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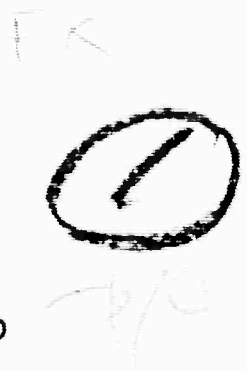
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Ionospheric Data Report — October 1961



IONOSPHERIC DATA: BANGKOK, THAILAND

Compiled by: VICHAI T. NIMIT

Prepared for:

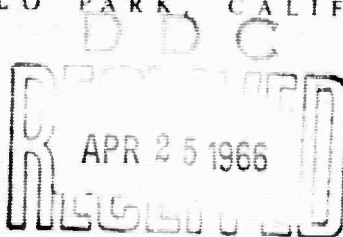
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FORT MONMOUTH, NEW JERSEY

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ORDER NO. 5384-PM-63-91

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



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⑪ March 1965

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Prepared for:

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Compiled by: VICHAI T. NIMIT.

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CONTENTS

I	INTRODUCTION	1
II	TERMINOLOGY AND SYMBOLS	3
	A. Terminology	3
	B. Descriptive Letters	4
	C. Qualifying Letters	4
	D. Description of Standard Types of E_s	5
	E. Multiple Reflections from E_s	6
III	IONOSPHERIC DATA	7
	f_{min}	7
	$f_c F_2$	8
	$M(3000)F_2$	9
	$h' F_2$	10
	$h' F$	11
	$f_o F_1$	12
	$M(3000)F_1$	13
	$f_o E$	14
	$h' E$	15
	$f_b E_s$	16
	$f_o E_s$	17
	$h' E_s$	18
	Types of E_s	19
	Median Values	20

ILLUSTRATIONS

Fig. 1 Summary Graphs	21
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1 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

- f_oF_2 }
 f_oF_1 } The ordinary wave critical frequency for the F₂ and F₁ layers
 f_oE } 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., F_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
- L 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_oE. (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_oE 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 $f_o E$ 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: f_{min}

IONOSPHERIC
 Sweep: 1 Mc to 25 Mc
 October 1

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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	E030S	020*	C	C
4	C	C	C	C	C	C	C	C	C	C	-	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	032	032	041	03
9	020	019	E019S	B	027	E030S	C	C	C	033	035	035	C
10	030	E021C	024	022	E025C	B	B	029	029	036	041	046	05
11	017	016	016	E	013	B	B	025	025	035	029	C	03
12	029	023	019	020	019	017	B	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C
14	016	016	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	E	E	E	C	C	C	E027S	E	E	E036C	039	030	03
17	C	E	E	E	B	B	E019S	025	031	032	036	040	04
18	C	C	C	E	B	B	E024C	028	032	033	066	B	05
19	C	C	C	C	C	C	C	C	C	C	039	035	01
20	E017S	E	E	E	E	015	E022C	033	044	B	C	C	03
21	C	C	C	C	B	B	B	B	B	C	C	C	C
22	C	C	E	C	E012S	B	C	027	026	034	034	040	04
23	C	C	C	C	C	C	C	C	C	C	C	C	04
24	C	E	E	E	C	B	E018S	E018S	027	E039S	030	040	04
25	C	C	E	C	C	B	E017S	019	029	031	032	040	03
26	C	015	012	013	014S	E	E017S	C	027	027	C	C	C
27	018	015	E	E	015S	E014S	C	C	C	032	034	040	04
28	017	012	E	E	015	B	020	023	032	035	C	C	04
29	C	C	C	C	C	C	C	C	C	C	C	036	03
30	E017S	E	E	E	E015S	E014S	E017S	020	019	043	040	027	03
31	C	C	C	C	C	C	C	C	C	C	C	043	02
Median	017	016	019	-	015	016	019	025	029	033	034	040	04
Count	9	8	5	3	9	6	9	10	11	15	14	13	11
5Q	024	020	022	-	022	021	023	028	032	036	039	040	04
1Q	017	015	014	-	014	014	017	020	026	032	032	035	03
QR	7	5	8	-	8	7	6	8	6	4	7	5	6

* Tabulation of 029 = 2.9 Mc.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
029 ^F	C	C	C	C	026	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	039	C	C	C	C	C	C	C	C	C	C	C
032	041	033	036	029	031	027	E025S	031	025	C	024	021	E026S
035	035	C	027	E041C	C	C	C	E030C	C	E027S	016	E030S	E025C
041	046	050	031	036	040	036	030	030	029	019	018	018	020
029	C	036	041	040	035	029	C	E032S	S	S	017	017	018
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	E026S	C	029	016
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
039	030	032	040	042	033	031	028	C	C	C	C	C	C
036	040	042	040	037	031	025	E025S	C	C	C	C	C	C
066	B	063	046	C	C	C	C	C	C	C	C	C	C
039	035	040	044	053	040	C	027	C	C	C	C	C	E021S
C	C	036	034	030	034	031	035	C	C	C	C	C	C
C	C	C	C	C	C	C	E029S	C	C	C	C	C	C
034	040	045	C	C	C	C	C	C	C	C	C	C	C
C	C	041	039	024	020	E024S	E025S	E018S	C	C	C	C	C
030	040	042	036	034	030	C	C	018	C	C	E917S	026	017
032	040	036	039	039	029	024	023	E017S	018	E018S	017	E016S	017
C	C	C	C	025	028	C	C	C	C	E018S	E017S	E018S	E018S
034	040	040	040	035	034	E024S	019	E017S	E017S	017	E017S	E018S	E016S
C	C	040	C	C	C	C	C	C	C	C	C	C	C
C	036	039	040	033	026	025	020	E018S	E017S	C	E018S	E018S	E017S
040	027	035	C	034	022	027	E025S	017	018	E017S	E017S	E017S	E017S
C	043	026	029	040	022	030	025	E018S	E017S	E017S	018	017	016
034	040	040	039	036	031	027	025	018	018	018	017	020	017
14	13	18	15	16	16	12	13	11	7	8	11	12	13
039	040	042	040	040	034	031	029	030	025	023	018	027	021
032	035	036	034	032	026	024	024	017	017	017	017	018	017
7	5	6	6	8	8	7	5	13	8	6	1	9	4

7
2

Characteristic: f_oF₂

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in

Date: 1961

Observed at:

Bangkok, Thailand

Lat. 12.73°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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	084*	070	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	066
8	C	C	C	C	C	C	C	C	C	077	071	072	070
9	030	025	021	031	063	077	C	C	C	082	078	078	C
10	038	038	046	033	U027C	B	B	059	072	075	075	075	077
11	043	040	026	A	A	A	B	060	072	080	072	C	078
12	075	080	U070S	039	A	A	E	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C
14	052	046	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	042	C	C	C	C	E035C	035	092	095	085	071	067
17	C	C	C	024V	B	B	030	J067R	U080S	087	090H	078	082
18	C	C	C	C	B	B	E030C	J070S	077	078	J070R	E071D	U072R
19	C	C	C	C	C	C	C	C	C	C	076	070	071
20	091	U088C	C	U042C	U040C	U036S	043	063	R	B	C	C	080
21	C	C	C	017	B	B	B	B	B	C	C	C	C
22	C	C	C	C	A	B	C	U067L	083	093	R	088	090
23	C	C	C	C	C	C	C	C	C	C	C	C	063
24	C	C	C	C	S	B	031	061	072	075	081	074	073
25	C	C	C	C	C	B	U033S	060	068	086	095	U082R	080
26	C	U051S	U039S	023	022	018	U026R	C	074	080	C	C	C
27	025	026	024	019	017	017	C	E065S	084	085	077	074	074
28	045	040	044	035	020	B	027	062	073	087	C	C	C
29	C	C	C	C	C	C	C	C	C	C	C	076	078
30	040	025	028	023	018	020	034	071	081	085	080	072	075
31	C	C	C	C	C	C	C	C	C	C	C	080	082
Median	043	040	033	035	022	020	031	063	076	082	077	074	075
Count	9	11	8	10	7	5	9	12	12	15	13	14	17
UQ	064	051	045	028	040	028	035	067	082	086	083	078	080
LQ	034	026	025	023	018	018	028	060	072	079	072	072	071
QR	30	25	20	5	22	10	7	7	10	7	11	6	9

* Tabulation of 084 = 8.4 Mc.

IONOSPHERIC DATA

eqp: 1 Mc to 25 Mc in 0.5 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
070	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	066	C	C	C	C	C	-	-	-	-	-	-
071	072	070	073	082	090	085	U090S	090	080	C	062	054	U053S
078	078	C	076	090	C	C	C	C	C	091	068	063	046
075	075	077	076	076	082	086	J090R	J095S	085	085	J072S	057	047
072	C	078	077	080	085	089	090	U093S	S	S	086	081	F
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	086	C	057	052
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
085	071	067	073	075	078	087	089	C	C	C	C	C	C
090H	078	082	090	097	091	S	S	C	C	C	C	C	C
J070R	E071D	D072R	077	C	C	C	C	C	C	C	C	C	C
076	070	071	068	078	080	C	091	C	C	C	C	C	083
C	C	080	079	080	087	090	091	C	C	C	C	C	C
C	C	C	C	C	C	C	086	C	C	C	C	C	C
R	088	090	C	C	C	C	C	C	C	C	C	C	C
C	C	063	070	072	078	088	090	090	C	C	C	C	C
081	074	073	072	082	082	C	C	091	C	C	071	062	055
095	D082R	080	079	083	089	097	U095R	S	S	S	F	073	057
C	C	C	C	084	083	C	C	C	C	077	060	042	028
077	074	074	078	079	078	085	087	U090S	087	087	082	062	048
C	C	C	076	C	C	C	C	C	C	C	C	C	C
C	076	078	087	097	U100S	S	S	S	S	C	U076C	U062C	U047S
080	072	076	C	086	084	085	088	085	078	079	084	U078S	053
C	080	082	090	092	096	101	S	S	089	086	085	070	052
077	074	076	077	082	084	087	090	090	085	086	074	062	052
13	14	17	16	16	15	10	11	7	5	7	10	12	12
083	078	080	079	088	090	090	091	093	088	087	084	071	054
072	072	071	073	079	080	085	088	090	079	079	068	057	047
11	6	9	6	9	10	5	3	3	9	8	16	14	7

2

Character: 10: M(3000)F2

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

October 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	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	235*	-	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	260	C
8	C	C	C	C	C	C	C	C	C	270	270	270	270	270
9	350	360	340	320	330	290	C	C	C	265	275	230	C	285
10	310	320	350	375	U375C	B	B	330	300	245	255	270	265	260
11	345	300	315	A	A	A	B	350	330	320	265	C	265	265
12	335	345	U375S	350	A	A	B	C	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C	C
14	340	365	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	360	C	C	C	C	U330C	340	325	300	255	255	255	250
17	C	C	C	350V	B	B	345	R	U325S	310	240H	265	270	275
18	C	C	C	C	B	B	U330C	S	280	255	R	D	265	265
19	C	C	C	C	C	C	C	C	C	C	275	290	250	280
20	325	U350C	C	U310C	U305C	U315S	300	330	R	B	C	C	260	255
21	C	C	C	340	B	B	B	B	B	C	C	C	C	C
22	C	C	C	C	A	B	C	U345L	325	295	R	260	280	C
23	C	C	C	C	C	C	C	C	C	C	C	C	260	255
24	C	C	C	C	S	B	320	320	290	260	245	260	250	250
25	C	C	C	C	C	B	U340S	355	335	320	295	R	260	270
26	C	U370S	U370S	330	340	350	U325R	C	310	260	C	C	C	C
27	325	330	350	340	330	340	C	U320S	310	280	265	250	265	260
28	340	330	340	350	360	B	310	330	310	290	C	C	C	275
29	C	C	C	C	C	C	C	C	C	C	C	C	230	310
30	340	340	340	350	315	300	320	345	320	310	270	255	275	C
31	C	C	C	C	C	C	C	C	C	C	C	270	265	290
Median	340	345	345	345	300	315	325	335	315	280	265	260	263	265
Count	9	11	8	10	7	5	9	10	12	15	11	11	16	16
UQ	342	360	360	350	360	345	335	345	325	310	275	270	267	275
LQ	325	330	340	336	315	295	318	330	305	260	255	255	258	258
QR	17	30	20	20	45	50	17	15	20	50	20	15	9	17

* Tabulation of 235 = factor of 2.35.

ICNONPHERIC DATA

1 M. to 25 Mc in 0.5 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
-	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	260	C	C	C	C	C	-	-	-	-	-	-
270	270	270	270	280	315	320	U315S	330	330	C	300	310	U325S
275	230	C	265	290	C	C	C	C	C	340	330	330	315
255	270	265	260	270	280	285	R	S	320	325	S	320	330
265	C	265	265	280	305	310	310	U320S	S	S	315	310	F
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	330	C	370	335
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
255	255	255	250	270	265	275	290	C	C	C	C	C	C
240H	265	265	275	295	310	S	S	C	C	C	C	C	C
R	B	R	265	C	C	C	C	C	C	C	C	C	C
275	290	250	280	280	270	C	295	C	C	C	C	C	290
C	C	260	255	275	230	290	300	C	C	C	C	C	C
C	C	C	C	C	C	C	280	C	C	C	C	C	C
R	260	280	C	C	C	C	C	C	C	C	C	C	C
C	C	260	255	260	280	295	290	290	C	C	C	C	C
245	260	250	250	270	280	C	C	295	C	C	315	330	340
295	R	260	270	260	280	290	U310R	S	S	S	F	340	345
C	C	C	C	270	280	C	C	C	C	330	330	350	340
265	250	265	260	260	260	285	290	U295S	300	320	330	350	330
C	C	C	275	C	C	C	C	C	C	C	C	C	C
C	C	230	310	280	U295S	S	S	S	S	C	U330C	U330C	U310S
270	255	275	C	290	270	270	270	270	290	300	325	U355S	350
C	270	265	290	295	230	300	S	S	300	310	325	340	350
265	260	263	265	278	280	290	293	295	300	325	325	340	340
11	11	16	16	16	15	10	10	6	5	7	9	12	12
275	270	267	275	285	295	300	310	320	325	330	330	352	348
255	255	258	258	270	265	285	290	290	295	310	315	325	328
20	15	9	17	15	30	85	20	30	30	20	15	27	20

2

Characteristic: f^oF_2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5 min
October 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	-	-	-	-	-	-	-	C	C	C	C	C	C	C
2	-	-	-	-	-	-	-	C	C	C	C	C	C	C
3	-	-	-	-	-	-	-	C	C	E340L	350 ^o	C	C	C
4	-	-	-	-	-	-	-	C	C	C	C	C	C	C
5	-	-	-	-	-	-	-	C	C	C	C	C	C	C
6	-	-	-	-	-	-	-	C	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	370	C
8	-	-	-	-	-	-	-	-	-	L	350	360	340	315
9	-	-	-	-	-	L	C	C	C	300	340	330	C	E330
10	-	-	-	-	-	-	-	L	L	L	-	350	350	341
11	-	-	-	-	-	-	-	L	270	L	335	C	345	350
12	-	-	-	-	-	-	-	C	C	C	C	C	C	C
13	-	-	-	-	-	-	-	C	C	C	C	C	C	C
14	-	-	-	-	-	-	-	C	C	C	C	C	C	C
15	-	-	-	-	-	-	-	C	C	C	C	C	C	C
16	-	-	-	-	-	-	-	260	285	295	330	L	390	350
17	-	-	-	-	-	-	-	252	289	300	330	350	350	335
18	-	-	-	-	-	-	-	L	L	L	L	E430B	E400B	335
19	-	-	-	-	-	-	-	C	300	C	335	E330L	258	330
20	-	-	-	-	-	-	-	270	300	B	C	C	350	L
21	-	-	-	-	-	-	-	B	B	C	C	C	240	C
22	-	-	-	-	-	-	-	-	290	300	L	370	325	C
23	-	-	-	-	-	-	-	C	C	C	C	C	370	350
24	-	-	-	-	-	-	-	L	310	345	340	260	370	360
25	-	-	-	-	-	-	-	L	280	315	L	250	360	L
26	-	-	-	-	-	-	-	C	L	L	C	C	C	C
27	-	-	-	-	-	-	-	E260L	L	L	L	L	250	E330L
28	-	-	-	-	-	-	-	L	L	300	L	C	C	330
29	-	-	-	-	-	-	-	C	C	C	C	L	338	329
30	-	-	-	-	-	-	-	260	L	L	340	L	340	C
31	-	-	-	-	-	-	-	C	C	C	C	L	L	315
Median	-	-	-	-	-	-	-	260	290	307	340	350	350	332
Count	-	-	-	-	-	-	-	5	8	8	9	9	17	14
UQ	-	-	-	-	-	-	-	265	300	330	345	360	370	340
LQ	-	-	-	-	-	-	-	260	283	300	333	295	332	330
QR	-	-	-	-	-	-	-	5	17	30	12	70	38	19

* Tabulation of 350 = 350 km.

IONOSPHERIC DATA

Mc to 25 Mc in 0.5 minute

October 1964

	11	12	13	14	15	16	17	18	19	20	21	22	23
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	260	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	370	C	C	C	C	C	-	-	-	-	-	-
	360	340	319	345	282	260	L	-	-	-	-	-	-
	330	C	U330L	320	C	C	C	-	-	-	-	-	-
	350	350	341	325	L	280	260	-	-	-	-	-	-
	C	345	340	320	292	280	L	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	-	-	-	-	-	-
	L	390	350	L	L	L	280	-	-	-	-	-	-
	350	350	335	300	305	L	L	-	-	-	-	-	-
	E130E	E400B	335	C	300	L	L	C	-	-	-	-	-
	U330L	298	330	330	L	300	L	-	-	-	-	-	-
	C	350	L	346	310	298	L	-	-	-	-	-	-
	C	240	C	335	E290B	C	L	-	-	-	-	-	-
	370	325	C	C	C	C	-	-	-	-	-	-	-
	C	370	350	330	L	275	L	-	-	-	-	-	-
	260	370	360	330	320	C	C	-	-	-	-	-	-
	250	360	L	L	310	300	L	-	-	-	-	-	-
	C	C	C	335	310	C	L	-	-	-	-	-	-
	L	250	U330L	L	L	L	L	-	-	-	-	-	-
	C	C	330	C	C	C	C	-	-	-	-	-	-
	L	338	329	300	295	290	L	-	-	-	-	-	-
	L	340	C	280	L	L	L	-	-	-	-	-	-
	L	L	315	310	L	L	L	-	-	-	-	-	-
	350	350	332	328	300	285	-	-	-	-	-	-	-
	9	17	11	14	11	8	2	-	-	-	-	-	-
	365	370	340	335	310	300	-	-	-	-	-	-	-
	295	332	330	310	291	278	-	-	-	-	-	-	-
	70	38	10	25	19	22	-	-	-	-	-	-	-

2

Characteristic: HF

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.1

October 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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	E270A	E270A	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	E200B
8	C	C	C	C	C	C	C	C	C	221*	E240A	215	220
9	245	235	E290S	280	240	225	C	C	C	220	E230A	E250A	C
10	300	280	245	215	E280C	B	B	240	230	221	205	E220B	B
11	248	340	230	A	A	A	B	240	230	E250A	A	C	A
12	232	230	210	225	A	A	B	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C
14	240	230	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	220	230	220	C	C	C	265	230	220	210	E248B	E229A	260
17	C	220	215	225	B	B	250	230	222	E220B	E210B	220	250
18	C	250	212	240	B	B	E280S	E230B	215	220	E265B	B	B
19	C	C	C	C	C	C	C	C	220	C	E225B	219	E230B
20	330	233	220	260	260	240	270	250	E271S	B	C	C	230
21	C	C	C	260	B	B	B	E	B	C	C	C	E210A
22	220	215	210	252	A	B	280	243	210	210	E250A	E210B	E220B
23	C	C	C	C	C	C	C	C	C	C	C	C	E210B
24	222	215	210	220	S	B	270	232	220	E230S	210	E218B	E220B
25	230	230	220	C	C	E	270	240	E235A	E240A	E225A	E215A	E210A
26	C	215	210	235	245	260	270	C	230	230	C	C	C
27	265	260	255	250	E290S	E309S	270	240	230	E220A	E210A	E205B	E210B
28	238	260	239	229	230	B	270	230	E240B	E250B	210H	C	C
29	C	C	C	C	C	C	C	C	C	C	C	208	E200B
30	265	240	240	250	E280A	E270S	250	250	220	E220A	E230B	E215A	A
31	C	C	C	C	C	C	C	C	C	C	C	E260B	E300A
Median	238	232	220	240	260	260	270	240	226	225	228	218	220
Count	13	16	15	13	7	5	11	12	14	15	14	13	14
UQ	265	255	240	258	280	289	270	242	235	240	248	220	230
LQ	226	225	210	223	240	233	265	232	220	220	210	213	210
QR	39	30	30	35	40	56	5	10	15	20	38	7	20

* Tabulation of 221 = 221 km.

IONOSPHERIC DATA

1 Mc to 25 Mc in 0.5 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
E270A	C	C	C	C	E260A	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	E200B	C	C	C	C	C	C	C	C	C	C	C
E240A	215	220	210	200	209	240	240	250	240	C	250	295	290
E230A	E250A	C	210	E230C	C	C	C	250	C	240	240	250	280
205	E220B	B	A	E230B	E230B	235	230	240	240	230	230	221	260
A	C	A	218	E185B	E200B	210	240	250	S	S	240	250	260
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	220	C	260	240
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
E248B	E220A	260	E215B	E290B	E200B	230	240	C	C	C	C	C	C
E210B	220	250	220	210	E210A	E260A	240	C	C	C	C	C	C
E265B	B	B	B	C	B	240	255	C	C	C	C	C	C
E225B	219	E230B	B	B	E260B	240	240	260	250	C	C	C	285
C	C	230	E260A	E240A	E230B	E230B	250	C	C	C	C	C	C
C	C	E210A	C	E295A	E210B	C	E240S	260	C	C	C	C	C
E250A	E210B	E220B	C	C	C	C	C	C	C	C	C	C	C
C	C	E210B	E205B	185	195	E228A	230	250	C	C	C	C	C
210	E218B	E220B	210	E260A	A	C	C	250	260	240	235	240	220
E225A	E215A	E210A	E210B	E210B	E295A	E220A	255	257	260	250	240	230	230
C	C	C	C	A	A	C	240	335	220*	203	220	230	240
E210A	E205B	E210B	E210B	E190B	195	230	240	260	235	220	220	220	235
210H	C	C	E210B	C	C	C	C	C	C	C	C	C	C
C	208	E200B	E210B	201	209	210	230	250	220	C	210	220	250
E230B	E215A	A	C	200	190	240	240	252	270	230	230	220	210
C	E260B	E300A	E260B	E200B	E200A	230	245	250	241	225	220	235	228
228	218	220	210	220	209	230	240	250	240	230	230	232	240
14	13	14	13	15	14	14	16	14	10	9	11	12	13
248	220	230	219	240	230	240	242	257	260	240	240	250	270
210	213	210	210	200	200	228	240	250	230	220	220	220	229
38	7	20	9	40	30	12	2	7	30	20	20	30	41

2

Characteristic: 101

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5
October 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	-	-	-	-	-	-	-	C	C	C	C	C	C	C
2	-	-	-	-	-	-	-	C	C	C	C	C	C	C
3	-	-	-	-	-	-	-	C	C	L	L	C	C	C
4	-	-	-	-	-	-	-	C	C	C	C	C	C	C
5	-	-	-	-	-	-	-	C	C	C	C	C	C	C
6	-	-	-	-	-	-	-	C	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	015C	C
8	-	-	-	-	-	-	-	C	C	L	U015L	048*	015	U01
9	-	-	-	-	-	L	C	C	C	L	U046L	045	C	U01
10	-	-	-	-	-	-	-	L	L	L	045	018	B	A
11	-	-	-	-	-	-	-	L	L	L	A	C	A	01
12	-	-	-	-	-	-	-	C	C	C	C	C	C	C
13	-	-	-	-	-	-	-	C	C	C	C	C	C	C
14	-	-	-	-	-	-	-	C	C	C	C	C	C	C
15	-	-	-	-	-	-	-	C	C	C	C	C	C	C
16	-	-	-	-	-	-	-	L	L	L	043	045	051A	01
17	-	-	-	-	-	-	-	L	L	L	044	U046L	0048B	L
18	-	-	-	-	-	-	-	L	L	L	L	B	B	B
19	-	-	-	-	-	-	-	C	C	C	U046L	U046L	049	B
20	-	-	-	-	-	-	-	L	L	B	C	C	048	L
21	-	-	-	-	-	-	-	B	B	C	C	C	C	C
22	-	-	-	-	-	-	-	L	L	L	L	U045L	046	C
23	-	-	-	-	-	-	-	C	C	C	C	C	045	01
24	-	-	-	-	-	-	-	L	L	U044L	045	045	045	04
25	-	-	-	-	-	-	-	L	L	U046L	U048L	045	045	L
26	-	-	-	-	-	-	-	C	L	U045L	C	C	C	C
27	-	-	-	-	-	-	-	L	L	L	L	U045L	045	U04
28	-	-	-	-	-	-	-	L	L	U044L	C	C	C	04
29	-	-	-	-	-	-	-	C	C	C	C	045	046	04
30	-	-	-	-	-	-	-	L	L	L	U045L	L	A	C
31	-	-	-	-	-	-	-	C	C	C	C	L	048A	L
Median Count	-	-	-	-	-	-	-	-	-	045	045	045	045	04
UQ	-	-	-	-	-	-	-	-	-	4	9	11	13	9
LQ	-	-	-	-	-	-	-	-	-	046	046	046	048	04
QR	-	-	-	-	-	-	-	-	-	014	045	045	045	044
	-	-	-	-	-	-	-	-	-	2	1	1	3	1

* Tabulation of 048 = 4.8 Mc.

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 minute

October 1964

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
L	L	C	C	C	C	L	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
C	C	C	045C	C	C	C	C	C	-	-	-	-	-	-
L	U045L	048*	045	U045L	L	L	L	L	-	-	-	-	-	-
L	U046L	045	C	U046L	U046L	C	C	C	-	-	-	-	-	-
L	045	048	B	A	U042L	L	L	L	-	-	-	-	-	-
L	A	C	A	046	U045L	L	L	L	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	-	-	-	-	-	-
L	043	045	051A	041	L	L	L	L	C	-	-	-	-	-
L	044	U046L	D044R	L	044	L	L	L	-	-	-	-	-	-
L	L	B	B	B	C	B	L	L	C	-	-	-	-	-
C	U046L	U046L	049	B	B	L	C	L	-	-	-	-	-	-
B	C	C	048	L	L	L	L	L	-	-	-	-	-	-
C	C	C	C	C	C	C	C	L	-	-	-	-	-	-
L	L	U045L	045	C	C	C	C	-	-	-	-	-	-	-
C	C	C	045	043	U044L	L	L	L	-	-	-	-	-	-
044L	045	045	045	044	045	A	C	C	-	-	-	-	-	-
046L	U048L	045	045	L	L	L	L	L	-	-	-	-	-	-
045L	C	C	C	C	A	A	C	L	-	-	-	-	-	-
L	L	U045L	045	U044L	L	L	L	L	-	-	-	-	-	-
044L	C	C	C	045	C	C	C	C	-	-	-	-	-	-
C	C	045	046	045	045	L	L	L	-	-	-	-	-	-
L	U045L	L	A	C	U043L	L	L	L	-	-	-	-	-	-
C	C	L	048A	L	L	L	L	L	-	-	-	-	-	-
045	045	045	045	045	045	-	-	-	-	-	-	-	-	-
4	9	11	13	9	8	-	-	-	-	-	-	-	-	-
046	046	046	048	045	045	-	-	-	-	-	-	-	-	-
041	045	045	045	044	044	-	-	-	-	-	-	-	-	-
2	1	1	2	1	1	-	-	-	-	-	-	-	-	-

2

Characteristic: M(3000)

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in 0.5

October 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	-	-	-	-	-	-	-	C	C	C	C	C	C
2	-	-	-	-	-	-	-	C	C	C	C	C	C
3	-	-	-	-	-	-	-	C	C	L	L	C	C
4	-	-	-	-	-	-	-	C	C	C	C	C	C
5	-	-	-	-	-	-	-	C	C	C	C	C	C
6	-	-	-	-	-	-	-	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	C
8	-	-	-	-	-	-	-	C	C	C	C	C	390C
9	-	-	-	-	-	L	C	C	C	L	U370L	370*	400
10	-	-	-	-	-	-	-	C	C	L	U370L	365	C
11	-	-	-	-	-	-	-	L	L	L	390	370	B
12	-	-	-	-	-	-	-	L	L	L	A	C	A
13	-	-	-	-	-	-	-	C	C	C	C	C	C
14	-	-	-	-	-	-	-	C	C	C	C	C	C
15	-	-	-	-	-	-	-	C	C	C	C	C	C
16	-	-	-	-	-	-	-	C	C	C	C	C	C
17	-	-	-	-	-	-	-	L	L	L	385	370	A
18	-	-	-	-	-	-	-	L	L	L	380	U375L	B
19	-	-	-	-	-	-	-	L	L	L	L	B	B
20	-	-	-	-	-	-	-	C	C	C	U370L	U375L	365
21	-	-	-	-	-	-	-	L	L	B	C	C	360
22	-	-	-	-	-	-	-	B	B	C	C	C	C
23	-	-	-	-	-	-	-	L	L	L	L	U390L	365
24	-	-	-	-	-	-	-	C	C	C	C	C	390
25	-	-	-	-	-	-	-	L	L	U360L	380	380	390
26	-	-	-	-	-	-	-	L	L	U355L	U375L	350	410
27	-	-	-	-	-	-	-	C	L	U370L	C	C	C
28	-	-	-	-	-	-	-	L	L	L	L	U385L	395
29	-	-	-	-	-	-	-	L	L	U370L	C	C	C
30	-	-	-	-	-	-	-	C	C	C	C	380	315
31	-	-	-	-	-	-	-	L	L	L	U370L	L	A
								C	C	C	C	L	A
Median	-	-	-	-	-	-	-	-	-	365	375	375	390
Count	-	-	-	-	-	-	-	-	-	1	9	11	10
UQ	-	-	-	-	-	-	-	-	-	370	382	380	395
LQ	-	-	-	-	-	-	-	-	-	358	370	370	365
QR	-	-	-	-	-	-	-	-	-	12	12	20	30

* Tabulation of 370 = factor of 3.70.

Characteristic: Ion

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0

October 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	-	-	-	-	-	-	-	C	C	C	C	C	C
2	-	-	-	-	-	-	-	C	C	C	C	C	C
3	-	-	-	-	-	-	-	C	C	S	A	C	C
4	-	-	-	-	-	-	-	C	C	C	C	C	C
5	-	-	-	-	-	-	-	C	C	C	C	C	C
6	-	-	-	-	-	-	-	C	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C	C
8	-	-	-	-	-	-	-	C	C	B	A	B	B
9	-	-	-	-	-	S	C	C	C	B	B	B	B
10	-	-	-	-	-	-	-	B	B	B	B	B	B
11	-	-	-	-	-	-	-	B	B	B	B	C	C
12	-	-	-	-	-	-	-	C	C	C	C	C	C
13	-	-	-	-	-	-	-	C	C	C	C	C	C
14	-	-	-	-	-	-	-	C	C	C	C	C	C
15	-	-	-	-	-	-	-	C	C	C	C	C	C
16	-	-	-	-	-	-	-	A	R	C	B	A	A
17	-	-	-	-	-	-	-	B	B	B	B	B	B
18	-	-	-	-	-	-	-	B	B	B	B	B	B
19	-	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	-	B	B	B	C	C	C
21	-	-	-	-	-	-	-	B	B	B	C	C	C
22	-	-	-	-	-	-	-	B	B	B	C	C	C
23	-	-	-	-	-	-	-	C	A	C	A	B	B
24	-	-	-	-	-	-	-	S	A	B	B	B	B
25	-	-	-	-	-	-	-	S	A	B	B	B	B
26	-	-	-	-	-	-	-	C	B	B	C	C	C
27	-	-	-	-	-	-	-	A	B	B	B	B	B
28	-	-	-	-	-	-	-	B	B	B	B	C	C
29	-	-	-	-	-	-	-	C	C	C	C	B	B
30	-	-	-	-	-	-	-	A	A	B	B	A	A
31	-	-	-	-	-	-	-	C	C	C	C	B	A
Median	-	-	-	-	-	-	-	-	-	-	-	-	-
Count	-	-	-	-	-	-	-	-	-	-	-	-	1
UQ	-	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-	-

* Tabulation of 355 = 3.55 Mc.

Characteristic: h'l.

IONOSPHERIC
 Sweep: 1 Mc to 25
 October

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
1	-	-	-	-	-	-	-	C	C	C	C	C
2	-	-	-	-	-	-	-	C	C	C	C	C
3	-	-	-	-	-	-	-	C	C	S	105 ⁺	C
4	-	-	-	-	-	-	-	C	C	C	C	C
5	-	-	-	-	-	-	-	C	C	C	C	C
6	-	-	-	-	-	-	-	C	C	C	C	C
7	-	-	-	-	-	-	-	C	C	C	C	C
8	-	-	-	-	-	-	-	C	C	B	A	B
9	-	-	-	-	-	S	C	C	C	B	B	B
10	-	-	-	-	-	-	-	B	B	B	B	B
11	-	-	-	-	-	-	-	B	B	B	B	C
12	-	-	-	-	-	-	-	C	C	C	C	C
13	-	-	-	-	-	-	-	C	C	C	C	C
14	-	-	-	-	-	-	-	C	C	C	C	C
15	-	-	-	-	-	-	-	C	C	C	C	C
16	-	-	-	-	-	-	-	A	B	C	B	A
17	-	-	-	-	-	-	-	B	B	B	B	B
18	-	-	-	-	-	-	-	B	B	E	B	B
19	-	-	-	-	-	-	-	C	C	C	B	B
20	-	-	-	-	-	-	-	B	B	B	C	C
21	-	-	-	-	-	-	-	B	B	C	C	C
22	-	-	-	-	-	-	-	B	B	B	B	B
23	-	-	-	-	-	-	-	C	C	C	C	C
24	-	-	-	-	-	-	-	125	A	B	120	B
25	-	-	-	-	-	-	-	130	B	B	B	B
26	-	-	-	-	-	-	-	C	B	B	C	C
27	-	-	-	-	-	-	-	A	B	B	B	B
28	-	-	-	-	-	-	-	B	B	B	B	C
29	-	-	-	-	-	-	-	C	C	C	C	B
30	-	-	-	-	-	-	-	A	A	B	B	A
31	-	-	-	-	-	-	-	C	C	C	C	B
Median Count	-	-	-	-	-	-	-	2	-	-	1	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-

* Tabulation of 105 = 105 km.

IONOSPHERIC DATA

freq: 1 Mc to 25 Mc in 0.5 minute

October 1961

	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
105#	C	C	C	C	C	B	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	A	B	110	C	C	C	C	C	-	-	-	-	-	-
	B	B	C	B	125	C	B	S	-	-	-	-	-	-
	B	B	C	A	C	B	C	C	-	-	-	-	-	-
	B	C	B	A	B	B	B	B	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	B	A	A	B	B	B	B	B	C	-	-	-	-	-
	B	B	B	B	B	A	A	-	C	-	-	-	-	-
	B	B	B	B	C	B	B	B	C	-	-	-	-	-
	C	C	C	C	C	C	C	S	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	C	C	C	C	C	C	C	C	-	-	-	-	-	-
	B	A	A	B	B	B	B	B	-	-	-	-	-	-
	B	B	B	B	B	A	A	-	C	-	-	-	-	-
	B	B	B	B	B	B	B	B	C	-	-	-	-	-
	C	C	C	C	C	C	C	S	-	-	-	-	-	-
	B	C	B	B	C	A	A	-	C	-	-	-	-	-
	B	C	B	B	B	B	B	B	C	-	-	-	-	-
	B	C	B	B	B	B	B	B	C	-	-	-	-	-
	B	A	A	B	B	B	B	B	-	-	-	-	-	-
	C	B	A	A	B	A	B	A	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	1	-	1	1	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2

Characteristic: (M3)

IONOSPHERIC DATA
 Sweep: 1 Mc to 25 Mc in 0.5
 October 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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	042*	042'	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	G
8	C	C	C	C	C	C	C	C	C	036	040	G	G
9	B	B	S	B	-	S	C	C	C	G	040	041	C
10	G	C	G	G	C	B	B	G	G	G	G	G	B
11	023M	022M	018	A	A	A	B	027	027	040	044M	C	M
12	B	-	B	025	A	A	B	C	C	C	C	C	C
13	B	G	C	C	C	C	C	C	C	C	C	C	C
14	B	B	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	E	E	E	C	C	C	S	028	017R	G	B	040	016R
17	C	C	C	E	B	B	S	G	G	G	B	B	B
18	C	C	C	C	-	B	C	B	B	B	B	B	B
19	C	C	C	C	C	C	C	C	C	C	B	G	B
20	M	C	C	C	C	M	C	B	B	B	C	C	048
21	C	C	C	C	B	B	B	B	B	C	C	C	C
22	C	C	C	S	A	B	C	B	B	B	041	B	B
23	C	C	C	C	C	C	C	C	C	C	C	C	B
24	C	C	C	C	C	B	S	024	030	B	036	3	B
25	C	C	C	C	C	B	019M	028	033	038	040	4	039
26	C	M	M	-	-	E	M	C	033	037	C	;	C
27	-	017	E	E	S	S	C	-	G	035	036	5	B
28	-	017M	-	E	-	B	B	G	B	B	B	C	C
29	C	C	C	C	C	C	C	C	C	C	C	048	B
30	025M	E	-	-	M	-	S	021S	031	B	B	024M	050
31	C	C	C	C	C	C	C	C	C	C	C	B	047M
Median	-	-	-	-	-	-	-	027	031	038	040	030	047
Count	2	3	1	1	-	-	1	5	6	6	8	4	5
UQ	-	-	-	-	-	-	-	028	033	040	041	041	051
LQ	-	-	-	-	-	-	-	023	027	036	038	030	043
QR	-	-	-	-	-	-	-	5	6	4	3	5	8

* Tabulation of 042 = 4.2 Mc.

IONOSPHERIC DATA

1 Mc to 25 Mc in 0.1 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
012M	C	C	C	C	035M	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	G	C	C	C	C	C	C	C	C	C	C	C
010	G	G	G	033	G	G	S	B	029	C	M	B	S
010	011	C	040	C	C	C	C	C	C	029	027M	C	C
G	G	B	048	B	B	B	G	B	B	B	026	B	B
041M	C	M	G	B	B	G	B	S	S	S	026M	027M	030M
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	S	C	B	B
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
B	010	D046R	B	B	B	B	B	C	C	C	C	C	C
B	B	B	B	B	034	M	-	C	C	C	C	C	C
B	B	B	B	C	B	B	B	C	C	C	C	C	C
B	G	B	B	B	B	B	B	C	C	C	C	C	S
C	C	018	042	035	B	B	E	C	C	C	C	C	C
C	C	C	C	C	B	C	S	C	C	C	C	C	C
041	B	B	C	C	C	C	C	C	C	C	C	C	C
C	C	B	B	033	031	031M	M	S	C	C	C	C	C
036	B	B	D037R	041	047M	C	C	M	C	C	-	B	B
040	M	039	B	B	041	032M	034M	032	B	S	035M	026M	M
C	C	C	C	052	046M	C	G	C	C	-	S	S	S
036	B	B	B	B	G	030	024	S	M	B	B	-	-
B	C	C	B	C	C	C	C	C	C	C	C	C	C
C	038	B	B	038	032	-	022	-	M	C	M	-	-
B	034M	051	C	B	D024R	B	G	B	B	S	-	M	019
C	B	047M	040	B	033M	B	028	S	S	S	024M	024	-
010	039	017	040	036	034	-	026	-	-	-	026	-	-
8	4	5	5	6	9	3	4	1	1	1	5	3	2
041	011	051	045	041	043	-	031	-	-	-	031	-	-
038	036	043	039	033	033	-	023	-	-	-	025	-	-
3	5	8	6	8	10	-	8	-	-	-	6	-	-

2

Characteristic: f_oF₂

IONOSPHERIC DATA
 Sweep: 1 Mc to 25 Mc in 0.5
 October 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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	018 ²	032M	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	036	040	G	G
9	B	B	S	B	033	S	C	C	C	G	042	045	C
10	G	C	G	G	C	B	B	G	G	G	G	G	B
11	035M	035M	024	023	028	030	B	027	027	048	055M	C	088M
12	B	039	B	028	040	027	B	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C
14	B	B	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	E	E	E	C	C	C	S	033	D017R	G	B	041	0046R
17	C	C	C	E	B	B	S	G	G	G	B	B	B
18	C	C	C	C	-	B	C	B	B	B	B	B	B
19	C	C	C	C	C	C	C	C	C	C	B	G	B
20	031M	U030C	C	U018C	025M	025M	C	B	B	B	C	C	048
21	C	C	C	C	B	B	B	B	B	B	C	C	C
22	C	C	C	S	013	B	C	B	B	B	043	B	B
23	C	C	C	C	C	C	C	C	C	C	C	C	B
24	C	C	C	C	C	B	S	030	030	B	037	E	B
25	C	C	C	C	C	B	044M	030	033	038	042	048M	039
26	C	030M	021M	018	017	E	030M	C	033	037	C	C	C
27	022	022	E	E	S	S	C	021	G	035	036	B	B
28	024	035M	025	E	019	B	B	G	B	B	B	C	C
29	C	C	C	C	C	C	C	C	C	C	C	038	B
30	037M	E	025	025	031M	016	S	D021S	033	E	B	051M	057
31	C	C	C	C	C	C	C	C	C	C	C	B	050M
Median	031	033	025	023	026	026	037	024	032	038	042	045	049
Count	5	6	4	5	8	4	2	6	6	6	8	5	6
LQ	026	035	025	027	032	029	-	033	033	048	048	050	057
LQ	023	030	023	018	018	021	-	021	027	036	039	040	046
QR	13	5	2	9	14	8	-	12	6	12	9	10	11

* Tabulation of 048 = 4.8 Mc.

IONOSPHERIC DATA

1 Mc to 25 Mc in 0.5 minute

October 1964

10	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
052M	C	C	C	C	057M	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	G	C	C	C	C	C	C	C	C	C	C	C
010	G	G	G	045	G	G	S	B	033	C	068M	B	S
012	015	C	010	C	C	C	C	C	C	032	036M	C	C
G	G	B	018	B	B	B	G	B	B	B	026	B	B
055M	C	088M	G	B	B	G	B	S	S	S	011M	030M	016M
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	S	C	B	B
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
B	011	1046R	B	B	B	B	B	C	C	C	C	C	C
B	B	B	B	B	039	073M	037	C	C	C	C	C	C
B	B	B	B	C	B	B	B	C	C	C	C	C	C
B	G	B	B	B	B	B	B	C	C	C	C	C	S
C	C	048	017	037	B	B	B	C	C	C	C	C	C
C	C	C	C	C	B	C	S	E	C	C	C	C	C
043	B	B	C	C	C	C	C	C	C	C	C	C	C
C	C	B	B	033	036	060M	034M	S	C	C	C	C	C
037	B	B	1037R	043	055M	C	C	056M	C	C	C	C	C
042	018M	039	B	B	047	044M	070M	039	B	S	019	B	B
C	C	C	C	058	088M	C	G	C	C	021	036M	038M	022M
036	B	B	B	B	G	038	037	S	022M	B	S	S	S
B	C	C	B	C	C	C	C	C	C	C	B	038	020
C	038	B	B	038	033	028	022	020	043M	C	C	C	C
B	051M	057	C	B	10024R	B	G	B	B	S	029M	020	036
C	B	050M	042	B	055M	E	028	S	S	S	019	031M	021
											037M	032	022
042	045	049	042	040	043	044	035	039	033	026	036	032	022
8	5	6	5	6	9	5	6	3	3	2	9	6	6
048	050	057	047	045	056	066	037	047	-	-	039	034	036
039	040	046	039	037	035	033	025	029	-	-	023	030	21
9	10	11	8	8	21	33	9	18	-	-	16	8	15

2

Characteristic: E₁₁₅

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc in 0.5 Mc

October 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	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	C	C	C	C
3	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C
5	C	C	C	C	C	C	C	C	C	C	C	C	C
6	C	C	C	C	C	C	C	C	C	C	C	C	C
7	C	C	C	C	C	C	C	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C
9	B	B	S	B	125	S	C	C	C	G	110	110	C
10	G	C	G	G	C	B	B	G	G	G	G	G	B
11	106	100	100	100	100	103	B	125	140	130	118	C	109
12	B	120	B	100	100	100	B	C	C	C	C	C	C
13	B	C	C	C	C	C	C	C	C	C	C	C	C
14	B	B	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	C	C	C	C	C	C	C	C	C
16	E	E	E	C	C	C	S	108	120	G	E	105	104
17	C	125	110	E	B	B	S	G	G	G	B	B	B
18	C	C	C	C	125	B	C	B	B	B	B	B	B
19	C	C	C	C	C	C	C	C	C	C	B	G	B
20	155	130	130	130	120	110	C	B	B	B	C	C	110
21	C	C	C	115	B	B	B	B	B	C	C	C	C
22	120	C	110	S	100	B	C	B	B	B	120	B	B
23	C	C	C	C	C	C	C	C	C	C	C	C	B
24	C	C	C	C	C	B	S	128	130	B	125	B	B
25	C	C	C	C	C	B	108	140	125	130	120	111	120
26	C	127	115	100	101	E	112	C	130	120	C	C	C
27	130	125	E	!	S	S	C	100	G	140	140	B	B
28	125	119	130	E	120	B	B	G	B	B	B	C	C
29	C	C	C	C	C	C	C	C	C	C	C	140	B
30	110	E	110	111	110	110	S	111	119	B	B	119	100
31	C	C	C	C	C	C	C	C	C	C	C	B	099
Median Count	123 6	125 7	110 7	105 6	110 9	108 4	110 2	118 6	128 6	125 6	119 8	110 5	106 6
UQ	130	127	130	115	122	110	-	130	130	130	122	125	110
LQ	110	119	110	100	100	104	-	110	120	120	113	108	100
QR	20	8	20	15	22	6	-	20	10	10	9	17	10

* Tabulation of 102 = 102 km.

IONOSPHERIC DATA

10 25 Mc in 0.5 minute

October 1964

	11	12	13	14	15	16	17	18	19	20	21	22	23
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
15	C	C	C	C	100	C	C	-	-	-	-	-	-
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
00	G	G	G	100	G	G	S	B	120	C	110	B	S
10	110	C	100	C	C	C	C	C	C	115	110	C	C
G	G	B	100	B	B	B	G	B	B	B	125	B	B
18	C	109	G	B	B	G	B	S	S	S	102	100	100
C	C	C	C	C	C	C	C	C	C	S	S	B	B
C	C	C	C	C	C	C	C	C	C	S	C	B	B
C	C	C	C	C	C	C	C	C	C	C	C	C	C
C	C	C	C	C	C	C	C	C	C	C	C	C	C
B	105	104	B	B	B	B	B	C	C	C	C	C	C
B	B	B	B	B	120	110	100	C	C	C	C	C	C
B	B	E	B	C	B	B	B	C	C	C	C	C	C
B	G	B	B	B	B	B	B	C	C	C	C	C	S
C	C	110	109	110	B	B	B	C	C	C	C	C	C
C	C	C	C	120	B	C	S	099	C	C	C	C	C
20	B	B	C	C	C	C	C	C	C	C	C	C	C
C	C	B	E	100	100	100	100	S	C	C	C	C	C
25	B	B	125	115	110	C	C	120	C	C	120	B	B
20	111	120	B	B	110	100	100	085	B	B	135	110	105
C	C	C	C	110	105	C	G	C	C	130	S	S	S
40	B	B	B	E	G	110	120	S	111	B	B	130	130
B	C	C	B	C	C	C	C	C	C	C	C	C	C
C	110	B	B	120	110	120	115	110	120	C	120	120	110
B	110	100	C	B	110	B	G	E	B	S	120	110	105
C	B	099	100	B	098	B	115	S	S	S	109	100	102
19	110	106	100	120	110	110	113	105	120	122	120	110	105
8	5	6	5	7	9	5	6	4	3	2	9	6	6
22	125	110	117	120	110	115	115	115	120	-	122	120	110
13	108	100	100	100	102	100	100	092	116	-	110	100	102
9	17	10	17	20	8	15	15	23	4	-	12	20	8

2

MEDIAN VALUES OCTOBER 1964

Hour Local	fmin (Mc)	foF2 (Mc)	M(3000)F2	h'F2 (km)	h'F (km)	foF1 (Mc)	M(3000)F1	foE* (Mc)	h'E* (km)	flEs (Mc)	foEs (Mc)	h'Es (km)
00	1.7	4.3	3.40	-	238	-	-	-	-	-	3.1	123
01	1.6	4.0	3.45	-	232	-	-	-	-	-	3.3	125
02	1.9	3.3	3.45	-	220	-	-	-	-	-	2.5	110
03	-	3.5	3.45	-	240	-	-	-	-	-	2.3	105
04	1.5	2.2	3.30	-	260	-	-	-	-	-	2.6	110
05	1.6	2.0	3.15	-	260	-	-	-	-	-	2.6	108
06	1.9	3.1	3.25	-	270	-	-	-	-	-	3.7*	110*
07	2.5	6.3	3.35	260	240	-	-	-	-	2.7	2.4	118
08	2.9	7.6	3.15	290	226	-	-	-	-	3.1	2.2	128
09	3.3	8.2	2.80	307	225	4.5	3.65	-	-	3.8	3.8	125
10	3.4	7.7	2.65	340	228	4.5	3.75	-	-	4.0	4.2	119
11	4.0	7.4	2.60	350	218	4.5	3.75	-	-	3.9	4.5	110
12	4.0	7.6	2.63	350	220	4.5	3.90	-	-	4.7	4.9	106
13	3.9	7.7	2.65	332	210	4.5	3.90	-	-	4.0	4.2	100
14	3.6	8.2	2.78	328	210	4.5	3.80	-	-	3.6	4.0	110
15	3.1	8.4	2.80	300	209	-	-	-	-	3.4	4.3	110
16	2.7	8.7	2.90	285	230	-	-	-	-	-	4.4	110
17	2.5	9.0	2.93	-	240	-	-	-	-	2.6	3.5	113
18	1.8	9.0	2.95	-	250	-	-	-	-	-	3.9	105
19	1.8	8.5	3.00	-	240	-	-	-	-	-	3.3*	120
20	1.8	8.6	3.25	-	230	-	-	-	-	-	2.6*	122*
21	1.7	7.4	3.25	-	230	-	-	-	-	2.6	3.6	120
22	2.0	6.2	3.40	-	232	-	-	-	-	-	3.2	110
23	1.7	5.2	3.40	-	240	-	-	-	-	-	2.2	105

* Insufficient data for reliable median.

IONOSPHERIC DATA
 MONTHLY MEDIAN CHARACTERISTICS
 BANGKOK, THAILAND
 OCTOBER 1964

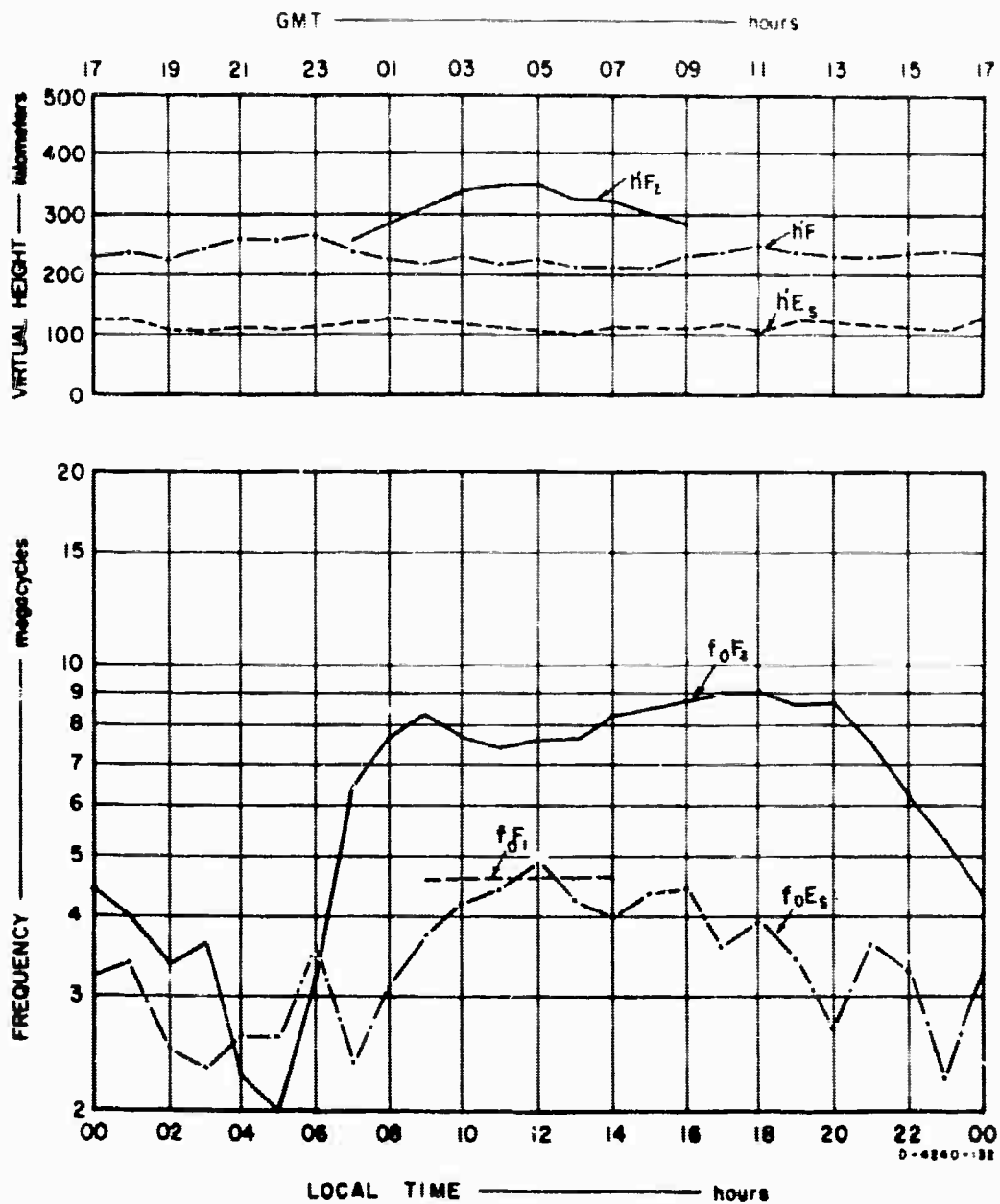


FIG. 1 SUMMARY GRAPHS

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