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 1 = 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 $f^{o}F2$ (and $f^{o}E$ 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 $f^{o}F2$, as equal to or less than $f^{o}F1$.
   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 $f^{o}E$, 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 ERPL-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 63 and figures 1 to 120 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:

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

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:
- Slough, England
- Falkland Is.

Canadian Radio Wave Propagation Committee:
- Churchill, Canada
- Clyde, Baffin I.
- Ottawa, Canada
- Portage la Prairie, Canada
- Prince Rupert, Canada
- St. John's, Newfoundland

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

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

Scientific Research Institute of Terrestrial Magnetism, Moscow, U.S.S.R.:
- Alma Ata, U.S.S.R.
- Bay Tiksey, U.S.S.R.
- Dukhta Tikhaya, U.S.S.R.
- Chita, U.S.S.R.
- Leningrad, U.S.S.R.
- Moscow, U.S.S.R.
- Sverdlovsk, U.S.S.R.
- Tomsk, U.S.S.R.

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:
Adak, Alaska
Okinawa I.

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

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

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

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

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

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

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

Norwegian Defense Research Establishment, Florida, Bergen, Norway:
Tromso, Norway

Beginning with CRPL-F26, publication of tables of so-called "provisional data" reported to the CRPL by telephone or telegraph was discontinued. The reason for this change in policy is that users of the data hitherto published in this form receive them through established channels sooner than through the F-series. Furthermore, having two sets of data, "provisional" and "final," for the same station for the same month leads to confusion.

It must be emphasized that no change has been made in the methods used for rapid reporting and exchange of data. The change has to do only with the printing of provisional data in the F-series.

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 $f^{o}F2$ is less than or equal to $f^{o}F1$, 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. 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. The final presentation is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number. The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

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

AT WASHINGTON, D. C.

The data given in tables 64 to 75 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 76 presents ionosphere character figures for Washington, D.C., during March 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 77 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 March 1948.

Table 78 lists for the stations whose locations are given the sudden ionosphere disturbances observed at the Point Reyes, California, receiving station of RCA Communications, Inc., from March 17 to March 19, 1948.

Table 79 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., from March 7 through March 16, 1948.

Table 80 gives provisional radio propagation quality figures for the North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, February 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 81 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 82a and 82b are listed the intensities of the green (5303A) line of the emission spectrum of the solar corona as observed during March 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 83a and 83b give similarly the intensities of the first red (6374A) coronal line; tables 84a and 84b list the intensities of the second red (6704A) coronal line. The following symbols are used in tables 82, 83, and 84: a, observation of low weight; -, corona not visible; and x, position-angle not included in plate estimates.

REVISION OF WASHINGTON CRITICAL FREQUENCIES, OCTOBER 1942 THROUGH OCTOBER 1945, INCLUSIVE

Because of an incorrect frequency scale on the recorder, the following corrections of Washington critical frequencies (f^oF2, f^oF1, f^oE, fEs) for October 1942 through October 1945, inclusive, should be made:

Frequency (Mc) as previously published	Correction (Mc) to be subtracted	Frequency (Mc) as previously published	Correction (Mc) to be subtracted
1.6--1.9	0.10	9.5	0.15
2.0	0.15	9.6, 9.7	0.20
2.1--2.3	0.20	9.8	0.15
2.4	0.25	9.9--11.3	0.10
2.5--2.7	0.30	11.4	0.15
2.8	0.35	11.5--12.3	0.20
2.9--3.1	0.40	12.4	0.25
3.2	0.45	12.5--13.0	0.30
3.3	0.40	13.1	0.35
3.4--5.7	0.00	13.2--13.8	0.40
5.8	0.05	13.9	0.35
5.9--6.8	0.10		
6.9--7.4	0.00		
7.5	0.05		
7.6--9.4	0.10		

ERRATA

1. Calibration of the height scale at Adak, Alaska, necessitated the issue of a new table of virtual heights and F2 muf factors for the month of January 1948. This table is number 63 of this issue. Corresponding changes should be made in figures 9 and 10 of CRPL-F43.

2. CRPL-F43, p. 8, 2nd par., 3rd line: Change February to January.

TABLES AND GRAPHS OF IONOSPHERIC DATA

Table 1

ashington, D.C. (39.0°N, 77.5°W) March 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	(5.8)						(2.9)
01	250	5.7						2.9
02	250	(5.5)						(2.9)
03	250	(5.1)						(2.9)
04	250	(4.8)						(2.9)
05	250	4.4						2.9
06	250	4.6						3.0
07	235	6.6			110	2.1		3.4
08	230	8.2	220		100	2.7		3.3
09	240	9.2	215		100	3.0		3.2
10	240	10.1	200		100	3.3		3.2
11	240	11.0	195		100	3.4		3.1
12	250	11.3	200		100	3.6		3.1
13	250	11.1	210	(4.8)	100	3.6		3.0
14	250	11.3	200		100	3.5		3.0
15	250	11.0	210		100	3.3		3.0
16	240	10.7	220		100	3.0		3.1
17	230	10.4			100	2.6		3.1
18	230	(10.1)			120	1.9		(3.2)
19	220	9.3						3.0
20	220	8.0						3.0
21	220	7.3						3.0
22	220	6.8						3.0
23	250	6.2						3.0

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

Table 2

Fairbanks, Alaska (64.9°N, 147.8°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	320	2.6					5.0	(2.7)
01	340	3.0					5.5	2.7
02	352	3.2					5.5	2.6
03	372	3.5					5.5	2.6
04	360	4.2					5.2	2.6
05	322	4.2					4.8	2.6
06	332	4.0					3.5	2.6
07	295	4.2				1.6	3.0	2.8
08	262	5.0				1.9	2.9	3.0
09	250	6.2				2.2	2.9	3.2
10	245	7.0				2.4	2.9	3.1
11	245	7.9				2.5	2.6	3.0
12	240	8.2				2.5	2.6	3.0
13	240	9.2				2.5	2.9	3.0
14	240	9.6				2.4	2.8	3.0
15	240	9.6				2.1	2.9	3.0
16	235	9.4				1.6	2.0	3.1
17	235	8.2				1.4	2.8	3.0
18	236	6.5					2.9	3.0
19	240	4.8					2.9	3.1
20	260	3.8					3.0	3.0
21	288	3.0					3.0	2.9
22	300	3.0					4.3	2.8
23	315	2.8					4.8	2.6

Time: 150.0°W.
Sweep: 16.0 Mc to 0.5 Mc in 15 minutes, automatic operation.

Table 3

Adak, Alaska (51.9°N, 176.6°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	320	3.1						2.8
01	330	3.0						2.7
02	340	3.0						2.6
03	340	3.0						2.6
04	330	3.1						2.6
05	300	3.2						2.7
06	290	3.3						2.8
07	250	5.5			140	1.8		3.1
08	225	7.8			120	2.3		3.4
09	230	9.3			120	2.6		3.3
10	240	10.2	220		120	3.0		3.2
11	240	11.0	210	4.1	120	3.1		3.2
12	230	11.2	215	(4.8)	120	3.2		3.2
13	230	11.0	220		130	3.1		3.2
14	230	10.8			130	3.1		3.2
15	230	10.4	230		130	2.8		3.3
16	230	9.3			130	2.4		3.3
17	220	8.2			140	2.0		3.3
18	220	6.8						3.3
19	230	5.1						3.3
20	240	3.6						3.2
21	270	3.2						3.0
22	280	3.1						2.8
23	310	3.2						2.7

Time: 180.0°W.
Sweep: 1.2 Mc to 15.5 Mc in 12 minutes, manual operation.

Table 4

Boston, Massachusetts (42.4°N, 71.2°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270	5.5						2.7
01	275	5.2						2.7
02	275	5.0						2.7
03	260	5.0						2.8
04	250	4.7						2.8
05	250	4.3						2.8
06	250	4.1						2.8
07	250	6.4			110	2.0		3.0
08	245	8.8						3.2
09	245	9.9						3.1
10	250	11.0						3.0
11	250	11.5						3.0
12	250	12.0	228					3.0
13	250	12.0						2.9
14	250	11.9						2.9
15	250	11.5						3.0
16	245	10.9			120	2.4		3.0
17	245	10.8						3.0
18	245	9.9						2.9
19	250	8.9						2.9
20	245	7.4						2.8
21	250	6.6						2.8
22	260	6.0						2.8
23	260	5.5						2.8

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

Table 5

San Francisco, California (37.4°N, 122.2°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	3.5						2.7
01	280	3.7						2.7
02	280	3.8						2.7
03	280	3.8						2.7
04	260	3.6						2.7
05	280	3.4						2.7
06	280	3.5						2.6
07	240	5.6						3.0
08	230	8.6			120	2.5		3.2
09	230	10.1			110	3.0		3.1
10	230	10.8	220		110	3.3		3.0
11	250	12.0	220		110	3.4		3.0
12	250	12.2	220		110	3.6		2.9
13	240	12.0	215		110	3.5		2.9
14	230	12.0	220		110	3.4		2.9
15	240	11.5	220		110	3.3		2.8
16	240	11.2			120	2.9		2.9
17	230	10.2			120	2.4		3.0
18	210	9.0						3.0
19	220	7.2					2.2	3.0
20	220	5.4					2.2	3.1
21	240	4.4.					2.4	3.0
22	260	3.6						2.9
23	280	3.6						2.7

Time: 120.0°W.
Sweep: 1.3 Mc to 18.5 Mc in 4 minutes 30 seconds, automatic operation.

Table 6

White Sands, New Mexico (32.3°N, 106.5°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	4.0					2.4	2.8
01	280	4.1					2.5	2.8
02	280	4.2					2.5	2.8
03	260	4.1					2.4	2.9
04	260	3.7					2.4	2.9
05	280	3.7					2.5	2.7
08	300	3.6					2.5	2.7
07	230	6.2			(150)	2.0	3.0	3.1
08	240	8.6			120	2.7	3.4	3.3
09	230	9.5			120	3.2	4.0	3.2
10	220	10.5			120	3.4	4.5	3.1
11	220	11.0	220		120	3.5	4.7	3.1
12	220	11.5	220		120	3.6	4.7	3.0
13	220	11.3			120	3.7	4.5	3.0
14	220	11.0			120	3.5	4.4	3.0
15	230	10.8			120	3.3	4.4	3.0
16	240	10.5			120	3.1	4.2	3.0
17	240	10.2			120	2.4	3.7	3.1
18	220	9.0					2.7	3.1
19	220	7.3					2.6	3.0
20	240	6.3					2.4	3.1
21	240	4.8					2.5	3.0
22	270	4.1					2.4	2.8
23	280	4.1					2.5	2.8

Time: 105.0°W.
Sweep: .75 Mc to 14.0 Mc in 2 minutes.

Table 7

Wuchang, China (30.6°N, 114.5°E) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	4.6						2.8
01	270	4.4						2.9
02	255	4.3						3.0
03	245	4.4						3.1
04	220	4.1						3.4
05	225	3.5						3.0
06	260	3.2						2.9
07	240	5.9			155	1.7		3.1
08	210	8.8			100	2.3		3.5
09	210	9.9			90	2.9		3.4
10	220	12.0	200	4.7	90	3.2		3.2
11	240	13.0	200	5.0	90	3.5		3.2
12	240	13.0	200	5.0	90	3.6		3.1
13	250	13.5	200	5.2	90	3.5		3.1
14	240	13.5	200	5.0	90	3.5		3.1
15	235	13.2	200	4.5	90	3.3		3.0
16	220	13.0	205	5.0	90	3.0		3.1
17	220	13.2	215		100	2.6		3.2
18	210	12.0			110	1.8		3.2
19	200	11.5						3.2
20	200	9.6						3.2
21	200	7.8						3.2
22	210	6.3						3.0
23	240	5.0						3.0

Time: 120.0°E.
Sweep: 1.2 Mc to 19.2 Mc, manual operation.

Table 8

Baton Rouge, Louisiana (30.5°N, 91.2°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	4.3						3.0
01	295	4.4						3.0
02	290	4.2						3.0
03	290	4.2						3.0
04	290	4.1						2.9
05	290	4.0						2.9
06	290	4.0						2.9
07	275	6.8						3.3
08	285	8.7	230		120	2.8		3.2
09	290	10.0	230		120	3.1		3.2
10	290	10.9	230		120	3.5		3.1
11	295	11.6	220	(5.2)	120	3.8		3.1
12	300	11.8	230	(5.1)	120	3.7		3.1
13	300	11.5	220	(5.2)	120	3.7		3.1
14	290	11.6	220	(5.0)	120	3.7		3.0
15	300	11.2	220		120	3.4		3.0
18	300	11.0	230		120	2.9		3.0
17	290	10.8			120	2.3		3.1
18	250	9.0						3.1
19	240	7.2						3.1
20	240	6.2						3.0
21	260	5.3						3.0
22	285	4.5						3.1
23	290	4.4						3.0

Time: 90.0°W.
Sweep: 2.15 Mc to 18.5 Mc in 5 minutes, automatic operation.

Table 9

Maui, Hawaii (20.8°N, 156.5°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	240	5.6						3.0
01	230	5.2						3.2
02	220	4.2						3.2
03	210	3.8						3.5
04	255	2.9						3.2
05	250	2.4						3.0
06	300	2.4						2.8
07	255	5.3						3.0
08	220	9.0			105	2.6		3.4
09	240	10.8	210		100	3.2		3.2
10	260	12.2	200	5.4	100	3.5		3.1
11	260	13.0	200	5.4	100	3.7		3.0
12	280	13.6	195	5.6	100	3.9		2.9
13	290	14.2	200	5.8	100	3.8		2.9
14	290	14.8	200	5.7	100	3.7		2.9
15	270	14.7	200	5.4	100	3.5		2.9
16	250	14.1	205	4.7	100	3.2		3.0
17	220	13.7			100	2.8		3.1
18	200	12.7			100	2.2	2.7	3.2
19	200	11.0						3.2
20	210	8.6						3.1
21	230	8.1						3.1
22	230	7.6						3.2
23	230	6.3						3.0

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

Table 10

San Juan, Puerto Rico (18.4°N, 66.1°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		6.1						2.8
01		6.0						2.8
02		5.6						2.9
03		5.0						2.8
04		4.4						2.7
05		4.4						2.6
06		4.4						2.7
07	270	6.8						2.9
08	270	9.3		3.0		E		2.9
09	280	11.3				3.2		2.9
10	280	12.0		5.2		3.5		2.8
11	290	12.1		5.4		3.8		2.8
12	295	11.9		5.3		3.9		2.7
13	315	11.4		5.3		3.9		2.6
14	310	11.3		5.4		3.8		2.7
15	310	11.3				3.6		2.6
16	310	11.2				3.2		2.7
17	300	11.1				2.8		2.7
18	280	(11.0)		2.3				(2.8)
19	270	9.7						2.8
20		8.0						2.8
21		7.3						2.7
22		7.0						2.7
23		6.7						2.8

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

Table 11

Guam I. (13.6°N, 144.9°E) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	240	10.5					2.8	2.9
01	240	10.5					2.4	3.0
02	240	10.1					2.3	3.1
03	240	7.9					1.8	3.1
04	240	6.0					1.8	3.0
05	240	5.4					2.4	3.2
06	240	4.6					2.4	3.2
07	270	6.9					2.5	3.0
08	250	10.2					4.8	3.0
09	230	12.1					4.5	2.9
10	230	13.0	220		120	3.7	5.2	2.6
11	220	12.6			120	3.8	5.2	2.4
12	210	11.2			115	4.0	5.2	2.4
13	200	11.2			120		5.2	2.3
14	200	11.5			115	3.9	5.2	2.3
15	220	12.0			120		5.0	2.4
16	230	12.9					4.8	2.4
17	240	13.2					4.2	2.5
18	260	13.3					3.8	2.5
19	300	12.3					3.0	2.5
20	320	11.4					2.2	2.5
21	280	(10.9)					1.8	(2.6)
22	240	(10.6)					2.2	(2.8)
23	240	10.5					3.4	2.9

Time: 150.0°E.
Sweep: 1.25 Mc to 19.0 Mc in 14 minutes, manual operation.

Table 12

Trinidad, Brit. West Indies (10.6°N, 61.2°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	230	7.6						3.1
01	230	6.9						3.1
02	220	5.8						3.2
03	220	4.2						3.2
04	260	3.4						2.9
05	270	3.7						2.9
06	250	4.4					2.2	3.0
07	240	7.9			120		2.6	3.4
08	220	10.2			110	3.0	3.4	3.3
09	250	12.4	220	4.8	100	3.5	4.2	3.2
10	260	13.0	210	5.1	100	3.7	4.4	3.2
11	260	12.4	200	5.3	100	3.9	4.4	3.1
12	270	12.1	200	5.4	100	4.0	4.6	2.9
13	280	12.2	200	5.4	100	4.0	4.6	2.9
14	280	12.0	220	5.4	100	3.8	4.7	2.8
15	280	12.1	215	5.2	100	3.6	4.6	2.8
16	280	12.3	220	5.0	110	3.3	4.3	2.9
17	240	12.2	225		110	2.9	3.4	2.9
18	240	11.8					3.4	3.0
19	230	11.2					2.8	3.0
20	220	9.8					2.2	2.9
21	240	9.4						2.9
22	240	9.0						2.9
23	240	8.6						3.0

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

Table 13

Palmyra I. (5.9°N, 162.1°W) February 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	240	12.0					3.6	3.2
01	240	10.5					3.3	3.2
02	240	7.8					2.1	3.1
03	250	6.2					2.1	3.1
04	250	5.4					2.2	3.0
05	250	4.8					2.2	3.0
06	250	4.3					2.1	3.0
07	270	7.2			140	2.0	3.0	3.0
08	250	9.9			120	2.9	3.6	2.8
09	270	11.5	230		120	3.4	3.8	2.5
10	300	11.4	220		120	3.7		2.4
11	320	11.3	210	5.3	110	4.0		2.3
12	330	11.1	200	5.3	120	4.0		2.3
13	340	11.7	200	5.2	120	4.0		2.3
14	350	12.2	200	5.0	120	3.8		2.3
15	350	12.9	200	4.4	110	3.6		2.5
16	265	13.4	230		110	3.3	3.6	2.6
17	250	13.5	250		120	3.0	3.8	2.6
18	280	13.7			140	2.2	3.7	2.7
19	300	13.7					3.5	2.6
20	320	13.3					2.6	2.5
21	280	13.2					2.0	2.6
22	260	13.2					3.6	2.8
23	250	12.8					4.7	3.0

Time: 157.5°W.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 36 seconds; 11.0 Mc to 18.0 Mc, manual operation.

Table 14

Prince Rupert, Canada (54.3°N, 130.3°W) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	2.4						2.9
01	300	2.4						2.8
02	300	2.5						2.8
03	320	2.4						2.8
04	310	2.4					3.0	2.7
05	300	2.4						2.7
06	290	2.5					2.8	2.8
07	300	2.6						2.8
08	280	3.2				E		2.7
09	260	6.2				1.9		3.1
10	230	8.3			120	2.3		3.1
11	230	9.8			120	2.6		3.1
12	230	10.8			120	2.7		3.1
13	230	11.1			120	2.8		3.1
14	230	11.9			120	2.7		3.0
15	230	11.6			120	2.6		3.1
16	220	10.8			125	2.1		3.1
17	220	9.8				E		3.1
18	220	8.9				E		3.1
19	220	6.8						3.1
20	230	4.8						3.2
21	250	3.3						3.0
22	280	2.7						3.0
23	280	2.5						3.0

Time: 120.0°W.
Sweep: 1.6 Mc to 13.5 Mc, manual operation.

Table 15

Wakkanai, Japan (45.4°N, 141.7°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	3.3						2.8
01	300	3.3					1.9	2.7
02	310	3.1					1.2	2.6
03	310	(2.8)						(2.6)
04	300	3.1					1.4	(2.6)
05	265	3.3						2.9
06	220	3.1					2.1	3.0
07	(230)	(5.0)					2.0	(3.2)
08	210						2.6	
09	210				100		3.4	
10	205		200		100		2.9	
11	220	(10.2)					(3.1)	
12	210							
13	215				100		2.8	
14	215	(9.0)					(2.7)	(3.4)
15	220	(8.8)					(2.3)	
16	205	(7.6)				2.0	(1.5)	
17	210	(6.7)					1.6	(3.2)
18	210	5.9						3.1
19	210	4.7						3.2
20	220	3.5					1.8	3.1
21	290	3.3					1.8	2.9
22	290	3.2						2.8
23	295	3.2					1.2	2.7

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

Table 16

Shibata, Japan (37.9°N, 139.3°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		(3.2)						
01	(300)							
02	(300)	(3.4)						(2.8)
03	(270)	(3.3)					(2.4)	(2.7)
04	310	2.9						2.7
05	330	3.1						2.7
06	280	3.5						2.9
07	250	5.8				1.7	2.6	3.1
08	230	9.1			120	2.6	2.3	3.4
09	250	10.4	230		120	3.0	3.2	3.2
10	250	12.0	240		120	3.3	3.4	3.2
11	240	11.7	230		110	3.4	3.4	3.2
12	240	11.1	220		120	3.5		3.2
13	(240)	(10.6)			110	3.5		(3.2)
14	(250)	(9.9)						(3.2)
15	(245)				110	3.0		
16	(220)	(8.6)					(2.6)	(3.4)
17	230	7.2					2.8	3.2
18	230	6.9					2.1	3.1
19	220	5.3					2.3	3.3
20	230	4.4						3.1
21	260	3.2						2.9
22	310	3.4					2.1	2.8
23	310	3.5					2.1	2.8

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

Table 17

Tokyo, Japan (35.7°N, 139.5°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	330	3.5					2.3	2.6
01	360	3.6					2.0	2.4
02	330	3.7					1.8	2.6
03	300	3.3					1.8	2.7
04	300	3.1					1.8	2.5
05	350	3.0					1.8	2.5
06	290	3.4					1.8	2.7
07	250	6.6			110	1.8	2.3	3.0
08	250	8.9			110	2.4		3.2
09	250	10.3	230		100	3.0		3.1
10	255	12.4	235		100		3.4	3.2
11	250	12.1	230		100			3.2
12	260	11.6	240		100			3.0
13	260	11.0	240				(4.8)	2.9
14	260	10.9	230		100		(4.6)	2.9
15	250	10.4	230		100	2.9	2.8	3.0
16	250	9.7			100	2.4	2.8	3.0
17	230	8.0				2.0	2.3	3.0
18	230	6.3					2.4	2.9
19	240	6.3					2.4	3.0
20	245	4.6					2.2	3.0
21	270	3.8					2.2	2.6
22	305	3.6					1.9	2.5
23	320	3.6					1.9	2.6

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

Table 18

White Sands, New Mexico (32.3°N, 106.5°W) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	3.6					2.7	2.8
01	280	3.6					3.0	2.8
02	280	3.8					2.9	2.8
03	270	3.7					3.2	2.9
04	280	3.5					3.0	2.9
05	300	3.4					3.7	2.7
06	300	3.4					3.0	2.8
07	255	6.5					3.3	3.0
08	240	8.4			120	2.6	4.2	3.3
09	230	9.8			120	3.1	4.8	3.2
10	220	10.8			110	3.3	5.0	3.1
11	220	11.4			120	3.5	5.2	3.1
12	220	11.5			120	3.5	5.2	3.1
13	220	11.2			120	3.5	5.1	3.0
14	220	11.0			120	3.5	5.0	3.0
15	230	11.0			115	3.3	5.1	3.0
16	240	10.3			120	2.8	4.8	3.0
17	230	10.0			120	2.2	3.3	3.0
18	220	8.5					3.2	3.1
19	240	7.0					3.2	3.0
20	240	5.8					3.3	3.1
21	240	4.4					3.1	3.1
22	270	3.8					2.6	2.9
23	300	3.6					3.0	2.8

Time: 105.0°W.
Sweep: 0.79 Mc to 14.0 Mc in 2 minutes.

Table 19

Yamakawa, Japan (31.2°N, 130.6°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	3.9						2.8
01	300	3.8						2.7
02	300	3.8						2.8
03	295	3.5						2.8
04	290	3.2						2.8
05	320	2.8						2.6
06	320	3.0						2.6
07	300	4.8					(2.2)	2.8
08	240	8.3	230		110	2.3		3.2
09	240	10.5	230		110	2.8	2.6	3.2
10	260	11.4	230		110	3.2	3.8	3.2
11	260	12.2	230		110	3.6	3.7	3.1
12	280	12.4	230		110	3.6	3.8	2.9
13	290	12.4	240		110	3.5	4.1	2.9
14	290	12.2	230		110	3.4	3.8	2.9
15	275	12.0	230		110	3.2	3.6	2.8
16	255	10.9			110	2.9	3.5	2.9
17	240	10.3			110	2.4	2.8	3.0
18	230	9.4					2.6	3.1
19	220	7.9					2.4	3.1
20	240	7.9						3.0
21	230	6.8						3.0
22	240	5.0						2.9
23	275	4.4						2.8

Time: 135.0°E.
Sweep: 0.6 Mc to 18.5 Mc in 15 minutes, manual operation.

Table 20

Okinawa I. (26.3°N, 127.7°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		6.4					2.4	2.7
01		6.2					2.2	2.9
02		(6.9)					2.0	(3.0)
03		(5.2)					2.0	(3.1)
04		(4.0)					2.0	(3.0)
05		3.4					2.2	2.7
06		(3.6)					2.2	(2.8)
07		(6.4)					2.1	(2.9)
08		9.6					3.2	3.3
09		(11.8)					3.8	(3.2)
10		13.0					4.6	(3.2)
11		12.8					4.8	3.1
12		13.0					5.0	2.9
13		14.0					4.6	(2.9)
14		14.8					5.0	2.8
15		14.8					4.8	2.8
16		13.9					4.4	2.9
17		13.7					4.0	3.0
18		12.6					3.6	3.0
19		(11.5)					3.2	(3.0)
20		(11.3)					2.8	(2.8)
21		11.5					2.9	3.1
22		9.4					2.9	3.0
23		7.4					2.5	2.8

Time: 135.0°E.
Sweep: 1.8 Mc to 18.0 Mc in 15 minutes, manual operation.

Table 21

Leyte, Philippine Is. (11.0°N, 125.0°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		8.8					2.8	3.1
01		7.8						3.1
02		6.7						3.2
03		5.6						3.1
04		5.4						3.1
05		4.6						3.2
06		5.7					2.2	2.9
07		9.7				3.1	3.2	3.0
08		12.1				3.8	4.4	2.8
09		12.4				4.2	4.8	2.5
10		11.2				(4.4)	5.0	2.4
11		10.9				(4.6)	5.6	2.3
12		10.7				4.6	8.0	2.2
13		10.7				4.4	5.4	2.2
14		11.0				(4.2)	5.3	2.2
15		11.4				3.8	5.1	2.3
16		11.5				3.1	5.3	2.3
17		11.3				2.3	4.0	2.3
18		10.7					3.5	2.4
19		10.5					2.4	2.3
20		9.8					1.8	2.3
21		9.4					2.5	2.4
22		9.2					3.2	2.6
23		9.0					3.1	2.8

Time: 120.0°E.
Sweep: 1.6 Mc to 16.0 Mc, manual operation.

Table 22

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270	6.9						2.8
01	260	6.4						2.9
02	260	5.8						2.8
03	270	5.2						2.8
04	270	5.0						2.8
05	280	4.9						2.8
06	250	6.5			115	2.3		3.0
07	250	8.0	230	4.5	110	2.9		3.0
08	300	9.4	230	4.9	100	3.5		2.8
09	320	10.0	210	5.4	100	3.7		2.7
10	340	10.5	210	5.6	100	3.9		2.7
11	350	11.1	200	5.7	100			2.7
12	360	11.4	200	5.8	100			2.6
13	360	11.3	200	5.8	100			2.6
14	360	11.0	210	5.7	100	4.0		2.7
15	350	10.9	210	5.6	100	(3.8)		2.7
16	330	10.4	210	5.3	100	3.6		2.7
17	300	9.9	220	4.8	100	3.2	3.7	2.8
18	270	9.4	240	(4.3)	110	2.6	3.1	2.8
19	250	9.0					2.2	2.8
20	250	9.1						2.8
21	250	8.6						2.8
22	250	7.6						2.8
23	270	7.1						2.7

Time: 30.0°E.
Sweep: 2.0 Mc to 15.0 Mc in 8 seconds.

Table 23

Watheroo, W. Australia (30.3°S, 115.9°E) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	265	7.1					3.2	2.8
01	255	6.7					2.8	2.7
02	260	6.2					3.1	2.7
03	265	5.8					3.8	2.7
04	275	5.6					2.8	2.7
05	285	5.3					2.8	2.6
06	255	5.8				2.1	2.8	2.9
07	298	6.7	240	4.4		2.9	3.6	2.9
08	352	7.5	235	5.1		3.3	4.1	2.7
09	375	8.1	225	5.4		3.6	4.3	2.7
10	380	8.8	222	5.5		3.7	4.2	2.6
11	368	9.2	212	5.5		3.9	4.5	2.6
12	380	9.1	215	5.5		3.8	4.5	2.6
13	380	9.4	220	5.5		3.9	4.3	2.6
14	385	9.5	220	5.5		3.9	4.4	2.6
15	380	9.3	225	5.5		3.8	4.2	2.6
16	378	8.8	225	5.4		3.5	3.8	2.6
17	340	8.4	230	5.0		3.2	3.5	2.7
18	295	8.2	242	4.2		2.5	3.6	2.7
19	265	8.2					2.8	2.8
20	250	8.2					2.8	2.7
21	265	7.7					2.8	2.7
22	280	7.5					2.7	2.7
23	280	7.3					2.8	2.7

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

Table 24

Fukaura, Japan (40.6°N, 139.9°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	370	3.4					2.0	2.5
01	360	3.4						2.5
02	340	3.5						2.5
03	320	3.6					1.8	2.6
04	370	3.6					2.0	2.6
05	320	3.6					2.0	2.6
06	280	3.8					1.9	2.9
07	250	6.2						(3.0)
08	(250)	(9.1)				2.2		
09								
10								
11								
12								
13	(250)							
14								
15								
16								
17	230	(7.4)						(3.0)
18	235	6.4					2.2	3.0
19	250	5.4					2.4	3.0
20	250	4.1					2.2	2.9
21	300	3.4					2.0	2.6
22	320	3.3					2.0	2.6
23	355	3.2					2.2	2.5

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

Table 25

Fiji Is. (18.0°S, 178.2°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	11.0					3.0	
01	300	10.4					3.4	
02	305	9.9					3.4	
03	290	10.2					3.3	
04	260	9.7					3.5	
05	230	9.1					3.0	
06	240	9.5			100	2.2	2.8	
07	230	9.8			100	2.8	4.4	
08	230	9.7			100	3.4	4.8	
09	245	10.6	230	6.4	100	3.7	5.2	
10	270	11.2	210	6.2	100	4.0	4.8	
11	375	11.8	230	6.6	100	4.2	5.4	
12	405	12.7	230	6.5	102	4.3	5.5	
13	390	D	240	6.4	100	4.2	5.4	
14	385	(13.2)	240	6.4	100	4.1	5.3	
15	365	D		6.3	100	3.8	6.7	
16	345	12.6		6.0	100	3.5	7.0	
17	260	11.3			100	2.9	6.6	
18	250	10.6			100	(2.2)	5.5	
19	295	10.1					5.1	
20	370	10.4					4.7	
21	350	11.2					3.6	
22	320	11.3					3.4	
23	300	11.2					2.9	

Time: 180.0 E.
Sweep: Upper limit, 13.0 Mc.

Table 26

Townsville, Australia (19.4°S, 146.5°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270	10.5					3.2	2.8
01	255	9.5					4.4	3.7
02	290	9.5					3.8	2.6
03	290	9.0					3.6	2.6
04	270	8.7					2.9	2.3
05	290	8.8					3.0	2.6
06	240	8.8				2.2	3.1	2.9
07	230	9.5				3.0	4.0	2.8
08	300	10.3	228			3.5	5.8	2.7
09	320	10.4	220	5.8		3.8	6.1	2.6
10	350	10.8	212	5.9	100	4.0	5.5	2.5
11	370	11.0	200	6.0	100	(4.1)	5.7	2.5
12	380	12.0	210	6.4	100	(4.2)	5.6	2.5
13	360	12.0	220	6.0	100	(4.2)	5.5	2.6
14	350	(12.0)	220	6.0	100	4.1	5.5	2.6
15	350	12.0	230	6.0	100	3.9	4.8	2.7
16	330	11.0		5.8	100	3.6	4.7	2.6
17	320	10.2	240		100	3.2	4.3	2.3
18	(260)	9.8				2.1	3.6	2.6
19	290	10.1					4.8	2.6
20	320	10.3					6.6	2.5
21	300	(10.5)					3.7	2.6
22	300	(10.5)					3.4	2.7
23	280	(10.8)					3.2	(2.8)

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

Table 27

Rarotonga I. (21.3°S, 159.8°W) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		10.9						
01								
02								
03		10.0						
04								
05								
06		10.2						
07		10.8						
08		11.3						
09		11.8						
10		11.6						
11		12.1						
12		12.7						
13		14.0						
14		13.8						
15		13.8						
16		13.5						
17		12.4						
18		11.6						
19		11.5						
20		10.4						
21		10.7						
22		11.0						
23		11.0						

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

Table 28

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270	6.9					2.3	[illegible]
01	270	6.5					2.2	[illegible]
02	270	5.7					2.6	[illegible]
03	290	5.6					2.2	2.5
04	290	5.1					2.2	[illegible]
05	280	5.5					2.4	[illegible]
06	240	7.4			110	2.5	3.7	[illegible]
07	270	8.7	230	4.6	100	3.1	3.8	2.9
08	320	9.7	210	5.4	100	3.5	3.8	2.7
09	350	10.5	210	5.6	100	3.8	4.1	2.6
10	370	10.9	200	5.9	100	4.0		[illegible]
11	380	11.1	200	6.0	100	4.1		[illegible]
12	380	11.0	200	5.9	100			[illegible]
13	380	10.8	205	5.8	100	4.1		[illegible]
14	360	10.8	210	5.6	100	4.0		2.5
15	370	10.7	210	5.5	100	3.9		2.5
16	350	10.3	220	5.3	100	3.6	3.8	2.6
17	325	9.9	230	4.8	100	3.2	3.6	2.7
18	280	9.6	245		110	2.5	3.2	2.7
19	260	9.4					2.6	2.8
20	250	9.1					2.3	2.8
21	250	8.4						2.9
22	270	7.5					2.2	2.8
23	280	7.1					2.1	2.7

Time: 30.0°E.
Sweep: 2.0 Mc to 15.0 Mc in 8 seconds.

Table 29

Brisbane, Australia (27.5°S, 153.0°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	275	9.6					3.9	2.8
01	265	9.0					3.7	2.7
02	280	8.8					2.9	2.7
03	270	8.3					2.6	2.7
04	275	8.0					2.4	2.6
05	260	8.0			120	1.9		2.8
06	250	8.5			110	2.7		2.8
07	240	8.9			105	3.2	3.4	2.8
08	290	9.2			110	3.6	4.2	2.8
09	370	9.9	250	5.8	105	3.9	4.5	2.6
10	370	10.2	220	6.0	105	4.0		2.6
11	380	10.6	200	6.0	110	4.1		2.5
12	380	10.8	220	6.3	110	4.1		2.5
13	380	11.0	230	6.1	110	4.2		2.5
14	370	11.0	230	5.8	110	4.0		2.6
15	360	10.6	240	5.8	110	3.8		2.6
16	350	9.8	240	5.3	110	3.5		2.6
17	300	9.3			110	3.1		2.7
18	270	9.0				2.2	4.7	2.6
19	280	9.0					4.4	2.6
20	310	9.2					3.2	2.5
21	320	9.4					4.3	2.6
22	320	9.8					4.2	2.6
23	300	10.0					3.8	2.7

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

Table 30

Watheroo, W. Australia (30.3°S, 115.9°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	285	7.6					4.1	2.7
01	280	7.2					4.6	2.6
02	288	6.9					3.7	2.5
03	280	6.6					3.0	2.6
04	280	6.2					2.8	2.6
05	270	6.0					2.9	2.7
06	250	6.5				2.4	2.8	2.8
07	300	7.4	240	5.1		3.1	3.8	2.7
08	355	8.0	240	5.4		3.5	5.3	2.7
09	370	8.5	240	5.5		3.7	5.2	2.6
10	375	8.9	238	5.6		3.9	5.1	2.6
11	380	9.7	235	5.9		4.0	5.1	2.5
12	400	9.8	248	6.0		4.1	4.8	2.5
13	405	9.8	242	5.9		4.0	4.8	2.5
14	380	10.0	248	5.9		3.9	4.8	2.6
15	392	10.0	248	5.7		3.8	4.6	2.6
16	365	9.8	240	5.5		3.6	4.5	2.6
17	330	9.6	250	5.1		3.2	4.2	2.6
18	270	9.3		4.0		2.5	4.3	2.7
19	265	9.3					3.9	2.7
20	268	8.7					3.4	2.7
21	270	8.2					3.0	2.6
22	298	8.0					3.0	2.6
23	280	8.3					3.7	2.6

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

Table 31

Canberra, Australia (35.3°S, 149.0°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	8.5					3.6	2.6
01	280	8.0					3.4	2.6
02	275	7.4					3.5	2.6
03	280	6.9					3.4	2.6
04	280	6.6					3.0	2.5
05	275	6.6			120	1.7	2.9	2.6
06	250	7.0			110	2.6	3.5	2.7
07	295	7.4	245	4.8	100	3.2	4.2	2.7
08	370	7.4	240	5.5	100	3.5	5.4	2.6
09	375	7.9	230	5.5	100	3.8	6.9	2.6
10	400	8.0	230	5.8	100	3.8	5.8	2.6
11	400	8.4	240	6.0	100	3.8	6.5	2.5
12	402	8.5	240	6.0	100	3.8	6.5	2.5
13	400	8.5	235	6.0	100	3.9	6.2	2.5
14	390	8.5	230	6.0	100	3.9		2.5
15	380	8.5	230	5.7	100	3.8		2.5
16	378	8.6	240	5.5	100	3.6		2.6
17	340	8.5	240	5.0	110	3.2	3.6	2.5
18	290	8.4			120	2.7	5.3	2.6
19	280	8.5					5.6	2.6
20	280	8.4					5.5	2.5
21	310	8.5					4.5	2.5
22	300	8.5					4.6	2.5
23	290	8.6					5.3	2.6

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

Table 32

Hobart, Tasmania (42.8°S, 147.4°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	298	7.0					2.8	2.4
01	290	6.5						2.5
02	290	6.0					2.7	2.4
03	290	5.7					2.7	2.5
04	290	5.3					2.6	2.6
05	285	5.5	270		100	2.1	3.3	2.7
06	290	6.0	250	4.0	100	2.7	2.8	2.8
07	330	6.5	250	4.7	100	3.2	3.6	2.8
08	360	7.0	250	5.2	100	3.4	4.3	2.7
09	420	6.8	250	5.6	100	3.6	5.2	(2.5)
10	430	(7.5)		5.8	100	3.8	5.5	(2.6)
11	415	(7.2)		5.7	100	3.9	5.6	(2.5)
12	450	(7.2)	250	5.8	100	3.8	5.1	
13	460	(7.0)	255	5.7			4.4	(2.5)
14	425	(7.0)	250	5.6	100	3.8	4.2	(2.5)
15	440	(7.0)	235	5.5	100	3.5	3.9	(2.4)
16	415	(7.0)	230	5.3	100	3.5	2.7	2.5
17	400	(7.0)	245	5.0	100	3.3		2.6
18	325	7.5	250	4.5	100	2.8	3.9	2.7
19	295	7.4			100	2.1	4.1	2.6
20	300	7.6					4.0	2.6
21	300	8.0					4.5	2.6
22	300	8.2					3.7	(2.6)
23	300	7.5					2.5	2.4

Time: 150.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 15 seconds.

Table 33

Christchurch, New Zealand (43.5°S, 172.7°E) December 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	8.2					2.7	2.4
01	300	7.8					2.6	2.5
02	305	7.2					3.2	2.5
03	300	6.8					3.2	2.4
04	295	6.6				1.1	3.2	2.5
05	270	6.8				2.1	2.6	2.7
06	250	7.2				2.7		2.7
07	250	7.5		5.0		3.2	4.4	2.7
08	340	8.0	240	5.5		3.5	5.6	2.7
09	360	8.1	230	5.5		3.7	6.0	2.7
10	360	8.4	230	5.8		3.8	5.8	2.6
11	390	8.6	220	5.9		3.8	5.7	2.6
12	400	8.7	230	6.0		3.8	4.5	2.5
13	420	8.5	230	6.0		3.8	4.5	2.5
14	420	8.5	230	5.9		3.8	4.2	2.5
15	410	8.5	240	5.7		3.8		2.5
16	390	8.5	240	5.5		3.6		2.5
17	250	8.6	260	5.2		3.2		2.6
18	260	8.7				2.7		2.6
19	280	8.8				2.0	4.0	2.6
20	290	9.0				(1.2)	5.0	2.6
21	295	9.1					4.9	2.5
22	300	8.9					4.8	2.5
23	310	8.7					3.6	2.5

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

Table 34

Peiping, China (39.9°N, 116.4°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		6.3						3.2
01		5.4						3.1
02		5.4						3.2
03		5.4						2.9
04		5.6						3.0
05		5.2						3.2
06		5.2						3.3
07		7.2						3.2
08		10.7						3.2
09		11.2						3.2
10		12.3						(3.3)
11		12.5						3.4
12		12.5						3.4
13		12.5						3.6
14		12.2						3.6
15		12.1						3.6
16		11.5						3.7
17		(12.0)						3.6
18								
19		(9.7)						(3.9)
20		8.1						3.5
21		(7.8)						(3.3)
22		6.5						3.2
23		6.6						3.2

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

Table 35

Chungking, China (29.4°N, 106.8°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	7.0						2.5
01	300	6.7						2.6
02	290	6.1						2.7
03	290	5.0						2.7
04	280	4.2						2.7
05	310	4.0						2.5
06	320	5.6					2.6	2.5
07	280	11.2					3.5	2.7
08	280	13.5	260		140	3.2	4.2	2.8
09	290	15.0	260		120	3.3	4.4	2.7
10	295	15.6	260		130	3.4	4.4	2.7
11	300	15.7	250		120	3.5	4.6	2.7
12	310	16.5	250	6.8	120	3.9	4.6	2.6
13	320	17.0	260	7.0	130	3.6	4.4	2.6
14	320	17.3	260	6.6	130	3.5	4.4	2.6
15	310	17.0	260		120	3.2	4.2	2.6
16	300	17.0	270		120	3.0	3.9	2.6
17	290	16.5	270		130	3.0	3.6	2.7
18	260	15.5					3.0	2.6
19	260	15.0					2.5	2.7
20	250	14.0						2.7
21	260	12.0						2.7
22	260	9.6						2.6
23	260	8.4						2.6

Time: 105.0°E.
Sweep: 1.7 Mc to 20.0 Mc in 15 minutes, manual operation.

Table 36

Fiji Is. (18.0°S, 178.2°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	260	11.3					2.7	
01	275	10.5					2.9	
02	290	10.1					2.6	
03	300	9.8					2.6	
04	280	9.7					2.6	
05	280	9.4					2.5	
06	240	10.7			100	2.2	2.8	
07	230	11.5			100	3.0	4.7	
08	220	11.6			100	3.4	4.8	
09	230	11.9			100	3.7	4.8	
10	250	12.7	230	7.3	100	4.0		
11	370	D	230	7.3	100	4.1		
12	350	D	220	7.0	100	4.1		
13	370	D	230	7.0	100	4.1		
14	365	D	230	7.0	100	4.0		
15	360	D	230	8.6	100	3.7		
16	250	D			100	3.4	5.1	
17	250	12.6			100	2.8	5.1	
18	270	12.2			90	1.9	4.2	
19	310	10.9					3.4	
20	340	11.0					3.0	
21	320	12.3					3.0	
22	295	12.6					2.9	
23	290	12.0					2.8	

Time: 180.0°E.
Sweep: Upper limit 13.0 Mc.

Table 37

Townsville, Australia (19.4°S, 146.5°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	270	10.2					3.0	2.7
01	275	9.5					3.5	2.6
02	300	9.3					3.0	2.5
03	280	9.4					2.9	2.6
04	285	8.8					3.0	2.6
05	300	8.5					2.7	2.5
06	260	9.1				2.3	3.0	2.7
07	250	10.0				2.9	3.4	2.8
08	290	11.2			100	3.5	3.8	2.8
09	300	12.0		6.0	100	3.7	3.7	2.7
10	328	12.0		6.2	100	3.9	3.5	(2.5)
11	368	(12.2)	200	6.8	100	(4.1)	4.8	(2.5)
12	378	(12.8)	210	6.7	100		4.8	(2.5)
13	375	(12.5)	200	6.5	100			(2.4)
14	350	(12.0)	220	6.5	100	(3.9)		(2.4)
15	350	(12.5)	240	6.4	100	3.8		2.5
16	350	12.0	240	6.1	100	3.5		2.5
17	300	11.5			100	3.0	3.5	2.7
18	260	11.0					4.2	2.7
19	295	10.5					4.2	2.6
20	300	11.0					3.5	2.5
21	300	10.5					3.9	2.6
22	300	11.0					3.0	(2.6)
23	295	11.0					3.0	2.7

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

Table 38

Rarotonga I. (21.3°S, 159.8°W) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		11.7						
01								
02								
03		10.0						
04								
05								
06		11.2						
07		12.0						
08		13.1						
09		13.1						
10		14.2						
11		14.4						
12		15.2						
13		15.3						
14		15.5						
15		15.2						
16		14.5						
17		13.8						
18		13.5						
19		12.2						
20		11.9						
21		12.4						
22		13.0						
23		12.6						

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

Table 39

Brisbane, Australia (27.5°S, 153.0°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	280	9.0					3.6	2.6
01	280	8.4					3.8	2.5
02	300	8.2					3.8	2.5
03	300	7.8					3.5	2.5
04	300	7.7					1.3	2.6
05	280	8.0			110	1.9	1.1	2.7
06	250	8.8			110	2.8		2.8
07	240	9.5	240		110	3.2		2.6
08	320	10.3	220	5.8	110	3.6	3.5	2.7
09	325	11.3	225	6.0	110	3.8	4.2	2.6
10	370	11.8	230	6.1	110	4.0	3.8	2.6
11	355	12.0	230	6.6	110	4.1		2.6
12	370	12.3	240	6.4	110	4.1		2.5
13	370	12.1	230	6.3	110	4.0		2.6
14	370	11.6	240	6.3	110	4.0		2.6
15	350	11.0	240	6.0	110	3.8		2.5
16	250	9.9	245		110	3.4		2.6
17	260	9.6			110	2.8	1.7	2.6
18	280	10.0				1.5	4.0	2.8
19	280	9.5					3.7	2.5
20	310	9.4					3.4	2.5
21	320	9.3					4.0	2.5
22	305	9.5					4.1	2.6
23	300	9.5					4.3	2.6

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

Table 40

Canberra, Australia (35.3°S, 149.0°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290	8.2					3.0	2.6
01	290	7.7					3.0	2.5
02	290	7.0					2.9	2.4
03	300	6.7					2.8	2.4
04	300	6.4					2.6	2.5
05	290	6.6			125	1.6	2.8	2.6
06	250	7.4			110	2.5	3.5	2.7
07	250	7.6	240	5.8	100	3.1		2.6
08	360	8.2	235	5.5	100	3.5		2.6
09	390	8.5	235	6.0	100	3.8	5.1	2.5
10	380	8.5	225	5.9	100	3.8	4.8	2.5
11	390	8.8	225	6.0	100	3.9	4.4	2.5
12	380	9.3	220	8.0	100	3.9	5.2	2.5
13	385	9.0	240	6.0	100	4.0		2.5
14	380	8.6	240	6.0	100	3.9		2.5
15	390	8.6	240	5.9	100	3.7		2.5
16	360	8.5	240	5.6	100	3.5		2.5
17	290	8.6	250	4.6	100	3.0		2.6
18	270	8.5			120	2.4	3.4	2.6
19	280	8.6					3.5	2.6
20	290	8.5					3.7	2.6
21	295	8.5					3.5	2.6
22	315	8.5					3.4	2.5
23	310	8.4					3.2	2.5

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

Table 41

Hobart, Tasmania (42.8°S, 147.4°E) November 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	7.0						2.4
01	300	6.5						2.4
02	300	6.0						2.4
03	300	5.5						2.5
04	300	5.4						2.5
05	290	5.5						2.6
06	255	6.4			110	2.6		2.7
07	350	6.9	250	5.3	105	3.1	2.9	2.7
08	390	7.0	250	5.4	105	3.4	2.6	2.6
09	420	7.2	240	5.5	110	3.5	3.9	2.7
10	455	(7.0)	215	5.5	105	3.6	4.0	(2.5)
11	430	7.5	240	5.6	105	3.7	4.0	(2.5)
12	450	(7.4)	240	5.6		3.7	3.9	(2.4)
13	435	(7.8)	245	5.7		3.8	3.9	(2.4)
14	422	(7.4)	242	5.6		3.6	3.5	(2.6)
15	400	(7.2)	240	5.5	105	3.5		(2.4)
16	400	7.4	242	5.4	100	3.3	2.5	2.4
17	290	7.5	260	5.1	105	3.0	2.8	(2.5)
18	290	7.5			105	2.6	2.9	2.8
19	290	8.0					3.3	2.7
20	295	(8.0)					2.9	(2.6)
21	300	7.5					2.6	2.5
22	300	7.4					2.6	2.4
23	300	7.2						2.5

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

Table 42

Lanchow, China (36.1°N, 103.8°E) October 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	330	7.2					2.6	2.4
01	320	6.4					2.8	2.4
02	330	6.4					2.6	2.4
03	360	6.2						2.4
04	350	6.2						2.3
05	340	5.6						2.3
06	320	6.3						2.5
07	280	12.0	280		160	2.9	2.9	2.6
08	280	14.2	280		130	3.2	3.8	2.5
09	280	14.5	260		120	3.2	4.2	2.5
10	290	15.1	260		125	3.5	4.4	2.5
11	300	15.0	260				4.3	2.5
12	310	14.6	260				4.0	2.4
13	320	14.5	270				4.0	2.4
14	320	14.6	260	7.0			4.0	2.4
15	320	15.0	260	6.6	130	3.4	3.9	2.4
16	315	14.4	260		130	3.2	4.2	2.4
17	300	14.0	280		120	2.9	3.5	2.5
18	305		285				2.8	
19								
20	300	9.8					3.0	2.5
21	300	9.4					2.5	2.5
22	300	8.7						2.4
23	320	7.4					2.8	2.4

Time: 105.0°E.
Sweep: 2.2 Mc to 16.0 Mc in 15 minutes, manual operation.

Table 43

Townsville, Australia (19.4°S, 146.5°E) October 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	250	10.5					2.8	2.7
01	250	9.5					2.5	2.6
02	290	9.0					2.6	2.5
03	280	8.7					2.5	2.6
04	280	8.5					2.2	2.6
05	300	7.9					2.4	2.6
06	265	9.7				2.1	2.8	2.8
07	250	11.5			100	3.0	3.0	3.0
08	240	12.0	230		100	3.5		2.8
09	250	12.0	220		100	3.8		2.8
10	290	(12.0)	200		100		3.7	
11	328	D	200	7.2	100			
12	350	(13.0)	200	7.5	100	(4.1)		
13	380	(13.0)	205	7.0	100		4.0	
14	375	(12.6)	215	7.0	100	(4.0)		
15	370	(12.0)	230	7.0	100	3.9		2.5
16	350	12.0	245		100	3.5		2.6
17	250	11.5	250		100	2.8	3.1	2.6
18	270	11.2				2.0	2.7	2.6
19	290	11.0					3.0	2.6
20	300	11.0					2.5	2.6
21	300	11.2					2.7	2.7
22	280	11.2					2.6	2.7
23	270	11.0					2.8	2.8

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

Table 44

Rarotonga I. (21.3°S, 159.8°W) October 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		12.2						
01								
02								
03		9.7						
04								
05								
06		10.8						
07		12.7						
08		13.8						
09		14.6						
10		15.0						
11		15.5						
12		15.8						
13		15.9						
14		15.6						
15		15.3						
16		15.0						
17		15.0						
18		14.8						
19		14.5						
20		14.0						
21		14.0						
22		13.8						
23		13.5						

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

Table 45

Canberra, Australia (35.3°S, 149.0°E) October 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	295	7.6					2.5	2.6
01	290	7.1					2.5	2.6
02	290	6.8					2.4	2.5
03	300	6.5					2.6	2.5
04	300	6.5					2.5	2.5
05	310	6.4					2.6	2.6
06	260	7.7			110	2.3	2.8	2.9
07	240	8.4			100	3.0		2.9
08	240	8.4	240	4.9	100	3.4		2.8
09	270	9.7	230	5.2	100	3.8		2.8
10	350	9.9	220	5.5	100	3.8		2.7
11	365	10.2	230	5.8	100	3.8		2.7
12	380	10.0	230	6.1	100	3.9		2.7
13	390	10.0	230	6.0	100	4.0		2.7
14	365	10.0	240	6.2	100	3.9		2.7
15	370	10.0	240	6.0	100	3.8		2.7
16	280	9.2	240	5.4	100	3.3		2.7
17	260	8.8	250	4.2	105	2.3		2.7
18	270	8.8			100	2.1	2.6	2.8
19	260	8.7						2.7
20	278	8.5					2.1	2.7
21	300	9.2					2.0	2.6
22	300	8.2					2.4	2.6
23	300	7.9					2.2	2.6

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

Table 46

Hobart, Tasmania (42.8°S, 147.4°E) October 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	6.4						2.4
01	300	6.0						2.4
02	300	5.5						2.4
03	300	5.3						2.4
04	300	5.0						2.3
05	300	4.8						2.6
06	265	5.5			100	2.2	2.0	2.8
07	250	6.5			100	2.7		2.8
08	302	7.0	250	4.8	100	3.2		2.7
09	370	7.4	240	5.1	100	3.4		2.7
10	390	7.8	240	5.9	100	3.5		2.6
11	392	8.0	225	5.8	100	3.5		2.6
12	390	7.3	215	5.8	100	3.5	3.5	2.6
13	402	7.5	225	6.0	100	3.5		2.6
14	400	7.5	235	6.0	100	3.5		2.5
15	400	7.5	240	5.8	100	3.5		2.5
16	358	7.5	240	5.2	100	3.2		2.5
17	255	8.0	255	4.9	100	2.8		2.6
18	270	8.2			105	2.2	2.0	2.7
19	260	8.1						2.6
20	265	7.4						2.6
21	292	7.4						2.5
22	300	7.0						2.4
23	300	6.7						2.4

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

Table 47

Fribourg, Germany (48.1°N, 7.8°E) June 1947

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	300	(7.9)					2.7	
01	300	7.6					2.6	
02	300	7.1					2.8	
03	300	6.6					3.1	
04	280	6.6			115	1.6	2.9	
05	(330)	7.3	250		100	2.2	4.2	
06	(375)	8.1	230		100	2.8	4.6	
07	340	(8.4)	210	5.3	100	3.4	5.4	
08	340	(8.4)	210	(5.6)	100	(3.6)	5.2	
09	350	8.6	210	5.8	90	(3.9)	5.1	
10	375	8.7	220	5.9	97	(3.9)	5.5	
11	370	8.8	205	6.0	95	4.0	5.4	
12	365	8.6	210	(6.0)	100	4.1	5.3	
13	380	8.4	210	(6.0)	97	4.2	5.2	
14	370	8.3	210	(5.7)	90	4.1	4.5	
15	380	8.2	210	(5.7)	95	3.9	4.8	
16	380	8.0	210	5.3	95	3.8	4.9	
17	330	8.4	210	(5.0)	100	3.4	5.3	
18		8.5	230		100	2.8	4.6	
19	250	8.4			105	2.2	4.2	
20	260	8.2			100	1.7	4.1	
21	260	(8.3)					3.5	
22	270	(8.1)					3.3	
23	280	8.0					2.6	

Time: Local.
Sweep: 1.4 Mc to 16.6 Mc in 10 minutes, automatic operation.

Table 48*

Christchurch, New Zealand (43.5°S, 172.7°E) October 1942

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	287	4.2					3.1	
01	294	3.6					2.9	
02	290	3.2					3.0	
03	284	3.1					2.8	
04	281	3.0					3.2	
05	289	2.9	200#	3.3#			3.3	
06	262	3.8	227	3.7			3.0	
07	252	4.2	248	3.5			3.2	
08	311	5.0	221	3.8			3.5	
09	313	5.6	219	4.0			3.2	
10	305	6.0	206	4.2			3.2	
11	307	6.0	205	4.2			3.4	
12	310	6.2	197	4.2			3.3	
13	297	6.3	193	4.3			3.6	
14	295	6.3	196	4.2			3.8	
15	306	6.2	208	4.1			3.7	
16	278	5.9	205	3.9			3.4	
17	276	5.8	227	3.5			3.4	
18	244	5.9					3.2	
19	247	6.3					3.1	
20	255	6.4					2.7	
21	257	6.0					3.0	
22	259	5.2					3.1	
23	272	4.6					3.4	

Time: 180.0°E.
*Averags values.
**Reported as "Abnormal E."
#One or two values only.

Table 49*

Christchurch, New Zealand (43.5°S, 172.7°E) September 1942

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	284	3.4					3.2	
01	292	3.2					3.0	
02	285	3.0					3.0	
03	277	2.8					3.2	
04	277	2.6					3.2	
05	281	2.2					3.6	
06	295	2.4					3.6	
07	254	3.6					3.4	
08	259	4.5	224	3.5	121	2.4	3.3	
09	279	4.9	217	3.8	112	2.6	3.6	
10	304	5.5	204	4.0	108	2.6	3.8	
11	307	5.9	201	4.1	108	2.7	3.7	
12	298	6.1	195	4.1	108	2.8	3.5	
13	289	6.0	204	4.1	104	3.0	3.3	
14	292	5.9	200	4.0	107	2.8	4.0	
15	285	5.6	207	3.9	107	2.6	3.7	
16	272	5.5	212	3.7	112	2.5	3.4	
17	254	5.3	219	3.2	117	2.2	3.4	
18	244	5.0					2.9	
19	258	4.9					2.9	
20	275	4.6					3.3	
21	262	4.2					2.9	
22	285	3.8					3.0	
23	283	3.5					3.3	

Time: 172.5°E.
*Average values.
**Reported as "Abnormal E."

Table 50*

Christchurch, New Zealand (43.5°S, 172.7°E) August 1942

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	312	2.7					4.4	
01	307	2.7					4.2	
02	301	2.7					4.7	
03	302	2.6					3.3	
04	307	2.4					4.1	
05	302	2.2					3.5	
06	328						3.3	
07	295	2.6					3.3	
08	242	3.8					3.8	
09	245	4.3	215	3.1			3.8	
10	276	4.5	212	3.5			3.7	
11	288	4.9	201	3.7			3.6	
12	302	5.1	224	3.9			4.2	
13	282	5.5	222	3.9			4.6	
14	286	5.4	217	3.9			4.3	
15	302	5.3	219	3.7			4.0	
16	261	5.1	235	3.4			3.8	
17	247	4.6	230#	2.9#			3.7	
18	254	4.0					3.8	
19	289	3.7					3.2	
20	288	3.4					3.8	
21	298	3.1					3.6	
22	306	2.9	200#	2.2#			3.1	
23	297	2.8					3.2	

Time: 172.5°E.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 51*

Canberra, Australia (35.3°S, 149.0°E) December 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	322	8.5					4.5	
01	318	8.3					4.0	
02	312	7.8					4.6	
03	315	7.3					4.3	
04	311	6.7					4.2	
05	290	6.4					4.4	
06	312	6.7	270#	5.0#	110	2.7	2.8	
07	292	7.2	280	5.1	110	3.1	4.1	
08	298	8.0	270	5.0	104	3.3	5.5	
09	350	8.6	247	5.0	110	3.5	5.1	
10	380	8.7	215#	5.0	107	3.8	6.0	
11	390	8.7	212	5.0	110#	3.9	5.9	
12	400	8.9	223	5.1	103	3.7	6.6	
13	375	8.9	237	4.9	108	3.4	5.4	
14	378	8.8	245	5.1	108	3.4	5.5	
15	388	8.6	264	5.0	108	3.5	4.4	
16	370	8.7	277	5.0	110	3.4	4.6	
17	348	8.6	274	4.9	112	3.2	4.5	
18	302	8.7			114	2.6	4.5	
19	302	8.3					4.5	
20	310	8.0					4.1	
21	320	8.1					4.2	
22	325	8.3					4.1	
23	328	8.7					4.0	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 52*

Canberra, Australia (35.3°S, 149.0°E) November 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	306	8.0					3.7	
01	298	7.5					3.8	
02	299	7.0					3.7	
03	309	6.1					3.7	
04	313	6.6					3.4	
05	295	6.8					3.4	
06	287	7.4			113	2.6	3.7	
07	287	7.8	260#	5.0#	108	3.2	3.8	
08	327	8.1	271	5.1	107	3.5	4.6	
09	341	8.4	252	5.1	109	3.7	5.5	
10	352	9.1	236	5.0	108	3.7	5.7	
11	341	9.3	222	5.0	107	3.7	5.7	
12	345	9.4	226	5.1	105	3.8	6.3	
13	349	9.2	237	5.1	104	3.8	6.2	
14	339	9.2	242	5.1	104	3.7	6.1	
15	332	8.9	258	5.1	106	3.6	4.7	
16	325	8.8	280	5.1	108	3.4	4.1	
17	284	8.7	307	5.1	115	3.1	3.9	
18	283	8.7			124	2.6	4.2	
19	285	8.8					4.4	
20	294	8.4					4.5	
21	308	8.4					4.5	
22	316	8.2					3.8	
23	324	8.2					3.9	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 53*

Canberra, Australia (35.3°S, 149.0°E) October 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	300	7.2					3.5	
01	294	6.9					3.2	
02	284	6.4					3.0	
03	288	6.0					3.2	
04	296	5.8					3.3	
05	288	5.7					3.0	
06	268	6.8	255#	3.6#		2.3	2.8	
07	272	8.0	262	4.1		2.8	3.7	
08	286	8.8	249	4.4		3.2	4.6	
09	296	9.4	253	4.8		3.5	4.5	
10	295	9.9	231	4.9		3.6	4.1	
11	301	10.0	223	5.0		3.7	4.3	
12	303	10.1	223	5.0		3.7	4.3	
13	290	10.2	234	4.9		3.8	4.1	
14	288	10.0	236	4.9		3.7	3.7	
15	282	9.8	257	4.7		3.5	3.4	
16	273	9.7	249	4.3		3.2	3.4	
17	259	9.5	269	4.0		2.7	3.2	
18	261	9.5				2.6#	3.2	
19	262	9.1					3.1	
20	275	8.6					3.1	
21	287	8.3					3.2	
22	299	7.9					3.4	
23	302	7.7					3.3	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 54*

Canberra, Australia (35.3°S, 149.0°E) September 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	284	6.3					2.8	
01	293	5.8					3.4	
02	296	5.4					3.1	
03	299	4.9					3.2	
04	313	4.6					3.2	
05	311	4.5					2.8	
06	274	5.3				1.6	3.2	
07	260	7.7	255#	3.6#		2.6	3.3	
08	266	9.1	243	4.2		3.0	3.5	
09	268	9.5	235	4.6		3.3	3.6	
10	277	10.0	227	4.8		3.5	3.8	
11	275	10.2	218	4.8		3.6	3.8	
12	278	10.3	216	4.9		3.6	3.7	
13	270	10.1	217	4.8		3.6	3.9	
14	271	9.7	219	4.7		3.5	4.0	
15	269	9.6	225	4.4		3.4	3.7	
16	262	9.4	233	4.1		3.0	3.7	
17	254	9.1	250#	4.1#		2.4	3.4	
18	250	9.0				1.8	2.8	
19	256	8.4					3.5	
20	272	7.7					3.1	
21	276	7.3					3.5	
22	285	7.0					3.2	
23	289	6.8					2.9	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 55*

Canberra, Australia (35.3°S, 149.0°E) August 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	291	4.7					4.1	
01	297	4.7					4.0	
02	297	4.6					3.9	
03	295	4.5					4.3	
04	286	4.4					4.4	
05	283	4.2					3.9	
06	274	4.1					3.8	
07	241	6.8				2.3	3.2	
08	235	8.8	232	4.5		2.7	3.1	
09	245	9.7	232	4.4		3.2	4.0	
10	255	10.4	228	4.6		3.4	4.5	
11	254	10.5	222	4.8		3.5	4.3	
12	257	10.6	219	4.8		3.6	4.2	
13	259	10.3	218	4.8		3.5	5.0	
14	252	10.3	222	4.6		3.5	5.3	
15	248	10.2	221	4.2		3.2	5.6	
16	236	9.8	220	3.8		2.8	4.4	
17	238	9.5	220#	3.6#		2.3	4.1	
18	238	8.8					4.2	
19	245	7.8					3.7	
20	247	6.9					3.3	
21	256	6.0					3.3	
22	264	5.4					4.2	
23	277	5.0					3.6	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 56*

Canberra, Australia (35.3°S, 149.0°E) July 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	294	3.9					3.6	
01	310	3.9					3.5	
02	309	4.0					4.3	
03	302	4.0					3.5	
04	279	4.4					3.9	
05	258	4.0					4.0	
06	262	3.7					4.2	
07	245	4.8					3.7	
08	234	7.4				2.4	3.6	
09	247	8.6	242	4.1	114	2.9	3.5	
10	254	9.0	233	4.4	110	3.3	4.2	
11	256	9.2	230	4.6	109	3.4	4.7	
12	255	9.2	225	4.6	107	3.4	5.6	
13	259	9.3	218	4.6	104	3.4	5.9	
14	251	9.4	224	4.4	107	3.3	6.8	
15	250	9.2	227	4.1	108	3.0	5.8	
16	238	8.8	233	3.6	110#	2.7	5.0	
17	234	8.4					5.0	
18	232	7.3					4.1	
19	230	6.3					4.8	
20	246	5.1					5.4	
21	262	4.5					4.4	
22	271	4.2					4.3	
23	291	4.0					4.0	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 57*

Canberra, Australia (35.3°S, 149.0°E) June 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	291	3.7					3.3	
01	308	3.8					3.2	
02	307	3.9					3.4	
03	305	4.0					3.1	
04	286	4.3					3.5	
05	251	4.3					3.4	
06	250	3.7					3.8	
07	239	4.7					3.6	
08	228	7.1				2.4	3.7	
09	235	8.4	237	3.8	100#	2.8	3.4	
10	240	9.0	232	4.1	109	3.1	3.6	
11	244	9.1	223	4.3	108	3.3	4.2	
12	250	9.0	222	4.4	107	3.3	4.6	
13	250	9.1	216	4.3	104	3.3	4.7	
14	247	9.2	219	4.2	105	3.2	4.8	
15	240	9.2	226	3.9	114	2.9	4.6	
16	233	8.8		3.8#		2.5	3.6	
17	222	7.6		3.0#			3.5	
18	228	6.5					3.5	
19	234	5.3					3.8	
20	230	4.5					3.3	
21	260	4.1					3.0	
22	273	3.9					3.2	
23	279	3.8					3.3	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 58*

Canberra, Australia (35.3°S, 149.0°E) May 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	300	4.8					3.5	
01	305	4.8					3.7	
02	300	4.7					3.2	
03	300	4.8					3.3	
04	275	4.8					3.0	
05	250	4.4					3.0	
06	250	4.0					3.0	
07	240	6.0				2.2#	3.1	
08	235	8.8	225	4.3		2.5	3.4	
09	240	10.0	232	3.9	114	3.0	3.9	
10	250	10.9	228	4.4	110	3.2	4.0	
11	250	11.2	224	4.4	108	3.4	4.1	
12	245	10.9	219	4.5	107	3.4	4.7	
13	240	10.8	218	4.4	106	3.4	4.5	
14	250	10.8	220	4.3	105	3.3	4.5	
15	240	10.8	225	3.9	105	3.0	3.9	
16	230	10.2	240	3.8	105#	2.5	3.5	
17	225	9.5	225#	3.6#			3.5	
18	230	8.2					3.3	
19	240	7.3					3.1	
20	250	6.3					3.4	
21	260	5.6					3.4	
22	270	5.0					3.4	
23	285	4.9					3.7	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 59*

Canberra, Australia (35.3°S, 149.0°E) April 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	298	6.6					4.1	
01	296	6.5					4.2	
02	287	6.4					3.8	
03	277	6.2					4.5	
04	273	5.6						
05	262	5.1					3.8	
06	266	4.9					3.8	
07	249	7.7	(250)#	(3.6)#			2.8#	
08	243	10.0	239	4.0		2.8	3.5	
09	249	11.2	236	4.2		3.2	4.0	
10	244	11.7	227	4.5		3.4	4.4	
11	248	12.1	217	4.6		3.5	4.5	
12	249	12.1	217	4.7		3.6	4.7	
13	248	12.0	216	4.5		3.6	4.5	
14	246	12.0	226	4.5		3.5	4.5	
15	246	11.8	233	4.3		3.3	4.1	
16	246	11.7	238	3.9		2.9	3.4	
17	236	11.3				2.4	3.3	
18	230	10.5					3.9	
19	236	9.1					3.3	
20	249	8.2					3.7	
21	252	7.5					5.9	
22	276	7.1					4.0	
23	284	6.8					4.2	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 60*

Canberra, Australia (35.3°S, 149.0°E) March 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	315	7.1					4.0	
01	316	6.9					3.8	
02	306	6.7					3.7	
03	302	6.2					3.6	
04	300	5.9					3.3	
05	315	5.7					3.3	
06	288	6.1		(2.5)#			3.5	
07	277	7.8	261	3.5	120#	2.4	4.0	
08	282	9.2	241	4.4	114	2.9	4.0	
09	302	9.8	237	4.7	107	3.3	4.3	
10	306	10.2	230	4.8	107	3.5	4.7	
11	277	10.1	222	4.8	103	3.6	4.4	
12	278	10.4	216	4.7	103	3.6	4.7	
13	280	10.3	222	4.8	104	3.6	4.8	
14	271	10.3	221	4.6	103	3.6	4.9	
15	270	10.2	232	4.6	104	3.4	4.6	
16	270	10.1	238	4.4	103	3.2	4.2	
17	270	10.1	242	4.0	105	2.6	3.7	
18	265	9.8	245	3.7	120#	2.3	3.8	
19	262	9.2					4.4	
20	274	8.4					4.1	
21	281	8.0					3.8	
22	292	7.6					4.4	
23	306	7.4					4.5	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 61*

Canberra, Australia (35.3°S, 144.9°E) February 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	313	7.6					4.1	
01	300	7.3					4.1	
02	301	6.8					3.5	
03	298	6.5					3.6	
04	298	6.0					3.7	
05	296	5.8					3.3	
06	278	6.4	250	3.5	140#	2.4#	3.4	
07	282	7.6	243	3.7	124	2.6	3.6	
08	300	8.2	230	4.2	113	3.1	4.3	
09	308	8.6	231	4.8	111	3.4	4.8	
10	301	9.1	221	4.8	105	3.7	5.1	
11	293	9.3	219	5.0	104	3.7	4.8	
12	297	9.5	212	5.0	103	3.8	5.1	
13	306	9.5	222	4.9	102	3.8	5.4	
14	309	9.5	225	4.9	103	3.8	4.8	
15	315	9.4	227	4.8	104	3.7	4.2	
16	304	9.3	224	4.6	106	3.4	4.6	
17	284	9.2	241	4.1	112	3.0	4.0	
18	263	9.1	246	3.8	130	2.5	3.6	
19	262	8.9					4.0	
20	270	8.3					4.6	
21	288	7.9					4.4	
22	304	7.6					4.6	
23	311	7.5					4.3	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 62*

Canberra, Australia (35.3°S, 149.0°E) January 1938

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs**	F2-M3000
00	311	7.5					4.4	
01	301	6.8					4.6	
02	330	6.3					5.1	
03	338	5.9					4.6	
04	331	5.5					4.4	
05	309	5.2					3.2	
06	306	5.7	234	4.0	141	2.4	3.8	
07	339	6.5	241	4.3	126	2.8	4.5	
08	369	7.1	258	4.7	119	3.2	5.3	
09	366	7.5	243	4.8	119	3.5	6.1	
10	378	7.7	243	5.3	113	3.6	6.3	
11	395	7.9	228	5.3	116	3.6	5.8	
12	388	8.2	222	5.3	114	3.6	5.7	
13	392	8.7	224	5.4	114	3.7	5.0	
14	365	8.7	228	5.3	114	3.7	5.6	
15	352	8.6	241	5.2	114	3.5	5.0	
16	329	8.5	235	5.1	117	3.4	5.8	
17	294	8.4	240	4.7	121	3.1	4.7	
18	268	8.3	260	4.5	129	2.5	4.5	
19	270	8.0			95#	2.4#	4.8	
20	282	7.4					5.3	
21	311	7.5					5.6	
22	321	7.8					5.4	
23	326	7.6					4.4	

Time: 150.0°E.
Sweep: 2.2 Mc to 13.0 Mc in 2 minutes.
*Average values.
**Reported as "Abnormal E."
#One or two values only.

Table 63* (See table 5, CRPL-F43)

Adak, Alaska (51.9°N, 176.6°W) January 1948

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	330							2.8
01	310							2.7
02	320							2.7
03	320							2.7
04	310							2.7
05	300							2.8
06	275							3.0
07	250							2.7
08	220				160			3.3
09	205				120			3.4
10	210				115			3.3
11	230				110			3.4
12	220				115			3.3
13	210				110			3.3
14	230				125			3.3
15	220				130			3.4
16	210				150			3.4
17	200							3.3
18	210							3.5
19	220							3.4
20	250							3.2
21	280							3.0
22	290							2.9
23	320							2.7

Time: 150.0°W.
Sweep: 1.2 Mc to 15.5 Mc in 12 minutes, manual operation.
*Medians of daily data for heights and F2-M3000 revised for the month on the basis of subsequent information furnished by the station.

TABLE 64

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

Form adopted June 1946

IONOSPHERIC DATA

h' F2 (Characteristic), KM (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: K.L.W., M.C.E.

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	C	(320)^{C}	C	(300)^{C}	C	C	(240)^{C}	240	230	240	270	300	280	240	260	250	240	230	220	250	240	240	240
2	250	250	250	250	250	250	250	240	(240)^{A}	240	240	250	270	240	250	250	240	230	230	200	230	240	250	240
3	250	240^{K}	350^{K}	320^{K}	300^{K}	250^{K}	250^{K}	230^{K}	210^{K}	240^{K}	240^{K}	240^{K}	260^{K}	260^{K}	C^{K}	240^{K}	250^{K}	230^{K}	220^{K}	220^{K}	220^{K}	230^{K}	240^{K}	250^{K}
4	270^{K}	270^{K}	290^{K}	300^{K}	300^{K}	310^{K}	250	240	220	240	250	240	240	250	240	240	230	240	230	200	200	(230)^{S}	240	250
5	250	250	250	250	250	250	260	240	230	230	240	240	250	240	240	250	240	230	220	200	210	210	250	240
6	260	250	250	240	250	270	300	240	230	240	240	240	250	250	240	250	240	250	230	230	220	230	230	240
7	260	250	250	260	250	240	240	230	230	220	230	240	250	240	250	240	250	230	220	210	220	220	240	240
8	250	270	280	260	250	240	240	230	230	240	240	250	250	240	250	250	240	240	220	220	230	220	240	240
9	250	250	250	250	270	260	240	240	230	230	240	240	230	250	210	230	220	230	230	210	210	240	240	240
10	250	260	260	240	230	240	240	230	230	230	240	230	230	250	250	260	230	230	230	210	210	230	230	240
11	250	240	240	240	230	240	230	230	240	230	240	240	230	(230)^{M}	250	250	220	240	230	240	240	220	230	240
12	270	270	280	300	270	260	270	240	230	230	240	240	240	240	240	240	240	240	230	220	230	250	250	270
13	270	250	250	260	260	(300)^{S}	320$^{F}_{K}$	280^{K}	250^{K}	280^{K}	250^{K}	(240)$^{M}_{K}$	C^{K}	230^{K}	250^{K}	250^{K}	240^{K}	240^{K}	240^{K}	240^{K}	240^{K}	250^{K}	(280)$^{S}_{K}$	280^{K}
14	280^{K}	(330)$^{F}_{K}$	(330)$^{F}_{K}$	330$^{F}_{K}$	320$^{F}_{K}$	270$^{F}_{K}$	270$^{F}_{K}$	230^{K}	220	220	240	240	250	260	250	250	240	230	230	210	220	220	(300)$^{S}_{K}$	(380)$^{S}_{K}$
15	(360)$^{F}_{K}$	F^{K}	(400)$^{F}_{K}$	(380)$^{F}_{K}$	B^{K}	B^{K}	370^{K}	(280)$^{F}_{K}$	G^{K}	(400)^{K}	630^{K}	580^{K}	(650)^{K}	580^{K}	(700)^{K}	620^{K}	440^{K}	240^{K}	270^{K}	270^{K}	280^{K}	280^{K}	C^{K}	260^{K}
16	270^{K}	250^{K}	250^{K}	270^{K}	300^{K}	300^{K}	280^{K}	240^{K}	240^{K}	240^{K}	240^{K}	230^{K}	270^{K}	270^{K}	290^{K}	230^{K}	250	240	230	220	220	240	260	250
17	270	280	250	250	270	270	280	240	240	230	240	220	250	270	210	240	230	230	230	250	C	C	C	270
18	250	250	240	240	240	260	260	240	230	200	230	240	230	240	250	230	230	240	230	210	230	250	240	250
19	240	250	240	240	280	280	260	240	250	240	250	260	260	270	260	250	240	230	230	200	240	240	240	250
20	250	250	250	250	250	270	250	230	230	240	240	250	260	250	240	240	250	240	230	210	240	250	240	250
21	250	250	270	250	230	220	300	220	230	240	240	270	250	270	250	250	250	230	220	210	230	240	250	250
22	250	240	250	250	220	230	250	210	220	240	240	240	240	250	250	240	240	230	230	200	220	240	240	C
23	230	230	230	C	C	C	C	C	C	C	240	230	250	240	240	240	230	230	230	210	220	220	C	230
24	240	250	250	250	230	250	250	230	240	240	240	240	240	270	260	260	250	230	230	220	200	230	230	250
25	250	250	250	230	230	240	240	230	220	240	C	230	250	250	250	240	240	230	230	220	210	240	240	240
26	250	250	250	240	220	230	240	230	210	250	250	260	270	260	250	250	230	240	230	220	240	240	230	230
27	(220)^{S}	(270)^{S}	(280)^{S}	240	(250)^{S}	230	220	220	210	240	240	270	260	280	250	240	220	230	220	220	220	(230)^{S}	(250)^{S}	(240)^{S}
28	(230)^{S}	(240)^{S}	(240)^{S}	240	(280)^{S}	(280)^{S}	260	240	230	240	(230)	270	270	260	250	240	250	230	240	220	230	240	250	(270)^{S}
29	(280)^{S}	(280)^{S}	260	240	240	250	250	240	230	240	250	290	280	260	300	270	C	230	230	220	230	230	240	260
30	260	270	260	240	240	240	250	230	230	230	230	230	250	250	260	240	240	240	230	230	230	220	200	250
31	280	270	260	230	220	230	240	230	220	240	240	270	260	270	270	250	230	230	230	220	240	250	280	250
Median	250	250	250	250	250	250	250	235	230	240	240	240	250	250	250	250	240	230	230	220	230	240	240	250
Count	31	29	31	29	29	28	29	30	30	30	30	31	30	31	30	31	30	31	31	31	30	30	28	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE: 1948 O - 702319

TABLE 65

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

Form adopted June 1946

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), March (Month), 1948

National Bureau of Standards (Institution)

Observed at Washington, D.C.

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

Lat 39.0°N, Long 77.5°W — 75° W Mean Time

Calculated by: M.C.E., K.L.W.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(5.8)S	[4.5]C	(3.2)JF	C	F	C	C	4.8	5.6	6.8	7.3	7.7	8.3	8.9	8.7	8.6	8.6	8.5	8.6	8.2	(6.7)J	6.0	5.2	5.2
2	5.0	4.8	4.8	4.9	4.4	4.0F	3.4	5.6	(7.5)J	9.0	(10.0)C	10.2	(11.3)SC	11.1	11.4	(10.6)C	(10.6)S	[9.8]S	(9.0)S	(8.7)S	(6.8)J	5.2	5.4	5.2
3	4.5	3.2FK	(3.0)JK	2.8FK	(2.8)JFK	3.1FK	[4.0]FK	5.0K	(5.9)SK	7.0K	8.7K	(9.1)SK	(9.8)SC	C K	C K	9.4K	S C K	S K	(9.5)SK	8.7K	(6.3)JK	(5.9)JK	(4.8)SK	(4.1)JK
4	(3.9)GK	(3.7)SK	(3.4)SK	(3.4)SK	3.4K	3.0K	(2.9)S	(5.9)S	7.3	8.5	9.0	10.1	10.2	(10.6)J	11.4	11.0	11.0	(10.5)J	(10.2)JS	8.7	7.2	(6.1)JS	5.2	5.3
5	4.9	4.8	4.9V	4.2	4.0	3.7V	4.1V	6.1	8.1	8.7	10.4	10.4	11.2	11.2	11.3	11.3	11.3	11.3	(10.6)J	(9.6)S	(7.9)S	5.9	5.7	5.6
6	5.2	4.9F	4.8	(4.4)JS	(4.0)JFHK	[3.4]F	2.9F	(5.8)S	8.1	8.7	9.8	10.7	10.3	11.0	11.3	11.1	11.1	11.0	(10.4)JS	9.4	8.3	7.2	(6.4)J	5.6
7	5.2F	5.0F	4.9F	4.8F	(4.8)F	4.4F	4.1F	6.3	8.2	9.3	10.3	11.1	11.4	11.1	11.0	(10.6)P	10.8	10.7	(10.2)S	9.2	7.4	(6.4)J	5.7	5.2
8	4.8	4.5	4.5	(4.4)S	4.5	4.1	3.9	6.3	8.0	9.3	9.6	(11.0)C	10.8	11.1	11.3	11.4	10.6	(10.4)S	9.7	(9.4)S	8.5	7.3	6.5	(6.2)J
9	5.5	5.2	5.2	4.6	4.4	4.4	4.6	6.7	8.6	9.5	9.6	10.8	11.3	11.4	11.3	(11.4)S	11.4	11.3	(10.9)J	9.7	(8.0)J	7.3	6.9	6.1
10	5.7	5.7	5.5	5.4	5.1	4.3	4.3	6.9	8.8	10.3	(10.5)J	11.1	11.3	11.6	11.5	11.4	(11.0)S	(10.4)J	(10.3)SP	9.5	8.7	7.9	7.2	(6.4)J
11	(5.8)P	5.6	5.5	5.3	4.9	4.6	4.5	7.6	9.6	9.8	(10.7)J	11.0	11.5	11.3	11.2	11.0	10.5	(10.2)J	(9.8)P	9.2	9.4	8.1	7.8	5.8
12	5.4	5.7	5.4	5.5	5.1	5.0	4.8	6.7	8.8	10.4	11.0	11.5	11.9	11.6	11.4	(10.3)C	(9.8)S	9.3	9.4	8.7	7.8	7.2	(6.8)J	(6.4)J
13	(6.4)J	6.6	5.6	5.7	(5.2)J	4.4	[4.6]FK	(4.9)FK	5.8FK	7.0K	8.0VK	8.9K	[9.3]CK	9.7K	9.5K	10.1K	9.5K	9.7K	(10.0)SK	9.4K	8.0K	(7.2)JK	(5.9)JK	(6.8)JK
14	(6.4)JK	FK	FK	FK	FK	FK	FK	(6.5)JK	(8.4)F	10.0	12.0	12.6	12.4	12.6	12.4	12.6	12.5	12.4	(12.0)P	(9.7)J	8.2	(6.9)JV	(5.3)SK	FNK
15	FNK	FK	(3.2)FK	FK	FK	(3.8)FK	(3.7)FK	(4.4)FK	(4.6)FA	5.4K	4.9K	5.0K	4.9K	4.9K	5.5K	5.3K	(5.7)SK	5.7K	5.5K	5.4K	4.9K	4.9K	[4.8]CK	4.7K
16	(4.9)JK	4.7K	(3.9)JK	(3.1)JK	(2.7)FK	2.3FK	(3.3)FK	5.9K	6.9K	7.9K	8.6K	9.2K	9.3K	9.3K	9.4K	9.9K	10.0	(10.0)S	9.5	8.8	7.3	(6.5)J	(6.5)J	(5.8)S
17	(5.1)JS	(5.3)J	(5.1)J	4.4	(4.0)J	3.7	(3.8)J	6.5	8.5	8.9	9.5	10.2	10.4	10.4	11.3	11.5	11.3	11.3	(10.0)J	7.1	C	C	C	(6.7)J
18	6.7	(6.6)J	(5.9)S	(5.0)JS	(4.7)JS	(4.0)JF	(4.1)JF	6.9	8.8	9.5	10.1	11.1	11.3	11.4	11.4	[11.4]C	(11.3)C	(11.2)C	[10.6]C	(9.9)C	8.8	(8.3)S	(7.4)S	7.2
19	6.9	6.8	6.4	5.4	(4.9)J	(5.0)J	(5.2)J	(6.9)JF	(7.8)C	8.7	9.3	10.3	10.8	10.5	10.3	11.1	10.7	10.4	10.2	9.2	7.8	7.6	6.8	6.6
20	(6.4)J	(6.3)J	(5.9)J	(5.4)JV	(4.8)J	(5.1)J	(5.4)J	7.1	8.3	8.9	10.2	10.8	11.6	11.0	11.0	10.4	10.2	10.3	9.4	8.8	7.9	8.2	(7.2)J	(6.6)J
21	(6.0)S	5.8	(6.0)J	5.0	5.0	4.8	(4.2)JS	6.5	8.8	9.4	10.4	11.5	11.6	11.6	11.6	11.4	11.0	(10.5)JS	(10.1)P	9.0	8.4	8.2	7.6	(6.4)J
22	6.5	(5.9)J	5.9	(5.5)S	5.2	4.8	5.0	6.8	9.0	9.6	10.7	11.2	12.4	11.8	11.4	11.6	10.8	11.1	(10.7)S	(10.4)S	(8.9)S	(7.9)S	7.7	[7.3]C
23	(6.9)JS	(6.3)J	(6.1)JS	C	C	C	C	C	C	C	10.4	11.2	11.8	11.2	10.5	10.8	10.8	10.3	(10.4)S	(9.3)S	8.6	(7.6)S	C	6.8
24	(6.5)J	6.1	(6.2)S	(5.7)JS	5.3	(4.7)JF	4.9	6.9	8.9	9.5	10.3	11.2	11.4	11.0	11.2	11.0	(10.5)C	10.4	(10.0)C	(9.5)C	7.6	7.5	6.8	6.0
25	(5.8)S	(5.6)S	(5.5)J	5.1	(4.6)J	4.2	4.8	7.0	8.2	9.0	[10.1]C	11.2	11.2	11.0	11.3	11.0	(10.4)JS	10.3	(10.3)S	9.3	7.8	7.6	(7.2)JS	6.6
26	(6.5)S	(6.1)JS	6.0	(5.6)JS	(5.0)JS	(4.5)JS	(4.7)F	(6.8)F	9.0	10.2	10.5	11.5	11.0	11.5	11.5	(10.6)C	(10.2)S	(10.3)S	(10.1)C	(9.5)S	(9.5)S	9.0	(8.0)J	7.7
27	(6.8)J	(5.8)J	(5.8)J	(5.8)J	(5.8)J	5.4	5.7	7.6	9.0V	10.1	11.0	11.7	11.4	11.7	11.8	11.5	(10.7)P	(10.8)J	(10.1)P	(9.5)S	(8.1)J	7.2	(7.0)J	(7.2)S
28	(6.8)J	(6.2)S	(5.8)JS	(4.6)JS	(4.0)JS	(3.8)JS	(4.8)JS	6.8	7.8	8.2	9.6H	10.1	10.2	11.0	11.0	10.5	10.4	9.8	9.3	8.7	(7.6)J	(6.8)J	(5.8)J	(5.8)JS
29	(5.6)JS	(5.6)JS	(5.6)J	(5.4)J	(5.0)J	(4.7)J	5.2	6.5	7.2	8.0	9.2	9.8	(9.7)JF	10.3	(10.2)S	(10.0)S	[9.9]C	9.8	9.3	8.7	7.9	7.5	(6.5)J	(5.8)JS
30	(5.7)F	(5.7)F	(5.7)J	(5.6)JF	(5.0)JF	(4.6)J	5.6	8.0	(9.8)S	10.3	11.8	11.8	11.8	12.0	(11.9)C	11.4	11.1	10.9	(10.0)S	(10.2)S	9.3S	7.5	6.8	(6.3)S
31	6.1	6.0	6.1	(5.4)S	4.9	4.3	(5.4)S	7.6	9.3	10.3	10.8	11.4	11.8	11.6	11.5	12.0	11.5	11.3	(11.0)S	(10.0)S	(8.5)JS	7.9	7.8	7.8
Median	(5.8)	5.7	(5.5)	(5.1)	(4.8)	4.4	4.6	6.6	8.2	9.2	10.1	11.0	11.3	11.1	11.3	11.0	10.7	10.4	(10.1)	9.3	8.0	7.3	6.8	6.2
Count	30	29	30	27	29	28	28	30	30	30	31	31	31	30	30	31	30	30	31	31	30	30	29	30

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 703519

TABLE 66

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

Form adopted June 1946

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), March (Month), 1948

National Bureau of Standards (Institution)

Observed at Washington, D.C.

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

Lat. 39.0°N, Long 77.5°W

75°W Mean Time

Calculated by: M.C.E., K.L.W.

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330
1	(5.9)P	[4.6]C	3.2F	[3.4]C	(3.6)F	[3.9]C	(4.2)JF	(5.5)S	[6.2]C	6.8	7.6	8.0	8.8	8.8	8.7	8.4	8.4	8.6	8.6	(6.9)J	(6.8)J	(5.8)S	(5.2)S	5.1
2	4.9	4.9	4.8	4.7F	4.1	3.5F	4.1	6.3	(7.6)	(9.3)	[10.1]C	(10.8)	11.2	(11.4)S	10.3	(10.5)S	(10.2)J	[9.8]S	(9.4)S	(6.7)	[5.4]C	5.5	5.2	4.8
3	(4.2)	3.1FK	(3.1)JK	2.9FK	2.9FK	[3.4]FK	3.9K	6.8K	7.8K	8.6K	8.9K	(9.0)K	(9.2)K	[9.4]CK	(9.5)K	(9.4)S	S K	S K	8.9K	S K	S K	(5.1)SK	[4.5]SK	(3.9)JK
4	(3.5)K	3.3K	3.4K	(3.4)SK	3.3K	2.9K	(3.9)S	7.0	(8.4)J	9.0	[9.6]C	10.3	10.8	11.2	10.9	11.0	10.8	(10.2)J	(9.7)S	(8.0)JS	(6.9)J	5.7	5.2	5.2
5	4.9	4.9	4.3	4.2	4.1	3.9V	4.8	7.5	8.5	9.6	(10.3)S	10.5	10.4	10.6	11.4	[11.3]C	11.2	11.1	(10.7)S	8.7	7.2	(5.8)S	5.6	5.2
6	5.2V	4.8	(4.5)S	(4.2)S	(4.0)JK	F	(4.2)F	(7.5)S	8.8	9.2	10.2	10.8	10.6	11.3	11.2	11.5	11.3	(10.4)S	9.6	9.1	8.0	6.5	5.7	5.2
7	5.2F	5.0F	(4.9)F	(4.8)F	4.5F	4.1F	5.0	7.4	8.5	9.6	10.5	11.3	11.3	11.3	10.8	10.6	10.5	(10.4)JS	(9.6)S	8.5	7.1	6.2	5.5	5.2
8	4.8	4.4	4.5	4.5	4.3	4.0	4.8	7.1	8.8	[9.8]C	(10.9)C	(10.6)C	11.1	11.0	11.3	[10.8]C	10.3	9.7	(9.5)S	8.8	8.1	6.7	(6.2)J	(5.8)C
9	5.4	5.3	5.0	4.6	4.3	4.4	5.5	7.9	9.2	(9.9)C	(10.3)J	(10.9)C	11.3	11.3	(11.5)S	11.2	(11.4)S	11.0	(9.8)S	8.9	7.5	6.9	6.7	6.2
10	5.5	5.5	5.4	5.4	4.7	4.3	5.6	7.7	9.7	9.6	11.3	11.2	11.8	11.6	11.4	11.2	(10.8)S	(10.3)J	(9.6)P	9.3	8.0	7.8	(6.8)J	(5.9)P
11	5.8	5.7	5.5	5.2	4.7	4.4	5.5	8.6	(9.7)P	10.3	(10.6)J	11.4	11.3	11.3	[11.0]C	(10.8)C	10.7	(11.3)S	(9.3)P	8.8	8.8	(8.0)J	(6.7)J	5.5
12	5.5	5.7	5.0	5.1	5.2	4.9	5.4	7.6	9.2	10.2	11.5	11.5	11.8	11.6	(10.6)C	(10.0)C	(9.3)C	(9.4)P	9.0	8.0	7.4	7.0	(6.8)J	6.4
13	6.6	6.5V	6.0	(5.4)F	4.6	3.7	(4.0)FK	(5.8)FK	6.6FK	7.6K	8.6K	[9.2]CK	9.9K	9.7K	9.7K	9.7K	9.4K	(10.3)SK	(9.7)SK	8.2N	7.0VK	(6.2)JK	(7.0)RK	(6.4)JK
14	(5.5)JK	F K	F K	F K	F K	F K	(4.6)FK	(7.8)FK	9.5	11.2	12.0	12.1	12.6	12.5	12.6	12.4	12.5	(12.3)S	(11.8)P	9.4	(7.8)J	5.8	(4.8)JK	[4.8]FK
15	(4.9)FK	(3.4)FK	F K	F K	3.6K	(3.8)FK	(4.2)FK	6K	(5.1)FK	G K	5.1K	(5.0)K	4.9K	(5.1)BK	[5.2]CK	5.3K	5.7K	5.7K	5.3K	4.8K	4.7K	(4.9)SK	4.9K	(4.9)JK
16	C K	C K	C K	C K	C K	C K	C K	C K	C K	7.9K	9.0K	9.3K	9.3K	9.2K	9.7K	10.2K	(9.9)	(9.8)	(9.2)	(8.0)J	(7.3)J	(6.5)J	(6.2)S	5.7
17	5.3	(5.3)J	4.8	(4.2)J	(3.7)J	(3.4)J	5.2	(7.6)J	8.6	9.0	(9.5)	(10.4)	10.3	10.5	11.5	11.4	11.3	(10.8)	(7.2)	C	C	C	C	6.8
18	6.4	(6.4)JS	(5.5)JS	(4.9)JS	(4.2)JS	(3.8)JF	5.5	8.1	8.9	9.8	10.3	11.3	11.0	11.0	(10.2)C	(11.4)C	(11.3)C	C	C	(9.3)S	8.5	(8.1)J	7.6	7.3
19	6.8	6.5	(5.7)	(4.9)J	(4.9)J	(5.1)JS	[6.0]J	(7.0)C	[8.0]C	9.1	9.7	10.7	10.5	10.4	10.9	10.7	10.6	10.2	10.0	8.3	8.0	(6.7)SC	(6.5)J	6.5
20	(6.4)JS	6.2	(5.7)J	(5.1)J	(4.9)J	(5.1)J	(6.2)J	8.2	8.6	9.5	10.4	11.1	11.2	11.3	10.8	10.5	10.2	9.7	9.3	8.6	8.2	7.7	(7.2)J	(6.6)J
21	(5.8)J	(6.0)J	(5.8)J	(5.2)J	(4.6)JS	(3.9)S	(5.2)JS	7.8	8.8	9.8	11.0	11.5	11.6	11.5	11.3	11.0	(10.0)S	(10.0)JS	(9.0)P	8.6	8.2	8.0	(7.4)JS	6.7
22	(6.6)JS	6.0	5.4	(5.3)S	5.0	4.4	(6.2)JS	7.7	7.5	10.2	10.9	11.9	12.0	[11.6]C	(11.2)JS	11.3	11.2	11.3	10.8	(9.3)JS	8.3	(7.6)J	7.5	(7.1)JS
23	[6.7]C	(6.3)J	C	C	C	C	C	C	C	10.4	10.8	11.8	11.6	11.0	11.2	11.0	(10.7)JS	(10.7)JS	(10.3)JS	(9.0)JS	8.2	7.6	[7.0]C	(6.5)JS
24	(6.1)JS	(6.2)JS	(5.7)JS	5.5	(4.7)F	(4.7)F	6.2	7.9	9.1	9.8	10.7	11.4	11.0	11.1	11.2	[11.2]C	10.2	(10.0)C	9.6	8.8	7.6	(7.2)C	(6.4)JS	(6.2)JS
25	5.8	5.6	5.4	4.8	4.2	4.2	5.7	7.4	9.0	9.9	11.0	11.5	11.0	11.4	[11.2]C	C	(10.3)JS	(10.1)JS	(9.7)JS	8.6	(7.7)JS	7.6	7.1	6.5
26	6.2	(6.0)JS	(6.0)JS	5.2	(4.8)JS	(4.5)JS	6.1	7.9	9.4	(10.1)JS	11.0	11.3	(10.8)JS	[11.0]C	11.3	(9.8)C	10.2	10.5	(9.6)C	(9.3)JS	(9.3)JS	(8.8)J	8.0	(7.4)J
27	(5.8)J	(5.6)J	(5.7)J	5.6	(5.6)J	(5.1)F	(6.6)C	8.4	9.5	(10.6)J	11.3	11.6	(11.4)JS	11.8	11.5	11.0	(10.4)JS	(10.5)JS	(9.8)JS	(9.0)J	7.8	(7.0)J	(7.2)FJ	7.0
28	6.3	(6.2)JS	(5.1)J	(4.2)J	(4.0)JS	(4.1)JS	(5.7)J	7.2	8.6	8.8	9.9	10.2	10.6	11.2	10.8	10.4	10.0	9.5	9.0	(8.1)J	(7.2)S	(6.5)JS	[6.0]SC	(5.6)SJ
29	(5.6)JS	(5.7)JS	(5.7)J	(5.4)J	(5.0)J	(4.6)JF	5.9	7.0	7.7	8.6	9.5	(10.0)C	[10.1]C	10.3	(9.7)JS	(10.0)S	(9.7)S	9.4	9.0	9.1	7.9	7.0	(5.8)JS	(5.7)JS
30	(5.7)JF	(5.0)JV	(5.7)J	(4.9)JF	5.0F	(4.8)JF	7.2	9.5	(10.0)JF	(11.2)P	11.8	11.8	11.8	(12.0)C	11.5	10.9	11.1	(10.5)JS	(10.4)JS	9.8S	8.4	7.3	6.7	(6.0)J
31	(6.0)J	6.1	(5.9)J	5.1	4.5	4.3	6.4	8.5	9.5	10.3	11.4	11.8	11.6	11.6	11.8	11.5	(11.3)C	11.3	(10.7)JF	9.0	(8.0)J	7.8	8.0	(7.4)J
Median	5.8	5.6	(5.4)	(4.9)	4.5	(4.2)	5.5	7.6	8.8	9.6	10.4	11.1	11.0	11.2	11.2	10.8	10.4	(10.3)	(9.6)	8.7	7.8	7.0	(6.6)	6.0
Count	30	29	27	27	28	27	29	29	29	31	31	31	31	31	31	30	30	29	30	29	29	30	30	31

Sweep 10 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 67

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

Form adopted June 1946

IONOSPHERIC DATA

h' F1 (Characteristic), KM (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5° W

75° W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: K.L.W., M.C.E.

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											210	220	220	220	220	220	210									
2										220	200	200	200	220	(190)	200	200									
3												190^{K}		C^{K}	C^{K}	210^{K}										
4										200	200	200	220	200	200	200										
5										210	190	190	190	220	220	210	220									
6										210	190	190	200	230		200	230									
7											200	220	200	220	220	220	230									
8										220	200	220	200	(200)	220	220	220									
9										210	200	200	200	210												
10									220		190	200	220	210	200	230										
11										220	190	200	190	200	220	220										
12										220	200	200	B	210	200	220	230									
13										240^{K}	230^{K}	200^{K}	C^{K}	220^{K}	220^{K}	230^{K}										
14											200	190	200	210	190	220	220									
15									240^{K}	240^{K}	230^{K}	230^{K}	230^{K}	230^{K}	220^{K}	230^{K}	240^{K}									
16									220^{K}	210^{K}	190^{K}	190^{K}	220^{K}	200^{K}	200^{K}		220									
17									230	200	210		210	200		200	220									
18											200	190	200	190	200	200										
19									230	220	200	(180)	200	200	210	210	230									
20									220	220	230	200	210	220	200	200	220									
21										220	210	220		210		200	220									
22										230	210	200	210	220	B	200	220									
23										C	210	190	190	200	200	220	200	220								
24									230	210	200	190	200	200	200	200	230									
25									210	220	C	180	200	200	190	210	220									
26										200	200	180	200	210	200	210										
27										190	210	(180)	(200)^{B}	200	230	200										
28										220	190	180	(200)^{B}	220	210	210	220									
29										210	190	210		210	200	200	C									
30									210	200	190	180	220	200	210	200	200	220								
31										200	200	190	210	200	200	210										
Median									220	215	200	195	200	210	200	210	220									
Count									9	24	29	30	26	30	25	29	20									

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

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

TABLE 68

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

Form adopted June 1946

IONOSPHERIC DATA

f° F1 (Characteristic), Mc (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: K.L.W., M.C.E.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	(4.8)	L	L	L							
2										L	L	L	5.7	L	L	L	L							
3												L K		L K	C K	L K								
4										L	L	L	L	(4.5)	4.1	L								
5										L	L	L	L	L	L	L	L							
6										L	L	(4.4)	L	L		L	L							
7											L	L	L	L	L	L	L							
8										L	L	L	L	L	L	L	L							
9										L	L	L	L	L										
10									L		L	L	L	L	L	L								
11										L	L	L	L	L	L	L								
12										L	L	L	L	L	(4.2)	L	L							
13										L K	L K	L K	C K	L K	L K	L K								
14											L	L	L	L	L	L	L							
15									4.2 K	(4.7) F K	4.4 K	4.5 K	4.5 K	4.6 K	4.6 K	4.5 K	4.4 K							
16									L K	L K	L K	L K	L K	L K	L K		L							
17									L	L	L		L	L		L	L							
18											L	L	L	L	L	L								
19									L	L	L	L H	L H	L	L	L	L							
20									L	L	L	L	L	L	L	L	L							
21										L	L	L		L		L	L							
22										L	L	L	L	L	B	L H	L							
23										C	L	L	L	L	L	L	L	L						
24									L	L	L	L	L	L	L	L	L							
25									L	L	C	4.1	L	(4.9)	L	L	L							
26										L	L	L	L	L	L	L								
27										L	L	L	L	L	L	L								
28										L	L	L	L	L	L	L	L							
29										L	L	L		L	(4.6) H	L	C							
30									L	L	4.7	L	L	4.8	L	L	(4.2) S	L H						
31										L	L	L	L	L	L	L								
Median														(4.6)										
Count														5										

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 703518

TABLE 69

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

Form adopted June 1946

IONOSPHERIC DATA

h' E (Characteristic), KM (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: K.L.W., M.C.E.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									(120)^{S}	100	100	A	110	100	100	100	100	110	S					
2								120	110	100	100	100	100	100	100	100	110	120						
3								130^{K}	110^{K}	100^{K}	100^{K}	100^{K}	(100)$^{N}_{K}$	C^{K}	C^{K}	100^{K}	100^{K}	110^{K}							
4									100	100	100	(130)^{B}	100	110	100	100	100	110							
5								110	100	100	100	100	100	100	100	100	100	110							
6								(130)^{B}	100	100	100	110	100	100	100	100	100	110							
7								100	100	100	100	100	100	100	100	100	100	100	120						
8								120	100	100	100	100	100	100	100	100	100	100							
9								130	100	100	100	100	100	100	100	100	100	100	130						
10								110	100	100	100	100	100	100	100	100	100	100	(140)^{S}						
11								A	110	100	100	100	100	110	B	100	100	110	(130)^{S}						
12								(120)	110	A	100	110	110	110	100	110	100	110	120						
13								110^{K}	100^{K}	100^{K}	100^{K}	100^{K}	C^{K}	110^{K}	100^{K}	110^{K}	100^{K}	100^{K}	(120)$^{S}_{K}$						
14								120^{K}	100	100	100	100	100	100	100	100	110	110	130						
15								110^{K}	A^{K}	A^{K}	(130)$^{S}_{K}$	110^{K}	(110)$^{S}_{K}$	(120)$^{S}_{K}$	(110)$^{S}_{K}$	100^{K}	100^{K}	100^{K}							
16								100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100^{K}	100	100	130						
17								100	100	100	100	B	110	110	100	100	100	100	120						
18								120	100	100	100	100	100	100	100	100	100	100	120						
19								110	100	100	100	100	100	110	100	100	100	100	130						
20								110	110	100	100	100	100	100	100	100	100	100	130						
21								100	100	100	100	100	100	100	100	A	100	100	(140)^{B}						
22								100	100	100	100	100	100	(110)^{B}	B	90	100	100	130						
23								C	C	C	100	100	100	100	100	100	100	100	120						
24								100	100	100	100	100	100	100	110	100	100	100	A						
25								110	100	100	C	100	100	100	100	90	100	100	120						
26								100	100	100	100	100	100	100	100	100	A	100	(120)^{S}						
27								100	A	100	(120)^{A}	(110)	100	100	100	100	110	100	(110)^{S}						
28								110	100	100	A	100	100	110	100	100	100	100	(120)^{S}						
29								110	100	100	100	100	B	110	100	90	C	100	120						
30								100	100	100	100	100	100	100	100	100	100	100	110						
31								100	100	100	100	100	100	100	100	100	100	110	110						
Median								110	100	100	100	100	100	100	100	100	100	100	120						
Count								27	28	28	29	29	29	30	28	30	29	31	22						

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE: 1948 O - 702519

TABLE 70

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

Form adopted June 1946

IONOSPHERIC DATA

f°E (Characteristic), Mc (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: K.L.W., M.C.E.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									(2.4)^{S}	(2.8)	A	A	3.6	3.5	3.4	3.2	2.8	2.3	S					
2								(2.8)	(2.1)^{A}	3.0	3.2	3.3	(3.3)	(3.4)^{B}	(3.4)^{B}	3.2	2.9	2.3						
3								1.9^{K}	2.6^{K}	2.9$^{H}_{K}$	3.3$^{H}_{K}$	3.3^{K}	(3.5)^{K}	C^{K}	C^{K}	3.0^{K}	2.8^{K}	B^{K}						
4									2.2	2.9	3.2	(3.2)^{B}	3.4	3.4	3.1^{H}	(2.9)^{H}	(2.7)^{H}	(2.2)^{H}						
5								(2.0)^{S}	2.5	2.9	3.2	3.3	3.5	3.6	3.5	3.2	2.9	2.5						
6								1.9	2.6	3.1	3.3	3.4	3.5	3.5	3.3	3.3	3.0	2.5^{H}						
7								(2.0)^{S}	2.7^{H}	3.1	3.4	3.6	[3.6]^{A}	3.7	3.6	3.3	(3.1)^{S}	2.6	1.7					
8								2.0	2.8	3.3	3.4	3.6	3.7	3.6	3.6	3.3	3.0	2.6						
9								2.0	2.7^{H}	3.2^{H}	3.4	3.5^{H}	3.7	3.8	3.7	3.3	3.1	2.6	1.8					
10								1.9^{H}	(2.7)	3.2	3.5	3.6	3.7	3.7	3.7	3.5	[3.0]^{A}	2.5	1.8					
11								A	3.0	3.2	[3.4]^{A}	3.5	3.7	3.7	[3.4]^{B}	3.2	3.1	2.6	1.8^{H}					
12								2.1	2.3^{H}	3.2	3.4	3.6	[3.6]^{B}	3.7	3.6	3.3	(3.1)	(2.8)^{A}	(1.7)^{H}					
13								2.3^{K}	2.5$^{H}_{K}$	3.0^{K}	3.0^{K}	(2.9)$^{A}_{K}$	[3.3]$^{C}_{K}$	(3.7)^{K}	3.6^{K}	3.5^{K}	3.0$^{H}_{K}$	(2.7)^{K}	1.7$^{H}_{K}$					
14								(2.2)^{K}	(2.5)^{A}	(3.0)^{H}	(3.2)^{A}	(3.5)^{B}	3.6	(3.8)	(3.2)^{H}	3.4	3.1	(2.7)	(2.0)					
15								(2.5)$^{F}_{K}$	[2.8]$^{A}_{K}$	3.1$^{F}_{K}$	3.4^{K}	3.5^{K}	3.7^{K}	3.6^{K}	3.5^{K}	3.3^{K}	2.9^{K}	2.5$^{H}_{K}$						
16								2.0$^{H}_{K}$	2.7^{K}	2.9$^{H}_{K}$	2.9^{K}	3.1^{K}	3.4$^{H}_{K}$	[3.3]$^{B}_{K}$	(3.2)^{K}	3.2^{K}	3.1	(2.5)	1.8					
17								(1.9)^{H}	2.8^{H}	2.7^{H}	3.0^{H}	[3.4]^{B}	3.7	3.2^{H}	3.5	3.3^{H}	3.1	2.6^{H}	1.9					
18								2.2	2.8^{H}	2.7^{H}	3.1^{H}	3.6^{H}	3.7	3.6	3.5	3.3	3.0	2.3^{H}	1.9^{H}					
19								2.1^{H}	2.7^{H}	3.2	3.4	(3.4)^{H}	(3.6)	(3.4)	3.6	3.3	3.1	2.6	(1.9)					
20								2.1	3.0	3.3	3.3	(3.3)^{B}	(3.3)^{B}	(3.3)^{B}	3.5	3.2	3.1	2.6^{H}	1.9					
21								2.4	2.5^{H}	2.8^{H}	3.0^{H}	3.4	3.6	3.6	3.6	[3.4]^{A}	3.2	[2.6]^{A}	(2.0)^{B}					
22								2.2	2.6	(3.0)^{B}	(3.1)^{B}	B	B	B	[3.0]^{B}	3.3	2.9^{H}	(2.7)^{B}	(1.8)^{B}					
23								C	C	C	3.2	(3.2)^{B}	(3.4)^{B}	[3.3]^{B}	3.2	3.3	3.1	2.5	(1.7)^{H}					
24								1.9^{H}	2.7^{H}	3.1	3.3	3.3	3.6	3.7	3.5	3.4	3.1	2.7	1.9					
25								2.2	2.8	3.0^{H}	[3.3]^{C}	3.6	3.7^{H}	(3.6)^{B}	3.6	3.3	3.0	2.6	1.8^{H}					
26								2.1^{H}	2.7	3.2	3.4	3.2^{H}	(3.5)^{S}	(3.6)^{B}	3.6^{B}	3.2	[2.8]^{A}	(2.4)^{H}	(1.9)^{H}					
27								2.3	(2.8)^{A}	3.0	(3.4)^{B}	(3.6)	(3.4)^{B}	3.6	(3.7)	3.4	3.1	2.6	1.9					
28								(2.2)^{J}	2.8	(3.2)^{F}	[3.2]^{A}	(3.2)^{A}	(3.6)^{B}	(3.6)	3.6	3.4	3.0^{H}	2.6	2.0					
29								2.4	(2.9)^{A}	(2.8)^{A}	A	A	B	(3.6)^{A}	3.6	3.5	[3.1]^{C}	2.7	2.0					
30								2.5	2.9	3.2	3.3	3.5	(3.3)^{A}	3.1^{H}	3.6	3.4	(3.0)^{A}	2.7	2.0					
31								2.5	3.0	3.3	[3.5]^{B}	(3.7)^{B}	B	B	B	(3.4)^{B}	(3.3)^{D}	[2.6]^{A}	(2.0)^{A}					
Median								2.1	2.7	3.0	3.3	3.4	3.6	3.6	3.5	3.3	3.0	2.6	1.9					
Count								27	30	30	29	28	28	28	29	31	31	30	23					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 71

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

Form adopted June 1946

IONOSPHERIC DATA

Es (Characteristic), Mc,Km (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: F.H.L., J.T.D.

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		C		C		C	C				3.2/120	3.2/100												
2									3.8/110	2.6/100														
3														C	C									
4									3.3/110							3.0/130								
5							3.1/100		3.1/110	3.1/100					4.0/130									
6								1.9/110		3.7/100	4.1/110							3.1/130						
7								1.9/110					4.0/100											
8										3.7/120														
9																4.1/120	3.7/120	3.1/120	1.9/130					
10								2.0/110	3.5/120							3.4/120	3.2/130	3.2/120						
11						3.7/110		2.0/120	3.2/120	3.4/120	3.3/110					1.9 90								
12								1.9/110		2.8/100	3.4/110	2.8/100				3.7/130	3.2/130	2.6/130						
13									2.7/130	3.1/120	3.2/120	3.2/100	C		3.7/130	3.6/120				(3.3)(90)	2.8/110			
14							1.3/150	3.2 90	2.6/120		3.3/110												C	
15			1.7/130						3.4/110	3.0/100	3.0/110												C	
16											3.5/100													
17																					C	C	C	
18											3.3 00													
19																3.3/130			2.1/140					
20														3.4/110										
21								3.1/150		3.4/130	3.7/120					3.2/100		3.4/120						
22										3.1/140														C
23				C	C	C	C	C	C	C		3.8/120	3.8/120		3.5/110				1.9/130				C	
24																			1.9/120					
25								4.1/130	3.8/110		C								2.1/140					
26									3.5/110								3.2/120							
27									3.4/100		2.9/100	3.8/120	3.1/100											
28											3.7/100	3.3/100												
29								4.1/120	3.2/120	3.3/110	3.4/120	3.5/100		3.7/130			C							
30								3.2/130									3.2/130							
31																		3.1/120	2.4/130					
Median	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
Count	31	30	31	29	30	29	29	30	30	30	30	31	30	30	30	31	30	31	31	31	30	30	27	30

** MEDIAN f_{Es} LESS THAN MEDIAN $f^{o}E$, OR LESS THAN LOWER FREQUENCY LIMIT OF RECORDER.

Sweep 1.0 Mc to 25.0 Mc in .025 min

Manual ☐ Automatic ☒

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 702519

TABLE 72

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

Form adopted June 1946

IONOSPHERIC DATA

F2-MI500 (Characteristic), ____ (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

National Bureau of Standards (Institution)

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

Calculated by: B.C.V., J.L.K.

75°W Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	(1.9)S	C	(1.8)VF	C	F	C	C	2.1	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.1	2.1	(1.9)J	2.0	2.1	2.0
2	1.9	1.9	2.0	1.9	2.0	1.9	2.0	2.2	(2.3)J	2.2	(2.1)C	2.2	(2.1)S	2.0	2.1	(2.1)C	(2.1)S	S	(2.2)S	(2.1)S	(2.1)V	2.1	2.0	2.1
3	1.7	2.0FK	(1.8)VFK	1.7FK	(1.8)VFK	1.9FK	FK	2.2K	(2.3)SK	2.1K	1.9K	(2.2)SK	(2.0)SK	CK	CK	2.2K	SCK	SK	(2.2)SK	2.1K	(2.1)VSK	(2.2)VK	(2.0)VK	(2.0)V
4	(1.8)SK	(1.9)SK	(1.9)SK	(2.0)SK	2.1K	2.0K	(2.0)S	(2.3)S	2.4	2.3	2.2	2.0	2.1	(2.1)J	2.1	2.1	2.1	(2.1)J	(2.2)JS	2.2	2.1	(1.9)SJ	2.1	2.0
5	2.0	1.9	1.8V	2.0	1.9	2.0V	1.9V	2.3	2.4	2.3	2.2	2.0	2.1	2.0	2.1	2.0	2.0	2.0	(2.2)J	(2.1)S	(2.2)S	2.0	2.1	2.0
6	2.0	2.0F	2.0	(1.9)VJS	(2.0)VJFS	F	1.8F	(2.2)S	2.2	2.3	2.3	(2.1)	2.1	2.0	2.0	2.0	2.1	2.1	(2.2)S	2.1	1.8	2.1	(2.0)V	2.0
7	2.0F	1.7F	1.8F	1.9F	(1.9)F	1.9F	2.0F	2.4	2.2	2.2	2.2	2.1	2.1	2.0	2.1	(2.1)P	2.1	2.1	(2.2)S	2.1	2.2	(2.0)V	2.1	2.0
8	1.8	1.9	1.9	(2.0)S	2.0	2.1	2.2	2.4	2.2	2.3	2.1	(2.1)C	2.1	2.0	2.0	2.0	2.1	(2.1)S	2.1	(1.9)S	1.9	2.1	2.0	(2.1)V
9	1.9	1.9	1.9	2.0	1.8	2.0	2.0	2.2	2.3	2.3	2.2	2.1	2.0	2.0	2.0	(2.0)S	2.0	2.0	(2.1)V	2.2	(2.0)V	1.9	2.0	2.1
10	2.0	1.9	2.1	1.9	2.1	2.1	2.0	2.4	2.3	2.3	(2.4)J	2.1	2.0	2.1	2.0	2.1	(2.0)S	(2.1)J	(2.2)SP	2.1	2.0	2.1	2.1	(2.0)V
11	(2.0)P	2.0	1.9	2.0	2.0	2.0	2.1	2.3	2.5	2.3	(2.3)J	2.1	2.0	2.0	2.0	2.0	2.3	(2.1)J	(2.2)P	2.1	2.4	2.2	2.2	2.1
12	1.9	1.8	1.8	1.5	1.7	1.8	1.8	2.2	2.5	2.2	2.2	2.2	2.1	2.1	2.0	(2.0)C	(2.3)S	2.0	2.0	2.0	2.1	2.0	(1.8)V	(1.9)V
13	(1.9)J	2.0	2.0	1.9	(1.8)J	1.7	FK	(1.9)FK	2.2F	2.0K	2.1VK	2.0K	CK	2.0K	1.9K	1.9K	1.9K	2.0K	(2.2)SK	1.9K	1.9K	(1.9)VK	(1.8)VRK	(1.6)VRK
14	(2.0)VRK	FK	FK	FK	FK	FK	FK	(2.2)VFK	(2.1)F	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	(2.1)P	(2.2)J	2.0	(2.0)VJ	(1.7)VK	FNK
15	FNK	FK	FK	FK	FK	FK	(1.7)FK	(1.8)FK	FK	1.9K	1.5K	1.5K	1.5K	1.5K	1.4K	1.5K	(1.7)SK	2.0K	1.9K	1.8K	1.8K	1.8K	1.9K	1.9K
16	(1.9)VSK	2.0K	(2.0)VJVK	(1.9)VJVK	(1.7)FK	2.0FK	(2.0)FK	2.4K	2.2K	2.2K	2.0K	2.0K	2.0K	2.0K	2.2K	2.0K	(2.0)	(2.1)S	(2.2)J	2.0	2.1	(1.9)J	(1.9)J	(2.0)S
17	(2.1)VJS	(1.9)J	(1.9)J	2.0	(2.2)J	2.2	(2.0)V	2.3	2.4	2.0	2.2	2.1	2.1	2.0	2.0	2.0	2.0	2.1	(2.1)J	1.9	C	C	C	(1.9)V
18	1.9	(1.8)J	(2.1)S	(2.1)VJS	(1.9)VJS	(2.0)JF	(2.0)JF	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	C	(2.0)C	(2.0)C	C	(2.0)C	2.0	(2.0)S	(1.9)S	1.9
19	2.1	1.9	1.9	2.0	(1.9)J	(1.9)VJ	(2.1)J	(2.3)VJF	(2.3)C	2.3	2.2	2.1	(2.1)	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.0	2.0	1.9	2.0
20	(2.0)J	(2.0)J	(1.9)J	(2.1)VJV	(2.0)J	(1.8)J	(2.1)J	2.4	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.0	2.0	2.0	(2.1)VJ	(2.0)VJ
21	(2.2)S	2.2	(1.8)J	2.0	2.4	2.1	(1.9)VJS	2.2	2.3	2.1	2.1	2.2	2.1	2.1	2.1	2.0	2.1	(2.3)S	(2.2)P	2.1	1.9	2.1	2.1	(2.2)J
22	2.0	(2.1)J	2.0	(2.0)S	1.9	2.0	2.2	2.3	2.3	2.2	2.2	2.1	2.0	2.1	2.0	2.0	2.1	2.1	(2.2)S	(1.9)S	(2.0)S	(2.1)S	2.0	C
23	(2.0)VJS	(2.1)J	(2.1)VJS	C	C	C	C	C	C	C	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.2	(2.2)S	(2.2)S	2.0	(2.1)S	C	2.0
24	(1.9)J	1.9	(1.9)VJS	(2.0)VJS	2.0	(2.0)VJF	2.2	2.3	2.3	2.3	2.2	2.1	2.2	2.1	2.0	2.1	(2.1)C	2.2	(2.2)C	(2.1)C	2.3	2.1	2.1	2.1
25	(2.1)S	(2.0)S	(2.0)VJ	2.2	(2.0)V	2.1	2.3	2.4	2.3	2.1	C	2.1	2.1	1.9	2.0	2.0	(2.1)VJS	2.2	(2.2)S	2.2	2.2	2.1	(2.0)VJS	2.0
26	(2.0)S	(2.0)VJS	2.0	(2.1)VJS	(2.2)VJS	(2.0)VJS	(2.1)F	(2.3)F	2.2	2.2	2.1	2.1	2.0	2.0	2.0	(2.1)C	(2.1)S	(2.1)S	(2.2)C	(2.1)S	(1.9)S	2.1	(2.0)VJ	2.1
27	(2.1)J	(1.8)J	(1.8)J	(2.0)V	(2.0)V	2.1	2.1	2.3	2.1	2.2	2.1	2.1	2.1	2.0	2.1	2.0	(2.1)P	(2.1)J	(2.2)P	(1.9)S	(2.0)J	2.0	(1.9)J	(1.9)S
28	(2.2)J	(2.1)S	(2.1)VJS	(2.0)VJS	(1.8)VJS	(1.9)VJS	(2.0)VJS	2.2	2.2	2.1	2.2H	2.0	1.9	2.0	2.0	2.1	2.0	2.0	2.1	2.0	(2.0)J	(1.9)V	(1.9)J	(1.9)V
29	(1.9)VJS	(1.9)VJS	(2.0)VJ	(2.0)J	(2.1)J	(2.0)VJ	2.1	2.4	2.1	2.1	2.0	2.1	(2.0)P	1.9	(2.0)S	(2.0)S	C	2.0	2.0	2.0	1.9	1.9	(1.9)J	(1.9)VJS
30	(1.9)F	(1.8)F	(1.8)VJ	(2.0)VF	(2.1)VJF	(2.0)V	2.1	2.4	(2.3)S	2.1	2.0	2.0	2.0	1.9	(2.0)C	2.0	2.0	2.0	(2.2)S	(2.1)S	(2.0)S	2.0	1.9	(1.7)S
31	1.8	1.8	1.9	(2.0)S	2.0	2.0	(1.9)S	2.3	2.1	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.0	1.9	(2.0)S	(2.0)S	(1.9)VJ	1.7	1.8	1.7
Median	(2.0)	1.9	(1.9)	(2.0)	(2.0)	2.0	2.0	2.3	2.3	2.2	2.2	2.1	2.0	2.0	2.0	2.0	2.1	2.1	(2.2)	2.1	2.0	2.0	2.0	2.0
Count	30	28	29	27	27	26	26	30	29	30	30	31	30	30	30	30	29	29	30	31	30	30	29	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 73

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

Form adopted June 1946

IONOSPHERIC DATA

F2-M3000 (Characteristic), _____ (Unit), March (Month), 1948

National Bureau of Standards (Institution)

Observed at Washington, D.C.

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

Lat 39.0°N, Long 77.5°W 75°W Mean Time

Calculated by: J.L.K., B.C.V.

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	(29)^{S}	C	(26)$^{J}_{F}$	C	F	C	C	31	33	31	31	30	30	30	30	30	30	30	32	31	(29)^{J}	30	29	30
2	29	29	29	29	27	28^{F}	29	33	(33)^{J}	32	(31)^{C}	32	(31)$^{S}_{C}$	30	31	(31)^{C}	(31)^{S}	S	(33)^{S}	(32)^{S}	(32)^{J}	32	30	31
3	29	29$^{F}_{K}$	^{K}(26)$^{J}_{F}$	25$^{F}_{K}$	^{K}(28)$^{J}_{F}$	28$^{F}_{K}$	F^{K}	33^{K}	(32)$^{S}_{K}$	31^{K}	28^{K}	(32)$^{S}_{K}$	(31)$^{S}_{K}$	C^{K}	C^{K}	32^{K}	S$^{S}_{K}$	S^{K}	(33)$^{S}_{K}$	31^{K}	^{K}(32)$^{J}_{S}$	(32)$^{J}_{K}$	(30)$^{S}_{K}$	^{K}(30)$^{J}_{S}$
4	(27)$^{S}_{K}$	(29)$^{S}_{K}$	(28)$^{S}_{K}$	(29)$^{S}_{K}$	29^{K}	28^{K}	(30)^{S}	(33)^{S}	34	34	33	30	31	(31)^{J}	31	31	31	(32)^{J}	(33)$^{J}_{S}$	33	32	(30)$^{J}_{S}$	33	30
5	30	29	27^{V}	29	29	29^{V}	29^{V}	33	35	34	34	31	31	30	30	31	30	30	31	(32)^{J}	(31)^{S}	(32)^{S}	31	31	30
6	29	30^{F}	29	(28)$^{J}_{S}$	^{S}(30)$^{J}_{F}$	F	28^{F}	(33)^{S}	34	34	33	(30)	31	30	30	31	32	32	(32)^{S}	32	30	32	(30)^{J}	30
7	29^{F}	29^{F}	27^{F}	28^{F}	(29)^{F}	29^{F}	30^{F}	35	33	33	32	31	31	31	31	(31)^{P}	31	32	(31)^{S}	31	32	(29)^{J}	31	30
8	29	28	28	(29)^{S}	30	31	32	35	33	32	31	(32)^{C}	31	30	29	31	31	(32)^{S}	31	(29)^{S}	29	30	29	(30)^{J}
9	29	28	29	29	28	29	30	33	34	33	33	32	30	30	31	(30)^{S}	31	30	(31)^{J}	33	(30)^{J}	30	29	31
10	30	30	29	29	31	31	30	35	34	34	(33)^{J}	31	30	30	30	29	(30)^{S}	(31)^{J}	(32)$^{S}_{F}$	29	30	30	32	(30)^{J}
11	(30)^{P}	30	31	30	30	30	31	34	35	35	(35)^{J}	31	30	31	31	30	31	(32)^{J}	(33)^{P}	31	31	31	31	31
12	28	27	26	23	26	28	28	30	32	33	32	30	31	31	30	(29)^{C}	(32)^{S}	30	30	30	31	30	(28)^{J}	(28)^{J}
13	(28)^{J}	30	31	28	(28)^{J}	25	F^{K}	(29)$^{F}_{K}$	31$^{F}_{K}$	30^{K}	31$^{V}_{K}$	29^{K}	C^{K}	30^{K}	29^{K}	29^{K}	29^{K}	30^{K}	(32)$^{S}_{K}$	29^{K}	29^{K}	^{K}(29)$^{J}_{V}$	^{K}(27)$^{J}_{R}$	^{K}(25)$^{J}_{R}$
14	^{K}(30)$^{J}_{K}$	F^{K}	F^{K}	F^{K}	F^{K}	F^{K}	F^{K}	^{K}(33)$^{J}_{F}$	(32)^{F}	30	30	31	30	30	30	29	29	30	(31)^{P}	(32)^{J}	29	(30)$^{J}_{V}$	(27)$^{J}_{K}$	F$^{N}_{K}$
15	F$^{N}_{K}$	F^{K}	F^{K}	F^{K}	F^{K}	F^{K}	(26)$^{F}_{K}$	(27)$^{F}_{K}$	F^{K}	28^{K}	23^{K}	24^{K}	22^{K}	22^{K}	21^{K}	22^{K}	(27)$^{S}_{K}$	31^{K}	29^{K}	28^{K}	28^{K}	27^{K}	C^{K}	28^{K}
16	^{K}(28)$^{J}_{S}$	29^{K}	^{K}(30)$^{J}_{V}$	^{K}(29)$^{J}_{V}$	(26)$^{F}_{K}$	30$^{F}_{K}$	(30)$^{F}_{K}$	34^{K}	33^{K}	32^{K}	30^{K}	30^{K}	30^{K}	30^{K}	31^{K}	29^{K}	30	(31)^{S}	(32)^{J}	30	32	(28)^{J}	(29)^{J}	(30)^{S}
17	(31)$^{J}_{S}$	(29)^{J}	(30)^{J}	30	(32)^{J}	34	(30)^{J}	34	34	31	33	30	30	30	29	30	30	31	(32)^{J}	28	C	C	C	(28)^{J}
18	30	(28)^{J}	(31)^{S}	(31)$^{J}_{S}$	(29)$^{J}_{S}$	(30)$^{J}_{F}$	(30)$^{J}_{F}$	34	34	33	32	31	31	30	30	C	(31)^{C}	(30)^{C}	C	(30)^{C}	30	(30)^{S}	(29)^{S}	30
19	31	29	30	30	(29)^{J}	(29)^{J}	(33)^{J}	(33)$^{J}_{F}$	(33)^{C}	33	32	31	(31)	31	31	30	31	31	31	30	31	31	29	30
20	(30)^{J}	(30)^{J}	(30)^{J}	(31)$^{J}_{V}$	(30)^{J}	(28)^{J}	(31)^{J}	35	32	32	31	31	30	31	30	31	30	31	34	30	30	29	(31)^{J}	(29)^{J}
21	(33)^{S}	33	(29)^{J}	29	34	31	(28)$^{J}_{S}$	31	34	32	32	31	31	30	30	30	31	(32)^{S}	(33)^{P}	30	30	30	32	(33)^{J}
22	30	(33)^{J}	30	(29)^{S}	29	31	32	35	34	32	32	31	31	31	30	30	31	31	(32)^{S}	(29)^{S}	(30)^{S}	(31)^{S}	30	C
23	(32)$^{J}_{S}$	(32)^{J}	(32)$^{J}_{S}$	C	C	C	C	C	C	C	34	31	31	31	32	31	31	33	(32)^{S}	(32)^{S}	30	(32)^{S}	C	30
24	(28)^{J}	29	(29)^{S}	(29)$^{J}_{S}$	30	(29)$^{J}_{F}$	32	34	34	33	32	30	31	30	31	31	(31)^{C}	32	(31)^{C}	(32)^{C}	33	32	31	31
25	(31)^{S}	(30)^{S}	(30)^{J}	31	(32)^{J}	31	33	35	34	32	C	31	31	30	30	30	(31)$^{J}_{S}$	32	(31)^{S}	32	30	31	(31)$^{J}_{S}$	30
26	(29)^{S}	(29)$^{J}_{S}$	30	(31)$^{J}_{S}$	(32)$^{J}_{S}$	(30)$^{J}_{S}$	(32)^{F}	(34)^{F}	33	32	31	30	30	30	30	(30)^{C}	(31)^{S}	(31)^{S}	(30)^{C}	(32)^{S}	(29)^{S}	31	(30)^{J}	31
27	(32)^{J}	(28)^{J}	(29)^{J}	(29)^{J}	(29)^{J}	31	32	33	31^{V}	32	30	32	31	30	31	30	(31)^{P}	(30)^{J}	(33)^{P}	(31)^{S}	(31)^{J}	29	(30)^{J}	(29)^{S}
28	(32)^{J}	(31)^{S}	(30)$^{J}_{S}$	(29)$^{J}_{S}$	(28)$^{J}_{S}$	(28)$^{J}_{S}$	(29)$^{J}_{S}$	34	32	32	31^{H}	30	29	30	30	31	29	31	30	30	(30)^{J}	(28)^{J}	(30)^{J}	(28)$^{J}_{S}$
29	(29)$^{J}_{S}$	(28)$^{J}_{S}$	(29)^{J}	(30)^{J}	(31)^{J}	(29)^{J}	31	35	32	31	30	32	(29)^{P}	29	(29)^{S}	(29)^{S}	C	29	29	30	29	30	(29)^{J}	(28)$^{J}_{S}$
30	(29)^{F}	(27)^{F}	(28)^{J}	(29)$^{J}_{F}$	(32)$^{J}_{F}$	(31)^{J}	32	34	(33)^{S}	31	30	29	30	29	(29)^{C}	29	29	30	(32)^{S}	(30)^{S}	(29)^{S}	29	31	(27)^{S}
31	27	27	29	(30)^{S}	27	29	(31)^{S}	33	31	30	31	31	30	30	29	28	29	28	(29)^{S}	(29)^{S}	(29)$^{J}_{F}$	28	27	28
Median	(29)	29	(29)	(29)	(29)	29	30	34	33	32	32	31	31	30	30	30	31	31	(32)	30	30	30	30	30
Count	30	28	29	27	27	26	26	30	29	30	30	31	30	30	30	30	29	29	30	31	30	30	28	29

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

U. S. GOVERNMENT PRINTING OFFICE 1946 O - 703519

TABLE 74

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

Form adopted June 1946

IONOSPHERIC DATA

FI-M3000 (Characteristic), ____ (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

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

Calculated by: J.L.K., B.C.V.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L	L	L	(39)	L	L	L							
2										L	L	L	3.9	L	L	L	L							
3												L K		L K	C K	L K								
4										L	L	L	L	(4.0)	4.2	L								
5										L	L	L	L	L	L	L	L							
6										L	L	(3.0)	L	L		L	L							
7											L	L	L	L	L	L	L							
8										L	L	L	L	L	L	L	L							
9										L	L	L	L	L										
10									L		L	L	L	L	L	L								
11										L	L	L	L	L	L	L								
12										L	L	L	L	L	(4.2)	L	L							
13										L K	L K	L K	C K	L K	L K	L K								
14											L	L	L	L	L	L	L							
15									3.3 K	(3.2) F K	3.5 K	3.5 K	3.6 K	3.5 K	3.6 K	3.6 K	3.4 K							
16									L K	L K	L K	L K	L K	L K	L K		L							
17									L	L	L		L	L		L	L							
18											L	L	L	L	L	L								
19									L	L	L	L H	L H	L	L	L	L							
20									L	L	L	L	L	L	L	L	L							
21										L	L	L		L		L	L							
22										L	L	L	L	L	B	L H	L							
23										C	L	L	L	L	L	L	L	L						
24									L	L	L	L	L	L	L	L	L							
25									L	L	C	44	L	(46)	L	L	L							
26										L	L	L	L	L	L	L								
27										L	L	L	L	L	L	L								
28										L	L	L	L	L	L	L	L							
29										L	L	L		L	(3.9) H	L	C							
30									L	L	4.0	L	L	4.0	L	L	(3.8) S	L H						
31										L	L	L	L	L	L	L								
Median														(4.0)										
Count														5										

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

Manual ☐ Automatic ☒

TABLE 75

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

Form adopted June 1946

IONOSPHERIC DATA

E-MI500 (Characteristic), _____ (Unit), March (Month), 1948

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

National Bureau of Standards (Institution)

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

Calculated by: J.L.K., B.C.V.

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									(4.3)S	(4.4)	A	A	4.2	4.3	4.3	4.3	4.2	4.0	S					
2								(2.8)	(4.6)A	4.2	4.3	4.4	(4.6)	(4.3)B	(4.1)B	4.1	4.2	4.4						
3								4.3K	4.0K	4.1H K	4.0H K	4.4K	(4.1)H K	C K	C K	4.3K	4.1K	B K						
4									4.4	4.2	4.1	(4.3)B	4.2	4.4	4.8H	(4.4)H	(4.6)H	(4.4)H						
5								(4.4)S	4.4	4.1	4.2	4.5	4.3	4.1	4.3	4.4	4.1	4.2						
6								3.9	4.2	4.3	4.4	4.4	4.3	4.4	4.5	4.0	4.3	4.3H						
7								F	4.1H	4.2	4.1	4.2	A	4.1	4.2	4.4	(4.3)F	4.1	3.9					
8								4.0	4.3	4.2	4.4	4.2	4.2	4.3	4.2	4.2	4.2	4.2						
9								4.1	4.4H	4.5H	4.4	4.3H	4.4	4.2	4.2	4.5	4.4	4.2	4.2					
10								4.5H	(4.5)	4.2	4.3	4.2	4.2	4.3	4.1	4.1	A	4.4	4.2					
11									4.7	4.7	A	4.5	4.2	4.2	B	4.5	4.5	4.3	4.0					
12								4.3	4.8H	4.3	4.3	4.4	B	4.3	4.2	4.2	(4.2)	(4.3)	(4.6)H					
13								4.1K	4.8K	4.7K	4.7A K	(4.8)A K	C K	(4.2)K	4.2K	4.3K	4.5H K	(4.3)H K	4.6H K					
14								(4.3)K	(4.5)A	(4.4)H	(4.8)A	(4.4)B	4.4	(3.9)	(4.7)H	4.4	4.5	(4.1)	(4.1)					
15								(4.0)F K	A K	A K	4.2K	4.2K	4.1K	4.2K	4.3K	4.4K	4.4K	4.4H K						
16								4.5H K	4.1K	4.6K	4.8K	4.8K	4.5H K	B K	(4.7)K	4.4K	4.1	(4.4)	4.3					
17								(4.2)H	4.2H	4.5H	4.3H	B	4.1	4.7H	4.6	4.5H	4.2	4.3H	4.1					
18								4.1	4.2H	5.1H	4.8H	4.3H	4.3	4.6	4.4	4.3	4.5	4.7H	4.0H					
19								4.3H	4.4H	4.1	4.4	(4.5)H	(4.2)	(4.4)	4.2	4.5	4.5	4.2	(4.0)					
20								4.5	4.6	4.5	4.5	(4.5)B	(4.4)B	(4.5)B	4.3	4.4	4.2	4.1H	4.2					
21								4.2	4.8H	4.7H	4.7H	4.4	4.4	4.2	4.2	A	4.6	A	(3.9)B					
22								4.3	4.7	(4.3)B	(4.5)B	B	B	B	B	4.4	4.5H	(4.2)B	(4.4)B					
23								C	C	C	4.8	(4.7)B	(4.5)B	B	4.7	4.5	4.5	4.6	(4.6)H					
24								4.6H	4.6H	4.7	4.7	4.7	4.3	4.3	4.5	4.4	4.4	4.4	A					
25								4.3	4.3	4.5H	C	4.4	4.3H	(4.2)B	4.2	4.4	4.3	4.3	4.6					
26								4.5H	4.8	4.4	4.4	4.6H	(4.4)S	(4.2)B	(4.2)B	4.6	A	(4.7)H	(4.2)H					
27								4.0	(4.2)A	4.6	(4.2)B	(3.9)	(4.4)B	4.2	(4.6)	4.4	4.4	4.5	4.5					
28								(4.3)J	4.3	(4.4)F	A	(4.6)A	(4.4)B	4.4	4.3	4.5	4.7	4.6	4.4					
29								3.9	(4.1)A	(4.6)A	A	A	B	(4.4)A	4.2	4.4	C	4.4	4.5					
30								4.3	4.4	4.4	4.6	4.6	(4.7)A	4.8H	4.4	4.4	(4.4)A	4.4	4.3					
31								3.9	4.5	4.5	B	(4.3)B	B	B	B	(4.4)B	(4.4)B	A	(4.3)A					
Median								4.2	4.4	4.4	4.4	4.4	4.3	4.3	4.3	4.4	4.4	4.3	4.2					
Count								26	29	29	25	27	25	26	27	30	27	28	22					

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

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U.S. GOVERNMENT PRINTING OFFICE 1948 O - 702519

Table 76

Ionospheric Storminess at Washington, D.C.

March 1948

Day	Ionospheric character* 00-12 GCT	12-24 GCT	Principal storms Beginning GCT	End GCT	Geomagnetic character** 00-12 GCT	12-24 GCT
1	3	3			5	3
2	1	1			4	4
3	4	4	0600	---/	4	2
4	4	1	---/	1100	2	1
5	1	1			2	2
6	1	1			2	2
7	1	1			2	1
8	2	1			0	2
9	1	1			2	2
10	1	0			1	2
11	1	1			0	1
12	2	1			3	2
13	2	4	1100	---/	4	4
14	***	3	---/	1300	4	3
15	***	7	0300	---/	6	5
16	4	4	---/	2100	2	1
17	2	2			3	1
18	1	1			2	1
19	1	2			2	2
20	1	2			2	2
21	1	1			3	2
22	1	1			1	2
23	0	1			1	1
24	1	1			1	0
25	1	1			1	2
26	1	1			1	2
27	1	1			3	2
28	1	1			2	0
29	2	3			1	1
30	2	0			3	3
31	2	1			2	2

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

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

***No readable record. Refer to table 65 for detailed explanation.

/Dashes indicate continuing storm.

Table 77

Sudden Ionosphere Disturbances Observed at Washington, D.C.

March 1948

Day	GCT Beginning	GCT End	Location of transmitters	Relative intensity at minimum*	Other phenomena
6	1854	1925	Ohio, D.C.	0.0	
11	1223	1310	Ohio, D.C., England	0.2	
11	1847	1920	Ohio, D.C., England	0.0	
12	1625	1705	Ohio, D.C., England	0.02	
13	1921	2005	Ohio, D.C.	0.03	
14	1921	2000	Ohio, D.C.	0.1	
17	1543	***	Ohio, D.C., England	0.03	
17	1627	1655	Ohio, D.C., England, New Brunswick	0.0	Terr.mag.pulse** 1625-1655
19	1902	1950	Ohio, D.C., England, New Brunswick	0.02	
19	2216	2300	Ohio, D.C.	0.01	
20	1218	1305	Ohio, D.C., England	0.0	
20	1740	1800	Ohio, D.C., England	0.02	
21	1418	1450	Ohio, D.C., England	0.01	
21	1659	1725	Ohio, D.C., England	0.1	

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

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

***Incomplete recovery of SID.

Table 78

Sudden Ionosphere Disturbances Reported by

RCA Communications, Inc., as Observed

at Point Reyes, California

1948 Day	GCT Beginning	GCT End	Location of transmitters
March 17-18	2330	0005	Australia, China, Chosen, Hawaii, Japan, Philippine Is.
18	0300	0329	Australia, China, Chosen, Hawaii, Japan, Philippine Is.
19	1900	2000	Australia, China, Hawaii, Japan, Philippine Is.
19	2215	2310	Australia, China, Hawaii, Japan, Philippine Is.

Table 79

Sudden Ionosphere Disturbances Reported by

Engineer-in-Chief, Cable and Wireless, Ltd.,

as Observed in England

1948 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters
March 7	1015	1055	Brentwood	Austria, Belgian Congo, Greece, Iran, Spain, Syria
7	1015	1040	Somerton	Nigeria, Union of S. Africa
11	0700	0755	Brentwood	Belgian Congo, French Equatorial Africa, India, Iran, Kenya, Palestine, Southern Rhodesia, Syria
11	1215	1315	Brentwood	Austria, Belgian Congo, Bulgaria, Canary Is., Chile, Colombia, Greece, India, Iran, Kenya, Malta, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Surinam, Switzerland, Syria, Thailand, Turkey, U.S.S.R., Yugoslavia, Zanzibar

Table 79 (Continued)

1948 Day	GCT Beginning	GCT End	Receiving station	Location of transmitters
11	1221	1310	Somerton	Argentina, Australia, Barbados, Brazil, Canada, Ceylon, Egypt, Gold Coast, India, Malay States, New York, Nigeria, Union of S. Africa
13	1010	1200	Brentwood	Austria, Bahrein I., Belgian Congo, Bulgaria, Canary Is., Chile, Greece, India, Iran, Kenya, Madagascar, Palestine, Portugal, Southern Rhodesia, Spain, Syria, Switzerland, Turkey, Uruguay, U.S.S.R., Yugoslavia, Zanzibar
13	1020	1210	Somerton	Argentina, Australia, Brazil, Canada, Ceylon, Egypt, Gold Coast, India, New York, Nigeria, Union of S. Africa
15	0615	0800	Brentwood	Belgian Congo, Bulgaria, Kenya, India, Iran, Palestine, Southern Rhodesia, Syria, U.S.S.R.
16	1155	1220	Brentwood	Canary Is., Chile, Colombia, Kenya, Southern Rhodesia, Spain, Thailand, U.S.S.R., Yugoslavia, Zanzibar

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 80

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

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

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

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

Symbols:
X Warning given or probable disturbed date

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

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

G Quality 3 or better on day of no warning

(S) Quality 5 on day of warning

S Quality 6 or better on day of warning

( ) Quality 4 or worse (disturbed)

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

Table 81

American and Zürich Provisional Relative Sunspot Numbers

March 1948

Date	R_A*	R_Z**	Date	R_A*	R_Z**
1	127	103	16	99	114
2	133	113	17	112	83
3	119	115	18	98	83
4	111	112	19	90	77
5	102	108	20	63	61
6	105	108	21	31	39
7	90	102	22	9	18
8	88	90	23	47	41
9	92	99	24	59	54
10	105	79	25	68	65
11	125	103	26	83	66
12	119	125	27	115	76
13	121	125	28	106	98
14	125	132	29	161	136
15	141	139	30	195	166
			31	178	138
			Mean	103.8	95.7

*Combination of 40 observers; see page 8.

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

Table 82a

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																																							
Mar. 11.8	-	1	2	2	2	2	2	3	4	7	9	12	10	10	11	11	14	15		5	9	24	28	20	17	15	13	10	8	4	2	1	-	-	2	3	4	7	-25
12.7	-	1	1	2	3	3	2	3	5	5	7	8	8	10	12	13	15	16		10	12	25	30	20	17	13	14	12	11	8	4	-	-	2	4	5	8	8	-25

Table 83a

Coronal observations at Climax, Colorado (6374A), 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																																							
Mar. 11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	1	2	9	3	1	2	4	1	-	-	-	-	-	-	-	-	-	-	-25
12.7	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	1	5	2	2	1	1	2	1	-	-	-	-	-	-	-	-	-	-	-25

Table 84a

Coronal observations at Climax, Colorado (6704A), 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																																							
Mar. 11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-25
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-25

Table 82b

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																																								
Mar. 11.8	7	7	7	8	7	6	8	8	7	6	6	-	-	14	15	16	14	14		15	15	10	28	23	19	13	12	3	2	-	-	-	-	-	-	-	-	-		-25
12.7	8	9	9	9	8	7	8	9	7	6	3	-	10	15	20	25	23	22		15	10	12	17	16	13	10	6	3	2	2	-	-	-	-	-	-	-	-		-25

Table 83b

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																																								
Mar. 11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	2	3		3	1	-	5	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-		-25
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	3	3	3		1	1	1	2	2	1	1	1	-	-	-	-	-	-	1	1	1	1	1		-25

Table 84b

Coronal observations at Climax, Colorado (6704A), 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																																								
Mar. 11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1		1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-		-25
12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1		1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-25

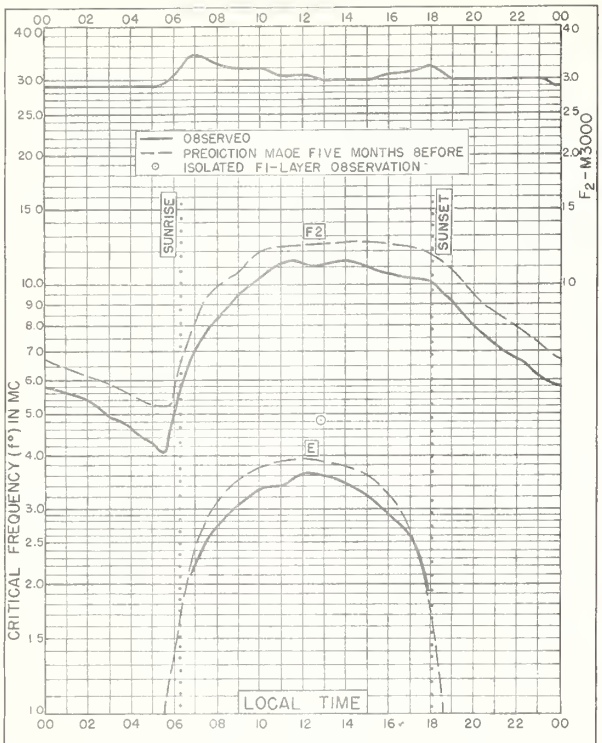


Fig. 1. WASHINGTON, D. C.
39.0°N, 77.5°W MARCH 1948

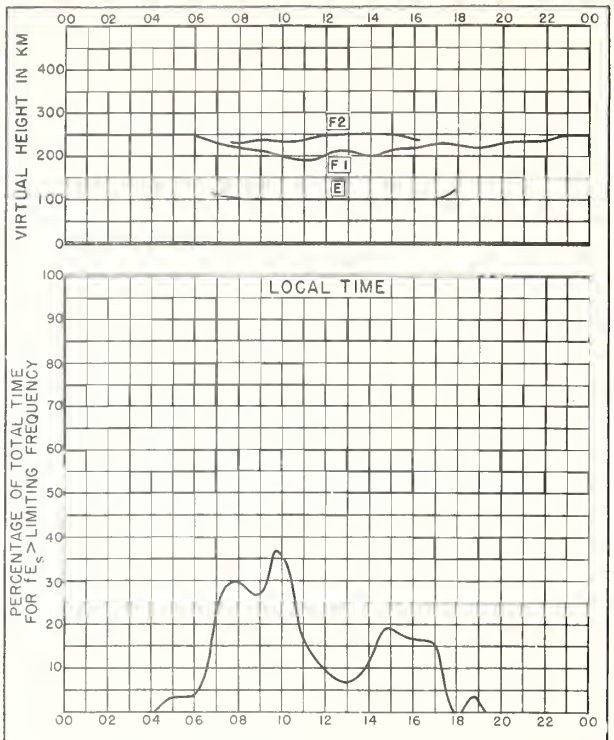


Fig. 2. WASHINGTON, D. C. MARCH 1948

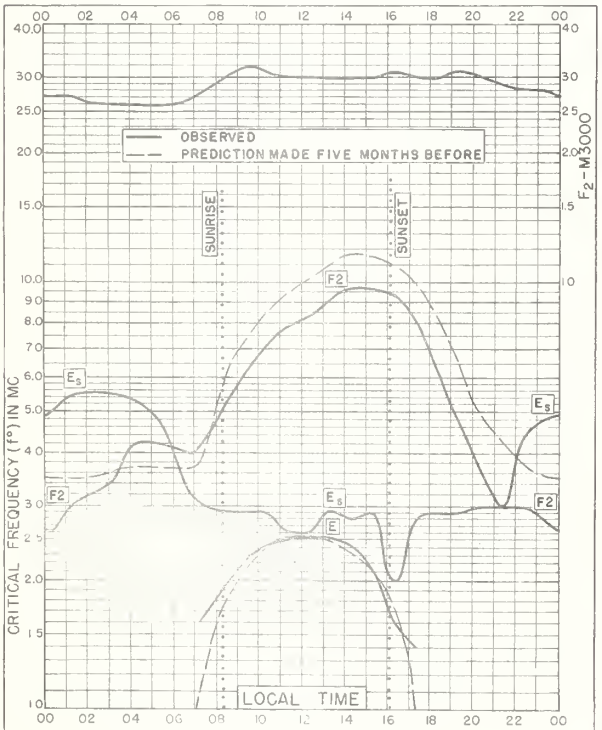


Fig 3. FAIRBANKS, ALASKA
64.9°N, 147.8°W FEBRUARY 1948

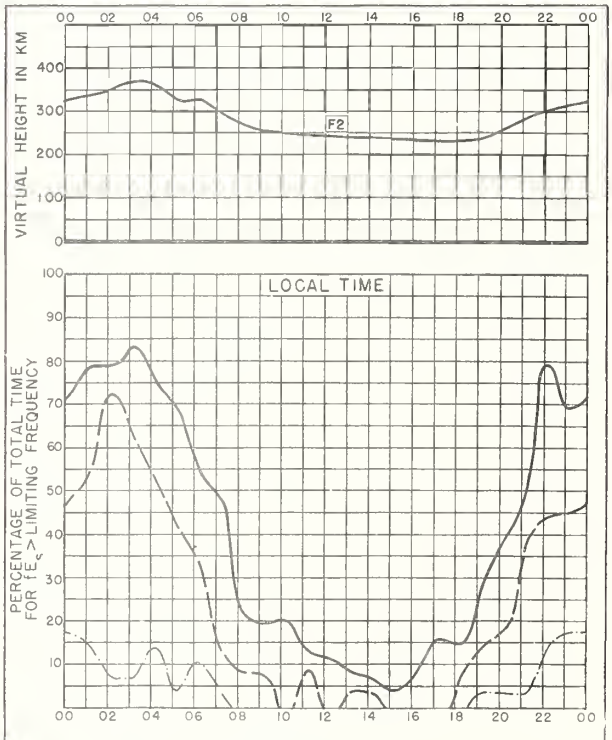


Fig. 4. FAIRBANKS, ALASKA FEBRUARY 1948

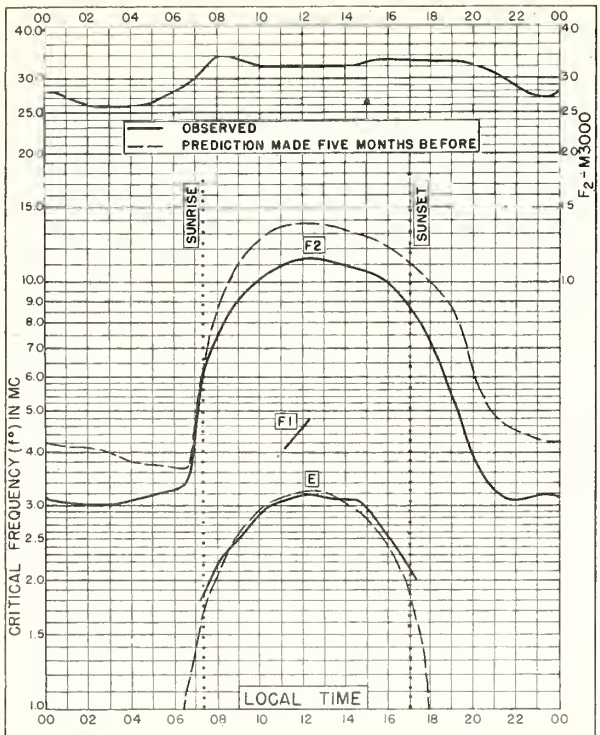


Fig. 5. ADAK, ALASKA
51.9°N, 176.6°W FEBRUARY 1948

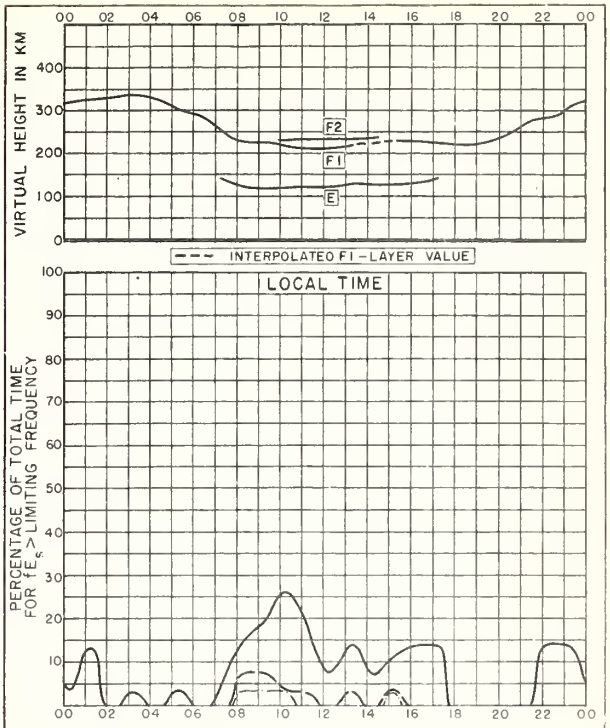


Fig. 6. ADAK, ALASKA FEBRUARY 1948

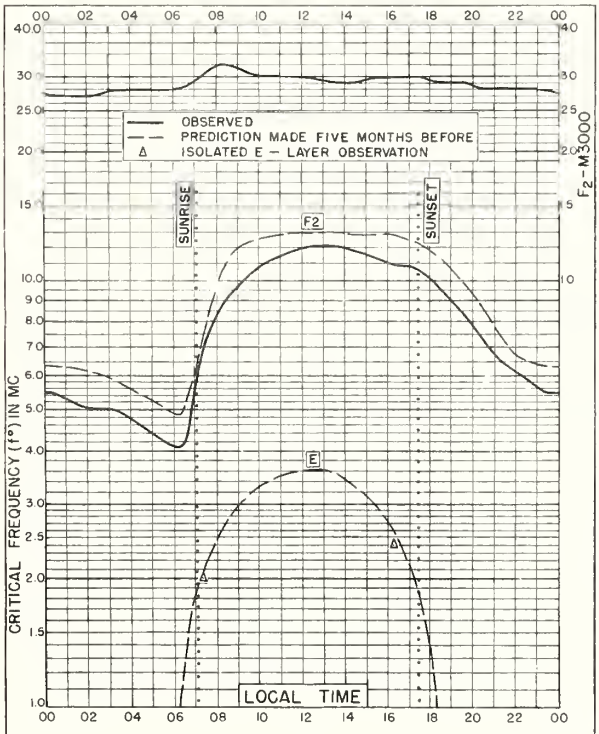


Fig. 7. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W FEBRUARY 1948

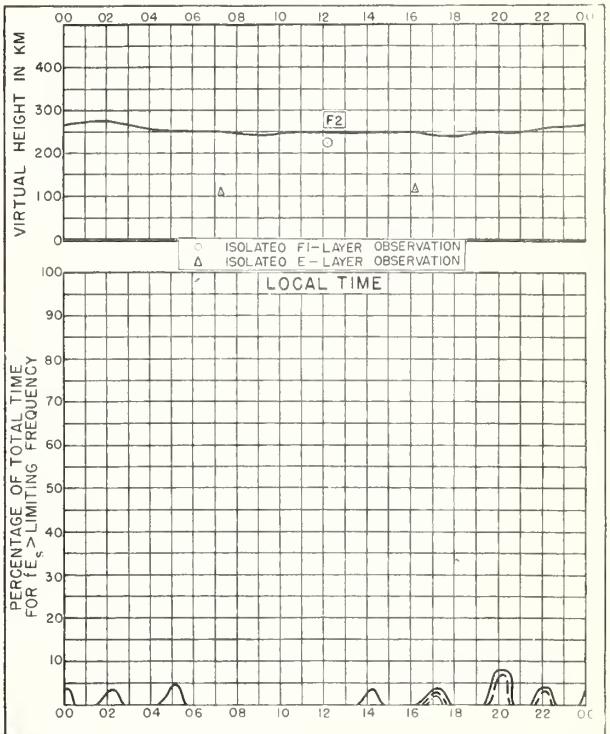


Fig. 8. BOSTON, MASSACHUSETTS FEBRUARY 1948

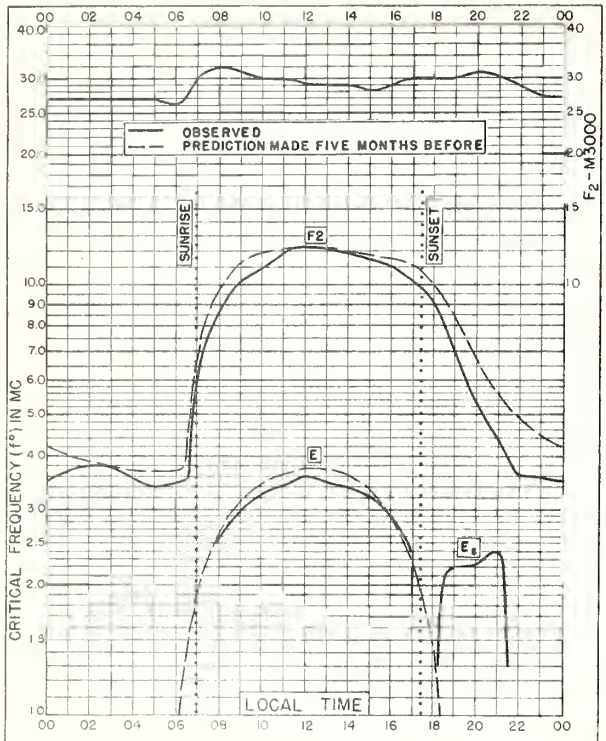


Fig. 9. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W FEBRUARY 1948

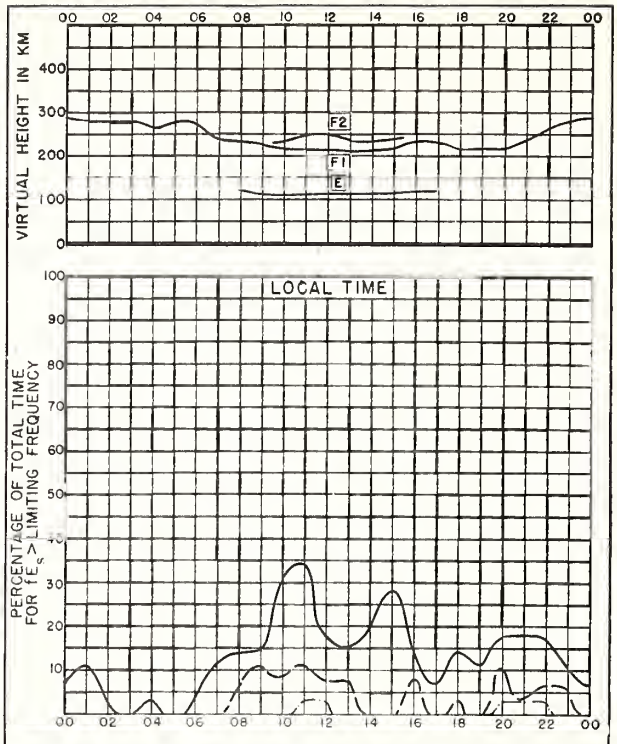


Fig. 10. SAN FRANCISCO, CALIFORNIA FEBRUARY 1948

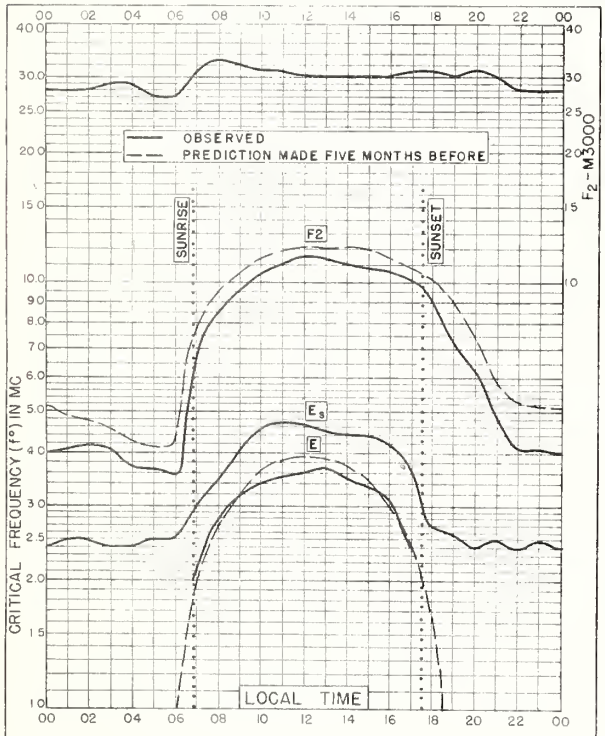


Fig. 11. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W FEBRUARY 1948

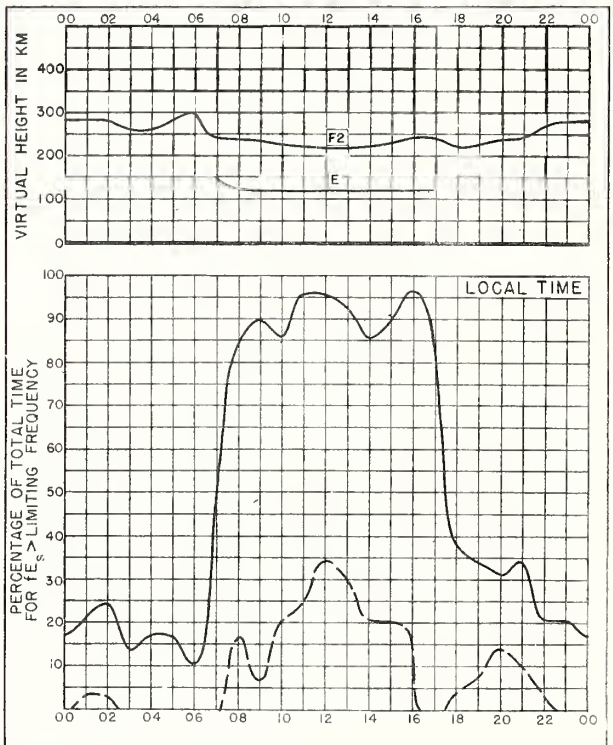


Fig. 12. WHITE SANDS, NEW MEXICO FEBRUARY 1948

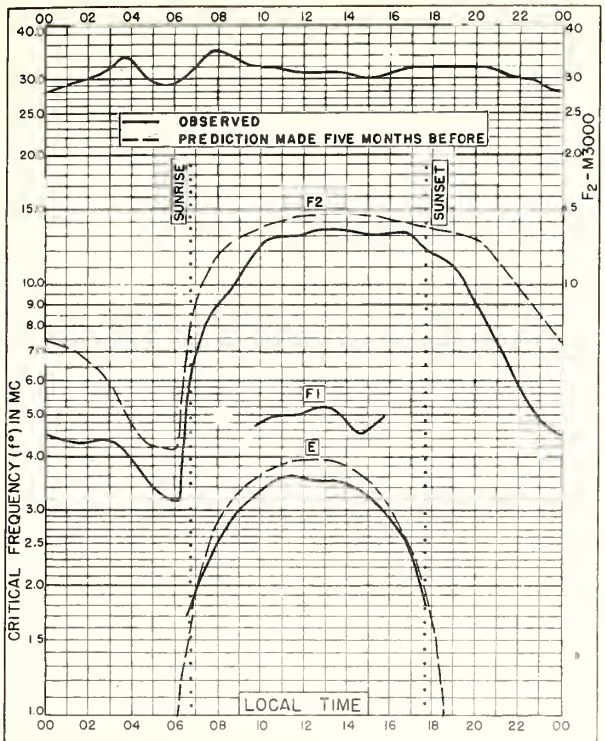


Fig. 13. WUCHANG, CHINA
30.6°N, 114.4°E FEBRUARY 1948

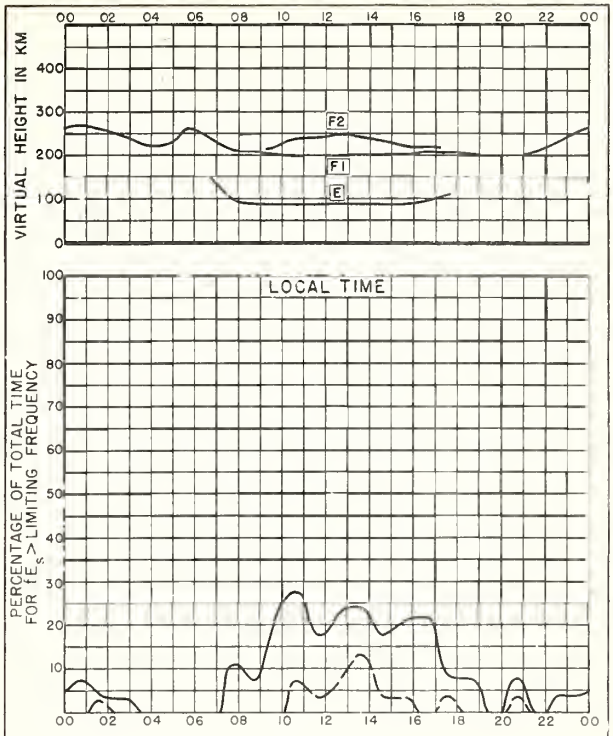


Fig. 14. WUCHANG, CHINA FEBRUARY 1948

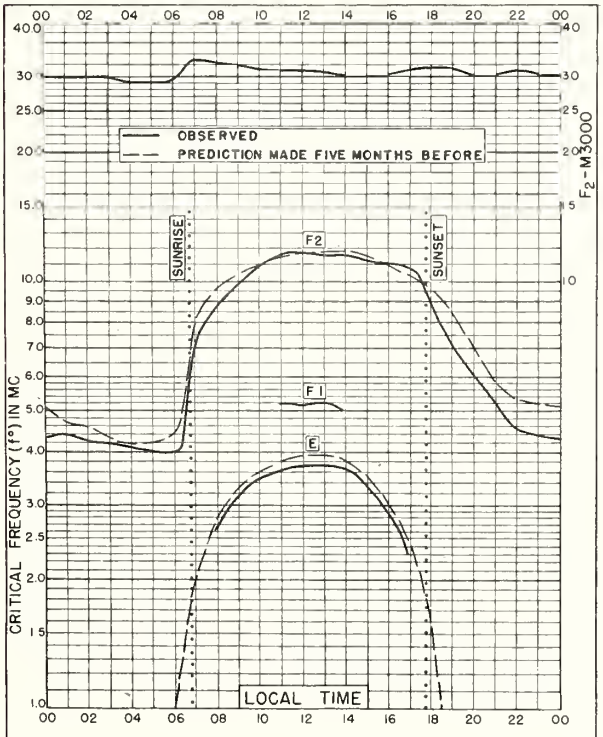


Fig. 15. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W FEBRUARY 1948

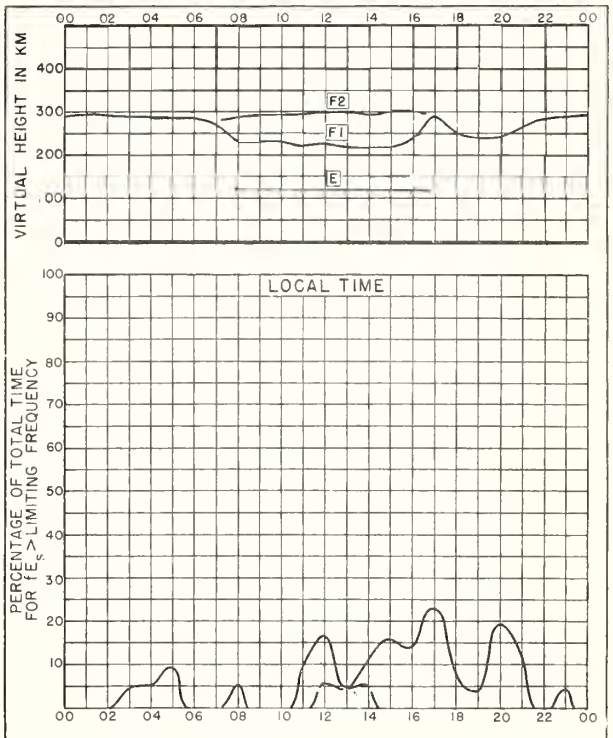


Fig. 16. BATON ROUGE, LOUISIANA FEBRUARY 1948

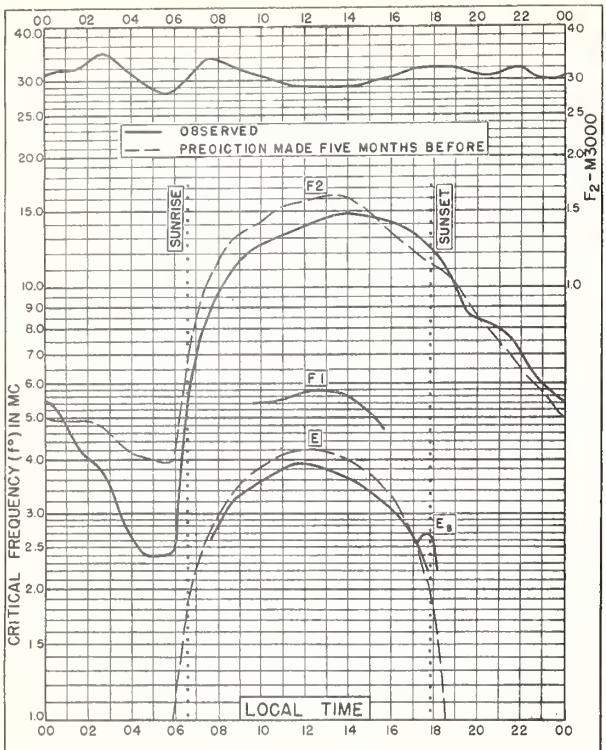


Fig. 17. MAUI, HAWAII
20.8°N, 156.5°W FEBRUARY 1948

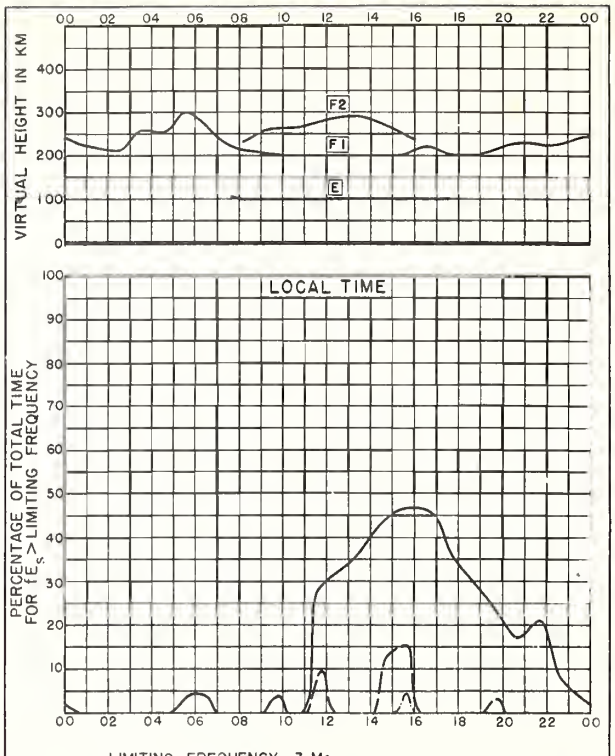


Fig. 18. MAUI, HAWAII FEBRUARY 1948

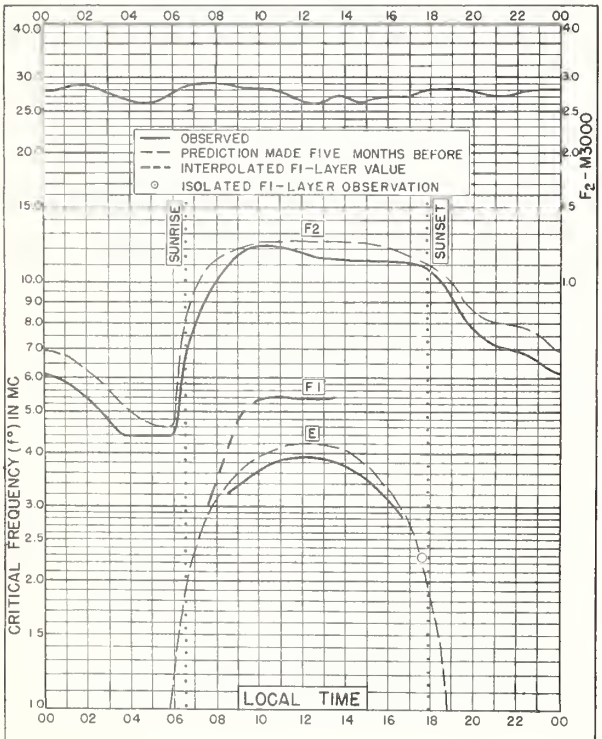


Fig. 19. SAN JUAN, PUERTO RICO
18.4°N, 66.1°W FEBRUARY 1948

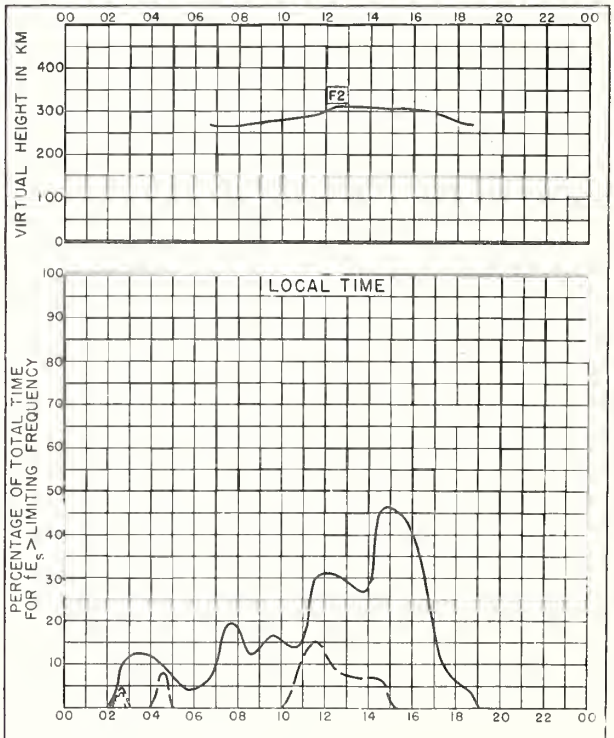


Fig. 20. SAN JUAN, PUERTO RICO FEBRUARY 1948

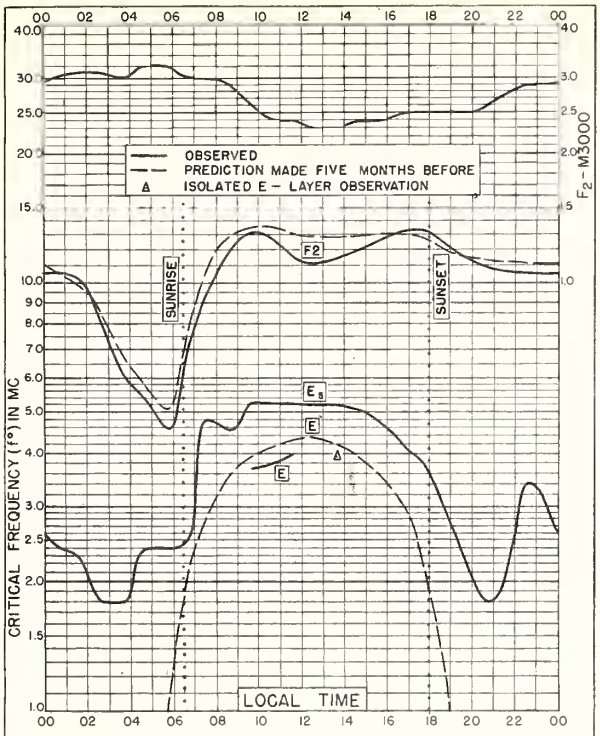


Fig. 21. GUAM I.
13.6°N, 144.9°E FEBRUARY 1948

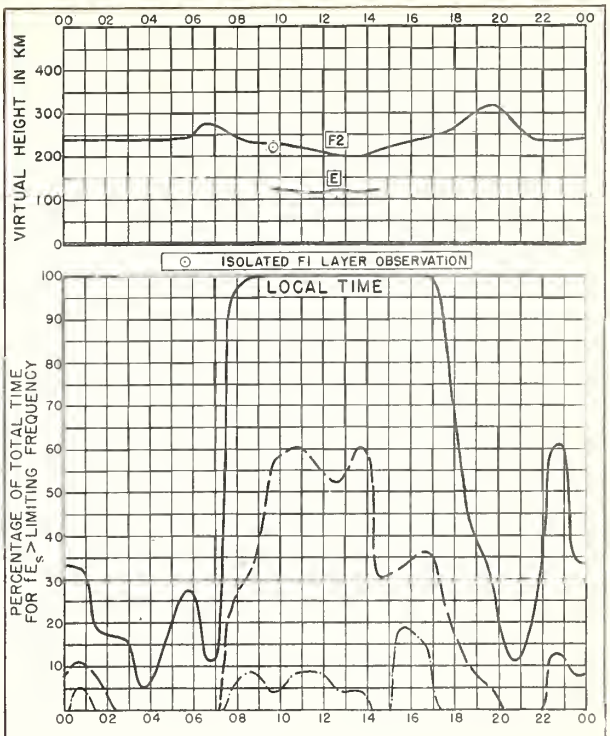


Fig. 22. GUAM I. FEBRUARY 1948

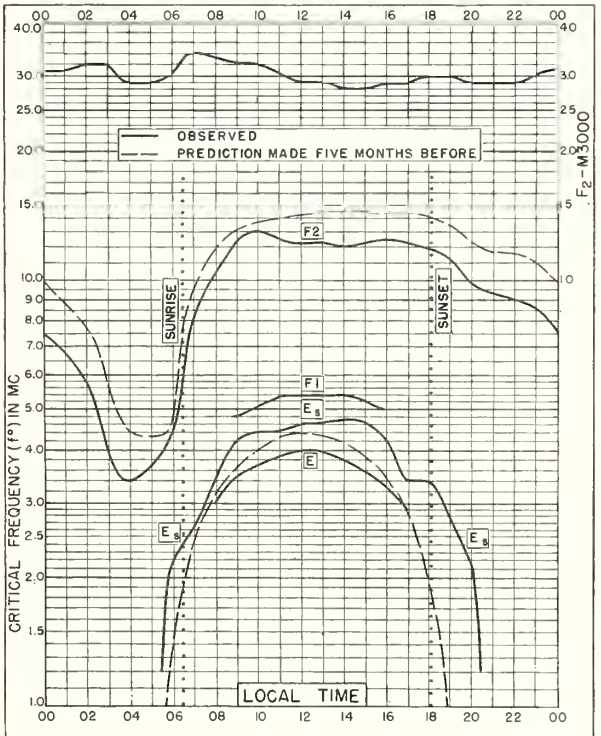


Fig. 23. TRINIDAD, BRIT. WEST INDIES
10. 6°N, 61. 2°W FEBRUARY 1948

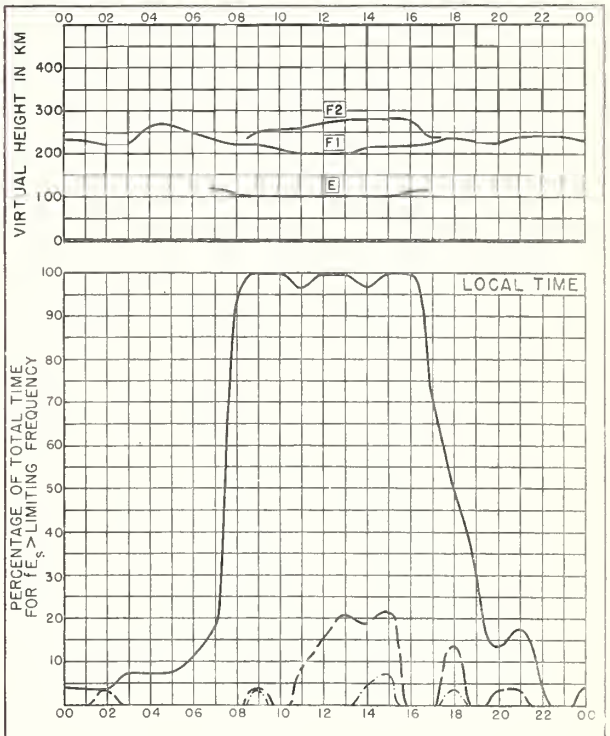


Fig. 24. TRINIDAD, BRIT. WEST INDIES FEBRUARY 1948

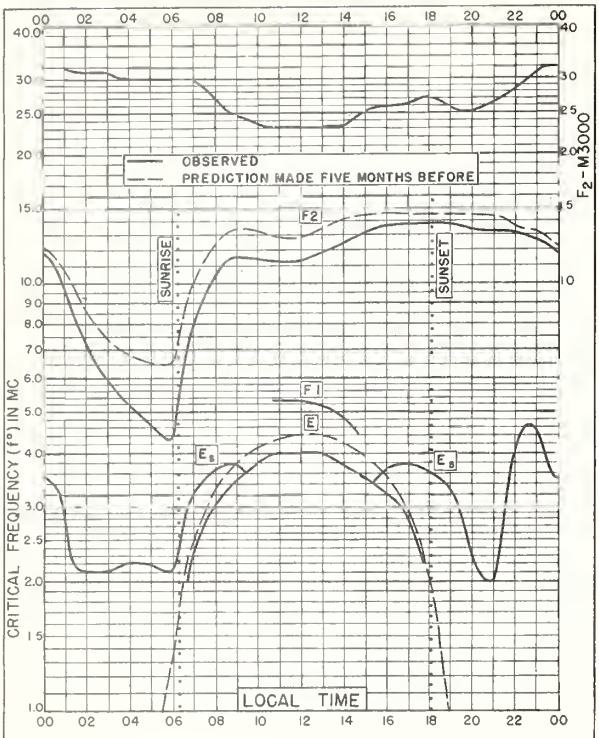


Fig. 25. PALMYRA I.
5.9°N, 162.1°W FEBRUARY 1948

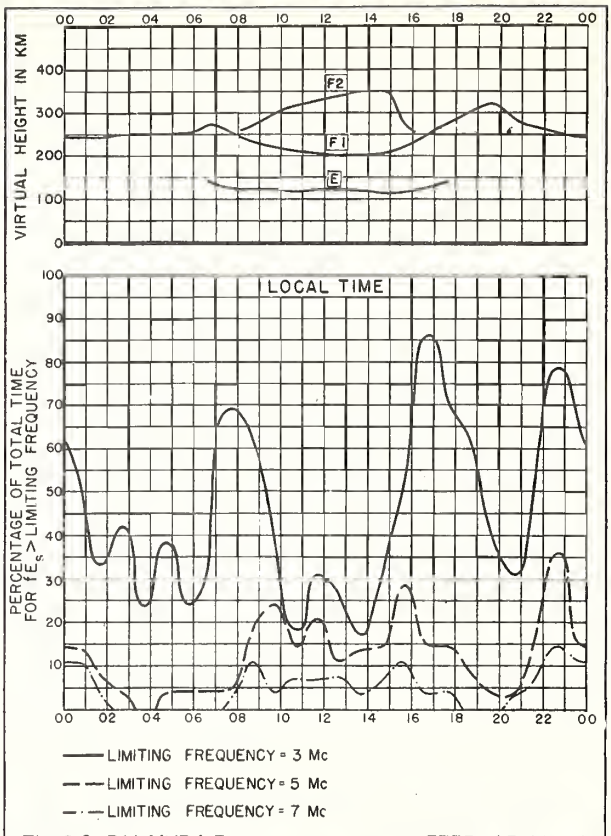


Fig. 26. PALMYRA I. FEBRUARY 1948

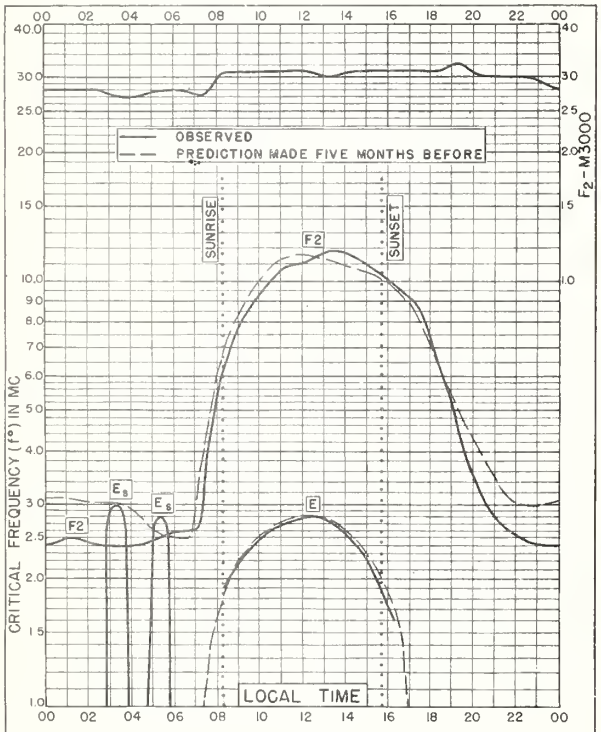


Fig. 27. PRINCE RUPERT, CANADA
54.3°N, 130.3°W JANUARY 1948

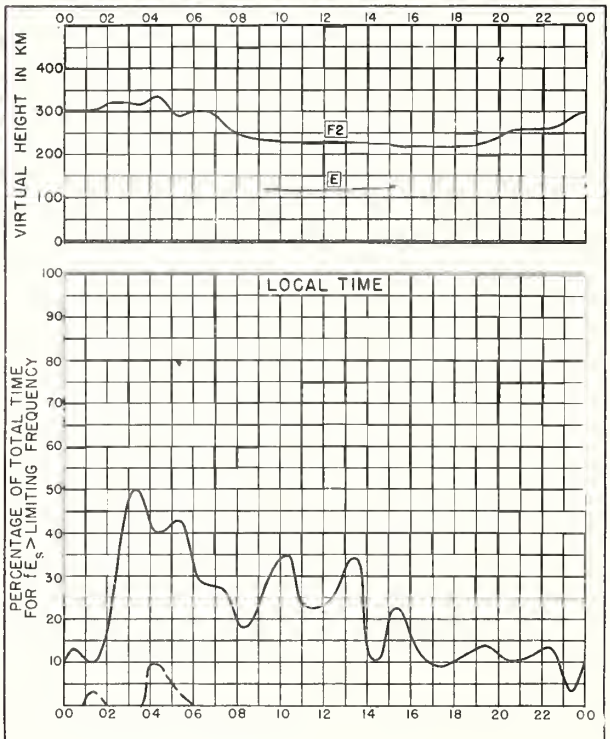


Fig. 28. PRINCE RUPERT, CANADA JANUARY 1948

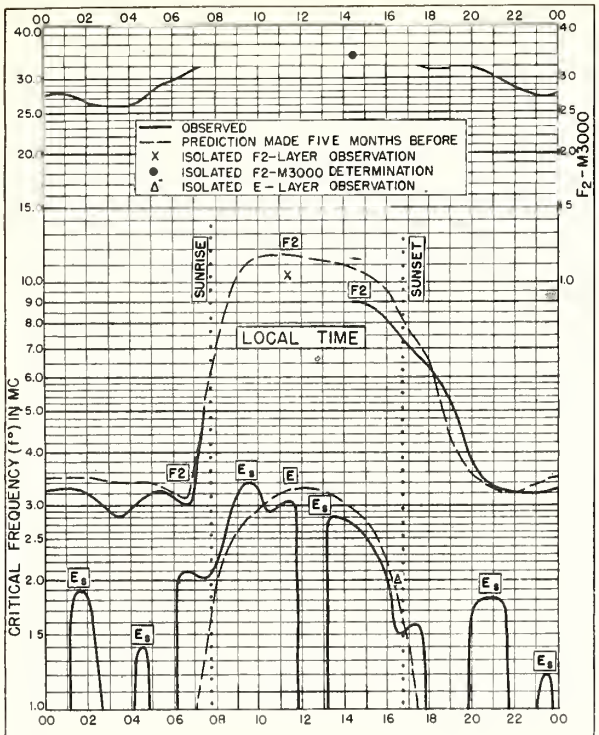


Fig. 29. WAKKANAI, JAPAN
45.4°N, 141.7°E JANUARY 1948

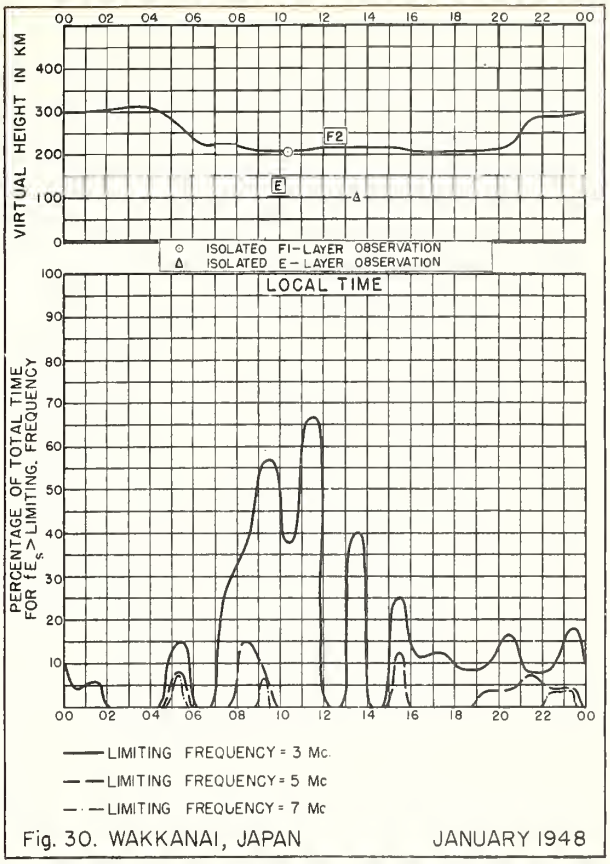


Fig. 30. WAKKANAI, JAPAN JANUARY 1948

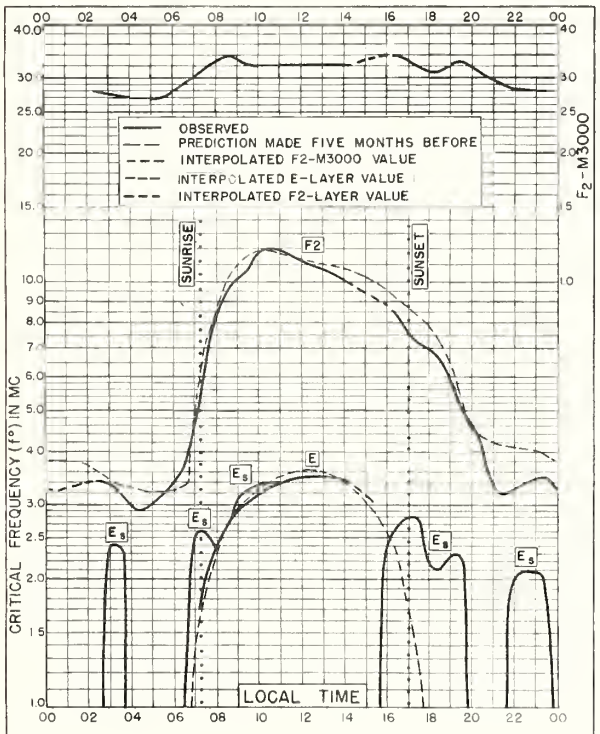


Fig. 31. SHIBATA, JAPAN
37.9°N, 139.3°E JANUARY 1948

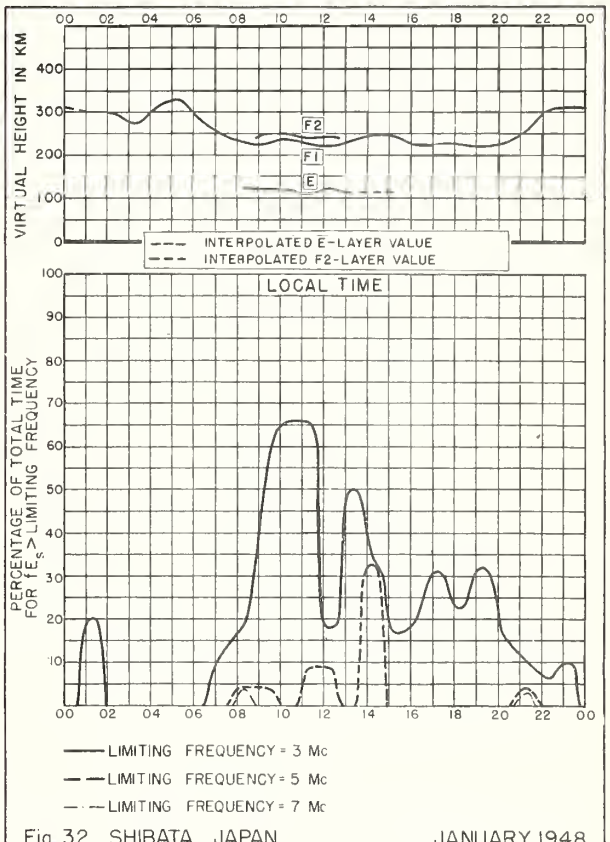


Fig. 32. SHIBATA, JAPAN JANUARY 1948

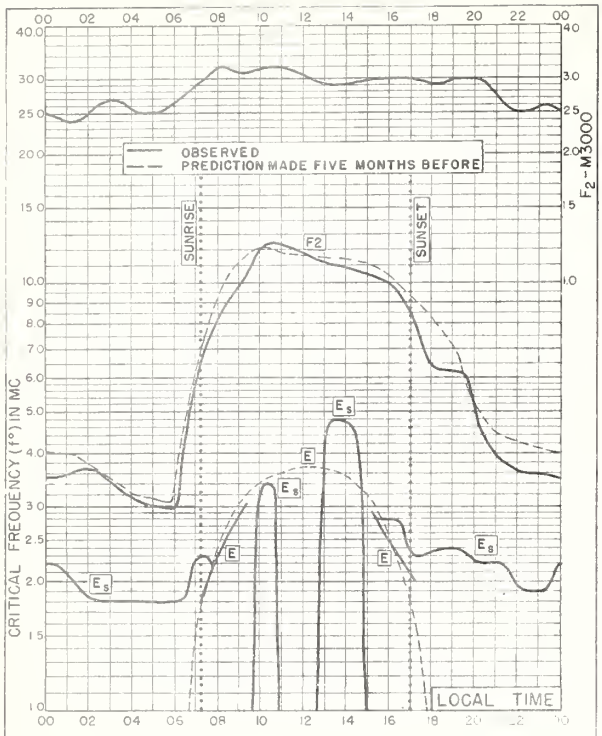


Fig. 33. TOKYO, JAPAN
35.7°N, 139.5°E JANUARY 1948

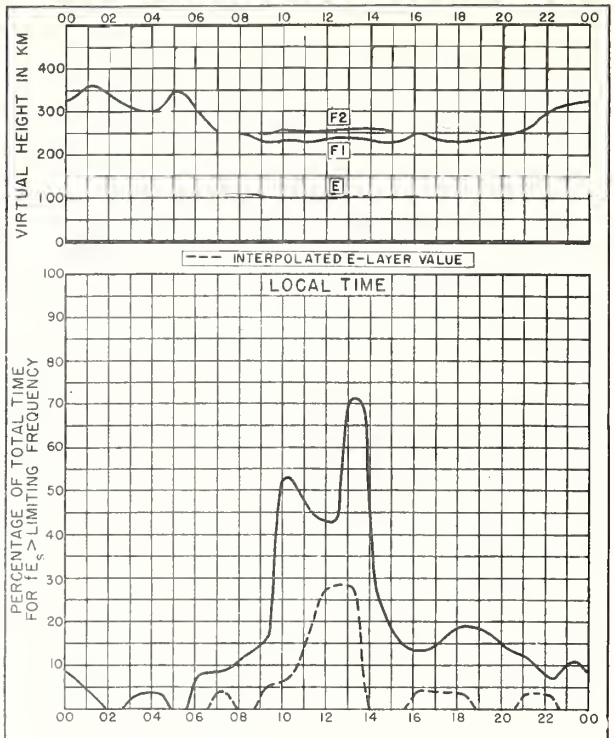


Fig. 34. TOKYO, JAPAN JANUARY 1948

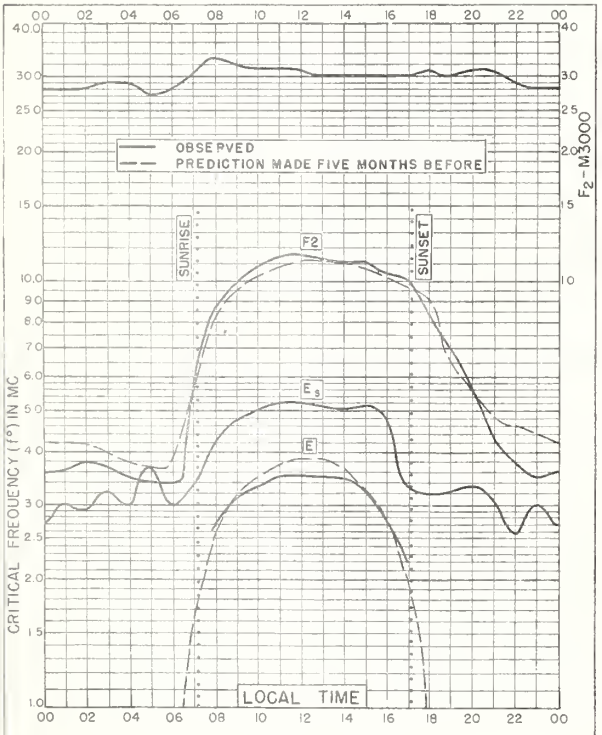


Fig. 35. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W JANUARY 1948

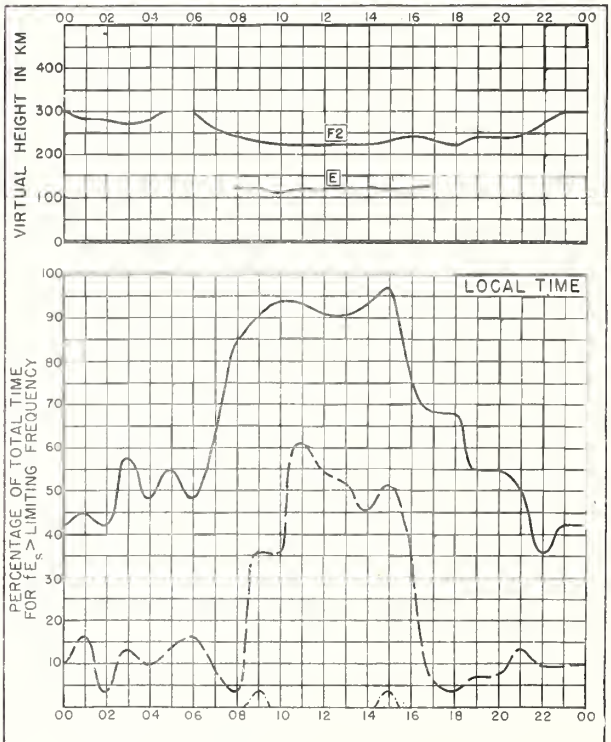


Fig. 36. WHITE SANDS, NEW MEXICO JANUARY 1948

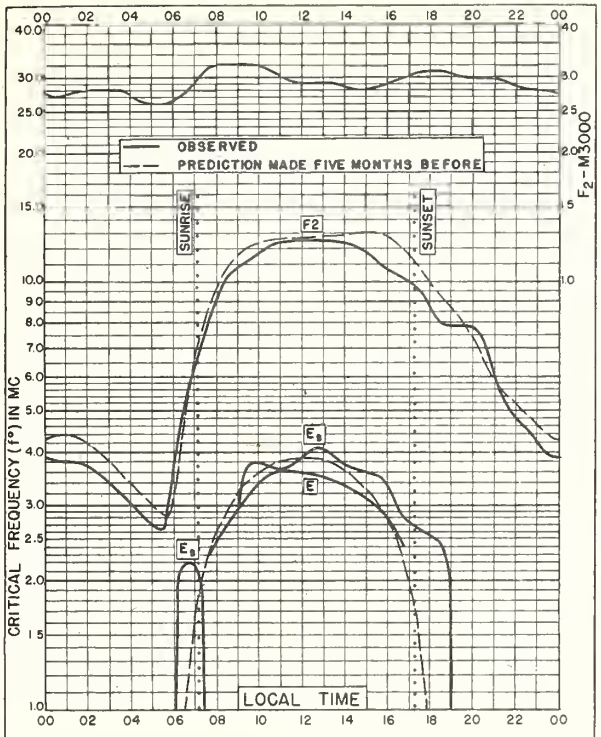


Fig. 37. YAMAKAWA, JAPAN
31.2°N, 130.6°E JANUARY 1948

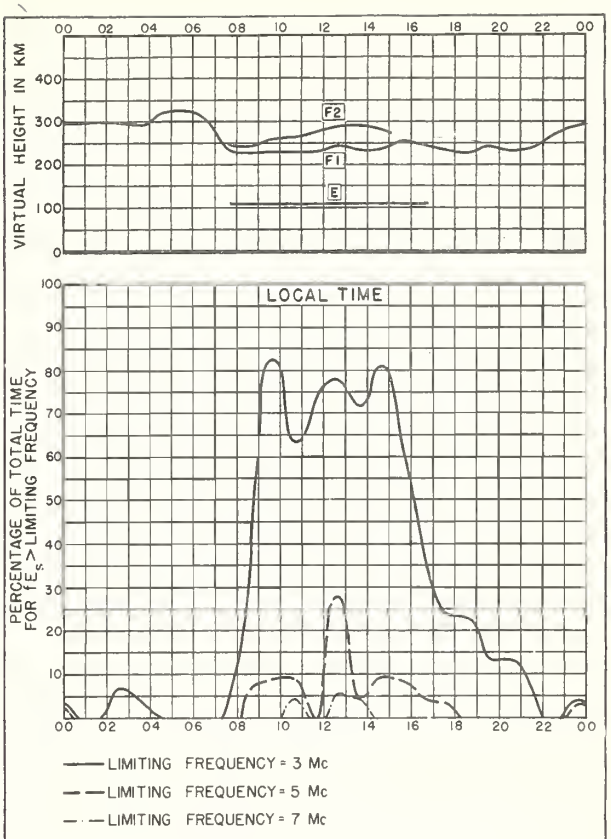


Fig. 38. YAMAKAWA, JAPAN JANUARY 1948

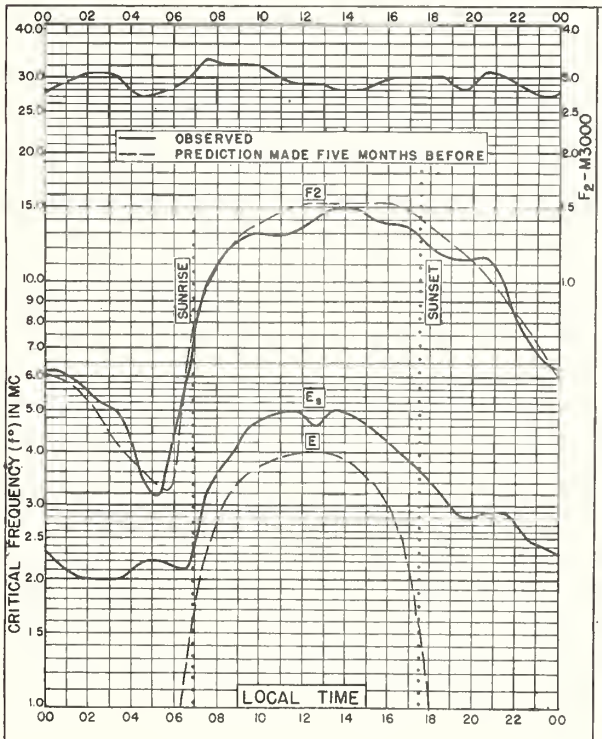


Fig. 39. OKINAWA I.
26.3°N, 127.7°E JANUARY 1948

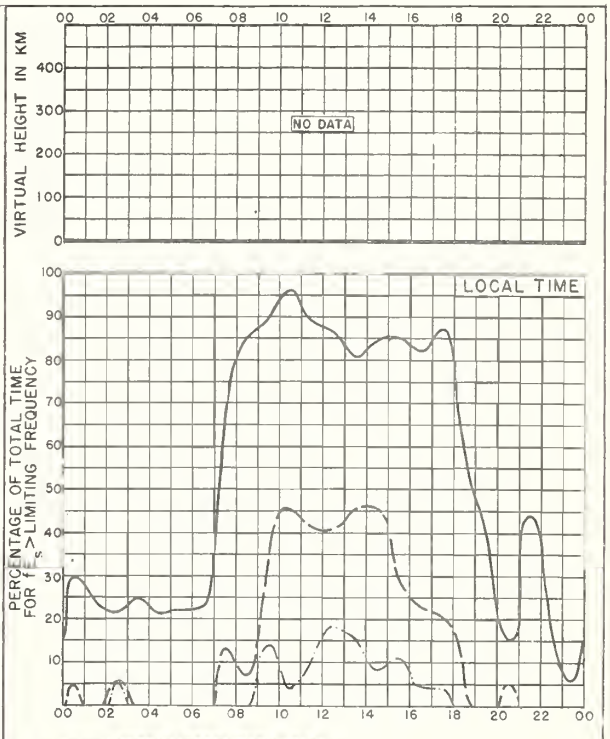


Fig. 40. OKINAWA I. JANUARY 1948

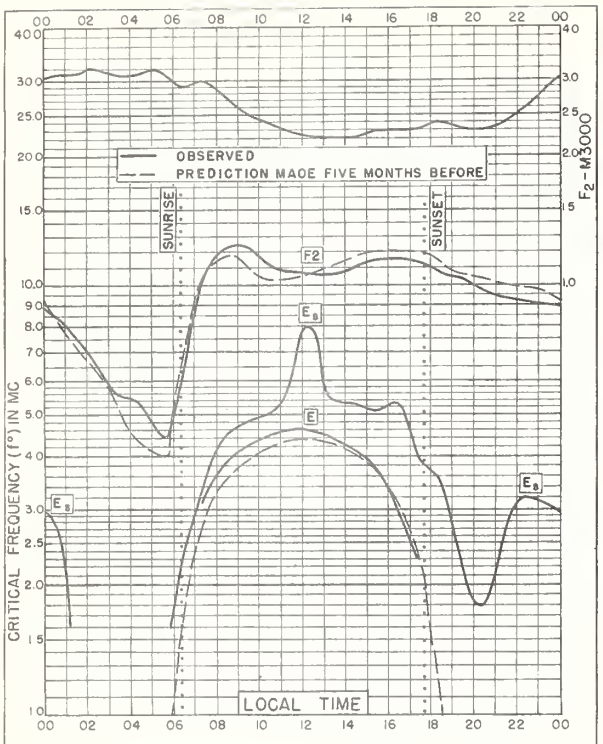


Fig. 41. LEYTE, PHILIPPINE IS.
11.0°N, 125.0°E JANUARY 1948

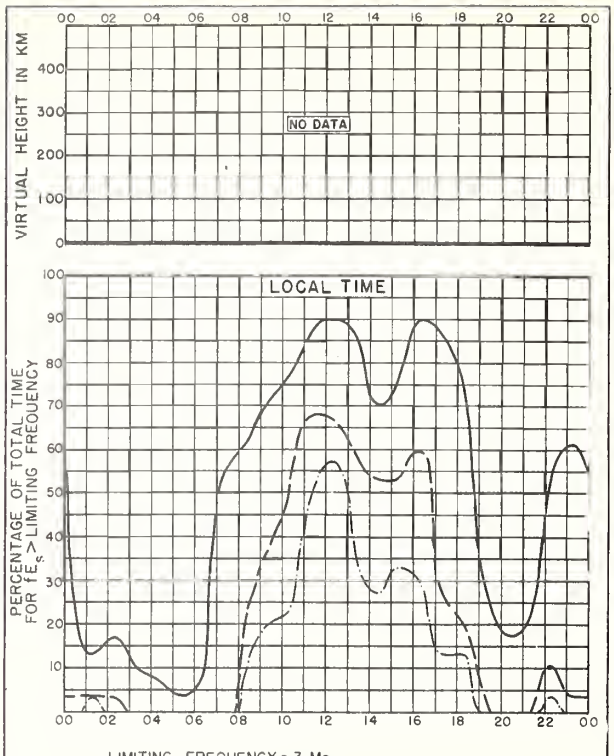


Fig. 42. LEYTE, PHILIPPINE IS. JANUARY 1948

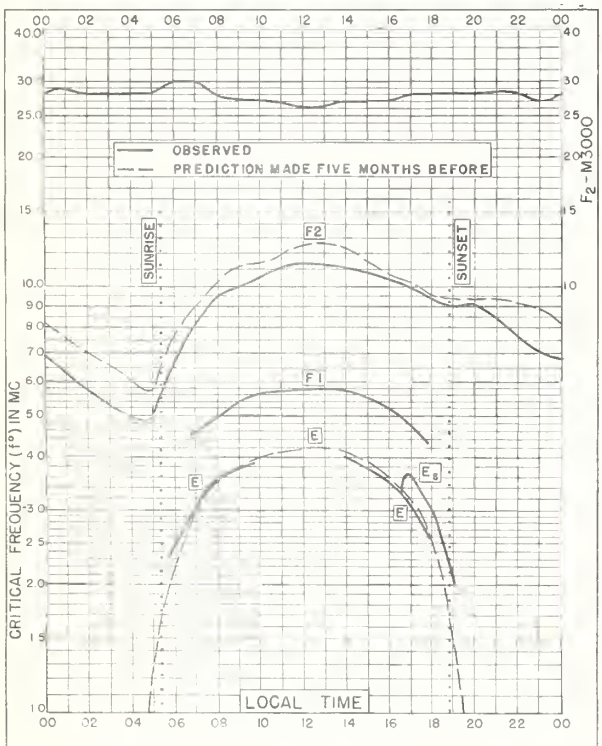


Fig. 43. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.0°E JANUARY 1948

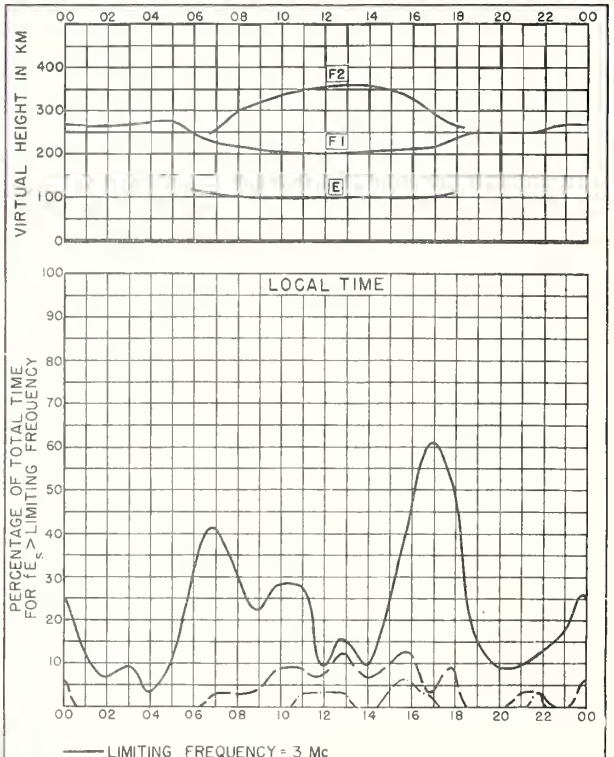


Fig. 44 JOHANNESBURG, U. OF S. AFRICA JANUARY 1948

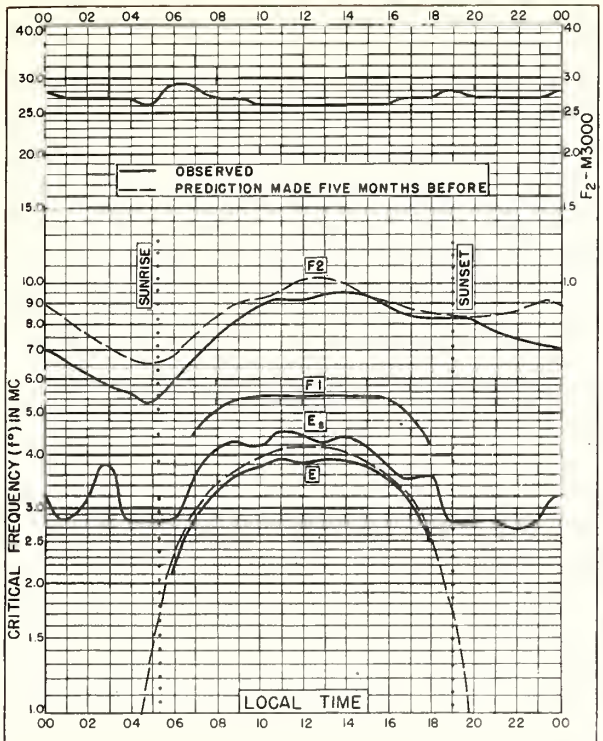


Fig. 45. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E JANUARY 1948

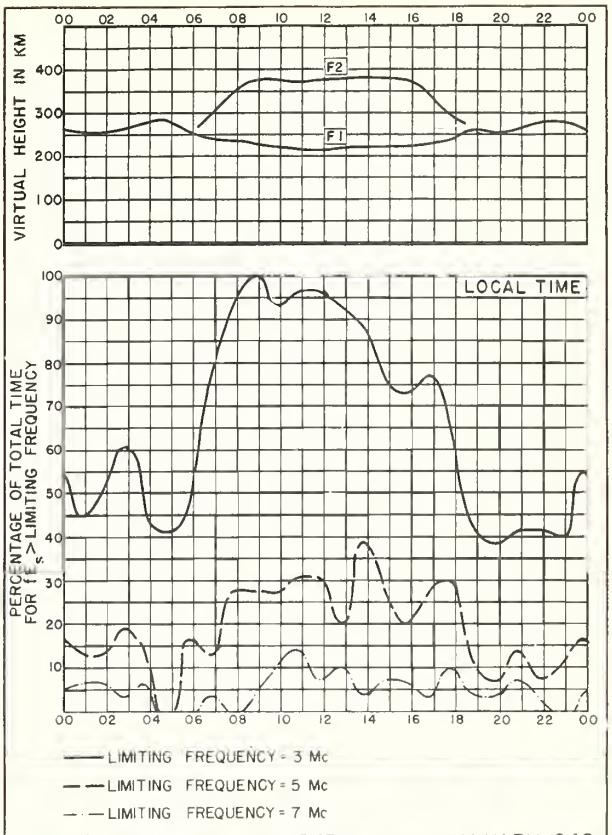


Fig. 46. WATHEROO, W. AUSTRALIA JANUARY 1948

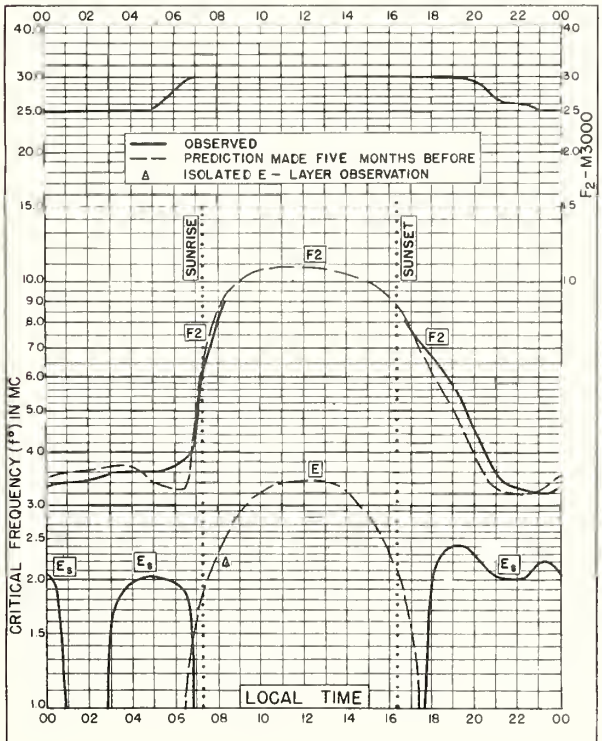


Fig. 47. FUKAURA, JAPAN
40.6°N, 139.9°E DECEMBER 1947

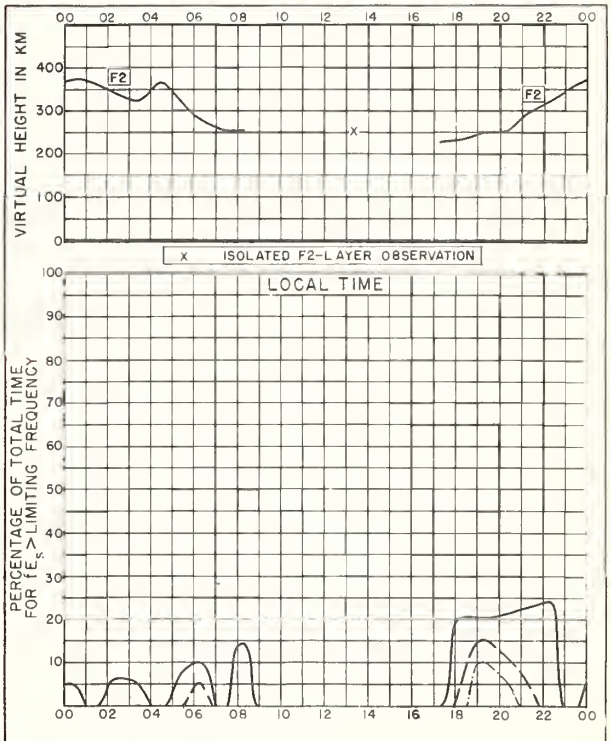


Fig. 48. FUKAURA, JAPAN DECEMBER 1947

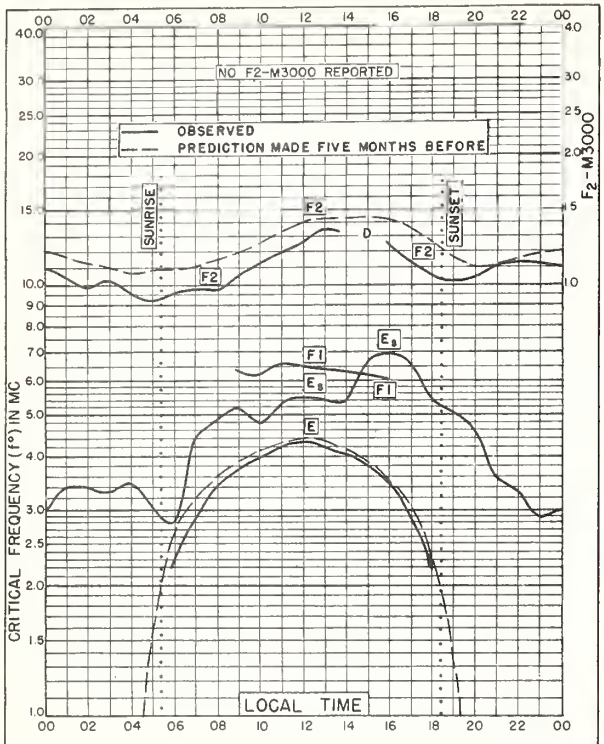


Fig. 49. FIJI IS.
18.0°S, 178.2°E DECEMBER 1947

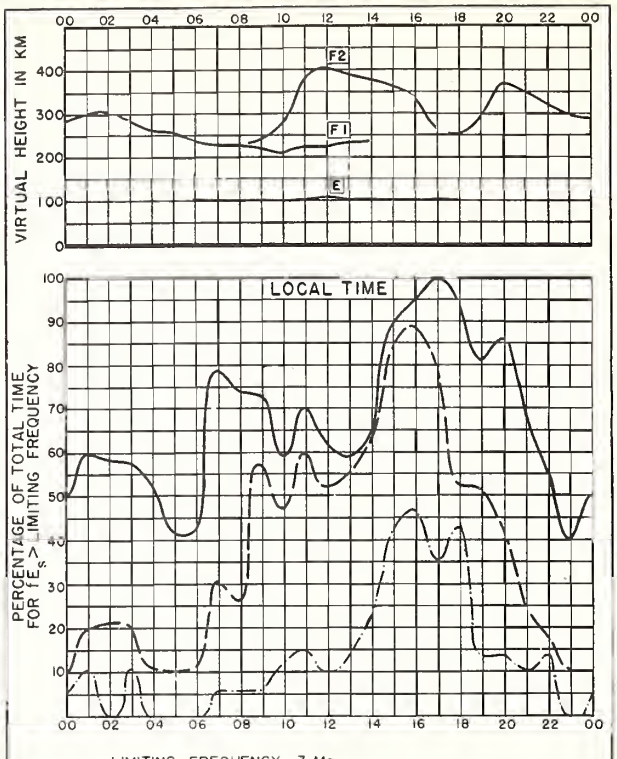


Fig. 50. FIJI IS. DECEMBER 1947

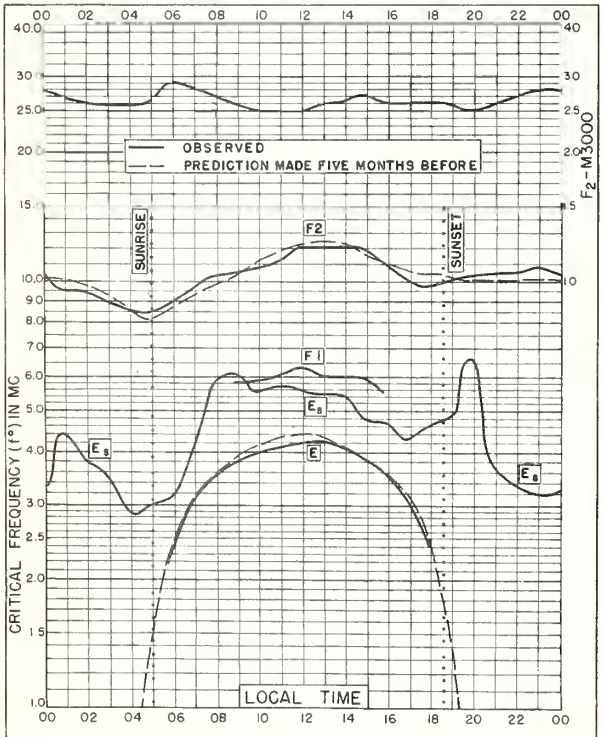


Fig. 51. TOWNSVILLE, AUSTRALIA
19.4°S, 146.5°E DECEMBER 1947

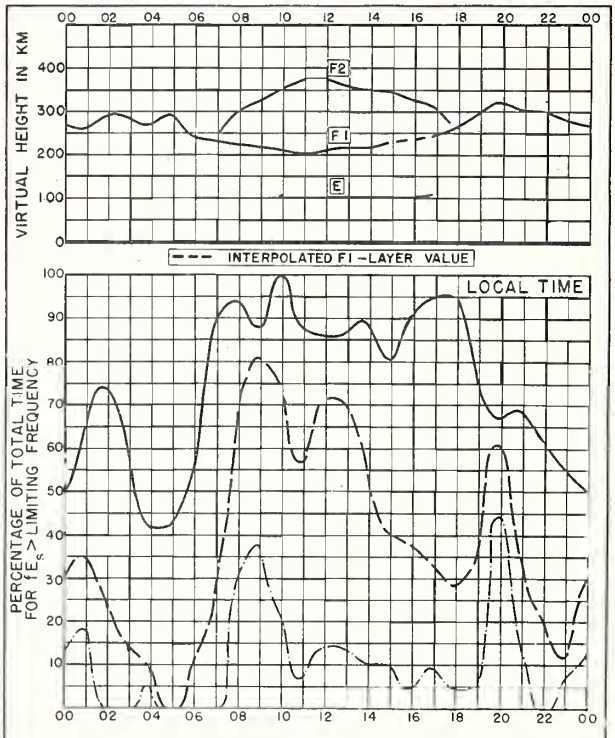


Fig. 52. TOWNSVILLE, AUSTRALIA DECEMBER 1947

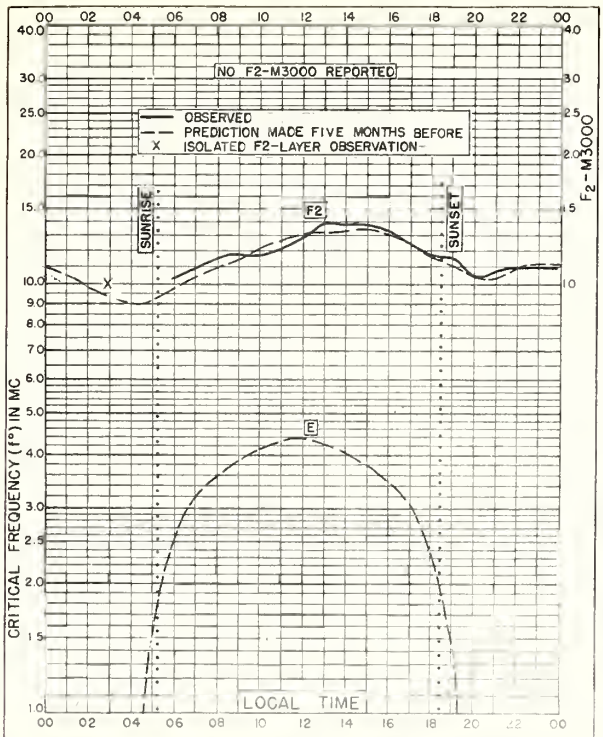


Fig. 53. RAROTONGA I.
21.3°S, 159.8°W DECEMBER 1947

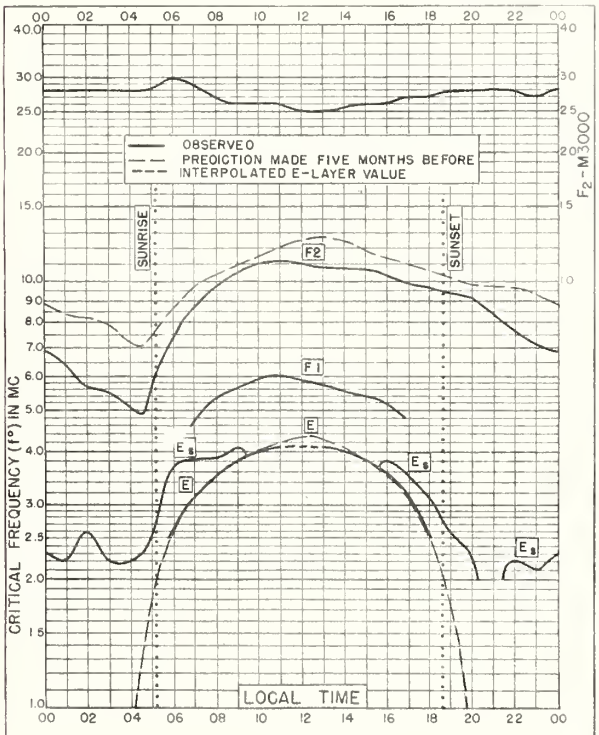


Fig. 54. JOHANNESBURG, U. OF S. AFRICA
26.2°S, 28.0°E DECEMBER 1947

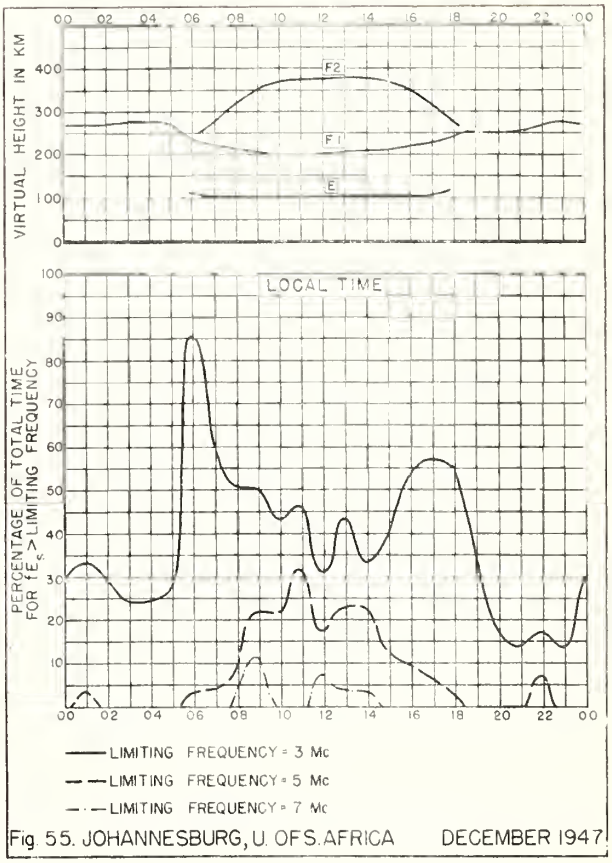


Fig. 55. JOHANNESBURG, U. OF S. AFRICA DECEMBER 1947

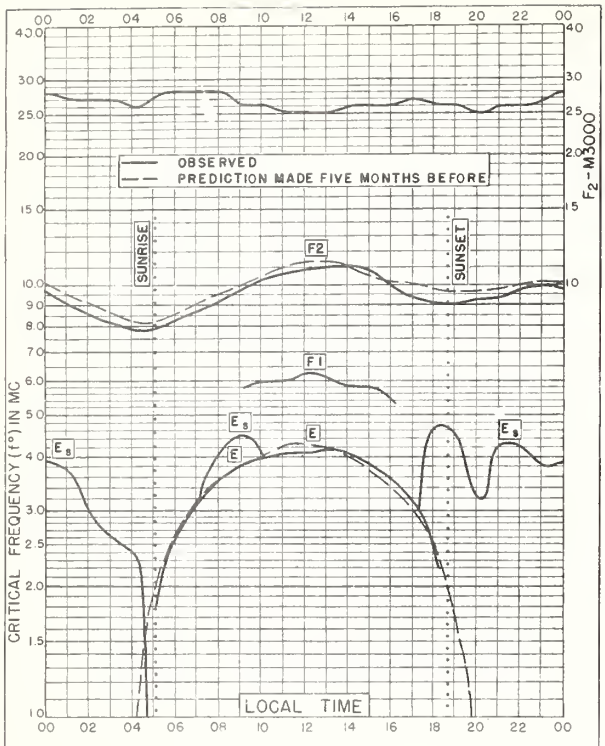


Fig. 56. BRISBANE, AUSTRALIA
27.5°S, 153.0°E DECEMBER 1947

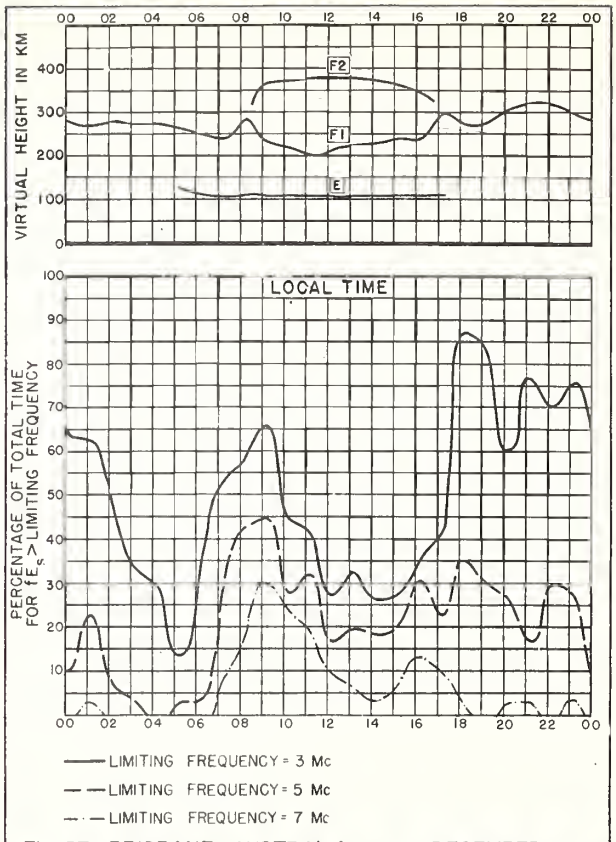


Fig. 57. BRISBANE, AUSTRALIA DECEMBER 1947

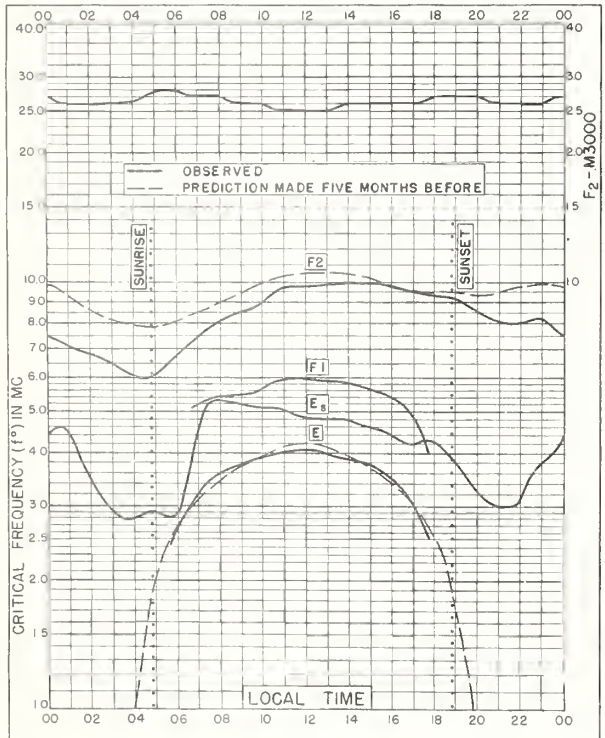


Fig. 58. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E DECEMBER 1947

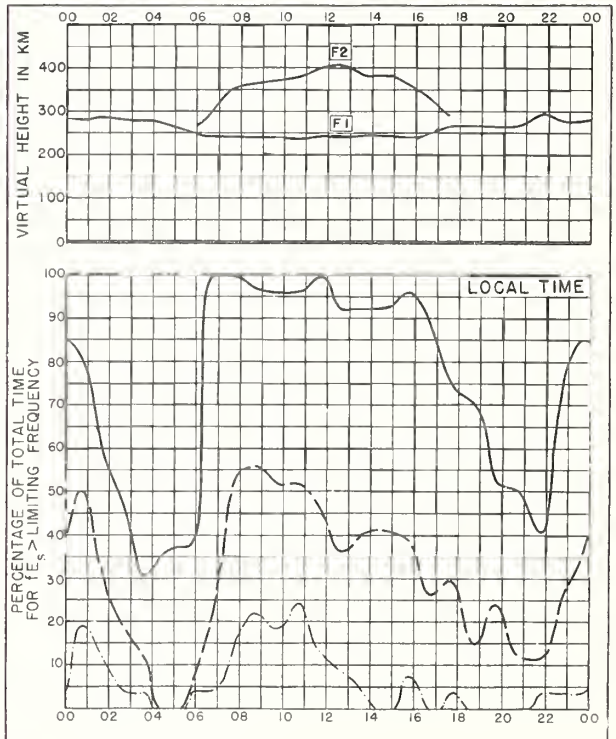


Fig. 59. WATHEROO, W. AUSTRALIA DECEMBER 1947

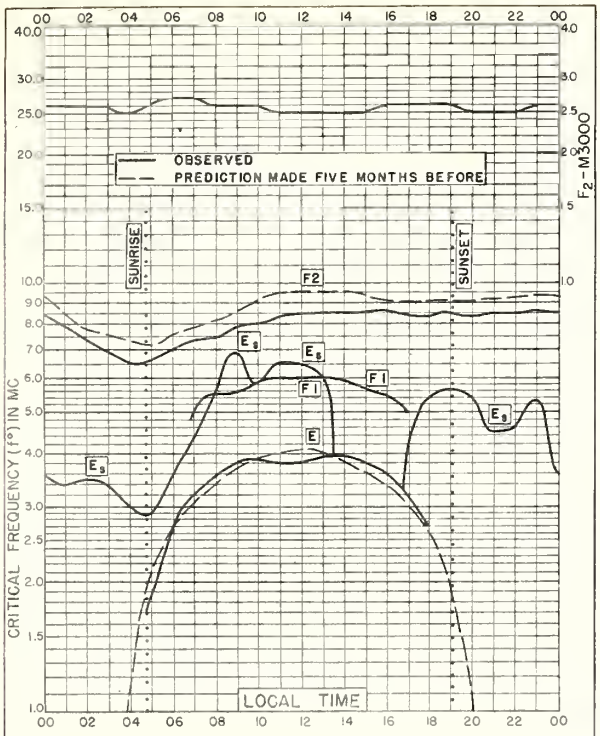


Fig. 60. CANBERRA, AUSTRALIA
35.3°S, 149.0°E DECEMBER 1947

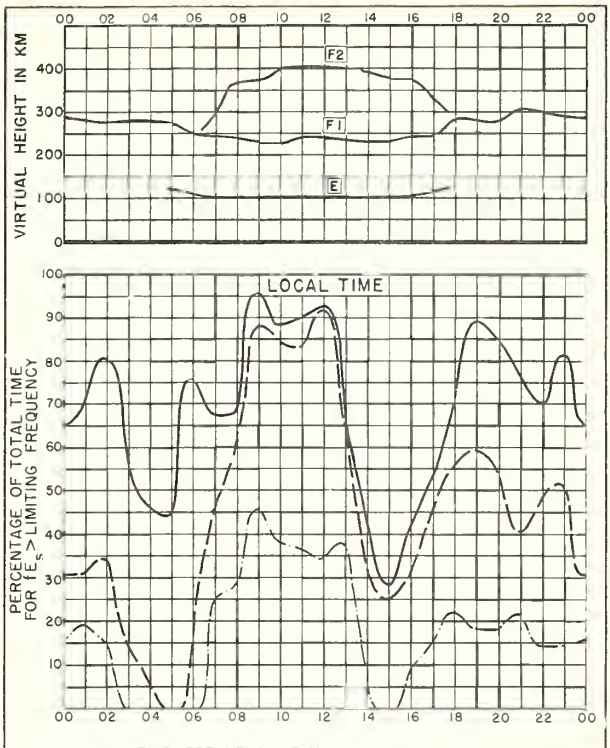


Fig. 61. CANBERRA, AUSTRALIA DECEMBER 1947

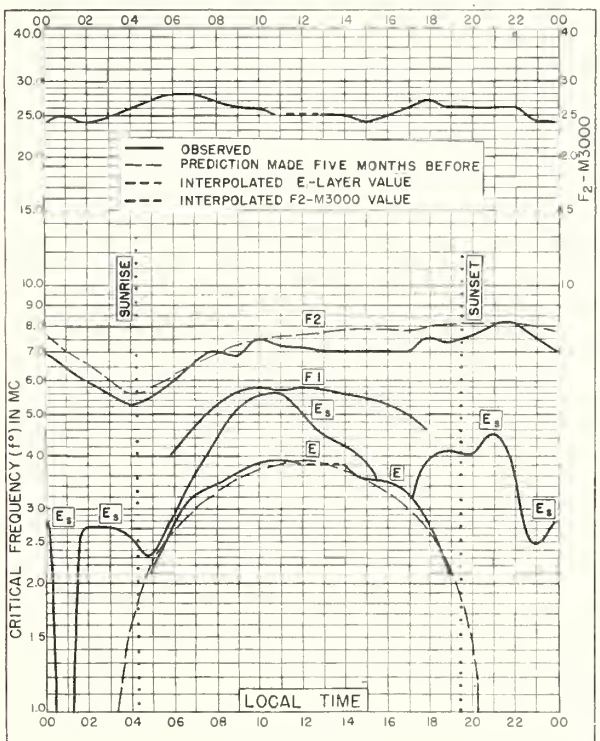


Fig. 62. HOBART, TASMANIA
42.8°S, 147.4°E DECEMBER 1947

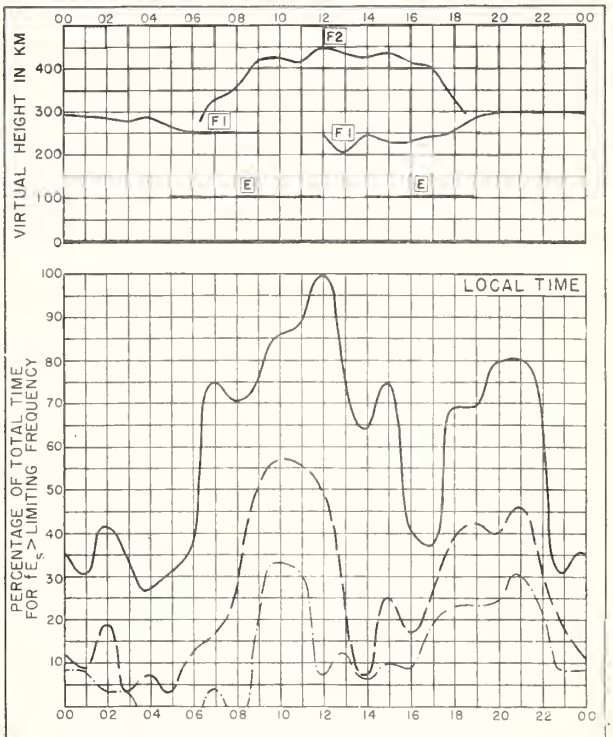


Fig. 63. HOBART, TASMANIA DECEMBER 1947

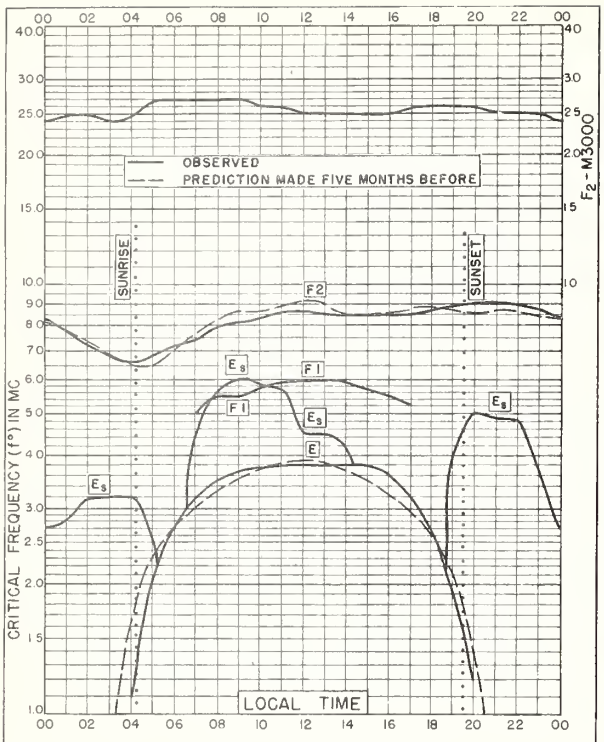


Fig. 64. CHRISTCHURCH, N.Z.
43.5°S, 172.7°E DECEMBER 1947

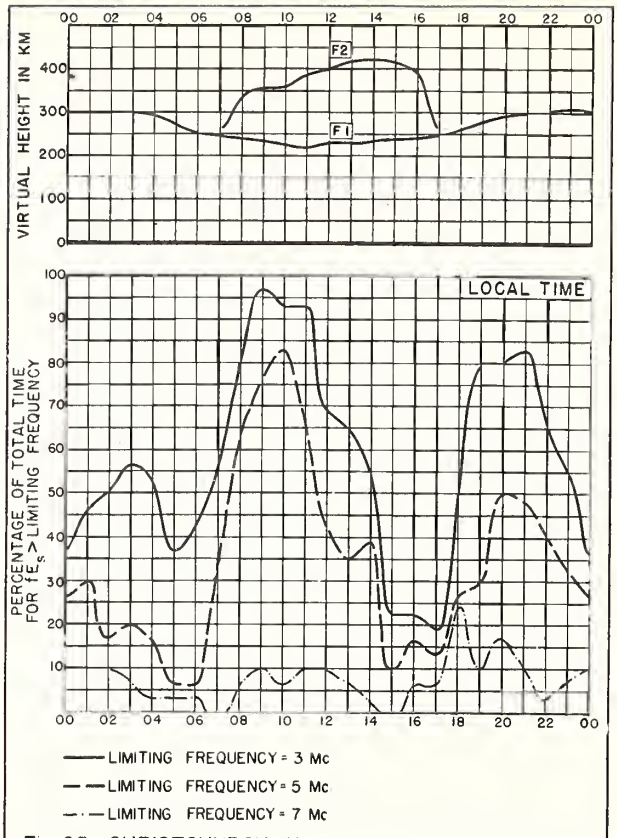


Fig. 65. CHRISTCHURCH, N.Z. DECEMBER 1947

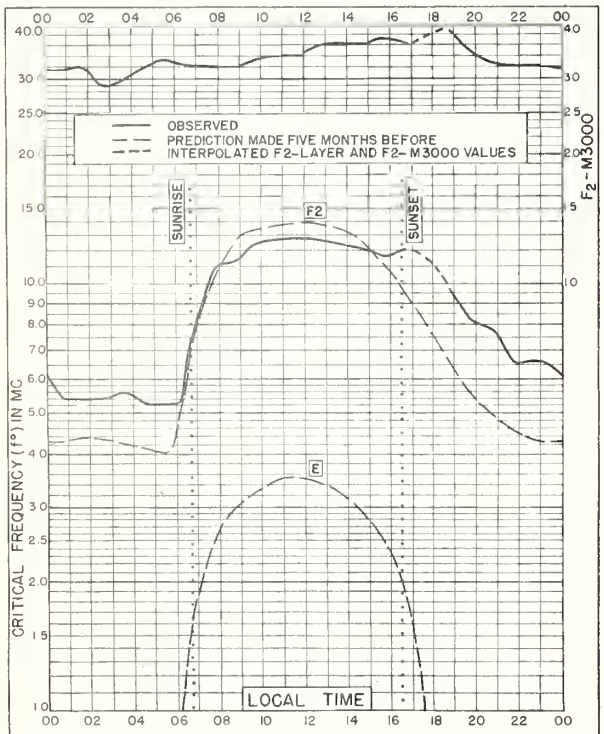


Fig. 66. PEIPING, CHINA
39.9°N, 116.4°E NOVEMBER 1947

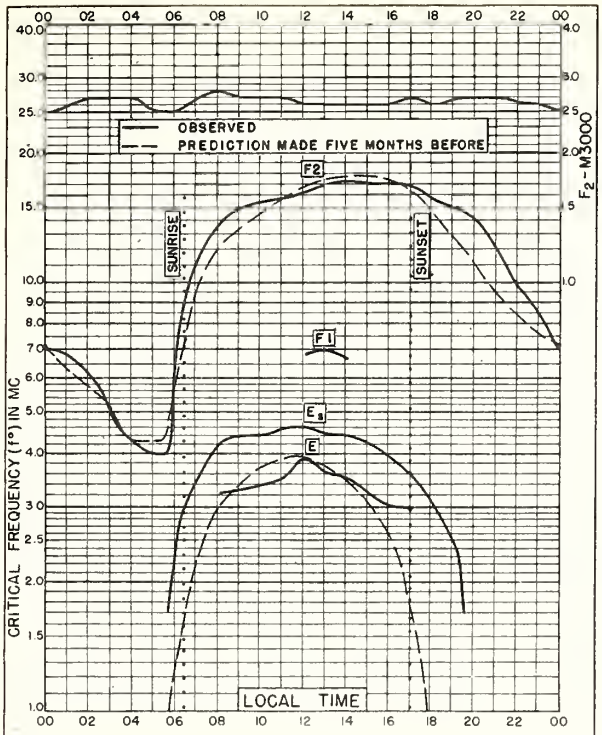


Fig. 67. CHUNGKING, CHINA
29.4°N, 106.8°E NOVEMBER 1947

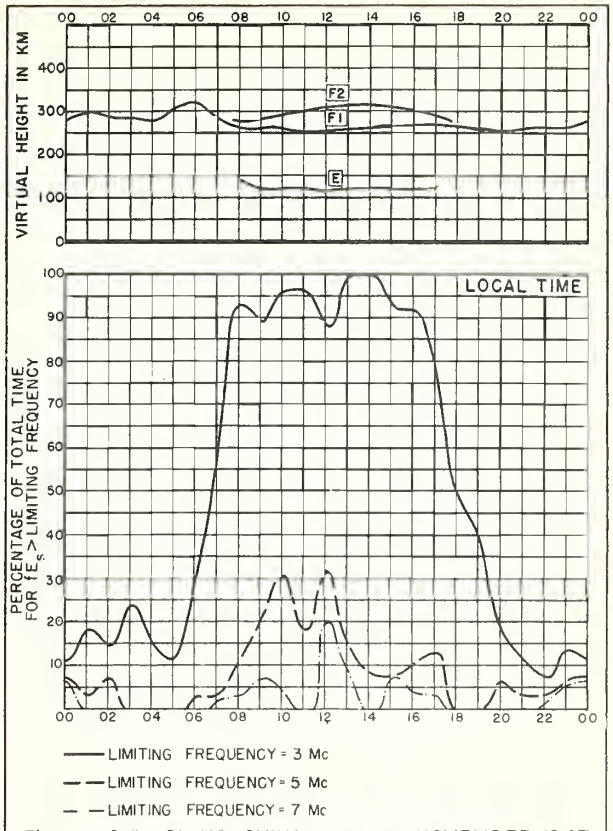


Fig. 68. CHUNGKING, CHINA NOVEMBER 1947

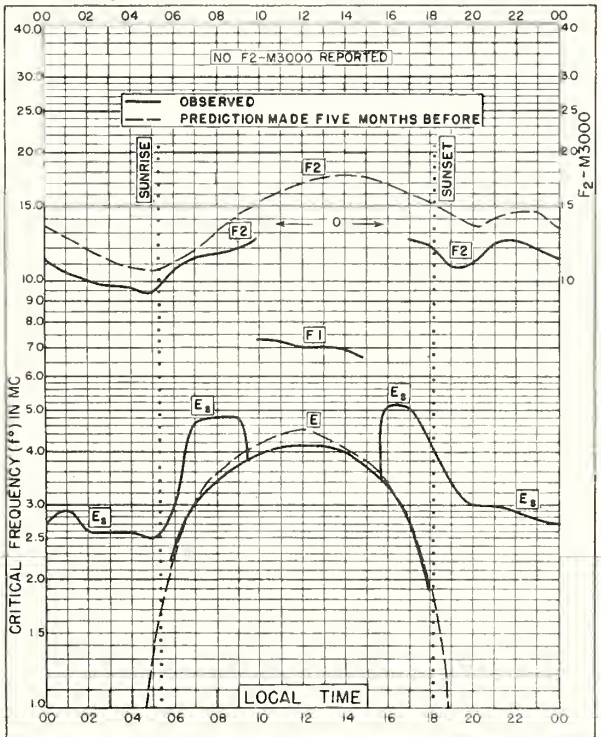


Fig. 69. FIJI IS.
18.0°S, 178.2°E NOVEMBER 1947

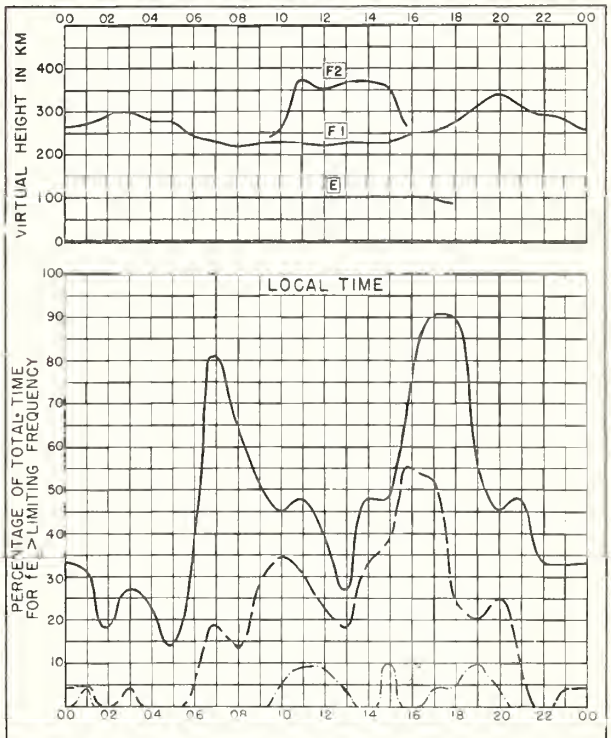


Fig. 70. FIJI IS. NOVEMBER 1947

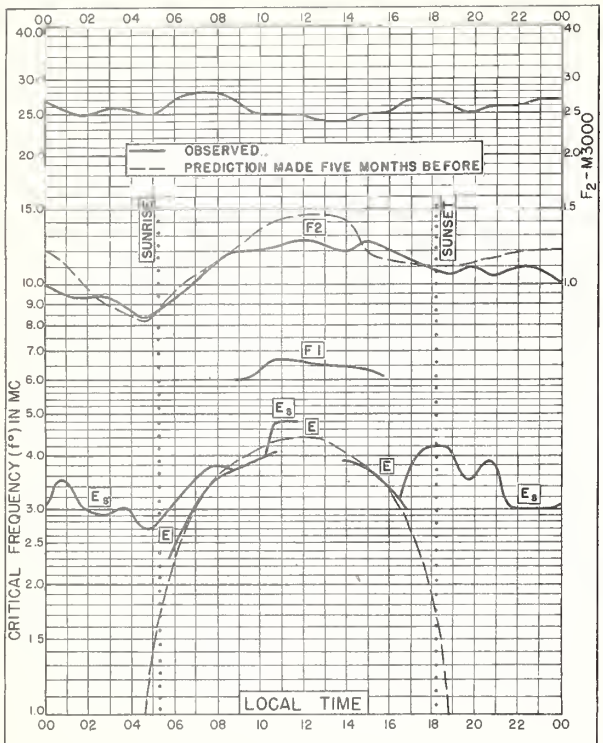


Fig. 71. TOWNSVILLE, AUSTRALIA
19.4°S, 146.5°E NOVEMBER 1947

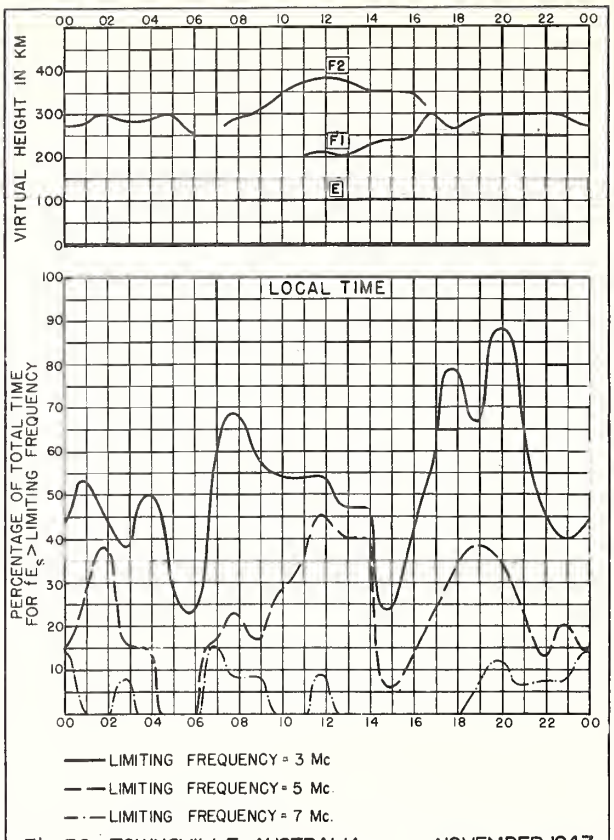


Fig. 72. TOWNSVILLE, AUSTRALIA NOVEMBER 1947

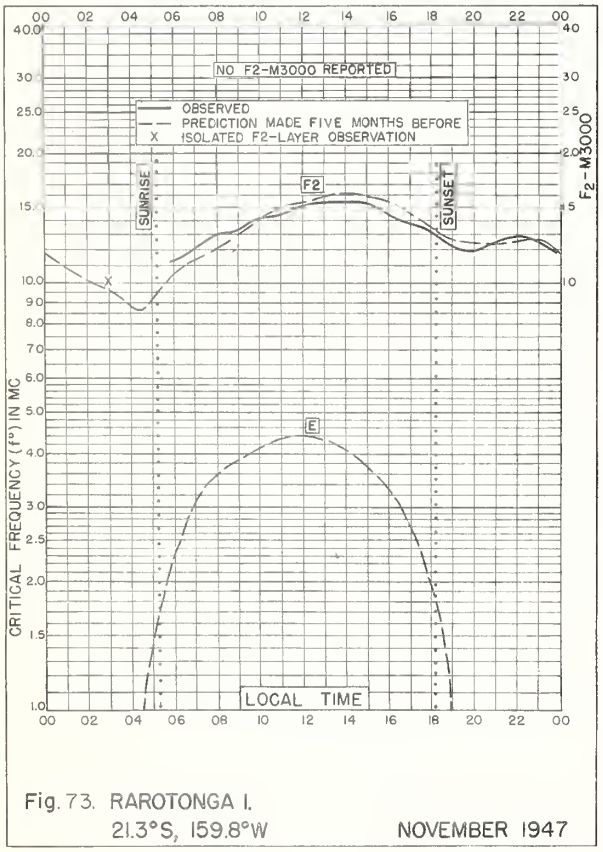


Fig. 73. RAROTONGA I.
21.3°S, 159.8°W NOVEMBER 1947

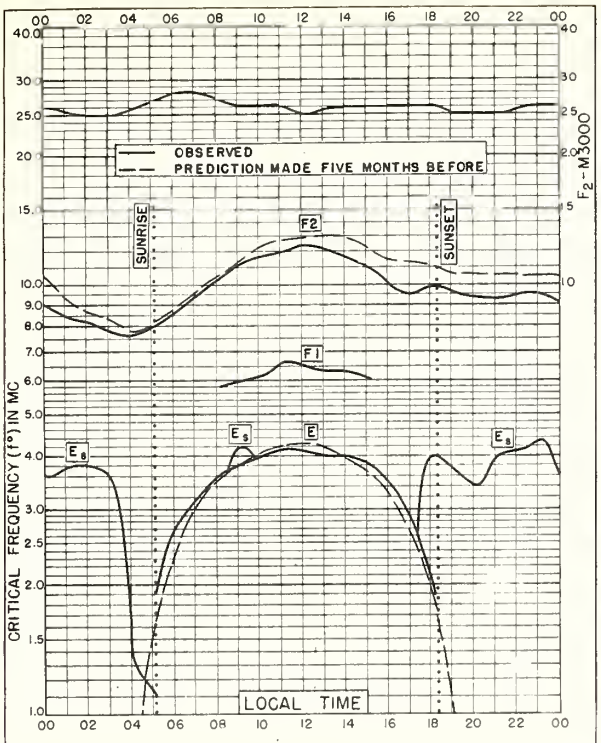


Fig. 74. BRISBANE, AUSTRALIA
27.5°S, 153.0°E NOVEMBER 1947

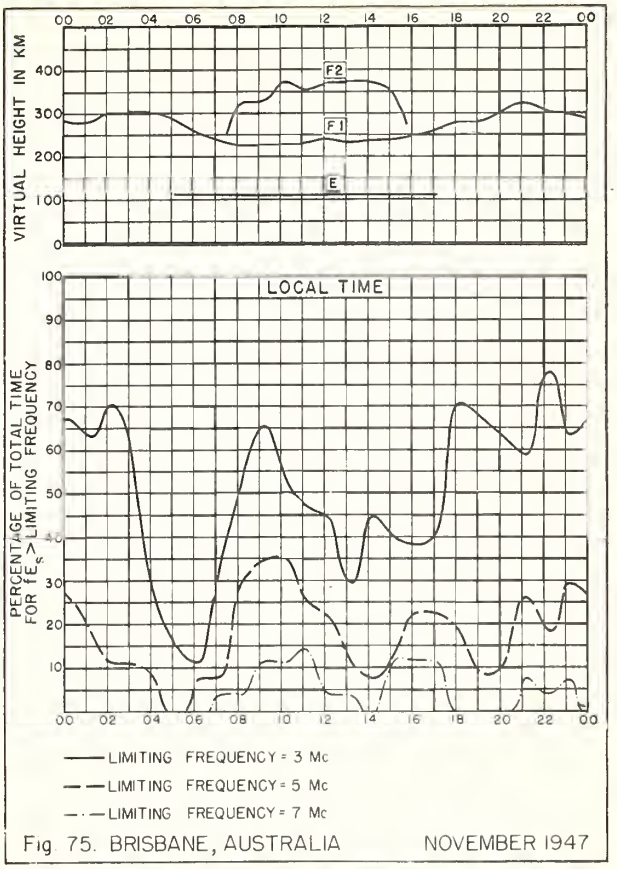


Fig. 75. BRISBANE, AUSTRALIA NOVEMBER 1947

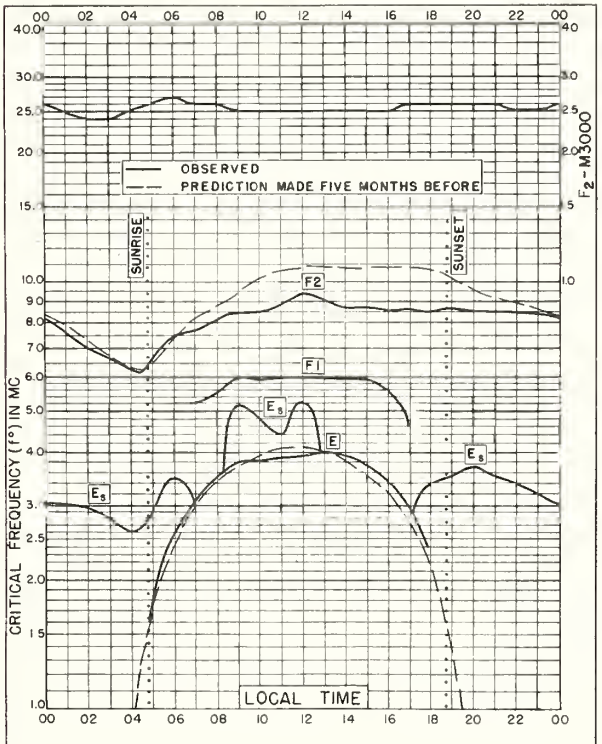


Fig. 76. CANBERRA, AUSTRALIA
35.3°S, 149.0°E NOVEMBER 1947

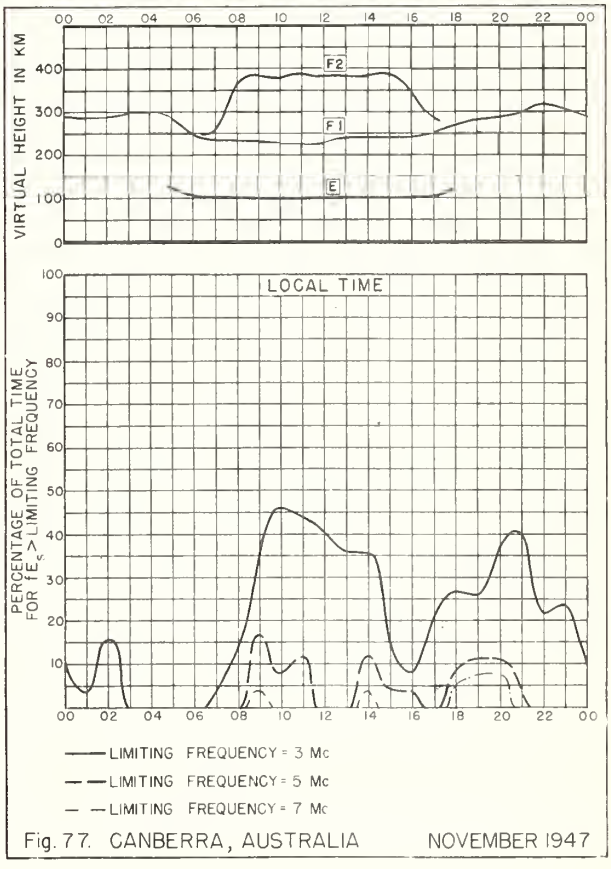


Fig. 77. CANBERRA, AUSTRALIA NOVEMBER 1947

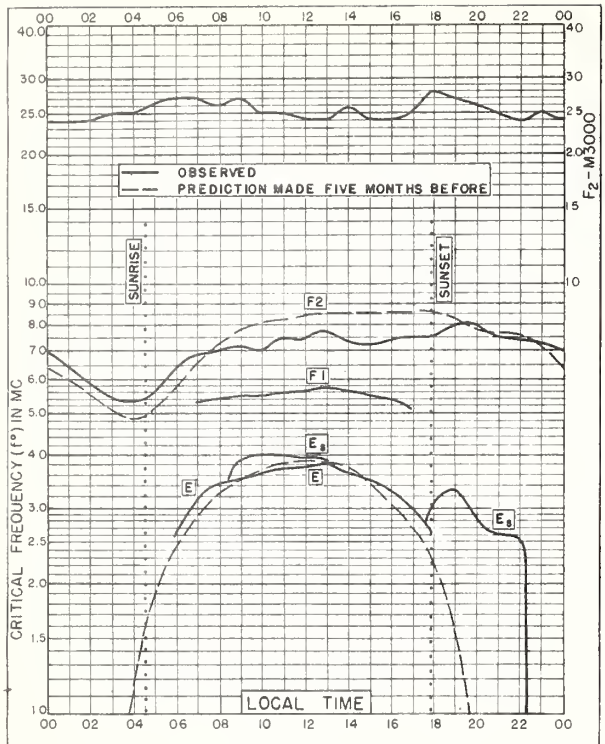


Fig. 78. HOBART, TASMANIA
42.8°S, 147.4°E NOVEMBER 1947

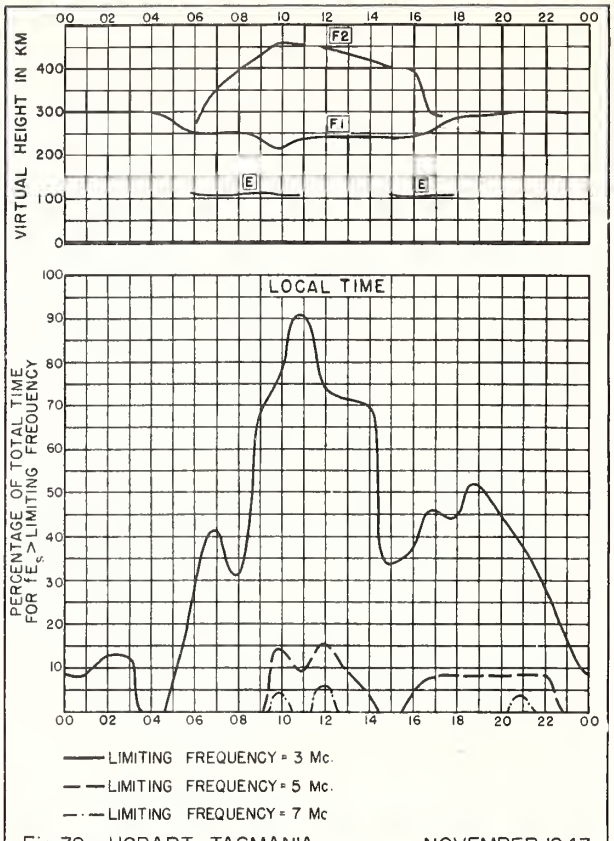


Fig. 79. HOBART, TASMANIA NOVEMBER 1947

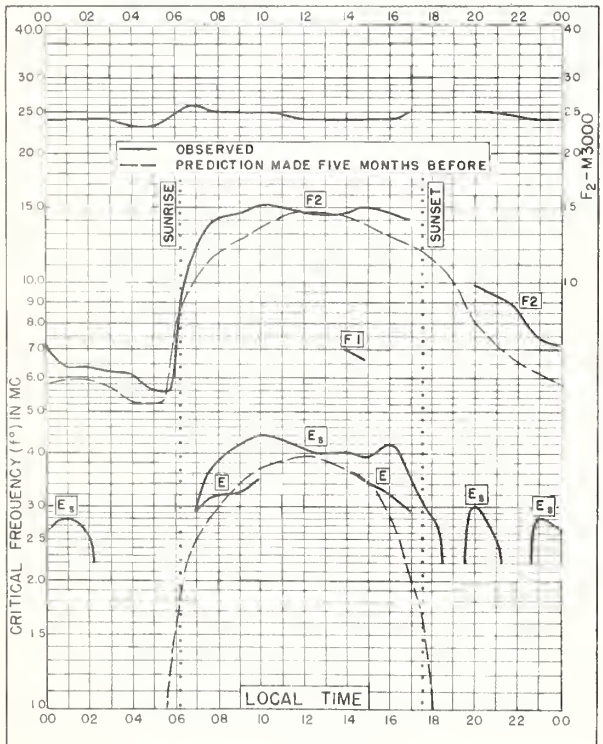


Fig. 80. LANCHOW, CHINA
36.1°N, 103.8°E OCTOBER 1947

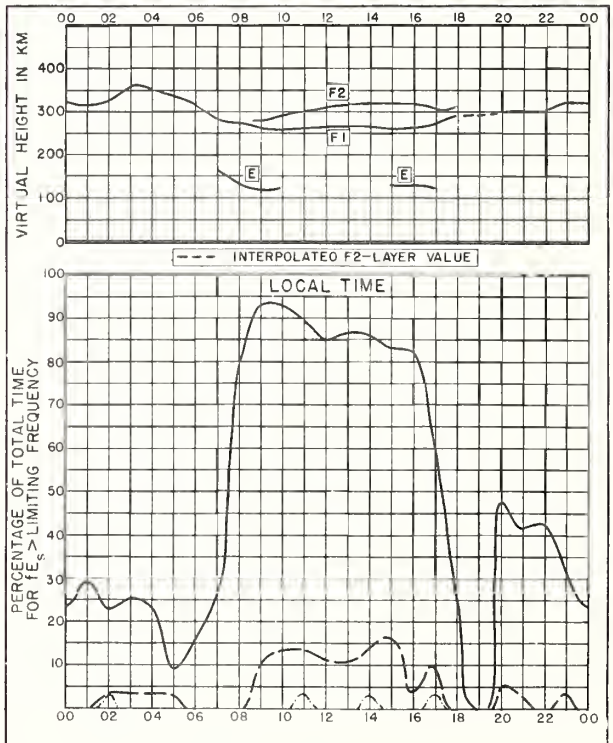


Fig. 81. LANCHOW, CHINA OCTOBER 1947

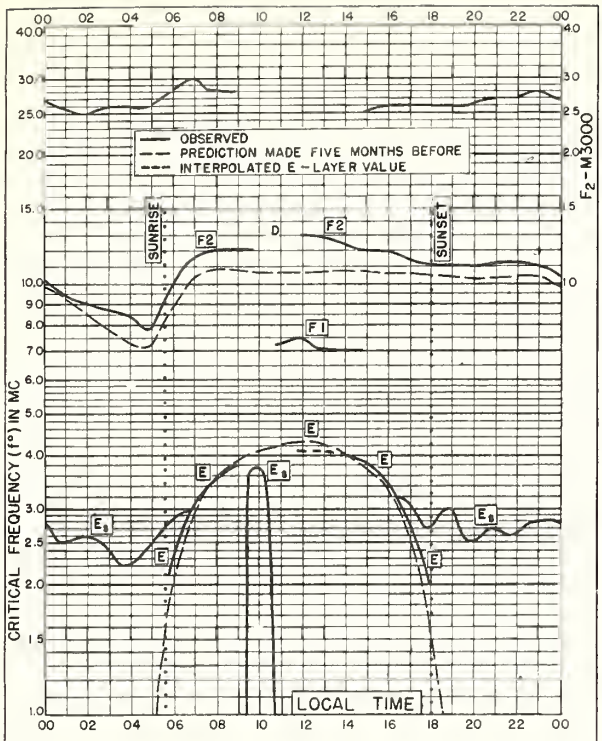


Fig 82. TOWNSVILLE, AUSTRALIA
19.4°S, 146.5°E OCTOBER 1947

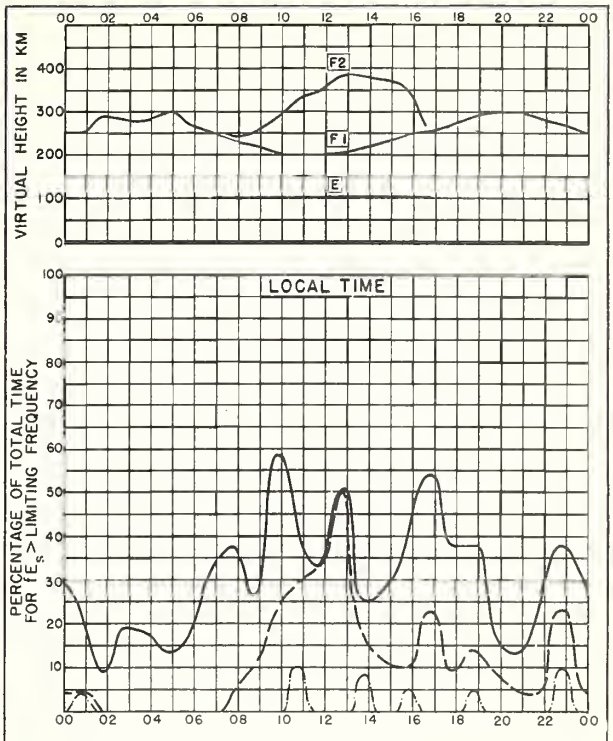


Fig. 83. TOWNSVILLE, AUSTRALIA OCTOBER 1947

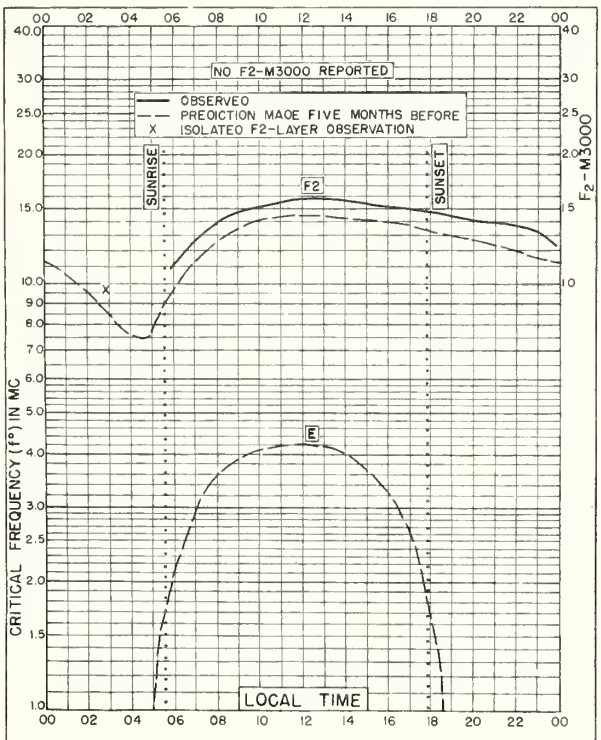


Fig. 84. RAROTONGA I.
21.3°S, 159.8°W OCTOBER 1947

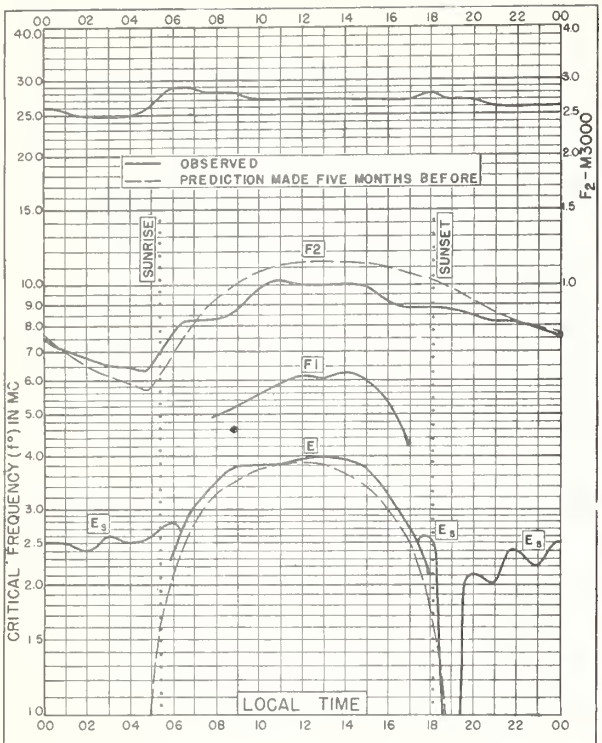


Fig. 85. CANBERRA, AUSTRALIA
35.3°S, 149.0°E OCTOBER 1947

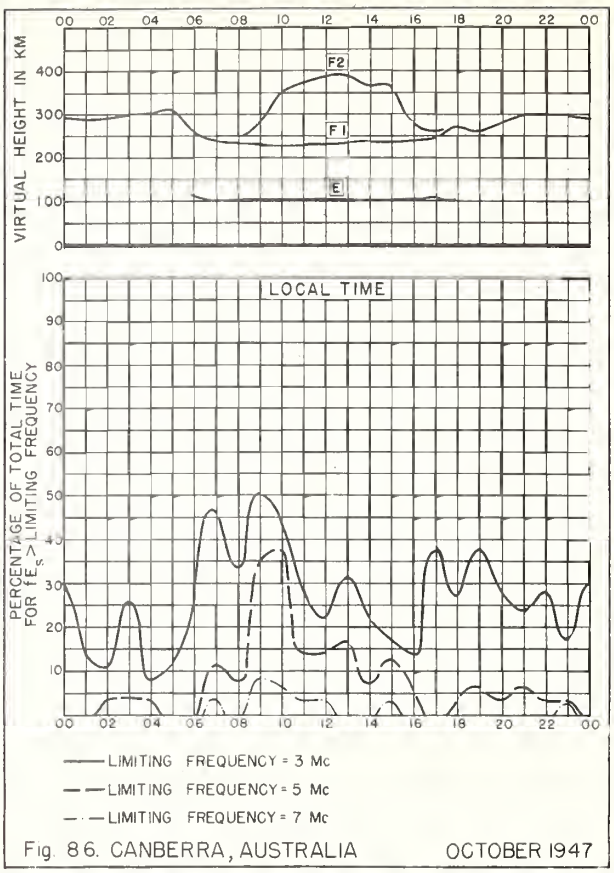


Fig. 86. CANBERRA, AUSTRALIA OCTOBER 1947

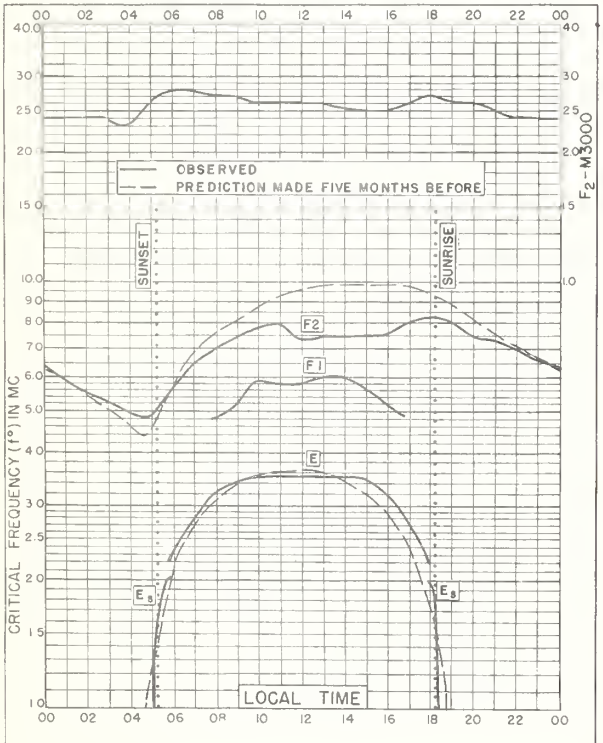


Fig. 87. HOBART, TASMANIA
42.8°S, 147.4°E OCTOBER 1947

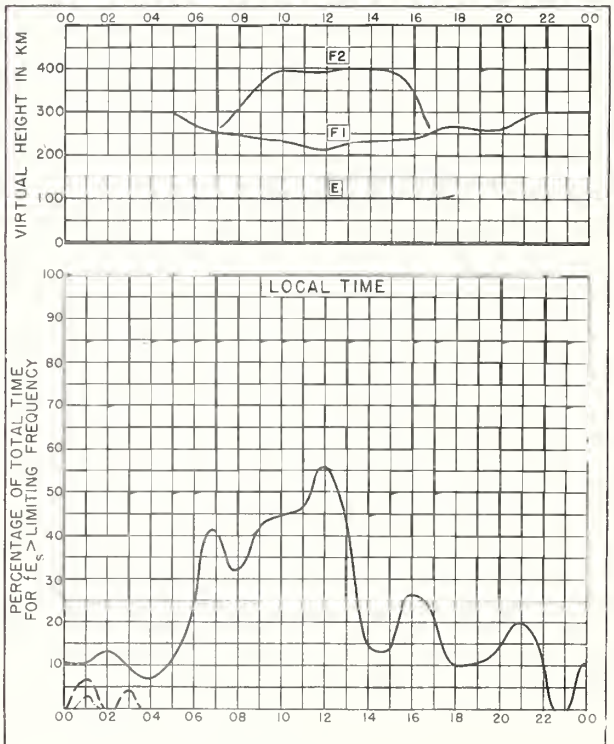


Fig. 88. HOBART, TASMANIA OCTOBER 1947

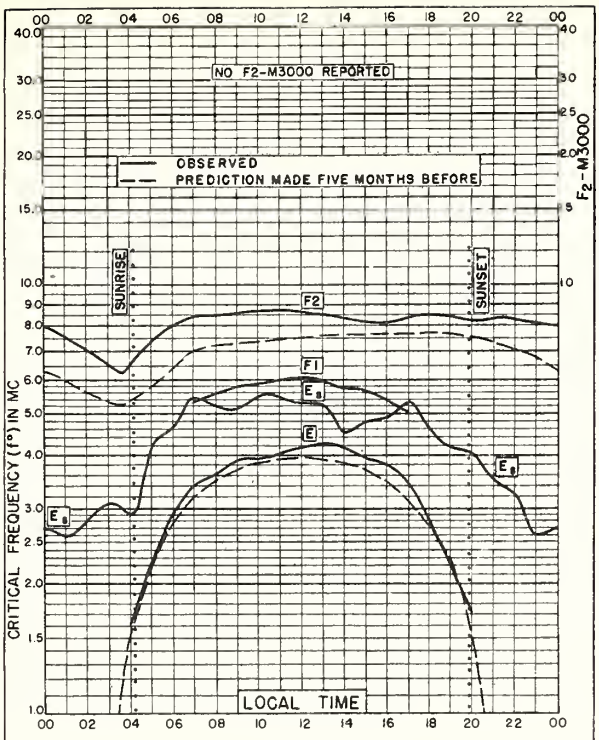


Fig. 89. FRIBOURG, GERMANY
48.1°N, 7.8°E JUNE 1947

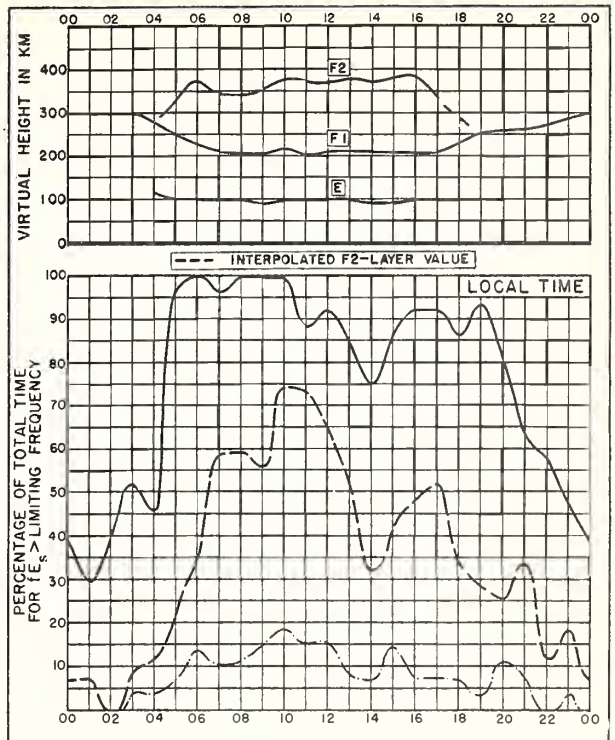


Fig. 90. FRIBOURG, GERMANY JUNE 1947

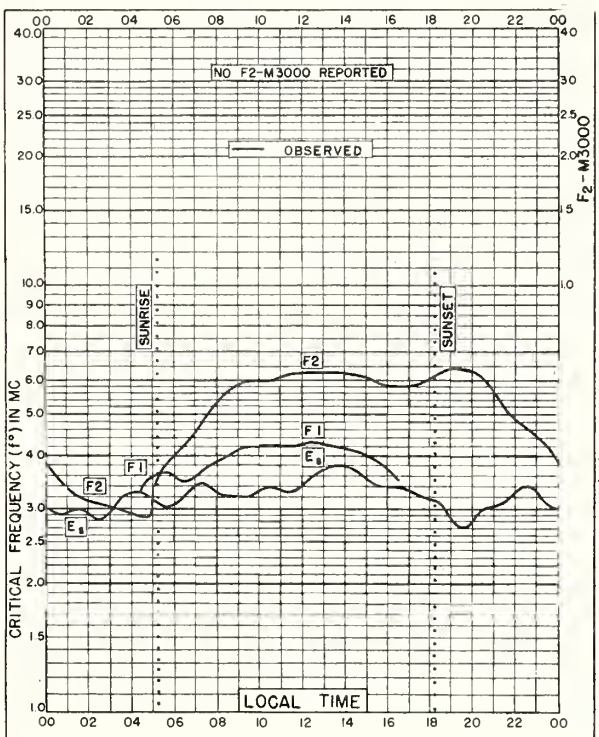


Fig 91. CHRISTCHURCH, N.Z.
43.5°S, 172.7°E OCTOBER 1942

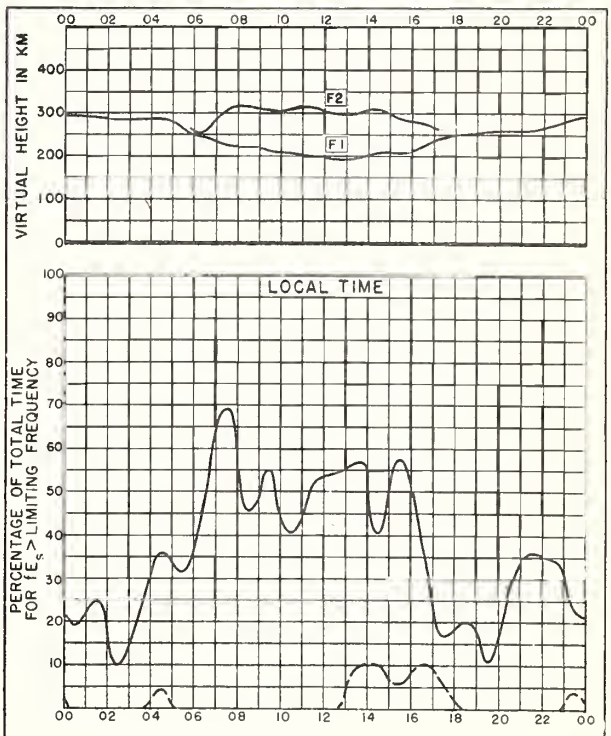


Fig. 92. CHRISTCHURCH, N.Z. OCTOBER 1942

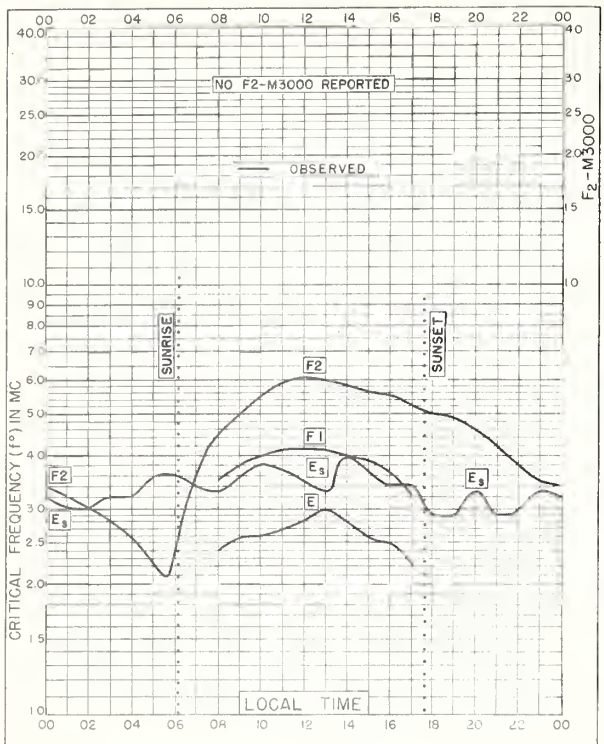


Fig. 93. CHRISTCHURCH, N.Z.
43.5°S, 172.7°E SEPTEMBER 1942

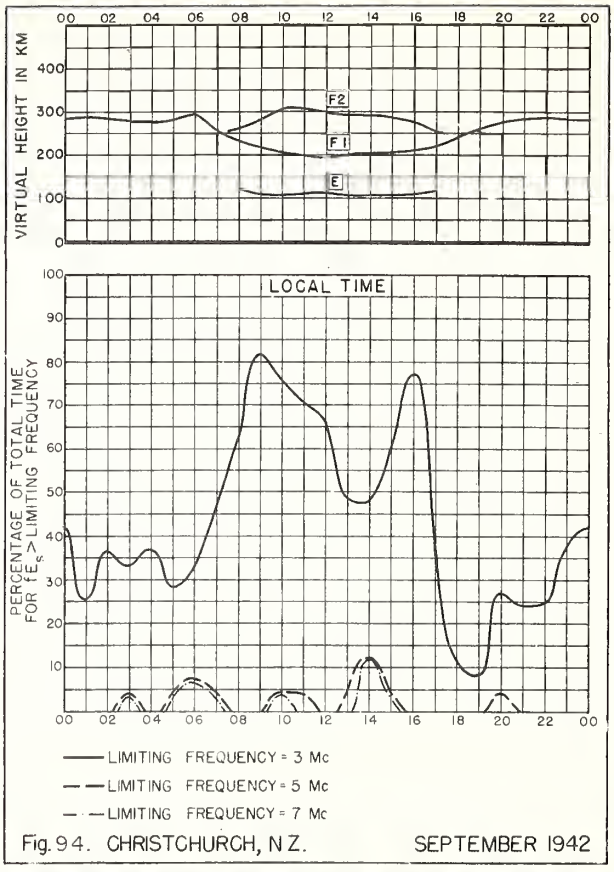


Fig. 94. CHRISTCHURCH, N.Z. SEPTEMBER 1942

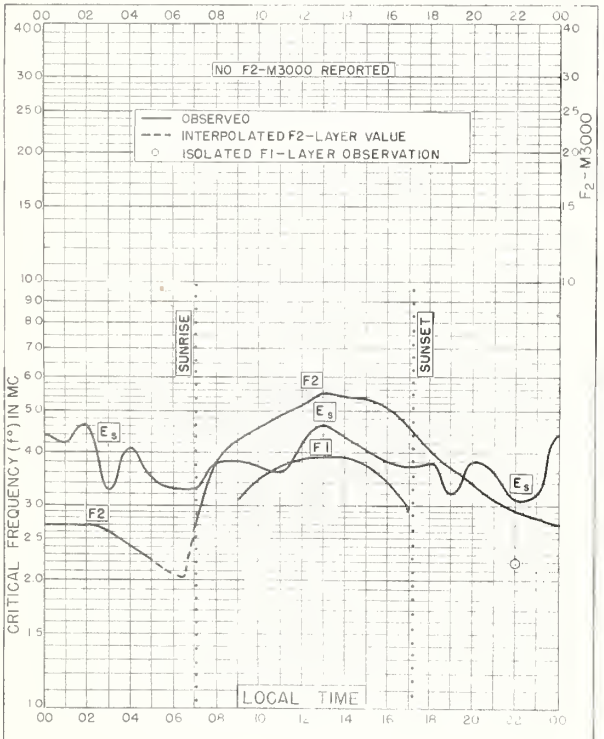
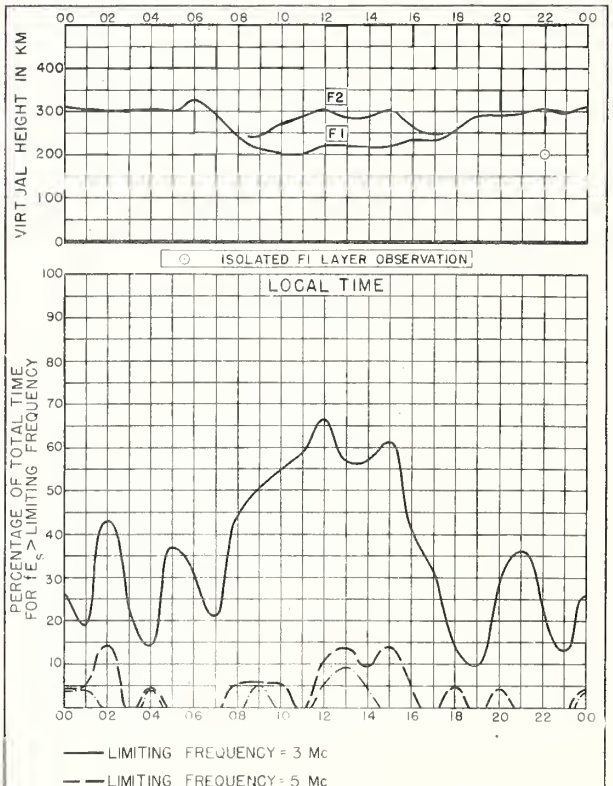


Fig. 95. CHRISTCHURCH, N.Z.
43.5°S, 172.7°E AUGUST 1942



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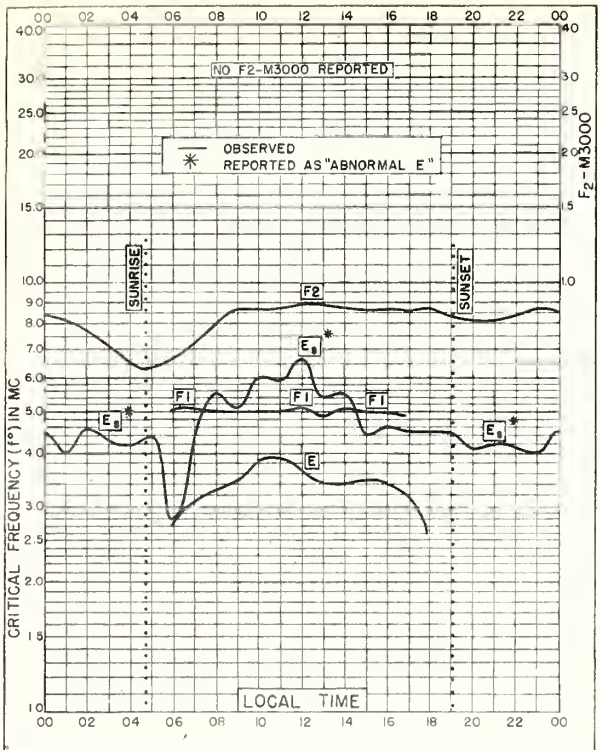


Fig. 97. CANBERRA, AUSTRALIA
35.3°S, 149.0°E DECEMBER 1938

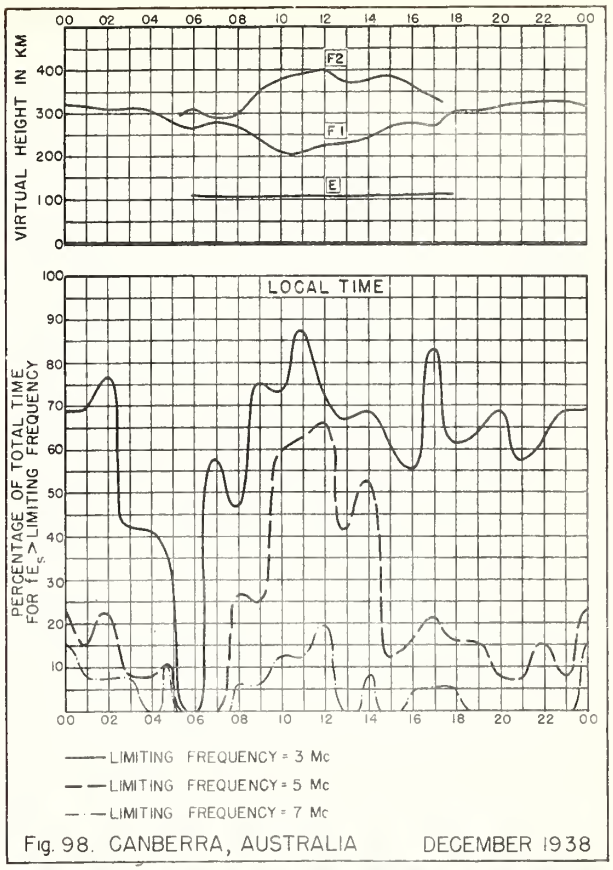
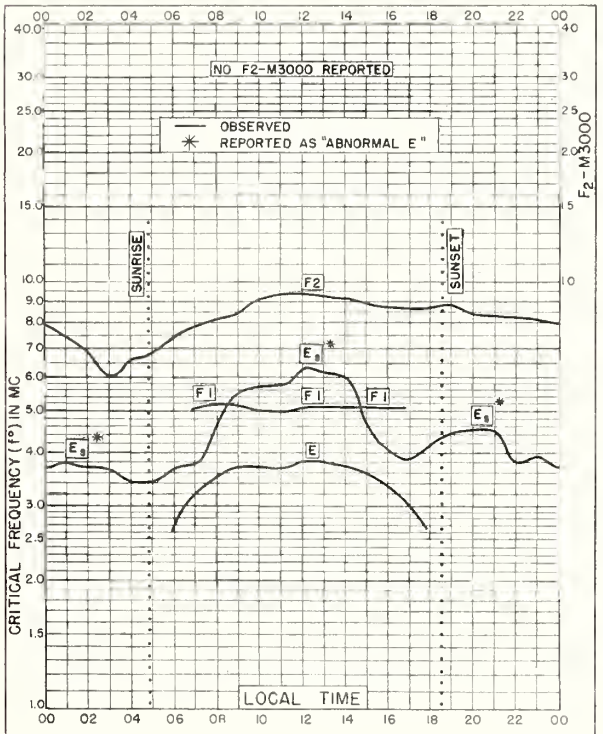


Fig. 98. CANBERRA, AUSTRALIA DECEMBER 1938



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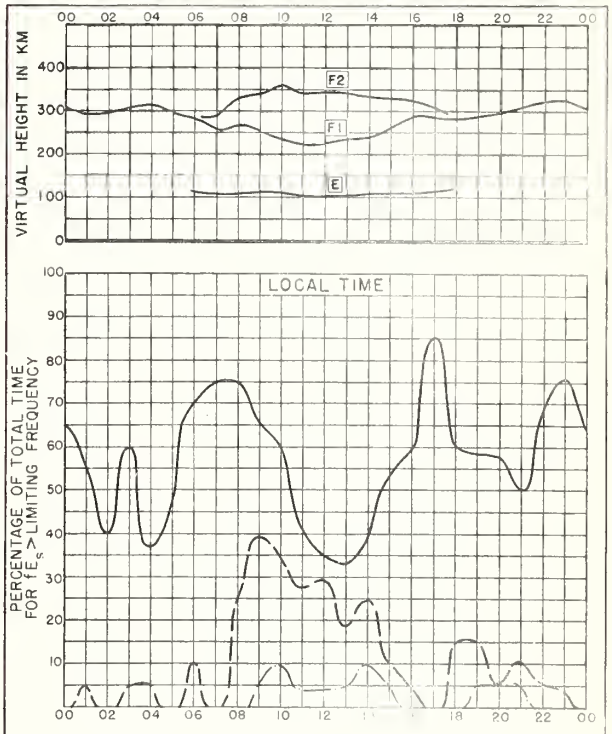

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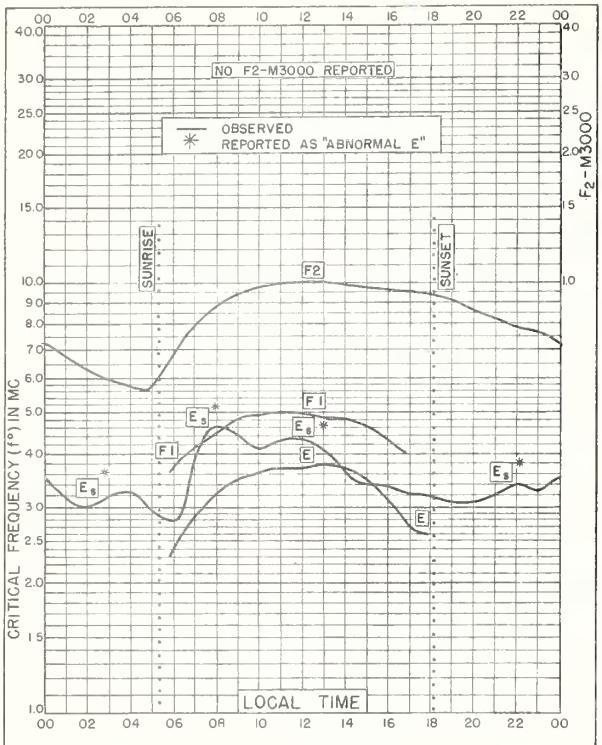

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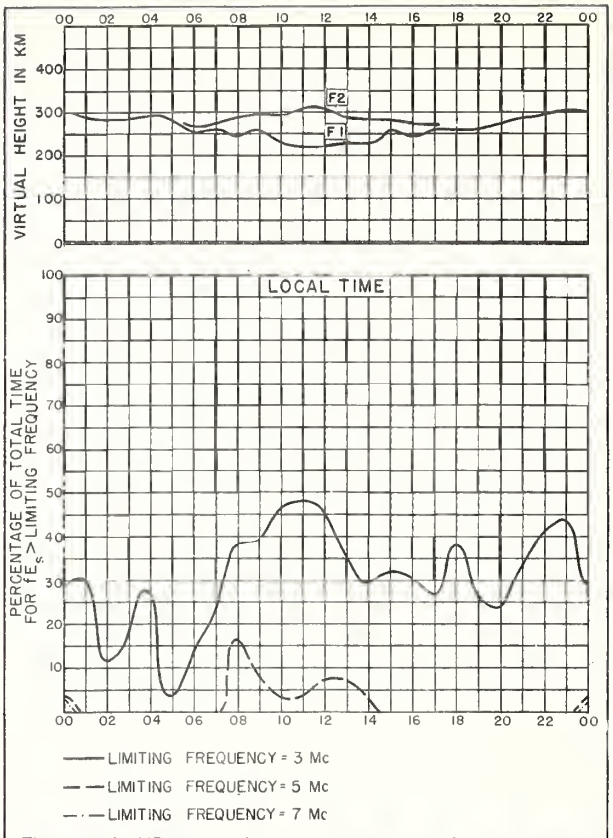

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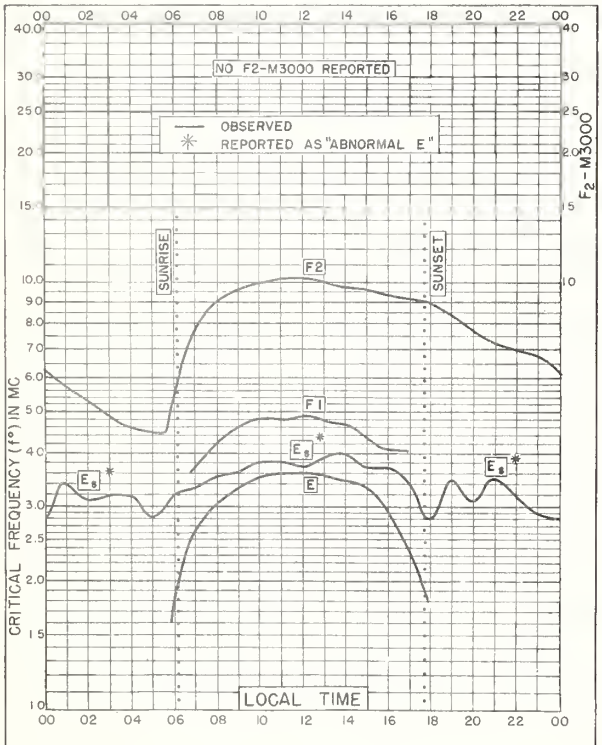

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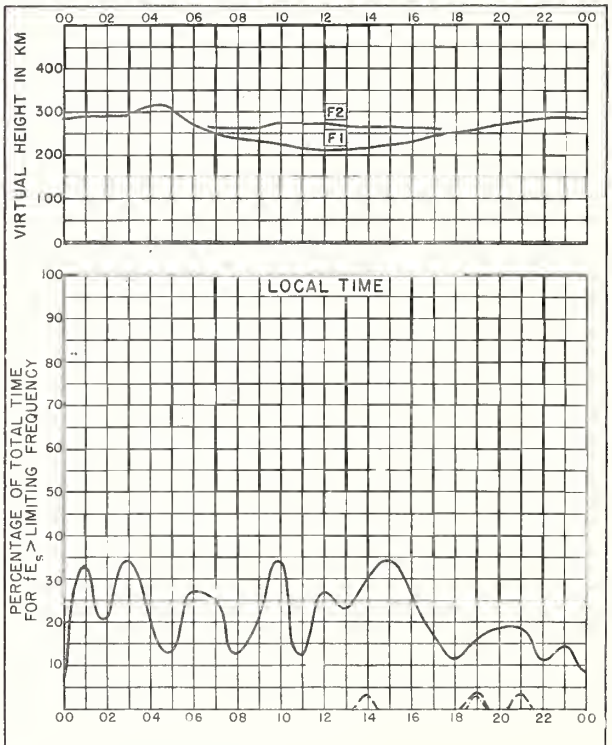

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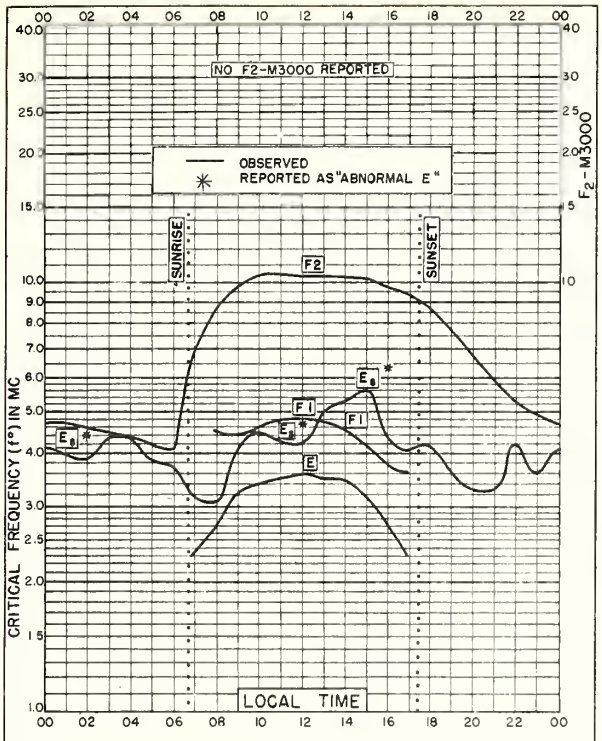

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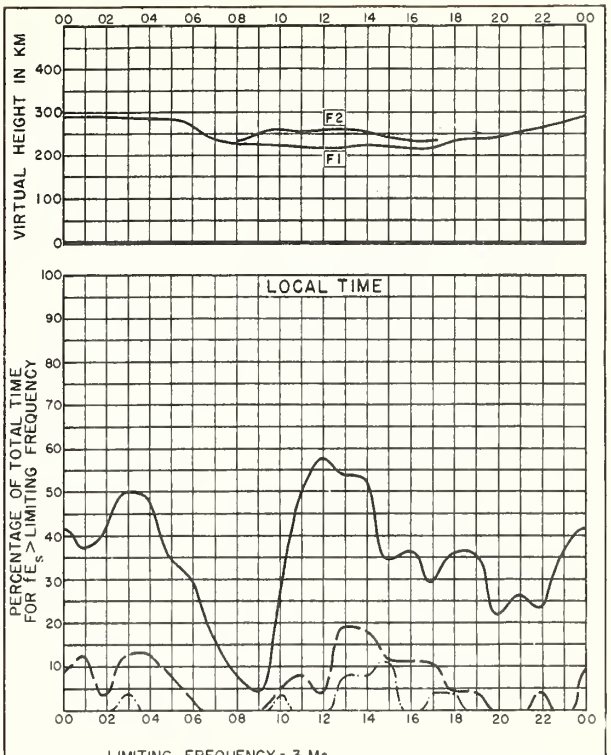

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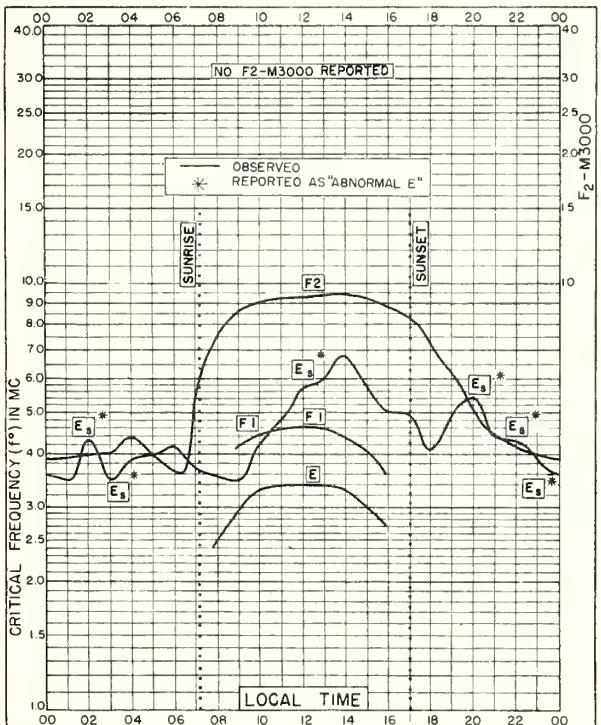

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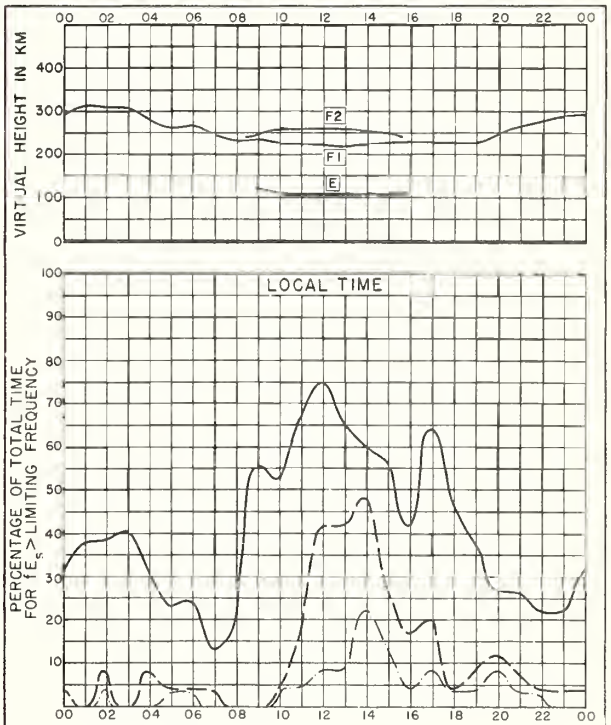

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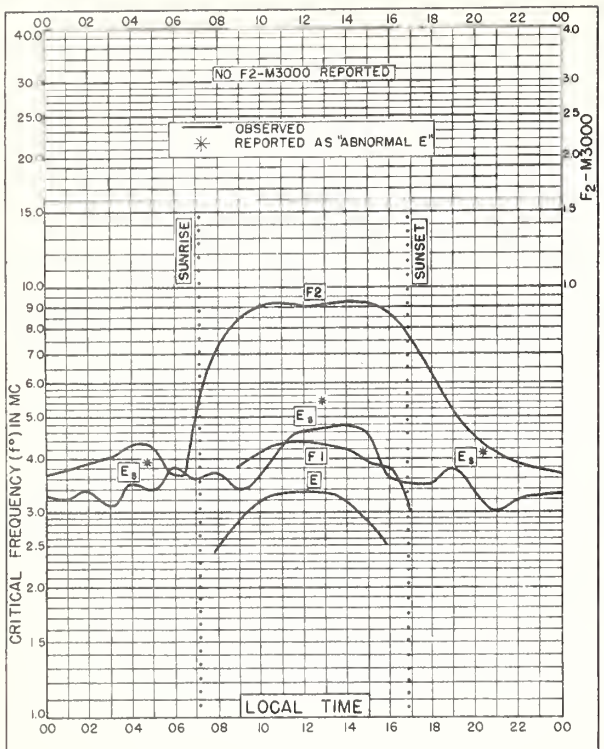

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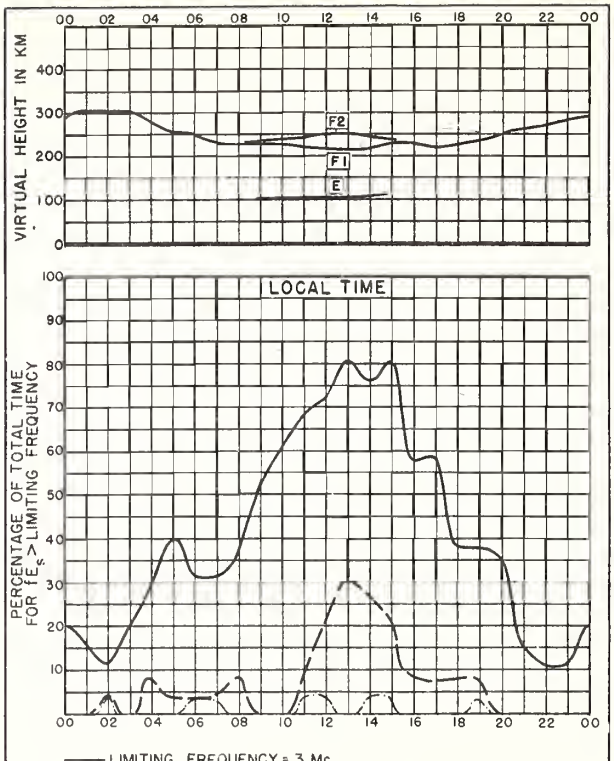

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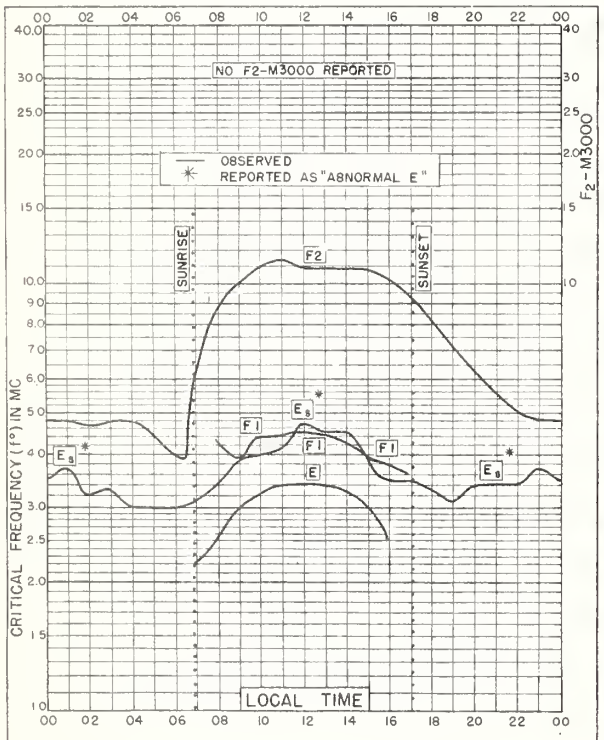

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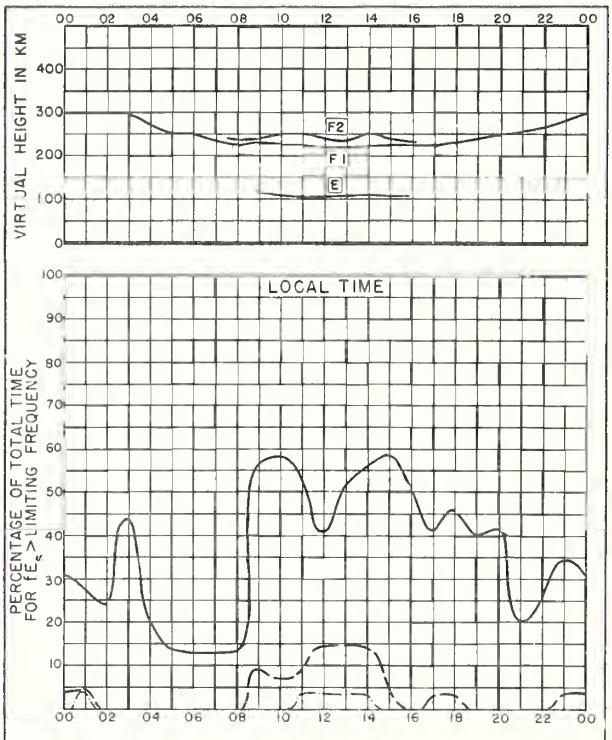

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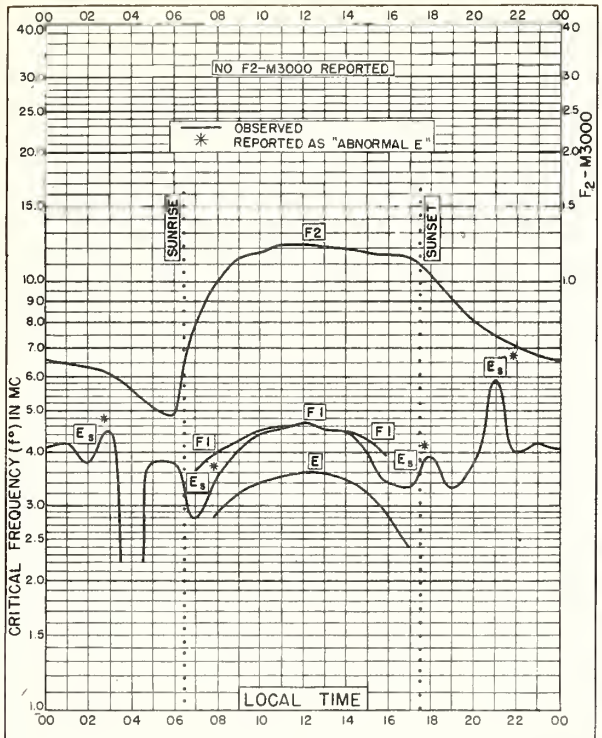

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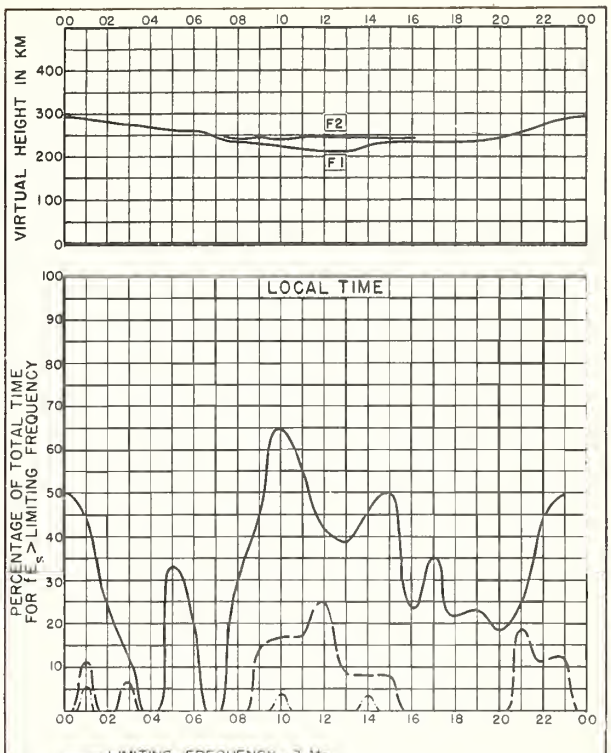

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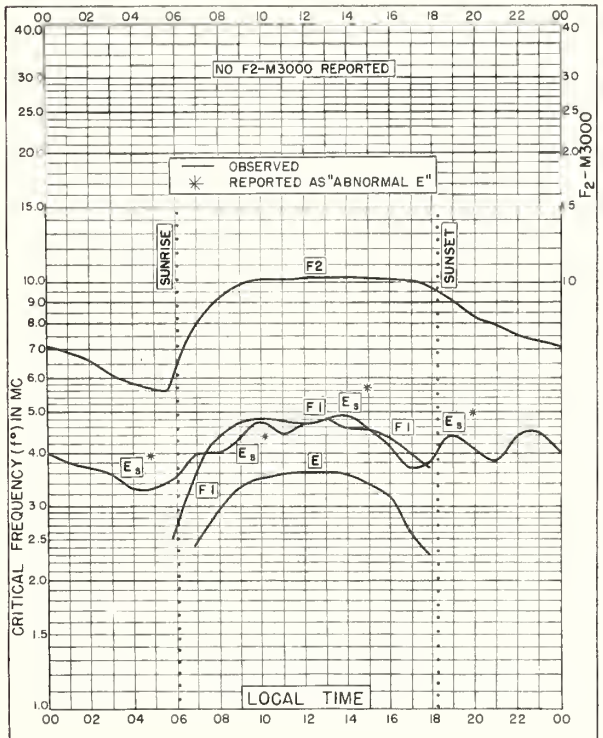

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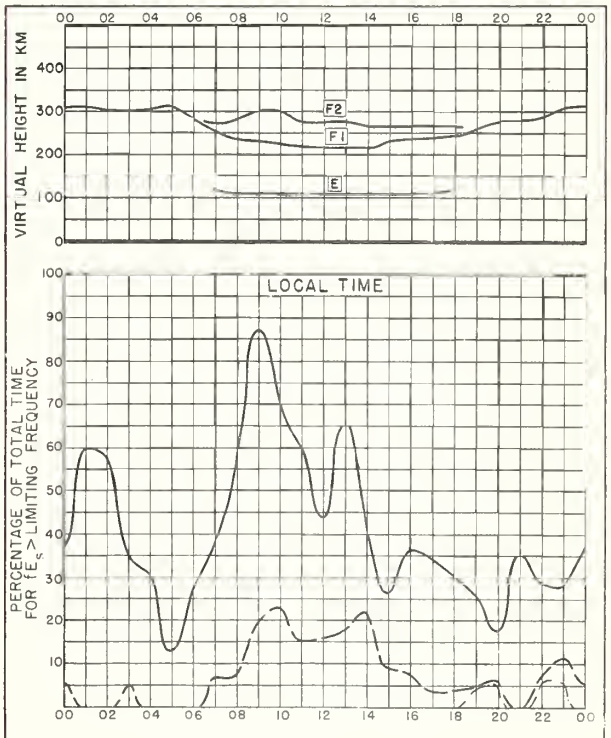

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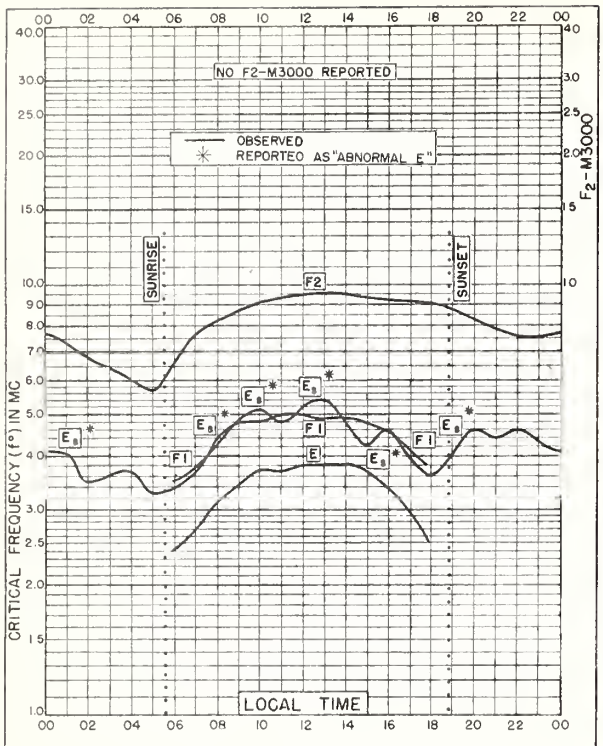

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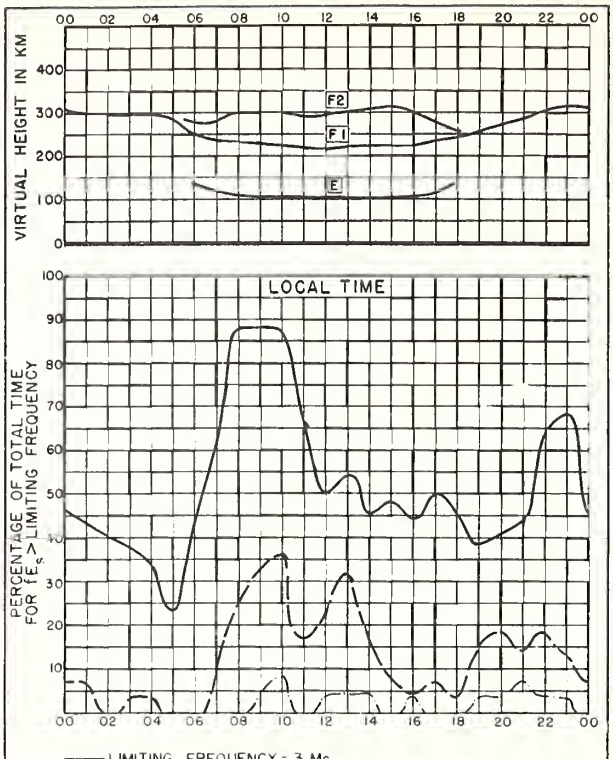

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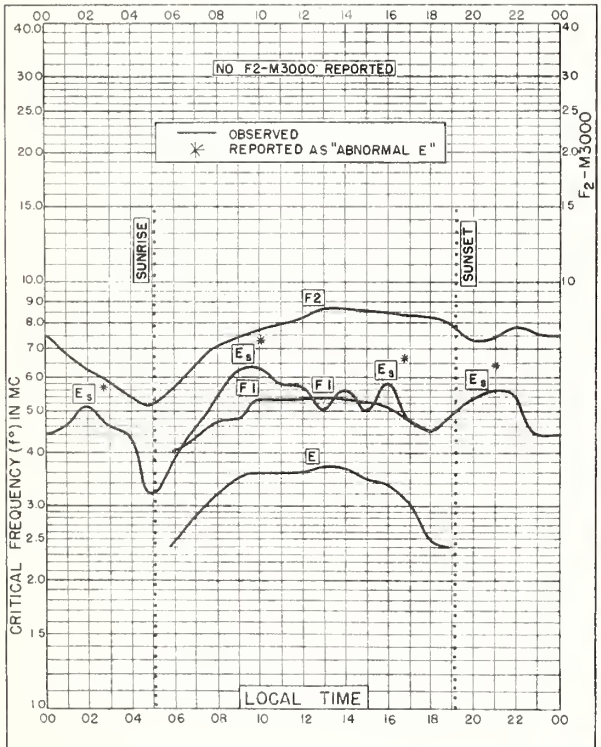

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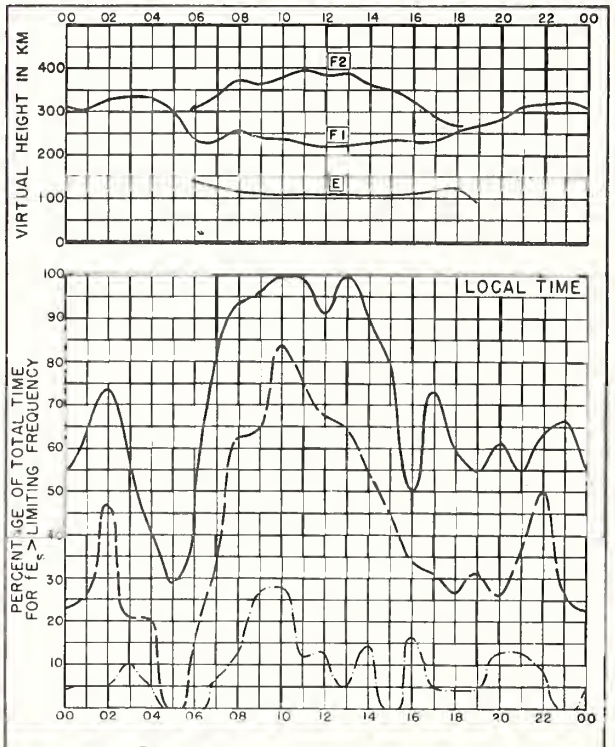

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