

IONOSPHERIC DATA AT SYOWA BASE  
(ANTARCTICA)

February—July 1959



2826

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(1)

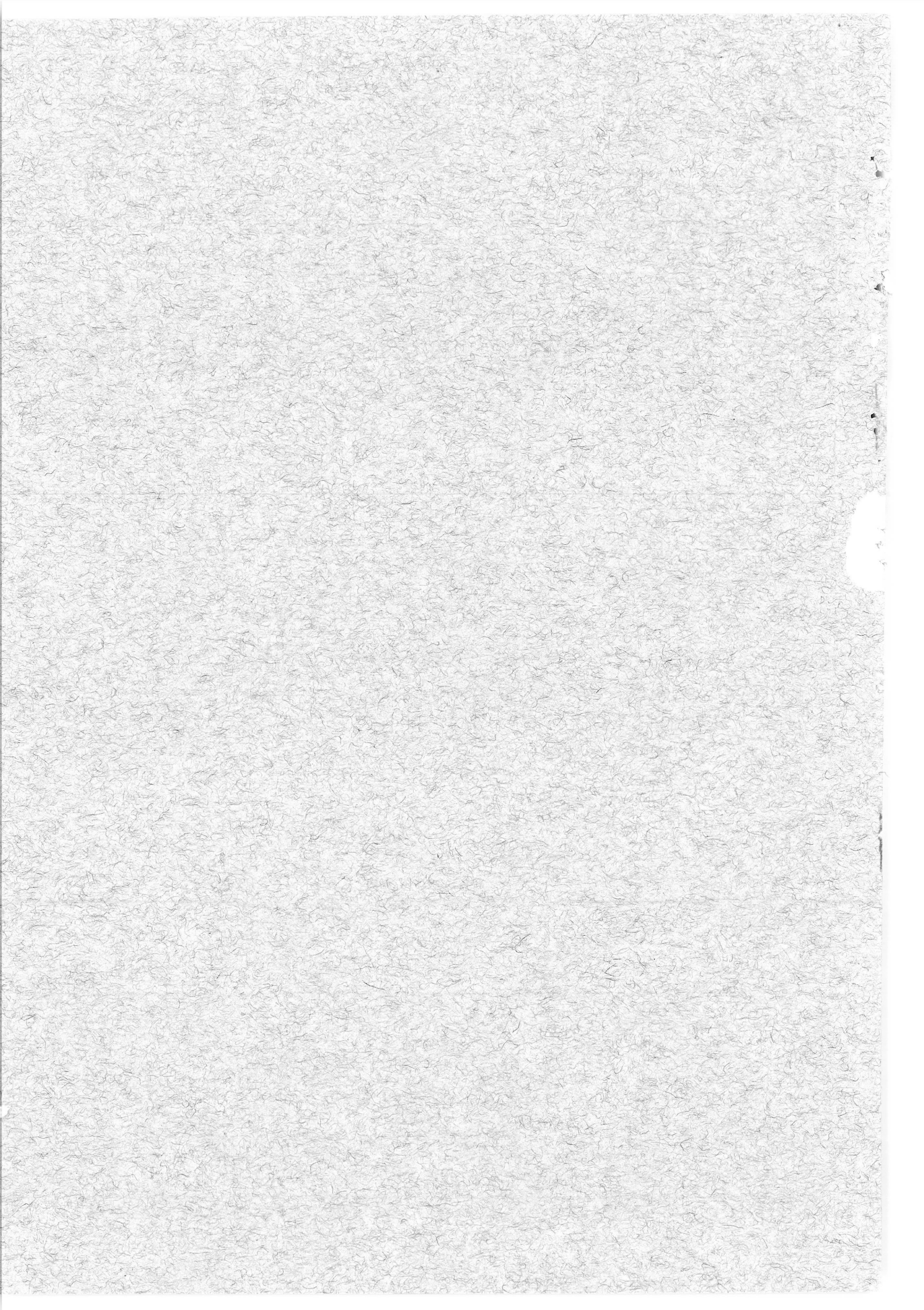
Issued in February 1962

Prepared by

THE RADIO RESEARCH LABORATORIES  
MINISTRY OF POSTS AND TELECOMMUNICATIONS

TOKYO, JAPAN





# IONOSPHERIC DATA AT SYOWA BASE (ANTARCTICA)

February—July 1959

THE RADIO RESEARCH LABORATORIES  
TOKYO, JAPAN

## CONTENTS

	Page
Main Characteristics of the Ionosonde used at Syowa Base .....	2
Symbols and Terminology .....	2
Graphs of Ionospheric Data .....	6
Tables of Ionospheric Data .....	9

**MAIN CHARACTERISTICS OF THE IONOSONDE  
USED AT SYOWA BASE**

Item	Specification
Frequency Range	1-20 Mc/s
Transmitting Power	5 kW (peak value)
Duration of Sweep	15 sec and 30 sec
Transmitted Pulse width	40-120 $\mu$ sec (variable)
Recurrence Frequency of Transmitted Pulse	50 c/s (by power frequency)
Frequency Scale	Every 1 Mc/s
Height Range	1100 k.m
Height Scale	Every 100 km
Total Receiver Gain	140 db
Noise Figure	About 9 (at 5 Mc/s)
Time Constant of Differential Circuit	50 $\mu$ sec
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 $\Omega$
Receiving Antenna	15 m high vertical delta terminated by 600 $\Omega$

**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**

- $f_0F2$  } The ordinary-wave critical frequency for the  $F2$ ,  $F1$  and  $E$  layers  
 $f_0F1$  } respectively.  
 $f_0E$  }
- $f_oE_s$  The ordinary wave top frequency corresponding to highest frequency at which a mainly continuous trace is observed.
- $f_oE_s$  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  $f_0E_s$ .
- $h_pF2$  The virtual height of the  $F2$  layer measured on the ordinary-wave branch at a frequency equal to  $0.834 f_0F2$ .
- $y_pF2$  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  $h_pF2$  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 normal 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 preceding symbol on monthly tabulation sheets.

D	<i>greater than.....</i>
E	<i>less than.....</i>
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  $E_s$**

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 thick 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  $E_s$  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  $l$ .

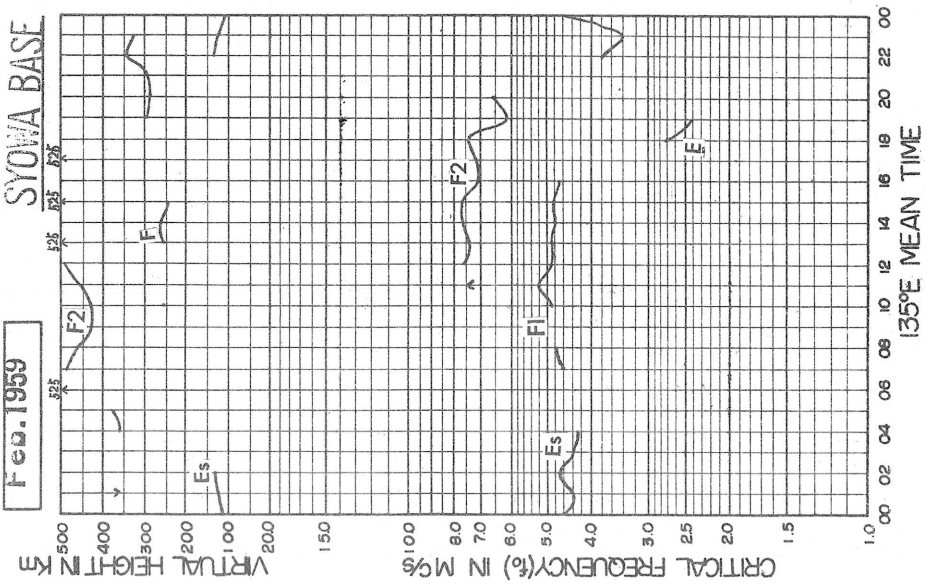
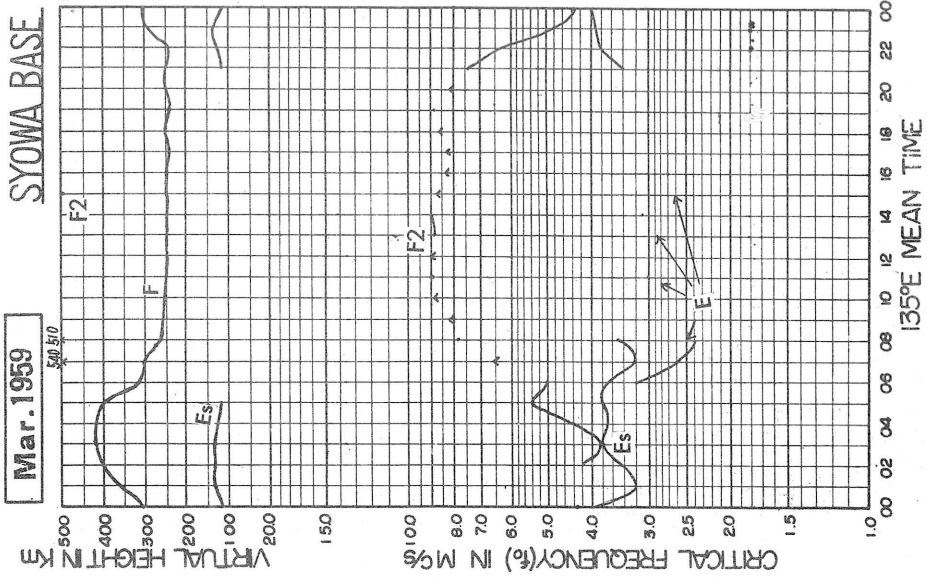
*n*

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

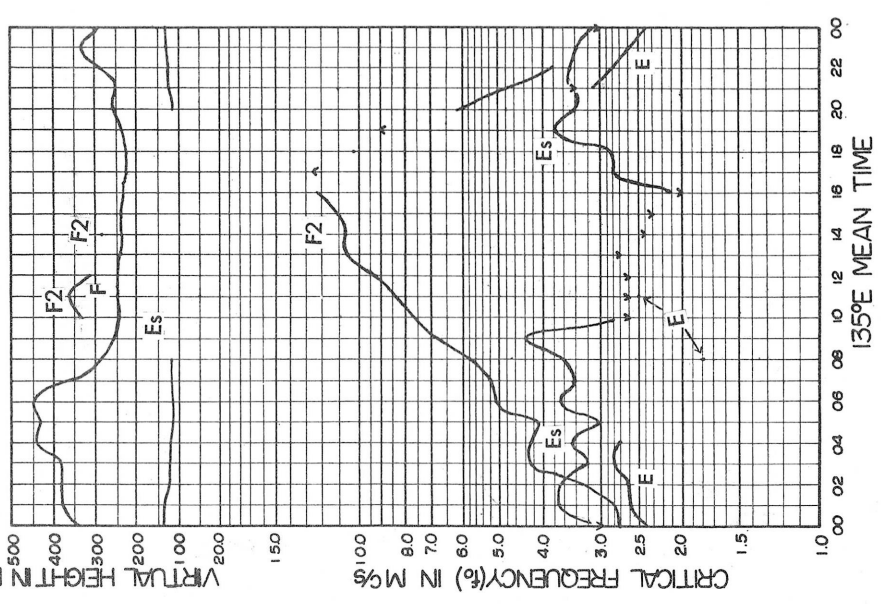
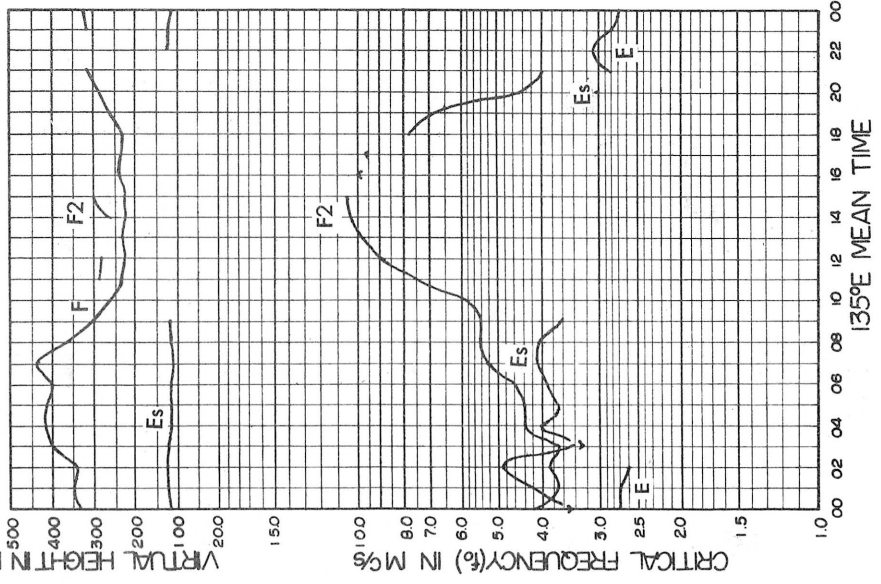




IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS

**May. 1959**

**Apr. 1959**



**SYOWA BASE**

**SYOWA BASE**

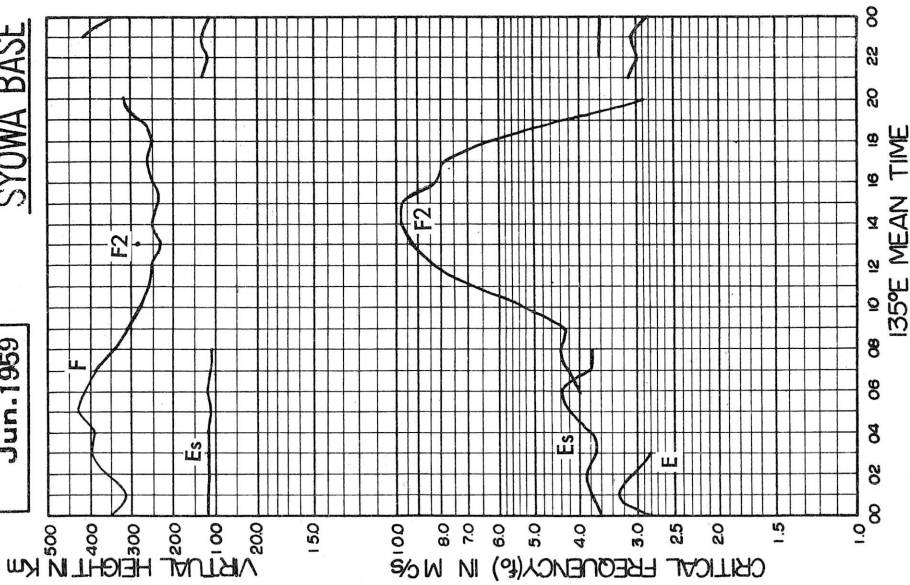
135°E MEAN TIME

135°E MEAN TIME

IONOSPHERIC DATA  
MONTHLY MEDIAN CHARACTERISTICS

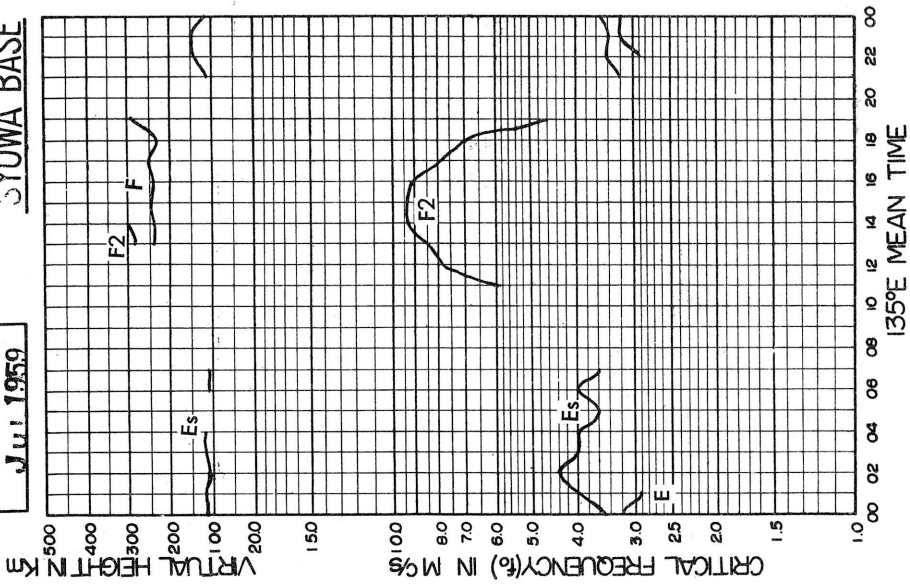
Jun. 1959

SYOWA BASE



July 1959

SYOWA BASE



# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

**Syowa Base**

45° E Mean Time (G.M.T.+3h.)

foF<sub>1</sub>

Feb. 1950

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																									
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12	F	F	F	A	F	U48F	52F	55 <sup>S</sup>	R	B	R	62	U75R	77	81R	83S	C	I86R	C	C	C	U48F	50	F	
13	U50F	54	A	B	A	B	U64R	U74S	U83R	80	82	U81R	78	74	73	70	70	B	B	B	60	50F	43	41F	
14	42F	50F	B	B	52R	B	B	B	B	B	B	B	R	C	C	C	C	C	C	C	50	C	C	47	
15	C	F	F	43	A	B	B	B	B	B	B	B	R	R	B	70	66	R	R	R	C	C	C	C	
16	43	42	A	42	B	B	R	A	B	B	B	B	R	B	U54F	53	53	52	50	B	B	A	B	B	
17	43F	F	B	A	U53F	U60R	55	B	B	A	A	A	B	B	C	C	C	C	C	C	C	C	C	C	
18	C	41	3.7R	53F	51F	58	66	72	77	80	80R	80	76R	U77R	79	83R	U79R	U80R	U75R	77R	80R	72R	63	59	
19	56V	63	7.0	6.0	R	B	B	B	A	R	R	60F	70	69F	76	82	U71R	57F	53	52	45	R	31	35	
20	36F	A	3.7R	40F	59	58	66	U72R	80	U85R	U80R	U79R	U83R	80R	C	71	66	C	66	69	U74R	71	68		
21	63	66	7.0	7.1S	73S	76R	81R	81.7R	U79R	U89R	U80R	U80R	U82R	U83R	U82R	U83R	U82R	C	78	82	U82R	66V	60	A	
22	A	F	58F	56	64	64S	U72R	68R	U58R	62R	66	70F	71F	75F	75R	80R	U80F	77R	75	69	64F	U61F	F	F	
23	F	F	43F	A	A	R	A	R	F	A	R	B	B	R	C	U74FR	B	87R	76	65	72	57F	57F	54F	
24	55F	55F	56F	62	J61R	64	76	U87R	U81R	U81R	U82R	U80R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	U82R	
25	64	67	U65F	66	U68F	R	77F	R	F	B	B	B	R	52	74	80R	U75FR	A	R	R	F	A	U35R	A	
26	A	A	A	F	F	F	F	A	B	A	42F	B	B	R	C	57	58	44	44	44	44	36F	A	U43R	
27	A	A	52	F	F	U57F	R	B	B	R	61F	U60R	U60F	61F	U60R	63R	65F	64	66	45	F	R	A	F	
28	F	F	A	F	A	F	F	48	52F	58R	63	62	65	60	63	65	60	56	43	43F	F	B	F	F	
29																									
30																									
31																									
No.	9	8	9	9	9	8	9	8	7	7	9	10	10	10	12	14	13	10	11	12	10	9	9	8	
Median	50	54	56	56	60	59	69	69	72	72	80	80	74	76	77	77	71	72	74	62	66	61	50	50	
U.Q.	60	64	68	64	66	64	76	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	
L.Q.	42	46	40	42	52	58	60	62	56	62	62	62	70	61	68	65	62	57	50	48	50	49	39	42	
Q.R.	18	18	28	22	14	06	16	16				16	16	16	12	12	16	29	26	25	30	24	27	20	

foF<sub>2</sub>

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

foF1

Feb. 1959

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
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7																								
8																								
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10																								
11						R	40	42	43	B	R	50	54	54 <sup>R</sup>	B	L	L	L	C					
12						B	B	50	49	49 <sup>R</sup>	B	51	B	53 <sup>R</sup>	50	51	49	B	L	L	B			
13						B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C			
14						B	B	B	B	B	B	B	45	44 <sup>R</sup>	B	48	47	44	45	B				
15						B	B	B	B	B	B	B	47 <sup>R</sup>	B	48 <sup>R</sup>	49	47 <sup>R</sup>	41	41					
16						B	B	A	B	A	A	A	B	B	C	C	C	C	C					
17						B	B	46 <sup>L</sup>	49	45 <sup>R</sup>	49 <sup>L</sup>	52 <sup>R</sup>	55 <sup>R</sup>	L	L	L	L	L	L					
18						B	A	B	A	A	A	49	52	L	52 <sup>L</sup>	51 <sup>L</sup>	44	41	L					
19					A	A	L	L	48 <sup>L</sup>	48	49	54 <sup>L</sup>	L	L	L	C	L	L	C					
20						L	L	46 <sup>L</sup>	L	L	L	52 <sup>L</sup>	L	L	L	L	L	L	L	L				
21						L	L	L	L	L	L	52 <sup>L</sup>	L	L	L	L	L	L	L	L				
22						L	L	L	42	R	R	52 <sup>L</sup>	50	48 <sup>R</sup>	B	L	49	L	L	L				
23						A	B	B	F	A	47	B	B	50	C	48	B	L	B	L				
24						L	L	L	L	L	55 <sup>L</sup>	B	L	L	L	L	L	L	L	L				
25						L	52 <sup>L</sup>	45 <sup>R</sup>	B	B	B	B	44 <sup>R</sup>	44 <sup>F</sup>	L	L	44	A	35 <sup>S</sup>					
26						A	B	A	B	A	B	B	B	R	C	48	46	C	L	L				
27						B	B	B	B	44 <sup>R</sup>	44 <sup>R</sup>	B	R	48 <sup>R</sup>	48 <sup>R</sup>	48 <sup>R</sup>	L	L	L					
28						B	B	B	41	R	45	45	44 <sup>R</sup>	B	47	45 <sup>R</sup>	B	42	B					
29																								
30																								
31																								
No.							2	5	7	4	8	8	7	8	5	8	7	4	3					
Median							42	46	48	48	49	52	49	49	48	48	47	42	41					

foF1

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

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Measn Time (G.M.T. +3h.)

Feb. 1959

foE

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																								
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6																								
7																								
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9																								
10																								
11																								
12	230				A	A	270 <sup>R</sup>	350 <sup>R</sup>	340	B	B	B	B	350 <sup>R</sup>	B	B	B	315	C	C	C	A	370	340
13					A	B	B	420	360	B	B	B	B	B	B	B	B	B	B	300	B	A		
14					B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	B	B		
15					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	
16					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	
17					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
18					B	A	B	B	R	340	B	B	B	B	B	C	C	C	C	C	C	C	C	
19					A	A	B	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B	B	
20	225				B	235	250	B	270	280	300	A	B	B	B	B	B	240	B	235	225	240		
21					B	B	B	B	B	B	B	B	B	B	B	B	B	290	C	220	A	A		
22					270	280	B	B	B	B	B	B	B	B	B	A	A	C	260	245	230	B		
23					A	B	B	B	A	B	B	B	B	U <sub>330</sub> <sup>R</sup>	B	B	B	B	270	A	A	A		
24					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
25					A	U <sub>330</sub> <sup>S</sup>	B	300	B	B	B	B	A	B	B	B	B	B	270	A	B	B	B	
26					A	B	A	B	B	B	290	B	B	B	B	B	B	290	B	B	A	A	A	
27					A	235	B	B	B	B	B	B	B	B	B	B	B	C	A	255	235	B	B	
28					B	A	A	B	B	B	B	B	B	B	B	B	B	B	270	A	A	A	A	
29																		B	B	B	B	A	B	
30																		B	B	B	B	A	B	
31																								
No.	2	1	1	1	1	4	2	3	4	2	2	1	1	1	1	1	4	2	5	5	4	1	1	1
Median	23	30	26	27	29	26	26	35	32	31	30	35	33	35	30	32	30	28	27	24	23	24	39	34

foE

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

Feb. 1959

foEs

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																								
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12	35	J34	33	J44	35																			
13	J41	J45	J53	B	J46	B																		
14	J33	J56	B	B	B	B																		
15	C	G	B	B	B	B																		
16	B	J34	J64	45	B	B																		
17	J41	J51	B	J48	B	J42	B																	
18	C	23	G	J27	B	29	B																	
19	J42	J52	J37	J39	J50	J53	B																	
20	J62	J51	G	B	B	30	G																	
21	J60	J50	B	B	B	B	B																	
22	J60	J37	29	G	G	G	B																	
23	29	J36	J46	45	J61	B	45																	
24	B	B	B	B	B	B	B																	
25	B	B	B	B	30	G	B																	
26	J81	J47	J38	J33	J43	B	26																	
27	J45	44	34	J61	35.5	J59	B																	
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29																								
30																								
31																								
No.	12	14	11	10	10	9	5	5	5	8	6	5	4	3	5	3	4	5	6	7	9	9	11	10
Median	46	44	44	44	43	E33	E27	44	E36	34	39	38	E30	34	42	35	E30	34	E29	33	34	38	38	34

Sweep 10 Mc to 200 Mc in 20 min sec in automatic operation.

foEs

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

**Syowa Base**

45° E Mean Time (G.M.T. + 8h.)

f-min

Feb. 1959

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																									
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11																									
12	160	210	170	240	240	220	220	240	250	B	380	270	370	250	600	400	510	280	1280 <sup>C</sup>	1225 <sup>C</sup>	220	210	210	170	
13	180	230	330	B	335	B	435	375	330	400	500	450	520	380	340	415	360	B	B	B	200	200	200	210	
14	240	240	B	B	390	B	B	B	B	B	B	B	500 F	C	C	C	C	C	C	C	390	B	385	370	
15	C	220	360 F	360	400	B	B	B	B	B	B	B	410	410	B	410	380	380	385	385	C	C	C	C	
16	375	240	375	330	B	B	B	480	380	B	B	B	376	B	375	375	370	365	365	365	B	B	B	370	
17	250	220	B	365	290	400	390	B	B	B	410	375	390	B	C	C	C	C	C	C	C	C	C	B	
18	C	210	220	230	365	270	330	280	280	330	360	365	365	370	365	270	230	230	230	265	220	220	210	200	
19	215	175	170	275	220	210	B	B	380	330	430	390	415	370	365	370	310	300	365	215	200	170	210	170	
20	205	240	270	365	370	220	210	300	225	245	220	325	375	360	270	C	220	210	1215 C	220	200	200	200	205	
21	205	170	210	170	215	230	265	310	230	365	370	405	460	410	320	280	260	1235 C	225	215	210	210	215	175	
22	245	205	170	220	230	220	360	370	370	370	400	360	280	365	560	410	370	320	240	220	210	210	210	160	
23	205	205	165	380	240	370	415	470	225	415	380	B	B	385	C	365	B	385	600	380	360	220	335	220	
24	220	245	300	345	385	340	380	385	400	385	370	340	370	370	330	300	360	320	320	270	300	320	225	210	
25	235	210	220	200	230	265	285	270	260	B	B	B	265	365	370	420	255	410	315	B	225	270	215	220	
26	230	220	160	210	220	370	230	435	B	420	270	B	B	385	C	360	325	C	285	220	225	220	150	220	
27	240	315	320	220	230	225	410 F	B	B	330	400	470	400	375	390	420	430	320	280	280	250	225	320	220	
28	220	220	220	220	370	225	235	380	385	380	320	275	400	500	370	380	430	340	370	370	210	B	175	165	
29																									
30																									
31																									
No.	15	17	15	15	16	13	14	12	11	12	13	11	14	14	12	14	14	13	15	13	14	13	14	15	
Median	22	22	22	24	26	23	34	38	28	38	38	36	39	37	37	38	36	32	28	22	22	22	21	21	

Sweep 1.0 Mc to 2.0 Mc in 20 min-sec in automatic operation.

The Radio Research Laboratories, Japan.

S

f-min

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

RTF

Feb 1955

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																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11									R	B	R	525	430	455	450	L	L	C						
12						495	600 <sup>F</sup>	500	445	430	460	460	465	500	470	465	485	L	L	B	B			
13						B	B	B	B	B	B	B	590	C	C	C	C	B	B	B	C			
14						B	B	B	B	B	B	B	R	R	B	525	500	R	R	R	R			
15						B	B	B	B	B	B	B	R	R	B	720	610	650	600	500				
16						B	540 <sup>B</sup>	A	B	B	B	B	R	B	B	C	C	C	C	C				
17							490	B	B	A	A	A	B	B	C	C	C	C	C	C				
18						450	460	425 <sup>L</sup>	420	420	385	420	460	L	L	L	L	L	L	L				
19						520	600 <sup>F</sup>	B	A	A	R	530	L	465	460	420	495	525	525	L				
20						L	L	L	440	425	420	425	385	L	L	L	L	C	C					
21						L	L	400 <sup>L</sup>	L	370 <sup>L</sup>	370	365	L	L	L	L	L	L	L	L				
22						L	L	L	560	620	440	420	510	525	450	L	395	L	L	L				
23						A	R	A	F	A	R	B	B	R	C	485	B	L	L	385	L			
24						L	L	L	L	L	350	L	L	L	L	L	L	L	L	L				
25						L	L	L	F	B	B	B	R	720 <sup>F</sup>	525 <sup>L</sup>	380	465	A	R					
26							A	A	B	A	B	B	B	R	C	600	560	C	L	L				
27						535 <sup>F</sup>	B	B	B	R	560	600 <sup>B</sup>	565	530	565	535	L	L	L	L				
28						600	600	635	600	600	530	570	545	580	570	550	610	525	600					
29																								
30																								
31																								
No.					1	3	6	5	5	6	8	9	8	7	8	9	8	3	3	3	1			
Median					520	495	525	480	465	430	430	460	490	525	500	525	500	525	525	600	500			

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 2.0 Mc in 20 min. in automatic operation.

RTF

S



# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

**Syowa Base**

45° E Mean Time (G.M.T.+3h.)

01

Feb. 1959

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																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12	330	290	E 320 A	A	500	A	325	300	280	B	260 S	230	235	225	B	250	E 320 B		C	C	C	350	400	F	
13	420	380	B	B	A	B	B	E 330 R	E 365 R	E 300 B	B	245	B	250	260	E 245 B	E 250 B	250	265	300	285	350	420 A	480	
14	500	410	B	B	410	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	
15	C	570 F	F	E 420 B	A	B	B	B	B	B	B	B	290	290	B	E 300 B	E 300 B	E 320 B	B	C	C	C	C	U 420 F	
16	E 490 B	390	A	460	B	B	B	A	B	B	B	B	250	B	270	240	270	E 335 B	E 320 B	B	B	A	B	B	
17	E 470 R	480	B	A	340	490	B	B	B	A	A	A	B	B	C	C	C	C	C	C	C	C	C	C	
18	C	320	E 420 A	F	450	B	320	255	260	235	235	E 360 A	245	270	240	230	250	250	260	250	245	245	E 240 A	285	
19	E 300 A	E 350 A	315	460	A	A	B	B	A	A	290	260	270	255	230	265	270	315	315	300	320	360	420	370	
20	365	A	E 480 R	490	365	390	305	270	245	240	240	265	230	240	240	C	240	240	280	270	265	265	E 270 A		
21	E 375 A	295	295	E 315 B	340	300	275	260	260	250	245	260	E 300 B	250	250	C	250	C	250	265	260	260	270	A	
22	A	415	370	E 325 R	330	380	325	330 F	300	A	280	255	260	260	B	270	245	260	285	270	270	285	335	330	
23	F	F	460 B	A	A	325	A	B	F	A	375	B	B	340	C	270	B	280	B	285	285	280	350	300	
24	E 310 B	315	350	E 360 B	E 365 B	380	E 300 B	E 270 B	E 270 B	255	235	260	E 280 A	E 240 A	260	235	235	240	240	240	250	265	270		
25	280	290	310	320	365	380	310	310	270 F	B	B	B	260	270	265	300	300	A	330	B	F	A	320	A	
26	A	A	A	480 F	650 F	430 B	370 F	A	B	A	220	B	B	275	C	270	275	C	315	335	330	365	A	495 F	
27	A	A	525	400	400	380	B	B	B	325	300	B	270	260	280	E 300 B	E 320 B	275	250	E 420 A	F	330	A	F	
28	480 F	F	A	F	A	330 F	F	B	E 430 B	E 330 A	280	275	270	B	245	280	B	E 325 B	B	510	F	B	F	440	
29																									
30																									
31																									
No.	8	12	8	8	11	10	8	6	6	5	11	9	9	13	10	11	9	8	9	10	10	11	10	11	
Median	350	E 370	E 335	430	365	380	320	285	270	265	265	265	260	255	260	250	260	255	265	290	280	285	340	330	

RF

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

9'ES

Feb. 1959

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																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
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26																									
27																									
28																									
29																									
30																									
31																									
No.	12	13	10	9	9	7	3	3	4	4	6	5	4	3	2	5	3	1	2	3	5	7	8	11	10
Median	120	125	130	125	115	150	145	150	130	135	120	120	120	120	130	120	115	125	140	165	160	160	120	135	125

The Radio Research Laboratories, Japan.

Sweep 10 Mc to 200 Mc in 20 Sec in automatic operation.

9'ES

S

# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

**Syowa Base**

45° E Mean Time (G.M.T.+3h.)

Types of Es

Feb. 1959

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																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12	l	a	a	a	a	t					h				l				h	h	a	l	a	
13	a	a	f		t																h	a	a	
14	a	a			a																	a	a	
15																								
16		h	a	a	a			a														r		
17	a	a	a	a	a	a				a	l	l												
18													l	h							h		t	t
19	t	t	f	a	a	a			l	r	C	C			l	h					h	l	a	
20	t	a			h				C				h	h	h	h				C	l	l	t	
21	f	f													l	l			C	h	C	a	r	
22	a	a	r		a				a	a	a	h				l						a	a	
23	a	a	a	f	a	a			a	a	a	l	l	l	l	l				h	C	a	a	
24																								
25									h	h		l	l	l	l	l		a		l	l	l	l	
26	a	a	a	a	a	a		a	h	a									a	a	h	a	a	
27	r	f	a	a	a	h													a	a	a	r	r	
28	a	a	a	a	l	l		l	l	l	l								l	a	a	a	a	
29																								
30																								
31																								
No.																								
Median																								

Sweep 10 Mc to 240 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

Types of Es

S

# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

## Syowa Base

45° E Mean Time (G.M.T. + 3h.)

foF<sub>2</sub>

Mar. 1959

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	F	B	F	F	F	B	B	R	B	B	R	B	B	64R	55	F	C	A	A	A	A
2	B	B	B	F	B	F	B	B	B	B	B	B	B	B	B	63F	62	64F	56	48	48	A	A	F
3	B	B	B	F	B	R	B	B	B	B	B	B	B	B	B	68	67R	73	77	77	47F	R	A	A
4	A	A	A	F	A	A	A	A	B	B	B	B	B	B	B	69	80R	B	70R	64	54	A	A	A
5	A	A	A	F	A	B	B	B	A	B	B	B	B	B	B	64	65	67	68	59	F	A	A	A
6	A	A	A	F	A	A	A	B	62F	65F	68	73	75R	81	81R	82R	82R	R	83R	82R	73	61R	F	24
7	B	B	B	F	B	57	58	58	69	74	80	80R	87R	87	87	84R	C	C	C	C	C	A	F	52F
8	F	F	F	F	44F	B	46	48	B	A	A	62R	61	67	76	77	76	74	76	67	62	46F	F	R
9	F	F	F	F	46	50F	F	42F	53	65	67	71F	76	84R	83R	80R	B	81R	80R	81	78R	46F	35F	
10	F	F	F	F	44F	53	67	70F	82R	80R	82R	82R	82R	83R	80R	B	82R	83R	82R	90R	84R	73R	70R	61F
11	58F	54	53	55	56	58	68R	74R	80R	80R	82R	82R	83R	82R	82R	79R	87R	86R	89R	82R	82R	74R	59	34
12	32	37F	56F	C	C	C	C	C	C	61F	C	C	C	C	C	C	84R	83R	82R	73R	39	F	F	A
13	F	38F	F	F	F	F	A	53F	65F	83	82	83	84	87R	86R	79	83R	83R	88R	85R	70	58	53R	47F
14	44F	A	45R	R	70R	76R	80R	80R	86R	85R	86	85R	86	85R	108R	87R	83R	90R	90R	95R	90R	66	F	F
15	45	48F	42	A	46F	55	B	80	77	86R	92R	92R	92R	92R	92R	82R	86R	82R	84R	90R	95R	80R	67F	57F
16	53F	R	A	68R	F	77R	72F	85R	82R	83R	85R	83R	90R	82R	84R	87R	83R	82R	81R	90R	88R	C	C	39F
17	37F	C	32	R	F	S	83F	83F	F	F	F	103	103	108	110R	106	106	R	103S	110S	105R	82S	64	57
18	50	43F	R	41	42	42	F	61	72	82	95	98R	110	109R	118R	107S	106	106	105	110S	105R	76	60	50
19	39	35	28	25	28	34	43F	55	66	78	94R	99	109R	120R	122R	C	82R	90S	91S	90S	85S	85R	66	42F
20	43	40	33F	32	32F	32F	B	72F	83	93R	C	102R	109R	119R	118R	114R	107R	80R	101R	113R	82R	80R	65R	50F
21	F	F	F	F	66R	69R	82R	82R	83R	82R	90R	107R	103R	136R	133	130R	130R	130	133R	92R	90R	90R	82R	F
22	A	48R	A	32	45R	73R	86R	86R	88R	90R	90R	90R	90R	104R	130R	128R	128R	128R	103R	103R	100R	93R	93R	52F
23	43F	C	C	C	C	C	A	82R	80F	71	F	F	F	91	88	92	C	C	C	C	C	C	C	32R
24	25	61F	R	A	55R	B	48	550C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	A	A	A	A	F	30	F	32F	40	B	B	B	R	R	B	B	C	C	50	B	F	A	A	B
29	A	A	R	A	B	B	B	B	B	B	B	B	C	B	B	B	53	B	F	F	A	F	A	A
30	A	A	A	30F	32	A	42R	B	B	B	B	B	B	B	B	B	900P	82R	80R	B	60R	R	C	C
31	C	C	A	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
No.	11	9	11	11	16	14	11	18	18	14	14	12	14	14	14	17	23	16	22	18	21	15	12	14
Median	43	40	42	38	44	54	50	66	78	82	88	89	89	88	90	98	83	83	86	88	82	74	64	48
U.Q.	50	48	54	45	56	69	82	82	82	86	93	100	103	119	118	106	100	94	101	100	90	82	68	52
L.Q.	37	36	32	32	37	42	46	53	65	72	74	72	84	84	84	66	76	71	80	80	61	61	56	35
Q.R.	13	12	22	13	19	27																21	12	17

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 2.0 Mc in 20 <sup>min</sup> sec in automatic operation.

foF<sub>2</sub>

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. +3h.)

Mar. 1959

$f_oF_2$

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							R	43.5 <sup>R</sup>	B	B	B	B	B	46 <sup>R</sup>	B	45	45	L	B					
3							B	B	B	B	B	B	44 <sup>R</sup>	B	B	44	L	L	L					
4							A	R	44.5 <sup>R</sup>	B	B	B	B	47 <sup>R</sup>	B	L	L	L	L					
5						B	B	B	A	B	B	B	B	B	46	C	L	L	B					
6						A	A	B	R	43	R	B	B	B	B	L	L	L	L					
7						R	B	R	R	L	L	L	L	L	L	L	C	C						
8						B	B	R	B	A	B	B	B	L	L	L	L	L	L					
9									41	43	L	L	L	L	L	L	L	L						
10									L	L	L	L	L	L	L	L	L	L						
11									L	L	L	L	L	L	L	L	L	L						
12						C	C	C	F	A	L	C	C	L	L	L	L	L						
13							A	B	R	L	L	L	L	L	L	L	L	L						
14								R	L	L	L	L	L	L	L	L	L	L						
15							B	B	L	L	L	L	L	L	L	L	L	L						
16									L	L	L	L	L	L	L	L	L	L						
17									L	L	L	L	L	L	L	L	L	L						
18								L	L	L	L	L	L	L	L	L	L	L						
19									L	L	L	L	L	L	L	L	L	L						
20									L	L	L	L	L	L	L	L	L	L						
21						R	R	L	L	L	L	L	L	L	L	L	L	L						
22								L	L	L	L	L	L	L	L	L	L	L						
23									L	L	L	L	L	L	L	L	L	L						
24					34	B			L	L	L	L	L	L	L	L	L	L						
25							C	C	C	45 <sup>C</sup>	C	C	C	C	C	C	C	C						
26							C	C	C	C	C	C	C	C	C	C	C	C						
27							C	C	C	C	C	C	C	C	C	C	C	C						
28								L	30	B	B	B	40	B	B	C	C	C						
29						B	B	B	B	B	B	B	B	43	B	L	B	B						
30						B	B	B	B	B	B	B	B	B	B	B	B	B						
31						C	C	C	C	C	C	C	C	C	C	C	C	C						
No.					1	0	0	1	3	4	3	1	2	3	1	2	1							
Median					34			35	41	44	44	45	42	46	46	44	45							

$f_oF_1$

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

foE

Mar. 1959

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	3.65	260	B	B	B	B	B	B	B	B	B	B	B	B	C			
2					320	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B		
3					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B		
4					B	B	A	A	R	B	B	B	B	B	B	B	B	B	B	A	B	B		
5					A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
6					A	B	B	B	B	3.35	B	B	B	B	B	B	B	B	B	B	B	B		
7					B	A	B	A	A	A	B	B	B	B	B	B	B	B	B	C	C	C		
8					265	B	A	A	B	B	B	B	B	B	B	B	280	240	B	B	B	B		
9					A	A	B	A	A	2.80	2.75	B	B	B	B	B	B	B	B	B	B	B		
10					A	B	B	B	B	B	A	B	B	B	B	B	B	A	A	A	A			
11					A	A	B	B	B	B	B	A	A	A	A	A	2.95	2.65	B	B	B	B		
12					C	C	C	C	B	B	3.00	C	C	C	C	3.00 <sup>R</sup>	B	B	B	B	B			
13					290	B	B	B	B	B	B	B	B	B	3.30	3.15	2.90 <sup>R</sup>	R	B	A	B			
14					A	2.80	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B		
15					A	B	B	B	B	B	B	B	3.00	B	B	B	B	B	B	B	B	B		
16					B	A	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B		
17					260	A	A	B	B	B	B	B	B	B	B	B	B	B	R	B	B	B		
18					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
19					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
20					A	B	B	A	2.70 <sup>R</sup>	2.60	C	3.10	A	A	3.30	B	2.60	B	B	B	B			
21					A	A	A	2.20	2.10	2.80	2.90	3.00	2.90	3.10	B	2.90	2.40	2.40	B	B	B			
22					A	2.20	2.40	2.30	2.30	2.30	3.00	2.80	3.00	3.10	3.10	2.90	2.70	B	B	B	B			
23					C	C	4.30	4.40	3.60	B	B	B	B	B	B	R	C	C	B	B	B	B		
24					R	B	B	3.30	3.50	A	R	C	C	C	C	C	C	C	C	C	C			
25					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
26					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
27					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
28					220	A	2.00	A	2.25	B	B	B	B	B	B	B	B	B	B	B	B	3.30		
29					B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	2.60	A			
30					B	1.80	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
31					C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
No.	0	2	3	3	4	3	5	5	5	4	4	5	3	3	3	3	5	3	1	1	0	1	0	1
Median		1.9	3.3	2.6	2.8	2.2	3.2	2.6	2.4	2.7	3.0	3.0	3.0	3.1	3.1	2.9	2.7	2.4	2.6	3.3	3.3	3.3	3.3	2.4

foE

Sweep 1.0 Mc to 2.00 Mc in 20 <sup>min</sup> Sec in automatic operation.

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Mean Time (G.M.T. +3h.)

**foEs**

Mar 1958

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	43	37	B	36	35.5	G	B	B	B	B	B	B	B	B	B	B	B	C	37	44	48	60
2	B	B	B	34	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	38	53
3	B	B	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	33	39
4	60	50	26	30	4.6	4.5	44	45	G	B	B	B	B	B	B	C	B	B	B	B	23	34	39	48
5	41	32	36.9	26	4.5	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29	35.3	35.0	45.1
6	42	35	35.2	37	2.9	44	48	B	42	G	B	B	B	B	B	B	B	B	B	B	B	B	27	B
7	B	B	40	B	B	38	B	28	33	26	B	B	B	B	B	B	C	C	C	C	C	35.3	42	39
8	41	36	38.3	39	30	B	37	34	B	4.6	B	B	B	B	B	3.3	3.2	2.8	B	B	B	27	B	29
9	28	35	36.7	46	34	30	B	4.5	44	34	G	G	3.6	34	38	B	3.2	B	B	B	B	B	30	24
10	27	27	28	29	26	B	B	B	B	B	3.3	4.2	4.5	35.2	48	B	3.1	3.8	34	42	2.9	B	B	B
11	27	B	B	B	38	32	B	B	B	B	B	B	34	47	4.3	3.7	G	G	B	B	B	B	B	2.9
12	23	25	30	C	C	C	C	C	B	44	34	C	C	C	G	B	B	B	B	B	38	33	41	33
13	40	32	28	38	43	B	4.5	B	44	B	B	B	B	G	G	G	G	B	B	B	B	B	B	1.9
14	41	38	43	33	3.7	G	B	3.9	40	B	B	B	B	34	33	B	B	B	B	B	B	B	B	24
15	35	32	34	41	34	4.5	B	B	B	B	B	B	B	33	B	B	B	B	B	B	B	B	B	B
16	B	32	31	36.5	B	4.2	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	B
17	B	C	B	43	38	5.1	43	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	4.2	4.8	34	33	B	C	B	B	B	B	B	B	B
20	B	32	29	B	36	B	B	42	32	G	C	G	3.3	33	G	B	G	B	B	B	B	B	B	B
21	B	33	33	32	34	40	32	G	G	G	3.6	3.9	34	G	B	G	G	G	B	B	B	B	B	2.3
22	30	28	30	46	40	C	G	G	G	G	G	G	G	G	G	G	G	B	B	B	B	B	B	B
23	B	C	C	C	C	C	38	G	42	B	B	B	B	B	B	G	C	B	B	B	B	B	B	24
24	32	364	G	34	34	B	G	G	37	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	47	76	4.5	G	G	2.5	2.9	30	G	B	B	B	B	B	B	B	C	B	B	B	B	3.9	3.1	3.9
29	42	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	3.9	3.1	3.9
30	4.5	27	G	28	3.1	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	3.9	3.1	3.9
31	C	C	C	27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
No.	16	19	21	20	18	13	11	10	14	9	6	8	8	8	8	6	8	5	5	4	7	11	12	15
Median	40	32	34	38	37	38	37	32	35	35	34	33	34	33	32	29	28	26	29	40	37	34	38	39

Lat. 69° 00.4' S  
Long. 39° 35.4' E

IONOSPHERIC DATA

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

f-min

Mar. 1959

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	230	220	B	265	255	220	B	B	370	B	B	375	B	370	370	375	375	C	225	220	250	235
2	B	B	B	225	230	335	320	B	B	B	B	B	415	B	B	370	340	375	235	240	225	220	340	220
3	B	215	330	220	B	420	365	B	B	B	B	B	B	325	600	370	380	400	250	240	320	230	210	400
4	270	420	220	220	375	325	300	250	370	415	B	B	B	B	320	C	370	B	330	210	210	230	210	210
5	330	210	370	230	220	B	B	B	370	B	B	390	B	B	B	430	360	370	290	250	210	250	220	270
6	320	320	370	220	220	395	370	B	325	375	370	420	590	555	365	320	320	580	365	360	220	225	160	220
7	B	250	210	220	235	270	B	260	220	235	405	385	360	370	320	370	C	C	C	C	C	210	230	225
8	220	170	200	210	180	B	235	220	B	420	B	520	360	400	360	310	210	225	270	320	200	150	180	160
9	170	190	180	190	210	200	360	280	260	290	230	225	330	325	365	310	310	315	270	280	210	175	170	200
10	150	170	160	180	170	210	230	260	365	400	270	370	370	280	390	B	330	220	250	285	230	230	220	155
11	165	165	165	165	165	170	270	305	360	315	375	285	280	280	285	215	200	215	270	230	235	200	200	180
12	170	180	230	C	C	C	C	C	370	370	230	C	C	C	220	360	320	280	270	310	220	220	220	220
13	210	200	200	200	220	300	330	390	285	430	370	410	360	210	200	250	240	260	220	220	240	220	220	170
14	220	200	360	225	220	235	300	360	230	360	350	400	360	370	320	320	290	310	300	200	200	210	210	170
15	200	170	220	200	200	320	B	B	360	320	320	350	275	360	230	310	375	375	270	225	360	300	220	180
16	170	170	235	200	370	240	280	285	260	310	370	270	370	320	320	360	300	265	285	230	200	C	C	200
17	200	175	130	210	205	210	220	310	260	310	390	400	320	330	320	370	280	220	300	280	150	165	140	200
18	170	160	180	170	160	180	200	220	280	320	320	330	350	360	350	310	300	300	280	200	210	230	160	200
19	200	190	180	210	180	310	200	225	280	300	260	310	310	300	370	C	300	320	230	200	210	200	160	200
20	200	200	200	200	150	180	B	215	215	220	C	260	300	235	250	310	220	300	230	240	235	220	200	165
21	170	160	170	170	200	210	200	200	200	200	210	220	220	220	400	220	230	200	270	220	200	220	220	170
22	170	180	260	220	220	170	170	190	280	200	200	205	210	210	210	200	200	280	220	200	190	200	170	180
23	180	C	C	C	C	C	C	290	240	550	380	370	370	380	380	200	300	300	210	210	160	180	200	160
24	140	210	170	180	210	B	270	230	220	210	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	150	320	170	140	150	150	150	170	180	B	B	B	330	B	B	350	320	320	B	220	140	150	230	B
29	330	330	460	B	B	B	B	B	B	B	B	B	B	B	B	B	360	360	180	220	220	160	170	220
30	310	200	160	150	310	160	B	B	B	B	B	B	B	B	B	B	450	490	600	B	235	150	C	C
31	C	C	250	200	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	240	B
No.	23	24	26	25	22	21	20	19	21	20	17	18	19	20	20	21	24	23	24	23	25	25	25	24
Median	20	20	20	20	21	24	27	25	26	32	35	36	35	34	32	32	30	30	27	23	21	22	21	20

f-min

Sweep 1.0 Mc to 2.0 Mc in 20 Sec in automatic operation.

The Radio Research Laboratories, Japan.

S



IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

Syowa Base

45° E Mean Time (G.M.T. + 8h.)

R'F2

Mar. 1959

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							420	F	B	B	R	B	B	670F	620F	L	F							
2							450	B	B	B	B	B	F	520	470L	450	L							
3							B	B	B	B	B	B	B	440	E520B	430	L	L						
4							A	500	520	500	B	B	B	B	475	C	390L	B						
5							B	B	A	B	B	B	B	B	B	B	470	L	L					
6							A	A	B	500	485	480	450	450	E305B	L	L	L						
7							485	B	540	495	L	420	L	L	L	L	C	C						
8							B	650	B	A	B	F530B	L	L	L	L	330L							
9									640	570	L	L	L	L	L	L	L							
10									L	L	L	L	L	L	L	L	L							
11									L	L	L	L	L	L	L	L	L							
12							C	C	F	A	L	C	C	L	L	L	L							
13							A	600	390	L	L	L	L	L	L	L	L	L						
14								460	L	L	L	L	L	L	L	L	L	L						
15							B	B	L	L	L	L	L	L	L	L	L	L						
16									L	L	L	L	L	L	L	L	L	L						
17									L	L	L	L	L	L	L	L	L	L						
18									L	L	L	L	L	L	L	L	L	L						
19									L	L	L	L	L	L	L	L	L	L						
20									L	L	C	L	L	L	L	L	L	L						
21							495	370	L	L	L	L	L	L	L	L	L	L						
22									L	L	L	L	L	L	L	L	L	L						
23									L	L	L	L	L	L	L	L	L	L						
24							B		C	C	C	C	C	C	C	C	C	C						
25									C	C	C	C	C	C	C	C	C	C						
26									C	C	C	C	C	C	C	C	C	C						
27									C	C	C	C	C	C	C	C	C	C						
28									L	620	B	B	R	B	B	C	C	C						
29							B	B	B	B	B	C	B	R	B	B	560	575	B					
30							B	B	B	B	B	B	B	B	B	B	B	B						
31							C	C	C	C	C	C	C	C	C	C	C	C						
No.							2	4	5	6	3	2	3	1	2	2	6	4						
Median							490	470	540	510	500	450	E 490	450	370	E 500	465	490	450					

R'F2

S

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

IONOSPHERIC DATA

45° E Mean Time (G.M.T. + 3h.)

Mar. 1959

R'F

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	E520 <sup>A</sup>	450 <sup>F</sup>	B	F	B	B	B	B	295	B	B	280	B	270	E370 <sup>B</sup>	370	B	C	A	A	A	A
2	B	B	B	480	F	E390 <sup>B</sup>	B	B	B	B	B	B	E330 <sup>B</sup>	B	B	270	260	E320 <sup>B</sup>	340	290	315	A	A	525
3	B	B	460 <sup>F</sup>	F	B	470	B	B	B	B	B	B	B	265	B	250	285	365	290	315	360	R	A	A
4	A	A	365	F	A	A	A	B	370	340	B	B	B	B	255	C	290	B	285	300	350	A	A	A
5	A	A	400	A	350	B	B	B	A	B	B	320	B	B	B	E300 <sup>B</sup>	280	E300 <sup>B</sup>	290	300	305	A	A	A
6	A	A	A	390	430	A	B	B	E370 <sup>A</sup>	295	260	300	B	B	245	230	225	E290 <sup>B</sup>	240	260	250	255	F	400
7	B	450	410	385	440	B	B	B	B	A	B	B	265	240	270	245	C	C	C	C	C	A	F	400
8	550	400 <sup>F</sup>	450	F	465	B	B	B	B	400	260	240	240	255	250	250	265	270	270	270	270	250	295	500
9	F	A	F	F	480	400	395	F	400	290	260	240	240	255	250	250	250	250	255	250	265	285	F	300
10	350	370	400	400	370	340	300	280	270	285	270	265	270	260	265	B	250	235	240	240	240	235	250	240
11	260	280	315	325	320	325	300	280	270	250	245	250	250	270	245	240	230	230	230	235	230	230	240	455
12	450	400 <sup>F</sup>	400 <sup>F</sup>	C	C	C	C	C	F	A	275	C	C	C	260	265	270	250	275	280	E540 <sup>A</sup>	F	F	A
13	F	550 <sup>F</sup>	420 <sup>F</sup>	F	410	435	A	B	B	320	295	305	265	230	250	260	265	275	260	250	260	285	280	375
14	310	A	500	420	385	415	320	B	335	285	270	270	240	250	245	250	245	245	250	245	240	265	300	440
15	350	300	400	A	480	380	B	B	300	260	245	240	230	235	250	235	250	230	240	240	255	270	250	265
16	280	345	A	230	385	400	315	260	245	250	265	250	245	240	240	240	240	240	230	240	235	C	C	265
17	E290 <sup>B</sup>	C	320	435	490 <sup>F</sup>	450	400	330	265	260	275	260	250	250	235	250	240	250	235	235	250	230	230	270
18	255	365	510	390	400	370	320	270	270	265	250	245	240	240	245	250	230	245	250	245	230	235	230	240
19	280	300	E400 <sup>B</sup>	E500 <sup>B</sup>	E430 <sup>B</sup>	E400 <sup>B</sup>	E350 <sup>B</sup>	295	270	260	260	240	240	240	250	C	240	235	225	235	230	225	235	E300 <sup>B</sup>
20	300	305	340	E370 <sup>B</sup>	E400 <sup>A</sup>	E370 <sup>B</sup>	B	360	285	285	C	245	250	250	240	235	235	235	235	230	220	230	235	255
21	305	305	420	F	420	B	B	290	270	240	245	240	240	235	245	230	240	240	240	235	225	235	235	275
22	A	330	A	540	465	400	400	305	270	250	250	240	240	235	230	230	240	240	235	225	265	225	230	265
23	305	C	C	C	C	C	A	445	330	350	270	270	265	270	265	250	C	245	235	235	245	260	250	295
24	380	F	R	A	250	B	590	600	C	265	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	A	A	A	F	520	F	400	355	320	B	B	B	370	B	B	C	C	380	B	F	A	A	A	B
29	A	A	A	410	B	B	B	B	B	B	B	C	B	310	B	340	B	B	400	A	240	A	A	A
30	A	A	A	400	450	A	F	B	B	B	B	B	B	B	B	B	270	280	300	B	280	430	C	A
31	C	C	A	450	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B
No.	14	15	17	15	18	13	11	13	15	18	17	17	17	19	19	20	21	20	23	21	23	16	13	17
Median	310	365	400	420	415	400	320	300	270	260	260	260	250	250	250	250	250	245	250	245	250	240	240	295

Sweep 1.0 Mc to 240. Mc in 240 sec in automatic operation.

R'F

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Mean Time (G.M.T. + 3h.)

K'ES

Mar. 1959

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	130	120	B	150	155	G	B	B	B	B	B	B	B	B	B	B	B	C	120	120	115	105
2	B	B	B	145	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170	B	B	120	115
3	B	120	B	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150	B	G	130	150
4	105	175	125	125	120	115	110	110	G	B	B	B	B	B	B	C	B	B	B	150	150	130	125	105
5	150	130	145	130	125	B	B	B	140	B	B	B	B	B	B	B	B	B	B	B	B	150	170	125
6	110	110	100	120	120	100	105	B	120	G	B	B	B	B	B	B	B	B	B	B	B	B	160	B
7	B	B	105	B	B	125	B	120	115	120	B	B	B	B	B	B	C	C	C	C	C	115	135	120
8	130	130	105	130	150	B	120	125	B	140	B	B	B	B	B	130	140	120	B	B	B	135	B	135
9	140	140	130	130	125	135	B	130	120	120	G	G	135	135	120	B	120	B	B	B	B	B	165	120
10	125	140	130	125	110	B	B	B	B	B	110	120	120	120	115	B	115	115	115	115	105	B	B	B
11	110	B	B	B	160	110	B	B	B	B	B	115	115	115	115	110	G	G	B	B	B	B	B	125
12	165	150	150	C	C	C	C	C	B	150	160	C	C	C	G	B	B	B	B	B	140	125	135	115
13	115	145	140	130	165	B	130	B	130	B	B	B	B	B	G	G	G	B	B	B	B	B	B	175
14	120	120	175	115	110	G	B	115	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120
15	135	120	125	110	150	150	B	B	B	B	B	B	125	B	G	B	B	B	B	B	B	B	B	B
16	B	120	150	130	B	115	B	B	G	B	B	B	B	B	B	B	B	B	B	B	B	C	C	B
17	B	C	B	125	145	120	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	B	B	B	B	B	125	120	115	115	B	C	B	B	B	B	B	B	B
20	B	115	135	B	100	B	B	115	155	G	C	G	115	120	G	B	G	B	B	B	B	B	B	B
21	B	150	145	135	140	105	120	G	G	G	120	105	105	G	B	G	G	G	B	B	B	B	B	165
22	110	125	150	140	125	C	G	G	G	G	G	G	G	G	G	G	G	B	B	B	B	B	B	B
23	B	C	C	C	C	C	150	G	160	B	B	B	B	B	B	B	C	C	B	B	B	B	B	150
24	130	160	G	125	120	B	B	G	120	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
28	115	110	170	G	G	135	115	130	G	B	B	B	B	B	B	B	B	B	B	B	120	120	115	B
29	150	130	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	160	105	110	110	100
30	120	115	G	180	140	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	115	110	C
31	C	C	130	100	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	110	B
No.	16	19	19	19	16	11	9	7	9	4	4	4	7	5	3	2	3	2	5	4	7	10	12	15
Median	120	130	130	130	125	120	120	120	120	120	120	120	115	120	115	120	125	120	150	130	120	120	130	135

K'ES

IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

Types of Es

Mar. 1959

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	h														a	a	a	a	
2			a	a															a			a	a	h	
3			a	a															a			a	γ	a	
4	f	a	a	a	f		a												a			a	a	a	
5	a	a	a	a	a				a													a	a	a	
6	a	a	f	a	a		l		a													a	a	a	
7			f	a	a		a		a													a	a	a	
8	a	a	f	a	a		a		a													a	a	a	
9	a	a	a	a	a		a		a													a	a	a	
10	a	f	a	a	a		a		a		l	l	h	h	h	h	h	l	l	l	f			h	
11	f										l	l	l	l	l	l	l	l	l	l				h	
12	a	C	a						a		h											a	a	a	
13	γ	γ	a	a	h		a		a										a			a	γ	a	
14	a	a	a	a	a			γ	a				C											a	
15	γ	a	a	γ	a		a																	a	
16	γ	γ	a	a	a		a																	a	
17			γ	l	γ		γ																	a	
18																								a	
19																								a	
20			f		fr			a	h		h	C	C	C										a	
21		a	a	a	a		γ				C	C	l	a										a	
22	γ	γ	a	a	a																			a	
23							h		h															a	
24	a	a	a	a	l				a															a	
25																									
26																									
27																									
28	a	a	h		a		a	a											h	h	γ	f	a	a	
29	f	a																	h	f	a	γ	a	a	
30	γ	a	a	h	a														h	f	a	γ	a	a	
31			f	f																				a	
No.																									
Median																									

Sweep /D Mc to 200 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

Types of Es

S

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

IONOSPHERIC DATA

45° E Meath Time (G.M.T. +3h.)

f<sub>o</sub>F<sub>2</sub>

Apr. 1959

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	53R	A	B	R	F	F	B	B	B	B	B	B	B	C	68R	C	68R	68	62	63	58	47	B	B	28
2	25	R	R	24	27	36	U50R	B	B	U84R	R	R	B	D89R	R	D90R	D80R	S	D80R	D96R	D67R	R	R	R	A
3	A	A	R	F	D60R	B	B	A	B	A	58R	64	68	S	80R	D73R	D80R	D70R	D80R	U82R	38	A	R	R	
4	R	R	R	B	53F	B	A	B	B	60	72	D88R	D90R	C	D100R	D08R	D00R	D102S	U102R	J84R	63	42R	B	R	
5	R	A	F	48F	40F	B	58R	80R	75R	D73R	D80R	D98R	D94R	107R	D200R	D03R	U103R	J89R	70	48	31R	30			
6	30	28	R	F	53R	A	F	48F	53R	D15R	D85R	100R	D105R	D100R	D100R	D100R	J125R	D100S	D97S	D90R	45F	40	F	R	
7	F	A	R	F	F	F	55F	65F	F	63F	67	84	D100R	D90R	D100R	D100R	D100R	D123R	R	D100R	D70R	F	A	A	
8	A	F	F	A	F	A	B	A	A	B	B	B	B	B	D95R	D100R	R	D105R	B	B	F	A	F	A	R
9	F	F	F	F	F	A	B	A	A	B	B	B	B	B	D75R	U68S	60R	64	58	43	34	R	R	A	R
10	A	F	F	F	53F	41	B	B	B	60F	U77R	B	B	R	R	67	52	B	F	F	F	F	F	F	A
11	A	F	F	F	58	F	B	B	A	B	B	B	B	B	U87R	105R	106R	98	93R	J83R	S	F	F	F	F
12	F	27F	B	52	54	F	44F	46F	A	U62R	73	84R	F	102	C	104S	U104S	D96S	95S	J87R	62F	F	F	F	26
13	F	40	39	A	F	55	52F	57	F	80	82F	100	108R	109	107	107	U102S	U112S	97S	103S	89	47	33F	F	F
14	A	F	50	39	F	F	R	60	72	F	75	83R	100R	J124R	J122R	127	128	127	D100S	D100S	D90S	64F	48	28F	
15	40F	U42F	48	U59F	39F	A	F	55	58	68F	73	82	U92F	100	103	103	97S	95S	94S	J84R	62	44	R	40	
16	F	33F	31F	R	A	53	F	60F	63	73F	83	83	J91R	108	D106F	115	127	127	110	97	76S	53F	40F	31F	
17	27	30F	29F	31F	33	J34R	A	42F	52F	60F	63	78	88	100	110S	J117S	J127S	J124S	D98S	78	60R	R	U43R		
18	39	36F	A	A	F	F	55R	F	64F	80	794	83	J122S	130	134	138	J127R	127	D90S	92	J84S	64F	40F	22	
19	26	26	26	26	J24R	R	R	30	50	73	90	J120R	133	134	133R	144	J141S	U133R	D102S	D112S	D90S	79R	51	42F	
20	30F	28F	R	43	51F	U53F	50	J50F	65F	69F	78	98R	U127F	126	128	133	J127S	127	D103S	J124S	D110S	D85S	46F	29F	
21	27F	26F	25	A	58F	F	F	54	F	F	D100D	102	102	107	B	D126R	R	U116S	130S	D96S	62	54R	30	25F	
22	20	34	35F	R	U43F	43	J44R	B	51	68	84	100	105R	109R	112	110	D90S	J114S	J102S	86	62F	44F	33	26	
23	26	26F	24	22F	24	25F	28	29	49F	77	92	122	129	136	143	139S	128	J129R	J122S	F	42F	F	A	A	
24	68	F	U40F	40F	A	A	G	F	44	B	47F	45	56	56	60	56	62	60F	43	A	37F	34	33	R	
25	R	A	A	A	R	B	B	A	B	B	B	B	B	D88R	113	115S	S	D125S	D110S	53	F	A	A	A	
26	A	B	B	45	46	B	A	B	51	54	59	B	B	B	100R	110	127	J134R	120S	95S	35	38	A	A	
27	A	R	A	A	35S	40F	F	B	A	A	B	B	B	C	C	C	D92S	F	42	42	35	A	A	38R	
28	A	F	A	A	B	C	C	C	C	A	B	55F	B	68F	90F	D104R	130R	138F	D104R	F	R	R	53R	A	
29	A	28F	B	50R	B	F	37F	B	A	B	A	B	68	U75R	80R	D92S	D117S	J122S	63	F	F	27F	37F	F	
30	27F	R	A	52R	A	A	R	A	A	A	B	B	66	76R	78	83	J90R	J84R	41F	A	44F	A	A	A	
31																									
No.	13	13	10	15	15	9	12	12	15	16	20	17	21	16	17	22	19	21	22	23	24	16	12	13	
Median	27	28	33	43	43	41	51	52	58	68	76	84	92	108	107	110	121	123	102	90	62	48	38	29	
U.Q	40	35	40	52	53	54	55	59	64	77	87	101	907	125	125	125	127	127	110	98	77	59	47	39	
L.Q	26	27	26	31	33	31	41	44	51	63	73	83	75	88	84	103	90	87	63	83	43	41	33	26	
Q.R	14	08	14	21	20	23	14	15	13	14	18	14	18	37	41	37	37	37	37	34	18	14	14	13	

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

f<sub>o</sub>F<sub>2</sub>

S

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

IONOSPHERIC DATA

45° E Mean Time (G.M.T. +3h.)

foF1

Apr. 1955

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			L	S	L					
2							B	B			B	B	B	L			L	B	B					
3						B	B	B			B	B	B	S			L	L	L					
4						B	B	B	A		L	L	L	C			L	L	L					
5						B	B				L	L	L	L			L	L	L					
6						B							L	L			L	L	L					
7						B	B		L				B	B			L	B	B					
8						B	B		B		B	B	B	B			L	L	L					
9						B	B		B		B	B	B	B			L	B	B					
10						B	B				B	B	B	B			L	B	B					
11						B	B		B		B	B	B	B			L	B	B					
12									B		B	B	L	L			L	L	L					
13								L	L		L	L	L	L			L	L	L					
14								B	B		B	B	L	L			L	L	L					
15								L	L		L	L	L	L			L	L	L					
16								L	L		L	L	L	L			L	L	L					
17								L	L		L	L	L	L			L	L	L					
18								L	L		L	L	L	L			L	L	L					
19								L	L		L	L	L	L			L	L	L					
20											L	L	L	L			L	L	L					
21														L			L	B	L					
22											L													
23																								
24							29	26	26	B	A	36	L	40 <sup>4</sup>	L	L	L	L	L	A				
25																								
26																								
27																								
28																								
29																								
30																								
31																								
No.							1	1	1		1	1	2											
Median							29	26	26		36	42												

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 20 Mc in 20 sec in automatic operation.

foF1

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

Apr. 1950

foE

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	B	B	B	B	C	B	B	B							
2			230	190	200	R	B	B	B	B	B	B	B	B	B	B	B	S				310	300		
3						B	B	A	B	B	B	B	B	S	B	B	B	B	B					260	200
4	210	280				B	A	B	B	B	B	B	B	C	B	B	B	B	B					260	
5	300		300			B	A	A	A	B	B	B	B	B	B	B	B	B	B						
6					350	B	A	280	B	B	B	B	B	B	B	B	B	B	B				320	310	400
7	340				250	270	R	A	A	A	B	300	B	A	B	B	220	B				340			
8			330			B	B	A	A	A	B	B	B	B	B	B	B	B	B						290
9						B	A	350	A	B	B	B	B	B	B	B	B	B	A				340	430	
10	400	265	300			B	B	B	A	370	B	B	B	A	B	B	B	B	B				250	235	
11						B	B	A	B	B	B	B	B	B	B	B	B	B	B						
12						200	B	A	B	B	B	B	B	12.70 <sup>F</sup>	C	240	B	B	B						230
13	250					A	A	A	A	B	B	B	B	B	B	B	B	B	B						270
14			370	380		A	B	A	A	B	B	B	B	B	B	B	B	B	B						
15						A	A	A	250	B	B	B	B	B	B	B	B	B	B						260
16	230	230	255			A	A	A	B	B	R	260	R	B	B	B	B	B	B						170
17	1220 <sup>F</sup>					A	B	B	185	B	235	B	260	B	B	B	B	B	B						270
18	220					A	A	A	230	220	230	250	260	A	A	A	A	A	A						
19						A	B	B	B	B	240	240	240	B	B	B	B	B	B						
20						A	B	B	170	215	B	240	250	250	240	B	200	B	B						
21						A	A	A	A	A	B	B	B	B	B	B	B	B	B						
22						B	B	B	B	B	B	B	B	B	230	220	B	B	B						
23						B	B	B	B	B	B	B	B	B	240	220	200	B	B						
24						A	A	A	180	B	A	B	A	235	B	B	200	230	B						
25						B	B	A	B	B	B	B	B	B	B	B	S	B	B				260	280	280
26						B	B	B	B	B	B	B	B	B	B	B	B	B	B				320	330	
27						B	B	B	B	A	B	B	B	B	C	C	B	B	B				310		
28						C	C	C	C	A	B	B	B	B	B	B	B	B	B				260		
29						A	A	A	B	B	B	B	B	B	B	B	B	B	A						200
30			190			B	A	A	B	A	B	B	B	B	B	B	B	B	B						
31						B	A	A	B	A	B	B	B	B	B	B	B	B	B						
No.	8	8	7	10	7	3	2	3	5	3	4	5	3	4	3	3	4	1	4	2	4	8	9	10	
Median	240	260	260	280	270	220	240	280	180	220	240	250	260	260	260	240	220	200	230	340	270	310	280	260	

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

foEs

Apr. 1959

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	29	36	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
2	18	21	G	G	G	B	B	B	B	B	B	B	B	B	B	B	B	S	B	B	25	G	G	32
3	35	47	37	26	35	B	B	32	B	44	B	B	B	S	B	B	B	B	B	B	34	B	G	G
4	23	G	51	B	38	B	39	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	G
5	G	63	62	57	32	B	37	42	38	B	B	B	B	B	B	B	B	B	B	B	B	B	28	B
6	B	B	24	25	32	B	34	G	63	B	B	B	B	B	B	B	B	B	B	B	B	G	38	G
7	45	42	36	30	54	B	34	G	63	B	G	G	B	30	B	B	G	B	S	B	B	G	54	55
8	37	43	G	43	40	B	B	39	36	47	43	B	B	B	B	B	B	B	B	B	39	G	40	39
9	31	20	37	B	60	B	39	37	29	B	B	B	B	B	B	B	B	26	B	B	B	G	G	36
10	46	37	50	31	B	B	B	B	29	G	B	B	B	38	B	B	B	B	43	B	32	77	85	65
11	34	37	36	G	24	B	B	41	43	B	B	B	B	B	B	B	B	B	B	B	S	23	35	38
12	34	18	B	37	G	G	B	B	52	B	B	B	B	G	C	G	B	B	B	B	B	B	23	G
13	26	62	79	61	51	51	44	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	27	39
14	48	44	45	33	46	B	B	31	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	23
15	F	37	48	0000	28	39	47	34	G	B	B	B	B	G	B	B	B	B	B	B	B	B	33	34
16	28	29	33	38	50	45	43	33	B	B	G	G	B	B	B	B	B	B	B	B	B	B	B	26
17	G	24	26	23	19	14	B	B	B	B	G	G	G	29	B	B	20	29	B	B	B	B	B	29
18	27	33	41	38	38	48	40	36	G	G	G	G	G	29	25	47	20	B	B	B	B	B	B	B
19	20	22	21	24	27	27	B	B	B	B	G	G	B	B	B	B	B	B	B	B	B	B	B	B
20	25	G	G	42	37	G	G	G	G	G	B	B	B	G	G	B	G	B	B	B	B	B	B	B
21	22	G	29	33	40	37	37	36	44	38	B	B	B	B	B	B	B	B	B	B	B	B	21	33
22	21	26	28	B	24	23	B	B	B	B	B	37	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	17	B	B	B	B	B	B	B	B	B	B	B	G	B	28	B	43	42	39	62
24	33	43	28	27	45	24	30	33	G	B	37	B	28	G	B	B	G	28	39	49	33	31	28	G
25	23	67	38	32	28	B	B	38	B	B	B	B	B	B	B	B	S	B	B	B	G	35	43	56
26	60	B	B	B	G	B	46	B	B	B	B	B	B	B	B	B	B	B	B	B	29	G	40	38
27	43	39	58	B	31	B	B	B	38	44	B	B	B	C	C	C	B	B	29	38	41	43	29	33
28	51	B	40	39	34	C	C	C	B	48	B	B	B	B	B	B	B	B	30	B	37	36	34	38
29	48	61	B	28	B	30	37	B	45	B	43	B	B	B	B	B	B	28	G	39	34	28	64	34
30	27	29	43	35	41	38	28	31	52	44	B	B	B	B	B	B	B	B	G	30	42	46	42	40
31																								
N.o.	27	26	25	25	27	16	14	18	17	9	8	6	5	7	4	4	5	4	8	5	12	14	21	23
Median	30	37	37	32	35	30	37	34	36	44	44	42	42	47	44	43	40	40	48	38	34	34	35	34

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

foEs

units



# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

## Showa Base

f-min

Apr. 1959

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	220	230	B	360	330	B	B	B	B	B	B	B	B	B	C	440	400	320	380	420	340	B	B	160	
2	140	150	140	150	140	160	230	230	360	330	530	480	360	350	320	340	330	S	220	220	150	150	160	220	
3	300	160	220	160	260	B	B	230	B	330	470	500	500	S	400	370	460	500	230	320	160	140	150	130	
4	160	160	160	B	220	B	210	B	B	360	300	360	340	C	380	500	380	270	400	180	150	220	B	140	
5	130	200	160	200	200	B	235	230	225	300	270	370	300	320	280	290	240	220	190	140	135	120	150	150	
6	170	140	150	140	240	B	225	200	235	270	290	310	310	310	260	285	310	225	170	190	210	175	135	200	
7	190	200	200	160	180	215	170	140	210	260	210	230	300	290	320	260	190	220	500 <sup>S</sup>	200	170	130	170	200	
8	300	280	180	300	230	455	B	200	220	380	230	530	340	370	410	410	260	B	B	190	150	220	130	150	
9	160	150	180	210	250	B	210	180	230	B	B	B	B	B	370	550	310	200	210	220	210	200	200	210	
10	220	190	200	150	230 <sup>F</sup>	220	B	B	230	305	B	B	B	B	320	290	400	B	200	170	200	165	150	235	
11	140	170	170	130	130	B	B	280	370	B	B	B	520	B	400	390	265	230	200	170	S	155	150	250	
12	140	130	B	240	200	160	310	270	350	380	360	270	280	220	C	170	230	180	160	135	170	170	160	150	
13	140	150	160	140	200	230	220	220	220	230	280	260	330	300	290	300	220	200	180	270	150	200	140	135	
14	225	150	170	160	150	150	410	240	210	340	530	450	480	300	350	270	220	200	170	170	150	130	140	140	
15	140	150	160	200	150	200	190	180	200	220	410	360	240	240	250	230	220	180	160	200	150	160	130	130	
16	150	130	150	280	230	210	200	170	210	220	220	210	220	310	230	400	310	210	210	180	200	140	150	140	
17	150	150	140	140	140	120	160	160	160	220	215	250	220	260	270	310	210	200	180	170	190	310	140	140	
18	150	150	160	260	170	190	220	200	170	180	180	180	200	200	200	180	160	200	200	190	150	150	150	150	
19	150	180	140	150	150	180	180	160	210	220	200	200	280	350	380	380	250	220	210	220	220	220	180	190	
20	130	130	170	180	160	150	150	130	150	180	230	200	230	200	200	230	170	170	180	180	120	160	140	140	
21	150	150	180	150	160	170	250	200	210	210	230	260	240	490	B	490	750	420	320	220	300	360	170	120	
22	150	170	130	150	160	160	320 <sup>F</sup>	B	310	280	270	300	300	240	200	180	200	150	150	140	120	140	150	150	
23	140	140	140	140	140	160	210	170	200	220	240	260	320	260	200	190	140	140	150	220	140	130	170	170	
24	200	150	140	160	150	170	200	150	160	B	230	230	230	220	230	220	140	140	150	160	140	140	150	130	
25	130	300	220	230	230	B	200	200	B	B	B	B	B	470	420	300	S	230	190	210	170	180	240	230	
26	210	B	B	170	220	B	330	B	410	450	350	B	B	B	590	210	240	220	180	230	140	150	210	170	
27	130	270	290	B	185	310	330	B	300	250	B	B	B	C	C	C	225	310	200	140	180	140	180	190	
28	160	370	320	220	240	C	C	C	C	230	B	315	B	270	240	520	530	270	160	200	140	190	200	165	
29	180	160	B	230	B	170	250	B	300	B	360	B	400	330	235	230	400	200	145	150	150	140	140	140	
30	170	170	220	220	285	320	220	240	450	270	B	B	520	380	230	310	210	210	130	180	220	170	360	190	
31																									
No.	30	29	26	28	29	20	23	22	25	24	22	21	23	23	26	29	29	27	29	30	29	29	28	30	
Median	150	160	165	165	200	175	220	200	220	265	270	270	300	300	290	300	250	210	190	190	150	160	150	150	

f-min

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. +3h.)

R'F2

Apr. 1959

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			L	S	L					
2							B			300	410	260	260	L	285	L	290	280						
3					B		B			300			L	C	L	L	L	L						
4					B		B						L	L	L	L	L	L						
5					B				500				L	L	L	L	L	L						
6													L	L	L	L	L	L						
7																								
8					420	B						370	280	280	270	250	L	B						
9					B					R	B	B	B	B	350	F 400 <sup>B</sup>								
10						B					B	B	B	R	L	L		B						
11					B						B	B	B	B	280	L								
12										320	280		L	L	C	L	L	L						
13									L	L	L	L	L	L	L	L	L	L						
14										250	330	270	L	L	L	L	L	L						
15										L	L	L	L	L	L	L	L	L						
16										L	L	L	L	L	L	L	L	L						
17										L	L	L	L	L	L	L	L	L						
18										L	L	L	L	L	L	L	L	L						
19										L	L	L	L	L	L	L	L	L						
20													L	L	L	L	L	L						
21														L	B	L								
22																								
23																								
24							G	750	630	B	570	700	L	F	L	L	L	L						
25					B		B		B	B	B	B	B	B	300	255	310	S	L					
26										500	450	380	B	B	280	C								
27											B	B	B	B	C	C								
28											B	L	B	B	L	265								
29					C	C	C	C		B	A	B	B	B	290	L	L							
30											B	B	330	290	L	L								
31											B	B	340											
No.					1			1	3	4	6	5	6	3	6	3	1	1	1					
Median					420			750	500	310	330	370	315	290	280	265	290	280	640					

Sweep 1.0 Mc to 200 Mc in 20 <sup>min</sup> sec in automatic operation.

R'F2

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Meas Time (G.M.T.+3h.)

R'F

Apr. 1950

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	380	A	B	440	400	B	B	B	B	B	B	B	B	C	330	300	300	300	305	330	330	B	B	B	370		
2	375	400	R	550	470	480	355	370	290	255	B	B	B	B	240	255	260	S	230	230	275	R	R	R	A		
3	A	A	375	F	360	B	B	A	B	B	A	B	B	S	B	B	B	B	B	255	270	320	A	R	R	A	
4	A	R	365	B	500	B	A	B	B	B	B	B	B	C	230	245	220	225	250	220	220	250	B	R	R	A	
5	R	A	320	370	400	R	500	A	A	300	250	265	250	250	250	220	230	210	215	230	210	230	290	290	400	A	
6	360	300	A	360	A	B	430	355	280	260	245	250	245	225	225	220	225	215	220	225	270	370	335	R	R	A	
7	390	A	370	F	440	440	420	280	280	275	265	250	260	265	265	245	245	235	250	225	210	F	A	A	A	A	
8	A	365	320	350	320	B	B	680	A	A	B	B	B	B	B	B	B	B	B	B	300	F	A	A	A	A	
9	F	320	A	320	A	B	A	A	A	A	B	B	B	B	B	B	B	270	300	300	270	F	A	A	A	A	
10	A	350	F	F	300	370	B	B	500	340	B	B	B	370	375	350 <sup>6</sup>	600	B	B	430	350	F	F	F	A	A	
11	A	370	480	245	300	B	B	A	A	B	B	B	B	B	B	B	245	240	220	235	225	S	250	350	290	A	
12	250	320	B	520	445	430	565	540	A	B	B	B	245	250	C	235	245	245	225	235	250	230	250	320	450	A	
13	500	F	370	A	280	485	500	325	290	275	260	250	250	230	255	260	220	230	230	235	270	230	255	360	480	A	
14	A	520	545	490	F	F	480	395	305	B	B	B	270	245	225	240	235	235	230	210	220	220	250	350	350	A	
15	F	F	470	470	450	A	500	445	375	300	320	280	250	250	255	240	240	220	235	240	220	220	230	R	370	A	
16	370	465	550 <sup>F</sup>	A	A	A	495	345	280	265	270	265	245	240	240	235	230	230	215	230	225	225	235	255	370	A	
17	340	360	370	370	390	400	380	355	295	260	230	230	240	245	240	230	240	240	260	220	220	235	290	R	370	A	
18	310	330	A	A	480	430	480	355	300	260	245	250	240	235	220	225	215	215	210	210	210	220	245	230	250	A	
19	340	380	500	535	440	R	450	350	290	235	230	235	245	230	220	235	210	240	205	230	215	240	230	250	A		
20	265	430	R	570 <sup>A</sup>	460	400	350	300	270	250	240	235	220	235	235	225	235	235	210	220	210	210	220	220	280	A	
21	320	370	565	A	F	365	370	305	370	300	270	270	250	280	B	270	290	270	260	240	280	325	300	345	A		
22	350	370	380	370	570	450	480	B	350	230	230	265	250	235	230	230	215	215	215	215	210	220	250	285	A		
23	300	290	265	360	400	420	460	265	285	245	230	230	230	230	220	230	235	210	255	350	400	F	A	A	A		
24	300	F	365	490	A	A	270	220	175	B	A	305	300	300	285	310	330	350	A	A	400	F	A	A	A		
25	A	A	A	A	A	B	B	A	B	B	B	B	B	B	B	B	S	215	230	300	400 <sup>F</sup>	A	A	A	A	A	
26	A	A	B	460	440	B	A	B	B	B	B	B	B	B	B	B	235	240	220	260	300	390	A	A	A	A	
27	A	420	A	B	500 <sup>F</sup>	520	440	B	A	A	B	B	B	C	C	C	260	285	310	400	470	A	A	370	A	A	
28	A	F	A	A	A	C	C	C	A	B	B	B	B	B	B	B	280	265	240	285	365	400	330	A	A	A	
29	A	280	B	340	B	520	450 <sup>F</sup>	B	A	B	A	B	B	B	B	270	300	270	370	465 <sup>F</sup>	270	230	290	320	A	A	
30	300	260	A	235	A	A	A	A	A	A	B	B	B	B	280	270	230	270	345	A	345	A	A	A	A	A	
31																											
N.o.	16	19	16	16	20	13	19	16	16	15	14	17	17	20	20	24	28	26	28	28	27	19	15	17			
Median	340	380	380	380	440	430	450	350	290	260	250	230	250	245	245	245	240	235	235	240	270	250	290	320			

R'F

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 55.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

0'ES

Apr. 1959

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	130	110	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
2	120	120	G	G	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	140	115	120	160	125	B	B	115	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	180	G	120	B	120	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
5	G	110	130	125	115	B	125	115	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
6	B	B	130	120	110	B	105	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	175	125	140	130	125	135	120	G	100	B	B	B	B	140	B	B	B	B	B	B	B	B	B	B
8	110	130	G	130	140	B	120	120	120	120	110	B	B	B	B	B	B	B	B	B	120	G	120	150
9	140	140	130	B	125	B	135	125	135	B	B	B	B	B	B	B	B	135	B	B	B	G	G	160
10	150	140	140	130	B	B	B	B	130	G	B	B	B	180	B	B	B	B	125	B	B	165	135	110
11	125	125	125	G	120	B	B	140	120	B	B	B	B	B	B	B	B	B	B	B	B	160	150	175
12	110	140	B	120	G	B	B	140	110	B	B	B	B	G	C	G	B	B	B	B	B	B	145	G
13	125	130	120	140	110	105	110	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	165	130
14	110	135	120	140	130	110	B	130	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	130
15	130	140	125	110	100	120	120	120	G	B	B	B	B	B	B	B	B	B	B	B	B	B	125	150
16	145	140	140	150	110	100	110	110	B	B	B	G	G	B	B	B	B	B	B	B	B	B	B	150
17	G	130	130	130	140	120	B	B	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170
18	115	120	120	120	105	120	110	165	G	G	G	G	G	110	130	100	110	100	100	B	B	B	B	B
19	150	140	125	130	135	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	140	G	G	125	160	G	G	G	G	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	170	G	145	120	120	120	130	130	125	120	B	B	B	B	B	B	B	B	B	B	B	B	B	150
22	120	130	160	150	170	120	B	B	B	B	B	115	B	B	B	B	B	B	B	B	B	B	B	B
23	B	B	B	B	150	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	125	135	130	110	120	100	125	125	G	B	120	B	160	G	B	B	G	150	120	120	130	170	170	G
25	150	140	120	115	135	B	B	110	B	B	B	B	B	B	B	B	B	B	B	B	B	G	120	120
26	120	B	B	G	G	B	B	105	B	B	B	B	B	B	B	B	B	B	B	B	125	G	125	120
27	110	190	110	B	195	B	B	B	150	105	B	B	B	C	C	C	B	B	B	150	120	115	125	
28	150	B	120	115	120	C	C	C	C	110	B	B	B	B	B	B	B	B	B	170	B	115	120	115
29	120	130	B	125	B	120	120	B	120	B	120	B	B	B	B	B	B	100	G	125	120	155	150	130
30	120	100	115	115	120	115	120	110	110	B	B	B	B	B	B	B	B	B	G	115	120	125	125	120
31																								
No.	26	23	22	22	24	13	14	15	12	6	3	1	1	3	1	1	1	4	5	4	11	10	18	19
Median	130	130	125	125	125	120	120	120	120	115	120	115	160	140	130	100	110	120	135	120	120	125	125	130

Sweep 1.0 Mc to 20.0 Mc in 2.0 min. sec in automatic operation.

0'ES

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 38° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 8h.)

Types of Es

Apr. 1959

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	r																						
2	a	a	a							a											a	a		a
3	a	a	a	a																	a	a		
4	h	a	a	a																				
5	a	a	a	a					a															
6	a	a	a	a																				
7	h	a	a	a	f																			
8	a	a	a	a	a	h																		
9	a	a	a	a	a	a																		
10	a	a	a	a	a	a																		
11	a	a	a	a	a	a																		
12	fa	a	a	a	a	a																		
13	l	a	a	a	a	a																		
14	r	a	a	a	a	a																		
15	a	a	a	a	a	a																		
16	a	a	a	a	a	a																		
17	a	a	a	a	a	a																		
18	r	r	a	a	a	r																		
19	a	a	a	a	a	a																		
20	a	a	a	a	a	a																		
21	a	a	a	a	a	a																		
22	a	a	a	a	a	a																		
23	a	a	a	a	a	a																		
24	a	a	a	a	a	a																		
25	a	a	a	a	a	a																		
26	a	a	a	a	a	a																		
27	a	a	a	a	a	a																		
28	a	a	a	a	a	a																		
29	a	a	a	a	a	a																		
30	f	f	a	r	a	a																		
31																								
No.																								
Median																								

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

foF<sub>2</sub>

May, 1959

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	A	A	A	A	A	3.7R	4.6R	B	B	6.0	6.6	7.2R	8.1	8.4	10.2	10.0R	10.0	10.2	9.0	5.0	R	R	R	R
2	A	A	A	R	F	F	B	B	A	7.0R	7.3R	8.2	7.2R	10.0R	9.0	9.6	10.0R	7.8R	7.6	5.7	4.0	2.3	2.4	B	B
3	4.4R	3.7	A	A	3.5	4.2	4.0	4.4	5.0	F	8.4R	10.0	10.5	12.5R	7.2R	7.2R	1.30	7.10R	7.10R	8.3	5.8	4.2	2.8F	A	A
4	A	F	A	A	4.5R	5.0F	5.3F	5.4	5.4	6.5	7.8	9.6R	9.8	7.9R	10.0	7.0R	7.0R	7.19R	11.5	8.8R	5.0	4.0	C	C	C
5	F	F	R	3.3	A	A	7.2R	R	A	5.4	5.7	5.9	6.0	6.6	7.4	8.0R	7.7	7.86	5.7	3.2	2.3	A	R	R	R
6	R	R	4.1	5.6	4.7	3.0	F	4.5R	R	5.6	8.3R	9.8R	10.3R	7.1R	11.0S	9.6S	10.0	7.7	6.4R	4.3F	3.5	2.6	2.2	2.2	
7	2.0	2.1	2.3R	2.4	2.5	2.6	F	F	3.6	4.9	7.7	9.0R	9.8	7.2S	1.28	1.28R	9.5S	9.4S	9.0S	7.8R	5.6	3.9	3.5	3.2	3.2
8	3.0	2.5	A	A	6.2R	F	7.0S	6.0	5.6F	B	B	B	6.0	6.0	10.3R	7.2R	7.45R	7.80R	6.2	6.9	5	3.2	R	3.4	3.4
9	F	3.9R	F	2.9	F	5.0	A	5.0	6.8	5.9	6.8	8.5	9.06	7.24	7.29R	7.22R	7.29R	7.22R	7.05R	7.8R	5.4	3.4	3.5	4.0	4.0
10	4.8	B	F	R	5.0	F	4.2	C	5.7	5.5	C	6.5	8.8R	8.3R	7.08R	7.29R	7.29R	7.14R	7.00R	7.82R	5.0F	R	R	4.3	4.3
11	R	3.7	A	F	A	A	5.0	F	5.3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	F	5.6	B	B	B	B	B	B	7.00P	7.00P	8.2R	8.2R	5.7	5.8	B	F	F
16	A	A	A	4.0R	B	B	B	B	B	B	B	B	B	B	B	6.3R	6.7	7.6R	6.0R	5.2	3.3	B	B	B	B
17	A	A	A	A	R	B	A	F	5.1	5.4	5.8	7.8R	8.0R	9.0R	9.0R	7.22	7.22	7.26	7.15R	7.0R	3.5	R	A	2.6R	
18	4.4R	4.3	F	A	A	5.6F	B	A	B	B	B	7.2	8.0R	9.0R	8.3R	7.22R	7.22R	7.22R	7.22R	7.8	3.5	R	A	5.4R	
19	3.8	A	B	B	B	4.1	A	A	5.7	6.2	6.8	8.5	9.2	9.1R	B	R	1.35	7.15R	7.05R	R	4.7F	4.0	F	A	
20	4.3R	A	A	F	B	B	B	A	A	A	B	F	R	10.5R	7.10R	9.90R	7.10R	7.05R	7.05R	7.0	2.6	R	5.0	A	
21	A	A	F	A	3.8	4.4	B	A	A	B	B	7.0	8.7	10.0	10.7	7.24R	7.22R	7.22R	7.22R	8.5R	4.0	A	A	A	
22	3.9	A	3.8	A	3.7	B	B	A	4.3	5.3	5.2F	6.2R	B	9.00P	7.12R	7.12R	7.12R	7.12R	7.12R	5.8	R	A	A	3.8	
23	3.7	F	4.0R	A	A	F	4.6F	B	A	F	B	6.2	8.0	7.02R	10.5R	10.6R	7.00R	7.91R	7.9	6.0	R	A	R	R	
24	4.3/F	3.3	3.6R	4.0F	B	B	A	A	A	B	B	B	B	6.0	5.2	R	R	F	4.2	F	4.5F	4.3	3.7	3.4	
25	4.70R	A	A	A	A	A	A	R	4.0R	R	4.5	B	5.3	6.0R	7.0F	5.9	5.8	5.9	4.8F	3.0F	F	R	R	A	
26	A	A	A	A	B	A	A	3.8R	3.9	4.0F	5.8F	7.6	9.1	10.7	10.7R	10.0	7.97R	7.83R	5.6	B	2.6	R	R	A	
27	4.0	R	B	A	B	A	R	B	4.7	4.5	5.3	7.0	7.86R	9.7	10.5R	7.03R	7.9R	7.0R	5.3	B	B	B	B	R	
28	R	F	F	3.3	3.0	3.0F	F	B	B	3.4R	B	7.0R	7.81R	9.5R	7.92R	7.86R	6.6R	6.2R	4.7	2.8	B	B	B	B	
29	4.0R	A	A	4.0	4.1	5.4	4.3R	4.6S	4.3R	5.0	7.4R	7.7R	7.7R	7.7R	7.6R	F	5.1	4.5F	4.5R	3.0	B	B	B	B	
30	R	R	3.9	F	4.5R	F	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	4.5R	3.7	3.5	2.4	B	B	
31	4.3R	R	R	S	4.8R	5.3F	S	A	5.8	F	F	F	7.00P	7.00P	7.03	7.04F	7.91R	7.88R	C	R	R	4.7R	B	A	
No.	14	7	6	8	12	11	9	10	14	17	17	20	19	20	21	19	21	21	22	26	23	18	12	7	9
Median	4.2	3.7	3.9	3.7	4.4	4.4	4.6	5.2	5.4	5.4	5.9	7.5	8.7	7.7	10.3	10.4	7.00	7.00	7.8	6.7	4.4	4.0	3.5	3.4	3.4
U.0	4.4	3.9	4.0	4.8	5.1	5.3	5.3	6.0	5.7	5.8	7.5	9.8	8.8	10.6	7.09	7.22	7.26	7.08	7.00	8.2	5.0	4.3	3.7	4.2	4.2
L.0	3.7	2.5	3.6	3.1	3.6	3.0	3.9	4.4	4.7	4.3	5.4	6.8	8.1	8.2	8.4	8.6	7.2	7.6	5.6	5.2	3.3	3.3	2.6	2.8	2.8
Q.R	4.4	4.4	4.4	4.7	4.5	4.5	4.5	4.6	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 20.0 Mc in 2.0 sec in automatic operation.

foF<sub>2</sub>

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

foF1

May. 1959

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	L	B								
2							B			B						L								
3								B					B		L	L	L	L						
4											B	B	B	L	B	B	B	B						
5								B		B	L	L	L	L	L	L	L	L						
6																								
7								L	L	L	L	L	L	L	L	L	L	L						
8							B	B	B	B	B	B	B	B	B	B	B	B						
9																								
10								C		C	L	L	L	L	L	L	L	L						
11							B	B	B	B	B	B	B	B	B	B	B	B	B					
12							B	B	B	B	B	B	B	B	B	B	B	B	B					
13							B	B	B	B	B	B	B	B	B	B	B	B	B					
14							B	B	B	B	B	B	B	B	B	B	B	B	B					
15							C	B	B	B	B	B	B	B	B	B	B	B	B					
16							B	B	B	B	B	B	B	B	B	B	B	B	B					
17								L	L	L	L	L	L	L	L	L	L	L	L					
18							B	B	B	B	B	B	B	B	B	B	B	B	B					
19												L	L	L	L	L	L	L	L					
20							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					
22								B		B	L	L	L	L	L	L	L	L	L					
23								B	B	B	B	B	B	B	B	B	B	B	B					
24								B	B	B	B	B	B	B	B	B	B	B	B					
25								B	B	B	B	B	B	B	B	B	B	B	B					
26																								
27							B					B				B								
28							B	B	B	B	B	B	B	B	B	B	B	B	B					
29																								
30																								
31																								
No.																								
Median																								

IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

Sjowda Base

45° E Mean Time (G.M.T.+3h.)

foE

May, 1959

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	270							A	B	B	B	B	B	B	B	B	B	B				240	310	300 <sup>H</sup>	
2								B	A	B	B	B	B	B	B	B	B	B						320	
3	300				260			320	A	A	B	B	B	B	B	B	B	B			200				
4								B	A	A	B	B	B	B	B	B	B	B							
5		230						A	A	A	B	B	B	225	A	B	170						270	280	
6	290	280	250	270	250			B	B	B	B	B	B	230	220	B	B								
7								B	B	B	200	210	220	220	200	185	B						210	210	280
8							290	A	B	B	B	B	B	B	B	B	B	B					230		300
9	260	295						A	A	230	B	B	B	B	B	B	B	B					260	270	210
10	390	290		400		380	330	C	A	A	C	B	B	B	B	B	B	B							
11	300	290						B	B	B	B	B	B	B	B	B	B	B							
12								B	B	B	B	B	B	B	B	B	B	B							
13								B	B	B	B	B	B	B	B	B	B	B							
14								B	B	B	B	B	B	B	B	B	B	B							
15								C	B	B	B	B	B	B	B	B	B	B							
16								B	B	B	B	B	B	B	B	B	B	B						260	
17								A	A	B	B	B	B	B	B	B	B	B				330			
18	270	260	270					B	B	B	B	B	B	B	B	B	B	B				310	320		
19								B	A	B	B	B	B	B	B	B	B	B							
20								A	A	B	B	B	B	B	B	B	B	B				310	330		
21								B	B	B	B	B	B	B	B	B	B	B							
22								A	A	A	A	B	B	B	B	B	B	B			240	270	350 <sup>H</sup>		
23	250	235	A		230	270	240	B	A	A	B	B	B	B	B	B	B	B						270	
24	245		300				A	A	A	B	B	B	B	B	B	B	B	B			300	360	400	380	
25							380	340	430	A	B	B	B	B	B	B	B	B			280	360	330	310 <sup>R</sup>	
26								230	200	B	B	A	B	B	B	B	B	B							
27								B	B	A	B	B	B	B	B	B	B	B						210	
28								B	B	B	B	B	B	B	R	B	B	B							
29								B	B	B	B	B	B	B	B	B	B	B							
30								B	B	B	B	A	A	A	B	B	B	A							
31								A	A	A	A	A	B	B	B	B	B	B			380	350 <sup>H</sup>			
No.	9	8	6	4	3	2	4	3	2	1	1	1	1	3	2	1	1	1	2	2	4	4	13	10	12
Median	270	270	260	310	250	325	310	340	315	230	200	210	220	225	210	185	170	170	215	250	335	360	280	310	280

Sweep 10 Mc to 200 Mc in 20 sec in automatic operation.

foE

The Radio Research Laboratories, Japan.

S



# IONOSPHERIC DATA

Lat. 49° 00.4' S  
Long. 33° 35.4' E

Suwaya Base

45° E Mean Time (G.M.T. + 3h.)

foEs

May, 1959

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	G	357	359	332	339	339	335	334	B	B	B	B	B	B	B	B	B	B	B	B	B	G	G	G
2	G	369	342	350	29	34	30	B	363	344	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	G	349	349	350	345	333	28	43	336	28	B	B	B	B	B	B	B	B	B	B	B	B	333	37
4	G	354	351	348	353	344	29	32	333	32	B	B	B	B	B	B	B	B	B	G	31	337	C	C
5	G	349	336	333	340	343	349	343	43	341	B	B	B	G	25	B	B	B	B	226	333	330	32	32
6	G	G	G	G	G	G	26	18	B	B	B	B	B	G	G	B	B	B	B	B	B	B	B	B
7	B	225	224	339	380	349	346	340	341	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	G	G	47	352	30	354	24	48	346	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	G	347	B	352	362	41	341	337	30	324	C	B	B	B	B	B	B	B	B	B	B	B	B	B
10	G	36	328	331	43	339	340	38	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	G	339	364	354	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	G	352	352	360	331	29	B	338	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	G	G	G	337	358	352	361	B	339	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	351	361	B	B	B	B	346	351	339	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	330	362	354	32	B	B	337	338	342	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	337	337	361	337	330	330	362	B	346	340	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	21	350	334	330	G	B	B	B	348	338	23	B	B	B	B	B	B	B	B	B	B	B	B	B
23	G	457	357	335	340	G	360	B	343	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	G	26	353	39	B	B	340	350	351	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	360	354	353	27	347	336	G	G	42	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26	363	336	337	335	B	37	349	30	G	B	B	20	B	B	B	B	B	B	B	B	B	B	B	B
27	335	G	B	337	B	353	32	B	B	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	330	29	30	348	329	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	333	30	G	334	334	339	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	30	333	333	333	332	B	33	B	B	19	34	336	B	B	27	B	B	B	B	B	B	B
31	B	B	B	26	350	339	343	37	338	343	332	24	B	B	B	B	B	B	B	B	B	B	B	B
No.	23	23	24	26	20	19	19	15	16	11	3	4	2	4	4	1	1	2	3	4	7	13	14	19
Median	335	4.2	4.9	333	40	37	39	41	4.1	3.6	2.3	3.2	2.8	3.2	3.2	3.0	2.7	3.0	2.5	2.5	3.0	3.3	3.7	3.7

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

IONOSPHERIC DATA

45° E Mean Time (G.M.T. +3h.)

f-min

May. 1959

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	1.60	1.80	1.80	2.70	3.20	1.90	2.10	2.00	B	B	3.70	4.00	4.65	4.50	4.00	3.80	2.60	3.50	2.20	3.50	2.30	1.90	1.70	1.60
2	1.90	2.00	2.60	2.10	2.10	2.00	B	B	2.30	3.00	4.70	2.30	2.40	2.40	2.60	2.15	3.80	2.35	2.80	1.50	1.70	1.70	1.70	B
3	1.50	1.60	2.00	2.00	1.90	1.80	1.70	1.90	2.30	2.00	2.20	2.20	3.80	2.20	2.40	2.00	2.20	1.80	2.00	1.60	1.40	1.60	1.60	1.50
4	1.60	1.65	4.30	2.30	2.10	2.10	2.35	2.00	1.70	1.70	2.75	2.55	3.20	4.00	3.70	4.35	3.50	2.30	1.50	1.70	1.50	1.40	C	C
5	1.50	1.50	1.50	1.20	2.00	2.10	2.20	2.40	3.00	1.70	3.50	2.85	2.65	2.65	2.65	2.10	1.70	1.70	1.40	1.90	1.50	1.80	1.50	1.50
6	1.30	1.30	1.90	1.90	1.50	1.50	1.35	1.80	3.10	2.60	2.10	2.20	2.20	2.10	2.00	2.00	1.80	1.80	1.60	1.40	1.30	1.40	1.45	1.45
7	1.50	1.50	1.70	1.45	1.50	1.60	1.50	1.50	1.40	1.80	1.80	2.10	2.10	2.20	2.00	1.85	1.70	1.60	1.75	1.75	1.30	1.50	1.20	1.40
8	1.45	1.45	1.75	2.00	2.00	1.80	2.00	1.80	4.10	B	B	B	B	4.00	B	2.30	4.00	2.50	2.30	3.65	S	1.60	1.80	1.70
9	1.30	1.40	1.40	1.50	1.40	2.00	2.20	1.80	1.80	2.00	2.50	3.50	3.20	2.80	3.20	2.10	2.10	3.10	1.90	4.80	2.30	1.35	1.50	1.70
10	1.75	B	1.80	2.00	2.00	2.00	1.90	2.00 <sup>C</sup>	1.75	1.70	C	3.20	3.00	2.70	2.50	2.10	2.00	1.90	2.00	2.20	2.00	1.50	1.40	1.40
11	1.40	2.00	2.10	1.40	3.60	2.35	2.20	3.00	3.60	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	3.10	3.00	2.80	5.20	B	B	B	B	B	B	B	B	B	B	B	4.40	4.10	2.80	3.20	3.00	2.50	B	B	2.05
17	2.35	2.50	2.90	2.30	2.20	B	2.20	1.90	2.20	2.25	3.00	3.00	4.50	B	5.00	3.30	3.00	3.00	2.20	3.00	B	1.80	1.80	2.10
18	1.80	1.60	1.70	1.80	2.30	2.10	B	3.60	B	B	3.40	3.40	4.10	3.90	4.20	2.20	4.00	2.10	2.10	1.80	1.80	1.80	2.10	2.10
19	2.00	2.20	B	B	B	2.30	2.60	B	1.90	2.30	2.20	2.50	2.40	3.70	B	6.50	2.40	3.10	3.30	2.20	2.00	1.80	1.90	2.80
20	2.20	2.70	2.70	2.20	B	B	2.50	2.10	2.50	B	B	3.10	5.30	4.00	4.10	2.80	3.00	3.20	2.20	2.00	2.00	2.00	2.20	2.00
21	2.30	3.10	2.00	2.20	1.60	2.00	B	3.30	3.10	B	3.70	4.10	3.80	4.50	4.00	4.30	3.70	3.50	3.00	3.50	1.70	1.80	2.00	2.00
22	1.70	2.80	2.30	2.30	1.90	B	B	2.90	2.00	2.20	1.90	4.10	B	B	4.30	3.70	2.30	2.20	1.80	2.00	2.20	1.80	2.40	1.70
23	1.40	1.45	1.80	2.30	2.20	2.00	1.80	B	2.10	2.10	3.80	3.40	3.20	2.60	3.70	3.80	2.80	2.10	2.10	1.40	1.40	1.50	1.70	1.65
24	1.60	1.65	1.80	1.70	B	B	3.20	2.90	3.00	B	B	B	B	3.00	3.20	5.20	B	1.90	2.00	1.40	1.30	1.45	1.30	1.70
25	3.70	2.70	3.00	1.90	2.00	2.80	1.80	F200 <sup>C</sup>	F200 <sup>C</sup>	2.00	B	B	3.95	4.70	3.50	2.85	2.60	1.70	1.60	1.70	1.70	1.70	1.45	1.70
26	2.10	2.30	2.00	2.70	B	3.10	2.10	1.80	1.60	1.70	1.60	1.70	2.00	2.00	2.10	3.10	2.00	2.00	2.00	B	1.70	1.70	1.70	2.30
27	1.90	2.00	B	2.30	B	4.10	2.90	B	2.00	1.30	2.10	1.90	2.00	2.10	4.00	4.10	4.50	3.50	3.05	B	B	B	B	1.30
28	1.70	1.40	1.30	1.20	1.70	1.40	1.40	B	B	2.20	B	4.00	3.50	2.00	1.50	1.80	2.00	2.20	1.90	2.00	B	B	B	B
29	3.60	2.60	2.20	2.10	1.90	1.80	1.70	2.20	2.50	1.80	2.00	2.10	2.00	2.00	2.00	2.20	2.00	1.70	2.00	1.50	B	B	B	B
30	1.20	2.40	1.75	1.70	1.70	2.10	2.10	2.00	1.65	1.60	1.80	1.60	2.00	1.80	1.80	1.80	1.80	1.80	1.70	1.45	1.80	B	B	B
31	2.00	2.50	1.70	1.80	2.10	1.70	1.70	3.20	3.30	2.05	2.00	1.80	2.35	2.20	2.10	2.00	1.80	2.00	C	2.45	1.90	1.45	B	2.10
No.	27	26	26	26	21	22	22	21	24	20	18	22	22	23	23	26	26	27	26	25	22	22	19	22
Median	1.70	2.00	1.95	2.00	2.00	2.00	2.10	2.00	2.25	2.00	2.20	2.70	3.10	2.60	3.20	2.65	2.50	2.20	2.00	2.00	1.75	1.70	1.70	1.70

Sweep 1.0 Mc to 20.0 Mc in 20 min. in automatic operation.

f-min

The Radio Research Laboratories, Japan.

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Mean Time (G.M.T. + 3h.)

R'F2

May. 1959

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	300	300	300	310	L	295									
2							B			280						L									
3													240			L	L	L							
4														L	265	265	260	L							
5										490	L	L	L	L		L									
6																									
7																									
8									B	B	B	B	L	L	L										
9																									
10																									
11								C					L	L											
12								B	B	B	B	B	B	B	B	B	B								
13								B	B	B	B	B	B	B	B	B	B								
14								B	B	B	B	B	B	B	B	B	B								
15								C	375	300	B	B	B	B	B	B	B								
16								B	B	B	B	B	B	B	B	B	300								
17													285	B	B	B	B	325	L						
18									B	B	B	L	L	L	L										
19																									
20									B	B			250	B	B	300									
21												265	260	255			L								
22									B		280	L	L	L	L										
23										L	300	B	B	B	L	L									
24								B		340	F 290 <sup>B</sup>	290	250			L									
25									B	B	B	B	B			335									
26										B	B	B	350	F 330 <sup>B</sup>											
27																245									
28																265									
29									B	B	B	250													
30																									
31																									
No.									1	1	3	5	6	6	3	5	6	2							
Median									375	300	340	290	285	260	265	300	280								

R'F2

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

h'F

May, 1959

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	350	A	A	A	430	375	A	570	540	B	300	B	B	B	310	B	265	270	235	250	300	R	R	R
2	A	A	A	430	375	420	B	B	A	320	B	250	235	245	240	230	260	230	230	220	250	260	285	B
3	295	F	A	A	500	430	470	520	410	290	255	230	B	215	220	230	225	210	215	215	225	260	325	A
4	A	A	A	A	500	465	420	350	345	300	270	250	210	270	300	B	B	B	270	265	280	305	C	C
5	F	530F	425	520	A	A	500	700	A	425	B	275	300	280	300	290	250	270	240	270	345	370	A	405
6	R	R	280	300	335	425	400	380	400F	280	230	225	220	220	190	215	220	220	210	220	215	245	235	250
7	350	400	400	460	460	460	400	350	315	265	255	215	215	220	220	215	205	215	220	215	210	270	265	265
8	280	320	A	A	435	465	380	465	365	B	B	B	5300 <sup>B</sup>	B	5300 <sup>B</sup>	B	270	300	280	290	S	345	R	370
9	F	F	F	210	F	320	A	530	475	310	280	270	235	240	230	235	240	240	240	280	280	400	365	320
10	340	B	270	450	360	550	550	C	365	325	C	280	270	235	220	215	205	220	230	235	270	R	A	270
11	R	265	A	F	A	A	470	400	365	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	340	290	280	285	290	B	B	R
17	A	A	A	A	500	B	A	465	330	300	300	285	300	300	260	230	280	240	215	260	B	A	A	425
18	370	300	320	A	A	370	B	A	F	B	B	240	260	B	B	B	265	220	235	270	305	R	A	280
19	305	A	B	B	B	330	A	R	400	300	265	240	260	B	B	B	215	220	235	270	255	505	F	A
20	320	A	A	A	480F	B	B	A	A	B	B	270	B	B	B	220	250	250	235	220	290	R	250	A
21	A	A	350	A	370	405	R	A	A	B	320	B	230	270	230	270	230	215	250	250	370	A	A	A
22	S	A	405	A	405	B	R	A	570	300	300	B	B	B	225	225	265	265	280	310	295	A	A	365
23	330	540A	A	A	A	F	400	B	A	370	B	B	B	B	245	B	260	235	220	225	R	R	R	R
24	335	270	540A	290	B	B	A	A	A	A	B	B	B	320	350	B	B	B	315	350	370	295	460	5420A
25	270	A	A	A	A	A	R	502	R	5300A	B	B	B	B	B	270	260	265	235	260	420	A	A	A
26	A	A	A	A	B	A	A	A	395	285	240	220	230	225	210	B	205	225	210	B	280	R	R	A
27	350	R	B	A	B	A	A	B	305	285	285	225	215	235	B	240	205	265	285	B	B	B	B	R
28	315	320	370	380	400	385	370	B	B	B	B	B	230	245	215	220	205	265	235	250	B	B	B	B
29	450	A	A	A	500	390	345	330	310	305	265	240	230	220	225	215	220	225	220	270	B	B	B	B
30	325	450	330	F	380	360	365	345	360	295	240	210	220	220	210	210	240	235	235	240	235	B	B	B
31	420	350	320	S	460	415	380	A	440	315	280	235	220	220	265	225	240	265	265	C	385	400	B	A
No.	16	9	10	10	14	15	14	14	16	18	15	17	16	18	18	20	24	27	26	26	21	12	7	9
Median	330	350	340	400	420	415	400	445	365	300	270	240	230	240	240	230	245	240	240	265	290	320	285	320

Sweep 10 Mc to 200 Mc in 20 minutes in automatic operation.

h'F

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Mean Time (G.M.T. + 3h.)

K'ES

May, 1959

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	G	120	115	140	115	115	115	120	B	B	B	B	B	B	B	B	B	B	B	B	B	G	G	G
2	110	110	130	135	125	125	B	B	110	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B
3	G	150	105	110	G	100	125	115	130	145	B	B	B	B	B	B	B	B	B	B	B	B	B	B
4	115	120	100	115	115	125	165	B	120	120	B	B	B	B	B	B	B	B	B	B	150	155	120	C
5	140	155	125	130	110	110	125	135	130	105	B	B	B	G	165	B	B	B	B	160	115	120	170	170
6	G	G	G	G	G	G	125	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
7	B	B	B	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
8	150	120	115	130	120	110	120	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9	G	130	145	115	130	115	115	110	105	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10	120	B	120	120	115	120	120	C	120	130	C	B	B	B	B	B	B	B	B	B	B	B	B	B
11	G	150	150	120	110	105	105	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	120	110	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	210	135	120	110	120	B	110	110	155	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	G	G	150	120	110	120	B	100	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	130	110	B	B	B	B	B	120	B	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20	150	120	110	165	B	B	110	110	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21	110	130	130	130	120	115	B	130	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22	130	110	120	120	G	B	B	110	110	110	125	B	B	B	B	B	B	B	B	B	B	B	B	B
23	G	140	140	125	120	G	120	B	105	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24	G	140	145	125	B	B	105	110	105	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25	110	100	125	110	110	115	G	G	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26	110	130	110	130	B	145	165	170	G	B	B	110	B	B	B	B	B	B	B	B	B	B	B	B
27	110	G	B	125	B	110	160	B	B	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	120	150	150	120	135	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29	B	120	140	G	120	130	115	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30	B	B	G	120	145	170	B	B	B	B	B	140	115	110	B	B	B	B	B	B	B	B	B	B
31	B	B	145	150	120	120	120	115	110	120	115	120	B	B	B	B	B	B	B	B	B	B	B	B
No.	15	20	21	23	17	18	18	14	14	10	2	3	1	1	1	1	1	1	1	3	6	9	10	14
Median	120	125	125	125	120	120	120	115	115	120	120	120	115	110	165	100	100	160	120	120	125	150	125	125

K'ES

IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4 E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

Types of Es

May. 1959

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	γ	γ	l	a														
2	fa	a	a	a	a	f	a	l	a	a											a	a	a	a
3	a	a	a	a	γ	a	a	a	a	a											a	a	h	h
4	a	a	f	a	a	a	a	a	a	a				h						a	a	h	h	h
5	a	a	a	a	a	a	a	a	a	a														
6						a	a																	
7				f																				
8	f	a	a	a	a	a	a	a	a	a											l	a	a	a
9		l	γ	a	a	f	a	a	a	a												h	h	h
10	l		a	a	γ	γ	l	a	a	a														
11		h	a	a	f	f	a	a																
12																								
13																								
14																								
15																						a		a
16	a	a	f	a	a	a	a	γ	h												a	f	a	a
17	a	f	a	a	a	a	a	f	a												a	γ	γ	γ
18			h	a	a	a	a	a	a															
19	a	f	f	a	a	f	a	a	a													a	a	a
20	a	a	a	a	a	f	a	a	l	a												f	a	f
21	a	a	h	a	a	a	a	a	a	a												a	a	a
22	f	a	a	a	a	a	a	a	a	a												a	a	a
23	LT	a	a	γ	a	a	a	a	a	a												a	a	a
24	a	a	a	h	a	a	γ	l	l	f														la
25	f	a	γ	a	a	f	a	l	l	a											a	h	a	a
26	a	a	a	a	a	a	f	h		a														a
27	a		a	a	a	f	a																	
28	a	h	h	f	a	a	a	a																
29	a	a	a	a	a	a	a	a													f			
30				a	a	a	a	γ	l	a														
31			a	a	a	a	a	a	l	a												a		a
No.																								
Median																								

Sweep 1.0 Mc to 20.0 Mc in 20 min in automatic operation.

The Radio Research Laboratories, Japan.

Types of Es

S

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Showa Base

IONOSPHERIC DATA

45° E Mean Time (G.M.T.+3h.)

foF2

Jun. 1950

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	R	F	A	B	A	A	A	A	A	42	53	59	73	80	D90R	64R	56	U43R	B	B	R	R	R	
2	F	4.5R	A	F	A	A	A	5.3	A	A	B	B	61	J84R	D96R	D95R	D95R	D95R	69	4.3	R	R	A	A	3.6
3	A	A	A	B	B	B	B	A	B	B	40	B	B	B	F	V7.5R	ZOR	D75R	F	3.1R	R	R	A	A	A
4	A	A	A	A	B	B	B	A	4.2F	B	B	B	B	60	62	68	J70R	B	D60R	5.8R	4.3	R	A	A	A
5	J3.8R	R	A	A	A	A	A	3.6	B	B	5.2	5.9	67	8.0	J84R	J94R	D70R	69	B	F	F	A	A	R	R
6	A	A	A	F	3.7	B	5.3F	U5.8R	6.4	5.5	F	8.0	8.3	J9.5R	8.8R	D9.9R	U8.1R	8.2	D.6.8R	D.7.0R	B	A	A	F	F
7	A	A	A	A	A	A	A	4.1	4.5	3.8	5.7	5.6F	7.4F	J9.2R	D9.0R	D8.6R	C	C	5.9	4.6	B	B	A	A	A
8	3.1	R	3.1	3.7F	F	4.8	4.4R	F	F	F	F	5.2	B	D.8.4R	U.9.0R	J.7.7R	6.6	6.6	6.3R	5.1	3.4F	A	A	R	R
9	A	A	A	A	C	A	A	A	B	B	B	F	6.0	R	D.8.0R	D.1.0.0D	D.1.0.0D	D.9.5R	B	5.0	2.7F	R	R	3.7	4.0
10	2.9	R	R	3.4	F	A	A	A	A	A	5.2F	5.8	R	B	D.9.0R	1.0.1R	3.0R	3.0R	6.9	5.0R	B	B	B	B	B
11	R	R	R	A	A	A	A	5.7	5.5	4.0	5.1	7.6R	9.6R	7.7R	6.9	F	B	D.1.0.0D	D.8.6R	5.2	3.4	3.4	2.4	A	A
12	3.7	3.3R	U.3.6R	R	R	2.6	3.0	3.3F	3.2	4.0	6.0	7.5	9.9R	1.0.2	1.0.5	J.7.1R	6.0	5.1	2.8R	2.5R	B	B	B	B	2.3
13	3.2	2.9	F	3.1	2.7	3.0	3.1	3.3F	F	3.7	5.4	7.6	J.8.8R	1.0.2R	1.0.2	8.0	J.6.6R	6.2F	4.5F	U.3.4F	2.0	B	B	B	B
14	B	2.0	2.3	2.3	2.7	2.5	2.6	2.7	2.9	3.7	5.5	J.7.6R	8.8	1.0.0	1.0.0	9.6	J.8.4R	J.7.4R	7.3R	5.5	U.3.5R	B	B	B	B
15	B	U.7.0R	A	B	A	4.5	R	4.0	U.4.7R	5.1R	B	B	B	B	B	B	R	R	5.9R	F	3.8R	B	B	B	B
16	B	B	B	B	4.0	A	5.5	A	B	6.0	5.8F	6.5	7.7	9.6	9.8	U.7.8R	J.9.2R	7.1	J.7.1R	4.4	2.5	B	B	B	B
17	B	3.9	2.9	3.5	3.4F	3.5F	3.6F	3.4F	3.3F	4.4	5.5F	J.7.2R	9.3	1.0.8	9.5R	8.1	6.6	4.9	3.7	2.2	1.9	B	B	R	R
18	R	5.3	R	R	F	F	U.5.0R	A	F	5.6	6.4	6.8	7.1	9.0	1.1.9	U.1.0.4R	1.0.3R	U.1.0.2R	7.8	6.0R	2.9	R	R	5.8R	F
19	F	R	U.4.5R	R	A	4.2	A	B	4.0F	U.4.3F	B	6.5F	J.8.8R	D.7.4R	1.0.1R	F	9.6R	J.8.6R	U.6.2R	U.3.8R	B	B	B	R	R
20	B	5.1R	4.0	4.2R	A	B	A	A	4.3	4.6	5.2	7.2R	8.7	1.0.8	1.0.3	1.0.0	9.3	9.2	5.9	3.9	2.3	B	B	B	R
21	4.5	3.9	6.3	4.0	B	3.8	4.0F	4.2F	4.4	4.3	U.4.9R	5.9	8.3	1.0.1R	1.0.2	1.0.2S	8.5	7.8	6.6R	B	B	B	R	4.2	
22	4.3	3.9	R	R	U.3.8F	A	B	3.7	4.6	4.4F	4.6	5.7R	U.8.0R	U.1.0.0R	9.8	9.7	J.9.7R	J.9.4R	D.8.0R	4.2	3.7R	A	A	4.2	U.5.0S
23	5.5R	U.5.7R	D.6.0S	4.0	4.7	B	5.3	U.5.3R	F	F	5.4R	J.7.2R	C	C	D.9.3R	F	7.0R	F	5.0R	U.2.2F	A	R	A	A	C
24	A	A	A	C	A	B	B	B	B	A	B	B	B	B	U.8.7R	1.0.0	1.0.2	9.0	7.9	3.9	3.9	C	C	C	C
25	C	C	C	C	C	C	C	C	C	3.8	J.5.2R	7.1R	D.9.2R	9.2	9.2	D.9.2R	R	5.8	5.5	B	B	B	B	A	A
26	A	A	A	A	A	4.7F	4.6F	4.6	B	B	B	B	B	B	B	B	B	B	D.9.5R	R	A	R	A	A	A
27	A	R	A	R	A	R	3.0	F	3.8F	3.9	4.5	5.6R	7.2	U.8.8R	J.9.3R	R	D.7.8R	J.8.4R	J.7.4R	B	B	B	B	B	B
28	3.8	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R	D.7.0R	B	A	A	C	A	A	A
29	F	A	A	A	B	A	R	F	B	A	R	F	B	B	B	B	1.4.5R	6.2R	5.3	4.3	B	A	A	A	A
30	A	R	R	A	B	B	B	B	B	B	B	B	B	B	B	B	F	D.9.8R	B	A	A	F	A	A	A
31																									
No.	9	12	8	8	7	9	14	15	12	16	18	20	19	18	19	18	18	22	24	22	21	11	3	5	6
Median	3.8	4.0	3.8	3.6	3.7	3.8	4.0	4.2	4.4	4.3	5.2	6.7	8.3	9.4	9.8	9.8	8.3	8.0	6.3	4.3	2.9	3.4	3.7	3.8	3.8
U.Q	4.4	5.2	5.3	4.0	4.0	4.6	5.0	5.3	4.7	5.3	5.5	7.4	8.8	10.1	10.2	10.1	9.6	9.3	6.9	5.2	3.5	3.7	3.7	5.0	4.2
L.Q	3.2	3.6	3.0	3.3	2.7	2.8	3.1	3.4	3.6	3.9	4.9	5.9	7.1	8.4	8.8	8.0	4.6	4.1	4.5	3.6	2.3	3.4	2.2	2.6	2.6
Q.R	1.2	1.6	1.6	2.3	1.3	1.8	1.9	1.9	1.1	1.4	1.4	1.5	1.7	1.7	1.4		3.0	3.2	1.6	1.6	1.2	1.2	0.3	2.8	1.6

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

foF2

S

IONOSPHERIC DATA

Lat. 69° 00.4' S

Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

foF1

Jun. 1959

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									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															
6								B																	
7																									
8								B	B	B	B	B	B	B			B								
9								B	A																
10								B									B								
11											L														
12																									
13																									
14								34																	
15									B	B	B	B	B	B	B	B	B								
16								B	B																
17																									
18									B	B															
19									B	B															
20									L				L												
21									L			L	B												
22										B	B	C	C												
23									B	B	B	B													
24									B	B	B	B													
25									C																
26								B	B	B	B	B	B	B	B	B	B								
27																									
28								B	B	B	B	B	B	B	B	B									
29								B	B	B	B	B	B	B	B	B									
30								B	B	B	B	B	B	B	B	B									
31																	B								
No.																									
Median																									

Sweep 1.0 Mc to 20.0 Mc in 20 <sup>min</sup> sec in automatic operation.

The Radio Research Laboratories, Japan.

foF1

S



# IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.3'E

**Syowa Base**

45° E Medn Time (G.M.T.+3h.)

foE

Jun. 1959

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	A	A	B	B	B	B							270	310		
2		340							A	A	B	B	B	B	B	B				300	330					
3									B	A	B	B	B	B	B	B										
4									A	B	B	B	B	B	B	B										
5									A	B	B	B	B	B	B	B										
6									A	B	B	B	B	B	B	B							300	290		
7									B	B	B	B	B	B	B	B										
8	270	325							270	A	B	B	B	225	B	B							240	300		
9									A	B	B	B	B	B	B	B						280		310 <sup>H</sup>		
10	240	360	320	260					B	B	A	B	B	B	B	B										
11	290	250	260						B	B	B	B	A	A	A	B										
12	260		300	280	270				B	A	A	A	A	A	A	B										
13									B	B	B	B	B	B	B	B										
14									B	B	B	B	B	B	B	B										
15									B	B	B	B	B	B	B	B										
16									B	B	B	B	B	B	B	B										
17		290							B	B	B	B	160	130 <sup>B</sup>	B	B								330		
18	330	370							A	A	220	B	B	B	B	B						320 <sup>H</sup>	340	260		
19		450	360	320					A	B	B	A	B	B	B	B								240		
20		325	220	280					230	245	130	160	B	B	B	B										
21	220	300	350			330	230		B	B	B	B	B	B	B	B								360		
22		340	360	320	290				A	A	B	A	B	B	B	B						250 <sup>R</sup>	330	390		
23	400								B	B	B	B	B	B	B	B										
24									B	B	B	B	B	B	B	B										
25									C	B	B	B	B	B	B	B										
26									B	B	B	B	B	B	B	B						280	320	290		
27	280					300		310	B	B	B	B	B	B	B	B								300		
28									B	B	B	B	B	B	B	B										
29									B	A	B	B	B	B	B	B										
30									B	B	B	B	B	B	B	B						255				
31									B	B	B	B	B	B	B	B										
No.	8	12	10	5	3	3	4	2	2	1	2	3	2	2	2							1	4	5	6	10
Median	280	330	310	280	290	330	270	345	250	245	175	160	185	200	200							300	305	315	300	310

foE

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

foEs

Jun. 1955

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	54	35	30	57	B	B	42	47	54	50	57	30	B	B	B	B	B	B	B	B	B	B	G	G
2	30	40	48	50	47	49	46	47	50	53	B	B	B	B	B	B	B	B	B	33	35	44	51	53
3	44	37	30	B	B	50	B	47	B	B	B	B	B	B	B	B	B	B	B	23	35	36	31	32
4	37	43	30	29	B	B	44	37	34	B	B	B	B	B	B	B	B	B	B	B	130	137	130	138
5	27	38	51	37	35	37	26	27	37	B	B	B	B	B	B	B	B	B	B	B	16	27	35	G
6	42	39	37	29	31	B	45	38	25	B	B	B	B	B	B	B	B	B	B	B	32	32	37	19
7	26	59	53	43	49	42	35	38	B	B	B	24	B	G	B	B	C	C	B	B	B	B	B	27
8	31	34	38	38	38	36	50	32	28	24	B	B	B	B	B	B	B	B	B	B	B	28	31	39
9	63	38	47	52	C	44	43	40	51	40	B	B	B	B	B	B	B	B	B	B	B	G	36	34
10	G	G	G	50	24	40	52	60	B	51	36	B	B	B	B	B	B	B	B	B	B	B	B	B
11	G	28	G	34	39	40	38	34	B	B	B	B	G	G	B	B	B	B	B	B	B	26	22	29
12	G	30	G	G	G	B	B	B	B	B	B	B	28	23	26	B	B	B	B	B	B	B	B	B
13	26	27	25	16	18	28	38	27	33	37	23	29	44	26	36	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	38	44	B	44	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	46	48	48	B	B	B	B	B	B	B	B	B	B	B	B	B	24	B	B	B
17	B	37	27	B	B	B	B	B	B	B	B	B	G	B	B	B	B	B	B	B	B	B	B	B
18	G	G	44	37	38	48	47	40	40	33	G	B	B	B	B	B	24	B	B	B	B	G	39	51
19	54	G	G	35	38	42	47	B	38	B	B	32	B	B	B	B	B	B	B	B	B	B	B	G
20	B	G	G	31	52	B	43	G	G	G	G	G	B	B	B	B	B	B	B	B	B	B	B	28
21	35	G	57	39	B	43	36	33	B	B	B	B	B	B	B	B	21	B	B	B	B	B	B	G
22	43	G	G	G	G	44	44	38	37	26	B	24	B	B	B	B	B	B	B	27	B	31	36	G
23	G	B	G	47	37	B	44	43	B	B	B	B	C	C	B	B	B	B	B	B	27	24	41	37
24	48	48	32	74	B	B	B	B	B	45	B	B	B	B	B	B	B	B	B	B	B	C	C	C
25	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B	B	B	31
26	34	50	46	62	43	56	G	G	B	B	B	B	B	B	B	B	B	B	B	26	G	G	39	32
27	37	G	41	30	28	33	G	B	B	B	B	B	B	B	B	B	B	36	30	B	B	B	B	B
28	29	B	40	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	31	40	C	43	35
29	36	33	31	B	43	G	G	B	B	44	B	B	B	B	B	B	28	23	29	B	33	34	40	40
30	34	G	G	31	B	B	B	33	B	B	B	B	B	B	B	B	B	B	B	36	B	43	30	36
31																								
No.	19	17	20	20	17	16	17	16	11	9	3	4	2	2	2	2	3	2	4	6	6	11	16	16
Median	36	38	39	37	38	42	44	38	38	44	36	31	36	25	31	24	24	30	30	27	32	32	36	36

Sweep 10 Mc to 200 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

foEs

S

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

IONOSPHERIC DATA

45° E Mean Time (G.M.T.+3h.)

Jun. 1959

f-min

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	2.25	1.80	1.70	2.40	B	B	3.10	3.50	3.50	2.80	2.50	2.10	2.00	2.60	3.20	2.80	3.10	3.20	3.00	B	B	E	2.00	1.50
2	2.20	2.10	2.20	1.90	2.10	2.00	2.10	1.90	1.90	2.10	B	B	3.50	3.20	4.00	4.10	4.00	2.30	2.30	1.90	1.70	1.80	1.70	1.90
3	1.80	1.70	2.00	B	B	3.10	B	2.00	B	B	2.00	B	B	B	3.20	2.15	3.50	4.00	2.20	1.50	1.30	1.40	2.30	2.35
4	1.90	2.20	2.30	2.00	B	B	2.60	2.00	2.00	B	B	B	B	4.70	3.10	2.50	1.80	B	3.20	2.20	1.40	1.50	2.00	1.80
5	1.35	2.80	1.90	2.40	2.00	2.50	2.00	B	2.30	B	3.80	1.90	2.20	2.00	2.80	2.00	3.10	3.20	B	1.70	1.35	1.50	1.55	1.80
6	2.00	1.80	1.70	1.80	1.70	1.80	1.75	1.45	1.45	2.00	1.70	2.15	2.20	2.35	4.60	2.80	3.10	2.80	3.80	2.50	B	1.45	1.50	1.50
7	1.70	2.00	4.60	1.80	2.30	1.80	1.80	1.50	B	3.00	2.20	2.00	2.10	2.00	4.70	3.60	C	C	1.65	2.40	B	B	B	1.45
8	1.35	1.45	1.85	1.45	1.60	1.70	1.50	1.80	1.70	1.80	1.60	3.00	B	4.30	3.30	3.50	3.50	2.40	2.30	2.45	1.65	2.10	1.20	1.50
9	1.75	1.70	1.85	1.80	C	2.40	2.20	1.90	2.10	B	B	2.50	2.10	5.00	5.00	3.25	3.00	5.00	B	2.10	2.00	1.90	1.40	1.40
10	1.30	1.70	1.80	1.60	1.50	3.20	3.10	5.00	B	4.20	2.10	2.80	5.10	B	3.25	2.10	3.60	2.00	1.80	3.70	B	B	B	B
11	2.00	2.00	1.80	2.30	2.25	2.45	2.25	2.00	2.10	2.20	1.75	1.70	1.75	1.70	2.05	3.15	B	3.30	2.20	2.20	2.20	2.10	1.90	2.30
12	2.20	2.10	2.10	2.20	2.00	2.20	2.10	1.60	2.00	1.40	1.80	2.05	1.75	1.80	1.60	1.30	1.90	2.00	2.20	1.80	B	B	B	B
13	2.00	1.60	1.50	1.30	1.30	1.20	1.30	1.60	1.30	1.30	1.40	1.50	1.80	1.50	1.80	1.60	2.40	1.60	1.20	1.35	1.20	B	B	B
14	B	1.45	1.70	1.40	1.40	1.80	1.40	1.75	2.20	2.20	2.20	2.00	2.10	2.00	2.20	1.90	2.00	3.10	3.80	2.80	2.35	B	B	B
15	B	3.00	3.35	B	3.20	3.00	2.80	3.00	3.00	2.35	B	B	B	B	B	3.70	3.80	3.00	3.20	2.20	B	B	B	B
16	B	B	B	B	2.15	2.40	3.00	B	B	4.30	2.45	2.35	2.30	2.10	2.10	2.20	2.00	1.65	2.10	1.40	2.05	B	B	B
17	B	1.70	2.10	1.90	1.90	2.00	1.30	1.20	1.20	1.30	1.30	1.60	1.80	2.00	1.80	1.60	1.50	1.30	1.60	1.20	1.10	B	B	1.60
18	1.50	2.10	3.10	2.70	2.80	2.15	2.10	2.40	2.10	1.60	1.70	2.00	3.10	2.00	2.35	2.00	1.85	2.00	1.80	2.10	2.10	1.40	2.05	1.30
19	2.60	2.40	2.00	1.80	1.95	2.05	2.30	B	2.50	3.50	B	2.35	2.20	4.10	3.70	2.50	2.20	2.20	1.60	3.35	B	B	B	1.40
20	B	1.70	1.35	2.00	3.70	B	2.10	1.30	1.60	1.20	1.20	1.20	1.70	2.00	1.90	1.20	1.10	1.30	E	1.10	1.55	B	1.60	1.15
21	1.25	1.60	2.20	1.90	B	2.10	1.70	1.60	1.65	1.80	2.65	3.60	2.10	2.00	2.10	2.00	1.80	1.30	4.20	B	B	B	1.40	1.25
22	1.50	1.50	2.20	2.10	1.80	2.20	B	2.80	1.70	2.15	2.10	1.75	5.00	3.10	2.15	2.30	2.10	2.30	3.70	1.70	3.20	1.60	1.30	2.00
23	1.60	3.50	2.10	2.35	2.10	B	2.35	2.50	2.00	3.10	3.20	2.70	C	C	2.50	2.05	2.00	2.10	2.00	1.70	1.40	2.05	2.40	2.10
24	2.10	2.70	2.20	2.20	B	B	B	B	B	3.30	B	B	B	B	4.10	2.00	1.90	1.90	2.00	2.50	2.20	C	C	C
25	C	C	C	C	C	C	C	C	C	2.40	2.00	2.30	2.50	2.10	2.10	2.00	5.00	3.70	2.50	B	B	B	B	2.30
26	2.10	2.20	2.10	2.50	3.00	2.10	2.10	2.00	B	B	B	B	B	B	B	B	B	2.50	5.20	1.20	2.00	2.80	2.00	2.00
27	2.00	1.80	1.80	2.50	2.20	2.25	1.70	2.10	1.80	2.05	2.00	2.00	2.80	4.00	3.20	5.10	3.10	2.10	2.20	B	B	B	B	B
28	1.70	B	3.20	2.60	B	B	B	B	B	B	B	B	B	B	B	3.10	4.40	3.40	B	2.30	3.30	C	1.80	2.40
29	1.20	1.70	2.00	B	3.30	2.40	2.25	B	B	2.40	4.80	3.20	B	B	B	3.00	2.70	2.00	1.80	B	2.90	2.30	2.00	2.10
30	2.00	2.20	2.00	2.10	B	B	B	2.50	B	B	B	B	B	B	B	B	4.05	B	3.00	2.20	2.00	2.15	2.70	1.60
31																								
No.	24	27	28	25	21	21	24	23	20	23	21	22	20	22	25	29	27	27	26	25	19	14	18	23
Median	1.85	1.80	2.00	2.00	2.10	2.20	2.10	2.00	2.00	2.20	2.00	2.10	2.15	2.10	2.50	2.25	2.20	2.30	2.25	2.10	2.00	1.75	1.90	1.80

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 20.0 Mc in 20 <sup>min</sup> sec in automatic operation.

f-min

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

RF2

Jun. 1959

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									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																								
7									B															
8									B	B	B	B	B	B			330							
9									B	A														
10									B								B							
11												L												
12																								
13																								
14									L	B	B	B	B	B										
15									B	400							300							
16																								
17																								
18																								
19										460	B													
20													L											
21									L															
22																								
23											375	B	C											
24									B		B	B	B											
25									C															
26									B	B	B	B	B	B			B							
27																								
28									B	B	B	B	B	B										
29									B	290														
30									B	B	B	B	B	B										
31									B	B	B	B	B	B										
No.									2	3			2	5	1	1	3							
Median								4.30	335			375	300	200	300	275	330							

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

RF2

The Radio Research Laboratories, Japan.

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. + 3h.)

Jun. 1959

UT

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	470	A	A	B	B	A	A	A	A	430	300	270	255	260	260	230	230	245	B	B	R	R	R	
2	280	295	A	390	A	A	A	480	A	A	B	B	295	275	280	250	260	270	270	410	405	A	A	400	
3	400	A	A	B	B	A	B	A	B	B	325	B	B	B	270	240	295	270	235	300	A	A	A	A	
4	A	A	A	A	B	B	A	470	400	B	B	B	B	B	285	255	270	B	295	290	325	A	A	A	
5	210	300	A	A	A	A	285	B	A	B	B	260	225	230	230	245	235	235	B	280	F	A	400	R	
6	A	A	A	400F	315	B	460	380	310	305	270	270	230	230	275	265	265	270	290	260	B	A	A	300	
7	A	295	A	A	A	A	440	375	B	315	285	270	265	225	265	235	C	C	235	250	B	B	B	A	
8	390	A	475	475	480	475	500	380	380	310	290	315	B	B	260	230	260	285	265	270	365	450	A	410	
9	A	A	A	A	A	C	A	A	A	B	B	275	300	B	B	305	B	270	B	295	415	R	485	430	
10	395	R	R	A	280	A	A	A	B	A	305	265	B	B	250	225	270	240	215	285	B	B	B	B	
11	R	A	R	A	A	A	A	385	290	285	270	240	245	270	290	280	B	265	270	295	430	340	370	A	
12	350	335	295	R	390	E4108	260	360	315	315	275	230	230	220	230	200	225	210	230	295	B	B	B	430	
13	370	315	370	265	400	380	380	385	310	280	270	225	225	235	220	210	200	270	205	245	260	B	B	B	
14	B	345	380	350	360	400	360	365	E4008	365	280	215	215	220	225	220	220	230	260	280	260	B	B	B	
15	B	400	A	B	A	450	380	400	380	340	B	B	B	B	B	B	B	300	250	270	260	B	B	B	
16	B	B	B	B	B	A	460	B	B	B	280	265	265	235	220	250	235	225	220	260	320	B	B	B	
17	B	295	420	400	370	370	335	305	230	360	250	220	230	220	200	210	205	205	220	220	270	B	B	R	
18	315	305	A	345	465	355	E600A	A	350	325	290	290	290	250	260	220	235	250	230	220	280	R	325	230	
19	350	R	460	475	A	460F	A	B	400	B	B	265	265	235	265	255	255	240	220	320	B	B	B	520	
20	B	300	320	400	A	B	A	550	370	285	265	245	255	225	210	210	245	240	220	320	270	B	B	430	
21	380	335	280	395	B	560	430	395	340	290	280	290	260	240	235	200	220	220	270	260	270	B	B	440	
22	270	440	E600R	R	365	A	B	E670A	450	290	260	240	B	280	290	245	240	270	250	285	380	A	450	335	
23	350	300F	215	250	415	B	400	400	290	310	B	265	C	C	260	220	230	270	220	280	A	A	A	A	
24	A	A	A	A	B	B	B	B	B	A	B	B	B	B	B	260	245	240	225	230	270	C	C	C	
25	C	C	C	C	C	C	C	C	C	330	285	235	225	220	220	220	280	300	280	280	B	B	B	A	
26	A	A	A	A	A	500	450	480	295	B	B	B	B	B	B	B	B	270	300	A	R	350	A	A	
27	A	R	A	A	A	A	420	380	295	255	230	265	B	B	240	260	270	240	385	B	B	B	B	B	
28	300	B	A	A	A	B	B	B	B	B	B	B	B	B	B	300	340	335	B	A	A	C	A	A	
29	F	A	A	A	B	A	490	B	B	A	B	400F	B	B	B	265	260	300	400	B	A	A	A	A	
30	A	R	R	A	A	B	B	A	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	
31																									
No.	13	14	9	12	11	9	15	16	15	16	18	18	17	17	24	28	24	27	26	22	13	3	7	10	
Median	360	370	370	400	370	430	420	390	340	310	280	265	265	235	260	245	250	265	260	280	320	350	400	420	

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

The Radio Research Laboratories, Japan.

RFF

S

IONOSPHERIC DATA

Lat. 69° 00.4'S  
Long. 39° 35.4'E

Sjowda Base

45° E Mean Time (G.M.T. + 3h.)

R'ES

Jun. 1959

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	140	120	120	120	B	B	120	115	105	105	110	140	B	B	B	B	B	B	B	B	B	B	G	G	
2	140	120	120	115	115	110	110	105	105	105	B	B	B	B	B	B	B	B	B	180	G	110	105	115	
3	110	120	125	B	B	105	B	120	B	B	B	B	B	B	B	B	B	B	B	160	160	160	120	115	
4	120	120	125	120	B	B	110	105	105	B	B	B	B	B	B	B	B	B	B	B	130	115	135	115	
5	145	110	120	115	120	120	130	B	105	B	B	B	B	B	B	B	B	B	B	B	160	125	150	G	
6	110	105	120	120	115	B	120	150	120	B	B	B	B	B	B	B	B	B	B	B	B	120	110	140	
7	115	130	120	105	105	110	120	105	B	B	B	125	B	B	B	B	C	B	B	B	B	B	B	170	
8	170	170	120	120	115	120	115	110	150	150	B	B	B	B	B	B	B	B	B	B	B	165	140	120	
9	110	115	115	105	C	105	110	105	105	B	B	B	B	B	B	B	B	B	B	B	B	G	110	140	
10	G	G	G	150	120	105	105	140	B	105	105	B	B	B	B	B	B	B	B	B	B	B	B	B	
11	G	180	G	140	115	120	110	115	B	B	B	G	G	G	B	B	B	B	B	B	B	175	150	180	
12	G	150	G	G	G	B	B	B	B	B	B	B	115	110	135	B	B	B	B	B	B	B	B	B	
13	165	150	120	160	150	155	145	145	160	155	110	110	120	125	115	B	B	B	B	B	B	B	B	B	
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
15	B	150	105	B	130	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
16	B	B	B	B	135	115	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
17	B	135	160	B	B	B	B	B	B	B	B	G	G	B	B	B	B	B	B	B	B	B	B	B	
18	G	G	110	150	155	150	120	135	110	125	G	B	B	B	B	B	150	B	B	B	B	G	150	155	
19	120	G	G	145	120	120	120	120	115	B	B	115	B	B	B	B	B	B	B	B	B	B	B	G	
20	B	G	G	125	120	B	115	G	G	G	G	G	B	B	B	B	B	B	B	B	B	B	B	165	
21	150	G	120	145	B	115	130	110	B	B	B	B	B	B	B	B	110	B	B	B	B	B	130	G	
22	120	G	G	G	G	130	B	120	110	140	B	140	B	B	B	B	B	B	B	170	B	150	165	G	
23	G	B	G	170	130	B	120	130	B	B	B	B	C	C	B	B	B	B	B	120	125	125	115	120	
24	115	115	115	105	B	B	B	B	B	115	B	B	B	B	B	B	B	B	B	B	B	C	C	C	
25	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B	B	B	140	
26	125	110	115	105	110	120	G	G	B	B	B	B	B	B	B	B	B	B	B	110	G	G	125	120	
27	145	G	180	140	120	125	G	B	B	B	B	B	B	B	B	B	B	105	120	B	B	B	B	B	
28	140	B	120	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	115	115	160	115	160	
29	115	120	135	B	120	G	G	B	B	105	B	B	B	B	B	B	145	140	120	B	180	130	110	120	
30	120	G	G	130	B	B	B	120	B	B	B	B	B	B	B	B	B	B	B	160	180	120	120	115	
31																									
No.	19	17	20	20	17	16	17	16	11	9	3	5	2	2	2	2	2	2	2	4	6	7	11	16	16
Median	120	120	120	120	120	115	120	115	110	115	110	125	120	120	120	125	130	120	120	120	145	160	130	120	130

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

R'ES

The Radio Research Laboratories, Japan.

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

Types of Es

Jun. 1959

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	a	a	a	a	a	l	l	l	a								h		r	f	a
2	a	a	r	a	a	a	r	a	a	a	a									a	h	h	a	a
3	a	a	a	a	a	l	a	a	a	a	a									a	a	a	a	a
4	a	a	a	a	a	a	a	a	a	a	a									a	a	a	h	a
5	a	f	a	a	a	a	f	a	a	a	a										a	a	f	a
6	a	a	a	a	a	a	a	a	a	a	a	a										a	a	a
7	a	f	a	a	a	f	a	a	h	a	a	a										a	h	a
8	h	h	a	a	a	a	f	a	r	a	a											a	h	a
9	a	r	a	a	a	r	a	a	r	a	l	a											a	a
10																								
11		h				r	a	a			l	l	a									a	a	a
12		h																						
13		a	a			f	f	f	a	h	a	l	l	l										
14																								
15			f			a	a												f					
16						a	a																	
17			a			a	a										a						a	a
18			a			a	a																	
19						a	a																	
20						r	r																	
21	ah		a			l	C																r	a
22	r					r	a															a	h	a
23						a	a															a	r	a
24																								
25																								
26	a		a			a	a																	a
27	a		a			a	h																h	a
28	r		a			a																	a	a
29	a		a			a																	a	a
30	a		r			a																	a	a
31																								
N.o.																								
Median																								

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

Types of Es

Lat. 69° 00.4' S  
Long. 39° 35.4' E

IONOSPHERIC DATA

Syowa Base

45° E Mean Time (G.M.T.+3h.)

foF2

Jul. 1959

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	B	B	B	R	B	B	B	B	B	B	B	B	B	R	58R	47R	B	B	B	B	B	B
2	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	C	99R	80R	30R	B	B	B	B	B
3	R	A	A	R	36R	945R	B	37	39	37	45F	58	73R	90R	90R	90R	54F	50F	49F	B	A	A	B	R
4	R	B	A	A	R	27R	28	28R	B	B	B	62	382R	80	94R	95R	95R	74R	61	47	32	R	A	A
5	A	A	A	A	A	49	50	40R	B	A	50F	B	72	80R	867	87R	87R	20R	B	B	B	B	A	A
6	A	A	R	A	A	942R	A	R	B	B	49	60	972F	B	75	972R	R	982R	B	B	B	B	B	R
7	A	32	R	A	A	A	42R	B	B	55R	45	84	B	B	B	B	B	B	B	46	A	A	30R	A
8	R	A	R	37R	R	R	R	B	B	B	B	53	B	B	58R	58R	B	984R	R	B	B	A	R	36R
9	A	A	A	A	A	A	A	A	A	A	B	B	B	70R	R	R	80R	B	R	B	A	A	A	R
10	32	A	A	A	942R	B	A	R	B	B	B	B	962R	86R	973F	C	962R	945F	B	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	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	994F	987R	980R	R	B	A	A	R
21	C	C	C	C	R	B	46R	B	B	B	B	B	73R	80R	97R	103	B	89	83	44R	B	B	R	52F
22	51F	A	B	R	A	B	A	A	A	55F	B	B	B	96	97R	C	73	78	70	B	B	B	A	B
23	R	51	A	B	B	B	B	B	B	B	B	59	62	85	F	96	89R	80	F	43	932F	B	B	A
24	A	35F	B	A	B	B	A	45	42	38F	B	57	61	970R	91	98	101	97	88	54	C	R	C	R
25	B	C	C	C	B	B	B	A	A	B	B	50	B	B	B	987	100	B	64	B	B	A	A	A
26	R	R	B	B	B	B	B	B	B	40	B	B	B	B	B	994	96F	C	C	952R	R	A	A	A
27	A	B	R	A	A	F	B	B	A	B	B	B	B	B	B	94F	R	80	R	B	B	R	R	R
28	B	B	B	B	B	B	B	A	F	941F	B	B	86	93F	96	B	F	920F	F	60R	B	26F	R	26F
29	A	A	B	A	A	B	B	B	B	B	B	72F	984R	98	96	B	B	84	965F	B	B	C	R	42R
30	A	R	F	32	A	A	35	F	F	44	58	76	97	F	97	87	82	667	55F	29	C	C	R	18
31	R	40R	944R	35	A	A	A	F	B	69F	58F	77F	94F	F	95	1085	100	100	89F	57F	F	R	R	A
No.	2	4	2	5	2	3	5	4	3	8	7	11	10	11	12	11	12	19	15	10	2	1	2	4
Median	45	37	446	35	39	42	42	38	42	42	50	59	78	86	94	94	92	80	70	46	32	26	26	31
U.Q.		46		36		46	46	42	48	54	58	62	86	96	96	98	998	989	933	54				45
L.Q.		34		31		34	35	32	40	39	45	54	72	73	85	87	81	67	49	43				22
Q.R.		12		05		12	11	10	08	11	13	08	14	23	11	11				11				23

Sweep 1.0 Mc to 200 Mc in 20 <sup>min</sup> sec in automatic operation.

foF2

The Radio Research Laboratories, Japan.

S



# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

foF1

Jul. 1959

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	B	C	B								
3																								
4									B	B	B	B	B											
5									B	B	B	B	B	B										
6									B	B	B	B	B	B	B	B								
7									B	B	B	B	B	B	B	B								
8									B	B	B	B	B	B	B	B								
9									B	B	B	B	B	B	B	B								
10									B	B	B	B	B	B	B	B								
11									B	B	B	B	B	B	B	B								
12									B	B	B	B	B	B	B	B								
13									B	B	B	B	B	B	B	B								
14									B	B	B	B	B	B	B	B								
15									B	B	B	B	B	B	B	B								
16									B	B	B	B	B	B	B	B								
17									B	B	B	B	B	B	B	B								
18									B	B	B	B	B	B	B	B								
19									B	B	B	B	B	B	B	B								
20									B	B	B	B	B	B	B	B								
21									B	B	B	B	B	B	B	B								
22									B	B	B	B	B	B	B	B								
23									B	B	B	B	B	B	B	B								
24									B	B	B	B	B	B	B	B								
25									B	B	B	B	B	B	B	B								
26									B	B	B	B	B	B	B	B								
27									A	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								
30									B	B	B	B	B	B	B	B								
31									B	B	B	B	B	L	B	B								
No.																								
Median																								

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

foE

Jul. 1959

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		3.00								B	B	B	B	B	C							2.70	2.80		
3	2.90	2.70	3.00	3.00						B	B	B	B	B	B										
4										B	B	B	B	B	B										
5							3.80	2.40		A	B	B	B	B	B										
6		4.00				3.20				B	B	B	B	B	B									3.00	
7										B	B	B	B	B	B								1.85		
8	2.80	2.80	3.00	3.25	3.20	3.30				B	B	B	B	B	B							3.15	2.80		
9				3.20						B	B	B	B	B	B							2.60	2.70		
10	3.60									B	B	B	B	B	B										
11										B	B	B	B	B	B										
12										B	B	B	B	B	B										
13										B	B	B	B	B	B										
14										B	B	B	B	B	B										
15										B	B	B	B	B	B										
16										B	B	B	B	B	B										
17										B	B	B	B	B	B										
18										B	B	B	B	B	B										
19										B	B	B	B	B	B										
20										B	B	B	B	B	B										
21										B	B	B	B	B	B									3.80	
22	3.20	4.00								B	B	B	B	B	B							3.30	2.90	3.20	
23	3.10									B	B	B	B	B	B									3.20	
24		2.70								B	B	B	B	B	B							2.85	C	3.70	
25										B	B	B	B	B	B										
26	4.50									B	B	B	B	B	B						3.00			4.40	
27	4.10									B	B	B	B	B	B							3.20	3.70	3.30	
28										B	B	B	B	B	B								2.60		
29		3.80								B	B	B	B	B	B										
30		2.60				3.30				B	B	A	B	B	B										
31		2.70	2.90	2.80	3.00					B	B	B	B	B	B							2.70	3.30	3.65	
No.	7	9	3	4	3	2	1	1														1	3	8	11
Median	3.2	2.9	3.0	3.1	3.2	3.2	3.2	2.4														3.0	2.8	2.9	3.2

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 2.0 Mc in 20 min in automatic operation.

foE

Jul. 1959

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. +3h.)

f<sub>o</sub>F<sub>2</sub>

Jul. 1959

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	168	168	B	B	B	26	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	G	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	25	24
3	31	143	40	G	30	136	B	132	28	B	B	B	B	B	B	B	133	B	B	B	140	191	B	23
4	30	B	168	B	B	B	B	B	B	B	45	B	B	B	B	B	B	B	B	B	B	35	150	181
5	164	150	135	152	149	139	G	G	B	46	B	B	B	B	B	B	B	B	B	B	B	B	138	131
6	137	42	137	137	137	136	50	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33
7	135	164	184	154	45	136	137	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	134	21
8	32	134	G	36	36	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	131	33	32
9	30	35	153	45	42	40	140	B	138	B	B	B	B	B	B	B	B	B	B	B	B	26	30	32
10	176	136	43	142	B	B	139	44	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	34
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	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	C	C	C	C	45	B	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	133	34	G
22	146	149	B	52	140	B	134	163	149	B	B	B	B	B	B	B	B	B	B	B	B	B	46	46
23	G	156	45	B	B	B	42	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	136
24	163	133	B	140	B	B	141	130	B	B	B	B	B	B	B	B	B	B	B	B	B	C	32	C
25	B	C	C	B	B	B	B	42	62	B	B	B	B	B	B	B	B	B	B	B	B	144	172	146
26	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	43	150	48
27	150	B	164	162	126	B	132	174	174	B	B	B	B	B	B	B	B	B	B	B	B	G	G	37
28	B	39	B	140	B	B	B	148	122	B	B	B	B	B	B	B	B	B	B	B	B	24	29	126
29	127	174	B	38	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	129
30	26	G	152	140	137	164	130	22	23	B	28	B	131	B	B	139	B	B	B	B	C	C	B	B
31	B	132	36	35	141	145	154	37	B	B	B	B	B	B	B	B	B	B	B	B	B	256	137	141
No.	15	16	12	14	12	9	11	11	7	1	0	2	1	0	0	1	1	1	1	0	1	3	12	13
Median	35	40	44	40	40	36	40	36	38	46	36	36	31	0	0	39	33	18	0	23	30	32	34	34

Sweep 1.0 Mc to 20.0 Mc in 20 min in automatic operation.

The Radio Research Laboratories, Japan.

f<sub>o</sub>F<sub>2</sub>

S

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

f-min

Jul. 1959

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	170	210	B	B	B	220	B	B	B	B	B	B	B	360	320	320	320	350	210	B	B	B	B	B
2	B	180	B	B	B	B	B	B	B	B	B	B	B	B	C	470	210	370	230	210	B	B	B	150
3	130	170	200	210	170	230	B	200	200	200	210	220	305	340	315	210	220	235	220	B	290	200	B	210
4	260	B	210	210	210	170	210	220	B	B	B	320	210	280	200	240	310	400	320	200	200	300	200	200
5	210	200	200	220	210	220	225	210	B	210	300	B	B	400	320	250	220	220	B	B	B	B	200	190
6	170	200	170	190	200	200	220	220	B	B	360	340	290	B	480	410	500	330	B	B	B	B	B	180
7	190	150	200	200	210	220	200	B	350	210	200	210	B	B	B	B	B	B	300	250	220	125	130	160
8	180	165	180	210	210	220	B	B	B	B	320	225	B	B	320	380	B	420	315	B	B	145	160	180
9	170	170	240	210	300	350	350	B	340	B	B	B	B	260	450	620	280	B	430	B	200	200	120	130
10	140	160	210	210	260	B	320	350	B	B	B	B	B	400	410	380	C	340	270	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	340	410	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	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	420	420	630	500	B	220	230	200
21	C	C	C	C	420	B	240	B	B	B	B	B	550	370	340	310	B	200	200	350	B	B	170	200
22	210	220	B	500	270	B	280	250	250	420	B	B	B	520	460	C	270	230	300	B	B	B	370	B
23	230	250	380	B	B	B	360	B	B	B	B	360	400	300	410	400	250	260	280	250	210	B	B	170
24	160	210	B	290	B	B	210	200	210	170	B	360	330	470	210	370	330	220	190	180	C	150	C	250
25	B	C	C	C	B	B	B	B	B	B	B	B	B	B	B	400	260	B	500	B	B	200	410	310
26	210	B	B	B	B	B	B	B	B	320	B	B	B	B	B	500	370	C	C	165	160	160	220	230
27	220	B	400	380	190	B	B	B	280	B	B	B	B	B	B	530	870	200	530	B	B	170	150	180
28	B	320	B	150	B	B	B	220	190	180	B	B	415	285	335	B	480	360	370	340	B	170	130	180
29	210	320	B	280	350	B	B	B	B	B	B	280	300	270	270	B	B	520	450	B	B	B	170	150
30	140	170	220	180	220	350	260	190	160	160	210	210	220	230	230	210	160	155	220	220	C	180	150	
31	200	210	150	170	230	170	190	250	B	350	480	420	350	300	790	420	250	230	250	300	200	130	160	170
No.	17	16	12	15	14	10	12	12	9	9	7	11	14	16	17	17	17	19	20	11	7	12	16	19
Median	1.9	1.9	2.0	2.1	2.2	2.2	2.4	2.2	2.5	2.1	3.0	2.8	3.2	3.2	3.2	3.9	2.8	3.2	3.0	2.5	2.0	1.7	1.7	1.8

Sweep 1.0 Mc to 20.0 Mc in 20 sec in automatic operation.

The Radio Research Laboratories, Japan.

f-min

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

RP2

Jul. 1959

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											
6									B	B	B	B	B											
7									B	B	B	B	B											
8									B	B	B	B	B											
9									B	B	B	B	B											
10									B	B	B	B	B											
11									B	B	B	B	B											
12									B	B	B	B	B											
13									B	B	B	B	B											
14									B	B	B	B	B											
15									B	B	B	B	B											
16									B	B	B	B	B											
17									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	B	B											
27									A	B	B	B	B											
28									B	B	B	B	B											
29									B	B	B	B	B											
30									B	B	B	B	B											
31									B	B	B	B	B											
N o.									1	2	2	2	4	5	5	3								
Median								320	400	500	500	295	280	280	300	325								

RP2

IONOSPHERIC DATA

Lat.  $\uparrow$  69° 00.4' S  
 Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T.+3h.)

h'f

Jul. 1959

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	B	B	B	A	B	B	B	B	B	B	B	240	220	220	230	260	220	B	B	B	B	B
2	B	R	B	B	B	B	B	B	B	B	B	B	B	B	C	B	245	280	230	300	B	B	A	A
3	500	A	A	R	400	365	B	490	300	245	265	220	265	230	200	235	235	235	265	B	A	A	B	A
4	A	A	A	460	450	430	410	410	B	B	B	280	265	235	240	210	215	280	225	270	305	A	A	A
5	A	A	A	280	A	435	470	285	B	A	350	B	B	B	265	300	265	220	B	B	B	B	A	A
6	A	A	A	A	A	500	A	520	B	B	355	270	245	B	B	230	275	285	B	B	B	B	B	A
7	A	410	280	A	A	490	B	B	320	290	280	230	B	B	B	B	B	B	230	315	A	A	A	360
8	A	A	R	430	A	R	B	B	B	B	325	285	B	B	285	275	B	250	265	B	B	A	A	335
9	A	A	A	A	A	A	A	A	B	A	B	B	B	240	B	B	265	240	B	B	A	A	A	A
10	400	A	A	A	A	310	B	A	405	B	B	B	B	B	B	280	C	280	270	B	B	B	B	B
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	260	400	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	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	C	C	C	C	A	B	B	B	B	B	B	B	B	B	B	B	280	300	280	280	B	A	A	R
22	230	A	B	A	A	B	A	A	A	B	B	B	B	B	250	240	B	270	230	300	B	B	B	285
23	R	290	A	B	B	B	520	B	B	B	B	B	B	270	235	250	240	250	235	B	B	B	A	B
24	A	450	B	A	B	B	A	400	260	350	B	345	290	B	220	280	220	240	230	250	C	A	C	R
25	B	C	C	B	B	B	B	A	A	R	B	B	B	B	B	220	220	220	220	B	B	A	A	A
26	R	B	B	B	B	B	B	B	B	E400B	B	B	B	B	B	290	220	C	C	350	R	A	A	A
27	A	B	A	A	A	405	B	B	A	A	B	B	B	B	B	280	360	270	230	B	B	R	R	A
28	B	A	B	A	B	B	B	A	310	265	B	B	B	240	260	B	270	270	220	265	B	270	A	370
29	A	A	B	A	A	B	B	B	B	B	B	230	220	230	210	B	B	250	270	B	B	B	B	380
30	A	R	340	470	A	A	565	400	300	250	240	230	240	235	225	215	230	235	220	340	C	C	E340BE	310B
31	490	370	320	340	A	A	A	A	375	B	B	B	260	240	B	B	285	220	220	285	300	A	A	A
No.	4	4	4	5	4	4	6	8	5	5	6	9	7	10	12	14	17	18	19	11	3	1	4	3
Median	445	390	300	430	400	430	495	400	300	290	300	270	260	240	240	245	245	255	230	290	300	270	370	335

Sweep 1.0 Mc to 20.0 Mc in 20 <sup>min</sup> sec in automatic operation.

The Radio Research Laboratories, Japan.

h'f

S

# IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

**Syowa Base**

45° E Mean Time (G.M.T. + 3h.)

JUL 1959

RES

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	B	B	B	125	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
2	B	G	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
3	160	12	140	G	120	120	B	115	150	B	B	B	B	B	B	B	120	B	B	B	105	105	B	110
4	110	115	115	B	B	B	B	B	B	B	B	105	B	B	B	B	B	B	B	B	B	B	B	110
5	110	115	130	115	115	115	G	B	B	115	B	B	B	B	B	B	B	B	B	B	B	B	B	115
6	125	150	115	110	110	120	110	170	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170
7	135	120	105	110	110	105	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	170
8	155	125	G	160	170	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	120
9	120	120	120	125	120	150	120	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	160
10	115	115	110	120	B	B	115	115	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	145
11	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19	B	B	B	B	B	B	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	C	C	C	C	120	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	185
22	130	180	B	150	120	B	100	110	120	B	B	B	B	B	B	C	B	B	B	B	B	B	B	150
23	G	130	110	B	B	B	140	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150
24	120	170	B	130	B	B	110	130	B	B	B	B	B	B	B	B	B	B	B	B	C	170	C	G
25	B	C	C	B	B	B	B	B	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	110
26	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	110	G	110	120	150
27	130	B	150	110	120	B	B	100	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	160
28	B	140	B	130	B	B	B	100	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	125
29	130	115	B	120	110	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	150
30	120	G	110	110	120	120	115	150	130	B	B	150	140	B	B	110	B	150	B	B	C	C	B	B
31	B	125	140	140	125	110	105	120	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	140
No.	14	14	11	13	12	8	10	10	7	1	0	2	1	0	0	1	1	1	0	1	3	11	11	16
Median	120	120	115	120	120	120	115	115	120	115	130	140	140	120	150	110	120	150	110	120	115	140	140	150

IONOSPHERIC DATA

Lat. 69° 00.4' S  
Long. 39° 35.4' E

Syowa Base

45° E Mean Time (G.M.T. +3h.)

Types of Es

Jul. 1959

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	a				a																		
2	h	C	h		r	a		a	a			a					a				f	h	h	h
3	f	a	f																			f	f	f
4	f	a	a			r																a	a	a
5	a	h	a	a	a	a	r	h															h	h
6	a	a	a	a	r	a	a															a	h	a
7	a	h	a	h	h	a	a															a	h	h
8	h	h	a	a	a	r	a															a	h	h
9	r	r	a	a	a	r	a	a	a													a	h	h
10	f	f	r	a																				
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																						a	r	h
21																								
22	h	h	f	a	a		a	f	f													a	a	a
23		f	a				a	a														h	a	a
24	a	a																				a	a	a
25																								
26	h		f	a	a			f	f												f	a	h	h
27																								
28		h	a	a	a																	a	h	a
29	a	a	a	a	a																	a	h	a
30	r		f	h	h																			
31		h	h	h	a																	l	h	h
No.																								
Median																								

The Radio Research Laboratories, Japan.

Sweep 1.0 Mc to 20.0 Mc in 20 min in automatic operation.

Types of Es

S