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# IONOSPHERIC DATA IN JAPAN

FOR JANUARY 1949

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Prepared by THE ELECTRICAL COMMUNICATION LABORATORY

(Denki-Tushin Kenkyujo)

MINISTRY OF TELECOMMUNICATIONS

TOKYO, JAPAN

THE ELECTRICAL COMMUNICATION LABORATORY  
(Denki-Tushin Kenkyujo)

MINISTRY OF TELECOMMUNICATIONS

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## FOREWORD

Although we have had long period of experience on the ionospheric observations in Japan since 1931, it was unable to publish the results of the observations as restricted by the military officials of the past.

Japan is not allowed to become a member of the International Telecommunication Conference. However, in accordance with the Recommendation of C.C.I.R., we send our results of the ionospheric observations and on radio propagation to the main organizations concerned with radio propagation hereafter.

Symbols and presentation in this report were used in accordance with the Recommendation No. 6 of C.C.I.R. Stockholm 1948: Standardization of Symbols and presentation of Results of Ionospheric Soundings Annex 1-5.

We will be very much appreciated to receive the similar publications from the organizations concerned with radio propagation in the world.

June, 1949

Goro Yoshida, Dr. Eng.  
Director of  
The Electrical Communication Laboratory,  
Ministry of Telecommunications,  
Tokyo, Japan

## SITE OF THE IONOSPHERIC STATIONS

Ionospheric observation is carried out at five stations in Japan.

The stations are situated as follows :

	longitude	latitude	site
Wakkanai	141° 41.1' E	45° 28.6' N	Wakkanai-machi, Soya-gun, Hokkaido
Fukaura	139° 54.1' E	40° 36.6' N	Fukaura-machi, Nishitugaru-gun, Aomori-ken
Shibata	139° 15.8' E	37° 75.0' N	Seiro-mura, Kitakanbara-gun, Niigata-ken
Kokubunji	139° 29.3' E	35° 42.4' N	Koganei-machi, Kitatama-gun, Tokyo-to
Yamagawa	130° 37.7' E	31° 12.5' N	Yamagawa-machi, Ibusuki-gun, Kagoshima-ken

### REMARKS ON SYMBOLS

Except both  $f_{\min} E$  and  $f_{\min} F$ , other symbols are used in accordance with recommendation of C.C.I.R.  $f_{\min} E$  and  $f_{\min} F$  in the table are defined as follows :

$f_{\min} E$  Minimum frequency, on which echo reflected from E-layer begins to appear by use of the observation equipment on routine work.

$f_{\min} F$  Minimum frequency, on which echo reflected from F-layer begins to appear by use of the observation equipment on routine work.

Lat. 45°23.6'N  
Long. 141°41.1'E

Wakkanai

IONOSPHERIC DATA

Jan 1949

ft<sub>z</sub>

155°E Mean Time

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	2.9	3.1	3.4	3.8	3.3	2.9	4.8	(6.2)	9.5	12.2	11.8	9.4	8.8	9.6	9.1	7.1	5.7	5.8 <sup>J</sup>	4.0	3.2	2.6	2.6	2.6	2.6
2	2.6	2.6	2.7	3.2	3.6	3.8 <sup>F</sup>	5.0	6.7	B	11.0 <sup>J</sup>	10.5	10.1	9.8	9.6	9.2	7.5	6.6 <sup>J</sup>	B	6.1	4.5	4.0	4.2	3.9	3.1
3	3.2	3.3	4.0	3.1	3.1	3.5	5.1	6.8 <sup>P</sup>	9.7	B	B	9.4	10.2	9.6	B	7.1	6.1	(5.4)	2.8	2.7	2.6	2.9	3.1	3.1
4	3.9	C	C	C	C	C	C	C	(9.2)	10.8 <sup>J</sup>	11.0	9.4	B	B	9.8	9.1	7.6	5.0	5.4	A	2.4	2.5	2.6	A
5	2.8 <sup>F</sup>	2.8 <sup>F</sup>	A	2.9 <sup>F</sup>	3.0 <sup>F</sup>	3.1 <sup>F</sup>	2.8	C	C	C	C	C	C	C	C	6.4	5.2	5.0	3.6	2.8	2.2	2.5	2.6	2.6
6	2.7	C	C	C	C	C	C	C	9.3	B	10.5 <sup>P</sup>	10.1	9.4	9.8	9.4	B	B	5.6	3.6	3.1	3.2	3.5	3.6	3.6
7	3.2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	7.6	6.8 <sup>J</sup>	5.3	3.5	3.1	3.5	3.5	3.5	
8	3.4	C	C	C	C	C	C	C	C	B	10.5	12.1	11.0 <sup>J</sup>	11.0 <sup>J</sup>	9.9	7.1	6.7	6.1 <sup>F</sup>	5.0	3.7	3.6	3.4	3.1	
9	3.5	C	C	C	C	C	C	C	C	C	C	C	C	C	10.0	(8.3) <sup>C</sup>	(6.6)	6.7	5.7	4.5	3.4	3.4	3.4	
10	3.5	C	C	C	C	C	C	C	B	10.8 <sup>P</sup>	10.6	9.7	(10.5) <sup>F</sup>	10.8	9.9 <sup>F</sup>	B	6.8	5.4	4.1	2.8	2.8	3.2	A	
11	3.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	8.1	7.4 <sup>J</sup>	6.9 <sup>J</sup>	5.0	3.0	3.1	2.9	3.0	
12	3.0	C	C	C	C	C	C	C	B	10.4 <sup>J</sup>	(10.4) <sup>F</sup>	B	B	10.0	10.1	8.3 <sup>J</sup>	7.5 <sup>H</sup>	6.5	4.4	3.2	3.5 <sup>F</sup>	3.5 <sup>F</sup>	3.4 <sup>F</sup>	
13	3.5 <sup>F</sup>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	10.2	9.3 <sup>J</sup>	7.6 <sup>J</sup>	4.4	4.2	3.0	2.7	3.7	
14	3.3 <sup>F</sup>	C	C	C	C	C	C	C	C	10.5 <sup>P</sup>	10.3	11.1	(10.6) <sup>F</sup>	(10.2) <sup>F</sup>	9.7	8.1 <sup>P</sup>	(7.5)	7.0 <sup>P</sup>	5.7	3.7	2.9	2.9	3.0	3.0
15	3.2	C	C	C	C	C	C	C	C	C	C	C	C	C	10.1	C	C	6.1	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	6.5	5.1	4.0	3.8	2.8	2.6	2.9	
18	3.0	C	C	C	C	C	C	C	9.6	8.8	11.1	(10.7) <sup>J</sup>	(10.3) <sup>F</sup>	9.9	9.5	8.0	6.5	6.6 <sup>J</sup>	5.2	3.7 <sup>F</sup>	4.0 <sup>F</sup>	3.9 <sup>F</sup>	4.0 <sup>F</sup>	
19	4.0 <sup>F</sup>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	9.2	7.6	6.7	5.4 <sup>J</sup>	4.2 <sup>H</sup>	3.7	3.9	3.6	
20	3.6	C	C	C	C	C	C	C	C	11.5	B	B	C	C	11.5	(10.9) <sup>J</sup>	9.5	B	7.8	6.3	4.1	3.8	3.8 <sup>V</sup>	3.8
21	3.9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	9.4	8.4	5	6.8	4.9 <sup>F</sup>	3.6	3.5	(3.5)	3.7
22	3.6	3.8	4.1 <sup>F</sup>	2.9	3.5	3.6	6.4	7.7	B	(10.1) <sup>P</sup>	12.2	10.7 <sup>J</sup>	9.5	9.6	9.0	7.8	8.1 <sup>P</sup>	6.4	4.7	3.7	3.2	3.5	3.2	
23	3.4	3.3	3.4	3.0	2.9	3.0	5.4	C	C	C	C	C	C	C	C	8.1 <sup>P</sup>	7.4	B	3.9 <sup>J</sup>	2.7	3.0	3.0	3.1	
24	C	C	C	C	C	C	C	C	9.6	10.5 <sup>J</sup>	11.4	11.6	11.2	9.7	10.1	9.9	9.2	9.0	6.6	5.0	3.7	3.8	3.3	3.5
25	3.2	3.2 <sup>F</sup>	3.1	3.2	2.8 <sup>F</sup>	2.4 <sup>K</sup>	2.2 <sup>K</sup>	4.5 <sup>K</sup>	C	C	C	C	C	C	C	6.4 <sup>K</sup>	6.4 <sup>K</sup>	6.0 <sup>K</sup>	4.5 <sup>K</sup>	6.2	5.5	5.1	3.3	
26	3.2	3.5	3.2	2.8 <sup>F</sup>	F	(3.6) <sup>J</sup>	(4.1) <sup>C</sup>	(4.5) <sup>F</sup>	6.6 <sup>F</sup>	B	9.6	11.4	(11.9) <sup>J</sup>	10.4	12.0 <sup>P</sup>	(11.1) <sup>C</sup>	10.2	9.5	9.2	B	8	6.6 <sup>P</sup>	5.1 <sup>P</sup>	5.4
27	3.6	2.2 <sup>F</sup>	1.8 <sup>K</sup>	2.0 <sup>F</sup>	1.9 <sup>K</sup>	1.8 <sup>F</sup>	2.6 <sup>F</sup>	B	C	C	C	C	C	C	C	9.2	6.9	5.2	4.1	4.2	3.2	3.1 <sup>F</sup>	3.1 <sup>F</sup>	
28	3.4 <sup>F</sup>	3.2 <sup>F</sup>	3.3 <sup>F</sup>	3.7 <sup>F</sup>	3.7 <sup>F</sup>	3.7 <sup>F</sup>	2.9 <sup>F</sup>	5.6	(8.5) <sup>F</sup>	11.4 <sup>J</sup>	C	9.5	9.7	9.9	10.6	9.2	7.4	5.5	5.2	5.4	2.9 <sup>F</sup>	3.2 <sup>F</sup>	2.7 <sup>F</sup>	
29	2.8	2.6 <sup>F</sup>	2.6 <sup>F</sup>	3.7 <sup>F</sup>	3.5 <sup>F</sup>	3.5 <sup>F</sup>	5.8	9.3	C	C	C	C	C	C	C	7.8 <sup>P</sup>	B	6.7 <sup>J</sup>	5.8	3.8	3.8	(3.6) <sup>F</sup>	(3.9) <sup>F</sup>	
30	(3.8) <sup>F</sup>	(3.9) <sup>F</sup>	3.9	3.8	3.4	3.6	3.5	6.2	C	C	C	C	C	C	C	B	6.4	5.3	4.2	3.0	3.1	3.5 <sup>F</sup>	3.4	
31	3.4	3.3	3.2	3.2 <sup>F</sup>	3.4 <sup>F</sup>	C	C	C	C	C	C	C	C	C	C	9.9	B	6.7	5.0	4.8	3.7	3.3 <sup>F</sup>	3.3 <sup>F</sup>	3.2
Median Value	3.4	3.2	3.3	3.0	3.4	3.3	5.3	(7.2)	(9.7)	10.6	11.1	10.1	10.0	9.9	9.7	8.0	6.8	6.1	4.5	3.7	3.2	2.9	3.3	3.4
Count	28	13	12	11	12	12	10	8	9	10	12	13	12	17	16	23	25	28	27	28	29	29	29	27

Sweep 10-MHz to 10-MHz in 15-min

Manual

W 1

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

hp F<sub>2</sub>

Lat. 45°23.6'N  
Long 141°41.1'E

Wakkanai

135°E Mean Time

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	430	460	460	340	270	290	310	230	300	270	270	270	240	300	270	240	300	230	230	270	290	380	360
2	360	360	400	410	370	310	260	230	220	B	260	B	260	250	250	260	260	300	B	300	260	310	350	420
3	400	340	340	400	370	380	330	240	280	B	B	B	300	220	A	250	310	B	B	250	330	370	390	340
4	330	C	C	C	C	C	C	C	C	C	290	B	B	B	B	230	240	390	280	A	350	350	320	A
5	370	380	A	400	400	320	330	C	C	C	C	C	C	C	C	290	260	260	260	260	250	380	370	380
6	390	C	C	C	C	C	C	C	C	C	270	B	280	280	270	280	B	B	250	250	340	380	390	320
7	330	C	C	C	C	C	C	C	C	C	C	C	C	C	C	270	280	B	250	250	320	370	370	350
8	330	C	C	C	C	C	C	C	C	C	B	B	300	310	270	290	270	250	290	240	290	340	350	330
9	390	C	C	C	C	C	C	C	C	C	C	C	C	C	290	(250)	210	240	300	290	290	350	390	410
10	410	C	C	C	C	C	C	C	C	B	280	290	(280)	270	300	230	B	250	290	230	290	410	390	A
11	370	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	250	300	300	250	310	390	400	400
12	380	C	C	C	C	C	C	C	C	C	B	B	B	270	290	290	300	300	250	260	280	400	410	400
13	400	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	300	290	270	290	300	330	440
14	340	C	C	C	C	C	C	C	C	C	220	(290)	280	(280)	280	230	280	280	330	290	300	320	380	350
15	370	C	C	C	C	C	C	C	C	C	C	C	C	C	C	250	C	C	270	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	420	C	C	C	C	C	C	C	C	C	(270)	(230)	300	(310)	(320)	290	(330)	250	280	300	250	400	370	420
19	400	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	310	280	260	310	330	340	320
20	380	C	C	C	C	C	C	C	C	C	270	B	B	C	310	B	290	B	280	250	360	340	390	390
21	400	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	310	S	240	290	320	370	430	290
22	410	340	340	320	310	380	320	240	230	B	(270)	300	300	300	300	270	310	320	280	310	310	390	380	350
23	400	350	280	330	340	360	360	270	C	C	C	C	C	C	C	C	250	(290)	B	260	320	350	340	330
24	C	C	C	C	C	C	C	C	C	250	290	260	280	250	290	280	280	290	240	310	360	300	310	410
25	410	390	350	330	290	A	520	320	C	C	C	C	C	C	C	C	250	380	380	330	310	320	360	370
26	320	400	470	450	F	470	(370)	(270)	280	F	300	350	290	310	P	(330)	340	(290)	310	A	B	280	350	330
27	250	350	450	360	K	430	400	340	B	C	C	C	C	C	C	C	B	250	300	290	260	350	320	370
28	310	410	400	350	F	300	310	300	(290)	C	C	C	230	(310)	290	290	240	250	240	240	290	300	400	330
29	390	350	410	F	380	330	310	290	250	C	C	C	C	C	C	C	230	B	280	260	330	330	(330)	(460)
30	(390)	(330)	340	360	340	340	330	280	C	C	C	C	C	C	C	C	B	B	240	230	250	280	360	320
31	340	350	380	350	340	C	C	C	C	C	C	C	C	C	C	260	B	280	290	290	340	360	390	400
Mean Value	330	360	390	360	340	340	330	280	(250)	(270)	(270)	290	280	290	290	280	260	290	280	270	310	350	370	370
Count	28	13	12	12	11	11	12	10	8	9	9	12	12	12	16	15	21	25	27	27	28	28	29	27

Sweep 1.0 Mc to 11.0 Mc in 1.5 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shingagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

hr:

Wakkanai

Lat. 45°23.6'N  
Long. 141°41.1'E

155°E Mean Time

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	290	330	350	350	290	210	240	240	200	210	200	220	200	200	210	210	210	220	200	230	240	220	280	270	
2	300	300	310	290	280	270	230	200	200	220	200	210	210	210	210	210	210	200	230	210	200	220	280	310	
3	300	250	260	220	290	300	270	210	210	230	200	210	200	210	200	200	200	220	210	210	210	300	310	280	
4	270	C	C	C	C	C	C	C	C	200	200	200	240	200	200	200	200	A	210	A	A	A	A	A	
5	320	300	A	310	300	260	210	C	C	C	C	C	C	C	C	C	210	200	200	200	210	320	310	310	
6	300	C	C	C	C	C	C	C	C	200	200	210	220	230	220	220	220	200	220	220	230	300	320	280	
7	280	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	200	220	200	200	230	250	290	270	
8	290	C	C	C	C	C	C	C	C	230	230	230	230	230	220	240	200	200	210	210	220	280	300	280	
9	A	C	C	C	C	C	C	C	C	C	C	C	C	C	220 <sup>F</sup>	(210) <sup>C</sup>	200	200	200	220	220	250	280	310	320
10	A	C	C	C	C	C	C	C	C	200	210	210	220	(230) <sup>C</sup>	240	220	210	220	210	200	210	310	A	A	
11	300	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	210	280	200 <sup>A</sup>	220	A	300 <sup>A</sup>	320	310	
12	A	C	C	C	C	C	C	C	C	200	210	220	240	290	220	220	210 <sup>H</sup>	210	210	230	290	320	320	320	
13	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	300	290	200	210	240	270	300	300	
14	300	C	C	C	C	C	C	C	C	300	200	220	(240) <sup>C</sup>	200	200	200	210	210	210	220	240	250	270	260	
15	290	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	220	(230) <sup>C</sup>	230	(220) <sup>C</sup>	200	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	200	200	210	220	A	A	A	
18	A	C	C	C	C	C	C	C	C	210	210	220	(270) <sup>C</sup>	290	220	220	200	200	200	220	210	300	290	(300) <sup>K</sup>	310
19	290	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	200 <sup>F</sup>	210	210	210 <sup>H</sup>	220	260	260	
20	280	C	C	C	C	C	C	C	C	200	200	260	290	(300) <sup>C</sup>	290	210	210	230	200	220	200	280	280	A	
21	330 <sup>A</sup>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	210	200	210	200	240	260	290	200	
22	310	300	240 <sup>F</sup>	270	250	230	260	200	210	200	220	270	230	230	220	210	230	220	200	210	220	290	300	270	
23	310	270	220	250	A	270	260	220	C	C	C	C	C	C	C	C	210	280	210	210	290	290	290	290	
24	C	C	C	C	C	C	C	C	C	220	210	210	200	210	240	220	230	210	200	200	210	240	280	300	
25	310	320	290	270	200 <sup>N</sup>	A <sup>K</sup>	(350) <sup>E</sup>	250 <sup>K</sup>	210 <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	200 <sup>K</sup>	220 <sup>K</sup>	320 <sup>K</sup>	270 <sup>K</sup>	240	210	230	250	
26	260	340	340	400	350	340	(230) <sup>K</sup>	200	220	280	B	280	300	220	270	(280) <sup>K</sup>	290	220	210	240	220	220	220	240	
27	210	320 <sup>K</sup>	320 <sup>K</sup>	320 <sup>K</sup>	E <sup>K</sup>	E <sup>K</sup>	290	200	200	C	C	C	C	C	C	C	220	200	200	260	220	240	290	290	
28	250	300	300	300	220	210	260	220	(210) <sup>C</sup>	200	210	200	200	210	220	210	210	200	210	210	200	210	(270)	310	
29	340	A	380	390	290	280	260 <sup>A</sup>	220 <sup>A</sup>	200	C	C	C	C	C	C	C	210	200	220	200	240	250	240	320	
30	330	260	250	270	300	280	240	220	C	C	C	C	C	C	C	C	220	240	210	200	200	210	300	280	
31	290	270	A	270	260	C	C	C	C	C	C	C	C	C	C	C	240	250	200	230	210	A	300	A	
Median Value	300	300	300	290	280	260	220	220	210	200	210	220	230	220	220	210	210	210	210	210	210	230	280	300	290
Count	23	12	11	13	11	10	12	11	10	15	14	15	15	15	18	19	29	29	29	28	26	26	26	25	

Sweep 1.0 Mc to 17.0 Mc in 15 min

Manual

W 3

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Densetsushin Kenkyūjo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Lat. 45°23.6'N  
 Long. 141°41.1'E

Wakkanai

ff<sub>3</sub>

Jan 1949

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							A	A	A	A	A	A	A	A	A	A	A	A							
2							A	A	A	A	A	A	A	A	A	A	A	A							
3							A	A	A	A	A	A	A	A	A	A	A	A							
4							C	C	C	C	C	C	C	C	C	C	C	C							
5							A	A	A	A	A	A	A	A	A	A	A	A							
6							C	C	C	C	C	C	C	C	C	C	C	C							
7							C	C	C	C	C	C	C	C	C	C	C	C							
8							C	C	C	C	C	C	C	C	C	C	C	C							
9							C	C	C	C	C	C	C	C	C	C	C	C							
10							C	C	C	C	C	C	C	C	C	C	C	C							
11							C	C	C	C	C	C	C	C	C	C	C	C							
12							C	C	C	C	C	C	C	C	C	C	C	C							
13							C	C	C	C	C	C	C	C	C	C	C	C							
14							C	C	C	C	C	C	C	C	C	C	C	C							
15							C	C	C	C	C	C	C	C	C	C	C	C							
16							C	C	C	C	C	C	C	C	C	C	C	C							
17							C	C	C	C	C	C	C	C	C	C	C	C							
18							C	C	C	C	C	C	C	C	C	C	C	C							
19							C	C	C	C	C	C	C	C	C	C	C	C							
20							C	C	C	C	C	C	C	C	C	C	C	C							
21							C	C	C	C	C	C	C	C	C	C	C	C							
22							A	A	A	A	A	A	A	A	A	A	A	A							
23							A	A	A	A	A	A	A	A	A	A	A	A							
24							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							
26							C	C	C	C	C	C	C	C	C	C	C	C							
27							A	A	A	A	A	A	A	A	A	A	A	A							
28							A	A	A	A	A	A	A	A	A	A	A	A							
29							A	A	A	A	A	A	A	A	A	A	A	A							
30							A	A	A	A	A	A	A	A	A	A	A	A							
31							C	C	C	C	C	C	C	C	C	C	C	C							
Wakkanai Value Count																									

Sweep 1.0- Mc to 17.0 Mc in 1.5 min Manual





Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki Tsushin Kenkyujo) Gotanda, Shinagawaku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 35°23.6'N  
Long. 141°41.1'E

Wakkanai

fb

Jan 1949

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							E	E	(2.0)	A	B	B	B	B	B	B	B	E						
2							A	1.4	2.1	B	B	B	B	B	B	B	A	A						
3							E	1.5	A	2.3	B	B	B	B	B	B	A	A						
4							C	C	C	2.9	2.0	(3.0)	(3.0)	B	B	B	(1.9)	A						
5							E	C	C	C	C	C	C	C	C	C	(1.9)	A						
6							C	C	C	C	B	B	B	B	B	B	B	(1.3)						
7							C	C	C	C	C	C	C	C	C	C	A	A						
8							C	C	C	(2.6)	B	B	B	B	B	B	(2.0)	E						
9							C	C	C	C	C	C	C	C	C	C	A	A						
10							C	C	C	A	A	3.0	B	B	B	B	1.9	A						
11							C	C	C	C	C	C	C	C	C	C	A	A						
12							C	C	C	2.6	B	B	B	B	B	B	(2.0)	1.3						
13							C	C	C	C	C	C	C	C	C	C	A	A						
14							C	C	C	A	B	B	B	B	B	B	A	A						
15							C	C	C	C	C	C	C	C	C	C	2.4	C						
16							C	C	C	C	C	C	C	C	C	C	C	C						
17							C	C	C	C	C	C	C	C	C	C	C	C						
18							C	C	C	(3.1)	B	B	B	B	B	B	(2.8)	2.0	A					
19							C	C	C	C	C	C	C	C	C	C	2.3	A						
20							C	C	C	C	3.2	B	B	B	B	3.2	(2.8)	(2.1)	A					
21							C	C	C	C	C	C	C	C	C	C	2.2	A						
22							A	B	2.4	B	B	A	B	3.1	A	B	(2.1)	1.4						
23							E	(1.7)	C	C	C	C	C	C	C	C	C	B	A					
24							C	C	(2.4)	2.6	3.1	B	B	B	B	3.1	(2.6)	2.2	(1.4)					
25							E	(1.7)	(2.5)	C	C	C	C	C	C	C	C	B	1.5					
26							C	A	(2.3)	B	B	B	B	(3.4)	B	C	B	(1.4)						
27							B	A	A	C	C	C	C	C	C	C	C	B	E					
28							(1.2)	1.6	C	B	B	A	B	B	B	B	B	B	B					
29							A	A	A	C	C	C	C	C	C	C	A	A						
30							E	1.8	C	C	C	C	C	C	C	B	B	B	1.5					
31							C	C	C	C	C	C	C	C	C	C	B	(2.4)	A					
Median Value							E	1.6	2.4	2.6	-	-	-	-	-	-	-	2.1	1.4					
Count							7	7	6	7	3	2	1	2	2	3	3	14	10					

Sweep 1.0 Mc to 15.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 45°23.6'N  
Long. 141°41.1'E

Wakkanai

h<sub>E</sub>

Jan. 1949

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							E	E	A	A	B	A	A	A	B	B	B	E							
2							A	100	100	B	B	B	A	A	B	B	A	A							
3							E	(110)	A	100	A	A	A	B	B	B	A	A							
4							C	C	C	100	100	100	100	A	A	A	A	A							
5							E	C	C	C	C	C	C	C	C	C	B	A							
6							C	C	C	100	B	B	B	B	B	B	B	100							
7							C	C	C	C	C	C	C	C	C	C	A	A							
8							C	C	C	100	B	B	B	B	B	B	B	E							
9							C	C	C	C	C	C	C	C	C	B	C	A							
10							C	C	C	A	A	100	B	C	C	C	A	A							
11							C	C	C	C	C	C	C	C	C	C	A	A							
12							C	C	C	100	B	B	B	B	B	120	B	B							
13							C	C	C	C	C	C	C	C	C	C	A	A							
14							C	C	C	A	B	B	B	B	B	B	A	A							
15							C	C	C	C	C	C	C	C	C	C	A	C							
16							C	C	C	C	C	C	C	C	C	C	C	C							
17							C	C	C	C	C	C	C	C	C	C	C	B							
18							C	C	C	B	B	B	B	B	B	120	B	A							
19							C	C	C	C	C	C	C	C	C	C	C	A							
20							C	C	C	100	100	110	100	100	(100) <sup>C</sup>	100	100	B	A						
21							C	C	C	C	C	C	C	C	C	C	A	A							
22							A	B	90	100	100	A	100	100	A	A	B	A							
23							E	A	C	C	C	C	C	C	C	C	B	A							
24							C	C	A	100	100	A	A	B	100	100	100	A							
25							E	100	100	C	C	C	C	C	C	C	A	100							
26							C	A	A	B	B	B	B	B	B	C	C	A							
27							B	A	A	C	C	C	C	C	C	C	B	E							
28							B	(140) <sup>F</sup>	C	B	B	A	B	B	B	B	B	A							
29							A	A	C	C	C	C	C	C	C	C	A	A							
30							E	A	A	C	C	C	C	C	C	A	B	A							
31							C	C	C	C	C	C	C	C	C	C	A	B							
Median Value									100																
Count							4		3	8	4	3	3	2	3	4	2								

Sweep 1.0 Mc to 11.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki Tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

fts

Wakkanai

Lat. 45°23.6'N  
 Long. 141°41.1'E

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	1.4	1.3	E	E	2.4	2.8	B	B	B	B	B	3.6	4E	1.5	E	E	E	3.1	E	E
2	E	E	E	E	1.5	2.3	3.4	4E	B	B	B	B	B	B	B	B	2.2	2.2	2.9	2.4	2.6	1.9	E	1.3
3	1.5	2.1	2.0	2.0	1.7	2.7	2.5	2.4	4E	B	B	B	B	B	B	B	3.0	3.0	3.0	3.7	3.4	2.1	2.0	3.4
4	2.0	C	C	C	C	C	C	C	C	4E	4E	4E	4E	4E	4E	4E	2.6	2.4	2.4	3.8	3.5	3.4	3.7	4.4
5	3.7	2.5	3.6	1.6	1.5	E	E	E	C	C	C	C	C	C	C	B	B	1.6	E	E	E	E	E	2.4
6	2.4	C	C	C	C	C	C	C	C	C	B	B	B	B	B	B	4.1	4E	1.7	E	E	E	E	1.7
7	3.0	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.5	2.2	B	E	2.3	E	E	E
8	E	C	C	C	C	C	C	C	C	C	B	B	B	B	B	4E	4E	E	E	E	E	E	E	3.0
9	2.4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.0	2.4	2.1	2.1	2.0	E	E	1.9	E
10	3.6	C	C	C	C	C	C	C	3.7	3.7	3.7	4E	B	B	B	1.9	1.9	3.5	2.0	2.6	E	2.0	3.0	4.2
11	2.4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.5	4.9	3.6	3.6	3.6	3.4	2.7	2.8	E
12	1.6	C	C	C	C	C	C	C	C	B	B	B	B	B	B	B	B	B	1.5	2.0	1.6	2.9	2.1	1.6
13	2.5	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.5	2.7	2.1	2.0	2.0	2.0	E	E	B
14	2.0	C	C	C	C	C	C	C	3.5	B	B	B	B	B	B	3.2	3.0	E	E	1.6	1.6	1.6	1.8	E
15	E	C	C	C	C	C	C	C	C	C	B	B	2.4	C	B	2.4	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	3.4	C	C	C	C	C	C	C	C	B	B	B	B	B	B	3.1	(2.1)	1.8	1.7	1.6	E	2.4	3.0	3.2
19	1.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	5.0	B	1.6	1.6	1.6	E	1.3	1.5	3.6
20	2.8	C	C	C	C	C	C	C	C	4E	4E	B	B	B	B	(2.3)	3.6	1.4	1.7	2.6	1.6	1.6	2.5	4.8
21	3.9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.4	3.7	2.5	2.4	2.3	E	B	B
22	2.5	2.6	4.4	3.4	E	1.9	1.6	1.8	4E	B	B	3.8	B	B	B	B	B	1.4	E	E	E	E	E	E
23	3.5	2.9	1.8	3.2	2.5	2.5	E	1.5	C	C	C	C	C	C	C	C	C	2.5	2.5	2.8	2.4	1.8	(1.5)	E
24	C	C	C	C	C	C	C	C	4E	2.7	B	B	B	B	4E	B	B	2.2	2.4	1.5	E	1.7	1.6	1.6
25	2.5	1.8	3.6	2.5	1.6	2.5	2.3	2.3	(2.5)	C	C	C	C	C	C	C	B	4E	1.8	E	2.5	E	E	E
26	3.6	2.6	2.4	2.4	2.3	2.6	C	3.0	2.4	B	B	B	B	B	B	B	B	2.5	B	(1.4)	1.8	2.0	2.1	E
27	E	E	E	E	E	2.2	B	1.5	3.4	C	C	C	C	C	C	C	B	1.2	3.9	4.0	3.2	2.3	2.7	2.0
28	2.1	E	(1.3)	E	E	2.3	B	4E	C	B	B	5.1	(3.6)	B	B	B	B	B	2.0	2.0	4.4	2.4	2.5	3.2
29	2.5	2.6	2.6	2.5	1.9	1.9	2.6	5.9	3.2	C	C	C	C	C	C	3.5	2.6	2.6	2.4	2.3	E	2.0	2.0	2.0
30	E	2.0	2.7	2.4	2.6	2.6	2.3	2.5	C	C	C	C	C	C	C	B	B	B	E	2.1	1.8	3.5	3.6	3.5
31	3.0	3.1	2.9	2.5	E	C	C	C	C	C	C	C	C	C	C	4E	3.2	3.6	4.1	3.7	2.5	2.4	1.7	1.7
Station Voice Count	2.4 2.8	2.1 1.3	2.4 1.3	2.4 1.3	1.5 1.3	2.3 1.2	9	1.8	(2.4)	(2.7)	-	-	-	-	-	2	2.4	2.4	2.0	1.7	1.9	1.6	1.9	1.7
									8	7	3	4	3	3	2	2	1.8	2.5	2.7	2.9	2.9	2.9	2.8	2.7

Sheep 1.0 Mc to 17.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 45°23.6'N  
Long. 141°41.1'E

Wakkanai

F<sub>2</sub>-M3000

Jan 1949

135°E Mean Time

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	2.7	2.6	2.5	2.5	3.1	3.2	3.1	3.0	(3.5)	3.1	3.2	3.2	3.4	3.0	3.2	3.2	3.5	3.1	T	3.6	3.3	3.1	2.6	2.7
2	2.8	2.7	2.6	2.8	3.2	3.1	3.5	3.8	B	J	3.4	3.5	3.6	3.4	3.4	3.4	3.4	J	B	3.2	3.5	3.2	2.8	2.6
3	2.7	2.9	3.0	2.5	2.8	3.1	3.5	3.3	B	B	3.5	3.2	3.7	3.7	B	3.5	3.1	B	3.4	3.0	2.8	2.7	2.9	A
4	2.8	C	C	C	C	C	C	C	C	F	J	3.3	3.4	B	3.4	3.5	2.6	2.6	A	2.9	3.0	3.0	A	
5	2.8	2.8	A	2.7	2.9	2.8	2.8	C	C	C	C	C	C	C	C	3.1	3.3	3.4	3.1	3.5	2.8	3.0	2.9	
6	2.7	C	C	C	C	C	C	C	C	3.4	B	3.3	3.4	3.2	3.2	3.2	B	B	3.2	3.3	2.9	2.7	2.7	3.1
7	2.8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	3.5	J	3.3	3.0	2.8	2.6	2.8
8	2.7	C	C	C	C	C	C	C	C	B	B	3.3	3.2	J	3.3	3.2	3.4	3.2	3.6	3.0	3.2	2.7	3.0	
9	2.8	C	C	C	C	C	C	C	C	C	C	C	C	C	3.2	(3.5)	3.7	3.1	3.4	3.2	2.8	2.8	2.6	
10	2.6	C	C	C	C	C	C	C	C	B	3.2	3.2	(3.2)	3.3	3.3	B	3.3	3.1	3.6	3.1	2.9	2.7	A	
11	2.7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.4	J	J	3.4	3.1	2.9	2.7	2.8	
12	2.8	C	C	C	C	C	C	C	C	B	B	B	B	B	B	3.2	J	J	3.3	3.4	3.2	2.5	2.6	2.7
13	2.8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.1	J	3.3	3.3	3.1	3.1	2.5	
14	3.0	C	C	C	C	C	C	C	C	3.6	3.2	3.2	(3.2)	(3.3)	3.4	3.4	3.5	3.5	3.4	3.2	3.2	3.0	2.8	
15	2.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
18	2.7	C	C	C	C	C	C	C	C	3.3	3.3	3.2	C	C	3.3	2.9	3.4	3.2	3.4	3.0	3.1	2.8	2.7	2.5
19	F	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.3	3.1	J	3.3	3.1	2.9	3.0	
20	2.7	C	C	C	C	C	C	C	C	3.3	B	B	C	C	3.2	J	3.2	B	3.3	3.3	3.4	2.8	2.9	2.6
21	2.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.1	S	3.3	3.2	2.9	2.8	(2.6)	3.2
22	2.7	2.8	2.9	2.9	3.0	2.8	3.0	3.5	3.6	B	(3.3)	3.0	J	3.2	3.2	3.2	2.9	3.1	3.3	3.0	2.9	2.7	2.8	2.8
23	2.6	2.8	3.3	3.0	3.0	2.9	2.8	3.4	C	C	C	C	C	C	C	C	3.4	3.1	B	J	3.0	2.9	3.0	2.8
24	C	C	C	C	C	C	C	C	3.3	J	3.4	3.4	3.6	3.2	3.2	3.2	3.2	(3.1)	3.4	3.1	2.7	3.1	3.2	2.5
25	2.5	2.7	2.9	3.1	3.5	A <sup>K</sup>	(2.1) <sup>K</sup>	3.0 <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	C <sup>K</sup>	3.5	2.8	2.6	2.9	3.0	3.0	3.1	2.8
26	2.8	2.5	2.3	2.5	F	J	F	C	3.1	B	3.2	3.3	J	3.5	3.0	(3.0)	3.0	3.1	3.0	B	A	J	2.8	2.9
27	3.4	2.7	(2.2) <sup>F</sup>	2.6	2.6	2.6	2.7	2.8	B	C	C	C	C	C	C	C	3.0	3.4	3.0	3.3	3.4	2.8	3.1	2.8
28	3.0	2.6	2.7	2.9	F	3.1	3.0	3.1	C	J	C	C	3.7	3.3	3.3	3.2	3.4	3.5	3.4	3.5	3.2	3.0	2.6	2.9
29	2.6	2.7	2.6	F	2.5	2.9	3.1	3.2	3.5	C	C	C	C	C	C	C	3.3	B	J	3.2	2.9	2.9	F	J
30	J	(2.8)	2.9	2.9	2.9	3.0	2.8	3.1	C	C	C	C	C	C	C	B	B	3.5	3.5	3.5	3.2	2.8	2.8	3.0
31	2.9	2.9	2.8	2.9	2.8	C	C	C	C	C	C	C	C	C	C	3.4	B	3.2	3.2	3.3	3.0	2.9	2.8	2.6
Mean Value	2.7	2.7	2.7	2.7	2.9	2.9	3.0	(3.2)	(3.5)	(3.3)	(3.2)	3.3	3.4	3.2	3.3	3.2	3.3	3.2	3.3	3.3	3.1	2.9	2.8	2.8
Count	26	13	12	12	11	10	11	9	7	6	7	12	10	10	15	15	22	21	21	25	27	27	27	25

W 9°

Manual

Sweep 150 Mc to 11.0 Mc in 1.5 min

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 45°23.6'N  
Long. 141°41.1'E

Wakkanai

f<sub>r</sub> min

Jan 1949

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	E	2.0	A	3.2	3.2	3.5	3.4	3.2	3.2	1.8	1.1	1.3	1.3	1.1	1.1	1.3	1.3
2	1.2	1.1	E	E	A	A	A	1.5	2.3	2.7	3.4	3.6	3.4	3.5	3.6	3.6	A	A	A	A	1.4	1.4	E	E
3	E	E	1.2	E	E	E	E	1.5	2.1	2.4	3.0	2.7	2.6	2.9	2.8	2.9	A	E	A	E	A	E	E	E
4	E	E	C	C	C	C	C	C	2.9	3.1	3.3	3.1	3.0	2.9	3.0	1.9	A	A	A	A	A	A	A	A
5	A	E	A	A	A	E	E	C	C	C	C	C	C	C	C	1.9	A	E	E	E	E	1.1	E	E
6	E	C	C	C	C	C	C	C	2.9	3.3	3.2	3.0	3.5	3.4	3.4	2.1	2.0	A	1.3	E	E	E	E	A
7	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	1.4	1.3	1.4	1.1	E	E	1.4
8	1.1	C	C	C	C	C	C	C	3.5	3.7	3.8	3.8	3.6	3.5	3.8	2.0	1.2	1.3	1.3	1.2	E	E	1.4	E
9	A	C	C	C	C	C	C	C	C	C	C	C	C	3.7	(2.8)	1.9	A	E	1.4	1.4	1.3	1.3	1.3	1.2
10	A	C	C	C	C	C	C	C	C	A	A	A	3.5	(3.2)	3.4	2.9	1.9	A	A	A	1.3	1.4	A	A
11	1.2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	A	A	E
12	A	C	C	C	C	C	C	C	2.9	3.5	3.5	3.4	3.6	3.4	3.2	2.2	1.3	1.5	A	A	A	A	A	A
13	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A	1.7	1.5	1.6
14	A	C	C	C	C	C	C	C	A	3.4	3.5	3.5	(3.5)	3.8	2.9	A	A	1.4	1.8	A	A	A	A	1.4
15	1.3	C	C	C	C	C	C	C	C	C	C	C	C	C	3.8	(3.1)	2.4	C	A	C	C	C	C	C
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.4	1.2	E	E	E	A	A	A
18	A	C	C	C	C	C	C	C	3.2	3.8	3.9	4.0	(3.9)	3.2	2.9	2.0	A	E	A	E	E	E	A	E
19	E	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.3	A	E	E	E	1.1	A	A
20	A	C	C	C	C	C	C	C	C	2.9	3.2	3.4	3.4	(3.4)	3.2	2.8	2.1	A	E	A	A	A	A	A
21	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.2	A	E	A	A	E	E	1.4
22	A	A	E	A	E	E	A	A	2.4	3.0	3.4	A	4.1	3.5	A	2.7	2.1	1.4	1.2	E	E	E	E	E
23	A	A	A	A	A	A	E	A	A	C	C	C	C	C	C	2.4	A	A	A	A	A	A	1.4	1.6
24	C	C	C	C	C	C	C	C	2.4	2.9	3.4	3.3	3.4	4.4	3.1	3.0	2.2	1.4	A	E	E	E	A	E
25	E	E	E	E	E	A	E	1.8	2.6	C	C	C	C	C	C	C	1.9	1.5	A	1.2	1.3	1.3	1.1	1.3
26	A	E	1.2	1.1	1.2	A	C	A	2.3	3.1	4.1	4.3	4.2	4.1	3.6	(3.3)	2.9	1.4	1.2	A	1.2	1.3	E	E
27	E	E	1.1	1.1	1.2	1.2	1.3	1.5	A	C	C	C	C	C	C	2.9	A	1.2	A	A	A	1.2	A	1.1
28	E	1.2	E	1.1	1.1	1.2	1.2	1.7	(2.4)	3.1	3.8	A	3.4	4.2	3.5	3.4	3.1	2.9	A	A	A	A	A	A
29	A	A	A	A	E	E	A	A	C	C	C	C	C	C	C	C	A	A	A	A	A	1.3	1.3	1.2
30	1.2	E	A	A	A	A	A	1.8	C	C	C	C	C	C	3.3	3.4	3.4	1.5	A	A	A	A	A	A
31	A	A	A	A	1.2	E	C	C	C	C	C	C	C	C	C	3.4	2.4	A	A	A	A	1.3	A	1.4
Maximum Value	E	(E)	(E)	(E)	(E)	(E)	(E)	(1.5)	(2.4)	2.9	3.4	3.5	3.5	3.4	3.1	3.1	2.2	1.4	1.2	1.2	1.1	1.1	1.1	1.2
Count	13	8	8	8	10	7	8	7	8	12	14	12	15	15	17	19	22	12	16	13	15	20	15	20

Sweep - 1.0 Mc to 17.0 Mc in 1.5 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

f<sub>o</sub>F<sub>min</sub>

Wakkanai

Lat. 45°23.6'N  
Long. 141°41'E

155°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E	E	E	E	E	E	E	E	1.3	1.7	B	2.0	2.3	2.3	B	3.2	1.3	1.3	E	E	E	1.1	E	E
2	E	E	E	E	E	E	E	E	1.6	B	B	2.3	2.1	2.3	2.3	B	1.3	E	E	E	E	1.4	E	E
3	E	E	1.2	E	1.3	1.1	2.3	1.3	1.6	1.5	1.7	1.9	1.9	B	B	B	1.9	E	E	E	E	E	E	E
4	E	E	E	E	E	E	E	E	1.7	1.7	2.0	2.1	2.2	1.8	1.8	1.5	E	E	1.4	1.3	E	E	E	1.1
5	E	E	1.1	E	E	E	E	E	E	E	E	E	E	E	E	E	B	E	E	E	E	E	E	E
6	E	E	E	E	E	E	E	E	2.2	B	B	B	B	B	B	B	3.1	1.3	1.3	E	E	E	E	E
7	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.3	1.2	B	E	1.4	E	E	E
8	E	E	E	E	E	E	E	E	1.6	B	B	B	B	B	B	B	1.8	E	E	E	E	E	E	E
9	E	E	E	E	E	E	E	E	1.8	2.8	2.8	2.8	(2.9)	(3.0)	2.1	2.1	1.6	1.2	1.3	1.3	E	1.8	1.1	1.3
10	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.2	1.5	E	1.5	1.5	E	E
11	E	E	E	E	E	E	E	E	1.5	B	B	B	(2.9)	B	2.2	B	B	B	E	E	1.3	1.4	1.6	E
12	E	E	E	E	E	E	E	E	1.9	B	B	B	B	C	C	C	1.5	E	1.4	1.4	1.8	E	E	B
13	E	E	E	E	E	E	E	E	1.9	B	B	B	B	C	(3.4)	B	1.7	1.7	E	1.4	1.1	1.1	E	E
14	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	1.1	C	C	C	C	C
15	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C
16	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C
17	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C
18	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C
19	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C
20	E	E	E	E	E	E	E	E	2.1	2.1	2.1	2.1	2.1	(2.1)	2.0	2.1	(2.1)	E	E	E	1.1	E	E	E
21	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.9	E	E	E	E	E	E	B
22	E	E	E	E	E	E	E	E	1.1	1.5	1.6	1.7	2.0	1.8	1.9	2.0	B	E	E	E	E	E	E	E
23	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	B	E	E	E	E	E	(1.4)	E
24	E	E	E	E	E	E	E	E	1.3	2.0	2.2	2.2	2.0	B	2.2	2.2	1.2	E	E	E	E	E	E	E
25	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.4	1.1	E	E	1.7	E	E	E
26	1.1	1.2	1.2	1.1	1.2	1.2	(1.2)	1.2	1.5	B	B	B	B	B	B	B	B	E	B	(1.2)	1.2	1.8	E	E
27	E	E	E	E	E	E	E	E	2.2	C	C	C	C	C	C	C	B	E	1.2	1.2	1.3	1.2	1.1	1.1
28	E	E	(1.2)	E	E	1.2	B	1.2	C	B	B	2.9	(3.4)	1.8	B	B	B	1.1	1.3	1.2	1.3	1.5	1.3	E
29	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.8	1.2	1.8	1.3	1.2	E	1.8	1.8
30	E	1.5	E	E	E	E	E	E	E	E	E	E	E	E	E	E	1.9	(1.4)	E	1.3	1.2	1.2	1.5	1.2
31	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	2.0	1.1	1.3	1.3	1.6	1.3	1.3	1.4
Median Value	E	E	E	E	E	E	E	E	(1.3)	1.8	(1.9)	(2.1)	(2.1)	(2.3)	(2.1)	(2.1)	1.6	E	E	E	E	E	E	E
Count	28	13	13	13	13	12	10	11	9	12	6	9	8	8	8	9	21	27	28	29	29	29	28	27

Sweep—1.0—Mc to 17.0—Mc in 1.5—mc Manual

W 11

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyūjo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

ft:

Fukaura

Lat. 40°36.6'N  
Long. 139°54.1'E

135°E Meca Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	3.0	3.0	3.0	3.1	3.5	3.2	2.4	5.2	8.9 <sup>J</sup>	10.3	11.2	10.9	10.1	10.5	9.2	(9.0) <sup>C</sup>	8.9	C	C	C	C	C	C	2.3	2.5
2	2.5	2.5	4.4	2.8	3.0	3.2	3.4	5.0	C	C	C	C	11.0	C	(9.2) <sup>C</sup>	9.2 <sup>H</sup>	C	C	C	C	C	C	3.6	3.7	
3	2.9	4.1	4.3	3.0	3.3	3.3	3.5	6.4	8.8	9.2	12.4	11.8	10.0	9.1	(9.2) <sup>C</sup>	9.2 <sup>H</sup>	C	C	C	C	C	C	3.0	3.1	
4	3.2	3.1	3.2	3.1	3.1	3.0	3.0	4.3	3.4	C	C	C	11.7	9.8	10.8	10.4	C	C	C	C	C	C	2.5	2.6	
5	2.6	A	2.8	2.8	2.8	2.8	3.0	5.0	C	C	C	C	C	11.3	C	C	C	C	C	C	C	C	C	3.0	
6	2.9 <sup>P</sup>	3.1	3.2	3.2	3.1	3.1	3.2	5.1	3.2	C	C	C	10.5	C	C	9.9	C	C	C	C	C	C	C	3.7	3.2
7	3.5	3.4	3.5	3.5	3.5	3.2	2.8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.3	3.5
8	3.3	3.5	3.5	3.1	3.2	3.2	3.1	4.1	C	C	C	C	10.8	C	C	C	C	C	C	C	C	C	C	3.3	3.4
9	3.4	3.4	3.5	4.4	3.5	3.5	3.8	5.3	C	C	C	C	11.0 <sup>V</sup>	9.7	9.2	9.1	9.1	9.7	C	C	C	C	C	3.6	3.6
10	3.1	3.7	3.8	3.8	3.6	3.5	3.0	(5.2) <sup>C</sup>	7.3	10.3	(10.9) <sup>S</sup>	11.4	12.3	C	C	C	C	C	5.1	4.4	(3.5) <sup>S</sup>	2.8	2.3	3.4	
11	3.4	3.5	3.8	3.1	3.1	3.1	2.8	5.1	9.1	11.2	11.5	S	10.5	11.6	12.1	12.0 <sup>S</sup>	(8.4) <sup>S</sup>	8.3	(8.1) <sup>C</sup>	C	C	C	C	3.1	3.1
12	2.1	3.2	3.1	3.1	3.1	3.1	2.8	C	C	C	C	C	C	C	C	9.8	9.0	9.0	7.4	5.1 <sup>T</sup>	3.2	3.0	3.2	3.3	
13	4.2 <sup>F</sup>	3.8 <sup>F</sup>	3.9	3.6	3.4 <sup>F</sup>	3.3 <sup>F</sup>	C	C	C	C	B	11.5 <sup>V</sup>	11.4 <sup>V</sup>	(11.4) <sup>C</sup>	11.4	11.1	10.9	S	8.0	5.8	3.7	2.8	3.2	3.2	
14	3.4	3.4	3.5	3.5	3.7	3.7	3.2	5.5	7.5	10.2	11.7	10.2	C	B	9.6	8.6 <sup>T</sup>	7.4	6.5	5.9	3.4 <sup>T</sup>	3.2	3.2	3.2	3.1	
15	3.0	2.9	3.1	3.2	3.2	3.4	2.6	5.5	9.0	C	C	C	10.1	10.8	(10.6) <sup>S</sup>	10.4	(9.3) <sup>C</sup>	8.2	7.6	4.8	3.3	3.0	2.8	2.9	
16	3.0	3.1	3.2	3.1	3.0	3.1	3.3	5.2	7.8	9.9	10.8	11.4	10.0	9.7	9.7	C	C	7.6	7.6	6.1	4.4 <sup>F</sup>	3.4 <sup>F</sup>	3.1 <sup>F</sup>	3.1 <sup>F</sup>	
17	3.2	3.3	3.5 <sup>V</sup>	3.5	3.1	3.2	3.1	6.3	10.4	9.3	B	C	C	C	C	9.6	8.1	7.2	5.7	4.9 <sup>V</sup>	2.4	2.9	2.9	3.1 <sup>F</sup>	
18	3.2	3.3 <sup>F</sup>	3.5 <sup>F</sup>	3.3 <sup>F</sup>	3.0	3.0	6.1	9.5	9.5	11.4	10.4	11.3	10.6	10.3	(10.1) <sup>S</sup>	9.9	9.9	8.2	7.1	5.3	3.8	4.1	4.2	4.1	
19	3.8	3.9	3.4 <sup>F</sup>	(3.5) <sup>C</sup>	3.5	3.6	2.5	6.5	9.2	10.7	12.1	12.0	11.8	11.7	11.1	11.1	9.8	7.9	8.2	6.9	4.7	3.9	3.9	3.8	
20	3.5	3.4	3.5	3.7	3.2	3.2	3.4	7.0	10.7	11.4	11.6	12.5	12.2	10.8 <sup>H</sup>	11.1	10.9	9.9	9.0	8.9	7.5	5.1	3.5	3.8	3.7	
21	3.5	3.9	3.8	3.5	3.8	3.5	3.5	C	C	C	C	C	C	C	C	C	10.0	8.1	6.6	4.2	3.4	3.4	3.2	3.4	
22	3.3	3.4	3.7	3.0	3.1	3.0	3.1	5.6 <sup>F</sup>	8.2	C	C	C	11.1	9.7	10.5	10.0	9.0	8.6	7.2	4.8	4.5	4.3	3.7	3.9	
23	3.5	3.7	4.3	3.1	3.2	3.0	3.1	6.1	9.0	10.6	B	B	11.9	9.5	9.7	9.6	8.6	7.4	7.2	4.6	3.0	3.7	3.2	3.2	
24	3.1	3.1	3.1 <sup>F</sup>	3.2	3.1	3.3 <sup>F</sup>	3.1	5.9	9.6	B	11.5	11.8 <sup>S</sup>	11.2	C	C	10.3	9.4	8.8	7.5	5.5	4.6	4.0	3.9	3.8	
25	3.4	3.4	3.7	3.5	2.6 <sup>K</sup>	2.4 <sup>K</sup>	2.3 <sup>K</sup>	5.4 <sup>K</sup>	10.3 <sup>K</sup>	9.9 <sup>K</sup>	10.5 <sup>K</sup>	12.5 <sup>K</sup>	11.0 <sup>K</sup>	12.1 <sup>K</sup>	12.4 <sup>K</sup>	9.4 <sup>H</sup>	8.2 <sup>H</sup>	(7.4) <sup>H</sup>	6.5 <sup>K</sup>	6.3 <sup>K</sup>	6.6	6.3	5.5	4.4	
26	4.3	3.5	3.6	3.2	2.9	3.1	3.3 <sup>F</sup>	6.8	7.8	B	B	11.7	(11.7) <sup>C</sup>	11.7	B	10.6	10.6	10.6	9.4	9.2	6.6	6.2	5.5	5.5	
27	5.4	2.5 <sup>K</sup>	2.0 <sup>F</sup>	2.2 <sup>F</sup>	1.6 <sup>F</sup>	2.1 <sup>F</sup>	3.0	C	C	C	C	B	11.0 <sup>H</sup>	11.6	12.0	11.2	10.0	8.0	C	C	C	2.6	2.8	3.0	
28	3.2 <sup>F</sup>	2.8 <sup>F</sup>	3.0 <sup>F</sup>	3.3 <sup>F</sup>	3.5 <sup>F</sup>	2.8 <sup>H</sup>	2.6	6.0	(3.4) <sup>C</sup>	11.8	B	11.5	10.6	9.5	9.3	9.5	9.3	C	C	C	4.0	3.3	3.3	3.5	
29	3.7	A	3.5 <sup>Z</sup>	3.5 <sup>F</sup>	3.7 <sup>F</sup>	3.5	3.5	6.1	8.5	10.2	11.6	11.7	10.7	10.5	10.5	10.0	8.9	6.8	7.0	7.0	4.5	3.2	3.0	3.1	
30	3.0 <sup>Z</sup>	3.5 <sup>F</sup>	4.5 <sup>F</sup>	3.4 <sup>F</sup>	2.8 <sup>F</sup>	3.2 <sup>F</sup>	4.0	6.0	3.7	9.9	11.7	12.5	11.4	11.2	10.7	10.5	8.9	7.5	6.0	5.0	3.6	3.7	3.8	3.4	
31	3.5	3.5	3.6	3.5	3.1	3.0	3.2	7.0	9.5	10.5	10.9	11.9	10.8	(10.2) <sup>C</sup>	9.6	9.6	9.3	7.5	5.0	3.5	4.1	3.3	3.2	3.1	
Median Value	3.3	3.4	3.5	3.2	3.1	3.1	3.1	5.0	8.9	10.3	11.5	11.7	11.0	10.6	10.6	10.0	9.1	8.0	7.3	5.5	4.1	3.3	3.3	3.2	
Count	31	29	30	31	31	30	26	22	16	14	15	25	21	20	23	21	20	20	19	20	21	20	21	30	31

Sweep 1.0 Mc to 17.2 Mc in 1.5 min

Manual

F I



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Day	135° E Mean Time																				Fukaura		Lat. 40° 36' N	
	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	390	420	450	430	340	250	320	280	290	270	250	270	280	300	270	240	C	C	C	C	C	C	390	400
2	370	400	420	410	310	240	270	250	C	C	C	290	290	C	C	C	C	C	C	C	C	C	S	420
3	430	340	320	350	400	380	340	280	260	300	270	280	280	280	280	290	C	C	C	C	C	C	400	380
4	380	370	360	360	350	360	300	320	300	C	C	C	290	270	340	300	S	C	C	C	C	C	400	330
5	400	A	400	370	350	370	300	330	C	C	C	C	C	300	C	C	C	C	C	C	C	C	C	410
6	430	400	360	370	320	400	220	320	260	C	C	C	300	C	C	270	C	C	C	C	C	C	C	370
7	350	360	410	340	280	220	280	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	400	360
8	350	370	470	300	320	400	310	270	C	C	C	C	280	C	C	C	C	C	C	C	C	C	380	360
9	380	400	370	310	360	360	350	290	C	C	C	310	290	250	280	290	290	290	C	C	C	C	400	400
10	410	410	330	340	350	370	350	330	350	280	250	300	300	C	C	C	C	C	C	C	C	300	420	430
11	410	390	340	370	350	320	270	320	300	310	260	S	310	320	310	320	(370) <sup>S</sup>	310	(280)	C	C	C	410	410
12	410	370	370	370	350	350	320	C	C	C	C	C	C	C	C	270	270	280	310	260	220	(370) <sup>S</sup>	430	420
13	450	360	330	320	410	410	C	C	C	C	B	300	310	C	C	280	280	320	300	300	300	320	430	410
14	380	350	400	380	360	320	290	290	280	270	C	C	290	C	B	280	280	300	300	300	300	270	310	400
15	420	400	380	400	330	310	360	300	270	C	C	C	300	310	(310) <sup>S</sup>	300	(310) <sup>S</sup>	270	260	260	230	210	330	400
16	420	370	290	320	380	350	330	360	340	310	250	B	C	C	C	240	250	320	310	270	310	390	330	450
17	420	400	430	400	360	370	340	310	280	310	280	B	C	C	310	300	310	300	280	250	400	350	370	
18	350	400	SF	390	300	290	300	310	300	300	290	290	310	310	310	310	310	310	310	260	320	300	310	370
19	400	370	420	420	420	350	300	290	260	250	260	260	310	310	310	310	290	290	310	260	320	300	310	370
20	400	400	410	370	400	420	330	280	300	270	250	280	290	320	330	310	290	280	310	290	300	250	350	420
21	410	420	380	370	350	360	310	C	C	C	C	C	C	C	C	C	C	310	310	300	320	340	350	410
22	390	360	310	(450) <sup>A</sup>	470	470	310	290	260	C	C	C	330	280	330	290	320	290	290	320	290	370	400	410
23	380	370	330	340	370	310	360	270	260	300	B	B	290	310	340	290	320	280	260	240	270	250	290	320
24	390	470	430	420	410	370	350	300	300	300	300	290	310	C	C	290	280	310	290	300	310	370	310	380
25	400	400	360	320	270	GK	440 <sup>A</sup>	360	260	260	290	350	280	340	330	300	300	310	(350) <sup>H</sup>	380	270	230	340	350
26	320	430	500	470	520	360	350	280	280	B	B	B	320	(350) <sup>S</sup>	390	B	280	350	330	330	290	320	320	320
27	330	480	F	420	430	440	330	C	C	C	C	B	300	320	290	280	250	270	C	C	C	250	350	370
28	360	390	380	340	290	(360) <sup>S</sup>	340	290	(280) <sup>S</sup>	260	B	270	290	290	270	280	260	C	C	C	280	270	420	350
29	370	A	420	430	380	350	310	260	250	270	280	280	270	300	310	300	310	300	310	300	290	370	350	350
30	380	440	F	380	350	380	330	300	260	290	290	280	280	300	290	280	290	280	280	280	310	320	340	350
31	400	380	380	320	320	340	290	250	230	240	290	300	(310) <sup>S</sup>	310	290	270	290	290	330	300	310	350	320	370
Month Value	390	400	380	370	360	350	330	300	280	290	280	290	310	310	310	290	280	310	310	290	320	360	320	320
Count	31	29	29	31	31	31	29	25	32	16	14	15	25	20	20	23	21	20	19	20	21	29	31	31

Sweep - 1 sec. Mc to 13.5 Mc in 1.5 min

F 2

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denritsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

hr:

Fukaura

Lat. 40°36'N  
Long. 139°54'E

135°E Mean Time

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	360	380	350	280	210	S	250	230	220	230	230	230	250	230	220	210	C	C	C	C	C	C	360	330	
2	300	300	350	340	320	290	230	220	C	C	C	C	240	C	C	C	C	C	C	C	C	C	C	S	320	
3	300	270	250	230	E	300	280	240	210	210	240	220	230	250	260 <sup>H</sup>	260 <sup>H</sup>	C	C	C	C	C	C	C	C	330	300
4	300	310	300	300	300	300	240	250	210	S	C	C	250	220	230	220	C	C	C	C	C	C	C	C	A	240
5	320	A	350	(300) <sup>A</sup>	290	300	210	220	C	C	C	C	C	240	C	C	C	C	C	C	C	C	C	C	C	320
6	320	300	330	280	260	290	280	220	230	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	310
7	320	300	330	290	240	250	240	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	280
8	280	270	270	260	280	310	250	220	C	C	C	C	230	C	C	C	C	C	C	C	C	C	C	C	C	300
9	300	(320)	320	300	300	280	260	210	C	C	C	C	230	290	210	220	230	210	C	C	C	C	C	C	C	310
10	320	350	300	310	300	300	A	C	270	250	(280)	250	230	C	C	C	C	C	C	C	C	C	C	C	C	340
11	340	320	370	300	290	270	270	210	230	230	220	240	230 <sup>H</sup>	250	250	230	200	230	260	C	C	C	C	C	C	370
12	320	320	250	300	310	310	240	250	C	C	C	C	C	C	C	C	230	210	(230)	210	210	230	320 <sup>H</sup>	310	320	
13	350	310	300	280	320	310	C	C	C	C	240	250	270	(280)	280	240	240	230	210	210	210	(230)	230	350	310	
14	320	300	310	310	300	250	230	230	210	250	220	230	(230)	230	230	240	240	200	200	210	210	(230)	230	300	320	
15	340	350	320	300	290	270	(250)	250	240	220	C	C	240	290	(270)	240	(240)	240	200	220	210	250	250	290	320	
16	320	300	200	270	280	290	250	250	210	220	220	240	220	220	220	C	C	C	250	250	230	240 <sup>F</sup>	250 <sup>F</sup>	290	320	
17	350	350	320	300	250	320	260	*260	220	220	220	240	C	C	C	C	220	210	230	220	240	(270)	270	370		
18	340	330	340 <sup>F</sup>	300	280	300	250	(230)	200	220	250	240	290	320	280	(280)	280	250	290	200	270	280	270	290		
19	300	300	320	310	320	280	250	250	220	240	230	250	240	230	240	260	220	220	220	220	270	260	260	300		
20	300	310	320	320	320	350	250	220	220	230	240	250	230	220 <sup>H</sup>	230	250	230	230	220	210	210	210	310	A		
21	(330) <sup>A</sup>	(410)	320	300	290	280	240	230	C	C	C	C	C	C	C	C	C	C	220	240	210	220	300	300		
22	310	320	270	A	370	340	250	230	230	C	C	C	240	200	260	210	250	250	220	220	220	220	300	300		
23	300	300	260	240	310	340	300	240	240	220	240	240	230	240	240	230	230	250	220	220	220	220	300	290		
24	210	350	350	310	300	280	250	220	220	240	240	250	270	C	C	240	230	220	220	200	230	220	280	310		
25	310	340	290	240	310	310	350 <sup>K</sup>	280 <sup>K</sup>	210 <sup>K</sup>	230 <sup>K</sup>	250 <sup>K</sup>	230 <sup>K</sup>	250 <sup>K</sup>	230 <sup>K</sup>	250 <sup>K</sup>	230 <sup>K</sup>	220 <sup>K</sup>	250 <sup>K</sup>	250 <sup>K</sup>	260 <sup>K</sup>	260 <sup>K</sup>	250	240	260		
26	270	350	370	370	430	300	350	240	260	230	220	230	230	220	230	230	220	(200) <sup>A</sup>	230	240	(200) <sup>A</sup>	230	210	250		
27	200	350 <sup>K</sup>	(430) <sup>K</sup>	300 <sup>K</sup>	(440) <sup>K</sup>	360 <sup>K</sup>	300	330	C	C	C	C	250 <sup>H</sup>	210	230	230	230	210	C	C	C	250	A	310		
28	300	340	330	270	220	210 <sup>H</sup>	300	240	(240) <sup>C</sup>	240	230	220	220	220	230	230	220	210	C	C	210	270	340	300		
29	290	A	A	350	300	280	250	240	220	250	230	210	250	250 <sup>A</sup>	250	240	240	A	250	250	220	230	230	260		
30	310	370	270	270 <sup>F</sup>	250 <sup>F</sup>	330 <sup>F</sup>	260 <sup>F</sup>	240	220	230	220	230	230	250	250	250	220	220	220	220	210	210	300	300		
31	300	300	310	270	230	300	240	240	240	230	220	220	220	(220) <sup>F</sup>	210	220	230	220	220	240	240	270	310	310		
Median Value	310	320	320	300	300	300	260	240	230	230	240	230	230	250	240	230	230	230	220	210	220	220	270	300		
Count	31	24	30	30	31	28	28	22	22	19	19	19	26	22	21	24	21	21	21	20	19	20	27	30		

Sweep 1.0 Mc to 1.7 Mc in 15 min

Manual

F 3

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-tsushin Kenkyujo) Gotanda, Shingawaku, Tokyo, Japan

# IONOSPHERIC DATA

Lat. 40°36.0'N  
 Long. 139°54.1'E

Day	135° E Mean Time											Fukauro													
	00	01	02	03	04	05	06	07	08	08	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1																									
2						S	Q	Q	Q	Q	L	Q	Q	Q	Q	Q	Q	Q							
3						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
4						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
5						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
6						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
7						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
8						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
9						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
10						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
11						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
12						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
13						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
14						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
15						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
16						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
17						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
18						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
19						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
20						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
21						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
22						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
23						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
24						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
25						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
26						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
27						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
28						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
29						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
30						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						
31						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q						

MUF            M3000            Mc            min            Manual  
 Sweep            Mc to            Mc in            min

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 40°36.6'N  
 Long. 139°54.1'E

Fukaura

h'F<sub>1</sub>

Jan 1949

Day	135°E Mean Time												16	17	18	19	20	21	22	23
	00	01	02	03	04	05	06	07	08	09	10	11								
1						S	Q	Q	Q	Q	Q	Q	Q	Q	C	Q				
2						Q	Q	C	C	Q	210	Q	Q	C	C	C				
3						Q	Q	Q	Q	Q	Q	Q	240	1240	230	C				
4						Q	Q	Q	Q	Q	Q	Q	220	Q	Q	C				
5						Q	Q	Q	Q	Q	Q	Q	Q	Q	C	C				
6						Q	Q	Q	Q	Q	Q	Q	Q	Q	C	C				
7						Q	Q	Q	Q	Q	Q	Q	Q	Q	C	C				
8						Q	Q	Q	Q	Q	Q	Q	Q	Q	C	C				
9						Q	Q	Q	Q	Q	Q	220	220	Q	Q	Q				
10						Q	Q	230	1240	240	220	Q	Q	C	C	C				
11						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
12						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
13						Q	Q	Q	Q	Q	210	220	220	Q	Q	Q				
14						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
15						Q	Q	Q	Q	Q	Q	Q	220	Q	Q	C				
16						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	C				
17						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
18						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
19						Q	Q	Q	Q	Q	230	Q	Q	Q	Q	200				
20						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
21						Q	Q	Q	Q	Q	Q	Q	Q	Q	C	C				
22						Q	Q	Q	Q	Q	Q	230	230	200	Q	Q				
23						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
24						Q	Q	Q	Q	Q	230	220	Q	Q	Q	Q				
25						Q	Q	Q	Q	Q	240	Q	Q	Q	Q	Q				
26						Q	Q	250	Q	Q	230	Q	Q	Q	Q	Q				
27						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
28						Q	Q	Q	Q	Q	220	Q	Q	Q	Q	Q				
29						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
30						Q	Q	Q	Q	Q	Q	Q	Q	230	Q	Q				
31						Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
Mean Value										220	230	220	220	230	-	-				
Count							2	1	5	8	7	5	5	2	1					

Sweep 1.0-1.5 Mc to 17.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

f3

Fukaura

Lat. 40°36.6'N  
Long. 139°54.1'E

Day	135°E Mean Time											16	17	18	19	20	21	22	23	
	00	01	02	03	04	05	06	07	08	09	10									11
1																				
2							S (1.4)	2.4	2.6	3.1	3.0	3.0 (2.9)	A	C	C	2.4	C			
3							A (1.4)	C	C	C	C	C	C	C	C	C	C			
4							E 1.4	2.1	2.6	2.8	A	A	3.0 (2.8)	2.6	C	C	C			
5							B	A	2.3	C	C	(3.2)	B	(3.0)	2.7	C	C			
6							A	A	C	C	C	C	A	C	C	C	C			
7							E	B	2.5	C	C	3.1	C	C	A	C	C			
8							E	B	C	C	C	C	C	C	C	C	C			
9							E	A	2.6	C	C	3.2	C	C	C	C	C			
10							A	A	A	C	C	3.1	A	(2.6)	(1.3)	E				
11							A (1.5)	2.2 <sup>H</sup>	2.6 <sup>J</sup>	A	A	3.2	A	3.0	2.4	2.0	A			
12							E	(1.5)	C	C	C	C	C	C	C	2.4	A			
13							C	C	C	A	B	3.1	3.1	2.6	2.0	A	A			
14							E	A	2.4	3.3	3.3	3.2	3.1	3.1	A	A				
15							B	1.6	2.1 <sup>H</sup>	2.5	C	3.4 <sup>J</sup>	3.2	(3.0)	2.8	C	A			
16							E	B	2.2	A	A	3.0	A	B	C	C	A			
17							E	A	2.0	2.8	3.2	3.2	3.2	3.2	2.6	2.2	1.8			
18							E	A	2.0	2.8	3.2	3.2	3.2	3.2	3.2	2.3	2.3	A		
19							E	1.9	2.2	2.8	3.2	A	B	A	A	2.6	2.2	E		
20							E	1.8	B	A	3.4	(3.0)	3.3	B	3.2	A	A	E		
21							E	1.3	C	C	C	C	C	C	C	C	C	A		
22							E	A	2.1	C	C	C	A	3.0	A	A	2.4	1.8		
23							F	1.6	2.2	2.9	3.1	A	B	3.2	2.9	A	A			
24							E	B	2.3	2.8	A	A	C	C	A	2.2	A			
25							B	A	A	3.2	3.2	3.2	3.2	3.2	2.8	2.3	A			
26							F	1.8	A	A	3.1	B	B	A	A	A	2.4	A		
27							E	B	C	C	3.2	B	B	2.9	2.7	2.3	B			
28							E	A	C	2.9	3.1	B	B	2.6	(2.2)	A	E			
29							E	A	A	A	A	A	A	A	A	A	A	A		
30							E	1.5	2.3	2.8	A	B	3.2	3.4 <sup>J</sup>	A	2.9	2.3	A		
31							E	1.9	2.2	2.9	B	B	C	A	2.8	2.4	A			
							E	1.5	2.2	2.8	3.2	3.1	3.2	3.1	2.7	2.3	E			
							2.1	1.3	1.7	1.3	1.0	1.1	1.0	1.2	1.7	1.4	6			

Sweep 1.0 Mc to 11.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 40°36'N  
 Long. 139°54'E

Fukaaura

h<sub>g</sub>

Jan 1949

155°E Mean Time

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							S	A	110	100	110	100	100	110	A	C	100	C						
2							A	(120)	C	C	C	C	110	C	C	C	C	C						
3							E	(110)	110	A	110	A	A	110	A	110	C	C						
4							B	A	110	C	C	C	A	110	120	120	C	C						
5							A	A	C	C	C	C	A	C	C	C	C	C						
6							E	B	120	C	C	C	100	C	C	100	C	C						
7							E	B	C	C	C	C	C	C	C	C	C	C						
8							E	B	C	C	C	C	(110)	C	C	C	C	C						
9							E	A	120	C	C	C	A	110	A	110	100	E						
10							A	A	A	A	A	A	A	A	A	A	A	A						
11							A	100	100 <sup>H</sup>	110	A	A	110	A	110	A	110	A						
12							E	B	C	C	C	C	C	C	C	C	120	A						
13							C	C	C	C	A	A	B	110	120	110	110	A						
14							E	A	110	110	100	100 <sup>H</sup>	(110)	110	110	110	A	B						
15							B	B	130 <sup>H</sup>	110	C	C	110	110	(120)	120	C	A						
16							E	B	110	A	A	110	A	(110)	(110)	C	C	A						
17							E	A	110	120	A	C	C	C	C	110	110	A						
18							E	A	120	110	110	110	A	110	110	(110)	110	A						
19							E	100	100	110	110	A	A	A	A	110	110	E						
20							E	AF	A	A	120	110	120	A	120	A	A	E						
21							E	110	C	C	C	C	C	C	C	C	C	A						
22							E	A	110	C	C	C	A	110	A	A	110	B						
23							E	B	120	110	110	110	A	B	120	120	A	A						
24							E	B	110	110	A	A	A	C	C	A	120	B						
25							110	A	A	A	110	110	120	110	110	110	110	A						
26							E	110	A	A	110	A	A	A	A	A	100	A						
27							E	B	C	C	C	110	A	A	110	110	110	B						
28							E	A	C	140	110	100	100	(100)	100	100	A	E						
29							E	A	A	A	A	A	A	A	A	A	A	A						
30							E	B	110	120	A	A	100	110	A	110	110	A						
31							E	140	130	110	(110)	(110)	C	A	A	110	110	A						
Media							-	110	110	110	110	110	110	110	110	110	110	110						
Values							-	110	110	110	110	110	110	110	110	110	110	110						
Count							-	7	17	12	11	10	12	13	12	17	14	14						

Sheep 1.0 Mc to 1.7 Mc in 1.5 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawaku, Tokyo, Japan

# IONOSPHERIC DATA

Lat. 40°36.6'N  
Long. 139°54.1'E

Fukaura

fts

Jan 1949

155°E Mean Time

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	24	25
1	2.6	3.4	1.6	E	E	E	S	2.8	<F	3.0	<F	3.2	B	4.8	3.2	C	<F	C	C	C	C	C	E	E	2.2	E
2	2.4	2.8	2.8	2.5	2.5	2.2	2.0	3.5	C	C	C	C	<F	C	C	C	C	C	C	C	C	C	C	2.8	2.4	2.0
3	E	3.1	2.0	1.9	2.2	2.2	1.9	<F	2.8	2.8	4.0	5.4	3.2	B	2.8	3.2	C	C	C	C	C	C	2.5	2.0	2.6	
4	5.3	3.6	3.2	2.4	3.5	4.0	B	3.2	2.5	C	C	C	5.0	B	<F	<F	C	C	C	C	C	C	4.1	F	2.6	
5	3.1	F	4.1	3.4	4.8	2.2	2.0	2.3	C	C	C	C	C	3.2	C	C	C	C	C	C	C	C	C	C	C	E
6	E	E	E	2.2	2.5	2.1	2.0	2.2	2.9	C	C	C	C	3.5	C	C	C	C	C	C	C	C	C	C	2.4	2.4
7	2.0	2.7	2.6	2.8	E	E	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	E	E
8	E	E	E	E	2.5	E	B	C	C	C	C	C	3.8	C	C	C	C	C	C	C	C	C	C	E	E	E
9	3.2	3.4	2.8	3.8	1.6	2.6	3.4	2.2	<F	C	C	C	B	3.4	3.2	3.2	<F	E	C	C	C	C	C	2.2	2.4	2.4
10	2.2	3.0	3.0	3.0	3.0	3.0	3.0	C	3.0	4.1	C	3.6	B	C	4.0	2.6	2.4	2.2	7.4	C	C	C	4.8	F	3.5	2.8
11	E	2.2	3.4	3.1	3.1	2.1	1.9	<F	<F	<F	5.4	5.0	<F	4.2	4.0	2.6	2.4	2.2	7.4	C	C	C	C	3.2	4.0	4.0
12	3.1	3.2	E	E	2.8	E	3.4	C	C	C	C	C	C	C	C	C	3.6	3.1	3.0	E	E	E	E	2.0	2.4	2.4
13	3.4	2.2	2.6	2.2	E	2.2	C	C	C	C	3.1	B	B	3.4	4.0	3.3	2.3	2.2	E	3.0	2.3	2.5	2.0	2.0	1.9	2.5
14	2.8	2.8	2.6	E	2.8	2.2	2.0	3.0	3.0	<F	<F	<F	C	<F	<F	<F	3.4	2.4	2.0	2.5	2.0	2.0	2.0	1.9	2.5	1.9
15	2.2	2.4	3.0	2.2	2.4	E	2.4	B	<F	<F	C	C	4.0	3.6	C	3.2	C	4.6	3.3	3.3	2.7	2.4	2.1	2.1	1.9	2.5
16	2.1	E	2.5	2.4	E	E	E	E	2.6	3.0	3.2	3.6	3.8	B	B	C	C	2.0	E	E	E	E	E	E	2.2	2.2
17	2.7	3.0	1.4	E	E	E	E	1.8	<F	3.2	C	C	C	C	C	C	<F	2.8	2.8	2.4	2.2	2.3	2.2	2.2	E	E
18	3.0	2.6	3.5	3.0	2.4	2.2	2.5	2.3	<F	3.0	<F	3.3	B	<F	3.3	C	3.0	2.8	2.5	2.0	2.5	2.5	2.5	1.8	E	E
19	3.2	3.0	1.5	C	E	2.2	E	2.3	<F	3.2	<F	3.2	R	3.4	3.4	3.2	2.6	E	2.8	2.4	2.2	2.0	2.0	E	E	E
20	3.4	2.8	2.8	3.0	2.6	2.2	E	2.2	F	B	4.0	4.1	B	<F	B	3.5	4.0	3.8	E	2.7	E	E	2.5	3.2	F	F
21	4.7	4.7	3.6	2.3	3.0	2.2	1.5	2.0	C	C	C	C	C	C	C	C	C	2.8	2.0	3.2	3.4	3.8	2.6	2.6	2.3	F
22	3.8	3.3	3.3	3.2	3.4	2.3	2.0	2.6	2.9	C	C	C	3.4	<F	3.0	3.0	2.8	1.8	1.6	1.4	1.8	1.6	1.6	1.6	1.6	1.6
23	2.2	2.5	3.1	2.9	2.5	2.3	2.8	3.0	3.1	3.0	3.2	<F	B	B	<F	3.6	3.6	3.2	2.9	2.7	2.0	2.0	1.9	2.1	2.1	2.1
24	2.1	2.0	2.5	E	2.5	2.6	2.7	2.7	<F	3.1	3.2	3.4	3.6	C	C	C	2.6	2.2	E	E	E	E	E	E	E	E
25	2.8	3.6	E	2.4	2.2	2.8	2.7	3.0	3.2	3.2	<F	<F	<F	<F	3.2	3.2	3.0	3.0	2.4	2.2	2.8	2.4	2.6	2.6	2.6	2.6
26	2.4	2.2	E	E	2.0	E	2.3	4.5	3.2	<F	B	B	B	3.4	2.8	4.0	3.0	4.6	4.0	3.1	3.6	2.8	2.4	3.2	3.2	3.2
27	2.2	1.9	E	E	2.0	E	E	B	C	C	C	<F	B	<F	3.2	3.2	3.3	2.9	C	C	C	3.2	3.6	3.6	3.6	3.6
28	2.4	3.3	4.2	E	E	1.4	2.5	1.6	C	2.8	4.0	<F	B	B	2.8	2.8	2.1	3.0	C	C	C	E	E	2.0	2.0	2.0
29	3.0	5.0	4.8	3.0	1.2	E	4.2	5.0	5.0	5.0	5.0	5.0	3.8	7.5	7.5	5.0	4.8	4.7	3.0	3.5	3.4	2.2	2.8	2.6	2.6	2.6
30	2.8	2.2	2.2	2.2	3.1	3.1	3.0	2.7	3.2	3.0	3.4	B	5.0	4.8	4.2	<F	3.0	1.8	2.8	2.0	3.0	3.0	2.6	2.6	2.6	2.6
31	3.0	3.0	3.2	2.6	2.0	2.3	E	<F	2.8	3.0	B	B	B	C	3.6	4.0	3.8	4.0	2.8	2.6	2.0	2.2	E	E	2.9	2.9
Median	2.8	2.8	2.6	2.4	2.4	2.2	2.0	2.3	2.6	3.0	3.2	3.3	3.6	3.4	3.2	3.2	2.8	2.8	2.7	2.4	2.2	2.3	2.2	2.2	2.2	2.3
Count	31	31	31	30	31	31	27	25	21	19	17	14	14	15	19	22	20	22	20	19	19	21	30	30	31	31

Sweep 1.0 Mc to 1.7 Mc in 1.5 min

Manual

F 8

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-tsushin Kenkyujo) Gotanda, Shinagawaku, Tokyo, Japan

# IONOSPHERIC DATA

Lat. 40°36.6'N  
 Long. 139°54.1'E

F<sub>2</sub>-M3000

Jan 1949

Fukaura

135°E Mean Time

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	2.6	2.6	2.4	2.5	2.3	3.4	3.3	3.0	J	3.2	3.3	3.3	3.3	3.1	(2.3)C	3.6	C	C	C	C	C	C	2.7	2.6
2	3.8	3.6	3.5	2.4	2.6	2.8	3.3	3.5	C	C	C	C	3.2	C	C	C	C	C	C	C	C	C	2.5	2.5
3	2.4	3.9	2.7	2.8	2.5	2.7	2.8	3.1	3.4	3.4	3.1	3.3	3.5	3.2	(3.1)C	3.0	C	C	C	C	C	C	2.6	2.3
4	2.7	2.8	2.8	2.7	2.9	2.7	3.2	3.1	3.1	C	C	C	3.3	3.2	3.0	3.1	C	C	C	C	C	C	2.8	2.0
5	2.6	A	2.6	2.7	2.8	2.7	3.0	2.9	C	C	C	C	C	3.3	C	C	C	C	C	C	C	C	C	2.6
6	2.4	P	2.6	2.8	2.6	2.9	2.5	3.3	3.4	C	C	C	3.3	C	C	3.3	C	C	C	C	C	C	C	2.7
7	2.8	2.7	2.5	2.9	3.3	3.2	3.2	3.2	C	C	C	C	C	C	C	C	C	C	C	C	C	C	2.6	2.8
8	2.7	2.7	2.7	3.2	2.7	2.5	3.0	3.4	C	C	C	C	3.3	C	C	C	C	C	C	C	C	C	2.7	2.8
9	2.7	2.6	2.8	3.0	2.7	3.0	2.8	3.1	C	C	C	C	3.2	3.2	3.1	C	3.1	2.9	C	C	C	C	2.7	2.7
10	3.1	2.6	2.9	2.9	2.8	2.8	2.7	(2.9)C	3.2	3.2	(3.1)C	3.1	3.1	P	C	C	C	C	3.1	3.1	(2.8)C	2.5	2.5	2.5
11	2.5	2.7	2.9	2.8	2.8	3.1	3.2	2.9	3.2	3.1	3.4	S	3.1	2.9	3.2	3.1	(2.6)S	3.0	3.2	C	C	C	2.5	2.5
12	2.5	2.8	2.7	2.8	2.9	2.9	3.0	C	C	C	C	C	C	C	C	3.2	3.2	3.2	3.1	J	3.0	2.7	2.8	2.6
13	2.5	F	2.8	3.0	2.6	2.7	C	C	C	C	6	J	J	P	C	3.1	3.3	S	3.3	3.1	2.9	2.8	2.5	2.5
14	2.8	2.8	2.6	2.7	2.7	3.6	3.1	3.1	3.5	3.1	3.3	3.2	C	C	B	3.4	J	3.1	3.1	3.0	3.0	2.8	2.8	2.7
15	2.6	2.6	2.8	2.6	3.0	3.1	(2.8)	3.1	3.5	C	C	C	3.2	3.3	(3.3)C	3.4	(3.2)C	3.0	3.3	3.3	3.0	3.0	2.8	2.5
16	2.6	2.6	3.1	3.0	2.7	2.8	3.0	2.8	3.2	3.4	3.3	3.2	3.1	3.0	3.0	C	C	3.0	3.3	3.2	3.3	3.1	2.6	2.5
17	2.6	2.5	J	2.6	2.8	2.7	2.8	3.0	3.2	3.3	B	C	C	C	C	3.6	3.2	2.9	3.1	J	3.1	2.7	2.9	2.6
18	2.8	2.7	SF	JF	2.5	2.8	3.0	3.0	3.1	3.4	3.3	3.3	3.3	2.8	H	3.0	(2.7)C	2.9	3.0	2.9	2.6	2.6	2.6	2.7
19	2.6	2.6	2.6	(2.5)C	2.5	2.8	3.1	3.1	3.4	3.3	3.1	3.1	3.0	3.0	3.1	3.0	3.1	3.1	3.1	3.4	3.1	2.6	2.6	2.6
20	2.6	2.6	2.6	2.7	2.6	2.5	2.9	3.2	3.0	3.3	3.6	3.3	3.2	2.9	2.9	3.1	3.1	2.8	3.0	3.1	3.2	2.7	2.7	2.4
21	2.5	2.5	2.7	2.7	2.8	2.8	3.0	C	C	C	C	C	C	C	C	C	C	C	3.0	3.0	3.0	2.9	2.7	2.6
22	2.7	2.9	3.0	2.4	2.3	2.3	3.0	3.1	3.4	C	C	C	2.8	3.4	2.9	3.1	2.9	2.9	3.1	2.9	3.1	2.7	2.7	2.5
23	2.7	2.9	2.9	2.9	2.7	2.7	2.7	2.7	3.2	3.3	B	B	3.2	3.1	3.0	3.1	3.0	3.1	3.4	3.5	2.8	2.7	3.0	2.6
24	2.7	2.5	2.6	2.6	2.6	2.7	2.7	2.7	3.2	3.3	3.3	3.3	3.3	C	C	3.2	3.1	3.0	3.0	3.1	3.1	2.8	2.8	2.6
25	2.6	2.6	2.7	3.0	3.4	2.4	2.4	2.7	3.3	3.3	3.2	3.0	2.8	K	2.9	3.0	3.1	H	(2.9)C	2.7	2.8	2.5	2.5	2.3
26	3.0	2.5	2.4	2.3	2.3	2.9	2.9	3.2	2.9	B	B	B	3.0	(4.0)C	2.9	B	3.2	2.9	3.0	2.9	3.1	2.9	3.0	3.0
27	2.9	2.3	2.5	2.6	2.6	2.6	3.0	C	C	C	C	C	3.3	3.0	3.0	3.4	3.5	3.3	C	C	C	2.8	2.7	
28	2.8	2.8	2.8	2.8	3.1	3.2	2.7	3.1	(3.2)C	3.4	B	3.3	3.2	3.1	3.2	3.2	3.2	C	C	C	3.3	2.7	2.7	2.8
29	2.7	A	2.6	2.5	2.7	2.9	3.1	3.3	3.3	3.3	3.2	3.4	3.2	3.2	3.1	3.2	3.2	3.2	3.1	3.2	3.2	2.6	2.6	2.8
30	2.6	2.5	2.7	2.7	2.8	2.6	2.9	3.1	3.4	3.1	3.3	3.1	3.2	3.1	3.2	3.1	3.1	3.0	3.0	3.0	3.0	2.6	2.6	2.8
31	2.6	2.7	2.7	2.9	2.9	2.7	2.8	3.1	3.4	3.6	3.1	3.1	3.1	(3.1)C	3.1	3.1	3.2	3.1	2.8	3.0	2.9	2.8	2.8	2.8
Mean Value	2.6	2.7	2.7	2.7	2.7	2.8	3.0	3.1	3.1	3.3	3.3	3.2	3.2	3.1	3.0	3.1	3.1	3.0	3.1	3.1	3.0	2.7	2.7	2.6
Count	31	29	29	30	31	31	30	26	21	16	14	14	23	20	20	23	20	20	20	17	19	20	30	31

Sweep 10.0 Mc to 17.2 Mc in 1.5 min

Manual



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

fF min

Fukaura

Lat. 40°36'N  
Long. 139°54.1E

Day	135°E Mean Time																														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25					
1	1.4	1.4	E	E	E	S	1.4	2.7	A	A	3.3	A	A	C	2.4	C	C	C	C	C	C	C	C	C	C	C	1.4				
2	E	E	E	1.2	A	1.4	C	C	C	C	C	3.4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.4				
3	1.1	1.1	E	E	E	E	1.4	2.4	2.5	A	A	3.7	A	2.6	C	C	C	C	C	C	C	C	C	C	C	1.4					
4	A	A	E	1.2	1.4	1.6	A	2.3	C	C	C	A	3.3	3.0	3.7	C	C	C	C	C	C	C	C	C	C	C	1.4				
5	1.4	A	E	E	E	E	A	A	C	C	C	A	C	C	C	C	C	C	C	C	C	C	C	C	C	1.2					
6	E	1.1	1.1	1.1	1.1	1.2	A	2.5	C	C	C	C	A	C	A	C	C	C	C	C	C	C	C	C	C	C	1.2				
7	E	E	1.2	1.3	1.5	1.7	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.4				
8	1.4	E	E	E	E	E	E	1.4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	1.6				
9	1.6	A	1.4	E	E	E	A	2.5	C	C	C	C	3.6	3.7	A	3.0	2.2	1.4	C	C	C	C	C	C	C	1.3	1.4				
10	1.1	A	1.2	A	A	A	C	A	A	A	C	3.8	3.8	C	C	C	C	C	1.4	1.4	(1.6)	1.8	A	A	A	1.4					
11	1.1	1.2	A	1.4	1.4	E	E	1.5	2.2	2.9	3.5	3.0	3.4	A	A	3.4	2.1	1.6	A	C	C	C	C	C	C	1.5	A				
12	1.4	1.5	E	1.4	1.8	1.7	1.4	1.5	C	C	C	C	C	C	C	3.0	2.1	2.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
13	1.5	1.8	1.4	1.3	1.7	1.5	C	C	C	C	3.1	3.4	3.4	3.1	3.1	3.2	2.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.4				
14	1.2	1.2	1.1	1.1	1.1	1.1	1.4	1.7	2.5	3.5	3.4	3.3	(3.4)	3.4	3.3	3.1	2.4	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6				
15	1.4	1.4	1.3	1.3	1.3	1.5	1.6	1.6	2.5	3.0	C	C	3.7	3.7	(3.4)	3.0	(2.6)	2.1	2.0	1.7	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
16	E	E	E	E	E	E	E	1.5	2.3	2.9	3.7	3.3	3.7	C	C	C	C	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.4				
17	1.4	1.5	E	E	E	E	E	1.2	2.1	2.9	3.4	C	C	C	C	3.9	2.4	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
18	1.4	1.2	1.5	1.5	A	1.1	1.4	A	2.4	2.8	3.8	3.5	3.4	3.4	3.6	(3.3)	2.9	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
19	1.2	1.1	E	C	E	E	E	1.9	2.4	3.1	3.2	3.6	3.7	3.6	3.5	3.9	2.6	1.3	1.7	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
20	1.4	1.3	E	1.3	1.2	E	E	1.8	2.6	A	3.7	3.1	3.5	3.7	3.4	3.9	2.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4				
21	A	A	A	1.5	1.5	1.2	1.2	1.5	C	C	C	C	C	C	C	C	C	1.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4				
22	1.5	1.4	1.7	A	1.5	1.2	1.3	1.8	2.5	C	C	C	3.6	3.7	3.7	2.9	2.5	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
23	1.2	1.2	1.4	1.4	1.4	1.4	1.4	1.6	2.4	2.9	3.2	3.1	3.6	3.4	3.5	3.0	2.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3				
24	E	E	E	E	E	E	E	1.7	2.5	2.8	3.8	4.0	4.0	C	3.0	2.4	1.9	1.9	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
25	1.5	1.6	E	E	E	E	E	1.7	2.4	2.4	3.3	3.4	3.4	3.5	3.5	2.8	2.3	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
26	1.1	1.2	1.4	1.4	1.4	1.5	1.5	2.2	3.0	3.1	3.1	3.1	3.5	3.7	3.8	3.6	2.4	A	2.0	A	A	A	A	A	A	A	A				
27	1.6	1.1	E	E	1.4	E	2.0	1.5	C	C	3.5	3.5	3.4	3.1	2.7	3.5	1.9	C	C	C	C	C	C	C	C	C	A				
28	1.6	1.2	1.2	E	E	1.8	E	1.7	(2.5)	3.2	3.6	3.4	3.5	3.5	2.8	2.8	2.2	1.8	C	C	C	C	C	C	C	C	1.6				
29	1.6	A	1.2	A	A	E	E	A	A	A	A	A	A	A	A	A	A	A	2.2	A	A	A	A	A	A	A	1.4				
30	1.4	1.4	1.1	1.2	1.5	1.6	1.4	1.5	2.2	2.9	A	3.0	A	A	A	3.8	2.8	1.5	1.5	1.5	A	A	A	A	A	A	1.4				
31	1.3	1.3	1.3	1.6	1.6	1.6	1.4	1.8	2.6	3.0	(2.2)	(2.6)	3.8	(3.6)	3.3	3.2	2.8	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.5				
Mean Value	1.4	1.2	1.1	1.2	1.2	1.1	1.2	1.6	2.4	2.9	3.4	3.4	3.6	3.6	3.4	3.0	2.4	1.8	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4				
Count	24	25	27	28	29	30	26	22	21	16	15	16	20	17	16	21	19	19	19	17	17	20	20	27	26	26					

Manual

Sweep 1.0 - 1.5 Mc to 1.7 Mc in 1.5 min

F 10

# IONOSPHERIC DATA

Jan 1949

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

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

Lat. 40°36.6'N  
Long. 139°34.1'E

135°E Mean Time

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	25
1	1.6	1.4	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
2	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
7	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
9	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
10	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
11	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
12	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
13	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
14	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
15	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
16	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
17	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
18	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
19	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
20	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
21	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
22	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
23	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
24	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
25	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
26	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
27	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
28	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
29	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
30	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
31	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Average Value	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
Count	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

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

Shibata

Lat. 37°57'0" N  
Long 139°15'8" E

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	3.1	3.0	3.0	3.1	3.5	3.1	C	C	C	C	C	C	C	C	C	C	C	6.5	6.4	S	3.7	2.0	2.5	2.6
2	2.7	2.6	2.6	2.6	2.8	2.6	3.4	5.2	8.2	8.7	9.4	11.0	11.6	10.0	10.0	10.3	9.2	8.2	7.3	8.1	6.0	3.9	3.7	3.4
3	4.0	3.9	3.3	3.1	3.0	3.2	3.5	6.8	9.1	10.1	12.4	13.1	10.1	9.4	9.6 <sup>H</sup>	9.8	8.5	6.3	5.6	4.9	3.0	2.8	3.1	3.2
4	3.5	3.3	3.2	3.2	3.2	3.1	3.2	5.0	7.4	10.0	9.9	10.9	12.7	11.2	11.3	11.9	9.7	7.2	5.6	6.2	4.0	2.7	2.4	2.8
5	2.6	3.0	3.0	C	C	C	C	C	C	C	C	C	C	10.4	10.4	10.3	9.7	C	C	C	3.2	2.6	2.8	3.0
6	3.0	3.2	3.3	3.3	3.1	3.0	3.1	5.3	7.9	8.0	9.7	C	C	10.4	9.6	9.9	9.1	7.5	6.7	4.5	3.5	2.9	3.6	3.3
7	3.8	3.5	3.6	4.1	3.9	3.1	3.0	5.3	7.2	9.2	13.5	13.3	11.4	10.9	10.6	10.3	9.3	8.2	9.0	7.1	3.8	3.0	3.3	3.6
8	3.4	3.4	3.9	3.2	3.2	3.1	3.2	5.5	C	C	C	C	C	C	C	C	C	7.7	7.3	6.0	4.5 <sup>H</sup>	2.9 <sup>Z</sup>	3.2	(3.3)
9	S	3.5 <sup>F</sup>	C	C	C	C	C	C	C	C	C	12.3	10.3	10.6	10.5	9.4	9.1	S	6.7	4.8	3.3	3.4	3.8	4.0
10	3.8	4.1	4.2 <sup>F</sup>	3.9	3.1	2.9	3.1	5.9	9.7	9.6	11.1	11.7	11.6	11.3	11.6	10.9	10.3	7.9	6.4	4.3	3.2	3.0	3.2	3.4
11	3.5	3.7	4.1	3.0	3.1	3.0	3.0	5.0	8.2	11.8	14.2	12.7	11.2	12.1	13.3 <sup>S</sup>	13.0	9.9	9.1	9.4	6.0 <sup>H</sup>	4.6	3.4	3.3	3.4 <sup>V</sup>
12	3.5	3.5	3.6	3.2	3.2	3.1	3.1	5.4	C	C	C	C	11.0	11.4 <sup>H</sup>	11.4 <sup>H</sup>	10.3	9.6	9.7	7.6	5.4	3.7	3.0	3.1	3.4
13	3.4	3.7	3.7	3.7	3.7	3.7	3.6 <sup>F</sup>	5.8	7.9	11.9	13.1	13.2	12.4	12.5	11.1 <sup>H</sup>	12.0	11.3	10.1	8.9	7.0	4.4	3.2	3.3	3.3
14	3.5	3.7	3.7	3.5	3.6	3.4	3.4	5.8	8.0	9.2	12.9	10.9 <sup>H</sup>	10.5	10.7	10.4	9.7	8.2	7.1	7.0	6.3	4.1	3.4	3.6	3.1
15	2.7	2.9	3.0	3.0	3.2	3.2	3.0	5.9	C	C	C	C	C	11.0	10.9	10.7	9.2	7.6	8.3	6.7 <sup>S</sup>	3.8	3.4	3.3	3.0
16	3.0	3.1	3.2	3.0	3.1	3.1	3.6	6.1	8.3	10.0	11.2	11.4	10.4	10.0	10.0	9.9	9.2	7.1	8.1 <sup>S</sup>	6.8	4.3	(3.4) <sup>F</sup>	(3.4) <sup>F</sup>	3.4 <sup>F</sup>
17	3.4	(3.7)	(4.0)	(3.8)	(3.4) <sup>F</sup>	(3.6) <sup>F</sup>	3.4 <sup>F</sup>	5.3	9.6	10.7	11.7	12.8	12.9	11.3	10.8 <sup>H</sup>	10.6 <sup>H</sup>	8.3	6.8	5.7	5.6	3.2 <sup>F</sup>	3.0	3.0	3.1
18	3.2 <sup>F</sup>	3.5 <sup>F</sup>	3.2 <sup>F</sup>	3.5 <sup>F</sup>	3.1 <sup>F</sup>	3.1 <sup>F</sup>	3.2	5.9 <sup>F</sup>	8.6 <sup>F</sup>	8.6	9.9	11.1	11.2	11.1	10.5	10.0	9.7	8.7	6.3	6.3	4.0	4.0	4.2	4.2
19	3.8	3.9	3.8	3.6 <sup>J</sup>	4.0	3.9	2.8	6.0	C	C	C	C	12.3	12.7	11.4	11.4	10.5	10.0	8.2	7.7	5.3	3.7	3.8	3.8
20	3.5	3.7	3.5	3.7	3.7	3.5	3.6	6.9	10.3	11.1	12.7	13.2	12.5	11.4	11.3	11.4	10.4	9.1	9.4	7.7	5.9	4.2 <sup>F</sup>	3.7	(3.8)
21	(3.7)	3.9	4.0 <sup>F</sup>	3.8	4.0 <sup>F</sup>	3.7 <sup>F</sup>	3.6	6.4	8.4	12.2	13.4 <sup>H</sup>	13.1	13.0	12.0	12.3	13.3	10.7	11.2	9.1 <sup>P</sup>	(8.1) <sup>S</sup>	5.8	4.0	3.6	3.8
22	3.8	3.9	3.9	2.6 <sup>F</sup>	2.7 <sup>F</sup>	2.7 <sup>F</sup>	2.9	6.3 <sup>H</sup>	C	C	C	C	C	C	C	C	C	7.8	7.5	5.9	5.7	3.5	3.5	3.7
23	3.8	3.9	4.2	2.8	3.1	3.0	3.1	6.8	8.7	9.9	12.8 <sup>F</sup>	12.9	11.7	10.2	9.9	9.5	8.7	7.5	7.4	5.5 <sup>S</sup>	3.6	3.2	3.4	3.3
24	3.4 <sup>F</sup>	3.3	3.2	3.3	3.2	3.5	3.2	6.0	9.9	12.1	12.7	12.0	10.8	10.4	11.4	10.7	10.2	8.7	7.5	6.4 <sup>S</sup>	4.8	4.4	4.8	4.2
25	3.9	3.8	4.2	3.8	3.0	2.0 <sup>K</sup>	5.1 <sup>K</sup>	10.8 <sup>K</sup>	9.6 <sup>K</sup>	11.7 <sup>K</sup>	13.7 <sup>K</sup>	13.1 <sup>K</sup>	12.8 <sup>K</sup>	13.0 <sup>K</sup>	13.0 <sup>K</sup>	9.4 <sup>K</sup>	8.9 <sup>K</sup>	8.5 <sup>K</sup>	6.8 <sup>S</sup>	5.6 <sup>K</sup>	5.7	S	C	4.3
26	4.3	3.8	3.2	3.2	3.1	S	3.0 <sup>F</sup>	7.0	C	C	C	C	C	12.8	12.2	13.3	A	11.4	10.8	9.7	7.5 <sup>F</sup>	6.3	6.1	5.3
27	4.6	3.5 <sup>F</sup>	2.7 <sup>K</sup>	2.2 <sup>K</sup>	3.0	3.1	3.3	7.3 <sup>F</sup>	10.8	13.9	13.7	15.3	12.3	11.4	13.1	11.9 <sup>S</sup>	10.5	8.6	7.3	6.6	4.3	S	2.4	2.8
28	3.0	3.1	3.1	3.4	3.6	2.8	3.2	5.8 <sup>S</sup>	8.8 <sup>F</sup>	11.0	12.0	12.6	10.8	10.3	10.7	9.6	9.1	8.7	6.9	5.3	4.5	3.3	3.2	3.5
29	3.7	3.6	3.3 <sup>F</sup>	3.5 <sup>F</sup>	3.2 <sup>F</sup>	3.8	6.0	C	C	C	C	C	C	C	C	C	C	7.3	7.2	7.2	5.3	3.0	3.2	3.0
30	3.0	3.5	4.0 <sup>F</sup>	3.8 <sup>F</sup>	3.2 <sup>F</sup>	3.7 <sup>F</sup>	4.2 <sup>F</sup>	6.6 <sup>F</sup>	9.0	9.5	11.6	12.9	12.3	11.8	11.7	10.6	9.7	8.3	5.7	5.0	3.9 <sup>F</sup>	3.9	3.8	3.6
31	3.8	4.0	3.8	3.7	3.4	3.3	3.5	7.5	9.4	11.8	11.1	12.1	11.5	10.5	(10.5) <sup>F</sup>	10.4	9.5	7.0	6.2	5.4	4.8 <sup>F</sup>	3.3 <sup>F</sup>	S	A
Mean Value	3.5	3.5	3.6	3.3	3.2	3.1	3.2	5.9	8.7	10.0	12.0	12.7	11.6	11.1	10.9	10.4	9.5	8.2	7.3	6.2	4.3	3.3	3.3	3.4
Count	3.0	3.1	3.0	2.9	2.9	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.6	2.7	2.7	2.5	2.9	3.0	2.9	3.1	2.9	2.9	3.0

Seepp. 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862,

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 1 Denki Tsushin Kenkyujo Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

h<sub>p</sub>F<sub>2</sub>

Shibata

Lat 37°27.0'N  
 Long 139°15.8'E

135°E Mean Time

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	410	420	400	320	230	C	C	C	C	C	C	C	C	C	C	C	280	300	S	200	210	360	330
2	360	330	360	340	330	310	250	250	220	220	230	250	270	250	280	270	250	240	280	230	240	210	380	320
3	330	280	270	290	380	340	290	270	210	180	240	240	230	230	300	220	230	240	240	260	230	290	350	310
4	330	300	310	320	310	340	270	260	320	220	230	270	260	280	300	230	230	260	230	230	210	270	250	310
5	310	380	340	C	C	C	C	C	C	C	C	C	C	C	240	240	C	C	C	C	260	260	360	300
6	340	330	320	300	270	320	260	270	230	220	250	C	C	250	270	260	230	270	270	240	320	310	230	340
7	290	380	370	320	230	S	250	240	220	390	240	230	280	240	300	240	250	310	230	250	310	340	400	330
8	280	340	320	280	350	400	290	230	C	C	C	C	C	C	C	C	C	260	260	280	240	300	350	360
9	S	390	C	C	C	C	C	C	C	C	C	C	C	C	C	230	290	230	220	270	260	290	330	370
10	380	390	310	300	300	360	270	290	200	250	270	280	340	340	290	250	260	240	220	250	290	370	350	370
11	390	360	290	290	340	330	270	280	290	290	260	310	250	330	290	240	230	240	290	270	240	290	370	270
12	390	350	310	300	290	320	290	260	C	C	C	C	C	290	270	260	270	270	230	220	300	340	330	340
13	380	360	340	310	420	290	390	240	330	290	290	280	320	230	310	280	280	290	260	230	260	240	390	310
14	360	320	340	320	290	260	250	210	270	270	260	240	280	270	280	250	250	230	290	240	240	350	270	310
15	390	390	330	340	310	300	300	280	C	C	C	C	C	280	250	270	250	310	270	260	290	320	310	310
16	370	360	320	300	340	320	(250)	260	230	260	240	300	270	290	290	260	260	290	290	240	370	(270)	(320)	330
17	390	(390)	(390)	(340)	(320)	(370)	330	310	240	240	290	270	290	300	300	300	270	260	310	240	260	300	320	360
18	420	360	330	310	270	340	230	240	250	270	250	300	300	300	340	310	280	270	280	280	350	320	330	370
19	330	350	380	420	410	280	240	280	C	C	C	C	C	310	310	310	260	300	310	240	240	330	370	340
20	350	350	360	360	380	390	280	240	270	250	270	280	280	320	320	240	270	310	310	260	270	300	390	370
21	370	400	350	340	320	330	260	270	240	280	270	290	300	320	320	290	280	290	280	(270)	210	330	350	390
22	360	360	290	260	400	410	300	270	C	C	C	C	C	C	C	C	C	300	290	310	260	320	390	360
23	390	360	270	280	290	360	360	260	270	230	290	280	290	290	320	280	250	280	270	230	260	340	330	360
24	360	410	420	380	380	350	350	290	280	250	210	250	280	310	290	300	250	310	230	260	260	350	290	340
25	240	410	330	290	250	350	370	360	250	290	310	350	300	340	320	310	320	300	(330)	320	210	S	C	310
26	300	440	310	430	470	S	250	320	C	C	C	C	C	310	340	290	A	300	270	300	250	330	280	300
27	260	430	380	400	400	440	370	240	260	260	270	280	270	270	270	260	260	250	260	230	230	S	270	360
28	350	260	340	360	270	420	350	240	230	280	280	230	260	270	290	250	250	260	220	290	240	290	350	440
29	320	340	350	420	390	320	310	240	C	C	C	C	C	C	C	C	C	250	280	240	230	310	330	290
30	380	300	350	310	350	330	340	280	250	270	240	290	280	280	290	280	240	250	250	270	270	370	300	350
31	380	370	320	280	330	330	360	220	230	270	300	260	270	(280)	280	250	290	290	280	290	270	240	S	A
Mean Value	360	360	340	320	340	290	270	240	250	270	280	280	280	270	290	270	250	280	280	260	260	320	350	340
Count	30	31	30	29	27	28	28	28	21	21	21	21	21	21	26	27	25	29	30	29	31	29	29	30

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shimagawaku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 37°37.8'N  
Long. 139°15.8'E

Shibata

h<sub>p</sub>F<sub>2</sub>

Jan 1949

Day	135°E Mean Time											Shibata												
	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	290	350	320	320	250	190	C	C	C	C	C	C	C	C	C	C	C	220	210	220	180	210	300	290
2	270	280	300	310	280	260	220	200	200	200	230	230	230	200	240	200	200	1200	220	200	1200	200	240	270
3	260	230	210	220	280	270	230	220	190	180	220	230	210	200	230	210	200	180	1200	200	190	230	310	280
4	280	270	280	280	220	220	220	180	200	200	210	200	210	200	250	220	200	220	1200	1200	1200	210	200	280
5	280	300	270	C	C	C	C	C	C	C	C	C	C	C	220	220	C	C	C	C	220	220	350	350
6	280	300	270	220	210	250	210	210	200	200	C	C	C	220	210	200	200	200	1200	200	250	270	290	280
7	240	300	320	250	200	S	200	210	200	210	220	200	210	200	210	210	210	220	230	1200	190	230	310	280
8	210	220	250	220	240	320	230	220	C	C	C	C	C	C	C	C	C	220	220	210	210	260	300	300
9	310	320	C	C	C	C	C	C	C	C	180	210	190	200	210	210	210	220	200	200	210	300	300	290
10	310	300	240	200	250	280	230	210	190	210	230	210	200	240	210	210	210	190	1200	200	220	1200	300	300
11	A	290	230	2200	260	250	230	200	230	210	200	200	200	200	200	220	200	200	220	180	200	250	300	A
12	320	280	240	230	220	260	220	210	C	C	C	C	C	C	200	200	210	210	1200	200	240	250	280	280
13	300	300	290	230	290	300	300	200	200	220	210	210	210	200	200	220	200	200	200	200	200	210	300	300
14	300	280	280	260	260	220	200	200	190	200	230	200	220	210	220	200	200	210	220	210	210	290	220	260
15	320	310	290	270	240	240	240	240	C	C	C	C	C	250	220	220	200	220	210	200	210	250	260	270
16	310	290	260	220	250	270	230	220	190	200	210	230	220	210	210	220	210	200	220	210	200	290	280	280
17	300	300	300	240	230	280	240	230	210	180	220	240	230	200	210	210	210	210	1210	210	190	240	240	230
18	340	290	280	280	210	280	210	200	200	200	260	230	260	210	210	220	230	220	200	220	260	240	260	260
19	250	240	260	310	290	220	200	210	C	C	C	C	C	210	220	210	210	230	220	200	200	280	280	280
20	250	300	290	270	260	320	210	190	230	200	200	210	210	209	200	210	210	200	220	200	210	210	A	310
21	320	310	290	300	270	260	220	210	200	210	280	210	220	230	210	210	210	230	200	210	200	270	300	300
22	290	240	220	210	320	A	260	200	C	C	C	C	C	C	C	C	C	210	210	210	210	250	310	290
23	290	290	210	200	190	300	280	220	200	200	230	220	210	220	220	220	210	1220	210	200	200	280	280	280
24	290	310	240	290	280	250	240	220	220	210	200	200	200	250	250	210	200	200	200	200	260	250	270	270
25	270	310	260	210	200	350	210	200	230	250	200	210	220	220	220	210	220	200	200	260	250	230	300	300
26	250	290	260	C	A	310	220	190	C	C	C	C	C	220	220	210	A	250	220	220	250	220	200	200
27	200	250	280	290	330	280	250	220	200	220	200	210	220	200	240	200	200	190	200	190	220	190	250	220
28	310	300	320	270	190	300	280	210	200	210	210	200	200	200	200	220	220	200	200	210	210	270	250	330
29	260	260	290	320	290	240	250	220	C	C	C	C	C	C	C	C	C	1200	260	210	200	270	270	250
30	280	280	270	240	210	290	250	220	210	210	220	210	210	210	210	200	200	200	200	220	200	280	280	290
31	300	310	270	210	190	280	270	240	200	210	300	210	190	1210	230	230	230	200	200	220	190	A	230	190
Mean Value	290	290	280	250	250	280	230	210	200	210	210	210	210	210	220	210	210	210	210	210	200	250	280	280
Count	30	31	30	28	27	28	28	21	21	21	21	21	21	21	26	27	27	25	30	30	31	30	30	30

Sweep 1.0 Mc to 17.0 Mc in 15 min

Manual

S 3



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Lat. 37°57.0'N  
Long. 139°15.8'E

Shibata

h<sub>p</sub>

Jan 1949

IONOSPHERIC DATA

135°E Mean Time

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	24	25
1								C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
2								Q	Q	A	Q	200	200	200	Q	Q	Q	A	Q	Q	Q	Q	Q	Q	Q	
3								Q	Q	Q	190	200	200	Q	200	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
4								Q	Q	Q	Q	Q	A	C	210	Q	Q	A	A	A	A	A	A	A	A	
5								C	C	C	C	C	C	C	C	Q	C	C	C	C	C	C	C	C	C	
6								Q	Q	Q	Q	Q	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
7								Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
8								200	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
9								C	C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
10								Q	Q	Q	A	Q	Q	Q	200	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
11								Q	Q	200	Q	Q	Q	Q	Q	Q	180	Q	Q	Q	Q	Q	Q	Q	Q	
12								Q	C	C	C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
13								Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
14								Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
15								Q	C	C	C	C	C	210	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
16								Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
17								Q	Q	Q	Q	220	220	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
18								Q	Q	Q	190	210	220	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
19								Q	C	C	C	C	C	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
20								Q	Q	Q	A	Q	A	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
21								Q	Q	Q	Q	Q	Q	200	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
22								Q	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
23								Q	Q	Q	210	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
24								Q	Q	Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
25								Q	Q	Q	210	220	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
26								Q	C	C	C	C	C	Q	Q	B	A	A	A	A	A	A	A	A	A	
27								Q	Q	Q	Q	Q	200	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
28								Q	180	Q	Q	Q	Q	Q	Q	210	Q	Q	Q	Q	Q	Q	Q	Q	Q	
29								Q	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
30								Q	Q	Q	Q	Q	Q	Q	Q	A	Q	A	A	A	A	A	A	A	A	
31								Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
Mean Value											210	200	200	200	200	200										
Count											4	5	5	3	5	5	1	1	1	1	1	1	1	1	1	1

Sweep 1.0 Mc to 1.0 Mc in 1.5 min

Manual

S 5

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Lot 372570/N  
Long 139-15.2 E

Shibata

fe

Jan 1949

IONOSPHERIC DATA

135° E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2								(1.6)	(2.5)	2.8	3.1	3.2	3.4	3.2	3.0	2.8	2.5	A	E					
3								1.8	(2.2)	(3.1)	3.2	3.3	3.3	3.1	3.1	2.6	(2.5)	(1.4)	B					
4								(1.6)	2.3	A	3.1	3.4	3.2	(3.1)	3.0	A	(2.5)	A	E					
5								C	C	C	C	C	C	C	(3.0)	B	C	C	C					
6								B	2.5	2.9	(3.2)	C	C	C	B	2.8	2.3	B	E					
7								(1.6)	2.1	2.9	(3.1)	A	3.3	3.3	3.0	2.9	2.1	B	E					
8								1.8	C	C	C	C	C	C	C	C	C	(1.6)	E					
9								(1.8)	2.6	(3.2)	3.3	3.5	3.3	3.1	2.8	2.5	(1.7)	E						
10								1.6	(2.6)	(3.3)	(3.3)	A	(3.5)	3.4	3.2	2.4	2.4	1.8	E					
11								1.7	C	C	C	C	C	C	3.5	3.2	2.7	A	1.7	A				
12								1.8	2.3	3.0	3.3	3.4	3.5	(3.4)	3.2	2.9	2.3	(1.6)	E					
13								1.7	2.4	3.0	3.4	3.6	3.5	3.5	3.5	3.0	B	B	E					
14								1.6	C	C	C	C	C	C	3.5	B	A	B	E					
15								1.7	(2.6)	A	(3.3)	B	B	3.5	B	B	2.4	1.8	E					
16								1.6	2.3	3.1	3.4	3.5	(3.5)	3.5	3.4	2.9	(2.2)	(2.0)	E					
17								1.8	A	3.1	3.3	(3.3)	3.5	3.6	3.3	3.2	2.4	A	A					
18								(1.9)	C	C	C	C	C	3.5	3.3	3.1	(2.4)	(2.0)	E					
19								(1.7)	(2.7)	(3.3)	A	A	A	A	3.3	2.9	2.7	A	E					
20								1.5	2.3	3.2	A	A	3.6	3.6	3.5	3.1	2.5	1.3	A					
21								1.9	C	C	C	C	C	C	C	C	C	1.7	E					
22								(1.8)	2.7	2.9	3.4	B	B	B	A	3.2	(2.6)	A	E					
23								(1.8)	2.8	2.9	(3.3)	A	3.6	(3.5)	(3.3)	3.0	2.6	2.0	E					
24								1.8	(2.5)	3.2	3.3	3.6	3.7	B	(2.5)	(3.1)	(2.7)	(2.2)	B					
25								B	C	C	C	C	C	A	B	B	A	A	E					
26								(1.9)	(1.8)	B	(3.3)	B	3.5	3.3	(2.5)	AT	(2.1)	B						
27								1.7	2.3	3.0	3.3	3.5	3.4	3.3	3.3	3.0	2.6	(1.6)	E					
28								(1.7)	C	C	C	C	C	C	C	C	C	A	A					
29								(1.6)	(2.5)	(2.7)	3.3	(3.3)	(3.3)	3.3	A	(3.1)	A	A	E					
30								(1.7)	(2.5)	(3.1)	3.3	3.3	3.5	3.4	(3.3)	3.1	2.7	A	E					
31								1.7	2.5	3.1	3.3	3.4	3.5	3.5	3.3	2.9	2.5	1.8	E					
26								2.6	2.0	1.8	1.8	1.3	1.7	2.0	2.0	2.2	2.0	1.6	2.2					

Sweep 110 Mc to 11.0 Mc in 1.5 min Manual



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

h<sub>E</sub>

Lat. 37°57.0' N  
 Long. 139°15.8' E

Shibata

IONOSPHERIC DATA

135° E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								C	C	C	C	C	C	C	C	C	C	C	B	B				
2								B	B	100	100	100	100	100	100	100	100	A	A	E				
3								B	A	(100)	100	100	100	100	100	100	130 <sup>H</sup>	B	B					
4								B	(120)	A	100	100	100	(100)	100	A	A	A	E					
5								C	C	C	C	C	C	C	C	B	C	C	C					
6								B	110	110	100	C	C	C	B	(100)	100	110	B	E				
7								B	100	100	100	100	100	100	100	100	100	100	B	E				
8								B	C	C	C	C	C	C	C	C	C	C	B	E				
9								C	C	C	C	C	C	C	C	C	A	A	B	E				
10								B	100 <sup>H</sup>	100	110	110	100	(100)	(100)	110	110	B	E					
11								B	A	A	100	A	A	100	100	100	100	B	E					
12								(150)	C	C	C	C	C	C	C	100	100	A	B	E				
13								B	A	100	100	100	100	A	100	100	100	B	E					
14								B	100	110	(110)	100	100	100	A	100	(120)	B	E					
15								B	C	C	C	C	C	C	(100)	B	A	B	E					
16								B	A	A	100	B	B	100	(100)	B	100	B	E					
17								B	110	100	100	100	100	100	100	110	B	A	E					
18								B	A	(120)	100	100	100	100	100	100	100	A	A					
19								B	C	C	C	C	C	C	100	100	100 <sup>F</sup>	B	E					
20								B	(100)	100	A	A	A	A	100	100	(120)	B	E					
21								(120)	A	100	A	A	A	100	110 <sup>A</sup>	100	100	A	A					
22								A	C	C	C	C	C	C	C	C	C	B	E					
23								A	110	100	100	B	B	B	A	100	A	A	E					
24								B	(100)	100	100	A	100	100	100	100	100	B	E					
25								B	110 <sup>H</sup>	100	(100)	100	100	B	100	(100)	(100)	A	B	E				
26								B	C	C	C	C	C	C	A	B	(100)	A	E					
27								B	B	(100)	100	110	110	100	100	A	100	B	B					
28								A	100	100	100	100	100	100	100	100	110	B	E					
29								B	C	C	C	C	C	C	C	C	C	A	A					
30								B	A	100	100	(100)	100	100	A	A	A	A	E					
31								B	A	A	100	100	100	100	(110)	120	A	A	E					
Mean Value								-	100	100	100	100	100	100	100	100	100	100						
Count								2	11	17	19	14	16	20	23	21	16							

\* Sweep 1.0 Mc to 17.0 Mc in 1.5 min Manual

S 7

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
 (Denki-Isushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

fes

Shibata

Lat 37°57.0'N  
 Long 139°15.8'E

135°E Mean Time

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	24	25
1	3.0	2.5	2.5	E	E	E	E	C	C	C	C	C	C	C	C	C	C	E	E	E	E	E	E	E	E	E
2	3.0	2.3	2.2	2.2	E	E	E	E	B	5.8	3.8	4.0	4.0	5.5E	5.5E	5.5E	5.5E	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
3	2.4	E	2.5F	E	E	2.6	E	2.9	3.1	5.6	6.3F	5.0	(5.3)	4.0	3.2	2.7	2.9	2.5	2.2	2.4	2.0	2.4	2.0	2.4	2.0	
4	2.4	2.5	3.9	2.5F	2.5	2.6	E	2.4	3.0	4.6	5.6	5.0	5.0	3.8	5.2	3.7	3.8	3.6	3.7	3.1	2.8	2.2	2.4	2.4	2.4	
5	E	E	E	C	C	C	C	C	C	C	C	C	C	4.4	B	C	C	C	C	C	E	E	E	E	E	
6	2.3	E	E	2.2	2.3	2.2	2.2	2.3	5.5E	3.8	C	C	C	B	B	5.5E	2.2	B	2.7	E	E	E	E	2.8	3.0	
7	E	2.4	E	E	2.6	E	2.4	B	2.3	5.5E	5.2	3.5	3.5	5.3	3.1	5.5E	2.2	2.3	2.3	3.8	2.3	2.3	E	E	3.0	
8	E	2.4	E	2.4	E	E	E	B	C	C	C	C	C	C	C	C	C	2.7	2.5	2.1	E	E	2.8	E	2.4	
9	2.0	3.0	C	C	C	C	C	C	C	C	C	B	5.5E	5.5E	5.5E	5.5E	2.3	2.4	B	E	E	2.0	2.4	E	2.1	
10	2.4	3.0	F	2.9F	E	E	2.6	2.4	5.5E	6.7	6.6	5.2	3.9	3.9	B	3.5	2.6	2.8	4.0	2.3	2.9	2.5	3.0	3.0	3.2	
11	4.4	E	2.6	2.4	2.7	2.3	2.1	2.4F	3.8	5.8	5.3	4.3	4.3	5.5	5.5E	5.5E	5.5E	5.5E	2.6	2.2	2.6	2.5	3.0	3.2	3.2	
12	2.8	2.3	2.4	2.5F	2.4	(2.8)	F	2.4	C	C	C	C	C	5.5E	5.5E	2.9	2.5	5.5E	3.1	3.0	2.5	2.3	2.0	E	E	
13	2.7	2.2	2.0	2.3	2.4	F	E	2.3	2.5F	3.6	3.5	(3.8)	5.5E	5.5E	5.5E	3.1	2.4	2.4	2.3	2.1	1.9	F	2.5	2.4		
14	2.3	2.2	1.4	1.2	2.2	1.2	2.3	2.3	5.5E	3.1	B	5.5E	5.5E	5.5E	5.5E	3.7	5.5E	B	3.2	2.2	2.5	2.6	B	E	E	
15	2.4	2.4	2.2	2.4	B	B	2.7	2.5	5.5E	C	C	C	C	4.8	C	5.5E	3.7	2.3	2.3	2.3	2.3	2.3	E	2.2	E	
16	2.4	2.3	E	E	2.2	2.3	2.3	2.5	2.7	3.8	3.6	B	B	B	B	B	5.5E	2.4	4.3	2.7	F	2.3	2.3	2.8	2.8	
17	E	E	2.6	2.8	2.5	2.3	E	B	3.0	(3.6)	3.9	5.5E	3.7	5.5E	5.2	5.5E	2.3	2.6	E	2.6F	2.5	2.0	2.2	E	E	
18	2.4F	3.0	2.3	2.8	2.6F	2.7F	2.6F	2.4	3.7	3.1	5.5E	5.9	5.5E	5.5E	5.5E	5.5E	5.5E	3.0	2.5	2.4	2.5	E	2.4	2.4	2.4	
19	2.4	E	2.5	1.8	1.2	E	E	2.3	C	C	C	C	C	3.9	5.5E	5.5E	3.4	2.1	2.4	E	2.3	3.0	(3.0)	2.4	2.4	
20	1.8	(3.4)	3.0	3.0	2.2	(2.3)	E	2.5	(2.4)	3.8	7.7	2.4	5.8	5.5	5.5E	5.5E	5.5E	3.5	3.3F	2.9	3.1	3.5	4.1F	3.1	3.1	
21	2.9	5.9	4.1	4.0	3.5	2.8	2.7	3.0	3.1	3.7	5.0	7.1	5.4	5.5E	3.9	5.5E	5.5E	3.0F	3.0	3.2	2.5	2.7	2.6	E	E	
22	E	2.3	2.4	2.4	2.8	3.1	3.1	2.9	C	C	C	C	C	C	C	C	C	5.5E	2.6	2.9	2.3	E	1.9	2.6	2.6	
23	1.9	2.3	2.6	2.5	2.2	2.8F	2.4	2.4	5.5E	3.8	3.8	B	B	B	3.4	5.5E	3.7	3.2	2.0	3.0	2.7	2.4	2.2	B	B	
24	2.2	1.9F	1.3	B	E	1.1	2.9	2.7	2.5	5.5E	2.9	5.5E	5.5E	5.5E	5.5E	5.5E	5.5E	2.4	2.4	E	2.9	2.5F	2.4	2.4	2.4	
25	2.8	2.9	2.6	2.1	E	2.2	B	2.3	3.8	4.2	5.6	5.5E	5.5E	B	2.8	2.5	B	3.1	5.0	4.8	3.1	3.8	2.8	2.5F	2.5F	
26	2.6	2.2	2.0	2.1	2.1	1.6	S	2.2	C	C	C	C	C	B	B	B	1.36	6.1F	4.6	4.4	3.4	2.8	2.7	2.3	2.3	
27	2.1	E	1.9	2.2	2.4	E	E	B	5.5E	P	B	5.5E	5.5E	5.5E	5.5E	5.5E	3.8	2.5	B	B	4.9	4.3	3.0F	2.9F	2.9F	
28	3.5F	2.4F	2.8	2.3	1.2	2.2	B	2.2	5.5E	5.5E	5.5E	5.5E	5.5E	5.3	3.1	2.8	3.9	3.9	2.1	B	2.7	B	2.6	2.6	2.6	
29	2.6	2.3F	2.9F	2.9F	2.4	2.4	2.4	2.4	C	C	C	C	C	C	C	C	C	4.0	5.7	3.9	3.6	2.4	2.7	2.8	2.8	
30	2.3	2.4	E	2.4F	1.2	2.4	2.5	2.5F	5.5E	3.4	3.4	B	3.8	8.2F	5.6	5.4	4.5	3.2	2.6	2.8	E	3.8	3.1	3.4F	3.4F	
31	2.3	4.3	2.8	2.2	2.3	2.5F	2.3F	2.3F	2.9F	3.7	5.5E	5.5E	5.5E	5.5E	C	3.3	3.3	3.8	4.7	3.2	2.9F	3.9	4.3	4.3	4.3	
Median Value	2.4	2.3	2.4	2.4	2.2	2.3	2.3	2.4	2.6	3.7	3.8	3.6	3.5	5.5E	3.1	2.9	2.5	3.0	2.7	2.6	2.5	2.4	2.4	2.4	2.4	2.4
Count	31	31	30	2.8	2.8	2.9	2.5	2.4	2.0	1.9	1.7	1.9	2.0	2.1	2.3	2.4	2.4	2.7	2.8	2.9	3.0	3.0	3.0	3.0	3.0	3.0

Sweep 1.0 Mc to 11.0 Mc in 1.5 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

F<sub>2</sub>-M3000

Shibata

Lat. 37°57.0'N  
Long. 139°15.8'E

IONOSPHERIC DATA

155°E Mean Time

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	24	25
1	3.0	2.5	2.0	2.0	3.0	3.5	C	C	C	C	C	C	C	C	C	C	C	3.3	3.1	S	3.8	4.0	2.8	3.0		
2	2.8	3.0	2.7	2.8	3.1	3.0	3.2	3.4	3.8	3.7	3.5	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.2	3.6	3.5	3.6	3.7	3.1	2.9	3.0
3	3.0	3.3	3.1	3.2	2.8	3.1	3.2	3.3	3.7	3.9	3.6	3.6	3.5	3.6	3.3	3.5	3.5	3.4	3.5	3.6	3.7	3.1	2.9	3.0		
4	2.9	3.1	3.1	3.0	3.1	2.9	3.4	3.4	3.6	3.7	3.6	3.3	3.2	(3.2) <sup>C</sup>	3.2	3.4	3.5	3.3	3.2	3.5	3.7	3.3	3.7	3.1		
5	3.1	2.6	2.9	C	C	C	C	C	C	C	C	C	C	C	3.4	3.5	C	C	C	C	3.4	3.3	2.8	3.1		
6	2.8	2.9	3.1	3.2	3.3	3.0	3.3	3.3	3.5	3.7	3.5	C	C	3.3	3.2	3.5	3.5	3.4	3.3	3.5	3.0	3.1	2.7	I		
7	3.1	2.8	2.7	3.1	3.0	(2.8) <sup>S</sup>	3.4	3.4	3.7	2.8	3.1	3.1	3.2	3.3	3.1	3.3	3.4	3.0	3.3	3.5	3.0	2.9	1.5	3.0		
8	3.2	2.9	3.0	3.0	2.8	2.6	3.1	3.7	C	C	C	C	C	C	C	C	C	3.4	3.4	3.3	I	3.0	2.8	(2.7) <sup>S</sup>		
9	5	2.8 <sup>F</sup>	C	C	C	C	C	C	C	C	C	3.7	3.2	3.7	3.2	3.3	3.3	S	3.5	3.3	3.4	2.6	2.8	2.8		
10	2.7	2.7	3.1 <sup>F</sup>	3.0	3.2	2.7	3.3	3.2	4.0	3.6	3.3	3.1	3.1	3.3	3.3	3.3	3.4	3.4	3.7	3.4	3.1	2.7	2.8	2.8		
11	2.6	2.8	3.3	3.1	2.9	3.0	3.4	3.2	3.2	3.2	3.5	3.1	3.3	3.0	3.2 <sup>S</sup>	3.5	3.6	3.4	3.3	3.3	3.5	3.2	2.8	I		
12	J	2.8	3.0	3.1	3.2	3.1	3.3	3.3	C	C	C	C	C	3.2	3.4 <sup>H</sup>	3.4	3.3	3.4	3.6	3.8	3.1	2.8	3.0	2.9		
13	2.8	(2.8) <sup>F</sup>	2.9	3.0	3.0	2.7	3.4	3.4	3.7	3.2	3.5	3.2	3.2	3.3	3.2	3.2	3.2	3.2	3.1	3.4	3.6	3.5	3.3	2.7	3.0	
14	2.8	2.9	2.7	3.0	3.0	3.1	3.4	3.4	3.7	3.2	3.5	3.2	3.2	3.3	3.2	3.4	3.3	3.2	3.3	3.2	3.5	3.3	2.7	3.0		
15	2.7	2.7	3.0	2.7	3.1	3.1	3.3	C	C	C	C	C	C	3.2	3.4	3.4	3.3	3.1	3.3	3.4	3.2	3.0	3.0	3.0		
16	2.8	2.9	3.0	3.1	2.9	2.9	3.1 <sup>S</sup>	3.5	3.6	3.4	3.5	3.2	3.1	3.3	3.3	3.1	3.2	3.2	3.3	3.6	3.3	(3.2) <sup>F</sup>	I <sup>F</sup>	3.2 <sup>F</sup>		
17	3.2 <sup>F</sup>	(2.7) <sup>F</sup>	J <sup>F</sup>	J <sup>F</sup>	(3.0) <sup>F</sup>	J <sup>F</sup>	2.9	3.0	3.5	3.5	3.3	3.2	3.2	3.2 <sup>H</sup>	3.2	3.2	3.3	3.4	3.1 <sup>S</sup>	3.7	3.4	3.0	3.0	2.8 <sup>F</sup>		
18	J <sup>F</sup>	2.8 <sup>F</sup>	2.9 <sup>F</sup>	3.1 <sup>F</sup>	3.2 <sup>F</sup>	2.9 <sup>F</sup>	3.8	3.4 <sup>F</sup>	3.4	3.3	3.3	3.4	3.2	3.2	3.2	3.1	3.2	3.3	3.2	3.2	2.8	3.1	2.8	2.7		
19	2.8	2.7	2.7	J	2.7	3.2	3.4	3.3	C	C	C	C	C	3.1	3.0	3.0	3.3	3.2	3.1	3.5	3.5	2.9	2.7	2.8		
20	2.9	2.8	2.8	2.8	2.7	2.6	3.2	3.4	3.5	3.2	3.3	3.2	3.2	3.2	3.2	(3.2)	3.2	3.1	3.0	3.3	3.4	3.0	3	(2.7) <sup>F</sup>		
21	(2.8)	2.6	2.8 <sup>F</sup>	2.8	3.0 <sup>F</sup>	2.9 <sup>F</sup>	3.4	3.2	3.5	3.3	3.4 <sup>H</sup>	3.3	3.1	3.0	3.0	2.2	3.1	3.2	3.3 <sup>P</sup>	3.5	3.4	2.8	2.8	2.6		
22	2.8	2.8	3.1	3.4	2.7	2.5	3.1	3.4 <sup>H</sup>	C	C	C	C	C	C	C	C	3.0	3.0	3.3	3.0	3.4	2.9	2.6	2.8		
23	2.6	2.9	3.3	3.2	3.2	2.8	2.9	3.3	3.2	3.6	3.2 <sup>F</sup>	3.3	3.3	3.2	3.0	3.3	3.4	3.3	3.2	3.6	3.3	3.0	2.9	2.8		
24	2.8	2.6	2.6	2.7	2.8	2.8	2.8	3.2	3.2	3.4	3.4	3.4	3.3	3.0	3.3	3.0	3.4	3.1	3.6	3.4	3.3	2.8	3.3	2.9		
25	2.9	2.6	2.9	3.2	3.3	2.7 <sup>K</sup>	2.7 <sup>N</sup>	2.8 <sup>N</sup>	3.5 <sup>K</sup>	3.1	3.0 <sup>N</sup>	2.8 <sup>K</sup>	2.8 <sup>K</sup>	2.8 <sup>K</sup>	2.8 <sup>K</sup>	2.9 <sup>K</sup>	3.1	3.0 <sup>K</sup>	3.0 <sup>K</sup>	3.0 <sup>K</sup>	3.2	3.0	3.0	3.0		
26	3.2	3.4	3.0	2.8	(2.6)	S	3.3	(3.1) <sup>C</sup>	C	C	C	C	C	3.0	2.8	3.1	A <sup>1</sup>	3.1	3.3	3.0	3.5	2.9	3.2	3.1 <sup>H</sup>		
27	3.2	J <sup>K</sup>	2.7	3.7 <sup>F</sup>	2.5	3.0	2.9	3.5	3.5	3.3	3.3	3.5	3.2	3.2	3.3	3.2 <sup>S</sup>	3.3	3.4	3.5	3.7	3.5	3.0	3.6	2.8		
28	2.9	2.8	2.8	2.8	3.2	2.5	2.9	3.5 <sup>S</sup>	3.5	3.3	3.1	3.5	3.5	3.4	3.3	3.5	3.3	3.5	3.8	3.2	3.4	3.3	2.9	2.6		
29	2.9	3.0	3.2	2.6 <sup>F</sup>	2.7	3.1 <sup>F</sup>	3.1	3.6	C	C	C	C	C	C	C	C	3.5	3.5	3.6	3.7	3.5	2.8	3.1			
30	2.8	2.6	2.9	3.0 <sup>F</sup>	2.8	2.7	2.9	3.2	3.4	3.2	3.3	3.2	3.2	3.2	3.2	2.3	3.5	3.4	3.3	3.2	3.1 <sup>F</sup>	2.7	3.1	2.8		
31	2.8	2.8	2.9	3.2	3.0	3.0	2.9	3.4	3.7	3.6	3.2	3.3	3.3	3.2	(3.3)	3.4	3.4	3.1	3.3	3.3	3.3	2.8 <sup>F</sup>	S	A		
Mean Value	2.8	2.8	2.9	3.0	3.0	2.9	3.1	3.3	3.5	3.4	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.4	3.4	3.0	2.8	2.9		
Count	2.9	3.0	2.9	2.7	2.8	2.8	2.8	2.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	

Sweep 150 Mc to 17.0 Mc in 1.5 min

Manual

S 9

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

1F min

Shibata

Lat. 37°57.0'N  
Long. 139°15.8'E

Day	135°E Mean Time																														
	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	1.6	1.6		E	E	C	C	C	C	C	C	C	C	C	C	C	C	1.5	1.8	1.6	1.6	1.6	1.5	1.5							
2	1.5	1.4	1.4	E	E	1.5	1.6	2.5	A	3.2	3.6	3.7	3.3	3.3	2.8	2.5	A	2.2	A	A	2.1	1.4	1.7	1.7							
3	1.2	1.2	1.1	1.1	1.1	1.5	1.8	2.2	A	3.2	3.6	3.4	3.3	3.1	2.8	2.6	1.4	1.6	1.6	A	1.5	1.6	1.5	1.5							
4	1.8	1.8	1.6	1.1	1.6	1.4	2.0	2.3	3.0	3.2	3.4	A	C	3.3	3.3	2.5	A	A	A	A	1.6	1.6	1.9	1.9							
5	1.3	1.7	1.2	C	C	C	C	C	C	C	C	C	C	C	A	2.4	C	C	C	C	1.6	1.5	1.4	1.5							
6	1.4	1.4	1.4	1.1	1.1	E	1.4	2.6	3.3	3.4	C	C	3.8	3.7	3.1	2.3	1.6	A	1.5	1.5	1.6	1.4	1.5								
7	1.4	1.3	1.2	1.4	E	E	1.3	1.6	2.0	3.4	3.5	3.4	3.5	3.2	2.9	2.2	1.6	1.6	A	1.5	1.4	1.6	1.4								
8	E	E	E	E	E	1.5	1.8	C	C	C	C	C	C	C	C	C	1.6	1.6	1.6	1.6	1.6	A	1.6	1.6							
9	1.4	1.2	C	C	C	C	C	C	C	C	3.6	3.7	3.4	3.4	3.3	2.5	1.7	1.4	1.5	1.4	1.5	1.4	1.6	1.6							
10	1.4	1.5	1.1	A	1.3	E	1.2	1.8	2.6	3.2	A	3.6	A	3.7	3.6	(3.1)	2.8	1.6	A	1.6	1.6	1.5	1.7	1.7							
11	A	1.2	E	A	E	1.2	1.1	1.6	2.6	(2.2)	A	A	3.5	3.5	3.2	2.9	2.4	1.8	1.6	1.6	A	1.5	1.4	A							
12	A	1.3	1.1	E	E	1.1	(1.2)	1.7	C	C	C	C	3.7	3.5	3.3	3.1	1.8	A	A	1.6	1.6	1.5	1.5	1.5							
13	1.3	1.4	1.5	1.2	1.2	E	E	1.8	2.3	3.0	3.3	3.4	3.5	3.4	3.3	3.2	3.3	1.6	1.5	1.6	1.6	1.6	1.6	1.6							
14	1.5	1.6	1.3	1.3	1.2	E	E	1.7	2.7	3.3	3.7	3.6	3.7	3.6	3.7	3.0	2.7	A	A	1.5	1.6	1.6	1.5	1.6							
15	1.4	1.3	1.7	1.1	E	1.2	1.4	1.7	C	C	C	C	C	3.7	3.6	3.7	A	A	A	1.5	1.6	1.4	1.5	1.5							
16	1.6	E	E	E	E	E	1.7	2.6	3.5	3.6	3.8	3.8	4.7	3.8	3.5	3.7	2.7	1.7	A	1.6	1.5	1.3	1.6	1.6							
17	1.1	1.1	1.1	E	E	E	1.5	1.6	3.0	3.1	3.4	3.7	3.7	3.6	3.4	3.2	2.2	2.0	1.8	1.6	1.6	1.5	(1.5)	1.5							
18	E	E	E	A	E	1.1	E	1.8	A	3.1	3.4	3.6	3.6	3.7	3.6	3.3	2.6	2.3	A	1.7	1.5	1.4	1.7	1.5							
19	1.3	E	1.2	E	E	E	1.4	1.9	C	C	C	C	3.7	3.6	3.6	3.2	2.0	1.4	1.5	A	A	1.7	1.4	1.4							
20	E	A	1.4	E	E	E	E	1.9	2.7	3.3	(3.7)	3.8	A	A	3.6	3.2	2.7	2.0	2.1	A	A	1.7	A	1.7							
21	A	A	A	A	A	1.5	1.5	2.5	3.2	A	A	3.7	3.7	3.8	3.1	2.5	1.8	A	A	1.5	1.8	1.5	1.5	1.5							
22	1.4	1.4	A	1.3	A	A	1.7	1.9	C	C	C	C	C	C	C	C	1.7	1.4	1.7	1.5	1.5	1.8	1.5	1.5							
23	1.4	1.2	A	E	A	1.3	1.5	1.8	2.7	3.1	3.6	6.6	4.6	3.7	3.3	2.6	A	A	A	1.7	1.6	1.6	1.4	1.4							
24	1.5	1.4	3	E	E	E	1.3	1.8	2.8	3.1	3.4	3.7	3.7	3.7	3.1	2.6	2.0	1.6	1.6	1.6	1.6	1.7	1.6	1.6							
25	1.4	E	E	E	E	1.4	(1.5)	1.7	2.8	(3.4)	3.4	3.7	3.8	3.8	3.5	3.1	2.7	2.2	A	A	A	A	1.4	1.3							
26	1.4	E	E	A	A	AF	E	2.7	C	C	C	C	3.8	3.8	3.2	A	A	A	A	A	A	A	1.4	1.3							
27	1.4	E	1.4	E	1.1	E	E	1.9	1.8	3.4	2.7	3.7	3.7	3.6	3.3	2.5	2.6	2.1	1.6	1.9	A	A	A	A							
28	A	1.5	1.4	E	E	2.4	1.5	1.7	2.7	3.3	3.5	3.7	3.4	3.7	A	3.1	2.7	1.6	1.7	1.5	1.9	A	1.3	1.5							
29	1.5	1.4	1.3	1.3	E	E	1.6	1.7	C	C	C	C	C	C	C	C	C	A	A	A	1.7	A	1.6	1.5							
30	1.3	E	E	E	E	E	1.5	1.5	2.6	3.3	3.4	3.8	3.8	3.7	A	3.1	A	A	1.5	1.6	E	1.6	A	A							
31	1.5	A	1.2	E	E	E	E	1.7	2.5	3.1	3.4	3.8	3.7	3.5	(3.3)	3.1	2.7	A	1.6	1.7	1.6	A	A	(1.7)							
Mean Value	1.4	1.3	1.2	E	E	E	1.4	1.7	2.6	3.2	3.4	3.7	3.7	3.4	3.1	2.6	1.8	1.6	1.6	1.6	1.6	1.6	1.5	1.5							
Count	27	28	27	24	25	27	28	29	20	19	18	19	18	24	24	27	23	22	19	19	23	22	26	28							

Sleep 10.0 Mc to 17.0 Mc in 15 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shingawaku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

f<sub>o</sub>Fmin

Shibata

Lat. 37°57.0'N  
Long. 139°15.0'E

Day	155°E											Mean Time				Shibata				20	21	22	23	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18					19
1	1.6	1.4	1.8	E	E	E	C	C	C	C	C	C	C	C	C	C	C	B	2.0	2.2	1.4	(2.3)F	E	1.8
2	1.5	1.5	1.5	2.0	E	E	2.3	1.7	1.6	1.9	1.7	1.7	1.8	2.3	1.7	1.7	1.6	1.5	1.5	2.2	1.7	2.2	E	2.0
3	1.7	E	2.3	E	E	2.3	E	1.6	1.6	1.6	2.0	2.0	2.1	1.8	1.8	1.8	1.6	1.8	1.6	1.9	1.7	1.6	1.7	1.5
4	1.5	1.2	1.1	E	E	2.3	E	1.6	1.6	1.8	1.8	1.8	(1.9)C	1.8	1.8	1.8	1.6	1.5	1.6	1.6	1.5	1.6	1.9	2.1
5	E	E	E	C	C	C	C	C	C	C	C	C	C	C	C	C	2.0	B	C	C	C	E	E	E
6	1.9	E	E	2.1	1.6	1.9	1.6	1.7	1.7	1.8	C	C	C	B	2.3	2.0	1.8	B	1.5	E	E	E	E	1.7
7	E	1.9	E	E	2.0	E	B	1.7	1.7	1.7	1.9	2.0	2.0	1.9	1.9	1.7	2.1	1.6	1.8	1.8	1.6	E	E	1.4
8	E	F	F	E	E	E	F	C	C	C	C	C	C	C	C	C	C	1.7	2.3	1.9	E	1.5	E	2.3
9	1.9	1.3	C	C	C	C	C	C	C	2.8	2.2	2.1	2.0	1.9	1.9	1.9	1.7	1.9	B	E	1.8	1.5	E	1.6
10	1.9	1.2	E	1.1	E	1.8	1.9	1.7	2.1	2.1	2.3	2.3	2.3	2.3	2.3	2.2	1.9	2.2	1.6	1.4	1.7	1.5	1.6	1.3
11	1.3	E	E	E	E	(1.1)	1.8	1.5	1.8	1.6	1.7	1.6	1.7	1.6	1.7	1.6	1.6	1.6	2.2	1.9	1.6	(1.7)	1.5	1.5
12	1.2	1.1	1.9	2.1	E	E	1.9	C	C	C	C	C	C	2.1	2.1	1.8	1.8	1.6	1.6	1.6	1.6	1.6	1.6	1.5
13	1.5	1.8	1.3	E	1.9	E	1.5	1.6	1.6	1.8	2.0	2.0	2.0	1.8	1.6	1.6	1.6	2.1	1.8	1.9	1.7	E	E	E
14	1.6	1.3	1.2	E	1.2	E	2.1	2.0	1.6	1.7	2.0	1.9	1.9	1.8	1.7	1.8	1.8	2.0	1.5	1.5	1.5	1.5	1.9	E
15	1.6	E	E	2.1	B	1.8	1.5	C	C	C	C	C	C	2.2	2.3	B	2.0	1.6	2.0	1.6	(1.5)	E	2.1	E
16	1.1	E	E	E	2.1	2.0	2.1	1.4	1.8	2.1	2.3	B	B	1.8	2.0	2.5	B	1.8	2.0	1.7	1.9	E	1.6	1.5
17	E	E	(1.5)	E	E	E	B	1.6	1.8	2.0	2.1	1.8	1.9	1.9	1.9	1.6	1.6	E	E	1.6	1.5	1.5	1.8	E
18	2.1F	E	E	E	E	E	1.9	1.6F	1.6	2.0	2.0	2.0	2.0	1.8	1.8	1.8	1.7	1.7	1.6	1.4	1.9	E	1.9	1.9
19	1.9	E	E	1.6	1.1	E	1.9	C	C	C	C	C	C	1.9	1.8	1.7	1.6	1.6	1.7	1.5	1.4	1.5	1.5	1.5
20	1.5	E	E	E	E	1.6	E	1.4	1.8	1.9	2.1	2.0	2.0	2.0	2.3	2.0	2.1	1.6	1.6	1.5	1.6	1.5	1.4	1.5
21	1.5	1.4	E	E	E	E	1.5	1.4	1.5	1.7	1.9	2.2	1.9	1.8	1.8	1.7	1.7	1.7	1.4	1.4	1.4	1.5	2.2	E
22	E	1.6	1.2	E	E	E	E	C	C	C	C	C	C	C	C	C	C	B	1.6	1.6	1.6	E	1.5	1.6
23	1.5	1.2	1.1	E	E	E	1.5	1.6	1.7	1.7	B	B	B	1.8	1.8	1.6	1.6	1.5	1.5	1.4	1.5	1.4	1.4	B
24	2.1	E	E	B	E	E	1.8	1.6	1.6	1.9	2.7	2.6	2.0	1.6	1.8	1.7	1.6	1.7	2.0	E	1.6	1.5	1.6	1.6
25	1.1	E	E	E	E	E	B	1.7	1.6	1.7	2.1	2.0	B	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.4	1.4	1.4	1.9
26	1.6	E	E	E	E	E	2.0	C	C	C	C	2.2	B	2.2	1.9	1.4	1.4	1.4	1.8	1.5	1.4	1.4	1.4	1.6
27	1.1	E	1.2	E	E	E	B	(2.3)	1.6	2.7	2.2	2.1	2.0	2.2	1.7	1.7	B	B	B	1.6	1.6	1.6	1.4	1.5
28	E	E	E	E	E	B	1.4	1.7	2.0	1.8	1.5	2.6	1.9	2.0	2.0	1.9	1.6	1.7	1.5	B	1.6	1.6	1.4	1.9
29	1.1	E	E	E	E	E	1.8	2.5	C	C	C	C	C	C	C	C	C	1.1	1.5	1.4	1.4	1.5	1.5	1.5
30	1.6	1.5	E	E	E	E	1.5	1.6	2.6	2.5	2.1	2.5	2.0	1.8	1.6	1.6	1.6	1.5	2.4	E	1.5	1.4	1.4	1.4
31	1.1	1.1	E	E	E	2.2F	2.2F	1.4	1.5	1.7	1.6	1.8	1.9	1.8	(1.8)C	1.8	1.8	1.6	1.5	1.5	1.5	1.5	1.4	1.5
Mean Value	1.5	E	E	E	E	E	1.7	1.6	1.7	1.8	2.0	2.0	1.9	2.0	1.8	1.7	1.7	1.5	1.6	1.6	1.5	1.5	1.5	1.5
Count	31	31	30	28	28	29	26	24	20	21	21	19	19	23	26	24	26	26	28	29	30	30	31	30

Sweep 1.0-Mc to 17.0-Mc in 1.5 min

Manual

S 11

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Demki-susshin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Jan 1949

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

Kokubunji, Tokyo

Lat. 35°42.4'N  
Long. 139°29.3'E

135°E Mean Time

Day	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	3.5	3.3	3.3	3.3	3.3	3.0	2.4	(50)P	9.6J	12.5	12.0	10.0P	10.8	11.1	10.7	10.8	9.8	6.9	6.7	7.6	5.4	B	B	B	2.0
2	2.7	2.7	2.8	2.6	2.8	2.7	3.2	6.1	9.0	9.6S	9.8	11.1	11.4	B	10.7	10.3	(2.7)S	7.2	7.2	7.0	5.6J	3.8	3.8	4.0	3.1
3	4.3	4.2P	3.5P	3.2	3.2	3.2	3.2	6.5B	10.4	10.7	11.3	12.9	10.7	9.8	9.2	10.4	8.7	7.2	6.2J	5.0	3.6J	2.9	2.9	3.1	2.9
4	3.3	3.3	3.3	3.3	3.1	3.2	3.2	6.3	8.3	9.7	10.6	11.2	12.7	12.5	10.6	12.2	9.6H	7.1	6.1	6.4	6.2B	2.9	2.7	2.9	2.9
5	3.0	3.0	3.0	3.1	3.2	2.7	3.1	5.9	8.6	11.4	11.7	12.8	12.2	10.8	12.1	10.7	9.3	7.7	6.0J	6.1	3.1	3.0	2.9	3.1	3.1
6	3.1	3.2	3.5	3.5	3.3	2.9	2.9	5.7	7.4	9.5	9.9	11.4	11.5	10.4	9.9J	9.9	8.3	7.4	6.0	5.8B	3.7	3.2	3.4J	4.0	4.0
7	3.8	3.6	3.8	4.3	3.8J	2.9	3.1	6.2	8.4	8.8	13.6*	13.5	14.4	10.7	10.6	10.7	9.2	8.0	9.1	7.4	3.4	3.2	3.4	3.6	3.6
8	3.5J	3.5	3.9	3.3	3.3	2.8	3.2	5.8	7.8	9.6	12.6	12.3	11.3	11.2	11.2	11.1	9.1	8.4P	7.4	5.5	4.3	3.4	3.0	3.2	3.2
9	3.1	3.3	3.4	3.5	3.3	3.5	3.5	6.3	9.0	10.2	12.6	12.0	11.0	10.4	10.3	9.6	9.5J	9.8	6.7	5.5J	4.0	3.5	4.5	4.4	4.4
10	3.1	3.3	3.4	3.6	3.1	3.0	3.2	7.5	8.1	11.3	12.2	(11.9)P	11.6	11.7	12.0	10.7	9.2	7.6	6.0	4.0	3.5	4.5	4.4	4.4	4.4
11	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
12	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
13	3.3	3.3	3.9	3.7	3.3	3.7	3.3	6.6	7.4	11.8	13.7	13.4	12.6	13.8	11.6	12.9	11.6	10.0	9.9	8.0	5.0	4.1	3.6	3.9	3.9
14	3.8	4.0	3.7	3.5	3.4	3.6	3.5	6.7	8.0	8.9	14.1	12.0	10.5	10.7	10.9	10.7	9.3	7.8	7.5	6.9	5.3J	4.1	4.3	3.4	3.4
15	2.7	3.0	3.0	3.2	3.0	3.0	3.1	6.6	8.7	9.8	13.0	12.3	12.1	11.2	12.0	11.6	9.6	7.9	7.5	7.9	5.6	4.1	3.8	3.4P	3.4P
16	3.2	3.2	3.2	(3.1)C	3.0	3.0	3.4	8.0	8.4	10.0	(10.5)P	11.0	11.2	(10.8)C	10.4	10.0	9.8	7.5	(8.3)S	6.9	4.4	3.9	3.6	3.6V	3.1
17	(3.2)C	3.8	3.9P	3.7P	3.3P	3.4P	3.6P	6.0	9.5	11.2	12.1	13.2	13.0	11.6	11.4	10.4	10.5	7.1	6.3	5.5	3.6	3.2	3.2P	3.1	3.1
18	3.0F	3.6	3.6	3.4	2.7	(3.3)C	3.9	5.7	8.4	9.3	10.0	11.4	11.5	11.8	11.0	10.7	10.6	7.3	7.0	6.0	4.5	4.5	4.5	4.0	4.0
19	4.0	3.7	3.9	3.8	3.8	4.0	3.4	5.9	8.7	11.2	13.5	12.8	11.6	12.9	13.1	11.9	11.2	9.5	7.9	8.6	5.9	3.8	3.7	3.8	3.8
20	3.7	3.7	3.4	3.8	3.4	3.2	3.5	B	9.6	12.4	13.2	12.4	12.5	11.8	11.4	11.4	10.6	9.2P	9.3	8.2	6.1	4.8	4.7	3.9S	3.9S
21	3.7P	3.7	3.5	3.8	3.8	3.5	3.6	7.5	8.5	11.9	13.6	12.8	12.8	13.1	13.4	13.8	12.0	12.2	10.9	10.2	7.5	4.6	4.0	4.1	4.1
22	4.6	4.4	4.3	2.8	2.6	2.6	3.0	6.2	9.1	11.7	11.6	11.2	10.7	10.8	11.9	11.5	9.5P	8.9J	9.0	7.0	6.4	3.9	3.5	3.2P	3.2P
23	3.9	4.2	4.2	2.8	2.0	2.9	3.0	6.4	9.1	10.5	12.5	13.6	11.9	11.0	10.7	10.2	9.5	7.9	6.7	4.3	3.3	3.7	3.5	3.5	3.5
24	3.3	3.5	3.3	3.3	3.4	3.5	3.6	6.8	9.0	12.8	13.1	12.0	10.1	10.8	11.4	11.0	10.1	8.7	8.7	6.6J	5.0P	4.6	4.8	4.7	4.7
25	3.4	3.9	4.1	3.8	3.0K	2.2K	2.2K	5.7	10.1	9.0	C	C	13.0	11.6	12.6	9.4	9.4	9.3	7.3	6.1	6.8	6.3	5.6	4.8	4.8
26	4.2	3.3	3.1	3.2F	(2.7)F	3.3J	3.1	6.5	8.4	(9.4)C	11.2	11.2	12.6	12.6	12.2	13.2	12.4	(11.8)C	11.1	9.8	7.8	(7.1)C	6.3	4.8	4.8
27	4.3	2.2	2.7	2.8	2.6	3.1	3.3	6.2	10.8	14.4K	14.8K	14.8K	13.1	11.4K	13.4K	12.8K	11.5K	9.2	8.1	C	C	C	C	2.8	2.8
28	4.9	(3.3)S	3.1	3.1	3.2	2.5	2.8	6.6	8.7	10.8	12.5	12.0	9.9	10.4	10.7	9.1	9.1	9.3	7.6	4.7	4.8	3.7	3.6	3.8	3.8
29	3.9	3.7	3.3	3.4	3.4	3.2	3.8	7.5	9.3	10.7	12.3	13.1	12.4	11.4	12.0	11.1	(9.6)C	8.0	7.5	8.3	B	3.8	3.4	2.7	2.7
30	2.8	3.0	3.3	3.3	2.9	3.1	3.4	7.2	8.6	9.6	12.3	12.5	12.4	11.8	12.5	10.7	10.5	C	C	C	4.7F	4.2F	4.2F	3.6	3.6
31	3.7	3.9	3.8	3.0	3.1	3.3	3.8	8.5	10.3	11.6	12.0	12.1	12.0	11.3	10.5	10.9	(9.4)C	7.5	6.2	5.7	4.9	3.9	3.6	3.7	3.7
Mean Value	3.5	3.5	3.5	3.3	3.2	3.1	3.3	6.5	8.7	10.7	12.3	12.3	11.6	11.4	11.4	10.9	9.6	8.3	7.5	6.8	4.9	3.9	3.7	3.6	3.6
Count	28	29	29	30	30	30	30	29	29	29	29	30	31	30	31	31	31	30	30	28	28	28	28	28	29

Sweep 1.0 Mc to 15.0 Mc in 1.5 min

Manual

K I

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denkitsu-shin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

hp F<sub>2</sub>

Kokubunji, Tokyo

Lat. 35°42.4'N  
Long. 139°29.3'E

135°E Mean Time

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	330	330	420	410	270	270	280	(250)P	230	220	250	310	270	320	270	300	260	260	300	280	240	R	B	270
2	340	330	420	360	330	300	280	250	240	230	240	280	280	B	270	(250)	240	270	270	230	250	230	360	340
3	320	280	260	310	410	300	320	(220)B	230	240	260	230	210	220	250	270	240	250	250	240	(230)J	350	350	370
4	340	300	320	360	290	280	280	220	230	260	270	290	270	260	260	280	240	250	250	260	(240)K	210	380	330
5	360	370	360	350	320	330	310	260	230	220	230	300	280	270	290	260	260	240	280	220	250	290	300	350
6	370	400	340	330	250	360	310	250	230	220	240	230	270	270	250	250	240	270	270	270	330	310	370	350
7	300	350	400	290	210	340	270	290	290	310	290	290	270	270	(290)B	270	240	280	260	220	210	340	320	300
8	270	330	310	250	340	390	280	260	230	250	260	260	270	270	(290)B	270	260	240	260	250	240	260	350	370
9	370	370	360	350	360	320	310	240	240	240	230	290	240	260	280	270	260	280	C	C	C	260	330	300
10	C	C	C	240	230	380	360	270	C	(400)S	280	240	260	240	250	310	310	290	300	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	240	300	370	310	260	270	260	270	(190)N	240	200	200	250	310	C
12	C	320	290	310	310	330	270	230	190	250	280	280	280	280	290	250	270	290	280	250	280	330	370	360
13	420	390	340	290	340	390	310	230	210	270	300	340	320	340	320	290	290	310	300	250	250	340	430	430
14	420	360	350	320	340	390	290	230	200	230	300	250	290	290	300	260	260	270	250	240	250	360	280	310
15	420	360	330	360	340	370	310	230	230	260	260	290	320	300	310	300	230	270	260	240	240	380	300	340
16	410	380	330	(360)C	360	370	290	240	220	250	(280)C	300	290	(300)C	300	320	290	280	(290)K	240	290	310	370	380
17	(370)C	360	360	320	300	390	300	270	250	270	270	270	290	280	270	260	270	270	250	270	230	340	(340)F	350
18	(480)F	390	340	280	280	(300)C	320	250	220	250	250	300	310	320	330	320	260	240	260	270	330	310	300	340
19	300	350	330	430	420	380	270	260	240	260	270	280	280	280	290	290	280	270	270	260	220	320	340	330
20	340	340	350	350	370	390	280	B	280	250	300	280	260	290	300	280	280	280	270	270	250	350	390	380
21	410	420	360	400	370	370	310	260	260	330	330	330	310	340	350	340	350	350	310	270	260	350	430	450
22	410	370	310	290	470	470	330	340	280	300	290	280	310	310	300	300	270	310	310	270	260	270	410	370
23	400	360	260	290	300	400	360	260	250	270	280	290	260	270	300	300	270	300	280	220	230	290	330	350
24	330	390	420	410	400	360	390	260	270	270	270	270	280	280	320	300	300	300	300	290	260	330	280	310
25	370	380	340	280	360	420	490	280	240	320	C	C	280	360	360	360	340	270	290	330	350	270	(230)C	300
26	320	430	310	470	(250)F	330	330	250	(330)C	280	350	310	330	340	270	280	(270)C	250	320	280	280	(290)C	300	250
27	270	210	350	410	420	370	350	290	250	270	240	DK	250	300	300	290	260	260	250	C	C	C	C	390
28	340	(380)K	410	(360)B	290	370	390	280	230	260	260	230	250	280	300	250	250	260	230	270	270	250	330	410
29	380	340	390	430	420	340	330	250	250	230	250	260	300	300	280	300	(290)C	270	350	270	B	340	310	310
30	400	400	380	300	390	410	360	270	260	310	370	380	350	360	310	300	280	C	C	C	(330)F	(340)F	340	340
31	410	370	360	240	400	380	350	260	240	280	270	280	300	290	290	290	(280)C	270	260	260	270	290	390	340
Median Value	370	370	350	340	340	370	310	260	240	270	280	300	300	300	300	290	260	270	270	260	250	310	340	350
Count	28	29	29	30	30	30	30	29	29	29	29	31	31	31	31	31	31	30	29	27	27	28	28	29

Sweep 1.0 Mc to 17.0 Mc in 1.5 min

Manual

K 2

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

### IONOSPHERIC DATA

Lat. 35°42.4'N  
Long 139°29.3'E

Kokubunji, Tokyo

hr.

Jan 1949

Day	155°E Mean Time																								
	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	310 <sup>A</sup>	330	330	340	330	250	250	210	220	200	190	200	240	270	250	230	230	200	230	220	210	(230) <sup>B</sup>	(230)	220	
2	300	300	320	330	270	250	330	190	190	(200) <sup>A</sup>	200	200	210	210	210	220	210	200	190	190	180	190	260	260	
3	230	220	220	260	290	300	220	220	230	220	190	200	170	200	200	210	210	210	210	210	(200) <sup>A</sup>	210	200	310	
4	300	250	260	280	250	270	240	210	200	210	200	230	220	240	220	250	200 <sup>H</sup>	200 <sup>H</sup>	200 <sup>H</sup>	(200) <sup>A</sup>	210	190	220	240	290
5	290	300	310	320	250	340	260	230	220	200	200	230	230	210	260	210	200	200	200	210	190	190	220	240	290
6	280	310	300	240	210	310	270	210	200	210	230	230	240	260	230	210	220	190	210	210	200	250	240	280	260
7	250	260	300	250	200	280	220	210	230	210	260	240	240	240	250	220	220	230	220	190	190	240	270	250	
8	220	260	270	220	250	330	230	210	210	(240) <sup>C</sup>	(230)	(220)	210	210	210	220	(210)	200	200	200	200	210	290	300	
9	320	300	290	270	270	260	230	210	230	210	210	200	220	210	210	220	220	200	200	200	(150) <sup>N</sup>	200	(250)	250	
10	C	C	C	170	230	290	290	260	C	C	360	240	(240) <sup>C</sup>	230	220	280	260	260	250	C	C	(150) <sup>N</sup>	200	250	
11	C	C	C	C	C	C	C	C	C	C	C	210	230	230	220	230	260	260	250	C	C	C	C	C	
12	C	250	240	240	230	250	230	180	180	230	220	230	250	230	280	270	220	210	220	210	250	250	300	290	
13	310	250	250	250	250	300	230	180	180	240	240	250	250	230	200	270	220	210	220	210	220	220	230	330	
14	330	300	280	260	290	280	250	200	200	200	260	240	270	220	260	240	230	(210) <sup>A</sup>	220	220	190	260	240	240	
15	(320)	310	270	(240)	230	270	260	230	210	220	240	220	220	210	240	240	210	200	220	190	180	270	240	260	
16	300	330	270	(270) <sup>C</sup>	270	300	270	210	210	220	(230) <sup>C</sup>	240	240	(250) <sup>C</sup>	250	250	230	230	230	210	200	220	280	290	
17	(350) <sup>C</sup>	280	300	280	250	310	260	230	250	230	230	230	240	220	270	230	210	210	210	210	AF	260	280	290	
18	370	300	(300) <sup>A</sup>	280	250	(320) <sup>C</sup>	230	250	200	220	220	220	220	220	240	250	270	230	230	200	240	230	250	260	
19	250	280	260	320	310	290	200	220	200	220	240	220	260	260	230	200	200	230	200	(200) <sup>A</sup>	200	200	230	230	
20	240	240	270	(220)	220	330	230	220	200	220	260	220	220	200	220	210	200 <sup>H</sup>	200	220	210	200	210	(350)	330	
21	350	340	320	310	280	280	230	240	210	260	260	260	240	200	260	230	240	240	230	220	220	240	350	340	
22	310	280	250	250	250	490	280	230	240	260	260	260	240	200	260	230	240	200	200	210	200	230	250	270	
23	310	290	210	220	(270)	340	290	250	210	250	240	270	210	210	210	210	230	230	220	210	210	230	230	250	
24	290	290	320	310	320	270	230	230	210	250	270	220	230	260	210	280	320	300	240	220	250	250	250	290	
25	280	310	270	220	230 <sup>K</sup>	370 <sup>K</sup>	460 <sup>K</sup>	200	230	210	C	250	300	300	280	280	320	300	240	220	220	250	250	290	
26	240	250	250	240	220	250	290	230	240	(270) <sup>C</sup>	220	270	230	230 <sup>H</sup>	200	220	220	230	190	200	210	210	240	280	
27	200	(180)	290	330	(300)	300	250	210	200	200 <sup>K</sup>	200 <sup>K</sup>	200 <sup>K</sup>	200 <sup>K</sup>	250 <sup>K</sup>	200 <sup>K</sup>	200 <sup>K</sup>	200 <sup>K</sup>	190	180	C	C	C	C	(330)	
28	250	260	310	300	210 <sup>N</sup>	300	310	230	200	260	220	230	240	200	220	210	210	210	210	200	200	240	260	330	
29	300	300	300	350	340	280	280	230	220	200	220	220	210 <sup>H</sup>	230	250	(240) <sup>C</sup>	230	250 <sup>A</sup>	250 <sup>A</sup>	A	250	250	250	250	
30	340	340	310	230	240	320	300	230	230	270	310	270	260	280	260	250	250	250	C	C	240	260	270	260	
31	350	300	310	(290) <sup>A</sup>	(310) <sup>A</sup>	310	280	230	220	250	240	220	220	220	230	(220) <sup>C</sup>	210	(210) <sup>A</sup>	200	210	210	210	(310)	280	
Mean Value	290	290	290	270	250	300	250	220	210	210	230	230	230	230	230	230	220	210	210	210	210	230	260	280	
Count	28	29	29	30	30	30	30	30	29	29	29	30	31	30	31	31	31	30	29	27	27	29	29	29	

Swap 1.0 Mc to 6.0 Mc in 1.5 min

Manual



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

f<sub>h</sub>

Lat. 35°42.4'N  
Long. 139°29.3'E

Kokubunji, Tokyo

IONOSPHERIC DATA

135°E Mean Time

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								Q	L	L	Q	Q	Q	L	L	Q	Q	Q	Q					
2								Q	L	A	Q	Q	Q	Q	A	Q	Q	Q	Q					
3								Q	Q	Q	Q	L	L	L	L	Q	Q	Q	Q					
4								Q	Q	Q	Q	L	L	L	L	Q	L	Q	Q					
5								Q	Q	Q	L	L	L	L	L	Q	Q	Q	Q					
6								Q	Q	L	L	L	L	L	L	Q	L	Q	Q					
7								Q	Q	Q	L	L	L	L	L	Q	Q	L	Q					
8								Q	Q	Q	L	L	L	L	L	Q	L	Q	Q					
9								Q	Q	Q	Q	Q	Q	Q	Q	Q	L	Q	Q					
10								L	C	C	Q	A	Q	L	L	L	Q	Q	Q					
11								C	C	C	A	A	Q	L	L	L	Q	L	Q					
12								Q	Q	L	(53)	L	L	L	L	L	Q	Q	Q					
13								Q	Q	L	Q	L	L	L	L	L	Q	Q	Q					
14								Q	Q	Q	L	L	L	L	L	L	Q	Q	Q					
15								Q	Q	L	L	L	L	L	L	Q	Q	Q	Q					
16								Q	Q	Q	C	BS	BS	BS	C	BS	BS	Q	Q					
17								Q	Q	L	L	L	L	L	L	L	Q	Q	Q					
18								Q	Q	Q	Q	Q	L	L	L	L	L	L	Q					
19								Q	Q	Q	Q	L	L	L	L	L	L	Q	Q					
20								Q	L	L	L	L	L	L	L	L	Q	Q	Q					
21								L	Q	L	L	Q	A	L	L	L	Q	Q	Q					
22								Q	Q	L	L	L	Q	L	L	L	L	Q	Q					
23								Q	Q	L	L	L	Q	Q	Q	Q	Q	Q	Q					
24								Q	Q	L	L	L	L	L	L	L	Q	Q	Q					
25								Q	Q	Q	C	C	L	L	L	L	L	L	Q					
26								L	L	C	Q	Q	Q	Q	A	Q	Q	L	Q					
27								Q	Q	Q	Q	Q	Q	Q	L	L	Q	Q	Q					
28								Q	Q	Q	Q	L	L	L	L	L	Q	Q	Q					
29								Q	Q	L	L	L	L	L	L	L	L	Q	Q					
30								Q	Q	L	L	L	L	L	L	L	L	L	Q					
31								Q	Q	L	L	L	L	L	L	L	L	L	Q					

Sweep 1.0 Mc to 15.0 Mc in 1.5 min

Manual

K 4

Maximum  
Virtual  
Height  
Count



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat. 35°42.4'N  
Long. 139°29.3'E

Kokubunji, Tokyo

fE

Jan 1949

Day	135°E Mean Time											16	17	18	19	20	21	22	23
	00	01	02	03	04	05	06	07	08	09	10								
1								2.6	3.0	A	3.2	A	B	A	A	A	A		
2							(1.6)	2.3	A	(3.3)	A	B	A	B	A	A	A		
3							B	2.7	(2.8)	3.4	B	B	3.4	3.2	3.0	2.5	(1.7)	E	
4							A	2.3	3.0	3.4	(3.6)	3.1	(3.6)	3.2	2.8	2.3	A	E*	
5							B	2.9	3.5	3.6	B	(3.5) <sup>B</sup>	(3.3)	2.9	2.3	A	E*		
6							B	2.7	3.1	B	B	3.6	B	B	B	B	B	E	
7							1.7	2.6 <sup>H</sup>	2.9	B	B	3.6	B	2.9	2.3	1.8	E		
8							(1.5)	2.5 <sup>H</sup>	3.1 <sup>H</sup>	(3.5)	B	C	C	C	2.4 <sup>H</sup>	(1.8)	E		
9							B	2.6	2.9	B	B	B	A	2.8	2.3	B	E		
10							2.0	C	C	B	A	C	B	A	A	A	E		
11							C	C	C	A	A	A	A	B	2.5	E	E		
12							B	2.5	A	B	3.5	(3.5)	B	A	A	A	E		
13							1.9	2.7	2.9	B	B	B	B	B	3.1	2.6	B	B	
14							A	A	(2.3) <sup>I</sup>	B	B	B	B	B	B	(3.2)	A	E	
15							(1.8)	2.6 <sup>A</sup>	(3.0) <sup>A</sup>	B	B	3.0	3.5	3.4	B	B	A	E	
16							2.6	(2.8) <sup>B</sup>	A	C	B.5	C	B.5	B.5	2.7	1.9	E	E	
17							C	A	(2.8)	3.1	(3.6) <sup>A</sup>	A	3.8	3.6	A	3.0	2.6	A	E
18							(2.3)	B	3.3	B	B	B	3.8	B	(3.3) <sup>B</sup>	3.0	B	E	
19							(1.4)	(2.7) <sup>A</sup>	A	A	A	A	B	B	(3.4)	B	2.5	2.1	B
20							(1.9) <sup>B</sup>	(2.6) <sup>B</sup>	A	A	A	A	A	A	A	A	A	A	A
21							2.0	2.6	3.1	A	A	A	A	A	A	A	A	A	A
22							A	2.6	B	B	B	B	B	B	B	B	B	B	B
23							6	A	A	B	B	B	B	B	B	B	B	B	B
24							1.9	(2.4) <sup>A</sup>	3.0	B	B	B	3.7	3.6	3.4	A	2.6	2.0	E
25							1.9	(2.8) <sup>A</sup>	A	C	C	B	B	B	B	A	A	A	A
26							(2.0)	2.6	C	A	A	A	3.6	3.5	A	A	A	(2.2)	E
27							(1.6)	A	2.8	A	A	A	B	B	A	(2.8)	(1.8)	E	
28							8	(2.8)	3.0	3.7	(3.5) <sup>B</sup>	B	3.6	B	2.6	2.6	A	A	A
29							2.0	2.8	3.3	3.5	B	A	A	A	3.1	(2.6) <sup>C</sup>	2.0 <sup>I</sup>	A	
30							1.9	(2.6)	A	A	(3.9)	(4.0)	(3.9)	(3.9)	AF	2.8	C	C	
31							1.7	2.5	3.1	3.5	B	B	3.5	B	B	C	2.2 <sup>B</sup>	A	
Mean Value							1.9	2.6	3.0	3.5	3.6	3.7	3.6	3.4	3.0	2.6	1.9	E	
Count							18	24	1.9	9	6	1.0	1.1	8	1.0	2.1	1.2	2.1	

K 6

Sweep 1.0 Mc to 1.0 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications,  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

h<sub>E</sub>

Jan 1949

Kokubunji, Tokyo Lat. 35°42.4'N  
Long. 139°29.3'E

# IONOSPHERIC DATA

Day	135° E Mean Time											Kokubunji, Tokyo												
	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	100	A	A	90	A	A	100	A	A	A	A	E					
2							B	100	A	100	A	B	A	B	B	B	90	A	E					
3							B	110	120	100	90	(80) <sup>N</sup>	90	90	100	90	90	A	E					
4							A	100	100	100	100	100	100	100	100	100	100	A	E					
5							B	(120) <sup>B</sup>	100	100	100	90	100	100	A	110	100	A	E					
6							B	A	110	100	100	100	B	B	B	B	B	B	E					
7							(170)	110	100	100	100	100	100	100	100	100	100	100	E					
8							B	120	110	90	90	C	C	C	C	C	C	C	E					
9							B	130	110	B	B	B	B	B	A	100	B	B	E					
10							C	C	C	B	A	C	B	A	A	100	100	A	E					
11							C	C	C	A	A	A	A	A	A	100	100	E						
12							B	100	100	100	100	100	90	100	A	A	A	E						
13							150	100	90	100	100	100	100	90	100	100	100	B						
14							A	A	100	100	(100)	100	100	100	100	100	100	A	E					
15							110	110	A	B	100	100	100	100	110	B	B	E						
16							110	110	A	C	B5	B5	C	B5	B5	110	B	E						
17							E	A	100	100	(100) <sup>A</sup>	100	100	A	100	100	A	E						
18							110	100	100	B	B	B	B	B	B	B	100	B	E					
19							E	A	A	A	A	100	100	(100)	100	100	100	B	E					
20							B	B	A	A	90	A	A	A	A	A	A	A	E					
21							B	100	100	100	A	A	100	A	A	(130) <sup>A</sup>	A	A	E					
22							A	A	(110)	(110)	(120)	(100)	B	B	(100)	100	B	B	E					
23							B	A	A	100	B	B	B	A	A	90	A	A	E					
24							B	(100) <sup>A</sup>	90	100	(100)	100	100	100	100	100	100	B	E					
25							B	A	A	C	C	110	100	110	A	A	A	A	E					
26							A	110	C	A	A	(120)	100	A	A	A	A	A	E					
27							B	A	100	A	B	A	B	(100)	A	(90)	100	E						
28							130	100	100	(100)	B	B	100	A	(100)	100	A	E						
29							130	110	100	100	(100)	A	A	A	100	(110) <sup>C</sup>	A	A						
30							B	A	0.13 <sup>A</sup>	(1.00) <sup>A</sup>	110	120	(120) <sup>A</sup>	A	4F	110	C	C						
31																								
Number Value Count	130	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	110	6	21	18	21	110

Sweep 10 Mc to 15.0 Mc in 15 min

Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Lat. 35°42.4'N  
Long. 139°29.3'E

Kokubunji, Tokyo

fts

Jan 1949

IONOSPHERIC DATA

Day	155°E Mean Time											19	20	21	22	23							
	00	01	02	03	04	05	06	07	08	09	10						11	12	13	14	15	16	17
1	3.2	2.4	2.6	E	E	(2.4)	E	1.9	<F	3.4	4.2	3.8	B	3.2	3.0	2.8	1.28	1.24	3.2	2.8	2.8	B	
2	2.2	2.0	2.0	2.8	2.4	3.2	2.6	5.4	3.6	(3.6) <sup>B</sup>	B	3.6	B	B	3.2	2.6	E	E	1.8	4.0	2.6	E	
3	1.8	1.8	1.8	E	E	(2.1)	E	B	<F	3.8	5.2	B	<F	<F	<F	2.4	2.2	3.1	3.1	1.7	1.9	1.8	
4	2.4	2.1	1.8	3.0	1.6	E	E	3.3	<F	3.3	4.2	4.2	3.4	3.1	3.4	2.4	1.9	2.4	2.0	2.0	3.2	2.4	
5	1.8	2.4	1.8	1.6	1.6	2.0	2.5	2.8	B	3.4	<F	3.5	B	<F	2.4	3.6	1.9	E	E	E	1.8	E	
6	E	2.4	E	E	E	B	B	2.8	3.3	B	B	<F	B	B	B	B	B	E	2.0	B	2.2	E	
7	2.0	E	1.5	E	E	<F	2.0	<F	<F	3.1	B	<F	<F	B	<F	3.3	B	B	E	E	E	E	
8	2.2	E	B	3.1	3.1	2.4	E	2.4	E	2.4	9.0	<F	C	C	C	<F	<F	<F	E	2.2	2.3	2.5	
9	E	E	2.4	3.2	2.1	E	E	2.0	<F	E	B	B	B	3.2	4.0	<F	B	B	E	E	E	E	
10	3.0	E	2.4	3.0	E	2.4	(2.2)	3.2	C	C	5.9	C	5.5	B	4.0	3.0	4.2	C	C	C	C	C	
11	C	C	C	C	C	C	C	C	C	C	6.0	4.6	4.9	3.8	B	<F	E	E	E	B	B	C	
12	C	1.8	E	2.4	E	E	E	B	(1.8)	3.4	B	<F	B	B	4.9	4.1	3.4	3.1	3.2	2.1	2.1	2.2	
13	E	1.5	E	E	E	E	E	<F	<F	3.4	B	B	B	3.4	<F	B	B	B	2.4	1.8	1.8	E	
14	2.0	2.6	2.2	3.0	2.2	2.3	2.8	B	<F	3.0	B	B	B	B	4.2	3.5	3.0	1.8	1.7	E	B	E	
15	1.8	E	E	E	B	2.2	2.8	B	<F	3.2	B	B	B	B	B	2.8	E	E	E	E	E	E	
16	E	2.2	E	C	E	E	1.8	<F	B	3.8	C	8.5	C	8.5	8.5	2.2	2.2	2.4	2.8	E	2.4	E	
17	C	2.6	E	E	E	E	(2.4)	<F	3.7	4.4	3.9	<F	4.3	3.8	3.5	2.8	3.1	3.0	3.1	3.0	2.5	2.7	
18	E	1.3	2.2	2.5	1.7	C	2.0	<F	B	(4.2)	B	4.2	<F	B	3.4	<F	2.4	E	E	E	E	E	
19	E	E	E	2.4	2.1	E	E	E	3.0	4.2	3.8	4.0	B	B	B	<F	<F	<F	3.2	2.2	2.2	E	
20	2.6	2.8	2.6	3.1	2.2	E	E	2.0	2.6	3.3	4.2	8.8	8.6	4.4	5.3	3.4	3.2	4.3	3.6	3.4	3.4	3.6	
21	3.4	3.4	3.4	3.2	2.4	B	B	<F	<F	<F	4.2	8.8	5.4	4.5	3.6	3.4	3.4	3.6	3.8	2.2	2.0	2.6	
22	2.3	2.3	2.6	2.2	2.6	3.0	2.6	3.8	2.8	B	B	B	B	B	B	B	<F	B	2.8	2.6	E	1.8	
23	1.8	E	1.6	2.5	1.8	2.8	2.4	2.6	3.6	4.0	B	B	B	B	4.2	3.4	3.4	3.0	2.2	2.3	2.7	2.4	
24	2.0	B	2.1	2.2	E	E	E	<F	3.1	3.3	B	B	<F	<F	(3.2)	<F	<F	3.2	2.8	3.2	E	2.2	
25	E	E	E	E	E	E	B	<F	<F	4.4	C	B	B	B	3.2	3.8	4.1	2.8	2.4	3.4	3.6	3.0	
26	2.4	1.4	1.3	2.1	3.0	1.6	<F	2.0	<F	C	6.0	F	7.5	4.2	5.2	6.2	3.6	<F	E	2.0	C	E	
27	1.9	E	E	E	E	E	2.4	2.8	3.5	3.2	4.4	3.8	B	B	3.6	B	<F	3.0	C	C	C	E	
28	E	E	2	2.9	2.2	2.0	2.0	B	<F	<F	(3.1) <sup>B</sup>	3.7	B	B	3.6	B	<F	2.8	3.3	4.2	3.0	3.0	
29	1.8	E	2.2	2.0	2.4	E	E	<F	3.1	<F	B	4.8	5.8	3.6	3.5	C	2.6	3.7	3.9	3.0	3.0	1.7	
30	E	2.2	B	E	E	B	2.4	3.4	3.0	5.4	3.9	<F	4.5	6.5	7.2	<F	C	C	2.0	2.2	2.2	2.7	
31	3.0	2.6	3.0	E	1.8	1.8	E	<F	<F	3.2	<F	B	B	B	B	C	3.2	3.0	2.8	3.0	3.2	2.4	
Median Value	1.9	1.8	1.8	2.3	1.6	1.6	E	2.0	<F	3.3	4.1	4.0	3.6	4.3	3.6	3.4	<F	2.8	2.5	2.4	2.2	2.2	
Count	28	30	28	26	29	27	26	26	26	27	16	17	16	18	14	19	27	26	27	26	27	29	28

Sweep 1.0 Mc to 15.0 Mc in 1.5 min Manual

K 8

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

F<sub>2</sub>-M3000

IONOSPHERIC DATA

Kokubunji, Tokyo

Lt. 35°42.4'N  
Long 139°29.3'E

Day	135°E Mean Time																														
	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	2.9	2.7	2.6	2.7	3.3	3.4	3.2	3.5	3.6	3.5	3.1	3.2	3.1	3.1	3.1	3.1	3.7	3.1	3.1	3.3	3.5	B	B	2.7							
2	2.8	2.9	2.8	2.9	2.9	3.1	3.3	3.4	3.5	3.7	3.4	3.3	3.2	6	3.3	J	3.5	3.4	3.3	3.5	J	2.9	2.8	3.0							
3	3.0	3.3	3.5	3.1	2.5	2.6	3.0	3.6	3.7	3.6	3.5	3.3	3.6	3.7	3.3	3.2	3.5	3.4	J	3.6	J	2.7	2.8	2.8							
4	2.9	3.2	3.0	2.8	3.1	3.1	3.1	3.7	3.8	3.6	3.3	3.2	3.1	3.2	3.3	3.1	3.5	3.5	3.6	3.4	BPJ	3.8	2.9	3.2							
5	2.8	2.6	2.8	2.9	3.0	2.5	3.2	3.3	3.7	3.6	3.3	3.1	3.2	3.4	3.2	3.4	3.3	3.5	J	J	3.5	3.0	3.0	2.8							
6	2.7	2.6	2.8	3.1	3.5	2.7	3.4	3.3	3.7	3.4	3.2	3.3	3.3	3.4	J	3.4	3.5	3.2	3.3	3.2	3.5	3.1	J	2.8							
7	3.1	2.8	2.6	3.2	J	2.8	3.2	3.1	3.5	3.0	3.3	3.2	3.3	3.3	3.2	3.2	3.4	3.3	3.5	3.6	3.9	2.8	2.7	3.4							
8	J	2.9	3.2	3.3	2.8	2.7	3.3	3.7	3.7	3.4	3.4	3.3	3.4	3.2	3.3	3.5	3.4	3.3	3.4	3.6	3.5	2.9	2.8	2.8							
9	2.8	2.8	2.8	2.8	2.8	3.1	3.0	3.4	3.6	3.5	3.7	3.3	3.6	3.3	3.1	3.2	J	3.1	3.8	J	3.8	3.4	2.9	2.9							
10	0	0	0	3.4	2.9	2.6	2.8	3.3	0	2.6	3.2	(3.3)0	3.4	3.6	3.0	3.0	3.0	3.1	3.1	0	0	0	0	0							
11	0	0	0	0	0	0	0	0	0	0	0	0	3.4	3.2	3.0	3.3	3.1	J	3.4	3.8	3.9	3.4	3.0	0							
12	0	2.8	3.2	3.0	3.0	2.9	3.4	3.6	3.6	3.5	3.1	3.2	3.1	3.3	3.1	3.5	3.2	3.1	3.4	3.6	3.3	3.0	2.7	2.7							
13	2.5	FV	3.2	3.2	2.9	2.6	3.1	3.6	3.6	3.3	3.2	2.9	2.9	3.1	2.9	2.9	3.1	2.9	3.1	3.5	3.4	2.9	2.5	2.5							
14	2.5	2.9	2.9	3.0	2.8	2.9	3.2	3.5	4.0	3.6	3.5	3.3	3.1	3.1	3.0	3.2	3.4	3.2	3.4	3.6	J	2.7	3.2	3.0							
15	2.5	2.8	3.0	2.8	2.8	2.7	3.0	3.1	3.6	3.2	3.3	3.1	3.1	3.0	3.0	3.1	3.5	3.2	3.5	3.5	2.4	2.6	3.1	3.0							
16	2.5	2.7	3.0	(2.8)0	2.6	2.7	3.2	3.5	3.8	3.5	(3.3)0	3.1	3.2	(3.1)0	3.0	3.0	3.1	3.2	3.5	3.5	3.1	3.1	2.7	2.7							
17	(2.7)0	2.8	FJ	FJ	FJ	FJ	FJ	3.3	3.4	3.3	3.3	3.3	3.1	3.2	3.1	3.4	3.5	3.2	3.5	3.3	3.7	2.8	2.9	3.1							
18	2.3F	2.7	2.8	3.0	3.2	(3.0)0	2.9	J	3.8	3.5	3.5	3.4	3.0	2.8	2.9	2.9	3.3	3.5	3.3	3.4	2.8	3.1	2.9	2.9							
19	3.2	2.9	3.0	2.5	2.5	2.7	3.2	3.4	3.4	3.3	3.3	3.2	3.1	2.9	3.0	3.1	3.2	3.2	3.5	3.5	4.0	2.9	3.0	3.0							
20	2.9	2.9	3.2	2.9	2.7	2.7	3.3	B	3.2	3.5	3.1 <sup>P</sup>	3.2	3.3	3.2	2.9	3.1	3.2 <sup>H</sup>	3.0 <sup>P</sup>	3.3	3.3	3.6	2.8	2.6	2.6							
21	2.6P	2.5	2.9	2.6	2.7	2.8	3.0	3.4	3.4	2.8	3.0	2.9	2.8	2.9	2.8	2.9	2.9	2.8	3.2	3.0	3.3	2.5	2.4	2.4							
22	2.6	2.7	3.0	3.2	2.3	2.4	3.0	2.9	3.3	3.2	3.1	3.3	J	2.9	2.9	3.0	3.3 <sup>P</sup>	J	2.9	3.3	3.2	3.3	2.6	JF							
23	2.6	2.8	2.5	3.1	3.1	2.7	2.7	3.4	3.6	3.3	3.2	3.2	3.3	3.2	3.0	3.1	3.3	2.6	3.2	3.6	3.5	3.1	2.9	2.8							
24	3.0 <sup>H</sup>	2.7	2.5	2.6	2.6	2.5	2.6	3.3	3.3	3.4	3.3	3.3	3.0	3.2	3.0	3.1	3.0	3.1	3.4	3.3 <sup>J</sup>	3.4 <sup>P</sup>	3.9	3.5	3.1							
25	2.8	2.7	2.9	3.3	2.7K	2.5K	3.1	3.5	3.0	0	0	3.2	2.8	2.8	2.7	2.9	2.8	3.4	3.1	2.8	3.2	3.2	3.0	3.2							
26	3.1	2.6	3.0	2.5F	3.3F	J	3.2	3.7	2.7	(2.9)0	3.1	2.9	3.0	2.9 <sup>H</sup>	3.1	3.2	3.1	(3.2)0	3.4	3.0	3.3	(3.2)0	3.2	3.5							
27	3.3	3.8	2.9	2.6	2.6	2.7	2.8	3.1	3.4	3.4 <sup>H</sup>	3.5 <sup>H</sup>	PK	3.5 <sup>H</sup>	3.1	3.1	3.1	3.1	3.1	3.1	3.1	0	0	0	2.6							
28	2.7	2.5	2.9	3.1	2.8	2.7	3.2	3.6	3.2	3.5	3.6	3.5	3.1	3.0	3.5	3.5	3.5	3.4	3.6	3.2	3.3	3.1	2.9	2.5							
29	2.8	2.9	2.9	2.4	2.5	2.9	2.9	3.6	3.4	3.6	3.4	3.4	3.3	3.1	3.2	3.1	(3.1)0	3.2	2.9	3.4	B	2.8	3.0	2.9							
30	2.6	2.6	2.8	3.1	2.6	2.6	2.9	3.3	3.4	3.0	2.7	2.9	2.9	3.1	3.1	3.1	3.1	0	0	F	FJ	FJ	2.9	2.9							
31	2.6	2.8	2.8	3.6	2.7	2.8	2.7	3.5	3.5	3.3	3.2	3.2	3.1	3.0	3.1	(3.1)0	3.2	3.3	3.3	3.3	3.1	2.8	2.7	2.7							
Median Value	2.8	2.8	2.9	2.9	2.8	2.7	3.0	3.3	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.1	3.2	3.2	3.2	3.3	3.4	3.1	2.9	2.8							
Count	27	28	28	29	28	28	29	28	29	29	30	30	30	30	30	30	29	28	27	26	23	27	26	26							

Sweep 1.0 Mc to 15.0 Mc in 1.5 min

Notes

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denkitsu-shin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

35°42.4'N  
139°23.3'E

Kokubunji, Tokyo

IONOSPHERIC DATA

Jan 1949

f<sub>r</sub> min

135° E Mean Time

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	2.0	1.8	1.6	1.6	1.6	A	1.6	A	2.8	3.0	A	3.4	A	A	3.6	A	2.4	A	1.6	1.8	A	A	A	1.6
2	(1.8)	(1.3)	A	1.4	1.4	1.4	1.6	1.7	2.7	A	3.4	4.0	5.2	A	4.2	5.2	3.4	1.7	1.5	1.6	1.6	A	1.6	1.6
3	1.4	E	1.4	1.4	1.2	1.3	1.3	1.8	2.8	(2.8)	3.5	3.6	3.8	3.6	3.0	2.5	1.9	1.5	1.4	(1.6)	1.6	1.6	1.5	1.5
4	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.6	2.4	3.0	3.5	4.0	3.6	3.8	2.6	3.2	2.5	1.6	1.4	(1.6)	1.6	1.6	1.6	1.6
5	1.4	1.4	1.4	1.4	1.4	1.4	1.5	(1.9)	3.0	2.9	3.6	3.6	3.6	3.6	3.2	2.9	2.4	A	2.3	1.5	1.5	1.5	1.9	1.5
6	1.5	1.4	1.5	1.4	1.9	2.0	1.9	1.9	2.7	3.1	3.6	3.8	3.4	3.8	4.8	3.8	2.8	2.0	1.5	(1.6)	2.0	1.6	1.6	1.6
7	1.4	1.1	E	E	E	1.1	1.3	1.7	2.6	2.9	3.6	3.6	3.6	4.2	2.9	2.3	1.8	2.0	1.8	1.6	1.6	1.4	1.5	1.4
8	1.4	1.4	1.8	1.3	1.4	1.4	1.4	1.6	2.6	3.1	3.8	4.4	C	C	C	C	2.5	1.8	1.8	1.5	1.5	1.5	1.5	1.5
9	1.4	1.5	1.4	1.4	1.4	1.4	1.4	2.2	2.6	3.1	3.5	4.0	4.4	4.0	3.0	2.4	2.0	2.6	2.0	1.9	1.6	1.6	1.6	1.6
10	C	C	C	(1.4)	1.4	1.6	1.4	2.0	C	C	5.8	A	C	5.5	3.7	3.8	3.1	(2.0)	2.0	C	C	C	C	C
11	C	C	C	C	C	C	C	C	C	C	3.7	3.8	3.8	3.5	3.4	2.5	2.0	1.5	1.6	2.0	2.0	2.0	2.0	C
12	C	1.6	1.6	2.0	1.1	1.1	1.6	2.0	2.5	3.2	3.7	3.7	3.8	3.8	3.9	3.2	A	A	A	A	1.5	1.6	1.7	1.5
13	1.4	1.3	E	E	1.2	1.4	1.6	1.9	2.7	3.6	4.0	4.2	4.4	4.4	4.1	3.1	2.6	2.4	1.6	1.6	1.5	1.4	1.6	1.5
14	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.0	A	A	3.6	3.8	4.0	3.8	4.0	3.5	A	A	2.4	2.6	2.4	1.8	1.6	1.6
15	A	1.6	1.4	1.4	1.4	E	1.6	1.8	2.6	3.0	3.9	4.2	3.8	3.8	4.4	3.0	A	2.2	1.9	1.5	1.6	1.6	2.0	1.6
16	1.5	A	1.6	(1.5)	1.4	1.4	A	2.8	2.8	A	C	5.6	(5.5)	5.4	5.4	2.7	1.9	1.5	1.6	1.6	1.6	2.0	2.0	1.6
17	(1.5)	1.4	1.4	1.4	1.4	1.3	1.5	1.6	2.8	3.1	3.7	4.0	3.9	3.9	3.9	3.1	2.8	2.0	1.8	2.0	AF	1.8	1.6	1.9
18	E	E	E	A	E	C	1.8	2.3	3.3	3.4	A	A	4.2	A	4.2	3.6	3.5	2.5	2.1	1.7	1.5	1.5	1.5	1.6
19	1.5	1.5	1.4	1.4	1.3	1.4	1.4	1.4	2.7	2.7	A	A	4.4	4.2	3.6	3.5	2.5	2.1	1.7	1.5	A	1.6	1.5	1.6
20	1.4	1.4	A	1.8	1.4	1.4	1.6	2.0	2.6	A	3.8	A	A	A	5.6	4.1	A	A	2.1	2.2	(2.2)	A	1.5	1.6
21	A	A	A	1.4	1.4	1.4	1.6	2.0	2.7	3.5	A	4.7	A	3.9	3.8	3.2	2.5	2.3	2.0	1.6	1.6	1.5	1.6	1.5
22	1.5	1.6	1.6	1.6	1.4	1.4	1.6	1.6	A	(3.8)	3.7	(4.4)	5.2	4.7	4.2	4.0	2.8	2.0	1.8	1.7	1.5	1.5	1.4	1.7
23	1.4	1.4	1.2	A	A	1.8	E	2.0	A	A	3.6	7.2	5.7	4.4	3.9	3.6	2.7	1.9	A	A	1.6	1.6	1.6	1.5
24	1.5	1.4	1.4	1.4	1.4	1.1	1.4	1.9	2.4	3.6	4.2	3.9	3.8	3.9	3.8	3.6	2.7	2.0	A	A	1.6	1.8	1.5	1.6
25	1.7	1.6	1.6	1.4	1.6	1.5	1.8	1.9	2.8	A	C	4.1	3.6	4.0	A	2.7	2.4	1.8	1.5	1.5	A	1.6	1.6	1.6
26	1.5	1.4	1.3	1.8	1.8	A	1.6	2.0	2.6	C	A	A	A	A	A	A	A	2.2	1.8	1.6	1.6	(1.8)	C	2.0
27	1.6	1.4	1.3	1.3	1.3	1.3	1.4	1.6	A	3.4	A	4.2	4.1	4.2	3.8	3.4	2.8	2.0	1.6	C	C	C	C	1.9
28	1.4	1.8	1.4	(2.0)	1.5	1.5	1.8	2.0	2.9	3.0	3.7	3.8	3.9	3.7	3.6	3.8	2.7	A	AF	AF	1.5	1.5	1.5	1.5
29	1.5	1.5	1.3	1.3	1.3	1.3	1.3	2.0	2.8	3.4	3.6	3.9	A	A	3.7	3.3	(2.8)	2.2	A	A	A	A	1.6	1.6
30	1.3	1.3	1.4	1.2	1.2	1.2	A	1.9	2.6	3.6	A	4.2	4.1	3.9	(3.9)	A	2.8	C	C	C	1.5	1.6	1.6	1.7
31	(1.8)	1.6	1.6	1.4	1.4	1.4	1.6	2.2	2.7	3.5	3.5	3.6	4.2	3.7	3.6	3.4	(2.9)	2.4	2.0	2.0	1.8	2.0	2.0	1.8

Median Value 1.5  
Count 26  
Sweep 1.0 Mc to 19.0 Mc in 15 min  
Manual  
K. 10

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

fe min

Kokubunji, Tokyo

Lat. 35°42.4'N  
Long. 139°29.2'E

135°E Mean Time

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	1.6	1.8	1.6	E	E	1.4	E	1.6	1.8	1.7	1.8	1.8	2.2	2.2	2.2	2.4	1.6	1.6	(2.6) <sup>B</sup>	2.8	2.0	2.1	2.2	2.3
2	1.8	1.8	1.4	1.4	1.4	1.6	2.0	(1.5) <sup>B</sup>	1.8	1.8	1.8	1.8	2.2	1.8	2.0	2.0	2.0	1.7	E	E	1.6	1.6	1.6	E
3	1.4	1.6	1.4	E	E	(1.9) <sup>B</sup>	E	B	1.8	2.0	1.8	1.8	2.0	2.1	1.8	1.8	1.7	1.6	2.0	1.4	1.5	1.5	1.7	
4	1.5	1.8	1.4	1.4	1.4	E	E	1.6	1.8	2.0	1.6	1.8	1.7	1.7	1.8	1.6	1.4	1.4	1.6	1.6	1.6	1.6	1.6	
5	1.4	1.2	1.4	1.4	1.4	1.4	1.6	(1.8) <sup>B</sup>	1.5	1.5	1.6	1.7	1.7	1.7	1.8	2.2	1.7	1.8	1.6	E	E	1.5	E	
6	E	1.4	E	E	E	B	B	B	2.0	1.9	1.9	1.8	1.8	B	B	B	B	B	E	1.6	B	1.5	E	
7	1.4	E	1.4	E	E	E	1.4	1.5	1.5	1.5	1.8	2.1	1.8	1.8	1.8	1.6	1.7	1.6	B	B	E	E	1.8	
8	1.3	E	B	1.4	1.4	1.4	E	1.8	1.8	1.9	2.1	2.1	C	C	C	C	1.8	B	E	1.8	1.8	1.5	E	
9	E	1.4	1.4	1.4	1.4	E	E	1.8	2.0	2.2	B	B	B	B	2.0	2.0	2.2	B	B	B	E	E	E	
10	C	C	1.4	1.4	1.4	1.4	2.0	1.6	C	C	B	3.2	C	B	2.4	2.2	2.0	2.0	1.8	C	C	C	C	
11	C	C	C	C	C	C	C	C	C	C	C	1.8	1.6	1.7	1.6	1.7	1.6	E	E	E	B	B	C	
12	C	1.3	E	2.2	E	E	E	2.0	2.0	2.0	1.9	2.2	2.1	2.2	1.9	1.8	1.5	1.3	1.4	1.5	1.5	1.5	1.6	
13	E	1.3	E	E	E	E	E	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	B	B	B	1.4	1.4	1.5	
14	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	2.0	2.2	1.9	1.8	1.8	1.9	1.9	1.6	1.6	1.5	1.5	1.4	1.4	1.5	
15	1.6	E	E	B	1.4	1.4	B	1.7	1.6	1.8	2.0	2.4	2.4	2.5	2.1	2.8	B	2.2	E	E	E	E	E	
16	E	1.6	E	E	E	E	E	1.4	1.6	1.8	2.0	C	B	5	C	8	5	2.2	1.8	1.4	1.4	1.6	1.6	
17	C	1.4	E	E	E	E	E	E	2.0	1.8	1.8	2.1	2.0	1.8	1.8	1.6	1.6	1.4	1.4	1.5	1.4	1.5	1.4	
18	E	1.1	1.9	1.1	E	C	1.8	1.6	1.6	1.6	B	B	3.4	3.5	B	B	2.7	2.2	E	E	E	E	E	
19	E	E	1.4	1.4	1.4	1.4	E	E	1.5	1.8	1.8	B	3.4	3.5	B	B	2.7	2.2	E	E	E	E	E	
20	1.4	1.4	1.1	1.4	1.4	1.4	E	E	B	1.8	2.2	2.3	2.3	2.0	2.0	2.2	1.8	1.8	1.8	1.8	1.5	1.6	1.5	
21	1.5	1.4	1.4	1.3	1.4	B	B	1.8	2.0	2.0	1.9	2.1	2.3	2.0	2.0	2.0	1.7	1.3	1.6	1.6	1.6	1.5	1.6	
22	1.5	1.6	2.0	2.0	1.4	1.4	1.6	1.4	1.6	2.0	2.0	2.8	2.9	B	B	1.7	2.0	B	1.8	1.6	1.5	1.6	1.5	
23	1.4	E	1.2	1.2	1.8	E	E	2.2	1.8	2.8	1.7	B	B	B	1.7	1.7	2.0	B	1.8	1.6	E	1.4	1.7	
24	1.5	E	1.4	1.4	E	E	E	1.4	1.5	1.9	2.0	2.3	2.3	2.4	2.0	2.0	1.9	1.4	1.6	1.6	1.6	1.6	1.5	
25	E	E	E	E	E	E	E	1.6	1.8	1.4	C	C	2.4	2.2	2.4	2.0	2.0	1.5	1.5	1.4	1.4	1.4	1.4	
26	1.2	E	E	1.1	1.1	1.1	1.2	1.4	1.5	(1.8) <sup>C</sup>	2.0	2.0	2.4	2.1	2.0	2.4	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
27	1.5	E	E	E	E	E	1.4	1.6	1.7	1.8	1.8	3.4	2.2	2.2	2.1	2.0	1.9	2.0	1.4	C	C	C	1.8	
28	E	1.4	E	1.1	1.4	1.6	B	2.0	1.9	1.9	2.1	2.0	2.1	2.1	2.0	1.8	1.8	1.5	1.4	1.5 <sup>F</sup>	1.5	1.5	1.5	
29	1.5	1.5	1.3	1.3	E	E	E	2.0	1.6	2.0	2.0	2.0	2.1	1.7	1.7	1.5	(1.6) <sup>C</sup>	1.6	1.4	1.5	1.5	1.5	1.6	
30	E	1.4	B	E	E	E	B	1.4	1.8	1.8	1.7	1.9	2.3	2.4	2.2	2.0	1.8	1.7	C	C	1.7	1.6	1.8	
31	1.4	1.4	1.4	1.4	1.4	1.4	E	1.6	1.5	1.8	1.8	(1.8) <sup>B</sup>	1.8	1.8	1.8	1.9	(1.9) <sup>C</sup>	1.8	1.8	2.0	1.8	1.8	1.8	
Mean Value	1.4	1.3	1.4	1.3	1.1	E	E	1.6	1.8	1.8	1.9	2.1	2.2	2.1	2.0	2.0	1.8	1.7	1.4	1.5	1.5	1.5	1.5	
Count	2.7	2.9	2.9	2.7	2.9	2.6	2.7	2.6	2.8	2.9	2.6	2.6	2.6	2.5	2.6	2.8	2.9	2.5	2.7	2.5	2.7	2.7	2.7	

Sweep 1.0 Mc to 16.0 Mc in 1.5 min

Manual

K 11



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denkikatsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

# IONOSPHERIC DATA

Day	Jan 1949										Yamagawa										Lat. 31°12.5'N Long. 130°37.7'E				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	3.0	3.2	3.6	3.9	4.4	2.6	2.4	2.9	8.2	11.8 <sup>H</sup>	12.0 <sup>T</sup>	10.9 <sup>T</sup>	C	C	C	C	C	C	C	9.2 <sup>J</sup>	26 <sup>J</sup>	(4.6)	3.7	3.4	
2	3.4	3.3	3.0	3.0	3.3	3.1	2.7	4.1	9.3	10.5	9.8 <sup>T</sup>	9.7	(2.5) <sup>F</sup>	12.2 <sup>T</sup>	11.7	10.9	10.7	10.4 <sup>H</sup>	8.6 <sup>H</sup>	8.9	7.7 <sup>S</sup>	(7.5)	5.8 <sup>S</sup>	5.8	
3	5.8	5.0 <sup>J</sup>	2.8 <sup>J</sup>	3.5	3.2	2.9	2.7	4.7	9.4	9.9	10.5	11.4 <sup>S</sup>	13.9	13.5	11.7	10.6 <sup>J</sup>	10.1 <sup>J</sup>	9.0 <sup>S</sup>	8.0	6.6	6.5 <sup>S</sup>	4.2	4.2	3.7	
4	3.8	4.0	3.9	3.9	3.8	2.8	3.2	4.8	7.9	10.0	10.4 <sup>S</sup>	10.4	13.1	13.3	13.6 <sup>S</sup>	13.4	13.1 <sup>T</sup>	10.2	7.7	7.1	7.5 <sup>J</sup>	5.2 <sup>J</sup>	3.7	3.4	
5	3.3 <sup>2</sup>	3.2	2.9	3.3	3.5	2.7 <sup>F</sup>	2.5	4.1 <sup>F</sup>	8.3 <sup>S</sup>	8.1 <sup>F</sup>	9.1	12.2	13.0 <sup>B</sup>	13.6 <sup>H</sup>	13.3 <sup>B</sup>	13.1	13.0 <sup>T</sup>	9.5	8.8	6.2 <sup>B</sup>	7.0 <sup>S</sup>	5.3	4.5 <sup>H</sup>	3.6	
6	3.8	3.6	3.7	3.1	4.1 <sup>T</sup>	2.2	2.2	3.6	8.2 <sup>T</sup>	9.7 <sup>S</sup>	34.5 <sup>U</sup>	11.1	9.9	10.7 <sup>T</sup>	9.9 <sup>T</sup>	9.5	9.5 <sup>T</sup>	9.9	7.4	7.1 <sup>J</sup>	6.7	4.8	4.4	3.4	
7	3.2	3.3	3.5	4.7 <sup>T</sup>	S	2.1 <sup>J</sup>	2.2	4.9	7.5 <sup>T</sup>	10.3 <sup>H</sup>	12.3 <sup>T</sup>	12.7 <sup>T</sup>	13.6 <sup>S</sup>	13.1 <sup>T</sup>	12.9 <sup>H</sup>	C	C	C	C	C	S	5	4.2	4.0	
8	3.3	3.4	3.7	3.9	3.5	2.6 <sup>F</sup>	2.8	4.3	7.5	8.5	9.6	12.0	11.3	11.7 <sup>S</sup>	12.1 <sup>H</sup>	13.4	13.5	11.2	9.0	5.6	7.0	4.9	3.1	3.0	
9	3.1	3.5	3.5	(3.4)	3.4	2.8	2.6	4.2	9.1	10.5	11.9	10.4	11.2 <sup>C</sup>	12.0	11.6 <sup>H</sup>	11.4	11.7 <sup>H</sup>	10.5	10.7 <sup>J</sup>	7.0	8.2	7.6	5.8	5.5	
10	5.1	5.2	(5.2)	4.6	2.6	2.3	2.4	4.0	7.3	8.4	10.5 <sup>H</sup>	C	C	C	C	C	10.9 <sup>T</sup>	9.9 <sup>S</sup>	7.6	6.2 <sup>J</sup>	5.3	4.9	3.7		
11	3.5	3.7	3.9 <sup>F</sup>	3.4	2.4 <sup>F</sup>	2.5	2.4	5.9	8.3	10.0	13.4 <sup>P</sup>	C	C	C	C	C	C	C	11.4 <sup>H</sup>	10.9	10.9	7.1 <sup>J</sup>	4.7	4.2	
12	4.1 <sup>F</sup>	4.0	4.6 <sup>S</sup>	4.1	3.5	2.9	3.3 <sup>J</sup>	4.7	8.3	18.9 <sup>S</sup>	9.4	10.3 <sup>F</sup>	11.2	11.2 <sup>H</sup>	11.2 <sup>C</sup>	11.2	11.9	9.0 <sup>P</sup>	7.3	6.1	5.5 <sup>S</sup>	5.2	4.0	4.2	
13	(3.8)	3.6	3.7	4.0	3.0	3.2	3.1 <sup>F</sup>	6.0	C	C	C	C	C	C	C	C	C	C	C	C	8.1 <sup>P</sup>	7.8	5.5	4.3	
14	4.1	4.2	4.2	4.3	4.7	3.5	3.3	C	C	C	C	C	C	C	C	C	C	C	9.0	8.4 <sup>H</sup>	8.0 <sup>S</sup>	6.5	4.6	4.4	
15	3.6	2.9	3.3	3.6 <sup>F</sup>	3.0	2.6	3.1	3.9 <sup>H</sup>	8.4	10.0	10.6	13.3	(2.6)	12.9	13.4	11.7	11.7 <sup>T</sup>	10.4	S	9.9 <sup>S</sup>	8.9 <sup>S</sup>	6.2 <sup>S</sup>	5.1	4.9	
16	4.8	3.4	3.4	3.9 <sup>S</sup>	2.6	2.8	2.8 <sup>Z</sup>	6.2	9.4	10.0 <sup>H</sup>	9.5	11.4	12.5	11.3 <sup>H</sup>	11.2 <sup>H</sup>	10.7 <sup>H</sup>	11.1 <sup>H</sup>	10.7 <sup>S</sup>	9.0 <sup>T</sup>	8.1	7.0 <sup>T</sup>	6.0	5.0	4.4	
17	4.0	3.7	3.3	4.4	3.8	3.5	4.2	4.6	9.5	10.5	10.9 <sup>H</sup>	13.4	14.2	13.0	12.5	12.1 <sup>S</sup>	11.1	10.4 <sup>H</sup>	7.4	6.5	6.2	5.3 <sup>J</sup>	4.0 <sup>T</sup>	3.9	
18	3.3	3.2	3.4	13.0 <sup>F</sup>	2.6	3.1	3.2	4.8	7.9	9.9	9.9	10.5 <sup>H</sup>	11.7	11.9 <sup>S</sup>	(2.9) <sup>F</sup>	13.0 <sup>S</sup>	C	C	10.1 <sup>B</sup>	8.9 <sup>S</sup>	8.8 <sup>H</sup>	7.7	5.8	4.8 <sup>H</sup>	
19	3.7	3.7 <sup>J</sup>	3.9	3.6	3.6	4.3	3.9	4.5 <sup>F</sup>	7.9	8.8	11.2	B	13.5	11.5	13.0 <sup>S</sup>	13.4	12.9	11.7	10.8 <sup>H</sup>	10.4	9.2 <sup>T</sup>	6.9 <sup>S</sup>	4.7 <sup>S</sup>	4.3 <sup>J</sup>	
20	4.2	4.5	4.4	3.7	3.5	3.9	3.7	4.1	8.5	10.4	11.0	11.6	13.7 <sup>S</sup>	9.2 <sup>T</sup>	13.1	12.3	12.6	(13.3) <sup>S</sup>	12.9 <sup>S</sup>	11.2 <sup>J</sup>	10.6	7.6	5.3	4.9	
21	4.5	4.6	4.6	3.2	3.8	(3.2)	3.4 <sup>Z</sup>	4.7	9.4	10.2	10.5	12.0 <sup>H</sup>	13.3 <sup>H</sup>	14.4 <sup>H</sup>	14.4 <sup>S</sup>	15.0 <sup>J</sup>	15.3 <sup>T</sup>	15.7 <sup>J</sup>	S	15.4 <sup>S</sup>	5.1 <sup>H</sup>	13.1 <sup>S</sup>	8.6	8.0	
22	7.7	7.2	5.8	4.5	3.6	2.9	3.2	4.7	7.8	9.2	11.8 <sup>SH</sup>	11.7	11.5	11.4	11.8 <sup>H</sup>	12.3	12.1 <sup>B</sup>	11.5 <sup>H</sup>	10.4	10.3	(9.8) <sup>F</sup>	5.8 <sup>P</sup>	4.6	4.4	
23	4.0 <sup>S</sup>	4.3	4.6	4.5	2.8	2.8	2.9 <sup>Z</sup>	4.8	9.3 <sup>P</sup>	10.2	10.7	B	(13.7) <sup>H</sup>	12.4 <sup>H</sup>	11.4	11.6	11.3	10.7	10.4 <sup>J</sup>	9.2 <sup>T</sup>	8.6 <sup>S</sup>	6.4	4.7	4.3	
24	3.8	4.1	3.3 <sup>H</sup>	3.5	3.3	3.6	3.5	4.0	3.6	9.5	12.4 <sup>H</sup>	11.8 <sup>H</sup>	11.7	11.3	11.5	12.5	12.0	11.2 <sup>H</sup>	9.9	9.7 <sup>H</sup>	9.0 <sup>S</sup>	7.6	6.2	6.1 <sup>T</sup>	
25	5.2	4.6	4.6 <sup>J</sup>	3.8	3.0 <sup>K</sup>	2.6 <sup>K</sup>	2.7 <sup>K</sup>	3.1 <sup>K</sup>	6.0 <sup>K</sup>	7.2 <sup>K</sup>	13.8 <sup>K</sup>	13.0 <sup>T</sup>	BK	11.2 <sup>K</sup>	10.9 <sup>K</sup>	10.4 <sup>K</sup>	11.5	12.0	8.8	8.5 <sup>H</sup>	8.3 <sup>H</sup>	7.7 <sup>H</sup>	5.8 <sup>H</sup>	5.4 <sup>P</sup>	
26	4.5	3.7	3.0	3.1	3.0	3.8 <sup>J</sup>	3.3	4.3	7.0	10.5	12.0 <sup>H</sup>	11.9	13.5 <sup>H</sup>	S	(12.5) <sup>S</sup>	S	11.5	11.0 <sup>H</sup>	10.7 <sup>H</sup>	S	9.4	(6.5)	5.7	5.9	
27	5.1	3.4	2.8	2.8	2.7	3.1	3.2	4.1	10.8	11.1	13.3 <sup>T</sup>	B	15.4 <sup>T</sup>	13.4	13.5	13.8	13.6	13.5	(16.5) <sup>B</sup>	9.8 <sup>J</sup>	7.6	7.5	4.7	2.8	
28	3.2	3.0	3.1	3.2	3.8 <sup>J</sup>	(2.8) <sup>F</sup>	2.8 <sup>F</sup>	3.9	8.9 <sup>T</sup>	8.9 <sup>T</sup>	10.4	13.8 <sup>T</sup>	11.9	11.8	10.0	11.1 <sup>H</sup>	10.9	10.5	9.4	8.8	5.4	S	4.9	5.0 <sup>T</sup>	
29	5.0	4.4	3.7	3.6	3.7 <sup>T</sup>	3.5	3.1	4.8	9.3	11.9	12.1 <sup>P</sup>	13.0	15.4 <sup>T</sup>	15.3 <sup>T</sup>	15.0 <sup>T</sup>	BH	16.1 <sup>T</sup>	15.3	11.7	12.0	8.8	8.3	6.3	6.0	
30	4.7	4.5	4.4	4.5	3.0	2.5	2.7	4.2	7.6	9.4	11.4	13.2	13.5	14.5	14.4 <sup>J</sup>	B	14.8	S	7.2 <sup>K</sup>	6.3 <sup>K</sup>	7.1 <sup>K</sup>	6.7	5.1	4.4	
31	4.4	4.2	4.0	3.5	3.5	2.7	3.0	4.0	7.8	11.1	11.1	12.7	12.8	12.8	(12.7) <sup>C</sup>	12.6	12.3	12.1	19.4 <sup>C</sup>	6.7	6.5	5.7	5.1	4.5	
Median Value	4.0	3.7	3.7	3.8	3.5	2.8	3.0	4.6	8.3	10.0	10.9	11.9	13.0	12.4	12.5	12.3	12.0	10.7	9.0	8.7	8.0	6.5	4.7	4.4	
Count	31	31	31	31	31	31	31	30	29	29	29	24	25	25	25	23	25	24	23	23	28	29	30	31	31

Sweep 1.2 Mc to 18.5 Mc in 1.5 min. Manual. Y 1

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denkikatsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

hr F<sub>2</sub>

IONOSPHERIC DATA

Yamagawa

Lat. 31°12.5'N  
Long 139°37.7'E

155°E Mean Time

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	420	440	430	360	B	370	350	280	300 <sup>H</sup>	290 <sup>J</sup>	260 <sup>J</sup>	C	C	C	C	C	C	C	C	290 <sup>J</sup>	260 <sup>J</sup>	240	370	400
2	400	410	330	420	330	280	360	400	250	240	260 <sup>J</sup>	260 <sup>J</sup>	370 <sup>P</sup>	350 <sup>J</sup>	320	360	320	320 <sup>H</sup>	290 <sup>H</sup>	300	300 <sup>S</sup>	320 <sup>S</sup>	(320)	(400)	340
3	350	350 <sup>J</sup>	310 <sup>J</sup>	320	410	420	370	330	270	270	500 <sup>S</sup>	310 <sup>S</sup>	300 <sup>P</sup>	300 <sup>P</sup>	310 <sup>S</sup>	310 <sup>S</sup>	300 <sup>J</sup>	290 <sup>J</sup>	290 <sup>J</sup>	280	290 <sup>S</sup>	290 <sup>S</sup>	290 <sup>S</sup>	290 <sup>S</sup>	370
4	410	340	340	340	320	310	400	320	240	250	290 <sup>S</sup>	290 <sup>S</sup>	320 <sup>J</sup>	310 <sup>J</sup>	300 <sup>H</sup>	310	330 <sup>J</sup>	260	270	280	250 <sup>J</sup>	250 <sup>J</sup>	240 <sup>J</sup>	310	370
5	370 <sup>K</sup>	(360)	400	340	330 <sup>J</sup>	290 <sup>J</sup>	400	360 <sup>F</sup>	240 <sup>F</sup>	250 <sup>F</sup>	300	300	310 <sup>H</sup>	320 <sup>H</sup>	320 <sup>H</sup>	340 <sup>J</sup>	320 <sup>J</sup>	270	240	330 <sup>B</sup>	250 <sup>S</sup>	250 <sup>S</sup>	330	270 <sup>H</sup>	370
6	420	410	400	240	250 <sup>J</sup>	(260)	(410) <sup>B</sup>	350	240 <sup>J</sup>	250 <sup>J</sup>	250 <sup>J</sup>	260 <sup>J</sup>	300 <sup>J</sup>	300 <sup>J</sup>	300 <sup>J</sup>	300	300 <sup>H</sup>	270 <sup>S</sup>	300	350 <sup>J</sup>	300	300	260	350	460
7	(410) <sup>S</sup>	420	(480) <sup>B</sup>	330 <sup>F</sup>	S	390 <sup>F</sup>	420	330	290 <sup>H</sup>	310 <sup>H</sup>	300 <sup>J</sup>	300 <sup>J</sup>	320 <sup>H</sup>	310 <sup>J</sup>	340 <sup>H</sup>	C	C	C	C	B	S	S	350	320	390
8	400	380	360	320	280	260 <sup>F</sup>	380	230	250	250	310	280	320 <sup>S</sup>	350 <sup>J</sup>	330	310	250	250	250	280	300	240	240	330	400
9	410	410	380	(480)	(300)	320	370	340	270	280	300	300	(310) <sup>C</sup>	310	350 <sup>H</sup>	300	300 <sup>H</sup>	220	280	270	300	280	280	280	400
10	350	360	330	260	330	420	440	440	240	250	300 <sup>H</sup>	C	C	C	C	C	300 <sup>J</sup>	280 <sup>J</sup>	280 <sup>J</sup>	280 <sup>J</sup>	280	280	280	280	420 <sup>F</sup>
11	420	360	270 <sup>F</sup>	300	380 <sup>Z</sup>	410	530	500	280	320	300 <sup>F</sup>	C	C	C	C	C	C	C	C	270 <sup>H</sup>	290	270 <sup>J</sup>	400	410	
12	400 <sup>P</sup>	420	420	420	350	340	330 <sup>J</sup>	310	250	(240)	220	(270)	310	300	(310) <sup>C</sup>	310	320	240 <sup>F</sup>	250	240	260 <sup>S</sup>	290	420	370 <sup>Z</sup>	
13	(390)	(490)	400	310	350	400	400	400	C	C	C	C	C	C	C	C	C	C	C	C	260 <sup>F</sup>	330	310	420	
14	370	390	370	370	280	440	400	C	C	C	C	C	C	C	C	C	C	C	C	C	260 <sup>F</sup>	240	290	300	
15	300	420	350	300 <sup>F</sup>	230	410	320	340 <sup>H</sup>	250	230	220	220	340 <sup>J</sup>	330	330	340 <sup>H</sup>	320 <sup>J</sup>	270	270	S	300 <sup>S</sup>	250 <sup>S</sup>	260 <sup>J</sup>	320	310
16	320	340	360	380 <sup>S</sup>	350	310	340 <sup>Z</sup>	310	270	290 <sup>F</sup>	450	300	300	320 <sup>H</sup>	340 <sup>H</sup>	340 <sup>H</sup>	340 <sup>H</sup>	340 <sup>H</sup>	290 <sup>S</sup>	290	280	250 <sup>J</sup>	240 <sup>J</sup>	340	410
17	440	350	380	360	290	440	510	340	260	280	300 <sup>H</sup>	370	320	320	370	330 <sup>S</sup>	300	350 <sup>H</sup>	240 <sup>S</sup>	290	280	250 <sup>J</sup>	240 <sup>J</sup>	360	
18	420	(400)	420	(370)	320	400	380	280	290	290	300 <sup>H</sup>	300 <sup>H</sup>	370	330 <sup>S</sup>	(430) <sup>B</sup>	400 <sup>F</sup>	C	C	C	290 <sup>B</sup>	300 <sup>S</sup>	300 <sup>S</sup>	260	350 <sup>J</sup>	
19	420	410 <sup>J</sup>	550	420	400	380	400	(320) <sup>B</sup>	260	250	340	B	330	320	360 <sup>S</sup>	350	350	330	(330) <sup>H</sup>	310	310 <sup>J</sup>	260 <sup>S</sup>	(350) <sup>S</sup>	320 <sup>F</sup>	
20	420	380	390	330	360	420	400	400	300	270	240	290	310 <sup>S</sup>	350	330	370	380	(250) <sup>S</sup>	330 <sup>J</sup>	290 <sup>J</sup>	320	300	290	360	
21	350	400	410	350	320	(320)	450	280	280	230	300	300 <sup>H</sup>	380 <sup>H</sup>	360 <sup>H</sup>	350 <sup>H</sup>	400 <sup>J</sup>	370 <sup>J</sup>	350 <sup>H</sup>	S	310 <sup>H</sup>	300 <sup>S</sup>	300 <sup>S</sup>	330	380	
22	390 <sup>F</sup>	300	310	300	440	400	400	400	(230)	270	290 <sup>S</sup>	220	340 <sup>H</sup>	340 <sup>H</sup>	350 <sup>H</sup>	340 <sup>H</sup>	340 <sup>H</sup>	310 <sup>J</sup>	310	310	310	250 <sup>S</sup>	290	360	
23	390 <sup>F</sup>	410	330	270	310	310	410 <sup>Z</sup>	470	270 <sup>F</sup>	250	300	B	300 <sup>H</sup>	340 <sup>H</sup>	330	390	370	310	310 <sup>J</sup>	300 <sup>J</sup>	250 <sup>S</sup>	290	360		
24	410	500	420 <sup>Z</sup>	390	430	380	320	(430)	250	280	300 <sup>H</sup>	390 <sup>F</sup>	310	380 <sup>H</sup>	350	390	350	310 <sup>H</sup>	300	300	300 <sup>S</sup>	300 <sup>S</sup>	310	320 <sup>F</sup>	
25	(410)	420	320 <sup>J</sup>	260	380	490 <sup>K</sup>	490 <sup>K</sup>	390 <sup>K</sup>	220 <sup>K</sup>	420 <sup>K</sup>	350 <sup>K</sup>	320 <sup>K</sup>	B K	400 <sup>F</sup>	430 <sup>K</sup>	440 <sup>K</sup>	390 <sup>K</sup>	320	300	380 <sup>H</sup>	320 <sup>F</sup>	310 <sup>H</sup>	330 <sup>H</sup>	330 <sup>F</sup>	
26	340	380	310	210	270	410 <sup>J</sup>	290	340	300	380	240	400 <sup>F</sup>	S	S	(380) <sup>S</sup>	380	380	340 <sup>H</sup>	300 <sup>H</sup>	S	280	(250)	310	320	
27	240	240	460	450	420	500	370	270	270	300	300 <sup>J</sup>	B	240 <sup>J</sup>	360 <sup>J</sup>	380	330	320	310	(260) <sup>B</sup>	300 <sup>J</sup>	250	270	280	310	
28	320	(410)	340	400	400	(400) <sup>F</sup>	(390) <sup>F</sup>	350	280 <sup>J</sup>	280 <sup>J</sup>	260	320 <sup>J</sup>	270	310	300	330 <sup>H</sup>	320	280	280	280	320	S	290	300	
29	340	350	340	390	320 <sup>J</sup>	470	520	320	230	300	240 <sup>F</sup>	320	340 <sup>J</sup>	330 <sup>J</sup>	330 <sup>J</sup>	B H	330 <sup>J</sup>	330	280	270	270	270	270	430	
30	320	360	320	260	210	430	360	390	270	290	280	340	350	350 <sup>J</sup>	B	370	S	240 <sup>K</sup>	310 <sup>K</sup>	(260) <sup>B</sup>	(240)	300	340		
31	360	370	320	310	340	340	330	280	280	280	200	320	340	(320) <sup>C</sup>	320	350	320	350	320	310	320	310	360	390	
Median Value	390	390	360	330	400	390	340	260	280	300	320	340	320	25	25	23	25	24	25	24	310	290	290	320	370
Count	31	31	31	31	30	30	30	29	29	24	25	25	25	25	23	25	25	24	25	28	29	30	31	31	

Swesep 4.2 Mc to 18.5 Mc in 15 min

Managi

Y 2

IONOSPHERIC DATA

Yamagawa

Lat. 31°12.5'N  
Long 130°37.7'E

h<sub>p</sub>F<sub>2</sub>

Jan 1949

155°E Mean Time

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	450	400	350	300	250	200	150	100	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
2	370	330	300	280	250	230	210	190	170	150	130	110	90	70	50	30	20	15	10	5	5	5	5	5
3	280	250	230	210	190	170	150	130	110	90	70	50	30	20	15	10	5	5	5	5	5	5	5	5
4	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5	5	5	5	5
5	340	310	280	250	220	190	160	130	100	70	40	20	10	5	5	5	5	5	5	5	5	5	5	5
6	370	340	310	280	250	220	190	160	130	100	70	40	20	10	5	5	5	5	5	5	5	5	5	5
7	370	360	340	320	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5
8	290	310	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5	5	5
9	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550
10	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5	5	5	5	5
11	310	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5	5	5	5
12	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540
13	280	340	330	280	240	200	160	120	80	50	30	20	15	10	5	5	5	5	5	5	5	5	5	5
14	300	320	320	250	200	150	100	50	30	20	15	10	5	5	5	5	5	5	5	5	5	5	5	5
15	240	E	290	260	210	160	110	60	30	20	15	10	5	5	5	5	5	5	5	5	5	5	5	5
16	290	290	300	320	340	360	380	400	420	440	460	480	500	520	540	560	580	600	620	640	660	680	700	720
17	320	300	320	300	280	260	240	220	200	180	160	140	120	100	80	60	40	20	10	5	5	5	5	5
18	(300)	(330)	320	(290)	250	210	170	130	90	50	30	20	15	10	5	5	5	5	5	5	5	5	5	5
19	280	290	320	380	340	310	280	250	220	190	160	130	100	70	40	20	10	5	5	5	5	5	5	5
20	(300)	300	250	300	320	(350)	310	250	220	190	160	130	100	70	40	20	10	5	5	5	5	5	5	5
21	300	290	290	300	310	320	330	340	350	360	370	380	390	400	410	420	430	440	450	460	470	480	490	500
22	300	290	260	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
23	320	300	290	240	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
24	260	340	340	310	320	320	280	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290
25	290	300	270	220	(370)	400	450	360	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
26	240	280	250	210	240	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
27	220	220	(360)	(340)	340	4.0	290	250	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
28	320	300	300	270	220	(310)	(350)	A	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
29	250	280	270	240	300	300	300	290	220	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
30	250	250	280	230	200	(330)	310	300	250	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
31	280	290	290	300	280	380	300	300	250	250	220	210	210	210	210	210	210	210	210	210	210	210	210	210
Median Values	300	300	300	290	280	330	320	270	230	230	230	270	270	270	280	290	250	230	220	220	210	210	210	210
Count	31	30	31	31	29	29	29	29	29	29	29	26	26	26	25	25	25	25	28	30	31	31	31	31

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Lat 31°12.5'N  
Long 139°37.7'E

Yamagawa

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

Jan 1949

135°E Mean Time

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	Q	L	L	L	L	C	C	C	C	C	C	C					
2							Q	Q	L	L	L	L	L	L	L	L	L	L	L	L				
3							Q	Q	Q	Q	Q	Q	(5.0)	(5.3)	(5.3)	(5.3)	Q	Q	Q	Q				
4							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
5							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
6							Q	Q	L	L	L	L	Q	6.0 <sup>J</sup>	Q	Q	Q	Q	Q	Q				
7							Q	Q	L	Q	Q	L	5.0	4.8	4.8	C	C	C	C	Q				
8							Q	Q	L	Q	Q	L	Q	Q	Q	5.6	L	Q	Q	Q				
9							Q	Q	Q	L	L	L	Q	Q	Q	Q	Q	Q	Q	Q				
10							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
11							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
12							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
13							Q	Q	L	L	L	L	L	L	L	L	L	L	L	L				
14							Q	Q	L	L	L	L	L	L	L	L	L	L	L	L				
15							Q	Q	L	L	L	L	L	L	L	L	L	L	L	L				
16							Q	Q	Q	Q	Q	Q	Q	L	(5.4) <sup>J</sup>	Q	Q	Q	Q	Q				
17							Q	Q	Q	Q	Q	(5.7)	L	A	Q	Q	Q	Q	Q	Q				
18							Q	Q	L	Q	Q	L	Q	Q	Q	Q	Q	Q	Q	Q				
19							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
20							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
21							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
22							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
23							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
24							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
25							Q	Q	Q	Q	Q	(4.8)	L	(4.7)	Q	5.8	L	Q	Q	Q				
26							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
27							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
28							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
29							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
30							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
31							Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q				
Median value																								
Count																								

Sweep 1.2 Mc to 12.5 Mc in 1.5 min Manual

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denshi-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

Jan 1949

h<sub>p</sub>

Yamagawa

Lat. 37°15'N  
Long. 139°37.7'E

IONOSPHERIC DATA

135°E Mean Time

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	Q	230	210	220	C	C	C	C	C	C	C	C						
2							Q	Q	220	230	240	240	240	240	240	240	240	240	240	240					
3							Q	Q	Q	Q	210	230	240	240	240	240	240	240	240	240					
4							Q	Q	Q	Q	210	210	200	230	240	240	240	240	240	240					
5							Q	Q	Q	Q	210	Q	220	220	220	240	240	240	240	240					
6							Q	Q	220	230	230	230	230	230	230	230	230	230	230	230					
7							Q	Q	210	Q	210	210	230	240	210	C	C	C	C	C					
8							Q	Q	Q	Q	210	220	220	220	220	260	260	260	260	260					
9							Q	Q	Q	220	250	220	Q	220	Q	210	Q	Q	Q	Q					
10							Q	Q	Q	Q	Q	C	C	C	C	C	C	C	C	C					
11							Q	Q	Q	220	Q	C	C	C	C	C	C	C	C	C					
12							Q	Q	220	C	Q	C	230 <sup>A</sup>	240 <sup>H</sup>	Q	220	Q	Q	Q	Q					
13							Q	240	C	C	C	C	C	C	C	C	C	C	C	C					
14							Q	C	C	C	C	C	C	C	C	C	C	C	C	C					
15							Q	Q	Q	Q	Q	220	230	250	240	Q	Q	Q	Q	Q					
16							Q	Q	Q	Q	Q	220	220	220	230	Q	Q	220	220	220					
17							Q	Q	Q	Q	Q	230	220	220	Q	Q	230	230	230	230					
18							Q	220	Q	220	250	Q	(250)	Q	Q	250	C	C	Q	Q					
19							Q	Q	Q	Q	230	Q	Q	230	230	Q	240	Q	Q	Q					
20							Q	Q	Q	Q	230	Q	220	220	220	220	220	220	220	220					
21							Q	Q	220	Q	Q	250 <sup>A</sup>	200 <sup>A</sup>	200 <sup>A</sup>	200 <sup>A</sup>	Q	200 <sup>A</sup>	200 <sup>A</sup>	200 <sup>A</sup>	200 <sup>A</sup>					
22							Q	Q	Q	Q	Q	230	Q	Q	Q	Q	Q	Q	Q	Q					
23							Q	Q	Q	Q	Q	B	B	Q	Q	Q	Q	Q	Q	Q					
24							Q	Q	Q	Q	Q	Q	Q	Q	Q	220	220	220	220	220					
25							Q	Q	220	240	220 <sup>A</sup>	240	Q	210	250	250	250	250	250	250					
26							Q	Q	Q	230	Q	Q	210 <sup>A</sup>	230	Q	230	(220 <sup>A</sup> )	A	Q	Q					
27							Q	Q	Q	Q	Q	Q	Q	Q	220	200	Q	Q	Q	Q					
28							Q	A	Q	Q	230	Q	230	Q	Q	Q	Q	Q	Q	Q					
29							Q	Q	Q	Q	210	Q	210	220	210	Q	200	200	200	200					
30							Q	Q	Q	Q	Q	230	210	220	Q	Q	Q	Q	Q	Q					
31							Q	Q	Q	230	Q	Q	Q	Q	C	Q	Q	Q	Q	Q					
Mean Value									220	230	230	230	220	230	220	230	230	230	230	230					
Count								1	7	8	9	14	16	17	15	14	12	5	2						

Sweep 1.2 Mc to 18.5 Mc in 1.5 min

Manual

Y 5





Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

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Yamagawa

Lat. 31 12.5N  
Long 139 37.7E

Day	155°E Mean Time											19	20	21	22	23								
	00	01	02	03	04	05	06	07	08	09	10						11	12	13	14	15	16	17	18
1	2.4	2.2	2.2	2.4	4.2	B	E	R	2.4	B	B	C	C	C	C	C	C	C	3.2	E	2.2	E	E	
2	E	E	E	E	E	E	E	E	<fE	<fE	3.6	B	4.3	5.3	4.6	B	3.0	3.8	3.4	B	2.4	(3.6)	E	
3	E	E	E	E	E	E	E	E	<fE	B	B	B	4.0	4.2	3.2	B	B	2.2	3.3	E	E	2.3	E	
4	E	B	E	E	E	E	E	E	<fE	2.4	3.4	5.4	3.8	4.2	<fE	4.4	3.8	5.2	3.6	2.8	2.2	2.0	B	
5	E	E	E	E	E	E	E	E	<fE	<fE	3.4	(4.6)	B	B	B	B	3.6	B	<fE	E	E	E	E	
6	E	E	E	E	E	E	E	E	4.2	3.0	B	3.6	B	B	B	B	<fE	<fE	B	B	2.4	2.2	E	
7	E	E	E	E	E	E	E	E	(2.3)	3.5	<fE	3.8	3.8	3.5	3.5	C	C	C	E	E	E	E	E	
8	E	E	E	E	E	E	E	E	<fE	<fE	4.2	4.8	3.4	B	B	3.2	3.0	<fE	2.6	E	E	E	E	
9	E	E	E	E	2.8	2.2	E	E	2.4	3.6	<fE	4.1	5.0	5.2	4.2	4.2	<fE	3.2	3.4	3.0	2.8	E	E	
10	E	E	E	E	2.2	E	E	E	<fE	<fE	<fE	C	C	C	C	C	5.6	<fE	<fE	E	2.4	E	E	
11	E	E	E	E	E	E	E	E	<fE	3.0	<fE	C	C	C	C	C	C	C	C	4.8	3.8	3.0	2.8	E
12	E	E	E	E	E	E	E	E	B	C	<fE	C	4.6	B	<fE	B	3.2	<fE	B	E	E	3.0	E	
13	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C	C	C	C	E	E	E	E	
14	E	E	E	E	E	E	E	E	C	C	C	C	C	C	C	C	C	C	2.2	2.4	3.2	E	E	
15	E	E	E	E	E	E	E	E	2.9	<fE	3.8	4.6	4.2	4.2	B	B	B	2.3	B	B	E	E	E	
16	E	E	E	E	E	E	E	E	<fE	3.3	3.5	<fE	B	B	<fE	B	3.5	2.4	B	E	E	E	E	
17	E	E	E	E	E	E	E	E	4.0	<fE	B	B	4.4	5.4	B	3.2	<fE	<fE	<fE	E	E	E	E	
18	E	2.6	3.0	C	E	E	E	E	<fE	<fE	B	B	B	B	B	B	C	C	2.6	3.2	3.0	E	E	
19	E	2.0	2.7	E	E	E	E	E	B	<fE	4.3	4.2	4.3	4.6	3.3	3.6	3.2	(4.2)	E	E	E	E	E	
20	2.2	E	E	E	E	E	E	E	B	<fE	3.8	4.2	5.4	5.2	(6.6)	(7.4)	4.2	5.0	5.2	5.4	3.4	E	E	
21	E	E	E	E	E	E	E	E	2.3	3.8	4.4	5.2	4.8	7.0	6.4	5.4	5.8	4.6	2.8	2.4	E	2.4	E	
22	E	E	E	E	E	E	E	E	<fE	<fE	<fE	B	3.8	3.6	4.1	5.2	<fE	<fE	<fE	2.8	E	E	E	
23	E	E	E	E	2.6	E	E	E	<fE	3.6	3.6	B	B	B	B	B	B	2.8	B	E	E	E	E	
24	E	E	E	E	E	E	E	E	<fE	B	3.8	4.2	4.2	3.7	B	4.0	2.6	3.2	2.0	E	3.0	E	E	
25	2.4	E	E	E	E	E	E	E	<fE	<fE	5.0	4.2	4.2	B	4.4	4.1	<fE	<fE	<fE	E	E	E	E	
26	E	E	E	E	E	E	E	E	<fE	<fE	2.6	5.0	5.8	4.4	6.8	B	5.4	5.2	3.8	4.2	3.8	2.4	E	
27	E	E	E	E	E	E	E	E	<fE	B	4.4	5.2	5.0	6.0	4.0	3.6	B	<fE	1.8	E	E	E	E	
28	E	E	E	E	E	E	E	E	2.5	3.1	3.6	3.8	4.7	3.8	4.2	4.6	3.7	3.8	2.5	2.5	2.2	E	E	
29	E	E	E	E	E	E	E	E	<fE	B	<fE	4.5	4.3	B	4.2	3.6	3.0	4.2	2.4	2.8	2.6	3.2	3.6	
30	E	E	E	E	E	E	E	E	<fE	3.4	4.5	4.1	4.8	4.6	3.8	4.2	4.0	5.2	3.6	3.6	4.4	2.6	E	
31	E	E	E	E	E	E	E	E	<fE	<fE	3.7	B	B	B	C	3.6	2.8	<fE	C	6.6	6.2	4.4	E	
Median Value	E	E	E	E	E	E	E	E	<fE	3.6	4.5	4.4	4.3	4.2	4.1	3.2	2.8	2.5	2.7	E	E	E	E	
Count	31	3.0	31	30	31	30	31	20	26	23	24	19	18	17	18	19	24	22	28	30	31	30	30	

Sweep 1.2 Mc to 18.5 Mc in 1.5 min Manual



Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Daimitsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Yamagawa  
 Lat. 31°25'N  
 Long. 139°37'E

F<sub>2</sub>-M3000

Jan 1949

Day	135°E Mean Time											19	20	21	22	23										
	00	01	02	03	04	05	06	07	08	09	10						11	12	13	14	15	16	17	18		
1	2.7	2.7	2.7	2.6	3.0	2.9	2.7	2.9	3.2	JH	J	J	C	C	C	C	C	C	J	J	J	J	3.1	3.1	3.0	2.5
2	2.9	2.7	3.0	2.6	3.0	3.2	2.8	2.9	3.5	3.7	J	J	3.3	(2.7) <sup>P</sup>	J	3.0	2.9	J	3.1	2.9	3.2	H	3.3	3.2	S	2.9
3	2.9	J	J	3.0	2.7	2.6	3.0	3.0	3.5	3.1	S	J	3.5	3.3	3.3	J	J	3.5	3.3	3.3	3.3	3.3	3.3	3.3	3.1	2.8
4	2.7	3.0	2.9	3.0	3.0	2.6	3.1	3.4	3.6	3.6	J	J	J	J	J	J	J	3.4	3.3	3.4	3.3	3.4	J	J	3.2	2.9
5	2.8	2.8	2.7	2.9	J	(3.5) <sup>F</sup>	2.7	2.8	3.4	JF	3.3	3.3	J	J	J	J	J	3.2	3.5	2.9	3.3	3.3	3.3	3.0	3.3	2.7
6	2.6	2.6	2.7	3.2	J	3.4	2.7	2.9	J	J	J	J	J	J	J	J	J	3.3	3.4	3.2	J	3.3	3.3	3.0	3.0	2.5
7	2.7	2.6	2.4	JF	5	JF	2.7	3.0	JH	3.0	H	J	J	J	J	J	C	C	C	C	C	C	C	3.0	3.0	2.8
8	2.6	2.7	2.9	3.1	3.3	3.3	2.8	3.2	3.5	3.5	3.3	3.1	3.2	J	J	J	3.2	3.4	3.4	3.3	3.1	3.6	2.9	2.7	2.7	
9	2.6	2.6	2.7	(2.4)	3.2	3.0	2.7	2.9	3.5	3.4	3.4	3.2	(3.2) <sup>C</sup>	3.3	2.9	H	3.2	3.1	3.3	J	3.3	J	3.2	3.1	2.7	
10	2.9	2.9	(3.0)	3.0	2.9	2.5	2.5	2.5	3.5	3.1	H	C	C	C	C	C	J	3.5	3.6	J	3.4	3.3	3.4	3.4	3.1	
11	2.6	2.8	2.4	3.0	2.6	2.9	3.1	3.3	3.0	3.3	C	C	C	C	C	C	3.1	3.5	3.5	3.2	3.2	3.4	3.2	3.2	2.4	
12	2.6	2.5	2.5	2.9	2.8	3.1	J	3.1	3.3	(3.5) <sup>F</sup>	3.7	(3.4) <sup>C</sup>	3.2	3.1	(3.1) <sup>C</sup>	3.1	3.1	3.5	3.5	3.2	3.2	3.0	3.0	2.5	2.6	
13	(2.6)	2.4	2.7	3.0	2.8	2.7	2.6	3.3	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.0	3.0	2.6	
14	2.7	2.6	2.8	2.7	3.1	2.4	2.6	C	C	C	C	C	C	C	C	C	C	C	C	C	C	3.1	3.3	3.4	3.2	3.0
15	3.0	2.5	3.0	JH	3.6	2.6	3.0	2.8	3.5	3.2	3.3	3.0	(3.9)	3.1	2.7	2.9	H	3.0	3.0	J	3.0	3.5	J	3.1	3.0	
16	3.0	2.8	2.7	J	3.2	2.9	2.8	3.0	3.3	JH	3.3	3.2	3.2	3.0	3.0	2.8	2.8	3.0	3.3	J	3.2	J	3.2	J	2.8	
17	2.4	2.9	2.7	2.8	3.1	2.4	2.3	2.9	3.3	3.2	3.0	2.8	2.9	J	2.8	3.0	3.2	3.3	3.1	3.1	3.2	J	3.2	J	2.8	
18	2.6	2.6	2.5	(2.7)	3.0	2.5	2.5	2.5	3.3	3.2	3.3	3.2	3.2	2.9	J	2.8	2.7	3.1	2.8	2.9	2.9	3.3	3.3	2.9	3.3	2.9
19	2.5	J	2.7	2.5	2.6	2.7	2.7	2.9	3.4	3.2	2.9	B	2.9	2.7	5	2.8	3.1	2.8	2.9	2.9	J	J	J	3.5	2.8	
20	2.6	2.8	2.9	2.9	2.8	2.5	2.8	2.8	3.3	3.5	3.2	3.3	3.1	2.8	2.9	2.9	2.8	2.9	3.5	3.5	3.2	3.1	3.2	3.1	3.2	2.8
21	2.9	2.6	2.7	2.9	3.1	(2.8)	2.4	2.7	3.3	3.6	3.1	3.2	2.7	2.7	H	J	J	J	3.1	3.1	3.1	3.1	3.1	3.1	2.9	2.8
22	2.7	3.1	3.0	3.1	2.8	2.7	2.6	2.8	3.4	3.2	3.5	3.0	3.0	2.9	H	3.0	3.0	3.0	2.9	3.2	3.2	3.2	3.2	3.2	2.9	2.8
23	2.7	2.5	3.0	3.3	3.2	2.5	2.7	2.5	3.3	3.4	3.2	B	(3.1) <sup>H</sup>	2.8	3.0	2.8	2.8	3.0	3.0	J	3.3	3.3	3.3	3.3	3.0	2.6
24	2.5	2.3	2.6	2.7	2.5	2.5	3.0	2.8	3.3	3.3	3.4	H	3.3	3.0	2.7	2.8	2.8	3.1	3.1	3.2	3.1	3.2	3.1	3.2	2.9	2.4
25	2.7	2.5	J	3.4	(2.6) <sup>K</sup>	2.4	2.6	2.6	3.6	J	3.0	J	B	3.0	2.5	2.7	2.7	3.0	3.1	2.8	3.1	2.8	3.0	3.0	2.9	3.0
26	2.9	2.7	3.0	3.8	3.4	J	3.1	3.0	3.1	2.6	3.2	2.8	J	H	S	S	2.7	2.9	3.4	3.4	3.4	3.3	3.1	3.1	3.0	
27	3.5	3.4	2.5	2.4	2.5	2.2	2.8	2.7	3.3	3.1	J	B	J	J	2.8	3.0	3.0	3.1	(3.3) <sup>B</sup>	J	3.4	3.4	3.4	3.5	3.0	
28	2.6	2.6	3.0	2.6	J	JF	(2.7) <sup>F</sup>	2.9	J	J	3.3	J	3.3	3.0	3.2	2.9	3.0	3.2	3.3	3.3	3.3	2.9	5	3.2	3.1	
29	2.9	2.8	2.9	2.8	J	2.4	2.5	2.9	3.5	2.2	3.4	2.9	J	J	J	BH	J	2.9	3.3	2.9	3.3	3.3	3.3	3.0	2.6	
30	3.0	2.9	2.9	3.3	3.7	2.5	2.0	2.6	3.2	3.1	3.3	3.2	2.8	2.9	J	B	2.8	S	3.5	3.0	3.3	3.0	2.8	3.1	2.9	
31	2.7	2.7	3.0	3.1	3.0	2.7	2.9	3.0	3.3	3.3	3.2	3.3	2.9	3.0	(2.9) <sup>C</sup>	2.9	2.9	2.9	(2.9) <sup>C</sup>	2.9	2.9	2.9	2.9	3.1	2.7	2.6
Mean Value	2.7	2.7	2.8	2.9	3.0	2.6	2.7	2.9	3.3	3.3	3.2	3.2	3.0	2.9	2.9	2.9	2.9	3.1	3.3	3.2	3.3	3.1	3.3	3.1	3.0	2.8
Count	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Y 9

Manual

Sweep 1.2 Mc to 18.5 Mc in 1.5 min

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

f<sub>min</sub>

Yamagawa

Lat. 35°12.5'N  
Lon. 130°37.7'E

135°E Mean Time

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	2.0	A	2.0	A	A	2.3	2.0	2.0	2.2	3.4	3.0	3.8	C	C	C	C	C	C	C	A	2.2	A	2.0	1.9
2	2.0	1.8	2.0	1.9	2.0	2.0	1.7	2.7	2.7	2.8	3.2	A	4.6	A	A	3.6	3.0	2.2	2.0	A	2.2	2.0	2.0	2.0
3	2.0	2.2	2.0	2.0	1.9	2.0	2.0	1.8	2.2	2.9	3.3	3.5	4.2	4.1	A	3.6	3.1	2.2	2.0	1.9	1.8	2.1	2.0	2.0
4	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.3	2.2	A	A	A	A	A	3.5	A	A	A	A	A	1.8	2.1	2.2
5	2.0	2.0	1.8	2.0	1.8	1.9	2.0	2.0	2.2	2.7	A	A	3.8	3.7	3.6	3.4	3.6	2.3	1.8	1.7	1.8	1.8	1.7	1.8
6	1.7	1.8	1.8	2.0	2.1	2.0	2.1	2.0	2.2	3.0	3.4	3.5	4.2	4.1	4.4	4.1	3.0	2.4	2.2	2.0	A	2.0	2.0	1.9
7	1.6	1.6	1.6	2.0	2.0	2.0	2.1	2.0	2.2	2.9	3.5	3.8	4.1	3.7	4.1	C	C	C	1.8	1.8	2.0	1.8	1.8	2.0
8	1.8	2.0	1.8	1.5	1.9	2.0	1.9	1.5	2.3	2.8	A	3.8	4.1	3.8	4.1	3.8	3.4	2.5	1.6	1.6	1.5	1.8	1.6	1.5
9	1.5	1.6	1.5	1.6	1.6	1.6	1.6	1.6	2.2	3.0	3.4	A	A	A	A	A	3.0	2.7	4.1	1.8	1.8	2.0	1.8	2.0
10	2.0	2.0	1.7	1.7	1.7	1.5	1.6	1.6	2.4	3.3	4.4	C	C	C	C	C	A	2.8	1.6	1.8	1.8	1.6	1.6	1.6
11	1.5	1.5	A	A	1.6	1.5	1.4	2.6	2.1	3.0	3.4	C	C	C	C	C	C	C	C	A	A	2.0	2.0	2.0
12	2.0	1.8	1.5	2.0	2.0	1.8	2.0	2.0	2.0	(2.7)	3.4	C	A	3.8	3.6	3.5	3.2	2.5	2.2	1.8	1.6	1.6	1.6	1.6
13	1.6	1.6	1.6	1.5	2.0	1.5	1.5	2.0	C	C	C	C	C	C	C	C	C	C	C	C	1.8	1.8	1.8	2.0
14	1.8	1.9	1.8	1.7	1.8	1.6	1.8	C	C	C	C	C	C	C	C	C	C	C	C	A	1.7	1.6	1.5	1.5
15	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.7	2.3	3.2	A	A	A	A	4.2	4.0	3.8	A	3.8	4.0	2.0	2.0	2.0	1.8
16	2.0	1.5	1.8	1.7	1.7	1.6	1.8	2.2	2.4	3.1	3.7	4.1	4.1	4.4	4.1	4.4	3.1	2.6	2.0	1.8	1.9	1.8	1.6	1.6
17	1.4	1.6	1.5	1.8	1.8	1.8	1.8	1.8	2.3	3.0	3.6	4.0	3.4	A	4.2	3.6	2.8	2.4	1.6	1.6	1.6	1.6	1.6	1.6
18	1.6	2.0	1.6	(1.6)	1.6	1.5	1.6	1.6	2.5	3.0	3.6	4.2	4.2	4.4	3.8	3.2	C	C	2.0	A	A	1.8	1.6	1.6
19	1.6	1.7	A	2.0	1.8	1.8	1.8	2.0	2.2	2.8	3.4	A	A	A	A	A	3.0	A	2.0	A	A	1.8	1.6	1.6
20	A	1.6	1.5	1.4	1.6	1.6	1.4	1.5	2.5	3.0	A	A	A	A	A	A	A	A	A	2.0	1.8	2.0	1.8	1.7
21	1.6	1.5	1.6	1.8	1.8	1.8	1.8	1.8	2.2	A	A	4.7	A	3.8	A	A	A	A	A	A	A	1.5	1.6	1.6
22	2.0	2.0	1.8	1.6	1.6	1.6	1.6	1.6	2.2	2.9	3.5	4.0	4.0	4.1	A	A	3.4	2.5	1.8	A	1.7	1.6	1.6	1.7
23	1.7	1.7	1.7	A	1.5	1.5	1.5	1.6	2.2	3.0	3.4	(1.6)	6.4	4.7	4.6	4.2	4.0	A	2.0	1.8	2.0	2.0	2.0	2.2
24	1.8	1.8	1.8	1.5	1.5	1.5	1.6	1.5	2.3	3.2	3.3	A	A	4.0	3.8	A	3.2	2.6	A	1.6	1.6	1.6	1.6	1.6
25	1.6	1.6	1.6	1.7	A	1.6	1.5	1.4	4.4	3.1	3.3	A	4.1	4.3	A	A	3.0	2.6	1.8	1.8	1.6	1.6	1.6	1.6
26	1.5	1.6	1.6	A	1.8	2.0	1.6	2.0	1.9	3.0	A	A	A	4.2	4.2	4.2	A	A	A	A	A	2.0	1.5	1.5
27	1.6	1.6	1.6	1.6	1.7	1.9	1.8	1.8	3.2	3.0	4.0	4.2	4.0	4.0	3.6	3.4	3.1	2.7	1.6	1.8	1.5	1.6	1.6	1.4
28	1.5	1.4	1.6	1.5	1.4	1.4	A	A	2.4	3.0	3.4	4.2	4.2	4.2	4.2	4.0	3.1	2.8	1.8	2.0	1.6	2.0	1.6	1.6
29	1.6	1.6	1.8	1.8	2.0	1.8	1.6	1.6	2.8	2.8	3.5	3.8	3.8	4.2	3.2	(3.3)	3.0	2.6	2.0	2.2	2.0	A	A	1.6
30	1.6	1.5	1.6	1.5	1.5	1.5	1.5	1.6	2.1	3.1	3.5	3.8	4.1	4.6	3.6	3.8	3.8	3.4	2.0	A	A	1.6	1.5	1.5
31	1.8	1.6	1.5	1.6	1.4	1.4	1.7	1.6	2.7	3.0	3.4	3.6	3.6	3.4	(3.2)	3.0	3.0	2.8	C	A	A	1.8	1.8	1.8
Median Value	1.7	1.7	1.6	1.7	1.8	1.6	1.8	1.8	2.3	3.0	3.4	3.9	4.1	4.1	4.0	3.6	3.1	2.6	2.0	1.8	1.8	1.8	1.8	1.7
Count	30	30	29	27	29	31	30	29	29	28	22	16	17	19	18	17	20	18	21	18	22	26	30	31

Sweep 12 Mc to 15.5 Mc in 15 min

Manual

Y 10

Electrical Communication Laboratory, Japanese Ministry of Telecommunications  
(Denki-tsushin Kenkyujo) Gotanda, Shinagawa-ku, Tokyo, Japan

IONOSPHERIC DATA

Jan 1949

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

Yamagawa

Lat. 31°12.5'N  
Long. 130°37.7'E

Day	135°E Mean Time												16	17	18	19	20	21	22	23			
	00	01	02	03	04	05	06	07	08	09	10	11									12	13	14
1	2.0	2.0	2.0	2.0	2.0	B	B	2.2	B	B	B	C	C	C	C	C	C	2.0	E	2.0	E	E	
2	E	E	E	E	E	E	E	2.0	2.2	2.1	2.1	2.6	2.2	2.1	2.2	2.2	2.0	2.0	B	2.2	(2.4)	E	E
3	E	E	E	E	E	E	E	B	B	2.1	3.0	B	2.8	2.8	2.2	B	B	2.0	1.9	E	E	2.1	E
4	E	B	E	E	E	E	E	2.0	2.2	2.2	2.2	2.2	2.2	2.8	2.2	2.2	2.0	1.6	1.8	1.8	1.8	E	B
5	E	E	E	E	E	E	E	2.1	2.1	2.4	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	E	E	E	E	E
6	E	E	E	E	E	E	E	2.0	2.2	2.2	2.2	B	B	B	B	2.2	(2.2)	B	B	2.0	2.0	E	E
7	E	E	E	E	E	E	E	2.0	2.1	2.0	2.2	2.5	2.0	2.0	C	C	C	C	E	E	E	E	2.0
8	E	E	E	E	E	E	E	2.1	2.2	2.2	3.8	2.4	B	B	2.8	2.8	2.0	2.2	E	E	E	E	E
9	E	E	E	E	2.2	1.6	E	1.6	2.0	2.2	2.4	2.6	3.4	2.4	2.0	2.0	2.0	1.8	1.8	1.8	E	E	E
10	E	E	E	E	1.7	E	E	1.6	2.4	2.4	C	C	C	C	C	2.8	2.2	(1.6)	E	2.2	E	E	E
11	E	E	1.4	1.6	E	E	E	2.0	2.0	2.0	C	C	C	C	C	C	C	C	2.0	2.0	2.0	2.0	E
12	E	E	E	E	E	E	E	B	C	2.2	(2.7)	3.2	3.2	2.2	2.1	2.2	1.6	B	E	E	2.0	E	
13	E	E	E	E	1.5	E	E	C	C	C	C	C	C	C	C	C	C	C	C	E	E	E	E
14	E	E	1.8	E	E	E	E	C	C	C	C	C	C	C	C	C	C	1.9	1.6	2.4	E	E	E
15	E	E	E	E	E	E	E	1.6	2.0	2.2	3.6	3.5	3.3	B	B	B	2.2	B	B	E	E	E	E
16	E	E	E	E	E	E	E	2.1	2.0	2.9	3.0	B	B	B	3.3	B	2.1	1.8	B	E	E	E	E
17	E	E	E	E	E	E	E	1.8	2.0	B	B	4.0	2.8	B	B	2.2	2.0	2.0	B	E	E	E	E
18	E	2.4	2.4	C	E	E	E	B	2.0	B	B	B	B	B	B	C	C	2.0	1.7	1.8	E	E	E
19	E	1.7	1.5	E	E	E	E	2.0	2.0	2.0	2.0	2.8	2.2	2.2	2.0	2.0	2.2	(2.8)	E	E	E	E	E
20	1.6	E	E	E	E	E	E	B	2.0	2.2	3.0	3.4	3.0	3.0	2.8	2.0	2.0	2.0	1.7	E	E	E	E
21	E	E	E	E	E	E	E	1.8	2.1	2.2	2.9	3.5	3.8	1.9	2.2	2.2	2.2	2.0	1.6	1.6	E	2.0	E
22	E	E	E	E	E	E	E	(1.8)	1.8	2.0	3.2	2.0	2.0	2.0	2.1	2.0	2.0	E	1.8	E	E	E	E
23	E	E	E	E	1.5	E	E	1.6	1.6	2.0	B	B	B	B	B	B	B	2.2	B	E	E	E	E
24	E	E	E	E	E	E	E	1.8	2.2	2.7	3.2	3.0	3.0	2.9	3.0	2.2	1.8	1.8	E	(2.0)	E	E	E
25	2.2	E	E	E	(1.8)	E	E	2.0	1.8	2.0	2.5	2.6	B	2.3	2.0	1.7	1.6	B	E	E	E	E	E
26	E	E	E	1.6	E	E	E	B	2.2	2.2	2.6	2.8	4.2	4.2	B	3.9	2.2	1.8	1.8	1.8	1.6	E	E
27	E	E	E	E	E	E	E	1.8	B	2.0	2.0	2.6	3.6	1.9	2.0	B	2.0	1.6	E	E	E	E	E
28	E	E	E	E	E	1.5	E	1.6	1.6	2.2	2.7	2.8	3.0	2.6	2.2	2.2	2.0	2.0	1.6	E	E	E	E
29	E	E	E	E	E	E	E	1.6	B	3.4	2.3	2.3	B	2.2	1.8	2.0	1.8	1.8	1.8	1.8	1.8	1.6	E
30	E	E	E	E	E	E	E	2.0	2.0	1.9	2.2	2.3	2.2	3.4	2.6	2.8	2.0	1.6	1.5	1.7	1.6	E	E
31	E	E	E	E	E	E	E	1.5	2.2	2.0	3.0	B	B	C	2.0	2.2	2.0	(1.8)	1.6	1.6	1.8	E	E
Mean Value								1.9	2.0	2.2	2.6	2.6	2.9	2.3	2.2	2.2	2.0	1.8	1.6	E	E	E	E
Count	31	30	31	30	31	30	31	24	2.4	2.6	2.3	2.0	1.8	1.9	1.9	2.1	2.4	2.0	2.8	3.0	3.1	3.1	3.0

Sweep 1.2 Mc to 18.5 Mc in 15 min Manual

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