

CRPL-F 127

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IONOSPHERIC DATA

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CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

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 foF2 (and foE near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of h'F2 (and h'E near sunrise and sunset) missing for this reason are counted usually 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 foF2, as equal to or less than foF1.
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 limit 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:

<u>Month</u>	<u>Predicted Sunspot Number</u>										
	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945
December	11	15	33	53	86	108	114	126	85	38	
November	10	16	38	52	87	112	115	124	83	36	
October	10	17	43	52	90	114	116	119	81	23	
September	8	18	46	54	91	115	117	121	79	22	
August	8	18	49	57	96	111	123	122	77	20	
July	8	20	51	60	101	108	125	116	73		
June	9	21	52	63	103	108	129	112	67		
May	10	22	52	68	102	108	130	109	67		
April	10	24	52	74	101	109	133	107	62		
March	11	27	52	78	103	111	133	105	51		
February	14	12	29	51	82	103	113	133	90	46	
January	12	14	30	53	85	105	112	130	88	42	

WORLD - WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 78 and figures 1 to 156 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Commonwealth of Australia, Ionospheric Prediction Service of the Commonwealth Observatory:

Brisbane, Australia
 Canberra, Australia
 Hobart, Tasmania
 Townsville, Australia

Commonwealth of Australia, Department of External Affairs:
 Macquarie I.

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

University of Graz:
 Graz, Austria

Meteorological Service of the Belgian Congo and Ruanda-Urundi:
 Leopoldville, Belgian Congo

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

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

Defence Research Board, Canada:

Baker Lake, Canada
Churchill, Canada
Ottawa, Canada
Resolute Bay, Canada
Winnipeg, Canada

Radio Wave Research Laboratories, National Taiwan University,

Taipeh, Formosa, China:
Formosa, China

Danish National Committee of URSI:

Godhavn, Greenland

Institute for Ionospheric Research, Lindau Über Northeim, Hannover,
Germany:

Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:

De Bilt, Holland

Ministry of Postal Services, Radio Research Laboratories, Tokyo,
Japan:

Akita, Japan
Tokyo (Kokubunji), Japan
Wakkanai, Japan
Yamagawa, Japan

Christchurch Geophysical Observatory, New Zealand Department of
Scientific and Industrial Research:

Christchurch, New Zealand
Rarotonga, Cook Is.

Norwegian Defence Research Establishment, Kjeller per Lillestrom,
Norway:

Oslo, Norway

Manila Observatory:

Baguio, P. I.

South African Council for Scientific and Industrial Research:

Capetown, Union of South Africa
Johannesburg, Union of South Africa
Nairobi, Kenya (East African Meteorological Department)

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

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

Royal Board of Swedish Telegraphs, Radio Department, Stockholm,
Sweden:
Lulea, Sweden

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

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

National Bureau of Standards (Central Radio Propagation Laboratory):

Anchorage, Alaska
Fairbanks, Alaska (Geophysical Institute of the University
of Alaska)
Guam J.
Huancayo, Peru (Instituto Geofisico de Huancayo)
Maui, Hawaii
Narsarssuak, Greenland
Panama Canal Zone
Puerto Rico, W. I.
San Francisco, California (Stanford University)
Washington, D. C.

HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 79 through 90 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 91 presents ionosphere character figures for Washington, D. C., during February 1955, 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.

SUDDEN IONOSPHERE DISTURBANCES

Table 92 shows that no sudden ionosphere disturbances were observed at Ft. Belvoir, Virginia, during the month of February 1955. Table 93 lists the sudden ionosphere disturbances observed in the Netherlands for January 1955.

RADIO PROPAGATION QUALITY FIGURES

Tables 94a and 94b give for January 1955 the radio propagation quality figures for the North Atlantic area, the relevant CRPL advance and short-term forecasts, a summary geomagnetic activity index and sundry comparisons, specifically as follows:

- (a) radio propagation quality figures, Q_a, separately for each 6-hour interval of the Greenwich day, viz., 00-06, 06-12, 12-18, 18-24 hours UT (Universal Time or GCT).
- (b) whole-day radio quality indices (beginning October 1952). Each index is a weighted average of the four quarter-day Q_a-figures, before rounding off, with half weight given to quality grades 5 and 6. This procedure tends to give whole-day indices suitable for comparison with whole-day advance forecasts which designate whenever possible the days when significant disturbance or unusually quiet conditions will occur.
- (c) short-term forecasts, issued by CRPL every six hours (nominally one hour before 00^h, 06^h, 12^h, 18^h UT) and applicable to the period 1 to 13 (especially 1 to 7) hours ahead. Note that new scoring rules have been adopted beginning with October 1952 data.
- (d) advance forecasts, issued semiweekly (CRPL-J reports) and applicable 1 to 3 or 4 days ahead, 4 or 5 to 7 days ahead, and 8 to 25 days ahead. These forecasts are scored against the whole-day quality indices.
- (e) half-day averages of the geomagnetic K indices measured by the Cheltenham Magnetic Observatory of the U. S. Coast and Geodetic Survey.
- (f) illustration of the comparison of short-term forecasts with Q_a-figures and also with estimates of radio quality based on CRPL observations only.
- (g) illustration of the outcome of advance forecasts (1 to 3 or 4 days ahead) and, for comparison, the outcome of a type of "blind" forecast. For the latter the frequency for each quality grade, as determined from the distribution of quality grades in the four most recent months of the current season, is partitioned among the grades observed in the current month in proportion to the frequencies observed in the current month.

These radio propagation quality figures, Qa, are prepared from radio traffic data reported to CRPL by American Telephone and Telegraph Company, Mackay Radio and Telegraph Company, RCA Communications, Inc., Marconi Company, British Admiralty Signal and Radar Establishment, and the following agencies of the U. S. Government:--Coast Guard, Navy, Army Signal Corps, and U. S. Information Agency. The method of calculation, summarized below, is similar to that described in a 1946 report, IRPL-R31, now out of print. Only reports of radio transmission on North Atlantic paths closely approximating New York-London are included in the estimation of quality.

The original reports are submitted on various scales and for various time intervals. The observations for each 6-hour interval are averaged on the quality scale of the original reports. These 6-hour indices are then adjusted to the 1 to 9 quality-figure scale by a conversion table 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 originally 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. The 6-hourly quality figures are (subjectively) weighted means of the reports received for that period. These 6-hourly quality figures replace, beginning January 1953, the half-daily quality figures which formerly appeared in this table. (These forecasts and quality indices are prepared by the North Atlantic Radio Warning Service, the CRPL forecasting center at Ft. Belvoir, Virginia.)

These quality figures are, in effect, a consensus of reported radio propagation conditions. The reasons for low quality are not necessarily known and may not be limited to ionospheric storminess. 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.

Note: A tabulation of forecasts for the North Pacific area and comparisons with observed radio propagation conditions will appear in a later issue.

OBSERVATIONS OF THE SOLAR CORONA

Tables 97 through 99 give the observations of the solar corona during February 1955, obtained at Climax, Colorado, by the High Altitude Observatory of Harvard University and the University of Colorado. Tables 100 through 102 list the coronal observations obtained at

Sacramento Peak, New Mexico, during February 1955, derived by Harvard College Observatory as a part of its performance of a research contract with the Upper Air Research Observatory, Geophysical Research Directorate, Air Force Cambridge Research Center. 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.

Beginning with January 1, 1955, the Climax, Colorado, coronal measurements are reported in absolute units rather than on the arbitrary relative scale that has been used in the past. Absolute intensities are given in millionths of the intensity in one angstrom of the spectrum of the center of the solar disk at the wavelength of the coronal line. The conversion tables from arbitrary relative to absolute units are published in this issue. Table 95 gives the green-line conversions to absolute units applicable for all readings made since 1943. Table 96 gives the red-line conversions applicable for the years 1952 to present. For earlier years a table is available from the High Altitude Observatory, Boulder, Colorado, showing changes in red-green sensitivity. Absolute yellow-line ($\lambda 5694$) intensities may be obtained approximately by multiplying the values in the $\lambda 5303$ table by 0.75. Absolute far red ($\lambda 6702$) may be obtained approximately by multiplying the values in the $\lambda 6374$ table by 0.9.

The Sacramento Peak measurements will continue to be on an arbitrary relative scale.

Table 97 gives the intensities of the green (5303A) line of the emission spectrum of the solar corona; table 98 gives similarly the intensities of the first red (6374A) coronal line; and table 99, the intensities of the second red (6702A) coronal line; all observed at Climax in February 1955.

Table 100 gives the intensities of the green (5303A) coronal line; table 101, the intensities of the first red (6374A) coronal line; and table 102, the intensities of the second red (6702A) coronal line; all observed at Sacramento Peak in February 1955.

The following symbols are used in tables 97 through 102; a, observation of low weight for whole limb (if in date column) or for portion of limb indicated; -, corona not visible; and X, no observation for whole limb (if in date column) or for portion of limb indicated.

RELATIVE SUNSPOT NUMBERS

Table 103 lists the daily provisional Zürich relative sunspot number, RZ, for February 1955, as communicated by the Swiss Federal Observatory. Table 104 contains the daily American relative sunspot number, RA^o, for January 1955, as compiled by the Solar Division, American Association of Variable Star Observers.

OBSERVATIONS OF SOLAR FLARES

Table 105 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).

INDICES OF GEOMAGNETIC ACTIVITY

Table 106 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) daily "equivalent amplitude" A_p; (4) 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 three criteria: (1) the sum of the eight K_p's; (2) the greatest K_p; and (3) the sum 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.

A_p indicates magnetic activity on a linear scale rather than the quasi-logarithmic scale of the K-indices. The column headed A_p gives the daily average for the eight values a_p per day, where a_p is defined as one-half the average gamma range of the most disturbed of the three force components, in the three-hour interval at standard stations. A_p is computed from the 8 indices K_p per day, see IATME Bulletin No. 12h (for 1953), p. VIII f. Values of A_p (like K_p and C_p) have been published for the Polar Year 1932/33 and currently since January 1937.

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. Current tables are also published quarterly in the Journal of Geophysical Research along with data on sudden commencements (sc) and solar flare effects (sfe).

ERRATA

- (1) San Francisco, December and October 1954. Graphs of Percentage of Total Time for fEs >3 Mc (Fig. 6 of F126 and Fig. 10 of F124) should be modified as follows (no change at other hours).

Local Time	02	03	06	09	10	11	12	13	14	15	16	19	22	23		
Pctge, Dec. '54	42	36	65	77	79	68	68	65	73	75			48			
Pctge, Oct. '54							79	60	46	41	51	56	70	44	14	35

- (2) San Francisco, October 1954. In Table 5 of F124 at 1300, fEs column, change 3.8 to G; at 1400, change (3.6) to (3.3). Make corresponding changes in Fig. 9 of F124.

Table 13

Panama Canal Zone (9.4°N, 79.9°W)								January 1955	
Time	h ¹ F2	f _o F2	h ¹ F1	f _o F1	h ¹ E	f _o E	f _{Es}	(M3000)F2	
00	280	(3.3)			2.6	(3.1)			
01	250	(3.2)			3.1	(3.3)			
02	230	3.4			3.0	3.4			
03	240	2.7			3.1	3.4			
04	260	2.4			3.6	3.1			
05	280	(2.5)			3.2	3.0			
06	280	2.4			2.2	3.1			
07	250	4.7	---	---	2.0	3.1	3.5		
08	270	5.0	230	3.7	120	2.4	4.2	3.4	
09	290	6.7	220	4.3	110	2.9	4.3	3.2	
10	300	7.8	200	4.4	110	3.1	4.6	3.2	
11	300	7.4	200	4.4	110	3.3	5.1	3.1	
12	340	7.9	220	4.5	110	3.4	5.1	2.9	
13	320	8.6	220	4.5	110	3.4	4.7	3.0	
14	320	0.9	210	4.4	110	3.3	4.7	3.0	
15	290	8.8	230	4.3	110	3.1	4.6	3.2	
16	280	6.3	240	4.1	110	2.9	4.4	3.3	
17	250	7.2	240	(3.6)	120	2.4	4.3	3.5	
18	230	5.5		---	---	3.3	3.6		
19	230	3.8				3.1	3.45		
20	240	3.0				3.1	3.3		
21	290	3.0				2.7	3.0		
22	290	3.0				2.7	2.9		
23	300	3.1				2.5	3.0		

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 14

Leopoldville, Belgian Congo (4.3°S, 15.3°E)								January 1955	
Time	h ¹ F2	f _o F2	h ¹ F1	f _o F1	h ¹ E	f _o E	f _{Es}	(M3000)F2	
00	260	3.8							2.3
01	265	3.5							2.4
02	250	3.2							2.5
03	260	2.6							2.4
04	255	2.3							2.6
05	250	3.4							2.4
06	260	5.1	230	---	115	2.2	3.1	2.6	
07	310	5.6	220	4.0	110	2.6	3.6	2.4	
08	375	6.0	215	4.3	110	3.1	3.6	2.1	
09	410	7.0	205	4.4	110	3.3	3.1	2.0	
10	375	8.3	200	4.4	110	3.4	3.4	2.0	
11	365	9.6	200	4.5	110	3.5	3.0	2.1	
12	360	9.8	200	4.5	105	3.5		2.1	
13	350	9.5	200	4.4	110	3.4	2.7	2.1	
14	355	9.0	220	4.2	110	3.2	3.5	2.1	
15	345	8.5	220	4.1	110	2.9	3.2	2.1	
16	340	8.2	235	(3.9)	110	2.4	3.0	2.1	
17	310	8.2	250	---	---	---	2.9	2.1	
18	280	8.0						2.5	
19	260	7.7						2.2	
20	250	7.4						1.6	
21	230	6.6						2.1	
22	215	5.8						2.6	
23	220	4.5						2.4	

Time: 0.0°.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 15

Resolute Bay, Canada (74.7°N, 94.9°W)								December 1954	
Time	h ¹ F2	f _o F2	h ¹ F1	f _o F1	h ¹ E	f _o E	f _{Es}	(M3000)F2	
00	260	2.3			5.0	3.3			
01	270	2.4			4.4	3.2			
02	260	2.3			4.5	3.2			
03	260	2.3			5.0	3.2			
04	260	2.3			5.0	(3.2)			
05	250	2.3			4.0	3.3			
06	260	2.3			4.0	3.2			
07	260	2.5			4.3	3.2			
08	250	2.8			4.3	3.2			
09	250	2.9			4.2	3.2			
10	250	3.0			4.6	3.2			
11	240	3.1			4.9	3.3			
12	240	3.2			4.3	3.2			
13	240	3.5			3.6	3.2			
14	230	3.5			2.9	3.3			
15	250	3.2			4.0	3.2			
16	240	3.2			4.0	(3.2)			
17	240	3.0			3.0	3.2			
18	250	3.0			2.0	(3.2)			
19	240	3.0			3.0	3.1			
20	250	2.7			4.0	3.2			
21	250	2.7			3.8	3.25			
22	260	2.3			4.0	3.25			
23	250	2.4			4.0	(3.3)			

Time: 90.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

Kiruna, Sweden (67.6°N, 20.3°E)								December 1954	
Time	h ¹ F2	f _o F2	h ¹ F1	f _o F1	h ¹ E	f _o E	f _{Es}	(M3000)F2	
00	310	2.2						2.8	3.1
01	310	2.2						2.4	3.05
02	320	2.4						1.9	3.0
03	300	2.3						2.0	3.05
04	310	2.1						1.4	3.1
05	(300)	2.2						2.0	3.1
06	---	---						2.0	---
07	---	---						(3.1)	---
08	(310)	(2.0)							(3.1)
09	250	2.4							3.3
10	220	3.3							3.5
11	215	3.9							3.5
12	210	4.0							3.5
13	210	3.9							3.5
14	210	3.2							3.5
15	240	2.4							3.5
16	220	3.1							3.5
17	240	2.1							3.4
18	260	(1.5)						4.3	(3.15)
19	(300)	---						3.1	---
20	---	---						4.5	---
21	(540)	---						4.5	---
22	(320)	---						4.5	---
23	(340)	(2.4)						4.5	---

Time: 15.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 18

Fairbanks, Alaska (64.9°N, 147.0°W)								December 1954	
Time	h ¹ F2	f _o F2	h ¹ F1	f _o F1	h ¹ E	f _o E	f _{Es}	(M3000)F2	
00	290	(2.6)						4.9	(3.2)
01	300	(2.4)						5.8	(3.1)
02	330	(2.8)						5.9	(2.9)
03	320	(2.8)						6.0	(3.0)
04	340	(2.6)						5.2	(2.9)
05	310	(2.1)						5.4	(3.0)
06	300	(1.8)						4.4	(3.0)
07	310	(1.5)						4.5	(2.9)
08	320	(1.6)						4.2	(2.8)
09	240	(2.7)						4.1	(3.3)
10	220	3.8						2.2	3.5
11	220	4.5						2.5	3.5
12	220	4.8	---	---	4.0			3.6	
13	210	4.8			150	(1.2)	2.8	3.5	
14	210	4.2						2.6	3.5
15	220	3.5						1.8	3.4
16	240	2.0							3.3
17	240	2.1						3.2	3.4
18	260	(1.5)						4.3	---
19	(300)	---						3.1	---
20	---	---						4.5	---
21	(540)	---						4.5	---
22	(320)	---						4.5	---
23	(340)	(2.4)						4.5	---

Time: 15.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 25

Anch., Alaska (51.9°N, 176.6°W)		December 1954							
Time		h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00		240	2.9			2.6	3.1		
01		260	2.8			2.2	3.1		
02		250	2.7			2.3	3.1		
03		260	2.7			1.7	3.0		
04		250	2.8			2.4	3.1		
05		240	2.8			2.1	3.1		
06		220	2.8			2.4	3.4		
07		230	2.5			---	3.0	3.4	
08		210	4.2		120	1.6	2.7	3.6	
09		220	5.3	220	---	130	1.9	2.7	3.6
10		230	5.7	210	2.9	120	2.1	2.1	3.6
11		230	6.0	220	3.2	110	2.3	3.4	3.6
12		220	5.9	220	---	120	2.3	2.8	3.6
13		220	5.9	220	2.7	120	2.2	2.6	3.7
14		220	5.5	220	---	120	2.0	1.7	3.6
15		210	4.7	---	---	130	1.6	2.0	3.7
16		210	3.7	---	---	---	---	3.2	3.6
17		220	2.7					2.9	3.5
18		220	2.1					2.4	3.5
19		230	2.0					2.7	3.5
20		230	2.1					2.6	3.3
21		260	2.4					2.7	3.1
22		260	2.7					2.4	3.1
23		250	2.9					2.6	3.1

Time: 100.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 27

Winnipeg, Canada (49.9°N, 97.4°W)		December 1954							
Time		h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00		(400)	2.0					---	
01		(380)	2.0					3.0	---
02		---	2.0					3.9	---
03		(320)	2.1					4.0	---
04		---	1.9					4.0	---
05		---	2.0					4.0	---
06		(300)	2.0					4.0	(3.3)
07		320	2.1					3.6	(3.0)
08		250	2.7						3.2
09		230	4.2	230	---	140	1.9		3.5
10		240	5.0	220	---	120	2.2		3.5
11		250	5.6	230	3.2	120	2.4		3.5
12		250	5.9	220	3.5	120	2.5		3.5
13		240	6.1	220	3.5	120	2.5		3.5
14		240	6.0	230	3.2	120	2.4		3.5
15		230	5.8	230	---	130	2.1		3.5
16		220	5.3			120	1.8		3.5
17		220	4.5					3.4	
18		230	3.3					3.3	
19		250	2.5					3.3	
20		290	2.0					3.2	
21		(310)	1.9					(3.0)	
22		(340)	1.8					---	
23		(350)	2.0					---	

Time: 90.0°W.

Sweep: 1.0 Mc to 10.0 Mc in 16 seconds.

Table 29

Schwarzenburg, Switzerland (46.8°N, 7.3°E)		December 1954							
Time		h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00		260	3.1					3.4	
01		260	3.0					3.4	
02		260	3.1					3.4	
03		260	3.1					3.4	
04		250	3.1					3.35	
05		240	2.7					3.6	
06		220	2.5					3.7	
07		220	2.4					3.7	
08		200	3.5					3.9	
09		200	4.6	100	2.0			4.0	
10		200	5.2	100	2.2			4.0	
11		200	5.6	100	2.4			4.0	
12		200	5.6	100	2.6			4.0	
13		200	5.4	100	2.5			4.0	
14		200	5.2	100	2.4			4.0	
15		200	5.2	100	2.1			4.0	
16		200	5.0	---	---			4.0	
17		200	3.0					4.0	
18		200	2.6					3.95	
19		240	2.7					3.7	
20		225	3.0					3.6	
21		210	3.0					3.7	
22		250	2.8					3.5	
23		260	2.9					3.4	

Time: 15.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 26

Lindau/Harz, Germany (51.6°N, 10.1°E)		December 1954							
Time		h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00		265	2.9						2.4
01		250	3.0						2.4
02		250	3.0						3.15
03		250	3.0						2.3
04		250	2.6						3.2
05		240	2.4						2.5
06		250	2.2						3.3
07		250	2.1						2.4
08		210	3.3						3.4
09		205	4.6						3.5
10		210	5.0						E
11		215	5.6						3.6
12		220	5.5						3.7
13		215	5.4						3.7
14		210	5.2						3.65
15		215	5.2						
16		205	4.5						
17		210	3.4						
18		240	2.6						
19		250	2.4						
20		250	2.6						
21		250	2.6						
22		250	2.5						
23		260	2.8						

Time: 15.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 8 minutes.

Table 28

Graz, Austria (47.1°N, 15.5°E)		December 1954							
Time		h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00		280	3.1						
01		280	3.1						
02		280	3.3						
03		290	3.2						
04		265	3.0						
05		250	2.9						
06		250	2.4						
07		240	2.7						
08		200	4.6						
09		230	5.0	230	(2.9)	120	2.2		3.5
10		240	5.4	220	(3.4)	120	2.5		3.6
11		250	6.0	210	(3.7)	110	2.6		3.5
12		240	6.0	210	3.7	110	2.7		3.6
13		240	6.0	220	3.6	110	2.6		3.5
14		240	5.8	220	3.4	110	2.4		3.5
15		230	5.9	220	2.9	120	2.2		3.5
16		220	5.3	---	---	130	(1.6)		3.5
17		220	4.4						3.4
18		230	3.4						3.3
19		250	2.7						3.2
20		280	2.2						3.1
21		300	1.9						3.1
22		320	1.9						(3.0)
23		340	1.9						(3.0)

Time: 75.0°W.

Sweep: 1.0 Mc to 15.0 Mc in 15 seconds.

Table 31
 Formosa, China (25.0°N, 121.5°E) December 1954

Time	h^F2	$foF2$	h^F1	$foF1$	h^E	foE	fEs	(M3000) $F2$
00	280	2.7					1.9	2.9
01	280	2.8					3.0	
02	260	3.0					3.1	
03	240	3.0					3.4	
04	240	2.5					3.35	
05	240	2.0					1.8	(3.0)
06	280	2.1					1.8	(2.9)
07	220	4.7						3.5
08	240	6.0	220	3.6	120	2.4	2.8	3.4
09	250	7.5	230	4.0	120	2.7	3.6	3.5
10	240	8.1	220	4.2	120	3.0	3.8	3.45
11	260	7.8	220	4.3	120	3.1	3.8	3.4
12	250	9.0	200	4.3	110	3.2	3.8	3.2
13	240	10.4	200	4.2	100	3.1	4.0	3.4
14	240	8.8	220	4.1	100	3.0	3.9	3.4
15	230	8.6	220	3.9	100	2.8	3.6	3.65
16	220	7.6	220	3.4	110	2.3	3.3	3.6
17	200	6.8					3.4	3.7
18	200	5.1					3.0	3.5
19	240	4.4					2.8	3.35
20	240	4.3					2.4	3.2
21	240	3.7					1.8	3.3
22	240	3.3						3.3
23	240	3.0						3.1

Time: 120.0°E.

Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Leopoldville, Belgian Congo (4.3°S, 153.5°E)							December 1954	
Time	h^F2	$foF2$	h^F1	$foF1$	h^E	foE	fEs	$\beta_{\text{max}} \text{ (ms)}$
00		270	1.0					1.2
01		260	3.8					2.4
02		260	3.2					2.1
03		250	3.2					2.3
04		240	2.9					2.0
05		240	4.2	240	---	130	---	2.4
06		270	5.6	225	---	115	2.3	2.6
07		310	6.1	220	4.1	110	2.9	2.4
08		345	6.8	210	4.2	110	3.1	2.7
09		360	8.0	210	4.3	105	3.3	3.0
10		390	8.7	210	4.4	110	3.4	3.4
11		390	9.0	210	4.4	105	3.4	3.0
12		390	9.6	200	4.4	110	3.4	3.4
13		370	9.4	215	4.3	110	3.3	3.6
14		350	9.3	220	4.1	110	3.1	3.4
15		350	9.2	215	4.1	110	2.7	3.4
16		340	9.2	240	3.7	115	2.2	3.0
17		270	9.2	260	---			2.9
18		260	8.8					2.3
19		280	8.2					2.2
20		250	8.8					2.4
21		220	9.2					2.7
22		205	6.0					2.7
23		230	4.6					2.35

Time: 0.0°.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

 Table 33
 Huancayo, Peru (12.0°S, 75.3°W) December 1954

Time	h^F2	$foF2$	h^F1	$foF1$	h^E	foE	fEs	(M3000) $F2$
00	300	(3.9)					3.1	
01	300	(2.5)					---	
02	290	---					---	
03	290	(2.6)					3.5	
04	270	(2.0)					3.4	
05	290	(1.4)					4.5	---
06	240	4.9			120	1.8	5.4	3.3
07	(280)	6.5	220	---	110	2.5	9.3	3.1
08	310	7.3	210	4.1	100	2.9	10.4	3.0
09	330	7.8	200	4.2	100	---	11.3	2.8
10	370	8.0	200	4.4	100	---	12.1	2.6
11	380	7.8	200	4.4	100	---	12.0	2.6
12	370	7.6	190	4.4	100	---	12.1	2.6
13	370	7.8	190	4.4	100	3.5	11.2	2.7
14	360	8.1	190	4.3	100	3.3	9.9	2.7
15	330	8.1	200	4.2	100	3.1	8.3	2.8
16	310	8.1	200	---	110	2.8	7.2	3.0
17	290	8.2	230	---	110	2.4	6.2	3.0
18	250	8.3			120	---	2.4	3.0
19	250	8.0						3.1
20	280	7.4						3.0
21	300	5.8						3.0
22	310	4.6						3.05
23	310	(3.7)						(3.0)

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

 Table 35
 Kiruna, Sweden (67.8°N, 20.3°E) November 1954

Time	h^F2	$foF2$	h^F1	$foF1$	h^E	foE	fEs	(M3000) $F2$
00	(330)	(3.0)					3.2	(3.0)
01	320	3.0					2.9	3.0
02	300	3.0					2.2	3.0
03	300	2.8					3.1	
04	305	2.3					3.0	
05	300	2.3					3.0	
06	(290)	(2.1)					3.0	
07	280	2.2					3.1	
08	240	3.0					3.3	
09	220	3.9	---	---			3.5	
10	220	4.2	---	---			3.5	
11	220	4.3	---	---			3.5	
12	220	4.8	---	---			3.5	
13	220	4.6					3.5	
14	225	4.0					3.5	
15	230	3.8					3.4	
16	250	3.1					3.3	
17	250	2.8					3.2	
18	(280)	(2.6)					3.3	(3.3)
19	(300)	(2.2)					3.2	
20	(310)	(2.8)					2.4	(3.1)
21	(360)	(2.8)					2.8	(3.0)
22	(340)	(2.2)					2.9	(3.15)
23	(355)	(2.9)					3.8	(2.8)

Time: 15.0°E.

Sweep: 0.8 Mc to 15.0 Mc in 30 seconds.

 Table 36
 Lulea, Sweden (65.6°N, 22.1°E) November 1954

Table 49

Baguio, P. I. (16.4°N, 120.6°E)							November 1954	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	220	4.4						3.5
01	220	4.0						3.5
02	210	3.6			1.6			3.6
03	200	2.4						3.7
04	220	1.8				1.6		3.4
05	270	1.8						3.0
06	250	3.4						3.3
07	230	6.0			110	2.0	2.6	3.4
08	(270)	7.3	220	---	110	2.6	3.6	3.25
09	290	8.6	210	---	110	2.9	4.0	3.2
10	300	9.4	200	---	110	3.1	4.9	2.95
11	310	9.4	200	4.3	100	3.1	6.1	2.7
12	310	9.6	200	4.3	100	3.2	5.2	2.85
13	290	9.5	200	---	100	3.1	5.2	2.9
14	290	10.0	200	---	100	3.0	5.2	3.0
15	280	10.4	200	---	110	2.6	5.9	3.2
16	240	10.3	210	---	110	2.2	4.4	3.4
17	220	9.4					3.1	3.4
18	210	8.5					3.1	3.4
19	210	7.2					4.0	3.3
20	220	6.8					3.8	3.2
21	230	6.2					3.0	3.2
22	230	5.8					2.2	3.4
23	220	5.2					3.4	

Time: 120.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 51

Johannesburg, Union of S. Africa (26.2°S, 28.1°E)							November 1954	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	<280	3.7						2.9
01	260	3.6				1.9		3.1
02	240	3.4				1.8		3.1
03	250	3.2						3.1
04	250	3.0						3.2
05	240	3.2						3.2
06	240	4.7	230	2.7	120	2.0		3.4
07	290	5.5	220	3.9	110	2.5		3.2
08	300	6.0	210	4.1	110	2.9	3.4	3.1
09	310	6.5	200	4.3	110	3.1	3.3	3.1
10	330	6.8	200	4.5	110	3.3	3.9	3.0
11	320	7.2	200	4.5	110	3.4		2.9
12	320	7.9	200	4.5	110	3.5		2.9
13	310	8.0	210	4.5	110	3.4	4.1	2.9
14	310	8.1	220	4.4	110	3.3	4.0	3.0
15	300	8.0	210	4.3	110	3.1	4.0	3.0
16	280	8.0	220	4.0	110	2.9	3.8	3.1
17	270	8.0	220	3.7	110	2.4	3.5	3.1
18	250	7.8	240	2.7	---	---	2.8	3.2
19	230	7.0					2.2	3.2
20	230	6.3					3.3	
21	220	5.0					3.2	
22	250	4.0					3.1	
23	270	3.7					3.0	

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 53

Capetown, Union of S. Africa (34.2°S, 18.3°E)							November 1954	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	280	3.6					1.8	2.9
01	280	3.5						2.9
02	270	3.4						2.95
03	260	3.4				2.0		3.0
04	250	3.2						3.1
05	250	3.2						3.1
06	240	4.2	---	---	140	1.7		3.3
07	270	5.1	240	3.6	120	2.3		3.2
08	310	5.7	220	4.0	120	2.7		3.1
09	310	6.5	220	4.2	110	3.0	3.4	3.0
10	320	6.7	220	4.4	110	3.2	4.2	3.0
11	340	6.8	210	4.4	110	3.3	4.0	2.8
12	340	7.2	200	4.5	110	3.4	4.0	2.9
13	330	7.6	210	4.5	110	3.4	4.0	2.9
14	330	7.7	220	4.4	110	3.3	3.7	2.9
15	320	7.9	220	4.4	110	3.2	3.6	2.9
16	300	7.6	220	4.2	110	3.0	3.4	3.0
17	290	7.2	220	3.9	110	2.7	3.4	3.05
18	270	6.9	230	3.5	120	2.3	3.1	3.2
19	240	6.4	240	2.5	---	1.7	2.4	3.2
20	230	5.9					2.1	3.2
21	230	5.4					2.0	3.2
22	240	4.0					1.9	3.1
23	250	3.8					1.6	3.0

Time: 30.0°E.

Sweep: 1.0 Mc to 15.0 Mc in 7 seconds.

Table 50

Leopoldville, Belgian Congo (4.3°S, 15.3°E)							November 1954	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M2000)F2
00	250							2.3
01	240							2.4
02	225							2.7
03	230							2.6
04	220							2.8
05	235	4.7	230					1.6
06	270	5.7	220	---				2.8
07	300	6.4	220	4.1				3.0
08	335	7.1	220	4.3				3.0
09	380	8.0	220	4.4				2.0
10	390	8.9	210	4.4				2.0
11	400	9.6	220	4.5				2.0
12	380	10.2	210	4.4				2.8
13	365	10.8	215	4.3				2.1
14	360	11.1	240	4.2				2.1
15	335	11.2	235	4.0				2.1
16	300	>11.5	240	---	120	2.0		2.2
17	250	11.1						3.1
18	240	10.0						2.7
19	265	9.3						2.4
20	250	9.8						2.3
21	235	10.0						2.5
22	210	8.9						2.6
23	220	6.2						2.5

Time: 0.0°E.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.

Table 52

Watheroo, W. Australia (30.3°S, 115.9°E)							November 1954	
Time	h'F2	foF2	h'Fl	foFl	h'E	foE	fEs	(M3000)F2
00	270							3.0
01	270							3.25
02	240							3.25
03	280							3.0
04	300							2.9
05	300							2.95
06	250	4.6						3.3
07	260	6.5	240	3.5	120	2.2	3.0	3.5
08	270	6.9	230	4.2	110	2.7	3.6	3.4
09	280	7.5	220	4.4	105	3.0	4.1	3.3
10	290	8.2	210	4.5	105	3.2	4.2	3.2
11	290	8.5	200	4.5	105	3.4	4.5	3.2
12	290	8.5	200	4.6	105	3.3	4.7	3.2
13	290	8.9	200	4.6	105	3.3	4.7	3.2
14	300	9.0	200	4.4	105	3.2	3.9	3.1
15	300	7.6	210	4.4	105	3.1	3.8	3.1
16	300	8.1	220	4.2	110	2.8	3.6	3.1
17	280	8.2	250	4.1	115	2.4	3.6	3.1
18	260	8.3	---	---	E	3.1		3.2
19	250	7.4						3.1
20	250	7.0						2.6
21	260	6.5						2.5
22	290	6.0						2.1
23	300	5.2						2.1

Time: 157.5°W.

Sweep: 1.5 Mc to 20.0 Mc in 5 minutes, manual operation.

Table 67*

Time	Nigeria (7.4°N, 4.0°E)						March 1954	
	h'F2	foF2	h'Fl	foFl	h'E	fOE	fEs	(M3000)F2
00	260	(6.2)						---
01	245	5.6						3.2
02	240	5.2						3.3
03	230	4.9						3.4
04	240	3.3						3.5
05	250	6						---
06	255	3.8			125	(1.4)		3.3
07	(270)	6.1	245		115	2.4	3.8	3.2
08	310	>7.0	225	(4.0)	110	3.0	5.0	(2.7)
09	340	>7.0	215	4.2	110	3.2	6.2	2.6
10	360	6.8	206	4.3	105	3.4	6.8	2.6
11	370	6.8	202	4.4	105	3.5	6.8	2.6
12	365	>7.0	201	4.4	105	3.6	6.8	2.6
13	360	>7.0	199	4.3	105	3.5	6.8	2.5
14	345	8.0	205	4.2	105	3.4	6.7	2.5
15	320	8.4	205	4.0	105	3.2	6.6	2.6
16	305	8.5	235		110	(3.0)	4.7	2.7
17		8.9	250		115	(2.3)	4.8	2.7
18	260	9.2			110	(1.5)	2.1	2.7
19	280	8.4						(2.6)
20	295	>7.0						(2.6)
21	265	>6.8						---
22	245	---						---
23	245	---						---

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

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

Table 69

Time	Macquarie I. (54.5°S, 159.0°E)						December 1953	
	h'F2	foF2	h'Fl	foFl	h'E	fOE	fEs	(M3000)F2
00	270	2.8					3.9	(3.2)
01	300	2.7					3.8	3.0
02	280	2.6					3.2	3.1
03	260	2.8					2.2	3.1
04	250	3.3			---	1.8	2.1	3.2
05	250	<3.7	230	3.5	100	2.0	2.2	3.2
06	320	4.0	220	3.8	100	2.5		3.0
07	350	4.4	210	3.9	100	2.7	3.4	3.0
08	340	4.6	200	4.0	100	3.0	3.7	3.0
09	330	4.8	200	4.0	100	3.0	3.4	3.0
10	330	5.0	200	4.0	100	3.2	3.6	3.0
11	330	5.0	200	4.1	100	3.2	4.0	3.1
12	340	5.2	200	4.1	100	3.2	3.8	3.0
13	340	5.2	200	4.1	100	3.2	3.5	3.0
14	340	5.2	200	4.0	100	3.1	3.4	3.0
15	320	5.0	200	4.0	100	3.0	3.5	3.0
16	320	5.2	210	4.0	100	2.8	3.5	3.1
17	300	5.1	210	3.8	100	2.6	3.6	3.1
18	280	5.1	230	3.5	100	2.1	4.0	3.1
19	260	4.8	240	3.2	110	1.8	3.8	3.15
20	250	4.5					3.8	3.2
21	250	4.0					3.8	(3.1)
22	250	3.6					3.8	3.1
23	270	(3.2)					3.8	(3.0)

Time: 157.5°E.

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

Table 71

Time	Macquarie I. (54.5°S, 159.0°E)						October 1953	
	h'F2	foF2	h'Fl	foFl	h'E	fOE	fEs	(M3000)F2
00	---	---					4.0	---
01	(350)	---					(3.5)	---
02	---	---					2.7	---
03	---	--					(2.4)	---
04	(280)	(2.3)					(2.8)	---
05	270	3.2						3.15
06	(390)	(3.7)	250	3.6	120	2.0		6
07	6	<4.0	220	3.8	110	2.4		6
08	420	4.2	210	3.9	110	2.7		2.7
09	420	(4.3)	200	4.0	100	2.8		2.75
10	400	4.5	220	4.0	100	2.9		2.8
11	400	4.5	200	4.0	100	3.0		2.8
12	380	4.6	200	4.0	100	3.0		2.9
13	360	4.6	200	4.0	100	3.0		2.9
14	350	5.0	200	4.0	100	2.8		3.1
15	330	5.0	210	3.8	100	2.6		3.0
16	310	4.7	220	3.7	110	2.3		3.0
17	280	4.5	240	3.5	120	2.1		3.1
18	250	4.5	---	---	---	3.6		3.1
19	250	4.0				2.9		3.0
20	(250)	(4.0)				3.0		(3.1)
21	(280)	(2.9)				(3.4)		(2.9)
22	(300)	(2.8)				(4.0)		(3.0)
23	---	---				3.8		---

Time: 157.5°E.

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

Table 67*

March 1954

Table 68

Time	h'F2	foF2	h'Fl	foFl	h'E	fOE	fEs	(M3000)F2
00					(2.2)			3.3
01					(2.0)			5.5
02					(2.0)			3.4
03					(1.9)			5.1
04					(2.2)			5.0
05					(2.7)			4.0
06					(2.5)			5.2
07					(2.7)			6.4
08					(2.7)			4.4
09					(3.4)			3.8
10					(3.8)			2.8
11					(4.0)			2.8
12					(4.2)			2.1
13					(3.9)			4.4
14					(3.8)			3.3
15					(3.6)			3.25
16					(3.4)			3.2
17					(3.5)			5.2
18					(3.3)			(3.2)
19					(3.2)			(3.2)
20					(3.0)			(3.5)
21					(2.6)			(3.2)
22					(2.4)			(3.4)
23					(2.4)			3.4

Time: 157.5°W.

Sweep: 1.0 Mc to 25.0 Mc in 18 seconds.

February 1954

Table 72

Time	h'F2	foF2	h'Fl	foFl	h'E	fOE	fEs	(M3000)F2
00								3.7
01								4.0
02								4.0
03								3.4
04								2.9
05								3.0
06								(3.1)
07								(2.2)
08								3.25
09								3.2
10								3.3
11								3.1
12								3.1
13								3.0
14								3.15
15								3.1
16								3.15
17								3.15
18								3.6
19								2.9
20								(2.7)
21								4.0
22								4.2
23								3.9

Time: 157.5°E.

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

TABLE 79
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

Day	75°W Mean Time													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	2.70	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
2	3.20	(2.9)S	2.60	2.60	2.70	2.60	2.40	2.20	2.30	2.30	2.40	2.40	2.40	2.40
3	2.60	2.60	2.60	2.60	2.60	2.60	2.50	2.30	2.40	2.40	2.40	2.40	2.40	2.40
4	2.60	2.70	2.60	(3.0)A	C	C	C	2.40	2.50	2.70	2.60	2.70	2.60	2.70
5	(2.6)S	2.60	2.50	2.50	2.50	2.30	2.30	2.40	2.50	2.50	2.60	2.50	2.40	2.40
6	(2.8)S	2.50	2.50	(2.8)S	2.70	2.60	2.50	2.50	2.50	(3.0)L	(2.6)S	2.50	2.40	2.40
7	2.50	2.50	2.50	2.70	2.40	2.50	2.40	2.30	2.40	2.40	2.40	2.40	2.40	2.40
8	(2.7)S	(2.8)S	2.80	(2.4)S	2.70	2.60	(2.4)A	(2.5)A	2.30	2.30	2.40	2.50	2.50	2.40
9	3.00	F	2.80	2.70	2.90	2.70	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
10	2.80	2.60	2.50	2.60	2.60	2.60	2.40	2.20	2.40	2.50	2.50	2.50	2.50	2.50
11	(2.7)S	(2.7)S	2.70	2.70	2.70	2.70	2.60	2.40	2.40	2.60	2.60	2.60	2.60	2.60
12	(3.0)S	2.80	2.80	2.70	2.60	2.40	2.60	2.40	2.40	2.70	2.70	2.70	2.70	2.70
13	(2.8)S	2.70	2.70	2.60	2.70	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
14	2.70	2.60	2.70	2.70	2.60	2.80	2.60	2.60	2.80	2.80	2.80	2.80	2.80	2.80
15	2.80	2.90	3.00	2.80	2.50	2.60	2.70	2.50	2.80	2.70	(2.8)L	2.80	2.80	2.80
16	(2.0)S	(2.1)S	3.00	2.70	2.80	2.50	2.50	2.40	2.80	2.80	2.50	2.60	2.60	2.60
17	2.50	3.00	2.80	2.70	2.60	2.60	2.30	2.30	2.40	2.70	2.60	2.60	2.60	2.60
18	(2.7)S	(2.7)S	3.00	2.70	2.40	2.40	2.20	2.40	2.70	2.70	2.50	2.60	2.60	2.60
19	S	S	(3.0)S	(2.8)S	(2.6)S	(2.4)S	2.40	2.40	2.20	2.30	2.30	2.60	2.60	2.60
20	(2.9)S	(2.9)S	(2.8)S	(2.8)S	(2.8)S	(2.8)S	2.50	2.50	2.40	2.30	2.50	2.70	2.70	2.70
21	(2.0)A	(2.0)S	(2.0)S	(2.0)S	(2.0)S	(2.0)S	2.60	2.60	2.50	2.50	2.60	2.60	2.60	2.60
22	(2.8)S	(2.9)S	(2.8)S	(2.5)S	2.60	(2.7)S	2.60	2.60	2.70	2.60	2.70	2.50	2.30	2.40
23	2.90	2.80	2.70	F	2.80	(2.7)P	(2.6)S	2.50	2.70	3.0	3.0	2.90	2.60	2.40
24	2.60	2.60	2.40	2.70	2.60	2.50	2.40	2.20	2.40	2.40	2.70	2.60	2.30	2.30
25	(3.0)S	(2.6)S	2.80	2.50	2.50	2.50	2.40	2.20	2.40	2.30	(2.7)L	2.60	2.60	2.60
26	2.80	2.80	2.70	2.70	2.80	(2.8)S	(2.8)S	2.20	(2.7)L	2.60	2.60	2.70	2.70	2.70
27	S	S	(3.0)S	(2.7)S	(2.7)S	(2.6)S	(2.6)S	2.50	(2.6)S	2.60	2.60	2.50	2.50	(2.7)S
28	(2.7)S	(2.4)S	3.00	2.60	2.40	(2.9)S	(2.8)S	2.70	3.0	3.60	K	3.40	K	3.00
29														
30														
31														
Median	2.80	2.80	2.70	2.70	2.60	2.50	2.30	2.30	2.40	2.60	2.70	2.70	2.70	2.70
Count	24	24	24	24	24	24	24	24	24	24	24	24	24	24

Sweep Δ Mc 10-25.0 Mc min 225 min
Manual Automatic

TABLE 80
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

$f_0 F_2$, Mc (Characteristic)
Mc (Month)
February, 1955

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

National Bureau of Standards
Scaled by: E. J. W., E. J. W., J. W. P., L. E. M., J. J. S.
Calculated by: E. J. W., J. W. P., L. E. M., J. J. S.

Day	75°W Mean Time											
	00	01	02	03	04	05	06	07	08	09	10	11
1	2.5	3.5	4.8	2.7	2.9	3.0	3.1	3.5	5.2	5.7	5.8	4.0
2	2.2	3.3	2.1	3.1	3.0	3.1	F	3.2	5.4	5.8	6.4	6.0
3	3.5	3.3	3.4	3.3	3.1	3.0	2.9	F	3.2	4.8	6.5	6.8
4	2.4	2.1	3.0	2.5	3.1	C	C	C	5.1	5.3	5.9	6.2
5	2.1	3.4	3.5	3.6	F	3.8	F	3.7	F	3.9	5.6	6.4
6	2.4	F	2.6	2.7	F	2.7	F	3.2	F	3.1	3.5	5.8
7	2.5	3.5	F	3.5	F	3.2	F	2.9	3.5	4.2	5.5	6.0
8	2.7	2.4	2.4	2.7	F	2.8	F	2.9	A	3.4	4.8	5.4
9	2.2	F	2.1	F	2.7	F	2.6	F	2.9	F	3.1	F
10	2.1	F	2.2	F	2.7	F	2.8	F	2.9	F	3.0	F
11	2.3	F	2.4	F	2.5	F	2.1	F	2.8	F	3.8	F
12	2.4	F	2.8	F	3.2	F	3.4	F	3.5	F	3.1	F
13	2.5	2.8	2.4	2.6	F	2.4	S	2.4	F	2.5	3.0	3.0
14	2.1	F	2.2	F	3.3	F	3.0	F	3.0	F	3.1	F
15	2.9	F	2.9	F	2.9	S	3.1	F	2.8	F	3.6	F
16	2.6	F	2.0	F	2.6	F	2.0	F	2.5	H	3.2	F
17	2.5	2.5	2.8	2.9	F	2.4	F	2.9	F	3.1	F	3.1
18	2.3	2.5	2.7	2.8	F	2.7	F	3.0	F	3.4	F	3.7
19	1.8	F	2.4	2.4	F	2.6	F	2.7	F	2.7	F	3.0
20	2.4	F	2.5	2.5	F	2.3	F	2.5	F	2.7	F	3.0
21	2.2	F	2.2	2.4	F	2.8	F	3.0	F	2.6	F	2.6
22	3.0	2.7	3.1	2.9	F	2.7	F	3.2	F	3.9	F	3.7
23	2.8	2.8	2.7	F	2.9	F	2.7	F	3.0	F	3.5	F
24	2.5	F	2.5	2.5	F	2.6	F	2.5	F	2.6	F	2.7
25	2.1	F	2.1	3.0	F	2.7	F	2.7	F	2.7	F	2.7
26	2.0	2.9	2.1	2.4	F	2.5	F	2.5	F	2.5	F	2.7
27	1.9	2.0	2.3	1.5	F	2.4	F	2.5	F	2.5	F	2.5
28	2.0	2.1	2.4	2.8	F	2.7	F	2.7	F	2.7	F	2.7
29												
30												
31												

Sweep 100 Mc to 250 Mc in 0.225 min
Manual □ Automatic ■

On 60

TABLE 81
IONOSPHERIC DATA

(Month) February, 1955

f₀F₂ Mc
(Characteristic) (Unit)

Washington, D. C.

Lat. 38.7°N Long. 77.1°W

Day	75°W Mean Time											
	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130
1	2.5	2.8	2.9	2.9	3.0	3.1	3.2	4.4	5.3	5.7	6.5	6.0
2	2.3	2.6	2.9	3.0	3.0	3.2	4.8	6.0	5.6	5.8	6.3	6.3
3	3.2	3.5	3.2	3.1	2.9	2.9	4.2	5.0	5.0	5.4	5.6	6.1
4	(2.8) ^F	3.1 ^F	3.2	C	C	C	C	5.0	5.4	(5.8) ^S	5.7	6.1
5	3.3 ^S	3.5 ^F	3.6 ^S	3.6 ^F	3.7	3.8	3.5 ^F	4.2	5.6	5.4	6.8	6.8
6	(2.6) ^F	(2.7) ^F	(2.6) ^F	(2.6) ^F	3.2	3.2	4.5	5.4	5.8	6.6	6.8	6.8
7	3.8	3.5 ^S	3.1 ^F	3.5 ^F	(3.3) ^S	3.2	2.8 ^F	5.3	6.4	6.0	7.2	7.4
8	2.3	2.4	2.4	2.5	2.7	2.8	2.9	4.4	5.7	5.5	6.3	6.8
9	2.3 ^F	(2.7) ^F	(2.7) ^F	(3.0) ^F	(3.2) ^F	3.2	2.8 ^F	4.6	5.4	5.8	6.6	6.8
10	(3.2) ^S	3.2 ^F	3.1 ^F	2.7 ^F	2.8	2.9 ^F	3.1 ^F	5.0	5.7	6.8	6.8	6.8
11	2.4 ^F	2.5 ^F	2.6 ^F	2.8 ^F	2.8 ^F	2.8 ^F	3.0 ^F	5.1 ^S	5.7 ^S	6.5	7.2	7.7
12	2.7 ^F	(2.9) ^F	3.3 ^S	(3.2) ^F	(3.1) ^F	2.9	2.9	4.7 ^S	5.8	7.2	7.5	7.5
13	3.0	2.8	2.8	2.4	2.3	2.3	2.2	4.0	5.0	5.4	5.8	6.2
14	(3.1) ^F	3.3 ^S	3.3 ^F	3.0 ^F	3.0 ^F	3.2 ^F	3.5 ^F	4.6 ^S	5.5	6.0	6.4	6.4
15	2.5 ^F	2.8 ^F	2.9 ^F	3.1 ^F	3.0	2.9	3.1 ^F	4.9	5.7	5.8	6.4	6.7
16	2.0	2.3	2.5	2.6 ^F	2.6	2.5	2.6 ^F	4.9	5.3	(5.8) ^H	6.8	6.5
17	2.4	2.6 ^F	2.9	3.0	3.0	3.0	3.0	4.5	6.0	6.0	6.3 ^H	6.7
18	2.3 ^S	2.5 ^S	2.8	2.8 ^S	2.8 ^F	3.0 ^F	3.4	5.6	5.7	[6.0] ^S	6.8	6.4
19	(1.8) ^J	2.0 ^S	2.5	2.6 ^F	2.8 ^F	2.7 ^F	3.0 ^F	5.0 ^S	5.8	6.0	6.8	6.0
20	2.4 ^F	(2.5) ^F	(2.6) ^F	(2.3) ^S	2.4 ^F	2.7 ^F	2.9 ^F	5.2 ^S	6.3 ^F	6.2	6.3	5.8
21	2.2 ^J	2.4 ^F	2.6 ^F	3.0 ^F	2.9 ^F	2.6 ^F	(2.9) ^F	4.9	6.1	6.4	6.7	6.3
22	3.0	3.1	3.0	2.7	2.3	2.0	2.4	4.0	5.0	5.8	6.1	6.3
23	2.8	2.7	2.9	2.9	2.3	2.0	2.3	4.2	4.6	4.5 ^F	5.7	6.1
24	2.5	2.5	2.3	2.4	2.6 ^F	2.8	3.2 ^S	4.9	5.4	5.8	6.2	6.4
25	2.9 ^F	2.9	3.0	2.9	2.8	2.8	2.9 ^S	4.5 ^S	5.9	6.0	6.6	6.9
26	2.7	2.7	2.6	2.4	2.3	2.6	3.0	5.0	4.7	[5.8] ^C	6.8	6.3
27	(1.9) ^J	(2.0) ^S	2.2	2.5	2.5	3.2	5.4	5.9	6.0	5.7	6.2	6.6
28	(2.0) ^J	(2.5) ^S	2.9 ^F	2.8	2.2 ^S	1.9	2.5	4.1	4.6	4.8 ^K	5.1 ^K	4.9 ^K
29										5.1 ^K	5.2 ^K	5.2 ^K
30												
31												

Sweep 10 Mc 102.5 Mc in 22.5 min
Manual □ Automatic ☒

Oil

GPO 8-16049

Median 2.5 2.7 2.9 2.8 2.8 3.0 4.6 5.4 5.8 6.2 6.6 6.5 6.4 6.4 6.0 5.8 4.6 3.8 3.0 2.6 2.5

Count 2.8 2.8 2.8 2.7 2.7 2.7 2.7 2.7 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.8 2.7 2.7

TABLE 82
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

hF — Km — February, 1955
(Characteristic) (Unit) (Month)
Observed at Washington, D.C.
Lat. 38.7°N., Long. 77.1°W.

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

NBS-D-5
Form adopted June 1946
National Bureau of Standards
(Institution)
Calculated by E.J.W., J.W.P., L.F.M., J.S.S.
Scaled by E.J.W., J.W.P., L.F.M., J.S.S.

Sweep 10 Mc to 25.0 Mc in 225 min
Manual Automatic

TABLE 83

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

f_{OF} Mc
(Characteristic)
Observed at Washington, D.C.
Lat. 38°7'N, Long. 77°10'W

IONOSPHERIC DATA

Day	February, 1955												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	Q	L	L^H	4.1^H	4.1	4.0	L	L	L	Q															
2	Q	L	$(3.6)L$	$(4.0)L$	$(4.2)L$	$(4.0)L$	L	L	L	Q															
3	C	3.3	$(3.4)H$	L	L	L	L	L	L	L	L	L	L	L	L	Q									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
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22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									

Median

Count

Sweep 10 Mc to 250 Mc in 0.225 min
Manual Automatic

GPO 83-46049

NBS-D-3
Form adopted June 1946

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

National Bureau of Standards
(Institution)

Scaled by E.J.W., J.W.P., L.F.M., J.J.S.

TABLE 84
IONOSPHERIC DATA
Washington, D.C.
Lat 38.7°N, Long 77.0°W

hE (Characteristic) . Km (Month)
February, 1955

Observed at Washington, D.C.

Day 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

	75°W Mean Time																								
	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																									
12																									
13																									
14																									
15																									
16																									
17																									
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22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									

Median
Count

Sweep 10 Mc to 22.0 Mc in 0.25 min
Manual □ Automatic ■

TABLE 85
IONOSPHERIC DATA
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
Observed at Washington, D.C.
Lat 38°7'N., Long 77°1'W.
f₀E Mc February 1955
(Characteristic) (Unit) (Month)

Day	75°W		Mean Time												16	17	18	19	20	21	22	23											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15																	
1										S	2.4	2.6	2.8	2.9	2.7	2.6	2.2	S															
2										S	2.3	2.7	2.8	2.9	2.9	2.8	2.6	A	A														
3										(1.8) ^s	2.4	2.7	2.9	3.0	2.9	2.8 ^H	2.6 ^A	A	A														
4										C	2.2	2.5	2.7	2.8	2.9	2.8	2.6	2.2	S														
5										S	2.5	2.7	2.8	2.9	2.9	2.7	2.3	1.7															
6										S	2.5	2.8	2.9	3.0	3.0	2.8 ^M	2.7	2.3	1.8														
7										1.8	2.5	2.8 ^H	2.8	2.9	2.9	2.8 ^H	2.7 ^H	2.3	S														
8										1.9 ^H	2.4 ^F	2.6 ^H	2.9 ^H	3.0 ^H	2.9	2.8	2.6	2.3	1.7														
9										(1.8) ^S	2.4 ^H	(2.7) ^S	(2.8) ^A	2.9 ^H	2.9	2.8	2.6	2.3	S														
10										1.9 ^H	2.4	2.7	2.9	3.0	2.9	2.8	2.7 ^H	2.4	S														
11										S	A	A	(2.8) ^A	2.9	(2.9) ^A	2.9 ^P	2.6 ^H	(2.4) ^S	1.8														
12										(1.9) ^S	(2.4) ^S	(2.7) ^A	(2.9) ^A	3.0 ^H	3.0	2.9	2.7	(2.3) ^A	(2.0) ^S														
13										(1.9) ^P	(2.5) ^A	(2.7) ^A	A	A	2.9	2.9	2.6	2.2	A														
14										2.0 ^H	(2.4) ^A	(2.7) ^P	2.8	2.9 ^H	2.9	2.8	2.6 ^H	2.3	(1.7) ^S														
15										2.0 ^H	2.4 ^H	(2.6) ^A	2.8	2.9	(2.9) ^A	2.7	2.6 ^H	2.4	1.8														
16										1.9 ^H	2.4 ^H	2.6 ^H	2.9 ^H	2.9	2.8	2.6	2.7 ^H	2.5 ^F	1.8														
17										1.7	2.2	2.7	2.9	2.9	2.9	2.7	2.7	2.4	1.8														
18										(2.0) ^P	2.3	(2.6) ^A	2.9 ^H	2.9	2.9 ^H	2.7	2.6	2.4	(1.8) ^P														
19										1.9	2.4	2.7	2.9	2.9	2.9	2.8	2.7 ^H	2.4	1.9														
20										A	2.3 ^F	(2.7) ^A	2.9	(3.0) ^A	3.0	2.9	(2.7) ^P	2.4	(1.8) ^P														
21										(1.9) ^P	2.5	2.7	2.9	3.0	3.0 ^H	2.9 ^H	2.7	2.5 ^F	(2.0) ^F														
22										2.0	C	A	A	A	A	A	2.2	1.9															
23										B	A	2.6 ^H	2.7	2.9	2.9	(2.8) ^C	(2.7) ^P	2.3	1.7														
24										2.2	2.6	(2.8) ^A	2.9	3.0	(2.9) ^P	2.6	2.4	1.9															
25										S	2.5 ^H	2.8 ^H	2.9 ^H	3.0 ^H	3.0 ^H	2.9 ^H	2.8	2.5	1.9														
26										A	C	A	2.7	3.0	(2.9) ^A	2.7	2.4	(1.8) ^A															
27										(2.0) ^P	2.5	2.8 ^H	2.9 ^H	3.0	3.0	3.0 ^H	2.9	2.6 ^H	2.1														
28										2.2 ^H	2.5 ^H	(2.7) ^K	2.8 ^K	2.9 ^K	3.0 ^K	2.9 ^K	(2.5) ^K	(2.4) ^P	(1.9) ^S														
29																																	
30																																	
31																																	

04.00
Median
Count

Swept 10 Mc to 250 Mc in 0.225 min
Manual Automatic

TABLE 86
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

National Bureau of Standards
Scale by: E.J.W., J.W.P. (Institution)
Calculated by: E.J.W., J.W.P., L.F.M., J.S.

E_S, Km February, 1955

(Month)

NBS-D-3 Form adopted June 1946

Observed at Washington, D.C.
Lat 38°79'N, Long 77°19'W

Day	75°W Mean Time													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	E	E	E	E	E	E	E	E	G	G	3 0 / 1 / 0	3 3 / 0 / 0	3 9 / 0 / 0	5 2 / 1 / 0
2	E	2 1 / 3 0	E	E	E	E	E	E	G	G	2 9 / 1 / 0	(3 2) 5 / 0	4 2 / 1 / 0	5 9 / 1 / 0
3	1 9 / 1 0 0	E	E	E	E	E	E	E	G	G	2 0 / 1 / 0	3 1 / 1 / 0	3 6 / 1 / 0	4 9 / 1 / 0
4	1 6 7 / 2 0	E	2 3 / 1 2 0	4 3 / 1 1 0	C	C	C	C	G	G	2 1 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0
5	E	E	E	E	E	E	E	E	G	G	(3 0) 5 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0
6	E	E	E	3 0 / 1 / 0	3 0 / 1 / 0	E	E	G	G	3 5 / 1 / 0	3 3 / 1 / 0	G	M	G
7	E	E	E	E	E	E	E	G	G	3 0 / 1 / 0	3 0 / 1 / 0	G	G	G
8	2 1 / 1 0 0	E	E	E	E	E	E	G	G	3 1 / 1 / 0	3 3 / 1 / 0	4 5 / 1 / 0	3 2 / 1 / 0	E
9	E	E	E	E	E	E	E	G	G	4 2 / 1 / 0	4 3 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	E
10	E	E	E	E	E	E	E	G	G	4 6 / 1 / 0	3 9 / 1 / 0	4 0 / 1 / 0	4 0 / 1 / 0	E
11	E	E	E	E	E	E	E	G	G	4 7 / 1 / 0	4 7 / 1 / 0	4 7 / 1 / 0	4 7 / 1 / 0	E
12	E	E	E	E	E	E	E	G	G	3 2 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	E
13	E	E	E	E	E	E	E	G	G	3 6 / 1 / 0	4 0 / 1 / 0	4 0 / 1 / 0	4 0 / 1 / 0	E
14	E	E	E	E	E	E	E	G	G	4 6 / 1 / 0	4 7 / 1 / 0	4 7 / 1 / 0	4 7 / 1 / 0	E
15	E	E	E	E	E	E	E	G	G	3 2 / 1 / 0	3 9 / 1 / 0	4 4 / 1 / 0	4 4 / 1 / 0	E
16	E	E	E	E	E	E	E	G	G	3 6 / 1 / 0	4 0 / 1 / 0	4 0 / 1 / 0	4 0 / 1 / 0	E
17	E	E	E	E	E	E	E	G	G	3 4 / 1 / 0	3 4 / 1 / 0	3 4 / 1 / 0	3 4 / 1 / 0	E
18	E	E	E	E	E	E	E	G	G	4 9 / 1 / 0	4 1 / 1 / 0	4 2 / 1 / 0	4 2 / 1 / 0	E
19	E	E	E	E	E	E	E	G	G	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	E
20	E	E	E	E	E	E	E	G	G	2 8 / 1 / 0	2 8 / 1 / 0	2 8 / 1 / 0	2 8 / 1 / 0	E
21	3 3 / 1 0 0	E	E	E	E	E	E	G	G	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	E
22	E	E	E	E	E	E	E	G	G	3 5 / 1 / 0	2 9 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	E
23	E	E	E	E	E	E	E	G	G	3 0 / 1 / 0	3 4 / 1 / 0	3 7 / 1 / 0	3 4 / 1 / 0	E
24	E	E	E	E	E	E	E	G	G	3 4 / 1 / 0	4 2 / 1 / 0	4 2 / 1 / 0	4 2 / 1 / 0	E
25	E	E	E	E	E	E	E	G	G	3 5 / 1 / 0	3 7 / 1 / 0	3 7 / 1 / 0	3 7 / 1 / 0	E
26	E	E	E	E	E	E	E	G	G	3 2 / 1 / 0	3 6 / 1 / 0	3 2 / 1 / 0	3 2 / 1 / 0	E
27	E	E	E	E	E	E	E	G	G	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	3 1 / 1 / 0	E
28	E	E	E	E	E	E	E	G	G	2 6 / 1 / 0	2 1 / 1 / 0	2 1 / 1 / 0	2 1 / 1 / 0	E
29														
30														
31														

Median less than median f_{oe} or less than lower frequency limit of the recorder

Sweep 10 Mc to 250 Mc in 225 min
Manual □ Automatic □

(M1500)E2 , (Unit) February, 1955
(Characteristics)
Observed at Washington, D.C.

TABLE 87

IONOSPHERIC DATA

National Bureau of Standards
(Institution)
Scaled by E.J.W., J.W.P., L.E.M., J.J.S.

Day	75°W Mean Time											
	00	01	02	03	04	05	06	07	08	09	10	11
1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.5	2.6	2.6	2.7	2.7
2	1.7	2.0 ³	2.1	2.0	2.0	2.0	2.1 ^F	2.3	2.6	2.5	2.4	2.4
3	2.1	2.1	2.1	2.1	2.1	2.1	2.2 ^F	2.4	2.5 ^H	2.5	2.4	2.4
4	2.1 ^P	2.0 ^E	2.1	2.1	2.1	2.1	2.2 ^F	2.4	2.5 ^H	2.3	2.4	2.4
5	2.1	2.1 ^F	2.0 ^F	2.1	2.1 ^F	2.2 ^F	2.3 ^F	2.4	2.4	2.3	2.3	2.3
6	2.0 ^P	2.0 ^E	1.9 ^P	2.0 ^P	1.9 ^E	2.0 ^P	1.9 ^E	2.1	2.4	2.3	2.4	2.4
7	2.0	2.1 ^F	2.1 ^F	2.0 ^F	2.2 ^F	2.2	2.2	2.3	2.5	2.3	2.4	2.4
8	2.0	2.0	2.1	2.1	2.1	2.2	2.2 ^A	2.3	2.4	2.3	2.3	2.3
9	2.1 ^F	2.1 ^F	2.0 ^F	2.0 ^F	2.0 ^F	2.2 ^F	2.2 ^F	2.4	2.5	2.3	2.4	2.4
10	2.0 ^F	2.1 ^E	2.2 ^F	2.2 ^F	2.1 ^F	2.0 ^F	2.1 ^F	2.3	2.5	2.4	2.4	2.4
11	2.1 ^F	2.4	2.4	2.2	2.2	2.2						
12	2.1 ^F	2.1 ^P	2.1 ^F	2.4	2.5	2.2	2.1	2.1				
13	2.0	2.0	2.1	2.2	2.1 ^F	2.1 ^F	2.0 ^P	2.2	2.4	2.4	2.2	2.2
14	2.1 ^F	2.0 ^F	2.1 ^F	2.5	2.4	2.2	2.2	2.2				
15	2.0 ^F	2.1 ^F	2.2	2.3	2.2	2.2	2.2					
16	J	2.1	2.0 ^F	2.1	2.1	2.2	2.3	2.4	2.5 ^H	2.5	2.3	2.4
17	2.2	1.7	2.0	2.1	2.1	2.2 ^F	2.3	2.3	2.4	2.5	2.4	2.4
18	2.1	2.0	2.0	2.0	2.1	2.3 ^F	2.4	2.5	2.4	2.3	2.4	2.4
19	1.7 ^F	1.7 ^F	1.7	2.1 ^F	2.1 ^F	2.2 ^F	2.2 ^F	2.5	2.7	2.3	2.4	2.4
20	2.1 ^F	2.2 ^F	2.4	2.4	2.3	2.4	2.4					
21	2.1 ^F	2.0 ^F	2.0 ^F	2.2 ^F	2.2 ^F	2.1 ^F	2.1 ^F	2.5	2.5	2.4	2.4	2.4
22	2.0	1.7	2.0 ^S	2.2	2.2	2.0 ^P	2.2	2.3	2.4	2.5	2.3	2.4
23	2.1	2.1	2.1 ^F	2.1	2.1 ^F	2.2 ^F	2.2 ^F	2.5	2.7	2.3	2.4	2.4
24	2.2 ^F	2.2 ^F	2.3	2.2	2.2 ^F	2.2 ^F	2.3	2.5	2.4	2.4	2.4	2.4
25	1.7	2.0	2.1	2.2	2.3	2.3	2.4	2.4	2.2	2.3	2.2	2.3
26	2.0 ^S	2.0	2.1	2.2	2.1 ^S	2.1	2.4	2.7	C	2.4	2.4	2.4
27	J	J	J	J	J	J	J	J	J	J	J	J
28	1.7 ^F	1.7	2.1 ^F	2.2	2.1	J	J	J	J	J	J	J
29												
30												
31												
Median	2.1	2.0	2.1	2.1	2.1	2.2	2.2	2.5	2.5	2.4	2.4	2.4
Count	2.6	2.7	2.8	2.8	2.7	2.6	2.7	2.7	2.6	2.8	2.8	2.6

Sweep-10 Mc to 250 Mc in 0.225 min
Manual □ Automatic ☒

TABLE 88
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

(M3000)E2, (Unit)
(Characteristic)
Observed at Washington, D.C.
Lat 38.7°N, Long 77.1°W

February, 1955
(Month)
Calculated by E.J.W., J.W.P., I.F.M., J.J.S.
(Institution)
Scaled by E.J.W., J.W.P., I.F.M., J.J.S.

Day	75°W Mean Time												75°W Mean Time												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
2	29	(20)5	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
3	32	32	32	31	31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
4	(31)F	(30)F	31	31	32	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
5	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
6	(30)F	(29)P	(30)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P	(29)P											
7	30	32	F	31	F	30	F	33	F	32	F	34	F	36	F	34	F	35	F	35	F	35	F	35	F
8	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
9	(31)F	(31)F	F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F	(30)F											
10	30	F	(31)5	33	F	33	F	30	F	31	F	32	F	34	F	37	F	34	F	35	F	37	F	35	F
11	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	
12	31	F	(31)F	(32)F	P	(31)5	F	(35)5	S	34	S	32	S	35	S	37	S	35	S	35	S	35	S	35	S
13	30	29	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
14	(31)5	31	F	31	F	31	F	31	F	31	F	31	F	31											
15	30	F	30	F	(31)5	33	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	F	31	
16	J	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
17	32	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
18	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
19	(29)5	24	F	29	31	F	31	F	33	F	36	F	38	F	37	F	33	F	34	F	35	F	32	F	
20	31	31	F	(31)5	31	F	31	F	32	F	(32)5	35	F	34	F	36	F	35	F	37	F	34	F	31	F
21	31	F	30	F	(30)5	30	F	31	F	32	F	31	F	31	F	32	F	31	F	32	F	31	F	30	F
22	30	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
23	31	31	31	31	31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
24	32	F	32	F	33	S	32	F	34	S	35	S	37	S	36	S	35	S	36	S	34	S	35	S	
25	29	30	31	33	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	
26	(30)5	30	31	32	(31)5	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
27	J	5	J	5	(30)5	30	(30)5	31	33	37	37	35	37	37	37	37	37	37	37	37	37	37	37	37	
28	(28)5	28	28	31	F	31	F	33	J	5	31	32	30	K	32	K	28	K	34	K	33	K	34	K	
29																									
30																									
31																									

Manual □ Automatic □
Sweep 10 Mc to 250 Mc in 225 min

04.60

TABLE 89
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.

IONOSPHERIC DATA

W3000(FI), (Unit)
(Characteristic) February, 1955
Observed at Washington, D.C.
(Month)

Lat. 38.7°N., Long. 77.1°W.

Day	75°W Mean Time											
	00	01	02	03	04	05	06	07	08	09	10	11
1	Q	L	L	3.8 ^H	3.8	3.9	L	L	L	L	L	Q
2	Q	L	(4.0) ^L	(3.8) ^L	(3.8) ^L	(3.8) ^L	L	L	L	L	L	Q
3	L	L	L	L	L	L	L	L	L	L	L	Q
4	C	Y ₁	(3.8) ^L	L	L	L	L	L	L	L	L	Q
5	Q	L	L	L	L	L	L	L	L	L	L	Q
6	Q	L	L	3.9	L	M	L	L	L	L	L	Q
7	Q	Q	L	L	3.8	L	L	L	L	L	Q	Q
8	Q	L	3.6 ^H	L	3.7	3.6 ^H	(3.7) ^L	L	L	L	L	L
9	L	L	4 ^H	L	4 ^H	L	3.7 ^H	3.7 ^H	L	A	A	A
10	L	L	4 ^H	L	4 ₁	L	L	L	L	L	L	Q
11	Q	L	L	4 ^L	4 ^L	(3.8) ^L	(3.8) ^L	L	L	L	L	L
12	Q	L	(4 ₁) ^L	4 ₁	(3.8) ^H	(3.9) ^H	(3.7) ^L	(3.7) ^L	L	H	L	Q
13	L	(3.9) ^L	3.8	3.8	3.8	3.7	L	L	L	L	L	Q
14	L	L	4 ^H	L	3.8	L	L	L	L	L	L	L
15	L	L	4 ^H	3.7	4 ^H	L	L	L	L	L	L	Q
16	Q	L	L	3.8	4	3.8 ^H	3.6 ^H	L	L	L	L	Q
17	L	L	L	L	L	(3.9) ^L	L	L	L	L	L	Q
18	L	L	L	4 ^H	L	3.8	(3.8) ^L	L	L	L	L	Q
19	L	L	L	(3.7) ^L	(3.8) ^L	(3.6) ^L	(3.8) ^L	L	L	H	L	Q
20	L	L	L	L	L	3.6	3.8	L	L	L	L	Q
21	Q	L	(3.8) ^L	(3.8) ^L	3.8	(3.8) ^L	(3.8) ^H	L	H	L	L	L
22	L	C	3.7 ^H	3.7	3.8	3.9 ^H	3.9 ^H	L	L	L	L	Q
23	L	(3.9) ^L	3.9	3.5 ^H	3.5	3.9 ^H	3.5	3.7	L	L	L	L
24	L	L	L	4 ^H	L	3.7 ^H	3.6	3.6 ^H	L	H	L	Q
25	L	L	L	4 ^H	(3.8) ^L	3.9 ^H	(3.7) ^L	L	L	H	L	L
26	L	C	4 ^H	4 ^H	(3.9) ^L	L	L	L	L	L	L	Q
27	L	L	L	4 ^H	3.9 ^H	3.8 ^H	3.8	3.7	L	H	L	Q
28	35	(3.5) ^H	3.8 ^K	3.7 ^K	3.8 ^K	3.8 ^K	3.8 ^K	3.8 ^K	L	H	L	K
29												
30												
31												

04.60

Median Manual Count Sweep 10 Mc to 25 Mc in 0.225 min

NBS - D-3
Form adopted June 1946

GPO 63-4649

National Bureau of Standards
(Institution)
Scaled by: E.J.W., J.W.P., L.F.M., J.J.S.
Calculated by: E.J.W., J.W.P., L.F.M., J.J.S.

NBS-D-3
Form adopted June 1946

National Bureau of Standards
(Institution)
Calculated by: E.J.W., J.W.P., L.F.M., J.S.

TABLE 90
Central Radio Propagation Laboratory, National Bureau of Standards, Washington 25, D.C.
IONOSPHERIC DATA

(M1500E), (Unit)
(Characteristic) February, 1955

Observed at Washington, D.C.

Lat 38°7'N, Long 77°10'W

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

Sweep 1.0 Mc to 25.0 Mc in 0.225 min
Manual Automatic

Table 91Ionospheric Storminess at Washington, D. C.February 1955

Day	Ionospheric character*		Principal storms		Geomagnetic character**	
	00-12 GCT	12-24 GCT	Beginning GCT	End GCT	00-12 GCT	12-24 GCT
1	1	2			0	1
2	2	1			1	2
3	0	2			3	1
4	1	3			3	4
5	0	1			3	3
6	1	0			3	3
7	0	1			3	2
8	2	1			2	3
9	2	2			3	2
10	1	1			2	1
11	2	1			1	3
12	2	1			3	2
13	2	2			3	2
14	1	2			2	2
15	2	1			3	1
16	3	1			1	2
17	2	1			2	1
18	3	2			2	1
19	3	1			2	2
20	2	2			2	2
21	2	1			3	2
22	1	2			3	2
23	2	3			4	3
24	1	2			2	2
25	2	0			3	1
26	1	1			3	2
27	3	1			1	2
28	3	4	0000	2300	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.

Table 92Sudden Ionosphere Disturbances Observed at Washington, D. C.February 1955

No sudden ionosphere disturbances were observed during the month of February.

Table 93
Sudden Ionosphere Disturbances Reported by the Netherlands Postal and Telecommunication Services, as Observed at Nederhorst den Berg, Netherlands

1955 Day	GCT		Location of transmitters	Other phenomena
	Beginning	End		
January 6	1741	1825	Paramaribo, Curacao, Lima, Rio de Janeiro, Buenos Aires	Reinforcement (of atmospheric long-wave noise) 1745-1802
10	1207	1306	Paramaribo	Reinforcement 1206-1345
19	1339	1453	Paramaribo	Reinforcement 1341-1511

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, Boulder, Colorado; Attention: Mr. Vaughn Agy.

Table 94a

Radio Propagation Quality Figures

(Including Comparisons with Short-Term and Advance Forecasts)

January 1955

Day	North Atlantic 6-hourly quality figures				Short-term forecasts issued about one hour in advance of:	Whole day quality index	Advance forecasts (J-reports) for whole day; issued in advance by:			Geomag- netic K _{Ch}				
	00	06	12	18			00	06	12	18	1-4 days	4-7 days	8-25 days	Half Day (1)
1	5	6	7	7	6	6	7	7	6	6	6	6	2	1
2	6	6	7	7	6	6	7	7	7	6	6	6	2	1
3	6	6	7	7	6	6	7	7	6	6	6	6	1	2
4	6	6	7	6	6	6	7	7	6	6	6	6	3	2
5	6	6	6	7	6	6	7	7	6	7	7	7	1	2
6	6	6	7	6	6	6	7	7	6	7	7	7	2	2
7	6	6	7	6	6	6	7	5	6	6	7	7	2	2
8	6	6	7	6	5	5	6	6	6	6	7	7	1	1
9	6	6	6	6	6	(4)	6	5	6	(4)	7	7	3	3
10	5	6	7	7	5	5	6	6	6	(4)	7	7	1	1
11	(4)	6	7	7	6	5	6	6	6	6	5	5	2	3
12	6	6	6	7	5	5	6	7	6	6	5	5	2	1
13	6	5	6	6	6	6	6	6	6	6	5	5	(4)	3
14	6	5	7	6	6	6	6	6	6	6	6	6	2	1
15	5	5	7	6	6	6	7	7	6	6	6	6	0	0
16	6	5	7	7	6	5	6	6	7	6	6	6	2	2
17	6	5	6	5	6	6	7	5	6	6	6	6	3	(5)
18	(2)	(3)	6	(3)	(3)	(2)	(4)	5	(3)	(3)	6	6	(5)	3
19	(2)	(2)	(4)	(3)	(2)	(3)	(4)	(3)	(3)	(3)	6	6	(6)	(4)
20	(3)	(4)	6	(4)	(3)	(2)	5	(4)	(4)	(4)	6	6	3	2
21	(4)	5	6	6	(3)	(4)	6	6	5	5	5	5	3	2
22	(4)	5	6	6	5	5	6	6	5	5	5	5	2	1
23	5	5	6	6	5	5	6	6	6	5	6	6	2	3
24	5	(4)	6	6	5	5	6	6	5	6	6	6	1	1
25	(4)	5	6	6	5	5	6	6	5	5	6	6	1	1
26	5	5	6	6	6	5	6	6	6	6	6	6	1	0
27	5	6	6	6	6	6	6	7	6	6	6	6	1	3
28	6	5	7	6	6	5	6	6	6	6	6	6	3	1
29	6	6	7	6	6	5	6	6	6	6	6	6	1	2
30	6	6	7	6	6	5	7	6	6	6	6	6	2	2
31	6	6	6	6	6	5	7	6	6	6	6	6	1	1

Score:

Quiet Periods	P	18	14	17	20
	S	6	12	12	8
	U	0	0	0	0
	F	0	1	1	0

20 15

Disturbed Periods	P	2	0	1	2
	S	4	3	0	0
	U	0	1	0	1
	F	1	0	0	0

3 0

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

Scoring: (beginning October 1952)

- P - Perfect: forecast quality equal to observed
 S - Satisfactory: (beginning October 1952)
 forecast quality one grade different
 from observed
 U - Unsatisfactory: forecast quality two or more
 grades different from observed when both
 forecast and observed were ≥ 5, or both ≤ 5
 F - Failure: other times when forecast quality
 two or more grades different from observed

Symbols:
 X - probable disturbed date

Note: All times are UT (Universal Time or GCT)

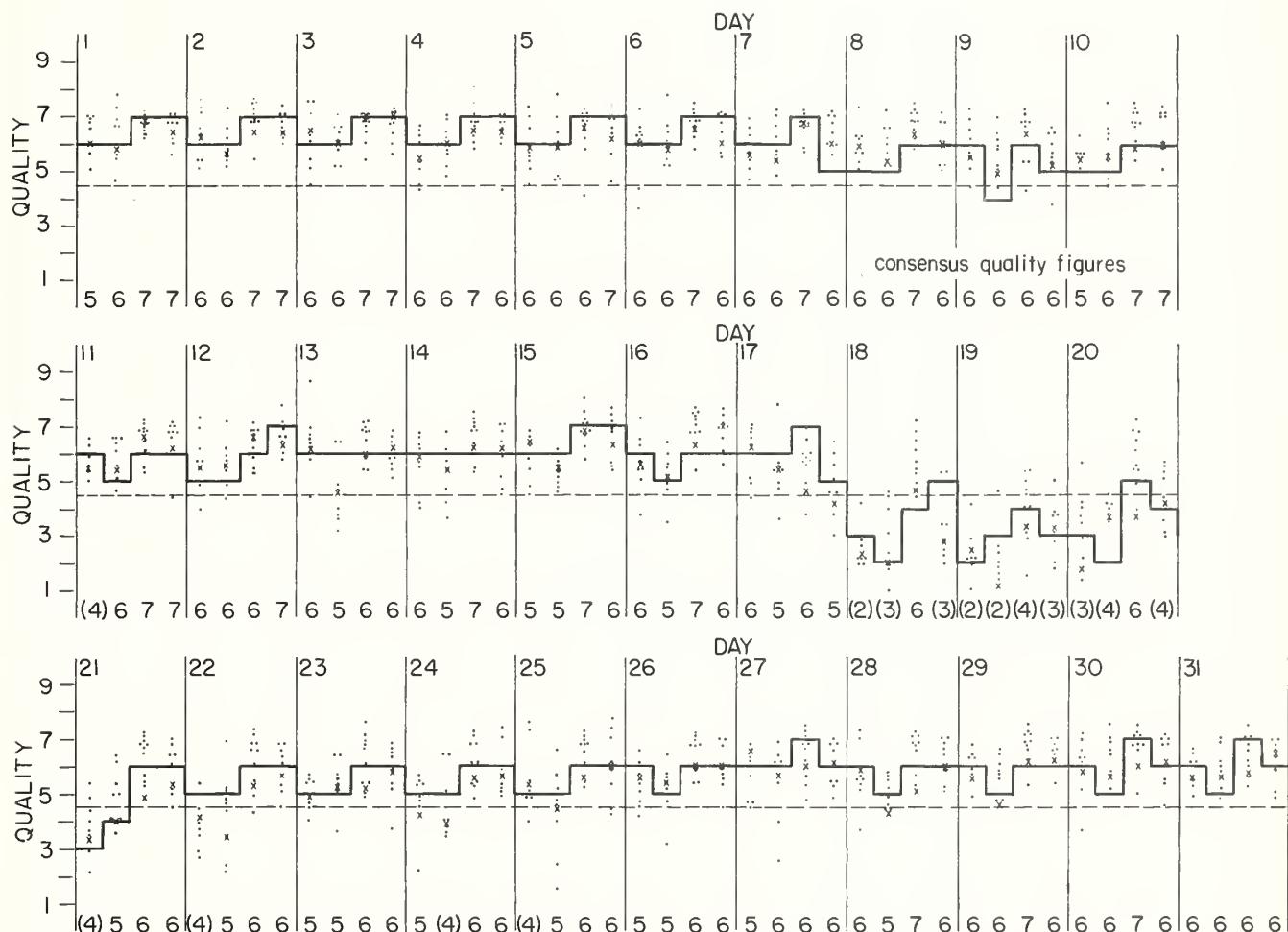
Table 94b

Short - Term Forecasts — January 1955

— Forecast

- Individual reports of quality
(adjusted to CRPL scale)

x CRPL observation (not in consensus)



Outcome of Advance Forecasts (1 to 4 Days Ahead) — January 1955

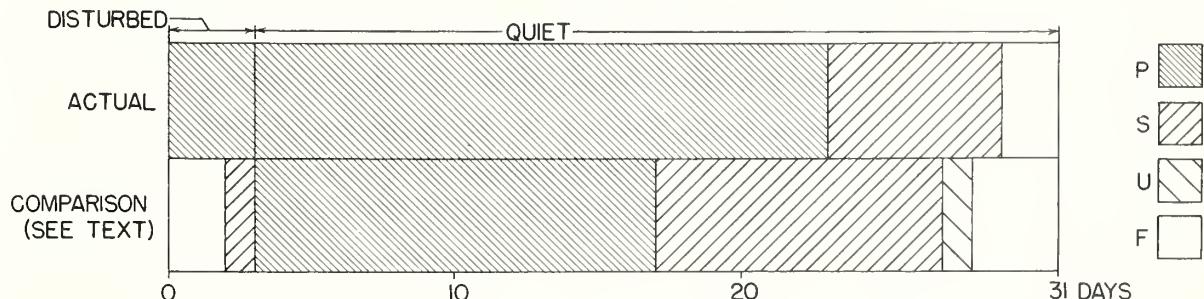


Table 95

Climax, Colorado, Conversion Table giving Absolute Units for Arbitrary Relative Units

Green line 5303A

Threshold	Arbitrary Relative Units																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
1	0	0	1	1	2	2	3	4	5	7	8	9	11	13	15	18	20	22	25	28	31	34	36	38	40	42	44	45	46	48	49		
2	0	0	1	1	2	3	3	4	5	7	9	11	13	15	18	20	22	25	27	30	32	35	38	40	42	44	46	47	49	51	53	55	
3	0	0	1	1	2	3	4	5	7	9	11	14	16	18	21	24	26	29	31	33	36	39	41	43	45	47	49	51	53	55	57	59	
4	0	0	1	2	3	3	4	5	6	8	11	13	15	18	20	23	26	28	31	33	35	38	41	43	45	47	50	52	54	57	59	61	64
5	1	1	2	3	4	5	5	6	9	12	14	17	19	21	24	27	29	32	34	37	39	42	45	47	50	52	55	58	60	63	66	68	
6	1	1	2	3	4	5	6	7	9	12	14	17	19	21	25	27	30	32	35	37	40	44	47	49	53	57	59	62	65	67	70	75	
7	1	1	2	3	4	5	6	8	9	12	15	18	20	22	25	28	30	33	35	38	41	45	48	52	56	60	63	65	68	71			
8	1	2	3	4	5	6	7	8	10	13	15	18	21	23	26	29	32	35	37	40	44	47	49	53	57	59	62	65	67	70			
9	1	2	3	4	5	7	8	9	12	14	17	20	23	25	29	31	34	36	40	43	47	50	54	57	62	67							
10	1	3	4	5	6	7	9	10	13	16	19	23	25	28	31	34	37	40	43	46	49	53	57	61	66	72							
11	1	3	5	6	7	9	11	13	15	18	21	25	27	30	33	36	39	42	45	48	52	57	60	65	70								
12	2	3	5	7	8	9	11	13	16	20	23	26	29	32	35	39	41	45	48	50	55	59	64	67									
13	2	4	6	8	9	10	12	14	18	21	25	29	32	35	38	41	44	48	50	53	58	64	67	71									

Climax, Colorado, Conversion Table giving Absolute Units for Arbitrary Relative Units

Red Line 6374A

Table 96

Threshold	Arbitrary Relative Units																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	0	0	0	1	1	1	1	2	3	4	4	5	6	7	8	9	10	11	11	12	13	14	15	
2	0	1	1	1	1	2	2	3	4	5	6	7	8	9	10	11	11	12	13	13	14	15	15	16
3	0	1	1	1	1	2	2	3	4	5	6	7	8	9	10	11	11	12	12	13	14	15	15	16
4	1	1	1	1	2	2	3	4	5	6	7	8	9	10	11	12	12	13	14	14	15	15	16	17
5	1	1	1	1	2	2	3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18
6	1	1	1	1	2	2	3	3	4	4	5	6	7	8	9	10	11	12	13	14	15	16	16	18
7	1	1	1	2	2	3	3	4	4	4	5	6	7	8	9	10	11	12	13	14	15	16	16	18
8	1	1	1	2	3	3	3	4	4	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19
9	1	1	1	2	3	3	3	4	4	4	5	6	7	8	8	9	10	12	13	14	15	16	17	19
10	1	1	1	2	3	3	4	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	20
11	1	1	2	3	3	4	4	5	6	7	8	9	10	11	12	13	14	14	15	16	17	18	19	20
12	1	1	2	3	3	4	4	5	5	6	7	8	9	10	11	12	13	15	16	17	19	22	23	25
13	1	3	4	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	22	23	26	28	31	34
14	1	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	22	23	26	28	30		

Table 99a

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

(absolute values in millions of the brightness of one angstrom at the center of the solar disk)

Table 1003

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

(Arbitrary Scale)

* Yellow line (5694A), N22 - N24, Intensity: 2

Table 103Zürich Provisional Relative Sunspot NumbersFebruary 1955

Date	R _{Z*}	Date	R _{Z*}
1	19	16	16
2	28	17	7
3	32	18	0
4	34	19	0
5	32	20	0
6	32	21	0
7	34	22	9
8	24	23	19
9	28	24	28
10	27	25	28
11	27	26	30
12	26	27	30
13	28	28	26
14	10	Mean:	20.8
15	8		

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

Table 104
American Relative Sunspot Numbers
January 1955

Date	RA'	Date	RA'
1	21	17	14
2	16	18	11
3	16	19	10
4	29	20	4
5	37	21	8
6	53	22	9
7	57	23	22
8	47	24	22
9	38	25	15
10	28	26	25
11	32	27	26
12	31	28	16
13	28	29	13
14	17	30	21
15	16	31	22
16	17	Mean:	23.3

Table 105

Solar Flares, February 1955

Observatory	Date	Time Observed		Duration (Min.)	Area (Mill.) (of) (Visible)	Position Latit- tude (Hemisph.)	Long- itude Diff. (Deg.)	Time of Maxi- mum (GCT)	Int. of Maxi- mum	Rela- tive Area of Maximum (Tenths)	Import- ance	SID Obser- ved
		Begin- ning (GCT)	End- ing (GCT)									
S. Peak	Feb. 3	2155B	2250	> 55	62	N20	W53	2237	10	6	(1-)	None Obs. Wash. D.C.
S. Peak	Feb. 7	2125	2140	15	43	N41	E56	2131	16	5	(1)	None Obs. Wash. D.C.

S. Peak = Sacramento Peak.

() Importance rating deduced by CRPL
from the reported observations.

B Flare began before given time.

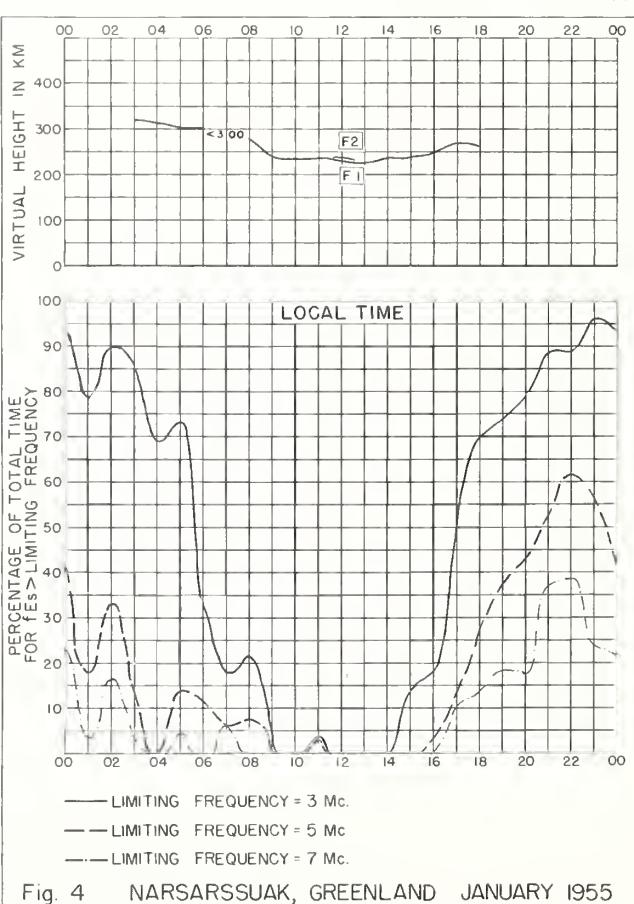
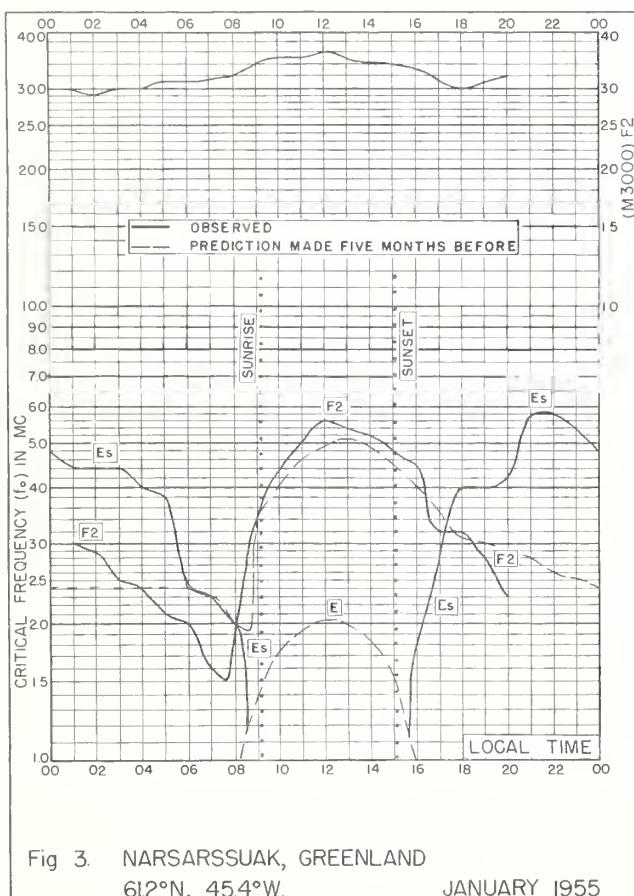
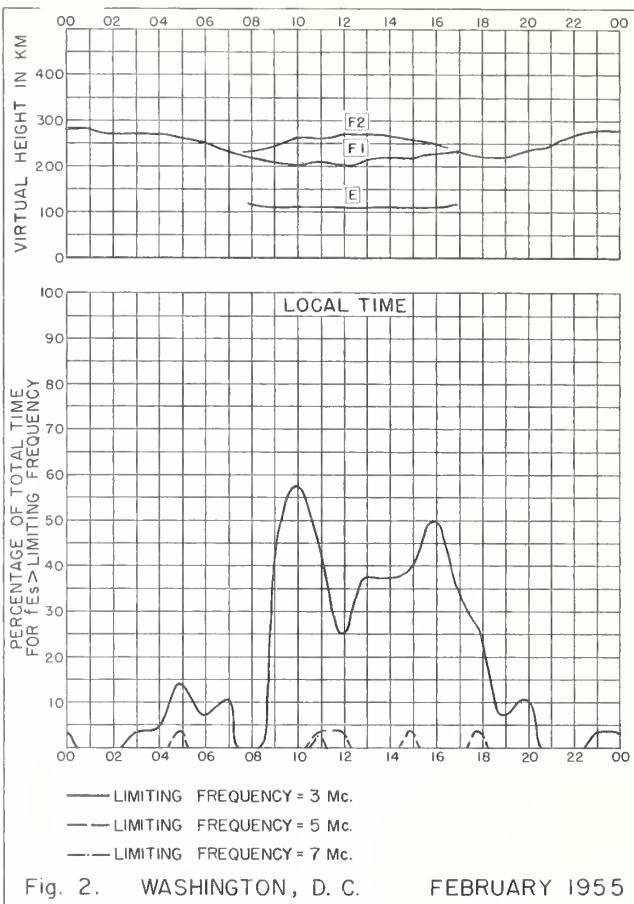
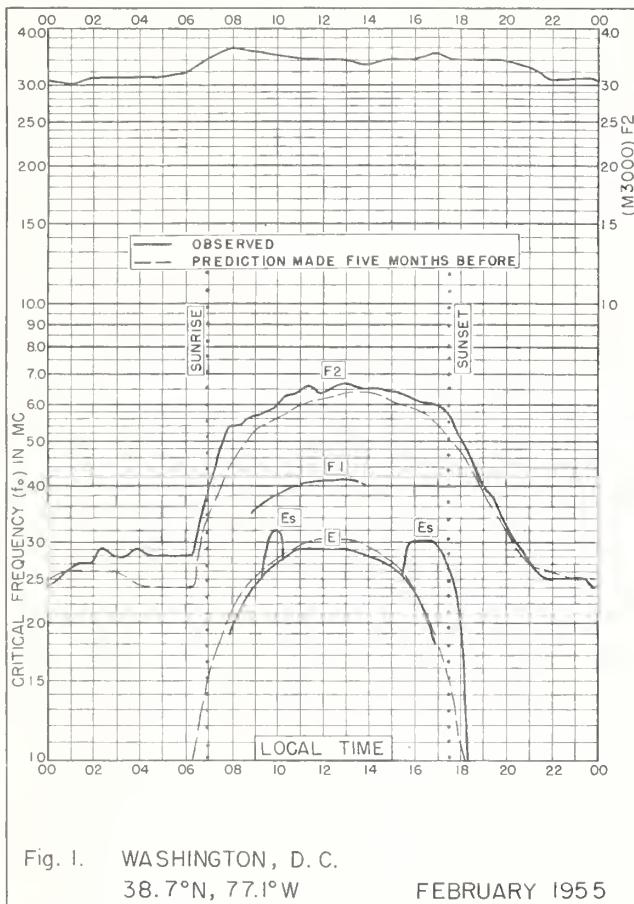
Table 106

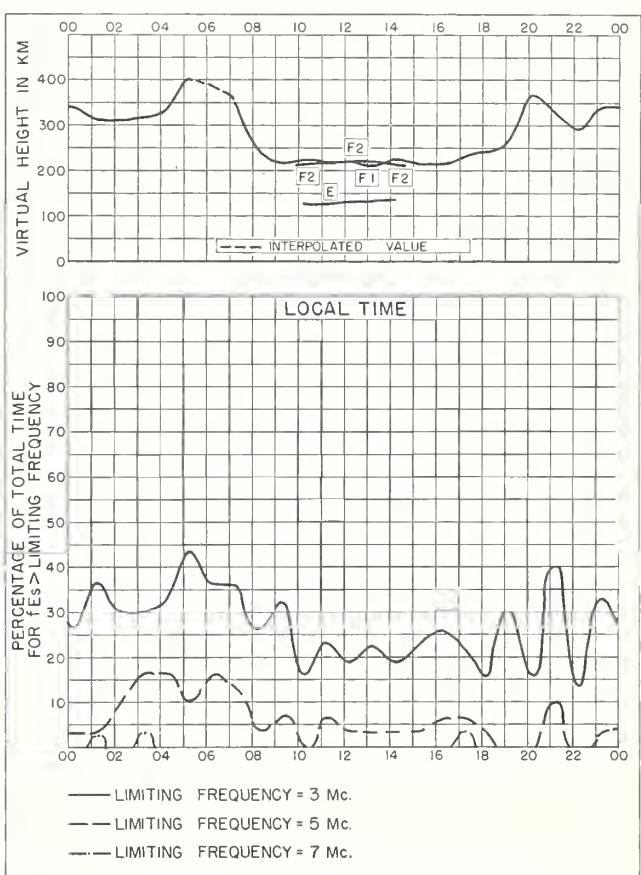
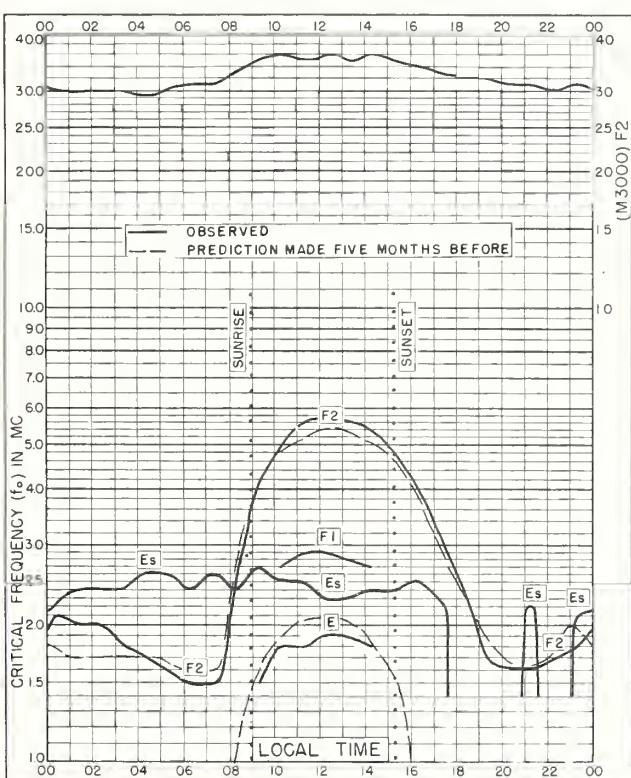
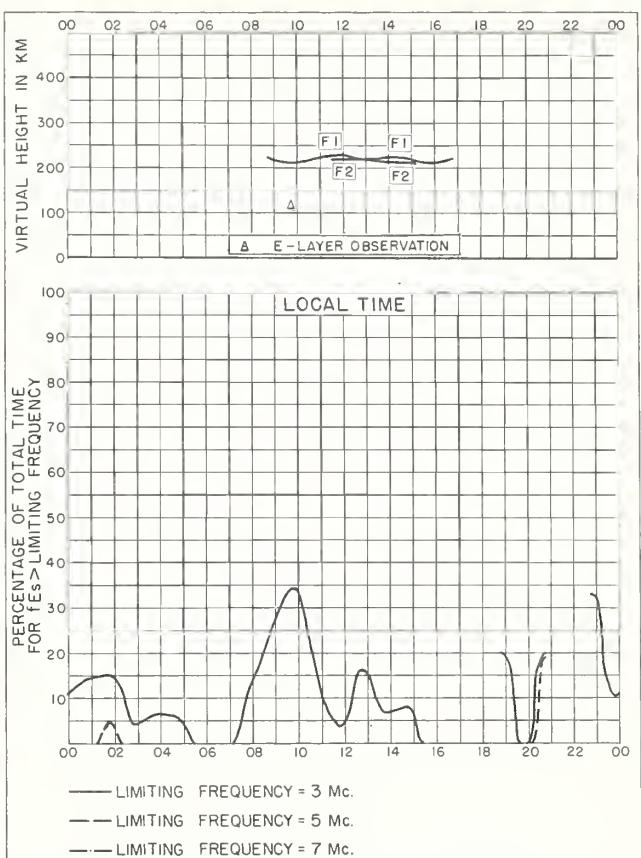
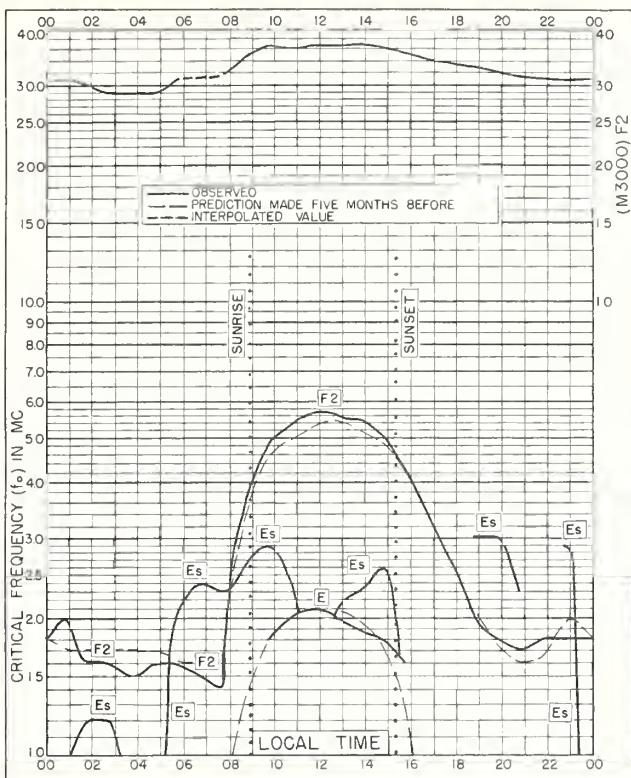
Indices of Geomagnetic Activity for January 1955

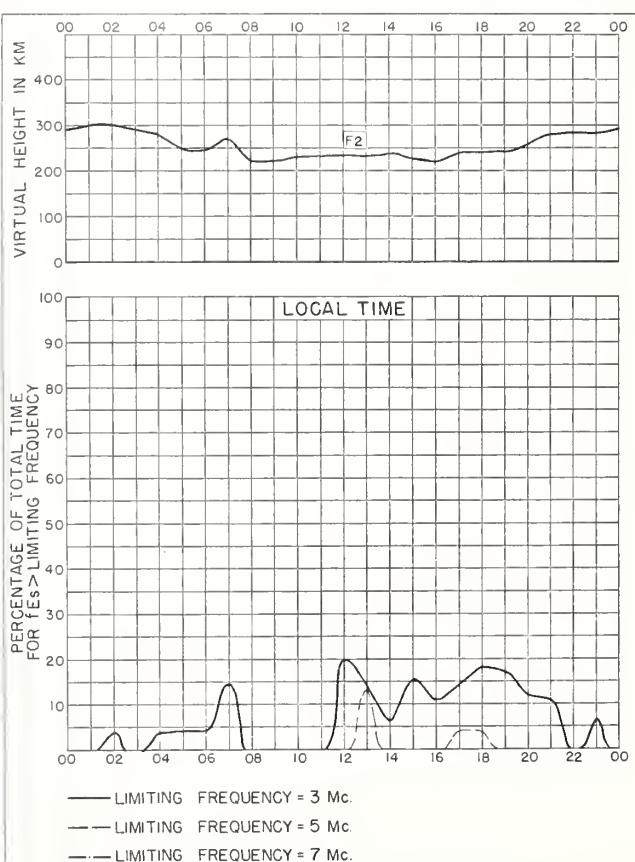
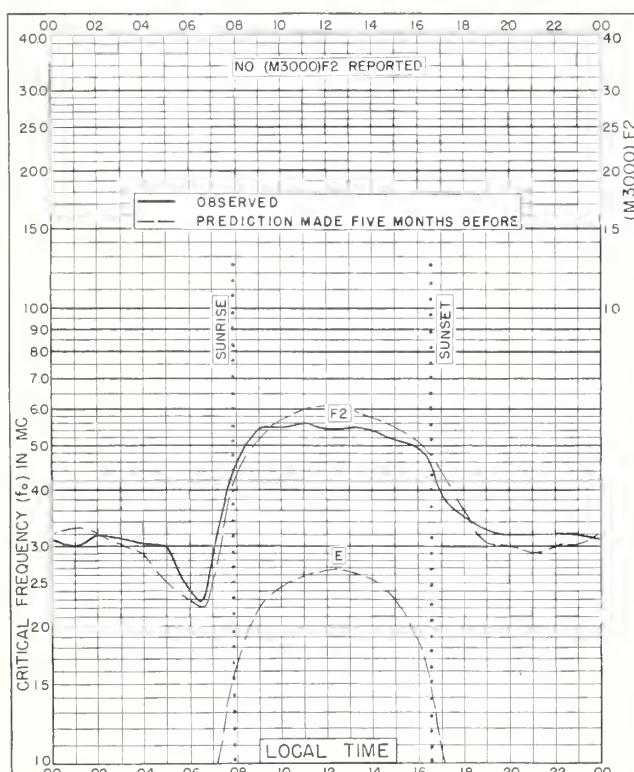
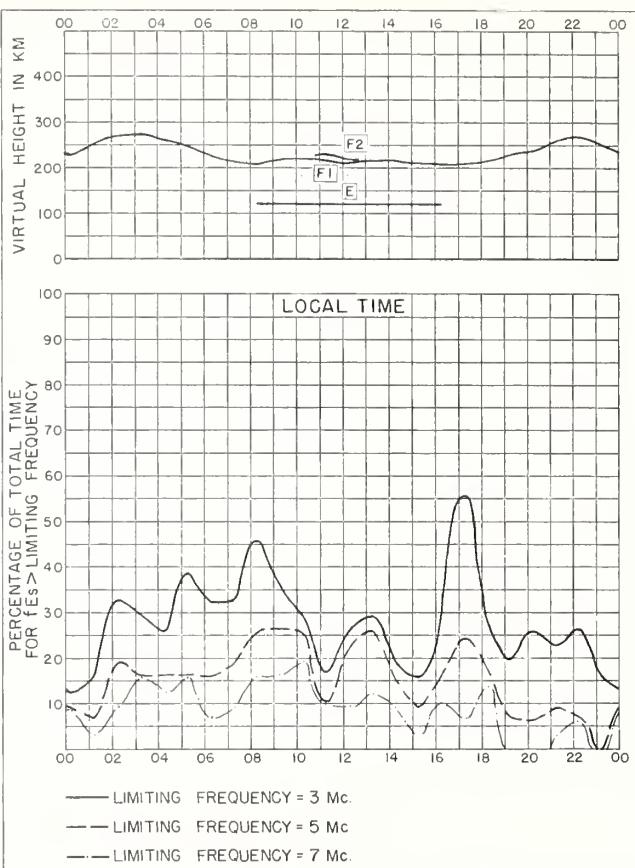
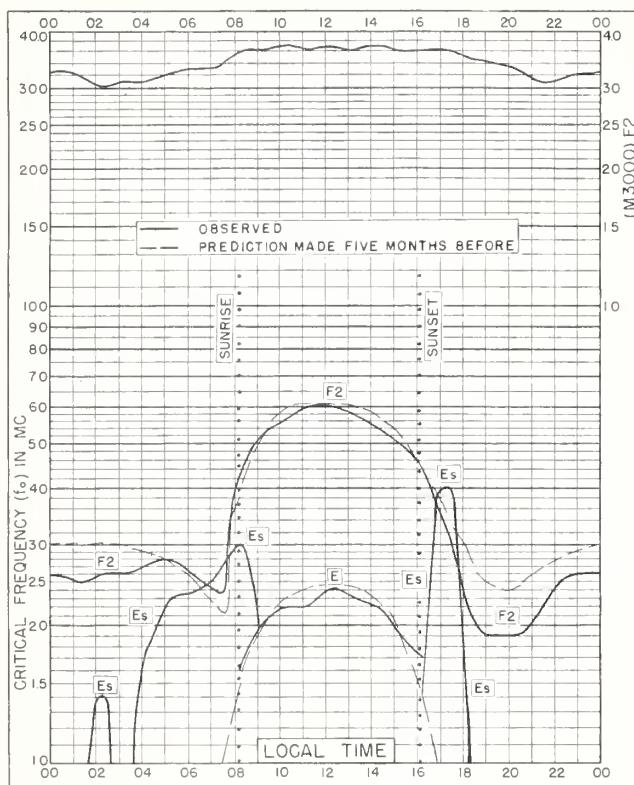
Preliminary values of international character-figures, C;
 Geomagnetic planetary three-hour-range indices, Kp;
 Daily "equivalent amplitude", Ap;
 Magnetically selected quiet and disturbed days

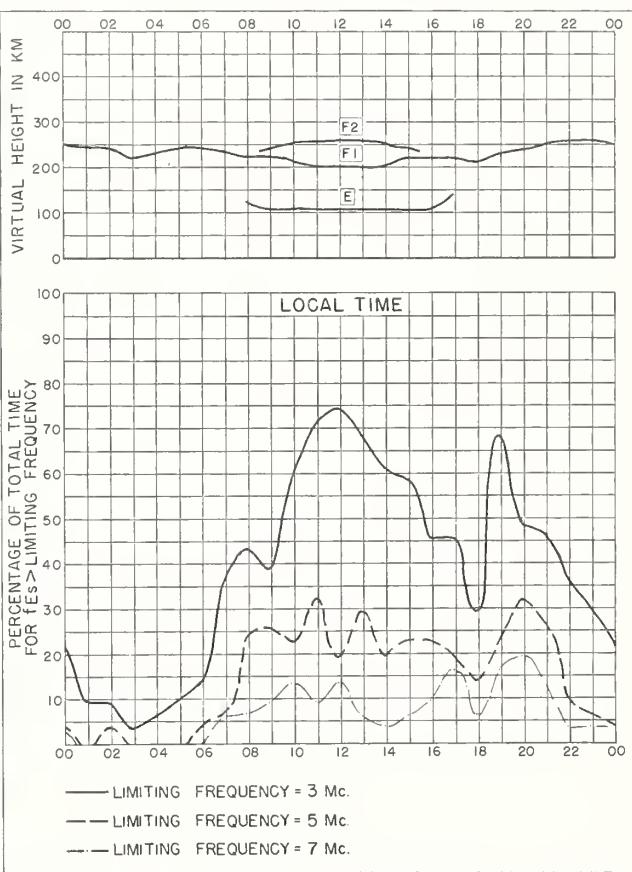
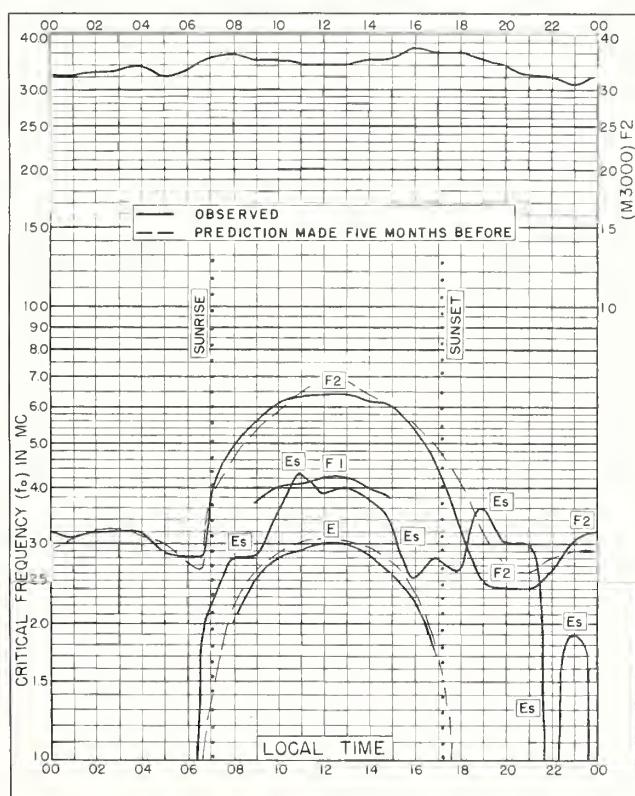
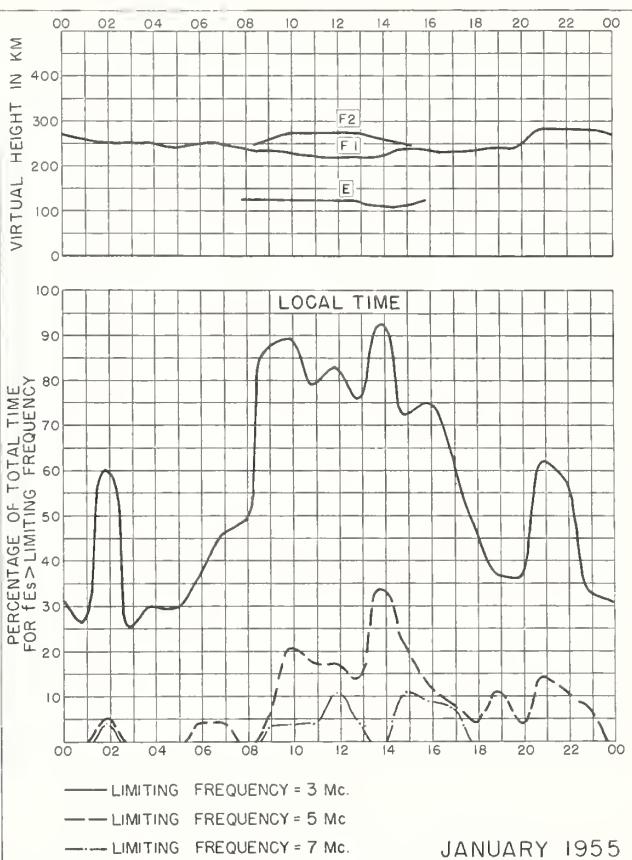
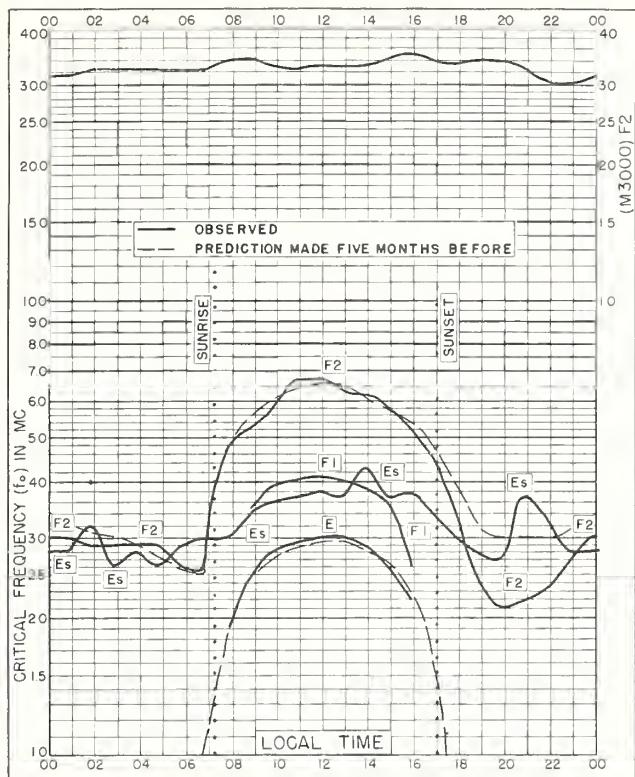
Jan. 1955	C	Values Kp								Sum	A _p	Final Selected Days
		Three-hour Gr. interval				5	6	7	8			
1	0.4	1+	1+	1+	2o	1o	1+	2o	2+	13-	6	Five
2	0.3	3-	1+	2+	2-	1o	2-	1-	2-	13o	6	Quiet
3	0.2	1-	1-	2-	2-	2-	1+	0+	1+	9+	4	
4	0.7	4-	2+	1+	2+	3-	2o	2+	2o	19-	10	10
5	0.5	1+	1-	1o	0+	1o	1+	2+	3o	11o	6	15
												24
6	0.6	3-	3+	2-	1+	2-	2-	2+	1+	16o	8	25
7	0.5	2o	2o	2o	2-	2+	2o	2+	2-	16o	7	26
8	0.4	1+	0+	2-	1-	0+	1-	2o	3-	10-	5	
9	1.2	4o	3-	4o	3o	4-	5-	3+	1o	26+	20	
10	0.2	1o	1-	1o	1o	1-	1+	2+	0o	8o	4	
												18
11	1.2	2+	2-	1-	1o	5-	1+	3-	5o	19+	16	Five
12	0.7	5o	2+	2-	1-	0o	0+	1+	0+	12-	9	Disturbed
13	0.8	3o	4o	3+	4-	3o	2+	2o	2-	23o	15	
14	0.7	1o	1+	1+	2-	3-	2o	3+	0+	14-	7	9
15	0.0	0+	0+	0+	0+	0o	0o	0o	0+	2-	1	17
												18
16	0.5	1+	1o	1o	2+	2+	2o	2+	2o	14+	7	19
17	1.7	1+	3o	3o	4o	7-	6-	5o	5+	34o	43	20
18	1.7	8-	7o	6-	2-	2+	4+	4o	4-	36+	59	
19	1.7	5o	6+	6+	5+	5-	4o	4o	5-	40+	53	
20	1.0	4+	4-	2+	1o	2+	2+	3+	4-	23o	16	
												8
21	0.6	4o	3-	2o	1-	1-	1o	2o	2+	15+	9	Ten
22	0.2	3-	2o	2o	1-	1o	1-	1-	1o	11-	5	Quiet
23	1.0	3-	2+	2+	2+	3o	3-	3+	3-	21+	12	
24	0.1	2-	2-	1o	0+	1-	2-	1-	1o	9-	4	3
25	0.1	1o	1+	1o	0+	1o	1o	1o	1-	7+	4	5
												8
26	0.0	1-	1-	1o	1-	0+	1-	0o	0o	4o	2	10
27	0.9	0o	0o	1+	2+	1+	3+	4-	4o	16o	11	15
28	0.4	3o	3-	2+	2-	0+	1+	1o	2+	15-	8	22
29	0.6	1+	1o	1-	1+	1-	1+	3-	4-	13-	7	24
30	0.6	2-	2+	1-	2-	3-	2o	2+	2o	15+	7	25
31	0.2	2-	1+	1+	1-	0+	1-	1o	2+	9+	5	26
Mean:	0.63									Mean: 12		31

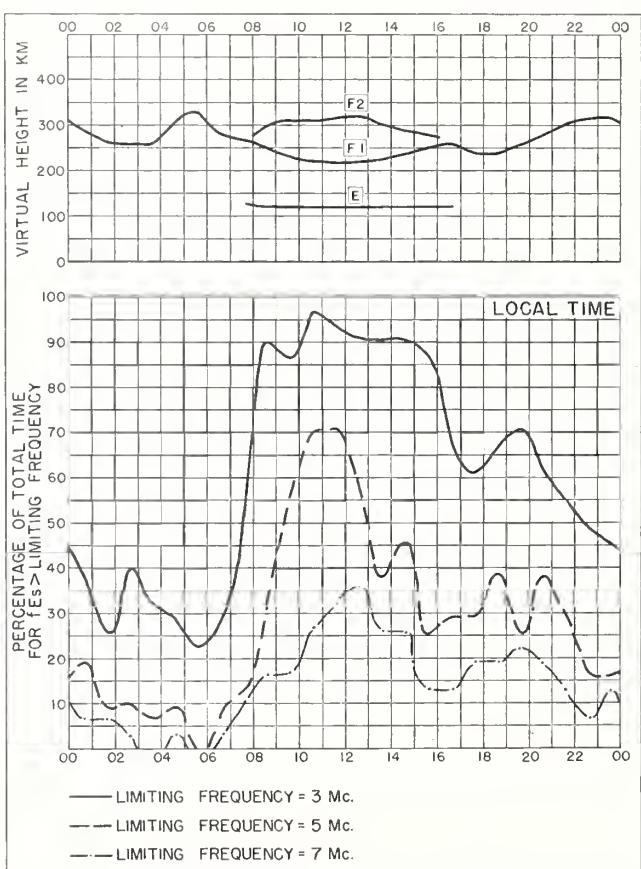
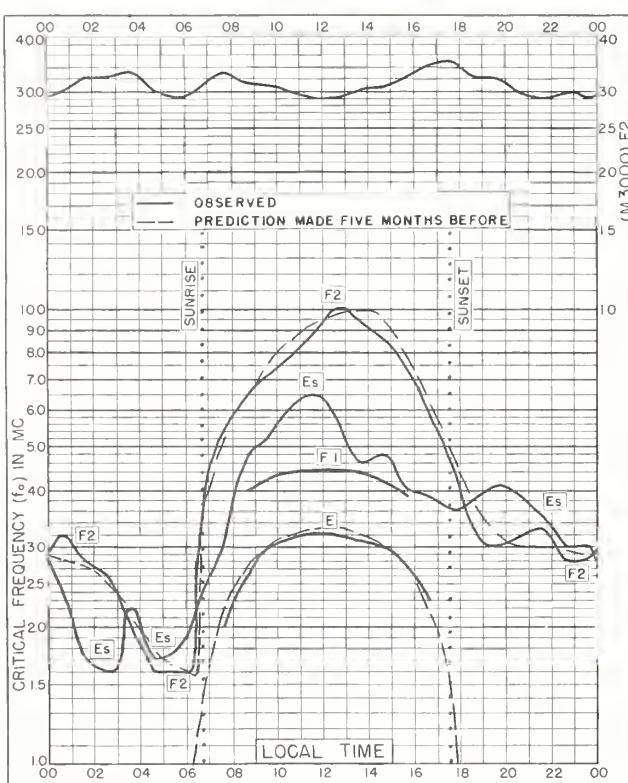
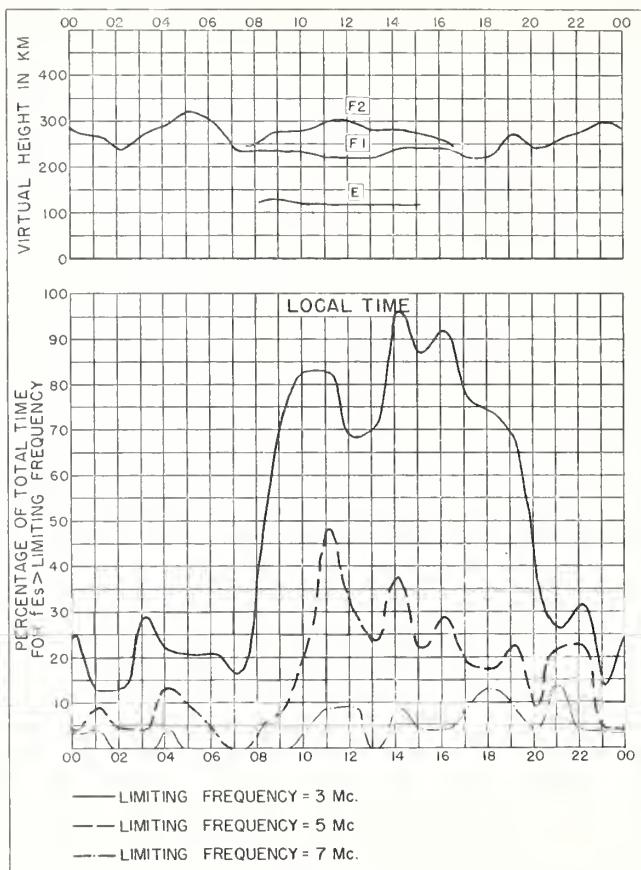
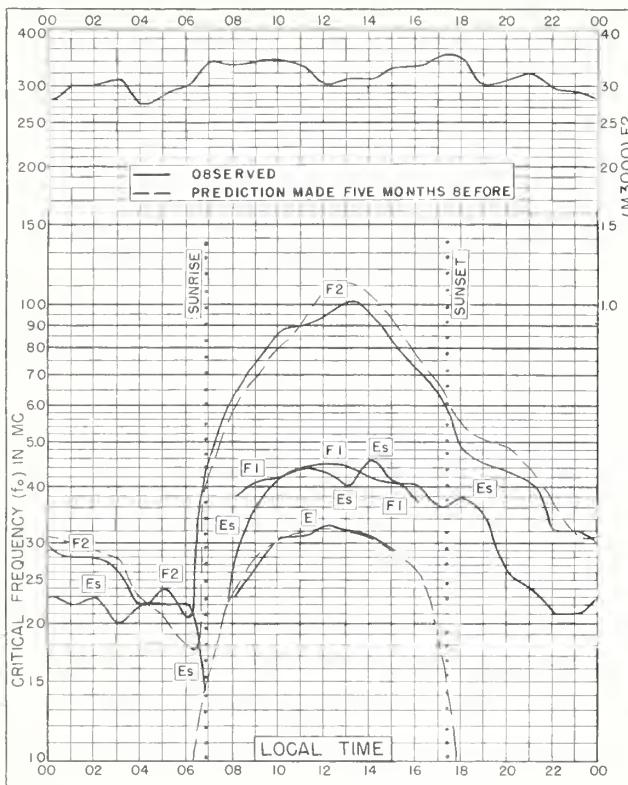
GRAPHS OF IONOSPHERIC DATA











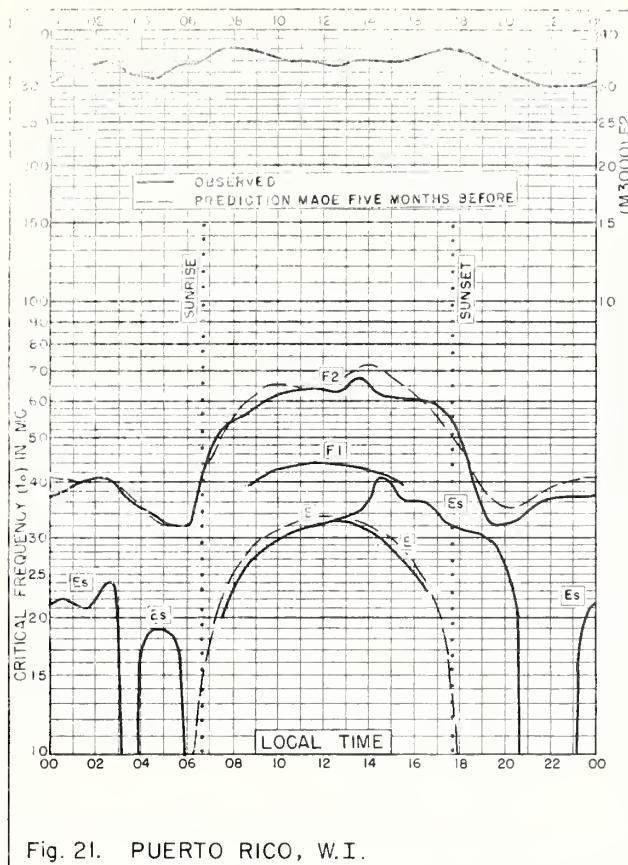


Fig. 21. PUERTO RICO, W.I.
18.5°N, 67.2°W JANUARY 1955

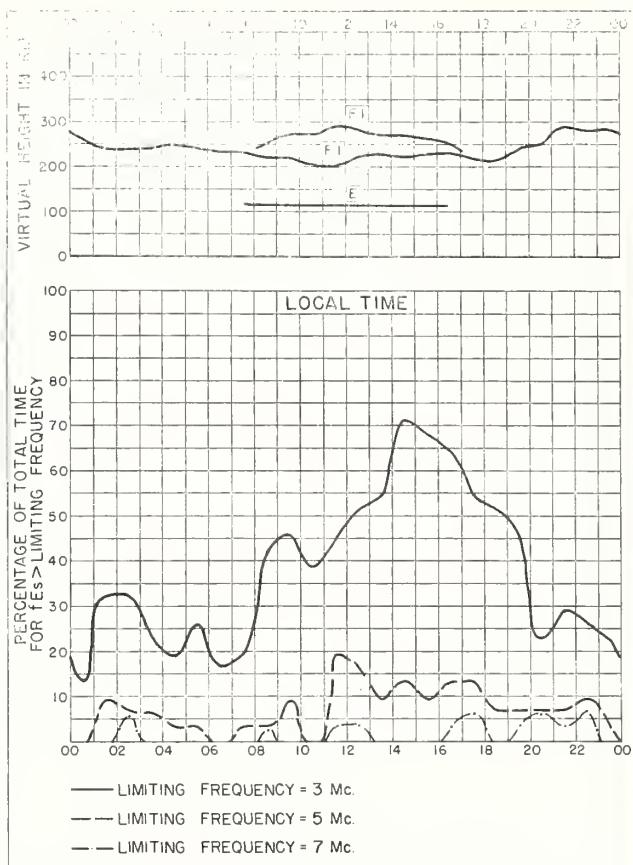


Fig. 22. PUERTO RICO, W.I. JANUARY 1955

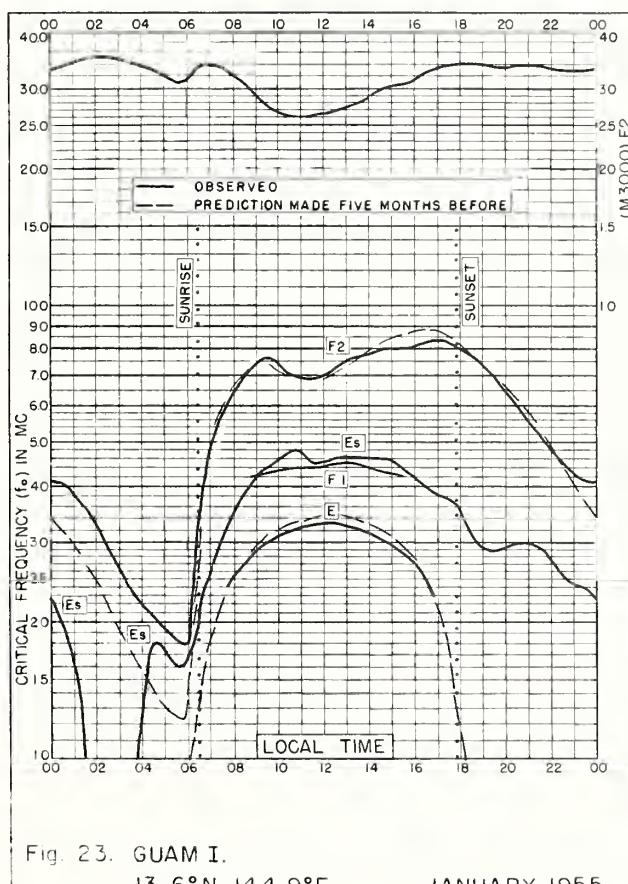


Fig. 23. GUAM I.
13.6°N, 144.9°E JANUARY 1955

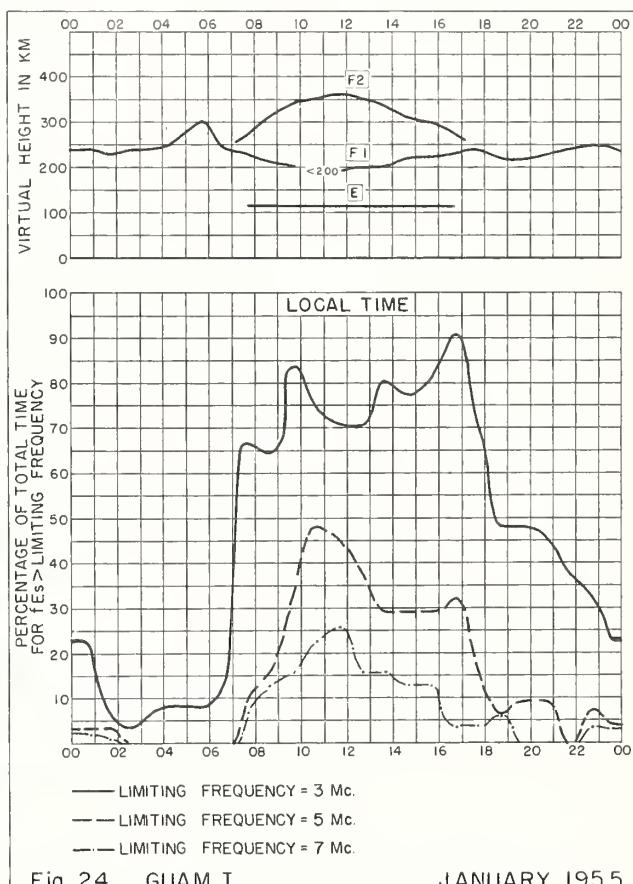
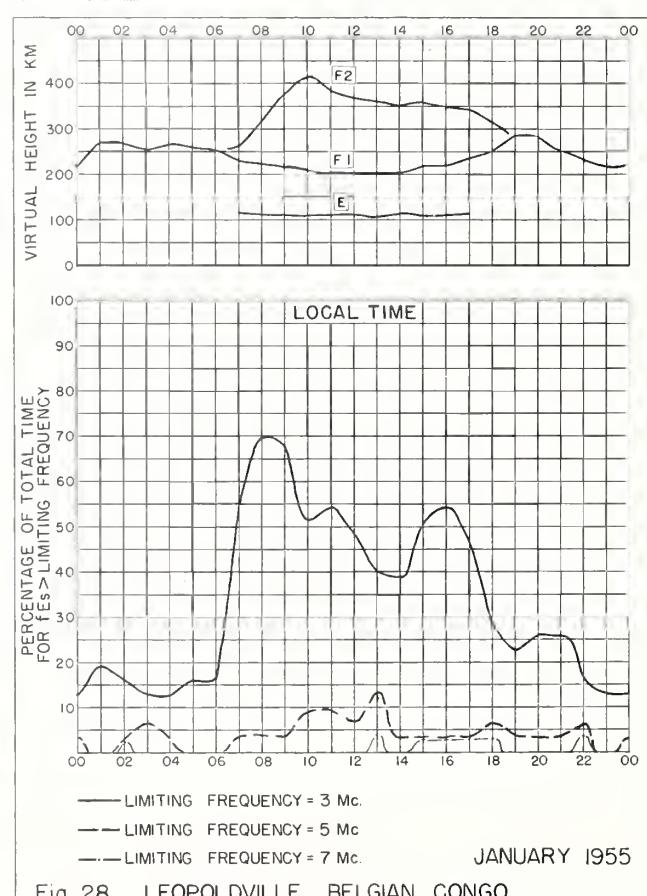
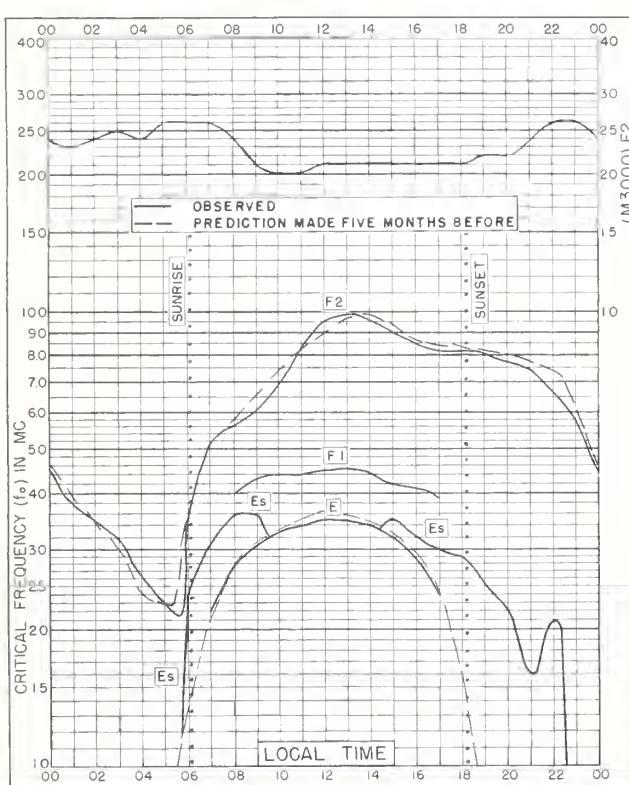
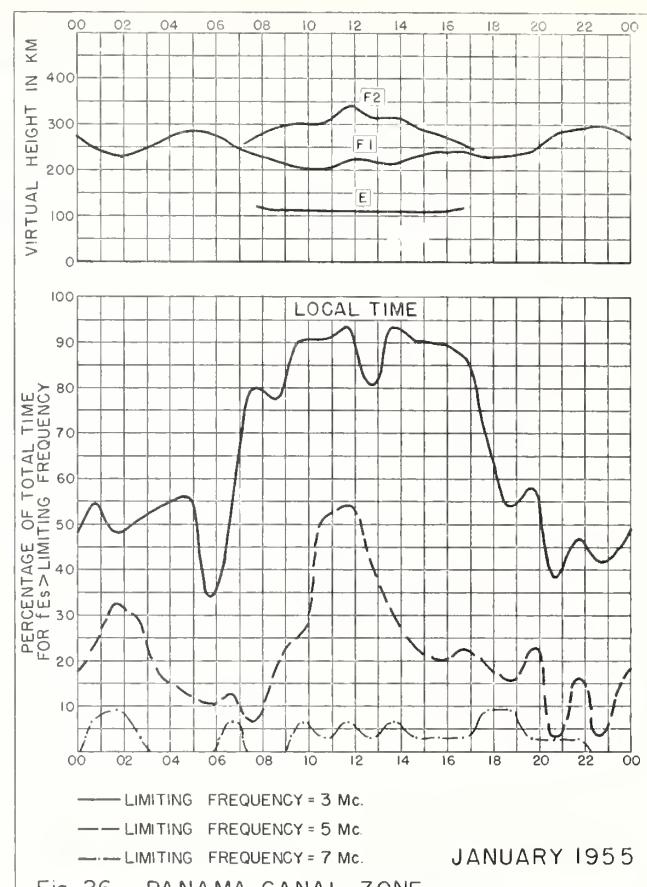
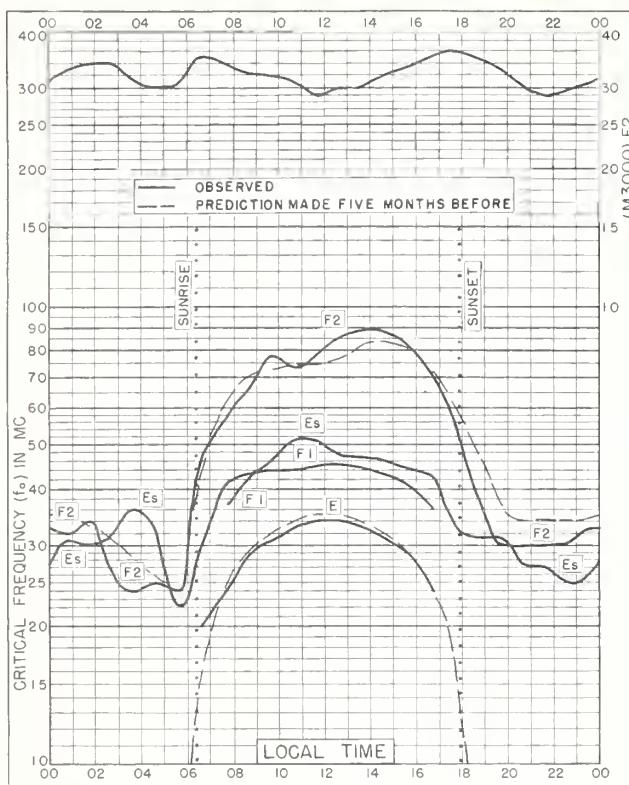
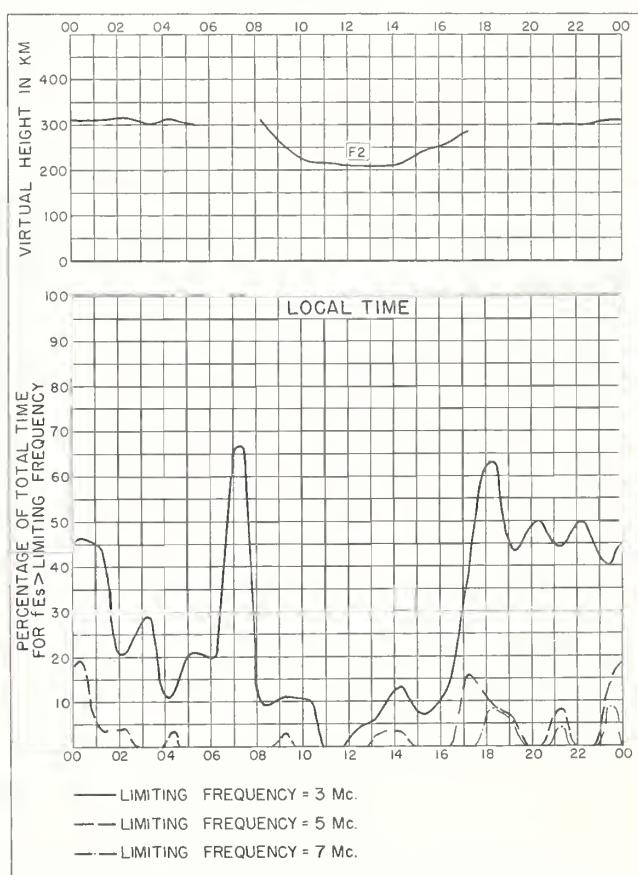
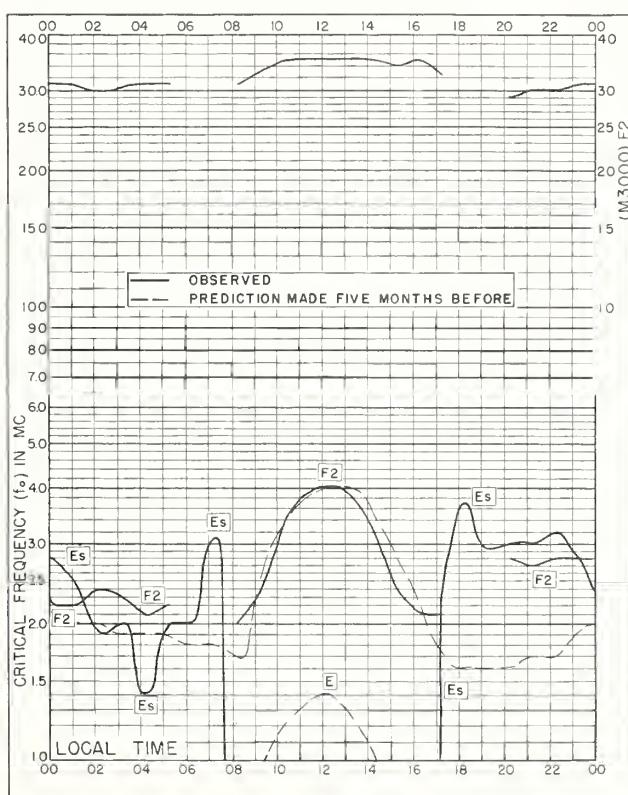
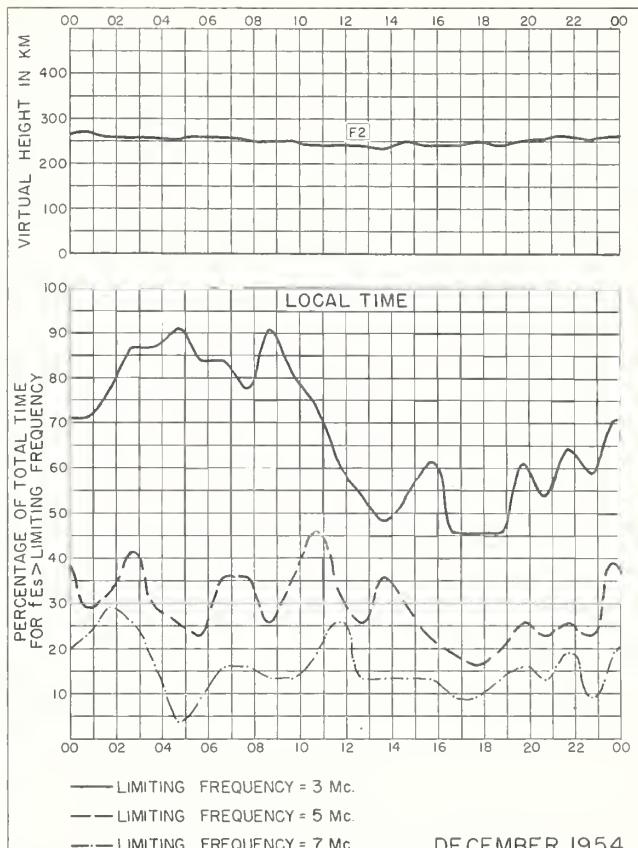
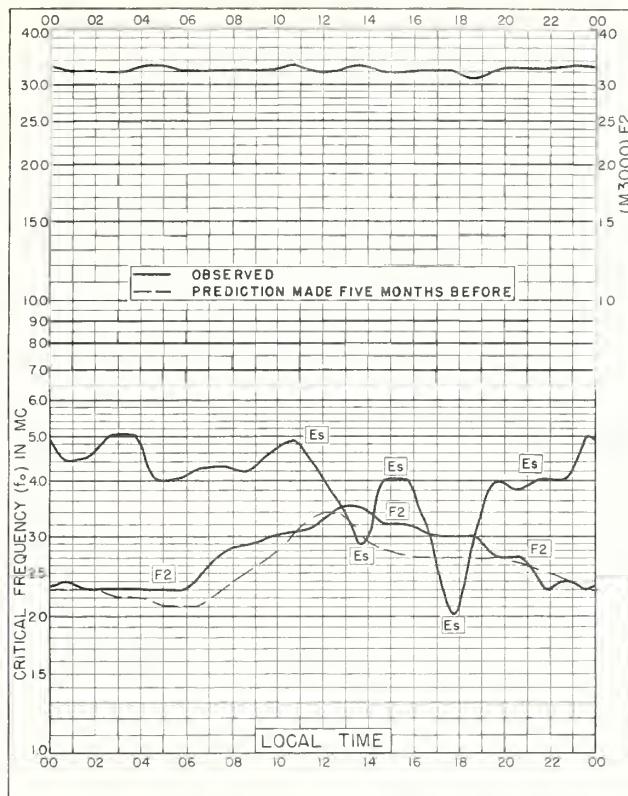


Fig. 24. GUAM I. JANUARY 1955





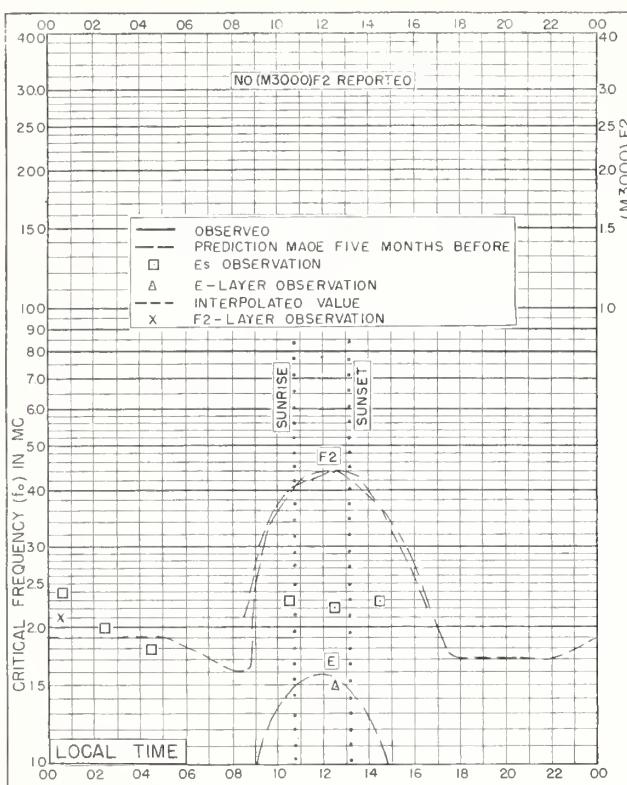


Fig. 33. LULEA, SWEDEN

65.6°N, 22.1°E.

DECEMBER 1954

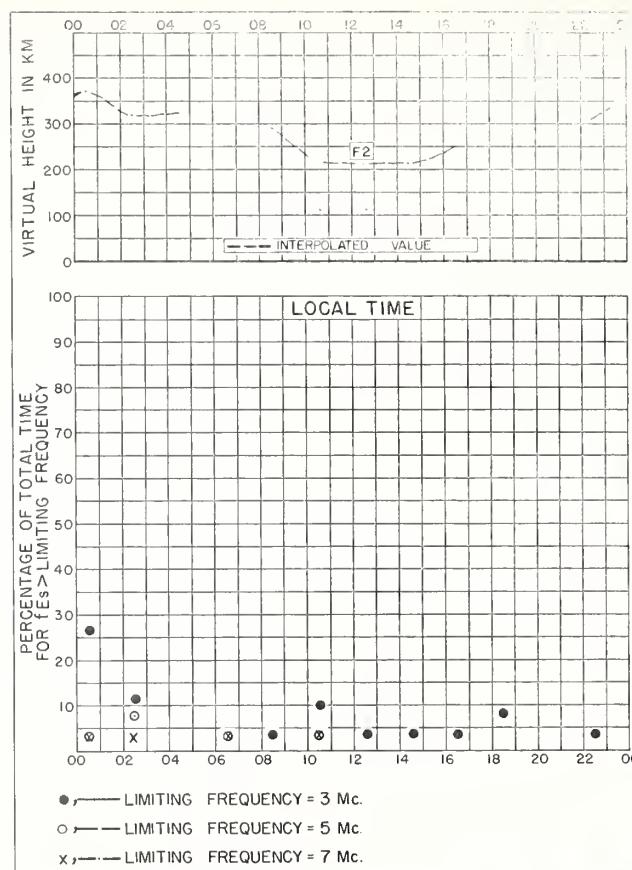


Fig. 34. LULEA, SWEDEN

DECEMBER 1954

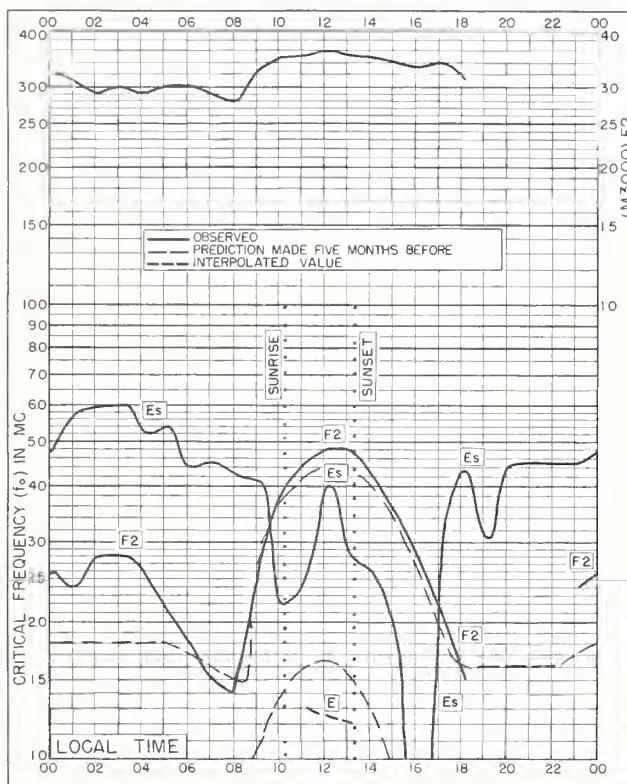


Fig. 35. FAIRBANKS, ALASKA

64.9°N, 147.8°W

DECEMBER 1954

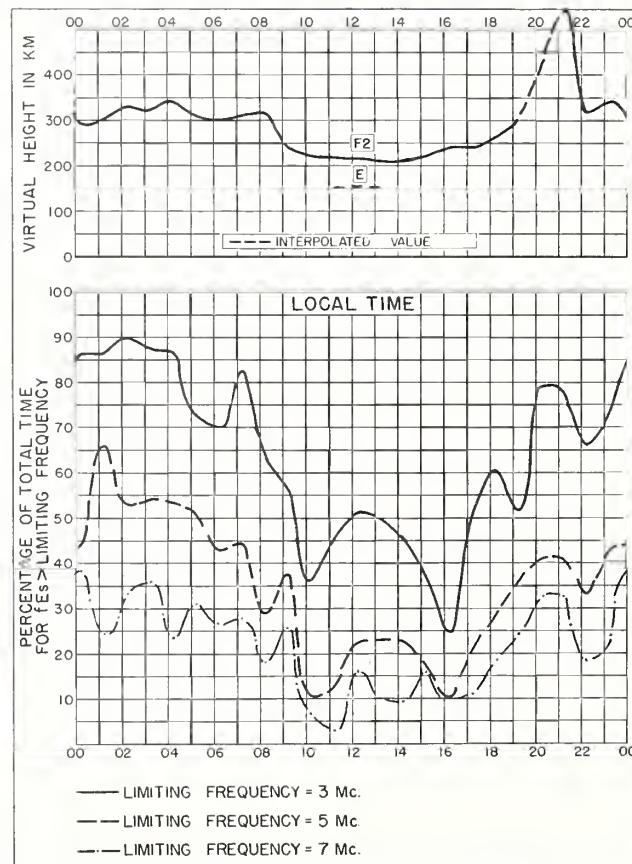


Fig. 36. FAIRBANKS, ALASKA

DECEMBER 1954

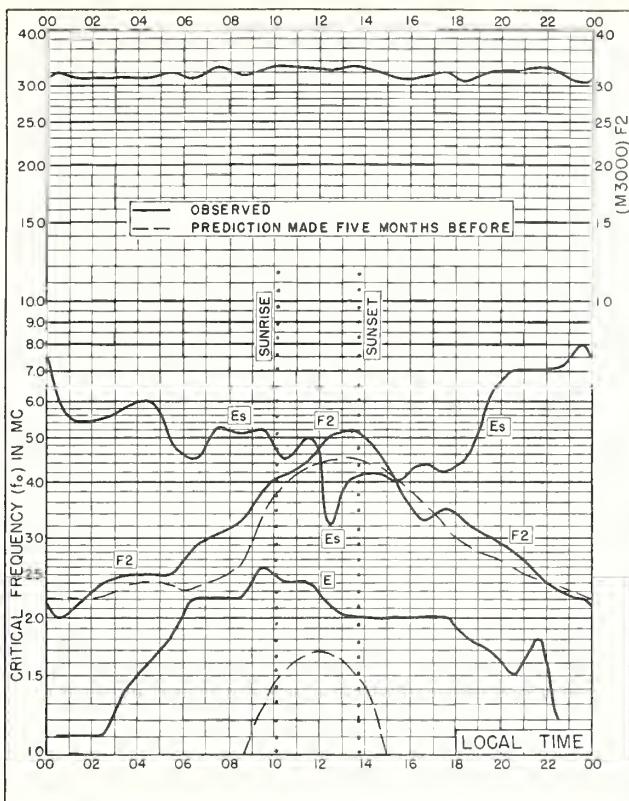


Fig. 37. BAKER LAKE, CANADA
64.3°N, 96.0°W DECEMBER 1954

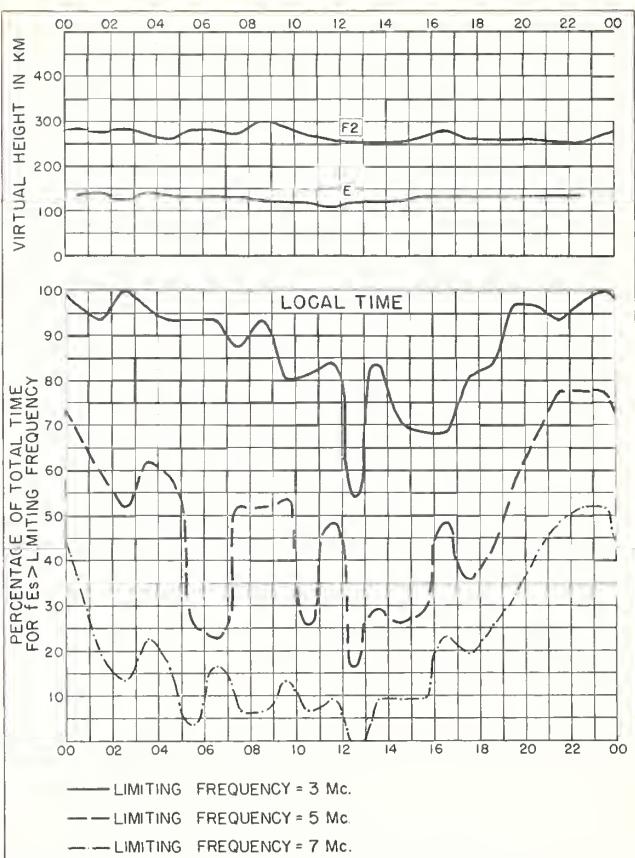


Fig. 38. BAKER LAKE, CANADA DECEMBER 1954

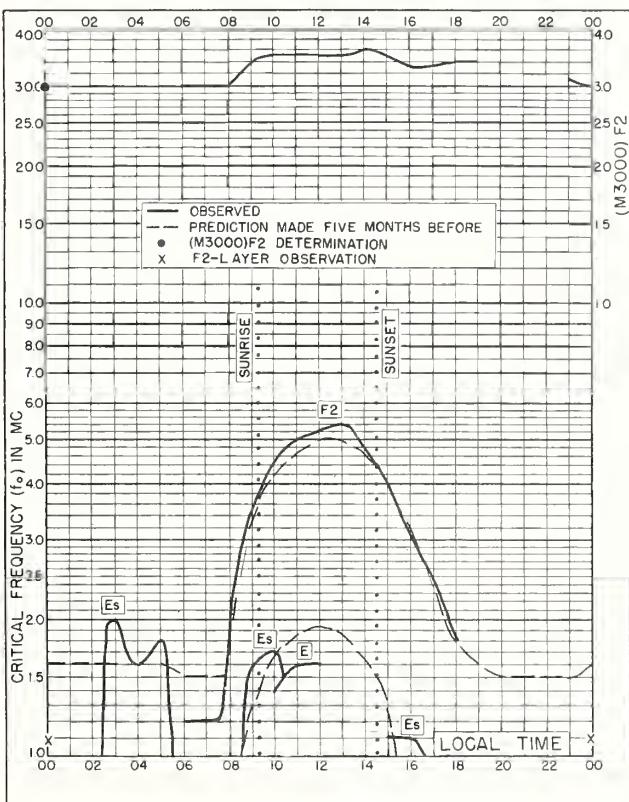


Fig. 39. ANCHORAGE, ALASKA
61.2°N, 149.9°W DECEMBER 1954

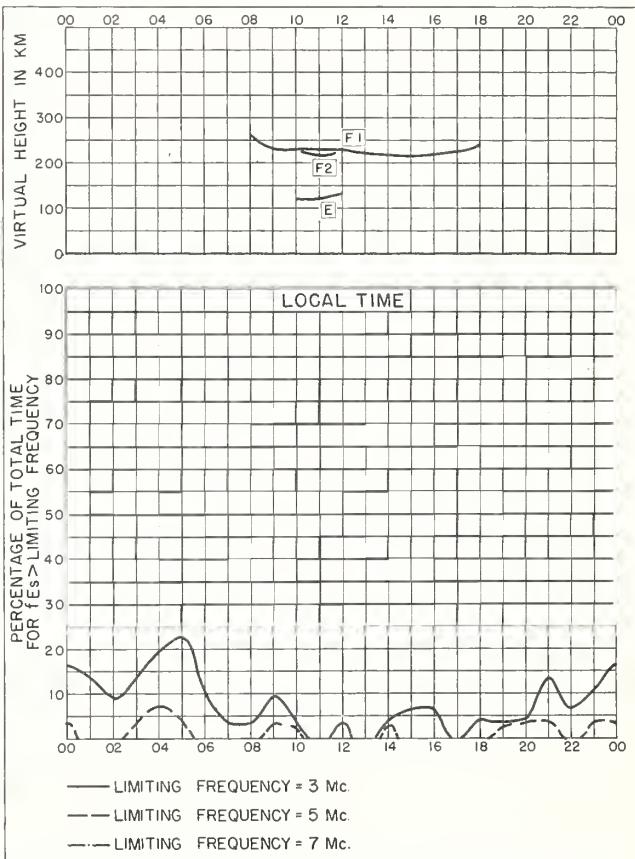


Fig. 40. ANCHORAGE, ALASKA DECEMBER 1954

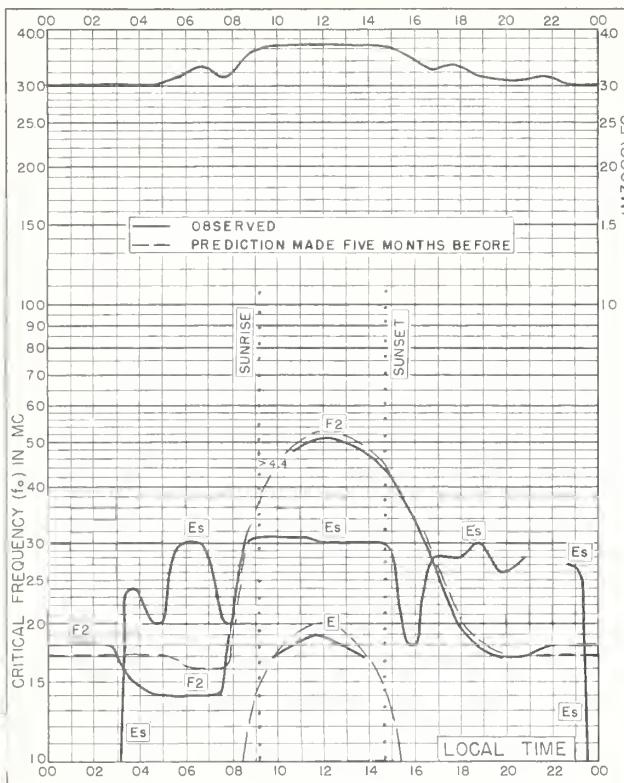


Fig. 41. OSLO, NORWAY

60.0°N, 11.1°E

DECEMBER 1954

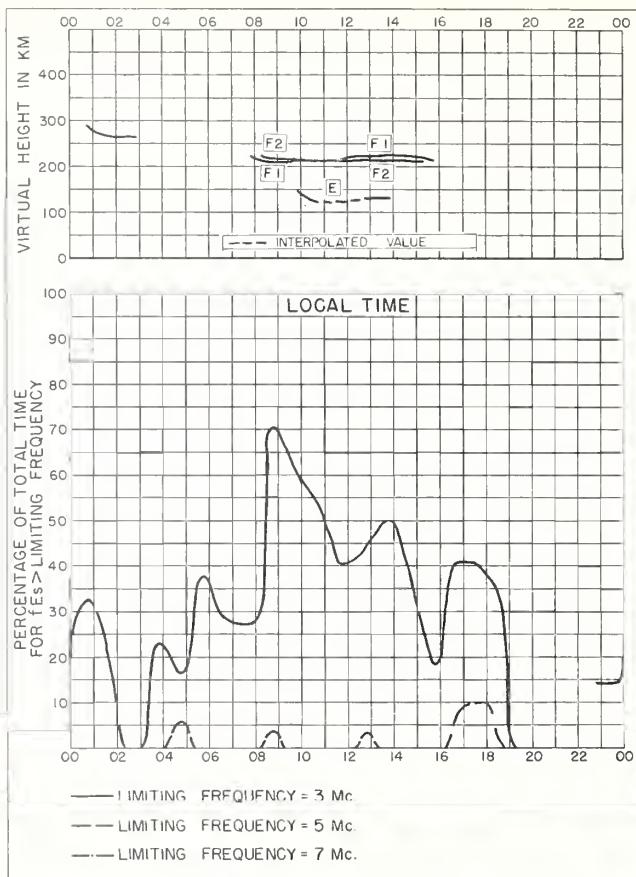


Fig. 42. OSLO, NORWAY

DECEMBER 1954

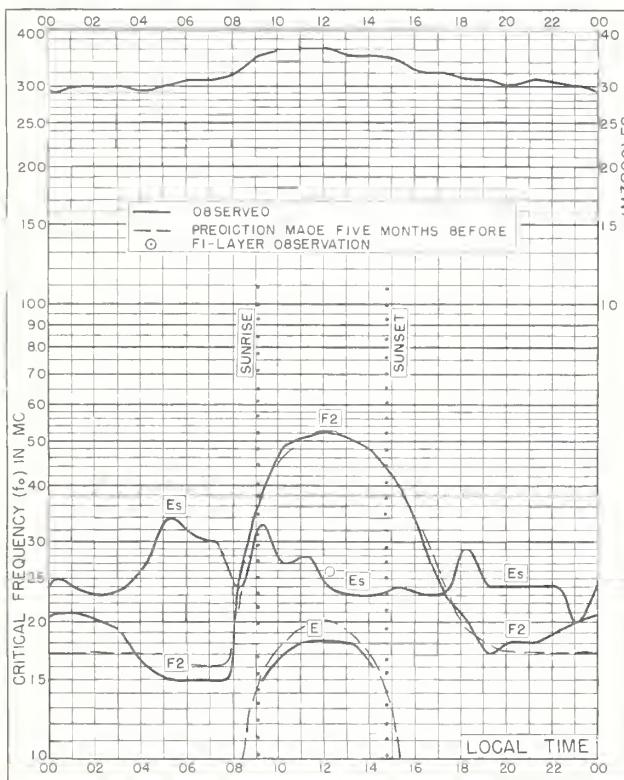


Fig. 43. UPSALA, SWEDEN

59.8°N, 17.6°E

DECEMBER 1954

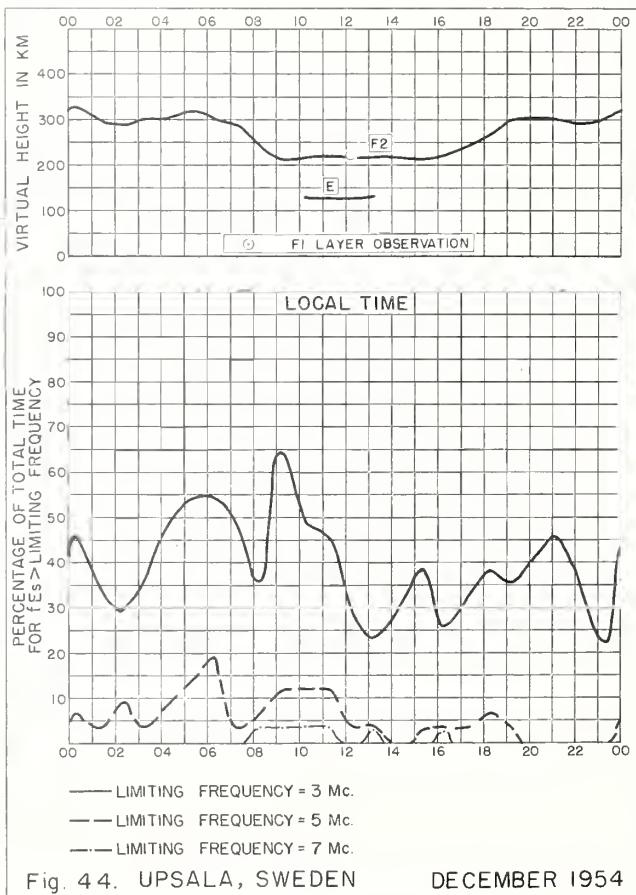
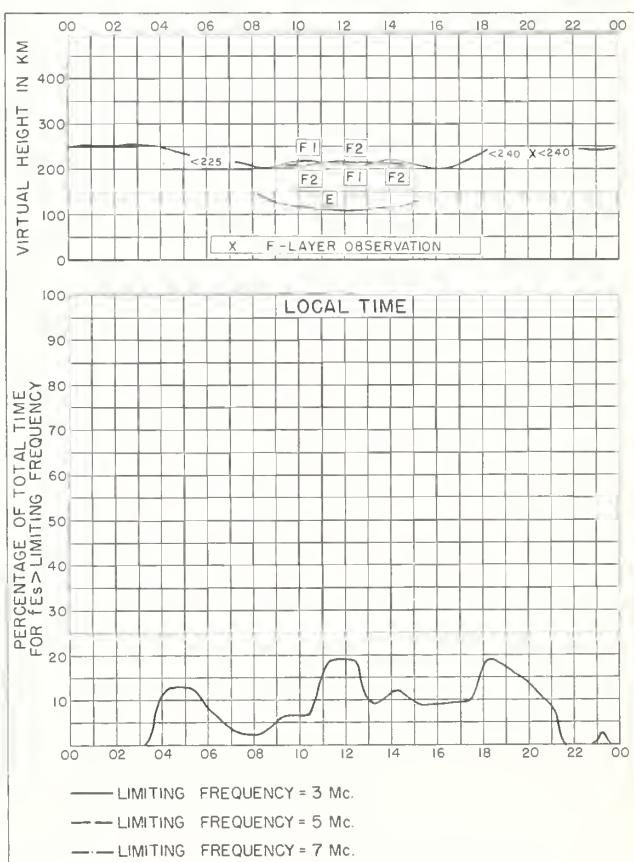
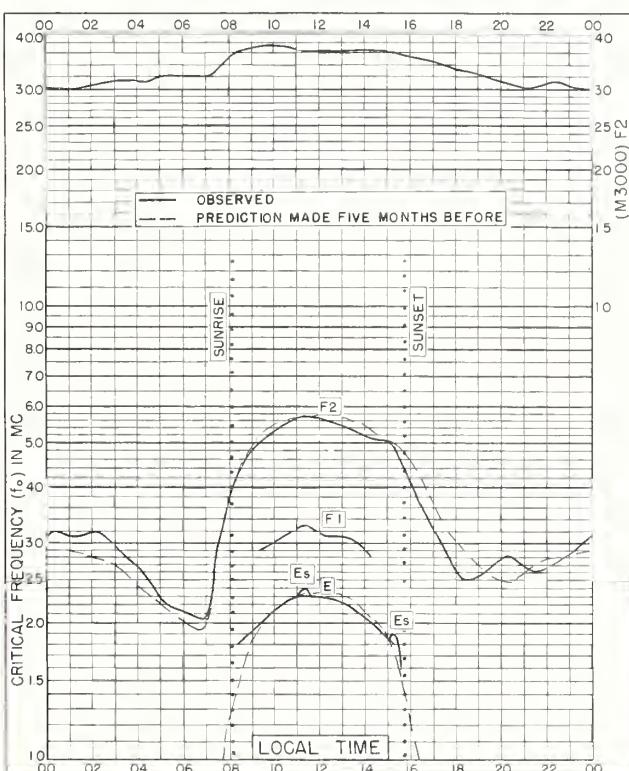
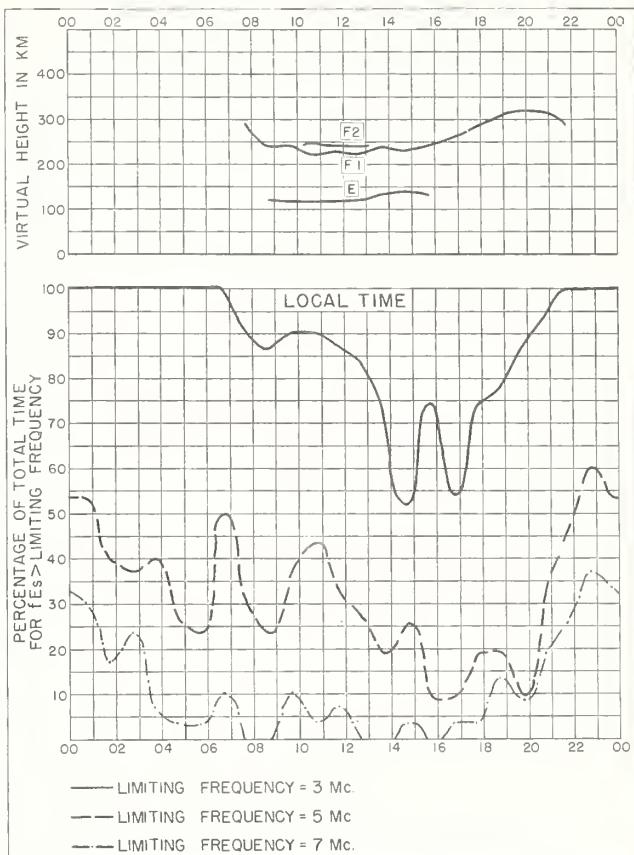
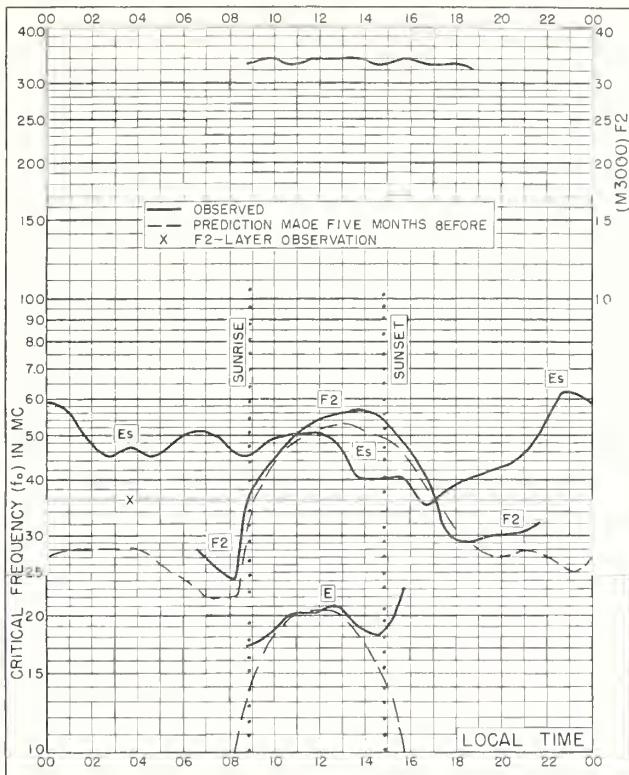
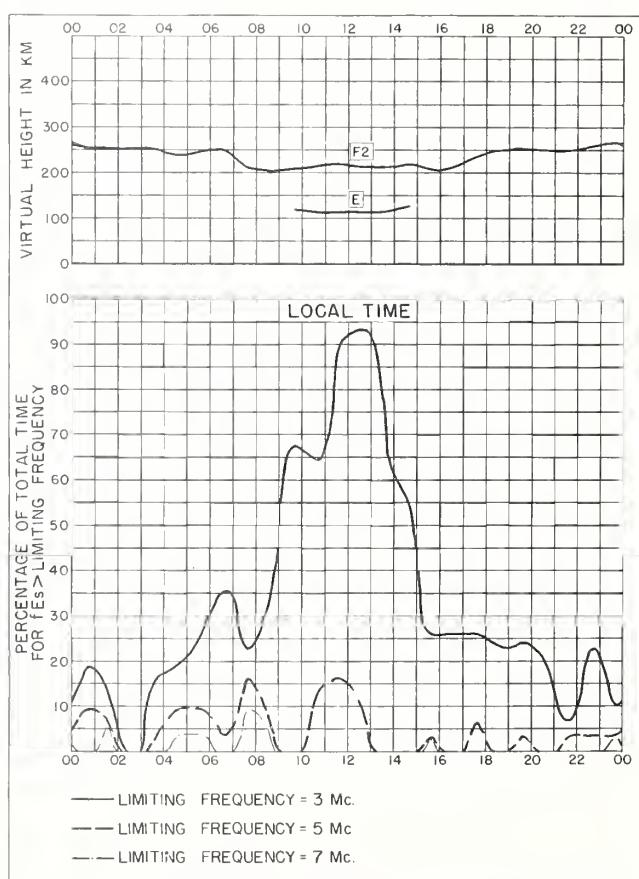
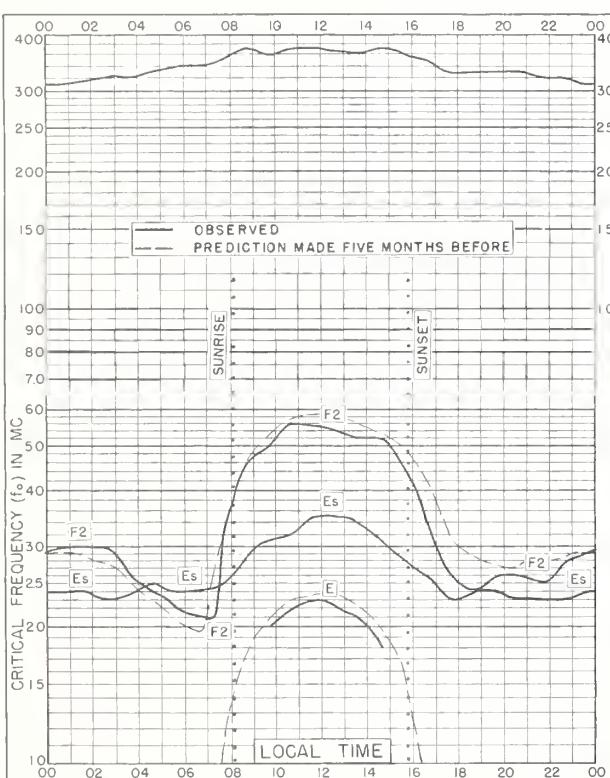
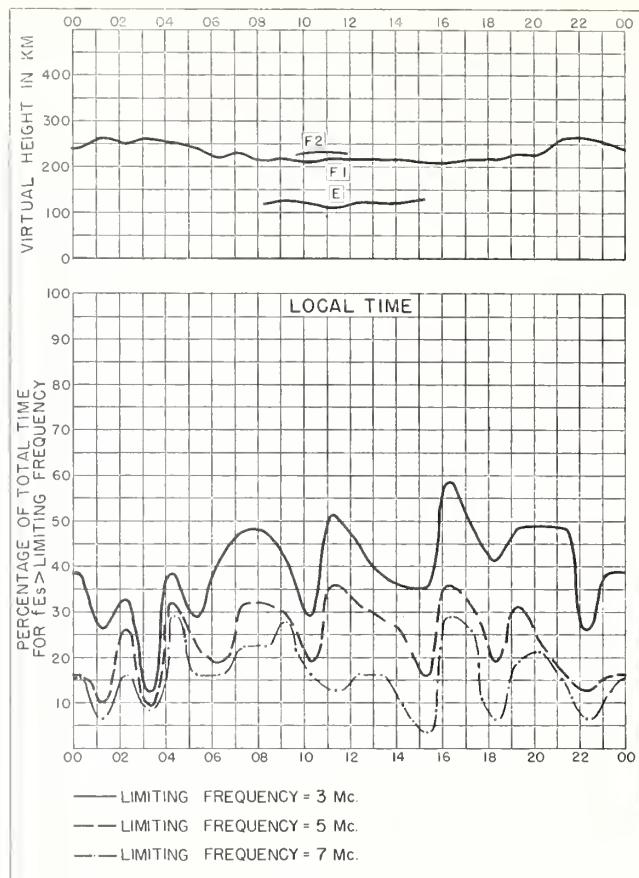
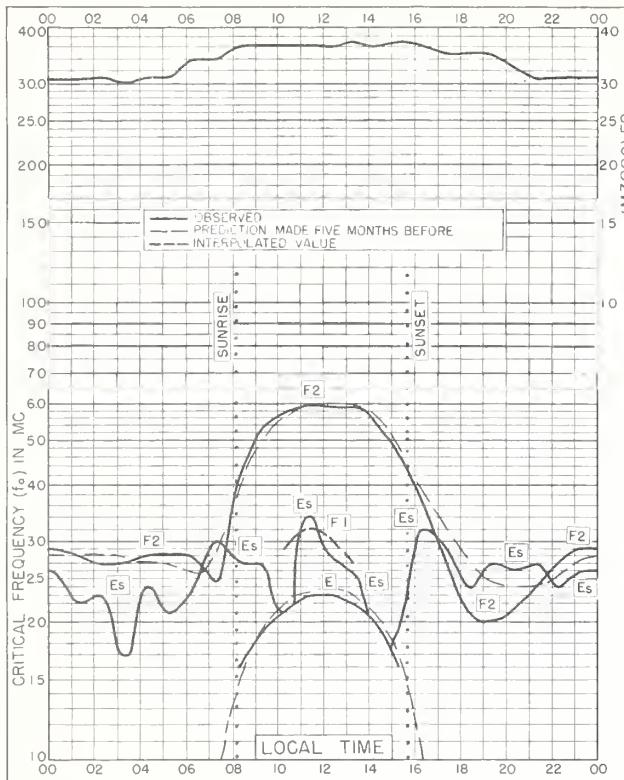


Fig. 44. UPSALA, SWEDEN

DECEMBER 1954





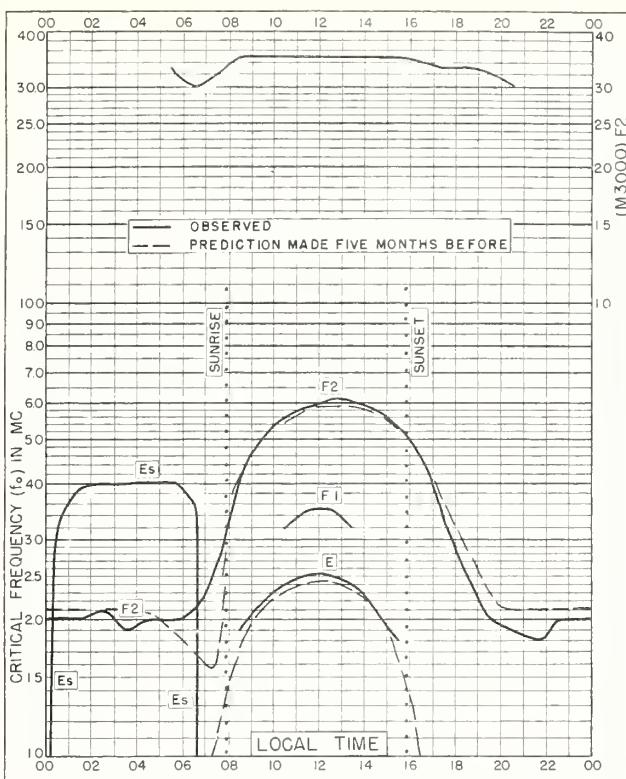


Fig. 53. WINNIPEG, CANADA
49.9°N, 97.4°W DECEMBER 1954

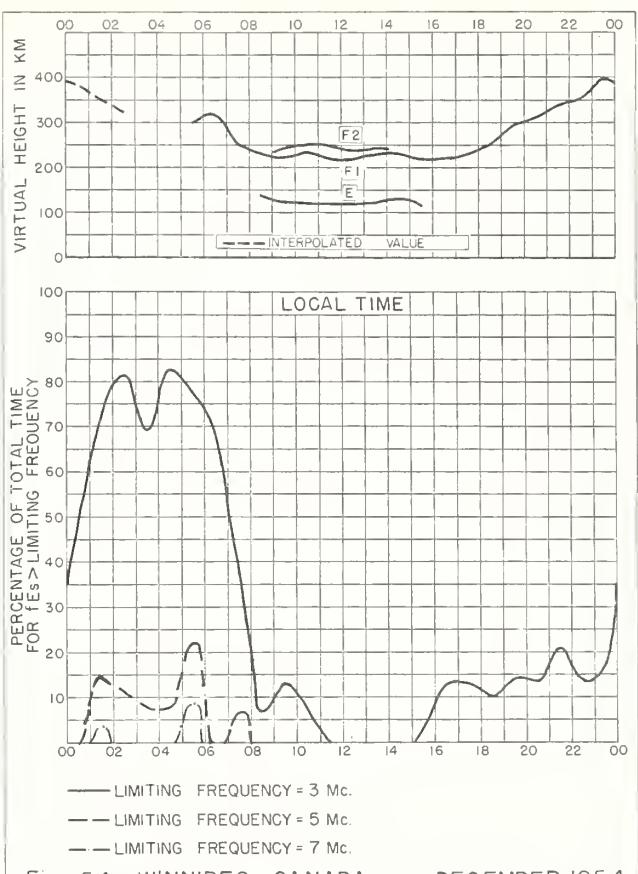


Fig. 54. WINNIPEG, CANADA DECEMBER 1954

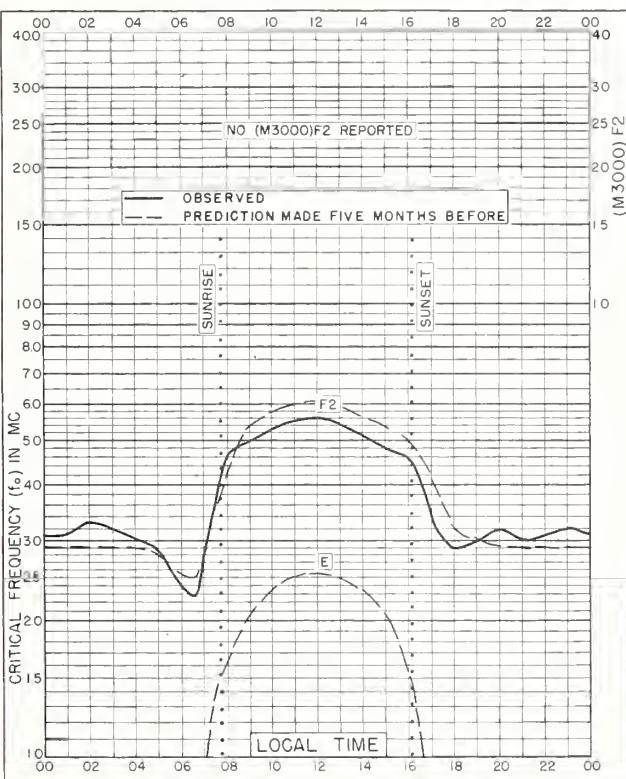


Fig. 55. GRAZ, AUSTRIA
47.1°N, 15.5°E DECEMBER 1954

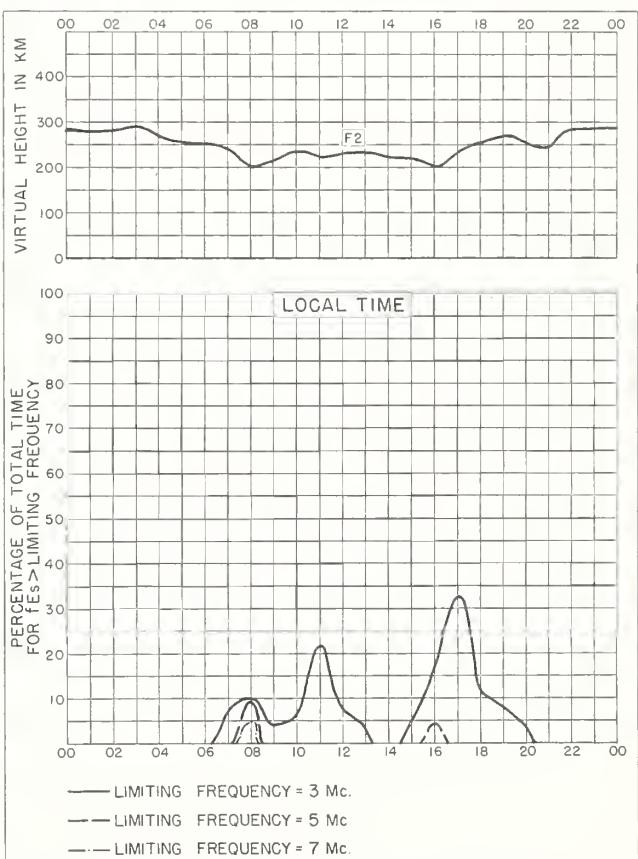
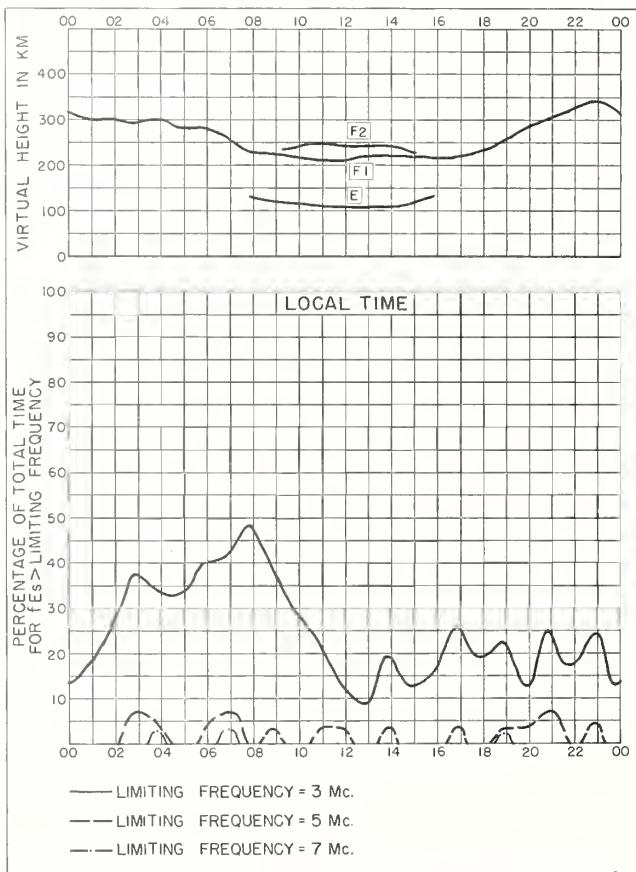
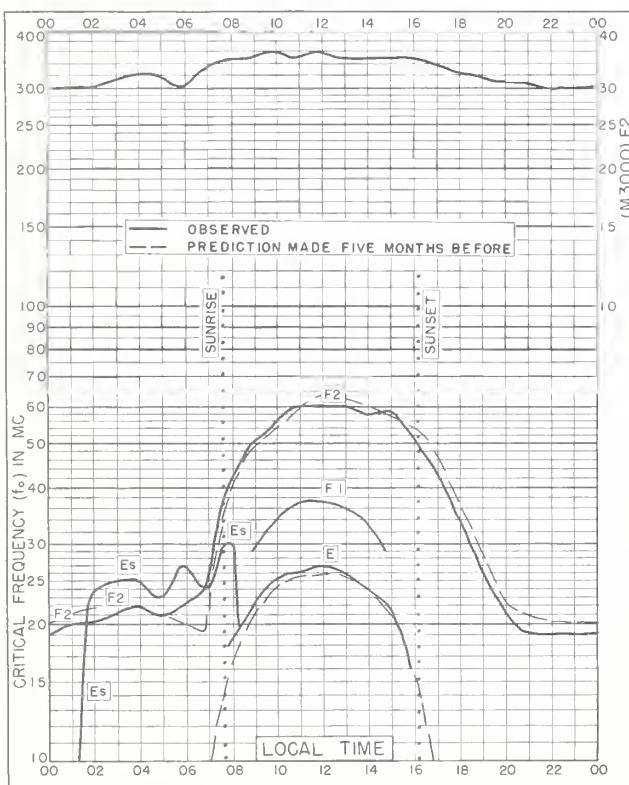
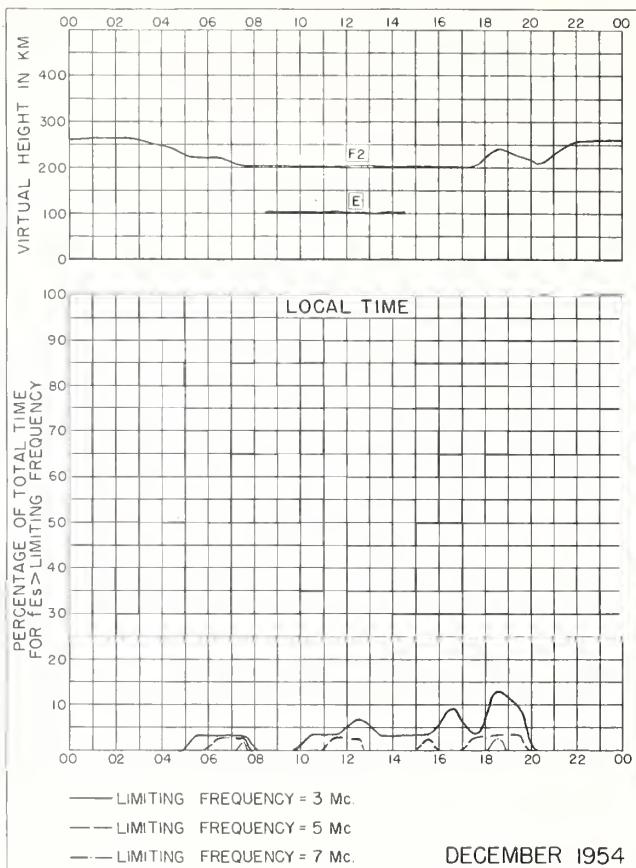
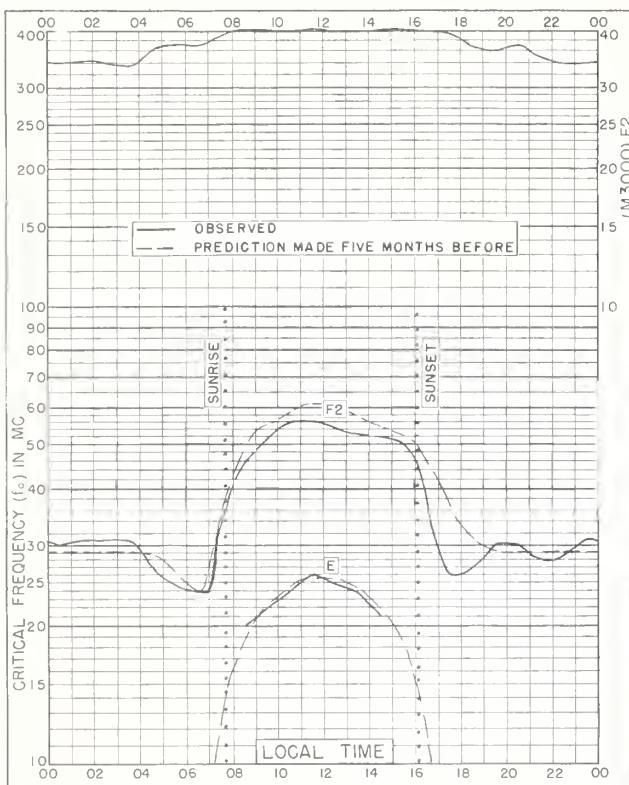
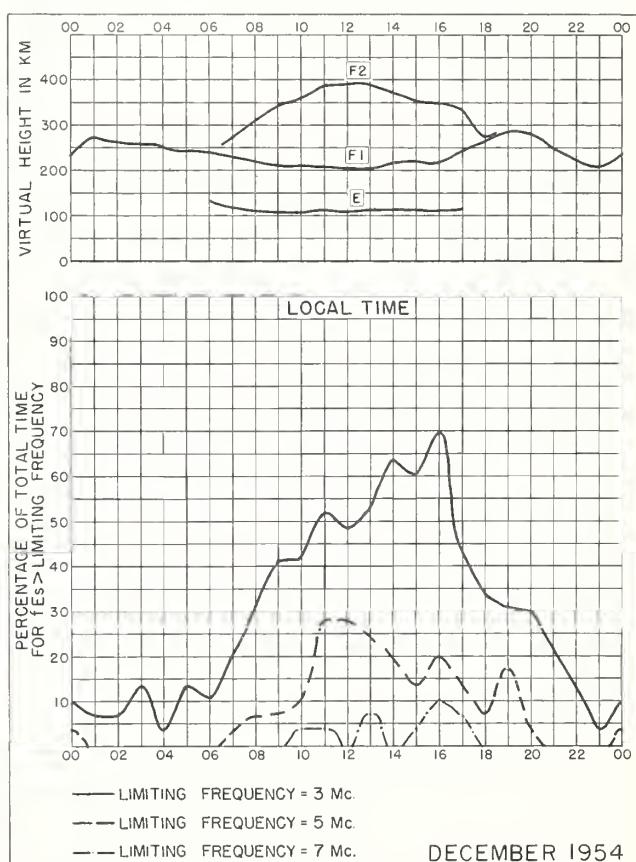
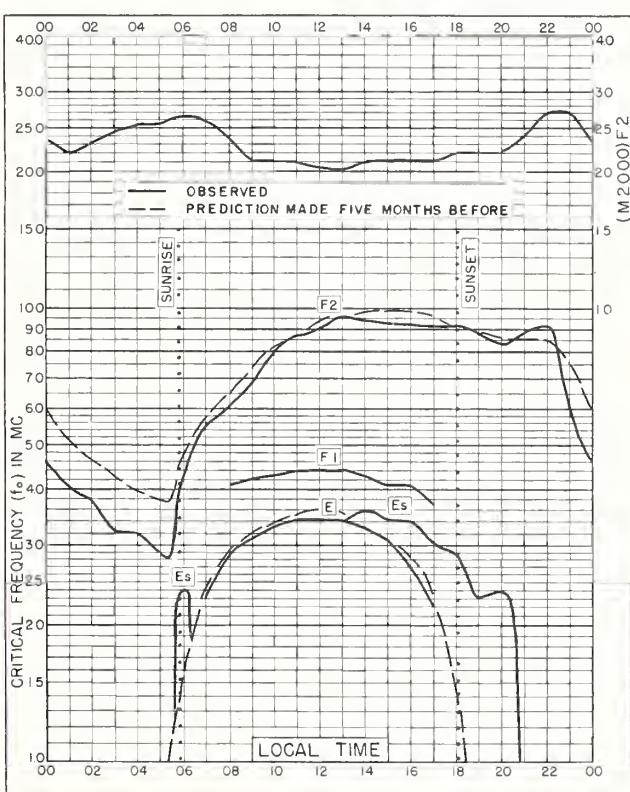
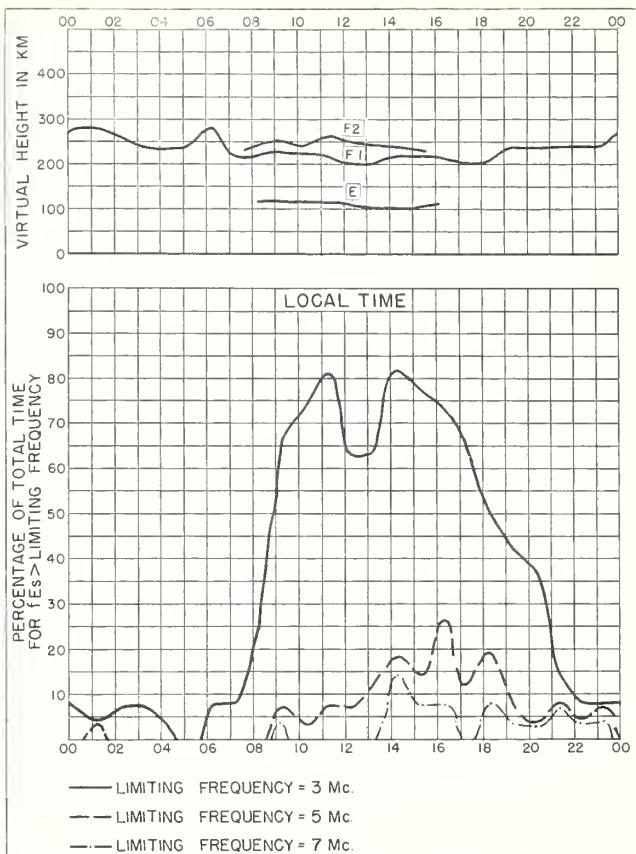
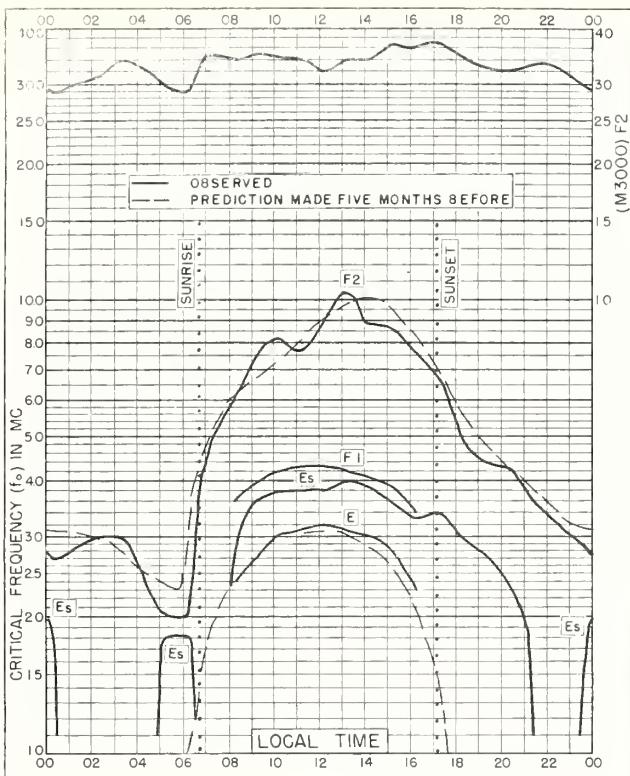


Fig. 56. GRAZ, AUSTRIA DECEMBER 1954





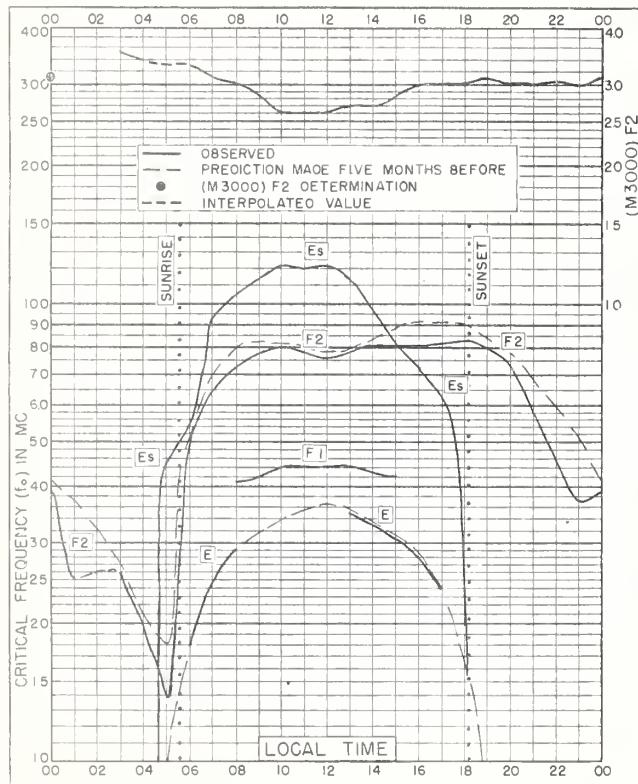


Fig. 65. HUANCAYO, PERU
12.0°S, 75.3°W.

DECEMBER 1954

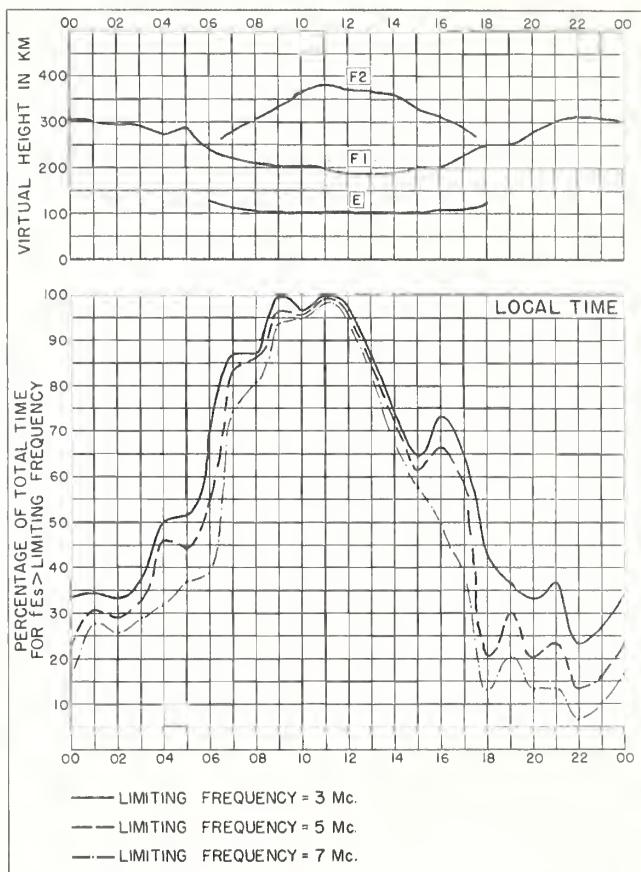


Fig. 66. HUANCAYO, PERU
DECEMBER 1954

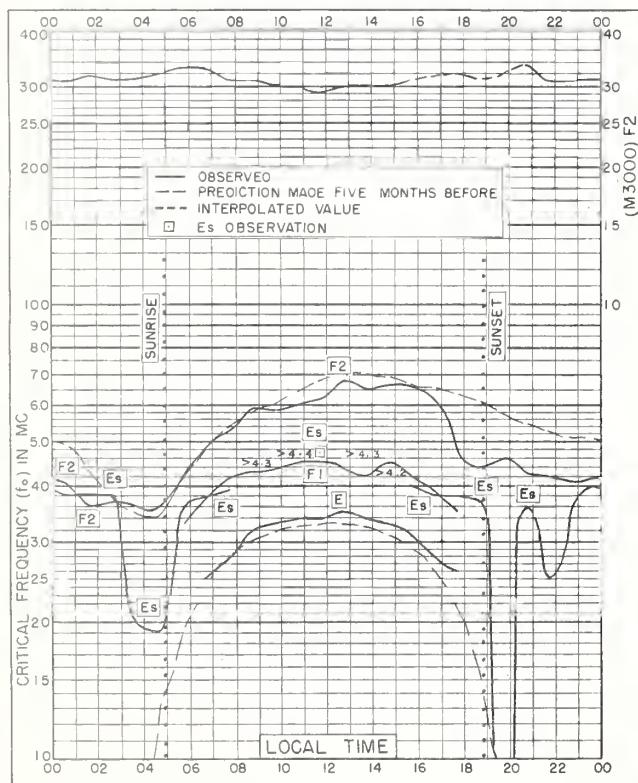


Fig. 67. WATHEROO, W. AUSTRALIA

30.3°S, 115.9°E.

DECEMBER 1954

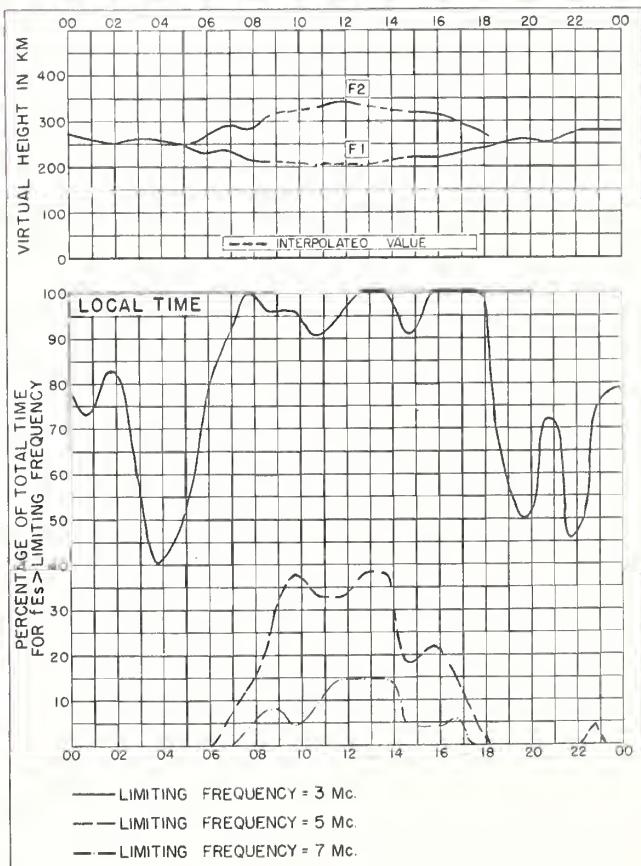
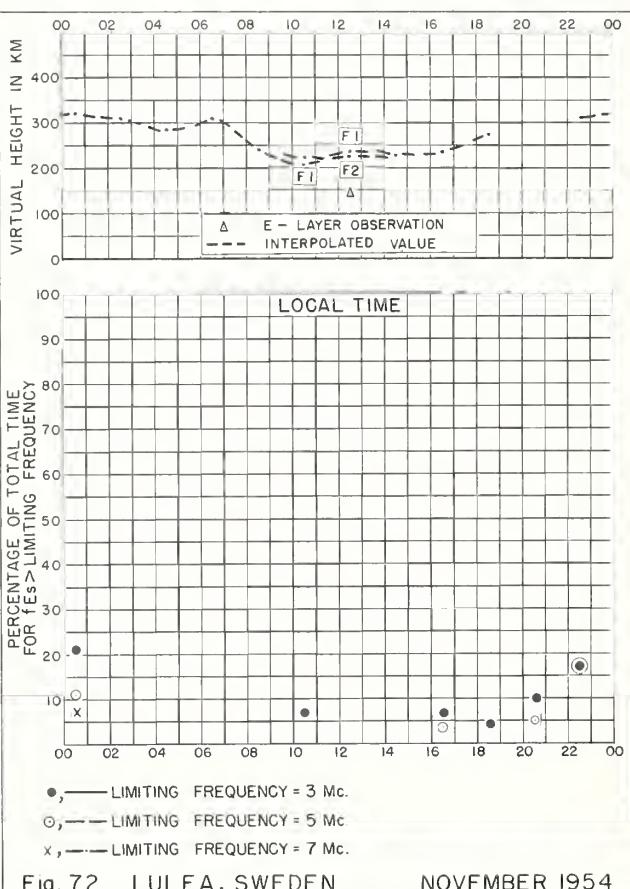
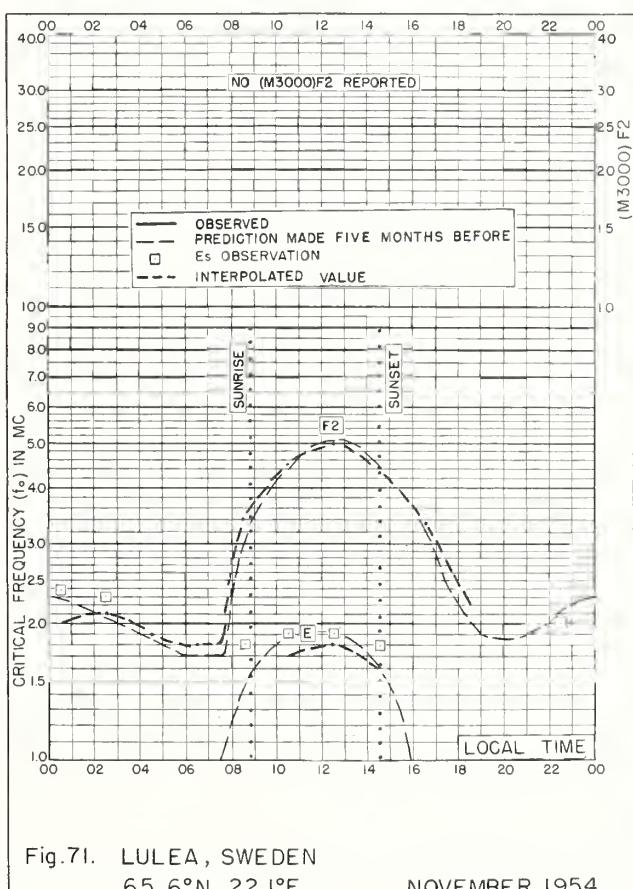
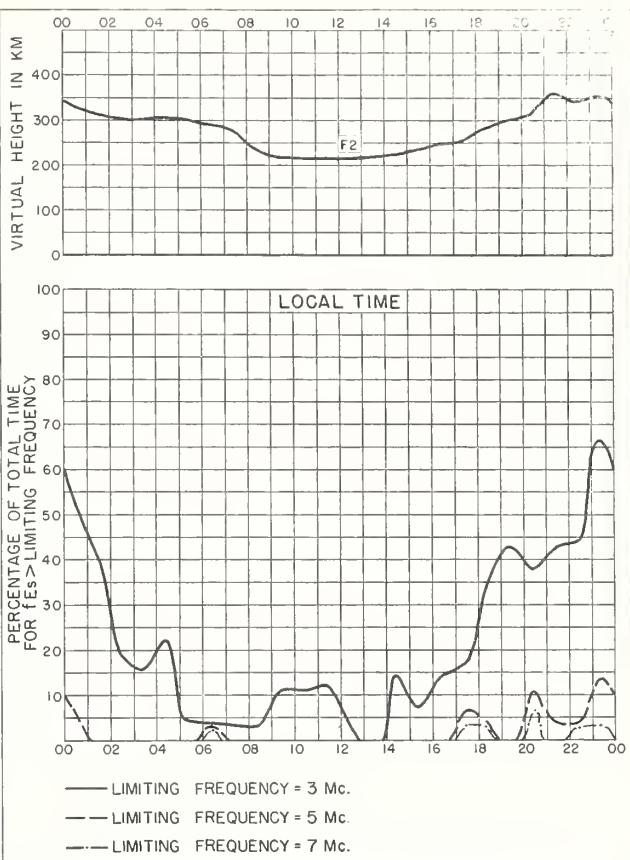
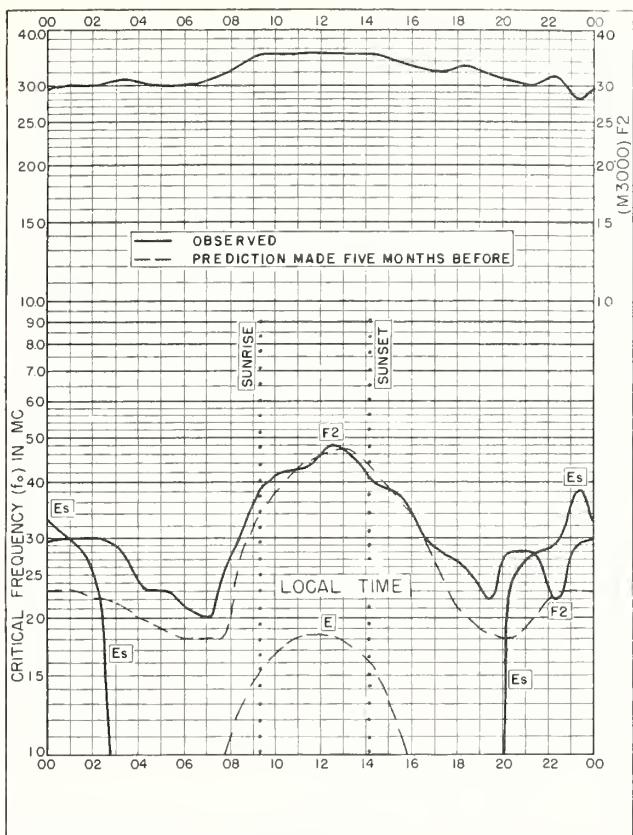


Fig. 68. WATHEROO, W. AUSTRALIA DECEMBER 1954



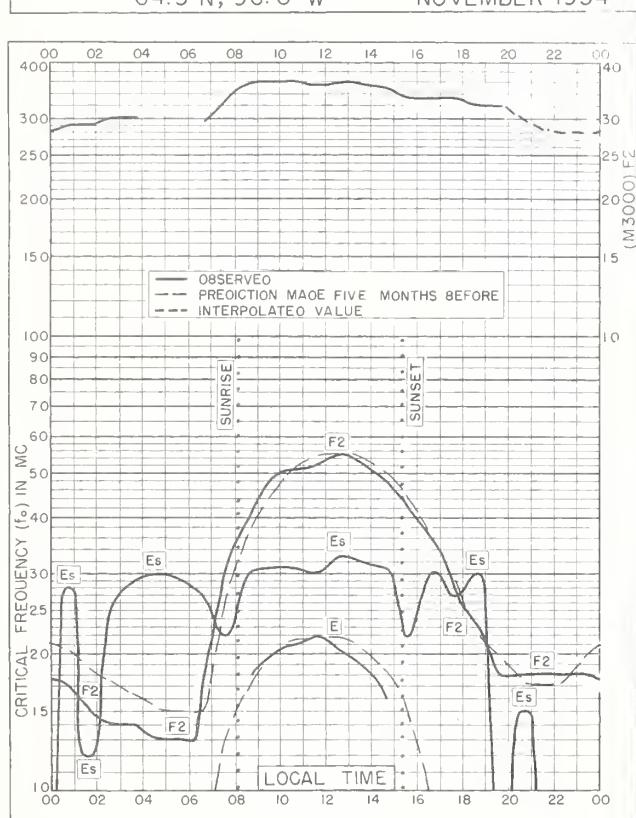
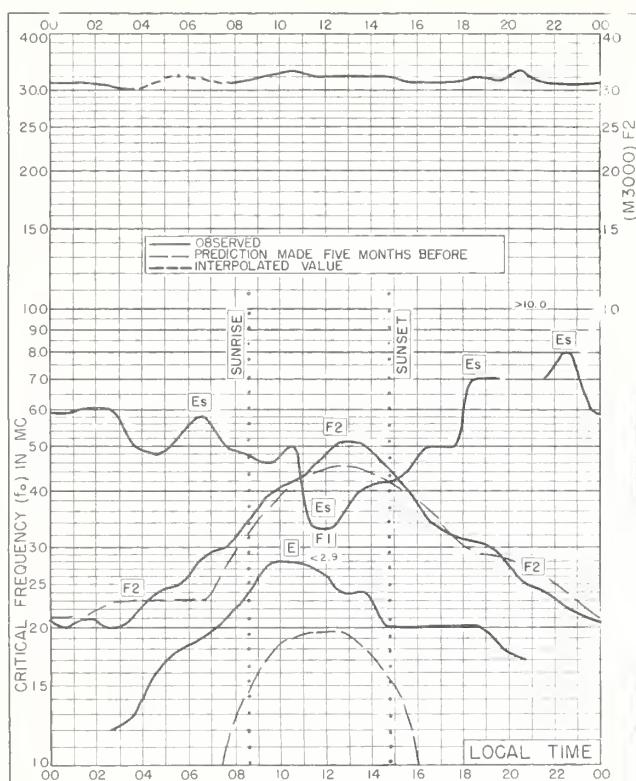
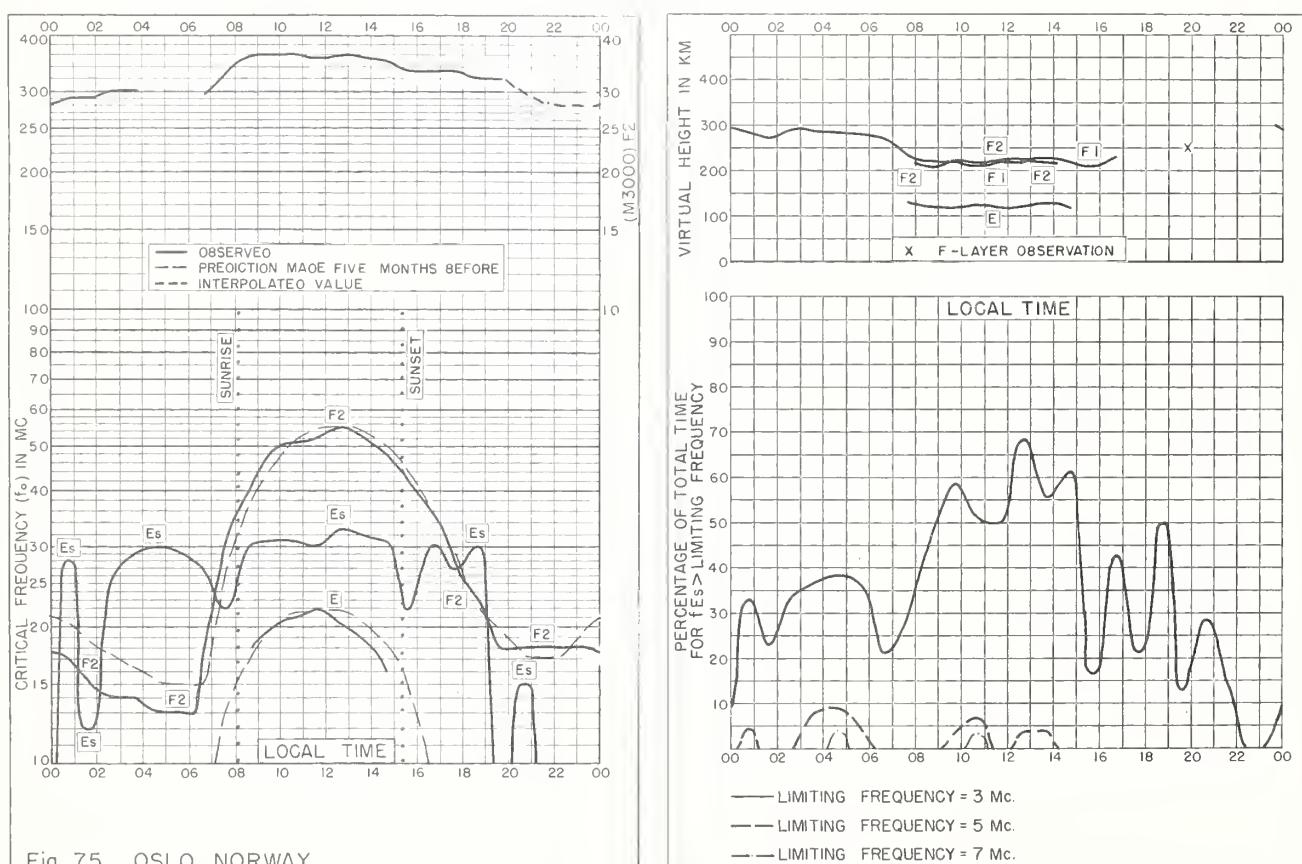


Fig. 75. OSLO, NORWAY
60.0°N, 11.1°E NOVEMBER 1954

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Fig. 74. BAKER LAKE, CANADA NOVEMBER 1954



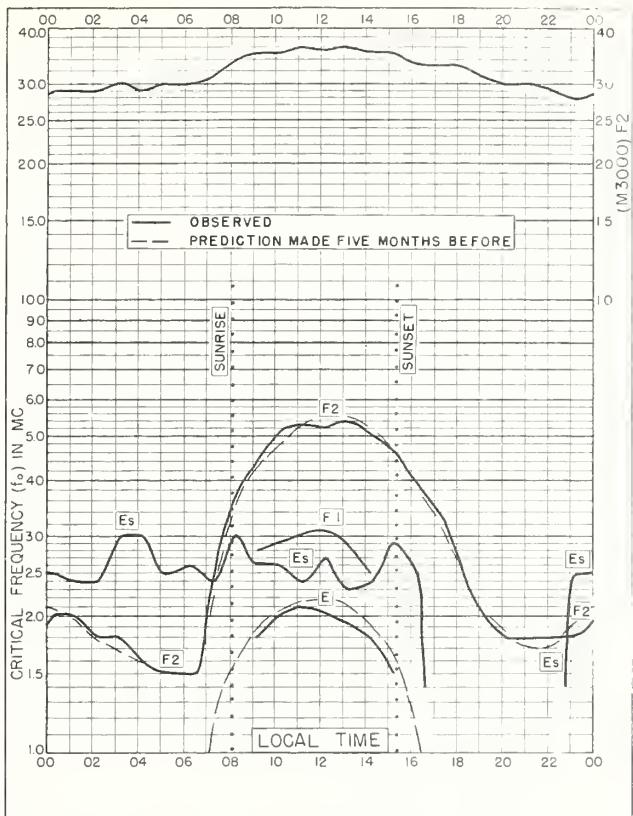


Fig. 77. UPSALA, SWEDEN
59. 8°N, 17. 6°E NOVEMBER 1954

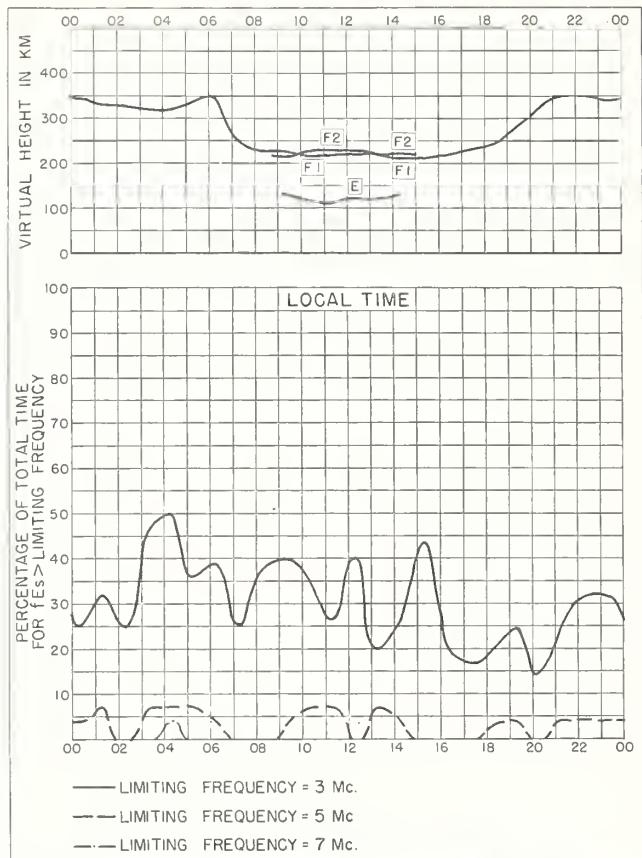


Fig. 78. UPSALA, SWEDEN NOVEMBER 1954

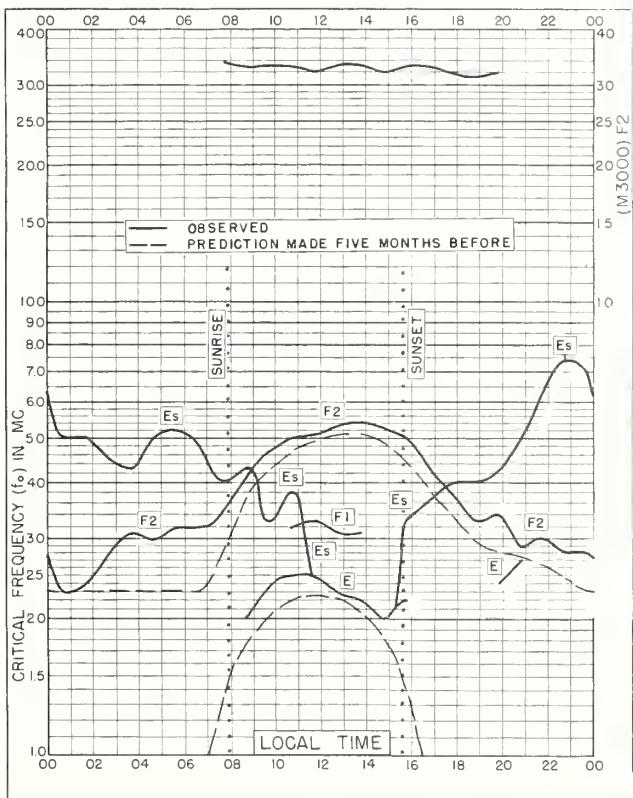


Fig. 79. CHURCHILL, CANADA
58. 8°N, 94. 2°W NOVEMBER 1954

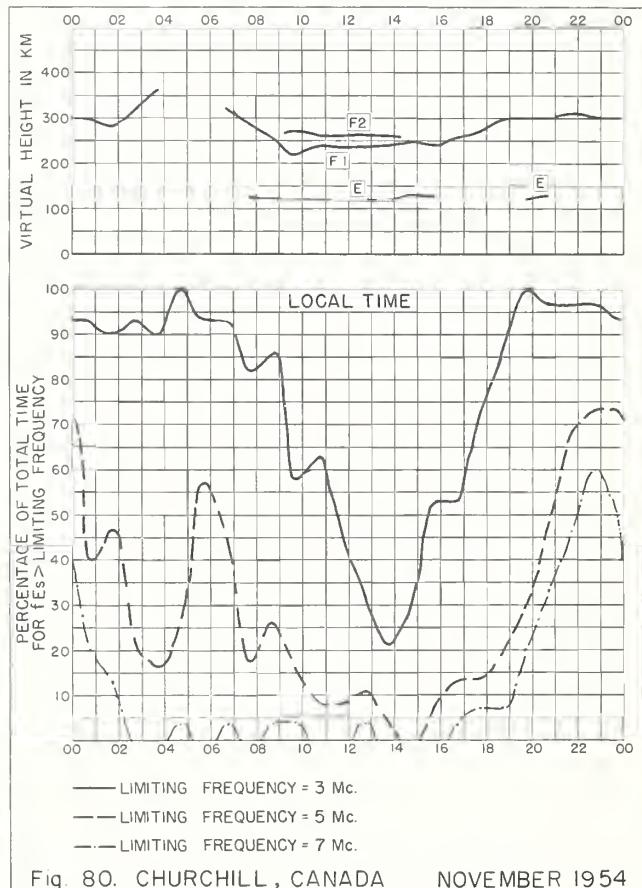


Fig. 80. CHURCHILL, CANADA NOVEMBER 1954

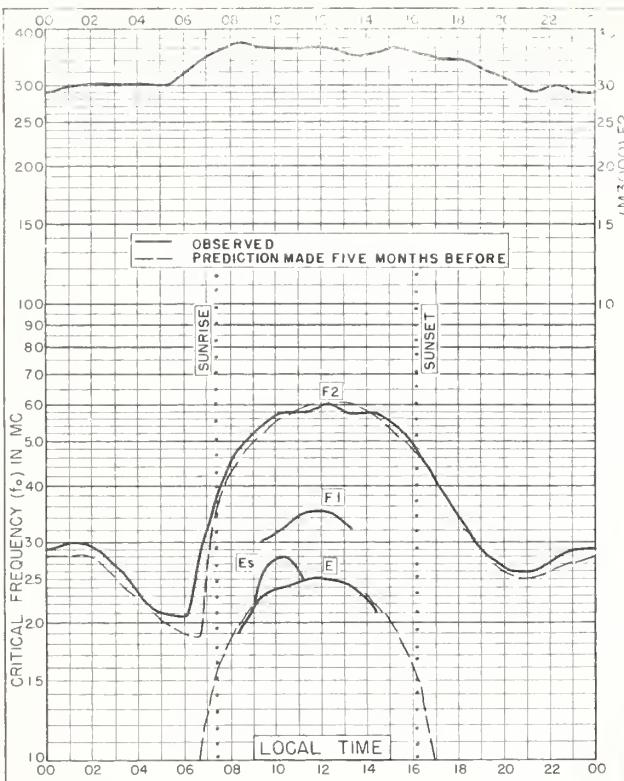


Fig. 81 De BILT, HOLLAND
52.1°N, 5.2°E NOVEMBER 1954

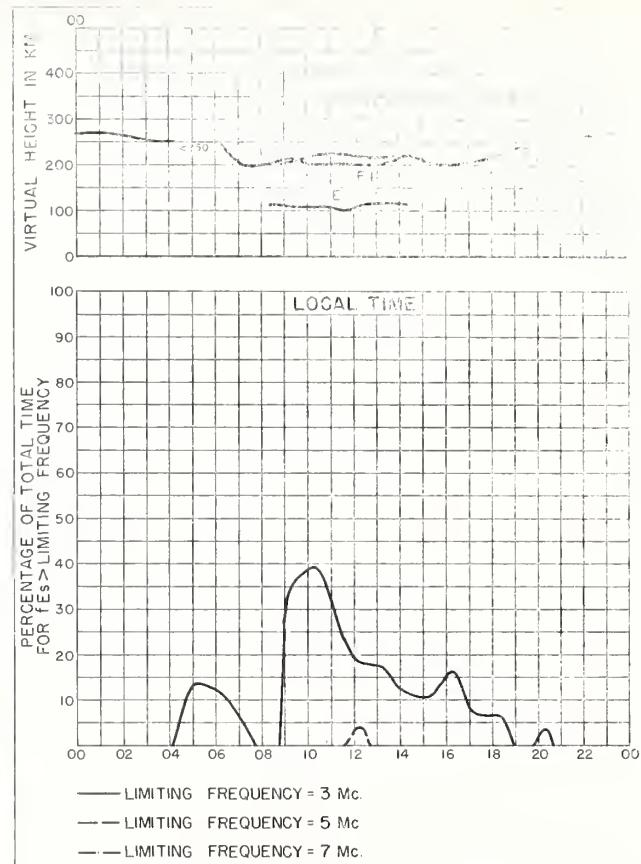


Fig. 82. De BILT, HOLLAND NOVEMBER 1954

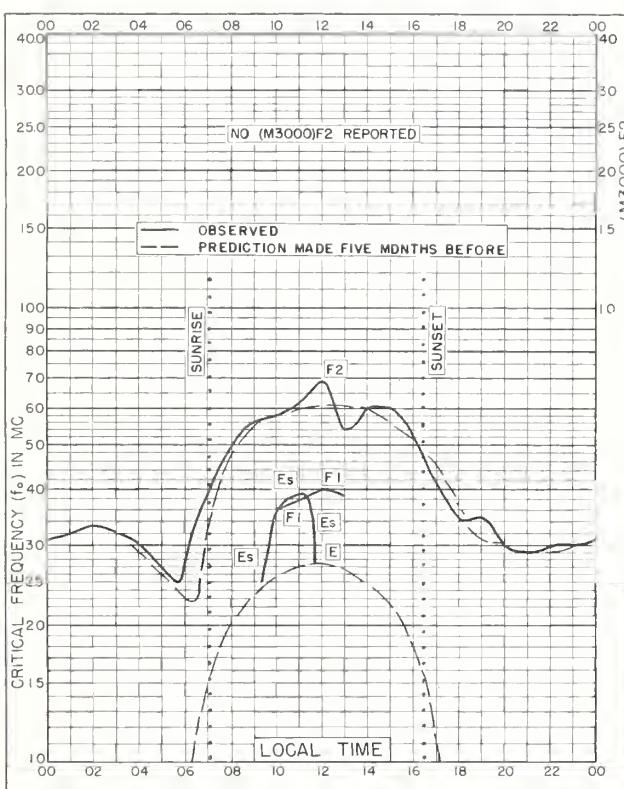


Fig. 83. GRAZ, AUSTRIA
47.1°N, 15.5°E NOVEMBER 1954

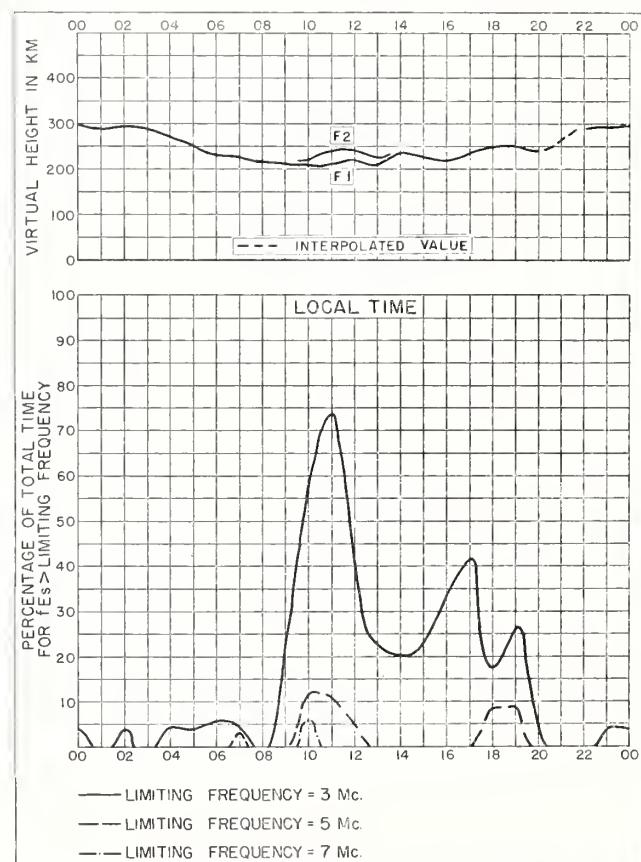
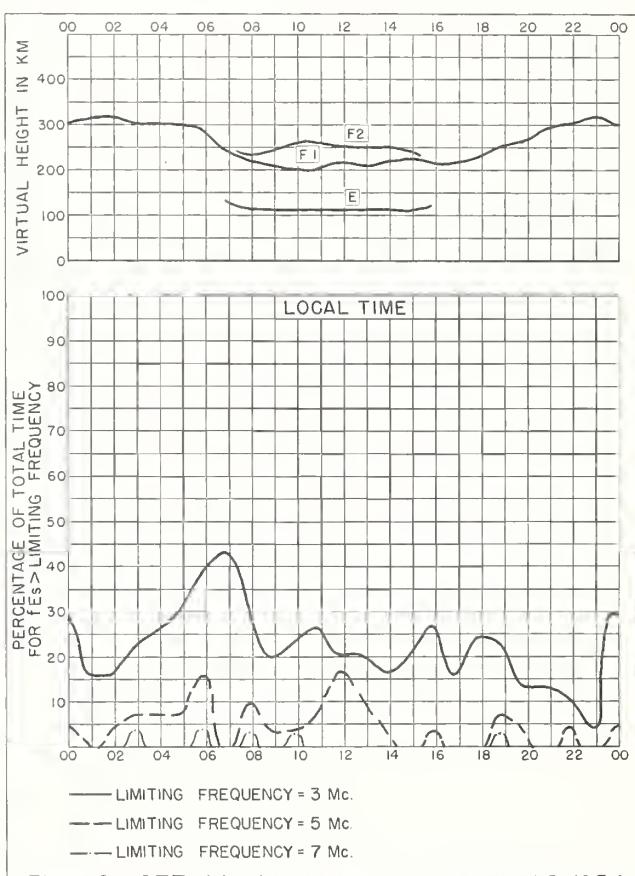
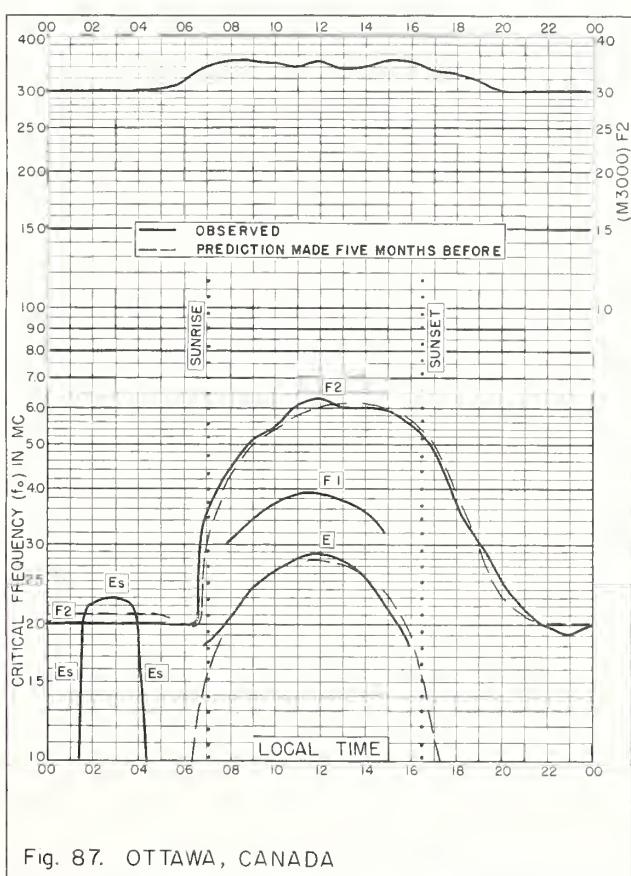
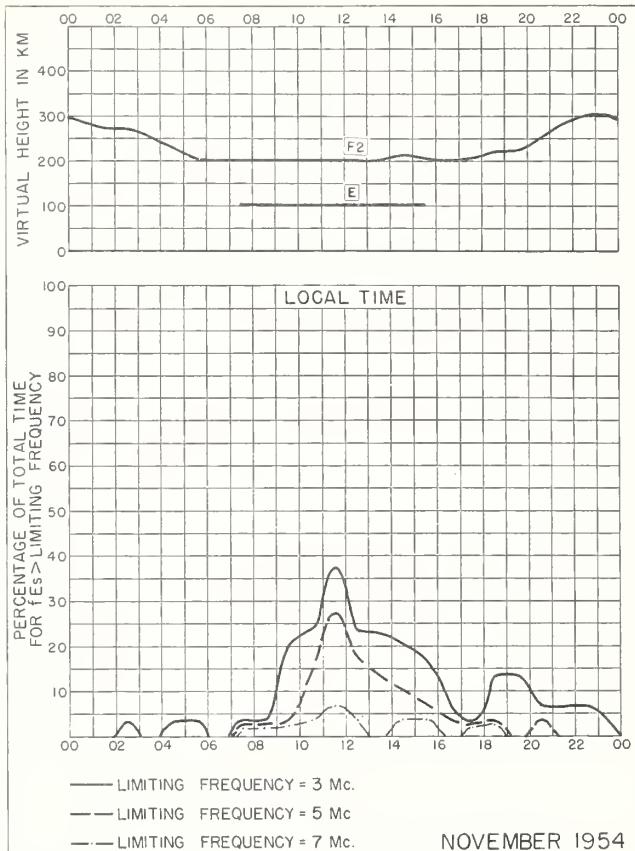
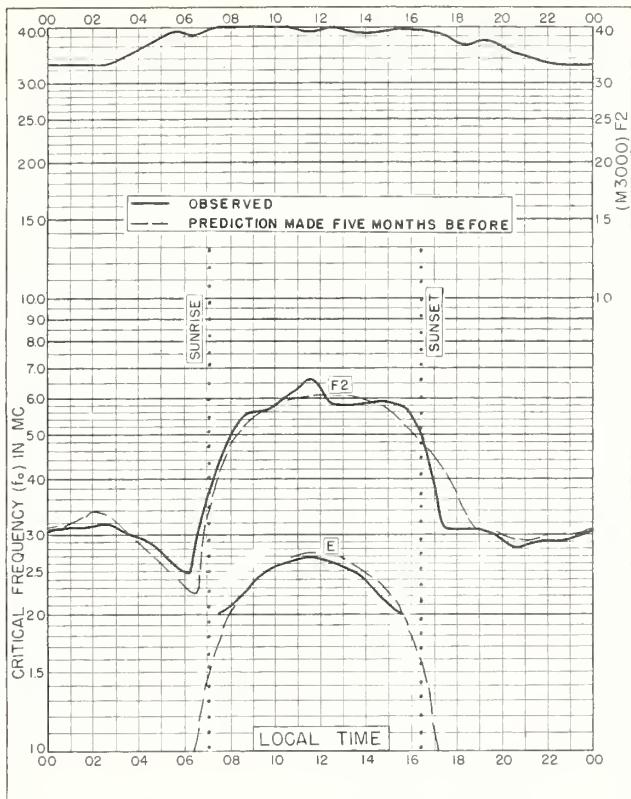


Fig. 84. GRAZ, AUSTRIA NOVEMBER 1954



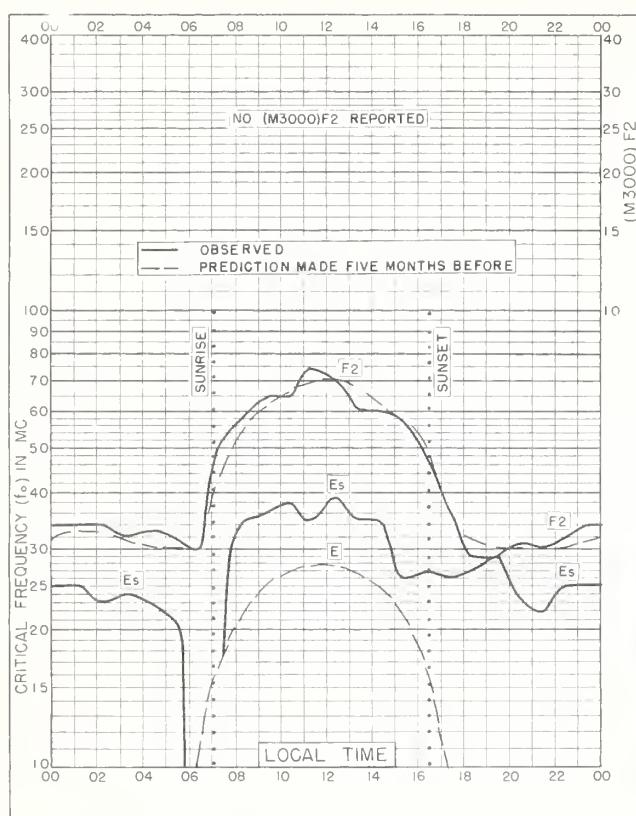


Fig. 89. WAKKANAI, JAPAN
45.4°N, 141.7°E NOVEMBER 1954

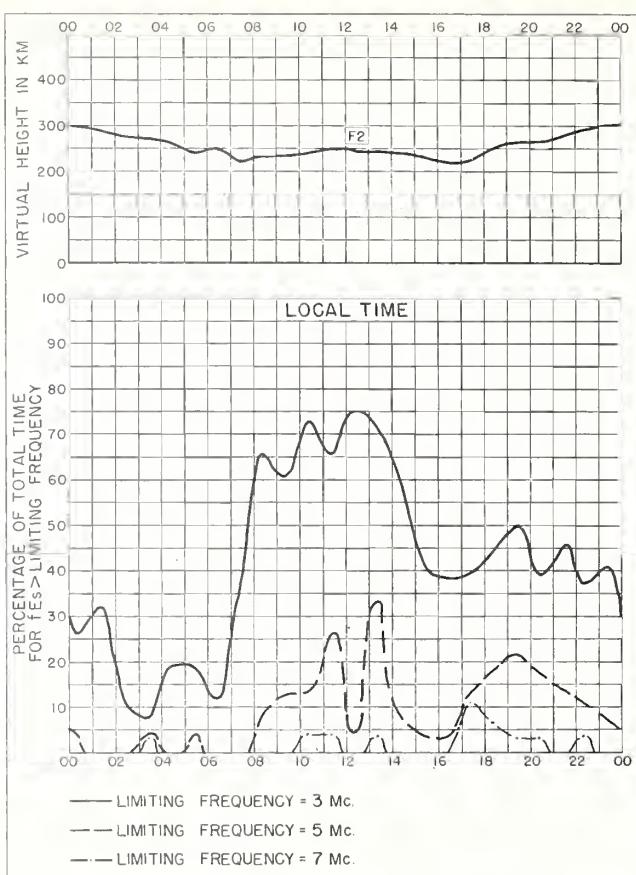


Fig. 90. WAKKANAI, JAPAN NOVEMBER 1954

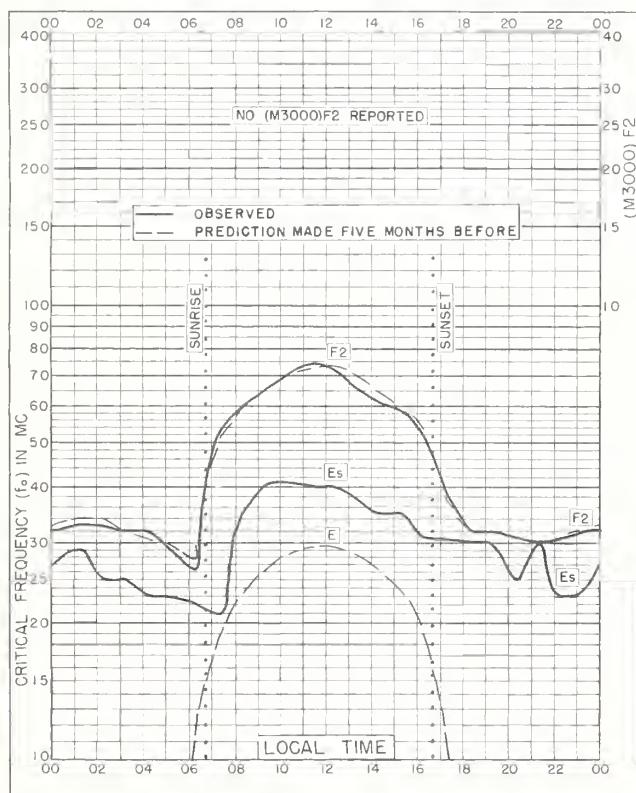


Fig. 91. AKITA, JAPAN
39.7°N, 140.1°E NOVEMBER 1954

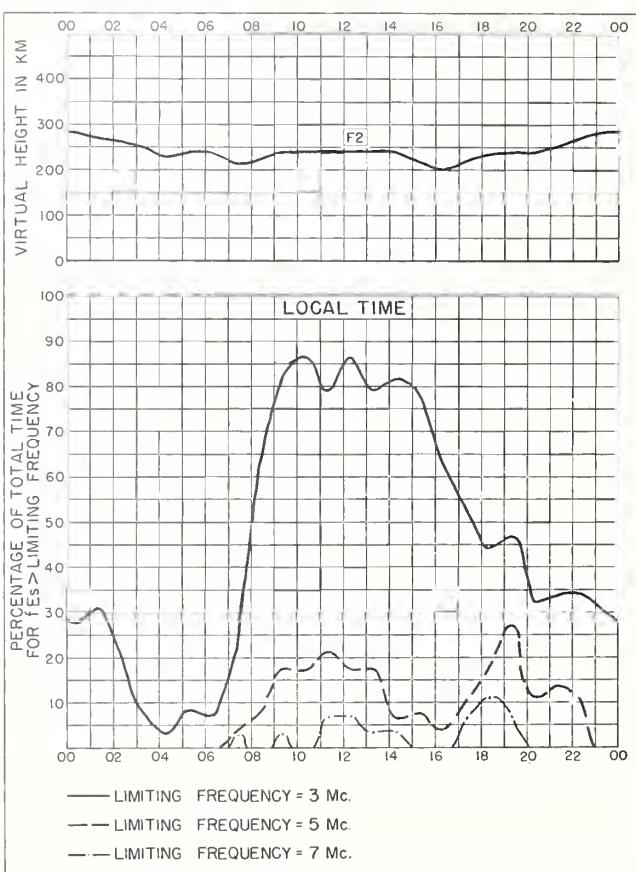


Fig. 92. AKITA, JAPAN NOVEMBER 1954

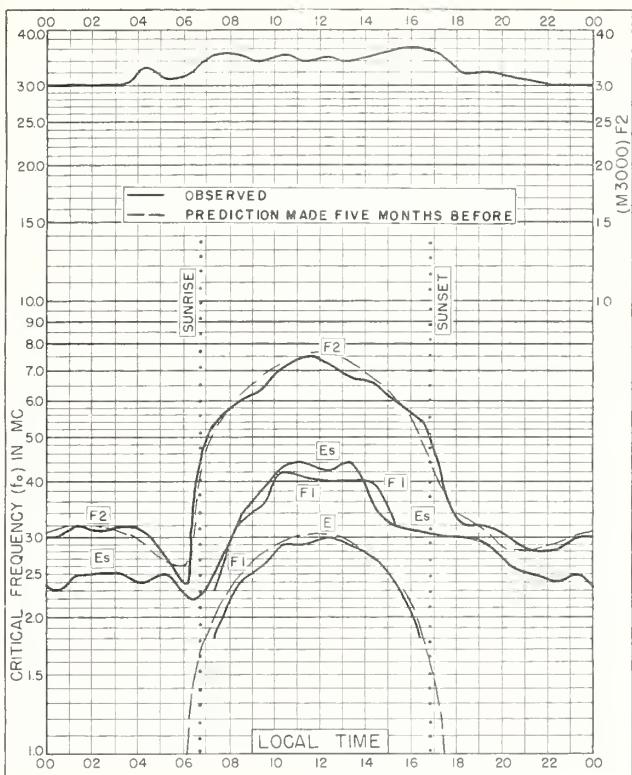


Fig. 93. TOKYO, JAPAN
35.7°N, 139.5°E NOVEMBER 1954

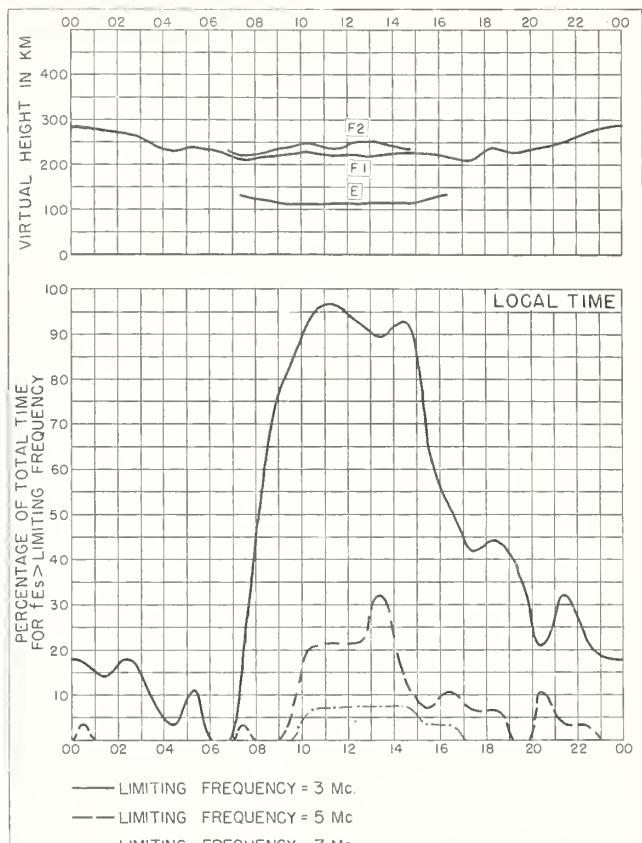


Fig. 94. TOKYO, JAPAN NOVEMBER 1954

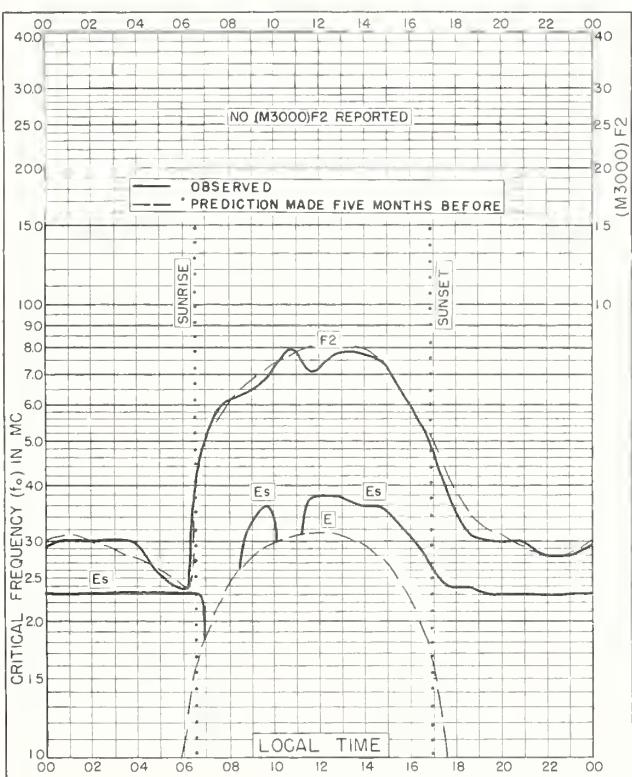


Fig. 95. YAMAGAWA, JAPAN
31.2°N, 130.6°E NOVEMBER 1954

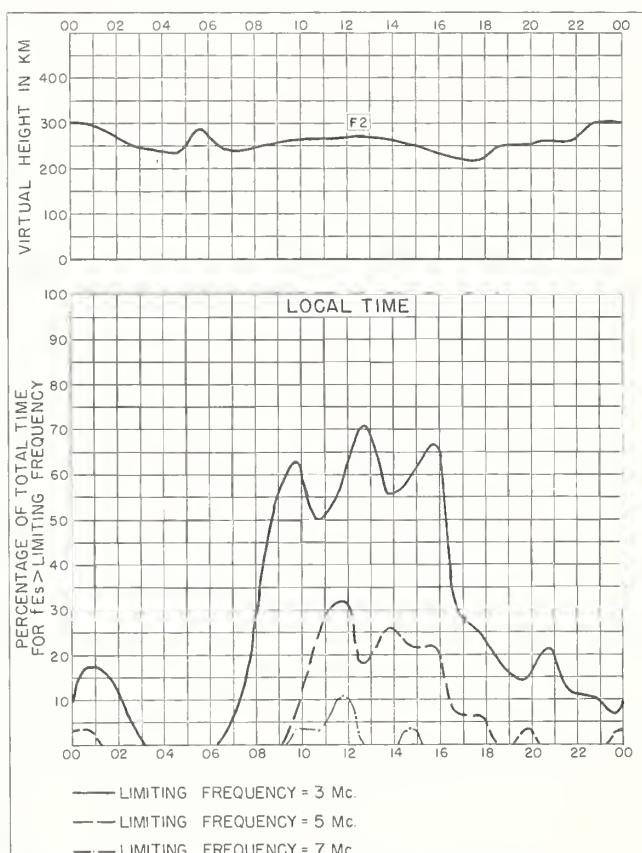


Fig. 96. YAMAGAWA, JAPAN NOVEMBER 1954

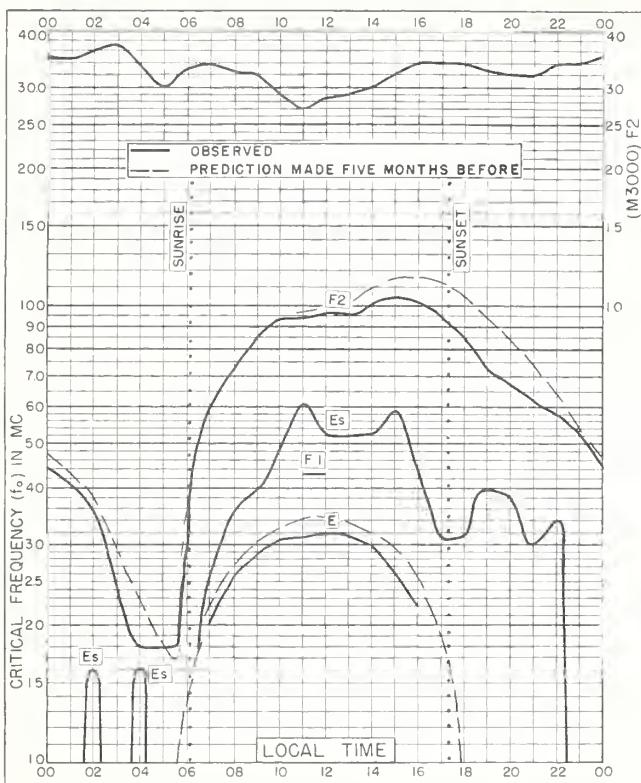


Fig. 97. BAGUIO, P.I.

16.4°N, 120.6°E

NOVEMBER 1954

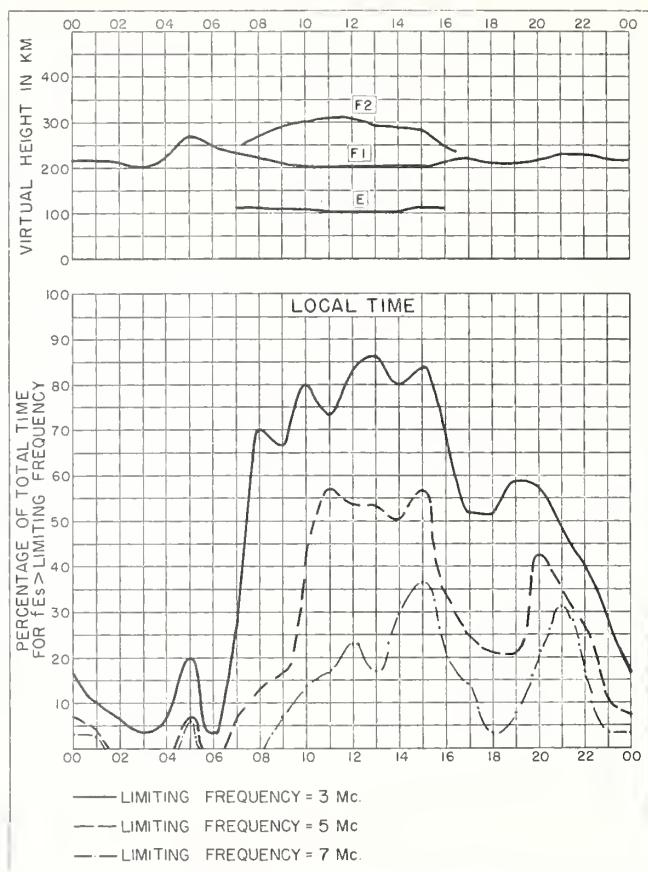


Fig. 98. BAGUIO, P.I.

NOVEMBER 1954

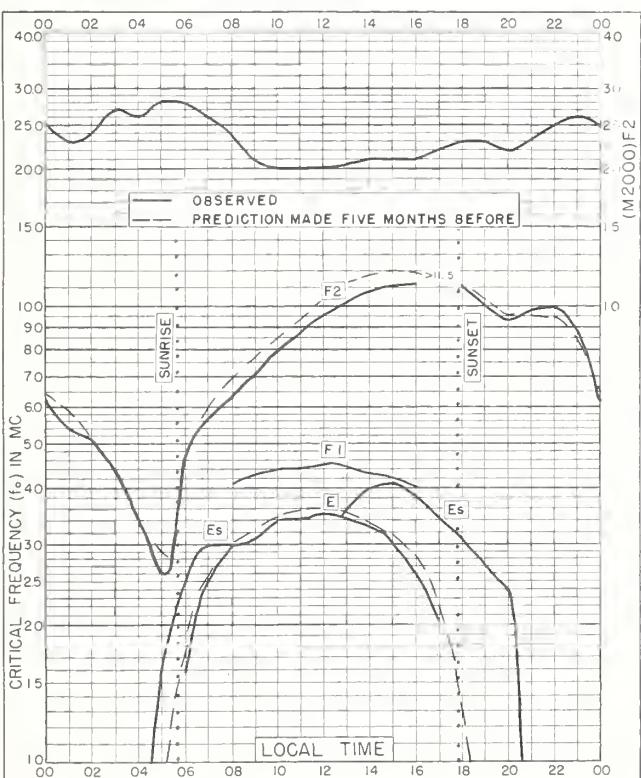
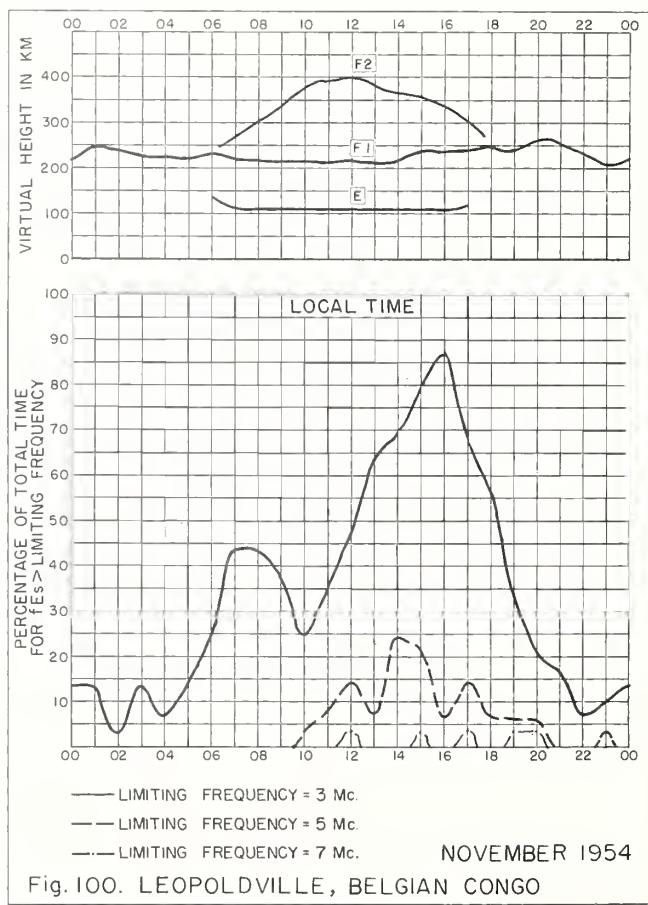
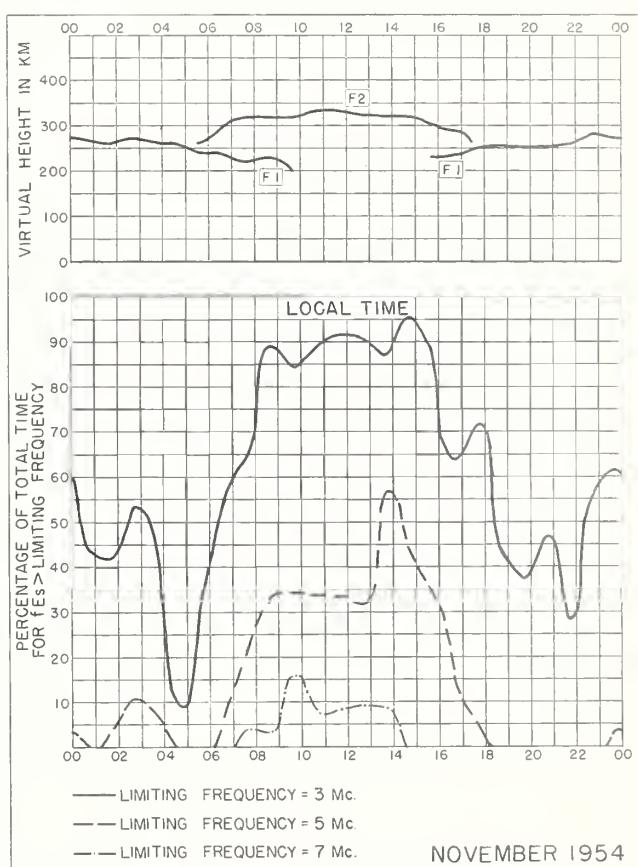
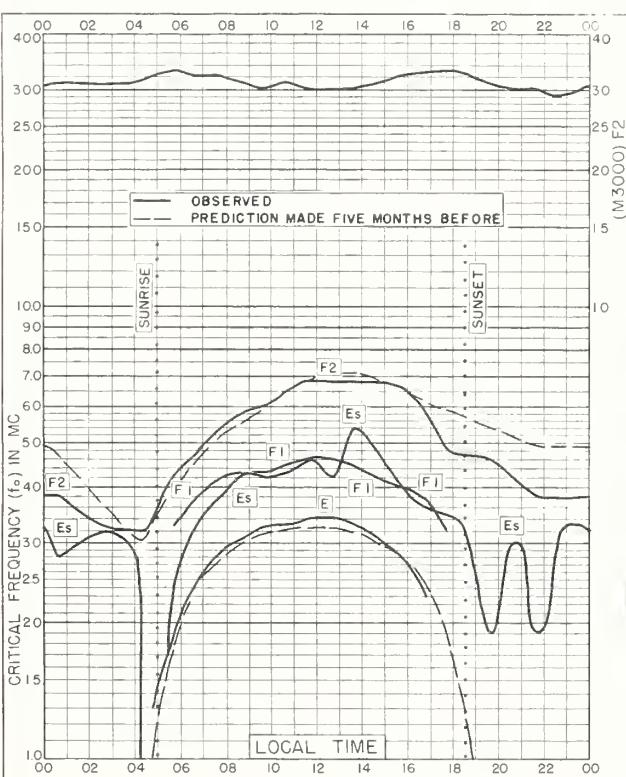
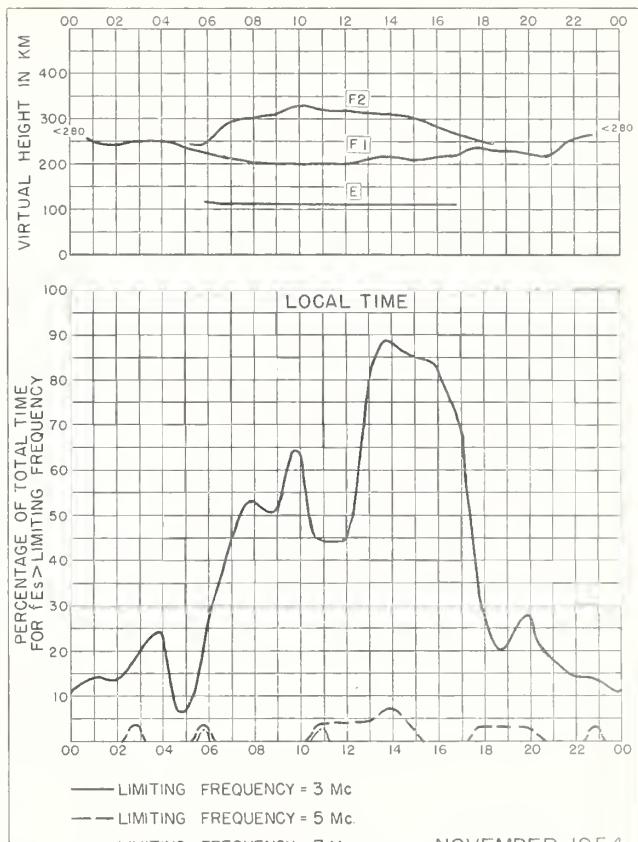
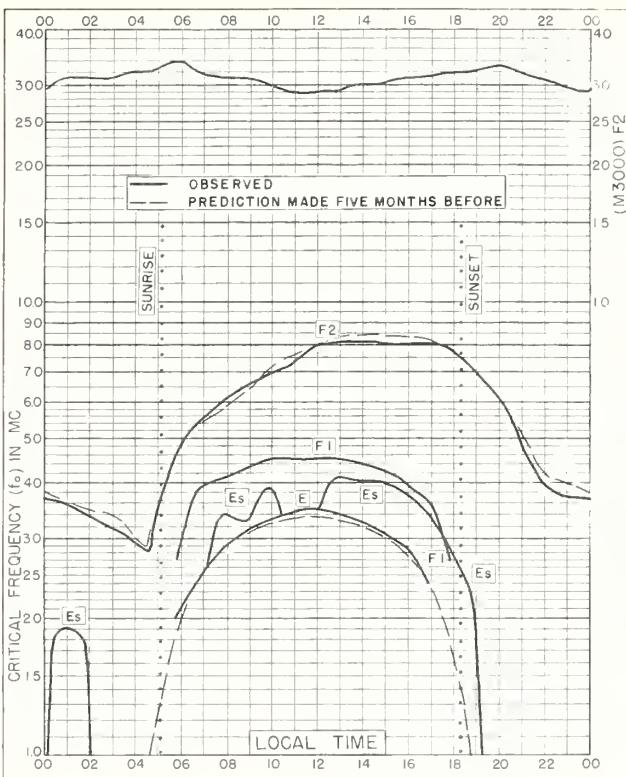
Fig. 99. LEOPOLDVILLE, BELGIAN CONGO
4.3°S, 15.3°E NOVEMBER 1954

Fig. 100. LEOPOLDVILLE, BELGIAN CONGO

NOVEMBER 1954



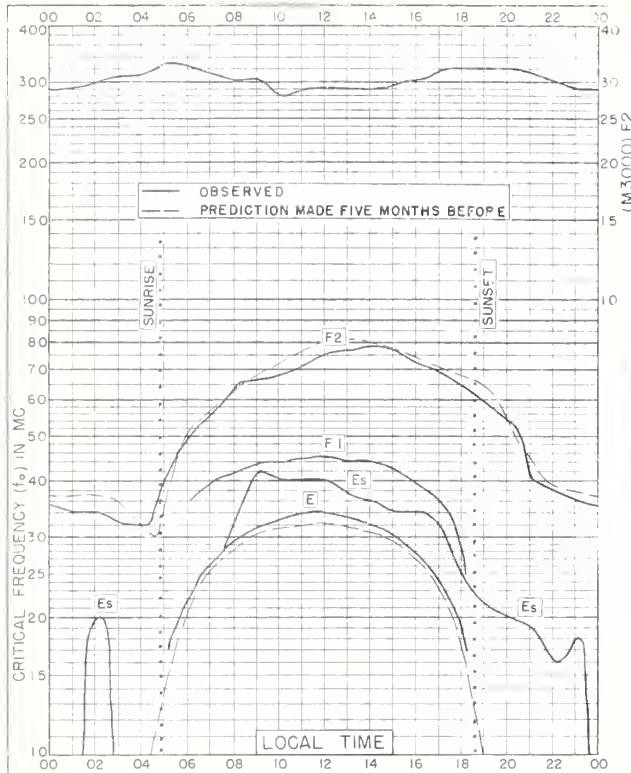


Fig. 105. CAPE TOWN, UNION OF S. AFRICA
34°2'S, 18.3°E NOVEMBER 1954

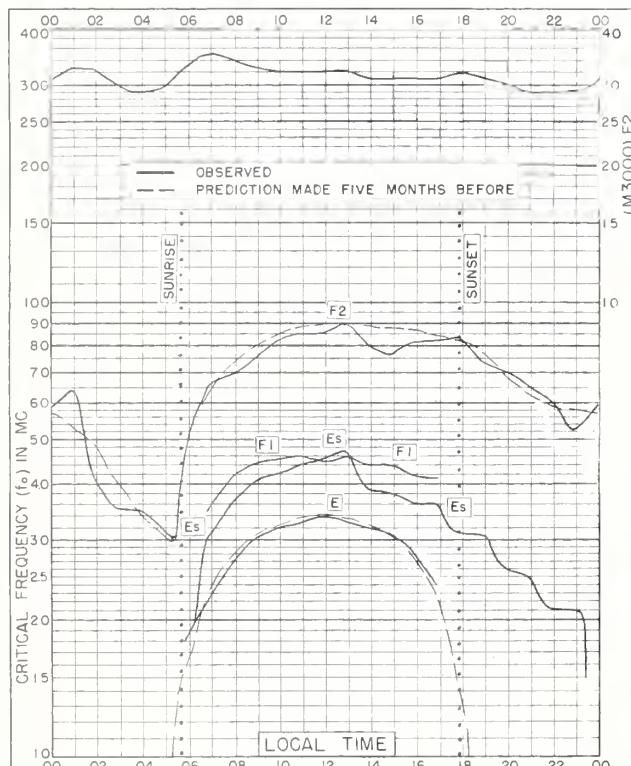


Fig. 107. RAROTONGA I.
21.3°S, 159.8°W OCTOBER 1954

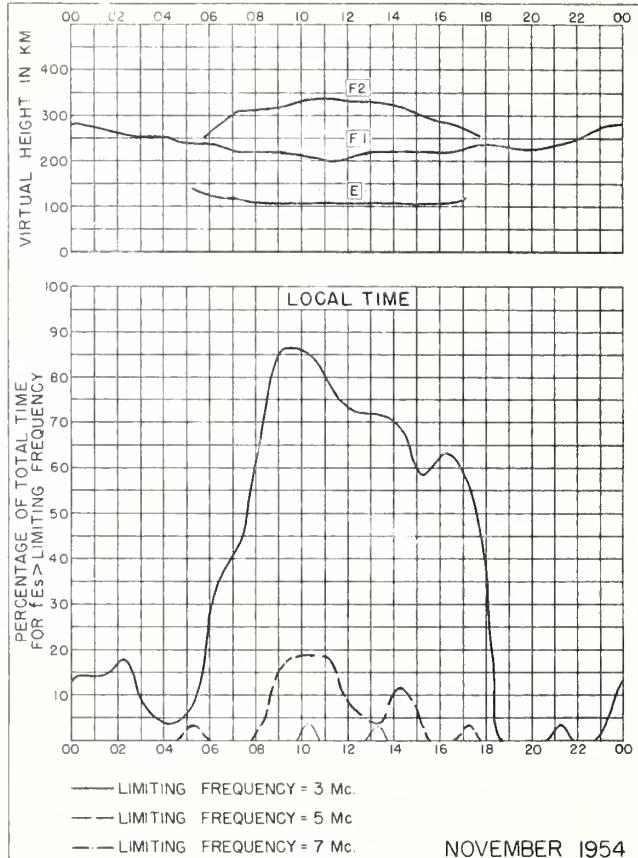


Fig. 106. CAPE TOWN, UNION OF S. AFRICA

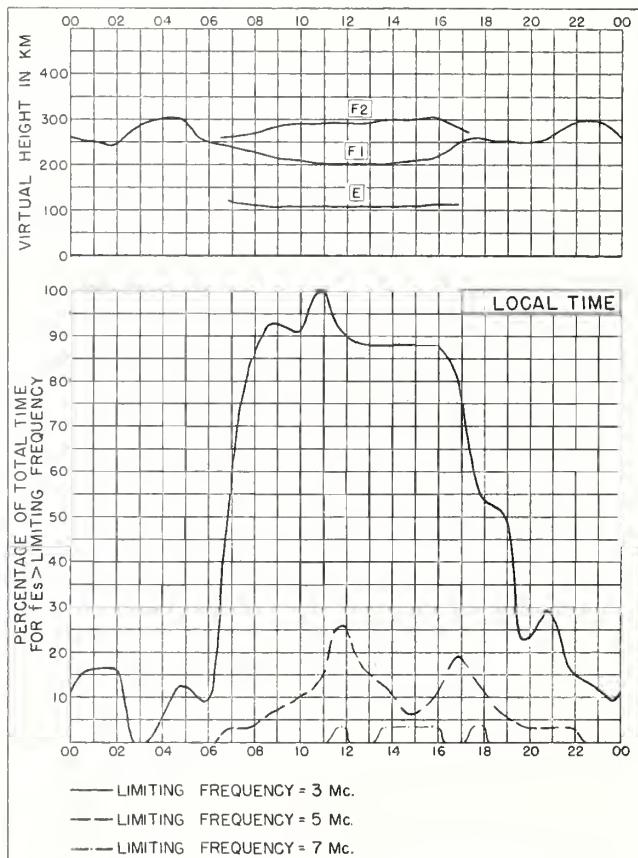


Fig. 108. RAROTONGA I. OCTOBER 1954

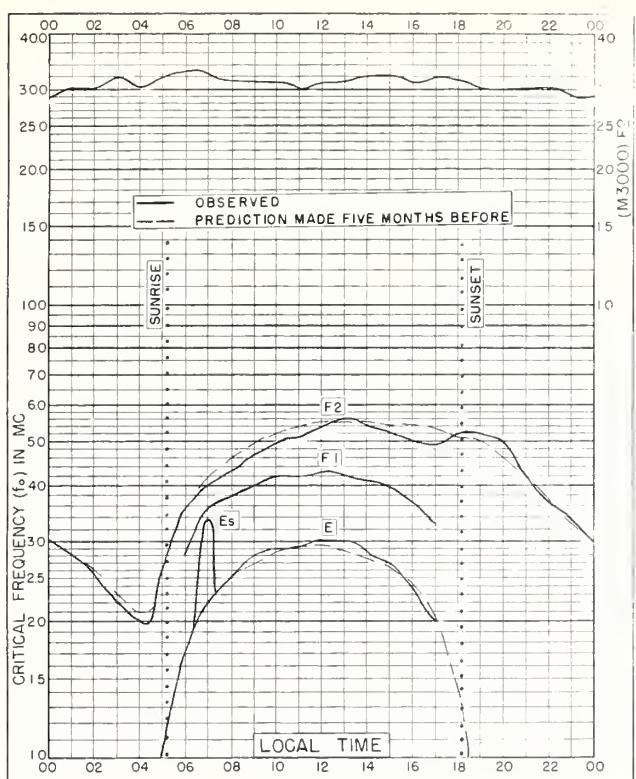


Fig. I09. CHRISTCHURCH, NEW ZEALAND
43°S, 172°E OCTOBER 1954

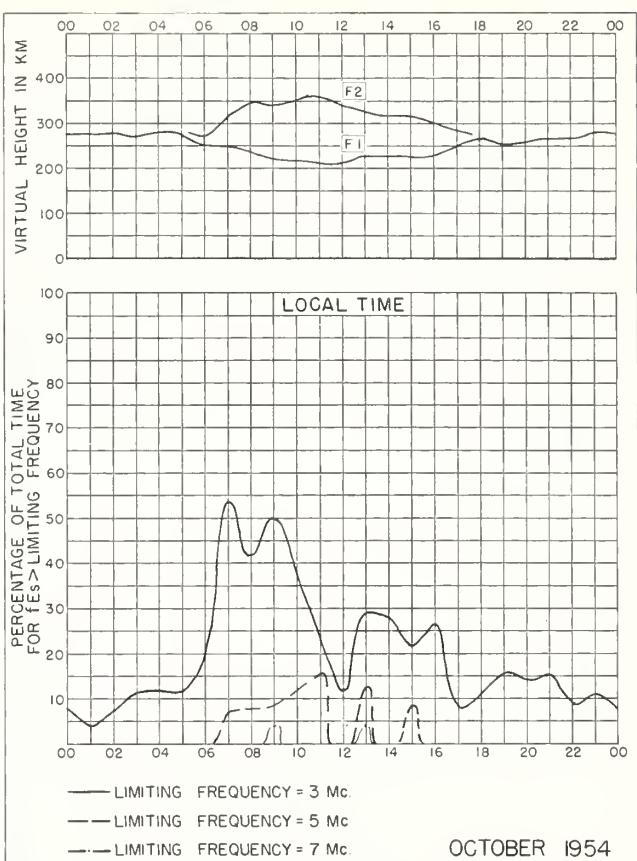


Fig. I10. CHRISTCHURCH, NEW ZEALAND

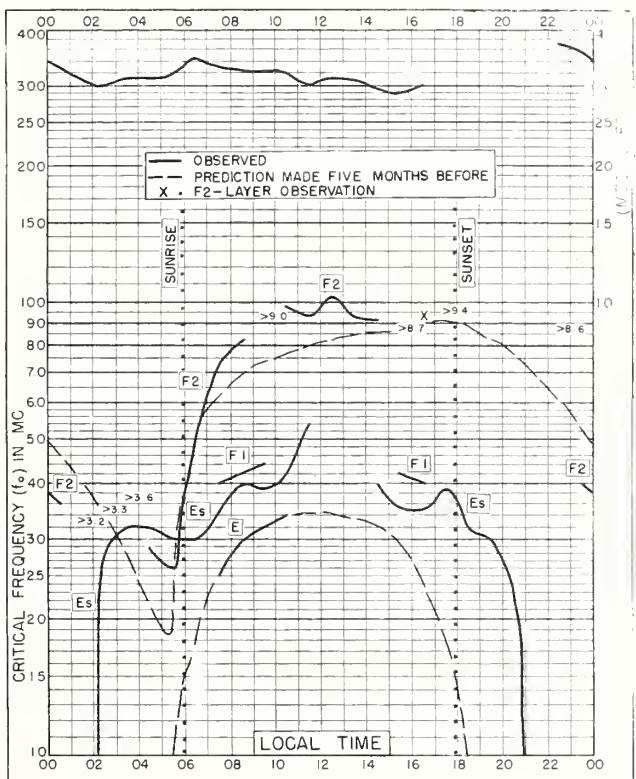


Fig. III. NAIROBI, KENYA
1.3°S, 36.8°E SEPTEMBER 1954

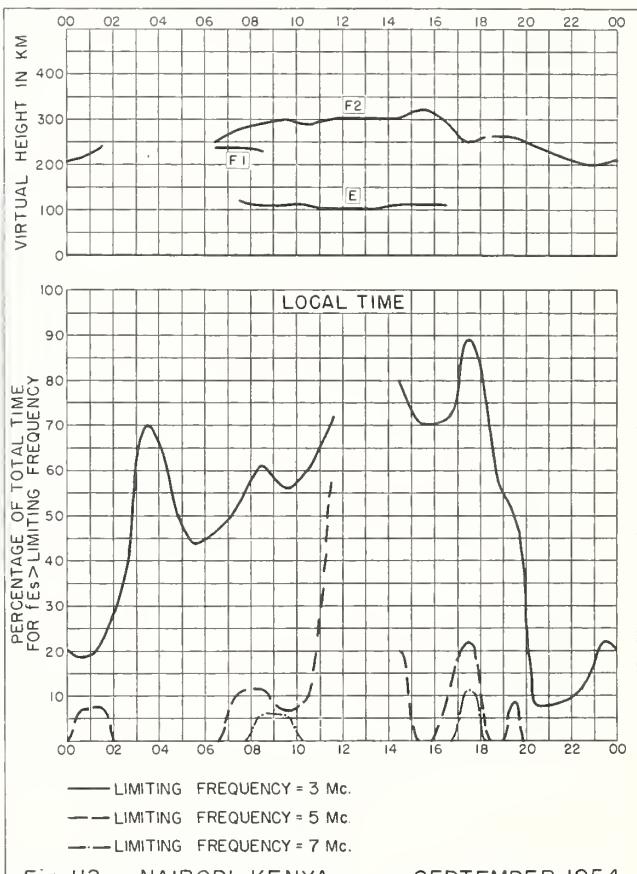


Fig. I12. NAIROBI, KENYA SEPTEMBER 1954

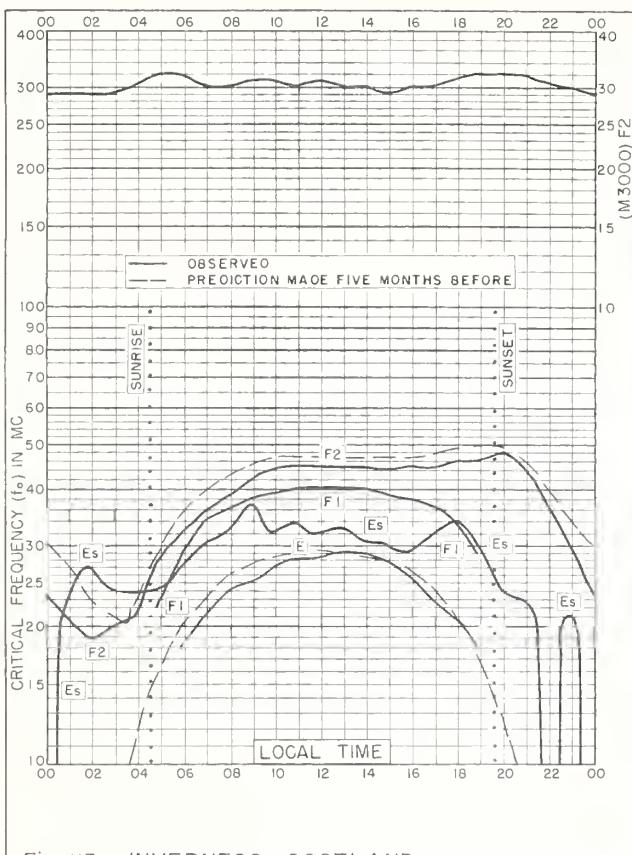


Fig. 113. INVERNESS, SCOTLAND
57.4°N, 4.2°W AUGUST 1954

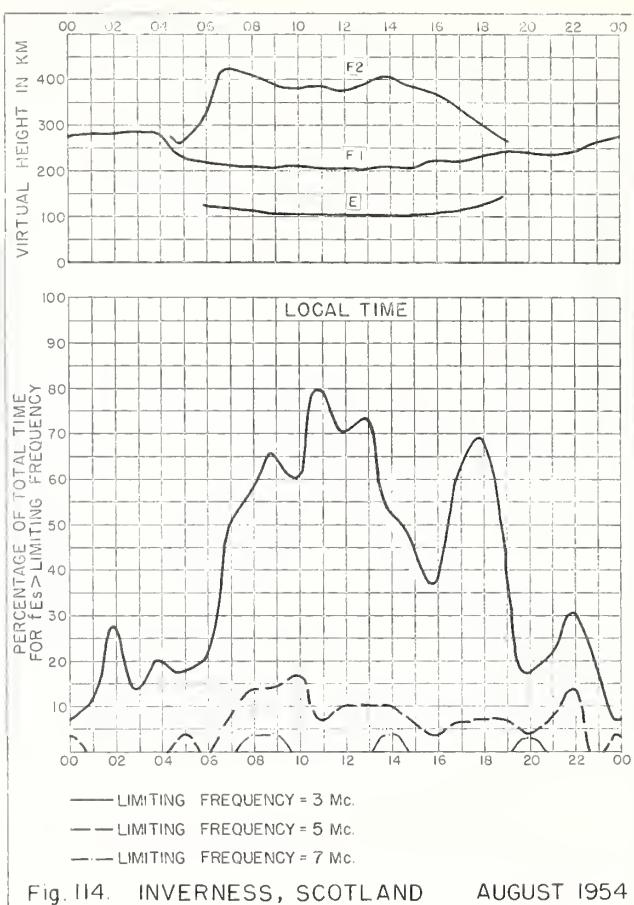


Fig. 114. INVERNESS, SCOTLAND AUGUST 1954

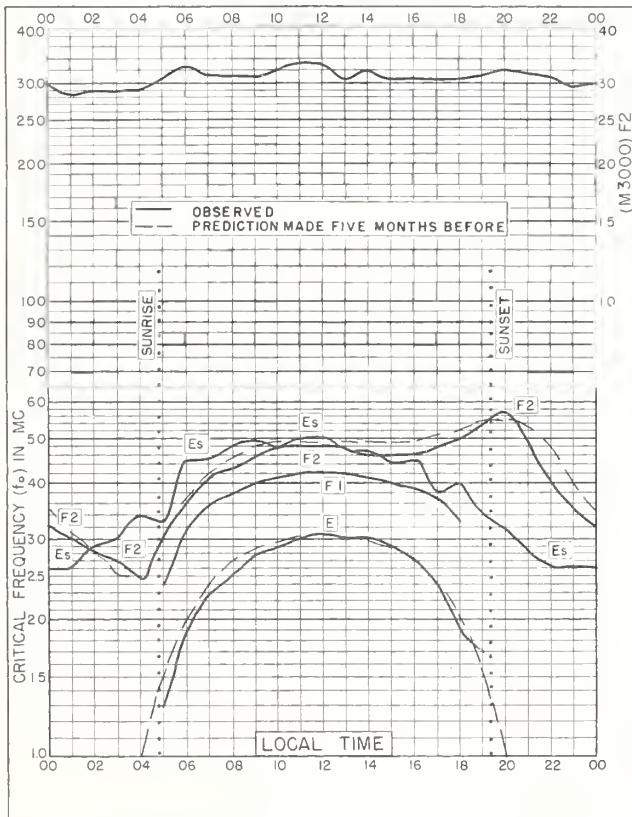


Fig. 115. SLOUGH, ENGLAND
51.5°N, 0.6°W AUGUST 1954

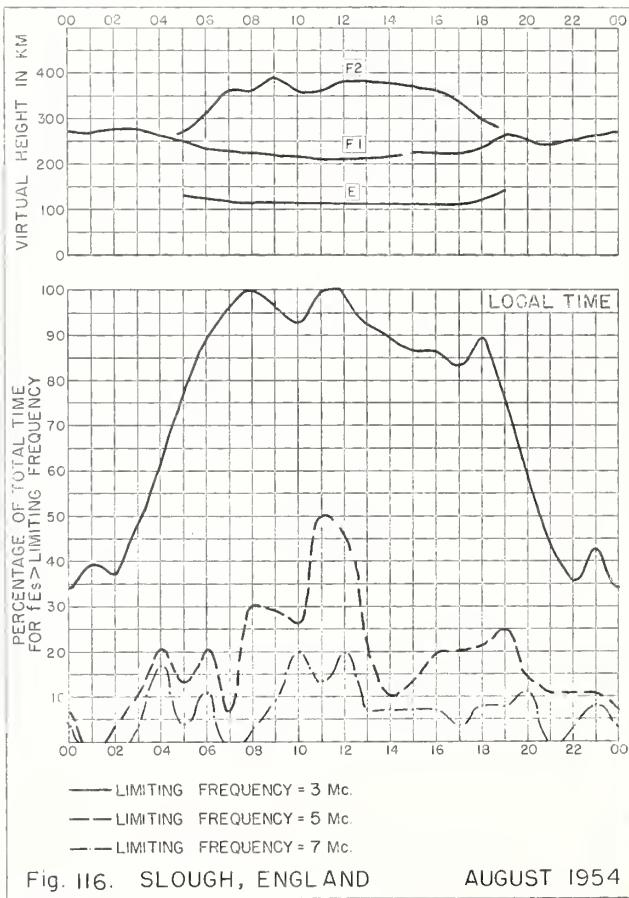


Fig. 116. SLOUGH, ENGLAND AUGUST 1954

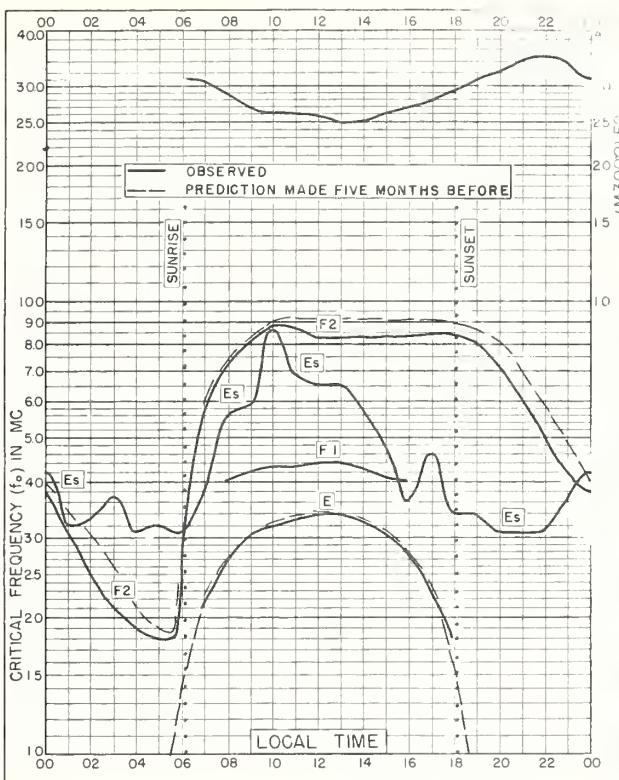


Fig. 117. SINGAPORE, BRITISH MALAYA
1.3°N, 103.8°E AUGUST 1954

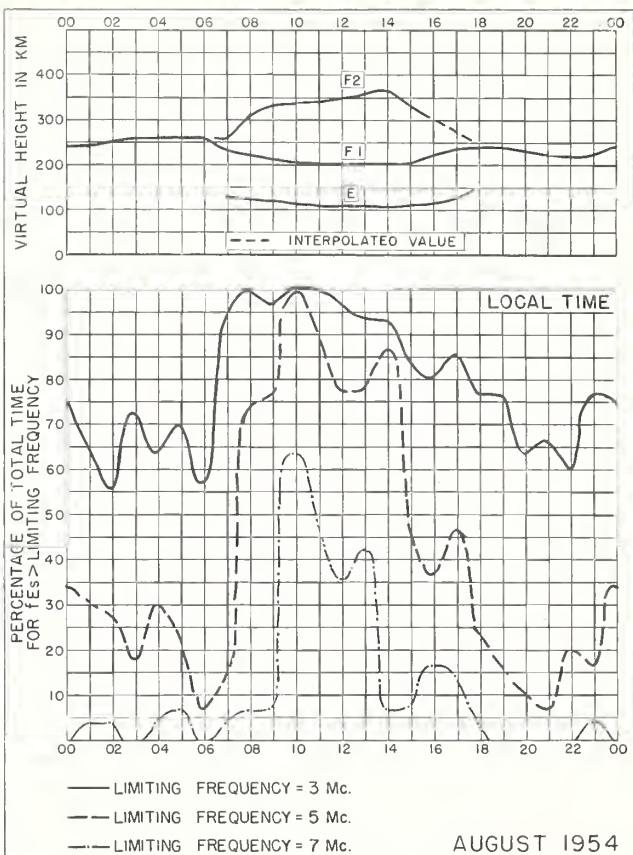


Fig. 118. SINGAPORE, BRITISH MALAYA

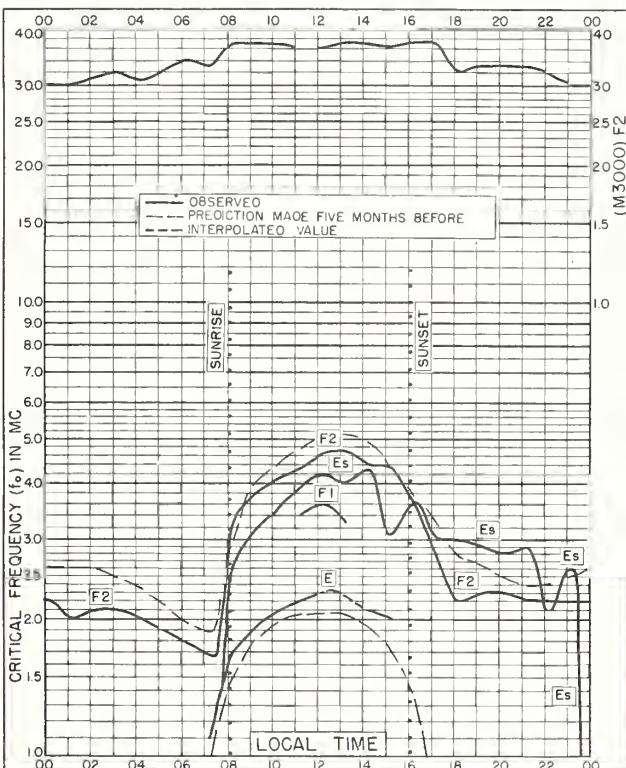


Fig. 119. FALKLAND IS.
51.7°S, 57.8°W JULY 1954

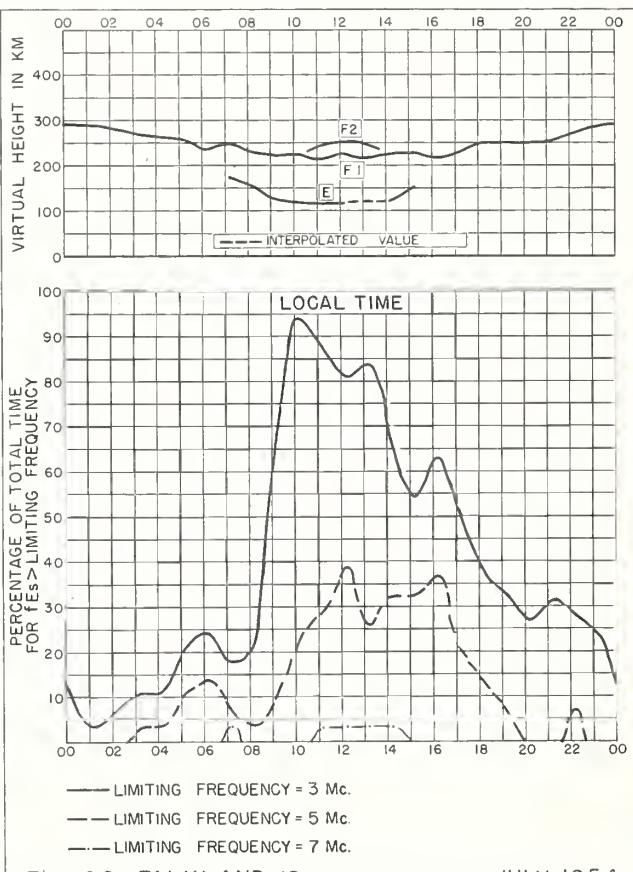
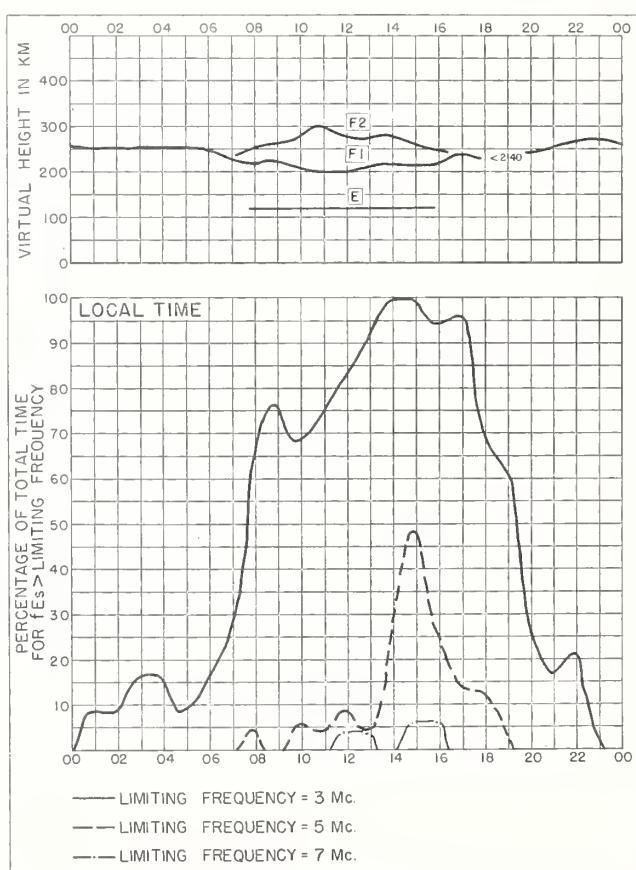
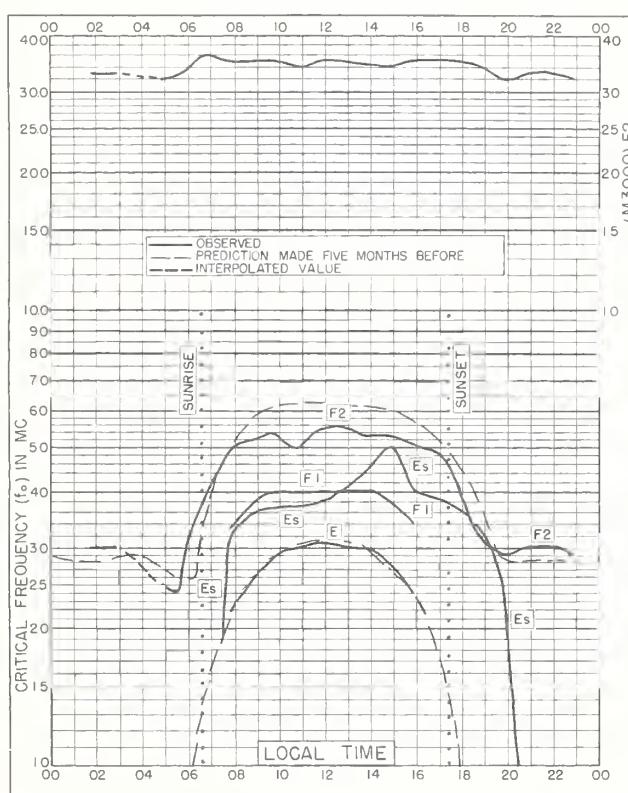
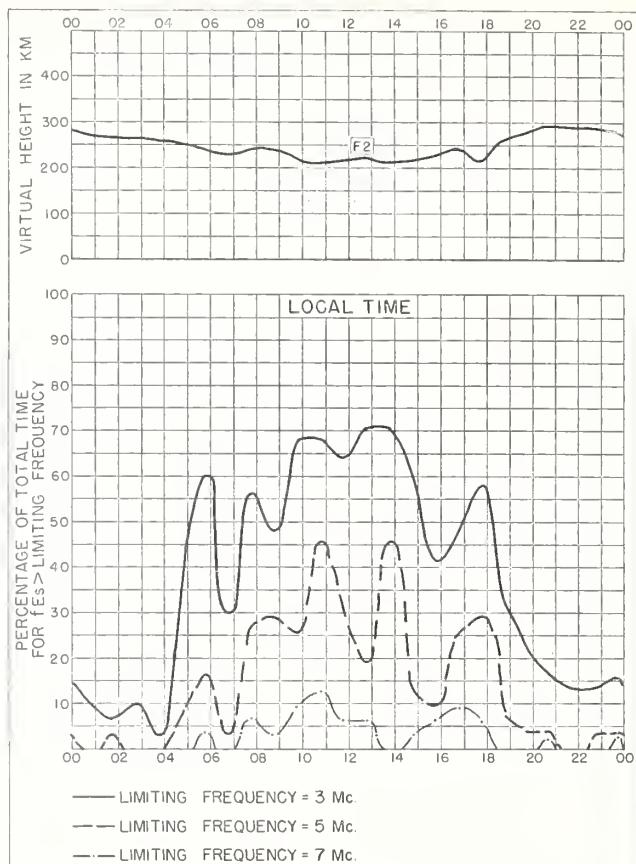
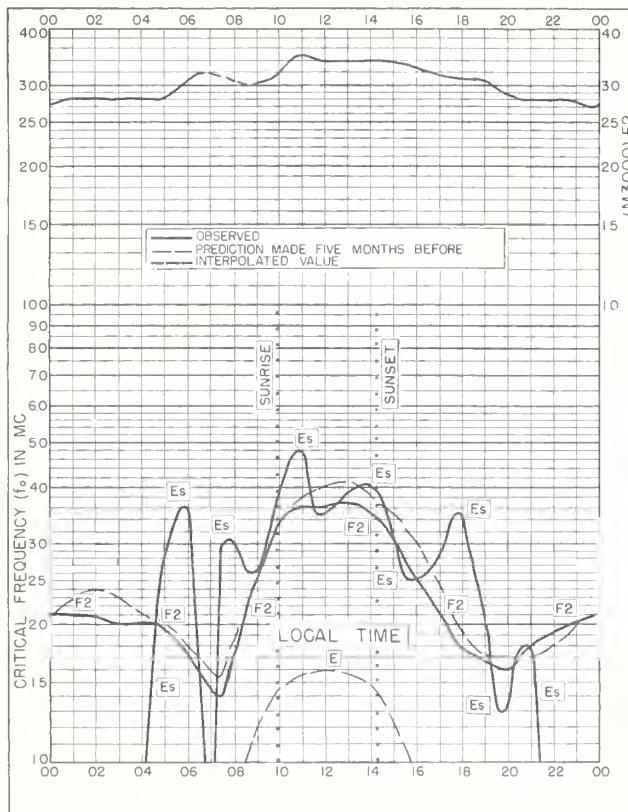


Fig. 120. FALKLAND IS.



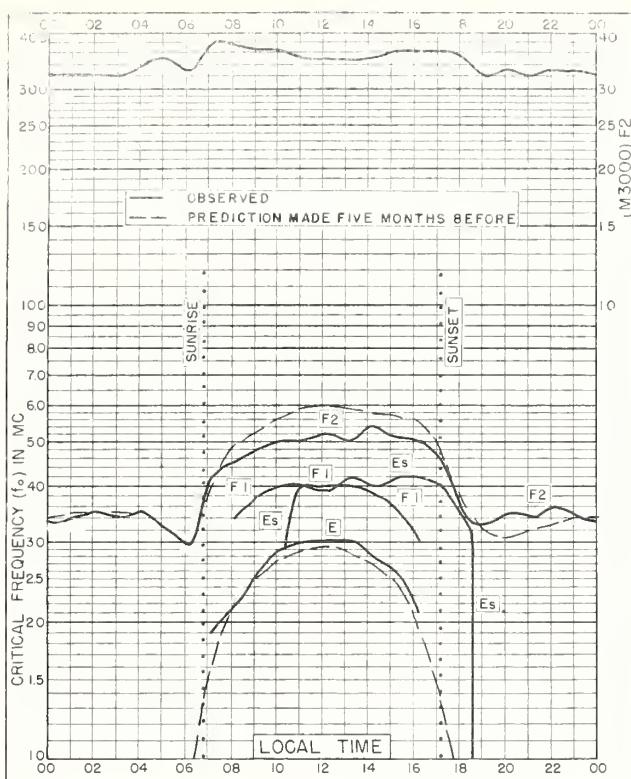


Fig. 125. BRISBANE, AUSTRALIA

27.5° S, 153.0° E

JUNE 1954

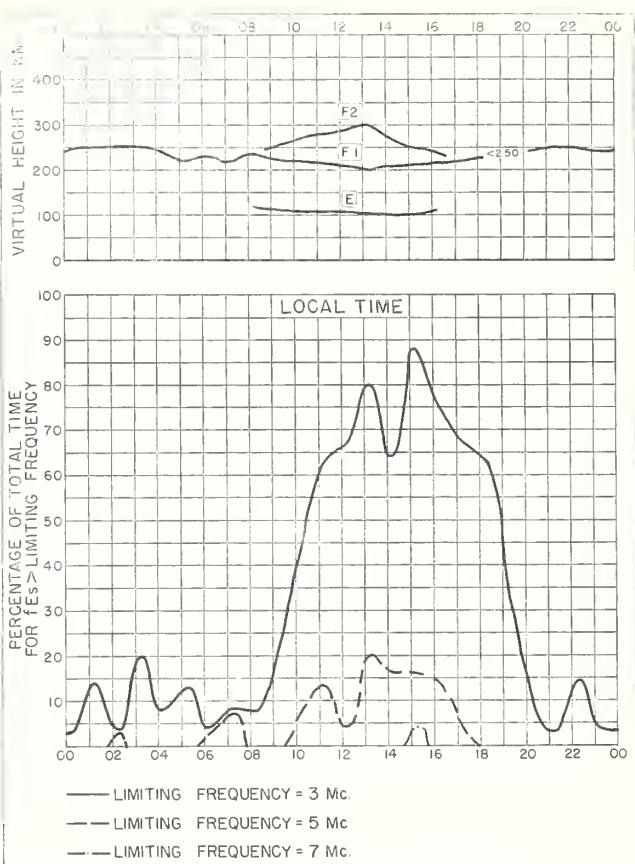


Fig. 126. BRISBANE, AUSTRALIA

JUNE 1954

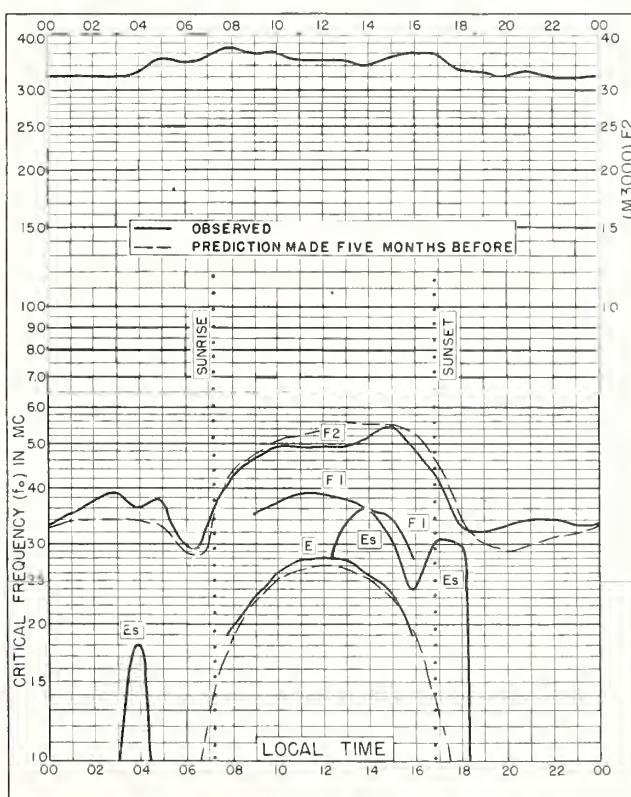


Fig. 127. CANBERRA, AUSTRALIA

35.3° S, 149.0° E

JUNE 1954

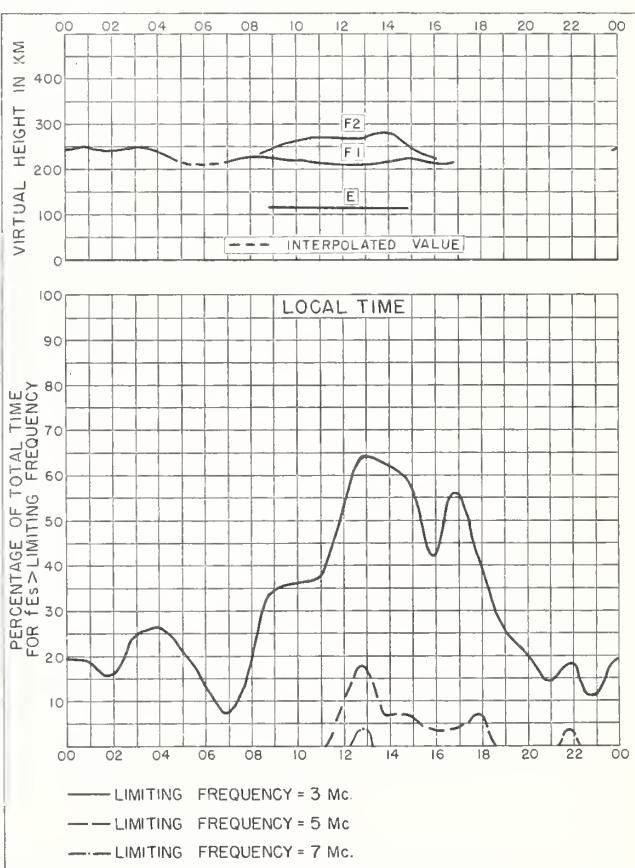


Fig. 128. CANBERRA, AUSTRALIA

JUNE 1954

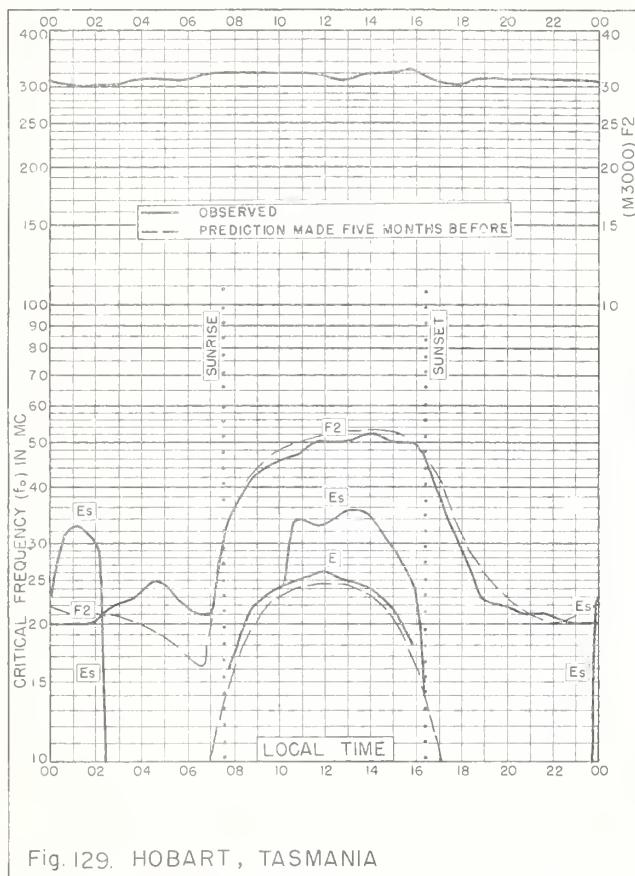


Fig. 129. HOBART, TASMANIA
42.9°S, 147.3°E

JUNE 1954

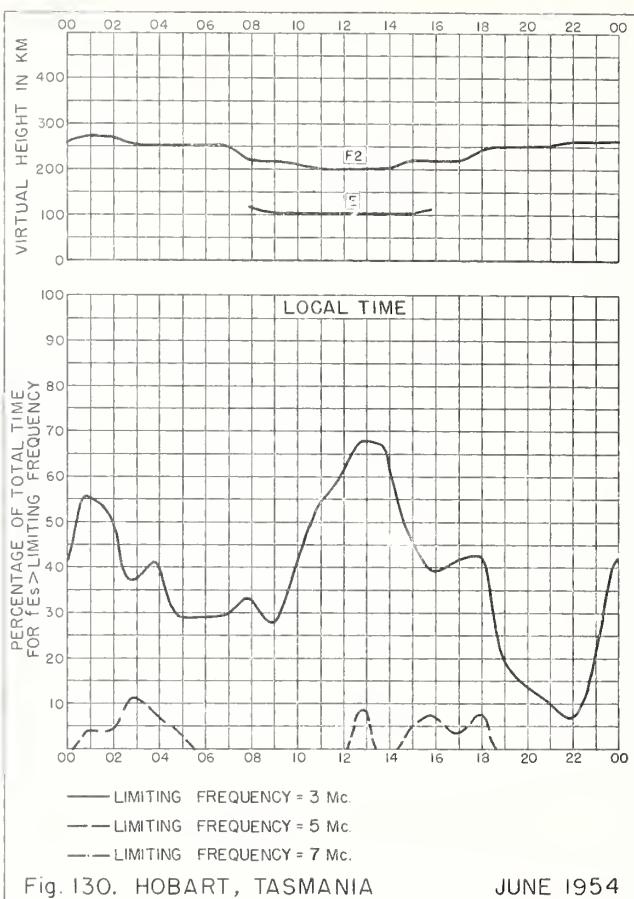


Fig. 130. HOBART, TASMANIA

JUNE 1954

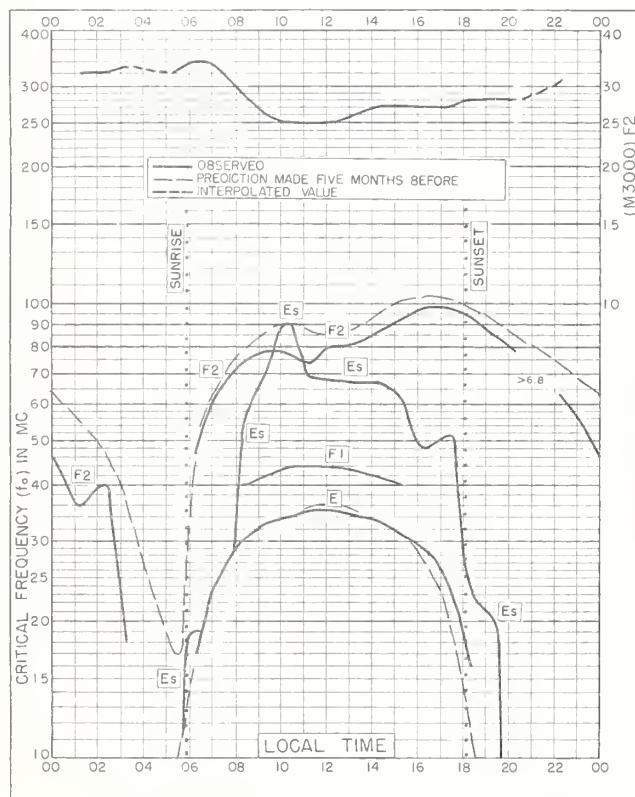


Fig. 131. IBADAN, NIGERIA
7.4°N, 4.0°E

APRIL 1954

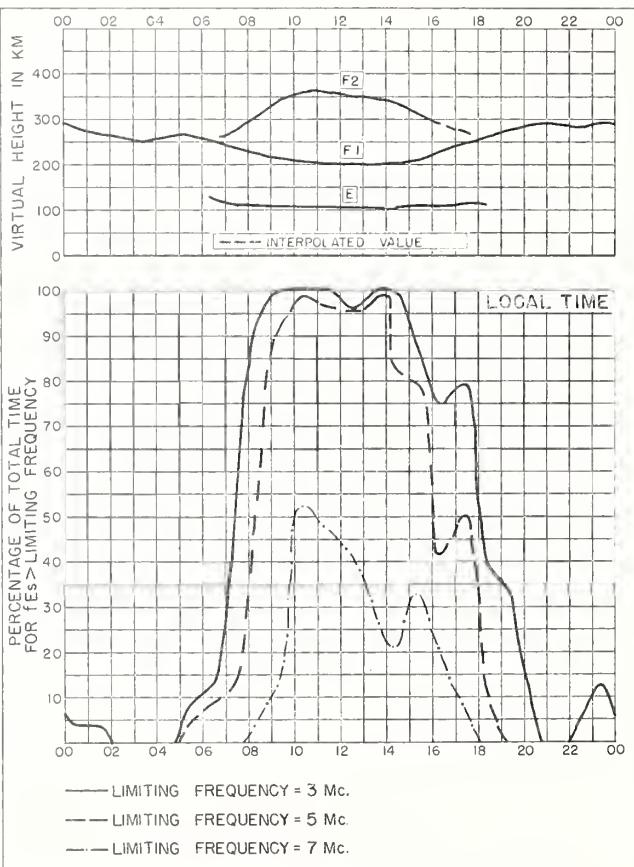


Fig. 132. IBADAN, NIGERIA

APRIL 1954

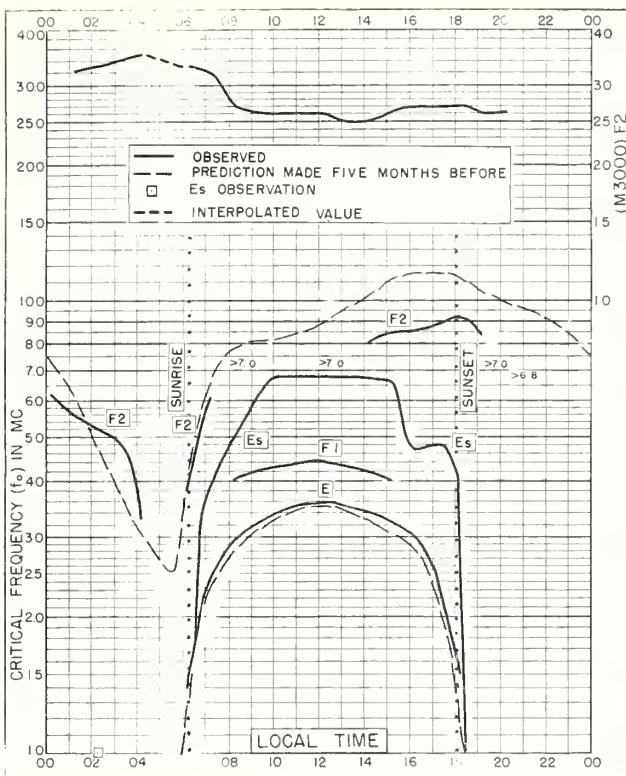


Fig. 133. IBADAN, NIGERIA
7.4°N, 4.0°E MARCH 1954

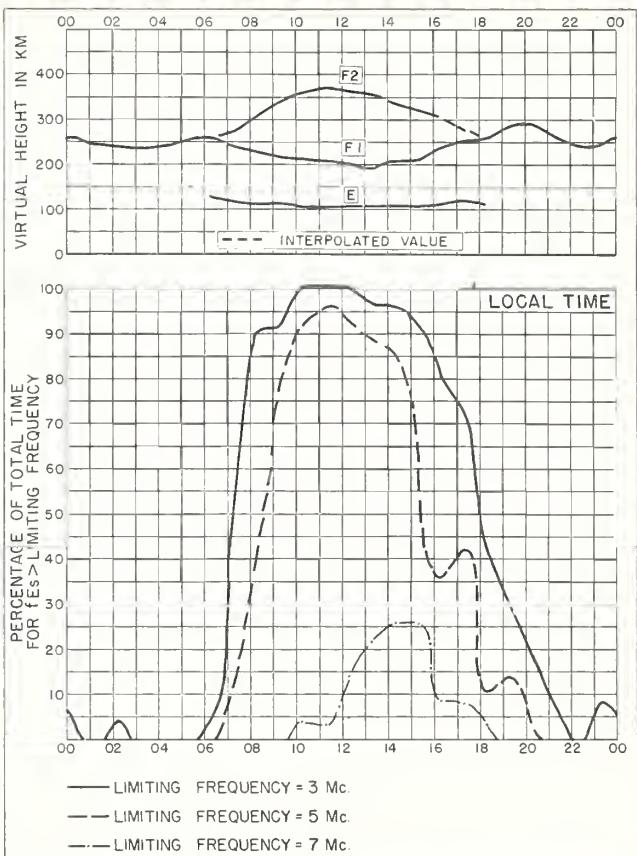


Fig. 134. IBADAN, NIGERIA MARCH 1954

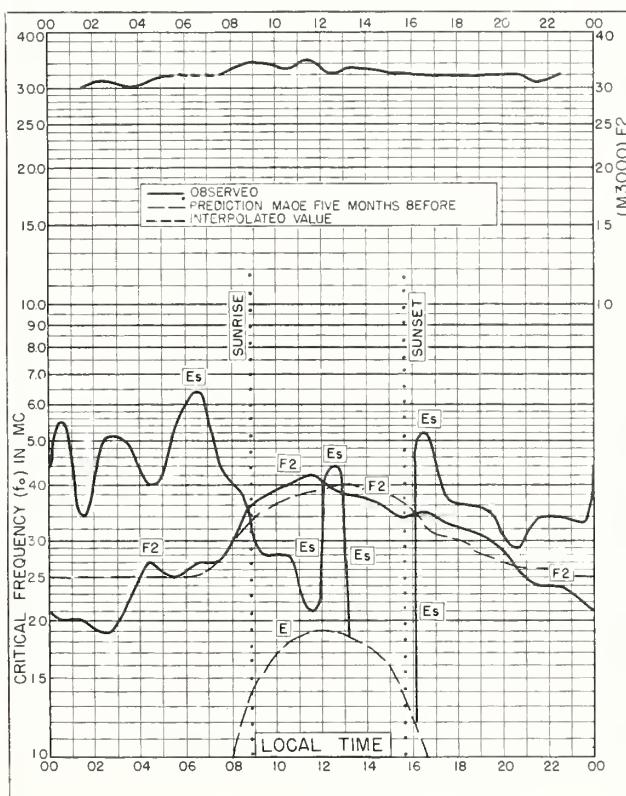


Fig. 135. GODHAVN, GREENLAND
69.2°N, 53.5°W FEBRUARY 1954

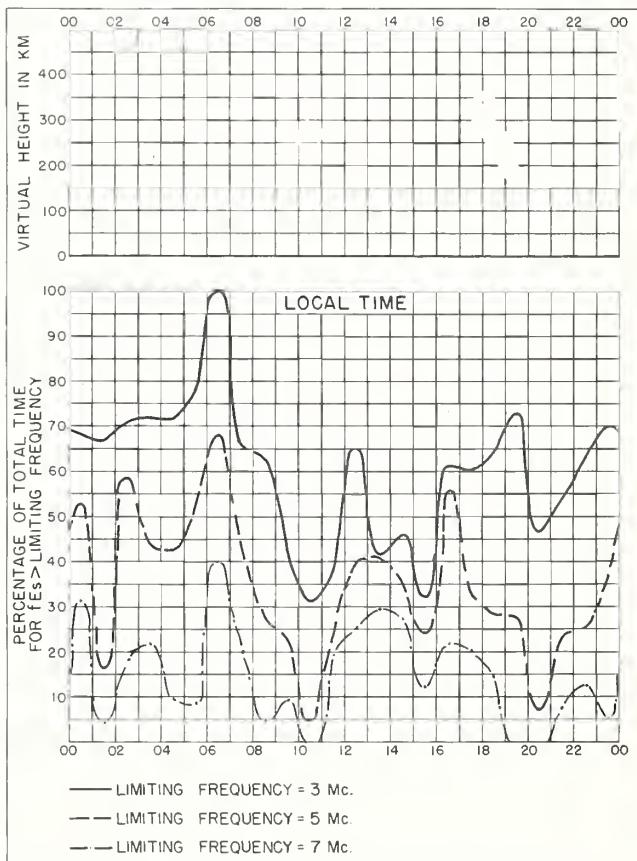


Fig. 136. GODHAVN, GREENLAND FEBRUARY 1954

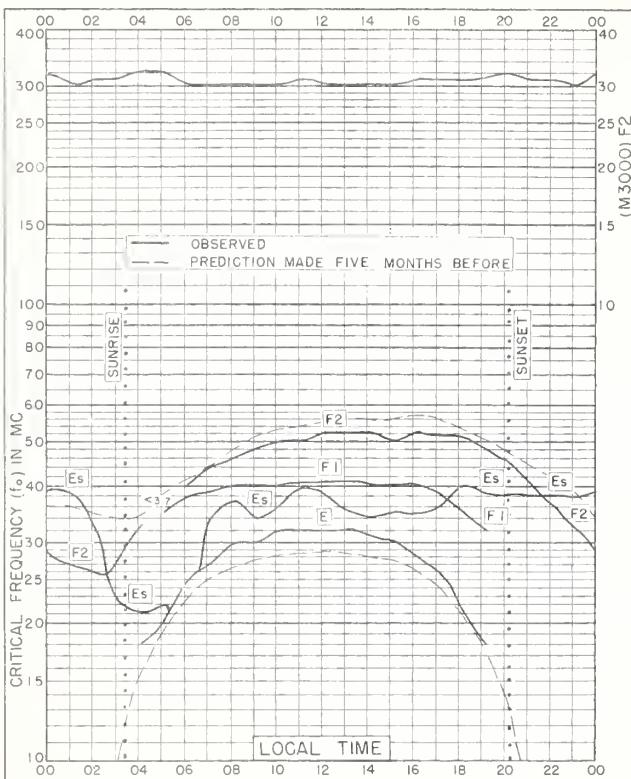


Fig. 137. MACQUARIE I.
54.5°S, 159.0°E DECEMBER 1953

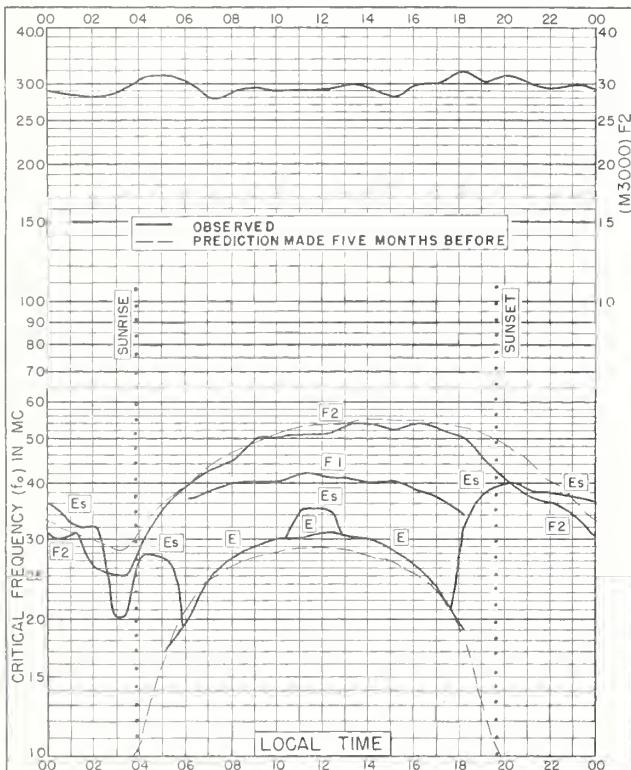


Fig. 139. MACQUARIE I.
54.5°S, 159.0°E NOVEMBER 1953

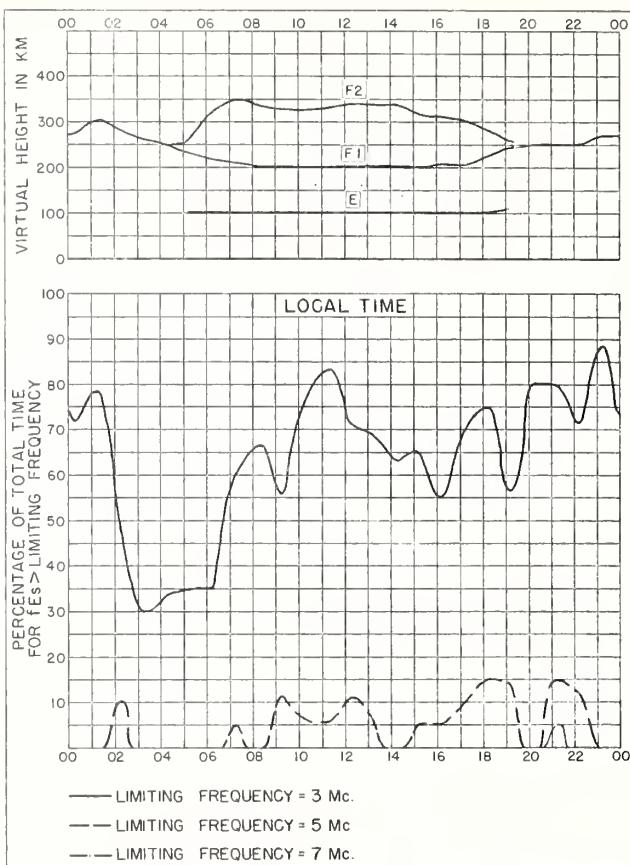


Fig. 138. MACQUARIE I. DECEMBER 1953

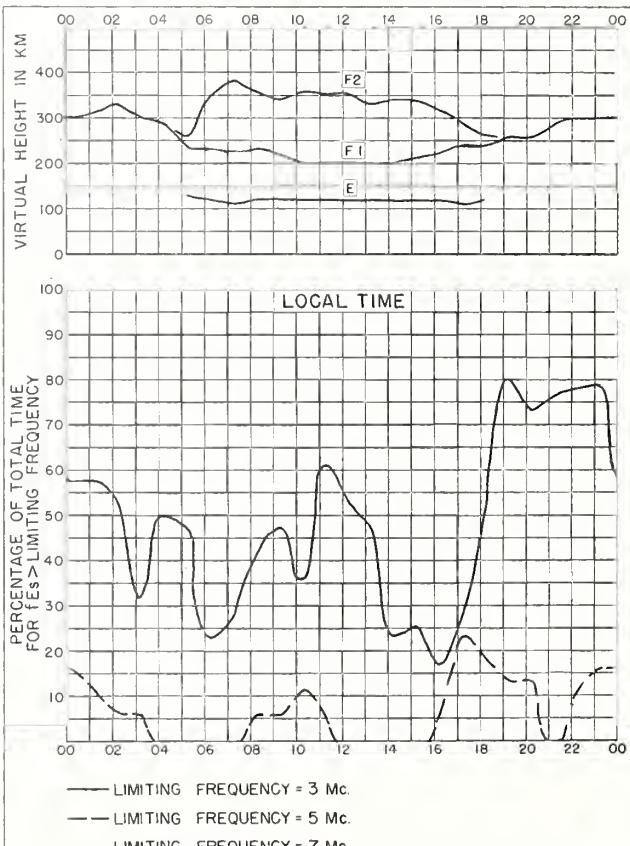
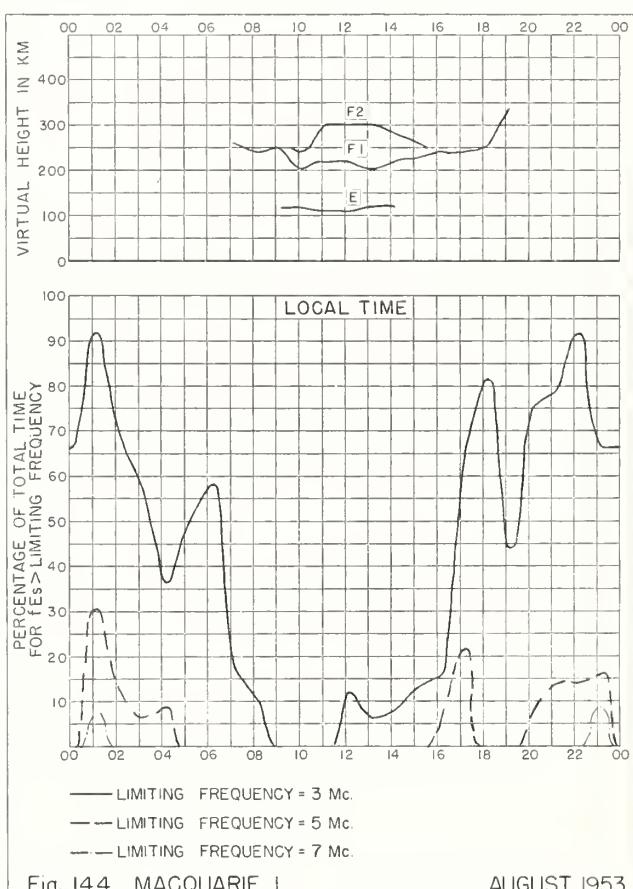
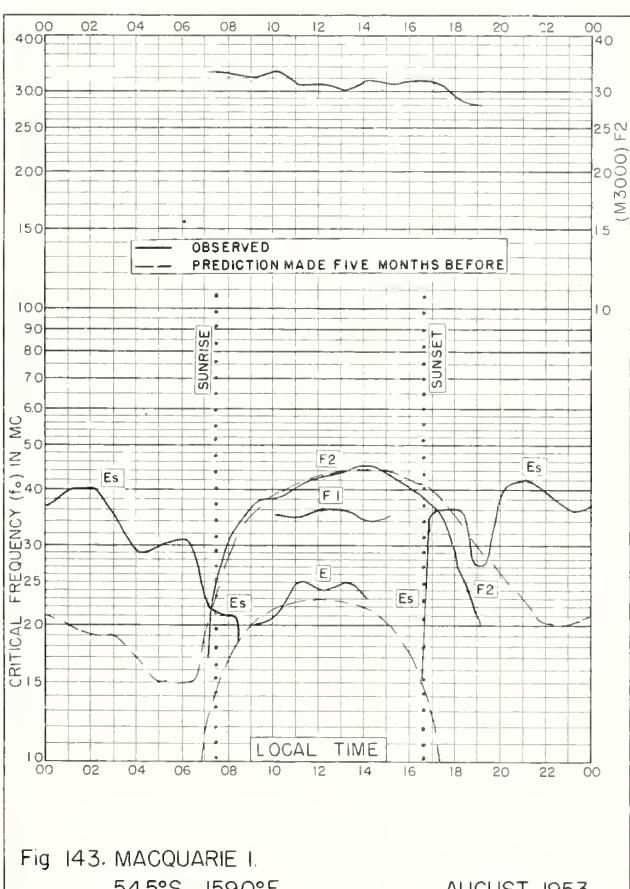
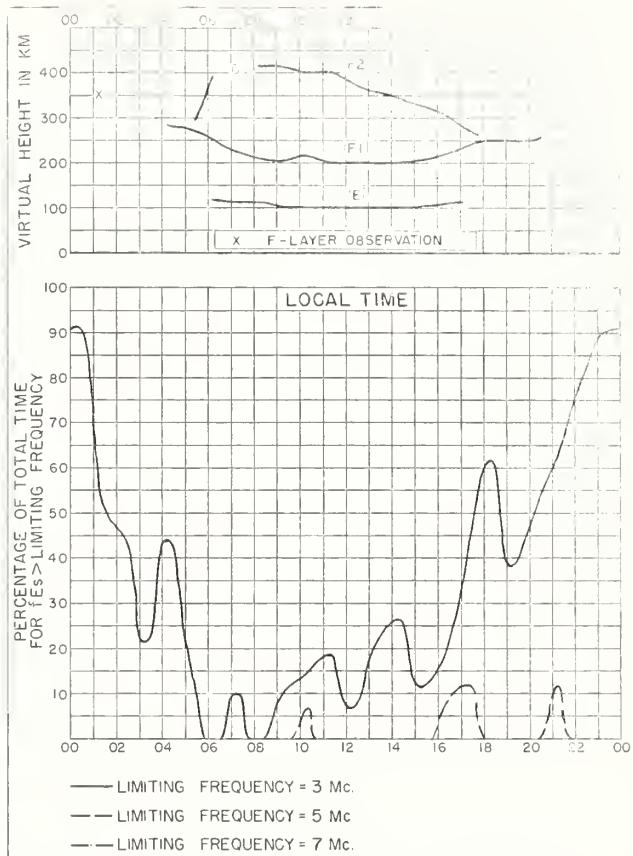
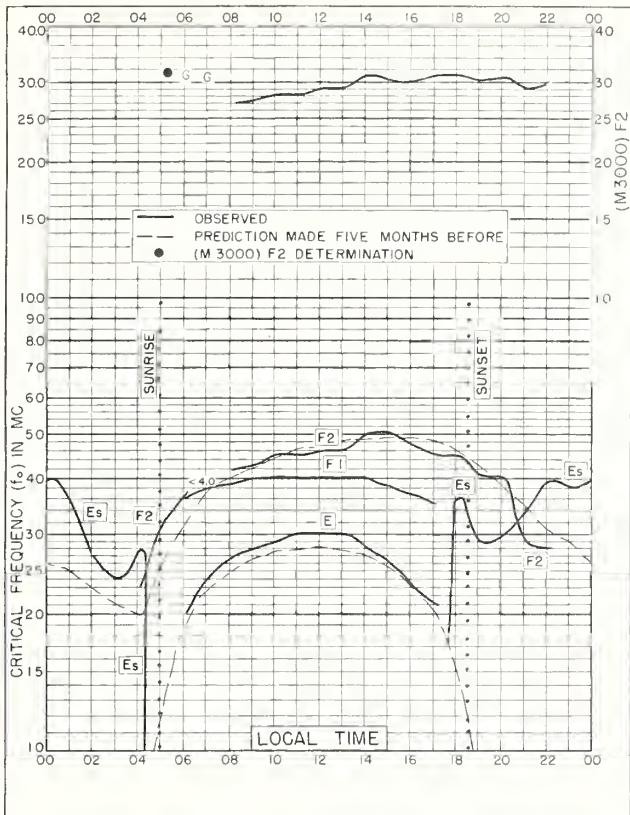


Fig. 140. MACQUARIE I. NOVEMBER 1953



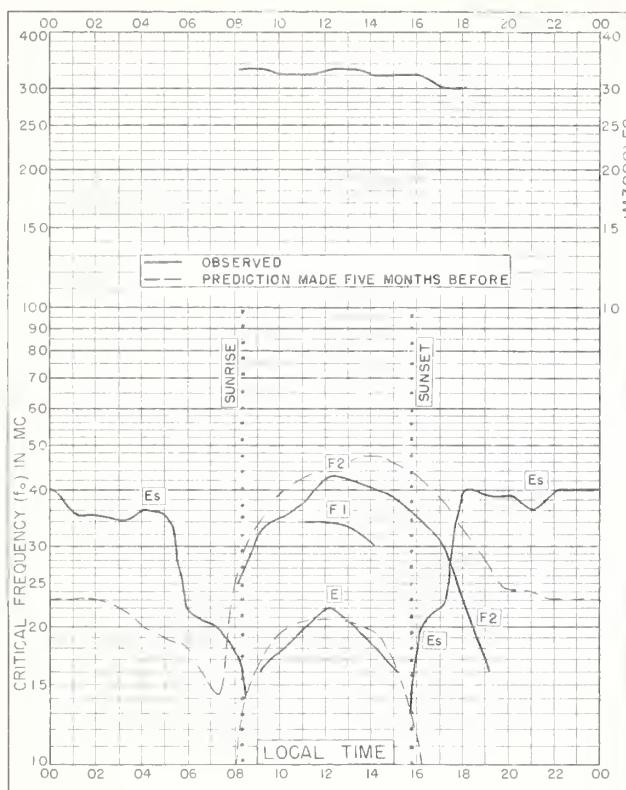


Fig. I45. MACQUARIE I.
54.5°S, 159.0°E

JULY 1953

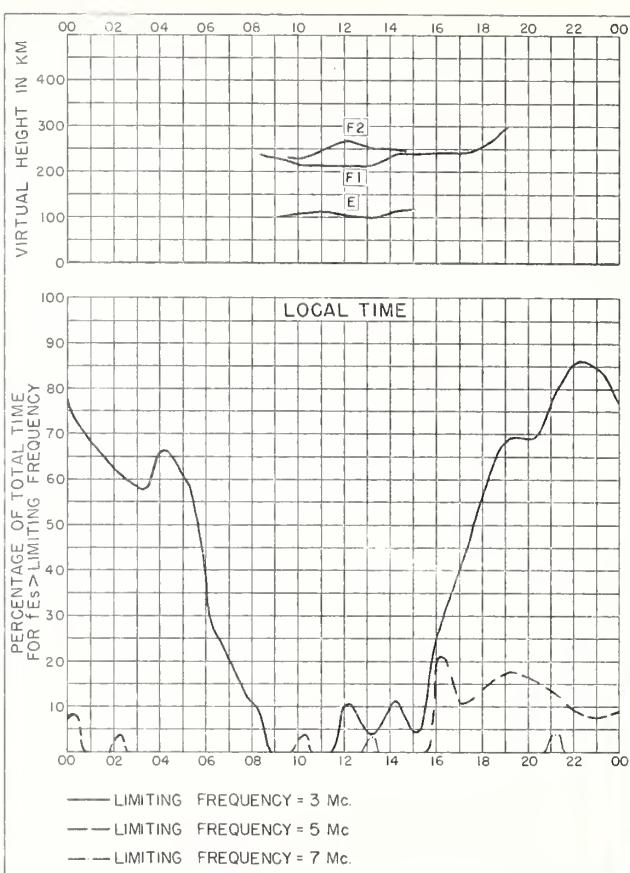


Fig. I46. MACQUARIE I.

JULY 1953

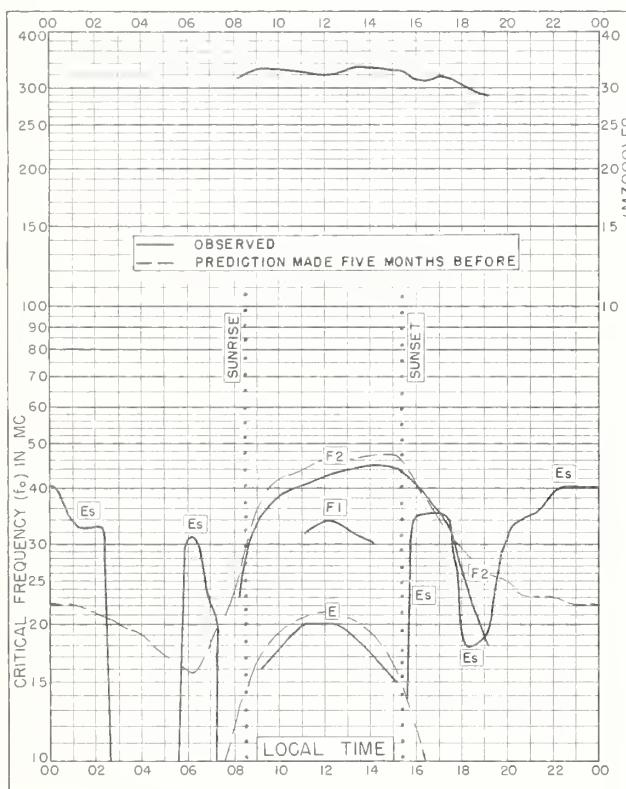


Fig. I47. MACQUARIE I.
54.5°S, 159.0°E

JUNE 1953

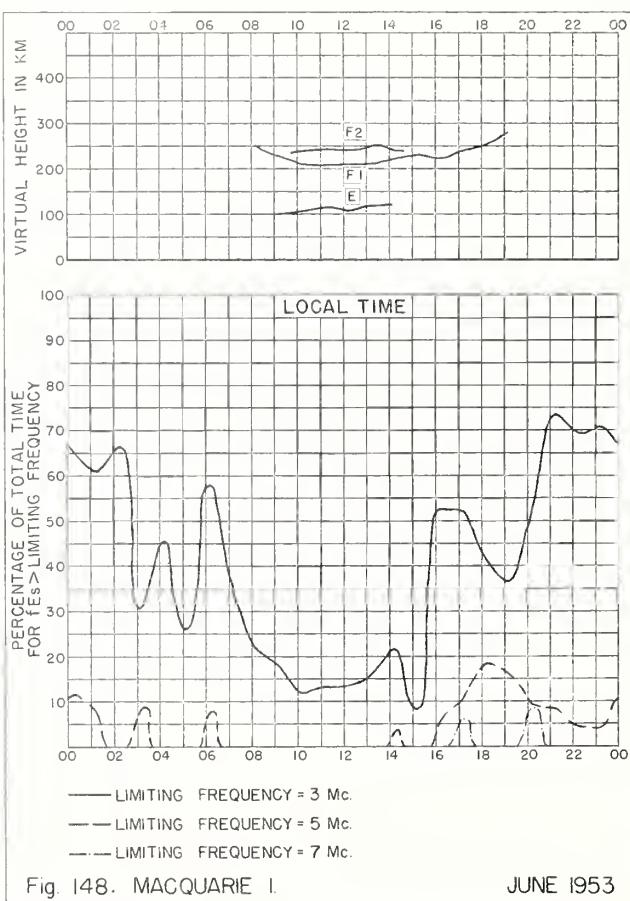
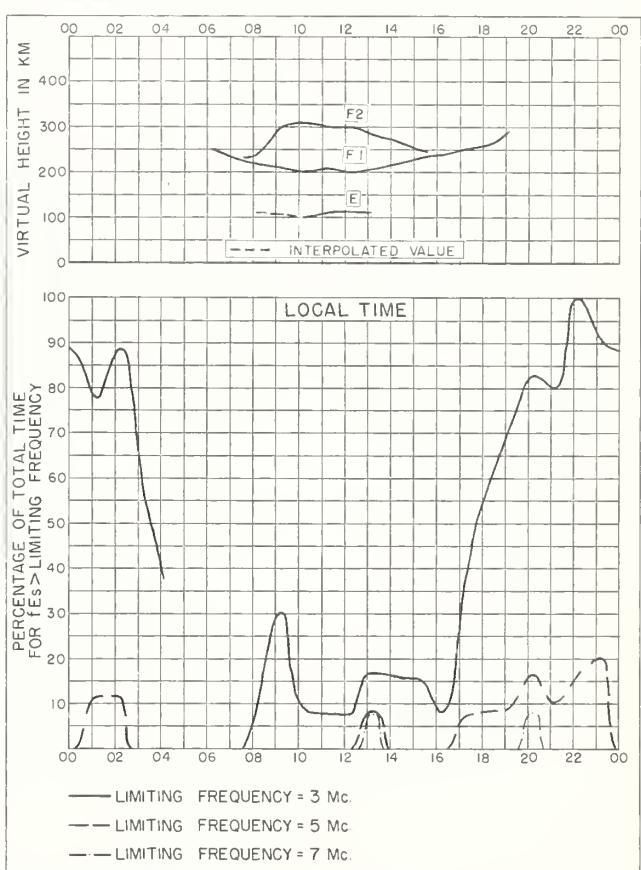
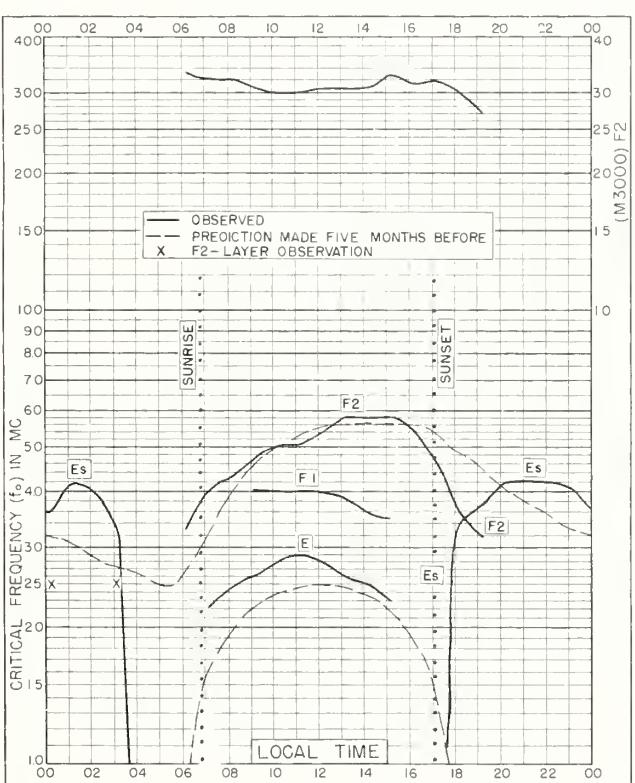
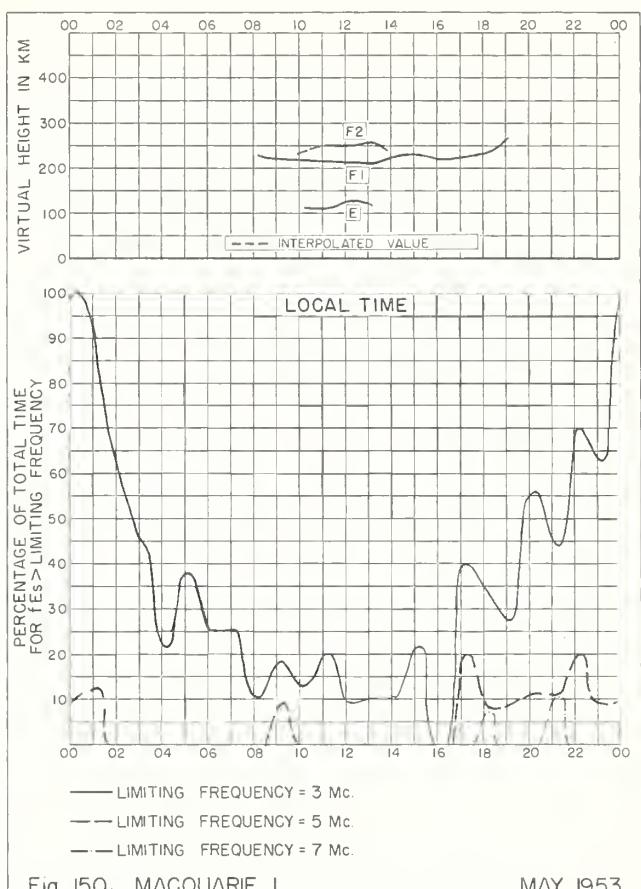
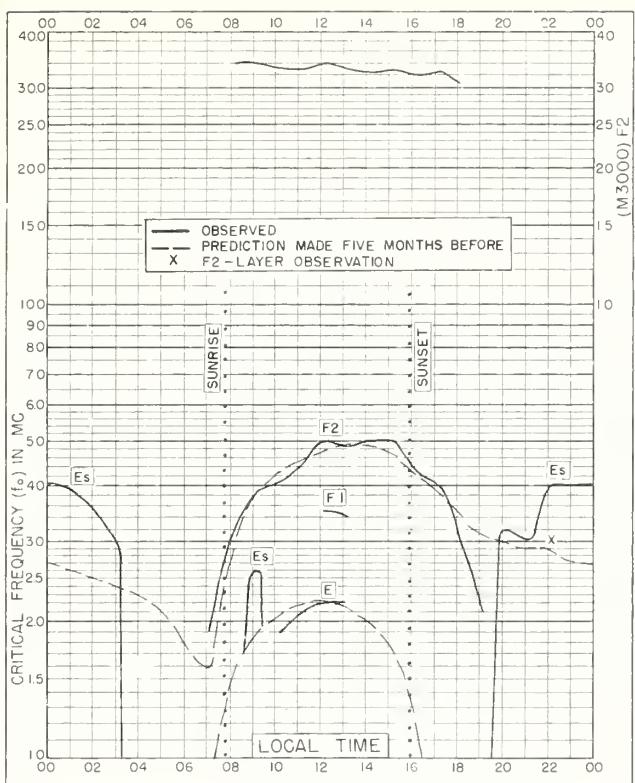


Fig. I48. MACQUARIE I.

JUNE 1953



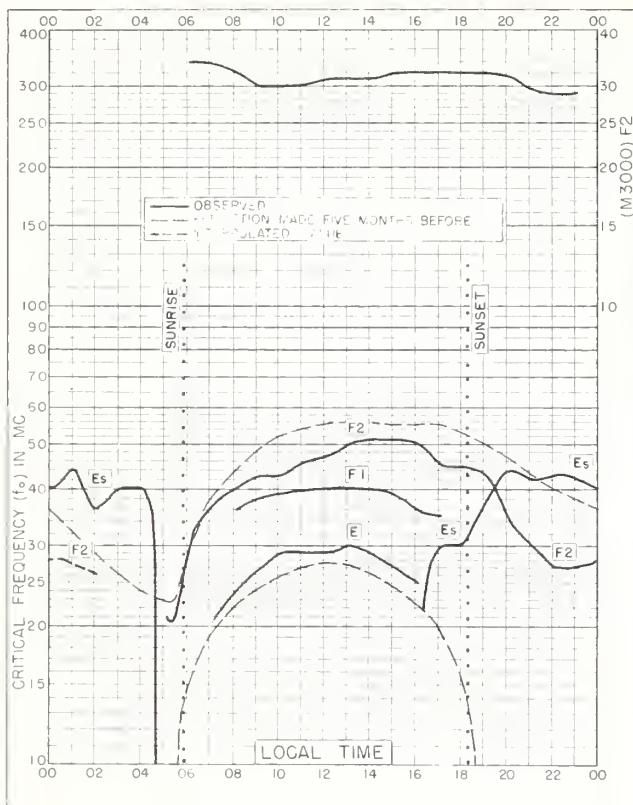


Fig 153. MACQUARIE I
54 5°S, 159°E

MARCH 1953

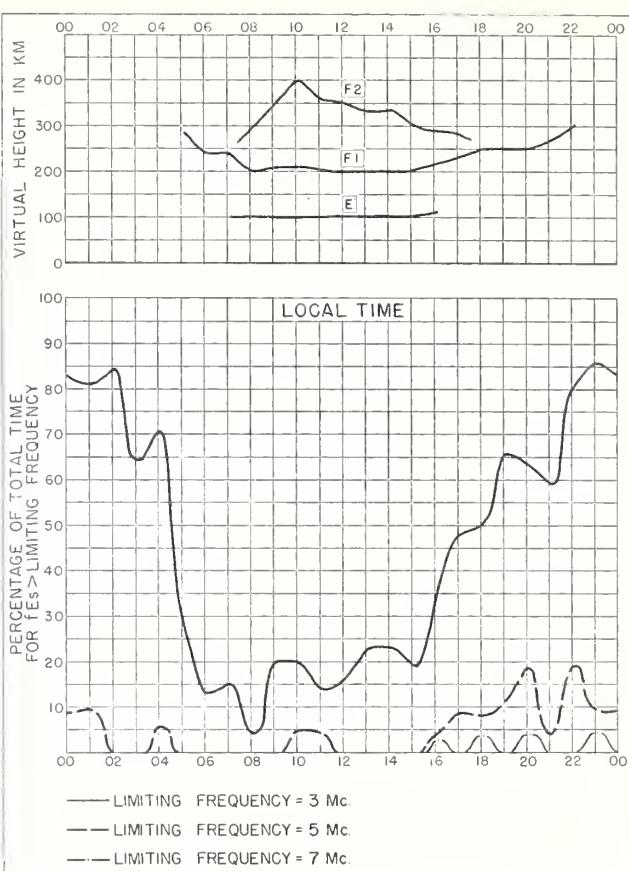


Fig 154. MACQUARIE I

MARCH 1953

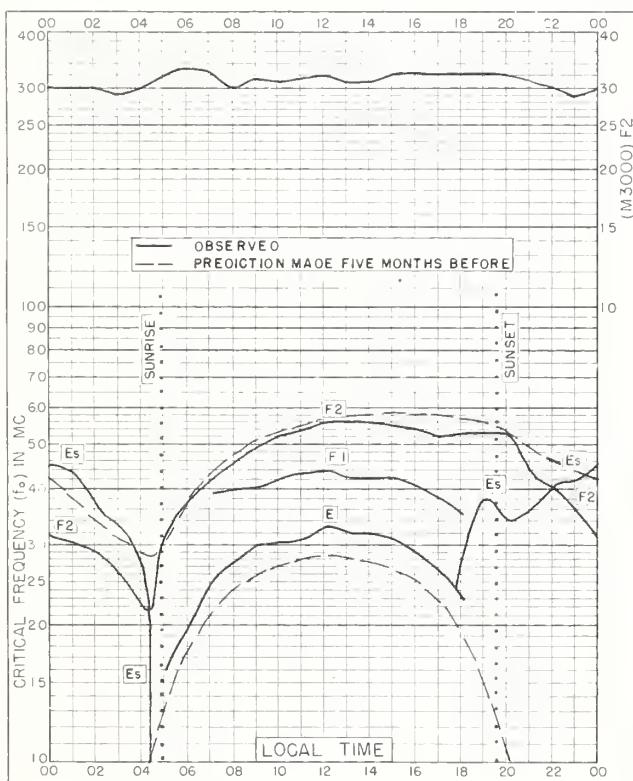


Fig 155. MACQUARIE I.
54.5°S, 159.0°E

FEBRUARY 1953

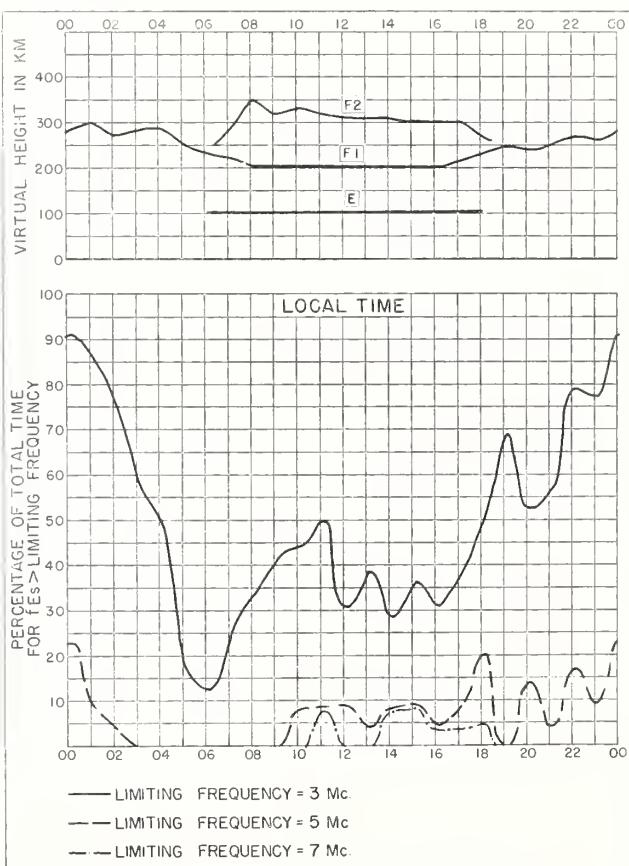


Fig 156. MACQUARIE I.

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