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Ionospheric Data Report — July 1964

IONOSPHERIC DATA: BANGKOK, THAILAND

Compiled by: VICHAI T. NIMIT

Prepared for:

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

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ORDER NO. 5384-PM-63-91

SPONSORED BY THE ADVANCED RESEARCH PROJECTS AGENCY
FOR THE
THAI-U.S. MILITARY RESEARCH AND DEVELOPMENT CENTER
SUPREME COMMAND HEADQUARTERS
BANGKOK, THAILAND



STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA

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IONOSPHERIC DATA: BANGKOK, THAILAND

Prepared for:

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ARPA ORDER -371

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Compiled by: VICHAI T. NIMIT,

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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

Project's 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 f_oE	The ordinary wave critical frequency for the F_2 and F_1 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 F_2 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 F_1 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
- 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 $f_o E$. (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

and 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 I
Sweep: 1 Mc to 25 Mc

July 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
1	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
3	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
5	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
7	014*	E014S	017	E013S	013	E015S	E015S	E016S	E023S	E023S	E026S	029
8	E015S	021	019	B	017	014	E019S	022	023	035	031	031
9	021	B	022	019	023	016	E018S	E018S	E025S	E024S	033	035
10	020	014	017	014	014	015	020	E018S	E024S	019	023	029
11	017	018	019	B	013	015	E018S	019	021	F025S	E022S	E027S
12	018	022	022	023	011	015	018	019	021	026	025	030
13	024	024	024	015	023	012	021	025	025	022	021	025
14	E016S	E010E	E010E	E010E	E010E	E010E	E016S	E016S	E017S	E021S	022	E028S
15	015	014	014	014	014	014	015	017	020	021	024	016
16	022	022	E020E	024	024	024	E022S	023	029	027	026	029
17	C	C	C	C	C	C	C	C	C	E026S	E026S	028
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	U022C	U022C	E020E	C	C	C	C	C	C	U033C	034	036
21	U026C	U022C	U024C	U022C	C	C	C	C	026	028	030	032
22	E020E	021	022	C	C	C	C	C	C	027	024	031
23	B	B	B	023	025	B	028	026	034	029	033	029
24	023	024	021	024	E022S	022	022	E030S	E031S	030	E031S	E032S
25	027	025	B	B	B	025	024	028	027	031	032	031
26	B	U027C	U022C	U022C	U022C	021	026	028	028	030	030	031
27	025	025	021	U0253	B	U024C	U027C	U031C	U029C	U030C	U032C	031
28	023	022	U025C	B	C	C	C	E035S	E030S	E028S	033	033
29	C	C	C	C	C	C	C	C	033	U035S	U036S	038
30	B	B	B	B	B	B	016	E028S	031	038	031	033
31	022	020	B	022	021	023	028	024	030	030	030	030
Median	022	022	021	022	019	015	020	024	027	028	030	031
Count	18	18	17	14	14	15	17	18	20	23	23	23
UQ	023	024	022	023	023	023	025	028	030	030	032	032
LQ	017	018	018	014	013	014	017	018	024	024	024	029
QR	6	6	4	9	10	9	8	10	6	6	8	3

* Tabulation of 014 = 1.4 Mc.

ATTENTION: The accuracy of the frequency parameters in this bulletin is of the C-2 sounder, from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

SPHERIC DATA
to 25 Mc in 0.5 minute
July 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	C	C	C	C	C	C	C	C	C	C	C
	C	C	C	C	C	C	C	C	C	C	C	C	C
	C	C	C	C	C	C	C	C	C	C	C	C	C
	C	C	C	C	C	C	C	C	C	C	C	C	C
SS	029	032	033	024	030	027	021	E016S	E015S	E017S	021	023	E017S
A	031	050	047	031	031	C	E025S	E017S	E018S	E017S	E024S	020	E017S
B	035	E036S	E039S	E030S	024	022	E018S	E016S	E016S	E016S	E016S	E016S	E017S
B	029	028	031	022	027	019	019	E018S	E019S	E018S	E019S	025	018
SS	E027S	030	E029S	E023S	022	020	023	018	015	E016S	E017S	E017S	022
S	030	025	025	028	024	025	018	025	018	021	E015S	E017S	023
L	025	E029S	029	E024S	023	022	024	E018S	E017S	E014S	E023S	E018S	E027S
2	E028S	030	029	026	C	C	C	C	E013S	014	014	015	015
A	016	017	E024S	017	015	015	E018S	E016S	E016S	013	E012S	B	E020E
S	029	034	034	030	027	026	028	E026S	023	023	E026S	E026S	C
SS	028	031	031	E026S	026	E027S	024	E022S	E025S	E019S	E026S	C	C
	C	030	020	028	026	026	026	E026S	C	C	C	C	C
	C	E030S	E030S	E030S	E025S	E026S	E026S	E022S	E023S	E022S	E022S	E022S	E022S
	036	036	040	E030S	026	027	E030S	E026S	E026S	E026S	U015C	U026C	U026C
	032	E032S	E032S	C	C	C	C	C	C	C	C	C	E021S
	031	E035S	029	027	027	E028S	030	025	032	029	E030S	E029S	023
	029	030	031	030	025	027	028	U025S	026	026	U029S	E026S	B
S	E032S	E032S	E032S	E031S	E026S	E025S	E030S	030	E026S	024	029	025	B
	031	025	029	029	027	E028S	E028S	E026S	E026S	E027S	E029S	E029S	B
	031	032	033	028	027	032	E032S	E027S	028	E029S	034	028	027
C	031	038	036	E032S	034	032	027	E022S	024	023	E031S	B	025
	033	031	032	030	031	028	030	029	C	C	C	C	C
SS	038	037	036	031	028	028	E029S	030	024	E027S	E027S	B	B
	033	E044S	033	032	C	C	C	C	C	026	029	029	022
	030	033	033	031	036	E027S	024	024	024	C	C	C	C
	031	032	032	032	027	027	026	025	023	022	024	024	022
	23	23	25	24	22	21	22	22	21	21	21	18	17
	032	036	033	036	028	028	029	026	026	026	029	028	024
	029	030	029	030	025	024	023	018	017	017	017	017	017
	5	6	4	6	3	4	6	8	9	9	12	11	7

This bulletin is questionable because of an error in frequency markers
original frequency parameters have been increased by 1 Mc since the

2

Characteristic: foF2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	F	021	U016S	019	019	036	U041S	050	J054S	061	063
8	031	024	023	B	020	A	037	051	067	072	070	J065S
9	029	B	A	A	A	A	042	052	59	056	U058S	U055S
10	A	A	F	A	A	A	036	065	065	066	071	072
11	F	031	A	B	F	A	038	06	060	065	070	059
12	F	A	F	F	A	A	047	06	071	072	053	A
13	F	F	F	F	A	A	037	059	060	062	065	072
14	030	F	F	F	F	F	U042F	060	U080S	076	070	U062S
15	040	034	027	F	F	029	045	U050S	U052S	057	U058S	J057S
16	A	A	D030	F	F	A	A	044	A	056	A	A
17	C	C	C	C	C	C	C	C	C	044	047	050
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	U031C	U027C	C	C	C	C	C	C	C	U075C	068	D065R
21	U045C	U045C	F	F	C	C	C	C	065	066	064H	060H
22	U016F	F	F	C	C	C	C	C	C	062H	063H	054H
23	B	B	1	A	A	B	038	060	063	066	070	070
24	A	A	A	A	A	A	032	051	060	066	069	063H
25	F	F	B	B	B	A	U032C	U045C	U060C	U070C	U062C	067H
26	B	A	A	A	A	A	A	060	065	065H	U061S	056H
27	F	F	F	F	B	F	U034C	U052C	U067C	U065C	U055C	A
28	A	A	A	B	C	C	C	U046S	U065S	U066S	A	A
29	C	C	C	C	C	C	C	C	A	A	U050S	A
30	B	B	B	B	B	B	035	053	U052S	U054S	U049S	058H
31	030	F	B	A	A	A	034	049	060	063H	063H	054
Median Count	031 8	031 5	025 4	- 1	- 2	- 2	037 15	052 18	061 18	065 22	063 21	061 18
UQ	035	039	028	-	-	-	042	060	065	068	070	065
LQ	030	026	022	-	-	-	034	049	060	057	057	056
QR	5	13	7	-	-	-	8	11	5	11	13	9

*

Tabulation of 028 = 2.8 Mc.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

OSPHERIC DATA
to 25 Mc in 0.5 minute
July 1964

0	11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	063	066	066	061	069	068	085	088	U066S	U050S	U047S	J059S	028*
70	J065S	066	075	083	093	C	092	085	102	074	049	046	U042S
58S	U055S	058	064	067	066	U072S	U080S	075	U072S	A	U050S	042	U045F
71	072	A	062	070	080	072	100	E105S	U065S	J060S	U055S	049	037
70	059	062	069	075	080	087	095	095	U094S	078	U060S	A	F
53	A	064	084	081	085	070	087	087	102	085	072	U050S	F
55	072	072	U062S	070	081	086	085	101	U114S	U050S	037	061	F
70	U062S	S	S	052	C	C	C	C	063	061	042	U035F	032
58S	U057S	055	U056S	U057S	064	U066S	U072S	081	078	050	030	036	030
A	A	A	049	052	U055S	064	U075S	090	059	U045S	036	B	A
47	050	U060S	055	U050S	U050S	U057S	U070S	U074S	U073S	U056S	U046S	F	C
C	C	067H	071H	081	085	083	076	U092S	C	C	C	C	C
C	C	068	070	067H	066H	072	086	U080S	U065S	U060S	U042S	U034S	U022C
38	D065R	063H	064H	066H	071	U079S	U080S	084	070	U061S	U047C	U042C	U045C
34H	060H	061	065	C	C	C	C	C	C	C	C	C	032
33H	054H	050	060	C65	067H	A	082	073	075	091	057	037	030
70	070	035	067	065H	U055S	U062S	U060S	U075S	076	070	U060S	031	B
59	063H	058H	057H	A	U056S	066	U069S	U100S	080	041	U040S	U035S	B
52C	067H	A	A	062H	U062H	U063S	U062S	U072S	080	067	U036S	U031S	B
31S	056H	U062S	A	062	062H	075	069	075	084	081	U063S	A	U042F
55C	A	R	R	U050S	U058S	060	U054S	U070S	U070S	U050S	U035S	B	A
A	A	A	U052S	U062S	072	U066S	066	081	C	C	C	C	C
50S	A	A	U062S	064H	061H	071	079	082	072	U050S	A	B	B
49S	058H	D050S	U048S	056	C	C	C	C	C	U050S	045	034	031
33H	054	A	A	A	060	080	095	086	054	C	C	C	C
53	061	062	063	064	066	071	080	083	073	060	047	037	032
21	18	17	20	22	22	20	22	22	21	20	20	15	12
70	065	066	068	070	080	077	086	090	082	076	056	040	042
57	056	058	057	058	060	063	069	075	066	050	039	034	030
13	9	8	11	12	20	12	17	15	16	26	17	15	12

is bulletin is questionable because of an error in frequency markers
original frequency parameters have been increased by 1 Mc since the

Characteristic: M(3000)F2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	F	F	265	U320S	320	355	330	U310S	270	S	225	230
8	290	300	300		350	A	300	320	310	260	280	S
9	230	B	A	A	A	A	340	340	300	250	U220S	U340S
10	A	A	F	A	A	A	350	340	330	280	270	250
11	F	340	A	B	F	A	350	310	290	250	200	255
12	F	A	F	F	A	A	350	335	290	240	240	A
13	F	F	F	F	A	A	320	330	260	265	260	240
14	300	F	F	F	F	F	U310F	310	U280S	280	230	U230S
15	300	300	285	F	F	340	370	U350S	U325S	300	U250S	U225S
16	A	A	S	F	F	A	A	310	A	235	A	A
17	C	C	C	C	C	C	C	C	C	270	230	225
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	U370C	U340C	U350C	C	C	C	C	C	C	U270C	230	R
21	U320C	U350C	F	F	C	C	C	C	285	260	230H	220H
22	U300F	F	F	C	C	C	C	C	C	255H	220H	210H
23	B	B	B	A	A	B	350	320	270	250	240	260
24	A	A	A	A	A	A	330	320	300	280	250	240H
25	F	F	B	B	B	A	U340C	U320C	U310C	U280C	U260C	220H
26	B	A	A	A	A	A	A	340	300	260H	U230S	220H
27	F	F	F	F	B	F	U350C	U310C	U300C	U250C	U220C	A
28	A	A	A	B	C	C	C	U320S	U320S	U250S	A	A
29	C	C	C	C	C	C	C	C	A	A	U250S	A
30	B	B	B	B	B	B	320	330	U270S	U240S	U230S	210H
31	330	F	B	A	A	A	360	300	270	250H	220H	290
Median	300	340	297	-	-	-	340	320	295	260	230	230
Count	8	5	4	1	2	2	15	18	18	21	21	16
UQ	325	345	325	-	-	-	350	335	310	270	225	245
LQ	295	300	275	-	-	-	320	310	270	250	223	220
QR	30	45	50	-	-	-	30	25	40	20	2	25

* Tabulation of 320 = factor of 3.2.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 sounder from 15 July to 21 September 1964. The original error is estimated to have been approximately 1 Mc.

PHERIC DATA
25 Mc in 0.5 minute

ly 1964

	11	12	13	14	15	16	17	18	19	20	21	22	23
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	S	320*
	230	235	250	260	270	275	310	340	U340S	U350S	U370S	350	U320S
	S	250	270	265	280	C	300	300	320	360	315	300	U310F
S	U340S	220	240	250	260	U260S	U290S	320	U340S	A	U310S	290	270
	250	A	U230S	250	260	250	300	S	U330S	S	U300S	A	F
	255	260	230	230	270	290	300	300	U340S	330	U340S	U330S	F
	A	260	250	270	260	265	280	300	325	330	330	350	F
	240	225	U215S	230	280	290	290	315	U360S	U350S	C20	U290F	260
	U230S	S	S	245	C	C	C	C	320	350	325	320	305
S	U225S	210	U240S	U230S	220	U250S	U285S	330	375	375	215	B	A
	A	A	230	250	U275S	265	U310S	370	330	U330S	335	F	C
	225	U205S	215	U260S	U250S	U270S	U280S	U290S	U330S	U310S	U320S	C	C
	C	230H	240H	265	295	310	320	U340S	C	C	C	C	C
	C	245	235	230H	215H	240	310	U320S	U325S	U300S	U310S	U290S	U310C
	R	225H	220H	225H	245	U270S	U290S	320	310	U320S	U320C	U310C	U310C
H	220H	240	250	C	C	C	C	C	C	C	C	C	310
H	210H	250	255	240	240H	A	315	320	310	340	350	320	270
	260	250	250	230H	U250S	U230S	U280S	U315S	350	330	U360S	300	B
	240H	210H	220H	A	U245S	270	U300S	U340S	370	340	U330S	U280S	B
C	220H	A	A	210H	U260S	U240S	U320S	U300S	340	360	U370S	U340S	B
S	220H	U210S	A	250	240H	270	280	290	330	350	U360S	A	U300F
C	A	R	R	S	U250S	260	U300S	U310S	U350S	U350S	U310S	B	A
	A	A	U230S	U220S	280	U300S	295	320	C	C	C	C	C
S	A	A	U250S	240H	240H	270	315	320	340	U350S	A	B	B
S	210H	S	U230S	270	C	C	C	C	C	U280S	350	340	330
H	290	A	A	A	280	300	350	370	380	C	C	C	C
	230	233	238	245	260	270	300	320	340	340	328	315	310
	16	16	20	21	22	20	22	21	21	19	20	14	12
	245	250	250	260	275	283	310	325	350	350	350	340	320
	220	215	230	230	245	255	290	300	325	330	313	290	285
	25	35	20	30	30	28	20	25	25	20	43	50	35

in this bulletin is questionable because of an error in frequency markers
The original frequency parameters have been increased by 1 Mc since the

Characteristic: h'F2

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	400*	430	E460A
8	-	-	-	-	-	-	-	-	-	-	410	360
9	-	-	-	-	-	-	-	-	-	-	500	400
10	-	-	-	-	-	-	-	-	-	360	430	400
11	-	-	-	-	-	-	-	-	-	400	460	450
12	-	-	-	-	-	-	-	-	-	-	500	A
13	-	-	-	-	-	-	-	-	E470A	E400A	375	360
14	-	-	-	-	-	-	-	-	-	340	380	-
15	-	-	-	-	-	-	-	-	-	-	430	490
16	-	-	-	-	-	-	-	-	A	450	A	A
17	-	-	-	-	-	-	-	-	-	-	420	460
18	-	-	-	-	-	-	C	C	C	C	C	C
19	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	-	-	-	-	E470A	E530A
21	-	-	-	-	-	-	C	C	-	-	460	480
22	-	-	-	-	-	-	C	C	C	-	390	480
23	-	-	-	-	-	-	-	-	-	370	430	370
24	-	-	-	-	-	-	-	E360A	320	E400A	350	430
25	-	-	-	-	-	-	-	-	-	-	410	480
26	-	-	-	-	-	-	-	-	-	-	480	470
27	-	-	-	-	-	-	-	-	-	-	E520A	A
28	-	-	-	-	-	-	-	-	-	400	A	A
29	-	-	-	-	-	-	C	C	A	A	540	A
30	-	-	-	-	-	-	-	-	-	470	480	510
31	-	-	-	-	-	-	-	-	350	400	430	470
Median	-	-	-	-	-	-	-	-	360	400	430	460
Count	-	-	-	-	-	-	-	1	3	11	21	17
UQ	-	-	-	-	-	-	-	-	410	400	480	485
LQ	-	-	-	-	-	-	-	-	335	360	410	415
QR	-	-	-	-	-	-	-	-	75	40	70	70

* Tabulation of 400 = 400 km.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 scander from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

ERIC DATA
 5 Mc in 0.5 minute
 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
E460A	420	E530A	E420A	380	-	-	-	-	-	-	-	-
360	E460B	350	360	320	C	310	-	-	-	-	-	-
490	540	410	390	-	-	-	-	-	-	-	-	-
400	A	E500A	E440A	-	-	-	-	-	-	-	-	-
450	400	440	470	330	320	300	-	-	-	-	-	-
A	430	390	350	E440A	E400A	-	-	-	-	-	-	-
360	500	460	420	330	-	-	-	-	-	-	-	-
-	S	S	500	C	C	C	-	-	-	-	-	-
490	550	480	450	390	390	-	-	-	-	-	-	-
A	A	570	490	400	-	-	-	-	-	-	-	-
460	720	510	480	500	400	-	-	-	-	-	-	-
C	410	430	350	310	300	-	-	-	-	-	-	-
C	420	410	440	460	-	-	-	-	-	-	-	-
E530A	500	430	460	380	340	-	-	-	-	-	-	-
480	420	390	C	C	C	C	-	-	-	-	-	-
480	490	410	E480A	410	A	-	-	-	-	-	-	-
370	400	390	440	400	440	-	-	-	-	-	-	-
430	540	500	A	400	360	320	-	-	-	-	-	-
480	A	A	540	380	-	-	-	-	-	-	-	-
470	550	A	410	420	340	-	-	-	-	-	-	-
A	R	R	U640S	400	-	-	-	-	-	-	-	-
A	A	540	450	330	320	-	-	-	-	-	-	-
A	A	430	370	540	350	300	-	-	-	-	-	-
510	460	560	390	C	C	C	-	-	-	-	-	-
430	A	A	A	370	-	-	-	-	-	-	-	-
460	460	435	440	395	350	305	-	-	-	-	-	-
17	17	20	22	20	11	4	-	-	-	-	-	-
485	540	505	480	415	400	315	-	-	-	-	-	-
415	420	410	390	350	320	300	-	-	-	-	-	-
70	120	115	90	65	80	15	-	-	-	-	-	-

bulletin is questionable because of an error in frequency markers
 original frequency parameters have been increased by 1 Mc since the

2

Characteristic: h'F

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	370	340	E380B	280	250	260	220	220	190	A	A	A
8	340	E390B	300	B	260	A	280	220	E270A	210	E200A	210
9	520	B	A	A	A	A	240	220	230	E260A	200	195
10	A	A	280	A	A	A	270	260	230	A	A	A
11	340	270	A	B	320	A	240	230	210	190	180	180
12	300	A	320	330	A	A	240	220	200	E240A	200	A
13	320	300	280	210	A	A	250	220	A	A	A	180
14	300	250	230	230	260	270	250	220	210	E210A	E210A	E210A
15	280	315	370	380	340	265	230	220	E300	220	200	180
16	A	A	310	240	250	A	A	E230A	A	200	A	A
17	C	C	C	C	C	C	C	C	C	170	180	210
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	230	250	250	C	C	C	C	C	C	400	A	A
21	260	230	220	250	C	C	C	C	210	190	180	170
22	340	350	290	C	C	C	C	C	C	220	200	190
23	B	B	B	A	A	B	250	220	200	200	210	220
24	A	A	A	A	A	A	280	A	A	A	A	A
25	350	330	B	B	B	A	270	240	210	200	190	E220A
26	B	A	A	A	A	A	A	260	310	400	210	A
27	260	230	240	U250S	B	300	250	E270A	200	360	A	A
28	A	A	A	B	C	C	C	220	200	190	A	A
29	C	C	C	C	C	C	C	C	A	A	A	A
30	B	B	B	B	B	B	290	240	220	200	190	190
31	290	260	B	A	A	A	240	210	210	210	A	180
Median	310	285	285	250	260	268	250	220	210	210	200	190
Count	14	12	12	8	6	4	15	17	16	18	13	13
U _o	340	335	315	305	320	285	270	240	230	240	205	210
L _o	280	250	245	235	250	263	240	220	200	200	185	180
Q _R	60	85	70	130	70	22	30	20	30	40	20	30

* Tabulation of 220 = 220 km.

ATTENTION: The accuracy of the frequency parameters in this bulletin is quoted of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

SPHERIC DATA
 o 25 Mc in 0.5 minute
 uly 1964

	11	12	13	14	15	16	17	18	19	20	21	22	23
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-
	A	A	A	A	A	240	205	240	230	230	250	220*	270
DA	210	B	B	200	E320A	C	A	E250A	250	220	270	250	E340A
D	195	A	200	180	190	230	210	270	230	A	E300A	300	250
	A	A	A	A	340	210	300	210	230	250	300	A	350
D	180	200	205	170	E200A	A	A	270	210	210	250	250	320
D	A	A	A	A	A	A	305	250	250	210	250	230	250
	180	170	160	A	200	200	340	280	210	210	270	300	310
DA	E210A	E210A	E200A	190	C	C	C	-	220	220	240	250	290
D	180	180	180	170	170	180	180	220	210	190	E580A	B	A
	A	A	180	180	170	170	200	230	210	250	200	330	C
D	210	180	200	170	180	180	E230A	E220A	220	245	270	C	C
	C	200	210	A	E280A	A	220	240	C	C	C	C	C
	C	200	200	200	190	200	E230A	220	210	240	270	320	310
	A	A	205	200	200	200	210	200	240	250	260	290	280
D	170	180	190	C	C	C	C	C	C	C	C	C	280
D	190	200	E230A	A	A	A	210	210	260	230	220	280	E370B
D	220	A	205	200	A	E230A	220	240	210	210	200	E350A	B
	A	180	210	A	A	A	A	280	210	240	260	320	B
D	E220	A	A	180	180	200	210	230	220	200	220	280	B
D	A	220	A	190	180	A	220	E230A	230	230	220	A	260
	A	170	200	170	170	170	220	240	220	220	E280S	B	A
	A	A	200	200	A	200	E250A	240	C	C	C	C	C
	A	A	A	A	A	A	A	280	240	210	A	B	B
D	190	S	190	190	C	C	C	C	C	230	230	230	270
	180	A	A	A	200	220	200	220	200	C	C	C	C
D	190	190	200	190	190	200	220	240	220	225	260	280	290
B	13	12	17	15	15	14	18	22	21	20	20	16	15
	210	200	205	200	200	220	230	250	235	240	270	310	340
B	180	180	190	170	180	180	210	220	210	210	235	250	270
D	30	20	15	30	20	40	20	30	25	30	45	60	70

alleles is questionable because of an error in frequency markers
final frequency parameters have been increased by 1 Mc since the

2

Characteristic: foF1

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	L	L	A	A	A
8	-	-	-	-	-	-	-	L	L	L	041*	042
9	-	-	-	-	-	-	-	L	L	L	042	042
10	-	-	-	-	-	-	-	A	L	A	A	A
11	-	-	-	-	-	-	-	L	L	042	043	044
12	-	-	-	-	-	-	-	L	L	L	042	A
13	-	-	-	-	-	-	-	L	A	A	A	042
14	-	-	-	-	-	-	-	L	L	042	042	043
15	-	-	-	-	-	-	-	L	L	L	032	033
16	-	-	-	-	-	-	-	A	A	043	A	A
17	-	-	-	-	-	-	C	C	C	L	043	043
18	-	-	-	-	-	-	C	C	C	C	C	C
19	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	C	C	C	L	A	A
21	-	-	-	-	-	-	C	C	L	L	054	054
22	-	-	-	-	-	-	C	C	C	L	041	043
23	-	-	-	-	-	-	-	L	L	045	045	044
24	-	-	-	-	-	-	-	A	A	A	A	A
25	-	-	-	-	-	-	-	A	L	L	033	035
26	-	-	-	-	-	-	-	A	A	A	033	A
27	-	-	-	-	-	-	-	A	L	L	A	A
28	-	-	-	-	-	-	-	L	L	032	A	A
29	-	-	-	-	-	-	C	C	A	A	A	A
30	-	-	-	-	-	-	-	L	L	033	032	033
31	-	-	-	-	-	-	-	L	030	032	A	034
Median	-	-	-	-	-	-	-	-	-	042	042	042
Count	-	-	-	-	-	-	-	-	1	7	13	13
UQ	-	-	-	-	-	-	-	-	-	043	043	043
LQ	-	-	-	-	-	-	-	-	-	032	033	035
QR	-	-	-	-	-	-	-	-	-	11	10	8

* Tabulation of 041 = 4.1 Mc.

ATTENTION: The accuracy of the frequency parameters in this bulletin is that of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

PHERIC DATA
 25 Mc in 0.5 minute
 y 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
A	A	A	A	A	L	L	-	-	-	-	-	-
042	B	B	043	043	C	A	-	-	-	-	-	-
042	A	043	041	L	L	L	-	-	-	-	-	-
A	A	A	A	L	L	L	-	-	-	-	-	-
044	044	044	043	041	A	A	-	-	-	-	-	-
A	A	A	A	A	A	L	-	-	-	-	-	-
042	044	044	A	042	L	L	-	-	-	-	-	-
043	043	043	043	C	C	C	-	-	-	-	-	-
033	033	033	032	031	030	L	-	-	-	-	-	-
A	A	043	043	041	L	L	-	-	-	-	-	-
043	043	043	042	041	040	L	-	-	-	-	-	-
C	044	044	042	041	A	L	-	-	-	-	-	-
C	044	043	043	041	L	L	-	-	-	-	-	-
A	A	043	041	043	041	L	-	-	-	-	-	-
054	044	044	C	C	C	C	-	-	-	-	-	-
043	043	044	A	A	A	L	-	-	-	-	-	-
044	A	043	041	A	041	L	-	-	-	-	-	-
A	042	A	A	A	A	A	-	-	-	-	-	-
035	A	A	041	041	L	L	-	-	-	-	-	-
A	044	A	043	042	A	L	-	-	-	-	-	-
A	043	042	042	040	L	L	-	-	-	-	-	-
A	A	034	033	A	032	L	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
033	S	033	U032S	C	C	C	-	-	-	-	-	-
034	A	A	A	032	L	L	L	-	-	-	-	-
042	044	043	042	041	040	-	-	-	-	-	-	-
13	12	17	16	13	5	-	-	-	-	-	-	-
043	044	044	043	042	041	-	-	-	-	-	-	-
035	043	042	037	041	031	-	-	-	-	-	-	-
8	1	2	6	1	10	-	-	-	-	-	-	-

ulletin is questionable because of an error in frequency markers
 ginal frequency parameters have been increased by 1 Mc since the

Characteristic: M(3000)F

IONOSPHERIC I
Sweep: 1 Mc to 25 Mc

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	L	L	A	A	A
8	-	-	-	-	-	-	-	L	L	L	390 [*]	410
9	-	-	-	-	-	-	-	L	L	L	400	410
10	-	-	-	-	-	-	-	A	L	A	A	A
11	-	-	-	-	-	-	-	L	L	380	410	410
12	-	-	-	-	-	-	-	L	L	L	400	A
13	-	-	-	-	-	-	-	L	A	A	A	420
14	-	-	-	-	-	-	-	L	L	390	400	410
15	-	-	-	-	-	-	-	L	L	L	420	415
16	-	-	-	-	-	-	-	A	A	365	A	A
17	-	-	-	-	-	-	C	C	C	L	410	400
18	-	-	-	-	-	-	C	C	C	C	C	C
19	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	C	C	C	L	A	A
21	-	-	-	-	-	-	C	C	L	L	410	420
22	-	-	-	-	-	-	C	C	C	L	400	420
23	-	-	-	-	-	-	-	L	I	390	400	395
24	-	-	-	-	-	-	-	A	A	A	A	A
25	-	-	-	-	-	-	-	A	L	L	400	400
26	-	-	-	-	-	-	-	A	A	A	410	A
27	-	-	-	-	-	-	-	A	L	L	A	A
28	-	-	-	-	-	-	-	L	L	420	A	A
29	-	-	-	-	-	-	C	C	A	A	A	A
30	-	-	-	-	-	-	-	L	L	390	410	420
31	-	-	-	-	-	-	-	L	380	390	A	420
Median	-	-	-	-	-	-	-	-	-	390	400	410
Count	-	-	-	-	-	-	-	-	1	7	13	13
UQ	-	-	-	-	-	-	-	-	-	390	410	420
LQ	-	-	-	-	-	-	-	-	-	380	400	405
QR	-	-	-	-	-	-	-	-	-	10	10	15

* Tabulation of 390 = factor of 3.9.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 sounder from 15 July to 21 September 1964. The original error is estimated to have been approximately 1 Mc.

HERIC DATA
 25 Mc in 0.5 minute
 y 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
A	A	A	A	A	L	L	-	-	-	-	-	-
410	B	B	420	-	C	A	-	-	-	-	-	-
410	A	425	440	L	L	L	-	-	-	-	-	-
A	A	A	A	L	L	L	-	-	-	-	-	-
410	410	410	420	400	A	A	-	-	-	-	-	-
A	A	A	A	A	A	L	-	-	-	-	-	-
420	420	415	A	400	L	L	-	-	-	-	-	-
410	420	420	420	C	C	C	-	-	-	-	-	-
415	20	430	430	420	400	L	-	-	-	-	-	-
A	A	425	430	410	L	L	-	-	-	-	-	-
400	430	430	420	400	370	L	-	-	-	-	-	-
C	410	420	-	-	A	L	-	-	-	-	-	-
C	400	410	410	415	L	L	-	-	-	-	-	-
A	A	410	410	390	410	L	-	-	-	-	-	-
420	420	420	C	C	C	C	-	-	-	-	-	-
420	420	410	A	A	A	L	-	-	-	-	-	-
395	A	420	425	A	375	L	-	-	-	-	-	-
A	430	410	A	A	A	A	-	-	-	-	-	-
400	A	A	440	420	L	L	-	-	-	-	-	-
A	420	A	410	410	A	L	-	-	-	-	-	-
A	420	430	440	430	L	L	-	-	-	-	-	-
A	A	420	410	A	400	L	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
420	A	430	440S	C	C	C	-	-	-	-	-	-
420	A	A	A	400	L	L	L	-	-	-	-	-
410	420	420	420	410	400	-	-	-	-	-	-	-
15	12	17	15	11	5	-	-	-	-	-	-	-
420	420	428	430	420	405	-	-	-	-	-	-	-
405	410	410	410	400	373	-	-	-	-	-	-	-
15	10	18	20	20	32	-	-	-	-	-	-	-

this bulletin is questionable because of an error in frequency markers
 The original frequency parameters have been increased by 1 Mc since the

2

Characteristic: foE

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in
July 1961

Observed at:
Bangkok, Thailand
Lat. 13.75° 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	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	A	A	A	A	A
8	-	-	-	-	-	-	-	A	A	B	A	A
9	-	-	-	-	-	-	-	A	A	A	A	A
10	-	-	-	-	-	-	-	A	A	A	A	A
11	-	-	-	-	-	-	-	A	A	A	A	A
12	-	-	-	-	-	-	-	A	A	A	A	A
13	-	-	-	-	-	-	-	A	A	A	A	A
14	-	-	-	-	-	-	-	A	A	A	A	A
15	-	-	-	-	-	-	-	A	A	A	A	A
16	-	-	-	-	-	-	-	A	A	A	A	A
17	-	-	-	-	-	-	C	C	C	A	A	A
18	-	-	-	-	-	-	C	C	C	C	C	C
19	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	C	C	C	A	A	A
21	-	-	-	-	-	-	C	C	A	A	A	A
22	-	-	-	-	-	-	C	C	C	A	A	A
23	-	-	-	-	-	-	-	A	B	A	A	A
24	-	-	-	-	-	-	-	A	A	A	A	A
25	-	-	-	-	-	-	-	A	A	A	A	A
26	-	-	-	-	-	-	-	A	A	A	A	A
27	-	-	-	-	-	-	-	A	A	A	A	A
28	-	-	-	-	-	-	-	S	A	A	A	A
29	-	-	-	-	-	-	C	C	A	A	A	A
30	-	-	-	-	-	-	-	A	A	A	A	A
31	-	-	-	-	-	-	-	A	A	A	A	A
Median	-	-	-	-	-	-	-	-	-	-	-	-
Count	-	-	-	-	-	-	-	-	-	-	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-

ATTENTION: The accuracy of the frequency parameters in this bulletin is of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

SPHERIC DATA
25 Mc in 0.5 minute
ly 1964

[illegible]

alleles is questionable because of an error in frequency markers
genetic frequency parameters have been increased by 1 Mc since the

Characteristic: h'E

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in C

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	A	A	A	A	A
8	-	-	-	-	-	-	-	A	A	B	A	A
9	-	-	-	-	-	-	-	A	A	A	A	A
10	-	-	-	-	-	-	-	A	A	A	A	A
11	-	-	-	-	-	-	-	A	A	A	A	A
12	-	-	-	-	-	-	-	A	A	A	A	A
13	-	-	-	-	-	-	-	A	A	A	A	A
14	-	-	-	-	-	-	-	A	A	A	A	A
15	-	-	-	-	-	-	-	A	A	110	A	A
16	-	-	-	-	-	-	-	A	A	A	A	A
17	-	-	-	-	-	-	C	C	C	A	A	A
18	-	-	-	-	-	-	C	C	C	C	C	C
19	-	-	-	-	-	-	C	C	C	C	C	C
20	-	-	-	-	-	-	C	C	C	A	A	A
21	-	-	-	-	-	-	C	C	C	A	A	A
22	-	-	-	-	-	-	C	C	C	A	110	110
23	-	-	-	-	-	-	-	A	B	A	A	A
24	-	-	-	-	-	-	-	A	A	A	A	A
25	-	-	-	-	-	-	-	A	A	A	A	A
26	-	-	-	-	-	-	-	-	A	A	A	A
27	-	-	-	-	-	-	-	-	A	A	A	A
28	-	-	-	-	-	-	-	S	A	110	A	A
29	-	-	-	-	-	-	C	C	A	A	A	A
30	-	-	-	-	-	-	-	A	A	A	A	A
31	-	-	-	-	-	-	-	110	A	A	A	A
Median	-	-	-	-	-	-	-	-	-	-	-	-
Count	-	-	-	-	-	-	-	1	-	2	1	1
UQ	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-

* Tabulation of 110 = 110 km.

ATTENTION: The accuracy of the frequency parameters in this bulletin is that of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

HERIC DATA
25 Mc in 0.5 minute

ly 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	B	B	A	A	C	A	-	-	-	-	-	-
A	A	S	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	110*	A	-	-	-	-	-	-
A	A	A	A	C	C	C	-	-	-	-	-	-
A	A	A	A	A	110	S	-	-	-	-	-	-
A	A	A	A	A	110	A	-	-	-	-	-	-
C	A	A	A	A	A	A	-	-	-	-	-	-
C	A	A	110	110	110	A	-	-	-	-	-	-
A	A	B	A	A	A	A	-	-	-	-	-	-
A	110	C	C	C	C	C	-	-	-	-	-	-
110	110	A	110	100	110	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	115	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	E	B	110	B	B	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	A	A	A	A	A	A	-	-	-	-	-	-
A	S	110	110	C	C	C	-	-	-	-	-	-
A	A	A	A	B	A	110	110	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
1	3	2	4	2	6	1	1	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

bulletin is questionable because of an error in frequency markers
original frequency parameters have been increased by 1 Mc since the

2

Characteristic: fbEs

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	-	S	B	S	B	-	016	025	026	036	040	050
8	023	B	B	B	-	-	024	031M	037M	B	037	038
9	B	B	-	-	-	-	021	027	035	038	037	037
10	-	-	022	-	-	-	026	040	036	043	060	050
11	026	021	-	B	017	-	019	025	031	031	034	036
12	B	-	B	B	-	-	025	030	030	035	036	-
13	B	B	B	B	-	-	-	031	035	035	040	034
14	-	-	013	-	011	-	020	025	030	036	040	038
15	B	B	3	B	B	B	B	020	023	025	027	024
16	-	-	B	B	-	-	-	029	-	037	-	-
17	C	C	C	C	C	C	C	C	C	032	034	040
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	B	M	M	C	C	C	C	C	C	U045C	054	055
21	B	B	B	-	C	C	C	C	033	035	036	036
22	B	B	B	C	C	C	C	C	C	036	037	038
23	B	B	B	-	-	B	B	030	B	036	040	040
24	-	-	-	-	-	M	026	050	045	045	044	044
25	-	B	B	B	B	-	027	030	036	040	039	042
26	B	C	C	C	-	-	-	045	U042C	050	040	044
27	B	B	B	E	P	B	B	U042C	U036C	037	046	-
28	-	-	C	B	C	C	C	S	034	037	-	-
29	C	C	C	C	C	C	C	C	-	-	039	-
30	B	B	B	B	B	B	029	030	032	-	037	038
31	B	B	B	-	-	-	B	029	035	036	044	037
Median	-	-	-	-	-	-	025	030	035	036	039	038
Count	2	1	2	-	2	-	10	17	17	20	21	18
UQ	-	-	-	-	-	-	026	035	036	039	042	044
LQ	-	-	-	-	-	-	020	026	030	035	037	037
QR	-	-	-	-	-	-	6	9	6	4	5	7

* Tabulation of 018 = 1.8 Mc.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 sounder from 15 July to 21 September 1964. The original error is estimated to have been approximately 1 Mc.

HERIC DATA
25 Mc in 0.5 minute

y 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	018*	S
050	049	065	050	046	034	027	026M	025M	022M	034	032M	032
038	B	B	036	042	C	039	029M	035	020	S	021	018
037	045	S	036M	034	031	027	045	050M	M	040	027	023
050	-	058	058	054	033	040	025	030	034	U030S	-	022
036	040	039	034	036	046	041	038	025	026	025M	026	B
-	048	045	053	065	052	028	034	035	026	030	S	B
034	036	035	052	053	031	040	038	028	-	027	-	M
038	040	039	-	C	C	C	C	S	B	B	B	B
024	021	029M	027	024	023	S	S	S	-	017M	B	-
-	-	035	037	032	B	-	-	-	-	B	B	C
040	039	041	035	034	131M	032	026	030	S	S	C	C
C	038	044	042	040	043	033	030	C	C	C	C	C
C	037	035	035	035	033	033M	026M	027M	M	-	S	S
055	045M	B	035	036	033	-	-	-	-	B	E	B
036	038	037	C	C	C	C	C	C	C	C	C	-
038	039	040	050	045	-	-	-	035	-	S	-	B
040	044	039	038	040	037	032	U028S	B	B	B	027	B
044	036	039	-	040	041	U046S	U075S	U040S	038	B	B	B
042	-	-	036	036	033	032	-	S	S	S	S	B
044	042	-	038	037	041	035	029	B	S	B	-	B
-	B	B	B	B	B	032	029	B	027	S	B	-
-	-	040	040	051	038	038	031	C	C	C	C	C
-	M	050M	044	051	042	049	050	040	030	-	B	B
038	S	B	B	C	C	C	C	C	B	B	B	B
037	-	-	-	B	-	030	027	B	C	C	C	C
038	040	039	038	039	034	033	029	033	026	030	027	023
18	16	17	19	20	17	18	17	12	B	7	6	4
044	045	045	050	046	042	040	038	037	032	034	027	027
037	038	036	035	035	032	032	026	028	024	025	021	020
7	7	9	15	11	10	8	12	9	8	9	6	4

bulletin is questionable because of an error in frequency markers
original frequency parameters have been increased by 1 Mc since the

2

Characteristic: f_oF_2

IONOSPHERIC D
Sweep: 1 Mc to 25 Mc 1

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	022	S	B	S	B	017	022	036	036	045	050	085
8	031	B	B	S	029	037	046	060M	070M	B	030	033
9	B	B	037	031	029	040	049	080	045	047	040	039
10	026	026	024	030	040	048	046	080	057	104	102	085
11	051	052	033	B	028	075	040	051	035	052	040	041
12	B	027	B	B	107	070	042	043	048	090	060	105
13	B	B	B	B	025	025	036	040	035	035	050	034
14	040	035	024	021	020	030	042	036	044	045	040	040
15	B	B	B	B	B	B	B	030	033	038	037	037
16	032	030	B	B	027	026	045	065	074	045	092	075
17	C	C	C	C	C	C	C	C	C	042	038	065
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	B	030M	050M	C	C	C	C	C	C	U050C	070	069
21	B	B	B	030	C	C	C	C	047	045	040	045
22	B	B	B	C	C	C	C	C	C	075	038	047
23	B	B	B	040	052	B	B	057	B	050	055	074
24	040	035	055	040	055	075M	045	056	060	055	054	065
25	037	B	B	B	B	062	045	095	050	063	044	090
26	B	B050C	U056C	U040C	050	070	083	095	U080C	091	087	065
27	B	B	B	B	B	B	B	U050C	U045C	039	060	087
28	026	030	U028C	B	C	C	C	S	042	057	056	092
29	C	C	C	C	C	C	C	C	072	060	039	056
30	B	B	B	B	B	B	043	042	033	048	037	038
31	B	B	B	040	027	032	B	046	040	036	047	047
Median	032	030	034	035	029	040	045	050	045	049	047	065
Count	9	9	8	8	12	13	13	17	19	22	23	23
UQ	040	042	043	040	051	070	046	085	060	060	060	074
LQ	026	029	026	030	027	028	041	039	036	045	039	040
QR	14	13	17	10	24	42	5	46	24	15	21	34

* Tabulation of 018 = 1.8 Mc.

ATTENTION: The accuracy of the frequency parameters in this bulletin of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

HERIC DATA
25 Mc in 0.5 minute

y 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	018*	S
095	080	086	070	046	034	047	051M	065M	045M	044	055M	032
033	B	B	036	045	C	075	043E	045	031	S	021	020
039	045	S	041M	040	031	057	055	085M	095M	045	028	029
085	100	095	100	097	045	061	040	040	034	U042S	052	042
041	043	050	037	078	061	095	065	045	033	036M	035	B
105	090	095	113	110	088	050	057	047	050	040	S	B
034	037	042	095	046	035	056	056	047	035	036	020	045M
040	050	044	044	C	C	C	C	S	B	B	B	B
037	031	041M	037	034	035	S	S	S	033	037M	B	055
075	046	036	037	032	B	-	036	031	030	B	B	C
035	046	080	035	037	033M	055	045	036	S	S	C	C
C	038	057	086	075	070	046	038	C	C	C	C	C
C	037	037	036	036	033	040M	033M	034M	035M	035	S	S
069	060M	B	040	039	038	036	035	030	029	B	B	B
045	039	044	C	C	C	C	C	C	C	C	C	024
047	055	044	061	100	220	050	035	090	041	S	045	B
074	075	039	047	040	047	035	U040S	B	B	B	036	B
065	042	045	100	080	086	U085S	U112S	U085S	034	B	B	B
090	075	085	080	070	037	045	039	S	S	S	S	B
065	047	125	075	061	082	047	033	B	S	B	075	B
037	B	B	B	B	B	070	040	B	031	S	B	036
092	072	047	045	067	049	049	044	C	C	C	C	C
056	085M	087M	052	070	082	060	067	047	031	034	B	B
038	S	B	B	C	C	C	C	C	B	B	B	B
047	070	090	055	B	042	030	027	B	C	C	C	C
065	049	049	050	053	045	050	040	046	034	037	036	034
25	22	20	22	20	19	20	21	14	15	9	10	8
074	075	087	080	076	082	061	056	065	041	043	052	044
040	042	043	037	040	035	046	035	036	031	036	021	027
34	33	44	43	36	47	15	21	9	10	7	31	17

bulletin is questionable because of an error in frequency markers
original frequency parameters have been increased by 1 Mc since the

2

Characteristic: S'E

IONOSPHERIC DATA
Sweep: 1 Mc to 25 Mc in

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	140	S	B	S	B	120	110	105	110	100	100	100
8	090	B	B	B	100	105	105	110	100	B	110	110
9	B	B	112	110	110	105	105	105	105	105	130	130
10	090	090	090	090	090	100	102	100	100	100	100	100
11	120	120	120	B	090	100	100	100	100	100	100	100
12	B	100	B	B	100	100	102	105	105	100	100	100
13	B	B	B	B	110	100	100	120	105	105	100	100
14	110	110	118	110	110	102	105	105	100	100	100	100
15	B	B	B	B	B	B	B	130	130	130	130	095
16	100	110	B	B	120	120	100	100	100	100	100	100
17	C	C	C	C	C	C	C	C	C	105	100	100
18	C	C	C	C	C	C	C	C	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C
20	B	110	110	C	C	C	C	C	C	120	120	110
21	B	B	B	115	C	C	C	C	100	100	105	110
22	B	B	B	C	C	C	C	C	C	110	130	110
23	B	B	B	100	100	B	B	100	B	100	100	100
24	110	110	110	110	110	105	105	112	120	110	110	110
25	120	B	B	B	B	105	110	100	110	100	100	100
26	B	120	110	110	110	105	102	100	100	100	100	100
27	B	B	B	B	B	B	B	100	105	100	100	100
28	110	110	110	B	C	C	C	S	120	110	100	100
29	C	C	C	C	C	C	C	C	110	110	120	110
30	B	B	B	B	B	B	110	110	110	118	110	100
31	B	B	B	100	110	110	B	110	110	100	100	100
Median	110	110	110	110	110	105	105	105	105	100	100	100
Count	9	9	8	8	12	13	13	17	19	22	23	23
UQ	120	115	115	110	110	107	107	110	110	110	110	110
LQ	95	105	110	100	100	100	101	100	100	100	100	100
QR	25	10	5	10	10	7	6	10	10	10	10	10

* Tabulation of 180 = 180 km.

ATTENTION: The accuracy of the frequency parameters in this bulletin is that of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

ERIC DATA
5 Mc in 0.5 minute

1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	180*	S
100	100	100	100	100	140	100	090	090	090	120	090	090
110	B	B	110	100	C	100	100	090	090	S	090	090
130	120	S	100	100	100	095	090	090	090	090	090	090
100	100	100	100	100	090	090	090	090	090	140	120	090
100	100	100	100	100	090	090	090	090	090	090	100	B
100	100	100	100	100	095	095	090	090	090	090	S	B
100	100	100	100	100	140	110	110	105	120	120	120	100
100	100	100	100	C	C	C	C	S	B	B	B	B
095	090	110	110	100	110	S	S	S	095	120	B	100
100	110	118	105	120	B	160	110	110	105	B	B	C
100	100	100	100	100	100	090	090	090	S	S	C	C
C	100	100	100	100	100	100	115	C	C	C	C	C
C	100	105	170	130	120	110	105	100	100	110	S	S
110	120	B	110	100	100	100	100	100	100	100	B	B
110	110	110	C	C	C	C	C	C	C	C	C	090
110	110	110	110	105	100	110	105	100	100	S	110	B
100	100	100	100	095	110	110	105	B	B	B	120	B
110	110	100	100	100	100	100	090	100	090	B	B	B
100	100	100	100	100	100	090	090	S	S	S	S	B
100	110	100	100	100	100	110	095	B	S	B	100	B
100	B	B	B	B	B	090	090	B	090	S	B	110
100	100	100	100	100	100	110	110	C	C	C	C	C
110	110	110	110	090	100	090	090	090	090	130	B	B
100	S	B	B	C	C	C	C	C	B	B	B	B
100	100	100	100	B	090	130	130	B	C	C	C	C
100 23	100 22	100 20	100 22	100 20	100 19	100 21	95 21	90 14	90 15	120 9	105 10	090 8
110 100 10	110 100 10	107 100 7	107 100 7	100 100 -	110 100 10	110 90 20	105 90 15	100 90 10	100 90 10	125 90 35	120 90 30	100 90 10

let in is questionable because of an error in frequency markers
nal frequency parameters have been increased by 1 % since the

2

Characteristic: Type of E_s

IONOSPHERIC DATA

Sweep: 1 Mc to 25 Mc

July 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
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-
7	f	-	-	-	-	f	f	l	l	l	l	l2
8	f2	-	-	-	f	f2	f2	l	l2	-	l	l
9	-	-	f	f	f	f2	f	l2	l	l	h	h
10	f	f	f	f	f	f3	f	l4	l2	l2	l2	l2
11	f2	f	f	-	f2	f2	f	l2	l2	l	l	l
12	-	f	-	-	f6	f4	f2	l	l	l	l	l2
13	-	-	-	-	f	f	f	l	c	c	ch	l
14	f	f	f	f	f	f	f	l	l	l	l	l
15	-	-	-	-	-	-	-	h	h	h	h	l
16	f	f	-	-	f	f	f2	l	l	l2	l3	l2
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-
20	-	f	f3	-	-	-	-	-	-	l	l	l
21	-	-	-	f	-	-	-	-	l	l	l	l
22	-	-	-	-	-	-	-	-	-	l	h	c
23	-	-	-	f2	f2	-	-	l	-	l	l	l
24	f	f	f2	f2	f4	f5	f	l3	f2	h2 l	h l	h l
25	f	-	-	-	-	f2	f2	l	l	l	l	l2
26	-	f	f2	f3	f4	f7	f4	l	l2	l3	l	f2
27	-	-	-	-	-	-	-	l4	l2	l	l3	f2
28	f	f	f	-	-	-	-	-	l	l	l	f2
29	-	-	-	-	-	-	-	-	l4	f2	c	l
30	-	-	-	-	-	-	f	l	c	l	l	l
31	-	-	-	f2	f	f2	-	l5	l	l	l	l
Median	-	-	-	-	-	-	-	-	-	-	-	-
Count	-	-	-	-	-	-	-	-	-	-	-	-
UQ	-	-	-	-	-	-	-	-	-	-	-	-
LQ	-	-	-	-	-	-	-	-	-	-	-	-
QR	-	-	-	-	-	-	-	-	-	-	-	-

ATTENTION. The accuracy of the frequency parameters in this bulletin is of the C-2 sounder from 15 July to 21 September 1964. The original frequency error is estimated to have been approximately 1 Mc.

HERIC DATA
 25 Mc in 0.5 minute
 y 1964

11	12	13	14	15	16	17	18	19	20	21	22	23
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	f	-
f2	f2	f2	l	h	h	h	f	f	f	f	f	f2
l	-	-	l	h2	-	f2	f2	f5	f	-	f	f
h	h	-	l	l	-	l	f8	f7	f8	f6	f	f3
2	f3	l	f2	f2	f2	f3	f	f	f3	f	f2	f
l	l	l	l	l	l	l4	f3	f	f4	f	f	-
f2	f2	f2	f3	f2	f3	f3	f4	f2	f	f	-	-
l	l	l	f2	l	h	f2	f5	f4	f3	f	f	f
l	l	l	l	-	-	-	-	-	-	-	-	-
l	l	l	l	-	l	-	-	-	f	f	-	f3
lc	c	c	l	c	-	h	f	f	f	-	-	-
l	l	l	l	l	l	l3	f	f	-	-	-	-
-	h	l	f2	l	f2	l	f3	-	-	-	-	-
-	h	-	h	h	h	c2	f	f	f	f	-	-
l	c	-	l	-	l	l	f	f	f	-	-	f
c	c	l	l	f3	l6	-	f	f2	f	-	f	-
l	f2	c2	l	c2	c	c	f	-	-	-	-	-
h	l	l	f5	f3	f3	f3	f4	f2	f2	-	-	-
f2	f3	f3	l	l	l	l2	f2	-	-	-	-	-
f2	-	f6	l	l	-	l2	l	-	-	-	f2	-
f2	l	l	l	l	l	l3	f	-	f2	-	-	f2
l	c2	l	l	l	l	f2	f	-	-	-	-	-
l	-	-	-	-	-	l4	f5	f3	f	f	-	-
l	l	l	l	-	l	h	h	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

bulletin is questionable, because of an error in frequency markers
 original frequency parameters have been increased by 1 Mc since the

2

MEDIAN VALUES JULY 1964

Hour Local	fmin (Mc)	f _o F2 (Mc)	M(3000)F2	h'F2 (km)	h'F (km)	f _o F1 (Mc)	M(3000)F1	f _o E (Mc)	f'E* (km)	f _o E _s (Mc)	h'E _s (km)
00	2.2	3.1	3.00	-	310	-	-	-	-	3.2	110
01	2.2	3.1	3.40	-	285	-	-	-	-	3.0	110
02	2.1	2.7	297	-	285	-	-	-	-	3.4	110
03	2.2	-	-	-	250	-	-	-	-	3.5	110
04	1.9	-	-	-	260	-	-	-	-	2.9	110
05	1.5	-	-	-	268	-	-	-	-	4.0	105
06	2.0	3.7	3.40	-	250	-	-	-	2.5	4.5	105
07	2.4	5.2	3.20	-	220	-	-	-	3.0	5.0	105
08	2.7	6.0	2.45	360	210	-	-	-	3.5	4.5	105
09	2.8	6.5	2.60	400	210	4.2	3.90	-	-	4.9	100
10	3.0	6.3	2.30	420	200	4.2	4.00	-	-	4.7	100
11	3.1	6.0	2.30	460	190	4.2	4.10	-	-	6.5	100
12	3.2	6.2	2.33	460	190	4.4	4.20	-	-	4.9	100
13	3.2	6.4	2.38	435	200	4.3	4.20	-	-	4.9	100
14	3.2	6.5	2.45	440	190	4.2	4.20	-	-	5.0	100
15	2.7	6.6	2.60	395	190	4.1	4.10	-	-	5.3	100
16	2.7	7.1	2.70	350	200	4.0	4.00	-	-	4.5	100
17	2.6	8.0	3.00	305	220	-	-	-	-	5.0	100
18	2.5	8.2	3.20	-	240	-	-	-	-	4.0	95
19	2.3	7.3	3.40	-	220	-	-	-	-	4.6	90
20	2.2	6.0	3.40	-	225	-	-	-	-	3.4	90
21	2.4	4.7	3.28	-	260	-	-	-	-	3.7	120
22	2.4	3.7	3.15	-	280	-	-	-	-	3.6	105
23	2.2	3.2	3.10	-	290	-	-	-	-	3.4	90

* Insufficient data for reliable median

IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS
BANGKOK, THAILAND
JULY 1964

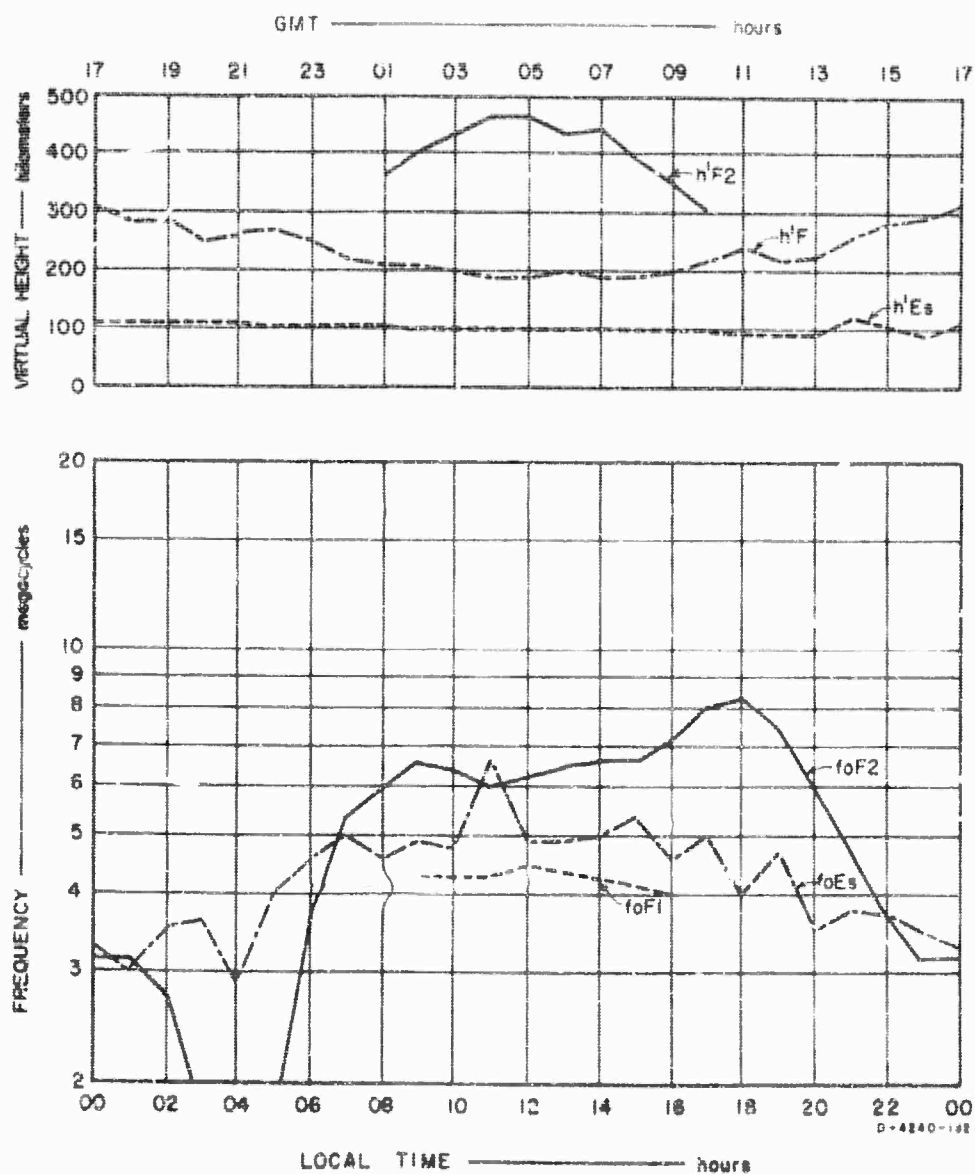


FIG. 1 SUMMARY GRAPHS

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