

CRPL-F 94

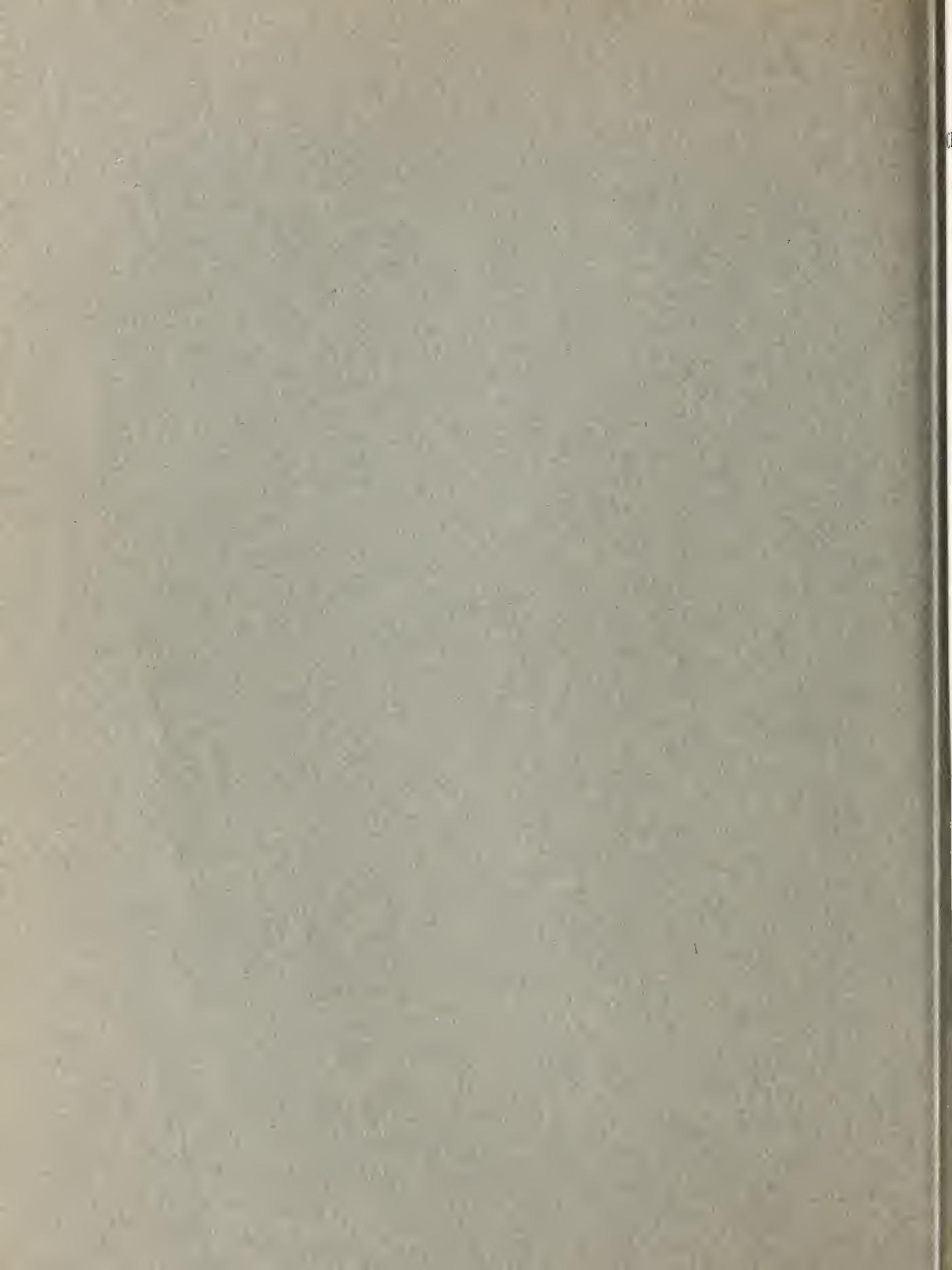
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IONOSPHERIC DATA

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JUNE 1952

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



IONOSPHERIC DATA

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SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

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 Document No. 626-E referred to above.

a. For all ionospheric characteristics:

Values missing because of A, C, F, L, M, N, Q, S, or T are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of f_0F2 (and f_0E near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of $h'F2$ (and $h'E$ near sunrise and sunset) missing for this reason are counted as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

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_0F2 , as equal to or less than f_0Fl .
2. For $h'F2$, as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic. This practice represents a change from that listed in issues previous to CRPL-F78.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency count of the recorder.

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

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

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

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

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

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

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

- a. Differences in scaling records when spread echoes are present.
- b. Omission of values when f_{oF2} is less than or equal to f_{oF1} , leading to erroneously high values of monthly averages or median values.
- c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

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

Ordinarily, a blank space in the f_Es column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of f_{oE} . Blank spaces at the beginning and end of columns of $h'F1$, f_{oF1} , $h'E$, and f_{oE} are usually the result of diurnal variation in these characteristics. Complete absence of medians of $h'F1$ and f_{oF1} is usually the result of seasonal effects.

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

- a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.
- b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.

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

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

Month	Predicted Sunspot Number							
	1952	1951	1950	1949	1948	1947	1946	1945
December	53	86	108	114	126	85	38	
November	52	87	112	115	124	83	36	
October	52	90	114	116	119	81	23	
September	54	91	115	117	121	79	22	
August	57	96	111	123	122	77	20	
July	60	101	108	125	116	73		
June	63	103	108	129	112	67		
May	52	68	102	108	130	109	67	
April	52	74	101	109	133	107	62	
March	52	78	103	111	133	105	51	
February	51	82	103	113	133	90	46	
January	53	85	105	112	130	88	42	

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 56 and figures 1 to 112 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

República Argentina, Ministerio de Marina:
Buenos Aires, Argentina

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

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

University of Graz:
Graz, Austria

British Department of Scientific and Industrial Research, Radio Research Board:

Falkland Is.
Ibadan, Nigeria (University College of Nigeria)
Inverness, Scotland
Singapore, British Malaya
Slough, England

Defence Research Board, Canada:

Baker Lake, Canada
Churchill, Canada
Ottawa, Canada
Prince Rupert, Canada
St. John's, Newfoundland
Winnipeg, Canada

Radio Wave Research Laboratories, National Taiman University, Taipeh,
Formosa, China:
Formosa, China

Icelandic Post and Telegraph Administration:
Reykjavik, Iceland

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

Radio Regulatory Commission, Tokyo, Japan:
Akita, Japan
Tokyo (Kokubunji), Japan
Wakkanai, Japan
Yamagawa, Japan

Norwegian Defence Research Establishment, Kjeller per Lillestrom,
Norway:
Oslo, Norway
Tromso, Norway

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

Research Laboratory of Electronics, Chalmers University of Technology,
Gothenburg, Sweden:
Kiruna, Sweden

Research Institute of National Defence, Stockholm, Sweden:
Uppsala, Sweden

Post, Telephone and Telegraph Administration, Berne, Switzerland:
Schwarzenburg, Switzerland

United States Air Force:
Cocoa, Florida

United States Army Signal Corps:
Adak, Alaska
Okinawa I.
White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):
Anchorage, Alaska
Batavia, Ohio (mobile unit)
Baton Rouge, Louisiana (Louisiana State University)
Fairbanks, Alaska
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
Panama Canal Zone
Point Barrow, Alaska
Puerto Rico, W. I.
San Francisco, California (Stanford University)
Washington, D. C.

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 57 to 68 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

IONOSPHERIC STORMINESS AT WASHINGTON, D.C.

Table 69 presents ionosphere character figures for Washington, D. C., during May 1952, as determined by the criteria given in the report IRPL-R5, "Criteria for Ionospheric Storminess," together with Cheltenham, Maryland, geomagnetic K-figures, which are usually covariant with them.

OBSERVATIONS OF SOLAR FLARES

Table 70 gives the preliminary record of solar flares reported to the CRPL. These reports are communicated on a rapid schedule at the sacrifice of detailed accuracy. Definitive and complete records are published later in the Quarterly Bulletin of Solar Activity, I.A.U., in various observatory publications, and elsewhere. The present listing serves to identify and roughly describe the phenomena observed. Details should be sought from the reporting observatory.

Reporting directly to the CRPL are the following observatories: Mt. Wilson, McMath-Hulbert, U. S. Naval, Wendelstein, Kanzel and High Altitude at Sacramento Peak, New Mexico. The remainder report to Meudon (Paris), and the data are taken from the Paris-URSIgram broadcast, monitored fairly regularly by the CRPL. The data on solar flares reported from Sacramento Peak, New Mexico, communicated by the High Altitude Observatory at Boulder, Colorado, are provided by Harvard University as the result of work undertaken on an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories.

The table lists for each flare the reporting observatory, date, times of beginning and ending of observation, duration (when known), total area (corrected for foreshortening), and heliographic coordinates. For the maximum phase of the flare is given the time, intensity, area relative to the total area, and the importance. The column "SID observed" is to indicate when a sudden ionosphere disturbance, noted elsewhere in these reports, occurred at the time of a flare. Times are in Universal Time (GCT).

RADIO PROPAGATION QUALITY FIGURES

The radio propagation quality figures (North Atlantic area) for January through March 1952 have been recalculated and appear in Tables 71a, 72a, and 73a, respectively. Table 74a gives the same information for April 1952. These data supersede Table 86 in F91 (January data), Table 70 in F92 (February data), and Table 80 in F93 (March data).

In addition to the radio propagation quality figures for 00 to 12 and 12 to 24 hours UT (Universal Time or GCT) for each day, these tables in this report list some of the CRPL forecasts and warnings for North Atlantic paths for the same periods of time: (1) radio disturbance warnings broadcast on WWV, (2) short term forecasts, issued every six hours for a 12-hour period, (3) advance forecasts (semi-weekly CRPL-J reports) issued from one to 25 days in advance. The tables also give half-day averages of geomagnetic K-indices measured by the Cheltenham Magnetic Observatory of the U.S. Coast and Geodetic Survey. Part b of the tables illustrates the comparison between the short term forecasts and the quality figures. The forecasts are plotted approximately at the time of issue, and they are intended to represent conditions in the 12-hour period following. The figures also illustrate the overall outcome of the advance forecasts, issued one to three or four days ahead, and in comparison is shown the result

The radio propagation quality figures are prepared from radio traffic data reported to CRPL by a method similar to that described in IRPL-R31 "North Atlantic Radio Propagation Disturbances, October 1943 through October 1945," now out of print. Beginning with the re-calculated figures for January 1952, only reports of radio transmission on North Atlantic paths closely approximating New York-London are included in the estimation of quality. Observations of selected ionospheric characteristics, even though strongly correlated with radio transmission quality, and traffic reports for paths such as New York-Stockholm or New York-Tangier, previously included in the quality-figure determination with low weight, have been left out of the present calculations inasmuch as a sufficient number of homogeneous reports are now available.

The original reports are submitted on various scales and for various time intervals. The observations for each Greenwich half day are averaged on the quality scale of the original reports. These half-day indices are then adjusted to the 1 to 9 quality figure scale. The conversion table was prepared by comparing the distribution of these indices for at least four months, usually a year, with a master distribution determined from analysis of the reports made on the 1 to 9 quality figure scale. A report whose distribution is the same as the master is thereby converted linearly to the Q-figure scale. Each report is given a statistical weight which is the reciprocal of the departure from linearity. The half-daily radio propagation quality figures, beginning January 1948, is the weighted mean of the reports received for that period.

These quality figures are, in effect, a consensus of reported radio propagation conditions in the North Atlantic area. The reasons for low quality are not necessarily known and may not be ionospheric storminess alone. For instance, low quality may result from improper frequency usage for the path and time of day. Although, wherever it is reported, frequency usage is included in the rating of reports, it must often be an assumption that the reports refer to optimum working frequencies. It is more difficult to eliminate from the indices conditions of low quality because of multipath, interference, etc. These considerations should be taken into account in interpreting research correlations between the Q-figures and solar, auroral, geomagnetic or similar indices.

In the comparison of forecasts and quality figures the following conventions apply: Radio disturbance warnings -- direct comparison by half-days where N is scored G when $Q \geq 5$ and M when $Q \leq 4$; U is scored 0 when $Q \geq 6$, H when $Q = 5$ or 4, and (M) when $Q \leq 3$; W is scored 0 when $Q \geq 5$ and H when $Q \leq 4$. If a warning is broadcast for a quarter-day, the more disturbed grade is used in the comparison. Short term forecasts -- direct comparison by half days, both forecast and quality figure being on the Q-scale. Only the forecasts for 00-12 and 12-24 hours are evaluated; the results for the intervening forecasts should be similar. Advance forecasts -- the whole-day forecast, on the Q scale, is compared with a whole-day index derived from the two half-daily quality figures, when different, as follows: if either half-day Q-figure is 4 or less, the whole-day index is the lower of the two; if both half-day Q-figures are 6 or more the whole-day index is the higher of the two; if the 00-12 Q-figure is 5 and the other is greater than 5, the whole-day index is the higher; if the 00-12 Q-figure is greater than 5 and the other is 5, the whole-day index is 5.

Note. The North Pacific quality figures which were published through October 1951 have been temporarily discontinued. Since the establishment of the North Pacific Radio Warning Service at Anchorage, Alaska, a larger number of reports are being received than were previously available in Washington. The preparation of the quality figures will be resumed when sufficient data have been accumulated for determination of conversion tables for these new reports.

OBSERVATIONS OF THE SOLAR CORONA

Tables 75 through 77 give the observations of the solar corona during May 1952 obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 78 through 80 list the coronal observations obtained at Sacramento Peak, New Mexico, during May 1952, derived by the High Altitude Observatory from spectrograms taken by Harvard University as a part of its performance of an Air Materiel Command Research and Development Contract administered by the Air Force Cambridge Research Laboratories. The data are listed separately for east and west limbs at 5-degree intervals of position angle north and south of the Solar Equator at the limb. The time of observation is given to the nearest tenth of a day, GCT.

Table 75 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 76 gives similarly the intensities of the first red (6374A) coronal line; and table 77, the intensities of the second red (6702A) coronal line; all observed at Climax in May 1952.

Table 78 gives the intensities of the green (5303A) coronal line; table 79, the intensities of the first red (6374A) coronal line; and table 80, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in May 1952.

The following symbols are used in tables 75 through 80: a, observation of low weight; -, corona not visible; and X, position angle not included in plate estimates.

RELATIVE SUNSPOT NUMBERS

Table 81 lists the daily provisional Zürich relative sunspot number, R_Z , as communicated by the Swiss Federal Observatory. Table 82 continues the new series of American relative sunspot numbers, R_A . Beginning with 1951, the observations collected by the Solar Division, AAVSO, have been reduced according to a new procedure, such that only high quality observations of experienced observers are combined into R_A . Observatory coefficients for each of the 28 selected observers were recomputed on data for 1948-1950, years when there was a wide range of solar activity. Otherwise, the procedure is that outlined in Publication of the Astronomical Society of the Pacific, 61, 13, 1949. The scale of the American numbers in 1951 differs from that of the reports for earlier years because of these changes, and the new series is designated R_A , rather than R_A . The American relative sunspot numbers appear monthly in these pages, as communicated by the Solar Division.

INDICES OF GEOMAGNETIC ACTIVITY

Table 83 lists various indices of geomagnetic activity based on data from magnetic observatories widely distributed throughout the world. The indices are: (1) preliminary international character-figures, C; (2) geomagnetic planetary three-hour-range indices, K_p; (3) magnetically selected quiet and disturbed days.

The C-figure is the arithmetic mean of the subjective classification by all observatories of each day's magnetic activity on a scale of 0 (quiet) to 2 (storm). The magnetically quiet and disturbed days are selected by the international scheme outlined on pages 219-227 in the December 1943 issue of Terrestrial Magnetism and Atmospheric Electricity. The details of the currently used method follow. For each day of a month, its geomagnetic activity is assigned by weighting equally the following four criteria: (1) C; (2) the sum of the eight K_p's; (3) the greatest K_p; and (4) the sums of the squares of the eight K_p's.

K_p is the mean standardized K-index from 11 observatories between geomagnetic latitudes 47 and 63 degrees. The scale is 0 (very quiet) to 9 (extremely disturbed), expressed in thirds of a unit, e.g., 5- is 4 2/3, 5o is 5 0/3, and 5+ is 5 1/3. This planetary index is designed to measure solar particle-radiation by its magnetic effects, specifically to meet the needs of research workers in the ionospheric field. A complete description of K_p has appeared in Bulletin 12b, "Geomagnetic Indices C and K, 1948," published in Washington, D. C., 1949, by the Association of Terrestrial Magnetism and Electricity, International Union of Geodesy and Geophysics. Tables of K_p for 1945-48 are in Bulletin 12b; for 1940-44 and 1949, in these CRPL-F reports, F65-67; for 1950, monthly in F68 and following issues. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

The Committee on Characterization of Magnetic Disturbance, ATME, IUGG, has kindly supplied this table. The Meteorological Office, De Bilt, Holland, collects the data and compiles C and selected days. The Chairman of the Committee computes the planetary index. At the meeting of ATME held in Brussels in August 1951, it was decided that the computation of K_w would be discontinued after the month of December 1951 since K_p is available from January 1, 1940. K_w, therefore, no longer appears in these reports.

SUDDEN IONOSPHERE DISTURBANCES

Table 84 shows that no sudden ionosphere disturbances were observed during the month of May 1952. Tables 85 and 86 list respectively the sudden ionosphere disturbances observed at Lindau, Harz, Germany, April 1952 and in England, April 1952.

TABLES OF IONOSPHERIC DATA

Table 1								May 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	280	3.2						2.9	
01	280	3.0						2.9	
02	270	2.5						2.9	
03	290	2.2						3.0	
04	300	2.0						2.9	
05	270	2.8						2.9	
06	310	3.7	230	3.3	120	1.5	1.3	3.1	
07	400	4.1	220	3.6	110	2.0	2.6	3.1	
08	440	4.4	210	3.9	100	2.7	4.0	2.7	
09	450	4.5	200	4.0	100	3.0	3.1	2.7	
10	500	4.6	200	4.2	100	3.1	4.0	2.5	
11	470	4.7	190	4.2	100	3.2	4.0	2.7	
12	460	4.8	200	4.3	100	3.3	4.1	2.7	
13	440	5.0	200	4.3	100	3.2	4.1	2.7	
14	400	5.0	210	4.2	100	3.2		2.9	
15	370	5.1	210	4.1	100	3.1		2.9	
16	350	5.3	220	4.0	110	2.8		3.0	
17	330	5.4	220	3.7	110	2.5		3.0	
18	290	5.8	250	3.3	110	2.1		3.1	
19	250	5.7	240	—	120	1.6	3.1		
20	250	5.3					3.1		
21	260	4.6					3.0		
22	270	4.0					3.0		
23	270	3.5					2.9		

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 3								April 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	(385)	(3.2)						3.6	(2.8)
01	(325)	(2.8)						3.6	(2.8)
02	---	(2.8)						3.6	(2.8)
03	---	(3.0)					(1.3)	4.1	(2.8)
04	---	(3.4)						3.2	(3.0)
05	---	(3.7)	250	—	110	1.8	2.5		(2.8)
06	---	(4.0)	215	—	105	2.1			(2.8)
07	(310)	(4.3)	240	(3.6)	110	2.3			(3.0)
08	(385)	(4.6)	235	3.8	110	2.5			(2.9)
09	(350)	5.0	230	3.9	110	2.6	(2.8)		3.0
10	350	5.0	215	4.0	105	2.7			3.0
11	340	5.0	225	4.0	110	2.8			3.0
12	360	5.1	215	4.0	110	2.8			2.9
13	330	4.8	225	4.0	110	2.8			3.0
14	360	4.8	230	3.9	110	2.7			2.9
15	310	4.4	210	3.8	110	2.6	2.8		3.0
16	310	4.7	240	(3.6)	110	2.6	2.0		3.0
17	290	4.8	245	—	110	2.2	3.0		3.1
18	290	4.3	255	—	110	2.0	3.5		3.1
19	310	4.2	—	—	—	—	3.8		3.1
20	310	4.0	—	—	—	—	4.0		3.0
21	(305)	3.6	—	—	—	—	4.2	(3.0)	
22	---	(3.7)	—	—	—	—	3.7	—	
23	—	—	—	—	—	—	3.7	—	

Time: 15.0°E.

Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 5								April 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	315	2.6						2.8	
01	310	2.6						2.8	
02	340	2.3						2.8	
03	< 330	2.3						2.7	
04	310	2.2						2.8	
05	280	2.6	—	—	115	1.4		3.0	
06	250	3.4	210	—	125	1.8		3.1	
07	250	3.7	225	3.5	115	2.1		3.1	
08	375	4.0	220	3.6	110	2.4		3.0	
09	400	4.3	215	3.8	110	2.6		2.9	
10	380	4.5	210	4.0	105	2.8		2.9	
11	350	4.8	205	4.1	105	2.9		3.0	
12	350	5.0	210	4.2	105	2.9		3.0	
13	370	5.2	210	4.2	105	2.9		2.9	
14	360	5.1	210	4.1	110	2.8		3.0	
15	340	5.0	220	4.0	110	2.7		3.0	
16	330	5.2	225	3.8	110	2.5		3.0	
17	300	5.2	235	3.6	115	2.4		3.1	
18	260	5.1	240	3.3	120	1.9		3.1	
19	255	4.7	250	—	115	1.6		3.2	
20	260	4.6	—	—	E			3.1	
21	260	4.1	—	—				3.0	
22	290	3.9	—	—				2.8	
23	310	3.0	—	—				2.8	

Time: 15.0°E.

Sweep: 1.3 Mc to 1h.0 Mc in 8 minutes, automatic operation.

Table 2								April 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	260	(3.1)						4.6	(3.0)
01	(210)	3.1						5.0	(3.0)
02	(270)	(3.0)						6.0	—
03	280	(2.9)						4.0	2.9
04	280	(2.8)						3.0	(3.0)
05	(260)	3.2						100	(1.8)
06	(260)	(3.2)						100	(2.0)
07	(360)	3.4						5.2	—
08	—	—	—	—	—	—	—	4.7	—
09	(170)	(1.0)						100	(2.7)
10	(550)	(3.9)						100	(2.5)
11	G	(3.8)						100	—
12	(520)	(3.9)						100	2.6
13	470	4.1						100	2.7
14	440	4.2						100	2.7
15	440	4.3						100	2.7
16	400	4.2						100	2.9
17	350	4.1						100	3.0
18	(300)	3.9						100	(2.3)
19	280	3.8						100	3.2
20	250	3.6						100	3.2
21	(270)	(3.3)						5.7	(3.1)
22	(260)	3.6						7.5	(2.9)
23	(260)	(3.2)						6.9	—

Time: 15.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 4								April 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	320	2.6						1.6	2.9
01	350	2.6						2.0	3.0
02	350	2.4						2.5	2.8
03	350	2.4						2.0	2.8
04	320	2.5							3.0
05	280	3.0						2.8	2.9
06	540	3.4						3.0	2.5
07	520	3.8						3.4	2.5
08	600	< 3.8						3.5	2.4
09	G	(3.8)						100	G
10	0	(4.0)						100	2.9
11	530	< 4.0						100	2.5
12	550	4.0						100	2.5
13	480	4.2						100	3.0
14	450	4.4						100	2.7
15	400	4.2						100	2.8
16	360	4.3						100	3.1
17	320	4.3						100	3.2
18	270	4.1						100	3.2
19	250	4.1						100	3.2
20	260	3.5							3.0
21	260	3.1							3.1
22	300	2.7							3.0
23	320	2.3							3.0

Time: 15.0°E.

Sweep: 1.0 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 6								April 1952	
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2	
00	330	2.5						2.5	2.7
01	320	2.1						2.6	2.6
02	325	2.0						2.4	2.6
03	330	2.1						2.4	2.7
04	290	2.2						2.5	2.8
05	280	3.0						1.7	2.9
06	G	< 3.5						115	3.0
07	G	< 3.8						115	3.0
08	455	4.2						3.8	3.0
09	385	4.5						110	2.5
10	430	4.7						110	2.9
11	340	5.1						110	3.0
12	350	5.3						105	2.9
13	355	5.1							

Adak, Alaska (51.9°N , 176.6°W)

Table 7

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	3.0						2.8
01	300	2.8						(2.7)
02	300	2.7						(2.8)
03	300	2.6						2.8
04	300	2.6						2.9
05	320	3.0	280	2.7	130	1.6	2.2	2.9
06	160	< 3.5	250	3.3	120	1.9	2.3	2.7
07	180	1.1	240	3.6	110	2.4	3.5	2.8
08	120	1.4	210	3.8	110	2.8	3.8	2.8
09	520	1.4	220	4.0	110	3.0	4.0	2.5
10	110	1.7	210	4.1	110	3.1	4.6	2.9
11	110	1.9	210	4.1	110	3.1	4.3	2.8
12	390	5.2	210	4.2	110	3.1	4.0	2.9
13	360	5.3	220	4.2	110	3.1	4.3	3.0
14	310	5.4	220	4.2	110	3.0	3.9	3.1
15	300	5.4	230	4.0	110	2.9	3.0	3.1
16	290	5.3	210	3.8	110	2.6	2.3	3.1
17	270	5.4	250	---	120	2.3	2.6	3.2
18	260	5.3	250	---	120	1.8	2.0	3.2
19	250	5.2			110	1.6	1.8	3.1
20	250	5.1					2.1	3.1
21	260	5.6					1.6	3.0
22	250	5.0						3.0
23	270	5.4						(3.0)

Time: 180.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Batavia, Ohio (39.1°N , 84.1°W)

Table 9

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	(300)	2.6						2.8
01	(300)	2.6						(2.8)
02	(300)	2.5						2.8
03	(300)	2.4						2.7
04	(290)	2.3						(2.8)
05	---	(2.1)						(2.8)
06	270	2.6						3.0
07	290	3.6	210	3.3	120	2.0	3.1	
08	400	(4.2)	220	3.7	110	2.5	(2.9)	
09	450	(4.2)	210	3.9	110	2.7	(2.7)	
10	430	4.8	200	4.0	110	2.9	3.0	2.8
11	400	4.9	190	4.1	110	3.0	2.8	
12	400	5.2	180	4.2	110	3.1	2.8	
13	380	5.2	200	4.2	110	3.2	2.8	
14	360	5.4	210	4.3	110	3.1	2.9	
15	340	5.6	210	4.2	110	3.0	3.0	
16	340	5.4	220	4.0	110	2.8	2.9	
17	320	5.3	220	3.8	110	2.5	3.0	
18	290	5.4	210	3.4	120	(2.1)	3.1	
19	250	5.4	---	---	---		3.1	
20	230	4.9					3.1	
21	(240)	4.1					3.1	
22	(270)	3.6					2.9	
23	(300)	3.0					2.8	

Time: 75.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds. Mobile unit.

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

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	3.0	3.3						2.8
01	280	3.3						2.8
02	280	3.2						2.8
03	270	3.2						2.9
04	270	3.0						3.0
05	250	2.9						3.0
06	260	4.2	260	---	120	1.8	2.3	3.2
07	280	5.0	230	3.5	110	2.3	2.4	3.3
08	310	5.3	220	4.0	110	2.7	3.1	3.1
09	340	5.5	210	4.2	110	3.0	3.3	3.0
10	350	5.6	200	4.3	100	3.1	3.5	3.0
11	370	6.0	200	4.4	110	3.2	3.4	2.8
12	380	6.4	210	4.4	110	3.3	3.4	2.8
13	360	6.6	210	4.4	110	3.2	3.2	2.9
14	320	6.6	220	4.3	110	3.2	3.2	3.0
15	310	6.4	230	4.2	110	3.0	2.9	3.1
16	300	6.2	230	4.0	110	2.7	2.5	3.1
17	270	6.2	240	3.6	110	2.4	2.5	3.2
18	250	5.8	260	---	---	2.6	3.3	3.3
19	230	5.3				2.4	3.2	
20	210	4.6				2.4	3.1	
21	260	3.8				2.2	3.0	
22	290	3.3				2.3	2.8	
23	300	3.2				2.8	2.7	

Time: 105.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 7

April 1952

Graz, Austria (47.1°N , 15.5°E)

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	3.6						2.8
01	310	3.5						2.8
02	300	3.4						2.8
03	300	3.2						2.6
04	300	2.9						2.9
05	290	3.1						2.8
06	250	3.0						(3.2)
07	250	4.1	220			3.8		
08	290	4.9	200			4.0		2.8
09	300	5.1	200			4.0	(110)	3.0
10	300	5.9	200			4.3	110	3.1
11	300	6.3	200			4.4	110	3.2
12	300	6.1	200			4.5	100	3.2
13	300	6.3	200			4.5	105	3.5
14	300	6.5	200			4.4	105	3.2
15	300	6.1	210			4.2	110	3.0
16	280	6.3	210			4.0		3.5
17	250	6.3	210			3.7		
18	250	6.3	210					
19	250	6.0	200					
20	250	5.8	200					
21	260	5.0	200					
22	290	4.8	200					
23	300	3.7	200					

Time: 15.0°E .

Sweep: 2.5 Mc to 25.0 Mc in 2 minutes.

Table 11

April 1952

San Francisco, California (37.1°N , 122.2°W)

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	3.3						2.8
01	290	3.2						2.8
02	280	3.1						2.8
03	270	3.0						2.8
04	280	2.9						2.9
05	280	2.8						2.9
06	280	4.2	250	---	130	---	3.1	
07	300	5.0	250	---	120	2.2	3.1	3.2
08	350	5.2	240	4.0	120	2.6	5.8	3.0
09	370	5.4	220	4.2	120	2.9	6.2	2.9
10	380	5.9	210	4.4	120	3.1	4.9	2.8
11	380	6.2	220	4.4	120	3.2	3.6	2.8
12	370	6.6	220	4.5	120	3.3	4.1	2.8
13	360	7.4	240	4.5	120	3.3	4.3	2.9
14	350	7.2	230	4.4	120	3.2	3.7	2.8
15	330	7.0	240	4.3	120	3.1	3.8	3.0
16	320	6.8	250	4.1	120	2.8	3.7	3.0
17	300	6.8	260	3.7	120	2.3	3.0	
18	270	6.6						
19	250	6.0						
20	250	5.8						
21	260	4.8						
22	280	4.0						
23	310	3.8						

Time: 90.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 12

April 1952

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

April 1952

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	3.4						2.8
01	320	3.3						2.8
02	300	3.4						2.8
03	300	3.1						2.8
04	300	3.0						2.9
05	300	2.8						2.9
06	280	4.2	250	---	130	---	3.1	
07	300	5.0	250	---	120	2.2	3.1	3.2
08	350	5.2	240	4.0	120	2.6	5.8	3.0
09	370	5.4	220	4.2	120	2.9	6.2	2.9
10	380	5.9	210	4.4	120	3.1	4.9	2.8
11	380	6.2	220	4.4	120	3.2	3.6	2.8
12	370	6.6	220	4.5	120	3.3	4.1	2.8
13	360	7.4	240	4.5	120	3.3	4.3	2.9
14	350	7.2	230	4.4	120	3.2	3.7	2.8
15								

Kiruna, Sweden (67.8°N , 20.5°E)

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	323	5.2				2.1	2.8
01	300	5.2				2.7	
02	270	5.4				2.2	3.0
03	250	4.2					3.1
04	(310)	3.6					3.1
05	310	3.6					2.8
06	310	3.6					2.7
07	210	3.2					2.7
08	250	7.0	---	---	120	(2.2)	3.6
09	270	7.2	250	---	120	2.8	4.1
10	310	7.4	250	---	120	3.1	4.4
11	330	8.8	240	4.5	120	(3.3)	4.6
12	340	10.8	240	4.7	120	(3.4)	4.6
13	320	11.9	240	4.6	120	(3.3)	4.6
14	310	13.0	250	4.6	120	3.4	4.4
15	310	12.9	240	4.4	120	3.2	4.0
16	290	12.3	250	---	120	2.9	3.5
17	280	11.4	260	---	120	(2.4)	3.4
18	260	11.8					3.3
19	250	9.8					3.2
20	250	6.7					3.0
21	330	5.6					2.6
22	350	5.3					2.6
23	310	5.5					2.7

Time: 127.5°E .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 15

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	280	4.9				2.9	
01	260	4.8				3.0	
02	250	4.8				3.1	
03	240	4.3				3.2	
04	260	3.5				3.0	
05	250	3.2				3.0	
06	250	3.2				3.2	
07	230	5.2	220	---	110	2.1	3.5
08	250	5.8	220	---	100	(2.5)	3.4
09	280	6.3	230	(4.3)	100	3.0	3.2
10	320	6.6	220	(4.6)	100	3.2	3.0
11	330	7.8	220	4.6	100	3.4	2.9
12	320	9.4	220	4.5	100	3.5	3.0
13	290	10.0	220	4.6	100	3.5	3.1
14	280	9.8	220	4.0	100	3.4	3.2
15	280	9.4	220	(4.5)	100	3.3	3.2
16	270	9.6	220	(4.3)	110	3.0	3.1
17	260	9.4	220	---	110	2.6	3.3
18	240	9.4	230	---	110	---	3.2
19	220	7.8				2.8	3.3
20	220	6.4				2.2	3.0
21	240	5.6				2.1	3.0
22	270	5.2					2.9
23	280	5.2					2.9

Time: 60.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 17

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	220	7.1				4.7	3.2
01	220	6.7				4.5	3.3
02	220	5.8				4.3	3.2
03	21	4.7				3.7	3.2
04	240	5.9				3.2	3.3
05	250	5.1				4.0	3.3
06	270	4.1				3.4	3.1
07	210	7.2			110	2.0	5.2
08	260	8.6	220	---	110	2.1	3.1
09	280	9.1	210	4.4	110	---	2.9
10	300	9.4	210	4.5	100	---	2.6
11	31	9.1	200	(4.6)	100	---	2.6
12	320	9.0	200	4.6	100	---	2.6
13	310	9.2	200	4.6	100	---	2.6
14	310	9.2	200	4.6	100	---	2.6
15	310	9.3	200	4.4	100	---	2.6
16	(260)	9.4	200	---	100	---	10.2
17	(260)	9.5	200	---	110	---	9.1
18	270	9.2					2.6
19	270	9.0					2.6
20	300	8.3					2.6
21	310	8.1					2.7
22	260	8.2					2.9
23	240	8.1					3.2

Time: 127.8°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 13

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	323	5.2				2.1	2.8
01	300	5.2				2.7	
02	270	5.4				2.2	3.0
03	250	4.2				3.1	
04	(310)	3.6				2.8	
05	310	3.6				2.7	
06	310	3.6				2.7	
07	250	7.0	---	---	120	(2.2)	3.3
08	270	7.2	250	---	120	2.8	4.1
09	310	7.4	250	---	120	3.1	4.4
10	330	8.8	240	4.5	120	(3.3)	4.6
11	340	10.8	240	4.7	120	(3.4)	4.6
12	310	11.9	240	4.6	120	(3.3)	4.6
13	320	13.0	250	4.6	120	3.4	4.4
14	310	12.9	250	4.4	120	3.2	4.0
15	290	12.3	250	---	120	2.9	3.0
16	280	11.4	260	---	120	(2.4)	3.0
17	260	11.8					3.0
18	250	9.8					2.7
19	250	6.7					
20	250	6.7					
21	330	5.6					
22	350	5.3					
23	310	5.5					

Time: 127.5°E .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 14

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	300	4.2					1.6
01	290	4.4					2.8
02	260	4.2					3.0
03	250	3.4					3.1
04	300	3.2					3.1
05	310	3.1					2.8
06	270	3.7					2.8
07	250	5.8	210	---	120	2.1	2.9
08	280	6.6	230	---	120	2.6	3.1
09	300	7.4	220	4.5	120	3.0	4.3
10	340	8.5	210	4.5	110	3.2	4.3
11	360	9.3	210	4.8	110	3.4	4.4
12	310	11.0	200	4.7	120	3.4	4.6
13	310	12.2	220	4.7	120	3.4	4.3
14	300	12.6	240	4.7	110	3.4	5.1
15	320	12.6	240	4.6	120	3.3	4.6
16	300	12.6	240	4.4	120	3.0	4.6
17	270	11.2	240	---	120	2.6	4.2
18	250	10.4					4.3
19	240	9.0					4.2
20	270	8.0					3.3
21	270	7.5					2.4
22	270	7.0					2.5
23	200	6.5					2.7

Time: 150.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

Time	April 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						(M3000)F2
00	280	6.3					2.3
01	260	6.1					2.6
02	260	5.5					2.9
03	260	5.2					2.8
04	260	4.6					2.9
05	< 260	3.5					2.9
06	270	3.2					2.9
07	260	5.2	210	---	130	2.1	3.0
08	(300)	6.5	250	4.7	120	2.7	4.0
09	360	7.6	240	(4.7)	110	3.1	4.2
10	360	8.8	240	4.7	120	3.3	4.4
11	380	9.7	240	4.8	120	3.4	4.6
12	380	10.7	240	4.7	120	3.6	5.0
13	350	11.8	230	4.7	120	3.6	4.6
14	320	12.6	240	4.6	120	3.3	4.6
15	320	12.6	240	4.4	120	3.0	4.6
16	300	12.6	240	4.4	120	2.6	4.6
17	280	11.2	240	4.2	120	2.6	4.2
18	270	10.4					3.6
19	255	9.9					4.1
20	(250)	10.0					4.1
21	(260)	10.6					

Table 19

Fairbanks, Alaska (64.9°N, 147.8°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	---	---			5.1				
01	---	---			6.0	---			
02	---	---			6.4	---			
03	---	---			6.0	---			
04	---	---			6.5	---			
05	(340)	(2.4)			6.5	(2.9)			
06	(300)	(3.0)			6.0	(3.0)			
07	(290)	(3.7)	---	---		(3.0)			
08	(330)	(3.8)	---	---		(3.0)			
09	360	4.0	240			2.9			
10	(360)	4.2	220	3.6	---		(3.0)		
11	330	4.6	220	(3.7)	---		(3.1)		
12	320	4.8	220	(3.6)	---		(3.1)		
13	330	4.7	240	3.6	120		3.1		
14	320	4.9	240	(3.6)	---		3.0		
15	370	5.0	(240)	---			3.1		
16	260	4.8	(250)	---			3.1		
17	260	4.5	---	---			3.1		
18	(270)	(3.8)	---	---			3.1		
19	250	3.5					3.0		
20	(280)	(3.0)			4.2	(3.0)			
21	(270)	(2.7)			4.3	(3.0)			
22	(300)	(2.3)			4.0	(3.0)			
23	---	(2.0)			4.8	(3.0)			

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 20

Baker Lake, Canada (64.3°N, 96.0°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	250	2.8			---			4.2	
01	290	2.8			---			3.8	
02	270	2.8			---			4.0	
03	280	2.7			---			3.9	
04	310	2.5			---			3.7	
05	290	2.5			---			3.7	
06	270	2.8			100	1.9	4.0	(3.0)	
07	280	3.2	---	---	110	2.0	4.2	3.0	
08	290	3.8	220	3.0	110	2.6	3.5	3.0	
09	300	4.0	210	3.7	100	2.7	3.0	(3.0)	
10	300	4.4	220	3.6	100	2.6	3.0		
11	360	4.8	240	3.8	100	3.0	2.9	(2.9)	
12	360	4.8	210	3.9	100	2.8	3.0		
13	330	5.0	230	3.9	100	2.9	2.9		
14	320	4.9	240	3.5	100	2.9	2.8		
15	350	5.0	210	3.7	100	2.8	2.9		
16	340	4.8	250	3.1	100	2.5	2.9		
17	280	4.5	---	---	100	2.2	3.0		
18	280	4.4	---	---	110	2.3	4.0	3.0	
19	260	4.0	---	---	100	1.7	3.8	3.0	
20	270	3.7	---	---	130	(2.8)	5.0	2.9	
21	270	3.5	---	---	---		5.4	2.9	
22	260	3.0	---	---	---		4.0	2.9	
23	280	2.9	---	---	---		4.0	3.0	

Time: 90.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 21

Churchill, Canada (58.6°N, 94.2°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	(300)	2.8			5.2	(3.0)			
01	(310)	2.8	120	2.5	5.0	(3.1)			
02	(350)	2.7	---	---	5.0	---			
03	(310)	(2.0)	130	2.2	5.0	---			
04	310	2.3	130	2.1	4.5	---			
05	(350)	(2.9)	130	2.6	4.5	---			
06	---	(2.2)	120	3.2	---				
07	(500)	3.5	120	3.5	---	(3.0)			
08	(315)	4.0	120	3.8	---	(2.8)			
09	(360)	(4.2)	230	3.0	120	3.1	(2.4)		
10	(350)	4.2	---	---	120	2.7	(2.5)		
11	400	4.3	220	3.8	120	2.9	2.8		
12	400	4.7	230	3.8	120	2.8	2.8		
13	390	4.8	230	3.9	120	2.8	2.8		
14	380	5.0	230	3.8	120	2.7	2.9		
15	360	5.0	240	3.7	120	2.8	2.8		
16	320	5.0	210	3.6	120	2.6	3.0		
17	300	4.7	260	3.2	120	2.4	2.9		
18	290	4.0	---	---	120	2.6	3.0		
19	300	3.8	---	---	120	2.7	4.4	2.9	
20	300	3.7	---	---	120	2.6	5.0	3.0	
21	300	3.3	---	---	120	3.0	(2.6)		
22	300	3.1	---	---	120	6.6	(3.0)		
23	290	3.0	---	---	120	6.0	(3.0)		

Time: 90.0°W.

Sweep: 0.6 Mc to 20.0 Mc in 15 seconds.

Table 22

Prince Rupert, Canada (54.3°N, 130.3°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	300	1.8			---			1.4	
01	320	2.0			---			1.8	
02	350	2.0			---			2.0	
03	350	2.2			---			2.7	
04	360	2.2			---			2.0	
05	380	2.2			---			2.7	
06	350	2.0			---			2.7	
07	300	2.8			---			E	
08	280	3.6	250	3.0	120	1.9		3.0	
09	310	3.8	220	3.4	110	2.3		2.9	
10	400	4.2	210	3.7	110	2.4		2.8	
11	360	4.3	220	3.8	110	2.8		2.7	
12	400	4.5	220	3.9	110	2.8		2.7	
13	390	4.8	230	3.9	110	2.8		2.7	
14	380	4.7	220	3.9	110	2.8		2.8	
15	360	4.8	220	3.7	110	2.7		2.8	
16	300	4.9	240	3.7	110	2.5		2.9	
17	270	5.0	240	4.0	110	2.3		3.0	
18	250	4.5	---	---	130	1.9		3.0	
19	260	4.0	---	---	---			3.0	
20	260	3.1	---	---	---			3.0	
21	270	2.5	---	---	---			3.0	
22	290	2.0	---	---	---			3.0	
23	300	2.0	---	---	---			2.9	

Time: 120.0°W.

Sweep: 0.6 Mc to 20.0 Mc in 15 seconds.

Table 23

Winnipeg, Canada (49.9°N, 97.1°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	330	2.4			3.1	(2.8)			
01	360	2.3			3.2	2.7			
02	350	2.5			3.6	2.8			
03	360	2.6			4.0	---			
04	310	(2.5)			3.2	---			
05	(360)	(2.4)			1.0				
06	310	2.2			3.6	(3.0)			
07	270	3.2	120	1.8	3.2				
08	280	3.8	230	2.3	3.1				
09	360	4.1	220	3.8	2.6				
10	360	4.5	220	3.9	2.8				
11	320	4.8	220	3.9	2.9				
12	400	4.9	220	4.0	3.0				
13	380	5.1	220	4.0	3.0				
14	340	5.2	220	4.0	3.1				
15	340	5.2	230	3.9	2.8				
16	320	5.2	230	3.6	2.6				
17	280	5.2	240	3.5	2.3				
18	260	5.0	---	---	1.8				
19	240	4.5	---	---	3.1				
20	260	3.6	---	---	2.9				
21	280	3.1	---	---	3.0				
22	290	2.7	---	---	3.0				
23	300	2.6	---	---	3.1	2.9			

Time: 90.0°W.

Sweep: 0.6 Mc to 20.0 Mc in 15 seconds.

Table 24

St. John's, Newfoundland (47.6°N, 52.7°W)								March 1952	
Time	h'F2	f0F2	h'F1	f0F1	h'E	f0E	fEs	(M3000)F2	
00	320	2.7			---			2.8	
01	310	2.4			---			2.8	
02	300	2.4			---			2.9	
03	300	2.1			---			3.0	
04	310	1.8			---			3.0	
05	310	1.9			---			3.0	
06	250	3.2	---	---	120	1.8		3.3	
07	250	4.3	230	3.0	110	2.2		3.4	
08	270	4.7	220	3.7	110	2.6		3.3	
09	310	5.1	200	3.9	110	2.8		3.3	
10	330	5.3	200	4.0	110	3.0		3.2	
11	320	5.8	200	4.0	110	3.0		3.2	
12	300	5.9	210						

Table 25

Schwarzenburg, Switzerland (46.8°N , 7.3°E)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	300	2.9						3.1
01	300	2.9						3.1
02	300	3.0						3.1
03	300	2.7						3.1
04	300	2.6						3.2
05	280	2.4						3.2
06	300	2.4						3.4
07	230	3.6						3.6
08	220	4.4	---	---	100	2.2		3.7
09	225	5.2	200	3.7	100	2.5		3.6
10	260	5.5	200	4.0	100	2.8		3.6
11	300	5.8	200	4.2	100	2.8		3.5
12	270	5.9	200	4.2	100	2.9		3.6
13	300	6.0	200	4.3	100	2.9		3.5
14	280	6.0	200	4.2	100	3.0		3.5
15	260	6.0	210	4.0	100	2.8		3.6
16	230	6.0	210	4.0	100	2.6		3.6
17	220	6.0			100	2.2		3.6
18	230	5.8						3.7
19	220	5.9						3.6
20	220	5.2						3.5
21	230	4.2						3.5
22	280	3.3						3.2
23	300	3.1						3.1

Time: 15.0°E .

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 27

Wakkanai, Japan (45.4°N , 141.7°E)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	330	4.4						2.7
01	320	4.1						2.6
02	320	4.0						2.7
03	310	3.9						2.8
04	300	4.0						2.8
05	300	3.7						2.8
06	290	4.6						3.0
07	280	5.4	---	---	120	2.2		3.2
08	300	6.1	290	3.6	120	2.8		3.1
09	300	7.2	260	4.0	120	---		3.1
10	300	7.6	270	4.2	120	---		3.1
11	300	8.0	250	4.3	120	---		3.0
12	300	8.0	250	4.4	120	---		3.0
13	300	7.6	270	4.3	120	---		3.0
14	300	7.5	270	4.0	120	---		3.1
15	290	7.1	270	4.0	120	2.6		3.1
16	290	7.0	280	---	120	2.4		3.1
17	280	6.7			120	---		3.0
18	280	6.0						3.0
19	290	5.4						2.9
20	300	5.0						2.8
21	300	4.7						(2.8)
22	320	4.5						2.8
23	330	4.3						2.7

Time: 135.0°E .

Sweep: 1.0 Mc to 15.5 Mc in 2 minutes.

Table 29

Tokyo, Japan (35.7°N , 139.5°E)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	300	4.1					1.7	2.7
01	290	3.9						2.8
02	280	3.8						2.8
03	280	3.8						2.9
04	260	3.3						2.9
05	280	3.3						2.9
06	250	5.0						3.2
07	250	6.8	250	---	110	2.1	2.6	3.3
08	250	7.3	210	---	110	2.6	3.2	3.3
09	260	7.8	230	4.2	110	2.8	3.4	3.2
10	280	8.6	220	4.5	110	3.0	4.0	3.2
11	280	9.4	220	4.6	110	3.1	3.9	3.2
12	280	10.1	230	4.5	110	3.2	3.8	3.2
13	280	9.6	220	4.5	110	3.1	3.6	3.2
14	270	9.4	230	4.2	110	3.0	3.6	3.2
15	270	8.2	230	4.0	110	3.0	3.3	3.1
16	260	7.7	210	3.8	110	2.6	3.3	3.1
17	250	7.4	---	---	110	2.2	2.5	3.3
18	230	6.8						3.3
19	210	5.0						3.2
20	250	4.5						2.8
21	280	4.5						3.0
22	290	4.1						2.8
23	300	4.4						2.8

Time: 135.0°E .

Sweep: 1.0 Mc to 17.0 Mc in 2 minutes.

Table 26

Ottawa, Canada (45.4°N , 75.7°W)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	310	2.5						2.8
01	310	2.2						2.8
02	350	2.2						2.7
03	320	2.2						2.8
04	(380)	2.0						2.7
05	(380)	2.4						(2.8)
06	(280)	2.6						3.0
07	260	3.9	---	---	120	2.0		3.2
08	280	4.6	230	3.6	120	2.5		3.2
09	310	5.0	220	3.8	120	2.8		3.2
10	320	5.3	220	4.0	120	2.9		3.0
11	320	5.6	210	4.0	120	3.0		3.0
12	320	5.8	220	4.2	110	3.0		3.0
13	320	6.2	230	4.2	120	3.0		3.0
14	320	6.0	230	4.0	120	3.0		3.0
15	300	6.0	240	3.9	120	2.9		3.0
16	300	5.8	240	3.6	120	2.7		3.0
17	280	6.0	250	3.2	120	2.2		3.0
18	260	5.4	---	---	120	---		3.0
19	250	5.2						3.0
20	260	4.2						3.0
21	280	3.2						2.9
22	280	3.0						2.8
23	310	2.5						2.8

Time: 75.0°W .

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 28

Akita, Japan (39.7°N , 140.1°E)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	280	4.3						2.9
01	280	4.1						2.9
02	270	3.8						3.0
03	270	3.8						3.0
04	210	3.5						3.1
05	260	3.4						3.0
06	230	4.8						3.3
07	220	6.1	---	---	110	2.2		3.5
08	230	6.8	220	5.8	110	2.5	3.1	3.4
09	250	7.6	220	4.2	110	2.8	3.5	3.3
10	260	8.1	210	4.3	110	3.0	3.5	3.3
11	260	8.8	220	4.3	110	3.1	3.6	3.3
12	260	8.8	220	4.4	110	3.1	2.8	3.5
13	260	8.8	220	4.2	110	3.1	3.1	3.3
14	250	8.3	220	4.1	110	3.0		3.3
15	250	7.5	220	3.8	110	2.8		3.4
16	240	7.1	220	3.8	110	2.5		3.3
17	230	7.0	---	---	120	2.1		3.4
18	220	6.4						3.4
19	230	5.2						2.2
20	250	4.8						2.2
21	250	4.6						3.1
22	270	4.3						3.0
23	280	4.2						2.9

Time: 135.0°E .

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

Table 30

Yamagawa, Japan (31.2°N , 130.6°E)

March 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	290	4.0						2.5
01	270	3.8						2.0
02	270	3.7						3.1
03	250	3.7						3.1
04	250	3.4						3.1
05	250	3.0						3.0
06	260	3.1						3.0
07	230	4.1						3.4
08	230	6.8	---	---	110	2.3		3.5
09	240	7.2	220	4.3	100	2.8		3.4
10	260	7.6	210	4.4	100	3.0		3.2
11	280	8.2	200	4.5	100	3.1	4.0	(3.2)
12	270	11.6	210	4.6	100	3.2	3.8	3.3
13	260	11.0	220	4.5	100	3.2	3.8	3.3
14	260	11.8	220	4.5	100	3.2	3.9	(3.3)
15	250	10.4	210	4.3	100	3.1	3.9	3.3
16	250	8.2	220	3.9	100	2.8	3.7	(3.4)
17	240	7.1	230	3.5	100	2.5	3.6	3.5
18	230	7.1						3.0
19	210	6.3						2.7
20	210	4.7						3.0
21								

Table 31

Time	March 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	300	3.9					2.8
01	290	3.9					2.8
02	290	3.9					2.8
03	280	3.7					3.0
04	270	3.4					2.8
05	280	3.4					2.8
06	280	3.2					2.9
07	260	4.8	250	---	120	1.8	3.2
08	260	5.6	240	---	120	2.3	3.3
09	290	6.1	230	3.8	120	2.7	3.1
10	300	6.5	220	4.2	120	3.0	3.0
11	330	7.2	220	4.5	110	3.2	2.9
12	320	7.8	220	4.5	110	(3.3)	3.0
13	310	8.2	230	4.4	120	(3.3)	2.9
14	300	8.3	240	4.4	120	(3.3)	3.0
15	310	8.2	240	4.3	120	3.1	3.0
16	290	8.3	250	4.1	120	2.9	3.1
17	270	7.6	250	---	120	2.4	3.1
18	250	7.0	---	---	130	(1.8)	3.0
19	240	5.8					2.3
20	250	4.4					2.9
21	280	4.0					2.8
22	300	4.0					2.8
23	300	3.9					2.8

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 33

Time	February 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	320	3.3					2.7
01	310	3.3					2.8
02	300	3.4					2.8
03	310	3.4					2.8
04	300	3.6					3.0
05	300	3.0					2.8
06	290	3.2					2.9
07	270	5.0	---	---	120	1.6	3.1
08	260	6.8	---	---	120	2.0	3.2
09	270	7.2	---	---	120	2.6	3.2
10	290	8.2	260	4.0	120	2.9	3.1
11	290	8.1	280	4.2	120	3.0	3.1
12	280	8.6	280	4.0	120	3.0	3.1
13	280	8.0	260	4.0	120	3.0	3.1
14	290	7.9	270	4.0	110	2.9	3.1
15	280	7.3	---	---	120	2.6	3.2
16	270	6.6	---	---	120	2.0	3.2
17	260	5.6					3.1
18	280	4.3					3.0
19	290	4.0					3.0
20	300	3.3					2.8
21	320	3.2					2.8
22	320	3.6					2.8
23	320	3.4					2.7

Time: 135.0°E.

Sweep: 1.0 Mc to 15.5 Mc in 2 minutes.

Table 35

Time	February 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	300	3.4				1.6	2.8
01	280	3.6				1.7	3.0
02	250	3.4				1.8	3.0
03	260	3.2				1.6	3.0
04	250	3.1					3.1
05	300	2.8					2.9
06	260	3.1					3.0
07	230	5.7	---	---	120	1.8	3.3
08	250	6.6	210	---	120	2.4	3.3
09	260	8.2	230	---	110	2.7	3.2
10	270	8.3	220	4.3	110	3.0	3.2
11	270	9.2	220	4.4	110	3.2	3.3
12	270	9.4	220	4.4	110	3.2	3.3
13	260	8.5	230	4.3	110	3.2	3.3
14	260	8.2	230	4.1	110	3.0	3.3
15	250	7.6	220	---	110	2.7	3.1
16	250	6.9	220	---	110	2.3	3.1
17	230	5.8	---	---	120	1.8	2.0
18	230	5.0					3.2
19	210	4.4					3.2
20	250	3.6					3.1
21	260	3.4					3.0
22	300	3.4					2.8
23	300	3.4					2.8

Time: 135.0°E.

Sweep: 1.0 Mc to 17.2 Mc in 2 minutes.

Table 32

Time	February 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	---	---					4.5
01	---	---					4.3
02	---	---					4.3
03	---	---					4.4
04	---	---					4.6
05	---	(330)	(3.0)				3.4
06	(300)	(1.9)					3.5
07	270	3.1					2.4
08	260	3.8	---	---			2.9
09	260	4.2	---	---			3.2
10	260	4.6	---	---			3.4
11	260	5.0	---	---			3.3
12	250	5.1	---	---			3.3
13	260	5.3	---	---			3.2
14	260	5.3	---	---			3.1
15	250	5.1	---	---			3.1
16	260	4.3	---	---			3.1
17	270	4.4	---	---			3.2
18	290	(3.5)	---	---			3.0
19	300	(3.6)	---	---			3.8
20	(320)	(3.3)	---	---			3.1
21	(300)	(3.4)	---	---			4.4
22	370	(3.0)	---	---			4.3
23	---	---	---	---			4.5

Time: 15.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Table 34

Time	February 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	280	3.4					1.6
01	270	3.6					3.0
02	280	3.5					3.0
03	260	3.5					3.1
04	250	3.2					3.0
05	270	2.9					3.0
06	240	3.1					3.2
07	220	5.2	---	---		1.9	3.1
08	220	6.4	210	---	110	2.3	3.5
09	240	7.4	220	---	110	2.6	3.4
10	250	8.0	220	4.3	110	2.8	3.3
11	260	8.8	220	4.3	110	3.0	3.3
12	250	8.8	220	4.4	110	3.0	3.4
13	250	7.8	220	4.1	110	3.0	3.4
14	240	7.8	220	3.9	110	2.8	3.4
15	230	7.2	220	3.4	110	2.6	3.5
16	220	6.6	---	---	110	2.3	3.5
17	210	5.7	---	---	110	2.1	3.5
18	220	4.1	---	---	110	2.0	3.3
19	240	4.0	---	---	110	2.4	3.2
20	240	3.4	---	---	100	2.4	3.2
21	270	3.3	---	---	100	2.2	3.0
22	280	3.4	---	---	100	1.9	3.0
23	290	3.4	---	---	100	2.0	3.0

Time: 135.0°E.

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

Table 36

Time	February 1952						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs
	(M3000)F2						
00	280	3.4					2.1
01	260	3.6					3.0
02	250	3.3					2.5
03	250	3.5					3.1
04	240	3.2					3.1
05	270	2.7					2.9
06	300	2.6					2.8
07	250	4.0	---	---			3.2
08	230	5.8	---	---		2.1	3.5
09	230	7.3	220	---	100	2.6	3.4
10	250	7.8	220	---	100	3.0	3.3
11	260	(8.1)	220	4.5	100	3.1	4.0
12	260	9.0	220	4.5	100	3.2	4.0
13	260	9.2	220	4.5	100	3.2	4.0
14	250	(8.8)	220	4.5	100	3.2	4.0
15	250	8.2	220	4.1	100	3.0	4.1
16	240	7.4	210	---	100	2.7	3.5
17	230	7.0	---	---	100	2.1	3.4
18	210	5.8	---	---			2.5
19	210	5.0	---	---			2.5
20	230	4.1	---	---			3.2
21	240	3.9	---	---			3.0
22	260	3.4	---	---			2.0
23	280	3.4	---	---			2.9

Time: 135.0°E.

Sweep: 1.0 Mc to 22.0

Johannesburg, Union of S. Africa (26.2°S, 28.1°E)

February 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	260	4.1				2.0	3.0	
01	250	4.0				2.8	3.0	
02	240	3.7				2.0	3.0	
03	250	3.2				2.1	3.0	
04	270	3.0				2.2	3.0	
05	260	2.9				2.5	2.9	
06	250	4.1	---	---	130	1.7	2.4	3.2
07	260	5.7	210	3.9	110	2.4	3.1	3.3
08	300	6.5	220	4.3	110	2.9	3.8	3.0
09	320	7.4	210	4.6	110	3.2	4.0	3.0
10	330	8.0	210	4.7	110	3.4	4.2	2.9
11	320	8.5	200	4.8	110	3.6	4.2	2.9
12	310	9.0	200	4.8	110	3.7	3.9	2.9
13	320	9.0	200	4.8	110	3.7	3.9	2.9
14	310	8.9	200	4.7	110	3.5	3.8	2.9
15	300	8.8	210	4.6	110	3.4	3.9	3.1
16	280	8.1	210	4.4	110	3.1	3.8	3.1
17	270	7.5	220	3.9	110	2.7	3.6	3.2
18	250	7.3	230	3.1	110	2.2	3.3	3.2
19	230	6.7		---		2.4	3.2	
20	240	6.7				2.2	3.1	
21	240	5.6				2.0	3.2	
22	250	4.6				2.1	3.0	
23	270	4.3				2.0	2.9	

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 39

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

February 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	270	3.7				2.0	2.9	
01	280	3.6				2.0	2.8	
02	270	3.6				2.2	3.0	
03	260	3.2				2.0	3.0	
04	270	3.0				2.0	2.9	
05	280	3.0				2.9		
06	280	3.1		---	E	1.6	2.9	
07	250	4.9	250	---	120	2.0	2.4	3.2
08	300	5.8	210	4.0	120	2.5	3.2	3.1
09	320	6.8	230	4.2	110	3.0	3.7	3.0
10	320	7.4	220	4.4	110	3.2	4.0	2.9
11	330	7.6	210	4.7	110	3.4	3.8	2.8
12	330	8.0	210	4.7	110	3.4	4.0	2.9
13	320	8.4	210	4.7	110	3.5	4.0	2.9
14	320	8.2	210	4.7	110	3.5	3.8	2.9
15	320	8.0	210	4.6	110	3.4	2.9	
16	300	7.6	220	4.5	110	3.1	3.6	3.0
17	280	7.3	220	4.1	110	3.0	3.2	3.1
18	270	6.8	230	3.7	110	2.6	3.1	3.2
19	250	6.6	240	3.0	120	1.9	2.3	3.2
20	240	6.0		---		3.2		
21	240	5.2				2.1	3.2	
22	250	4.4				2.1	3.0	
23	270	3.9				2.2	2.9	

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 41*

Slough, England (51.5°N, 0.6°W)

January 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	300	2.7				2.4	2.8	
01	285	2.8				2.9	2.8	
02	290	2.5				3.5	2.8	
03	285	2.2				3.8	2.8	
04	280	1.9				3.3	2.8	
05	295	1.8				4.2	2.9	
06	300	1.7				3.9	2.9	
07	305	1.9				4.0	2.8	
08	235	4.1		155	1.7	3.7	3.3	
09	225	6.0		125	2.1	4.3	3.5	
10	230	6.5	230	3.5	130	2.3	4.2	3.5
11	230	6.9	230	3.7	130	2.5	4.3	3.5
12	230	6.9	220	3.8	130	2.6	4.2	3.4
13	235	7.2	220	3.7	130	2.6	4.1	3.4
14	235	7.3	235	3.6	130	2.4	4.1	3.4
15	225	6.5	225	3.2*	135	2.2	3.9	3.5
16	220	6.1		145	1.8	3.4		
17	220	5.6				2.9	3.3	
18	235	4.2				3.2		
19	260	3.0				3.0		
20	290	2.6				2.0		
21	305	2.5				2.0		
22	315	2.5				2.8		
23	320	2.4				2.7		

Time: 0.0°E.

Sweep: 0.55 Mc to 16.5 Mc in 5 minutes.

*Average values except foF2 and fEs, which are median values.

*One or two observations only.

Table 38

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

February 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	280	4.1					4.2	2.8
01	270	4.0					4.2	2.9
02	270	3.7					4.0	3.0
03	275	3.1					3.2	2.9
04	300	2.9					2.9	2.9
05	300	2.8					2.8	2.8
06	260	3.1		---			1.4	2.8
07	250	4.4	210	3.3			2.2	2.8
08	330	4.8	210	3.9			2.6	3.4
09	350	5.2	210	4.2			3.0	3.0
10	375	5.6	230	4.2			3.2	4.5
11	340	6.3	230	4.3			3.2	4.0
12	350	6.6	220	4.4			3.2	4.9
13	330	7.4	225	4.4			3.3	4.5
14	330	7.1	235	4.3			3.3	4.2
15	320	7.3	230	4.2			3.2	3.6
16	300	6.5	250	4.0			3.0	3.1
17	285	6.0	210	3.8			2.6	3.1
18	250	6.2	210	3.8			2.0	3.1
19	250	5.7					2.8	3.1
20	250	5.4					2.8	3.0
21	260	4.8					3.0	2.8
22	280	4.2					3.0	2.8
23	280	4.2					3.2	2.8

Time: 120.0°E.

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

Table 39

Inverness, Scotland (57.4°N, 4.2°W)

January 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	340	(2.0)						(2.8)
01	330	(2.0)						(2.7)
02	325	(1.8)						(2.7)
03	315	1.6						1.3
04	305	1.7						2.6
05	295	(1.8)						2.0
06	(310)	(1.8)						1.7
07	(295)	(2.0)						(2.7)
08	235	4.3						(2.9)
09	235	5.3						(3.3)
10	230	5.3						(3.4)
11	230	6.0						(3.4)
12	230	6.7						(3.4)
13	235	6.9	(215)					(3.4)
14	235	6.6						(3.4)
15	225	6.2						(3.4)
16	225	(6.0)						(3.4)
17	235	5.0						(3.2)
18	255	3.8						(3.1)
19	275	(2.7)						(3.0)
20	310	(2.3)						(2.8)
21	335	2.2						(2.6)
22	355	(2.1)						(2.7)
23	350	(2.2)						(2.7)

Time: 0.0°E.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

*Average values except foF2 and fEs, which are median values.

Table 41*

Formosa, China (25.0°N, 121.5°E)

January 1952

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	310	3.6						3.2
01	280	3.8						3.4
02	270	3.4						3.5
03	260	3.0						3.5
04	330	2.9						3.2
05	370	2.6						3.0
06	310	2.6						3.1
07	260	5.2						3.5
08	260	7.8		250	4.1	130	3.0	3.1
09	270	9.1		210	4.4	130	3.2	3.7
10	260	9.3		210	4.6	120	3.3	3.8
11	280	10.0		220	4.6	120	3.5	4.4
12	280	11.6		210	4.6	120	3.8	3.5
13	280	13.2		220	4.8	120	4.5	3.5
14	280	13.5		220	4.5	120	3.0	3.4
15	270	12.8		230	4.4	120	3.0	3.8
16	260	11.6		230	4.3	120	3.1	3.5
17	260	10.3		225	3.6	120	2.9	3.8
18	220	7.2						3.8
19	240	6.0						3.5
20	240	6.4						

Table 43*

Singapore, British Malaya (1.3°N, 103.8°E)							January 1952	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	260	4.8					2.8	
01	265	4.2					2.9	
02	270	3.8					2.9	
03	265	3.2					2.9	
04	(265)	3.0					2.9	
05	(265)	2.8					2.9	
06	230	3.2					2.9	
07	265	5.3	240		130	2.3	3.0	
08	305	7.2	230		120	2.8	3.8	
09	335	7.3	220		(115)	(3.0)	4.2	2.6
10	395	7.9	215	4.7		4.0	(2.3)	
11	425	8.4	210	4.8		4.2		
12	425	8.8	210	4.8		4.5	(2.2)	
13	390	9.0	205	4.7		4.1	2.2	
14	385	8.8	205	4.6		4.2	2.2	
15	375	9.0	215			4.3	2.2	
16	355	9.1	230			3.9	2.3	
17	320	9.2	25		125	(2.5)	3.4	2.4
18	275	8.8				2.6	2.4	
19	315	8.4					2.5	
20	325	7.2					(2.6)	
21	280	7.3					2.9	
22	245	7.1					(3.1)	
23	235	5.7					3.0	

Time: 105.0°E.

Sweep: 2.2 Mc to 16.0 Mc in 1 minute.

*Average values except f0F2 and fEs, which are median values.

Table 45

Watheroo, W. Australia (30.3°S, 115.9°E)							January 1952	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	290	4.6				4.3	2.8	
01	275	4.3				4.2	2.9	
02	290	3.8				4.0	2.9	
03	280	3.1				3.0	2.9	
04	300	3.0				3.1	2.8	
05	300	3.0				3.0	2.8	
06	260	3.8	265	---	1.9	2.9	3.0	
07	320	4.5	230	3.6	2.4	3.0	3.0	
08	370	5.0	230	1.0	2.9	4.2	2.9	
09	430	5.0	220	4.2	3.2	4.1	2.7	
10	400	5.1	220	4.3	3.3	5.0	2.6	
11	410	6.0	230	1.4	3.3	4.2	2.7	
12	390	6.2	220	4.5	3.3	5.0	2.8	
13	350	6.8	225	1.5	3.3	4.5	2.8	
14	360	6.3	220	1.4	3.3	4.6	2.9	
15	345	6.1	235	4.3	3.3	5.0	2.9	
16	350	6.2	210	1.1	3.1	4.5	3.0	
17	325	6.0	230	3.9	2.8	4.4	3.0	
18	300	5.6	230	3.4	2.3	3.6	3.0	
19	260	5.4				3.3	3.0	
20	260	5.1				4.1	2.9	
21	280	4.9				3.3	2.8	
22	300	4.6				3.0	2.8	
23	300	4.7				3.3	2.8	

Time: 120.0°E.

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

Table 47

Hobart, Tasmania (42.8°S, 147.1°E)							January 1952	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	260	4.0					3.1	2.7
01	265	3.4					3.2	2.8
02	260	3.5					3.1	2.9
03	280	2.9					2.6	2.0
04	265	3.0					3.0	2.9
05	250	3.7					3.2	3.0
06	250	4.3	250	4.0	120	1.8	2.5	3.0
07	310	4.7	220	4.3	100	2.4	3.0	3.0
08	350	5.1	220	4.5	100	3.2	5.0	2.9
09	360	5.5	200	4.5	100	3.5	5.4	2.9
10	390	5.5	200	4.6	100	3.5	5.5	2.8
11	390	5.5	200	4.6	100	3.6	5.8	2.8
12	400	5.5	200	4.6	100	3.7	4.5	2.8
13	400	5.6	200	4.6	100	3.6	5.5	2.7
14	400	5.9	200	4.6	100	3.5	4.0	2.7
15	350	6.0	200	4.5	100	3.5	4.0	2.8
16	350	6.0	210	4.5	100	3.5	4.0	2.8
17	310	6.1	230	4.3	100	3.0	3.5	2.9
18	250	6.2	---	---	100	2.5	3.8	3.0
19	250	6.0	---	---	E	4.1	3.0	
20	250	6.1	---	---		4.1	2.9	
21	250	5.6				4.0	2.8	
22	260	5.2				4.6	2.8	
23	250	5.0				3.5	2.8	

Time: 150.0°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 48

Brisbane, Australia (27.5°S, 153.0°E)

January 1952

Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	260	6.3						3.2
01	280	5.4						3.6
02	270	4.8						2.9
03	275	4.0						2.5
04	290	4.0						2.9
05	275	3.6						3.0
06	255	4.5	240		130	2.3	3.3	3.2
07	315	4.7	220		120	2.8	3.2	3.1
08	380	5.5	220		120	4.4	4.0	2.8
09	360	6.3	220		120	4.6	4.4	2.8
10	360	6.9	210		120	4.6	4.4	2.9
11	335	7.4	200		120	4.8	5.9	2.9
12	355	7.5	210		120	5.0	3.8	2.8
13	310	7.6	220		120	5.0	4.4	2.8
14	320	7.5	220		120	4.6	4.0	2.9
15	320	7.6	210		120	4.5	3.4	3.0
16	300	7.7	220		120	4.4	3.1	3.1
17	290	7.2	220		120	4.1	3.0	3.0
18	260	6.7	245		120	3.2	4.4	3.0
19	260	6.7					4.7	2.8
20	290	6.3					4.6	2.8
21	300	6.3					4.0	2.7
22	300	6.6					3.8	2.7
23	280	6.4					3.2	2.8

Time: 150.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 1 minute 55 seconds.

*No record 17th through 31st.

Table 46

Canberra, Australia (35.3°S, 149.0°E)							January 1952	
Time	h'F2	f0F2	h'Fl	f0Fl	h'E	f0E	fEs	(M3000)F2
00	(250)	(5.1)					3.4	---
01	(240)	4.4					3.8	(3.1)
02	(250)	4.0					3.8	3.1
03	(265)	3.4					3.7	(2.7)
04	(270)	(3.1)					3.0	(2.8)
05	(290)	3.2					3.5	2.9
06	255	4.0					3.2	
07	---	---	220		3.9	100	2.7	---
08	---	---	---		4.1	100	3.1	---
09	---	---	---		100	3.4	6.5	---
10	---	---	---		100	3.5	(7.8)	---
11	---	---	---		100	3.5	7.5	---
12	---	---	---		100	3.5	7.7	---
13	---	---	---		100	3.6	7.0	---
14	---	---	---		100	3.5	5.5	---
15	---	---	---		100	3.5	6.4	---
16	---	---	---		4.3	100	3.3	(3.2)
17	280	6.6	200		4.1	100	3.0	5.5
18	(270)	(7.0)	230		3.0	100	2.5	3.5
19	(250)	(6.1)			---	---	4.0	(3.5)
20	245	6.3					4.0	(3.1)
21	(250)	---					3.4	---
22	(265)	---					3.9	---
23	(270)	(5.6)					3.7	---

Time: 150.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

Time	December 1951						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	250	8.0					3.0
01	250	7.0					3.0
02	260	6.4					3.0
03	255	5.6					3.1
04	240	5.3					3.4
05	235	(1.0)					3.3
06	255	5.4	250	(1.5)	135	1.6	2.7
07	240	7.9	235	120	2.4	5.1	3.0
08	235	9.0	230	120	3.0	7.0	2.7
09	240	9.2	215	110	3.3	10.0	2.5
10	240	8.9	210	110	3.5	11.0	(2.5)
11	(335) #	8.6	210	110	3.6	10.8	2.5
12	240	9.0	210	110	3.6	13.2	2.5
13	325	9.6	205	115	3.6	12.6	2.5
14	240	9.3	205	110	3.1	11.6	2.4
15	270 #	9.7	225	115	3.0	9.5	2.4
16	240	9.9	240	115	2.6	8.8	2.4
17	260	9.7	245	125	2.0	3.2	2.4
18	290	9.6				2.6	2.4
19	315	9.0				2.4	
20	295	9.4				2.6	
21	270	9.2				2.8	
22	260	8.5				2.9	
23	245	7.7				3.0	

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

*Average values except foF2 and fEs, which are median values.

#One or two observations only.

Table 51

Time	October 1951						
	*	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	300	4.1					(3.4)
01	---	(3.9)					
02							
03							
04	280	4.9					(3.5)
05	280	5.4					
06	280	6.3					
07	260	7.9					
08	280	8.7					(3.6)
09	280	9.9					
10	290	10.5					
11	300	11.0					
12	300	11.3					3.3
13	300	11.8					
14	300	11.8					
15	300	11.6					
16	290	11.5					3.5
17	300	11.0					
18	280	10.0					
19	280	7.7					
20	290	6.0					3.6
21	300	5.0					
22	300	4.8					
23	300	4.5					

Time: Local.

Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.

*Height at 0.83 foF2.

**Average values; other columns, median values.

Table 52

Time	October 1951						
	*	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00							
01							
02							
03							
04							
05							
06							
07	360	7.6					
08	360	9.5					(2.9)
09	420	10.8					
10	450	11.0					
11	480	10.6					
12	480	10.7					
13	480	10.8					
14	480	11.1					
15	480	12.0					
16	480	12.9					
17	480	13.1					
18	480	13.0					
19	460	12.6					
20	420	(12.1)					
21	420	11.1					
22	(390)	10.6					
23							

Time: Local.

Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.

*Height at 0.83 foF2.

**Average values; other columns, median values.

Table 50*

Time	December 1951						
	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00	325	7.4					3.5
01	320	7.3					2.5
02	310	6.9					2.6
03	320	6.6					2.5
04	335	6.8	285	3.3			2.5
05	340	7.5	255	3.7	160 #	2.2	2.8
06	345	7.6	255	4.1	135	2.6	2.5
07	345	7.4	250	4.4	125	2.9	2.6
08	360	7.3	250	4.7	120	3.2	2.6
09	375	7.4	245	4.7	120	3.0	2.6
10	375	7.6	245	4.7	120	3.4	2.6
11	375	7.8	235	4.8	115	3.5	2.6
12	370	7.7	210	4.8	120	3.5	2.7
13	355	7.6	235	4.7	120	3.5	2.8
14	340	7.1	245	4.7	120	3.4	2.8
15	310	7.0	245	4.6	120	3.3	2.8
16	335	7.1	250	4.5	125	3.1	2.8
17	320	7.1	245	4.3	130	2.8	2.9
18	300	7.7	255	4.0	145	2.4	2.9
19	280	7.6					
20	285	7.0					
21	315	7.3					
22	325	7.5					
23	325	7.5					

Time: 60.0°W.

Sweep: 2.2 Mc to 16.0 Mc in 1 minute.

*Average values except foF2 and fEs, which are median values.

#One or two observations only.

Table 53

Time	October 1951						
	*	foF2	h'Fl	foFl	h'E	foE	fEs (M3000)F2
00							
01							
02							
03							
04							
05							
06							
07	360	7.0					
08	390	8.2					
09	480	10.3					
10	510	10.2					
11	520	9.8					
12	540	10.2					
13	540	10.1					
14	540	10.6					
15	540	10.8					
16	540	11.2					
17	540	11.1					
18	540	10.8					
19	540	10.8					
20	540	10.4					
21	540	10.0					
22	540	(9.8)					
23							

Time: Local.

Sweep: 1.8 Mc to 16.0 Mc in 5 minutes, manual operation.

*Height at 0.83 foF2.

**Average values; other columns, median values.

Table 55

Buenos Aires, Argentina (34.5° S, 58.5° W)

October 1951

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	300	7.4						2.9
01	300	7.2						2.9
02	280	7.5						3.0
03	230	6.5						3.2
04	250	5.6			---	---		3.0
05	270	5.7			---	---		3.0
06	230	6.9	---	---	110	---		3.3
07	240	7.6	210	---	110	2.8	3.4	3.4
08	260	8.1	220	---	110	3.2	3.8	3.2
09	290	9.4	220	---	---	---	4.4	3.1
10	310	10.1	230	---	---	---	4.6	3.0
11	300	11.2	220	---	---	---	5.0	3.0
12	300	12.0	220	---	---	---	4.8	3.0
13	300	12.9	220	---	---	---	4.4	3.0
14	300	13.4	230	---	---	---	4.0	3.1
15	290	13.6	240	---	---	---	3.8	3.1
16	270	13.6	230	---	---	---	3.6	3.2
17	260	13.4	240	---	---	---	3.0	3.3
18	240	13.4				2.8	3.4	
19	220	(12.0)					(3.3)	
20	230	(9.4)					(3.0)	
21	290	(8.6)					(2.8)	
22	300	(8.0)					(2.9)	
23	310	7.4					2.9	

Time: 60.0° W.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 56

Buenos Aires, Argentina (34.5° S, 58.5° W)

September 1951

Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	300	5.8						2.9
01	300	5.6						2.9
02	270	5.6						3.0
03	260	5.0						3.0
04	280	4.5						3.0
05	290	4.2						3.0
06	240	5.8	---	---	---	---	---	3.2
07	230	6.4	---	---	---	---	---	3.4
08	250	(7.8)	230	---	---	---	(3.0)	(3.2)
09	260	8.5	230	---	---	---	---	3.3
10	280	9.0	230	---	---	---	---	3.3
11	290	10.5	210	---	---	---	---	3.1
12	290	11.5	210	---	---	---	---	3.2
13	290	11.2	220	---	---	---	---	3.2
14	280	11.3	220	---	---	---	---	3.2
15	270	11.1	230	---	---	---	---	3.2
16	260	10.8	240	---	---	---	---	3.2
17	250	10.0	---	---	---	---	---	3.3
18	230	10.0						3.3
19	210	8.9						3.3
20	240	8.0						3.0
21	260	7.0						3.0
22	270	6.6						3.0
23	300	6.0						2.9

Time: 60.0° W.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

TABLE 57
 Ionosphere, National Bureau of Standards
IONOSPHERIC DATA

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

p1.0 Mc to 25.0 Mc in 0.25 min
Manual Automatic

TABLE 58
 Central Radio Propagation Laboratory, National Bureau of Standards
IONOSPHERIC DATA

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

Sweep 1.0 Mc to 25.0 Mc in 0.25 min

TABLE 59
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

foF₂, Mc
May, 1952
(Characteristic)
Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W
(Month)

Sweep L.O.—Mc 1025.0 Mc in 0.25 min

75°W

Mean Time

Day	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330				
1	(2.4)F	(2.0)F	(1.5)F	(1.3)F	(1.8)F	2.7	<3.4	3.9	<3.8	G	<3.9	G	<4.1	G	<4.0	G	<4.0	G	4.1	K	4.2	K	4.1	K	3.8	K		
2	2.9	F	(3.0)F	1.7	[1.6]F	(1.4)F	2.8	3.5	3.7	4.4	H	4.4	H	4.7	K	5.2	K	5.9	K	5.7	K	6.0	K	6.6	K	6.3	K	
3	2.6	F	(2.2)F	(2.2)F	(1.5)F	(1.7)F	2.9	3.7	<3.9	G	<3.9	G	<4.1	G	<4.1	G	4.3	K	(4.6)F	4.9	K	5.1	K	6.2	H	5.7	K	
4	[2.7]F	(2.4)F	(2.4)F	(2.4)F	(2.4)F	(2.4)F	2.9	3.7	<3.9	G	<3.9	G	<4.1	G	<4.1	G	4.2	K	4.5	K	4.8	K	5.2	K	5.3	K		
5	(1.7)F	(1.5)F	(1.5)F	(1.5)F	(1.5)F	(1.5)F	3.0	3.7	<3.6	G	<4.0	G	<4.1	G	<4.1	G	4.2	K	4.5	K	4.8	K	5.2	K	5.3	K		
6	2.9	F	2.7	K	[2.2]F	(2.2)F	2.9	3.7	<3.7	G	<3.9	G	<4.0	G	<4.1	G	4.2	K	<4.3	G	4.7	K	4.8	K	5.0	K		
7	(3.5)F	(2.3)F	(2.3)F	(2.3)F	(2.3)F	(2.3)F	3.2	3.7	<3.5	G	<3.5	G	<3.7	G	<3.7	G	4.0	K	4.4	K	4.8	K	5.0	K	5.2	K		
8	(1.8)F	(1.6)F	(1.6)F	(1.6)F	(1.6)F	(1.6)F	2.7	3.3	3.7	G	<3.9	G	<4.0	G	<4.0	G	4.1	K	4.5	K	4.9	K	5.0	K	5.2	K		
9	2.3	F	(2.1)F	(2.1)F	(2.1)F	(2.1)F	3.1	3.9	4.2	4.1	<4.1	G	<4.1	G	<4.1	G	4.5	(4.5)F	4.5	G	4.7	G	5.0	G	5.0	G		
10	2.2	2	(1.9)S	(1.8)S	(1.9)S	(1.9)S	3.3	(3.9)S	4.1	H	4.2	H	4.6	H	4.6	H	4.8	G	4.7	G	5.1	G	5.4	H	5.2	H		
11	3.4	K	2.1	2.0	2.0	2.0	2.1	3.7	4.5	4.8	H	5.0	H	5.5	H	5.7	G	5.9	G	6.2	G	6.5	G	6.7	G			
12	4.5	3.9	2.5	2.5	2.5	2.5	2.5	3.5	4.5	5.0	H	5.7	H	6.0	H	6.4	G	6.7	G	7.0	G	7.3	G	7.5	G			
13	2.8	2.6	2.1	1.6	1.9	3.1	3.7	4.2	4.1	<4.0	G	4.5	H	4.6	H	4.4	G	4.7	G	5.0	G	5.2	G	5.5	G			
14	3.1	2.9	2.5	2.5	2.1	(2.3)A	3.3	(4.1)A	4.2	4.5	H	5.0	H	4.9	H	5.1	H	5.1	G	5.4	G	5.3	G	5.5	G			
15	3.2	3.0	2.8	2.8	2.5	2.5	3.5	(4.0)A	4.7	(5.4)A	(5.7)A	(5.9)A	(5.9)A	(5.9)A	(5.9)A	5.7	H	5.9	H	6.2	H	6.2	H	6.4	H			
16	3.1	(3.1)F	3.0	F	(2.5)F	(2.5)F	3.7	H	<4.4	H	5.3	H	5.2	H	5.8	H	6.0	H	6.2	H	6.4	H	6.7	H	7.0	H		
17	3.5	3.2	3.0	2.9	2.7	2.8	3.8	4.3	4.7	4.2	H	4.5	H	4.5	H	4.6	H	4.7	H	5.0	H	5.2	H	5.5	H			
18	3.9	2.7	2.4	2.4	2.0	2.1	(3.2)F	3.7	4.1	4.5	H	4.6	H	4.6	H	4.5	G	4.9	G	5.0	G	5.1	G	5.2	G			
19	2.5	2.3	2.3	2.3	2.0	2.0	2.5	3.5	(4.0)A	4.0	H	4.4	H	4.4	H	4.5	G	4.7	G	(5.0)A	4.9	G	5.1	G	5.2	G		
20	3.4	2.8	2.4	2.4	2.1	2.1	2.7	3.6	4.3	5.1	H	5.1	H	5.1	H	5.1	H	5.1	H	5.2	H	5.4	H	5.5	H			
21	3.1	2.8	2.8	2.8	2.5	2.5	3.0	3.6	4.7	4.7	H	4.5	H	4.7	H	4.6	H	4.8	H	5.0	H	5.2	H	5.4	H			
22	3.8	3.5	3.1	3.0	2.9	2.9	4.2	4.6	H	5.1	H	5.2	H	5.4	H	5.6	H	5.4	H	5.1	H	5.3	H	5.4	H			
23	(3.4)F	3.2	3.1	3.0	3.1	3.1	3.1	3.7	4.1	4.4	5.5	6.0	6.0	6.2	6.6	6.1	6.2	6.3	6.5	6.5	6.7	7.2	7.4	7.5	7.7			
24	4.2	3.5	3.0	2.9	H	2.8	H	3.7	4.2	4.5	H	5.0	H	5.3	H	5.9	H	5.8	H	6.0	H	6.4	F	6.7	F	7.0	F	
25	3.8	3.3	2.6	2.6	2.3	2.3	3.4	4.5	4.4	4.7	H	4.7	H	4.6	H	4.5	H	4.8	H	5.0	H	5.2	H	5.4	H	5.6	H	
26	3.9	F	(3.8)F	(2.9)A	(2.9)A	(2.5)F	(2.5)F	3.2	4.1	4.8	5.2	H	5.2	H	5.5	H	5.6	H	5.4	H	5.4	H	5.5	H	5.9	H	6.2	H
27	(2.4)F	(1.6)A	(1.6)A	(1.6)A	(2.1)F	(2.1)F	2.9	K	<3.3	K	<3.3	K	<3.6	G	<3.8	G	<4.0	G	<4.4	K	<4.7	K	<5.3	K	<5.5	K	<5.6	K
28	A	X	A	X	A	X	2.1	3.4	K	3.8	K	<3.8	G	<4.1	G	<4.1	G	<4.4	G	4.7	K	4.9	K	5.2	K	5.6	K	
29	3.2	3.0	(2.8)F	(2.8)F	(2.1)F	(2.1)F	3.3	4.0	H	(4.3)S	4.0	H	(4.1)G	<4.1	G	4.2	G	4.5	H	4.4	H	4.7	H	4.8	H	5.4	H	
30	3.1	F	3.0	(2.9)F	(2.9)F	(2.1)F	3.1	3.7	4.5	(4.3)P	4.5	H	4.9	H	5.0	H	5.3	H	5.4	H	5.2	H	5.4	H	5.7	H		
31	3.6	3.5	3.1	2.6	2.5	3.2	3.2	4.1	4.5	4.5	H	4.5	H	4.7	H	4.9	H	5.1	H	5.7	H	6.3	H	6.7	H	7.0	H	
Jedian	3/	2.8	2.4	2.1	2.2	3.2	4.0	4.4	4.5	4.6	H	4.6	H	4.7	H	4.9	H	5.1	H	5.2	H	5.4	H	5.5	H	5.6	H	
Count	30	30	30	29	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		

National Bureau of Standards
(Institution) A.C.K.

Calculated by: M.G.C., A.C.K., E.J.W., R.F.B.

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

**TABLE 60
IONOSPHERIC DATA**

h'F₁ **Km** **May**
 (Characteristic) (Unit) (Month)
 Observed at Lat 38.7°N, Long 77.1°W

75°W**Mean Time**

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

National Bureau of Standards
(Institution), A.C.K., E.J.W., R.F.B.

Calculated by: McC.

Sweep II

Mc 1025.0

Mc 1025 min

Automatic

Manual

□

Automatic

Manual

□

Automatic

h_E Km May
(Characteristic) (Unit) 1952

Observed at Washington, D. C.

Lat 38°N, long 77.1°W

IONOSPHERIC DATA

TABLE 62
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D. C.
IONOSPHERIC DATA

National Bureau of Standards
(Institution) A.C.K.

Scaled by: Mc C., A.C.K., E.J.W., R.F.B.

75°W Mean Time

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

Manual Automatic
Sweep 10 Mc 1025.0 Mc in 0.25 min

U.S. GOVERNMENT PRINTING OFFICE: 1952 14-1000-100

TABLE 63
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

foE Mc May
(Characteristic) (Unit) (Month)

Observed at Washington, D.C.

Lat 38.7°N, Long 77.1°W

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
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14																									
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16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
Median Count	1.5	2.0	2.4	2.7	3.0	3.1	3.2	3.3	3.2	3.2	3.1	2.8	2.5	2.1	1.6										
	5	21	25	23	19	19	19	19	19	19	19	19	25	25	25	27	23	5							

National Bureau of Standards
(Institution) A.C.K.
Calculated by: McC., A.C.K., E.J.W., R.F.B.

Scolded by: McC.

Collected by: McC., A.C.K., E.J.W., R.F.B.

75°W Mean Time

75°W

Mean Time

TABLE 64
IONOSPHERIC DATA

F.S. — Mc.Kin. — May
 (Characteristic) (Unit) (Month)

Observed at Washington, D.C.
 Lat 38°7'N., Long 77°10'W.

National Bureau of Standards
 (Institution) A.C.K.

Calculated by: MCC, A.C.K. E.J.W. R.F.B.
 Scaled by: Mc.C.

75°W Mean Time

Doy	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	21/60	E	26/30	E	E	1/3	1/10	G	G	G	G	G	G	G	G	G	G	G	1/9/20	E	E	E	E			
2	E	E	E	E	50/100	E	G	G	G	45/110	34/120	54/100	G	G	G	G	G	G	E	E	E	E	E			
3	E	E	E	E	E	1/3	1/10	G	G	20/110	G	G	30/110	41/100	43/100	32/110	G	G	E	E	E	E	E			
4	E	E	E	E	E	E	7/3	1/40	C	C	G	G	G	39/100	50/120	G	G	G	G	E	E	E	E			
5	E	E	E	E	46/120	G	80/110	G	G	G	G	76/120	G	44/140	G	G	G	G	E	E	E	E	E			
6	E	E	E	E	E	1/3	1/10	G	G	94/110	36/120	G	G	G	76/110	42/110	G	32/130	1/7/30	E	E	E	E			
7	E	E	E	E	E	19/20	G	G	G	29/100	32/100	G	G	G	G	G	G	G	1/2/30	E	24/130	1/2/30	E			
8	E	E	E	E	E	75/100	G	G	G	14/110	6/120	44/110	G	G	G	54/120	82/120	45/110	52/110	45/110	30/110	32/110	32/110			
9	31/110	30/110	30/100	74/110	40/110	1/3	32/130	52/120	40/20	G	G	33/110	68/100	36/120	34/110	40/110	36/110	40/120	60/110	54/110	56/110	44/110	E			
10	E	E	E	E	E	21/110	27/100	G	36/120	40/110	G	G	G	G	G	G	G	31/110	39/110	31/110	26/110	E	E	E		
11	E	34/110	30/100	42/110	11/110	14/110	24/110	G	3/110	4/120	4/110	4/100	G	G	34/110	G	G	G	2/120	1/120	4/110	27/120	E			
12	E	E	66/100	E	E	E	G	G	4/1/20	4/0/20	4/0/120	G	G	G	58/110	80/110	70/110	126/110	36/120	G	4/6/120	4/1/20	1/3/110	4/0/110	33/110	
13	E	E	E	E	E	E	G	G	4/2/20	4/8/110	G	4/3/110	25/100	70/120	G	71/100	G	G	4/8/120	8/5/110	4/7/110	24/120	E	E	E	
14	E	E	E	E	E	38/40	29/110	31/130	37/120	48/110	6/1	110	54/110	4/6/110	4/3/110	G	G	G	4/6/120	4/1/20	5/2/110	24/110	54/110	44/110	32/110	
15	26/110	23/110	E	24/100	2/150	3/20	38/100	52/120	5/2/110	4/7/10	75/110	74/110	58/110	5/9/110	95/110	50/110	44/110	4/0/110	55/110	6/6/110	4/7/110	76/110	22/110	78/110		
16	76/110	74/110	40/110	46/110	33/110	40/110	4/2/110	10/5/110	47/120	70/120	50/130	6/1	110	4/4/110	4/1/130	G	G	G	4/1/120	5/8/110	1/20	4/5/110	38/110	4/8/110	E	
17	30/110	30/100	50/100	40/100	4/0/100	1/9	110	31/120	4/0/110	42/110	7/1/20	4/0/110	3/6/110	3/3/110	G	G	G	G	G	3/6/130	4/2/120	4/7/120	E	E	E	
18	E	20/140	E	E	E	E	G	33/130	G	G	4/4/110	4/5/120	5/4/110	G	G	G	G	G	G	1/8/130	4/4/130	7/4/110	E	E	E	
19	E	E	E	E	E	E	G	30/120	70/110	4/0/110	4/0/110	3/3/110	G	66/110	5/4/110	56/110	4/8/110	9/0/110	7/2/110	3/2/120	3/1/110	3/8/110	3/1/110	3/0/110	E	
20	26/110	24/110	E	4/2/110	4/0/120	5/0/110	4/2/110	5/0/110	7/0/110	4/5/110	5/0/100	G	4/1/100	4/1/110	7/3/110	10/120	110/110	50/120	4/3/120	5/8/110	1/10	6/0/100	4/2/100	32/100	32/100	
21	E	25/100	4/2/100	3/0/100	3/0/100	3/5/100	7/2/100	3/5/100	7/2/100	4/2/100	3/4/100	6/3/100	4/2/100	6/3/100	7/0/100	3/1/110	10/130	4/2/120	4/2/120	1/10	5/8/110	3/2/110	4/0/110	3/8/110		
22	30/100	25/110	E	2/3/110	3/0/110	4/8/110	3/0/110	4/8/110	G	G	G	54/110	53/110	110	4/5/110	4/2/110	3/8/110	5/1/110	4/3/110	1/10	3/0/110	3/0/110	24/110	33/100		
23	50/110	42/100	30/100	31/100	2/8/100	G	4/0/110	7/0/110	5/2/110	6/2/110	5/5/100	4/0/100	3/8/100	4/0/100	G	8/0/100	3/7/120	3/5/130	3/1/120	3/6/110	3/8/110	3/3/110	25/110	E		
24	50/110	29/100	32/110	E	3/7/110	2/4/110	9/1/110	3/6/110	4/1/110	4/2/110	6/6/110	G	5/4/100	G	G	4/1/130	E	E	E	E	E	E	E	E	E	
25	E	E	E	E	E	E	G	3/9/100	3/4/100	4/0/110	G	G	G	4/7/100	7/8/110	6/1/110	5/5/110	110	G	G	G	5/6/20	7/6/20	7/2/20	4/5/20	4/4/110
26	39/120	57/110	50/110	49/110	3/5/110	3/2/110	G	G	G	G	50/120	50/110	4/6/110	4/6/110	35/110	3/4/110	G	G	G	3/2/140	E	E	E	E		
27	E	E	76/110	72/110	38/110	G	G	G	G	G	G	G	G	G	G	G	G	G	E	3/5/160	3/4/120	E	E	E		
28	74/110	78/110	58/110	76/100	51/100	37/120	4/6/120	4/2/110	G	110	110	55/110	52/110	7/6/110	G	4/5/110	3/3/110	G	G	E	E	E	E	E		
29	E	E	25/110	E	E	G	G	G	G	G	G	G	G	G	G	G	G	G	G	E	E	E	E	E		
30	E	E	36/100	E	E	G	G	G	G	4/0/110	5/4/110	5/0/110	5/8/110	5/4/110	7/6/110	G	G	G	G	E	E	E	E	E		
31	E	E	E	E	E	24/110	G	45/110	3/2/110	9/2/100	3/9/110	52/100	7/6/100	G	G	G	G	G	G	1/9/110	1/3/110	E	E	E	E	E
Condition **	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**		
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	

LOWER FREQUENCY LIMIT OF THE RECORDER.
 Sweep 5.0 Mc in 5.0 min Automatic

Form 64-1946-10-10159
 U. S. GOVERNMENT PRINTING OFFICE 1946 O-10159

TABLE 65
 Central Radio Propagation Laboratory, National Bureau of Standards
IONOSPHERIC DATA

M1500)F2 May 1952

Observed at Washington, D. C. (month)
(Characteristic) (Unit)

Lat 38.7°N, Long 77.1°W

body	00	01	02	03	04	05
1	1.8 ζ	(17) ζ	ζ ((17)) ζ	((17)) ζ	ζ	E K

2	$\frac{1}{8}$	$\frac{1}{8}F$	$\frac{1}{8}F$	$\frac{1}{17}$	$\frac{1}{17}F$	$\frac{1}{17}S$	F	S	$2C$
7	$\frac{1}{8}F$	$\frac{1}{16}G$	$\frac{1}{16}G$	$\frac{1}{17}F$	$\frac{1}{17}F$	S	F	$\frac{1}{18}S$	$\frac{1}{18}S$

3	H_2	H_2	H_2	H_2	H_2	H_2
4	$\text{K}(\text{H}_2)^{\frac{1}{2}}$	$\text{S}^{\frac{1}{2}}$	$(\text{H}_2)^F$	$\text{K}((\text{H}_2)^{\frac{1}{2}})$	$E^{\frac{1}{2}}$	Z_0

5	18K	16K	17K	E K	Z /
6	18K	18K	19K	11.8F	11.6F

7 20 K(18)^M 1.8 K(18)^F K(18)^S K(17)

8	$(1/6)_K^S$	$1/7_K$	$(1/7)_K^S$	E_K	$(1/6)_K^F$	$1/9$
9	$3/0_F$	$1/9_F$	$1/9_F$	$(1/9)^A$	A	$3/1$

3	19	19	19	20	19	21
10						

11	21	20	19	20	20	22
12	30	31	24	31	20	20

13	2.0	2.0	2.1	2.0	1.9	2.1
----	-----	-----	-----	-----	-----	-----

14	21	19	20	20	2.0	2.2
15	20	20	20	21	2.2	2.4

16 A A $(20)^F$ 20^F 21 23

17 2.0 2.0 4 30 30' 24
18 2.3 2.0 19 20 18 2.2

19 18 19 20 23 (19) ^S _J 21

20	21	22	23	24	25	26	27	28	29	30	31
(2.0) ^F	(2.0) ^F	1.9 ^F	1.9 ^F	(2.0) ^A	(2.0) ^A	(2.1) ^F	(2.1) ^F	(2.1) ^A	(2.1) ^A	(2.1) ^F	(2.1) ^F
21	22	23	24	25	26	27	28	29	30	31	32

22 20 20 21 20 21 21

23 24

25	21	21	21	22	19	20
26	715	706	A	316	116	93

26	$(1/8)_K^F$	$(1/2)_K^F$	A	A	$(1/7)_K^F$	$(1/7)_K^F$	$(1/7)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$
27	$(1/8)_K^F$	$(1/7)_K^F$	A	K	$(1/7)_K^F$	$(1/7)_K^F$	$(1/7)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$	$(1/8)_K^F$

28	A K	A K	19 K	4 K	A K	22
29	19	19	19	(18) F	(19) F	21

23	1.1	1.1	1.1	(1.0)	0.1	2.1
30	1.9 F	1.9 F	1.9 F	(2.0)F	1.9 F	2.3

31 20 1.9 2.0 2.0 2.0 2.1

median 20 19 19 20 19 21

Count	29	28	27	25	30

Lat 38.7°N, Long 77.1°W																		Mean Time		
75°W																		A.G.K., E.W., R.F.B.		
Calculated by M.G.C.,																				
Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	
1	18 ^K	(17) ^K	K(17) ^S	(17) ^S	E ^K	19 ^K	19 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	17 ^K	19 ^K	18 ^K	19 ^K	
2	18 ^F	17 ^F	17 ^F	17 ^F	F ^S	20	21	19	15 ^H	13	16	18	20	19	21	19	20	21	19	19
3	18 ^F	(17) ^F	(17) ^F	S ^F	(18) ^S	20	21	20 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	17 ^K	19 ^K	(17) ^S	(17) ^S	
4	K(17) ^S	S ^A	(18) ^A	K(17) ^S	E ^K	20 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	19 ^K	19 ^K	19 ^K	19 ^K	
5	18 ^A	16 ^K	17 ^K	E ^A	E ^K	21 ^K	(21) ^S	18 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	19 ^K	20 ^K	20 ^K	20 ^K	
6	18 ^K	18 ^K	19 ^K	(18) ^K	(18) ^K	20 ^K	21 ^K	19 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	18 ^K	(18) ^S	20 ^K	(20) ^S	
7	20 ^K	K(18) ^S	(18) ^S	18 ^F	K(18) ^F	(18) ^F	K(17) ^S	K(17) ^S	K(17) ^S	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	19 ^K	20 ^K	19 ^K	(19) ^S	
8	(16) ^S	17 ^K	(17) ^S	E ^K	(16) ^K	19 ^K	22 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	G ^K	17 ^K	18 ^K	21 ^K	21 ^K	
9	20 ^F	19 ^F	19 ^F	(19) ^A	A	21	22	(19) ^A	15	G	G	17	14	18	19	20	21	20	20	19
10	19	19	19	20	19	21	(21) ^S	21 ^H	16	19	20	19	18	18	19	20	21	22	21	21
11	21	20	19	20	20	22	23	23 ^H	20 ^H	20	21	21	21	20	20	21	21	19	21	
12	20	21	24	21	20	20	20	21	18	18	18	18	A	A	A	21	20	20	20	
13	20	20	21	20	19	21	20	19	5	16	16	16	19	17	16	16	20	21	20	
14	21	19	20	20	20	22	20	22	18	19	20	18 ^H	21 ^H	20 ^H	20	21	21	22	A	19
15	20	20	20	21	22	24	24	A	23	21	A	22	20	21	20	21	22	23	22	20
16	A	A	(20) ^S	20 ^F	21	23 ^H	23 ^m	23 ^H	23 ^m	22	20	21	21 ^H	20 ^H	22	20	21	21	23	(20)A
17	20	20	A	20	20 ^F	24	23	22 ^H	24	23	21	20	21	21	21	20	21	21	23	21
18	23	20	19	20	18	22	16	17	19	19	G	A	G	G	16	18	19	20	19 ^F	
19	18	19	20	23	(19) ^S	21	18	19 ^F	22	18	15 ^H	16	(19) ^S	20	19	20	A	(21)A	22	21
20	21	22	20 ^F	19 ^F	20 ^F	A	20	23	(19) ^m	23	18	19	19 ^H	21	20 ^H	20 ^H	21 ^H	(22) ^F	(22) ^F	
21	(20) ^F	19 ^F	19 ^F	(20) ^A	(21) ^F	21	(14) ^B	19	23 ^H	16	1.5	17	G	1.6	1.7	1.9	20	21	20	
22	20	20	21	20	21	24	24	20 ^H	22 ^H	20	21	18	22	20	20	21	21	22	20	
23	21 ^F	20 ^F	20	23	23	21	(21) ^H	23 ^H	20	22	21 ^H	22	20	20	21	21	22	20	20	
24	21	21	20	20	23	23	20	19	20	20	1.8 ^H	1.9	1.9 ^S	21 ^H	21	20	22	(20) ^S	20	19 ^F
25	21	21	21	22	19	20	21	16	1.8	20	19 ^H	19	(19) ^A	20	21 ^H	21	20	21	22	
26	21 ^S	20 ^F	A	21 ^F	(19) ^F	22	16 ^S	1.9 ^H	1.9	21 ^H	1.9	2.0	18 ^K	20 ^K	19 ^K	19 ^K	18 ^K	(18) ^S	(17) ^K	
27	(18) ^K	(17) ^K	A	K	(17) ^K	(18) ^K	22 ^K	G ^K	G ^K	G ^K	G ^K	G ^K	1.6 ^K	1.6 ^K	1.7 ^K	1.7 ^K	22 ^K	(21) ^S	20 ^K	
28	A ^K	A ^K	19 ^K	A ^K	A ^K	22 ^K	22 ^K	G ^K	G ^K	G ^K	A ^K	(14)A	17	A	18	20	21	22	19	20
29	19	19	19	(18) ^F	(19) ^F	21 ^F	(19) ^S	(19) ^S	21	G	G	G	1.6	1.8	21	19	20	22	19	19
30	19 ^F	19 ^F	19 ^F	(20) ^F	19 ^F	23	G	1.9	1.9 ^H	1.7	17 ^H	18 ^H	18	20	21	21	22	20	21	
31	20	19	20	20	20	21	17 ^H	17 ^H	19 ^H	(15)A	1.9 ^H	1.9 ^H	A	21	19	20	20	21	22	20
median	20	19	19	20	19	21	19	21	18	18	16	18	18	19	20	20	21	20	20	20
count	29	28	28	27	30	30	30	30	31	30	31	31	31	31	31	30	30	31	30	30

TABLE 68
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

May, 1952

(Month)

Lat 38° 7' N., Long 77° 10' W.

(Unit)

W.G.

(Characteristic)

Observed at Washington, D.C.

Form adopted June 1946

National Bureau of Standards
(Institution)

Scaled by: McC. A.C.K. E.I.W. R.F.B.

Day	75° W												Mean Time													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	4.3 X	4.1 X	4.2 X	4.3 X	4.2 X	4.1 X	4.0 X	4.1 X	4.2 X	4.3 X	4.3 X	4.3 X	4.2 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X		
2	4.1	4.1 H	4.2	(4.0) P	A	A	4.1	(4.3) P	4.1	4.1	4.1	4.1	4.1	A X	A X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X		
3	3.9	4.1 X	(3.9) X	4.2 X	(4.3) X	P	4.0 X	4.1 X	A X	A X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X	4.1 X							
4	4.5 X	C X	(4.2) X	P	4.0 X	(4.1) X	(4.2) X	(4.3) X	P	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X		
5	5 X	4.1 X	(4.1) X	P	4.1 X	(4.1) X	4.3 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X							
6	4.1 X	4.1 X	(4.3) X	P	A X	A X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	4.2 X	
7	(4.2) X	H	4.2 X	X	A	K	4.1 X	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	(4.2) X	P	
8	4.4 X	4.4 X	(4.3) X	P	4.3 X	4.2 X	(4.2) X	P	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	A X	
9					4.3	4.1	4.2	4.4	A	A	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
10					A	4.3	A	A	A	A	4.2	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
11					A	4.2	4.5	A	A	A	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
12					S	4.1	4.1	A	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
13					S	4.0	4.2	4.3	4.4	A	A	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
14					S	4.4	4.3	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
15					A	4.3	4.3	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
16					A	A	A	A	A	A	4.2	A	A	A	A	A	A	A	A	A	A	A	A	A		
17					S	4.4	4.5	4.4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
18					H	4.2	4.2	4.5	A	A	A	(4.2) P	(4.3) P	P	4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
19					S	A	A	A	4.5	A	A	4.2	4.4	4.2	A	4.1	(4.5) A	A	A	A	A	A	A	A	A	
20					A	A	(4.4) A	A	A	A	4.3	A	A	A	A	4.5	4.3	4.5	4.6	A	A	A	A	A		
21					S	A	(4.6) A	4.5	A	A	A	A	A	A	A	4.2	4.3	A	4.1	4.3	A	A	A	A		
22					S	4.0	4.0	4.3	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
23					S	4.4 H	A	A	A	A	A	A	A	A	A	4.3	4.3	A	A	A	A	A	A	A	A	
24					S	A	A	A	A	A	A	A	A	A	A	(4.9) P	4.2	(4.2) P	4.3	4.3	4.3	4.3	4.3	4.3	4.3	
25					(4.7) S	A	A	4.6	4.7	A	A	A	A	A	A	A	A	A	4.2	4.3	4.2	4.2	4.2	4.2	4.2	
26					S	4.3	4.2	4.2	4.2	4.3	4.4	4.4	4.3 X	A X	A X	A X	A X	A X	4.3 X	4.5 X	4.3 X	3.7 X	3.7 X	3.7 X	3.7 X	3.7 X
27					S	4.3 X	4.3 X	4.2 X	4.4 X	4.4 X	(4.3) X	(4.3) X	(4.2) X	(4.5) X	(4.5) X	4.4 X	4.4 X	4.4 X	4.3 X	4.5 X	4.3 X	4.2 X	3.9 X	3.9 X	3.9 X	3.9 X
28					A X	A X	4.4 X	4.4 X	4.4 X	4.3 X	4.4 X	A X	A X	A X	A X	4.3	4.5	4.4	A	A	4.1	3.7	3.7	3.7	3.7	3.7
29					S	(4.3) P	4.6	(4.4) P	(4.5) P	(4.2) P	4.3	4.2	4.2	4.3	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
30					S	4.2	4.4	(4.3) P	A	A	A	A	A	A	A	4.3	4.5	4.5	4.6	4.3	4.2	3.6	3.6	3.6	3.6	3.6
31					S	A	4.5	4.4	A	A	A	A	A	A	A	A	A	A	(4.9) P	4.3	4.4	4.4	4.4	4.4	4.4	4.4
					4.1	4.2	4.2	4.3	4.3	4.3	4.2	4.2	4.3	4.3	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
					5	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.

Sweep I.Q.—Mc 1025.0 Mc in 0.23 min
Manual □ Automatic ■

Farm adopted June 1946

U.S. GOVERNMENT PRINTING OFFICE: 1946 O-102319

Table 69

Ionospheric Storminess at Washington, D. C.May 1952

Day	Ionospheric character*		Principal storms		Geomagnetic character**	
	00-12 GCT	12-24 GCT	Beginning GCT	End GCT	00-12 GCT	12-24 GCT
1	4	5	###	----	5	4
2	2	1	----	0400	4	4
3	3	4	1200	----	4	4
4	4	5	----	----	4	4
5	4	4	----	----	4	3
6	4	4	----	----	4	3
7	4	5	----	----	5	5
8	5	3	----	1800	4	3
9	3	3			1	1
10	3	2			2	1
11	2	3			1	3
12	1	1			3	2
13	1	3			2	3
14	0	2			3	2
15	1	3			1	2
16	2	3			2	2
17	2	3			2	2
18	1	3			5	4
19	1	3			5	3
20	1	2			4	3
21	1	3			3	3
22	0	2			2	1
23	1	3			2	3
24	1	1			3	3
25	1	1			4	2
26	1	3	1700	----	3	5
27	5	5	----	----	5	4
28	4	4	----	1700	4	5
29	3	3			4	4
30	2	2			4	3
31	1	2			4	3

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

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

----Dashes indicate continuing storm.

##Storm began at 0600 GCT on April 30, 1952.

Table 70

Solar Flares, April 1952

Observatory	Date	Time Observed		Dura-	Position		Time of Maxi-	Int. Rela-	Import-	SID Obser-
		Begin-	End-	tion	Latit-	Long-	Maxi-	tive Area of	ance	ved
		ning	(GCT)	(Min)	ude	itude	num-	Maximum		
					(Deg)	(Deg)	(GCT)	(Tenths)		
Boulder	Apr. 3	1511	1516	5	S05	W49	1512	10	8	-
"	3	1832	1932	60	S05	W49	1842	18	5	1
"	4	2218	2258	40	S02	W70	2240	25	8	1
"	7	2050	2115	25	N02	E09	2100	8	8	1
"	8	1440	1515	35	N06	E00	1445	10	3	1
Boulder	12	1717	1737	20	N06	W47	1722	5	6	-
"	14	2307	-	150	N10	W89	2320	10	-	1
"	19	1516B	1521	-	S08	W12	1516	5	0	1
"	19	1824	1839	15	S08	W12	1832	10	5	1
"	19	2048	2113	25	S08	W12	2051	5	5	1
"	19	2131B	2146	-	S09	W12	2131	5	0	1

B Flare started before given time

A Flare ended after given time

Q Time reported as questionable

Table 71a

Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings, Short Term and Advance Forecasts)

January 1952

Day	North	CRPL	Short-term forecasts				Advance forecasts				Geomag- netic K _{Ch}
	Atlantic	Warning	issued about one hour in advance of 12-hour period, UT:				(J-reports) for whole day; issued in advance by:				
Jan	Half Day	Half Day	00	06	12	18	1 to 3/4 days	4/5 to 7 days	8 to 25 days	Half day	Geomag- netic K _{Ch}
	UT	UT	to 12	to 18	to 24	to 06	days		days		
1	5	5	U	U	(4)	5	6	6	5	7	(4) 3
2	5	6	U		5	6	6	6	6	7	2 2
3	5	5			6	6	7	7	6	6	2 2
4	5	6			6	5	6	6	(4) (4)	X	2 3
5	(4)	5	W	W	5	(3)	5	(4)	(4) (4)	X	(5) 3
6	(4)	5	W	W	(4)	(3)	(4)	5	(4) (4)	X	(4) 3
7	(4)	5	W	U	(4)	(4)	5	5	(4) (4)	X	2 3
8	(4)	6	U		5	5	6	7	5	5	3 2
9	5	7			6	6	5	7	6	5	2 3
10	(4)	5	U		6	5	6	6	6	6	3 (4)
11	(4)	6			U	5	5	6	5	6	(4) 3
12	(4)	5	U	U	6	(4)	5	6	5	6	(4) (4)
13	5	5	U	W	5	5	6	(4)	5	6	(4) (5)
14	(4)	5	W	W	(4)	(1)	5	6	5	5	(4) (4)
15	(3)	5	W	W	5	(4)	5	6	5	5	(4) (4)
16	(4)	5	U	U	(4)	5	5	5	(4) (4)		3 2
17	(4)	5	U		5	5	6	6	(4) (4)		2 2
18	6	6			6	5	6	6	5	5	1 1
19	5	6			6	6	7	6	6	5	1 1
20	6	6			6	6	7	6	5	6	1 1
21	6	6			6	6	7	7	5	6	1 1
22	6	6			7	7	7	7	6	6	1 2
23	5	5			7	6	7	6	7	6	3 (4)
24	5	6			6	6	6	6	6	6	2 3
25	5	6			6	6	7	7	6	6	3 2
26	5	7			7	5	7	7	6	6	1 1
27	6	(4)		(U)	7	6	5	5	5	6	3 (4)
28	(4)	6	U		5	5	6	7	5	6	(4) 2
29	5	5			7	5	6	7	6	6	2 (4)
30	(4)	6			5	5	6	6	6	6	3 2
31	5	6			6	5	7	7	5	6	1 2
Score:											
P					9	15			12	11	
S					18	26			20	19	
H					19	4	0		5	5	
(M)					0	6	1		5	2	
M					2	3	0		4	7	
(O)					1	1			0	0	
O					6	0	0		1	1	
G					35	17	29		16	16	

Note: See above for scoring legend, scales and symbols; see text for scoring conventions and other information.

Scales:
Q-scale of Radio Propagation Quality

- (1) - useless
- (2) - very poor
- (3) - poor
- (4) - poor to fair
- 5 - fair
- 6 - fair to good
- 7 - good
- 8 - very good
- 9 - excellent

K-scales of Geomagnetic Activity

0 to 9, 9 representing the greatest disturbance; K_{Ch} > 4 indicates significant disturbance, enclosed in () for emphasis

Symbols:

W= disturbed; U= unsettled; N= normal, left blank in Table; () broadcast for one quarter day. X= probable disturbed date.

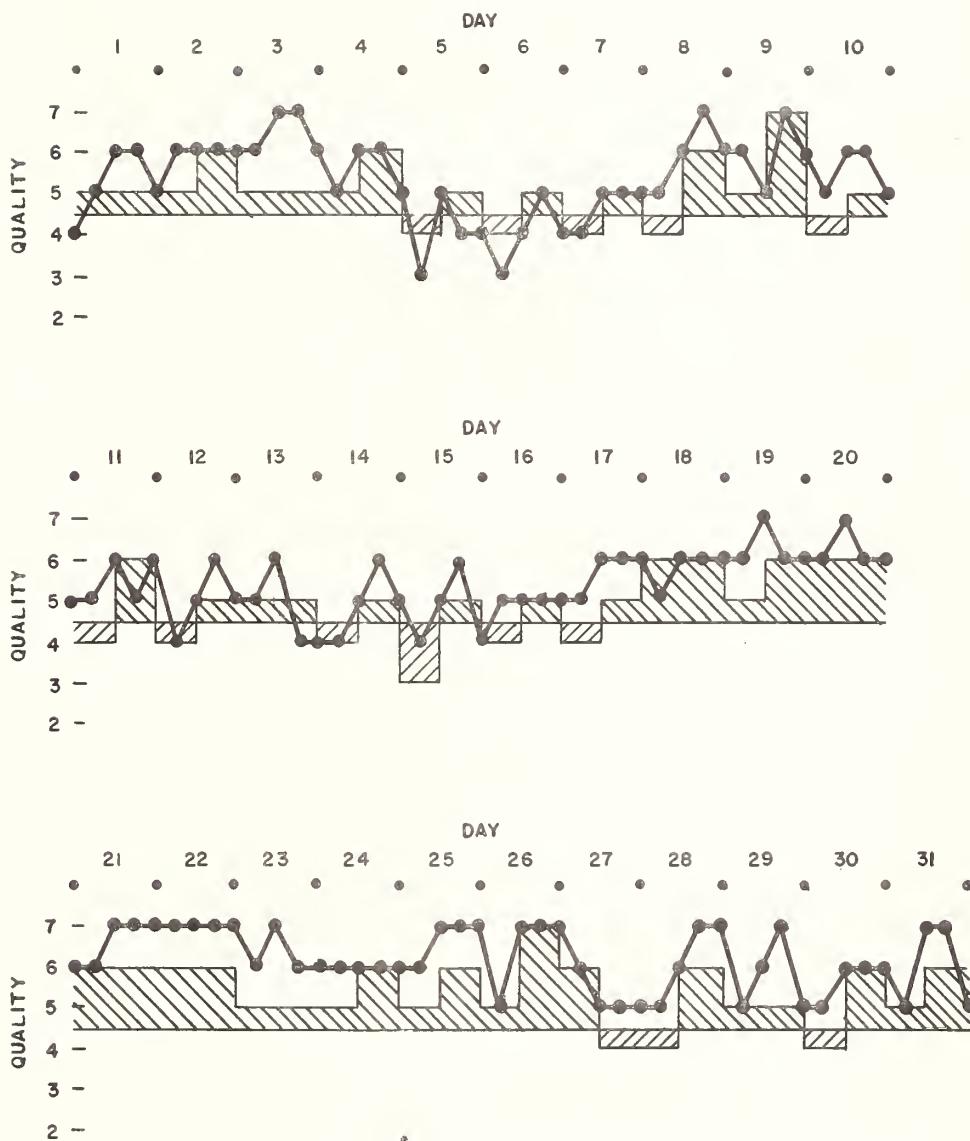
Scoring:

- P - Perfect forecast; observed equal to forecast
- S - Satisfactory forecast; P plus other times correctly designated as disturbed or quiet, within one grade
- H - Storm (Q ≤ 4) hit, except (M)
- (M) - Storm hit, severity underestimated by two grades or a 5 forecast for Q=4 day
- M - Storm missed
- (O) - Overwarning on observed fair day
- O - Other overwarnings
- G - Good (quiet) day forecast

Table 7lb

Short Term Forecasts--January 1952

observed disturbance observed quiet ● forecasts



Advance Forecasts (1 to 3/4 days ahead) -- January 1952

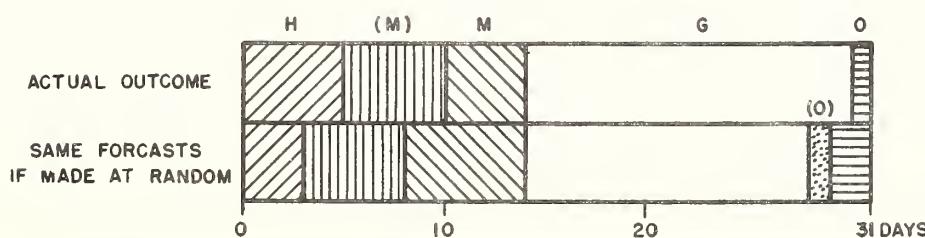


Table 72a

Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings, Short Term and Advance Forecasts)

February 1952

Day	North	CRPL	Short-term forecasts				Advance forecasts				Geomag-	
	Atlantic	Warning	issued about one hour in advance of 12-hour period, UT:				(J-reports) for whole day; issued in advance by:					
Feb	Half Day	Half Day	00	06	12	18	1 to 3/4	4/5 to 7	8 to 25	Half day	K _{Ch}	
	UT	UT	to 12	to 18	to 24	to 06	days	days	days	UT		
(1)	(2)	(1)	(2)							(1)	(2)	
1	5	5	W	W	5	5	(4)	5	(4)	X	3	3
2	(4)	6			5	(4)	5	6	(4)	X	(4)	2
3	5	6			6	6	7	7	5	X	2	2
4	6	7			7	6	7	7	5		1	1
5	5	7			7	6	7	6	5		1	1
6	5	5			7	6	6	6	5	X	3	(4)
7	(4)	5	U	U	5	(4)	5	6	(4)	X	(5)	3
8	(4)	5	W	W	5	(4)	5	5	(4)	X	(4)	(4)
9	(4)	5	W	W	(4)	(3)	(4)	5	(3)	X	(4)	(4)
10	(4)	5	W	W	(4)	(4)	5	6	(4)	X	3	(4)
11	(4)	(4)	W	W	(4)	(3)	5	5	(4)	(4)	(4)	(4)
12	(4)	5	W	W	5	(3)	5	5	5		(4)	(4)
13	(4)	6	W	W	(4)	(4)	5	5	(4)		(4)	(4)
14	(4)	6	W		(4)	(4)	6	6	5		3	3
15	(4)	7			5	5	6	6	6		3	2
16	(4)	5		U	6	5	5	(4)	7	7	(5)	(4)
17	(4)	6	W	W	(4)	(3)	(4)	5	7	7	3	2
18	5	6			5	5	6	6	5	5	3	3
19	5	6	U		6	(4)	6	6	(4)	5	(4)	3
20	5	5			5	5	6	5	5	(4)	3	1
21	5	7			5	5	7	7	6	6	1	1
22	6	7			6	6	7	7	6	6	1	1
23	7	8			7	6	7	7	5	5	2	2
24	(4)	(4)	W	W	5/(3)	(3)	(4)	(4)	5	5	(5)	(4)
25	(4)	6	W	W	(4)	(3)	5	5	5	5	3	2
26	5	6	U	U	5	(4)	6	5	6	6	(4)	(4)
27	(4)	5	U	U	5/(4)	(4)	5	5/(4)	5	6	(5)	3
28	(4)	(4)	W	W	(4)	(4)	5	5	(4)	5	(5)	3
29	(4)	5	W	U	(4)	(4)	5	(4)	(4)	5	3	3

Score:											
P											
S											
H											
(M)											
M											
(O)											
O											
G											

Note: See above for scoring legend, scales and symbols; see text for scoring conventions and other information.

Scales:
Q-scale of Radio Propagation Quality

(1) - useless
(2) - very poor
(3) - poor
(4) - poor to fair
5 - fair
6 - fair to good
7 - good
8 - very good
9 - excellent

K-scale of Geomagnetic Activity

0 to 9, 9 representing the greatest disturbance; K_{Ch} > 4 indicates significant disturbance, enclosed in () for emphasis

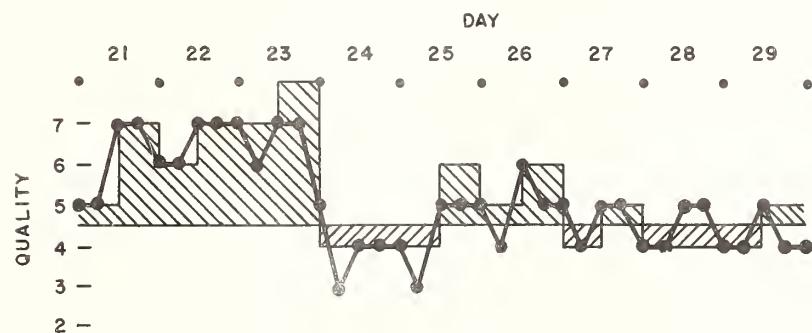
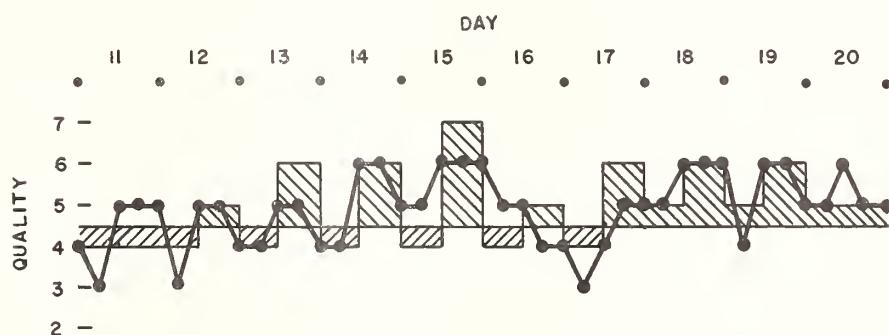
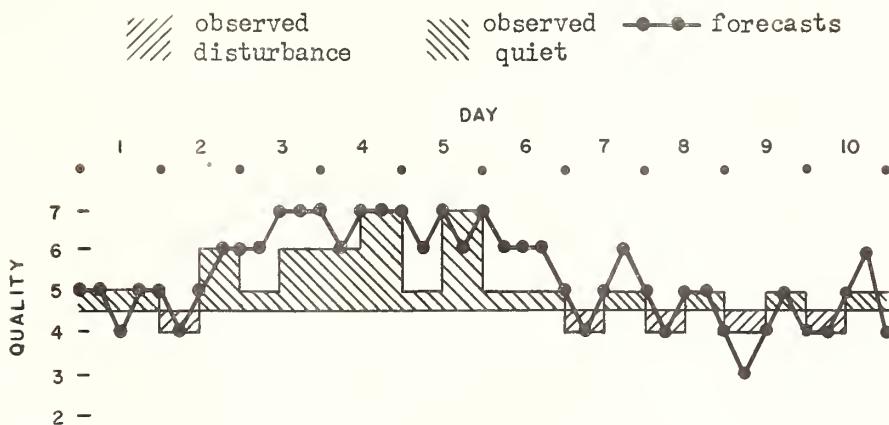
Symbols:

W - disturbed; U - unsettled; N - normal, left blank in Table; () broadcast for one quarter day. X - probable disturbed date.

Scoring:

P - Perfect forecast; observed equal to forecast
S - Satisfactory forecast; P plus other times correctly designated as disturbed or quiet, within one grade
H - Storm (Q < 4) hit, except (M)
(M) - Storm hit, severity underestimated by two grades or more
5 forecast for Q=4 day
M - Storm missed
(O) - Overwarning on observed fair day
O - Other overwarnings
G - Good (quiet) day forecast

Table 72b

Short Term Forecasts--February 1952

Advance Forecasts (1 to 3/4 days ahead) -- February 1952

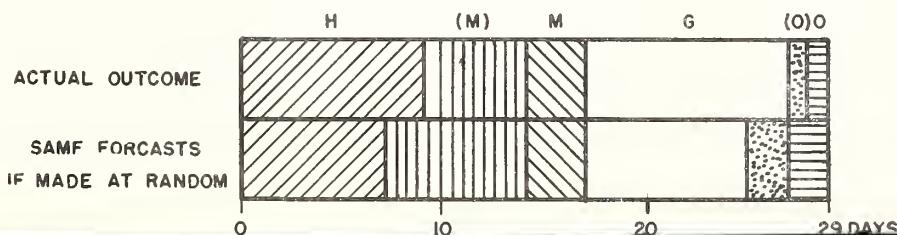


Table 73a

Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings, Short Term and Advance Forecasts)

March 1952

Day	North Atlantic quality figure	CRPL Warning Broad- cast	Short-term forecasts issued about one hour in advance of 12-hour period, UT:				Advance forecasts (J-reports) for whole day; issued in advance by:				Geomag- netic K _{Ch}	
			Half Day UT	Half Day UT	00 (1)	06 (2)	12 (1)	18 (2)	1 to 3/4 days	4/5 to 7 days		
Mar												
1	(4)	5	U	U	(4)	(4)	5	5	(4)	6	(4)	2
2	(4)	6			5	5	6	6	6	6	1	1
3	5	6			6	5	6/(4)	(4)	6	6	1	(5)
4	(2)	(4)	W	W	(4)	(3)	(4)	(4)	5	5	(5)	(4)
5	(2)	(4)	W	W	(4)	(2)	(4)	5	(3)	(4)	X	(5) (5)
6	(2)	(3)	W	W	(3)	(2)	(4)	(4)	(3)	(4)	X	(6) (4)
7	(4)	(3)	W	W	(4)	(3)	5	(4)	(4)	(4)	X	(4) (4)
8	(3)	(4)	W	W	(4)	(3)	5	5	(4)	(4)	X	(4) (4)
9	(3)	5	W	W	(4)	(3)	5	5	(3)	(4)	X	(4) (4)
10	(3)	5	W	W	(4)	(4)	5	5	(3)	(4)	X	(4) (4)
11	(3)	(4)	W	W	(4)	(3)	5	5	(4)	(4)	X	(4) 3
12	(4)	5	U		5	(4)	5/6	6	(4)	(4)		3 3
13	(4)	6			5	5	6	6	5	5		3 3
14	5	7			6	6	6	7	5	5		2 2
15	6	7			6	6	7	7	6	5		2 3
16	5	6			6	6	6	6	6	5		3 3
17	(3)	6			6	5	6	6	5	5		(4) 3
18	6	7			6	5	6	6	5	5		(4) 2
19	6	8			6	6	6	6	6	7		1 2
20	6	7			6	6	7	7	5	7		2 1
21	6	5	W		7	6	6/(4)	(4)	5	6		(4) (5)
22	(3)	5	W	W	(4)	(3)	6	5	(4)	(4)	X	(4) 3
23	(2)	5	W	W	(4)	(2)	(4)	(4)	(4)	(4)	X	(5) (4)
24	(3)	(4)	W	W	(4)	(3)	(4)	(4)	(4)	(4)	X	(5) (4)
25	(3)	5	W	W	(3)	(4)	(4)	(4)	(4)	(4)	X	(4) (4)
26	5	6	W	W	(4)	(3)	5	6	(4)	(4)	X	3 3
27	(5)	6	U	U	5	(4)	5	6	(4)	(4)	X	3 3
28	(4)	7	U		5	5	6	7	5	5		1 2
29	6	7			6	5	6	7	5	5		1 2
30	6	6			6	5	6	5/(4)	5	5		3 (5)
31	(2)	5	W	W	(4)	(3)	5	5	(3)	(3)	X	(6) (4)

Score:												
P			10		16		7		3			
S			21		25		18		16			
H		25	10		4		13		10			
(M)			8		2		3		5			
M		3	1		1		3		4			
(O)			1		2		0		0			
O		11	0		0		2		2			
G		23	11		22		10		10			

Note: See above for scoring legend, scales and symbols; see text for scoring conventions and other information.

Scales:
Q-scale of Radio Propagation Quality

- (1) - useless
- (2) - very poor
- (3) - poor
- (4) - poor to fair
- 5 - fair
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- 7 - good
- 8 - very good
- 9 - excellent

K-scale of Geomagnetic Activity
0 to 9, 9 representing the greatest disturbance; K_{Ch} > 4 indicates significant disturbance, enclosed in () for emphasis

Symbols:

W - disturbed; U - unsettled; N - normal, left blank in Table; () broadcast for one quarter day. X - probable disturbed date.

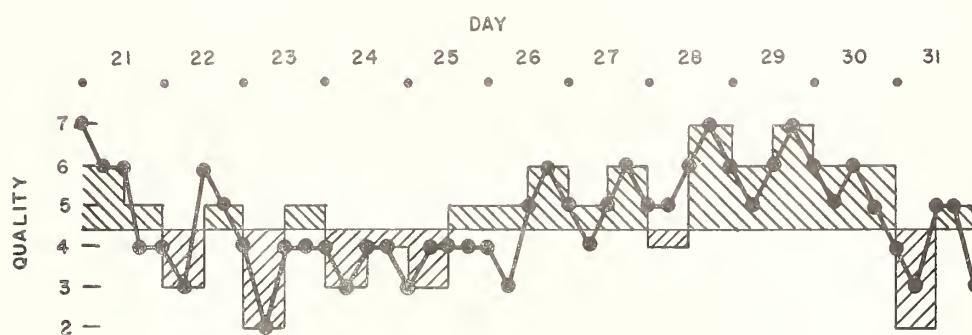
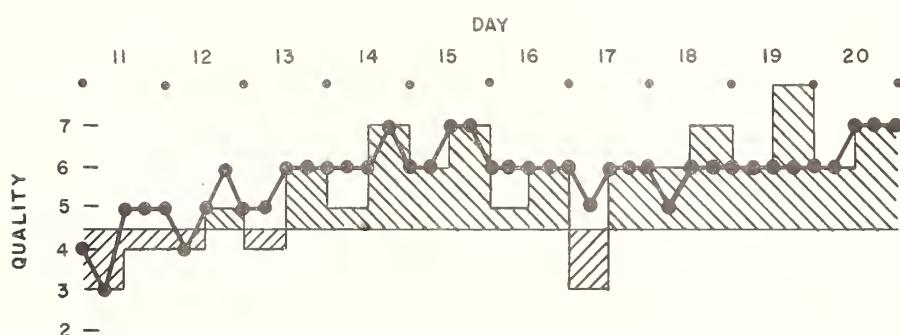
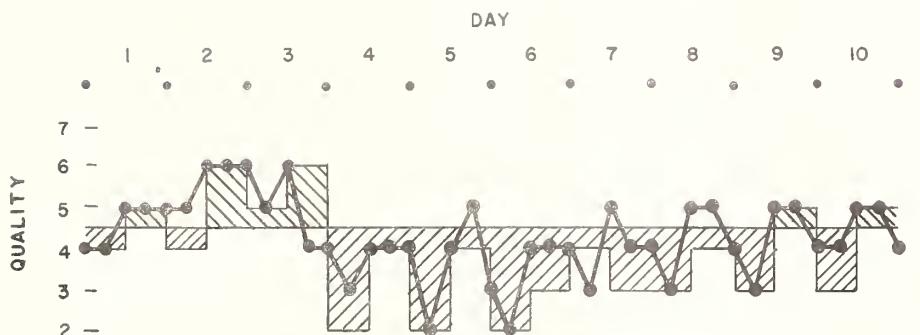
Scoring:

- P - Perfect forecast; observed equal to forecast
- S - Satisfactory forecast; P plus other times correctly designated as disturbed or quiet, within one grade
- H - Storm (Q ≤ 4) hit, except (M)
- (M) - Storm hit, severity underestimated by two grades or more forecast for Q=4 day
- M - Storm missed
- (O) - Overwarning on observed fair day
- O - Other overwarnings
- G - Good (quiet) day forecast

Table 73b

Short Term Forecasts--March 1952

observed disturbance observed quiet ● forecasts



Advance Forecasts (1 to 3/4 days ahead) -- March 1952

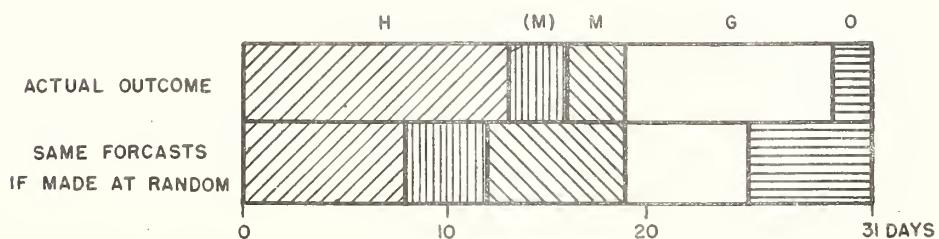


Table 74a

Radio Propagation Quality Figures
(Including Comparisons with CRPL Warnings, Short-Term and Advance Forecasts)

April 1952

Day	North Atlantic Quality figure	CRPL Warning WWV Broad- cast	Short-term forecasts issued about one hour in advance of 12-hour period, UT:						Advance forecasts (J-reports) for whole day; issued in advance by:				Geomag- netic K Ch
			Half Day UT (1) (2)	Half Day UT (1) (2)	00 to 12	06 to 18	12 to 24	18 to 06	1 to 3/4	4/5 to 7	8 to 25	Half Day UT (1) (2)	
Apr													
1	(3)	5	W	w	(3)	(2)	(4)	(4)	(3)	(3)	X	(4)	(4)
2	(3)	5	W	W	(4)	(3)	(4)	5	(3)	(3)	X	(5)	(5)
3	(2)	(4)	W	W	(4)	(3)	(4)	(4)	(3)	(4)	X	(6)	(4)
4	(3)	5	W	W	(3)	(2)	(4)	(4)	(3)	(4)	X	(5)	(5)
5	(2)	5	W	W	(4)	(3)	5	(4)	(3)	(4)	X	(5)	(4)
6	(2)	5	W	W	(4)	(2)	5	5	(4)	(4)	X	(5)	(4)
7	(3)	6	W	W	(4)	(3)	5	5	(4)	(4)	X	(5)	(4)
8	(3)	5	W	W	(4)	(4)	5	5	(4)	5		(4)	(4)
9	(4)	5	W	W	(4)	(4)	5	5	(4)	5		(4)	3
10	(3)	6	W	W	(4)	(3)	5	5	(4)	5		(5)	3
11	5	7	U	(U)	5	5	6	6	6	6		3	2
12	6	7			6	5	6	6	6	6		3	2
13	5	6			6	5	6	6	5	5		3	2
14	(4)	7			6	5	6	6	5	5		2	3
15	(4)	6			6	5	6	6	6	6		3	3
16	5	6			6	(4)	6	6	6	6		(4)	3
17	(4)	6	U	(U)	5	(4)	6	6	5	(4)	X	(4)	2
18	6	6			6	6	7	5	(4)	(4)	X	1	3
19	5	6	U		(4)	(4)	6	6	(4)	(4)	X	3	(4)
20	(4)	7	U		5	(4)	6	6	(4)	(4)	X	3	2
21	5	(4)			W	6	5	7/(3)	(3)	(4)	(4)	X	(4)
22	(2)	(4)	W	W	(3)	(2)	(4)	5	5	5	X	(5)	3
23	(3)	6	W	(W)	(4)	(3)	5	6	(4)	5		(4)	3
24	(4)	6			5	5	6	7	5	7		2	3
25	5	7			5	5	7	6	6	7		2	2
26	5	6			5	5	7	7	5	5		2	2
27	6	7	U		5	5	6	6	(3)	(3)	X	2	2
28	6	6	W	W	5	(4)	5	5	(3)	(3)	X	(4)	3
29	(4)	5	U	U	5	5	5	5	(3)	(3)	X	(5)	(5)
30	(2)	(4)	W	W	(4)	(2)	(4)	(4)	(4)	(3)	X	(5)	(4)
<hr/>													
Score:													
P					8		15			7	7		
S					19		26			19	15		
H					23	9	3			13	9		
(M)					0	8	0			5	5		
M					3	2	1			2	6		
(O)					1		3			0	0		
O					15	0	0			4	4		
G					19	10	23			6	6		

Note: See above for scoring legend, scales and symbols; see text for scoring conventions and other information.

Scales:
Q-scale of Radio Propagation Quality

- (1) - useless
- (2) - very poor
- (3) - poor
- (4) - poor to fair
- 5 - fair
- 6 - fair to good
- 7 - good
- 8 - very good
- 9 - excellent

K-scale of Geomagnetic Activity
0 to 9, 9 representing the greatest disturbance; K_{ch} > 4 indicates significant disturbance, enclosed in () for emphasis

Symbols:

W= disturbed; U= unsettled; N= normal, left blank in Table; () broadcast for one quarter day, X= probable disturbed date.

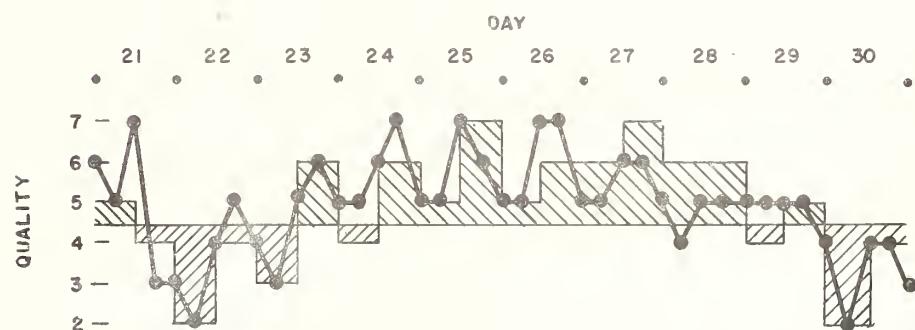
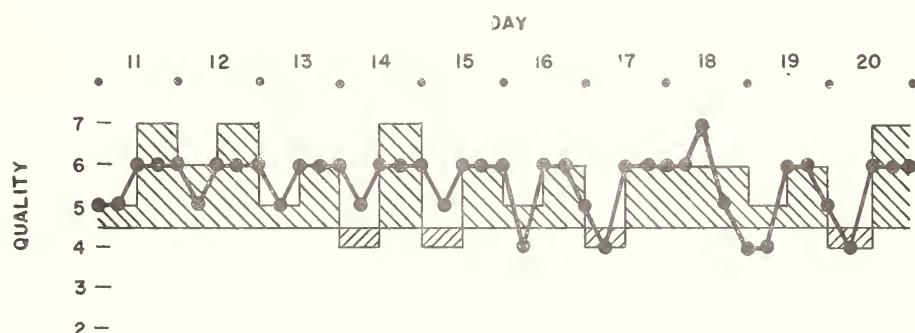
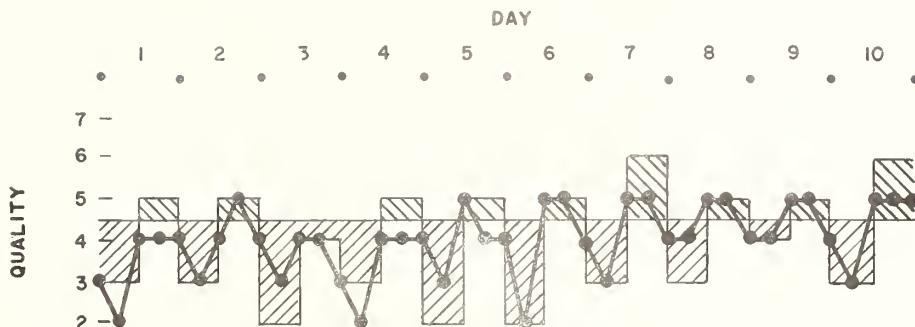
Scoring.

- P - Perfect forecast; observed equal to forecast
- S - Satisfactory forecast; P plus other times correctly designated as disturbed or quiet, within one grade
- H - Storm (Q ≤ 4) hit, except (M)
- (M) - Storm hit, severity underestimated by two grades or a 5 forecast for Q4 day
- M - Storm missed
- (O) - Overwarning on observed fair day
- O - Other overwarnings
- G - Good (quiet) day forecast

Table 74b

Short Term Forecasts--April 1952

observed disturbance observed quiet -●- forecasts



Advance Forecasts (1 to 3/4 days ahead) -- April 1952

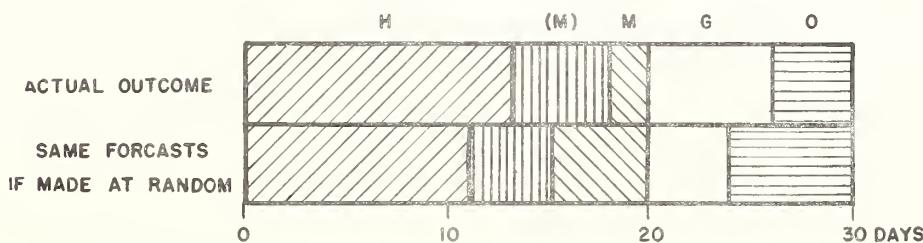


Table 75a

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

Table 76a

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

Table 77a

Coronal observations at Climax, Colorado (6702A), east limb

Table 75b

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

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator																									
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90						
1952																																										
May 2.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
3.0	-	-	-	3	3	4	4	4	4	3	3	3	3	3	3	6	10	15	18	23	15	12	6	4	3	3	3	3	3	3	3	-	-	-	-	-	-					
3.7	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	4	6	12	17	11	12	12	6	4	3	3	3	3	3	3	3	-	-	-	-	-	-					
4.7	-	-	-	-	-	3	3	3	3	3	-	-	-	-	-	3	3	5	5	4	6	9	6	5	5	4	6	8	3	-	-	-	-	-	-							
7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	7	15	14	15	12	9	9	5	5	5	5	4	3	5	6	6	6	3	-	-				
8.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	5	6	10	15	18	16	13	16	10	8	6	3	5	5	5	3	3	-	-	-	-				
9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
10.7	-	-	-	-	-	-	-	-	-	3	4	3	3	3	3	5	12	15	20	18	20	25	19	20	18	12	10	6	5	6	6	6	6	5	7	4	3	-	-			
11.7a	-	-	-	-	-	-	-	-	-	3	4	4	4	4	4	3	3	5	10	16	25	20	20	18	16	12	9	6	4	5	5	5	5	5	5	4	3	-	-			
12.6	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	5	9	15	22	20	20	15	14	9	6	5	5	5	5	5	5	5	5	X	X	X	X		
13.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8	12	13	12	13	9	4	4	4	4	3	3	-	-	-	-	-	-	-	-	-	-	
14.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	6	6	6	6	8	6	3	3	-	-	-	-	-	-	-	-	-	-	-	-		
15.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	4	4	4	4	3	3	-	-	-	-	-	-	-	-	-	-	-	-			
24.6a	-	-	-	-	-	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-				
25.6a	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	4	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-			
27.6	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	5	16	23	14	6	4	3	3	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-			
28.6	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	6	12	17	16	15	10	5	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-				
30.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5	5	5	5	5	5	5	5	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-		
31.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	8	10	4	5	4	3	4	15	10	6	4	3	3	3	3	3	3	3	3	3	-	-	-	-	-

Table 76b

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

Date GCT	Degrees south of the solar equator															0°	Degrees north of the solar equator																		
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20		5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
1952																																			
May 2.0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3.0	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	2	2	16	16	2	2	5	4	4	4	3	6	5	3	3	3	3	3	3	3
3.7	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	16	16	4	3	10	6	5	4	4	5	5	3	3	3	3	3	3	3	4
4.7	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	16	16	6	5	15	2	-	-	-	2	3	3	3	3	3	3	3	4	
7.6	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	15	15	4	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
8.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8	4	3	4	4	5	8	5	8	4	3	4	-	-	-	-	-	-	
9.8	3	2	3	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10.7	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	12	16	4	5	3	4	3	3	3	3	3	3	3	3	3	3	3	3	
11.7a	-	-	-	2	2	2	2	2	2	2	3	3	4	4	4	6	7	9	4	4	7	5	3	3	3	-	-	-	-	-	-	2	2		
12.6	3	3	3	3	3	3	X	X	X	X	X	X	X	X	X	4	4	13	3	2	2	-	-	-	-	-	-	-	X	X	X	X	X		
13.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	9	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
14.7a	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	3	4	4	4	4	3	3	4	3	2	2	2	2	2	2	2		
15.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
24.6a	2	2	-	-	-	-	-	-	-	-	3	3	3	3	3	3	3	3	4	3	3	4	4	3	3	3	3	2	2	2	2	2	2		
25.6a	-	-	-	-	-	2	2	2	2	3	4	3	2	2	2	2	2	2	3	2	2	2	4	5	5	5	3	3	3	2	2	2			
27.6	-	-	-	-	-	2	2	2	2	2	2	2	2	3	3	3	18	8	3	2	2	2	3	3	3	3	3	3	3	3	3	3	3		
28.6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	3	2	8	15	2	2	2	2	3	3	5	3	3	2	-	-	-			
30.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
31.7a	-	-	-	-	-	-	-	-	-	-	3	3	3	3	3	2	2	8	17	4	6	4	2	21	15	4	3	3	3	3	-	-	-		

Table 77b

Coronal observations at Climax, Colorado (6702A), west limb

Table 78a

Coronal observations at Sacramento Peak, New Mexico (6373A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																							
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		
1952																																							
May 1.8a	4	4	4	4	3	4	4	4	5	6	5	7	6	5	5	6	25	23	14	10	5	10	11	13	13	11	8	6	6	6	6	7	5	4	3	3	3		
3.7a	4	5	4	4	5	4	5	5	5	4	4	5	4	3	3	3	4	4	5	5	5	18	14	10	5	3	3	3	4	4	3	3	4	3	3	3	3		
4.8a	4	4	4	5	5	5	5	5	5	4	4	4	4	4	3	3	4	4	4	5	4	5	10	8	6	5	5	4	4	4	3	6	5	5	5	4	4		
7.6a	2	-	-	2	2	2	2	3	3	8	10	10	8	4	4	4	5	4	5	3	4	8	10	11	14	8	5	5	4	4	4	4	4	4	3	2	2		
9.7a	3	2	2	2	3	2	3	4	5	7	3	3	3	4	4	4	4	5	4	5	18	16	11	8	5	5	4	4	4	5	5	5	6	6	5	5	5		
10.7	2	2	2	3	3	3	3	3	6	8	5	5	4	4	5	5	5	4	5	5	6	10	11	12	11	11	10	7	6	6	7	8	8	6	6	4	3	3	
11.7	2	2	2	2	2	2	3	3	4	5	4	4	4	5	5	5	5	6	5	7	10	11	8	9	10	8	8	6	5	6	8	9	10	5	5	3	2	2	
14.7	2	2	2	2	2	2	3	3	4	5	6	5	4	5	6	7	8	12	13	14	14	12	10	8	7	6	4	3	3	4	4	4	5	5	5	4	4	3	3
15.7a	3	3	3	3	3	3	3	4	4	5	5	4	5	5	5	5	5	6	6	6	6	5	5	5	5	4	4	5	5	5	4	4	5	5	5	4	4	3	3
20.0a	4	4	4	5	5	5	5	5	6	5	4	4	4	5	5	5	5	5	6	6	5	5	5	5	5	5	4	4	4	5	5	4	4	4	5	5			
23.8	4	4	3	3	3	4	4	4	4	4	4	5	5	5	6	9	12	14	16	16	17	17	14	10	5	4	4	3	4	4	4	5	4	3	3	3	3		
24.8	2	2	3	3	2	2	2	3	3	4	4	3	3	3	3	3	3	6	14	16	16	14	12	8	6	5	3	3	2	2	2	2	3	3	3	2	2		
29.8a	2	2	2	2	3	3	3	3	4	4	5	5	5	4	5	5	5	5	5	5	5	5	6	7	8	7	5	4	5	6	6	6	5	4	3	3	2	2	

Table 79a

Coronal observations at Sacramento Peak, New Mexico (6374A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																				
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
1952																																				
May 1.8a	4	4	4	4	3	3	2	3	3	2	3	9	8	7	7	8	10	8	8	7	7	8	5	4	3	2	3	2	2	3	3	3	4			
3.7a	3	3	4	4	3	2	2	2	2	2	3	4	4	5	5	5	3	3	3	3	12	11	3	-	2	2	3	3	2	2	3	2	3			
4.8a	2	3	2	3	3	2	2	2	3	3	2	3	2	5	6	6	5	4	4	3	4	12	14	3	2	4	3	3	2	-	2	2	2			
7.6a	5	4	5	5	4	4	3	3	3	2	-	3	5	7	6	5	4	5	6	8	13	14	13	11	12	13	10	8	5	3	2	2	2	2		
9.7a	3	3	4	4	3	3	3	3	2	3	4	4	2	3	3	4	4	5	5	14	16	13	11	4	3	5	5	4	5	4	3	X	X	X	X	
10.7	4	4	3	4	4	2	2	2	2	2	3	3	2	3	2	3	2	3	3	5	10	5	5	4	3	2	2	3	2	3	3	3	3	3	3	
11.7	4	4	4	3	3	2	2	2	2	2	3	5	4	5	4	4	6	7	6	4	7	4	4	4	3	2	2	2	2	3	2	3	3	3		
14.7	3	2	2	2	2	2	2	2	2	3	4	3	2	3	4	4	4	4	4	5	2	2	2	3	4	4	3	2	2	2	2	2	2			
15.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20.0a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23.8	4	X	X	X	X	X	X	3	3	3	4	4	3	3	3	4	3	4	4	10	14	8	5	5	3	4	4	3	3	4	3	3	4	4		
24.8	2	3	3	2	3	3	2	2	2	2	2	2	3	2	3	3	2	3	2	2	5	8	10	5	2	4	4	2	2	2	2	2	2	2		
29.8a	4	4	3	2	3	3	3	3	2	3	4	4	4	4	3	3	3	5	5	8	5	4	3	3	2	2	3	4	3	2	2	2	3	3		

Table 80a

Coronal observations at Sacramento Peak, New Mexico (6702A), east limb

Date GCT	Degrees north of the solar equator															Degrees south of the solar equator																				
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	0°	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
1952																																				
May 1.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4.8a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7.6a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
9.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
15.7a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
20.0a	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23.8	X	X	X	X	X	X	X	-	3	3	3	3	3	3	3	4	4	5	5	4	4	4	3	-	-	-	-	-	-	-	-	-	-	-		
24.8	-	-	-	-	-	-	-	-	3	2	2	2	3	3	3	3	4	4	4	4	3	3	3	-	-	-										

Table 78b

Coronal observations at Sacramento Peak, New Mexico (5303A), west limb

Date GCT.	Degrees south of the solar equator															0°	Degrees north of the solar equator																														
	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	15	10	5	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90											
1952																																															
May	1.8a	3	3	2	2	2	3	5	7	5	3	3	3	3	3	4	5	8	11	16	15	14	13	11	7	4	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4
	3.7a	3	3	5	5	5	5	5	5	5	4	4	4	3	3	3	3	4	5	11	14	13	11	12	12	5	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	
	4.8a	4	5	4	5	5	5	5	6	5	5	5	4	5	6	5	5	5	5	5	5	5	6	5	6	7	6	5	6	5	6	5	6	5	5	5	5	4	4	4	4	4					
	7.6a	2	3	2	2	3	3	3	3	3	3	3	3	3	3	X	X	X	8	11	14	20	23	26	18	16	16	X	X	X	X	X	X	11	11	14	16	11	11	2	2	2					
	9.7a	5	4	4	4	4	5	5	5	5	5	4	4	4	5	5	5	5	5	11	20	25	23	23	18	16	20	14	3	5	5	5	8	11	12	11	11	5	3	3	3	3					
	10.7	3	2	2	2	2	2	2	2	2	2	2	2	2	3	5	5	5	5	8	14	16	23	25	23	23	22	16	11	8	5	11	11	11	12	13	6	4	4	3	2						
	11.7	2	2	2	2	2	2	3	3	3	3	3	3	4	6	6	6	4	5	6	14	20	32	44	41	36	23	20	14	11	0	8	11	11	12	11	8	3	3	3	2						
	14.7	3	3	-	-	2	2	2	2	2	3	4	5	5	5	5	6	6	7	11	12	13	14	14	13	11	6	5	5	5	5	5	7	5	3	2	2	2									
	15.7a	3	3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	3	3									
	20.0a	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	5	5	5	3	4	3	3	4	4	4	4	3	5	4	4	4	4	4									
	23.8a	3	4	4	3	3	3	3	3	3	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	5	4	4	4	4	4	4	4	4	4	4									
	24.8a	2	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	5	5	6	4	5	5	5	5	5	5	4	4	4	4	3	3	2										
	29.8J	2	3	3	3	3	4	4	4	4	4	4	4	4	4	4	5	5	6	7	10	14	11	10	6	5	6	5	5	5	5	4	4	5	3	3	3										

Table 79b

Coronal observations at Sacramento Peak, New Mexico (6374A), west limb

Table 80b

Coronal observations at Sacramento Peak, New Mexico (6702A), west limb

Table 81

Zürich Provisional Relative Sunspot NumbersMay 1952

Date	R_{Z*}	Date	R_{Z*}
1	30	17	10
2	15	18	18
3	8	19	22
4	19	20	36
5	30	21	26
6	34	22	25
7	30	23	32
8	27	24	31
9	23	25	17
10	0	26	10
11	7	27	43
12	6	28	57
13	8	29	49
14	15	30	36
15	14	31	23
16	8	Mean:	22.9

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

Table 82
American Relative Sunspot Numbers
April 1952

Date	R_A , *	Date	R_A , *
1	25	17	11
2	19	18	20
3	25	19	36
4	28	20	44
5	33	21	55
6	27	22	50
7	35	23	31
8	29	24	26
9	31	25	23
10	30	26	23
11	35	27	21
12	21	28	25
13	19	29	40
14	10	30	40
15	2	Mean:	
16	5	27.3	

*Combination of reports from 28 observers; see page 10.

Table 83
Indices of Geomagnetic Activity for April 1952

Preliminary values of international character-figures, C;
Geomagnetic planetary three-hour-range indices, K_p;
Magnetically selected quiet and disturbed days

Table 84Sudden Ionosphere Disturbances Observed at Washington, D. C.May 1952

No sudden ionosphere disturbances were observed during the month of May 1952.

Table 85

Sudden Ionosphere Disturbances Reported by Institut für Ionosphärenforschung,
as Observed at Lindau, Harz, Germany

1952 Day	GCT		Location of transmitters	Relative intensity at minimum*	Other phenomena
	Beginning	End			
April 22	1154	1216	München**, Lindau***	0.0	

*Ratio of received field intensity during SID to average field intensity before and after, for station München, 6160 kilocycles, 400 kilometers distant.

**Station München, 6160 kilocycles.

***Station Lindau, 1850 kilocycles, pulse transmitter and receiver at Lindau.

Table 86Sudden Ionosphere Disturbances Reported by Engineer-in-Chief,Cable and Wireless, Ltd., as Observed in England

1952 Day	GCT	Receiving station	Location of transmitters	Other phenomena
	Beginning			
April 22	1158	Brentwood	Austria, Bahrein I., Barbados, Belgian Congo, Brazil, Canary Is., Chile, Eritrea, Greece, India, Malta, New York, Palestine, Portugal, Southern Rhodesia, Spain, Switzerland, Thailand, U.S.S.R., Venezuela, Yugoslavia, Zanzibar	
22	1155	Semerton	Ceylon, India	

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.

GRAPHS OF IONOSPHERIC DATA

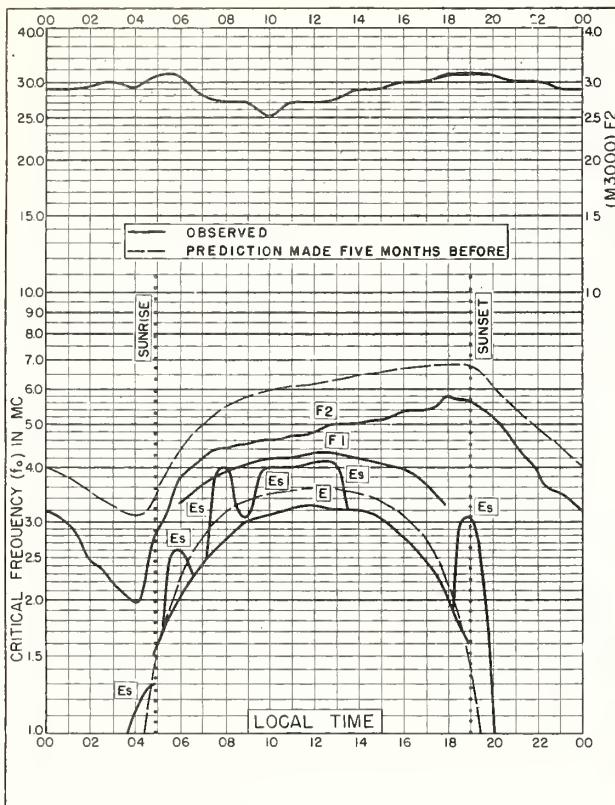


Fig. 1. WASHINGTON, D. C.
38.7°N, 77.1°W

MAY 1952

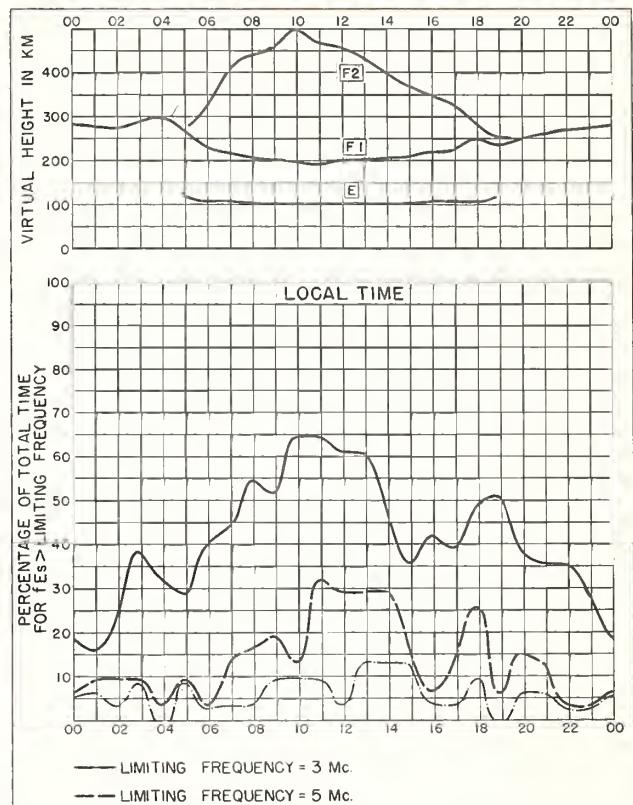


Fig. 2. WASHINGTON, D. C.

MAY 1952

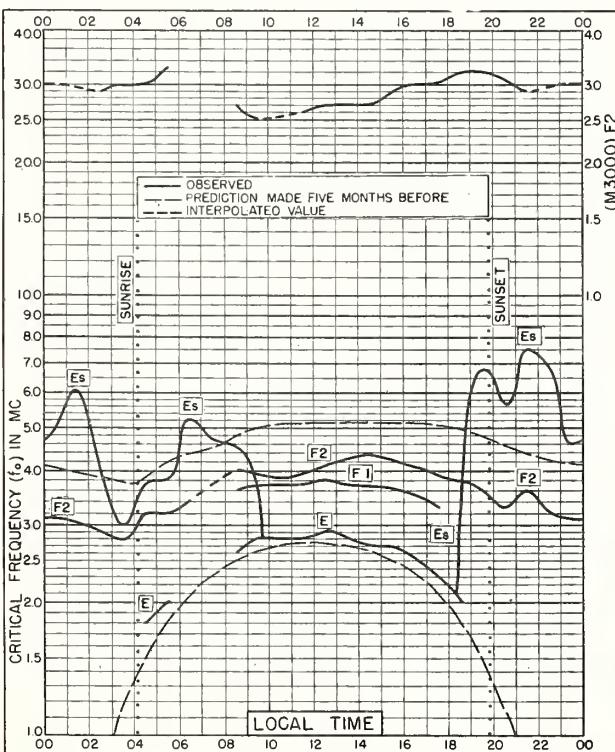


Fig. 3. POINT BARROW, ALASKA

71.3°N, 156.8°W

APRIL 1952

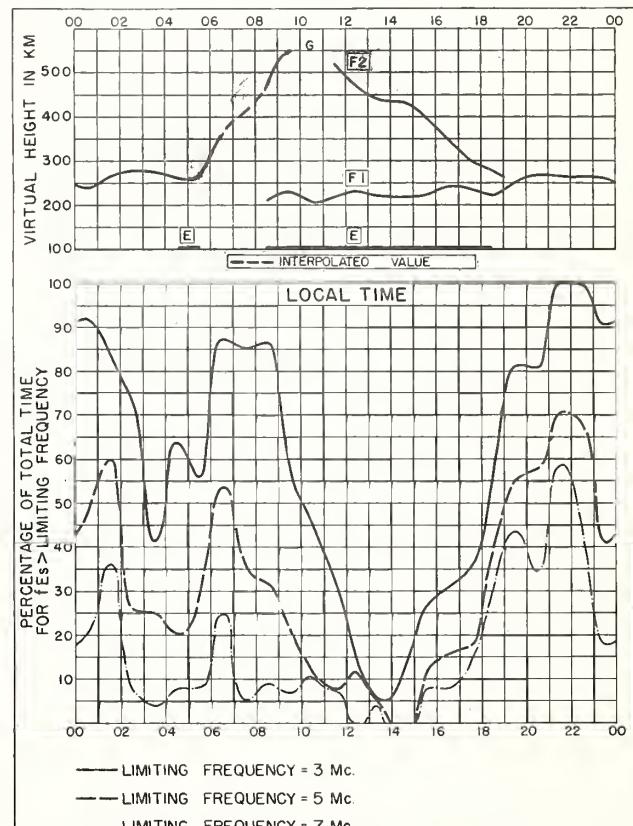
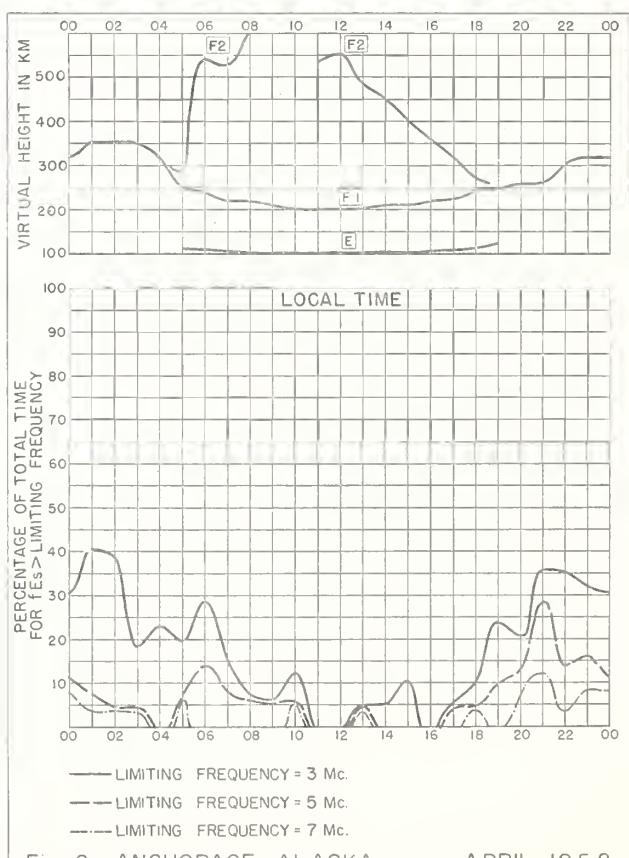
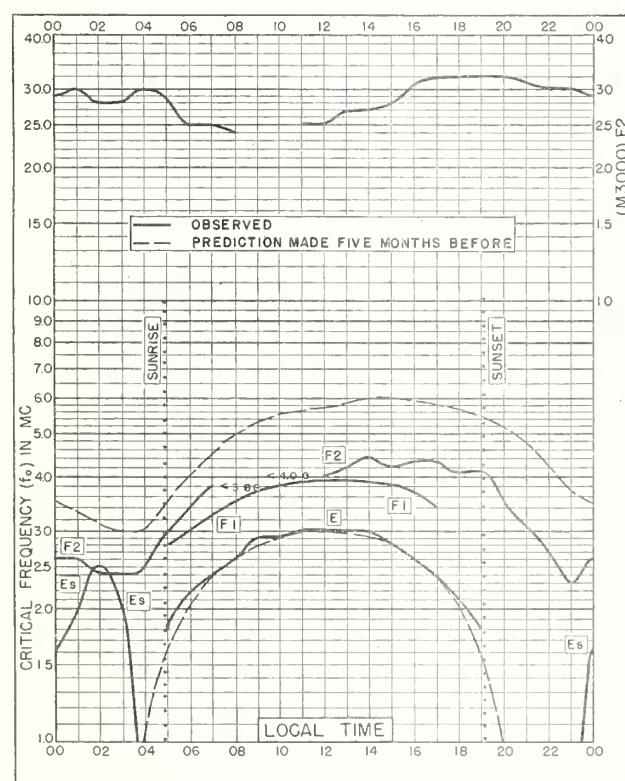
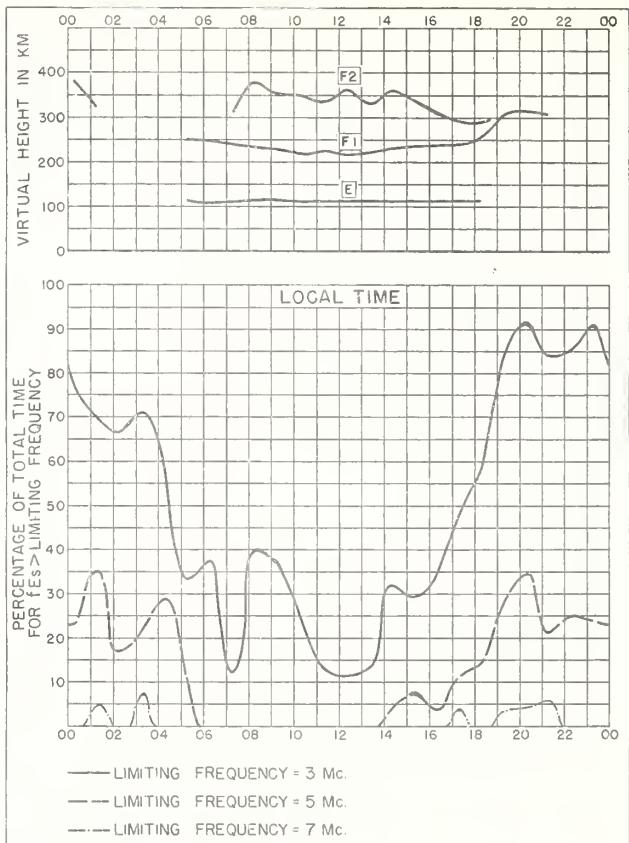
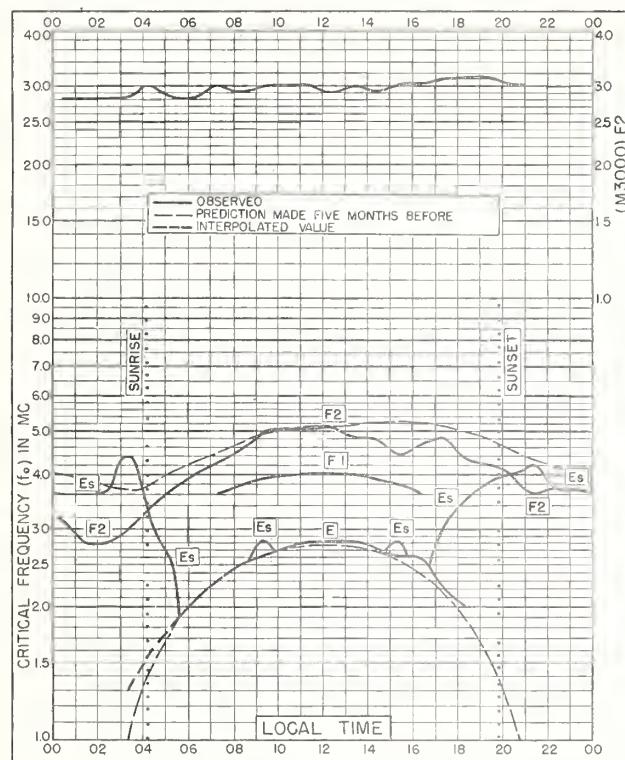


Fig. 4. POINT BARROW, ALASKA

APRIL 1952



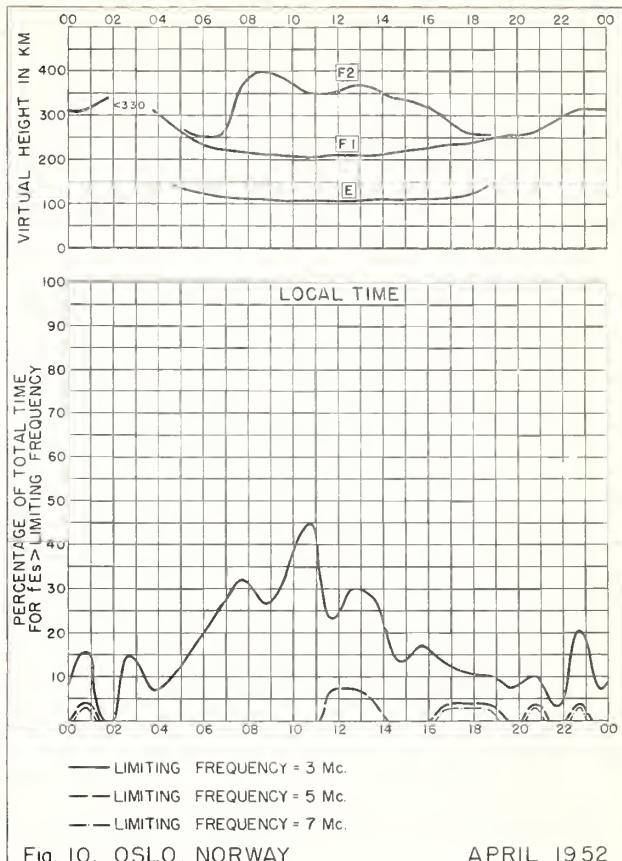
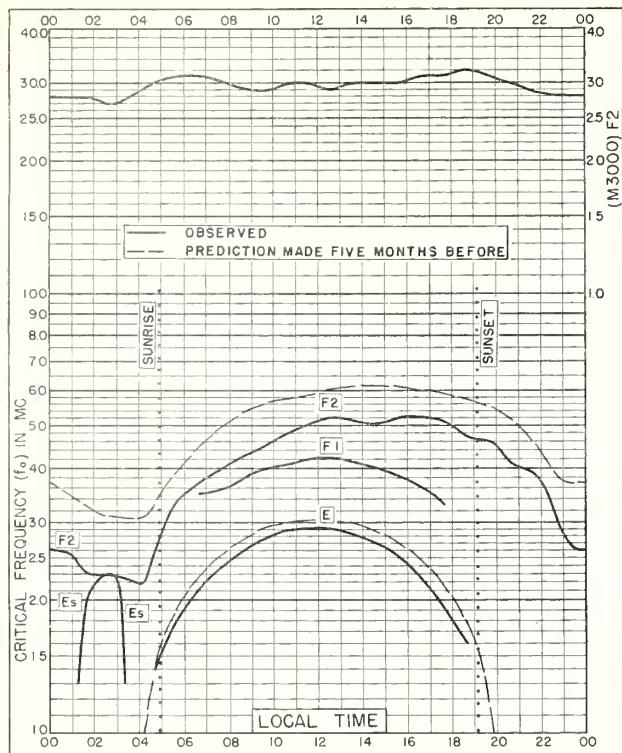


Fig. 10. OSLO, NORWAY APRIL 1952

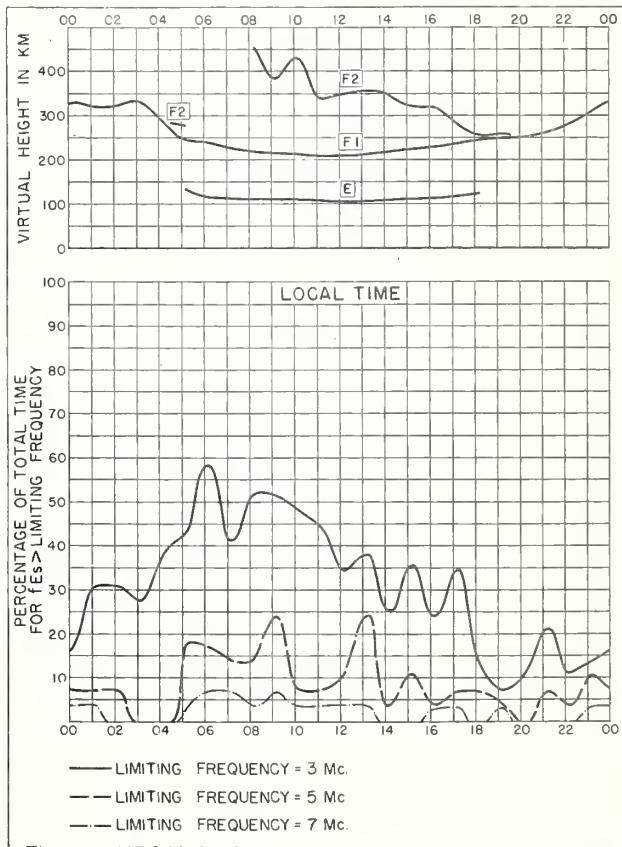
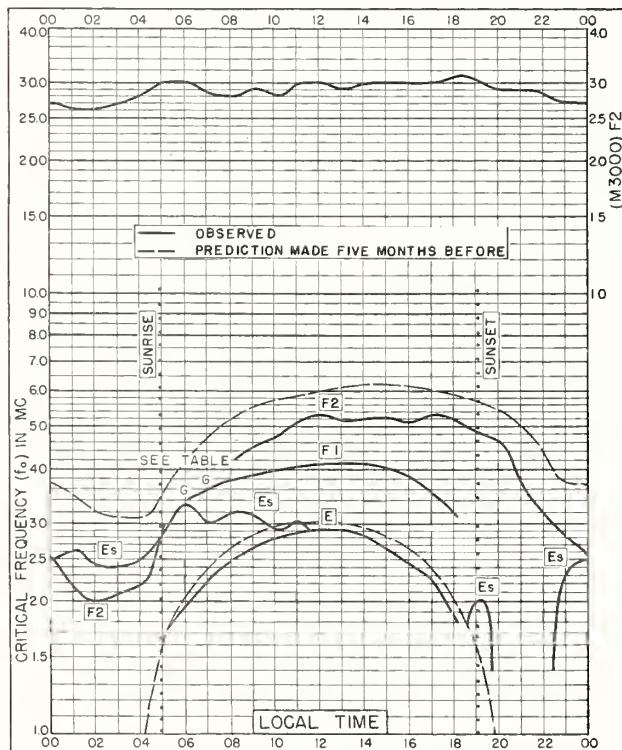


Fig. 12. UPSALA, SWEDEN APRIL 1952

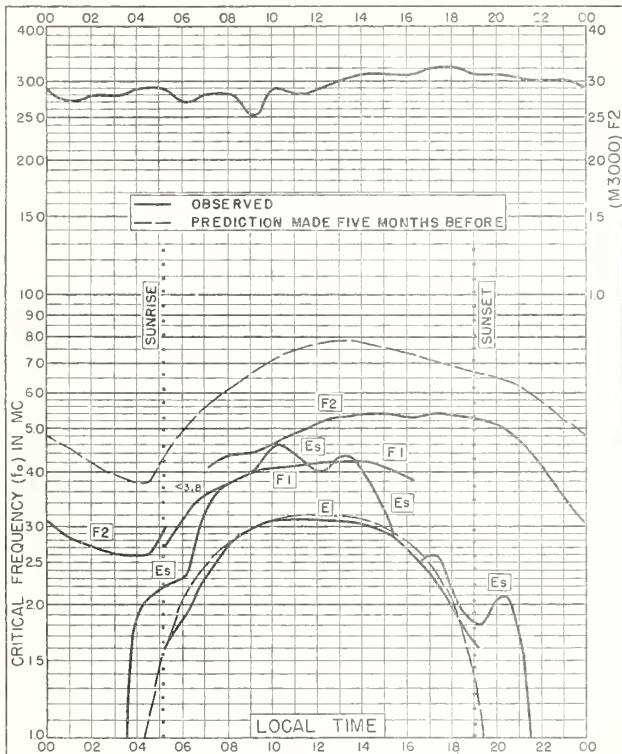


Fig. 13. ADAK, ALASKA
51.9°N, 176.6°W APRIL 1952

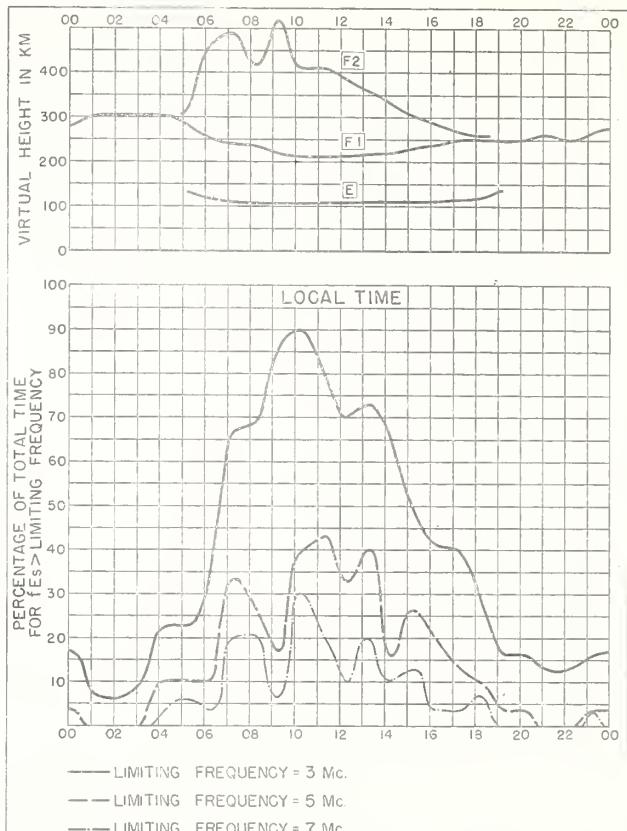


Fig. 14. ADAK, ALASKA APRIL 1952

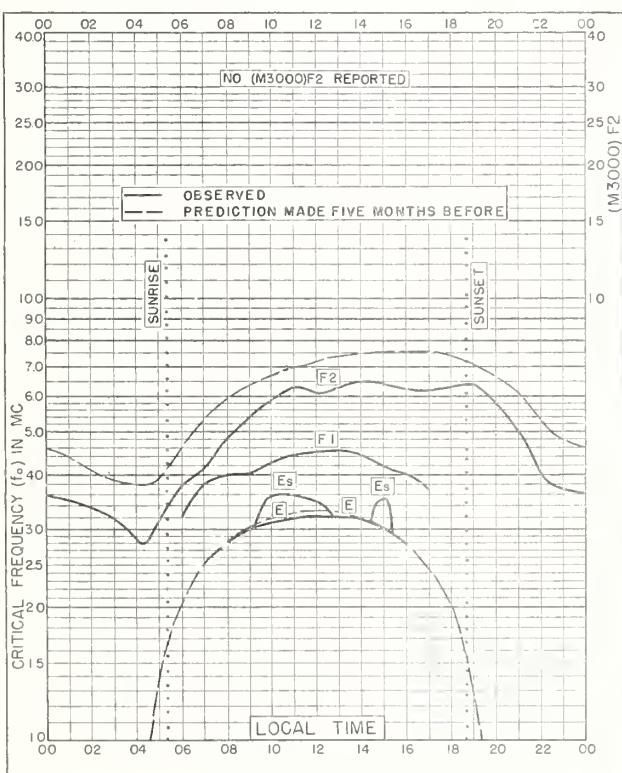


Fig. 15. GRAZ, AUSTRIA
47.1°N, 15.5°E APRIL 1952

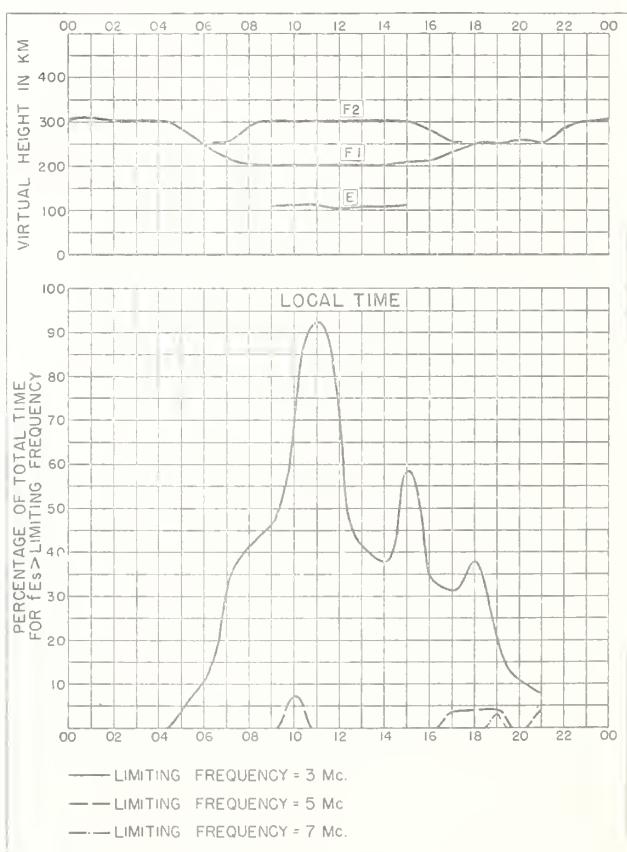
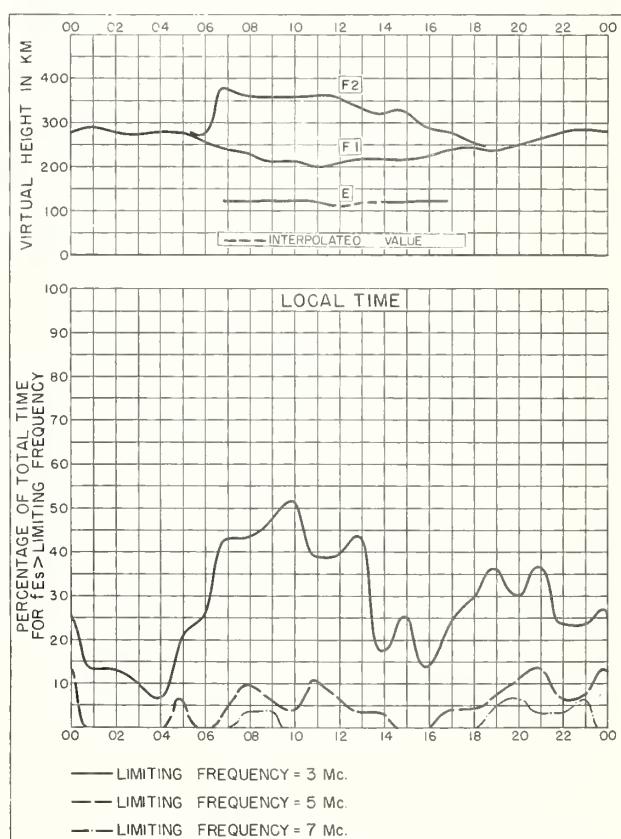
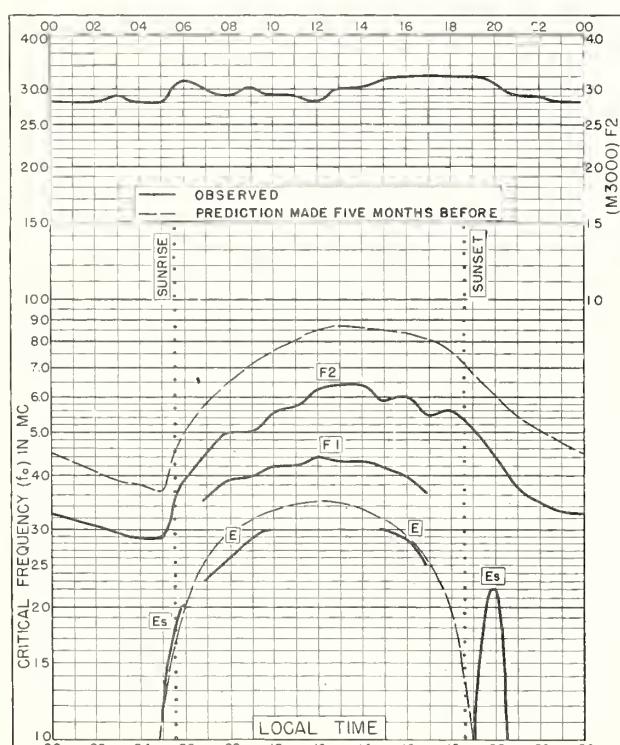
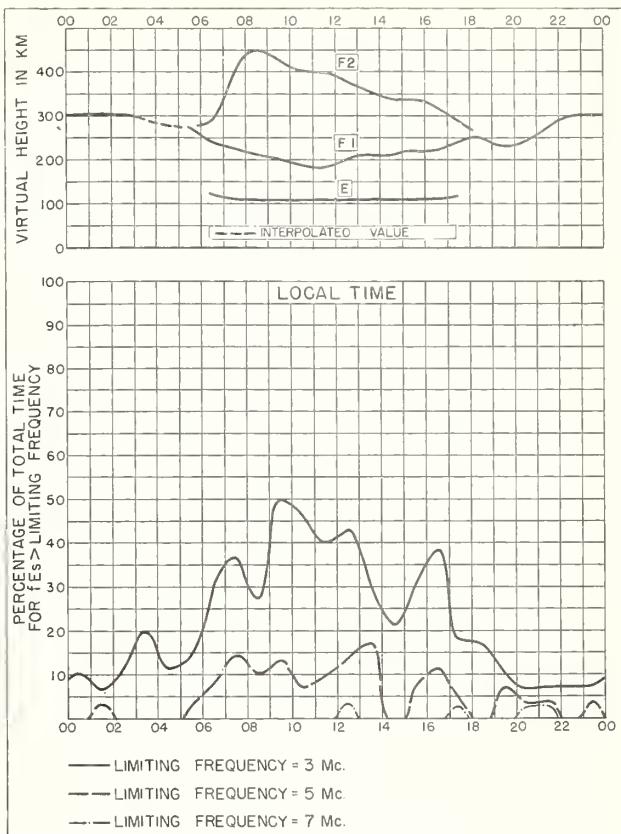
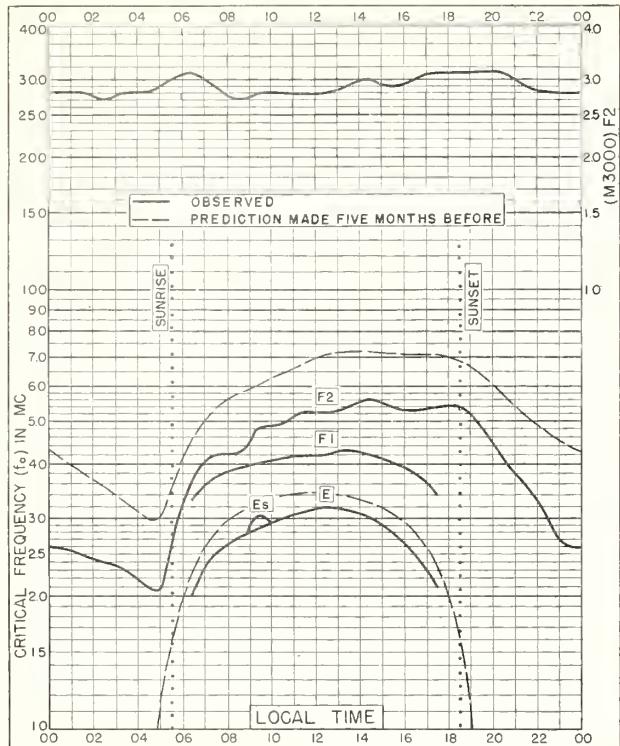


Fig. 16. GRAZ, AUSTRIA APRIL 1952



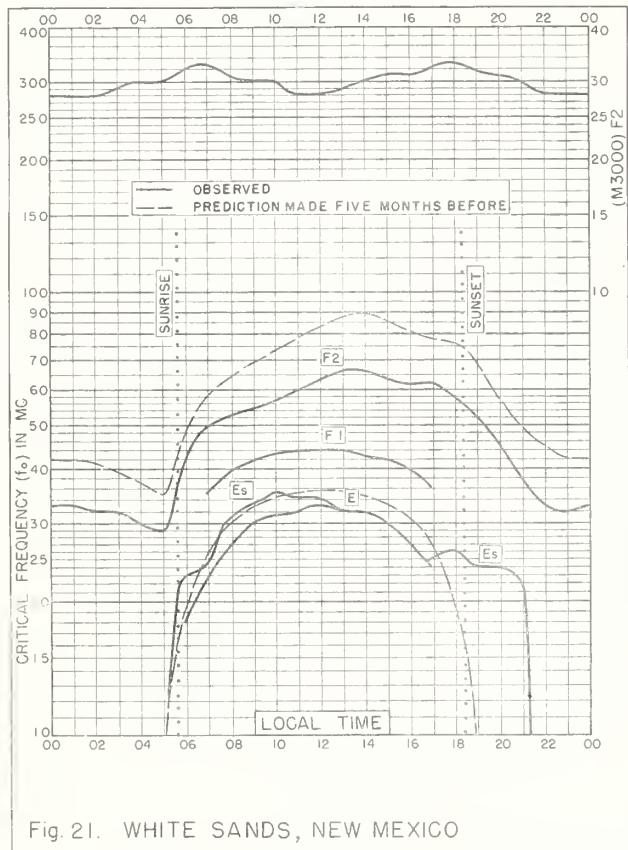


Fig. 21. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W APRIL 1952

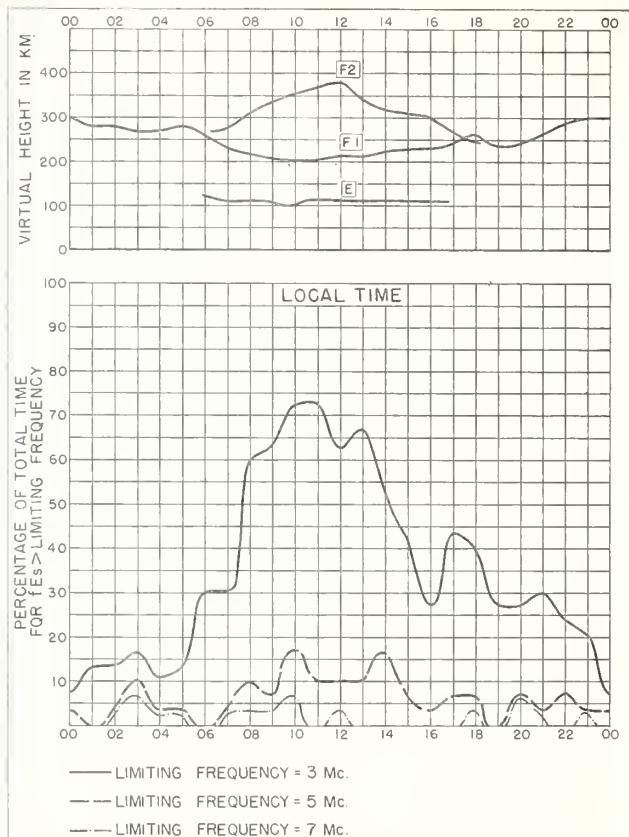


Fig. 22. WHITE SANDS, NEW MEXICO APRIL 1952

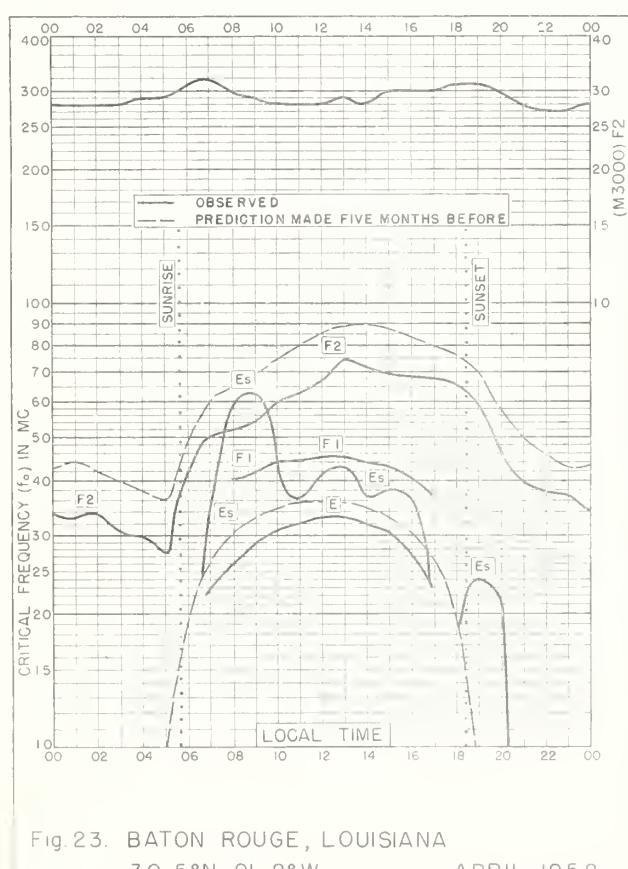


Fig. 23. BATON ROUGE, LOUISIANA
30.5°N, 91.2°W APRIL 1952

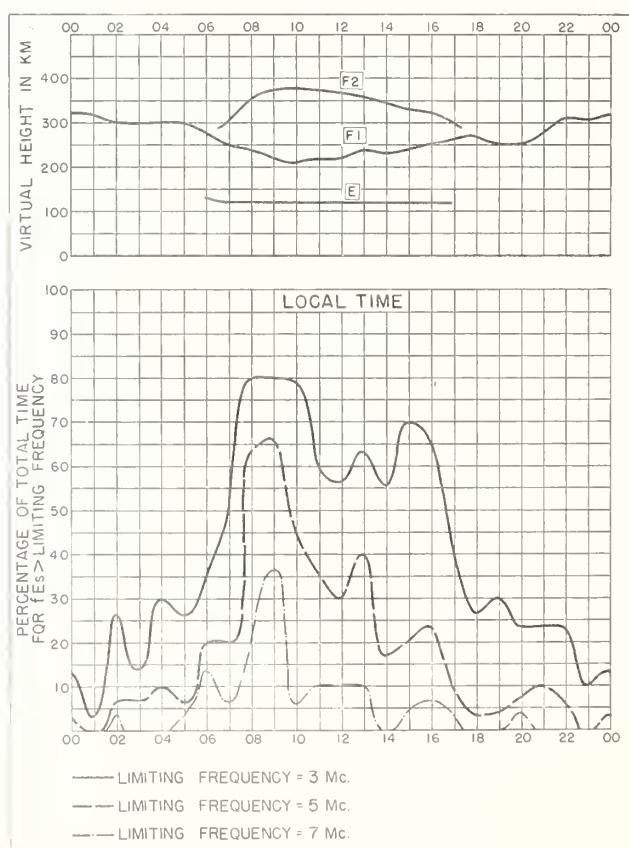
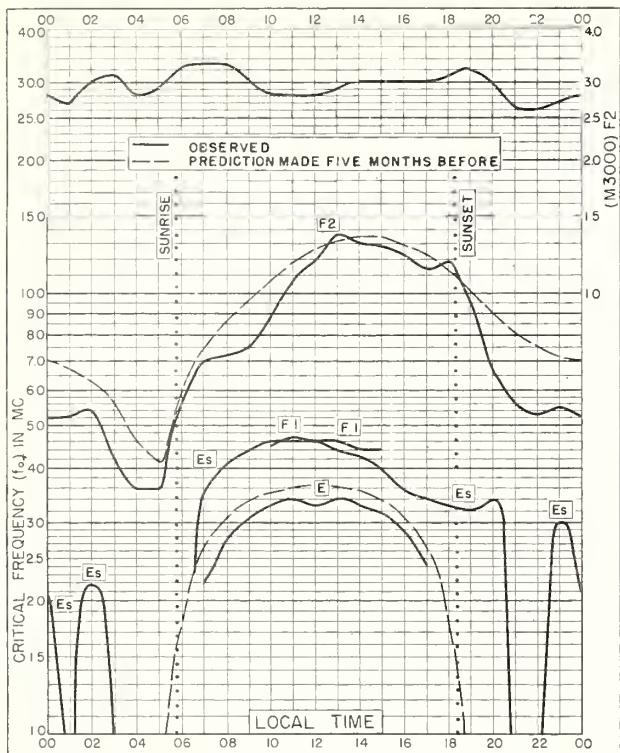
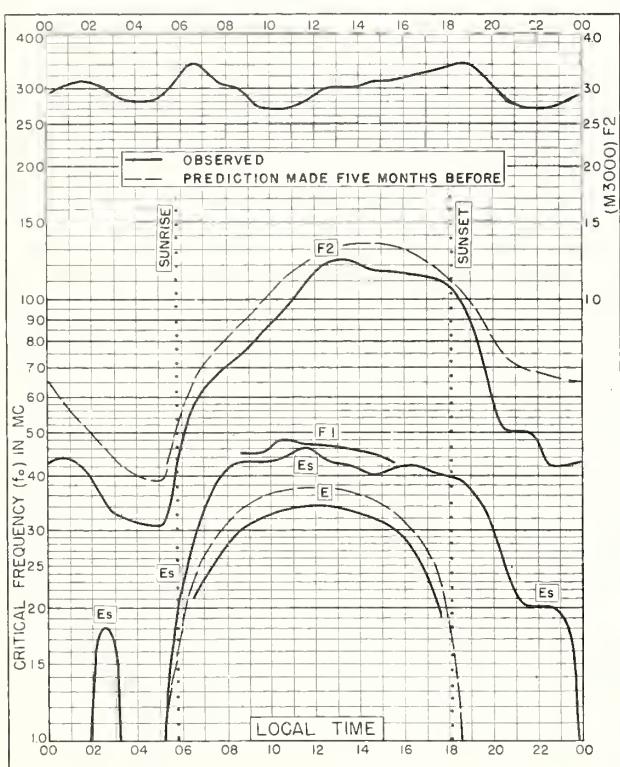
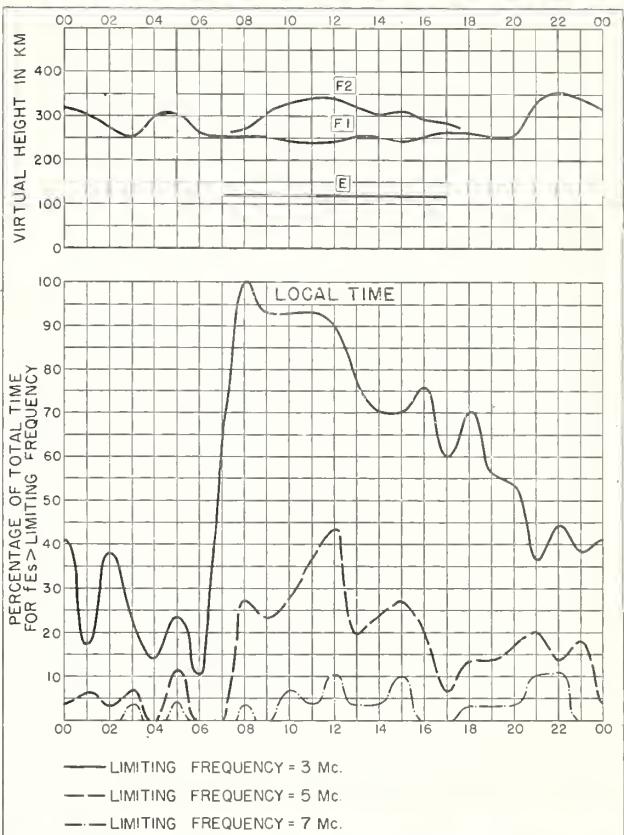


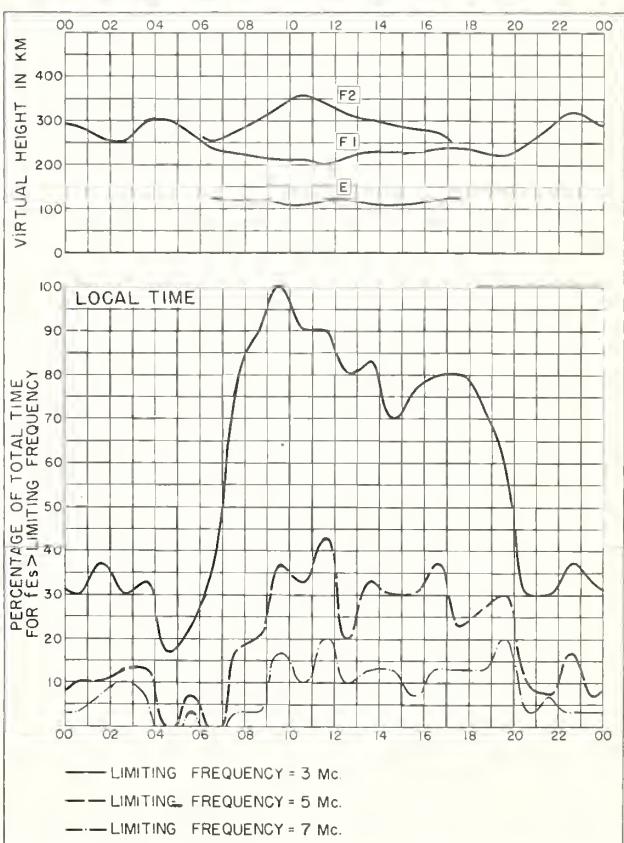
Fig. 24. BATON ROUGE, LOUISIANA APRIL 1952



APRIL 1952



APRIL 1952



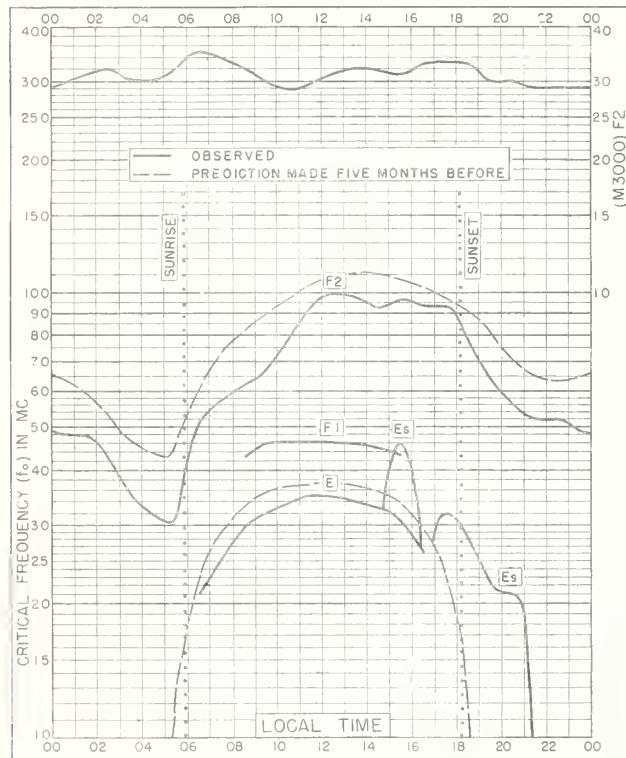


Fig. 29. PUERTO RICO, W. I.

18.5°N, 67.2°W

APRIL 1952

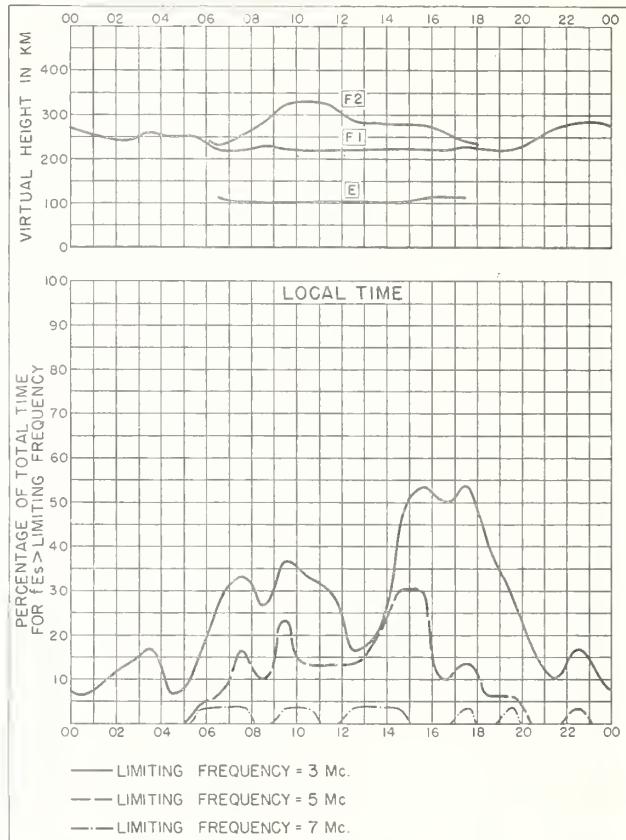


Fig. 30. PUERTO RICO, W. I.

APRIL 1952

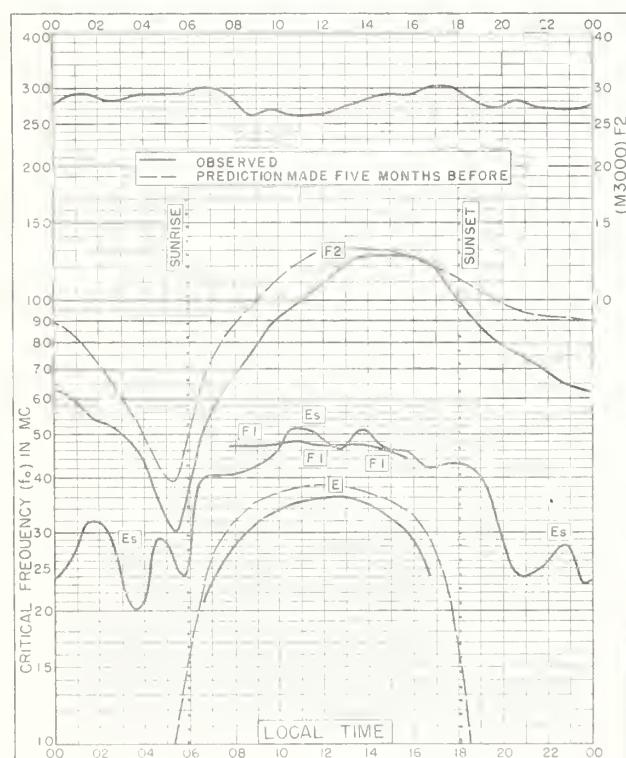


Fig. 31. PANAMA CANAL ZONE

9.4°N, 79.9°W

APRIL 1952

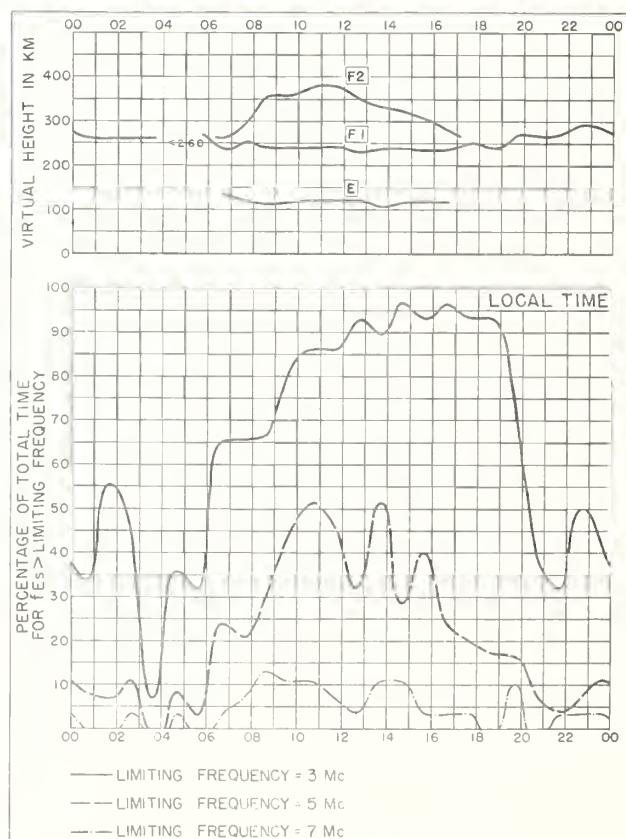


Fig. 32. PANAMA CANAL ZONE

APRIL 1952

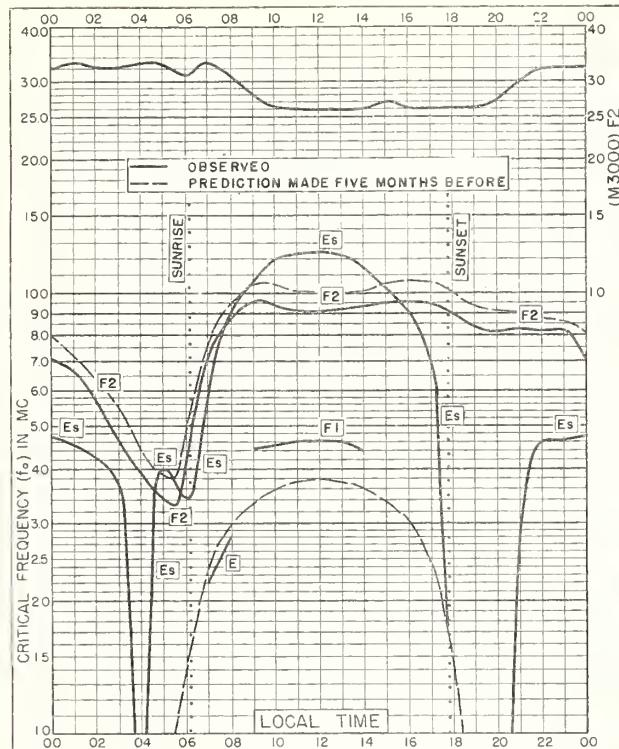


Fig. 33. HUANCAYO, PERU
12.0°S, 75.3°W APRIL 1952

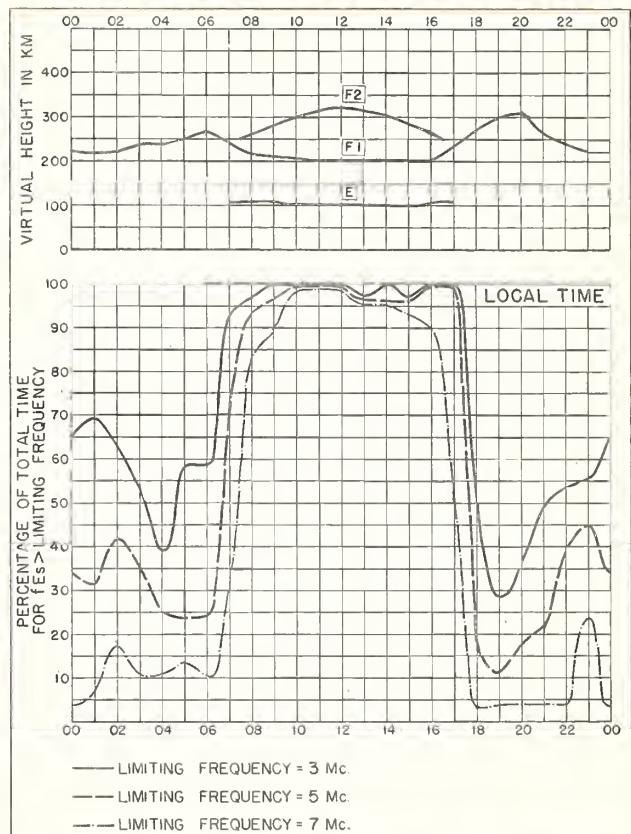


Fig. 34. HUANCAYO, PERU APRIL 1952

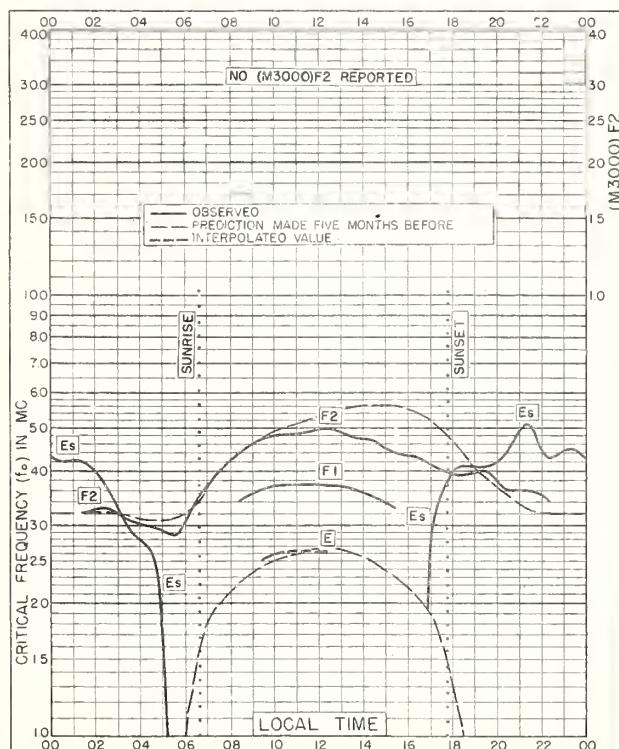


Fig. 35. KIRUNA, SWEDEN
 67.8°N, 20.5°E . MARCH 1952

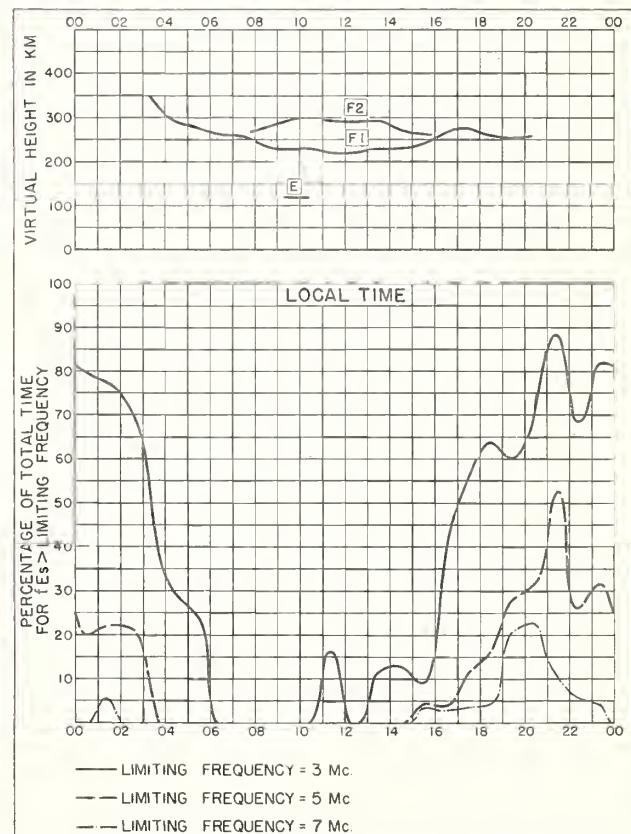
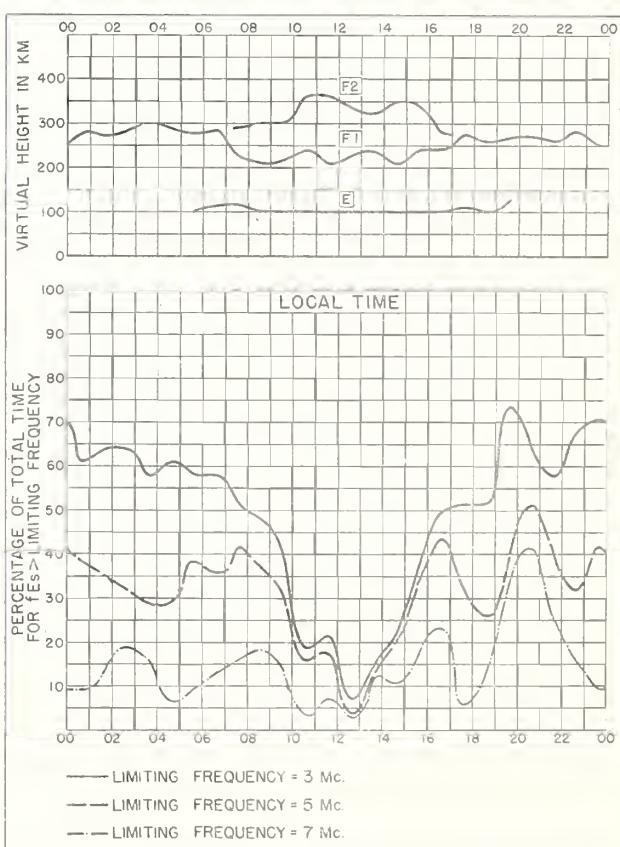
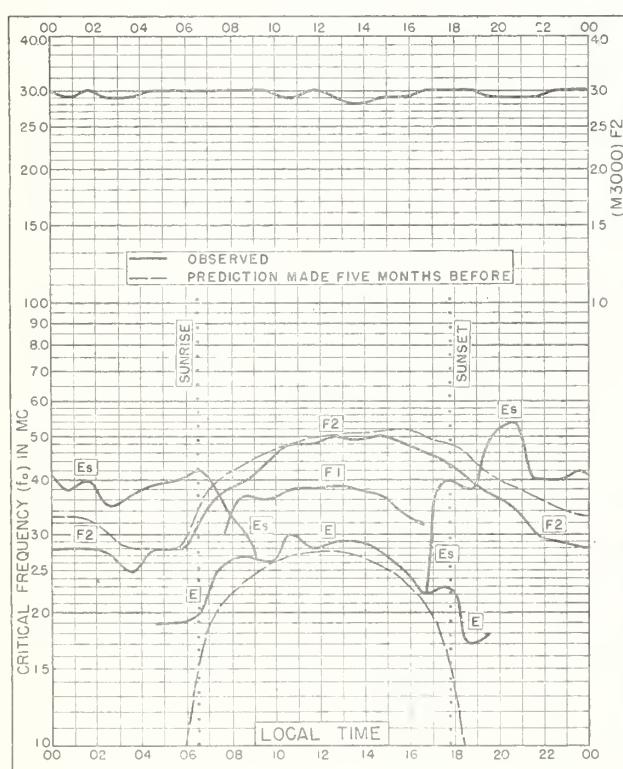
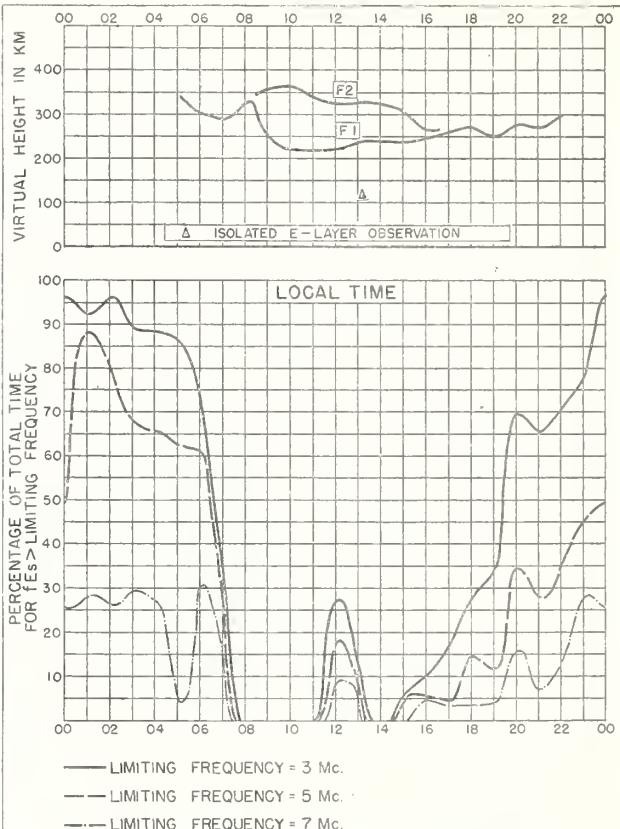
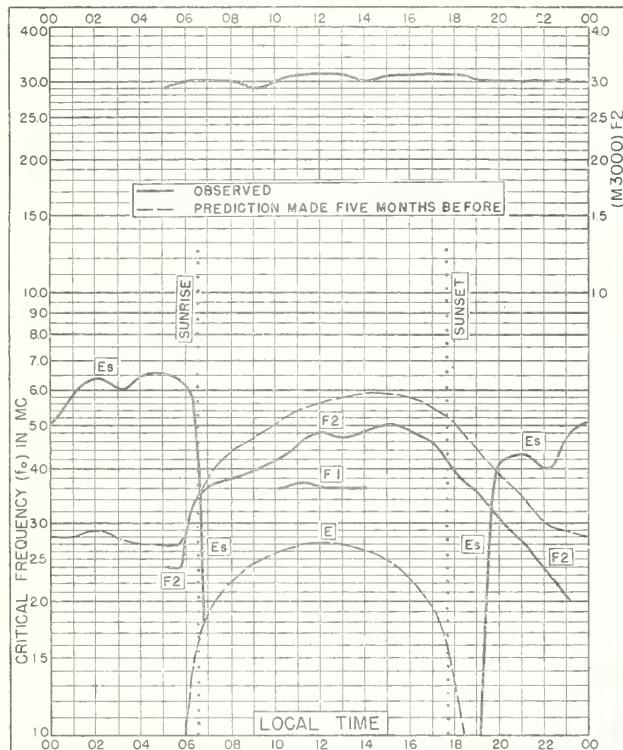
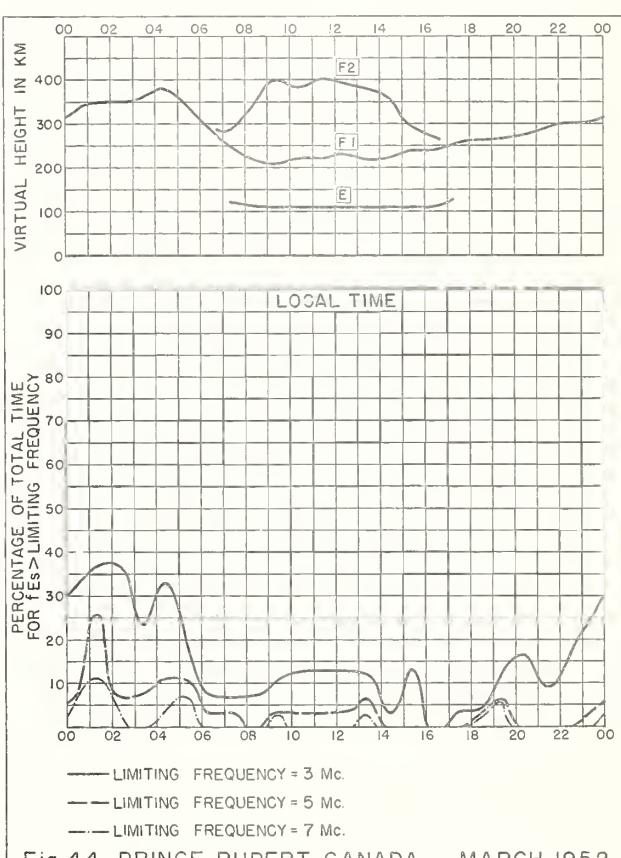
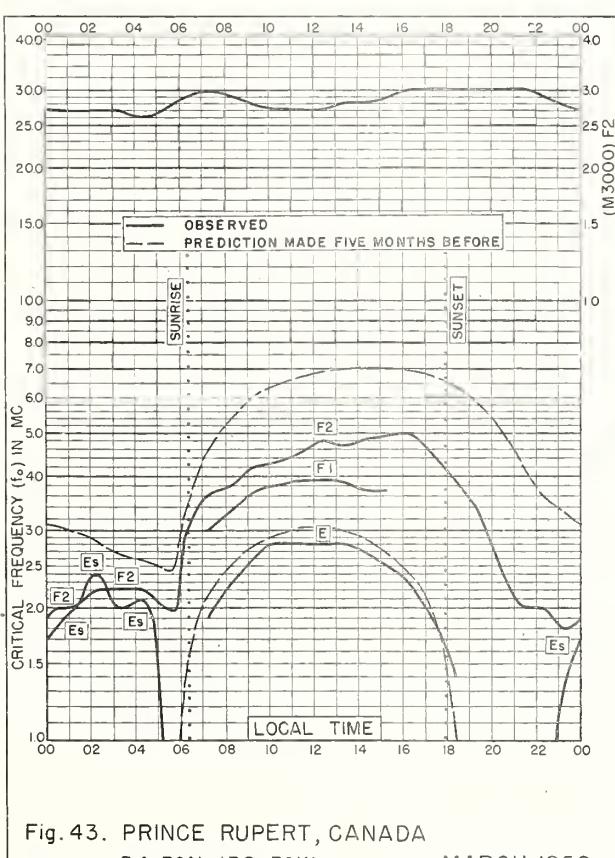
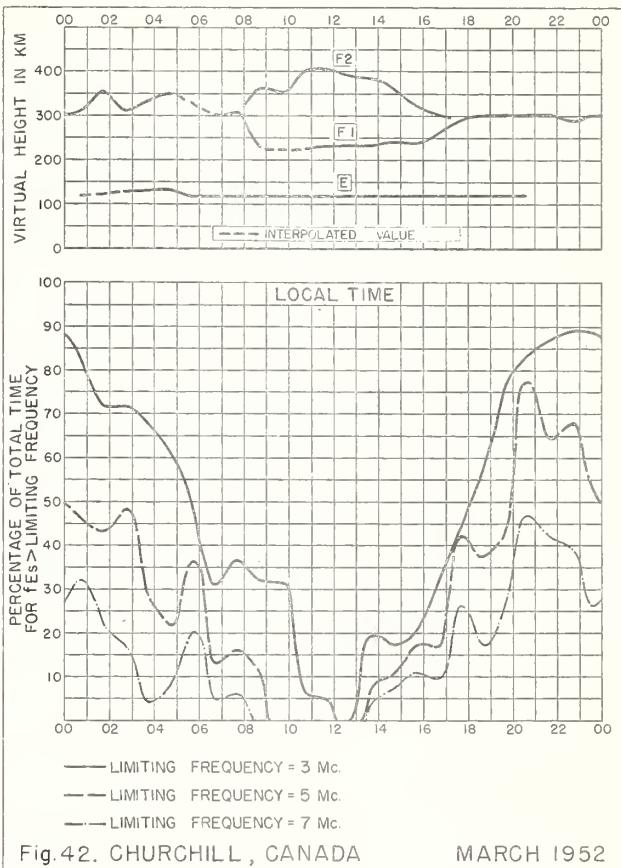
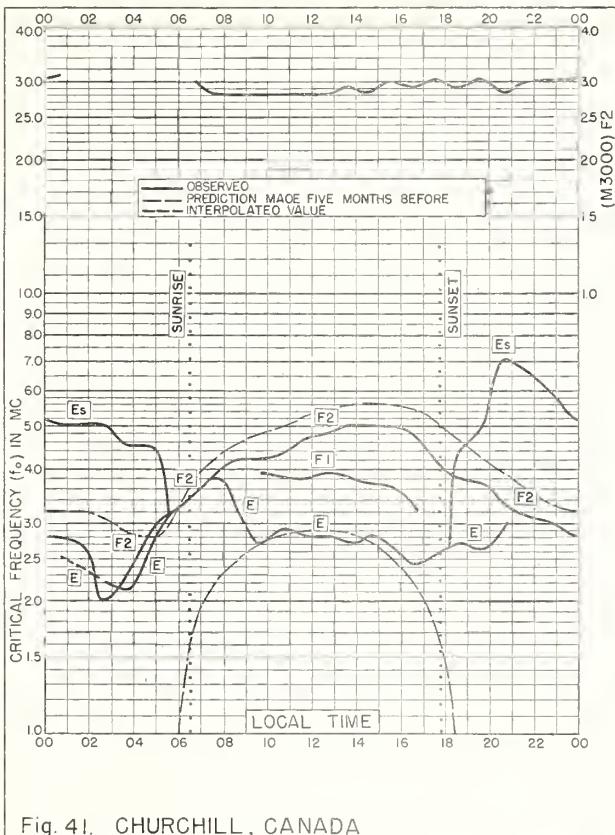


Fig. 36. KIRUNA, SWEDEN MARCH 1952





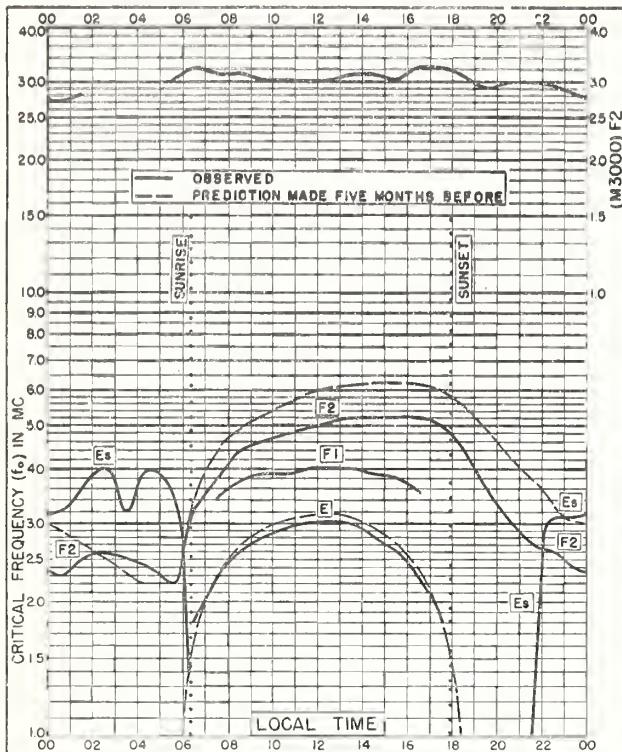


Fig. 45. WINNIPEG, CANADA
49.9°N, 97.4°W

MARCH 1952

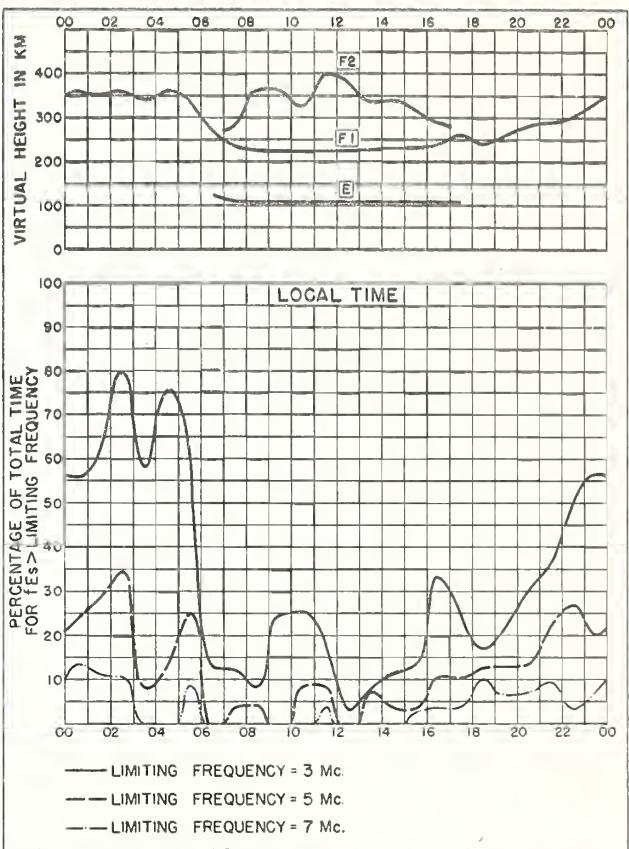


Fig. 46. WINNIPEG, CANADA

MARCH 1952

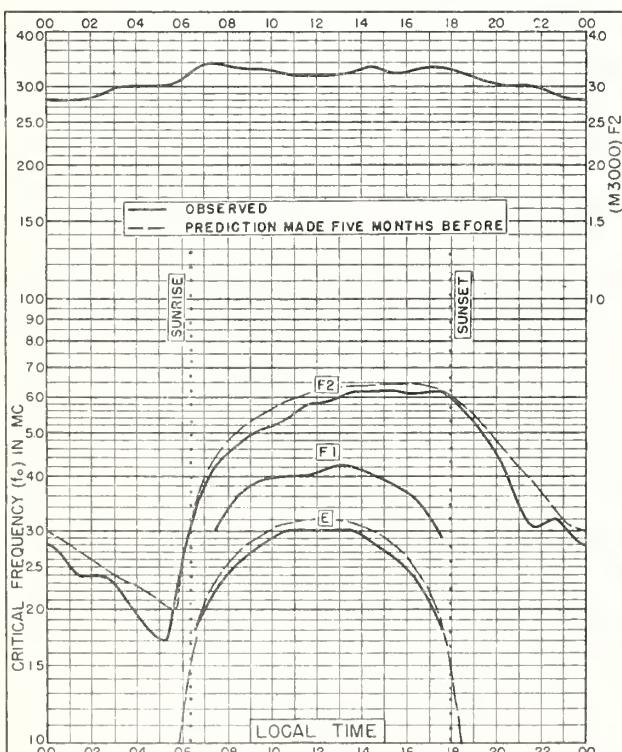


Fig. 47. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W

MARCH 1952

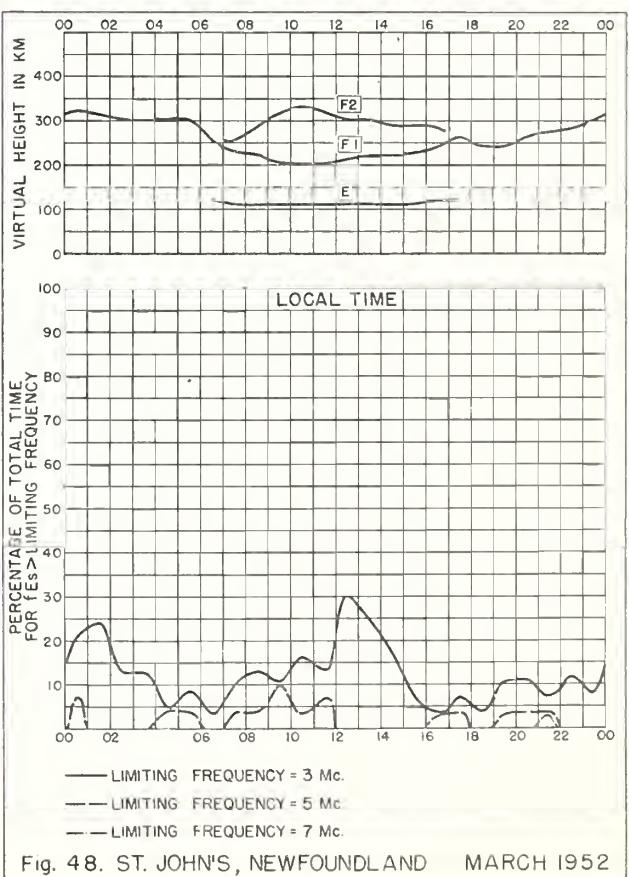


Fig. 48. ST. JOHN'S, NEWFOUNDLAND MARCH 1952

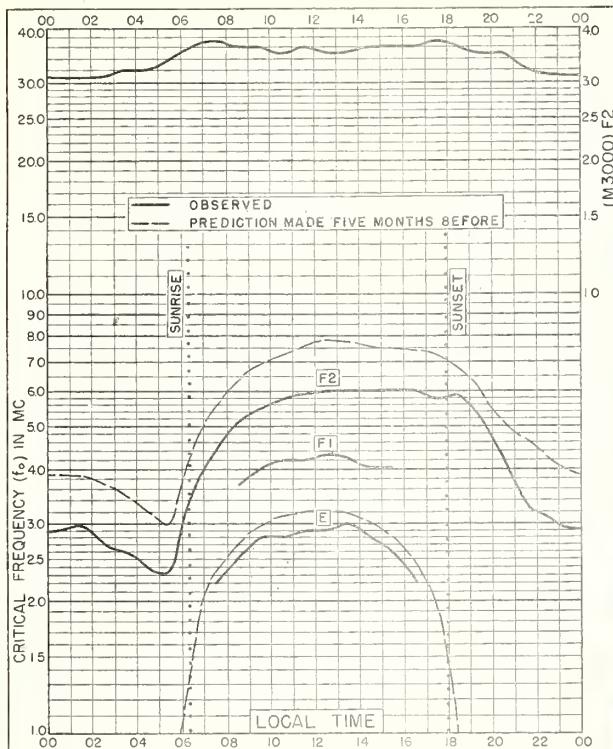


Fig. 49. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E MARCH 1952

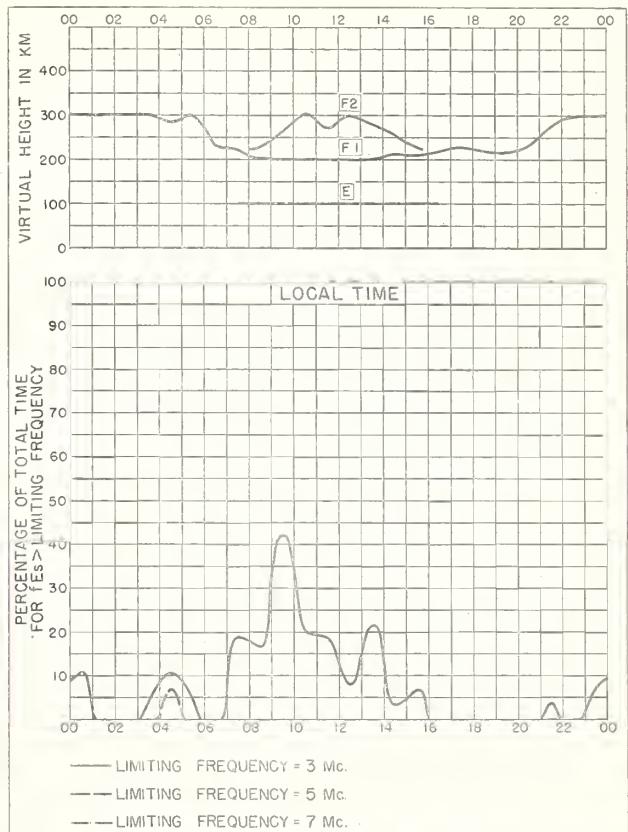


Fig. 50. SCHWARZENBURG, SWITZERLAND MARCH 1952

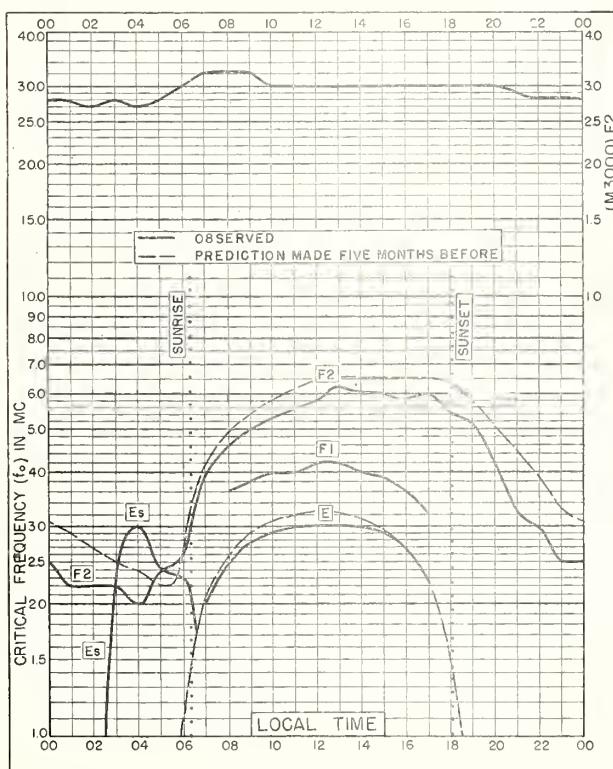


Fig. 51. OTTAWA, CANADA
45.4°N, 75.7°W MARCH 1952

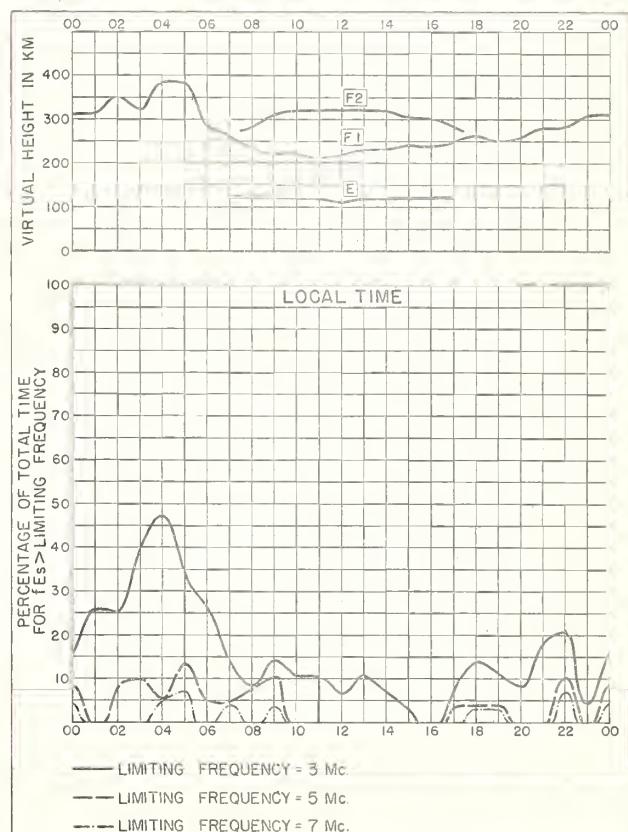


Fig. 52. OTTAWA, CANADA MARCH 1952

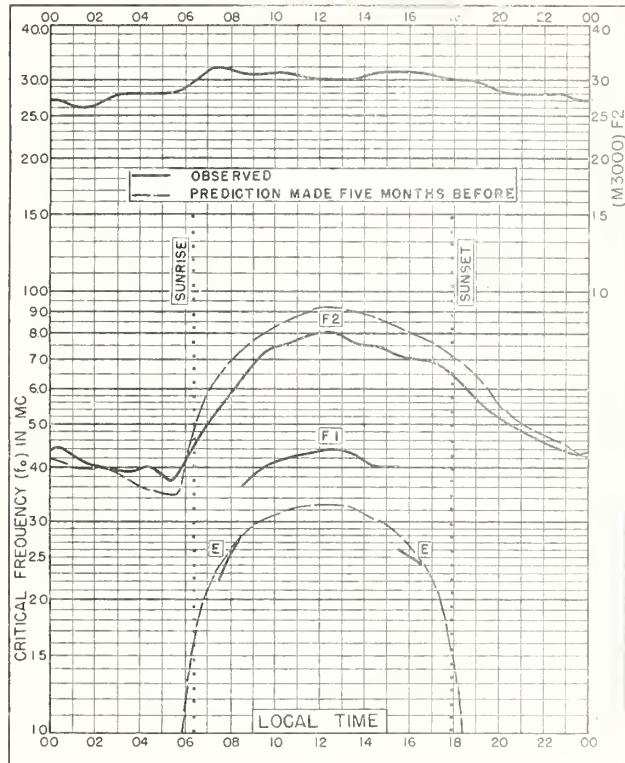


Fig. 53. WAKKANAI, JAPAN
45.4°N, 141.7°E MARCH 1952

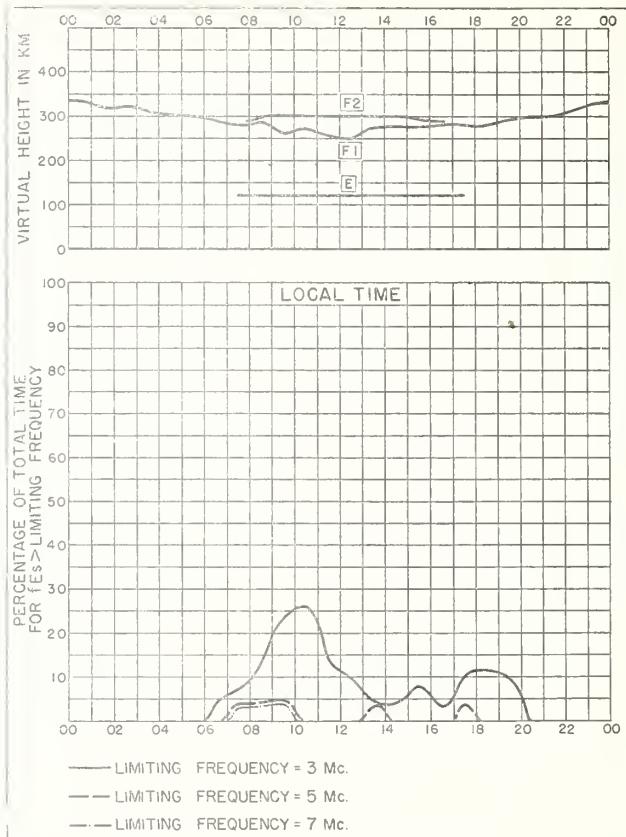


Fig. 54. WAKKANAI, JAPAN MARCH 1952

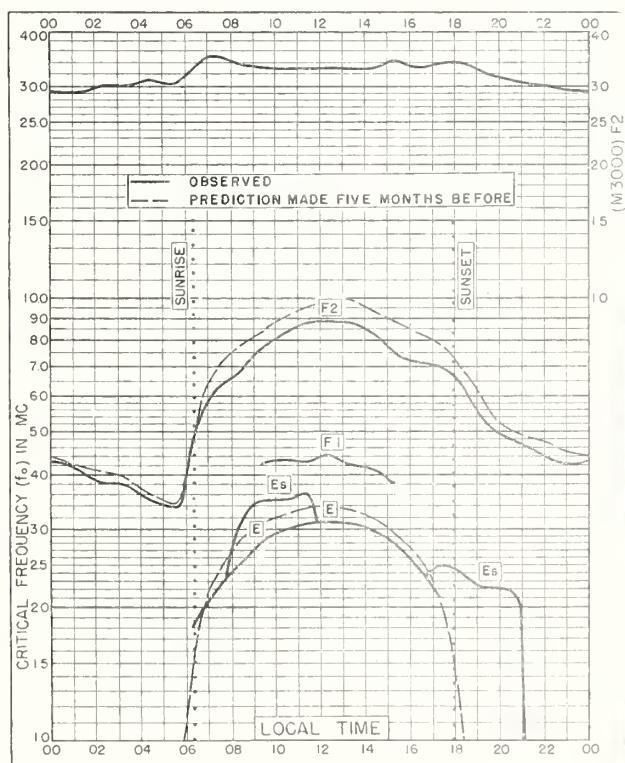


Fig. 55. AKITA, JAPAN
39.7°N, 140.1°E MARCH 1952

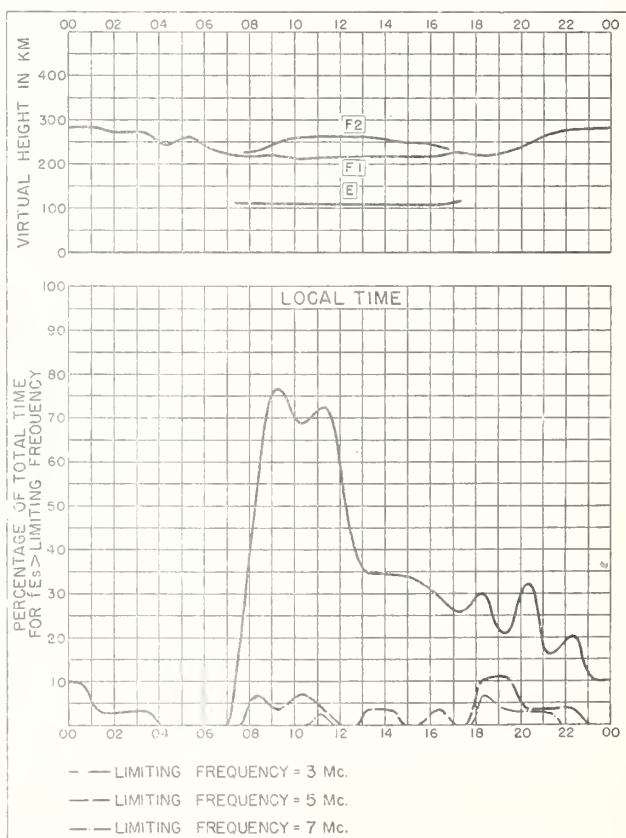


Fig. 56. AKITA, JAPAN MARCH 1952

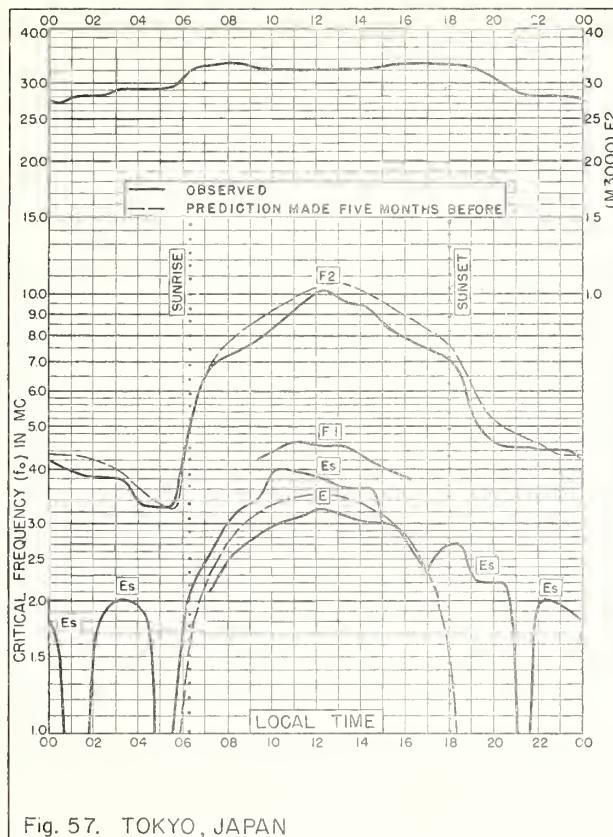


Fig. 57. TOKYO, JAPAN

35.7°N, 139.5°E

MARCH 1952

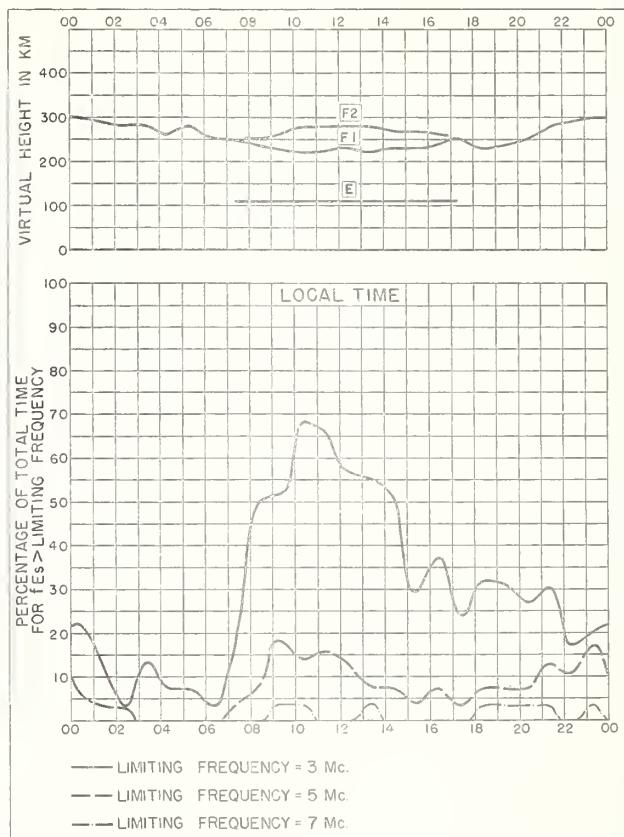


Fig. 58. TOKYO, JAPAN

MARCH 1952

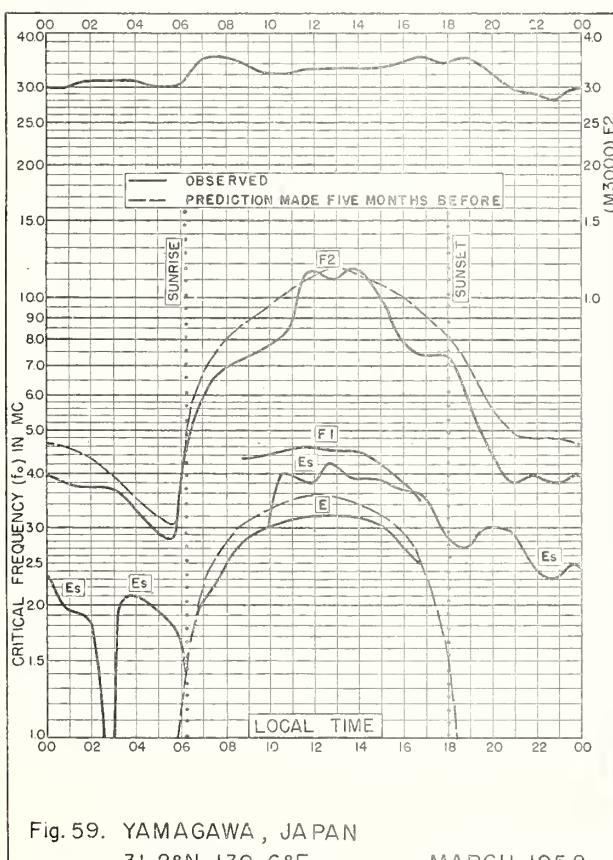


Fig. 59. YAMAGAWA, JAPAN

31.2°N, 130.6°E

MARCH 1952

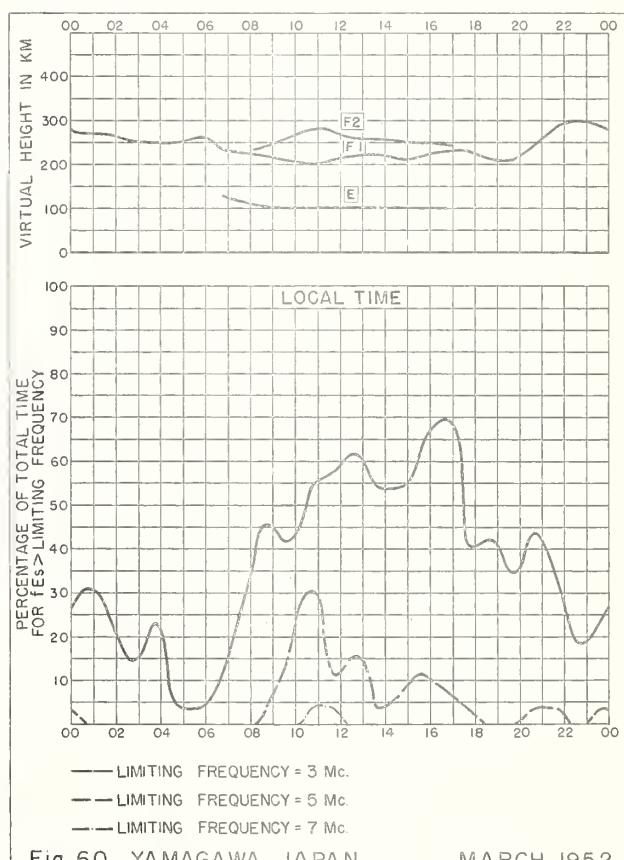


Fig. 60. YAMAGAWA, JAPAN

MARCH 1952

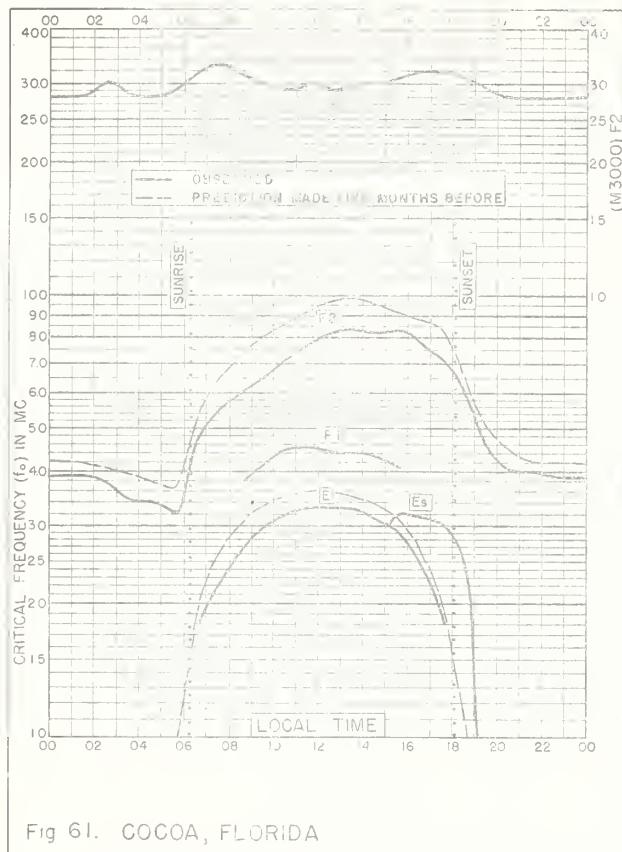


Fig. 61. COCOA, FLORIDA
28.2°N, 80.6°W

MARCH 1952

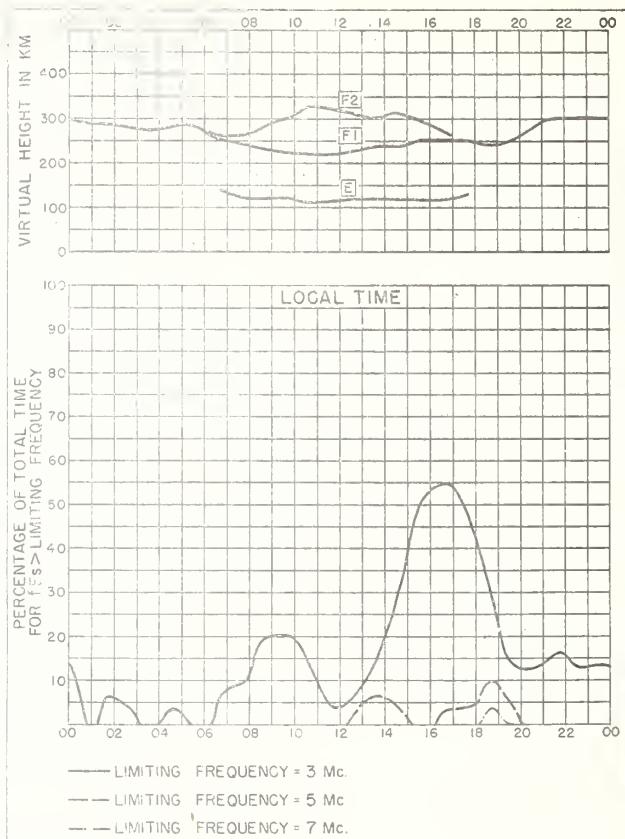


Fig. 62. COCOA, FLORIDA

MARCH 1952

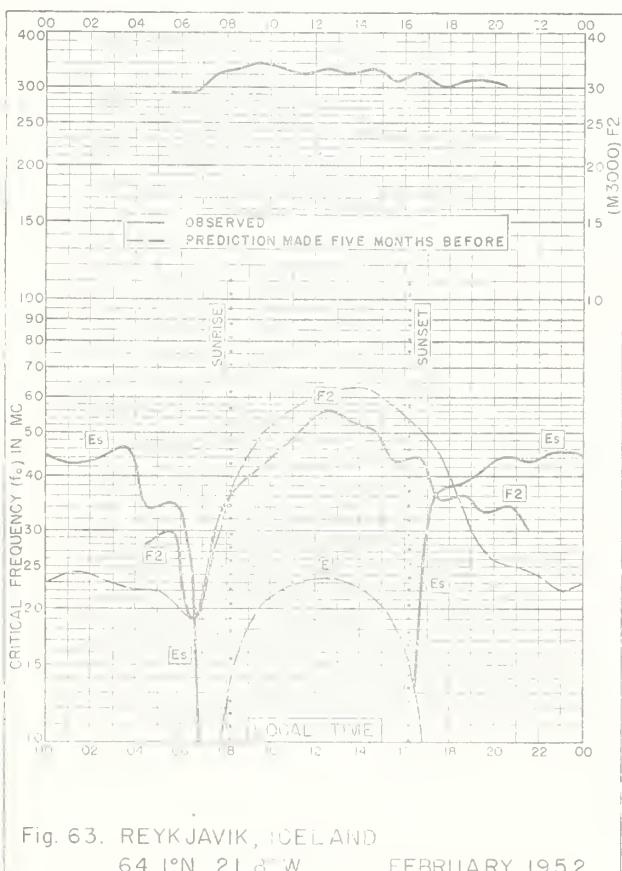


Fig. 63. REYKJAVIK, ICELAND

64.1°N, 21.8°W

FEBRUARY 1952

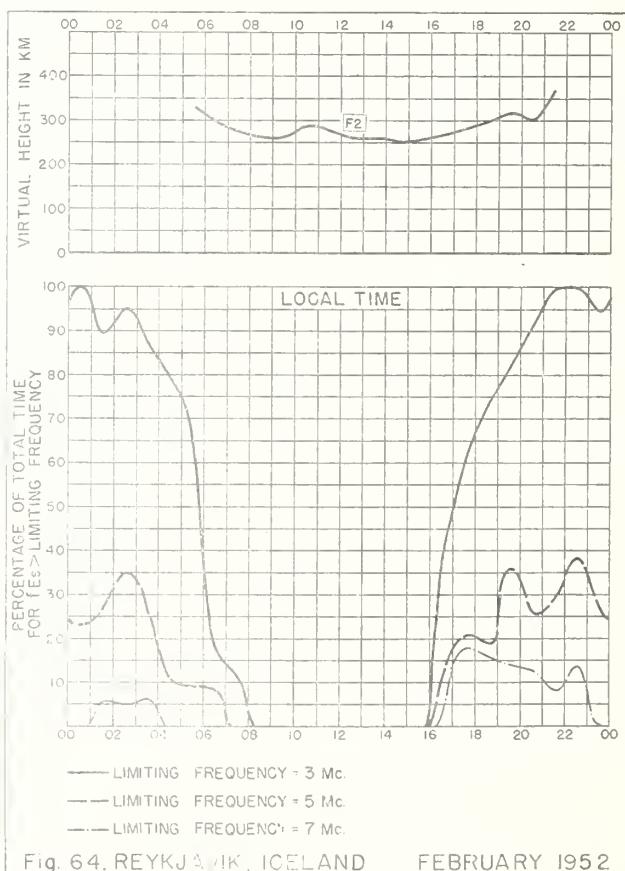
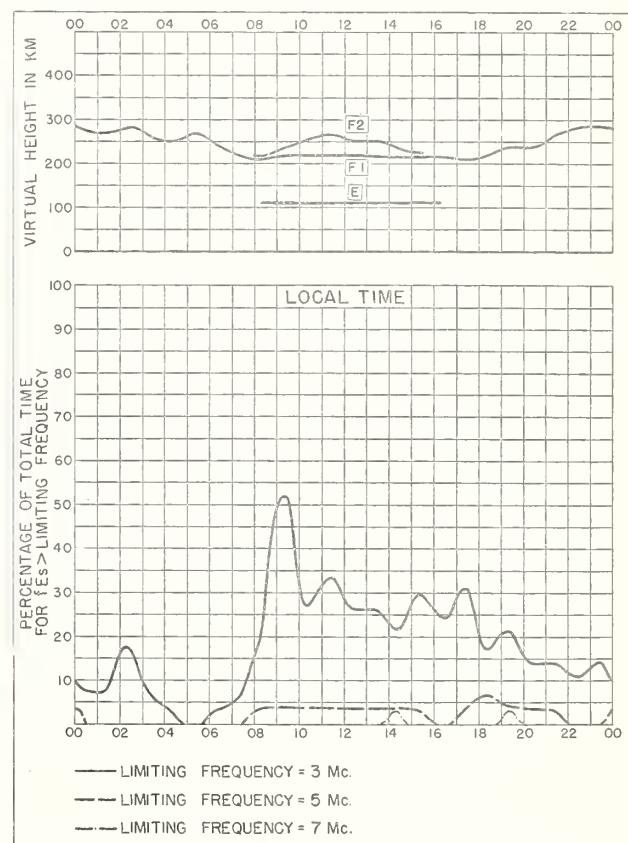
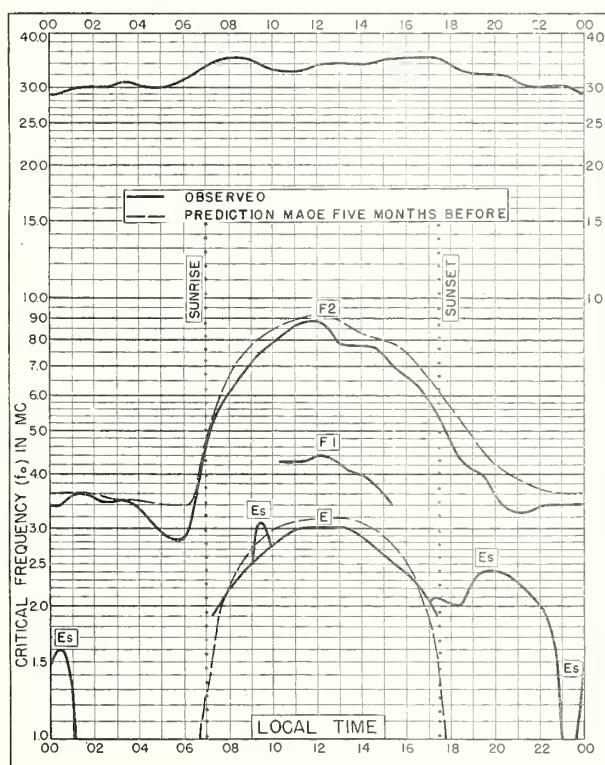
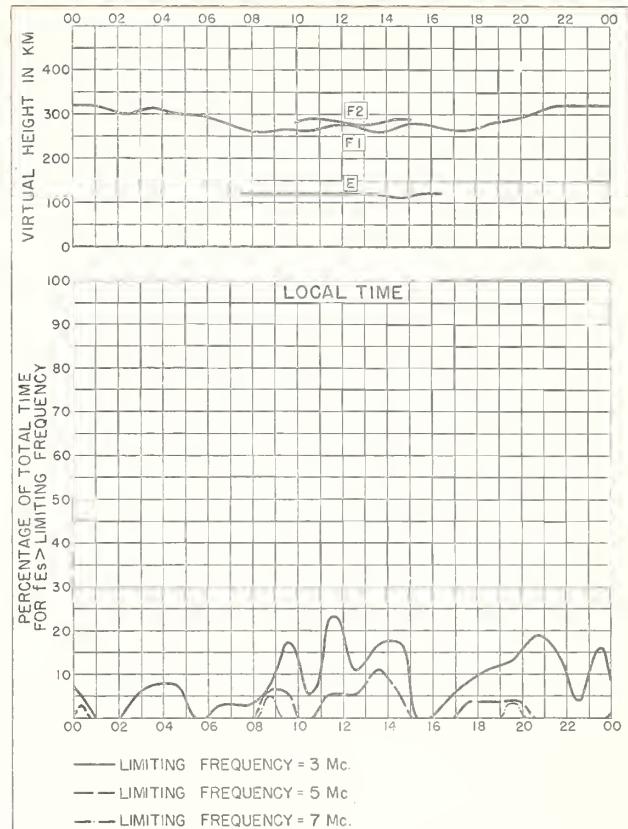
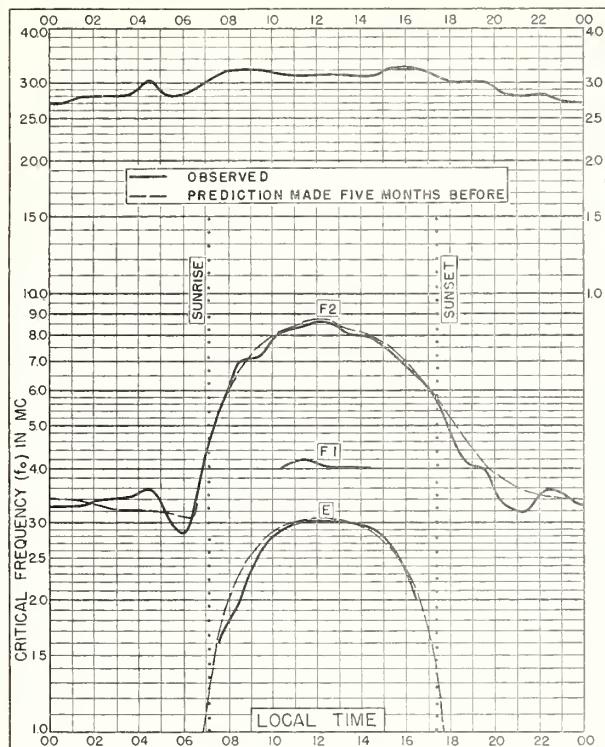


Fig. 64. REYKJAVIK, ICELAND

FEBRUARY 1952



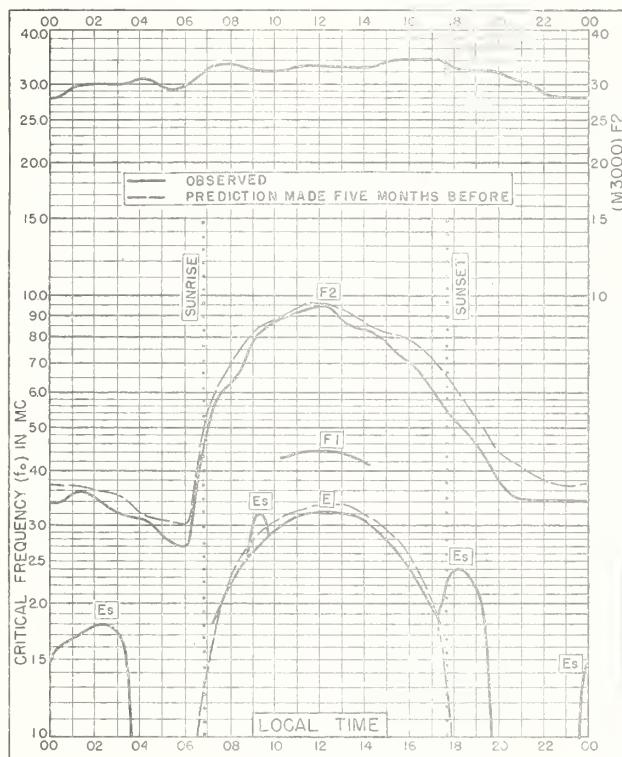


Fig. 69. TOKYO, JAPAN
35.7°N, 139.5°E FEBRUARY 1952

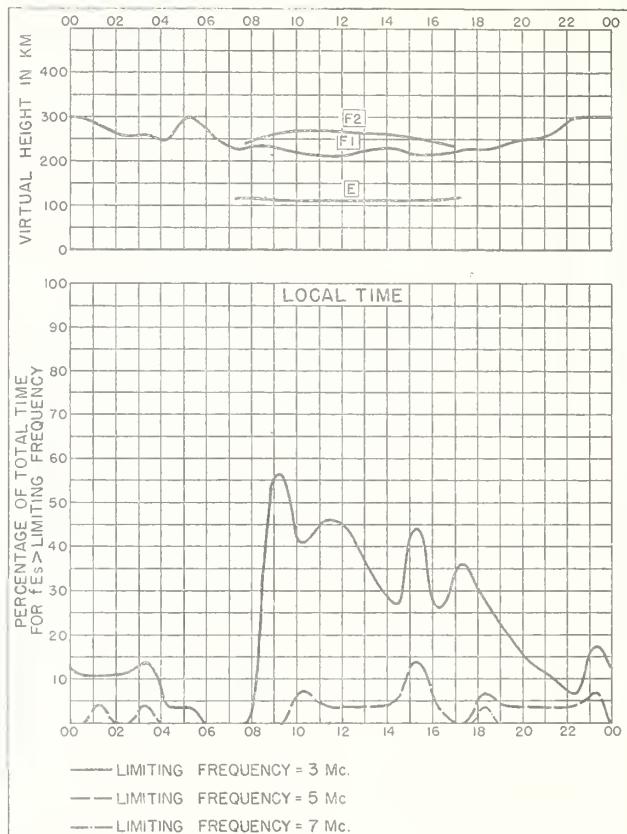


Fig. 70. TOKYO, JAPAN FEBRUARY 1952

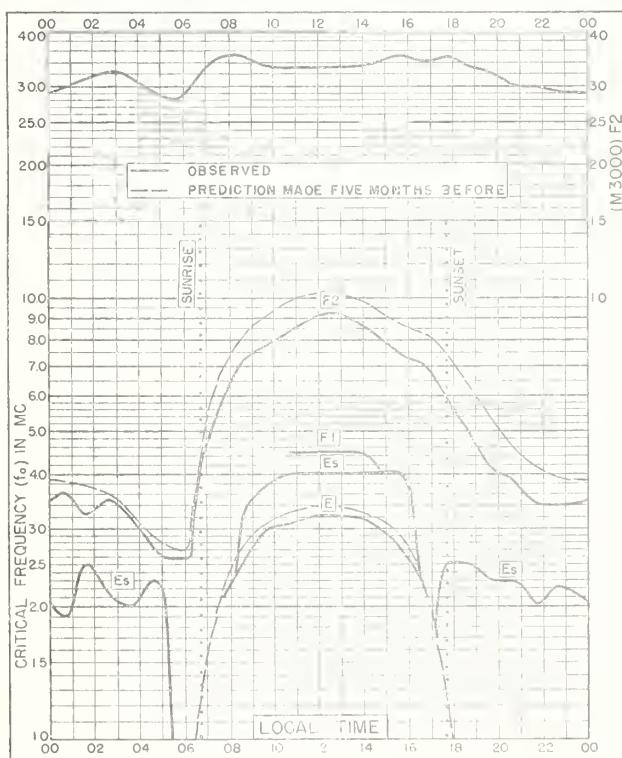


Fig. 71. YAMAGAWA, JAPAN
31.2°N, 130.6°E FEBRUARY 1952

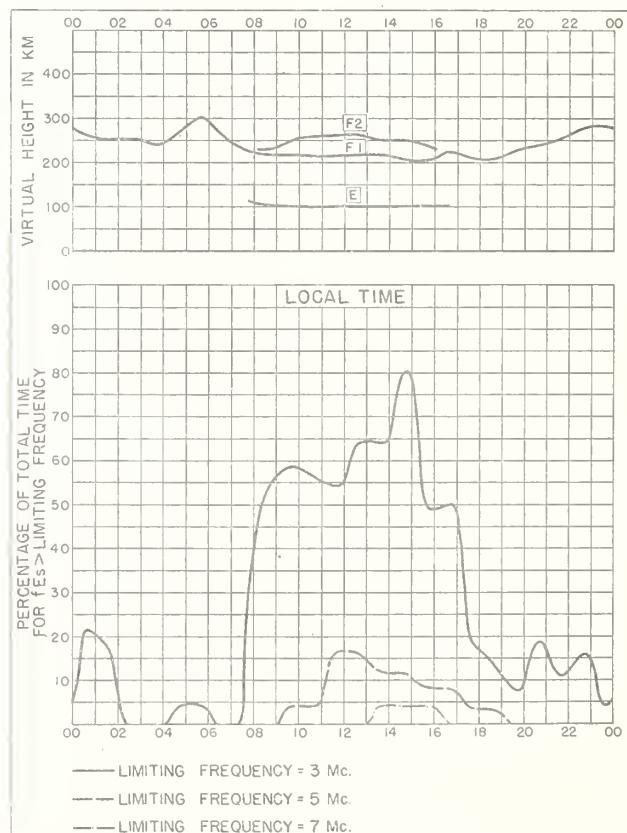


Fig. 72. YAMAGAWA, JAPAN FEBRUARY 1952

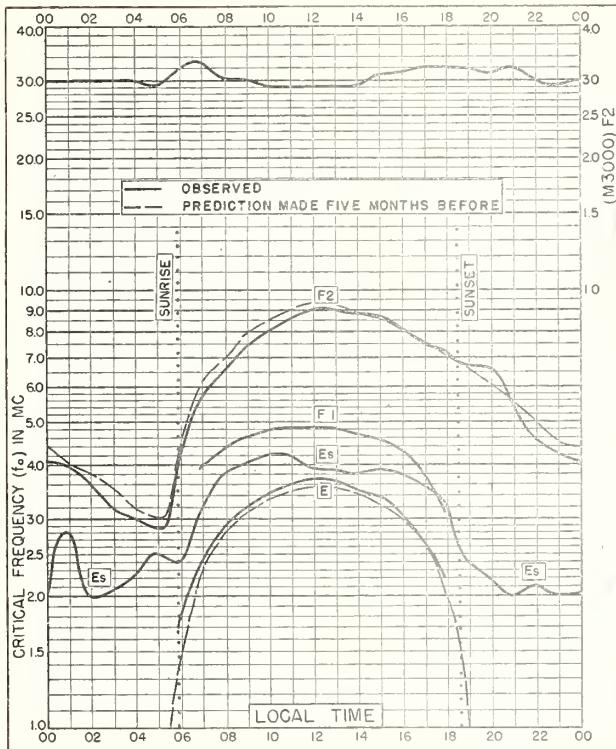


Fig. 73. JOHANNESBURG, U.O.F S. AFRICA
26.2°S, 28.1°E FEBRUARY 1952

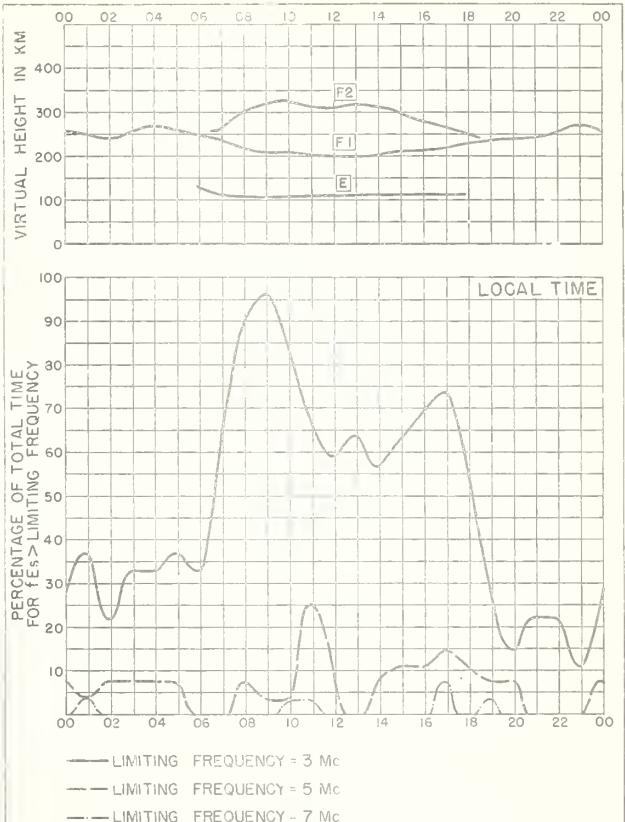


Fig. 74. JOHANNESBURG, U.O.F S. AFRICA FEBRUARY 1952

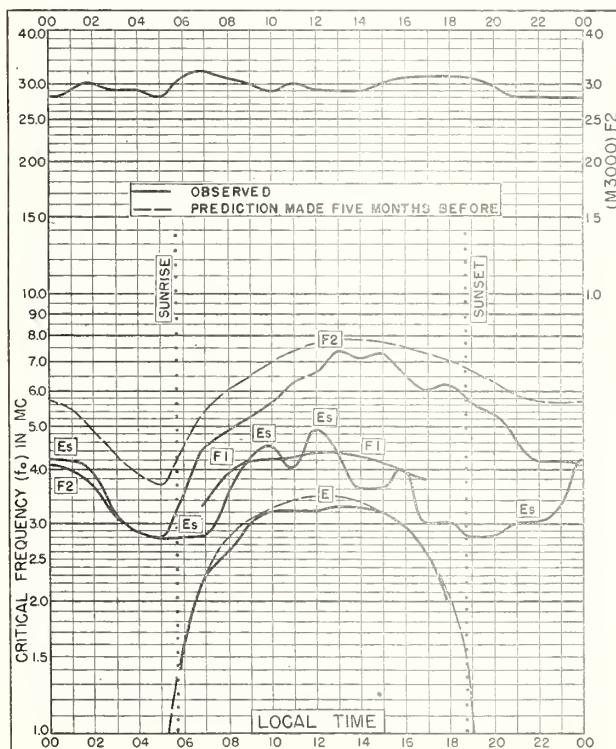


Fig. 75. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E FEBRUARY 1952

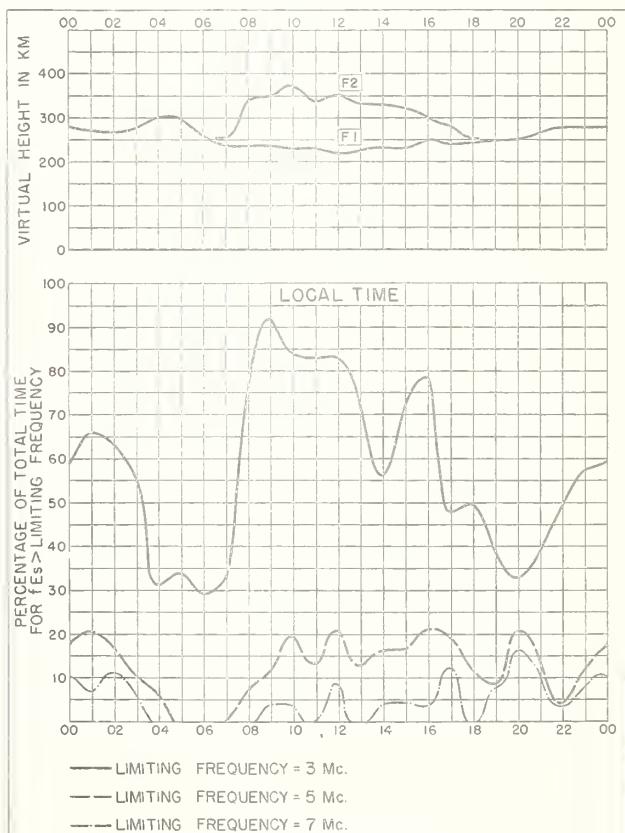
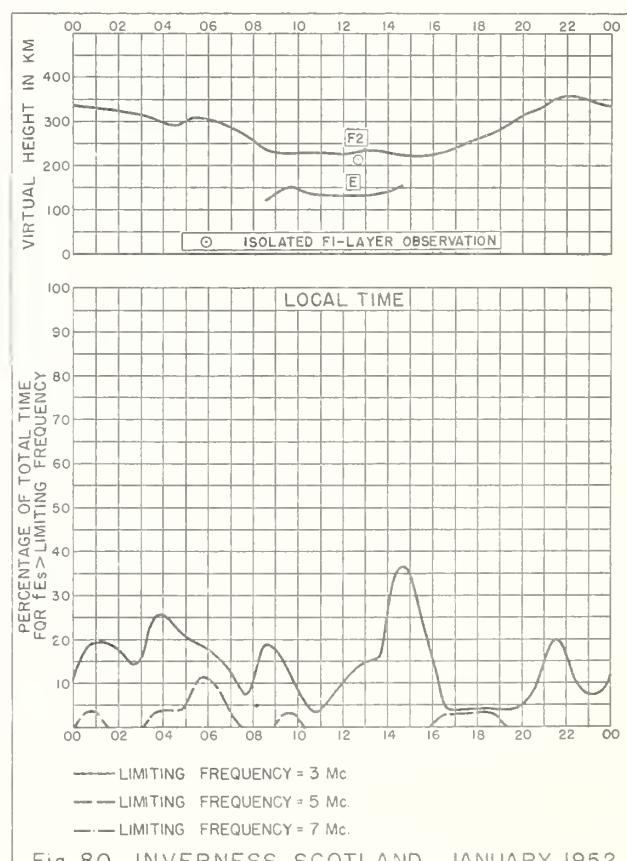
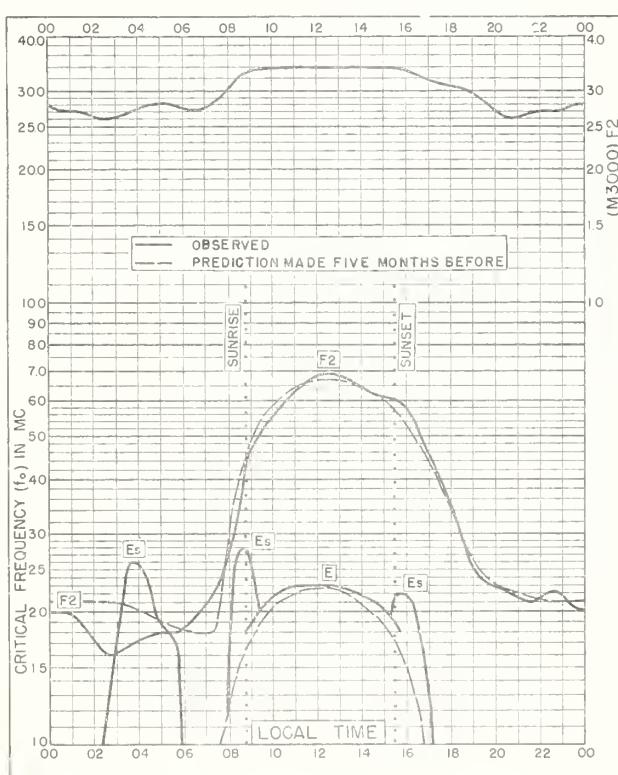
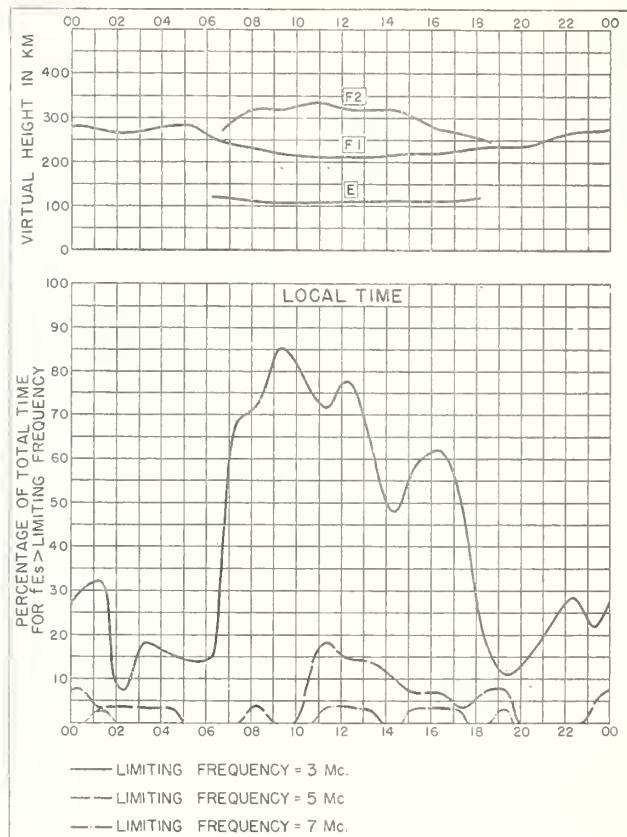
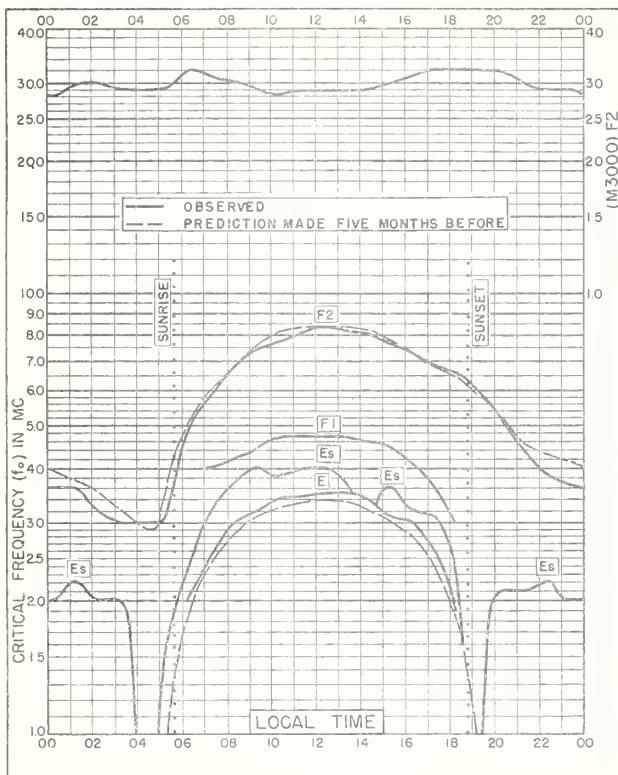


Fig. 76. WATHEROO, W. AUSTRALIA FEBRUARY 1952



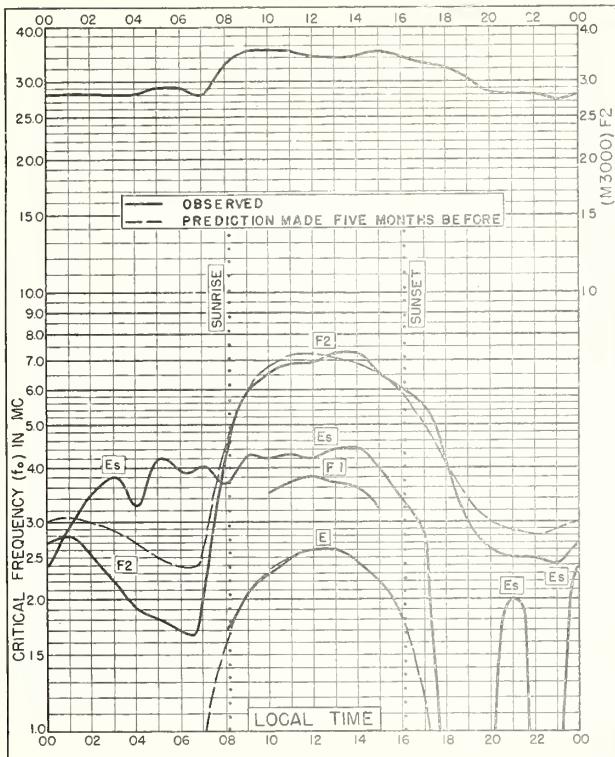


Fig. 81. SLOUGH, ENGLAND
51.5°N, 0.6°W JANUARY 1952

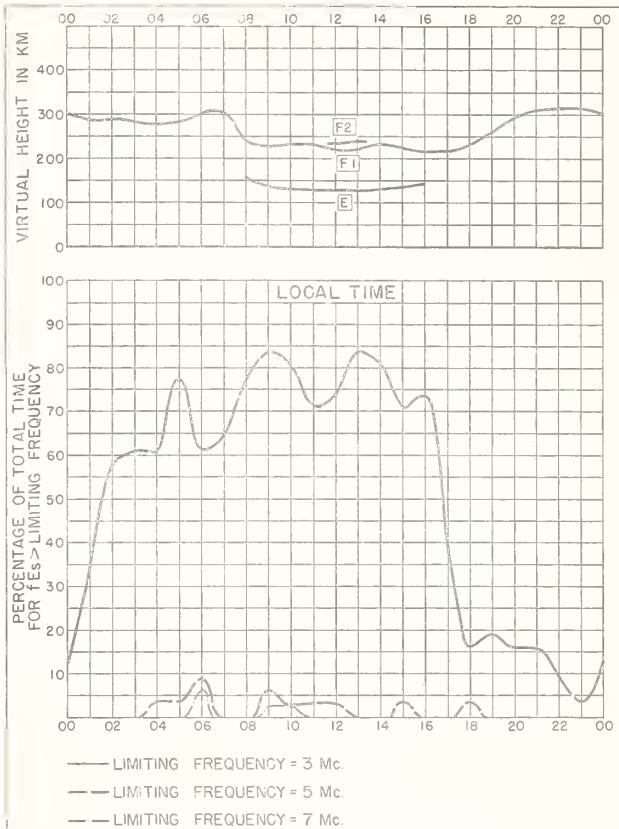


Fig. 82. SLOUGH, ENGLAND JANUARY 1952

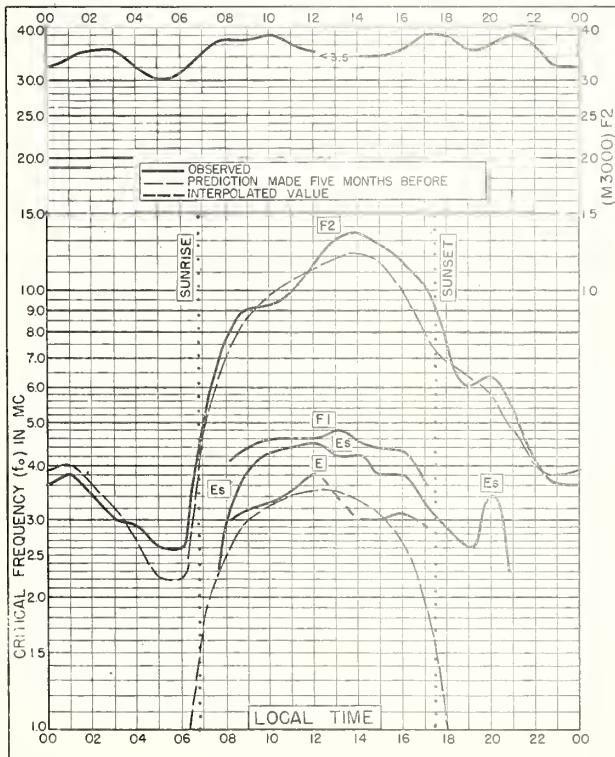


Fig. 83. FORMOSA, CHINA
25.0°N, 121.5°E JANUARY 1952

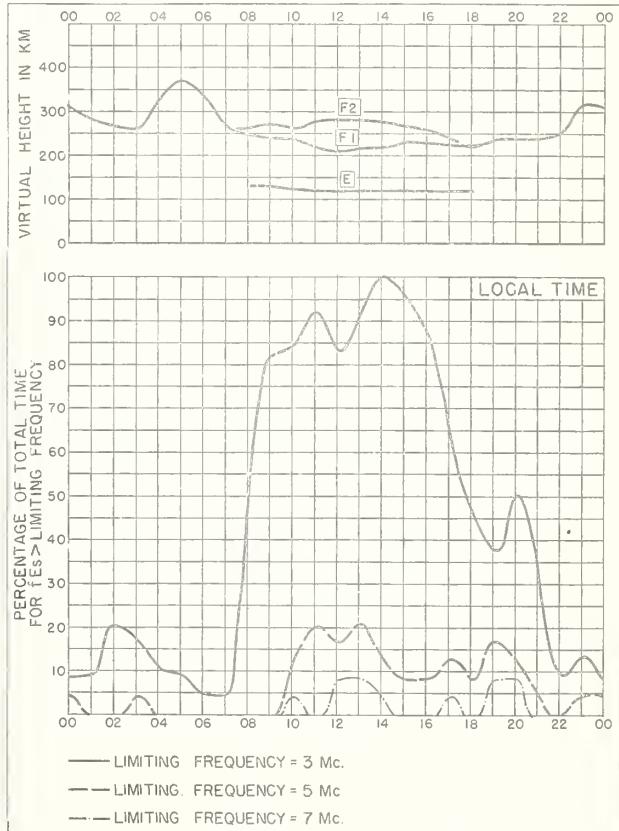


Fig. 84. FORMOSA, CHINA JANUARY 1952

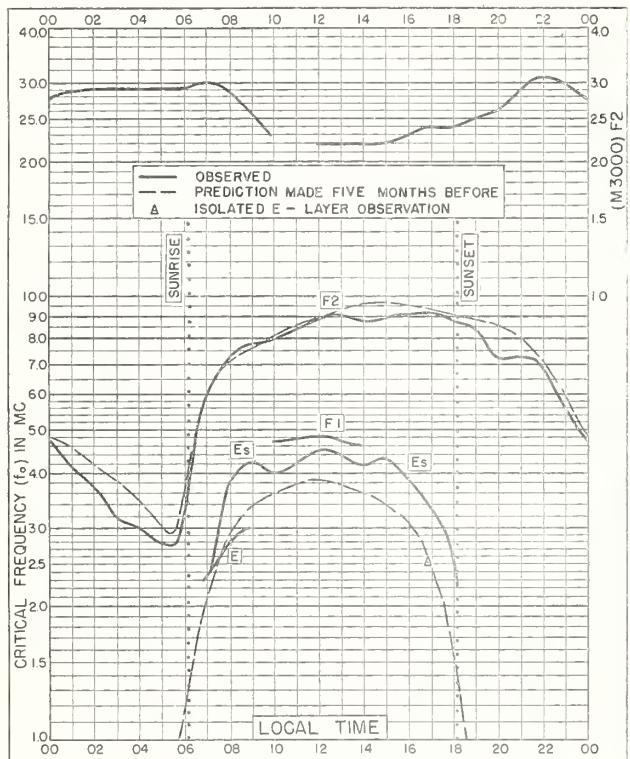


Fig. 85. SINGAPORE, BRIT. MALAYA
1.3°N, 103.8°E JANUARY 1952

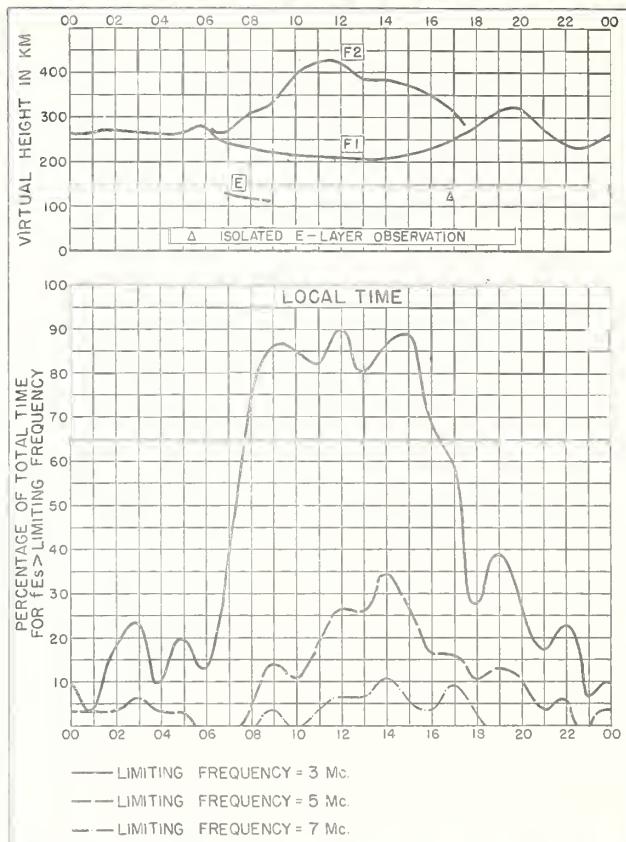


Fig. 86. SINGAPORE, BRIT. MALAYA JANUARY 1952

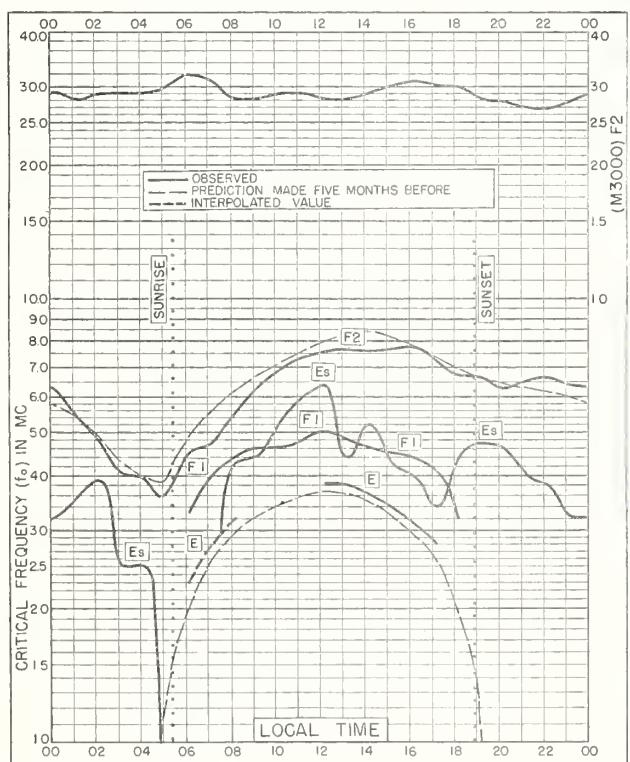


Fig. 87. BRISBANE, AUSTRALIA
27.5°S, 153.0°E JANUARY 1952

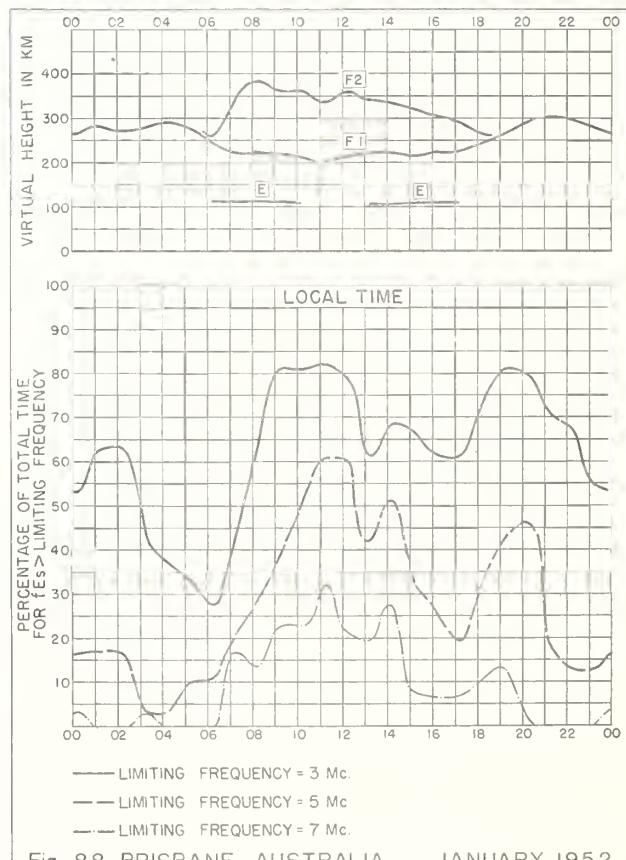


Fig. 88. BRISBANE, AUSTRALIA JANUARY 1952

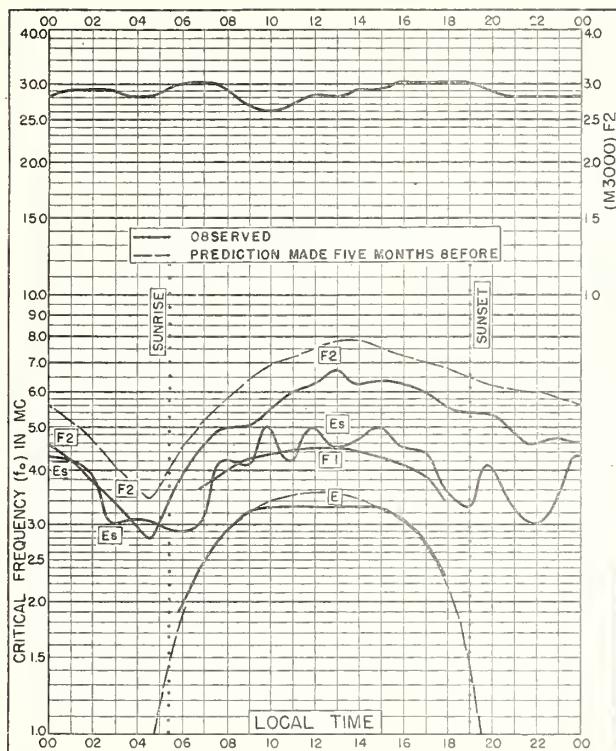


Fig. 89. WATHEROO, W. AUSTRALIA
30.3° S, 115.9° E JANUARY 1952

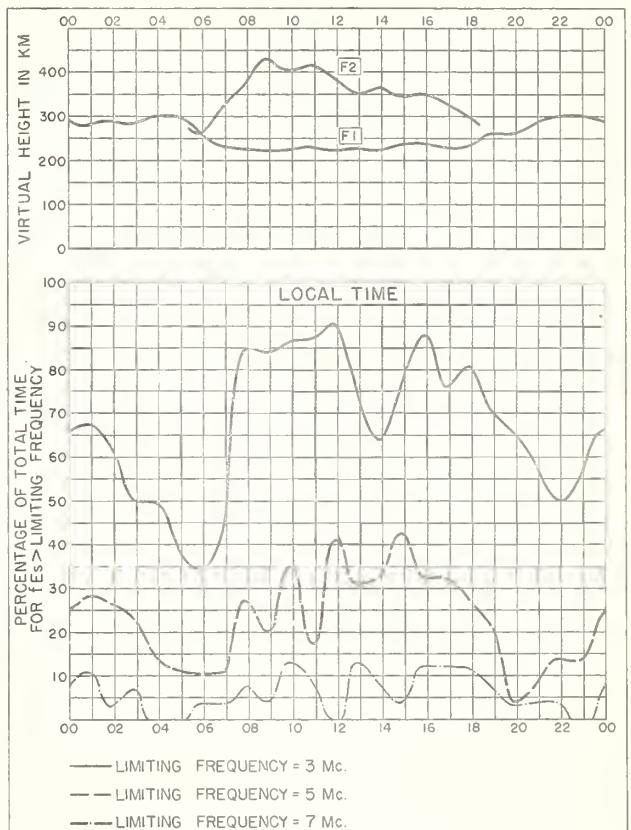


Fig. 90. WATHEROO, W. AUSTRALIA JANUARY 1952

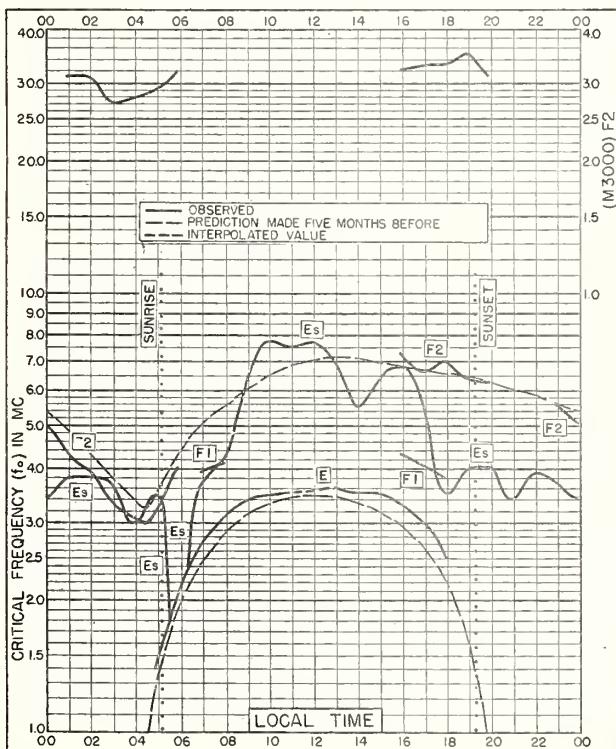


Fig. 91. CANBERRA, AUSTRALIA
35.3° S, 149.0° E JANUARY 1952

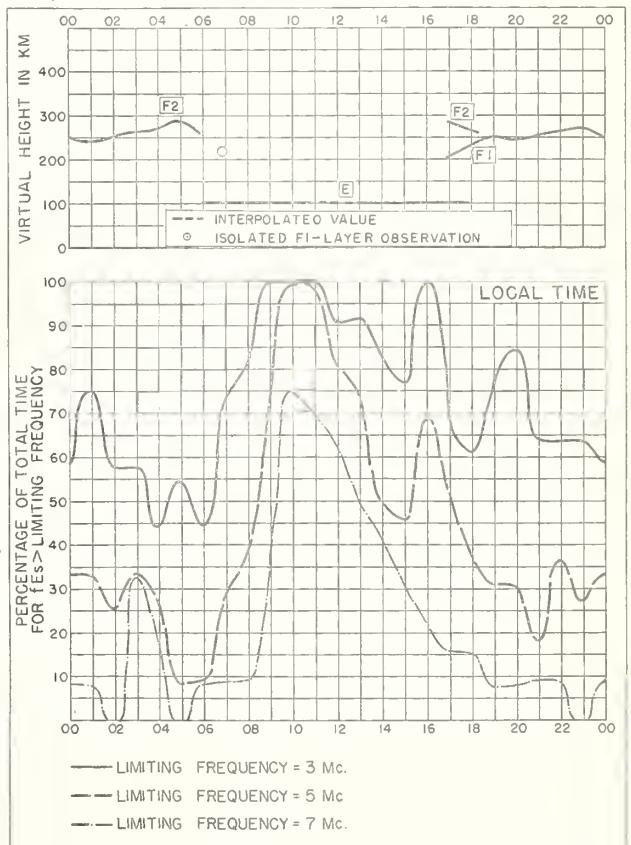


Fig. 92. CANBERRA, AUSTRALIA JANUARY 1952

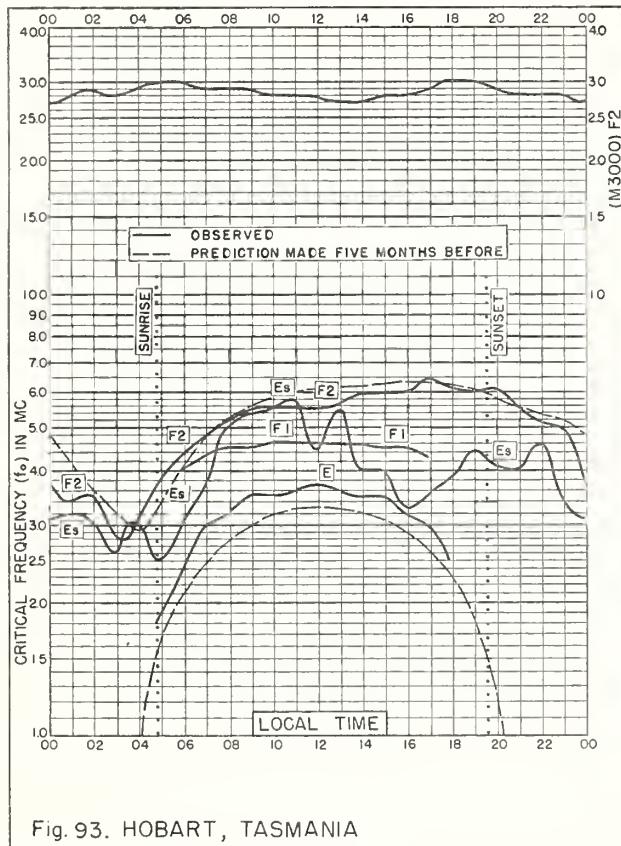


Fig. 93. HOBART, TASMANIA
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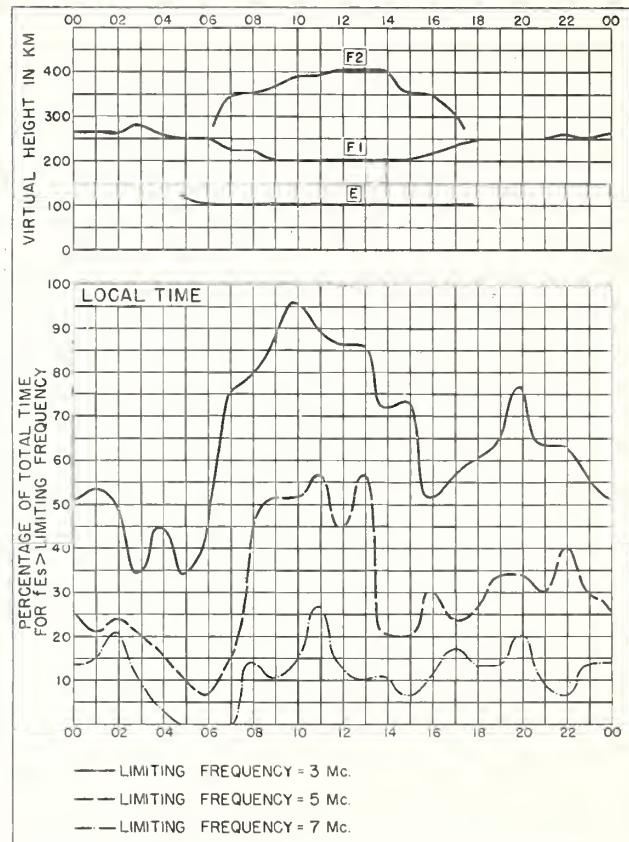


Fig. 94. HOBART, TASMANIA JANUARY 1952

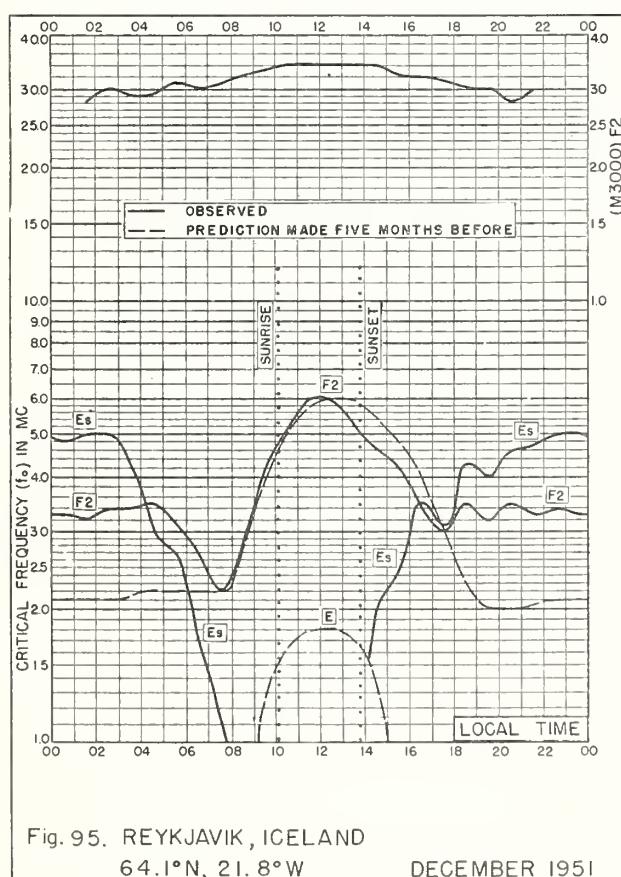


Fig. 95. REYKJAVIK, ICELAND
64.1°N, 21.8°W DECEMBER 1951

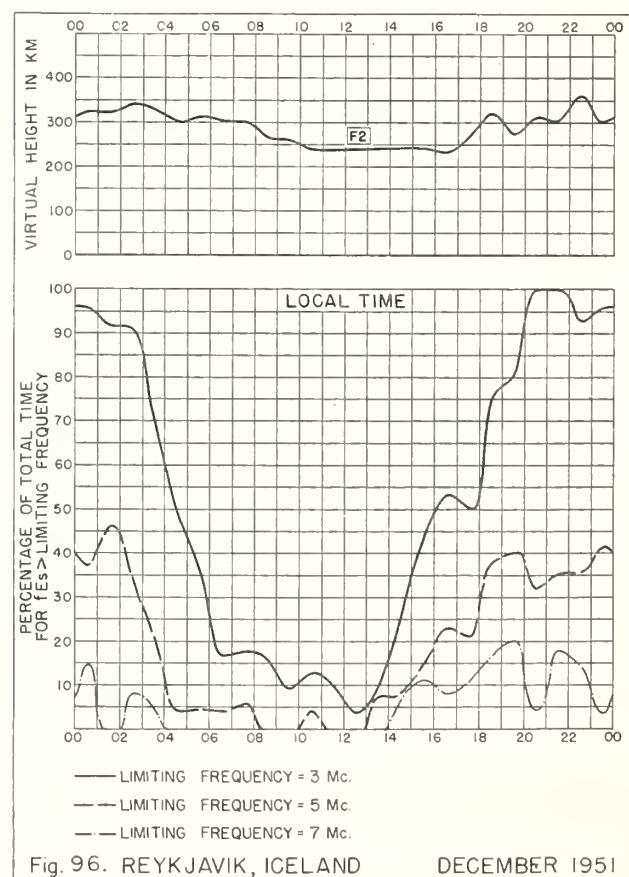


Fig. 96. REYKJAVIK, ICELAND DECEMBER 1951

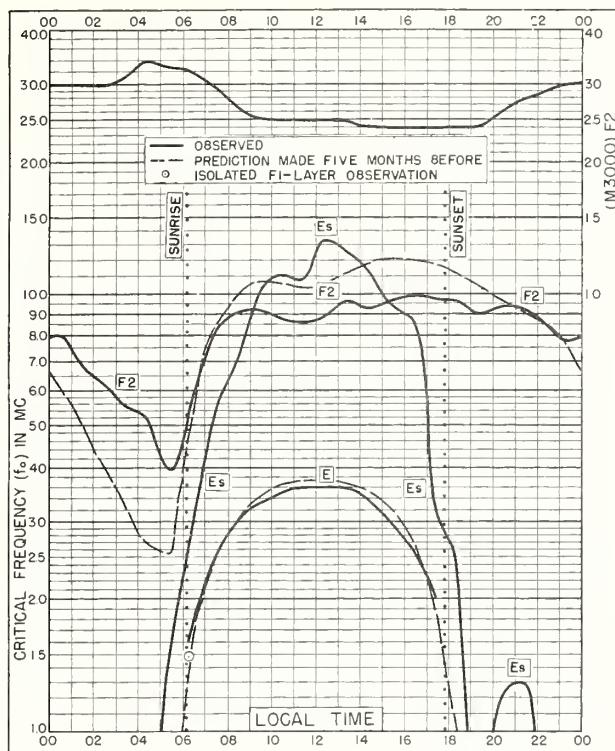


Fig. 97. IBADAN, NIGERIA
7.4°N, 4.0°E DECEMBER 1951

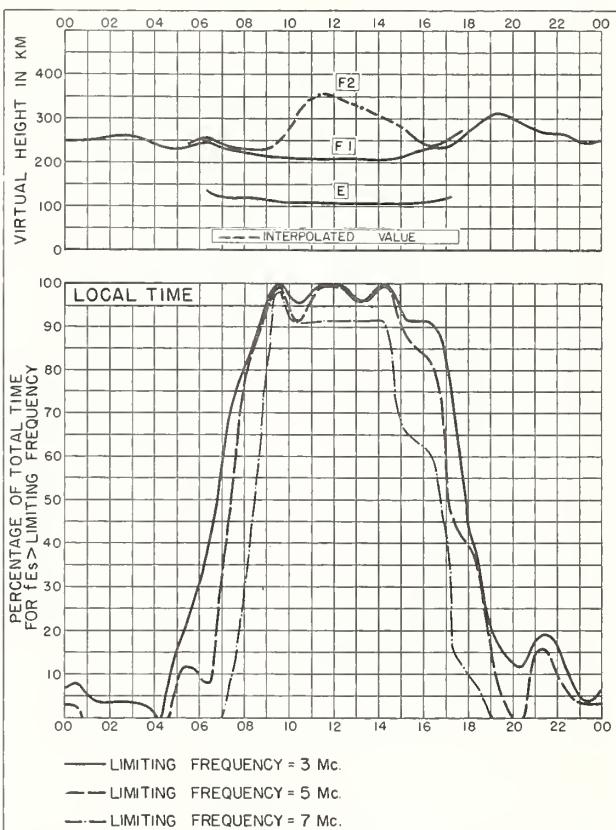


Fig. 98. IBADAN, NIGERIA DECEMBER 1951

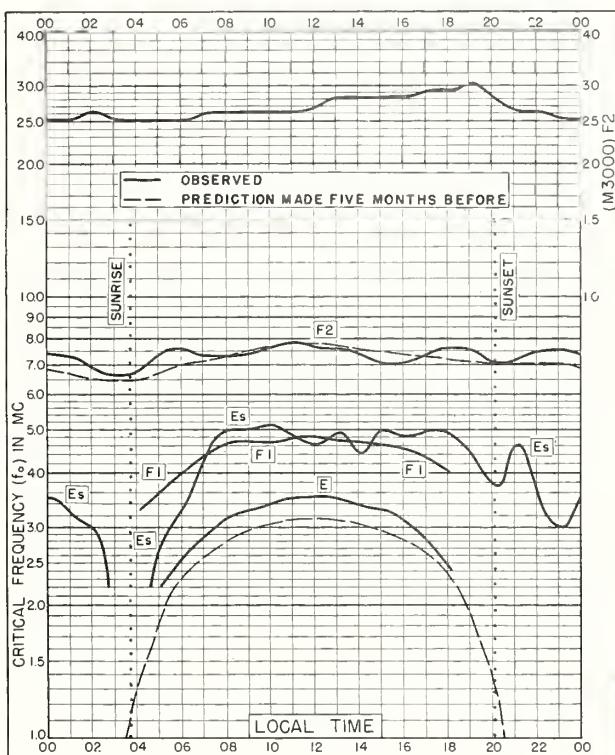


Fig. 99. FALKLAND IS.
51.7°S, 57.8°W DECEMBER 1951

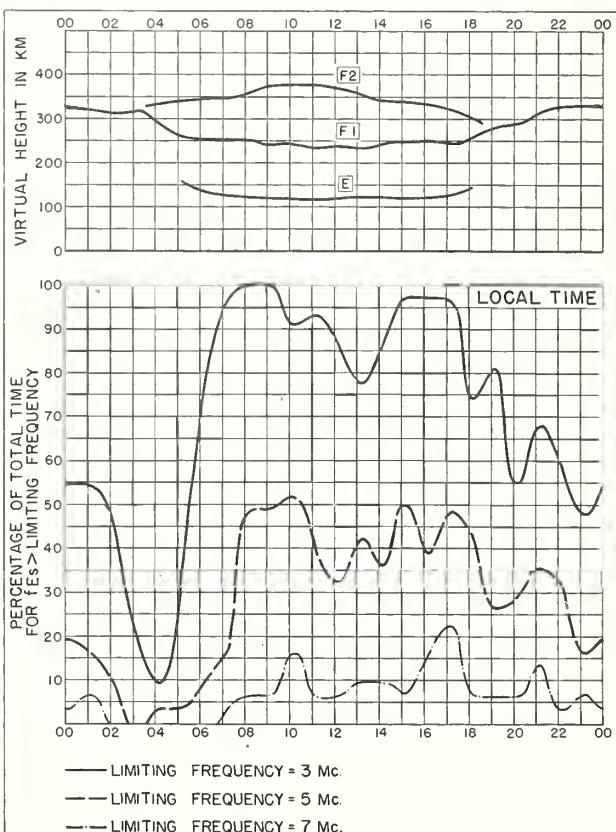


Fig. 100. FALKLAND IS. DECEMBER 1951

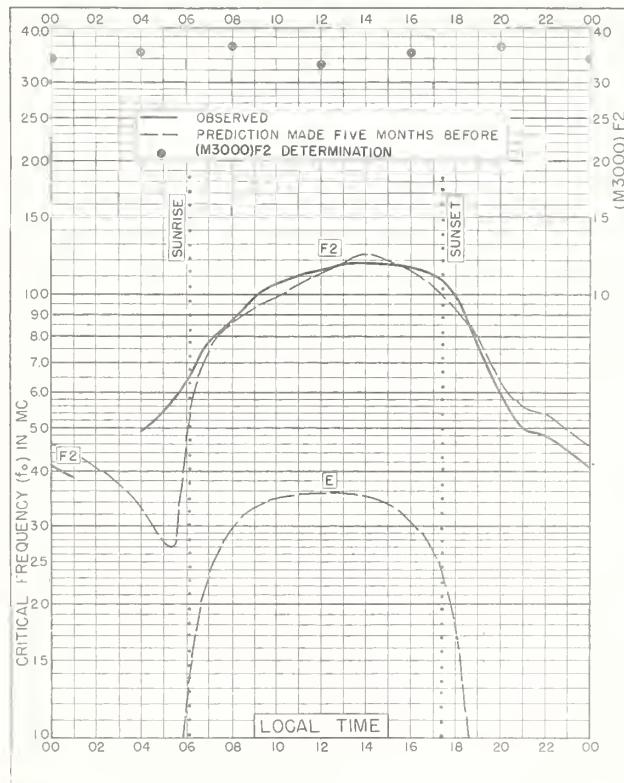


Fig. 101. DELHI, INDIA

28.6°N, 77.1°E

OCTOBER 1951

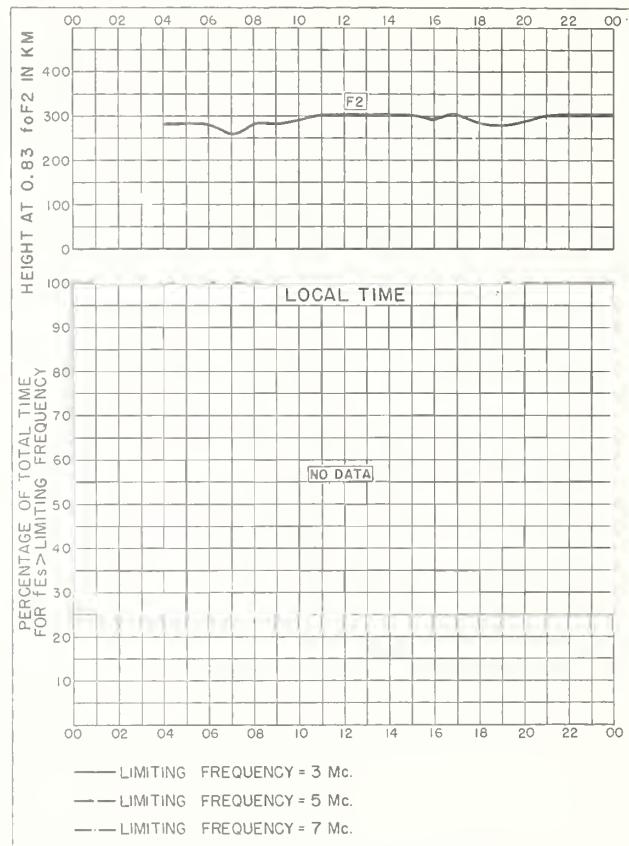


Fig. 102. DELHI, INDIA

OCTOBER 1951

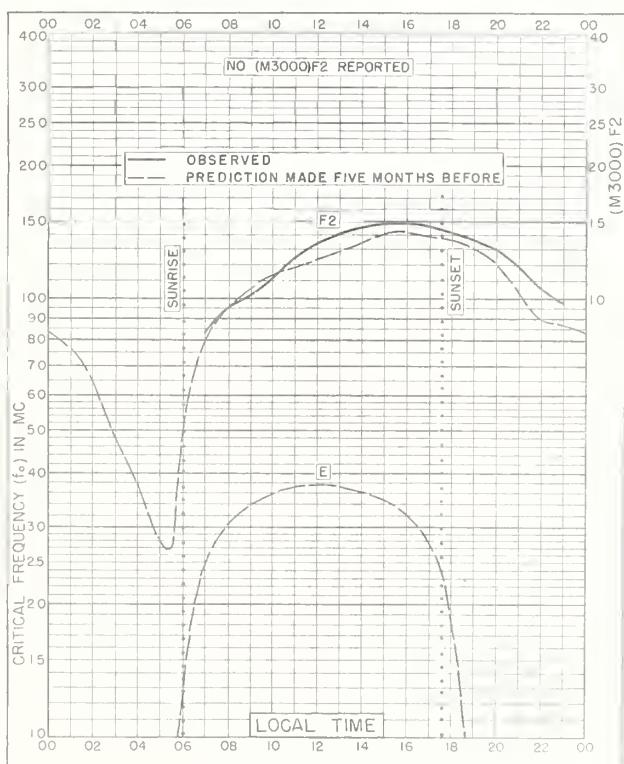


Fig. 103. BOMBAY, INDIA

19.0°N, 73.0°E

OCTOBER 1951

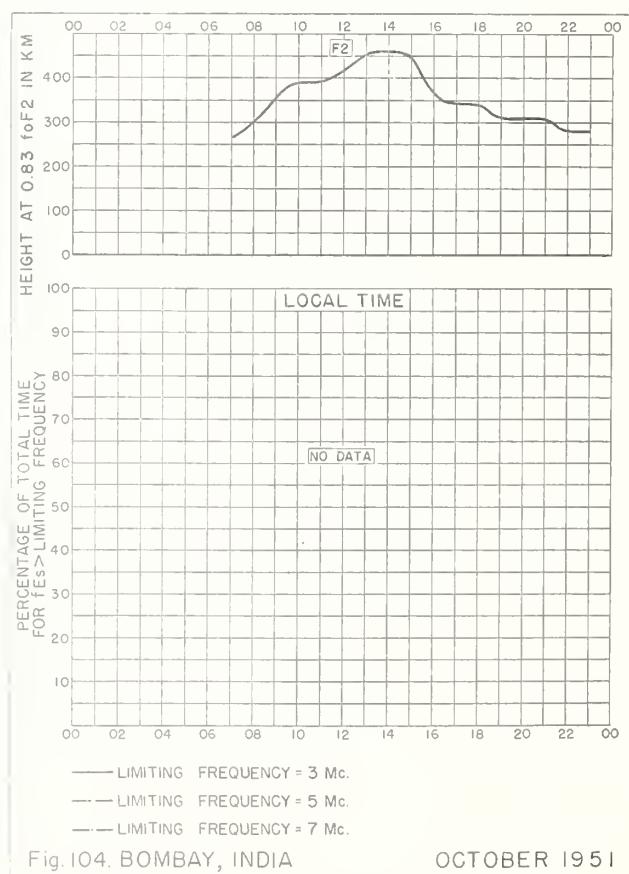
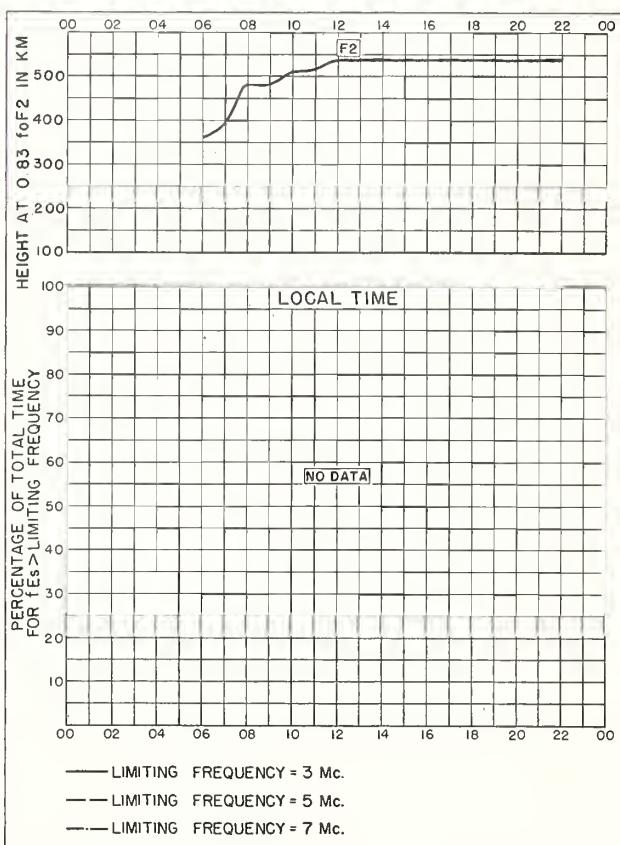
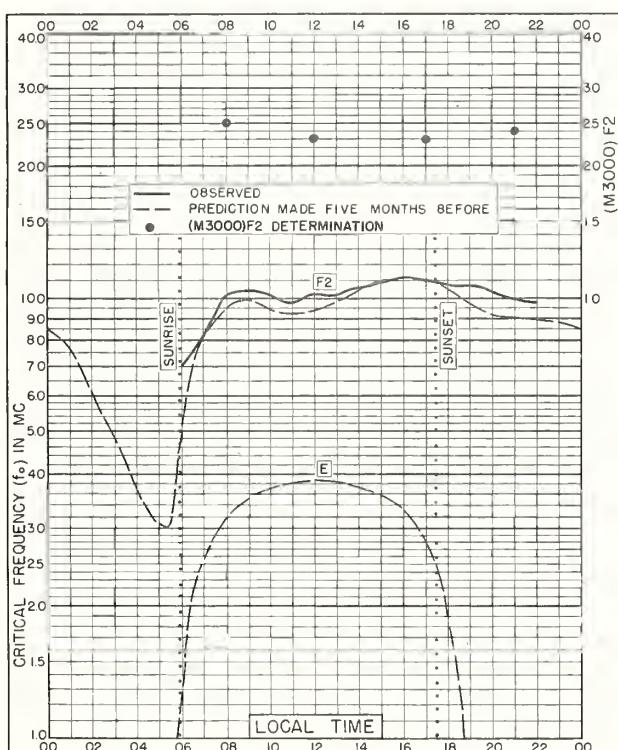
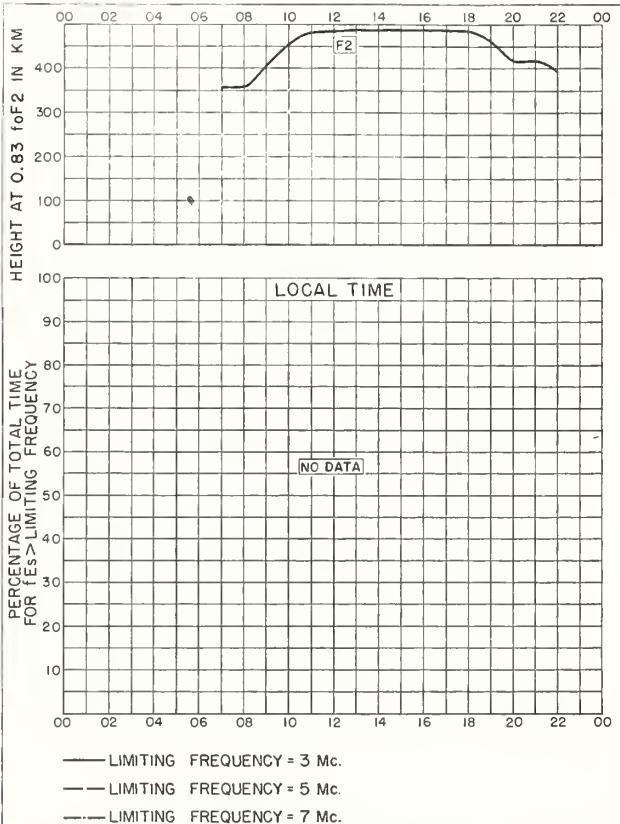
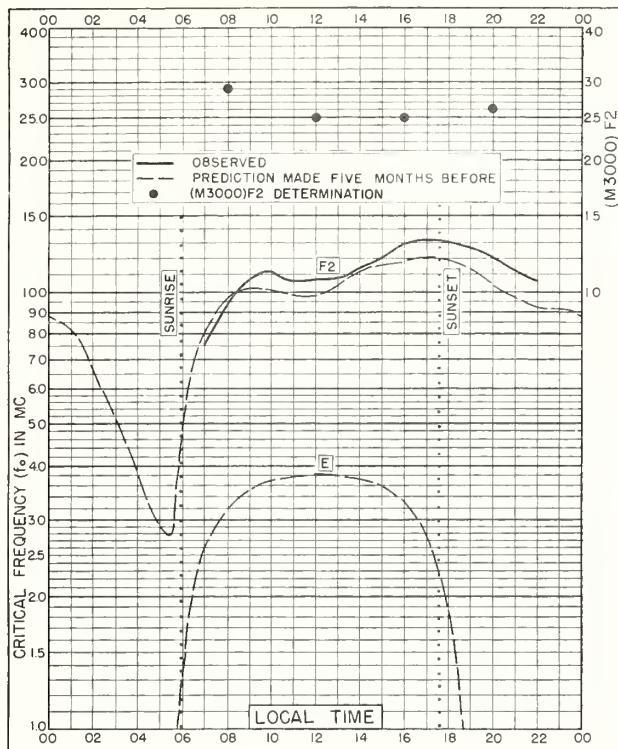


Fig. 104. BOMBAY, INDIA

OCTOBER 1951



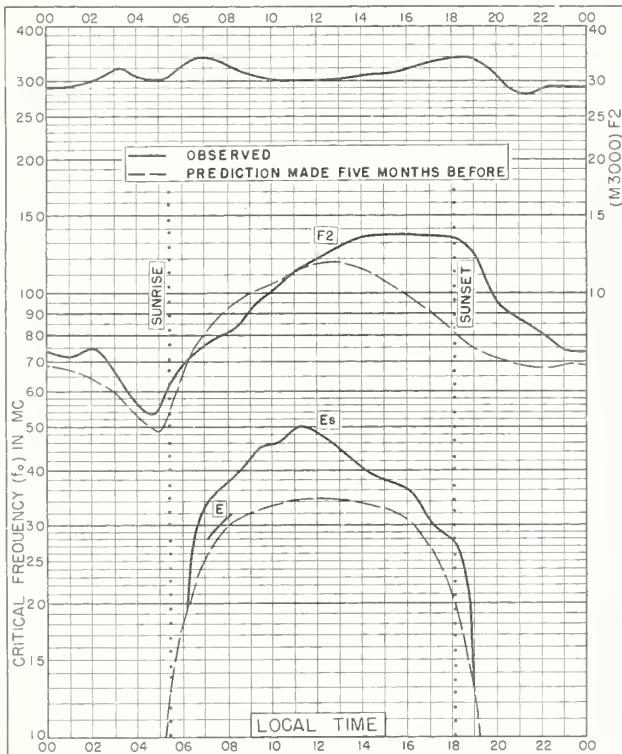


Fig. 109. BUENOS AIRES, ARGENTINA
34. 5°S, 58. 5°W OCTOBER 1951

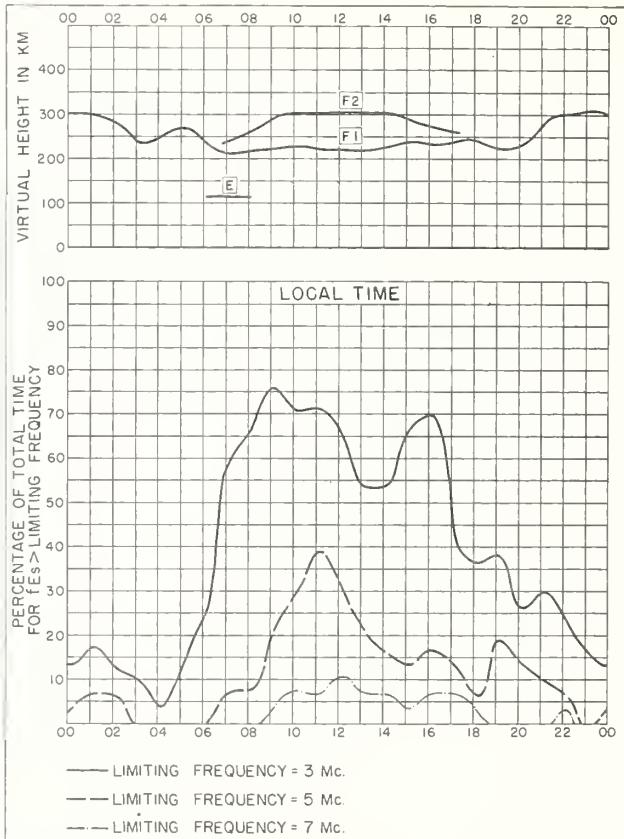


Fig. 110. BUENOS AIRES, ARGENTINA OCTOBER 1951

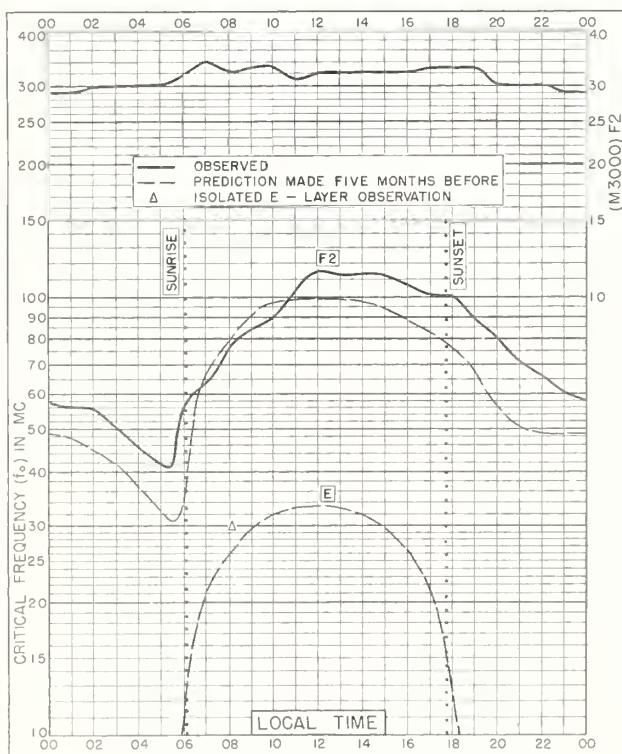


Fig. 111. BUENOS AIRES, ARGENTINA
34. 5°S, 58. 5°W SEPTEMBER 1951

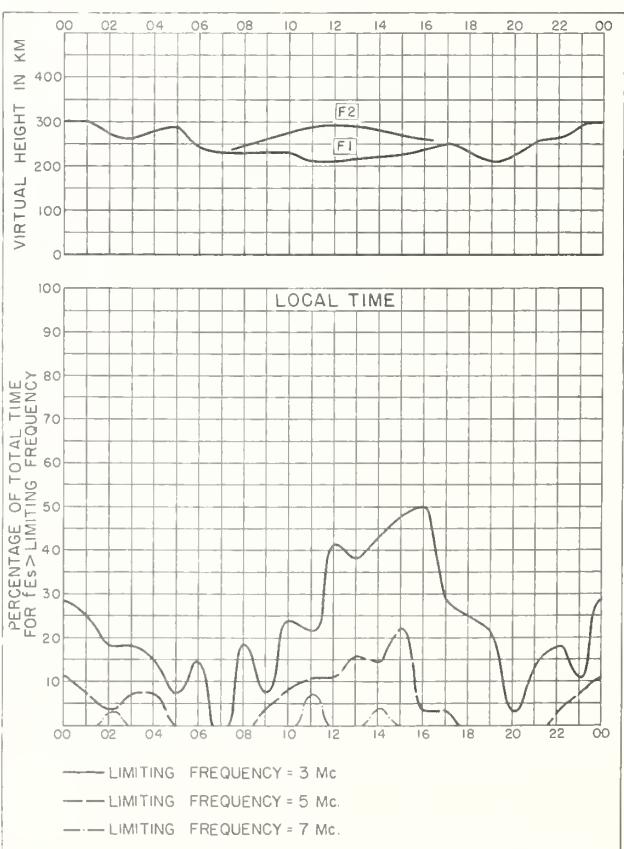


Fig. 112. BUENOS AIRES, ARGENTINA SEPTEMBER 1951

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CRPL and IRPL Reports

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

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

Weekly:

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

Semimonthly:

CRPL—Ja. Semimonthly Frequency Revision Factors For CRPL Basic Radio Propagation Prediction Reports.

Monthly:

CRPL—D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11-499-, monthly supplements to TM 11-499; Dept. of the Navy, DNC 13 () series; Dept. of the Air Force, TO 16-1B-2 series.)

CRPL—F. Ionospheric Data.

*IRPL—A. Recommended Frequency Bands for Ships and Aircraft in the Atlantic and Pacific.

*IRPL—H. Frequency Guide for Operating Personnel.

Circulars of the National Bureau of Standards:

NBS Circular 462. Ionospheric Radio Propagation.

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

Reports issued in past:

IRPL—C61. Report of the International Radio Propagation Conference, 17 April to 5 May 1944.

IRPL—G1 through G12. Correlation of D. F. Errors With Ionospheric Conditions.

IRPL—R. Nonscheduled reports:

R4. Methods Used by IRPL for the Prediction of Ionosphere Characteristics and Maximum Usable Frequencies.

R5. Criteria for Ionospheric Storminess.

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

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

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

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

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

**R12. Short Time Variations in Ionospheric Characteristics.

R14. A Graphical Method for Calculating Ground Reflection Coefficients.

**R15. Predicted Limits for F2-Layer Radio Transmission Throughout the Solar Cycle.

**R17. Japanese Ionospheric Data—1943.

R18. Comparison of Geomagnetic Records and North Atlantic Radio Propagation Quality Figures—October 1943 Through May 1945.

**R21. Notes on the Preparation of Skip-Distance and MUF Charts for Use by Direction-Finder Stations. (For distances out to 4000 km.)

**R23. Solar-Cycle Data for Correlation with Radio Propagation Phenomena.

**R24. Relations Between Band Width, Pulse Shape and Usefulness of Pulses in the Loran System.

**R25. The Prediction of Solar Activity as a Basis for the Prediction of Radio Propagation Phenomena.

**R26. The Ionosphere as a Measure of Solar Activity.

R27. Relationships Between Radio Propagation Disturbance and Central Meridian Passage of Sunspots Grouped by Distance From Center of Disc.

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