ION. ANT.—3

IONOSPHERIC DATA AT SYOWA BASE (ANTARCTICA)

February 1960—July 1960

Issued in October 1965

Prepared by

THE RADIO RESEARCH LABORATORIES
MINISTRY OF POSTS AND TELECOMMUNICATIONS

TOKYO, JAPAN

ION. ANT. — 3

IONOSPHERIC DATA AT SYOWA BASE (ANTARCTICA)

February 1960—July 1960

THE RADIO RESEARCH LABORATORIES
TOKYO, JAPAN

CONTENTS

MAIN CHARACTERISTICS OF THE IONOSONDE USED AT SYOWA BASE

Item	Specification
Frequency Range	1–20 Mc/s
Transmitting Power	10 kW (peak value)
Duration of Sweep	30 sec
Transmitted Pulse width	40–120 μsec (variable)
Recurrence Frequency of Transmitted Pulse	50 c/s (by power frequency)
Frequency Scale	Every 1 Mc/s
Height Range	1100 km
Height Scale	Every 100 km
Total Receiver Gain	140 db
Noise Figure	About 9 (at 5 Mc/s)
Time Constant of Differential Circuit	50 μsec
Recording Method	35 mm film running and 16 mm movie picture
Power Supply	100 V AC, 3 kVA
Transmitting Antenna	20 m high vertical delta terminated by 600 Ω
Receiving Antenna	15 m high vertical delta terminated by 600 Ω

SYMBOLS AND TERMINOLOGY

All symbols and terminology in the table of ionospheric data are used in accordance with the First Report of the Special Committee on World-Wide Ionospheric Soundings (URSI/AGI), Brussels, September 2, 1956, and the Second Report of the Committee, May, 1957, supplementary to the First Report.

Terminology

f_0F2, f_0F1, f_0E — The ordinary-wave critical frequency for the $F2$, $F1$ and E layers respectively.

f_0E_s — The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.

f_bE_s — The ordinary wave frequency at which the highest blanketing E_s layer becomes effectively transparent. This is usually determined from the minimum frequency at which reflections from layers at greater heights are observed.

f-min — That frequency below which no echoes are observed.

(M 3000) $F2$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F2$ layer.

(M 3000) $F1$ — The maximum usable frequency factor for a path of 3000 km for transmission by $F1$ layer.

$h'F2$ — The minimum virtual height, $h'F2$, refers to the highest, most stable stratification observed in the F region and can only be scaled when such stratification is present.

$h'F$ — The natural and most significant F region virtual height parameter is that for lowest F region stratification. This will be denoted by $h'F$. Thus $h'F$ is identical with the current $h'F2$ when F region stratification is absent, e. g., at night, and with the current $h'F1$ when $F1$ stratification is present.

$h'E_s$ The lowest virtual height of the trace used to give the f_0E_s.

$hpF2$ The virtual height of the $F2$ layer measured on the ordinary-wave branch at a frequency equal to 0.834 f_0F2.

$ypF2$ The semi-thickness of the $F2$ layer deduced from a parabolic fit to the "nose" of the electron density distribution with height and based on the observed $h'f$ trace. (The difference between $hpF2$ and the virtual height at 0.969 f_0F2).

a. Descriptive Symbols

Used following the numerical value on monthly tabulation sheets.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example E_s.

B Measurement influenced by, or impossible because of, absorption in the vicinity of f-min.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the nomal frequency range. Used in a qualifying sense, see below.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range. Used in a qualifying sense, see below.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced or impossible because the ionization density is too small compared with that of a lower thick layer.

H Measurement influenced by, or impossible because of, the presence of a stratification.

L Measurement influenced by or impossible because the trace has no sufficiently definite cusp between layers.

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

N Conditions are such that the measurement cannot readily be interpreted, for example, in the presence of oblique echoes.

O Measurement refers to the ordinary component.

R Measurement influenced by, or impossible because of, absorption in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Intermittent trace.

Z Third magneto-ionic component present.

b. Qualifying Symbols

Used as a preceeding symbol on monthly tabulation sheets.

D — *greater than.....*

E — *less than.....*

I — Missing value has been replaced by an interpolated value.

J — Ordinary component characteristic deduced from the extraordinary component.

T — Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U — Uncertain or doubtful numerical value.

Z — Measurement deduced from the third magnetoionic component.

c. Description of Standard Types of *E*

The nine standard types of E_s are identified by small (lower case) letters: *l*, *c*, *h*, *q*, *r*, *a*, *s*, *f*, *n*. These letters are suggestive of the names low, cusp, high, equatorial, retardation, auroral, slant, flat and unclassified, respectively; it is strongly emphasized that these names are suggestive, not restrictive. The standard types are:

l — At flat E_s trace at or below the normal *E* layer minimum virtual height. Use in daytime only.

c — An E_s trace showing a relatively symmetrical cusp at or below f_0E. This is usually continuous with the normal *E* trace though, when the deviative absorption is large, part or all of the cusp may be missing. Use in daytime only.

h — An E_s trace showing a discontinuity *in height* with the normal *E* layer trace at or above f_0E. The cusp is not symmetrical, the low frequency end of the E_s trace lying clearly above the high frequency end of the normal *E* trace. Use in daytime only.

q — An E_s trace which is diffuse and non-blanketing over a wide frequency range. The spread is 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 which is non-blanketing 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 at present from true group retardation (a blanketing thich layer included in the *E* layer tables: f_0E, $h'E$) by the lack of group retardation in the *F* traces at corresponding frequencies.

a — An *E* pattern having a well defined flat or gradually rising lower edge with stratified and diffuse (spread) traces present above it. These sometimes exceed over several hundred kilometers of virtual height.

s — A diffuse E_s trace which rises steadily with frequency. This usually emerges from another E_s trace which should be classified separately. At high latitudes the slant trace usually starts to rise from a horizontal E_s trace, *l*, *h* or *f*, and frequencies which greatly exceed the *E* layer critical frequency (e.g. about 6 Mc/s) whereas at low latitudes it usually rises from equatorial type E_s, *q*, at frequencies near the *E* region critical frequency.

f — An E_s trace which shows no appreciable increase of height with

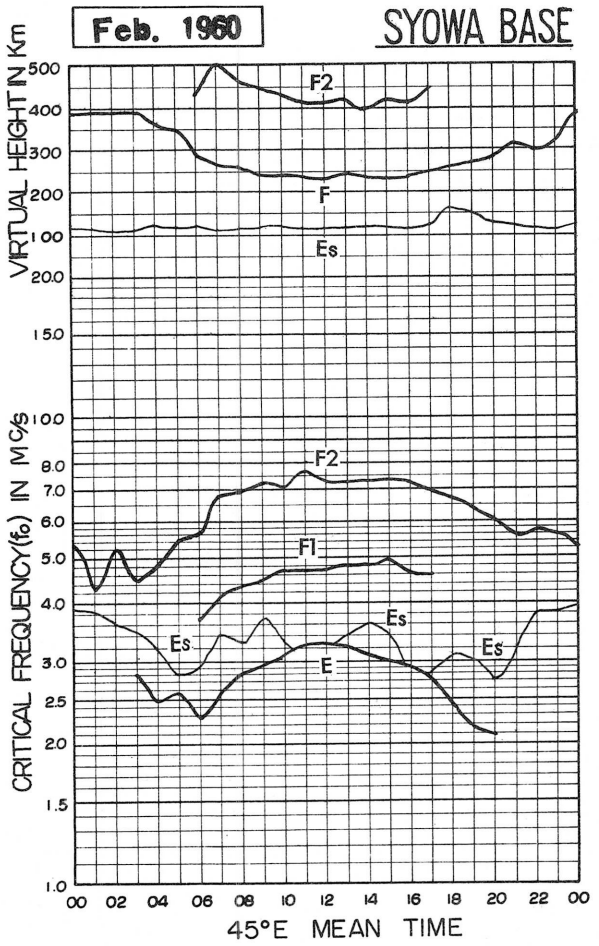
frequency. The trace is usually relatively solid at most latitudes. This classification may only be used at night; apparently flat E_s traces observed in the daytime are classified according to their virtual height: *h* or *l*.

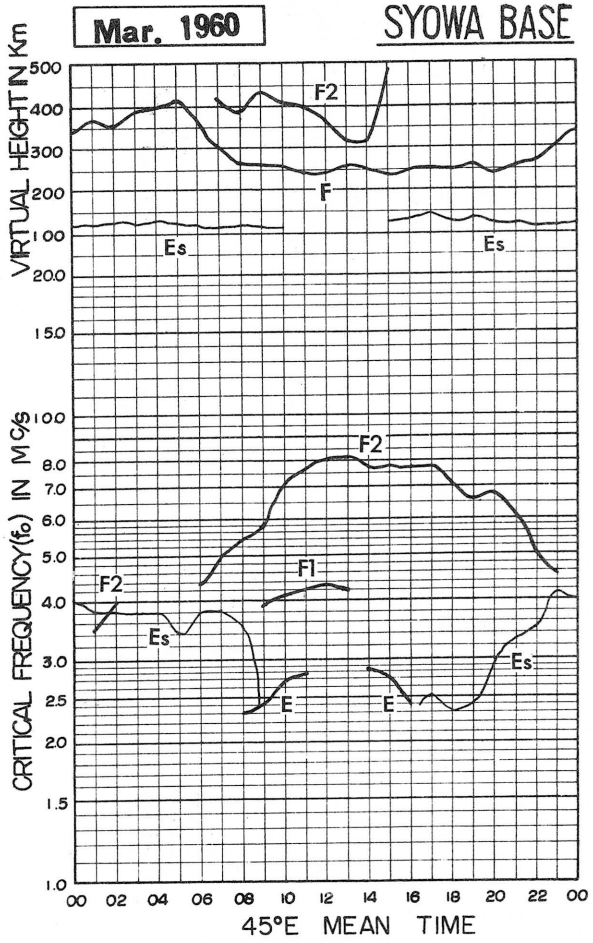
n An *E* trace which cannot be classified into one of the standard types. This must not be used for intermediate cases between any two classes. A choice should always be made whenever possible, even if it is doubtful.

d. Multiple Reflections from E_s

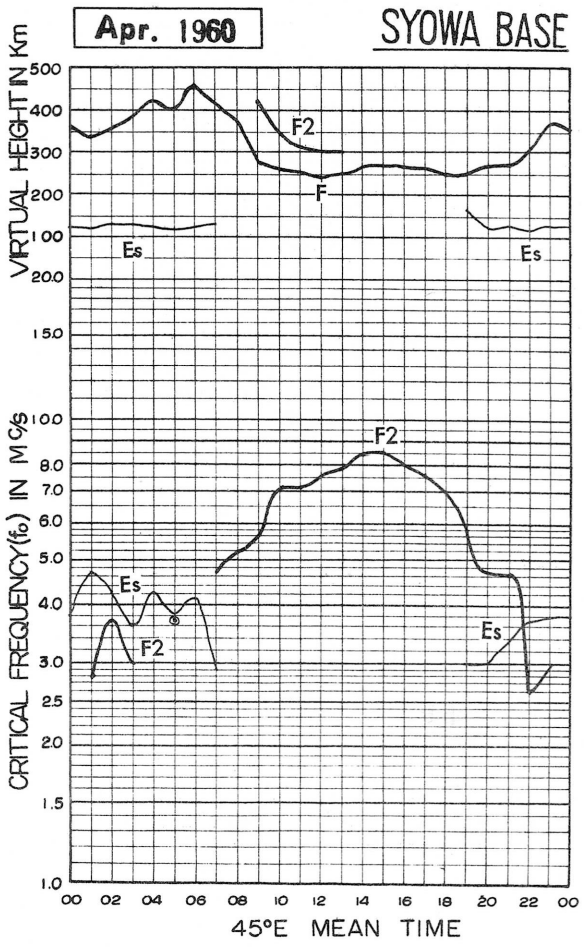
When the ionogram shows the presence of multiple reflections from E_s, the number of traces seen should be recorded after the letter indicating the type.

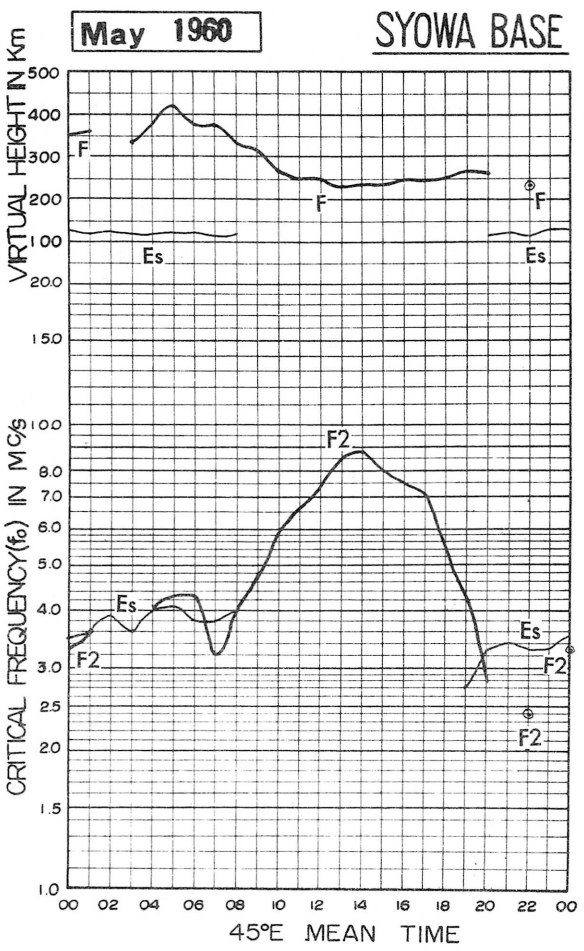
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS



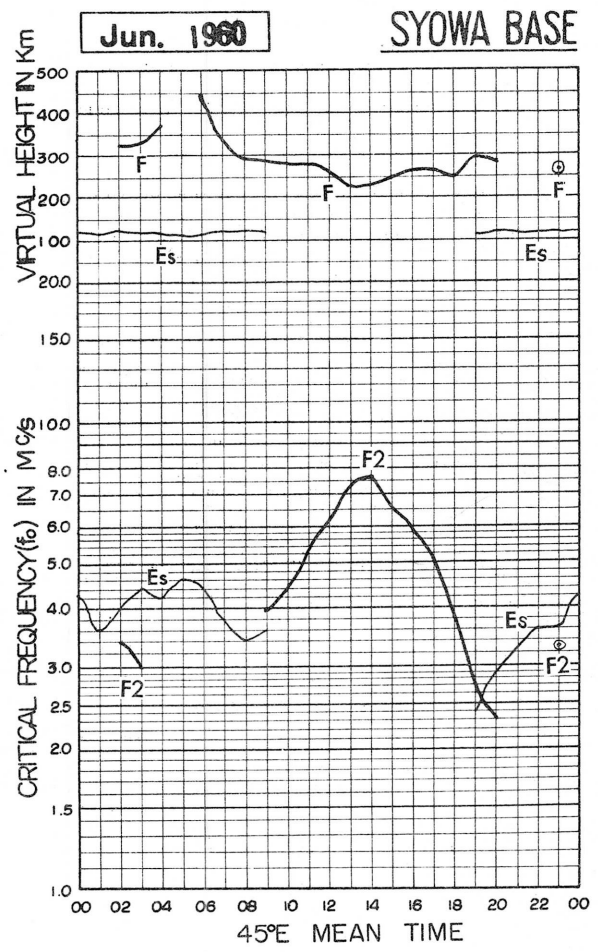


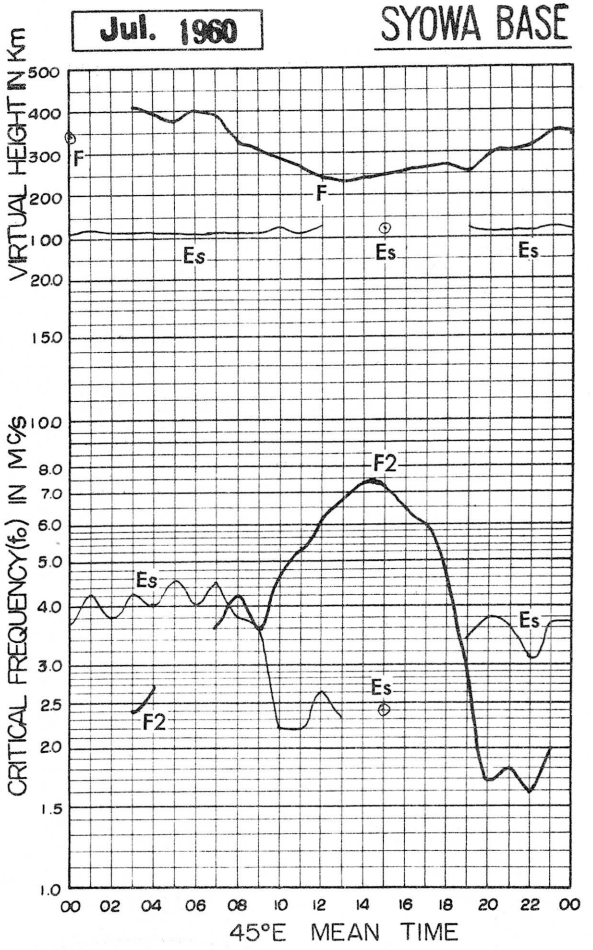
IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA
MONTHLY MEDIAN CHARACTERISTICS





IONOSPHERIC DATA

Feb. 1960 | foF2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	F	C	F	F	F	8.8	9.3	9.1^{F}	9.1^{F}	F	^{J}6.6^{F}	^{U}5.7^{F}	C	5.2	^{U}5.5^{C}
2	5.7	^{J}5.5^{R}	6.1^{C}	^{J}6.4^{R}	C	C	C	F	C	7.6^{F}	F	8.3^{F}	7.7^{F}	7.6^{F}	7.8	7.6^{F}	7.6^{F}	8.0^{F}	6.8^{F}	6.2^{F}	F	F	F	F
3	^{D}6.3^{C}	F	F	C	F	C	^{J}6.4^{F}	C	5.1	C	F	5.7^{F}	5.5^{F}	5.9	6.3	6.1^{F}	C	6.4^{F}	5.2^{F}	C	3.6	3.7	C	C
4	C	C	C	C	C	C	C	C	F	C	C	C	B	5.4	B	5.6^{F}	5.9	6.2	6.3	6.3^{F}	5.8^{F}	^{U}4.2^{FH}	RF	S
5	A	^{U}3.7^{F}	R	F	F	F	^{U}5.1^{F}	5.4	F	6.5	6.6^{F}	6.3	6.3	6.3	6.4	6.7	F	6.3	^{U}4.5^{F}	S	^{U}5.3^{FR}	5.2	4.6^{FR}	FR
6	FA	A	A	FR	FR	FR	F	A	R	R	R	S	B	R	R	5.3	^{J}5.7^{F}	5.7	5.4^{R}	5.0^{F}	F	F	^{J}4.5^{R}	4.3^{FR}
7	4.2^{R}	F	5.1^{F}	F	F	F	F	5.4	F	F	^{U}6.7^{F}	^{J}6.8^{F}	6.7^{F}	6.9^{F}	6.6	6.5	6.0^{F}	6.1^{F}	^{U}6.1^{SR}	5.9^{F}	6.1^{F}	6.2^{S}	5.7^{S}	5.4^{S}
8	^{J}5.4^{FR}	^{J}4.9^{FR}	F	5.0	F	F	F	F	9.0	9.4	9.8	9.6	9.2^{F}	9.2^{F}	F	7.9^{F}	^{J}8.3^{F}	7.9^{F}	6.8	6.5^{F}	F	F	5.2^{F}	F
9	4.3	4.6^{F}	F	F	R	R	5.1^{R}	6.1	^{J}6.5^{F}	7.3^{F}	7.6^{F}	C	7.4	7.2^{F}	7.2	7.2	7.2^{F}	7.0	6.6^{F}	6.4^{S}	6.6	6.6	6.6	6.4^{F}
10	^{J}6.5^{F}	F	F	F	F	F	^{J}6.4^{F}	6.9	^{J}8.2^{F}	6.8^{F}	7.1	F	F	7.9^{F}	7.5^{F}	7.5	7.6	7.5	6.7	6.7	6.4^{F}	6.3	6.0	5.6^{F}
11	5.3^{F}	5.3	F	F	5.2	F	F	8.1^{F}	8.5	8.7^{F}	9.0	8.7	8.7	8.7	8.0	7.3	7.2	6.8	6.8	6.5	6.2	4.3	4.3	F
12	R	F	F	F	F	F	F	F	6.7^{F}	7.1^{F}	6.7	7.0^{F}	7.3^{F}	7.4^{F}	7.4	7.5^{F}	7.2^{F}	6.7	6.7	6.4	6.3	^{D}5.9^{S}	5.9	5.7^{F}
13	5.7	F	5.8	F	F	F	8.2^{F}	8.8	^{U}9.0^{F}	9.6	F	10.9	11.0	10.7	C	C	C	C	C	C	C	C	C	B
14	F	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	5.8	F	R	A
15	B	R	R	F	F	F	F	6.4	^{U}6.5^{F}	6.6^{F}	6.7	6.6	6.6	6.5	6.2	6.3	6.0	5.8^{F}	F	5.0	F	3.8	A	A
16	3.7	3.6	3.7	F	^{J}4.9^{F}	B	B	5.3^{F}	5.5^{F}	F	5.7	6.0^{F}	5.7^{F}	6.0	6.6	6.4	6.2^{F}	5.8^{F}	5.8	5.4	4.4	4.7^{M}	3.9	F
17	A	^{J}3.7^{F}	A	F	5.0	F	F	F	F	7.2	F	B	B	6.4^{F}	6.1^{F}	F	6.5^{F}	6.3	F	5.5^{F}	5.3	A	A	A
18	F	A	A	R	A	F	B	A	G	G	A	R	5.1	F	F	F	6.4^{F}	^{P}5.8^{S}	5.3^{F}	5.1^{F}	F	3.7^{F}	A	A
19	F	F	F	^{U}4.5^{F}	F	^{U}5.6^{F}	F	F	F	^{U}6.2^{F}	6.4^{F}	F	7.0^{F}	6.8	F	8.2	8.3	8.0	6.9^{F}	FH	F	R	F	A
20	R	F	F	A	4.2	B	F	F	F	4.6	4.9	SR	F	^{U}6.6^{F}	^{J}7.3^{F}	F	^{U}7.1^{F}	6.3	6.3	5.4	F	R	F	F
21	A	3.0^{F}	A	A	F	^{D}4.7^{F}	R	F	5.4^{F}	^{D}5.4^{F}	B	6.2	^{U}6.9^{F}	C	C	C	C	7.6^{F}	^{J}6.5^{F}	4.9	F	^{D}3.5^{S}	F	R
22	^{U}2.4^{F}	F	F	^{U}4.0^{R}	R	6.1	F	F	F	8.2^{F}	8.2^{F}	8.5	7.7^{F}	7.9	7.7	7.7	7.8	7.5	7.2	6.8	6.4^{F}	6.3	5.8	R
23	A	^{U}5.1^{F}	^{U}5.4^{F}	F	F	F	F	6.8^{F}	^{J}7.1^{F}	7.2^{F}	7.9^{F}	F	F	F	^{U}7.4^{F}	6.9	7.0	7.0	7.0	7.1	F	2.9^{F}	3.9^{F}	3.9^{F}
24	^{U}3.2^{F}	A	3.5^{F}	F	^{U}3.8^{F}	4.8	5.7^{F}	F	F	F	F	C	F	7.2^{F}	^{J}7.2^{SR}	7.0^{F}	6.7^{F}	6.3^{F}	6.1	5.9^{S}	5.8	5.9^{S}	^{J}5.8^{F}	^{U}5.6^{S}
25	F	F	F	4.2^{F}	4.6	F	F	C	F	8.2^{F}	8.7^{F}	9.3^{F}	9.3	8.9	8.3	^{U}8.2^{F}	8.4^{F}	8.0^{F}	^{U}7.4^{S}	6.8^{F}	6.7^{S}	6.7^{S}	^{U}6.1^{F}	F
26	F	^{U}4.0^{F}	F	F	F	F	F	8.5	9.3^{F}	9.7^{F}	10.1	9.7	9.5	9.1	8.8	8.0	8.2	7.4^{S}	7.1^{S}	7.3	7.0^{S}	F	F	F
27	F	S	F	F	F	F	5.4^{F}	F	F	A	B	5.7^{F}	^{U}5.7^{F}	^{U}6.6^{F}	7.0	7.3^{F}	8.2	8.1	8.0^{F}	F	F	F	F	F
28	^{J}4.4^{FR}	F	F	A	5.0^{F}	F	F	F	7.4^{F}	7.8^{F}	8.2^{F}	8.1^{F}	8.2^{F}	8.1^{F}	7.9	7.7	7.3	6.9	6.8	6.6^{S}	6.3^{S}	6.0^{S}	6.0^{S}	5.7^{SF}
29	^{J}5.5^{FR}	F	F	F	A	^{J}5.4^{FR}	^{U}5.3^{F}	F	F	6.3^{R}	^{U}5.5^{F}	F	5.8^{F}	6.1^{F}	6.6	^{U}7.0^{C}	7.0	7.1	7.2^{S}	7.6^{S}	F	F	R	A
30																								
31																								
No.	13	10	6	5	7	5	8	10	14	20	17	16	20	23	21	23	24	27	24	23	17	17	15	9
Median	5.3^{F}	4.3^{F}	5.2^{F}	4.5	4.9	5.5^{F}	5.6^{F}	6.8	6.9^{F}	7.2^{F}	7.1^{F}	7.6^{F}	7.2^{F}	7.2^{F}	7.3	7.3	7.2^{F}	6.9	6.7	6.4	6.1	^{U}5.6	5.7	5.6^{F}
U.Q.	5.7	5.1	5.8	5.7	5.0	5.8	6.4	8.1	8.5	8.2	8.4	9.0	9.0	8.1	7.8	7.7	8.0	7.6	7.0	6.7	6.4	6.2	6.0	5.7
L.Q.	4.0	3.7	3.7	4.1	4.2	4.8	5.2	5.4	5.5	6.5	6.5	6.2	6.0	6.4	6.6	6.5	6.4	6.3	6.1	5.4	5.5	4.0	4.5	4.8
Q.R.	1.7	1.4	2.1	1.6	0.8	1.0	1.2	2.7	3.0	1.7	1.9	2.8	3.0	1.7	1.2	1.2	1.6	1.3	0.9	1.3	0.9	2.2	1.5	0.9

foF2 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

6

IONOSPHERIC DATA

Feb. 1960 | foF1 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C			C	L	C	C	U4.7C	C	5.1F	U5.1C	5.1H	5.1H	5.2C	5.0	5.2	5.2	L	L	L				
2					C	C	C	5.4	C	4.8	5.2F	5.2	5.3F	5.2	LH	5.5	L	L	L	L	3.3			
3						C	U3.9F	C	A	4.5	4.9	4.8	4.8	4.8	4.8	4.9F	4.7	4.9	L	C	3.4			
4						C	C	C	B	C	C	C	B	4.8	B	4.9	4.6	4.7F	L	L				
5					B	F	3.6	4.3	4.6	4.7	4.7	4.7	4.7	4.8	4.7H	4.7R	4.8F	4.5	3.9	S				
6							B	A	R	A	R	S	B	4.6	4.7	4.5H	4.4F	4.6	L	L				
7							4.1F	4.3	4.5	4.7	4.7	4.8	4.8	5.0	4.9	L	L	L	L					
8					L	L	4.1L	L	4.6	4.6	4.7L	5.0L	5.0LH	5.1L	L	5.1F	L	L	L					
9						A	B	4.1	4.1	4.4	4.7	4.8H	LH	4.9L	A	4.8	L	L						
10						U4.1F	F	4.1	U4.4F	4.5	4.5	U4.7F	5.0H	5.0	L	5.0	L	L	L					
11						R	L	U4.2F	4.5	L	4.7L	4.9	4.9	L	L	L	L	A						
12					L	A	3.6	U3.9F	4.4H	4.3	4.4H	4.6	4.6	4.8L	4.9L	5.0	L	L	L					
13							L	L	L	L	5.1L	L	A	L	C	C	C	C	C	C	C			
14					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
15							3.5F	3.9F	4.2	4.3	4.3H	4.5	4.6	4.6L	L	4.4	4.4	L	4.0F					
16						B	B	A	R	A	4.3	4.6	4.6	4.7H	L	L	L	4.3	3.9					
17							3.7	3.8	F	4.2	B	B	B	4.5	4.4	L	4.4	L	L					
18							B	A	U4.1R	4.1	A	4.2	4.4	4.2F	4.4	4.3	L	L						
19						3.5F	A	3.9	4.1	4.2	4.4F	4.4	4.6	4.4	L	4.6	L	L	B					
20						B	B	3.6	R	A	B	S	4.4	B	L	L	L	L	L	L				
21							B	3.7	B	U4.3F	B	B	4.5	C	C	C	C	L	L	L				
22							B	4.0	LF	L	4.4	4.6L	L	L	L	L	L	L						
23							A	L	4.3	4.5	4.6	4.7L	L	L	L	L	L	LH						
24							L	4.1	4.3	4.6	L	C	4.7	L	L	L		L						
25							L	C	L	LH	L	L	L	L	L	L	L							
26							L	L	L	L	L	L	L	LH	L	L	L							
27							F	F	B	B	B	L	L	L	L	L		L						
28								L	4.2	4.4H	L	4.7	L	L	L	L	L							
29							B	L	4.0	A	4.4	4.9L	4.9H	L	L	L	L		L					
30																								
31																								
No.						2	7	15	14	17	17	18	17	16	8	13	7	5	3		2			
Median						3.8F	3.7	4.1	4.3	4.5	4.7	4.7	4.7	4.8	4.8	4.9	4.6	4.6	3.9		3.4			
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 2

10

IONOSPHERIC DATA

Feb. 1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	3.00	2.60	C	A	C	C	3.10	A	A	A	3.55	3.45	R	B	B	R	2.85	3.00	2.60	2.10	A	3.00H	2.70
2	2.80	2.50	3.00	2.80	A	A	3.00	R	3.35	B	B	3.40R	3.50R	3.50	3.10R	A	3.10R	3.20	2.90	2.65	B	A		
3				C	3.10R	2.90	A	A	A	A	3.70	R	3.60	B	B	3.20R	3.35	3.20	2.90	3.20R	2.60R	3.35	3.45	
4				3.65	2.80R	C	A	A	B	B	C	C	B	B	B	U3.40R	B	3.20	2.85	R	2.30	A		
5				1.85	B	2.50	R	A	3.90	3.25	R	R	B	B	3.50	B	R	B	R	S	3.40	A		2.20
6	2.60			B	B	2.60H	B	B	B	A	R	S	B	B	B	B	3.15	B	B	2.40	A			
7		U2.70R	3.10	A	A	A	2.30	A	B	B	B	B	R	R	B	3.35R	B	2.70	A	B	B	B		
8				B	2.30	A	2.30	2.60	U2.85R	3.10	3.40	S	3.35	A	B	2.70	3.00	3.00	B	U2.40R	B	B		
9				A	B	A	B	A	A	2.85	3.10	3.25	3.30	3.30	R	3.40H	3.10	B	2.30	A	2.20	1.60		R
10				B	B	B	2.60	2.60	R	B	B	B	B	3.40	3.35	3.20	2.80	2.80	2.50	2.40	B			
11				B	B	R	R	R	B	3.00	3.15	3.10	R	3.00	2.60	R	A	A	A	2.05	1.60	B		3.35
12	4.30	3.30	3.25	B	A	A	A	2.70R	3.35	3.10	3.05	2.85	2.85	U3.10R	2.85	A	3.00	2.85	2.65	B	2.10	B		
13				E	A	A	2.50	B	2.85	B	B	3.20	3.15	3.00	C	C	C	C	C	C	C	C	C	
14			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	B		
15				3.00	2.50	A	1.90	A	2.70	3.00	3.00	3.20	3.20	U3.15R	3.05	2.80	2.80	2.65	A	2.10	A	A		
16				B	B	B	B	A	A	A	A	U3.30R	U3.30R	3.20	3.15	2.95	2.50	2.70	2.30	2.65	2.35	1.90		
17				B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	2.55	2.15	A	B		
18				B	B	2.00	B	B	B	A	A	B	B	B	B	B	B	2.40	B	1.90	1.60	A		
19				B	B	A	A	A	A	B	A	B	B	B	B	B	B	B	B	1.85	B	A		
20				B	B	B	A	B	R	A	B	S	B	B	B	B	B	B	B	B	A	B		
21				B	A	A	B	B	B	A	B	B	B	C	C	C	C	2.70	B	B	B	B		
22				B	B	B	B	2.40R	R	2.90	3.00	B	B	R	R	U3.00R	B	B	B	B	1.70R	B		
23				B	B	B	B	3.15	2.60	B	B	B	3.10	B	2.80	R	2.85	B	2.40	B	B	B		
24	1.80			A	A	2.55	A	A	B	B	B	C	U3.00R	2.80	S	2.90R	2.90	R	A	A	A	A		
25				B	B	B	A	C	2.65	2.85	B	B	B	B	R	2.65	2.85	A	B	B	R	B		
26				A	2.10	R	2.00	2.40	2.65	2.80	3.00	3.10	R	3.25	3.10	A	A	2.60H	2.35	1.90	B	B		
27				B	A	A	A	A	B	B	B	B	3.25	B	3.15	3.00	R	2.60	2.30	A	A	A		
28				B	B	A	A	2.35	2.40H	2.85	3.00	3.10	R	R	3.00	2.65	2.80	2.60	2.30	2.00	1.60R	A		
29				A	B	A	B	A	A	B	B	B	3.20	R	B	B	R	2.55	U2.30R	2.10H	B	A		
30																								
31																								
No.	4	4	4	5	5	5	7	8	10	10	9	10	13	10	11	13	13	16	14	15	11	3	2	3
Median	2.70	2.85	3.05	2.80	2.50	2.55	2.30	2.60	2.80	2.95	3.05	3.20	3.25	3.20	3.10	3.00	2.90	2.70	2.45	2.15	2.10	1.90	3.20	2.70
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 3

IONOSPHERIC DATA

Feb. 1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	G	G	C	2.9	C	C	G	J4.4	3.9	3.8	G	G	G	B	B	G	3.6	4.1	3.6	3.3	J3.6	G	G
2	G	G	G	G	J3.1	J3.8	G	G	G	4.8	B	G	4.0	J5.5	3.6	J3.6	3.4	G	3.2	3.0	J5.4	J6.1	J9.0	J7.1
3	J8.6	J9.3	J8.4	C	G	G	J4.6	5.2	4.5	4.8	G	G	G	4.3	3.7	G	G	3.7	3.2	G	G	G	4.0	J4.6
4	J6.4	J6.9	C	G	G	C	J4.3	4.3	B	4.4	C	C	B	B	B	G	B	3.6	3.2	3.3	2.9	3.2	J6.9	S
5	4.9	3.5	3.9	2.2	B	G	G	4.3	4.6	G	G	G	B	B	G	B	3.5	B	3.9	S	3.8	J4.1	J4.7	J5.3
6	J4.3	J8.0	5.1	J4.7	J8.5	3.3	4.7	J5.1	3.6	J4.7	G	S	B	B	B	B	G	B	B	3.0	J4.1	3.4	J4.0	3.6
7	3.2	J4.7	J4.0	2.7	J7.2	2.7	3.3	J4.2	J3.7	B	B	B	G	G	B	3.6	3.9	J8.1	J4.9	B	3.3	J6.4	3.8	3.1
8	J2.4	J2.9	J3.0	2.8	G	2.8	2.9	2.8	3.1	G	G	S	G	3.4	B	3.4	G	J5.2	J7.6	J8.1	2.7	3.8	J4.5	4.2
9	3.6	4.3	J3.2	2.2	J6.3	5.1	B	J4.4	J3.3	3.3	3.6	3.4	G	4.3	J5.2	4.6	4.0	3.3	3.3	3.2	G	1.8	B	G
10	B	2.3	3.1	J3.7	3.3	2.5	G	J3.8	G	B	B	B	B	3.6	3.6	3.4	3.6	3.1	G	3.1	J2.7	1.9	1.6	1.6
11	1.9	2.7	3.3	2.6	2.5	G	G	G	B	3.5	J5.9	J12.4	J5.9	J5.8	J10.2	J4.8	J6.5	J8.9	J3.8	2.4	G	2.6	J4.7	3.9
12	4.6	3.9	G	2.6	2.0	4.3	3.4	G	G	G	3.3	J4.2	3.4	4.9	J4.8	J4.5	2.5G	2.3G	2.3G	B	G	B	B	B
13	B	J2.8	2.8	2.5	2.4	2.8	G	B	G	3.2	3.6	J4.6	J5.9	5.5	C	C	C	C	C	C	C	C	C	J8.7
14	J5.3	J10.0	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	J4.2	J5.1	J6.8	J4.7
15	B	4.7	J4.6	3.5	3.2	J3.0	2.7	4.4	G	G	G	G	G	3.9	J5.2	3.4	3.1	G	3.1	2.6	J3.2	J3.5	J3.7	4.0
16	4.1	J3.9	B	J6.0	J3.8	B	B	J4.2	4.6	J4.7	4.2	G	G	3.4	3.6	5.5	J4.0	G	2.8	3.2	G	G	2.2	3.8
17	J4.7	J5.2	J6.0	J4.7	J7.0	3.6	J4.4	4.3	45Y	J4.6	B	B	B	B	B	B	B	B	2.8	J3.4	2.1	J7.9	J3.3	J4.1
18	2.7	J4.3	4.4	3.4	J4.7	3.2	B	J4.8	4.6	4.8	J4.5	B	B	B	B	B	B	2.6	B	J3.5	J3.4	3.4	J4.7	4.0
19	3.9	J3.7	4.0	J4.2	3.4	2.7	J4.3	2.9	J4.1	4.5	3.7	B	B	B	B	B	B	B	B	2.9	J3.1	2.9	J8.9	J4.7
20	4.8	2.8	J4.2	J5.5	B	B	4.2	3.4	G	J4.5	B	S	B	B	B	B	B	B	B	2.6	2.2	B	2.6	2.6
21	J3.8	5.2	J5.1	J5.2	2.4	3.3	B	B	B	3.3	B	B	B	C	C	C	C	2.9	2.8	2.4	3.2	B	2.0	3.5
22	2.3	3.6	2.8	B	J4.2	4.6	B	G	G	G	G	B	B	G	3.3	G	B	B	B	B	G	B	B	J3.8
23	J7.8	4.6M	3.4	3.6M	J5.0	B	4.4M	3.6	3.4	B	B	B	G	B	G	G	G	B	2.6	B	2.7	B	1.7	1.9
24	2.4	J3.8	2.9	2.6	2.6	G	2.6H	3.3	B	B	B	C	G	3.2	S	G	G	3.0	J3.7	2.4M	2.2M	2.6	1.8M	1.3M
25	2.5	2.0	2.3	2.6	B	J3.4	3.0	C	G	G	B	B	B	B	G	3.2	G	2.7	B	B	G	G	B	1.4M
26	2.8	J4.8	4.0	3.6	2.6	G	G	G	G	G	G	G	G	G	2.6G	J4.4	J2.9	1.7G	G	G	B	B	B	1.6M
27	J3.0	3.3	J5.3	5.1	2.5M	2.6M	2.7	3.1	B	J6.7	B	B	3.6	B	G	G	G	G	2.6	3.0M	J7.2	3.0	J3.4	3.6
28	J4.2	J2.5	4.8	J5.4	J4.0	2.6	2.7	G	G	G	G	G	G	G	3.2	2.8	G	G	G	G	G	1.4	B	J4.3
29	J4.7	3.2M	3.3M	J4.7	J11.0	2.6	B	J3.4	3.6M	5.6M	3.8	4.0	G	G	B	B	G	G	G	G	2.4	J3.1	3.0	J4.0
30																								
31																								
No.	25	29	26	25	25	23	21	25	23	24	17	13	17	17	15	18	20	20	21	21	27	22	22	27
Median	3.9	3.8	3.6	3.5	3.2	2.8	2.9	3.4	3.3	3.7	3.3	G	G	3.4	3.6	3.4	G	2.8	3.1	3.0	2.7	3.2	3.8	3.8
U.Q.	4.8	4.8	4.6	4.7	4.8	3.4	4.3	4.3	4.4	4.8	3.8	4.1	3.5	4.6	4.8	4.4	3.6	3.6	3.5	3.2	3.3	3.8	4.7	4.3
L.Q.	2.6	2.8	2.9	2.6	2.4	2.5	G	G	G	G	G	G	G	G	G	G	G	G	2.4	2.4	G	1.9	2.2	1.9
Q.R.	2.2	2.0	1.7	2.1	2.4	0.9													1.1	0.8		1.9	2.5	2.4

The Radio Research Laboratories, Japan

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 4

IONOSPHERIC DATA

Feb. 1960 | f-min | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	1.30	1.20	C	1.45	C	C	1.85	2.00	1.60	2.70	1.90	1.85	2.40	4.50	3.65	2.20	2.10	2.20	1.50	1.80	1.35	1.35	1.20
2	1.20	1.20	1.30	1.45	1.40	1.65	1.80	2.20	1.70	3.40	2.30	1.90	1.70	2.00	1.90	1.80	2.10	1.40	1.40	1.40	1.70	1.30	1.20	1.30
3	1.40	1.30	1.40	C	1.55	1.30	1.30	1.35	1.70	2.00	2.15	3.00	3.20	3.60	3.50	2.45	1.80	1.65	2.40	1.80	1.50	2.00	1.90	2.80
4	1.40	1.40	C	2.65	1.50	C	2.00	2.00	4.20	3.40	C	C	B	4.50	B	2.50	3.50	2.20	1.75	2.40	1.50	1.40	1.40	S
5	1.40	1.20	3.55	E	3.20	1.60	2.00	2.25	2.00	1.70	2.10	3.20	3.70	3.70	2.25	3.35	2.40	3.20	1.70	S	1.45	1.20	1.35	E
6	E	2.60	3.10	1.95	2.60	1.40	3.60	3.40	3.20	2.80	2.00	S	B	4.10	3.70	3.50	1.85	3.35	2.75	1.75	1.50	1.55	1.40	1.20
7	E	1.40	2.25	1.30	1.50	1.75	1.60	2.10	2.85	3.80	4.05	3.50	2.40	3.00	3.55	2.50	3.30	1.90	2.10	2.45	1.80	1.50	1.15	E
8	E	E	1.20	2.10	1.50	1.90	1.60	1.70	1.90	1.95	2.25	E 4.65 S	2.40	3.15	3.40	2.00	2.20	2.10	3.50	2.10	2.10	1.40	1.80	2.20
9	2.40	1.80	E	1.10	1.60	1.60	4.60	2.30	2.00	1.85	1.90	1.90	1.60	1.95	1.85	1.50	1.65	2.60	1.30	1.40	1.40	1.30	1.40	1.40
10	1.25	E	1.25	1.45	1.40	1.50	1.50	1.90	1.95	4.30	3.60	3.45	3.50	1.90	2.00	1.70	1.40	1.70	1.60	2.10	2.00	1.50	1.30	E
11	1.20	1.30	1.30	1.85	2.00	1.90	2.30	2.10	3.40	2.35	2.20	1.60	1.80	1.95	2.00	1.85	1.80	1.40	1.40	1.40	1.30	2.15	1.60	1.80
12	3.30	2.50	1.80	1.40	E	2.20	2.00	1.70	2.10	1.50	1.60	1.70	2.05	2.00	1.95	2.20	1.80	1.55	1.45	2.50	1.50	2.40	1.50	1.50
13	1.55	1.30	1.30	E	1.90	1.85	2.00	2.70	2.00	3.10	3.30	1.90	1.95	1.80	C	C	C	C	C	C	C	C	C	4.00
14	2.00	1.90	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.40	1.70	1.20	2.00
15	B	2.00	2.90	1.85	1.85	1.70	1.50	1.90	1.40	1.90	1.80	1.85	1.80	2.10	1.80	1.70	1.80	1.45	1.35	1.75	1.30	1.25	1.90	3.00
16	1.50	1.35	3.25	1.50	1.50	B	B	1.80	1.85	1.85	2.00	2.30	1.90	2.00	2.00	1.80	1.60	1.35	1.35	2.00	1.85	1.30	1.30	E
17	E	E	3.00	2.10	1.80	2.30	1.80	2.20	3.60	3.20	4.35	B	B	3.50	3.20	3.70	2.85	3.00	1.50	1.50	1.50	1.80	1.45	1.40
18	1.55	1.55	2.60	1.55	3.40	1.50	B	3.20	3.65	2.15	2.10	3.80	3.70	3.30	3.30	3.20	3.50	2.20	2.70	1.60	E	E	1.40	1.80
19	1.60	2.00	E	1.50	1.90	1.50	1.80	1.90	2.05	3.20	2.45	3.60	3.50	4.10	3.60	3.35	3.80	3.20	4.10	1.35	1.60	E	E	1.80
20	3.90	1.80	1.70	3.75	3.60	B	2.55	2.30	2.10	3.10	4.60	E 4.60 S	3.35	5.20	3.85	3.30	3.35	3.00	3.30	2.00	1.60	2.60	1.50	E
21	1.80	E	2.00	1.90	E	1.70	4.70	3.40	4.70	2.40	B	4.60	4.10	C	C	C	C	2.15	2.40	2.00	1.85	2.00	E	E
22	E	1.50	1.80	3.35	3.30	2.70	3.90	1.85	1.85	2.00	2.35	3.30	3.30	2.85	2.00	2.45	3.10	3.40	3.10	2.30	1.60	1.80	1.60	1.40
23	E	2.10	2.60	1.30	3.40	3.30	2.40	1.90	1.50	3.60	3.50	3.40	2.75	3.30	2.15	2.45	2.00	2.80	2.15	2.40	1.80	1.65	E	E
24	E	1.15	E	E	E	1.60	1.50	1.90	3.50	3.60	3.25	C	1.85	2.10	E 3.80 S	1.90	1.65	1.90	1.65	1.30	1.40	1.15	1.20	E
25	E	1.20	1.10	1.20	3.70	2.10	1.70	C	1.70	1.30	3.30	3.30	3.65	4.00	2.60	1.80	1.60	1.30	2.50	2.10	1.40	1.40	E	E
26	1.40	1.60	1.40	E	1.40	1.30	1.40	1.30	E	1.50	1.55	2.10	1.85	2.15	1.65	1.40	1.30	1.45	1.80	1.60	1.80	1.55	1.30	E
27	E	E	E	1.40	1.40	1.65	1.90	2.25	4.30	4.40	B	3.65	2.80	3.30	1.60	2.00	2.00	E	1.70	1.50	E	E	E	E
28	E	1.70	1.90	1.65	1.65	1.35	1.40	1.70	E	1.85	1.45	2.00	2.35	2.60	2.10	1.90	1.80	1.80	1.50	1.70	1.40	E	E	E
29	E	1.35	1.10	1.20	3.70	1.50	4.00	1.80	2.00	4.30	3.30	2.80	2.00	1.80	3.35	3.05	2.15	1.85	1.50	1.50	2.00	1.10	E	1.35
30																								
31																								
No.	28	29	27	26	28	26	27	27	28	28	27	25	28	27	26	26	26	27	27	26	28	28	28	28
Median	1.30	1.35	1.40	1.40	1.60	1.70	2.00	1.90	2.00	2.40	2.35	U 3.00	2.80	2.85	2.30	2.30	2.00	1.90	1.75	1.75	1.50	1.40	1.30	1.25
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 5

IONOSPHERIC DATA

Feb. 1960 | h'F2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C			C	380	C	C	C	C	420	485	480	440	460	480	435	420	L	L	L				
2					C	C	460	500	C	490	460	420	475	480	470	480	L	L	L	L	690			
3						C	430	C	640	C	600	600	690	600	500	580	C	470	L	C	L			
4						C	C	C	680	C	C	C	B	675	B	600	510	420	L	L				
5					430F	F	565	695	535	500	495	505	565	510	590	570	500	515	650	S				
6							F	A	R	R	R	S	B	R	R	595	550	550	L	L				
7							515	610	575	500	480	500	480	420	440	410	L	L	L					
8					L	L	420	385	405	400	400	380	370	380	380	460	400	L	L					
9						500	B	500	480	450	425	460C	430	420	400	390	L	L						
10						F	490F	F	500F	455	470	410	390	380	L	420	L	L	L					
11						420F	415	410	400	390	370	395	390	370	370	L	L	L						
12					L	535	F	510F	460	415	450	450	415	415	415	370	L	L	L					
13							L	360	360	L	385	360	320	370	C	C	c	c	c	c	c			
14					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
15							490	475	430	450	410	400	395	360	400	335	390	L	480F					
16						B	B	510	540	610	510	400	490	475	425	L	L	425	445					
17							460	510	480	460	435	B	B	400	360	L	390	380	L					
18							B	A	B	G	A	R	500	460	435	435	410	L						
19						460F	425F	380	470	490	460	460	415	435	L	390	L	L	290					
20						B	450	550	F	700	625	520	485	480	400	340	355	L	L	L				
21							550	600	560	495	B	520	380	C	C	C	C	L	L	L				
22							435	400	370	360	380	365	L	325	335	360	L	L						
23							400	410	420	430	400	370	L	360	L	290	L	L						
24							400	400	410	400F	365	C	350	L	L	L		L						
25							350	C	L	L	370	325	315	L	L	L	L							
26							L	L	L	335	320	L	330	325	335	L	L							
27							390	505F	B	A	B	L	L	L	L	L		L						
28								L	400	395	365	375	330	350	L	L	L							
29							380	L	400	A	550	L	470	L	400	L	L		L					
30																								
31																								
No.					2	4	18	18	20	21	23	20	22	22	17	17	9	6	4		1			
Median					405F	480F	430	500	465	450	435	415	415	420	400	420	410	450	410		690			
U.Q.																								
L.Q.																								
Q.R.																								

h'F2

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

IONOSPHERIC DATA

Feb. 1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	390	360	C	365	C	C	230	C	230	220	200H	200H	220	E 300B	250	265	270	285	280	295	310	360	320
2	290	290	295	330	C	C	280	220	C	260	235	230	220	260	220H	240	220	250	260	280	E 470A	490	390	450
3	410	F	F	C	400	350	285	290	A	345	250	240	230	280	260	240	260	270	250	C	330	620	450	C
4	C	C	C	C	C	C	C	C	B	C	C	C	B	320	B	240	255	260	265	280	270	410H	390F	S
5	A	560	B	380	B	F	300R	E 425A	300	260	230	210	240	250	235H	250	280	275	E 350R	S	400	380	450	355
6	415F	A	A	495	360	370	B	A	R	A	R	S	B	270	265	235H	240	290	265	270	400	400	370	350
7	390	450	355	340	F	285	F	A	275	270	265	255	245	220	225	240	230	300A	250	260	270	285	260	280
8	285	315	350	360	305	340	265	260	215	245	250	E 300S	210H	240	245	230	235	270	300	265	390	390	380	350
9	410	350	F	290	460	A	B	E 400A	265	240	220	225H	250H	250	A	280	260	230	235	250	255	270	260	255
10	270	285	280F	F	270	325F	265	270	240	B	F 280B	250	240H	220	230	245	240	220	225	260	270	275	260	265
11	300	340	390	380	380	R	290	240	270	240	260A	240	230	260A	245	280	E 300A	E 280A	260A	250	280	515	A	380
12	A	520	425	F	320	A	A	265	320H	260	235H	265	240	A	300A	230	230	230	240	270	265	255	260	270
13	270	285	350	355	340	320	290	240	255	240	250	260	A	A	C	C	C	C	C	C	C	C	C	B
14	390	400	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	310	380	380	A
15	B	A	500F	415	375	370	275	260A	255	245	235H	240	240	260	A	230	235	245	315	270	A	400	A	A
16	400	390	410	290	300	B	B	A	A	A	280	215	230	215H	265	245	240	240	290	315	290	265	305	480A
17	A	290	A	405	A	380	A	A	F	300	B	B	B	250	220	270	245	260	260	285	280	A	A	A
18	F	A	A	A	B	465	B	A	350	335	A	330	270	255	255	260	275	255	250	300	320	400	A	A
19	460	470	385	545	350	315	A	290	E 350A	375	260	270	285	300B	250	250	270	255	B	295H	300	370	315	A
20	B	460	405	B	440	B	B	340	R	A	B	S	260	B	265	265	250	265	300B	270	300	300	300	345
21	A	360	A	A	330	345	B	335	B	240	B	B	E 340B	C	C	C	C	265	280	270	355	280	310	565
22	480	420	435	450	A	390	B	250	235	220	235	240	200	210	225	240	250	270H	260	250	240	240	260	A
23	A	450	410	320	370F	290	A	310	285	290B	270	260	220	220	230	235	230	225H	260	270	320	350	290	265
24	330	A	560	390	380	380	280	300	300B	280	220	C	200	200	E 260S	220	250	230	250	240	240	230	235	230
25	280	310	365	390	450	395	320	C	220	210H	245	220	225	250B	230	230	215	235	230	235	240	235	220	255
26	400	390	380	370	335	290	270	240	235	225	220	220	220	215H	220	215	230	240	240	260	235	240	235	270
27	320	550	600	370	300	300	300F	F	B	B	B	290	240	240	235	220	240	235	250	260	240	380	F	580
28	400	300	450	A	390	380	300	230	260	230H	225	220	225	220	220	215	220	235	255	255	240	235	235	265
29	260	280	300	F	B	400F	B	320	295	A	310	280A	220H	235	250	220	220	250	260	275	250	285	A	A
30																								
31																								
No.	19	23	20	18	20	19	13	20	18	21	21	22	24	24	23	26	26	27	26	25	27	27	22	19
Median	390	390	390	395	360	350	285	265	265	245	240	240	230	245	235	240	240	250	260	270	280	310	300	320
U.Q.																								
L.Q.																								
Q.R																								

h'F

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 7

IONOSPHERIC DATA

Feb. 1960 | h'E | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	110	125	C	A	C	C	110	A	A	A	100	100	105	B	B	105	100	115	105	120	A	120H	115
2	115	115	120	120	A	A	115	105	105	B	B	100	100	100	100	A	100	100	100	110	B	A		
3				C	115	105	A	A	A	A	110	115	115	B	B	110	105	100	120	110	115	115	100	
4				115	105	C	A	A	B	B	C	C	B	B	B	110	B	110	100	140	115	A		
5				105	B	115	115	A	110	105	100	115	B	B	100	B	110	B	105	S	120	A		105
6	120			B	B	105H	B	B	B	A	105	S	B	B	B	B	110	B	B	115	A			
7		130	115	A	A	A	110	A	B	B	B	B	110	115	B	115	B	110	A	B	B	B		
8				B	125	A	120	115	110	110	110	S	105	A	B	105	120	120	B	E 140S	B	B		
9				A	B	A	B	A	A	105	105	105	100	105	100	105H	105	B	110	A	120	120		150
10				B	B	B	115	110	105	B	B	B	B	100	100	100	100	105	105	E 140B	B			
11				B	B	105	170	120	B	110	105	100	100	100	100	100	A	A	A	105	120	B		115
12	110	105	130	B	A	A	A	120	115	105	100	100	110	105	100	A	115	120	A	B	130	B		
13				E	A	A	E 160B	B	120	B	B	105	105	100	C	C	C	C	C	C	C	C	C	
14			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	B		
15				120	120	A	100	A	100	115	110	110	105	110	105	105	110	110	A	135	A	A		
16				B	B	B	B	A	A	A	A	105	100	105	100	100	105	110	110	125	175	140		
17				B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	110	105	A	B		
18				B	B	105	B	B	B	A	A	B	B	B	B	B	B	115	B	110	105	A		
19				B	B	A	A	A	A	B	A	B	B	B	B	B	B	B	B	120	B	A		
20				B	B	B	A	B	105	A	B	S	B	B	B	B	B	B	B	B	A	B		
21				B	A	A	B	B	B	A	B	B	B	C	C	C	C	120	B	B	B	B		
22				B	B	B	B	115	110	115	115	B	B	120	110	120	B	B	B	B	130	B		
23				B	B	B	B	115	110	B	B	B	115	B	110	110	110	B	150	B	B	B		
24	120			A	A	115	A	A	B	B	B	C	105	105	S	110	105	110	A	A	A	A		
25				B	B	B	A	C	110	100	B	B	B	B	100	100	100	A	B	B	100	B		
26				A	120	115	115	100	105	115	100	110	105	100	A	A	A	115H	115	125	B	B		
27				B	A	A	A	A	B	B	B	B	125	B	120	110	110	110	120	A	A	A		
28				B	B	A	A	115	100H	115	105	105	115	120	110	110	110	115	115	145	170	A		
29				A	B	A	B	A	A	B	B	B	105	105	B	B	120	105	125	135H	B	A		
30																								
31																								
No.	4	4	4	5	5	7	9	10	13	10	11	12	17	15	13	15	17	17	14	16	12	3	2	4
Median	120	110	120	120	120	105	115	115	110	110	105	105	105	105	100	110	110	110	110	115	120	120	110	115
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'E

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 8

IONOSPHERIC DATA

Feb. 1960 | h'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	G	G	C	125	C	C	G	100	100	120	G	G	G	B	B	G	170	135	150	140	125	G	G
2	G	G	G	G	120	145	G	G	G	165	B	G	125	110	130	100	155	G	180	170	130	105	115	115
3	120	120	105	C	G	G	105	100	100	100	G	G	G	110	120	G	G	170	180	G	G	G	180	110
4	145	120	C	G	G	C	105	110	B	120	C	C	B	B	B	G	B	180	165	150	135	125	115	S
5	110	110	150	110	B	G	G	120	130	G	G	G	B	B	G	B	150	B	185	S	165	105	115	105
6	130	110	110	120	140	150	145	130	100	110	G	S	B	B	B	B	G	B	B	150	130	140	125	120
7	120	130	130	110	130	125	160	110	120	B	B	B	G	G	B	130	115	110	100	B	140	100	100	115
8	160	125	125	150	G	125	160	155	140	G	G	S	G	125	B	110	G	130	145	140	135	125	135	130
9	150	110	105	135	120	100	B	100	110	120	115	125	G	115	110	115	115	115	115	110	G	150	B	G
10	B	120	130	140	130	120	G	115	G	B	B	B	B	130	125	140	115	135	G	150	125	125	100	100
11	140	125	130	130	135	G	G	G	B	130	120	110	110	105	100	100	100	100	100	135	G	125	110	170
12	160	170	G	160	170	120	120	G	G	G	130	110	115	110	100	100	100	100	100	B	G	B	B	B
13	B	140	120	140	145	135	G	B	G	150	120	115	110	100	C	C	C	C	C	C	C	C	C	105
14	115	115	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	115	115	120	120
15	B	105	110	165	160	110	150	115	G	G	G	G	G	130	115	120	130	G	110	170	120	125	120	145
16	125	120	B	125	150	B	B	100	120	100	100	G	G	160	140	115	110	G	160	160	G	G	130	120
17	110	115	105	100	115	150	105	120	160	125	B	B	B	B	B	B	B	B	165	140	140	160	105	105
18	135	115	115	105	105	140	B	120	170	100	100	B	B	B	B	B	B	180	B	140	150	115	100	110
19	115	120	100	100	115	100	105	115	115	120	115	B	B	B	B	B	B	B	B	170	160	110	135	100
20	140	105	100	150	B	B	145	120	G	105	B	S	B	B	B	B	B	B	B	180	170	B	145	150
21	135	140	100	100	115	110	B	B	B	130	B	B	B	C	C	C	C	180	175	150	120	B	140	115
22	115	120	120	B	120	115	B	G	G	G	G	B	B	G	110	G	B	B	B	B	G	B	B	165
23	110	110	140	110	140	B	120	135	150	B	B	B	G	B	G	G	G	B	160	B	110	B	185	150
24	140	115	115	115	110	G	110H	115	B	B	B	C	G	120	S	G	G	110	105	105	120	110	115	100
25	110	110	110	110	B	150	130	C	G	G	B	B	B	B	G	115	G	100	B	B	G	G	B	105
26	140	110	100	105	150	G	G	G	G	G	G	G	G	G	100	100	100	100	G	G	B	B	B	100
27	125	120	140	115	120	135	120	125	B	125	B	B	175	B	G	G	G	G	175	125	130	115	110	110
28	110	120	100	100	125	115	120	G	G	G	G	G	G	G	130	130	G	G	G	G	G	125	B	100
29	100	130	120	160	105	120	B	105	110	125	140	115	G	G	B	B	G	G	G	G	155	130	115	115
30																								
31																								
No.	24	27	23	23	22	18	15	18	13	16	9	5	5	11	11	12	10	14	17	17	19	19	21	25
Median	125	120	115	115	125	120	120	115	120	120	120	115	115	115	115	115	115	120	160	150	135	125	115	115
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 9

IONOSPHERIC DATA

Feb. 1960

Types of Es

45° E Mean Time (G.M.T. +3h)

Syowa Base

Lat. 69°00.4' S
Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					r				a	r	a							h	h	h	h	a		
2					a	a				a			h	h	h	a	h		h	h	a	a	a	a
3	a	a	a				a	a	r	r				h	h			h	h				h	a
4	a	a					a	r		a								h	h	h	h	r	f	
5	r	r	a	h				r	h								h		h		h	a	a	h
6	h	f	r	a	a	a	h	h	l	a										h	a	r	a	r
7	r	c	h	fa	a	a	h	a	h							h	h	c	l		h	l	f	f
8	a	a	a	a		a	h	h	h					h		h		h	h	h	r	r	a	r
9	a	a	a	a	a	r		l	a	h	h	h		h	h	h	h	h	h	l		h		
10		a	a	a	a	a		a						h	h	h	h	h		h	l	l	l	f
11	a	r	r	r	a					h	h	h	h	h	c	c	l	l	l	h		a	r	h
12	h	h		a	hl	r	r				h	h	h	h	c	l	l	l	l					
13		af	r	r	a	r				h	h	h	h	c										l
14	a	a																			a	a	a	a
15		r	a	h	h	a	h	r						h	h	h	hl		r	h	l	r	a	a
16	r	a		a	a			r	r	a	a			h	h	h	h		h	h			a	r
17	a	a	a	a	a	a	a	r	h	a									h	h	h	a	aa	a
18	a	a	r	f	a	h		a	h	r	r							h		h	h	r	a	r
19	r	a	f	a	r	a	a	a	a	l	a									h	a	r	a	r
20	a	a	a	a			a	a		l										h	r		a	a
21	a	a	a	f	a	a				a								h	h	h	a		a	r
22	a	a	a		a	r									c									a
23	a	a	a	l	a		a	h	h										h		a		h	a
24	h	a	r	r	r		a	a						h				c	l	l	l	l	f	f
25	a	a	r	r		a	a									h		l						f
26	r	a	r	r	h										l	l	l	l						l
27	a	r	a	r	a	a	a	a		a			h						h	a	a	a	r	r
28	a	a	a	a	a	r	r								k	h						f		f
29	f	af	a	a	a	a		a	a	a	a	a									a	r	r	a
30																								
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 10

IONOSPHERIC DATA

Mar. 1960 | foF2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	F	F	F	F	F	A	A	A	5.5	5.3^{F}	F	6.1	6.9	6.7^{F}	7.4	7.4^{F}	6.8^{F}	6.1^{Sp}	F	A	A	A
2	R	R	F	F	F	R	B	R	R	R	A	F	R	R	5.7	5.5	6.3	6.5	6.2^{F}	6.2^{F}	F	F	A	S
3	F	B	A	A	F	A	B	B	B	B	B	B	B	F	F	^{U}5.2^{F}	5.8	^{U}5.3^{F}	F	F	F	R	A	A
4	A	A	F	A	4.1^{F}	F	F	F	F	5.1^{F}	5.0	5.7^{F}	5.6^{F}	5.8	6.3	7.0^{F}	7.8	8.1	F	4.0^{F}	R	B	A	A
5	2.5	A	A	A	A	A	4.4	R	A	B	4.3	B	5.0^{F}	5.3	5.3^{F}	5.3^{F}	5.7^{F}	6.1	5.5^{F}	5.6^{F}	F	F	A	A
6	F	A	A	A	F	F	F	F	B	F	F	^{J}6.3^{F}	^{U}6.4^{F}	6.5^{F}	6.6	6.6^{F}	6.6	6.6	6.6	6.5^{F}	F	F	R	R
7	A	F	4.8^{R}	F	F	F	F	F	F	F	8.0	8.2^{F}	8.0^{F}	7.5	7.1	6.8	6.7	6.5	6.4^{F}	6.2^{F}	6.3^{F}	6.0^{F}	4.9^{F}	4.7^{F}
8	F	F	F	F	R	4.6^{F}	F	F	F	F	10.2^{R}	F	6.7^{F}	F	F	F	7.9^{F}	F	F	F	F	F	F	F
9	^{U}3.3^{R}	F	F	F	F	F	4.0^{F}	F	F	F	F	F	F	F	F	^{U}7.5^{F}	7.4^{F}	S	6.6	7.3^{F}	^{J}7.4^{F}	F	F	F
10	4.5^{F}	F	F	F	F	F	5.4^{F}	F	F	F	F	F	F	F	F	F	F	6.4^{F}	6.9^{F}	F	B	A	A	A
11	A	A	F	F	F	A	F	F	F	5.9	F	F	F	F	6.3^{F}	7.4	B	6.5^{F}	F	5.1^{F}	B	A	A	A
12	A	4.6	F	A	R	A	F	F	F	F	F	7.4^{F}	7.5^{F}	7.7^{F}	7.6	7.4	7.4	7.5	7.5	7.0	F	F	F	F
13	S	A	A	4.0^{F}	A	F	5.3	F	F	F	7.2^{F}	7.8^{F}	8.5^{F}	8.4^{F}	8.1^{F}	7.7	7.5	6.8	6.7	6.6^{F}	5.9^{FS}	F	F	R
14	A	A	3.8^{F}	F	F	F	F	B	F	7.3	F	F	9.3^{F}	9.6^{F}	9.3	10.2	9.7	8.0^{F}	7.1^{F}	6.8^{F}	6.8^{F}	6.9	6.5^{F}	F
15	F	F	F	F	3.4^{F}	F	4.0^{F}	^{J}5.0^{F}	5.9	6.9	7.6	8.2	8.3	8.2	8.7	9.0^{F}	9.0^{F}	8.9^{F}	8.3^{F}	^{J}6.5^{F}	F	F	A	F
16	F	F	A	F	F	A	A	B	B	3.1^{F}	A	B	B	4.0^{FW}	4.4^{F}	F	F	F	4.6^{F}	F	R	A	F	F
17	A	F	A	B	F	F	F	B	4.3^{F}	4.8^{F}	5.4^{F}	5.5^{F}	5.9	F	6.4	F	F	7.5^{F}	7.0^{F}	F	F	R	R	A
18	A	R	F	3.8^{F}	A	4.1	4.4^{F}	5.2	5.1	B	6.2	F	6.4^{F}	F	^{U}7.2^{F}	7.8^{F}	8.0^{F}	8.0^{F}	8.0^{F}	6.6^{F}	6.8^{F}	5.3^{F}	F	2.8
19	2.6	3.5	R	F	R	F	F	F	F	F	8.6^{F}	8.6	9.3	9.5	10.0^{F}	9.6^{F}	C	10.5^{F}	9.9^{F}	F	F	F	F	R
20	F	R	R	A	F	F	5.7^{F}	^{U}6.6^{F}	F	7.6^{F}	8.1^{F}	F	7.9^{F}	^{U}8.0^{F}	8.0^{F}	7.7^{F}	7.8	8.7^{FR}	7.8	^{U}7.6^{F}	F	F	4.8^{F}	4.4^{F}
21	F	F	R	A	F	F	F	F	F	F	6.5^{F}	B	B	8.5^{F}	F	^{U}9.4^{F}	10.0^{F}	10.6^{R}	9.0^{F}	F	F	F	F	F
22	F	C	C	C	C	C	C	C	C	F	F	F	F	F	F	11.5	10.6	10.0	9.5^{FR}	^{U}8.9^{F}	7.8	^{U}6.6^{F}	F	F
23	F	F	4.0^{F}	A	4.7	F	F	F	F	F	9.6	9.9	10.6	11.3	11.0	10.7	10.5^{F}	10.2	9.9	^{U}8.8^{F}	F	F	F	F
24	F	B	A	F	F	B	F	6.1	F	F	^{U}7.5^{F}	^{U}7.7^{F}	8.3^{F}	9.3^{F}	9.0^{F}	9.0^{F}	8.9^{F}	^{U}8.5^{F}	7.8^{F}	6.6	F	R	R	A
25	A	R	^{U}4.4^{F}	F	F	F	F	F	^{U}5.2^{F}	6.1^{F}	6.6	7.0^{F}	^{U}7.6^{F}	8.4^{F}	8.2	8.4^{F}	8.3	8.1^{F}	8.0	7.6^{F}	7.0^{F}	F	4.1^{F}	F
26	F	^{U}3.3^{F}	F	R	F	A	F	^{U}6.3^{F}	7.3^{F}	F	^{U}8.1^{F}	8.0^{F}	^{U}8.5^{F}	9.0	10.0	9.6	9.0	9.2	8.4	7.2^{S}	^{J}6.3^{S}	6.1^{S}	5.1^{F}	4.0^{F}
27	F	2.7	R	F	F	F	5.2^{F}	^{U}5.0^{F}	5.5^{F}	F	^{U}7.1^{F}	F	^{U}8.9^{F}	10.4^{F}	10.7	F	11.0	F	F	F	F	F	^{U}5.3^{F}	4.9^{F}
28	F	3.5^{F}	3.4^{F}	3.2^{F}	3.1^{F}	3.2^{F}	F	4.4^{F}	5.5^{F}	F	7.5	8.4	9.2^{R}	10.1	C	C	F	F	F	F	A	F	A	5.0
29	R	A	F	F	F	F	B	^{J}4.3^{FR}	F	B	F	5.4	B	6.4^{R}	F	F	F	7.2^{F}	^{U}6.7^{F}	^{U}6.7^{F}	F	F	F	F
30	A	3.6	A	B	B	B	4.1^{F}	4.9^{F}	5.4	5.7^{R}	6.2	6.5^{F}	6.3	6.4^{F}	7.5	7.4	6.9	F	F	F	R	R	A	A
31	A	F	F	B	B	B	B	B	B	B	B	B	B	B	B	B	F	B	B	B	B	B	R	F
No.	4	6	5	3	4	3	9	9	8	9	19	16	20	21	22	23	23	24	23	20	8	5	6	6
Median	3.0	3.5	4.0^{F}	3.8^{F}	3.8^{F}	4.1^{F}	4.4^{F}	5.0^{F}	5.4^{F}	5.9^{F}	7.2	7.6^{F}	8.0^{F}	8.2^{F}	7.6	7.7	7.8	7.8^{F}	7.1^{F}	6.6^{F}	6.8^{F}	6.1^{F}	5.0^{F}	4.6^{F}
U.Q.	3.9	3.6	4.6	3.9	4.4	4.4	5.4	6.2	5.7	7.1	8.1	8.2	8.7	9.4	9.0	9.4	9.0	8.8	8.3	7.2	7.2	6.8	5.3	4.9
L.Q.	2.6	3.3	3.6	3.5	3.2	3.6	4.0	4.6	5.2	5.0	6.2	6.0	6.4	6.4	6.4	6.8	6.9	6.6	6.6	6.2	6.3	5.6	4.8	4.0
Q.R.	1.3	0.3	1.0	0.4	1.2	0.8	1.4	1.6	0.5	2.1	1.9	2.2	2.3	3.0	2.6	2.6	2.1	2.2	1.7	1.0	0.9	1.2	0.5	0.9

foF2

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

19

IONOSPHERIC DATA

Syowa Base

Lat. 69°00.4' S
Long. 39°35.4' E

Mar. 1960

foF1

45° E Mean Time (G.M.T. +3h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	4.1	4.2	4.3F	4.4	L	B	L							
2							B	A	A	3.6F	A	4.1F	4.3	B	B	4.4	B							
3							B	B	B	B	B	B	B	4.3	L	4.2	B	B	L					
4									A	4.0	4.1	B	4.3	L	L	L	L							
5								A	A	B	4.0	B	4.3	L	4.4	4.3	L	L						
6								A	B	4.0	4.1	4.3	L	L	L	L	L							
7								L	L	L	4.4L	LH	LH	L	L	L								
8									L	L	B	L	L	L	L	L	L							
9							A	3.4	U4.3F	L	L	L	4.3F	4.4L	L	L	L							
10							A	A	L	4.3	L	LF	LF	L	B	B	L							
11								U3.4F	F	B	4.0F	B	L	L	4.2	B	B							
12								A	L	L	L	4.4L	4.3L	L	L	L								
13								3.3	L	L	4.3	L	L	L	L	L								
14								B	B	L	L	L	L	B	B									
15									L	L	L	L	L	L	L									
16								B	B	3.0	A	B	B	3.8	LF	3.9F	L							
17								B	A	3.8	4.0	4.0	B	4.2	L		L							
18									A	B	B	L	L	L	B	L								
19									L	L	L	L	L	L	L		C							
20									L	B	L	L	B	L	L									
21									L	L	L	B	B	B										
22						C	C	C	C			L	B	B										
23														L										
24											L	L	L		L									
25									L	L	L	L	L	L	L	L								
26										L	L	L	LH	3.4	3.3									
27								A	B	L	L		L	L		L								
28										L	L	L	L	L	C	C								
29							B	U2.6F	F	B	L	B	B	B	B									
30						B			L	B		L	L	L										
31							B	B	B	B	B	B	B	B	B	B	B	B	B					
No.								4	1	6	8	5	6	6	3	4								
Median								U3.4F	U4.3F	3.9	4.1	4.2	4.3	4.2	4.2	4.2								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 2

IONOSPHERIC DATA

Mar. 1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					2.80	B	B	A	A	B	B	B	3.30	B	B	B	B	B	B					
2						B	B	A	A	R	B	3.10	B	B	B	3.00	B	B	B		3.80			
3						B	B	B	B	B	B	B	B	B	B	R	B	B	B	2.70	2.25			
4						B	B	A	A	A	B	B	B	B	3.00R	2.85	2.65	B	A					
5							B	A	B	B	B	B	B	B	3.10	B	B	2.55	2.10					
6						B	B	B	B	B	R	B	R	B	B	B	B	B	B					
7						B	A	2.20H	2.35	2.40	2.70	2.80	3.00	2.85	A	2.80	A	A	A					
8						3.00	B	B	A	2.80	B	B	B	R	2.90	B	B	B	B			3.00		
9					3.10	3.40	R	B	2.60	A	A	2.65	B	B	R	B	B	S	1.80					
10							B	A	2.30	2.60	2.70	B	B	B	B	B	B	B	B	2.25				
11						B	B	R	B	B	B	B	B	B	B	B	B	B	B					
12						B	B	B	2.90	2.30	2.80	B	B	R	B	B	B	B	B					
13						B	B	A	B	B	A	3.00	R	R	2.90	R	R	2.35H	B					
14						B	B	B	B	B	B	R	3.00	B	B	B	B	B	B					
15						B	B	R	R	2.60R	2.60	2.65R	2.65	2.90H	2.80	B	2.50H	2.25	1.60					
16						B	B	B	B	2.40	A	B	B	2.75	R	A	2.30H	B	B					
17						B	B	B	A	A	B	B	B	B	B	B	B	B	B	1.80				
18						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
19						B	B	B	B	2.10R	R	B	B	B	B	B	C	B	B					
20	2.50	2.30				B	B	B	B	B	B	B	B	B	B	2.50	A	B	B					
21						B	B	R	R	2.40	B	B	B	B	B	B	2.30	B	B					
22						C	C	C	C	B	B	B	B	B	2.65	2.60	B	B	B					
23						B	A	B	2.30	B	B	B	B	B	B	B	2.45	B	B					
24						B	B	B	B	A	3.00	B	B	B	B	B	B	B	B					
25						A	A	A	2.00	U 2.30HR	2.65H	R	B	R	2.70H	2.55	B	B	B					
26						B	B	A	B	R	2.60	2.70	B	R	R	R	2.35	B	A					
27						B	B	B	B	B	R	3.00	B	2.80	2.70	B	2.40	B	B					
28						B	B	B	B	R	B	B	B	B	C	C	B	B	B					
29						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
30						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
31						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
No	1	1			2	2		1	6	9	7	7	4	4	8	6	7	3	3	3	2	1		
Median	2.50	2.30			2.95	3.20		220H	230	2.40	2.70	2.80	3.00	280	2.85	270	2.40	2.35	1.80	2.25	3.00	3.00		
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 200 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 3

21

IONOSPHERIC DATA

Mar. 1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J5.4	J5.8	J6.6	J3.4	G	J3.1	4.9	J4.2	5.3	5.0	B	B	3.8	B	B	B	B	B	B	2.3	J3.7	J4.0	J4.6	J6.6
2	4.3	4.4	3.3	2.9	2.3	4.4	B	4.1	J4.0	G	J4.3	G	B	B	B	G	B	B	B	B	3.5	3.4	J7.1	S
3	2.3	11.4Y	J6.5	4.0	2.6	J5.8	B	B	B	B	B	B	B	B	B	G	B	B	B	J4.1	3.0	3.4	J4.1	4.1
4	3.8	J3.9	1.9	4.4	3.7	2.5	J4.7	J3.5	J4.1	J4.0	B	B	B	B	G	G	G	B	2.6	B	3.6	B	3.5M	J3.9
5	J5.9	J8.9	J5.0	J3.7	4.6	J4.3	4.0	3.8	4.8M	B	B	B	B	B	G	B	12.0M	G	3.0M	J3.1	J0.5	J3.2	J4.0	J5.2
6	J4.4	J5.7	J4.7	J4.7	5.2	2.6M	J5.1	3.8	B	B	G	B	G	B	B	B	G	B	B	B	2.4	J2.4	3.1	3.5
7	4.0	J4.8	B	4.0	J3.3	3.0	3.0	G	G	2.7	G	G	2.5G	3.1	3.4	3.0	2.8	J3.5	2.5	J4.3	2.6M	J5.0	J2.8	1.6M
8	3.0	J3.6	J3.4	3.6	J5.2	G	J4.0	J3.8	3.3	G	B	B	B	G	G	B	B	B	B	J3.4	J3.8	3.7	3.0	J3.2
9	2.4	J3.8	J3.8	J5.5	G	G	3.7	B	G	J3.4	3.5	3.0	B	B	G	4.9	G	S	G	2.3M	B	1.6	2.2	2.4
10	J3.9	J5.7	J3.2	2.2	J4.6	J4.0	3.6	J3.3	G	G	G	B	B	B	B	B	B	B	2.3M	G	B	J4.7	J7.8	J4.0
11	4.4	J4.0	6.9	3.2	J3.5	J6.1	3.0	G	3.9	B	B	B	B	B	B	B	B	2.6	B	2.1	B	J8.0	4.2	J5.0
12	6.9	J7.2	J3.5	J5.1	J4.3	4.6	4.3	4.4	G	G	G	B	B	G	B	B	B	B	B	B	B	1.8	1.9	2.3
13	S	3.3	3.6	4.0	J6.1	2.9	B	3.4	3.6M	B	3.7	G	G	G	G	G	G	G	B	1.8	1.9	B	B	J3.0
14	4.0	4.0	2.8	2.6	1.9	2.9	J4.0	B	B	B	B	G	G	B	B	B	B	B	B	B	B	2.6	2.3	B
15	B	1.3	J2.1	2.9	2.6	2.1	B	6.7Y	G	G	G	2.8	3.0	3.2	G	B	2.8	2.4	G	J3.2	3.9	J4.6	J8.2	J5.0
16	J4.2	J5.4	J6.9	3.0	J3.8	4.7	J5.6	J8.0	5.0	G	J4.2	B	B	3.0	G	3.6	2.8	4.5	J11.7	2.1	2.6	4.3	J4.0	J7.2
17	J5.1	3.7M	J3.9	B	J3.8	1.9	B	B	J4.0	3.8	B	B	B	B	B	B	B	B	B	G	2.2	J3.0	J2.8	J5.0
18	4.0	3.8	J5.0	4.7M	5.3	B	3.3	4.8	4.3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	2.5	J3.0	3.8	J6.0	J4.8	4.1	3.4	3.6	B	G	G	B	B	B	B	B	C	B	B	B	B	1.9M	2.0M	3.5
20	2.8	3.0	3.2M	J7.1	3.5	3.7M	4.0	4.0	B	B	B	B	B	B	B	2.8	2.5	B	B	B	3.0	J3.3	2.6	1.5
21	2.0M	1.6M	3.0	J8.5	J5.3	J4.3	2.6M	G	G	G	B	B	B	B	B	B	G	B	B	B	J8.3	J5.0	J6.4	4.6
22	J6.8	C	C	C	C	C	C	C	C	3.6	B	B	B	B	3.0	2.8	2.4	B	B	B	B	B	B	4.4
23	3.1M	3.2	J4.2	J4.7	4.0	J3.8	3.0	B	G	B	B	B	B	B	B	B	G	B	B	B	B	B	B	B
24	B	3.5	J4.0	J3.7	J6.7	B	2.7	J5.0	3.6	3.1	G	B	B	B	B	B	B	B	B	B	2.3	J3.1	2.7	J4.8
25	J4.7	4.1	J3.8	2.7	2.6	2.6	2.7	2.5	2.5	G	G	G	B	B	4.6	2.2G	B	B	B	2.4	2.5	J3.0	2.8	1.6
26	2.7	J3.0	J4.0	J7.5	3.7	J6.3	4.1	J2.8	B	G	G	G	B	G	G	G	G	B	2.2	B	B	1.7	B	B
27	1.5	1.2	2.6	2.5	2.6	J4.2	J4.1	J4.1	B	B	G	G	B	G	G	B	2.6	B	B	B	B	B	B	B
28	B	2.4	2.7	J2.7	1.6	2.1	2.4	3.2	3.5Y	G	4.5	B	B	B	C	C	B	3.3	B	J2.8	3.6	J3.3	J3.8	J6.8
29	4.3	5.3	3.1	3.7	J5.1	3.0	B	2.4	3.3	B	B	B	B	B	B	B	B	2.4	2.1	B	B	B	1.4	J2.7
30	3.0	J8.3	4.8	B	B	B	3.8	B	B	B	B	B	B	B	B	B	B	B	B	B	3.4	3.6	J7.9	J4.1
31	4.1	2.6	3.6	2.8	5.4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	4.0	J5.0
No.	27	30	29	28	29	26	23	23	21	18	15	9	6	8	12	11	14	8	9	14	18	23	25	25
Median	4.0	3.8	J3.8	3.8	3.8	3.4	3.8	3.8	3.5	G	G	G	G	G	G	G	G	2.5	2.3	2.4	3.0	J3.3	3.5	J4.1
U.Q.	4.4	5.4	4.8	4.7	5.2	4.3	4.1	4.2	4.0				3.0			3.0	2.6	3.4	2.6	3.2	3.6	4.0	4.4	5.0
L.Q.	3.0	3.0	3.2	3.0	2.6	2.6	3.0	2.8	G				G			G	G	E2.4	F2.1	2.1	2.4	2.6	2.6	2.8
Q.R.	1.4	2.4	1.6	1.7	2.6	1.7	1.1	1.4										D1.0	D0.5	1.1	1.2	1.4	1.8	2.2

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 4

IONOSPHERIC DATA

Mar. 1960 | f-min | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	1.60	2.00	1.20	E	1.60	4.00	1.90	1.90	3.00	4.05	3.30	2.80	4.10	3.15	4.80	3.35	3.15	3.20	1.80	1.50	E	E	1.70
2	2.70	2.10	1.70	E	E	3.90	B	1.85	1.80	2.00	3.20	2.10	4.15	B	4.80	2.10	4.30	3.60	3.30	3.20	1.85	1.40	1.60	S
3	1.85	4.35	2.40	1.80	2.00	3.35	B	B	B	B	B	B	B	3.55	3.35	2.00	4.40	4.10	3.25	1.65	E	E	E	E
4	E	1.70	E	1.95	1.40	1.65	3.50	1.85	1.80	1.90	3.55	4.30	4.10	4.10	2.20	1.75	1.50	3.10	2.00	2.10	2.25	B	1.70	E
5	E	1.70	2.00	1.65	3.00	2.75	2.50	2.10	2.10	B	3.50	B	3.90	3.85	2.10	3.10	2.80	2.10	1.60	1.90	1.40	1.10	1.15	E
6	1.15	2.60	1.80	1.45	3.00	1.60	2.55	2.30	B	3.40	2.40	3.00	2.10	3.35	3.40	3.10	2.10	2.50	3.10	2.70	2.00	E	E	1.25
7	1.30	1.50	3.60	2.60	1.80	2.00	1.85	1.60	1.60	1.75	1.70	1.70	1.75	1.90	1.80	1.60	1.60	1.30	1.20	1.40	1.30	E	1.25	E
8	1.10	1.15	1.30	1.30	1.40	2.10	1.65	1.80	1.80	2.35	5.80	3.70	3.15	2.50	2.00	3.30	2.80	4.50	2.90S	1.35	1.20	1.20	1.10	1.20
9	E	1.30	E	1.15	1.15	1.30	2.25	3.00	1.85	1.80	1.85	1.85	3.00	2.85	2.60	2.80	2.20	S	1.35	1.40	1.70	1.25	E	E
10	1.35	E	1.30	E	E	1.5^	1.70	1.50	1.40	1.80	1.80	3.20	3.30	3.60	4.40	4.10	3.10	3.00	1.85	1.90	B	E	E	E
11	1.80	1.80	E	1.40	E	2.80	1.70	1.90	3.20	4.70	3.00	4.10	3.00	3.10	3.00	5.80	B	2.30	3.20	1.70	B	E	1.80	1.70
12	1.50	1.25	E	2.00	2.30	2.60	2.45	2.30	1.40	1.60	2.00	3.20	3.10	2.15	3.15	3.40	3.15	4.90	4.80	1.75	1.60	E	1.20	E
13	S	1.40	1.80	1.60	2.20	2.10	4.10	1.90	3.10	3.60	2.60	2.60	2.00	2.25	2.10	2.40	2.00	1.40	2.00	1.50	E	1.15	1.50	E
14	1.45	3.15	2.00	1.70	1.65	1.75	1.60	B	3.90	3.70	3.30	2.35	1.60	5.00	5.70	3.35	4.30	2.55	3.60	1.90	1.40	1.80	1.40	1.40
15	1.30	E	E	1.50	1.20	1.40	1.75	1.50	1.60	1.60	1.80	2.50	1.85	1.85	2.00	2.90	1.80	1.40	1.40	1.20	1.50	1.20	1.80	1.55
16	1.50	1.45	1.90	1.15	1.70	3.10	2.40	4.80	3.00	1.50	1.80	B	B	2.00	2.35	2.40	1.70	1.90	1.60	1.40	1.90	1.30	1.15	1.40
17	1.10	1.15	2.15	B	1.35	1.50	2.70	B	1.20	1.40	3.00	3.60	4.40	3.80	4.00	2.85	3.30	2.25	1.85	1.40	1.55	E	E	1.40
18	2.00	1.70	1.40	1.35	1.60	3.10	2.80	3.00	3.30	B	4.30	3.20	3.00	3.10	4.60	3.00	2.40	2.10	2.30	2.90	2.20	1.90	2.00	1.50
19	1.50	1.40	1.60	1.50	3.10	1.90	1.80	2.45	2.40	2.10	1.80	3.10	3.00	3.30	3.00	2.60	C	2.30	1.80	2.00	2.40	1.35	1.50	E
20	E	1.40	2.85	1.30	1.50	2.50	1.80	1.90	2.70	4.30	3.20	3.60	4.00	3.40	3.15	2.00	2.20	2.30	3.00	2.60	2.00	1.65	E	E
21	1.60	E	1.50	1.60	1.70	1.55	1.50	1.45	1.90	1.40	3.40	B	B	4.65	3.40	2.60	1.60	4.80	4.60	4.00	2.00	1.85	1.65	1.30
22	1.35	C	C	C	C	C	C	C	C	3.10	2.90	3.70	4.70	3.80	2.10	2.35	2.00	2.90	3.15	2.10	2.00	2.20	1.65	1.50
23	1.20	1.40	1.60	2.00	3.35	1.60	1.50	2.60	1.90	3.00	3.00	3.00	3.00	3.15	2.80	2.65	1.80	2.15	2.10	2.00	1.65	1.90	1.95	1.60
24	1.40	3.15	1.60	1.30	1.85	B	2.45	3.40	3.20	1.80	2.45	2.85	3.20	3.20	4.00	3.10	3.10	2.40	1.80	1.55	E	1.45	1.50	1.45
25	1.30	2.00	1.40	1.40	1.40	1.25	1.40	1.50	1.30	1.50	1.60	2.15	2.75	1.95	2.00	1.55	2.30	1.95	1.90	1.60	1.65	1.30	1.20	E
26	1.20	1.20	1.60	1.60	2.60	1.60	1.75	1.70	2.40	1.40	1.70	1.85	2.90	2.35	2.20	2.00	1.75	2.10	1.30	1.20	1.40	1.35	1.30	1.30
27	1.30	E	1.60	1.85	1.35	2.00	2.00	1.60	4.20	2.70	2.45	2.30	3.00	2.20	2.20	2.75	2.00	2.15	3.15	2.30	1.80	1.45	1.70	1.35
28	1.50	1.45	1.35	E	1.40	1.70	1.80	2.45	1.80	1.80	2.90	3.55	3.30	3.00	C	C	3.70	2.50	3.45	1.35	1.70	1.30	1.35	2.35
29	2.70	3.50	1.65	2.00	1.70	1^0	B	1.70	1.90	B	3.30	4.50	B	4.65	4.20	3.20	2.40	1.80	1.60	1.60	1.45	1.30	E	E
30	1.30	3.30	3.00	B	B	B	3.00	3.30	3.10	4.40	4.00	2.95	3.00	2.85	3.50	3.30	2.90	2.20	2.30	1.60	2.30	1.90	2.00	2.00
31	2.60	1.90	2.15	2.30	4.15	B	B	B	B	B	B	B	B	B	B	B	4.30	B	B	B	B	B	2.60	2.20
No.	30	30	30	30	30	30	30	30	30	31	31	31	31	31	30	30	30	30	31	31	31	31	31	30
Median	1.30	1.55	1.60	1.55	1.70	1.95	2.30	2.00	2.00	2.35	3.00	3.20	3.10	3.20	3.10	2.80	2.40	2.30	2.30	1.75	1.70	1.30	1.35	1.30
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 5

IONOSPHERIC DATA

Mar. 1960 | h'F2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								A	A	A	500	535	470	490	375	380	L							
2							B	R	R	R	A	580F	R	B	405B	510	415							
3							B	B	B	B	B	B	B	F	L	580	410	400F	L					
4									F	530F	570	465	470	L	390	L	L							
5								R	A	B	720	B	560	L	460F	500	390	L						
6								410	B	500	440	420	L	390	L	L	L							
7								375	L	L	350	350	350	320	L	L								
8									L	L	360	L	365	L	L	L	L							
9							530F	650	400	435	L	400	380	400	L	L	L							
10							470	405	400	400	350	370F	400	L	300	300	L							
11								400E	F	B	440	405	L	400	485	480	B							
12								420	320	L	L	380	350	325	315	L								
13								330	370	360	380	370	L	L	L	L								
14								B	350	315	L	L	L	290B	300									
15									L	L	L	L	L	L	L									
16								B	B	F	A	B	B	740	LF	F	L							
17								B	A	455	440	465	460	385	L		L							
18									E 550A	B	365	380	L	L	310	L								
19									L	L	L	300	320	L	L		C							
20									L	365	L	310	300	L	L									
21									L	L	L		B	275										
22						C	C	C	C			L	265	250										
23														280										
24											L	L	L		L									
25									L	L	320	L	L	L	L	L								
26										L	L	L	L	260	260									
27								440	510	L	L		L	L		L								
28										L	L	L	L	L	C	C								
29							B	540F	F	B	L	500	B	320	300									
30						B			485	510		L	L	L										
31							B	B	B	B	B	B	B	B	B	B	500	B	B					
No.							2	9	8	9	12	15	12	14	11	6	4	1						
Median							500F	410	390	435	410	400	370	320	315	490	410	400F						
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 6

IONOSPHERIC DATA

Mar. 1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	A	470	465	330	F	F	A	A	A	B	260	270	E 300 B	240	B	270 B	270	270	285	380	A	A	A
2	A	A	F	410	F	B	B	A	A	245	A	250	E 340 B	B	B	250	B	300	265	285	385	F	A	S
3	F	B	A	A	400	A	B	B	B	B	B	B	B	255	235	235	B	B	330	295	300	A	A	A
4	A	A	F	A	A	420	F	F	A	310	280	B	E 310 B	E 300 B	245	240	265	265	500	305	A	B	A	A
5	380 A	A	A	A	A	A	520	A	A	B	300	B	E 315 R	275	230	255	260	280	265	280	285	320	A	A
6	F	A	A	A	F	325	420	A	B	300 B	240	220	240	265	260	230	235	265	265	265	290	350	A	A
7	A	490	405	F	310	345	370	265	250	335	215	220 H	210 H	225	230	225	235	250	250	260	245	255	260	255
8	F	F	F	F	440	420	345	300	280	235	B	280	225	235	235	250	250	E 300 B	280	280	370	400	315	F
9	400	F	F	410	490	425	A	400	260	240	240	230	240	230	250	235	260	S	260	265	230	285	300	370
10	390	F	F	F	F	F	A	A	230	230	230	230	240	280	B	B	250	280	250	320	B	A	A	A
11	A	A	400	280	F	A	380 F	F	F	B	340	B	220	260	260	B	B	265	280	275	B	A	A	A
12	A	315	295	A	A	A	500	A	320	260	240	260	250	230	250	250	250	285	265	245	290	300	290	390
13	S	A	A	400	A	F	450	290	300	260	285	240	235	225	250	245	235	230	230	230	225	260	310	A
14	A	A	480	350	360	370	350	B	B	300 B	265	250	240	B	B	250	255	230	255	230	240	235	260	240
15	270	290	250	365	450	410	300	280	260	255	245	240	225	250	250	240	250	235	225	270	F	F	A	F
16	F	F	A	270	400	A	A	B	B	245	A	B	B	260	265	265	270	275	280	285	A	A	F	F
17	A	F	A	B	F	F	320	B	A	315	290	E 300 B	B	E 340 B	E 325 B	255	280	265	260	335	345	A	A	A
18	A	A	F	415	A	500	450	485 A	A	B	B	260	240	260	B	255	250	240	240	240	230	235	265	300
19	340	370	A	340	A	370	320	300	250	265	250	240	240	240	250	235	C	260	235	230	260	240	300	465
20	475	510	B	A	300	420	435	360	270	B	285	270	B	260	250	240	250	220	235	240	230	250	265	270
21	290	325	A	A	470	425	370	285	255	255	250	B	B	B	250	240	250	265	250	260	250	275	280	300
22	350	C	C	C	C	C	C	C	C	260	265	265	B	B	230	235	220	230	225	215	230	230	250	265
23	300	390	350	A	485	420	370	280	260	250	240	230	250	250	235	235	220	215	220	215	215	250	260	250
24	270	B	A	350	405 F	B	350	400	300	280	270	245	250	260	275	250	250	235	230	260	375	A	A	A
25	A	A	490	440	445	400	390	300	270	265	240	240	235	245	245	250	240	235	235	230	240	245	285	325
26	400	375	F	480	415	A	350	320	270	255	250	240	235 H	240	215	235	230	250	220	220	220	250	250	265
27	265	300	A	F	360	480	430	A	B	275	265	230	245	245	240	220	230	220	245	240	215	235	250	265
28	280	320	355	375	385	400	350	310	285	265	250	260	240	265	C	C	275	210	260	270	A	425	A	300
29	A	A	320	F	F	370	B	430	F	B	330	B	B	B	B	265	270	250	245	240	240	280	330	375
30	A	370	A	B	B	B	R	400	E 360 B	B	E 380 B	270	260	260	285	265	260	255	265	250	A	A	A	A
31	A	F	300	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	F
No.	13	11	11	14	16	16	20	16	16	22	24	23	23	25	24	26	26	28	30	30	23	19	16	15
Median	340	370	355	390	400	415	370	305	265	260	255	240	240	255	250	240	250	250	250	260	245	255	270	300
U.Q.																								
L.Q.																								
Q.R.																								

h'F

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 7

IONOSPHERIC DATA

Mar 1960 | h'E | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					120	B	B	A	A	B	B	B	120	B	B	B	B	B	B					
2						B	B	A	A	110	B	105	B	B	B	110	B	B	B		130			
3						B	B	B	B	B	B	B	B	B	B	105	B	B	B	115	115			
4						B	B	A	A	A	B	B	B	B	110	110	110	B	A					
5							B	A	B	B	B	B	B	B	110	B	B	130	120					
6						B	B	B	B	B	120	B	105	B	B	B	120	B	B					
7						B	A	120^{H}	120	110	105	115	120	100	A	130	A	A	A					
8						140	B	B	A	125	B	B	B	115	110	B	B	B	B			110		
9					130	120	125	B	120	A	A	110	B	B	130	B	135	S	105					
10							B	A	115	115	115	B	B	B	B	B	B	B	B	E 180^{B}				
11						B	B	120	B	B	B	B	B	B	B	B	B	B	B					
12						B	B	B	115	110	110	B	B	115	B	B	B	B	B					
13						B	B	A	B	B	A	120	115	115	110	125	120	115^{H}	B					
14						B	B	B	B	B	B	120	110	B	B	B	B	B	B					
15						B	B	100	120	115	115	115	110	120^{H}	115	B	115^{H}	125	120					
16						B	B	B	B	115	A	B	B	115	125	A	120^{H}	B	B					
17						B	B	B	A	A	B	B	B	B	B	B	B	B	B	180				
18						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
19						B	B	B	B	135	110	B	B	B	B	B	C	B	B					
20	115	120				B	B	B	B	B	B	B	B	B	B	125	A	B	B					
21						B	B	135	120	110	B	B	B	B	B	B	120	B	B					
22						C	C	C	C	B	B	B	B	B	120	135	B	B	B					
23						B	A	B	150	B	B	B	B	B	B	B	115	B	B					
24						B	B	B	B	A	135	B	B	B	B	B	B	B	B					
25						A	A	A	125	120^{H}	115^{H}	120	B	115	110^{H}	135	B	B	B					
26						B	B	A	B	140	110	115	B	125	140	105	120	B	A					
27						B	B	B	B	B	135	120	B	120	125	B	135	B	B					
28						B	B	B	B	120	B	B	B	B	C	C	B	B	B					
29						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
30						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
31						B	B	B	B	B	B	B	B	B	B	B	B	B	B					
No.	1	1			2	2	1	4	8	12	10	9	6	9	11	9	10	3	3	3	2	1		
Median	115	120			125	130	125	120	120	115	115	115	110	115	115	125	120	125	120	180	120	110		
U.Q.																								
L.Q.																								
Q.R.																								

h'E

Sweep 10 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 8

IONOSPHERIC DATA

Mar. 1960 | f'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	115	110	110	115	G	120	155	100	105	120	B	B	150	B	B	B	B	B	B	150	120	120	110	110
2	120	120	115	120	120	160	B	105	100	G	100	G	B	B	B	G	B	B	B	B	170	110	105	S
3	140	105	105	100	140	100	B	B	B	B	B	B	B	B	B	G	B	B	B	140	130	105	115	110
4	100	110	120	100	110	125	125	115	100	100	B	B	B	B	G	G	G	B	110	B	120	B	115	105
5	120	105	100	110	125	135	115	110	120	B	B	B	B	B	G	B	135	G	155	150	140	135	110	120
6	120	100	100	100	140	110	120	120	B	B	G	B	G	B	B	B	G	B	B	B	180	150	115	115
7	115	120	B	150	130	125	120	G	G	140	G	G	100	120	110	130	100	100	100	105	115	100	100	100
8	115	120	125	125	110	G	110	105	115	G	B	B	B	G	G	B	B	B	B	145	125	160	120	120
9	125	120	125	125	G	G	165	B	G	110	110	150	B	B	G	120	G	S	G	135	B	145	135	125
10	130	135	125	135	125	125	125	120	G	G	G	B	B	B	B	B	B	B	160	G	B	110	115	105
11	105	100	110	125	130	110	120	G	170	B	B	B	B	B	B	B	B	180	B	160	B	150	120	120
12	155	120	100	125	110	100	105	110	G	G	G	B	B	G	B	B	B	B	B	B	B	140	150	120
13	S	120	135	120	110	115	B	110	150	B	120	G	G	G	G	G	G	G	B	100	100	B	B	120
14	115	110	120	115	135	140	115	B	B	B	B	G	G	B	B	B	B	B	B	B	B	100	100	B
15	B	100	100	115	115	150	B	130	G	G	G	120	110	145	G	B	130	125	G	165	120	130	110	115
16	115	115	115	130	120	135	110	130	135	G	110	B	B	165	G	135	145	125	125	150	125	115	115	115
17	100	140	100	B	130	120	B	B	120	115	B	B	B	B	B	B	B	B	B	G	165	115	120	105
18	110	105	125	140	135	B	125	110	130	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	150	115	110	105	100	105	120	145	B	G	G	B	B	B	B	B	C	B	B	B	B	130	120	120
20	180	140	160	120	135	125	115	120	B	B	B	B	B	B	B	130	140	B	B	B	100	100	100	100
21	100	155	125	125	130	125	120	G	G	G	B	B	B	B	B	B	G	B	B	B	130	120	110	110
22	110	C	C	C	C	C	C	C	C	125	B	B	B	B	135	140	100	B	B	B	B	B	B	100
23	105	120	110	100	120	110	115	B	G	B	B	B	B	B	B	B	G	B	B	B	B	B	B	B
24	B	150	115	105	120	B	120	110	120	110	G	B	B	B	B	B	B	B	B	B	150	165	115	110
25	120	120	120	125	125	100	100	100	105	G	G	G	B	G	100	100	B	B	B	105	100	100	100	120
26	135	120	135	105	130	135	110	145	B	G	G	G	B	G	G	G	G	B	100	B	B	120	B	B
27	135	120	130	160	130	125	145	110	B	B	G	G	B	G	G	B	150	B	B	B	B	B	B	B
28	B	160	120	120	130	145	140	170	140	G	100	B	B	B	C	C	B	170	B	140	120	115	125	115
29	115	110	125	125	130	120	B	140	130	B	B	B	B	B	B	B	B	165	140	B	B	B	160	150
30	130	130	110	B	B	B	125	B	B	B	B	B	B	B	B	B	B	B	B	B	120	120	115	120
31	130	130	130	130	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	145	130
No.	27	30	29	28	27	24	23	20	14	7	5	2	3	3	3	6	7	6	7	12	18	23	25	25
Median	120	120	120	120	130	125	120	110	120	115	110	135	110	145	110	130	135	145	125	140	120	120	115	115
U.Q.																								
L.Q.																								
Q.R.																								

f'Es — Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 9

IONOSPHERIC DATA

Mar. 1960

Types of Es

45° E Mean Time (G.M.T. +3h)

Syowa Base

Lat. 69°00.4′ S
Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	a	a	a	a		l	a	la	r	r			h							r	a	r	a	f
2	a	r	r	r	f	a		r	l		a										h	r	a	
3	a	f	a	a	a	f														h	h	r	a	r
4	r	a	a	a	a	a	a	a	a	a									l		a		a	a
5	a	a	a	a	a	a	a	a	a								h		h	a	a	a	r	a
6	a	f	f	f	a	a	a	r													a	a	r	a
7	r	r		a	a	a	a			h			l	h	l	c	l	l	a	f	f	f	f	f
8	r	a	a	r	a		a	a	a											af	rf	h	r	a
9	r	a	a	a			f			a	a	h				l				a		a	a	a
10	r	a	a	a	f	a	r	a											a			a	a	a
11	r	a	a	a	a	a	a		a									a		a		a	r	a
12	a	a	f	a	a	r	r	r														a	a	r
13		r	r	a	a	a		r	a		a									f	f			a
14	r	a	a	r	a	a	a															f	f	
15		f	f	r	a	a		h				h	c	h			h	cl		a	r	a	a	a
16	a	a	a	a	a	a	a	a	a		a			h		a	h	l	l	a	a	r	a	a
17	a	a	fa		f	a			a	al											a	a	a	a
18	r	a	a	a	a		r	r	r															
19	a	a	r	f	a	r	a	r														a	f	r
20	h	h	a	a	a	a	r	a								h	h				f	f	f	f
21	f	a	a	a	a	a	a														f	f	a	a
22	f									a					h	h	l							f
23	f	a	a	a	a	a	r																	
24		a	a	a	a		l	l	a	a											a	a	a	a
25	a	r	a	r	r	l	l	l	l						l	l				f	f	f	f	a
26	r	a	a	a	a	a	a	a											l			f		
27	a	a	a	a	a	a	a	a									h							
28		a	a	a	a	a	a	a	a		l							a		a	a	a	r	a
29	a	a	a	a	a	l		a	a									a	a				a	a
30	r	a	a				a														a	a	a	a
31	a	a	a	a	a																		a	a
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 10

IONOSPHERIC DATA

Apr. 1960 | foF2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	B	B	B	R	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	R	R	F	R	F	B	B	B	B	B	B	$^{U}4.3^{R}$	5.3	5.4^{F}	4.9^{F}	5.6	F	F	3.2	B	F	R
4	F	F	3.7^{FH}	4.3^{F}	4.2^{F}	F	F	$^{U}5.0^{F}$	F	F	6.9^{F}	7.4^{F}	8.1^{F}	8.4	8.5	8.4	7.4^{F}	F	6.1^{F}	F	F	R	3.8	R
5	B	B	F	F	F	R	5.2^{F}	4.6^{F}	B	B	B	F	F	7.9	F	8.6^{F}	F	8.7	7.0	B	3.3	R	A	R
6	R	$^{U}4.3^{FR}$	3.7^{R}	F	B	$^{U}3.8^{F}$	F	4.3^{F}	5.7	B	B	F	F	F	8.4^{F}	9.3^{F}	9.6^{F}	9.7	F	F	F	F	F	F
7	A	A	F	F	B	B	B	B	A	4.7	F	F	6.7^{F}	F	F	F	F	7.1^{F}	7.0^{F}	F	R	F	A	F
8	A	A	A	A	A	B	B	B	B	$^{U}5.3^{F}$	5.1^{F}	5.8	6.3^{F}	6.1	F	6.8	6.8^{F}	6.2	5.6	5.1^{F}	R	2.2	B	C
9	A	B	A	A	B	3.8	F	B	B	5.9	B	$^{U}7.5^{R}$	7.1^{R}	B	7.9	7.8^{F}	7.5^{F}	7.4^{F}	7.4^{F}	5.8	5.1	F	2.6	A
10	A	R	4.0^{F}	3.0	3.2	B	4.8^{F}	5.0	R	B	B	6.1	7.1^{F}	7.9^{R}	8.3^{F}	9.0	10.3	10.6^{R}	F	F	F	5.7	5.1	A
11	F	A	F	B	F	F	A	F	F	4.2	B	7.1	7.0	F	7.3^{F}	6.5^{F}	6.7^{F}	6.1	5.2^{F}	3.9^{F}	2.8^{R}	A	A	A
12	A	A	3.7	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	7.2^{FR}	5.4	B	A	A	A
13	A	B	B	B	B	$^{U}3.6^{F}$	B	B	B	F	B	B	B	F	F	C	6.3^{F}	F	6.3^{F}	F	F	F	2.0	3.6
14	3.4	R	F	B	B	B	A	$^{U}5.2^{R}$	5.2^{F}	B	7.3^{F}	B	9.6	10.2^{R}	10.4^{R}	11.2^{R}	R	R	$^{J}10.0^{R}$	8.1	4.8^{F}	R	2.6	A
15	B	B	A	B	B	B	R	F	B	B	5.4	6.2^{F}	6.4	6.1	6.7	7.9^{F}	8.1^{F}	8.6^{F}	$^{U}7.0^{F}$	6.6^{F}	F	F	2.2	2.6
16	R	4.6^{R}	B	A	B	A	4.8^{R}	4.7^{R}	5.4	F	7.1^{R}	F	8.3^{R}	B	$^{J}10.4^{R}$	10.4	11.6^{S}	F	S	F	F	R	F	F
17	B	R	F	R	B	5.0^{R}	B	B	B	B	5.9	B	6.2	6.5	7.6	7.9^{R}	8.0^{R}	7.5^{F}	7.5	5.0^{R}	F	A	A	A
18	A	A	R	F	A	B	B	C	C	C	B	B	B	6.3	6.3	8.0^{R}	8.2^{F}	7.7	7.0^{F}	6.7^{F}	3.5^{R}	B	R	3.0^{R}
19	R	R	A	R	B	R	F	5.7^{R}	$^{D}5.3^{R}$	6.4^{F}	7.6^{F}	F	8.7^{F}	9.2	9.7	10.0^{R}	9.5	8.7	7.0	5.6	4.3^{F}	3.1	2.1	1.9
20	$^{U}1.7^{R}$	1.8	1.9^{R}	2.0^{R}	2.1^{R}	2.1^{R}	B	B	4.2	F	8.4^{F}	F	10.4^{R}	10.9^{RJ}	11.5^{R}	11.1	$^{J}12.0^{R}$	10.7	9.6^{FR}	F	4.7^{F}	3.2	2.6^{R}	B
21	B	B	B	1.7	2.0	2.0^{R}	2.3^{R}	3.0^{F}	4.7^{F}	7.3	9.1^{R}	10.2^{R}	$^{J}11.8^{R}$	11.6^{R}	12.5^{R}	11.7^{S}	$^{J}11.6^{R}$	11.0	9.0	8.0	8.2	6.4^{F}	3.8^{F}	2.8^{F}
22	2.1	2.3	A	A	F	F	F	F	5.0	5.6^{F}	R	F	10.2^{R}	R	10.6^{RJ}	11.2^{R}	11.0^{R}	11.3^{R}	9.3^{R}	8.2^{F}	7.5^{F}	6.2^{F}	4.9^{F}	3.5
23	2.7	2.8	R	F	F	F	F	F	F	F	F	F	F	10.6^{R}	11.7^{RJ}	11.4^{R}	11.2	10.7^{R}	9.0^{R}	6.9	5.3^{F}	4.7^{F}	3.5	3.7
24	A	R	5.5	6.4^{F}	F	B	R	B	B	B	B	B	B	6.6^{F}	6.9	F	F	F	B	R	R	A	A	A
25	A	B	R	F	F	B	4.0	F	B	B	B	B	B	B	F	F	7.1	7.0	F	R	R	R	A	A
26	R	A	A	A	B	A	A	B	B	B	B	B	B	B	B	6.6^{F}	6.3	5.3	3.5	R	R	A	A	A
27	A	R	R	B	B	B	A	2.5	R	B	B	B	R	5.9^{R}	6.7^{R}	7.8^{R}	7.6	7.6^{F}	F	4.5	R	R	R	R
28	A	R	B	B	B	R	R	A	B	B	B	B	B	B	B	R	4.6^{F}	B	B	A	A	A	A	R
29	R	A	A	A	R	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
No.	4	5	6	5	4	6	4	9	7	7	9	7	14	15	18	20	21	19	18	13	11	7	11	7
Median	2.4	2.8	3.7	3.0	2.6	3.7^{R}	4.8^{F}	4.7	5.2	5.6	7.1^{F}	7.1	7.6	7.9	8.4	8.5	8.0	7.7	7.0^{F}	5.8	4.7	4.7	2.6	3.0
U.Q.	3.0	4.4	4.0	5.4	3.7	3.8	5.0	5.1	5.6	6.4	8.0	7.5	9.6	10.2	10.4	10.8	10.6	10.6	9.0	7.4	5.3	6.2	3.8	3.6
L.Q.	1.9	2.0	3.7	1.8	2.0	2.1	3.6	3.6	4.7	4.7	5.6	6.1	6.7	6.1	6.9	7.8	6.8	7.0	6.3	5.0	3.3	3.1	2.2	2.6
Q.R.	1.1	2.4	0.3	3.6	1.7	1.7	1.4	1.5	0.9	1.7	2.4	1.4	2.9	4.1	3.5	3.0	3.8	3.6	2.7	2.4	2.0	3.1	1.6	1.0

foF2 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

IONOSPHERIC DATA

Apr. 1960 | foF1 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									B	B	B	B	B	B	B	B	B	B						
2								B	B	B	B	B	B	B	B	B	B	B						
3								B	B	B	B	B	B											
4											L		L											
5									B	B	B	B		L										
6										B	B	B	B	B	B									
7								B	B	B	L	L	B											
8								B	B	L	3.7	B	B	B										
9								B	B	B	B	B	B	B	B									
10										B	B													
11										3.6	B	B	B	L	L	B								
12								C	C	C	C	C	C	C	C	C	C	C						
13								B	B	B	B	B	B	B	L	C								
14										B	B	B	B	B										
15									B	B	B	B	B											
16									B	B	B		B	B	B									
17								B	B	B	B	B	B	B	B									
18								C	C	C	B	B	B		B	B								
19																								
20								B								B								
21																								
22																								
23																								
24								B	B	B	B	B	B	B										
25									B	B	B	B	B	B	L									
26								B	B	B	B	B	B	B	B									
27										B	B	B	B	B	B	B								
28									B	B	B	B	B	B	B			B						
29								B	B	B	B	B	B	B	B	B	B	B						
30								B	B	B	B	B	B	B	B	B	B	B						
31																								
No.										1	1													
Median										3.6	3.7													
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

foF1 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 2

IONOSPHERIC DATA

Apr. 1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	B	B	B	B	B	B	B	B	B	B						
2								B	B	B	B	B	B	B	B	B	B	B						
3								B	B	B	B	B	B	B	B	B	B	B						
4								B	B	B	B	B	B	B	B	B	B	B						
5								B	B	B	B	B	B	B	B	B	B	B						
6								B	B	B	B	B	B	B	B	B	B	B						
7								B	B	B	B	B	B	B	B	B	B	B		2.20				
8								B	B	B	B	B	B	B	B	B	B	B						
9								B	B	B	B	B	B	B	B	B	B	B						
10								B	B	B	B	B	B	B	B	B	B	B						
11								B	B	B	B	B	B	B	B	B	B	B		1.60				
12								C	C	C	C	C	C	C	C	C	C	C						
13								B	B	B	B	B	B	B	B	C	B	B						
14								B	B	B	B	B	B	B	B	B	B	B						
15								B	B	B	B	B	B	B	B	B	B	B						
16								B	B	B	B	B	B	B	B	B	B	B						
17								B	B	B	B	B	B	B	B	B	B	B						
18								C	C	C	B	B	B	B	B	B	B	B						
19								B	B	B	B	B	B	B	B	B	B	B						
20								B	B	B	B	B	B	B	B	B	B	B						
21								B	B	B	B	B	B	B	B	B	B	B						
22								A	B	B	B	B	B	B	B	B	B	E						
23								B	B	B	B	B	B	B	B	A	A	B						
24								B	B	B	B	B	B	B	B	B	B	B						
25								B	B	B	B	B	B	B	B	B	B	B						
26								B	B	B	B	B	B	B	B	B	B	B						
27								B	B	B	B	B	B	B	B	B	B	B						
28								B	B	B	B	B	B	B	B	B	B	B						
29								B	B	B	B	B	B	B	B	B	B	B						
30								B	B	B	B	B	B	B	B	B	B	B						
31																								
No.																		1		2				
Median																		E		1.90				
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 3

IONOSPHERIC DATA

Apr. 1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	3.7	J4.3	4.4	B	5.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	J8.8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.7
3	B	B	5.5	5.0	J4.6	3.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.7
4	2.7	B	B	2.8	2.4	B	3.1	2.7	B	B	B	B	B	B	B	B	B	B	B	B	B	2.1	2.4	2.9
5	B	B	J3.9	2.9	2.4	J4.9	4.1	4.0	B	B	B	B	B	B	B	B	B	B	B	B	B	3.3	J4.0	3.9
6	3.7	J6.3	3.0	3.6	B	3.0	4.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J7.8
7	J7.7	J6.0	J7.9	2.3	B	B	B	B	4.8	4.7	B	B	B	B	B	B	B	B	B	G	J2.3	2.1	4.6	J6.8
8	J8.9	J6.6	3.9	J4.0	3.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.6	1.7	B	C
9	2.6	2.7	J4.6	J7.1	4.7	2.8	2.4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.1	2.7
10	2.8	3.6	2.8	J3.4	1.8	B	4.3	3.8	3.9	B	B	B	B	B	B	B	B	B	B	B	J3.3	5.1	J7.5	J5.8
11	J4.1	J4.7	4.0	B	2.8	2.3	5.5	2.9	B	B	B	B	B	B	B	B	B	B	B	G	J3.2	3.5	J3.7	J3.8
12	J4.7	J6.5	J6.2	J4.7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	3.6	3.8	J6.3
13	3.3	J8.3	J5.7	5.0	B	2.6	B	B	B	B	B	B	B	B	B	C	B	B	B	B	1.8	B	2.0	2.9
14	3.9	3.2	4.6	B	B	4.6	4.8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	1.6	1.8	3.0
15	B	5.0	4.3	B	B	B	4.4	3.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.4
16	2.7	3.1	B	3.6	4.9	J4.6	B	B	B	B	B	B	B	B	B	B	B	B	S	J5.2	J4.8	3.4	3.0	J4.5
17	B	3.9	J3.2	3.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	3.6	J4.2	J8.7
18	4.0	J6.1	3.2	2.6	J6.4	B	B	C	C	C	B	B	B	B	B	B	B	B	B	B	2.6	B	2.3	2.6
19	2.8	2.8	5.0	3.9	B	J4.1	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	E
22	B	B	J3.0	J5.7	J4.5	J3.9	J3.5	1.7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	2.5	2.5	2.7	J3.0	2.7	J3.8	2.7	B	B	B	B	B	B	B	2.6	J2.3	J3.0	B	B	B	E	2.6	J4.5
24	J5.2	B	4.8	3.2	J4.8	B	J4.1	B	B	B	B	B	B	B	B	B	B	2.3	B	2.0	3.3	J4.8	J6.4	J7.4
25	4.6	B	3.0	J3.6	J3.8	B	J3.6	2.6	B	B	B	B	B	B	B	B	B	B	2.4	3.6	J4.0	B	J7.3	J8.2
26	3.8	J9.8	J7.6	J6.3	B	3.9	3.7	B	B	B	B	B	B	B	B	B	B	B	2.6	2.5	2.6	J4.9	J4.2	J5.6
27	J3.1	2.7	3.0	B	5.5	4.3	2.9	B	B	B	B	B	B	B	B	B	B	B	B	2.2	2.9	3.2	3.6	3.2
28	J6.2	4.3	B	5.6	J7.5	J4.8	4.8	J4.5	B	B	B	B	B	B	B	B	B	B	B	J7.5	J7.1	J4.2	4.0	3.7
29	3.1	J5.4	J4.8	J4.6	2.9	B	4.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
No.	19	19	22	21	18	15	17	9	3	1						1	1	2	2	6	12	15	19	22
Median	3.8	4.7	4.2	3.6	4.2	3.9	4.1	2.9	4.8	4.7						2.6	J2.3	J2.6	2.5	3.0	J3.0	3.4	3.7	J3.8
U.Q.	4.7	6.3	4.8	5.0	4.9	4.6	4.5	3.9	5.0											5.2	3.6	4.2	4.2	6.3
L.Q.	2.8	3.1	3.0	3.0	2.9	2.8	3.6	2.6	4.4											2.2	2.6	2.1	2.3	2.9
Q.R.	1.9	3.2	1.8	2.0	2.0	1.8	0.9	1.3	0.6											3.0	1.0	2.1	1.9	3.4

The Radio Research Laboratories, Japan

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

IONOSPHERIC DATA

Apr. 1960 | f-min | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.60	B	B	B	2.60	2.15	3.00	B	3.85	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	3.10	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	3.45	3.45	3.20	3.35	3.70	B	B	B	B	B	B	3.90	3.85	3.35	3.10	3.40	2.20	1.70	1.80	B	3.40	2.00
4	2.00	2.10	2.00	1.75	1.75	2.10	1.60	2.30	3.00	3.30	3.00	2.80	3.10	2.90	3.15	2.70	2.50	2.10	1.70	1.65	1.70	1.80	1.70	1.70
5	B	B	2.80	1.40	1.40	3.15	2.15	3.20	B	B	B	4.30	3.35	3.40	3.50	3.30	4.30	3.15	3.55	B	3.10	2.45	2.45	3.10
6	2.40	2.40	2.00	2.35	B	2.20	2.40	3.10	4.30	B	B	5.60	4.00	4.30	4.60	3.00	2.80	4.20	2.30	1.60	1.70	1.60	1.80	1.80
7	1.70	1.75	1.50	1.50	B	B	B	B	3.95	3.40	3.60	3.40	3.70	3.65	2.40	2.30	2.30	2.00	1.75	1.10	1.60	1.30	1.65	1.55
8	1.35	2.50	1.60	1.70	3.00	B	B	B	B	2.70	3.20	4.15	4.15	4.40	3.15	3.40	2.90	3.30	3.40	1.45	1.50	1.40	B	C
9	1.70	2.40	1.50	1.90	3.35	1.80	1.65	B	B	4.30	B	4.70	6.10	B	5.10	3.40	3.10	2.30	3.30	3.15	3.00	2.00	1.50	1.50
10	1.55	1.80	2.10	2.00	1.40	B	3.10	1.65	3.10	B	B	3.30	3.15	4.30	3.40	3.40	3.00	3.50	2.30	2.40	1.30	2.00	1.70	1.30
11	1.80	1.90	2.60	B	2.30	1.40	2.20	1.50	2.90	3.40	B	4.30	4.20	3.00	3.25	3.40	3.20	3.85	1.60	1.30	1.55	1.60	1.30	1.30
12	1.20	2.00	2.00	1.65	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.20	3.30	B	1.60	2.35	1.40
13	1.30	4.00	4.20	3.60	B	2.15	B	B	B	3.40	B	B	B	4.30	3.00	C	3.15	3.00	2.40	1.40	1.35	1.70	1.20	1.20
14	1.65	1.35	3.00	B	B	4.00	2.50	4.60	3.50	B	4.20	B	4.25	4.75	3.90	6.20	8.40	7.30	4.20	3.90	3.30	1.30	1.40	1.25
15	B	3.00	2.30	B	B	B	3.00	2.35	B	B	4.25	3.90	5.25	3.20	3.20	3.05	2.25	1.60	1.75	1.35	1.35	1.50	1.70	2.10
16	2.15	2.20	B	2.40	4.30	3.30	3.85	4.20	4.20	3.60	4.60	3.40	5.60	B	6.40	2.90	2.10	3.70	S	2.20	1.20	2.00	1.30	1.40
17	B	2.65	1.35	2.25	B	3.45	B	B	B	B	4.70	B	4.60	4.10	3.70	5.30	6.20	2.40	2.20	3.80	1.55	2.00	1.30	2.10
18	1.60	3.50	2.30	2.00	1.85	B	B	C	C	C	B	B	B	4.00	4.65	4.60	3.25	4.10	2.50	1.60	1.40	B	1.75	2.20
19	1.60	1.30	2.05	3.15	B	2.60	4.20	3.60	4.40	3.35	3.35	3.30	3.40	4.05	4.05	3.10	2.50	2.35	1.90	1.40	1.50	1.40	1.60	1.50
20	1.60	1.30	1.40	1.60	1.50	1.50	B	B	3.15	2.75	3.50	3.40	3.45	3.50	3.60	E 6.70 S	2.40	1.60	1.80	2.15	1.75	1.70	2.05	B
21	B	B	B	1.35	1.50	1.35	1.35	1.40	2.10	3.00	3.00	2.80	2.70	2.50	2.55	2.20	6.15	1.70	1.65	1.40	1.70	1.40	E	E
22	1.60	1.50	1.50	1.90	2.40	E	1.70	E	1.25	2.20	4.50	2.60	3.55	3.20	2.60	2.15	2.10	E	1.70	1.60	1.70	1.65	1.70	1.65
23	1.80	2.00	2.00	1.80	1.50	1.65	1.65	1.75	4.10	3.10	2.30	3.10	2.50	2.40	2.40	1.60	1.60	1.70	1.80	1.60	1.40	E	1.50	1.60
24	2.40	2.00	2.25	2.00	3.25	B	2.20	B	B	B	B	B	B	3.90	3.85	3.60	2.65	1.50	B	1.55	1.40	1.70	1.40	1.70
25	1.80	B	2.20	2.25	1.70	B	2.40	2.20	B	B	B	B	B	B	2.60	4.00	4.20	3.10	1.40	1.30	1.70	B	1.35	1.20
26	3.40	3.85	2.00	3.60	B	2.25	2.70	B	B	B	B	B	B	B	B	4.10	3.45	2.05	1.60	1.65	2.30	2.10	1.70	1.90
27	1.65	1.90	2.10	B	4.15	3.40	2.00	1.90	2.10	B	B	B	5.05	4.60	4.85	4.30	3.35	3.20	1.80	2.00	1.90	1.85	1.80	2.20
28	2.30	2.50	B	4.00	6.20	2.20	3.45	2.30	B	B	B	B	B	B	B	3.80	3.30	B	B	4.00	3.20	3.10	2.40	2.30
29	2.10	2.40	2.20	2.35	1.80	B	3.00	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
No.	30	30	30	30	29	29	29	28	28	28	29	29	29	29	29	28	29	29	29	30	30	30	30	29
Median	1.90	2.40	2.20	2.30	3.20	3.30	3.00	4.40	B	B	B	5.60	5.05	4.30	3.85	3.40	3.15	3.15	2.30	1.70	1.70	1.80	1.70	1.70
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 5

IONOSPHERIC DATA

Apr. 1960 | h'F2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1									B	B	B	B	B	B	B	B	B	B						
2								B	B	B	B	B	B	B	B	B	B	B						
3								B	B	B	B	B	B											
4											L		L											
5									B	B	B	300		L										
6										B	B	290	270	270	250									
7								B	A	450	L	315	290											
8								B	B	L	500	400	320	360										
9								B	B	340	B	310	B	B	300									
10										B	B													
11										420	B	375	320	320	L	320								
12								C	C	C	C	C	C	C	C	C	C	C						
13								B	B	560	B	B	B	300	L	C								
14										B	285	B	255	270										
15									B	B	345	310	365											
16									365	290	290		290	B	300									
17								B	B	B	370	B	335 B											
18								C	C	C	B	B	B		360	300								
19																								
20								B								250								
21																								
22																								
23																								
24								B	B	B	B	B	B	315										
25									B	B	B	B	B	B	L									
26								B	B	B	B	B	B	B										
27										B	B	B	310	300	290	270								
28									B	B	B	B	B	B	B			B						
29								B	B	B	B	B	B	B	B	B	B	B						
30								B	B	B	B	B	B	B	B	B	B	B						
31																								
No.									1	5	5	7	9	7	5	4								
Median									365	420	345	310	310	300	300	285								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F2 | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 6

IONOSPHERIC DATA

Apr. 1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	370	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	B	B	430	B	535F	B	B	B	B	B	B	E410B	370	300	280	300	265	250	280	B	310	460
4	450	F	360H	305	445	360	485	460	300	275	250	255	250	250	245	240	240	230	215	250	300	B	300	A
5	B	B	440	340	320	A	435	500	B	B	B	B	250	260	265	260	255	260	335	B	420	B	A	B
6	A	275	300	365	B	450	460	370	400	B	B	B	B	B	B	245	245	250	220	220	220	280	360	F
7	A	A	280	310	B	B	B	B	B	B	350	285	B	290	260	250	250	235	250	300	R	F	A	F
8	A	A	A	A	A	B	B	B	B	290	330	B	B	B	280	280	260	265	280	275	A	390	B	C
9	A	B	A	A	B	455	F	B	B	B	B	B	B	B	B	265	260	260	270	270	280	270	280	A
10	A	A	300	460F	270	B	500	425	R	B	B	270	270	290	280	270	290	245	295	290	370	325	315	A
11	F	A	F	B	400	270	A	485	400	E360B	B	B	B	280	280	B	280	290	270	300	370	A	A	A
12	A	A	430	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	260	300	B	A	A	A
13	A	B	B	B	B	500	B	B	B	B	B	B	B	B	270	C	280	280	280	260	265	290	400	400
14	A	A	F	B	B	B	A	460	380	B	280	B	B	B	275	275	300	280	240	250	270	A	410	A
15	B	B	A	B	B	B	A	420	B	B	B	B	B	265	280	270	275	240	250	255	265	270	325	415
16	B	305	B	A	B	A	390	510	B	B	B	275	B	B	B	280	265	315	S	F	F	570	F	F
17	B	A	F	A	B	410	B	B	B	B	B	B	B	B	280	300	300	250	230	300	290	A	A	A
18	A	B	A	400	A	B	B	B	B	B	B	B	B	295	B	B	275	285	270	250	335	B	B	390
19	B	A	A	B	B	A	500	400	400	285	260	255	240	250	235	230	240	215	215	220	250	235	290	290
20	360	335	390	400	425	400	B	B	340	265	250	235	220	225	230	B	235	210	200	205	230	240	265	B
21	B	B	B	380	410	375	350	310	265	250	230	230	220	200	220	205	255	210	205	220	220	210	210	260
22	320	340	A	A	F	370	390	350	280	250	280	235	250	250	225	215	215	230	210	230	230	230	235	280
23	295	380	B	F	F	535	400	410	400	300	250	260	230	235	220	215	220	220	200	200	240	250	325	360
24	A	360	365	400	F	B	A	B	B	B	B	B	B	B	290	275	270	330	B	500	A	A	A	A
25	A	B	B	465	500	B	580A	F	B	B	B	B	B	B	300	340	330	355	370	A	A	B	A	A
26	B	B	A	A	B	A	A	B	B	B	B	B	B	B	B	280	270	265	335	B	B	A	A	A
27	A	A	B	B	B	B	A	400	370	B	B	B	B	B	B	B	230	255	250	350	A	A	A	A
28	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	440	420	B	B	A	A	A	A	A
29	R	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
No.	5	6	8	10	8	10	11	13	10	8	9	9	8	13	18	20	25	24	23	21	17	12	13	8
Median	360	340	360	390	420	405	460	420	375	275	260	255	245	255	270	270	265	260	250	255	270	270	310	375
U.Q.																								
L.Q.																								
Q.R.																								

h'F Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 7

IONOSPHERIC DATA

Apr. 1960 | h'E | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								B	B	B	B	B	B	B	B	B	B	B						
2								B	B	B	B	B	B	B	B	B	B	B						
3								B	B	B	B	B	B	B	B	B	B	B						
4								B	B	B	B	B	B	B	B	B	B	B						
5								B	B	B	B	B	B	B	B	B	B	B						
6								B	B	B	B	B	B	B	B	B	B	B						
7								B	B	B	B	B	B	B	B	B	B	B		150				
8								B	B	B	B	B	B	B	B	B	B	B						
9								B	B	B	B	B	B	B	B	B	B	B						
10								B	B	B	B	B	B	B	B	B	B	B						
11								B	B	B	B	B	B	B	B	B	B	B		170				
12								C	C	C	C	C	C	C	C	C	C	C						
13								B	B	B	B	B	B	B	B	C	B	B						
14								B	B	B	B	B	B	B	B	B	B	B						
15								B	B	B	B	B	B	B	B	B	B	B						
16								B	B	B	B	B	B	B	B	B	B	B						
17								B	B	B	B	B	B	B	B	B	B	B						
18								C	C	C	B	B	B	B	B	B	B	B						
19								B	B	B	B	B	B	B	B	B	B	B						
20								B	B	B	B	B	B	B	B	B	B	B						
21								B	B	B	B	B	B	B	B	B	B	B						
22								A	B	B	B	B	B	B	B	A	A	E						
23								B	B	B	B	B	B	B	B	A	A	B						
24								B	B	B	B	B	B	B	B	B	B	B						
25								B	B	B	B	B	B	B	B	B	B	B						
26								B	B	B	B	B	B	B	B	B	B	B						
27								B	B	B	B	B	B	B	B	B	B	B						
28								B	B	B	B	B	B	B	B	B	B	B						
29								B	B	B	B	B	B	B	B	B	B	B						
30								B	B	B	B	B	B	B	B	B	B	B						
31																								
No.																		1		2				
Median																		E		160				
U.Q.																								
L.Q.																								
Q.R.																								

h'E

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

IONOSPHERIC DATA

Apr. 1960 | h'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	B	120	120	135	B	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	B	B	B	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	B	B	150	145	145	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150
4	150	B	B	150	160	B	140	180	B	B	B	B	B	B	B	B	B	B	B	B	B	130	130	150
5	B	B	135	150	150	110	120	135	B	B	B	B	B	B	B	B	B	B	B	B	B	120	125	140
6	145	120	145	140	B	150	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120
7	110	110	125	170	B	B	B	B	125	110	B	B	B	B	B	B	B	B	B	B	120	165	110	130
8	120	100	100	110	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120	155	B	C
9	120	160	110	115	130	120	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	180	130
10	130	130	150	170	140	B	120	115	140	B	B	B	B	B	B	B	B	B	B	B	150	110	105	120
11	115	100	140	B	120	120	120	120	B	B	B	B	B	B	B	B	B	B	B	G	140	150	110	110
12	140	110	5	115	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	120	135	110
13	110	110	105	110	B	165	B	B	B	B	B	B	B	B	B	C	B	B	B	B	170	B	120	120
14	130	125	140	B	B	140	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	140	165	120
15	B	110	110	B	B	B	120	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170
16	120	150	B	135	125	105	B	B	B	B	B	B	B	B	B	B	B	B	S	135	125	120	115	135
17	B	135	135	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110	120	105
18	125	130	135	155	125	B	B	C	C	C	B	B	B	B	B	B	B	B	B	B	115	B	120	150
19	165	120	140	110	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E	E
22	B	B	160	135	150	120	130	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23	B	160	135	135	125	140	135	130	B	B	B	B	B	B	B	100	100	100	B	B	B	E	150	130
24	150	B	120	130	120	B	125	B	B	B	B	B	B	B	B	B	B	165	B	155	120	140	110	110
25	160	B	125	135	115	B	140	135	B	B	B	B	B	B	B	B	B	B	110	120	110	B	115	100
26	150	130	120	135	B	120	120	B	B	B	B	B	B	B	B	B	B	B	140	180	130	135	110	110
27	125	130	135	B	120	120	115	B	B	B	B	B	B	B	B	B	B	B	B	170	125	120	120	140
28	120	120	B	120	180	125	125	130	B	B	B	B	B	B	B	B	B	B	B	170	120	130	135	160
29	135	125	130	100	100	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31																								
No.	19	19	22	21	18	15	17	9	3	1						1	1	2	2	6	12	14	18	21
Median	130	125	135	135	125	120	125	135	135	110						100	100	130	125	160	120	130	120	130
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.0 Mc to 200 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 9

IONOSPHERIC DATA

Apr. 1960 | Types of Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1					a	a	a		a															
2					a																			
3			a	a	a	a																		a
4	r			a	a		a	a														a	a	a
5			a	a	a	a	a	a														r	a	r
6	a	a	a	r		a	a																	a
7	a	a	fa	a					a	a											f	a	a	a
8	a	f	r	a	a																r	a		
9	r	a	a	a	a	a	a																a	a
10	r	r	a	a	a		a	a	a												a	r	a	a
11	a	f	a		a	a	a	a													a	r	a	a
12	a	a	a	a																		a	r	a
13	a	f	r	r		a															a		a	r
14	r	r	a			a	r															a	a	r
15		a	r				a	a																r
16	a	a		a	a	a														a	a	a	a	a
17		a	a	r																		r	a	f
18	r	a	r	a	a																r		r	a
19	a	r	a	r		a																		
20																								
21																								
22			a	a	a	a	a	a																
23		a	a	a	a	a	a	a								l	l	f					a	a
24	a		a	r	a		a											a		a	r	a	f	f
25	a		a	a	a		a	a											a	r	f		a	f
26	a	f	a	a		r	a												a	a	a	a	a	a
27	a	a	f			a	a													a	r	r	r	r
28	a	r		a	a	a	f	a												a	a	a	a	a	a
29	a	a	a	f	f		a																	
30																								
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es | Sweep 1.0 Mc to 200 Mc in 30 sec in automatic operation

S 10

IONOSPHERIC DATA

May.1960 | **foF2** | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	A	A	B	R	B	B	F	6.7^{F}	6.6^{F}	6.8^{F}	6.7^{R}	7.3	6.8^{F}	B	6.0^{F}	^{U}4.3^{R}	3.2	3.4	B	B	B
2	A	B	B	4.2	5.3^{F}	B	A	B	B	4.8	6.2	B	B	7.8^{R}	8.3	7.3	B	7.1^{F}	F	F	2.7^{F}	B	B	A
3	A	A	B	A	B	B	R	B	4.9^{F}	F	F	^{U}6.7^{F}	6.8^{F}	7.8^{F}	R	F	F	F	7.7^{F}	F	B	B	B	B
4	3.7^{R}	A	A	F	F	4.6	F	F	F	F	6.9^{F}	7.4	8.4	9.4	9.9	8.8^{F}	F	6.7^{F}	^{U}5.4^{F}	4.2^{F}	3.0^{F}	2.0	B	R
5	A	R	R	R	F	4.3	R	F	F	5.8	F	7.6^{F}	8.7^{R}	9.0	8.9	8.1	8.8	7.3	5.5	B	B	B	2.0	B
6	R	A	A	B	B	A	^{U}4.1^{F}	A	4.7	5.3^{F}	B	B	B	B	B	7.0^{F}	8.3	9.3	R	3.9^{F}	A	B	A	4.0
7	F	B	B	F	B	B	B	B	B	B	B	B	R	B	6.5	6.2	5.3	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	^{U}6.8^{R}	B	B	B	B	B	B	A
9	B	B	B	B	B	A	A	A	2.7^{F}	C	6.0	^{J}9.5^{R}	8.9	10.6	11.2	8.9	8.9	F	8.3^{R}	6.0	B	B	B	B
10	3.5	B	B	B	R	B	R	4.7	4.7^{F}	5.4^{F}	7.7^{F}	8.4	B	10.9	10.0	10.3	8.6	8.8	8.6^{F}	R	B	B	B	R
11	R	B	B	A	R	F	B	^{U}5.1^{F}	B	B	B	B	B	B	6.2^{F}	F	7.9^{F}	8.0	7.1^{F}	4.5^{F}	B	B	R	3.7
12	A	A	A	A	A	B	R	B	B	B	B	5.2^{F}	B	F	10.5	10.4	R	B	F	B	2.3	A	A	R
13	R	B	F	B	A	R	4.3	B	R	B	6.3	F	9.0^{F}	10.4	10.2	9.4^{R}	F	8.3^{F}	F	4.8^{F}	B	B	B	B
14	B	B	B	B	B	4.5^{F}	B	B	B	B	B	5.4	B	B	R	F	F	8.9^{F}	F	F	5.9^{F}	R	R	R
15	3.6	3.4	R	R	F	A	4.7^{F}	F	F	6.0	F	F	8.3^{F}	^{U}8.9^{F}	R	10.0	F	10.7^{F}	F	F	5.0^{S}	B	2.4	R
16	R	3.6	R	R	A	A	4.4^{F}	F	F	B	F	8.4^{F}	R	F	10.0^{R}	8.3^{F}	F	7.6	F	A	^{U}5.6^{F}	F	5.0^{F}	A
17	R	F	4.4^{F}	F	6.1^{F}	R	F	F	F	F	C	6.7	6.9^{F}	8.0^{F}	^{D}8.8^{S}	8.9^{F}	8.5^{F}	F	6.4	F	4.1	B	B	R
18	R	3.8^{F}	R	A	R	R	B	R	B	F	5.6	F	F	9.6	9.5^{F}	9.0^{F}	7.5^{F}	7.0	5.7^{F}	F	F	B	B	B
19	^{U}2.8^{F}	R	A	A	A	4.8^{F}	F	F	F	F	B	6.0	6.9^{F}	8.2^{F}	F	8.3^{F}	F	5.9^{F}	4.7^{F}	3.0	2.2	B	1.8	A
20	3.3	3.6	F	2.6	2.7	2.8	3.1^{F}	3.4^{R}	2.6^{R}	^{U}3.9^{F}	F	8.0^{F}	8.3	8.7	9.2^{R}	7.3	7.6	7.6	4.9^{F}	4.6^{F}	2.6^{F}	B	B	B
21	2.1^{F}	B	F	A	4.8^{F}	F	F	F	F	F	F	F	8.4^{F}	9.9^{F}	9.9^{F}	F	7.6	F	5.9^{F}	5.1^{F}	B	B	B	B
22	R	3.5	A	3.4	3.4	F	F	2.2^{F}	2.4^{F}	F	4.7^{F}	7.3^{F}	9.4	9.4	8.6	6.4	5.8	4.3	3.0^{R}	2.2	B	B	B	R
23	1.7^{R}	A	2.1	A	2.4	2.7	2.8^{F}	2.5^{F}	F	2.7	F	6.5^{F}	8.2^{F}	9.5	9.8^{F}	8.0^{F}	6.9	^{U}5.6^{F}	4.8^{F}	4.4^{F}	3.4^{F}	A	F	4.5
24	B	A	F	F	A	4.1	F	B	A	B	B	B	B	B	5.2^{F}	6.8^{F}	F	7.6	R	R	R	A	A	R
25	R	R	A	A	F	A	R	3.1^{F}	B	3.4	S	4.4^{F}	5.0^{F}	6.0^{F}	6.8^{S}	F	7.0^{F}	5.7^{F}	F	B	R	A	4.4^{F}	R
26	R	R	B	R	A	R	B	A	R	A	B	B	4.6^{F}	6.0^{F}	F	F	F	F	B	B	R	R	A	A
27	F	A	A	B	B	B	R	R	R	B	R	5.5	6.1^{F}	6.5^{F}	7.6	6.4^{F}	5.4^{F}	5.1	B	B	B	R	R	R
28	R	R	A	B	B	B	B	B	4.0^{F}	B	4.3	F	6.9^{F}	7.5^{F}	F	6.4^{F}	5.2^{F}	4.4^{F}	^{U}3.6^{F}	2.0	2.0	B	B	B
29	A	A	A	A	A	B	B	A	F	F	B	B	5.0	5.4	6.1^{F}	6.1^{R}	5.0	3.9	3.5	2.2	2.1	B	A	A
30	F	B	B	B	B	B	4.8	F	4.0	4.2	5.0	4.9^{F}	R	R	6.9^{F}	R	F	R	R	B	B	R	A	B
31	A	A	A	A	A	B	B	B	B	B	4.2	6.0^{F}	7.4	8.3^{R}	8.3	7.6^{R}	C	C	3.6	C	2.2	B	B	B
No.	7	5	2	3	6	7	7	6	8	9	11	18	19	22	23	23	17	21	17	13	14	1	5	3
Median	3.3	3.6	3.2^{F}	3.4	4.1^{F}	4.3	4.3^{F}	3.2^{F}	4.0^{F}	4.8	6.0	6.6^{F}	7.4^{F}	8.5	8.8	8.0	7.5	7.1	5.4^{F}	4.2^{F}	2.8	2.0	2.4	4.0
U.Q.	3.6	3.7		3.8	5.3	4.6	4.7	4.7	4.7	5.6	6.7	7.6	8.4	9.5	9.9	8.9	8.4	7.8	6.8	4.7	4.1		4.7	4.2
L.Q.	2.1	3.4		3.0	2.7	2.8	3.1	2.5	2.6	3.6	4.7	5.5	6.8	7.5	6.9	6.8	5.6	5.6	4.0	2.6	2.2		1.9	3.8
Q.R.	1.5	0.3		0.8	2.6	1.8	1.6	2.2	2.1	2.0	2.0	2.1	1.6	2.0	3.0	2.1	2.8	2.2	2.8	2.1	1.9		2.8	0.4

foF2

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

IONOSPHERIC DATA

May.1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										B	B	B	B	B	B	B								
2										B	B	B	B	B	B	B								
3										B	B	B	B	B	B	B								
4										B	B	B	B	B	B	B								
5										B	B	B	B	B	B	B								
6										B	B	B	B	B	B	B								
7										B	B	B	B	B	B	B								
8										B	B	B	B	B	B	B								
9										C	B	B	B	B	B	B								
10										B	B	B	B	B	B	B								
11										B	B	B	B	B	B	B								
12										B	B	B	B	B	B	B								2.75
13	3.20									B	B	B	B	B	B	B								
14										B	B	B	B	B	B	B								
15	2.70									B	B	B	B	B	B	B								2.30
16										B	B	B	B	B	B	B								
17										B	C	B	B	B	B	B								1.85
18	2.30									B	B	B	B	B	B	B								
19										B	B	B	B	B	B	B								
20										B	B	B	B	B	B	B								
21										B	B	A	A	B	B	B								
22										B	B	B	B	B	B	B								
23										B	B	B	B	B	B	B								
24										B	B	B	B	B	B	B								
25										B	B	B	B	B	B	B								
26										B	B	B	B	B	B	B								
27										B	B	B	B	B	B	B								
28										B	B	B	B	B	B	B								
29										B	B	B	B	B	B	B								
30										B	B	B	B	B	B	B						2.40	2.15	
31										B	B	B	B	B	B	B								
No.	3																					1	1	3
Median	2.70																					2.40	2.15	2.30
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 2

IONOSPHERIC DATA

May.1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	J8.4	B	J8.7	J6.0	5.6	3.7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	J5.2	B	B	B	3.5	B	J5.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	3.2
3	3.2	3.2	B	3.7	4.5	B	3.7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	3.4	J3.0	3.7	4.0	2.8	4.5	2.4	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.7
5	J6.5	3.9	3.9	3.3	2.6	3.8	4.3	4.0	2.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.7
6	2.8	4.0	3.6	5.6	B	4.5	3.9	J5.7	B	B	B	B	B	B	B	B	B	B	2.6	2.7	J4.8	B	4.7	2.8
7	3.6	B	4.9	3.0	B	J7.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	4.4
9	B	5.0	B	B	B	3.9	2.8	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10	B	B	B	B	2.8	B	3.7	3.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.7
11	3.0	3.7	J5.7	5.1	3.7	4.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.3	3.7
12	J7.6	5.0	4.3	4.7	4.3	B	4.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.8	2.9	3.4
13	3.4	B	3.8	B	4.1	3.6	J3.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	4.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.9	2.2
15	3.7	3.7	3.4	2.9	2.7	4.0	J2.9	J3.9	J4.3	B	B	B	B	B	B	B	B	B	B	B	B	B	2.2	2.7
16	2.7	2.6	3.2	3.6	J5.0	4.8	J4.2	3.0	2.2	B	B	B	B	2.7	B	B	B	3.3	B	J4.6	4.6	J4.2	J5.2	J6.0
17	J3.9	J4.4	J4.6	B	J5.0	4.3	3.6	2.8	2.0	B	C	B	B	B	B	B	B	B	B	B	B	B	B	3.0
18	2.6	3.5	3.2	4.0	3.2	3.9	B	4.4	B	B	B	B	B	B	3.8	B	B	B	1.7	B	B	B	B	B
19	B	2.5	J4.0	J7.2	J3.9	J4.2	2.7	B	1.9	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.4
20	2.8	2.5	3.8	2.4	B	B	B	B	B	B	B	B	3.0	B	B	B	B	B	B	E	B	B	B	B
21	B	2.6	2.2Y	4.2	J4.8	J3.7	1.6	B	B	2.0	1.8	2.4	2.3	B.	B	B	B	B	B	B	B	B	B	B
22	2.9	J2.8	J4.0	J2.7	B	B	J3.9	B	B	2.0	J4.2	2.7	B	B	J4.1	J2.9	J3.3	B	B	B	B	B	B	B
23	2.3	J3.2	B	2.7	2.1	J3.1	J4.9	B	B	B	B	B	B	B	2.4	B	B	B	B	1.9	2.2	J4.0	3.6	J7.7
24	B	3.7	3.0	2.9	J6.6	4.4	J8.5	B	J5.5	B	B	B	B	B	B	B	B	B	B	2.9	J3.4	J4.3	J4.2	J4.1
25	J5.0	J3.7	J7.0	5.4	J2.8	J4.2	3.9	2.4H	4.6	B	S	B	B	B	B	B	B	B	2.7	B	3.2	J8.5	4.2	4.1
26	3.4	4.2	4.0	3.0	4.8	3.9	5.1	4.0	3.8	4.6	B	B	B	B	B	B	B	B	B	B	2.7	2.4	2.9	J3.2
27	J5.1	J6.0	J4.0	B	B	B	4.5	3.5	4.1	B	B	B	B	B	B	B	B	B	B	B	B	2.6	3.0	3.8
28	3.9	3.5	J4.6	B	3.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	4.8	3.3	J4.2	3.6	J5.9	B	B	J5.2	J4.1	B	B	B	B	B	B	B	B	B	B	B	B	B	3.3	J6.2
30	J6.3	B	3.8	4.8	B	B	B	2.9	B	B	B	B	B	B	B	B	B	B	B	B	B	2.8	3.4	J7.1
31	3.0	J3.5	3.1	3.0	4.0	B	3.6	B	B	B	2.3	B	B	B	B	B	C	B	B	C	B	B	B	B
No.	24	24	23	22	22	18	22	12	10	3	3	2	2	1	3	1	1	1	4	5	6	8	13	20
Median	3.5	3.6	3.9	3.6	4.0	4.1	3.8	3.8	4.0	2.0	2.3	2.6	2.6	2.7	3.8	J2.9	J3.3	3.3	2.6	2.7	3.3	J3.4	3.3	3.3
U.Q.	4.9	4.1	4.3	4.8	4.8	4.5	4.3	4.2	4.3	3.3	3.2				4.0				2.9	3.8	4.6	4.2	4.2	4.2
L.Q.	3.0	3.1	3.4	3.0	2.8	3.9	3.2	3.0	2.2	2.0	2.0				3.1				2.2	E1.9	2.7	2.7	2.9	2.7
Q.R.	1.9	1.0	0.9	1.8	2.0	0.6	1.1	1.2	2.1	1.3	1.2				0.9				0.7	D1.9	1.9	1.5	1.3	1.5

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories Japan

S 3

IONOSPHERIC DATA

May.1960 | f-min | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	650	B	3.20	2.85	5.05	3.40	B	B	5.30	4.15	3.40	4.35	4.60	5.05	4.60	B	2.00	2.60	1.70	2.80	B	B	B
2	3.00	B	B	3.30	2.70	B	3.40	B	B	3.50	4.30	B	B	6.65	5.60	4.70	B	3.70	2.15	2.10	2.00	B	B	1.65
3	1.70	1.85	B	2.70	3.80	B	2.30	B	3.90	2.25	3.15	4.15	4.20	4.30	7.00	4.10	4.10	2.00	3.70	2.50	B	B	B	B
4	1.70	1.80	2.00	1.90	1.85	2.00	1.70	1.85	1.60	1.80	2.40	3.20	3.20	3.10	2.50	3.55	2.20	1.55	1.50	1.50	1.90	1.60	B	1.80
5	3.50	3.60	3.15	2.50	1.80	3.00	2.15	1.85	2.00	3.15	3.15	3.30	4.05	4.30	3.60	3.40	2.40	3.55	4.40	B	B	B	1.70	1.80
6	2.15	2.15	2.00	4.10	B	3.25	2.65	3.20	4.00	3.85	B	B	B	B	B	3.40	1.65	3.20	1.50	1.50	1.70	B	2.10	1.90
7	2.30	B	4.25	2.50	B	4.60	B	B	B	B	B	B	4.70	B	4.60	3.70	3.70	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	6.10	B	B	B	B	B	B	3.30
9	B	4.05	B	B	B	2.20	2.20	B	1.65	C	2.60	2.30	2.65	2.25	2.15	3.00	3.25	4.00	4.85	3.00	B	B	B	B
10	3.10	B	B	B	2.20	B	3.35	2.55	2.50	2.20	2.60	3.35	B	4.25	3.10	2.60	3.60	4.00	3.50	4.35	B	B	B	2.10
11	1.90	2.40	1.60	2.85	2.90	3.15	B	3.10	B	B	B	B	B	B	4.50	2.20	2.00	2.60	1.70	3.40	B	B	1.50	1.40
12	1.80	3.50	2.35	2.70	3.20	B	2.20	B	B	B	B	2.70	B	4.60	6.40	4.60	7.40	B	3.30	B	2.00	1.90	1.60	1.60
13	1.50	B	3.20	B	3.15	3.30	2.10	B	3.90	B	4.40	3.50	5.00	4.35	7.30	4.80	4.20	3.70	3.15	3.45	B	B	B	B
14	3.55	B	B	B	B	3.20	B	B	B	B	B	B	B	B	5.90	3.40	2.90	3.40	4.00	1.90	2.50	3.20	2.20	1.80
15	1.90	2.00	1.70	2.20	2.20	2.20	1.60	1.85	1.90	3.80	4.20	3.00	2.80	3.10	6.15	2.10	3.85	2.65	1.65	2.00	2.90	B	1.60	1.35
16	1.35	1.60	2.40	2.10	2.95	2.90	1.55	1.40	1.65	B	4.20	4.05	3.30	2.35	3.00	2.70	2.15	2.35	1.20	1.40	1.50	1.50	1.60	1.60
17	1.55	1.60	1.55	1.90	2.10	1.80	1.70	1.70	1.60	1.70	C	3.55	2.35	2.20	3.90	2.20	2.20	1.30S	3.60	1.60	1.95	B	B	1.30
18	E	1.65	1.70	1.60	1.60	2.10	B	3.40	B	3.20	3.65	3.20	3.40	2.40	2.25	1.60	1.80	1.60	1.50	1.40	1.50	B	B	B
19	2.00	1.70	1.55	1.40	1.70	1.90	1.65	1.60	E	1.90	B	3.70	2.20	4.90	3.80	3.20	2.05	2.10	2.20	1.70	1.60	B	1.40	1.80
20	1.35	1.65	2.20	1.80	2.20	1.85	1.65	1.65	1.80	2.60	2.20	2.20	2.40	2.65	2.40	1.80	1.80	2.00	2.00	E	1.90	B	B	B
21	1.40	2.00	1.20	E	1.90F	1.40	E	1.85	1.35	1.25	1.60	1.40	1.55	1.90	3.35	3.20	2.00	2.20	3.90	3.40	B	B	B	B
22	1.50	1.35	1.55	1.50	1.70F	1.90	1.60	1.55	1.60	1.50	1.90	2.10	2.20	2.70	2.10	1.90	1.80	1.55	1.80	1.65	B	B	B	2.00
23	1.70	1.25	1.80	1.50	1.50	1.50	1.40	1.50	1.50	1.45	1.60	1.70	3.10	2.00	1.60	1.60	1.60	1.70	1.40	1.60	1.40	1.50	1.40	1.40
24	B	2.15	1.50	1.90	4.20	2.70	1.60	B	2.10	B	B	B	B	B	3.15	3.35	2.90	3.65	4.20	1.45	1.30	1.55	1.40	2.15
25	1.90	1.35	1.95	2.10	1.40	2.25	2.60	1.10	3.40	2.80	S	3.10	3.40	3.30	2.60	3.60	1.75	1.65	1.55	B	1.20	1.75	1.90	2.80
26	3.00	1.70	3.35	1.70	2.85	2.70	4.30	1.60	2.70	3.10	B	B	3.30	3.65	4.70	4.30	4.20	2.55	B	B	1.50	1.75	1.65	1.80
27	1.40	1.45	1.80	B	B	B	3.65	1.80	3.45	B	4.20	3.85	3.20	3.20	2.10	1.65	1.65	2.20	B	B	B	1.45	1.40	1.85
28	3.25	3.30	2.20	B	2.60	B	B	B	2.20	B	3.35	2.50	3.40	2.00	2.60	2.00	1.60	1.60	1.45	1.30	1.50	B	B	B
29	2.15	2.10	1.95	1.80	4.20	B	B	2.50	1.90	3.45	B	B	3.10	2.50	2.10	2.20	1.95	1.85	1.55	1.55	1.60	B	1.50	2.10
30	2.05	B	3.00	3.60	B	B	4.30	2.55	2.40	3.20	3.60	3.30	4.30	4.30	3.65	4.80	4.00	4.40	3.10	B	B	1.40	1.40	4.35
31	2.30	1.70	1.40	1.35	2.00	B	3.20	B	B	B	2.00	2.40	3.10	3.25	2.10	2.20	C	3.10	2.00	C	1.60	B	B	B
No.	31	31	31	31	31	31	31	31	31	30	29	31	31	31	31	31	30	31	31	30	31	31	31	31
Median	2.00	2.00	2.20	2.50	2.85	3.15	2.60	2.55	2.50	3.50	4.20	3.40	3.40	3.65	3.60	3.20	2.30	2.55	2.60	2.05	2.00	B	B	2.10
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 4

IONOSPHERIC DATA

May.1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	B	B	A	A	B	B	B	B	500	370	315	410	320	315	295	B	260	250	285	300	B	B	B
2	A	B	B	410	300	B	A	B	B	305	250	B	B	330	240	270	B	250	220	290	260	B	B	A
3	A	A	B	A	B	B	A	B	400	275	260	260	250	250	290	250	235	235	275	230	B	B	B	B
4	385	A	A	F	530	535	395	320	290	250	240	230	230	215	215	215	210	220	220	220	240	290	B	B
5	A	B	B	B	380	415	A	400	320	300	280	250	250	250	240	235	235	260	295	B	B	B	335	B
6	B	A	A	B	B	A	450	A	450	350	B	B	B	B	B	300	290	280	A	400	A	B	A	450
7	F	B	B	300	F	B	B	B	B	B	B	B	340	B	315	270	385	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	400	B	B	B	B	B	B	A
9	B	B	B	B	B	A	A	B	400	C	280	215	235	230	225	220	245	275	275	260	B	B	B	B
10	365	B	B	B	B	B	B	430	300	285	230	235	B	240	230	210	265	250	265	290	B	B	B	B
11	A	A	A	A	B	F	B	335	B	B	B	B	B	B	290	255	265	230	250	360	B	B	A	330
12	A	A	A	A	A	B	A	B	B	B	B	275	B	270	260	265	300	B	240	B	300	A	A	A
13	B	B	320	B	A	B	A	B	420	B	275	240	235	230	300B	240	265	265	235	280	B	B	B	B
14	B	B	B	B	B	380	B	B	B	B	B	320	B	B	285	255	250	240	265	240	250	400	B	B
15	335	370	A	B	350	A	370	370	330	320	280	235	230	230	265	215	260	265	225	230	300	B	330	A
16	A	360	B	A	A	A	450	390	305	B	270	215	220	235	240	210	240	280	250	A	F	275	400	F
17	A	F	400	340	380	A	460	400	330	290	C	280	285	265	260	250	250	210	270	275	340	B	B	A
18	A	325	A	A	A	A	B	A	B	320	310	245	220	220	210	200	200	225	220	235	255	B	B	B
19	300	B	A	A	A	450	365	290	285	315	B	270	250	270	235	225	220	215	220	240	265	B	280	A
20	380	320	F	330	500	420	390	400	410	350	270	250	220	215	220	220	230	220	220	220	260	B	B	B
21	290	B	F	A	335	425	315	265	265	240	250	235	225	230	220	210	235	250	215	230	B	B	B	B
22	A	380	A	415	400F	400	365	345	340	280	235	205	235	205	210	210	200	220	215	365	B	B	B	375
23	E380R	A	465	A	435	390	365	365	350	290	265	225	250	220	220	215	210	220	265	290	320	A	F	380
24	B	A	F	F	B	360	310	B	A	B	B	B	B	B	325	310	285	300	360F	A	A	A	A	A
25	A	A	A	A	F	A	A	445	B	395	S	335	300	280	240	240	250	275	270	B	A	A	340	A
26	A	A	B	A	A	B	B	A	A	A	B	B	300	280	275	270	250	260	B	B	A	B	A	A
27	F	A	A	B	B	B	B	A	B	B	425	300	275	225	250	230	220	220	B	B	B	A	A	A
28	B	B	A	B	B	B	B	B	290F	B	340	260	255	220	225	205	200	230	210	240	240	B	B	B
29	A	A	A	A	B	B	B	A	F	375	B	B	340	300	260	215	235	230	250	360	335	B	A	A
30	F	B	B	B	B	B	570	420	380	360	340	300	300	280	275	335	310	360	360	B	B	B	A	B
31	A	A	A	A	A	B	B	B	B	B	265	245	220	230	220	235	C	240	215	C	265	B	B	B
No.	7	5	3	5	9	9	12	14	17	18	19	23	23	25	29	30	28	28	24	20	14	3	5	4
Median	350	360	400	340	380	415	380	380	330	310	270	250	250	235	240	235	250	245	250	270	265	290	335	380
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'F Sweep 10 Mc to 20.0 Mc in 30 sec in automatic operation

S 5

IONOSPHERIC DATA

May.1960 | h'E | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										B	B	B	B	B	B	B								
2										B	B	B	B	B	B	B								
3										B	B	B	B	B	B	B								
4										B	B	B	B	B	B	B								
5										B	B	B	B	B	B	B								
6										B	B	B	B	B	B	B								
7										B	B	B	B	B	B	B								
8										B	B	B	B	B	B	B								
9										C	B	B	B	B	B	B								
10										B	B	B	B	B	B	B								
11										B	B	B	B	B	B	B								
12										B	B	B	B	B	B	B								115
13	115									B	B	B	B	B	B	B								
14										B	B	B	B	B	B	B								
15	120									B	B	B	B	B	B	B								110
16										B	B	B	B	B	B	B								
17										B	C	B	B	B	B	B								120
18	115									B	B	B	B	B	B	B								
19										B	B	B	B	B	B	B								
20										B	B	B	B	B	B	B								
21										B	B	A	A	B	B	B								
22										B	B	B	B	B	B	B								
23										B	B	B	B	B	B	B								
24										B	B	B	B	B	B	B								
25										B	S	B	B	B	B	B								
26										B	B	B	B	B	B	B								
27										B	B	B	B	B	B	B								
28										B	B	B	B	B	B	B								
29										B	B	B	B	B	B	B								
30										B	B	B	B	B	B	B						120	120	
31										B	B	B	B	B	B	B								
No.	3																					1	1	3
Median	115																					120	120	115
U.Q.																								
L.Q.																								
Q.R.																								

h'E

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 6

IONOSPHERIC DATA

May.1960 | h'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	160	B	120	100	110	100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	125	B	B	B	150	B	100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	115
3	120	120	B	135	125	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	120	120	130	130	120	110	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	140
5	160	120	135	130	110	140	130	115	170	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150
6	120	115	115	110	B	105	120	105	B	B	B	B	B	B	B	B	B	B	115	110	110	B	135	135
7	165	B	125	150	B	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	130
9	B	135	B	B	B	120	125	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10	B	B	B	B	135	B	125	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170
11	115	115	130	105	135	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	140	130
12	110	115	105	110	130	B	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120	115	130
13	150	B	110	B	140	140	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150	145
15	170	120	120	135	130	120	115	110	105	B	B	B	B	B	B	B	B	B	130	B	B	B	160	150
16	130	130	150	140	135	120	105	110	140	B	B	B	B	115	B	B	B	150	B	120	115	120	115	135
17	110	145	115	B	110	110	110	120	150	B	C	B	B	B	B	B	B	B	B	B	B	B	B	120
18	180	120	120	120	120	120	B	110	B	B	B	B	B	B	110	B	B	B	100	B	B	B	B	B
19	B	130	120	110	105	105	120	B	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	160
20	150	165	150	130	B	B	B	B	B	B	B	B	110	B	B	B	B	B	B	E	B	B	B	B
21	B	155	140	135	100	110	100	B	B	105	105	110	100	B	B	B	B	B	B	B	B	B	B	B
22	130	120	115	110	B	B	120	B	B	160	120	115	B	B	100	100	115	B	B	B	B	B	B	B
23	105	105	B	135	160	125	110	B	B	B	B	B	B	B	105	B	B	B	B	135	155	115	110	115
24	B	120	125	115	110	135	130	B	110	B	B	B	B	B	B	B	B	B	B	140	115	115	115	105
25	125	110	125	100	115	120	120	115"	115	B	S	B	B	B	B	B	B	B	140	B	120	110	115	120
26	160	120	135	120	120	125	160	110	125	110	B	B	B	B	B	B	B	B	B	B	115	115	120	110
27	130	105	110	B	B	B	125	115	120	B	B	B	B	B	B	B	B	B	B	B	B	120	110	115
28	130	135	120	B	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	115	115	120	120	135	B	B	110	120	B	B	B	B	B	B	B	B	B	B	B	B	B	115	150
30	140	B	135	120	B	B	B	135	B	B	B	B	B	B	B	B	B	B	B	B	B	170	160	135
31	150	120	125	130	110	B	105	B	B	B	135	B	B	B	B	B	C	B	B	C	B	B	B	B
No.	24	24	23	22	22	18	22	12	10	3	3	2	2	1	3	1	1	1	4	4	6	8	13	20
Median	130	120	125	120	120	120	120	110	120	110	120	110	105	115	105	100	115	150	110	130	115	120	115	130
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 7

IONOSPHERIC DATA

May. 1960 | **Types of Es** | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		a		a	f	f	f																	r
2	f				a		f																	
3	r	r		a	a		a																	a
4	r	a	a	r	a	r	a																	r
5	a	f	r	a	fa	r	r	r	a										f	a	a		a	a
6	a	a	a	a		a	a	f																
7	a		a	a		a																		a
8																								
9		a				r	a																	a
10					a		a	r																
11	a	a	a	r	a	a																	a	a
12	a	a	a	r	a		r															r	r	k
13	k		f		r	a	r																a	a
14	a																		r				a	k
15	k	a	a	a	a	a	a	a	a															
16	r	r	a	a	a	a	r	r	a					l				a		r	r	a	a	a
17	r	a	a		a	r	r	r	a						l				f					c
18	k	r	r	a	a	a		f																
19		a	a	a	a	a	r		a				f											a
20	a	a	a	a																				
21		a	a	a	a	a	f			l	l	a	l											
22	a	f	f	f			f			a	l	l			l	l	f							
23	f	f		a	a	a	f								l					a	a	a	r	a
24		r	r	f	a	a	a		a											a	a	a	a	a
25	a	a	a	a	a	a	a	a	a										a		r	a	r	r
26	a	a	a	a	a	a	a	a	a	a											r	f	a	a
27	a	a	a				a	a	a													a	a	r
28	a	a	a		a																			
29	r	a	a	a	a			a	a														a	a
30	a		a	a				a														k	k	a
31	a	a	r	r	a		a				a													
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 8

46

IONOSPHERIC DATA

Jun. 1960 | foF2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	A	B	A	B	B	B	B	B	B	B	B	B	B	R	F	R	B	B	B	B	B	B	3.4R
2	3.9	3.6R	A	R	F	R	F	F	F	3.4F	4.9F	5.6F	7.0F	7.3	7.4F	5.4F	5.3F	F	3.8R	B	B	B	B	B
3	B	R	R	2.9F	F	F	F	F	F	F	F	6.2F	6.5F	6.9F	8.3F	F	5.0F	F	3.6F	A	B	B	R	F
4	4.0F	A	A	B	4.0F	B	B	B	F	A	F	B	B	F	F	F	F	F	3.9	R	B	B	A	3.7
5	F	F	4.0	F	B	B	R	B	B	B	B	B	B	B	B	B	F	F	B	B	R	R	R	A
6	R	A	3.7	A	A	B	B	B	B	4.7	B	B	B	7.4	U8.3R	B	9.6	R	R	B	B	B	B	R
7	R	A	A	2.9R	B	A	B	A	A	F	B	B	F	B	F	9.8R	8.2	F	F	4.0	B	B	A	2.5
8	A	A	A	3.8R	A	R	B	B	B	A	B	B	B	B	F	B	F	F	F	F	2.6	R	A	A
9	A	A	B	A	B	B	B	B	B	B	B	B	5.4	F	F	8.2	F	F	F	B	B	R	R	R
10	R	R	R	R	A	A	B	3.8	F	4.0R	F	6.2F	7.3F	7.9F	8.3	6.6F	5.7F	F	F	B	B	B	B	4.2R
11	F	A	A	B	4.3	A	F	F	F	F	3.9F	5.1	7.3F	7.7F	7.3F	7.1	5.6F	U4.5F	3.2F	1.9F	1.9F	B	B	B
12	B	B	2.2	2.7F	F	F	2.2	2.3F	2.5F	2.8F	F	F	F	F	7.6FH	7.4F	C	C	3.7	2.5F	B	B	B	R
13	R	3.6F	U3.2F	3.2F	2.9F	A	F	F	F	F	F	F	F	8.4F	7.7F	F	U5.8F	5.0F	F	3.9	3.1	B	3.1R	3.2F
14	3.0	4.1	4.0F	A	A	F	5.2R	F	F	4.0F	4.5F	F	F	8.3F	9.0F	8.5F	8.8	B	B	B	A	R	3.1F	A
15	A	R	A	A	A	F	4.8R	F	F	F	F	F	B	B	7.6F	F	7.7F	B	F	U2.4R	B	B	A	A
16	A	A	A	R	A	A	A	B	B	F	B	5.3F	F	F	7.8F	5.6F	4.2F	4.0F	4.1F	2.4	B	B	B	B
17	R	2.9R	2.4	A	A	A	4.2F	F	F	4.0	F	6.8F	6.2F	7.9F	8.7F	F	3.7F	5.0F	F	2.8	2.2	B	B	B
18	A	A	A	3.6R	A	B	B	A	F	B	B	5.3F	6.4F	7.2	7.8F	B	F	F	6.4F	B	B	B	A	U3.2F
19	F	F	F	F	F	R	A	A	F	B	B	4.9	B	B	B	B	7.7	F	6.2F	5.0	R	A	A	A
20	A	A	A	A	A	B	B	B	R	A	F	B	6.4F	7.2F	U5.5F	6.5	6.6F	7.0F	4.0F	2.8F	B	B	B	A
21	A	A	A	A	A	A	R	F	B	B	B	B	4.6	B	B	4.5F	F	5.3R	F	2.3	A	A	A	A
22	A	A	A	B	A	B	B	B	B	B	B	F	F	6.2F	F	5.3F	5.3F	5.1F	3.3F	2.5F	B	B	A	A
23	F	A	A	B	B	A	A	F	B	B	B	4.8F	F	6.4F	7.5R	7.2	4.5	4.1R	2.6	B	A	A	A	F
24	A	A	A	B	R	B	B	A	4.3	F	F	B	B	6.3	7.7F	6.5	6.8	S	B	B	B	A	A	A
25	A	B	B	A	A	B	B	B	B	F	3.6R	5.4F	6.2	7.6	6.9R	6.3F	F	7.0R	4.7F	A	A	B	A	A
26	B	B	B	B	B	B	B	B	A	B	B	B	B	C	C	6.0	6.0F	B	B	B	B	B	B	R
27	R	B	B	B	B	B	B	B	B	B	B	B	F	B	B	5.7F	4.4	F	B	B	B	A	A	A
28	A	B	B	B	A	A	F	F	F	F	5.1F	6.0	5.8	F	5.2F	8.8	11.7	B	F	B	B	4.5F	A	B
29	B	B	B	B	B	B	B	B	B	B	B	B	U5.3F	B	6.6F	F	F	5.6F	F	2.8F	2.3F	1.9	B	B
30	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	R	B	A	A
31																								
No.	3	4	6	6	3		4	2	2	6	5	11	12	14	18	17	19	10	12	12	5	2	2	6
Median	3.9	3.6R	3.4	3.0F	4.0F		4.5R	3.0F	3.4F	4.0F	4.5F	5.4F	6.3F	7.4F	7.6F	6.5F	5.8F	5.0F	3.8F	2.6	2.3	3.2F	3.1F	3.3
U.Q.	4.0	3.8	4.0	3.6	4.2		5.0			4.0	5.0	6.2	6.8	7.9	8.3	7.8	7.7	5.6	4.4	3.4	2.8			3.7
L.Q.	3.4	3.2	2.4	2.9	3.4		3.2			3.4	3.8	5.1	5.6	6.9	7.3	5.6	5.0	4.5	3.4	2.4	2.0			3.2
Q.R.	0.6	0.6	1.6	0.7	0.8		1.8			0.6	1.2	1.1	1.2	1.0	1.0	2.2	2.7	1.1	1.0	1.0	0.8			0.5

foF2

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

47

IONOSPHERIC DATA

Jun. 1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											B	B	B	B	B									
2											B	B	B	B	B									
3											B	B	B	B	B									
4											B	B	B	B	B									
5											B	B	B	B	B									
6	2.90										B	B	B	B	B									2.20
7											B	B	B	B	B									
8											B	B	B	B	B									
9											B	B	B	B	B									
10	U 2.85 R	2.80	2.80								B	B	B	B	B									
11											B	B	B	B	B									
12											B	B	B	B	B									
13											B	B	B	B	B									
14			2.90								B	B	B	B	B									
15											A	A	B	B	B									
16											B	B	B	B	B									
17				2.50							B	B	B	B	B									
18											B	B	B	B	B									
19											B	B	B	B	B									
20											B	B	B	B	B									
21											B	B	B	B	B									
22											B	B	B	B	B									
23											B	B	B	B	B									
24											B	B	B	B	B									
25											B	B	B	B	B									
26											B	B	B	C	C									
27	3.70										B	B	B	B	B									
28											B	B	B	B	B									
29											B	B	B	B	B									
30											C	C	C	C	C									
31																								
No.	3	1	2	1																				1
Median	2.90	2.80	2.85	2.50																				2.20
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 2

IONOSPHERIC DATA

Jun. 1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	3.6	J4.5	J8.3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.9
2	B	3.2	3.9	J3.3	3.4	2.9	2.2	B	B	B	B	B	J4.6	J4.6	J4.7	B	B	B	B	B	B	B	B	B
3	B	1.9	2.4	B	B	B	2.3	B	B	B	2.0	4.2	B	J3.3	J5.9	J5.4	B	B	B	J5.2	B	B	3.6	3.6
4	3.4	J6.0	4.1	B	B	B	B	5.6	B	J7.2	B	B	B	B	B	B	B	B	B	2.6	B	B	3.8	3.6
5	J5.0	J6.6	J6.4	B	B	B	2.8	B	B	B	B	B	B	B	B	B	B	B	B	B	3.0	3.2	3.3	J7.7
6	3.6	3.6	3.8	J7.9	J6.4	B	4.4	B	B	4.6	B	B	B	B	B	B	B	B	J8.8	B	B	B	B	2.5
7	2.4	3.0	3.0	2.5	B	5.0	B	3.6	4.8	3.6	B	B	B	B	B	B	B	B	B	B	B	B	3.7	1.9
8	J3.8	3.6	J6.9	3.5	4.4	2.0	5.5	B	5.2	J5.0	B	B	B	B	B	B	B	B	B	2.3	2.3	2.2	3.4	J8.1
9	J6.1	J5.4	8.0	J3.8	5.0	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.5	2.7	2.8
10	G	3.1	3.4	2.6	3.1	4.6	B	J3.3	2.0	B	3.0	B	B	B	B	B	B	2.0	B	B	B	B	B	3.2
11	J5.0	J3.6	3.6	4.4	J6.4	J6.0	B	B	2.6	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	2.3	1.9	B	B	2.6	B	B	B	B	B	2.9	B	B	C	C	B	B	B	B	B	2.3
13	3.2	J2.9	3.6	J2.9	2.8	J5.7	J5.3	J4.8	2.2	J3.6	B	2.9	B	B	J8.0	J7.2	J4.0	2.4	B	B	B	B	B	2.0
14	J5.9	J4.3	G	J3.8	4.0	3.2	J6.5	J3.6	2.1	1.8	B	B	B	4.3	J5.2	J8.9	B	B	B	B	4.0	2.4	2.2	J3.0
15	4.3	3.1	J7.6	J4.4	J4.0	4.6	J4.6	J4.8	2.7	B	2.3	1.9	B	B	B	B	B	B	B	B	B	B	3.7	3.9
16	3.8	J3.7	J3.7	3.0	4.7	J4.6	5.3	B	B	B	B	B	B	B	B	B	B	B	B	2.0	B	B	B	B
17	2.7	2.4	2.2	J7.3	4.8	4.7	J4.3	2.4	B	B	B	1.7	B	B	B	B	B	B	B	B	2.3	B	B	B
18	J4.8	J3.2	3.9	3.4	J4.2	4.7	B	J4.9	2.3	B	B	B	B	B	B	B	B	B	B	B	B	B	3.1	2.3
19	J3.0	3.3	J3.9	J4.6	2.7	B	J4.5	J4.5	4.5	B	B	B	B	B	B	B	B	B	B	B	2.7	3.4	J4.8	J8.0
20	J9.5	J2.9	J7.0	J6.1	3.2	4.4	B	5.4	J6.3	6.2	J4.6	B	B	B	B	B	B	B	B	B	B	B	B	3.4
21	J4.4	J3.8	4.0	J7.7	5.8	5.1	3.8	2.6	B	B	B	B	B	B	B	B	B	B	B	2.4	J3.9	3.5	2.5	4.1
22	3.9	J8.4	J6.6	4.6	3.0	B	B	5.4	B	B	B	B	B	B	B	2.2	2.3	B	B	E	B	B	2.4	J4.8
23	J5.8	J4.3	J3.6	J6.3	B	4.6	3.6	2.6	B	B	B	B	B	B	B	B	B	B	B	B	J2.8	J2.9	3.5	3.6
24	J6.3	J9.0	3.3	B	2.4	B	B	4.0	J4.1	2.2	B	B	B	B	B	B	B	S	B	B	B	J3.5	J3.9	3.9
25	3.8	B	5.0	J5.6	J4.7	B	B	B	4.4	2.6	B	B	B	B	B	B	B	B	B	3.8	4.7	B	J5.1	J4.9
26	B	B	B	4.4	4.7	J7.2	B	B	4.4	B	B	B	B	C	C	B	B	B	B	B	B	B	B	2.8
27	4.1	4.6	5.1	4.7	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	J4.2	J4.5	J8.3
28	J7.7	4.9	5.4	5.3	4.1	J4.7	3.0	J3.6	2.8	B	B	B	B	B	B	B	B	B	B	B	B	3.6	J4.3	B
29	4.2	4.2	4.3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	4.2
30	J8.0	6.6	4.6	B	4.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	2.8	B	3.6	4.3
31																								
No.	25	27	28	24	22	16	14	16	14	9	4	4	1	4	4	4	2	2	1	7	9	10	18	25
Median	J4.2	3.6	4.0	J4.4	4.2	4.6	4.4	3.8	3.4	3.6	2.6	2.4	J4.6	J3.8	J5.6	J6.3	J3.2	2.2	J8.8	2.4	2.8	3.3	3.6	3.6
U.Q.	5.8	4.9	5.2	5.8	4.7	5.0	5.3	4.8	4.5	5.6	3.8	3.6		4.4	7.0	8.0				3.8	4.0	3.5	3.9	4.6
L.Q.	3.5	3.1	3.6	3.4	3.1	4.5	3.0	3.0	2.3	2.4	2.2	1.8		3.1	5.0	3.8				2.0	2.5	2.5	3.1	2.8
Q.R.	2.3	1.8	1.6	2.4	1.6	0.5	2.3	1.8	2.2	3.2	1.6	1.8		1.3	2.0	4.2				1.8	1.5	1.0	0.8	1.8

foEs

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 3

IONOSPHERIC DATA

Syowa Base

Lat. 69°00.4' S
Long. 39°35.4' E

Jun.1960 | **f-min** | 45° E Mean Time (G.M.T. +3h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	2.30	3.80	1.90	B	B	B	B	B	B	B	B	B	B	6.10	3.40	3.45	B	B	B	B	B	B	2.40
2	3.40	2.00	3.20	2.00	1.90	2.15	1.85	2.00	1.70	1.50	1.70	3.30	3.00	1.80	1.80	2.00	2.25	2.80	2.40	B	B	B	B	B
3	B	1.50	2.00	2.10	2.00	1.30	1.55	1.60	1.50	1.55	1.60	2.00	2.00	1.75	2.00	1.60	2.10	1.75	2.00	2.85	B	B	2.10	2.15
4	1.80	3.20	2.50	B	3.30	B	B	4.35	3.20	3.35	3.10	B	B	3.30	3.10	3.10	3.00	2.00	2.10	2.05	B	B	2.15	2.15
5	2.00	2.00	2.15	3.20	B	B	2.00	B	B	B	B	B	B	B	B	B	4.00	4.40	B	B	1.80	1.80	2.20	2.40
6	1.70	1.90	1.70	2.00	1.75	B	3.75	B	B	3.20	B	B	B	4.70	4.55	B	4.10	7.85	3.30	B	B	B	B	1.75
7	1.60	1.75	2.10	1.60	B	3.60	B	2.60	3.35	3.15	B	B	3.10	B	4.40	4.00	4.80	1.90	2.20	3.00	B	B	1.60	1.45
8	1.90	2.20	2.10	1.55	1.60	1.75	4.20	B	4.60	2.05	B	B	B	B	4.60	B	3.80	3.30	3.40	1.65	1.65	1.40	1.10	1.40
9	1.10	1.60	5.80	2.20	4.00	B	B	B	B	B	B	B	4.10	2.85	2.65	3.40	3.20	3.10	3.20	B	B	1.50	1.40	2.00
10	1.60	1.50	1.40	1.40	1.70	2.20	B	1.90	1.65	3.20	2.00	2.00	1.85	1.85	1.60	1.60	1.50	1.60	2.10	B	B	B	B	1.15
11	1.20	1.60	1.55	3.40	2.20	3.50	3.40	3.00	2.00	1.60	1.80	3.00	3.65	3.40	3.00	1.60	1.80	2.00	1.65	1.50	1.60	B	B	B
12	B	B	1.65	1.65	1.60	2.45	1.90	1.80	1.70	1.70	2.35	2.15	3.10	2.05	2.10	3.85	C	C	2.60	2.10	B	B	B	1.10
13	1.35	1.65	1.50	1.60	1.50	2.55	2.00	1.90	1.85	1.75	1.85	2.00	2.70	2.60	1.85	1.90	1.50	1.25	1.25	2.60	2.00	B	2.50	1.70
14	1.30	E	1.20	E	1.75	2.00	3.20	2.10	1.65	1.25	1.95	4.90	3.55	2.50	1.65	2.15	3.00	B	B	B	1.65	1.40	E	1.50
15	1.85	1.40	1.50	1.65	1.60	3.30	2.00	2.00	1.60	1.20	E	1.45	B	B	2.80	4.30	4.25	B	4.10	2.00	B	B	E	E
16	E	E	E	2.00	3.05	1.95	3.20	B	B	2.15	B	4.20	1.90	1.80	1.85	2.10	1.95	1.90	2.00	E	B	B	B	B
17	1.20	1.70	1.65	E	3.00	1.70	1.60	1.40	1.50	1.50	1.40	1.40	1.65	1.60	1.30	1.65	1.40	1.50	1.50	1.50	1.45	B	B	B
18	1.55	1.45	1.70	1.95	2.30	4.00	B	2.00	2.00	B	B	4.10	2.15	3.00	1.80	B	2.40	3.10	4.10	B	B	B	1.55	E
19	E	1.30	1.60	1.30	2.10	3.20	1.80	2.00	1.85	B	B	3.60	B	B	B	B	3.80	4.35	2.15	3.80	2.40	1.30	2.00	1.60
20	1.60	E	2.00	2.05	2.00	3.65	B	4.10	3.75	4.20	2.20	B	4.40	4.10	3.35	2.10	3.70	3.45	2.25	1.60	B	B	B	E
21	E	1.80	3.60	E	3.40	2.00	1.85	E	B	B	B	B	3.90	B	B	3.15	3.80	4.45	2.00	E	E	E	E	2.10
22	1.70	2.00	3.40	3.80	2.15	B	B	3.90	B	B	B	2.20	2.60	2.45	1.80	1.75	1.60	2.70	2.00	E	B	B	E	1.50
23	E	1.60	1.75	3.20	B	2.05	2.10	1.85	B	B	B	3.15	2.30	2.15	1.85	1.50	1.65	2.60	1.90	B	E	E	E	1.80
24	1.40	1.40	1.55	B	2.00	B	B	2.80	1.75	1.85	2.20	B	B	3.70	2.20	4.30	3.90	S	B	B	B	1.40	1.55	3.00
25	1.65	B	4.50	1.60	2.50	B	B	B	3.40	1.75	3.10	3.30	4.60	4.50	4.70	2.00	2.15	6.00	3.20	1.30	1.70	B	1.80	1.55
26	B	B	B	3.00	3.50	4.70	B	B	3.10	B	B	B	B	C	C	4.30	3.00	B	B	B	B	B	B	2.15
27	3.05	3.10	3.20	4.10	B	B	B	B	B	B	B	B	3.60	B	B	3.75	3.20	2.30	B	B	B	2.15	2.20	1.90
28	2.00	3.50	4.20	3.80	2.20	1.90	1.70	2.15	2.30	3.00	2.20	2.20	3.50	3.60	2.20	4.90	3.15	B	3.65	B	B	2.15	2.30	B
29	3.05	3.10	3.30	B	B	B	B	B	B	B	B	B	3.60	B	4.10	3.60	2.05	2.00	2.10	1.40	1.15	1.25	B	1.90
30	2.40	3.20	3.25	B	4.10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	1.45	B	1.70	1.70
31																								
No.	30	30	30	30	30	29	29	29	29	29	29	29	29	28	28	29	28	27	29	30	30	30	30	30
Median	2.20	1.80	2.05	2.00	2.25	3.50	3.75	2.80	3.20	3.15	B	4.20	3.60	3.35	2.70	3.40	3.00	3.10	2.40	3.40	B	B	2.20	1.85
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 4

IONOSPHERIC DATA

Jun. 1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	A	B	A	B	B	B	B	B	B	B	B	B	B	E 425 B	300	270	B	B	B	B	B	B	400
2	470	365	A	A	F	A	375	310	280	265	235	255	210	210	230	200	250	260	280	B	B	B	B	B
3	B	B	330	360	370	380	315	300	290	290	260	210	220	210	230	230	245	235	225	A	B	B	B	F
4	260	A	A	B	300	B	B	B	265	A	F	B	B	340	300	290	315	300	305	410	B	B	A	A
5	F	F	220	225	B	B	B	B	B	B	B	B	B	B	B	B	300	335	B	B	A	A	A	A
6	A	A	360	A	A	B	B	B	B	400	B	B	B	275	280	B	295	E 340 B	260	B	B	B	B	B
7	B	A	A	330	B	A	B	A	A	380	B	B	295	B	260	250	300	270	265	290	B	B	A	315
8	A	A	A	335	A	B	B	B	B	A	B	B	B	B	265	B	260	230	270	275	300	A	A	A
9	A	A	B	A	B	B	B	B	B	B	B	B	320	230	240	270	260	275	250	B	B	A	A	B
10	R	A	A	A	A	A	B	390	340	390	310	220	215	205	220	205	215	275	270	B	B	B	B	365
11	F	A	A	B	275	A	370	330	290	265	265	280	250	225	220	205	200	210	240	300	285	B	B	B
12	B	B	360	395	420	470	440	460	350	345	285	230	240	210	210	235	C	C	220	270	B	B	B	B
13	A	360	310	310	380	A	460	390	295	250	265	235	240	220	220	250	230	230	220	300	280	B	455	295 F
14	330	360	320	A	A	F	500	350	295	280	300	325	270	250	220	295	260	B	B	B	A	370	360	A
15	A	A	A	A	A	F	460	375	330	270	290	265	B	B	230	280	280	B	245	330	B	B	A	A
16	A	A	A	A	A	A	A	B	B	280	B	300	225	215	210	200	225	265	225	260	B	B	B	B
17	A	415	480	A	A	A	450	325	280	280	250	205	210	220	200	200	215	230	215	280	390	B	B	B
18	A	A	A	280	A	B	B	A	F	B	B	300	255	280	240	B	285	265	300 F	B	B	B	A	395
19	F	F	300	F	410	300	A	A	500	B	B	400	B	B	B	B	275	280	280	350	B	A	A	A
20	A	A	A	A	A	B	B	B	A	A	280	B	285	235	250	235	270	240	230	265	B	B	B	A
21	A	A	B	A	A	A	A	F	B	B	B	B	400	B	B	340	370	290	290	365	A	A	A	A
22	A	A	B	B	A	B	B	B	B	B	B	280	280	270	220	250	220	240	240	265	B	B	A	A
23	F	A	A	B	B	A	A	F	B	B	B	300	240	215	225	215	245	230	240	B	A	A	A	F
24	A	A	A	B	B	B	B	A	430	330 F	365	B	B	285	250	270	275	S	B	B	B	A	A	B
25	A	B	B	A	A	B	B	B	B	380	385	290	285	255	265	250	265	310	260	A	A	B	A	A
26	B	B	B	B	B	B	B	B	A	B	B	B	B	C	C	350	250	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	360 F	B	B	280	310	F	B	B	B	A	A	A
28	A	B	B	B	A	A	F	320 F	335	310	300	285	300	275	320	310	265	B	300	B	3	400	A	B
29	B	B	B	B	B	B	B	B	B	B	B	B	300	B	250	265	220	250	235	300	265	295	B	B
30	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	A	B	A	A
31																								
No.	3	4	8	7	6	3	8	10	13	15	13	16	20	19	24	24	28	21	23	14	5	3	2	5
Median	330	360	325	330	375	380	445	340	295	290	285	280	260	230	230	250	260	265	250	295	285	370	410	365
U.Q.																								
L.Q.																								
Q.R.																								

h'F Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 5

IONOSPHERIC DATA

Syowa Base

Lat. 69°00.4′ S
Long. 39°35.4′ E

52

Jun. 1960

R'E

45° E Mean Time (G.M.T. +3h)

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											B	B	B	B	B									
2											B	B	B	B	B									
3											B	B	B	B	B									
4											B	B	B	B	B									
5											B	B	B	B	B									115
6	120										B	B	B	B	B									
7											B	B	B	B	B									
8											B	B	B	B	B									
9											B	B	B	B	B									
10	110	110	110								B	B	B	B	B									
11											B	B	B	B	B									
12											B	B	B	B	B									
13											B	B	B	B	B									
14			115								B	B	B	B	B									
15											A	A	B	B	B									
16											B	B	B	B	B									
17				120							B	B	B	B	B									
18											B	B	B	B	B									
19											B	B	B	B	B									
20											B	B	B	B	B									
21											B	B	B	B	B									
22											B	B	B	B	B									
23											B	B	B	B	B									
24											B	B	B	B	B									
25											B	B	B	B	B									
26											B	B	B	C	C									
27	135										B	B	B	B	B									
28											B	B	B	B	B									
29											B	B	B	B	B									
30											C	C	C	C	C									
31																								1
No.	3	1	2	1																				115
Median	120	110	110	120																				
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

R'E

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 6

IONOSPHERIC DATA

Jun. 1960 | h'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	B	120	130	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	155
2	B	135	150	135	120	120	130	B	B	B	B	B	160	150	140	B	B	B	B	B	B	B	B	B
3	B	140	125	B	B	B	130	B	B	B	110	110	B	110	100	100	B	B	B	110	B	B	125	165
4	125	110	155	B	B	B	B	120	B	105	B	B	B	B	B	B	B	B	B	160	B	B	135	120
5	125	135	120	B	B	B	115	B	B	B	B	B	B	B	B	B	B	B	B	B	120	140	140	165
6	135	110	115	135	105	B	130	B	B	130	B	B	B	B	B	B	B	B	115	B	B	B	B	165
7	135	110	125	135	B	120	B	130	120	115	B	B	B	B	B	B	B	B	B	B	B	B	110	140
8	115	160	135	120	120	105	120	B	130	100	B	B	B	B	B	B	B	B	B	115	120	115	105	105
9	120	110	160	110	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110	135	115
10	G	150	120	110	110	110	B	115	135	B	110	B	B	B	B	B	B	130	B	B	B	B	B	110
11	110	105	100	160	110	105	B	B	105	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	120	135	B	B	115	B	B	B	B	B	105	B	B	C	C	B	B	B	B	B	170
13	140	150	130	105	110	105	105	105	120	110	B	110	B	B	105	105	105	120	B	B	B	B	B	150
14	135	125	G	110	115	115	110	120	160	140	B	B	B	110	105	100	B	B	B	B	150	110	110	120
15	100	110	105	115	115	160	100	120	110	B	125	135	B	B	B	B	B	B	B	B	B	B	115	120
16	120	120	135	125	125	110	105	B	B	B	B	B	B	B	B	B	B	B	B	115	B	B	B	B
17	160	165	165	140	105	100	105	120	B	B	B	140	B	B	B	B	B	B	B	B	165	B	B	B
18	120	115	120	120	120	135	B	105	110	B	B	B	B	B	B	B	B	B	B	B	B	B	120	110
19	110	110	110	125	150	B	110	105	110	B	B	B	B	B	B	B	B	B	B	B	170	115	110	115
20	100	110	105	105	125	110	B	100	100	100	110	B	B	B	B	B	B	B	B	B	B	B	B	110
21	115	110	120	105	110	100	110	115	B	B	B	B	B	B	B	B	B	B	B	115	105	110	110	110
22	115	115	110	135	130	B	B	120	B	B	B	B	B	B	B	115	105	B	B	E	B	B	150	120
23	145	115	130	130	B	115	120	125	B	B	B	B	B	B	B	B	B	B	B	B	110	115	120	140
24	110	105	125	B	125	B	B	120	105	140	B	B	B	B	B	B	B	S	B	B	B	115	125	120
25	110	B	140	100	110	B	B	B	120	115	B	B	B	B	B	B	B	B	B	120	110	B	100	115
26	B	B	B	120	170	135	B	B	115	B	B	B	B	C	C	B	B	B	B	B	B	B	B	120
27	145	115	100	130	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110	105	110
28	105	120	130	110	100	100	120	110	165	B	B	B	B	B	B	B	B	B	B	B	B	110	110	B
29	110	130	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120
30	150	120	125	B	120	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	110	B	110	110
31																								
No.	24	27	27	24	22	16	14	16	14	9	4	4	1	4	4	4	2	2	1	6	9	10	18	25
Median	120	115	125	120	120	110	110	120	120	115	110	120	160	110	105	100	105	125	115	115	120	110	110	120
U.Q.																								
L.Q.																								
Q.R.																								

h'Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 7

IONOSPHERIC DATA

Jun. 1960

Types of Es

45° E Mean Time (G.M.T. +3h)

Syowa Base

Lat. 69°00.4' S
Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		a	a	a																				a
2		a	a	a	a	a	a						a	a	a									
3		a	a				a				a	l		l	l	f				f			a	a
4	a	a	a					a		f										a			a	a
5	a	a	a				a														a	a	a	a
6	h	a	a	a	fa		a			a									a					h
7	a	r	a	a		a		a	a	a													r	a
8	a	a	a	r	r	a	a		a	a										a	a	a	r	a
9	a	a	a	a	a																	a	a	a
10		h	h	f	r	a		a	a		a							a						r
11	a	a	a	a	f	a			a															
12				a	a			a						l										a
13	a	a	a	a	a	a	a	a	a	a		l			l	f	f	f						a
14	a	a		a	r	a	f	a	a	a				l	l	f					a	a	a	a
15	r	a	a	a	a	a	a	a	a		a	a											r	r
16	r	a	a	a	a	a	a													f				
17	a	a	a	h	a	a	a	a				a									a			
18	a	r	a	a	a	a		a	f														r	a
19	a	r	a	a	a		f	a	r												a	a	a	a
20	a	a	a	a	r	a		a	a	a	a													r
21	a	a	a	a	a	r	r	f												a	a	r	a	a
22	a	a	a	a	a			a								f	f						a	a
23	a	a	a	a		a	a	a													a	a	r	a
24	a	a	a		a			a	a	a												r	a	a
25	r		a	a	a				a	a										a	a		a	a
26				a	a	a			a															a
27	h	a	a	a																		r	a	f
28	a	a	a	a	a	a	a	a	a													a	a	
29	a	a	a																					a
30	a	a	a		a																r		r	r
31																								
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 8

IONOSPHERIC DATA

Jul. 1960 | foF2 | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	B	A	2.4	2.7^{F}	B	B	A	R	B	B	B	B	5.6^{R}	F	S	F	5.9^{F}	6.1^{F}	5.4^{F}	B	B	A	A
2	A	A	3.3^{F}	A	B	B	R	B	B	B	B	B	B	B	R	7.0^{R}	B	F	5.5^{F}	B	B	B	R	R
3	3.6	R	R	R	R	3.8^{F}	B	A	4.6	B	^{U}4.5^{F}	5.9^{F}	F	F	7.3^{F}	B	B	F	F	B	1.7	B	2.5	A
4	A	B	B	B	B	B	B	B	B	B	B	4.8^{F}	B	B	F	F	6.7^{F}	F	F	4.2	R	R	A	4.3^{F}
5	F	A	A	A	A	A	B	B	A	4.0^{F}	B	F	6.0^{F}	B	6.7	8.5^{F}	8.4	^{U}8.7^{R}	R	5.3^{F}	B	B	R	B
6	A	A	A	A	B	B	R	R	B	B	4.1	5.6^{F}	7.0^{F}	7.2^{F}	B	B	6.8^{R}	F	B	B	B	B	3.3	F
7	F	3.2^{F}	R	3.8	2.3	2.6^{F}	2.4^{F}	2.7^{F}	2.7	3.0^{F}	F	F	C	C	F	^{U}7.4^{F}	5.9^{F}	4.5^{F}	F	2.9	B	1.8	1.6	2.0^{R}
8	A	A	3.8	2.3^{F}	3.1	3.0^{F}	3.3^{F}	3.6^{F}	3.2^{F}	3.3	4.7^{F}	F	6.1^{F}	6.6^{F}	7.1^{F}	5.6^{F}	F	5.1^{F}	F	2.2^{F}	B	B	B	B
9	B	3.0^{R}	2.3^{F}	2.4	2.4	A	A	4.0^{F}	F	F	^{U}4.6^{F}	5.8^{F}	6.2^{F}	F	8.0	6.4^{F}	5.7^{F}	F	3.3^{F}	^{U}2.5^{F}	B	1.4	B	B
10	1.7^{F}	3.5^{R}	A	^{U}3.6^{F}	F	F	B	A	F	F	4.7^{F}	6.1^{F}	F	F	F	F	5.7^{F}	5.4^{F}	4.9^{F}	B	1.9	B	B	A
11	A	A	A	F	A	A	F	B	A	4.2	4.8^{F}	5.4^{F}	7.2^{F}	6.7	^{U}7.5^{R}	7.8	7.6	6.2	5.2	3.3^{F}	B	B	R	3.2
12	A	A	A	A	F	A	A	A	^{J}4.6^{F}	B	4.2	5.3^{F}	F	7.7^{F}	8.7^{R}	B	F	F	F	B	B	B	R	A
13	A	A	A	A	A	A	A	A	4.8^{F}	B	5.0^{F}	F	5.8^{F}	F	7.0	6.4	F	7.6^{F}	F	B	B	A	R	A
14	A	A	A	A	A	A	A	3.3^{F}	A	B	4.8^{F}	F	F	6.2^{F}	B	7.0^{F}	^{J}8.0^{R}	F	F	B	B	A	A	A
15	A	A	A	F	F	F	F	F	A	4.2^{F}	F	4.5^{F}	4.6^{F}	B	B	F	F	F	F	F	A	A	A	A
16	B	B	R	B	B	B	B	B	A	B	A	B	B	B	B	4.3^{F}	4.9^{F}	F	R	A	A	A	A	B
17	A	A	B	A	B	B	B	B	B	B	B	4.6	B	B	B	F	B	F	F	R	A	A	A	A
18	B	A	R	B	B	R	R	B	A	A	B	4.7^{R}	5.3^{F}	5.7^{F}	F	F	F	6.0^{F}	F	3.2^{F}	B	B	R	A
19	F	R	R	R	F	F	F	F	F	F	B	B	B	B	F	^{U}13.2^{R}	F	B	R	^{U}2.9^{R}	^{U}3.5^{F}	3.9^{F}	A	A
20	A	A	R	B	B	B	B	B	A	F	4.4^{F}	5.2^{F}	6.4	7.4	7.0^{F}	7.9^{F}	B	^{U}7.2^{R}	3.7	2.6	B	B	A	A
21	A	A	B	B	B	R	B	A	B	B	B	4.5^{F}	5.5^{F}	6.4^{F}	8.2	7.2	7.2^{R}	C	C	2.4^{F}	B	A	R	B
22	A	A	R	B	A	B	B	B	B	B	B	B	F	7.6^{F}	7.5^{F}	9.2	B	R	B	B	B	B	A	A
23	A	B	B	B	B	B	B	B	4.2^{F}	B	B	B	6.1^{F}	7.6^{F}	C	7.0^{F}	5.0^{F}	F	3.5^{R}	B	B	B	1.5	1.5
24	B	A	A	B	A	B	A	3.7^{F}	B	4.2	F	5.2^{F}	6.9^{F}	9.2^{F}	7.5^{F}	7.5^{F}	7.1	6.3^{F}	4.6^{F}	2.2^{F}	1.7	1.8^{F}	A	A
25	A	B	A	A	A	A	3.9^{F}	F	B	F	5.1^{F}	6.6^{F}	7.3	6.7^{F}	8.1^{F}	7.4	5.9	4.5	3.1	1.9	R	1.5	1.6	A
26	A	A	A	A	A	A	A	B	B	3.2^{F}	F	5.6^{F}	6.7^{F}	6.9^{F}	F	7.2^{F}	7.2^{F}	6.3	B	B	B	B	R	A
27	A	A	2.0^{F}	A	3.9^{F}	A	A	A	F	F	4.8^{F}	5.7	6.8	7.1^{R}	7.5^{F}	6.5^{F}	5.8^{F}	5.4^{F}	4.2^{F}	2.3^{F}	1.7	B	1.7^{F}	1.7^{F}
28	2.0^{F}	A	A	A	A	A	2.0	2.1	2.4	3.2^{F}	4.8	5.6	7.1	7.4^{F}	7.0^{F}	7.2^{F}	F	F	5.0^{F}	B	B	B	B	A
29	A	A	A	A	B	A	B	3.8^{F}	B	A	A	5.0^{F}	5.7^{F}	6.5^{F}	6.8^{F}	7.0	6.2^{F}	F	3.6^{F}	R	A	A	A	A
30	A	A	A	2.5^{F}	A	A	F	B	B	B	4.1^{F}	4.6^{F}	5.4	5.8^{F}	6.4^{F}	8.4	R	B	4.5	A	B	R	R	R
31	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	6.3^{F}	F	F	F	R	A	B	B	A
No.	3	3	4	6	5	3	4	7	7	8	14	19	18	18	16	22	16	13	13	14	5	5	6	5
Median	2.0^{F}	3.2^{R}	2.8^{F}	2.4^{F}	2.7	3.0^{F}	2.8^{F}	3.6^{F}	4.2^{F}	3.6^{F}	4.7^{F}	5.3^{F}	6.2^{F}	6.8^{F}	7.4^{F}	7.2^{F}	6.4^{F}	6.0^{F}	4.5^{F}	2.8^{F}	1.7	1.8	1.6	2.0
U.Q.	2.8	3.4	3.6	3.6	3.5	3.4	3.6	3.8	4.6	4.2	4.8	5.7	6.9	7.4	7.8	7.8	7.2	6.8	5.1	3.3	2.7	2.8	2.5	3.8
L.Q.	1.8	3.1	2.2	2.4	2.4	2.8	2.2	2.7	2.7	3.2	4.4	4.7	5.7	6.4	7.0	6.5	5.8	5.2	3.6	2.3	1.7	1.4	1.6	1.6
Q.R.	1.0	0.3	1.4	1.2	1.1	0.6	1.4	1.1	1.9	1.0	0.4	1.0	1.2	1.0	0.8	1.3	1.4	1.6	1.5	1.0	1.0	1.4	0.9	2.2

foF2

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 1

IONOSPHERIC DATA

Jul. 1960 | foE | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4 S, Long. 39°35.4 E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										B	B	B	B	B	B	S								
2										B	B	B	B	B	B	B							2.20	2.80
3	3.00	3.30	3.10	3.15						B	B	B	B	B	B	B								
4										B	B	B	B	B	B	B								
5										B	B	B	B	B	B	B								
6										B	B	B	B	B	B	B								1.75
7.	2.65	2.90	2.90	2.60						B	B	B	C	C	B	B								
8										A	A	A	B	B	B	B								
9										B	B	1.60	B	B	B	B								
10										B	B	B	B	B	B	B								
11										B	B	B	B	B	B	B								
12										B	B	B	B	B	B	B								
13										B	B	B	B	B	B	B								
14										B	B	B	B	B	B	B								
15										B	B	B	B	B	B	B								
16										B	B	B	B	B	B	B								
17										B	B	B	B	B	B	B								
18										B	B	B	B	B	B	B								
19										B	B	B	B	B	B	B								
20										B	B	B	B	B	B	B								
21										B	B	B	B	B	B	B								
22										B	B	B	B	B	B	B								
23										B	B	B	B	B	B	B								
24										B	B	B	B	B	B	B								
25										B	B	B	B	R	B	B								
26										B	B	B	B	B	B	B								
27										B	1.55	2.20	B	B	B	B								
28										B	B	B	B	B	B	A								
29										B	B	B	B	B	B	B								
30										B	B	B	B	B	B	B						2.00	2.15	1.85
31										B	B	B	B	B	B	B								
No.	2	2	2	2							1	2										1	2	3
Median	2.80	3.10	3.00	2.90							1.55	1.90										2.00	2.20	1.85
U.Q.																								
L.Q.																								
Q.R.																								

foE

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 2

IONOSPHERIC DATA

Jul. 1960 | foEs | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4′ S, Long. 39°35.4′ E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.2	B	J4.0	2.3	2.7	6.0	B	4.5	4.2	B	B	B	B	B	B	S	B	B	B	B	B	B	J3.2	J5.8
2	J7.9	J5.0	J5.2	J7.2	B	B	3.5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	G
3	3.2	3.5	G	3.4	3.3	J4.8	5.2	4.9	J3.8	B	B	B	B	B	B	B	B	B	B	B	B	B	2.0	J3.8
4	J6.5	5.1	B	4.2	J8.0	B	3.9	B	B	B	B	B	B	B	B	B	B	B	B	B	2.3	J3.6	J4.6	J5.9
5	J8.2	J6.7	5.0	J6.3	J8.4	5.3	B	B	5.2	J3.9	B	B	B	B	B	B	B	B	B	B	B	B	3.0	4.4
6	J4.1	3.5	J6.3	5.0	B	4.1	3.9	3.8	B	B	B	2.2	B	B	B	B	B	B	B	B	B	B	B	2.1
7	3.2	G	G	J3.9	2.7	1.9	1.7	B	B	2.8	B	B	C	C	B	B	B	B	B	B	B	B	B	1.6
8	J3.2	J4.0	J3.8	2.0	2.6	2.8	J4.0	J3.6	2.2	J3.2	2.0	2.2	2.6	2.1	B	B	3.5	J5.6	B	B	B	B	B	B
9	B	2.3	2.4	1.9	2.0	J4.6	4.4	J3.9	2.3	B	2.7	G	2.9	J3.5	B	1.8	B	B	B	B	B	B	B	B
10	2.2	3.0	J4.8	J7.2	5.8	J5.1	B	4.9	2.7	B	B	B	B	B	B	2.1	B	B	B	B	B	B	B	J4.5
11	4.1	J5.1	J7.6	2.6	4.9	4.5	5.2	5.5	J5.1	4.0	J3.7	B	B	B	B	B	B	B	B	B	B	B	B	J3.1
12	J5.9	J4.4	J5.7	6.0	J6.8	4.4	J4.6	J4.8	3.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.5
13	2.7	J3.8	J3.6	J4.2	4.6	J5.0	J4.9	J5.5	4.0	B	B	B	B	B	B	B	B	B	B	B	B	J3.2	2.1	2.8
14	J5.2	4.3	4.0	4.3	J9.0	J5.9	4.1	J3.7	J3.8	B	B	B	B	B	B	B	B	B	B	B	B	J9.7	J5.1	J5.0
15	J3.5	J5.9	J3.2	J3.4	J4.0	3.0	2.6	2.9	J3.9	J4.1	2.6	B	B	B	B	B	2.9	J4.1	2.5	J3.6	J4.8	J8.6	J4.9	4.6
16	B	B	4.7	B	B	B	B	J5.8	3.5	B	4.1	B	B	B	B	2.3	B	B	2.5	J8.4	J9.0	J8.1	J5.9	B
17	J7.4	J3.7	B	J4.2	J9.3	4.8	B	B	B	B	B	4.1	B	B	B	B	B	B	B	2.8	J3.8	2.5	J4.1	J4.2
18	3.6	J7.8	2.0	4.6	4.0	3.1	2.4	4.9	J5.9	J5.1	B	B	B	B	B	B	B	B	B	B	B	B	2.0	J3.8
19	3.8	3.8	3.6	2.6	3.3	3.2	2.4	2.4	B	B	B	B	B	B	B	B	B	B	2.7	2.8	3.3	J3.8	J6.7	5.0
20	J3.8	J5.1	2.8	B	B	B	B	J5.1	J4.0	2.4	1.8	2.5	B	B	B	B	B	B	B	B	B	B	3.7	4.5
21	J4.8	J4.2	B	B	5.0	2.3	4.5	4.5	B	B	B	B	B	B	B	B	B	C	C	B	B	2.3	2.2	B
22	2.4	4.0	2.2	5.6	4.9	5.1	4.6	4.3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	3.7	3.7
23	2.8	B	B	B	B	B	5.2	4.3	2.3	B	B	B	B	B	B	B	B	S	B	B	B	B	1.5	1.9
24	B	2.2	J3.2	4.6	J4.8	4.5	3.7	3.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.6	3.0
25	J4.9	J6.3	4.2	4.8	3.7	2.7	J3.9	J3.8	B	J3.1	2.2	B	2.4	G	B	B	B	B	B	2.3	B	E	B	2.5
26	J2.9	3.7	3.2	J3.4	J3.8	3.0	J4.5	B	B	2.9	2.2	J4.0	2.8	J7.7	J5.0	J7.6	J7.5	B	B	B	B	B	2.0	J3.3
27	J4.2	J6.0	B	J4.5	3.4	4.6	J4.6	J5.3	J3.1	B	G	G	B	B	2.4	2.4	B	1.7	B	J3.7	B	B	B	J2.9
28	J2.1	J2.9	3.0	2.9	2.5	J3.9	J3.1	2.2	B	B	1.7	B	2.6	B	B	J3.7	J7.7	B	2.3	B	B	B	B	J3.5
29	J3.6	4.4	J6.2	J5.4	B	J6.3	B	4.5	B	5.9	5.2	B	B	2.3	B	B	B	B	B	1.6	J5.0	J4.1	J4.6	3.9
30	J5.5	J4.7	3.7	J3.0	J5.2	4.8	J3.6	B	B	B	B	B	B	B	B	B	B	B	B	J3.4	B	2.2	2.4	2.6
31	J3.3	4.2	4.0	J3.0	J3.6	B	J4.6	5.1	J5.0	B	B	B	B	B	B	B	B	B	B	3.4	J3.6	B	B	J5.0
No.	28	28	26	27	25	25	24	24	17	10	11	7	5	5	2	6	4	3	4	9	7	11	20	27
Median	J3.7	J4.2	3.8	4.2	4.0	4.5	4.0	4.5	3.8	J3.6	2.2	2.2	2.6	2.3	3.7	2.4	J5.5	J4.1	2.5	3.4	J3.8	J3.6	3.1	3.7
U.Q.	5.0	5.1	4.8	5.0	5.5	5.0	4.6	5.0	4.6	4.1	3.7	4.0	2.8	5.6		4.7	7.6	4.8	2.6	3.5	5.0	8.1	4.6	4.5
L.Q.	3.2	3.6	3.0	3.0	3.3	3.0	3.6	3.8	2.9	2.9	1.8	G	2.5	E2.1		2.1	3.2	2.9	2.4	2.6	3.3	2.3	2.0	2.6
Q.R.	1.8	1.5	1.8	2.0	2.2	2.0	1.0	1.2	1.7	1.2	1.9		0.3	D3.5		2.6	4.4	1.9	0.2	0.9	1.7	5.8	2.6	1.9

The Radio Research Laboratories, Japan

foEs | Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 3

IONOSPHERIC DATA

Jul. 1960 | f-min | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.25	B	2.10	1.35	1.30	4.10	B	3.20	3.65	B	B	B	B	4.15	3.60	S	1.60	1.80	1.40	1.60	B	B	1.40	1.60
2	1.60	2.15	1.40	1.50	B	B	3.00	B	B	B	B	B	B	B	6.80	4.85	B	3.30	3.60	B	B	B	1.60	1.40
3	1.60	1.60	1.50	1.60	1.90	2.10	4.60	3.30	2.20	B	3.10	3.05	2.30	2.70	2.20	B	B	2.60	3.50	B	1.30	B	1.40	1.55
4	1.40	4.40	B	3.50	4.80	B	3.60	B	B	B	B	3.50	B	B	6.40	4.30	2.65	2.30	3.60	3.80	1.90	1.30	1.40	1.80
5	1.80	1.30	1.40	1.65	2.15	3.20	B	B	3.10	1.70	B	3.20	3.55	B	4.70	5.70	5.90	7.85	6.10	3.35	B	B	1.30	4.20
6	1.85	1.60	1.60	2.10	B	3.60	3.20	3.15	B	B	3.35	1.90	2.15	1.80	B	B	5.00	4.30	B	B	B	B	1.80	1.30
7	1.20	1.40	1.10	1.40	1.40	1.35	1.35	1.60	1.60	1.65	2.10	1.75	C	C	2.00	2.10	1.85	2.10	1.50	1.80	B	1.15	1.35	1.25
8	1.30	1.10	1.35	1.10	1.40	1.35	1.35	1.20	1.35	1.15	1.25	1.50	1.90	1.55	1.55	1.75	1.55	1.60	1.85	1.50	B	B	B	B
9	B	1.40	1.15	1.15	1.20	1.65	2.30	1.50	1.35	1.60	1.25	1.60	2.20	1.85	1.50	1.45	1.50	1.20	1.40	1.40	B	1.15	B	B
10	1.20	1.35	1.40	1.40	1.25	1.65	B	1.70	1.65	1.60	1.90	2.25	3.35	3.30	1.60	1.50	2.00	1.65	1.85	B	1.55	B	B	1.40
11	1.15	1.20	1.45	1.50	2.20	1.90	3.35	4.25	3.20	1.75	1.85	2.05	2.00	1.85	3.10	3.15	3.30	2.00	3.60	1.80	B	B	2.30	1.30
12	1.35	1.75	1.75	1.70	1.50	2.10	3.15	2.20	1.40	B	3.60	4.10	3.45	4.40	6.00	B	3.90	4.30	3.30	B	B	B	1.50	1.30
13	1.10	2.10	1.30	1.30	2.00	1.85	1.75	1.80	3.30	B	4.15	3.15	3.10	3.20	3.90	4.85	4.30	3.90	2.50	B	B	1.85	1.10	1.15
14	1.80	1.90	1.90	1.60	1.70	2.10	1.70	1.50	1.90	B	3.00	1.25	2.00	4.00	B	4.10	5.05	4.35	4.00	B	B	1.80	1.80	1.60
15	1.20	1.35	1.20	1.15	1.35	1.40	1.45	1.50	1.80	1.80	2.00	3.70	3.60	B	B	2.50	2.00	1.70	1.45	1.20	1.40	1.60	3.00	2.15
16	B	B	3.50	B	B	B	B	3.80	2.10	B	3.10	B	B	B	B	2.00	3.70	3.10	2.00	1.60	1.90	1.50	1.65	B
17	1.40	1.25	B	1.70	3.50	4.15	B	B	B	B	B	3.00	B	B	B	2.75	B	4.20	1.85	1.50	1.15	1.70	1.80	1.80
18	3.10	1.40	1.10	3.65	3.20	1.70	1.90	4.30	2.00	2.55	B	3.70	3.25	3.00	3.60	4.30	3.60	3.30	1.30	1.85	B	B	1.20	1.40
19	1.45	2.50	2.10	1.20	1.75	1.65	1.45	1.60	1.60	1.50	B	B	B	B	3.15	6.35	3.90	B	2.30	2.10	1.20	1.40	1.70	3.35
20	1.95	1.80	1.40	B	B	B	B	3.00	2.05	1.60	1.40	1.90	2.10	3.55	2.30	1.70	B	6.25	3.05	2.00	B	B	1.50	1.95
21	2.10	1.30	B	B	3.40	1.70	3.40	2.00	B	B	B	2.60	2.35	2.40	3.35	3.35	4.00	C	C	1.50	B	1.40	1.40	B
22	1.40	1.50	2.05	3.40	2.10	3.70	3.60	3.25	B	B	B	B	3.00	2.60	2.70	2.60	B	4.30	B	B	B	B	1.25	2.10
23	1.35	B	B	B	B	B	4.30	3.60	1.80	B	B	B	3.00	2.00	3.80	1.65	1.80	E 5.40 S	2.10	B	B	B	E	1.15
24	B	1.55	1.20	3.20	2.40	3.20	1.80	1.75	B	3.35	3.60	4.10	4.30	4.60	1.85	1.65	2.20 S	2.40	1.90	1.60	1.20	1.50	1.10	1.55
25	1.80	3.10	1.75	1.40	1.50	1.35	1.15	1.70	B	1.60	1.65	2.00	1.85	1.60	1.80	1.80	1.40	1.85	1.50	1.50	1.20	E	1.20	1.15
26	1.30	1.70	1.45	1.50	1.50	1.50	1.40	B	B	1.70	1.70	1.85	1.70	1.65	2.10	2.20	1.65	4.40	B	B	B	B	1.50	1.30
27	1.25	1.30	1.50	2.85	1.75	3.60	2.00	1.80	1.60	1.80	1.40	1.85	2.65	2.25	2.10	2.00	1.50	1.45	1.40	1.40	1.30	B	1.15	1.30
28	1.30	1.40	1.15	1.25	1.35	1.15	1.35	1.35	1.20	1.30	1.40	2.25	1.95	2.65	1.90	1.40	1.70	2.45	1.85	B	B	B	B	1.30
29	1.20	2.15	1.85	2.10	B	3.50	B	3.20	B	4.20	4.45	3.35	3.10	2.00	3.10	2.70	2.10	1.80	1.35	1.15	E	1.50	1.30	1.15
30	1.50	1.20	E	1.20	1.50	3.20	1.30	B	B	B	3.10	2.20	2.60	3.30	3.60	1.90	6.20	B	3.20	1.70	B	1.10	1.40	1.30
31	1.30	1.55	1.60	1.20	1.35	B	3.20	4.10	3.10	B	B	B	B	B	B	3.60	3.00	2.20	2.40	1.65	1.30	B	B	1.10
No.	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	30	31	30	30	31	31	31	31	31
Median	1.40	1.55	1.50	1.50	1.90	2.10	3.15	3.15	3.10	4.20	3.60	3.05	3.05	3.25	3.35	2.65	3.30	U 2.70	2.20	1.85	B	B	1.50	1.40
U.Q.																								
L.Q.																								
Q.R.																								

f-min

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 4

IONOSPHERIC DATA

Jul. 1960 | h'F | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	A	B	A	500	395	B	B	A	B	B	B	B	B	360	280	S	240	280	250	245	B	B	A	A
2	A	A	410	A	B	B	B	B	B	B	B	B	B	B	300B	310B	B	265	270	B	B	B	B	R
3	370	B	R	B	A	380	B	A	400	B	340	280	210	230	220	B	B	270	240	B	325	B	380	A
4	A	B	B	B	B	B	B	B	B	B	B	300	B	B	295	265	280	225	280	360	B	A	A	280
5	F	A	A	A	A	A	B	B	A	430	B	300	300	B	305	350	310	310	320	280	B	B	A	B
6	A	A	A	A	B	B	B	B	B	B	365	235	250	255	B	B	335	250	B	B	B	B	350	F
7	345	400	A	425	470A	380	270	310	300	340	280	265	C	C	210	205	200	220	235	250	B	300	270	350
8	A	A	350	440	470	470	400	380	270	285	265	215	210	210	220	220	200	250	270	245	B	B	B	B
9	B	305	350	300	390	A	A	400	295	270	250	235	220	260	215	215	220	200	260	225	B	350	B	B
10	400F	400	A	400F	325	370	B	A	320	290	285	265	255	270	245	210	260	250	220	B	290	B	B	A
11	A	A	A	F	A	A	A	B	A	405	300	240	230	240	245	255	250	245	265	250	B	B	320	380
12	A	A	A	A	F	A	A	A	340	B	400	300	265	260	275	B	280	270	270	B	B	B	320	A
13	A	A	A	A	A	A	A	A	380	B	330	280	260	270	250	335	285	265	275	B	B	A	A	A
14	A	A	A	A	A	A	A	480	A	B	340	250	265	295	B	300	295	280	260	B	B	A	A	A
15	A	A	A	F	F	445	400	400	A	450	385	310	450	B	B	510	480	F	320F	F	A	A	A	A
16	B	B	A	B	B	B	B	B	A	B	A	B	B	B	B	370	380	360	B	A	A	A	A	B
17	A	A	B	A	B	B	B	B	B	B	B	280	B	B	B	240	B	290	265	A	A	A	A	A
18	B	A	B	B	B	A	B	B	A	A	B	365	280	265	220	260	280	240	280	280	B	B	B	A
19	290	A	A	A	290	F	390	330	330	300	B	B	B	B	400	270	275	B	B	365	380	280	A	A
20	A	A	A	B	B	B	B	B	A	340	265	275	260	250	260	240	B	300B	300	310	B	B	A	A
21	A	A	B	B	B	B	B	A	B	B	B	270	240	225	235	235	280	C	C	260	B	A	B	B
22	A	A	B	B	A	B	B	B	B	B	B	B	245	240	235	230	B	280	B	B	B	B	A	A
23	A	B	B	B	B	B	B	B	380	B	B	B	210	215	220	205	200	280	220	B	B	B	335	380
24	B	A	A	B	A	B	A	450	B	385	300	300	235	240	210	210	225	230	210	215	300	350	A	A
25	A	B	A	A	A	A	450	390	B	320	250	260	220	210	210	200	205	215	200	300	300	300	265	A
26	A	A	A	A	A	A	A	B	B	295	225	225	220	220	250	250	215	280	B	B	B	B	B	A
27	A	A	320	A	500	A	A	A	265	295	265	250	225	235	250	240	200	215	220	260	255	B	280	350
28	310	A	A	A	A	A	480	390	320	285	250	210	245	215	210	240	200	270	270	B	B	B	B	A
29	A	A	A	A	B	A	B	F	B	A	A	290	285	270	260	270	240	250	285	A	A	A	A	A
30	A	A	A	300	A	A	480	B	B	B	320	280	265	230	265	275	300	B	270	A	A	B	B	A
31	A	A	A	A	A	B	B	B	A	B	B	B	B	B	B	310	240	255	345	A	A	B	B	A
No.	5	3	4	6	7	5	7	9	11	14	18	24	23	22	25	27	26	27	25	14	6	5	8	5
Median	345	400	350	410	395	380	400	390	320	310	290	270	245	240	245	250	255	265	270	255	300	300	320	350
U.Q.																								
L.Q.																								
Q.R.																								

h'F

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 5

IONOSPHERIC DATA

Jul. 1960 | R'E | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S / Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1										B	B	B	B	B	B	S								
2										B	B	B	B	B	B	B							120	115
3	115	110	110	115						B	B	B	B	B	B	B								
4										B	B	B	B	B	B	B								
5										B	B	B	B	B	B	B								
6										B	B	B	B	B	B	B								115
7	115	110	110	110						B	B	B	C	C	B	B								
8										A	A	A	B	B	B	B								
9										B	B	B	B	B	B	B								
10										B	B	B	B	B	B	B								
11										B	B	B	B	B	B	B								
12										B	B	B	B	B	B	B								
13										B	B	B	B	B	B	B								
14										B	B	B	B	B	B	B								
15										B	B	B	B	B	B	B								
16										B	B	B	B	B	B	B								
17										B	B	B	B	B	B	B								
18										B	B	B	B	B	B	B								
19										B	B	B	B	B	B	B								
20										B	B	B	B	B	B	B								
21										B	B	B	B	B	B	B								
22										B	B	B	B	B	B	B								
23										B	B	B	B	B	B	B								
24										B	B	B	B	B	B	B								
25										B	B	B	B	110	B	B								
26										B	B	B	B	B	B	B								
27										B	125	120	B	B	B	B								
28										B	A	B	B	B	B	A								
29										B	B	B	B	B	B	B								
30										B	B	B	B	B	B	B						150	115	110
31										B	B	B	B	B	B	B								
No.	2	2	2	2							1	1		1								1	2	3
Median	115	110	110	110							125	120		110								150	120	115
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

R'E

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 6

IONOSPHERIC DATA

Jul. 1960 | h'Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S / Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	135	B	105	135	120	110	B	115	150	B	B	B	B	B	B	S	B	B	B	B	B	B	115	110
2	115	150	115	110	B	B	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	G
3	165	170	G	145	110	150	115	100	100	B	B	B	B	B	B	B	B	B	B	B	B	B	155	120
4	110	130	B	150	135	B	160	B	B	B	B	B	B	B	B	B	B	B	B	B	180	120	110	135
5	105	115	150	110	110	110	B	B	105	100	B	B	B	B	B	B	B	B	B	B	B	B	110	130
6	105	105	125	100	B	165	120	135	B	B	B	100	B	B	B	B	B	B	B	B	B	B	B	150
7	135	G	G	130	115	120	110	B	B	135	B	B	C	C	B	B	B	B	B	B	B	B	B	180
8	155	135	110	115	110	125	110	105	110	100	145	120	120	110	B	B	140	120	B	B	B	B	B	B
9	B	165	130	120	115	105	110	105	120	B	170	G	135	120	B	120	B	B	B	B	B	B	B	B
10	160	120	105	110	120	125	B	105	130	B	B	B	B	B	B	140	B	B	B	B	B	B	B	115
11	105	130	115	115	100	100	105	105	105	105	105	B	B	B	B	B	B	B	B	B	B	B	B	120
12	120	120	125	110	115	105	110	100	105	B	B	B	B	B	B	B	B	B	B	B	B	B	B	130
13	115	150	120	120	100	110	100	105	160	B	B	B	B	B	B	B	B	B	B	B	B	120	110	110
14	105	100	100	105	135	110	110	110	120	B	B	B	B	B	B	B	B	B	B	B	B	110	110	110
15	125	110	125	125	120	120	120	120	110	110	130	B	B	B	B	B	115	145	155	135	100	115	120	120
16	B	B	115	B	B	B	B	120	110	B	110	B	B	B	B	115	B	B	135	115	135	110	110	B
17	110	110	B	110	100	165	B	B	B	B	B	110	B	B	B	B	B	B	B	115	100	110	105	110
18	150	120	120	125	135	110	115	105	100	120	B	B	B	B	B	B	B	B	B	B	B	B	105	110
19	110	125	120	110	115	110	110	170	B	B	B	B	B	B	B	B	B	B	150	150	110	110	110	105
20	110	110	120	B	B	B	B	110	105	115	115	110	B	B	B	B	B	B	B	B	B	B	105	110
21	115	115	B	B	110	110	115	110	B	B	B	B	B	B	B	B	B	C	C	B	B	115	170	B
22	140	110	125	110	100	110	130	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110	115
23	110	B	B	B	B	B	125	130	125	B	B	B	B	B	B	B	B	S	B	B	B	B	160	150
24	B	125	110	125	105	105	110	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110	115
25	115	130	110	105	110	110	110	120	B	115	135	B	110	G	B	B	B	B	B	110	B	E	B	125
26	115	110	110	115	110	115	110	B	B	110	110	140	150	125	130	120	135	B	B	B	B	B	165	120
27	110	120	B	110	115	115	115	105	130	B	G	G	B	B	155	125	B	150	B	110	B	B	B	170
28	165	115	115	115	115	120	150	150	B	B	165	B	135	B	B	140	130	B	125	B	B	B	B	120
29	120	140	110	110	B	100	B	155	B	120	120	B	B	165	B	B	B	B	B	125	110	110	100	100
30	100	100	120	115	110	105	110	B	B	B	B	B	B	B	B	B	B	B	B	160	B	175	160	130
31	110	115	100	130	110	B	125	100	115	B	B	B	B	B	B	B	B	B	B	125	110	B	B	110
No.	28	27	24	27	25	25	24	24	17	10	10	5	5	4	2	6	4	3	4	9	7	10	19	26
Median	115	120	115	115	110	110	110	110	110	110	125	110	135	120	140	120	120	145	140	125	110	110	110	120
U.Q.																								
L.Q.																								
Q.R.																								

The Radio Research Laboratories, Japan

h'Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

S 7

IONOSPHERIC DATA

Jul. 1960 | Types of Es | 45° E Mean Time (G.M.T. +3h) | Syowa Base | Lat. 69°00.4' S, Long. 39°35.4' E

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	a		a	a	a	a		a	a														a	a
2	a	a	a	a			a																	
3	h	h		h	r	a	a	f	a														a	a
4	a	a		a	a		a														a	a	a	a
5	a	a	a	a	f	a			a	a													r	a
6.	a	r	a	a		a	a	a				l												h
7.	h			h	r	a	a			a														a
8.	a	a	a	a	a	a	a	a	f	l	a	a	a	l			a	f						
9		a	a	a	a	a	a	a	a		h		a	a		a								
10	a	a	a	a	a	a		a	a							a								a
11	a	a	a	a	a	a	a	a	a	a	a													a
12	a	a	a	a	r	r	a	a	r															a
13	r	a	a	a	a	a	a	a	a													a	a	r
14	a	r	r	r	a	a	r	a	a													a	a	a
15	a	a	a	a	a	r	a	a	a	a	a						a	a	a	a	f	a	a	a
16			a					a	a		a					a			a	a	a	a	a	
17	a	a		a	a	a						a								a	a	a	a	a
18	a	a	a	a	a	a	a	a	a	a													a	a
19	r	a	r	a	a	a	r	a											a	a	r	a	a	a
20	a	a	a					a	a	a	a	a											r	a
21	a	a			a	a	a	a														a	a	
22	a	a	a	a	r	a	a	a															r	r
23	r						a	a	a														a	a
24		a	a	a	a	a	r	r															a	a
25	a	a	r	r	r	r	a	a		a	a		l							f				a
26	a	r	a	a	a	a	a			a	l	a	a	l	l	l	a						a	a
27	a	a		a	a	a	a	a	a						a	a		a		f				a
28	a	a	r	r	r	a	a	a			a		a			a	f		a					a
29	a	a	a	a		a		a		a	a			a						a	a	a	a	a
30	a	a	a	a	a	a	a													a		h	h	h
31	a	r	r	a	a		a	f	a											a	a			a
No.																								
Median																								
U.Q.																								
L.Q.																								
Q.R.																								

Types of Es

Sweep 1.0 Mc to 20.0 Mc in 30 sec in automatic operation

The Radio Research Laboratories, Japan

S 8

62