IONOSPHERIC DATA

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CENTRAL RADIO PROPAGATION LABORATORY
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TERMINOLOGY AND SCALING PRACTICES

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

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

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

In the past, ionospheric conditions were summarized on a monthly basis by using average or mean values for each hour of the day for each month. However, following the recommendations of the International Radio Propagation Conference, held in Washington 17 April to 5 May, 1944, beginning with data for 1 Jan. 1945, median values were used by IRPL wherever possible. Thus, median values are given for Washington, for all stations reporting directly to the CRPL, for the Canadian stations, and for all others sending to the CRPL detailed tabulations from which medians can be computed.

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 missing because of E are counted as equal to or less than the lower limit of the recorder.
   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 as 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.

It is expected that this practice will be of assistance in evaluating the monthly median Washington data.

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

"Extent of E" is defined as follows: the highest value of $f^{o}E$. This is usually Es, but may include cases of normal E which were difficult to distinguish from Es, owing to the absence of a definite cusp.

MONTHLY AVERAGE AND MEDIAN VALUES OF WORLD-WIDE IONOSPHERIC DATA

The ionospheric data given here in Tables 1 to 69 and Figs. 1 to 119 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
- Cape York, Australia
- Hobart, Tasmania
- Townsville, Australia

British Department of Scientific and Industrial Research,
Radio Research Board:
- Burghead, Scotland
- Falkland Is.
- Oslo, Norway
- Slough, England
- Tromso, Norway

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

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

South African Council for Scientific and Industrial Research:
- Capetown, Union of S. Africa
- 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.
- Bukhta Tikhaya, U.S.S.R.
- Chita, U.S.S.R.
- Leningrad, U.S.S.R.

Scientific Research Institute of Terrestrial Magnetism, Moscow, U.S.S.R.: (Continued)
Moscow, U.S.S.R.
Sverdlovsk, U.S.S.R.
Tomsk, U.S.S.R.

Carnegie Institution of Washington (Department of Terrestrial Magnetism):
Huancayo, Peru
Watheroo, W. Australia

United States Army Signal Corps:
Leyte, Philippine Is.
Okinawa I.
Shibata, Japan
Tokyo, Japan
Yamakawa, Japan

National Bureau of Standards (Central Radio Propagation Laboratory):
Adak, Alaska
Baton Rouge, Louisiana (Louisiana State University)
Boston, Massachusetts (Harvard University)
Fairbanks, Alaska (University of Alaska, College, Alaska)
Guam I.
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
Peshawar, India

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

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

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

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 it through established channels sooner than it reaches them in 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 there is no change 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. Comments on this decision are invited.

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 where spread echoes are present.

b. Omission of values where $f^{o}F2$ is less than or equal to $f^{o}F1$, leading to erroneously high values of monthly averages or median values.

c. Omission of values where 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 chart since some smoothing of the contours is necessary to allow for the longitude effect within a zone. The following predicted 12-month running-average Zurich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot No.	Month	Predicted Sunspot No.
January 1947	88	July 1946	73
December 1946	85	June 1946	67
November 1946	83	May 1946	67
October 1946	81	April 1946	62
September 1946	79	March 1946	51
August 1946	77		

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

The data given in Tables 70 to 81 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 82 presents ionosphere character figures for Washington, D.C., during February 1947, as determined by the criteria presented in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, magnetic K-figures, which are usually covariant with them.

Table 83 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 February 1947.

Table 84 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. during January 1947 and February 1947.

Table 85 gives provisional radio propagation quality figures for North Atlantic and North Pacific areas, for 01 to 12 and 13 to 24 GCT, January 1947, 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 for the North Atlantic are prepared from radio traffic and ionospheric data reported to the CRPL, in the manner described in detail in report IRPL-R31, "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," issued 1 February 1946.

The radio propagation quality figures for the North Pacific are prepared from radio traffic and ionospheric data reported to the CRPL, in a manner similar to that of IRPL-R31. The master scale of IRPL-R31 was used to formulate conversion scales for the North Pacific reports. Currently, beginning with CRPL-F23, issued July 1946, the North Pacific radio propagation quality figures reported are prepared from these revised conversion scales rather than, as hitherto, from the conversion scales of report IRPL-R13, "Ionospheric and Radio Propagation Disturbances, October 1943 through February 1945," issued 24 May 1945.

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 usage 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 RELATIVE SUNSPOT NUMBERS

Table 86 presents the daily median values of relative sunspot numbers as reported by American observers for February 1947. The reports have been reduced, by appropriate constants, approximately to the Zurich scale of relative sunspot numbers. The monthly relative sunspot number is the mean of the daily median values listed in the table. This method was devised by Mr. A. H. Shapley while a member of the staff of the Department of Terrestrial Magnetism, Carnegie Institution of Washington. Details will be found in his article, "American Observations of Relative Sunspot Numbers in 1945 for Application to Ionospheric Prediction," Popular Astronomy, Vol. 54, No. 7, pp. 351-358, August 1946. The criteria for A observers have been modified slightly, beginning with September 1946. In order for an observer's report to be included in the American sunspot numbers, the mean deviation of the reduction factors for his observations for the four preceding months must have been within 15% of the 4-month running mean of his reduction factors, rather than within an interval of ± 0.16 of that running mean. This avoids favoring observers with small reduction factors and discriminating against observers with large reduction factors. In addition sunspot numbers must have been reported for at least one-half of the month during three-quarters of the preceding year. This will tend to restrict the observers to those whose observations are consistent from month to month without rejecting the work of observers for whom weather conditions are unsatisfactory for observations during some months of the year.

SOLAR CORONAL INTENSITIES OBSERVED AT CLIMAX, COLORADO

In table 87 the intensities of the green (λ 5303A), first red (λ6374A), and second red (λ6704A) lines of the solar corona as observed during February 1947, by the High Altitude Observatory of Harvard University and the University of Colorado at Climax, Colorado, are given for every 5° from astronomical north for each day on which observations were possible. An arbitrary intensity-scale of approximately 0 to 40 is used. To convert from astronomical north and to determine the positions relative to the solar rotational equator subtract the algebraic value of the position-angle of the solar axis. This quantity varies from +26 to -26 degrees during the year, and is tabulated in the nautical almanacs. If observations are uncertain, the initials l.w. (low weight) will follow the date. The time of observation in hours GCT is listed. Dashes indicate that the intensity for that position is below the observable threshold. Absence of observation made at a given position is indicated by X.

ERRATUM

CRPL-F30, figure 80, p. 71: Legend for height should have been "Height at 0.83 f°F2 in km" instead of "Virtual height in km."

Table 1

Washington, D. C. (39.0°N, 77.5°W) February 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	290	5.2						2.7
07	280	6.8						2.8
08	260	9.8						3.1
09	260	11.5						3.0
10	260	12.4						2.9
11	265	12.8			(130)			2.8
12	260	13.0			(120)			2.8
13	250	12.9						2.8
14	250	12.8						2.8
15	250	12.8						2.8
16	255	12.6						2.8
17	260	12.3						2.8
18	260	11.4						2.8
19								
20								
21								
22								
23								

Time: 75.0°W.
Sweep: 4.6 Mc to 17.0 Mc, Feb. 1-5; 3.1 Mc to 17.0 Mc, Feb. 6-28. Manual operation.

Table 2

Fairbanks, Alaska (64.9°N, 147.8°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	290	2.6					3.0	2.9
01	300	2.3					2.9	2.8
02	310	3.5					3.0	2.8
03	335	3.1					3.6	2.8
04	328	3.4					5.3	2.8
05	305	3.5					3.6	2.7
06	300	3.6					3.0	2.8
07	290	3.4				1.2	2.8	2.8
08	260	3.9				1.3	2.4	2.9
09	250	5.9				1.6	2.7	3.1
10	240	8.2				2.0	2.8	3.1
11	235	9.4				2.1	2.8	3.1
12	240	10.4				2.2	2.7	3.1
13	240	11.1				2.1	2.8	3.1
14	230	10.6				1.9	2.8	3.1
15	230	10.0				1.5	1.6	3.0
16	225	9.2					2.6	3.0
17	232	7.2					2.6	3.0
18	230	5.4					2.2	3.1
19	245	3.8					2.5	3.0
20	265	3.3					2.8	3.0
21	280	3.0					2.9	3.0
22	300	2.9					3.0	3.0
23	270	3.3					3.8	2.9

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

Table 3

Adak, Alaska (51.9°N, 176.6°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	270	2.7						2.8
01	300	2.5						2.8
02	300	2.5						2.8
03								
04	(255)	(2.9)						(3.1)
05	(270)	(2.9)						(2.8)
06	260	2.7						3.0
07	250	3.5						(2.9)
08	220	7.6			115	2.0	2.2	3.3
09	215	9.9			120	(2.5)		3.4
10	220	11.2			120	2.8		3.4
11								
12	215	11.8	220		110	3.0		3.3
13	225	11.5	220		120	(2.9)		3.3
14	220	11.0			120	2.7		3.3
15	215	10.0			120	2.5		3.3
16	220	9.2			125	2.0		3.3
17								
18	210	5.6						3.4
19	215	4.2						3.4
20	230	2.5						3.3
21	255	2.6						3.1
22	260	2.8						3.0
23	270	2.8						2.9

Time: 180.0°W.
Sweep: Manual operation.

Table 4

Portage la Prairie, Manitoba (49.9°N, 98.3°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	260	3.2						2.8
01	260	3.2						2.8
02	265	3.3					1.4	2.8
03	260	3.4						2.8
04	260	3.4					1.3	2.8
05	260	3.4						2.9
06	250	3.2						2.9
07	260	3.0						2.9
08	250	4.3						2.9
09	230	7.3			110	2.1		3.2
10	230	9.6			110	2.4		3.2
11	230	10.4			110	2.6		3.2
12	240	11.1			110	2.7		3.1
13	230	11.4			110	2.7		3.1
14	240	12.0			110	2.7		3.1
15	230	11.6			110	2.4		3.1
16	220	10.8			110	2.1		3.1
17	210	10.4						3.1
18	210	8.8						(3.1)
19	210	7.0						3.2
20	220	5.2						3.1
21	240	4.5						3.0
22	250	4.1						3.0
23	250	3.6						2.9

Time: 90.0°W.
Sweep: 1.2 Mc to 16.0 Mc in approximately 2 minutes.

Table 5

Ottawa, Canada (45.5°N, 75.8°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	280	4.8						2.9
01	280	5.1						2.9
02	280	4.8						2.8
03	270	4.0						2.9
04	270	4.3						2.9
05	265	4.2						3.0
06	260	3.9						3.0
07	240	4.2						3.0
08	230	6.5						3.0
09	220	10.2			120	2.6		3.1
10	220	11.6			120	3.2		3.1
11	220	12.2			120	3.5		3.0
12	220	12.7			120	3.6		3.0
13	220	12.4			120	3.6		3.0
14	230	12.8			120	3.3		3.0
15	230	12.1			120	3.0		3.0
16	220	11.5			120	2.4		3.0
17	220	11.2						3.0
18	220	10.0						3.0
19	220	8.8						3.0
20	230	6.9						3.0
21	250	6.4						3.0
22	260	6.0						3.0
23	260	5.0						2.9

Time: 75.0°W.
Sweep: 1.7 Mc to 18.0 Mc. Manual operation.

Table 6

Boston, Massachusetts (42.4°N, 71.2°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	300	4.8						2.6
01	300	5.0						2.7
02	290	4.9					1.0	2.7
03	275	4.6					1.3	2.7
04	270	4.3					1.6	2.7
05	265	4.2					1.7	2.7
06	278	4.0						2.8
07	270	5.1			128	2.2		2.9
08	250	9.0			130	2.2		3.1
09	250	10.9			130	2.6		3.0
10	250	12.1			142	3.2		3.0
11	250	12.5			125			2.9
12	252	12.5			130	3.2		2.9
13	255	12.5						2.8
14	255	12.5			132	3.3		2.8
15	250	12.0			125			2.9
16	250	11.9			135	2.4		2.9
17	250	11.1			130	1.9		2.9
18	250	10.0			130	2.2		2.9
19	250	8.5						2.9
20	258	6.1						2.8
21	260	6.3						2.8
22	290	5.8						2.7
23	295	5.2						2.6

Time: 75.0°W.
Sweep: 0.85 Mc to 13.75 Mc in 1 minute.

Table 7

San Francisco, California (37.4°N, 122.2°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	280	3.2						2.8
01	260	3.1						2.9
02	260	3.2						2.8
03	260	3.1						2.8
04	280	3.0						2.8
05	300	3.1						2.6
06	300	3.0						2.7
07	260	4.6						2.8
08	220	8.0			120	2.5		3.3
09	225	9.6			120	3.0		3.1
10	230	11.1	220	4.5	120	3.3		3.0
11	230	12.4			120	3.5		3.0
12	230	12.2	215	4.6	110	3.5		3.0
13	220	11.4			110	3.5		2.9
14	235	11.7			115	3.5		2.9
15	240	11.4			120	3.2		2.8
16	240	10.6			120	2.7		3.0
17	220	9.4			130	2.2		3.0
18	220	8.6						3.1
19	220	6.3						3.2
20	220	5.0						3.1
21	240	3.8						3.0
22	260	3.2						3.0
23	280	3.1						2.8

Time: 120.0°W.
Sweep: 1.5 Mc to 18.5 Mc in 4.5 minutes.

Table 8

White Sands, New Mexico (32.6°N, 106.5°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	270	3.7						2.8
01	260	3.8						2.9
02	250	3.5						2.9
03	250	3.2						2.7
04	280	3.2						2.7
05	290	3.0						2.6
06	290	3.0						2.7
07	260	5.7			110	1.8	2.2	3.0
08	240	8.4	200		120	2.6		3.1
09	250	(9.4)			110	3.2	3.7	(3.1)
10	265	10.6	230		110	3.4		3.1
11	260	11.2	225		110	3.6		3.0
12	270	11.5	225		110	3.7		3.1
13	270	11.4	220		110	3.7		2.8
14	270	11.2	220		110	3.5		2.8
15	280	11.0	235		110	3.3		2.8
16	250	10.6	230		110	2.8		3.0
17	235	9.2	200		110	2.0		3.0
18	220	8.2						3.0
19	220	6.6					2.2	3.0
20	220	5.0					2.4	3.0
21	240	3.7					2.3	2.9
22	270	3.7					2.3	2.7
23	280	3.6					2.2	2.8

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

Table 9

Baton Rouge, Louisiana (30.5°N, 91.2°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	290	4.2						3.0
01	285	4.3						3.0
02	265	4.3						3.0
03	275	4.0						3.0
04	295	3.8						3.0
05	300	3.6						2.9
06	290	4.0						3.0
07	260	6.2						3.1
08	250	9.0	240	(3.7)	130	2.4		3.2
09	250	9.6	240	(4.3)	130	3.0		3.2
10	260	10.3	240	(4.8)	120	3.4		3.2
11	270	10.5	240	(5.0)	120	3.5		3.0
12	280	10.8	240	(5.3)	120	3.6		3.0
13	280	10.6	240	5.2	120	(3.5)		3.1
14	270	10.3	240	(5.0)	120	3.5		3.0
15	270	10.0	240	(4.6)	120	3.2		3.1
16	260	9.6	240		130	2.6		3.1
17	260	9.2	240	3.6		2.1		3.1
18	240	9.0						3.1
19	240	6.9						3.0
20	240	5.9						3.0
21	250	4.8						3.0
22	270	4.3						3.0
23	280	4.2						3.0

Time: 90.0°W.
Sweep: 2.0 Mc to 15.0 Mc in 3 minutes, 30 seconds.

Table 10

Maui, Hawaii (20.8°N, 156.5°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	(285)	(3.8)						(2.9)
01	(350)	(3.4)						(2.8)
02								
03								
04								
05	(450)	(2.8)						(2.2)
06	300	3.9					2.6	2.7
07	252	9.0					3.2	3.2
08	245	12.0	240	3.6		3.0	4.6	3.2
09	245	12.2	230	4.2		3.4	6.0	3.1
10	250	12.5	225	4.6		3.7	5.4	2.8
11	252	14.5	220	4.8		3.9	5.0	2.8
12	260	15.5	225	5.0		4.0	5.8	2.8
13	255	(10.5)					5.2	2.8
14	252	13.5	230	4.5		3.7	4.6	2.9
15								
16							(3.6)	
17								
18	230	8.6						3.4
19								
20	300	5.4						3.0
21								
22								
23								

Time: 156.5°W. (Local)
Sweep: 2.2 Mc to 16.0 Mc in 1 minute; supplemented by manual operatio

Table 11

Trinidad, Brit. West Indies (10.6°N, 61.2°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	250	7.2						3.1
01	230	6.5						3.3
02	230	5.0						3.2
03	255	3.5						3.0
04	280	3.7						2.7
05	280	3.7					2.4	2.8
06	270	4.9					2.6	2.9
07	250	9.4			120	2.2	2.8	3.2
08	250	12.6	240		120	2.9	3.5	3.1
09	260	14.2	230	4.7	120	3.4	4.0	3.2
10	260	12.6	220	5.2	120	3.7	4.4	3.0
11	280	12.4	210	5.4	120	3.9	4.6	2.8
12	300	12.4	220	5.8	120	4.0	4.6	2.8
13	320	12.6	225	6.0	120	4.0	4.6	2.7
14	330	12.0	225	6.0	120	3.9	4.6	2.7
15	320	12.0	230	5.8	120	3.7	4.4	2.6
16	280	11.8	240	5.6	120	3.3	4.0	2.7
17	260	11.8	250		120	2.8	3.6	2.8
18	250	11.6					3.3	2.9
19	230	9.8					2.8	2.9
20	260	8.9					2.6	2.8
21	260	8.6					2.0	2.8
22	240	8.4					2.0	2.9
23	250	7.8						2.9

Time: 60.0°W.
Sweep: 1.2 Mc to 15.5 Mc. Manual operation.

Table 12

Palmyra I. (5.9°N, 162.1°W) January 1947

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	240	10.4					3.4	3.0
01	245	8.2					3.1	3.0
02	242	7.4					2.0	3.0
03	245	6.5					2.2	3.0
04	240	6.4					2.2	3.0
05	235	5.5					2.0	3.1
06	250	4.7					2.7	2.9
07	252	7.7			120	2.3	3.4	2.8
08	240	10.6			105	3.1	3.6	2.7
09	230	11.8			105	3.6		2.5
10	278	11.5	210	5.4	105	3.9		2.4
11	300	11.1	215	5.6	105	4.2		2.3
12	310	11.0	210	6.1	110	4.2		2.3
13	312	11.5	205	5.9	110	4.2		2.3
14	340	12.0	212	6.4	110	4.2		2.3
15	335	13.2	230	6.6	110	3.9		2.4
16	330	13.7	235	6.3	100	3.4		2.7
17	250	13.5	250		105	2.9	4.0	2.7
18	270	13.8			140		3.6	2.7
19	282	13.2					3.5	2.6
20	285	12.2					3.2	2.6
21	275	11.8					3.0	2.6
22	280	10.5					3.7	2.6
23	255	10.3					3.3	2.9

Time: 157.5°W.
Sweep: 1.0 Mc to 13.0 Mc in 1.6 minutes.

Table 13

Churchill, Canada (58.8°N, 94.2°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	300	4.0			135	3.0	5.3	2.8
01	310	4.2			140	2.7	5.0	2.8
02	330	3.8			130	3.0	4.0	(2.8)
03	320	3.9			110	3.2	3.5	2.8
04	330	4.1			110	3.2	3.3	(2.7)
05	330	3.9			110	3.4	3.6	(2.8)
06	310	4.1			110	3.0	3.6	2.7
07	290	4.4			110	3.2	3.2	2.9
08	300	4.4			110	3.0	3.2	2.9
09	260	6.1			110	3.1	3.3	3.1
10	260	8.4				2.8	3.3	3.1
11	250	9.6			130	2.6	3.2	3.1
12	245	10.9			140	2.5	3.2	3.0
13	240	11.8			130	2.6	3.0	3.0
14	240	12.3			120	2.7	2.8	3.0
15	230	12.0			125	2.7	2.7	3.0
16	230	10.6			130	2.7	2.8	3.0
17	240	9.0			110	2.8	3.1	2.9
18	260	7.0			110	2.8	2.9	2.8
19	270	5.2			110	3.0	2.8	2.8
20	310	4.6			110	3.0	3.5	(2.6)
21	280	4.4			110	3.1	3.4	2.8
22	290	4.6			110	2.9	4.7	2.8
23	320	4.2			120	3.0	4.9	(2.9)

Time: 90.0°W.
Sweep: 2.0 Mc to 16.0 Mc in 1 minute.
*These criticals, although given for the entire twenty-four hours, nevertheless, are obtained from the same characteristic traces as the E-layer values, commonly reported only for daylight hours throughout the greater part of the world.

Table 14

St. John's, Newfoundland (47.6°N, 52.7°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	260	3.8						2.9
01	270	3.8					2.5	2.8
02	270	3.6					2.6	2.8
03	270	3.8					2.6	2.8
04	260	3.9					2.7	2.9
05	250	3.6					2.7	2.9
06	240	3.0					2.7	2.8
07	230	3.7					2.9	3.0
08	210	6.4					3.2	3.1
09	215	9.6			100	2.4	4.2	3.4
10	210	11.2			100	2.7	3.7	3.4
11	210	11.5			100	3.0	3.1	3.4
12	210	(11.7)			100	3.1	3.5	3.4
13	220	(11.5)			100	3.0	3.3	3.4
14	210	(11.5)			90	2.8	3.9	3.4
15	210	11.5			100	2.5	3.3	3.4
16	210	11.3			100	2.3	3.5	3.3
17	210	10.2					3.4	3.3
18	220	9.0					2.2	3.2
19	220	7.5					2.8	3.2
20	230	6.4					2.6	3.2
21	230	5.6					2.5	3.1
22	250	5.0					2.6	3.0
23	250	4.5						2.9

Time: 52.5°W.
Sweep: Manual operation.

Table 15

Peiping, China (39.9°N, 116.4°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		7.8						3.2
01		5.2						3.4
02		5.8						3.3
03		6.0						3.3
04		5.4						3.4
05		6.0						3.4
06		6.2						3.4
07		7.1						3.3
08		8.1						3.2
09		9.8						3.0
10		9.6						3.0
11		10.2						3.0
12		10.3						2.8
13		10.0						3.0
14		10.6						3.0
15		10.0						3.1
16		10.2						3.2
17		8.6						3.2
18		(8.4)						(3.2)
19		(7.5)						(3.0)
20		8.8						3.2
21		8.4						3.2
22		7.9						3.2
23		9.0						3.3

Time: 120.0°E.

Table 16*

Lanchow, China (36.1°N, 103.8°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	360	3.3						2.6
01	355	3.2						2.6
02	350	3.2						2.6
03	340	3.4						2.7
04	320	3.4						2.8
05	310	3.1						(2.8)
06	315	3.3						2.6
07	280	(5.0)						(2.9)
08	(240)	(6.3)						(3.2)
09	(240)	(9.4)						(3.2)
10	(230)	(9.6)						(3.0)
11	(260)	(9.8)			110	3.4		(3.1)
12	(270)							
13	(280)	(9.6)			125	3.7		(3.2)
14	(270)	(10.0)			130	3.5		(3.1)
15	275	(9.6)			120	3.2		(3.0)
16	(270)	(9.0)			140			(3.0)
17	(280)	(7.9)						(3.0)
18								
19								
20								
21								
22	310	3.4						2.6
23	395	3.2						2.6

Time: 105.0°E.
Sweep: 2.3 Mc to 19.0 in 15 minutes.
*Observations began 15 December 1946.

Table 17

Tokyo, Japan (35.6°N, 139.6°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	300	3.4						2.8
01	290	3.4						2.8
02	280	3.3						2.9
03	270	3.4						2.9
04	250	3.3						3.0
05	270	3.1						2.8
06	240	3.4						3.0
07	210	7.3			140	1.9		3.5
08	200	9.4			100	2.6	3.0	3.7
09	200	10.3	190		100	3.2	3.4	3.6
10	200	11.5	200		100	3.4	4.0	3.5
11	210	11.6	200		100	3.6	3.1	3.4
12	210	11.4	200		100	3.7	4.1	3.3
13	210	11.4	200		100	3.5	3.9	3.3
14	210	11.0	200		100	3.4	4.0	3.3
15	200	10.2			100	3.0	3.1	3.4
16	200	9.2			100	2.4	2.4	3.4
17	200	8.0				1.7	2.4	3.4
18	200	6.6					2.2	3.4
19	200	5.8					1.9	3.3
20	210	4.7						3.3
21	220	4.0						3.2
22	250	3.4						2.9
23	300	3.4						2.8

Time: 135.0°E
Sweep: 1.3 Mc to 15.0 Mc. Manual operation.

Table 18

Yamaguchi, Japan (32.2°N, 130.6°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	320	4.4						
01	320	4.1						
02	300	4.2						
03	300	3.6						
04	300	3.6						
05	310	3.2						
06	350	3.0						
07	285	5.8						
08	240	(9.6)	240		125	2.5	2.2	
09	240	(10.6)	240			3.1	3.5	
10	250	(11.5)	230				3.9	
11	250	(11.2)	220		120	3.5	3.9	
12	250	(12.0)	220		120	3.7	3.9	
13	260	(12.4)	240		110	3.6	4.3	
14	260	(12.0)	230				4.2	
15	260	(12.1)	230				4.0	
16	240	(11.1)			110	2.8	3.1	
17	220	(10.2)				2.2	2.4	
18	220	(9.1)					2.4	
19	220	7.4						
20	225	6.8						
21	230	6.6						
22	240	5.9						
23	285	4.4						

Time: 135.0°E.
Sweep: Lower limit of recorder, 2.0 Mc.

Table 19

Chungking, China (29.4°N, 106.8°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	280	4.5						2.6
01	280	4.2						2.7
02	280	3.9						2.7
03	250	3.5					2.6	2.8
04	250	3.2					2.9	3.0
05	280	3.0					3.0	2.7
06	280	3.5					3.4	2.8
07	240	8.2					4.1	3.1
08	240	11.2	240		100	2.8	4.5	3.1
09	240	12.3	210		100	3.2	4.8	3.1
10	240	12.7	210		95	3.4	5.1	3.1
11	250	12.8	210		100	3.6	5.3	2.9
12	260	12.7	210	7.0	100	3.8	5.6	2.8
13	280	14.5	210	7.0	95	3.7	4.5	2.7
14	260	15.2	210		100	3.4	4.4	2.7
15	240	14.8	220		100	3.2	3.7	2.7
16	220	14.0			95	2.8	3.2	2.6
17	210	13.1				2.3	2.8	2.8
18	200	12.0					2.2	2.8
19	220	10.5						2.8
20	200	9.4						2.9
21	210	8.0						2.9
22	215	6.8						2.8
23	240	5.2						2.6

Time: 105.0°E.
Sweep: 2.0 Mc to 16.1 Mc in 15 minutes.

Table 20

Maui, Hawaii (20.8°N, 156.5°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	300	4.4						2.8
01	310	4.0						2.8
02	300	3.8						2.9
03	310	3.5						3.0
04	300	3.0						2.3
05		2.8						2.5
06	290	6.6				2.4	2.8	2.8
07	282	9.0	258	3.8		2.8	3.4	3.1
08	268	12.0	252	4.4		3.2	3.7	3.0
09	275	13.8	250	4.8		3.6	4.1	3.1
10	272	13.5	232	5.0		3.8	4.5	3.0
11	290	13.0	225	5.4		3.8	4.2	2.9
12	300	13.2	228	5.6		4.0	4.4	2.8
13	350	12.4						2.8
14	375	12.3						2.7
15	350	12.1						2.8
16	300	11.8						2.8
17	300	11.8						2.8
18	300	9.4						3.0
19	300	7.3						3.0
20	300	6.7						2.8
21	300	7.4						2.8
22	290	5.8						2.9
23	300	5.2						2.8

Time: 157.5°W.
Sweep: 2.2 Mc to 16.0 Mc in 1 minute. Manual operation.

Table 21

San Juan, Puerto Rico (18.4°N, 66.1°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		5.0						2.8
01		4.8						2.8
02		4.2						2.7
03		4.0						2.7
04		4.0						2.5
05		4.2						2.6
06		4.6						2.7
07	290	7.8						3.0
08	280	10.3		2.8				3.0
09	290	11.4				3.1		3.0
10	295	11.3				3.4		2.9
11	300'	11.1				3.5		2.9
12	300	10.9				3.7		2.8
13	320	10.5				3.6		2.7
14	320	10.5				3.6		2.7
15	320	10.2				3.4		2.7
16	290	10.0				3.2	4.0	2.8
17	280	9.8						2.8
18	280	8.9						2.9
19	280	7.5						2.8
20		6.1						2.7
21		6.1						2.8
22		6.3						2.8
23		5.8						2.8

Time: 60.0°W.
Sweep: 2.8 Mc to 14.0 Mc in 8 minutes.

Table 22

Palmyra I. (5.9°N, 162.1°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	235	9.2					4.0	3.0
01	(235)	(7.5)					(3.4)	(3.0)
02	240	6.7					3.6	3.0
03	(255)	(6.2)					(3.4)	
04	250	6.0					3.2	3.1
05	(245)	(5.6)					(3.1)	(2.8)
06	230	5.8					2.8	3.0
07	(250)	(8.6)					(3.4)	(3.0)
08	210	12.7			110	3.7		3.0
09	(210)	(13.0)			100		(4.2)	(3.0)
10	210	13.5	188	5.1	100	4.0	4.0	2.7
11	(200)	(13.5)			100			(2.6)
12	240	12.3	180	5.6	100	4.2	4.9	2.5
13	(212)	(12.0)			100			(2.4)
14	240	12.8	180	6.1	100	4.0	4.0	2.5
15	(250)	(13.2)						(2.4)
16	225	13.8	200	6.2	100	3.4	4.2	2.7
17	(245)	(13.9)					(4.0)	(2.7)
18	240	13.9			90		3.4	2.9
19	(290)	(13.6)					(4.0)	(2.8)
20	250	13.2					2.5	2.7
21	(245)	(12.1)					(2.8)	(2.6)
22	240	11.7					2.8	2.8
23	(255)	(9.4)					(3.0)	

Time: 157.5°W.
Sweep: 1.0 Mc to 18.0 Mc. Manual operation. 1.0 Mc to 13.0 Mc in 1 minute, 30 seconds. Automatic recording began the 24th.

Table 23

Rarotonga I. (21.3°S, 159.8°W) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		11.4						
01		10.5						
02		9.9						
03		9.6						
04		9.6						
05		9.5						
06		9.8						
07		10.7						
08		10.6						
09		10.8						
10		11.5						
11		12.1						
12		12.9						
13		13.5						
14		13.5						
15		13.5						
16		13.2						
17		12.5						
18		11.8						
19		10.7						
20		10.3						
21		10.7						
22		11.2						
23		11.2						

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

Table 24

Johannesburg, Union of S. Africa (26.2°S, 28.0°E) December 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	280	7.1					2.3	2.8
01	270	6.7					2.3	2.9
02	260	6.2					2.8	2.9
03	270	5.6						2.9
04	270	5.1					2.2	2.8
05	270	5.4						2.9
06	240	7.0			100	2.5	3.2	3.1
07	250	8.0	220	(4.4)	100	3.1	3.6	2.9
08	310	9.4	210	5.4	100	3.5		2.7
09	350	10.1	210	5.5	100	(3.8)		2.7
10	360	10.6	210	5.8	100	(3.8)		2.7
11	375	10.6	210	6.0	100			2.6
12	370	10.7	205	5.8	100			2.6
13	375	10.8	210	5.8	100			2.6
14	370	10.7	220	5.8	100			2.7
15	370	10.5	220	5.6	100	(3.8)		2.7
16	350	10.2	220	5.4	100	3.6		2.7
17	310	9.9	220	4.7	100	3.2	3.8	2.8
18	270	9.6	240	3.5	100	2.6	3.0	2.8
19	260	9.6					2.8	2.9
20	250	9.2					3.0	(2.9)
21	250	8.1					2.5	(2.9)
22	260	7.5					2.2	2.8
23	280	7.2						2.8

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

Table 25*

Kermadec Is. (29.3°S, 177.9°W) December 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06	290	9.6	290	4.2	135	2.7		2.6
07	310	10.0	275	5.0	135	3.2		2.6
08	325	10.3	270	5.2	130	3.6		2.6
09	350	10.6	275	5.8	130	3.8		2.4
10	375	11.3	290	6.0	130	3.8		2.4
11	400	11.5	265	6.1	130			2.4
12	400	11.5	290	6.1	130	4.1		2.4
13	410	D	290	6.3	130	4.0		2.4
14	400	11.4	285	5.9	130			2.4
15	390	11.1	300	5.6	135	3.8		2.5
16	375	10.9	290	5.6	130	3.5		2.5
17	360	10.6	275	5.0	135	3.0		2.5
18	325	10.4				2.4		2.5
19	315	10.2						2.5
20								
21								
22								
23								

Time: 180.0°E.
Sweep: 1.8 Mc to 12.0 Mc. Manual operation.
*Observations taken from 0600 through 1900.

Table 26

Christchurch, N. Z. (43.6°S, 172.6°E) December 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs	F2-M3000
00	290	8.3					2.4	2.5
01	290	7.9					2.9	2.7
02	290	7.2					2.9	2.5
03	280	6.8					3.1	2.6
04	300	6.3				1.4	2.9	2.6
05	260	6.5				2.1		2.7
06	270	7.2	240	4.5		2.8	4.0	2.8
07	330	7.8	230	5.2		3.2	4.8	2.8
08	335	8.3	225	5.4		3.5	5.8	2.8
09	360	8.7	235	5.7		3.7	6.1	2.7
10	400	8.3	210	6.0		3.9	6.0	2.6
11	390	8.6	210	5.9		4.0	5.3	2.7
12	405	8.8	225	6.1		3.9	5.6	2.6
13	405	8.5	225	6.0		3.8	5.6	2.7
14	415	8.5	220	5.9		4.0	5.2	2.6
15	400	8.4	230	5.7		3.8	5.2	2.6
16	390	8.6	235	5.6		3.7		2.6
17	340	8.5	245	5.3		3.3	4.5	2.6
18	310	8.9		4.5		2.8	4.7	2.7
19	280	8.6				2.0	4.6	2.6
20	270	8.6					4.6	2.6
21	300	8.7					4.6	2.5
22	295	8.8					4.4	2.5
23	290	8.4					3.0	2.6

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

Table 27*

Campbell I. (52.5°S, 169.2°W) December 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs	F2-M3000
00								
01								
02								
03								
04								
05		6.5						2.7
06								
07		7.2						2.7
08		7.4						2.6
09		7.8						2.6
10		7.5						2.6
11		7.7						2.6
12		7.6						2.6
13		7.7						2.6
14		7.7						2.5
15		7.9						2.5
16		8.0						2.6
17		8.3						2.6
18		8.4						2.6
19		8.5						2.6
20								
21		8.6						2.6
22								
23		7.7						2.5

Time: 165.0°E.
Sweep: 1.0 Mc to 15.0 Mc. Manual operation.
*Observations taken on a 16-hour working schedule.

Table 28*

Slough, England (51.5°N, 0.6°W) November 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs	F2-M3000
00	307	3.8			113		2.6	2.5
01	304	3.6			113		2.5	2.5
02	306	3.6			112		2.5	2.5
03	297	3.1			113		2.6	2.5
04	278	3.1			114		2.6	2.7
05	260	3.0			118		2.5	2.9
06	260	2.7			119		2.5	2.8
07	246	5.1			116	1.7	2.6	2.9
08	230	7.8			120	2.1	2.7	3.2
09	230	10.1			120	2.5	3.8	3.2
10	229	11.3			115	2.8	4.9	3.2
11	231	12.0			114	2.9		3.1
12	230	12.2		4.1	114	3.0	4.9	3.1
13	229	11.9			114	2.9	4.9	3.0
14	236	11.9			113	2.7	3.7	3.0
15	234	11.7			115	2.3	2.6	3.1
16	226	10.4			110	1.8	3.5	3.2
17	223	9.2			108		3.5	3.1
18	225	7.8			109		3.5	3.1
19	232	6.0			109		3.5	2.9
20	252	4.8			111		2.5	2.8
21	272	4.2			113		2.6	2.6
22	303	4.0			114		2.5	2.5
23	313	3.7			110		2.5	2.5

Time: Local.
Sweep: 0.5 Mc to 16.0 Mc in 4 minutes.
*Average values except foF2 and fES, which are median values.

Table 29

Peiping, China (39.9°N, 116.4°E) November 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		8.6						3.2
01		8.3						3.5
02		7.6						3.5
03		7.6						3.4
04		7.7						3.5
05		8.1						3.5
06		8.6						3.5
07		9.3						3.3
08		10.0						3.3
09		10.7						3.2
10		(11.0)						(3.1)
11		(11.5)						(3.4)
12		(11.2)						(3.1)
13		11.2						3.2
14		11.2						3.2
15		11.0						3.0
16		10.8						3.0
17		11.2						3.0
18		(10.9)						(2.9)
19		(10.5)						(3.0)
20		(9.7)						(3.1)
21		(9.0)						3.0
22		8.8						3.1
23		8.8						3.3

Time: 120.0°E.

Table 30

Chungking, China (29.4°N, 106.8°E) November 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	240	6.0						2.7
01	240	5.2					2.0	2.7
02	250	4.6					2.4	2.8
03	240	4.2					2.0	2.9
04	240	3.7					2.0	3.0
05	275	3.2					2.4	2.6
06	280	4.4					3.4	2.7
07	240	9.2			125	2.4	4.4	3.1
08	250	11.3			120	2.8	5.0	3.1
09	240	12.5	230		120	3.2	5.0	3.0
10	280	13.7	220		120	3.5	6.6	2.8
11	270	14.5	220	6.4	120	3.6	5.6	2.8
12	300	14.5	220	7.0	120	3.8	5.5	2.6
13	280	16.0	210		110	3.7	4.6	2.7
14	280	16.0	220		105	3.5	4.4	2.8
15	260	16.0	230		100	3.2	3.8	2.7
16	240	15.7			100	2.7	3.4	2.8
17	220	15.8					2.9	2.8
18	210	13.5					3.2	2.9
19	230	12.4					3.0	2.8
20	210	11.0					2.0	2.8
21	220	9.8					2.4	2.7
22	220	8.1					2.0	2.8
23	240	7.0					2.0	2.8

Time: 105.0°E.
Sweep: 2.0 Mc to 16.1 Mc in 15 minutes.

Table 31

Okinawa I. (26.3°N, 127.8°E) November 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		(8.9)					(3.1)	(2.8)
01		(8.3)					(3.1)	(2.7)
02		(7.4)					3.2	2.9
03		(5.9)					(3.4)	(2.8)
04		(5.4)					(3.1)	(3.3)
05		(3.3)					(2.8)	(2.6)
06		(3.2)					(2.9)	(2.7)
07		(7.4)				1.9	(3.5)	(3.2)
08		(11.1)				2.7	(4.0)	(3.1)
09		12.6				3.1	5.0	(3.1)
10		13.6				3.4	4.9	3.0
11		14.0				3.5	4.9	3.0
12		14.8				3.7	(5.0)	2.8
13		15.4				3.6	4.9	2.9
14		15.6				3.5	5.0	2.9
15		(15.8)				3.2	(5.0)	(2.9)
16		(16.1)					(4.5)	(2.9)
17		(15.3)					(4.6)	(2.9)
18		13.9					4.4	3.0
19		14.6					3.8	2.9
20		14.8					3.0	3.0
21		14.2					(3.0)	(3.0)
22		12.2					(2.9)	3.0
23		10.2					(2.9)	3.0

Time: 135.0°E.
Sweep: Manual operation.

Table 32

Leyte, Philippine Is. (11.0°N, 125.0°E) November 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		9.5					3.0	3.0
01		8.8					3.1	3.1
02		7.9					2.0	3.1
03		6.7						3.1
04		5.9					2.0	3.0
05		5.3						3.0
06		4.9					2.0	3.1
07		8.3					2.8	3.0
08		11.4				2.9	3.6	2.9
09		13.0					4.4	2.7
10		13.6					6.4	2.4
11		12.6					8.2	2.3
12		11.7					9.4	2.3
13		11.7					8.5	2.3
14		12.2					8.0	2.2
15		12.6					7.8	2.3
16		12.8					5.4	2.3
17		12.7				2.9	4.1	2.3
18		12.0					(4.2)	2.3
19		11.1					3.0	2.2
20		10.4						2.2
21		10.1					(1.8)	2.3
22		10.0					3.0	2.6
23		10.0					3.2	2.7

Time: 135.0°E.
Sweep: Manual operation. Lower limit of frequency, 1.6 Mc.

Table 33

Huancayo, Peru (12.0°S, 75.3°W) November 1946

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	290							
01	250							
02	240	(7.4)						3.0
03	230	7.2						3.2
04	230	5.8						3.2
05	250	5.4				1.2		3.0
06	250	8.7				2.5	3.0	3.0
07	240	11.3				3.2	5.6	2.8
08	220	12.7					9.3	2.7
09	220	13.5	215	5.2			10.2	2.5
10	255	12.4	210	5.3			10.2	2.4
11	260	12.0	200	5.3			10.2	2.3
12	270	12.0	200	5.3			10.2	2.3
13	270	11.9	200	5.2			10.1	2.3
14	225	12.0	200	5.0			10.2	2.3
15	220	12.0					8.3	2.2
16	230	12.0					8.0	2.2
17	250	11.4				2.6	5.6	2.2
18	290	10.4				1.6	2.1	2.3
19	360	10.2				0.8		2.2
20	410	9.3						2.1
21	415	(10.0)						2.2
22	365							
23	335							

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

Table 34

Rarotonga I. (21.3°S, 159.8 W) November 1946

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00		11.8						2.9
01		10.5						2.8
02		9.8						2.7
03		9.7						2.8
04		9.5						2.7
05		9.3						2.8
06		10.4						2.8
07		11.2						3.0
08		11.4						2.9
09		12.0						2.7
10		13.0						2.7
11		14.5						2.6
12		15.1						2.6
13		15.3						2.6
14		15.0						2.6
15		14.7						2.6
16		14.4						2.6
17		13.8						2.7
18		13.1						2.7
19		12.0						2.7
20		11.9						2.6
21		12.3						2.6
22		12.5						2.7
23		12.7						2.8

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

Table 35

Tromso, Norway (69.7°N, 18.9°E) October 1946

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06								
07	254	6.5						
08	266	7.1				2.2		
09	262	8.0				2.4		
10	256	8.0				2.4		
11	247	8.4				2.4		
12	252	8.4				2.4		
13	246	8.1				2.3		
14	252	7.5				2.4		
15								
16								
17								
18								
19								
20								
21								
22								
23								

Time: 0.0°.
Sweep: 0.8 Mc to 11.4 Mc in 5 minutes.

Table 36

Chungking, China (29.4°N, 106.8°E) October 1946

Time	h'F2	f°F2	h'F1	f°F1	h'E	f°E	fEs	F2-M3000
00	220	6.8					3.0	2.9
01	220	6.7					3.2	3.0
02	220	6.0					3.0	3.1
03	200	4.7					2.2	3.1
04	220	4.1					2.6	2.9
05	260	3.8					2.4	2.8
06	240	6.0					3.6	3.1
07	200	9.8			90	2.5	4.3	3.4
08	200	10.8	200		80	3.0	4.7	3.3
09	220	12.2	200		80	3.3	5.0	3.2
10	240	13.2	195	5.7	80	3.5	5.6	3.0
11	255	14.6	190	5.2	80	3.8	6.4	2.9
12	265	15.2	185	6.4	80	3.8	6.3	2.8
13	260	16.0	200		80	3.9	4.9	2.9
14	250	16.0	200		80	3.8	5.8	3.0
15	240	15.9	210		90	3.4	4.9	2.9
16	225	15.5	210		95	3.1	4.8	2.8
17	220	14.8					4.6	3.1
18	200	12.5					4.0	3.2
19	205	12.2					4.0	3.0
20	200	11.3					3.2	3.0
21	200	9.4					2.9	3.0
22	205	8.6					3.2	3.0
23	220	7.5					2.8	2.9

Time: 105.0°E.
Sweep: 2.0 Mc to 16.1 Mc in 15 minutes.

Table 37

Cape York, Australia (11.0°S, 142.4°E) October 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00								
01								
02								
03								
04								
05								
06								
07								
08		D						
09	(250)	D					(4.5)	
10	(250)	D					(4.3)	
11	(300)	D	200			3.9	(4.5)	
12	(300)	D	200			3.9	(4.4)	
13	(338)	D	200				(4.4)	
14	(300)	D	200				(4.0)	
15	305	D	200			3.7	4.4	
16	(300)	D	210			3.4	3.9	
17	(300)	D				2.9	3.9	
18	(260)	D				2.0	(3.1)	
19	(295)	D					(3.8)	
20								
21	(300)						(2.8)	
22	(260)							
23	(230)							

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

Table 38

Townsville, Australia (19.4°S, 146.5°E) October 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	245	8.6					2.8	3.0
01	250	8.0					2.7	2.9
02	250	7.5					2.5	2.8
03	260	7.2					2.4	2.7
04	275	7.0					1.8	2.7
05	275	6.5					2.2	2.8
06	260	7.7			110	2.0	2.5	3.0
07	250	9.6	240		100	2.7	2.8	3.2
08	260	>10.0	230	5.0	100	3.2	3.0	(3.2)
09	260	>10.0	220	5.0	100	3.5	3.6	
10	275	>10.0	205	5.3	100	3.7	3.8	
11	275	>10.0	200	5.5	100	3.9	3.5	
12	300	>10.0	200	5.4	100	(3.9)	3.0	
13	300	>10.0	200	6.0	100	3.9	3.2	
14	300	>10.0	200	5.6	100	3.8	3.0	
15	300	>10.0	230	5.5	100	3.6	2.8	(3.1)
16	275	>10.0	225	5.0	100	3.3	2.8	3.0
17	250	10.0			100	2.7	3.0	3.1
18	250	10.0					3.5	2.9
19	260	9.5					3.0	2.8
20	275	9.5					2.6	2.8
21	280	9.5					2.7	2.8
22	275	9.7					2.9	2.9
23	260	9.6					3.2	3.0

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

Table 39

Brisbane, Australia (27.5°S, 153.0°E) October 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	280	7.9						2.8
01	280	7.3						2.8
02	290	6.8						2.7
03	300	6.5						2.7
04	305	6.5						2.7
05	290	6.5						2.8
06	240	8.0						3.0
07	235	9.7			110	2.8		3.0
08	280	10.8	230		105	3.3		2.9
09	290	11.6	220	5.2	100	3.5		2.9
10	290	11.8	210	5.2	100	3.6		2.8
11	300	11.7	210	5.5	100	3.7		2.9
12	300	11.5	210	5.7	100	3.7		2.9
13	310	11.3	212	5.3	100	3.7		2.8
14	300	10.8	220		100	3.6		2.8
15	300	10.4	220		105	3.5		2.8
16	260	10.3	230		110	3.0		2.9
17	250	10.1				2.4	3.2	2.9
18	250	9.5					2.6	2.8
19	270	8.7						2.7
20	290	8.6						2.7
21	300	8.5						2.7
22	300	8.5						2.7
23	290	8.3						2.8

Time: 150.0°E.
Sweep: 2.2 Mc to 12.5 Mc in 2 minutes, 30 seconds.

Table 40

Hobart, Tasmania (42.8°S, 147.4°E) October 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	275	5.8						2.7
01	270	5.4						2.7
02	270	5.0						2.7
03	270	4.5						2.6
04	268	4.0						2.7
05	270	3.9						2.8
06	250	5.0			100	2.1	2.7	3.1
07	250	6.3	240		100	2.6	3.0	3.1
08	275	6.9	225	4.6	100	3.0	2.9	3.0
09	300	7.2	220	4.7	100	3.3		3.0
10	315	7.6	218	4.8	100	3.4		2.9
11	345	8.1	220	5.0	100	3.5		2.8
12	322	8.5	200	4.8	100	3.5		2.9
13	300	8.5	200	4.8	100	3.5		2.9
14	295	9.0	200	4.7	100	3.4	2.9	2.8
15	285	9.0	220	4.5	100	3.3		2.8
16	250	8.8	230	4.5	100	3.1		2.9
17	250	8.4	250		100	2.7		2.8
18	250	8.9			105	2.0	2.5	2.9
19	250	8.5					1.8	2.9
20	245	7.5						2.7
21	250	6.9						2.7
22	260	6.5						2.6
23	270	6.2						2.6

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

Table 41*

Slough, England (51.5°N, 0.5°W) September 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	312	4.8			116		3.0	2.5
01	325	4.5			119		2.7	2.5
02	325	4.4			116		2.7	2.5
03	319	4.1			121		2.7	2.6
04	313	3.8			119		2.8	2.6
05	303	3.6			118		3.5	2.7
06	292	5.1	274	3.0	119	1.9	2.1	3.0
07	312	6.0	257	3.7	117	2.5		3.1
08	314	6.6	249	4.1	115	2.9		3.0
09	314	7.8	242	4.5	116	3.1		3.0
10	307	8.4	239	4.7	114	3.3	3.6	3.0
11	321	8.6	232	4.9	113	3.4		2.9
12	320	8.3	239	5.0	112	3.4		2.9
13	349	8.0	242	4.9	113	3.4		2.9
14	289	8.4	240	4.7	114	3.3	3.2	2.9
15	306	8.4	241	4.5	112	3.1		2.9
16	288	8.4	250	4.3	114	2.8		2.9
17	264	8.5	253	3.7	116	2.3		3.0
18	263	8.3			119	1.8	2.3	3.0
19	262	8.0			119		3.5	2.9
20	269	7.4			118		3.2	2.8
21	282	6.4			117		2.7	2.7
22	299	5.5			116		2.7	2.6
23	313	5.1			115		2.8	2.5

Time: Local.
Sweep: 0.5 Mc to 16.0 Mc in 4 minutes.
*Average values except foF2 and fEs, which are median values.

Table 42

Peshawar, India (34.0°N, 71.5°E) September 1946

Time	*	foF2	h'F1	foF1	h'E	** foE	fEs	*** F2-M3000
00								
01								
02								
03								
04								
05								
06								
07	300	8.2				3.5		
08	300	9.4				3.6		3.0
09	330	10.2				3.8		
10	360	11.3				3.8		
11	360	11.4				3.8		
12	390	12.2				3.8		2.5
13	390	12.4				3.8		
14	360	12.2				3.7		
15	360	12.2				3.6		
16	360	11.7				3.6		2.7
17	330	11.3				3.6		
18	330	10.4				3.4		
19	300	9.0				3.2		
20	330	7.6				3.3		2.8
21	360	6.5				3.1		
22	360	6.4						
23								

Time: Local.
Sweep: Manual operation.
*Height at 0.83 foF2.
**Includes both normal and abnormal values of foE.
***M3000, average values; other columns, median values.

Table 43

Wuchang, China (30.5°N, 114.4°E) September 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	270	7.4					2.5	2.9
01	270	6.8					2.0	2.9
02	260	6.6					2.3	2.9
03	240	6.3					2.2	3.1
04	250	5.4					2.0	3.0
05	260	5.1					1.9	2.9
06	240	6.5						3.2
07	220	8.2	(210)	(4.4)	110	2.6		3.4
08	220	9.0	215	5.0	100	3.1		3.4
09	230	9.0	200	5.2	105	3.4		3.2
10	260	9.5	205	5.6	100	3.4		3.1
11	255	11.4	210	5.6	110	3.9		3.0
12	280	12.0	220	5.8	110	3.8		3.0
13	285	13.0	210	5.6	110	3.9		3.0
14	280	13.0	220	5.3	100	3.6		3.0
15	280	13.5	215	5.5	110	3.6		3.0
16	260	12.8	220	5.1	110	3.3		3.1
17	240	12.2	220	5.1	110	2.8		3.2
18	230	11.5	220	4.6	110	2.2	3.8	3.3
19	225	10.0	220	4.9			3.6	3.2
20	230	9.2					2.6	3.0
21	240	8.3					3.0	3.0
22	260	8.2					3.6	2.9
23	270	7.8					2.6	2.9

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

Table 44

Delhi, India (28.6°N, 77.1°E) September 1946

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	** F2-M3000
00	390	6.5						2.9
01	360	6.4						
02	375	6.2						
03	(360)	(6.9)						
04	360	5.7						2.6
05	360	5.5						
06	330	6.4						
07	330	9.0						
08	330	9.8						2.9
09	360	10.6						
10	390	11.4						
11	405	12.3						
12		(12.5)						
13	(360)	(12.5)						
14		(12.6)						
15		(12.8)						
16	(360)	(12.6)						2.9
17	(360)	(12.6)						
18	360	(11.4)						
19	360	10.5						
20	360	9.1						2.7
21	390	8.3						
22	390	7.2						
23	390	6.9						

Time: Local.
Sweep: Manual operation.
*Height at 0.83 foF2.
**M3000, average values; other columns, median values.

Table 45

Bombay, India (19.0°N, 73.0°E) September 1946

Time	*	foF2	h'F1	FoF1	h'E	foE	fEs	**F2-M3000
00								2.8
01								
02								
03								
04								2.9
05								
06	315	6.3						
07	300	9.5						
08	345	10.3						2.9
09	420	11.4						
10	450	12.1						
11	510	13.0						
12	(495)	(14.0)						
13		(14.5)						
14	(450)	(14.6)						
15	(450)	(14.8)						
16	420	(15.0)						2.6
17	420	14.8						
18	420	14.7						
19	420	14.2						
20	420	14.1						2.7
21	390	13.6						
22	420	12.7						
23								

Time: Local.
Sweep: Manual operation.
*Height at 0.83 foF2.
**M3000, average values; other columns, median values.

Table 46

Madras, India (13.0°N, 80.2°E) September 1946

Time	*	foF2	h'F1	FoF1	h'E	foE	fEs	**F2-M3000
00								3.0
01								
02								
03								
04								3.1
05								
06								
07	360	9.3						
08	420	10.4						2.8
09	435	11.3						
10	480	11.2						
11	510	11.2						
12	540	11.3						
13	540	11.4						
14	540	11.8						
15	540	12.5						
16	540	13.0						
17	540	13.0						
18	480	13.0						
19	510	12.2						
20	(450)	12.8						
21	420	11.6						
22	420	12.3						
23								

Time: Local.
Sweep: Manual operation.
*Height at 0.83 foF2.
**M3000 average values; other columns, median values.

Table 47

Watheroo, W. Australia (30.3°S, 115.9°E) September 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs	F2-M3000
00	275	5.0					2.9	2.8
01	270	4.9					3.0	2.8
02	262	4.6					3.0	2.9
03	252	4.2					3.0	2.8
04	270	3.9					3.0	2.8
05	280	3.8					2.9	2.7
06	280	4.5				1.4	3.0	2.9
07	250	7.0				2.2	3.1	3.3
08	270	8.4	245	4.0		2.8	3.2	3.2
09	280	8.9	235	4.9		3.2	3.2	3.1
10	290	9.3	230	5.0		3.2	3.3	3.0
11	295	10.0	222	5.2		3.3	3.8	3.0
12	295	10.4	222	5.1		3.3	3.9	3.0
13	295	10.5	225	5.0		3.3	3.9	2.9
14	295	10.1	235	5.0		3.4	3.7	2.9
15	275	9.6	235	4.8		3.2	3.5	2.9
16	275	9.4	240	3.9		3.0	3.2	3.0
17	260	9.2				2.4	3.2	3.0
18	242	9.0					3.0	3.0
19	225	7.4					2.8	3.0
20	245	6.4					2.4	2.9
21	250	6.1					2.7	2.9
22	258	5.5					2.8	2.8
23	270	5.2					2.8	2.8

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

Table 48*

Falkland Is. (51.7°S, 57.7°W) September 1946

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	**	F2-M3000
00		4.6						2.7
01		4.9						2.6
02		4.8						2.5
03		4.8						2.5
04		4.8						2.7
05		4.7						2.6
06		6.1						3.1
07		7.5						3.2
08		8.8						3.3
09		9.4					2.0	3.2
10		9.9					4.0	3.1
11		10.1					4.2	3.0
12		10.4					4.3	3.0
13		10.5					3.4	3.0
14		10.1					3.0	3.0
15		9.3					2.6	3.0
16		8.6						3.0
17		8.2					2.6	3.2
18		7.6						3.1
19		5.8						2.9
20		4.8						2.7
21		4.8						2.6
22		4.7						2.6
23		4.7						2.5

Time: 60.0°W.
Sweep: Manual operation.
*This station ceased operation, 21 September 1946.
** "Extent of E."

Table 49*

Slough, England (51.5°N, 0.6°W) August 1946

Time	**	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	390	6.3					2.6	2.5
01	393	6.0					2.6	2.5
02	394	5.8					3.4	2.5
03	387	5.2					2.6	2.5
04	374	5.1					2.8	2.6
05	317	5.3					2.6	2.8
06	307	6.0					2.9	2.9
07	315	6.6					4.9	2.9
08	317	7.2					5.1	2.9
09	318	7.4					4.2	2.9
10	320	7.6						2.9
11	326	7.6					4.0	2.9
12	334	7.7					4.9	2.8
13	341	7.8					4.7	2.8
14	342	7.6					4.8	2.8
15	341	7.6					4.5	2.8
16	334	7.6						2.8
17	328	7.8						2.8
18	331	8.0					3.2	2.8
19	326	8.6					3.2	2.9
20	331	8.2					3.8	2.9
21	350	7.7					3.2	2.7
22	374	7.0					4.0	2.6
23	391	6.6					2.6	2.6

Time: Local.
Sweep: 0.5 Mc to 16.0 Mc in 4 minutes.
*Median values except F2-M3000, which are computed from average values.
**Height at 0.83 f°F2 in km.

Table 50

Watheroo, W. Australia (30.3°S, 115.9°E) August 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	260	3.9					3.2	2.8
01	265	4.0					3.2	2.8
02	270	4.1					3.2	2.8
03	258	4.2					3.2	2.9
04	250	4.0					3.1	2.8
05	265	4.0					3.2	2.9
06	250	4.0					3.2	3.0
07	248	6.0				2.0	3.2	3.3
08	240	8.0				2.6	3.2	3.4
09	260	9.2	240	5.0		3.1	4.0	3.2
10	270	9.7	230	5.0		3.3	4.0	3.1
11	270	9.7	230	5.0		3.5	4.0	3.1
12	280	9.8	220	5.0		3.6	4.1	3.1
13	278	9.9	220	5.0		3.6	4. 1	3.0
14	280	9.9	225	4.9		3.5	4.1	3.0
15	270	9.7	225	5.0		3.2	4.2	3.0
16	250	9.1	235	4.1		2.9	3.2	3.0
17	240	8.7				2.2	3.2	3.0
18	235	8.2				1.3	3.2	3.1
19	220	6.8					3.2	3.0
20	240	5.7					3.2	3.0
21	240	4.9					3.2	3.0
22	250	4.6					3.2	2.9
23	260	4.2					3.2	2.9

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

Table 51*

Calcutta, India (22.5°N, 88.4°E) July 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00		9.0						
01		7.6						
02		7.2						
03		7.1						
04		6.5						
05		6.8				2.0		
06		8.0				3.4		
07		8.9				3.9		
08		9.0				4.2		
09		(9.8)				4.4		
10		(9.2)				4.4		
11		(10.0)				4.4		
12		11.2				4.6		
13		(11.4)				4.5		
14		11.0				4.5		
15		11.7				4.3		
16		12.0				4.2		
17		12.8				4.1		
18		12.5				3.6		
19		11.8						
20		(10.5)						
21		10.3						
22		10.3						
23		9.8						

Time: Local
*Hourly values obtained 3 days a week.

Table 52

Fiji Is. (18.0°S, 178.2°E) July 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	255	(5.1)					2.6	
01	240	4.0					2.5	
02	220	3.8					2.8	
03	225	3.2					2.5	
04	210	2.6					2.4	
05	240	2.6					2.1	
06	(240)	3.1					2.9	
07	230				100	1.6	(3.6)	
08	225				100	2.5		
09	(240)		210	4.5	100	3.1		
10	245	(10.3)	200	4.8	100	3.4		
11	250		205	5.0	100	3.5		
12	270	(9.6)	205	5.2	100	3.5		
13	265	(10.3)	205	5.3	100	3.5		
14	285	(10.7)	200	5.0	100	3.4		
15	275		220	4.9	100	3.3		
16	260	(10.7)	225	4.7	100	3.0	3.9	
17	240	(10.3)			100	2.4		
18	220	10.1				1.6	2.5	
19	210	8.4					2.5	
20	210	7.2					2.7	
21	230	(7.6)					2.5	
22	240	(5.0)					2.5	
23	230	4.1					2.9	

Time: 180.0°E.
Sweep: From July 15, the upper limit of the recorder was changed from 9.2 Mc to 13.0 Mc.

Table 53

Fiji Is. (18.0°S, 178.2°E) June 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	240	4.1						
01	240	3.9						
02	245	3.5						
03	240	3.6						
04	230	3.0					2.1	
05	240	3.1					2.1	
06	250	3.5					1.8	
07	230	6.6			100	1.6	2.5	
08	230	D	230	4.1	100	2.5		
09	250	D	230	4.6	100	3.0		
10	250	D	210	4.8	100	3.3		
11	260	D	210	5.0	100	3.5		
12	265	D	200	5.0	100	3.5		
13	270	D	210	5.0	100	3.4		
14	260	D	220	4.8	100	3.3		
15	255	D	230	4.8	100	3.1		
16	250	D	235	4.4	100	2.8		
17	240	(9.8)			100	2.2	2.8	
18	220	9.1					2.8	
19	210	6.8					2.5	
20	220	5.2					2.5	
21	240	4.9					2.4	
22	240	4.8					2.0	
23	250	4.3						

Time: 180.0°E.
Sweep: Upper limit, 9.2 Mc.

Table 54

Fiji Is. (18.0°S, 178.2°E) May 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	(220)	(5.2)					(2.3)	
01	(220)	(4.9)						
02	(230)	(3.7)					(1.7)	
03	(235)	(3.5)					(1.7)	
04	(245)	(3.2)					(2.0)	
05		(3.2)					(2.2)	
06	(255)	(3.5)					(2.0)	
07	(240)					1.6		
08	(230)	D	215	3.8	100	2.5		
09	(230)	D	200	4.7	100	3.0		
10	(240)	D	200	4.8	100	3.3		
11	(250)	D	200	5.2	100	3.5		
12	(270)	D	205	5.4	100	3.5		
13	(265)	D	210	5.4	100	3.5		
14	(255)	D	215	5.3	100	3.3		
15	(245)	D	205	5.0	100	3.3		
16	(250)	D	210	4.6	100	3.0	(3.5)	
17	(225)	D			100	2.4	(2.8)	
18	(225)	(9.8)					(2.6)	
19	(210)	(8.2)					(2.6)	
20	(210)	(7.0)					(2.4)	
21	(220)	(6.2)					(2.5)	
22	(235)	(6.0)					(2.5)	
23	(220)	(5.2)					(2.1)	

Time: 180.0°E.
Sweep: Upper limit, 9.2 Mc.

Table 55

Fiji Is. (18.0°S, 178.2°E) April 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00	250	8.0						
01	240	7.9						
02	230	7.2					1.8	
03	220	6.0					2.2	
04	(235)	4.6					2.5	
05	250	4.2					2.4	
06	255	5.4					2.6	
07	240	D			100	2.1		
08	235	D	230	4.5	100	2.8		
09	250	D	220	5.3	105	3.2		
10	260	D	220	5.4	110	3.5		
11	270	D	215	5.5	110	3.6		
12	275	D	210	5.2	110	3.6		
13	300	D	220	5.5	102	3.6		
14	275	D	210	5.5	100	3.5		
15	265	D	210	4.8	100	3.3		
16	245	D	230		100	2.9		
17	240	D			100	2.4		
18	240	D					2.5	
19	230	D					2.5	
20	220	D					2.4	
21	240	9.1					2.2	
22	270	8.4						
23	265	8.0						

Time: 180.0°E.
Sweep: Upper limit, 9.2 Mc.

Table 56 (Supersedes table 17, IRPL-F22)

Rarotonga I. (21.3°S, 159.8°W) April 1946

Time	h'F2	f°F2	h'F1	F°F1	h'E	f°E	fEs	F2-M3000
00		7.4						3.1
01		6.9						3.0
02		5.9						2.9
03		5.0						3.0
04		4.6						2.8
05		4.5						2.8
06	300	4.8						2.8
07		8.6						3.3
08	260	11.0		5.0				3.2
09		11.5						3.2
10	300	12.5		5.5				3.1
11		12.5						3.0
12	300	12.6		5.9				3.0
13		13.8						3.0
14	300	14.0		5.6				3.0
15		13.4						2.9
16	300	12.5		5.4				3.0
17		12.4						3.0
18	250	12.0		5.2				3.0
19		11.2						3.1
20		10.0						2.9
21		9.4						2.9
22		8.6						3.0
23		7.9						3.0

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

Table 57 (Supersedes table 14, IRPL-F21)

Rarotonga I. (21.3°S. 159.8°W) March 1946

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00		9.6						3.1
01		8.8						(3.2)
02		7.7						(3.1)
03		6.4						(2.9)
04		6.5						(2.8)
05		6.7						(2.9)
06		7.2						(3.1)
07		9.2						(3.5)
08		10.8						3.3
09		11.8						3.2
10		12.7		5.5				3.0
11		13.4						3.0
12		13.8		6.0				3.0
13		14.3						3.1
14		13.5		5.8				(3.1)
15		13.6						(3.0)
16		13.3						(3.1)
17		12.6						(3.0)
18		12.2						(3.0)
19		11.2						(3.0)
20		11.0						(2.8)
21		10.5						(2.9)
22		10.2						(2.9)
23		9.9						3.0

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

Table 58*

Canberra, Australia (35.3°S, 149.0°E) December 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	278	7.2					4.7	
01	270	6.7					4.5	
02	271	5.9					4.1	
03	281	5.2					4.3	
04	292	4.9					3.5	
05	283	4.9					3.4	
06	267	5.7			116	2.4	3.7	
07	325	6.2	241	4.3	109	2.9	4.6	
08	328	6.8	228	4.6	106	3.2	5.8	
09	337	7.1	216	4.9	102	3.4	6.8	
10	341	7.5	214	5.0	101	3.5	7.3	
11	353	7.7	211	5.1	101	3.5	7.4	
12	362	7.8	214	5.0	102	3.6	7.0	
13	348	8.0	213	5.0	102	3.6	6.4	
14	343	7.8	220	5.0	102	3.6	6.1	
15	343	7.8	226	4.8	103	3.5	5.6	
16	326	7.9	230	4.6	106	3.4	6.2	
17	300	7.9	244	4.2	110	3.0	5.8	
18	275	7.9			117	2.4	5.6	
19	261	7.7					6.6	
20	271	7.4					6.0	
21	287	7.4					4.8	
22	301	7.4					4.9	
23	288	7.4					5.3	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 59*

Canberra, Australia (35.3°S, 149.0°E) November 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	280	6.4					4.4	
01	270	6.0					4.0	
02	268	5.2					3.8	
03	278	4.6					3.3	
04	284	4.2					3.7	
05	269	4.6					3.5	
06	273	5.5			117	2.3	4.0	
07	313	6.0	236	4.2	110	2.8	4.7	
08	349	6.4	225	4.5	105	3.2	4.9	
09	346	7.0	224	4.7	103	3.4	5.3	
10	339	7.5	214	4.8	102	3.5	5.8	
11	336	7.9	207	4.9	102	3.5	5.7	
12	344	8.0	212	4.9	101	3.5	5.7	
13	329	8.1	214	4.9	101	3.5	5.5	
14	323	8.0	223	4.8	101	3.4	5.3	
15	317	7.8	228	4.7	103	3.4	5.3	
16	303	7.7	234	4.4	104	3.1	5.5	
17	289	7.6	239	3.9	110	2.7	5.8	
18	260	7.6				2.1	4.8	
19	259	7.5					4.6	
20	265	7.2					4.6	
21	280	6.9					4.6	
22	291	6.7					4.2	
23	288	6.6					4.8	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 60*

Canberra, Australia (35.3°S, 149.0°E) October 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	281	5.4						
01	274	5.2						
02	266	4.8						
03	271	4.2						
04	293	4.1						
05	287	4.1						
06	255	5.0				2.0		
07	298	5.8	241	4.0	112	2.6		
08	312	6.3	231	4.4	107	3.0		
09	342	6.7	221	4.6	105	3.3		
10	337	7.2	211	4.8	103	3.4		
11	330	7.5	206	4.9	102	3.5		
12	324	7.7	205	4.9	102	3.6		
13	316	7.6	209	4.8	101	3.6		
14	316	7.5	218	4.7	101	3.5		
15	306	7.3	221	4.5	103	3.3		
16	298	7.4	232	4.3	106	3.0		
17	268	7.2	244	3.7	112	2.5		
18	256	7.4				1.8		
19	251	7.2						
20	255	6.8						
21	262	6.4						
22	276	6.0						
23	279	5.7						

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.

Table 61*

Canberra, Australia (35.3°S, 149.0°E) September 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	F2-M3000
00	282	4.3						
01	279	4.1						
02	278	3.9						
03	266	3.6						
04	270	3.3						
05	288	3.0						
06	267	3.7						
07	254	5.5			123	2.2		
08	268	6.4	236	4.0	113	2.8		
09	289	7.0	226	4.5	108	3.1		
10	291	7.4	223	4.7	105	3.4		
11	292	7.8	218	4.8	104	3.5		
12	287	8.1	217	4.8	103	3.6		
13	285	8.1	212	4.9	102	3.6		
14	273	7.8	214	4.7	103	3.4		
15	273	7.4	214	4.5	106	3.2		
16	259	7.1	228	3.8	109	2.8		
17	242	6.8			117	2.3		
18	237	6.6						
19	246	6.1						
20	259	5.8						
21	262	5.4						
22	267	5.0						
23	271	4.6						

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.

Table 62*

Canberra, Australia (35.3°S, 149.0°E) August 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	293	3.5						
01	295	3.5						
02	291	3.5						
03	295	3.5						
04	278	3.4						
05	275	3.1						
06	274	3.0						
07	250	4.5						
08	259	5.8	245	3.4		2.5	3.4	
09	267	6.2	232	3.8	120	2.8	3.4	
10	285	6.4	228	4.3	114	3.1	3.8	
11	293	6.9	227	4.5	112	3.2	4.0	
12	292	7.0	220	4.4	110	3.3	4.2	
13	290	7.1	223	4.4	111	3.3	4.0	
14	286	7.1	220	4.3	113	3.1	4.3	
15	270	7.0	223	4.0	115	2.9	3.9	
16	259	6.6	229	3.5	120	2.6	3.3	
17	244	6.2					3.1	
18	243	5.5					3.1	
19	245	5.0					3.7	
20	266	4.4					3.4	
21	280	4.0					2.8	
22	278	4.0					3.4	
23	286	3.7					3.2	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 63*

Canberra, Australia (35.3°S, 149.0°E) July 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	294	3.3					3.0	
01	299	3.2					3.7	
02	300	3.2					3.4	
03	302	3.4					3.3	
04	289	3.5					3.1	
05	262	3.4					3.0	
06	256	3.0					3.1	
07	244	3.8					3.1	
08	240	5.5					3.2	
09	253	6.3	239	3.5	120	2.5	3.6	
10	262	6.4	232	3.9	115	2.8	3.8	
11	271	6.8	225	4.1	112	3.0	4.3	
12	278	6.8	218	4.2	111	3.1	4.0	
13	273	7.0	216	4.1	112	3.0	4.2	
14	274	7.0	226	4.0	114	2.9	4.4	
15	255	6.7	228	3.7	117	2.7	4.1	
16	246	6.6	232	3.0		2.4	4.1	
17	236	5.8					3.6	
18	239	4.8					3.6	
19	258	4.0					3.7	
20	263	3.6					3.4	
21	269	3.5					3.6	
22	281	3.5					3.6	
23	284	3.4					3.4	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 64*

Canberra, Australia (35.3°S, 149.0°E) June 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	291	3.4					3.3	
01	303	3.4					3.2	
02	306	3.5					3.5	
03	308	3.6					3.4	
04	293	3.7					3.2	
05	262	3.6					3.3	
06	261	3.0					3.2	
07	251	3.7					3.2	
08	243	5.4					3.2	
09	256	6.2	238	3.2	113	2.5	3.9	
10	265	6.4	240	3.9	110	2.7	4.5	
11	268	6.8	233	4.0	109	2.9	4.3	
12	274	6.6	225	4.0	108	3.0	4.2	
13	272	7.0	225	4.0	108	2.9	4.3	
14	269	7.0	229	3.9	108	2.8	4.4	
15	257	6.8	229	3.5	111	2.6	4.3	
16	242	6.5					4.1	
17	238	5.6					4.3	
18	247	4.4					4.2	
19	264	3.9					4.0	
20	265	3.5					3.4	
21	273	3.4					2.9	
22	285	3.4					3.0	
23	282	3.3					3.1	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 65*

Canberra, Australia (35.3°S, 149.0°E) May 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	309	3.4					3.6	
01	312	3.5					3.9	
02	310	3.7					3.5	
03	300	3.8					3.3	
04	280	3.8					3.2	
05	255	3.5					3.4	
06	259	2.9					3.4	
07	244	4.3					3.4	
08	250	5.8				2.4	3.7	
09	261	6.5	238	3.5	108	2.6	4.8	
10	268	6.8	230	3.9	106	2.8	4.4	
11	271	7.1	225	4.1	106	3.0	4.4	
12	271	7.0	217	4.1	106	3.0	4.8	
13	280	7.1	222	4.0	105	3.0	4.8	
14	273	7.7	230	3.9	104	2.9	5.1	
15	261	7.5	232	3.7	106	2.7	5.2	
16	245	7.0				2.4	4.5	
17	233	6.2					4.4	
18	240	4.9					3.6	
19	258	4.2					3.4	
20	265	3.8					3.4	
21	276	3.6					3.4	
22	282	3.5					3.6	
23	295	3.4					4.1	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 66*

Canberra, Australia (35.3°S, 149.0°E) April 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	327	4.0					3.5	
01	319	4.0					3.5	
02	320	3.8					3.2	
03	305	3.8					3.1	
04	293	3.7					3.0	
05	285	3.2					3.1	
06	296	3.0					2.9	
07	259	5.1					3.2	
08	268	6.5	252	3.8		2.5	3.5	
09	284	7.4	244	4.1	109	2.8	4.2	
10	278	7.7	234	4.3	110	3.0	4.6	
11	282	8.1	224	4.4	110	3.2	4.8	
12	288	8.1	229	4.5	110	3.3	4.8	
13	290	8.5	230	4.4	110	3.2	5.0	
14	288	8.3	243	4.2	109	3.2	4.6	
15	272	8.1	247	4.0	110	2.9	4.2	
16	265	8.0	248	3.6		2.6	3.8	
17	254	7.7					3.6	
18	251	6.5					3.6	
19	265	5.3					3.3	
20	289	5.0					3.3	
21	298	4.6					3.9	
22	300	4.4					3.6	
23	308	4.1					3.4	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 67*

Canberra, Australia (35.3°S, 149.0°E) March 1941

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs**	F2-M3000
00	315	5.0					4.1	
01	307	4.8					3.4	
02	308	4.5					3.5	
03	308	4.1					3.4	
04	318	3.7					3.3	
05	337	3.4					3.1	
06	302	3.7					3.0	
07	281	5.2				2.1	3.3	
08	307	6.2	254	4.0	106	2.7	3.9	
09	316	6.8	244	4.3	106	3.0	4.5	
10	322	7.3	228	4.6	105	3.2	5.0	
11	324	7.6	220	4.7	105	3.4	4.7	
12	328	8.2	213	4.8	104	3.5	4.8	
13	315	8.5	217	4.8	103	3.5	4.9	
14	310	8.3	233	4.6	103	3.4	4.1	
15	301	8.1	239	4.4	106	3.2	3.9	
16	299	7.9	249	4.1	108	2.9	3.6	
17	287	7.8	266	3.6		2.4	3.6	
18	268	7.8					3.4	
19	262	7.4					3.8	
20	278	6.2					3.5	
21	305	5.5					3.1	
22	317	5.3					3.6	
23	320	5.1					4.0	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 68*

Canberra, Australia (35.3°S, 149.0°E) February 1941

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs**	F2-M3000
00	306	5.7					4.4	
01	302	5.4					4.1	
02	304	4.8					3.8	
03	304	4.2					3.7	
04	329	3.8					3.4	
05	337	3.4					3.1	
06	295	4.1					3.2	
07	321	5.1	252	3.8		2.4	3.8	
08	350	5.9	247	4.2	102	2.9	4.5	
09	376	6.4	236	4.5	104	3.2	5.0	
10	358	7.0	222	4.7	104	3.4	6.1	
11	350	7.4	213	4.8	102	3.5	6.4	
12	359	7.4	215	4.8	101	3.6	5.8	
13	341	7.6	219	4.8	101	3.5	5.6	
14	333	7.6	233	4.8	101	3.5	5.4	
15	328	7.4	232	4.6	102	3.4	5.2	
16	319	7.4	242	4.4	104	3.2	4.6	
17	302	7.0	259	4.0	104	2.8	4.2	
18	285	7.1				2.2	4.0	
19	271	7.1					3.9	
20	279	6.6					4.4	
21	297	6.3					4.0	
22	315	6.0					4.5	
23	332	5.8					4.5	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

Table 69*

Canberra, Australia (35.3°S, 149.0°E) January 1941

Time	h'F2	foF2	h'F1	FoF1	h'E	foE	fEs**	F2-M3000
00	295	6.3					4.4	
01	295	5.6					4.3	
02	296	5.1					3.7	
03	314	4.7					3.8	
04	313	4.4					3.4	
05	297	4.2					3.2	
06	284	5.0	240	3.4		2.3	3.7	
07	329	5.7	242	4.0	107	2.7	4.5	
08	345	6.3	229	4.5	103	3.1	5.1	
09	352	6.8	230	4.7	105	3.4	5.5	
10	363	7.2	227	4.8	103	3.5	5.9	
11	362	7.4	232	4.9	105	3.6	6.4	
12	379	7.5	230	4.9	104	3.6	6.1	
13	383	7.6	236	4.9	103	3.6	6.1	
14	372	7.7	241	4.8	104	3.5	5.9	
15	356	7.7	237	4.7	107	3.5	5.7	
16	341	7.6	235	4.6	105	3.3	4.9	
17	314	7.4	231	4.2	106	2.9	5.2	
18	289	7.2	226	3.7		2.4	5.7	
19	275	6.8					6.3	
20	293	6.9					5.8	
21	312	7.0					5.2	
22	311	7.1					4.2	
23	302	6.8					4.6	

Time: 150.0°E.
Sweep: 1.6 Mc to 12.5 Mc in 2 minutes.
*Average values.
**Abnormal E.

TABLE 70

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

Form adopted June 1946

IONOSPHERIC DATA

h'F2 (Characteristic), km (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	c	c	c	c	(280)	(270)	(270)	(260)	[260]c	260	(280)	c				c
2	c					c	c	c	c	c	c	c	240	250	270	250	230	(230)	270	c				c
3	c					c	c	c	c	c	c	c	(250)	240	250	250	240	240	270	c				c
4	c					c	c	c	(300)	300	280	270	240	300	(260)	[270]c	(290)	(270)	(300)	c				c
5	c					c	c	c	(250)	250	260	240	300	290	250	(250)	260	230	230	c				c
6	c					c	280	240	210	220	230	230	290	270	260	250	250	260	c	c				c
7	c					c	c	c	270	270	270	270	280	280	280	280	240	280	270	c				c
8	c					c	c	c	300	270	300	300	300	300	250	250	250	250	c	c				c
9	c					c	320	310	250	270	250	270	270	250	260	240	240	250	260	c				c
10	c					c	c	c	270	270	270	270	270	240	230	220	250	260	280	240	240	240	270	270
11	300	(270)	280	c	c	260	280	250	250	260	290	270	250	270	260	270	260	250	260	c				c
12	c					c	(260)	270	250	260	260	250	250	250	250	260	260	260	270	c				c
13	c					c	260	280	260	250	260	250	270	250	230	260	260	260	260	c				c
14	c					c	(260)	260	250	250	270	280	270	270	270	280	270	280	280	c				c
15	c					c	(310)	320	280	270	260	270	250	270	270	230	220	230	230	c				c
16	c					c	cK	cK	310K	eK	eK	cK	cK	(520)K	(500)K	(470)K	(420)K	(230)K	250K	c				c
17	c					c	(380)K	(300)K	(270)	270	260	250	250	250	250	260	250	250	250	c				c
18	c					c	300	(280)	270	260	250	250	230	270	230	230	250	270	260	c				c
19	c					c	280	260	250	250	250	230	270	230	230	230	250	270	250	c				c
20	c					c	c	250	260	250	270	280	280	280	[270]c	270	250	260	260	c				c
21	c					c	270	270	260	260	260	[260]c	260	240	[250]c	250	260	270	270	c				c
22	c					c	c	280	250	260	250	250	270	[260]c	250	250	260	260	250	c				c
23	c					c	290	300	260	250	250	250	240	250	250	250	250	260	250	c				c
24	c					c	320	310	250	250	280	270	270	[250]c	250	260	250	270	250	c				c
25	c					c	300	270	250	240	230	230	250	230	260	260	270	270	260	c				c
26	c					c	310	280	260	260	270	270	250	250	250	250	270	280	260	c				c
27	c					c	280	280	270	270	270	250	250	250	250	260	270	290	280	c				c
28	c					c	300	280	280	260	270	270	250	250	250	250	(280)	(280)	280	c				c
29																								
30																								
31																								
Median							290	280	260	260	260	265	260	250	250	250	255	260	260					
Count							17	19	25	24	24	24	27	28	28	28	28	28	26					

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 703519

TABLE 71

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

Form adopted June 1946

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	C	C	C	12.9	12.7	12.6	12.6	[12.0]^{C}	11.0	10.5	C →				→ C
2	C →					→ C	C	C	C	C	(12.6)	[12.6]^{C}	12.6	12.4	12.3	12.2	(12.1)	11.1	10.9	C →				→ C
3	C →					→ C	C	C	C	C	C	C	12.0	12.6	13.3	13.2	12.8	11.7	(11.3)	C →				→ C
4	C →					→ C	C	C	8.0	10.0	11.2	12.8	13.3^{F}	12.1	12.2	[12.3]^{C}	12.3	11.5	10.0	C →				→ C
5	C →					→ C	C	(5.7)	(8.7)	9.7	11.3	11.7	12.2	12.0	12.0	12.1	12.3	11.5	9.5	C →				→ C
6	C →					→ C	C	(6.0)^{F}	(8.8)^{J}	10.9	12.8	12.9	13.3	13.3	13.5	13.3	13.1	12.4	C	C →				→ C
7	C →					→ C	C	C	9.0	11.4	12.1	12.5	12.9	12.3	12.4	13.3	13.6	12.6	11.8	C →				→ C
8	C →					→ C	C	(6.0)^{J}	(9.0)	(9.7)^{J}	10.8	(11.8)^{J}	11.9	12.4	12.3	12.4	12.5	12.4	C	C →				→ C
9	C →					→ C	5.9	(6.8)^{J}	(9.8)^{J}	11.7	13.7	13.6	12.5	12.9	13.3	13.4	13.1	12.9	12.8	C →				→ C
10	C →					→ C	(4.6)^{J}	[7.0]^{C}	(10.7)^{J}	12.1	12.8	13.5	14.4	14.4	14.0	13.6	13.3	13.0	12.0	10.7	9.3	8.0	6.9^{F}	6.4^{F}
11	6.1^{F}	5.9^{F}	6.0	C	C	5.5^{F}	5.1^{F}	6.9^{F}	11.3	11.6	13.0	13.3	13.8	13.5	13.2	13.4	13.0	12.2	11.3	C →				→ C
12	C →					→ C	(5.2)^{F}	7.5^{F}	10.5	11.9	12.7	12.7	13.0	13.1	13.1	12.9	12.6	12.0	11.2	C →				→ C
13	C →					→ C	5.1	7.4	9.5	11.8	13.3	13.5	13.5	13.4	13.1	12.7	12.7	12.4	11.3	C →				→ C
14	C →					→ C	5.3	7.5	11.9	11.7	13.2	13.7	13.8	13.8	12.8	13.4	12.5	12.6	12.0	C →				→ C
15	C →					→ C	(5.0)	6.6	10.3	12.1	12.9	13.2	13.5	12.9	13.1	13.0	12.8	12.6	11.9	C →				→ C
16	C →					→ C	C^{K}	C^{K}	(5.7)$^{J}_{K}$	5.5^{K}	C^{K}	C^{K}	C^{K}	<5.3$^{E}_{K}$	6.9$^{F}_{K}$	7.0$^{F}_{K}$	7.4$^{F}_{K}$	7.8$^{F}_{K}$	7.5$^{F}_{K}$	C →				→ C
17	C →					→ C	(5.8)$^{J}_{K}$	(6.5)^{K}	(7.6)	8.4	10.5	12.0	12.7	12.9	12.5	12.1	11.7	11.2^{F}	(10.6)^{J}	C →				→ C
18	C →					→ C	(6.9)^{F}	7.8^{F}	9.8	11.4	11.8	12.9	13.0	12.9	13.0	12.7	12.6	12.5	12.0	C →				→ C
19	C →					→ C	5.2	6.7^{F}	(9.0)	11.6	12.4	12.8	14.0	14.1	13.9	12.9	13.0	12.8	12.1	C →				→ C
20	C →					→ C	(4.2)^{J}	(7.0)	(10.2)	11.7	12.4	12.5	13.2^{J}	13.1	12.6	12.5	12.1	11.7	11.2	C →				→ C
21	C →					→ C	C	(6.7)	9.2	11.8	(12.0)	C	C	12.5	[12.5]^{C}	12.3	12.0	12.3	11.7	C →				→ C
22	C →					→ C	C	6.3	10.3	11.3	12.3	13.1	12.8	[12.7]^{C}	12.8	12.6	12.2	12.1	11.4	C →				→ C
23	C →					→ C	5.4	6.8	9.9	11.5	12.5	12.4	13.0	12.6	12.4	12.0	12.1	11.4	10.5	C →				→ C
24	C →					→ C	(5.0)^{F}	6.8^{F}	9.5	10.7	12.4	12.4	12.9	[12.9]^{C}	12.6	12.5	12.5	12.3	11.9	C →				→ C
25	C →					→ C	5.3	(6.9)^{J}	9.9	11.8	12.3	13.3	13.8	13.6	13.0	12.9	12.9	12.5	12.3	C →				→ C
26	C →					→ C	5.2	7.5	(10.0)	(12.3)	12.5	12.8	13.2	13.0	13.1	12.8	12.8	12.4	11.4	C →				→ C
27	C →					→ C	(5.5)	6.7	9.6	11.3	12.8	13.2	12.8	13.1	12.8	13.1	12.7	12.5	11.8	C →				→ C
28	C →					→ C	5.3	8.5	10.0	11.1	11.7	12.8	12.9	13.1	12.6	12.9	12.5	12.2	11.6	C →				→ C
29																								
30																								
31																								
Median							5.2	6.8	9.8	11.5	12.4	12.8	13.0	12.9	12.8	12.8	12.6	12.3	11.4					
Count							17	22	25	25	25	24	26	28	28	28	28	28	26					

Feb. 1-5 4.6 Mc to 17.0 Mc

Feb. 6-28 3.1 Mc to 17.0 Mc

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

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

Form adopted June 1946

TABLE 72

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

IONOSPHERIC DATA

f°F2 (Characteristic), Mc (Unit), February (Month), 1947

Observed at Washington, D.C.

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

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C →					→ C	C	C	C	C	C	C	[12.8]^{C}	[12.7]^{C}	[12.6]^{C}	[12.4]^{C}	[11.7]^{C}	[10.8]^{C}	C →					→ C		
2	C →					→ C	C	C	C	C	[12.6]^{C}	[12.6]^{C}	[12.5]^{C}	[12.4]^{C}	[12.3]^{C}	[12.2]^{C}	[11.5]^{C}	[11.0]^{C}	C →					→ C		
3	C →					→ C	C	C	C	C	C	C	[12.3]^{C}	[12.1]^{C}	[13.3]^{C}	[13.1]^{C}	[12.5]^{C}	[11.5]^{C}	C →					→ C		
4	C →					→ C	C	C	[9.0]^{C}	[10.5]^{C}	[12.0]^{K}	[13.3]^{C}	[12.5]^{C}	[12.2]^{C}	[12.3]^{C}	[12.3]^{C}	[12.0]^{C}	[10.8]^{C}	C →					→ C		
5	C →					→ C	C	[8.0]^{C}	[9.2]^{C}	[10.8]^{C}	[11.5]^{C}	[12.0]^{C}	[12.1]^{C}	[12.2]^{C}	[12.0]^{C}	[12.3]^{C}	[12.0]^{C}	[11.0]^{C}	C →					→ C		
6	C →					→ C	C	[8.2]^{C}	[9.4]^{C}	[12.6]^{C}	[12.9]^{C}	[13.1]^{C}	[13.3]^{C}	[13.4]^{C}	[10.4]^{C}	[13.2]^{C}	[12.8]^{K}	C	C →					→ C		
7	C →					→ C	C	C	[10.1]^{C}	[11.8]^{C}	[12.3]^{C}	[12.7]^{C}	[12.8]^{C}	[12.3]^{C}	[12.8]^{C}	[13.5]^{C}	[13.3]^{C}	[12.2]^{C}	C →					→ C		
8	C →					→ C	C	[7.6]^{C}	[9.4]^{C}	[9.9]^{C}	[11.4]^{C}	[11.9]^{C}	[12.3]^{C}	[12.4]^{C}	[12.3]^{C}	[12.5]^{C}	[12.3]^{C}	C	C →					→ C		
9	C →					→ C	[6.4]^{C}	[7.8]^{C}	[10.9]^{C}	[12.7]^{C}	[13.7]^{C}	[13.2]^{C}	[12.7]^{C}	[13.2]^{C}	[13.4]^{C}	[13.3]^{C}	[13.0]^{C}	[12.9]^{C}	C →					→ C		
10	C →					→ C	[5.5]^{C}	[9.3]^{C}	[11.5]^{C}	[12.5]^{C}	[13.0]^{K}	[14.1]^{C}	[14.4]^{C}	[14.3]^{C}	[13.7]^{C}	[13.5]^{C}	[13.3]^{C}	[12.5]^{C}	[11.6]^{C}	[9.9]^{C}	[8.1]^{C}	[7.5]^{C}	[6.7]^{C}	[6.2]^{C}		
11	[6.0]^{C}	[5.9]^{C}	C	C	C	[5.1]^{C}	[5.4]^{C}	[8.7]^{C}	[11.5]^{C}	[12.2]^{C}	[13.2]^{C}	[13.5]^{C}	[13.5]^{C}	[13.5]^{C}	[13.5]^{C}	[13.3]^{C}	[12.6]^{C}	[11.7]^{C}	C →					→ C		
12	C →					→ C	[6.3]^{C}	[9.0]^{C}	[11.3]^{C}	[12.4]^{C}	[12.7]^{C}	[12.8]^{C}	[13.1]^{C}	[13.1]^{C}	[13.3]^{C}	[12.8]^{C}	[12.3]^{C}	[11.7]^{C}	C →					→ C		
13	C →					→ C	[6.2]^{C}	[8.5]^{C}	[11.0]^{C}	[12.7]^{C}	[13.4]^{C}	[13.5]^{C}	[13.5]^{C}	[13.3]^{C}	[12.7]^{C}	[12.7]^{C}	[12.6]^{C}	[12.0]^{C}	C →					→ C		
14	C →					→ C	[6.0]^{C}	[10.0]^{C}	[11.2]^{C}	[12.6]^{C}	[13.5]^{C}	[13.5]^{C}	[13.5]^{C}	[13.6]^{C}	[12.7]^{C}	[13.3]^{C}	[12.5]^{C}	[12.5]^{C}	C →					→ C		
15	C →					→ C	[5.2]^{C}	[8.7]^{C}	[11.3]^{C}	[12.6]^{C}	[13.0]^{C}	[13.4]^{C}	[13.4]^{C}	[13.0]^{C}	[13.2]^{C}	[12.9]^{C}	[12.7]^{C}	[12.3]^{C}	C →					→ C		
16	C →					→ C	C^{K}	C^{K}	[5.6]$^{C}_{K}$	C^{K}	C^{K}	C^{K}	C^{K}	C^{K}	[6.7]$^{C}_{K}$	[7.2]$^{C}_{K}$	[7.6]$^{C}_{K}$	[7.7]$^{C}_{K}$	C →					→ C		
17	C →					→ C	[6.1]$^{C}_{K}$	[6.9]$^{C}_{K}$	[8.0]^{C}	[9.3]^{C}	[11.4]^{C}	[12.6]^{C}	[12.8]^{C}	[12.8]^{C}	[12.3]^{C}	[11.9]^{C}	[11.5]^{C}	[10.9]^{C}	C →					→ C		
18	C →					→ C	[7.1]^{C}	[8.9]^{C}	[10.7]^{C}	[11.6]^{C}	[12.2]^{C}	[13.2]^{C}	[13.0]^{C}	[12.7]^{C}	[13.0]^{C}	[12.6]^{C}	[12.6]^{C}	[12.3]^{C}	C →					→ C		
19	C →					→ C	[6.0]^{C}	[7.8]^{C}	[10.3]^{C}	[12.2]^{C}	[12.6]^{C}	[13.5]^{C}	[14.1]^{C}	[14.0]^{C}	[13.5]^{C}	[12.9]^{C}	[12.9]^{C}	[12.4]^{C}	C →					→ C		
20	C →					→ C	[5.5]^{C}	[8.5]^{C}	[11.0]^{C}	[12.3]^{C}	[12.4]^{C}	[13.1]^{C}	[13.2]^{C}	[12.8]^{C}	[12.5]^{C}	[12.4]^{C}	[11.9]^{C}	[11.5]^{C}	C →					→ C		
21	C →					→ C	C	[8.0]^{C}	[10.6]^{C}	[11.9]^{C}	C	C	C	[12.5]^{C}	[12.4]^{C}	[12.2]^{C}	[12.1]^{C}	[12.2]^{C}	C →					→ C		
22	C →					→ C	C	[8.3]^{C}	[10.9]^{K}	[11.9]^{C}	[12.9]^{C}	[13.0]^{C}	[12.7]^{C}	[12.8]^{C}	[12.7]^{C}	[12.4]^{C}	[12.1]^{C}	[12.0]^{C}	C →					→ C		
23	C →					→ C	[6.1]^{C}	[8.3]^{C}	[10.7]^{C}	[12.2]^{C}	[12.5]^{K}	[12.4]^{C}	[12.9]^{C}	[12.5]^{C}	[12.2]^{C}	[12.1]^{C}	[11.7]^{C}	[11.0]^{C}	C →					→ C		
24	C →					→ C	[6.0]^{C}	[8.0]^{C}	[10.2]^{C}	[11.5]^{C}	[12.4]^{C}	[12.6]^{C}	[12.9]^{C}	[12.8]^{C}	[12.6]^{C}	[12.5]^{C}	[12.4]^{C}	[12.2]^{C}	C →					→ C		
25	C →					→ C	[6.0]^{C}	[8.1]^{C}	[11.0]^{C}	[12.2]^{C}	[12.5]^{C}	[13.7]^{C}	[13.5]^{C}	[13.3]^{C}	[12.7]^{C}	[12.9]^{C}	[12.8]^{C}	[12.3]^{C}	C →					→ C		
26	C →					→ C	[6.4]^{C}	[8.8]^{C}	[11.4]^{C}	[12.4]^{C}	[12.7]^{C}	[13.0]^{C}	[13.2]^{C}	[13.0]^{C}	[12.9]^{C}	[12.8]^{C}	[12.6]^{C}	[11.9]^{C}	C →					→ C		
27	C →					→ C	[6.2]^{C}	[8.5]^{C}	[10.6]^{C}	[12.1]^{C}	[13.0]^{C}	[13.0]^{C}	[13.0]^{C}	[13.3]^{C}	[12.9]^{C}	[12.9]^{C}	[12.6]^{C}	[12.2]^{C}	C →					→ C		
28	C →					→ C	[6.7]^{C}	[9.4]^{C}	[10.6]^{C}	[11.4]^{C}	[12.2]^{C}	[12.9]^{C}	[13.2]^{C}	[13.0]^{C}	[12.7]^{C}	[12.8]^{C}	[12.3]^{C}	[12.0]^{C}	C →					→ C		
29																										
30																										
31																										
Median							(6.1)	(8.4)	(10.7)	(12.2)	(12.6)	(13.0)	(13.0)	(12.9)	(12.8)	(12.8)	(12.5)	(12.0)								
Count							17	22	25	24	24	24	26	27	28	28	28	26								

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 703339

Form adopted June 1946

TABLE 73

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

IONOSPHERIC DATA

h'F1 (Characteristic), km (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1																										
2																										
3																										
4														260												
5													C	C												
6													240	220												
7																										
8																										
9																										
10																										
11																										
12																										
13													230													
14																										
15																										
16								K	K	K	K	K	C K	240 K	230 K	230 K	240 K	K								
17								K	K																	
18														230												
19													230													
20																										
21																										
22																										
23																										
24																										
25																										
26																										
27																										
28																										
29																										
30																										
31																										
Median																										
Count																										

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U.S. GOVERNMENT PRINTING OFFICE 1946 O - 705516

TABLE 74

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

Form adopted June 1940

IONOSPHERIC DATA

f° F1 (Characteristic), Mc (Unit) February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by M.S.L., J.M.C.

Calculated by R.C.C., V.C.A.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1																										
2																										
3																										
4														L												
5													L	L												
6													L	L												
7																										
8																										
9																										
10																										
11																										
12																										
13													L													
14																										
15																										
16							K	K	K	K	K	K	C K	5.3 K	5.4 K	6.0 K	L K	K								
17							K	K																		
18														L												
19													L													
20																										
21																										
22																										
23																										
24																										
25																										
26																										
27																										
28																										
29																										
30																										
31																										
Median																										
Count																										

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

TABLE 75

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

Form adopted June 1946

IONOSPHERIC DATA

h' E (Characteristic), km (Unit), February (Month), 1947

Observed at Washington, D.C.

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

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	E*	E	E	E	E	E					
2								C	C	C	E	E	E	E	E	E	E	E					
3								C	C	C	C	C	E	E	E	E	E	E					
4								E	E	E	E	E	E	E	E	E	E	E					
5								E	E	E	E	E	E	E	E	E	E	E					
6								E	E	E	E	E	(110)	(130)M	E	E	E	E					
7								E	E	E	E	E	E	E	E	E	E	E					
8								E	E	E	E	E	E	E	E	E	E	E					
9								E	E	E	E	E	E	E	E	E	E	E					
10								E	E	E	E	E	E	E	E	E	E	E					
11								E	E	E	E	E	E	E	E	E	E	E					
12								E	E	E	E	E	E	E	E	(120)	E	E					
13								E	—	E	E	(140)	(120)	E	E	E	E	E					
14								E	E	E	E	E	E	E	E	E	E	E					
15								E	E	E	E	E	E	E	E	120	E	E					
16								EK	EK	EK	EK	EK	EK	(120)K	(120)K	(120)K	EK	EK					
17								EK	E	E	E	(130)	E	E	E	E	E	E					
18								E	E	E	E	(120)	E	(120)	E	E	E	E					
19								E	E	E	E	E	E	E	E	E	E	E					
20								E	E	E	E	E	E	E	E	E	E	E					
21								E	E	E	E	E	E	E	E	E	E	E					
22								E	E	E	E	E	E	E	E	E	E	E					
23								E	E	E	E	E	E	E	E	E	E	E					
24								E	E	E	E	(120)	(120)	C	E	E	E	E					
25								E	E	E	E	(130)	E	(110)	E	E	E	E					
26								E	E	E	E	E	(120)	E	E	E	E	E					
27								E	E	E	E	E	E	E	E	E	E	E					
28								E	E	E	E	E	(130)	E	E	E	E	E					
29																								
30																								
31																								
Median												(130)	(120)										
Count												5	5										

* Not meosurable because of limited sweep

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U.S. GOVERNMENT PRINTING OFFICE 1946 O 702519

Form adopted June 1946

TABLE 76

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

IONOSPHERIC DATA

f°E (Characteristic), Mc (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	E	E	E	E	E	E						
2								C	C	C	E	E	E	E	E	E	E	E						
3								C	C	C	C	C	E	E	E	E	E	E						
4								E	E	E	E	E	E	E	E	E	E	E						
5								E	E	E	E	E	E	E	E	E	E	E						
6								E	E	E	E	(3.4)	3.6	(3.7)[H]	E	E	E	E						
7								E	E	E	E	E	E	E	E	E	E	E						
8								E	E	E	E	E	E	E	E	(3.3)	E	E						
9								E	E	E	E	E	E	E	E	E	E	E						
10								E	E	E	E	E	E	(3.9)	E	E	E	E						
11								E	E	E	E	E	E	E	E	E	E	E						
12								E	E	E	E	E	E	E	E	(3.4)	E	E						
13								E	E	E	E	(3.7)	(3.8)	E	E	E	E	E						
14								E	E	E	E	E	E	E	E	E	E	E						
15								E	E	E	E	E	E	E	E	(3.6)	E	E						
16								E[K]	E[K]	E[K]	E[K]	E[K]	E[K]	(3.8)[K]	(3.5)[K]	(3.5)[K]	E[K]	E[K]						
17								E[K]	E	E	E	A	E	E	E	E	E	E						
18								E	E	E	E	(3.7)	E	(3.8)	E	E	E	E						
19								E	E	E	E	E	E	E	E	E	E	E						
20								E	E	E	E	E	E	E	E	E	E	E						
21								E	E	E	E	E	E	E	E	E	E	E						
22								E	E	E	E	E	E	E	E	E	E	E						
23								E	E	E	E	(3.7)	(3.8)	E	E	E	E	E						
24								E	E	E	E	(3.7)	(4.0)	C	E	E	E	E						
25								E	E	E	E	(3.5)	E	(3.7)	E	E	E	E						
26								E	E	E	E	E	(3.8)	E	E	E	E	E						
27								E	E	E	E	E	E	E	E	E	E	E						
28								E	E	E	E	E	(3.9)	E	E	E	E	E						
29																								
30																								
31																								
								Data considered insufficient and inaccurate																
Median																								
Count																								

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U. S. GOVERNMENT PRINTING OFFICE 1948 O - 708519

Form adopted June 1946

TABLE 77

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

IONOSPHERIC DATA

E_s (Characteristic), Mc-km (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat. 39.0°N, Long. 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
2	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
3	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
4	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
5	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
6	C					C	E	E	E	E	E	E	E	3.5 100	4.9 150	E	E	E	E	C				C
7	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
8	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
9	C					C	E	E	E	3.5 150	E	E	E	E	E	3.3 150	E	E	E	C				C
10	C					C	E	E	E	E	E	E	E	E	E	E	E	5.0 150	E	E	3.2 120	4.7 120	3.7 120	E
11	E	E	E	C	C	E	E	E	3.5 120	E	E	E	3.5 150	(3.1) 160	E	(3.1) 160	E	E	E	C				C
12	C					C	E	E	E	E	3.5 150	3.5 150	E	3.5 150	E	E	E	E	E	C				C
13	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
14	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
15	C					C	E	E	E	E	E	E	E	E	E	E		E	E	C				C
16	C					C	E K	E K	E K	E K	E K	E K	E K	E K	E K	E K	E K	E K	E K	C				C
17	C					C	E	E K	E	E	E	(3.8) (130)	E	E	E	E	E	E	E	C				C
18	C					C	E	E	E	E	E	E	E	E	F	E	E	E	E	C				C
19	C					C	E	E	E	E	E	E	E	F	E	E	E	E	E	C				C
20	C					C	E	(5.0) 130	E	E	E	E	E	F	E	E	F	E	E	C				C
21	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
22	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
23	C					C	E	E	E	E	E	E	F	E	E	E	E	E	E	C				C
24	C					C	E	E	E	E	E	E	E	E	E	E	F	E	E	C				C
25	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
26	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
27	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
28	C					C	E	E	E	E	E	E	E	E	E	E	E	E	E	C				C
29																								
30																								
31																								
Median																								
Count																								

Sweep____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U.S. GOVERNMENT PRINTING OFFICE: 1946 O - 718619

Form adopted June 1945

TABLE 78

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

IONOSPHERIC DATA

F2-MI500 (Characteristic), ____ (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	C	C	C	2.0	1.9	1.9	1.9	C	2.0	2.1	C				C
2	C					C	C	C	C	C	(2.1)	C	2.0	2.0	2.1	2.0	(2.0)	2.0	2.0	C				C
3	C					C	C	C	C	C	C	C	(2.1)	1.9	1.9	1.9	2.0	2.1	2.0	C				C
4	C					C	C	C	1.9	1.8	1.8	1.8	2.0^{F}	2.0	2.1	C	1.7	1.7	1.8	C				C
5	C					C	C	(1.8)	(2.0)	2.0	1.9	2.2	1.9	1.9	1.9	1.8	1.9	2.1	2.0	C				C
6	C					C	C	(2.0)^{F}	(2.4)^{J}	2.1	2.1	2.0	1.8	1.9	1.8	1.9	2.0	2.0	C	C				C
7	C					C	C	C	2.1	2.1	2.0	1.9	1.9	1.9	1.8	1.8	2.0	1.8	1.8	C				C
8	C					C	C	(1.8)^{J}	(2.1)	(1.8)^{J}	1.9	(1.9)^{J}	1.7	1.7	1.9	1.8	1.9	1.8	C	C				C
9	C					C	1.6	(1.9)^{J}	(2.2)^{J}	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.8	1.9	C				C
10	C					C	(1.9)^{J}	C	(2.1)^{J}	2.0	1.9	1.8	1.7	1.9	1.9	1.9	1.8	1.8	1.8	2.0	2.1	2.1	1.9^{F}	2.1^{F}
11	1.9^{F}	1.9^{F}	1.9	C	C	1.9^{F}	1.7^{F}	1.7^{F}	2.0	2.0	1.9	1.8	1.9	1.9	1.8	1.9	1.8	1.7	1.7	C				C
12	C					C	(1.8)^{F}	1.8^{F}	2.0	2.0	1.9	1.9	1.8	1.9	1.8	1.8	1.7	1.7	1.7	C				C
13	C					C	1.7	1.8	2.0	2.0	1.9	1.8	1.8	1.7	1.7	1.6	1.7	1.7	1.8	C				C
14	C					C	1.8	1.9	2.2	2.1	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.9	C				C
15	C					C	(1.7)	1.8	2.1	2.0	2.0	1.9	1.9	1.9	1.8	1.9	2.0	2.0	1.9	C				C
16	C					C	C^{K}	C^{K}	(1.7)$^{J}_{K}$	1.9^{K}	C^{K}	C^{K}	C^{K}	G$^{F}_{K}$	1.5$^{F}_{K}$	1.6$^{F}_{K}$	1.8$^{F}_{K}$	1.9$^{F}_{K}$	2.0$^{F}_{K}$	C				C
17	C					C	(1.7)$^{J}_{K}$	(1.7)^{K}	(1.8)	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.8^{F}	(1.7)^{J}	C				C
18	C					C	(1.6)^{F}	1.8^{F}	2.0	1.9	2.0	1.9	1.9	1.9	1.9	1.9	1.7	1.8	1.8	C				C
19	C					C	1.9	1.7^{F}	(2.0)	2.0	2.0	1.9	1.9	2.0	1.9	2.0	1.8	1.7	1.7	C				C
20	C					C	(1.7)^{J}	(1.8)	(2.0)	2.0	2.1	1.9	(1.8)^{J}	1.8	1.8	1.9	1.8	1.8	1.7	C				C
21	C					C	C	(1.8)	2.2	2.0	(2.0)	C	C	1.8	C	1.8	1.8	1.8	1.8	C				C
22	C					C	C	1.9	2.0	2.1	1.9	1.8	1.9	C	1.8	1.9	1.8	1.9	1.9	C				C
23	C					C	1.6	1.8	2.1	2.2	2.0	1.9	2.0	1.9	1.8	1.8	1.8	2.0	1.9	C				C
24	C					C	(1.5)^{F}	1.7^{F}	2.1	2.1	2.1	1.8	1.9	C	1.8	1.8	1.9	2.0	2.0	C				C
25	C					C	1.8	(1.8)^{J}	2.2	2.1	2.1	2.1	1.9	2.0	1.9	1.9	1.9	2.0	1.9	C				C
26	C					C	1.9	2.0	(2.1)	(2.1)	2.0	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.8	C				C
27	C					C	(1.9)	2.0	2.1	1.9	2.0	1.9	1.9	1.8	1.8	1.7	1.8	1.9	1.9	C				C
28	C					C	1.9	1.9	1.9	2.0	2.0	1.9	1.8	1.8	1.7	1.7	1.8	1.7	1.8	C				C
29																								
30																								
31																								
Median							1.7	1.8	2.1	2.0	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.8	1.8					
Count							17	21	25	25	25	23	26	26	27	27	27	28	26					

Sweep ____ Mc to ____ Mc in ____ min

Manual ☒ Automatic ☐

U. S. GOVERNMENT PRINTING OFFICE: 1946 O - 725518

Form adopted June 1946

TABLE 79

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

IONOSPHERIC DATA

F2 - M3000, ____ (Characteristic) (Unit) February (Month), 1947

National Bureau of Standards (Institution)

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75°W Mean Time

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	C	C	C	3.0	2.9	2.8	2.8	C	3.0	3.1	C				C
2	C					C	C	C	C	C	(3.1)	C	2.9	2.9	3.1	3.0	(2.9)	2.9	2.9	C				C
3	C					C	C	C	C	C	C	C	(3.1)	2.9	2.8	2.9	3.0	3.1	(2.9)	C				C
4	C					C	C	C	2.9	2.7	2.7	2.8	3.0^F	3.0	3.0	C	2.7	2.7	2.7	C				C
5	C					C	C	(2.8)	(2.9)	3.0	2.9	3.2	2.9	2.8	2.8	2.8	2.9	3.0	3.0	C				C
6	C					C	C	$(2.9)^F$	$(3.5)^J$	3.1	3.1	2.9	2.7	2.8	2.8	2.8	3.0	2.9	C	C				C
7	C					C	C	C	3.1	3.1	3.0	2.9	2.8	2.8	2.7	2.7	2.9	2.8	2.7	C				C
8	C					C	C	$(2.7)^J$	(3.1)	$(2.8)^J$	2.9	$(2.8)^J$	2.6	2.6	2.8	2.8	2.9	2.8	C	C				C
9	C					C	2.5	$(2.9)^J$	$(3.3)^J$	3.0	2.9	3.0	3.0	2.8	2.8	2.8	2.8	2.8	2.8	C				C
10	C					C	$(2.9)^J$	C	$(3.2)^J$	3.0	2.8	2.7	2.7	2.9	2.9	2.9	2.8	2.8	2.7	2.9	3.1	3.1	2.9^F	3.1^F
11	2.9^F	2.9^F	2.8	C	C	2.8^F	2.5^F	2.5^F	2.9	3.0	2.8	2.7	2.9	2.8	2.8	2.8	2.7	2.6	2.6	C				C
12	C					C	$(2.7)^F$	2.7^F	3.0	3.0	2.9	2.8	2.7	2.8	2.7	2.7	2.6	2.7	2.7	C				C
13	C					C	2.7	2.7	3.0	3.0	2.8	2.7	2.7	2.6	2.6	2.5	2.7	2.6	2.7	C				C
14	C					C	2.8	2.9	3.2	3.2	2.9	2.8	2.8	2.8	2.8	2.7	2.7	2.8	2.8	C				C
15	C					C	(2.6)	2.7	3.1	3.0	3.0	2.9	2.9	2.8	2.7	2.8	2.9	3.0	2.9	C				C
16	C					C	C^K	C^K	$(2.5)^J$	2.9^K	C^K	C^K	C^K	Q^F_K	2.4^F_K	2.4^F_K	2.7^F_K	2.8^F_K	2.9^F_K	C				C
17	C					C	$(2.6)^J_K$	$(2.4)^K$	(2.8)	2.7	2.8	2.7	2.7	2.7	2.7	2.8	2.8	2.7^F	$(2.7)^J$	C				C
18	C					C	$(2.4)^F$	2.8^F	2.9	2.8	2.9	2.9	2.8	2.9	2.8	2.9	2.6	2.7	2.7	C				C
19	C					C	2.8	2.5^F	(3.0)	2.9	2.9	2.9	2.9	2.9	2.8	2.9	2.7	2.7	2.6	C				C
20	C					C	$(2.6)^J$	(2.7)	(3.0)	3.0	3.1	2.9	$(2.8)^J$	2.7	2.8	2.8	2.7	2.7	2.6	C				C
21	C					C	C	(2.8)	3.2	2.9	(3.0)	C	C	2.7	C	2.7	2.7	2.7	2.8	C				C
22	C					C	C	2.9	3.0	3.1	2.9	2.7	2.8	C	2.8	2.8	2.7	2.8	2.8	C				C
23	C					C	2.5	2.8	3.1	3.2	3.0	2.8	3.0	2.8	2.7	2.7	2.8	3.0	2.9	C				C
24	C					C	$(2.3)^F$	2.6^F	3.1	3.1	3.0	2.8	2.8	C	2.7	2.7	2.9	3.0	2.9	C				C
25	C					C	2.8	$(2.7)^J$	3.2	3.1	3.1	3.1	2.9	3.0	2.8	2.8	2.9	2.9	2.9	C				C
26	C					C	2.8	3.0	(3.1)	(3.1)	3.0	3.0	2.9	2.8	2.7	2.8	2.7	2.7	2.9	C				C
27	C					C	(2.9)	3.0	3.1	2.9	3.0	2.8	2.9	2.7	2.7	2.6	2.8	2.7	2.8	C				C
28	C					C	2.9	2.9	2.9	3.0	2.9	2.9	2.8	2.8	2.6	2.6	2.7	2.6	2.7	C				C
29																								
30																								
31																								
Median							2.7	2.8	3.1	3.0	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8					
Count							17	21	26	25	26	23	26	26	27	27	27	28	26					

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

U. S. GOVERNMENT PRINTING OFFICE 1946 O - 705319

Form adopted June 1946

TABLE 80

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

IONOSPHERIC DATA

F1-M3000 (Characteristic), ____ (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat. 39.0°N, Long. 77.5°W

75°W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22 •	23
1																								
2																								
3																								
4														L										
5													L	L										
6													L	L										
7																								
8																								
9																								
10																								
11																								
12																								
13													L											
14																								
15																								
16								K	K	K	K	K	C K	34F K	34K	31F K	L K	K						
17								K																
18														L										
19													L											
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
Median																								
Count																								

Sweep____Mc to____Mc in____min

Manual ☑ Automatic ☐

TABLE 81

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

Form adopted June 1946

IONOSPHERIC DATA

E - M1500 (Characteristic), _____ (Unit), February (Month), 1947

Observed at Washington, D.C.

Lat 39.0°N, Long 77.5°W

75° W Mean Time

National Bureau of Standards (Institution)

Scaled by: M.S.L., J.M.C.

Calculated by: R.C.C., V.C.A.

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	C	E*	E	E	E	E	E					
2								C	C	C	E	E	E	E	E	E	E	E					
3								C	C	C	C	C	E	E	E	E	E	E					
4								E	E	E	E	E	E	E	E	E	E	E					
5								E	E	E	E	E	E	E	E	E	E	E					
6								E	E	E	E	(4.2)	4.3	(4.1)H	E	E	E	E					
7								E	E	E	E	E	E	E	E	E	E	E					
8								E	E	E	E	E	E	E	E	(4.6)	E	E					
9								E	E	E	E	E	E	E	E	E	E	E					
10								E	E	E	E	E	E	(2.9)	E	E	E	E					
11								E	E	E	E	E	E	E	E	E	E	E					
12								E	E	E	E	E	E	E	E	(4.0)	E	E					
13								E	E	E	E	(4.1)	(3.9)	E	E	E	E	E					
14								E	E	E	E	E	E	E	E	E	E	E					
15								E	E	E	E	E	E	E	E	(4.5)	E	E					
16								E K	E K	E K	E K	E K	E K	(4.3) K	(4.6) K	(4.2) K	E K	E K					
17								E K	E	E	E	A	E	E	E	E	E	E					
18								E	E	E	E	(4.1)	E	(4.2)	E	E	E	E					
19								E	E	E	E	E	E	E	E	E	E	E					
20								E	E	E	E	E	E	E	E	E	E	E					
21								E	E	E	E	E	E	E	E	E	E	E					
22								E	E	E	E	E	E	E	E	E	E	E					
23								E	E	E	E	(3.8)	(3.6)	E	E	E	E	E					
24								E	E	E	E	(3.9)	(3.8)	C	E	E	E	E					
25								E	E	E	E	(4.2)	E	(4.4)	E	E	E	E					
26								E	E	E	E	E	(3.9)	E	E	E	E	E					
27								E	E	E	E	E	E	E	E	E	E	E					
28								E	E	E	E	E	(3.7)	E	E	E	E	E					
29																								
30																								
31																								
Median																								
Count																								

Sweep ____ Mc to ____ Mc in ____ min

Manual ☑ Automatic ☐

* Not determined because of limited sweep

U. S. GOVERNMENT PRINTING OFFICE: 1948 O - 703319

Table 82

Ionospheric Storminess, February 1947

Day Feb.	Ionosphere Character* 00-12 GCT	12-24 GCT	Principal Storms Beginning GCT	End GCT	Geomagnetic Character** 00-12 GCT	12-24 GCT
1	***	***			2	1
2	***	2			0	1
3	***	1			2	2
4	***	2			3	1
5	***	2			1	2
6	***	1			3	2
7	***	3			1	2
8	***	3			3	3
9	***	1			4	3
10	***	0			3	2
11	***	2			1	2
12	***	2			1	1
13	***	1			1	1
14	***	2			1	1
15	***	1			1	1
16	***	***	--//	---/	3	4
17	***	1	----	0300	5	2
18	***	1			2	2
19	***	1			2	4
20	***	2			2	1
21	***	1			0	1
22	***	1			0	1
23	***	2			0	0
24	***	2			1	2
25	***	1			2	2
26	***	1			3	2
27	***	1			1	0
28	***	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, magnetic K-figures on an arbitrary scale of 0 to 9, 9 representing the greatest disturbance.

***No readable record. Refer to Table 71 for detailed explanation.

/Dashes indicate continuing storm.

//Time of beginning unknown because of loss of record.

Table 83

Sudden Ionosphere Disturbances Observed at Washington, D.C.

1947 Day	GCT Beginning	GCT End	Location of Transmitters	Relative intensity at minimum*	Other Phenomena
February					
8	1409	1455	Ohio, D.C., England, Mexico, New York, Ontario	0.02	
8	1607	1700	Ohio, D.C., England, Mexico, New York, Ontario	0.0	
8	1735	1805	Ohio, D.C., Mexico, New York, Ontario	0.1	
8	1905	1940	Ohio, D.C., Mexico, New York, Ontario	0.03	
9	1839	1915	Ohio, D.C., Mexico, New York, Ontario	0.02	
10	1743	1815	Ohio, D.C., England, Mexico, New York, Ontario	0.02	
14	1354	1420	Ohio, D.C., England, Mexico, Ontario	0.2	
16	1452	1505	Ohio, D.C., Mexico, New York, Ontario	0.1	
16	1808	1950	Ohio, D.C., Mexico, Ontario	0.0	
25	2119	2150	Ohio, D.C., Mexico, Ontario	0.02	Terr.mag.pulse** 2118-2125
26	1034	1050	England	0.1	
28	1223	1310	England	0.02	
28	2011	2115	Ohio, D.C., England, Mexico, Ontario	0.0	

*Ratio of received field intensity during SID to average field intensity before and after, for station W8XAL, 6080 kilocycles, 600 kilometers distant, for all SID except the following: Station GLH, 13525 kilocycles, received in New York, 5340 kilometers distant, was used for the SID on February 26 and on February 28 at 1223.

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

Table 84

Sudden Ionosphere Disturbances Reported by Engineer-in-Chief

Cable and Wireless, Ltd.

1947 Day	GCT Beginning	GCT End	Receiving Station	Location of Transmitters
January 27	0853	1000	Brentwood, England	Belgian Congo, Bulgaria, Canary Islands, Greece, India, Iran, Kenya, Madagascar, Palestine, Southern Rhodesia, Spain, Turkey, U.S.S.R., Zanzibar
27	0855	0935	Somerton, England	Ceylon, Egypt, Gold Coast, India, Nigeria, Union of South Africa
February 7	1010	1055	Brentwood, England	Belgian Congo, Greece, Iran, Kenya, Portugal, Southern Rhodesia, Zanzibar
8	0950	1045	Brentwood, England	Austria, Belgian Congo, Brazil, Bulgaria, Canary Islands, Greece, India, Iran, Kenya, Madagascar, Malta, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Turkey, U.S.S.R., Yugoslavia, Zanzibar
8	0952	1020	Somerton, England	Argentina, Ceylon, China, Egypt, Gold Coast, India, Nigeria, Union of South Africa
8	1415	1445	Brentwood, England	Austria, Belgian Congo, Brazil, Chile, Colombia, Greece, Madagascar, Malta, Portugal, Spain, Switzerland, Uruguay, U.S.S.R., Zanzibar
	1420	1440	Somerton, England	Argentina, Ascension Island, Barbados, Canada, Gold Coast, New York, Union of South Africa
10	0850	0915	Brentwood, England	Austria, Belgian Congo, French Equatorial Africa, Greece, India, Iran, Kenya, Madagascar, Portugal, Southern Rhodesia, Spain, Syria, Turkey, U.S.S.R., Yugoslavia, Zanzibar
10	0840	0910	Somerton, England	Ceylon, Egypt, India, Nigeria, Union of South Africa
13	1000	1100	Brentwood, England	Aden, Austria, Belgian Congo, Brazil, Bulgaria, Greece, India, Iran, Kenya, Madagascar, Malta, Portugal, Southern Rhodesia, Spain, Switzerland, Syria, Turkey, U.S.S.R., Yugoslavia, Zanzibar
13	1005	1100	Somerton, England	Argentina, Ceylon, Gold Coast, India, Nigeria, Union of South Africa
14	1402	1410	Brentwood, England	Belgian Congo, Brazil, Canary Islands, Greece, Kenya

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 85

Provisional Radio Propagation Quality Figures
January 1947
Compared with CRPL Warnings and CRPL Probable Disturbed Period Forecasts

Day	North Atlantic Quality Figure		North Atlantic CRPL* Warning		North Atlantic CRPL Probable Disturbed Period Forecast		North Atlantic Geomagnetic K_{ch}		North Pacific Quality Figure		North Pacific CRPL* Warning		North Pacific CRPL Probable Disturbed Period Forecast		North Pacific 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	1	7	7					1	1
2	7	6					2	2	6	6					2	2
3	6	6					2	3	6	(4)					2	3
4	7	5	X	X			2	4	6	(4)	X	X			2	4
5	6	5	X	X			3	3	7	(4)	X	X			3	3
6	5	5	X				4	2	5	7	X				4	2
7	6	6					2	1	6	(4)					2	1
8	6	7					3	1	7	5					3	1
9	7	7					0	0	8	(4)					0	0
10	7	7					0	0	8	(4)					0	0
11	6	6					0	0	5	5					0	0
12	7	7					0	0	7	7					0	0
13	7	7			X		0	0	6	(4)			X		0	0
14	6	6			X		0	1	5	5			X		0	1
15	6	6			X		1	2	7	(4)			X		1	2
16	5	(4)		X			3	4	(4)	5		X			3	4
17	6	6	X				3	2	7	-	X				3	2
18	7	7					2	2	6	(4)					2	2
19	7	7					2	1	5	5					2	1
20	7	7					1	1	6	(4)					1	1
21	6	7			X		1	1	5	(4)			X		1	1
22	6	7			X		1	1	6	(4)			X		1	1
23	7	7			X		1	2	5	5			X		1	2
24	5	6					3	3	5	(4)					3	3
25	(4)	(4)		X			5	4	5	5		X			5	4
26	5	(4)	X	X			4	3	5	6	X	X			4	3
27	(4)	6	X				2	3	(4)	6	X				2	3
28	5	5	X				2	2	6	(4)	X				2	2
29	6	5			X		2	2	6	5			X		2	2
30	5	6			X		1	1	5	6			X		1	1
31	6	6					2	1	6	6					2	1
Score:																
H			4		0						3		4			
M			0		4						13		12			
G			22		19						11		11			
(S)			4		2						3		4			
S			1		6						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 5 or better on day of no warning.

(S) Quality 5 on day of warning.

S Quality 6 or better on day of warning.

( ) Quality 4 or worse (disturbed).

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

TABLE 86

Daily Median Values of American Relative Sunspot Numbers*

February 1947

Date	No.	Date	No.
1	63	16	155
2	78	17	140
3	93	18	134
4	69	19	104
5	92	20	105
6	94	21	104
7	126	22	94
8	136	23	113
9	132	24	136
10	153	25	162
11	171	26	192
12	160	27	156
13	166	28	135
14	186		
15	146		
No. of days	28	Mean	128.4

* Median of data from 18 observers

Table 87

CORONAL OBSERVATIONS AT CLIMAX, COLORADO

February 1947

First row - green line 5303A
Second row - red line 6374A
Third row - red line 6704A

Degrees from astronomical north

Date	Time of observation GCT	0	05	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175
2	2031-2113	5	6	10	13	14	15	18	19	20	20	22	23	20	19	17	16	16	19	24	30	33	35	33	23	15	10	6	5	5	5	5	--	--	--	--	--
													3	4	4	3	4	6	6	5	6	8	6	4													
4	2150-2216	5	7	11	15	15	18	20	20	25	27	25	23	21	20	20	17	20	30	34	34	30	24	16	12	10	8	6	5	6	6	5	5	--	--	--	5
										1	2	4	12	9	3	2	4	21	7	4	5	10	3	3	1												
5	1632-1739	8	15	20	20	20	22	25	29	29	27	27	28	31	33	31	30	29	28	28	25	20	15	13	10	8	5	3	4	5	4	3	3	3	2	2	2
										1	1	2	5	6	4	5	3	20	10	3	5	3	2	1	1												
6	1614-1634	13	15	16	16	18	20	23	23	20	20	24	36	38	37	30	20	16	18	23	25	23	19	14	12	11	9	8	7	8	6	5	4	--	--	--	--
						1	1			1	2	4	7	8	8	11	4	2	1	1	2	2	1	1		1	1	1	1								
8	1638-1813	12	14	15	15	15	16	16	15	13	20	32	40	38	30	20	18	16	22	31	35	29	18	14	12	10	6	4	3	3	3	3	2	2	2	2	3
										1	1	4	9	11	11	7	2	5	2	1	1	1	1	1	1	2	1	1	1	1	1						
12	1625-1805	7	8	8	5	5	6	10	15	24	38	43	42	35	27	21	13	15	19	28	30	28	25	24	15	8	4	3	2	2	3	5	5	4	3	2	1
									1	3	14	9	8	24	7	3	1	1	2	11	7	3	1	1	1												
13 l.w.	2322-2330	8	8	7	--	--	7	11	15	21	30	30	27	20	11	7	--	--	8	11	20	18	15	12	10	8	--	--	--	--	--	--	--	--	--	--	--
							1	2	4	10	6	15	20	15	4	3	1	1	8	4	3	1	1	1	1												
14	1602-1627	8	9	7	8	10	15	17	20	25	30	35	31	20	10	4	4	10	18	27	30	25	21	20	14	12	6	3	4	4	5	5	4	3	2	2	4
							1	2	4	8	1	7	17	12	9	4	1	1	5	12	4	1	1	1	1												
15	1838-1918	5	6	7	7	5	6	8	11	14	21	28	25	18	10	4	3	7	15	23	25	20	17	15	13	7	6	--	--	--	--	--	--	--	--	--	5
							1	1	2	3	1	6	12	8	2	1		1	3	15	9	2	1	1	1												

Table 87 (Continued)

Date	Time of observation GCT	Degrees from astronomical north																																				
		180	185	190	195	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	325	330	335	340	345	350	355
2	2031-2113	5	5	5	5	5	7	7	7	10	14	17 2	21 6	22 2	20 5	12 3	7 2	6	7 2	15 3	26 8	31 10	32 5	25 3	17 3	15 2	13	12	10	10	8	7	6	5	5	4	4
4	2150-2216	5	5	6	5	6	6	5	5 1	6 2	9 4	14 4	18 9	19 10	20 8	15 4	6 1	4	7	11 1	14 2	19 5	15 8	12 8	14 6	15 3	15 1	11 1	7	6	5	5	5	5	5	4	4
5	1632-1739	4	6	7	6	5	5	6	10	17	21 1	24 1	28 4	29 12	31 10	25 3	16 1	15	20	24 1	25 2	25 6	26 9	27 15	29 10	27 1	25 1	20	12	12	12	11 1	10 1	7 1	4	4	6
6	1614-1634	5	5	4	3	3	3	5	8	13	17 1	22 1	20 3	18 5	17 2	16 1	8 1	7	14	17 1	18 1	19 2	21 2	22 15	21 3	16 1	14 1	12	8	7	7	7	6	4	3	3	7
8	1638-1813	4	5	6	8	10	13	20	24 1	24 1	28 1	26 1	20 2	18 2	15 6	13 3	14 1	15	18	20	23	25 1	28 2	25 7	22 5	20 3	15 1	13 1	13 1	11	8	5	4	3	2	2	7
12	1625-1805	4	5	5	4	3	6	11	17 1	19 2	30 4	35 1	38 10	41 19	33 11	21 2	16 1	11	12	13	14	15	15	15 1	15 1	13 1	13	13	12	12	10	8	5	3	2	3	4
14	1602-1627	5	4	4	5	5	6	12	20 1	36 1	37 2	39 9	41 12	40 10	30 5	22 1	17	14	8	6	6	7	15	15	11	8	6	4	5	5	6	4	3	2	2	3	5
15	1838-1918	5	5	5 1	5 1	6 1	8	15	20	28 1	35 1	38 4	40 14	38 4	33 7	25 3	20 1	18 1	14	12	12	13	14	16	13 1	7 1	5	5	3	5	5	3	2	2	2	3	5

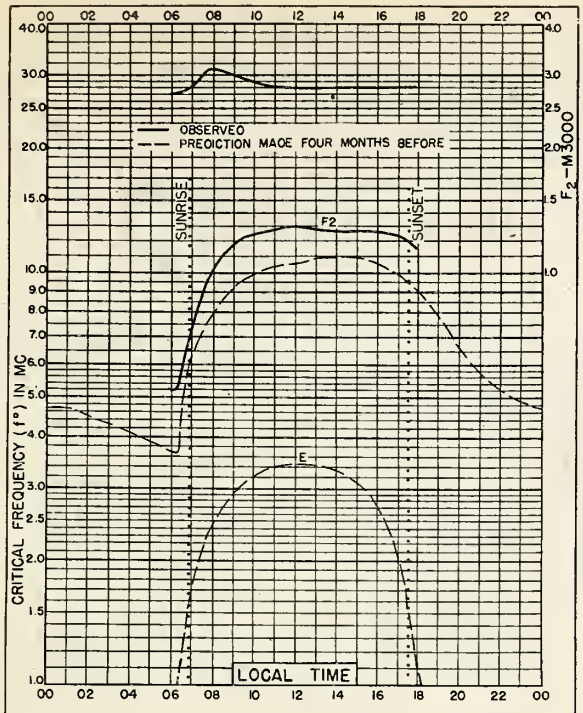

Fig. 1. WASHINGTON, D.C
39.0°N 77.5°W FEBRUARY 1947

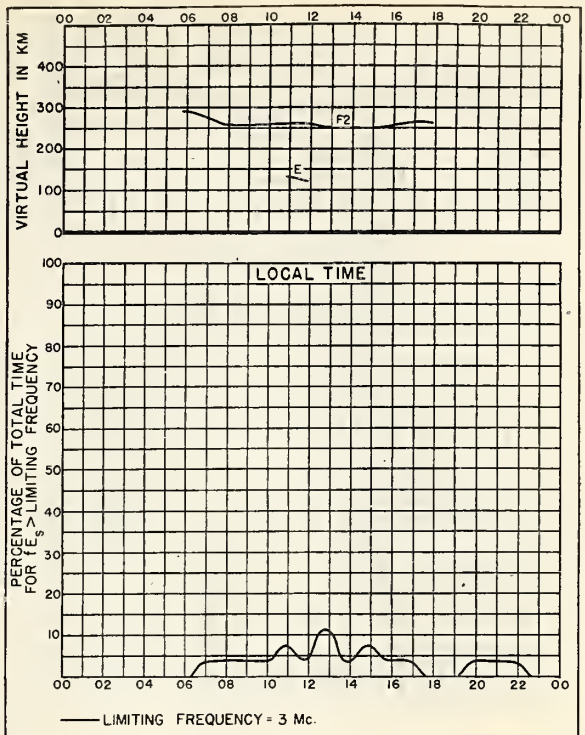

Fig. 2. WASHINGTON, D.C. FEBRUARY 1947

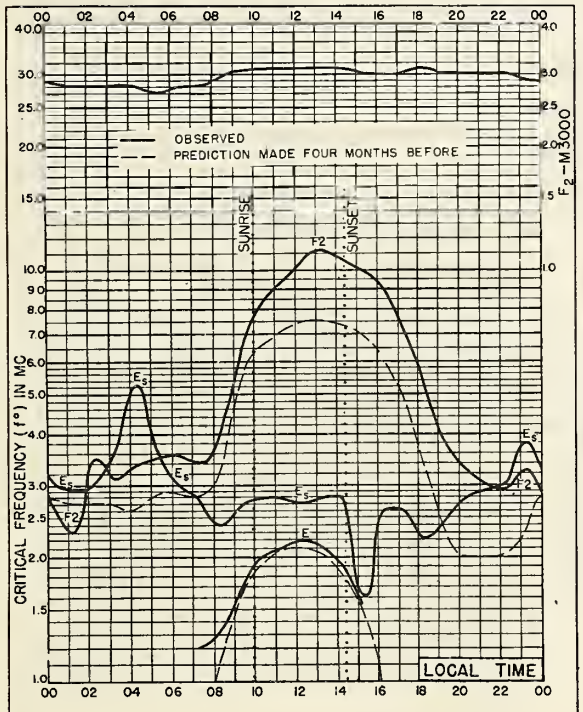

Fig. 3. FAIRBANKS, ALASKA
64.9°N, 147.8°W JANUARY 1947

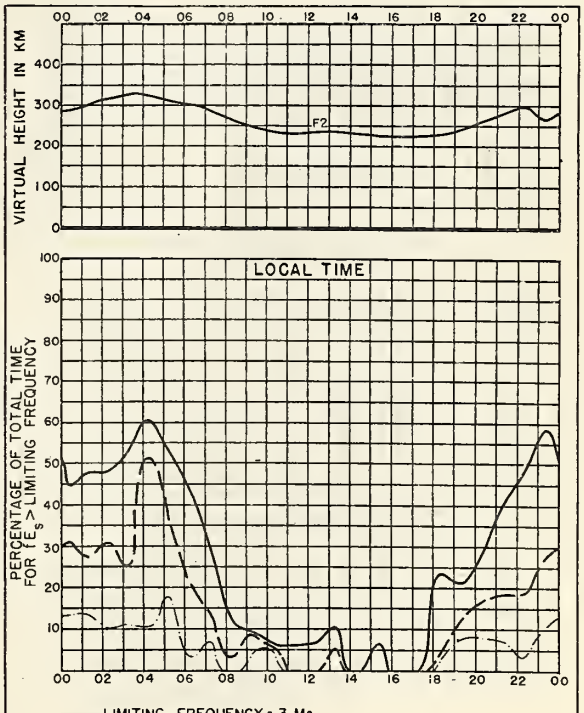

Fig. 4. FAIRBANKS, ALASKA JANUARY 1947

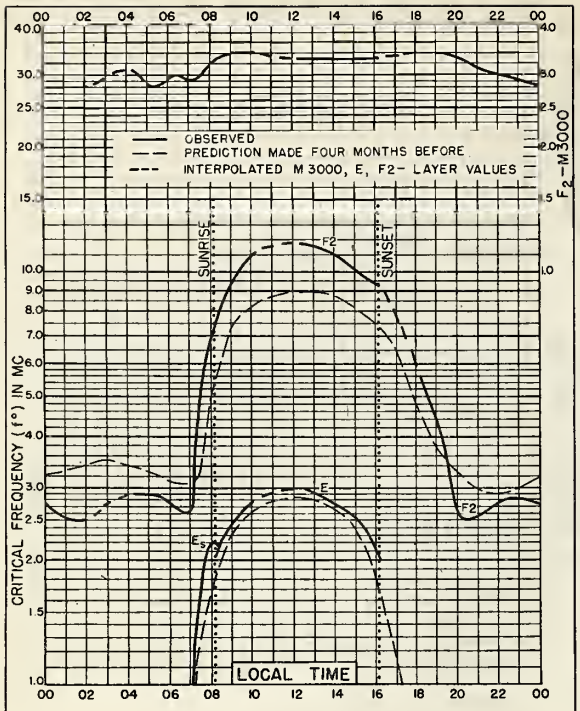

Fig. 5. ADAK, ALASKA
51.9°N, 176.6°W JANUARY 1947

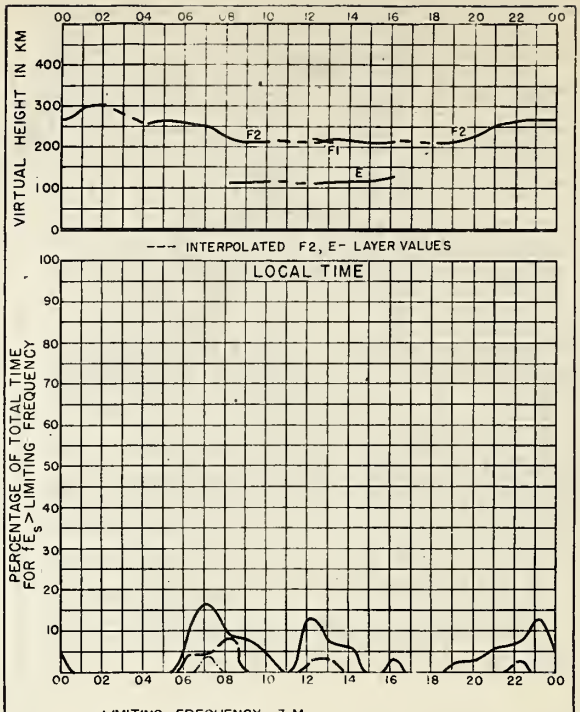

Fig. 6. ADAK, ALASKA JANUARY 1947

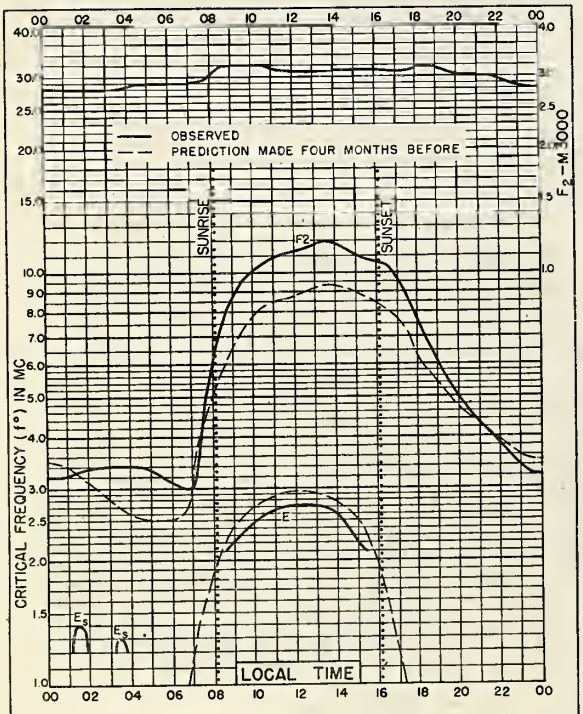

Fig. 7. PORTAGE la PRAIRIE, MANITOBA
49.9°N, 98.3°W JANUARY 1947

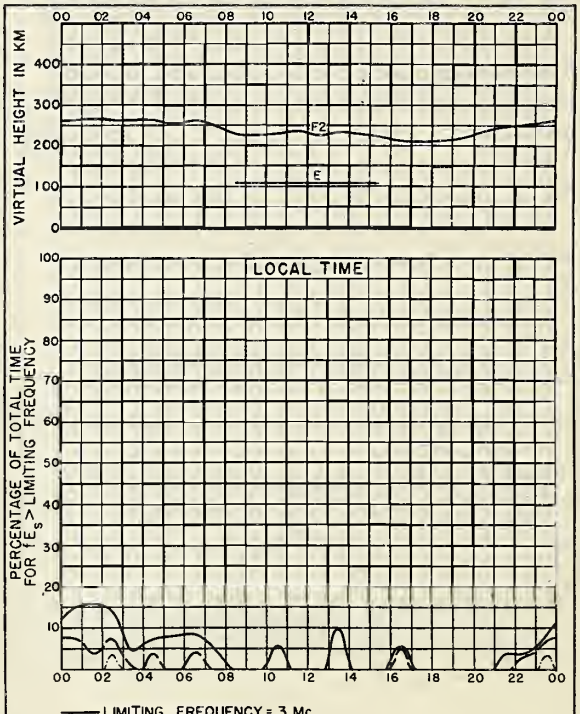

Fig. 8. PORTAGE la PRAIRIE, MANITOBA JANUARY 1947

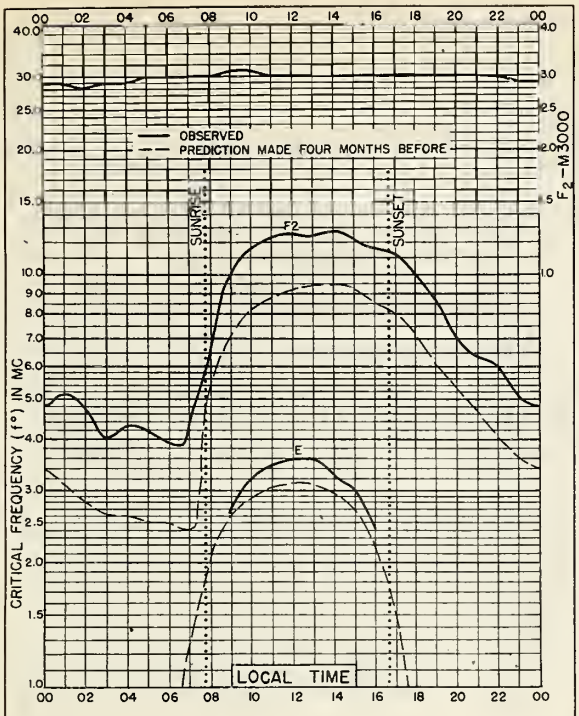

Fig. 9. OTTAWA, CANADA
45.5°N, 75.8°W JANUARY 1947

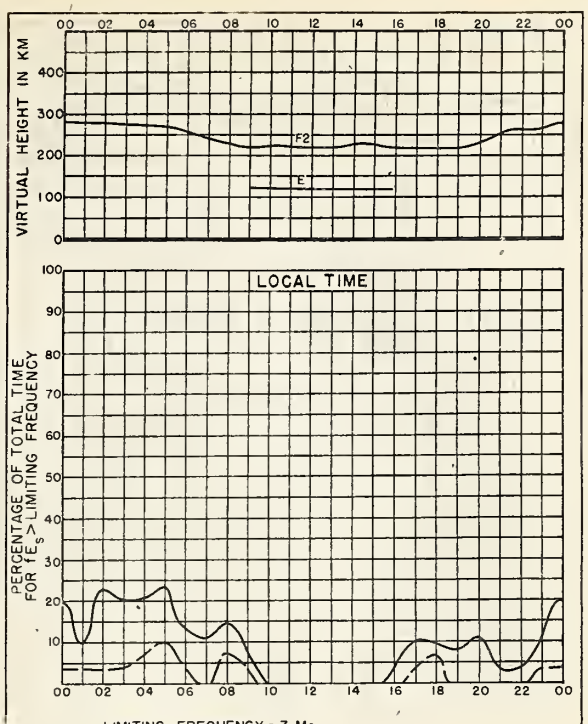

Fig. 10. OTTAWA, CANADA JANUARY 1947

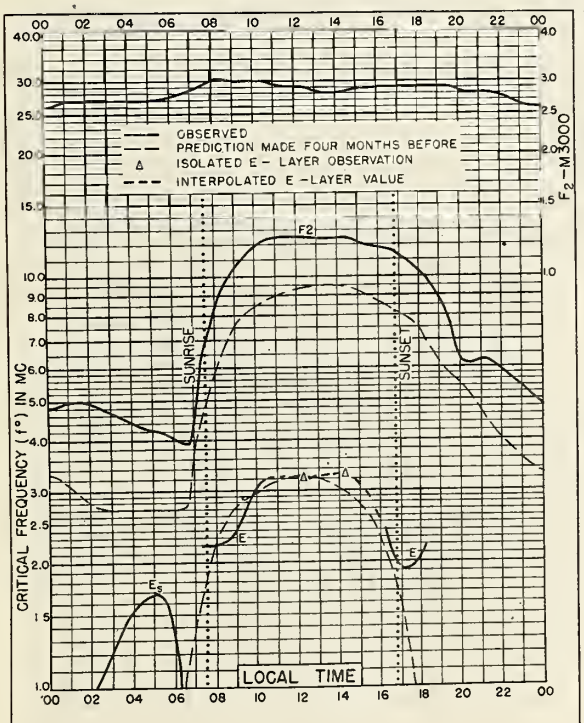

Fig. 11. BOSTON, MASSACHUSETTS
42.4°N, 71.2°W JANUARY 1947

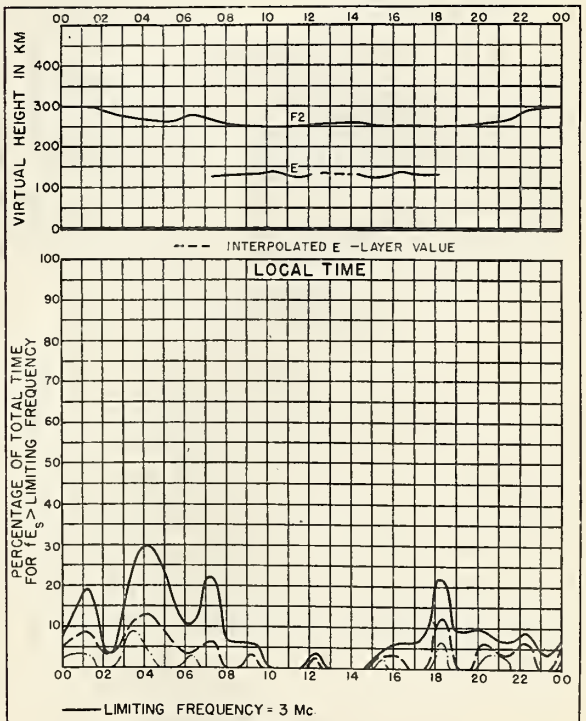

Fig. 12. BOSTON, MASSACHUSETTS JANUARY 1947

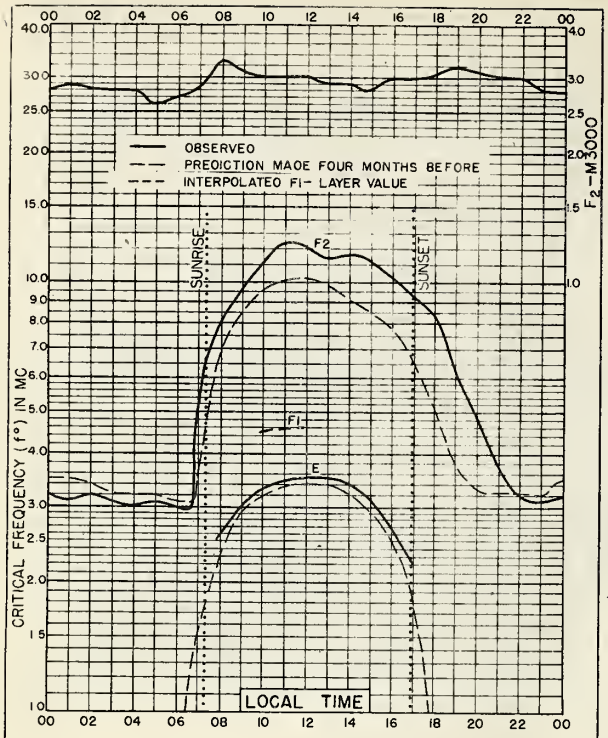

Fig. 13. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W JANUARY 1947

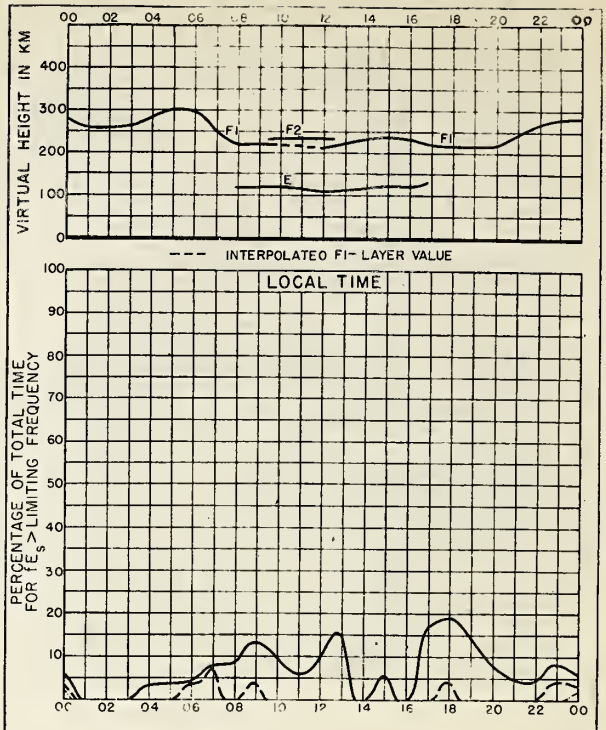

Fig. 14. SAN FRANCISCO, CALIFORNIA JANUARY 1947

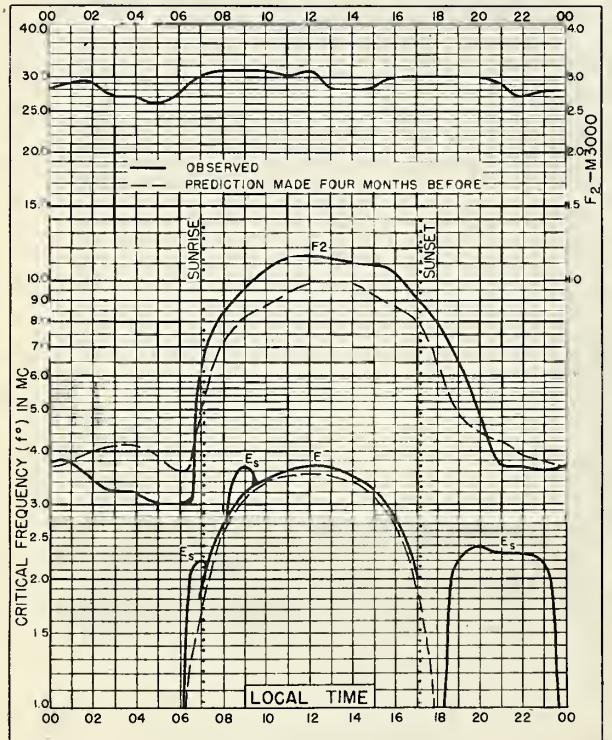

Fig. 15. WHITE SANDS, NEW MEXICO
32.6°N, 106.5°W JANUARY 1947

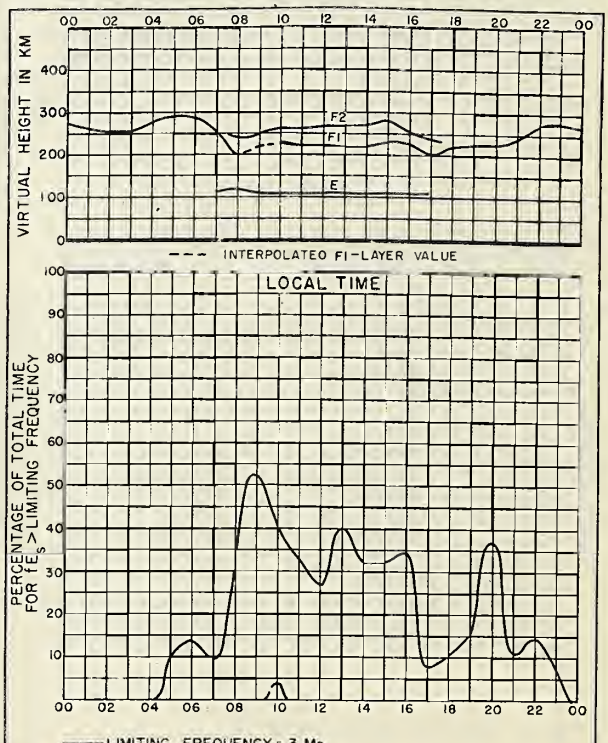

Fig. 16. WHITE SANDS, NEW MEXICO JANUARY 1947

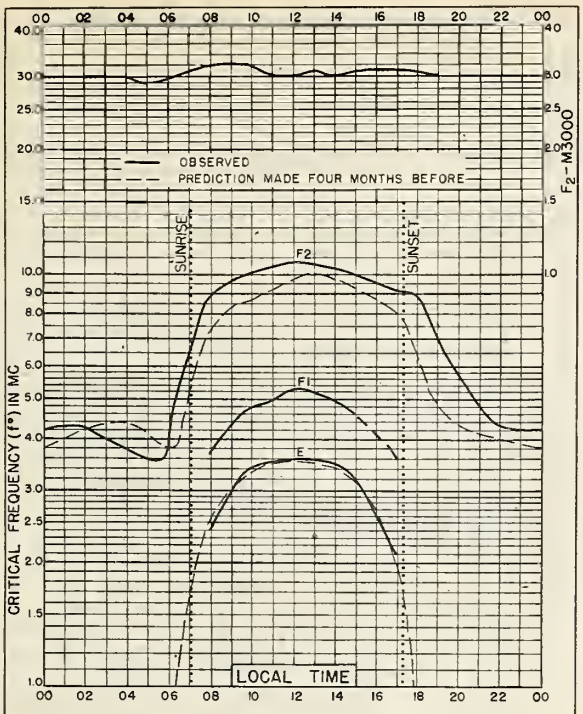

Fig. 17. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W JANUARY 1947

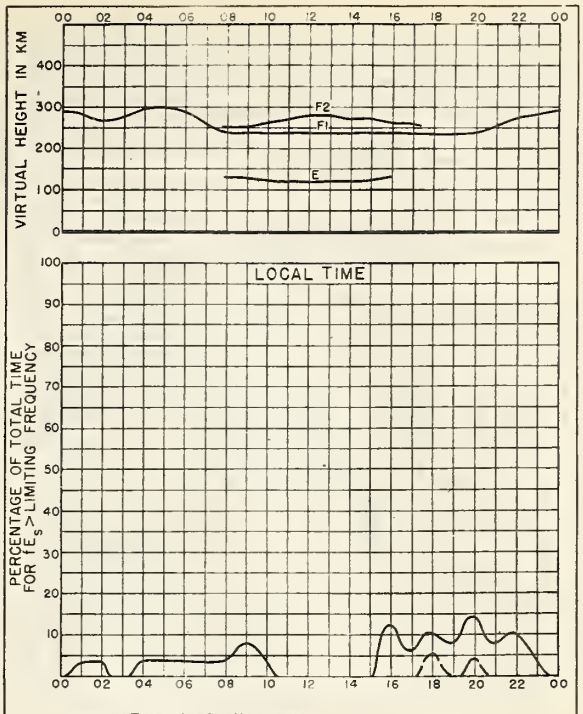

Fig. 18. BATON ROUGE, LOUISIANA JANUARY 1947

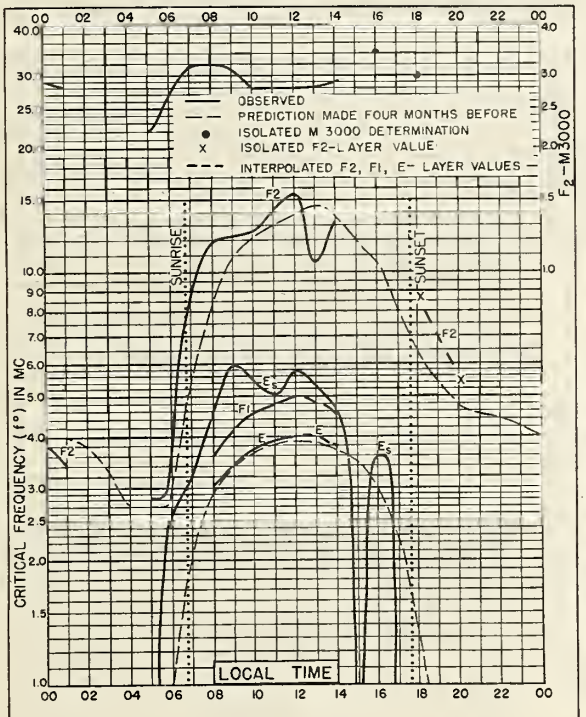

Fig. 19. MAUI, HAWAII
20.8°N, 156.5°W JANUARY 1947

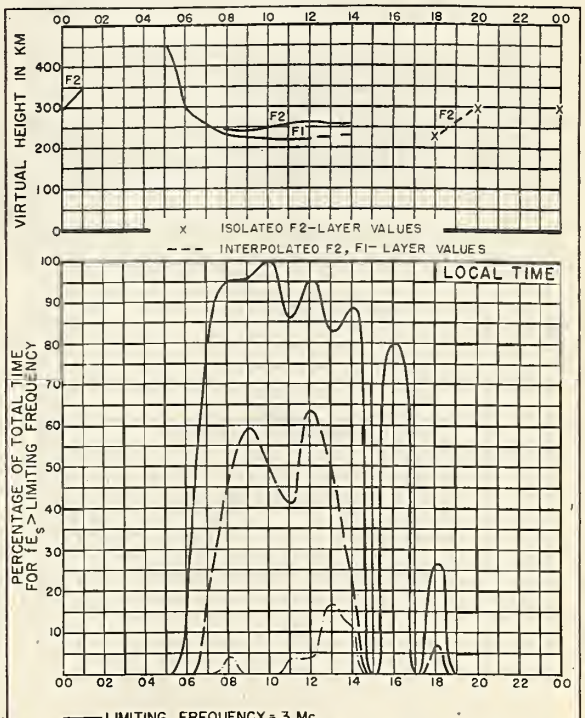

Fig. 20. MAUI, HAWAII JANUARY 1947

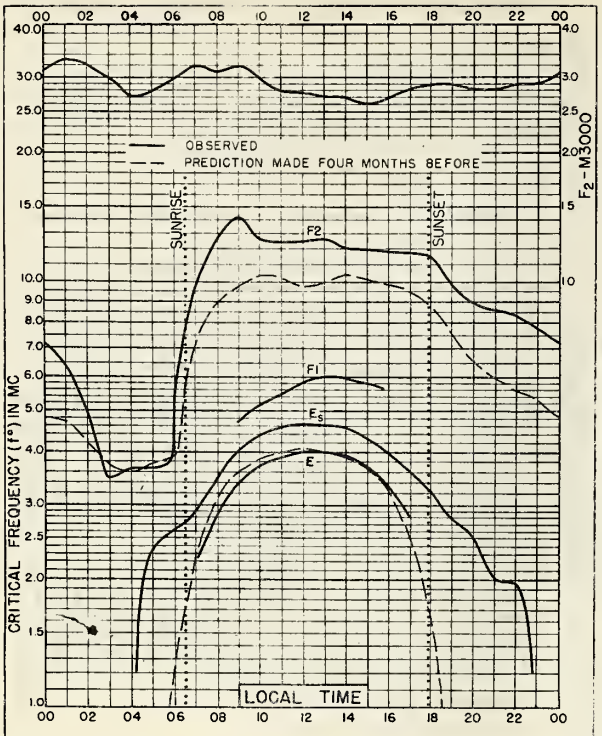

Fig.21. TRINIDAD, BRIT. WEST INDIES
10.6°N, 61.2°W JANUARY 1947

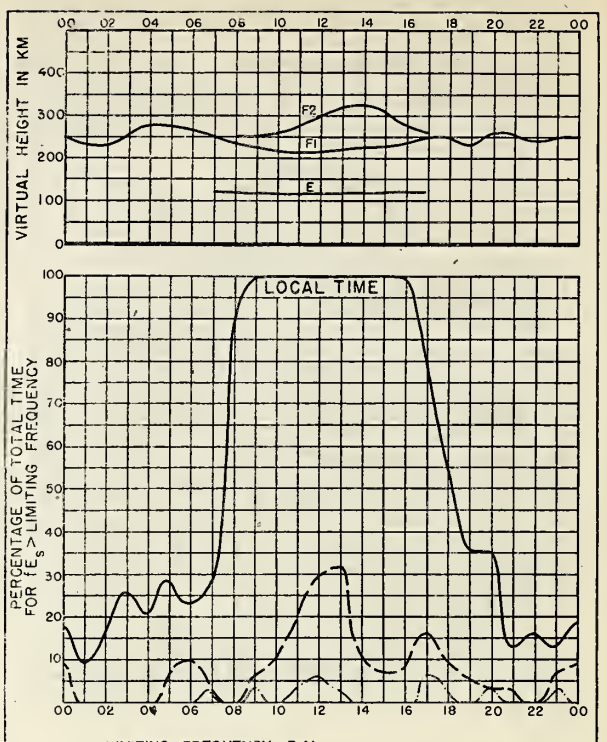

Fig.22. TRINIDAD, BRIT. WEST INDIES JANUARY 1947

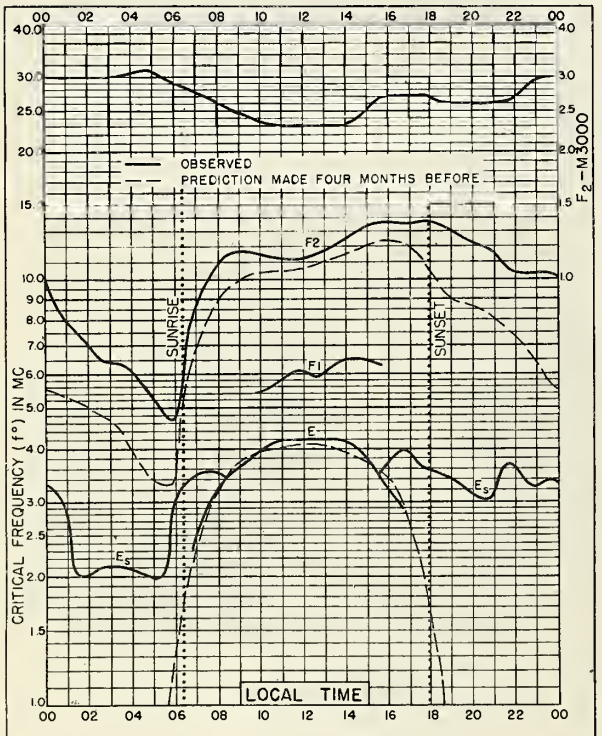

Fig.23. PALMYRA I.
5.9°N, 162.1°W JANUARY 1947

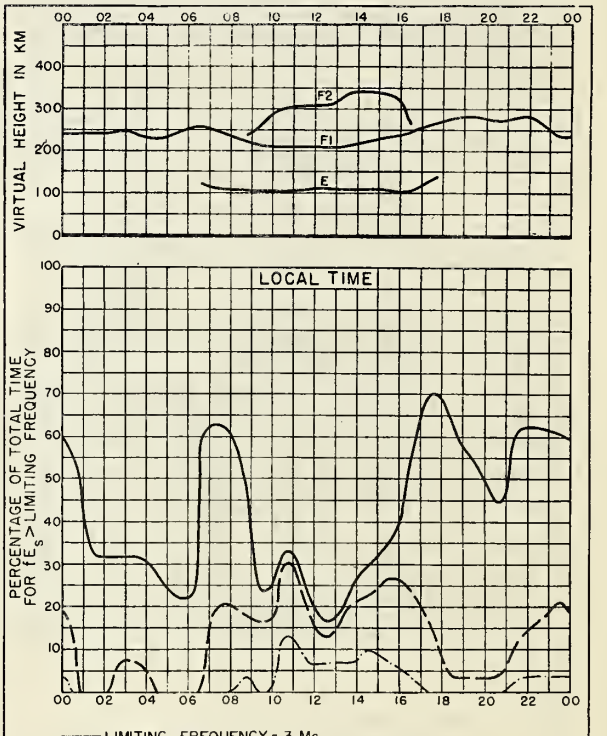

Fig.24. PALMYRA I. JANUARY 1947

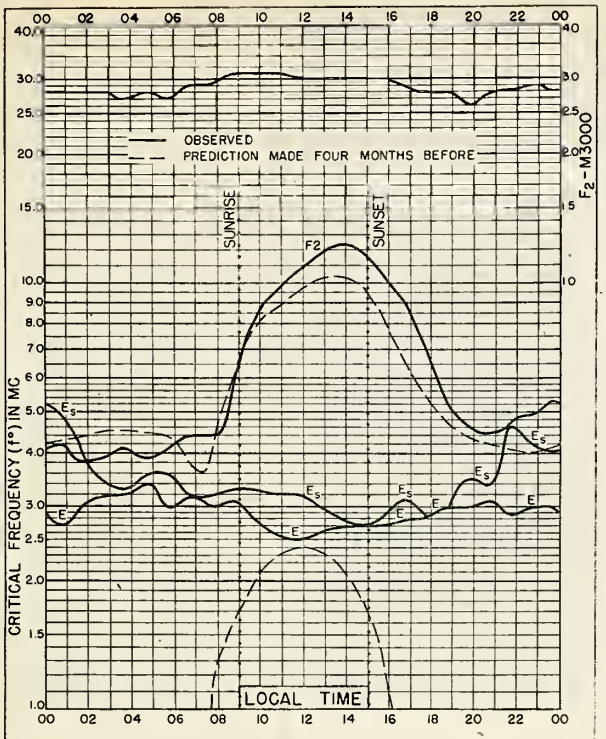

Fig. 25. CHURCHILL, CANADA
58.8°N, 94.2°W DECEMBER 1946

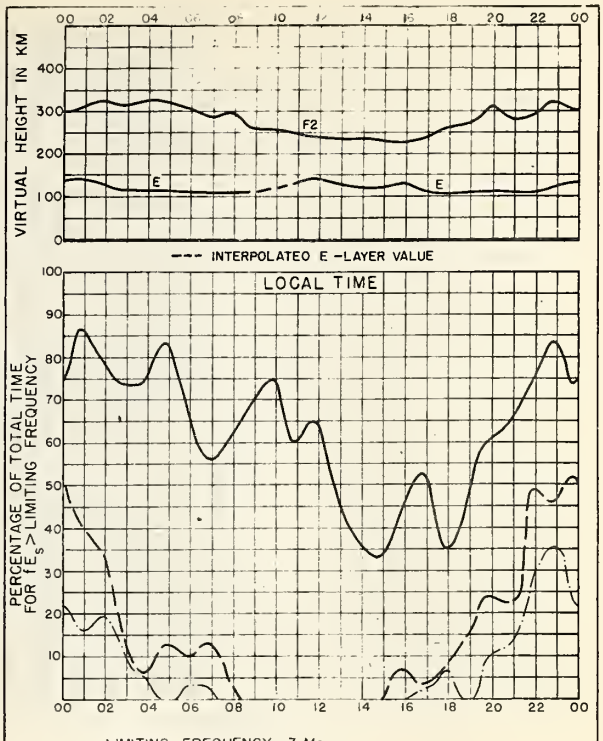

Fig. 26. CHURCHILL, CANADA DECEMBER 1946

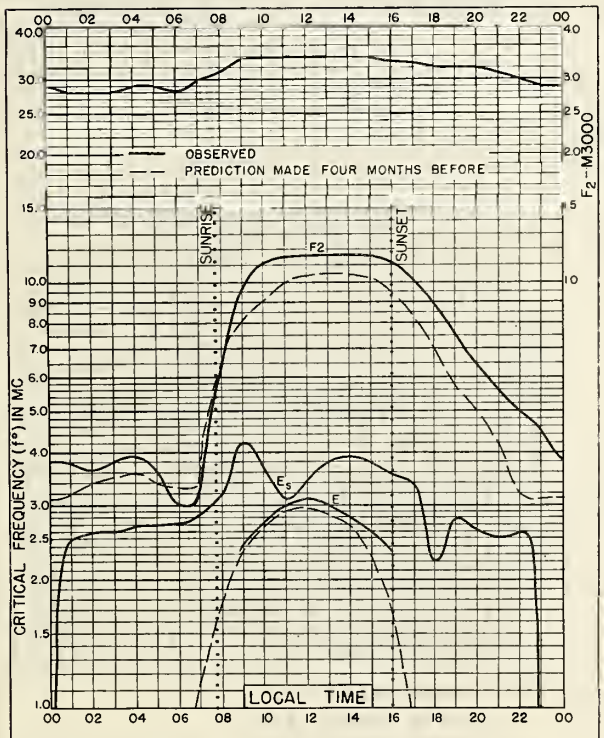

Fig. 27. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W DECEMBER 1946

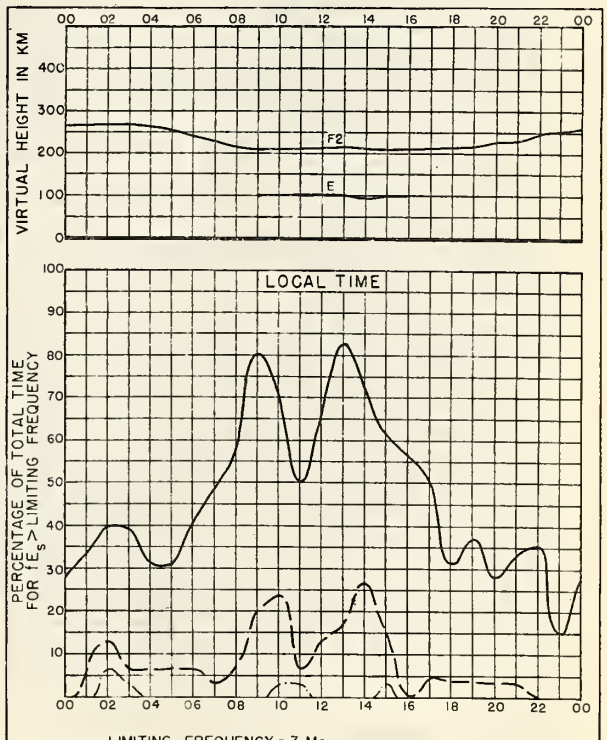

Fig. 28. ST. JOHN'S, NEWFOUNDLAND DECEMBER 1946

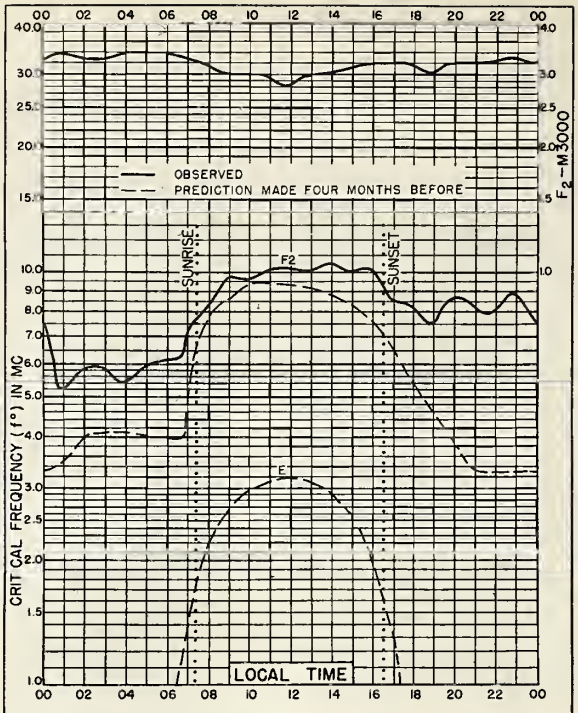

Fig.29. PEIPING, CHINA
39.9°N, 116.4°E
DECEMBER 1946

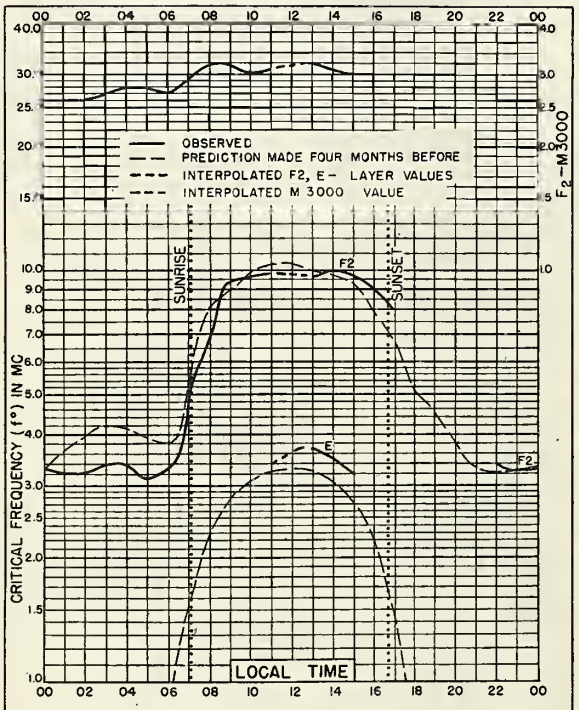

Fig.30. LANCHOW, CHINA
36.1°N, 103.8°E
DECEMBER 1946

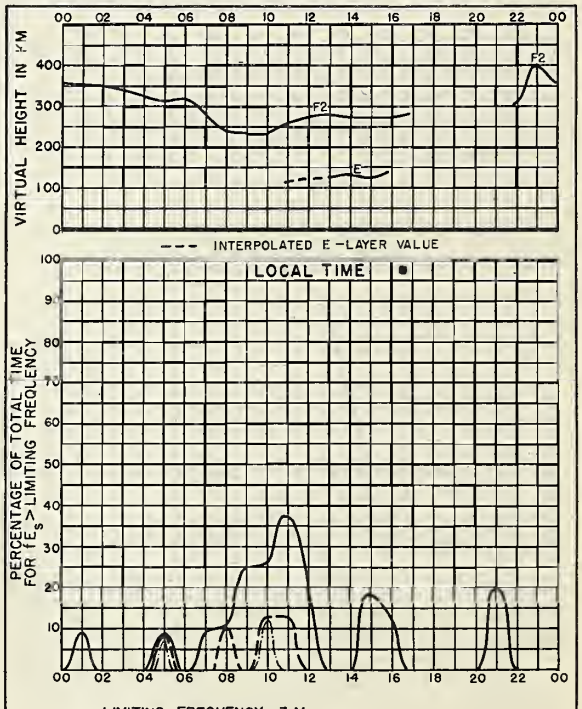

Fig.31. LANCHOW, CHINA
DECEMBER 1946

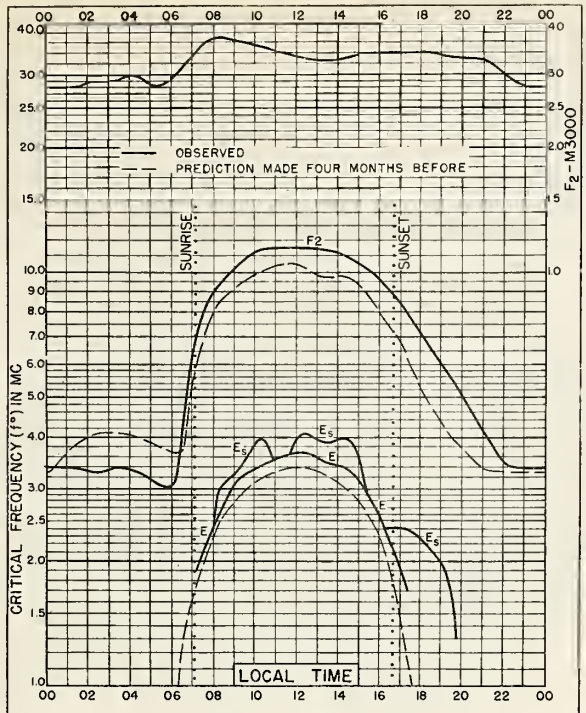

Fig.32. TOKYO, JAPAN
35.6°N, 139.6°E DECEMBER 1946

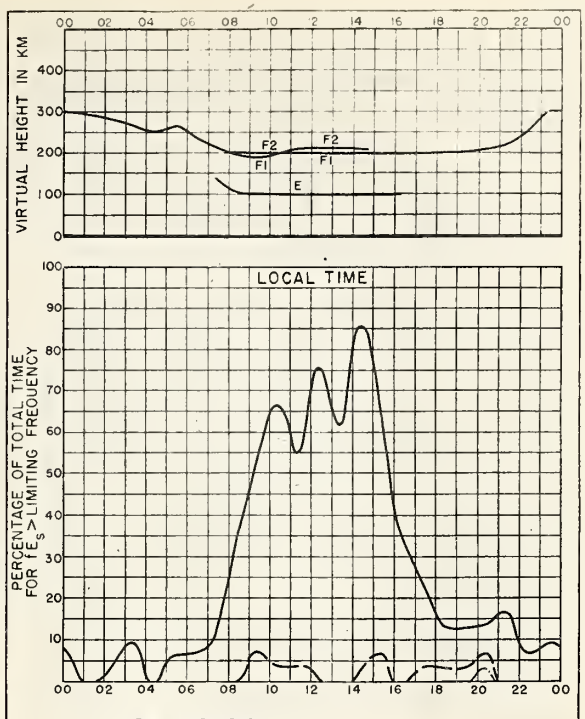

Fig.33. TOKYO, JAPAN DECEMBER 1946

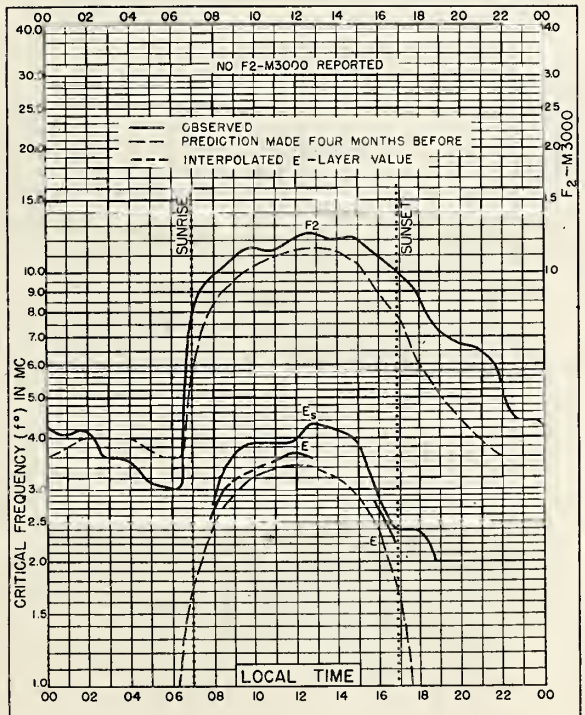

Fig.34. YAMAKAWA, JAPAN
32.2°N, 130.6°E DECEMBER 1946

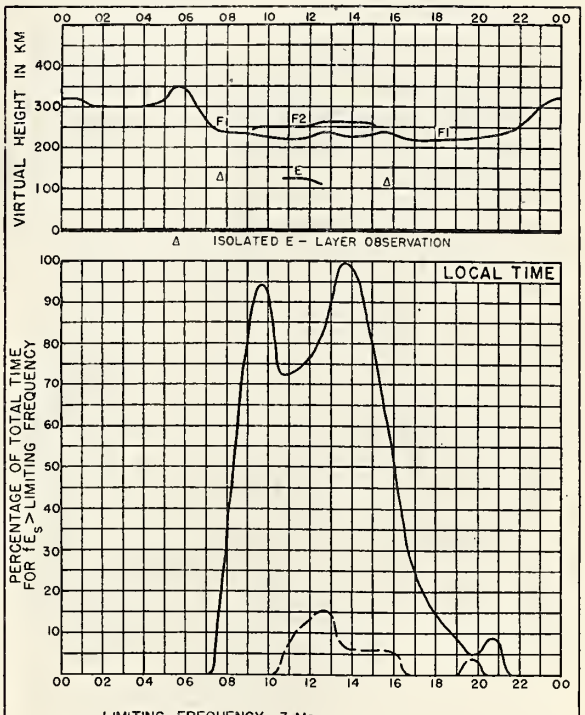

Fig.35. YAMAKAWA, JAPAN DECEMBER 1946

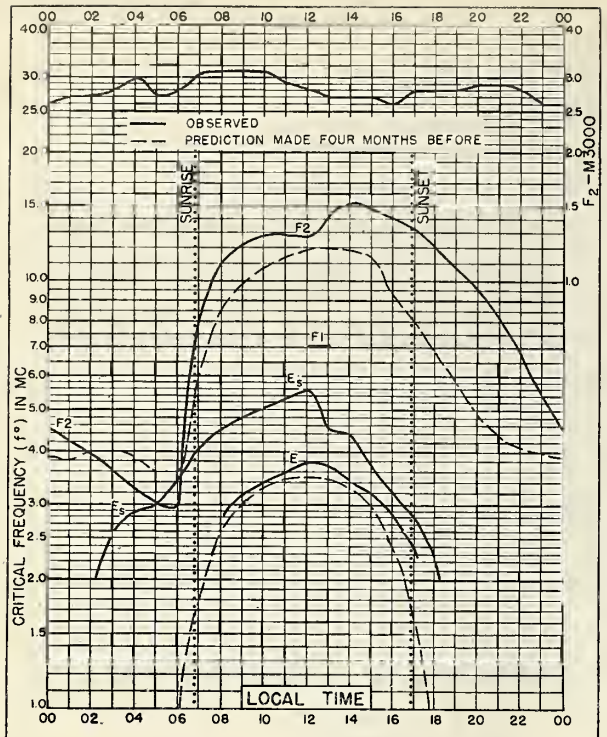

Fig.36. CHUNGKING, CHINA
29.4°N, 106.8°E DECEMBER 1946

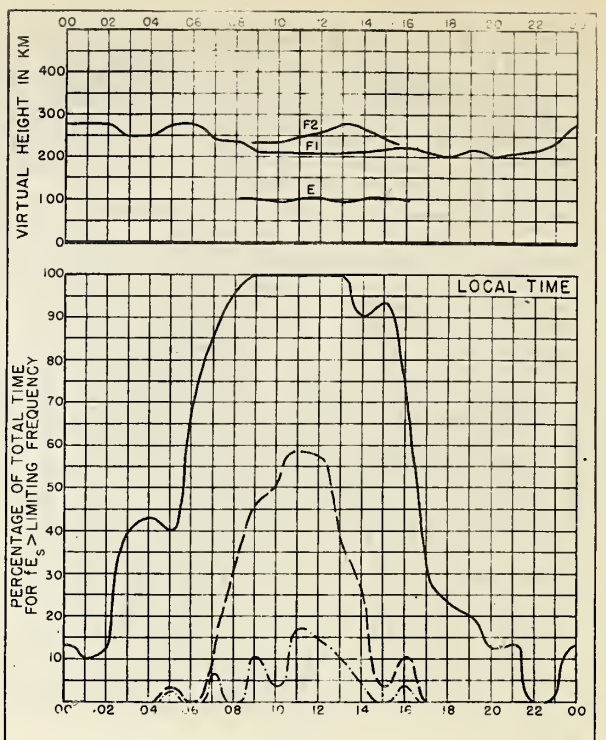

Fig.37. CHUNGKING, CHINA DECEMBER 1946

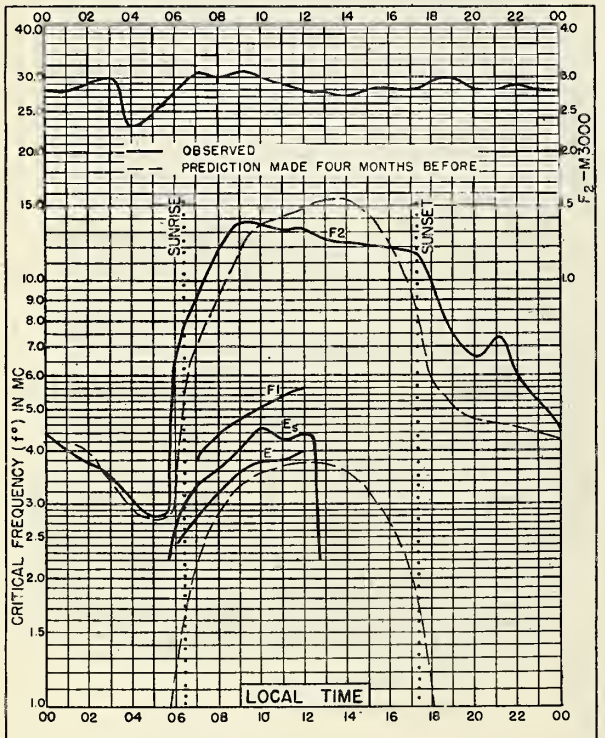

Fig.38. MAUI, HAWAII
20.8°N, 156.5°W DECEMBER 1946

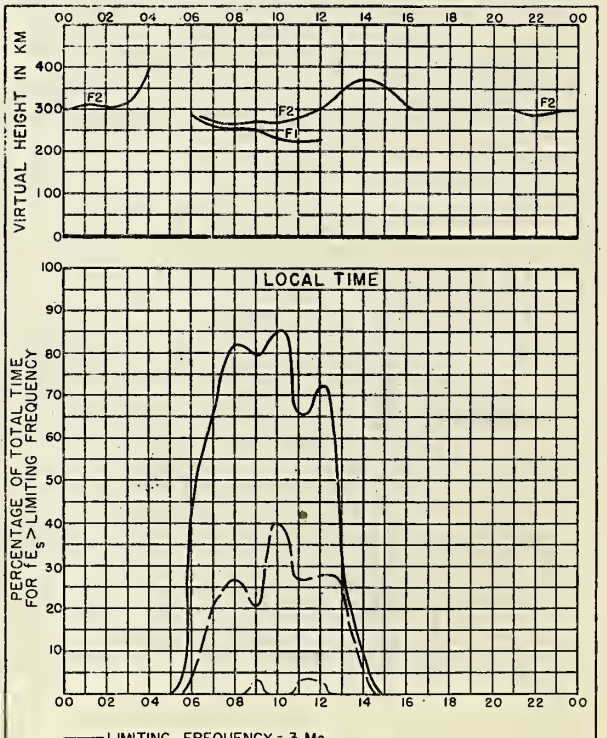

Fig.39. MAUI, HAWAII DECEMBER 1946

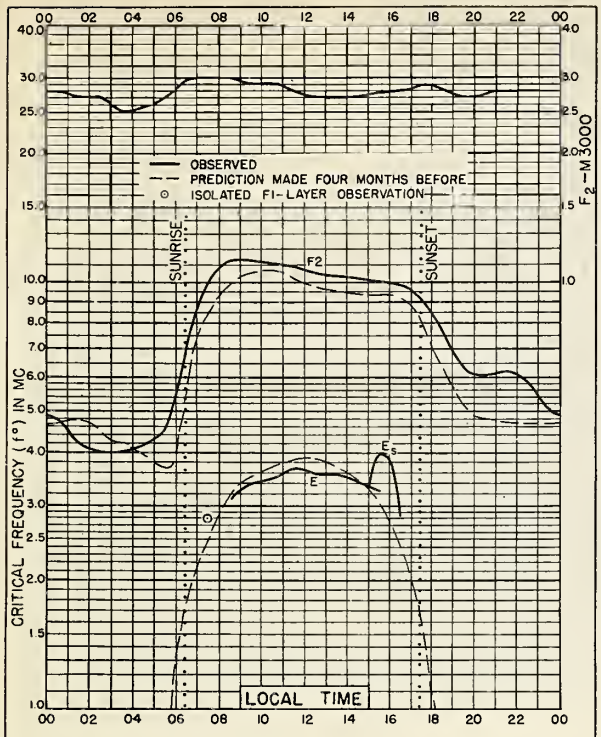

Fig. 40. SAN JUAN, PUERTO RICO
18.4°N, 66.1°W DECEMBER 1946

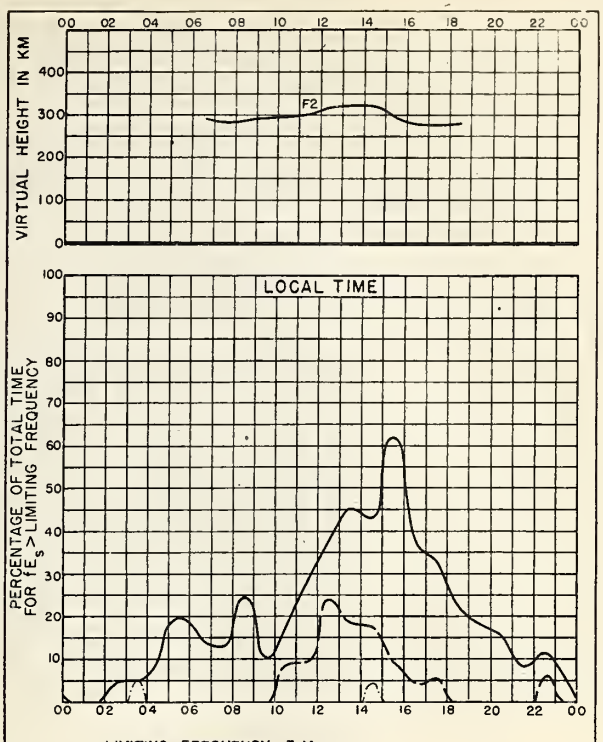

Fig. 41. SAN JUAN, PUERTO RICO DECEMBER 1946

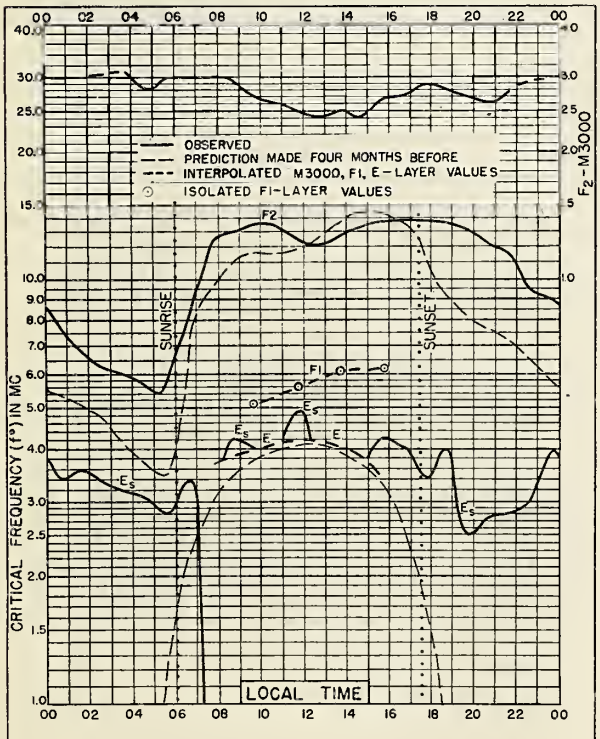

Fig. 42. PALMYRA I.
5.9°N, 162.1°W DECEMBER 1946

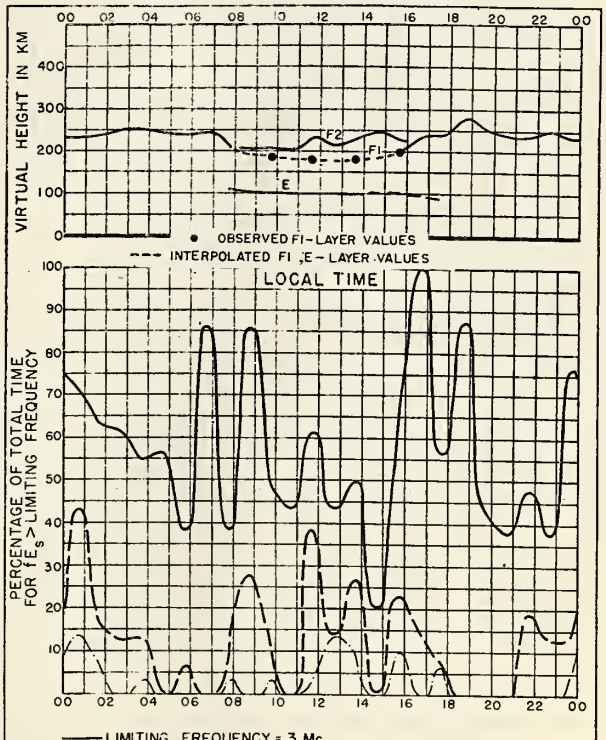

Fig. 43. PALMYRA I. DECEMBER 1946

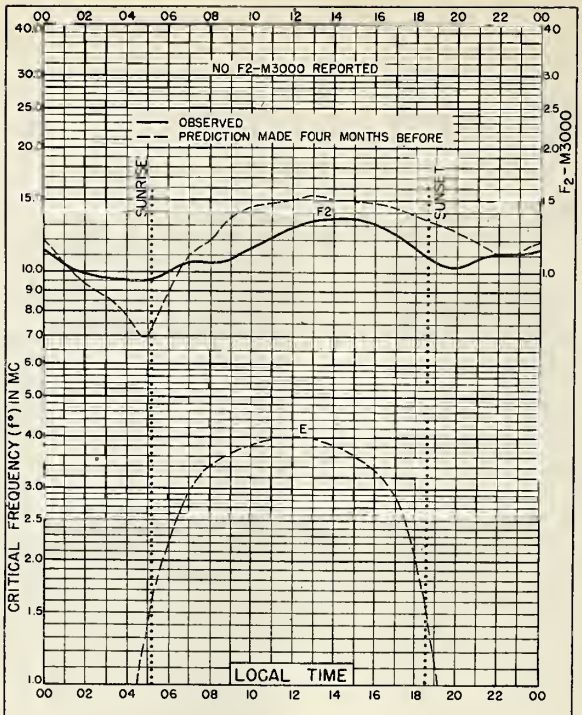

Fig. 44. RAROTONGA I.
21.3°S, 159.8°W DECEMBER 1946

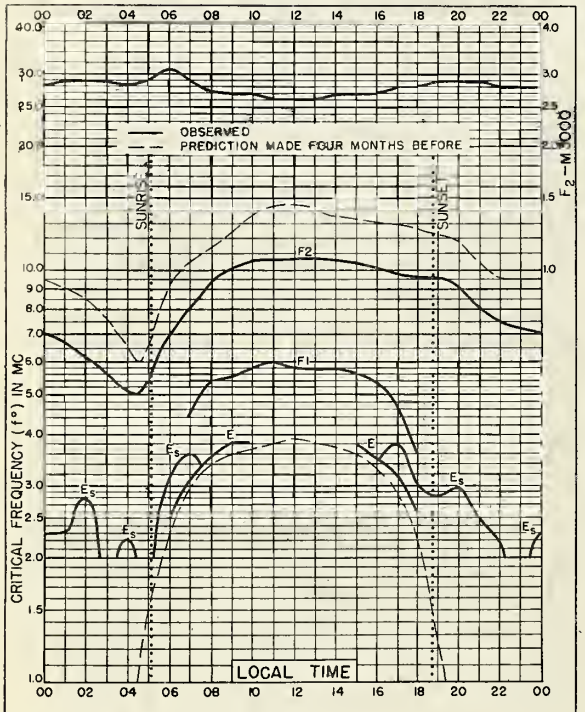

Fig. 45. JOHANNESBURG, UNION OF S. AFRICA
26.2°S, 28.0°E DECEMBER 1946

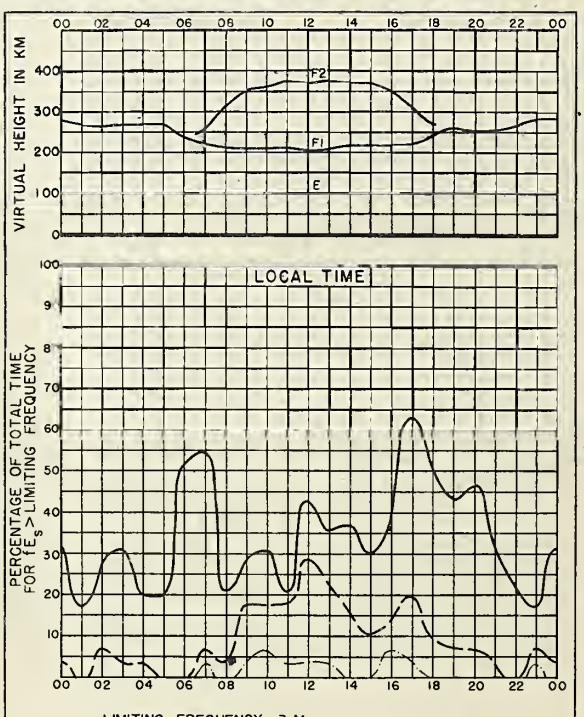

Fig. 46. JOHANNESBURG, UNION OF S. AFRICA DECEMBER 1946

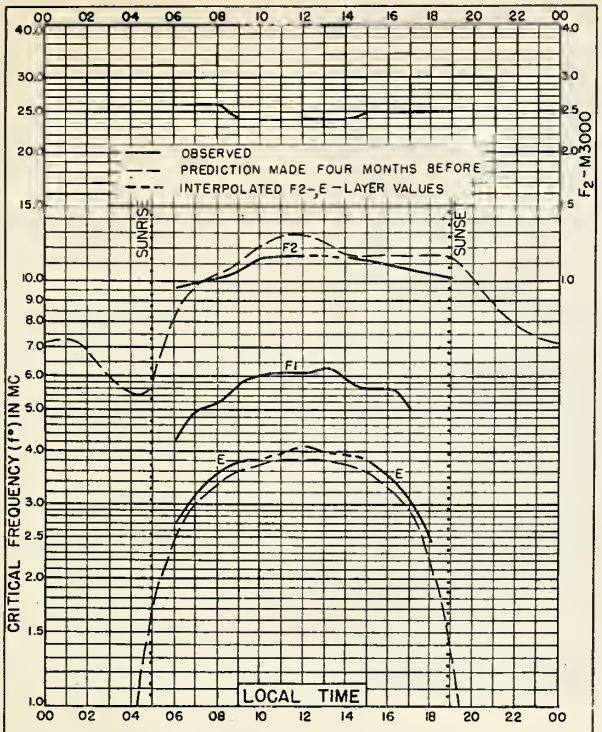

Fig. 47. KERMADEC IS.
29.2°S, 177.9°W DECEMBER 1946

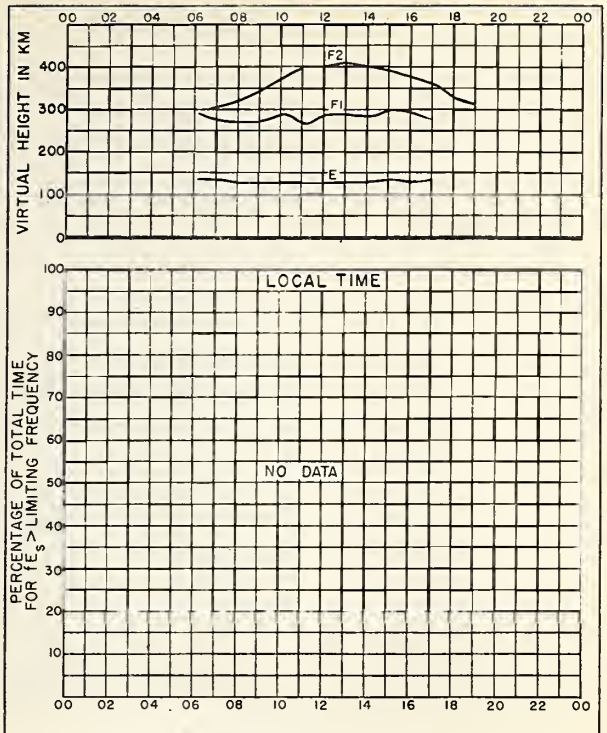

Fig. 48. KERMADEC IS. DECEMBER 1946

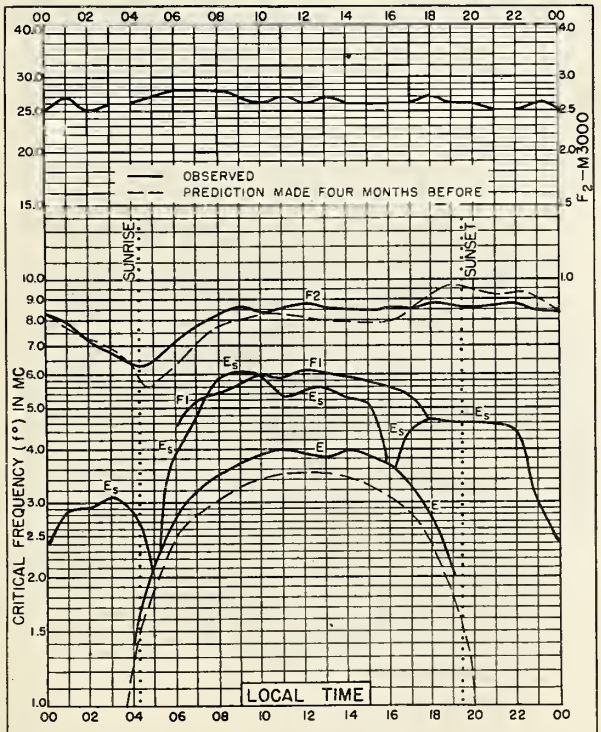

Fig. 49. CHRISTCHURCH, N. Z.
43.5°S, 172.6°E DECEMBER 1946

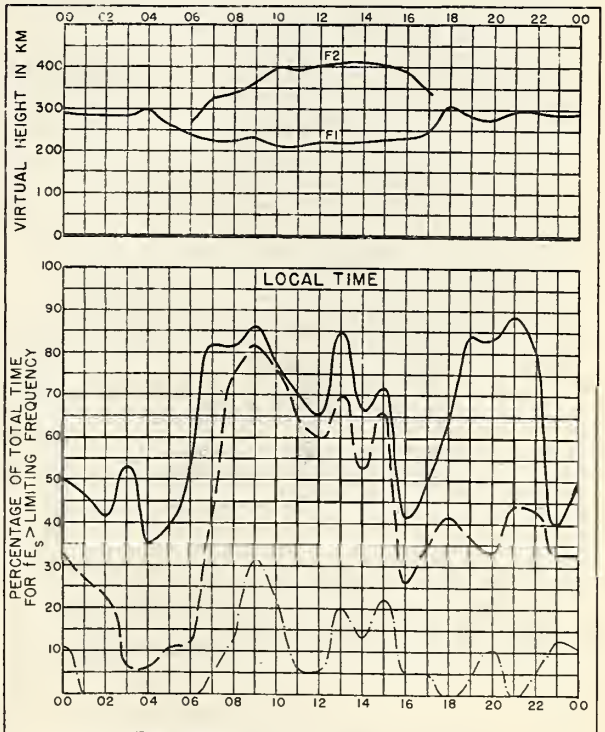

Fig. 50. CHRISTCHURCH, N. Z. DECEMBER 1946

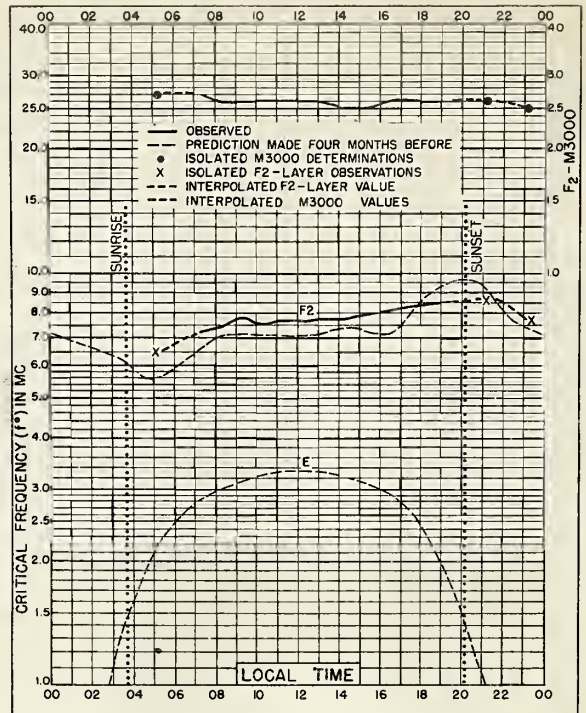

Fig. 51. CAMPBELL I.
52.5°S, 169.0°E DECEMBER 1946

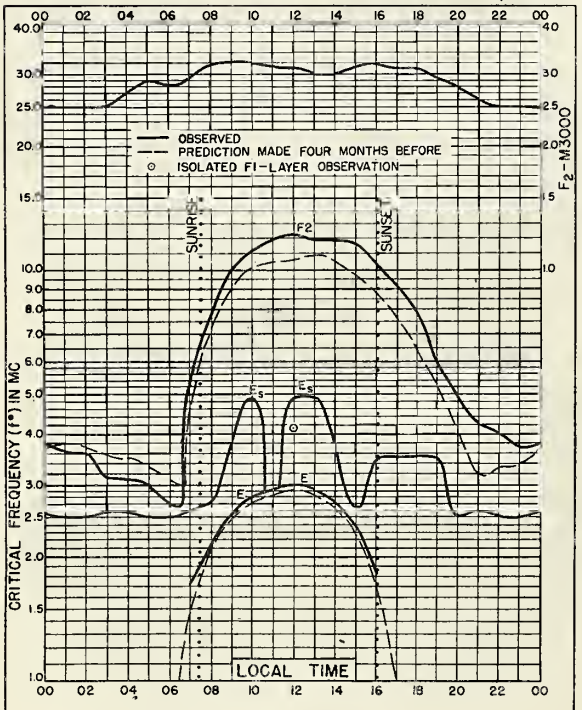

Fig. 52. SLOUGH, ENGLAND
51.5°N, 0.6°W NOVEMBER 1946

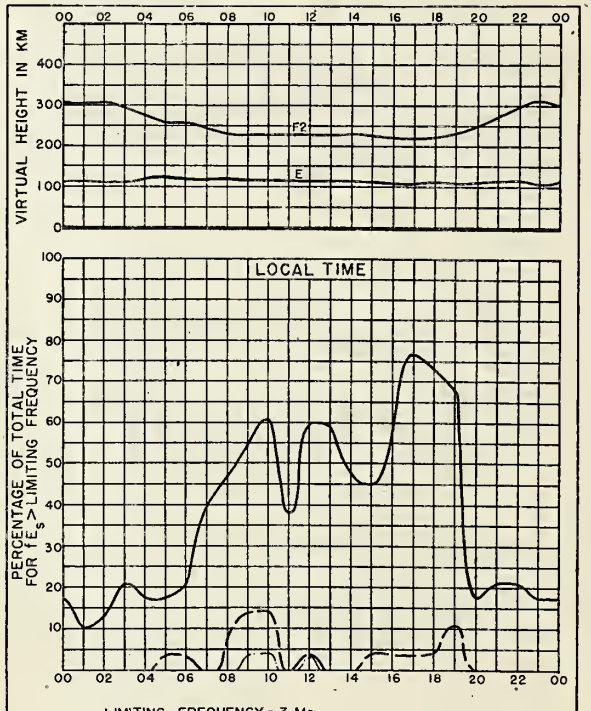

Fig. 53. SLOUGH, ENGLAND NOVEMBER 1946

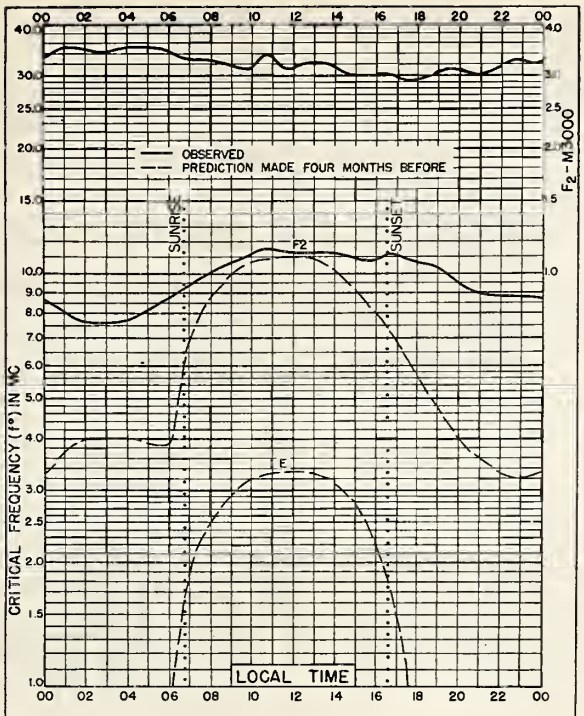

Fig. 54. PEIPING, CHINA
39.9°N, 116.4°E NOVEMBER 1946

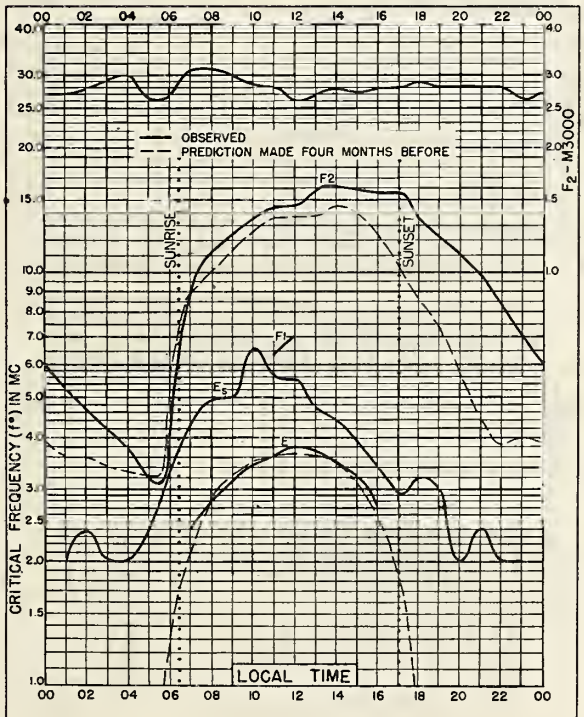

Fig. 55. CHUNGKING, CHINA
29.4°N, 106.8°E NOVEMBER 1946

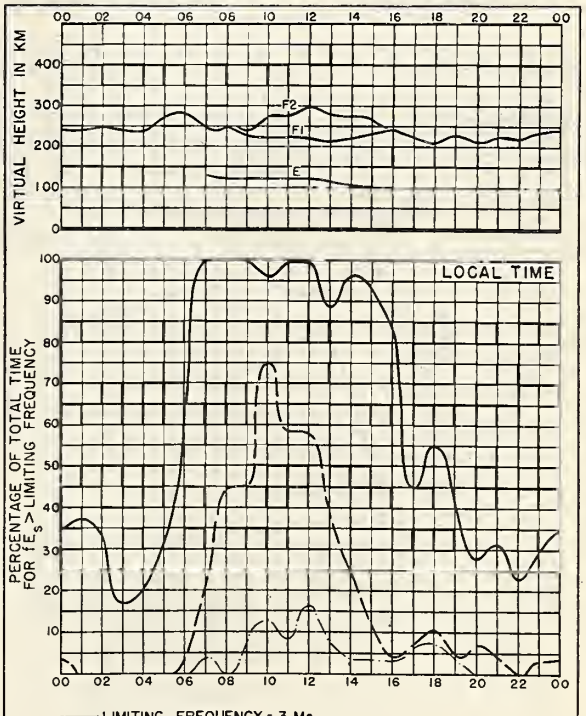

Fig. 56. CHUNGKING, CHINA NOVEMBER 1946

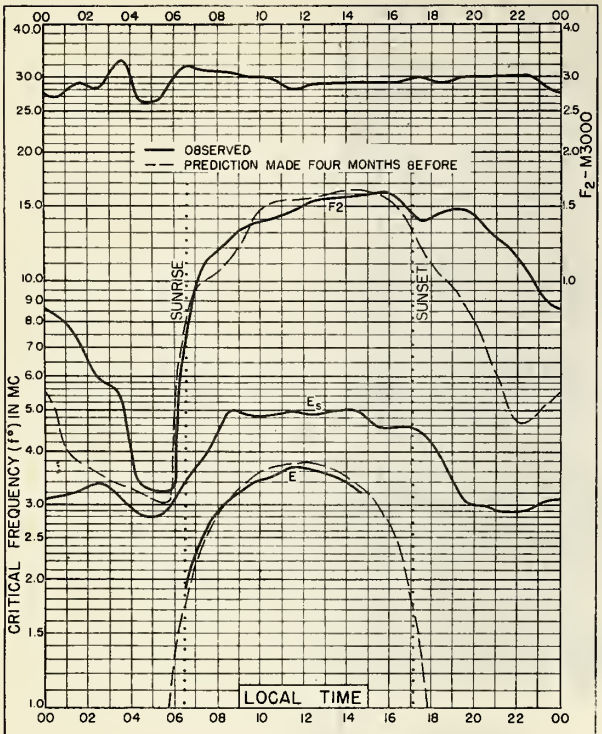

Fig. 57. OKINAWA I.
26.3°N, 127.8°E. NOVEMBER 1946

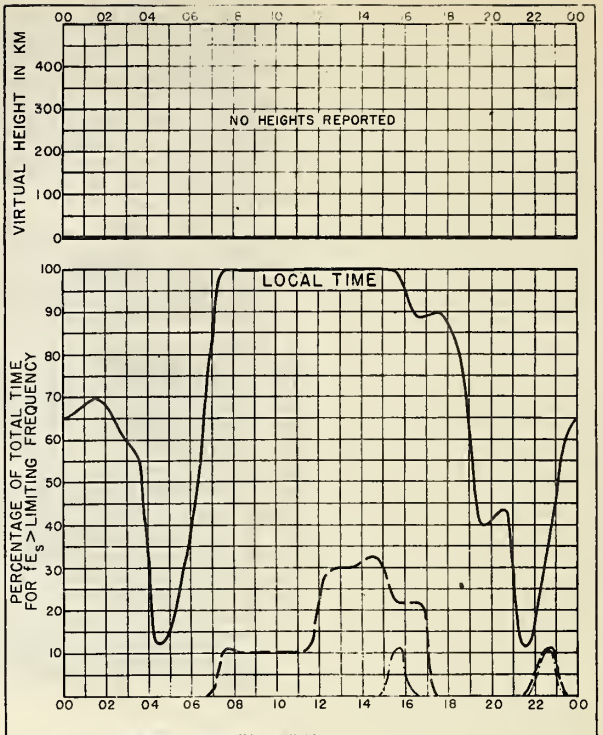

Fig. 58. OKINAWA I. NOVEMBER 1946

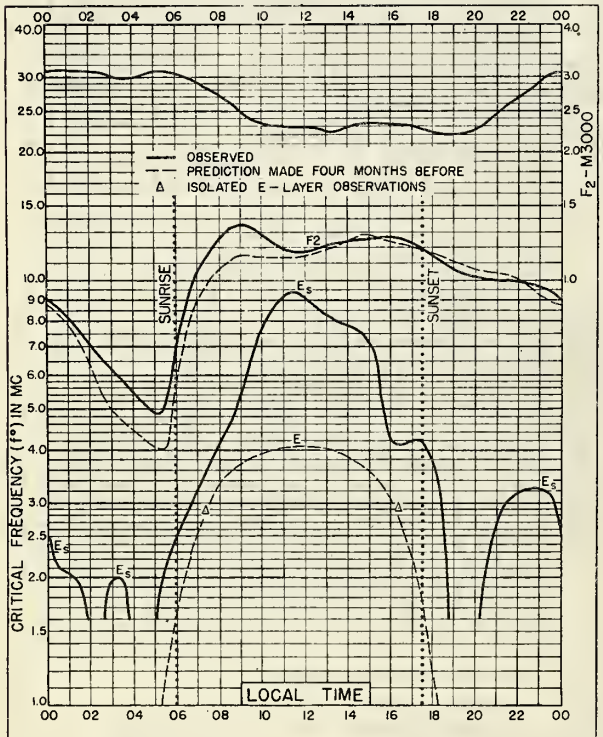

Fig. 59. LEYTE, PHILIPPINE IS.
11.0°N, 125.0°E. NOVEMBER 1946

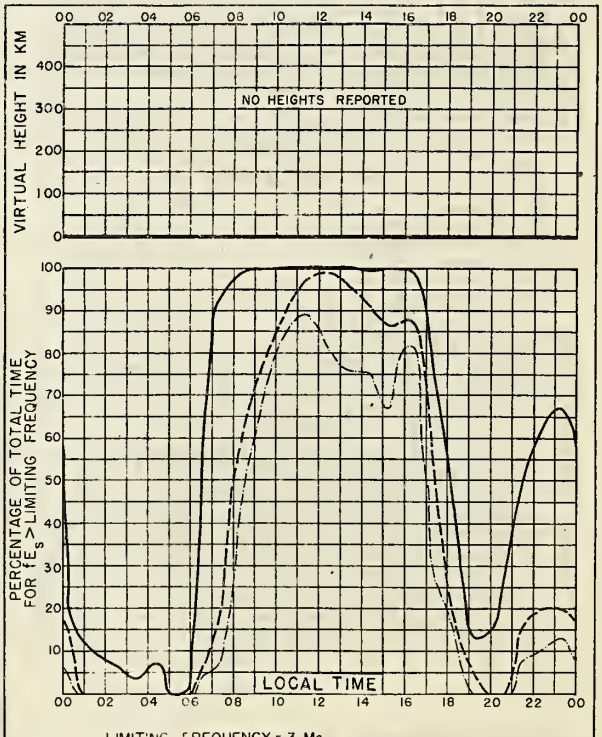

Fig. 60 LEYTE, PHILIPPINE IS. NOVEMBER 1946

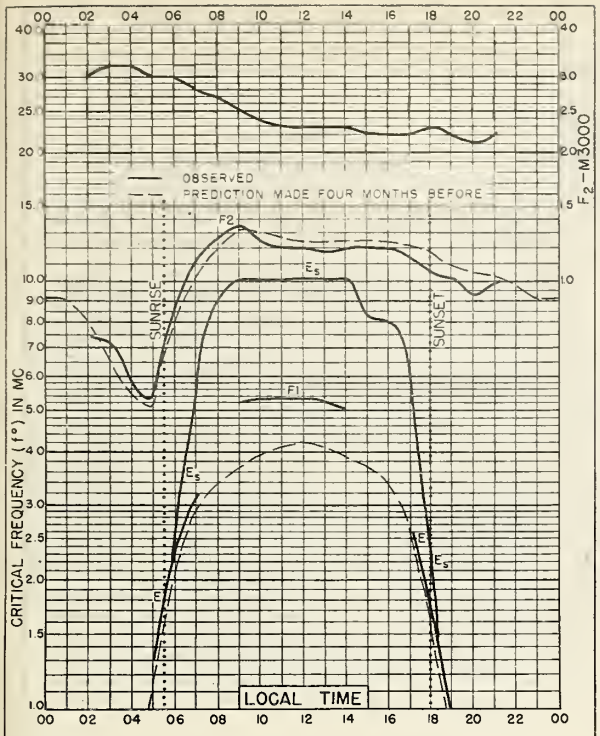

Fig. 61. HUANCAYO, PERU
12.0°S, 75.3°W NOVEMBER 1946

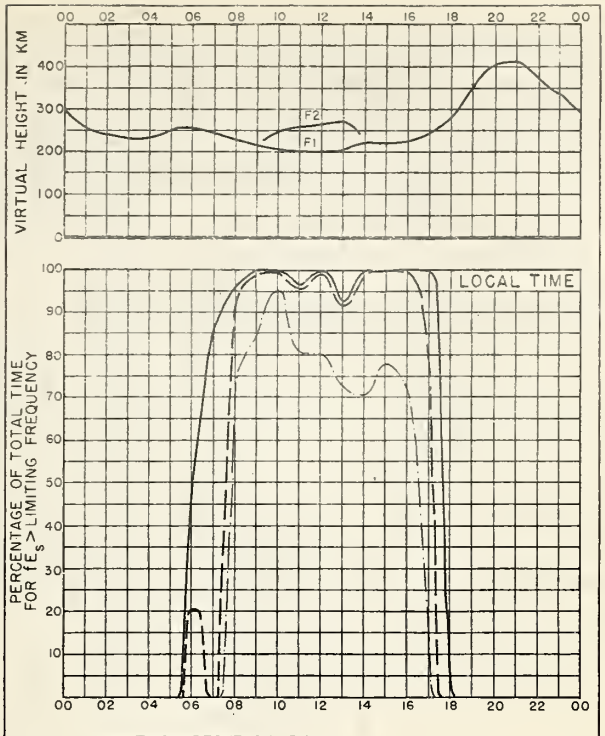

Fig. 62. HUANCAYO, PERU NOVEMBER 1946

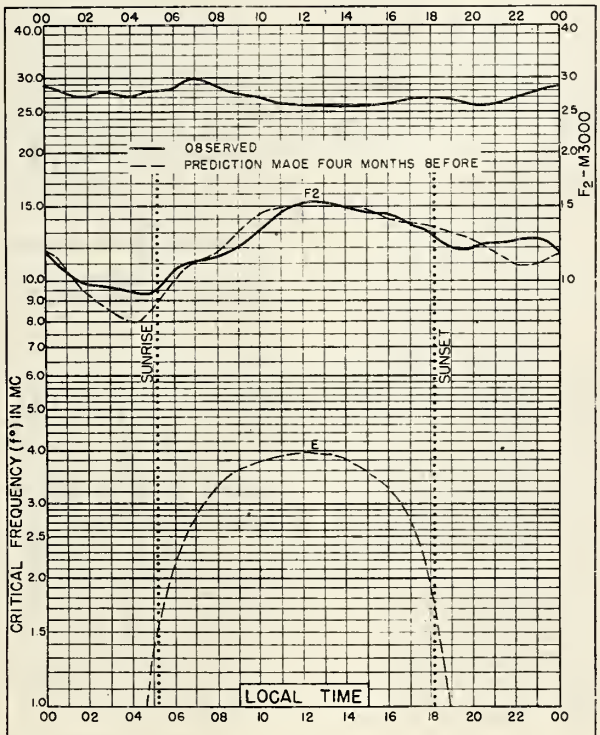

Fig. 63. RAROTONGA I.
21.3°S, 159.8°W NOVEMBER 1946

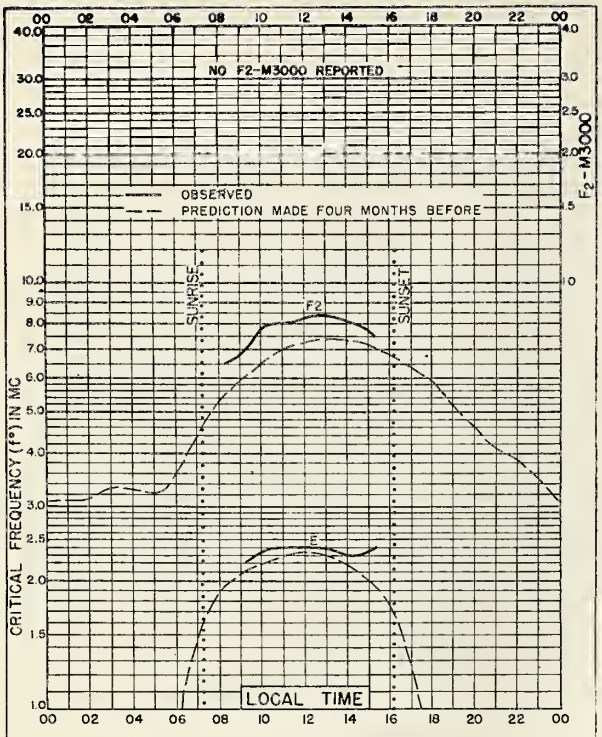

Fig.64. TROMSO, NORWAY
69.7°N, 18.9°E
OCTOBER 1946

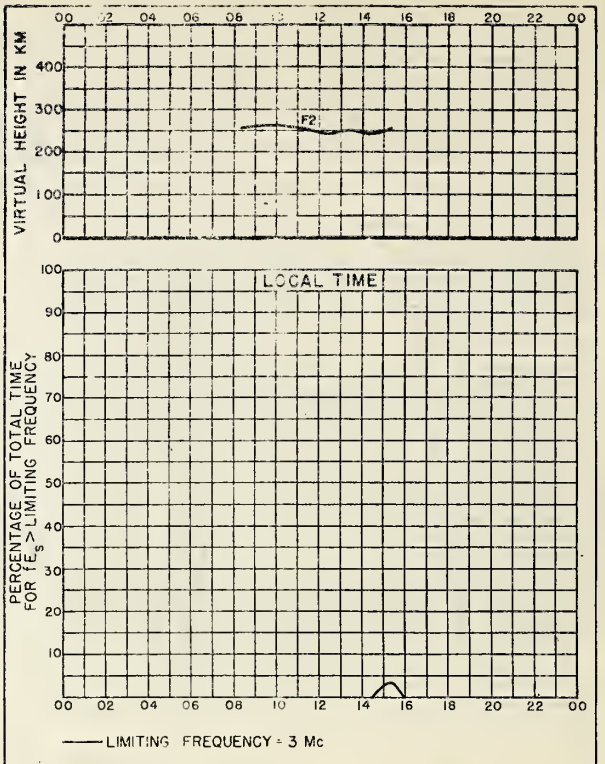

Fig.65. TROMSO, NORWAY
OCTOBER 1946

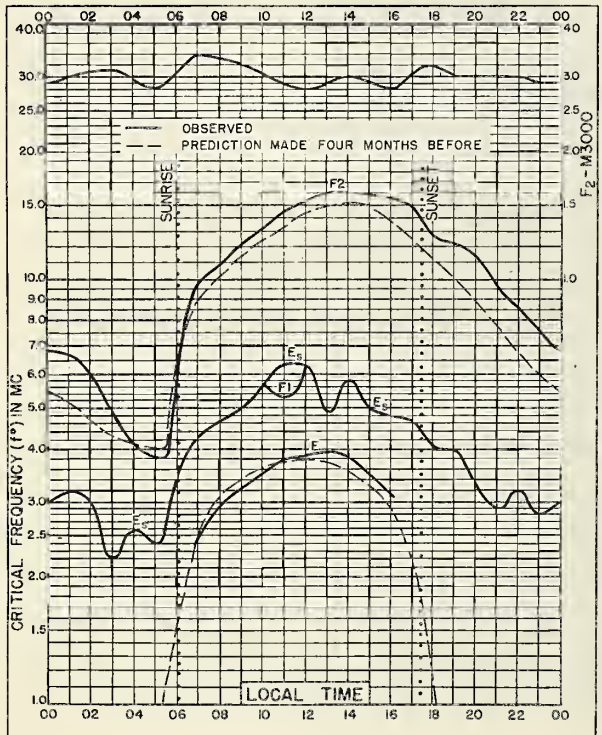

Fig.66. CHUNGKING, CHINA
29.4°N, 106.8°E
OCTOBER 1946

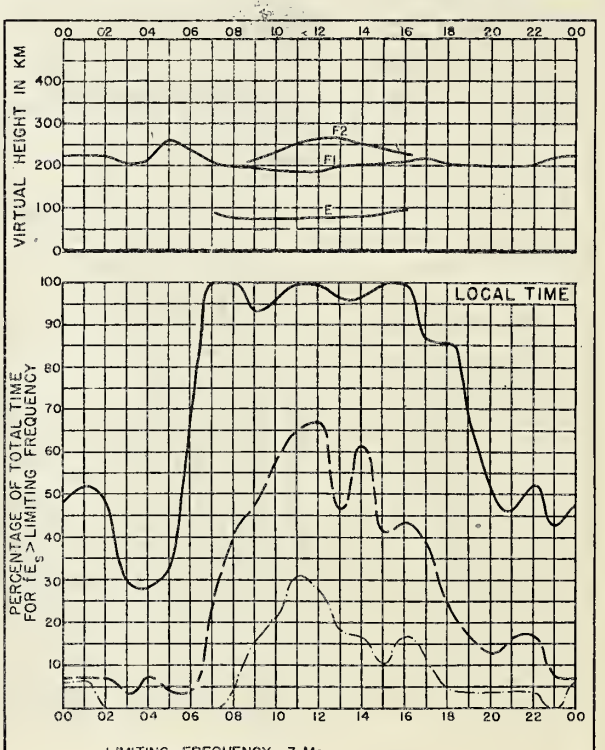

Fig.67. CHUNGKING, CHINA
OCTOBER 1946

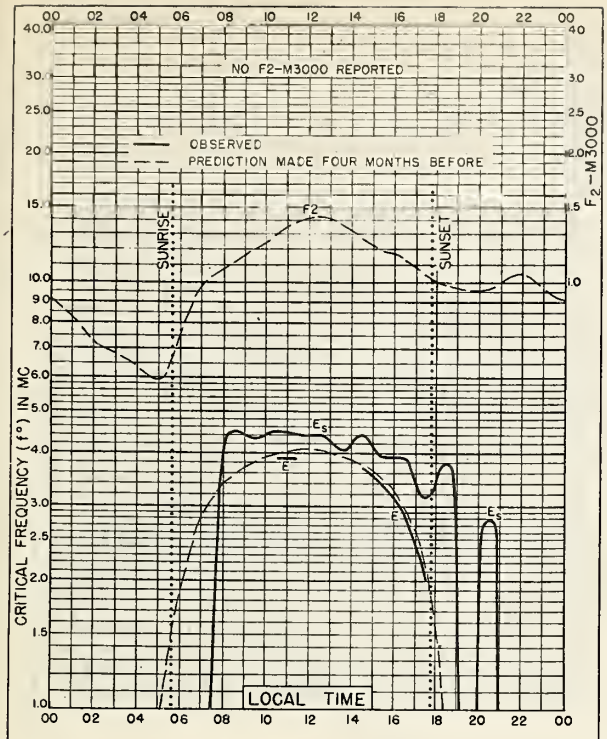

Fig.68. CAPE YORK, AUSTRALIA
11.0°S, 142.4°E OCTOBER 1946

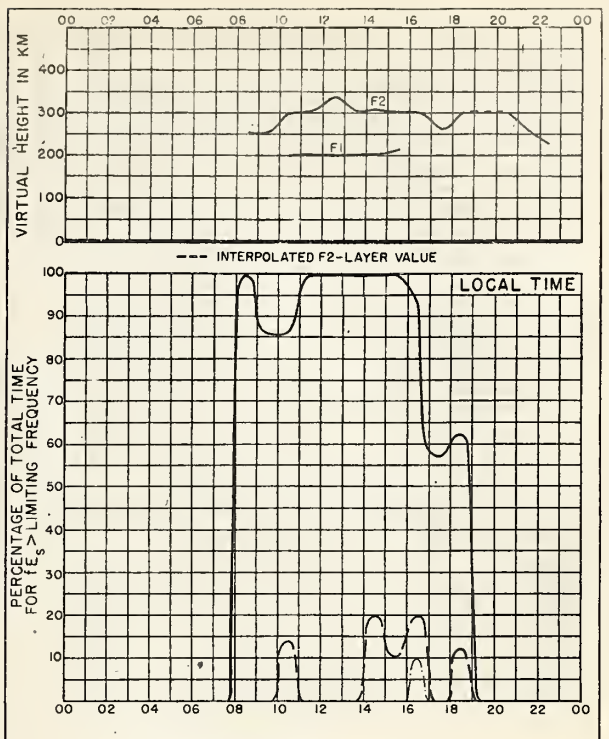

Fig.69. CAPE YORK, AUSTRALIA OCTOBER 1946

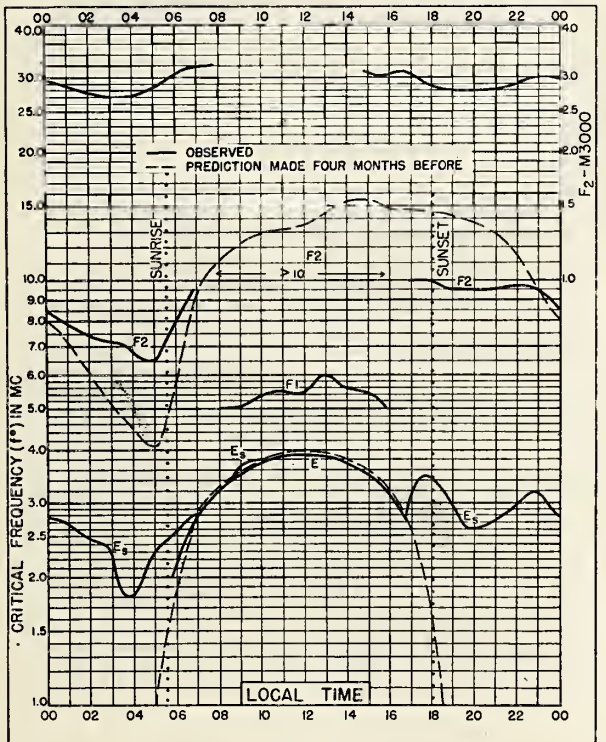

Fig. 70. TOWNSVILLE, AUSTRALIA
19.4°S, 146.5°E OCTOBER 1946

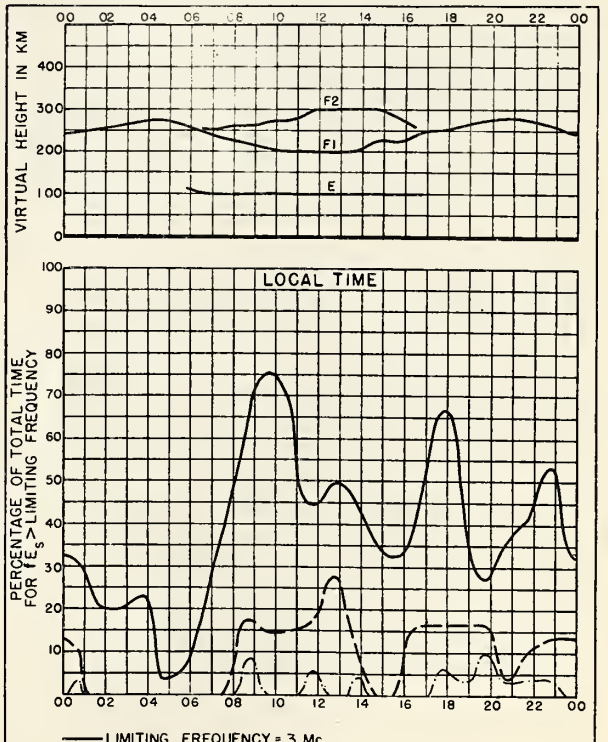

Fig.71. TOWNSVILLE, AUSTRALIA OCTOBER 1946

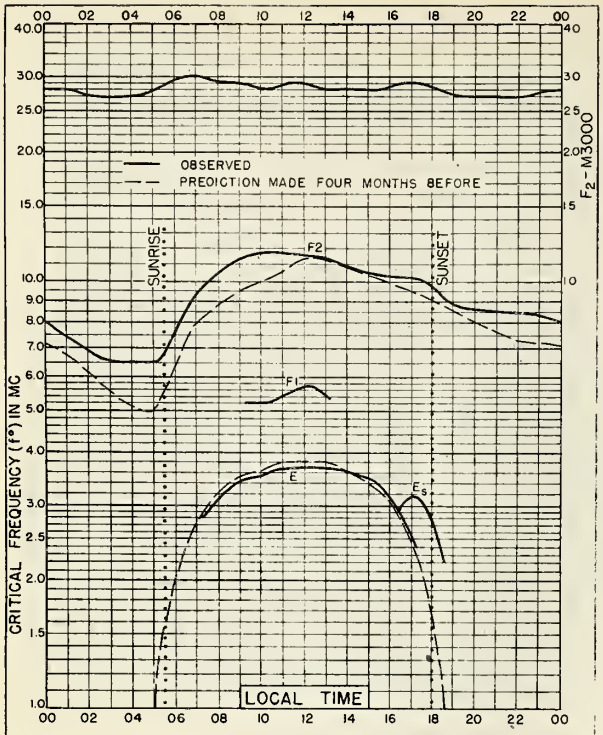

Fig. 72. BRISBANE, AUSTRALIA
27.5°S, 153.0°E OCTOBER 1946

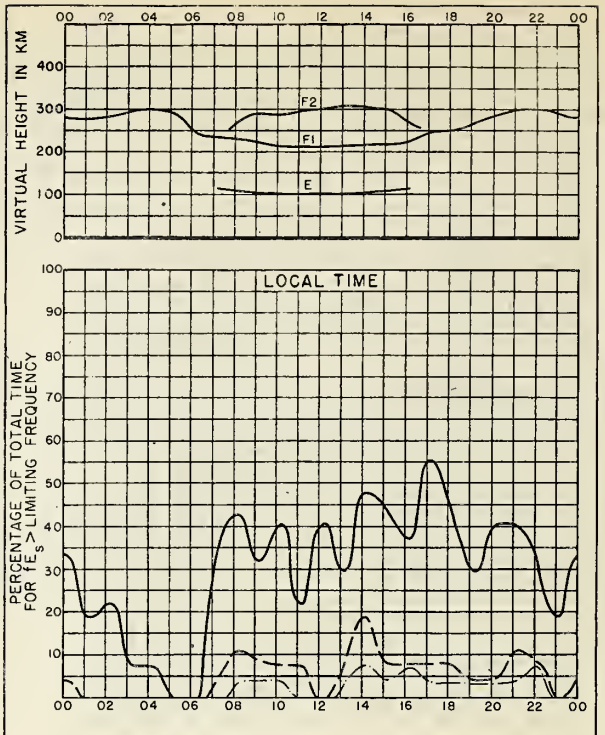

Fig. 73. BRISBANE, AUSTRALIA OCTOBER 1946

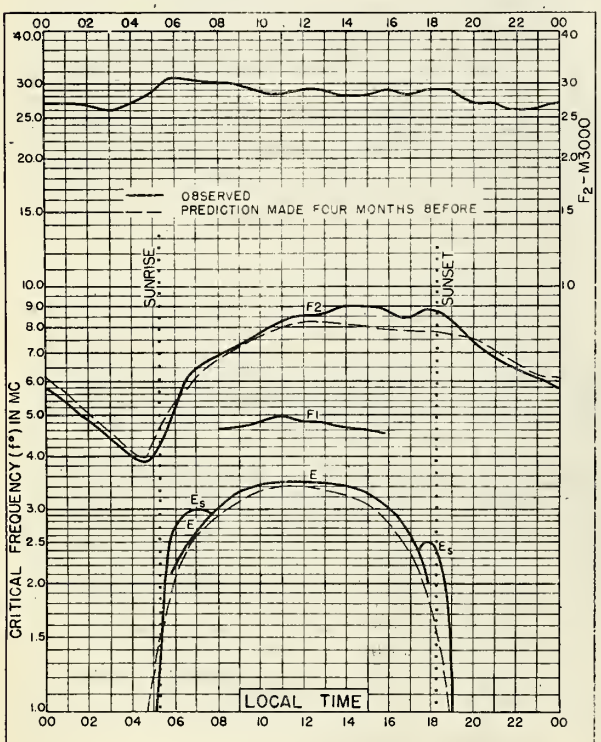

Fig. 74. HOBART, TASMANIA
42.8°S, 147.4°E OCTOBER 1946

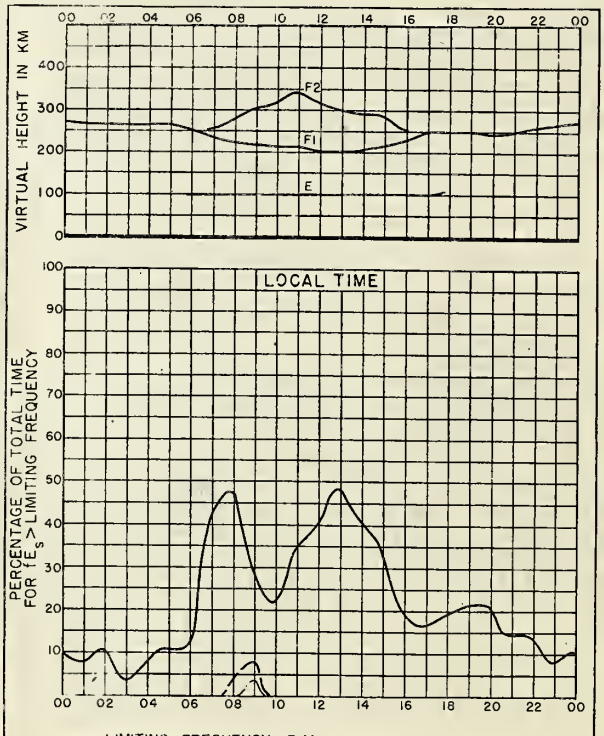

Fig. 75. HOBART, TASMANIA OCTOBER 1946

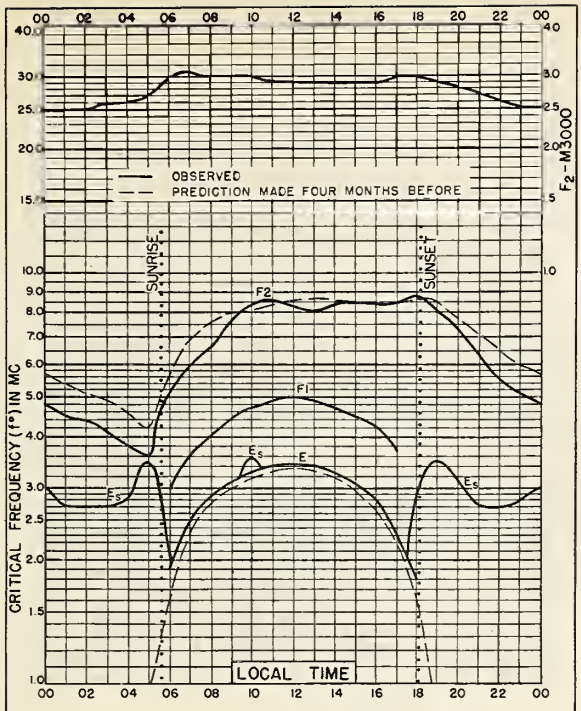

Fig. 76. SLOUGH, ENGLAND
51.5°N, 0.6°W SEPTEMBER 1946

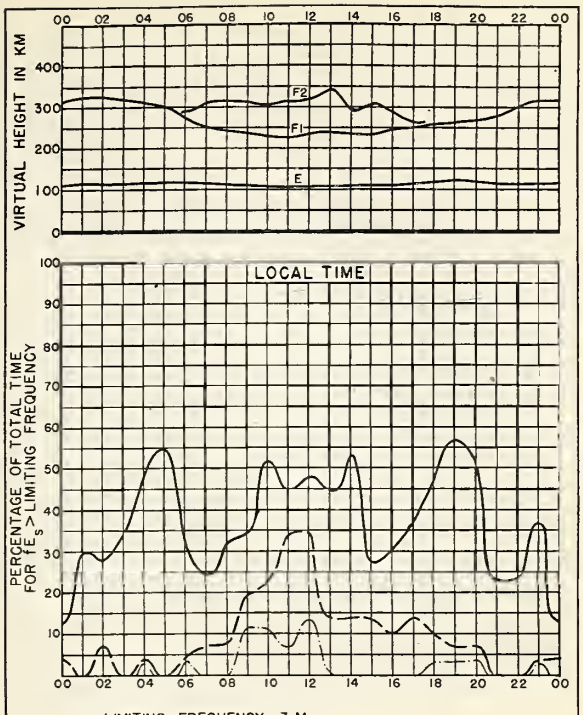

Fig. 77. SLOUGH, ENGLAND SEPTEMBER 1946

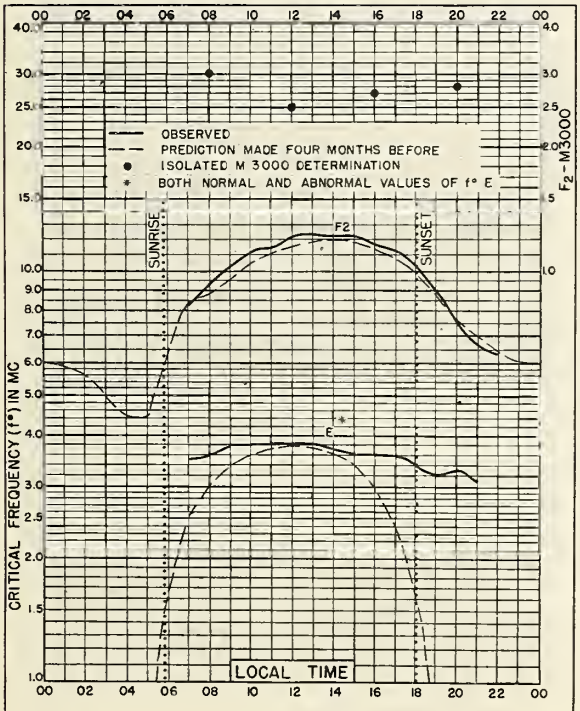

Fig. 78. PESHAWAR, INDIA
34.0°N, 71.5°E SEPTEMBER 1946

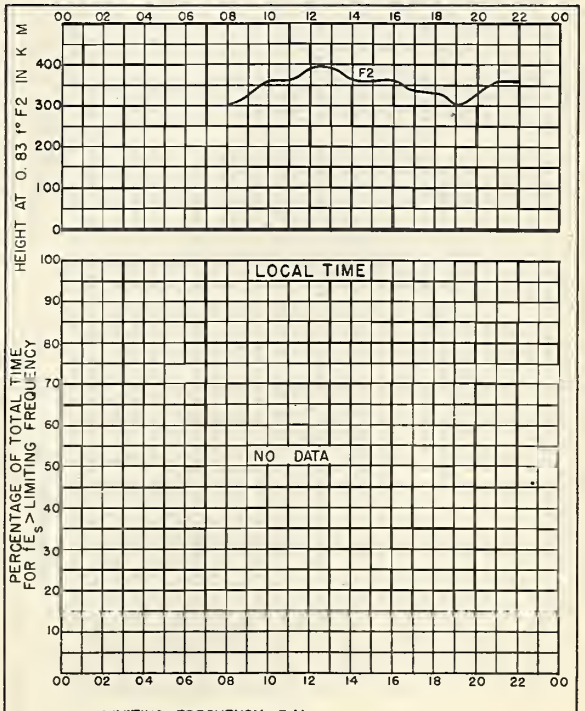

Fig. 79. PESHAWAR, INDIA SEPTEMBER 1946

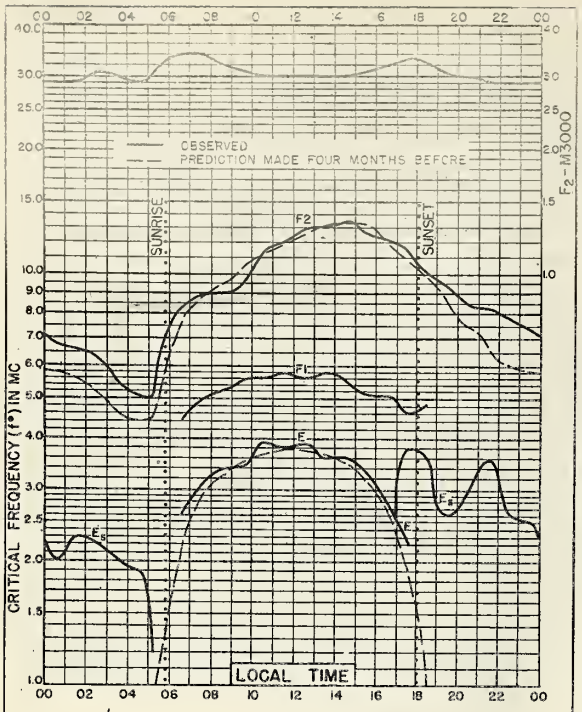

Fig. 80. WUCHANG, CHINA
30.6°N, 114.4°E SEPTEMBER 1946

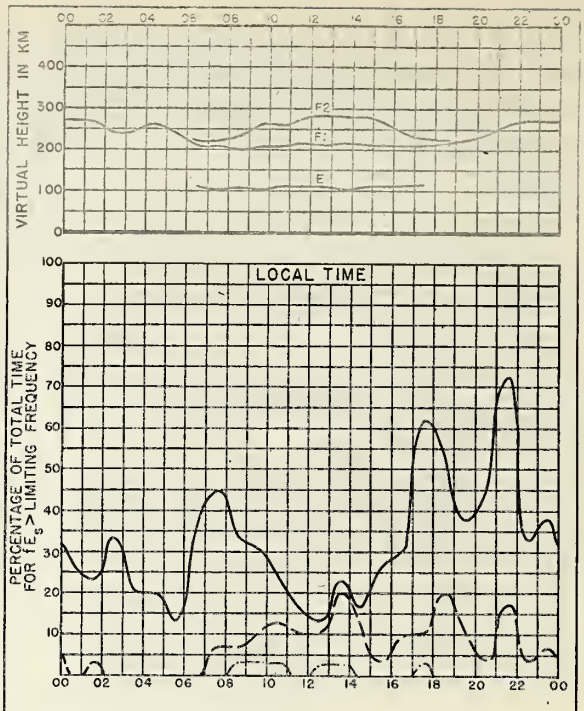

Fig. 81. WUCHANG, CHINA SEPTEMBER 1946

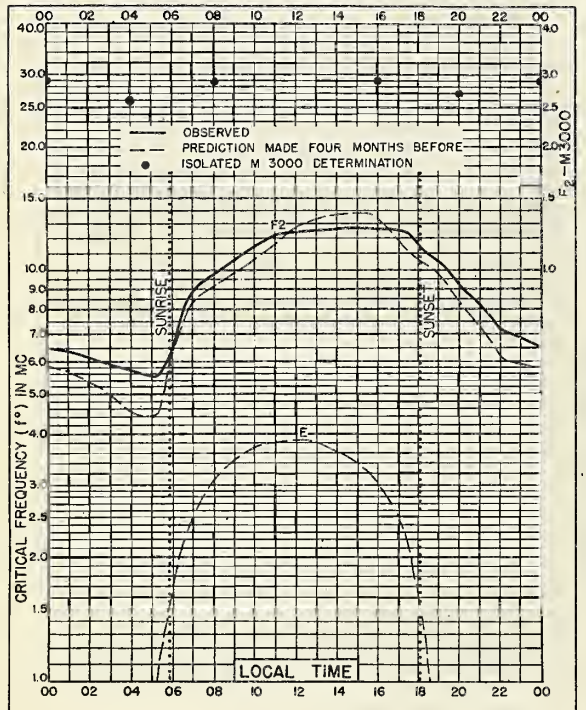

Fig. 82. DELHI, INDIA
28.6°N, 77.1°E SEPTEMBER 1946

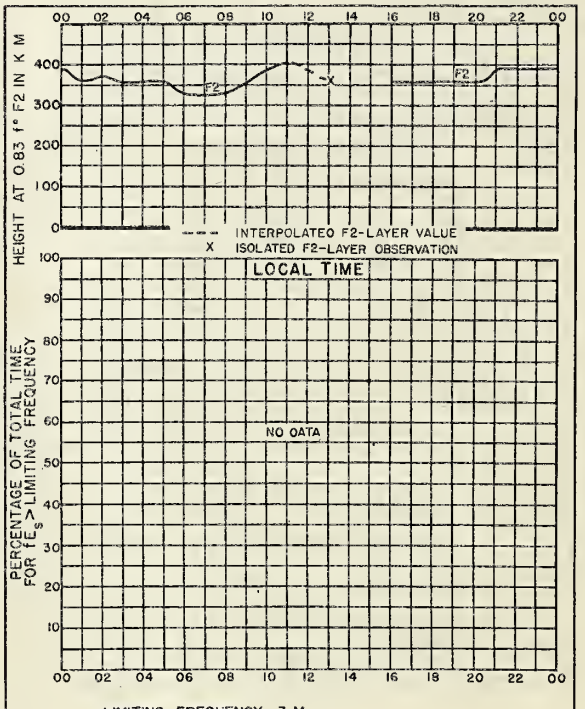

Fig. 83. DELHI, INDIA SEPTEMBER 1946

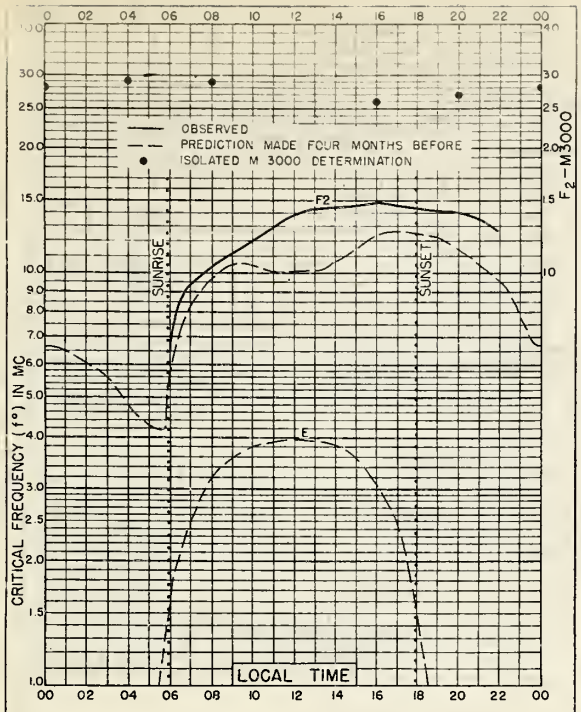

Fig.84. BOMBAY, INDIA
19.0°N, 73.0°E SEPTEMBER 1946

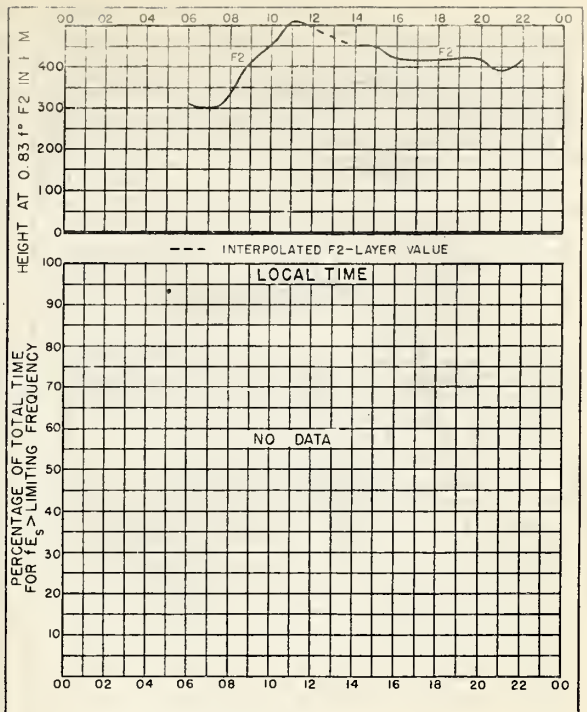

Fig.85. BOMBAY, INDIA SEPTEMBER 1946

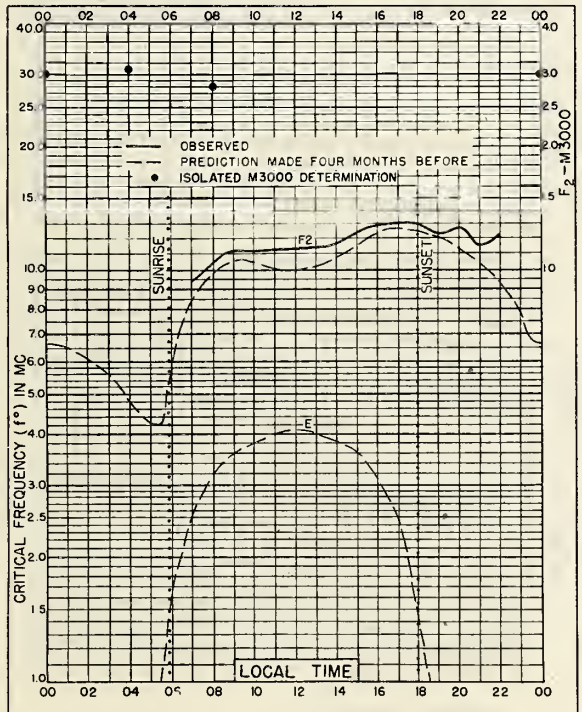

Fig.86. MADRAS, INDIA
13.0°N, 80.2°E SEPTEMBER 1946

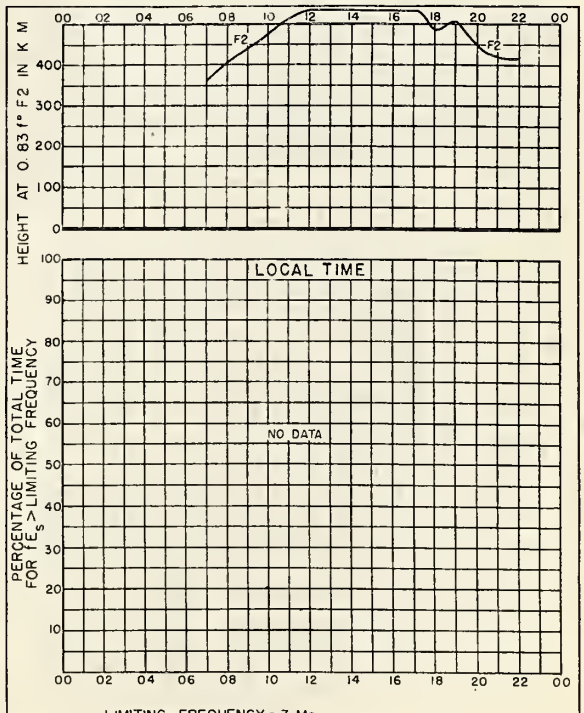

Fig.87. MADRAS, INDIA SEPTEMBER 1946

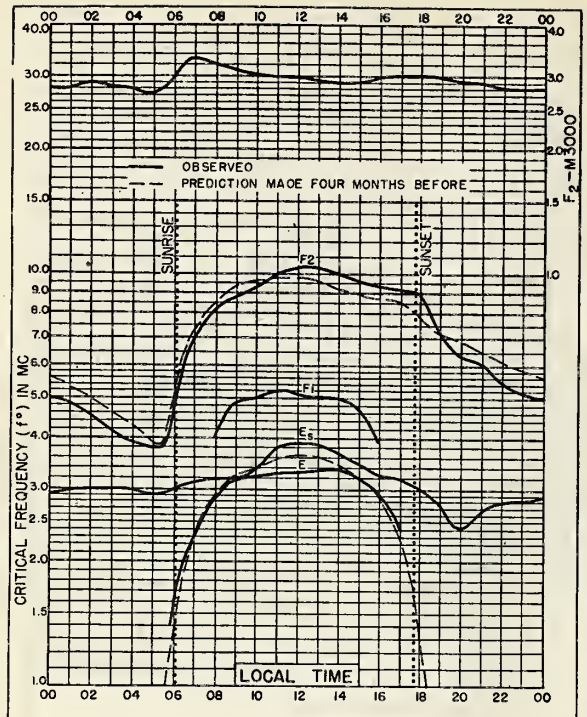

Fig.88. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E SEPTEMBER 1946

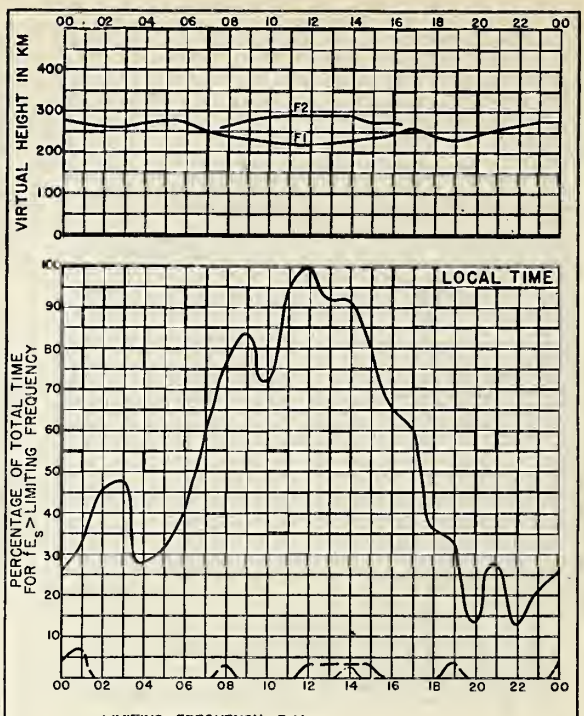

Fig.89. WATHEROO, W. AUSTRALIA SEPTEMBER 1946

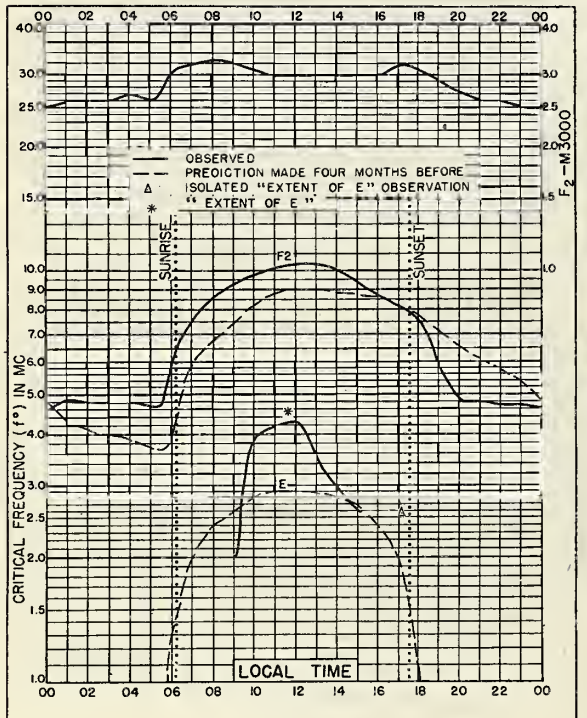

Fig.90. FALKLAND IS.
51.7°S, 57.7°W SEPTEMBER 1946

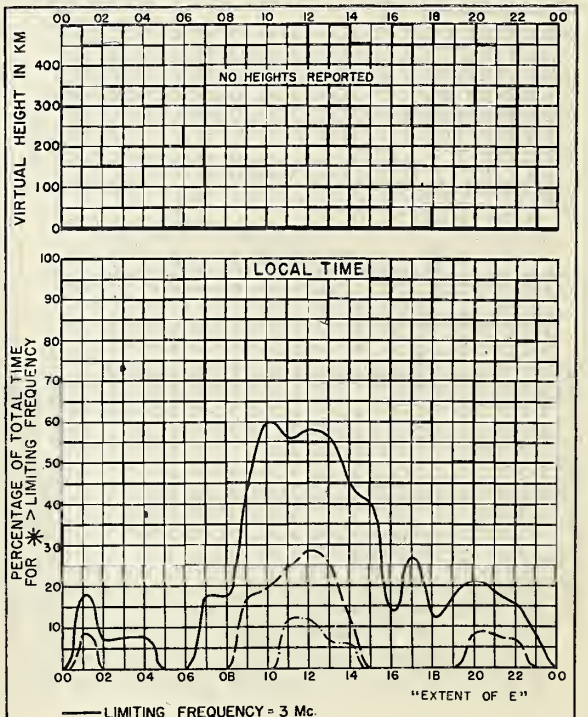

Fig.91. FALKLAND IS. SEPTEMBER 1946

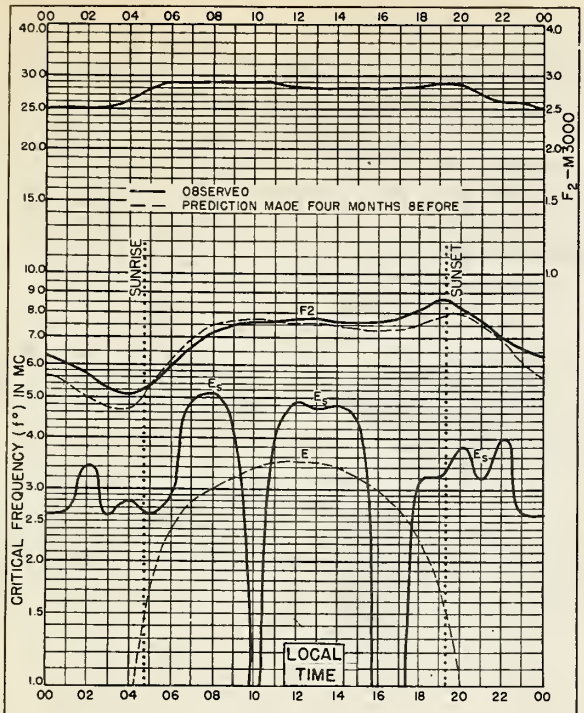

Fig. 92. SLOUGH, ENGLAND
51.5°N, 0.6°W AUGUST 1946

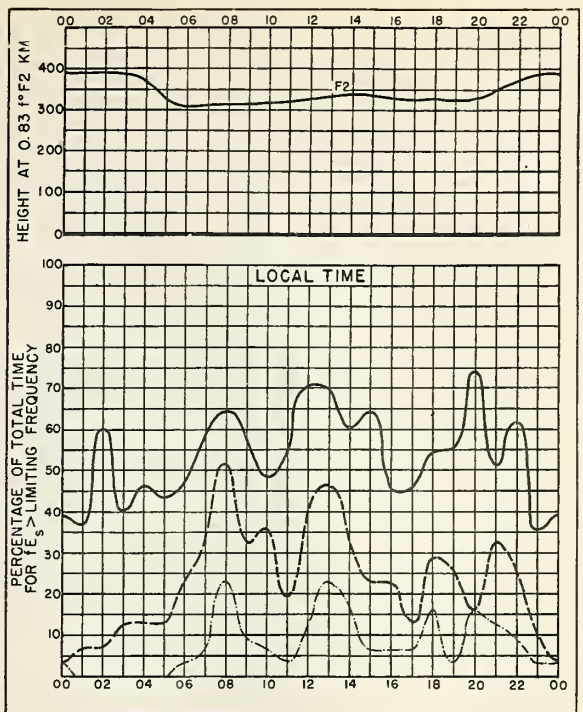

Fig. 93. SLOUGH, ENGLAND AUGUST 1946

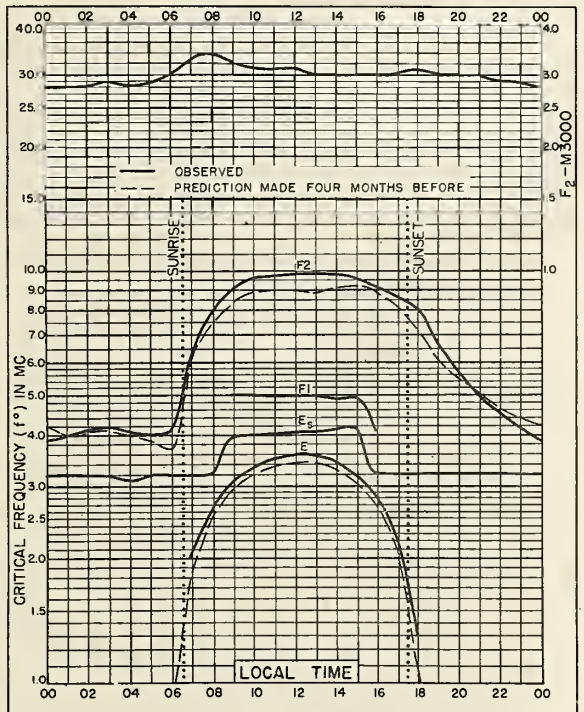

Fig. 94. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E AUGUST 1946

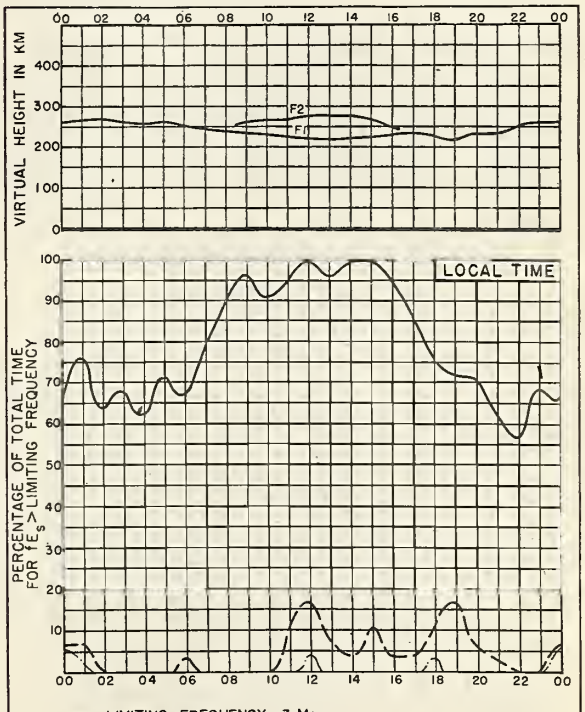

Fig. 95. WATHEROO, W. AUSTRALIA AUGUST 1946

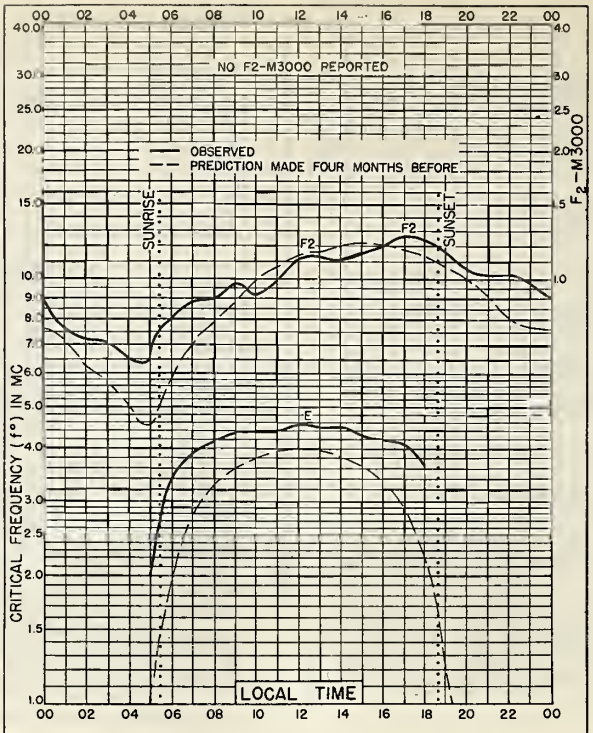

Fig. 96. CALCUTTA, INDIA
22.6°N, 88.4°E JULY 1946

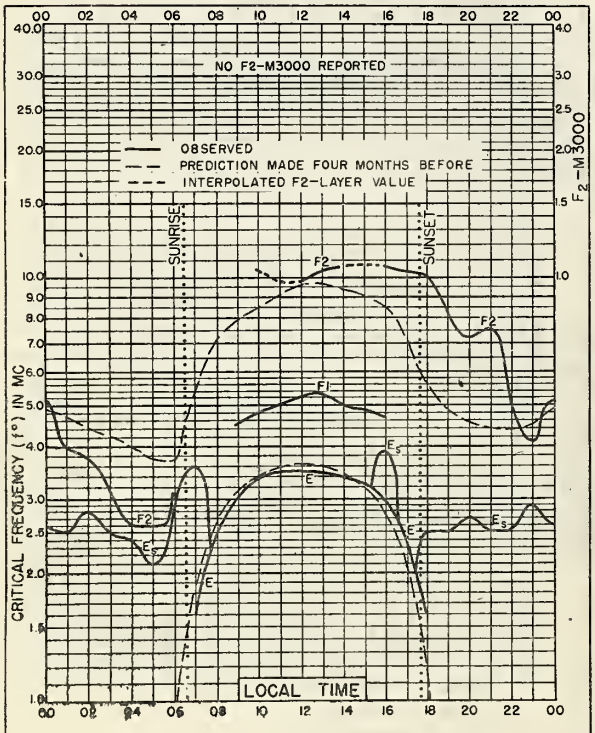

Fig. 97. FIJI IS.
18.0°S, 178.2°E JULY 1946

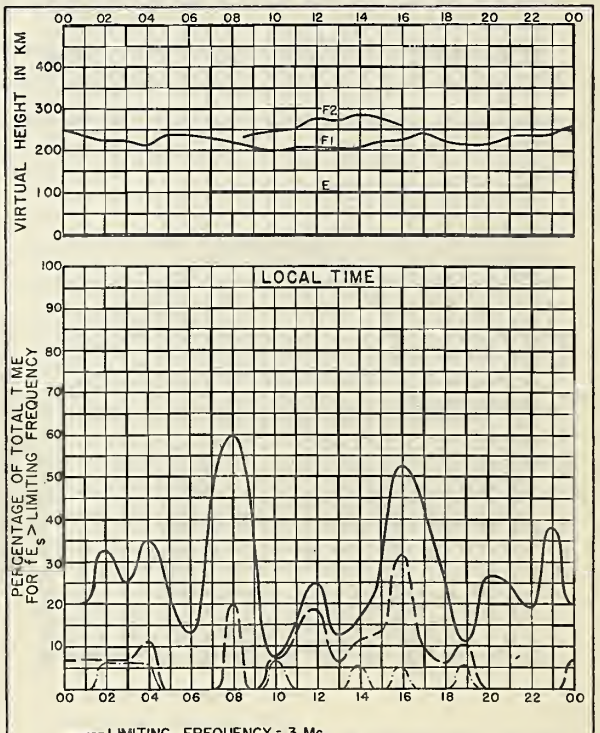

Fig. 98. FIJI IS. JULY 1946

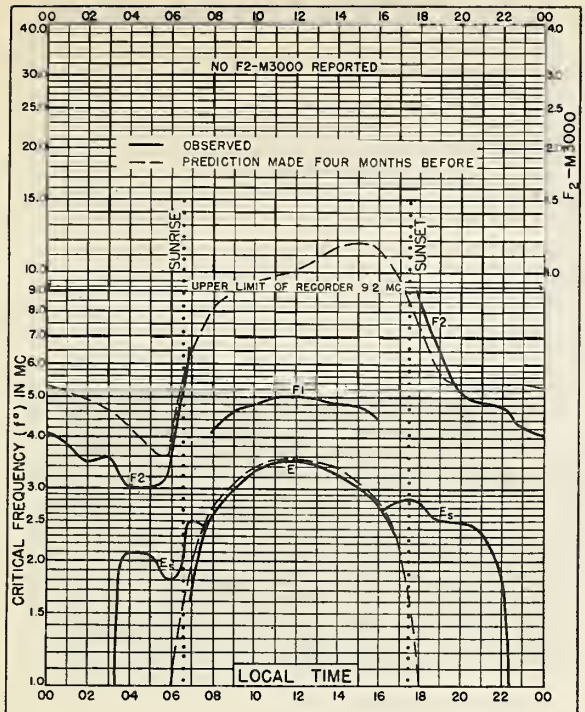

Fig. 99. FIJI IS.
18.0°S, 178.2°E
JUNE 1946

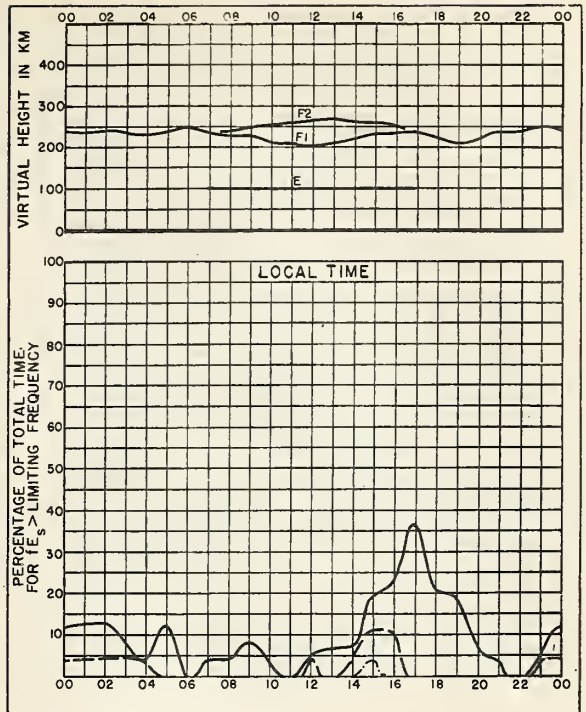

Fig. 100. FIJI IS.
JUNE 1946

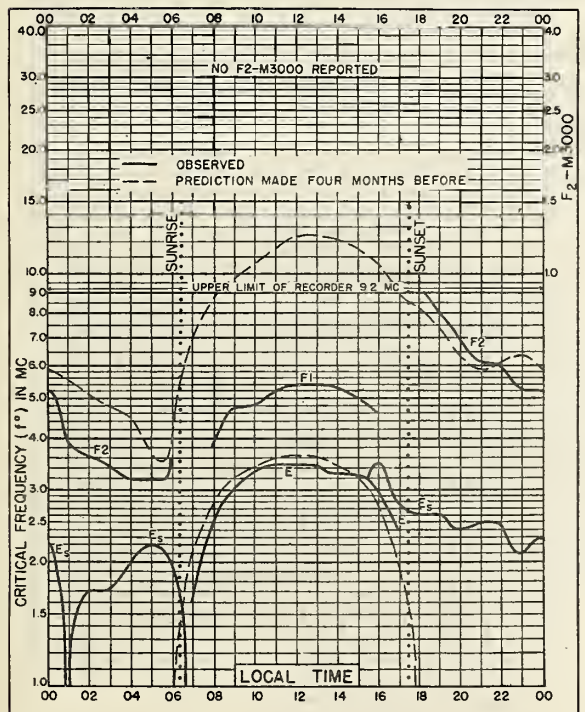

Fig. 101. FIJI IS.
18.0°S, 178.2°E
MAY 1946

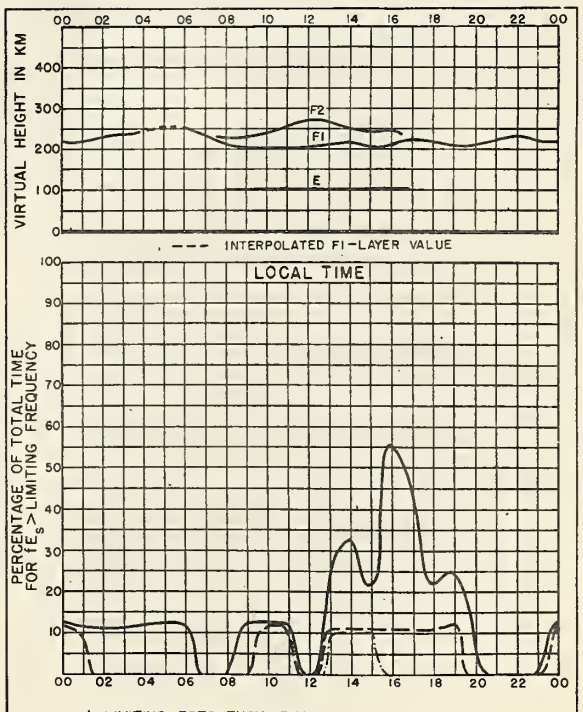

Fig. 102. FIJI IS.
MAY 1946

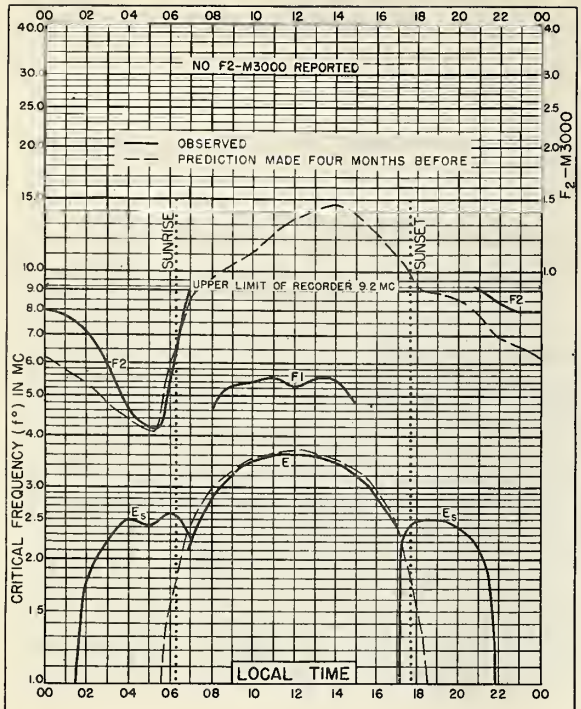

Fig. 103. FIJI IS.
18.0°S, 178.2°E
APRIL 1946

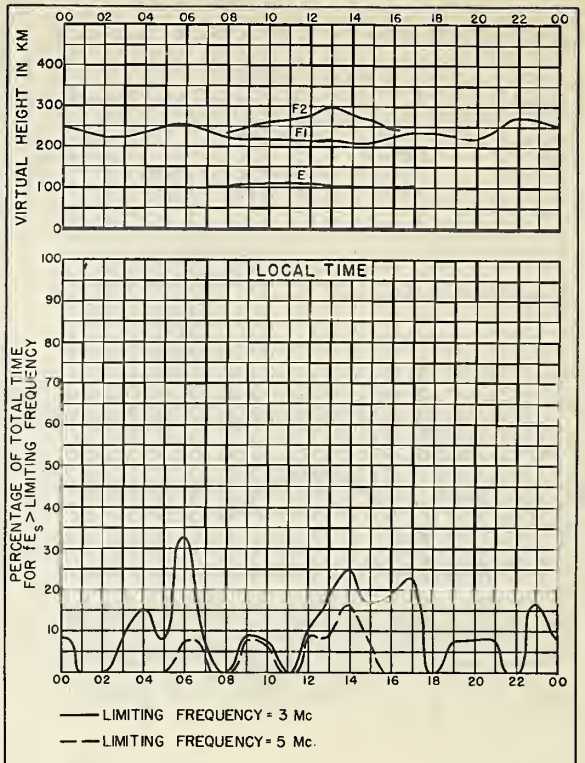

Fig. 104. FIJI IS.
APRIL 1946

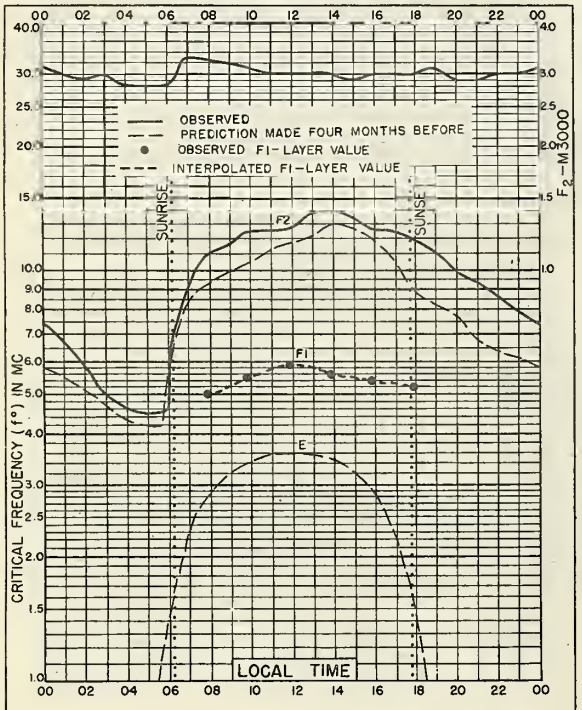

Fig. 105. RAROTONGA I.
21.3°S, 159.8°W
APRIL 1946

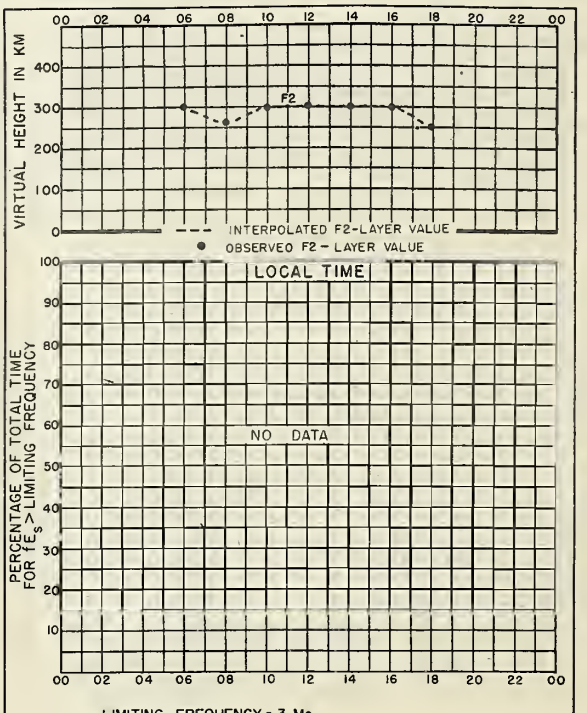

Fig. 106. RAROTONGA I.
APRIL 1946

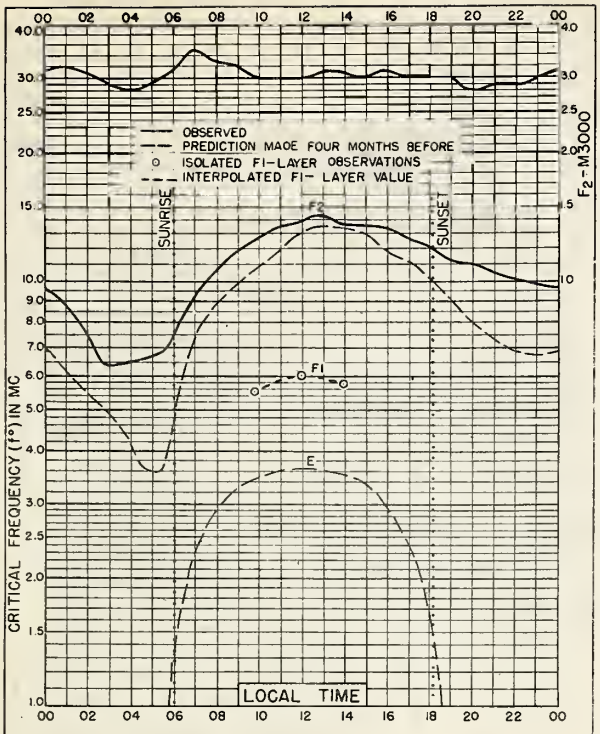

Fig. 107 RAROTONGA I.
21.3°S, 159.8°W MARCH 1946

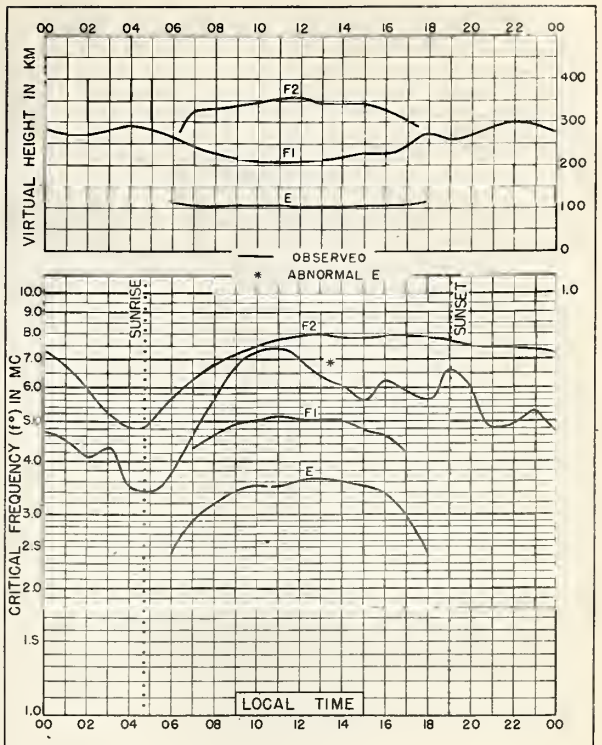

Fig. 108 CANBERRA, AUSTRALIA
35.3°S, 149.0°E DECEMBER 1941

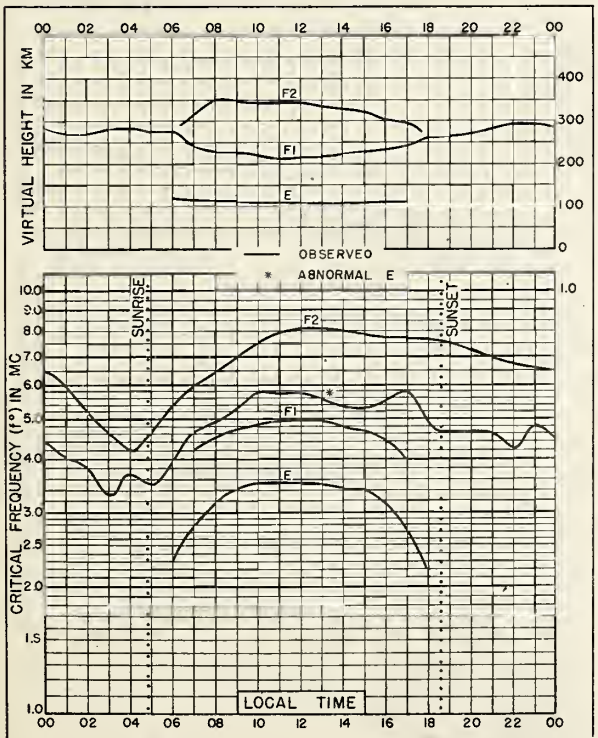

Fig. 109. CANBERRA, AUSTRALIA
35.3°S, 149.0°E NOVEMBER 1941

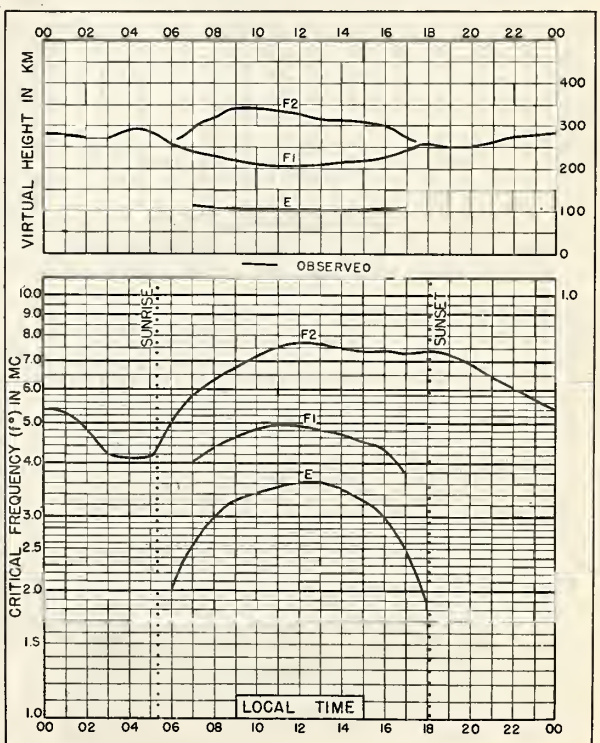

Fig. 110. CANBERRA, AUSTRALIA
35.3°S, 149.0°E OCTOBER 1941

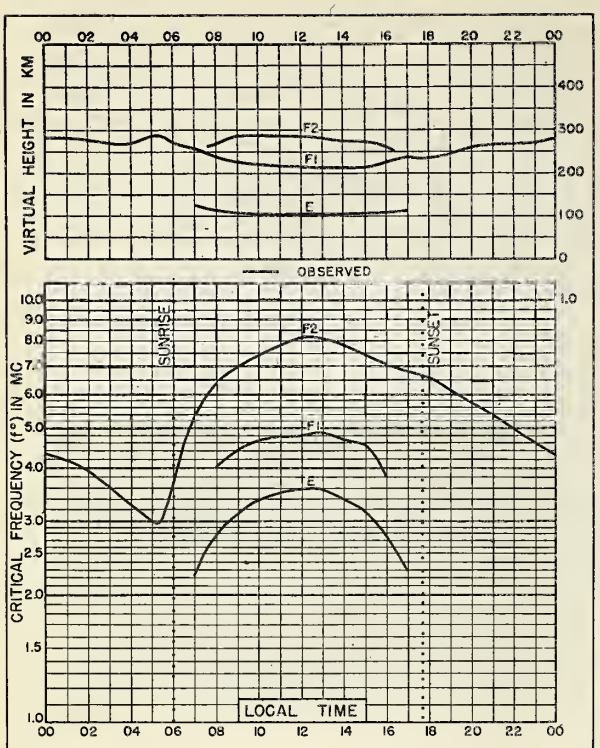

Fig. 111. CANBERRA, AUSTRALIA
35.3°S, 149.0°E SEPTEMBER 1941

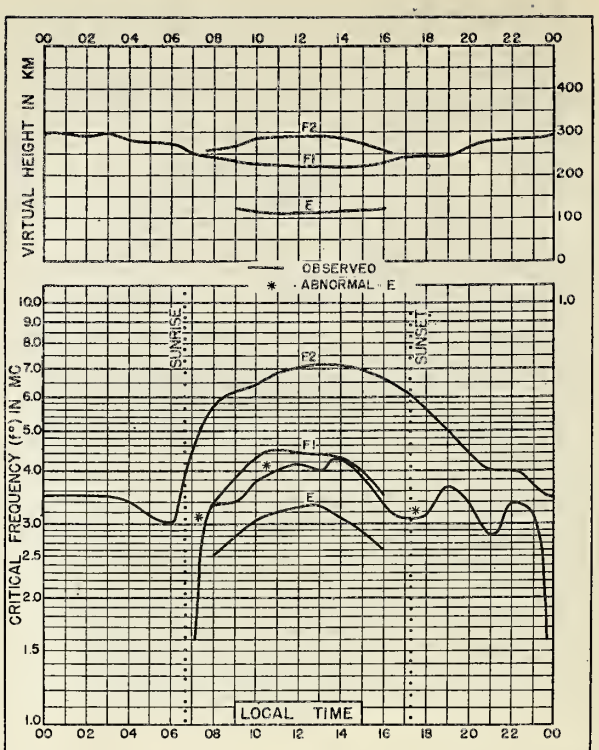

Fig. 112. CANBERRA, AUSTRALIA
35.3°S, 149.0°E AUGUST 1941

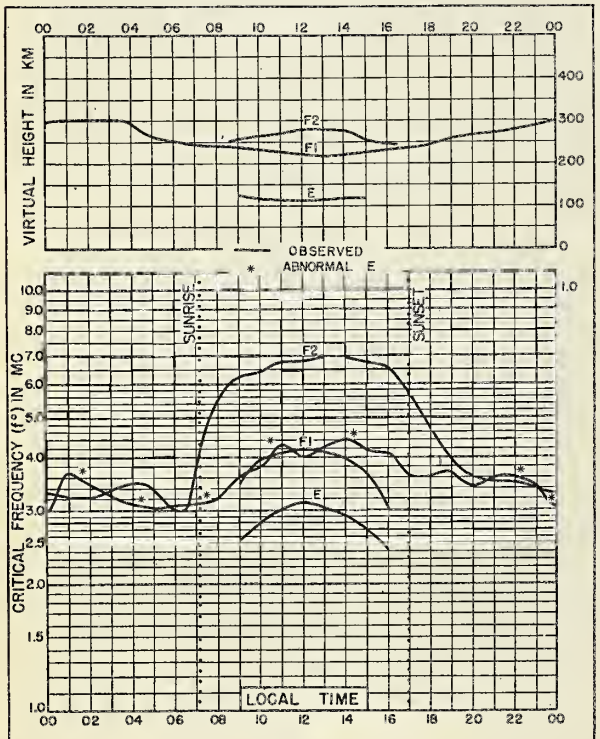

Fig. 113. CANBERRA, AUSTRALIA
35.3°S, 149.0°E JULY 1941

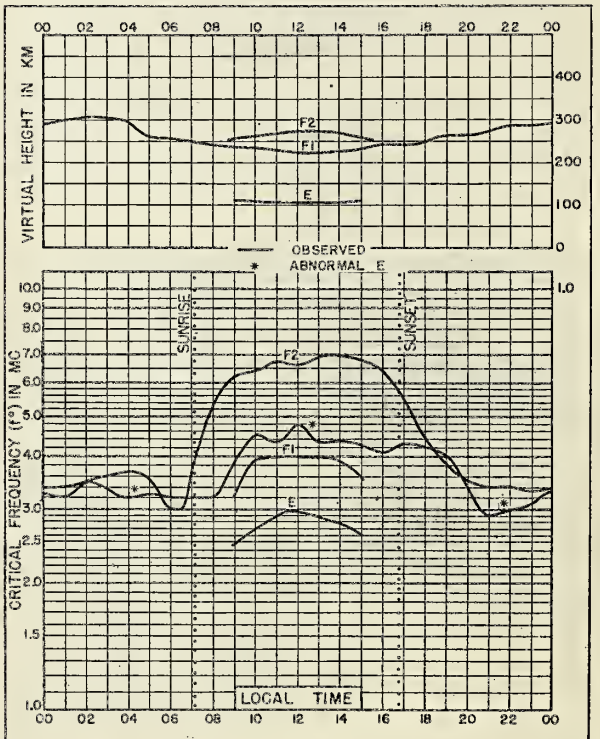

Fig. 114. CANBERRA, AUSTRALIA
35.3°S, 149.0°E JUNE 1941

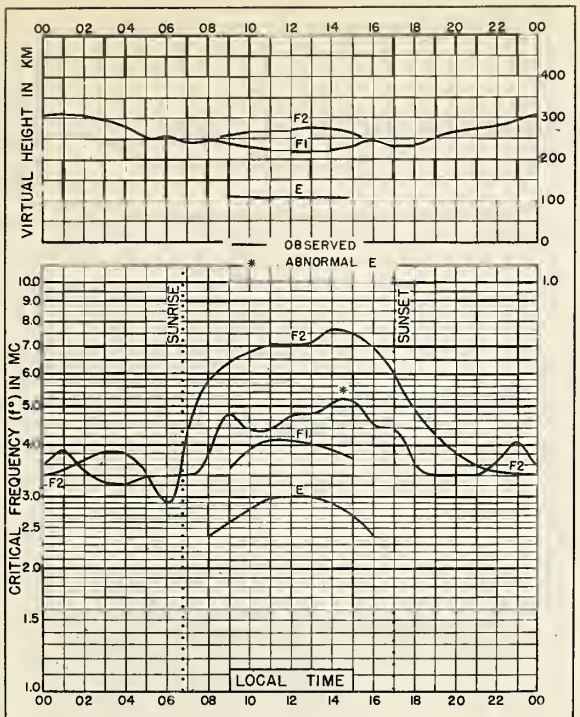

Fig.115. CANBERRA, AUSTRALIA
35.3°S, 149.0°E MAY 1941

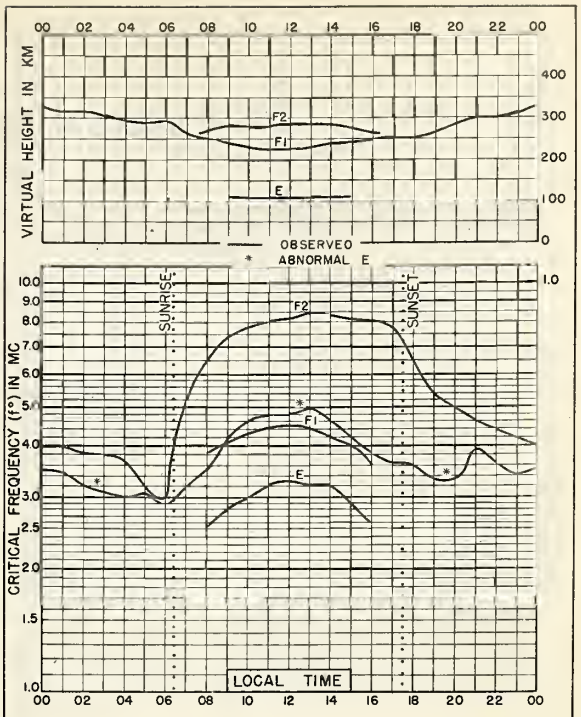

Fig.116. CANBERRA, AUSTRALIA
35.3°S, 149.0°E APRIL 1941

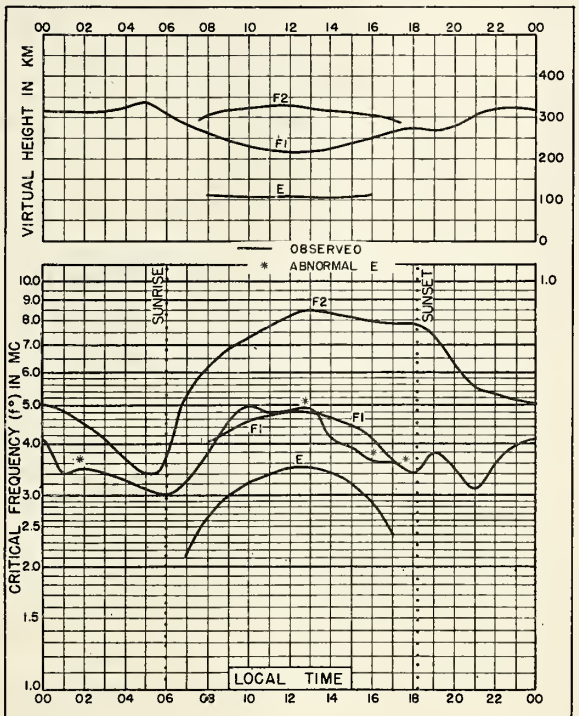

Fig.117. CANBERRA, AUSTRALIA
35.3°S, 149.0°E MARCH 1941

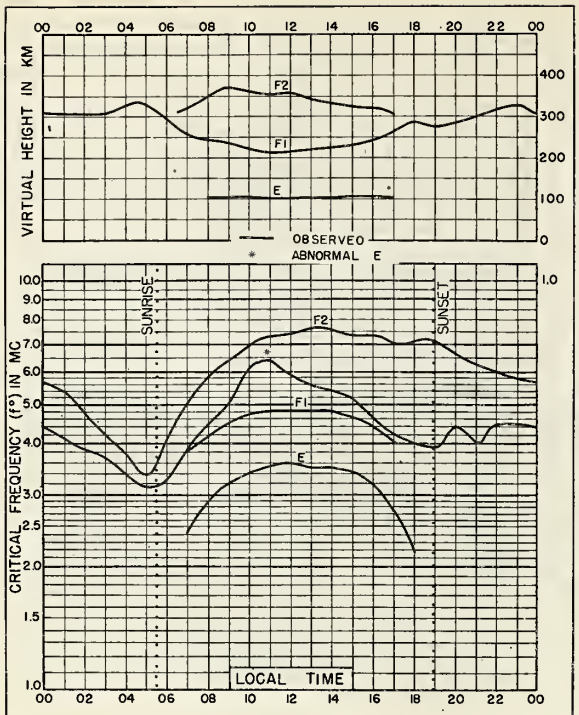

Fig. 118. CANBERRA, AUSTRALIA
35.3°S, 149.0°E FEBRUARY 1941

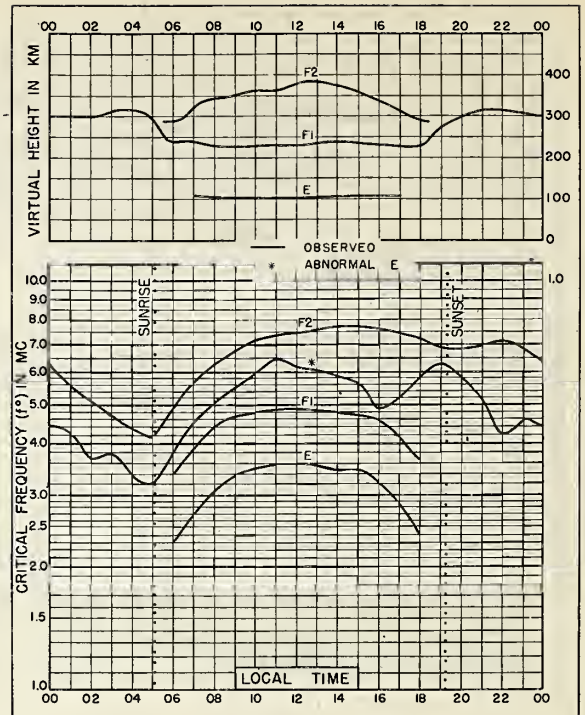

Fig. 119. CANBERRA, AUSTRALIA
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Daily:
Radio disturbance warnings, every half hour from broadcast station WWV of the National Bureau of Standards.
Telephoned and telegraphed reports of ionospheric, solar, geomagnetic and radio propagation data.

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

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

Monthly:
CRPL-D. Basic Radio Propagation Predictions—Three months in advance. (War Dept. TB 11-499- , monthly supplements to TM 11-499; Navy Dept. DNC-13-1 ( ), monthly supplements to DNC-13-1.)
CRPL-F. Ionospheric Data.

Quarterly:
*IRPL-A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.
*IRPL-H. Frequency Guide for Operating Personnel.
Reports on high-frequency standards.
Reports on microwave standards.

Reports Issued in Past:
IRPL Radio Propagation Handbook, Part 1. (War Dept. TM 11-499; Navy Dept. DNC-13-1.)
IRPL-C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.
IRPL-G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.
IRPL-R. Unscheduled reports:
- R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.
- R5. Criteria for Ionospheric Storminess.
- R6. Experimental Studies of Ionospheric Propagation as Applied to the Loran System.
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