PART A

IONOSPHERIC DATA

ISSUED
NOVEMBER 1957

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 159
PART A

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

Issued
22 Nov. 1957

IONOSPHERIC DATA

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SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, and continuing through December 1956, 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 1957, the symbols used are given in NBS Report 5033, "Summary of Changes in Ionospheric Vertical Soundings, Observing and Scaling Procedures - Effective 1 January 1957," which draws upon the First Report of the Special Committee on World-Wide Ionospheric Soundings (URSI/AGI), Brussels, Sept. 2, 1956. A list of these symbols is available upon request.

In the Second Report of the Special Committee on World-Wide Ionospheric Soundings of the URSI/AGI Committee, May 1957, a new descriptive letter was introduced:

M Measurement questionable because the ordinary and extraordinary components are not distinguishable.

There was an expansion in meaning of the following:

Z (1) (qualifying letter) Measurement deduced from the third magnetoionic component.
(2) (descriptive letter) Third magnetoionic component present.

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 above.

a. For all ionospheric characteristics:

Values missing because of A, C, F, H, L, N, R or S 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'F (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 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; the descriptive symbol D, only when it replaces a frequency characteristic.

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.

At night B for fEs is counted on the low side when there is a numerical value of foF2; otherwise it is omitted from the median count.

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 the count is four or less, the data are considered insufficient and no median value is computed.

2. For the F2 layer, h'F or foEs, if the count is from five to nine, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as the count is at least five, the median is not considered doubtful. A count of at least 5 is considered sufficient for an h'Es median.

3. For all layers, if more than half of the data used to compute the medians 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.

Ordinarily, a blank space in the fEs or foEs 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 foE. Blank spaces at the beginning and end of columns of h'F2 or h'F1, foF1, h'E, and foE are usually the result of diurnal variation in these characteristics. Complete absence of medians of h'F1 and foF1 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.

d. The tables may contain median values of either foEs or fEs. The graph of median Es corresponds to the table. Percentage curves of fEs are estimated from values of foEs when necessary.

PREDICTED AND OBSERVED SUNSPOT NUMBERS

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

Month	Predicted Sunspot Number										
	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948
December		150*	150	42	11	15	33	53	86	108	114
November		150*	147	35	10	16	38	52	87	112	115
October		150*	135	31	10	17	43	52	90	114	116
September		150*	119	30	8	18	46	54	91	115	117
August		150*	105	27	8	18	49	57	96	111	123
July		150*	95	22	8	20	51	60	101	108	125
June		150*	89	18	9	21	52	63	103	108	129
May		150*	77	16	10	22	52	68	102	108	130
April	150*	150*	68	13	10	24	52	74	101	109	133
March	150*	150*	60	14	11	27	52	78	103	111	133
February	150*	150*	53	14	12	29	51	82	103	113	133
January	150*	150*	48	12	14	30	53	85	105	112	130

*This number is believed representative of solar activity at a maximum portion of the current sunspot cycle.

The latest available information follows concerning the corresponding observed Zürich numbers beginning with the minimum of April 1954. Final numbers are listed through June 1956.

Observed Sunspot Number

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1954				3	4	4	5	7	8	8	9	12
1955	14	16	19	23	29	35	40	46	55	64	73	81
1956	89	98	109	119	127	137	145	148	149	154	157	162
1957	169	171	174	181								

WORLD-WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 72 and figures 1 to 143 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

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

University of Graz:
- Graz, Austria

Escola Politecnica, University of Sao Paulo:
- Sao Paulo, Brazil

British Department of Scientific and Industrial Research, Radio Research Board:
- Ibadan, Nigeria (University College of Ibadan)
- Inverness, Scotland
- Port Lockroy
- Singapore, British Malaya

Defence Research Board, Canada:
- Baker Lake, Canada
- Churchill, Canada
- Ottawa, Canada
- Resolute Bay, Canada
- Winnipeg, Canada

Danish National Committee of URSI:
- Godhavn, Greenland

General Direction of Posts and Telegraphs, Helsinki, Finland:
- Nurmijarvi, Finland

National Laboratory of Radio-Electricity (French Ionospheric Bureau):
- Casablanca, Morocco
- Poitiers, France

Institute for Ionospheric Research, Lindau Uber Northeim, Hannover, Germany:
- Lindau/Harz, Germany

The Royal Netherlands Meteorological Institute:
- De Bilt, Holland

Central Institute of Meteorology, Budapest, Hungary:
- Budapest, Hungary

Icelandic Post and Telegraph Administration:
- Reykjavik, Iceland

Indian Council of Scientific and Industrial Research, Radio Research Committee, New Delhi, India:
- Ahmedabad (Physical Research Laboratory)
- Bombay (All India Radio)
- Calcutta (Institute of Radio Physics and Electronics)
- Delhi (All India Radio)
- Kodaikanal (India Meteorological Department)
- Madras (All India Radio)
- Tiruchy (All India Radio)

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

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

Manila Observatory:
- Baguio, P. I.

Research Institute of National Defence, Stockholm, Sweden:
- Kiruna, Sweden
- Lycksele, Sweden
- Upsala, Sweden

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

United States Army Signal Corps:
- Adak, Alaska
- Grand Bahama I.
- St. John's, Newfoundland
- White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):
- Anchorage, Alaska
- Fairbanks, Alaska (Geophysical Institute of the University of Alaska)
- Huancayo, Peru (Instituto Geofisico de Huancayo)
- Maui, Hawaii
- Point Barrow, Alaska
- Puerto Rico, W. I.
- San Francisco, California (Stanford University)
- Talara, Peru (Instituto Geofisico de Huancayo)

ERRATA

1. CRPL-F158 (Part A), p. 53, fig. 91: Delete foF2 value, >10.4, at righthand end.

2. CRPL-F158 (Part A), p. 60, fig. 120: For greater accuracy in plotted values of h'F2 at hours 17 and 18, see table 60, p. 28.

EXAMPLES OF IONOSPHERIC VERTICAL SOUNDINGS
PUERTO RICO, W.I.; JULY 3, 1957
(Geomagnetic Latitude 29°N)

The following ionograms were obtained at the Puerto Rico, W.I. vertical sounding station. They are typical of day and night conditions for July at this geomagnetic latitude. Ionospheric data are scaled directly from these records onto the daily f-plot, a graph of frequency characteristics vs. time. The f-plot for the day represented by these soundings is found on the following page. Medians as found in the Tables of Ionospheric Data are computed using hourly values taken from the f-plot or directly from the ionogram.

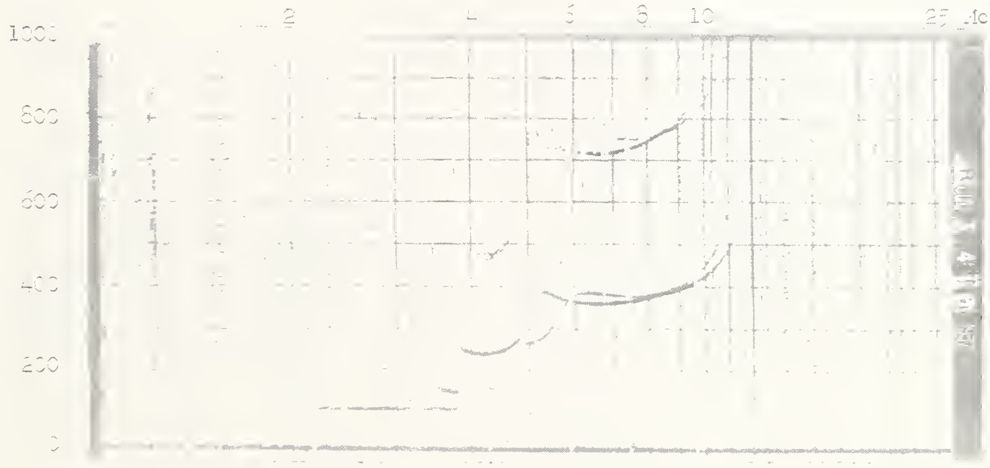

Fig. A. Puerto Rico, W.I., July 3, 1957, 1645 hours, 60°W time.

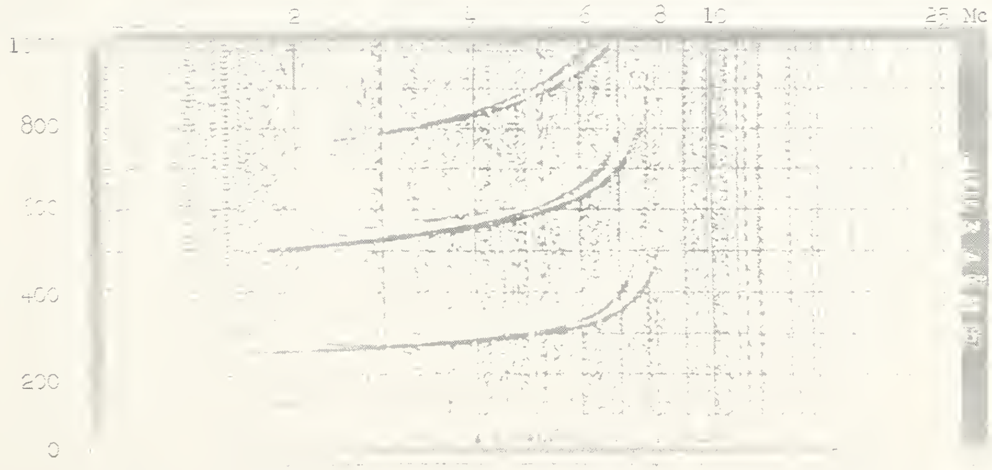

Fig. B. Puerto Rico, W.I., July 3, 1957, 0400 hours, 60°W time.

PUERTO RICO, W.I.

STATION ION PR f-PLOT OF IONOSPHERIC DATA DATE JULY 3, 1957

SCALED BY TRG

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Radio Noise Data

The results of radio noise measurements are presented in the following graphs and tables. These are based on three parameters of the noise: (1) the mean power, (2) the mean envelope voltage, and (3) the mean logarithm of the envelope voltage. The mean power averaged over a period of several minutes is the basic parameter and is expressed as an effective antenna noise figure, F_a. F_a is defined as the noise power available from an equivalent lossless antenna in db above ktb (the thermal noise power available from a passive resistance) where

k = Boltzman's constant (1.38×10^{-23} joules per degree Kelvin)

t = Absolute room temperature (taken as 288° K)

b = Bandwidth in cycles per second.

The mean voltage and mean logarithm are expressed as deviations, V_d and L_d, respectively, in db below the mean power.

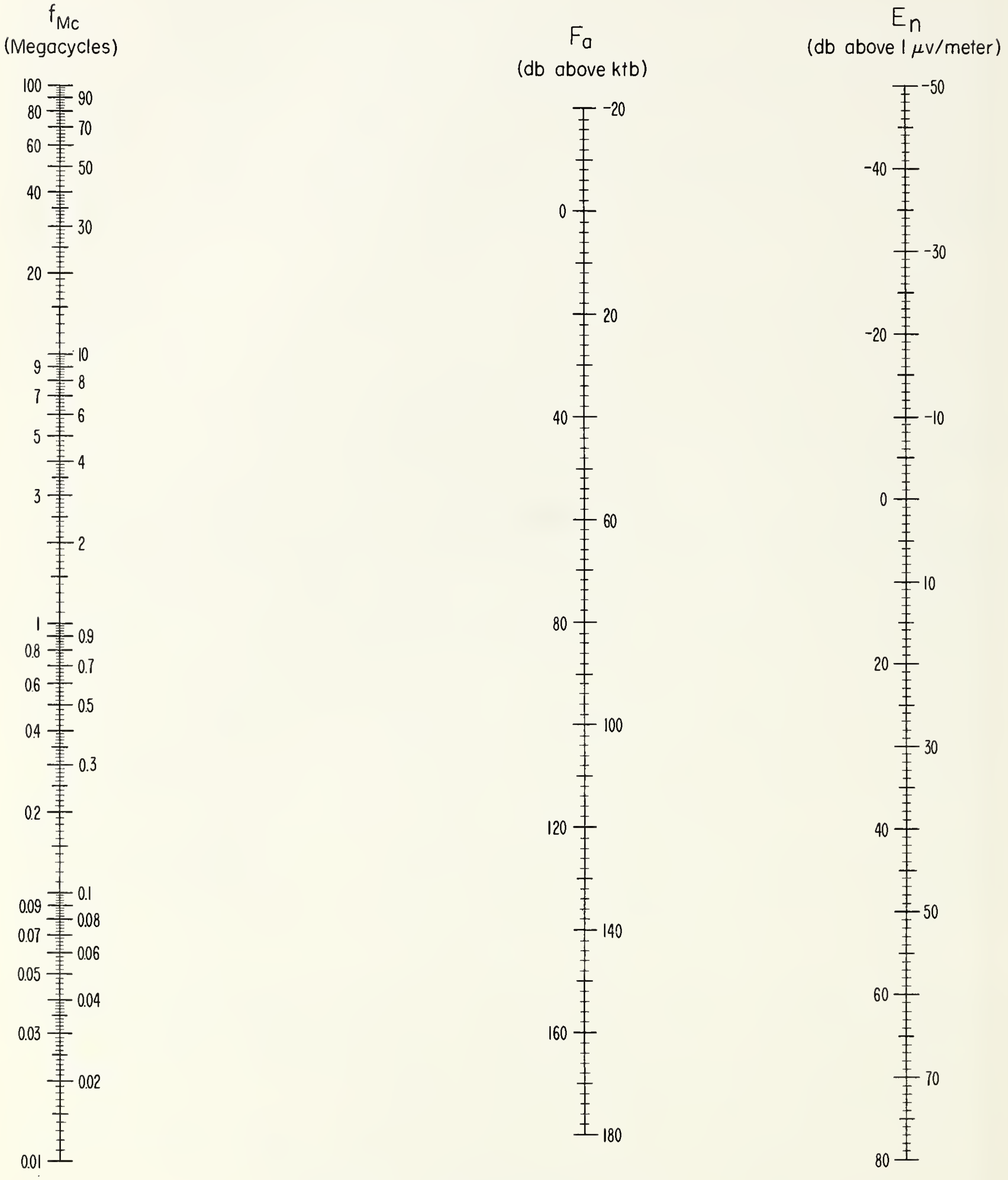
Measurements of these parameters were made with the National Bureau of Standards Radio Noise Recorder, Model ARN-2, which has an effective noise bandwidth of 280 cycles per second and uses a standard 21.75' vertical antenna. A 15-minute recording is made on each frequency each hour, and these 15-minute samples are taken as representing the noise conditions for the full hour. The month-hour medians, F_{am}, V_{dm}, and L_{dm} are determined from these hourly values for each of the corresponding parameters and the resulting medians are plotted at the half-hour point on the curves. Normally from 25 to 30 observations of the mean power are obtained monthly for each hour of the day, and from 10 to 15 observations of the voltage and logarithm deviations. When there are fewer than 15 observations of the mean power, or 7 observations of the voltage and logarithm deviations, the tabulated values are identified by an asterisk (*).

The upper and lower decile values of F_a are also reported in the following tabulation to give an indication of the extent of the variation of the noise power from day to day at a given time of day. These are expressed in db above and below the month-hour median, F_{am}, and designated by D_u and D_ℓ, respectively.

To convert F_a to an r.m.s. noise field strength, E_n, the nomogram or the equation on the following page may be used.

Information on expected worldwide noise levels and their application to systems problems is presented in NBS Circular 557 (available from the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C.). More recent estimates of radio noise levels are given in CCIR Report No. 65, "Report on Revision of Atmospheric Radio Noise Data", Warsaw, 1956 (available from the International Telecommunication Union, Geneva).

NOMOGRAM FOR TRANSFORMING EFFECTIVE ANTENNA NOISE FIGURE TO NOISE FIELD STRENGTH AS A FUNCTION OF FREQUENCY



$$E_n = F_a + 20 \log_{10} f_{Mc} - 65.5$$

F_a = Effective Antenna Noise Figure = External Noise Power Relative to ktb Available from an Equivalent Short, Lossless, Vertical Antenna in db Above ktb.

E_n = Equivalent Vertically Polarized Ground Wave R.M.S. Noise Field Strength in db Above 1 μv/meter for a 1 kc Bandwidth.

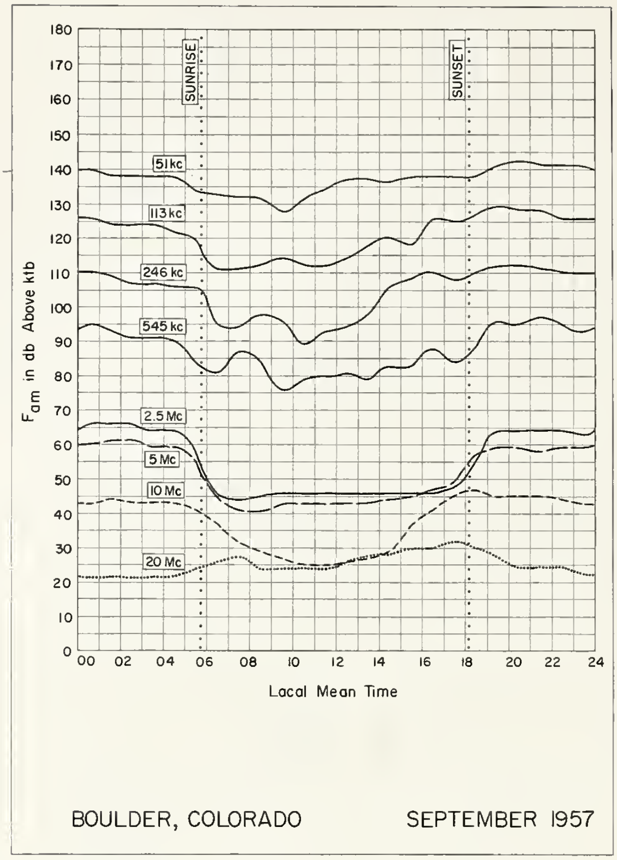
f_{Mc} = Frequency in Megacycles.

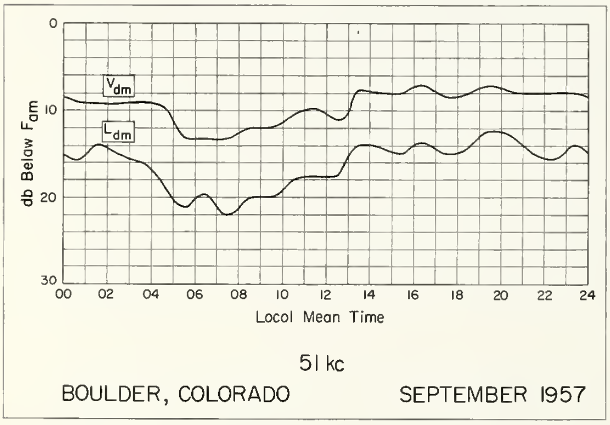
RADIO NOISE DATA

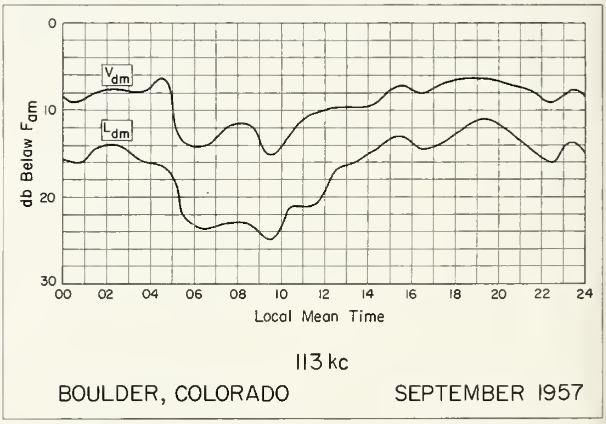
Station Boulder, Colorado Lat. 40.1° N Long. 105.1° W Type Recorder ARN-2 Month Sept. 19 57

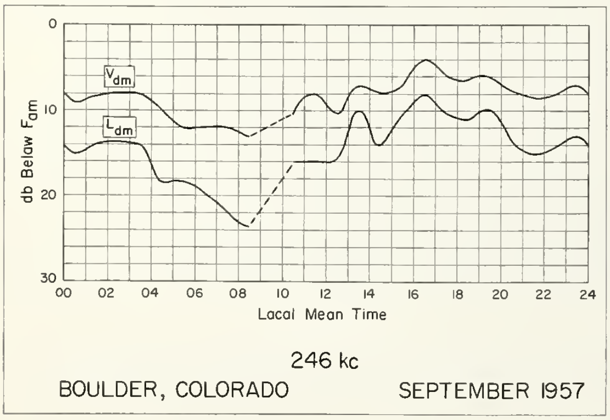
	Local Mean Time																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
51 kc																								
F_{am}	140	138	*138	*138	138	*134	*133	*132	*132	*128	*132	*134	*137	*137	136	*138	138	*138	*138	*141	*142	*141	*141	*141
D_u	4	6			2										8		8							
D_ℓ	6	6			6										8		6							
V_{dm}	9.0	9.0	9.0	9.0	9.5	*13.0	*13.0	*13.0	*12.0	*12.0	*10.5	*9.5	*11.0	*7.5	*8.0	*8.0	*7.0	*8.5	*8.0	7.0	*8.0	8.0	8.0	*8.0
L_{dm}	15.5	14.0	15.0	16.0	18.5	*21.0	*19.5	*22.0	*20.0	*20.0	*18.0	*17.5	*17.5	*14.0	*14.5	*15.0	*13.5	*15.0	*14.5	12.5	*13.0	15.0	15.5	*14.0
113 kc																								
F_{am}	126	124	124	*124	*122	*120	*111	*111	*112	*114	*112	*112	*114	*118	120	118	126	*125	*127	*129	*128	*128	*126	*126
D_u	6	6	6												16	18	10							
D_ℓ	8	8	8												12	14	20							
V_{dm}	9.0	8.0	7.5	8.0	*6.5	*13.5	*14.0	*12.0	*11.5	*15.0	*12.5	*10.5	*9.5	*9.5	*9.0	*7.0	*8.0	*7.0	6.5	*6.5	7.0	8.0	9.0	7.5
L_{dm}	16.0	14.5	14.0	15.5	*16.5	*22.0	*23.5	*23.0	*23.0	*25.0	*21.0	*21.0	*17.0	*16.0	*14.5	*13.0	*14.5	*13.5	12.0	*11.0	12.5	14.5	16.0	13.5
246 kc																								
F_{am}	110	*109	107	*107	*106	*106	*95	*94	*98	*96	*89	*93	*94	98	106	108	110	*108	*110	*112	*112	*111	*110	*110
D_u	6		7											22	14	16	12							
D_ℓ	12		9											22	18	30	32							
V_{dm}	9.0	8.5	8.0	8.0	10.0	*12.0	*12.0	*12.0	*13.0		*10.5	*8.0	*10.5	*7.0	*8.0	7.0	*4.0	*6.0	6.5	6.0	7.5	8.5	8.0	*7.0
L_{dm}	15.0	14.0	13.5	14.0	18.5	*18.5	*19.5	*22.0	*23.5		*16.0	*16.0	*16.0	*10.0	*14.0	10.5	*8.0	*10.5	11.0	10.0	13.5	15.0	14.5	*13.0
545 kc																								
F_{am}	95	93	91	*91	*90	*84	*81	*87	*84	*76	*79	*80	*81	79	83	83	*88	*84	*88	*96	*95	*97	*95	*93
D_u	4	6	6											26	20	24								
D_ℓ	8	6	6											8	12	10								
V_{dm}	6.0	6.0	7.0	7.0	*4.5	*8.5	*6.5			*5.5	*4.0		*7.0	*5.0	*6.0	*5.0	*10.5	*6.5	*5.5	*5.0	*7.0	5.5	*6.0	*5.0
L_{dm}	10.0	12.0	12.5	12.5	*11.0	*12.0	*12.5			*9.5	*8.0		*13.0	*9.0	*10.0	*8.0	*18.0	*10.5	*10.0	*9.5	*11.5	9.5	*9.0	*9.5
2.5 Mc																								
F_{am}	66	66	66	64	64	58	46	44	45	*46	*46	46	46	46	46	46	46	48	56	64	64	64	64	63
D_u	6	6	4	6	6	6	4	2	1			6	8	10	18	17	17	14	8	10	10	10	6	9
D_ℓ	12	12	10	8	10	10	4	2	6			6	4	4	4	4	3	4	8	14	12	14	14	13
V_{dm}	4.0	4.5	4.0	5.0	5.5	6.0	2.5	2.5	1.5	*2.0	*1.0	1.5	3.0	1.5	1.5	2.0	1.5	2.5	3.0	3.0	4.0	4.0	3.5	3.5
L_{dm}	9.0	9.0	9.0	10.0	8.0	8.0	3.5	3.0	3.0	*3.0	*2.5	2.5	4.0	2.5	2.5	3.0	2.5	3.5	5.0	6.0	8.0	7.0	7.5	7.5
5 Mc																								
F_{am}	60	61	61	59	59	55	45	41	41	*43	43	43	43	43	44	45	47	49	57	59	59	58	59	59
D_u	3	2	2	4	2	6	4	4	4		4	4	4	5	3	7	8	8	8	8	8	5	4	4
D_ℓ	5	6	8	2	4	6	6	6	8		8	15	8	8	9	12	6	2	6	6	6	5	6	4
V_{dm}	4.0	4.0	3.5	4.0	4.0	4.5	2.0	3.0	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.5	2.0	2.5	3.0	4.0	3.5	3.5	3.5
L_{dm}	7.5	8.0	7.5	8.0	8.5	8.5	4.5	4.0	3.0	3.0	2.5	3.0	3.5	3.5	3.5	3.0	5.0	4.0	5.0	6.0	7.0	7.5	7.5	8.0
10 Mc																								
F_{am}	43	44	43	43	43	41	37	31	*29	*27	*25	25	26	27	29	37	41	45	47	45	45	45	44	43
D_u	4	3	3	4	1	2	6	8				8	7	11	10	6	4	4	4	6	4	2	3	4
D_ℓ	4	6	4	6	11	7	3	7				5	3	4	4	6	8	6	6	4	6	6	3	4
V_{dm}	4.0	3.0	3.5	4.5	4.0	4.0	3.0	3.5	*4.0	3.0	2.5	3.0	2.5	2.5	3.0	3.5	3.0	3.0	3.0	3.5	4.0	4.0	3.0	3.5
L_{dm}	7.0	7.0	7.5	7.5	7.5	7.0	6.5	5.0	*6.0	5.0	4.0	4.5	3.5	5.0	6.0	6.5	7.0	6.0	6.5	7.0	7.0	7.5	7.0	7.0
20 Mc																								
F_{am}	22	22	22	22	22	24	26	28	*24	*24	*24	24	26	28	28	30	30	32	30	28	24	24	24	22
D_u	2	2	2	2	2	3	4	2				4	7	4	6	4	2	4	6	3	4	2	2	2
D_ℓ	0	0	2	2	2	2	4	6				5	2	5	4	6	4	6	6	5	2	2	2	0
V_{dm}	2.0	1.0	1.0	1.0	1.0	2.0	2.5	2.5	1.0	2.0	2.0	1.5	3.5	2.0	2.5	2.0	2.5	2.5	3.0	2.5	3.0	2.0	2.0	1.5
L_{dm}	2.5	2.5	2.5	2.5	2.0	3.0	4.5	4.0	2.5	3.5	3.5	3.5	4.5	4.0	4.0	4.0	4.5	5.0	5.0	4.0	4.5	3.0	3.5	2.5

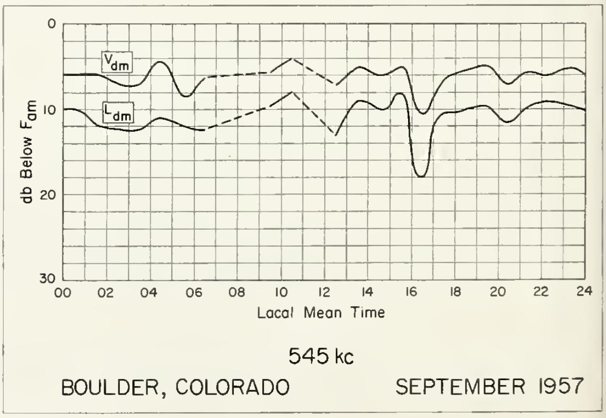
GRAPHS OF RADIO NOISE DATA











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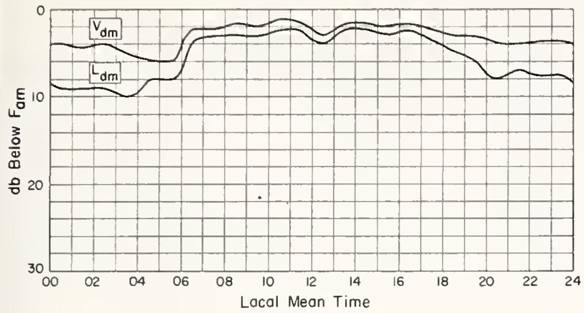
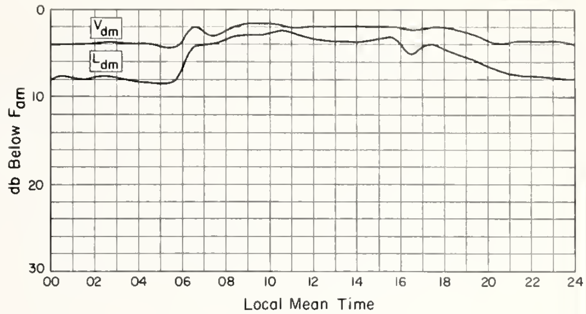


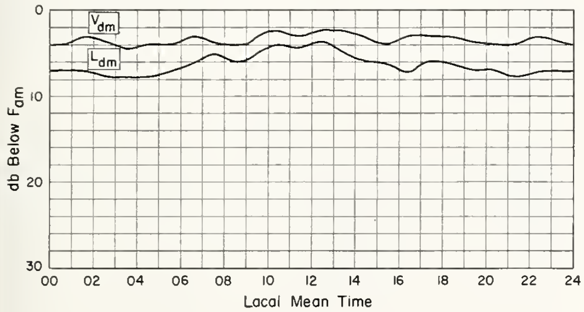
2.5 Mc

BOULDER, COLORADO SEPTEMBER 1957



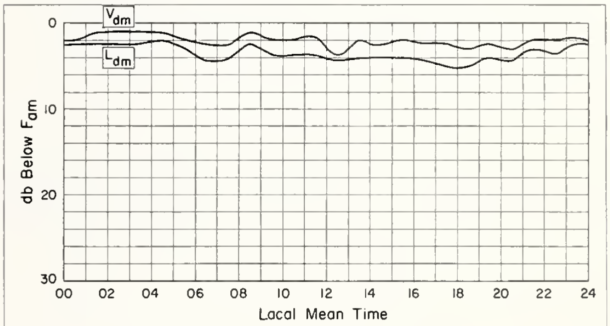
5 Mc

BOULDER, COLORADO SEPTEMBER 1957



10 Mc

BOULDER, COLORADO SEPTEMBER 1957



20 Mc

BOULDER, COLORADO SEPTEMBER 1957

Table 1

Kiruna, Sweden (67.8°N, 20.3°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.5	315				(4.1)	2.6
01		5.4	300				(3.3)	2.5
02		5.0	310		---	---	(2.3)	2.5
03	---	5.0	300	---	---	---	(3.3)	2.5
04	---	5.6	270	---	---	1.8		2.6
05	(460)	6.0	250	3.9	110	2.1		2.6
06	450	6.0	250	4.1	110	2.6		2.6
07	(455)	6.6	240	4.4	110	2.8	(2.4)	2.6
08	405	6.6	230	4.8	105	3.0	(2.8)	2.6
09	420	6.8	230	4.9	105	3.1		2.6
10	(420)	7.0	225	5.0	105	3.1		2.6
11	400	6.9	220	5.0	105	3.2		2.6
12	430	7.0	215	5.0	105	3.2	3.0	2.6
13	435	7.0	220	5.0	105	3.2		2.6
14	(440)	6.8	225	5.0	105	3.1		2.6
15	(445)	7.0	230	4.9	105	3.0		2.6
16	---	7.0	235	---	110	2.9		2.7
17	---	6.8	245	---	110	2.7		2.8
18	---	6.6	250	---	110	2.3	2.8	2.8
19		6.2	260	---	115	1.8	2.4	2.7
20		6.1	275		---	---	2.4	2.7
21		5.8	285		---	---	(3.3)	2.6
22		5.5	305		---	---	(3.8)	2.6
23		5.4	310				(4.3)	2.6

Time: 15.0°E.
Sweep: 0.8 Mc to 14.0 Mc in 30 seconds.

Table 2

Fairbanks, Alaska (64.9°N, 147.8°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(5.0)					3.4	(2.80)
01		(4.9)					3.5	(2.70)
02		(4.8)					3.3	(2.70)
03		(5.2)					3.7	(2.70)
04		(5.4)		---	---	----	2.9	(2.70)
05		(5.5)		(3.7)	115	2.30	3.6	(2.70)
06		(5.9)		4.2	110	2.65		(2.65)
07		6.2		4.5	103	3.00	3.1	2.65
08		6.2		4.6	103	3.20		2.60
09		6.2		4.8	101	(3.25)		2.60
10		6.5		4.9	103	3.40		2.65
11		6.4		5.0	103	(3.50)		2.60
12		6.4		5.0	102	3.50		2.60
13		6.4		5.0	102	3.50		2.70
14		6.6		(5.0)	101	3.40		2.60
15		6.7		4.8	101	3.25		2.70
16		6.6		(4.6)	103	3.05		2.75
17		6.5		(4.4)	105	2.90		2.85
18		6.6		---	109	2.50	2.8	2.95
19		6.6		---	119	2.20	2.6	3.00
20		5.8			---	----	2.3	3.00
21		(5.5)					2.4	(2.90)
22		(5.1)					3.0	(2.90)
23		(5.3)					3.7	(2.90)

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 3

Lycksele, Sweden (64.6°N, 18.8°E) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.6	310				2.4	2.4
01		5.4	310				2.4	2.4
02		5.2	300		---	E	2.3	2.4
03	---	4.9	290	----	---	E	2.2	2.4
04	340	5.2	270	3.20	120	1.65	2.2	2.6
05	280	5.7	250	3.70	110	2.15		2.7
06	280	6.0	235	3.95	105	2.50		2.7
07	330	6.9	235	4.50	105	2.80	2.8	2.7
08	335	6.9	225	4.80	105	3.10	3.2	2.7
09	350	7.3	220	4.95	105	3.20	3.5	2.7
10	355	7.4	215	5.20	105	3.30	3.5	2.7
11	360	7.2	215	5.20	105	3.40	3.7	2.7
12	355	7.3	210	5.30	105	3.50		2.7
13	380	7.3	215	5.20	105	3.40		2.7
14	330	7.1	215	5.10	105	3.30		2.7
15	315	7.3	215	4.90	105	3.20		2.7
16	330	7.5	230	4.70	105	3.10		2.7
17	275	7.2	230	4.30	105	2.85	3.6	2.7
18	280	7.2	250	3.80	110	2.40	3.7	2.8
19	(270)	6.9	255	3.20	115	1.80	2.3	2.8
20		6.7	260		---	E	2.0	2.7
21		6.7	265		---	E	2.2	2.6
22		6.2	290				3.2	2.5
23		5.8	310				2.7	2.4

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 4

Adak, Alaska (51.9°N, 176.6°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.8	290				1.5	2.60
01		5.4	305					2.55
02		5.0	320					2.50
03		4.8	315				2.2	2.50
04	---	4.8	330					2.50
05	(450)	5.4	285	---	117	2.05	2.0	2.60
06	440	6.4	250	4.2	114	(2.50)	2.9	2.60
07	390	7.4	245	4.6	111	(3.00)	3.4	2.70
08	420	8.0	230	4.8	109	(3.30)	3.9	2.65
09	405	8.0	220	5.2	108	(3.50)	4.0	2.70
10	410	8.0	215	5.4	109	(3.60)	4.1	2.70
11	390	8.2	220	5.5	109	3.70	4.2	2.65
12	400	8.2	220	5.5	109	3.80	4.0	2.70
13	380	8.0	220	5.4	110	3.80	4.1	2.70
14	395	8.0	220	5.2	107	3.70		2.70
15	380	7.7	230	5.1	109	3.50		2.75
16	(385)	7.8	240	5.0	111	3.25	3.3	2.80
17	---	7.6	245	---	111	2.90	3.2	2.90
18		7.7	260		113	(2.35)	3.0	2.90
19		7.6	260		119	----	2.5	2.95
20		7.4	260				2.6	2.85
21		7.2	260				2.7	2.75
22		6.7	270				2.0	2.75
23		6.1	290					2.65

Time: 180.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 5

Schwarzenburg, Switzerland (46.8°N, 7.3°E) August 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	7.0						3.0
01	290	6.6						2.95
02	290	6.4						2.9
03	280	6.2						2.9
04	280	5.6						3.0
05	250	5.6						3.1
06	220	6.4	---	---	100	2.0	2.7	3.5
07	210	7.2	200	4.2	100	2.6	3.4	3.6
08	230	7.8	200	4.8	100	3.1	4.4	3.4
09	280	8.5	200	5.1	100	3.4	4.8	3.4
10	260	8.5	200	5.4	100	3.6	4.8	3.3
11	300	8.7	200	5.8	100	3.7	4.6	3.2
12	300	9.0	200	6.0	100	3.8	4.5	3.1
13	300	9.0	200	5.9	100	3.8		3.2
14	300	9.0	200	5.8	100	3.8		3.2
15	310	8.6	200	5.6	100	3.6		3.2
16	300	8.4	200	5.4	100	3.4		3.2
17	290	8.4	200	5.0	100	3.1	4.0	3.3
18	230	8.4	200	4.5	100	2.7	3.2	3.4
19	230	8.3			---	---		3.3
20	220	8.2						(3.4)
21	240	8.0						3.2
22	240	7.2						3.2
23	260	7.0						3.0

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 6

Maui, Hawaii (20.8°N, 156.5°W) August 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		9.3	275					2.80
01		9.2	270					2.80
02		8.3	260					2.95
03		7.5	260					2.80
04		7.0	265					2.90
05		6.3	260					2.80
06		6.4	280		118	1.35	2.1	2.90
07	---	7.7	245		113	2.50	2.8	3.00
08	---	8.8	225		111	3.15	3.5	3.00
09	(295)	9.5	215	---	111	3.55	4.0	2.60
10	(380)	10.3	220	5.8	111	3.90	4.2	2.40
11	415	11.0	220	6.3	109	(4.10)	4.6	2.45
12	390	11.9	220	6.1	109	4.20	4.7	2.55
13	380	12.2	220	6.0	109	(4.20)	4.5	2.60
14	385	12.5	230	6.0	111	4.10	4.6	2.60
15	360	13.0	230	5.9	111	4.00	4.5	2.70
16	340	13.2	225	---	111	3.65	4.6	2.80
17	310	13.0	240		111	3.20	5.2	2.80
18	280	12.4	260		118	2.40	4.4	2.90
19		11.6	260		---	----	3.8	2.90
20		11.2	270				3.9	2.80
21		11.4	275				3.2	2.80
22		10.9	275				2.6	2.80
23		9.8	280				2.0	2.70

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 7

Point Barrow, Alaska (71.3°N, 156.8°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	---	5.6	290		126	2.30	2.8	2.90
01	---	5.2	285		125	2.40		2.85
02	---	5.2	270	---	---	----	3.0	2.80
03	(360)	5.5	260	---	---	----	2.6	2.85
04	---	5.6	(260)	---	113	2.30		2.80
05	390	5.8	230	4.0	111	2.60		2.70
06	460	5.6	250	4.0	103	2.80		2.70
07	470	5.6	230	4.2	101	3.10		2.50
08	430	6.4	(210)	4.4	101	3.25		2.60
09	(400)	(6.4)	(215)	4.7	101	3.30		2.70)
10	(440)	5.8	(235)	4.7	101	3.35		2.50
11	(410)	6.3	(220)	4.8	100	3.30		(2.70)
12	430	6.4	215	4.7	100	3.40		2.60
13	435	6.2	215	5.0	99	3.50		2.60
14	450	6.1	225	4.8	101	3.30		2.65
15	420	6.2	215	4.8	101	3.30		2.60
16	405	6.2	215	4.8	101	3.15		2.65
17	420	6.0	220	4.6	102	3.00		2.70
18	425	5.9	220	4.4	102	2.85		2.70
19	390	5.8	235	4.2	111	2.70		2.75
20	(380)	5.8	240	(3.9)	114	2.60		2.80
21	---	5.5	265	---	119	2.50		2.80
22	---	5.5	270		129	2.50		2.90
23	---	5.4	275		127	2.30	3.2	2.90

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 8

Tromso, Norway (69.7°N, 19.0°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	(305)	5.8	---		---	2.00	3.8	2.50
01	(310)	5.6	(320)	----	---	----	3.8	2.40
02	(360)	6.0	---	----	---	----	3.7	2.40
03	(430)	5.9	(295)	3.70	---	2.30	4.0	2.45
04	450	6.0	255	4.00	105	2.60	2.8	2.55
05	460	6.0	250	4.20	105	2.80		2.50
06	450	6.4	250	4.55	105	3.00		2.55
07	460	6.8	245	4.70	100	3.15		2.55
08	450	6.8	240	5.00	100	3.30		2.50
09	455	7.1	230	5.15	105	3.40		2.50
10	430	7.1	225	5.30	100	3.50		2.55
11	450	6.9	220	5.20	100	3.60		2.45
12	450	6.9	215	5.30	100	3.60		2.55
13	450	6.8	220	5.20	100	3.60		2.55
14	505	6.7	230	5.20	100	3.55		2.45
15	495	6.6	235	5.00	105	3.40		2.55
16	515	6.5	235	4.80	100	3.20		2.55
17	(515)	6.3	245	4.80	100	3.10		2.55
18	---	6.4	250	----	105	2.90	3.0	2.70
19	---	6.6	255	----	110	2.70	3.0	2.70
20	---	6.4	265	----	110	2.60	2.8	2.70
21	---	6.2	(285)		120	2.30	3.0	2.65
22	310	6.1	(295)		---	2.30	3.0	2.60
23	(300)	6.0	---		---	2.15	2.9	2.50

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 9

Fairbanks, Alaska (64.9°N, 147.8°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(5.4)	305		---	----	2.7	(2.80)
01		(5.7)	320		---	----		(2.70)
02		(5.4)	315		---	----	3.0	(2.70)
03		(5.8)	295		---	----	3.8	(2.70)
04	420	(6.0)	250	(3.7)	125	2.20		(2.70)
05	450	(6.1)	240	4.0	111	(2.70)	2.8	(2.60)
06	410	6.6	230	4.5	109	2.90	3.2	2.55
07	420	6.8	220	4.7	105	3.10	3.4	2.50
08	430	6.6	220	4.8	104	3.40		2.55
09	425	6.9	210	4.9	101	3.50		2.60
10	450	6.8	215	5.0	101	3.50	4.2	2.55
11	450	6.5	215	5.2	103	3.60		2.60
12	490	6.4	210	5.1	103	3.65		2.50
13	480	6.2	210	5.2	103	3.60		2.55
14	490	6.2	210	5.0	103	(3.55)		2.50
15	460	6.2	220	5.0	103	3.50		2.55
16	430	6.2	220	(4.8)	103	3.35		2.60
17	(450)	6.2	225	(4.7)	103	3.10		2.70
18	(470)	6.0	235	4.3	109	2.90		2.75
19	---	6.1	240	---	<117	2.50	2.8	2.80
20	---	6.2	270		<131	(2.25)	2.4	2.90
21		5.8	275		123	2.30		2.90
22		(5.5)	280		<131	----	2.5	(2.90)
23		(5.4)	280		---	----	2.9	(2.90)

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 10

Reykjavik, Iceland (64.1°N, 21.8°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(4.6)					4.2	----
01		>4.8					3.6	(2.50)
02		4.3					3.9	(2.40)
03		(4.8)			---	----	2.9	(2.50)
04		(5.0)		---	122	2.20		(2.60)
05		5.6		---	117	2.50		2.70
06		5.8		(4.1)	113	2.70		2.70
07		6.1		4.6	110	3.05		2.65
08		6.3		(4.8)	110	3.20		2.65
09		6.2		5.0	111	3.40		2.60
10		6.6		5.2	109	3.55		2.55
11		6.8		5.3	109	(3.60)		2.55
12		6.8		5.3	111	>3.60		2.55
13		7.0		5.4	109	>3.60		2.50
14		6.8		5.2	109	3.65		2.55
15		6.9		5.3	111	3.60		2.60
16		6.8		5.0	109	3.50		2.60
17		6.4		4.9	111	3.30		2.60
18		6.2		(4.6)	109	3.10		2.60
19		6.2		---	113	2.80	3.0	2.70
20		(5.9)		---	121	2.60	3.2	(2.70)
21		(5.7)			---	----	3.3	(2.60)
22		(5.5)			---	----	4.0	(2.55)
23		(4.9)					4.3	----

Time: 15.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 11

Anchorage, Alaska (61.2°N, 149.9°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(5.6)					2.0	(2.55)
01		5.2					2.7	2.50
02		(4.8)			---	----	2.5	(2.45)
03		5.0		---	151	(1.70)	2.2	2.45
04		5.4		3.6	119	2.00	2.6	2.50
05		6.1		3.9	111	2.45	3.0	2.45
06		6.4		4.3	109	2.85		2.40
07		6.6		4.6	109	3.10		2.40
08		7.0		4.8	105	3.30		2.35
09		6.9		5.0	105	3.40		2.40
10		6.8		5.1	106	3.50		2.35
11		6.8		5.1	106	3.60		2.40
12		6.6		5.2	105	(3.65)		2.35
13		6.3		5.1	107	(3.70)		2.40
14		6.3		5.1	105	(3.60)		2.40
15		6.4		5.1	105	3.50		2.45
16		6.3		5.0	105	3.35		2.45
17		6.2		4.9	105	3.10		2.55
18		6.2		4.5	111	2.80		2.60
19		6.2		---	117	2.45		2.65
20		6.3			129	2.05	2.9	2.70
21		6.3			---	----	2.4	2.70
22		6.1					1.7	2.70
23		5.8					1.8	2.60

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 12

Nurmijarvi, Finland (60.5°N, 24.6°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.9						2.60
01		6.5						2.60
02		6.3						2.50
03		6.4						2.60
04		5.9		---			2.6	2.60
05		6.4		3.8		----		2.65
06		6.8		4.3		2.70	2.8	2.65
07		6.6		4.5		3.00	3.2	2.60
08		7.0		4.9		3.20	3.7	2.70
09		7.1		5.2		3.45	3.8	2.60
10		7.7		5.3		3.60	4.2	2.60
11		7.7		5.4		3.70	4.1	2.65
12		7.6		5.4		----	4.0	2.60
13		7.4		5.4		----		2.60
14		7.3		5.4		----		2.60
15		7.3		5.3		----		2.60
16		7.2		5.1		----		2.70
17		7.2		5.1		----		2.70
18		7.2		---		2.90	3.2	2.70
19		7.0		---		----	2.8	2.70
20		7.2					4.4	2.80
21		7.3					(3.8)	2.80
22		7.4						2.70
23		7.6						2.60

Time: 30.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 1 minute.

Table 13

De Bilt, Holland (52.1°N, 5.2°E) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00	295	7.0					2.5	2.60
01	300	6.4					1.8	2.65
02	300	6.3						2.60
03	295	6.0						2.70
04	270	6.1	270	---	---	E	2.2	2.75
05	(275)	6.2	245	---	115	2.4	2.9	2.80
06	380	6.7	230	4.5	110	3.0	3.5	2.80
07	365	7.1	225	5.0	105	3.3	3.8	2.80
08	350	7.5	225	5.1	105	3.6	4.2	2.80
09	400	7.8	215	5.5	105	3.8	4.3	2.70
10	370	8.0	210	5.6	105	3.9	4.4	2.75
11	400	7.8	200	5.6	105	4.0	4.5	2.75
12	380	8.0	220	5.7	105	4.0	4.6	2.75
13	410	7.6	210	5.7	105	4.0	4.6	2.70
14	400	7.8	220	5.6	105	3.9	4.3	2.70
15	390	7.7	220	5.6	105	3.8	4.2	2.80
16	380	7.6	220	5.2	105	3.5	4.0	2.80
17	(360)	7.7	230	4.9	110	3.2	3.5	2.85
18	(300)	7.8	240	---	110	2.8	3.8	2.90
19	260	7.8	---	---	130	2.2	3.5	3.00
20	255	7.3					2.4	2.90
21	270	7.7						2.75
22	280	7.3						2.70
23	300	7.2						2.70

Time: 0.0°.
Sweep: 1.4 Mc to 16.0 Mc in 40 seconds.

Table 14

Adak, Alaska (51.9°N, 176.6°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(6.4)	310				2.3	(2.55)
01		6.0	315				2.1	2.50
02		(5.7)	320					2.45
03		5.4	345					2.40
04	(455)	5.6	<310	---	109	(1.80)		2.40
05	475	6.3	280	3.8	117	(2.40)	2.6	2.40
06	460	6.8	255	4.4	115	(2.90)	3.2	2.40
07	450	7.2	240	4.7	113	3.20	3.8	2.40
08	445	7.3	240	5.2	109	3.50	4.3	2.40
09	450	7.6	235	5.2	110	3.70	4.6	2.45
10	470	7.8	225	5.4	109	(3.80)	4.6	2.50
11	460	7.6	220	5.5	111	(3.85)	4.6	2.45
12	450	7.2	220	5.5	111	(3.80)	4.3	2.45
13	470	7.0	215	5.5	111	(3.80)	4.1	2.50
14	450	7.2	220	5.4	111	3.80	4.0	2.55
15	465	6.9	230	5.3	110	3.70	3.9	2.55
16	440	6.7	235	5.1	109	3.50	3.6	2.60
17	415	6.8	245	4.8	111	3.15	3.7	2.65
18	(360)	6.9	260	---	117	2.70	3.6	2.70
19		7.0	280		(120)	(2.15)	2.9	2.75
20		7.0	285		---	----	2.7	2.75
21		7.1	285				2.5	2.65
22		7.0	290				3.1	2.60
23		6.8	300				3.0	2.55

Time: 180.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 15

Winnipeg, Canada (49.9°N, 97.4°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.2	300				3.5	2.65
01		4.8	300				4.5	2.6
02		4.5	300				4.0	2.55
03		4.3	310				3.5	2.4
04		4.2	300		---	---	3.4	2.6
05	(310)	4.6	290	---	130	2.0	3.0	2.75
06	360	5.4	250	4.0	110	2.5		2.8
07	410	5.6	230	4.5	100	3.0		2.7
08	440	6.0	230	4.8	100	3.3		2.5
09	460	6.2	210	5.0	100	3.5		2.6
10	480	6.4	210	5.1	100	3.9		2.5
11	500	6.5	210	5.1	100	4.0		2.5
12	500	6.5	210	5.1	100	4.0		2.5
13	510	6.5	210	5.2	100	4.0		2.4
14	490	6.6	210	5.2	100	4.0		2.4
15	490	6.6	220	5.1	100	3.9		2.4
16	460	6.8	220	5.0	100	3.8		2.5
17	440	6.8	230	4.9	100	3.3		2.6
18	380	6.9	230	4.6	105	3.0		2.7
19	320	6.8	250	---	110	2.5		2.8
20	---	6.9	280		125	2.0	2.1	2.8
21		6.9	270		---	---	<1.9	2.8
22		6.6	280				2.0	2.7
23		5.9	280				<1.5	2.7

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 16

St. John's, Newfoundland (47.6°N, 52.7°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.3	290				3.1	2.60
01		6.0	290					2.70
02		5.5	280					2.60
03		5.1	300					2.70
04		5.0	280		123	1.75		2.80
05	---	5.6	250		115	2.45		2.90
06	(350)	6.0	235	4.4	109	3.00	3.0	2.85
07	465	6.2	230	5.0	105	3.25	3.5	2.80
08	500	6.6	220	5.2	105	3.50	3.8	2.75
09	470	6.4	210	5.4	105	(3.65)	4.0	2.60
10	490	6.6	210	5.4	103	(3.75)	3.8	2.60
11	430	6.6	210	5.5	103	3.95	4.0	2.60
12	480	6.6	210	5.6	105	(3.95)		2.60
13	440	6.8	215	5.5	105	4.00		2.50
14	440	6.9	220	5.4	105	3.85		2.60
15	440	7.2	220	5.4	105	3.65		2.60
16	405	7.4	220	5.0	107	3.40		2.70
17	380	7.6	240	4.6	110	3.05		2.70
18	---	7.8	260	---	119	2.55	2.9	2.70
19	---	8.0	280		---	----	2.3	2.70
20		7.8	270		---	----	3.0	2.70
21		7.8	275		---	----	1.6	2.60
22		7.1	280				3.1	2.60
23		6.4	280				2.4	2.60

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 17

Schwarzenburg, Switzerland (46.8°N, 7.3°E) July 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	7.3						2.9
01	280	7.2						2.9
02	300	6.8						3.0
03	290	6.6						2.9
04	270	6.2						3.0
05	270	6.2	---	---	---	---		3.1
06	240	6.6	230	4.1	100	2.4	2.6	3.3
07	250	7.5	210	4.8	100	3.0	4.0	3.3
08	300	7.8	200	5.2	100	3.3	4.8	3.2
09	310	8.7	200	5.6	100	3.5	5.6	3.1
10	320	8.5	200	5.8	100	3.8	5.5	3.1
11	340	8.7	200	6.0	100	3.9	5.8	3.05
12	360	8.7	200	6.1	100	4.0	5.4	3.0
13	360	8.8	200	5.9	100	4.0	4.8	3.0
14	360	8.4	200	6.0	100	4.0	4.6	3.0
15	350	8.4	200	5.7	100	3.8		3.0
16	340	8.5	200	5.6	100	3.7	4.8	3.1
17	320	8.0	210	5.4	100	3.4	5.0	3.1
18	280	8.0	210	4.8	100	3.0	4.0	3.2
19	250	8.1	---	---	100	2.5	3.6	3.3
20	250	8.1					3.3	3.3
21	250	8.0					2.8	3.2
22	280	8.0					4.4	(3.15)
23	280	7.7						2.95

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 18

San Francisco, California (37.4°N, 122.2°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.8	315				4.0	2.50
01		6.0	320				3.6	2.50
02		5.6	315				3.0	2.55
03		5.4	310				3.0	2.55
04		5.2	310				3.2	2.55
05	---	5.4	300		---	----	2.7	2.70
06	---	6.2	260	---	115	2.45	3.2	2.75
07	(470)	7.0	240	4.6	109	>3.00	3.7	2.60
08	400	8.0	220	5.2	107	3.45	4.2	2.50
09	460	8.3	220	5.2	105	3.70	4.2	2.45
10	425	8.6	205	5.4	109	3.90	4.5	2.50
11	420	8.6	215	5.6	109	4.00	4.5	2.50
12	435	8.6	210	5.6	109	4.00	4.4	2.50
13	410	8.8	210	5.5	109	4.00	4.2	2.50
14	400	8.7	230	5.5	109	4.00	4.1	2.50
15	395	8.6	230	5.5	109	3.85	4.0	2.55
16	385	8.2	230	5.2	109	3.65	4.0	2.60
17	375	7.9	240	4.9	109	3.30	3.7	2.65
18	---	7.8	250	---	115	2.80	3.2	2.75
19		7.7	270		123	2.20	2.3	2.80
20		7.4	260				3.4	2.80
21		7.1	260				3.9	2.65
22		6.4	280				4.2	2.60
23		6.0	290				3.7	2.55

Time: 120.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 19

White Sands, New Mexico (32.3°N, 106.5°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.4	300				3.8	2.55
01		6.4	<300				4.0	2.55
02		6.2	<300				3.5	2.60
03		5.9	290				3.4	2.60
04		5.8	<290				3.0	2.60
05		5.6	300		119	----	2.6	2.65
06		6.7	250		113	(2.40)	2.7	2.80
07	(400)	7.9	235	4.6	109	(3.10)	3.6	2.75
08	390	8.9	220	5.0	107	(3.45)	4.0	2.65
09	370	9.2	210	5.6	107	(3.75)	4.3	2.60
10	390	9.4	210	5.6	107	(4.00)	4.5	2.50
11	410	9.8	215	5.9	107	(4.00)	4.6	2.50
12	400	10.0	210	5.8	107	(4.15)	4.6	2.50
13	410	9.8	210	5.8	107	(4.00)	4.5	2.50
14	400	9.6	215	5.7	107	4.00	4.4	2.50
15	395	9.3	220	5.5	107	(3.90)	4.2	2.55
16	390	8.8	230	5.3	107	(3.60)	3.8	2.60
17	355	8.6	240	---	108	3.25	3.7	2.65
18	---	8.4	250		111	(2.70)	3.2	2.70
19		8.3	270		---	----	2.8	2.80
20		7.8	250				3.2	2.70
21		7.1	260				4.4	2.65
22		6.7	<280				4.0	2.60
23		6.3	295				4.0	2.55

Time: 105.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 20

Grand Bahama I. (26.6°N, 78.2°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.9	280				3.5	2.70
01		7.6	280				3.0	2.75
02		7.0	275				2.4	2.70
03		6.8	280				3.0	2.70
04		6.4	290				2.9	2.70
05		6.3	280				3.0	2.75
06		7.1	260		119	2.10	2.5	2.85
07	---	8.0	240	---	109	3.00	3.8	2.90
08	370	8.8	225	5.2	105	3.40	4.2	2.70
09	340	9.4	220	5.4	105	(3.70)	4.5	2.70
10	380	9.8	<210	5.8	107	4.00	4.5	2.60
11	380	9.9	210	5.8	109	4.15	4.6	2.55
12	375	10.2	215	5.9	109	4.25	4.4	2.60
13	380	10.4	215	5.9	109	4.20		2.55
14	380	10.0	<220	5.8	109	4.15		2.60
15	370	9.8	220	5.8	109	4.00	4.4	2.60
16	370	9.8	230	5.5	109	3.75	4.2	2.60
17	340	9.5	235	4.8	109	3.30	3.9	2.60
18	330	9.2	250	---	111	2.70	3.4	2.70
19		9.0	265		---	----	3.4	2.70
20		8.8	260				4.0	2.70
21		8.2	275				3.1	2.60
22		7.9	285				3.2	2.60
23		7.9	300				4.0	2.60

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 21

Maui, Hawaii (20.8°N, 156.5°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		9.0	300					2.70
01		8.1	290					2.70
02		8.0	290					2.70
03		7.5	280					2.70
04		7.0	295					2.70
05		6.6	290					2.70
06		6.6	280		123	(1.80)		2.75
07	---	7.7	250	---	113	2.70	3.1	2.90
08	---	8.0	230	---	111	3.30	3.8	2.70
09	(605)	9.0	220	---	109	(3.60)	4.1	2.40
10	420	9.6	215	6.2	109	(3.90)	4.5	2.25
11	445	10.4	215	6.1	109	(4.00)	4.4	2.35
12	425	11.0	220	6.1	109	(4.20)	4.6	2.40
13	415	11.4	220	6.1	109	(4.20)	4.5	2.50
14	415	11.9	220	6.1	109	(4.10)	4.5	2.50
15	395	12.3	230	5.9	109	3.90	4.4	2.60
16	365	12.7	230	5.6	109	3.70	4.2	2.70
17	335	12.5	240	---	111	3.30	4.1	2.75
18	310	11.7	250		115	(2.70)	4.1	2.80
19		11.2	275		---	----	3.1	2.80
20		10.9	280		---	----	3.4	2.70
21		10.5	290				3.0	2.70
22		9.9	300				2.4	2.65
23		9.4	300					2.70

Time: 150.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 22

Puerto Rico, W. I. (18.5°N, 67.2°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		10.2	275				(3.2)	2.80
01		9.7	255				(2.6)	2.90
02		8.8	250				(2.8)	2.85
03		8.0	265				(2.3)	2.80
04		7.7	265				(4.4)	2.80
05		7.3	260				(3.5)	2.80
06		7.2	275		---	----	3.5	2.90
07	---	8.6	240	---	111	(2.60)	2.8	3.00
08	---	9.2	230	---	109	(3.15)	3.5	2.95
09	340	9.6	220	5.5	109	3.65	4.0	2.70
10	350	10.2	215	5.6	109	(3.90)	4.2	2.65
11	365	11.1	210	5.9	109	(4.00)	4.5	2.55
12	360	11.7	210	5.9	109	4.15	4.3	2.60
13	365	11.9	220	6.0	109	4.20	4.5	2.60
14	370	12.0	215	6.0	109	4.15	4.5	2.60
15	360	11.5	225	5.9	110	4.00	4.4	2.60
16	355	11.4	220	5.6	111	3.75	4.2	2.60
17	340	11.1	235	5.2	111	3.35	3.9	2.70
18	305	10.8	250	---	114	(2.70)	3.6	2.70
19		10.3	270		---	----	2.8	2.65
20		10.3	275				3.9	2.60
21		10.3	295				3.2	2.65
22		10.2	290				(2.8)	2.65
23		10.3	290				(2.8)	2.70

Time: 60.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 23

Huancayo, Peru (12.0°S, 75.3°W) July 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.0	230					2.95
01		8.0	225					3.00
02		7.8	225					3.10
03		6.7	225					3.15
04		5.6	230					3.20
05		4.4	235					3.20
06		4.3	250	---	---	E	4.4	2.90
07		7.8	260	---	121	2.35	5.8	3.00
08		10.1	240	---	109	3.10	7.2	2.85
09		10.7	225	---	109	3.60	8.4	2.60
10	---	10.7	215	---	109	----	8.8	2.45
11	---	10.6	210	---	109	----	8.9	2.30
12	---	10.1	210	---	109	(4.00)	8.9	2.30
13	---	10.1	205	---	109	----	9.0	2.25
14	---	10.2	210	---	109	----	8.7	2.20
15	---	9.9	215	---	109	----	8.0	2.20
16	---	9.5	235		109	----	7.6	2.25
17		9.4	260		110	2.55	6.6	2.25
18		9.0	295		---	E	4.4	2.30
19		8.5	340					2.25
20		8.4	300				2.7	2.35
21		8.5	260				3.0	2.55
22		8.4	230				3.1	2.75
23		8.2	225				(3.2)	2.90

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 24

Resolute Bay, Canada (74.7°N, 94.9°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00	(370)	5.9	270	3.8	100	2.4		(2.7)
01	400	6.0	270	3.8	100	2.4		(2.8)
02	380	5.3	260	3.8	100	2.5		---
03	(390)	5.5	250	4.0	100	2.6		---
04	410	5.3	250	4.0	100	2.8		(2.8)
05	440	5.4	250	4.1	100	3.0		(2.4)
06	480	5.2	240	4.3	100	3.1		---
07	520	5.2	230	4.7	100	3.2		(2.3)
08	590	5.1	230	4.7	100	3.3		G
09	620	5.4	220	4.8	100	3.5		---
10	560	5.6	230	4.8	100	3.6		G
11	660	5.1	220	4.8	100	3.7		G
12	630	5.2	230	4.8	100	3.7		G
13	600	5.4	220	4.8	100	3.7		G
14	580	5.5	230	4.8	100	3.6		G
15	560	5.5	220	4.8	100	3.6		G
16	580	5.7	230	4.8	100	3.4		G
17	560	5.5	220	4.7	100	3.3		2.45
18	480	5.6	220	4.5	100	3.1		(2.45)
19	500	5.6	240	4.4	100	3.0		(2.45)
20	460	5.7	250	4.1	100	2.9		(2.5)
21	440	5.5	260	4.0	100	2.7		---
22	380	6.0	270	3.8	100	2.6		(2.75)
23	400	6.0	260	3.9	100	2.5		(2.5)

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 25

Tromso, Norway (69.7°N, 19.0°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00	(370)	5.6	(370)	----	---	2.45	3.2	2.40
01	(440)	5.5	---	3.20	---	----	4.0	2.40
02	---	6.0	---	----	---	2.35	4.0	2.45
03	440	6.5	(280)	4.00	110	2.40	4.0	2.40
04	(445)	6.6	255	4.25	105	2.70	3.0	2.50
05	(490)	6.4	250	4.45	110	3.00		2.45
06	460	6.3	245	4.75	105	3.10		2.40
07	500	6.4	245	4.90	105	3.30		2.40
08	490	6.6	240	5.00	105	3.45		2.40
09	540	6.8	240	5.15	105	3.60		2.40
10	530	6.8	240	5.20	100	3.70		2.40
11	505	6.8	240	5.30	105	3.70		2.40
12	520	6.6	240	5.30	105	3.70		2.40
13	540	6.4	240	5.30	105	3.70		2.40
14	530	6.5	240	5.20	100	3.60		2.40
15	510	6.2	235	5.25	105	3.55		2.50
16	(490)	6.3	245	5.00	105	3.45		2.45
17	---	6.4	250	----	105	3.20		2.55
18	---	6.4	250	----	110	3.00		2.55
19	---	6.4	255	----	110	2.80	3.3	2.55
20	---	6.4	275	----	110	2.80	3.0	2.55
21	---	6.6	(300)	----	115	2.80		2.55
22	---	6.0	---	----	---	----	4.0	2.50
23	---	6.1	---	----	---	----	3.4	2.50

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 26

Lycksele, Sweden (64.6°N, 18.8°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		6.2	325		---	---	2.8	2.4
01	---	6.5	330	----	---	E	3.0	2.4
02	340	6.2	300	3.00	110	1.60	2.4	2.4
03	340	6.4	270	3.30	105	1.90	3.2	2.4
04	360	6.3	255	3.85	105	2.35		2.4
05	430	6.2	250	4.35	105	2.65		2.4
06	420	6.8	230	4.80	105	2.95		2.4
07	430	6.8	230	5.00	105	3.20	3.4	2.4
08	450	7.0	225	5.10	105	3.35	3.8	2.4
09	440	7.0	220	5.30	105	3.50		2.4
10	465	7.0	220	5.40	105	3.60	4.0	2.4
11	480	7.0	220	5.45	105	3.65	4.0	2.4
12	490	6.8	220	5.45	105	3.70		2.4
13	505	6.8	220	5.40	105	3.70		2.4
14	480	6.6	220	5.30	105	3.50		2.4
15	475	6.8	220	5.30	105	3.40		2.4
16	420	6.8	225	5.10	105	3.30	3.5	2.5
17	400	6.8	230	5.00	105	3.10	3.8	2.55
18	360	6.9	250	4.60	105	2.80	4.0	2.6
19	320	7.0	255	4.10	105	2.45	4.2	2.6
20	310	6.8	270	3.60	110	2.10	3.6	2.6
21	---	6.8	285	----	125	1.70	2.6	2.5
22		6.5	310		---	E	2.6	2.5
23		6.2	320				2.6	2.4

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 27

Baker Lake, Canada (64.3°N, 96.0°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.7	290		115	1.7	4.0	
01		5.6	290		120	1.7	<3.8	
02	---	5.3	290	---	110	1.8	4.0	---
03	---	5.0	290	---	110	2.0	4.4	---
04	400	5.0	280	3.6	110	2.3	4.2	---
05	460	5.2	240	4.0	110	2.6	<5.0	---
06	530	5.3	240	4.3	105	3.0	5.0	---
07	480	5.2	230	4.5	100	3.2	5.6	---
08	590	5.4	220	4.7	100	3.6	5.7	G
09	580	5.8	220	4.8	100	3.7	6.0	G
10	550	5.7	230	5.0	100	3.9	6.0	G
11	540	6.2	230	5.1	100	3.9	6.0	2.5
12	500	6.8	220	5.2	100	4.0	5.8	(2.4)
13	480	6.8	220	5.2	100	3.9	6.0	(2.5)
14	470	6.7	220	5.1	100	3.8	5.5	(2.45)
15	460	6.4	210	5.0	100	3.8	<5.6	(2.45)
16	500	6.0	220	5.0	100	3.6	<4.9	G
17	430	6.2	220	4.8	100	3.4	5.9	---
18	420	6.4	230	4.8	105	3.2	5.2	---
19	420	6.1	240	4.5	105	2.9	<4.9	---
20	(460)	6.0	270	4.0	110	2.4	6.0	
21	---	5.8	290	---	115	2.3	7.4	
22		6.0	290		115	2.0	5.5	---
23		5.9	300		110	1.8	4.8	---

Time: 90.0°W.
Sweep: 1.0 Mc to 16.0 Mc in 16 seconds.

Table 28

Oslo, Norway (60.0°N, 11.1°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.4	315				2.4	2.45
01		7.1	315		---	----	2.6	2.40
02		6.8	315		---	----	2.7	2.40
03		6.5	315		---	1.80	3.0	2.45
04	---	6.6	280	----	---	2.10	3.2	2.40
05	(550)	6.6	260	3.90	---	2.60	3.2	2.45
06	(500)	6.6	250	4.25	100	2.90	3.7	2.45
07	500	6.9	245	4.70	100	3.15	3.6	2.45
08	495	7.0	245	5.00	100	3.45	4.0	2.40
09	475	7.6	240	5.25	100	3.60	5.2	2.45
10	500	7.4	240	5.35	100	3.75	4.4	2.40
11	500	7.2	240	5.50	100	3.80	4.2	2.40
12	480	7.0	225	5.50	100	3.80	4.2	2.40
13	525	7.0	225	5.55	100	3.90	4.2	2.40
14	490	7.0	235	5.50	100	3.80	4.2	2.40
15	495	7.1	235	5.30	100	3.75	4.1	2.40
16	515	7.3	245	5.20	100	3.60	3.8	2.45
17	(460)	7.4	250	4.90	105	3.35	4.0	2.55
18	---	7.5	250	----	110	3.10	3.9	2.55
19		7.4	260		110	2.75	4.0	2.55
20		6.9	280		---	2.35	3.2	2.70
21		6.9	290		---	1.95	2.8	2.60
22		6.8	300		---	----	2.2	2.55
23		7.0	315				3.3	2.45

Time: 15.0°E.
Sweep: 0.7 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 29

Upsala, Sweden (59.8°N, 17.6°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		7.0	315				2.8	2.3
01		6.8	320		---	E	2.8	2.3
02	---	6.6	325	----	---	E	3.1	2.3
03	375	6.6	300	3.10	125	1.70	3.4	2.3
04	375	6.8	265	3.80	115	2.20	3.8	2.4
05	415	6.6	250	4.50	110	2.60	5.2	2.3
06	400	6.8	245	4.90	110	3.00	6.8	2.4
07	430	7.0	240	5.20	105	3.30	6.8	2.35
08	450	7.3	240	5.20	105	3.50	6.8	2.4
09	435	7.5	230	5.40	105	3.60	6.9	2.4
10	465	7.4	225	5.50	105	3.70	6.4	2.3
11	495	7.3	220	5.50	105	3.80	7.0	2.3
12	495	7.2	225	5.55	105	3.80	6.6	2.3
13	475	7.2	220	5.60	105	3.80	7.2	2.3
14	475	7.1	235	5.50	105	3.70	6.7	2.4
15	440	7.0	230	5.50	105	3.60	4.8	2.4
16	430	7.0	240	5.40	105	3.50	4.9	2.4
17	380	7.2	245	5.20	105	3.25	5.2	2.5
18	355	7.3	255	4.80	110	2.95	4.8	2.5
19	335	7.2	275	4.00	115	2.50	5.0	2.5
20	(335)	7.2	280	3.70	130	2.00	4.5	2.5
21		7.0	290		---	1.55	3.3	2.5
22		7.0	295		---	E	2.7	2.4
23		7.1	305					2.4

Time: 15.0°E.
Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 30

Churchill, Canada (58.8°N, 94.2°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.2	310		---	1.2	6.5	
01		5.0	300		---	1.4	6.2	
02	---	5.2	320	---	130	1.5	5.0	---
03	---	5.0	320	---	110	2.0	5.0	---
04	(360)	5.0	300	---	100	(2.4)	5.0	---
05	400	5.2	270	4.0	100	2.9	5.0	---
06	500	5.4	250	4.4	100	3.1	5.2	(2.5)
07	580	5.5	250	4.6	100	3.6	4.9	(2.4)
08	580	5.6	250	4.9	100	3.8	4.4	2.3
09	560	6.0	240	5.0	100	3.8		(2.5)
10	520	6.1	230	5.2	100	3.9		2.4
11	530	6.6	220	5.3	100	4.0		2.4
12	540	6.7	220	5.3	100	4.0		2.4
13	520	6.8	220	5.3	100	4.0		2.4
14	500	7.0	220	5.3	100	3.9		2.4
15	480	7.0	220	5.1	100	3.9		2.5
16	460	6.8	230	5.0	100	3.7		2.5
17	430	7.0	240	5.0	100	3.4	4.2	2.5
18	440	6.5	260	4.7	100	3.5		(2.5)
19	440	6.1	280	4.2	110	3.0		(2.6)
20	(420)	5.6	300	---	110	3.0	4.3	(2.65)
21		5.7	340		110	2.7	4.3	---
22		5.6	320		120	2.0	6.0	---
23		5.4	310		120	(2.0)	6.0	---

Time: 90.0°W.
Sweep: 1.0 Mc to 17.0 Mc in 16 seconds.

Table 31

De Bilt, Holland (52.1°N, 5.2°E) June 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	7.5					2.2	2.6
01	300	7.2						2.6
02	300	6.8						2.6
03	310	6.9	---	---	130	1.7	2.0	2.6
04	280	7.0	280	3.4	125	2.1	2.5	2.6
05	350	7.3	240	4.0	110	2.7	3.4	2.7
06	375	7.5	230	4.8	105	3.1	3.8	2.7
07	405	7.4	235	5.2	100	3.4	4.2	2.7
08	380	8.0	220	5.5	100	3.7	4.7	2.7
09	390	7.9	225	5.6	100	4.0	5.0	2.6
10	415	8.0	225	5.8	100	4.0	4.3	2.5
11	420	8.2	220	5.9	100	4.2	4.6	2.6
12	410	8.2	230	6.0	100	4.2	4.3	2.65
13	410	8.0	230	6.0	100	4.1	4.7	2.65
14	400	8.0	235	5.9	100	4.0	4.2	2.65
15	390	8.0	230	5.7	100	3.9	4.2	2.7
16	380	8.0	230	5.5	100	3.7	4.2	2.7
17	350	7.6	240	5.1	110	3.3	4.0	2.8
18	300	7.8	230	4.4	110	2.8	4.6	2.8
19	270	7.6	---	---	120	2.1	4.4	2.85
20	270	7.5					3.6	2.8
21	290	7.6					2.7	2.6
22	300	7.8						2.65
23	300	7.5					2.6	2.6

Time: 0.0°.
Sweep: 1.4 Mc to 16.0 Mc in 40 seconds.

Table 32

Lindau/Harz, Germany (51.6°N, 10.1°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		7.85	305				3.3	2.45
01		7.55	300				3.0	2.45
02		7.30	300				3.0	2.47
03		7.10	305		---	----	3.2	2.46
04	---	7.00	310	----	---	----	3.2	2.54
05	---	7.25	265	----	108	2.15	3.5	2.55
06	---	7.65	250	----	104	2.75	4.2	2.55
07	480	8.00	240	4.75	102	3.15	5.2	2.57
08	435	7.90	230	5.30	102	3.50	5.5	2.58
09	445	8.35	230	5.60	100	3.70	5.6	2.50
10	430	8.20	225	5.70	100	3.85	5.4	2.50
11	425	8.35	215	5.80	100	3.95	5.5	2.48
12	465	8.30	225	5.80	100	4.00	5.7	2.48
13	455	8.10	230	5.90	100	3.95	5.6	2.48
14	430	7.90	230	5.70	100	3.90	5.3	2.50
15	420	8.10	230	5.65	100	3.85	5.1	2.55
16	415	8.00	235	5.40	102	3.65	5.1	2.57
17	420	8.00	235	5.15	102	3.45	5.3	2.60
18	---	8.10	250	----	106	3.10	4.9	2.65
19	---	8.25	260	----	108	2.60	5.2	2.70
20		8.15	275		108	----	4.8	2.74
21		8.00	275		---	----	4.3	2.61
22		8.15	290				3.0	2.52
23		8.25	300				3.0	2.46

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 4 minutes.

Table 33

Winnipeg, Canada (49.9°N, 97.4°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.0	300				4.0	2.70
01		5.0	300				3.2	(2.60)
02		5.0	310				4.4	2.60
03		4.5	320				4.1	2.60
04		4.7	320		---	---	3.0	2.55
05	380	5.0	290	---	120	2.1		2.70
06	390	5.4	250	4.0	110	2.8		2.60
07	440	5.8	240	4.6	105	3.1		2.50
08	500	6.1	230	4.9	105	3.5		2.45
09	520	6.0	220	5.0	100	3.8		2.40
10	540	6.3	220	5.0	100	3.9		2.40
11	550	6.4	210	5.2	100	4.0		2.30
12	570	6.4	210	5.2	100	4.0		2.30
13	590	6.5	210	5.2	100	4.0		2.30
14	580	6.6	210	5.2	100	4.0		2.30
15	510	6.7	220	5.1	100	3.9		2.40
16	490	6.8	220	5.0	100	3.8		2.50
17	480	6.8	230	5.0	105	3.5		2.50
18	400	6.8	240	4.7	110	3.1		2.50
19	330	7.0	260	---	115	2.8		2.70
20	---	7.0	290		120	2.0	2.8	2.70
21		6.9	280		---	1.7	2.6	2.75
22		6.8	280				3.0	2.70
23		5.8	300				4.2	2.65

Time: 90.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 15 seconds.

Table 34

Budapest, Hungary (47.4°N, 19.2°E) June 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	315	7.3						2.86
01	315	7.4					2.8	2.86
02	310	6.8						2.90
03	310	6.8						2.92
04	305	7.0			120	2.0		2.92
05	280	7.5	280	4.0	125	2.3		3.06
06	325	8.1	255	5.0	115	2.9	3.7	2.81
07	330	8.4	240	5.2	110	3.2	5.8	2.79
08	395	8.5	240	5.8	110	3.6	5.1	2.52
09	400	8.4	250	5.9	110	3.7	5.6	2.49
10	400	8.8	240	6.0	110	3.8	5.8	2.50
11	435	8.6	250	6.0	110	---	4.9	2.36
12	420	8.6	240	6.0	110	4.1	5.4	2.42
13	420	8.4	240	6.0	---	---	4.4	2.42
14	410	8.4	240	5.9	110	---	4.8	2.45
15	405	8.2	240	5.9	110	3.8		2.47
16	400	8.1	240	5.7	115	3.6		2.49
17	355	8.2	255	5.4	110	3.3	5.2	2.67
18	325	8.2	260	4.6	120	2.9	4.8	2.81
19	300	8.4	280	3.5	120	2.3	5.3	2.95
20	300	8.1					4.9	2.95
21	300	8.0					4.5	2.95
22	310	7.6					3.0	2.90
23	320	7.5					3.2	2.86

Time: Local time.
Sweep: 1.0 Mc to 20.0 Mc in 35 seconds.

Table 35

Graz, Austria (47.1°N, 15.5°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		7.9	315					
01		7.1	300					
02		7.1	335					
03		6.8	320					
04		6.9	300					
05		7.2	260					
06	(345)	7.8	250	4.9			4.0	
07	335	8.4	240	(5.0)	---	3.5	5.0	
08	365	8.6	235	(5.3)	---	3.7	4.8	
09	350	8.7	(220)	(5.3)	---	3.8	4.9	
10	350	>9.1		(6.5)	---		4.8	
11	350	>7.6		(6.2)	---		4.8	
12	400	(8.7)		(6.4)	---		4.6	
13	375	(8.4)		---	---		4.6	
14	375	>7.6		---	---		4.8	
15	380	8.1	(230)	>5.0	---	(3.8)	4.2	
16	360	8.4	240	5.0	---	3.7	4.5	
17	355	7.8	240	4.9	---	3.5	4.4	
18	(340)	7.9	270	(4.4)			4.6	
19		7.9	270				4.2	
20		>7.9	260				4.4	
21		7.5	300				5.0	
22		8.0	300				3.6	
23		7.9	330					

Time: 15.0°E.
Sweep: 2.5 Mc to 11.5 Mc in 2 minutes.

Table 36

Schwarzenburg, Switzerland (46.8°N, 7.3°E) June 1957

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	300	8.0					3.1	2.85
01	300	7.5					2.8	2.8
02	300	7.2					2.7	2.9
03	300	7.0						2.8
04	300	6.7						2.9
05	260	6.8	---	---	100	2.0	2.4	3.0
06	240	7.7	230	4.5	100	2.6	3.8	3.15
07	290	8.2	210	5.2	100	3.0	4.6	3.05
08	340	8.3	210	5.5	100	3.4	5.4	3.1
09	310	8.8	220	6.0	100	3.6	5.6	3.1
10	340	9.0	220	6.2	100	3.8	5.3	3.0
11	360	8.6	220	6.2	100	4.0	6.0	3.0
12	380	8.8	200	6.2	100	4.0	4.8	2.9
13	400	8.5	200	6.0	100	4.0	4.7	2.9
14	390	8.5	200	6.1	100	3.9	4.7	2.9
15	380	8.5	210	5.9	---	---	4.4	2.9
16	370	8.5	210	5.8	100	3.6	4.8	2.9
17	340	8.4	230	5.4	100	3.4	5.0	3.0
18	320	8.3	230	5.0	100	3.1	4.8	3.1
19	270	8.1	---	---	100	2.5	4.0	3.2
20	260	8.1					4.4	3.2
21	260	7.3					3.5	(3.1)
22	(300)	(8.0)					5.2	(2.9)
23	300	8.0					3.3	(2.9)

Time: 15.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 30 seconds.

Table 37

Ottawa, Canada (45.4°N, 75.9°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		5.2	300				<2.0	2.5
01		5.0	310				<1.6	2.5
02		4.9	310				2.0	2.5
03		4.6	300				<1.6	2.5
04		4.5	310		---	---		2.7
05	---	5.1	270		110	2.2		2.7
06	370	5.6	250	4.4	110	2.9		2.75
07	440	6.1	240	4.8	105	3.3		2.6
08	490	6.3	230	5.0	105	3.7		2.45
09	500	6.4	220	5.1	105	3.9		2.5
10	550	6.3	210	5.3	105	4.0		2.35
11	570	6.3	210	5.5	105	4.0		2.4
12	520	6.8	210	5.5	105	4.1		2.4
13	520	6.B	220	5.5	105	4.1		2.4
14	500	6.B	220	5.6	105	4.0		2.4
15	4B0	7.0	220	5.4	105	4.0		2.4
16	470	7.0	230	5.2	105	3.B		2.5
17	430	7.0	230	5.0	105	3.3		2.5
18	380	7.2	260	4.7	110	3.0		2.6
19	(340)	7.2	270		120	2.3	3.2	2.6
20		7.3	280		---	1.7	2.2	2.6
21		7.6	280		---	---	<1.6	2.6
22		7.0	280		---	---	3.0	2.6
23		6.6	300		---	---	2.4	2.5

Time: 75.0°W.
Sweep: 1.0 Mc to 20.0 Mc in 15 seconds.

Table 38

Grand Bahama I. (26.6°N, 78.2°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		8.4	300				2.5	2.60
01		8.0	285				(2.B)	2.65
02		7.7	280				(2.3)	2.70
03		7.2	290				(2.4)	2.65
04		6.9	290				(2.5)	2.65
05		7.0	295				2.4	2.70
06	---	7.2	260		119	2.40	2.8	2.80
07	(415)	B.0	240	4.7	109	3.00	3.5	2.70
00	435	8.2	235	5.2	107	3.60	4.0	2.60
09	410	9.1	220	5.4	109	3.85	4.4	2.55
10	435	9.2	220	6.0	105	4.05	4.5	2.50
11	415	9.4	220	5.B	109	4.25	4.5	2.50
12	400	9.9	220	5.9	109	4.35	4.5	2.50
13	400	10.0	225	6.0	109	4.35	4.5	2.55
14	410	9.7	220	6.0	109	4.20	4.4	2.55
15	400	9.8	225	5.7	109	4.00	4.3	2.55
16	400	9.4	230	5.5	109	3.75	4.2	2.55
17	380	9.3	240	5.0	109	3.30	3.8	2.60
18	<350	9.0	260	---	113	2.80	3.3	2.65
19		B.6	275		---	----	(2.B)	2.65
20		8.5	280				(2.4)	2.60
21		8.4	280				2.4	2.60
22		8.1	<300				(2.B)	2.55
23		8.3	305				3.2	2.55

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 39

Baguio, P. I. (16.4°N, 120.6°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		10.8	330				2.4	2.60
01		9.7	295					2.60
02		9.1	280					2.60
03		9.0	275					2.65
04		7.9	280				1.6	2.70
05		6.9	270				1.5	2.75
06		8.4	280		131	(2.30)	(2.8)	2.85
07		9.4	285		123	(3.00)	(4.7)	2.70
00		10.2	260		120	(3.50)	(6.5)	2.40
09		10.8	255		119	(3.90)	(6.9)	2.15
10	---	11.2	250		<121	(4.05)	(6.7)	2.05
11	---	11.5	245	---	<121	4.15		2.00
12	---	12.1	250	---	122	(4.20)		2.00
13	(520)	11.9	250	---	119	4.20		2.00
14	(550)	12.2	250	---	123	4.05		2.00
15	---	12.2	250	---	119	3.90	4.0	2.05
16	---	11.7	260		119	3.55	3.6	2.10
17		11.6	280		124	(3.00)	(3.6)	2.15
1B		11.6	310		139	(2.20)	(3.0)	2.15
19		11.2	380				(2.6)	2.10
20		10.B	430				2.2	2.10
21		10.5	420				2.6	2.20
22		10.6	405				2.2	2.20
23		11.0	370				2.7	2.40

Time: 120.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 40

Talara, Peru (4.6°S, 81.3°W) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		10.2	<240					2.90
01		9.3	<235					2.95
02		8.9	250					2.90
03		B.7	245					3.00
04		7.8	235					3.00
05		6.8	240					3.00
06		5.5	250					2.80
07		7.3	270		131	2.20		2.80
00		B.8	250		119	3.10	3.2	2.75
09		9.8	235		115	3.55		2.45
10		10.3	230		112	3.B5		2.25
11		>10.4	225		113	4.00		2.15
12	---	10.9	220		113	4.10		2.10
13	---	11.0	220		113	4.10	4.1	2.05
14	---	11.1	220	---	111	4.00		2.10
15	---	11.0	220		111	3.75		2.05
16		11.0	230		111	3.40	3.6	2.05
17		10.9	250		117	2.95	3.2	2.10
18		(10.5)	295		142	1.90	>3.8	(2.10)
19		10.3	355				>2.9	2.10
20		10.1	360				>3.0	2.15
21		(10.4)	350				2.3	(2.30)
22		>10.6	285				2.5	2.60
23		(10.5)	250				(2.2)	2.70

Time: 75.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 41

Brisbane, Australia (27.5°S, 152.9°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.8	260					2.70
01		4.9	260					2.70
02		4.B	260					2.70
03		5.0	260				2.0	2.70
04		4.4	245			----	2.1	2.65
05		4.2	250			E		2.70
06		4.6	250			E		2.B0
07		B.1	230			2.20		3.05
00		11.0	230			2.90		3.05
09		12.2	230			3.35		3.05
10		12.2	230			3.60	3.8	3.05
11		11.9	230			3.80	4.1	2.85
12		11.3	230			3.80	4.4	2.80
13		11.1	230			3.70	4.2	2.B0
14		11.4	230			3.50	4.3	2.80
15		11.0	230			3.20	3.8	2.80
16		10.8	240			2.60	3.4	2.B0
17		10.6	240			1.80	3.2	2.80
18		9.0	230			E	3.2	2.80
19		7.9	240			----	3.2	2.75
20		7.0	245				3.0	2.70
21		6.3	250					2.75
22		6.0	250					2.70
23		5.1	250					2.70

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

Table 42

Watheroo, W. Australia (30.3°S, 115.9°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.3	250					3.05
01		4.1	250					3.00
02		4.0	250					2.95
03		>4.1	250					(2.90)
04		4.2	260					3.00
05		(4.0)	240					(3.05)
06		(3.8)	240					(3.10)
07		5.4	250		1B0	1.60		3.20
00		8.7	220		110	2.50		3.40
09		10.8	230		100	3.10		3.30
10	---	11.8	220	---	100	3.50		3.25
11	---	11.9	220	---	100	3.60		3.20
12	---	12.0	220	---	100	3.75		3.10
13	---	11.B	220	---	100	3.70	3.9	2.95
14	---	11.9	220	---	100	3.55		3.00
15		11.B	230		100	3.30		2.95
16		>11.6	230		100	2.85	3.0	3.10
17		10.6	220		110	2.25	2.7	3.10
18		10.1	210			----	2.5	(3.00)
19		7.7	220			----	2.0	3.15
20		6.7	220			----	1.8	3.20
21		5.8	220				1.6	3.10
22		5.0	250				1.5	3.00
23		4.6	250				1.5	2.95

Time: 120.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 1 minute 45 seconds.

Table 43

Canberra, Australia (35.3°S, 149.0°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.8	<285					2.65
01		4.8	<280					2.60
02		4.8	<280					2.65
03		4.8	<275					2.70
04		4.8	260					2.85
05		4.5	<245					2.90
06		4.1	<250			----		2.80
07		>5.8	250			<1.70	2.1	----
08		>9.4	240			2.45		3.30
09		>11.4	240			3.00	3.1	3.20
10		>12.0	230			3.35	3.4	(3.10)
11		12.8	230			<3.50	3.7	(3.10)
12		>12.1	225			3 60	3.8	(2.95)
13		>12.5	240			3.55	3.8	(2.90)
14		>11.8	240			3.40	3.6	(2.90)
15		>11.5	240			3.10	3.4	(2.85)
16		>11.1	240			2.60	2.6	(3.00)
17		>10.9	240			1.75	2.5	2.90
18		>9.4	230			----	2.2	2.95
19		8.7	<235				2.1	3.00
20		7.0	<240				2.3	3.00
21		6.1	240					(2.95)
22		5.7	<250					2.80
23		5.2	<250					(2.70)

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

Table 44

Hobart, Tasmania (42.9°S, 147.2°E) June 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		4.2	300					2.60
01		4.2	300					2.60
02		4.3	300					2.60
03		4.3	300					2.60
04		4.3	290					2.65
05		4.2	280					2.75
06		3.7	260					2.75
07		3.8	270					2.80
08		7.5	250			2.20		3.05
09		10.2	240			2.75		3.20
10		11.3	240			3.10		3.15
11		11.9	240			3.30		3.05
12		12.2	240			3.35		3.10
13		>12.6	240			3.40		3.00
14		12.5	240			3.15		2.95
15		>12.0	240			2.80		3.00
16		12.0	240			2.30		2.95
17		11.0	240					2.95
18		>9.6	240					2.95
19		8.2	240					2.90
20		6.4	250					2.85
21		5.6	250					2.80
22		4.8	270					2.70
23		4.4	280					2.60

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

Table 45

Lindau/Harz, Germany (51.6°N, 10.1°E) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	fEs	(M3000)F2
00		7.45	300				2.5	2.50
01		7.10	<310				2.6	2.45
02		6.70	305				2.2	2.45
03		6.40	300		---	----	2.7	2.45
04		6.35	300		---	----	3.1	2.50
05		6.95	270		110	1.90	3.6	2.65
06		7.45	250	----	108	2.60	4.0	2.70
07	---	7.95	240	----	102	3.05	4.2	2.70
08	390	8.20	235	5.30	104	3.35	5.0	2.65
09	395	8.25	225	5.55	104	3.60	5.0	2.60
10	400	8.55	220	5.80	102	3.75	6.0	2.60
11	440	8.80	220	5.80	100	3.85	5.2	2.50
12	420	8.85	220	5.95	100	3.90	5.0	2.55
13	400	9.10	230	5.85	102	3.90	5.0	2.55
14	400	9.05	230	6.00	103	3.90	4.8	2.55
15	395	9.05	230	5.65	103	3.75	4.4	2.65
16	(430)	8.80	230	5.60	104	3.50	4.6	2.65
17	---	8.75	235	----	104	3.25	4.4	2.70
18	---	8.65	250	----	105	2.85	4.0	2.70
19		8.95	260		114	2.30	4.0	2.75
20		8.90	265		---	----	3.4	2.75
21		8.25	260		---	E	2.8	2.60
22		8.00	280				2.6	2.55
23		7.60	285				2.6	2.50

Time: 15.0°E.
Sweep: 1.0 Mc to 16.0 Mc in 4 minutes.

Table 46

Hobart, Tasmania (42.9°S, 147.2°E) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		5.6	280					2.70
01		5.3	280					2.70
02		5.1	290					2.70
03		5.0	290					2.70
04		4.8	280					2.75
05		4.5	270					2.85
06		4.0	260					2.80
07		5.2	270			----		3.00
08		9.0	240			2.30		3.30
09		>11.0	240			2.90		3.30
10		>12.0	230			3.20		3.15
11		>12.5	230			3.40		3.10
12		0	230			3.50		(3.15)
13		D	230			3.45		(3.05)
14		0	240			3.30		(3.00)
15		>12.0	240			3.10		----
16		>12.0	240			2.55		(3.10)
17		>11.5	230			----		3.05
18		10.3	240					3.00
19		8.8	240					3.00
20		7.4	250					2.95
21		6.4	260					2.80
22		6.1	270					2.70
23		5.8	280					2.70

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

Table 47

Christchurch, New Zealand (43.6°S, 172.8°E) May 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		6.0	300				<1.6	2.5
01		6.0	300				3.0	2.6
02		5.9	270				<1.5	2.6
03		5.8	260				<1.5	2.7
04		5.4	260				1.3	2.7
05		5.0	250				1.9	2.7
06		4.4	250		---	---	<1.5	2.7
07		6.4	250		---	(1.7)		2.95
08		9.1	240		110	2.4		3.1
09		11.4	240		100	2.9	2.9	3.1
10		12.0	230		100	3.2		3.0
11		12.4	240		100	3.4		3.0
12		12.2	230		---	3.4		3.0
13		12.8	240		---	3.4		2.9
14		12.8	240		---	3.2		2.9
15		12.8	240		---	2.9	3.2	2.95
16		11.9	240		---	(2.4)	2.5	3.0
17		11.0	230		---	---	2.4	2.9
18		9.4	240				<1.6	2.8
19		8.6	250				<1.8	2.8
20		7.5	250				1.8	2.8
21		6.8	250				<1.7	2.7
22		6.2	270				<1.6	2.7
23		6.0	260				<1.7	2.45

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 48

Christchurch, New Zealand (43.6°S, 172.8°E) April 1957

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		7.0	280				<1.7	2.5
01		6.8	280				<1.4	2.4
02		6.4	290				1.4	2.4
03		6.0	300				<1.4	2.5
04		5.8	260				<1.8	2.5
05		5.5	250				<1.6	2.6
06		5.6	270		---	<1.3		2.65
07		8.0	<250		110	2.1		2.9
08		10.4	240		110	2.7		3.0
09	---	11.9	230	---	105	3.1		3.0
10	---	12.5	230	---	100	3.4		2.9
11	---	12.9	230	---	100	3.6		2.9
12	---	13.1	230	---	100	3.7		2.8
13	---	13.0	230	---	100	3.6		2.75
14	---	12.6	240	---	100	3.5		2.7
15		12.6	240		100	3.1		2.8
16		12.1	240		110	2.8		2.8
17		12.0	240		120	2.2		2.8
18		10.9	240		---	<1.4	<1.5	2.8
19		9.2	240		---	---	2.7	2.6
20		8.6	250				<1.6	2.7
21		8.0	270				<1.5	2.6
22		7.7	260				<1.7	2.6
23		7.2	280				<2.4	2.5

Time: 172.5°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 49

Godhavn, Greenland (69.2°N, 53.5°W) December 1956

Time	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000)F2
00		(5.2)	260					----
01		5.4	260					2.65
02		4.6	275					(2.60)
03		5.0	270					----
04		(4.3)	265				2.1	----
05		---	275					----
06		(4.8)	270					----
07		(4.4)	<280					----
08		(5.0)	270					----
09		---	280					----
10		(6.4)	260				2.5	----
11		(7.3)	250				2.6	----
12		(7.5)	230				2.4	(2.60)
13		---	240				3.2	----
14		(6.4)	240				2.3	(2.80)
15		(6.1)	240					----
16		5.6	235					(2.70)
17		5.8	240					(2.60)
18		5.3	250					----
19		(5.8)	235				2.5	----
20		5.8	250				2.6	(2.70)
21		5.9	<250					(2.55)
22		(5.6)	260					(2.50)
23		(5.6)	250					(2.75)

Time: 45.0°W.
Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 50*

Ibadan, Nigeria (7.4°N, 4.0°E) November 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	10.5					5.8	(2.5)
01	275	(10.6)					5.8	(2.6)
02	265	10.4					5.6	(2.8)
03	245	10.1					5.1	(2.9)
04	235	8.6					4.2	(2.6)
05	225	---					4.8	---
06	265	8.6			(140)	2.2	7.8	---
07		11.4	245		(120)	3.1	>8.9	(2.7)
08		12.9	235			3.6	12.8	2.4
09		13.2	225			3.7	14.3	2.3
10		13.1	225			4.1	14.4	2.0
11		12.8	215			4.2	14.8	2.0
12		13.1	215			4.2	14.6	2.0
13		13.0	220			4.1	14.0	2.0
14		13.0	220			3.9	13.9	1.9
15		13.1	235			3.6	13.6	1.9
16		(12.2)	250			3.1	>11.2	(1.9)
17	285	---			(140)	2.2	>8.3	---
18	380	10.8				1.2	3.9	(1.8)
19	435	(8.6)						(1.8)
20	415	(8.5)						(2.0)
21	365	(9.4)					2.5	---
22	305	8.9					1.8	(2.4)
23	275	10.6					4.7	(2.5)

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 51

Budapest, Hungary (47.4°N, 19.2°E) September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	5.7						
01	310	5.4						
02	310	5.2						
03	305	4.7						
04	285	4.9			130	2.0		
05	250	6.5	---	---	135	2.2		
06	250	7.9	250	4.0	120	2.8	3.1	
07	260	8.6	240	4.6	115	3.2	3.6	
08	260	9.9	230	5.0	115	3.4	4.5	
09	250	10.3	225	5.1	115	3.5	4.8	
10	250	10.4	220	5.2	115	3.4	4.6	
11	270	10.4	220	5.7	115	3.5	4.8	
12	285	10.4	230	5.4	115	3.6	4.0	
13	255	10.3	235	5.4	110	3.4		
14	250	10.3	240	5.5	115	3.2		
15	255	10.3	250	4.9	120	2.9	3.1	
16	260	9.3	---	---	120	2.4	3.2	
17	260	9.2			---	---		
18	260	8.6						
19	260	7.2						
20	270	6.8						
21	300	6.0						
22	320	6.0						
23	320	5.8						

Time: 0.0°.
Sweep: 1.0 Mc to 20.0 Mc in 35 seconds.

Table 52

Delhi, India (28.6°N, 77.1°E) September 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	8.2						3.00
01	320	7.5						3.00
02	320	7.2						3.00
03								
04	360	6.2						2.80
05	340	6.5						2.90
06	280	8.3						3.25
07	280	10.0						3.25
08	280	11.6						3.25
09	320	12.0						3.00
10	350	13.4						2.85
11	350	13.8						2.85
12	360	14.8						2.80
13	360	15.1						2.80
14	360	>15.2						2.80
15	340	>15.0						2.85
16	320	>15.0						3.00
17	320	14.6						3.00
18	320	14.3						3.00
19	320	13.5						3.00
20	320	>11.5						3.00
21	360	9.4						2.80
22	340	8.9						2.90
23	340	8.6						2.90

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 53

Ahmedabad, India (23.0°N, 72.6°E) September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	275	11.8					3.0	2.85
01	260	11.0					2.9	2.85
02	240	9.7					3.0	2.90
03	240	7.1					3.0	2.80
04	285	6.0					3.0	2.70
05	280	5.7					1.7	2.75
06	270	7.5			---	---	3.0	3.05
07	245	10.4	250	4.4	110	2.6		3.25
08	250	11.0	230	4.8	110	3.1		3.00
09	260	12.3	220	5.2	107	3.5		2.80
10	350	13.3	225	5.5	105	3.8		2.65
11	365	14.4	220	5.7	105	4.0		2.65
12	390	>15.0	230	5.9	105	4.1		(2.65)
13	400	>15.2	250	5.8	105	4.1		(2.65)
14	390	(15.3)	235	6.0	105	4.0		(2.60)
15	360	(15.4)	240	6.0	110	3.8		<2.75
16	335	>14.2	250	5.4	110	3.5		<2.85
17	290	>14.0	250	5.0	115	2.7	3.6	<2.80
18	265	>15.0	---	---	---	1.8	3.8	2.80
19	275	>14.1					3.2	<2.65
20	280	>14.4					3.1	(2.65)
21	250	>14.0					3.0	2.70
22	280	>13.0					3.1	2.75
23	275	13.0					3.0	2.80

Time: 75.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 54

Calcutta, India (22.9°N, 88.5°E) September 1956*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	8.6					2.0	3.1
01	310	8.0						3.1
02	290	7.5					2.0	3.2
03	290	6.8						3.2
04	310	6.5						3.2
05	310	5.5						3.2
06	300	7.0			120	2.2	2.6	3.15
07	---	8.6	230	---	---	---	3.4	3.2
08	320	9.8	220	4.9	---	---	3.8	3.1
09	340	10.7	210	5.2	---	---	4.4	3.05
10	360	11.5	200	5.4	---	---	4.5	2.9
11	370	11.8	210	5.5	100	3.6	4.4	2.9
12	380	12.2	210	5.5	100	3.8		2.8
13	370	12.5	200	5.5	100	3.7		2.8
14	360	12.5	220	5.4	100	3.5		2.85
15	340	12.5	210	5.3	100	3.2	3.7	2.9
16	310	12.1	210	5.2	---	---	3.7	3.1
17	300	12.0	220	4.9	---	---	3.6	3.1
18	280	11.2			110	2.4	3.1	3.25
19	280	11.1						3.3
20	290	10.5						3.2
21	300	10.2						3.1
22	310	9.8						3.1
23	310	9.0						3.1

Time: 90.0°E.
Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.
*Data observed from September 10, 1956 to September 30, 1956, inclusive.

Table 55

Bombay, India (19.0°N, 73.0°E) September 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06	270	6.4						3.35
07	300	7.3						3.10
08	330	9.7						2.95
09	360	9.9						2.80
10	360	11.1						2.80
11	390	11.5						2.65
12	390	11.8						2.65
13	420	12.1						2.55
14	420	11.9						2.55
15	400	11.5						2.60
16	360	11.3						2.80
17	390	11.0						2.65
18	360	10.4						2.80
19	360	9.4						2.80
20	330	9.2						2.95
21	300	8.6						3.10
22	280	8.2						3.20
23								

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 56

Madras, India (13.0°N, 80.2°E) September 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	360	14.3						2.80
01	360	>13.7						2.80
02	340	10.2						2.90
03	(360)	>9.2						(2.80)
04	350	7.3						2.90
05	360	>6.7						2.80
06	320	>8.8						3.00
07	380	11.5						2.70
08	440	13.0						2.50
09	480	13.2						2.30
10	500	13.2						2.25
11	520	12.3						2.20
12	520	12.4						2.20
13	520	12.8						2.20
14	520	13.0						2.20
15	480	13.2						2.30
16	480	13.6						2.30
17	500	13.6						2.25
18	540	13.2						2.15
19	530	13.0						2.20
20	500	13.2						2.25
21	480	13.2						2.30
22	(460)	>14.1						(2.40)
23	400	>14.5						2.60

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 57

Tiruchy, India (10.8°N, 78.8°E) September 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06	320	9.2						3.00
07	360	10.4						2.80
08	400	11.5						2.60
09	480	11.8						2.30
10	480	12.0						2.30
11	520	12.0						2.20
12	520	12.0						2.20
13	520	12.0						2.20
14	520	11.8						2.20
15	520	11.8						2.20
16	520	11.6						2.20
17	520	11.0						2.20
18	480	10.5						2.30
19	480	9.8						2.30
20	480	9.6						2.30
21	440	9.4						2.50
21:30	---	---						----
23								

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 58

Kodaikanal, India (10.2°N, 77.5°E) September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	11.7						3.00
01	235	10.4						3.10
02	240	9.8						3.10
03	235	9.1						3.05
04	235	7.5						3.20
05	220	6.6						3.35
06	260	7.5						3.10
07	(260)	10.8	240	---	115	2.8		2.90
08	---	12.5	230	---	110	3.3	7.4	2.65
09	---	12.5	220	---	110	3.6	8.8	2.35
10	---	11.8	210	---	105	4.0	10.2	2.30
11	---	11.6	210	---	110	---	10.6	2.25
12	---	11.6	210	---	110	---	10.4	2.20
13	---	12.0	210	---	110	---	10.5	2.20
14	---	12.1	220	---	110	3.8	10.5	2.20
15	---	12.3	220	---	110	3.8	9.7	2.25
16	---	12.5	235	---	110	3.4	8.2	2.20
17	260	12.6			---	---	6.5	2.30
18	310	11.8						2.20
19	430	10.8						2.20
20	405	(10.7)						2.20
21	320	11.0						2.45
22	295	12.0						2.60
23	275	(11.9)						(2.90)

Time: 75.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 59*

Singapore, British Malaya (1.3°N, 103.8°E) September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	230	>10.5					1.4	2.6
01	250	10.2						2.6
02	250	9.9					1.4	2.8
03	240	8.7					1.1	3.0
04	235	7.7					1.9	3.1
05	235	6.0					2.0	3.2
06	280	6.6					2.3	2.9
07	255	10.6			120	2.8	3.1	3.0
08	(245)	12.7			115	3.4	3.6	2.7
09		13.5	(225)		110	3.8	4.4	2.3
10		13.9			115	4.1	4.8	2.1
11		>12.9			(110)	4.2		1.9
12		>12.5	(205)		(115)	4.2		1.9
13		>12.2	(205)		(110)	4.2		1.9
14		12.7	(210)		(110)	4.0		1.9
15		12.9	(210)		105	3.8	4.0	2.0
16	245	13.1	(230)		110	3.4	3.6	2.1
17	260	13.4			115	2.8	3.4	2.1
18	295	13.4				2.0	3.4	2.1
19	370	13.4					2.8	2.1
20	345	>12.6					2.0	---
21	265	>12.9					2.3	---
22	235	13.9					2.8	(2.8)
23	220	>11.6					2.4	2.8

Time: 105.0°E.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 60*

Inverness, Scotland (57.4°N, 4.2°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	310	6.3					2.4	2.5
01	325	5.8					2.6	2.4
02	320	5.3					2.7	2.4
03	315	5.1					2.7	2.5
04	300	4.8			(145)	(1.4)	2.7	2.6
05	290	5.3	---	---	130	1.8	2.8	2.7
06	295	5.8	(250)	(3.9)	115	2.3	3.4	2.8
07	310	6.3	245	4.3	110	2.7	2.9	2.8
08	350	7.0	240	4.6	105	3.1	4.3	2.8
09	370	6.9	230	5.0	105	3.3		2.8
10	335	7.6	225	5.1	105	3.5	4.8	2.8
11	355	7.5	220	5.2	105	3.6		2.8
12	385	7.3	220	5.5	100	3.7		2.7
13	385	7.5	220	5.5	100	3.7		2.7
14	385	7.3	230	5.4	100	3.6		2.6
15	370	7.4	235	5.3	105	3.5		2.7
16	340	7.4	235	5.1	105	3.3		2.7
17	305	7.6	245	(4.8)	110	3.0		2.8
18	280	7.8	245	(4.4)	115	2.6	3.1	2.8
19	265	7.9	---	---	130	2.2	3.4	2.8
20	260	7.6			(140)	(1.8)	2.9	2.8
21	265	7.3					2.8	2.7
22	280	7.0						2.5
23	300	6.7						2.5

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 61

Budapest, Hungary (47.4°N, 19.2°E) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	5.8					2.3	
01	320	5.6						
02	320	5.4						
03	310	5.4						
04	270	5.8	265	3.2	135	2.0		
05	260	6.8	250	3.7	120	2.6	3.6	
06	260	7.3	235	4.5	115	3.1	3.9	
07	310	8.1	240	5.1	110	3.4	4.9	
08	315	8.3	230	5.4	115	3.5	5.0	
09	340	8.4	220	5.5	110	3.6	5.6	
10	355	8.4	210	5.8	110	3.6	5.1	
11	345	8.8	210	5.7	110	3.6	4.7	
12	340	8.6	230	5.6	115	3.6	4.5	
13	340	8.5	230	5.6	115	3.6	3.7	
14	315	8.2	230	5.3	115	3.4	3.8	
15	310	8.2	240	5.0	115	3.3	3.8	
16	285	8.5	240	4.5	120	2.9	3.9	
17	270	8.4			125	2.2	3.8	
18	265	8.6					3.7	
19	270	8.2					3.8	
20	280	7.0					3.2	
21	300	6.4					2.8	
22	315	6.4					3.1	
23	320	6.0						

Time: 0.0°.
Sweep: 1.0 Mc to 20.0 Mc in 35 seconds.

Table 62

Delhi, India (28.6°N, 77.1°E) August 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	340	8.1						2.90
01	350	7.8						2.85
02	340	7.5						2.90
03								
04	320	6.8						3.00
05	320	7.0						3.00
06	280	8.2						3.25
07	280	9.5						3.25
08	280	9.5						3.00
09	320	10.0						3.00
10	360	11.0						2.80
11	360	12.0						2.80
12	370	13.2						2.75
13	360	13.6						2.80
14	360	14.1						2.80
15	360	14.2						2.80
16	360	13.5						2.80
17	320	13.3						3.00
18	320	12.8						3.00
19	320	11.6						3.00
20	320	10.3						3.00
21	360	9.1						2.80
22	360	8.6						2.80
23	360	8.5						2.80

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 63

Ahmedabad, India (23.0°N, 72.6°E) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	8.6					3.2	2.80
01	275	8.1					3.2	2.80
02	270	7.7					3.2	2.80
03	270	7.0					3.2	2.85
04	280	6.6					3.0	2.65
05	270	6.4					3.2	2.85
06	255	7.4			128	1.8	3.2	3.05
07	250	8.9	240	4.3	110	2.7	3.4	3.15
08	260	9.3	225	4.8	107	3.2	4.0	3.05
09	270	10.3	210	5.3	105	3.6		2.80
10	320	11.0	210	5.4	105	3.8		2.60
11	370	12.4	220	5.8	105	4.0		2.60
12	375	13.0	230	5.9	105	4.1		2.60
13	390	13.5	230	5.9	105	4.0		<2.65
14	380	14.4	230	5.8	105	4.0		2.65
15	355	14.6	230	5.7	105	3.8		2.65
16	330	>14.0	235	5.5	110	3.5		<2.75
17	310	>14.0	250	5.0	112	3.0		2.80
18	280	13.7	255	4.1	118	2.2	3.4	<2.85
19	270	13.0					3.2	2.85
20	275	12.2					3.2	2.65
21	280	11.6					3.1	2.65
22	300	10.8					3.1	2.60
23	300	9.0					3.2	2.65

Time: 75.0°E.
Sweep: 0.6 Mc to 25.0 Mc in 5 minutes, automatic operation.

Table 64

Bombay, India (19.0°N, 73.0°E) August 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06	250	6.2						3.45
07	270	7.4						3.35
08:30	300	8.7						3.10
09	330	9.4						2.95
10	360	9.8						2.80
11	360	10.7						2.80
12	390	11.5						2.65
13	420	11.6						2.55
14	420	11.6						2.55
15	390	11.4						2.65
16	390	11.2						2.65
17	390	11.0						2.65
18	360	10.4						2.80
19	360	9.4						2.80
20	330	8.8						2.95
21	300	8.2						3.10
22	270	6.6						3.35
23								

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 65

Madras, India (13.0°N, 80.2°E) August 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	390	11.4						2.65
01	380	11.4						2.70
02	340	9.2						2.90
03	330	7.9						2.95
04	320	6.1						3.00
05	300	5.7						3.05
06	320	8.3						3.00
07	360	9.8						2.80
08	420	11.2						2.55
09	480	11.5						2.30
10	490	11.2						2.30
11	520	11.2						2.20
12	510	11.4						2.20
13	500	11.4						2.25
14	500	11.8						2.25
15	500	12.1						2.30
16	480	12.0						2.30
17	480	12.4						2.30
18	480	12.3						2.30
19	500	11.7						2.30
20	480	11.1						2.30
21	480	10.6						2.30
22	420	11.2						2.55
23	440	11.8						2.50

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 66

Tiruchy, India (10.8°N, 78.8°E) August 1956

Time	*	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01								
02								
03								
04								
05								
06	360	7.8						2.80
07	400	10.2						2.60
08	440	10.7						2.50
09	480	11.5						2.30
10	520	11.5						2.20
11	520	11.2						2.20
12	520	11.2						2.20
13	520	11.0						2.20
14	(520)	(11.3)						(2.20)
15	520	10.9						2.20
16	520	10.5						2.20
17	520	10.2						2.20
18	480	10.0						2.30
19	480	9.7						2.30
20	(440)	(9.2)						(2.50)
21	440	8.9						2.50
21:30	---	---						----
23								

Time: 75.0°E.
Sweep: 1.5 Mc to 18.0 Mc in 5 minutes, manual operation.
*Height at 0.83 foF2.

Table 67

Kodaikanal, India (10.2°N, 77.5°E) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	11.0						2.90
01	250	9.8						3.00
02	250	9.2						3.10
03	255	8.4						3.10
04	240	7.6						3.20
05	235	6.0						3.25
06	275	7.1						3.10
07	245	10.0	240	---	120	3.3		2.90
08	---	11.5	230	---	115	3.4	4.0	2.70
09	(305)	11.8	225	---	110	3.6	7.9	2.40
10	---	11.2	215	---	110	---	9.0	2.30
11	---	10.7	210	---	110	---	10.0	2.30
12	---	10.8	210	---	110	---	10.3	2.20
13	(400)	10.9	210	---	110	4.1	10.2	2.25
14	---	11.1	215	---	110	---	10.0	2.20
15	---	11.5	215	---	110	3.6	8.8	2.20
16	---	11.6	230	---	110	3.3	8.5	2.20
17	255	11.8	245	---	115	3.0	4.2	2.30
18	295	11.4						2.30
19	390	10.3						2.30
20	415	9.8						2.30
21	360	10.4						2.40
22	330	10.8						2.50
23	305	11.0						2.70

Time: 75.0°E.
Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 68

Sao Paulo, Brazil (23.5°S, 46.5°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		11.4						
01		10.4						
02		10.5						
03		8.3						
04		5.6						
05		4.8						
06		4.3						
07		8.0						
08		10.2						
09		11.1						
10		11.8						
11		12.8						
12		13.0						
13		13.4						
14		12.8						
15		13.4						
16		13.8						
17		14.0						
18		>14.0						
19		13.6						
20		13.3						
21		12.6						
22		11.9						
23		11.8						

Time: 45.0°W
Sweep: 1.75 Mc to 20.0 Mc in 7 minutes 18 seconds.

Table 69*

Port Lockroy (64.8°S, 63.5°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	355	3.1						(2.4)
01	345	3.0						---
02	355	2.9					1.0	(2.3)
03	350	2.7						(2.4)
04	335	2.7						(2.4)
05	310	2.6						(2.4)
06	270	2.5					2.2	---
07	260	(3.4)			175	1.2		---
08	230	5.8			150	1.4	4.4	---
09	225	7.7	(225)		130	1.8	4.8	(3.2)
10	220	(8.2)	(225)	(4.8)	125	2.2	5.1	---
11	225	8.8	230	(5.0)	120	2.4	5.6	(3.3)
12	225	8.7	235	(4.9)	120	2.5	4.7	---
13	225	(8.6)	230	(4.9)	120	2.5	4.8	(3.2)
14	230	8.7	(235)	(4.9)	125	2.3	4.7	(3.2)
15	230	(8.2)	(230)	(5.4)	135	2.1	4.2	---
16	225	(7.5)	(235)		145	1.8	2.3	---
17	230	(6.1)			165	1.4	1.8	(3.4)
18	220	5.5			(180)	(1.1)	2.0	3.0
19	240	4.2						2.9
20	275	3.8						2.7
21	300	3.7					1.3	2.6
22	320	3.2					1.3	2.5
23	345	3.2						(2.4)

Time: 60.0°W.
Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.
*Average values except foF2 and fEs, which are median values.

Table 70

Sao Paulo, Brazil (23.5°S, 46.5°W) July 1956*

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	240	7.1						3.05
01	240	6.6						3.1
02	240	6.6						3.2
03	220	5.6						3.4
04	230	4.0						3.15
05	270	3.7						2.9
06	280	3.1						3.0
07	250	6.6			---	<2.2		3.2
08	240	8.4	---	---	130	2.6		3.3
09	240	10.6	230	---	120	3.1		3.15
10	270	11.8	220	---	120	3.4		3.1
11	260	12.4	210	4.6	120	3.5		3.1
12	(270)	12.5	200	4.6	120	3.6		2.8
13	250	13.0	200	4.3	120	3.6		2.8
14	(250)	13.2	210	4.3	125	3.4		2.8
15	270	13.3	230	---	130	3.2		2.9
16	250	13.6	---	---	130	2.8		2.9
17	250	12.8			---	<2.3	2.8	3.2
18	220	11.7					2.2	3.3
19	220	9.6					2.5	3.3
20	240	9.3					2.2	3.0
21	240	8.8						3.0
22	230	9.0						3.2
23	230	8.4					2.0	3.1

Time: Local.
Sweep: 1.75 Mc to 20.0 Mc in 7 minutes 18 seconds.
*Data observed only July 1 through July 16, inclusive.

Table 71

Poitiers, France (46.6°N, 0.3°E) May 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	6.9					2.2	----
01	300	6.7					2.2	(2.50)
02	300	6.4					2.0	2.60
03	290	6.1			---	---	2.2	2.60
04	285	5.8	---	---	---	---	2.4	2.65
05	275	6.0	260	2.9	---	1.8	2.7	2.85
06	300	6.6	245	4.1	110	2.6	3.2	2.80
07	310	6.9	240	4.6	105	3.0	3.6	2.80
08	330	7.4	230	4.9	100	3.3	3.8	2.85
09	350	7.8	225	5.2	100	3.6	4.1	2.75
10	330	7.8	220	5.5	100	3.6	4.1	2.80
11	350	8.1	220	5.5	100	3.7	4.3	2.70
12	350	8.6	230	5.6	100	3.8	3.5	2.80
13	350	8.6	230	5.5	100	3.7	4.2	2.80
14	345	8.7	230	5.4	100	3.6	4.0	2.80
15	330	8.6	230	5.2	100	3.5	3.9	2.85
16	310	8.3	240	4.9	105	3.3	3.6	2.85
17	300	8.3	250	4.5	110	3.0	3.6	----
18	275	8.0	250	4.0	110	2.5	3.1	----
19	260	8.5	(210)	(2.0)	---	1.6	3.3	----
20	255	(7.9)	---	---	---	---	3.0	
21	255	(7.1)			---	---	2.6	----
22	275	7.0					2.3	----
23	300	7.0					2.4	----

Time: 0.0°.
Sweep: 1.6 Mc to 16.8 Mc in 1 minute.

Table 72

Casablanca, Morocco (33.6°N, 7.6°W) May 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	<310	>8.60					3.1	2.50
01	<300	>8.45					3.0	(2.50)
02	<295	8.40					2.3	2.55
03	<280	8.40					2.5	2.70
04	<275	8.05					2.5	2.70
05	<275	7.20					2.7	2.70
06	260	7.60	270	3.30	---	1.90	3.4	2.90
07	250	7.80	245	3.90	115	2.60	3.5	3.10
08	260	8.20	230	4.50	110	3.10	4.5	3.10
09	285	8.30	230	5.15	110	3.45	4.8	2.90
10	335	8.75	225	----	110	3.65	5.3	2.80
11	350	9.45	210	----	110	3.80	5.2	2.70
12	350	10.40	250	6.00	110	(3.90)	4.6	2.70
13	350	11.10	250	6.00	110	(4.00)		2.75
14	340	11.55	250	(6.00)	110	(3.90)		2.75
15	325	>11.30	245	5.70	110	3.80		2.80
16	325	11.00	240	(5.20)	110	3.50	4.2	2.80
17	300	10.90	245	----	115	3.20	5.3	2.85
18	300	(10.95)	250	(4.50)	120	2.60	6.3	(2.90)
19	<260	>10.30	---	----	---	1.80	4.7	(2.95)
20	<250	>8.80					5.0	(2.70)
21	<270	>8.60					4.2	2.60
22	<310	>8.60					4.2	2.50
23	<320	>8.60					3.5	2.45

Time: 0.0°.
Sweep: 1.6 Mc to 16.0 Mc in 1 minute 15 seconds.

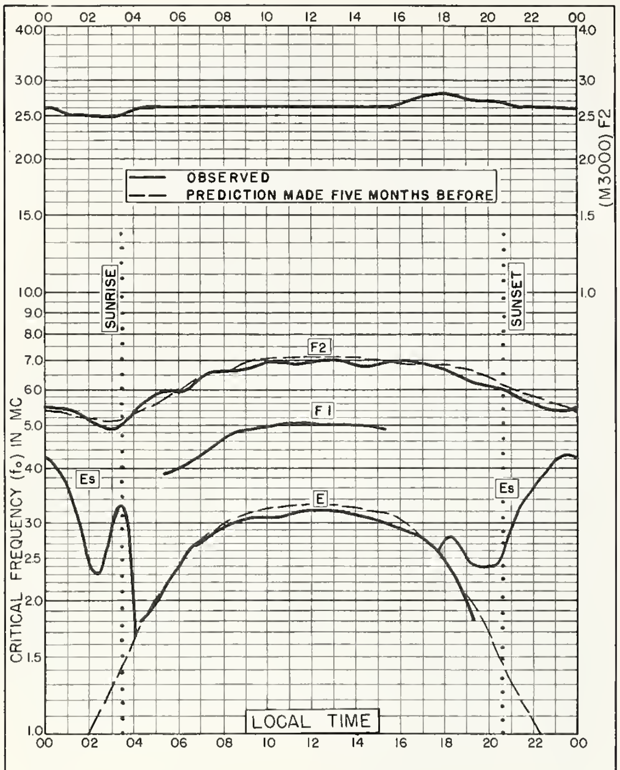


Fig. 1. KIRUNA, SWEDEN 67.8°N, 20.3°E AUGUST 1957

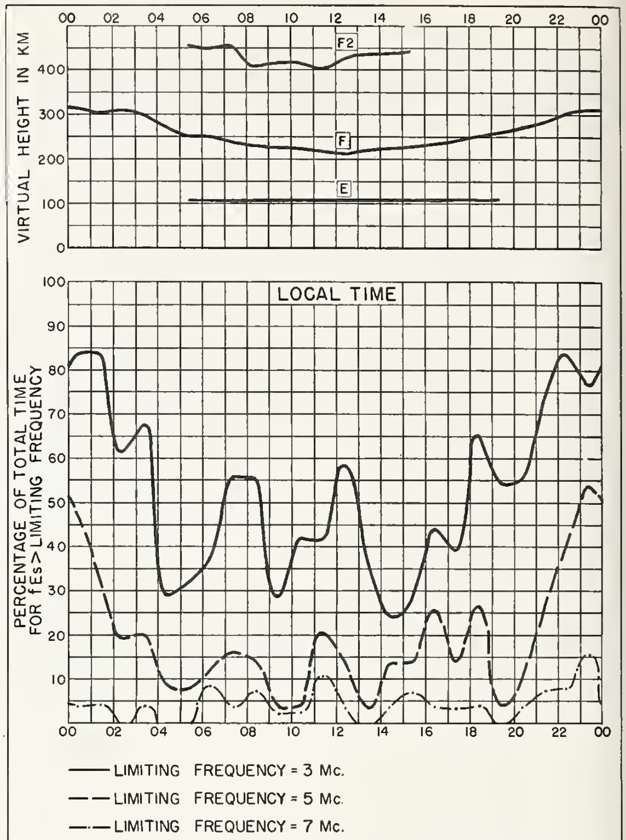


Fig. 2. KIRUNA, SWEDEN AUGUST 1957

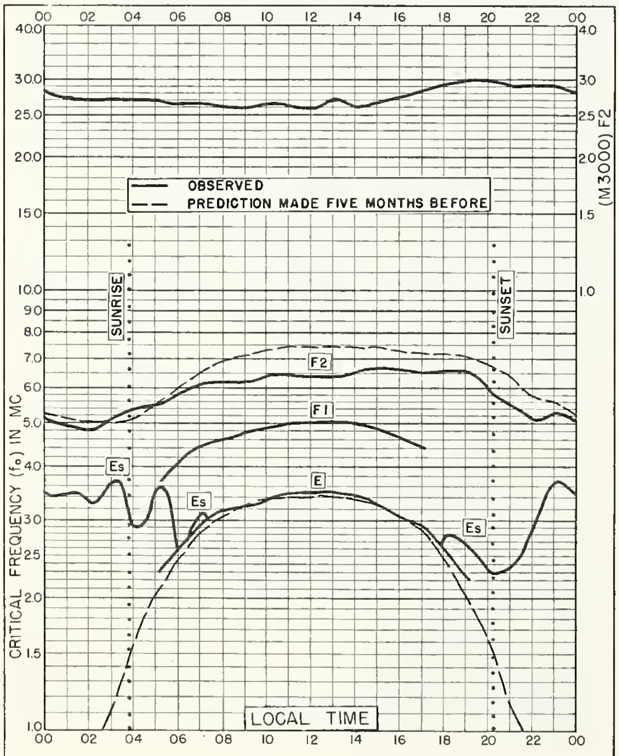


Fig. 3. FAIRBANKS, ALASKA 64.9°N, 147.8°W AUGUST 1957

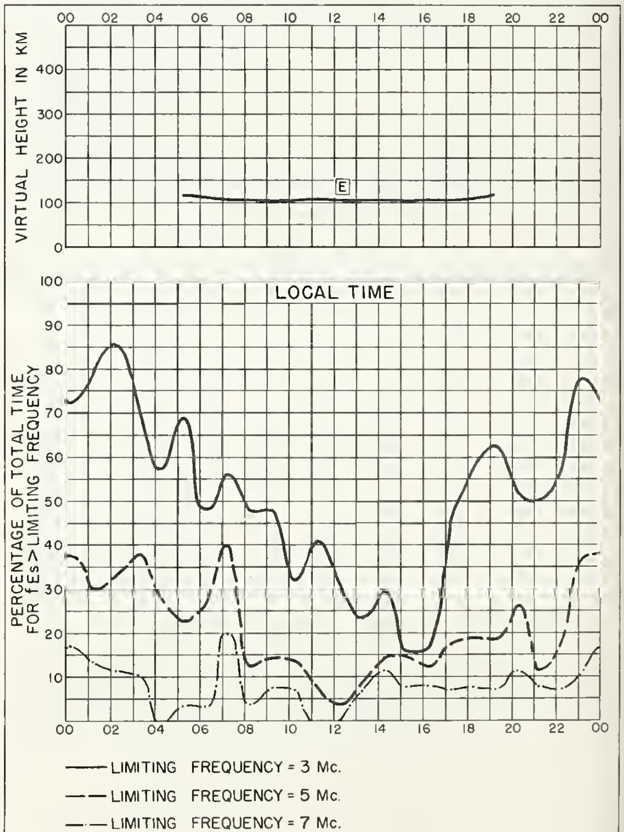


Fig. 4. FAIRBANKS, ALASKA AUGUST 1957

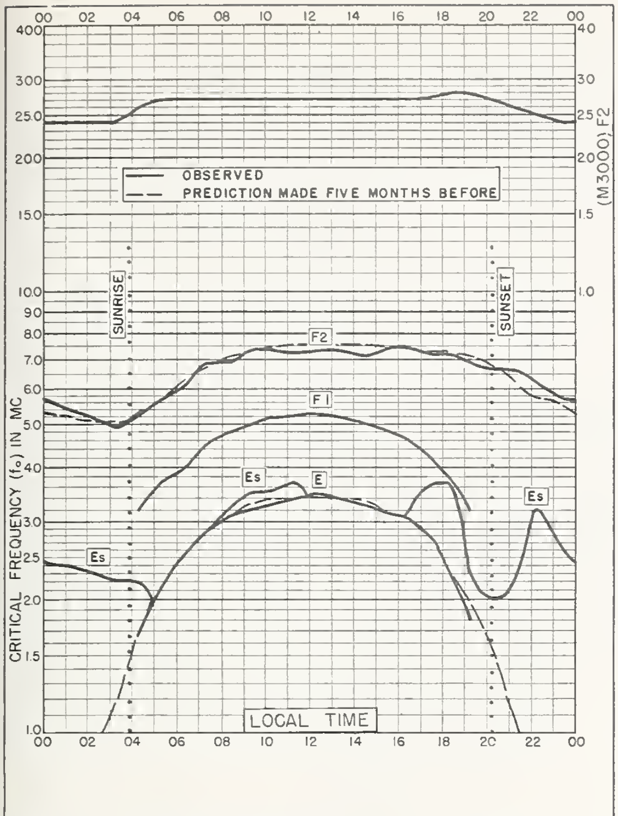


Fig. 5. LYCKSELE, SWEDEN
64.6°N, 18.8°E AUGUST 1957

NBS 503

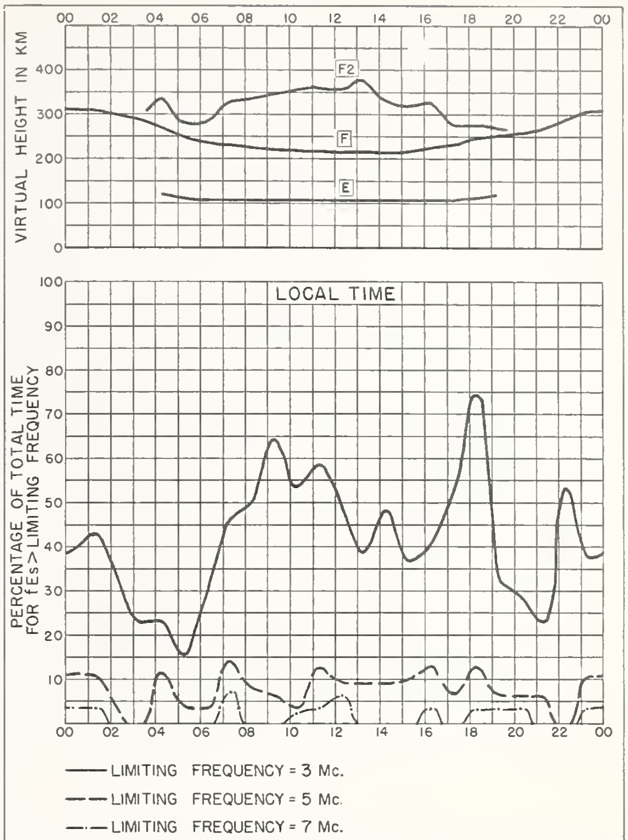


Fig. 6. LYCKSELE, SWEDEN AUGUST 1957

NBS 490

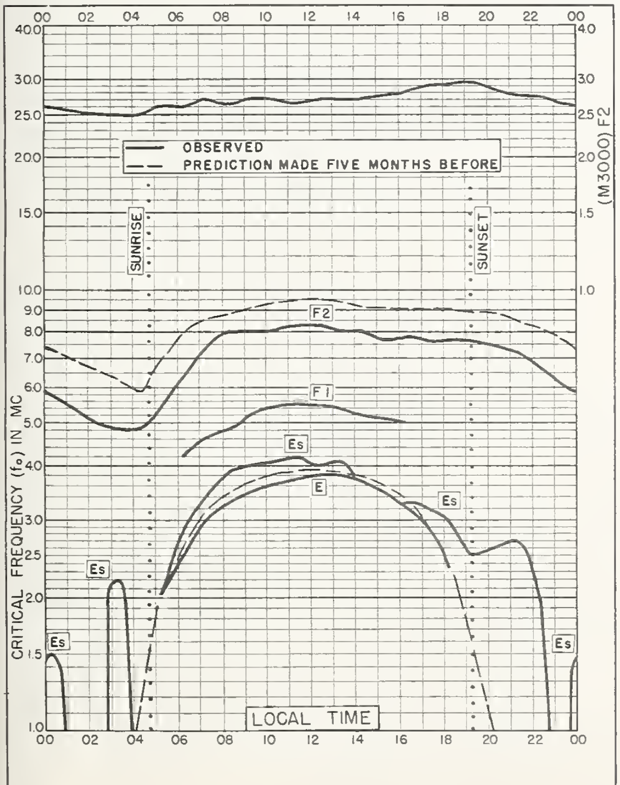


Fig. 7. ADAK, ALASKA
51.9°N, 176.6°W AUGUST 1957

NBS 503

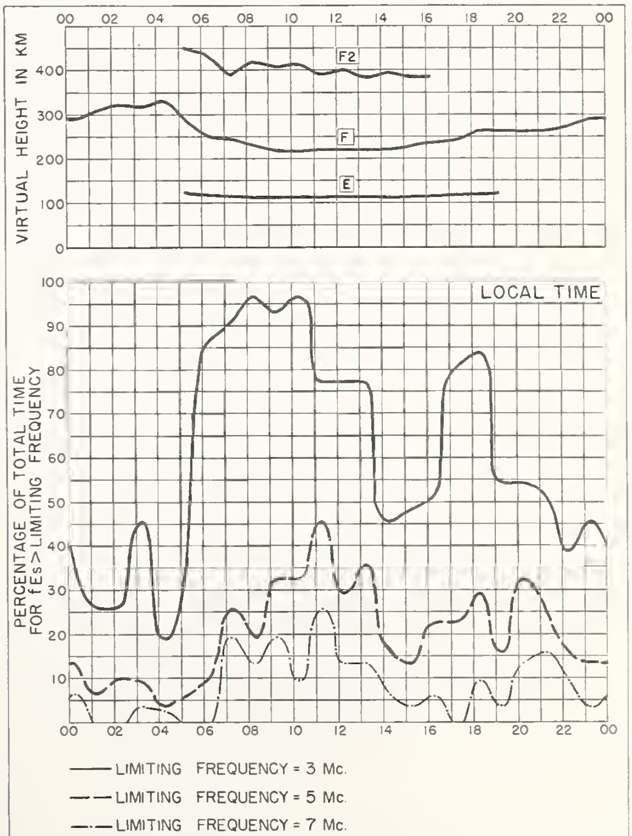


Fig. 8. ADAK, ALASKA AUGUST 1957

NBS 490

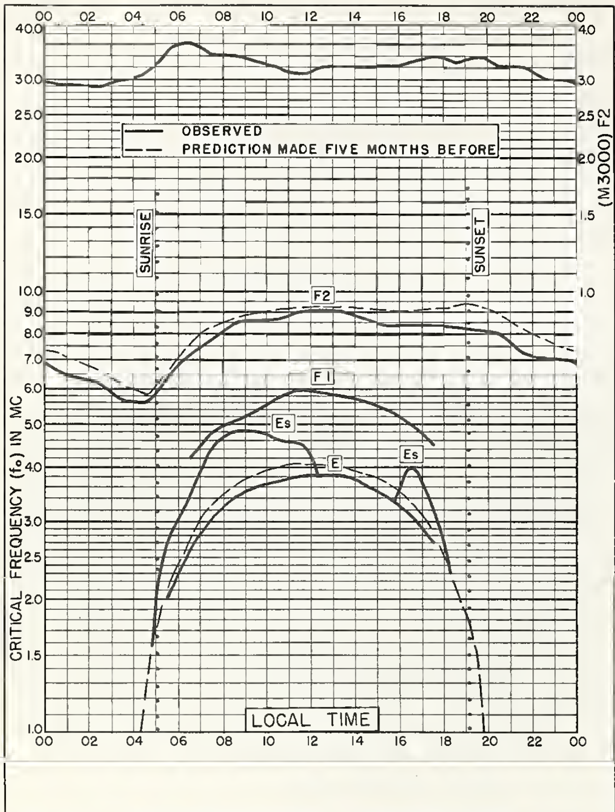


Fig. 9. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E AUGUST 1957

NBS 503

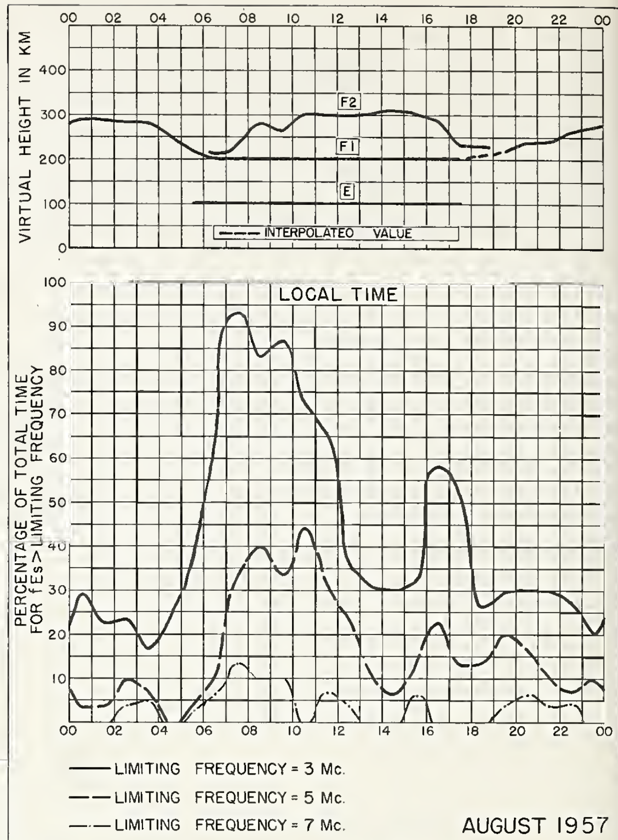


Fig. 10. SCHWARZENBURG, SWITZERLAND

Commerce-Standards-Boulder, Colo. NBS 490

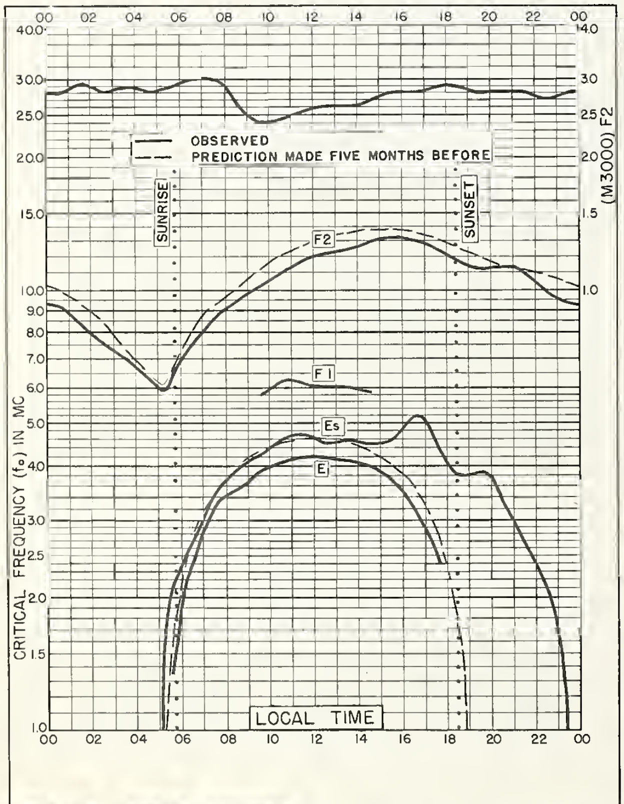


Fig. 11. MAUI, HAWAII
20.8°N, 156.5°W AUGUST 1957

NBS 503

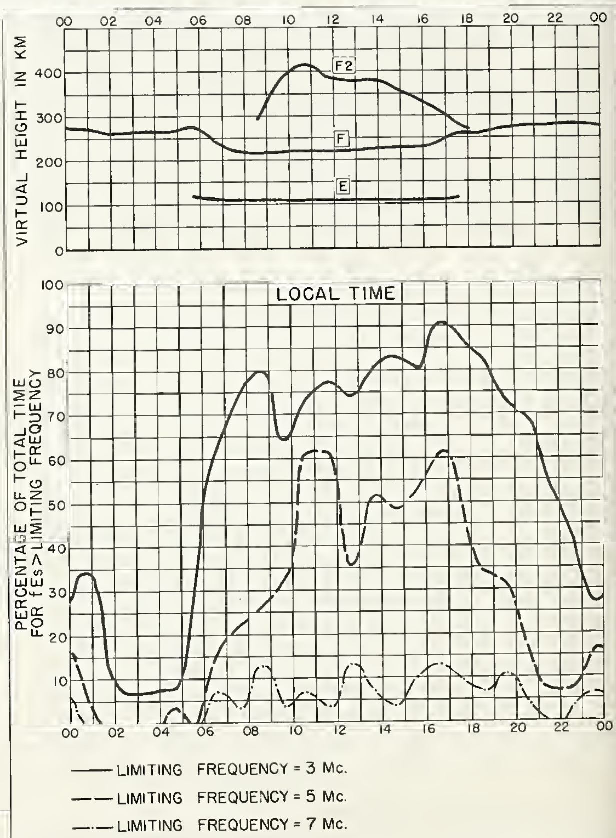


Fig. 12. MAUI, HAWAII AUGUST 1957

Commerce-Standards-Boulder, Colo. NBS 490

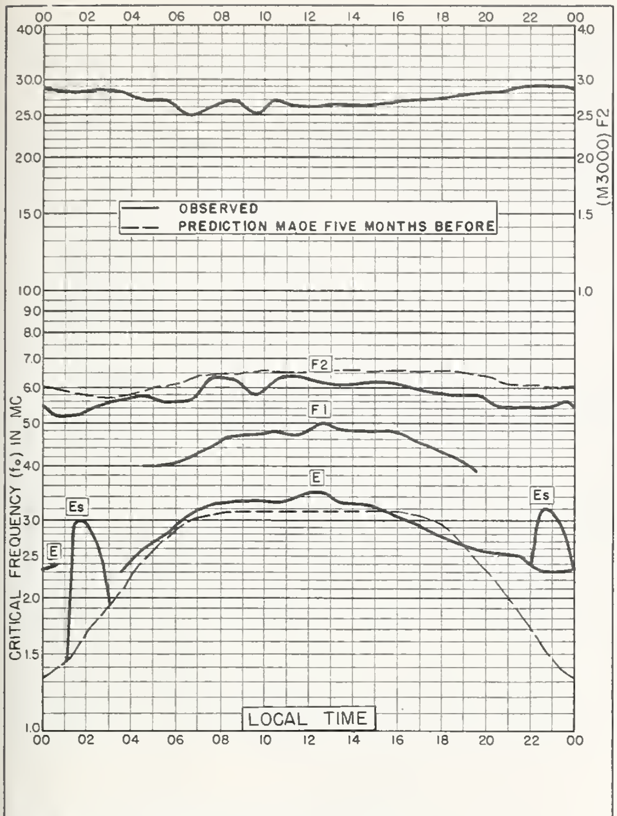


Fig. 13. POINT BARROW, ALASKA
71.3°N, 156.8°W JULY 1957

NBS 503

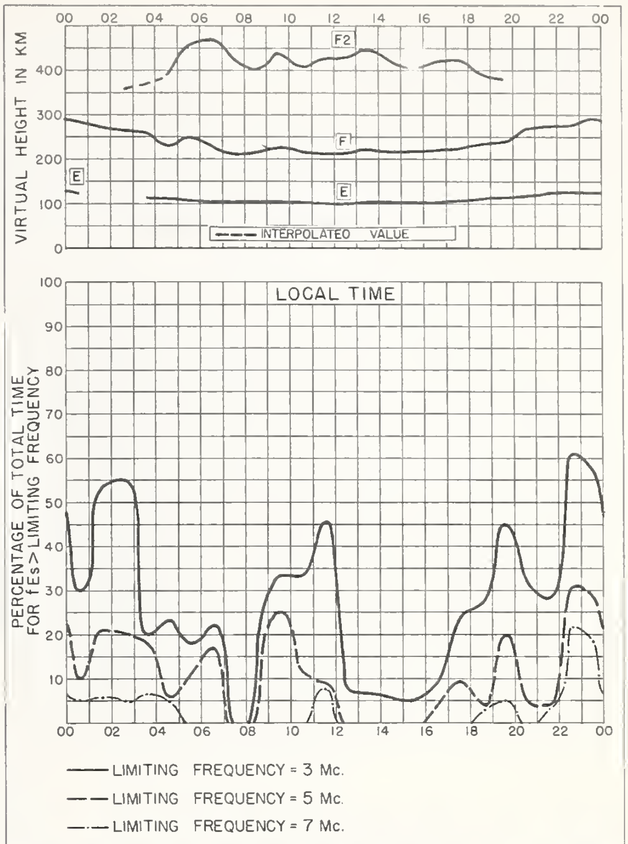


Fig. 14. POINT BARROW, ALASKA JULY 1957

NBS 490

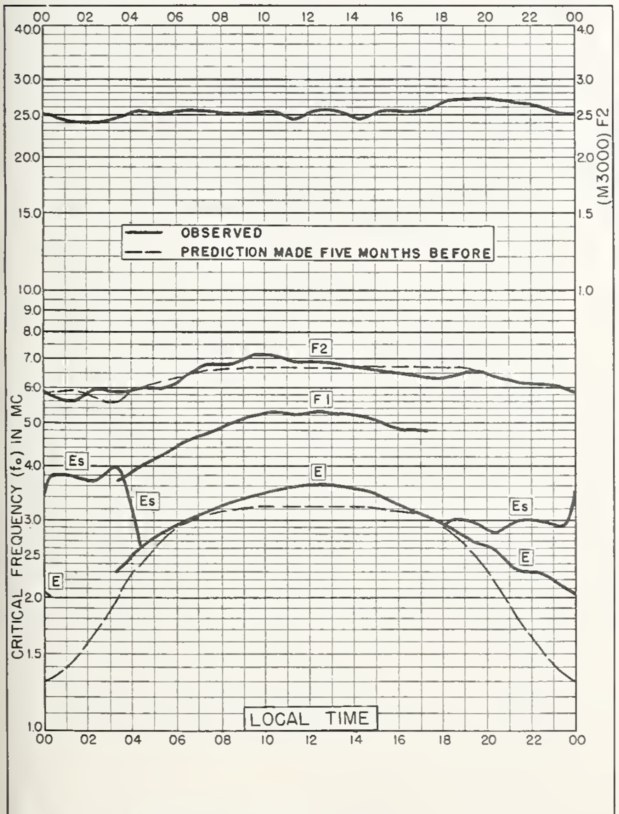


Fig. 15. TROMSO, NORWAY
69.7°N, 19.0°E JULY 1957

NBS 503

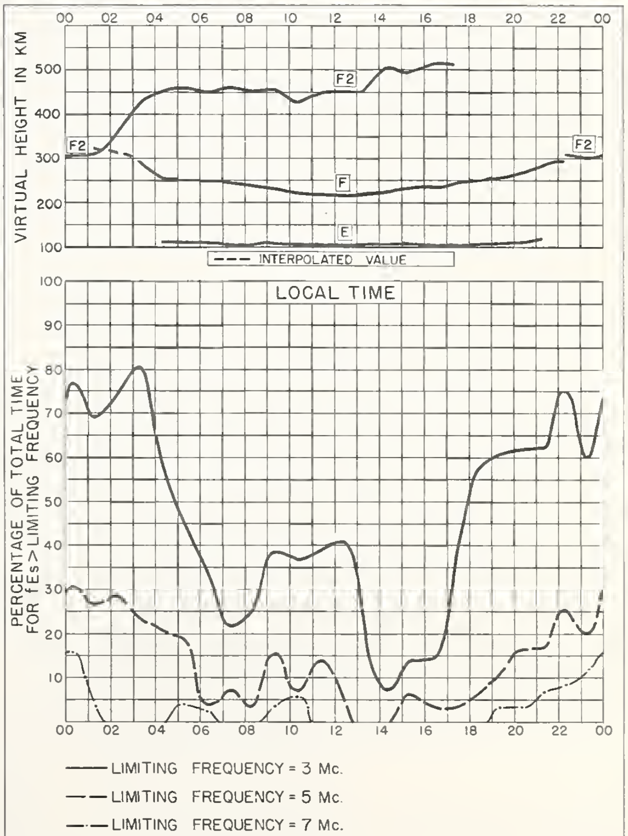


Fig. 16. TROMSO, NORWAY JULY 1957

NBS 490

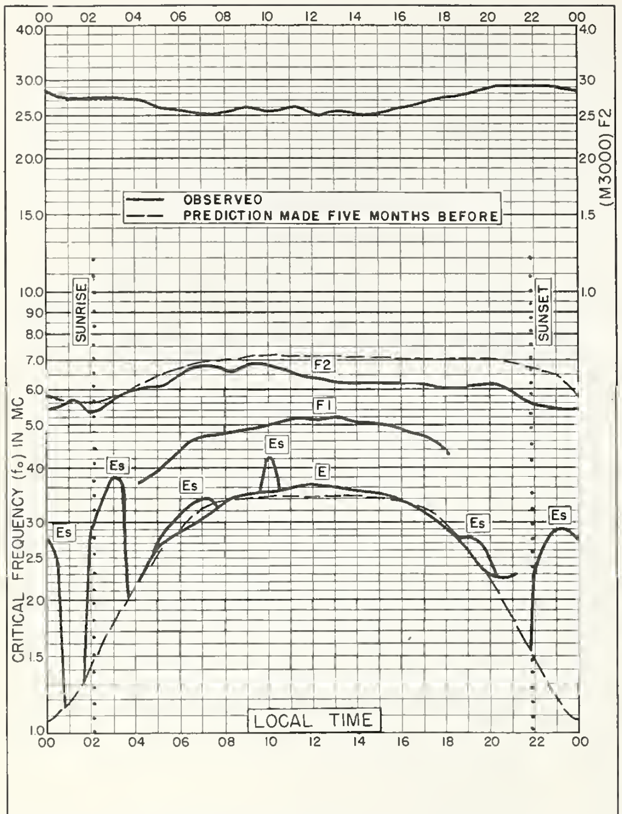


Fig. 17. FAIRBANKS, ALASKA
64.9°N, 147.8°W JULY 1957

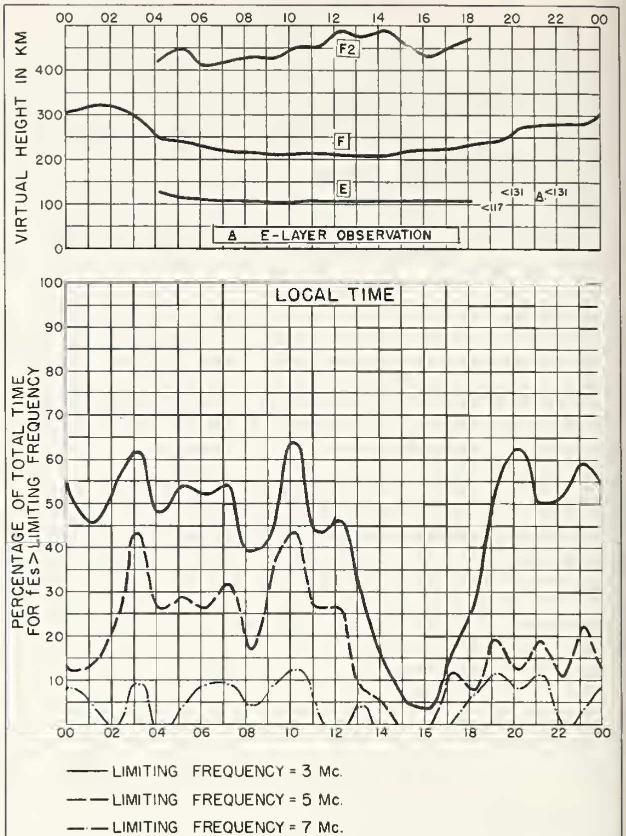


Fig. 18. FAIRBANKS, ALASKA JULY 1957

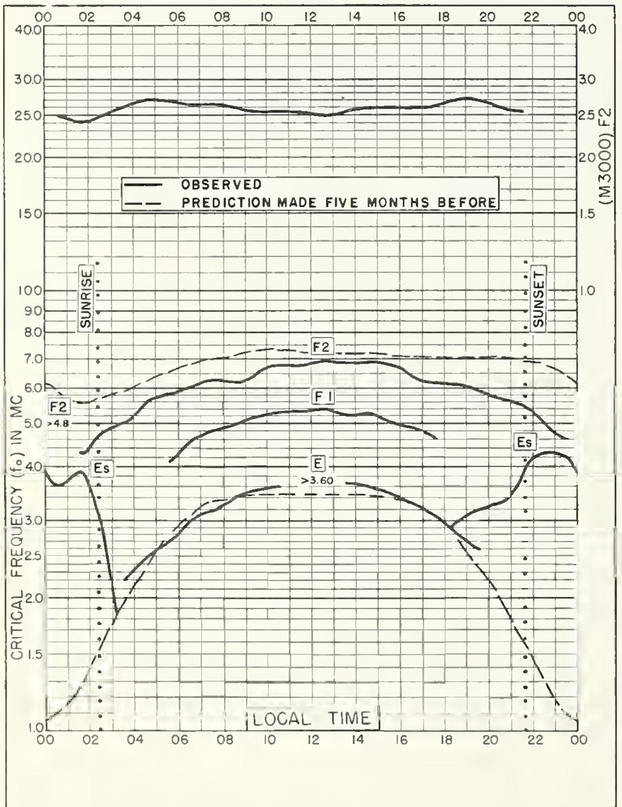


Fig. 19. REYKJAVIK, ICELAND
64.1°N, 21.8°W JULY 1957

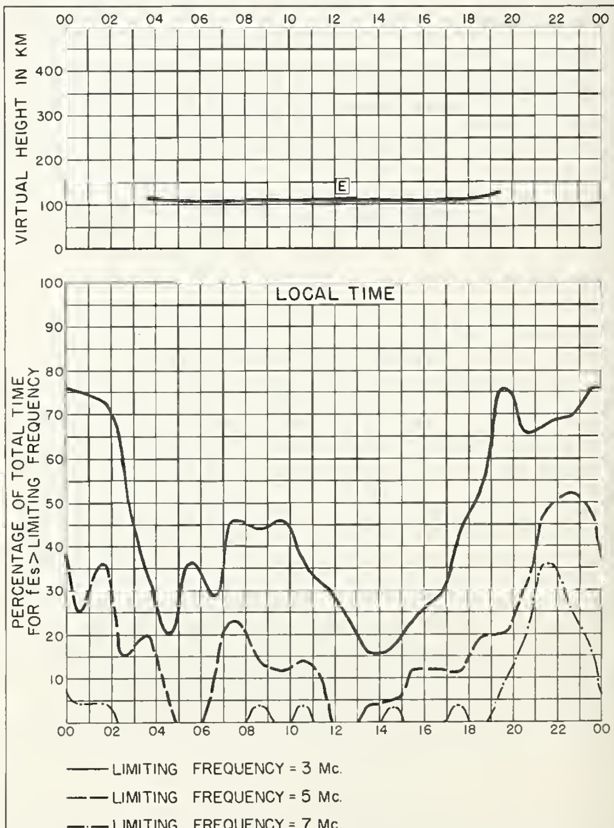


Fig. 20. REYKJAVIK, ICELAND JULY 1957

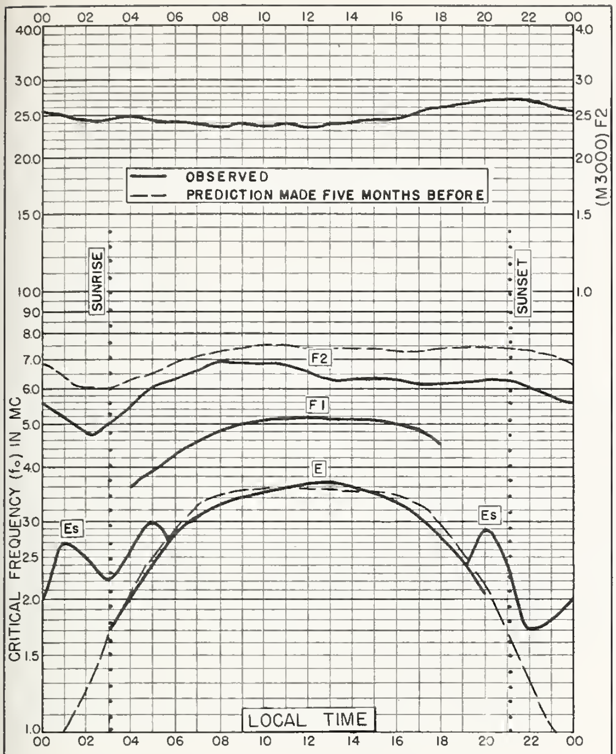


Fig. 21. ANCHORAGE, ALASKA
61.2°N, 149.9°W JULY 1957

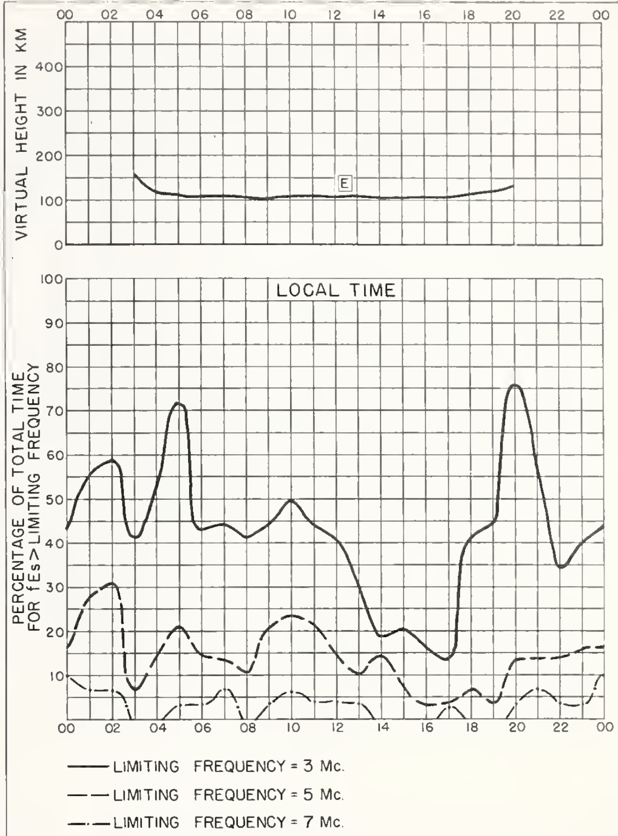


Fig. 22. ANCHORAGE, ALASKA JULY 1957

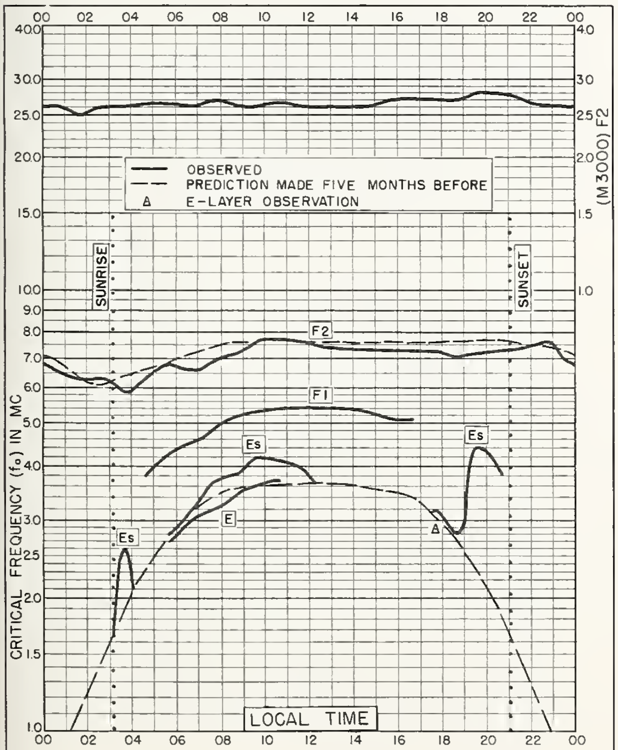


Fig. 23. NURMIJARVI, FINLAND
60.5°N, 24.6°E JULY 1957

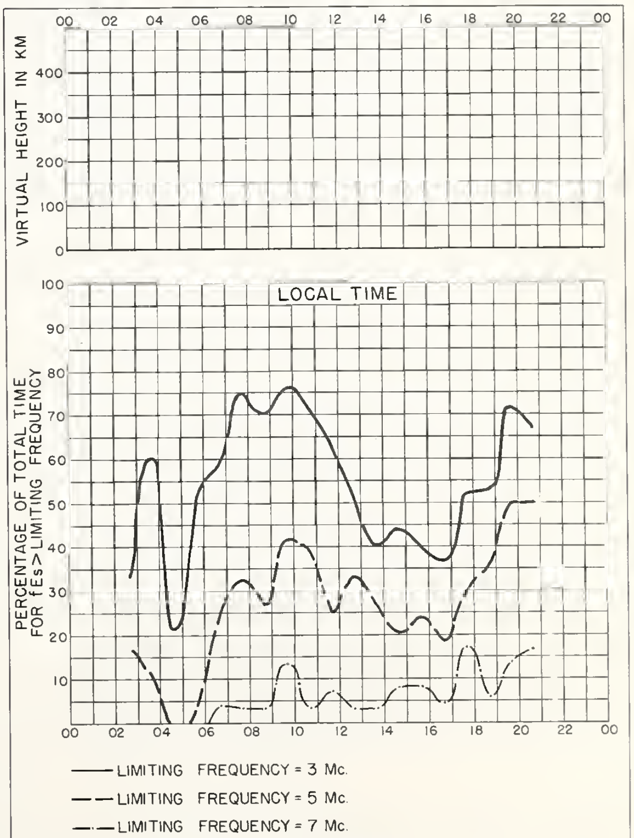


Fig. 24. NURMIJARVI, FINLAND JULY 1957

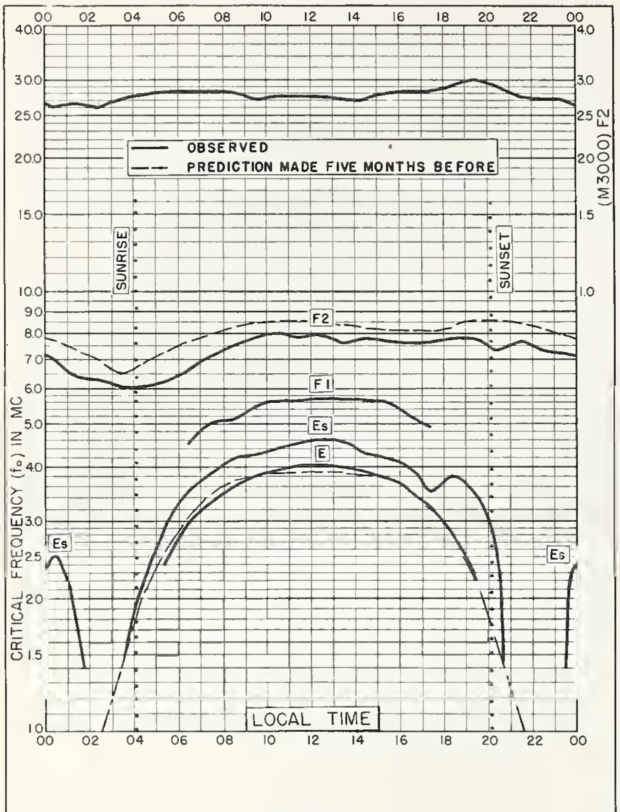


Fig. 25. De BILT, HOLLAND
52.1°N, 5.2°E JULY 1957

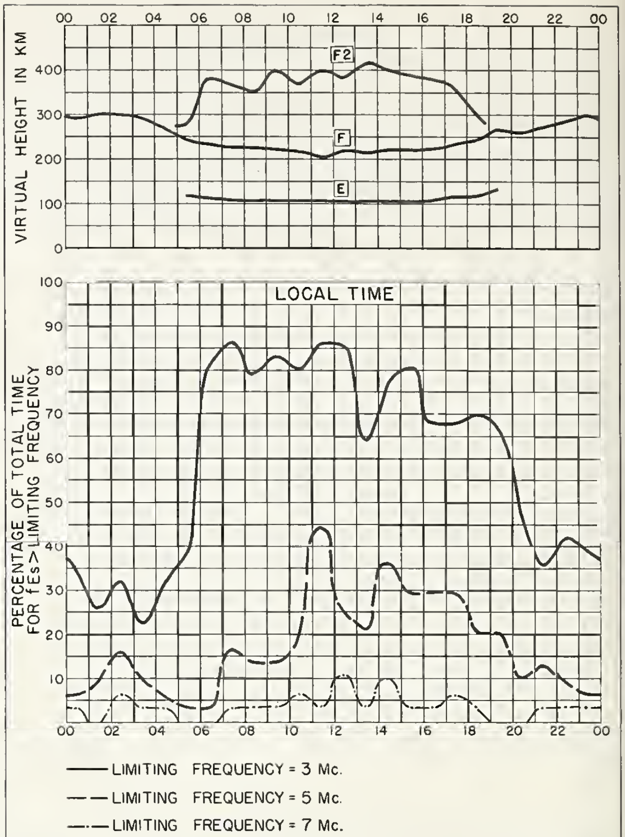


Fig. 26. De BILT, HOLLAND JULY 1957

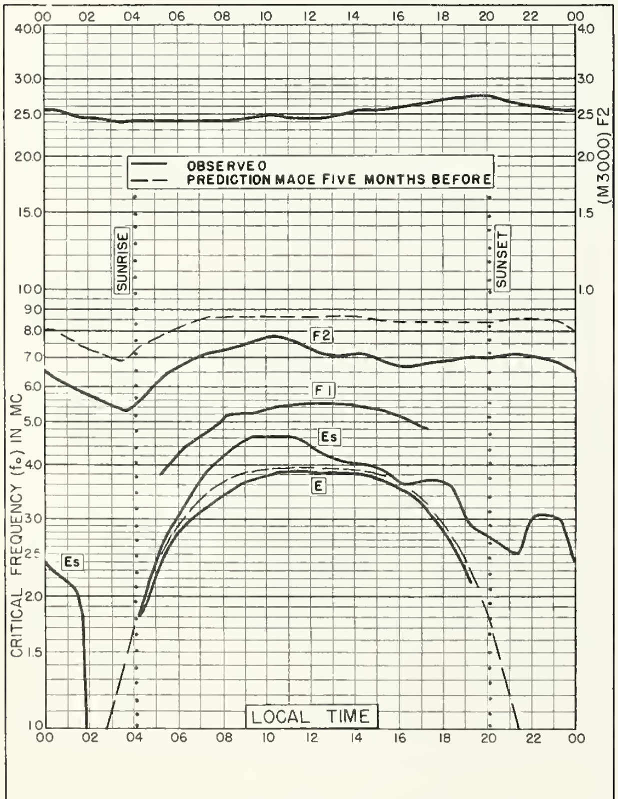


Fig. 27. ADAK, ALASKA
51.9°N, 176.6°W JULY 1957

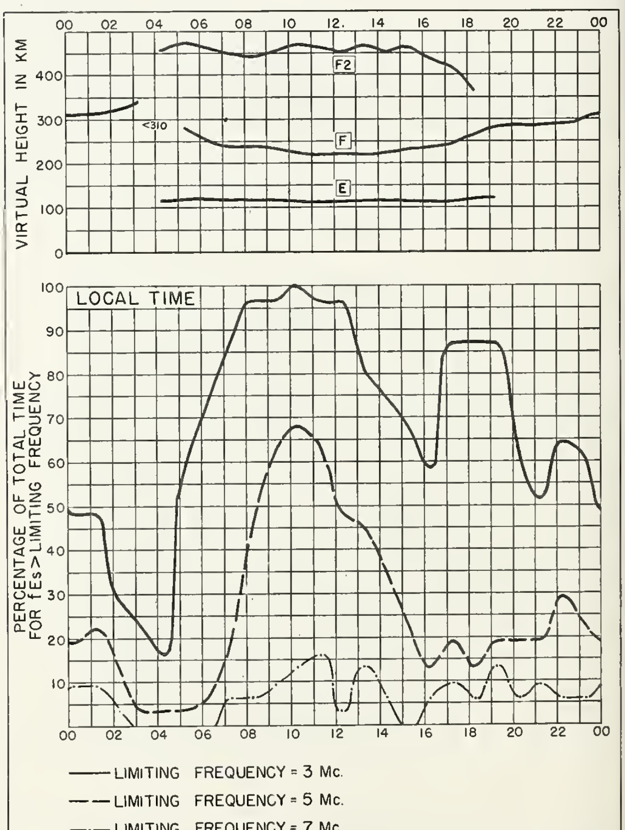


Fig. 28. ADAK, ALASKA JULY 1957

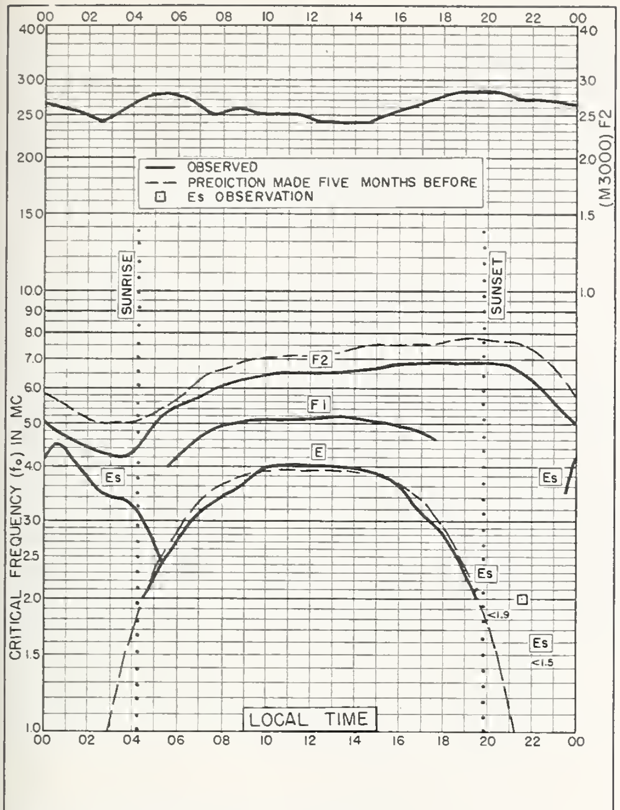


Fig. 29. WINNIPEG, CANADA
49.9°N, 97.4°W JULY 1957

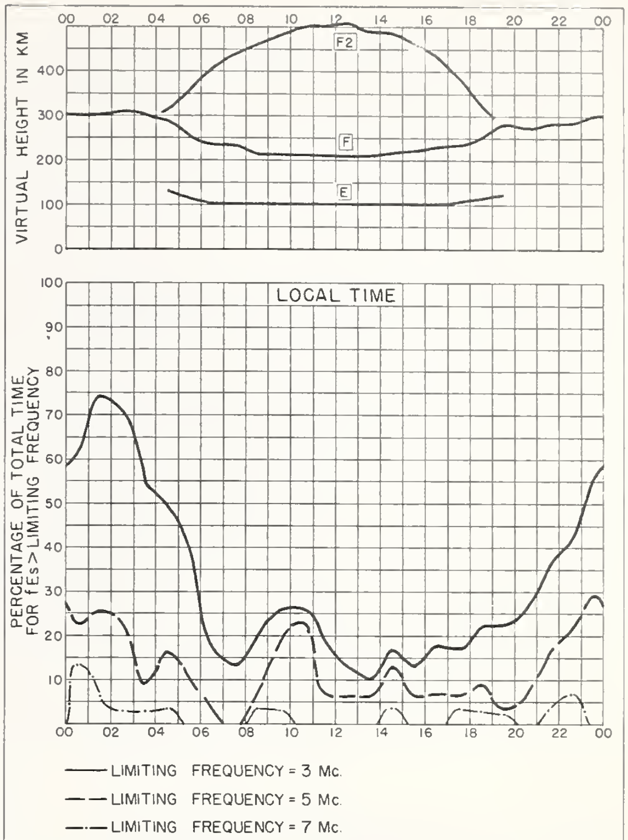


Fig. 30. WINNIPEG, CANADA JULY 1957

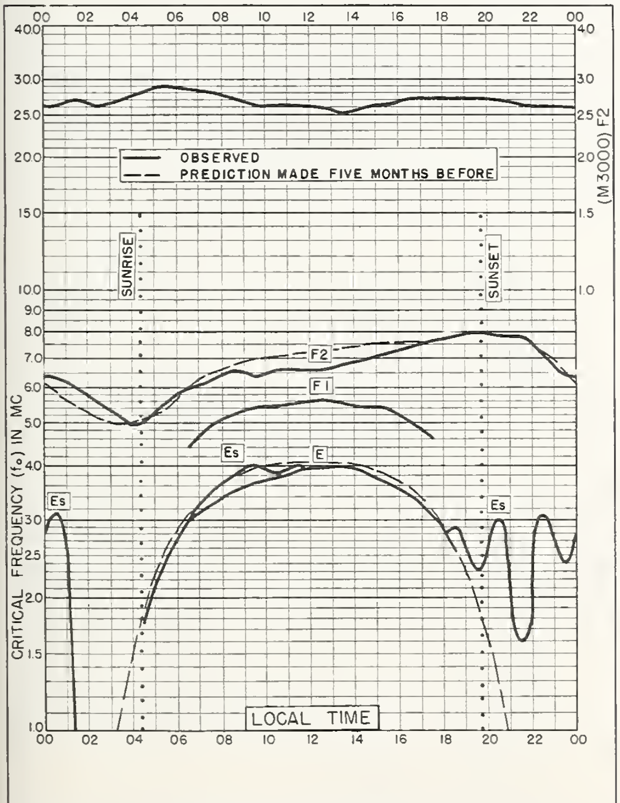


Fig. 31. ST. JOHN'S, NEWFOUNDLAND
47.6°N, 52.7°W JULY 1957

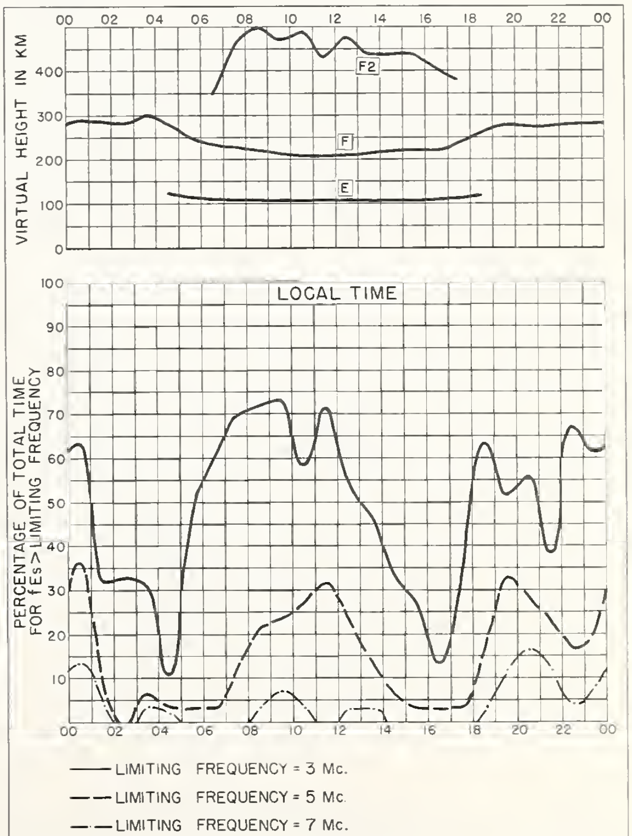


Fig. 32. ST. JOHN'S, NEWFOUNDLAND JULY 1957

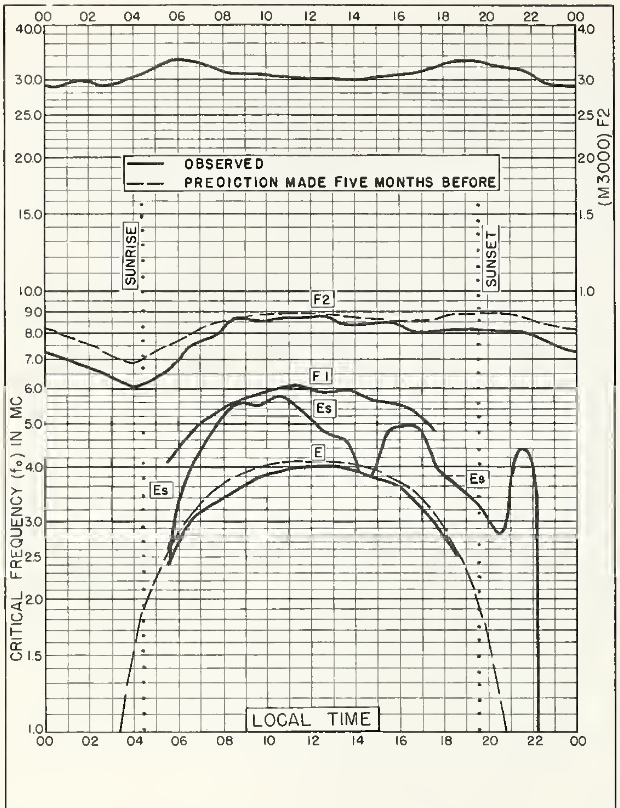
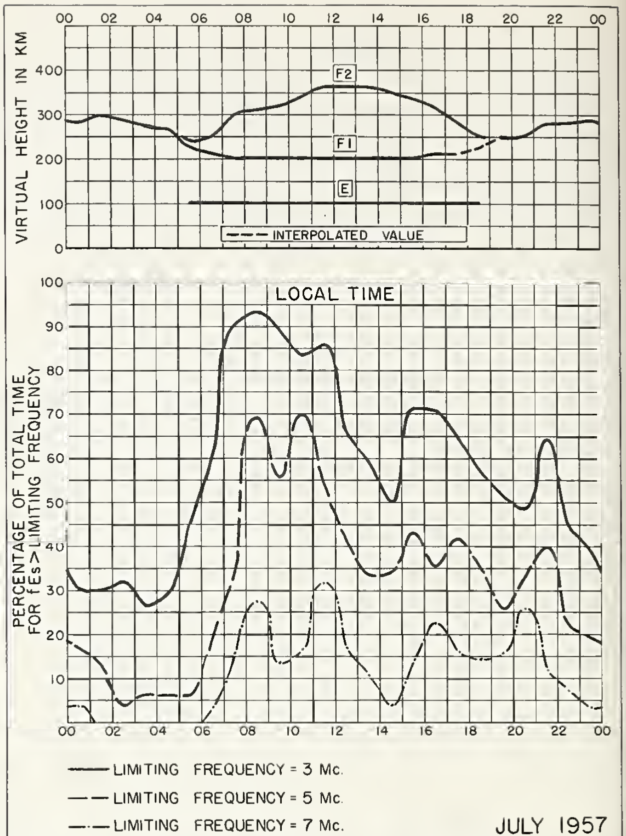


Fig. 33. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E JULY 1957



JULY 1957
Fig. 34. SCHWARZENBURG, SWITZERLAND

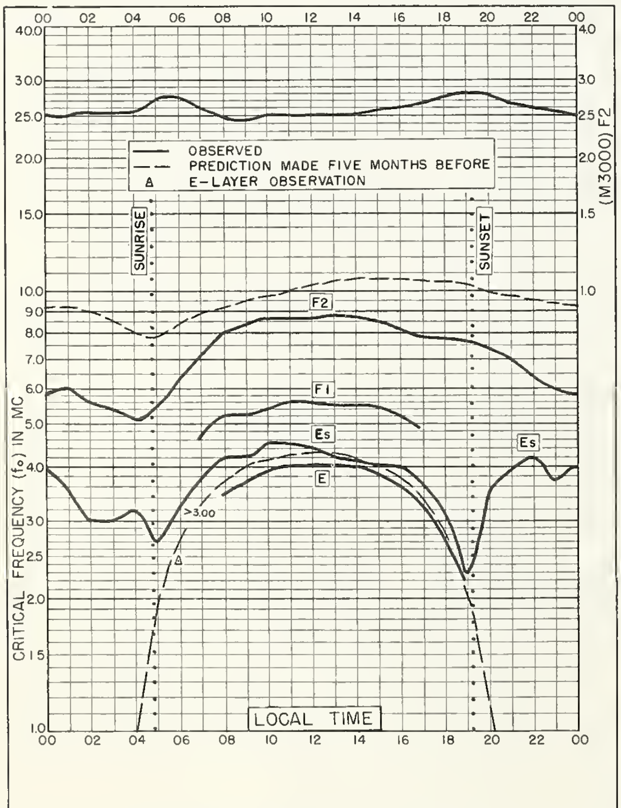


Fig. 35. SAN FRANCISCO, CALIFORNIA
37.4°N, 122.2°W JULY 1957

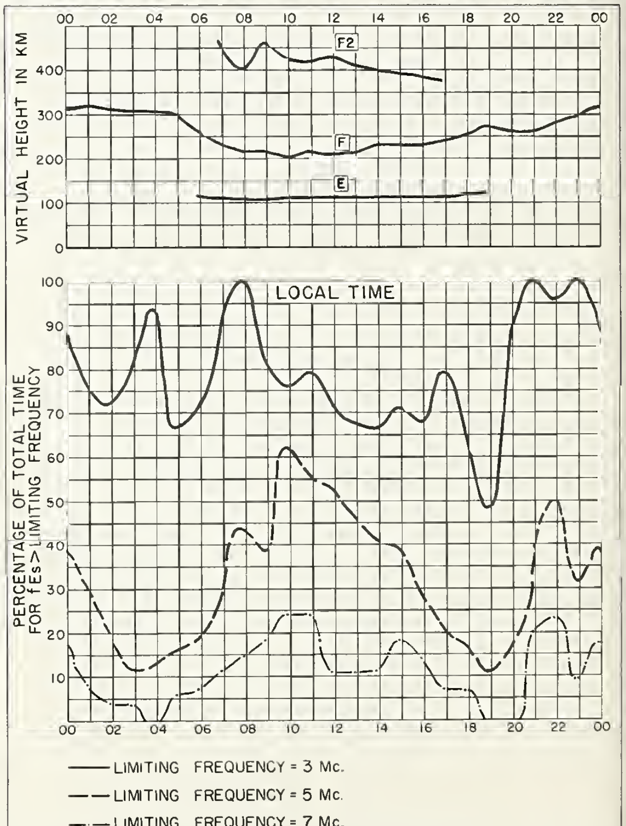


Fig. 36. SAN FRANCISCO, CALIFORNIA JULY 1957

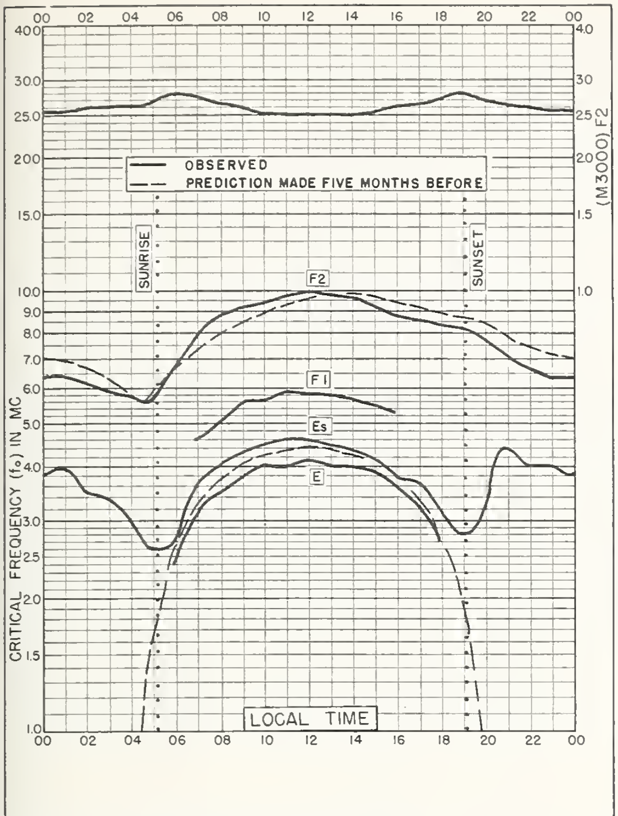


Fig. 37. WHITE SANDS, NEW MEXICO
32.3°N, 106.5°W JULY 1957

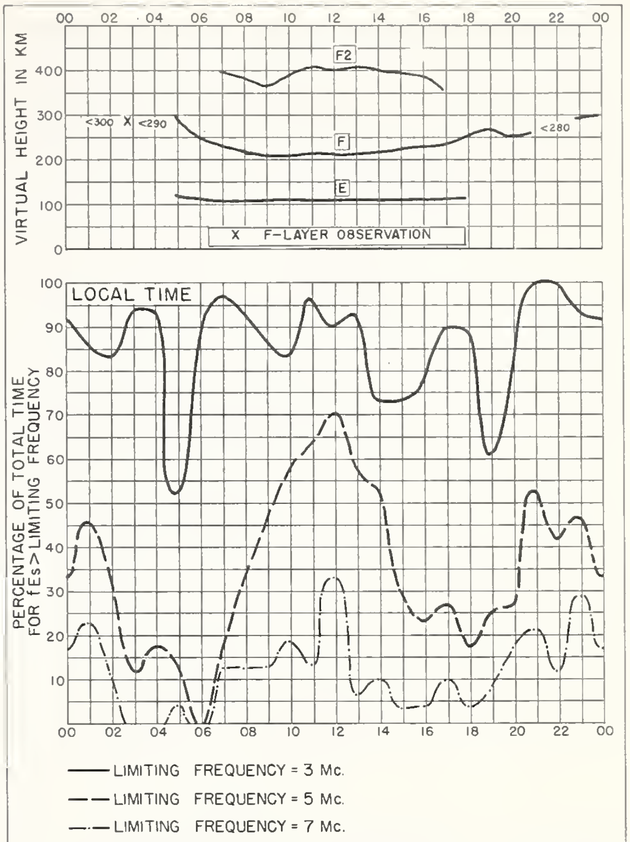


Fig. 38. WHITE SANDS, NEW MEXICO JULY 1957

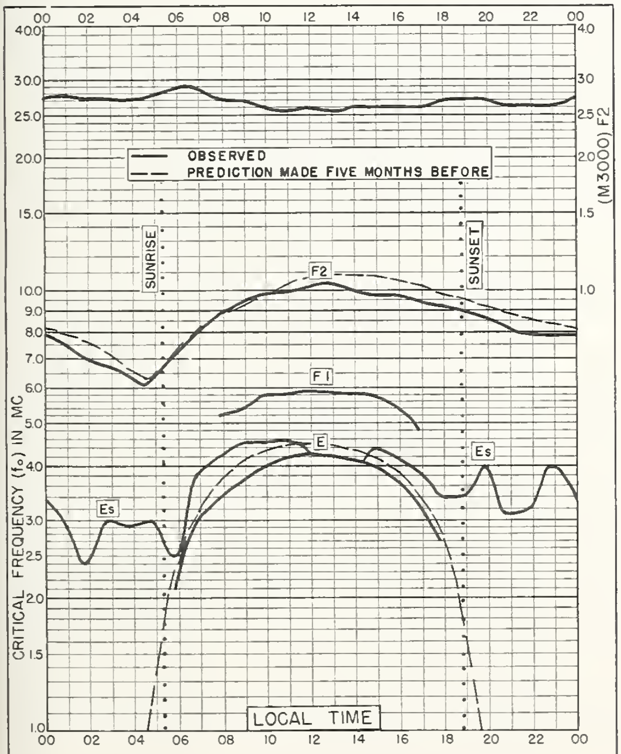


Fig. 39. GRAND BAHAMA I.
26.6°N, 78.2°W JULY 1957

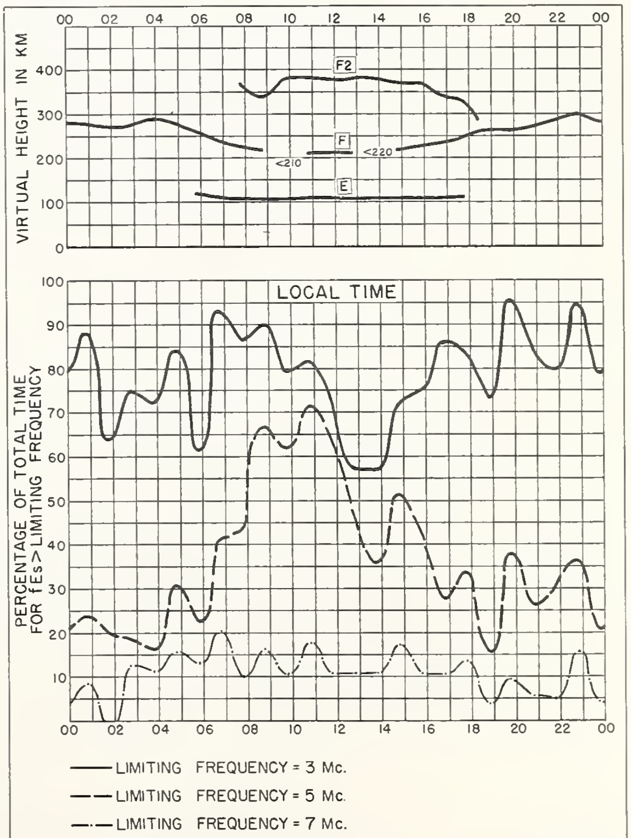


Fig. 40. GRAND BAHAMA I. JULY 1957

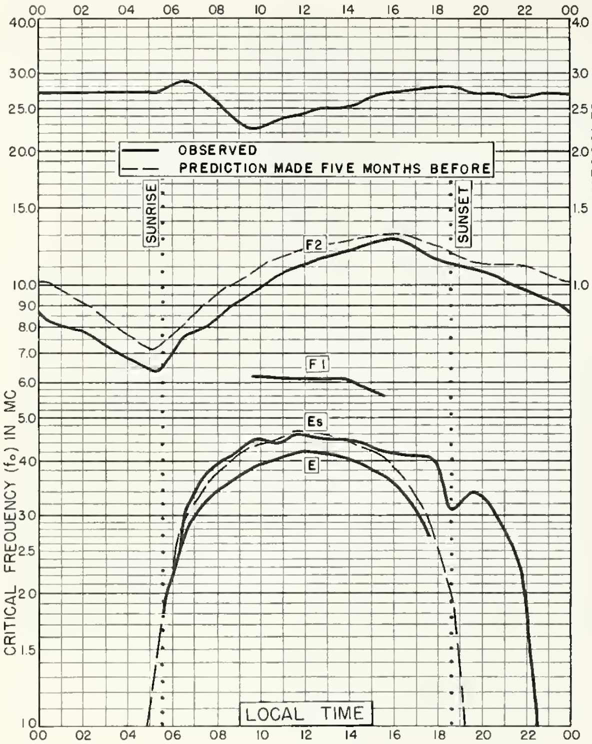


Fig. 41. MAUI, HAWAII
20.8°N, 156.5°W JULY 1957

NBS 503

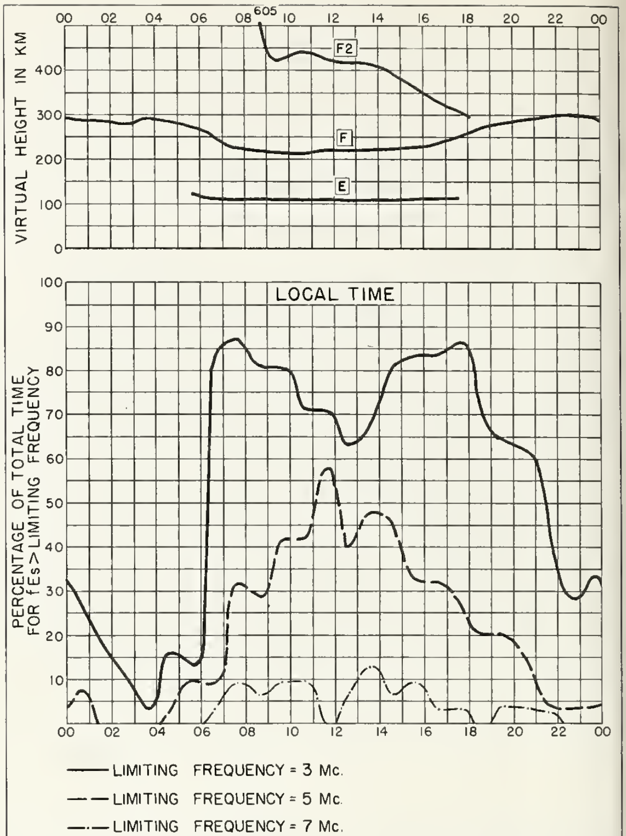


Fig. 42. MAUI, HAWAII JULY 1957

NBS 490

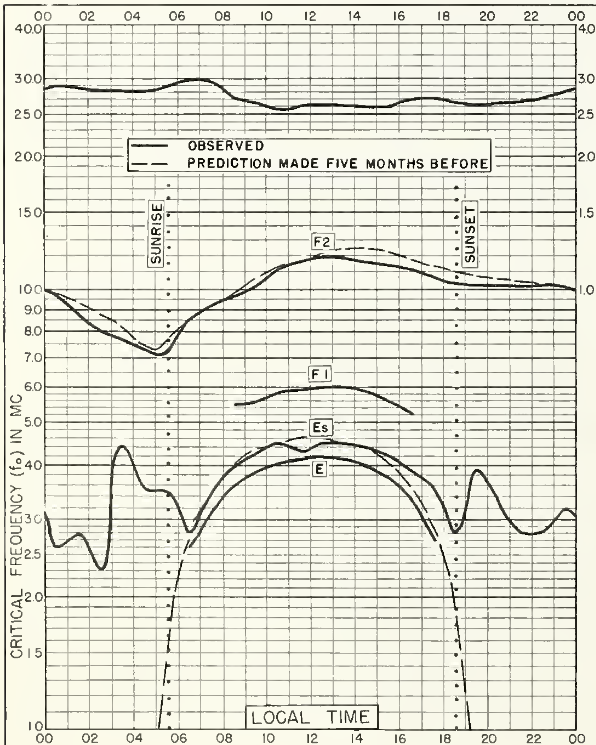


Fig. 43. PUERTO RICO, W.I.
18.5°N, 67.2°W JULY 1957

NBS 503

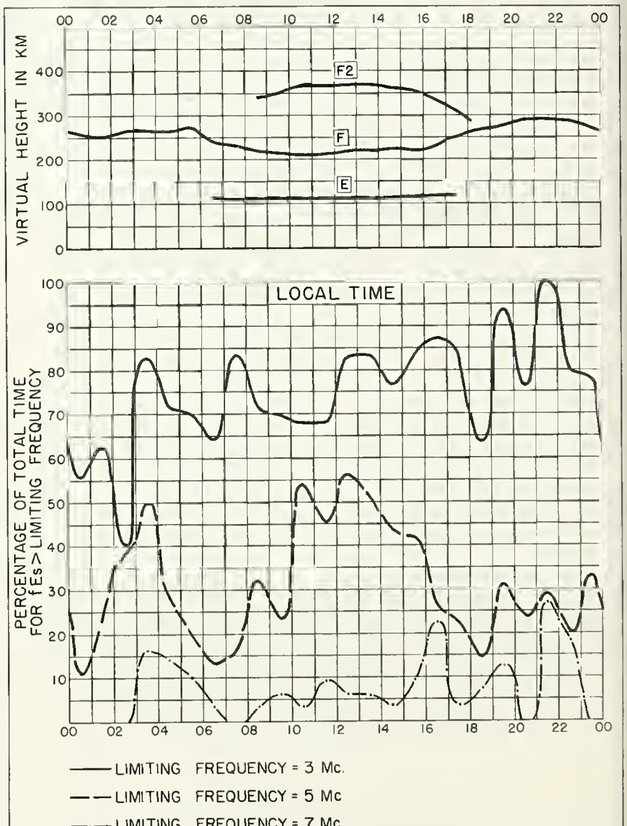


Fig. 44. PUERTO RICO, W.I. JULY 1957

NBS 490

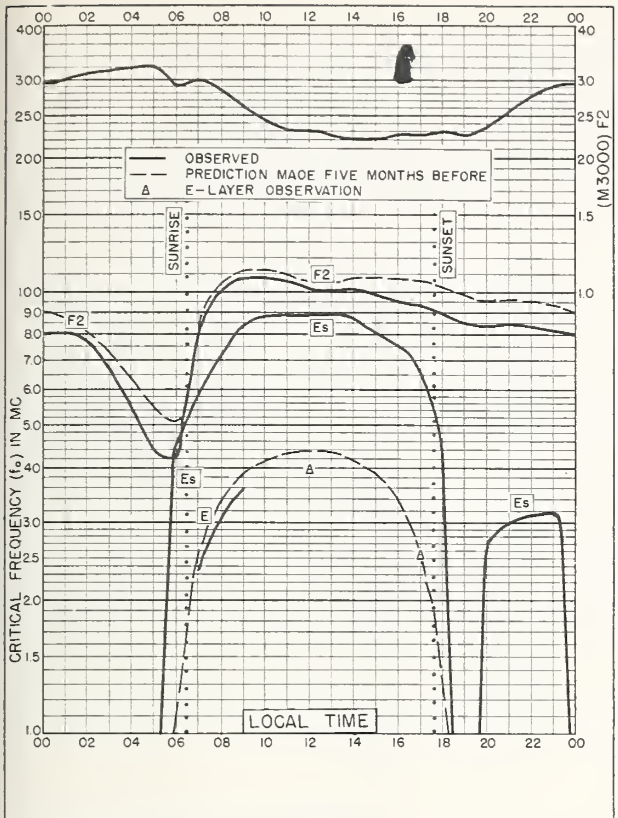


Fig. 45. HUANCAYO, PERU
12.0°S, 75.3°W JULY 1957

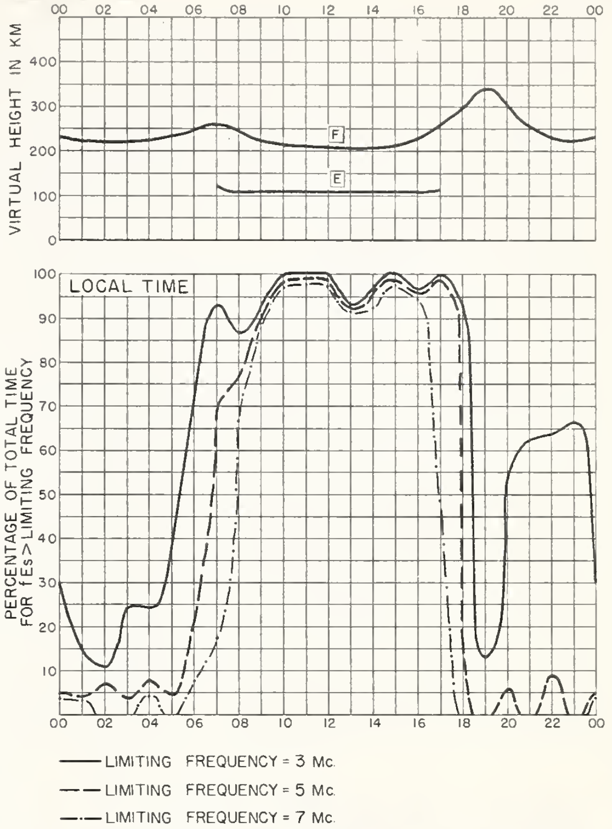


Fig. 46. HUANCAYO, PERU JULY 1957

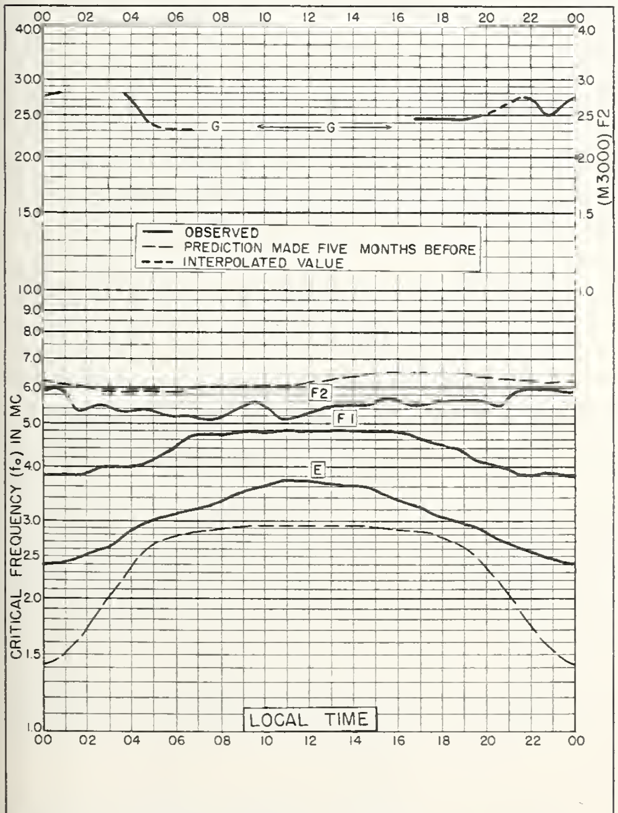


Fig. 47. RESOLUTE BAY, CANADA
74.7°N, 94.9°W JUNE 1957

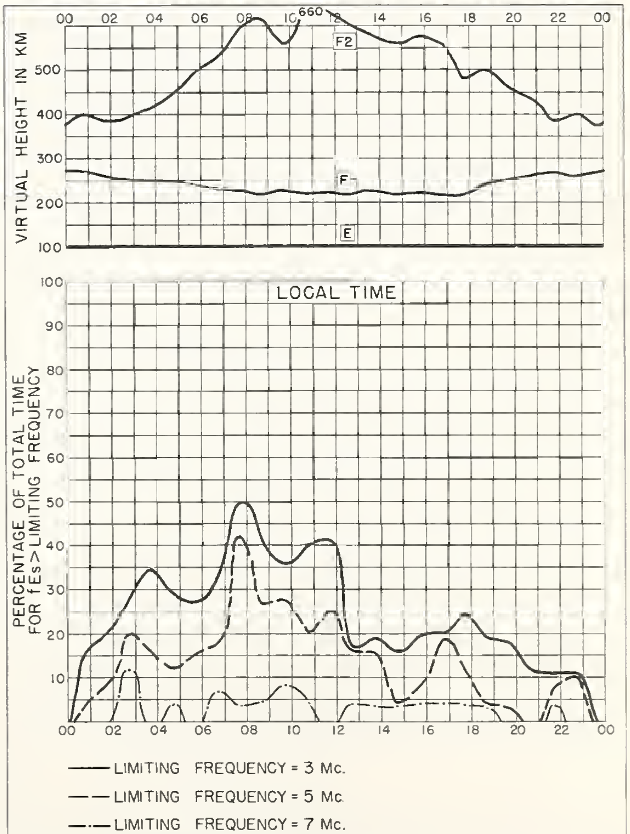


Fig. 48. RESOLUTE BAY, CANADA JUNE 1957

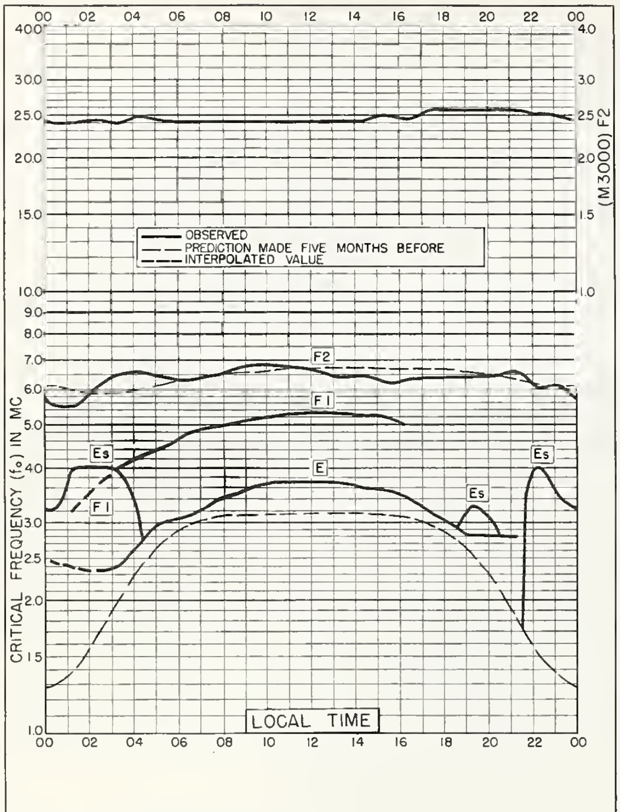


Fig. 49. TROMSO, NORWAY
69.7°N, 19.0°E JUNE 1957

NBS 503

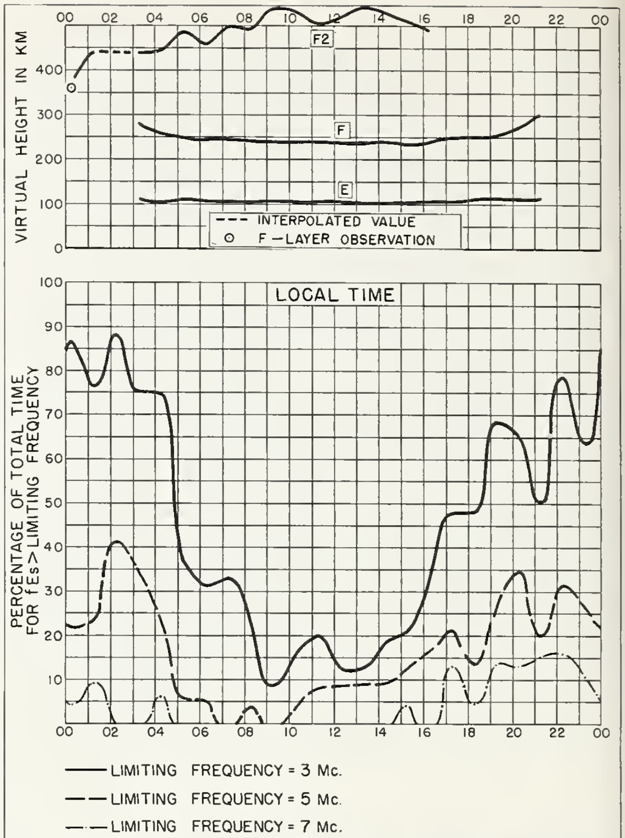


Fig. 50. TROMSO, NORWAY JUNE 1957

NBS 490

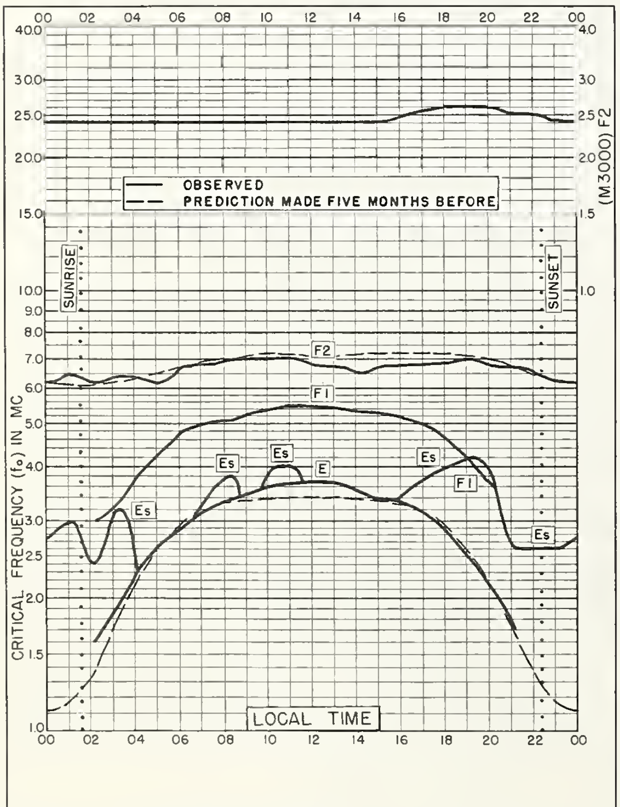


Fig. 51. LYCKSELE, SWEDEN
64.6°N, 18.8°E JUNE 1957

NBS 503

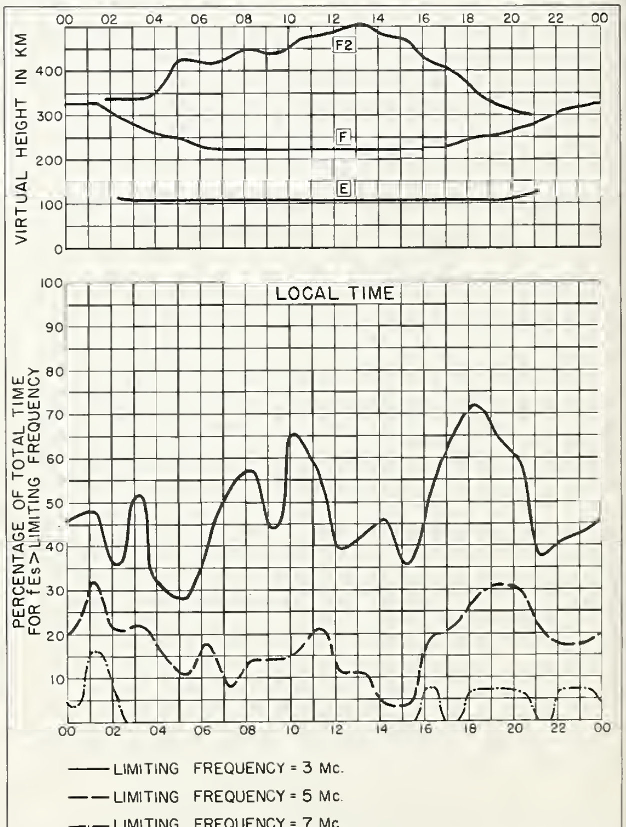


Fig. 52. LYCKSELE, SWEDEN JUNE 1957

NBS 490

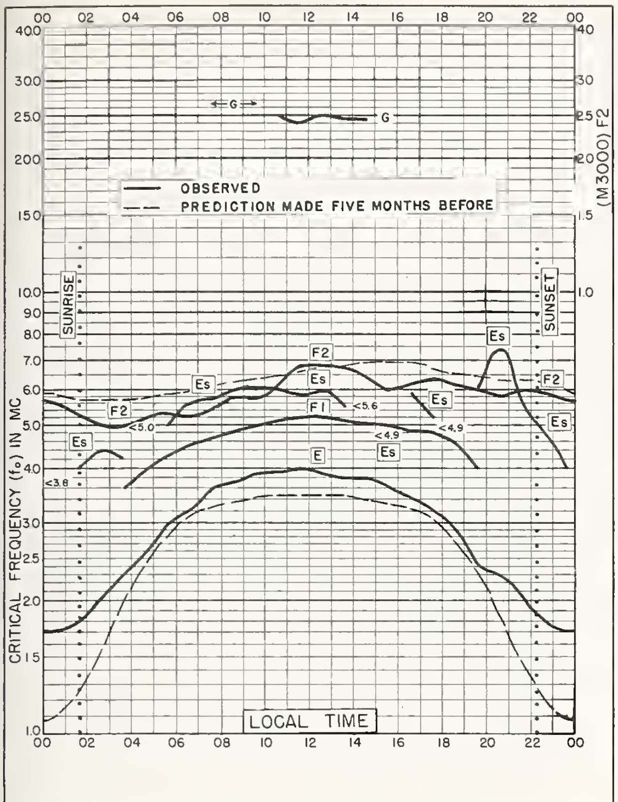


Fig. 53. BAKER LAKE, CANADA
64.3°N, 96.0°W JUNE 1957

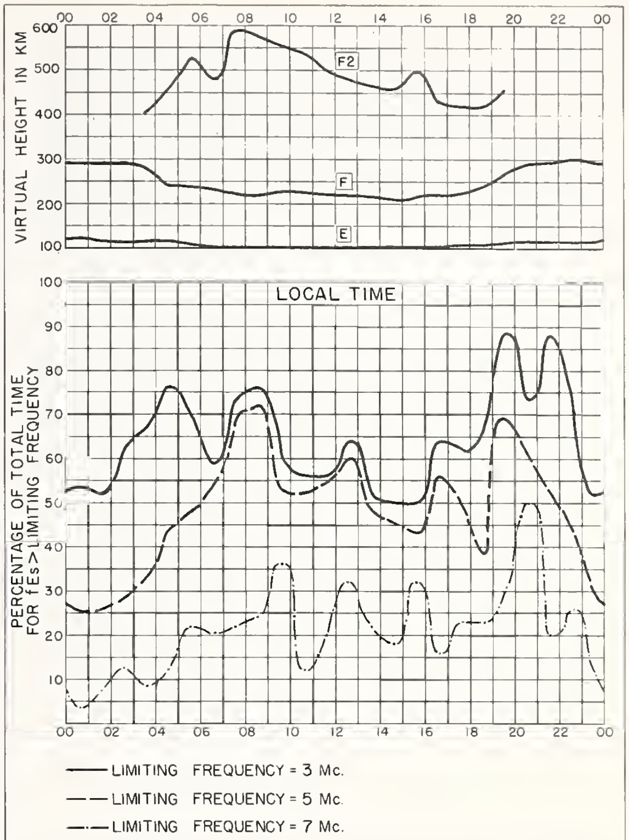


Fig. 54. BAKER LAKE, CANADA JUNE 1957

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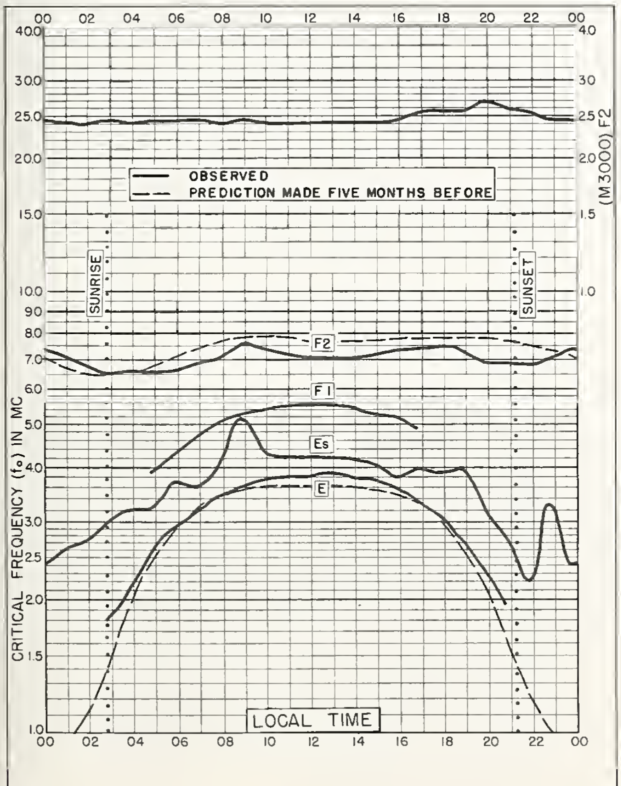


Fig. 55. OSLO, NORWAY
60.0°N, 11.1°E JUNE 1957

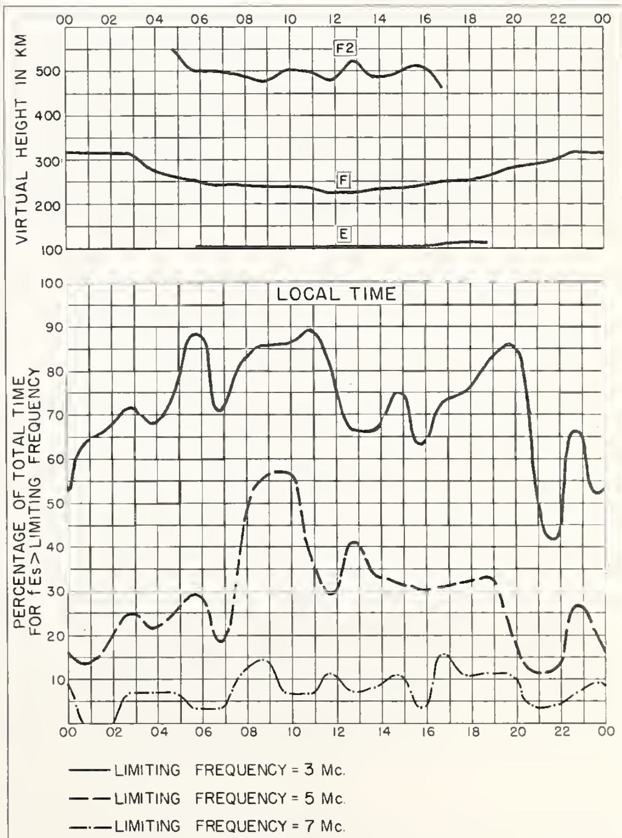


Fig. 56. OSLO, NORWAY JUNE 1957

NBS 503

Commerce-Standards-Boulder, Colo. NBS 490

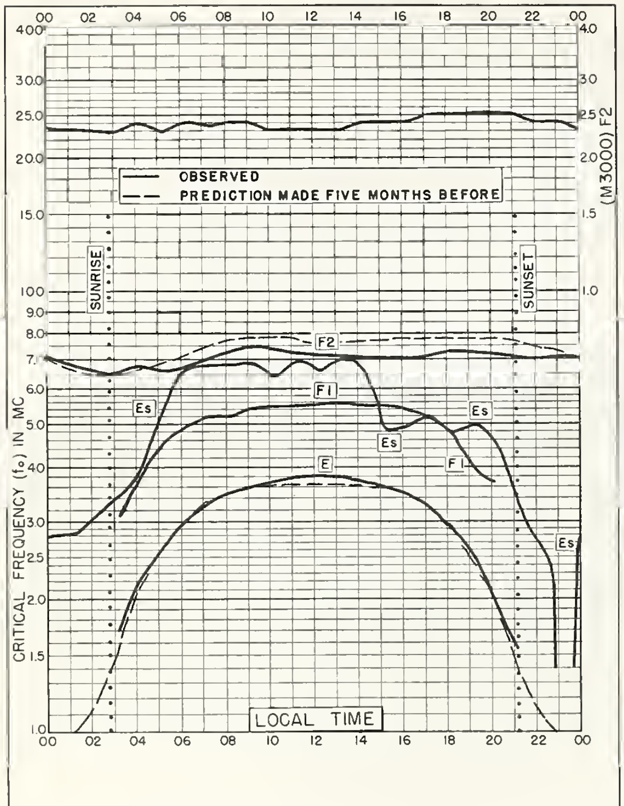


Fig. 57. UPSALA, SWEDEN
59.8°N, 17.6°E JUNE 1957

NBS 503

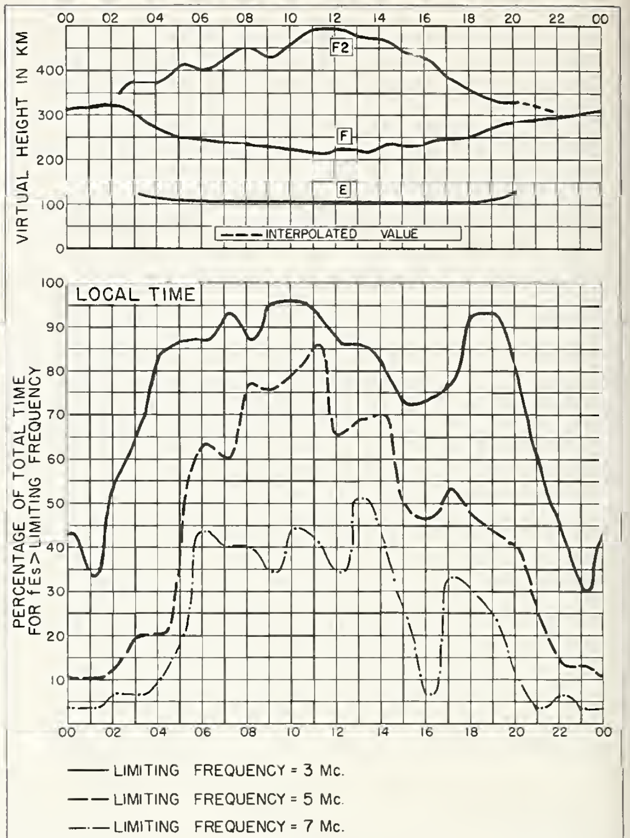


Fig. 58. UPSALA, SWEDEN JUNE 1957

Commerce-Standards-Boulder, Colo.

NBS 490

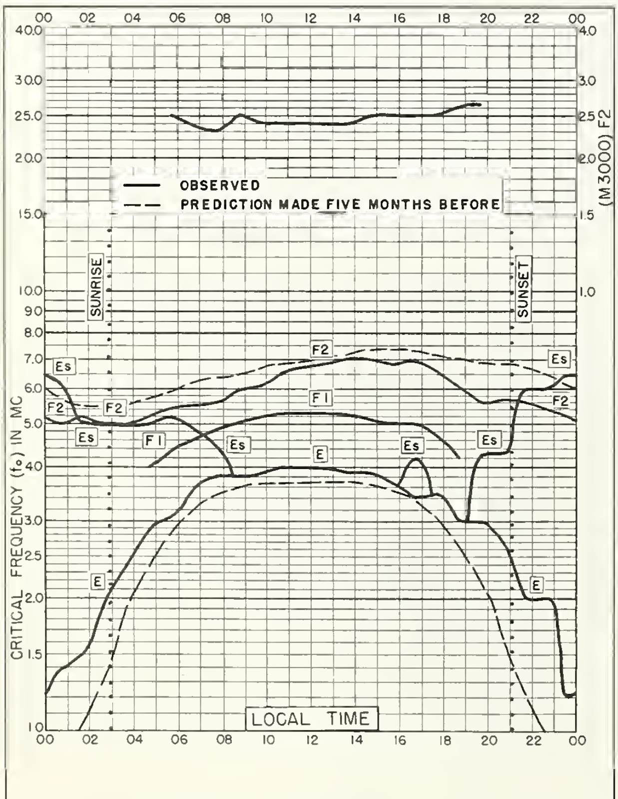


Fig. 59. CHURCHILL, CANADA
58.8°N, 94.2°W JUNE 1957

NBS 503

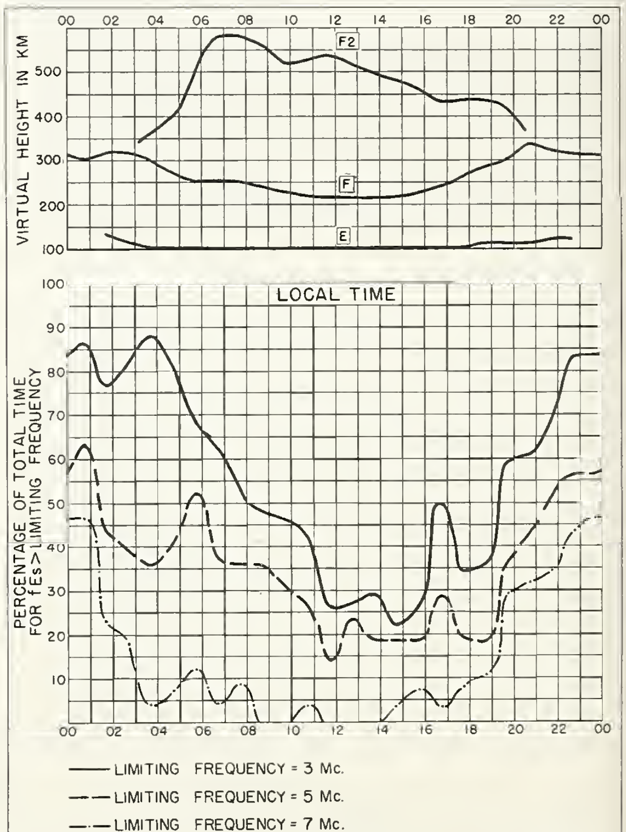


Fig. 60. CHURCHILL, CANADA JUNE 1957

Commerce-Standards-Boulder, Colo.

NBS 490

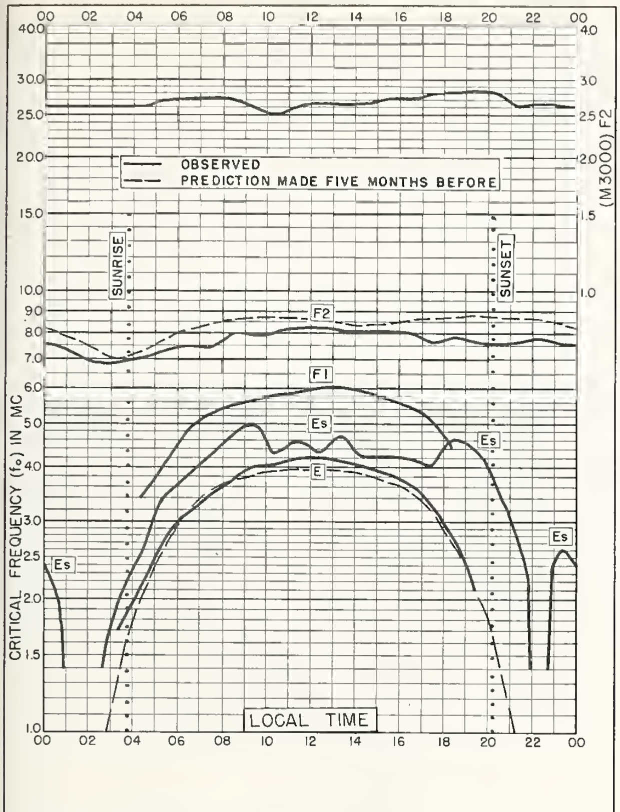


Fig. 61. De BILT, HOLLAND
52.1°N, 5.2°E JUNE 1957

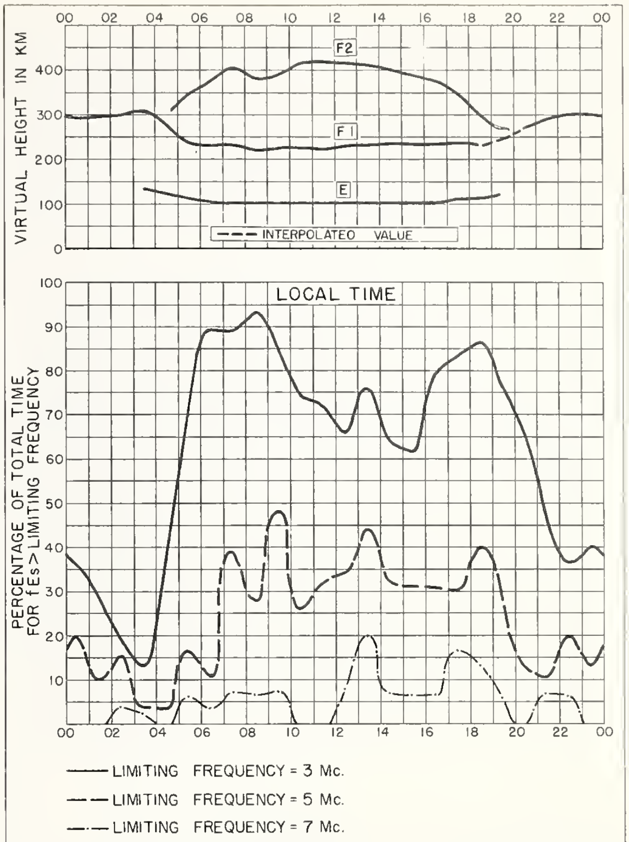


Fig. 62. De BILT, HOLLAND JUNE 1957

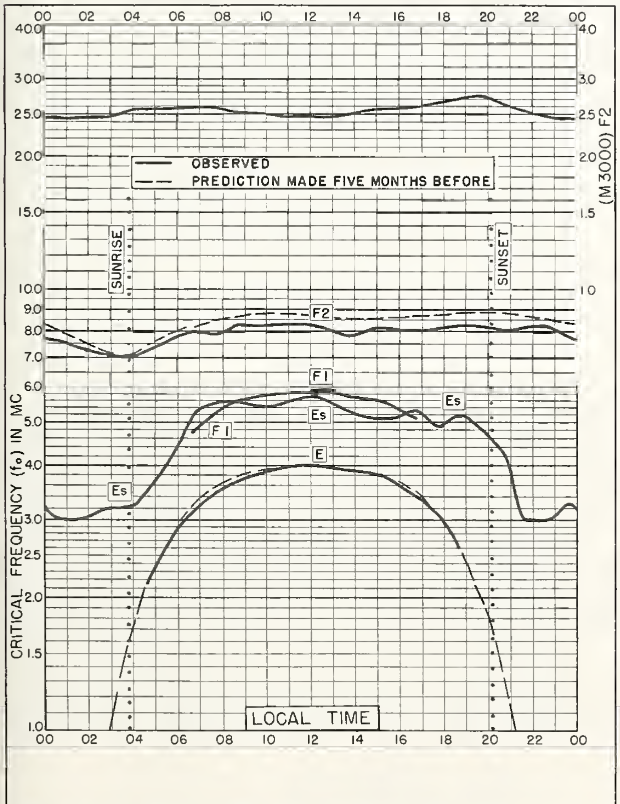


Fig. 63. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E JUNE 1957

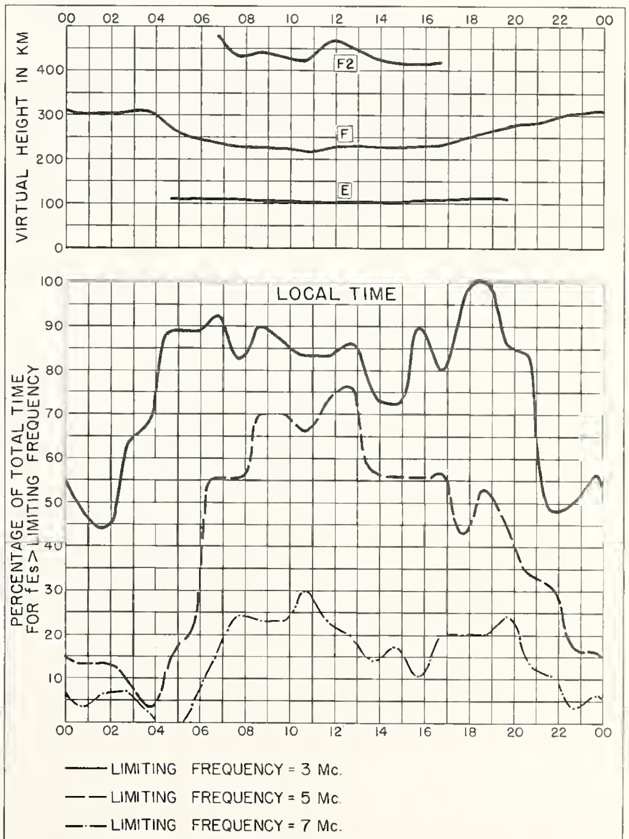


Fig. 64. LINDAU/HARZ, GERMANY JUNE 1957

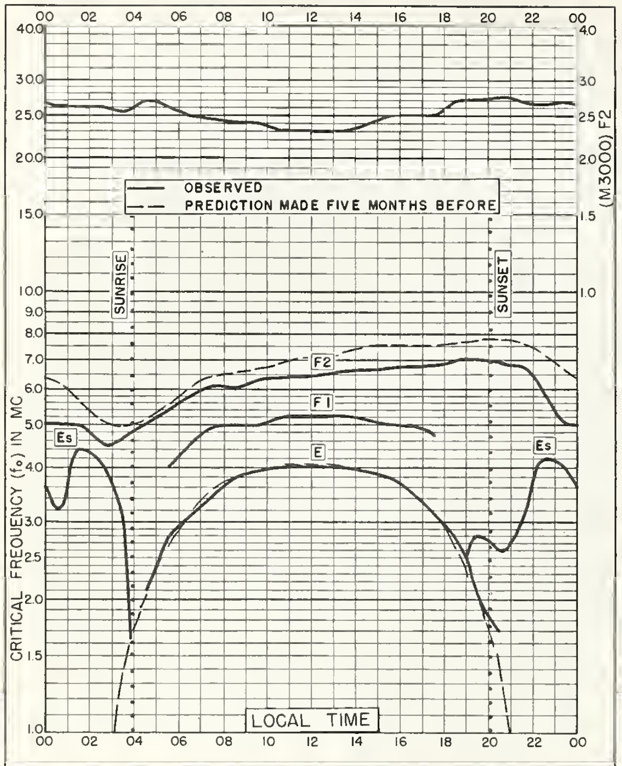


Fig. 65. WINNIPEG, CANADA
49.9°N, 97.4°W JUNE 1957

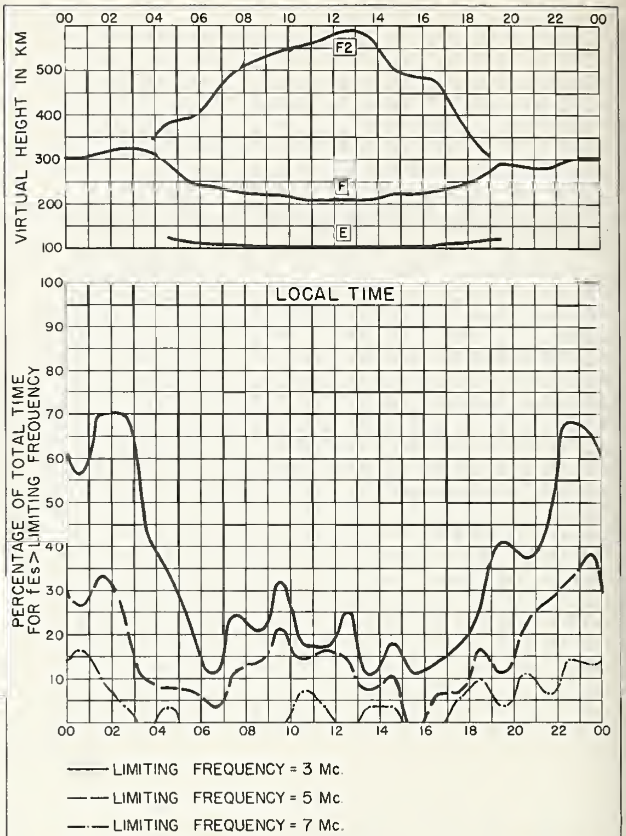


Fig. 66. WINNIPEG, CANADA JUNE 1957

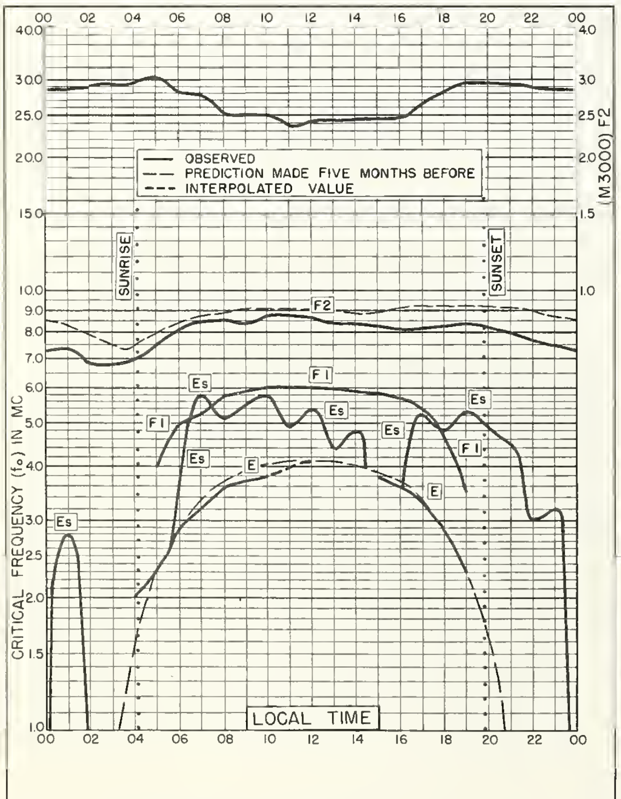


Fig. 67. BUDAPEST, HUNGARY
47.4°N, 19.2°E JUNE 1957

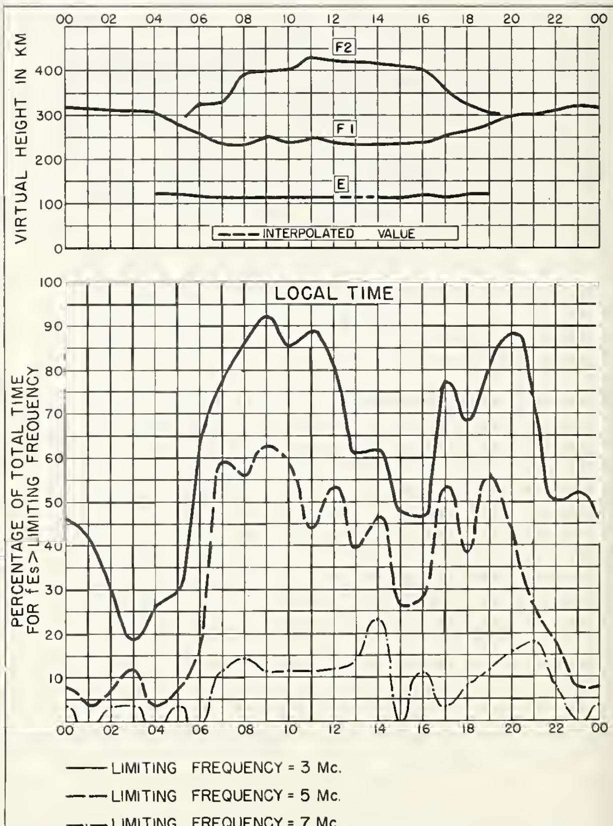


Fig. 68. BUDAPEST, HUNGARY JUNE 1957

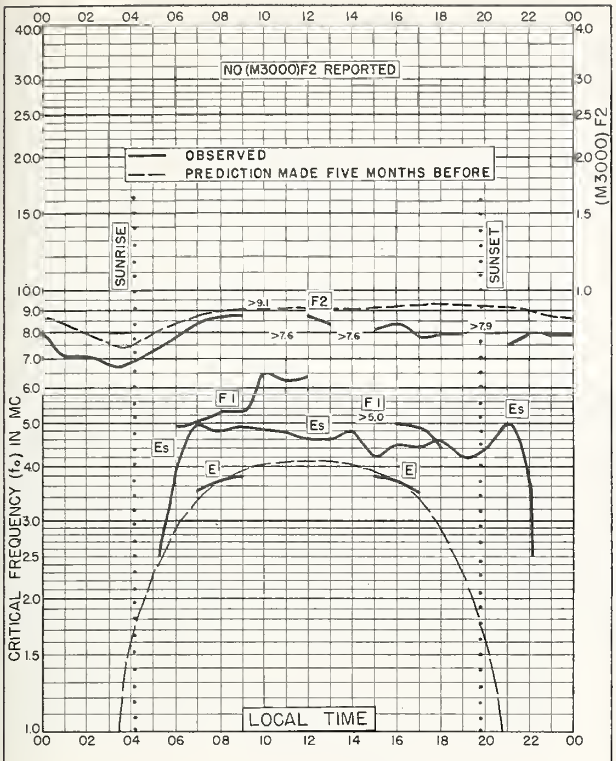


Fig. 69. GRAZ, AUSTRIA
47.1°N, 15.5°E JUNE 1957

NBS 503

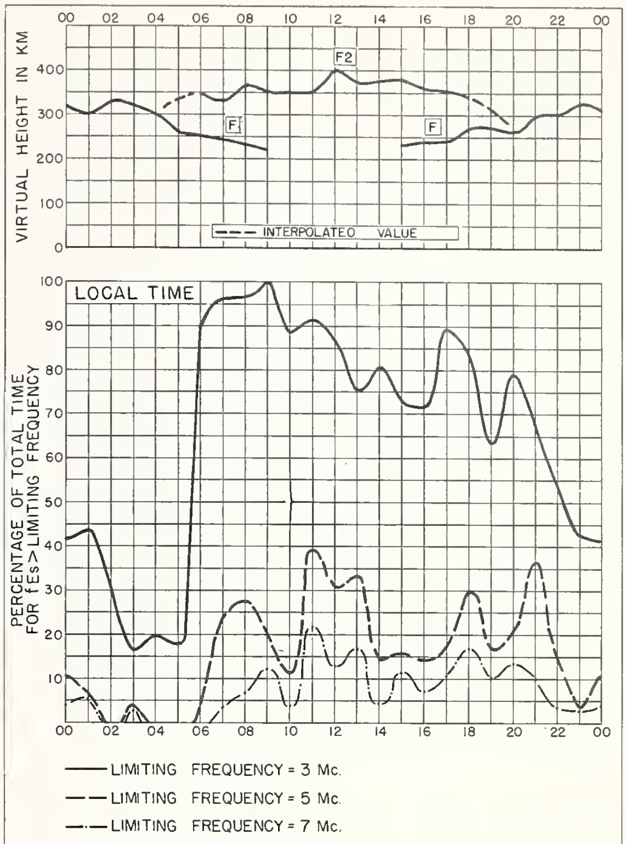


Fig. 70. GRAZ, AUSTRIA JUNE 1957

NBS 490

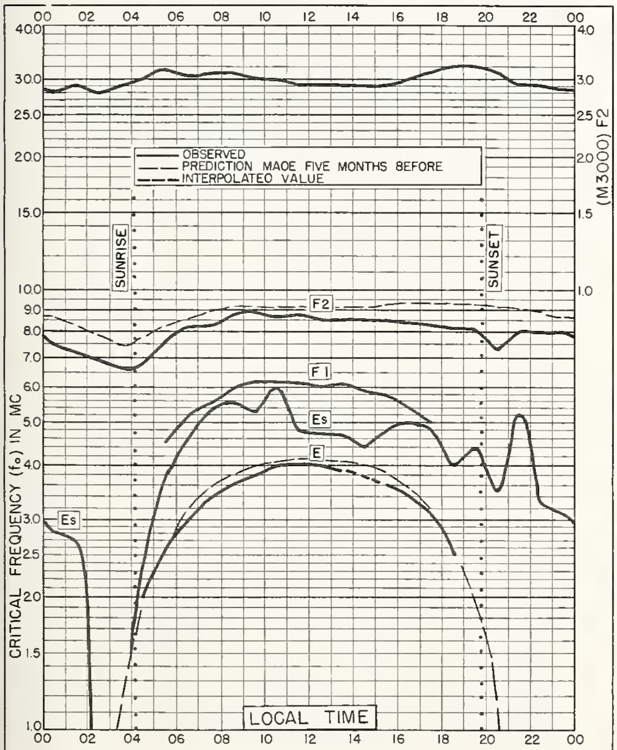
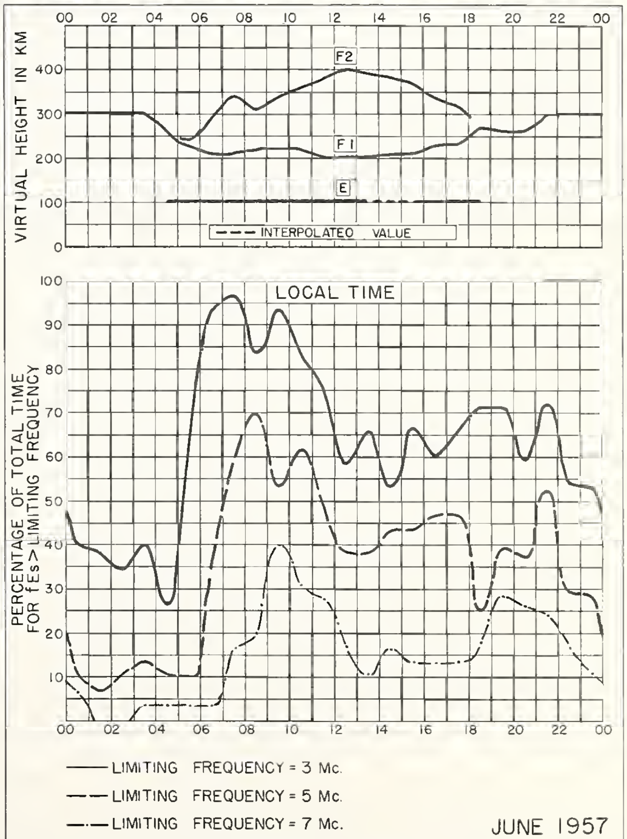


Fig. 71. SCHWARZENBURG, SWITZERLAND
46.8°N, 7.3°E JUNE 1957

NBS 503



JUNE 1957
Fig. 72. SCHWARZENBURG, SWITZERLAND

NBS 490

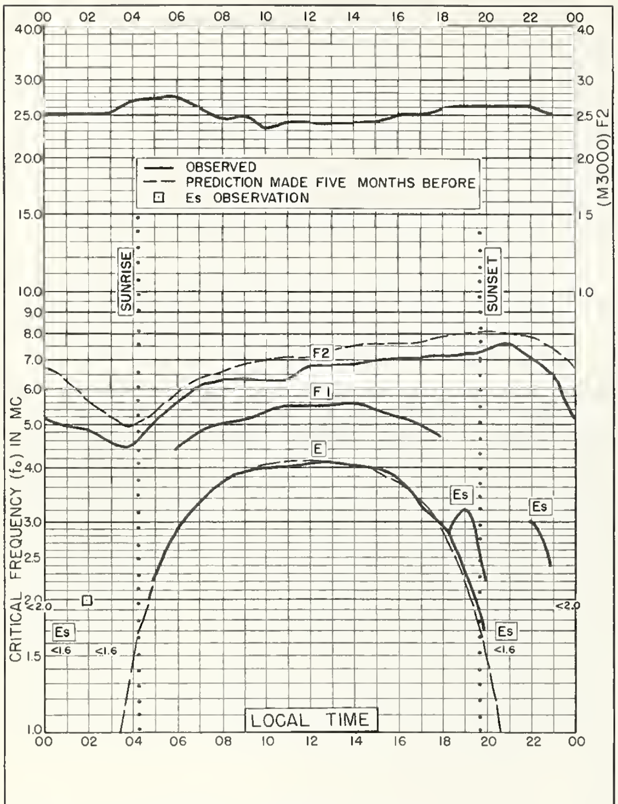


Fig. 73. OTTAWA, CANADA
45.4°N, 75.9°W JUNE 1957

NBS 503

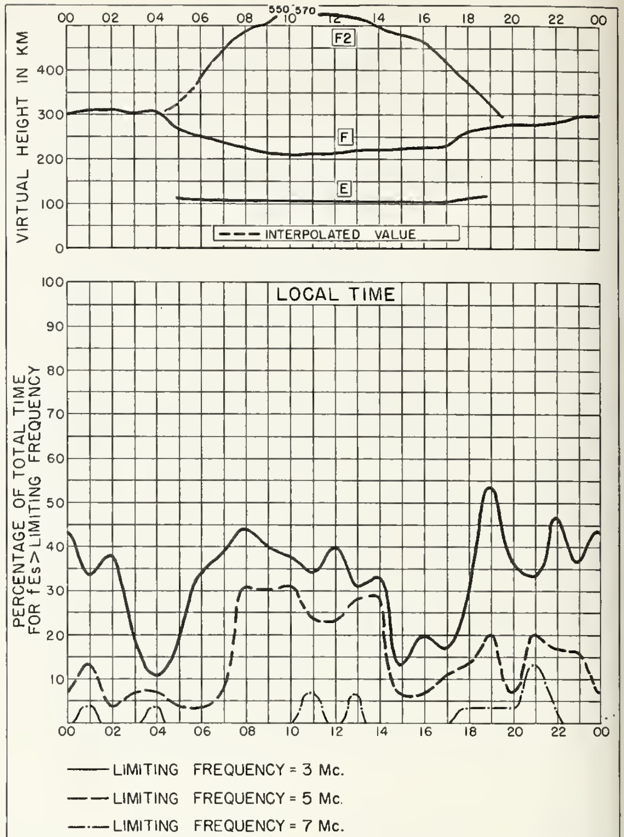


Fig. 74. OTTAWA, CANADA JUNE 1957

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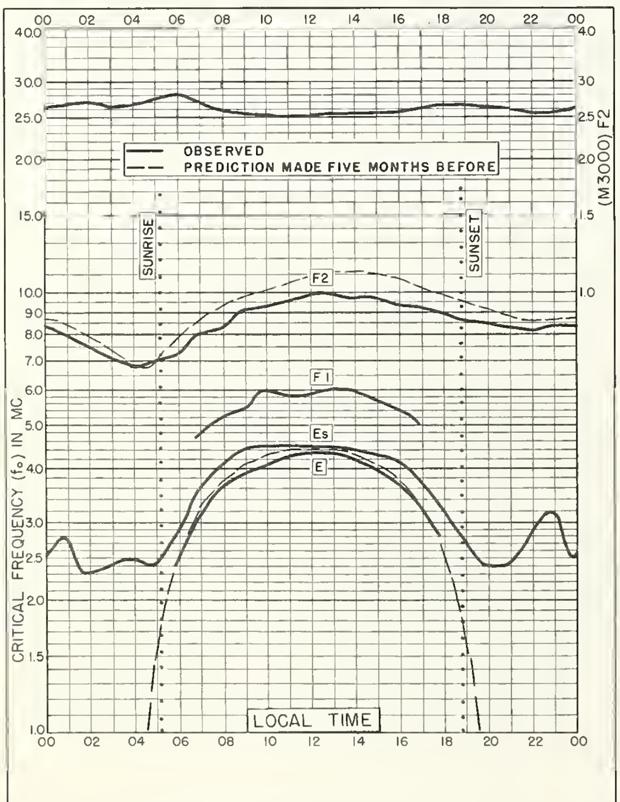

Fig. 75. GRAND BAHAMA I.
26.6°N, 78.2°W JUNE 1957

NBS 503

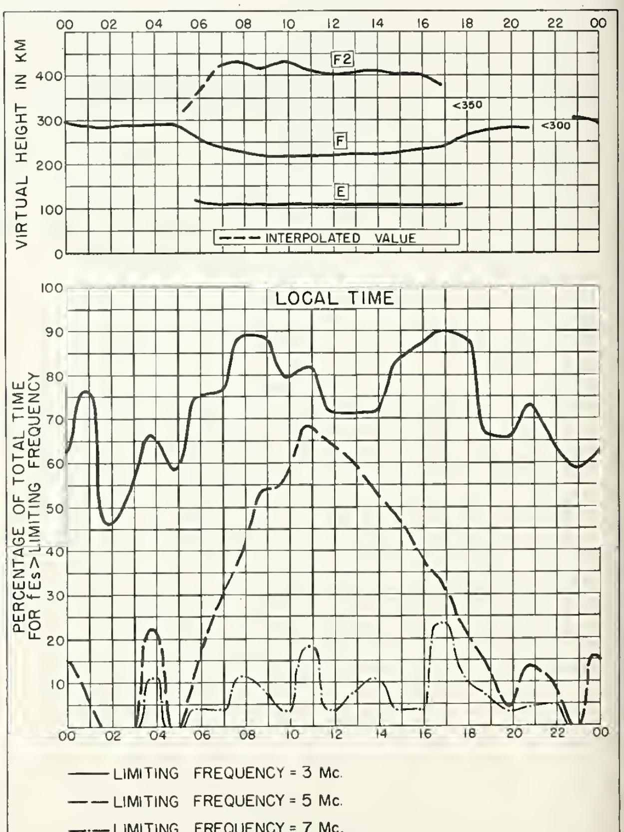

Fig. 76. GRAND BAHAMA I. JUNE 1957

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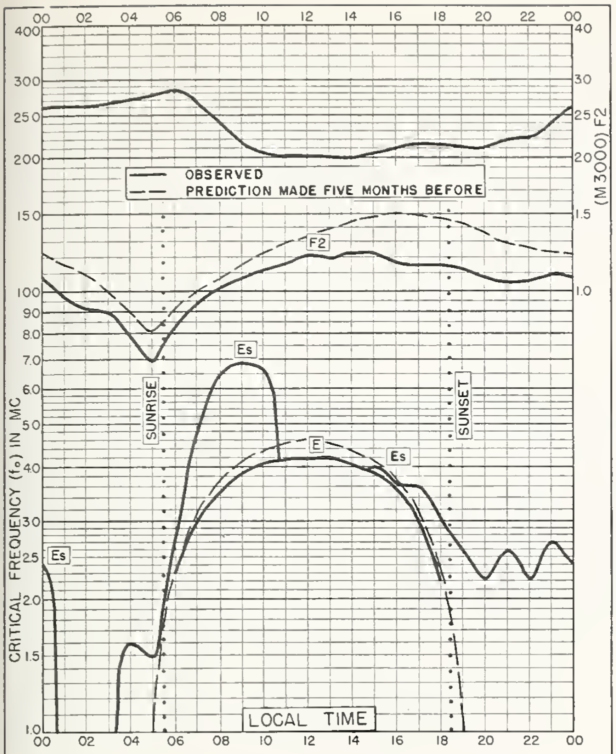

Fig. 77. BAGUIO, P. I.
16.4°N, 120.6°E JUNE 1957

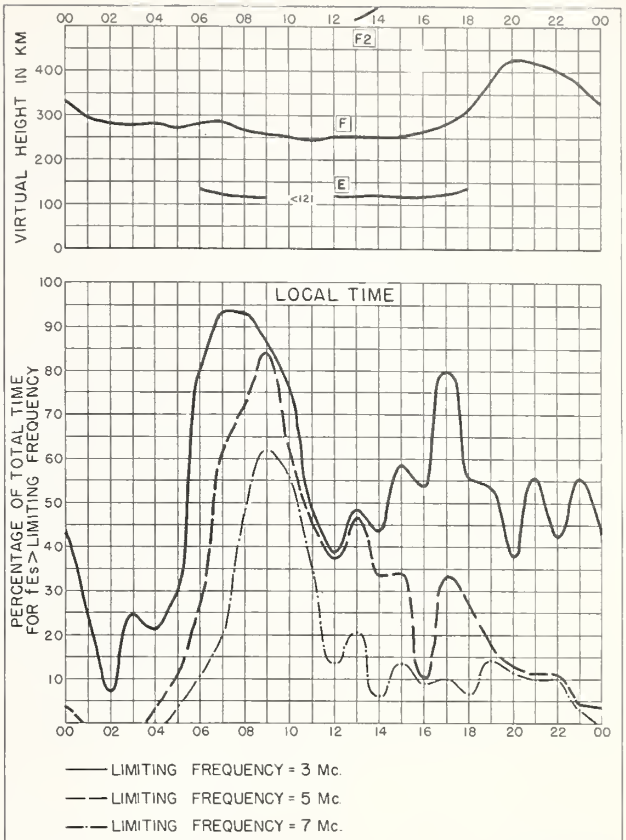

Fig. 78. BAGUIO, P. I. JUNE 1957

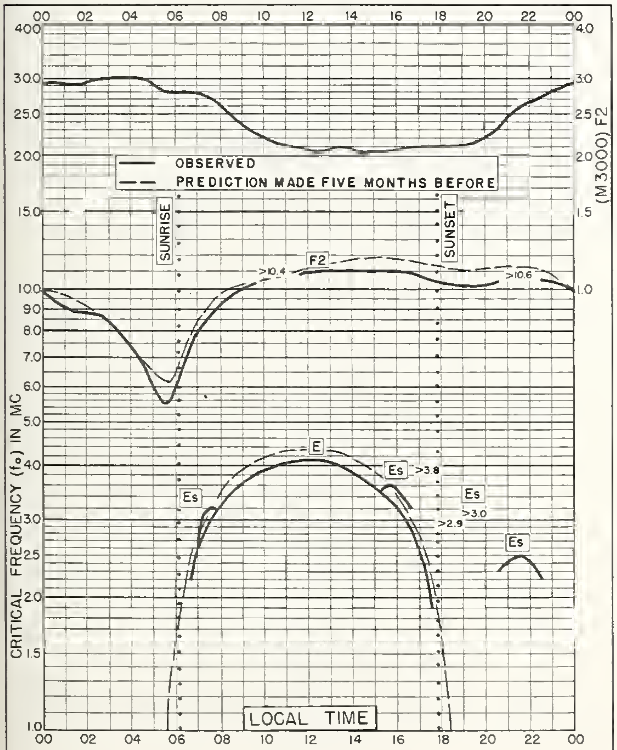

Fig. 79. TALARA, PERU
4.6°S, 81.3°W JUNE 1957

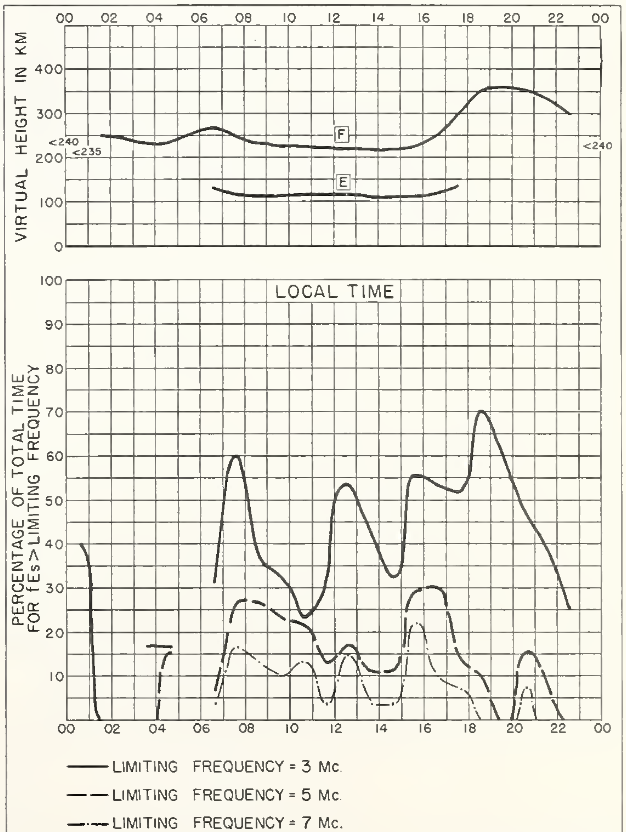

Fig. 80. TALARA, PERU JUNE 1957

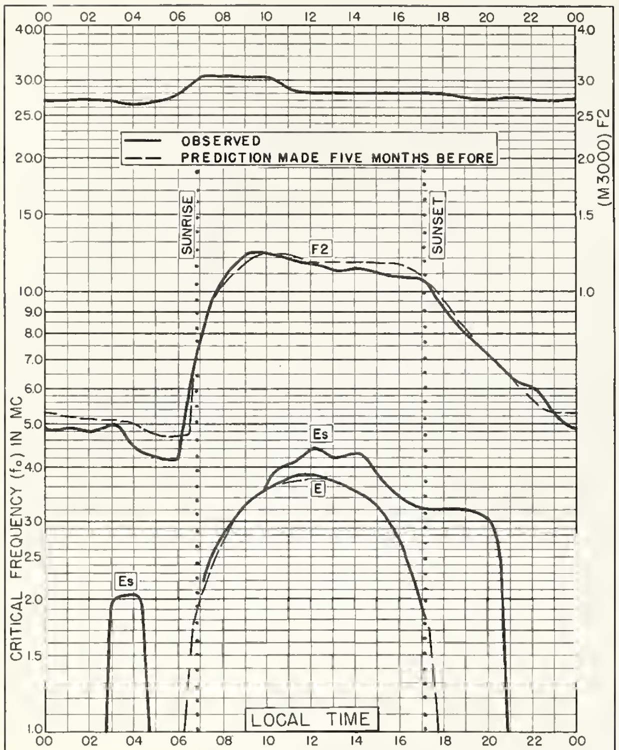

Fig. 81. BRISBANE, AUSTRALIA
27.5°S, 152.9°E JUNE 1957

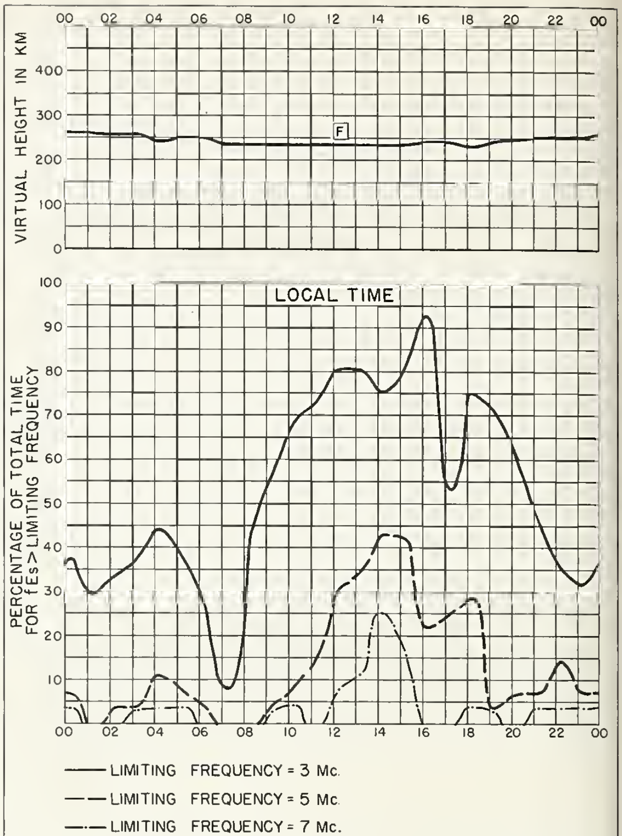

Fig. 82. BRISBANE, AUSTRALIA JUNE 1957

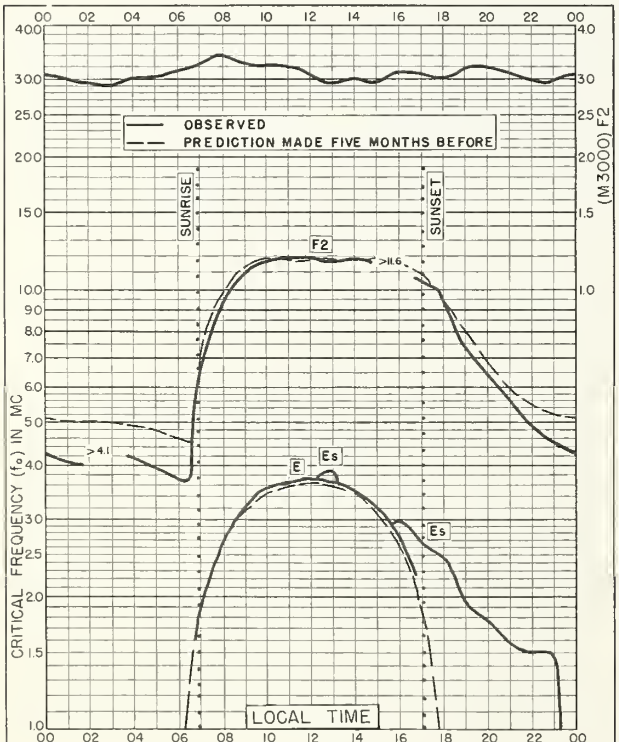

Fig. 83. WATHEROO, W. AUSTRALIA
30.3°S, 115.9°E JUNE 1957

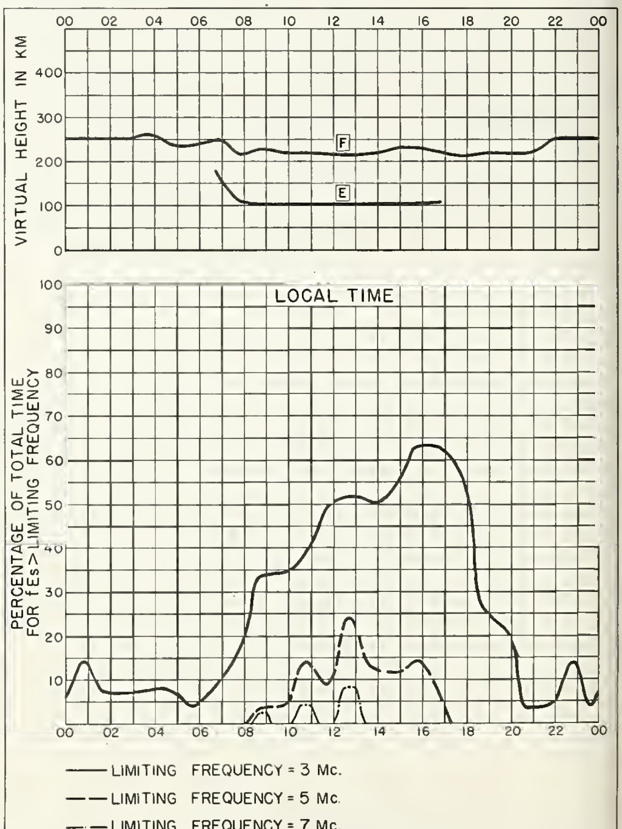

Fig. 84. WATHEROO, W. AUSTRALIA JUNE 1957

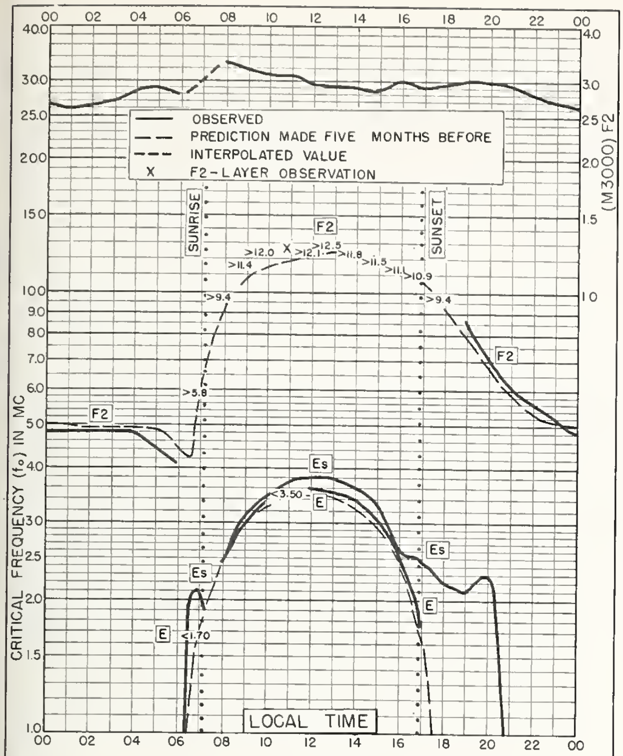

Fig. 85. CANBERRA, AUSTRALIA
35.3°S, 149.0°E JUNE 1957

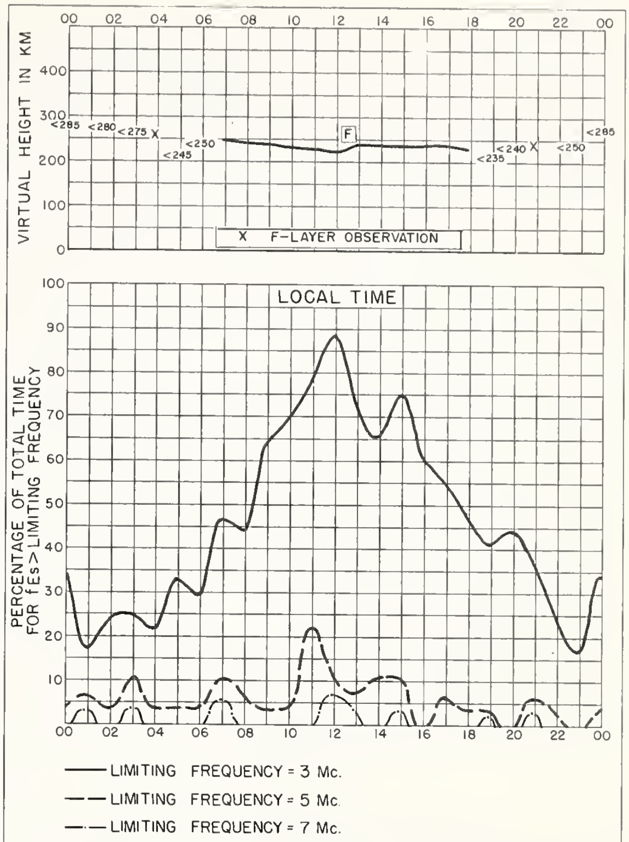

Fig. 86. CANBERRA, AUSTRALIA JUNE 1957

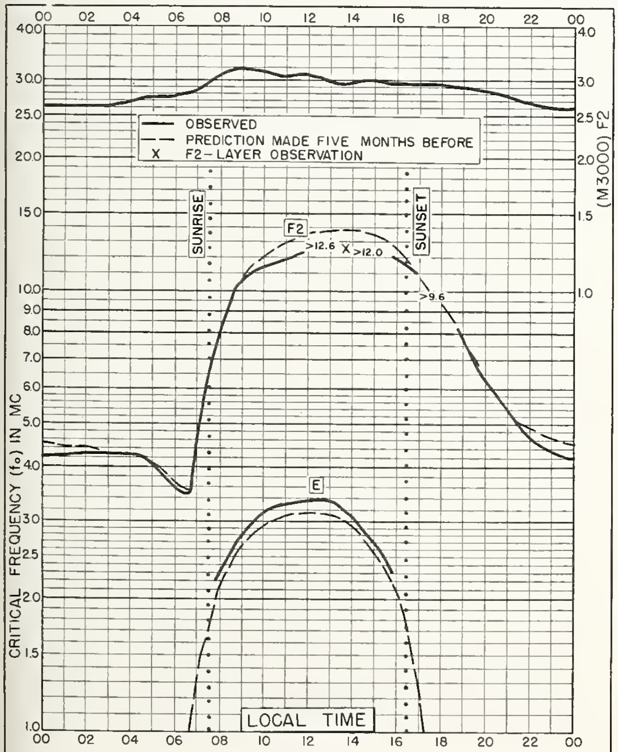

Fig. 87. HOBART, TASMANIA
42.9°S, 147.2°E JUNE 1957

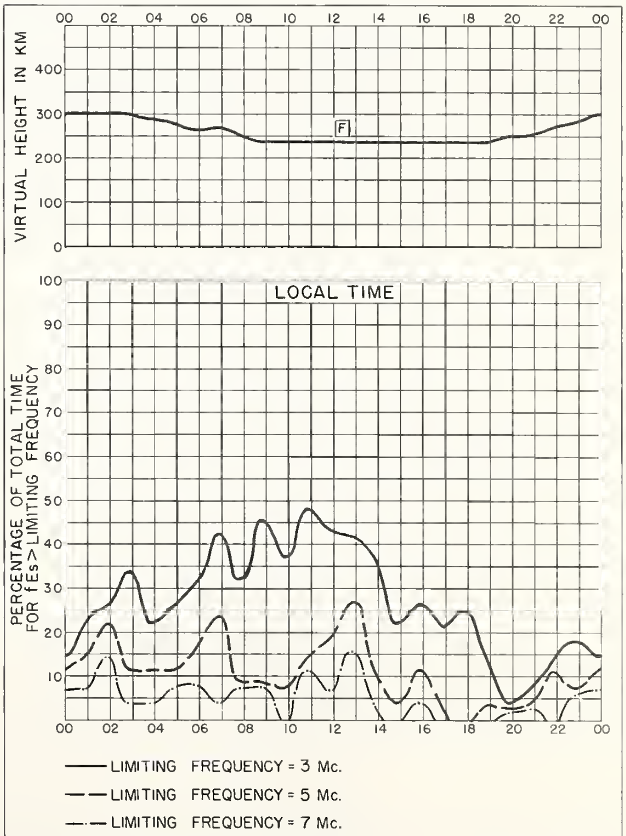

Fig. 88. HOBART, TASMANIA JUNE 1957

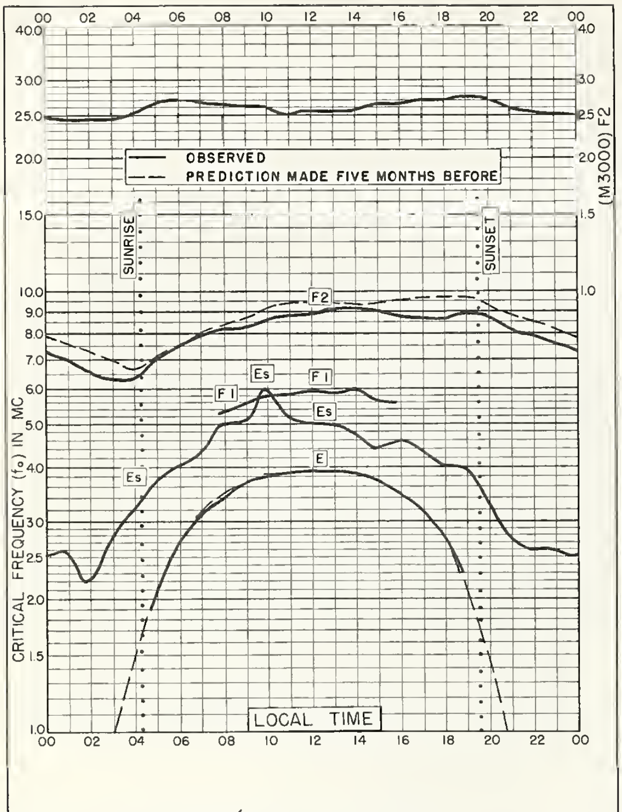

Fig. 89. LINDAU/HARZ, GERMANY
51.6°N, 10.1°E MAY 1957

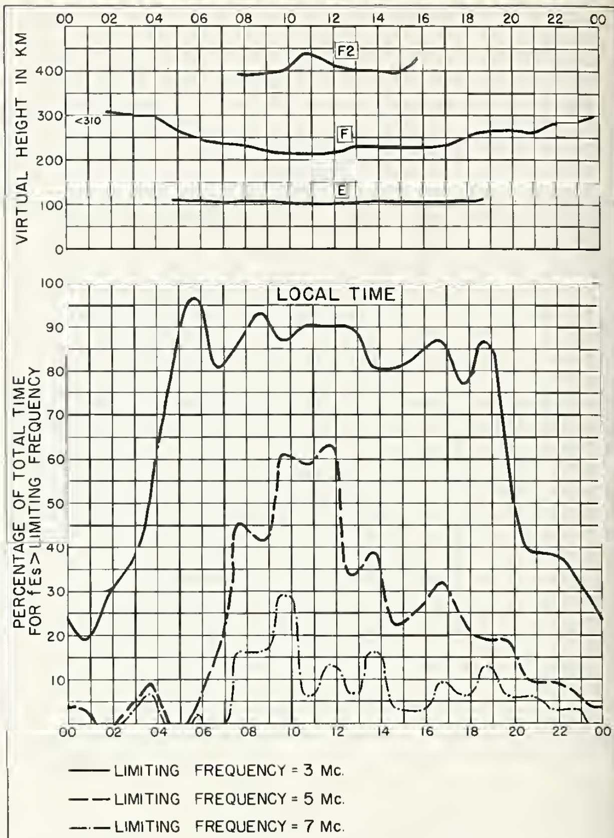

Fig. 90. LINDAU/HARZ, GERMANY MAY 1957

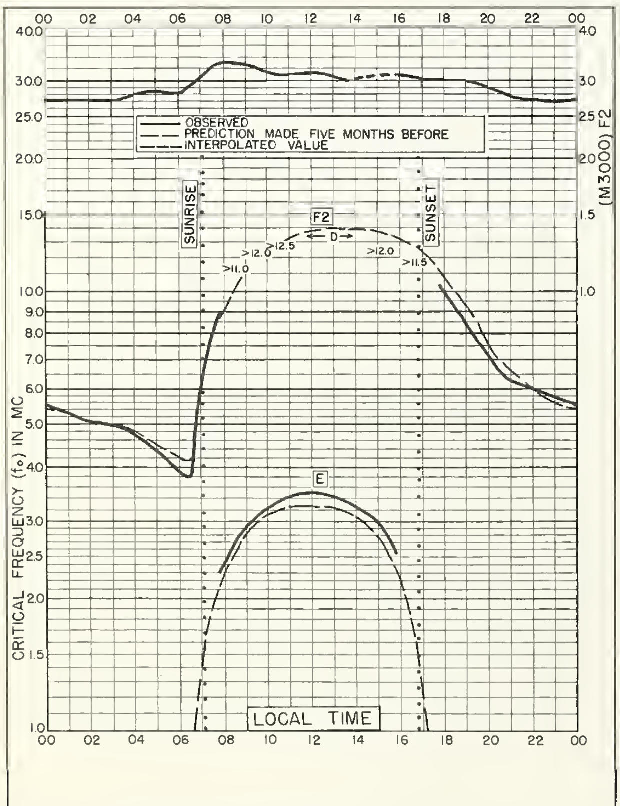

Fig. 91. HOBART, TASMANIA
42.9°S, 147.2°E MAY 1957

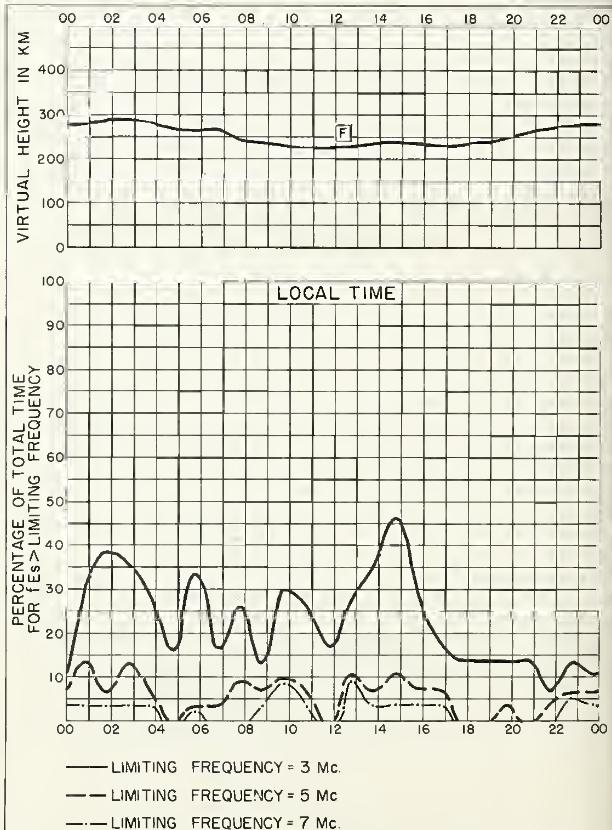

Fig. 92. HOBART, TASMANIA MAY 1957

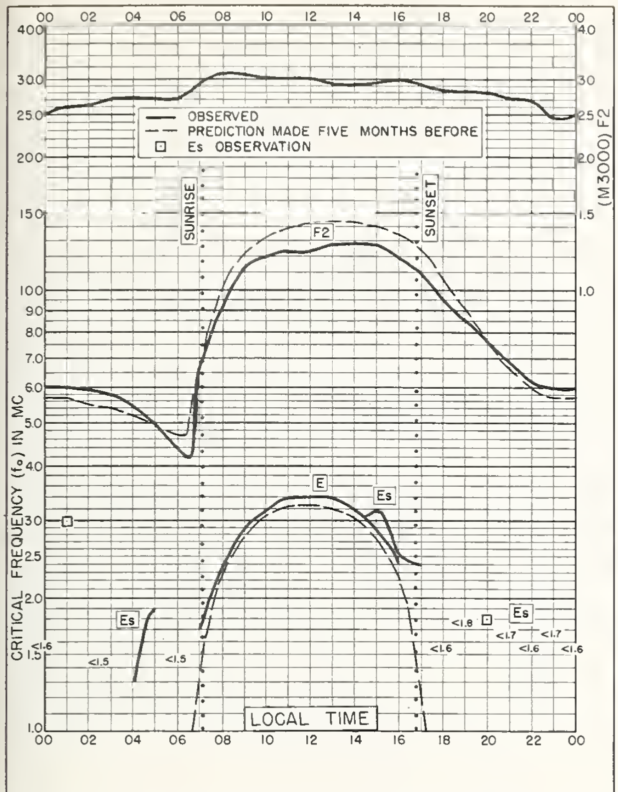

Fig. 93. CHRISTCHURCH, NEW ZEALAND
43.6°S, 172.8°E MAY 1957

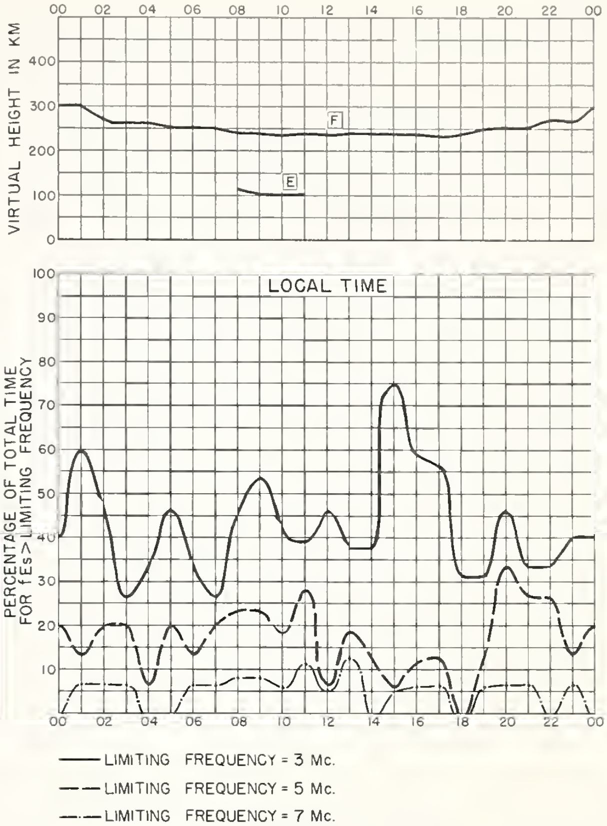

Fig. 94. CHRISTCHURCH, NEW ZEALAND MAY 1957

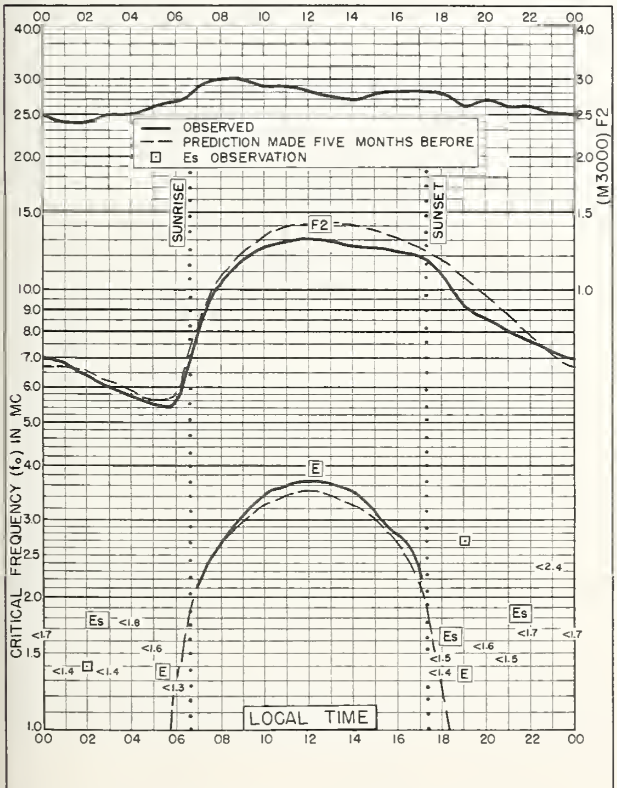

Fig. 95. CHRISTCHURCH, NEW ZEALAND
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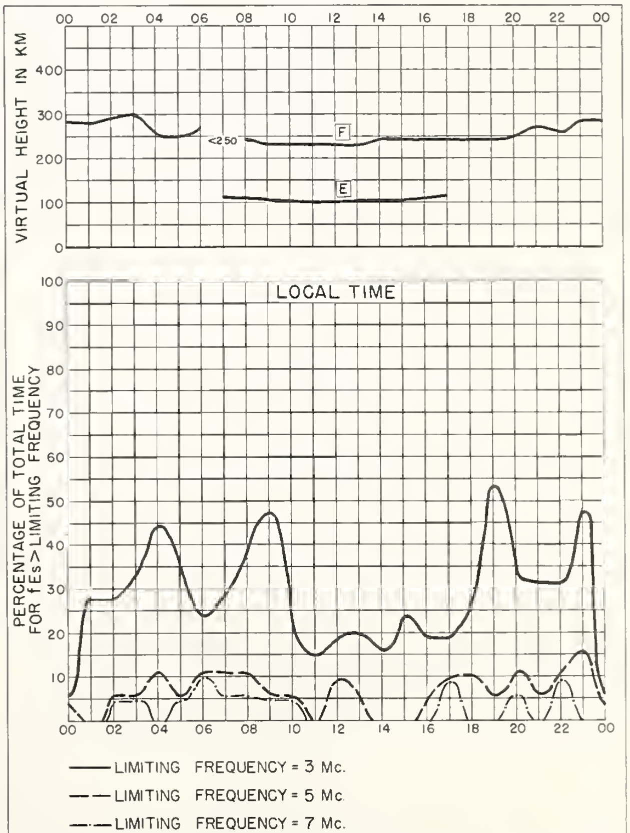

Fig. 96. CHRISTCHURCH, NEW ZEALAND APRIL 1957

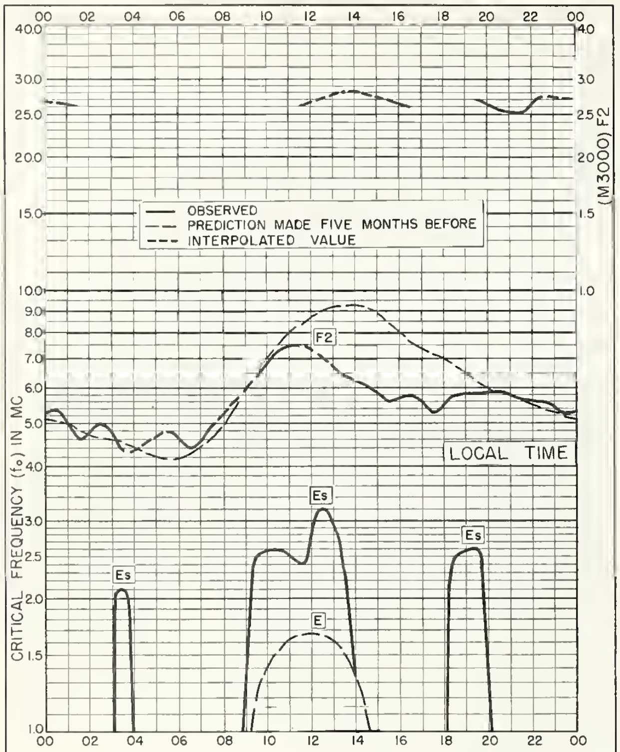

Fig. 97. GODHAVN, GREENLAND
69.2°N, 53.5°W DECEMBER 1956

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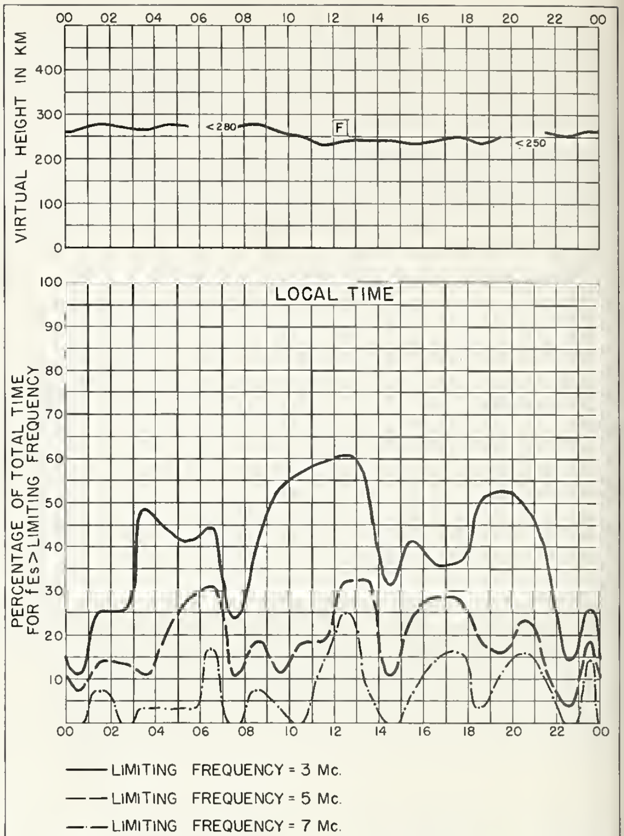

Fig. 98. GODHAVN, GREENLAND DECEMBER 1956

Commerce-Standards-Boulder, Colo. NBS 490

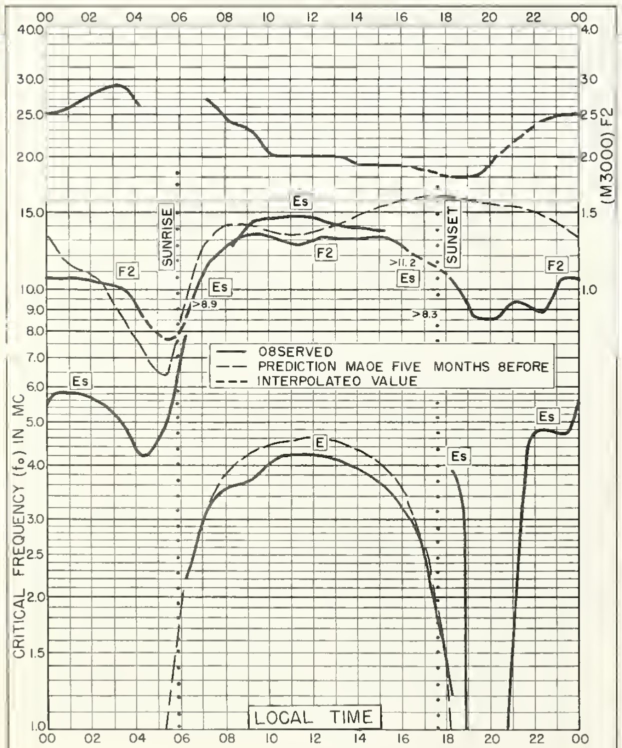

Fig. 99. IBADAN, NIGERIA
7.4°N, 4.0°E NOVEMBER 1956

NBS 503

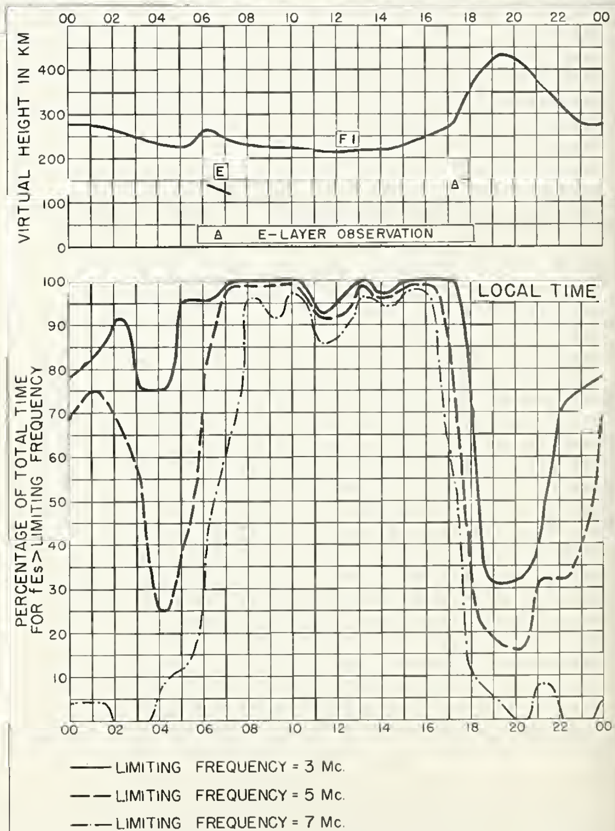

Fig. 100. IBADAN, NIGERIA NOVEMBER 1956

Commerce-Standards-Boulder, Colo. NBS 490

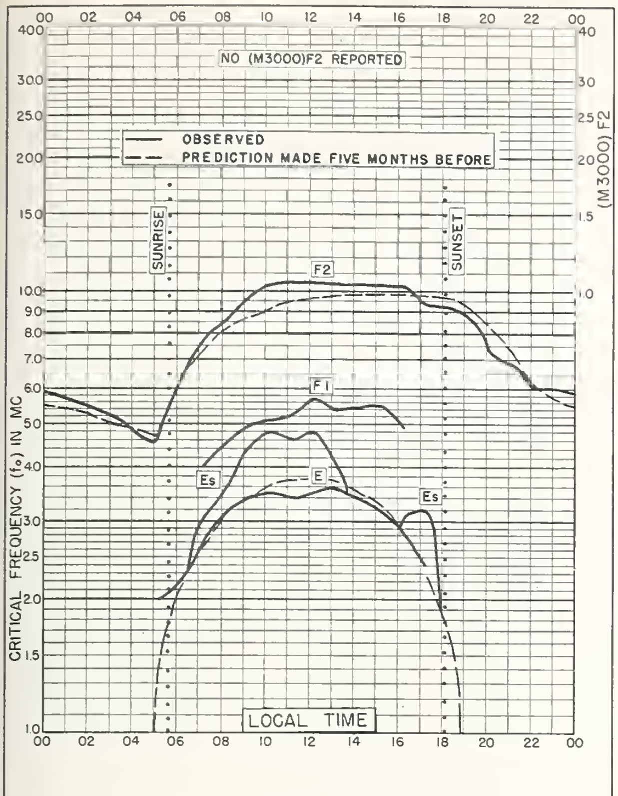

Fig. 101. BUDAPEST, HUNGARY
47.4°N, 19.2°E SEPTEMBER 1956

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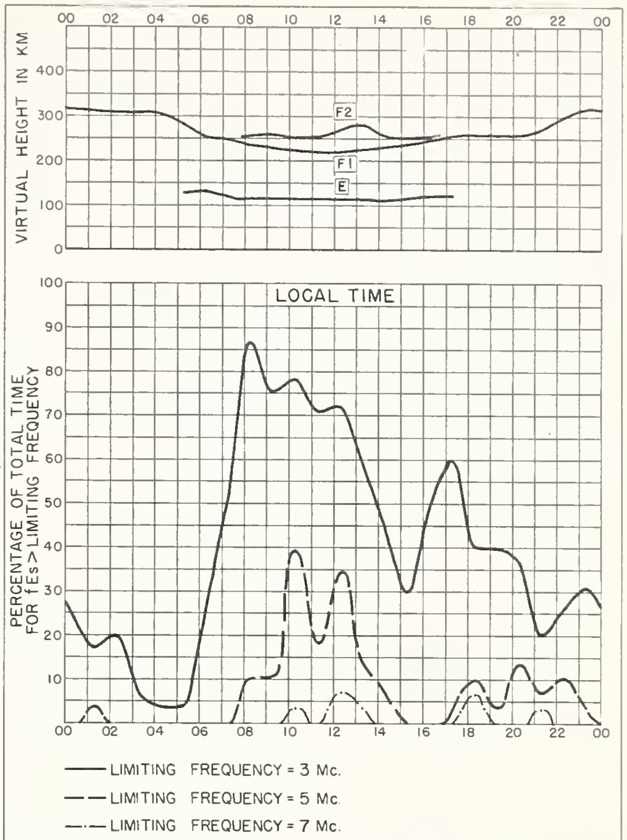

Fig. 102. BUDAPEST, HUNGARY SEPTEMBER 1956

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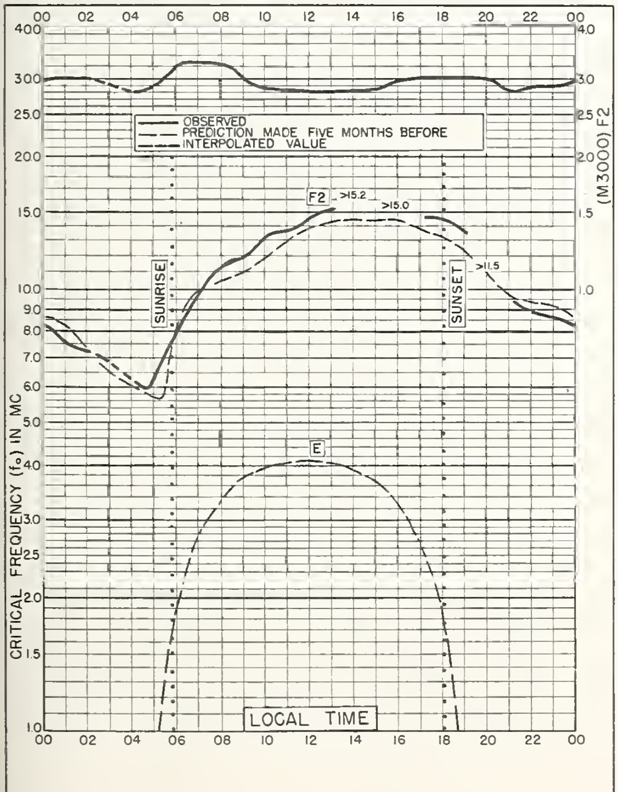

Fig. 103. DELHI, INDIA
28.6°N, 77.1°E SEPTEMBER 1956

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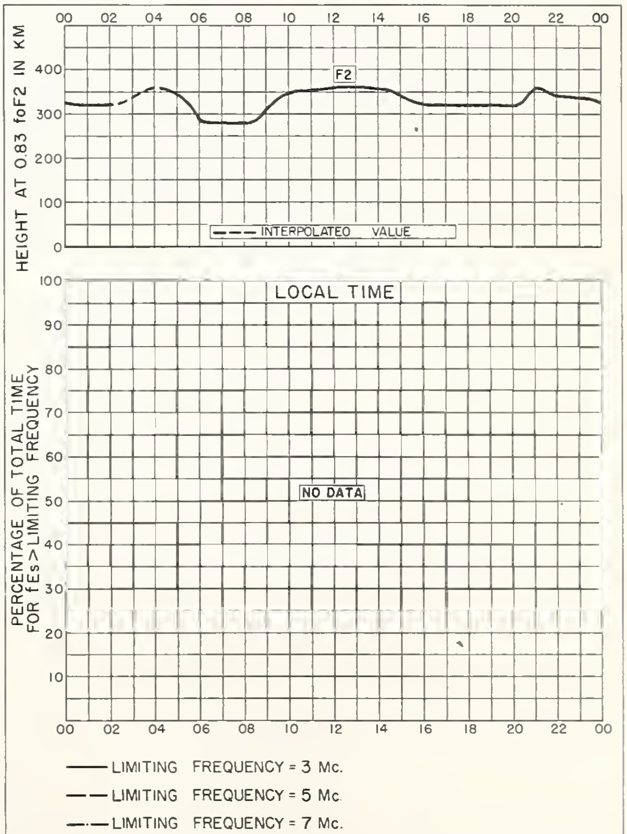

Fig. 104. DELHI, INDIA SEPTEMBER 1956

NBS 490

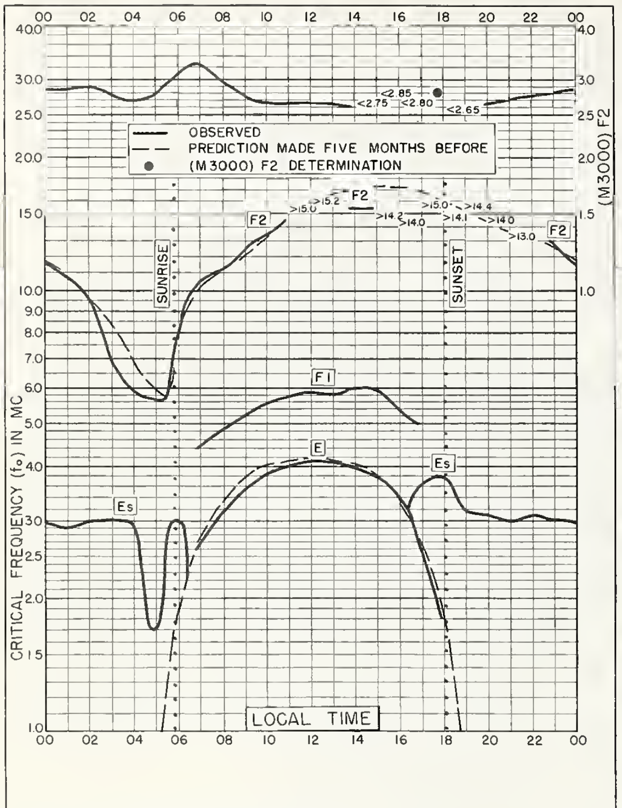

Fig. 105. AHMEDABAD, INDIA
23.0°N, 72.6°E SEPTEMBER 1956

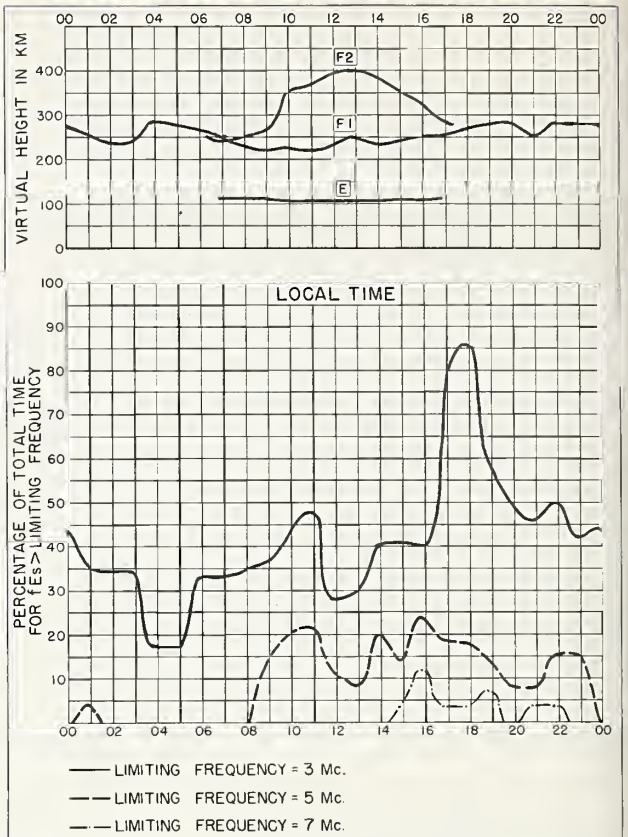

Fig. 106. AHMEDABAD, INDIA SEPTEMBER 1956

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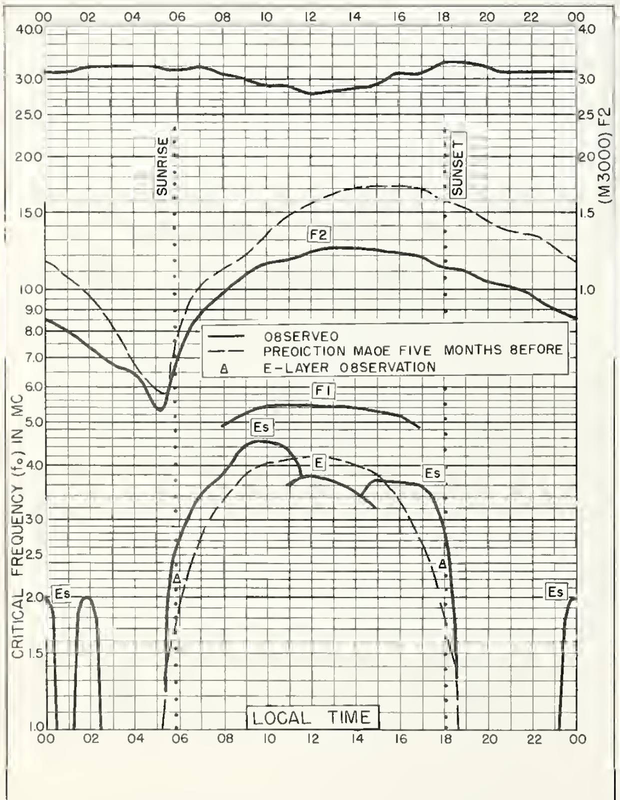

Fig. 107. CALCUTTA, INDIA
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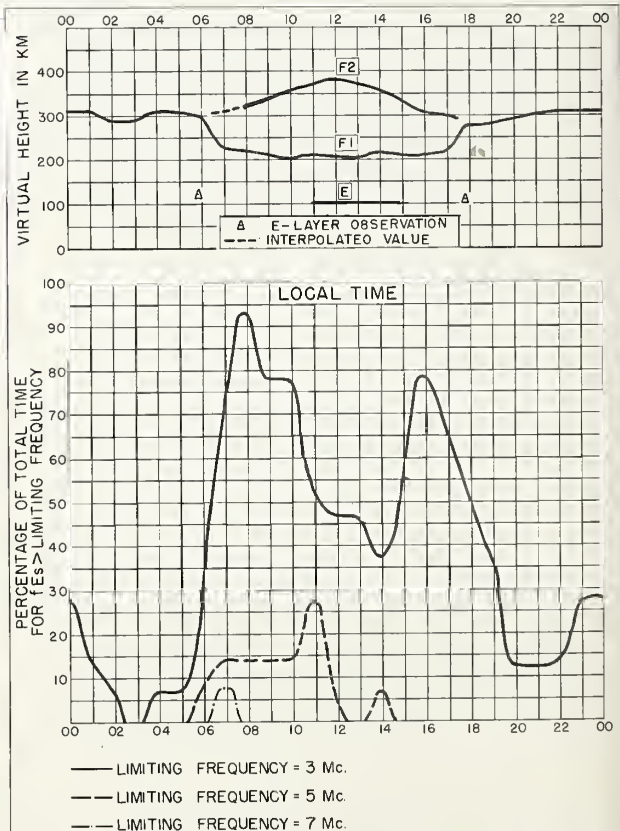

Fig. 108. CALCUTTA, INDIA SEPTEMBER 1956

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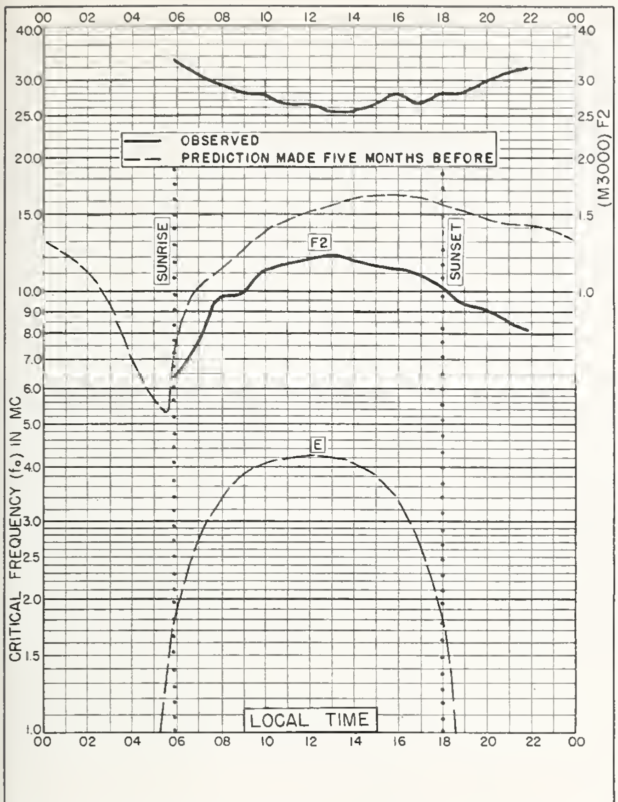

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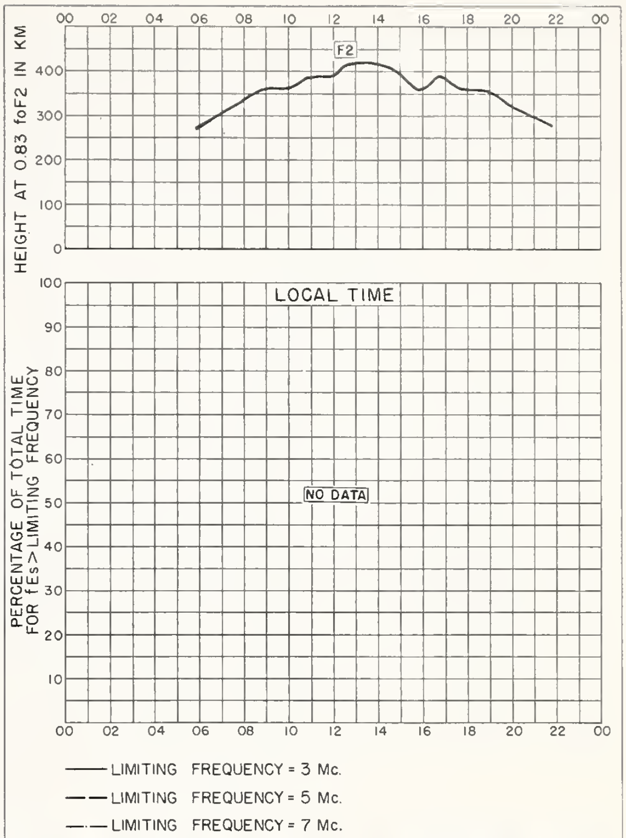

Fig. 110. BOMBAY, INDIA SEPTEMBER 1956

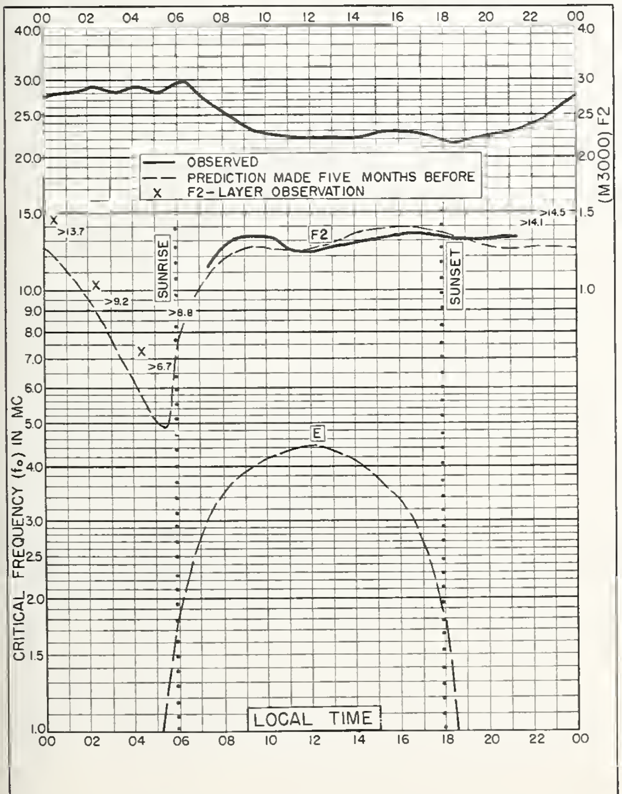

Fig. 111. MADRAS, INDIA
13.0°N, 80.2°E SEPTEMBER 1956

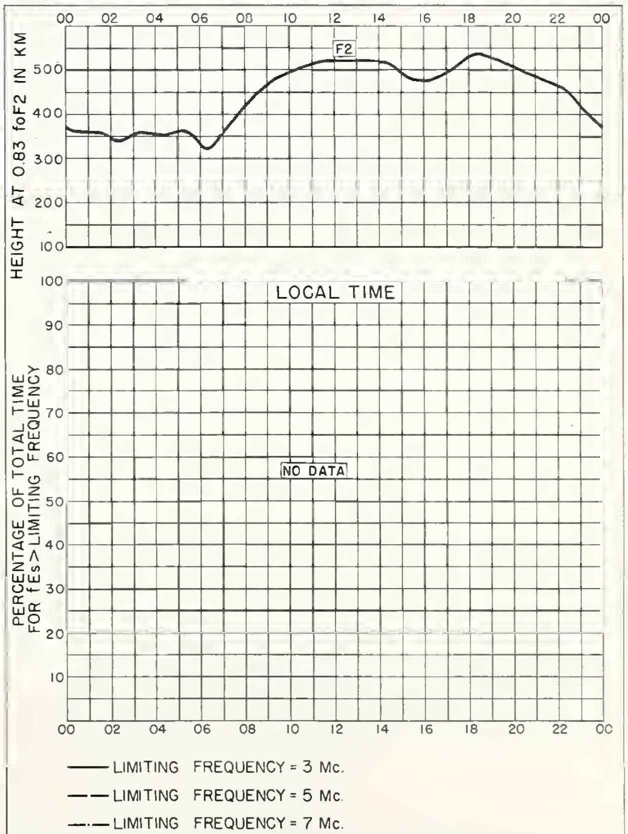

Fig. 112. MADRAS, INDIA SEPTEMBER 1956

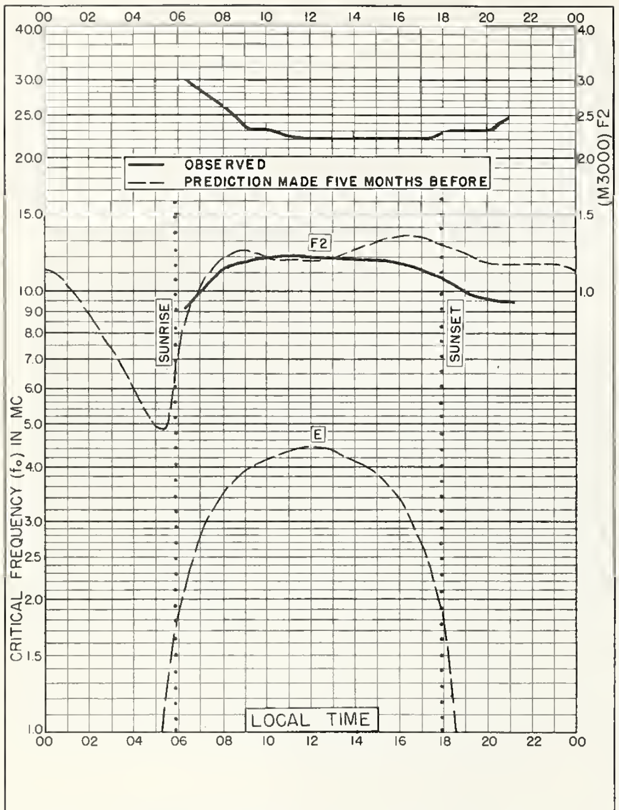

Fig. 113. TIRUCHY, INDIA
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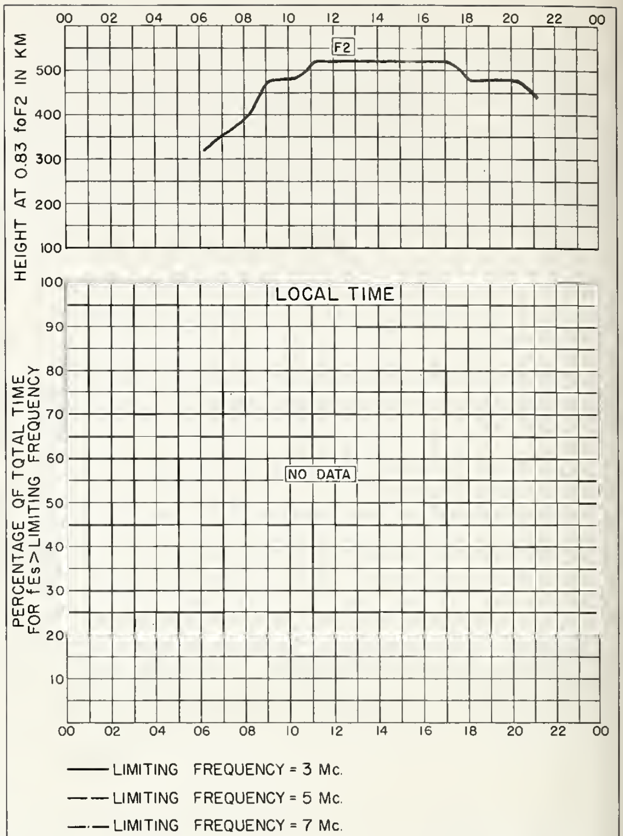

Fig. 114. TIRUCHY, INDIA SEPTEMBER 1956

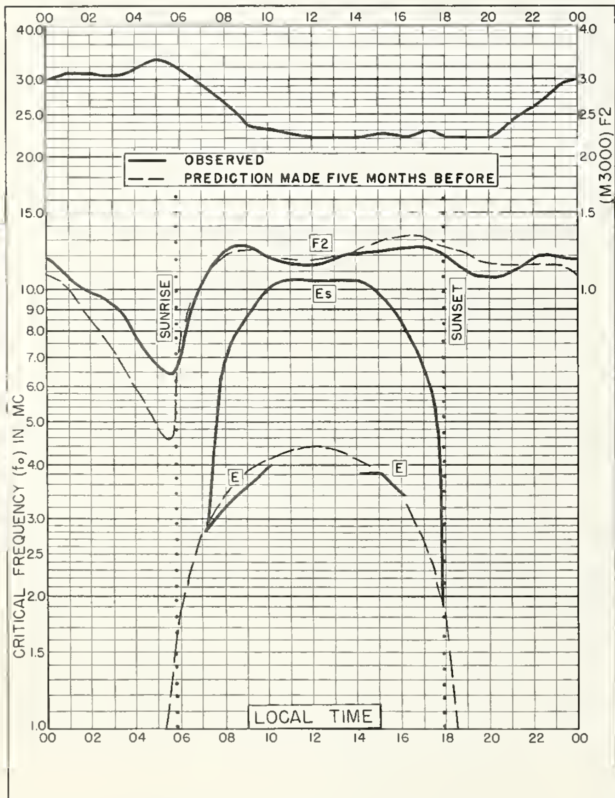

Fig. 115. KODAIKANAL, INDIA
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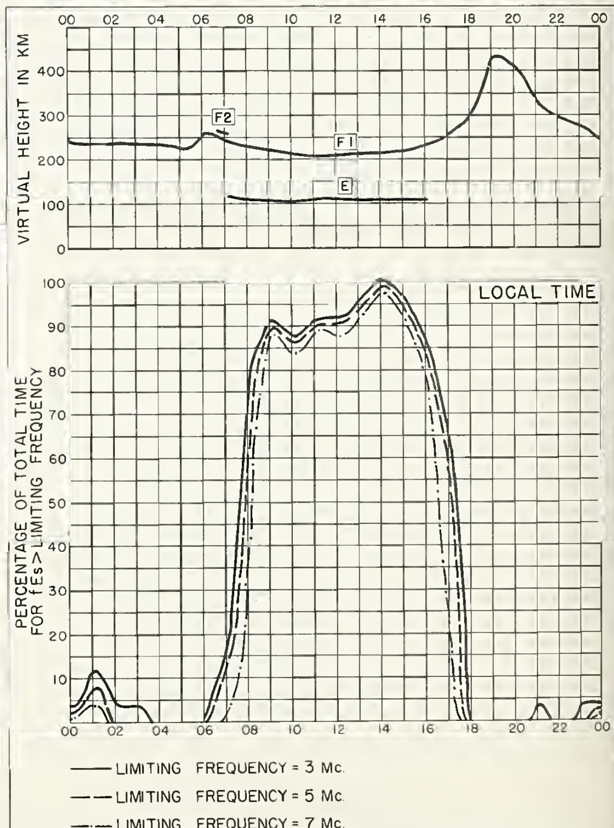

Fig. 116. KODAIKANAL, INDIA SEPTEMBER 1956

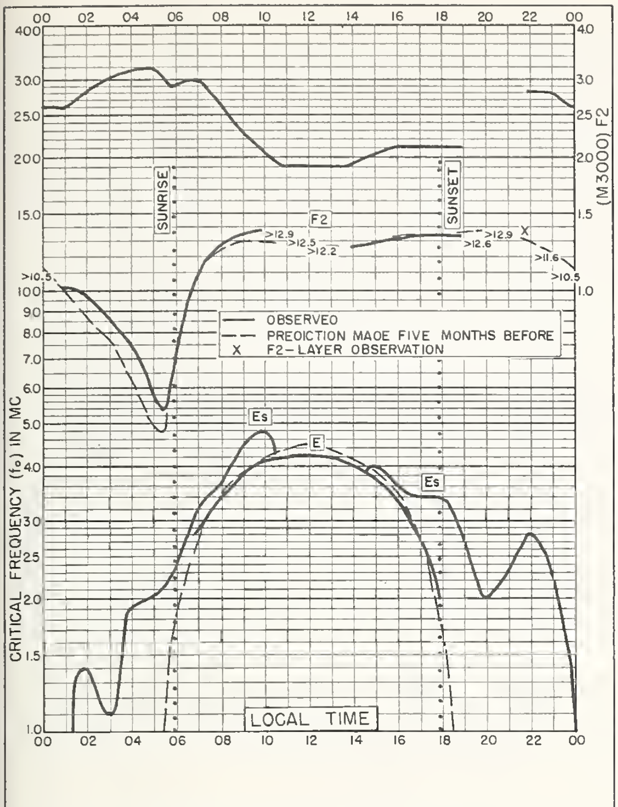

Fig. 117. SINGAPORE, BRITISH MALAYA
1.3°N, 103.8°E SEPTEMBER 1956

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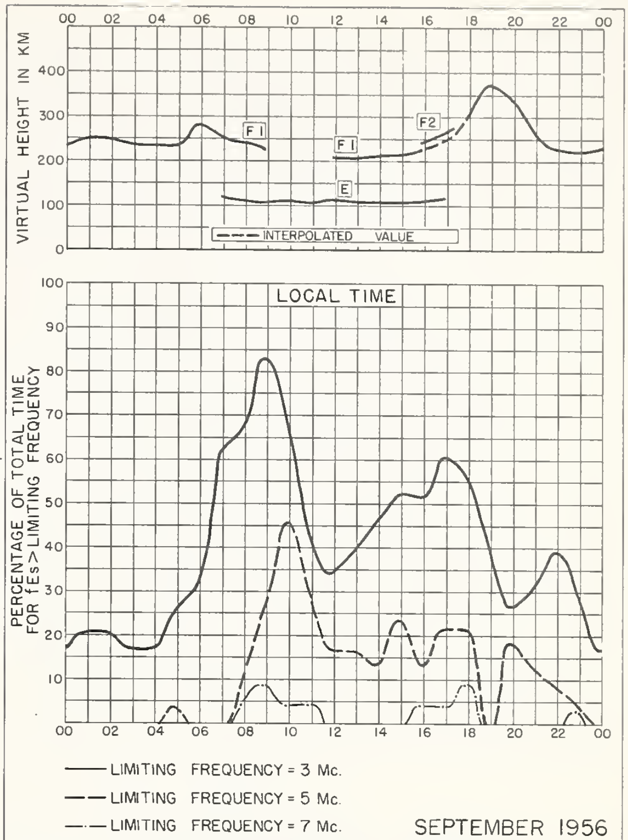

SEPTEMBER 1956
Fig. 118. SINGAPORE, BRITISH MALAYA

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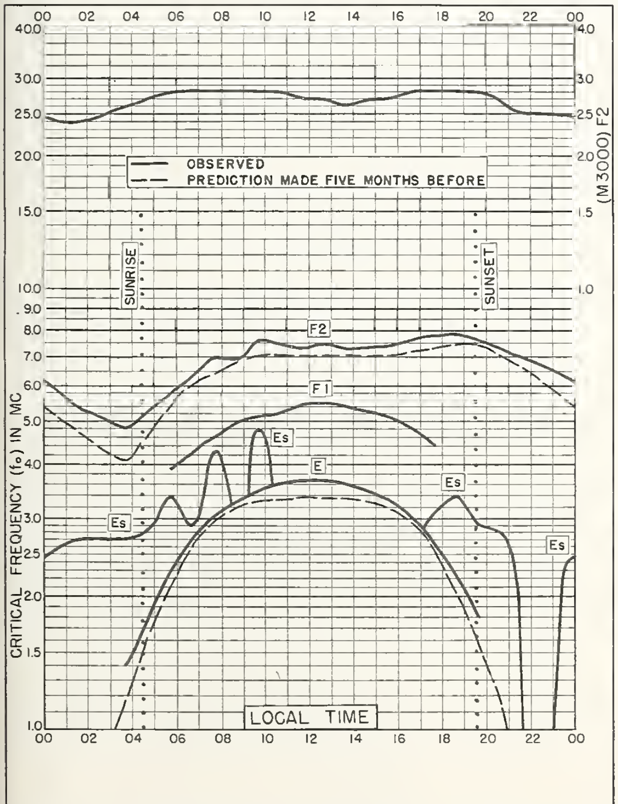

Fig. 119. INVERNESS, SCOTLAND
57.4°N, 4.2°W AUGUST 1956

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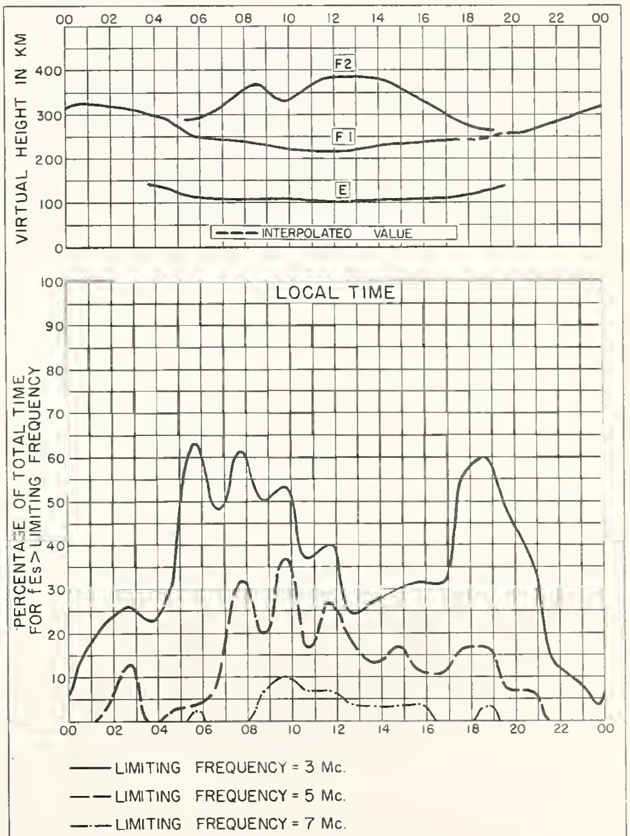

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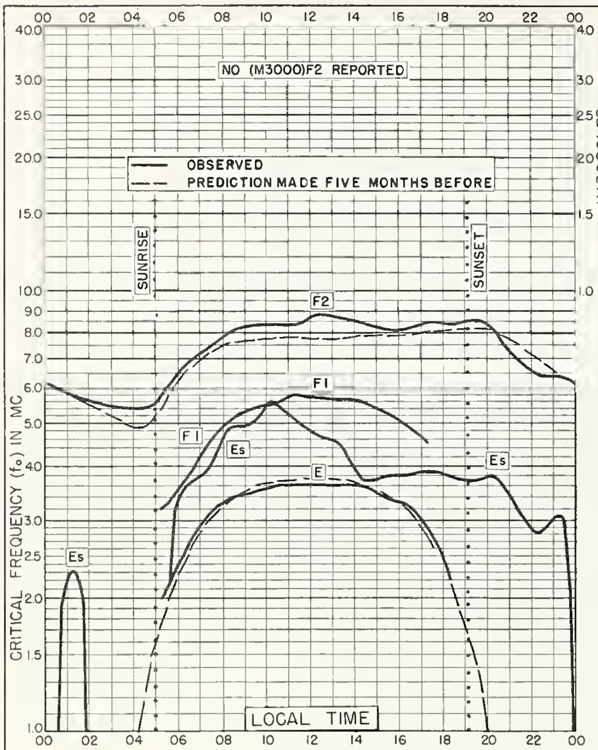

Fig. 121. BUDAPEST, HUNGARY
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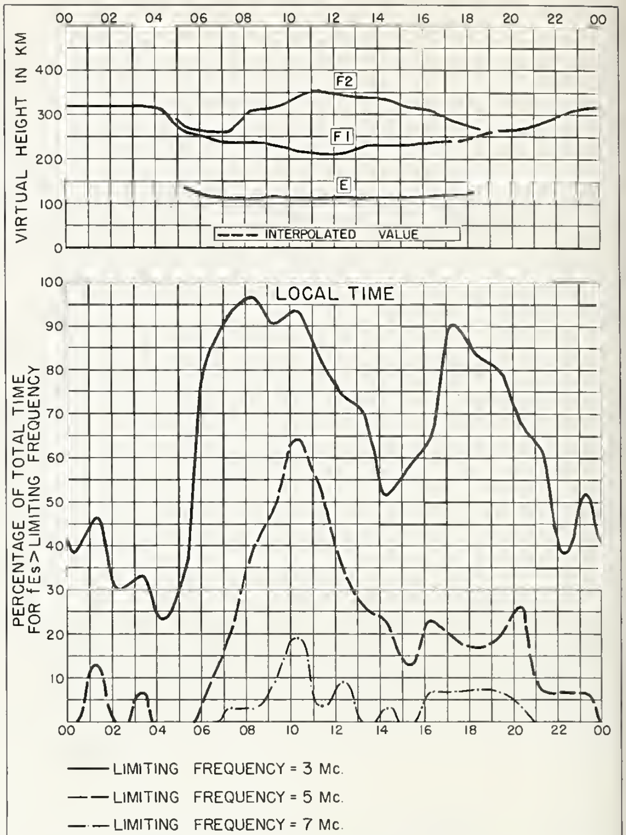

Fig. 122. BUDAPEST, HUNGARY AUGUST 1956

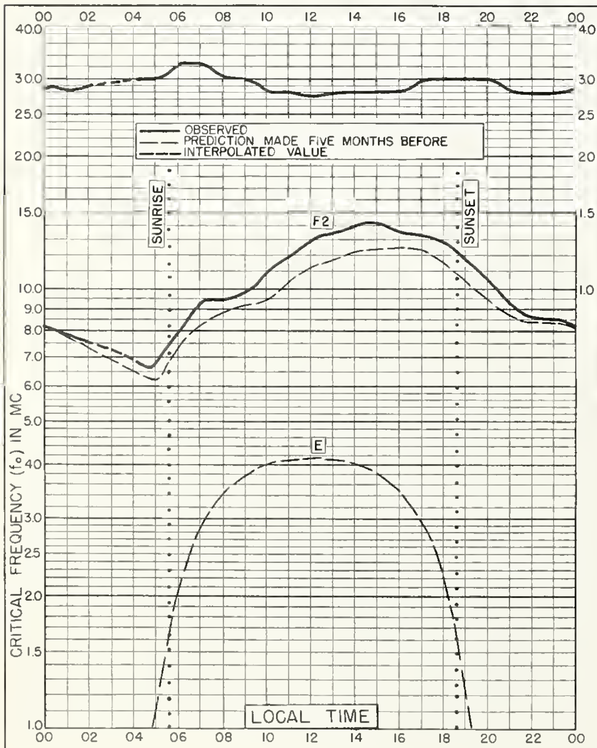

Fig. 123. DELHI, INDIA
28.6°N, 77.1°E AUGUST 1956

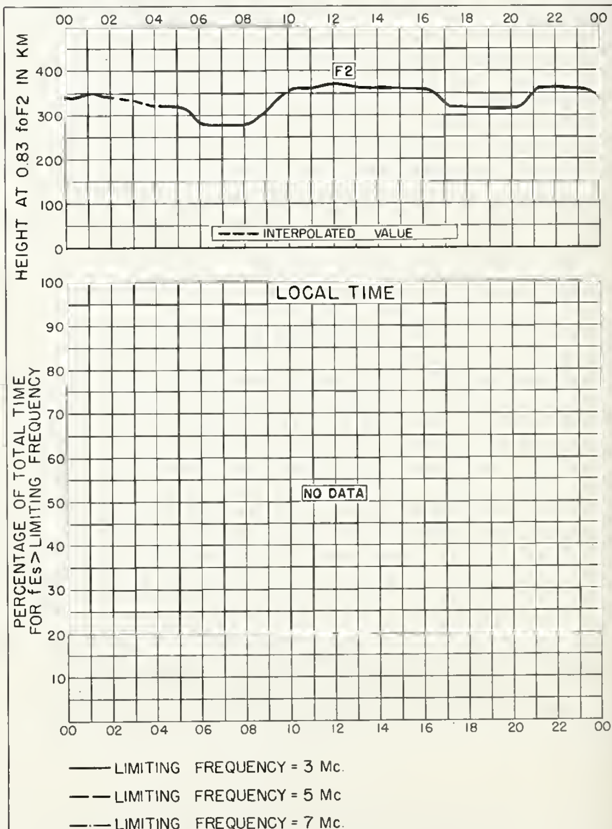

Fig. 124. DELHI, INDIA AUGUST 1956

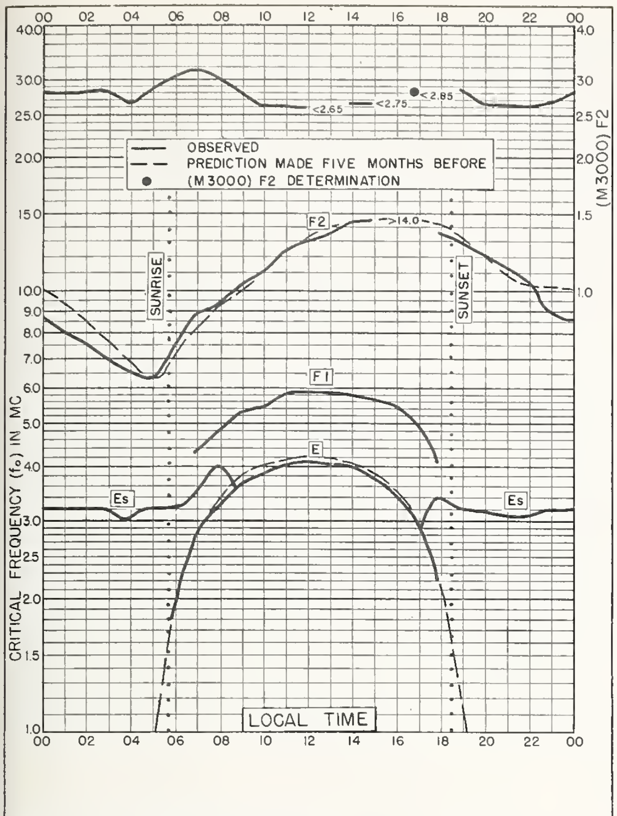

Fig. 125. AHMEDABAD, INDIA
23.0°N, 72.6°E AUGUST 1956

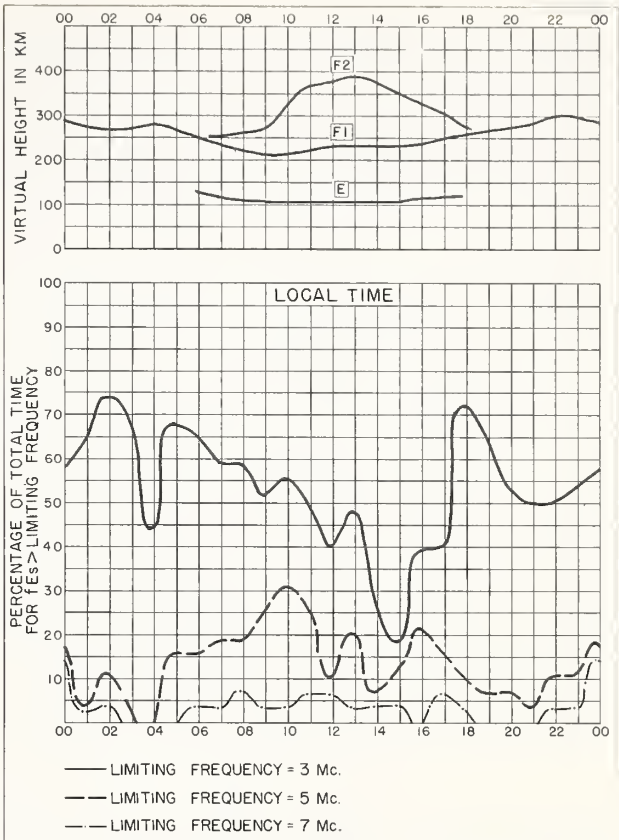

Fig. 126. AHMEDABAD, INDIA AUGUST 1956

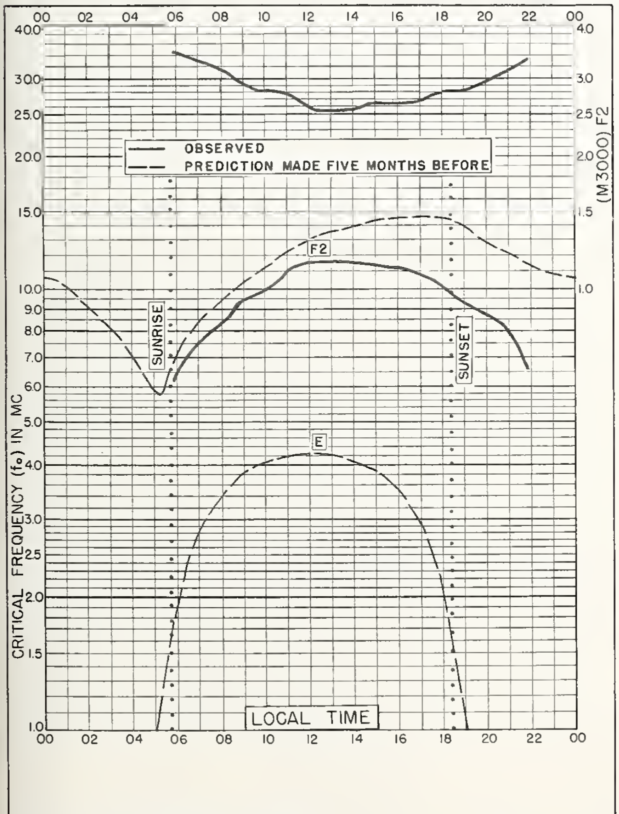

Fig. 127. BOMBAY, INDIA
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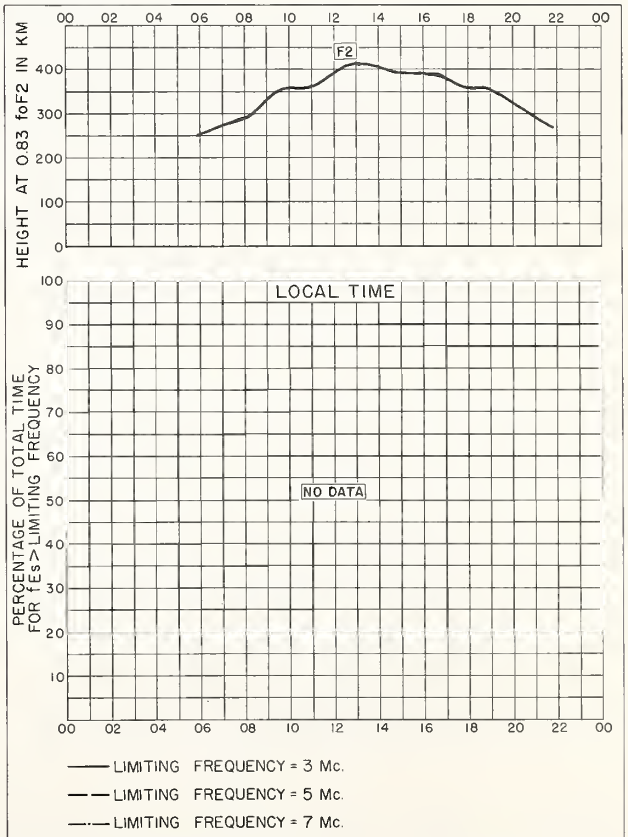

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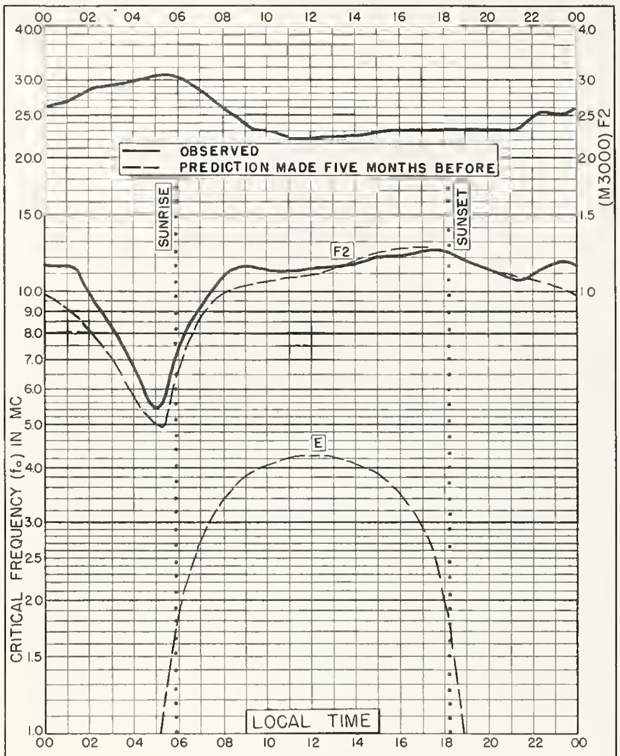

Fig. 129. MADRAS, INDIA
13.0°N, 80.2°E AUGUST 1956

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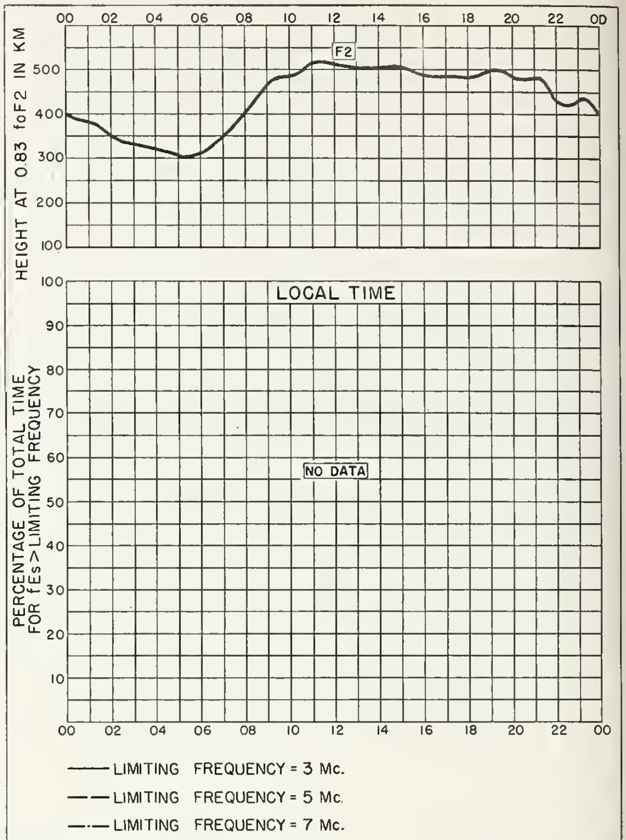

Fig. 130. MADRAS, INDIA AUGUST 1956

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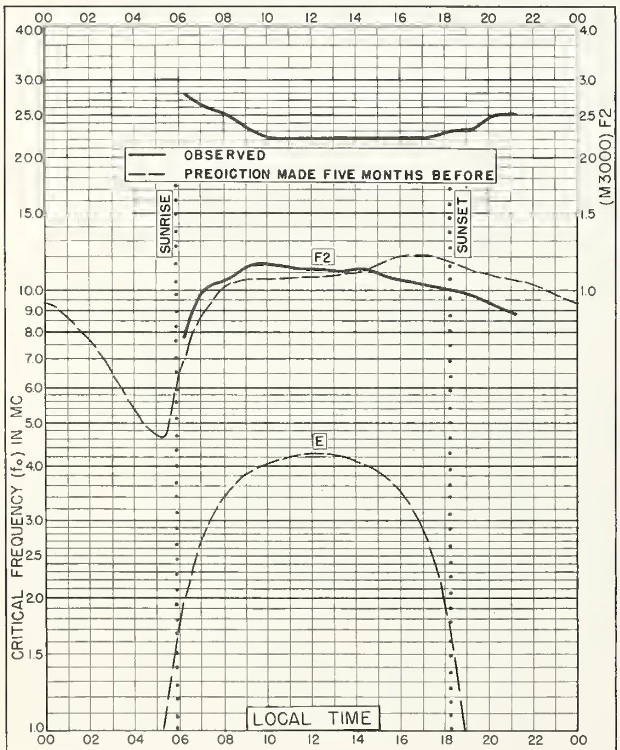

Fig. 131. TIRUCHY, INDIA
10.8°N, 78.8°E AUGUST 1956

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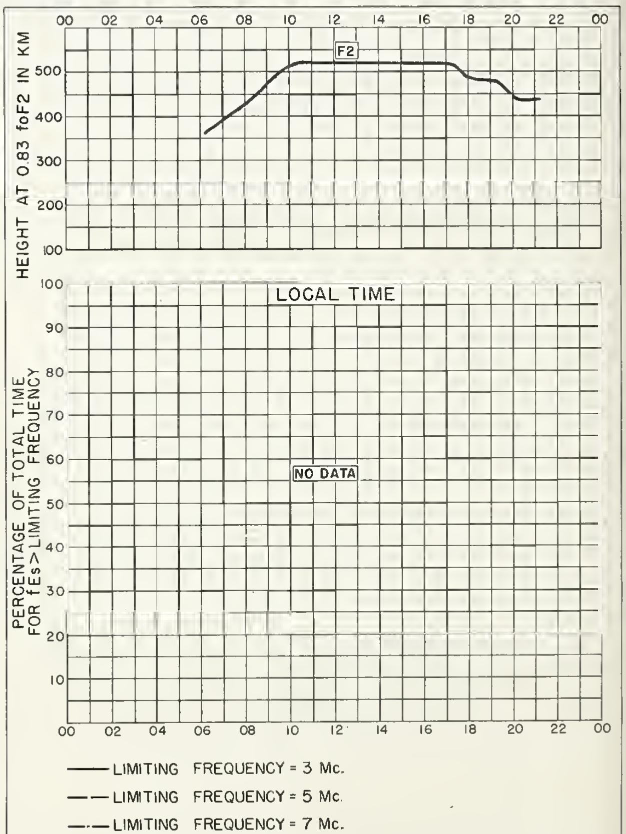

Fig. 132. TIRUCHY, INDIA AUGUST 1956

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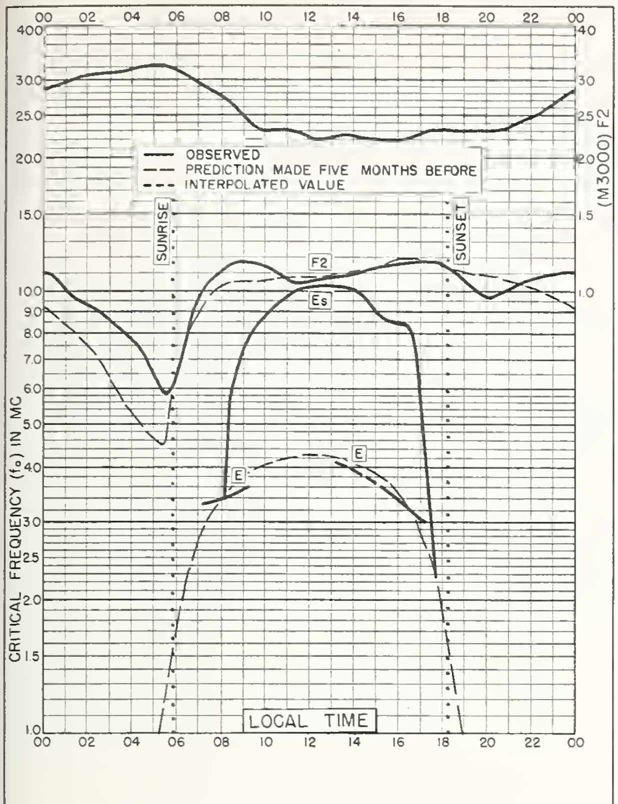

Fig. 133. KODAIKANAL, INDIA
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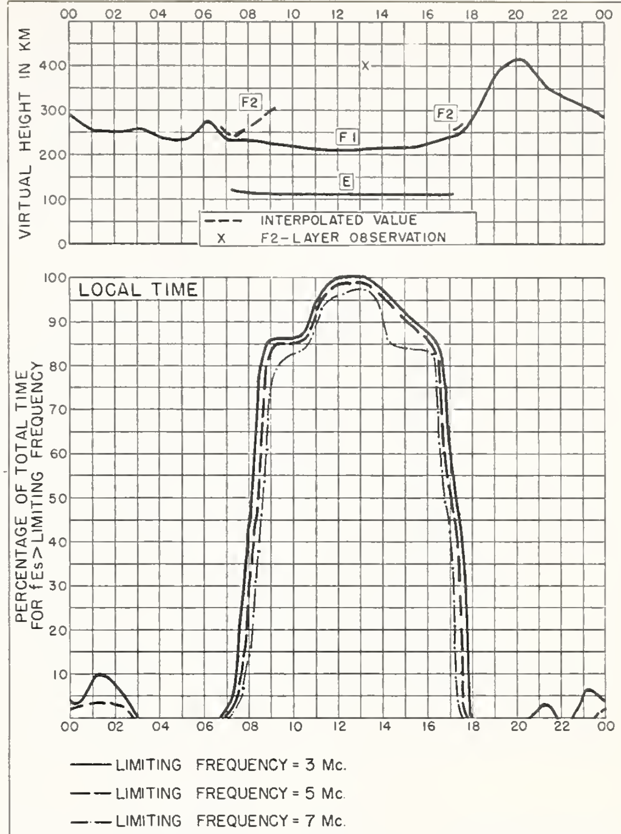

Fig. 134. KODAIKANAL, INDIA AUGUST 1956

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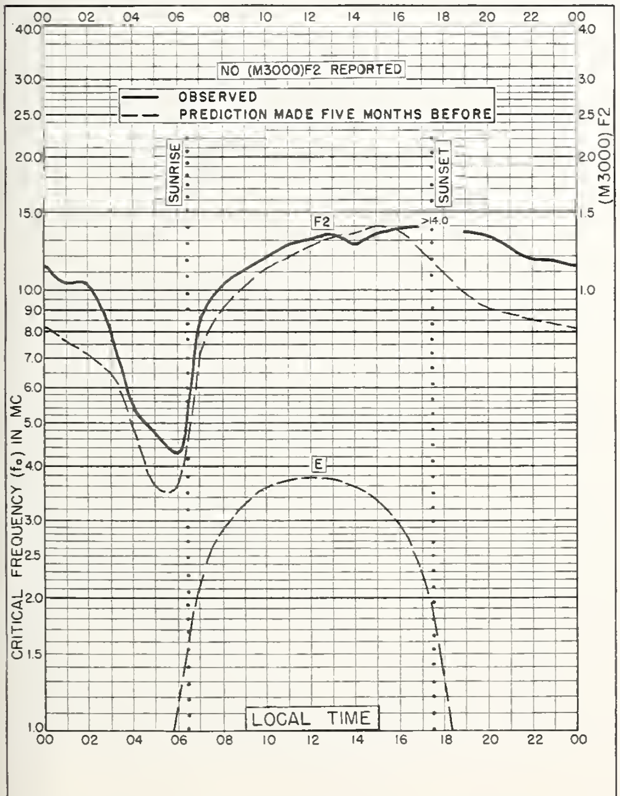

Fig. 135. SAO PAULO, BRAZIL
23.5°S, 46.5°W AUGUST 1956

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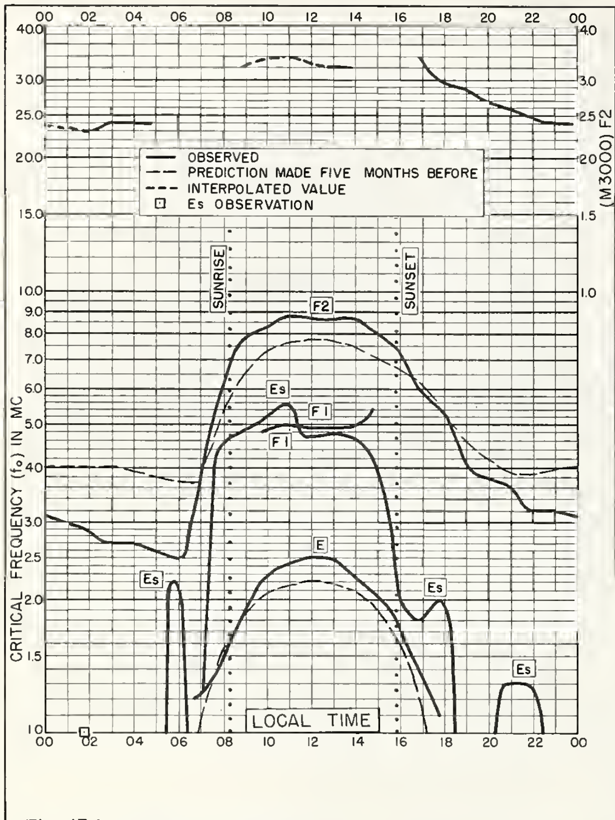

Fig. 136. PORT LOCKROY
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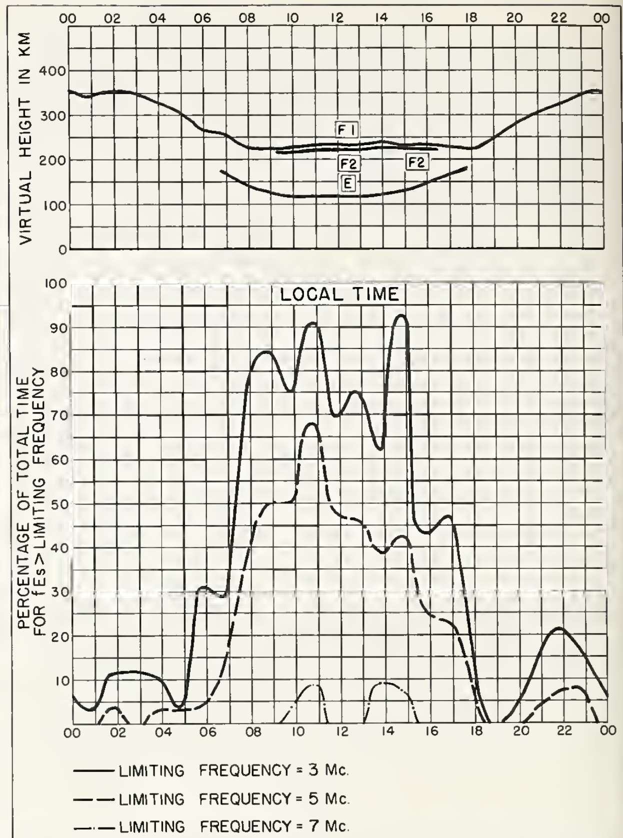

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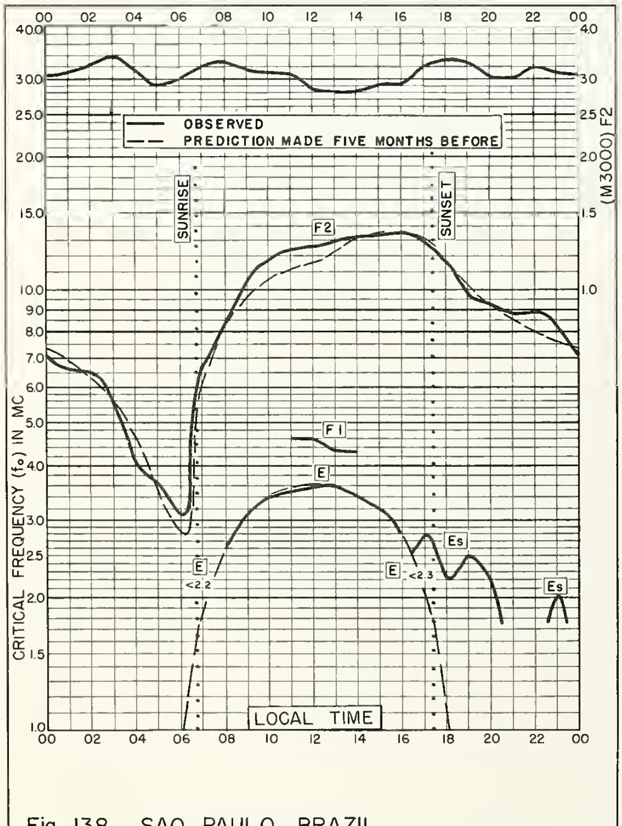

Fig. 138. SAO PAULO, BRAZIL
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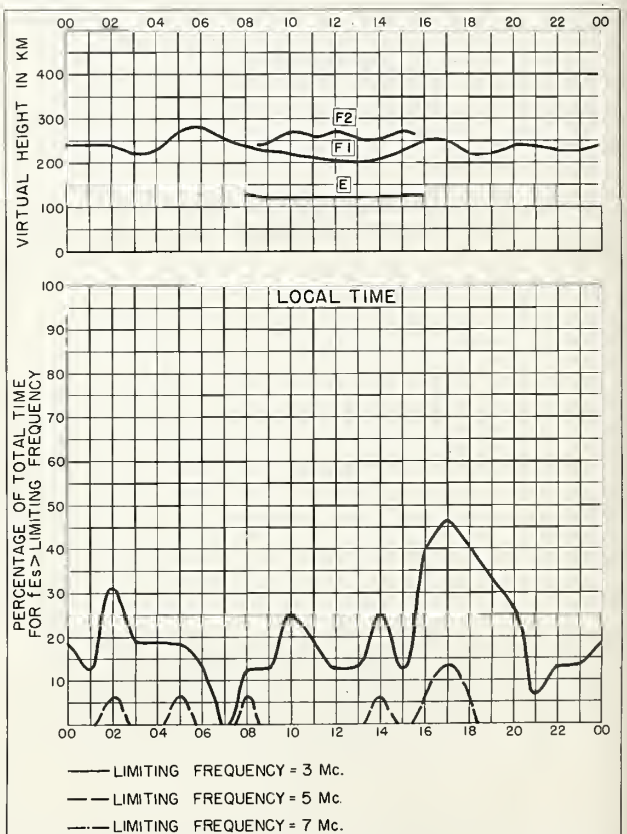

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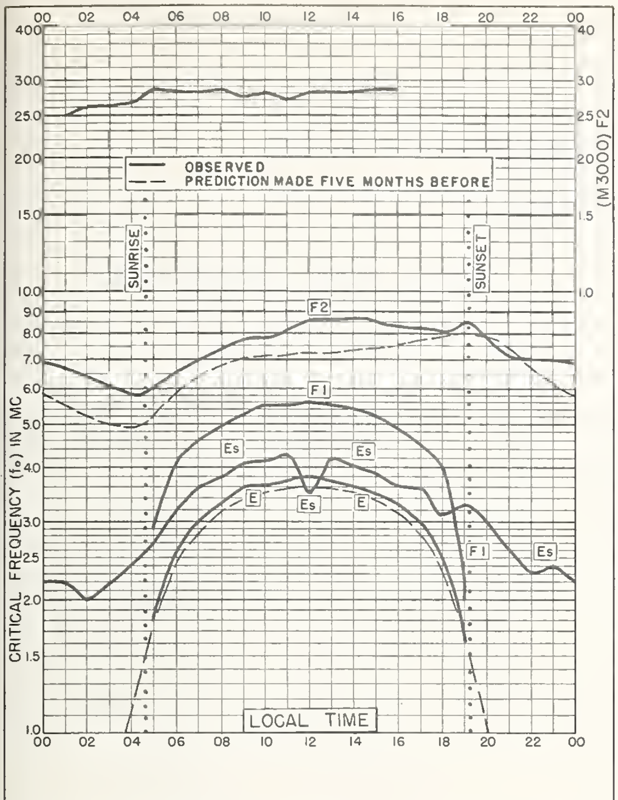

Fig. 140. POITIERS, FRANCE
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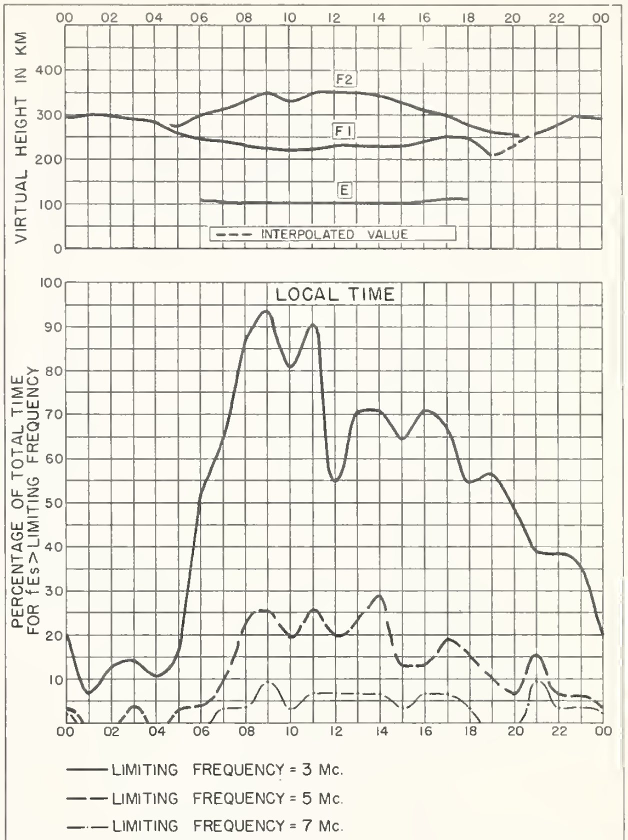

Fig. 141. POITIERS, FRANCE MAY 1956

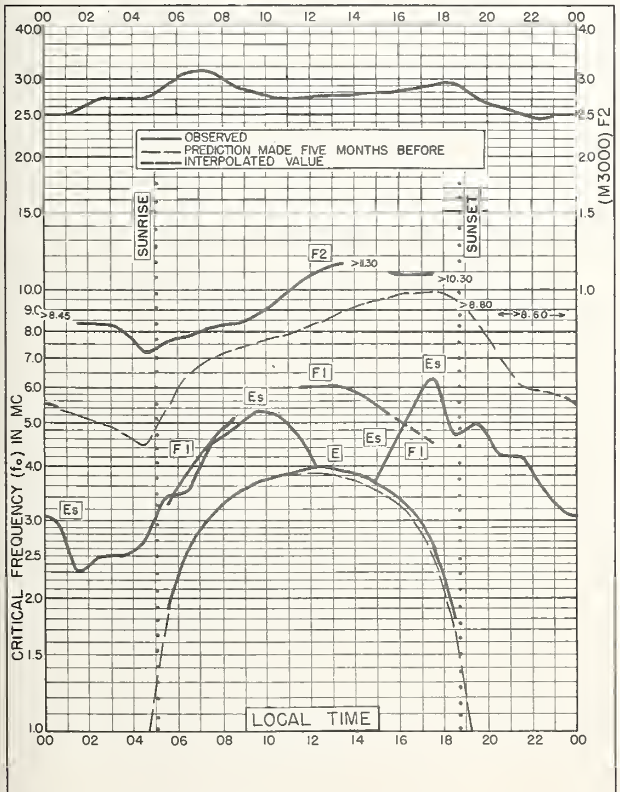

Fig. 142. CASABLANCA, MOROCCO
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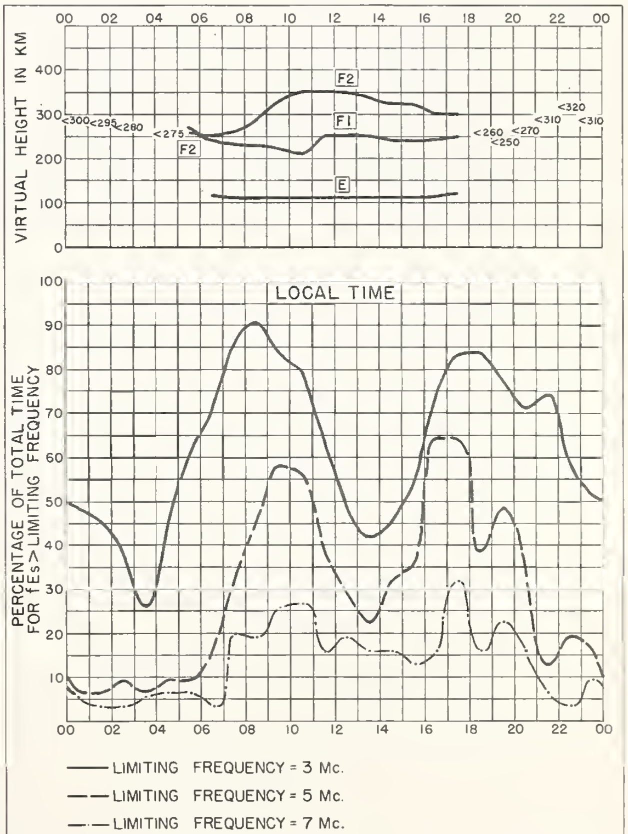

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July 1956	27	62
Schwarzenburg, Switzerland		
August 1957	16	30
July 1957	18	36
June 1957	21	45
Singapore, British Malaya		
September 1956.	25	57
Talara, Peru		
June 1957	22	47
Tiruchy, India		
September 1956.	25	56
August 1956	26	60
Tromso, Norway		
July 1957	17	31
June 1957	20	40
Upsala, Sweden		
June 1957	20	42
Watheroo, W. Australia		
June 1957	22	48
White Sands, New Mexico		
July 1957	19	37
Winnipeg, Canada		
July 1957	18	35
June 1957	21	44

CRPL Reports

[A detailed list of CRPL publications is available from the Central Radio Propagation Laboratory upon request]

Daily:

Radio disturbance forecasts, every half hour from broadcast stations WWV and WWVH of the National Bureau of Standards.

Telephoned and telegraphed reports of ionospheric, solar, geomagnetic, and radio propagation data.

Semiweekly:

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

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

Semimonthly:

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

Monthly:

CRPL—D. Basic Radio Propagation Predictions—Three months in advance. (Dept. of the Army, TB 11–499–, monthly supplements to TM 11–499; Dept. of the Air Force, TO 31–3–28 series). On sale by Superintendent of Documents.* Members of the Armed Forces should address cognizant military office.

CRPL—F. (Part A). Ionospheric Data.
(Part B). Solar-Geophysical Data.

Limited distribution. These publications are in general disseminated only to those individuals or scientific organizations which collaborate in the exchange of ionospheric, solar, geomagnetic or other radio propagation data or in exchange for copies of publications on radio, physics, and geophysics for the CRPL library.

The publications listed above may be obtained without charge from the Central Radio Propagation Laboratory, National Bureau of Standards, Boulder Laboratories, Boulder, Colorado, unless otherwise indicated. Please note that the F series is not generally available.

Circulars of the National Bureau of Standards pertaining to Radio Sky Wave Transmission:

NBS Circular 462. Ionospheric Radio Propagation. $1.25.

NBS Circular 465. Instructions for the Use of Basic Radio Propagation Predictions. 30 cents.

NBS Circular 557. Worldwide Radio Noise Levels Expected in the Frequency Band 10 Kilocycles to 100 Megacycles. 30 cents.

NBS Circular 582. Worldwide Occurrence of Sporadic E. $3.25.

These Circulars are on sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Members of the Armed Forces should address the respective military office having cognizance of radio wave propagation.

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