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AD 800616



Ionospheric Data Report - January 1964

IONOSPHERIC DATA: BANGKOK, THAILAND

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Prepared for:

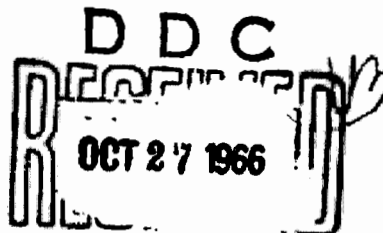
U.S. ARMY ELECTRONICS LABORATORIES
FORT MONMOUTH, NEW JERSEY

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THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND



STANFORD RESEARCH INSTITUTE
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BANGKOK, THAILAND

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I INTRODUCTION

Ionospheric observations are being carried out at the Laboratory of the Military Research and Development Center at Bangkok, Thailand, a joint United States-Thailand organization. A Model C-2 vertical-incidence sounder supplied and operated by the United States Army Radio Propagation Agency has been installed there. Table I gives pertinent information about the site.

Table I
VERTICAL-INCIDENCE SOUNDER SITE
AT BANGKOK, THAILAND

Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
13.73°N	100.57°E	2.5°N	169.83°E

Dip angle: 10°N

Distance from dip equator: 450 km

Equipment:

Instrument: Type C2 (automatic)

PRF: 60 pps

Frequency sweep time: 30 sec

Frequency sweep range: 1 to 25 Mc

Pulse duration: 50 μ sec

Peak pulse power: approximately 10 kw.

The cooperation and participation of staff members of the Thailand Ministry of Defense and the support of the United States Advanced Research

Projects Agency, the United States Army Electronics Laboratories, and the United States Army Radio Propagation Agency made it possible for the data presented in this report to be accumulated.

II TERMINOLOGY AND SYMBOLS

The terminology and symbols used in this data report are in accordance with the conventions established by the World Wide Soundings Committee.¹

A. TERMINOLOGY

- $\left. \begin{array}{l} f_oF_2 \\ f_oF_1 \\ f_oE \end{array} \right\}$ The ordinary wave critical frequency for the F₂ and F₁ layers and the E region, respectively.
- f_oE_s The ordinary wave top frequency corresponding to the highest frequency at which a mainly continuous E_s trace is observed.
- f_bE_s The blanketing frequency of an E_s layer, i.e., the lowest ordinary wave frequency at which the E_s layer begins to become transparent. (This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.)
- f_{min} The frequency below which no echoes are observed.
- $M(3000)F_2$ The maximum usable frequency factor for a path of 3000 km for transmission by the F₂ layer.
- $h'F_2$ The minimum virtual height of the ordinary wave trace for the highest stable stratification in the F region.
- $h'F$ The most significant F-region virtual height parameter, that for the lowest F'-region stratification. (Thus $h'F$ is identical with the current $h'F_2$ when F-region stratification is absent, i.e., at night, and with current $h'F_1$ when F₁ stratification is present.)

¹W. R. Piggott and K. Rawer, URSI Handbook of Ionogram Interpretation and Reduction of the World Wide Sounding Committee (Elsevier Publishing Company, Amsterdam, London, New York, 1961).

B. DESCRIPTIVE LETTERS

Certain effects observed on ionograms may make it difficult or impossible to obtain accurate numerical values. The descriptive letters listed below, when used alone indicate, in general, the presence of a phenomenon that may have influenced the measurement. Qualifying letters (Sec. C) indicate the nature of the uncertainty.

- A A lower thin layer present, e.g., E_s
- B Absorption in the vicinity of f_{min}
- C Any non-ionospheric reason
- D The upper limit of the normal frequency range
- E The lower limit of the normal frequency range
- F Spread echoes present
- G Ionization density of the layer too small for measurement
- H Stratification present
- I No sufficiently definite cusp between layers of the trace
- M Ordinary and extraordinary components indistinguishable
- N Conditions such that the measurement cannot be interpreted
- O Measurement referring to the ordinary component
- R Attenuation in the vicinity of a critical frequency
- S Interference or atmospherics
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- V Forked trace
- W Echo lying outside the height range recorded
- X Measurement referring to the extraordinary component
- Y Intermittent trace
- Z Third magneto-ionic component present.

C. QUALIFYING LETTERS

- D Greater than. . .
- E Less than. . .

- I An interpolated value
- J Ordinary component characteristic deduced from the extraordinary component
- O Extraordinary component characteristic deduced from the ordinary component
- T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful
- U Uncertain numerical value
- Z Measurement deduced from the third magneto-ionic component.

D. DESCRIPTION OF STANDARD TYPES OF E_s

The eight standard types of E_s are identified by lower-case letters: f, l, c, h, q, r, a, and s. These letters suggest the corresponding names, flat, low, cusp, high, equatorial, retardation, auroral, and slant, respectively, but are not restrictive. The letter n is used to designate an E_s trace that does not correspond to one of the eight types. The classifications are:

- f An E_s trace showing no appreciable increase of height with frequency, usually relatively solid at most latitudes. (This classification may be used only at night; it appears that flat E_s traces observed in the daytime are classified according to their virtual height: h or l.)
- l A flat E_s trace at or below the normal E-region minimum virtual height in the day or below the E-region minimum virtual height at night.
- c An E_s trace showing a relatively symmetrical cusp at or below $f_o E$. (This is usually continuous with the normal E trace, although when the deviative absorption is large, part or all of the cusp may be missing—usually a daytime type.)
- h An E_s trace showing a discontinuity in height with the normal E-region trace at or above $f_o E$ and an asymmetrical cusp. (The low-frequency end of the E_s trace lies clearly above the high-frequency end of the normal E trace—usually a daytime type.)
- q An E_s trace that is diffuse and nonblanketing over a wide frequency range, the spread being most pronounced at the upper edge of the trace. (This type is common in daytime in the vicinity of the magnetic equator.)
- r An E_s trace that is nonblanketing over part or all of its frequency range, showing an increase in virtual height at the high-frequency

end similar to group retardation. (This is distinguished from the usual group retardation—as in the case of an occulting thick E region—by the lack of group retardation in the F traces at corresponding frequencies and the lack of complete blanketing.)

- a An E_s pattern having a well-defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. (These sometimes extend over several hundred kilometers of virtual height.)
- s A diffuse E_s trace that rises steadily with frequency, usually emerging from another type of E_s trace. (The rising trace alone is classified as s; the horizontal trace is classified separately. At high latitudes, the slant trace usually starts to rise from a horizontal E_s trace, such as l or f, at frequencies that greatly exceed the E-region critical frequency, e.g., about 6 Mc; whereas at low latitudes it usually rises from equatorial-type E_s, q, c, or h, at frequencies near the regular E critical frequency. Type s is never used to determine f_oE unless echoes clearly identifiable as E_s echoes are seen.)
- n An E trace that cannot be classified as one of the standard types. (This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.)

E. MULTIPLE REFLECTIONS FROM E_s

When the ionogram shows the presence of multiple reflections from E_s, the number of traces seen will be recorded with the letter indicating the type.

Characteristic: fmin

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	019*	018	E016S	018	019	018	E018S	E027S	019	E023S	E024S	E028S	E028S	E027S
2	C	C	C	C	C	C	C	C	C	E023S	E024S	E028S	E027S	E028S
3	E017S	E014S	E014S	E017S	S	S	E017S	E027S	E022S	E028S	E026S	E027S	E027S	E028S
4	019	E016S	E014S	E016S	B	S	S	E027S	E024S	E030S	E027S	E027S	E025S	034
5	E015S	E016S	E016S	018	E018S	E017S	E017S	E017S	E021S	E029S	E027S	E023S	E026S	E023S
6	E017S	015	013	018	B	B	S	E017S	E017S	E017S	E030S	E027S	E026S	E034S
7	E016S	E014S	E013S	016	B	S	S	E017S	E017S	020	E020S	E028S	E026S	E034S
8	018	E017S	019	E014S	018	E016S	E018S	E017S	E017S	023	E027S	E037S	E029S	E030S
9	021	E016S	E016S	013	013	015	S	E022S	E027S	E032S	E027S	E026S	E027S	E026S
10	022	020	026	023	017	020	E017S	E022S	028	E025S	E027S	E028S	E033S	E029S
11	022	022	020	021	018	E020S	B	E022S	E026S	E027S	E027S	029	E033S	E028S
12	E016S	E016S	E016S	B	S	S	S	E019S	E022S	E029S	E029S	E027S	E028S	029
13	019	E016S	E016S	017	E016S	B	S	E019S	024	030	E027S	E029S	E029S	E029S
14	019	E016S	E016S	012	B	S	S	E021S	E027S	E025S	E023S	E028S	E033S	E028S
15	020	021	018	014	B	S	S	E024S	E022S	E027S	E027S	E030S	E029S	E027S
16	E016S	E016S	011	011	E016S	S	S	E022S	E017S	E022S	E027S	E028S	E029S	E029S
17	018	E016S	E016S	E016S	017	017	S	E019S	E028S	E027S	E028S	E028S	E029S	E029S
18	E016S	E016S	E016S	E	S	E023S	019	E017S	E022S	E028S	E025S	E027S	E028S	E029S
19	018	030	018	E016S	E016S	S	S	E022S	E018S	E027S	E029S	E028S	E027S	031
20	E017S	E017S	E016S	E016S	S	E017S	S	E037S	E027S	E028S	E027S	E027S	E027S	E027S
21	E016S	E017S	017	E016S	B	S	S	E018S	E022S	E031S	C	E027S	E032S	E030S
22	023	021	E017S	E016S	017	017	E017S	E018S	E025S	028	E023S	E029S	E032S	E029S
23	E016S	E016S	018	017	E016S	E017S	S	E027S	E015S	E027S	E027S	E027S	E030S	E032S
24	E017S	E	E	E011S	E019S	E017S	S	E019S	E029S	E029S	E027S	E027S	E030S	E030S
25	E017S	E016S	E	E	E016S	E016S	E018S	E020S	E020S	E023S	E027S	E027S	E030S	E030S
26	E016S	E016S	E017S	E017S	E017S	S	S	E020S	E030S	E029S	E029S	E029S	E026S	E029S
27	E	012	011	E017S	E017S	E017S	S	E029S	E030S	E034S	E023S	E034S	E034S	E028S
28	E016S	E016S	E016S	E016S	E017S	S	S	E019S	-	-	-	-	-	-
29	E017S	E017S	011	E	E016S	E017S	S	E023S	E027S	E022S	E029S	E040S	E034S	E030S
30	E016S	E017S	E016S	E016S	015	E016S	E018S	E027S	E022S	E023S	E024S	E027S	E029S	E029S
31	022	E016S	E017S	E017S	E011S	E017S	S	E021S	E018S	E025S	E023S	E027S	E030S	E030S
Median	017	016	016	016	017	017	018	021	022	027	027	027	029	029
Count	29	29	28	26	20	17	9	30	29	30	29	30	30	30
UQ	019	017	017	017	017	017	018	024	027	029	027	029	032	030
LQ	016	016	016	016	016	017	017	019	019	023	024	027	027	028
QR	3	1	1	1	1	0	1	5	8	6	3	2	5	2

* Tabulation of 019 = 1.9 Mc.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
19	E023S	E024S	E028S	E028S	E027S	032	C	C	C	C	C	C	C	C	C
22S	E023S	E024S	E028S	E027S	E028S	024	E034S	E030S	E030S	E023S	E017S	E017S	E020S	E021S	018
24S	E023S	E026S	E027S	E027S	E028S	035	E021S	018	E024S	E019S	E018S	E017S	E018S	E018S	018
15S	E030S	E027S	E027S	E025S	034	025	025	E017S	E023S	E018S	E017S	E025S	E017S	E017S	E017S
7S	E029S	E027S	E023S	E026S	E023S	E023S	E018S	E023S	E019S	E017S	E018S	E017S	E019S	E017S	E017S
7S	E017S	E030S	E027S	E026S	E034S	028	E023S	030	E029S	E021S	E017S	E017S	E023S	E022S	E017S
7S	020	E020S	E028S	E029S	E030S	E030S	023	019	E020S	E017S	020	022	019	019	E017S
7S	023	E027S	E037S	E032S	E023S	E021S	E017S	030	E028S	E025S	025	024	024	022	017
8	E032S	E027S	E026S	E027S	E029S	034	025	E017S	E023S	E018S	022	019	022	023	019
8	E025S	E027S	E028S	E033S	E029S	E028S	E023S	E022S	E026S	E018S	020	024	E024S	E023S	018
6S	E027S	E027S	029	E033S	E028S	031	030	E026S	E022S	E029S	E025S	E024S	E022S	E018S	021
2S	E029S	E029S	E027S	E018S	029	E030S	032	E025S	E022S	E022S	E018S	023	E017S	022	019
4	030	E027S	E029S	E029S	E029S	020	027	E025S	E026S	026	E025S	E022S	023	024	E017S
7S	E025S	E023S	E028S	E033S	E028S	033	031	E023S	E019S	E017S	E018S	E017S	E022S	021	027
2S	E027S	E027S	E030S	E029S	E027S	E022S	020	E018S	E018S	E018S	E017S	E017S	E022S	021	027
7S	E022S	E027S	E028S	E029S	E029S	E027S	E023S	E025S	E020S	E019S	E017S	E018S	026	E019S	020
7S	E027S	E028S	033	E033S	029	036	029	E024S	E020S	020	E017S	E017S	029	E017S	019
2S	E028S	E025S	E027S	E028S	E029S	030	E030S	E022S	023	E017S	E017S	023	021	024	E017S
3S	E027S	E029S	E028S	E027S	031	E029S	E025S	E025S	E022S	E019S	E017S	E019S	E017S	E018S	E017S
7S	E028S	E027S	E027S	E027S	E027S	E027S	E027S	E022S	E020S	E019S	E028S	025	E024S	020	020
2S	E031S	C	E027S	E032S	E030S	E027S	025	E025S	E025S	E024S	E018S	022	025	016	021
5S	028	E023S	E029S	E032S	E029S	031	C23	E023S	020	E019S	E023S	E022S	E021S	020	017
5S	E027S	E027S	E027S	E030S	E032S	036	029	E026S	E027S	E018S	E018S	E017S	E019S	E018S	E017S
5S	E029S	E027S	E027S	E030S	E030S	E031S	E029S	E022S	E024S	E019S	E017S	E019S	E017S	E017S	E017S
5S	E023S	E027S	E027S	E030S	E030S	E029S	E026S	E022S	E025S	E023S	E019S	E020S	E017S	E017S	E018S
5S	E029S	E029S	E026S	E028S	E029S	E030S	E023S	E020S	E024S	E018S	E020S	E018S	E020S	E018S	E018S
5S	E034S	E023S	E034S	E034S	E028S	E024S	E017S	E018S	E018S	E019S	E017S	E020S	E017S	E018S	E018S
5S	-	-	-	-	-	-	-	-	-	-	023	019	020	E018S	E017S
5S	E022S	E029S	E040S	E034S	E030S	033	E027S	E023S	E026S	E020S	E019S	021	022	E017S	021
5S	E023S	E024S	E027S	E029S	E029S	E028S	022	020	E026S	E018S	E018S	E019S	E017S	E017S	023
5S	E025S	E023S	E027S	E030S	E030S	E025S	023	E023S	E023S	E018S	E018S	E023S	E017S	E018S	020
	027	027	027	029	029	029	025	023	023	019	018	020	020	018	018
	30	29	30	30	30	30	29	29	29	29	30	30	30	30	30
	029	027	029	032	030	031	029	025	026	021	020	023	023	021	020
	023	024	027	027	028	025	023	020	020	018	017	018	017	018	017
	6	3	2	5	2	6	6	5	6	3	2	5	6	3	3

Characteristic: foF2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	029*	026	028	028	020	020	020	044	057	070	071	061	058H	052
2	-	-	-	-	-	-	-	-	-	067	065	D0585	058	065
3	019	019	F	F	S	S	024	053	073	082	100	067	D0878	D088H
4	H	020	017	D0188	H	S	H	J0508	063	D062W	073	067	084	084
5	020	019	D020R	T	019	S	D0245	J0498	D0575	072	075	082	D0685	058
6	027	021	021	D022R	H	B	S	045	063	081	078	067	056	082
7	019	015	015	A	B	S	S	046	064	075	071	067	067	068
8	F	035	036	035	028	018	S	J0508	070	085	073	068	070	067
9	037	F	037	037	J0308	021	S	044	060	077	075	089	D0808	066
10	A	038	037	A	A	A	A	042	065	078	086	D0878	J0738	069
11	045	046	D0338	D041F	024	D0228	B	044	063	075	080	D0758	075	073
12	023	019	019	H	S	S	S	051	056	065	073	070	080	002
13	028	031	027	027	019	B	S	037	053	062	062	065	D0678	081
14	023	017	017	J0138	B	S	S	D0465	062	068	D0678	066	075	076
15	028	029	031	020	B	S	S	J0295	D0465	055	061	063	083	D0708
16	030	D0235	023	025	020	H	S	J0398	J0588	070	067	065	065	D0708
17	028	D0268	028	D0308	A	A	S	043	056	071	067	062	063	065
18	042	D0338	022	D0128	S	A	A	D0465	080	J0755	086	055	055	061
19	028	J0398	022	017	018	S	S	045	061	074	067	064	061	060
20	F	F	F	A	S	A	S	D0685	J0588	077	063	055	053	054
21	027	027	027	028	B	S	H	046	064	078	C	056	055	062
22	D0345	J0338	028	J0208	D019H	A	A	D0465	059M	070	D0648	056	055	058
23	022	022	024	022	022	021	S	045	038	065	063	063	063	063
24	D0318	033	026	017	021	D0808	S	D0508	060	D0458	D0685	D0608	D0708	D0658
25	035	026	022	A	019M	017M	D0215	D0458	063	D0758	D0718	D0708	D0678	073
26	036	034	036	027	A	S	S	D0458	D0575	D0738	082	080	J0708	069
27	056	052	D0508	040	024	020	S	D0465	064	077	084	D0785	D0708	D0698
28	051	D0365	D0425	A	019M	S	S	042	-	-	-	-	-	-
29	A	A	029	025	021	019M	S	044	J0575	063	082	D0758	087	085
30	D0465	037	025	022	D0158	A	A	045	D0558	064	J0708	070	089	074
31	044	039	031	025	017	A	S	D0458	J0588	063	065	064	067	067
Median	029	029	027	024	020	020	022	045	060	072	071	067	067	066
Count	25	27	28	22	17	9	4	30	29	30	29	30	30	30
UQ	036	036	033	028	022	021	024	046	063	077	075	070	070	073
LQ	025	021	022	020	019	019	021	044	057	065	065	062	060	052
QR	11	15	11	8	4	2	2	2	6	12	10	C	10	11

* Tabulation of 029 = 2.9 Mc.

A

IONOSPHERIC DATA

Step: 1 Mc to 25 Mc in 0.5 minute

January 1964

	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	071	061	058H	058	058	-	-	-	-	-	-	-	-	-
	065	D056S	058	065	075	079	077	J071S	077	085	055	042	028	J22
	100	097	D087S	D088S	081	D080W	D080R	084	083	067	J079S	064	D042S	018
	073	067	064	065	074	077	083	D087S	075	063	053	041	030	020
	075	082	D068S	056	D058R	061	071	074	J080S	D065S	D055S	D044S	F	033
	076	067	056	062	065	070	072	075	082	070	053	D045S	037	026
	071	067	067	068	070	071	070	075	075	073	U067F	063	F	F
	073	068	070	067	068	069	068	075	075	068	065	067	052	040
	075	069	D080S	066	065	070	067	067	U071S	075	067	055	D045S	041
	086	D087S	J073S	069	069	075	082	086	083	081	D067R	069	053	050
	080	D075S	075	073	D066S	072	073	076	065	067	056	055	D046S	035
	073	070	080	082	081	083	081	086	085	075	070	060	042	030
	062	065	D067S	081	074	074	080	082	076	D066S	070	067	051	034
	D067S	066	075	076	079	072	070	070	074	D056S	056	046	040	037
	061	063	065	D070S	074	075	075	075	076	077	070	063	D045S	035
	067	065	065	D070S	084	075	076	067	072	068	068	J049S	U035S	031
	067	062	063	065	063	071	075	079	079	J070S	D055S	045	056	F
	065	055	055	061	067	068	075	080	071	062	052	052	042	032
	067	064	061	060	062	065	070	075	072	062	060	F	F	F
	063	055	053	054	061	069	075	070	071	D072S	062	J049S	D037S	031
	C	056	055	062	065	067	067	071	J070S	065	063	060	054	041
	D064S	056	055	056	060	070	081	075	065	052	045	D033R	037	030
	063	063	063	063	063	063	063	D060S	D068S	062	J056S	D053S	043	D029S
	D065S	D060S	D070S	D065S	065	D068S	D060S	D073S	D045S	D045S	D065S	064	056	042
	D071S	D070S	D067S	073	D075S	076	080	083	D065S	086	056	056	053	043
	082	080	J070S	065	064	062	062	063	065	F	F	F	F	F
	084	D078S	U070S	D069S	067	070	071	075	J070S	063	J060S	060	063	054
	-	-	-	-	-	-	-	-	-	062	057	U057F	U061F	F
	082	D075S	087	085	075	069	075	075	075	D070S	J071S	F	F	062
	J070S	070	069	074	075	073	077	081	077	073	J070S	062	053	045
	065	064	067	067	075	077	072	078	080	068	J059S	D057S	051	034
	071	067	067	066	068	071	075	075	075	068	062	056	045	034
	29	30	30	30	30	29	29	29	29	29	29	27	25	25
	075	070	070	073	075	075	078	080	079	073	069	063	053	041
	065	062	060	062	064	069	070	071	071	063	056	046	039	030
	10	8	10	11	11	6	8	9	8	10	13	17	14	11

B

Characteristic: M(3000)F2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Lon. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	365*	340	355	400	300	330	330	350	320	280	300	275	250M	270	280
2	-	-	-	-	-	-	-	-	-	290	285	S	290	300	330
3	310	300	F	F	S	S	330	340	320	325	330	330	S	S	280
4	H	350	360	S	S	S	S	S	315	W	290	290	265	280	275
5	330	315	R	F	320	S	S	S	S	S	355	340	310	S	285
6	350	360	370	R	S	S	S	S	S	S	355	340	310	S	285
7	340	300	310	A	B	S	S	370	350	350	300	270	270	255	270
8	F	360	350	360	365	380	S	S	390	355	350	295	270	260	270
9	330	F	340	360	J370S	400	S	S	360	360	355	300	280	280	270
10	A	320	350	A	A	A	A	340	340	345	340	S	S	280	265
11	330	340	R	F	360	S	B	350	355	360	345	S	S	280	275
12	355	370	380	B	S	S	S	370	390	370	360	330	300	300	300
13	340	360	360	370	380	B	S	330	300	310	320	275	S	320	315
14	350	370	370	S	B	S	S	S	300	300	S	215	290	330	350
15	310	350	370	400	B	S	S	J320S	S	320	300	275	290	S	300
16	355	S	335	380	400	S	S	J340S	S	260	300	300	280	S	310
17	310	S	390	S	A	A	S	340	300	300	270	260	240	250	275
18	350	S	390	S	S	A	A	S	330	J310S	270	280	260	270	270
19	330	S	330	350	370	S	S	360	310	295	260	250	270	270	270
20	F	F	F	A	S	A	S	S	S	300	260	270	270	270	270
21	340	330	340	410	B	S	S	380	360	360	260	270	270	300	290
22	S	S	390	R	R	A	A	S	360M	350	S	250	260	280	285
23	340	320	350	360	400	330	S	340	300	300	300	260	270	290	260
24	S	370	395	350	310	S	S	S	370	S	S	S	S	S	280
25	360	380	370	A	310M	290M	S	S	360	S	S	S	S	S	290
26	360	340	360	360	A	S	S	S	360	S	S	S	S	S	270
27	360	310	S	330	355	400	S	S	S	S	290	270	J360S	260	250
28	380	S	S	A	320M	S	S	S	340	340	340	345	S	S	280
29	A	A	370	400	400	390M	S	340	-	-	-	-	-	-	-
30	S	360	360	350	R	A	A	320	S	330	330	S	310	275	270
31	370	380	360	380	305	A	S	S	S	280	280	270	260	270	290
Median	345	330	360	360	365	380	325	340	340	327	300	275	270	270	280
Count	22	21	24	15	15	7	2	18	21	26	24	23	22	25	27
UQ	360	365	370	400	380	400	-	360	360	350	33	290	260	282	300
LQ	330	330	350	350	330	330	-	340	313	300	27	270	260	263	270
QR	30	45	20	50	60	70	-	20	47	50	4	20	20	19	30

* Tabulation of 365 = factor of 3.65.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
280	300	275	250H	270	280	-	-	-	-	-	-	-	-	-
290	285	S	290	300	330	345	315	S	325	350	355	365	350	330
325	330	330	S	S	280	W	R	305	320	330	J335S	340	S	380
W	290	290	265	280	275	290	310	S	360	380	360	355	360	360
355	340	310	S	285	R	290	310	325	J355S	S	S	S	F	360
350	300	270	270	255	270	340	340	350	350	390	360	S	350	370
350	295	270	260	270	300	310	300	340	340	355	F	350	F	F
355	300	280	280	270	260	265	280	320	340	340	355	360	370	350
350	320	270	S	260	265	260	265	280	U330S	340	350	350	S	350
345	340	S	S	280	275	285	325	330	350	330	R	350	S	335
360	345	S	280	265	S	285	290	315	310	280	305	340	S	365
370	350	320	300	300	300	310	320	340	350	360	360	365	370	350
310	320	275	S	320	315	310	330	340	350	S	340	360	380	370
300	S	315	290	330	350	350	350	350	370	S	330	340	345	310
320	300	275	290	S	300	320	330	320	325	320	340	360	S	320
260	300	300	280	S	310	330	350	350	360	370	360	S	U340S	320
300	270	260	240	250	275	300	320	340	355	J340S	S	310	360	F
J310S	270	280	260	270	270	285	320	350	370	360	380	350	380	350
295	260	250	270	270	270	290	310	310	350	360	340	F	F	F
300	260	270	270	300	290	305	320	370	380	S	390	S	S	370
360	C	250	260	280	285	275	270	320	S	360	350	345	370	370
350	S	280	270	250	260	280	340	350	375	370	370	R	385	380
300	300	280	270	260	280	290	290	S	S	340	J340S	S	380	S
S	S	S	S	S	290	S	S	S	S	S	S	335	370	370
S	S	S	S	270	S	290	270	290	S	330	350	370	360	360
S	290	270	J260S	260	250	250	270	280	310	F	F	F	F	F
340	345	S	S	S	280	280	300	300	S	320	S	320	350	380
-	-	-	-	-	-	-	-	-	-	340	360	F	F	F
330	330	S	310	275	270	300	300	280	270	S	S	F	F	350
280	S	280	280	270	270	260	300	315	320	320	J320S	340	360	350
280	280	270	260	270	290	330	310	320	320	340	S	S	370	370
327	300	275	270	270	280	290	310	320	350	340	350	350	360	360
26	24	23	22	25	27	27	27	25	24	23	21	19	19	24
350	330	290	280	282	300	310	325	345	355	360	360	360	370	370
300	290	270	260	263	270	280	290	308	325	330	340	340	350	350
50	40	20	20	19	30	30	35	37	30	30	20	20	20	20

Characteristic: h'F₂

IONOSPHERIC DATA
 Sweep: 1 Mc to 25 Mc in 0.5 minute
 January 1964

Observed at:
 Bangkok, Thailand
 Lat. 13.73°N, Long. 100.57°E
 105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	-	-	-	-	-	-	-	-	-	-	310*	360	380	380	-
2	-	-	-	-	-	-	-	-	-	305	315	330	350	320	27
3	-	-	-	-	-	-	-	-	-	265	275	280	330	315	30
4	-	-	-	-	-	-	-	-	-	315	310	310	370	330	-
5	-	-	-	-	-	-	-	-	-	-	-	-	355	380	30
6	-	-	-	-	-	-	-	-	-	-	-	330	340	300	33
7	-	-	-	-	-	-	-	-	-	-	300	340	U340S	365	33
8	-	-	-	-	-	-	-	-	-	-	290	360	350	360	33
9	-	-	-	-	-	-	-	-	-	270	300	310	U390S	370	-
10	-	-	-	-	-	-	-	-	-	-	280	300	340	315	33
11	-	-	-	-	-	-	-	-	-	-	265	280	330	345	34
12	-	-	-	-	-	-	-	-	-	-	250	270	330	320	32
13	-	-	-	-	-	-	-	-	-	-	300	300	310	295	30
14	-	-	-	-	-	-	-	-	-	-	U280S	300	305	300	20
15	-	-	-	-	-	-	-	-	-	310	340	345	330	310	20
16	-	-	-	-	-	-	-	-	-	315	305	310	330	320	20
17	-	-	-	-	-	-	-	-	-	300	310	335	400	360	35
18	-	-	-	-	-	-	-	-	-	-	U330S	E450A	300	300	33
19	-	-	-	-	-	-	-	-	-	-	U350S	E420S	380	370	E33
20	-	-	-	-	-	-	-	-	-	-	320	300	410	390	U20
21	-	-	-	-	-	-	-	-	-	-	-	420	415	365	33
22	-	-	-	-	-	-	-	-	-	-	300	380	E400A	380	37
23	-	-	-	-	-	-	-	-	-	300	-	340	370	380	35
24	-	-	-	-	-	-	-	-	-	250	290	300	330	360	34
25	-	-	-	-	-	-	-	-	-	260	260	320	330	350	30
26	-	-	-	-	-	-	-	-	-	300	320	350	380	E370A	37
27	-	-	-	-	-	-	-	-	270	285	280	300	335	360	34
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	300	E270S	280	340	32
30	-	-	-	-	-	-	-	-	-	-	300	315	310	330	30
31	-	-	-	-	-	-	-	-	-	310	320	340	360	350	30
Median	-	-	-	-	-	-	-	-	270	300	300	320	340	350	33
Count	-	-	-	-	-	-	-	-	1	14	26	29	30	30	2
UQ	-	-	-	-	-	-	-	-	-	310	315	345	380	370	34
LQ	-	-	-	-	-	-	-	-	-	270	280	300	330	320	30
QR	-	-	-	-	-	-	-	-	-	40	35	45	50	50	4

* Tabulation of 310 = 310 km.

R

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	310*	360	380	380	-	-	-	-	-	-	-	-	-	-
305	315	330	350	320	275	-	-	-	-	-	-	-	-	-
265	275	280	330	315	325	-	-	-	-	-	-	-	-	-
315	310	310	370	330	-	-	-	-	-	-	-	-	-	-
-	-	-	355	380	300	-	-	-	-	-	-	-	-	-
-	-	330	340	300	335	-	-	-	-	-	-	-	-	-
-	300	340	U340S	365	330	-	-	-	-	-	-	-	-	-
-	290	360	350	360	330	-	-	-	-	-	-	-	-	-
270	300	310	U390S	370	-	-	-	-	-	-	-	-	-	-
-	280	300	340	315	335	300	-	-	-	-	-	-	-	-
-	265	280	330	345	340	-	-	-	-	-	-	-	-	-
-	250	270	330	320	320	290	-	-	-	-	-	-	-	-
300	300	310	320	295	300	305	-	-	-	-	-	-	-	-
-	U280S	300	305	300	265	250	-	-	-	-	-	-	-	-
310	340	345	330	310	290	280	-	-	-	-	-	-	-	-
315	305	310	330	320	280	260	-	-	-	-	-	-	-	-
300	310	335	400	360	350	305	-	-	-	-	-	-	-	-
-	U330S	E450A	300	300	335	320	-	-	-	-	-	-	-	-
-	U350S	E420S	380	370	E330A	-	-	-	-	-	-	-	-	-
-	320	300	410	390	U280S	320	-	-	-	-	-	-	-	-
-	-	420	415	365	330	330	-	-	-	-	-	-	-	-
-	300	380	E400A	380	375	310	-	-	-	-	-	-	-	-
300	-	340	370	380	350	310	-	-	-	-	-	-	-	-
250	290	300	330	360	340	300	-	-	-	-	-	-	-	-
260	260	320	330	350	300	-	-	-	-	-	-	-	-	-
300	320	350	380	E370A	370	-	-	-	-	-	-	-	-	-
285	280	300	335	360	340	340	300	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	300	E270S	280	340	320	-	-	-	-	-	-	-	-	-
-	300	315	310	330	300	315	-	-	-	-	-	-	-	-
310	320	340	360	350	300	275	-	-	-	-	-	-	-	-
300	300	320	340	350	330	305	300	-	-	-	-	-	-	-
14	26	29	30	30	27	16	1	-	-	-	-	-	-	-
310	315	345	380	370	340	320	-	-	-	-	-	-	-	-
270	280	300	330	320	300	285	-	-	-	-	-	-	-	-
40	35	45	50	50	40	45	-	-	-	-	-	-	-	-

B

Characteristic: h'F

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	230*	240	240	200	E300R	E320B	E310S	E225S	215	200	180	175	165	170H	160
2	-	-	-	-	-	-	-	-	-	180	E180S	170	170	160	160
3	E325S	E330S	E350S	E335S	S	S	E270S	E230S	215	200	E200A	200	A	180	E190
4	A	E300S	250	E240S	B	S	S	E330S	215	200	180	185	185	175	200
5	E260S	E300S	E225S	U250F	E300S	S	E250S	E215S	210	200	210	E220A	190	E200A	190
6	E230S	E235B	220	E270B	B	B	S	220	205	210	E220S	180	165	180	165
7	E300S	E350S	E370S	A	B	S	S	E220A	E200A	E200A	E220A	E200A	180	170	E230
8	E200B	E210S	E220B	E200S	220	E260S	S	220	210	E240A	E220S	E200S	180	170	160
9	E230S	E230S	E230S	210	210	E210S	S	E230S	210	210	E180S	180	190	180	160
10	A	E250A	E230S	A	A	A	A	230	200	200	185	E180A	180	E200A	E220
11	E290A	240	210	210	215	E300S	B	225	215	205	190	180	180	E180A	180
12	E235S	E260S	E260S	B	S	S	S	230	215	-	E200A	180H	E200A	E210A	E210
13	E240S	E230S	E220S	E200A	200	B	S	E230S	E210A	210	170	175	160H	185	170
14	E230S	E280S	210	E205A	B	S	S	E220S	E200S	E180S	180	180	180	175	200
15	E300S	E250S	205	E205B	B	S	S	E240S	E200A	E200A	E180A	E170A	160	150H	E170
16	E220S	E250S	E255B	E240B	E195S	S	S	E210S	210	198	170	180	160	A	E200
17	E300S	E265S	E200S	E220S	A	A	S	E220S	E200S	180	200	175	175	170	170
18	E205S	E220S	E205S	250	S	A	A	220	208	E200A	E220A	A	E200A	E200A	E185
19	E260S	E290S	E290S	E300S	E265S	S	S	E225S	210	200	185	180	170	A	A
20	E215S	E230S	200	A	S	A	S	E240S	210	E200A	E200S	E200S	165	E165A	A
21	E250S	270	270	203	B	S	S	220	210	200	C	165	E170A	E200A	180
22	E220B	E225S	E210S	E200S	E340B	A	A	215	215	E210A	E200A	E220A	A	E260A	E210
23	E270S	E290S	260	E260S	E215S	E290S	S	E230S	200	E180S	E200A	E175A	165	170	170
24	E210S	E205E	200	230	E305S	E260S	S	220	E200A	E200S	190	E190S	170	170	160
25	E200S	E220A	220	A	E320S	E400S	E350S	220	210	200	200	E200A	E190A	E330A	E250
26	E205E	E230S	E230S	E210S	280	S	S	220	200	A	230	E200A	E200A	A	175
27	210	215	185	E200S	E200S	E270S	S	E220S	E200S	200	E180S	170	160H	E170S	A
28	200	E215A	200	A	E330S	S	S	220	-	-	-	-	-	-	-
29	A	A	220	E200B	E200S	E250S	S	E220S	E200S	190	E170S	S	180	170	170
30	E190S	E200S	E215S	E240S	E300A	A	A	E230S	200	E200A	180	E180S	180	170	170
31	E220A	E200S	200	E200S	220	A	S	220	E200A	E200A	E180A	160	180	160	180
Median Count	230 27	240 29	220 30	210 24	243 18	270 9	293 4	220 30	210 29	200 28	190 29	180 28	180 28	175 27	180 27
UQ	260	275	260	245	300	310	330	230	210	200	200	200	182	200	200
LQ	210	220	210	200	210	255	260	220	200	200	180	175	165	170	170
QR	50	55	50	45	90	55	70	10	10	0	20	25	17	30	30

* Tabulation of 230 = 230 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
215	300	180	175	165	170H	180	-	-	-	-	-	-	-	-	-
-	180	E180S	170	170	180	160	E210S	E220S	250	240	300	300	190	350	E285S
215	300	E200A	200	A	180	E190A	175	230	230	225	210	210	300	305	E260S
215	300	180	185	185	175	200	165	215	E221S	200	185	E180S	E205S	E210S	E250S
210	300	210	E220A	190	E200A	180	185	210	220	215	E210S	E210A	E200A	E230S	215
205	210	E220S	180	165	180	160	210	210	E220S	208	300	300	E220A	E230A	E220S
E200A	E200A	E230A	E200A	130	170	E230A	E290A	E240A	E250A	E230A	E210B	240	220	E200B	E210S
210	E240A	E220S	E200S	180	170	160	E210A	E200B	E220S	E215S	E210S	E200S	300	210	E220S
210	210	E180S	180	180	180	160H	320	E220A	E230A	E230A	230	E210S	300	205	E230A
300	300	155	E180A	180	E200A	E220S	E180A	215	220	225	225	225	230	235	E260A
215	305	190	180	180	E180A	180	200	E290A	E220A	225	E240S	240	235	205	220
215	-	E200A	180H	E200A	E210A	E210A	180	E200S	220	230	300	300	300	300	E210S
E210A	210	170	175	160H	185	170	180	185H	E215S	E210S	E205S	E200S	E210S	200	E210S
E200S	E180S	180	180	180	175	300	185	300	220	215	300	E225A	350	E260B	E300B
E200A	E200A	E180A	E170A	180	150H	E170A	185	190	E240A	E240A	E210A	E200S	E210A	E200S	E205S
210	198	170	180	160	A	E200A	E220A	300	220	220	E200S	E190S	E205S	E220S	E260S
E200S	180	300	175	175	170	170	180	E200A	E240A	220	E210S	E210A	E270A	E210S	E203S
208	E200A	E220A	A	E200A	E200A	E185A	A	E230A	240	E220A	E205A	200	E210A	E220A	E220S
210	300	185	180	170	A	A	E220A	200	E280A	E230A	240	220	230	U270F	U240F
210	E200A	E200S	E200S	165	E165A	A	A	E215A	E220A	215	E200S	300	E200S	E220S	E220S
210	300	C	165	E170A	E200A	180	175	E180A	E200S	215	E205S	300	E220S	E208S	E200S
215	E210A	E200A	E220A	A	E260A	E210A	E185A	E340A	220	305	E200S	E200S	E230A	E200A	E215A
300	E180S	E200A	E175A	165	170	170	170	E170S	E200S	220	E210S	E200A	200	300	E220A
E200A	E200S	190	E190S	170	170	160	200	200	210	230	E210S	200	220	205	E200S
210	300	200	E200A	E180A	E330A	E250A	E200A	E270A	E210S	230	220	E200S	E200A	E200S	E220S
300	A	230	E200A	E200A	A	175	E170A	E230A	E240A	E220A	U250F	U260F	U240F	E210S	205
E200S	300	E180S	170	160H	E170S	A	A	E280A	E210S	230	E210S	E220S	E230S	E210S	210
-	-	-	-	-	-	-	-	-	-	-	300	E210A	U215F	U230F	U220F
E200S	180	E170S	S	180	170	170	170	180	E200S	E230S	E230S	260	240	E230A	E200S
200	E200A	180	E180S	180	170	170	170	E170A	E200A	210	250	E210A	E210A	E230A	E230A
E200A	E200A	E180A	160	180	160	180	188	200	E210A	240	230	300	E210S	E210S	E210S
210	300	190	180	180	175	180	185	210	220	225	210	300	217	210	220
29	28	29	28	28	27	27	26	29	29	29	30	30	30	30	30
210	200	200	200	182	300	200	210	230	235	230	210	220	230	230	230
300	300	180	175	165	170	170	175	200	210	215	200	300	305	205	210
10	0	20	25	17	30	30	35	30	25	15	10	20	25	25	20

B

Characteristic: foF1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	-	-	-	-	-	-	-	-	L	L	043*	044	043	043	L
2	-	-	-	-	-	-	-	-	-	042	042	042	043	044	042
3	-	-	-	-	-	-	-	-	L	041	042	045	A	044	046
4	-	-	-	-	-	-	-	-	L	043	042	043	045	044	L
5	-	-	-	-	-	-	-	L	L	L	L	A	043	R	041
6	-	-	-	-	-	-	-	L	L	L	L	043	043	043	042
7	-	-	-	-	-	-	-	L	L	L	043	044	043	044	043
8	-	-	-	-	-	-	-	L	L	L	043	U047S	043	044	043
9	-	-	-	-	-	-	-	-	-	042	044	044	044	042	L
10	-	-	-	-	-	-	-	-	L	L	042	043	043	043	043
11	-	-	-	-	-	-	-	-	L	L	043	043	043	043	044
12	-	-	-	-	-	-	-	-	L	L	043	043	044	044	044
13	-	-	-	-	-	-	-	-	-	042	043	043	044	042	043
14	-	-	-	-	-	-	-	-	L	L	043	043	045	044	044
15	-	-	-	-	-	-	-	-	-	041	044	044	044	044	042
16	-	-	-	-	-	-	-	-	L	041	043	043	044	S	044
17	-	-	-	-	-	-	-	-	L	042	042	044	043	042	043
18	-	-	-	-	-	-	-	S	L	L	044	A	044	043	044
19	-	-	-	-	-	-	-	-	L	L	042	043	044	A	A
20	-	-	-	-	-	-	-	-	L	L	041	043	043	043	A
21	-	-	-	-	-	-	-	-	L	L	C	044	042	043	042
22	-	-	-	-	-	-	-	-	L	L	042	043	A	043	041
23	-	-	-	-	-	-	-	-	L	041	L	043	043	044	043
24	-	-	-	-	-	-	-	-	L	040	043	043	043	042	043
25	-	-	-	-	-	-	-	-	L	042	043	043	043	044	043
26	-	-	-	-	-	-	-	-	L	A	L	044	044	A	042
27	-	-	-	-	-	-	-	-	-	043	044	042	043	043	A
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	L	L	042	S	044	043	043
30	-	-	-	-	-	-	-	-	L	L	042	044	044	045	046
31	-	-	-	-	-	-	-	-	L	042	043	043	043	043	043
Median Count	-	-	-	-	-	-	-	-	-	042 13	043 25	043 27	043 29	043 26	043 24
UQ	-	-	-	-	-	-	-	-	-	042	043	044	044	044	044
LQ	-	-	-	-	-	-	-	-	-	041	042	043	043	043	042
QR	-	-	-	-	-	-	-	-	-	1	1	1	1	1	2

* Tabulation of 043 = 4.3 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	L	L	043*	044	043	043	L	-	-	-	-	-	-	-	-	-
-	-	G12	042	042	043	044	042	L	L	-	-	-	-	-	-	-
-	L	041	042	045	A	044	046	L	L	L	-	-	-	-	-	-
-	L	043	042	043	045	044	L	L	L	-	-	-	-	-	-	-
L	L	L	L	A	043	R	041	L	L	-	-	-	-	-	-	-
L	L	L	L	043	043	043	042	L	-	-	-	-	-	-	-	-
L	L	L	043	044	043	044	043	A	A	-	-	-	-	-	-	-
-	-	042	044	U047S	043	044	043	L	L	L	-	-	-	-	-	-
-	L	L	042	044	044	042	L	L	L	-	-	-	-	-	-	-
-	L	L	043	043	043	043	043	042	L	L	-	-	-	-	-	-
-	L	L	043	043	043	043	044	L	L	L	-	-	-	-	-	-
-	-	042	043	043	044	042	043	042	L	L	-	-	-	-	-	-
-	L	L	043	043	045	044	044	042	L	L	-	-	-	-	-	-
-	-	041	044	044	044	044	044	043	L	L	-	-	-	-	-	-
-	L	041	043	043	044	S	044	042	L	L	-	-	-	-	-	-
-	L	042	042	044	043	042	043	043	L	L	-	-	-	-	-	-
S	L	L	044	A	044	043	044	043	A	L	-	-	-	-	-	-
-	L	L	042	043	044	A	A	A	L	L	-	-	-	-	-	-
-	L	L	041	043	043	043	043	A	L	L	-	-	-	-	-	-
-	L	L	C	044	042	043	042	042	L	L	-	-	-	-	-	-
-	L	L	042	043	A	043	041H	040	L	L	-	-	-	-	-	-
-	L	041	L	043	043	043	043	041	L	L	-	-	-	-	-	-
-	L	040	043	043	043	042	043	042	L	L	-	-	-	-	-	-
-	L	042	043	043	043	044	043	L	L	L	-	-	-	-	-	-
-	L	A	L	044	044	A	042	L	L	L	-	-	-	-	-	-
-	-	043	044	042	043	043	A	A	045	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	L	L	042	S	044	G43	043	L	L	L	-	-	-	-	-	-
-	L	L	042	044	044	045	046	043	L	-	-	-	-	-	-	-
-	L	042	043	043	043	043	043	042	L	-	-	-	-	-	-	-
-	-	042	043	043	043	043	043	042	045	-	-	-	-	-	-	-
-	-	13	25	27	28	26	24	13	1	-	-	-	-	-	-	-
-	-	042	043	044	044	044	044	043	-	-	-	-	-	-	-	-
-	-	041	042	043	043	043	042	042	-	-	-	-	-	-	-	-
-	-	1	1	1	1	1	2	1	-	-	-	-	-	-	-	-

Characteristic: M(3000)F1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12
1	-	-	-	-	-	-	-	-	L	L	390*	395	410
2	-	-	-	-	-	-	-	-	-	380	400	430	430
3	-	-	-	-	-	-	-	-	L	380	395	380	A
4	-	-	-	-	-	-	-	-	L	375	405	400	400
5	-	-	-	-	-	-	-	L	L	L	L	A	410
6	-	-	-	-	-	-	-	L	L	L	L	400	420
7	-	-	-	-	-	-	-	L	L	L	400	415	430
8	-	-	-	-	-	-	-	L	L	L	410	U390S	420
9	-	-	-	-	-	-	-	-	-	375	370	400	400
10	-	-	-	-	-	-	-	-	L	L	390	410	420
11	-	-	-	-	-	-	-	-	L	L	400	430	420
12	-	-	-	-	-	-	-	-	L	L	415	410	410
13	-	-	-	-	-	-	-	-	-	375	405	420	420
14	-	-	-	-	-	-	-	-	L	L	400	420	415
15	-	-	-	-	-	-	-	-	-	380	400	415	410
16	-	-	-	-	-	-	-	-	L	390	395	420	430
17	-	-	-	-	-	-	-	-	L	370	390	400	430
18	-	-	-	-	-	-	-	S	L	L	375	A	400
19	-	-	-	-	-	-	-	-	L	L	410	400	400
20	-	-	-	-	-	-	-	-	L	L	420	430	425
21	-	-	-	-	-	-	-	-	L	L	C	410	420
22	-	-	-	-	-	-	-	-	L	L	420	420	A
23	-	-	-	-	-	-	-	-	L	400	L	420	430
24	-	-	-	-	-	-	-	-	L	400	400	420	420
25	-	-	-	-	-	-	-	-	L	380	400	410	430
26	-	-	-	-	-	-	-	-	L	A	L	400	400
27	-	-	-	-	-	-	-	-	-	390	405	430	415
28	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	L	L	400	S	420
30	-	-	-	-	-	-	-	-	L	L	390	400	410
31	-	-	-	-	-	-	-	-	L	370	390	390	420
Median Count	-	-	-	-	-	-	-	-	-	380 13	400 25	410 27	420 28
UQ	-	-	-	-	-	-	-	-	-	390	405	420	422
LQ	-	-	-	-	-	-	-	-	-	375	390	400	410
QR	-	-	-	-	-	-	-	-	-	15	15	20	12

* Tabulation of 390 = factor of 3.9.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
L	L	390*	395	415	430	L	-	-	-	-	-	-	-	-	-
-	380	400	430	430	430	385	L	L	-	-	-	-	-	-	-
L	380	395	380	A	390	360	L	L	L	-	-	-	-	-	-
L	375	405	400	400	390	L	L	L	-	-	-	-	-	-	-
L	L	L	A	410	R	420	L	L	-	-	-	-	-	-	-
L	L	L	400	420	410	410	L	-	-	-	-	-	-	-	-
J	L	400	415	430	420	400	A	A	-	-	-	-	-	-	-
L	L	410	U390S	420	410	390	L	L	L	-	-	-	-	-	-
-	375	370	400	400	430	L	L	L	-	-	-	-	-	-	-
L	L	390	410	420	410	380	380	L	L	-	-	-	-	-	-
L	L	40J	430	420	400	385	L	L	L	-	-	-	-	-	-
L	L	415	410	410	390	385	380	L	L	-	-	-	-	-	-
-	375	405	420	420	430	370	385	L	L	-	-	-	-	-	-
L	L	400	420	415	410	390	410	L	L	-	-	-	-	-	-
-	380	400	415	410	440	420	380	L	L	-	-	-	-	-	-
L	390	395	420	430	S	410	400	L	-	-	-	-	-	-	-
L	370	390	400	430	410	400	390	L	L	-	-	-	-	-	-
L	L	375	A	400	410	390	A	L	-	-	-	-	-	-	-
L	L	410	400	400	A	A	L	L	-	-	-	-	-	-	-
L	L	420	430	425	420	A	A	L	L	-	-	-	-	-	-
L	L	C	410	420	400	410	370	L	L	-	-	-	-	-	-
L	L	420	420	A	380	400H	410	L	-	-	-	-	-	-	-
L	40J	L	420	430	410	400	400	L	-	-	-	-	-	-	-
L	400	400	420	420	430	390	380	L	-	-	-	-	-	-	-
L	380	400	410	430	350	390	L	L	L	-	-	-	-	-	-
L	A	L	400	400	A	400	L	L	-	-	-	-	-	-	-
-	390	405	430	415	410	A	A	360	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L	L	400	S	420	415	390	L	L	L	-	-	-	-	-	-
L	L	390	400	410	400	430	360	L	-	-	-	-	-	-	-
L	370	390	390	420	420	420	380	L	-	-	-	-	-	-	-
-	380	400	410	420	410	395	380	360	-	-	-	-	-	-	-
-	13	25	27	28	26	24	13	1	-	-	-	-	-	-	-
-	390	405	420	422	420	405	400	-	-	-	-	-	-	-	-
-	375	390	400	410	400	390	380	-	-	-	-	-	-	-	-
-	13	15	20	12	20	15	20	-	-	-	-	-	-	-	-

Characteristic: foE

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
1	-	-	-	-	-	-	-	-	S	285*	A	R	A	A	
2	-	-	-	-	-	-	-	-	-	285	S	S	A	A	
3	-	-	-	-	-	-	-	-	A	S	A	A	A	A	
4	-	-	-	-	-	-	-	-	A	S	A	330	A	B	
5	-	-	-	-	-	-	-	A	A	S	A	A	A	A	
6	-	-	-	-	-	-	-	R	A	A	S	S	335	S	
7	-	-	-	-	-	-	-	S	A	A	A	A	A	A	
8	-	-	-	-	-	-	-	U230S	A	R	R	S	A	A	
9	-	-	-	-	-	-	-	-	-	S	320	320	330	S	
10	-	-	-	-	-	-	-	-	U240S	A	R	-	S	A	
11	-	-	-	-	-	-	-	-	S	285	320	320	S	A	
12	-	-	-	-	-	-	-	-	A	S	A	A	A	A	
13	-	-	-	-	-	-	-	-	S	B	310	330	340H	R	3
14	-	-	-	-	-	-	-	-	S	S	A	R	R	A	
15	-	-	-	-	-	-	-	-	-	A	A	A	A	A	
16	-	-	-	-	-	-	-	-	S	A	310	R	R	-	
17	-	-	-	-	-	-	-	-	S	280	330H	S	S	A	
18	-	-	-	-	-	-	-	S	A	S	A	A	A	A	
19	-	-	-	-	-	-	-	-	S	S	A	350H	S	A	
20	-	-	-	-	-	-	-	-	A	A	A	A	A	A	
21	-	-	-	-	-	-	-	A	S	S	C	A	S	A	
22	-	-	-	-	-	-	-	-	S	A	A	A	A	A	
23	-	-	-	-	-	-	-	-	S	S	A	S	S	S	
24	-	-	-	-	-	-	-	-	A	S	U320S	S	A	A	
25	-	-	-	-	-	-	-	-	S	A	A	A	A	S	
26	-	-	-	-	-	-	-	-	-	A	A	A	A	A	
27	-	-	-	-	-	-	-	-	-	S	S	S	S	A	
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
29	-	-	-	-	-	-	-	-	S	S	A	S	S	A	
30	-	-	-	-	-	-	-	-	S	A	A	R	A	A	
31	-	-	-	-	-	-	-	-	S	A	A	A	S	S	
Median	-	-	-	-	-	-	-	230	240	285	320	330	335	-	3
Count	-	-	-	-	-	-	-	1	1	4	6	5	3	-	-
UQ	-	-	-	-	-	-	-	-	-	285	320	340	338	-	-
LQ	-	-	-	-	-	-	-	-	-	283	310	320	333	-	-
QR	-	-	-	-	-	-	-	-	-	2	10	20	5	-	-

* Tabulation of 285 = 2.85 Mc.

A

IONOSPHERIC DATA

1 Mc to 25 Mc in 0.5 minute

January 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
285*	A	R	A	A	B	-	-	-	-	-	-	-	-	-
285	S	S	A	A	A	S	S	-	-	-	-	-	-	-
S	A	A	A	A	B	305	300	S	-	-	-	-	-	-
S	A	330	A	B	-	290	275	-	-	-	-	-	-	-
S	A	A	A	A	A	300	A	A	-	-	-	-	-	-
A	S	S	335	S	A	A	-	-	-	-	-	-	-	-
A	R	S	A	A	A	A	A	-	-	-	-	-	-	-
R	R	S	A	A	A	A	A	-	-	-	-	-	-	-
S	320	320	330	S	A	A	B	S	-	-	-	-	-	-
A	R	-	S	A	B	A	A	S	-	-	-	-	-	-
285	320	320	S	A	B	-	-	A	-	-	-	-	-	-
S	A	A	A	A	S	B	U300S	250	-	-	-	-	-	-
B	310	330	340H	R	330	A	A	S	-	-	-	-	-	-
S	A	R	R	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	330	A	-	-	-	-	-	-	-
A	310	R	R	-	A	A	R	-	-	-	-	-	-	-
280	330H	S	S	A	A	S	-	-	-	-	-	-	-	-
S	A	A	A	A	A	A	A	-	-	-	-	-	-	-
S	A	350H	S	A	A	A	300H	-	-	-	-	-	-	-
A	A	A	A	A	A	A	A	A	-	-	-	-	-	-
S	A	A	A	A	A	A	A	S	-	-	-	-	-	-
S	A	S	S	S	B	B	275	-	-	-	-	-	-	-
S	U320S	S	A	A	S	S	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	A	A	-	-	-	-	-	-
A	S	S	S	A	A	A	A	A	-	-	-	-	-	-
A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A	S	S	S	A	R	A	S	S	-	-	-	-	-	-
A	A	R	A	A	A	A	R	-	-	-	-	-	-	-
5	320	330	335	-	330	303	300	250	-	-	-	-	-	-
	6	5	3	-	1	4	5	1	-	-	-	-	-	-
5	320	340	338	-	-	318	300	-	-	-	-	-	-	-
3	310	320	333	-	-	295	275	-	-	-	-	-	-	-
	10	20	5	-	-	23	25	-	-	-	-	-	-	-

B

Characteristic: h'E

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	-	-	-	-	-	-	-	100*	100	100	110	110	100
2	-	-	-	-	-	-	-	-	-	100	100	100	100	A
3	-	-	-	-	-	-	-	-	110	107	100	100	100	100
4	-	-	-	-	-	-	-	-	S	S	100	105	115	B
5	-	-	-	-	-	-	-	110	105	S	100	104	E110A	A
6	-	-	-	-	-	-	-	120	105	A	S	S	100	S
7	-	-	-	-	-	-	-	S	100	A	A	A	A	E110A
8	-	-	-	-	-	-	-	130	100	100	100	S	E120S	A
9	-	-	-	-	-	-	-	-	-	110	E105S	E100S	100	S
10	-	-	-	-	-	-	-	-	105	E110S	105	110	S	100
11	-	-	-	-	-	-	-	-	S	105	105	E145A	S	105
12	-	-	-	-	-	-	-	-	125	S	110	110	E110S	100
13	-	-	-	-	-	-	-	-	S	B	100	E105S	100	105
14	-	-	-	-	-	-	-	-	S	100	A	100	100	102
15	-	-	-	-	-	-	-	-	-	A	E110S	102	100	A
16	-	-	-	-	-	-	-	-	E110S	102	E110S	100	100	100
17	-	-	-	-	-	-	-	-	120	110	E110S	S	S	100
18	-	-	-	-	-	-	-	S	E110S	S	100	E105S	100	E105S
19	-	-	-	-	-	-	-	-	103	105	E105S	100	100	100
20	-	-	-	-	-	-	-	-	E120S	S	100	A	A	100
21	-	-	-	-	-	-	-	A	105	S	C	110	S	A
22	-	-	-	-	-	-	-	-	S	100	A	A	A	A
23	-	-	-	-	-	-	-	-	100	100	100	100	100	S
24	-	-	-	-	-	-	-	-	E110S	S	100	100	A	A
25	-	-	-	-	-	-	-	-	E130S	A	A	A	100	S
26	-	-	-	-	-	-	-	-	-	A	A	A	A	A
27	-	-	-	-	-	-	-	-	-	S	S	S	S	A
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	S	100	100	S	S	A
30	-	-	-	-	-	-	-	-	S	A	A	100	A	A
31	-	-	-	-	-	-	-	-	S	A	A	A	E110S	100
Median	-	-	-	-	-	-	-	120	105	101	100	102	100	100
Count	-	-	-	-	-	-	-	3	17	14	20	19	18	14
UQ	-	-	-	-	-	-	-	125	115	107	105	110	110	105
LQ	-	-	-	-	-	-	-	115	102	100	100	100	100	100
QR	-	-	-	-	-	-	-	10	13	7	5	10	10	5

*Tabulation of 100 = 100 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	100*	100	100	110	110	100	B	-	-	-	-	-	-	-	-	-
	-	100	100	100	100	100	A	S	S	-	-	-	-	-	-	-
	110	107	100	100	100	100	B	E175A	E160S	S	-	-	-	-	-	-
	S	S	100	105	115	B	-	102	110	-	-	-	-	-	-	-
10	105	S	100	104	E110A	A	A	E110A	120	S	-	-	-	-	-	-
20	105	A	S	S	100	S	A	E150A	-	-	-	-	-	-	-	-
S	100	A	A	A	A	E110A	110	100	A	-	-	-	-	-	-	-
30	100	100	100	S	E120S	A	A	A	B	S	-	-	-	-	-	-
	-	110	E105S	E100S	100	S	B	E110A	A	S	-	-	-	-	-	-
	105	E110S	105	110	S	100	100	A	105	-	-	-	-	-	-	-
	S	105	105	E145A	S	105	B	110	A	-	-	-	-	-	-	-
	125	S	110	110	E110S	100	S	B	E100S	E120S	-	-	-	-	-	-
	S	B	100	E105S	100	105	E105A	110	100	S	-	-	-	-	-	-
	S	100	A	100	100	102	E120S	110	100	A	-	-	-	-	-	-
	-	A	E110S	102	100	A	101	E115A	A	-	-	-	-	-	-	-
	E110S	102	E110S	100	100	100	A	A	E110S	-	-	-	-	-	-	-
	120	110	E110S	S	S	100	S	S	-	-	-	-	-	-	-	-
	E110S	S	100	E105S	100	E105S	E110S	A	A	-	-	-	-	-	-	-
	103	105	E105S	100	100	100	E110S	A	100	-	-	-	-	-	-	-
	E120S	S	100	A	A	100	100	A	A	A	-	-	-	-	-	-
	105	S	C	110	S	A	A	A	A	S	-	-	-	-	-	-
	S	100	A	A	A	A	E110S	100	E110S	-	-	-	-	-	-	-
	100	100	100	100	100	100	S	B	B	E102S	-	-	-	-	-	-
	E110S	S	100	100	A	A	S	S	S	E110S	A	-	-	-	-	-
	E130S	A	A	A	100	A	A	A	A	-	-	-	-	-	-	-
	-	A	A	A	A	A	A	A	A	-	-	-	-	-	-	-
	-	S	S	S	S	A	A	A	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	S	100	100	S	S	A	B	100	100	S	-	-	-	-	-	-
	S	A	A	100	A	A	E110A	A	-	-	-	-	-	-	-	-
	S	A	A	A	E110S	100	100	100	E105S	-	-	-	-	-	-	-
00	105	101	100	102	100	100	110	110	105	120	-	-	-	-	-	-
	17	14	20	19	18	14	11	13	14	1	-	-	-	-	-	-
5	115	107	105	110	110	105	110	112	110	-	-	-	-	-	-	-
5	102	100	100	100	100	100	100	100	100	-	-	-	-	-	-	-
0	13	7	5	10	10	5	10	12	10	-	-	-	-	-	-	-

B

Characteristic: fbEs

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 minute
January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	-	B	S	B	B	B	S	S	G	S	031*	S	033	032
2	-	-	-	-	-	-	-	-	-	S	S	S	034	033M
3	S	S	S	S	S	S	S	S	027	029	034	034	050M	033
4	M	S	S	S	B	S	S	S	030M	S	-	S	033	B
5	S	S	S	B	S	-	S	025	030	031	034	041M	034	036
6	S	B	B	B	B	B	S	S	026M	032	036	034M	S	M
7	S	S	S	-	B	S	S	022	029	033	038	035	034M	035M
8	B	S	B	S	B	S	-	S	030	037	037	-	034	034
9	B	S	S	B	B	B	S	S	S	S	S	S	S	035
10	-	B	B	-	-	-	-	S	S	030	S	035	035	040
11	M	B	B	B	B	S	B	S	S	S	S	036	035	037
12	S	S	S	B	S	S	S	029	028	032	039	037	039	037
13	B	-	S	B	S	B	S	S	-	B	S	S	S	S
14	B	S	S	B	B	S	S	S	S	S	032	S	S	035
15	B	B	B	B	B	S	S	S	027	031M	033	035	035	-
16	S	S	B	B	S	S	S	S	S	030M	S	S	S	044
17	B	S	S	S	M	M	S	S	M	S	S	B	S	034
18	S	S	S	B	S	-	-	020	028	033	037	048	039	037
19	B	B	B	S	S	S	S	S	S	S	S	S	S	044
20	-	S	S	-	S	-	S	S	029	033	037	039M	035	034
21	S	S	B	S	B	S	S	023	S	S	C	036	036	038
22	B	B	S	S	B	-	-	025	027	035	040	040M	045	040
23	-	S	B	B	S	S	S	S	S	S	034	S	-	S
24	S	B	B	S	S	S	S	M	032	S	S	S	033	-
25	S	-	B	-	S	S	S	S	028	031	033	035	036	043
26	-	S	S	S	018	S	S	S	-	045	039	040	040	050
27	B	B	B	S	S	S	S	S	S	S	S	S	S	035
28	-	018	-	-	S	S	S	S	-	-	-	-	-	-
29	-	-	B	B	S	S	S	S	S	S	S	S	S	031
30	S	S	S	-	-	-	-	S	S	032	030	G	035	-
31	B	S	S	S	S	-	S	S	030	030	035	033	S	S
Median	-	018	-	-	018	-	-	024	028	032	035	036	035	035
Count	-	1	-	-	1	-	-	6	14	16	17	15	19	22
UQ	-	-	-	-	-	-	-	025	030	033	037	040	039	040
LQ	-	-	-	-	-	-	-	022	027	031	033	035	034	034
QR	-	-	-	-	-	-	-	3	3	2	4	5	5	6

*Tabulation of 031 = 3.1 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
S	G	S	031*	S	033	032	B	-	-	-	-	-	-	-	-	-
-	-	S	S	S	034	033M	032	S	S	S	S	S	S	S	S	B
S	027	029	034	034	050M	033	B	030M	032	-	S	S	019	019M	M	021
S	030M	S	-	S	033	B	033	B	-	S	S	022	S	S	S	S
25	030	031	034	041M	034	036	036	-	S	024	S	025M	023M	033	S	S
S	026M	032	036	034M	S	M	033	033	B	S	S	024	020	025	024	S
22	029	033	038	035	034M	035M	040	044M	039M	035	033M	B	B	026	B	S
S	030	037	037	-	034	034	033	034M	B	S	S	B	B	B	B	B
S	S	S	S	S	S	035	B	037	034M	034	S	B	B	036	030	021
S	S	030	S	035	035	040	039	032	S	-	024	032	034	036	030M	034
29	028	032	039	037	039	037	035	033	039	025	S	S	S	S	020	B
S	-	B	S	S	S	S	M	B	S	S	027	021	B	S	B	B
S	S	S	032	S	S	035	035	G	029	028	B	S	M	M	B	S
S	027	031M	033	035	035	-	034	-	029	034	020	029	035M	027	B	B
S	S	030M	S	S	S	044	039	039	030	025	022	020	-	029	S	B
S	M	S	S	B	S	034	S	-	030	031	026	024	025	S	S	S
20	028	033	037	048	039	037	035	052	036	035	B	023	026	025	B	B
S	S	S	S	S	S	044	044	037M	S	040	030	030	B	022	B	S
23	029	033	037	039M	035	034	045M	045	033	027	S	S	-	018	S	020
25	027	S	C	036	036	038	034	031	030	S	M	S	B	S	B	B
S	S	035	040	040M	045	040	038	030	036	027	S	-	-	026	023	020
S	032	S	S	S	-	S	B	B	S	S	S	S	025	-	019	021
S	028	031	033	035	033	-	S	032	028M	-	S	S	S	020	-	S
S	-	045	039	040	040	043	040	040	040	-	S	S	S	-	-	S
S	S	S	S	S	050	033	030	033	033	029	024	S	S	S	021	-
S	-	-	-	-	-	-	-	-	042	028	023	S	S	S	S	S
S	S	S	S	S	S	031	B	M	-	-	-	B	023M	-	-	021
S	S	032	030	G	035	-	034	032	030M	S	S	S	B	B	018M	-
030	030	035	033	S	S	S	034	G	S	025	034	021	022	020	-	B
04	028	032	035	036	035	035	035	033	032	028	026	024	024	026	022	021
	14	16	17	15	19	22	22	19	17	15	12	13	10	14	8	7
5	030	033	037	040	039	040	039	040	036	034	031	030	026	029	027	021
2	027	031	033	035	034	034	034	031	030	025	024	021	022	020	020	020
	3	2	4	5	5	6	5	9	6	9	7	9	4	9	7	1

Characteristic: foEs

IONOSPHERIC
Sweep: 1 Mc to 25 Mc
January 19

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	022*	B	S	B	B	B	S	S	G	S	031	S	033	03
2	-	-	-	-	-	-	-	-	-	S	S	S	045	04
3	S	S	S	S	S	S	S	S	027	032	035	038	065M	06
4	031M	S	S	S	B	S	S	S	033M	S	033	S	035	07
5	S	S	S	B	S	018	S	029M	031	031	035	070M	035	08
6	S	B	B	B	B	B	S	S	027M	034	036	040M	S	09
7	S	S	S	017	B	S	S	030	029	045	052	045	045M	10
8	B	S	B	S	B	S	019	S	030	037	037	037	035	11
9	B	S	S	B	B	B	S	S	S	S	S	S	S	12
10	047	B	B	040	039	035	030	S	S	030	S	035	035	13
11	050M	B	B	B	B	S	B	S	S	S	S	036	035	14
12	S	S	S	B	S	S	S	031	028	032	039	037	039	15
13	B	019	S	B	S	B	S	S	025	B	S	S	S	16
14	B	S	S	B	B	S	S	S	S	S	037	S	S	17
15	B	B	B	B	B	S	S	S	035	035M	033	037	037	18
16	S	S	B	B	S	S	S	S	S	036M	S	S	S	19
17	B	S	S	S	019M	018M	S	S	032M	S	S	B	S	20
18	S	S	S	B	S	025	021	029	030	034	037	054	039	21
19	B	B	B	S	S	S	S	S	S	S	S	S	S	22
20	025	S	S	026	S	041	S	S	034	033	037	045M	039	23
21	S	S	B	S	B	S	S	023	S	S	C	040	040	24
22	B	B	S	S	B	019	023	029	027	035	045	045M	045	25
23	027	S	B	B	S	S	S	S	S	S	035	S	036	26
24	S	B	B	S	S	S	S	021M	032	S	S	S	037	27
25	S	017	B	023	S	S	S	S	035	036	040	037	037	28
26	020	S	S	S	018	S	S	S	038	045	055	046	075	29
27	B	B	B	S	S	S	S	S	S	S	S	S	S	30
28	035	035	028	020	S	S	S	S	S	S	S	S	S	31
29	090	095	B	B	S	S	S	S	S	S	S	S	S	02
30	S	S	S	028	020	029	034	S	S	037	040	G	044	03
31	B	S	S	S	S	018	S	S	030	034	043	037	S	04
Median Count	031 9	027 4	028 1	025 6	020 4	022 8	023 5	029 7	030 17	035 16	037 18	039 16	038 20	039 2
UQ	049	065	-	028	030	032	032	030	033	036	040	045	044	04
LQ	024	018	-	020	019	018	020	023	028	033	035	037	035	03
QR	25	47	-	8	11	14	12	7	5	3	5	8	9	9

* Tabulation of 022 = 2.2 Mc.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
G	S	031	S	033	034	B	-	-	-	-	-	-	-	-	-
-	S	S	S	045	046M	040	S	S	S	S	S	S	S	S	B
027	032	035	038	065M	035	B	037M	033	029	S	S	S	S	S	B
033M	S	033	S	035	B	046	B	027	S	S	S	021	038M	035M	021
031	031	035	070M	035	036	036	030	S	S	S	031	S	S	S	S
027M	034	036	040M	S	065M	037	037	B	024	S	032M	034M	045	S	S
029	045	052	045	045M	045M	045	050M	047M	S	S	042	044	036	035	S
030	037	037	037	035	037	045	035M	B	045	045M	B	B	031	B	S
S	S	S	S	S	035	B	037	042M	035	S	B	B	B	B	B
S	030	S	035	035	045	046	042	S	034	029	039	044	067	062	077
028	032	039	037	035	037	034	035	046	037	S	S	S	077	056M	045
025	B	S	S	S	037	036	B	S	S	S	030	037	S	034	B
S	S	037	S	S	S	029M	031	033	S	B	S	B	S	B	B
035	035M	033	037	037	039	035	G	031	038	030	040	032M	035M	B	S
S	036M	S	S	S	044	043	030	041	042	040	027	075M	030	B	B
032M	S	S	B	S	034	S	040	032	037	034	036	035	035	S	B
030	034	037	054	039	037	036	068	042	044	B	035	042	035	B	B
S	S	S	S	S	060	057	070M	S	070	074	045	B	026	B	S
034	033	037	045M	039	037	055M	055	062	044	065	055	030	031	S	035
S	S	C	040	040	044	053	037	044	S	S	S	B	S	B	B
027	035	045	045M	045	045	038	031	042	S	030M	S	B	B	B	B
S	S	035	S	036	S	B	B	043	S	S	025	045	045	037	023
032	S	S	S	037	037	S	S	S	S	S	S	026	024	020	045
035	036	040	037	037	055	055	045	029M	035	S	S	S	029	020	S
038	045	055	046	075	088	088	080	075	043	S	S	S	027	027	S
S	S	S	S	S	065	041	061	044	044	035	S	S	S	031	021
-	-	-	-	-	-	-	-	-	-	030	S	S	S	S	S
S	S	S	S	S	033	B	037M	034M	S	-	B	027M	057	030	087
S	037	040	G	044	045	044	034	038M	S	S	S	B	B	040M	030
030	034	043	037	S	S	035	G	S	040	045	037	S	S	S	S
030	035	037	039	038	038	041	037	042	040	035	037	035	035	035	035
17	16	18	16	20	26	23	23	20	19	13	14	14	18	13	9
033	036	040	045	044	045	046	045	045	044	045	040	044	045	038	061
028	033	035	037	035	036	036	032	033	035	030	032	030	030	029	022
5	3	5	8	9	9	10	13	12	9	15	8	14	15	9	39

B

Characteristic: h'Es

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

Observed at:

Bangkok, Thailand

Lat. 13.73°N, Long. 100.57°E

105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	090*	B	S	B	B	B	S	S	G	S	120	S	130	105
2	-	-	-	-	-	-	-	-	-	S	S	S	100	099
3	S	S	S	S	S	S	S	S	130	115	125	115	100	100
4	100	S	S	S	B	S	S	S	125	S	115	S	100	B
5	S	S	S	B	S	115	S	130	120	130	125	110	100	100
6	S	B	B	B	B	B	S	S	110	120	105	100	S	150
7	S	S	S	100	B	S	S	115	115	110	099	100	100	100
8	B	S	B	S	B	S	120	S	140	130	130	120	120	090
9	B	S	S	B	B	B	S	S	S	S	S	S	S	100
10	100	B	B	100	100	100	100	S	S	130	S	110	110	100
11	099	B	B	B	B	S	B	S	S	S	S	125	130	110
12	S	S	S	B	S	S	S	125	110	130	120	120	120	108
13	B	120	S	B	S	B	S	S	150	B	S	S	S	S
14	B	S	S	B	B	S	S	S	S	S	100	S	S	100
15	B	B	B	B	B	S	S	S	110	100	120	110	100	100
16	S	S	B	B	S	S	S	S	S	105	S	S	S	105
17	B	S	S	S	120	-	S	S	130	S	S	B	S	130
18	S	S	S	B	S	120	110	120	115	110	110	105	105	105
19	B	B	B	S	S	S	S	S	S	S	S	S	S	100
20	100	S	S	100	S	110	S	S	120	110	110	100	105	105
21	S	S	B	S	B	S	S	120	S	S	C	110	120	102
22	B	B	S	S	B	120	120	120	120	115	110	100	100	100
23	100	S	B	B	S	S	S	S	S	S	105	S	100	S
24	S	B	B	S	S	S	S	120	150	S	S	S	100	100
25	S	100	B	100	S	S	S	S	100	100	100	100	120	100
26	100	S	S	S	130	S	S	S	100	100	100	100	100	100
27	B	B	B	S	S	S	S	S	S	S	S	S	S	100
28	102	100	100	100	S	S	S	S	-	-	-	-	-	-
29	100	100	B	B	S	S	S	S	S	S	S	S	S	090
30	S	S	S	100	100	100	100	S	S	100	100	G	095	100
31	B	S	S	S	S	120	S	S	102	100	100	100	S	S
Median	100	100	100	100	115	115	110	120	120	110	110	108	100	100
Count	9	4	1	6	4	7	5	7	17	16	13	16	20	26
UQ	100	110	-	100	125	120	120	125	130	125	120	113	120	105
LQ	100	100	-	100	100	100	100	120	110	100	100	100	100	100
QR	0	10	-	0	25	20	20	5	20	25	20	13	20	5

* Tabulation of 090 = 90 km.

A

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

January 1964

	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	S	120	S	130	105	B	-	-	-	-	-	-	-	-	-
	S	S	S	100	099	095	S	S	S	S	S	S	-	-	-
0	115	125	115	100	100	B	100	095	140	S	S	110	S	S	B
5	S	115	S	100	B	100	B	090	S	S	100	S	S	100	100
0	130	125	110	100	100	100	090	S	150	S	095	120	S	S	S
0	120	105	100	S	150	090	090	B	S	S	110	100	100	S	S
5	110	099	100	100	100	100	100	100	100	100	B	B	100	100	S
0	130	130	120	120	090	090	085	B	S	S	B	B	130	B	S
	S	S	S	S	100	B	115	110	110	S	B	B	B	B	B
	130	S	110	110	100	100	095	S	130	110	B	B	100	100	100
	S	S	125	130	110	120	105	100	100	S	090	103	095	100	100
0	130	120	120	120	108	105	B	S	S	S	S	S	S	100	B
0	B	S	S	S	S	095	150	100	S	118	102	B	S	100	B
	S	100	S	S	100	130	G	140	110	B	S	100	110	B	B
0	100	120	110	100	100	090	090	090	090	105	100	100	100	B	S
0	105	S	S	S	105	100	125	120	110	102	100	125	100	S	B
5	S	S	B	S	130	S	110	100	100	B	100	100	S	S	S
0	110	110	105	105	105	105	100	100	100	100	100	E110A	090	B	B
	S	S	S	S	100	100	100	100	S	098	100	090	100	B	S
0	110	110	100	105	105	100	100	100	100	100	090	120	100	S	100
	S	C	110	120	102	100	100	100	S	S	S	B	S	B	B
0	115	110	100	100	100	105	105	100	100	125	S	B	B	B	B
0	S	105	S	100	S	B	B	S	S	S	115	110	100	100	100
0	S	S	S	100	100	S	140	E130S	110	S	S	110	110	103	100
0	100	100	100	120	100	100	100	100	100	S	S	S	105	100	S
0	100	100	100	100	100	100	100	100	100	S	S	S	100	100	S
	S	S	S	S	100	080	080	080	095	100	S	S	S	100	100
	-	-	-	-	-	-	-	-	-	-	B	100	S	S	S
	S	S	S	S	090	B	100	110	S	S	B	100	100	100	100
	100	100	G	095	100	100	090	100	S	S	S	B	B	120	103
	100	100	100	S	S	102	G	S	100	120	110	110	100	100	B
	110	110	108	100	100	100	100	100	100	100	100	S	S	S	S
	16	18	16	20	26	23	23	20	19	13	14	14	18	13	9
	125	120	113	120	105	102	105	103	110	115	105	115	100	100	100
	100	100	100	100	100	095	090	100	100	100	090	100	100	100	100
	25	20	13	20	5	7	15	3	10	15	15	15	0	0	0

B

Characteristic: Type of Es

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 min

January 1964

Observed at:
Bangkok, Thailand
Lat. 13.73°N, Long. 100.57°E
105°E Mean Time (GMT + 7 hours)

Hour Date	00	01	02	03	04	05	06	07	08	09	10	11	12	13
1	f	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	c	-	h	c
3	-	-	-	-	-	-	-	-	-	-	-	-	l	l
4	f	-	-	-	-	-	-	-	c	c	c	c	c2	c
5	f	-	-	-	-	-	-	-	h	-	h	l	l	l
6	-	-	-	-	-	f	-	-	c	h	h	ch	lh	l
7	f	-	-	-	-	-	-	-	c	h	c	l	-	h
8	-	-	-	f	-	-	-	l	c	cl	l2	l	l	lc
9	-	-	-	-	-	-	f	-	h	c	h	h	c	lc
10	f	f	-	-	-	-	-	-	-	-	-	-	-	c
11	f	-	-	f3	f2	f3	f	-	-	h	h	c	c	c
12	f	-	-	-	-	-	-	-	-	-	-	h	h	h
13	-	f	-	f	-	-	-	f	h	h	-	c	c	c
14	-	-	-	-	-	-	-	-	h	-	-	-	-	-
15	f	-	-	-	-	-	-	-	l	-	l	-	-	lh
16	-	-	-	-	-	-	-	-	-	l	c	c	c	l
17	-	-	-	-	-	-	-	-	-	c	-	-	-	c
18	-	-	-	-	f	f	-	-	h	c	-	-	-	h
19	-	-	-	-	-	f	f	l	c	c	c	c2	c	c
20	f	-	-	-	-	-	-	-	-	-	-	-	-	c
21	-	-	-	f	-	f	-	-	h	c	c	lc	lc	c
22	-	-	-	-	-	-	-	l	h	-	-	c	c	l
23	f	-	-	-	-	f	f	f	c	c	cl	cl	c	c2
24	-	-	-	-	-	-	-	-	h	-	c	-	l	-
25	-	f2	-	f3	-	-	-	f	h	-	-	-	l	l
26	f	-	-	-	f	-	-	-	l	l	l	l	c	c
27	-	f	-	-	-	-	-	-	l	l2	l	l	l2	l3
28	f	f	f	f	-	-	-	-	-	-	-	-	-	l
29	f3	f4	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	l
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Median Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A

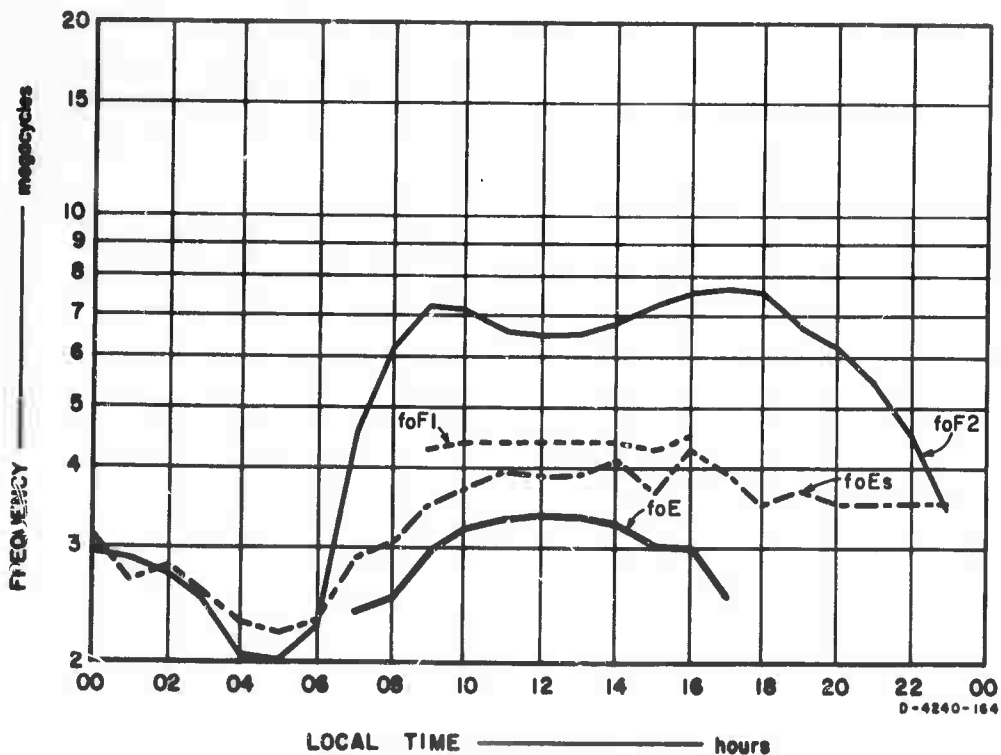
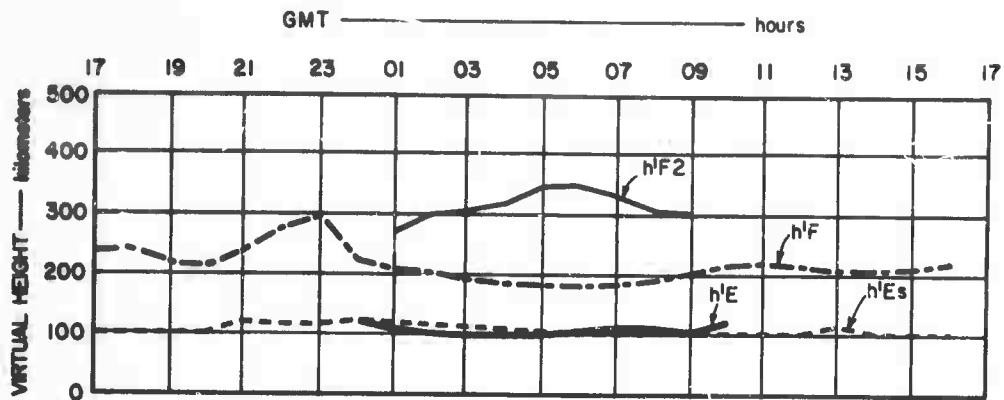
IONOSPHERIC DATA
 Sweep: 1 Mc to 25 Mc in 0.5 minute
 January 1964

7	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	c	-	h	c	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	l	l	l	l	l	h	-	-	-	-	-	-
-	c	-	c	c	c2	c	-	l	l	l	-	-	f	f	f	f
-	h	h	h	ch	lh	l	l	l	l	h	f	f	f	-	-	-
-	c	hl	h	l	l	h	l	lh	-	h	-	f	f	f3	-	-
-	c	cl	h	h	l	lc	lc	l	cl	h	f3	f	-	f	f	f
-	h	-	-	-	c	lc	-	cl	-	-	-	-	-	-	-	-
-	h	h	h	c	c	c	c2	h	h	c	f	f2	f	f3	f3	f2
-	h	h	-	h	c	h	h	c	c	-	l	f	-	-	f3	f
-	l	l	l	-	-	lh	h	h	h	l	f	f4	f4	f	-	-
-	h	c	-	-	c	l	ch	h	l2	l3	f2	f	f	f	-	-
-	c	-	c	c2	-	h	-	c	l	s	f	f	sf	f	f	-
-	h	c	-	lc	lc	c	c	l3	-	f3	f3	f	f	f	f	f
-	h	c	-	c	c	l	c2	l2	l2	l	f3	f3	f	f	f	f
-	h	c	cl	cl	l	c2	l	l	c2	l2	-	f	f	f	f	f
-	h	-	-	-	l	-	-	-	-	-	f	-	f2	f2	f	f
-	l	l2	l	l	c	l	cl	l2	l2	l2	s	-	-	f2	f	f
-	-	-	-	-	l2	l3	l3	l2	l3	l2	f	-	-	-	-	-
-	-	-	-	-	-	l	l	l	l	f	f	-	-	-	-	-
-	-	-	-	-	-	-	h	-	cl	-	-	-	-	f	f	f
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

15
 MEDIAN VALUES JANUARY 1964

Hour Local	fmin (Mc)	foF2 (Mc)	M(3000)F2	h'F2 (km)	h'F1 (km)	foF1 (Mc)	M(3000)F1	foE _i (Mc)	h'E (km)	fbEs (Mc)	foEs (Mc)	h'Es (km)
00	1.7	2.9	3.45	-	230	-	-	-	-	-	3.1	100
01	1.6	2.9	3.50	-	240	-	-	-	-	1.8	2.7	100
02	1.6	2.7	3.60	-	220	-	-	-	-	-	2.8	100
03	1.6	2.4	3.60	-	210	-	-	-	-	-	2.5	100
04	1.7	2.0	3.65	-	243	-	-	-	-	1.8	2.0	115
05	1.7	2.0	3.80	-	270	-	-	-	-	-	2.2	115
06	1.8	2.3	3.25	-	293	-	-	-	-	-	2.3	110
07	2.1	4.5	3.40	-	220	-	-	-	-	-	2.9	120
08	2.2	6.0	3.40	270	210	-	-	2.30	120	2.4	3.0	120
09	2.7	7.2	3.27	300	200	-	3.80	2.40	105	2.8	3.5	110
10	2.7	7.1	3.00	300	190	4.2	4.00	2.85	101	3.2	3.7	110
11	2.7	6.7	2.75	320	180	4.3	4.10	3.20	100	3.5	3.9	108
12	2.9	6.7	2.70	340	180	4.3	4.20	3.30	102	3.6	3.8	100
13	2.9	6.6	2.70	350	175	4.3	4.10	3.35	100	3.5	3.8	100
14	2.9	6.8	2.80	330	175	4.3	4.10	-	100	3.5	3.8	100
15	2.5	7.1	2.90	305	180	4.3	3.95	3.30	110	3.5	4.1	100
16	2.3	7.5	3.10	300	185	4.2	3.80	3.03	110	3.3	3.7	100
17	2.3	7.5	3.20	300	210	4.5	3.60	3.00	105	3.2	4.2	100
18	1.9	7.5	3.50	-	220	-	-	2.50	120	2.8	4.0	100
19	1.8	6.8	3.40	-	225	-	-	-	-	2.6	3.5	100
20	2.0	6.2	3.50	-	210	-	-	-	-	2.4	3.7	100
21	2.0	5.6	3.50	-	200	-	-	-	-	2.4	3.5	115
22	1.8	4.5	3.60	-	217	-	-	-	-	2.6	3.5	100
23	1.8	3.4	3.60	-	210	-	-	-	-	2.2	3.5	100
				-	220	-	-	-	-	2.1	3.5	100

IONOSPHERIC DATA
 MONTHLY MEDIAN CHARACTERISTICS
 BANGKOK, THAILAND
 JANUARY 1964



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