

IONOSPHERIC DATA AT SYOWA STATION (ANTARCTICA)

January – December 2009

CONTENTS

	Page
Introduction·····	1
Tables·····	4
Monthly plots of f_oF2 , f_{min} , fE_s , and $h'F$ ·····	64
Monthly median plots of f_oF2 ·····	76
Monthly median plots of fE_s ·····	88



NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This data book summarizes the results for vertical soundings of the ionosphere at Syowa Station, Antarctica in 2009. The observations were conducted by the National Institute of Information and Communications Technology under the sponsorship of the National Institute of Polar Research of Japan. The location of the station, specifications of the ionosonde, and symbols used in this data book are as follows:

Geographic		Geomagnetic *	
Latitude	Longitude	Latitude (Deg.)	Longitude (Deg.)
69°00.4'S	39°35.4'E	- 70.4	83.5

* Geomagnetic latitude and longitude were calculated using IGRF-10 (2005).

SPECIFICATIONS OF THE IONOSONDE USED AT SYOWA STATION

Items	Specifications
Frequency Range	1MHz - 15MHz
Transmitting Power	10kW (peak value)
Duration of Sweep	15 s
Transmitted Pulse Width	80 μ s
Pulse Repetition Frequency	100 Hz
Height Range	0 - 1000km
Recording Media	Hard drive
Power Supply	100V-AC, 2.0kVA
Transmitting Antenna and Receiving Antenna	30-m-high vertical delta antennas terminated by 600 Ω

OBSERVERS

Observer: M. Umetsu

Scaler: K. Fukushima

DESCRIPTION

- a. All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the *URSI Handbook of Ionogram Interpretation and Reduction* (second edition 1972)

b. Characteristics of Ionosphere

fxI	Top frequency of spread F traces or oblique traces.
$foF2$	Ordinary wave critical frequency for the $F2$ layer.
$fEs(ftEs)$	Top frequency of Es layer as reflected overhead
$fmin$	Lowest frequency of the vertical ionospheric reflections.
$h'F$	Minimum virtual height of the ordinary wave F trace as a whole.

Symbols

(i) Descriptive Letters.

The following letters are entered after, or used to replace, numerical values on the monthly tabulation sheets.

A	Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example, Es .
B	Measurement influenced by, or impossible because of, absorption in the vicinity of $fmin$.
C	Measurement influenced by, or impossible because of, any non-ionospheric reason.
D	Measurement influenced by, or impossible because of, the upper limit of the normal frequency range.
E	Measurement influenced by, or impossible because of, the lower limit of the normal frequency range.
F	Measurement influenced by, or impossible because of, the presence of spread echoes.
G	Measurement influenced or impossible because the ionization density of the layer is too small to enable it to be made accurately.
H	Measurement influenced by, or impossible because of, the presence of stratification.
K	Presence of particle E layer.
L	Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
M	Interpretation of measurement questionable because ordinary and extraordinary components are not distinguishable.
N	Conditions are such that the measurement cannot be interpreted.
O	Measurement refers to the ordinary component.
P	Spur type spread present.
Q	Range spread present.
R	Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S	Measurement influenced by, or impossible because of, interference or atmospheric.
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V	Forked trace that may influence the measurement.
W	Measurement influenced or impossible because the echo lies outside the recorded height range.
X	Measurement refers to the extraordinary component.
Y	Lacuna phenomena, severe layer tilt .
Z	Third magneto- electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before numerical values on the monthly tabulation sheets.

D	Greater than.
E	Less than.
J	Ordinary component characteristic deduced from the extraordinary component .
M	Mode interpretation uncertain.
O	Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
T	Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U	Uncertain or doubtful numerical value.
Z	Measurement deduced from the third magneto-electronic component.

(iii) Definitions of CNT, MED, UQ, and LQ

CNT (median count) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

MED (median) is the middle value when the numerical values are arranged in the order of magnitude, or the average of the two middle values if there is an even number of values.

UQ (upper quartile) is the median value of the upper half of the values when they are ranked according to magnitude.

LQ (lower quartile) is the median value of the lower half.

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2009 f_{XI} (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)
 LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	R	R	A	R	R	R	B	R	R	R	R	R	Y	R	B	R	B	B	B	O	X	B	X	X	X		
2	X	X	O	X	R	O	X	X	O	X	R	R	O	X	O	X	R	O	X	O	X	X	X	X	O	X	
3	54	R	R	B	B	B	B	R	R	R	R	R	O	X	B	B	B	B	R	O	X	X	X	X	X		
4	X	R	R	A	R	B	O	X	O	X	O	X	O	X	O	X	R	B	R	X	A	O	X	X	X		
5	X	X	A	O	X	R	O	X	X	R	X	O	X	R	B	R	B	R	O	X	O	X	X	R	O	X	
6	A	A	O	X	X	O	X	R	R	O	X	O	X	R	R	O	R	R	O	X	O	X	X	O	X	O	X
7	X	O	X	X	X	X	X	X	X	O	X	X	R	O	X	B	B	R	A	O	X	O	X	O	X	X	X
8	X	45	48	X	44	X	O	X	X	X	O	X	X	R	O	X	R	O	X	O	X	R	O	X	X	X	
9	X	B	A	A	A	O	X	O	X	R	X	X	O	X	O	X	B	O	X	R	R	B	O	X	X	X	
10	37	A	B	O	X	B	B	A	A	R	R	O	X	R	O	X	R	R	R	O	X	O	X	O	X	X	
11	X	R	A	A	A	R	R	X	O	X	O	X	R	R	R	R	O	X	R	A	O	X	A	O	X	X	
12	O	X	X	O	X	O	X	O	X	O	X	O	X	O	X	R	R	R	A	A	O	X	O	X	O	X	X
13	45	49	45	45	48		51	52	63	57	54		52		51	51	50			51	49	49	45	42	42		
14	X	O	X	X	X	A	A	A	A	O	X	O	X	A	A	R	O	X	R	R	B	A	A	A	X	X	
15	X	A	A	A	A	A	R	O	X	X	R	R	O	X	O	X	R	R	R	R	O	X	O	X	X	A	
16	A	A	A	A	A	59	A	O	X	O	X	O	X	X	R	R	R	R	R	R	O	X	O	X	O	X	
17	44	39	41	44	48	50	51	52	54		R	R	B	R	R	R	R	R	O	X	O	X	O	X	X		
18	34	36	40	44	45	46	44	47	51	52		R	R	R	R	R	R	R	O	X	R	O	X	O	X		
19	34	37	X	O	X	A	B	R	O	X	R	R	R	R	R	R	R	R	R	O	X	O	X	X	X		
20	A	A	B	B	R	R	X	O	X	O	X	R	R	R	R	R	R	R	R	O	X	O	X	O	X		
21	R	A	R	43	46	51	57	57	62		45	55															
22	X	A	R	R	R	44	50	52	53	58	56		57														
23	X	36	44	44	50	50	49	49	58	56	56	56															
24	X	X	39	44	50	56	60	57	56		C	C	C	C	56	56											
25	45	45	49	42	A	A	X	X	X	X	X	O	X	R	X	R	R	R	R	R	O	X	O	X	X		
26	X	39	O	X	X	B	R	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	O	X	X		
27	O	X	X	X	X	O	X	O	X	X	R	X	R	R	R	R	R	R	R	R	O	X	O	X	X		
28	O	X	O	X	X	X	O	X	X	X	X	O	X	R	R	X	X	X	X	X	O	X	O	X	X		
29	X	X	52	51	44	48	50	51		R	B	B	B	B	O	X	X	B	B	R	O	X	O	X	X		
30	44	45	44	45	48	50		49	53	53		R	R	R	O	X	R	B	X	O	X	O	X	X	X		
31	R	R	A	44	46	52	58	58		R	R	O	X	O	X	R	R	O	X	X	X	X	X	X	X		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	25	18	18	21	18	19	21	23	24	20	18	13	10	10	7	10	16	22	24	27	27	29	29	28			
MED	X	X	X	X	X	X	X	X	O	X	X	O	X	O	X	X	O	X	O	X	O	X	X	X	X		
U Q	43	40	42	44	46	48	50	52	54	56	55	56	54	56	56	52	50	48	48	47	46	45	44	42			
L Q	X	X	X	X	X	X	X	X	X	O	X	X	O	X	X	X	X	X	X	X	O	X	O	X	X		
	45	44	45	45	48	52	52	57	59	58	57	58	57	57	57	58	54	51	50	48	48	48	46	44			
	X	X	X	X	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	O	X	X	X	X	X		
	38	37	40	42	44	46	48	49	52	49	51	48	50	53	54	49	48	48	46	46	44	40	39	40			

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	R	A	B	A	A	R	R	R	Y	R	B	D	R	B	B	B	R	B	33	35	34		
2	33	34	34	R	R	R	40	46	48	48	R	R	R	A	R	R	41	40	39	38	37	40	38	B	36		
3	A	R	A	B	B	B	B	R	R	R	R	R	48	B	B	B	B	B	R	R	42	38	35	38	33		
4	37	A	A	A	R	B	R	42	43	46	42	45	48	51	45	R	B	R	A	A	R	39	34	32	34		
5	33	38	A	R	R	38	42	R	F	J	F	R	R	R	B	R	B	D	R	R	43	44	45	A	R		
6	A	A	R	36	36	40	41	R	A	R	R	R	R	R	R	R	R	R	R	R	44	42	42	R	R		
7	40	34	32	39	40	42	48	50	46	48	R	R	52	B	B	A	A	R	R	R	46	46	43	40	40		
8	39	F	38	39	34	F	38	43	45	51	57	61	56	52	R	R	U	R	U	R	R	R	J	R	43	35	
9	38	B	A	A	A	E	G	R	R	R	J	R	R	B	R	R	R	R	B	R	A	R	R	A	A		
10	F	A	B	R	B	B	A	A	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		
11	39	R	A	A	A	R	R	47	51	49	48	R	R	R	R	R	R	R	A	A	R	42	40	45	45	38	
12	R	36	37	38	40	43	47	47	50	50	50	51	50	R	R	R	R	R	A	A	R	40	44	39	35		
13	F	36	43	39	39	42	A	42	46	57	51	J	48	R	J	R	R	R	R	R	R	45	43	43	39	31	
14	32	R	F	33	35	37	A	A	A	A	R	R	A	A	R	R	R	R	B	A	A	A	40	34	30		
15	24	A	A	A	A	A	R	43	43	R	R	R	R	R	R	R	A	R	R	R	R	42	42	35	26		
16	A	A	A	A	A	A	A	R	R	R	R	J	R	R	R	R	R	R	R	R	R	R	R	R	R		
17	F	34	33	35	J	R	R	42	43	U	R	R	46	48	R	R	R	R	R	R	R	48	45	46	44	40	
18	F	F	34	38	V	39	40	35	F	41	45	46	R	R	R	R	R	R	R	R	R	44	42	41	41	38	
19	F	F	34	32	F	R	A	B	A	R	R	R	R	R	R	R	E	G	36	46	42	42	37	R	30		
20	A	A	B	B	R	R	39	42	42	41	R	R	R	R	R	R	R	R	R	R	R	44	42	42	37	41	
21	R	A	R	F	40	45	51	51	56	R	R	R	R	R	R	R	R	R	R	R	R	44	42	40	39	39	
22	31	A	R	R	A	38	44	46	47	52	50	R	J	R	R	R	R	R	R	R	R	42	42	42	41	40	
23	32	F	F	F	F	R	R	J	R	J	R	J	R	R	R	R	R	R	R	R	R	42	40	40	40	40	
24	40	34	26	31	F	44	50	52	51	50	R	R	R	R	R	R	R	R	R	R	R	42	42	39	J	R	
25	F	36	39	38	F	A	A	44	47	54	50	50	50	R	R	R	R	R	R	R	R	46	46	42	40	40	
26	40	29	43	35	B	R	44	51	50	56	56	56	59	J	R	54	56	58	J	R	54	39	38	B	A	A	
27	R	32	30	30	31	33	36	38	41	R	J	R	36	R	R	R	R	R	R	R	R	42	41	39	38	28	
28	R	34	25	32	36	39	42	46	52	58	50	50	50	R	R	R	R	R	R	R	R	52	51	53	41	42	
29	40	34	38	39	38	42	44	45	R	B	B	B	B	R	R	R	B	B	R	R	R	44	44	43	36	36	
30	F	34	F	38	39	42	44	B	R	R	R	R	R	R	R	R	R	R	R	R	R	50	46	44	A	38	
31	A	A	A	F	Z	F	F	F	R	R	R	R	R	R	R	R	R	R	R	R	R	48	52	58	64	44	41
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	24	18	18	21	18	18	21	23	24	20	18	13	10	10	7	11	17	22	24	27	27	29	29	28			
MED	34	34	34	36	40	42	44	46	48	50	49	50	48	50	50	46	44	42	42	41	40	39	37	35			
U Q	38	37	38	39	42	44	46	50	52	52	51	52	51	51	51	52	48	45	44	42	42	42	40	38			
L Q	32	F	F	F	38	40	42	43	46	43	45	42	44	47	48	43	42	42	40	40	38	34	33	32			

JAN. 2009 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2009 ftEs (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	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	40	39	46	27	34	40	68	J G 30	34	31	27	28	19	21	B	28	B	B	B E B	B	20	B	24	30	45
2	25	35	34	25	20	21	34	30	30	33	30	30	33	41	37	34	30	22	30	21	21	20	B	34	
3	34	33	37	B	B	B	B	39	32	36	29	31	32	B	B	B	B	B E B	B	28	28	26	20	20	19
4	31	35	39	44	34	B	32	26	28	28	28	32	30	30	G	B	G	24	43	37	30	32	30	34	
5	34	40	47	34	30	33	28	33	32	32	30	34	32	B	39	B	29	29	26	26	29	31	40	36	
6	104	82	35	30	30	G 22	32	39	30	30	30	26	33	33	26	35	31	30	27	28	25	23	30	34	
7	E B 20	25	26	42	26	23	30	25	25	28	34	30	B	B	43	69	42	32	26	24	24	20	20	16	
8	E B 14	B 15	27	25	34	28	30	26	33	34	34	34	36	42	42	33	41	25	28	38	22	20	21	30	
9	20	41	43	48	34	48	24	26	28	31	30	B	30	31	31	29	B	29	64	48	31	20	40		
10	36	34	70	37	B	B	43	56	41	29	32	29	32	27	35	28	42	32	37	32	38	27	21	16	
11	24	32	82	44	42	32	31	29	28	28	30	31	34	32	40	30	25	44	44	33	34	39	38	20	
12	E B E B 23 22	30	32	38	22	27	24	26	26	26	30	29	32	30	68	59	32	32	34	32	27	18	16		
13	15	38	48	48	44	44	32	45	43	32	32	33	43	36	34	43	45	45	75	57	36	37	18	39	
14	44	39	56	32	32	64	56	58	38	30	32	69	53	34	30	40	35	B	68	65	68	36	30	44	
15	34	43	43	44	44	44	45	33	32	32	48	32	34	35	35	47	28	G 22	22	32	26	31	34	42	
16	41	40	58	44	34	42	49	51	23	23	31	33	30	33	36	G 24	29	38	29	37	42	30	16	16	
17	16	22	21	18	18	24	27	24	30	27	28	B	31	27	32	29	31	25	26	25	24	16	26	32	
18	29	15	31	28	26	32	30	26	26	30	32	33	32	39	43	40	33	39	28	46	45	48	20	16	
19	25	28	36	69	38	58	B	40	31	32	G 22	29	34	33	36	30	30	29	37	24	18	32	22	43	
20	39	43	B	B	32	40	31	26	28	28	29	29	G 22	34	30	30	30	36	28	26	22	19	22	31	
21	36	43	34	24	42	26	28	26	26	30	32	35	39	30	30	39	38	30	32	23	26	31	31	36	
22	38	45	27	37	42	32	56	42	42	48	31	46	49	40	33	36	42	34	43	34	44	38	45	34	
23	28	30	22	34	25	20	28	29	32	44	C	C	C	C	70	36	30	77	28	34	43	43	23	28	35
24	36	48	28	38	41	49	50	40	33	C	C	C	C	70	36	30	77	28	34	43	43	23	28	35	
25	32	23	21	34	43	44	31	28	34	41	32	32	32	35	45	42	26	31	35	31	44	50	50	38	
26	42	31	70	63	B	32	32	31	23	31	25	36	33	30	38	29	29	E B 28	25	B	34	34	20	41	
27	17	18	32	20	20	24	24	33	27	28	29	38	29	42	36	G 20	25	24	24	G 16	20	22	17	32	
28	43	25	17	15	33	36	43	28	32	30	33	30	32	39	42	39	35	23	25	24	21	18	17	E B 13	
29	22	E B E B 14 14	E B 13	16	20	21	31	27	B	B	B	B	31	48	B	B	B E B	B E B	B E B	B E B	B E B	30	32	21	44
30	E B E B 12 13	18	16	16	19	B	44	33	G 20	24	34	30	33	G 24	B	36	24	28	42	20	31	18	29		
31	34	32	37	47	42	28	24	30	38	29	25	G E B 22 30	32	28	41	25	23	18	G 23	20	30	22	16		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	30	30	29	28	28	28	31	31	29	29	28	27	28	29	26	28	27	30	30	30	31	30	31	
MED	32	32	34	34	34	32	32	30	31	30	30	32	32	33	36	34	31	29	28	32	30	31	22	34	
U Q	38	40	46	44	42	41	44	40	33	32	32	34	34	39	41	41	41	34	37	38	42	34	30	40	
L Q	22	23	27	25	26	24	28	26	27	28	28	30	30	30	30	30	29	24	26	24	22	22	20	19	

JAN. 2009 ftEs (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	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	14	13	17	14	16	18	60	14	14	13	14	14	13	12	B	15	B	B	B	20	B	14	12	12
2	13	14	18	14	14	13	13	13	12	13	13	13	14	15	14	14	14	14	13	13	12	12	B	14
3	25	14	15	B	B	B	B	18	16	22	24	17	13	B	B	B	B	B	28	23	13	18	12	13
4	12	18	16	13	17	B	14	13	12	18	18	26	17	19	21	B	20	14	18	13	12	12	13	12
5	12	12	11	12	22	18	18	28	18	14	18	28	20	B	26	B	17	17	14	11	22	17	15	12
6	13	12	13	13	12	12	20	12	13	13	12	13	15	14	19	18	14	17	14	12	14	19	26	20
7	20	18	16	12	12	12	14	17	16	16	13	20	B	B	20	18	22	19	14	14	13	13	12	11
8	14	12	10	12	14	13	12	12	12	13	13	12	14	17	13	14	12	20	19	12	12	13	14	13
9	12	B	24	23	19	13	13	12	12	15	14	20	B	19	20	19	19	B	18	15	18	17	12	12
10	12	19	52	23	B	B	19	17	14	14	14	14	12	14	12	13	19	18	17	14	15	14	12	12
11	12	12	19	13	14	19	26	14	14	13	14	13	14	12	15	15	18	17	13	13	12	12	12	12
12	23	22	16	14	14	14	13	13	13	18	18	13	12	15	14	17	16	12	12	13	14	13	13	12
13	12	12	11	12	12	10	12	12	19	19	19	18	12	15	13	14	14	14	12	12	12	14	13	13
14	12	13	13	13	13	18	14	13	12	12	14	14	14	15	13	24	27	B	23	23	12	13	12	13
15	12	20	20	14	24	24	15	13	12	20	13	12	12	13	12	13	17	14	13	14	13	12	12	12
16	12	18	19	13	13	22	18	12	11	12	13	13	13	14	12	13	12	12	11	14	12	14	12	12
17	12	12	12	12	12	13	14	12	12	18	24	B	19	18	22	19	22	20	14	16	19	12	11	14
18	13	12	12	12	13	13	12	12	13	12	13	13	14	15	13	14	14	14	13	15	14	13	12	12
19	12	12	13	13	14	18	B	14	13	13	15	14	18	19	18	18	14	16	17	13	12	18	13	12
20	16	19	B	B	20	16	14	13	14	14	14	19	17	14	17	17	18	18	20	17	12	12	11	12
21	12	18	14	14	14	12	12	12	13	14	14	16	14	14	14	14	14	18	13	12	13	13	11	13
22	12	14	23	18	12	11	15	12	13	15	13	14	13	12	12	13	13	20	14	13	12	12	11	13
23	12	12	12	13	12	12	12	13	12	12	13	15	14	14	13	14	18	12	12	12	12	12	12	12
24	12	12	12	12	12	14	12	21	12	C	C	C	C	14	14	13	14	12	13	12	13	12	12	12
25	12	12	13	13	14	13	12	12	12	12	12	13	13	12	14	13	13	12	13	12	12	12	13	12
26	12	12	14	18	B	18	13	12	13	12	12	12	14	15	13	12	18	28	25	B	12	12	12	12
27	11	13	12	13	13	12	14	12	12	16	22	15	16	16	16	16	14	13	13	12	12	13	13	12
28	13	13	12	11	11	13	12	12	13	14	12	17	20	17	27	18	20	18	12	19	15	12	12	13
29	12	14	13	13	12	12	12	12	23	B	B	B	B	27	27	B	B	30	27	23	30	20	15	12
30	13	13	13	12	13	12	B	24	22	17	18	16	17	23	22	B	23	20	13	16	14	13	11	12
31	16	14	14	13	12	13	13	14	24	16	18	14	30	28	16	16	18	17	13	13	13	13	12	13
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31
MED	12	13	14	13	14	13	14	13	13	14	14	14	14	15	15	16	18	17	14	13	13	13	12	12
U Q	13	18	18	14	17	18	18	14	14	17	18	18	18	19	21	19	20	20	18	16	14	14	13	13
L Q	12	12	12	12	12	12	12	12	12	13	13	13	13	14	13	14	14	14	13	12	12	12	12	12

JAN. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2009 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D	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 A 260	A	A	A	A	A	B	A	A	218	208	A	Y	A	B	168	B	B	B	194	B	198	246	234	
2	230	238	A	A	246	214	224	202	194	194	204	180	220	A	A	196	196	182	202	184	184	198	B	A	
3	A	A	A	B	B	B	B	A	A	A	A	210	192	B	B	B	B	B	212	226	216	200	236	224	
4	E A 226	A	A	A	A	B	230	178	190	184	204	A	196	206	186	B	E A 222	A 176	H 248	E A 248	E A 186	A 216	A 216	A 244	
5	232	E A 268	A	206	A	E A 260	A	A	206	198	186	A	198	B	A	B	192	192	192	216	208	260	A	A	
6	A	A	A	E A 276	E A 226	A	A	A	204	174	174	170	H 186	A	192	A	202	198	H 174	H 160	206	E A 212	E A 234	A 234	
7	234	E A 258	E A 258	A	214	214	192	184	194	178	180	168	B	B	A	A	A	200	178	H 176	204	216	216	222	
8	202	252	282	178	H 164	224	190	190	184	176	184	194	202	214	194	176	204	194	194	A	186	210	224	224	
9	240	B	A	A	A	194	206	156	180	198	186	166	B	174	184	218	204	B	200	A	A	220	208	A	
10	184	A	B	A	B	B	A	A	200	190	200	180	196	196	196	196	E A 218	E A 218	E A 204	E A 234	220	222	202	242	
11	258	194	A	A	A	A	A	202	188	188	196	182	218	196	206	200	190	A	A	190	216	232	216	188	
12	E A 250	234	230	238	206	200	196	196	196	180	178	190	184	174	208	A	A	194	190	200	206	220	208	208	
13	218	224	218	238	A	E A 226	E A 204	A	190	200	202	196	218	196	246	E A 260	E A 214	A	A	204	200	218	202	296	
14	E A 266	A	E A 296	A	A	A	A	A	A	A	A	188	204	198	198	E A 214	A 194	A	B	A	A	A	E A 222	E A 260	O 242
15	A	A	A	A	A	E A 212	E A 214	202	A	A	180	180	H 180	A	H 170	A	196	192	H 200	200	194	200	A	A	
16	A	A	A	A	A	A	A	238	160	186	200	A	190	202	232	202	202	206	206	214	208	214	214	O 230	
17	214	214	230	246	226	192	196	188	204	192	180	B	180	194	224	196	204	200	194	194	208	172	192	A	
18	A	Q	E A 260	E A 248	240	E A 234	212	194	182	174	184	190	200	216	200	188	190	190	204	A	244	218	216	O 228	
19	216	246	A	A	212	A	B	A	208	230	210	178	E A 242	206	186	208	206	204	204	196	186	A	210	A	
20	A	A	B	B	A	E A 244	190	196	196	184	184	A	212	212	190	200	180	216	206	194	226	204	206	A	
21	A	A	A	A	A	200	208	196	208	198	194	A	192	198	208	178	208	226	212	202	204	220	238	O 224	
22	E A 224	A	A	A	A	200	226	182	182	176	200	A	222	186	190	A	186	A	204	A	232	208	220	A	
23	212	238	230	214	212	202	202	192	178	212	202	226	198	A	A	202	186	200	200	A	200	218	194	210	
24	226	A	242	244	214	A	194	200	190	C	C	C	C	190	182	196	A	202	206	236	232	180	O 208	O 214	
25	214	222	234	252	A	A	218	192	198	198	186	186	196	210	196	194	216	206	188	188	226	202	220	216	
26	210	248	248	A	B	A	236	194	182	180	180	188	198	198	198	186	210	208	208	B	A	A	204	A	
27	258	252	E A 262	E A 268	256	208	186	198	198	186	204	196	192	184	E A 214	H 188	178	178	178	180	212	214	222	O 256	
28	204	A	E A 280	E A 200	226	E A 264	170	212	202	190	182	188	174	202	208	198	208	188	194	218	224	224	218	218	
29	224	218	242	224	202	202	168	196	228	B	B	B	B	194	A	B	B	212	220	226	234	242	224	230	
30	224	220	230	230	230	206	210	194	188	182	198	198	198	212	184	B	196	196	196	A	210	222	O 216	O 246	
31	A	A	A	A	236	206	196	200	216	176	192	184	196	200	206	218	204	204	198	210	216	228	212	228	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	23	15	15	13	16	16	22	24	28	27	27	22	25	23	24	21	23	25	25	24	26	29	28	23	
MED	220	231	236	231	221	204	202	196	194	188	192	187	196	199	194	196	203	200	200	200	208	218	214	226	
U Q	240	252	E A 262	247	238	E A 219	226	202	203	198	202	196	201	212	208	202	208	206	206	217	220	222	223	242	
L Q	214	220	230	210	212	200	194	190	186	180	182	180	191	194	186	188	192	191	193	192	200	203	208	218	

JAN. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2009 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)
 LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	X 32	R	X 38	X 34	43	X 47	X 53	A	R	R	R	R	R	R	R	R	X 53	X 62	X 56	X 50	X 50	X 49	X 48	X 41	X 41
2	X 44	X 38	X 36	X 39	X 40	X 50	X 56	X 58	X 64	X 62	X 62	R	X 54	X 54	R	R	X 50	X 50	X 54	X 54	X 51	X 46	X 43	X 42	
3	X 43	X 43	X 44	X 44	X 46	X 49	X 50	X 61	X 64	X 65	X 64	X 57	X 58	X 56	X 54	X 52	X 50	X 46	X 49	X 49	X 49	X 50	X 46	X 43	
4	A	A	A	A	R	R	A	X 51	X 57	R	R	R	R	R	R	X 50	X 52	X 52	B	X 41	Y	A	A	A	
5	X 36	A	A	A	B	B	R	X 40	R	R	R	B	R	A	A	X 47	R	B	X 45	X 44	X 42	X 40	X 40	X 39	
6	R	A	R	B	R	A	A	R	R	X 49	X 49	R	R	R	R	X 52	R	R	X 48	X 42	X 41	X 40	X 40	X 40	
7	42	41	R	X 40	71	52	57	58	R	X 51	X 54	55	A	A	X 58	X 56	X 54	X 52	X 50	X 48	X 42	X 42	X 42	X 40	
8	42	44	41	44	X 45	X 49	X 53	X 56	X 56	X 54	X 53	R	A	A	X 58	X 62	X 56	X 52	X 49	X 47	X 44	X 40	X 39	X 43	
9	41	39	40	R	X 41	X 48	X 55	X 63	X 62	X 56	R	R	R	X 52	X 57	X 64	X 61	X 56	X 52	X 50	X 44	X 41	X 38	X 34	
10	31	31	A	44	X 42	X 49	X 56	X 55	X 55	X 54	X 56	X 56	X 60	X 63	X 56	X 55	X 49	X 50	X 48	X 48	X 44	X 40	X 40	X 36	
11	X 36	A	X 41	X 49	R	X 50	X 58	X 65	X 62	X 50	X 51	X 56	X 54	X 60	X 62	X 58	X 56	X 50	X 50	X 50	X 47	X 38	X 39	X 37	
12	X 37	Y	41	40	40	46	X 51	X 53	X 53	X 54	R	R	R	R	X 53	X 52	X 59	X 70	X 76	X 68	X 50	X 46	X 40	X 36	
13	33	32	36	37	34	40	47	50	54	54	54	52	B	B	B	B	B	B	R	R	R	R	X 36	X 30	
14	X 30	X 29	X 31	A	X 38	X 42	X 50	X 54	X 57	X 53	X 52	B	B	B	B	B	B	R	R	R	R	X 36	X 36	X 34	
15	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	B	X 51	B	B	B	X 43	X 39	X 37	X 30	
16	A	A	A	A	B	A	X 45	X 48	X 50	R	R	R	R	R	R	R	R	X 52	X 50	X 48	X 46	X 40	X 32	X 27	
17	X 32	A	A	X 30	39	43	X 50	X 51	X 49	X 49	R	R	R	R	R	R	X 50	X 50	X 48	X 47	X 44	X 41	X 37	X 32	
18	X 31	X 28	X 34	X 35	A	A	X 45	X 40	X 47	X 46	X 52	X 52	R	R	X 50	X 48	A	X 52	X 50	X 48	X 48	X 42	X 35	X 30	
19	X 29	X 29	X 37	X 36	39	41	X 45	X 48	X 49	X 50	R	R	R	R	R	R	X 53	X 50	X 50	X 48	X 46	X 46	X 40	X 36	
20	36	34	36	34	40	48	43	50	B	X 48	X 50	X 51	R	R	R	R	X 51	X 50	X 48	X 56	X 56	X 49	X 46	X 42	
21	A	69	A	A	X 40	44	43	49	X 52	X 52	X 56	R	R	R	R	R	X 52	X 53	X 57	X 55	X 49	X 44	X 45	X 42	
22	X 40	36	58	52	68	44	41	42	X 51	X 50	R	R	B	R	B	R	R	X 52	X 47	X 46	X 43	X 41	X 39	X 36	
23	31	29	A	A	41	44	50	51	X 51	X 51	X 49	X 53	X 54	A	X 57	X 56	X 56	X 52	X 50	X 42	R	A	A	A	
24	X 34	A	A	A	R	A	A	B	B	X 47	R	R	B	R	R	R	X 49	X 53	X 51	X 50	X 47	X 47	X 45	X 39	
25	35	34	34	38	B	A	R	R	R	B	R	R	R	R	R	R	X 50	X 50	X 50	X 49	X 49	X 46	X 44	X 42	
26	32	24	X 32	X 34	38	42	43	R	X 48	R	R	R	R	R	R	R	X 50	X 50	X 53	X 51	X 47	X 44	X 41	X 35	
27	28	28	A	A	X 40	X 41	R	X 46	X 51	X 49	X 52	X 53	X 54	B	B	X 66	B	B	X 47	X 48	X 44	X 38	X 32		
28	A	A	A	A	R	R	B	R	X 40	X 44	B	B	B	B	R	R	X 54	X 51	X 47	X 46	X 41	X 38	X 36	X 39	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	22	17	15	16	17	19	20	21	20	21	17	10	9	10	16	22	24	23	26	26	26	27	25	21	
MED	X 34	34	37	38	40	44	50	51	52	51	52	53	54	52	54	53	52	50	48	46	42	39	38	37	
U Q	40	40	41	44	44	49	53	56	57	54	56	56	56	56	58	58	56	55	50	48	46	42	40	40	
L Q	31	29	34	34	39	42	45	48	50	49	50	52	52	50	50	51	50	48	47	44	40	36	32	33	

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	26	A	32	28	F 33	F 41	47	A	R	R	R	R	R	R	R	R 47	J 56	R 50	44	44	R 43	42	35	35		
2	38	32	30	F 29	F 34	F 41	50	52	58	56	56	R	48	48	R	R	44	44	48	48	45	40	37	36		
3	37	37	38	38	40	43	44	55	F 54	F 57	F 55	51	52	50	48	46	44	J 40	43	43	43	F 40	F 37	F 33		
4	A	A	A	A	A	A	A	45	51	R	R	R	R	R	44	46	46	B	35	Y	A	57	A	A		
5	30	A	A	A	B	B	R	R	R	R	R	B	R	A	A	R	R	B	R	R	36	34	34	F 29		
6	A	A	R	B	R	A	A	R	R	R	43	43	R	R	R	46	R	R	42	36	35	34	34	34		
7	F 33	Z 35	A	34	36	F 43	51	52	R	45	48	49	A	A	J 52	50	R 48	R 46	R 44	R 42	R 36	R 36	R 36	F 34		
8	F 31	F 32	F 27	F 34	39	43	47	50	50	48	R 47	R	A	A	J 52	56	50	46	43	41	38	34	33	F 32		
9	F 29	F 24	F 30	A	A	35	42	49	57	56	J 50	R	R	R	46	51	58	55	50	46	44	38	35	F 24		
10	F 21	F 21	A	F 32	F 32	R 43	J 50	R 49	49	48	50	J 50	54	57	A	50	49	43	44	42	42	38	34	30		
11	R 30	A	R 35	43	R 44	R 48	F 52	F 52	44	45	50	48	J 54	R 56	J 52	R 50	R 44	R 44	R 44	F 37	32	33	F 25			
12	R 31	Y 30	F 30	F 28	F 35	45	47	47	48	R	R	R	U 47	R 46	J 53	64	Z 70	F 58	44	40	34	31	F 26	F 21		
13	F 20	F 20	F 21	F 20	F 23	34	39	44	48	48	48	46	R	R	48	52	53	51	43	42	42	39	29	F 22		
14	24	23	25	A	J 32	R 36	44	48	51	47	46	R	B	B	B	B	B	R	A	A	30	30	28	R 22		
15	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	45	B	B	B	R	37	33	31	F 18		
16	A	A	A	A	B	A	39	42	44	R	R	R	R	A	R	R	R	R	R	R	34	26	21	A		
17	R 26	A	A	24	F 29	F 33	44	44	45	43	43	R	46	R	R	44	44	42	41	38	35	31	27	F 24		
18	25	19	F 28	R 29	A	A	R 39	J 34	R 41	R 40	46	46	R	44	42	A	R	R	42	42	36	29	20	F 20		
19	R 23	R 23	F 28	F 26	F 29	35	39	42	43	44	R	44	46	A	R	47	44	44	42	40	40	34	F 30	F 27		
20	F 24	F 24	F 24	F 24	F 29	F 34	F 30	F 40	B	R	R	R	R	R	J 45	R 44	R 42	R 50	R 50	R 43	R 40	36	31	22		
21	A	B	A	A	34	F 31	J 37	R 43	R 46	46	50	R	R	R	R	46	47	R 51	R 49	R 43	38	39	36	30	32	
22	34	F 26	R 30	29	42	F 31	F 30	32	45	44	R	R	B	R	B	R	46	41	40	37	A	35	33	F 26	Z 34	
23	F 21	F 20	A	A	F 29	F 35	F 38	Z 45	R 45	45	43	47	48	A	J 51	50	50	46	44	36					A	
24	R 28	A	A	A	A	A	A	B	B	R	R	R	B	R	R	43	47	45	44	41	41	39	33	29	F 26	F 23
25	F 24	F 24	F 24	F 30	B	A	A	R	R	B	R	R	R	R	44	44	44	43	43	40	38	36	26	26	F 28	
26	F 21	18	26	24	F 29	F 23	37	R	R	R	R	R	R	R	44	44	47	45	41	38	35	29	23	18	F 18	
27	F 18	22	A	A	34	35	R	R	40	44	43	46	47	48	B	B	J 60	B	R	41	42	38	32	26	A	A
28	A	A	A	A	A	A	B	A	E 34	G 34	G 38	B	B	B	B	R	48	45	41	40	35	32	30	F 30	F 27	
29																										
30																										
31																										
CNT	22	16	15	16	17	19	20	21	20	21	17	10	9	10	16	22	24	23	26	26	26	27	25	21	F 21	
MED	26	24	28	29	32	35	43	45	46	45	46	47	48	46	48	47	46	44	42	40	36	33	30	28	F 28	
U Q	31	29	30	33	35	43	47	50	51	48	50	50	50	50	52	52	50	49	44	42	39	36	34	34	F 34	
L Q	F 23	F 20	F 25	F 25	F 29	F 34	38	41	44	43	44	46	46	44	44	45	44	42	41	38	34	30	26	24	F 24	

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	16	29 ^K	30	22	16	20	22	41	38	27 ^G	27	30	32	21 ^J	34 ^G	28	26 ^E	29 ^B	25 ^E	20	26	43	30	29	
2	12 ^E	12 ^B	13 ^E	15 ^B	29	24	37	40	26	28	28	31	24	33	43	29	38	25	23	19	17	25	14	14	
3	15 ^E	12 ^B	12 ^E	15 ^B	21	30	24	19	29	31	30	32	30	35	35	42	61	30	33	22	42	41	20	12 ^E	
4	52	58	59	44	40	39	46	40	25	27	28		31	30	30	30	25		36	21	72	58	58	44	
5	45	71	86	65			32	29 ^K	26	27	27		31	47	42	29	28 ^E		30	21	18	18	30	35	
6	32	43	34		37	40	39		34	30	28	30	30	31	28	27	25	23	22	18 ^E	20 ^B	16	24	13 ^E	
7	12 ^E	19	32	28	30	27	16 ^G	33	31	44	22	30	68	81	36	35	22	24	38	24 ^E	27 ^B	24 ^E	22	23 ^E	
8	18 ^E	15	30	30	26	25	66	41	28	26	43	46	60	99	43	32	58	25	31	21	28	30	22	22	
9	66	57	49	39	43	39	25	27	27	27	30	60	38	32	30	30	30	26	23	22	26	22	13 ^E	12 ^B	
10	12 ^E	19	58	26	30	38	28	30	32	28	30	33	46	63	80	38	59	34	24	39	36	37	37	35	
11	35	46	44	32	40	47	36	41	26	18 ^G	29	32	31	32	29	26	24	25	24	21	17	15	13 ^E	14 ^B	
12	32	17	16	17	14	18	23	38	22	25	29	37	44	44	67	66	26	34	38	42	19	18	15	29	
13	22	33	27	23	22	25	28	37	30	34	30	38	39	44	38	35	26	27	26	30	18	38	12 ^E	31	
14	17 ^E	21 ^B	31 ^K	45	30	49	44	29	31	42	27						30 ^E	30 ^B	44	39	28	32	29	26	
15	36	42		39	34		34									26 ^E					29	18	16	33	
16	32	45	44	29		36	20	24	24	33	25	29	32	41	28	36	25	24	33	33	24	16	15	26	
17	32	36	34	33	25	16	21	21	24	25	25	25	42	38	36	30	26	26	22	33	46	20	16	38	
18	68	20	32	34	38	40	24 ^G	20 ^G	24	22	31	30	30	25	44	85	40	35	21	21	16	16	12 ^E	33	
19	35	33	26	27 ^E	16 ^S	16	19	30	36	30	32	38	38	46	36	36	25	27	26	26	16	15	22	30	
20	21	20	26	26	35	30	28	29		24 ^E	26	24	30	30	32	34	24	32	22	22	14 ^E	17 ^B	12	42	
21	43 ^E	33 ^B	66	41	49	28	32	21	29	28	30	30	30	28	28	25	26	24	21	19	14	13 ^E	15	30	
22	13 ^E	41	33	31	33	30	20	28	26	27	43	43		32		30	30	24	24	19	16	31	42	32	
23	27	28	30	28	25	16	32	29	32	30	26	39	44	68	38	43	33	27	48	26	38	42	42	41	
24	36	38	40	44	36	50	48			24	28	26		25	25	25	27 ^E	26 ^B	20	21 ^E	16	15	27	31	
25	20	13 ^E	13 ^B	36		42	40	28 ^G	33		31	26	30	30	27	30	30	30	24	16	16	25	13 ^E	12 ^B	
26	25	12 ^E	16 ^B	30	28	16	20 ^E	14 ^B	30	28	30	32	28	31	27	26	26	23	23	19	16	15	14 ^E	14 ^B	
27	12 ^E	27	34	33	31	32	30	48	33	25	30	38	28			54 ^E		29	25	23	31	39	38	40	
28	68	38	47	40	37	41		38	31	40					29	24	25	22	20	17	17	16	23	26	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	28	28	27	27	25	26	27	26	25	26	26	24	23	24	24	27	26	25	27	28	28	28	28	28	
MED	30	30	32	31	30	30	28	29	29	28	28	32	31	32	34	30	26	26	24	22	18	20	20	30	
U Q	36	42	44	39	37	40	37	38	32	30	30	38	42	45	40	36	30	30	33	28	28	34	30	34	
L Q	16 ^E	19 ^B	26 ^E	26	25	24	22	27	26	25	27	30	30	30	28	27	25	24	22	20	16	16	14 ^E	18 ^B	

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	13	12	14	13	14	12	14	19	22	20	20	16	12	13	34	20	27	26	25	14	16	13	13	12
2	12	12	13	15	12	12	12	13	12	12	13	19	20	18	19	19	18	17	16	12	13	12	11	11
3	12	13	12	12	12	12	14	13	12	13	14	14	14	14	13	13	19	16	16	13	12	12	13	12
4	36	14	24	20	26	17	17	14	13	13	23	26	18	15	16	24	16	B	14	14	22	14	16	14
5	12	23	25	14	B	B	20	14	13	14	14	B	26	13	29	24	28	B	17	12	12	11	12	12
6	11	18	29	B	23	18	15	14	14	16	14	12	17	20	22	20	21	19	16	13	20	12	11	13
7	12	12	12	14	13	13	12	12	24	13	17	18	18	20	20	17	14	12	12	24	27	24	23	23
8	18	12	12	12	12	13	12	13	13	12	12	14	12	20	12	14	14	14	12	13	12	11	12	11
9	12	12	12	29	13	13	12	12	12	13	13	14	15	20	14	14	14	15	13	12	13	12	13	12
10	12	11	14	12	12	12	12	14	14	13	12	13	13	13	18	14	14	14	13	12	13	12	12	12
11	12	16	18	13	18	14	13	12	13	13	13	13	14	14	13	19	14	12	13	14	13	11	13	14
12	13	13	12	13	12	12	12	15	20	14	16	13	13	14	13	15	13	14	13	13	13	12	11	14
13	15	15	14	18	12	11	12	12	13	14	12	13	12	18	16	12	13	12	12	13	12	12	12	12
14	17	12	12	11	13	14	13	11	11	12	12	B	B	B	B	B	30	18	17	13	16	12	12	14
15	12	12	B	25	24	B	29	B	B	B	B	B	B	B	B	26	B	B	B	20	14	13	12	12
16	11	13	16	13	B	20	14	16	13	13	20	19	23	24	24	24	20	18	15	14	13	11	12	13
17	14	12	11	11	12	14	14	13	15	13	15	17	18	17	18	14	15	13	14	13	13	13	10	12
18	12	12	12	12	23	13	18	12	14	20	17	14	20	19	18	14	14	14	13	13	12	12	12	12
19	12	13	11	12	E S	16	12	12	12	12	12	12	13	17	13	12	12	13	13	11	12	12	13	12
20	12	13	13	13	15	14	13	13	B	24	17	12	20	18	20	19	16	18	22	14	14	12	12	13
21	12	33	20	14	13	13	12	13	12	14	14	14	14	13	14	14	14	14	14	13	12	13	12	12
22	13	13	12	13	13	14	12	12	14	12	13	13	B	17	B	23	16	12	20	13	12	12	11	12
23	12	16	16	12	11	12	13	12	12	13	13	13	14	18	15	18	14	13	12	12	14	14	13	12
24	11	12	14	16	13	20	18	B	B	14	17	16	B	21	20	20	27	26	17	21	16	12	11	12
25	12	13	13	12	B	19	24	13	26	B	18	15	13	21	15	22	17	16	24	16	12	11	13	12
26	11	12	16	12	13	12	20	14	27	28	30	32	25	25	17	15	19	16	13	13	13	15	14	12
27	12	12	12	11	20	17	17	20	13	15	12	12	19	B	B	54	B	16	25	13	13	12	11	12
28	13	21	13	13	12	22	B	14	13	13	B	B	B	B	22	20	14	12	13	13	12	12	13	11
29																								
30																								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	12	13	13	13	13	14	14	13	13	13	14	14	18	18	18	19	16	16	14	13	13	12	12	12
U Q	13	14	16	14	22	18	18	14	21	16	18	19	24	21	23	22	20	18	17	14	14	13	13	13
L Q	12	12	12	12	12	12	12	12	12	13	13	13	14	14	14	14	14	13	13	13	12	12	12	12

FEB. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2009 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D	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	246	210	210		A	A	232	232	188	208	190	224	182	192	208	200	210	220	220	220	238
2	218	220	234	232	226	212	208	198	186	186	176	204	174	224	A	206	202	196	196	196	196	206	218	218	
3	218	220	232	230	218	194	194	176	190	190	190	182	204	196	208	194	198	196	186	186	218	204	198	204	
4	A	A	A	A	A	A	A	A	230	198	192	194	198	196	184	A	A	196	BE	234	Y	A	A	206	
5	196	A	A	A	B	B	A	A	258	212	190	190	B	206	A	A	186	204	B	230	186	194	220	232	
6	A	A	A	B	A	A	A	R	A	194	202	202	208	202	168	178	192	204	204	206	214	214	226	226	
7	226	244	A	210	242	224	218	218	A	206	200	190	A	A	190	190	190	190	256	202	228	228	240	246	
8	244	244	260	268	230	216	214	196	196	196	232		A	A	A	A	208	226	196	200	212	212	214	214	
9	224	230	A	A	A	A	214	192	180	180	196	196	196	178	202	186	186	194	184	212	208	208	206	224	
10	E B	A	A	294	232	244	206	188	198	184	196	198		A	A	A	198	192	204	192	206	212	214	E A	
11	A	A	252	242	A	220	202	182	190	194	194	208	190	184	206	188	194	208	204	200	206	212	212	238	
12	A	Y	A	282	244	220	206	224	192	198	198	198	214	204	A	A	204	200	200	212	212	212	212	238	
13	E B	E B	E B	248	234	216	204	200	202	184	170	194	194	208	200	184	184	202	182	194	208	212	206	A	
14	E B	E S	A	A	A	A	236	208	206	212	186	B	B	B	B	B	248	238	A	A	232	240	294	A	
15	A	A	B	A	A	B	A	B	B	B	B	B	B	B	B	208	B	B	B	A	224	236	A	A	
16	A	A	A	A	B	A	A	236	212	194	182	182	202	192	A	A	206	202	200	224	228	246	A	A	
17	A	A	A	A	268	218	212	196	182	186	176	176	216	242	E A	196	204	194	200	196	202	232	206	E A	
18	A	278	A	302	A	A	A	208	234	184	176	200	210	202	A	A	200	206	200	200	200	216	230	A	
19	A	A	234	A	296	232	228	220	206	198	190	190		A	A	198	198	190	202	202	202	208	216	206	
20	218	226	226	A	280	248	200	206	B	194	194	200	208	206	196	200	208	210	194	218	206	208	268	A	
21	A	E B	212	A	A	A	200	192	192	218	222	202	198	198	198	210	186	194	194	202	214	202	226	254	
22	236	284	210	208	196	224	192	200	192	198	220	196	B	188	B	206	196	196	210	194	198	206	236	242	
23	260	A	A	A	A	214	220	190	172	192	180	214	242	A	212	198	182	200	236	198		A	A	A	
24	A	A	A	A	A	A	A	B	B	198	186	192	B	202	194	200	208	202	218	206	218	216	244	246	
25	232	250	E B	E A	B	A	A	A	A	B	216	166	208	196	196	188	182	214	214	214	210	234	234	236	
26	266	286	B	A	A	264	220	216	238	218	192	224	194	220	196	196	200	194	190	190	208	220	246	262	
27	E B	258	A	A	A	A	A	A	196	162	184	200	210	B	B	B	B	198	256	210	220	A	A	A	
28	A	A	A	A	A	A	B	A	212	212		B	B	B	B	212	206	192	192	196	214	218	222	212	
29																									
30																									
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	16	14	9	11	12	15	18	21	21	26	26	23	19	17	17	22	26	25	26	25	26	25	24	19	
MED	228	235	233	228	234	220	210	202	194	193	193	197	207	200	196	198	194	200	200	204	212	214	224	235	
U Q	248	278	256	282	257	232	220	217	206	198	200	202	210	207	205	206	204	204	214	212	220	221	235	246	
L Q	221	226	229	230	228	214	204	194	188	186	184	190	196	190	194	188	190	195	194	197	208	207	212	224	

FEB. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2009 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	29	R	A	27	X	B	A	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	38	36	38	
2	36	30	B	B	X	X	O	X	X	O	X	O	X	R	R	R	O	X	A	X	X	X	X	A	A	
3	29	27	B	X	X	B	O	X	O	X	O	X	O	X	O	X	X	O	X	X	X	X	R	A	A	
4	A	119	A	A	A	A	A	B	B	R	R	O	X	O	X	O	X	O	X	X	X	X	B	A		
5	A	A	B	A	A	X	A	B	B	O	X	O	X	R	O	X	O	X	X	X	X	X	X	29		
6	27	25	R	A	A	A	X	X	X	X	O	X	O	X	X	X	X	X	X	X	X	X	34	29		
7	24	A	B	X	52	32	39	44	49	46	47	48	50	51	52	51	51	46	45	41	39	32	29	26		
8	X	X	O	X	A	A	A	X	X	X	O	X	O	X	R	X	X	B	B	B	B	X	R	R		
9	R	R	R	R	R	X	35	40	43	46	47	49	51	48	50	50	47	44	42	33	27	30		B		
10	B	B	B	B	B	B	X	32	40	47	47	48	49	51	53	R	X	X	X	X	X	38	30	Y		
11	B	O	X	A	A	B	B	O	X	O	X	O	X	R	O	X	X	X	X	X	X	X	A	A		
12	A	A	A	A	A	B	B	A	X	X	R	R	R	O	X	O	X	X	X	X	X	35	31	26		
13	Y	A	A	B	A	A	B	A	A	R	B	B	B	B	R	B	B	B	B	30	B	A	A	A		
14	A	A	A	A	A	B	B	O	X	O	X	R	B	B	B	B	B	B	B	B	O	X	X	Y	A	
15	X	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	C	O	X	O	X	X	B	Y		
16	R	R	A	A	B	R	R	O	X	X	O	X	R	O	X	X	X	O	X	O	X	O	X	24	23	
17	B	B	R	O	X	O	X	O	X	R	R	O	X	R	O	X	X	X	X	X	X	X	A	B	O	X
18	X	O	X	R	A	R	R	O	X	X	O	X	R	O	X	O	X	X	X	X	X	X	A	A	A	
19	R	A	O	X	A	A	A	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	A	
20	X	B	A	A	O	X	R	X	X	X	X	X	O	X	X	X	O	X	O	X	X	X	X	X	A	
21	A	A	A	O	X	R	R	X	O	X	X	X	X	O	X	X	X	X	X	O	X	A	A	A	A	
22	A	A	49	A	A	A	B	B	R	O	X	X	O	X	O	X	X	O	X	O	X	X	X	X	B	
23	58	B	B	B	A	R	B	B	R	R	B	B	B	O	X	X	B	B	O	X	B	C	C	C	C	
24	C	A	67	A	A	B	B	B	B	B	B	O	X	B	B	B	B	B	B	B	B	Y	Y	B		
25	B	A	A	Y	B	A	A	A	B	B	B	B	B	B	B	X	X	X	X	X	O	X	B	B	B	
26	B	R	A	A	A	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	R	A	X	B	
27	A	A	A	A	R	Y	R	O	X	X	X	X	O	X	X	X	X	X	X	X	X	X	X	Y	A	
28	A	R	A	R	O	X	30	31	39	41	44	44	49	51	51	53	63	53	47	42	31	25	24	A	B	
29	B	B	X	O	X	B	A	31	42	47	48	52	53	60	60	57	54	49	38	34	28	B	B	O	X	
30	O	X	O	X	B	B	B	B	O	X	O	X	R	R	O	X	X	X	A	O	X	B	Y	B	Y	B
31	27	28	B	B	R	B	B	B	O	X	O	X	R	R	O	X	X	X	A	O	X	B	Y	B	Y	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	11	8	5	7	9	8	13	21	23	23	19	21	19	25	25	26	23	27	25	27	24	19	12	7		
MED	X	X	X	X	X	X	X	X	X	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	
U Q	29	28	35	34	34	30	35	40	44	46	47	49	51	52	55	54	50	47	43	39	34	30	30	29		
L Q	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	27	26	30	30	28	28	32	36	41	44	46	48	50	51	52	51	50	46	41	36	30	26	24	26		

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	F 18	R	A	21	21	B	A	38	40	41	43	46	49	47	46	43	43	40	40	35	33	28	F 24	F 20			
2	F 21	F 20	B	B	21	21	33	38	40	40	R	R	R	R	R	42	A	44	40	36	35	25	A	A			
3	F 20	R 21	B	24	36	B	R	R	R	43	44	45	48	45	49	50	R	R	44	42	27	F	A	A			
4	A	A	A	A	A	A	A	B	B	A	A	41	43	48	47	43	R	R	42	37	36	22	16	B	A		
5	A	A	B	A	A	A	A	B	B	R	R	R	R	R	R	41	R	R	39	34	28	26	F	F			
6	F 17	F	R	A	A	A	34	37	41	41	41	41	41	45	44	45	44	40	40	34	32	F	F	F			
7	R 18	A	B	R	Y	F	F	38	43	40	41	42	44	45	46	45	45	40	39	35	28	F	F	F			
8	18	20	R	A	A	A	A	36	40	41	43	43	R	J	R	50	B	B	B	B	29	A	A	R			
9	A	A	A	A	A	J	R	F	34	37	40	41	43	A	45	42	44	44	42	38	36	27	21	F	B		
10	B	B	B	B	B	B	26	F	F	R	42	43	45	47	R	57	44	40	38	36	34	28	F	F	Y		
11	B	R	A	A	A	B	B	F	R	R	R	R	R	R	R	R	R	41	42	35	29	23	F	A	A		
12	A	A	A	A	A	B	B	A	31	34	R	R	R	R	R	R	R	38	36	33	F	F	F	A			
13	Y	A	A	B	A	A	B	A	A	R	B	B	B	B	B	B	B	B	B	21	B	A	A	A			
14	A	A	A	A	A	B	B	E	G	E	G	R	B	B	B	B	B	B	B	R	R	Y	A	A			
15	24	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	C	U	R	35	33	28	20	B	Y		
16	R	R	A	A	B	A	R	R	34	35	38	40	46	46	51	48	R	R	R	R	R	R	B	F	F		
17	B	B	R	A	R	R	F	35	38	R	R	R	R	R	R	J	R	R	49	42	38	31	23	A	B	R	
18	26	30	R	A	R	R	R	32	40	43	R	R	R	R	R	44	47	46	41	35	30	F	F	A	A		
19	A	A	R	A	A	A	28	37	40	38	41	44	48	58	56	50	48	44	35	34	24	20	17	A	A		
20	J	R	B	A	F	A	24	24	32	37	39	40	44	45	44	49	44	43	43	34	29	F	F	F	J	R	A
21	A	A	A	R	R	A	F	18	28	38	40	44	46	49	46	53	68	68	56	40	28	A	A	A	A	A	
22	A	A	A	A	A	A	B	B	R	R	R	R	R	R	R	R	R	R	R	36	32	28	22	17	B	B	
23	A	A	A	A	A	B	A	R	29	33	37	42	43	B	R	R	R	R	38	33	28	22	19	R	B	B	
24	B	B	B	B	F	A	A	B	B	R	R	B	B	B	B	B	B	B	R	B	C	C	C	C	C	C	
25	C	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	Y	B	B	
26	B	A	A	Y	B	A	A	A	B	B	B	B	B	B	B	50	50	44	40	36	31	R	B	B	B	B	
27	B	R	A	A	A	R	24	31	38	38	40	42	45	J	R	51	J	R	J	R	A	A	J	R	B		
28	A	A	A	A	R	Y	R	27	35	39	38	42	46	48	48	45	44	41	35	24	F	18	16	Y	A		
29	A	A	A	A	R	F	F	F	35	38	38	43	45	45	47	57	47	41	36	25	19	18	R	R	A	B	
30	B	B	24	A	25	B	A	F	21	30	41	42	46	47	54	54	51	48	43	32	28	22	B	B	R		
31	21	22	B	B	A	B	B	B	R	R	R	R	R	R	J	R	53	51	A	R	B	Y	B	Y	B		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	10	6	3	5	7	8	13	21	23	23	19	21	19	25	25	26	23	27	25	27	24	19	12	7			
MED	20	22	24	26	25	22	28	32	38	40	41	43	45	46	49	48	44	41	37	33	26	22	20	20			
U Q	22	22	29	28	28	26	31	37	40	41	43	44	47	48	51	51	48	43	40	35	28	26	22	23			
L Q	18	20	23	22	21	20	24	30	35	38	40	42	44	45	46	45	44	40	35	29	24	19	17	15			

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	23	21	28	16	16		B	38	38	31	19	24	32	29	29	40	32	25	22	24	34	16	21	33	52			
2	21	E B 13	B	B	31	16	17	19	23	E B 28	E B 29	E B 28	30	32	34	48	69	30	29	22	18	30	30	28				
3	27	E B 14	B	15	28		E B 18	E B 21	23	24	24	24	24	30	41	27	26	28	36	24	28	25	38	32				
4	40	74	50	46	40	34	37		B		B	34	35	29	30	28	28	26	24	E B 26	E B 20	17	E B 12	E B 14	41			
5	48	44		B	58	39	26	40		B		B	26	24	24	28	28	28	25	25	17	22	16	15	E B 12	29	22	
6	16	28	20	41	41	34	28	19	31	23	24	24	30	28	28	27	24	23	22	14	E B 13	E B 12	27	E B 14				
7	23	30		E B 23	31	38	28		G	G	16	32	30	30	34	32	26	26	34	21	18	33	E B 12	35	18	31		
8	30	21	32	43	48	40	38	33	19	24	20	26	E B 24	29	20	25		B		B			32	32	32	21		
9	20	29	26	33	28	E B 13	16	18	21	24	31	39	75	50	28	28	22	23	21	19	E B 20	E B 12	E B 14					
10		B	B	B	B		E B 18	30	22	23	27	28	30	28	E B 30	58	30	24	26	20	E B 13	E B 17	E B 15	19				
11		B	22	30	28	29		B	B	34	20	E B 25	E B 26	31	34	30	26	31	22	22	19	16	E B 14	27	37	42		
12	42	45	51	40	40		B	B		K	37	26	22	30	29	29	28	26	25	22	22	18	16	E B 13	25	35	38	
13	16	44	74		B	57	59		B	B	42	41	39		B	B	B	B	B	B	B	B	B	B	B	38	40	42
14	43	42	39	36	34		B	B	G		E B 23	E B 25		B	B	B	B	B	B	B	B	B	E B 23	30	25	14	34	
15	29	33	36	38		B	54		B	B	B	B	B	B	B	B	B	C	E B 27		E B 26	E B 27	19	14		18		
16	18	16	43	38		B	30	28	E B 20	20		G	24	25	28	24	23	27	E B 26	E B 30	E B 24	E B 22	19		E B 13	E B 12		
17		B	B	16	30	42	41	30	22	30	24	E B 25	24	27	30	39	29	20	20	E B 17	14	26	29		B	23		
18	30	31	32	38	28	22	36	31	31	41	30	28	25	31	30	24	22	22	18	E B 12	31	22	28	26				
19	24	27	26	37	48	37	27	16	18	20	24	27	27	28	43	25	22	E B 22	E B 20	18	18	E B 13	E B 14	16	25			
20	28		B	31	35	36	28	16	26	24	26	20	24	24	24	24	24	26	E B 21	16	14	30	29	E B 16	34			
21	36	35	32	26	24	24	E B 13	16	23	E B 23	30	25	32	36	33	24	24	24	34	38	69	69	71	31	46			
22	40	36	41	44	37	39		B	B	36	25	24	22	30	25	25	24	21	E B 24	E B 20	16	14	12	14	B			
23	24	36	35	40	49		B	40	19	17	19	26	26	26	25	26	23	20	20	E B 15	E B 14	E B 13	E B 14	B	B			
24		B	B	B	E B 22	E B 33	27		B	E B 25	E B 28		B	E B 27	E B 27		B	B	E B 21		C	C	C	C	C			
25	C		87	42	56	59		B	B	B	B	B	E B 28		B	B	B	B	B	B	B	B	B	B	17	16	B	
26		B	35	43	20		B	40	36	37		B	B	B	B	B	B	23	E B 23	E B 20	E B 18	E B 15	E B 24	B	B	B	B	
27		B	24	33	34	36	22	16	15	14	19	22	24	22	24	36	24	36	31	16	15	31	40	36	B			
28	34	41	72	39	22	17	E B 14	E B 15	E B 19	E B 23	22	25	25	24	22	29	36	35	27	27	E B 12	E B 20	22	32				
29	35	24	32	29	32	18	24	E B 13	21	23	E B 26	26	26	E B 26	25	25	21	20	15	E B 14	E B 12	E B 12	29	B				
30		B	B	29	25	16		B	42	39	E B 14	21	24	25	25	37	24	22	18	22	33	E B 17	E B 14	B	B	30		
31	22	30		B	B		B	B	E B 21	E B 21	E B 24	27	E B 29	30	25	25	69	E B 28		B		19		16	B			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	23	26	24	26	27	21	23	24	25	28	26	26	25	26	28	26	25	27	25	27	27	26	24	22				
MED	28	30	32	36	34	33	28	20	22	24	24	26	28	28	26	25	24	22	20	17	16	22	28	30				
U Q	36	41	42	40	41	40	37	34	28	26	29	28	30	30	32	28	28	28	26	24	28	29	32	38				
L Q	22	24	30	28	28	22	17	16	19	22	24	24	25	26	25	24	22	21	18	15	E B 13	E B 14	E B 16	22				

MAR. 2009 ftEs (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	12	12	11	12	B	18	13	13	13	14	14	15	13	12	12	14	14	12	13	12	11	11	12
2	12	13	B	B	12	12	13	13	13	28	29	28	19	16	24	20	14	20	12	12	12	12	12	12
3	11	14	B	12	12	B	18	21	18	14	18	14	16	16	13	12	13	15	12	13	12	12	12	17
4	12	17	14	14	13	12	22	B	B	30	28	19	21	12	14	13	20	26	20	13	12	14	B	11
5	13	12	B	18	16	14	28	B	B	20	13	14	12	13	13	14	13	13	12	13	12	12	12	12
6	12	13	13	14	23	13	13	12	13	12	12	12	14	12	15	16	15	12	13	12	13	12	12	14
7	12	24	B	23	19	14	12	12	12	12	12	13	12	13	14	13	13	12	12	11	12	12	14	12
8	12	13	12	14	12	14	16	13	13	13	13	12	24	18	16	19	B	B	B	B	14	16	16	13
9	13	13	12	12	12	13	12	11	12	13	14	16	12	14	15	13	14	16	12	19	14	12	13	B
10	B	B	B	B	B	B	18	13	13	13	14	16	24	24	30	16	14	12	12	12	13	12	15	15
11	B	11	13	12	12	B	B	12	14	25	26	18	22	20	20	15	12	13	14	16	14	11	12	11
12	14	18	20	14	25	B	B	22	19	8	13	15	16	13	14	23	20	15	13	12	14	13	13	12
13	11	12	12	B	20	24	B	22	23	26	B	B	B	B	27	B	B	B	B	13	B	12	12	12
14	20	16	19	16	26	B	B	18	20	25	B	B	B	B	B	B	B	B	B	23	12	13	12	12
15	12	14	18	16	B	25	B	B	B	B	B	B	B	B	B	B	C	27	20	27	16	12	B	13
16	12	12	15	20	B	15	16	20	14	15	14	16	19	20	19	20	26	30	24	22	19	B	13	12
17	B	B	14	13	12	13	13	11	12	12	25	19	21	17	16	15	14	13	17	12	12	12	B	12
18	12	12	13	16	13	13	13	13	12	13	12	14	15	14	16	13	13	12	12	12	12	12	11	12
19	12	14	12	13	15	14	12	12	13	12	13	12	14	17	14	12	12	20	13	18	13	14	13	11
20	13	B	15	12	12	12	13	12	12	12	12	13	13	14	15	16	20	21	12	11	13	12	16	12
21	12	11	12	12	11	13	13	12	14	23	12	12	13	12	14	14	20	25	20	14	13	11	12	14
22	20	19	13	14	13	16	B	B	17	19	14	12	20	13	15	19	20	24	20	13	11	12	11	B
23	13	12	13	22	16	B	20	14	13	14	15	19	16	15	16	14	14	13	15	14	13	14	B	B
24	B	B	B	B	22	12	13	B	B	25	28	B	B	27	27	B	B	21	B	C	C	C	C	C
25	C	14	18	13	25	B	B	B	B	B	B	28	B	B	B	B	B	B	B	B	B	12	12	B
26	B	12	13	12	B	15	20	15	B	B	B	B	B	B	19	23	21	18	15	24	B	B	B	B
27	B	12	14	21	13	12	13	12	12	14	16	15	16	16	16	15	14	12	12	12	14	12	14	B
28	12	11	21	12	14	12	14	15	19	15	14	14	16	14	12	14	14	13	12	12	12	12	15	13
29	13	14	14	13	13	12	11	13	14	15	26	19	23	26	18	14	14	14	13	14	12	12	18	B
30	B	B	12	13	12	B	14	15	14	15	20	14	13	14	13	13	15	18	12	17	14	B	B	14
31	13	13	B	B	12	B	B	B	21	21	24	25	29	23	14	14	14	28	B	B	16	B	11	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	30	30	30	30	30
MED	13	13	14	14	13	14	16	14	14	15	15	16	19	16	16	15	14	18	13	14	13	12	13	13
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	14	16	B
L Q	20	18	21	21	23			22	23	25	28	25	24	24	23	20	20	26	20	19	14	14	16	B
L Q	12	12	13	12	12	13	13	12	13	13	13	14	14	14	14	13	14	13	12	12	12	12	12	12

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	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 A 272	A	A	A	A	B	A	250	230	184	190	202	202	198	234	200	200	188	182	H 212	Q 218	Q 224	Q 244	Q 238	
2	Q 232	250	B	B	A	236	222	204	196	210	206	180	218	186	216	A	A	204	208	Q 202	Q 190	E A 240	A	A	
3	A	A	B	E A 278	A	B	220	202	202	182	206	184	190	184	224	202	198	198	206	Q 210	Q 224	A	A	A	
4	A	A	A	A	A	A	A	B	B	A	A	192	192	H 206	206	196	196	E B 212	206	204	182	B	B	A	
5	A	A	B	A	A	A	A	B	B	216	172	188	198	198	206	206	204	204	224	210	210	222	Q 234	252	
6	248	282	A	A	A	A	232	196	190	172	H 168	162	184	186	198	204	206	188	214	202	Q 212	Q 212	E B 242	286	
7	E B 284	A	B	204	Y	246	224	198	200	194	178	188	204	194	188	194	198	198	Q 194	204	196	202	258	242	
8	E A 294	250	A	A	A	A	A	A	220	190	176	198	196	200	210	200	B	B	B	B	Q 278	A	A	A	
9	A	A	A	A	E B 294	Q 216	200	196	176	Q 194	218	204	196	198	204	198	198	Q 198	208	216	246	224	B	Y	
10	B	B	B	B	B	E B 238	200	206	182	202	194	198	208	228	198	190	170	204	210	202	252	236	A	A	
11	B	202	192	A	A	B	B	220	208	202	202	202	212	206	210	210	200	204	204	208	214	214	A	A	
12	A	A	A	A	A	B	B	A	258	208	180	216	216	202	202	202	186	196	Q 216	Q 212	222	240	234	A	
13	Y	A	A	B	A	A	B	A	A	A	B	B	B	B	214	B	B	B	B	E A 272	B	A	A	A	
14	A	A	A	A	A	B	B	232	224	224	B	B	B	B	B	B	B	B	B	E B 250	A	192	Y	A	
15	A	A	A	A	B	A	B	B	B	B	B	B	B	B	B	B	C E B 230	E B 228	A E B 264	E A E A 246	E A E A 270	B	Y	Y	
16	A	A	A	A	B	A	A	234	204	194	218	208	220	190	212	212	E B 222	210	210	220	E B 256	E B 296	E B 310	B	
17	B	B	A	A	200	246	178	E A 236	270	202	206	198	212	190	202	208	A 218	218	198	208	222	A	B	A	
18	242	184	A	A	A	A	A	304	218	202	202	190	214	198	194	182	H 202	H 202	H 206	H 204	H 206	234	234	A	A
19	A	A	224	A	A	A	A	226	194	174	H 178	H 160	H 176	H 218	218	196	208	210	198	214	E B 224	E B 250	E A 258	A	
20	A	B	A	A	A	A	A	264	218	210	208	194	202	184	202	194	202	218	206	H 178	Q 232	Q 254	Q 310	A	A
21	A	A	A	A	A	E B 262	210	214	210	Q 204	192	200	212	Q 224	216	E A E A 242	E A E A 258	254	240	A	A	A	A	A	A
22	A	A	A	A	A	A	B	A	204	226	206	206	194	202	212	214	214	214	220	208	230	E A 264	B	B	
23	A	A	A	A	A	B	A	A	208	184	218	206	226	198	228	200	202	208	E B 204	210	E B E B 218	E B E B 298	B	B	
24	B	B	B	B	B	A	A	B	E B 244	216	B	B	206	222	206	222	B	B	244	B	C	C	C	C	C
25	C	A	A	A	A	B	B	B	B	B	B	254	B	B	B	B	B	B	B	B	B	Y	Y	B	
26	B	A	A	Y	B	A	A	A	B	B	B	B	B	B	212	220	210	204	210	E B 244	B	B	B	B	
27	B	A	A	A	A	A	A	240	220	188	200	182	192	192	200	212	Q 216	214	200	202	210	A	A	B	
28	A	A	A	A	A	Y	B	248	200	206	178	H 202	202	188	196	196	Q 220	Q 200	Q 194	208	196	260	A	Y	A
29	A	A	A	A	192	A	206	206	180	208	208	208	216	216	216	216	Q 216	Q 204	198	204	E B E B 254	E B E B 286	A	B	
30	B	E A 260	A	A	A	B	A	260	186	202	204	204	210	214	206	Q 214	Q 212	200	200	224	234	B	B	210	
31	198	198	B	B	A	B	B	B	218	212	194	226	230	230	202	Q 206	Q 212	208	B	B	Y	B	Y	B	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	7	6	3	1	4	6	11	19	23	26	25	26	24	26	28	25	24	27	25	27	23	18	11	6	
MED	240	213	208	204	207	240	220	218	203	202	194	202	202	200	210	202	206	204	204	209	216	229	238	236	
U Q	284	250	260	257	246	262	234	218	208	206	208	214	206	217	212	215	210	212	224	234	260	258	286	286	
L Q	232	198	192	196	236	216	202	196	184	179	192	194	194	202	199	200	198	198	208	208	222	234	238	238	

MAR. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2009 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	Y	B	B	R	B	B	X	X	O	X	X	O	X	X	X	O	X	X	O	X	O	X	B	B	B
2	A	A	A	A	31	34	34	33	40	45	51	51	50	54	51	56	54	48	37	28	25		B	A	A	
3	A	O	X	X	A	X	A	O	X	X	X	X	X	X	X	X	X	X	X	X	X	B		R	B	
4	A	A	O	X	B	B	B	B	O	X	O	X	O	X	X	X	X	X	X	X	X	Y	Y	A	B	
5	A	B	O	X	O	X	A																B	B	B	
6		B	B		R	X															O	X	B	B	B	
7	B	A	B	B	O	X	B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B	B	B	
8	B	B	B	B	B	B	A														X	O	A	B	A	
9	X	X	O	X	O	X	B	A	A	A	B	B	B	X	X	X	X	X	O	X	O	X	A	A	A	
10	A	B	B	A	A	B	B	B			X	X	X	B	R	B	O	X	X	B	O	X	B	A	A	
11	Y	Y	A	B	B	B	B	B	O	X	B	B	B	B	B	B	B	B	O	X	B	B	A	A	A	
12	36	A	B	B	B	A	A	R	B	B	B	B	B	B	B	B	O	X	O	X	B	R	B	B	A	
13	A	A	A	B	A	A	A	A	R	B	B	B	B	O	X	O	X	X	X	X	A	B	B	R	B	
14	B	Y	X	R	R	R	R	R													B	B	B	B	B	
15	A	A	70	A	B	A	A	A	O	X	X	X	X	O	X	X	X	X	O	X	X	O	X	A	Y	
16	O	X	A	A	A	A	A	O	X	O	X	R	B	X	R	X	X	X	X	O	X	Y	Y	R	A	
17	B	A	45	A	A	35	31	29	34	41	45	52	53	60	66	81	57	38	31	B	B	B	Y	B		
18	A	A	O	X	A	A	A	B	B	B	B	B	O	X	R	O	X	R	X	O	X	X	B	B	B	
19	B	R	50	A	A	A	B	A	O	X	X	X	X	X	X	X	62	57	45	B	B	B	A	B	A	
20	A	A	A	A	A	B	A														O	X	B	O	X	
21	Y	R	R	R	R	A	A	B													O	X	Y	B	Y	
22	O	X	X	R	R	B	X	A	A	X	X	X	X	X	X	X	O	X	O	X	X	B	B	B	A	
23	B	60	64	34	32	29	29	26	36	48	48	57	63	75	66	56	49	32	24	25	B	B	O	X		
24	B	B	R	O	X	Y	52	58	60	31	39	48	66	63	71	74	70	58	36	27	23	23	B	A	A	
25	C	C	C	C	C	C	C	C	B	X	X	X	X	X	X	X	69	42	33	29	24	B	B	O	X	
26	A	O	X	A	A	R	O	X	B	B	O	X	X	X	X	X	X	X	X	A	B	B	B	B	B	
27	B	X	O	X	A	A	B	A	O	X	R	O	X	X	X	X	X	X	O	X	B	B	B	B	B	
28	B	B	B	A	R	B	B	B													B	B	B	B	B	
29	B	B	40	34	R	B	B														B	B	B	B	B	
30	B	B	59	39	A	O	X	X	30	30	40	50	52	62	61	68	59	36	24	X	O	X	B	R	A	
31																										
CNT	4	6	13	7	6	10	8	15	24	24	23	24	25	27	27	28	27	26	24	16	7	2	2	2		
MED	X	X	40	37	X	34	30	32	X	X	X	X	X	X	X	X	X	X	X	O	X	O	X	O	X	
U Q	38	38	58	39	32	38	35	34	39	46	51	56	60	64	67	70	56	44	36	26	25					
L Q	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	X			
D	28	28	31	34	30	30	28	29	32	40	47	50	54	54	57	58	46	33	28	24	21					

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	Y	B	B	R	B	B	23	29	R	40	46	J R	R	54	57	59	R	38	R	R	16	B	B	B			
2	A	A	A	A	F	F	F	F	F	39	45	45	44	48	45	50	48	42	31	22	14	F	B	A	A			
3	A	R	22	A	21	A	R	F	F	34	43	45	44	48	48	51	60	F	38	30	20	B	F	R	B			
4	A	A	30	B	B	F	B	B	B	32	40	45	45	52	49	J R	J R	45	39	29	17	F	Y	Y	A	B		
5	A	B	A	R	R	A	F	F	F	24	23	34	36	47	44	49	49	F	F	54	38	F	F	B	B	B		
6	B	B	B	R	A	F	20	21	24	F	35	40	43	44	47	J R	53	56	50	39	24	R	A	B	B	B		
7	B	A	B	B	R	F	B	21	33	F	42	42	46	54	60	54	62	53	40	29	20	15	B	B	B			
8	B	B	B	B	B	B	A	F	20	37	43	47	52	48	52	59	58	49	38	33	18	R	A	B	A			
9	21	25	23	R	R	B	A	A	A	B	B	B	J R	50	61	64	65	41	36	32	14	A	A	A	A			
10	A	B	B	A	A	B	B	B	F	29	35	39	39	B	R	B	U R	R	B	31	B	B	A	A	A			
11	Y	Y	A	B	B	B	B	B	31	B	B	B	B	B	R	B	B	B	R	B	B	R	A	A	A			
12	F	A	B	B	B	A	A	A	B	B	B	B	B	B	B	R	R	B	R	B	B	B	B	A	A			
13	A	A	A	B	A	A	A	A	R	B	B	B	B	R	R	41	48	48	42	28	22	A	B	B	R	B		
14	B	Y	30	A	A	R	R	R	F	27	36	44	J R	45	48	44	59	67	B	B	B	B	B	B	B			
15	A	A	A	A	B	A	A	A	31	34	35	42	42	47	51	56	42	36	25	18	A	Y	Y	F	27			
16	R	A	A	A	A	A	A	R	28	31	A	B	R	41	44	41	46	35	27	R	Y	Y	R	A	A			
17	B	A	F	A	A	F	F	F	F	24	21	20	F	R	R	46	47	54	60	J R	75	51	32	25	B	B	Y	B
18	A	A	R	A	A	A	A	B	B	B	B	B	U R	R	R	48	42	40	32	27	18	R	B	B	B	B		
19	B	A	A	A	A	A	B	A	R	27	33	41	43	51	59	50	50	F	F	B	B	B	A	B	A			
20	A	A	A	A	A	B	A	F	24	31	36	B	48	55	49	59	60	Z	F	R	B	R	A	B				
21	Y	A	A	A	A	A	A	B	F	23	34	R	B	R	R	R	R	B	R	Y	B	Y	B	B	B			
22	R	33	29	R	R	B	A	A	24	34	44	50	56	53	60	64	47	33	18	R	B	B	B	A	B			
23	B	Y	A	F	F	F	F	F	F	19	23	16	24	42	51	57	63	60	50	43	26	18	R	B	B	R	B	
24	B	B	R	R	Y	F	B	B	25	33	J R	42	60	57	60	68	58	52	27	21	17	17	B	A	A			
25	C	C	C	C	C	C	C	C	B	34	45	52	51	62	68	59	F	36	27	23	18	R	B	B	R	R		
26	A	R	A	A	A	R	B	B	R	24	34	43	43	J R	51	55	56	52	29	22	A	B	B	B	B	B		
27	B	22	R	A	A	B	A	R	A	R	36	37	44	47	47	60	53	39	18	F	R	B	B	B	B	B		
28	B	B	B	A	R	B	B	B	18	35	49	44	50	56	64	50	37	20	17	F	B	B	B	B	F	26		
29	B	B	28	F	R	B	B	F	F	21	19	29	44	46	56	55	58	53	30	13	F	B	B	B	B	B		
30	B	B	Y	F	A	R	F	F	F	30	20	20	22	28	47	51	F	F	F	57	30	22	21	16	B	R	A	B
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	4	5	8	7	6	10	7	14	24	24	23	24	25	27	27	28	27	26	24	15	7	2	2	2	2			
MED	23	25	26	R	24	F	22	F	29	36	44	45	50	52	57	56	45	34	25	R	15	18	R	F	26			
U Q	28	30	29	R	26	F	F	F	32	40	45	50	54	56	60	60	50	38	29	20	17							
L Q	22	22	22	F	22	F	F	F	24	34	41	44	48	48	51	51	40	27	21	17	F	14						

APR. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	18	B	B	25	B	B	E B E B	17	16	21	18	26	33	32	24	E B E B	20	18	16	27	29	B	B	B				
2	32	32	44	42	21	24	E B E B	15	14	16	22	30	26	28	24	28	25	20	27	25	24	22	B	35	29				
3	33	32	30	38	33	34	22	25	15	26	29	31	33	31	31	27	27	15	26	20		E B	20	24	B				
4	31	32	22	B	E B	E B	B	E B	E B	23	22	24	24	31	32	32	28	30	26	19	E B	12	17	17	30	B			
5	28	B	30	32	28	53	32	36	30	24	30	30	30	30	32	30	18	E B E B	E B E B	E B E B	E B E B	B	B	B	B				
6	B	B	B	34	34	31	23	E B	12	21	22	32	30	30	30	27	28	18	K	15	22	32	29	B	B	B			
7	B	32	B	B	E B	E B	E B	E B	12	30	19	24	31	31	25	24	22	18	16	22	E B E B	E B E B	B	B	B				
8	B	B	B	B	B	B	30	15	15	22	24	25	29	38	60	28	17	24	E B E B	E B E B	E B E B	B	B	B	31				
9	36	33	E B E B	14	18	24	B	50	67	41	B	B	E B E B	E B E B	E B E B	E B E B	35	E B E B	E B E B	E B E B	32	46	44	43	69				
10	35	B	B	35	43	B	B	B	B	22	21	24	28	B	E B	E B	E B	E B	E B	E B	E B	B	B	40	42	24			
11	15	17	33	B	B	B	B	B	27	B	B	B	B	B	B	26	B	B	21	B	B	34	29	30	34				
12	31	32	B	B	B	36	43	33	B	B	B	B	B	B	B	B	23	34	B	29	B	B	B	38	44				
13	44	34	39	B	39	44	44	36	25	B	B	B	B	E B E B	E B E B	E B E B	31	24	22	24	26	37	27	B	B	16	B		
14	B	17	34	34	28	22	16	22	18	E B	20	24	24	22	22	E B E B	E B E B	B	B	B	B	B	B	B	B	B			
15	32	39	43	41	B	42	60	40	40	22	31	30	30	22	22	24	16	E B E B	E B E B	E B E B	41	29	16	16	24				
16	15	32	44	46	57	51	45	36	35	34	B	30	26	23	20	22	E B E B	E B E B	E B E B	E B E B	17	13	24	67	25				
17	B	74	79	58	51	36	17	17	17	22	22	22	23	31	47	20	E B	19	23	E B	B	B	B	21	B				
18	36	42	25	43	42	48	44	B	B	B	B	B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	B	B	B	B				
19	B	23	31	32	43	39	B	30	26	E B	19	24	20	E B	20	20	21	22	E B	B	B	B	B	B	30	B	32		
20	34	39	41	40	39	B	32	21	E B E B	E B E B	B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	B	B	14	B	B	
21	21	22	28	28	23	29	35	B	E B E B	E B E B	13	17	29	B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	B	B	14	B	B	
22	15	21	24	22	E B	E B	15	39	34	E B	14	18	22	22	23	31	21	18	E B E B	E B E B	E B E B	B	B	B	28	B	B		
23	B	20	32	28	28	32	24	26	E B	12	17	28	25	29	30	28	20	E B E B	E B E B	E B E B	E B E B	B	B	E B E B	B	B	17	B	
24	B	B	21	20	19	E B E B	E B E B	E B E B	E B E B	13	16	29	29	22	35	26	22	28	24	12	12	12	12	B	B	32	36	B	
25	C	C	C	C	C	C	C	C	E B E B	15	18	20	20	22	19	19	15	12	12	13	B	B	B	B	20	22	B		
26	40	36	42	45	30	E S	B	E B	E B	17	19	20	22	20	34	37	34	34	26	32	B	B	B	B	B	B	B	B	
27	B	19	40	52	71	B	36	32	32	31	19	30	20	21	20	16	E B	14	16	E B	B	B	B	B	B	B	B	B	
28	B	B	B	29	30	B	B	E B E B	E B E B	14	15	20	22	24	23	E B E B	E B E B	E B E B	E B E B	E B E B	E B E B	B	B	B	B	E B E B	24	B	
29	B	B	22	27	27	B	B	E B	E B	12	18	19	28	29	26	35	16	E B E B	E B E B	E B E B	E B E B	B	B	B	B	B	B	B	
30	B	B	17	30	56	37	30	30	E B	E B	12	26	28	30	28	22	20	18	E B E B	E B E B	E B E B	E B E B	B	22	30	B	B		
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	16	21	22	22	23	20	20	22	27	25	23	24	26	29	27	29	28	26	26	19	12	12	17	12					
MED	32	32	32	34	30	33	32	28	18	21	24	26	28	26	24	22	19	E B E B	E B E B	E B E B	20	22	30	30					
U Q	36	35	41	42	43	40	44	34	27	22	29	30	30	31	32	28	26	23	22	27	29	30	36	35					
L Q	24	20	24	28	E	24	24	17	E B E B	14	18	20	22	23	23	20	20	E B E B	E B E B	E B E B	E B E B	12	16	20	24				

APR. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	14	B	B	18	B	B	13	16	20	15	14	12	12	15	24	20	13	16	12	12	B	B	B	
2	12	14	12	12	16	14	15	14	12	12	12	14	13	16	15	15	13	13	12	12	12	B	11	13	
3	11	14	15	16	13	13	17	14	12	12	12	12	13	12	12	13	13	11	11	14	B	20	16	B	
4	20	18	16	B	B	23	B	B	23	16	14	13	14	13	13	12	12	13	12	12	13	12	11	B	
5	17	B	15	13	18	14	13	14	12	12	12	12	12	12	12	14	12	14	13	13	12	B	B	B	
6	B	B	B	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	11	12	13	B	B	B	
7	B	16	B	B	16	20	B	12	12	12	14	13	11	12	13	12	13	12	10	12	13	B	B	B	
8	B	B	B	B	B	B	17	13	12	13	13	15	14	13	12	12	12	12	12	12	12	14	B	12	
9	11	12	14	18	16	B	14	19	20	B	B	B	27	24	23	28	15	20	17	13	10	12	15	12	
10	13	B	B	28	24	B	B	B	15	13	13	12	B	30	B	29	27	B	14	B	B	13	12	12	
11	13	13	20	B	B	B	B	B	14	B	B	B	B	26	B	B	B	20	B	B	13	15	12	11	
12	12	12	B	B	B	16	17	26	B	B	B	B	B	B	B	20	26	B	20	B	B	B	12	12	
13	18	20	19	B	26	20	17	13	19	B	B	B	B	31	24	22	14	26	19	12	B	B	12	B	
14	B	12	11	20	14	14	12	13	15	20	14	12	13	14	26	26	B	B	B	B	B	B	B	B	
15	12	12	20	20	B	23	21	19	15	12	12	15	15	13	13	12	13	20	13	12	15	11	12	12	
16	29	12	14	14	14	14	14	13	13	24	B	13	20	13	13	13	20	18	15	14	12	13	12	17	
17	B	16	13	14	13	12	11	12	12	12	14	14	13	16	12	16	19	12	12	B	B	B	12	B	
18	12	12	12	14	12	14	16	B	B	B	B	B	B	26	23	22	39	22	23	13	12	B	B	B	
19	B	13	12	14	17	13	B	27	14	19	17	16	26	16	15	13	16	15	B	B	B	14	B	12	
20	12	14	21	13	12	B	14	14	18	16	B	22	22	15	15	12	12	12	12	12	B	12	11	B	
21	15	12	12	12	11	20	14	B	13	17	21	B	17	26	41	55	22	B	16	12	B	11	B	B	
22	11	12	13	13	B	15	22	13	14	12	12	12	15	12	13	14	24	15	13	B	B	12	B		
23	B	14	12	13	14	12	17	12	12	12	14	13	13	12	13	13	13	13	12	12	B	B	17	B	
24	B	B	12	14	13	29	26	25	13	14	29	29	22	13	12	12	13	12	12	12	12	B	12	14	
25	C	C	C	C	C	C	C	C	B	15	14	14	13	13	14	19	15	12	12	13	B	B	20	11	
26	13	13	12	16	17	16	B	B	17	13	13	12	13	13	14	13	12	12	12	B	B	B	B	B	
27	B	13	12	14	37	B	16	20	20	15	12	14	13	14	14	16	11	12	12	B	B	B	B	B	
28	B	B	B	17	20	B	B	B	14	15	16	18	18	19	20	17	14	13	12	B	B	B	B	24	
29	B	B	18	18	18	B	B	24	12	12	12	12	12	12	13	12	16	14	B	B	B	B	B	B	
30	B	B	11	12	13	14	12	11	12	12	12	12	12	13	13	12	12	12	13	12	B	11	13	B	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	20	14	15	16	17	20	17	14	14	14	14	14	14	13	14	14	14	13	13	13	B	B	16	B	
U Q	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
L Q	12	12	12	13	13	14	14	13	12	12	12	12	12	13	12	13	12	12	12	12	12	13	13	12	12

APR. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	Y	B	B	A	B	B	A						H							A	B	B	B					
2	A	A	A	A	196	A	E	B															B	A	A				
3	A	206	A	A	A	A	S	Q														B	E	B	A	B			
4	A	A	230	B	B	B	B	B														Y	Y	A	B				
5	A	B	A	A	202	A	A	E	A													E	B	B	B	B			
6	B	B	B	A	A	A	A	Q														A	B	B	B				
7	B	A	B	B	A	A	B																B	B	B				
8	B	B	B	B	B	B	A	E	A													E	B	E	B	A	B	A	
9	A	198	E	B	E	B	A	B	A													A	A	A	A	A			
10	A	B	B	A	A	B	B	B														B	B	A	A	A			
11	Y	Y	A	B	B	B	B	B	A	B	B	B	B	B								B	B	A	A	A			
12	Q	A	B	B	B	A	A	A	B	B	B	B	B	B								B	B	A	A	A			
13	A	A	A	B	A	A	A	A	A	B	B	B	B	E	B							A	A	B	B	A	B		
14	B	Y	234	A	A	A	A	A	Q													B	B	B	B	B			
15	A	A	A	A	B	A	A	A	E	A	A											Q	Y	Y	A	A	A		
16	216	A	A	A	A	A	A	A	232	218												Y	Y	A	A	A			
17	B	A	F	A	A	A	A	A	222	326	296	220	210	206	178	210	204	204	198	190	204	B	B	B	A	B			
18	A	A	226	A	A	A	A	B	B	B	B	B	E	B								E	B	B	B	B	B		
19	B	A	A	A	A	A	B	A	A													B	B	A	B	A			
20	A	A	A	A	A	B	A	E	A													B	B	E	B	A	B		
21	A	A	A	A	A	A	A	B	212	234	234											Y	B	Y	B	B	B		
22	198	A	A	A	B	B	A	A	E	B	Q											B	B	B	A	B	B		
23	B	Y	A	A	A	E	A	A	Q	Q												A	B	B	E	B	B	B	
24	B	B	A	A	Y	A	B	B	212	186	188	188	204	196	190	184	178	184	196			E	B	B	A	A	A		
25	C	C	C	C	C	C	C	C	B													B	B	B	B	A	A		
26	218	220	A	A	A	E	S	B	B	E	B											B	B	B	B	B	B		
27	B	192	260	A	A	B	A	A	A	A												B	B	B	B	B	B		
28	B	B	B	A	A	B	B	B														B	B	B	B	E	B	B	B
29	B	B	212	A	A	B	B	A	Q	Q												B	B	B	B	B	B	B	
30	B	B	Y	A	A	A	A	A	Q	Q												B	A	A	A	B	B	B	
31																													
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
CNT	5	4	6	1	2	4	2	10	22	23	23	23	26	29	27	29	28	26	23	14	6	2	2	1					
MED	210	202	230	E	B	199	246	308	240	220	206	205	204	202	204	204	192	194	201	230	252	E	B	E	B				
U Q	217	213	260			E	299		E	A	256	242	226	224	210	206	213	218	214	200	212	228	262	284					
L Q	203	195	226			216			238	210	196	194	196	196	195	198	189	186	188	194	218	236							

APR. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2009 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	B	O X 34	B	B	B	B		29	40	48	56	74	55	63	49	38	O X 26	O X 22	B	B	B	B	B		
2	B	A	X 26	A	A	A	A	A		45	32	B	O X 49	X 60	X 62	X 65	60	39	30	O X 23	B	B	B	B	B		
3	O X 34	O X 32	A	X 39	A	A		36	31	30	38	44	48	61	58	56	48	36	27	O X 22	B	B	B	B	B		
4	B	A	B	Y	B		42	58	48	B	O X 34	44	58	51	60	61	53	O X 38	O X 30	X 25	B	B	B	R	B		
5	B	B	B	B	B	B	B	B		36	52	50	56	56	52	48	37	22	X B	A	B	B	A	B			
6	B	B	B	R		59	B	O X 36	37	42	46	49	58	61	64	49	36	32	O X 24	B	A	A	A	A			
7	A	A	B	A	B	A	B	B	A	B	O X 44	O X 47	X 50	X 51	X 54		R	O X 38	O X 29	O X 24	B	B	B	A			
8	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A		
9		A	A	R	Y	B	B	B	B	X 35	X 40	X 50	X 58	X 63							B	B	B	Y	A		
10		O X 33	A	A	A	A	A	R	R	O X 34	X 41	X 50	O X 54	X 53	X 63	56	38			B	B	B	B	B	R		
11	O X 31		O X 28	O X 36	A	A	R	Y	R	X 33	X 44	X 50	X 55	X 59	X 60	58		R	B	B	B	Y	B	B	Y		
12	R	R		B	A	R		B		24	32	47	49	53	56	44	41	24	O X 24	B	B	B	B	B			
13	A	A	X 28	A	A	X 30	34	30	31	33	41	48	53	54	46	45	32	24	O X 21	B	B	B	Y	B			
14	B	B	B	B	O X 39	X 31	B	B	A	O X 35	50	55		B	B	B	48	33	25	X B	B	B	R	A	A		
15	A		A	A	A	O X 28	O X 28	23	30	41	51	50	54	49	44	33	24	21	X B	B	B	B	B	B			
16	R	A	R	R		37	35	27		30	44	53	62	57	48	43	26		X 32	B	R	B	R	O X 29			
17	R	A	A	A	O X 27	R	R	R	R	X 28	X 39	X 51	X 55	X 49	40	40	32	O X 23	B	A	B	A	R	R			
18	A	A	A	A	X 31	A	A	A	A	O X 31	43		51	47	46	37	31	22	X R	B	B	B	A	A			
19	R	R	X 38	A	A	A	R	R	R	R	X 32	X 48	X 50	X 48	X 44	X 34	O X 41	X 34	B	R	A	O X 27	R	R	A		
20	O X 36	A	A	R		32		X 22	X 23	O X 40	32	39	50	51	46	46	34		R	B	B	Y	R	Y	B		
21	B	Y	Y	R	B		42		Y	A		X 26	X 38	X 50	X 47	X 41	X 39	B	B	Y	R	A	B	B	Y		
22	B	B	R	Y		35		R	B	R	B		25	36	46	48	50	47	36	28	B	Y	B	B	A	A	A
23	A	A	A	Y	Y	B	B	B	B	B	O X 36	O X 42		B	B	O X 42	O X 34			B	B	R	R	Y	B	O X 26	
24	A	B	O X 38	O X 40	B	A	Y	O X 34		B	R	X 38	X 50	X 48	X 44	X 43	X 28	X 29		B	B	B	B	B	B	B	
25	Y	A	O X 31	R	A	B	R	R	R		28	39	42	O X 47	48	41	41		R	B	B	B	B	B	B	B	
26	R	Y		42	29	O X 34	30		R	22	B	X 27	34	41	66	62	46	30	22	X A	A	A	A	R	R	A	
27	B	O X 36	O X 34	O X 34	B	R		B	B	B	O X 33	X 41	X 44	X 45	X 37	X 32		R	B	Y	B	B	B	R	B		
28	R	O X 37	A	A	A	A	R	R	R	R		33	38	48	56		R	B	B	B	B	B	R	A	R	B	
29	Y	A	A	O X 40	X 34	A	B	R	B	B	B	X 39	X 48	X 40	X 42		B	O X 31	C	C	B	B	B	B	R	A	O X 27
30	A	R	A	A	A	R	B	R	R	R		32	42	42	40	38				B	B	B	Y	B	B	B	
31	B	A	A	A		40	A	A	A	R	A		30	40	40	48	47	36		B	B	B	B	B	B	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	3	6	9	7	9	6	9	9	8	21	28	29	28	28	27	25	20	13	10		1				4		
MED	O X 36	O X 34	X 31	O X 36	35	30	35	30	X 30	30	32	40	49	51	54	47	43	34	25	O X 24	O X 27				O X 28		
U Q	48	37	38	40	40	42	47	35	38	35	44	50	57	58	56	48	38	30	24						30		
L Q	O X 34	O X 32	X 28	X 34	X 33	30	X 26	X 25	X 26	29	X 36	X 42	X 48	X 48	X 42	X 36	X 31	X 24	X 22						O X 26		

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	B	A	B	R 28	B	B	B	B	F 20	F 28	F 39	50	F 65	49	57	43	32	R 20	R 16	B	B	B	B	B	
2	B	A	22	A	A	A	A	A	F 25	F 26	B	R 43	54	56	59	54	29	24	14	F	B	B	B	B	
3	28	R 26	A J 33	F A	A	A	F 21	F 21	F 20	F 28	F 36	F 38	55	52	50	38	F 25	F 18	F 16	R	B	B	B	B	
4	B	A	B	Y	B	R 29	B	B	42	B	R 28	F 34	F 47	45	54	55	47	R 32	R 24	19	B	B	B	A	B
5	B	B	B	B	B	B	B	B	B	F 25	F 40	44	47	46	F 42	F 36	F 24	F 16	B	A	B	B	A	B	
6	B	B	B	R 48	F B	A	R 30	F 27	F 28	F 36	F 43	52	55	58	38	F 27	F 22	R 18	B	A	A	A	A		
7	A	A	B	A	B	A	B	B	A	B	R 38	R 41	44	45	48	R 32	R 23	R 18	B	B	B	A	F 20		
8	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
9	Z 42	A	A	R	Y	B	B	B	B	29	34	44	52	57	B	B	B	B	B	B	B	B	Y	A	
10	A	R 27	A	A	A	A	A	R	R	R 28	35	44	48	47	57	Z 50	F 26	B	B	B	B	B	B	R	
11	A	R 25	F 20	R 30	A	A	A	Y	R	27	38	44	49	50	54	47	F	R	B	B	B	Y	B	Y	
12	A	A	F 22	B	A	R	F 14	B	F 12	F 21	39	43	43	50	46	34	F 30	F 13	R 18	B	B	B	B	B	
13	A	A	22	A	A	24	23	24	21	24	35	42	47	48	40	39	22	18	15	B	B	B	Y	B	
14	B	B	B	B	F 26	25	B	B	A	R 29	F 40	F 44	B	B	B	F 36	27	19	B	B	B	R	A	A	
15	A	A	A	A	A	A	R 22	R 22	F 17	24	35	45	44	48	43	38	23	18	15	B	B	B	B	B	
16	R	A	R	R	F 24	A	F 24	21	A	24	32	44	56	46	42	37	20	A	26	B	A	B	R 23		
17	A	A	A	A	A	R 21	R	A	A	22	33	45	49	43	31	34	F 22	R 17	B	A	B	A	R A		
18	A	A	A	A	25	A	A	A	A	25	34	C	45	36	40	31	V 20	F 16	A	B	B	B	A	A	
19	R	A	32	A	A	A	R	R	R	A	26	42	44	42	42	35	R 28	B	A	A	R 21	A	R	A	
20	R 30	A	A	A	F 21	A	16	17	R 34	F 20	33	44	42	40	41	28	A	B	B	Y	Y	A	Y	B	
21	B	Y	Y	R	B	F 30	R	Y	A	F 16	32	39	40	41	35	33	B	B	Y	R	A	B	B	Y	
22	B	B	R	Y	F 26	A	B	R	B	F 17	30	40	42	43	41	30	R 22	B	Y	B	B	A	A	A	
23	A	A	A	Y	Y	B	B	B	B	B	R 30	R 36	B	B	R 36	R 28	B	B	R	R	Y	B	Y	R 20	
24	A	B	R 32	R 34	B	A	Y	R 28	B	R	32	44	42	38	37	22	23	B	B	B	B	B	B	B	
25	Y	A	R 25	A	A	B	A	A	R	F 17	26	32	41	38	32	30	F	R	B	B	B	B	B	B	
26	R	Y	F 29	F 20	R 28	F 21	A	F 14	B	21	24	35	44	50	38	24	16	A	A	A	A	R	R	A	
27	B	R 30	R 28	R 28	B	A	F 26	B	B	B	R 27	35	35	39	31	22	F	R	B	Y	B	B	A	B	
28	R	R 31	A	A	A	A	R	R	R	R	F 22	F 28	42	42	F	R	B	B	B	B	B	A	A	A	
29	Y	A	A	R 34	28	A	B	A	B	B	B	33	42	34	36	B	R 25	B	B	B	B	R	A	R 21	
30	A	A	A	A	A	R	B	A	R	R	26	36	36	34	32	C	C	B	B	B	Y	B	B	B	
31	B	A	A	A	Y	A	A	A	R	A	F 17	F 28	34	42	41	30	R	B	B	B	B	B	B	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	5	9	7	8	6	7	9	8	21	28	29	28	28	27	25	20	13	10		1			4	
MED	30	R 27	25	R 30	F 26	24	22	22	F 20	25	34	43	44	46	41	35	25	18	R 17		R 21			R 20	
U Q	Z 42	R 30	30	R 34	28	29	F 24	R 29	F 26	28	36	44	49	50	50	38	28	22	18					R 22	
L Q	28	R 26	22	28	F 24	21	16	19	F 18	21	28	36	42	40	36	30	22	16	15					20	

MAY 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	27	B	27	B	B	B	B	E B	B	22	19	21	20	E B	E B	16	E B	E B	B	B	B	B	B				
2	B	31	29	36	43	43	36	40	E B	E B	19	B	E B	E B	22	22	28	36	14	18	B	B	B	B				
3	27	34	41	48	42	34	22	E B	E B	B	42	14	22	22	41	19	17	22	E B	E B	B	B	B	B				
4	B	28	B	19	B	E B	E B	E B	B	B	27	21	40	22	22	25	22	22	E B	E B	B	B	B	21				
5	B	B	B	B	B	B	B	B	B	E B	B	12	29	19	20	24	28	34	30	24	B	B	B	B				
6	B	B	B	16	18	B	42	43	40	31	20	23	18	19	28	20	E B	E B	B	B	B	30	42	31	43			
7	71	79	B	43	B	64	B	B	43	B	E B	B	24	32	30	E B	E B	E B	E B	E B	B	B	B	31	34			
8	45	41	44	B	B	B	41	57	33	B	B	B	B	B	B	B	B	B	B	B	B	B	B	40	38			
9	45	39	42	25	17	B	B	B	B	14	16	16	E B	E B	B	B	B	B	B	B	B	B	B	16	30			
10	36	42	42	39	41	43	36	24	26	E B	B	25	18	E B	E B	28	17	E B	B	B	B	B	B	B	22			
11	38	33	18	36	39	36	30	18	14	13	18	17	20	22	15	15	16	E B	B	B	B	18	B	B	16			
12	30	31	42	B	36	21	22	B	E B	E B	E B	B	15	21	58	42	18	E B	B	E B	B	B	B	B	B			
13	26	28	33	35	33	32	32	E B	E B	E B	B	15	15	16	32	13	12	12	12	12	B	B	B	14	B			
14	B	B	B	E B	E B	E B	B	B	49	32	20	E B	B	B	B	18	E B	E B	E B	B	B	B	21	41	72			
15	46	39	94	48	43	39	26	16	E B	E B	B	15	16	16	16	18	E B	E B	E B	B	B	B	B	B	B			
16	22	30	21	22	34	40	39	31	39	32	39	20	27	19	32	24	36	30	27	B	24	B	19	33				
17	27	49	36	40	37	32	21	30	29	E B	B	12	18	27	31	48	17	24	14	E B	B	29	39	22	29			
18	29	31	26	26	E B	24	31	42	49	35	29	28	C	20	18	20	28	27	26	30	B	B	B	23	28			
19	22	30	55	44	43	49	31	28	37	36	17	17	18	19	19	E B	E B	B	B	33	28	19	28	24	35			
20	26	56	51	31	52	40	25	22	25	12	16	25	34	27	25	E B	14	30	B	B	15	17	29	14	B			
21	B	14	14	23	B	E B	23	15	40	66	E B	12	17	16	16	15	E B	B	B	15	21	36	B	17				
22	B	B	22	14	22	28	B	24	B	E B	B	12	24	12	16	20	25	21	16	B	20	41	32	30				
23	32	57	30	14	18	B	B	B	B	E B	E B	B	21	26	B	E B	E B	B	B	23	19	16	B	15	37			
24	48	B	41	40	B	31	16	28	B	E B	B	30	17	14	16	17	E B	E B	E B	B	B	B	B	B	B			
25	18	36	35	30	34	B	31	25	25	32	22	22	17	17	15	12	16	B	B	B	B	B	B	B	B			
26	21	15	32	33	34	34	26	24	B	E B	B	E B	12	24	13	34	32	18	24	E B	12	34	31	25	26	17	16	66
27	B	22	18	30	B	25	30	B	B	E B	E B	B	17	15	16	17	24	17	17	B	B	B	B	B	27	B		
28	23	31	88	70	57	66	23	21	22	26	31	21	18	18	43	B	B	B	B	B	B	21	30	20	B			
29	14	29	29	31	24	30	B	28	B	B	E B	B	18	33	18	E B	16	B	E B	B	B	B	B	15	26	36	B	
30	38	24	42	46	49	23	B	31	24	22	16	15	15	17	24	C	C	B	B	B	B	15	B	B	B	B		
31	B	A	29	43	42	17	43	40	36	22	32	26	36	18	E B	E B	E B	B	B	B	B	B	B	B	B	28		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	21	26	25	27	23	24	22	23	20	26	28	29	28	28	28	26	24	15	17	7	10	9	19	17				
MED	29	31	36	33	34	33	30	25	26	22	19	18	20	19	21	18	E B	E B	17	25	20	29	23	33				
U Q	42	39	42	42	43	42	36	31	38	32	24	24	22	25	26	24	22	24	28	29	26	40	31	38				
L Q	22	28	28	25	24	27	23	21	E B	E B	B	18	13	16	16	16	18	18	E B	E B	E B	E B	19	17	19	16	28	

MAY 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	20	B	18	B	B	B	B	12	12	12	14	16	23	21	13	14	12	12	B	B	B	B	B
2	B	11	12	11	12	12	12	13	18	19	B	27	21	18	12	12	12	11	12	B	B	B	B	B
3	12	12	12	13	12	11	11	14	12	14	12	13	12	13	12	12	12	12	11	B	B	B	B	B
4	B	21	B	14	B	25	28	25	B	19	14	12	12	16	17	16	18	16	13	B	B	B	12	B
5	B	B	B	B	B	B	B	B	B	12	12	12	12	12	12	12	16	13	B	21	B	B	20	B
6	B	B	B	12	13	B	15	12	12	12	12	12	12	12	12	12	12	12	12	B	13	12	12	14
7	17	27	B	22	B	20	B	B	15	B	24	20	14	21	23	29	19	15	12	B	B	B	12	12
8	12	19	19	B	B	B	27	21	27	B	B	B	B	B	B	B	B	B	B	B	B	B	12	11
9	21	20	20	14	12	B	B	B	B	12	12	13	20	26	B	B	B	B	B	B	B	B	13	12
10	11	12	20	19	17	14	12	13	15	22	15	15	17	16	14	14	12	B	B	B	B	B	B	12
11	12	13	12	12	18	13	16	12	12	13	18	17	12	12	15	11	16	B	B	B	14	B	B	12
12	12	13	12	B	14	12	12	B	12	12	13	12	15	12	13	12	13	12	12	B	B	B	B	B
13	11	12	11	20	14	15	12	14	12	13	14	15	14	14	13	12	11	12	12	B	B	B	12	B
14	B	B	B	B	24	24	B	B	14	17	12	19	B	B	B	13	14	12	B	B	B	12	12	12
15	15	12	20	16	17	13	12	12	12	13	12	13	12	14	13	13	11	11	12	B	B	B	B	B
16	11	14	11	12	11	16	12	12	12	14	12	13	12	12	12	12	12	11	12	B	12	B	14	12
17	12	13	14	13	12	12	13	12	16	12	12	12	13	12	11	12	12	11	B	13	B	16	13	12
18	11	13	12	12	24	11	12	12	13	12	12	C	12	12	13	12	12	12	16	B	B	B	11	11
19	12	12	12	12	12	12	12	12	19	12	12	12	13	14	12	16	17	B	14	12	16	14	21	12
20	12	12	12	12	11	13	12	11	13	12	12	13	13	13	11	14	14	B	B	12	12	14	12	B
21	B	12	12	12	B	26	12	12	11	11	12	12	12	13	13	14	B	B	13	12	14	B	B	15
22	B	B	13	12	13	13	B	12	B	12	13	12	15	20	22	14	16	B	16	B	B	12	12	12
23	12	12	12	12	15	B	B	B	B	B	21	26	B	B	26	20	B	B	16	13	13	B	12	11
24	12	B	13	14	B	13	13	12	B	23	17	13	12	13	13	12	12	B	B	B	B	B	B	B
25	12	11	12	11	12	B	14	14	12	12	12	12	12	12	12	13	13	B	B	B	B	B	B	B
26	11	12	12	13	12	11	12	12	B	12	11	13	14	13	12	13	12	12	12	11	12	12	13	11
27	B	11	15	12	B	12	22	B	B	B	17	15	13	13	13	12	11	B	13	B	B	B	12	B
28	12	12	12	12	13	12	16	12	12	12	11	12	13	13	25	B	B	B	B	B	13	14	10	B
29	11	11	12	12	12	13	B	23	B	B	18	13	13	16	B	18	B	B	B	B	B	12	12	12
30	12	12	12	14	17	12	B	19	16	14	13	11	11	12	12	C	C	B	B	B	12	B	B	B
31	B	12	11	11	11	12	12	24	13	12	12	13	12	22	20	20	B	B	B	B	B	B	B	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	30	30	31	31	31	31	31	31	31
MED	12	12	12	13	14	13	14	14	15	13	12	13	13	13	13	13	14	B	16	B	B	B	13	14
U Q	B	B	B	B	B	B	B	B	B	B	19	17	15	15	20	21	16	18	B	B	B	B	B	B
L Q	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	B	14	14	12	12

MAY 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	B	A	B	A	B	B	B	B	E B	Q	190	208	212	178	200	190	178	230	E A	B	B	B	B	B		
2	B	A	E A	A	A	A	A	A	E B	B	B	238	212	208	202	186	176	222	E B	B	B	B	B	B		
3	A	E A	A	A	A	E	E	B	E B	Q	196	196	218	200	198	188	170	208	E B	B	B	B	B	B		
4	B	A	B	Y	B	B	B	B	E B	H	196	192	194	194	194	202	264	200	E B	B	B	B	A	B		
5	B	B	B	B	B	B	B	B	Q	Q	214	214	196	184	186	176	176	168	232	B	A	B	B	A	B	
6	B	B	B	A	252	B	A	A	A	Q	252	206	206	180	188	184	184	188	218	218	B	A	A	A	A	
7	A	A	B	A	B	A	B	B	A	E B	B	268	238	248	224	204	204	194	222	224	B	B	B	A	220	
8	A	A	A	B	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	
9	228	A	A	A	A	B	B	B	B	B	222	234	208	210	246	B	B	B	B	B	B	B	B	A	A	
10	A	282	A	A	A	A	A	A	A	B	286	228	214	194	174	198	186	182	Q	B	B	B	B	B	A	
11	A	222	A	A	A	A	A	Y	A	228	204	204	198	204	186	186	206	B	B	B	Y	B	B	Y		
12	A	A	210	B	A	A	A	B	E B	B	Q	Q	Q	Q	Q	Q	Q	Q	A E B	B	B	B	B	B		
13	A	E A	A	A	A	A	A	A	E B	B	318	220	204	190	206	178	186	182	172	226	230	B	B	B	Y	B
14	B	B	B	B	B	B	B	B	A	A	Q	Q	Q	B	B	B	Q	Q	Q	B	B	B	A	A	A	
15	A	194	A	A	A	A	216	A	E B	B	298	220	212	202	192	196	196	186	176	202	280	B	B	B	B	
16	A	A	A	A	244	A	A	A	A	A	Q	Q	Q	Q	Q	Q	Q	E A	A	A	B	A	B	A	264	
17	A	A	A	A	A	204	A	A	A	A	244	194	196	186	178	188	188	176	202	B	A	B	A	A	A	
18	A	A	A	E B	268	A	A	A	A	A	Q	C	192	172	190	196	178	216	A	B	B	B	A	A	A	
19	A	A	204	A	A	A	A	A	A	A	240	232	210	206	204	196	206	B	A	A	204	A	A	A	A	
20	208	A	A	E A	A	E A	A	A	A	Q	Q	Q	Q	Q	Q	Q	A	B	B	Y	A	A	Y	B		
21	B	Y	Y	A	B	B	A	Y	A E	A	264	212	194	170	184	188	184	B	B	Y	Y	A	B	B	Y	
22	B	B	A	Y	A	A	B	A	E B	B	262	208	210	196	202	202	208	280	E B	B	Y	B	B	A	A	A
23	A	A	A	Y	Y	B	B	B	B	B	246	228	B	B	236	226	B	B	A	A	Y	B	Y	218		
24	A	B	212	224	B	A	Y	242	B	A	228	194	202	184	184	162	198	B	B	B	B	B	B	B	B	
25	Y	A	232	A	A	B	A	A	A	A	258	198	198	198	184	198	176	A	B	B	B	B	B	B	B	
26	A	Y	250	254	206	A	A	A	E B	B	270	204	188	206	188	172	188	218	A	A	A	A	A	A	A	
27	B	194	192	270	B	A	A	B	B	E B	Q	Q	Q	Q	Q	Q	Q	B	Y	B	B	B	B	A	B	
28	A	200	A	A	A	A	A	A	A	A	220	222	210	196	Q	Q	A	B	B	B	B	A	A	A	B	
29	Y	A	E A	A	A	A	B	A	B	B	B	210	192	192	202	C	C	216	B	B	B	B	A	A	216	
30	A	A	A	A	A	A	B	A	A	A	194	260	200	190	188	188			B	B	Y	B	B	B	B	
31	B	A	A	A	Y	A	A	A	A	A	A	200	194	208	198	208	B	B	B	B	B	B	B	B	A	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	2	6	8	5	6	2	3	4	7	18	27	29	28	28	27	26	22	13	9		1			4		
MED	218	204	214	U	U	E	A	U	E	B	U	232	210	202	196	188	190	186	186	219	234			219		
U Q		244	256	275	252	E	A	287	298	262	228	210	208	201	200	196	206	231	259					242		
L Q		194	207	219	228		216	239	248	220	204	196	192	183	184	182	176	205	221					217		

MAY 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2009 f_{XI} (0.1MHz)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	24	A	A	A	A	O X	X	B	A	56	X	O X	R	Y	Y	Y	B	B	B	B		
2	B	B	R	A	A	R	B	B	R	A	34	39	41	43	40	32	Y	Y	B	B	B	B	B	B		
3	Y	B	O X	A	A	A	A	A	R	O X	34	32	36	41	46	39	37	A	B	B	B	R	A	A	A	
4	A	X	O X	X	A	A	A	A	B	A	O X	O X	O X	O X	41	43	39	31	B	Y	Y	A	B	B	A	A
5	A	34	B	A	A	A	A	O X	A	A	A	O X	B	B	B	B	B	B	B	B	B	B	B	R	R	
6	A	A	A	A	O X	O X	A	R	R	A	O X	31	36	42	48	34	31	O X	B	B	B	A	B	B	R	
7	X	A	O X	A	O X	B	A	O X	O X	O X	B	B	B	38	42	34	X	R	B	B	B	B	A	R	A	
8	O X	O X	X	X	A	A	O X	A	O X	X	32	44	42	40	42	30	Y	Y	R	R	B	B	Y	R		
9	A	R	R	R	X	R	R	R	B	B	26	39	41	37	36	28	O X	B	R	B	B	B	B	Y		
10	A	A	A	X	O X	R	O X	O X	B	B	B	O X	O X	O X	O X	O X	B	R	B	A	A	R	Y	R		
11	R	A	A	A	30	A	30	A	R	A	X	36	41	38	38	30	O X	R	O X	B	R	B	R	A		
12	O X	A	X	A	27	30	A	A	Y	R	28	37	38	46	31	29	O X	B	B	B	A	B	B	R		
13	R	A	A	A	A	B	A	B	B	A	27	35	40	40	37	30	R	R	R	R	O X	A	A	50		
14	31	31	29	28	X	O X	O X	R	R	R	31	35	40	38	39	28	R	R	B	R	B	R	A	31		
15	A	A	A	31	A	A	R	R	A	A	A	38	44	43	40	31	R	Y	B	Y	R	B	B	Y		
16	Y	Y	A	A	A	A	A	A	B	B	O X	23	35	41	36	25	X	A	B	B	B	B	B	B		
17	B	R	A	A	O X	A	B	R	R	B	28	32	38	42	34	29	A	A	Y	R	B	B	B	R		
18	Y	A	A	A	36	30	30	34	R	R	O X	29	36	39	35	27	R	R	B	B	B	A	R	B		
19	30	R	30	52	A	A	A	O X	A	A	24	33	40	40	38	30	R	R	O X	B	R	B	B	B		
20	R	R	R	R	Y	51	38	R	R	B	28	34	37	41	36	26	A	A	A	R	R	B	R	R		
21	A	A	A	A	A	A	A	B	B	R	29	32	37	36	38	28	R	X	B	A	A	R	B	B		
22	A	A	A	A	A	A	39	O X	Y	Y	R	X	X	X	X	26	R	A	A	A	A	A	B	Y		
23	Y	A	A	R	A	A	A	B	R	R	28	37	40	34	37	29	X	R	A	A	A	R	B	A	A	
24	A	A	A	B	A	A	A	A	R	R	29	32	36	37	40	32	22	A	A	A	R	R	A	A		
25	58	28	B	A	A	A	A	A	A	R	O X	28	34	39	38	31	27	B	A	B	B	B	R	A	A	
26	B	56	A	A	A	B	A	R	B	B	B	O X	X	X	X	B	B	B	B	B	B	B	R	R		
27	A	A	O X	A	A	A	O X	A	R	R	28	32	35	38	33	O X	R	B	A	B	B	R	R	R		
28	A	30	O X	41	A	26	A	R	R	R	X	36	38	42	36	26	A	Y	B	A	A	A	A	A		
29	A	A	A	A	B	A	B	B	B	B	B	O X	X	B	B	B	B	R	B	B	B	B	A	A	A	
30	A	R	A	A	R	R	R	A	B	R	B	X	O X	56	40	B	B	B	B	B	B	B	A	Y	R	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	6	7	9	9	9	6	8	6	2	4	22	27	27	28	28	26	5	1	2		1			2		
MED	31	31	30	34	30	32	35	34	30	31	28	36	39	40	38	30	O X	X	O X		O X			40		
U Q	34	36	35	38	O X	38	37	37		O X	37	29	37	41	43	40	31	24								
L Q	30	28	O X	X	X	30	30	31		X	26	28	33	38	38	34	28	22								

JUN. 2009 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2009 foF2 (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	F 14	A	A	A	A	R 18	22	B	A	F 39	35	R 28	A	Y	Y	Y	B	B	B	B		
2	B	B	R	A	A	R	B	B	R	A	20	F 33	30	F 37	F 29	F 21	Y	Y	B	B	B	B	B	B		
3	Y	B	Y	R 22	A	A	A	A	A	R 28	F 20	F 24	35	F 35	F 25	F 26	A	B	B	B	R	A	A	A		
4	A		R 21	22	18	A	A	A	A	B	A	R 22	30	F 35	F 33	33	25	B	Y	Y	A	B	B	A	A	
5	A	F 24	B	A	A	A	A	R 34	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R	R	
6	A	A	A	A	26	27	R A	A	A	A	R 25	F 26	32	F 36	28	25	18	B	B	B	B	A	B	B	A	
7	25	A	R 25	A	U 27	R B	A	R 25	U 26	R 34	B	B	B	F 30	36	28	B	R	B	B	B	A	R	A		
8	R 28	R 30	F 20	30	A	A	R 30	A	R 23	J 22	R 19	F 25	F 31	F 34	F 30	F 21	Y	Y	A	A	B	B	Y	A		
9	A	A	A	28	R	A	R	R	B	B	F 16	F 29	F 30	F 31	F 26	22	16	R	B	R	B	B	B	Y		
10	A	A	A	28	R 30	A	R 30	R 31	B	B	B	B	B	33	36	F 31	27	B	R	B	A	A	R	Y	R	
11	A	A	A	A	F 21	A	F 22	A	R	A	21	F 26	F 32	F 27	F 27	F 20	15	R	R	R	B	R	B	R	A	
12	R 22	A	22	A	F 18	F 20	A	A	Y	A	F 19	31	32	40	25	19	18	R	B	B	B	A	B	B	R	
13	R	A	A	A	A	B	A	B	B	A	21	29	29	34	21	24	R	R	R	A	R	A	A	F 31		
14	F 20	20	F 20	F 15	20	F 27	R 28	A	A	R	F 20	F 25	34	32	33	22	R	R	B	R	B	A	A	F 20		
15	A	A	A	F 21	A	A	R	R	A	A	A	F 28	F 30	F 32	F 26	20	F	A	Y	B	Y	R	B	B	Y	
16	Y	Y	A	A	A	A	A	A	B	B	R 17	F 26	35	30	Z 30	Z 19	A	B	B	B	B	B	B	B	B	
17	B	A	A	A	20	A	B	R	R	B	F 18	F 26	32	36	28	F 18	F	A	A	Y	R	B	B	B	R	
18	Y	A	A	A	F 26	24	24	24	F	A	A	R 23	F 26	33	29	24	16	F	A	A	B	B	B	A	R	B
19	Y	R	A	A	A	A	A	R 25	A	A	F 14	F 20	F 29	F 23	F 26	F 18	A	A	R	B	R	B	B	B	B	
20	R	R	R	R	Y	Y	A	A	A	B	F 18	F 23	31	35	26	15	F	A	A	A	A	A	B	A	R	
21	A	A	A	A	A	A	A	B	B	R	F 20	26	31	26	F 32	22	R	16	B	A	A	A	A	B	B	
22	A	A	A	A	A	A	24	R 27	Y	Y	R	30	30	30	27	16	F	R	A	A	A	A	A	B	Y	
23	Y	A	A	R	A	A	A	B	R	R	F 14	F 26	F 30	F 23	F 26	23	A	A	A	A	R	B	A	A	A	
24	A	A	A	B	A	A	A	A	R	R	F 18	F 23	F 26	F 24	F 26	F 20	12	F	A	A	A	R	A	A	A	
25	A	F 18	B	A	A	A	A	A	A	R	R 22	F 24	33	32	25	17	F	B	A	B	B	B	A	A	A	
26	B	A	A	A	A	B	A	R	B	B	B	26	33	26	26	B	B	B	B	B	B	B	B	A	A	
27	A	A	R 26	A	A	A	R 22	A	A	A	F 16	F 20	F 25	F 32	F 21	F 25	R	R	B	A	B	B	A	R	R	
28	A	F 20	R 20	A	A	F 16	A	R	R	A	22	23	32	22	F 23	F 15	F	A	Y	B	A	A	A	A	A	
29	A	A	A	A	B	A	B	B	B	B	B	R 24	28	B	B	B	B	R	B	B	B	B	A	A	A	
30	A	R	A	A	A	A	R	A	B	A	B	28	33	F 37	R 34	B	B	B	B	B	B	B	A	Y	A	
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	4	6	7	7	9	5	7	6	2	4	22	27	27	28	28	26	5	1	2		1			2		
MED	24	20	22	22	21	F 24	R 24	R 26	R 24	R 25	R 20	F 26	32	32	26	F 21	R 16	16	20		R 24			F 26		
U Q	26	24	25	28	26	27	30	31		31	22	29	33	36	30	25	18									
L Q	21	20	20	18	F 19	F 18	22	25		R 20	F 18	F 24	30	28	F 26	F 18	14									

JUN. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	29	24	43	33	33	36	48	42	39	28	28	B	32	24	E B	20	30	28	14	15	16	B	B	B	B	
2	B	B	22	35	43	31	B	B	27	28	25	41	57	32	31	29	16	15	B	B	B	B	B	B		
3	14	B	22	32	41	40	39	40	28	32	24	12	28	29	39	34	28	B	B	B	21	29	37	38		
4	30	38	40	33	50	40	44	52	B	28	21	24	E B	E B	E B	E B	B	B	15	14	31	B	B	30	42	
5	32	66	B	34	33	41	50	42	41	38	34	31	B	B	B	B	B	B	B	B	B	B	B	20	28	
6	30	40	40	42	36	29	42	33	32	37	32	30	38	E B	E B	E B	E B	B	B	B	30	B	B	B	23	
7	34	34	50	34	33	B	44	31	26	31	B	B	B	E B	E B	B	B	20	B	B	B	29	18	26		
8	33	38	58	42	42	42	42	37	24	24	26	E B	12	22	25	20	28	14	17	29	28	B	B	17	22	
9	29	22	24	30	25	40	27	20	B	B	16	23	16	25	14	11	13	B	15	B	B	B	B	16		
10	37	49	32	28	27	36	32	32	B	B	B	E B	E B	E B	E B	E B	B	B	B	B	34	42	18	16	17	
11	29	30	48	52	41	83	39	30	27	30	36	27	30	29	24	29	13	14	26	B	15	B	15	30		
12	25	30	22	41	31	58	65	69	18	27	E B	12	31	42	27	E B	13	22	E B	B	B	32	B	22		
13	22	36	34	44	30	B	35	B	B	71	92	106	64	33	48	67	22	22	30	28	30	52	31	44		
14	42	52	38	43	71	59	35	32	34	24	25	E B	11	39	32	26	E B	13	20	21	B	21	30	35		
15	33	48	45	22	42	68	24	23	42	32	33	53	30	30	26	27	26	16	B	16	22	B	B	16		
16	16	16	30	37	70	74	37	30	B	B	E B	14	13	30	32	28	32	27	B	B	B	B	B	B		
17	B	26	30	35	29	34	B	23	22	B	E B	12	27	17	E B	12	17	15	41	42	16	23	B	21		
18	17	41	41	35	26	29	29	E B	20	29	27	14	22	28	28	30	29	21	25	B	B	B	30	20		
19	19	19	22	42	39	34	52	34	33	29	32	32	25	30	30	20	28	28	26	B	18	B	B	B		
20	27	22	20	25	17	22	30	30	27	B	E B	12	24	24	31	30	27	31	59	41	26	24	26	19		
21	29	36	30	37	63	57	55	B	B	21	23	19	32	21	22	17	15	35	B	25	72	24	B	B		
22	32	30	42	71	58	46	30	22	16	15	25	E B	12	13	22	E B	E B	20	41	41	31	38	28	16		
23	15	37	67	22	27	32	45	B	22	27	E B	12	25	29	32	E B	12	32	28	42	40	52	21	32	32	
24	39	32	57	B	46	58	57	32	22	22	E B	12	20	22	25	25	42	30	30	33	28	22	21	31	72	
25	42	71	B	42	51	59	40	32	42	21	26	29	21	22	17	E B	12	B	B	B	B	B	29	32	42	
26	B	47	40	40	42	B	34	23	B	B	B	14	E B	14	14	20	B	B	B	B	B	B	24	28		
27	33	26	23	32	30	31	48	41	26	21	30	36	32	31	25	E B	15	16	B	42	B	31	16	16		
28	32	31	27	34	34	43	32	17	22	24	23	28	25	34	29	21	27	16	B	28	33	38	57	75		
29	101	44	49	42	B	64	B	B	B	B	B	20	22	B	B	B	B	16	B	B	B	35	39	39		
30	28	22	28	37	30	33	18	36	B	30	B	26	22	E B	E B	E B	B	B	B	B	B	23	15	22		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	27	28	28	29	29	27	27	25	21	23	25	27	28	28	28	26	22	21	13	14	14	14	19	24		
MED	30	35	36	35	36	40	39	32	27	28	25	25	26	28	22	22	22	21	29	28	27	29	26	27		
U Q	33	42	44	42	44	58	48	38	34	31	31	31	32	31	28	29	28	32	40	31	33	31	32	38		
L Q	25	26	26	32	30	33	32	23	22	24	E B	E B	E B	E B	E B	E B	15	15	15	16	16	23	21	23	17	20

JUN. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	12	12	13	12	12	12	12	12	12	12	B	21	15	20	13	13	12	13	13	B	B	B	B
2	B	B	12	14	12	11	B	B	12	12	12	12	12	12	12	12	11	12	B	B	B	B	B	B
3	12	B	12	12	12	12	12	11	20	12	12	11	11	12	11	11	12	B	B	B	12	12	12	11
4	12	12	12	12	12	12	12	12	B	22	14	15	25	16	14	14	B	14	12	14	B	B	12	12
5	18	13	B	30	20	17	14	13	14	17	22	15	B	B	B	B	B	B	B	B	B	B	13	15
6	14	12	13	18	13	12	12	12	15	13	14	13	17	16	14	13	13	B	B	B	24	B	B	12
7	11	12	12	12	11	B	12	10	13	12	B	B	B	18	12	12	B	14	B	B	B	12	12	13
8	12	12	12	167	12	17	13	12	12	12	12	12	11	12	12	12	12	12	12	13	B	B	12	12
9	12	11	12	12	13	12	11	13	B	B	12	11	11	13	11	11	12	B	11	B	B	B	12	11
10	12	11	12	12	12	12	12	12	B	B	B	B	25	22	16	18	B	13	B	12	12	16	12	11
11	11	11	11	12	12	12	12	12	16	14	14	12	12	11	11	12	11	11	12	B	13	B	12	11
12	12	12	12	12	12	12	12	12	14	15	12	12	12	11	13	12	12	B	B	B	12	B	B	12
13	12	11	12	12	12	B	12	B	B	12	12	13	12	12	12	12	12	11	12	12	12	12	12	12
14	11	12	12	12	12	12	12	12	13	15	15	11	12	12	12	13	10	11	B	11	B	11	12	11
15	12	12	11	12	12	13	15	12	12	13	12	12	12	12	12	11	12	12	B	12	13	B	12	12
16	12	12	12	12	12	11	12	12	B	B	11	13	11	13	12	12	12	B	B	B	B	B	B	B
17	B	13	12	12	12	12	B	12	12	B	12	12	13	12	12	12	12	12	12	11	B	B	12	B
18	12	13	12	11	18	12	13	20	12	13	11	11	12	12	12	12	11	12	B	B	B	24	13	B
19	17	14	12	12	12	12	11	12	12	12	12	12	11	11	12	12	12	11	12	B	13	B	B	B
20	20	11	15	16	14	11	11	12	B	B	12	12	11	12	11	12	12	12	12	12	12	12	15	B
21	12	12	12	12	12	11	13	B	B	13	12	10	12	11	12	12	12	10	B	12	12	15	B	B
22	12	11	12	12	11	12	12	12	B	13	12	14	12	13	12	13	13	12	12	12	12	14	B	12
23	11	12	12	12	12	12	12	B	12	11	12	12	13	12	12	12	12	12	12	11	11	12	12	11
24	12	12	13	B	12	18	12	11	12	12	12	12	11	12	12	12	12	12	12	12	14	12	12	12
25	12	13	B	21	13	15	13	12	14	12	12	12	12	15	13	12	B	13	B	B	B	12	11	12
26	B	17	22	20	20	B	16	12	B	B	B	14	14	12	12	B	B	B	B	B	B	12	12	12
27	11	12	12	14	13	13	12	12	12	12	12	11	12	13	13	15	12	B	13	B	B	14	12	12
28	11	12	12	12	15	13	12	12	12	11	12	12	12	12	12	12	12	12	B	19	12	12	14	12
29	17	13	22	13	B	25	B	B	B	B	B	12	14	B	B	B	B	13	B	B	B	17	12	12
30	12	12	12	12	12	11	12	14	B	B	B	13	19	16	26	B	B	B	B	B	B	11	12	12
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MED	12	12	12	12	12	12	12	12	14	13	12	12	12	12	12	12	12	12	B	B	B	B	12	12
U Q	14	13	12	14	13	15	13	13	B	B	B	B	14	13	14	15	13	13	B	B	B	B	B	B
L Q	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

JUN. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	206	A	A	A	A	A	A	A	A	A	210	242	B	A	202	202	218	A	Y	Y	Y	B	B	B	B	
2	B	B	A	A	A	A	B	B	A	A	198	214	198	194	178	176	Q	Y	Y	B	B	B	B	B		
3	Y	B	A	A	A	A	A	A	A	A	200	210	200	176	188	198	Q	A	B	B	B	A	A	A	A	
4	A	202	A	A	A	A	A	A	B	A	A	238	202	208	196	190	Q	B	Y	Y	A	B	B	A	A	
5	A	A	B	A	A	A	A	206	A	A	A	E	A	B	B	B	B	B	B	B	B	B	B	A	A	
6	A	A	A	A	230	218	208	A	A	A	A	256	226	226	196	200	204	206	B	B	B	A	B	B	A	
7	218	A	A	A	202	B	A	202	E	A	248	B	B	B	194	190	204	B	A	B	B	B	A	A	A	
8	A	A	194	230	A	A	214	A	A	A	224	170	190	200	188	190	Q	Y	Y	A	A	B	B	Y	A	
9	A	A	A	208	A	A	A	A	B	B	236	198	188	176	180	180	216	B	A	B	B	B	B	A	A	
10	A	A	A	198	198	204	194	A	B	B	B	B	B	242	210	186	204	B	A	B	A	A	A	A	A	
11	A	A	A	A	192	A	206	A	206	A	226	200	194	194	182	194	230	A	A	B	A	B	A	A	A	
12	196	A	A	A	A	190	A	A	A	A	E	B	244	202	202	182	176	192	194	B	B	B	A	B	B	A
13	A	A	A	A	A	B	A	B	B	A	224	238	214	194	208	174	Q	A	A	A	A	A	A	A	A	
14	A	234	A	214	A	A	A	A	A	A	238	186	194	194	200	192	198	A	A	B	A	B	A	A	Q	
15	A	A	A	A	A	A	A	A	A	A	A	228	Q	196	202	194	196	A	Y	B	Y	A	B	B	Y	
16	Y	Y	A	A	A	A	A	A	B	B	272	198	202	202	194	232	A	A	B	B	B	B	B	B	B	
17	B	A	A	A	210	A	B	A	A	B	242	202	194	196	182	190	A	A	Y	A	B	B	B	A	A	
18	Y	A	A	A	A	200	A	B	A	A	238	206	190	176	184	184	A	A	B	B	B	A	A	B	B	
19	Y	A	A	A	A	A	A	216	A	A	244	190	190	204	176	188	A	A	A	B	B	B	B	B	B	
20	A	A	A	A	Y	Y	A	A	A	B	E	B	242	204	202	192	192	206	A	A	A	A	A	B	A	A
21	A	A	A	A	A	A	A	B	B	A	246	208	198	214	190	184	A	A	B	A	A	A	B	B	B	
22	A	A	A	A	A	A	194	200	Y	Y	A	198	186	194	186	214	A	A	A	A	A	A	B	Y	Y	
23	Y	A	A	A	A	A	A	B	A	A	B	230	200	186	178	192	192	A	A	A	A	A	B	A	A	
24	A	A	226	B	A	A	A	A	A	A	E	B	256	208	202	202	184	190	210	A	A	A	A	A	A	
25	A	A	B	A	A	A	A	A	A	A	264	218	208	210	196	182	B	A	B	B	B	B	A	A	A	
26	B	A	A	A	A	B	A	A	B	B	B	196	206	190	184	Q	B	B	B	B	B	B	B	A	A	
27	A	A	A	A	A	A	236	A	A	A	A	242	230	196	194	194	A	B	A	B	B	A	A	A	A	
28	A	A	200	A	A	190	A	200	A	A	252	206	192	204	202	186	A	Y	B	A	A	A	A	A	A	
29	A	A	A	A	B	A	B	B	B	B	B	B	A	B	B	B	B	A	B	B	B	B	A	A	A	
30	A	A	A	A	A	A	A	A	B	A	B	278	248	Q	Q	Q	B	B	B	B	B	B	Y	A	A	
31												230	228	204	218							196				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	3	2	4	5	5	5	6	5	1	2	21	27	27	28	28	26	6	1	2		1	1		1		
MED	206	218	207	211	202	200	207	202	206	229	240	206	198	195	190	192	208	206	221		246	196		220		
U Q	218		220	254	220	211	214	211			249	228	206	203	196	204	216									
L Q	196		197	203	195	190	194	200				228	198	192	193	184	186	198								

JUN. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2009 f_{XI} (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	O X 32	A	A	Y	R	B	A	R	A	29	R	B	B	B	R	B	R	B	B	B	B	B	B	
2	A	R	A	A	A	A	R	Y	B	B	26	X 36	O X 39	O X 38	B	B	B	R	B	B	B	B	A	R	
3	R	R	O X 33	B	B	B	O X 40	A	R	B	B	O X 36	O X 36	O X 36	O X 37	B	B	B	B	B	B	B	B	Y	
4	A	O X 29	A	A	O X 38	A	A	A	R	R	A	34	38	43	35	31	32	B	B	B	B	B	B	R	
5	R	A	A	A	X 30	A	A	A	R	B	O X 30	36	38	36	34	27	24	Y	B	B	B	B	B	O X 27	
6	A	A	A	A	A	Y	R		A	A	28	39	40	X 36	X 32	X 32	O X 24	B	B	B	B	B	B	R	
7	A	X 31	O X 32	R	A	A	A	R	R	A	O X 29	37	38	37	37	37	C	R	B	B	B	B	R	O X 25	
8	O X 28	A	B	R	R	A	R	Y	A	R	O X 28	33	40	B	B	B	O X 24	A	B	B	A	B	B	O X 33	
9	A	X 32	A	A	A	A	O X 34	R	B	B	X 29	X 35	O X 43	O X 36	O X 35	34	24	R	Y	Y	B	B	R	A	
10	A	A	B	A	A	A	A	A	A	B	A	36	41	41	42	34	24	B	Y	R	A	Y	A	Y	
11	A	A	A	A	A	A	A	B	R	B	X 26	36	38	42	31	30	O X 28	R	B	B	B	B	B	B	
12	B	A	A	A	A	R	A	R	B	B	28	B	O X 39	41	37		B	Y	Y	B	R	B	R	B	A
13	A	A	A	49	O X 36	A	O X 36	R	B	A	29	35	36	34	39	36	24	21	R	B	A	A	A	A	
14	A	A	A	A	A	A	A	A	B	B	B	B	B	B	X 34	O X 33	B	R	B	B	B	R	R	O X 26	
15	A	A	A	A	A	A	A	A	A	B	B	B	O X 36	41	34	31	24	R	R	B	B	B	B	B	
16	B	B	O X 32	A	A	A	R	R	B	Y	30	O X 39	X 44	X 38	X 36	O X 34	B	B	A	R	R	B	Y	Y	
17	28	28	R	R	A	O X 34	A	32	A	A	30	39	39	37	40	35	27	R	A	B	S	S	S	R	
18	A	A	O X 28	A	A	A	A	A	A	A	X 28	X 37	42	31	38	36	34	B	B	A	R	B	B	B	
19		Y	A	A	A	A	R	R	R	B	X 29	X 36	X 38	O X 41	O X 41	B	B	B	B	B	B	Y	R	B	
20	B	B	R	Y	R	R	A	A	R	B	30	36	40	B	X 38	O X 40	O X 25	A	B	X 28	O X 28	A	A	O X 26	
21	R	O X 32	R	A	R	O X 31	X 22	B	B	B	32	37	42	42	42	38	26	R	B	B	B	R	O X 28	A	
22	A	A	A	A	A	A	A	R	B	B	A	A	B	B	B	B	B	B	A	A	A	A	A	A	A
23	A	A	A	A	A	A	Y	Y	A	A	B	O X 38	O X 41	B	B	O X 35	O X 26	B	B	B	B	B	B	R	A
24	A	A	A	A	R	A	A	R	Y	R	X 31	X 36	44	B	42	32	31	A	B	R	B	B	R	A	
25	A	A	A	A	A	A	B	B	B	B	O X 34	O X 39	O X 39	X 47	X 43	O X 32	O X 38	B	B	B	B	B	B	Y	
26	A	A	R	R	A	O X 37	R	B	B	X 27	X 34	X 40	X 46	X 44	X 38	X 38	32	A	Y	B	B	Y	A	R	
27	A	R	R	A	O X 33	A	A	R	B	X 26	36	42	41	42	44	30	30	R	A	A	A	B	B	24	
28	A	44	R	R	O X 26	R	A	A	A	Y	B	O X 38	O X 43	O X 43	B	B	B	B	B	A	R	R	B	B	
29	R	R	R	B	B	R	A		R	O X 26	O X 34	O X 47	O X 44	O X 42	O X 39	O X 38	B	A	R	R	A	R	A	B	
30	R	A	A	A	X 37	Y	R	A	R	30	37	43	O X 38	X 48	O X 39	O X 29	A	A	R	A	R	R	R	R	
31	B	R	A	R	B	B	O X 36	R		B	B	B	B	B	B	O X 37	X 35	B	B	B	B	B	R	R	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	2	7	4	1	6	4	4	3		5	22	25	27	23	24	23	20	1		1	1		1	6	
MED	28	X 32	O X 32	O X 49	O X 34	O X 35	O X 35	X 34		26	30	37	40	41	38	34	26	21		28	O X 28	O X 28	O X 28	O X 26	
U Q		32	O X 32		X 37	O X 36	O X 38	59		28	32	39	42	42	40	37	32							O X 27	
L Q		29	O X 30		X 30	O X 32	X 28	32		26	28	36	38	36	35	32	24							25	

JUL. 2009 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2009 foF2 (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	26	A	A	Y	R	B	A	R	A	F	R	B	B	B	A	B	A	B	B	B	B	B	B
2	A	R	A	A	A	A	R	Y	B	B	20	30	33	32	B	B	B	R	B	B	B	B	A	A
3	A	A	R	B	B	B	R	A	R	B	B	30	30	30	R	R	B	B	B	B	B	B	B	Y
4	A	R	A	A	R	A	A	A	A	A	A	F	F	F	F	F	25	18	B	B	B	B	B	R
5	A	A	A	A	A	A	A	A	A	B	R	F	F	F	F	F	F	Y	B	B	B	B	B	R
6	A	A	A	A	A	Y	R	B	A	A	F	F	F	F	F	F	R	B	B	B	B	B	B	A
7	A	25	26	R	A	A	A	R	A	A	R	F	F	F	F	F	C	A	B	B	B	B	A	R
8	R	A	B	R	A	A	R	Y	A	A	R	F	R	B	B	B	R	A	B	B	A	B	B	R
9	A	26	A	A	A	A	R	R	B	B	22	29	37	30	29	24	18	A	Y	Y	B	B	A	A
10	A	A	B	A	A	A	A	A	A	B	A	F	35	35	F	F	B	Y	R	A	Y	A	Y	
11	A	A	A	A	A	A	A	B	R	B	20	25	32	36	20	20	R	R	B	B	B	B	B	B
12	B	A	A	A	A	A	A	R	B	B	F	B	R	F	F	B	Y	Y	B	A	B	R	B	A
13	A	A	A	A	R	A	R	R	B	A	F	F	F	F	F	F	R	A	B	A	A	A	A	A
14	A	A	A	A	A	A	A	A	B	B	B	B	B	B	28	27	R	B	R	B	B	A	R	R
15	A	A	A	A	A	A	A	A	A	B	B	B	R	F	F	F	F	R	R	B	B	B	B	B
16	B	B	R	A	A	A	A	A	B	Y	F	R	R	32	26	28	B	B	A	A	R	B	Y	Y
17	Y	Y	A	A	A	R	A	F	A	A	24	28	28	31	34	29	R	A	A	B	S	S	S	A
18	A	A	R	A	A	A	A	A	A	A	22	31	32	25	32	30	R	R	B	B	A	R	B	B
19		Y	A	A	A	A	R	R	R	B	23	30	32	35	35	R	B	B	B	B	B	Y	A	B
20	B	B	R	Y	A	A	A	A	A	B	24	30	34	B	J	R	R	A	B	J	R	R	A	R
21	A	R	A	A	A	R		B	B	B	F	31	28	36	36	32	20	A	B	B	B	A	R	A
22	A	A	A	A	A	A	A	A	B	B	A	A	B	B	B	B	B	B	A	A	A	A	A	A
23	A	A	A	A	A	A	Y	Y	A	A	B	R	35	B	B	R	R	B	B	B	B	B	R	A
24	A	A	A	A	A	A	A	A	Y	R	25	30	38	B	A	F	F	A	B	R	B	B	A	A
25	A	A	A	A	A	A	B	B	B	B	28	33	33	41	37	26	32	B	B	B	B	B	B	Y
26	A	A	A	R	A	R	R	B	B	21	28	34	40	38	32	27	26	A	Y	B	B	Y	A	A
27	A	R	R	A	27	A	A	A	B	20	26	36	35	36	38	24	20	F	A	A	A	A	B	F
28	A	R	A	A	R	R	A	A	A	Y	B	R	32	37	37	B	B	B	B	A	A	R	B	B
29	A	A	R	B	B	A	A	A	A	R	R	R	R	R	33	32	B	A	R	R	A	A	A	B
30	R	A	A	A	31	Y	A	A	A	F	F	F	32	42	33	33	R	A	A	R	A	R	R	A
31	B	A	A	A	B	F	B	R	A	F	B	B	B	B	B	R	R	B	B	B	B	R	A	A
						27		28		16						31	29							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1	6	4		6	4	4	2		5	22	25	27	23	23	23	20	1		1	1		1	6
MED	R	26	26		28	28	29	24		20	23	30	33	32	32	27	20	R		J	R	R	R	R
U Q		26	27		31	30	32			21	25	32	35	36	33	30	R							R
L Q		R	R		24	26	22			18	20	26	32	30	26	24	F							19

JUL. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2009 ftEs (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	33	36	40	70	15	22		B	38	27	38	30	30	B	B	B	30	B	26	B	B	B	B	B		
2	30	18	42	36	42	36	23	15	B	B	E B	13	18	E B	E B	20	B	B	23	B	B	B	B	34	28	
3	28	22	E B	B	B	B		30	59	26	B	E B	16	30	E B	E B	B	B	B	B	B	B	B	B	18	
4	28	36	31	41	38	46	42	40	33	28	31	33	35	30	16	15	23	B	B	B	B	B	B	18		
5	27	44	34	58	57	51	37	40	31	B	34	16	16	E B	13	15	E B	13	14	14	B	B	B	B	28	
6	42	29	28	26	23	16	E B	B		43	36	33	21	30	33	17	15	14	B	B	B	B	B	B	24	
7	33	36	32	30	35	41	36	22	29	38	59	30	E B	13	23	27	16	C		22	B	B	B	B	30	30
8	34	41	B	24	24	36	18	16	39	30	30	16	E B	B	B	B	E B	13	29	B	B	B	B	B	31	
9	41	36	46	48	50	50	36	16	B	B	16	15	24	32	32	18	E B	12	21	15	18	B	B	24	40	
10	37	51	B	48	52	44	43	39	42	B	31	24	K	21	26	17	26	22	B	18	21	30	17	33	15	
11	28	43	45	44	40	42	31	B	26	B	14	27	18	24	29	31	16	E B	12	B	B	B	B	B	B	
12	B	30	30	57	58	27	31	28	B	B	E B	13	B	E B	E B	B	B	16	15	B	29	B	24	B	31	
13	58	28	31	30	38	35	36	26	B	39	30	25	42	42	31	21	E B	11	15	18	B	36	43	35	42	
14	43	41	66	48	55	40	64	35	B	B	B	B	B	B	E B	E B	E B	B	20	B	B	B	27	16	31	
15	38	35	44	46	44	39	43	39	39	B	B	B	24	24	28	29	17	23	23	B	B	B	B	B	B	
16	B	B	31	46	36	43	24	27	B	16	E B	E B	E B	E B	E B	B	E B	B	B	39	23	23	B	18	15	
17	22	17	25	26	34	32	37	69	69	49	48	50	64	32	25	25	34	25	44	B	S	S	S	22	B	
18	36	47	42	43	34	32	52	41	32	48	64	28	32	18	44	32	24	B	B	41	21	B	B	B	B	
19		17	28	40	58	27	24	24	25	B	E B	12	30	28	18	E B	26	B	B	B	B	B	15	28	B	
20	B	B	24	18	35	34	55	42	32	B	E B	12	21	18	B	E B	24	24	33	27	B	B	B	58	58	
21	25	32	31	33	30	K E	B	B	B	B	22	16	25	19	16	15	26	24	B	B	B	30	22	30		
22	48	50	48	42	60	59	58	27	B	B	52	37	B	B	B	B	B	B	35	33	37	39	59	44		
23	56	41	53	47	48	32	18	16	30	32	B	E B	E B	E B	B	E B	20	17	B	B	B	B	B	K	41	
24	40	43	43	39	33	36	36	30	17	27	16	17	E B	30	B	E B	28	18	E B	13	30	15	B	24	31	
25	42	66	35	40	40	51	B	B	B	B	E B	18	18	32	39	44	E B	E B	E B	B	B	B	B	B	16	
26	27	32	26	23	30	40	29	B	B	30	E B	12	26	29	23	32	33	51	42	15	B	B	16	30	24	
27	31	24	22	32	20	42	31	23	B	26	E B	13	17	20	18	17	17	E B	14	26	31	72	69	B	21	
28	31	32	30	34	26	19	43	37	39	18	B	26	E B	E B	E B	24	B	B	B	B	38	26	18	B	B	
29	23	25	24	B	B	28	56	54	33	19	E B	E B	E B	B	E B	18	26	B	40	19	18	71	27	35	B	
30	21	70	70	51	26	17	36	41	30	E B	12	31	42	24	37	20	34	17	34	58	16	40	18	19	21	
31	B	25	34	30	B	E B	B	B	23	28	30	B	B	B	B	E B	19	20	B	B	B	B	19	25	31	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	26	29	29	29	28	30	28	26	20	17	25	27	27	23	24	24	21	19	11	12	11	13	17	24		
MED	33	36	32	40	37	36	36	32	32	30	22	22	24	24	22	20	17	24	23	26	36	24	28	29		
U Q	41	43	44	48	49	42	43	40	39	38	32	30	30	32	28	28	24	29	39	38	60	34	34	31		
L Q	28	26	28	30	30	27	26	23	28	22	E B	13	17	E B	20	18	17	E B	14	20	18	18	26	18	22	21

JUL. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	11	12	12	11	11		B	16	14	12	13	15		B	B	B	25	B	17		B	B	B	B			
2	12	12	12	12	12	12	12	12		B	B	13	11	26	20		B	B	16		B	B	B	12	13			
3	12	12	12		B	B	B		13	12	16		B	B	16	15	14	19		B	B	B	B	B	14			
4	12	12	12	12	13	12	12	12	12	12	12	12	12	12	11	12	12		B	B	B	B	B	B	11			
5	12	12	12	13	12	14	12	20	13		B	14	12	12	13	12	13	12	12		B	B	B	B	11			
6	12	12	13	12	12	12	13		B	13	14	12	12	12	13	12	12	11		B	B	B	B	B	11			
7	12	11	12	12	13	13	12	12	12	12	12	12	12	13	13	11	12		C		B	B	B	B	12	12		
8	12	15		B	16	14	12	13	12	13	12	20	12	15		B	B		13	21		B	B	B	12			
9	11	12	23	22	14	13	13	12		B	B	12	12	14	16	15	12	12	13	12	12		B	B	11	12		
10	12	12		B	19	16	13	14	15	12		B	14	13	12	13	13	12	12		B	13	12	14	11	11	12	
11	12	11	13	16	12	14	14		B	12		B	12	12	12	12	12	12	12		B	B	B	B	B	B		
12		B	12	11	13	12	12	12	12		B	B		13		27	20	13		B	12	12		13	B	B	11	
13	11	11	12	12	12	12	12	12		B	13	13	16	15	13	12	13	11	11	13		B	22	11	12	12		
14	12	12	12	21	14	13	20	25		B	B	B	B	B		17	14		B	12		B	B	B	12	12	12	
15	11	12	13	14	14	19	14	12	12		B	B	B		21	15	13	12	11	12	11		B	B	B	B		
16		B	B	12	12	14	17	13	12		B	13	13	19	17	17	12	18		B	B		B	13	12	12		
17	11	12	12	13	12	12	13	12	12	12	12	13	13	12	12	12	13	13	11	12		B	S	S	S	12		
18	12	12	12	11	12	12	12	12	11	12	12	13	13	13	13	12	15	14		B	B		B	B	B	B		
19		12	12	12	24	12	12	12	14		B	12	12	11	12	26		B	B	B	B	B	B	B	12	14	B	
20	B	B	13	14	12	12	12	12	11		B	12	12	18		B	24	15	12	16		B	B	B	14	16	11	12
21	12	12	12	12	12	12	12		B	B	B	11	12	12	12	12	12	11	11		B	B	B	B	12	12	12	
22	12	13	13	25	20	20	20	19		B	B		15	19		B	B	B	B		B	B	18	12	12	12	14	13
23	14	23	17	13	13	12	13	12	14	19		B	25	21		B	B	20	12		B	B	B	B	B	12	11	
24	12	12	13	22	18	23	13	12	12	12	12	12	13	30		B	28	13	13	12		B	B	B	11	14		
25	12	11	14	30	20	20		B	B	B		18	13	14	14	12	17	20		B	B	B	B	B	B	B	12	
26	12	12	11	12	12	12	11		B	B	11	12	11	13	12	12	12	12	12	12		B	B	B	11	12	14	
27	16	11	12	12	14	12	12	13		B	13	13	12	13	12	13	13	14	12	14	13	18		B	B	12		
28	11	12	12	11	12	12	16	12	13	15		B	21	20	24		B	B	B	B	B	22	16	14		B	B	
29	12	12	12		B	B	13	13	12	13	12	16	17	22	16	18	13		B	16	13	13	13	13	12		B	
30	12	12	12	12	12	12	12	12	23	12	12	12	12	16	15	14	20	13	12	12	12	12	12	15	12	13		
31		B	12	12	11		B	B		B	B	B	B	B	B		19	12		B	B	B	B	B	12	12	12	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	30	30	30	31			
MED	12	12	12	13	13	12	13	12	14	15	13	13	15	15	13	14	13	16		B	B	B	B	14	12			
U Q	12	12	13	19	16	14	14	19		B	B	B	18	19	22		B	B	B	B	B	B	B	B	B	14		
L Q	12	12	12	12	12	12	12	12	12	12	12	12	12	12	13	12	12	12	12	13	13	16	12	12	12			

JUL. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	198	A	A	Y	A	B	A	A	A	254	A	B	B	B	A	B	A	B	B	B	B	B	B	
2	A	A	A	A	A	A	A	Y	B	B	230	204	220	210	B	B	B	A	B	B	B	B	A	A	
3	A	A	196	B	B	B	192	A	A	B	B	204	216	198	190	B	B	B	B	B	B	B	B	Y	
4	A	A	A	A	E A	A	A	A	A	A	A	Q	Q	Q	Q	Q	Q	B	B	B	B	B	B	A	
5	A	A	A	A	256	A	A	A	A	B	A	Q	Q	Q	Q	Q	A	Y	B	B	B	B	B	204	
6	A	A	A	A	248	A	A	B	A	A	E A	264	208	190	184	174	206	212	B	B	B	B	B	A	
7	A	206	A	A	A	A	A	A	A	A	278	220	198	214	214	198	Q	C	A	B	B	B	B	A	
8	A	A	B	A	A	A	A	A	A	A	A	250	236	192	B	B	E A	A	B	B	A	B	B	A	
9	A	A	A	A	A	A	220	200	B	B	E A	236	220	220	216	222	190	E B	A	Y	A	B	B	A	
10	A	A	B	A	A	A	A	A	A	B	A	250	234	208	184	196	194	B	Y	A	A	Y	A	Y	
11	A	A	A	A	A	A	A	B	A	B	238	190	216	180	198	206	180	216	B	B	B	B	B	B	
12	B	A	A	A	A	A	A	A	B	B	232	B	218	196	200	B	Y	Y	B	A	B	A	B	A	
13	A	A	A	A	198	A	212	A	B	A	E A	248	242	208	206	190	184	206	302	A	B	B	A	A	
14	A	A	A	A	A	A	A	A	B	B	B	B	B	B	226	214	B	A	B	B	B	A	A	272	
15	A	A	A	A	A	A	A	A	A	B	B	B	220	206	234	212	222	A	A	B	B	B	B	B	
16	B	B	198	A	A	A	A	A	B	A	Q	198	212	198	192	208	198	B	B	A	A	A	B	Y	
17	A	A	A	A	200	A	A	A	A	A	250	210	210	190	190	198	224	A	A	B	S	S	S	A	
18	A	A	E A	A	A	A	A	A	A	A	A	Q	Q	Q	Q	Q	Q	B	B	A	A	B	B	B	
19	Y	A	A	A	A	A	A	A	A	B	206	202	202	182	208	B	B	B	B	B	B	Y	A	B	
20	B	B	A	Y	A	A	A	A	A	B	224	186	192	208	210	A	A	B	232	202	A	A	A	188	
21	A	E A	A	A	A	E B	B	B	B	B	Q	Q	Q	Q	Q	Q	Q	A	B	B	B	A	A	A	
22	A	246	196	A	A	290	A	A	B	B	208	190	188	212	214	200	198	B	B	A	A	A	A	A	
23	A	A	A	A	A	A	A	A	A	A	B	E B	272	230	B	B	224	232	B	B	B	B	B	A	A
24	A	A	A	A	A	A	A	A	Y	A	214	200	E B	252	B	A	188	196	A	B	A	B	B	A	A
25	A	A	A	A	A	A	B	B	B	B	232	200	186	196	192	240	210	B	B	B	B	B	B	Y	
26	A	A	A	A	196	A	B	B	222	172	188	206	186	194	200	214	A	Y	B	B	Y	A	A	A	
27	A	A	A	A	A	A	A	B	262	206	196	196	188	198	198	202	A	A	A	A	B	B	198	B	
28	A	214	A	200	194	A	A	198	A	Y	B	A	214	208	B	B	B	B	A	A	A	A	A	B	B
29	A	A	A	B	B	A	A	A	A	A	196	208	208	192	200	B	A	A	A	A	A	A	A	A	B
30	A	A	A	A	A	A	A	A	A	A	206	210	188	178	212	210	198	E A	A	A	A	A	A	A	A
31	B	A	A	A	B	B	B	A	A	A	B	B	B	B	B	190	198	B	B	B	B	A	A	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		4	3	2	4	2	4	2		3	20	24	27	23	23	23	19	2		1	1	1	1	5	
MED		206	197	198	U	210	198	209	199		222	224	204	205	196	198	200	205	259		232	202	200	194	204
U Q		230	E A	232	252	255				262	249	220	218	208	210	210	E A	224							264
L Q		202	196		196		202				206	209	195	194	186	190	196	198							193

JUL. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2009 f_{XI} (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	O	X	A	R	X	X	X	X	X	X	X	A	B	B	A	B	B	R		
2	A	A	A	X	A	A	O	X	R	B	30	36	39	46	43	47	38	29	R	B	B	B	B	A		
3	A	A	A	A	A	A	R	R	O	X	B	B	B	O	X	B	B	R	B	R	Y	B	B	B	A	
4	A	A	A	B	A	B	A	B	B	B	X	O	X	X	X	O	X	X	B	B	B	B	B	A		
5	O	X	R	R	A	A	A	A	O	X	A	A	A	B	B	O	X	X	A	A	A	A	A	A	A	
6	A	B	A	R	A	A	B	A	A	A	R	B	A	R	B	B	O	X	32	31	R	O	X	A	A	A
7	O	X	A	A	A	A	B	A	A	X	X	X	O	X	O	X	X	X	B	A	B	B	A	A	A	
8	A	R	B	A	A	A	A	A	O	X	X	X	X	X	O	X	X	X	X	A	A	A	A	R		
9	A	O	X	A	R	A	O	X	A	A	B	B	B	B	B	B	B	X	B	B	B	B	B	A		
10	A	A	A	A	A	R	B	B	B	X	X	X	X	X	X	X	X	B	B	B	B	B	B	B		
11	B	X	Y	A	A	X	B	B	B	B	O	X	O	X	O	X	O	X	B	B	B	A	Y	Y	A	
12	A	A	A	A	A	A	Y	Y	O	X	X	X	X	O	X	X	X	B	B	B	B	B	A	B		
13	O	X	B	A	A	A	R	Y	R	O	X	X	X	O	X	X	X	X	B	B	B	B	B	B		
14	B	A	X	A	A	A	X	R	A	X	O	X	O	X	B	O	X	O	X	B	B	B	B	B		
15	B	A	A	A	R	R	B	B	R	X	X	X	X	B	B	X	X	O	B	R	B	B	B	Y		
16	B	B	B	B	R	A	O	X	R	O	X	X	X	X	X	X	X	X	O	X	B	B	B	B		
17	B	R	B	R	R	R	R	R	X	X	X	X	O	X	X	X	X	X	B	B	A	A	B	R		
18	A	A	A	O	X	A	A	A	A	29	36	41	42	43	46	47	43	37	29	B	B	B	B	B		
19	A	A	54	A	O	X	R	R	Y	29	37	42	42	48	48	42	46	48	B	O	X	A	A	A	A	
20	A	66	A	B	B	A	R	A	A	R	O	X	R	B	B	B	B	O	X	B	B	B	B	B	B	
21	A	B	A	R	Y	A	A	R	29	37	42	44	B	B	B	X	B	34	32	R	B	A	R	A		
22	A	A	B	A	A	Y	B	B	B	O	X	X	X	X	X	X	X	X	B	B	B	B	R	R		
23	A	A	A	A	A	A	A	A	A	B	B	O	X	X	X	X	X	X	B	B	B	B	B	B		
24	A	A	R	A	O	X	B	B	R	30	38	46	44	48	46	46	45	39	36	27	25	Y	R	A	B	
25	B	R	R	R	B	A	B	B	33	40	44	50	47	44	42	40	35	26	25	B	B	B	B	B		
26	B	A	A	A	A	A	X	A	A	O	X	B	B	B	B	B	B	O	X	B	B	Y	Y	A	B	
27	B	A	A	A	R	A	O	X	A	O	X	X	X	X	X	X	X	X	X	X	O	X	A	X	A	
28	A	A	A	A	A	Y	A	B	A	B	B	O	X	O	X	X	X	X	O	X	O	Y	B	B	R	
29	A	A	X	A	Y	Y	B	O	X	X	X	B	O	X	O	X	X	X	B	B	Y	B	A	B		
30	R	B	R	R	R	R	B	B	X	34	41	B	B	B	B	X	B	A	O	X	A	A	A	A	32	
31	B	A	B	A	B	B	R	R	X	B	B	O	X	X	X	X	X	O	X	X	O	X	B	B	B	R
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	3	4	3	3	2	1	7	2	14	21	22	22	23	21	25	26	27	19	13	6	2		1	1		
MED	O	X	X	X	O	X	X	O	X	X	X	X	X	X	X	X	X	X	O	X	O	X	X	X	X	
U Q	O	X	36	68	54	36			O	X	34	33	39	42	44	47	48	48	45	41	36	32	26			
L Q	O	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	O	X	X				
	28	32	31	29			28		29	32	37	42	44	44	44	42	42	34	30	27	25					

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	A	A	18	31	36	40	F	39	36	F	A	B	B	A	B	B	R
2	A	A	A	23	A	A	R	A	B	F	20	30	33	40	F	41	32	23	A	B	B	B	B	A
3	A	A	A	A	A	A	R	R	R	B	B	B	R	B	B	41	B	R	Y	B	B	B	B	A
4	A	A	A	B	A	B	A	B	B	22	31	35	36	40	R	33	37	22	B	B	B	B	B	A
5	R	A	R	A	A	A	A	R	A	A	A	A	B	B	R	37	34	28	R	A	A	A	A	A
6	A	B	A	A	A	A	B	A	A	A	R	B	A	A	B	B	R	29	F	21	A	22	A	A
7	R	A	A	A	A	A	B	A	A	J	R	37	37	41	R	43	30	28	F	B	A	B	A	A
8	A	A	B	A	A	A	A	A	R	24	25	30	35	38	41	40	36	29	F	14	A	A	A	A
9	A	R	A	Y	A	A	23	A	A	A	B	B	B	B	B	J	R	B	B	B	B	B	B	A
10	A	A	A	A	A	R	B	B	B	26	32	34	38	42	42	39	F	F	B	B	B	B	B	B
11	B	J	R	Y	A	J	R	B	B	B	B	R	R	R	R	R	R	R	B	B	B	A	Y	Y
12	A	A	A	A	A	A	Y	Y	R	21	27	35	35	F	F	R	F	F	B	B	B	B	A	B
13	R	A	B	A	A	A	A	Y	R	31	35	41	37	36	40	40	30	25	B	B	B	B	B	B
14	B	A	27	A	A	A	23	A	A	26	33	38	39	R	R	39	38	25	17	B	B	B	B	B
15	B	A	A	A	A	R	B	B	R	30	33	38	B	B	41	39	32	R	B	A	B	B	B	Y
16	B	B	B	B	R	A	R	R	R	30	31	36	39	36	33	33	27	27	21	R	B	B	B	B
17	B	R	B	A	A	A	A	A	22	28	34	38	40	44	R	36	38	35	24	B	B	A	A	R
18	A	A	A	R	A	A	A	A	F	20	30	35	36	37	40	J	R	41	37	31	23	B	B	B
19	A	A	A	A	R	R	R	Y	F	18	31	31	F	F	42	42	36	40	42	B	R	A	A	A
20	A	A	A	B	B	A	A	A	A	R	R	R	B	B	B	B	R	B	B	B	B	B	B	B
21	A	B	A	R	Y	A	A	R	F	20	31	36	38	B	B	B	B	F	F	A	B	A	A	A
22	A	A	B	A	A	Y	B	B	B	B	36	38	38	36	36	38	38	27	22	B	B	B	A	R
23	A	A	A	A	A	A	A	A	A	B	B	38	35	42	J	R	38	31	33	20	B	B	B	B
24	A	A	R	A	R	B	B	R	F	20	32	40	38	42	40	40	39	F	R	R	Y	A	A	B
25	B	A	A	A	B	A	B	B	F	22	34	38	C	44	41	38	36	34	29	R	R	B	B	B
26	B	A	A	A	A	A	22	A	A	R	B	B	B	B	B	B	B	R	B	Y	Y	Y	A	B
27	B	A	A	A	R	A	R	A	F	R	R	38	41	46	42	38	40	30	23	17	R	A	J	R
28	A	A	A	A	A	Y	A	B	A	B	B	R	R	R	42	45	34	38	28	24	23	Y	B	R
29	A	A	25	A	Y	Y	B	R	F	20	25	34	35	B	R	J	R	R	R	B	B	Y	B	A
30	R	B	R	A	A	A	B	B	F	28	31	B	B	B	B	B	B	A	R	A	A	A	A	F
31	B	A	B	A	B	B	A	A	B	B	B	R	39	40	40	42	J	R	R	R	B	B	B	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	2	2	2	2	1	7	2	14	21	22	22	23	21	25	26	27	19	13	6	2		1	1
MED	R	R	26	26	R	J	R	R	R	22	30	34	38	39	40	40	38	31	27	R	R	J	R	F
U Q	30						R		24	32	36	38	41	42	42	39	35	30	24	20				
L Q	R						F		20	26	31	35	38	38	36	36	27	F	20	19				

AUG. 2009 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	35	43	40	36	30	31	23	42	28	E B 12	26	20	20	20	33	29	E B 15	30	B	B	32	B	B	17
2	32	41	30	32	33	45	22	24	B E 14	B E 13	24	22	24	24	16	E B 13	25	B	B	B	B	B	36	
3	56	27	72	69	57	57	24	31	25	B	B	B E 22	B	B	B E 18	B	28	15	B	B	B	B	36	
4	43	34	39	B	29	B	28	B	B E 12	B	19	22	22	32	26	36	16	B	B	B	B	B	31	
5	31	30	21	41	50	42	44	32	41	41	34	36	B	B E 24	B	22	E B 15	32	57	75	57	66	59	30
6	36	B	33	25	34	30	B	52	67	66	30	B	38	34	B	B E 23	B E 16	27	25	30	37	42	43	
7	32	36	42	44	K 40	32	B	40	32	15	39	20	E B 24	23	27	E B 15	16	24	B	32	B	30	52	
8	41	33	B	36	73	48	43	39	K E S 17	16	15	18	21	18	18	18	E B 13	25	30	31	34	30	22	
9	26	31	49	17	27	38	42	48	39	41	B	B	B	B	B	B E 29	B	B	B	B	B	B	29	
10	36	38	44	42	33	28	B	B	B E 12	B	G 16	22	22	26	E B 19	19	31	30	B	B	B	B	B	
11	B	16	16	42	32	22	B	B	B	B E 24	B E 23	B E 25	B E 20	B E 22	B E 21	B E 19	B	B	B	B	31	16	16	29
12	42	43	43	48	40	34	17	16	E B E 12	E B E 14	E B 18	18	24	24	23	18	E B 14	B	B	B	B	B	65	B
13	38	49	B	54	49	40	30	17	14	E B E 14	E B E 22	21	25	21	20	22	20	15	B	B	B	B	B	
14	B	34	36	42	41	38	36	30	43	43	22	E B E 22	E B 25	B	B E 20	B E 22	B E 17	K 16	B	B	B	B	B	B
15	B	30	30	38	35	26	B	B E 13	B E 12	B	19	31	B	B E 20	B E 21	B E 20	B	34	B	B	B	B	16	
16	B	B	B	B	22	58	44	22	E B E 13	E B 13	G 17	22	31	28	30	26	20	E B E 12	B	B	B	B	B	B
17	B	22	B	28	31	32	32	26	E B 12	B	16	20	24	24	23	23	18	18	24	K 4	B	B	B	24
18	32	37	34	30	55	52	34	30	19	17	22	22	22	25	23	22	E B E 13	E B 13	B	B	B	B	B	B
19	34	35	34	42	31	22	23	21	E B 13	18	29	31	34	32	21	E B 30	17	B E 21	B	44	47	48	46	45
20	45	39	31	B	B	44	27	37	37	20	22	21	B	B	B	B E 23	B E 20	B	B	B	B	B	B	B
21	38	B	41	25	16	43	36	23	15	E B E 20	22	32	B	B	B E 20	B E 12	30	24	B	B	B	28	24	30
22	34	32	B	35	25	16	B	B	B	E B 28	22	23	20	21	21	21	18	17	18	B	B	B	26	19
23	69	56	32	72	37	42	33	36	25	B	B E 23	B	25	24	23	19	E B 15	E B E 17	E B E 12	E B 12	B	B	B	B
24	32	32	19	30	30	B	B	24	E B 13	20	24	23	30	28	29	20	E B 20	E B E 17	E B E 16	30	17	26	35	B
25	B	26	27	26	B	30	B	B E 12	B	26	22	C	34	30	27	20	16	E B E 12	E B E 12	E B 12	B	B	B	B
26	B	35	30	42	58	58	31	42	35	E B 23	B	B	B	B	B	B	B E 16	B	B	B	17	16	29	B
27	B	42	40	35	19	46	40	42	24	E B 26	26	32	33	32	26	31	26	17	22	30	37	47	44	68
28	78	47	33	43	45	18	52	B	42	B	B	25	28	24	24	24	18	E B E 16	E B E 12	E B 17	16	B	B	18
29	30	32	32	31	15	17	B E 12	B E 13	B	18	21	B	30	34	32	34	24	E B 18	B	B	21	32	B	B
30	22	B	19	27	25	29	B	B E 20	B	18	B	B	B	B	26	B	B	38	32	72	45	39	43	68
31	B	69	B	52	B	B	31	30	27	B	B	26	22	28	24	E B E 20	E B E 20	E B E 22	E B E 18	E B 13	B	B	B	22
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	27	25	28	28	28	21	23	26	25	24	24	24	22	25	26	27	24	16	13	13	11	14	19
MED	36	35	33	37	33	36	32	30	22	17	22	22	24	24	24	20	E B 18	16	19	30	31	34	34	30
U Q	42	42	40	42	43	44	41	40	35	24	26	26	30	30	26	24	20	24	28	38	41	47	44	43
L Q	32	31	30	30	28	28	26	23	E B E 13	E B 14	19	22	22	23	21	19	E B E 16	E B E 16	E B E 14	E B 15	19	26	29	22

AUG. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	19	13	12	13	12	13	16	12	12	12	12	11	12	15	12	15	13	B	B	12	B	B	12
2	12	12	12	11	13	12	12	12	B	14	13	15	14	14	13	12	13	12	B	B	B	B	B	12
3	12	11	16	23	15	20	18	24	14	B	B	B	22	B	B	18	B	16	12	B	B	B	B	11
4	12	12	12	B	12	B	14	B	B	12	13	13	14	16	14	13	12	B	B	B	B	B	B	11
5	12	14	12	13	15	12	12	12	11	16	27	20	B	B	24	14	15	22	14	15	19	19	12	13
6	19	B	24	19	12	16	B	20	16	20	20	B	14	20	B	B	23	16	12	12	12	14	12	12
7	11	12	20	12	14	12	B	15	11	12	12	13	24	13	13	15	12	12	B	15	B	B	12	11
8	22	16	B	29	55	13	12	13	12	E S 16	12	12	13	14	13	13	11	12	11	12	12	12	13	12
9	12	12	12	12	13	16	12	12	15	14	B	B	B	B	B	B	29	B	B	B	B	B	B	12
10	12	15	13	24	23	14	B	B	B	12	13	15	14	15	19	12	13	13	B	B	B	B	B	B
11	B	12	12	12	11	11	B	B	B	B	24	23	25	20	22	21	19	B	B	B	13	11	12	12
12	12	11	13	14	14	12	11	12	12	14	18	12	14	13	14	13	14	B	B	B	B	B	23	B
13	12	13	B	16	12	18	12	12	11	14	22	21	18	21	16	12	20	15	B	B	B	B	B	B
14	B	12	13	18	15	12	12	12	14	12	12	22	25	B	20	22	17	12	B	B	B	B	B	B
15	B	12	12	15	12	12	B	B	13	12	12	16	B	B	20	21	20	B	B	B	B	B	B	11
16	B	B	B	B	12	20	18	18	13	13	12	12	12	13	11	12	12	12	14	B	B	B	B	B
17	B	12	B	13	12	13	12	12	12	12	14	15	15	14	16	12	12	12	B	B	12	12	B	12
18	11	12	12	14	12	14	13	12	12	12	12	12	13	16	13	13	13	13	B	B	B	B	B	B
19	12	11	12	12	12	12	13	16	13	12	12	13	12	12	13	30	12	B	21	20	12	12	12	12
20	15	12	26	B	B	12	14	25	13	17	14	18	B	B	B	B	23	B	B	B	B	B	B	B
21	12	B	13	14	12	14	15	13	11	20	22	14	B	B	B	20	B	12	12	14	B	12	12	12
22	13	18	B	23	14	12	B	B	B	B	28	18	18	14	16	14	13	12	12	B	B	B	12	12
23	13	12	12	13	14	12	12	12	13	B	B	B	23	20	14	14	13	15	12	12	12	B	B	B
24	20	24	14	12	13	B	B	B	12	14	12	14	14	13	12	12	16	20	17	11	12	14	12	12
25	B	11	12	11	B	20	B	B	12	12	13	C	13	12	12	12	12	12	12	B	B	B	B	B
26	B	11	12	11	23	14	12	12	20	23	B	B	B	B	B	B	B	16	B	B	12	12	12	B
27	B	26	22	13	12	12	12	12	13	26	20	13	12	15	12	15	12	12	11	12	11	12	12	12
28	12	12	27	13	12	11	12	B	15	B	B	19	12	20	18	14	15	16	12	17	13	B	B	12
29	12	12	12	11	11	13	B	B	12	13	14	12	B	B	B	B	16	16	18	B	B	15	12	B
30	14	B	12	12	12	11	B	B	20	12	B	B	B	B	18	B	B	28	17	18	15	12	12	13
31	B	12	B	21	B	B	20	13	13	B	B	20	14	12	19	20	20	22	18	13	B	B	B	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31
MED	13	12	13	13	13	13	14	13	13	14	14	17	15	16	16	15	15	16	21	B	B	B	B	12
U Q	B	18	26	21	15	16	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
L Q	12	12	12	12	12	12	12	12	12	12	12	13	13	13	13	13	12	12	12	14	13	12	12	12

AUG. 2009 fmin (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2009 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	184	A	A	E B	208	202	190	198	208	186	218	A	B	B	A	B	B	A
2	A	A	A	E A	A	A	A	A	B	E B	234	196	218	206	194	200	194	182	A	B	B	B	B	A
3	A	A	A	A	A	A	A	A	A	B	B	B	236	B	B	210	B	A	Y	B	B	B	B	A
4	A	A	A	B	A	B	A	B	B	214	204	226	170	196	190	194	214	B	B	B	B	B	B	A
5	196	A	A	A	A	A	A	212	A	A	A	A	B	B	206	206	214	A	A	A	A	A	A	A
6	A	B	A	A	A	A	B	A	A	A	A	B	A	A	B	B	E B	E B	Q	A	194	A	A	A
7	208	A	A	A	A	A	B	A	A	232	210	204	226	196	194	198	228	208	B	A	B	B	A	A
8	A	A	B	A	A	A	A	A	E A	E S	330	264	180	208	162	198	188	198	Q	E B	E A	A	A	A
9	198	196	A	Y	A	A	210	A	A	A	B	B	B	B	B	B	204	B	B	B	B	B	B	A
10	A	A	A	A	A	A	B	B	B	210	214	182	216	210	202	200	198	182	B	B	B	B	B	B
11	B	Y	Y	A	A	A	B	B	B	222	222	198	194	214	196	196	B	B	B	B	A	Y	Y	A
12	A	A	A	A	A	A	Y	Y	B	214	224	192	192	208	188	212	196	B	B	B	B	B	A	B
13	E A	A	B	A	A	A	A	Y	A	222	252	218	208	200	200	200	200	206	B	B	B	B	B	B
14	B	A	216	A	A	A	196	A	A	E A	240	202	216	228	228	220	198	A	B	B	B	B	B	B
15	B	A	A	A	A	A	B	B	B	250	190	204	226	B	B	224	202	200	B	A	B	B	B	Y
16	B	B	B	B	A	A	202	A	E B	262	196	182	202	202	202	198	202	202	190	218	B	B	B	B
17	B	A	B	A	A	A	A	A	E B	242	224	198	198	204	204	202	202	188	228	B	B	A	A	B
18	A	A	A	A	A	A	A	A	E A	286	214	200	198	198	206	212	188	184	184	B	B	B	B	B
19	A	A	A	A	A	A	200	A	A	240	214	196	194	212	200	200	224	222	E B	B	A	A	A	A
20	A	A	A	B	B	A	A	A	A	A	E A	236	216	B	B	B	B	B	B	B	B	B	B	B
21	A	B	A	A	Y	A	A	A	258	216	212	212	B	B	B	194	B	194	276	A	B	A	A	A
22	A	A	B	A	A	Y	B	B	B	B	E B	256	218	220	196	190	208	192	232	208	B	B	B	A
23	A	A	A	A	A	A	A	A	A	A	B	B	216	228	218	196	188	200	200	212	196	B	B	B
24	A	A	A	A	B	B	A	A	226	208	190	190	184	190	216	190	196	206	E A	A	A	A	A	B
25	B	A	A	A	B	A	B	B	214	204	192	C	200	196	186	202	202	190	E B	E B	B	B	B	B
26	B	A	A	A	A	A	A	216	A	222	B	B	B	B	B	B	B	202	B	B	Y	Y	A	B
27	B	A	A	A	A	A	186	A	E A	E B	268	262	232	208	200	212	212	184	202	228	214	302	216	A
28	A	A	A	A	A	A	A	B	A	B	B	200	200	206	206	200	206	212	226	E B	222	Y	B	B
29	A	A	A	Y	Y	B	E B	B	272	188	200	174	B	212	212	218	218	198	210	B	B	Y	B	A
30	A	B	A	A	A	A	B	B	262	208	B	B	B	B	200	B	B	A	E A	A	A	A	A	202
31	B	A	B	A	B	B	A	A	E A	284	B	B	252	212	194	238	206	222	200	236	236	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	1	2	2	2		5	3	13	21	22	23	23	21	25	26	27	18	12	6	2			1
MED	200	196	204	232	209		196	214	236	211	202	208	204	200	202	200	200	202	222	232	205			202
U Q	246						206	272	276	233	222	218	216	207	213	206	214	212	275	250				
L Q	197						185	212	233	208	196	198	198	196	195	194	196	190	216	222				

AUG. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2009 f_{XI} (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	R	Y	Y	B	X	B	O	X	X	X	50	50	53	45	X	X	X	X	X	B	B	B	R	
2	R	R	R	A	A	A	A	R	X	X	X	X	X	50	50	52	48	42	42	36	24		B	B	B	B	
3	B	A	R	R	A	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	B	B	B	B	X		
4	A	A	X	A	A	A	A	A	B	R	O	X	X	X	X	X	X	X	X	X			B	B	A		
5	O	X	A	A	Y	R	A	O	X	X	X	R	B	O	X	X	X	X	X	X	X	B	B	B	B		
6	B	B	R	B	Y	B	B	B	B	X	X	X	X	O	X	X	X	X	X	X	X	X	B	B	B		
7	A	A	R	R	A	O	X	B			X	X	X	X	X	X	X	X	X	X	X	X	B	B	B		
8	B	Y	A	A	R	R	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B	B	B		
9	O	X	A	A	A	O	X	R			O	X	X	X	X	X	X	X	X	X	X	X	X	B	B		
10	B	B	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B	B	B		
11	B	B	A	B	B	B	B	B	X	X	X	X	X	X	X	X	X	X	X	X	X	B	R	A	A		
12	A	R	B	B	A	A	X		O	X	B	O	X	X	X	X	X	X	X	X	X		B	B	B		
13	B	O	X	X	O	X	A	A	A	A		O	X	B	O	X	X	X	X	X	X	O	X	A	A	A	
14	A	A	O	X	O	X	A	A	A	R	A	B	B	R	R	R	O	X	X	X	X	O	X	A	R	O	X
15	A	A	A	A	O	X	R	O	X	X	O	X	B	R	R	O	X	O	X	X	X	B	B	B	B	B	
16	A	54	A	A	A	A	A	A	X	X	X	B	B	B	B	O	X	X	X	X	X	X	B	B	B		
17	R	R	R	A	48	B	B	R	B	R	R	R	R	R	R	R	X	X	X	X	X		B	O	X	35	
18	27	R	A	A	A	B	B	R	O	X	X	X	X	X	X	X	X	X	X	X	X		B	B	B		
19	B	R	B	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	O	X	B	B	B	
20	B	B	B	B	53	36	33	37	44	46	48	51	50	54	54	60	60	50	42	37	29	24		B	B		
21	A	A	A	54	B	B	A	O	X	X	X	X	R	O	X	B	B	O	X	X	X	X	B	R	B	B	
22	B	B	B	Y	B	B	B	O	X	X	X	X	X	B	B	X	X	X	X	X	X	O	X	O	X	B	
23	Y	B	R	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B	B	
24	B	B	B	Y	B	B	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B		
25	B	B	B	B	B	X	X	X	B	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	B		
26	B	Y	B	X	A	30	37	46	50	53	54	59	56	60	66	53	52	50	44	44	33	28	23		A		
27	A	A	A	X	30	31	B	B	R	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	A		
28	A	A	X	A	B	A	A	B	B	O	X	X	B	B	B	B	B	X	X	X	X	B		X	A		
29	X	A	B	R	30	30	X	X	X	X	R	O	X	X	X	X	X	X	X	X	X	X	X	X	B		
30	B	B	B	42	33	36	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	4	2	6	9	10	12	14	20	21	24	24	24	26	25	27	29	30	30	30	28	22	14	10	4			
MED	X	42	35	36	33	31	33	34	40	44	46	48	50	50	49	48	48	44	40	34	30	28	24	32			
U Q	O	X	56	41	38	36	34	39	43	48	50	50	52	54	54	52	50	48	44	39	33	30	30	O	X		
L Q	30		X	X	30	30	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	25	23	29		

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2009 foF2 (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	R	Y	Y	B		B	R	J	R		F	F	F			R	U	R	R	B	B	B	R								
2	A	A	A	A	A	A	A	R		30	37	38	42	44	44	46	42	36	36	26	F	12	B	B	B	B								
3	B	A	A	A	A		25	22	24	32	38	40	42	41	43	43	43	43	36	28	R	B	B	B	A	23								
4	A	A		A	A	A	F	A		A	B	A	R	R	R	R		35	35	31	22	F		B	B	A								
5	R	A	A	Y	R	A	R	V		A	B	R		F			R						B	B	B	B								
6	B	B	R	B	Y	B	B	B		B	J	R		R			42	41	41	36	29	25	17		B	B	B							
7	A	A	R	A	A	R	B	F		30	20	36	36	44	41	44	48	48	44	41	40	32	24	19		B	B	B						
8	B	Y	A	A	A	A	Y			24	32	38	42	43	43	46	42	41	39	34	30	20	19		R	B	B	B						
9	R	A	A	A	A	R	A	F		F	F	F	R	R	R	R	R	R	R	R	R	R	F			B	B	B						
10	B	B	Y	R	F	R		F		22	22	32	38	39	43	42	42	38	38	44	34	27	28	15		B	B	B	B					
11	B	B	A	B	B	B				26	36	43	42	43	42	40	42	48	51	44	37	29			R	A	A	A						
12	A	R	B	B	A	A		F		16	23	28		37	28	41	42	37	39	44	35	34	26	18		F	B	B	B					
13	B	R		A	R	A	A	A		A	A		35	38		44	44	46	40	40	39	38	28	27		R	A	A	A					
14	A	A	R	R	A	A	A	R		A	B	B	R	R	R	R	39	36	35	32	27	21	17			A	A	R	31					
15	A	A	A	A	A	R	R	R		27	22	27	32	B	R	R	41	42	39	40	38	34	32			B	B	B	B					
16	A		A	A	A	A	A	A		A	V	B	B	B	B			41	40	38	34	27	22			R	B	B	B					
17	R	R	R	A	A	B	B	A		B	R		R	38	43	44	44	44	44	39	35	27	18	13		F	F	B	R	29				
18	15	A	A	A	A	B	B	R		R	R	R	R	R	R	43	41	42	38	37	24	20	16	12		F	F	F	F	B				
19	B	A	B	R	R		F	24	32	36	42	44	44	45	44	44	44	46	44	38	24	22			F	R	B	B	B					
20	B	B	B	B	A	F	F			26	22	31	38	40	42	45	44	48	48	54	54	44	36	31	23	18		R	R	B	B			
21	A	A	A	A	B	B	A			31	34	33	33		40		B	B	43	43	38	37	30			B	A	B	B	B				
22	B	B	B	Y	B	B	B	R		R	R	R	R	R	B		B	J	R	J	R	J	R	R	R	R	R	R	R	B	B			
23	Y	B	A	R			F			31	39	43	43	43			B	J	R	J	R	J	R	R	R	R	R	R	R	B	B			
24	B	B	B	Y	B	B				28	37	44	45	45	48	51	48	49	47	47	41	41	32	30	24	17					B			
25	B	B	B	B	B					B	R	R	R	R	J	R		53	51	53	51	46	46	39	32	30	24	18		F	F	B		
26	B	Y	B		A	F	F			20	28	36		40	47	47	53	51	53	51	46	46	39	32	30	24	18				A			
27	A	A	A		F	F	B	B		A	R	R	R	R		J	R		R	43	42	39	35	24	19	20		F	F	F	A			
28	A	A		A	B	A	A	B		B	R		B	B	B	B		B	J	R	J	R	R	R	B	F					A			
29	27	A	B	R	F	F				19	20	29	34	38	41		44	50	50	44	45	42	42	39	34	26	24	15		F	B			
30	B	B	B	F	F	F				26	22	26	31	35	35	43	44	46	52	51	50	47	45	44	41	36	31	24	13	23		23		
31																																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT	4	2	4	6	8	12	14	20	21	24	24	24	26	25	27	29	30	30	30	28	22	14	9	4										
MED	27	29	26	27	23	24	23	28	34	38	40	42	44	44	43	42	42	38	34	28	22	22	17	26										
U Q	R			R	R						R		R	R	R																			
L Q	28		29	30	26	26	28	33	37	42	44	44	46	48	48	46	44	42	38	32	26	24	18	30										
	21		24	24	F	F		F		20	22	24	32	35	36	40	41	42	41	40	38	35	30	24	18	18	14	23						

SEP. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	34	32	16	16	16	17		B E B 12		B E B E B E B 22 25 23	33	39	37	30		E B E B E B E B 20 19 18 14				B	B	B	16				
2	24	36	24	48	46	36	36	21	21	21	21	23	24	31	23	31	22	16	E B E B E B 11 12		B	B	B	B			
3		B	24	27	24	28	E B E B E B 12 14	16	29	32	24	35	30	23	24	21	17	18		B	B	B	22	33			
4	46	42	43	47	54	46	31	42	42		B	34	31	22	24	E B E B E B 28 23	16	16	14	E B E B E B 12 15		B	B	B	32		
5	40	41	37	16	23	44	31	32	32	33		B	31	30	31	32	21	E B E B E B E B 13 22 22 14		B	B	B	B				
6	B	B	18		16		B	B	B		B	26	30	30	27	27	27	31	30	17	16	E B E B E B 12 11		B	B	B	B
7	33	28	24	27	31	20		B E B 12	18	21	26	28	32	24	27	25	E B E B E B E B 20 19 16 13			E B E B E B 12 13		B	B	B	B		
8	B	15	36	37	24	28	19	E B 12	25	20	28	33	34	28	27	27	25	15	14	12	E B E B E B 12 11		B	B	B	B	
9	18	30	30	48	41	34	34	25	21	32	30	26	26	26	25	26	22	25	20	E B E B E B 12 11		B	B	B	B		
10	B	B	29	18	31	29	28	12	20	27	35	34	35	31	30	32	28	18	15	E B E B E B 11 12		B	B	B	B		
11	B	B	30		B	B	B	E B 14	18	23	26	35	26	32	29	24	24	E B E B E B E B 18 18 19				B	25	42	46		
12	41	28			33	33	26	22	E B 18		B	32	32	26	25	26	E B E B E B 24 22	20	14	12	E B E B E B 12 12		B	B	B	B	
13	B	26	40	31	29	49	40	43	36	33	24		26	30	29	31	30	17	13	13		43	47	50	33		
14	40	46	39	57	41	44	43	22	33		B	26	26	24	24	23	21	20	17	E B 13		31	35	23	42		
15	46	52	43	36	32	25	16	16	E B 22		B E B E B E B 27 24	31	29	27	24	20	E B E B E B 15 22			B	B	B	B	B	B		
16	33	30	40	43	42	40	47	38	18	23	22					22	22	20	18	E B E B E B 15 15		B	B	B	B		
17	25	25	22	38	37		B	B	37		B	29	E B E B E B 25 25	28	33	30	29	25	18	16	E B E B E B 13 12 11		B	B	B	31	
18	31	30	39	34	36		B	B	27	17	22	25	28	28	26	26	28	20	20	15	E B E B E B E B 12 12 12 12		B	B	B	B	
19	B	27	B E B E B 27	E B E B 26	E B E B 29	E B 12	15	22	30	31	30	30	34	28	25	24	21	14	E B E B E B 12 16		B	B	B	B			
20	B	B	B	E B E B E B 28	E B E B E B 20	E B E B 13	18	21	22	26	29	34	33	33	24	24	17	E B E B E B E B 16 18			B	B	B	B	B		
21	71	42	50	37		B	41	26	21	26	24	22	25			B	E B E B E B E B E B 24 20 27 23 18					B	32	B	B		
22	B	B	B	17		B	B	E B E B 23	22	26	26	28				B	E B E B E B E B E B 31 32 31 37 24 19				E B E B E B E B 13 12 12		B	B	B	B	
23	16	B	30	E B 13	24	16	E B 13	25	29	32	32	34	37	31	31	28	28	20	18	E B E B E B E B 13 12 11		B	B	B	B		
24	B	B	B	15		B	E B E B 14	18	E B 23	23	29	28	30	27	26	32	31	23	20	12	E B E B E B E B 12 12 12 12		B	B	B	B	
25	B	B	B		B	E B E B E B E B 12	13	20		E B E B 26	24	33	37	33	32	24	24	20	16	16		E B E B E B 12 12		B	B	B	B
26	B	21	E B 18	E B 31	22	22	24	28	29	31	38	32	35	38	33	31	29	18	12	E B E B E B E B 12 12 13 12		B	B	B	30		
27	72	50	45	28	E B E B 14	E B 14			37	30	29	32	27	29	28	26	E B E B E B E B E B 23 21 20 22				E B E B E B E B 13 34 36		B	B	B	47	
28	43	44	70	74		B	52	39		B	26	25				B	E B E B E B E B E B 25 28 24 21				B	E B E B E B E B 16 31 36		B	B	B	B
29	71	70		24	24	24	22	21	20	24	24	28	24	24	23	28	E B E B E B E B E B 25 27 27 14				E B E B E B E B 14 13 13		B	B	B	B	
30	B	B	B	E B 26	E B 14	E B 25	E B 16	20	E B 23	31	28	26	26	32	27	25	23	21	E B 19	24	E B 14	E B 14	E B 12	37			
31																											
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	17	21	21	25	24	22	22	27	25	26	28	27	27	26	27	29	30	30	30	28	22	18	13	11			
MED	40	30	36	28	30	28	24	21	22	26	26	28	28	30	28	26	23	19	E B E B E B 18 13		E B E B E B 12 13 13		B	B	33		
U Q	46	43	42	40	36	40	36	26	28	30	30	32	33	32	31	30	25	E B E B E B 22 20 17			15	25	34	42			
L Q	28	26	26	18	24	20	E B E B 14 15	19	23	25	26	26	26	26	26	24	E B 21	17	15	12	E B E B E B 12 12 12		B	B	31		

SEP. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	12	12	12	12	12		B		B	22	25	23	12	13	13	12	20	20	18	14		B	B	B	12		
2	13	11	12	11	18	12	12	12	12	13	12	13	13	14	12	12	13	12	11	12		B	B	B	B			
3	B	11	13	9	12	13	12	14	12	12	12	14	13	16	18	17	14	12	18		B	B	B	12	12			
4	12	18	12	12	12	12	12	13	13		B	22	12	14	17	28	23	16	12	11	12	15		B	B	16		
5	12	12	11	10	12	12	12	12	18	21		B	20	16	12	12	12	13	22	22	14		B	B	B	B		
6	B	B		B	11		B	B	B		B	18	15	14	18	18	13	12	12	13	12	12	11		B	B	B	
7	12	12	14	12	12	15		B	12	13	13	13	12	12	14	15	16	20	19	16	13	13		B	B	B		
8	B	11	12	12	12	20	12	12	12	12	12	11	12	13	12	12	12	11	14	12	12	17		B	B	B		
9	15	12	11	13	12	12	11	11	11	12	12	12	14	13	13	12	12	12	12	12	12	11	13		B	B	B	
10	B	B		B	19	13	13	12	18	12	11	12	13	12	12	12	12	12	12	12	11	12		B	B	B		
11	B	B	13	B	B	B	B		14	12	12	12	14	13	12	12	13	18	18	18	19		B	12	12	15		
12	19	13		B	11	12	20	13	18		B	21	20	20	21	18	24	22	13	14	12	12		B	B	B		
13	B	12	12	12	12	13	12	18	12	13	24		B	20	14	12	13	12	12	13	13	12	13	13	11			
14	13	16	12	12	17	19	12	13	13		B	B	18	19	20	18	15	14	14	13	13	12	11	12	12			
15	173	23	17	12	12	12	11	12	22		B	27	24	18	13	15	19	16	15	22		B	B	B	B			
16	12	27	26	20	24	15	15	16	14	12	12		B	B	B	B	18	12	14	14	15	15		B	B	B		
17	12	12	13	12	28		B	B	22		B	19	26	25	16	11	12	12	13	13	13	13	12	11		B	12	
18	11	12	12	13	17		B	B	15	12	12	13	12	14	13	13	12	13	12	12	12	12	12	12	12	12	B	
19	B	19	B	27	26	19	12	12	12	12	12	12	12	15	18	16	15	11	11	12	16		B	B	B	B		
20	B	B	B	B	28	20	13	12	14	17	15	14	13	17	16	12	12	12	12	16	18	12	12		B	B	B	
21	19	13	13	13		B	B	14	14	12	12	12	12	15		B	B	24	20	27	23	18		B	B	B		
22	B	B	B	13		B	B	B	23	18	20	22	24		B	B	31	32	31	37	24	19	13	12	12		B	
23	13	B	11	13	14	12	13	12	12	12	12	12	13	12	12	12	12	13	12	12	13	12	11		B	B	B	
24	B	B	B	12	B	B		14	13	23	18	26	18	19	19	15	14	12	12	12	12	12	12	12	12	12	B	
25	B	B	B	B	B		12	13	20		B	26	16	12	12	12	12	12	14	12	13	12	11	12	12		B	
26	B	13	B	18	15	12	12	12	14	13	14	12	15	14	12	13	12	12	12	12	12	12	12	13	12	12		
27	12	13	12	12	14	14		B	B	14	16	12	13	14	13	28	26	23	20	20	22	13	11	12	12		B	
28	13	22	14	28		B	21	23		B	14	12		B	B	B	B	25	28	24	21		B	16	12	12	B	
29	13	17	B	20	12	13	12	14	13	12	13	20	18	12	12	24	25	27	27	14	14	13	13				B	
30	B	B	B	12	14	12	16	14	23	18	13	17	17	14	14	13	12	14	19	13	14	11	12	11				
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	19	16	13	13	14	14	14	13	14	14	13	14	14	14	14	13	14	13	14	13	13	13		B	B	B		
U Q	B	B	B	B	B	B	B		B		B	16	22	20	22	20	18	18	18	19	20	19	19	18		B	B	B
L Q	12	12	12	12	12	12	12	12	12	12	12	12	12	13	13	12	12	12	12	12	12	12	12	12	12	12	12	

SEP. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	Y	Y	B	B	B	B	B	200	196	188	208	192	208	224	E	B	B	B	B	A	
2	A	A	A	A	A	A	A	A	A	E	A	256	206	182	H	196	194	194	194	194	194	196	218	B	B
3	B	A	A	A	A	E	B	B	B	B	B	208	206	210	206	184	200	196	202	208	186	202	B	B	A
4	A	A	224	A	A	A	E	A	A	A	B	A	E	A	A	240	206	214	220	212	176	206	216	194	238
5	A	A	A	Y	A	A	A	A	A	A	B	B	204	204	204	190	196	204	196	228	196	B	B	B	B
6	B	B	A	B	Y	B	B	B	B	E	A	246	200	204	210	212	196	204	198	206	192	192	216	B	B
7	A	A	A	A	A	A	B	236	210	202	210	202	208	188	206	210	214	200	208	220	E	B	B	B	
8	B	Y	A	A	A	A	A	212	194	180	178	210	196	176	192	192	184	200	226	208	206	E	B	B	
9	204	A	A	A	A	202	200	256	204	188	200	202	194	212	200	208	202	198	198	224	202	212	B	B	
10	B	B	A	192	192	A	A	212	206	202	192	194	202	202	180	208	208	194	222	198	242	B	B	B	
11	B	B	A	B	B	B	B	204	210	202	198	198	196	188	178	202	210	198	204	220	B	A	A	A	
12	A	A	B	B	A	A	A	202	264	B	214	190	206	210	210	198	218	212	208	212	214	B	B	B	
13	B	194	228	210	A	A	A	A	A	A	220	214	200	200	196	196	194	202	220	222	198	A	A	A	
14	A	A	A	228	A	A	A	A	A	B	B	208	216	208	208	208	202	202	206	206	A	A	A	A	
15	A	A	A	A	208	A	A	208	224	B	E	B	252	198	210	210	202	216	228	194	226	B	B	B	
16	A	196	A	A	A	A	A	A	A	230	220	194	B	B	B	B	206	212	212	208	220	212	B	B	
17	A	A	A	A	A	B	B	A	B	A	208	218	192	196	206	202	206	188	212	208	204	E	B	190	
18	194	A	A	A	A	B	B	A	214	200	196	166	216	200	200	202	196	202	202	196	218	214	200	B	
19	B	A	B	B	204	A	238	230	202	204	192	208	186	190	198	198	216	202	202	198	216	B	B	B	
20	B	B	B	B	A	B	254	210	202	198	220	212	194	210	208	188	204	192	198	218	208	E	B	B	
21	A	A	A	A	B	B	A	214	220	200	180	180	200	B	B	212	202	E	B	228	216	216	B	B	
22	B	B	B	Y	B	B	B	E	B	254	216	226	212	224	B	242	244	224	234	216	222	234	250	262	
23	Y	B	A	204	E	B	248	184	194	216	202	192	192	208	204	212	202	202	202	208	216	192	B	B	
24	B	B	B	Y	B	B	238	204	200	200	230	212	212	194	202	202	214	204	198	202	178	214	206	B	
25	B	B	B	B	B	E	B	270	220	216	208	198	206	214	212	212	200	204	208	202	202	204	204	214	
26	B	Y	B	B	A	252	204	204	192	168	224	204	202	190	208	184	190	196	184	204	204	196	240	A	
27	A	A	A	222	B	E	B	284	B	B	A	206	192	224	194	194	E	B	234	214	224	206	214	A	
28	A	A	194	A	B	A	A	B	B	B	224	192	B	B	B	B	216	240	222	222	B	252	226	A	
29	274	A	B	A	B	278	242	212	198	196	184	206	186	192	192	206	198	216	216	210	204	214	244	B	
30	B	B	B	264	282	264	234	196	224	202	208	200	200	194	206	214	208	212	210	212	206	212	B	208	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	3	2	3	6	5	8	11	19	20	24	27	27	27	26	27	29	30	30	30	28	21	14	7	4	
MED	204	195	224	216	208	248	236	210	208	202	199	204	200	200	201	202	205	202	207	210	210	213	216	203	
U Q	274		228	228	321	281	248	234	222	218	214	210	208	210	208	211	214	212	216	220	223	250	244	224	
L Q	194		194	204	198	258	204	204	201	200	192	198	194	192	196	197	198	196	202	202	204	212	206	194	

SEP. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2009 f_{XI} (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	55	A	59	A	A	A	R	O	X	O	X	O	X	O	X	X	O	X	X	X	X	X	X	Y
2	B	Y	X	O	X	A	O	X	X	O	X	R	R	O	X	O	X	O	X	O	X	O	X	O	X
3	B	B	B	X	32	35	42	47	48	50	55	55	56	54	58	62	54	50	47	45	36	34	28	22	
4	28	28	B	38	30	33	37	42	48	47	52	60	60	62	61	57	62	59	57	51	38	32	29	24	
5	A	A	O	X	36	38	33	31	36	42	42	42	44	48	51	57	53	52	57	54	52	43	38	30	23
6	B	B	A	29	30	34	42	44	46	R	R	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	B	B	30	31	32	34	41	46	48	56	52	56	64	68	65	65	58	54	48	45	36	35	28	R	
8	B	R	O	X	34	30	34	36	43	46	47	50	R	X	X	X	X	X	X	X	X	X	X	B	
9	63	30	36	32	34	35	41	45	50	50	52	58	60	63	64	58	51	51	48	47	45	36	24	A	
10	A	43	A	X	34	36	37	X	X	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	27	25	25	28	32	38	41	48	46	48	51	B	O	X	X	X	X	X	X	X	X	X	X	X	X
12	41	A	O	X	34	38	42	44	46	48	50	53	53	54	54	57	51	49	50	46	42	43	32	31	
13	33	31	23	32	36	39	44	46	56	58	60	58	O	X	X	X	X	X	X	X	X	X	X	X	X
14	X	X	X	42	40	44	41	40	46	41	50	52	55	52	52	54	54	54	47	46	42	35	35	35	
15	32	32	34	33	53	41	43	47	48	54	62	R	X	X	X	X	X	X	X	X	X	X	X	A	
16	X	R	25	25	A	B	A	O	X	O	X	O	X	X	X	X	X	X	X	X	X	X	X	X	X
17	39	36	35	32	34	43	48	49	50	54	55	55	56	59	54	51	52	49	46	46	45	40	42	42	
18	34	35	34	40	42	41	47	49	54	60	59	59	62	60	60	56	52	50	49	51	46	40	42	37	
19	30	X	31	30	X	X	X	O	X	O	X	O	X	C	C	C	C	X	X	X	X	X	X	X	X
20	35	31	31	41	B	38	44	49	51	51	53	53	58	56	52	55	52	54	53	47	42	39	40	36	
21	42	42	44	58	40	46	50	52	52	58	57	58	60	60	60	57	56	54	56	50	47	41	37	40	
22	42	40	36	86	A	B	A	A	O	X	B	R	O	X	X	X	B	B	B	O	X	X	X	A	A
23	A	A	A	X	R	R	R	R	R	R	X	R	R	B	B	B	B	O	X	X	X	X	X	X	X
24	A	50	R	R	R	X	X	X	X	X	O	X	O	X	O	X	X	X	X	O	X	X	X	X	X
25	B	O	X	B	B	B	A	A	O	X	O	X	O	X	B	O	X	O	X	O	X	X	X	X	X
26	35	32	35	40	43	48	52	53	57	X	R	B	B	B	R	R	R	O	X	X	X	X	X	X	X
27	A	A	X	X	44	48	50	55	60	56	R	O	X	R	O	X	O	X	O	X	X	X	X	X	X
28	33	33	39	40	47	42	B	B	O	X	O	X	R	B	B	B	B	B	O	X	O	X	X	X	X
29	39	X	X	34	40	43	R	O	X	R	R	R	R	O	X	O	X	X	X	X	X	X	X	X	X
30	48	A	57	A	A	R	O	X	A	A	B	B	B	B	B	B	B	O	X	O	X	O	X	O	X
31	B	B	36	40	41	44	46	50	X	R	O	X	B	O	X	R	R	R	O	X	O	X	O	X	X
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	18	19	24	28	23	24	24	25	27	24	21	24	23	25	25	25	26	30	30	31	31	30	29	23	
MED	34	33	34	34	34	39	43	47	48	50	52	54	58	60	60	54	52	51	48	46	42	39	34	35	
U Q	41	40	36	40	41	43	46	49	51	54	55	58	63	63	63	58	56	54	50	48	46	40	40	40	
L Q	30	31	30	X	32	36	41	44	46	48	50	52	55	54	53	52	52	49	47	44	41	35	28	30	

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2009 foF2 (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2	B	Y			R	A	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
3	B	B	B		F	F	F																		
4	F	F	B		F	F	F																		
5	A	A	R		F	F	F																		
6	B	B	A		F	F	F																		
7	B	B	F		F	F	F																		
8	B	A	R		F	F	F																		
9	A	F	F		F	F	F																		
10	A	A	A		F	F	F																		
11	F	F	F		F	F	F																		
12	A	A	F		F	F	F																		
13	F	F	F		F	F	F																		
14	21	34	18		F	F	F																		
15	18	15	21		F	F	F																		
16	24	15	19		A	B	A																		
17	24	26	24		F	F	F																		
18	F	F	F		F	F	F																		
19	22	20	18		F	F	F																		
20	F	F	F		B	F	F																		
21	F	F	F		F	F	F																		
22	F	F	F		A	B	A																		
23	A	A	A		R	R	R																		
24	A	A	A		A																				
25	B	F	31		B	B	A																		
26	F	F	F		F	F	F																		
27	A	A	26		F	42	44																		
28	F	F	F		F	F	F																		
29	F	F	F		F	F	F																		
30	F	F	F		F	F	F																		
31	B	B	F		F	F	F																		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	16	16	23	27	23	24	24	25	27	25	22	24	24	25	25	25	26	30	30	31	31	30	29	23	
MED	F	F	F	F	F	30	36	41	42	44	46	48	52	54	54	48	46	45	42	40	36	30	22	F	
U Q	24	25	25	26	30	36	40	43	45	48	49	51	56	57	57	52	50	48	44	42	39	34	28	F	
L Q	F	F	F	F	F	F	F																		
	20	18	21	21	25	31	37	40	40	44	46	48	48	48	47	46	46	43	41	38	33	26	19	18	

OCT. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	43	50	57	44	50	44	52	40	39	26	33	28	33	28	26	30	24	E	B	E	B	E	B	E	B	17								
2	B	22	29	31	26	40	34	28	23	25	32	33	31	37	32	26	23	22	E	B	E	B	E	B	E	B	12							
3	B	B	E	B	16	36	E	B	15	24	25	28	29	31	22	32	31	32	31	20	26	16	14	11	12	23	E	B	12					
4	E	B	E	B	E	B	25	32	38	34	20	22	28	29	29	26	24	28	25	25	21	16	14	18	18	E	B	E	B	E	B	12		
5	29	30	30	30	33	35	34	31	32	32	28	32	30	30	34	26	28	22	22	E	B	E	B	E	B	E	B	E	B	B				
6	B	B	32	30	33	E	B	13	24	21	22	E	B	30	28	32	32	32	35	35	30	28	18	14	12	12	12	E	B	E	B	29		
7	B	E	B	E	B	E	B	E	B	13	17	21	19	G	32	37	33	35	28	26	25	29	21	20	14	E	B	E	B	E	B	21		
8	B	28	29	32	32	27	27	28	30	23	28	36	39	34	31	31	26	31	19	15	E	B	E	B	E	B	E	B	E	B	B			
9	37	37	38	32	E	B	E	B	16	12	28	22	24	30	30	35	36	28	25	25	25	22	18	17	14	E	B	E	B	E	B	31		
10	34	33	34	32	23	16	28	28	30	31	32	34	33	33	32	30	26	32	21	14	E	B	E	B	E	B	E	B	E	B	B			
11	E	B	12	20	12	12	30	22	30	25	30	30	30	B	E	B	41	31	31	31	32	22	28	16	E	B	E	B	E	B	38			
12	36	41	39	39	29	26	25	28	28	30	33	28	32	32	31	28	31	28	22	18	E	B	13	22	12	E	B	E	B	E	B	12		
13	E	B	E	B	12	21	23	41	35	31	29	30	33	36	34	33	32	33	30	27	24	18	19	E	B	E	B	E	B	E	B	14		
14	30	37	25	22	E	B	14	31	25	26	30	30	31	33	36	32	31	32	32	32	27	20	29	26	E	B	E	B	E	B	12			
15	E	B	E	B	E	B	E	B	13	16	26	21	28	34	32	E	B	32	29	28	33	31	19	G	19	22	26	17	23	42	36	34		
16	35	28	16	18	34	B	39	26	30	31	32	26	32	32	30	25	26	20	19	18	E	B	E	B	E	B	E	B	E	B	21			
17	28	27	E	B	E	B	12	22	25	25	25	25	32	29	29	33	32	33	30	32	23	E	B	E	B	E	B	E	B	E	B	13		
18	24	E	B	E	B	E	B	E	B	14	23	24	24	24	28	29	32	32	25	25	23	G	24	24	24	28	E	B	E	B	E	B	12	
19	E	B	E	B	E	B	E	B	14	17	G	24	29	29	31	30	26	C	C	C	C	30	28	27	25	E	B	E	B	E	B	12		
20	E	B	E	B	E	B	E	B	B	36	40	29	29	31	30	34	32	34	31	32	32	28	21	17	16	E	B	E	B	E	B	22		
21	E	B	E	B	E	B	E	B	20	24	G	16	28	28	30	23	21	36	34	33	29	30	24	26	25	14	E	B	E	B	E	B	12	
22	E	B	E	B	E	B	30	51	B	51	56	40	B	36	30	30	25	25	G	B	B	B	B	E	B	E	B	E	B	E	B	53		
23	38	70	40	70	34	36	29	43	42	36	25	24	28	G	B	B	B	B	B	B	E	B	25	21	24	17	28	18	38	38	38			
24	34	40	29	30	32	G	35	21	28	24	30	22	24	G	30	30	39	25	25	E	B	E	B	E	B	20	33	32	91	91	91			
25	B	51	32	B	B	B	43	38	31	30	30	31	B	E	B	30	26	26	24	E	B	23	22	28	15	15	E	B	E	B	14			
26	30	24	30	17	16	21	22	24	28	27	B	B	B	B	E	B	E	B	E	B	B	28	29	29	29	22	19	16	17	E	B	12		
27	30	34	34	32	32	24	28	28	30	33	34	29	28	28	28	24	27	22	E	B	24	17	18	23	20	29	29	29	29	29	29			
28	E	B	E	B	E	B	35	E	B	24	B	B	B	B	B	B	B	B	B	B	E	B	30	29	22	22	18	18	24	24	24	24		
29	31	29	30	23	25	71	30	23	E	B	31	30	34	34	41	34	31	29	26	26	22	18	18	18	30	30	30	30	30	30	30			
30	35	51	40	45	32	32	38	60	51	B	B	B	B	B	B	B	B	B	B	B	E	B	28	22	28	28	21	E	B	E	B	B		
31	B	B	29	24	22	E	B	21	20	28	E	B	E	B	B	B	B	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	17	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23										
CNT	24	27	29	30	29	28	30	30	31	29	28	27	26	26	27	26	27	30	30	31	31	31	30	28										
MED	30	28	29	24	30	24	28	28	29	30	30	32	32	31	31	29	26	24	22	17	E	B	E	B	E	B	E	B	E	B	E	B	17	
U Q	34	37	33	32	34	35	34	29	30	32	32	33	35	32	32	31	30	28	24	23	E	B	20	18	20	30								
L Q	E	B	E	B	E	B	E	B	20	16	24	24	27	28	29	28	G	30	28	28	26	25	22	19	15	E	B	E	B	E	B	E	B	12

OCT. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	13	14	14	13	13	19	13	20	13	14	11	13	12	12	12	12	12	21	17	16	13	14	12	12
2	B	18	12	18	12	13	11	12	14	20	20	20	18	14	14	19	14	18	22	20	20	12	12	12
3	B	B	B	16	14	15	12	13	12	12	11	12	13	13	12	12	12	12	12	12	11	12	12	12
4	16	18	B	25	16	12	13	12	12	13	12	17	15	13	12	12	12	12	12	11	12	13	12	12
5	11	12	12	13	18	13	12	12	13	12	12	15	12	13	14	12	13	12	12	14	12	12	12	B
6	B	B	12	20	17	13	12	13	16	30	16	13	13	13	14	12	13	13	12	14	12	12	12	12
7	B	B	15	18	19	13	12	12	12	14	12	12	13	12	14	14	13	12	12	12	13	12	11	18
8	B	20	14	13	12	12	12	12	12	12	14	14	12	14	12	12	13	12	12	12	12	13	12	B
9	11	12	12	12	16	12	13	14	20	13	13	13	15	21	19	17	15	13	12	12	11	13	11	12
10	12	11	11	14	12	12	12	12	12	13	12	14	12	12	13	12	12	13	14	12	12	12	12	12
11	12	12	12	12	12	12	12	12	12	12	12	B	41	15	13	14	14	12	14	13	14	13	12	11
12	12	11	12	14	12	12	12	12	11	11	12	19	12	12	13	16	12	11	12	12	13	12	12	12
13	12	12	12	12	12	13	12	12	12	13	12	12	14	12	14	13	12	14	14	12	12	12	12	14
14	12	12	12	12	14	12	12	12	12	11	12	12	15	12	13	13	12	12	11	12	13	12	12	12
15	13	12	12	12	13	12	12	12	13	12	14	32	20	16	14	14	13	12	11	12	12	12	12	12
16	14	13	12	13	14	B	20	15	14	20	17	14	12	12	13	13	12	12	12	12	12	12	13	12
17	14	13	12	12	13	12	12	17	19	14	15	21	14	15	14	14	13	18	20	15	16	13	12	13
18	12	12	12	12	14	12	12	24	15	14	14	13	14	18	18	17	12	13	12	12	13	13	13	12
19	13	13	12	13	14	12	13	12	12	13	15	14	C	C	C	C	12	13	12	12	13	12	12	12
20	12	12	13	14	B	12	12	12	13	12	12	12	13	14	13	14	13	13	12	11	12	13	13	12
21	12	12	12	12	12	12	12	12	12	14	13	13	12	15	13	12	12	11	13	11	12	12	12	12
22	12	12	12	13	12	B	18	13	14	B	26	17	19	15	22	B	B	B	B	30	26	17	15	11
23	13	25	17	16	22	29	23	29	20	20	20	15	14	B	B	B	B	25	18	14	14	13	12	12
24	12	12	13	25	20	15	13	13	12	14	12	13	15	15	14	15	19	15	23	20	20	12	12	13
25	B	13	13	B	B	B	17	14	14	14	21	21	B	30	23	18	18	23	12	15	12	12	14	14
26	12	12	12	13	13	13	14	12	14	16	B	B	B	B	28	29	29	19	12	12	12	12	12	12
27	12	11	13	14	14	14	12	14	14	13	14	14	23	22	23	19	20	19	24	14	18	23	12	12
28	13	13	12	12	12	24	B	B	25	20	21	B	B	B	B	B	B	30	16	22	19	15	12	12
29	224	12	12	14	13	12	25	19	31	27	20	21	29	29	22	19	14	14	12	12	15	11	14	12
30	12	14	16	13	28	16	16	30	20	B	B	B	B	B	B	B	B	28	20	28	28	21	B	B
31	B	B	12	13	16	21	13	13	27	26	B	24	22	19	19	19	16	29	24	23	23	16	14	17
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	30	30	30	30	31	31	31	31	31	31	31	31
MED	13	12	12	13	14	13	12	13	13	14	14	14	14	15	14	14	13	13	12	12	13	12	12	12
U Q	224	18	13	16	17	16	14	15	16	20	20	21	22	21	22	19	18	19	18	15	16	13	13	13
L Q	12	12	12	12	12	12	12	12	12	12	12	13	13	13	13	12	12	12	12	12	12	12	12	12

OCT. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D	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		214	210	210	234	212	214	198	198	204	204	216	216	226	E	B	E	B	Y
2	B	Y	290	A	A	A	A	204	194	198	180	200	210	188	196	196	200	214	204	208	228	216	Q	192	E	B	
3	B	B	E	B	E	B	Q	200	196	192	200	196	184	198	196	212	208	202	194	200	184	206	E	B	E	B	
4	E	B	E	B	B	B	330	240	240	198	200	194	228	202	200	200	208	212	218	214	202	214	208	E	B	E	B
5	A	A	242	E	A	E	A	E	A	232	208	218	216	200	210	210	200	200	202	222	212	212	194	218	210	E	B
6	B	B	A	A	A	A	220	210	220	210	232	190	206	198	214	194	194	202	210	190	202	192	206	212	E	A	
7	B	B	294	E	B	E	B	222	206	206	208	216	214	196	208	208	214	224	204	220	206	196	220	206	A	A	
8	B	A	A	A	A	A	224	208	188	200	200	220	204	218	206	170	200	214	200	200	200	200	200	200	232	B	
9	A	A	A	E	B	E	B	282	216	216	216	224	220	216	206	194	210	216	218	202	214	212	212	206	212	294	
10	A	A	A	A	A	A	226	222	196	192	204	204	194	206	206	194	194	236	216	216	198	216	216	238	252		
11	E	B	A	E	B	B	E	A	E	A		B	B	200	214	198	206	202	224	218	222	230	E	A	E	A	
12	A	A	232	232	230	230	200	206	194	194	186	186	206	222	210	190	198	194	210	206	202	218	224	224	E	B	
13	234	E	B	A	A	A	E	A	266	220	214	200	204	202	196	212	210	196	208	208	212	212	210	226	232	272	
14	A	228	270	266	266	222	212	196	196	196	196	196	214	206	206	198	210	210	206	206	220	212	226	242	A		
15	264	260	260	256	244	238	224	198	216	216	200	206	206	206	196	196	204	218	210	210	210	214	204		Q		
16	A	A	A	A	A	B	A	216	198	206	192	194	194	194	198	200	198	198	220	212	218	224	216	232	Q		
17	Q	Q	234	246	248	222	222	216	208	194	200	178	196	200	202	202	212	206	202	182	208	206	218	226			
18	228	240	240	248	238	216	206	200	208	216	212	194	194	194	194	200	214	210	206	210	204	216	228	228			
19	240	264	E	B	E	B	B	232	208	214	216	202	194	204		C	C	C	C	206	196	210	210	202	206	210	228
20	236	244	258	258	B	E	A	270	210	204	196	196	190	198	198	198	196	196	200	212	220	208	214	216	214	226	
21	232	228	236	246	234	230	216	206	206	202	202	202	202	202	198	206	190	186	206	206	206	206	208	224	226		
22	226	226	250	266	A	A	A	A	210			214	214	224	202						254	250	262				
23	A	A	A	228	A	A	A	A	A	A	184	204	238		B	B	B	B			238	248	248	222	260	266	294
24	A	A	A	A	E	A	A	A	318	202	202	202	196	176	206	206	210	212	234	226	226	226	232	218	344	220	
25	B	E	A	A	B	B	B	A	A	198	192	200	210		B	B	B	B			218	214	202	202	202	212	228
26	266	316	288	286	280	240	222	210	202	202		B	B	B	B	202	202	220	216	212	214	210	234	276	294		
27	A	A	A	A	A	E	A	284	240	210	196	196	200	194	194	204	228	202	210	216	212	208	218	238	228	246	
28	E	B	264	264	264	234	258	Q	E	B	B	B	B	B	B	B	B	B			212	232	230	220	220	240	232
29	256	E	A	E	A	A	A	270	228	A	200	218	196	226	222	A	206	198	208	192	202	188	220	208	208	236	270
30	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B			222	230	250	274	244	B	B
31	B	B	E	A	250	294	306	240	196	194	220	196	B	204	192	198	204	204	200	210	214	226	226	216	248	266	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
CNT	14	14	18	16	16	23	21	25	29	28	27	27	24	26	27	26	27	30	30	31	31	31	28	23			
MED	239	244	256	254	254	227	214	206	202	200	200	202	204	206	202	200	206	210	212	210	216	216	228	240			
U Q	266	296	290	282	305	264	228	215	214	208	212	206	210	210	210	204	212	216	216	220	222	230	259	266			
L Q	232	240	242	246	236	222	208	199	196	196	192	194	195	198	196	196	200	202	206	202	206	208	221	228			

OCT. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2009 f_{XI} (0.1MHz)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4' S LON. 039°35.4' E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	O X 29	A X 34	X R 42	X X 47	X X 52	X X 54	X X 54	X X 54	O X 54	R	R O 54	X O 55	X R 54	R O 54	X O 54	X X 54	X X 51	X X 50	X X 47	X X 46	X X 46	X X 43	X X 41	
2	X X 44	X X 45	X X 46	X X 43	X X 46	53	50	48	50	51	R O 51	X O 54	R	B O 54	X X 54	R O 54	X O 50	X O 48	X O 47	X X 47	X X 48	X X 49	X X 43	
3	X X 41	X X 41	X X 38	X X 46	50	B	B	B	R	R	R	R	R	R	R	B O 49	X O 51	X O 51	B O 46	X O 45	X X 43	X X 39	X X 40	
4	X X 40	X X 33	X X 33	X X 34	X X 42	X X 47	X X 52	X X 56	X X 56	56	R O 56	X X 58	R	X O 58	X O 55	X O 54	X O 51	X X 49	X X 50	X X 44	X X 45	X X 42	X X 40	
5	X X 41	X X 41	X X 45	X X 48	X O 49	X X 55	X X 57	X X 57	X X 62	R	B	B	B	R	R	R	R O 53	X X 50	X X 46	X X 43	X X 41	X X 46	X X 46	
6	X X 46	X X 46	X X 47	X X 47	X X 50	X X 56	X X 58	X X 58	X X 60	X X 59	65	64	69	R	X X 60	X O 57	X O 53	X O 53	X X 49	X X 48	X X 46	X X 43	X X 42	
7	X X 40	X X 40	X X 41	X X 46	X X 49	X O 53	X X 55	X O 57	X X 57	R	R	X O 57	X X 58	X X 62	X X 59	R O 53	X O 50	X X 50	X X 48	X X 44	X X 42	X X 40	X X 39	
8	X X 40	X O 36	X X 46	X X 45	X X 46	58	64	57	58	58	X O 57	X X 59	X X 60	X X 64	X X 65	X O 70	X O 57	X X 49	B	R	A	R	R	
9	O X 38	A	R	X 44	A	R	X 44	X 48	X 45	X 48	O X 56	O X 56	R	R O 56	X O 51	X O 48	R	B O 47	X O 46	X O 46	X X 41	X X 39	X X 39	
10	X X 36	X X 34	X X 33	R	X X 44	X X 46	X X 52	X X 52	X O 53	X O 53	R	R	R O 54	X R	R	R O 52	X O 50	X O 50	X X 45	X X 45	X X 44	X X 45	X X 44	
11	X X 34	X X 35	X X 42	X X 42	A	R O 46	X O 48	X X 57	X X 57	X X 57	R O 57	X R	R	R	X X 59	X X 59	X X 59	X X 56	X X 53	X X 49	X X 48	X X 45	X X 42	
12	X X 43	X X 44	X X 50	X X 52	X X 52	63	67	68	65	61	R	R	R	X X 59	X X 59	X X 59	X X 56	X X 53	X X 49	X X 48	X X 47	X X 45	X X 45	
13	X X 42	X X 41	X X 52	X X 52	66	69	71	73	74	69	65	60	58	57	57	59	55	55	50	48	46	44	41	43
14	X X 31	X X 34	X X 42	X X 50	X X 50	X X 59	X X 64	X X 64	X X 60	X X 60	X X 67	X X 72	X X 74	X X 74	X X 60	X X 57	X X 50	X X 52	X X 48	X X 46	X X 43	X X 39	X X 38	
15	A	A	40	A	A	A	A	A	A	A	R O 50	X O 51	X O 54	X O 54	X O 52	R	X X 50	X X 48	X X 41	X O 38	A	X X 38	X X 43	
16	X X 36	X X 38	X X 41	X X 43	X X 50	X X 50	X X 54	X X 58	R	R	X X 56	X X 56	X X 57	X X 56	X X 56	X X 53	X X 52	X X 51	X X 50	X X 48	X X 46	X X 44	X X 36	X X 34
17	X X 40	X X 38	X X 44	X X 44	X X 49	X X 53	X X 67	X X 71	X X 70	X X 66	X X 62	X X 56	X X 56	X X 57	X X 56	X O 53	X X 53	X X 50	X X 51	X X 49	X X 48	X X 49	X X 49	X X 51
18	X X 51	X X 52	X X 52	X X 52	X X 61	X X 67	X X 70	X X 69	X X 70	X X 71	X O 65	X O 69	X O 70	X O 71	X X 66	X X 57	X X 56	X O 54	X O 52	X X 48	X X 48	X X 47	X X 48	
19	X X 51	X X 58	X X 45	X X 51	X X 62	X X 71	X X 70	X X 70	X X 67	B O 70	X O 71	X X 72	X X 64	X X 61	X X 56	X X 57	X O 54	X O 53	X X 51	X X 50	X X 48	X X 49	X X 47	
20	X X 49	X X 89	A	A	X X 53	X O 60	X X 61	X X 62	X X 63	R O 64	X X 61	X X 59	R	X X 56	X X 56	X X 54	X X 52	X X 49	X X 50	X X 46	X X 51	X X 51	X X 51	
21	X X 47	X X 46	X X 47	X X 47	B	A	A	X X 52	X X 54	X X 56	X X 56	R	R	R	R	R O 45	X X 38	X X 52	X X 47	X X 49	X X 49	X X 50	X X 50	
22	X X 44	R O 44	X X 45	B	R	R O 48	X X 52	X X 55	X X 56	X X 58	X X 58	R	R	R O 53	X O 52	X O 52	X O 52	X X 44	B	X X 41	X X 39	X X 41	X X 39	
23	X X 40	X X 43	X X 45	X X 48	X X 50	X X 53	X X 53	X X 58	X X 65	X X 60	X O 60	X X 62	X X 60	X X 59	X X 60	X X 56	X X 47	X X 48	X X 50	X X 48	X X 48	X X 50	X X 49	X X 51
24	X X 49	X X 44	X X 44	X X 52	X X 56	X X 62	X X 57	X X 67	X X 70	X X 74	X X 72	X X 65	X O 62	X X 64	X X 59	X X 58	X X 56	X X 64	X X 56	X X 49	X X 50	X X 40	X X 40	
25	B	A	A	A	R	B	R	B	R	R O 55	X O 55	B	B	B	B	B	B	B O 52	X O 50	X O 51	X X 48	X X 47	X X 42	
26	X X 42	R O 42	X X 43	R	R O 50	X O 54	X X 60	X X 63	X X 62	X X 62	X X 64	B O 64	X X 67	X X 69	X X 68	X X 68	X X 51	X O 46	R	R	R	R	R	
27	B	B	R O 46	X O 49	X O 72	X O 51	X O 53	X O 54	X O 54	X O 55	X O 57	R O 58	X R	R O 57	R	X O 58	X O 53	X X 53	X X 47	X X 45	X X 46	X X 46	X X 46	
28	X X 46	X X 50	X X 53	X X 52	X X 59	X X 59	X X 65	X X 68	X X 68	X X 66	X X 66	X X 65	B O 64	X X 64	A	A	X O 58	X O 53	X O 53	X X 52	X X 48	X X 47	X X 44	
29	X X 37	X X 39	X X 42	X X 46	X X 47	X X 58	X X 63	X X 63	X X 64	X X 64	X O 64	X X 64	R	R	B	R	X X 58	X X 58	X X 51	X X 49	X X 46	X X 46	X X 47	X X 47
30	X X 48	X X 48	X X 48	X X 50	X X 54	X X 64	X X 71	X X 75	X X 74	X X 70	X O 67	X X 69	X O 64	X X 65	X X 62	X X 60	X O 59	X X 55	R O 48	X O 46	X X 46	X X 44	X X 40	X X 40
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	23	26	23	23	22	26	27	26	21	21	20	17	18	18	22	23	28	28	29	27	25	28	25
MED	X 41	X 41	X 44	X 47	X 50	X 57	X 57	X 58	X 62	X 60	X 62	X 59	X 60	X 59	X 60	X 56	X 54	X 52	X 50	X 48	X 46	X 46	X 44	X 43
U Q	46	46	47	51	54	63	65	68	67	66	65	65	66	64	62	59	57	56	52	49	48	48	47	47
L Q	X 38	X 38	X 41	X 44	X 47	X 53	X 52	X 53	X 55	X 56	X 56	X 56	X 56	X 57	X 56	X 54	X 52	X 50	X 50	X 46	X 45	X 44	X 40	X 40

NOV. 2009 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	R 23	A J 28	R J 28	R J 36	R 41	46	48	48	R	R	R	R	R	R	R	R	R	48	45	44	41	40	40	37	35			
2	F 34	F 39	F 37	F 37	V 40	F 41	B 44	B 42	B 44	R	R	R	R	R	R	B	R	R	44	42	41	41	42	40	F 32			
3	F 32	F 28	F 32	F 35	F 41					R	R	R	R	R	R	R	B	R	R	B	R	R	33	34				
4	F 23	F 23	F 23	F 28	36	41	46	50	50	50	R	R	R	R	R	R	R	R	43	45	40	39	37	36	34			
5	35	35	39	42	43	49	51	J 51	R 56	R	B	B	B	R	R	R	R	R	47	44	40	37	35	40	40			
6	40	40	41	41	44	50	52	J 52	R 54	J 53	R	R	R	R	R	R	R	R	47	47	43	42	40	37	36			
7	34	34	35	40	43	47	49	51	51	R	R	R	R	R	J 56	R 53	R	R	47	44	44	42	38	36	34	33		
8	34	30	R 40	F 26	40	Z 52	F 54	F 51	J 52	R 52	R	R	R	J 54	R 58	R	R	64	51	43	B	R	A	R	A			
9	R 32	A	A	38	A	R	38	42	39	42	50	R	R	R	R	R	R	R	41	40	40	35	33	33	F 34			
10	30	28	27	A	38	40	46	46	47	47	R	R	R	R	R	R	R	46	44	44	39	39	38	39	F 34			
11	F 18	F 17	F 28	F 27	A	A	R	40	42	51	51	51	R	R	R	R	R	49	48	47	46	44	42	39	38	36	36	
12	F 32	F 34	F 37	F 42	46	57	F 56	F 57	59	55	R	R	R	R	J 53	R 53	R	50	47	43	42	41	39	39	A			
13	36	35	38	46	55	55	58	60	63	56	59	J 54	R	52	51	51	J 53	R	49	49	44	42	40	38	35	24	F 24	
14	F 21	F 28	F 24	F 30	44	R	53	F 54	F 58	F 54	54	54	61	66	68	68	J 54	R	51	44	46	42	40	31	33	24	F 24	
15	A	A	F 25	A	A	A	A	A	A	A	R	R	R	R	R	R	44	45	48	48	R	R	A	32	37	F 37		
16	30	32	35	30	F 40	F 44	J 48	R 52	R	R	50	A	A	A	A	A	47	46	45	44	42	40	38	26	F 25			
17	F 27	F 32	F 35	F 36	F 37	F 47	F 56	F 60	64	60	56	50	50	51	50	R	R	47	47	44	45	43	42	43	39	F 39		
18	F 38	F 38	F 43	F 42	F 51	F 57	F 58	F 59	64	65	59	63	64	65	R	R	R	J 60	R 51	R	R	42	42	41	37	F 37		
19	F 38	F 37	F 39	F 39	F 50	F 57	F 57	F 57	F 58	B	R	R	R	R	R	J 55	J 50	J 51	R	48	47	45	44	42	40	41	F 41	
20	F 38	A	A	A	47	54	55	56	57	R	J 58	R	R	R	R	R	R	R	J 50	J 50	R	R	44	40	41	39	F 39	
21	F 32	F 36	F 34	41	B	A	A	46	48	50	50	R	R	R	R	R	R	R	39	32	46	41	43	43	44	R		
22	38	A	39	B	R	R	R	42	46	49	50	52	52	R	R	R	R	47	46	46	46	38	B	B	35	33	F 33	
23	34	37	39	42	43	47	47	52	59	54	54	56	54	J 53	J 54	R	R	50	41	J 42	44	42	42	44	43	38	F 38	
24	F 39	F 38	F 34	F 46	50	56	51	F 56	64	68	66	59	56	58	53	J 52	R	50	58	50	43	44	A	34	A			
25	B	A	A	A	A	B	R	B	R	R	R	R	R	B	B	B	B	B	B	B	R	R	R	R	R	41	36	F 36
26	F 29	A	37	A	R	R	44	48	54	57	56	56	58	B	R	58	61	63	62	62	45	40	R	R	A	A	F 36	
27	B	B	R	R	40	43	Y 45	R 47	R 48	R 48	R 49	R 51	R	R	R	R	R	R	51	R	52	47	47	41	39	40	40	
28	40	44	47	46	53	53	59	62	62	60	60	59	B	R	58	58	R	A	A	52	47	47	46	42	41	38	R	
29	31	33	36	40	41	52	57	57	58	58	58	R	R	R	B	R	R	52	52	45	43	40	40	40	41	41	R	
30	42	F 41	F 33	44	48	58	65	69	68	64	61	63	58	59	56	J 54	J 53	R	R	R	R	42	40	40	J 38	44	R	
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	27	22	26	23	23	21	26	27	26	21	21	20	17	18	18	22	23	28	28	29	27	25	28	25				
MED	34	34	36	40	43	50	51	52	56	54	56	53	53	54	53	50	48	46	44	42	40	40	38	36				
U Q	F 38	F 38	F 39	F 42	48	56	F 56	F 57	59	59	59	59	60	58	56	53	51	50	46	43	42	42	40	39	F 39			
L Q	F 30	F 30	F 32	F 35	40	44	46	47	49	50	50	50	50	51	50	48	46	44	44	40	39	38	34	33	F 33			

NOV. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2009 ftEs (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	30	34	34	26	39	42	35	35	27	31	22	30	30	34	30	34	31	30	21	20	16	15	E	B	E	B						
2	E	B	E	B	16	15	19	22	31	24	30	32	32	31	30	B	25	E	B	24	E	B	23	17	15	E	B	E	B			
3	E	B	E	B	E	B	13	15	B	B	B	25	27	29	30	36	36	28	B	E	B	B	E	B	E	B	E	B	E	B		
4	E	B	E	B	E	B	16	17	22	22	23	25	30	30	32	39	38	46	41	32	27	24	27	17	14	E	B	E	B	E	B	
5	E	B	E	B	E	B	31	24	24	28	25	G	E	B	B	B	28	30	26	30	22	28	20	26	22	E	B	E	B	E	B	
6	E	B	E	B	E	B	14	16	28	28	30	33	37	32	32	38	38	35	32	32	29	G	17	24	24	22	E	B	E	B	E	B
7	E	B	E	B	E	B	14	22	25	30	30	31	31	32	33	44	34	35	31	30	31	28	24	23	21	16	K	19	19	19		
8	E	B	E	B	E	B	30	29	31	25	27	30	30	32	32	32	30	29	35	32	E	B	26	26	26	36	42	34	40	40		
9	40	36	33	37	43	41	42	32	33	28	42	34	33	30	E	B	29	29	29	B	36	34	45	41	42	52	52	52	52			
10	70	43	34	41	39	30	30	30	30	30	31	42	32	42	32	24	30	26	23	23	22	17	34	E	B	12	12	12	12			
11	31	28	21	25	42	39	32	28	G	29	31	32	35	33	32	30	33	34	33	29	29	19	16	31	19	19	19	19	19			
12	40	25	22	16	26	30	28	20	G	27	29	32	32	31	32	41	45	37	40	26	31	E	B	22	24	30	54	54	54			
13	30	30	34	33	28	30	30	30	30	36	34	32	40	34	34	41	39	34	40	37	32	30	22	E	B	12	12	12	12			
14	23	32	22	31	43	39	20	G	G	33	28	34	36	36	31	30	G	25	25	G	18	20	28	34	31	29	29	29	29			
15	44	44	38	55	51	42	48	52	43	44	31	32	32	31	32	27	25	18	G	22	32	24	39	34	32	32	32	32	32			
16	34	35	33	25	27	29	28	26	31	32	32	46	59	62	68	38	33	32	21	21	20	27	26	22	22	22	22	22	22			
17	31	52	32	26	19	E	B	24	32	32	32	34	33	27	38	37	39	42	26	30	32	24	30	31	38	25	25	25	25			
18	52	48	38	46	30	29	33	42	44	40	32	41	42	38	58	39	41	35	35	24	20	21	39	52	52	52	52	52	52			
19	48	32	34	33	59	81	28	36	31	B	E	B	55	33	33	38	31	32	31	33	34	26	58	43	42	35	35	35	35			
20	32	71	48	52	35	28	28	29	32	32	33	47	48	31	35	32	44	38	36	28	24	29	22	22	22	22	22	22	22			
21	E	B	E	B	B	36	44	37	30	31	28	33	40	36	41	31	23	24	26	26	38	40	28	41	41	41	41	41	41			
22	39	41	33	B	36	36	26	24	30	24	21	27	26	G	G	G	22	24	22	30	B	B	20	17	17	17	17	17	17			
23	22	29	28	26	26	23	28	28	31	30	32	39	47	27	41	36	28	29	26	50	30	40	26	16	16	16	16	16	16			
24	16	16	24	32	32	31	32	31	31	32	32	30	44	102	67	37	31	26	26	24	33	44	34	40	40	40	40	40	40			
25	B	57	43	39	40	B	40	B	33	31	G	G	25	B	B	B	B	B	B	27	34	30	20	30	39	39	39	39	39			
26	30	35	35	37	32	27	G	G	G	19	19	26	27	32	B	38	50	59	65	28	E	B	21	36	31	35	37	41	41			
27	B	B	33	30	37	35	30	40	34	33	26	34	28	32	32	38	43	27	25	30	19	18	18	16	16	16	16	16	16			
28	E	B	14	16	16	27	42	44	36	31	29	24	34	B	38	62	63	67	38	39	31	27	19	25	16	16	16	16	16	16		
29	24	24	24	24	24	20	25	28	31	45	60	34	42	B	32	42	41	38	35	30	20	26	29	29	29	29	29	29	29	29		
30	35	69	44	51	35	64	42	49	48	30	30	38	43	50	40	41	22	22	E	B	E	B	23	24	28	15	15	15	15			
31																																
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	28	29	30	29	29	28	29	28	30	29	29	29	26	28	28	28	29	28	29	29	29	29	29	30	30							
MED	30	30	31	30	31	30	30	30	31	31	32	33	37	34	35	34	31	28	26	26	24	24	28	20								
U Q	37	42	34	38	39	39	34	36	33	32	32	36	42	38	41	41	38	33	33	31	30	37	34	39								
L Q	E	B	E	B	E	B	20	24	25	28	27	29	30	28	32	32	31	30	30	26	24	22	24	20	18	E	B	E	B	E	B	

NOV. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2009 fmin (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	12	12	14	20	22	13	12	12	12	13	20	17	18	26	14	13	12	14	12	12	12	12	12	12	
2	12	12	14	12	13	12	13	12	15	14	13	14	18	25	B	20	28	20	24	17	12	11	12	12	
3	12	12	12	13	11	B	B	B	19	14	13	19	20	19	25	B	27	18	B	22	19	12	12	12	
4	12	13	15	12	12	12	11	14	16	17	16	15	16	18	15	11	13	13	12	12	12	11	12	13	
5	12	12	12	18	12	12	12	12	16	32	B	B	B	21	15	14	12	12	12	12	13	12	12	12	
6	12	12	13	14	12	12	12	12	13	13	14	13	13	12	12	14	13	12	13	12	13	12	14	12	
7	13	12	12	14	12	13	12	13	12	13	14	13	14	14	13	12	12	11	12	12	12	12	11	12	
8	12	14	13	12	12	12	12	12	12	13	12	14	14	14	14	12	20	26	12	B	18	12	14	14	
9	12	27	18	12	12	22	12	12	13	14	18	28	12	22	29	24	20	B	20	13	12	13	13	13	
10	12	12	14	13	12	13	12	12	11	12	13	12	12	14	14	15	14	13	12	14	13	12	12	12	
11	12	12	13	12	13	13	13	12	12	12	13	12	14	14	14	14	14	13	13	13	13	13	13	12	
12	12	13	13	12	12	12	12	12	14	15	15	20	16	15	14	13	14	14	14	14	23	14	14	13	
13	12	12	13	12	11	12	12	13	12	12	13	13	15	16	12	13	14	14	12	12	12	14	12	12	
14	12	12	12	11	12	16	12	13	13	13	14	12	14	18	14	13	16	15	12	13	13	12	12	12	
15	14	13	13	18	13	12	12	18	19	13	17	16	13	12	14	15	16	12	13	12	14	13	11	12	
16	12	12	11	12	12	12	12	12	12	12	13	12	13	14	13	13	12	14	12	11	12	13	11	11	
17	12	12	12	12	12	24	13	12	12	15	13	12	13	11	13	13	12	13	15	12	12	12	12	12	
18	13	14	12	12	12	12	12	12	12	14	13	15	15	33	26	14	14	15	17	19	15	14	14	12	
19	12	13	13	12	13	12	12	14	12	B	55	19	15	13	14	14	14	14	14	15	18	14	13	12	
20	12	16	12	12	13	12	12	14	14	13	12	13	13	15	13	13	12	13	12	13	11	13	12	12	
21	13	14	14	16	B	13	12	13	13	13	12	12	18	21	16	18	19	20	17	12	13	13	13	13	
22	14	19	14	B	24	16	14	15	13	14	14	15	14	14	18	15	16	12	14	12	B	B	13	12	
23	12	12	12	12	13	14	12	13	12	12	12	12	13	12	15	13	14	16	19	13	15	14	12	12	
24	12	11	11	14	12	12	13	12	13	13	14	13	13	13	14	12	12	14	14	14	12	13	12	20	
25	B	14	19	24	21	B	26	B	20	20	21	20	B	B	B	B	B	B	B	24	23	13	18	21	13
26	14	16	14	20	19	19	14	14	14	14	16	21	B	20	31	30	19	13	21	13	25	13	23	23	
27	B	B	20	21	13	15	19	12	13	14	12	20	19	16	19	16	22	18	20	15	13	12	12	11	
28	15	12	12	12	12	12	14	12	13	15	13	24	B	23	26	25	18	19	16	12	12	12	13	12	
29	12	13	12	12	13	14	13	13	14	16	14	16	31	B	18	13	12	12	13	12	12	13	13	12	
30	12	12	12	12	12	13	13	12	13	13	13	14	14	15	13	13	14	15	26	24	14	16	14	12	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
MED	12	12	13	12	12	13	12	12	13	14	14	14	14	16	14	14	14	14	14	13	13	13	12	12	
U Q	13	14	14	16	13	15	13	14	14	15	16	19	18	21	19	16	19	18	19	15	15	14	13	13	
L Q	12	12	12	12	12	12	12	12	12	13	13	13	13	14	14	13	12	13	12	12	12	12	12	12	

NOV. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2009 h'F (KM)

45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

D	H	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		196	A	A	A	A	242	A	216	192	180	210	204	204	A	210	198	194	204	210	210	204	206	212	214
2		242	242	258	250	218	218	218	198	198	194	210	204	204	228	B	204	204	210	210	220	220	228	212	212
3		224	234	244	246	218	B	B	B	186	198	202	202	236	A	A	A	B	200	206	B	228	216	212	222
4		222	226	272	260	224	210	202	202	202	196	208	200	224	218	212	200	206	202	202	214	210	220	220	220
5		220	242	230	244	212	216	210	210	218	216	B	B	B	A	192	208	208	212	212	210	214	214	222	212
6		214	216	230	244	226	232	212	198	216	214	212	212	192	198	176	196	196	196	196	196	210	210	198	200
7		220	240	244	214	218	218	214	200	192	214	208	192	A	200	208	188	180	194	188	198	204	214	218	232
8		224	234	E A	E A	E A	212	212	190	188	188	208	198	202	198	210	206	214	220	202	B	A	A	A	A
9		240	A	A	226	A	A	248	208	200	212	208	A	206	190	234	234	214	B	234	280	246	236	238	256
10		244	252	A	A	246	218	206	192	200	200	176	A	190	200	208	208	202	204	204	198	208	218	230	222
11		262	310	274	256	A	A	244	196	188	196	192	212	204	210	214	214	206	206	204	204	218	210	228	228
12		250	238	242	242	214	212	210	194	188	216	222	202	200	200	206	E A	254	228	202	200	218	202	226	230
13		236	266	250	320	220	212	190	194	210	200	212	196	226	204	198	206	206	200	210	218	214	208	244	238
14		272	A	266	256	256	E A	242	212	186	190	198	198	202	200	200	200	200	200	196	206	224	264	266	248
15		A	A	266	A	A	A	A	A	A	A	194	198	202	202	210	202	202	206	202	226	246	A	A	A
16		A	A	A	E A	A	236	218	198	200	196	196	210	A	A	A	A	210	202	196	196	196	222	218	234
17		228	262	E A	E A	E A	218	250	202	186	190	194	198	202	226	212	208	190	190	222	196	206	220	226	214
18		240	244	270	240	230	208	208	A	A	204	194	212	A	A	A	200	200	210	230	202	194	222	234	228
19		238	256	A	240	222	198	198	190	200	B	B	206	220	198	198	204	226	196	196	216	220	216	224	228
20		256	A	A	A	E A	A	302	210	214	200	196	196	206	A	206	196	196	208	206	206	198	198	206	224
21		236	250	254	220	B	A	A	220	208	182	182	226	A	210	208	194	Y E A	210	218	214	220	230	232	230
22		214	A	222	B	A	A	232	202	188	198	192	196	198	182	194	188	188	188	206	206	B	B	234	236
23		236	220	252	232	226	208	208	198	190	192	222	224	210	206	198	202	202	202	202	236	208	236	222	226
24		234	228	226	214	232	202	196	202	196	204	204	200	210	A	204	212	202	196	200	202	202	A	288	A
25		B	A	A	A	A	B	A	B	A	A	200	196	B	B	B	B	B	B	B	242	242	242	230	232
26		256	A	226	A	A	A	238	208	198	198	182	196	A	B	A	A	A	190	200	198	A	A	198	A
27		B	B	A	A	232	232	A	200	186	186	194	210	200	230	206	190	246	194	202	206	206	216	222	226
28		222	234	228	210	202	218	A	196	196	196	192	208	B	A	A	A	A	208	246	A	208	202	202	218
29		234	250	254	214	214	204	204	190	202	212	A	202	A	B	206	224	224	212	200	194	200	206	212	218
30		226	228	244	216	216	216	202	202	A	192	176	218	190	A	202	196	196	196	190	200	220	226	234	230
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		26	20	22	21	22	23	23	26	26	27	27	24	20	20	23	26	26	28	29	29	27	25	28	25
MED		235	240	248	237	221	216	208	198	196	196	202	203	203	203	206	202	202	202	202	206	210	218	225	228
U Q		242	251	266	256	232	232	214	202	200	204	210	211	210	212	210	208	208	207	211	218	220	227	234	234
L Q		222	231	230	218	218	210	202	194	190	192	194	199	200	199	198	196	200	196	200	198	204	210	219	216

NOV. 2009 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2009 f_{XI} (0.1MHz)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	X	56	68	65	69	70	70	68	73	72	66	67	66	65	R	X	R	R	O	X	O	X	X	X	X	
2	X	50	51	53	58	60	71	76	81	74	71	67	68	66	67	69	62	62	56	56	56	52	50	47	47	
3	X	53	60	62	70	71	74	82	83	81	74	65	62	57	59	57	61	66	62	53	54	51	49	48	49	
4	X	46	48	48	50	54	54	69	75	76	69	66	65	59	61	58	56	53	56	54	55	54	47	48	45	
5	X	45	47	50	54	65	70	73	79	80	74	70	64	63	56	R	O	X	X	X	X	X	O	X	71	
6	X	69	52	A	A	X	A	R	R	R	R	R	R	O	X	R	R	O	X	O	X	O	X	X	X	
7	X	47	41	48	51	A	O	X	X	X	X	O	X	R	R	R	R	O	X	X	O	X	X	X	X	
8	X	39	39	39	48	56	52	58	58	57	58	R	O	X	A	R	R	R	O	X	O	X	X	X	X	
9	X	48	50	49	51	52	57	62	65	62	57	56	56	58	57	R	R	O	X	X	X	X	X	X	X	
10	X	56	52	56	56	56	64	70	74	76	68	68	67	65	66	R	R	O	X	O	X	A	X	X	X	
11	X	45	49	46	47	50	54	67	72	72	69	67	R	O	X	O	X	O	X	X	X	X	X	X	X	
12	X	50	52	57	60	58	68	71	73	72	70	66	63	63	63	57	R	R	O	X	X	X	X	X	X	
13	X	46	44	52	55	57	68	70	75	76	74	73	66	63	62	60	62	58	58	59	58	53	45	43	41	
14	A	O	X	O	X	O	X	X	X	X	A	B	R	X	X	X	X	O	X	R	O	X	X	O	X	X
15	X	54	62	60	63	62	64	66	63	63	63	64	66	63	R	R	A	O	X	X	O	X	X	X	X	
16	X	42	42	46	66	O	X	R	R	R	X	X	X	R	O	X	O	X	X	O	X	X	X	X	X	
17	X	40	40	46	52	54	52	51	58	60	64	66	63	66	60	60	59	56	51	51	50	50	56	56	51	
18	X	47	50	57	45	52	56	64	62	64	64	65	65	62	64	62	R	A	X	X	X	X	X	X	X	
19	X	50	50	50	51	52	52	54	59	64	70	57	56	54	58	63	58	A	A	X	X	X	X	X	X	
20	X	45	39	52	52	45	50	55	58	62	62	53	R	A	A	A	X	X	X	X	X	X	X	X	X	
21	X	46	46	49	51	53	54	56	62	67	72	65	64	R	R	R	R	O	X	X	X	X	X	X	X	
22	X	42	43	50	57	64	66	69	68	68	65	63	63	63	A	X	X	O	X	O	X	X	X	X	X	
23	X	41	43	47	48	51	55	63	70	76	76	72	69	67	64	66	56	56	56	56	53	53	50	50	46	
24	X	39	O	X	X	R	R	65	69	69	65	63	68	61	58	57	57	55	55	55	52	53	52	52	56	
25	X	58	58	64	62	58	67	70	81	86	83	80	82	68	66	54	R	O	X	O	X	A	X	X	X	
26	X	39	A	A	O	X	X	X	X	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	
27	X	45	44	43	51	48	55	58	62	69	70	72	70	R	R	O	X	O	X	X	R	X	X	X	X	
28	X	46	45	45	51	56	59	64	65	69	70	66	65	65	64	58	R	O	X	X	A	O	X	X	X	
29	X	60	52	51	51	56	O	X	62	64	66	68	70	71	71	57	55	46	A	O	X	O	X	X	X	
30	X	56	59	65	59	65	71	75	72	72	71	74	70	67	60	59	52	52	49	48	52	52	56	53	52	
31	X	53	57	48	50	57	63	73	81	80	80	70	67	R	O	X	X	X	O	X	X	A	O	X	X	X
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	30	30	29	30	29	28	29	29	29	29	28	26	25	21	21	21	24	27	29	30	31	30	31	31	31	
MED	X	46	48	50	52	56	60	65	68	69	69	66	66	63	63	59	57	54	54	54	54	52	50	49	50	
U Q	53	52	56	58	59	68	70	74	76	72	70	68	66	65	61	60	57	56	56	55	53	52	52	52	52	
L Q	X	45	43	46	50	50	54	57	62	62	64	64	63	58	58	57	54	52	51	51	51	50	48	47	45	

DEC. 2009 f_{XI} (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2009 foF2 (0.1MHz) 45°E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	50	F	F	F	F	F	F	67	66	60	R	R		R	51	R	R	R	R	R	42	42	42	44								
2	44	45	47	52	54	65	70	J	R	J	R	65	61	62	60	61	63	56	J	R	49	50	50	41	41							
3	F	F	F	F	R	R	76	77	75	68	59	56	51	53	J	R	51	55	60	56	47	48	45	43	43							
4	40	42	42	44	48	48	63	69	70	63	60	59	53	55	J	R	J	R	R	J	R	50	48	49	48	41	F	R	R			
5	39	41	44	48	F	A	64	67	73	74	64	64	58	57	50	R	R	J	R	J	R	51	56	51	48	50	45	F	R	R		
6	A	A	A	A	42	A	R	R	R	R	R	R	R	E	G	R	R	R	R	R	R	52	48	48	49	48	44	40	39	39	F	
7	F	F		R	A	R	H	J	R		R	R	R	R	R	A	R	R	R	R	R	45		49	44	44	40	31	28	F		
8	33	33	33	42	F	R	F	52	51	52	R	R	A	R	R	R	R	R	R	R	46	45	44	46	43	44	41	40	F	F		
9	F	F	F	F	J	R	F	J	R	J	R	R	R	R	R	R	R	R	R	R	47	48	50	49	45	45	44	40	F	F		
10	F	F		F	F	F	58	68	70	62	62	61	59	60	R	R	R	R	R	R	45	45	A	50	47	A	44	38	F	F		
11	39	43	40	38	44	48	58	66	66	63	61	R	R	R	R	R	R	R	R	R	J	R	J	R	49	47	50	48	45	F		
12	F	F	F	F	F	F	F	67	66	64	60	57	57	57	51	R	R	R	R	R	R	44	47	51	50	47	44	44	44	44	44	
13	40	34	42	45	51	56	60	69	70	68	67	60	57	56	54	56	52	52	53	52	J	R	J	R	47	39	37	35	F	F		
14	A	R	R	R	J	R	39	46	50	A	B	R	54	57	58	58	60	59	R	R	J	R	J	R	43	44	44	44	42	46	F	
15	48	56	50	57	56	58	60	57	57	57	58	60	57	R	R	R	R	R	R	R	R	51	43	45	47	46	42	41	38	F		
16	35	36	36	42	39	A	R	R	44	50	51	R	R	R	J	R	J	R	R	R	R	48	48	42	45	42	44	41	36	F		
17	34	34	36	42	45	42	41	52	50	58	56	57	60	54	54	J	R	J	R	J	R	50	45	45	44	44	50	50	45	F		
18	41	39	37	39	46	50	54	56	58	58	59	59	56	58	56	R	A	R	R	R	R	51	49	44	44	43	45	44	44	F		
19	44	43	44	45	46	J	R	48	49	54	55	51	50	48	J	R	J	R	A	A	J	R	51	52	49	50	48	40	F			
20	39	33	42	30	33	44	49	52	56	52	47	A	A	A	A	J	R	J	R	R	54	55	52	52	46	43	40	40	39	F		
21	40	40	40	45	47	48	46	56	57	60	56	58	R	R	R	R	R	R	R	R	49	47	47	48	44	41	42	40	F			
22	36	32	44	46	55	55	55	62	58	59	57	57	57	A	53	50	48	48	48	J	R	51	50	49	46	42	42	42	42	F		
23	35	31	41	42	41	49	57	64	66	67	62	63	61	58	60	50	50	50	50	J	R	47	47	44	44	44	40	40	F	F		
24	33	36	41	41	R	R	F	57	59	55	57	62	55	52	51	51	49	49	49	46	47	46	43	44	43	44	44	44	R	F		
25	F	F	F	F	F	F	J	R	80	77	74	76	62	60	R	A	R	R	R	R	A	45	49		47	47	40	40	R	F		
26	33	A	A	40	44	46	48	57	56	60	61	61	60	60	J	R	R	R	R	R	44	44	47	47	42	39	37	37	F			
27	39	38	37	45	42	49	J	R	56	63	64	66	64	R	R	R	R	R	R	R	47	50	42	44	45	40	40	40	F			
28	40	39	39	45	50	53	58	59	63	64	60	59	59	58	J	R	R	R	R	R	46	43	45	43	45	46	49	48	F	F		
29	F	F	F	F	F	U	S	F	F	F	F	F	F	51	R	R	R	R	R	R	A	47	43	43	45	43	43	42	42	F	F	
30	F	F	F	F	F	F	F	F	F	F	F	65	68	64	61	54	53	46	43	42	46	46	50	47	46	46	46	46	R	F		
31	F	F	F	F	51	57	67	J	R	74	74	64	61	R	R	J	R	R	R	A	R	48	48	48	50	48	48	48	46	F	F	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
CNT	29	29	29	30	29	28	29	29	29	29	28	26	25	21	21	21	25	27	29	30	31	30	31	30								
MED	40	40	42	45	47	52	57	59	60	60	60	60	57	57	53	51	48	48	48	48	46	44	43	40								
U Q	43	44	47	50	53	58	62	68	69	64	63	61	60	59	55	54	51	50	50	49	47	46	45	44								
L Q	36	35	39	41	44	47	49	56	56	56	56	57	52	52	51	48	46	45	45	45	44	42	41	39								

DEC. 2009 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2009 ftEs (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	15	^E 14 ^B	16	24	22	^G 18	^G 19	25	36	36	30	31	31	30	30	42	28	^G 24	23	21	38	36	34	28
2	25	14	20	27	27	28	^G 17	30	31	31	33	33	36	31	47	36	40	36	27	40	25	21	34	23
3	18	20	22	26	26	29	26	30	30	30	43	46	74	60	29	31	33	26	^G 21	23	22	32	43	27
4	33	39	58	33	28	35	44	51	32	30	40	62	57	35	30	30	33	57	40	42	34	20	19	28
5	24	35	31	31	30	30	30	28	31	27	34	46	35	43	56	31	30	30	50	24	22	28	35	41
6	49	45	83	52	41	51	33	48	31	31	32	35	37	41	32	41	30	35	29	32	27	25	32	35
7	42	44	88	140	66	40	^G 22	31	34	34	31	33	47	36	48	31	40	44	34	30	25	25	32	31
8	35	34	33	33	27	27	28	31	25	27	32	45	81	46	31	42	37	46	47	92	69	91	67	28
9	42	25	38	37	44	39	33	32	41	36	32	33	43	39	43	39	30	36	40	45	40	36	28	44
10	44	47	42	58	37	42	38	40	37	37	41	43	44	41	46	42	52	40	65	58	36	55	22	33
11	25	28	43	28	29	29	30	31	40	46	38	44	50	48	48	40	39	39	34	40	42	50	44	36
12	27	32	30	31	32	50	74	47	42	44	32	32	35	56	42	30	43	31	34	42	32	23	27	48
13	42	30	29	30	36	30	30	30	30	31	28	34	34	42	57	51	44	45	49	34	31	30	36	37
14	43	47	40	71	48	52	28	29	58	^B	32	40	35	33	40	38	30	30	30	28	22	24	19	17
15	^E 16 ^B	16	22	22	22	31	33	48	71	43	47	50	44	41	40	103	70	38	35	45	37	26	26	20
16	25	30	30	34	59	42	40	42	32	25	32	33	32	33	34	34	36	44	26	26	34	33	23	32
17	34	56	41	28	28	30	27	28	28	32	33	39	34	42	32	27	31	27	25	24	26	37	35	24
18	27	26	44	44	33	28	35	36	32	32	^G 24	38	35	35	40	42	54	43	36	48	33	28	18	24
19	23	25	27	30	58	38	^G 21	31	30	34	32	36	34	42	50	68	90	69	34	34	37	30	42	29
20	24	31	71	65	60	44	61	70	41	32	35	49	58	73	106	72	46	40	32	41	28	30	29	35
21	38	47	37	34	39	30	38	47	30	32	36	34	36	62	61	50	41	28	47	33	38	32	41	40
22	24	24	24	26	37	28	28	32	28	30	32	^G 26	36	59	83	69	31	47	43	45	35	47	31	25
23	32	33	44	38	31	30	30	30	27	32	33	33	33	32	32	32	32	31	31	36	30	27	28	23
24	37	36	38	36	47	48	43	34	34	34	36	36	36	35	32	39	36	32	28	33	23	37	46	51
25	34	25	25	29	35	37	36	36	35	30	30	50	34	41	60	46	40	40	54	58	42	30	24	38
26	38	120	57	44	40	52	41	40	34	33	31	34	32	35	38	60	38	50	36	37	29	21	21	17
27	28	26	25	22	30	30	38	33	33	32	28	35	30	33	36	31	32	87	39	30	23	21	20	19
28	32	36	34	30	31	38	38	43	28	32	38	38	39	41	34	28	37	37	42	52	41	42	44	20
29	24	27	29	29	29	32	30	30	32	32	37	34	38	36	38	47	59	39	28	38	37	38	41	29
30	31	28	35	58	40	40	41	38	32	40	40	39	41	44	47	40	41	34	35	39	40	36	28	44
31	16	24	28	29	27	36	31	50	28	34	36	41	34	34	38	32	46	28	61	35	31	38	40	33
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	31	30	34	31	33	35	33	33	32	32	33	36	36	41	40	40	38	38	35	37	33	30	32	29
U Q	38	39	43	44	41	42	38	43	36	34	37	44	44	44	48	47	44	44	43	45	38	37	41	37
L Q	24	25	27	28	28	30	28	30	30	31	32	33	34	35	32	31	32	31	29	30	26	25	24	24

DEC. 2009 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2009 fmin (0.1MHz) 45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

$\frac{H}{D}$	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	12	14	11	12	15	13	13	13	16	16	16	19	20	20	21	18	18	14	14	13	16	13	12	14
2	12	11	12	12	12	12	13	13	13	13	16	20	19	14	12	13	12	14	12	12	12	12	13	12
3	12	12	12	12	12	13	12	12	14	12	13	12	13	14	13	14	16	13	14	12	12	13	13	12
4	12	11	12	13	12	13	12	13	13	13	14	12	13	12	13	12	13	13	13	12	12	16	12	12
5	12	12	12	12	12	12	12	13	12	14	13	14	12	14	14	15	14	14	12	13	16	13	14	21
6	14	13	13	18	12	14	18	13	13	13	13	13	18	14	12	14	13	13	12	12	12	13	12	12
7	12	12	12	12	12	13	12	12	12	12	12	13	13	13	13	12	13	12	12	12	12	13	12	12
8	12	14	14	13	12	14	12	13	13	14	13	14	14	13	13	13	13	12	14	13	14	13	12	12
9	13	12	13	12	12	12	13	12	12	12	14	13	13	13	12	13	12	12	12	15	12	12	11	14
10	12	12	12	12	12	12	12	12	11	13	12	13	13	13	16	13	13	13	13	12	12	11	12	12
11	11	12	12	11	13	12	13	13	12	13	12	12	12	12	13	15	13	13	11	12	13	12	12	12
12	12	13	14	12	11	12	12	12	14	14	13	13	12	13	13	12	12	14	13	12	12	12	12	12
13	12	11	12	12	12	14	12	12	13	13	14	13	12	14	12	13	13	12	12	12	13	13	12	12
14	14	12	14	15	12	14	13	13	14	B	18	19	16	16	16	13	14	13	15	14	13	18	13	13
15	16	12	12	12	12	13	13	12	12	13	13	15	16	17	12	12	13	12	12	12	12	12	12	12
16	12	12	13	14	13	19	15	14	12	12	12	13	15	12	13	12	14	14	12	13	13	13	15	12
17	14	14	13	12	13	12	13	14	14	12	13	12	13	15	13	14	14	12	13	12	12	12	13	13
18	11	12	12	12	12	12	13	13	13	14	14	13	14	14	14	12	13	13	13	12	14	12	13	12
19	12	12	13	12	13	12	12	13	13	13	12	12	14	14	12	14	13	13	13	12	12	12	15	14
20	13	12	13	14	14	13	12	13	13	15	14	12	14	14	14	13	14	13	12	13	12	12	15	12
21	14	14	13	13	13	12	12	13	14	12	13	14	12	14	13	14	14	12	14	12	12	12	14	13
22	13	13	13	13	13	12	14	13	17	14	13	13	12	12	14	15	13	12	11	13	14	12	11	13
23	12	12	14	13	12	13	12	12	12	14	14	14	13	13	13	14	13	12	12	13	12	12	13	13
24	13	13	13	13	13	14	12	12	12	12	13	16	13	14	13	13	13	12	12	13	13	14	12	14
25	12	12	12	12	12	12	12	13	14	14	15	14	14	13	13	13	13	14	13	12	12	12	13	12
26	12	18	14	14	12	14	13	13	12	19	13	13	14	16	13	13	13	13	14	13	12	12	13	11
27	12	12	13	12	12	12	12	12	13	12	14	18	16	13	13	13	12	12	13	13	12	13	12	12
28	12	12	13	11	13	12	12	13	12	14	14	14	13	14	14	14	14	14	12	12	12	12	11	12
29	12	12	12	12	12	11	12	12	12	12	12	13	12	13	12	12	13	14	14	12	12	12	12	12
30	12	12	13	13	11	12	12	12	12	14	14	13	14	15	14	13	12	12	12	12	12	11	14	12
31	12	12	12	12	12	12	12	11	15	13	13	14	13	13	13	13	12	12	12	14	12	12	13	12
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	12	12	13	12	12	12	12	13	13	13	13	13	13	14	13	13	13	13	12	12	12	12	12	12
U Q	13	13	13	13	13	13	13	13	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13
L Q	12	12	12	12	12	12	12	12	12	12	13	13	13	13	13	13	13	12	12	12	12	12	12	12

DEC. 2009 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2009 h'F (KM)

45° E MEAN TIME (G.M.T. + 3 H)

LAT. 69°00.4'S LON. 039°35.4'E SWEEP 1.0MHz TO 15.0MHz IN 15.0SEC IN MANUAL SCALING

H D	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	216	226	232	216	206	192	196	180	200	210	202	194	224	186	184	188	192	210	200	200	200	210	214	212	
2	222	210	214	214	210	210	210	198	198	206	212	212	198	210	198	204	220	184	202	220	202	206	212	218	
3	214	218	228	208	218	208	204	192	194	200	214	250	208	194	218	194	198	198	198	194	196	208	222	212	
4	212	232	226	242	204	222	206	206	208	202	202			194	196	190	198	198	198	210	216	198	198	210	
5	224	226	210	210	212	192	192	192	200	202	218	232	184	196	208	192	196	208	266	196	196	208	238	196	
6	A	252	A	A	216	A	A	A	222	192	208	220	A	208	196	190	204	202	208	198	198	198	226	212	
7	234	274	318	228	A	A	224	200	200	200	196	208	A	218	A	200	224	A	202	190	194	206	222	234	
8	252	274	254	220	200	194	192	180	192	192	196	204	A	226	192	196	196	200	214	234	210	252	234	204	
9	208	218	200	200	200	200	204	192	188	196	196	196	212	196	196	200	184	202	212	206	206	220	220	238	
10	226	256	252	244	214	196	206	214	190	200	200	200	238	198	202	190	194	198	A	280	224		220	218	
11	218	228	214	218	206	196	188	194	214		200		A			202	202	202	202	196	208	230	224	220	
12	220	234	206	212	216	240	336	292		206	182	194	194	A	236	200	200	184	202	232	200	196	218	218	
13	226	226	230	216	206	206	204	198	190	190	180	200	202	A	A	A	208	220	A	204	208	236	250	242	
14		238		188	196	182	176	178	A	A	A	A	194	224	212		198	204	194	200	200	194	206	216	224
15	244	218	218	218	198	208	208					200		198			198	196	224	228	214	204	224	216	
16	216	224	236	204	202			204	194	194	198	206	202	234	196	190	204	202	206	206	228	222	214	232	
17	238		278	204	210	246	222	192	196	196	204	196	188	202	194	190	192	192	192	192	212	242	232	204	
18	188	192	232	242	208	208	210	198	190	196	204	204	204	210	224	204	A	A	A	204	194	224	208		
19	220	234	242	226	214	210	250	198	188	196	198	192	196	214	198		A	A	A	198	198	198	218	238	216
20	230	194	226	218	236	214		200	200	194	208						230	202	194	202	216	198	226	226	
21	230	248	208	218	212	220	190	226	206	180	194	192	194	208	206	200	200	190	196	202	198	208	210	230	
22	240	222	202	218	194	194	194	194	180	196	206	198	190		226	200	198		214	214	214	240	220	222	
23	236	248		214	230	204	188	196	190	194	198	198	198	202	198	188	196	196	204	204	200	198	218	230	
24	230		242		234	228	208	198	202	188	196	192	198	246	192	204	194	186	196	194	194	226	226	246	
25	224	232	226	216	222	232	190	184	196	196	182	216	218		A	214	200	216			216	216	190		
26	264		A	A	224	198		A	210	210	210	218	192	A	A		202	194	278	210	220	190	192	224	224
27	216	232	192	206	218	216	216	192	204	190	196	200	190	190	200	208	202	206	196	200	192	202	200	222	
28	218	224	224	218	214	214	198	204	196	170	194	196	188	A	198	198	174	198	198	292	234	226	226	214	
29	218	226	232	226	216	206	210	196	200	200	192	188	196	180	198	198		206	192	204	214	238	204	204	
30	228	238	212	210	202	202	208	228	202	212		194	202	A	A	182	194	190	202	220	232	232	196	226	
31	222	218	214	220	220	220	210	210	194	200	200	200			212	192		188		212	204	228	212	234	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	28	27	28	30	28	27	28	28	28	28	27	24	20	23	27	27	28	27	30	31	30	31	30	
MED	224	227	226	217	212	208	205	198	197	196	199	199	198	204	198	198	198	198	201	203	204	208	220	219	
U Q	232	238	236	220	218	218	210	204	202	201	205	208	206	213	208	202	204	204	208	220	214	228	226	230	
L Q	217	220	212	210	204	197	192	192	191	193	196	194	193	195	196	190	194	193	198	198	198	202	212	212	

DEC. 2009 h'F (KM)

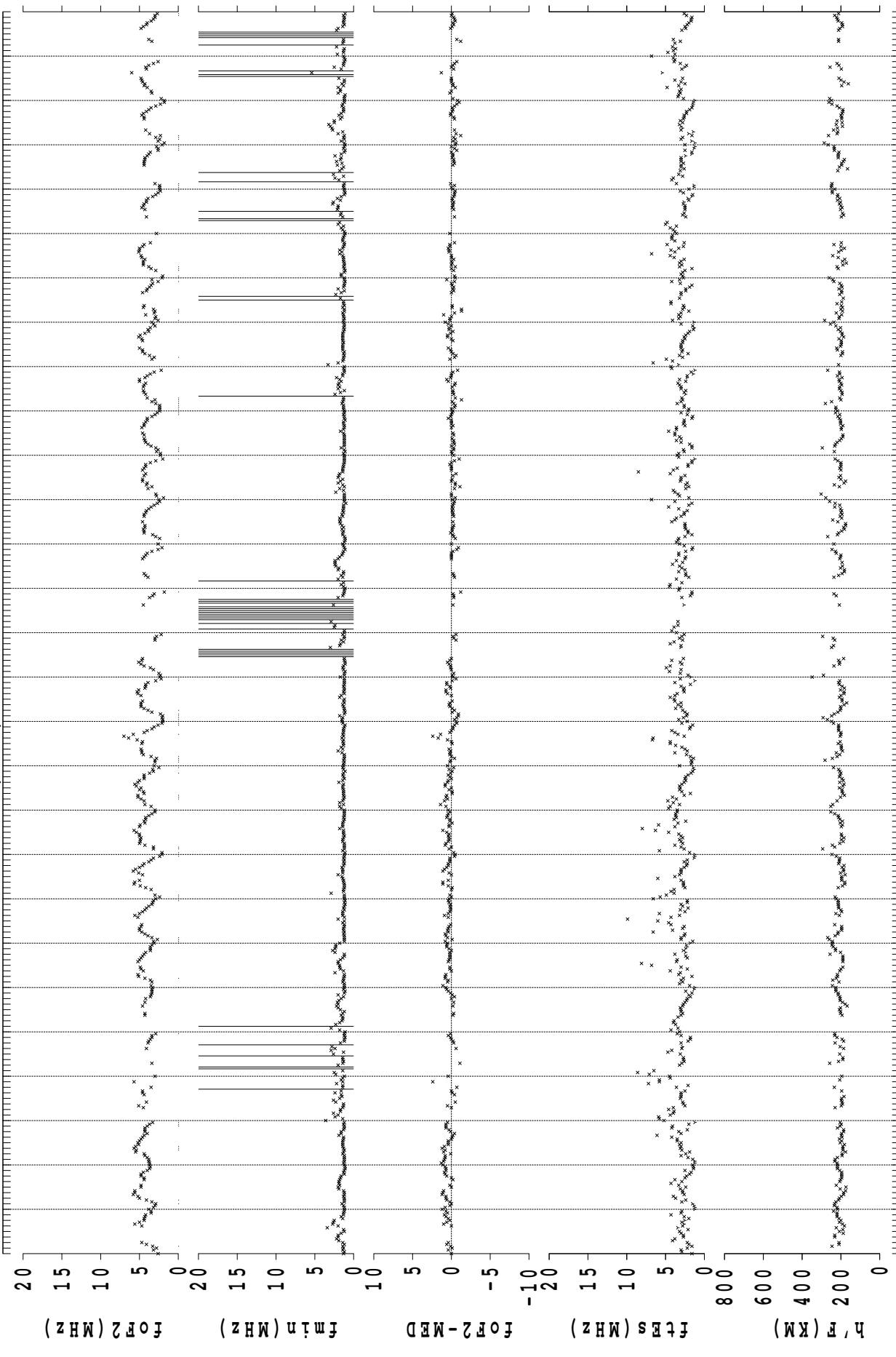
NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

2009 0101 -> 2009 0131 (99) SYOWA-ST.



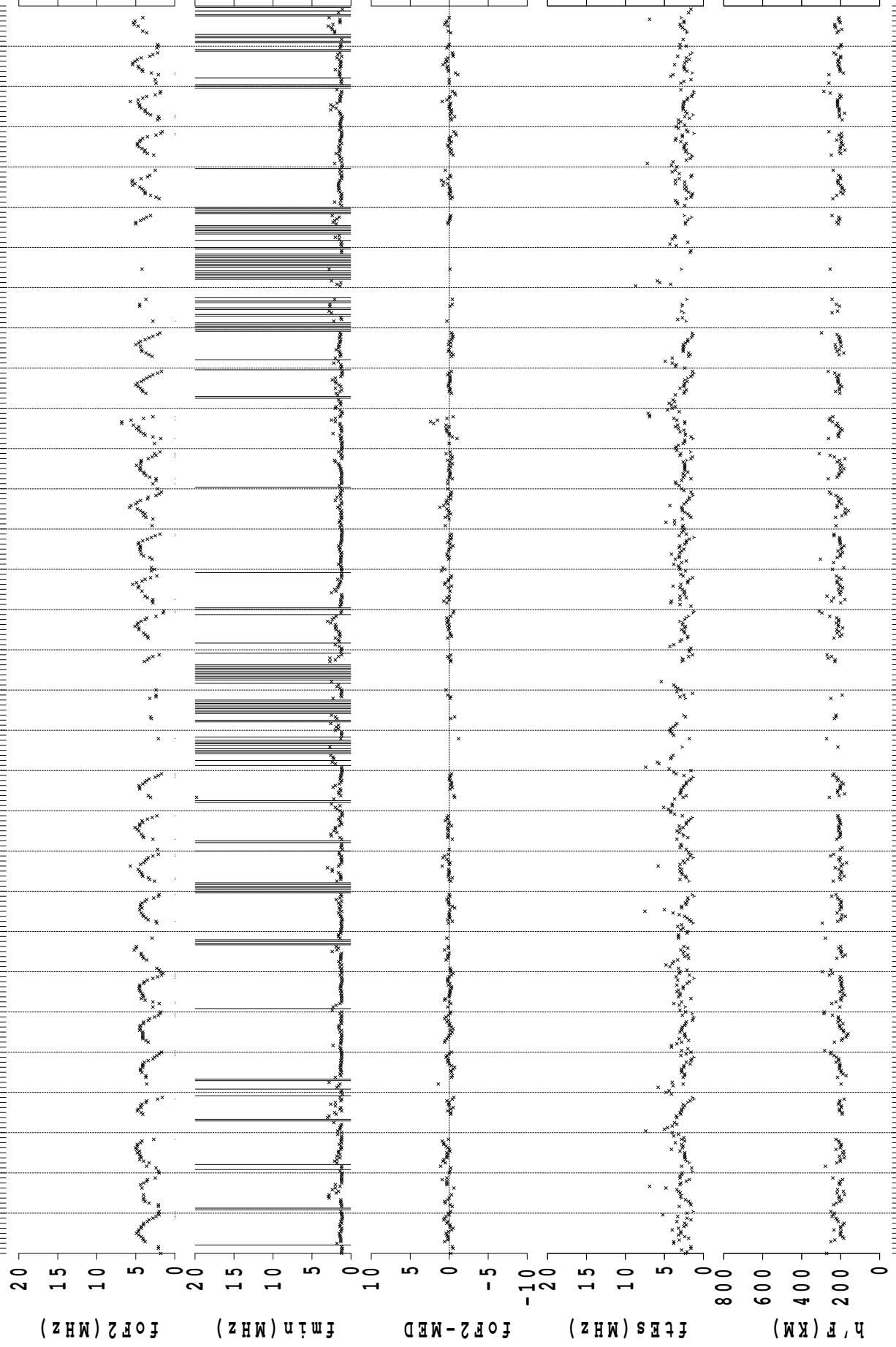
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2009 0201 -> 2009 0228 (99) SYOWA-ST.



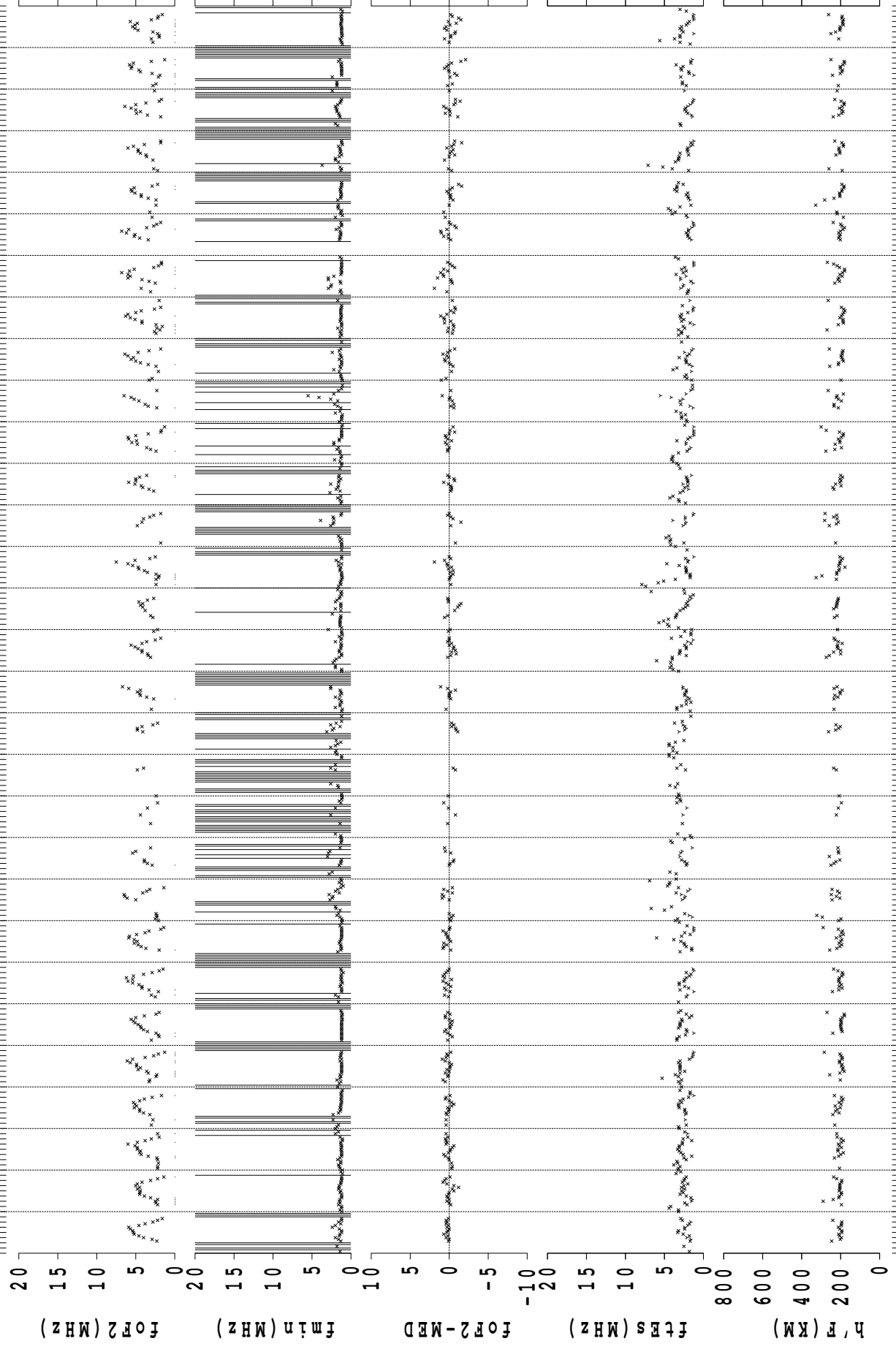
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2009 0301 -> 2009 0331 (99) SYOWA-ST.



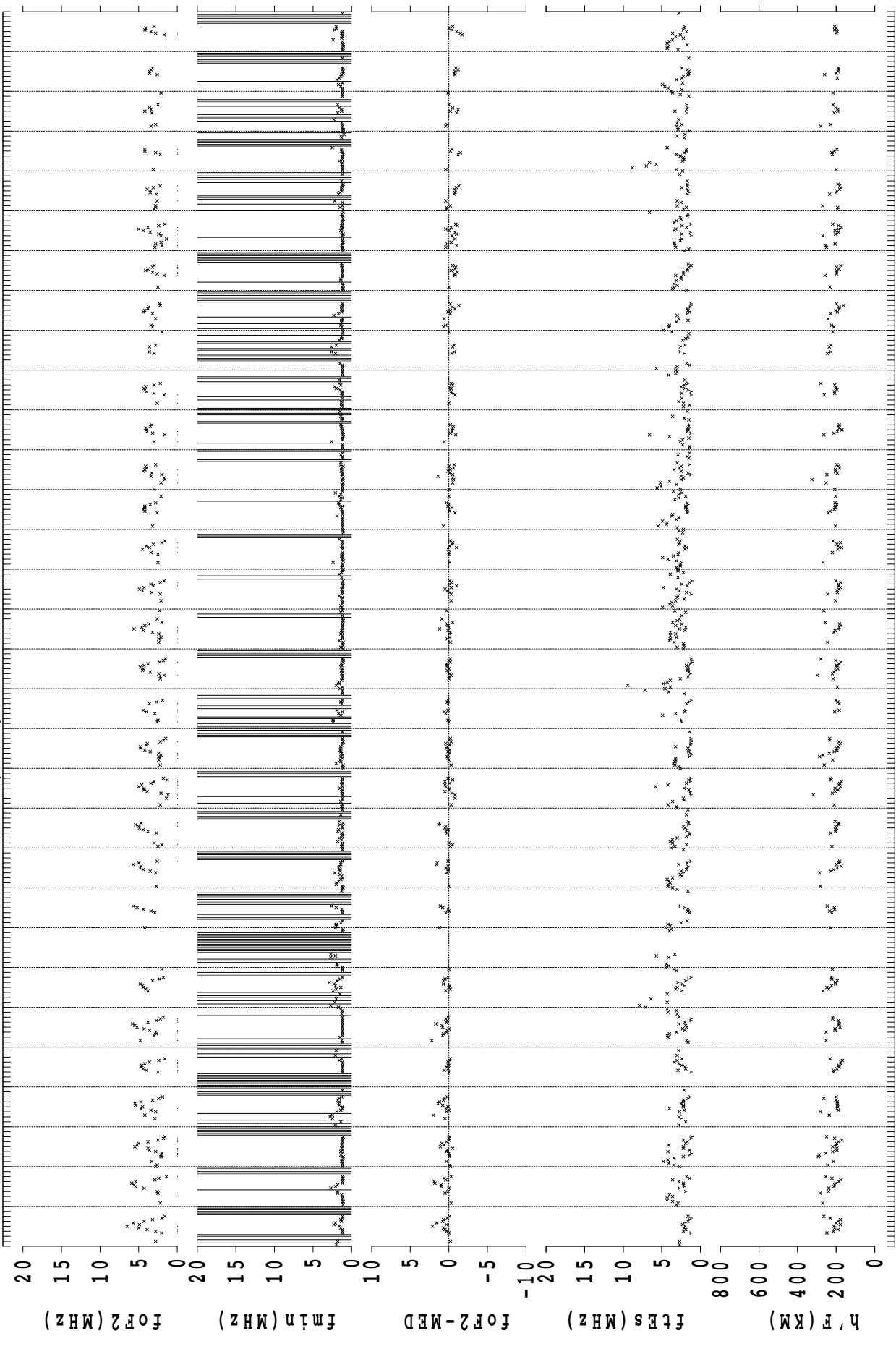
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2009 0401 -> 2009 0430 (99) SYOWA-ST.



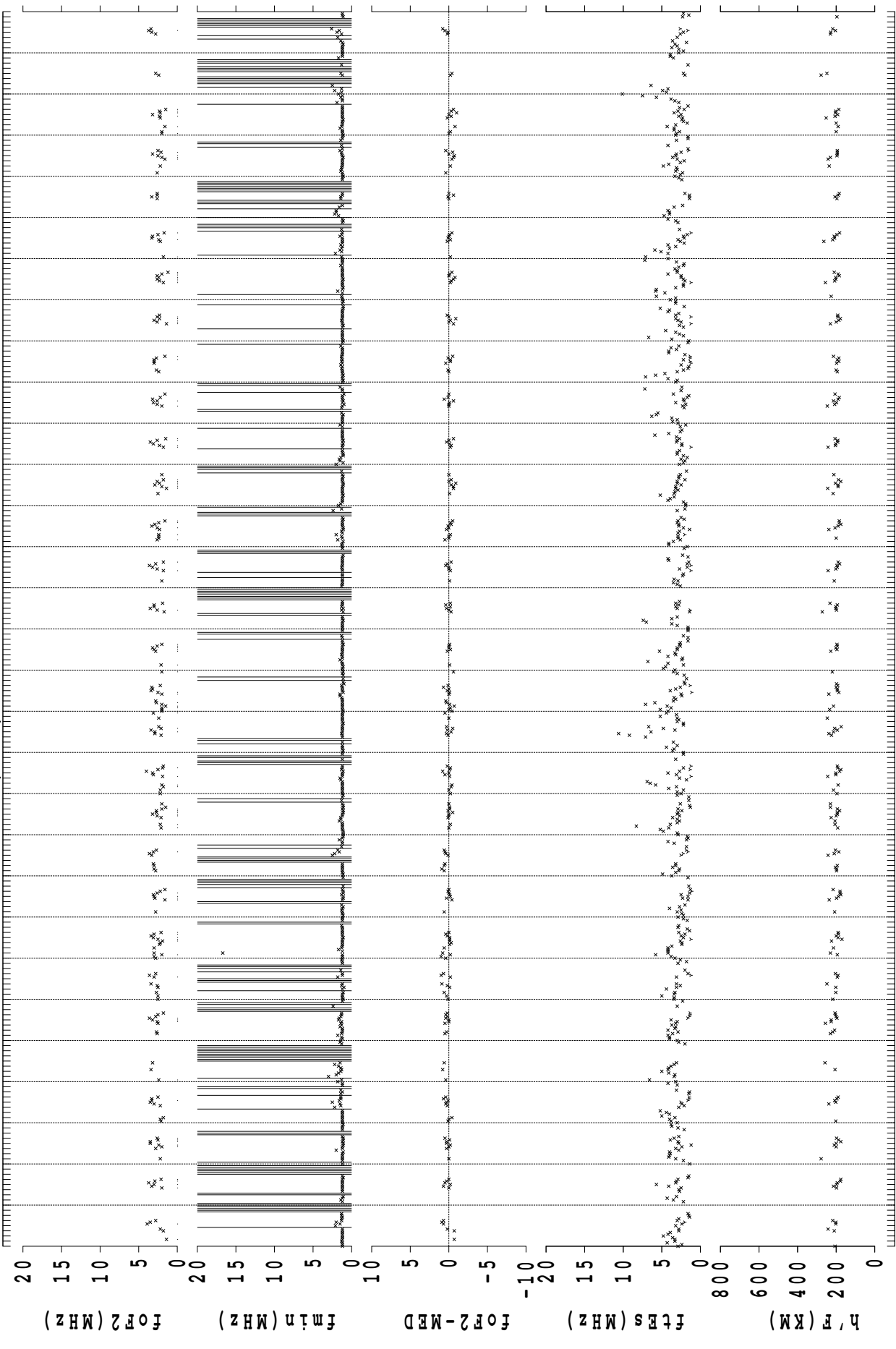
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2009 0501 -> 2009 0531 (99) SYOWA-ST.



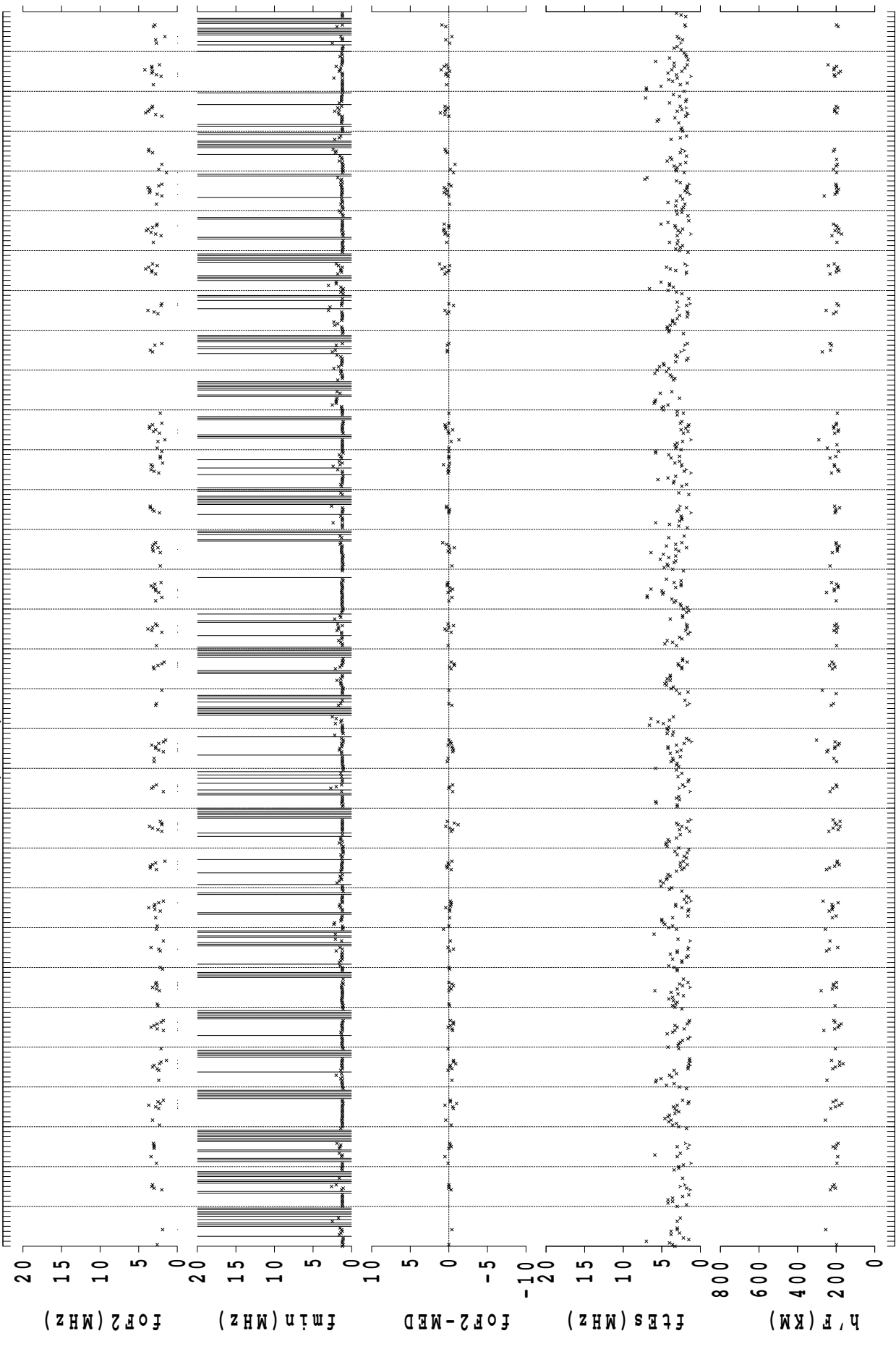
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2009 0601 -> 2009 0630 (99) SYOWA-ST.



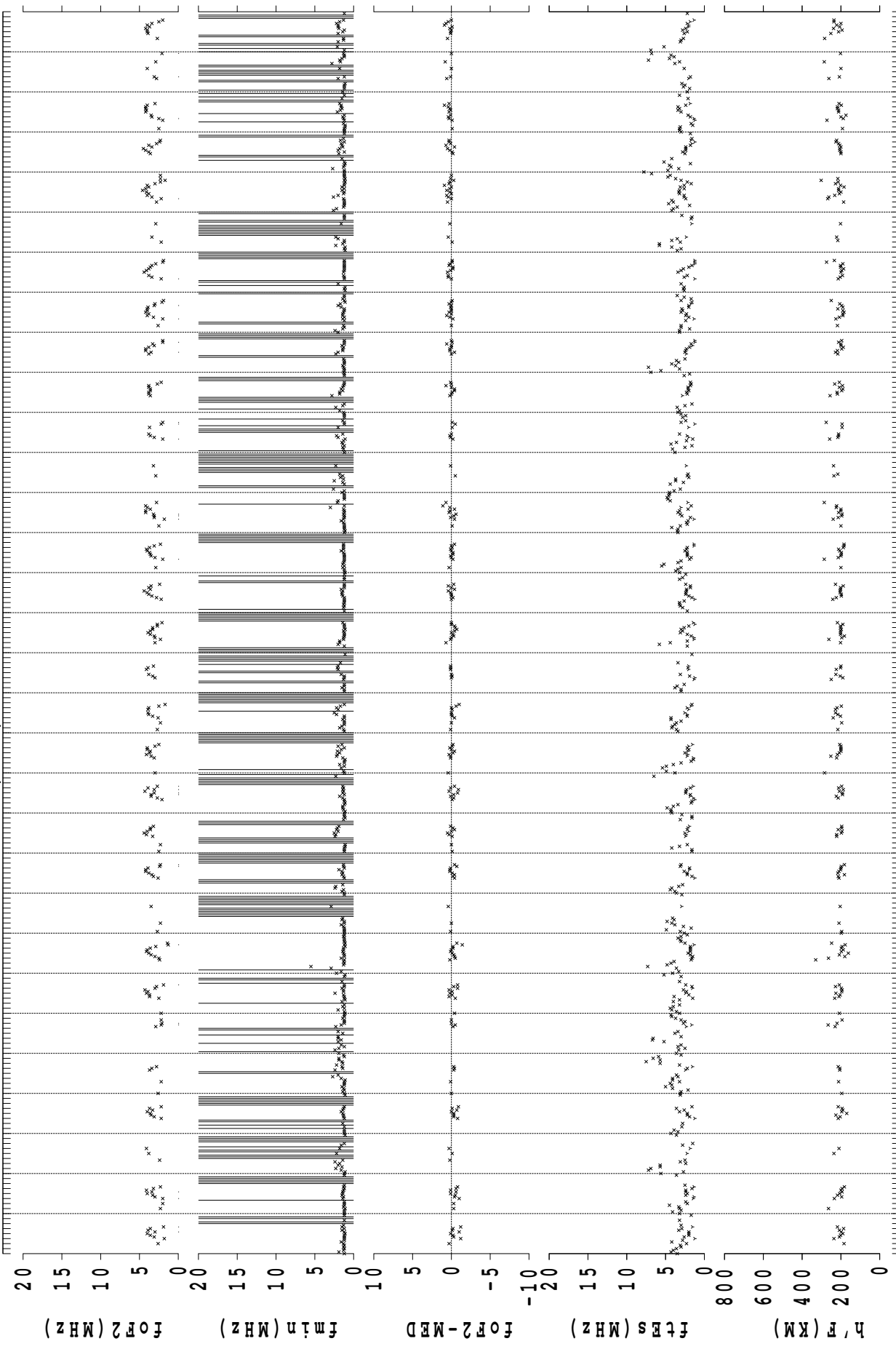
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2009 0701 -> 2009 0731 (99) SYOWA-ST.



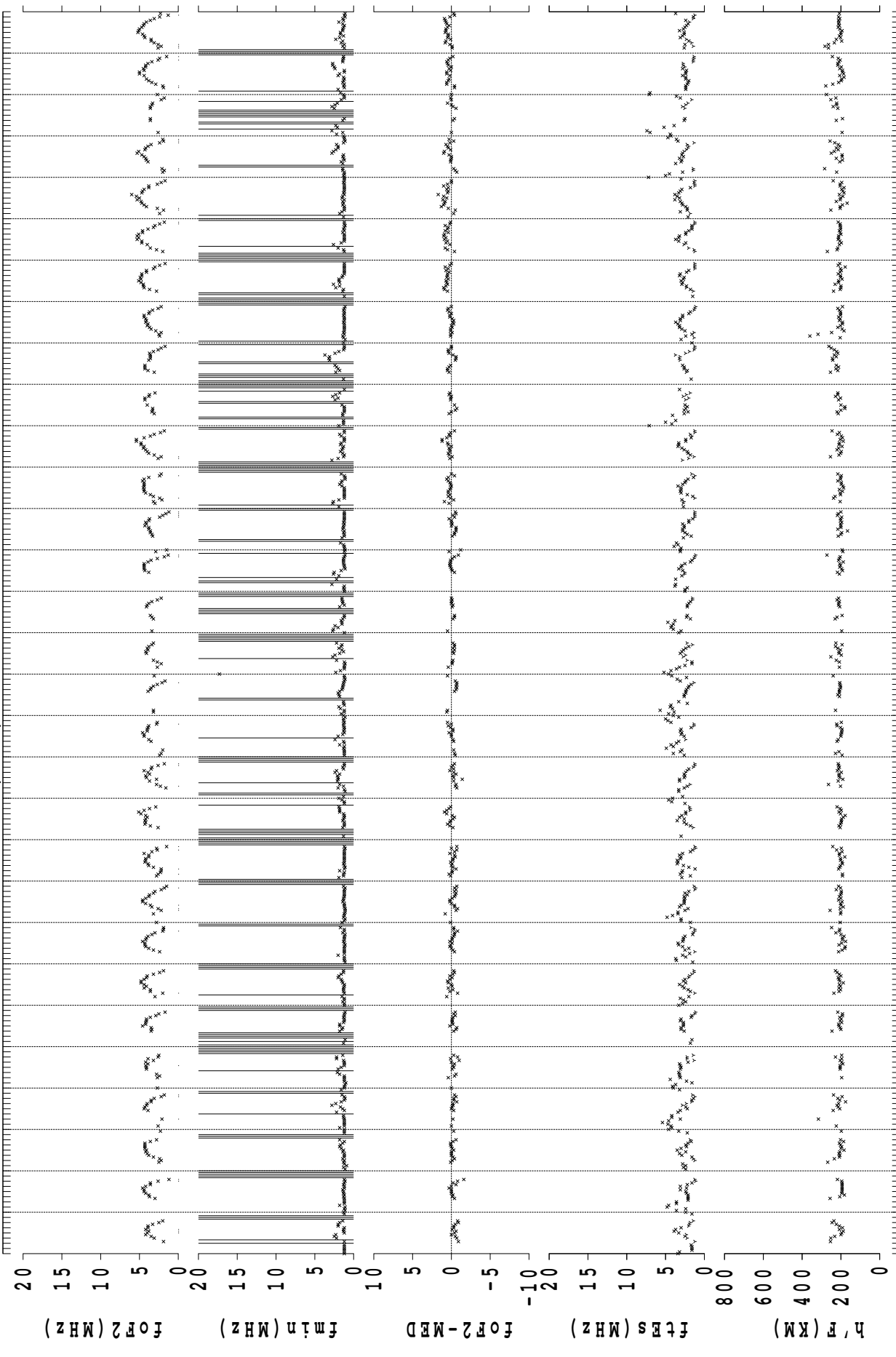
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2009 0801 -> 2009 0831 (99) SYOWA-ST.



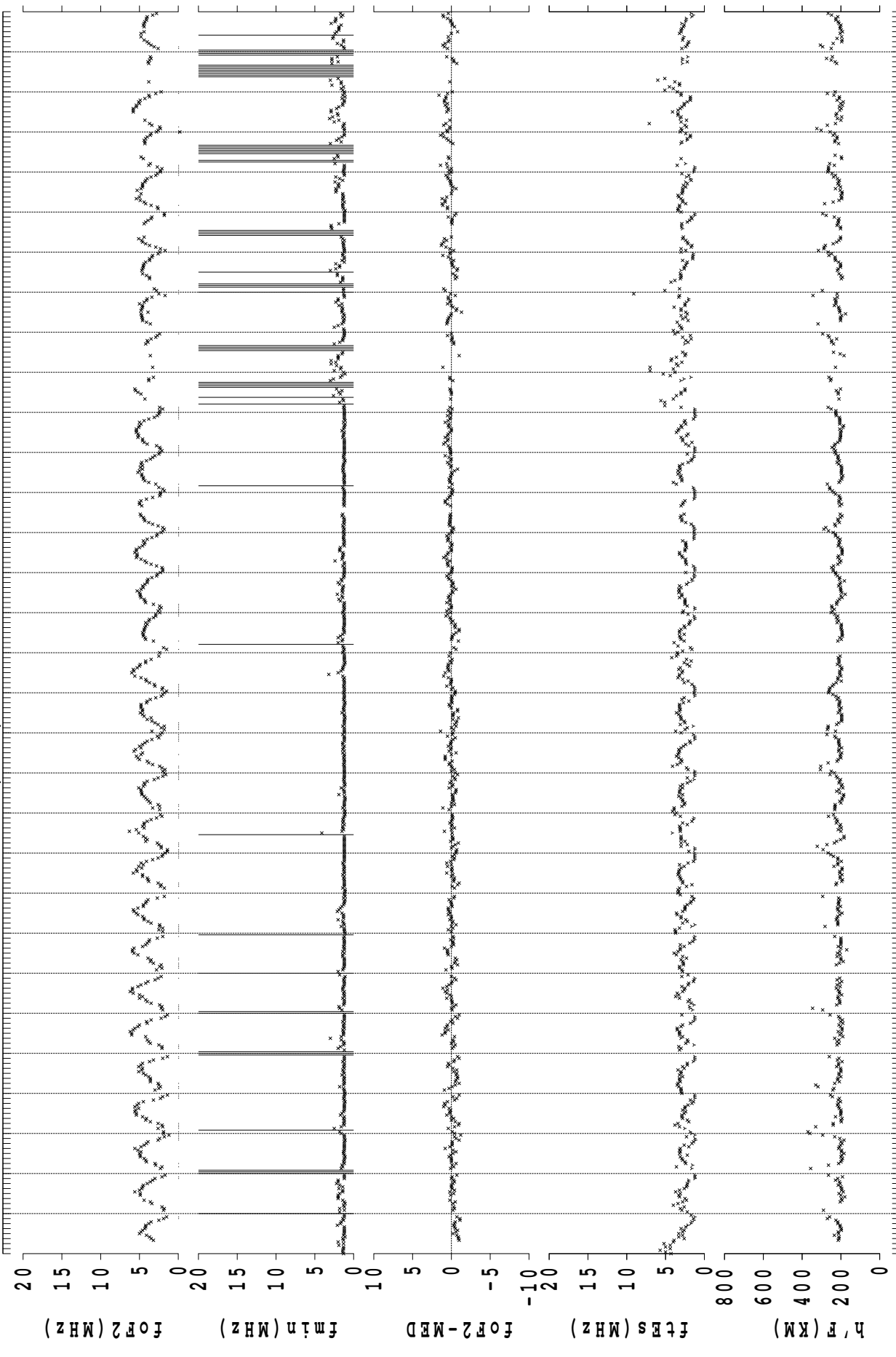
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2009 0901 -> 2009 0930 (99) SYOWA-ST.



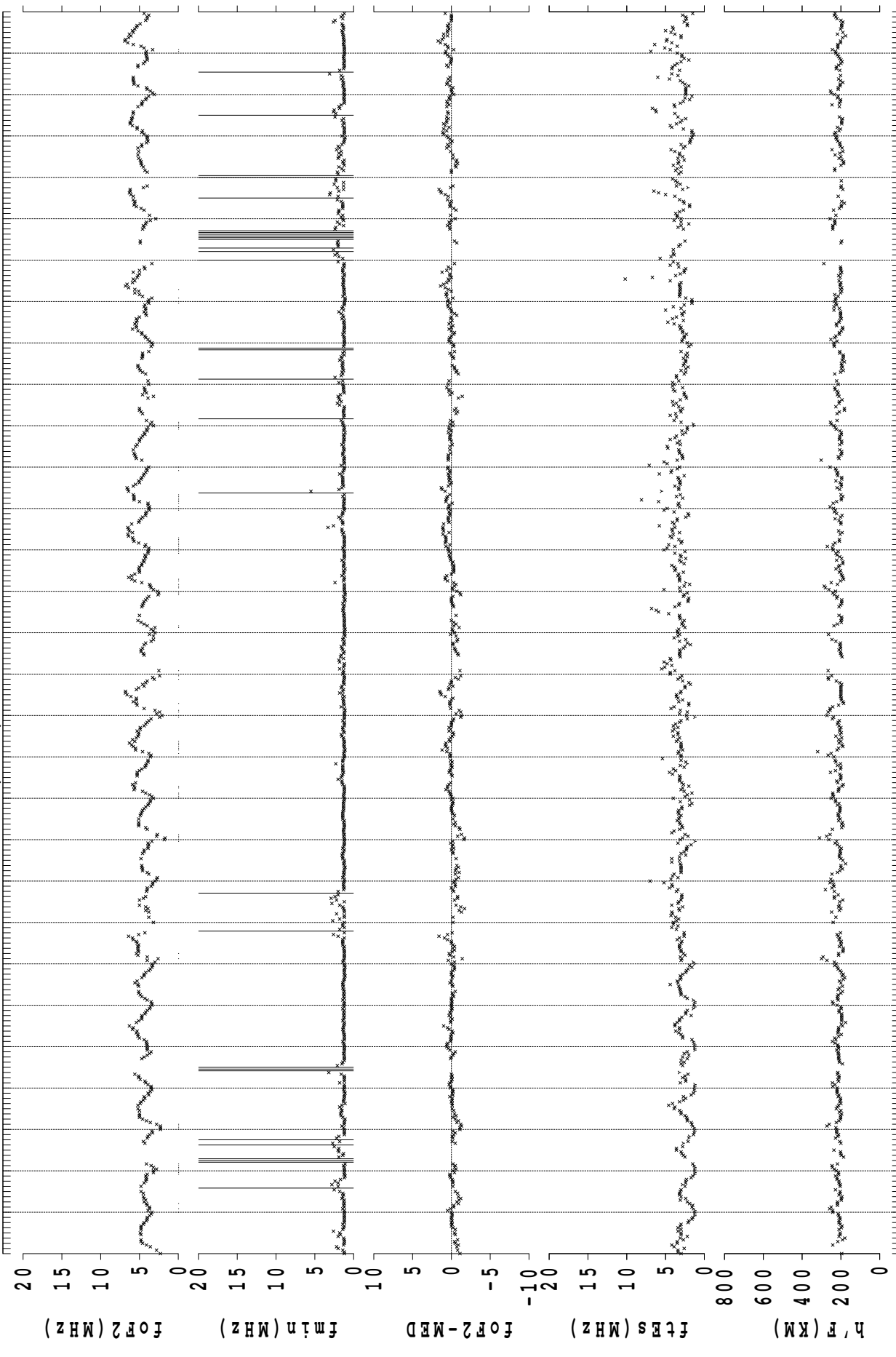
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2009 1001 -> 2009 1031 (99) SYOWA-ST.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

2009 1101 -> 2009 1130 (99) SYOWA-ST.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 DAY/45° EMT

2009 1201 -> 2009 1231(99) SYOWA-ST.

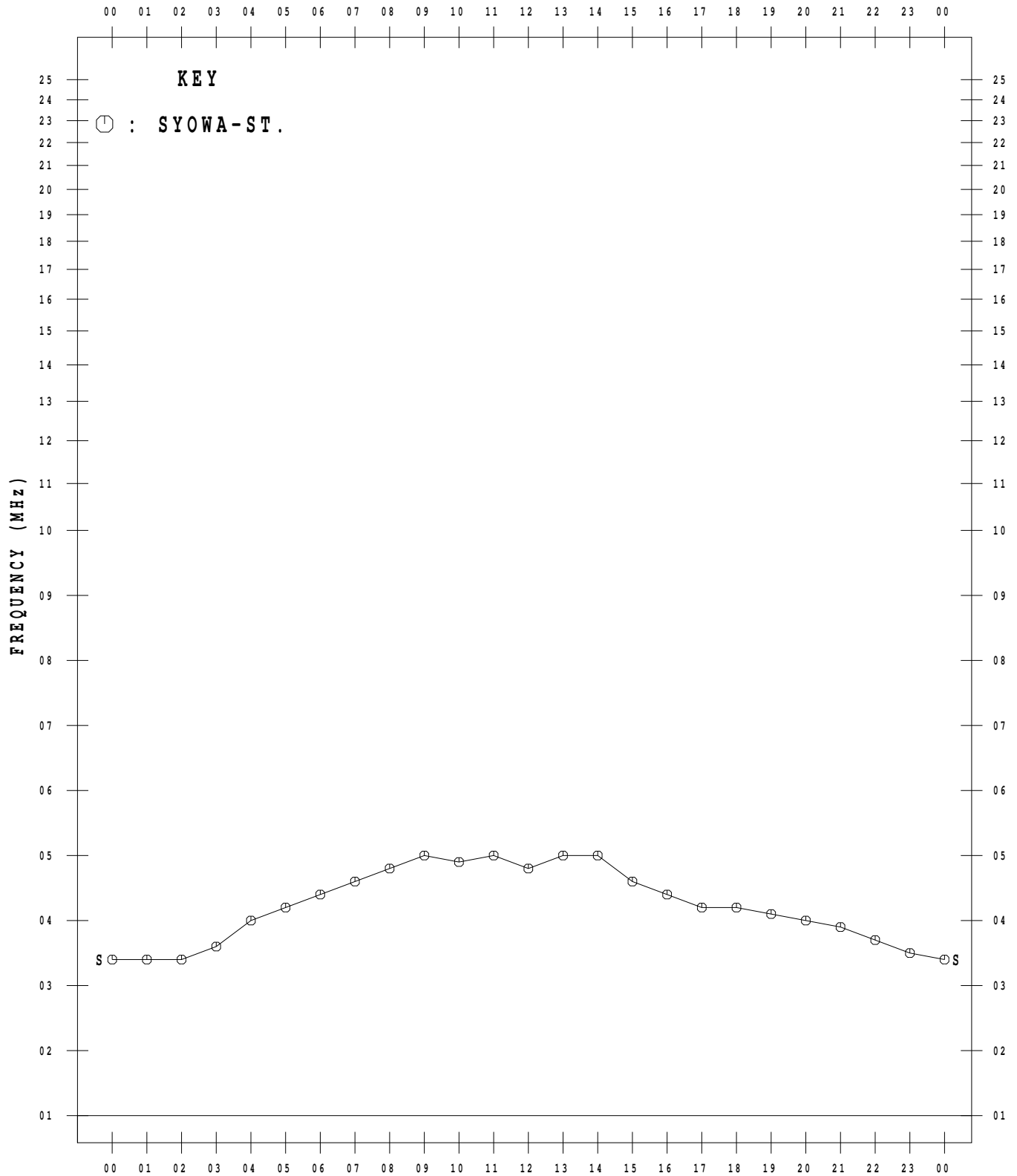


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DAY/45° EMT

MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

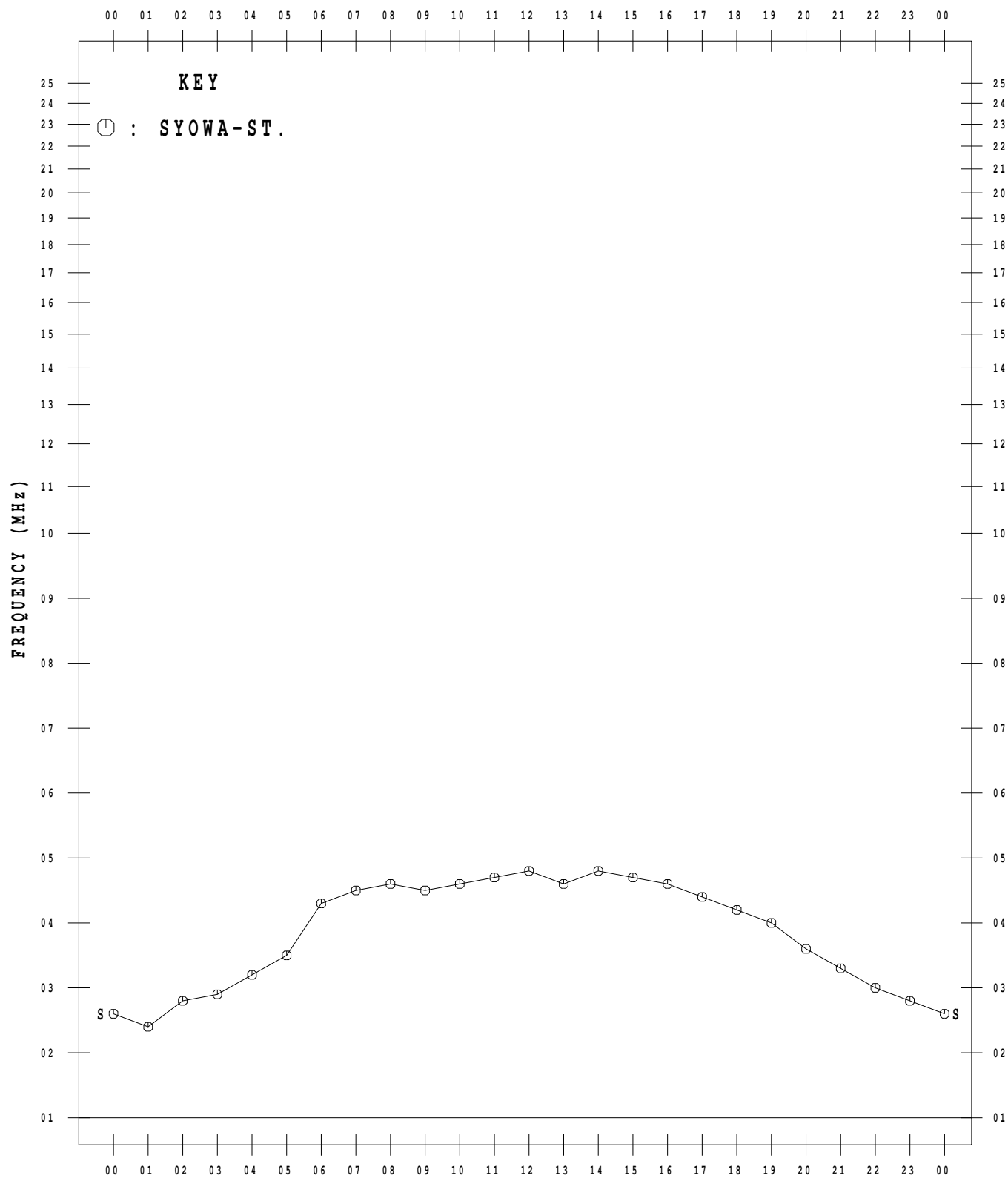
JAN. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

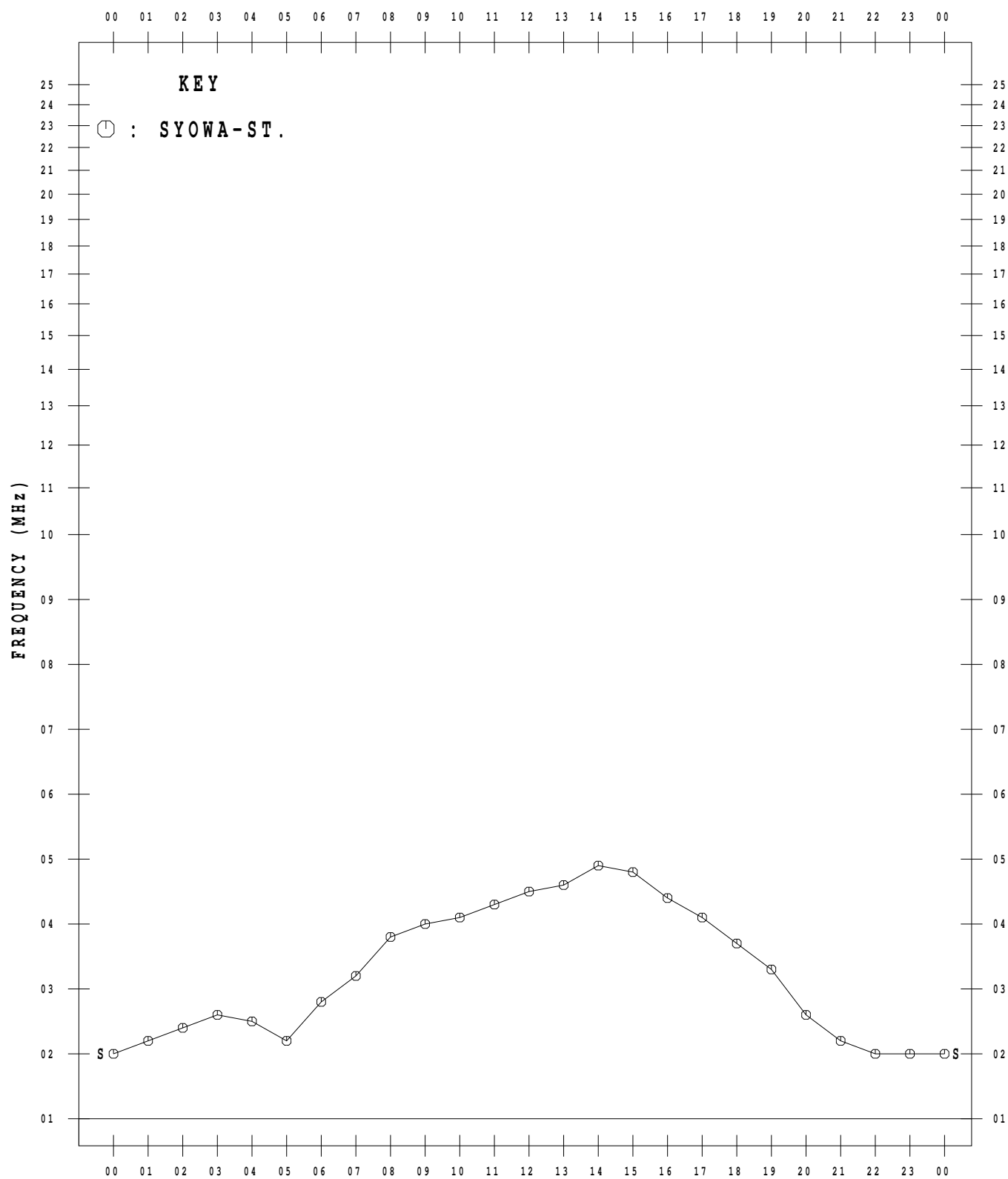
FEB. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

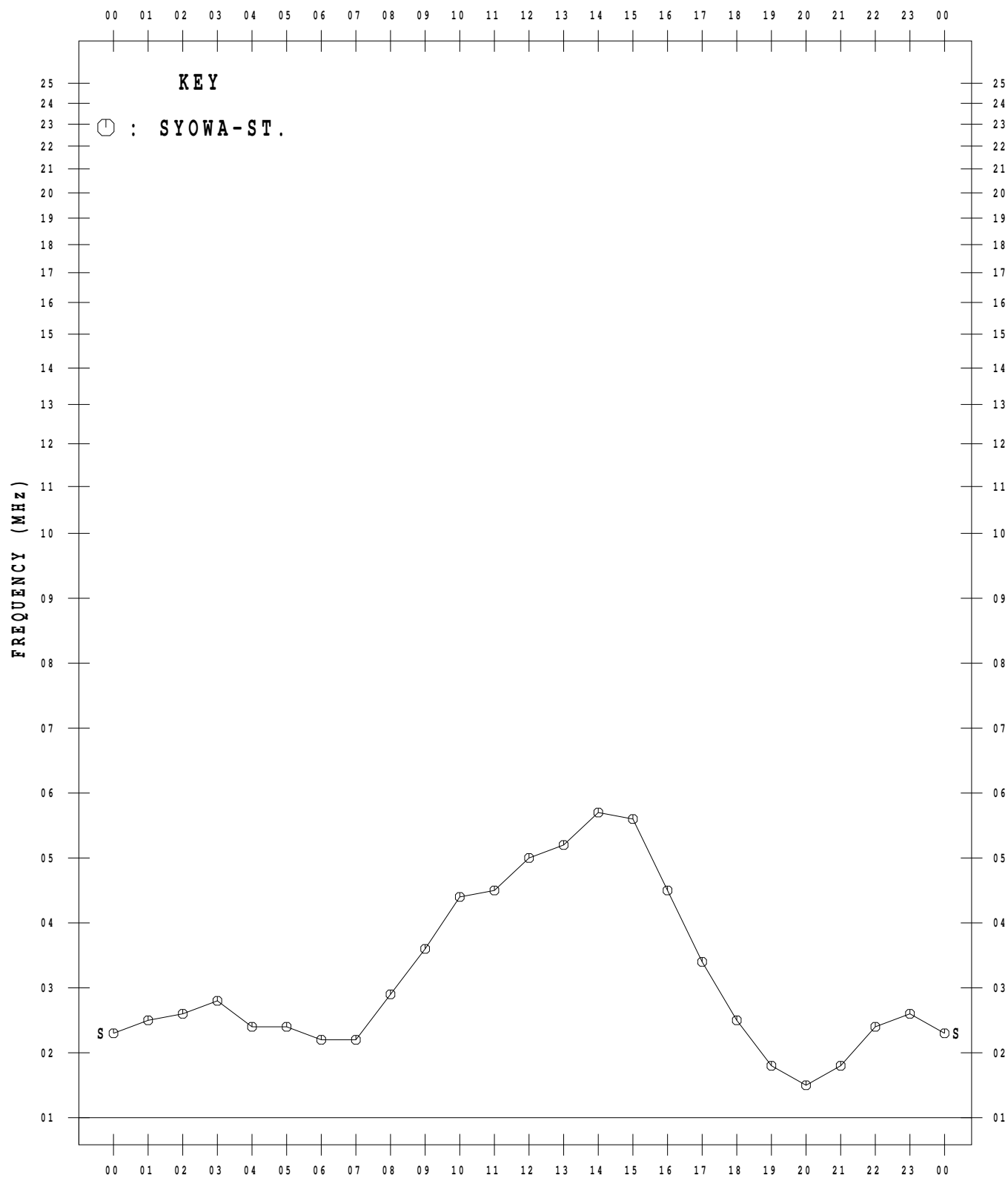
MAR. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

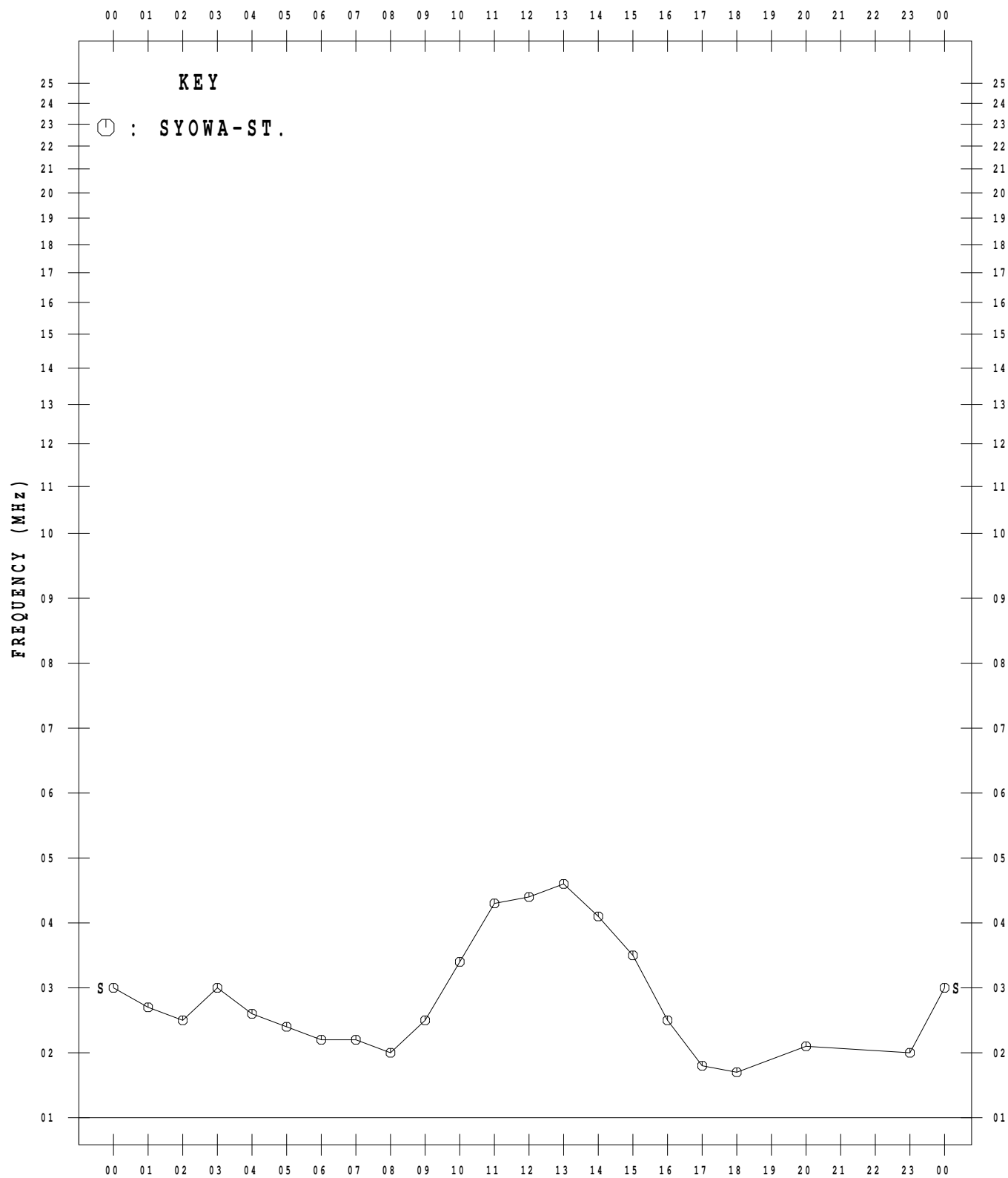
APR. 2009



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

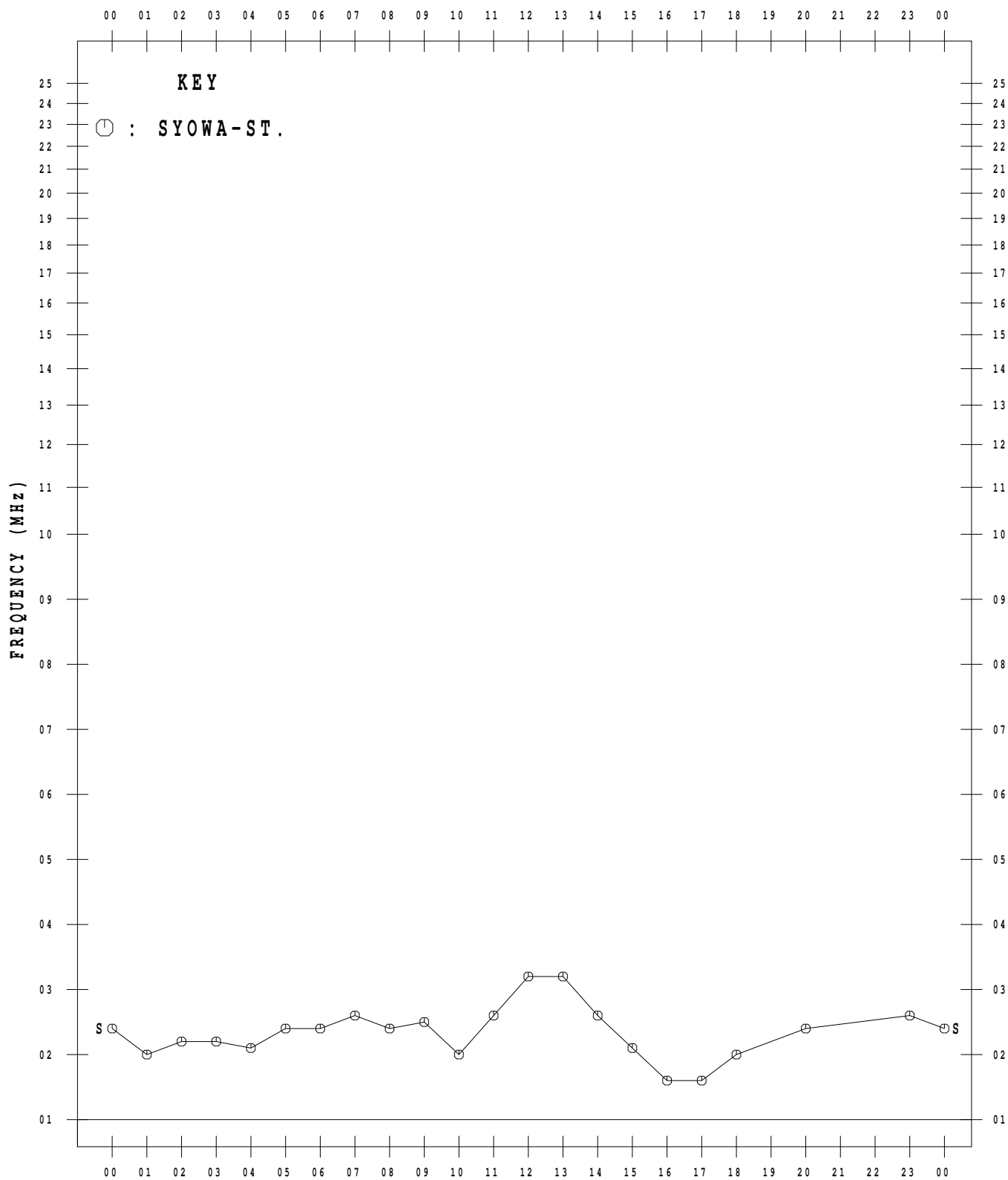
MAY 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

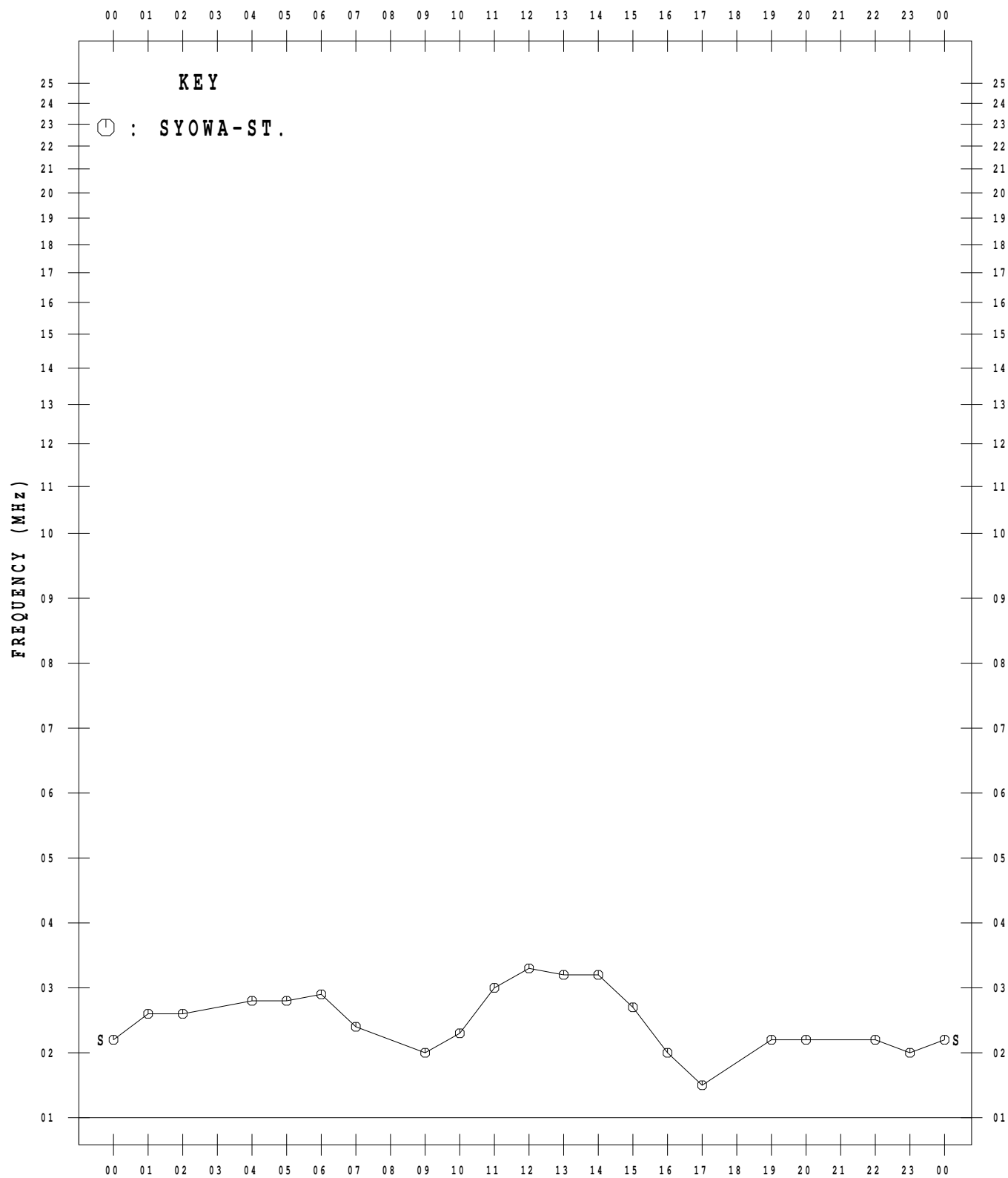
JUN. 2009



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

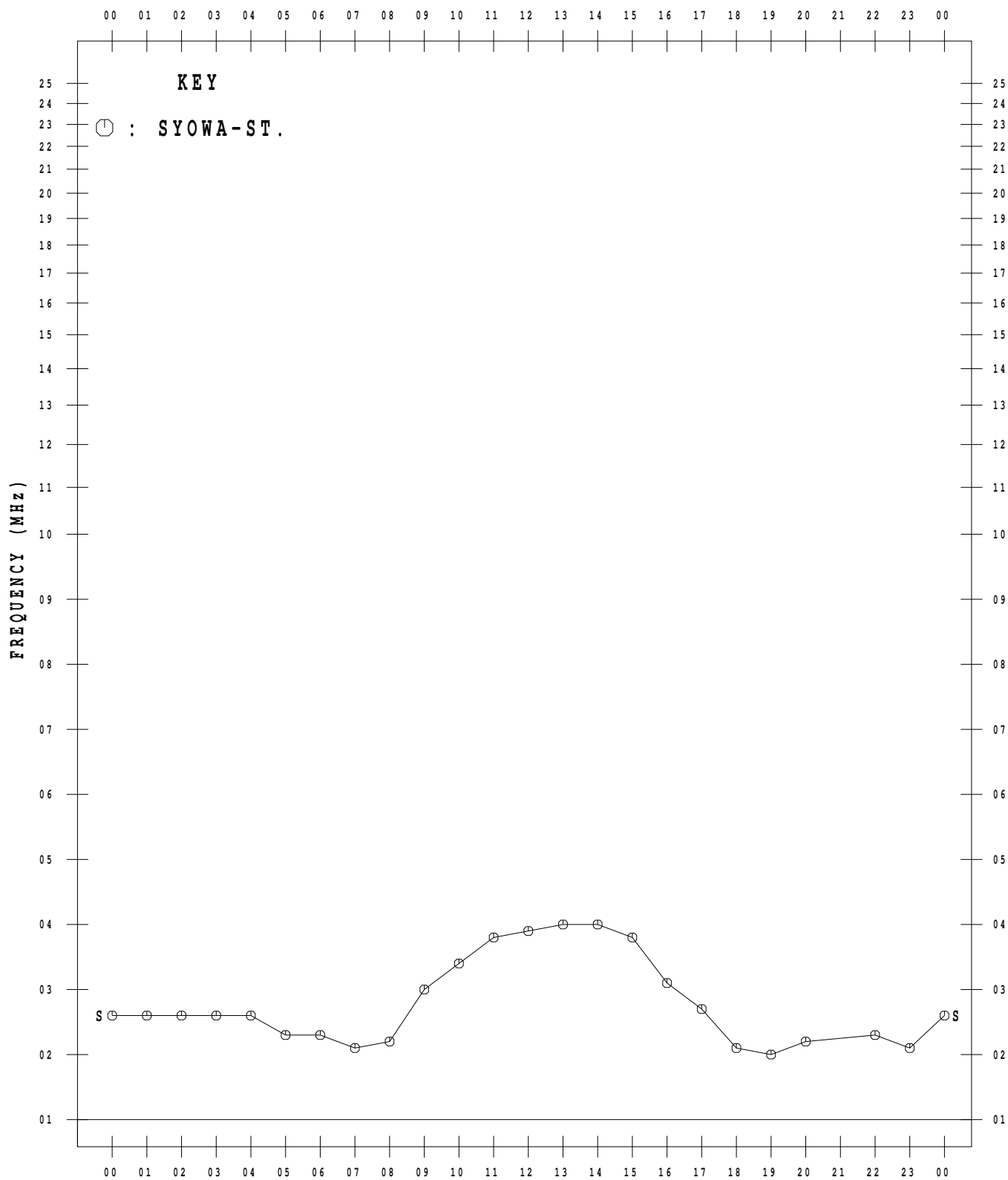
JUL. 2009



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

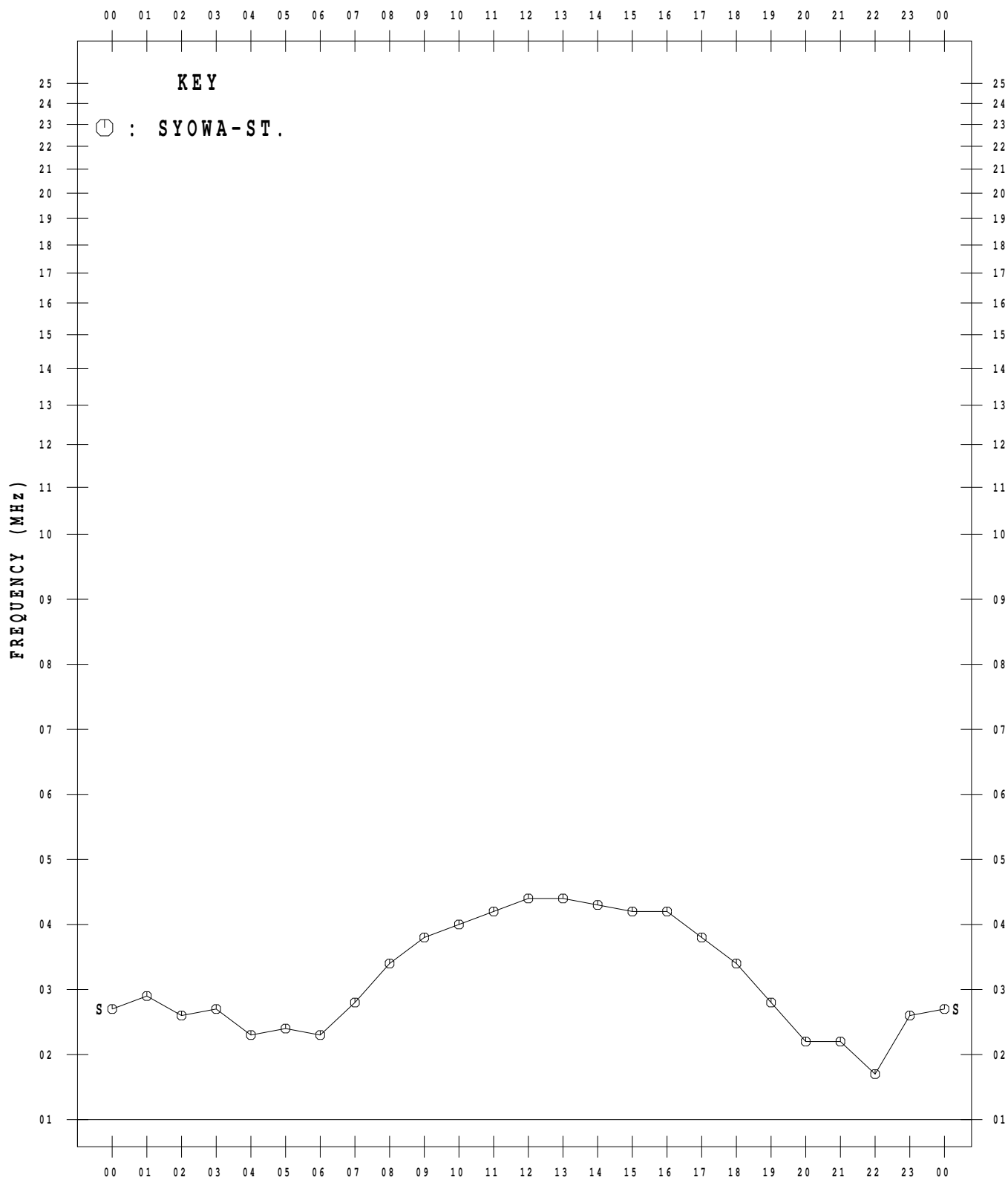
AUG. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

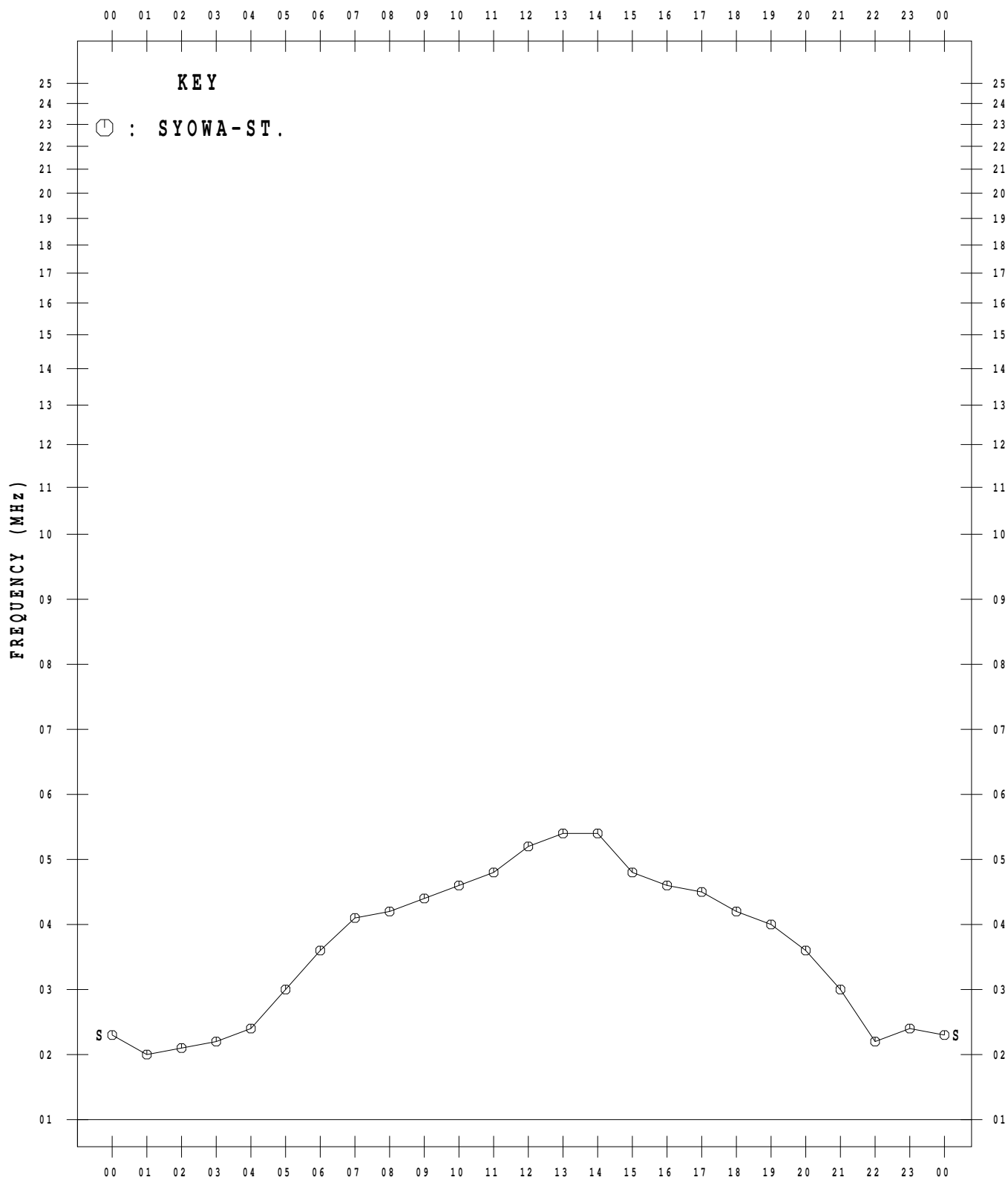
SEP. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

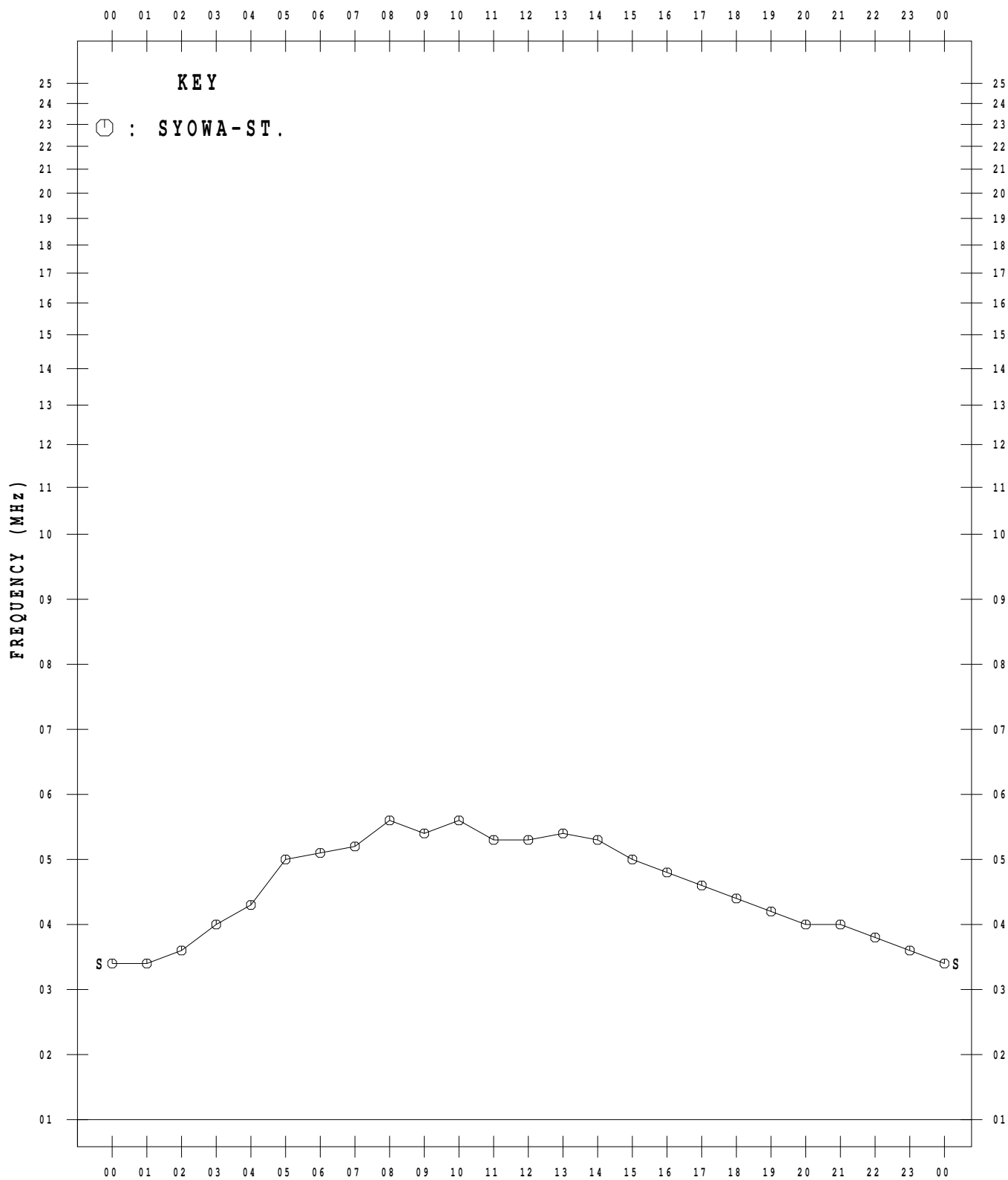
OCT. 2009



MONTHLY MEDIAN VALUES OF f_oF_2

45° E MEAN TIME

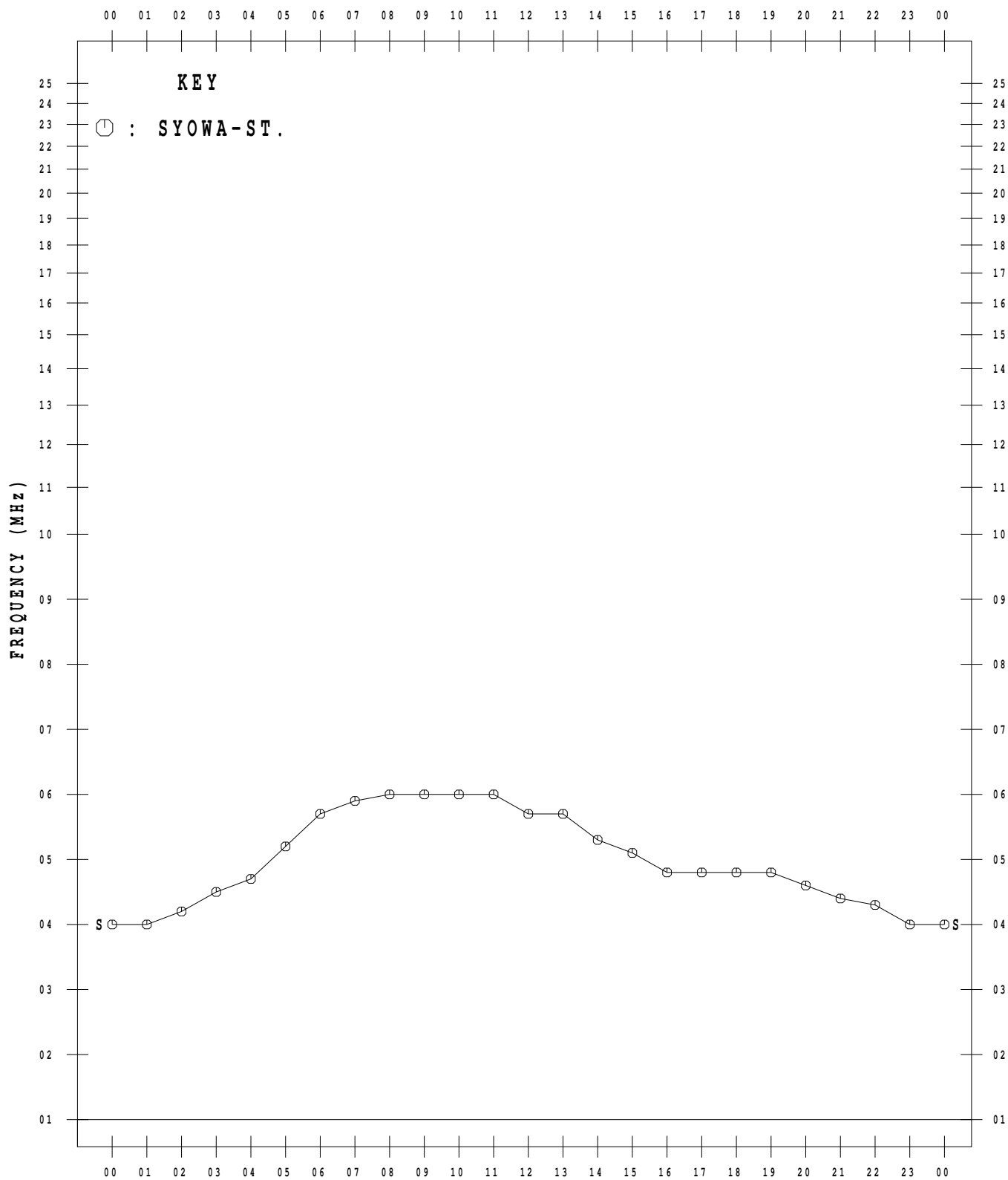
NOV. 2009



MONTHLY MEDIAN VALUES OF f_oF₂

45° E MEAN TIME

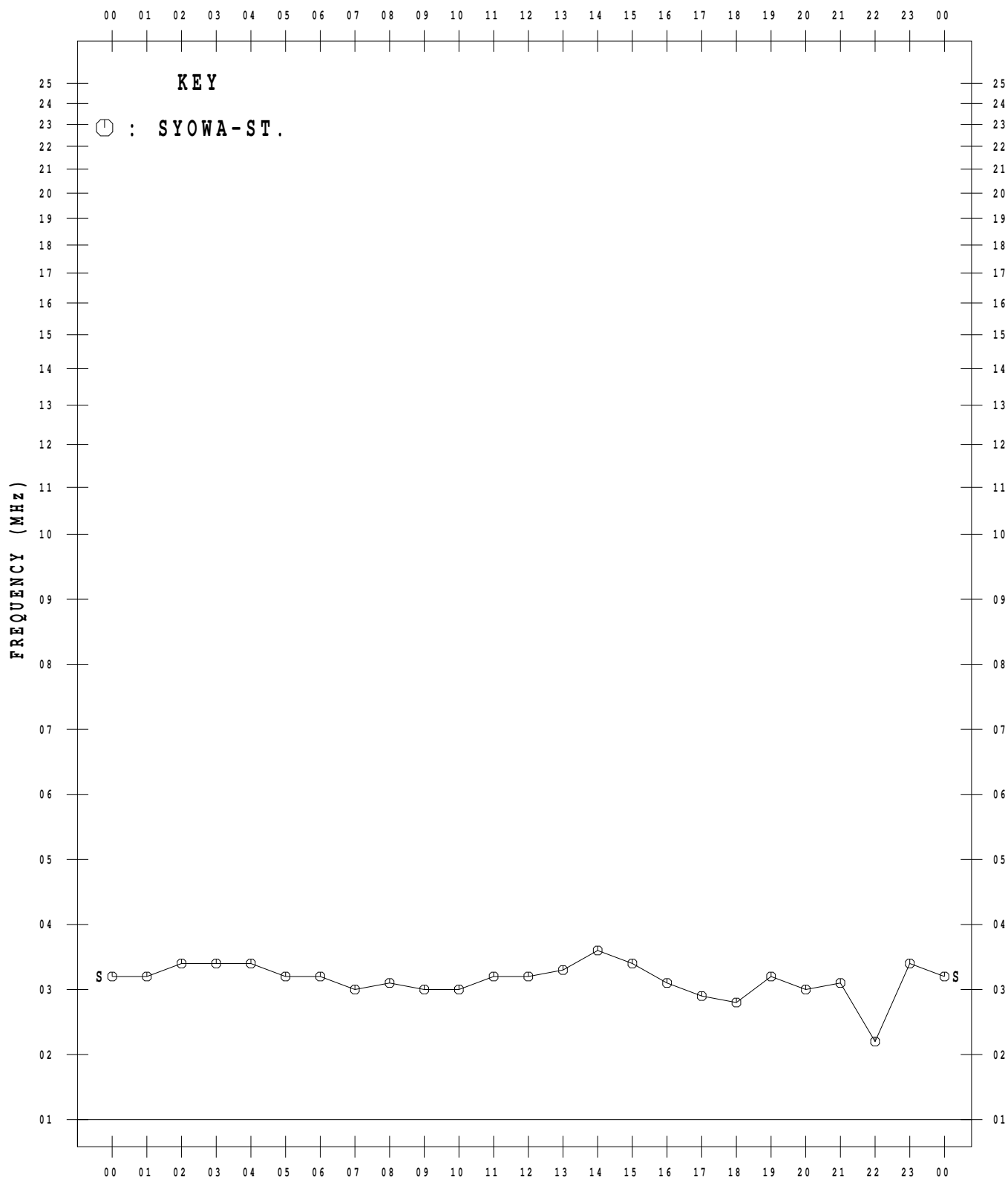
DEC. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

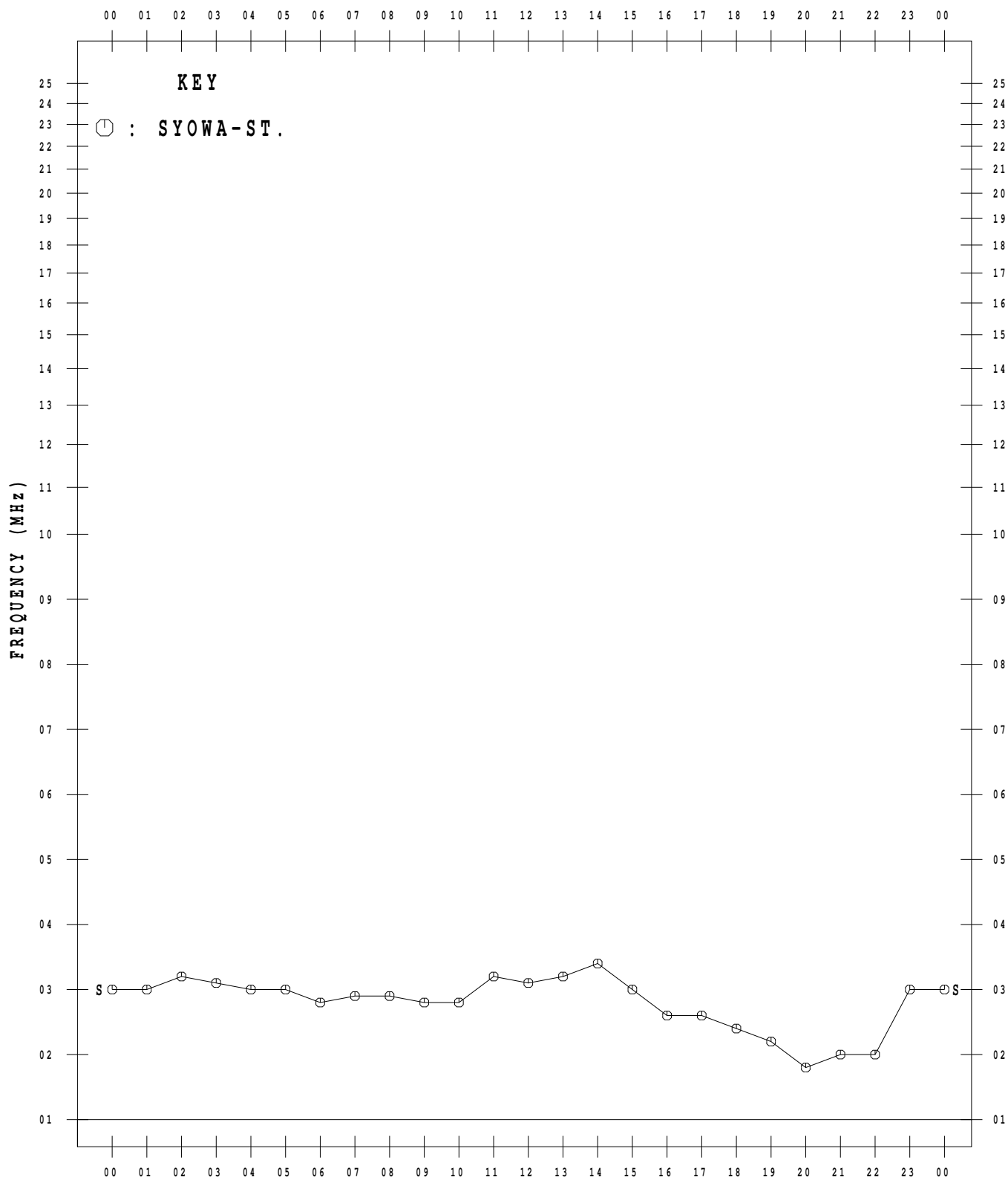
JAN. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

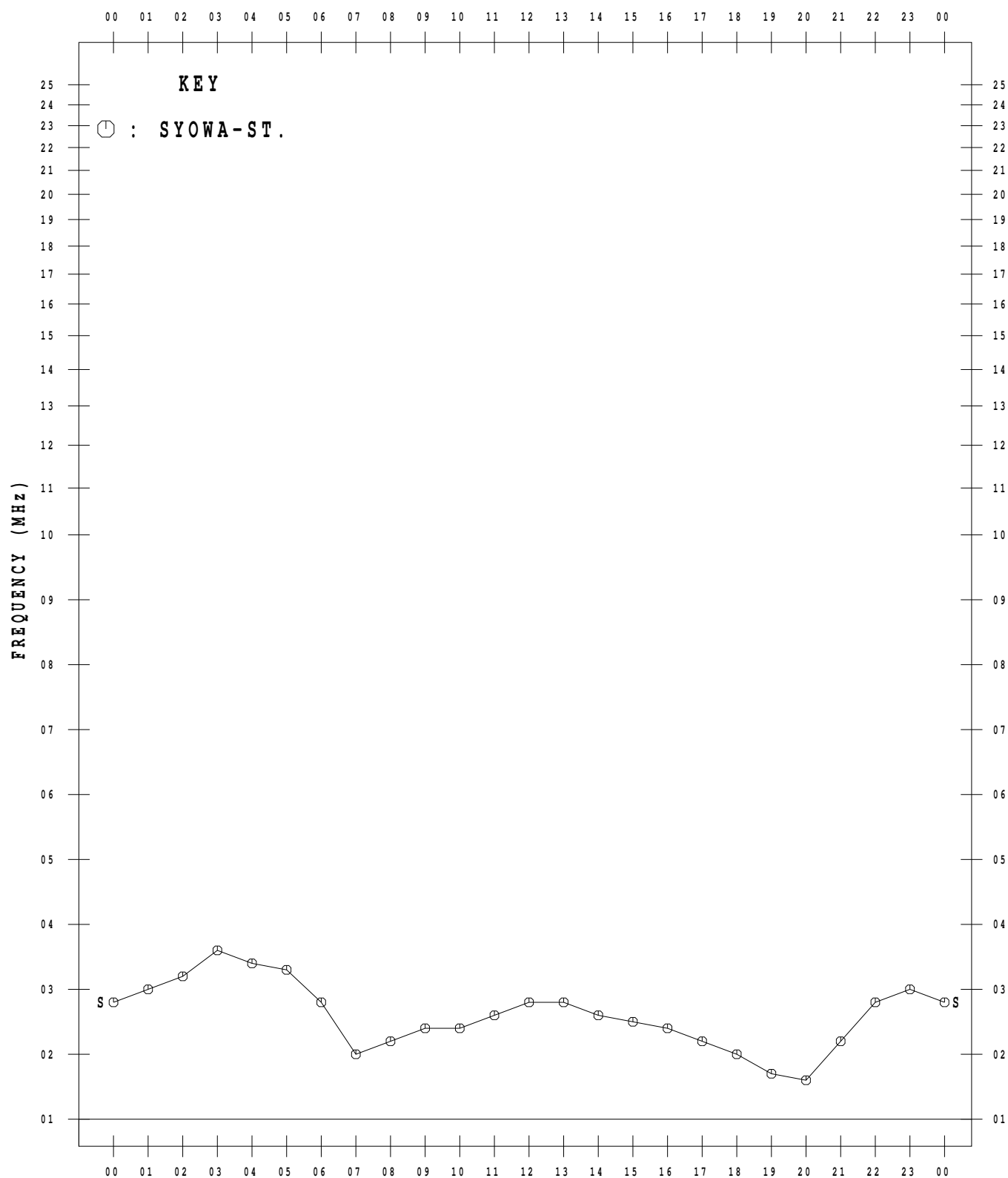
FEB. 2009



MONTHLY MEDIAN VALUES OF f_{tE}s

45° E MEAN TIME

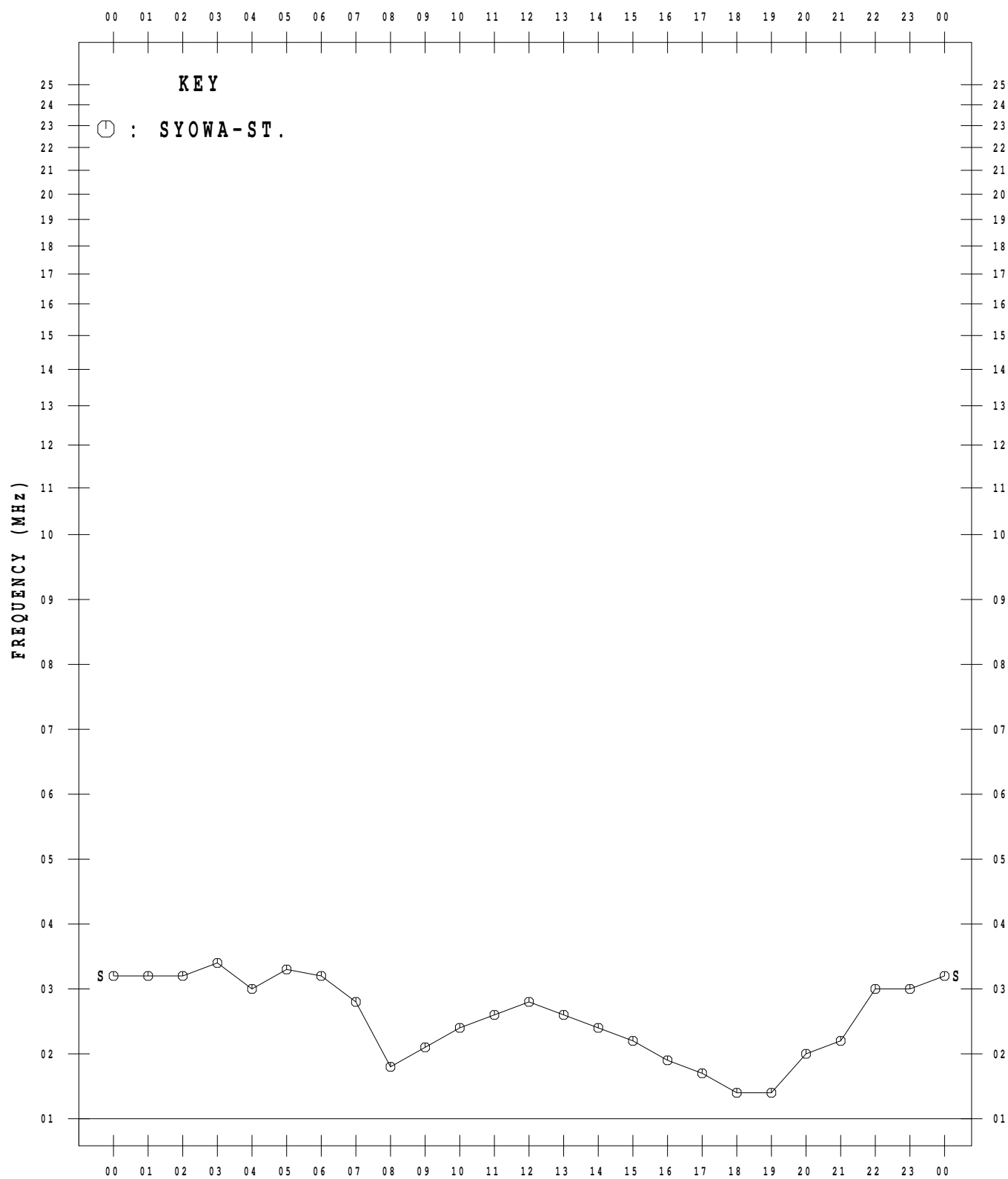
MAR. 2009



MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

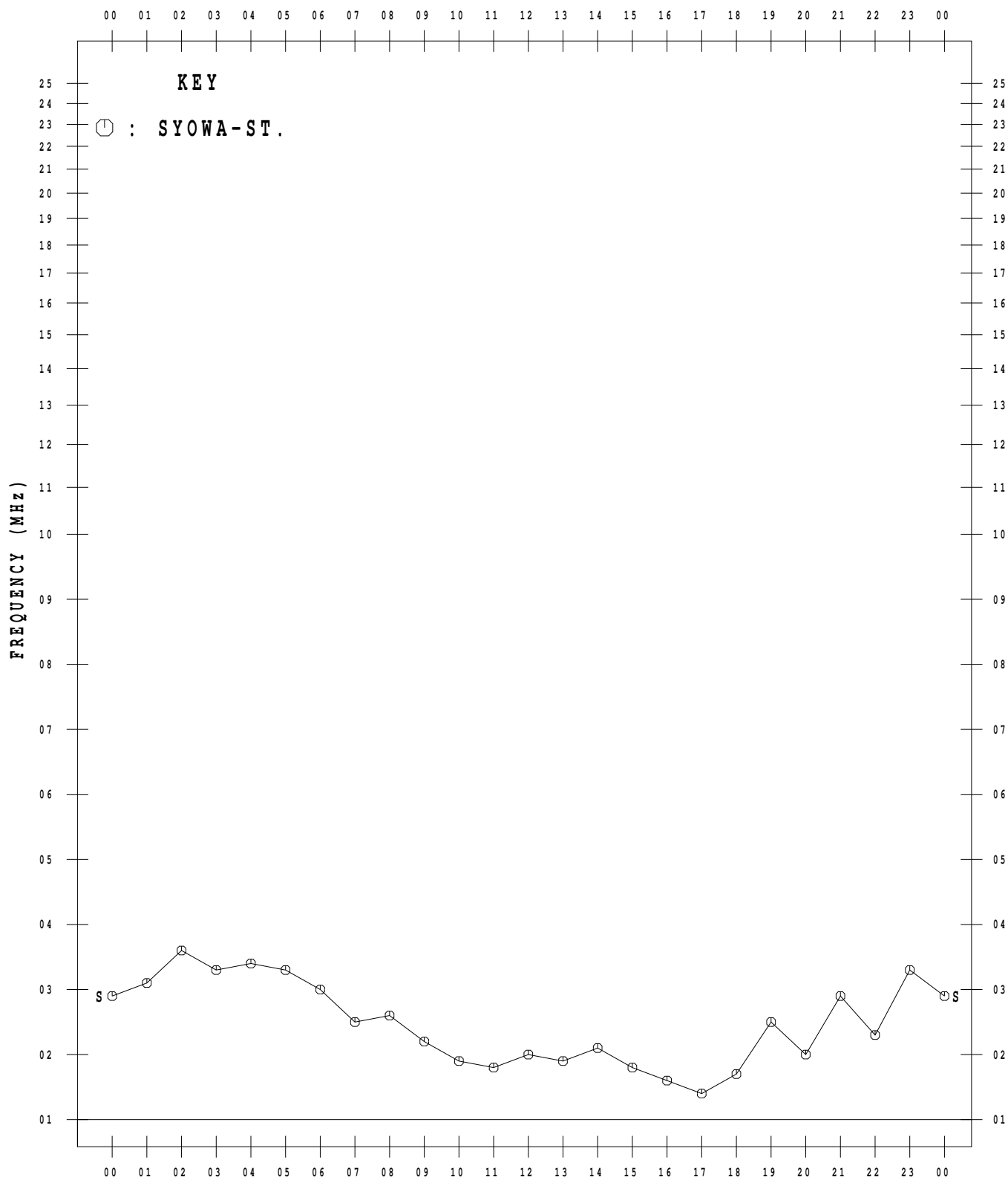
APR. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

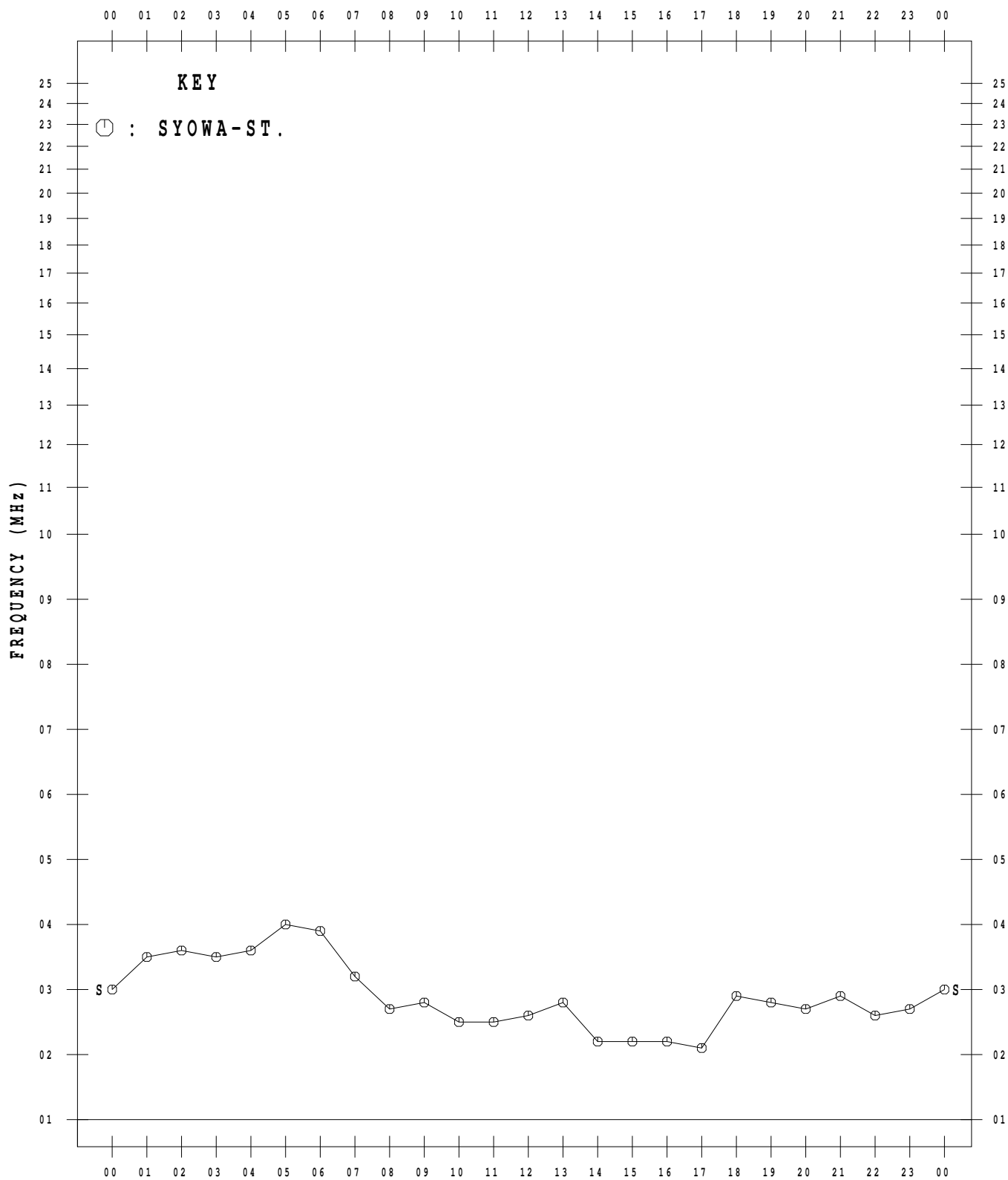
MAY 2009



MONTHLY MEDIAN VALUES OF f_{tE}s

45° E MEAN TIME

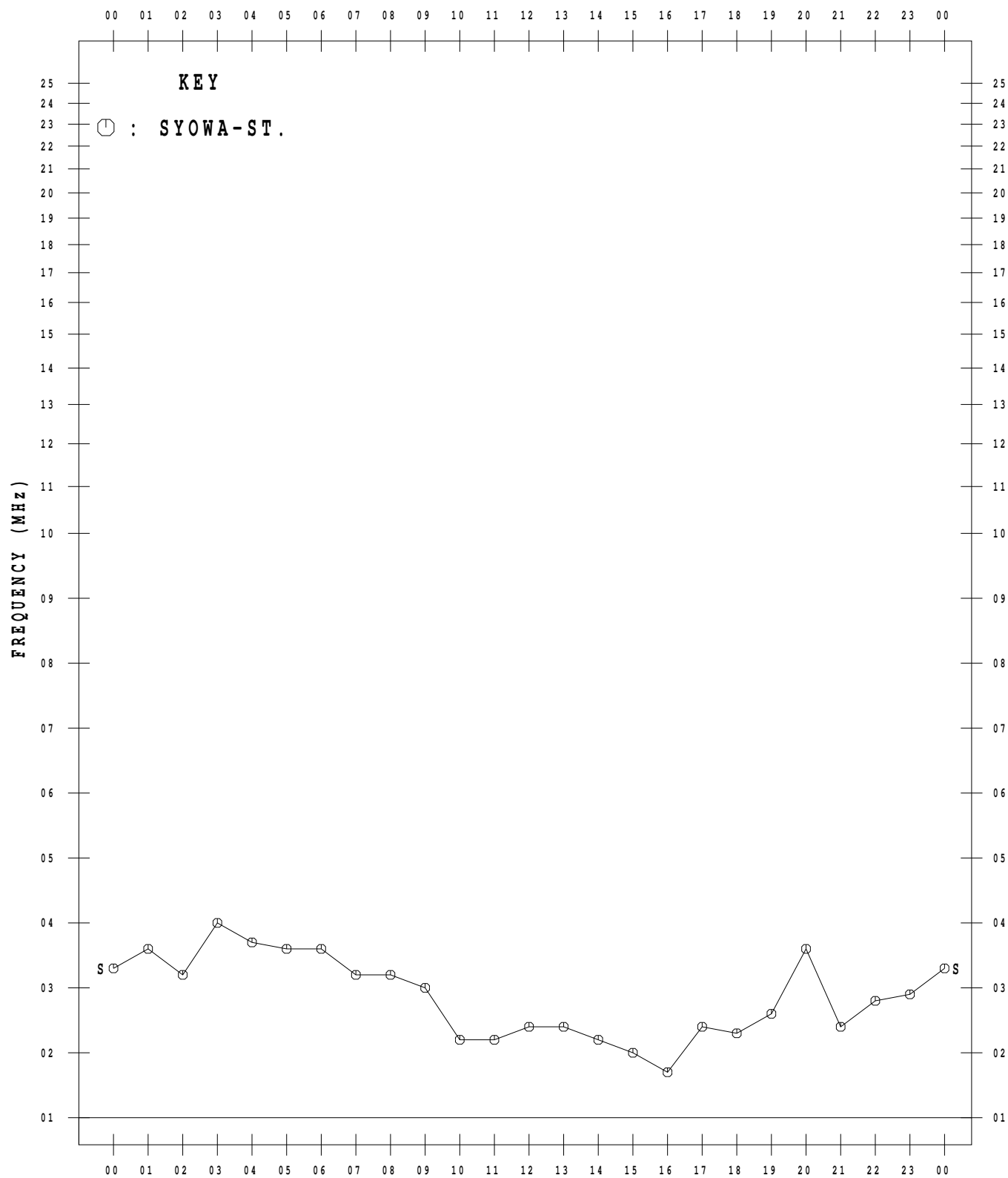
JUN. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

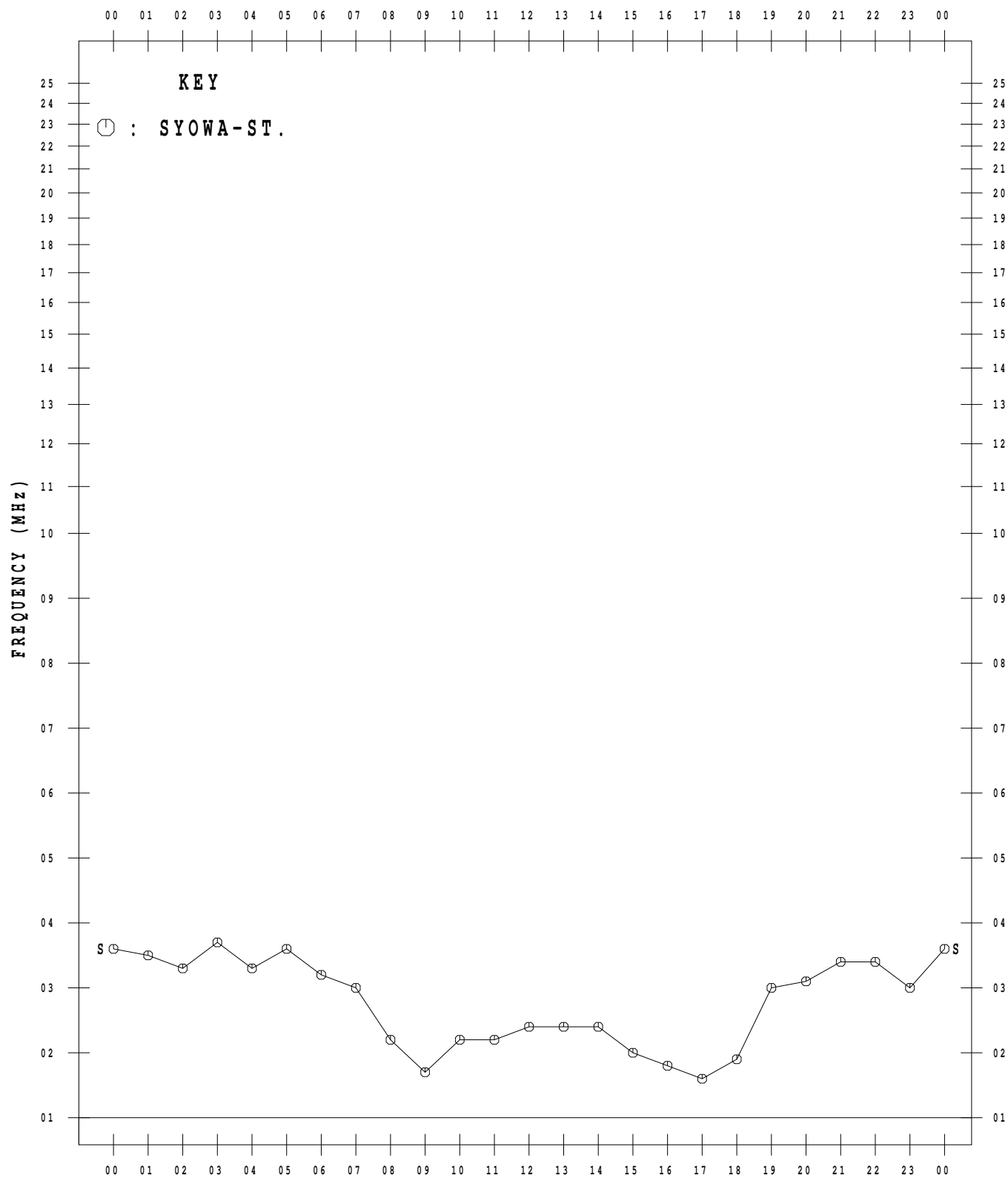
JUL. 2009



MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

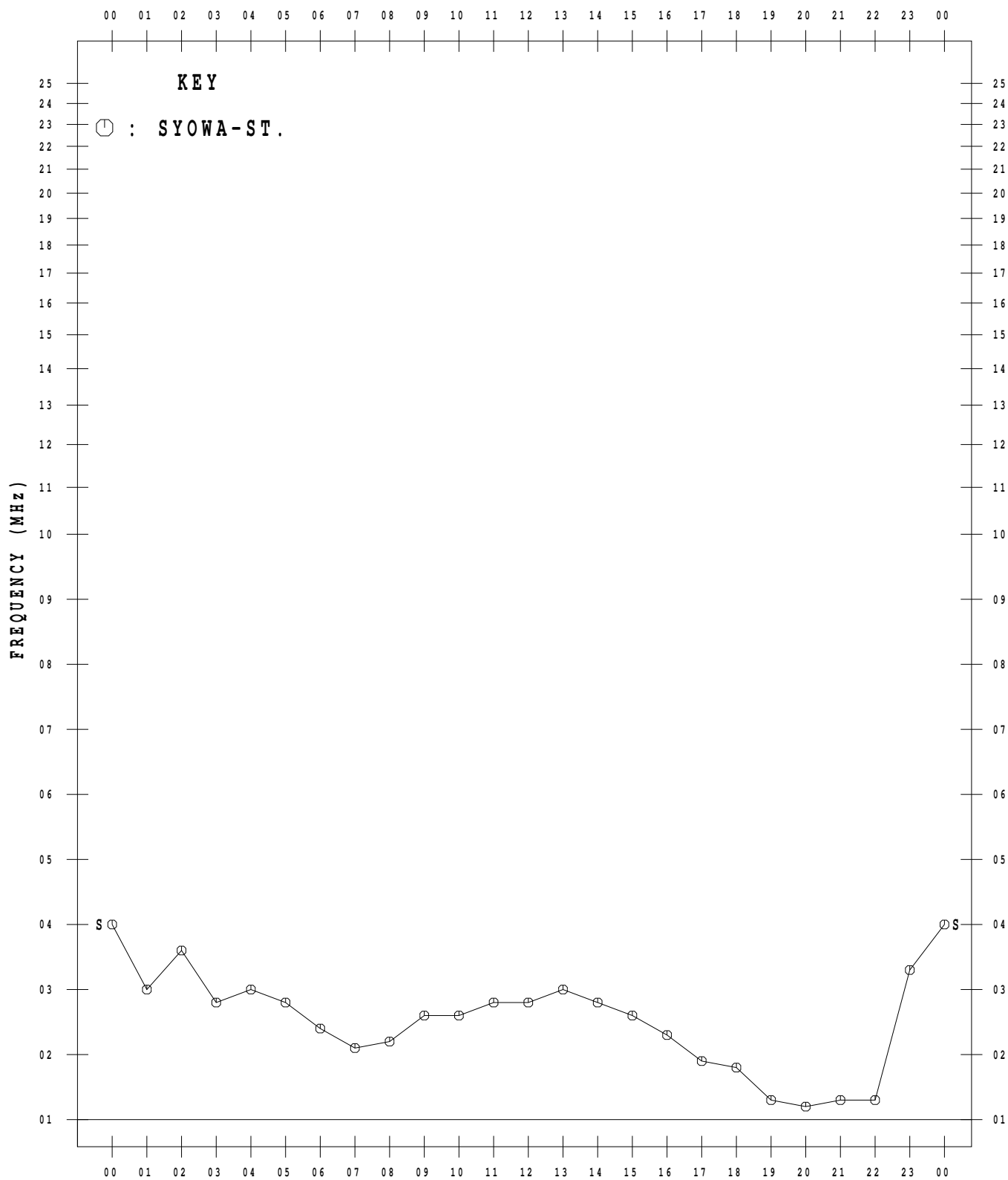
AUG. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

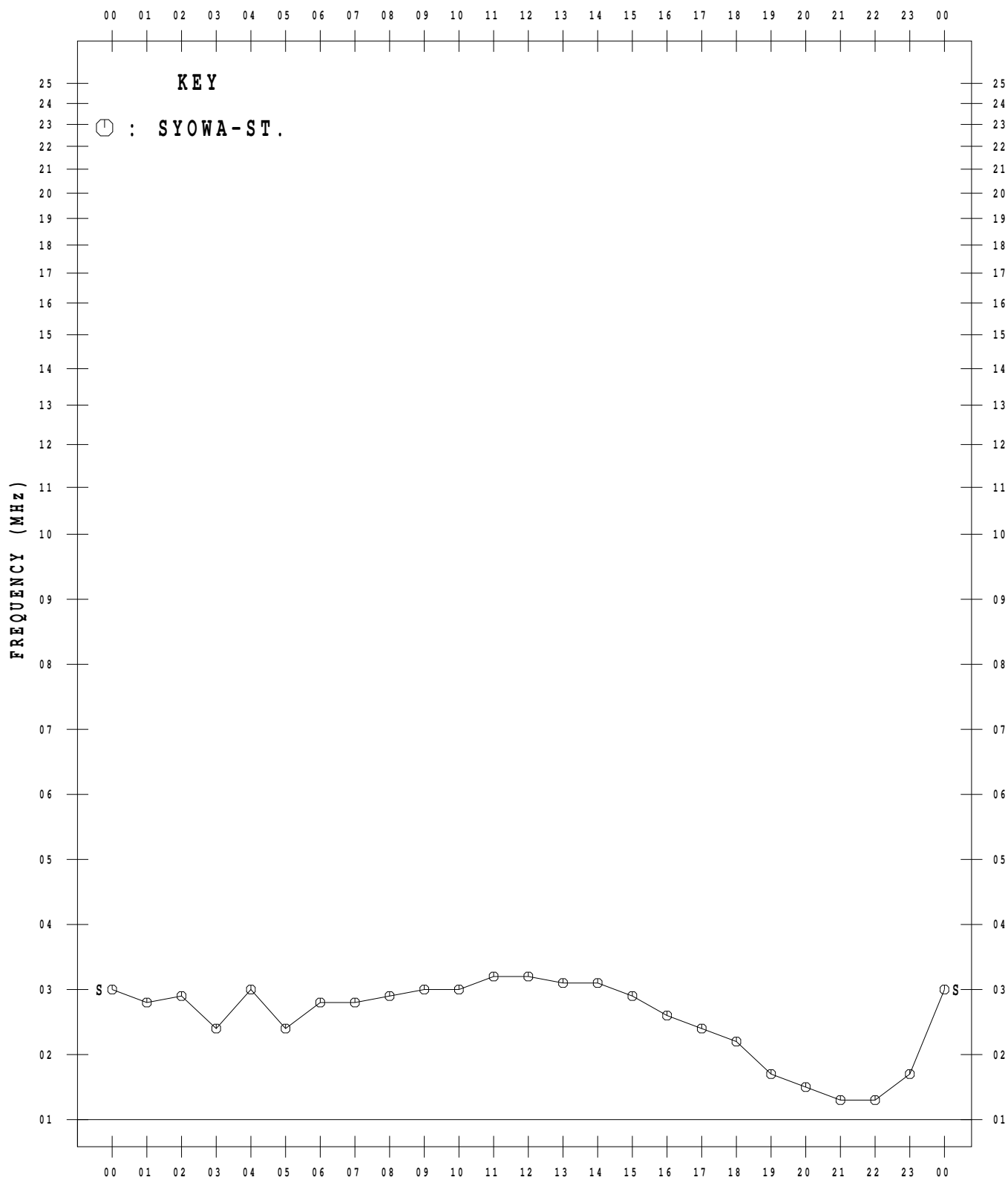
SEP. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

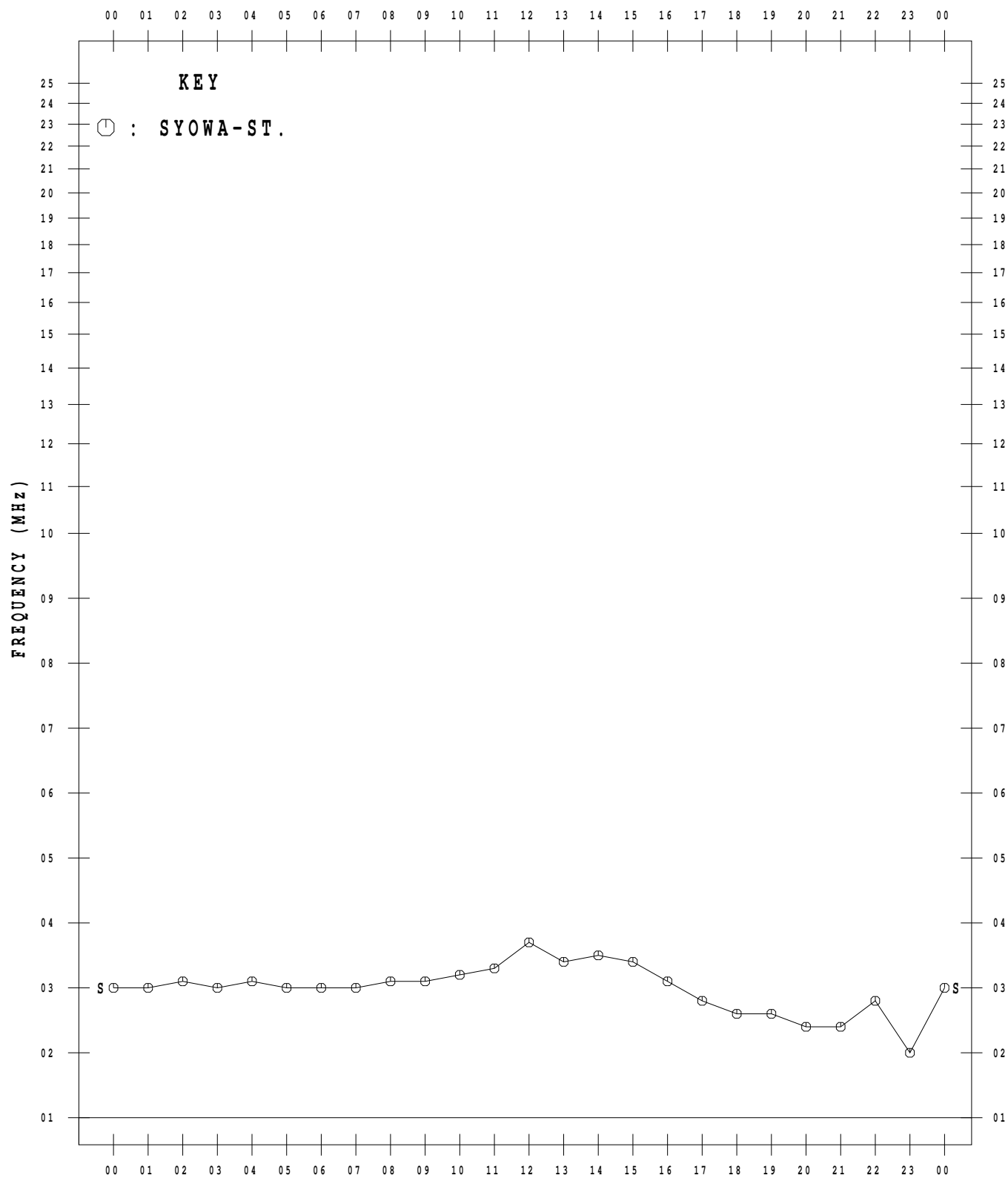
OCT. 2009



MONTHLY MEDIAN VALUES OF f_tE_s

45° E MEAN TIME

NOV. 2009



MONTHLY MEDIAN VALUES OF ftEs

45° E MEAN TIME

DEC. 2009

