147
				Mean:	174.6	143.2

*Combination of 47 observers; see page 8.

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

Table 58a

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

Date GCT	Degrees north of the solar equator															0°	Degrees south of the solar equator															P												
	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								
1948	-	-	-	-	-	-	-	-	-	-	4	6	2	3	8	10	10	9	5	4	4	2	-	-	-	-	-	-	-	-	-	-	-	-	420									
Sept.	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	3	5	4	4	3	3	4	5	5	3	3	-	-	-	-	420									
	2.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	4	4	3	-	-	-	-	-	-	-	-	-	-	420										
	3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	6	8	5	-	-	-	-	-	-	-	-	-	420										
	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420												
	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7	8	5	5	-	-	-	-	-	-	-	-	-	420										
	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	8	9	10	9	6	6	8	13	10	10	11	8	-	-	X	X	X	X	X	X	425				
	9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	10	11	12	11	14	12	13	12	10	12	14	13	13	10	8	7	6	-	X	X	X	X	X	X	425
	10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7	8	6	8	11	15	13	14	14	14	13	13	10	10	12	13	14	12	8	6	-	-	-	-	425
	11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	11	13	15	12	11	10	9	8	-	8	9	9	8	-	-	-	-	X	X	X	X	X	X	425
	12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	8	8	11	9	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425		
	20.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	11	5	3	5	5	7	10	6	2	-	-	-	-	-	-	-	-	-	-	-	425		
	21.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10	14	9	4	3	4	4	5	2	-	-	-	-	-	-	-	-	-	-	-	425		
	23.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	16	15	13	10	7	9	13	14	12	9	10	5	-	-	-	-	-	-	-	-	425			
	25.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	7	9	9	-	-	-	7	10	11	11	12	10	7	-	-	X	X	X	X	X	X	425		

Table 59a

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

Table 58b

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

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator															p										
	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						
1948	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	8	9	9	11	14	12	5	4	3	-	-	-	-	-	-	420								
Sept.1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	9	10	9	9	10	12	7	-	-	-	-	-	-	-	-	420								
2.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	8	7	7	8	7	-	-	-	-	-	-	-	-	-	420								
3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	8	7	7	8	7	-	-	-	-	-	-	-	-	-	420								
4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420										
5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420								
8.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	425									
9.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	425									
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	9	13	15	11	9	10	10	12	16	12	5	-	-	-	-	425									
11.9	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	8	9	10	10	10	7	6	5	5	5	-	-	-	-	-	-	425									
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425										
20.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7	6	6	5	2	-	-	-	-	-	-	-	-	-	-	425									
21.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	4	5	6	6	12	15	13	11	10	10	9	9	10	11	5	-	-	-	-	425				
23.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	2	8	8	7	10	15	12	13	13	16	15	13	14	10	8	5	4	3	2	-	-	-	425
25.7a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	425						

Table 59b

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

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator															P						
	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		
1948	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	2	-	1	1	3	1	7	8	1	1	-	-	-	-	-	-	
Sept. 1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-	-	1	3	5	1	-	-	-	-	-	-	-	420	
2.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420			
3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	1	-	-	-	-	-	-	-	-	420		
4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420		
5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420		
8.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	425
9.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	425
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	3	-	-	-	7	6	-	-	-	-	-	-	-	-	-	-	425	
11.9	X	X	X	X	X	X	X	X	X	-	-	-	-	-	-	-	-	-	2	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	425
20.9a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	425
21.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	425
23.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	425
25.7a	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	425

Table 60a

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

Table 60b

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

GRAPHS OF IONOSPHERIC DATA

42

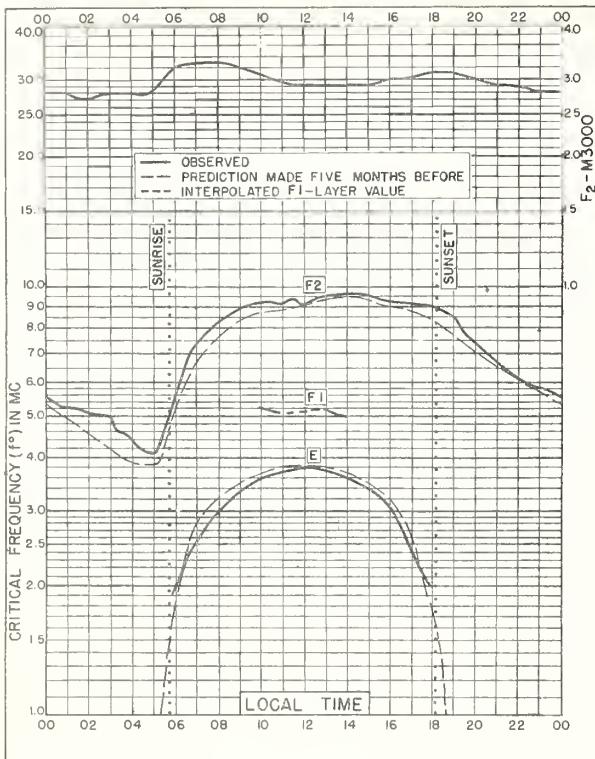


Fig. 1. WASHINGTON, D.C.
39.0°N 77.5°W

SEPTEMBER 1948

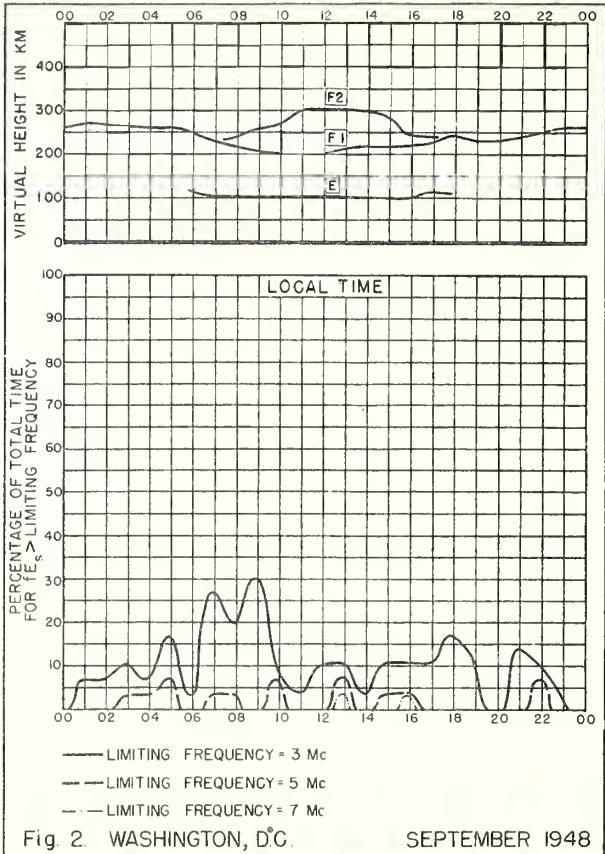


Fig. 2. WASHINGTON, D.C.

SEPTEMBER 1948

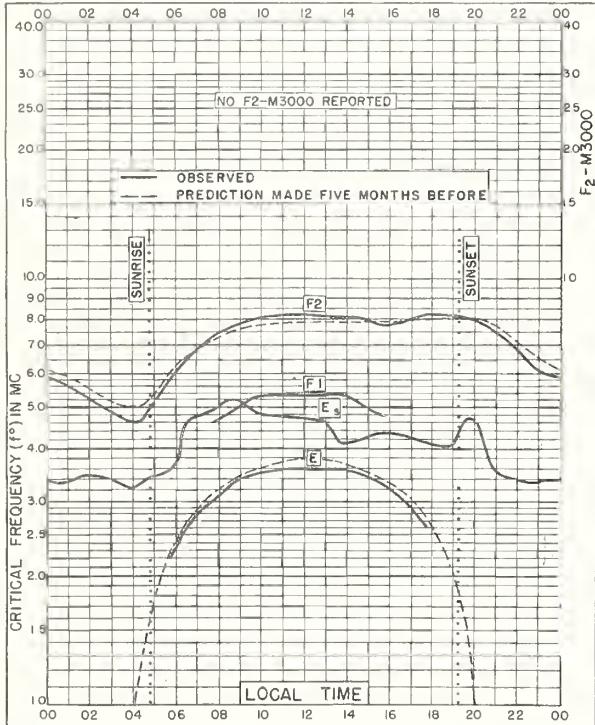


Fig. 3. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E

AUGUST 1948

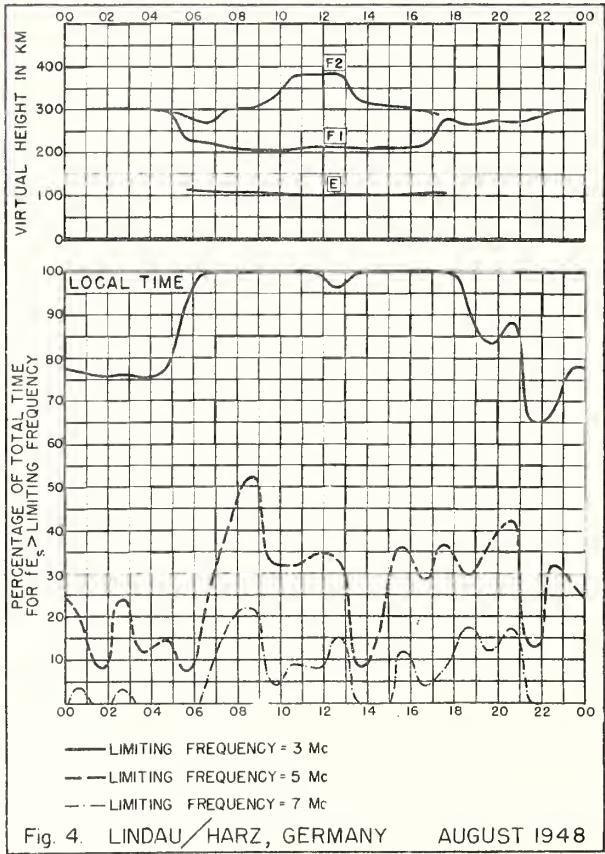


Fig. 4. LINDAU/HARZ, GERMANY

AUGUST 1948

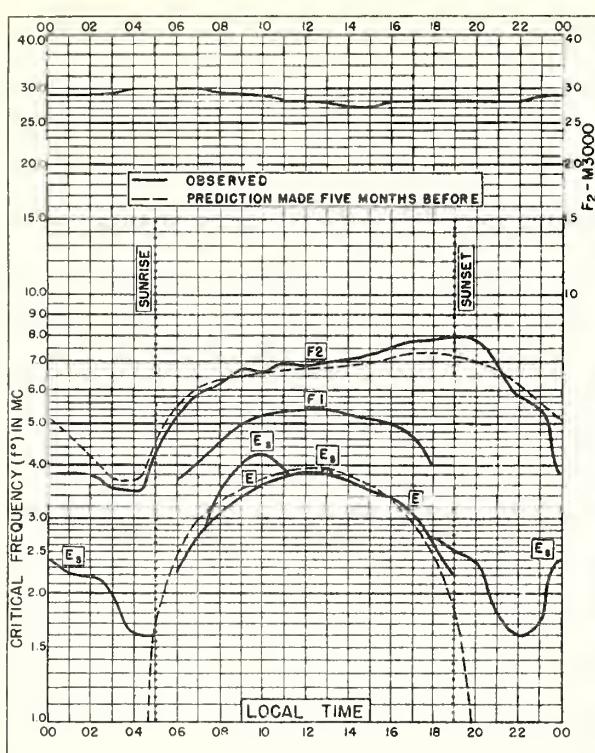


Fig. 5. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W AUGUST 1948

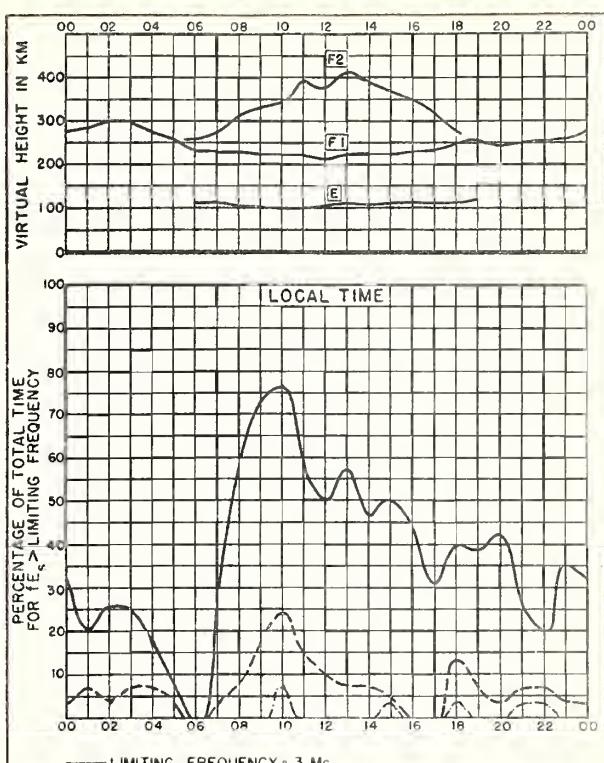


Fig. 6. ST. JOHN'S, NEWFOUNDLAND AUGUST 1948

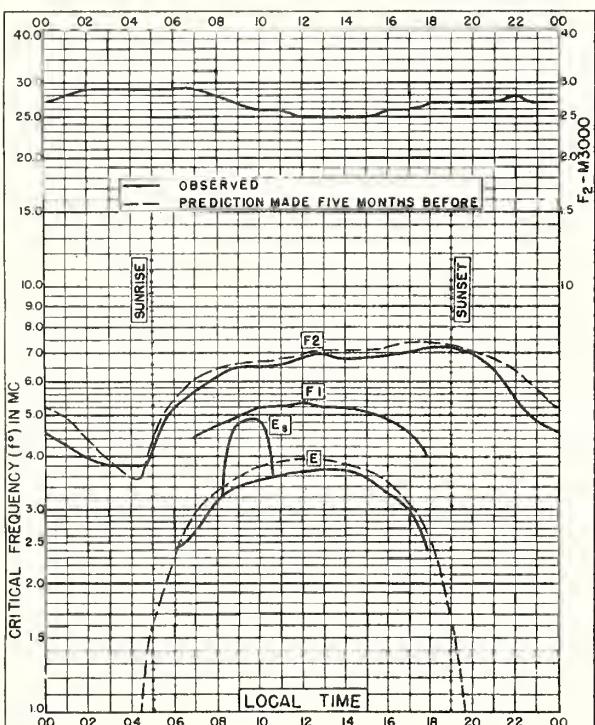


Fig. 7. OTTAWA, CANADA
45. 5°N, 75. 8°W AUGUST 1948

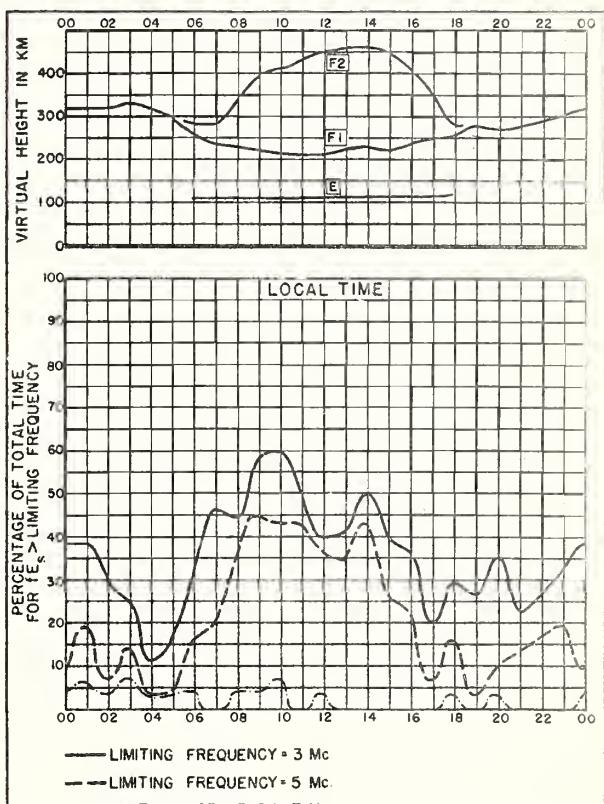
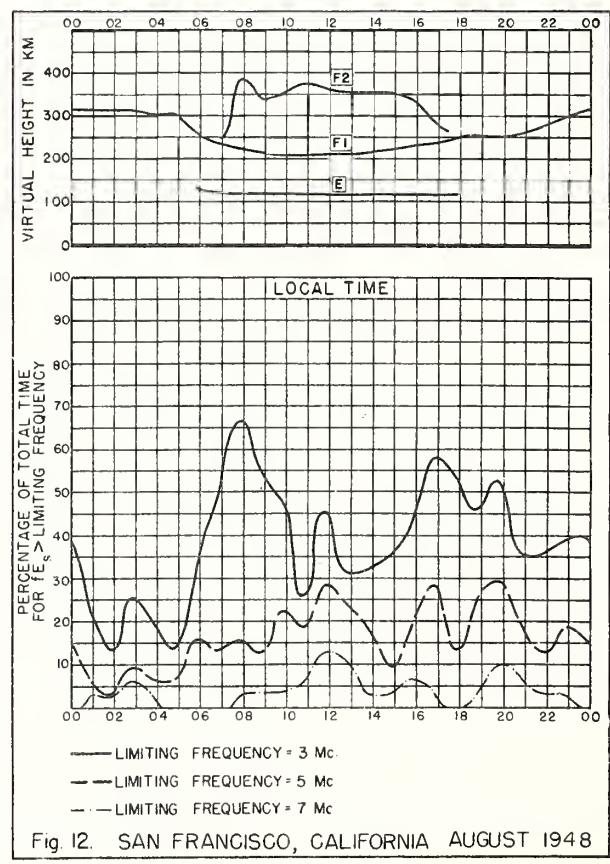
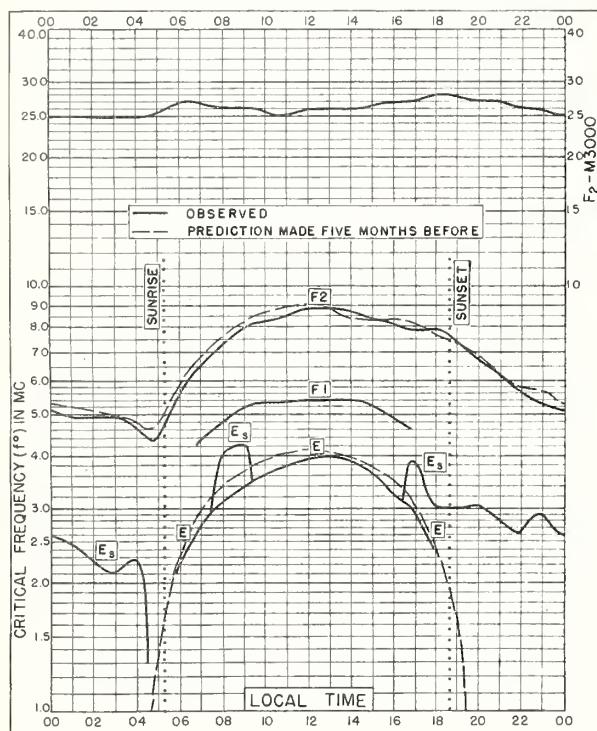
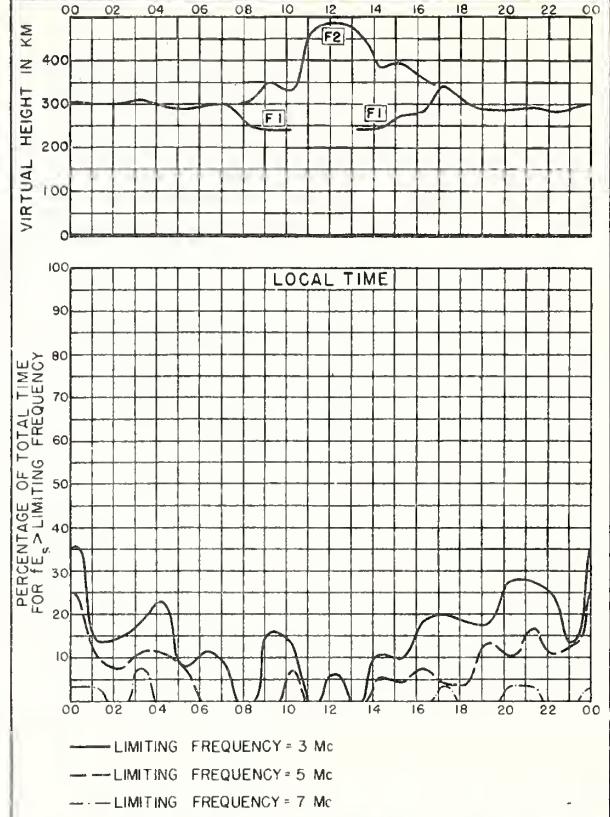
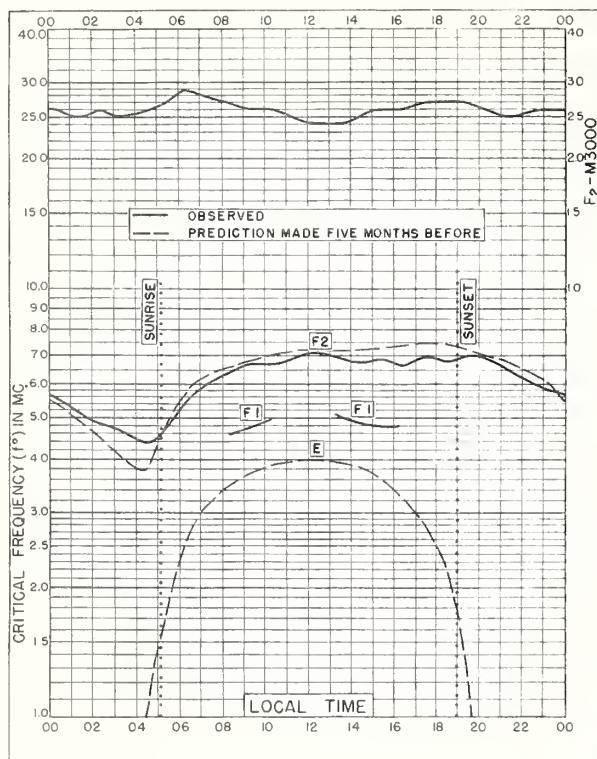
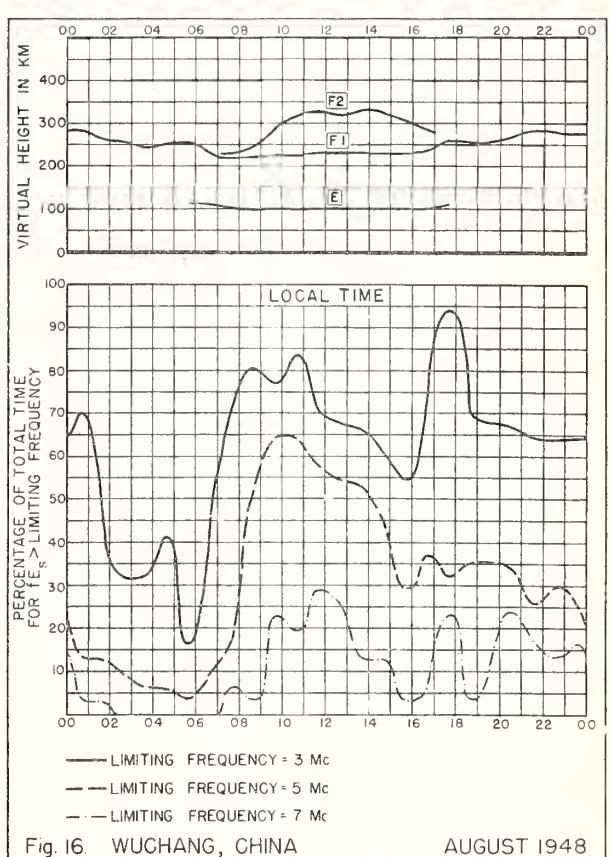
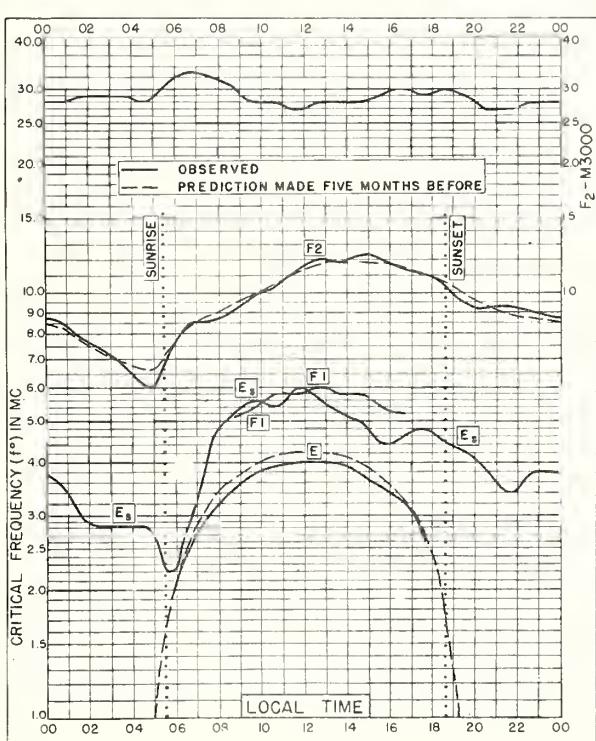
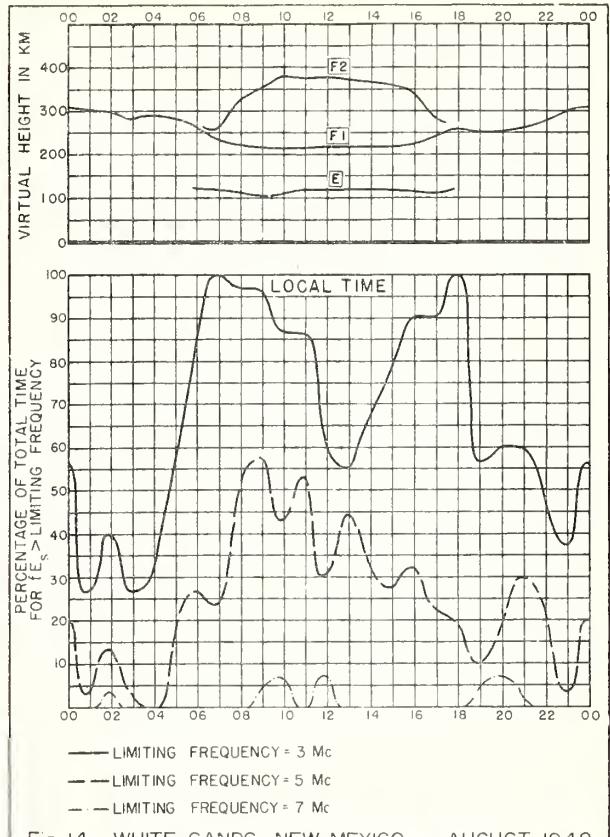
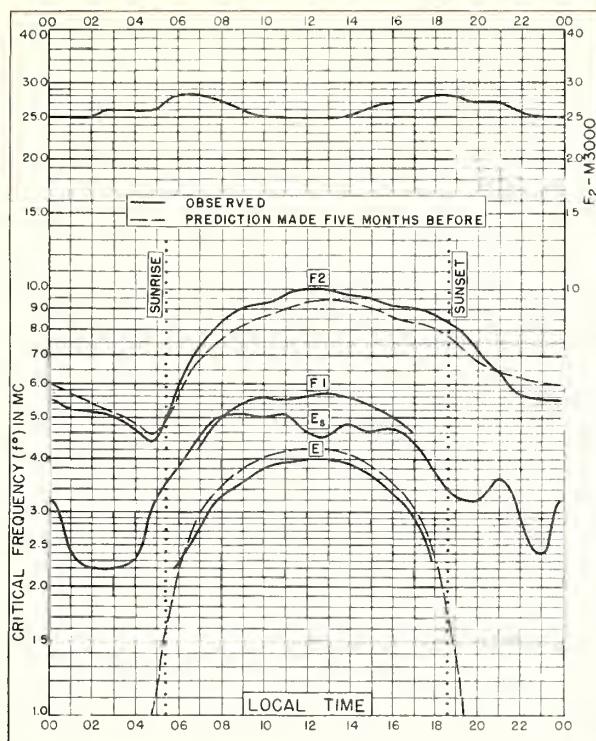


Fig. 8. OTTAWA, CANADA AUGUST 1948





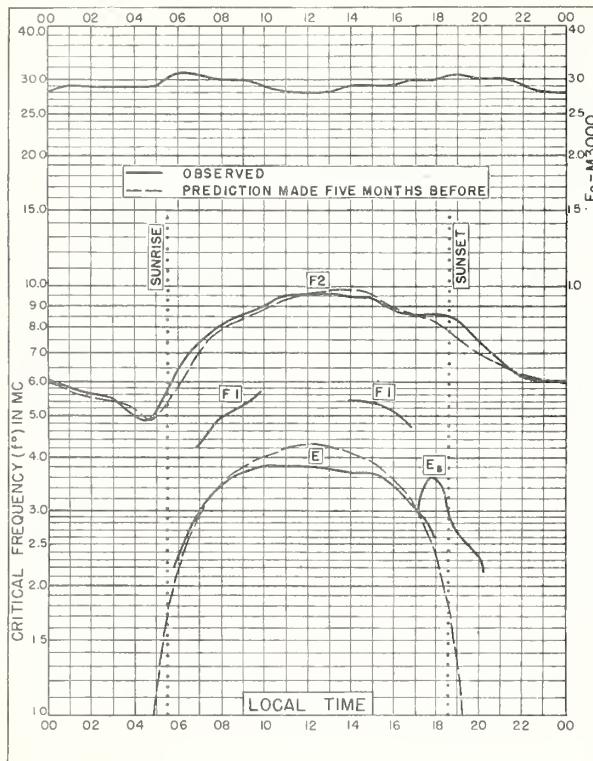


Fig. 17. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W AUGUST 1948

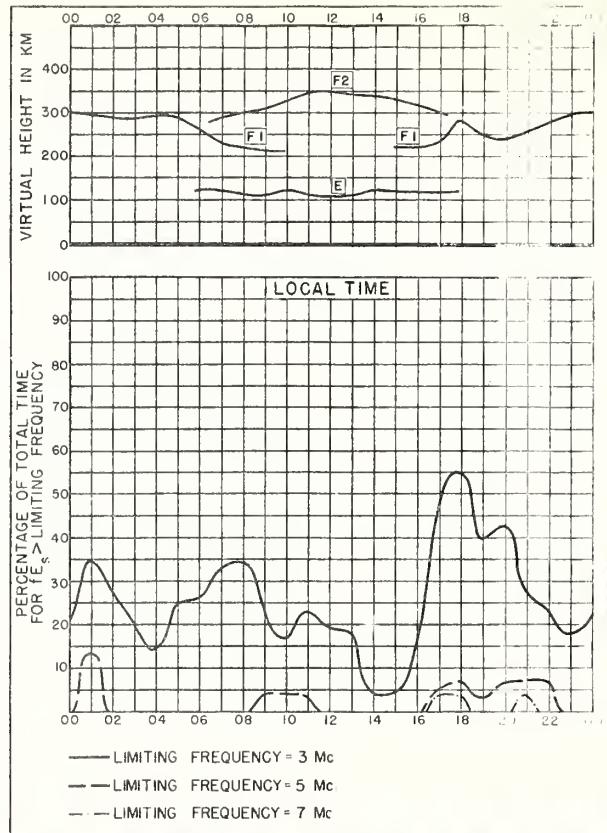


Fig. 18. BATON ROUGE, LOUISIANA AUGUST 1948

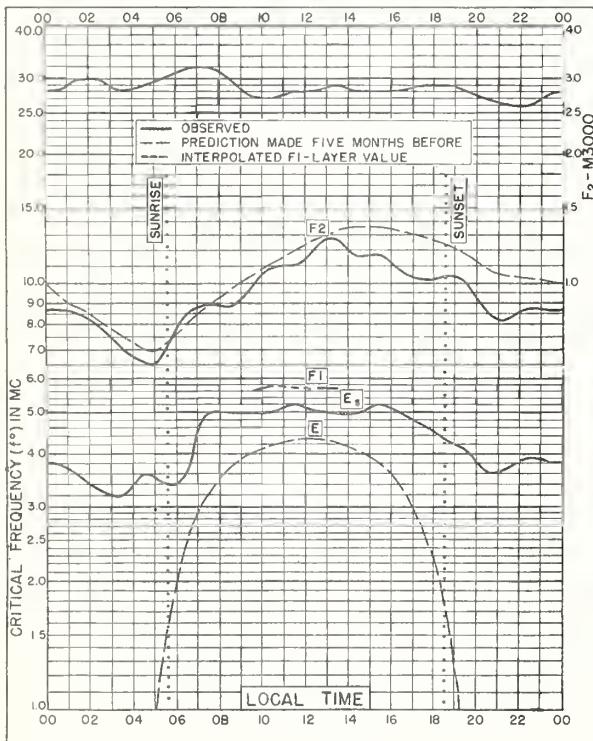


Fig. 19. OKINAWA I.
26.3°N, 127.7°E AUGUST 1948

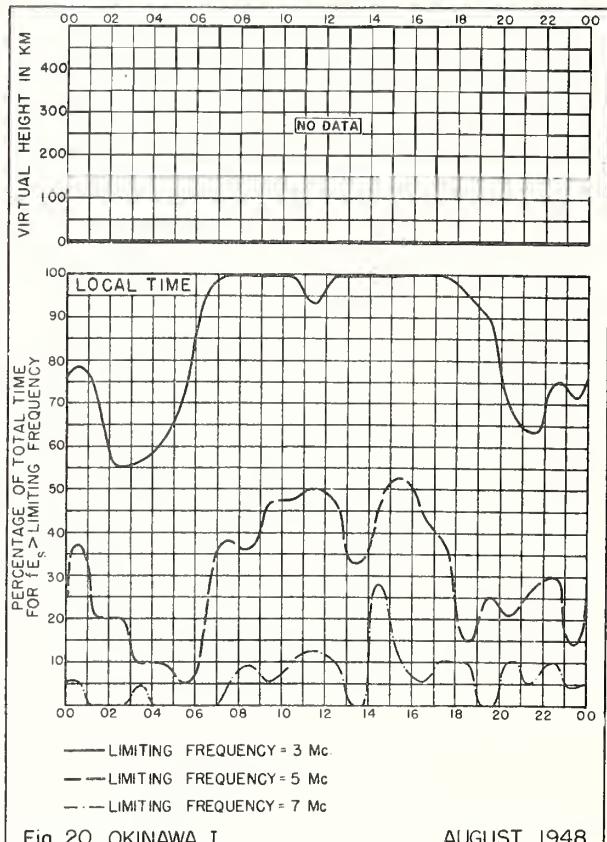


Fig. 20. OKINAWA I. AUGUST 1948

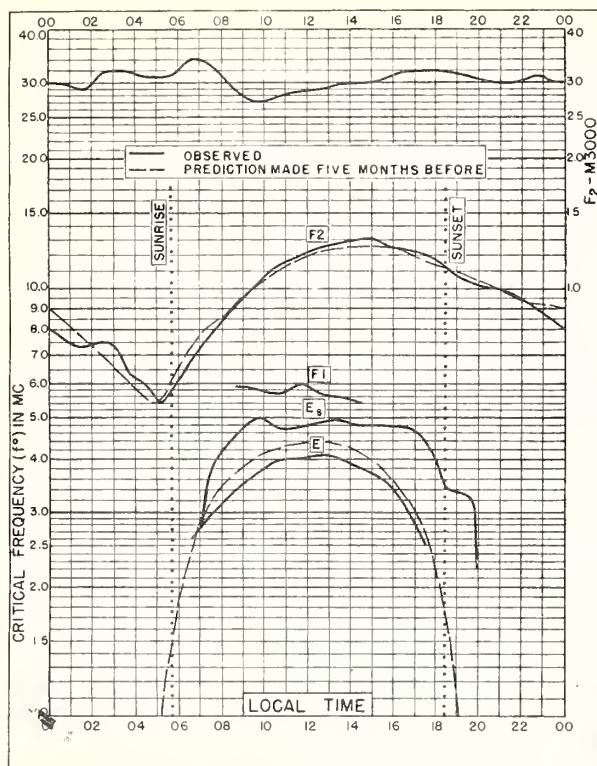


Fig. 21. MAUI, HAWAII

20.8°N, 156.5°W

AUGUST 1948

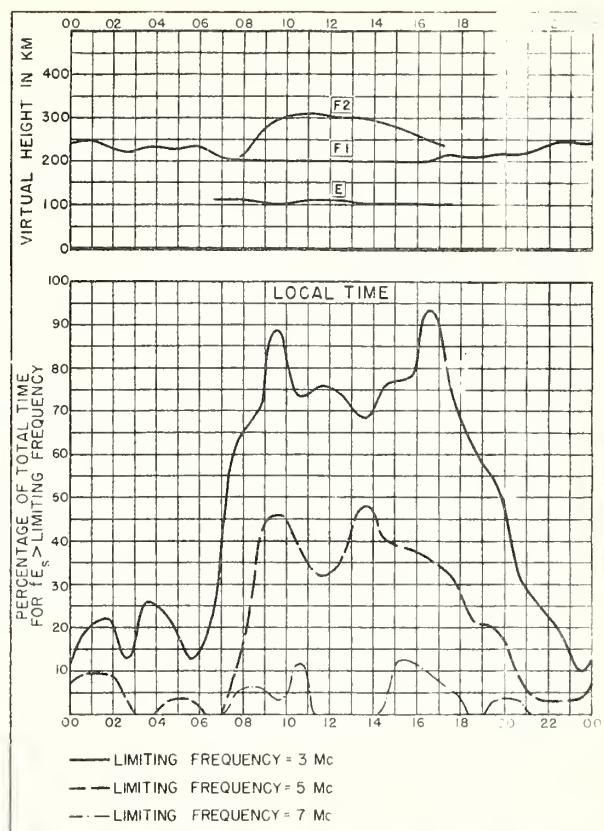


Fig. 22. MAUI, HAWAII

AUGUST 1948

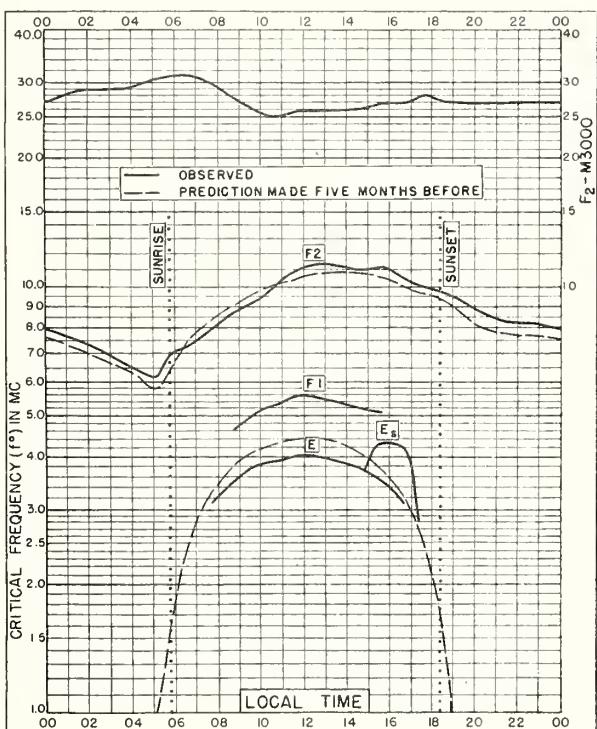


Fig. 23. SAN JUAN, PUERTO RICO

18.4°N, 66.1°W

AUGUST 1948

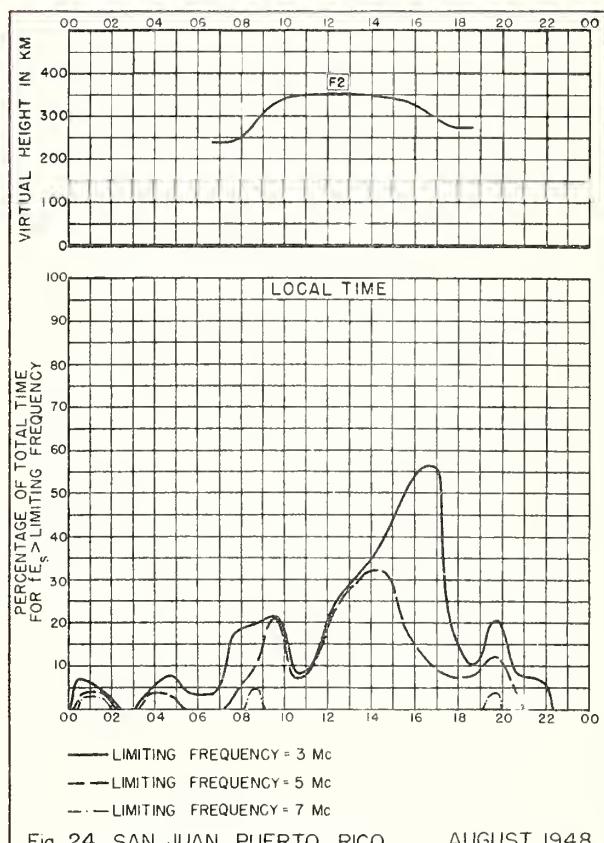


Fig. 24. SAN JUAN, PUERTO RICO

AUGUST 1948

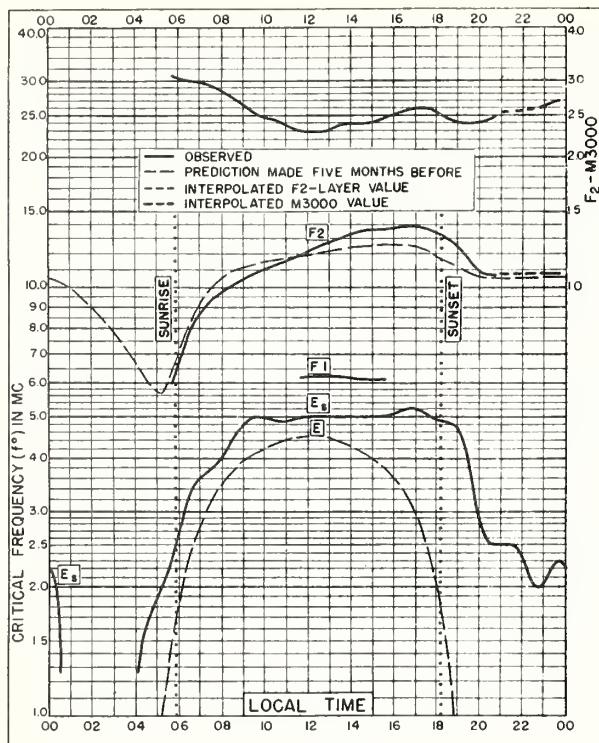


Fig. 25 GUAM I.
13.6°N, 144.9°E AUGUST 1948

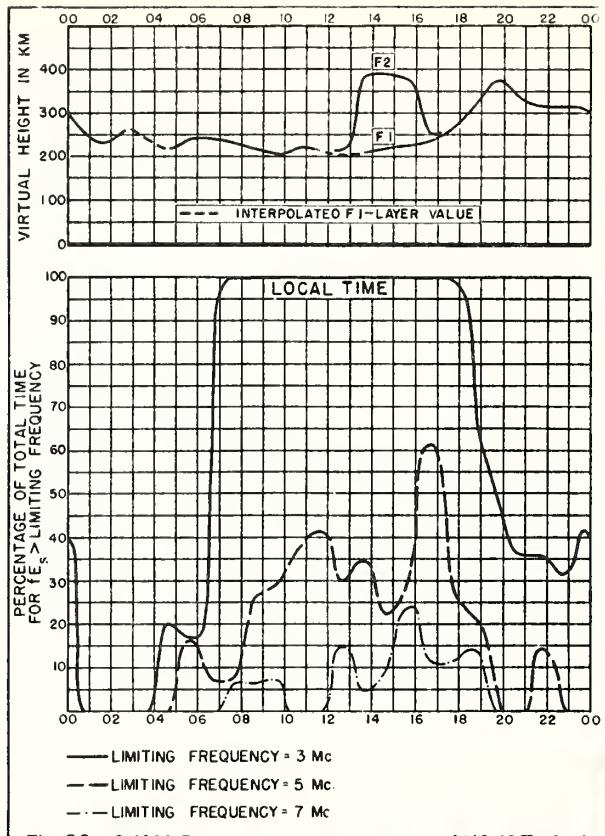


Fig. 26 GUAM I. AUGUST 1948

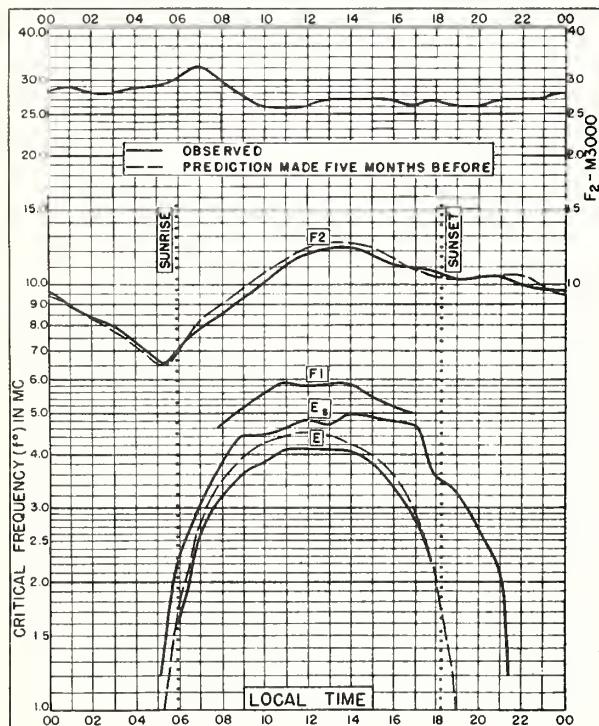


Fig. 27 TRINIDAD, BRIT. WEST INDIES
10.6°N, 61.2°W AUGUST 1948

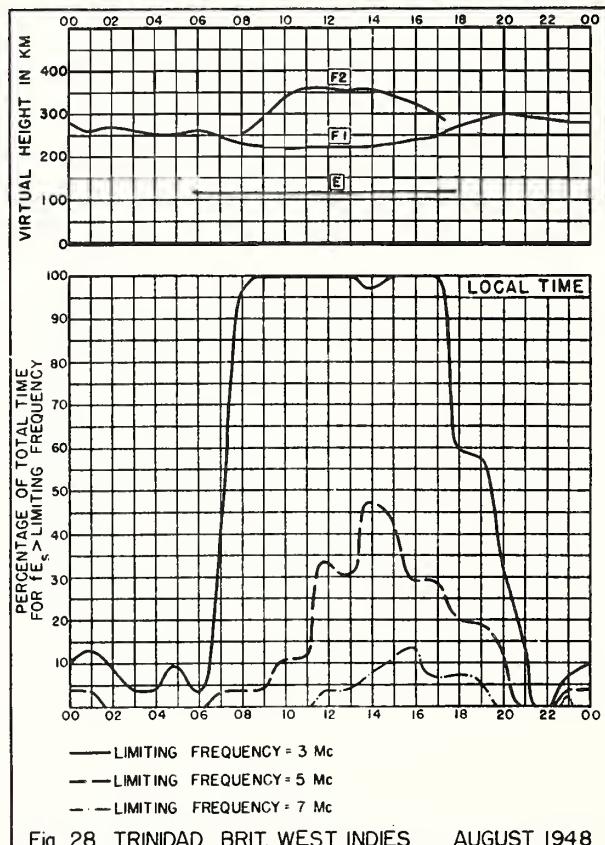
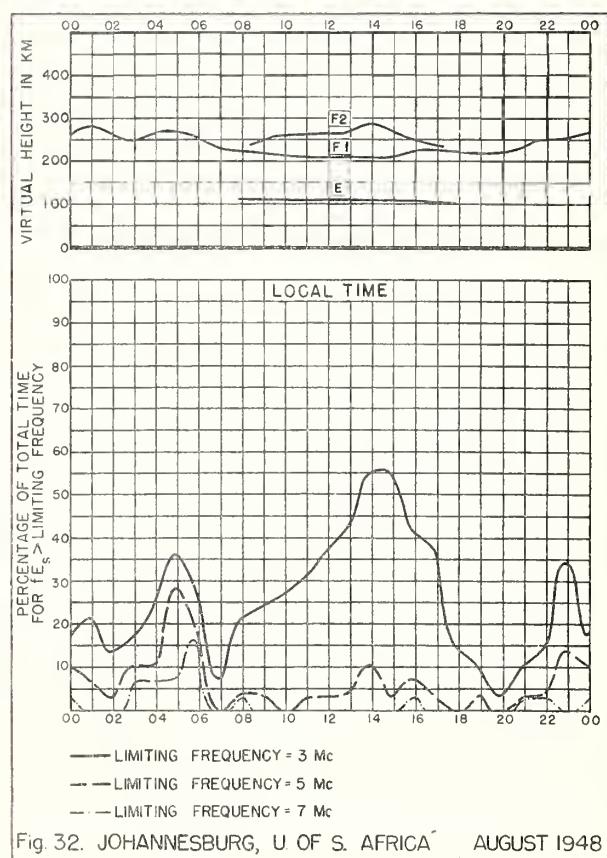
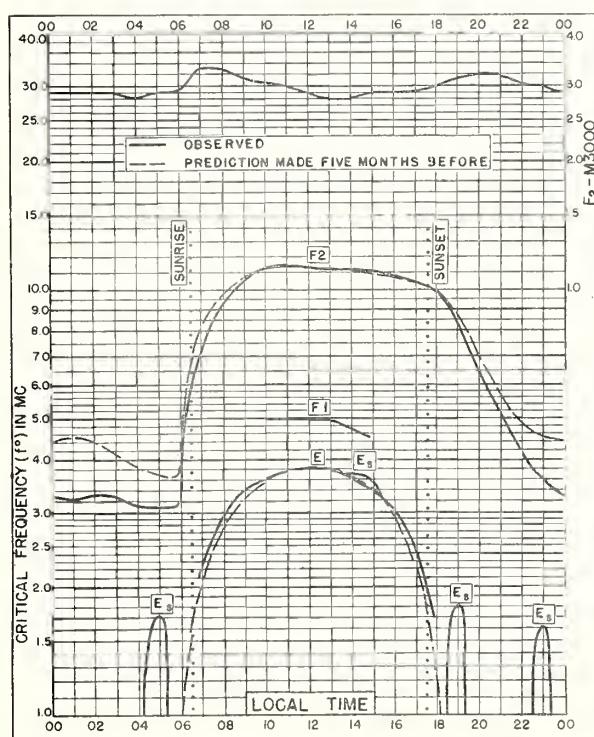
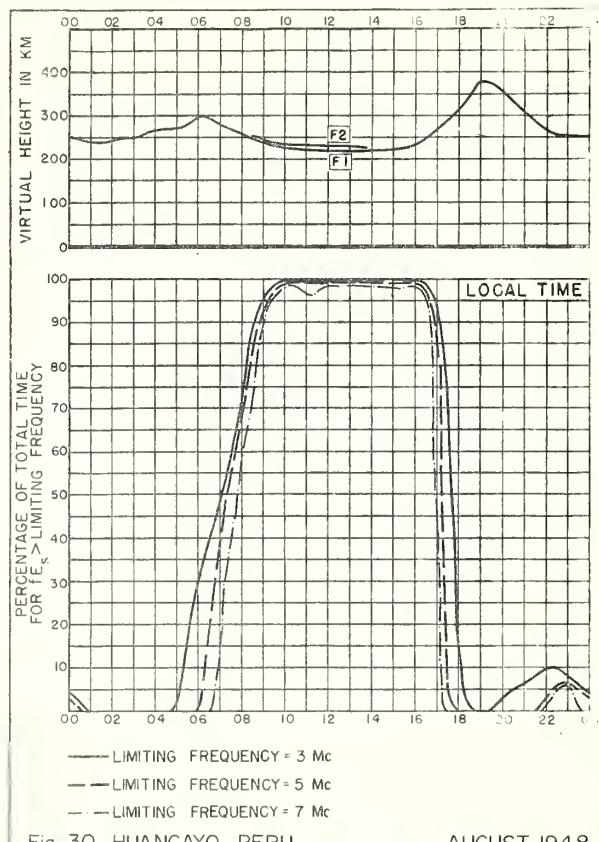
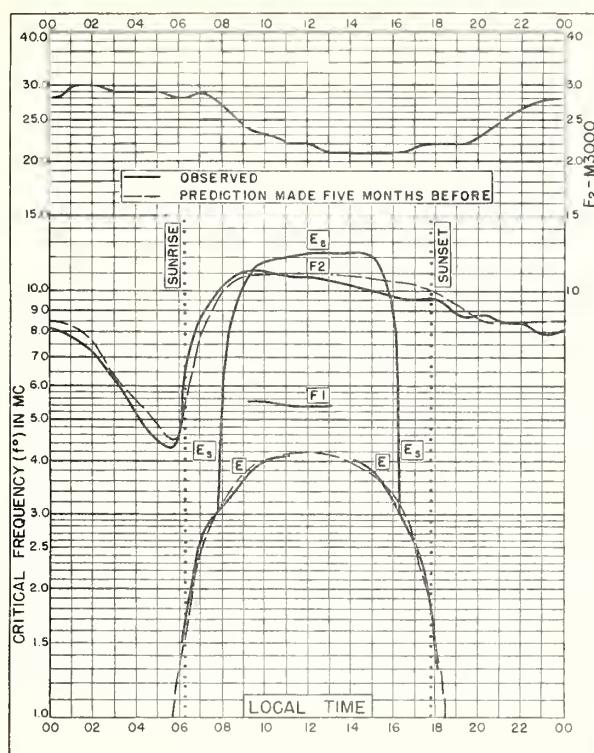


Fig. 28 TRINIDAD, BRIT. WEST INDIES AUGUST 1948



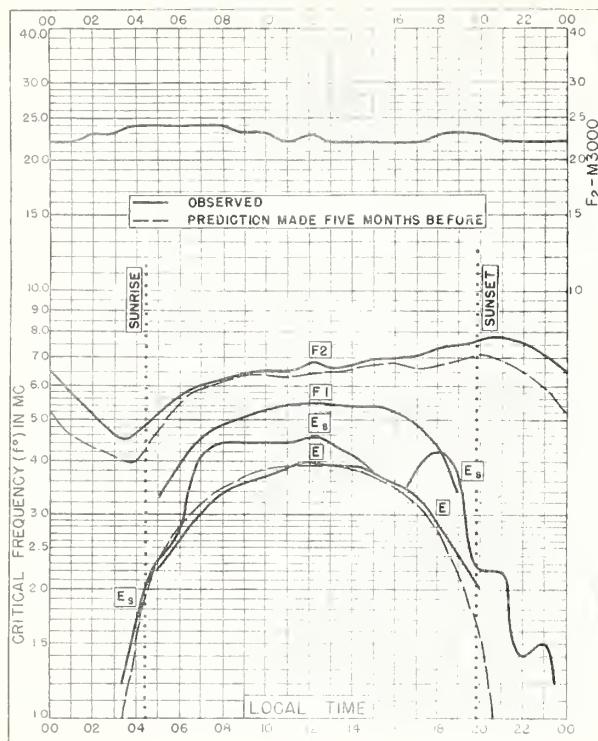


Fig. 33. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W JULY 1948

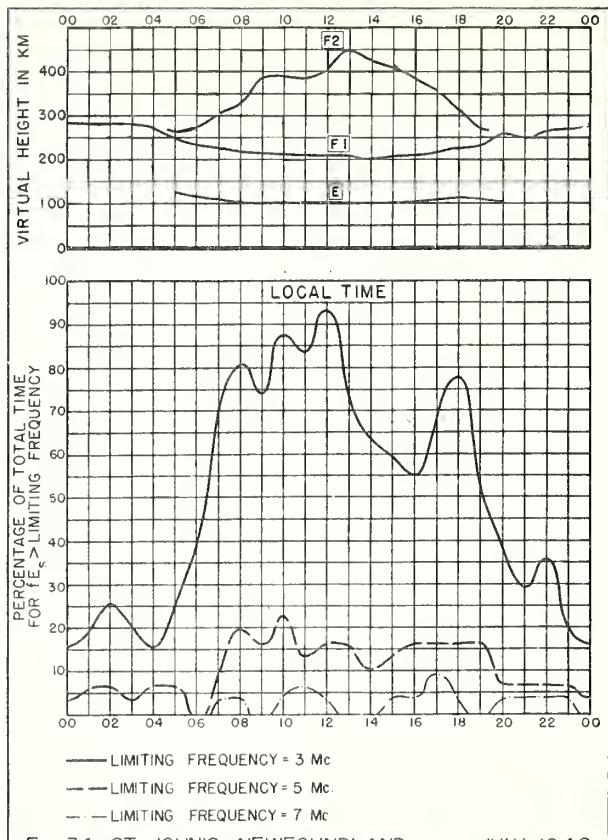


Fig. 34 ST. JOHN'S, NEWFOUNDLAND JULY 1948

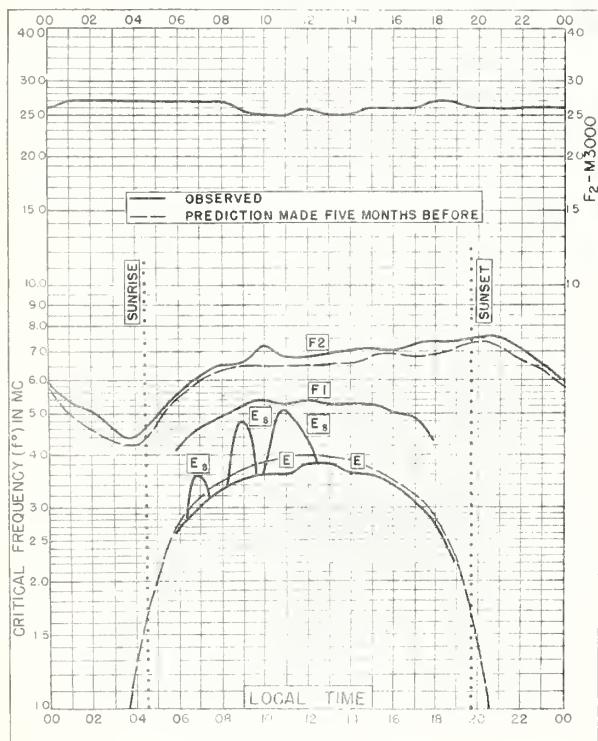


Fig. 35 OTTAWA, CANADA
45.5°N, 75.8°W JULY 1948

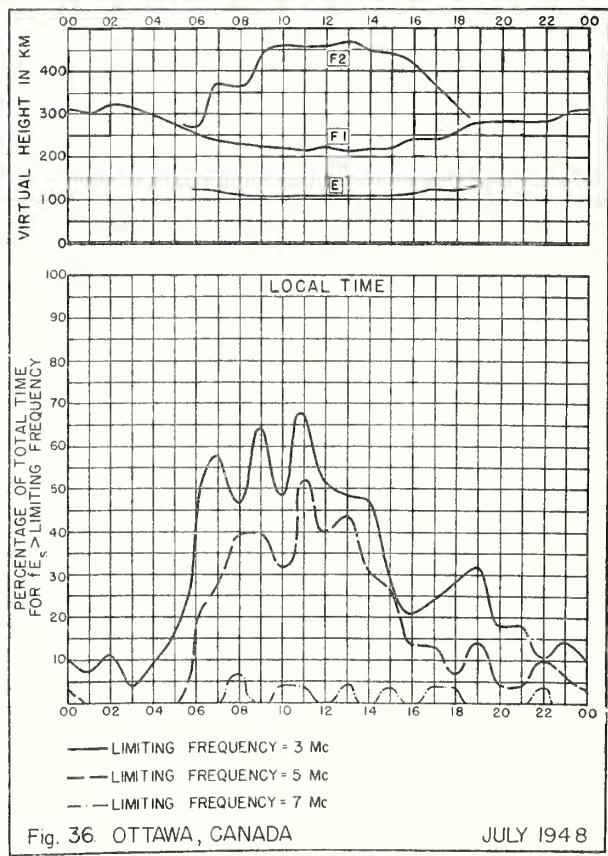
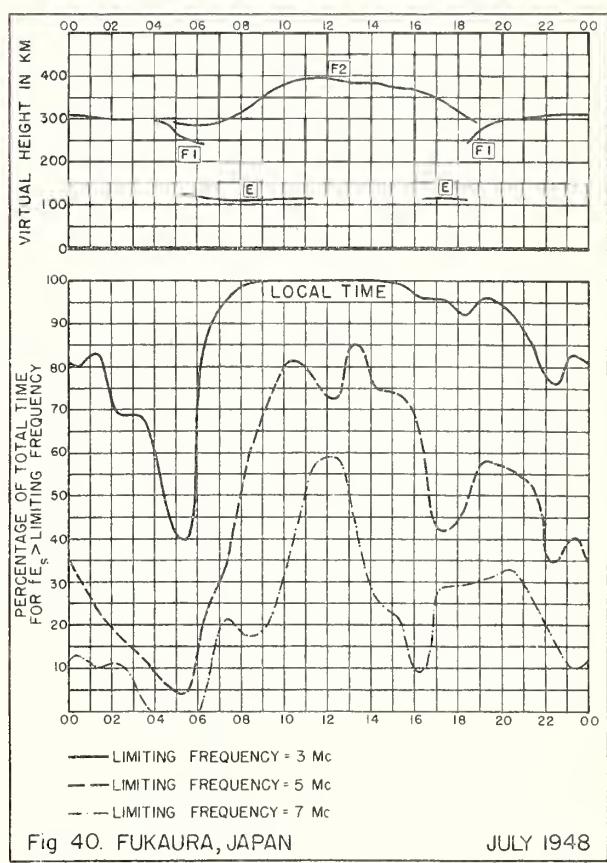
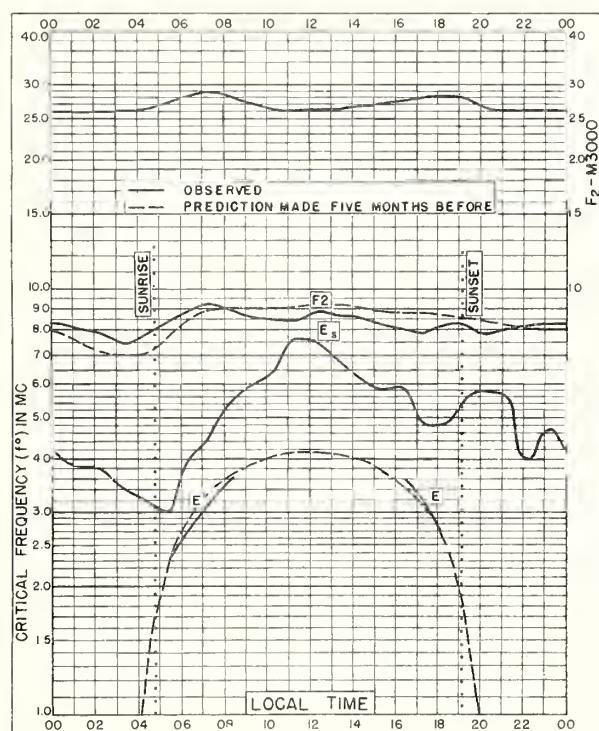
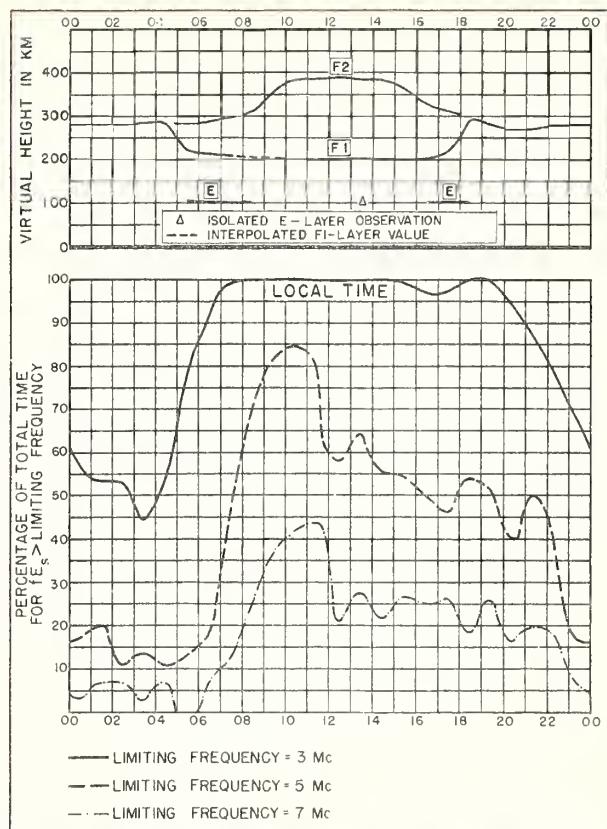
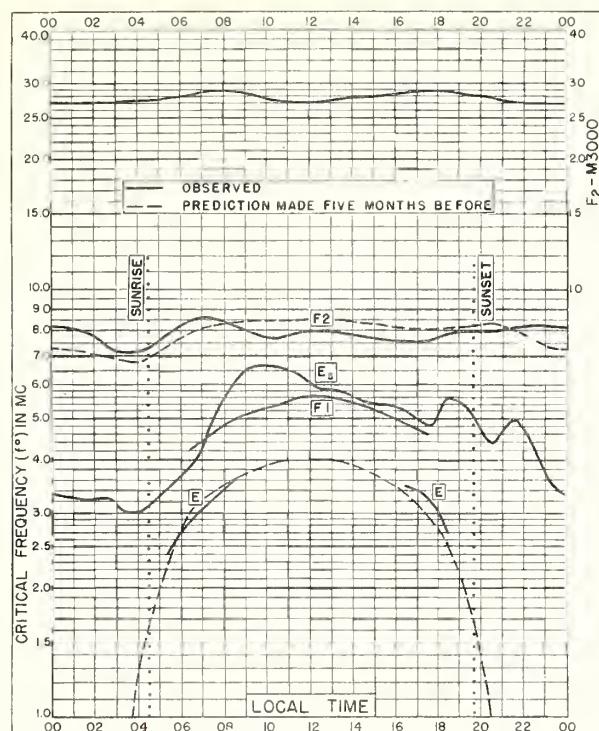


Fig. 36 OTTAWA, CANADA JULY 1948



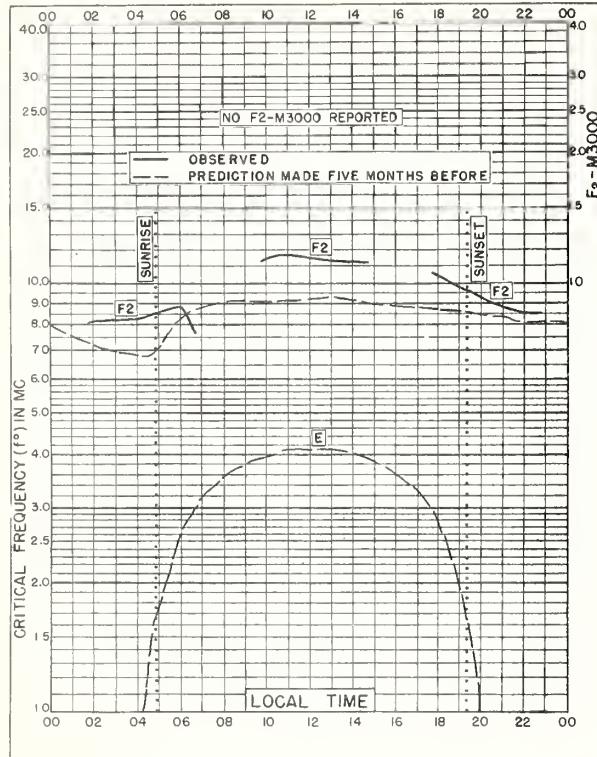


Fig. 41. PEIPING, CHINA
39.9°N, 116.4°E JULY 1948

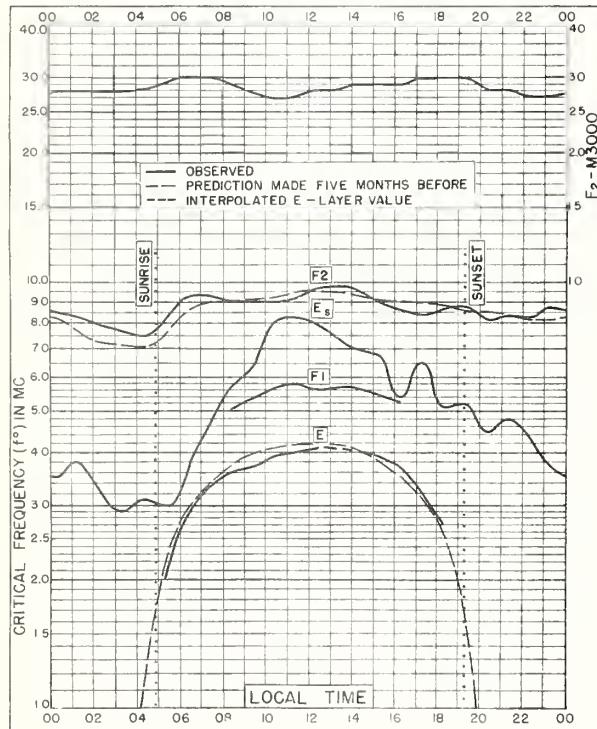


Fig. 42. SHIBATA, JAPAN
37.9°N, 139.3°E JULY 1948

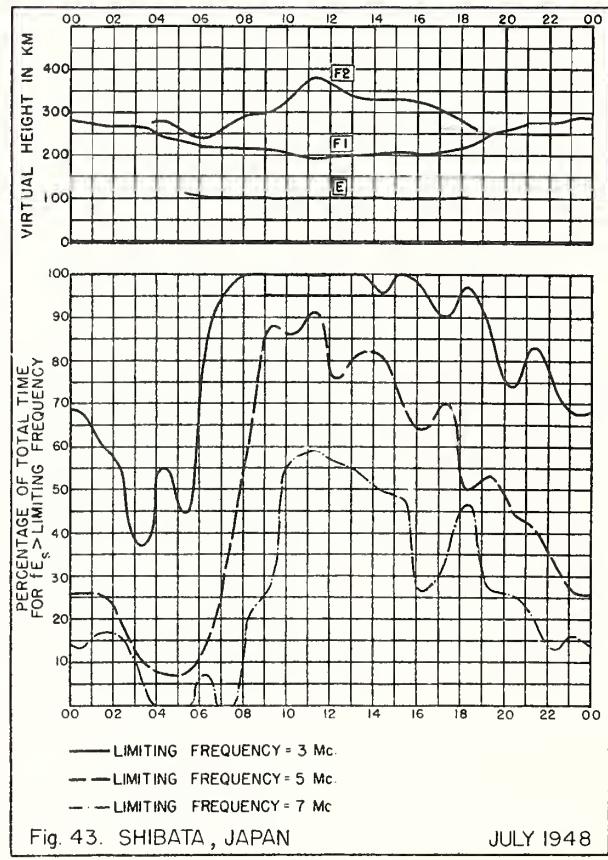


Fig. 43. SHIBATA, JAPAN JULY 1948

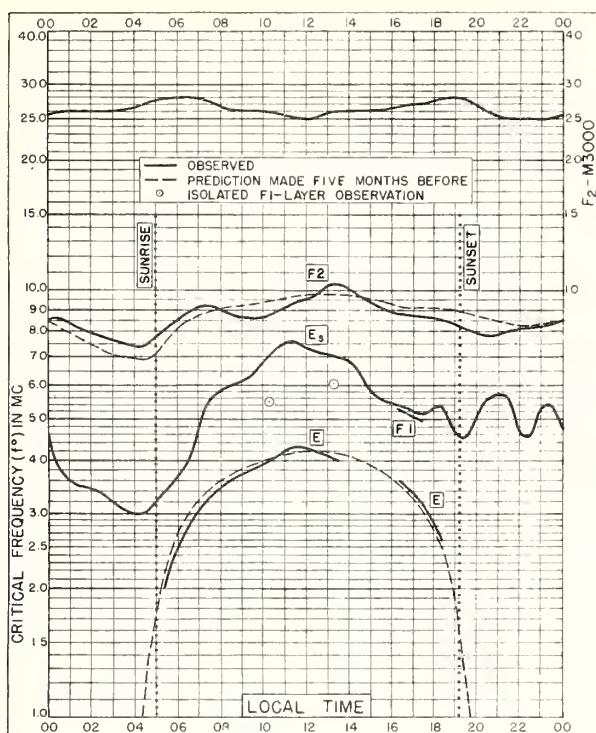


Fig. 44. TOKYO, JAPAN

35.7°N, 139.5°E

JULY 1948

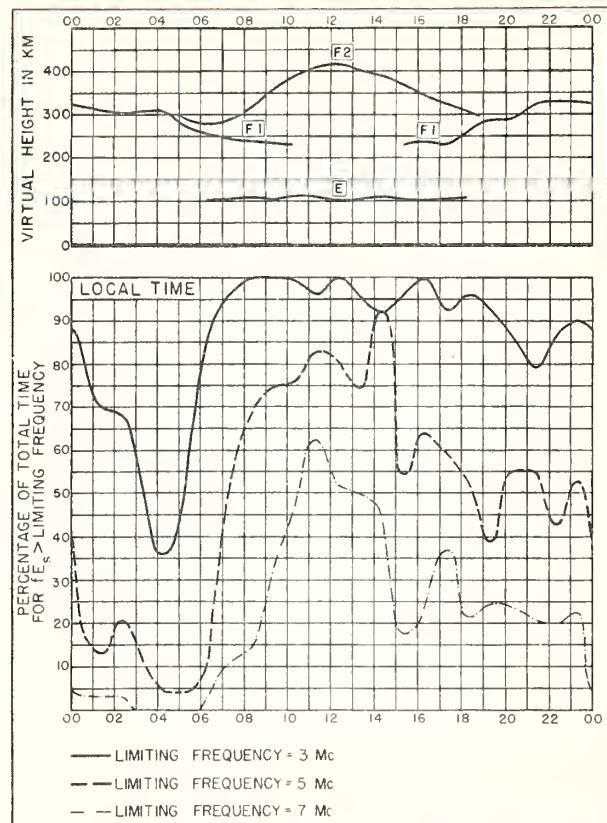


Fig. 45. TOKYO, JAPAN

JULY 1948

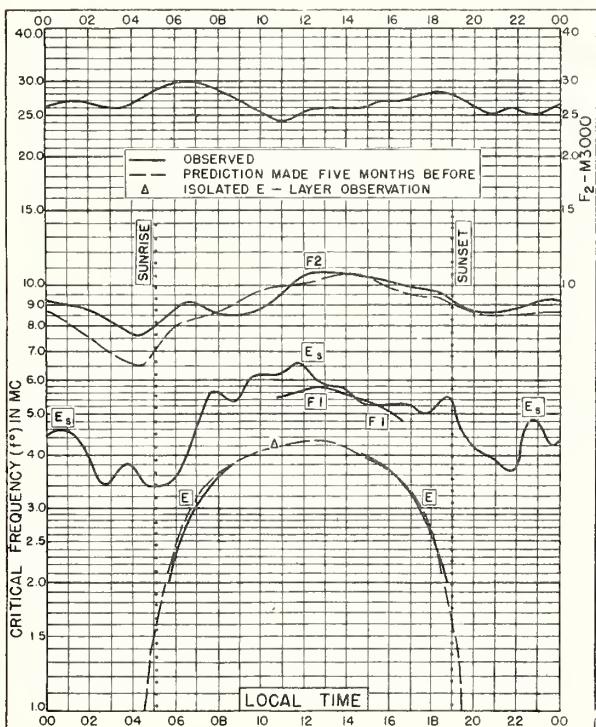


Fig. 46. YAMAKAWA, JAPAN

31.2°N, 130.6°E

JULY 1948

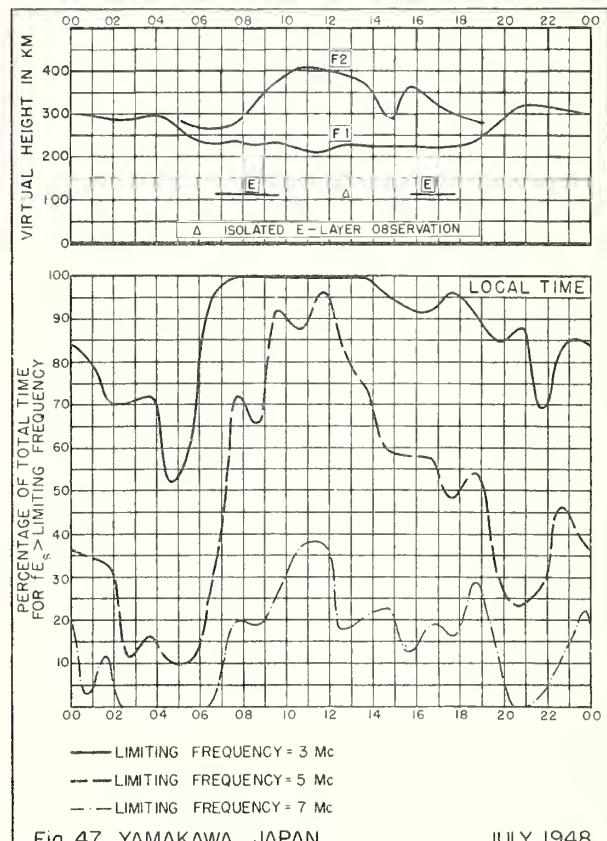


Fig. 47. YAMAKAWA, JAPAN

JULY 1948

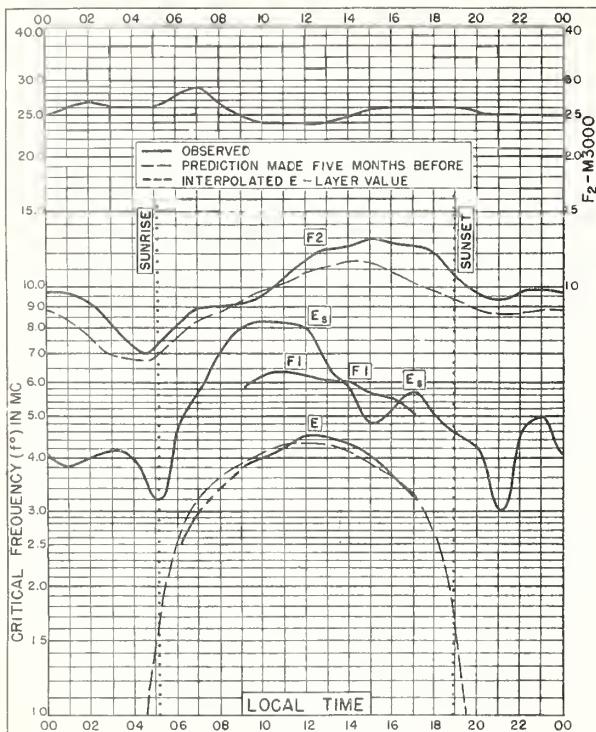


Fig. 48. CHUNGKING, CHINA
29.4°N, 106.8°E JULY 1948

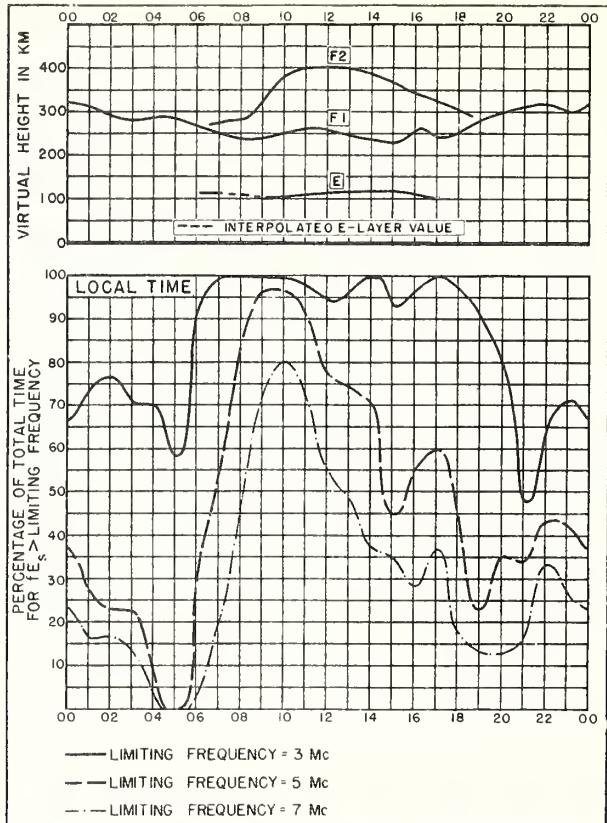


Fig. 49. CHUNGKING, CHINA JULY 1948

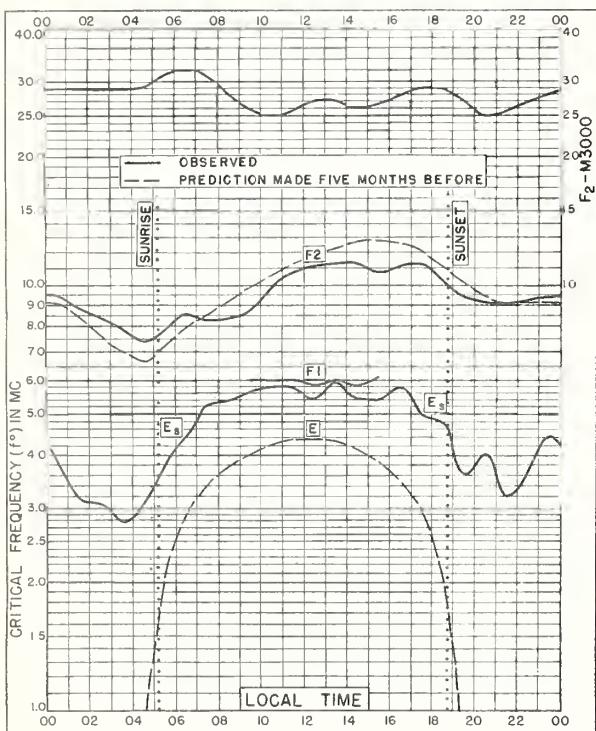


Fig. 50. OKINAWA I.
26.3°N, 127.7°E JULY 1948

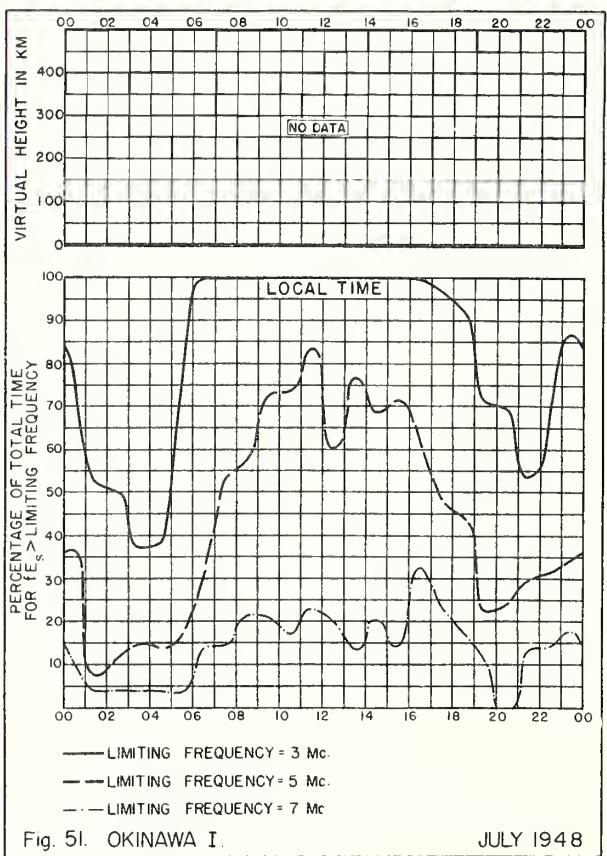
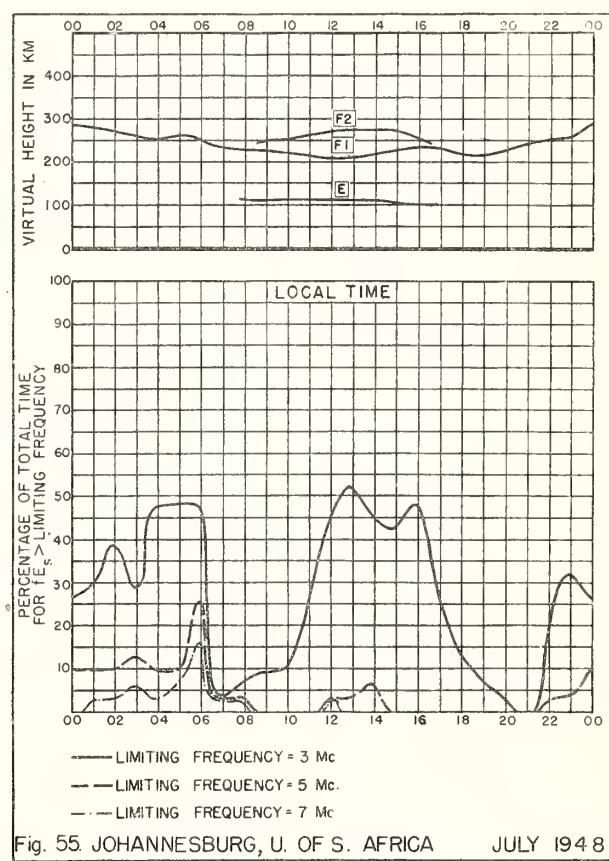
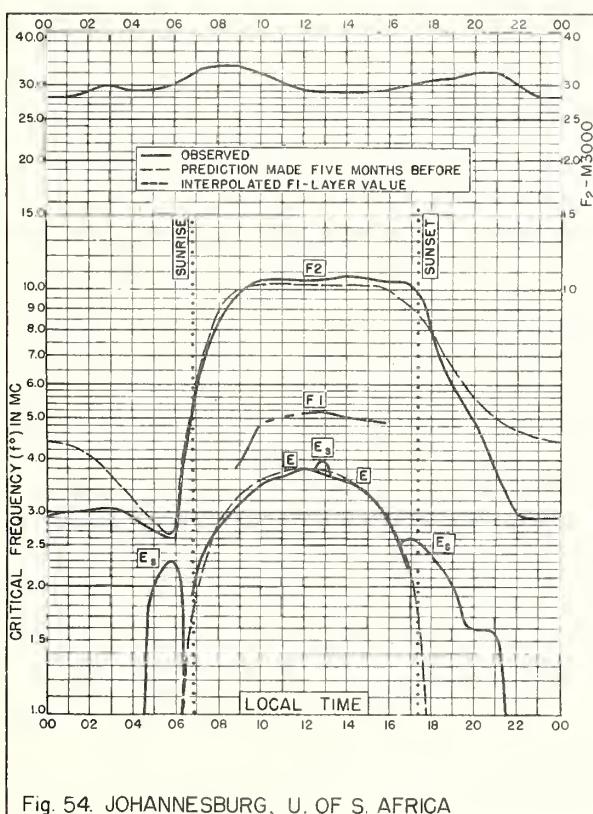
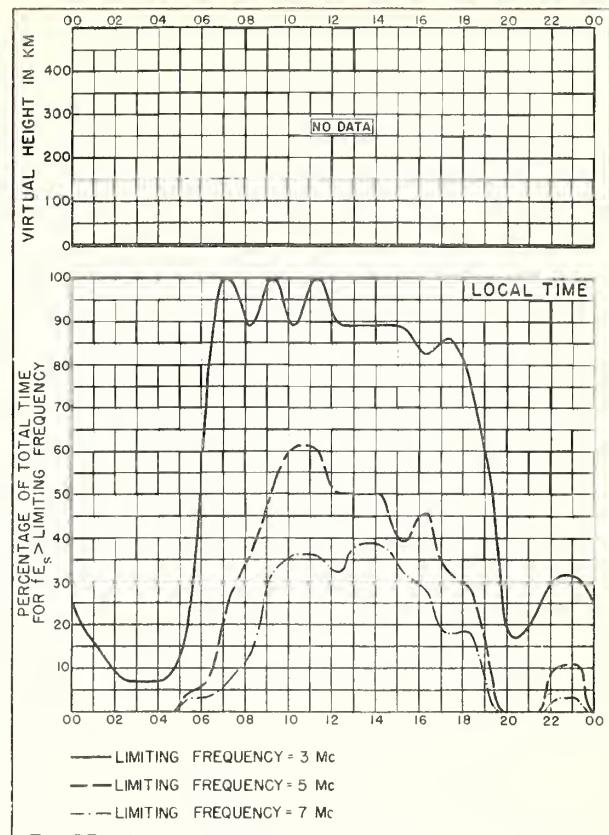
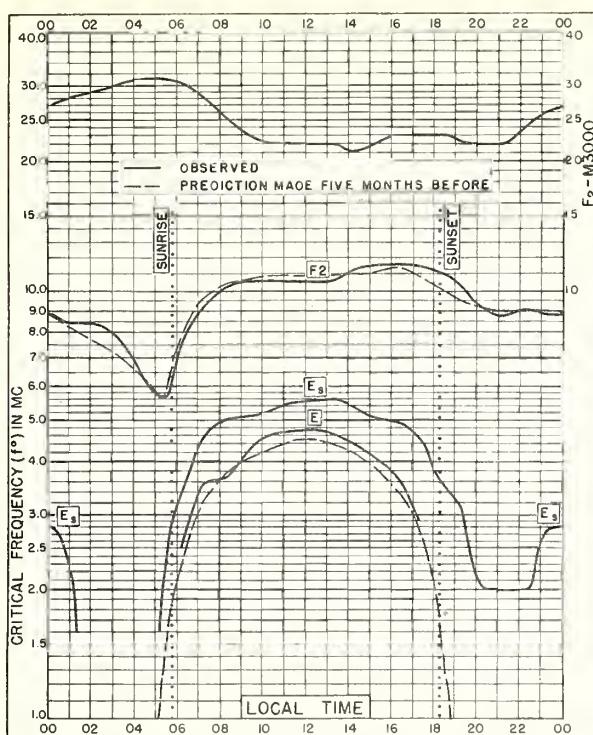


Fig. 51. OKINAWA I. JULY 1948



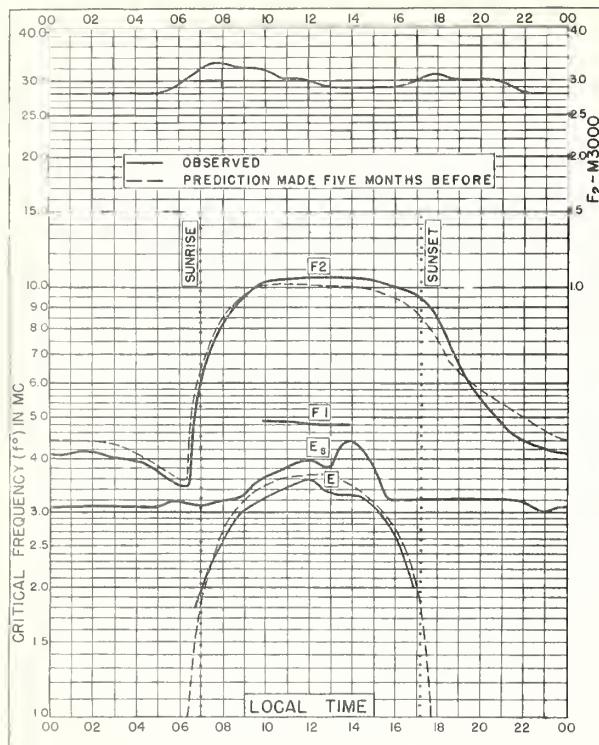


Fig. 56. WATHEROO, W. AUSTRALIA

30.3°S, 115.9°E

JULY 1948

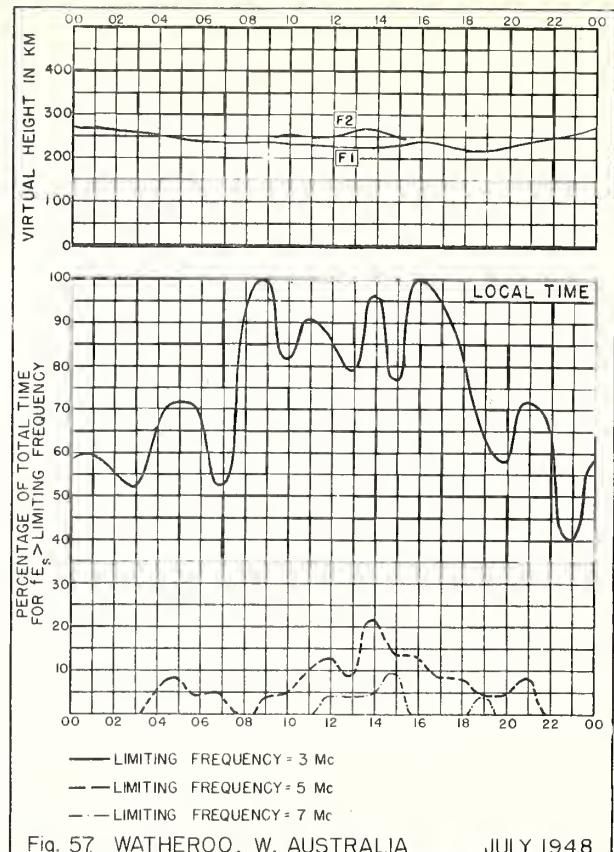


Fig. 57. WATHEROO, W. AUSTRALIA

JULY 1948

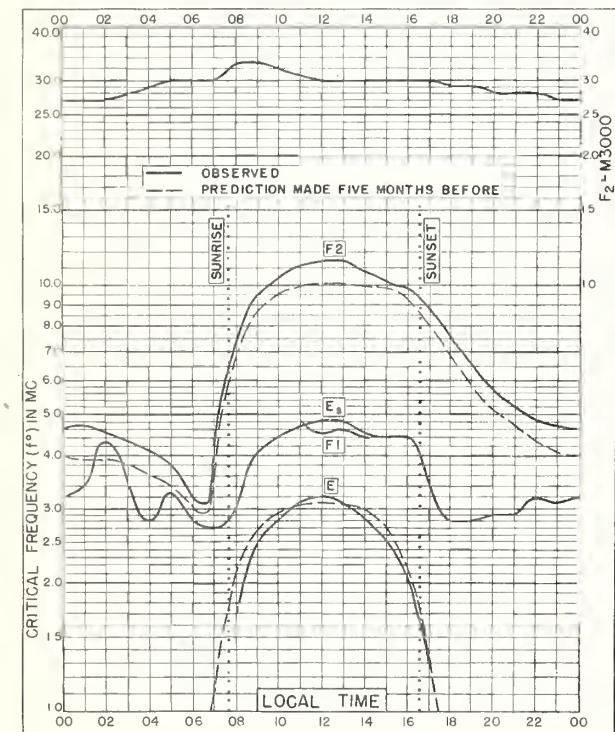


Fig. 58. CHRISTCHURCH, N. Z.

43.5°S, 172.7°E

JULY 1948

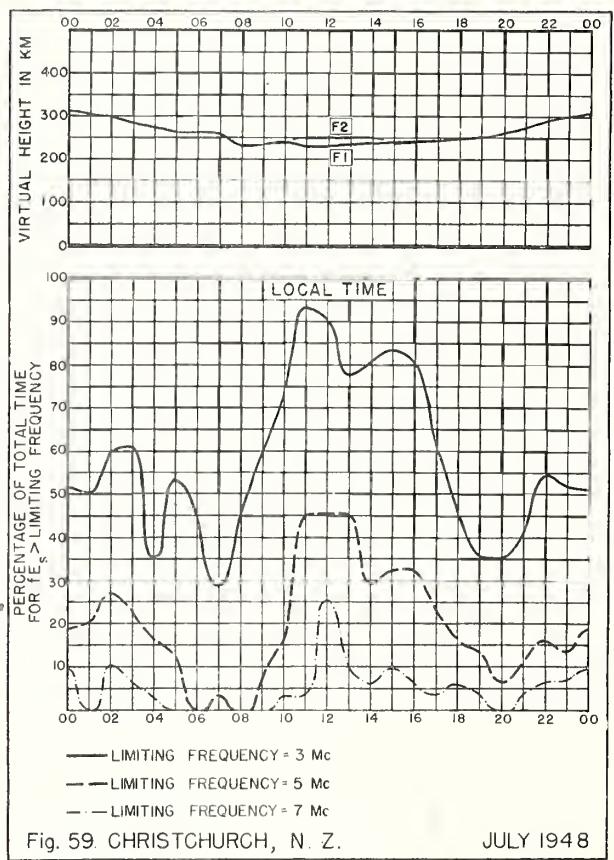
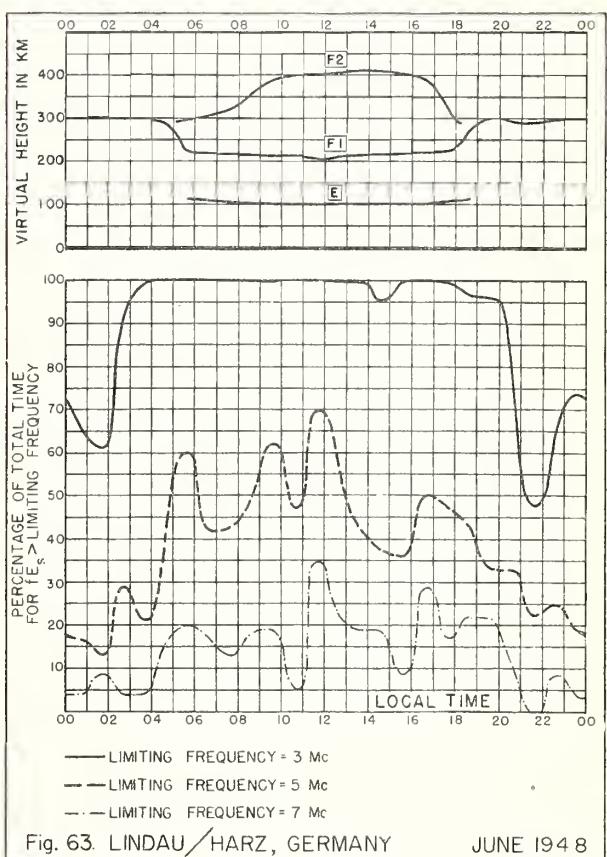
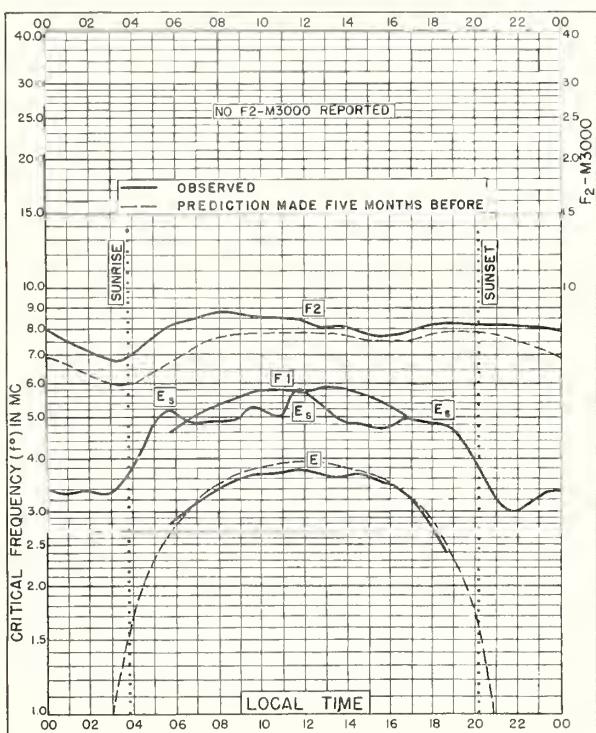
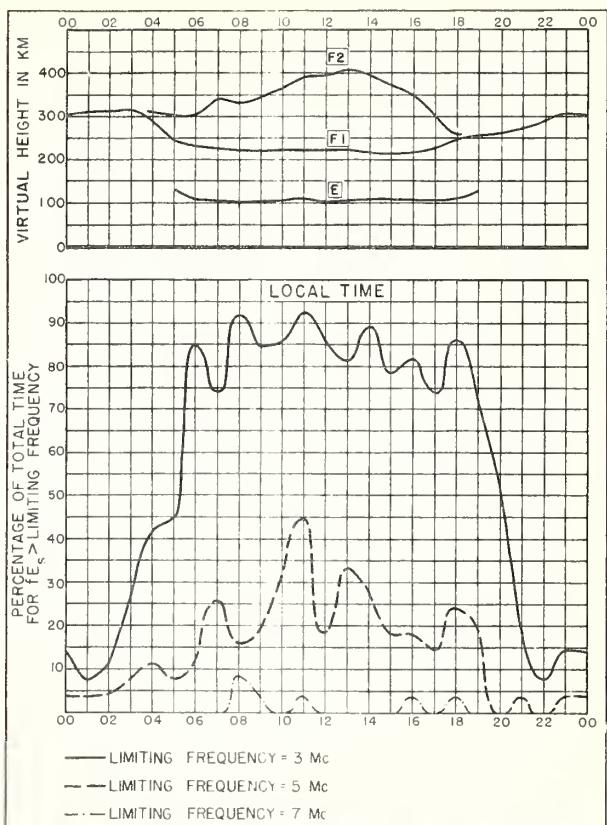
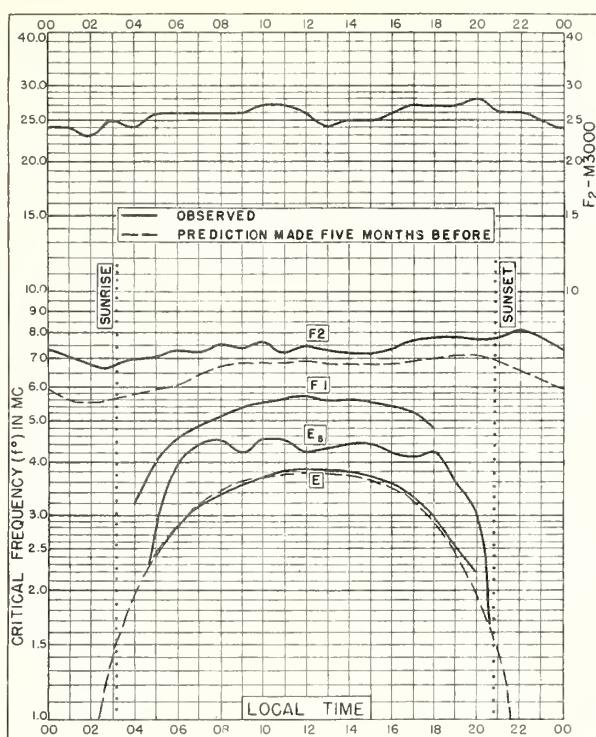


Fig. 59. CHRISTCHURCH, N. Z.

JULY 1948



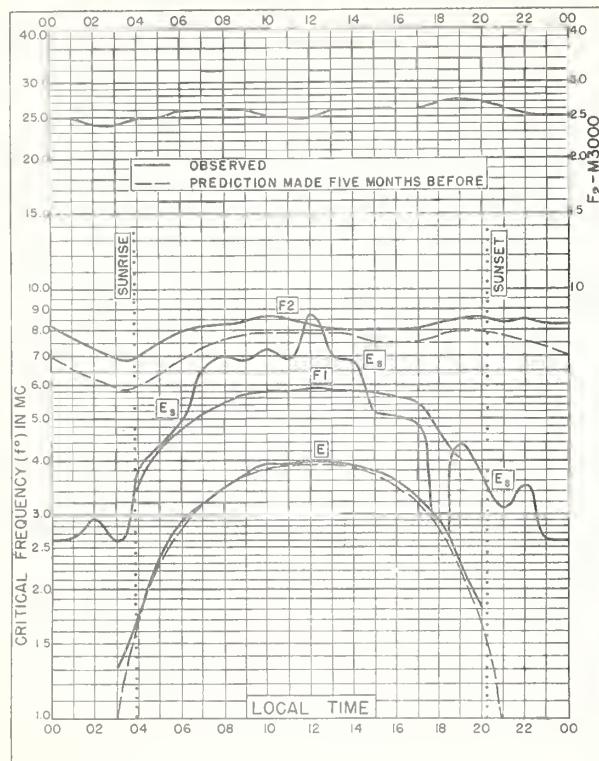


Fig. 64. SLOUGH, ENGLAND

51.5°N, 0.6°W

JUNE 1948

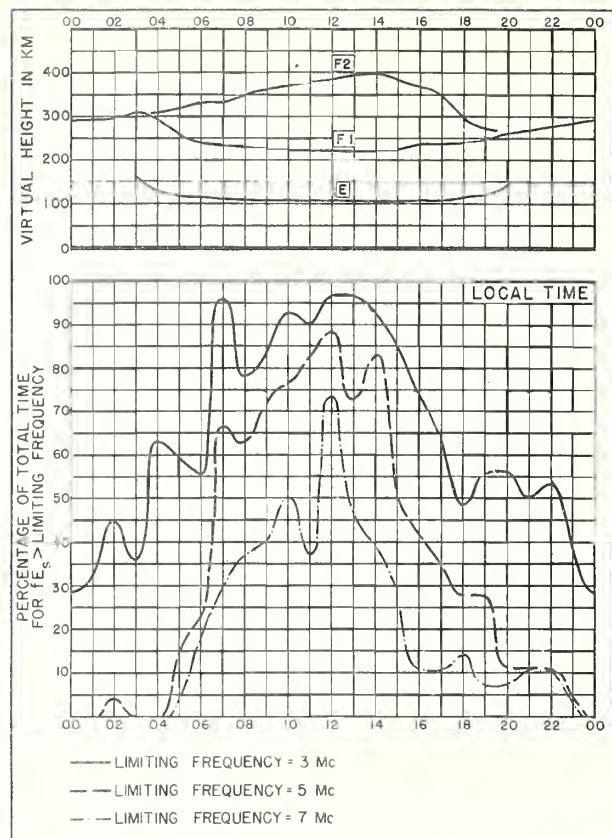


Fig. 65. SLOUGH, ENGLAND

JUNE 1948

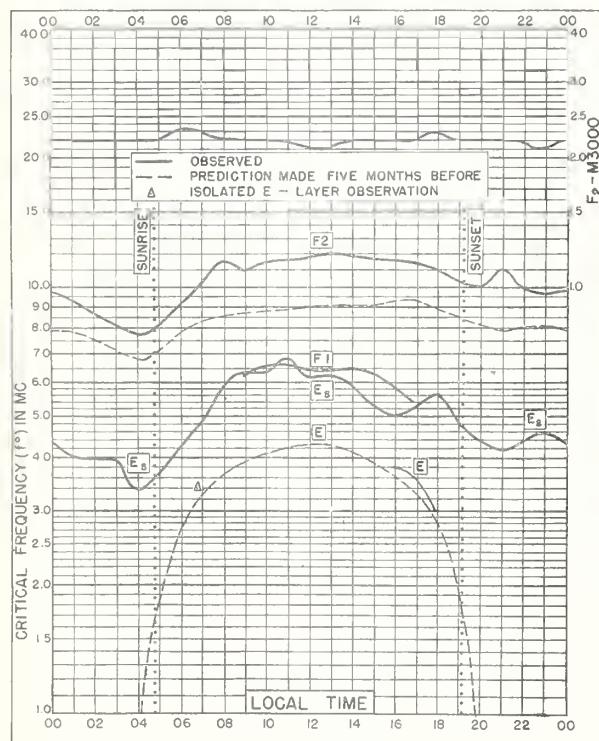


Fig. 66. LANCHOW, CHINA

36.1°N, 103.8°E

JUNE 1948

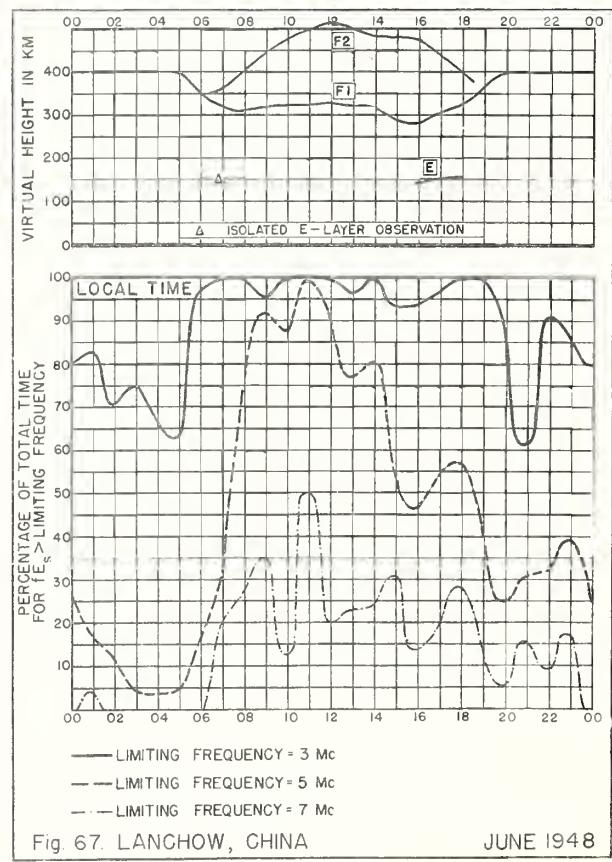
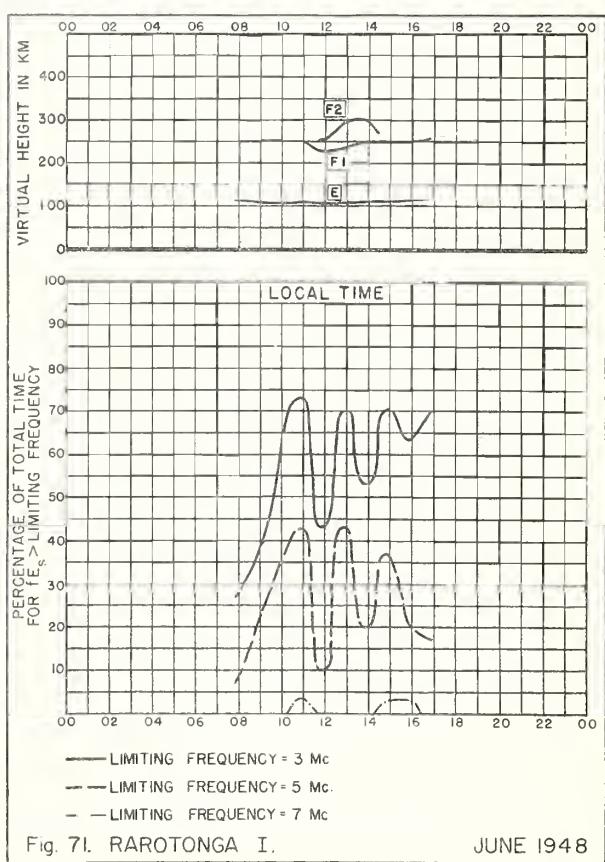
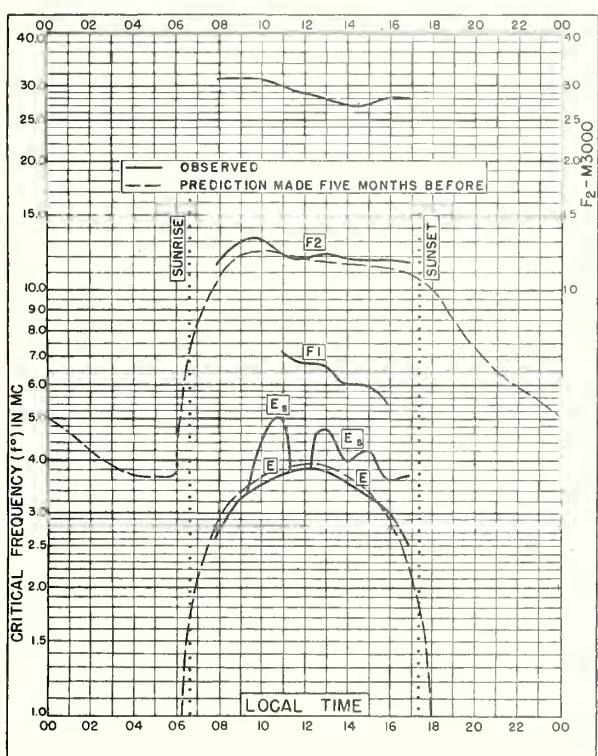
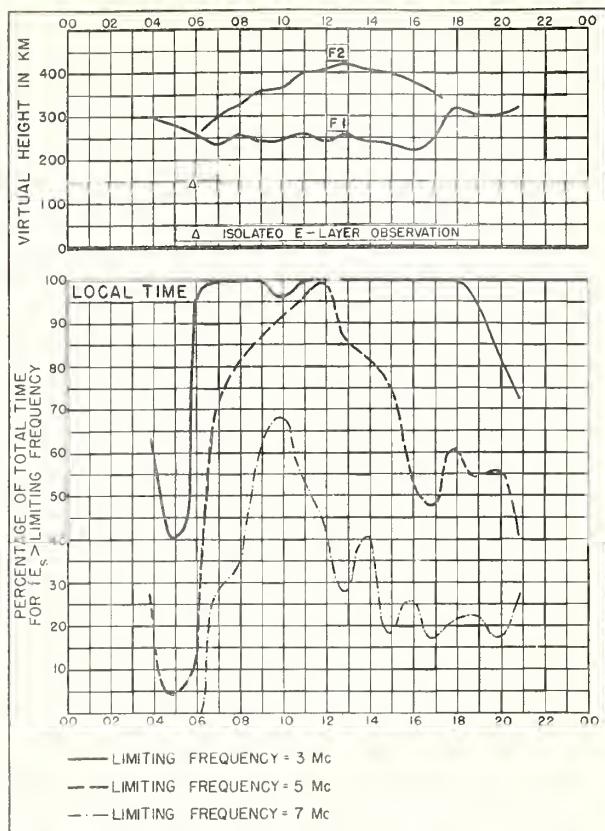
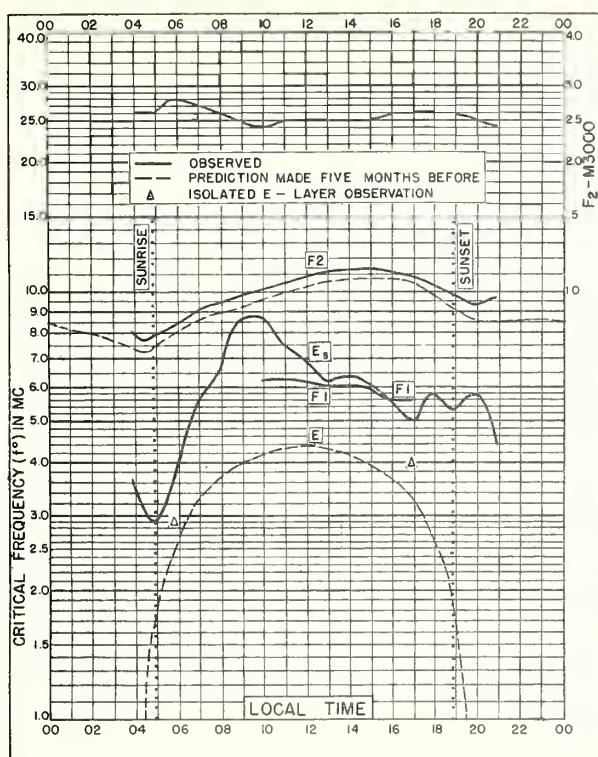


Fig. 67. LANCHOW, CHINA

JUNE 1948



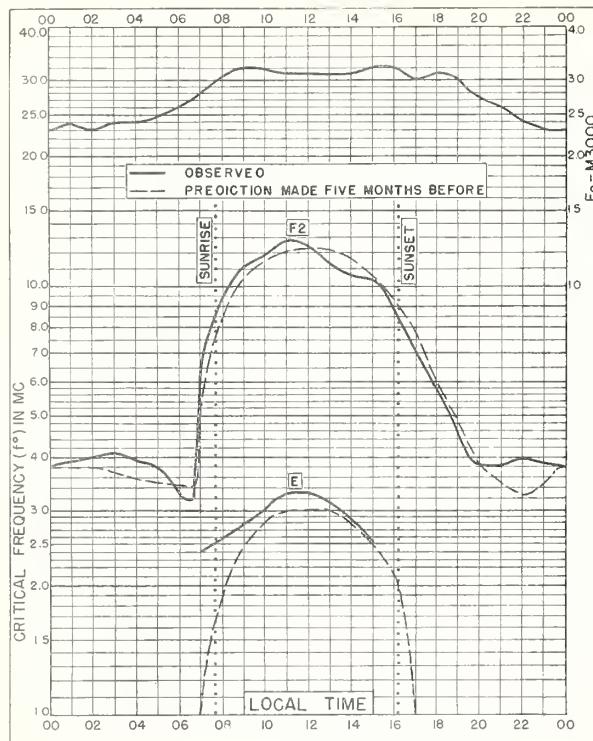


Fig. 72. FALKLAND IS.
51.7°S, 57.8°W
MAY 1948

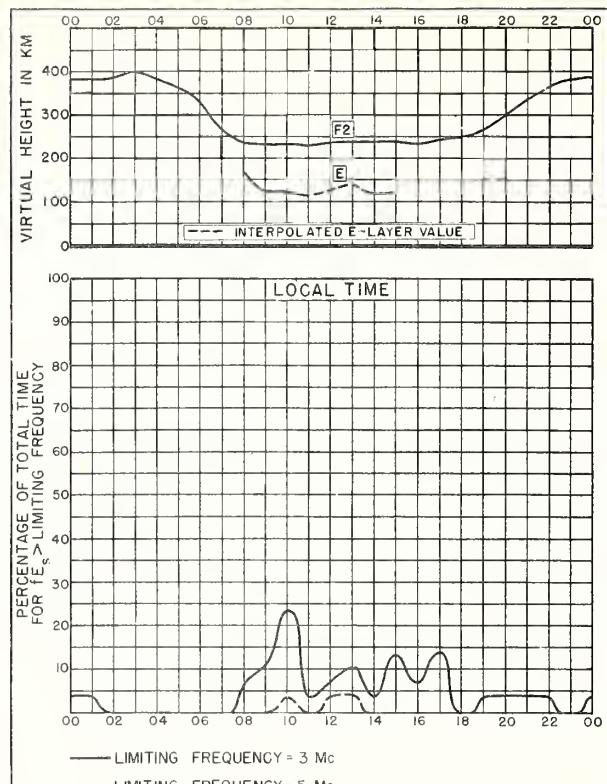


Fig. 73. FALKLAND IS.
MAY 1948

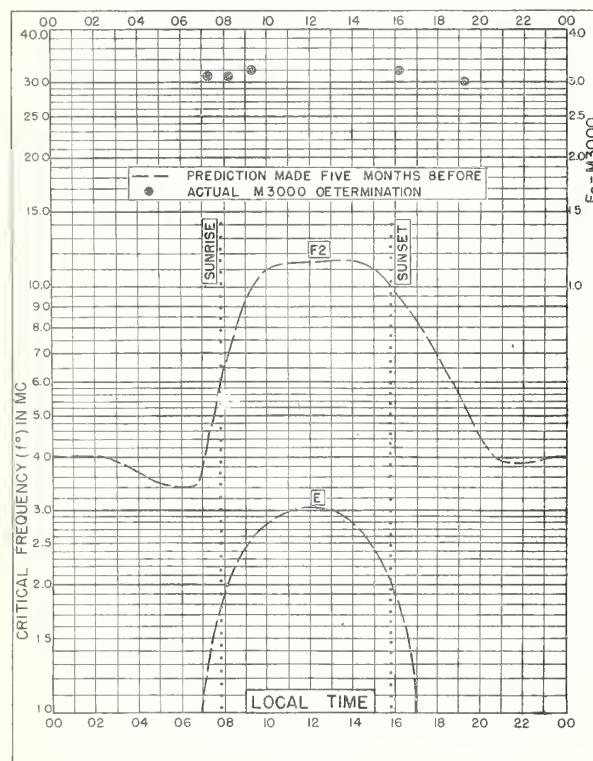


Fig. 74. BAGNEUX, FRANCE
48.8°N, 2.3°E
DECEMBER 1947

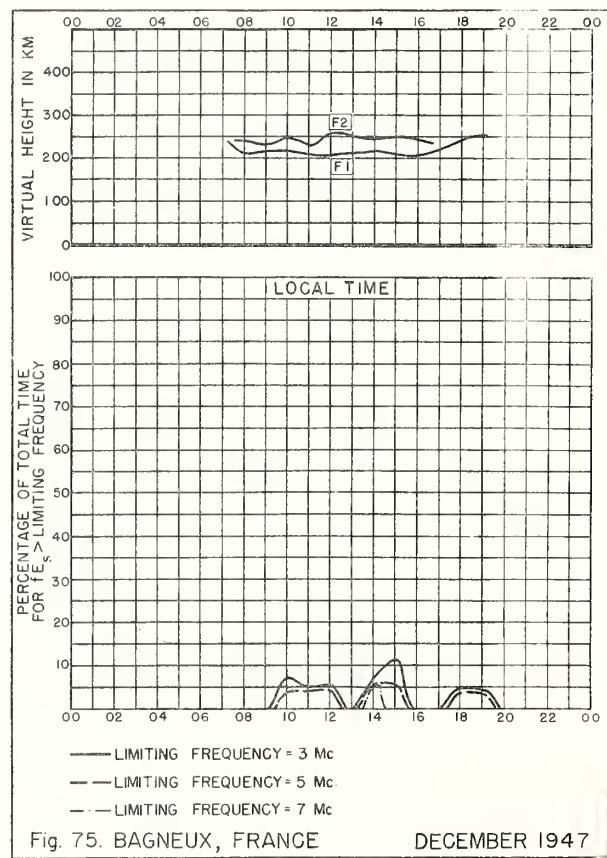


Fig. 75. BAGNEUX, FRANCE
DECEMBER 1947

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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.

Nonscheduled reports:

CRPL-1-1. Prediction of Annual Sunspot Numbers.

CRPL-1-2, 3-1. High Frequency Radio Propagation Charts for Sunspot Minimum and Sunspot Maximum.

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CRPL-1-4. Observations of the Solar Corona at Climax, 1944-46.

CRPL-1-5. Comparison of Predictions of Radio Noise with Observed Noise Levels.

CRPL-1-6. The Variability of Sky-Wave Field Intensities at Medium and High Frequencies.

CRPL-7-1. Preliminary Instructions for Obtaining and Reducing Manual Ionospheric Records.

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.

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

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

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

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

R11. A Nomographic Method for Both Prediction and Observation Correlation of Ionosphere Characteristics.

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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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