ION.ANT.– 78

IONOSPHERIC DATA AT SYOWA STATION

(ANTARCTICA)

January – December 2011

CONTENTS

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 2011. The observations were conducted by the National Institute of Information and Communications Technology. 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 μs
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 600Ω

OBSERVERS

Observer: H. Kitauchi

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 atmospherics.

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.

Acknowledgment
Ionospheric observation at Syowa Station is based on the consignment study from the Ministry of Internal Affairs and Communications.

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2011 fxI (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	X 46	X 45	47	48	X 47	R	X 48	X 57	X 65	X 68	X 68	66	B	X 64	R	O X 58	X 60	X 58	X 59	X 54	X 51	X 55	X 54	X 46
2	X 42	A	O X 43	O X 47	O X 53	R	R	X 59	X 63	X 66	X 66	X 66	X 66	X 63	O X 65	X 59	O X 52	O X 54	X 57	X 57	X 54	O X 50	X 49	R
3	R	O X 43	R	R	O X 48	X 56	R	O X 52	X 57	X 58	X 57	X 58	R	R	R	R	C	O X 55	O X 55	R	48	X 44	O X 49	R
4	R	O X 49	O X 46	O X 50	67	R	X 55	66	B	B	B	R	R	X 58	X 64	R	O X 59	X 58	B	O X 51	X 47	B	B	O X 44
5	X 36	X 42	X 47	X 52	O X 58	X 64	X 71	X 72	O X 72	O X 69	O X 68	B	O X 64	R	O X 65	R	R	R	O X 57	O X 55	X 49	X 49	X 48	X 41
6	X 39	O X 46	R	R	B	R	X 58	66	O X 69	O X 67	X 65	X 62	X 60	X 63	X 65	X 65	X 63	X 59	X 58	O X 55	X 53	O X 53	X 49	X 42
7	R	X 46	R	R	R	O X 42	R	60	R	R	R	R	B	B	B	B	R	R	O X 45	O X 44	R	X 47	X 41	49
8	R	R	B	B	R	B	B	R	R	B	B	R	B	B	B	B	B	B	B	B	B	X 47	X 42	R
9	O X 39	B	R	O X 46	X 46	X 54	R	B	R	R	O X 47	R	R	R	R	O X 54	O X 55	O X 54	R	O X 52	O X 47	O X 44	X 40	O X 52
10	R	B	R	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	O X 55	X 49	O X 54	X 50	X 39
11	R	R	A	O X 47	R	R	B	B	R	O X 51	R	R	R	R	R	R	R	R	X 56	O X 48	B	O X 42	R	X 41
12	R	B	O X 44	R	X 43	O X 48	R	B	R	R	R	Y	Y	B	B	B	R	O X 53	O X 49	R	O X 50	X 47	X 40	O X 40
13	45	B	B	B	B	B	R	O X 48	R	C	B	R	B	R	R	R	R	R	R	O X 52	O X 42	B	R	R
14	B	B	37	64	R	R	R	R	R	R	R	R	B	B	B	R	B	O X 42	O X 49	B	B	R	X 40	X 40
15	R	R	O X 36	A	R	X 43	X 47	R	B	B	O X 56	R	R	O X 53	O X 49	R	B	B	O X 54	B	O X 52	X 46	X 46	X 43
16	37	X 40	X 41	X 43	X 46	O X 47	R	64	X 63	O X 63	X 58	X 58	R	R	R	R	X 48	O X 48	O X 46	X 50	O X 49	X 49	O X 39	X 38
17	O X 39	B	R	B	B	R	O X 49	O X 50	O X 55	R	R	R	R	R	R	O X 52	R	R	O X 50	O X 52	O X 50	R	X 48	37
18	R	B	R	O X 52	Y	B	O X 50	X 54	R	O X 54	R	R	R	R	R	O X 49	O X 47	R	O X 46	R	O X 52	X 49	X 47	X 41
19	38	X 40	X 42	R	B	R	B	R	R	R	R	B	O X 58	X 58	B	B	B	B	O X 49	B	O X 46	X 39	X 40	O X 38
20	X 41	X 40	X 43	R	O X 41	X 48	O X 50	O X 53	X 58	X 59	R	R	R	R	B	B	B	R	O X 47	R	X 43	O X 46	R	X 35
21	X 34	X 40	O X 39	X 40	R	O X 45	O X 48	X 54	X 55	O X 55	R	X 57	R	R	O X 55	R	O X 50	C	C	C	C	C	X 44	O X 37
22	40	X 38	X 38	X 44	B	O X 47	X 52	R	X 56	R	R	R	Y	R	R	O X 54	R	X 52	O X 52	X 47	X 52	O X 49	X 49	X 38
23	33	X 36	46	X 43	X 39	X 49	X 56	O X 62	X 62	X 58	X 60	R	X 63	X 57	R	R	R	O X 51	X 47	X 47	X 52	X 52	X 46	O X 46
24	X 45	X 46	X 51	X 51	X 51	X 53	X 57	X 56	O X 64	B	R	O X 63	X 67	X 62	O X 56	R	R	R	O X 50	O X 52	X 49	X 51	R	R
25	A	R	37	R	R	R	O X 46	O X 49	X 51	B	R	R	O X 56	X 57	R	R	R	B	B	O X 49	R	X 44	38	O X 39
26	A	A	R	R	R	R	O X 48	X O 49	O X 53	O X 54	B	R	R	R	O X 52	R	R	O X 54	X 48	X 44	X 46	X 46	42	32
27	A	R	44	O X 41	R	A	O X 49	X 50	O X 50	B	R	R	B	R	O X 47	R	R	R	X 49	X O 47	O X 45	O X 48	O X 45	X 42
28	33	B	42	O X 45	41	X 47	R	R	R	B	B	B	Y	B	B	B	B	O X 48	R	B	X 49	R	R	A
29	A	O X 45	41	36	A	A	R	O X 47	O X 47	R	R	O X 57	R	R	R	R	R	O X 48	O X 46	X 43	O X 48	X 44	X 39	X 37
30	37	B	B	X 31	46	O X 46	O X 52	R	R	X 53	R	R	R	R	B	R	O X 48	R	O X 48	A	X 46	X O 47	O X 46	X 39
31	39	X 41	X 46	O X 47	X 52	O X 63	X 66	X 66	X 65	X 64	X 64	R	O X 68	X 66	X 56	O X 54	O X 50	O X 52	O X 52	X 52	X 48	X 46	44	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	17	15	19	18	14	15	17	20	17	14	10	8	8	10	10	8	10	15	23	20	25	25	25	24
MED	X 39	X 42	X 43	X 46	X 46	X 48	X 50	X 55	X 58	X 58	X 62	X 60	X 64	X 60	O X 56	O X 54	O X 51	O X 53	O X 49	O X 52	X 49	X 47	X 45	X 40
U Q	X 42	X 46	X 46	X 50	X 52	X 54	X 56	63	O X 64	X 66	X 66	X 64	X 66	X 63	O X 65	X 58	X 59	X 55	X 55	O X 53	X 52	O X 50	X 48	X 42
L Q	36	X 40	X 39	X 43	X 43	O X 46	O X 48	O X 50	O X 54	O X 54	O X 57	X 58	O X 59	X 57	O X 52	O X 53	O X 48	O X 48	O X 47	X 47	X 46	X 45	X 40	X 38

JAN. 2011 fxI (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2011 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

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	41	F 39	41	R	42	51	59	62	62	F 56	B	58	R	R 52	J R 54	J R 52	53	48	45	49	48	40
2	36	A	R 37	R 41	R 47	R	R	53	57	60	60	60	60	57	R 59	53	U R 46	48	J R 51	51	48	44	43	R
3	R	R 37	R	R	42	J R 50	R	46	51	52	51	J R 52	R	R	R	R	C	U R 49	U R 49	R	42	38	43	R
4	A	R 43	R 40	44	R	R	49	F 57	B	B	B	R	R	J R 52	58	R	R 53	J R 52	B	R 45	41	B	B	38
5	30	36	41	46	R 52	V 58	65	66	R 66	63	62	B	R 58	R	R 59	R	R	R	R 51	R 49	43	43	42	35
6	33	40	R	R	B	R	J R 52	F 56	63	R 61	59	J R 56	J R 54	57	59	59	57	J R 53	J R 52	R 49	47	47	43	36
7	A	40	R	R	A	36	R	R	R	R	R	R	B	B	B	B	R	R	R 39	R 38	R	41	35	F 40
8	A	A	B	B	R	B	B	R	R	B	B	R	B	B	B	B	B	B	B	B	B	41	36	A
9	R 33	B	R	R 39	40	48	R	B	R	R	R 41	R	R	R	R	R 48	49	R 48	R	U R 46	41	38	34	46
10	R	B	R	B	B	B	B	B	R	B	B	B	B	B	B	B	B	B	B	R 49	J R 43	48	44	33
11	R	R	A	R 41	R	R	B	B	R	R 45	R	R	R	R	R	R	R	R	50	42	B	R 36	A	35
12	R	B	38	R	37	R 42	R	B	R	R	R	Y	Y	B	B	B	R	U R 47	R 43	R	44	41	34	34
13	F 35	B	B	B	B	B	R	R 42	R	C	B	R	B	R	R	R	R	R	R	U R 46	36	B	R	R
14	B	B	F 26	A	R	A	R	R	R	R	R	R	B	B	B	R	B	R 36	R 43	B	B	R	34	34
15	A	R	30	A	R	37	41	R	B	B	R 50	R	R	47	R 43	R	B	B	R 48	B	46	40	41	37
16	F 27	34	35	V 37	40	41	R	F 47	57	57	J R 52	J R 52	R	R	R	R	R 42	R 42	40	44	43	43	33	32
17	33	B	R	B	B	R	R 43	R 44	R 49	R	R	R	R	R	R	R 46	R	R	44	46	44	R	42	F 25
18	R	B	R	46	Y	B	44	48	R	R 48	R	R	R	R	R	R 43	R 41	R	R 40	R	46	43	41	35
19	F 30	34	36	R	B	R	B	R	R	R	R	B	R 52	R 52	B	B	B	B	43	B	R 40	33	34	R 32
20	34	34	37	A	35	42	44	47	52	53	R	R	R	R	B	B	B	R	41	R	37	R 40	R	29
21	28	34	33	34	R	39	R 42	48	49	R 49	R	J R 51	R	R	R 49	R	R 44	C	C	C	C	C	38	31
22	F 28	32	32	38	B	R 41	46	R	J R 50	R	R	R	Y	R	R	48	R	46	R 46	41	46	43	43	32
23	F 22	30	F 34	37	33	43	50	R 56	J R 56	52	J R 54	R	57	51	R	R	R	R 45	R 41	41	46	46	40	R 40
24	39	40	45	45	45	47	51	J R 50	58	B	R	R 57	61	56	R 50	R	R	R	R 44	46	43	45	R	A
25	A	R	F 27	A	R	R	40	43	45	B	R	R	U R 50	J R 51	R	R	R	B	B	R 43	R	38	F 28	33
26	A	A	R	A	A	R	42	43	R 47	48	B	R	R	R	U R 46	R	R	R 48	42	38	40	40	F 32	F 22
27	A	R	A	R 35	A	A	R 43	R 44	R 44	B	R	R	B	R	R 41	R	R	R	43	41	R 39	42	39	36
28	F 24	B	F 34	39	F 30	41	R	R	R	B	B	B	Y	B	B	B	B	R 42	R	B	J R 43	R	A	A
29	A	R 39	F 30	F 27	A	A	R	R 41	41	R	R	U R 51	R	R	R	R	R	U R 42	R 40	J R 37	R 42	38	33	31
30	F 27	B	B	25	F 36	R 40	U R 46	R	R	J R 47	R	R	R	R	B	R	42	A	U R 42	A	J R 40	41	40	33
31	F 30	35	40	R 41	46	S 57	60	60	59	58	58	R	62	60	50	R 48	R 44	46	46	46	42	40	F 34	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	17	15	18	17	13	15	17	19	17	14	10	8	8	10	10	8	10	15	23	20	25	25	25	24
MED	30	36	36	39	40	42	44	48	52	52	56	R 54	58	54	R 50	R 48	R 45	R 47	R 43	46	43	41	39	34
U Q	34	40	40	42	46	48	50	56	58	60	60	R 56	60	57	R 59	52	R 53	J R 49	R 49	R 47	46	44	42	36
L Q	F 28	34	F 32	36	36	40	42	R 44	48	R 48	R 51	J R 52	R 53	51	R 46	R 47	R 42	R 42	R 41	41	40	39	34	32

JAN. 2011 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2011 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	31	32	39	33	32	31	30	G 20	32	35	34	32	B	35	34	34	29	26	32	22	32	31	37	38
2	41	45	42	32	32	41	42	31	33	35	18	39	44	42	42	36	31	40	32	G	E B 22	22	26	36
3	G 25	41	36	G	43	53	38	40	34	34	33	33	32	28	43	32	C	32	27	27	E B 22	27	42	36
4	40	41	35	31	37	39	26	29	B	B	B	36	34	25	36	32	34	27	B	26	22	B	B	39
5	G	39	25	24	27	28	33	36	34	35	34	B	36	35	45	33	34	30	42	42	30	24	34	28
6	28	38	36	34	B	35	42	38	32	35	33	40	58	42	42	64	36	42	29	34	26	26	26	27
7	40	71	32	40	42	39	33	31	29	39	34	35	B	B	B	B	G	33	E B 30	27	30	30	28	31
8	48	36	B	B	33	B	B	38	31	B	B	27	B	B	B	B	B	B	B	B	B	32	38	38
9	38	B	32	G	G 15	G 23	40	B	32	32	29	29	36	37	30	30	31	31	34	26	25	22	32	39
10	39	B	G 26	B	B	B	B	B	43	B	B	B	B	B	B	B	B	B	B	E B 29	E B 24	21	20	G
11	G 26	G	43	41	42	G 26	B	B	32	G 24	32	G	34	35	35	32	30	34	31	28	B	G	42	36
12	34	B	36	38	G 20	32	35	B	33	33	33	G 22	G	B	B	B	E B 31	E B 38	28	E B 30	26	24	19	35
13	36	B	B	B	B	B	33	G	E B 32	C	B	36	B	33	31	G 22	32	29	E B 30	25	E B 26	B	33	38
14	B	B	30	42	39	46	36	38	36	31	32	32	B	B	B	37	B	E B 30	27	B	B	34	33	34
15	38	33	G	43	G 20	28	28	38	B	B	G	G 25	G 25	G	G 25	G 25	B	B	30	B	40	G 16	42	31
16	25	25	43	26	30	28	37	31	32	40	33	34	36	34	34	33	32	36	28	38	28	25	28	26
17	36	B	G 28	B	B	44	39	37	36	G	35	G 25	36	34	32	32	28	32	45	30	24	E B 22		29
18	27	B	30	35	20	B	G	32	39	36	33	E B 34	34	G	G 24	G 25	G 20	31	29	34	24	34	22	22
19	32	33	65	70	B	33	B	36	34	31	E B 31	B	34	33	B	B	B	B	34	B	E B 31	31	30	27
20	32	35	37	42	G	35	33	32	E B 36	31	34	37	E B 34	35	B	B	B	G 24	29	E B 26	27	27	19	E B 13
21	E B 13	28	16	41	30	G 24	G	31	32	32	32	34	34	36	38	38	32	C	C	C	C	C	29	33
22	25	29	31	G 23	B	36	28	42	33	24	G 24	34	28	34	37	G 17	G 17	33	29	27	25	43	21	17
23	16	E B 14	16	G	24	26	28	32	36	37	34	31	31	32	32	41	46	42	34	25	25	31	21	28
24	32	29	29	30	30	29	25	G 20	G	B	E B 34	E B 38	G 28	30	39	39	39	31	30	34	35	30	31	39
25	40	34	44	48	36	40	40	36	36	B	G	33	G 21	33	34	32	32	B	B	29	E B 24	28	32	34
26	43	42	28	42	44	38	50	31	28	G 17	B	34	33	G 22	32	G	32	32	30	G	23	G	39	28
27	39	K 32	30	32	40	42	27	G	27	B	33	G 22	B	33	33	36	27	G 21	E B 27	26	G	E B 20	E B 15	E B 28
28	E B 23	B	14	E B 27	25	40	41	28	E B 30	B	B	B	29	B	B	B	B	29	29	B	E B 28	34	44	47
29	40	35	34	57	50	41	35	35	35	31	32	32	32	32	32	G 26	32	33	28	38	24	E B 19	22	28
30	48	B	B	28	21	18	23	25	G	29	34	35	38	28	B	32	32	42	32	67	29	E B 21	16	E B 15
31	E B 14	22	27	18	24	24	G	30	28	30	34	37	32	44	32	35	33	32	36	36	20	23	29	46
	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	22	28	27	25	27	27	27	29	22	25	27	24	25	22	24	23	25	26	25	27	28	29	31
MED	33	34	32	33	30	35	33	32	32	32	33	34	34	33	34	32	32	32	30	28	24	26	29	31
U Q	40	39	36	42	40	40	39	37	36	35	34	36	36	35	38	36	33	35	32	34	29	31	36	38
L Q	26	29	G	G 26	G 22	28	27	G 29	30	30	32	G 29	G 30	29	32	G	29	30	29	26	24	22	22	27

JAN. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2011 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	11	12	11	12	16	20	13	12	12	14	14	13	B	15	19	20	17	14	14	12	12	12	12	13
2	13	13	13	15	14	20	22	13	12	12	11	14	12	13	13	14	16	13	13	13	22	12	13	13
3	14	13	15	17	19	15	16	13	12	13	14	15	14	15	15	13	C	12	16	15	22	13	15	30
4	13	13	22	23	28	14	22	12	B	B	B	14	14	13	18	23	16	16	B	13	12	B	B	12
5	12	12	13	12	12	12	12	12	13	13	14	B	13	20	13	14	13	13	13	13	13	12	12	13
6	12	14	23	28	B	22	14	12	15	13	13	14	13	13	13	13	14	13	13	13	13	12	12	14
7	13	14	19	26	13	14	12	12	12	23	19	17	B	B	B	B	24	17	30	18	24	14	13	13
8	16	14	B	B	29	B	B	36	19	B	B	24	B	B	B	B	B	B	B	B	B	14	13	14
9	16	B	20	18	13	15	22	B	22	15	15	14	24	24	17	18	17	16	15	14	14	15	15	13
10	25	B	22	B	B	B	B	B	20	B	B	B	B	B	B	B	B	B	B	29	24	16	14	16
11	17	20	26	20	21	22	B	B	18	19	22	18	18	19	14	14	14	23	15	20	B	19	12	13
12	22	B	20	24	17	16	14	B	22	18	15	15	20	B	B	B	31	38	22	30	15	14	13	13
13	13	B	B	B	B	B	15	13	32	C	B	22	B	24	15	18	14	14	29	16	26	B	29	26
14	B	B	13	20	27	21	30	23	16	14	16	18	B	B	B	30	B	30	21	B	B	20	13	13
15	13	14	14	18	14	13	14	14	B	B	20	20	21	17	14	14	B	B	20	B	23	13	13	12
16	12	11	11	13	13	15	16	13	13	14	14	14	17	15	14	19	14	12	12	12	13	14	14	13
17	13	B	24	B	B	13	17	15	16	16	19	16	17	16	13	16	22	12	14	14	14	22	14	12
18	16	B	20	28	16	B	22	16	21	15	22	34	14	16	19	15	17	13	14	14	12	14	12	12
19	12	12	13	14	B	29	B	14	16	14	31	B	15	23	B	B	B	B	20	B	31	13	12	12
20	12	13	13	19	18	14	14	16	36	17	13	17	34	21	B	B	B	16	20	26	18	12	14	13
21	13	13	13	13	13	14	16	14	12	12	13	14	20	18	16	16	22	C	C	C	C	C	13	15
22	13	13	13	13	B	19	15	26	14	14	13	15	23	14	14	14	13	13	15	15	16	18	12	12
23	13	14	12	15	13	12	13	14	14	23	14	21	18	17	13	14	12	14	14	14	14	14	12	15
24	12	13	12	15	12	13	14	14	19	B	34	38	25	16	18	15	19	22	12	14	12	12	18	12
25	15	19	14	16	18	17	15	13	13	B	23	31	16	12	15	18	21	B	B	14	24	13	13	17
26	12	14	17	29	20	16	14	12	14	14	B	25	15	14	15	15	15	12	13	13	13	16	12	12
27	14	25	25	24	24	14	12	14	13	B	24	19	B	23	19	14	15	13	27	16	13	20	15	28
28	23	B	12	27	16	13	20	24	30	B	B	B	23	B	B	B	B	18	23	B	28	28	23	20
29	28	20	13	13	15	19	23	19	16	16	14	14	13	14	15	18	15	14	14	14	13	19	13	12
30	12	B	B	23	16	13	15	18	23	12	22	30	14	16	B	14	15	12	12	13	13	21	13	15
31	14	12	12	12	12	13	13	11	13	13	15	23	14	16	18	12	13	11	13	15	12	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	31	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	30	30	30	30	30	30	31	31
MED	13	14	14	19	17	15	15	14	16	16	19	18	18	17	17	16	17	14	15	14	14	14	13	13
U Q	16	B	22	27	B 28	21	22	23	22	B	B 31	30	B 34	B 24	B	B 30	B 31	B 23	23	B 26	24	19	14	15
L Q	12	13	13	14	13	13	14	13	13	14	14	14	14	15	14	14	14	13	13	13	13	13	12	12

JAN. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JAN. 2011 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	228	216	234	A	A	A	214	216	196	188	200	198	B	198	A	198	200	202	196	196	200	202	202	234
2	250	A	A	230	E A 274	A	A	202	196	192	192	208	208	208	216	206	198	198	200	200	194	208	208	A
3	A	A	A	A	A	E A 244	A	A	H 200	204	198	E Y 216	190	196	E A 262	200	C	198	198	218	202	A 218	A	A
4	A	A 244	A	A	A	A	198	190	B	B	B	A	194	A 214	200	200	A 210	202	B	188	188	B	B	A
5	226	E A 234	A 236	236	216	208	196	206	192	212	190	B	198	A	A	190	190	194	220	A 220	206	198	200	216
6	Q 240	A	A	A	B	A	A	A 242	204	208	218	A	218	196	192	A	212	A 224	218	210	214	206	212	240
7	A	228	A	A	A	A 232	222	206	A	A	A	A	B	B	B	B	208	220	198	198	A	208	244	198
8	A	A	B	B	R	B	B	A	A	B	B	216	B	B	B	B	B	B	B	B	B	216	E A 238	A
9	A	B	A	A	A 246	E A 288	A	B	A	E A 246	200	190	190	224	194	184	208	198	A	210	214	232	E A 278	A
10	A	B	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	218	218	214	228	264
11	A	A	A	A	A	A	B	B	212	198	190	192	204	208	200	204	202	206	212	206	B	E A 286	A	E A 298
12	A	B	E A 268	A	A	A	A	B	A	A	202	Y	Y	B	B	B	198	B	208	220	218	222	206	A
13	A	B	B	B	B	B	A	216	208	C	B	A	B	196	196	188	180	226	202	208	224	B	A	A
14	B	B	190	A	A	A	A	A	A	218	204	208	B	B	B	A	B	194	202	B	B	A	230	E A 280
15	A	A	A	A	A	A	210	A	B	B	192	214	196	194	200	184	B	B	214	B	E A 236	204	234	222
16	Q 228	246	A 260	E A 230	H 194	236	A	206	188	190	186	194	198	208	200	204	194	194	Q 200	218	198	218	A 228	208
17	A	B	A	B	B	A	A	A	224	216	196	E Y 218	208	198	198	198	190	200	198	206	200	200	200	E A 256
18	A	B	A	A	Y	B	E A 256	196	A 226	204	188	196	196	202	202	194	196	206	214	208	208	212	204	204
19	A	E A 270	208	210	B	R	B	A	A	E A 222	206	B	202	E A 228	B	B	B	B	200	B	E B 248	252	Q 252	A
20	234	218	A	A	A 244	204	210	198	B	198	204	200	200	188	B	B	B	198	200	206	204	218	218	212
21	216	A 260	238	A	A	A	190	210	184	188	196	186	184	E A 254	218	198	198	C	C	C	C	C	224	284
22	A	254	A	A	B	A	224	A	190	190	196	A	Y	A	206	200	188	198	198	208	208	226	Q 226	Q 236
23	212	Q 272	A 244	230	214	192	198	198	198	196	190	190	220	198	A	190	208	208	196	200	192	222	208	230
24	Q 238	250	244	A 238	218	210	200	200	198	B	198	E B 232	192	208	200	198	198	208	196	204	224	222	A	A
25	A	A	226	A	A	A	216	A	192	B	A	R	222	196	204	206	206	B	B	220	202	Q 212	204	A
26	A	A	A	A	A	A	196	190	196	188	B	198	E A 226	198	198	198	198	198	204	198	210	228	232	A
27	A	A	A	A	A	A	232	194	178	B	186	A	B	196	196	E A 224	198	202	210	196	224	230	216	248
28	B	B	Q 230	290	Q 240	232	A	222	202	B	B	B	Y	B	B	B	B	202	212	B	224	A	A	A
29	A	A	196	196	A	A	A	A	214	A	220	192	192	206	224	200	200	186	202	230	220	226	226	236
30	E A 272	B	B	B	A	216	198	204	202	210	A	210	210	A	B	184	204	A	192	A	192	230	Q 222	210
31	236	242	256	Q 218	Q 226	Q 226	208	194	194	194	204	196	E A 244	202	194	190	196	214	214	210	192	220	Q 220	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	11	12	13	9	9	11	16	18	21	19	22	19	21	22	19	22	23	23	25	24	26	26	25	18
MED	231	244	235	230	222	218	206	203	198	197	197	197	199	199	200	198	198	202	202	208	206	218	220	227
U Q	240	257	A 250	237	E A 245	E A 236	219	210	206	212	204	E 214	214	208	206	200	206	208	212	218	220	226	231	E A 256
L Q	226	231	217	214	215	208	198	196	192	190	190	192	193	196	196	190	196	198	198	200	200	208	207	212

JAN. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2011 fxI (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	A	58	A	42	48	44	O X 49	R	R	58	R	B	X 64	B	O X 56	R	O X 56	X 52	O X 50	O X 48	R	R	A	A
2	A	R	O X 36	A	A	56	B	R	O X 52	O X 50	B	R	O X 55	R	R	R	R	B	O X 52	O X 50	X 46	X 45	X 40	R
3	R	R	40	X 41	X 43	47	X 46	X 48	X 53	X 56	X 56	R	R	R 55	R	O X 52	R	O X 50	O X 51	R	X 45	X 43	X 46	X 43
4	X 36	43	49	X 45	X 49	X 54	X 64	B	B	R	R	R	X 60	O X 56	O X 54	O X 50	O X 50	X 56	O X 52	O X 52	X 46	86	A	A
5	A	R	X 33	36	R	B	A	R	X 43	R	R	B	B	B	B	B	O X 51	O X 48	O X 46	X 44	X 42	O X 42	A	A
6	B	B	R	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	R	X 48	O X 43	X 32	A	O X 40
7	R	R	B	R	R	R	O X 46	X 47	O X 50	O X 51	O X 56	O X 54	R	R	R	R	O X 55	O X 55	O X 51	X 51	X 46	X 42	X 38	X 26
8	O X 32	A	A	R	B	B	B	B	B	O X 54	X 59	X 56	R	B	X 60	B	B	B	O X 55	O X 53	X 50	X 46	X 45	X 39
9	R	A	R	B	R	X 47	56	X 53	O X 54	X 50	O X 54	R	X 60	R	R	R	O X 56	X 57	O X 55	O X 53	X 48	X 47	X 37	35
10	29	30	33	38	45	O X 53	X 57	X 60	63	X 60	X 60	X 64	O X 68	O X 65	X 58	X 59	R	X 61	X 58	O X 52	O X 53	X 49	X 51	X 50
11	50	A	A	A	O X 42	50	R	R	C	C	C	C	C	C	C	C	C	C	X 59	X 55	X 49	X 50	R	R
12	A	A	O X 46	X 44	A	A	50	R	X 49	X 53	X 55	X 56	B	B	X 58	O X 57	O X 54	O X 51	O X 52	O X 49	X 50	X 49	31	31
13	32	35	38	40	44	50	X 52	X 56	X 64	X 70	O X 70	X 68	O X 68	X 64	R	O X 62	X 60	X 57	X 56	54	O X 53	50	X 50	X 47
14	43	40	39	54	48	O X 53	X 55	65	X 66	X 69	X 74	X 74	X 76	O X 71	X 66	X 67	O X 66	O X 56	O X 53	50	X 46	50	R	66
15	A	A	57	70	57	R	O X 48	X 52	X 58	X 60	X 61	O X 63	B	X 60	O X 57	R	B	R	B	X 50	X 42	O X 37	B	X 26
16	53	B	A	A	O X 40	O X 49	O X 52	R	X 60	R	R	O X 64	X 64	O X 66	X 61	B	B	O X 54	X 52	O X 52	O X 50	X 46	X 46	X 46
17	X 42	31	32	35	44	O X 43	X 43	B	B	O X 66	B	B	B	B	O X 68	B	B	O X 61	X 50	R	O X 50	X 49	X 48	B
18	25	28	32	42	50	R	R	68	B	B	B	O X 66	B	B	R	B	O X 57	X 50	R	X 44	R	X 36	X 35	R
19	A	R	B	B	R	B	R	R	B	B	B	B	B	B	B	O X 44	B	B	B	O X 49	B	B	O X 42	R
20	R	A	A	A	A	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	O X 32
21	R	B	B	B	B	B	R	R	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	A
22	A	O X 39	B	B	B	A	X 47	O X 52	R	R	R	X 56	B	B	B	R	X 58	O X 52	O X 49	X 49	X 47	X 46	X 45	40
23	39	35	X 30	39	R	41	R	X 46	O X 49	R	R	X 54	B	B	X 58	R	B	X 55	B	B	R	O X 44	O X 38	R
24	A	26	33	32	38	O X 44	O X 45	O X 48	R	B	B	B	B	B	B	B	R	B	B	R	O X 46	B	X 42	X 34
25	X 36	40	X 44	X 46	O X 47	O X 48	X 54	X 59	X 66	X 66	O X 66	O X 74	O X 74	O X 73	O X 66	O X 60	O X 58	X 55	O X 54	X 49	O X 47	X 44	O X 38	35
26	A	A	32	32	38	X 43	X 49	X 53	X 57	R	O X 60	R	O X 64	O X 67	B	O X 64	O X 57	X 56	X 56	A	X 50	42	X 25	A
27	A	A	A	A	X 33	X 40	X 45	X 48	O X 52	R	X 56	X 56	58	X 59	X 60	X 59	X 60	X 54	X 50	X 49	X 47	X 41	35	X 33
28	31	X 27	25	X 24	X 27	A	X 46	X 50	R	R	X 64	R	R	O X 63	X 63	X 60	X 57	C	O X 52	X 46	X 45	X 43	37	34
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	12	12	16	16	16	16	18	15	15	13	13	13	11	11	13	11	14	18	20	21	22	23	19	17
MED	36	35	34	40	44	X 48	X 49	X 52	X 54	X 58	X 60	X 63	X 64	O X 64	X 60	O X 59	O X 57	X 55	O X 52	X 50	X 47	X 45	X 40	X 35
U Q	42	40	42	X 44	48	X 52	X 54	59	X 63	X 66	X 65	X 67	O X 68	O X 67	X 64	O X 62	X 58	X 56	X 55	O X 52	O X 50	49	X 46	X 44
L Q	32	29	32	36	X 39	X 44	X 46	X 48	X 50	X 52	X 56	X 56	X 60	X 59	O X 58	O X 52	O X 55	O X 52	O X 50	X 48	X 46	X 42	37	X 32

FEB.2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB. 2011 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

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	A	A	A	F 32	F 38	F 28	43	R	R	F 48	R	B	J R 58	B	R 50	R	50	46	44	42	A	A	A	A
2	A	A	R 30	A	A	F 46	B	R	R 46	44	B	R	R 49	R	R	R	R	B	U R 46	44	40	39	34	A
3	A	R	F 30	35	37	F 38	40	42	47	50	50	R	R	R	R	R 46	R	R 44	R 45	R	39	37	40	37
4	30	F 30	F 40	39	43	J R 48	58	B	B	R	R	R	J R 54	R 50	R 48	R 44	R 44	50	R 46	46	40	A	A	A
5	A	A	27	F 24	R	B	A	A	37	A	A	B	B	B	B	B	R 45	R 42	R 40	38	36	36	A	A
6	B	B	A	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	R	42	37	26	A	R 34
7	A	R	B	A	A	R	R 40	41	44	R 45	U R 50	R 48	R	R	R	R	R 49	R 49	R 45	45	40	36	32	20
8	R 26	A	A	R	B	B	B	B	B	R 48	J R 53	50	R	B	J R 54	B	B	B	R 49	47	44	40	39	33
9	A	A	A	B	R	41	F 46	47	R 48	R 44	48	R	J R 54	R	R	R	R 50	51	R 49	48	42	41	31	F 27
10	F 18	F 20	F 23	F 28	F 37	R 47	J R 51	J R 54	J R 57	J R 54	J R 54	J R 58	62	59	52	J R 53	R	55	52	R 46	47	43	45	44
11	31	A	A	A	36	F 41	A	R	C	C	C	C	C	C	C	C	C	C	53	49	43	44	R	R
12	A	A	R 40	38	A	A	F 40	A	43	47	49	50	B	B	52	R 51	R 48	45	46	43	44	43	F 21	F 22
13	F 22	F 25	F 28	F 30	F 33	F 41	46	50	58	64	U R 64	62	R 62	58	R	56	J R 54	R 51	50	R 48	R 47	44	44	41
14	F 30	F 30	F 23	F 30	F 37	47	49	F 55	60	63	68	68	J R 70	R 65	60	61	R 60	R 50	47	F 40	40	F 40	A	F 34
15	A	A	F 36	F 38	F 25	R	R 42	46	52	54	J R 55	57	B	54	R 51	R	B	R	B	44	36	31	B	20
16	A	B	A	A	R 34	43	R 46	R	J R 54	R	R	R 58	58	60	55	B	B	48	46	R 46	R 44	40	40	40
17	36	F 20	F 19	F 24	Z 38	R 37	J R 37	B	B	R 60	B	B	B	B	R 62	B	B	R 55	J R 44	R	R 44	J R 43	J R 42	B
18	F 16	F 20	F 21	F 30	R 44	D R 34	R	F 58	B	B	B	R 60	B	B	R	B	51	J R 44	R	38	A	30	29	R
19	A	R	B	B	R	B	R	R	B	B	B	B	B	B	B	38	B	B	B	R 43	B	B	R 36	A
20	R	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R 26
21	A	B	B	B	B	B	R	R	B	B	R	B	R	B	B	B	B	B	B	B	B	B	B	A
22	A	R 33	B	B	B	A	41	R 46	R	R	R	50	B	B	B	R	J R 52	R 46	R 43	43	41	40	39	V 34
23	F 27	F 21	24	F 30	A	F 30	R	40	43	R	R	R 48	B	B	J R 52	R	B	J R 49	B	B	A	38	R 32	A
24	A	F 18	F 21	F 20	F 28	R 38	R 39	R 42	R	B	B	B	B	B	B	B	R	B	B	R	R 40	B	36	28
25	30	F 27	38	40	R 41	R 42	R 48	J R 53	60	J R 60	R 61	68	68	R 67	60	R 54	U R 52	R 49	48	R 43	41	38	32	F 24
26	A	A	F 21	F 21	F 25	37	43	47	J R 51	R	R 54	R	58	61	B	58	51	50	50	A	44	F 32	19	A
27	A	A	A	A	27	34	39	42	46	R	50	50	52	53	54	53	54	48	44	43	41	35	F 23	27
28	F 21	21	F 15	18	21	A	40	44	R	R	58	R	A	R 57	J R 57	J R 54	51	C	46	40	39	37	F 28	F 24
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	11	11	16	16	16	17	18	15	15	13	13	13	11	10	13	11	14	18	20	21	22	22	19	17
MED	F 27	F 21	F 26	F 30	36	41	42	46	48	50	R 54	57	R 58	58	R 54	R 53	R 51	R 49	46	43	41	38	34	28
U Q	30	F 30	33	36	38	44	R 46	53	57	60	60	61	R 62	R 61	58	56	R 52	R 50	49	46	44	41	40	36
L Q	F 21	F 20	F 21	F 24	F 28	36	40	42	44	46	50	50	R 54	54	R 52	R 46	R 49	R 46	R 44	42	40	36	F 29	F 24

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2011 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	58	43	47	32	36	40	41	43	58	40	G	B	35	B	33	G	38	40	26	42	44	42	42	40
2	56	41	120	43	67	G 22	B	33	28	G	B	36	33	32	32	30	31	B	E B 28	E B 24	23	22	17	31
3	33	37	32	32	26	29	32	32	35	36	32	32	34	30	32	G 18	G 17	33	28	41	24	21	24	21
4	22	25	E B 14	E B 14	25	25	25	B	B	G	G	G 20	G 18	G 19	34	31	G 16	G	G 16	24	24	51	64	47
5	44	40	64	39	21	B	40	33	100	40	39	B	B	B	B	B	E B 32	19	28	30	27	J A 65	38	39
6	B	B	32	B	B	B	34	B	B	B	B	B	B	B	B	B	B	B	25	25	24	20	38	38
7	34	32	B	41	42	36	33	30	28	27	35	31	37	32	32	32	32	E B 30	24	25	25	18	16	21
8	25	43	35	31	B	B	B	B	B	32	32	E B 39	37	B	25	B	B	B	E B 26	G 19	E B 20	19	18	E B 14
9	37	44	35	B	G 25	38	30	G 15	G 15	36	G 22	32	32	32	30	44	42	33	G	24	25	25	E B 13	E B 13
10	E B 12	20	E B 15	29	16	16	25	30	G 19	G 18	G	E B 32	E B 35	32	35	28	44	43	27	25	E B 19	E B 19	25	51
11	35	69	50	43	36	29	44	38	C	C	C	C	C	C	C	C	C	C	31	24	32	24	32	33
12	43	43	39	42	47	44	42	50	34	28	33	G 22	B	B	G	G	30	G 17	26	24	24	33	E B 14	16
13	E B 13	24	E B 14	E B 17	18	G 15	G 16	28	30	30	G 24	E B 32	E B 56	E B 32	E B 40	34	34	G	G 21	E B 23	25	22	30	46
14	25	24	28	E B 14	E B 14	G 16	27	32	29	39	40	45	45	50	34	31	46	87	66	32	28	30	38	42
15	118	52	40	54	38	34	38	38	32	30	31	32	B	31	G	E B 30	B	32	B	26	21	E B 17	B	E B 20
16	32	B	42	38	K 24	E B 20	G 20	G 30	41	33	32	G 24	G 25	G 23	25	B	B	G 21	26	21	G 14	E B 15	24	30
17	28	E B 14	E B 13	E B 15	E B 17	E B 18	E B 24	B	B	E B 54	B	B	B	B	E B 50	B	B	E B 31	E B 25	G	E B 28	E B 14	E B 20	B
18	E B 12	E B 14	16	16	E B 14	E B 28	Y	G 27	B	B	B	E B 38	B	B	28	B	G	30	G	37	41	19	18	26
19	58	20	B	B	35	B	36	36	B	B	B	B	B	B	B	E B 30	B	B	B	E B 30	B	B	E B 26	37
20	G 20	42	46	40	39	41	41	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	30
21	29	B	B	B	B	B	37	36	B	B	G	B	E B 31	B	B	B	B	B	B	B	B	B	B	68
22	58	34	B	B	B	48	36	G	G 18	E B 29	26	31	B	B	B	E B 30	E B 30	E B 30	E B 24	E B 20	24	16	E B 12	E B 15
23	E B 14	22	25	28	36	34	36	G 19	G	G	G	G 18	B	B	28	30	B	34	B	B	44	E B 20	E B 13	36
24	33	26	E B 13	E B 14	E B 16	G	G 17	27	32	B	B	B	B	B	B	B	E B 29	B	B	36	E B 26	B	24	27
25	E B 14	22	E B 15	E B 13	E B 15	E B 14	20	G 14	25	G	G 23	G 25	27	26	38	49	30	32	G	E B 22	E B 18	E B 16	E B 12	30
26	37	K 38	26	20	E B 12	22	46	28	E B 28	G 19	G	E B 31	G 18	G	B	32	32	44	82	59	26	21	30	35
27	30	63	46	42	34	30	G 18	G	15	27	28	28	29	34	33	G 21	27	G	G 21	20	17	32	E B 13	E B 14
28	E B 13	E B 14	E B 14	E B 13	41	46	G 15	24	24	E B 28	G	G	50	26	33	G 20	25	C	32	18	17	17	E B 12	34
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	27	25	24	23	24	23	25	24	19	21	20	19	16	14	19	18	18	19	22	25	25	24	26	27
MED	32	34	32	31	26	29	33	30	28	28	G	E G 31	33	32	32	30	30	31	26	24	24	20	23	31
U Q	43	43	44	41	37	38	39	36	34	36	32	32	37	32	34	32	34	34	28	31	28	28	32	39
L Q	E B 20	22	E B 15	E B 15	E B 16	20	G 22	G 28	G	G	G	G 25	G 28	G 26	28	G	G 27	G	G	22	20	E B 18	E B 14	E B 21

FEB.2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2011 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	13	12	13	12	14	15	15	13	20	B	22	B	24	20	22	26	13	13	13	14	17	14
2	23	18	14	18	14	14	B	15	14	22	B	33	22	16	15	14	20	B	28	24	18	12	12	11
3	12	12	13	14	14	15	15	15	15	12	14	18	16	16	16	15	16	16	23	23	14	13	13	12
4	12	13	14	14	12	14	13	B	B	22	22	18	15	16	14	14	13	16	15	14	13	16	16	13
5	23	14	12	11	12	B	14	13	14	16	18	B	B	B	B	B	32	17	20	13	15	16	12	19
6	B	B	14	B	B	B	24	B	B	B	B	B	B	B	B	B	B	B	22	15	20	12	14	14
7	22	13	B	25	18	17	14	13	14	13	14	28	22	25	22	19	21	30	15	12	14	14	12	11
8	14	20	15	22	B	B	B	B	B	19	20	39	28	B	22	B	B	B	26	14	20	16	13	14
9	12	14	26	B	23	18	16	14	13	15	14	20	23	28	23	16	14	19	20	13	12	12	13	13
10	12	15	15	13	12	12	12	14	14	14	25	30	35	19	20	15	14	16	23	16	19	19	15	13
11	12	14	17	14	14	13	23	15	C	C	C	C	C	C	C	C	C	C	14	12	12	12	13	12
12	31	13	19	13	20	20	19	16	14	16	17	14	B	B	20	16	18	14	20	16	14	13	14	12
13	13	12	14	16	12	12	12	12	12	13	17	32	56	32	40	20	20	24	21	23	18	20	13	12
14	12	13	13	14	14	12	12	12	15	16	20	14	14	17	15	14	17	15	13	13	12	12	20	12
15	14	12	12	12	12	20	15	13	15	13	14	19	B	20	24	30	B	19	B	19	14	17	B	20
16	12	B	14	17	18	20	17	18	19	19	22	19	17	19	19	B	B	14	18	14	12	15	12	11
17	13	14	13	15	16	18	24	B	B	54	B	B	B	B	50	B	B	31	25	19	28	14	20	B
18	12	14	12	12	13	28	12	15	B	B	B	38	B	B	20	B	14	18	14	14	14	12	12	12
19	13	12	B	B	30	B	23	12	B	B	B	B	B	B	B	30	B	B	B	30	B	B	26	12
20	12	12	23	24	21	16	30	29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	20	12
21	13	B	B	B	B	B	26	23	B	B	22	B	31	B	B	B	B	B	B	B	B	B	B	23
22	13	13	B	B	B	20	18	12	15	29	17	16	B	B	B	30	30	30	24	20	13	12	12	14
23	14	12	12	12	14	14	15	13	14	15	12	15	B	B	20	21	B	15	B	B	24	20	13	11
24	12	13	13	14	16	12	13	16	16	B	B	B	B	B	B	B	29	B	B	28	25	B	15	22
25	14	12	16	13	15	14	13	12	13	22	20	23	16	20	16	15	21	16	18	22	18	16	12	12
26	17	11	13	12	12	12	14	12	28	16	22	31	16	18	B	20	16	14	13	13	13	11	12	12
27	12	14	14	12	14	12	14	13	12	12	13	14	16	15	14	14	12	14	13	12	11	14	13	14
28	13	14	14	13	14	13	12	12	20	28	19	21	17	18	19	17	19	C	14	15	12	12	12	12
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	27	27	27	27	27	27	27	27	27	26	28	28	28	28	28	28
MED	13	13	14	14	14	16	15	14	15	19	20	30	31	32	22	20	21	19	20	16	14	14	13	12
U Q	14	14	18	B 23	20	B 20	23	17	B	B 54	B	B	B	B	B	B	B	B	B 27	23	20	18	16	14
L Q	12	12	13	12	13	12	13	12	14	14	17	18	17	18	19	15	16	16	14	13	13	12	12	12

FEB.2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

FEB.2011 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	A	A	A	E A 230	E A 232	196	204	210	204	E A 254	A	B	198	B	198	202	234	200	210	A	A	A	A	A
2	A	A	A	A	A	230	B	E A 246	220	228	B	A	208	198	194	194	212	B	222	E B 234	222	240	226	A
3	216	224	218	E A 290	254	264	E A 250	208	198	198	206	196	196	182	202	190	198	200	200	208	214	216	220	222
4	230	260	Q 250	Q 250	262	220	210	B	B	A	A	224	194	194	184	210	204	214	214	220	226	A	A	A
5	A	A	A	210	A	B	A	A	192	A	A	B	B	B	B	B	224	216	200	212	232	252	A	A
6	B	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	212	232	216	200	A	218
7	A	A	B	A	A	A	A	194	194	186	194	182	A	190	200	210	204	210	204	Q 222	222	224	232	200
8	200	A	A	A	B	B	B	B	B	216	198	B	E A 208	B	Y	B	B	B	212	222	222	A 214	224	230
9	A	A	A	B	A	A	E A 286	192	188	192	H 184	216	210	212	196	A	200	204	204	198	198	212	194	242
10	E B 282	A	270	Q 276	E A 252	218	196	200	204	198	182	174	202	202	202	202	210	210	212	222	210	222	236	228
11	226	A	A	A	A	262	A	A	C	C	C	C	C	C	C	C	C	C	192	212	192	228	A	A
12	A	A	A	208	A	A	A	A	230	190	200	198	B	B	214	200	200	206	230	216	216	240	E B 298	E A 268
13	E B 268	Q 268	252	282	Q 258	212	196	200	206	202	194	198	E B 338	198	E B 274	210	206	212	208	188	218	218	222	Q 254
14	254	220	A	Q 284	220	226	214	198	198	212	206	218	A	A	192	210	A	204	208	204	E A 228	Q 246	A	E A 236
15	A	A	236	A	A	A	A	198	208	H 194	196	208	B	184	E Y 236	204	B	204	B	214	236	B	B	B
16	A	B	A	A	204	E B 268	A	A	A	A	A	Y	202	198	198	B	B	210	206	206	226	224	228	242
17	254	E B 316	E B 294	B 276	264	B	198	B	B	B	B	B	B	B	B	B	B	214	196	216	216	204	214	B
18	E B 286	E B 302	E B 286	272	272	B	Y	E A 266	B	B	B	B	B	B	204	B	204	204	A	A	A	270	250	A
19	A	A	B	B	E B 278	B	A	A	B	B	B	B	B	B	B	218	B	B	B	E B 266	B	B	E B 304	A
20	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	202
21	A	B	B	B	B	B	A	A	B	B	214	B	206	B	B	B	B	B	B	B	B	B	B	A
22	A	A	B	B	B	A	A	216	210	202	202	190	B	B	B	210	218	212	216	218	228	212	226	B 234
23	E B 290	E A 298	A	A	A	A	A	210	218	208	204	204	B	B	204	206	B	208	B	B	A	236	224	202
24	A	A	E B 290	282	274	252	230	230	218	B	B	B	B	B	B	B	216	B	B	A	238	B	E A 260	A 246
25	238	A 242	Q 248	Q 248	Q 260	252	236	210	202	206	198	198	198	218	A 222	A	222	222	224	220	214	226	236	E A 292
26	A	A	A	A	B 284	234	E A 250	212	220	206	196	202	202	196	B	206	210	212	212	A	224	226	A	A
27	A	A	A	A	226	204	196	212	200	198	208	202	192	206	202	202	202	200	206	206	214	Q 216	Q 260	E B 314
28	E B 306	E B 302	E B 294	E B 304	E B 286	A	212	198	200	192	200	212	A	212	198	208	208	C	208	198	214	Q 220	Q 210	E A 296
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	12	9	10	13	15	13	13	17	18	17	16	15	13	13	17	16	17	19	21	21	22	21	18	17
MED	U 231	U 244	U 244	U 263	257	228	205	205	204	200	199	202	200	198	200	206	208	210	208	214	218	224	226	229
U Q	E B 284	E B 302	E B 290	283	B 274	257	E A 243	214	218	210	205	212	208	209	209	210	217	212	213	222	226	238	E 250	E A 261
L Q	228	233	248	239	232	215	197	198	198	193	195	196	197	192	197	202	203	204	204	206	214	215	222	220

FEB.2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2011 fxI (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	81	52	A	A	B	B	O X 48	X 58	R	R	O X 51	O X 54	O X 58	X 70	X 71	X 80	X 80	X 67	O X 58	O X 48	58	34	O X 36	A
2	A	A	A	80	B	B	R	52	B	R	B	B	B	B	B	B	O X 48	B	B	R	B	A	A	A
3	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 54	B	R	B	O X 34	A	A	A
4	A	A	B	R	38	B	O X 40	B	B	B	B	B	B	B	X 56	B	B	B	O X 47	X 39	A	R	A	A
5	R	B	R	R	B	B	B	B	B	B	B	X 60	X 60	B	X 59	R	R	B	B	B	X 40	X 33	X 33	R
6	A	A	R	B	37	43	X 47	56	X 62	X 68	O X 71	X 71	X 72	X 74	X 73	X 70	X 68	X 67	X 57	X 56	O X 52	44	42	41
7	39	A	B	R	O X 37	R	R	57	B	R	O X 54	O X 56	X 60	X 60	X 66	X 68	X 72	X 66	X 63	X 54	X 41	R	A	A
8	A	A	48	A	A	R	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	O X 56	B	X 43	B	O X 36	B	B
10	B	B	A	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
11	B	R	A	32	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
12	94	A	O X 38	B	B	O X 36	R	R	R	R	B	B	B	B	B	O X 49	B	B	B	B	O X 40	O X 29	A	X 39
13	A	X 38	B	A	R	O X 43	O X 44	X 55	O X 56	R	X 67	O X 69	O X 66	O X 64	X 63	O X 61	X 61	X 56	66	X 49	X 38	54	A	A
14	X 30	A	A	40	37	X 43	R	X 50	O X 56	X 63	X 64	B	X 64	X 68	X 70	X 69	X 66	X 58	X 56	X 50	X 42	X 38	36	36
15	X 34	36	36	37	40	40	X 46	X 46	X 58	X 58	X 66	B	O X 73	O X 72	O X 76	X 77	X 70	O X 69	O X 62	X 56	X 42	40	37	34
16	33	32	33	36	44	44	49	X 51	O X 64	X 70	X 74	X 77	X 77	76	O X 74	X 72	X 73	X 66	X 64	X 47	X 41	39	X 32	X 26
17	X 24	29	32	34	36	39	O X 46	X 56	B	X 66	X 69	X 78	O X 76	O X 78	O X 82	X 86	X 70	O X 62	X 61	X 48	O X 47	43	29	A
18	A	32	35	35	32	41	33	50	X 52	O X 64	X 63	X 68	X 69	X 74	X 74	X 70	X 70	O X 62	X 56	X 55	X 48	40	32	30
19	X 25	28	O X 24	31	O X 35	A	49	54	X 59	X 63	X 67	X 78	X 81	X 88	O X 84	X 86	X 82	O X 73	O X 68	O X 55	O X 48	36	31	28
20	29	26	X 30	A	A	A	A	R	R	X 55	X 62	X 66	X 72	X 81	X 81	X 80	X 75	70	70	X 50	30	A	A	A
21	A	A	A	B	A	A	A	O X 43	R	R	B	B	B	O X 67	O X 68	O X 68	O X 63	X 58	O X 55	X 43	X 36	30	B	R
22	O X 36	B	A	R	A	R	B	B	B	B	B	B	B	X 59	X 58	X 58	X 54	O X 49	O X 48	X 44	X 38	X 33	X 29	30
23	X 25	O X 24	A	A	A	50	B	R	O X 51	O X 53	B	B	B	B	O X 74	X 70	X 62	X 59	X 53	X 30	R	R	A	R
24	B	A	A	A	X 30	34	42	O X 45	X 48	O X 52	X 59	O X 68	B	X 70	X 71	X 72	X 68	X 58	X 57	X 46	X 42	X 35	X 32	26
25	O X 22	23	R	X 28	32	40	34	X 40	O X 52	56	X 64	O X 70	O X 72	X 76	X 82	X 75	X 71	X 67	X 64	X 47	X 41	30	29	32
26	32	28	A	X 35	41	42	41	X 43	O X 52	X 60	X 66	X 67	O X 77	X 81	X 84	X 71	X 68	X 68	X 54	X 42	X 38	35	32	33
27	32	28	X 27	X 30	R	29	32	X 45	X 58	X 69	O X 76	X 80	X 79	X 87	O X 83	X 81	X 82	X 68	X 58	X 44	X 42	X 36	34	30
28	O X 30	A	O X 35	A	41	57	42	44	X 62	X 66	X 75	X 82	X 98	X 96	X 93	O X 96	X 83	X 70	X 58	X 54	X 44	34	X 22	A
29	A	A	O X 32	A	41	40	X 42	X 51	X 64	X 72	X 85	X 92	X 95	X 94	X 106	X 103	X 89	X 80	X 60	X 48	X 43	33	32	32
30	28	54	A	36	A	A	A	53	66	X 74	X 84	X 93	O X 102	X 98	X 95	X 88	X 81	X 76	68	52	42	46	42	37
31	32	26	24	O X 29	O X 30	O X 32	31	42	X 51	X 65	80	X 90	X 93	X 93	X 93	X 89	X 91	X 91	82	73	X 57	X 45	33	O X 26
	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	14	12	13	15	16	16	20	16	17	19	18	19	21	24	23	24	23	23	24	24	22	18	15
MED	32	28	32	35	37	40	42	X 50	X 57	X 64	X 67	X 70	X 73	X 76	X 74	X 72	X 70	X 67	X 58	X 48	X 42	36	32	32
U Q	35	36	36	36	41	43	X 46	54	X 62	X 68	X 75	X 80	X 81	X 88	X 84	X 86	X 80	X 70	64	X 54	X 46	40	36	36
L Q	X 26	26	X 28	X 30	32	38	37	X 44	X 52	X 57	X 63	X 67	X 66	X 69	X 69	X 69	X 64	X 58	X 56	X 44	X 39	33	31	28

MAR. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2011 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

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	A	A	A	A	B	B	R 42	52	R	R	R 45	48	52	64	65	J R 74	74	61	R 52	42	R 42	F 23	30	A
2	A	A	A	A	B	B	R	R	B	A	B	B	B	B	B	B	42	B	B	R	B	A	A	A
3	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 48	B	R	B	R 28	A	A	A
4	A	A	B	A	F 30	B	34	B	B	B	B	B	B	B	J R 50	B	B	B	R 41	33	A	A	A	A
5	A	B	A	R	B	B	B	B	B	B	B	J R 54	J R 54	B	J R 53	R	R	B	B	B	34	27	27	A
6	A	A	A	B	F 26	F 32	41	J R 50	56	62	65	65	66	68	67	64	62	61	51	50	46	F 34	F 31	F 28
7	F 25	A	B	A	R 31	A	A	A	B	R	R 48	R 50	J R 54	J R 54	60	62	66	60	57	48	35	A	A	A
8	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	50	B	J R 37	B	R 30	B	B
10	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
11	B	R	A	F 24	A	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
12	F	A	R 32	B	B	F 28	R	R	R	R	B	B	B	B	B	43	B	B	B	B	R 34	23	A	33
13	A	32	B	A	A	R 37	R 38	49	R 50	R	61	63	R 60	U R 58	57	U R 55	55	50	F 56	43	32	A	A	A
14	J R 24	A	A	F 28	F 26	37	A	44	50	J R 57	58	B	J R 58	62	64	63	60	J R 53	50	44	36	32	F 26	F 26
15	28	F 26	F 26	F 26	F 27	F 30	40	40	J R 52	J R 52	60	B	67	66	R 70	J R 71	J R 64	63	56	50	36	F 30	F 27	F 24
16	F 23	F 23	F 22	F 22	F 34	F 33	F 39	45	R 58	64	68	J R 71	71	70	R 68	66	67	60	58	41	35	F 30	26	20
17	18	F 18	F 23	F 23	F 27	33	40	50	B	60	J R 63	J R 72	R 70	72	76	80	64	56	55	42	41	F 32	F 20	A
18	A	F 21	F 24	F 24	F 21	F 29	F 23	F 33	46	58	57	62	63	68	68	64	64	56	50	49	42	F 28	F 20	F 16
19	19	F 18	R 18	F 18	29	A	F 38	F 44	53	57	61	72	J R 75	82	R 78	80	J R 76	R 67	R 62	U R 49	42	F 24	F 21	F 19
20	F 21	F 16	24	A	A	A	A	R	R	49	56	60	66	75	J R 75	74	69	F 61	F 56	44	F 20	A	A	A
21	A	A	A	B	A	A	A	R 37	R	R	B	B	B	R 61	R 62	R 62	57	J R 52	R 49	37	30	F 21	B	R
22	R 30	B	A	A	A	R	B	B	B	B	B	B	B	J R 53	J R 52	J R 52	48	R 43	R 42	38	32	27	23	F 20
23	19	18	A	A	A	F 27	B	A	U R 45	47	B	B	B	B	R 68	64	56	53	47	24	A	A	A	A
24	B	A	A	A	24	F 24	F 31	38	42	U R 46	53	62	B	64	65	66	62	52	51	40	36	29	26	F 17
25	F 13	F 14	R	22	F 22	F 30	F 24	34	R 46	J R 50	58	R 64	66	70	76	69	65	61	58	41	35	F 20	F 20	F 22
26	F 20	F 18	A	F 26	F 24	F 26	F 24	37	R 46	54	60	61	71	J R 75	J R 78	65	62	J R 62	48	36	32	F 23	F 22	F 21
27	F 21	F 16	21	24	R	F 20	F 21	39	52	63	R 70	J R 74	J R 73	J R 81	77	J R 75	J R 76	62	52	38	36	30	F 24	F 20
28	24	A	R 29	A	F 31	F 40	F 31	F 36	56	60	69	76	92	90	87	90	77	64	52	48	38	F 23	16	A
29	A	A	R 26	A	F 29	F 24	36	45	58	66	J R 79	J R 86	89	J R 88	J R 100	J R 97	J R 83	J R 74	54	42	37	F 24	F 23	F 21
30	F 19	A	A	F 26	A	A	A	F 43	F 56	68	78	87	96	92	89	82	75	70	F 58	F 41	F 32	F 36	F 32	F 26
31	F 20	F 16	F 14	22	R 24	26	F 20	F 30	45	59	J R 74	84	J R 87	J R 87	J R 87	J R 83	J R 85	J R 85	F 70	F 64	51	F 35	F 23	20
	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	15	12	11	12	15	16	16	18	16	17	19	18	19	21	24	23	24	23	23	24	24	21	18	15
MED	F 21	F 18	24	F 24	F 27	F 30	F 35	42	51	58	61	64	67	70	68	66	64	61	52	42	36	F 28	F 24	F 21
U Q	24	F 22	R 26	F 26	F 30	33	40	45	56	62	R 69	74	75	82	R 78	80	J R 74	63	57	48	40	F 31	F 27	F 26
L Q	19	F 16	21	22	F 24	F 26	F 24	F 37	46	R 51	57	61	J R 60	R 63	R 63	63	58	53	50	38	32	F 23	F 21	F 20

MAR. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2011 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	38	42	84	81	B	B	39	39	G	38	G 22	32	G 20	G	G 20	G	G	40	42	42	64	32	72	62
2	38	42	87	62	B	B	33	37	B	42	B	B	B	B	B	B	G	B	B	40	B	44	40	89
3	B	53	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 25	B	E B 23	B	22	38	37	41
4	67	35	B	32	31	B	47	B	B	B	B	B	B	B	E B 28	B	B	B	E B 24	24	K 40	32	70	46
5	30	B	30	28	B	B	B	B	B	B	B	E B 30	G 26	B	30	36	E B 31	B	B	B	E B 15	E B 13	15	32
6	36	37	34	B	24	28	32	28	G 20	26	G	30	30	29	26	G 22	G 19	G 22	18	28	E B 15	E B 13	E B 13	E B 12
7	E B 14	77	B	32	56	42	33	38	B	34	25	27	28	E B 38	G 23	G 22	E B 26	G 18	E B 31	25	E B 16	40	71	52
8	43	40	41	66	47	33	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 29	B	E B 30	B	E B 19	B	B
10	B	B	K 42	32	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	66	57
11	B	39	39	29	32	27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	70	69	64	47
12	51	54	57	B	B	24	30	31	33	33	B	B	B	B	B	E B 26	B	B	B	B	E B 21	16	38	70
13	80	70	B	32	34	32	E B 26	E B 23	E B 27	E B 24	28	E B 30	B	E B 30	32	G 22	E B 28	G 22	E B 20	E B 17	E B 12	41	88	32
14	30	46	41	41	71	32	40	31	G 20	G	G	B	25	30	28	G	G 18	G 17	G	E B 18	E B 14	E B 12	E B 13	E B 12
15	E B 13	21	16	16	17	E B 13	E B 20	E B 20	E B 23	E B 39	E B 29	B	E B 30	E B 52	E B 36	E B 29	E B 26	G	G	G	21	E B 12	E B 13	E B 12
16	E B 12	E B 12	E B 12	E B 12	E B 12	E B 12	E B 13	E B 19	E B 23	28	36	G 24	E B 27	G	28	E B 28	G 21	G	26	20	22	E B 13	14	31
17	24	29	E B 12	E B 12	E B 13	E B 12	E B 14	E B 21	B	E B 41	E B 30	E B 30	G 18	30	28	G 22	22	G 20	28	20	20	17	E B 12	51
18	35	25	28	19	E B 14	E B 14	E B 14	17	G 15	G 19	G 18	G 20	G 19	G	G	25	G	G	E B 22	E B 16	18	19	18	22
19	22	24	E B 13	E B 12	32	41	27	24	26	28	28	30	29	30	26	G	E B 30	G 18	E B 24	E B 18	16	16	16	30
20	20	20	33	33	50	57	48	32	42	33	32	G	28	G 22	G 20	G 19	G	E B 20	E B 19	E B 17	33	39	38	37
21	42	43	37	B	38	43	41	G	G	G	B	B	B	G	E B 35	E B 31	E B 23	E B 28	E B 24	E B 16	E B 12	E B 12	B	K 21
22	33	B	59	37	34	32	B	B	B	B	B	B	B	E B 28	G	E B 27	G	G	E B 23	E B 15	E B 16	E B 13	E B 12	E B 12
23	E B 12	E B 13	45	49	45	36	B	44	33	G	B	B	B	B	E B 45	E B 32	G 20	G	G	29	32	35	42	28
24	B	58	42	34	24	24	E B 17	E B 17	G 17	G	G 18	26	B	28	28	30	G 21	G 14	B	E B 13	E B 12	E B 13	E B 13	E B 14
25	E B 13	17	19	26	E S 15	E B 14	E B 14	E B 14	G 15	G 19	24	31	E B 36	E B 40	E B 29	26	G	E B 23	E B 21	E B 20	E B 14	E B 13	E B 13	E B 12
26	E B 13	33	41	38	16	E B 14	E B 14	G 15	G	29	G 25	26	G 25	26	E B 26	27	G	25	E B 17	16	E B 14	E B 13	E B 14	E B 11
27	E B 12	E B 12	E B 14	E B 14	E B 12	E B 13	E B 13	E B 14	22	30	29	30	32	31	E B 28	E B 28	G	G	E B 18	E B 12	E B 12	E B 13	27	E B 13
28	E B 20	31	40	47	46	25	E B 13	E B 14	19	24	26	27	40	33	G 20	G	25	21	16	E B 13	E B 12	E B 13	16	32
29	31	30	35	40	32	25	E B 16	E B 18	24	23	27	39	46	38	G	G	23	G	G	E B 13	E B 13	14	E B 12	E B 12
30	31	38	44	36	70	58	49	36	31	28	30	32	32	34	34	G	36	32	25	22	E B 13	E B 12	E B 12	E B 12
31	E B 12	E B 13	68	E B 14	E B 14	E B 14	E B 13	27	42	24	G 23	27	33	71	42	31	17	28	23	24	E B 14	E B 14	E B 13	E B 14
	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	27	26	26	24	24	23	23	20	23	19	18	18	21	24	24	25	23	23	25	27	29	28	29
MED	30	35	40	32	32	26	E B 26	23	E G 22	26	E G 26	30	28	29	27	E G 26	G	G	E B 22	E B 18	E B 16	E B 14	16	30
U Q	38	43	44	40	46	34	39	32	29	33	29	30	32	36	31	E B 28	E B 26	25	24	24	22	34	41	46
L Q	E B 13	E B 21	E B 28	E B 19	E B 16	E B 14	E B 14	E B 17	G 20	G	G 24	G 26	G 25	G	G	G	G	G 20	G 17	E B 16	E B 13	E B 13	E B 13	E B 12

MAR. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2011 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	12	12	19	13	B	B	19	15	16	23	17	17	16	19	16	22	22	14	13	13	14	15	15	19
2	12	13	14	18	B	B	22	21	B	24	B	B	B	B	B	B	14	B	B	14	B	12	16	14
3	B	12	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	B	23	B	18	12	13	12
4	14	22	B	13	14	B	19	B	B	B	B	B	B	B	28	B	B	B	24	15	13	12	28	12
5	22	B	20	25	B	B	B	B	B	B	B	30	20	B	20	17	31	B	B	B	15	13	12	13
6	12	20	16	B	19	14	15	18	17	17	16	18	19	19	20	17	16	19	12	12	15	13	13	12
7	14	24	B	13	15	25	20	22	B	18	18	23	20	38	19	15	26	15	31	14	16	12	12	14
8	21	20	14	23	14	28	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	29	B	30	B	19	B	B
10	B	B	16	23	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	23
11	B	34	16	13	27	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	19	16	14	14
12	18	14	14	B	B	13	23	26	27	29	B	B	B	B	B	26	B	B	B	B	21	13	13	13
13	20	12	B	22	23	22	26	23	27	24	26	30	30	30	24	21	28	20	20	17	12	11	18	19
14	18	23	15	12	13	13	20	20	17	18	18	B	20	22	18	17	15	15	14	18	14	12	13	12
15	12	12	12	13	15	13	20	20	23	39	29	B	30	52	36	29	26	18	14	12	12	12	13	12
16	12	12	12	12	12	12	14	19	23	14	18	19	27	18	20	28	13	19	15	13	11	13	11	12
17	12	12	12	12	13	12	14	22	B	41	30	30	17	14	15	16	15	15	16	13	12	11	12	13
18	16	12	12	12	14	14	14	13	12	13	15	15	15	16	18	16	15	14	21	16	12	13	14	12
19	12	13	13	12	14	13	12	13	12	18	14	16	18	12	19	21	30	16	24	18	12	12	13	12
20	13	12	11	12	15	17	15	22	18	18	16	17	15	16	16	14	20	20	19	17	12	12	11	12
21	17	19	21	B	24	14	16	16	14	18	B	B	B	23	35	31	23	28	24	16	12	12	B	13
22	12	B	14	19	23	23	B	B	B	B	B	B	B	28	19	27	20	19	23	15	16	13	12	12
23	12	14	14	15	14	14	B	20	18	18	B	B	B	B	45	32	17	13	13	14	14	12	12	11
24	B	22	14	12	14	12	17	17	12	12	12	15	B	20	14	13	12	12	12	13	12	13	13	14
25	13	12	12	13	15	14	14	14	12	12	15	15	36	40	29	15	16	23	21	20	14	13	12	12
26	13	12	13	13	12	13	14	12	16	13	14	18	17	16	26	23	14	16	17	12	14	13	14	11
27	12	12	14	14	12	13	13	14	13	16	19	18	18	22	28	28	18	14	14	13	12	13	13	13
28	20	12	14	14	13	12	13	14	13	14	15	17	12	13	14	14	13	14	13	13	12	13	13	12
29	12	12	12	28	12	12	16	18	13	12	15	15	18	16	14	15	13	15	13	13	13	12	12	12
30	12	13	14	13	13	15	14	12	12	12	13	13	13	13	12	13	13	12	13	12	13	12	12	12
31	12	13	13	14	14	14	13	12	11	13	13	12	14	14	13	13	12	12	13	12	14	14	13	14
	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	13	13	14	14	14	14	18	20	18	18	18	26	24	22	20	22	19	18	20	14	14	13	13	12
U Q	20	22	16	23	B 24	B 25	B 26	B 26	B	B 41	B	B	B	B	B 36	B 31	B 28	B 29	B 24	B 18	16	13	14	14
L Q	12	12	13	13	13	13	14	14	13	14	15	17	17	16	16	15	14	14	13	13	12	12	12	12

IONOSPHERIC DATA STATION SHOWA-ST.

MAR. 2011 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	A	A	A	A	B	B	A	A	A	A	198	226	210	212	228	228	228	A	A	A	E A 252	228	230	A
2	A	A	A	A	B	B	A	A	B	A	B	B	B	B	B	B	212	B	B	A	B	A	A	A
3	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	212	B	228	B	A	A	A	A
4	A	A	B	A	A	B	A 272	B	B	B	B	B	B	B	206	B	B	B	E B 268	198	A	A	A	A
5	A	B	A	A	B	B	B	B	B	B	B	198	196	B	216	216	226	B	B	B	228	244	282	A
6	A	A	A	B	A	A	218	226	232	222	200	200	B 232	242	220	210	220	228	198	208	218	Q 210	Q 226	250
7	Q 286	A	B	A	190	A	A	A	B	A	224	212	A 234	B 264	222	222	218	230	230	218	244	A	190	A
8	A	A	198	A	A	A	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	238	B	224	B	A 254	B	B
10	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A
11	B	A	A	A 254	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
12	A	A	A	B	B	194	A	A	A	A	B	B	B	B	B	232	B	B	B	B	266	E B 302	A	202
13	A	A	B	A	A	A	E A 350	250	246	H 192	230	220	214	E B 226	232	210	222	226	Q 234	Q 224	230	A	A	A
14	196	A	A	A 254	206	Q 262	A	A	202	218	206	B	196	196	204	220	220	204	208	208	200	208	Q 220	Q 254
15	Q 256	Q 282	Q 290	Q 296	Q 314	298	E B 280	242	216	B	232	B	210	B	E B 240	218	216	212	202	202	192	214	214	248
16	Q 256	264	254	Q 280	Q 272	272	254	252	224	216	216	210	196	200	200	212	222	206	206	194	198	212	212	E A 262
17	A 286	E A 268	268	286	272	264	268	246	B	E B 298	212	212	200	212	212	212	214	214	204	210	210	210	226	A
18	A	E A 358	A	A	B	E B 338	B 258	Q 214	198	212	200	200	200	212	212	212	220	216	200	212	Q 212	Q 212	E B 266	E A 268
19	A	A	B	B	202	A	290	218	204	204	218	210	210	202	200	220	218	204	210	186	Q 220	234	200	A
20	246	274	216	A	A	A	A	A	A	A	238	200	204	204	208	208	216	206	Q 212	Q 216	296	A	A	A
21	A	A	A	B	A	A	A	A	226	224	B	B	B	E Y 236	E B 254	232	E B 226	214	212	214	214	E B 266	B	A
22	214	B	A	A	A	A	B	B	B	B	B	B	B	228	218	218	222	218	226	216	218	230	242	268
23	E B 304	E B 354	A	A	A	E A 288	B	A	A	214	B	B	B	B	E B 262	E B 250	228	228	240	304	A	A	A	A
24	B	A	A	A	A	A	294	248	216	216	210	210	B	218	204	218	210	210	204	200	218	206	220	E B 284
25	B	A	A	A	S	E S 304	274	210	210	218	206	200	236	260	222	222	Q 214	214	202	210	210	238	256	260
26	266	A	196	214	186	Q 316	Q 286	204	216	216	210	204	A 204	212	202	212	202	202	202	194	226	202	248	234
27	Q 218	E B 272	B	E B 330	B	E B 316	Q 242	182	228	206	220	220	200	216	212	222	216	192	Q 192	198	202	216	244	230
28	B	A	244	A	A	A 318	Q 282	196	196	210	204	210	210	202	220	220	206	200	H 174	210	200	214	304	A
29	A	A	A 252	A	A	A	284	230	234	216	220	210	228	208	214	220	204	196	184	200	212	234	238	256
30	256	A	A	210	A	A	A	218	194	212	224	216	208	212	212	216	212	198	Q 198	Q 198	220	Q 214	Q 214	Q 234
31	Q 240	282	A 330	B	B	B	E B 294	250	E A 258	220	220	212	202	218	210	210	210	196	196	212	202	202	234	E B 284
	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	12	8	9	8	7	11	15	15	16	17	19	18	19	20	24	24	25	22	23	23	23	21	19	14
MED	254	274	252	260	206	U 281	276	226	216	216	216	210	208	212	212	218	216	211	204	210	216	214	228	U 244
U Q	276	E 318	279	291	Q 272	316	290	248	230	219	224	212	214	227	222	222	222	218	226	216	228	236	248	E 268
L Q	229	E 270	207	234	190	264	258	210	203	211	206	200	200	206	207	212	212	202	198	198	202	210	214	234

MAR. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2011 fxI (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	A	52	A	A	A	35	A	42	O X 54	X 59	X 66	X 70	X 83	X 104	X 105	X 112	O X 112	X 106	X 92	X 48	32	A	A	A
2	A	B	A	A	B	B	B	B	O X 40	R	B	B	B	B	B	B	B	B	O X 48	X 50	X 46	O X 31	A	A
3	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	O X 72	B	B	O X 44	B	B	B	B
5	X 33	O X 33	R	A	A	B	B	R	O X 43	O X 49	B	X 63	O X 66	O X 74	B	B	O X 71	O X 63	O X 58	O X 43	X 34	X 30	B	Y
6	A	A	A	O X 35	A	A	A	A	B	O X 40	B	X 72	X 81	X 88	X 86	O X 88	X 100	B	B	50	66	66	A	40
7	B	A	A	A	A	A	B	B	B	R	R	B	B	X 61	X 62	X 58	X 62	X 62	O X 52	O X 42	O X 33	31	23	A
8	R	O X 30	R	R	R	R	O X 36	40	O X 48	X 62	X 65	O X 73	X 82	X 82	X 78	X 79	X 86	B	66	O X 49	40	A	R	O X 39
9	A	A	B	B	B	B	B	B	R	R	B	B	B	B	B	O X 70	X 67	X 65	O X 56	B	34	B	R	R
10	R	R	R	R	A	A	X 28	O X 37	O X 43	O X 49	O X 59	X 66	O X 73	X 80	X 79	X 80	X 67	65	X 50	41	B	R	A	A
11	R	A	B	B	B	O X 38	31	40	O X 48	X 52	X 58	X 61	X 62	X 75	X 80	X 78	78	O X 77	X 56	X 46	30	A	30	A
12	A	A	58	44	R	R	46	46	43	O X 36	B	B	B	B	B	B	B	X 63	O X 52	S	R	A	A	A
13	S	O X 37	A	A	A	S	S	S	B	B	B	B	B	B	Y	B	B	B	O X 53	35	O X 36	B	B	B
14	B	A	R	R	R	R	A	B	X 40	O X 49	B	O X 72	O X 75	O X 78	X 80	X 72	O X 68	O X 56	B	B	B	A	B	B
15	R	39	A	A	A	A	A	X 40	B	B	X 69	X 80	X 84	X 86	X 91	X 85	X 70	X 62	49	38	36	X 24	B	B
16	O X 56	O X 35	30	33	35	38	43	R	X 43	X 56	X 75	X 102	X 102	X 96	O X 97	X 91	X 84	O X 63	X 46	X 41	X 26	X 24	O X 22	O X 22
17	O X 30	45	R	R	36	A	O X 48	R	O X 40	52	70	X 73	X 76	X 82	X 82	X 75	X 83	X 70	X 58	X 34	O X 26	B	B	B
18	R	32	30	X 30	36	B	B	B	B	B	O X 71	X 82	X 70	X 86	X 80	X 83	X 91	X 93	O X 70	R	R	O X 32	O X 27	O X 31
19	O X 33	X 41	O X 38	R	O X 38	R	38	34	R	B	B	X 70	O X 76	X 98	X 90	X 89	X 75	71	X 50	O X 37	O X 31	O X 28	B	A
20	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	X 78	X 66	X 49	X 30	O X 23	O X 23	A
21	A	53	A	A	R	A	B	B	B	O X 49	B	X 68	X 72	X 78	O X 85	X 78	X 59	O X 52	O X 43	X 30	B	B	B	B
22	B	B	A	O X 30	40	B	A	X 42	57	66	X 71	X 75	X 78	O X 83	B	X 86	X 70	X 64	X 49	B	O X 28	O X 24	B	B
23	B	A	X 25	69	A	A	A	52	55	X 51	X 57	X 71	X 82	X 90	B	O X 74	B	B	B	X 40	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	O X 88	X 93	X 86	X 86	X 89	X 63	X 64	X 57	X 48	X 30	B	B	B
25	O X 35	58	B	A	R	A	B	A	R	B	B	X 69	X 76	X 78	O X 71	X 69	X 58	X 48	X 42	X 37	28	B	B	O X 22
26	O X 21	O X 22	A	B	B	B	B	36	X 34	X 51	X 62	B	B	X 89	B	B	O X 65	O X 53	O X 48	O X 39	B	B	B	B
27	B	B	B	O X 28	O X 28	30	30	30	X 37	B	X 66	80	O X 94	O X 101	O X 95	93	70	X 49	X 52	42	27	X 22	25	O X 22
28	B	B	B	B	B	B	B	B	B	O X 50	X 69	X 89	O X 81	O X 92	X 80	X 83	66	X 51	X 40	X 29	X 23	B	A	A
29	A	A	A	A	X 42	41	A	A	49	B	B	75	X 89	X 81	X 94	X 82	X 74	X 63	48	X 38	B	B	A	A
30	A	B	B	B	64	A	B	R	B	B	O X 42	B	B	O X 68	O X 69	O X 80	X 80	68	R	R	R	A	A	O X 33
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	12	5	7	8	5	8	11	15	15	14	20	20	23	19	22	24	23	24	23	19	11	6	7
MED	O X 33	38	30	X 33	37	38	37	40	X 43	X 51	X 66	X 72	X 80	X 83	X 82	X 81	X 70	X 63	X 52	X 41	X 31	X 28	24	O X 31
U Q	O X 35	48	48	44	41	40	44	42	49	X 56	X 70	X 80	X 84	X 90	X 91	X 88	X 82	X 70	X 58	X 48	36	O X 31	27	39
L Q	O X 30	O X 32	28	X 30	36	32	30	36	X 40	O X 49	X 59	X 70	X 74	X 78	X 79	X 75	X 66	X 56	X 48	X 37	X 28	X 24	23	O X 22

APR. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2011 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

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	A	A	A	A	A	F 26	A	F 31	U R 47	53	60	64	77	98	J R 99	106	106	100	86	42	F 22	A	A	A
2	A	B	A	A	B	B	B	B	R 34	R	B	B	B	B	B	B	B	B	42	44	40	R 25	A	A
3	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	R 66	B	B	38	B	B	B	B
5	27	R 27	R	A	A	B	B	R	37	U R 43	B	57	60	U R 68	B	B	65	57	R 52	37	28	24	B	Y
6	A	A	A	R 29	A	A	A	A	B	34	B	66	75	R 82	80	R 82	J R 94	B	B	F 24	F 35	F 19	A	F 27
7	B	A	A	A	A	A	B	B	B	A	R	B	B	55	56	52	56	56	46	36	27	F 21	F 14	A
8	A	R 24	A	A	A	R	30	F 30	R 42	56	59	67	76	76	72	73	80	B	F 56	R 43	F 30	A	R	33
9	A	A	B	B	B	B	B	B	R	R	B	B	B	B	B	R 64	61	59	U R 50	B	F 24	B	R	R
10	A	R	A	A	A	A	22	31	37	43	53	60	R 67	J R 74	73	74	61	F 55	V 44	F 29	B	A	A	A
11	R	A	B	B	B	R 32	F 21	F 26	42	46	52	J R 55	56	69	74	72	F 68	R 71	50	40	F 19	A	F 14	A
12	A	A	F 46	F 34	A	A	F 24	F 24	F 34	30	B	B	B	B	B	B	B	J R 57	R 46	S	A	A	A	A
13	S	R 31	A	A	A	S	S	S	B	B	B	B	B	B	Y 66	B	B	B	47	F 27	30	B	B	B
14	B	A	A	R	R	A	A	B	34	R 43	B	R 66	R 69	U R 72	J R 74	66	62	R 50	B	B	B	A	B	B
15	R 30	F 29	A	A	A	A	A	34	B	B	63	74	77	80	J R 86	79	64	56	F 40	F 30	F 27	18	B	B
16	R 50	R 29	F 20	F 21	F 22	F 24	F 30	A	37	50	69	J R 96	J R 96	90	91	85	78	57	40	35	20	18	R 16	16
17	24	F 28	A	A	F 25	A	42	R	R 34	F 42	F 55	67	70	76	76	69	J R 77	64	52	28	R 20	B	B	B
18	A	F 22	F 20	24	F 21	B	B	B	B	B	R 65	76	V 64	80	J R 74	77	J R 85	J R 87	R 64	A	A	R 26	R 21	R 25
19	27	35	R 32	A	R 32	A	F 23	F 21	A	B	B	64	R 70	92	J R 84	J R 83	69	F 60	44	31	25	22	B	A
20	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	72	60	42	24	17	17	A
21	A	A	A	A	A	A	B	B	B	43	B	62	66	J R 72	79	72	53	R 46	37	24	B	B	B	B
22	B	B	A	R 24	F 20	B	A	J R 36	F 42	F 55	65	69	72	77	B	80	64	58	43	B	R 22	R 18	B	B
23	B	A	19	A	A	A	A	F 38	F 44	45	51	65	76	84	B	R 68	B	B	B	34	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	R 82	87	80	80	J R 83	57	58	51	42	24	B	B	B
25	29	39	B	A	A	A	B	A	R	B	B	63	70	J R 72	R 65	63	J R 52	42	36	31	F 17	B	B	R 16
26	15	16	A	B	B	B	B	F 29	28	J R 45	56	B	B	J R 83	B	B	59	U R 47	U R 42	R 33	B	B	B	B
27	B	B	B	R 22	R 22	F 21	F 20	F 23	31	B	60	F 70	R 88	R 95	89	F 82	F 61	43	J R 46	F 30	F 18	16	F 15	R 16
28	B	B	B	B	B	B	B	B	B	R 44	63	J R 83	R 75	85	74	77	F 56	45	34	23	17	B	A	A
29	A	A	A	A	36	F 28	A	A	F 40	B	B	F 66	83	75	88	76	68	57	F 38	32	B	B	A	A
30	A	B	B	B	A	A	B	R	B	B	36	B	B	62	R 63	R 74	J R 74	F 57	R	R	R	A	A	27
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	7	10	5	6	7	5	8	11	15	15	14	20	20	23	20	22	24	23	24	23	19	11	6	7
MED	27	28	F 20	24	F 22	F 26	F 24	F 30	37	44	60	66	74	77	75	75	64	57	46	33	24	19	16	25
U Q	R 30	31	39	29	32	30	30	34	42	50	63	72	77	84	85	82	J R 76	60	52	40	28	R 24	17	27
L Q	24	24	20	22	F 21	F 22	F 22	F 24	34	43	53	64	68	72	72	69	60	50	41	29	F 20	18	F 14	16

APR. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2011 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	32	27	80	44	34	29	49	30	20	30	27	29	35	42	27	35	25	25	26	E B 20	16	70	47	47
2	77	B	91	28	B	B	B	B	G	40	B	B	B	B	B	B	B	B	E B 27	30	42	27	41	65
3	42	50	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 54	B	B	E B 21	B	B	B	B
5	21	36	22	35	G 30	B	B	30	E B 25	E B 30	B	E B 30	27	E B 26	B	B	E B 34	E B 35	E B 30	E B 23	17	E B 15	B	19
6	92	72	43	58	G 31	41	46	42	B	34	B	G	27	G 22	31	E B 55	E B 23	B	B	41	34	62	68	81
7	B	40	36	34	50	43	B	B	B	40	34	B	B	E B 29	E B 30	E B 23	E B 26	E B 25	E B 24	E B 24	E B 14	E B 13	B 13	30
8	28	34	33	32	31	30	30	18	G	26	24	E B 28	G 22	G	G	G	24	B	E B 26	E B 26	E B 19	39	17	42
9	60	41	B	B	B	B	B	B	34	37	B	B	B	B	B	E B 56	E B 56	E B 32	E B 29	B	E B 20	B	19	17
10	28	25	30	35	42	38	K 28	E B 16	E B 20	20	21	22	31	E B 25	25	E B 21	17	E B 15	E B 13	E B 14	B	24	33	35
11	36	49	B	64	B	28	E B 15	E B 13	E B 19	24	21	26	30	26	30	24	21	20	36	35	24	40	31	43
12	42	40	40	43	36	37	E B 15	24	16	26	B	B	B	B	B	B	B	E B 32	E B 25	S	34	34	38	38
13	S	27	92	38	75	S	S	S	B	B	B	B	B	B	E B 56	B	B	B	E B 21	20	E B 24	B	B	B
14	B	36	K 26	30	30	34	37	B	54	E B 31	B	E B 55	E B 58	E B 57	E B 55	E B 30	E B 34	E B 30	B	B	B	29	B	B
15	E B 26	32	74	38	40	48	42	38	B	B	E B 49	E B 27	E B 25	G	E B 24	E B 28	E B 19	18	E B 12	E B 12	E B 12	16	B	B
16	24	32	26	24	20	16	24	21	E B 16	E B 18	21	E B 32	E B 28	E B 24	G	E B 23	E B 20	E B 14	E B 14	E B 13	E B 12	E B 13	E B 12	E B 12
17	38	39	42	39	39	43	43	25	E B 29	E B 18	E B 22	E B 23	G	G	G	G	E B 21	E B 20	22	E B 15	16	B	B	B
18	28		28	E B 18	E B 14	B	B	B	B	B	E B 38	E B 28	22	G	E B 55	23	24	E B 23	E B 40	41	32	32	30	34
19	34	60	39	34	41	32	17	31	48	B	B	E B 31	E B 50	25	E B 29	E B 32	29	22	E B 19	E B 12	E B 14	E B 14	B	31
20	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 29	E B 23	19	20	15	27	30
21	33	30	30	30	32	32	B	B	B	E B 22	B	E B 31	E B 30	E B 27	E B 34	E B 30	E B 27	E B 23	E B 25	E B 19	B	B	B	B
22	B	74	K 32	30	19	B	40	35	32	E B 25	18	23	G	G	B	E B 26	E B 22	E B 27	E B 24	B	E B 14	E B 14	B	B
23	B	31	24	27	40	38	40	33	28	G 15	21	19	30	E B 21	B	E B 56	B	B	B	E B 26	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	E B 40	E B 28	E B 26	E B 37	27	E B 23	E B 14	28	E B 13	E B 15	B	B	B
25	38	49	B	38	33	38	B	41	35	B	B	E B 22	25	E B 22	22	E B 20	E B 18	17	19	28	E B 14	B	B	E B 12
26	E B 11	E B 12	32	B	B	B	B	E B 13	E B 18	G	E B 22	B	B	E B 54	B	B	E B 32	E B 29	E B 26	E B 22	B	B	B	B
27	B	B	B	32	28	21	E B 14	E B 12	E B 13	B	E B 30	E B 25	E B 31	E B 26	G	E B 19	16	15	E B 15	E B 13	E B 12	E B 12	E B 12	E B 12
28	B	B	B	B	B	B	B	B	B	E B 20	E B 23	34	E B 20	25	22	G 16	22	E B 14	E B 12	E B 12	14	B	32	34
29	34	36	58	45	37	31	48	50	33	B	B	E B 26	E B 26	24	24	E B 17	15	E B 15	E B 12	E B 14	B	B	31	42
30	71	B	B	B	42	44	B	30	B	B	E B 20	B	B	E B 36	E B 39	E B 54	E B 55	35	32	21	G	38	58	44
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	20	22	20	22	21	18	15	18	18	18	15	20	20	23	20	22	24	23	25	25	22	18	16	19
MED	34	36	34	34	34	36	37	30	21	24	22	E B 28	26	E B 25	E B 28	E B 25	E B 24	E B 23	E B 24	E B 20	E G 16	26	31	34
U Q	42	49	50	39	40	41	43	35	33	31	E B 30	E B 31	30	E B 27	E B 36	E B 32	E B 30	E B 29	E B 28	26	24	38	40	43
L Q	28	31	29	30	30	30	E B 17	E B 18	16	E B 20	21	23	24	G	G 22	20	E B 20	E B 15	E B 17	E B 14	E B 14	E B 14	B 18	E B 19

APR. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2011 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	13	12	12	12	14	15	12	12	13	13	13	13	12	13	18	14	17	16	15	20	11	13	12	28
2	20	B	20	13	B	B	B	B	20	23	B	B	B	B	B	B	B	B	27	14	14	15	12	15
3	16	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	54	B	B	21	B	B	B	B
5	13	14	14	18	23	B	B	20	25	30	B	30	25	26	B	B	34	35	30	23	13	15	B	14
6	17	23	14	16	24	16	20	30	B	21	B	17	14	17	14	55	23	B	B	12	14	12	12	14
7	B	16	19	24	23	14	B	B	B	22	23	B	B	29	30	23	26	25	24	24	14	13	13	12
8	12	12	18	23	27	26	16	13	16	14	18	28	19	20	15	16	14	B	26	26	19	13	12	13
9	15	14	B	B	B	B	B	B	29	25	B	B	B	B	B	56	56	32	29	B	20	B	13	11
10	12	11	12	22	13	12	13	16	20	14	16	16	19	25	14	21	14	15	13	14	B	12	12	12
11	12	13	B	55	B	16	15	14	19	14	16	17	15	20	14	13	16	13	14	12	12	12	11	12
12	12	13	14	14	16	12	15	13	12	14	B	B	B	B	B	B	B	32	25	S	12	15	13	11
13	S	13	14	25	19	S	S	S	B	B	B	B	B	B	55	B	B	B	21	15	24	B	B	B
14	B	12	12	14	12	14	14	B	21	31	B	55	58	57	55	29	34	30	B	B	B	21	B	B
15	27	12	18	20	14	18	13	13	B	B	49	26	25	22	24	28	19	12	12	12	12	12	B	B
16	24	13	12	12	12	12	14	13	16	18	17	32	27	24	18	23	20	14	14	13	12	13	12	12
17	12	12	13	13	12	14	12	16	29	17	22	23	18	16	16	16	21	20	15	15	12	B	B	B
18	12	12	12	18	14	B	B	B	B	B	38	28	17	14	55	18	16	23	40	16	12	12	12	13
19	12	16	11	14	14	13	12	13	21	B	B	31	50	18	29	32	17	13	19	12	14	14	B	14
20	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	29	24	14	12	12	12	13
21	14	14	12	13	12	13	B	B	B	22	B	32	30	27	34	30	27	23	25	19	B	B	B	B
22	B	48	13	12	12	B	16	26	190	25	14	14	14	14	B	25	22	27	24	B	14	14	B	B
23	B	13	12	12	14	17	17	13	12	12	13	12	12	21	B	56	B	B	B	26	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	40	29	26	37	18	23	14	12	13	15	B	B	B
25	12	15	B	20	14	16	B	15	25	B	B	22	19	22	16	20	18	12	12	14	14	B	B	12
26	11	12	14	B	B	B	B	13	18	13	22	B	B	54	B	B	32	29	26	22	B	B	B	B
27	B	B	B	12	12	12	14	12	13	B	30	25	30	26	18	19	12	12	15	13	12	12	12	12
28	B	B	B	B	B	B	B	B	B	20	23	18	20	12	13	13	13	14	12	12	12	B	12	12
29	12	11	14	13	13	13	12	17	12	B	B	26	26	19	16	17	12	15	12	14	B	B	13	14
30	21	B	B	B	19	23	B	22	B	B	20	B	B	36	39	54	55	12	12	13	12	12	12	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	28	28	27	27	27	26	26	26	27	27	27	27	27	27	27	27	28	29	29	28	29	29	29	29
MED	16	14	14	18	14	16	16	16	25	23	38	28	26	24	30	25	22	23	24	14	14	15	13	14
U Q	B	B 20	B	B 25	B 27	B	B	B	B	B	B	B	B	B 36	B	B 56	44	B 34	28	22	B	B	B	B
L Q	12	12	12	13	13	13	14	13	16	14	18	18	18	18	16	18	16	14	14	13	12	12	12	12

APR. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

APR. 2011 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	A	A	A	A	A	A	A	E A 272	224	226	208	212	218	196	222	224	218	194	200	222	224	A	A	A
2	A	B	A	A	B	B	B	B	A	A	B	B	B	B	B	B	B	B	232	240	242	E A 292	A	A
3	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
4	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B 258	B	B	226	B	B	B	B
5	218	A 232	A	A	A	B	B	A	E B 302	E B 284	B	236	228	214	B	B	214	218	216	218	230	228	B	A
6	A	A	A	224	A	A	A	A	B	E A 288	B	224	214	E A 252	230	240	232	B	B	A	210	F	A	194
7	B	A	A	A	A	A	B	B	B	A	A	B	B	220	234	222	226	222	208	238	230	222	B 294	A
8	A	230	A	A	A	A	A	A	258	A 210	230	224	210	212	204	216	212	B	210	210	210	A	196	222
9	A	A	B	B	B	B	B	B	A	A	B	B	B	B	B	272	E B 298	226	228	B	E B 304	B	A	A
10	A	A	A	A	A	A	238	E B 300	E B 260	236	232	226	224	224	212	220	H 182	Q 198	212	236	B	A	A	A
11	A	A	B	B	B	A	E B 358	B 284	240	216	A 222	216	210	224	224	230	208	200	208	204	E A 280	A	190	A
12	A	A	A	220	208	A	218	A	224	E A 250	B	B	B	B	B	B	B	E B 256	294	S	A	A	A	A
13	S	A 244	A	A	A	S	S	S	B	B	B	B	B	B	E B 256	B	B	B	232	A 232	E B 284	B	B	B
14	B	A	A	A	226	A	A	B	B	E B 290	B	E B 302	E B 272	E B 250	B 248	216	218	214	B	B	B	A	B	B
15	216	194	A	A	A	A	A	A	B	B	E B 260	232	228	216	212	206	192	Q 192	Q 188	Q 206	204	210	B	B
16	210	196	A	A	A	E A 312	A 298	A	Q 252	228	216	230	214	208	200	200	196	190	198	192	234	222	E B 294	E B 256
17	A	A	A	A	A	A	216	A	E B	202	230	218	200	206	214	200	200	200	200	222	E A 258	B	B	B
18	A	E A 296	E A 284	B	B	B	B	B	B	B	222	228	198	204	246	218	228	194	254	A	A	208	A	A
19	224	A 228	228	A	228	A	A	198	A	B	B	220	266	218	212	216	196	196	202	206	226	E B 232	B	A
20	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	216	216	220	E B 280	E B 298	A
21	A	A	A	A	A	A	B	B	B	250	B	228	220	230	216	204	204	204	220	236	B	B	B	B
22	B	B	A	A	200	B	A	A	A	240	222	222	222	196	B	214	190	224	224	B	B 228	204	B	B
23	B	A	A	A	A		A	A	Q 258	236	222	212	230	220	B	272	B	B	B	220	B	B	B	B
24	B	B	B	B	B	B	B	B	B	B	B	238	210	206	204	204	198	198	206	Q 262	238	B	B	B
25	238	A	B	A	238	A	B	A	A	B	B	210	220	204	204	212	202	202	210	222	206	B	B	E B 292
26	E B 306	E B 294	A	B	B	B	B	E B 332	250	230	216	B	B	222	B	B	204	214	220	220	B	B	B	B
27	B	B	B	A	A	232	E B 326	E B 292	Q 264	B	218	218	214	214	192	188	178	Q 204	204	188	E B 220	E B 252	E B 236	E B 260
28	B	B	B	B	B	B	B	B	B	212	196	202	190	190	Q 194	196	188	194	194	204	228	B	196	A
29	A	A	A	A	A	A	A	A	216	B	B	226	222	212	212	196	198	196	Q 192	230	B	B	188	A
30	194	B	B	B	200	A	B	A	B	B	E B 292	B	B	B	B	B	E B 338	Q 298	A	A	R	A	A	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	7	8	2	2	6	2	6	6	11	15	14	20	20	22	19	21	24	23	24	22	19	10	8	5
MED	217	222	256	222	217	272	U 242	E B 288	246	226	221	224	218	213	212	216	202	201	210	221	224	216	U 202	E B 256
U Q	238	E A 269			228		E B 326	E B 300	E B 260	E 250	230	229	226	222	230	223	222	222	222	232	E 242	E B 252	E B 294	E B 276
L Q	210	212			200		218	272	224	216	216	217	210	206	204	202	196	196	201	206	220	210	193	208

APR. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2011 fxI (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	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	R	B	82	B	A	R	A	A	A
2	A	A	B	R	B	B	B	R	B	B	B	B	B	B	B	B	B	48	B	R	R	R	B	R
3	B	R	B	B	B	B	B	B	B	R	O X 49	O X 53	B	B	B	O X 70	X 61	X 62	X 59	38	B	X 37	R	A
4	A	A	B	A	B	B	R	X 26	X 32	X 46	O X 50	B	B	B	O X 85	O X 68	B	B	O X 39	R	B	B	B	R
5	Y	R	R	R	X 28	R	B	B	B	B	B	B	X 88	X 75	O X 86	X 82	X 70	O X 47	X 45	X 30	B	B	B	A
6	A	R	B	R	O X 38	37	X 33	32	37	B	X 47	X 68	X 88	X 88	X 88	X 73	X 63	B	O X 41	B	B	B	B	B
7	B	B	40	R	R	30	X 30	X 28	X 29	X 45	X 50	X 66	O X 74	X 82	O X 79	X 79	X 68	X 49	X 48	X 30	A	R	A	36
8	R	A	A	R	A	A	A	X 31	X 34	X 42	X 50	O X 54	X 66	X 73	X 73	X 66	X 58	51	41	32	X 19	O X 30	B	O X 21
9	A	37	O X 34	A	B	A	A	33	37	X 41	X 57	X 66	X 74	X 71	X 73	X 60	X 58	37	30	27	27	O X 21	B	B
10	B	B	B	58	B	X 56	X 62	B	30	O X 45	X 56	X 50	B	B	X 87	X 81	B	B	X 38	O X 34	A	X 38	A	O X 39
11	A	A	R	A	R	X 28	53	B	B	B	O X 47	O X 53	X 67	X 64	X 62	X 57	X 47	X 36	O X 26	B	B	B	B	B
12	R	X 32	O X 32	Y	B	B	R	A	R	X 38	X 43	X 64	X 66	O X 65	X 73	X 63	X 43	O X 36	B	B	B	B	R	B
13	B	A	O X 34	A	R	37	42	42	42	O X 38	X 48	73	X 72	X 73	X 75	O X 73	41	X 30	X 30	O X 24	B	B	B	B
14	B	B	X 37	B	X 54	B	R	A	54	59	61	X 80	O X 82	X 70	72	X 52	X 41	X 30	X 26	O X 23	O X 22	B	B	R
15	R	R	R	R	44	34	B	R	69	69	69	X 66	X 82	X 80	X 74	O X 63	X 44	42	X 38	34	O X 33	A	A	A
16	A	A	A	C	C	C	C	C	C	C	O X 47	O X 64	B	B	B	X 72	B	B	B	B	B	A	R	R
17	A	A	52	B	B	B	R	R	R	B	X 43	B	B	B	B	B	B	B	B	B	B	B	Y	R
18	A	A	A	A	R	A	B	B	B	O X 35	O X 50	X 61	X 68	O X 68	X 63	X 52	O X 38	X 36	O X 29	X 24	B	B	B	R
19	R	A	A	R	R	B	R	35	38	40	50	X 59	X 68	X 65	B	X 48	B	X 27	O X 24	B	B	B	B	B
20	B	B	Y	B	B	B	B	B	B	B	X 48	X 58	X 60	X 72	X 62	O X 38	O X 26	B	B	B	B	B	B	B
21	B	B	R	R	R	40	B	B	O X 35	B	O X 46	X 64	B	O X 69	X 61	X 46	O X 30	Y	B	B	B	R	R	A
22	A	A	A	A	O X 33	A	A	R	O X 46	X 47	X 47	X 62	X 70	X 65	X 51	X 51	33	30	28	O X 21	O X 21	X 21	O X 27	O X 22
23	R	R	A	A	A	A	47	R	R	O X 28	O X 43	O X 57	X 60	X 65	X 64	X 40	X 36	B	B	B	B	B	R	O X 36
24	O X 31	O X 33	A	A	A	B	R	A	R	36	X 47	X 56	X 70	X 65	65	51	41	O X 27	Y	B	B	B	B	B
25	B	R	A	A	A	R	A	R	42	41	46	X 62	X 72	60	X 57	X 45	S	S	S	S	S	B	B	B
26	R	R	A	A	A	36	37	36	35	B	O X 42	X 58	66	60	56	43	29	O X 24	24	X 22	A	O X 31	O X 44	R
27	O X 38	A	R	A	A	A	X 33	34	B	B	B	X 49	X 57	X 66	X 59	X 47	X 40	X 35	B	B	A	O X 33	A	B
28	A	A	A	A	A	B	B	B	A	B	B	B	B	B	X 94	X 76	R	R	R	R	A	A	A	A
29	R	A	39	A	A	R	A	R	A	B	B	B	B	B	B	B	36	B	R	72	A	R	B	B
30	R	R	B	B	B	R	R	R	B	B	B	O X 48	B	B	B	O X 68	B	B	B	O X 30	B	B	A	R
31	B	B	B	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	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	2	3	7	1	5	8	8	9	14	15	23	23	19	20	22	26	20	18	16	14	5	7	2	5
MED	O X 34	X 33	X 37	58	X 38	36	40	33	37	X 41	X 48	X 61	X 70	X 68	X 72	X 62	X 41	X 36	X 34	X 30	O X 22	O X 31	O X 36	O X 36
U Q		37	40		49	38	50	36	42	46	X 50	X 66	X 74	X 73	X 79	X 72	X 58	48	X 41	34	30	X 37		O X 38
L Q		X 32	O X 34		X 30	32	X 33	X 30	X 34	X 38	X 46	O X 54	X 66	X 65	X 62	X 48	36	X 30	X 27	X 24	X 20	X 21		O X 22

MAY 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2011 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

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	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	D R 62	B	F 72	B	A	A	A	A	A
2	A	A	B	A	B	B	B	R	B	B	B	B	B	B	B	B	B	J R 42	B	R	R	R	B	R
3	B	A	B	B	B	B	B	B	B	R	R 43	R 47	B	B	B	64	55	56	53	F 24	B	J R 31	A	A
4	A	A	B	A	B	B	R	20	25	40	R 44	B	B	B	R 79	62	B	B	33	R	B	B	B	R
5	Y	R	A	R	22	R	B	B	B	B	B	B	J R 82	J R 69	80	76	64	41	39	24	B	B	B	A
6	A	R	B	R	R 32	F 27	27	F 20	F 27	B	J R 41	62	J R 82	J R 82	J R 82	J R 67	57	B	R 35	B	B	B	B	B
7	B	B	A	A	A	F 21	24	22	23	39	R 44	60	68	J R 76	73	73	62	43	42	24	A	R	A	30
8	A	A	A	A	A	A	A	25	28	36	44	R 48	J R 60	67	67	60	52	F 39	F 30	F 22	13	R 24	B	R 15
9	A	F 26	R 28	A	B	A	A	F 23	F 24	35	51	60	68	65	67	54	52	F 26	F 20	F 18	F 18	R 15	B	B
10	B	B	B	Y	B	50	56	B	F 21	R 39	50	44	B	B	81	J R 75	B	B	32	R 28	A	32	A	33
11	A	A	A	A	A	22	B	B	B	B	R 41	R 47	61	58	56	51	41	30	R 20	B	B	B	B	B
12	A	26	26	Y	B	B	A	A	A	32	R 37	58	60	59	67	57	37	30	B	B	B	B	A	B
13	B	A	R 28	A	A	F 25	F 27	F 28	F 27	R 32	42	F 63	66	67	69	67	F 32	24	24	R 18	B	B	B	B
14	B	B	31	B	48	B	A	A	F 42	F 48	F 51	74	R 76	64	F 61	46	35	24	20	R 17	R 16	B	B	R
15	R	R	R	R	F 28	F 24	B	R	Y	F 32	43	60	76	74	68	57	38	F 32	32	F 24	F 24	A	A	A
16	A	A	A	C	C	C	C	C	C	C	41	58	B	B	B	66	B	B	B	B	B	A	A	A
17	A	A	A	B	B	A	A	R	R	B	37	B	B	B	B	B	B	B	B	B	B	B	Y	A
18	A	A	A	A	A	A	B	B	B	R 29	R 44	J R 55	62	62	57	46	32	30	R 23	18	B	B	B	A
19	A	A	A	A	A	B	A	F 26	F 26	F 30	F 40	53	62	59	B	42	B	21	R 18	B	B	B	B	B
20	B	B	Y	B	B	B	B	B	B	B	41	52	J R 54	66	56	R 32	20	B	B	B	B	B	B	B
21	B	B	R	R	R	F 29	B	B	R 29	B	R 40	R 58	B	63	55	40	R 24	Y	B	B	B	R	R	A
22	A	A	A	A	27	A	A	A	R 40	41	41	56	64	59	45	45	F 22	F 19	F 18	R 15	R 15	15	R 21	R 16
23	A	A	A	A	A	A	F 36	A	A	R 22	37	R 51	54	59	58	34	30	B	B	B	B	B	R	R 30
24	R 25	R 27	A	A	A	B	A	A	A	F 27	41	50	64	59	F 55	F 40	F 28	R 21	Y	B	B	B	B	B
25	B	A	A	A	A	A	A	R	F 34	F 23	F 36	56	J R 66	F 50	51	39	S	S	S	S	S	B	B	B
26	R	A	A	A	A	F 26	F 27	F 26	F 25	B	R 36	52	F 57	F 51	F 46	F 33	F 21	18	F 16	16	A	R 25	R 38	R
27	R 32	A	A	A	A	A	27	F 22	B	B	B	43	51	60	53	41	34	29	B	B	A	R 27	A	B
28	A	A	A	R	A	B	B	B	A	B	B	B	B	B	88	70	R	R	R	A	A	A	A	A
29	A	A	R	A	A	A	A	R	A	B	B	B	B	B	B	B	F 27	B	A	A	A	R	B	B
30	R	A	B	B	B	R	A	R	B	B	B	R 42	B	B	B	R 62	B	B	B	R 24	B	B	A	A
31	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	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	2	3	4		5	8	7	9	13	15	23	23	19	20	22	27	20	18	16	13	5	7	2	5
MED	R 28	26	28		28	F 26	27	F 23	F 27	32	41	55	64	62	64	57	34	30	27	22	16	R 25	R 30	R 30
U Q		R 27	30		40	F 28	36	F 26	32	39	44	60	R 68	67	73	66	52	41	34	24	F 21	31		32
L Q		26	27		24	F 23	27	21	24	29	40	R 48	60	59	55	41	F 28	24	F 20	18	14	15		R 16

MAY 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2011 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	B 42	40 43	41 B	37 33	B	B	B	B 28	B	B	B	B	B	B	B	E B 56	B	E B 25	B	34	34	35	39	41
2	B	B	B	B	B	B	B	28	B	B	B	B	B	B	B	B	B	E B 22	B	22	28	G	B	G
3	B 65	35 43	B	B 34	B	B	B 20	B 16	B	32 E B 22	E B 27	E B 26	B	B	B E B 55	E B 42 E B 56	E B 23 B	16	E B 22	20	B	17	35	42
3	B 17	28	K 34	26	18	K 23	B	B	B	B	B	B	E B 55	E B 54	E B 28	E B 28	E B 16	E B 20	E B 12	E B 20	B	B	B	K 35
4	K 35	K 24	B	23	K 17	E B 14	E B 14	40	E B 14	B	E B 23	E B 30	E B 28	E B 59	E B 28	E B 30	E B 24	B	E B 30	B	B	B	B	B
5	B	B	32	29	34	18	E B 13	E B 13	E B 13	16	21	E B 23	E B 29	E B 26	E B 20	E B 18	E B 16	E B 14	E B 13	E B 12	32	18	31	38
6	32	43	41	35	40	38	38	20	17	16	E B 20	E B 29	E B 26	22	E B 24	E B 24	E B 14	15	E B 17	E B 14	E B 13	E B 19	B	E B 12
7	33	31	33	41	B	43	41	31	16	E B 14	19	E B 18	E B 22	E B 20	E B 20	24	E B 13	E B 12	E B 12	E B 12	E B 12	E B 12	B	B
8	B	B	B	15	B	E B 22	E B 44	B	E B 12	E B 15	16	E B 18	B	B	E B 34	E B 55	B	B	E B 14	E B 19	42	42	42	39
9	42	42	38	43	31	35	E B 46	B	B	B	E B 22	E B 31	E B 28	E B 34	E B 26	E B 17	E B 16	E B 14	E B 16	B	B	B	B	B
10	29	28	18	15	B	B	35	36	30	24	20	E B 29	E B 23	E B 20	18	E B 15	E B 20	E B 15	B	B	B	B	18	B
11	B	70	37	38	34	24	18	24	28	E B 22	E B 20	E B 20	E B 20	G	E B 22	24	18	E B 14	E B 12	E B 13	B	B	B	B
12	B	B	E B 24	B	E B 26	B	42	43	42	24	18	G	22	E B 19	22	16	E B 12	E B 12	E B 13	E B 12	E B 12	B	B	18
13	K 31	27	31	32	16	16	B	31	27	E B 12	15	24	E B 19	E B 18	G 14	18	E B 13	E B 12	E B 13	E B 13	42	44	41	41
14	41	43	52	C	C	C	C	C	C	C	28	E B 25	B	B	B	E B 19	B	B	B	B	B	37	32	40
15	44	41	50	B	B	41	38	31	32	B	29	B	B	B	B	B	B	B	B	B	B	B	16	29
16	43	43	43	42	34	42	B	B	B	E B 23	E B 18	E B 23	E B 20	E B 19	37	27	31	E B 15	E B 15	15	B	B	B	32
17	33	32	40	34	35	B	35	28	16	E B 13	16	18	E B 26	E B 36	B	40	B	E B 13	E B 13	B	B	B	B	B
18	B	B	18	B	B	B	B	B	B	B	E B 19	E B 21	25	E B 19	29	38	E B 14	B	B	B	B	B	B	B
19	B	B	25	30	24	24	B	B	E B 22	B	E B 16	E B 17	B	E B 25	25	26	E B 17	19	B	B	B	24	27	42
20	40	42	44	53	33	62	57	41	34	E B 23	17	31	26	28	27	36	36	30	E B 13	16	17	31	E B 17	E B 12
21	22	24	37	38	48	48	31	41	42	24	E B 13	26	42	37	E B 18	E B 17	E B 15	B	B	B	B	B	21	22
22	29	35	40	50	59	B	38	43	39	K 19	E B 16	G	24	E B 19	E B 14	E B 12	E B 12	E B 14	19	B	B	B	B	B
23	B	29	39	42	64	38	47	35	42	28	K 22	24	29	22	20	16	S	S	S	S	S	B	B	B
24	18	24	43	44	47	31	25	E B 14	E B 14	B	E B 25	24	24	E B 19	22	E B 13	E B 15	18	E B 13	30	35	16	42	31
25	41	47	34	41	48	51	32	20	B	B	B	28	24	E B 19	E B 15	E B 24	E B 15	E B 16	B	B	42	42	101	B
26	K 38	44	88	24	45	B	B	B	47	B	B	B	B	B	32	42	34	30	34	43	44	43	47	40
27	38	52	27	74	39	31	38	33	70	B	B	B	B	B	B	B	30	B	37	35	40	26	B	B
28	K 27	37	B	B	B	30	36	37	B	B	B	E B 29	B	B	B	E B 56	B	B	B	18	B	B	36	29
29	B	B	B	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	33	24	41	40
	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	25	24	25	19	19	20	20	20	16	23	23	19	20	22	27	21	20	19	18	14	16	16	20
MED	35	40	38	35	34	31	36	31	28	20	19	E B 24	E B 25	E B 22	E B 23	E B 24	E B 16	E B 15	E B 14	17	34	25	36	34
U Q	42	43	42	42	47	42	42	38	40	24	23	E B 29	E B 28	E B 31	28	E B 40	24	20	E B 22	24	42	40	42	40
L Q	29	28	32	30	26	23	28	22	G E B 16	16	16	18	E B 22	E B 19	E B 20	E B 17	E B 14	E B 14	E B 13	E B 13	E B 17	18	24	23

MAY 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2011 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	B	28	18	14	B	B	B	B	B	B	B	B	B	B	B	56	B	25	B	12	12	12	12	13
2	18	20	B	14	B	B	B	17	B	B	B	B	B	B	B	B	B	22	B	14	14	12	B	18
3	B	22	B	B	B	B	B	B	B	29	27	26	B	B	B	42	23	13	22	13	B	13	12	14
4	37	16	B	14	B	B	15	14	12	22	20	B	B	B	55	56	B	B	22	14	B	B	B	12
5	14	12	12	18	13	12	B	B	B	B	B	B	55	54	28	28	16	20	12	20	B	B	B	13
6	13	12	B	12	13	14	14	13	14	B	23	30	28	59	28	30	23	B	30	B	B	B	B	B
7	B	B	16	24	12	13	13	13	13	11	15	23	29	26	20	18	16	14	13	12	12	13	12	12
8	21	16	18	15	26	19	12	12	12	12	19	29	26	22	24	24	13	12	17	14	13	19	B	12
9	12	12	12	15	B	14	13	12	11	98	15	18	22	20	19	14	13	12	12	12	12	12	B	B
10	B	B	B	12	B	22	44	B	12	13	13	18	B	B	34	55	B	B	14	19	13	13	12	11
11	14	26	14	18	20	14	47	B	B	B	22	30	28	34	26	17	16	14	16	B	B	B	B	B
12	14	12	11	12	B	B	22	14	12	14	12	29	23	20	16	15	20	15	B	B	B	B	15	B
13	B	11	14	19	13	13	12	12	12	22	20	20	20	16	22	12	12	14	12	13	B	B	B	B
14	B	B	24	B	26	B	16	15	14	13	12	15	16	19	12	13	12	12	13	12	12	B	B	13
15	13	12	12	12	12	13	B	14	12	12	12	16	19	18	12	14	13	12	13	13	12	13	16	12
16	12	13	17	C	C	C	C	C	C	C	20	25	B	B	B	19	B	B	B	B	B	13	12	13
17	14	24	19	B	B	20	13	13	22	B	17	B	B	B	B	B	B	B	B	B	B	B	13	14
18	12	14	17	22	20	30	B	B	B	23	18	23	20	19	14	14	16	15	15	12	B	B	B	13
19	13	13	12	13	14	B	16	13	12	13	13	12	26	36	B	16	B	13	13	B	B	B	B	B
20	B	B	12	B	B	B	B	B	B	B	19	21	20	19	20	15	14	B	B	B	B	B	B	B
21	B	B	12	11	12	16	B	B	22	B	16	17	B	25	16	14	17	14	B	B	B	12	12	12
22	13	10	12	12	13	21	24	14	22	24	14	13	16	13	12	12	12	12	13	12	12	11	17	11
23	11	12	12	13	12	12	12	12	12	12	13	14	13	12	18	17	15	B	B	B	B	B	12	12
24	12	11	14	17	20	B	27	19	13	12	16	13	13	19	14	12	12	14	15	B	B	B	B	B
25	B	14	21	26	23	21	14	17	14	12	13	12	14	12	14	12	S	S	S	S	S	B	B	B
26	12	11	13	16	14	12	12	14	15	B	25	17	18	19	13	13	15	13	13	12	13	12	11	27
27	13	15	20	24	17	14	12	13	B	B	B	20	16	18	15	24	15	16	B	B	13	12	15	B
28	23	14	18	15	15	B	B	B	27	B	B	B	B	B	14	13	13	27	18	12	12	13	12	12
29	12	12	13	23	14	26	20	20	26	B	B	B	B	B	B	B	12	B	14	12	12	16	B	B
30	13	24	B	B	B	20	23	27	B	B	B	29	B	B	B	56	B	B	B	14	B	B	11	12
31	B	B	B	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	13	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	31	31	31	30	30	30	30	30	30	30	31	31	31	31	31	31	30	30	30	30	30	31	31	31
MED	14	14	17	16	20	21	22	16	18	64	19	23	28	26	22	17	16	16	18	14	B	19	17	13
U Q	B	B 26	B 24	B 24	B	B	B	B	B	B	B	B	B	B	B	55	B	B	B	B	B	B	B	B
L Q	13	12	12	13	13	14	13	13	12	13	14	17	19	19	14	14	13	13	13	12	12	13	12	12

MAY 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

MAY 2011 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	B	A	A	A	B	B	B	B	B	B	B	B	B	B	B	258	B	238	B	A	A	A	A	A
2	A	A	B	A	B	B	B	A	B	B	B	B	B	B	B	B	B	252	B	A	A	A	B	R
3	B	A	B	B	B	B	B	B	B	A	252	232	B	B	B	E B 236	226	Q 208	230	A 244	B	A	A	A
4	A	A	B	A	B	B	A	A	E A 312	250	E A 286	B	B	B	212	E B 248	B	B	220	A	B	B	B	A
5	Y	A	E A 234	A	232	A	B	B	B	B	B	B	214	242	206	202	188	210	Q 214	224	B	B	B	A
6	A	A	B	A	A	E B 314	E B 314	E B 326	E B 310	B	230	216	216	E B 230	202	202	198	B	E B 234	B	B	B	B	B
7	B	B	A	A	A	A 302	E B 332	E B 338	318	212	204	216	218	206	200	200	200	214	196	242	A	198	A	226
8	A	A	A	A	A	A	A	A	284	232	218	224	208	208	204	210	Q 180	Q 194	Q 206	220	B 220	E B 280	B	E B 260
9	A	230	228	A	B	A	A	A	Q 294	244	224	218	216	202	202	194	Q 188	186	212	218	B 232	E B 242	B	B
10	B	B	B	Y	B	B	B	B	E B 278	240	206	226	B	B	236	242	B	B	254	E B 272	A	222	A	220
11	A	A	A	A	A	210	B 204	B	B	B	252	244	234	228	200	206	202	200	E B 282	B	B	B	B	B
12	A	E A 246	E A 278	Y	B	B	A	A	A	E A 268	202	230	200	194	200	190	192	208	B	B	B	B	A	B
13	B	A	198	A	A	A	A	284	266	272	238	Q 210	196	196	196	Q 196	Q 182	210	210	E B 260	B	B	B	B
14	B	B	B	B	292	B	A	A	A	Q 236	214	206	204	194	204	204	202	222	200	208	210	B	B	A
15	A	A	A	A	A	A	B	A	Y	230	208	208	212	Q 226	Q 200	Q 186	Q 194	Q 244	210	256	A	A	A	A
16	A	A	A	C	C	C	C	C	C	C	E A 286	248	B	B	B	216	B	B	B	B	B	A	A	A
17	A	A	A	B	B	A	A	A	A	B	262	B	B	B	B	B	B	B	B	B	B	B	Y	A
18	A	A	A	A	A	A	B	B	B	E B 264	220	216	200	192	192	196	240	214	226	264	B	B	B	A
19	A	A	A	A	A	B	A	A	E A 272	Q 228	192	Q 210	218	214	B	194	B	220	220	B	B	B	B	B
20	B	B	Y	B	B	B	B	B	B	B	210	210	196	208	194	196	210	B	B	B	B	B	B	B
21	B	B	A	A	A	A	B	B	B	B	222	202	B	208	196	190	210	Y	B	B	B	A	A	A
22	A	210	A	A	A	A	A	A	216	250	236	222	194	Q 190	Q 196	Q 196	208	E A 262	E B 262	E A 242	E A 296	214	E B 278	184
23	A	A	A	A	A	A	A	A	A	E A 268	Q 226	Q 190	Q 196	196	192	204	212	B	B	B	B	B	A	198
24	206	196	A	A	A	B	A	A	A	E A 254	244	196	202	200	Q 204	Q 204	Q 178	E B 230	Y	B	B	B	B	B
25	B	A	A	A	A	A	A	A	210	E A 258	Q 224	Q 200	194	200	Q 194	194	S	S	S	S	S	B	B	B
26	A	A	A	A	A	A	274	270	Q 266	B	282	Q 208	208	192	Q 184	Q 174	184	E A 278	E B 242	A 252	A	190	A	202
27	E A	A	A	A	A	A	A	E A 298	B	B	B	268	242	198	188	208	208	226	B	B	A	224	A	B
28	A	A	A	A	A	B	B	B	A	B	B	B	B	B	Q 266	Q 270	A	R	A	A	A	A	A	A
29	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	222	B	A	A	A	A	B	B
30	A	A	B	B	B	A	A	A	B	B	B	248	B	B	B	E B 250	B	B	B	A 266	B	B	A	A
31	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	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	1	4	4		2	3	4	5	11	15	23	23	19	20	22	27	20	18	16	13	4	7	1	6
MED	206	212	231		262	U 256	294	E 298	272	240	223	216	208	200	200	199	201	214	215	243	220	U 210	E B 278	206
U Q		238	E A 256			E B 314	E B 323	E B 332	E 310	E 264	252	230	216	211	204	216	210	238	E B 238	262	264	E B 242		226
L Q		203	213			210	239	277	266	232	210	208	196	195	194	194	Q 188	208	210	222	215	198		198

MAY 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2011 fxI (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	A	A	R	B	B	R	A	R	B	B	X 33	B	B	B	B	B	B	X 32	B	O X 29	A	A	A	A
2	A	A	B	B	B	A	B	B	R	R	B	B	B	B	B	B	B	B	B	B	Y	A	A	A
3	A	A	A	A	R	R	A	R	R	O X 32	X 41	X 48	X 57	X 58	B	X 42	O X 36	B	B	B	B	B	B	B
4	B	B	Y	R	R	A	A	33	R	X 30	X 32	X 49	X 56	X 58	X 51	X 42	O X 30	O X 24	O X 29	Y	B	B	B	B
5	B	A	A	A	B	B	A	43	X 64	R	B	O X 54	O X 52	X 58	X 50	X 53	X 48	X 39	B	A	R	A	A	A
6	A	A	B	R	R	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	Y	B	R
7	X 37	R	R	A	R	R	O X 28	X 28	O X 26	X 28	X 38	51	O X 52	O X 73	68	X 38	B	B	B	B	B	X 32	A	A
8	56	B	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	B
9	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	A	R
10	A	A	B	B	A	O X 40	R	X 27	O X 26	O X 24	O X 38	X 49	O X 54	O X 49	B	B	B	B	B	B	B	B	R	A
11	B	A	A	A	A	B	A	B	B	B	B	B	O X 47	B	O X 41	X 44	X 43	B	B	B	R	B	R	A
12	A	A	A	A	R	A	R	O X 35	B	B	B	B	B	B	O X 46	B	B	B	B	A	B	Y	A	R
13	O X 32	O X 38	O X 38	X 38	R	R	A	A	32	32	X 36	B	X 48	X 45	X 54	X 47	B	B	B	B	R	R	52	R
14	O X 37	A	A	A	A	A	A	A	A	A	X 39	X 43	X 45	B	B	B	B	B	B	B	B	B	B	O X 35
15	R	A	B	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	38	O X 36	A	B	A	R	O X 27	O X 26	26	X 32	O X 46	X 48	X 51	O X 48	X 39	O X 23	B	B	B	B	B	B	B
17	B	B	B	B	B	O X 37	B	B	O X 36	R	O X 39	X 46	X 49	X 50	O X 46	X 44	B	28	X 28	B	B	B	B	B
18	B	B	R	B	R	A	A	O X 34	B	B	B	B	O X 49	X 44	X 46	X 37	X 25	B	B	B	R	Y	Y	A
19	A	R	R	A	X 34	30	32	32	33	31	32	X 41	B	B	B	B	B	B	B	B	R	Y	B	R
20	A	A	O X 30	A	A	A	A	A	A	A	B	B	B	O X 43	O X 46	40	X 32	X 30	O X 25	B	B	B	B	B
21	A	A	O X 35	A	B	A	A	A	A	B	B	B	O X 48	B	X 42	X 37	X 32	32	B	B	A	A	A	A
22	A	B	B	A	O X 41	B	A	A	A	B	B	B	B	O X 50	X 56	X 58	B	B	B	B	A	A	A	A
23	B	B	A	A	B	A	B	B	A	B	B	B	B	O X 47	B	B	B	O X 40	B	R	A	A	A	A
24	A	B	R	R	B	B	B	R	R	A	B	B	B	B	O X 48	B	B	B	O X 30	B	B	B	A	O X 39
25	A	R	R	R	R	B	A	R	B	B	B	B	O X 50	B	B	B	B	B	B	B	B	B	B	B
26	R	R	B	B	A	R	R	B	B	A	X 37	X 38	X 48	57	X 46	X 45	B	X 24	O X 24	B	B	B	Y	38
27	R	Y	R	R	A	R	R	R	B	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B
28	42	R	A	A	R	R	R	B	B	O X 26	35	45	49	54	44	48	B	Y	B	B	B	B	B	B
29	R	R	R	B	A	R	A	R	B	R	X 30	X 41	X 44	56	X 44	X 37	B	R	B	R	B	Y	R	Y
30	R	R	B	52	48	57	A	A	Y	43	42	46	46	X 48	49	X 35	X 24	R	B	B	B	B	B	27
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	2	4	2	3	4	2	8	7	9	14	13	17	16	17	16	9	8	5	1		1	1	4
MED	X 37	38	O X 36	45	X 41	38	30	X 32	O X 32	X 30	X 36	X 46	X 49	X 50	X 46	X 42	X 32	X 31	O X 28	O X 29		X 32	52	36
U Q	49		O X 37		48	48		O X 34	X 36	32	X 39	X 49	O X 52	X 58	X 50	X 46	X 40	X 36	O X 30					38
L Q	X 34		O X 32		X 34	34		X 28	O X 26	O X 26	X 32	X 42	X 48	X 48	X 45	X 38	X 24	X 26	O X 24					31

JUN. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2011 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

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	A	A	A	B	B	A	A	A	B	B	J R 27	B	B	B	B	B	B	26	B	R 23	A	A	A	A
2	A	A	B	B	B	A	B	B	R	R	B	B	B	B	B	B	B	B	B	B	Y	A	A	A
3	A	A	A	A	A	A	A	A	A	R 26	35	42	51	52	B	36	R 30	B	B	B	B	B	B	B
4	B	B	Y	R	A	A	A	F 22	A	24	26	43	50	52	45	36	R 24	R 18	R 23	Y	B	B	B	B
5	B	A	A	A	B	B	A	F 30	58	R	B	48	R 46	52	44	47	42	33	B	A	A	A	A	A
6	A	A	B	A	A	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	Y	B	R
7	31	A	R	A	A	A	R 22	22	R 20	R 22	32	F 40	46	67	62	32	B	B	B	B	B	R 26	A	A
8	Y	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B
9	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	A	A
10	A	A	B	B	A	R 34	A	J R 21	R 20	R 18	32	43	R 48	43	B	B	B	B	B	B	B	B	R	A
11	B	A	A	A	A	B	A	B	B	B	B	B	R 41	B	R 35	38	37	B	B	B	A	B	A	A
12	A	A	A	A	A	A	A	R 29	B	B	B	B	B	B	40	B	B	B	B	A	B	Y	A	R
13	R 26	32	R 32	32	A	A	A	A	F 21	F 20	30	B	42	39	48	41	B	B	B	B	R	R	A	A
14	R 31	A	A	A	A	A	A	A	A	A	33	37	39	B	B	B	B	B	B	B	B	B	B	R 29
15	A	A	B	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	F 24	R 30	A	B	A	R	R 21	R 20	F 16	26	40	42	45	42	33	R 17	B	B	B	B	B	B	B
17	B	B	B	B	B	R 31	B	B	30	A	33	40	43	44	40	38	B	F 18	22	B	B	B	B	B
18	B	B	R	B	A	A	A	28	B	B	B	B	43	38	40	31	19	B	B	B	R	Y	Y	A
19	A	A	R	A	28	F 20	F 21	F 22	F 24	F 19	F 21	35	B	B	B	B	B	B	B	B	A	Y	B	R
20	A	A	R 24	A	A	A	A	A	A	A	B	B	B	R 37	40	F 30	26	24	R 19	B	B	B	B	B
21	A	A	R 29	A	B	A	A	A	A	B	B	B	R 42	B	36	31	26	F 22	B	B	A	A	A	A
22	A	B	B	A	R 35	B	A	A	A	B	B	B	B	R 44	50	J R 52	B	B	B	B	A	A	A	A
23	B	B	A	A	B	A	B	B	A	B	B	B	B	R 41	B	B	B	R 34	B	R	A	A	A	A
24	A	B	R	A	B	B	B	R	A	A	B	B	B	B	R 42	B	B	B	U R 24	B	B	B	A	R 33
25	A	A	R	R	R	B	A	A	B	B	B	B	R 46	B	B	B	B	B	B	B	B	B	B	B
26	R	R	B	B	A	R	A	B	B	A	31	32	42	Z 51	40	39	B	R 18	R 18	B	B	B	Y	F 24
27	A	Y	R	R	A	A	R	R	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
28	A	A	A	A	A	R	A	B	B	R 20	F 25	F 37	F 39	F 42	F 33	F 38	B	Y	B	B	B	B	B	B
29	R	A	R	B	A	R	A	R	B	A	24	35	38	F 46	38	R 31	B	R	B	R	B	Y	A	Y
30	A	A	B	A	A	R	A	A	Y	F 31	F 26	F 34	F 36	42	42	29	18	A	B	B	B	B	B	F 16
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	4	1	2	3	2	8	7	9	14	13	17	16	17	16	9	8	5	1		1		4
MED	R 31	28	R 30	32	32	R 31	22	22	21	20	28	40	42	44	40	36	26	23	R 22	R 23		R 26		26
U Q	R 31		R 31			R 34		28	30	25	32	42	R 46	52	44	38	34	30	R 24					R 31
L Q	R 26		R 26			F 20		R 22	R 20	F 18	26	35	40	42	39	31	18	R 18	R 18					F 20

JUN. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2011 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	48	39	31	B	B	34	43	35	B	B	E B 29	B	B	B	B	B	B	E B 20	B	20	36	40	39	42
2	43	40	B	B	B	42	B	B	28	25	B	B	B	B	B	B	B	B	B	B	17	33	31	35
3	40	43	41	48	33	30	41	40	41	23	25	19	E B 21	E B 24	B	E B 17	E B 22	B	B	B	B	B	B	B
4	B	B	14	18	32	42	41	33	36	E B 20	E B 19	E B 20	E B 24	20	E B 20	28	31	15	24	17	B	B	B	B
5	B	43	62	49	B	B	41	42	37	35	B	E B 30	E B 26	E B 17	E B 16	15	20	E B 22	B	33	28	33	47	43
6	39	46	B	33	32	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	16	B	25
7	31	K 35	31	42	34	30	18	E B 13	E B 14	E B 14	E B 14	30	E B 14	E B 26	E B 22	E B 17	B	B	B	B	B	40	40	K 40
8	26	B	B	35	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	B
9	37	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	31	39	34
10	39	43	E B 54	B	41	43	36	30	29	32	17	22	E B 26	E B 17	B	B	B	B	B	B	B	B	28	49
11	B	36	72	40	41	B	42	B	B	B	B	B	E B 26	B	E B 20	E B 17	E B 13	B	B	B	24	B	25	39
12	42	37	40	70	35	48	39	36	B	B	B	B	B	B	32	B	B	B	B	36	B	19	37	25
13	36	38	43	44	47	41	48	41	28	24	K 17	B	22	20	20	E B 20	B	B	B	B	22	25	33	33
14	42	57	84	44	52	58	59	56	48	43	31	33	22	B	B	B	B	B	B	B	B	B	B	40
15	32	42	66	52	42	B	B	B	B	K 32	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	50	34	45	35	B	40	20	15	E B 13	E B 13	E B 13	18	19	E B 15	K 14	E B 12	E B 14	B	B	B	B	B	B	B
17	B	B	B	B	B	E B 20	B	B	53	32	E B 29	33	27	29	27	22	B	15	E B 13	B	B	B	B	B
18	B	B	34	B	36	42	40	E B 23	B	B	B	B	27	E B 17	E B 15	E B 14	21	B	B	B	22	18	18	33
19	42	35	K 28	59	30	50	42	29	32	33	E B 13	19	B	B	B	B	B	B	B	B	26	17	B	22
20	40	39	30	33	36	45	57	56	45	48	B	B	B	E B 22	E B 21	E B 14	E B 14	E B 12	E B 14	B	B	B	B	B
21	31	40	50	42	B	45	40	45	40	B	B	B	E B 34	B	20	20	E B 12	17	B	B	38	43	44	56
22	41	B	B	42	34	B	34	30	32	B	B	B	B	E B 24	E B 18	E B 51	B	B	B	B	41	35	35	42
23	B	B	44	51	B	38	B	B	42	B	B	B	B	E B 23	B	B	B	E B 24	B	25	42	45	44	70
24	42	B	34	37	B	B	B	33	34	46	B	B	B	B	E B 28	B	B	B	E B 14	B	B	B	47	37
25	69	36	K 27	K 22	28	B	37	K 31	B	B	B	B	E B 30	B	B	B	B	B	B	B	B	B	B	B
26	27	17	B	B	38	28	35	B	B	36	K 25	E B 20	14	E B 15	E B 15	E B 15	B	E B 12	E B 12	B	B	B	15	34
27	30	20	21	30	41	34	24	24	B	32	34	B	B	B	B	B	B	B	B	B	B	B	B	B
28	36	35	42	41	32	25	35	B	B	19	27	14	15	16	E B 13	E B 16	B	16	B	B	B	B	B	B
29	24	32	28	B	40	29	38	20	B	21	E B 17	E B 18	E B 18	E B 16	E B 16	E B 17	B	17	B	18	B	16	30	16
30	32	32	B	34	42	30	58	43	34	31	24	E B 14	18	18	32	22	31	17	B	B	B	B	B	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	24	22	22	22	21	21	22	20	17	19	15	13	17	16	17	16	9	11	5	6	11	14	17	20
MED	39	38	38	42	36	40	40	33	34	32	U 20	20	E B 22	E B 19	E B 20	E B 17	E B 20	16	E B 14	22	26	32	35	36
U Q	42	42	50	48	41	44	42	42	42	35	29	30	E B 26	E B 24	24	21	26	E B 20	19	33	38	40	42	42
L Q	32	35	30	34	32	30	35	26	28	E B 21	E B 17	18	18	E B 16	E B 16	E B 15	E B 14	E B 15	E B 12	18	22	18	26	32

JUN. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2011 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	22	20	B	B	23	20	25	B	B	29	B	B	B	B	B	B	20	B	13	12	13	13	12
2	16	22	B	B	B	24	B	B	20	16	B	B	B	B	B	B	B	B	B	B	14	13	12	16
3	13	14	18	18	14	13	13	18	15	15	12	14	21	24	B	17	22	B	B	B	B	B	B	B
4	B	B	12	12	15	18	13	12	18	20	18	20	24	20	20	15	13	12	13	13	B	B	B	B
5	B	31	14	14	B	B	26	12	14	26	B	30	26	17	16	13	20	22	B	14	16	12	14	17
6	14	12	B	29	28	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	13	B	15
7	13	12	16	14	14	13	12	13	14	14	14	14	14	26	22	17	B	B	B	B	B	20	26	25
8	17	B	B	23	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	B
9	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	14	12	12	15
10	16	15	54	B	26	18	14	14	14	13	12	19	26	17	B	B	B	B	B	B	B	B	13	13
11	B	16	26	28	18	B	20	B	B	B	B	B	26	B	20	17	13	B	B	B	16	B	14	12
12	12	12	14	14	27	17	18	12	B	B	B	B	B	B	20	B	B	B	B	23	B	16	12	13
13	12	12	17	14	12	22	15	13	12	12	12	B	16	13	13	20	B	B	B	B	13	13	12	12
14	13	12	14	14	13	16	21	23	16	14	15	13	13	B	B	B	B	B	B	B	B	B	B	12
15	21	18	54	22	24	B	B	B	B	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	12	12	14	13	B	14	13	12	13	12	13	12	12	15	12	13	14	B	B	B	B	B	B	B
17	B	B	B	B	B	20	B	B	20	19	30	13	19	20	19	15	B	12	13	B	B	B	B	B
18	B	B	23	B	26	23	24	23	B	B	B	B	23	17	15	14	12	B	B	B	15	12	13	13
19	13	14	14	12	12	12	13	12	13	12	13	16	B	B	B	B	B	B	B	B	20	13	B	12
20	13	12	12	12	12	21	18	13	25	14	B	B	B	22	21	14	14	12	14	B	B	B	B	B
21	13	14	12	24	B	27	29	18	12	B	B	B	34	B	15	17	12	12	B	B	13	12	11	14
22	16	B	B	24	16	B	21	18	21	B	B	B	B	24	18	51	B	B	B	B	12	24	12	12
23	B	B	20	16	B	22	B	B	23	B	B	B	B	23	B	B	B	24	B	12	12	12	12	14
24	20	B	27	12	B	B	B	26	14	14	B	B	B	B	28	B	B	B	14	B	B	B	12	14
25	22	21	14	14	16	B	23	23	B	B	B	B	30	B	B	B	B	B	B	B	B	B	B	B
26	12	12	B	B	15	15	17	B	B	19	18	20	12	15	15	15	B	12	12	B	B	B	13	12
27	16	13	13	15	13	20	16	14	B	19	13	B	B	B	B	B	B	B	B	B	B	B	B	B
28	12	14	17	26	14	16	25	B	B	14	13	12	12	12	13	16	B	13	B	B	B	B	B	B
29	12	12	13	B	12	12	12	12	B	14	17	18	18	16	16	17	B	13	B	12	B	13	12	12
30	12	12	B	12	12	14	12	17	22	12	13	14	12	12	12	12	12	13	B	B	B	B	B	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	29	29	30	30	30	30	30	30	30	30	30	30
MED	14	14	19	20	21	22	20	20	22	19	B	B	26	24	22	36	B	B	B	B	B	B	14	14
U Q	B 21	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	13	12	14	14	14	16	14	13	14	14	13	16	17	17	16	15	20	13	B	B	15	13	12	12

JUN. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUN. 2011 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	A	A	A	B	B	A	A	A	B	B	B	B	B	B	B	B	B	B 234	B	E A 276	A	A	A	A
2	A	A	B	B	B	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	Y	A	A	A
3	A	A	A	A	A	A	A	A	A	200	230	208	208	198	B	196	B 230	B	B	B	B	B	B	B
4	B	B	Y	A	A	A	A	E A 354	A	E B 334	256	222	208	200	200	190	216	204	208	A	B	B	B	B
5	B	A	A	A	B	B	A	A	A	A	B	282	276	228	272	224	232	236	B	A	A	A	A	A
6	A	A	B	A	A	B	B	B	B	B	B	B	C	C	B	B	B	B	B	B	B	Y	B	A
7	E A 300	A	A	A	A	A	A	E B 298	E B 272	E B 248	248	220	204	204	200	206	B	B	B	B	B	A 220	A	A
8	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B
9	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A
10	A	A	B	B	A 220		A	A	A	A 282	248	226	246	Q 216	B	B	B	B	B	B	B	B	A	A
11	B	A	A	A	A	B	A	B	B	B	B	B	228	B	234	214	220	B	B	B	A	B	A	A
12	A	A	A	A	A	A	A	216	B	B	B	B	B	B	216	B	B	B	B	A	B	Y	A	R
13	A 218	228	222	E A 242	A	A	A	A	A 234	A	234	B	210	210	Q 202	204	B	B	B	B	A	A	A	A
14	208	A	A	A	A	A	A	A	A	A	A 278	250	254	B	B	B	B	B	B	B	B	B	B	214
15	A	A	B	A	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16	A	246	238	A	B	A	A	E A 308	E B 276	E B 286	254	198	188	Q 188	Q 204	Q 190	B 220	B	B	B	B	B	B	B
17	B	B	B	B	B	E B 324	B	B	A	A	E B 288	210	190	200	208	202	B	254	E B 248	B	B	B	B	B
18	B	B	A	B	A	A	A	B	B	B	B	B	222	198	206	190	198	B	B	B	A	A	Y	A
19	A	A	A	A	E A 290	A	A	A 284	260	A 250	236	230	B	B	B	B	B	B	B	B	A	Y	B	A
20	A	A	244	A	A	A	A	A	A	A	B	B	B	200	224	196	224	226	226	B	B	B	B	B
21	A	A	256	A	B	A	A	A	A	B	B	B	240	B	Q 214	214	190	214	B	B	A	A	A	A
22	A	B	B	A	196	B	A	A	A	B	B	B	B	206	224	B	B	B	B	B	A	A	A	A
23	B	B	A	A	B	A	B	B	A	B	B	B	B	258	B	B	B	E B 332	B	A	A	A	A	A
24	A	B	A	A	B	B	B	A	A	A	B	B	B	B	224	B	B	B	E B 264	B	B	B	A	170
25	A	A	A	A	A	B	A	A	B	B	B	B	226	B	B	B	B	B	B	B	B	B	B	B
26	A	R	B	B	A	A	A	B	B	A	248	226	208	196	188	226	B	254	246	B	B	B	Y	204
27	A	A	A	A	A	A	A	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B
28	A	A	A	A	A	A	A	B	B	A	242	204	Q 206	Q 206	Q 206	204	B	Y	B	B	B	B	B	B
29	A	A	A	B	A	A	A	A	B	A	E B 264	208	198	Q 204	212	186	B	R	B	R	B	Y	A	Y
30	A	A	B	A	A	A	A	A	Y	Q 264	Q 246	Q 192	Q 204	Q 204	Q 186	Q 202	202	A	B	B	B	B	B	206
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	4	1	2	2		5	4	7	13	13	17	16	17	15	9	8	5	1		1		4
MED	A 213	237	241	E A 242	243	272		E A 298	266	256	247	220	208	204	208	202	220	232	U 227	E A 276		A 220		205
U Q	E A 300		250					E A 331	E B 274	E B 286	260	228	234	208	224	214	227	254	E B 256					210
L Q	208		230					250	247	248	239	206	204	199	201	190	200	220	217					187

JUN. 2011 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2011 fxI (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	R	O X 38	44	A	X 40	R	R	B	A	A	B	R	R	B	B	B	B	O X 36	O X 39	A	A	A	A	A
2	A	A	A	A	A	A	X 31	39	O X 33	B	X 35	O X 47	O X 42	X 55	X 54	X 36	B	R	X 25	X 24	B	O X 29	67	A
3	A	A	A	A	50	B	B	B	B	A	33	X 41	X 45	X 47	X 42	39	O X 35	A	R	Y	B	B	B	R
4	O X 32	23	R	59	R	A	30	30	43	36	35	B	B	B	O X 43	X 40	B	33	O X 29	O X 22	A	A	A	A
5	A	59	A	A	A	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	O X 38	A
6	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
7	R	A	A	B	A	A	R	R	26	B	B	B	B	B	X 49	B	B	B	B	B	B	B	A	X 32
8	A	A	A	B	B	A	A	A	O X 33	B	B	B	B	B	O X 48	B	B	B	A	B	R	B	B	R
9	A	B	A	A	A	A	O X 41	B	B	R	39	X 42	X 48	O X 51	B	B	B	O X 26	B	B	B	B	A	A
10	A	A	A	A	A	A	O X 36	B	A	A	A	B	B	B	B	B	X 30	O X 26	O X 28	B	O X 28	O X 22	A	O X 32
11	A	A	A	A	B	B	A	A	R	O X 29	O X 34	B	B	B	B	B	B	X 36	B	B	B	A	A	67
12	A	A	A	A	A	A	A	A	B	B	X 36	O X 46	O X 52	X 52	X 57	O X 44	X 27	B	B	B	B	B	B	R
13	B	B	O X 30	A	B	B	B	B	B	R	O X 32	O X 43	O X 45	O X 45	X 48	O X 57	O X 37	O X 28	B	B	B	B	B	R
14	R	R	R	O X 34	A	B	A	34	B	B	A	B	B	O X 55	B	B	B	O X 35	B	B	B	B	A	A
15	A	R	B	A	A	R	R	A	B	B	40	X 47	O X 50	X 51	X 44	X 38	O X 26	R	R	A	Y	B	B	A
16	R	A	A	A	70	A	31	35	34	R	B	B	B	B	B	B	R	R	R	Y	Y	R	B	R
17	B	A	A	O X 31	A	R	O X 35	B	B	37	41	X 48	X 50	X 51	X 55	O X 55	X 25	X 28	X 27	27	A	B	B	A
18	A	A	S	A	O X 34	O X 36	R	O X 27	61	R	A	B	70	X 62	B	X 47	B	B	B	B	B	B	O X 32	O X 36
19	O X 34	A	O X 34	O X 33	R	O X 33	X 37	39	41	39	42	B	X 62	X 66	O X 72	X 60	X 37	37	33	O X 29	A	O X 34	44	B
20	A	X 48	R	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	R	R	O X 36	A
21	A	B	A	B	B	B	B	B	A	B	B	B	B	B	O X 56	X 53	X 50	B	B	B	R	44	X 32	O X 36
22	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	X 33	32	B	B	R	30	R
23	R	A	A	A	R	B	B	B	B	B	B	B	B	B	B	B	B	O X 36	R	B	B	A	B	R
24	A	R	A	A	O X 37	O X 35	A	X 26	O X 24	X 30	X 42	O X 54	O X 56	X 58	B	X 42	O X 31	O X 26	B	B	A	A	B	B
25	A	A	66	A	R	33	34	R	B	A	B	B	O X 62	B	X 58	X 64	B	B	B	B	B	R	R	R
26	O X 39	A	A		A	B	B	B	B	A	X 40	B	B	B	B	X 48	B	O X 34	B	B	B	B	Y	R
27	B	R	R	A	A	R	R	B	A	R	X 42	X 57	X 58	O X 54	X 46	O X 50	X 30	29	O X 23	B	B	B	B	B
28	B	B	B	R	R	A	A	B	32	X 34	X 44	X 53	O X 60	X 56	X 58	X 50	O X 37	O X 36	Y	B	B	B	Y	A
29	Y	A	56	X 31	B	X 32	31	X 30	31	32	X 44	X 53	X 48	X 53	O X 52	X 50	X 41	X 37	X 28	O X 20	A	A	B	A
30	A	A	Y	A	A	A	33	X 29	R	O X 32	X 48	X 53	B	O X 62	O X 52	X 54	51	43	R	B	A	A	70	A
31	A	A	A	A	O X 35	R	O X 38	R	A	B	B	B	B	B	R	B	B	B	B	B	B	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	3	4	5	5	6	5	11	9	10	8	16	12	14	15	16	17	13	17	9	5	1	4	8	5
MED	O X 34	43	44	O X 33	X 38	O X 33	X 34	30	33	33	X 40	X 48	X 51	X 54	X 52	X 50	X 35	O X 34	X 28	O X 24	O X 28	O X 32	37	O X 36
U Q	O X 39	54	61	46	50	O X 36	O X 37	37	41	36	X 42	X 53	X 60	X 58	X 56	X 54	X 39	X 36	32	28		39	56	52
L Q	O X 32	30	O X 32	X 31	O X 35	32	31	X 28	31	X 31	X 35	X 44	X 48	X 51	X 47	X 41	X 28	O X 28	X 26	O X 21		O X 26	X 32	X 32

JUL. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2011 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

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	A	R 32	A	A	34	A	R	B	A	A	B	R	R	B	B	B	B	R 30	R 33	A	A	A	A	A
2	A	A	A	A	A	A	R 25	F 24	R 27	B	29	41	36	49	48	30	B	R	19	18	B	R 23	A	A
3	A	A	A	A	A	B	B	B	B	A	F 23	35	39	41	36	F 30	R 29	A	R	Y	B	B	B	A
4	R 26	F 13	R	R 24	A	A	F 20	F 21	F 23	F 20	F 24	B	B	B	R 37	34	B	F 22	R 23	16	A	A	A	A
5	A	A	A	A	A	R	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R 32	A
6	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	R	A	A
7	R	A	A	B	A	A	R	R	F 18	B	B	B	B	B	43	B	B	B	B	B	B	B	A	J R 26
8	A	A	A	B	B	A	A	A	R 27	B	B	B	B	B	42	B	B	B	A	B	R	B	B	R
9	A	B	A	A	A	A	R 35	B	B	R	F 29	36	42	U R 45	B	B	B	R 20	B	B	B	B	A	A
10	A	A	A	A	A	A	R 30	B	A	A	A	B	B	B	B	B	24	R 20	R 22	B	R 22	R 16	A	R 26
11	A	A	A	A	B	B	A	A	R	R 23	R 28	B	B	B	B	B	B	30	B	B	B	A	A	A
12	A	A	A	A	A	A	A	A	B	B	30	40	R 46	U R 46	51	R 38	21	B	B	B	B	B	B	R
13	B	B	R 24	A	B	B	B	B	B	A	26	R 37	R 39	R 39	42	R 51	R 31	R 22	B	B	B	B	B	R
14	R	A	R	28	A	B	A	F 25	B	B	A	B	B	U R 49	B	B	B	29	B	B	B	B	A	A
15	A	A	B	A	A	A	A	A	B	B	F 31	41	R 44	45	38	32	R 20	R	A	A	Y	B	B	A
16	R	A	A	A	A	A	F 22	F 20	24	A	B	B	B	B	B	B	R	R	R	Y	Y	A	B	R
17	B	A	A	R 25	A	A	R 29	B	B	F 24	F 31	42	J R 44	J R 45	49	49	19	22	21	F 18	A	B	B	A
18	F	A	A	A	R 28	R 30	A	R 21	33	R	A	B	F 60	56	B	41	B	B	B	B	B	B	R 26	30
19	R 28	A	R 28	R 27	R	R 27	32	F 26	F 29	F 30	F 32	B	56	60	R 66	54	31	F 28	F 24	R 23	A	R 28	F 28	B
20	A	42	R	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	R	A	R 30	A
21	A	B	A	B	B	B	B	B	A	B	B	B	B	B	R 50	47	44	B	B	B	R	A	J R 26	R 30
22	F	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	27	F 21	B	B	R	F 20	R
23	R	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	R 30	A	B	B	A	B	A
24	A	R	A	A	R 31	R 29	A	20	R 18	24	36	R 48	R 50	52	B	36	R 25	R 20	B	B	A	A	B	B
25	A	A	A	A	A	F 24	F 24	A	B	A	B	B	R 56	B	52	58	B	B	B	B	B	A	A	A
26	33	A	A	A	A	B	B	B	B	A	34	B	B	B	B	42	B	R 28	B	B	B	B	Y	A
27	B	R	R	A	A	A	A	B	A	A	J R 36	51	52	U R 48	41	R 44	24	F 18	R 17	B	B	B	B	B
28	B	B	B	R	R	A	A	B	F 24	28	38	J R 47	54	R 50	J R 52	44	R 31	R 30	Y	B	B	B	Y	A
29	Y	A	A	25	B	26	F 20	24	F 20	F 20	38	47	42	47	U R 46	44	35	31	22	14	A	A	B	A
30	A	A	Y	A	A	A	F 24	23	R	26	42	47	B	R 56	R 46	48	F 41	F 33	R	B	A	A	A	A
31	A	A	A	A	29	A	R 32	A	A	B	B	B	B	B	D R 42	B	B	B	B	B	B	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	3	3	2	5	4	5	11	9	10	8	16	12	14	15	17	17	13	17	9	5	1	3	6	4
MED	R 28	32	R 26	R 25	30	R 27	25	F 23	24	24	31	42	45	R 48	46	44	29	28	22	18	R 22	R 23	R 27	R 28
U Q	33	42		28	32	R 30	R 32	F 24	27	27	36	47	54	52	R 50	48	33	R 30	R 24	20		R 28	R 30	30
L Q	R 26	F 13		24	28	25	F 22	F 20	F 20	F 22	28	38	42	45	42	35	22	R 21	20	15		R 16	26	R 26

JUL. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL.2011 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	28	37	35	40	40	36	32	B	71	68	B	38	32	B	B	B	B	31	41	40	38	43	42	42
2	38	38	38	41	36	30	32	E B 12	E B 13	B	E B 11	16	35	30	24	E B 15	B	19	E B 12	E B 11	B	17	40	76
3	98	70	52	43	35	B	B	B	B	42	34	31	29	25	E B 16	17	22	34	K 21	17	B	B	B	32
4	E B 24	E B 12	22	34	43	41	30	23	27	29	33	B	B	B	39	E B 22	B	E B 15	E B 12	E B 13	39	46	84	70
5	58	38	33	39	32	23	34	B	B	B	B	B	B	B	B	B	B	B	B	B	B	30	36	43
6	39	41	48	43	40	44	44	48	B	B	B	B	B	B	B	B	B	B	B	B	B	30	36	37
7	31	42	39	B	46	42	21	K 21	E B 14	B	B	B	B	B	E B 16	B	B	B	B	B	B	B	27	42
8	49	50	40	B	B	47	44	39	33	B	B	B	B	B	29	B	B	B	57	B	23	B	B	28
9	40	B	72	42	42	35	34	B	B	28	31	16	23	E B 24	B	B	B	E B 15	B	B	B	B	35	36
10	38	40	46	40	42	42	65	B	33	33	34	B	B	B	B	B	E B 14	E B 15	14	B	E B 12	29	35	29
11	42	40	55	52	B	B	42	42	24	20	E B 20	B	B	B	B	B	B	E B 23	B	B	B	39	34	40
12	44	39	40	70	40	42	44	43	B	B	16	E B 18	E B 20	E B 17	E B 16	E B 20	E B 14	B	B	B	B	B	B	K 23
13	B	B	34	30	B	B	B	B	B	30	E B 18	E B 28	E B 19	E B 19	22	E B 29	E B 19	19	B	B	B	B	B	14
14	18	24	22	41	43	B	35	K 21	B	B	34	B	B	E B 29	B	B	B	E B 20	B	B	B	B	25	38
15	42	34	69	41	42	33	28	38	B	B	E B 18	17	E B 17	24	E B 23	E B 16	E B 14	22	31	31	15	B	B	32
16	20	28	41	42	33	K 32	28	K 16	32	27	B	B	B	B	B	B	24	22	19	17	17	24	B	20
17	B	32	42	60	44	K 30	38	B	B	23	E B 13	17	24	25	19	19	15	E B 13	E B 12	29	27	B	B	34
18	43	70	S 34	49	34	42	32	34	28	33	34	B	24	E B 20	B	E B 26	B	B	B	B	B	B	24	40
19	34	36	40	34	25	36	30	32	31	27	31	B	26	18	E B 18	E B 18	E B 13	E B 14	17	24	41	34	39	B
20	59	44	33	B	B	B	33	42	B	B	B	B	B	B	B	B	B	B	B	30	K 23	32	35	46
21	70	B	40	B	B	B	B	B	40	B	B	B	B	B	E B 20	E B 15	17	B	B	B	K 17	34	44	39
22	44	50	43	33	B	36	40	B	B	B	B	B	B	B	B	B	B	E B 16	E B 13	B	B	22	28	22
23	19	38	38	48	38	B	B	B	B	B	B	B	B	B	B	B	B	E B 23	33	B	B	38	B	30
24	36	22	33	41	42	36	24	16	K 15	22	15	E B 19	E B 22	17	B	E B 23	23	E B 13	B	B	40	28	B	B
25	24	31	35	40	32	30	29	30	B	36	B	B	E B 25	B	E B 24	E B 20	B	B	B	B	B	30	38	32
26	40	53	48	42	41	B	B	B	B	34	K 22	B	B	B	B	E B 20	B	E B 20	B	B	B	B	17	27
27	B	30	27	38	40	33	32	B	37	32	E B 20	E B 18	24	E B 24	23	E B 19	E B 13	K 14	16	B	B	B	B	B
28	B	B	B	26	20	44	43	B	33	E B 14	15	20	E B 19	E B 20	E B 19	37	31	29	21	B	B	B	14	29
29	16	30	28	30	B	23	E B 14	E B 14	E B 13	E B 13	16	E B 20	24	24	24	24	E B 14	16	E B 14	E B 12	21	32	B	32
30	66	70	16	32	31	30	24	25	18	E B 17	E B 16	G	B	E B 32	E B 22	31	E B 28	E B 24	20	B	45	39	47	94
31	48	58	52	40	72	35	42	33	38	B	B	B	B	B	E B 37	B	B	B	B	B	B	32	36	38
	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	27	30	27	24	23	26	18	17	18	19	13	15	15	17	17	14	21	16	10	13	18	20	28
MED	40	38	40	41	40	36	32	31	31	28	20	18	24	E B 24	E B 22	E B 20	E B 16	E B 19	18	20	23	32	36	35
U Q	48	50	46	43	42	42	42	39	35	33	33	24	26	25	24	25	23	23	26	30	40	38	40	41
L Q	28	31	33	34	34	30	29	21	E B 16	E B 22	E B 16	16	E B 20	19	E B 18	E B 18	E B 14	E B 15	E B 14	E B 13	17	29	28	29

JUL.2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2011 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	12	13	22	24	13	30	27	B	16	28	B	29	28	B	B	B	B	16	14	11	12	12	12	12
2	11	12	13	13	12	11	11	12	13	B	11	10	12	20	14	15	B	12	12	11	B	12	12	14
3	23	25	26	22	16	B	B	B	B	17	14	16	13	13	16	12	14	13	13	15	B	B	B	21
4	24	12	12	12	15	12	12	12	11	11	12	B	B	B	25	22	B	15	12	13	12	12	13	13
5	12	18	20	26	19	17	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	14	16
6	18	13	19	24	20	23	18	13	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	13
7	22	22	20	B	18	14	13	13	14	B	B	B	B	B	16	B	B	B	B	B	B	B	12	13
8	15	15	17	B	B	21	12	12	13	B	B	B	B	B	21	B	B	B	26	B	15	B	B	13
9	12	B	13	25	12	14	15	B	B	23	16	16	18	24	B	B	B	15	B	B	B	B	12	12
10	12	12	12	18	22	14	13	B	23	13	13	B	B	B	B	B	14	15	12	B	12	12	13	17
11	12	21	12	23	B	B	22	14	15	13	20	B	B	B	B	B	B	23	B	B	B	12	12	13
12	13	13	18	13	23	20	17	13	B	B	13	18	20	17	16	20	14	B	B	B	B	B	B	19
13	B	B	13	13	B	B	B	B	B	17	18	28	19	19	13	29	19	12	B	B	B	B	B	12
14	11	12	15	14	18	B	12	14	B	B	26	B	B	29	B	B	B	20	B	B	B	B	12	11
15	12	23	46	18	18	17	14	12	B	B	18	14	17	14	23	16	14	14	14	14	11	B	B	12
16	12	12	11	13	14	13	12	12	13		B	B	B	B	B	B	18	14	13	14	14	12	B	12
17	B	12	13	12	15	13	12	B	B	13	13	14	13	14	12	13	12	13	12	14	14	B	B	13
18	12	14	22	13	14	13	12	12	12	16	16	B	18	20	B	26	B	B	B	B	B	B	14	12
19	12	14	14	13	12	13	14	16	13	13	13	B	20	14	18	18	13	14	14	13	16	14	12	B
20	16	16	15	B	B	B	26	23	B	B	B	B	B	B	B	B	B	B	B	18	17	14	11	13
21	14	B	23	B	B	B	B	B	25	B	B	B	B	B	20	15	12	B	B	B	12	12	13	12
22	12	15	17	30	B	24	21	B	B	B	B	B	B	B	B	B	B	16	13	B	B	14	12	12
23	12	12	20	20	25	B	B	B	B	B	B	B	B	B	B	B	B	23	23	B	B	19	B	11
24	13	14	14	19	18	14	12	12	11	12	11	19	22	15	B	23	14	13	B	B	21	13	B	B
25	12	11	12	14	12	12	12	20	B	18	B	B	25	B	24	20	B	B	B	B	B	12	11	12
26	11	16	14	18	22	B	B	B	B	23	13	B	B	B	B	20	B	19	B	B	B	B	12	11
27	B	12	12	14	16	13	13	B	15	20	20	18	17	24	18	19	13	12	12	B	B	B	B	B
28	B	B	B	13	12	17	18	B	13	14	14	15	19	21	19	15	17	17	13	B	B	B	12	18
29	12	12	12	12	B	12	14	14	13	13	13	20	15	16	15	12	14	12	14	12	12	12	B	27
30	12	12	12	12	12	13	13	12	12	17	16	15	B	32	22	13	28	24	14	B	12	12	14	14
31	21	12	20	15	14	12	15	22	14	B	B	B	B	B	37	B	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	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	12	14	15	18	18	17	14	20	23	23	18	B	B	B	25	26	B	17	26	B	B	14	13	13
U Q	21	21	20	24	B 25	B	B 22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	17
L Q	12	12	12	13	14	13	12	12	13	14	13	18	18	19	18	16	14	14	13	14	14	12	12	12

JUL. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

JUL. 2011 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	A	224	A	A	E A 262	A	A	B	A	A	B	A	A	B	B	B	B	A	218	A	A	A	A	A
2	A	A	A	A	A	A	A	E B 314	E B 314	B	242	194	A 250	222	Q 210	196	B	A	230	A 204	B	196	A	A
3	A	A	A	A	A	B	B	B	B	A		228	214	208	Q 208	224	E A 266	A	A	Y	B	B	B	A
4	B 214	190	A	208		A	A	214	E A 310	Q 248	Q 250	B	B	B	240	216	B	232	E B 248	206	A	A	A	A
5	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	204	A
6	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
7	A	A	A	B	A	A	A	A	E B 324	B	B	B	B	B	194	B	B	B	B	B	B	B	A	224
8	A	A	A	B	B	A	A	A	214	B	B	B	B	B	230	B	B	B	A	B	A	B	B	A
9	A	B	A	A	A	A	A	B	B	A	A	Q 226	220	220	B	B	B	E B 274	B	B	B	B	A	A
10	A	A	A	A	A	A	230	B	A	A	A	B	B	B	B	B	208	E B 260	212	B	192	194	A	A 180
11	A	A	A	A	B	B	A	A	A	A	242	B	B	B	B	B	B	218	B	B	B	A	A	A
12	A	A	A	A	A	A	A	A	B	B	236	204	204	198	204	208	252	B	B	B	B	B	B	A
13	B	B	224	A	B	B	B	B	B	A	260	254	198	198	194	208	B 226	E A 250	B	B	B	B	B	A
14	A	A	A	A 234	A	B	A	A	B	B	A	B	B	234	B	B	B	236	B	B	B	B	A	A
15	A	A	B	A	A	A	A	A	B	B	240	208	208	196	232	202	192	A	A	A	A	B	B	A
16	198	A	A	A	A	A	258	198	E A 310	A	B	B	B	B	B	B	A	A	A	Y	Y	A	B	A
17	B	A	A	A	A	A	222	B	B	278	226	214	198	192	Q 204	Q 194	198	214	214	Q 228	A	B	B	A
18	A	A	A	A	204	216	A	252	A	A	A	B	Q 244	200	B	202	B	B	B	B	B	B	192	222
19	202	A	224	222	196	240	210	E A 328	E A 302	210	256	B	202	228	Q 194	194	232	Q 246	Q 246	E A 286	A	208	A 234	B
20	A	196	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	B	A	A	208	224	A
21	A	B	A	B	B	B	B	B	A	B	B	B	B	B	208	Q 216	214	B	B	B	A	A	A	208
22	A	A	A	B	B	A	A	B	B	B	B	B	B	B	B	B	B	236	206	B	B	A	A 232	A
23	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	E B 252	A	B	B	A	B	A
24	A	A	A	A	216		A	A	A	E A 256	208	224	200	Q 200	B	Q 196	212	E B 236	B	B	A	A	B	B
25	A	A	A	A	198	228	226	A	B	A	B	B	218	B	232	218	B	B	B	B	B	228	A	A
26	E A 246	A	A	A	A	B	B	B	B	A	246	B	B	B	B	208	B	248	B	B	B	B	Y	A
27	B	A	A	A	A	A	A	B	A	A	210	212	198	198	198	202	186	244	B 244	B	B	B	B	B
28	B	B	B	A	A	A	A	B	A	242	220	192	198	194	200	206	214	232	Y	B	B	B	Y	A
29	Y	A	A	266	B	A	B	B	B	228	222	210	196	196	190	Q 190	196	218	200	E B 302	A	A	B	A
30	A	A	Y	A	A	A	A	A	A	E B 274	210	204	B	202	190	226	224	224	A	B	A	A	A	A
31	A	A	A	A	196	A	216	A	A	B	B	B	B	B	230	B	B	B	B	B	B	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	6	3	7	4	6	7	14	12	14	15	17	17	13	16	9	5	1	5	5	4
MED	204	196	224	228	199	228	222	283	E 310	238	238	211	203	200	204	206	213	232	216	U 216	192	208	224	215
U Q	230	224		250	216	240	230	E 321	E B 314	274	246	225	218	220	230	216	229	E B 249	B 245	E 294		218	A 233	223
L Q	200	190		215	196	216	214	225	302	228	220	204	198	196	194	Q 196	197	228	209	205		195	198	194

JUL. 2011 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2011 fxI (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	A	A	B	R	R	A	B	B	B	B	B	B	B	B	B	B	O X 49	B	B	B	B	B	Y	R
2	R	B	A	A	B	B	A	R	31	X 38	O X 46	X 56	O X 56	O X 66	O X 67	X 51	O X 39	O X 39	O X 34	O X 29	B	B	B	Y
3	R	B	A	A	A	O X 35	B	R	B	X 35	53	O X 48	X 58	X 54	X 65	X 46	O X 46	B	A	Y	B	R	B	Y
4	O X 34	A	R	Y	R	B	B	B	X 24	X 36	X 42	B	B	B	B	B	O X 38	O X 34	30	O X 25	R	B	B	B
5	A	B	R	B	A	A	B	A	A	B	B	B	B	B	B	B	B	O X 36	B	B	B	B	B	X 36
6	A	B	B	R	B	B	B	A	X 67	B	B	B	B	B	B	B	B	B	B	R	B	B	B	B
7	R	R	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R	R	A
8	B	A	A	A	B	B	A	B	B	B	B	B	B	X 64	B	B	B	B	B	B	B	B	R	A
9	R	A	O X 38	A	A	A	R	O X 26	B	B	B	B	B	B	B	B	B	B	B	30	B	B	B	R
10	A	A	A	A	A	A	R	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 37
11	R	R	A	R	R	A	R	A	B	X 43	R	O X 64	X 69	O X 64	B	R	45	O X 37	B	X 32	B	B	B	A
12	A	A	A	R	B	O X 23	B	A	A	O X 41	O X 50	X 69	O X 55	X 62	O X 55	O X 48	B	B	B	B	B	Y	R	O X 32
13	A	A	A	A	A	A	A	A	A	B	O X 44	O X 53	O X 63	B	X 59	X 54	44	X 45	X 40	O X 26	B	B	B	A
14	R	A	A	A	A	B	O X 37	A	B	B	X 50	O X 50	B	B	O X 56	X 58	O X 49	X 40	X 40	31	A	A	A	A
15	B	A	B	B	A	A	B	A	B	B	B	O X 52	X 52	X 55	B	X 56	B	B	B	O X 24	B	A	A	A
16	A	A	A	B	A	A	25	24	X 27	X 44	O X 52	X 55	O X 62	O X 69	B	B	B	B	B	B	B	B	B	R
17	R	A	B	A	B	B	B	R	B	X 41	B	B	B	X 68	O X 66	X 58	B	B	B	B	B	B	B	R
18	41	A	O X 36	O X 37	A	A	29	29	34	X 46	X 52	X 59	X 70	X 63	X 58	62	X 63	X 40	X 37	X 32	X 22	A	Y	28
19	28	A	A	R	R	R	B	B	O X 31	O X 46	O X 48	X 64	73	O X 64	X 58	X 59	X 50	X 39	X 39	34	X 24	B	B	B
20	R	A	51	32	X 23	31	36	B	36	X 46	O X 51	X 58	O X 58	X 69	R	X 64	O X 48	O X 42	X 39	B	R	B	O X 34	R
21	A	A	A	66	A	O X 37	41	45	X 39	O X 49	X 54	X 54	X 69	X 64	X 58	X 54	X 50	X 40	41	X 25	X 22	B	R	R
22	A	66	A	X 32	A	B	A	X 30	O X 36	X 40	X 53	57	B	B	71	62	X 60	X 44	34	32	O X 24	A	A	A
23	A	O X 36	A	A	A	A	34	34	39	O X 47	X 60	57	X 61	O X 66	X 68	X 62	X 60	43	X 47	41	23	A	A	A
24	A	O X 35	A	A	A	A	B	A	X 39	X 44	X 50	X 56	X 64	X 59	X 59	X 62	X 59	X 49	X 41	36	23	B	B	R
25	B	A	A	A	A	A	X 32	X 29	X 39	O X 49	X 55	X 61	X 64	O X 76	O X 75	70	X 68	X 52	O X 42	O X 36	B	Y	A	A
26	A	A	A	R	R	Y	28	X 32	X 40	X 52	O X 52	O X 67	X 81	O X 68	O X 68	X 64	X 63	X 42	X 42	38	26	B	A	X 28
27	B	59	R	R	R	R	R	B	X 36	X 48	O X 50	X 68	O X 65	X 81	X 65	X 67	X 68	X 56	X 57	54	O X 36	R	R	R
28	R	R	O X 37	A	A	A	A	A	O X 40	X 47	X 52	X 56	X 64	70	70	72	60	X 62	X 41	40	X 28	B	A	A
29	A	A	A	O X 38	A	A	A	O X 36	X 41	O X 48	O X 52	X 58	X 59	O X 64	B	X 64	O X 52	X 58	X 45	O X 36	32	O X 24	B	Y
30	R	R	A	A	O X 33	28	28	31	X 42	X 48	X 61	X 68	X 76	X 65	X 69	X 82	X 64	X 52	X 41	39	36	A	R	32
31	A	A	A	R	R	R	X 29	32	48	X 58	X 61	X 64	X 72	X 74	X 75	70	X 66	X 69	X 43	31	27	A	A	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	3	4	4	5	2	5	10	11	18	21	21	22	20	21	18	21	21	20	18	20	12	1	1	6
MED	34	48	O X 38	X 37	X 28	O X 31	30	31	X 39	X 46	X 52	X 58	X 64	X 65	X 66	X 62	X 52	X 42	X 41	32	25	O X 24	O X 34	X 32
U Q	41	62	44	52		O X 36	36	34	X 40	X 48	X 54	X 64	X 70	X 69	X 69	66	X 63	X 52	X 42	37	30			X 36
L Q	28	O X 36	O X 36	32		26	28	29	X 34	X 41	X 50	O X 55	X 58	X 64	X 58	X 55	O X 47	O X 40	X 39	O X 30	23			28

AUG. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2011 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

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	A	A	B	A	R	A	B	B	B	B	B	B	B	B	B	B	R 43	B	B	B	B	B	Y	A
2	A	B	A	A	B	B	A	R	F 20	32	40	50	U R 50	R 60	R 61	45	R 33	33	28	R 23	B	B	B	Y
3	R	B	A	A	A	R 29	B	R	B	29	F 43	42	J R 52	48	59	40	R 40	B	A	Y	B	R	B	Y
4	R 28	A	R	Y	A	B	B	B	18	30	J R 36	B	B	B	B	B	R 32	R 28	F 20	R 19	R	B	B	B
5	A	B	R	B	A	A	B	A	A	B	B	B	B	B	B	B	B	R 30	B	B	B	B	B	30
6	A	B	B	A	B	B	B	A	61	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B
7	R	R	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	R	A
8	B	A	A	A	B	B	A	B	B	B	B	B	B	58	B	B	B	B	B	B	B	B	R	A
9	R	A	R 32	A	A	A	R	R 20	B	B	B	B	B	B	B	B	B	B	B	F 20	B	B	B	R
10	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 31
11	A	R	A	R	R	A	R	A	B	37	R	R 58	63	R 58	B	R	F 35	R 31	B	26	B	B	B	A
12	A	A	A	A	B	R 17	B	A	A	35	44	63	R 49	56	R 49	R 42	B	B	B	B	B	Y	A	R 26
13	A	A	A	A	A	A	A	A	A	B	R 38	U R 47	57	B	R 53	48	F 33	39	34	20	B	B	B	A
14	R	A	A	A	A	B	R 31	A	B	B	R 44	44	B	B	U R 50	52	43	34	34	F 21	A	A	A	A
15	B	A	B	B	A	A	B	A	B	B	B	R 46	46	49	B	50	B	B	B	R 18	B	A	A	A
16	A	A	A	B	A	A	F 16	F 15	21	38	R 46	J R 49	56	63	B	B	B	B	B	B	B	B	B	R
17	A	A	B	A	B	B	B	R	B	35	B	B	B	62	60	52	B	B	B	B	B	B	B	R
18	A	A	R 30	31	A	A	F 19	F 19	F 24	40	46	53	64	57	52	F 52	57	34	31	26	16	A	Y	A
19	A	A	A	A	A	A	B	B	25	R 40	R 42	58	F 63	58	52	53	44	33	33	F 24	18	B	B	B
20	A	A	A	F 20	17	F 20	F 22	B	F 25	40	R 45	52	U R 52	63	R	58	R 42	36	33	B	R	B	27	A
21	A	A	A	A	A	31	F 27	F 26	33	43	48	J R 48	63	58	52	48	44	34	F 29	19	16	B	A	A
22	A	A	A	26	A	B	A	24	30	34	47	F 46	B	B	F 60	F 52	54	38	F 26	F 21	R 18	A	A	A
23	A	30	A	A	A	A	F 24	F 21	F 30	41	54	51	55	60	62	56	54	F 34	41	F 30	F 15	A	A	A
24	A	R 29	A	A	A	A	B	A	F 30	38	44	50	58	53	53	J R 56	J R 53	43	35	F 24	F 13	B	B	A
25	B	A	A	A	A	A	R 26	23	33	43	49	J R 55	58	70	69	F 61	62	46	36	R 30	B	Y	A	A
26	A	A	A	R	R	Y	F 18	26	34	46	46	61	75	62	62	58	J R 57	36	36	F 27	F 17	B	A	22
27	B	A	A	R	A	A	A	B	30	42	R 44	62	59	J R 75	J R 59	61	62	50	51	F 42	R 30	R	R	R
28	A	A	R 31	A	A	A	A	A	34	41	46	50	58	F 60	F 60	F 62	F 51	56	35	F 29	22	B	A	A
29	A	A	A	R 32	A	A	A	R 30	35	42	46	52	53	58	B	58	R 46	52	39	R 30	F 21	R 18	B	Y
30	R	R	A	A	R 27	F 19	F 17	F 21	36	42	55	62	70	59	63	J R 76	58	J R 46	35	F 27	F 24	A	A	F 22
31	A	A	A	A	A	A	R 23	F 20	F 38	52	J R 55	58	66	J R 68	69	F 60	60	J R 63	37	F 20	F 17	A	A	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	1	2	3	4	2	5	10	11	18	21	21	22	20	21	18	21	21	20	18	20	12	1	1	5
MED	R 28	30	R 31	28	22	20	F 22	F 21	30	40	46	52	58	59	60	53	46	36	34	F 24	18	R 18	27	26
U Q			R 32	32		30	R 26	26	34	42	48	58	63	62	62	59	57	46	36	F 28	22			30
L Q			R 30	23		18	F 18	F 20	25	35	44	48	R 52	58	52	49	R 41	34	F 31	20	16			22

AUG. 2011 foF2 (0.1MHz)

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IONOSPHERIC DATA STATION SHOWA-ST.

AUG.2011 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	44	40	B	34	31	40	B	B	B	B	B	B	B	B	B	B	E B 28	B	B	B	B	B	20	K 30
2	30	B	39	36	B	B	36	24	E B 15	15	E B 19	E B 22	E B 25	E S 23	24	E B 21	E B 18	E B 16	E B 14	E B 15	B	B	B	16
3	18	B	43	70	41	30	B	25	B	29	G	24	26	36	24	24	E B 22	B	46	20	B	27	B	14
4	32	39	K 18	15	30	B	B	B	E B 12	E B 13	E B 22	B	B	B	B	B	E B 24	B 20	E B 14	E B 13	18	B	B	B
5	31	B	22	B	35	43	B	43	44	B	B	B	B	B	B	B	B	E B 19	B	B	B	B	B	E B 26
6	73	B	B	34	B	B	B	43	33	B	B	B	B	B	B	B	B	B	B	K 27	B	B	B	B
7	22	20	B	48	B	38	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	25	G 21	K 31
8	B	58	63	69	B	B	32	B	B	B	B	B	B	E B 32	B	B	B	B	B	B	B	B	G	40
9	16	33	42	46	36	36	23	15	B	B	B	B	B	B	B	B	B	B	B	E B 14	B	B	B	G 16
10	27	32	34	42	36	39	33	33	28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	29
11	28	24	30	22	22	37	32	40	B	K 25	25	21	E B 23	E B 46	B	24	20	E B 20	B	E B 15	B	B	B	38
12	44	35	36	28	B	K 15	B	40	34	E B 24	28	33	25	G 20	E B 24	E B 30	B	B	B	B	B	14	25	35
13	38	32	42	31	33	38	39	41	35	B	E B 29	E B 29	28	B	G	23	20	E B 14	E B 13	E B 16	B	B	B	26
14	18	38	42	41	41	B	43	42	B	B	26	E B 27	B	B	E B 26	E B 20	E B 21	E B 13	E B 12	E B 12	39	37	40	43
15	B	96	B	B	41	32	B	32	B	B	B	E B 27	24	25	B	E B 26	B	B	B	E B 14	B	36	46	48
16	42	73	69	B	37	34	17	15	15	16	22	22	E B 27	E B 56	B	B	B	B	B	B	B	B	B	18
17	30	34	B	36	41	B	B	27	B	G 15	B	B	B	E B 28	21	20	B	B	B	B	B	B	B	24
18	32	38	36	38	44	47	29	16	E B 13	17	G	25	31	24	36	29	23	40	34	E B 12	E B 12	22	15	24
19	24	32	44	28	22	26	B	B	E B 16	E B 29	E B 24	E B 27	E B 30	E B 24	E B 21	E B 22	E B 18	E B 14	E B 13	E B 12	E B 12	B	B	B
20	24	33	30	38	35	26	24	B	E B 18	G	E B 24	30	E B 23	29	E B 26	G	26	K 16	33	B	23	B	34	28
21	30	53	51	50	43	35	21	E B 15	E B 14	16	21	32	31	25	24	23	20	14	28	E B 12	E B 12	B	22	24
22	26	28	34	30	56	B	31	25	E B 15	19	24	24	B	B	26	K 23	31	23	33	43	36	30	41	41
23	38	40	43	44	42	42	31	E B 15	18	21	G 18	25	25	25	25	G 18	20	E B 13	E B 13	27	25	32	35	42
24	39	43	47	44	44	33	B	36	25	18	22	23	26	23	24	22	25	17	13	15	E B 12	B	B	26
25	B	43	40	34	36	39	33	16	15	E B 19	24	25	25	26	28	31	G 19	17	E B 16	E B 21	B	16	39	41
26	34	33	42	26	22	15	E B 14	E B 14	14	G 17	G 18	25	27	G 20	G	25	24	E B 13	E B 13	E B 14	E B 12	B	29	24
27	B	38	24	18	32	32	32	B	E B 14	E B 30	25	25	G 25	26	25	G 19	22	16	E B 12	24	37	K 21	K 19	18
28	26	33	37	37	42	44	64	44	33	24	G	26	25	26	25	E B 25	22	E B 15	E B 13	32	39	B	33	40
29	34	34	36	41	44	45	46	32	G 17	17	G 20	E B 22	28	E B 25	B	G	E B 24	E B 22	23	E B 19	17	E B 13	B	15
30	20	26	35	42	35	22	E B 14	E B 14	G 15	22	G 20	23	G 20	G 20	26	G	E B 22	E B 23	E B 17	E B 13	19	28	22	40
31	30	26	60	30	33	31	E B 15	E B 14	17	22	26	30	30	31	32	28	E B 26	K 17	E B 13	32	E B 12	30	28	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	27	27	26	28	26	24	21	24	22	21	22	22	20	21	19	22	21	20	19	22	15	13	17	27
MED	30	34	40	36	36	36	32	26	16	18	E G 22	24	26	24	24	22	21	E B 16	E B 14	E B 15	18	27	28	28
U Q	38	40	43	43	42	40	38	40	28	24	25	27	28	30	26	25	24	B 20	28	24	36	31	37	40
L Q	24	32	34	30	33	30	22	E B 15	E B 15	16	G	23	25	24	24	G 20	20	E B 14	E B 13	E B 13	E B 12	18	G	24

AUG.2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2011 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	13	18	B	23	20	18	B	B	B	B	B	B	B	B	B	B	28	B	B	B	B	B	16	12
2	12	B	12	19	B	B	16	13	15	12	19	22	25	23	15	21	18	16	14	15	B	B	B	12
3	14	B	12	12	12	12	B	13	B	16	14	15	19	17	15	13	22	B	13	15	B	14	B	12
4	12	16	12	12	17	B	B	B	12	13	22	B	B	B	B	B	24	20	14	13	13	B	B	B
5	16	B	14	B	22	24	B	29	21	B	B	B	B	B	B	B	B	19	B	B	B	B	B	26
6	30	B	B	28	B	B	B	24	24	B	B	B	B	B	B	B	B	B	B	15	B	B	B	B
7	13	15	B	13	B	25	19	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12	12	12
8	B	14	19	15	B	B	20	B	B	B	B	B	B	32	B	B	B	B	B	B	B	B	12	12
9	12	12	13	18	26	16	15	13	B	B	B	B	B	B	B	B	B	B	B	14	B	B	B	14
10	13	15	14	32	22	14	12	14	14	B	B	B	B	B	B	B	B	B	B	B	B	B	B	12
11	11	11	15	12	14	18	13	21	B	16	14	18	23	46	B	18	15	20	B	15	B	B	B	13
12	14	15	12	13	B	13	B	14	15	24	22	18	18	17	24	30	B	B	B	B	B	12	11	12
13	12	12	12	13	13	24	26	14	14	B	29	29	23	B	18	15	13	14	13	16	B	B	B	12
14	12	12	12	29	28	B	12	12	B	B	18	27	B	B	26	20	21	13	12	12	12	12	12	12
15	B	13	B	B	14	20	B	26	B	B	B	27	21	17	B	25	B	B	B	14	B	12	13	12
16	12	13	14	B	12	16	14	12	12	13	13	15	27	56	B	B	B	B	B	B	B	B	B	12
17	11	13	B	20	37	B	B	18	B	14	B	B	B	28	15	14	B	B	B	B	B	B	B	12
18	11	12	14	14	14	13	12	12	13	12	15	13	13	16	13	13	13	12	12	12	12	13	12	12
19	12	12	12	12	12	12	B	B	16	29	24	27	30	24	21	22	19	14	13	12	12	B	B	B
20	12	12	12	12	12	12	12	B	18	12	24	19	23	18	26	16	15	13	12	B	18	B	12	12
21	12	24	12	18	14	14	12	15	14	11	15	14	13	14	13	12	12	12	12	12	12	B	11	12
22	12	13	12	11	20	B	15	13	15	12	14	13	B	B	18	17	15	12	13	13	13	12	14	13
23	13	13	20	20	15	13	12	15	14	12	15	15	16	18	14	15	12	13	13	11	12	13	12	12
24	13	14	12	23	18	20	B	17	12	12	14	13	14	17	14	13	11	12	11	12	12	B	B	13
25	B	12	21	20	18	12	12	13	13	19	15	17	15	18	18	15	14	12	16	21	B	12	11	14
26	13	16	12	13	13	13	14	14	11	13	14	15	18	16	16	14	15	13	13	14	12	B	12	12
27	B	13	12	13	13	20	15	B	14	30	15	18	16	19	16	16	12	12	12	12	12	15	13	12
28	12	12	12	12	17	19	14	14	16	15	17	18	18	17	14	25	15	15	13	12	13	B	12	12
29	12	11	12	14	15	13	13	14	13	12	12	22	18	25	B	17	24	22	12	19	13	13	B	13
30	12	13	17	15	13	11	14	14	13	15	14	15	15	16	19	19	22	23	17	13	12	12	11	11
31	12	12	12	19	12	12	15	14	14	13	16	20	20	20	18	19	26	12	13	11	12	12	12	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	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	13	12	15	17	18	15	14	15	16	18	20	23	24	21	19	22	19	14	15	B	B	14	12
U Q	14	16	B 19	23	B 26	B 25	B	B 29	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	13
L Q	12	12	12	13	13	13	13	13	13	12	14	15	18	17	15	15	15	13	13	12	12	12	12	12

AUG. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

AUG. 2011 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	A	A	B	A	A	A	B	B	B	B	B	B	B	B	B	B	218	B	B	B	B	B	Y	A
2	A	B	A	A	B	B	A	A	E B 280	Q 218	226	210	196	208	218	190	B 230	208	214	208	B	B	B	Y
3	A	B	A	A	A	A	B	A	B	230	184	174	206	200	200	196	222	B	A	Y	B	A	B	Y
4	A	A	A	Y	A	B	B	B	E B 268	214	206	B	B	B	B	B	210	206	234	B 234	A	B	B	B
5	A	B	A	B	A	A	B	A	A	B	B	B	B	B	B	B	B	210	B	B	B	B	B	E B 272
6	A	B	B	A	B	B	B	A	A	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B
7	A	A	B	A	B	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
8	B	A	A	A	B	B	A	B	B	B	B	B	B	E B 234	B	B	B	B	B	B	B	B	A	A
9	A	A	216	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	216	B	B	B	A
10	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	204
11	A	A	A	A	A	A	A	A	B	234	226	224	204	254	B	212	192	202	B	238	B	B	B	A
12	A	A	216	A	B	220	B	A	A	260	242	208	196	204	204	222	B	B	B	B	B	Y	A	208
13	A	A	A	A	A	A	A	A	A	B	224	226	220	B	222	Q 208	192	222	196	E B 228	B	B	B	A
14	A	A	A	A	A	B	202	A	B	B	E A 246	E B 240	B	B	204	208	192	214	Q 208	Q 210	A	A	A	A
15	B	A	B	B	A	A	B	A	B	B	B	244	E A 256	A 220	B	236	B	B	B	236	B	A	A	A
16	A	A	A	B	A	A	A	A	194	230	A 222	A 230	228	E B 306	B	B	B	B	B	B	B	B	B	A
17	A	A	B	A	B	B	B	A	B	202	B	B	B	222	204	204	B	B	B	B	B	B	B	A
18	A	A	220	188	A	A	A	E A 294	E B 246	216	224	196	206	194	200	Q 188	Q 208	194	Q 208	204	B 212	A	A	A
19	A	A	A	A	A	A	B	B	E B 256	E B 244	B 220	E B 232	B 228	B 204	198	E B 210	188	206	198	190	208	B	B	B
20	A	A	A	A	A	A	A	B	B 262	222	206	216	204	214	202	224	198	202	204	B	A	B	196	A
21	A	A	A	A	A	232	196	Q 280	242	200	208	202	206	194	196	Q 196	186	190	Q 184	194	236	B	A	A
22	A	A	A	E A 306	A	B	A	E A 336	250	198	210	198	B	B	220	200	204	204	226	B 258	E A 252	A	A	A
23	A	218	A	A	A	A	222	306	260	202	210	200	200	204	208	Q 214	200	Q 184	Q 206	Q 202	246	A	A	A
24	A	216	A	A	A	A	B	A	E A 276	202	218	218	220	210	204	220	208	206	206	216	E B 262	B	B	A
25	B	A	A	A	A	A	220	A	246	222	210	210	194	Q 210	200	204	206	190	210	252	B	Y	A	A
26	A	A	A	A	A	A	B	E B 262	236	218	202	212	232	206	196	194	202	182	206	206	210	B	A	E A 274
27	B	A	A	A	A	A	A	B	210	240	226	A 206	192	226	202	202	206	Q 198	Q 216	Q 234	220	A	A	A
28	A	A	222	A	A	A	A	A	A	224	224	224	202	216	214	214	Q 202	Q 208	202	Q 222	206	B	A	A
29	A	A	A	220	A	A	A	A	A	192	216	202	216	208	B	222	222	206	Q 196	E B 240	240	E B 300	B	Y
30	A	A	A	A	210	A	B	288	196	232	222	206	216	206	206	220	212	204	Q 196	218	Q 196	A	A	210
31	A	A	A	A	A	A	B	Q 246	Q 218	204	204	204	214	198	212	200	202	188	Q 208	226	226	A	A	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		2	4	3	1	2	4	7	15	21	22	22	20	21	19	22	21	20	18	20	12	1	1	5
MED		217	218	U 204	210	226	211	U 275	U 232	218	218	208	206	207	204	207	204	204	206	218	217	E B 300	196	207
U Q			221	E A 306			221	306	E B 262	231	224	224	220	221	212	220	211	207	210	235	243			E 273
L Q			216	188			199	262	218	202	208	202	201	204	200	200	195	192	Q 198	207	209			206

AUG. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2011 fxI (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	B	B	B	40	O X 36	A	O X 34	33	48	66	68	X 76	X 71	X 76	X 70	70	X 63	X 60	47	40	X 28	X 21	B	B
2	A	X 35	O X 34	A	A	R	33	36	B	O X 63	O X 66	X 70	O X 77	X 74	O X 74	O X 68	X 58	X 58	X 55	40	X 28	X 24	A	O X 25
3	A	A	A	54	A	B	A	A	B	R	X 54	X 60	X 63	X 68	X 70	X 70	72	O X 54	X 43	O X 39	R	Y	O X 25	A
4	A	O X 39	O X 44	A	A	X 51	A	B	B	B	B	R	X 58	X 57	O X 57	X 63	X 62	O X 62	X 57	X 54	R	R	O X 40	A
5	B	A	A	X 48	A	A	R	X 39	X 46	X 50	X 54	O X 55	X 56	X 64	X 64	X 68	X 65	X 49	X 48	X 48	O X 28	53	A	A
6	80	B	O X 34	X 32	A	A	A	B	B	B	B	B	B	B	B	B	O X 64	B	B	X 60	B	R	A	A
7	A	A	A	A	A	B	B	R	B	O X 48	B	O X 47	B	B	O X 71	X 72	B	B	B	O X 47	O X 35	B	R	A
8	R	Y	B	R	A	A	R	B	X 48	X 59	B	X 70	X 70	X 76	B	B	B	B	X 46	X 40	31	30	B	B
9	B	B	B	B	B	B	B	B	B	B	X 67	X 68	X 74	X 75	B	O X 75	68	X 62	52	R	68	31	A	39
10	42	B	B	B	B	B	B	B	B	A	R	B	B	B	B	B	O X 49	O X 48	B	B	R	R	A	A
11	A	B	B	O X 37	B	R	A	A	B	R	R	O X 43	O X 52	O X 51	O X 69	O X 65	X 59	X 58	X 58	X 30	B	A	O X 31	A
12	A	O X 34	A	71	O X 36	B	B	B	B	B	B	B	B	B	B	X 69	B	B	X 56	B	52	A	A	A
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 38	35	O X 28	A	56
14	71	B	A	B	B	R	X 38	O X 42	X 49	X 51	X 58	X 61	O X 73	X 71	X 74	X 70	X 68	X 62	O X 58	X 48	O X 44	30	Y	A
15	42	A	R	A	A	R	37	O X 46	O X 48	B	B	O X 71	X 77	O X 67	79	X 79	X 72	X 70	X 59	X 63	O X 57	X 32	B	O X 36
16	A	A	B	R	A	A	O X 41	X 45	O X 49	X 59	O X 58	X 66	X 77	O X 77	X 78	X 77	X 70	X 71	56	X 56	X 54	32	B	B
17	B	A	R	34	37	37	34	A	B	B	X 65	X 73	X 72	B	B	B	X 80	67	A	A	A	69	A	58
18	A	O X 37	40	32	A	R	O X 36	X 41	O X 41	X 51	O X 52	X 60	O X 66	X 70	X 67	73	78	X 76	B	O X 56	X 40	O X 28	R	A
19	A	A	X 41	X 39	37	43	42	X 43	O X 56	X 58	O X 65	O X 74	X 75	X 80	X 79	X 81	X 76	70	X 63	63	50	49	37	26
20	24	O X 22	B	O X 22	B	39	O X 38	O X 48	B	B	X 64	X 73	B	X 86	X 81	B	B	X 72	70	65	O X 58	O X 50	X 34	A
21	R	R	A	O X 28	B	O X 26	X 39	O X 48	B	X 66	B	O X 76	X 80	O X 81	X 92	X 86	X 86	X 82	X 71	O X 55	O X 38	35	A	A
22	A	A	A	O X 45	R	42	40	O X 52	O X 62	O X 69	X 71	X 78	O X 82	X 90	B	X 84	X 71	X 71	X 67	X 56	X 48	O X 27	A	A
23	A	A	A	B	A	X 36	O X 40	O X 48	X 64	O X 66	O X 66	O X 67	R	O X 83	X 78	X 74	X 81	X 68	X 58	O X 49	X 46	43	38	28
24	B	56	A	30	39	O X 32	O X 42	O X 55	O X 54	X 58	X 82	X 80	X 80	B	O X 86	X 84	B	O X 70	O X 69	O X 54	X 47	X 50	X 34	B
25	A	R	41	R	39	X 39	O X 40	O X 42	B	X 63	O X 77	X 81	B	X 89	X 84	X 82	X 83	X 78	X 75	O X 60	X 60	X 52	R	B
26	B	B	R	B	B	B	B	B	B	B	B	R	R	R	X 76	X 74	X 80	X 80	X 72	B	B	B	X 47	B
27	R	R	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 34	R	A
28	B	B	B	A	A	X 37	B	B	B	B	B	B	B	B	B	B	X 58	B	O X 47	O X 38	O X 31	R	R	R
29	A	A	A	R	R	O X 36	B	B	B	R	R	B	B	B	B	X 64	X 68	X 66	B	O X 52	O X 46	R	B	B
30	B	50	57	R	B	R	R	X 51	O X 60	X 66	O X 64	O X 70	B	O X 86	O X 86	X 86	84	O X 77	O X 75	O X 62	X 62	52	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	7	7	13	6	11	14	15	12	15	16	21	17	19	19	22	23	23	22	24	22	20	8	7
MED	42	O X 37	X 41	X 37	37	X 37	X 38	O X 45	O X 49	X 59	X 65	X 70	X 73	X 76	X 76	X 74	X 70	X 68	X 58	X 53	X 46	33	X 36	36
U Q	76	50	44	46	39	42	O X 40	O X 48	O X 58	X 66	X 68	X 75	X 77	X 83	X 81	X 81	X 80	X 72	X 69	X 58	X 54	50	X 39	56
L Q	33	O X 34	O X 34	31	O X 36	O X 36	36	41	X 48	X 51	X 58	X 60	X 64	X 68	X 70	X 69	X 63	X 60	X 52	X 40	X 35	X 29	O X 32	26

SEP.2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2011 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

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	B	B	B	Y	R 30	A	R 28	F 23	F 36	F 57	F 59	70	65	70	64	F 60	57	54	F	F 28	23	15	B	B
2	A	R 29	28	A	A	A	F 21	F 26	B	R 57	R 60	64	71	J R 68	R 68	R 62	52	52	49	F 26	22	18	A	R 19
3	A	A	A	A	A	B	A	A	B	A	R 48	J R 54	57	62	J R 58	64	Z 66	R 48	37	R 33	A	Y	R 19	A
4	A	R 33	R 32	A	A	J R 45	A	B	B	B	B	R	J R 52	J R 51	R 51	57	56	R 56	51	48	R	R	R 34	A
5	B	A	A	J R 42	A	A	A	33	40	44	48	R 49	J R 50	58	58	62	59	43	42	42	R 22	27	A	A
6	B	B	R 28	26	A	A	A	B	B	B	B	B	B	B	B	B	U R 58	B	B	J R 54	B	R	A	A
7	A	A	A	A	A	B	B	R	B	R 42	B	U R 41	B	B	R 65	J R 66	B	B	B	41	R 29	B	A	A
8	A	Y	B	R	A	A	R	B	42	J R 53	B	J R 64	J R 64	70	B	B	B	B	40	34	F 20	F 20	B	B
9	B	B	B	B	B	B	B	B	B	B	61	62	68	69	B	69	F 58	56	F 41	R	Y	F 16	A	F 29
10	F 25	B	B	B	B	B	B	B	B	A	R	B	B	B	B	B	R 43	R 42	B	B	R	A	A	A
11	A	B	B	R 31	B	A	A	A	B	A	R	R 37	U R 46	R 45	R 63	59	53	J R 52	52	24	B	A	R 25	A
12	A	R 28	A	A	R 30	B	B	B	B	B	B	B	B	B	B	J R 63	B	B	50	B	A	A	A	A
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 32	F 26	22	A	A
14	R 24	B	A	B	B	A	32	36	43	45	J R 52	J R 55	U R 67	65	68	64	62	56	U R 52	42	38	F 19	Y	A
15	F 31	A	A	A	A	A	F 26	R 40	R 42	B	B	R 65	J R 71	R 61	F 68	73	66	64	53	57	51	26	B	R 30
16	A	A	B	A	A	A	35	39	R 43	53	R 52	J R 60	J R 71	R 71	J R 72	J R 71	64	65	F 48	J R 50	48	F 20	B	B
17	B	A	A	F 20	F 26	F 20	F 22	A	B	B	59	J R 67	66	B	B	B	J R 74	F 57	A	A	A	F 20	A	F 23
18	A	R 31	F 30	F 17	A	R	R 30	35	R 35	R 45	R 46	J R 54	R 60	64	61	F 61	F 68	70	B	R 50	34	F 17	A	A
19	A	A	35	33	F 27	F 27	F 30	37	R 50	52	59	R 68	69	J R 74	73	75	70	F 60	57	F 55	F 40	F 40	F 24	F 17
20	F 16	R 16	B	R 16	B	F 22	R 32	R 42	B	B	58	67	B	80	J R 75	B	B	J R 66	F 61	F 53	R 52	44	28	A
21	R	R	A	R 22	B	R 20	33	42	B	60	B	U R 70	J R 74	R 75	J R 86	J R 80	80	J R 76	65	R 49	R 32	F 24	A	A
22	A	A	A	R 39	A	F 32	F 29	R 46	56	R 63	J R 65	J R 72	R 76	J R 84	B	J R 78	J R 65	J R 65	R 61	J R 50	42	R 21	A	A
23	A	A	A	B	A	30	R 34	R 42	58	R 60	R 60	R 61	R	R 77	72	J R 68	J R 75	J R 62	J R 52	R 43	40	F 33	F 28	F 17
24	B	A	A	F 20	F 29	26	R 36	49	U R 48	J R 52	76	J R 74	J R 74	B	R 80	J R 78	B	R 64	R 63	U R 48	41	44	28	B
25	A	R	F 31	A	F 29	33	35	R 36	B	J R 57	71	J R 75	B	J R 83	J R 78	J R 76	J R 77	72	69	R 54	54	46	R	B
26	B	B	A	B	B	B	B	B	B	B	B	R	R	R	J R 70	J R 68	J R 74	J R 74	66	B	B	B	41	B
27	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 28	R	A
28	B	B	B	A	A	R 31	B	B	B	B	B	B	B	B	B	B	52	B	41	R 32	R 25	R	A	A
29	A	A	A	A	A	30	B	B	B	R	R	B	B	B	B	58	62	J R 60	B	46	40	R	B	B
30	B	F 34	A	R	B	A	R	45	54	60	R 58	R 64	B	U R 80	R 80	J R 80	F 74	R 71	69	R 56	56	F 36	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	4	6	6	10	6	11	14	15	12	15	16	21	17	19	19	22	23	23	21	24	20	20	8	6
MED	F 24	R 30	30	24	F 29	30	31	39	43	R 53	59	R 64	R 67	R 70	R 68	67	64	R 60	52	47	39	23	28	F 21
U Q	F 28	33	32	R 33	R 30	32	34	42	52	60	60	R 69	J R 71	R 77	J R 75	J R 75	J R 74	R 66	62	R 52	45	34	31	29
L Q	20	R 28	28	F 20	F 27	F 22	F 28	35	41	45	R 52	R 54	R 58	R 62	R 63	62	57	54	45	34	26	F 20	R 24	F 17

SEP.2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2011 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	B 27	B 31	B 37	15 39	17 42	52 24	36 26	38 24	28 B	24 E 25	31 B 28	30 28	31 28	31 26	26 E 29	24 23	28 24	18 17	K 20 E 12	24 B 12	E B 13	18 24	B 33	B 31
2	41	38	72	42	54	B 32	32	44	B	38	32	32	29	26	28	E B 36	E B 28	E B 28	E B 20	31	37	17	34	55
3	69	43	42	41	44	76	56	B	B	B	B	32	30	27	G 22	22	E B 24	E B 36	E B 20	E B 14	34	37	38	36
4	B 32	32	30	46	48	37	E B 22	24	25	24	G	26	G 22	G 22	27	G	24	E B 14	E B 14	34	41	54	34
5	E B 58	B	39	49	42	43	43	B	B	B	B	B	B	B	B	B	E B 38	B	B	E B 23	B	18	32	34
6	36	38	36	42	42	B	B	28	B	E B 38	B	26	B	B	E B 29	E B 36	B	B	B	E B 19	E B 16	B	28	30
7	32	15	B	26	38	39	K 27	B	E B 17	E B 23	B	27	31	30	B	B	B	B	E B 16	E B 14	E B 12	E B 14	B	B
8	B 9	B	B	B	B	B	B	B	B	B	E B 28	32	31	31	B	26	28	27	30	32	32	41	62	41
9	35	B	B	B	B	B	B	B	B	42	34	B	B	B	B	B	E B 21	E B 22	B	B	27	36	40	44
10	68	B	B	40	B	40	41	42	B	32	28	26	29	27	28	27	24	K 33	E B 24	28	B	40	40	42
11	36	42	82	40	41	B	B	B	B	B	B	B	B	B	B	E B 56	B	B	E B 27	B	90	115	71	70
12	B 13	51	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 24	E B 17	E B 16	29	36
13	41	B	41	B	B	34	K 28	E B 22	E B 21	E B 27	E B 25	E B 28	30	30	26	E B 25	25	22	E B 26	E B 20	E B 15	E B 12	18	29
14	35	35	35	40	40	34	K 16	E B 18	E B 22	B	B	E B 58	E B 29	28	28	28	29	E B 18	K 15	E B 13	E B 18	E B 17	B	63
15	38	37	B	37	40	38	30	28	25	28	G 24	24	G	G	29	G 24	G	G	E B 14	E B 12	E B 12	E B 12	B	B
16	B 17	33	30	28	E B 14	16	48	38	B	B	29	G	G 28	B	B	B	E B 56	32	42	49	72	30	82	63
17	70	50	72	34	37	31	24	G	G	26	28	32	30	29	G 28	G 24	31	24	B	E B 29	E B 13	E B 14	28	35
18	33	38	42	43	32	34	24	23	G 19	G 20	G	E B 54	34	31	31	30	31	31	G 16	16	18	E B 14	E B 14	E B 13
19	16	18	B	16	B	16	E B 22	20	B	B	30	31	B	G	E B 57	B	B	E B 56	E B 30	E B 20	E B 15	E B 15	E B 17	K 30
20	30	24	29	21	B	E B 13	E B 14	E B 19	B	E B 24	B	E B 56	E B 56	E B 56	32	30	G	E B 30	E B 24	E B 27	E B 20	25	33	30
21	30	32	34	42	42	31	20	G 18	G 18	G 22	28	35	32	32	B	E B 63	28	25	19	E B 13	E B 13	23	36	33
22	32	40	42	B 36	32	34	G	G	E B 37	G	G 21	31	G 22	G 22	G	26	K 21	K 17	E B 15	E B 14	E B 12	E B 13	E B 12
23	B	32	32	25	15	E B 14	E B 20	G	E B 26	E B 28	E B 30	E B 31	G	B	G 25	E B 29	B	E B 31	E B 25	E B 19	E B 14	E B 13	E B 12	B
24	33	26	30	K 34	32	24	E B 20	E B 26	B	E B 30	E B 41	E B 32	B	E B 40	G	G	G	E B 26	E B 23	E B 24	E B 16	E B 13	22	B
25	B	B	K 25	B	B	B	B	B	B	B	B	E B 38	E B 35	E B 57	E B 39	E B 64	E B 55	E B 56	E B 27	B	B	B	E B 21	B
26	33	30	B	B	B	E B 56	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	22	22	38
27	76	B	B	40	37	E B 22	B	B	B	B	B	B	B	B	B	B	26	B	30	E B 24	K 20	25	27	30
28	30	32	36	34	33	23	B	B	B	E B 30	31	B	B	B	B	E B 38	G	E B 39	B	E B 26	E B 18	32	B	B
29	B	34	35	28	B	A	34	30	24	G 20	G 21	G 21	B	E B 54	G 25	E B 25	G	27	21	E B 16	E B 14	E B 14	B	B
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	22	20	23	20	22	21	19	12	19	19	23	19	20	19	22	23	23	23	26	26	28	24	22
MED	34	34	36	37	39	32	28	22	E G 22	26	28	U 28	30	28	27	E G 27	E G 26	U 24	E B 21	E B 20	E B 16	18	30	34
U Q	41	38	42	41	42	40	36	30	24	32	31	E B 32	31	E B 32	29	E B 36	29	E B 32	27	26	27	31	39	42
L Q	32	31	32	28	32	23	E B 21	G	G	G 24	G 24	G 26	G 28	G 26	G 25	G	G	22	E B 16	E B 14	E B 14	E B 14	E B 22	30

SEP. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP. 2011 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	B	B	B	12	12	13	234	13	12	14	23	14	14	13	15	14	13	12	12	12	12	12	B	B
2	12	13	18	12	12	12	12	14	B	25	28	14	14	14	29	14	12	13	12	12	13	11	12	12
3	12	17	15	14	28	B	22	14	B	24	19	16	17	16	14	36	28	28	20	14	13	14	12	13
4	13	12	13	12	24	14	20	B	B	B	B	16	15	19	18	18	24	36	20	14	16	12	12	12
5	B	25	20	18	24	16	12	22	13	13	13	17	18	18	17	13	17	13	14	14	12	12	12	28
6	58	B	12	13	20	18	22	B	B	B	B	B	B	B	B	B	38	B	B	23	B	15	11	13
7	12	13	15	23	21	B	B	21	B	38	B	21	B	B	29	36	B	B	B	19	16	B	12	12
8	13	12	B	16	13	14	20	B	17	23	B	22	24	20	B	B	B	B	16	14	12	14	B	B
9	B	B	B	B	B	B	B	B	B	B	28	23	20	20	B	18	15	13	12	29	12	13	14	12
10	12	B	B	B	B	B	B	B	B	22	22	B	B	B	B	B	21	22	B	B	12	12	12	15
11	18	B	B	13	B	25	20	21	B	20	18	18	20	21	18	17	19	17	24	12	B	12	12	12
12	27	12	26	36	13	B	B	B	B	B	B	B	B	B	B	56	B	B	27	B	14	14	14	14
13	B	22	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	24	17	16	12	10
14	11	B	14	B	B	13	16	22	21	27	25	28	19	23	18	25	14	15	26	20	15	12	12	12
15	13	20	14	24	27	18	13	18	22	B	B	58	29	20	18	15	14	18	13	13	18	17	B	12
16	12	16	B	15	21	12	14	14	16	16	20	19	22	22	16	16	16	12	14	12	12	12	B	B
17	B	12	11	13	14	11	12	24	B	B	26	22	18	B	B	B	56	24	12	12	14	11	13	12
18	12	13	11	12	16	16	12	17	14	15	16	16	16	18	16	19	16	18	B	29	13	14	11	12
19	12	14	12	15	12	12	12	13	15	16	20	54	21	22	15	15	13	12	13	12	12	14	14	12
20	11	12	B	12	B	12	22	15	B	B	18	19	B	23	57	B	B	56	31	20	15	15	17	11
21	26	12	13	13	B	13	14	19	B	24	B	56	56	56	21	20	18	30	24	27	20	12	12	12
22	12	12	14	19	17	13	13	12	14	15	14	16	28	20	B	63	16	16	12	13	13	12	11	24
23	29	14	20	B	13	16	13	16	18	37	17	17	20	17	17	13	16	15	12	15	14	12	13	12
24	B	13	12	12	12	14	20	19	26	28	30	31	22	B	23	29	B	31	25	19	14	13	12	B
25	12	13	13	14	13	13	20	26	B	30	41	32	B	40	25	20	19	26	23	24	16	13	15	B
26	B	B	13	B	B	B	B	B	B	B	B	38	35	57	39	64	55	56	27	B	B	B	21	B
27	22	24	B	B	B	55	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	16	17	17
28	56	B	B	26	23	22	B	B	B	B	B	B	B	B	B	B	18	B	18	24	17	12	13	19
29	15	19	22	28	20	16	B	B	B	30	25	B	B	B	B	38	18	39	B	26	18	13	B	B
30	B	12	12	14	B	18	19	15	210	16	16	16	B	54	20	23	16	26	15	16	14	14	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	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	16	15	16	16	22	16	20	22	B	29	27	22	26	23	27	27	18	26	22	19	14	13	13	13
U Q	B	B	B	B 36	B	B 55	B	B	B	B	B	B 58	B	B	B	B	B 56	B 56	B 31	26	17	14	B 17	B
L Q	12	12	13	13	13	13	13	15	18	20	19	17	19	20	18	17	16	15	13	13	13	12	12	12

SEP. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

SEP.2011 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	B	B	B	Y	A	A	A	A	204	222	248	212	200	194	194	204	Q 204	Q 182	Q 198	Q 198	198	220	B	B
2	A	A	220	A	A	A	A	A	B	244	226	204	198	198	216	216	202	198	Q 198	Q 198	242	246	234	248
3	222	A	A	A	A	B	A	A	B	A	A	A 238	218	218	216	234	228	206	E B 248	A	A	Y	216	A
4	A	220	234	A	A	208	A	B	B	B	B	A	E A 254	230	E A 244	218	234	234	242	236	A	A	226	A
5	B	A	A	214	A	A	A	280	240	232	H 210	214	214	214	220	228	202	196	Q 208	Q 218	230	224	A	A
6	224	B	A	210	A	A	A	B	B	B	B	B	B	B	B	B	242	B	B	250	B	A	A	A
7	A	A	A	A	A	B	B	A	B	B	B	224	B	B	222	222	B	B	B	204	204	B	A	A
8	A	Y	B	A	A	A	A	B	200	216	B	216	200	224	B	B	B	B	202	212	212	220	B	B
9	B	B	B	B	B	B	B	B	B	B	208	218	228	202	B	216	Q 204	204	Q 232	A	198	F	A	A
10	A	B	B	B	B	B	B	B	B	A	A	B	B	B	B	B	E B 242	260	B	B	A	A	A	A
11	A	B	B	A	B	A	A	A	B	A	204	222	228	196	198	204	196	208	230	198	B	A	206	A
12	A	A	A	A	198	B	B	B	B	B	B	B	B	B	B	B	B	B	246	B	A	A	A	A
13	B	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	250	230	E B 268	A	A
14	214	B	A	B	B	A	A	E B 254	236	220	188	240	222	A 226	200	224	Q 214	Q 214	234	212	212	212	A	A
15	230	A	A	A	A	A	A	E B 260	244	B	B	B	212	208	196	212	208	212	Q 210	210	210	E B 234	B	234
16	A	A	B	A	A	A	A	274	222	218	192	200	202	206	204	210	210	204	Q 196	Q 200	Q 186	B 222	B	B
17	B	A	A	A	B	A	E A 332	A	B	B	234	200	200	B	B	B	238	E A 284	A	A	A	F	A	F
18	A	A 232	226	232	A	A	A	A	A	H 232	236	E A 256	230	222	204	206	206	206	B	238	206	E B 284	A	A
19	A	A	222	A	A	A	A	236	208	222	204	E B 268	218	194	194	A 204	Q 208	Q 208	Q 198	Q 212	Q 212	Q 212	Q 212	E B 252
20	A 288	A	B	A	B	A	E B 314	238	B	B	204	204	B	214	300	B	B	248	228	220	202	212	240	A
21	A	A	A	A	B	B	Q 250	E B 250	B	218	B	E B 296	E B 272	268	212	212	220	228	210	226	240	A 282	A	A
22	A	A	A	242	A	232	E A 294	242	B 208	228	208	238	A	210	B	234	218	214	204	198	204	230	A	A
23	A	A	A	B	A	A	210	E A 280	228	E B 250	200	200	E A 224	214	202	210	210	214	198	Q 198	Q 198	Q 198	Q 214	234
24	B	A	A	A	A	E B 322	258	208	212	212	224	222	204	B	204	218	B	218	214	190	220	208	208	B
25	A	A	264	A	A 246	A	E B 286	E B 252	B	226	E B 260	212	B	242	234	210	222	212	212	196	216	208	A	B
26	B	B	A	B	B	B	B	B	B	B	B	B 232	224	E B 276	E B 244	E B 254	E B 270	E B 244	248	B	B	B	200	B
27	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A
28	B	B	B	A	A	E B 272	B	B	B	B	B	B	B	B	B	B	A 232	B	E A 308	E B 276	E A 336	A	A	A
29	A	A	A	A	A	224	B	B	B	E B 240	A	B	B	B	B	E B 250	230	230	B	230	218	A	B	B
30	B	222	A	A	B	A	A	E A 274	212	212	U Y 236	U Y 230	B	E B 288	214	222	Q 222	214	Q 208	Q 208	202	196	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	3	5	4	2	5	7	12	11	15	16	21	18	20	19	21	23	23	22	23	21	17	9	4
MED	224	222	226	223	222	U 220	E 286	245	212	221	208	218	213	213	208	214	214	213	210	211	211	216	214	238
U Q	259	A 232	249	237		E B 297	E 314	274	236	232	235	238	228	228	222	226	232	230	234	230	225	E B 240	230	250
L Q	218	220	221	212		216	250	240	208	218	204	208	202	204	200	210	206	206	Q 202	198	202	210	207	234

SEP.2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2011 fxI (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	R	R	O X 44	B	R	X 41	A	B	R	B	X 56	X 59	B	B	B	O X 88	O X 75	O X 66	X 68	O X 54	O X 41	Y	X 26	A
2	B	A	R	B	A	B	X 54	B	B	B	B	B	B	B	B	B	X 64	B	X 66	B	B	B	O X 36	R
3	R	R	R	O X 33	56	X 45	O X 59	R	X 64	O X 76	O X 82	O X 84	O X 87	O X 86	O X 88	B	B	X 78	X 66	B	B	B	R	R
4	R	R	R	X 43	B	R	R	67	X 70	O X 71	X 74	O X 74	O X 76	O X 80	X 82	B	B	X 76	X 74	X 58	X 40	R	O X 37	30
5	O X 36	A	A	A	A	A	X 58	X 64	O X 67	B	O X 78	O X 78	O X 85	B	B	B	B	X 57	B	O X 41	X 42	O X 34	O X 35	R
6	R	49	56	O X 40	X 40	X 47	X 51	X 63	O X 69	O X 72	O X 72	B	R	X 80	O X 81	X 72	X 74	X 69	X 64	O X 59	X 30	A	A	A
7	A	A	A	44	42	X 48	X 58	X 59	R	B	X 58	B	B	B	O X 85	B	X 68	72	X 62	O X 54	X 45	O X 40	B	X 30
8	O X 30	35	R	A	O X 46	O X 49	O X 63	O X 63	O X 70	X 74	X 80	X 81	X 88	O X 94	X 92	X 97	O X 98	X 76	X 71	X 61	X 49	R	R	A
9	40	B	A	B	A	50	O X 49	R	B	B	B	R	B	B	X 67	X 67	B	B	X 55	X 58	X 52	38	R	R
10	A	A	A	40	O X 44	R	O X 52	A	X 64	O X 73	O X 74	R	B	O X 74	B	X 76	X 76	X 70	X 66	X 60	X 47	X 47	X 40	30
11	A	36	32	39	42	X 44	O X 53	X 65	X 73	X 80	X 80	X 88	O X 88	O X 84	O X 90	X 88	X 86	X 80	X 68	66	65	38	36	45
12	42	A	44	52	X 48	R	R	R	X 67	73	X 68	X 82	B	B	X 99	B	B	B	X 76	X 65	X 62	X 54	38	A
13	A	X 30	X 32	47	51	B	A	A	B	R	X 67	O X 64	X 68	X 76	X 74	X 75	O X 72	X 70	X 68	X 67	X 60	X 56	X 49	46
14	X 42	42	42	40	49	56	X 57	67	X 68	X 73	X 90	X 100	X 94	97	X 91	O X 97	O X 78	X 77	X 72	X 70	O X 63	O X 59	X 51	51
15	44	41	32	38	X 36	A	B	R	X 62	X 71	X 77	X 77	X 77	X 82	X 84	X 87	X 84	X 80	X 68	X 57	B	X 40	43	42
16	34	34	40	X 47	O X 48	R	A	69	B	69	X 63	66	X 71	X 72	X 76	X 75	X 78	X 73	74	X 69	B	X 57	64	60
17	43	A	A	A	O X 46	B	O X 42	X 62	X 71	X 76	X 79	X 82	X 86	O X 88	X 85	O X 84	X 83	O X 76	O X 73	O X 75	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	X 75	X 69	65	X 60	X 48	58
19	53	49	59	62	70	B	R	R	B	X 68	X 77	X 81	O X 85	X 92	O X 88	O X 99	O X 99	X 89	O X 76	X 70	X 69	69	58	57
20	52	42	42	54	A	A	A	69	X 76	X 77	X 82	O X 85	X 95	O X 88	X 96	94	X 92	X 83	O X 75	X 72	67	X 58	R	R
21	38	31	37	O X 50	R	B	B	B	B	O X 66	X 67	X 70	X 80	X 80	X 82	X 79	X 80	X 74	X 74	O X 64	X 64	X 59	X 56	X 51
22	30	A	A	B	71	77	81	X 86	X 87	O X 88	X 95	X 98	X 88	89	B	X 78	X 78	X 78	X 76	X 70	X 68	65	60	58
23	62	66	71	70	70	78	91	X 98	O X 93	O X 95	X 96	O X 97	O X 97	O X 96	O X 96	O X 86	X 90	O X 81	O X 72	X 70	X 69	O X 69	O X 56	O X 47
24	O X 38	O X 38	X 38	A	B	B	B	B	X 74	X 83	X 82	X 88	101	O X 98	O X 94	X 94	X 94	X 83	O X 76	X 72	X 67	B	B	B
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	O X 52	B	O X 49	O X 49	O X 47	O X 47	X 43
26	X 43	X 44	45	47	X 47	O X 38	69	X 75	B	X 94	O X 91	X 78	O X 73	X 69	X 69	O X 63	R	X 59	X 61	X 65	X 57	X 53	X 52	48
27	X 32	A	A	X 40	R	R	R	R	B	X 66	X 77	B	B	B	R	O X 71	O X 76	B	O X 74	X 67	O X 60	B	O X 56	X 56
28	X 48	44	52	X 47	X 54	X 63	X 70	X 76	O X 87	X 88	X 87	87	X 92	O X 83	X 82	O X 86	X 74	X 78	X 74	X 71	X 58	X 58	X 58	58
29	X 60	O X 61	58	X 58	X 73	X 72	X 90	X 97	X 100	C	C	C	C	C	C	C	C	C	C	C	C	O X 60	X 63	O X 62
30	63	66	X 68	O X 64	66	X 72	X 72	X 96	X 101	X 106	O X 104	X 91	O X 91	X 93	O X 85	X 88	X 90	X 93	X 81	O X 63	X 64	X 57	X 58	X 47
31	X 47	51	A	A	91	B	R	X 69	X 74	X 77	X 76	O X 76	X 77	R	X 79	X 78	X 78	O X 74	X 68	X 58	X 58	X 56	A	X 39
	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	20	17	16	20	20	15	17	17	18	22	26	22	21	20	22	22	22	25	28	28	25	22	22	20
MED	42	42	43	46	50	X 49	X 58	X 69	X 72	X 75	X 78	X 81	X 86	X 85	X 85	X 85	X 78	X 76	X 72	X 65	X 60	X 56	X 50	48
U Q	50	50	57	52	68	72	X 71	X 81	X 87	X 83	X 82	X 88	X 92	X 92	X 91	X 88	X 90	X 80	X 74	X 70	X 65	X 59	58	58
L Q	37	36	38	40	X 45	X 45	O X 52	X 64	X 68	X 71	X 73	X 74	X 77	X 80	X 81	X 75	X 75	X 70	X 67	X 58	X 48	X 47	X 38	42

OCT. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2011 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

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	R	A	R 38	B	R	35	A	B	A	B	50	J R 53	B	B	B	R 82	U R 69	R 60	62	R 48	R 35	Y	20	A
2	B	A	R	B	A	B	48	B	B	B	B	B	B	B	B	B	58	B	60	B	B	B	30	A
3	R	A	R	27	F 32	39	R 53	R	58	R 70	U R 76	U R 78	U R 81	U R 80	U R 82	B	B	72	60	B	B	B	R	A
4	A	A	R	37	B	R	A	F 56	64	U R 65	68	68	R 70	U R 74	76	B	B	70	68	52	34	A	R 31	24
5	30	A	A	A	A	A	52	J R 58	61	B	R 70	U R 72	79	B	B	B	B	J R 51	B	R 35	36	F 24	R 29	A
6	A	A	R 34	R 34	34	41	J R 45	57	U R 63	66	U R 66	B	R	J R 74	75	66	68	63	58	R 53	24	A	A	A
7	A	A	A	F 30	F 29	42	J R 52	53	R	B	J R 52	B	B	B	U R 79	B	J R 62	F 61	56	U R 48	39	R 34	B	23
8	24	F 26	R	A	R 40	43	57	57	64	J R 68	J R 74	J R 75	J R 88	88	J R 86	91	S 92	70	65	55	43	R	R	A
9	F 28	B	A	B	A	A	R 43	R	B	B	B	R	B	B	J R 61	61	B	B	49	52	46	F 28	A	A
10	A	A	A	F 29	R 38	R	R 46	A	J R 58	67	R 68	R	B	R 68	B	J R 70	J R 70	J R 64	60	54	41	41	34	F 21
11	A	F 24	F 23	F 25	F 30	38	R 47	59	67	J R 74	J R 74	J R 82	R 82	R 78	R 84	J R 82	J R 80	74	62	F 57	F 54	F 26	F 20	F 30
12	F 24	A	A	F 34	F 39	42	R	R	R	J R 61	F 64	62	J R 76	B	93	B	B	B	70	59	56	J R 48	F 26	A
13	A	24	26	F 34	F 41	B	A	A	B	R	61	58	J R 62	70	68	69	66	64	62	61	54	50	43	F 36
14	36	F 30	F 30	F 28	F 38	F 46	J R 51	F 58	J R 62	J R 67	J R 84	94	88	91	J R 85	91	72	R 71	66	64	57	53	45	F 40
15	F 29	F 30	F 19	F 25	30	A	B	R	56	65	71	71	71	76	78	81	78	74	62	51	B	34	F 33	F 29
16	F 20	F 22	F 27	41	R 42	R	A	F 60	B	F 60	57	F 56	65	J R 66	70	69	72	67	F 63	63	B	51	F 50	F 48
17	F 26	A	A	A	40	B	36	56	65	70	73	76	80	82	J R 79	78	77	70	67	69	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	69	63	F 56	J R 54	42	F 43
19	F 35	F 39	F 47	F 48	F 59	B	R	R	B	62	71	J R 75	79	J R 86	R 82	S 93	S 93	J R 83	R 70	64	J R 63	F 59	F 48	F 46
20	F 39	F 26	F 26	F 28	A	A	A	F 59	70	71	76	79	89	R 82	90	88	J R 86	J R 77	69	66	F 57	52	A	R
21	F 24	F 18	F 24	44	R	B	B	B	B	R 60	61	64	74	74	76	J R 73	74	68	68	S 58	58	53	50	45
22	F 18	A	A	B	F 60	F 64	F 72	80	J R 81	R 82	J R 89	J R 92	J R 82	J R 83	B	J R 72	J R 72	J R 72	70	64	62	F 56	F 51	F 48
23	F 50	F 54	F 57	F 56	F 64	F 70	F 81	92	R 87	R 89	J R 90	R 91	R 91	R 90	R 90	R 80	J R 84	J R 75	R 66	J R 64	J R 63	R 63	R 50	R 41
24	R 32	R 32	32	A	B	B	B	B	J R 68	77	J R 76	J R 82	F 92	R 92	U R 88	88	88	J R 77	R 70	66	61	B	B	B
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	R 46	B	R 43	R 43	41	41	37
26	37	38	F 35	F 37	41	32	F 57	69	B	88	U R 85	72	R 67	J R 63	J R 63	R 57	R	J R 53	55	59	51	47	46	F 38
27	26	A	A	J R 34	A	A	A	A	B	R 60	71	B	B	B	R	65	70	B	68	61	54	B	U R 50	50
28	42	F 34	F	41	48	57	64	70	81	82	81	81	J R 86	77	76	R 80	68	72	68	65	52	J R 52	52	F 48
29	54	55	F 50	52	67	66	J R 84	91	X R 94	C	C	C	C	C	C	C	C	C	C	C	C	54	57	56
30	57	F 56	62	R 58	F 56	66	J R 66	90	95	100	R 98	J R 85	U R 85	J R 87	79	J R 82	J R 84	87	J R 75	R 57	58	51	52	41
31	41	F 39	A	A	57	B	R	63	68	J R 71	70	R 70	J R 71	D R 59	J R 73	72	72	68	62	52	52	50	A	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	20	16	15	20	20	14	17	17	18	22	26	22	21	21	22	22	22	25	28	28	25	22	22	20
MED	31	F 31	F 32	F 34	40	42	R 52	59	66	69	71	75	R 80	R 79	R 79	79	72	70	66	58	54	50	44	F 40
U Q	40	F 39	F 47	42	F 56	64	65	75	R 81	77	J R 76	J R 82	87	R 86	R 85	82	84	J R 74	68	64	58	53	50	F 47
L Q	F 25	F 25	F 26	F 28	F 36	39	R 46	57	62	65	66	68	R 71	R 72	75	69	69	R 64	61	52	42	41	31	32

OCT. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2011 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	K 21	38	36	B	37	42	42	B	38	B	32	29	B	B	B	E B 55	E B 40	E B 36	E B 27	E B 26	E B 20	16	15	79
2	B	50	32	70	58	B	G 22	B	B	B	B	B	B	B	B	B	E B 38	B	E B 26	B	B	B	22	31
3	32	36	28	22	16	K 21	G 14	23	24	G 21	G	E B 35	Y	E B 54	E B 57	B	B	E B 26	E B 20	B	B	B	19	38
4	35	K 35	35	33	B	38	42	31	29	G 18	G 23	G	E B 36	E B 51	32	B	B	E B 25	E B 39	E B 19	E B 15	37	26	28
5	36	54	40	49	74	42	29	25	27	B	E B 55	E B 58	G	B	B	B	B	29	B	29	25	29	27	32
6	33	E B 30	K 26	33	K 32	43	G	G	G 20	G 20	30	B	29	31	29	40	32	29	28	G	29	36	31	38
7	40	41	34	34	K 28	26	28	G 18	32	B	G	B	B	B	E B 55	B	E B 55	G	E B 26	E B 33	E B 21	E B 20	B	E B 20
8	28	33	28	42	K 30	25	G	G	G	G 22	G	G 24	G 24	32	32	31	28	G 21	G	19	K 27	39	30	57
9	48	B	44	B	61	28	29	32	B	B	B	32	B	B	E B 33	E B 33	B	B	E B 26	24	34	23	30	35
10	64	56	37	31	31	37	37	50	26	G 22	G	G	B	G	B	G	G	G	G	G	E B 13	E B 13	E B 12	E B 13
11	31	32	31	26	28	27	22	24	G	E B 29	E B 31	G	28	G	G 22	G	G	G	G 20	G	30	28	20	23
12	32	37	35	31	30	32	41	42	30	32	35	G	G	B	E B 52	B	B	B	25	E B 23	E B 16	E B 17	K 20	36
13	41	K 20	20	20	26	B	50	36	B	32	G	G	E B 40	G	27	G	G 24	K 24	E B 24	E B 25	E B 17	E B 14	E B 13	E B 13
14	E B 12	59	35	31	31	G	G	G	G 21	G 22	34	G	G	40	37	35	35	E B 25	G 15	G	24	E B 13	E B 13	E B 13
15	E B 14	29	30	28	23	44	B	37	33	43	34	G	33	38	38	34	33	30	30	32	B	E B 23	17	26
16	25	31	38	18	40	41	54	36	B	32	34	34	34	G 24	30	32	34	32	G	G	B	30	32	25
17	29	38	43	51	K 30	B	G	40	33	33	34	32	G	34	37	36	35	32	29	25	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	25	24	E B 14	E B 12	E B 13
19	E B 13	E B 13	16	E B 13	16	B	40	40	B	E B 51	G 26	31	28	G 25	G	G 20	G	29	E B 39	E B 24	20	18	28	30
20	E B 14	36	33	27	43	43	42	32	32	32	34	36	31	26	33	33	G 23	32	24	23	G	E B 13	37	23
21	15	E B 13	15	31	30	B	B	B	B	27	E B 39	E B 40	E B 39	G	G 24	G 24	G	G 20	E B 24	E B 25	E B 18	E B 16	E B 13	18
22	30	41	43	B	32	G 22	G 21	G 18	G 25	G	G 25	28	G	G 27	B	G	G 17	G	G	G 21	G	E B 14	E B 12	16
23	E B 14	E B 14	E B 16	E B 16	E B 20	E B 24	E B 32	E B 57	E B 31	E B 37	G	G	G	35	G	36	G	G	E B 58	E B 65	E B 42	E B 28	E B 23	E B 20
24	E B 19	34	E B 27	42	B	B	B	B	E B 31	G	G 28	G	G	G	G	G 27	31	31	E B 28	E B 24	E B 26	B	B	B
25	40	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 28	B	E B 34	E B 38	E B 20	E B 18	E B 16
26	K 18	K 21	23	24	E B 22	24	G	G	B	E B 40	G	G	G 24	G	G 25	E B 36	E B 34	E B 27	26	G	G	E B 18	E B 14	K 21
27	36	42	48	42	37	K 38	46	44	B	G	35	B	B	B	E B 37	E B 50	E B 55	B	E B 32	E B 31	E B 25	B	E B 24	E B 22
28	E B 18	32	24	23	29	23	30	32	35	35	37	33	32	G 24	G	G	29	32	G E 19	B 24	E B 35	E B 24	E B 14	E B 13
29	E B 13	E B 14	E B 14	E B 15	21	E B 25	E B 28	G 21	G	C	C	C	C	C	C	C	C	C	C	C	C	E B 14	E B 13	E B 12
30	E B 13	E B 13	21	E B 23	34	66	49	G	32	G	28	G	G 22	G	G	G	G 18	G 18	40	32	40	42	66	64
31	34	34	72	50	28	B	42	34	G	33	G	G	G	G 22	G 30	G 25	G 26	G	G	G	G	G	47	32
	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	29	26	27	22	26	25	21	23	26	24	21	21	23	22	23	25	28	28	25	26	28	29
MED	29	34	32	31	30	30	30	32	28	E G 29	E G 29	G	G	G	E G 30	E G 32	E G 29	25	E G 26	E G 24	E G 24	E B 19	19	23
U Q	36	40	38	42	37	42	42	38	32	33	34	32	32	34	37	36	E B 35	30	28	E B 28	30	28	29	34
L Q	E B 14	E B 25	24	E B 23	26	24	G	G	G	G 22	G	G	G	G 26	G 30	G	G	G	G	G	G	E B 14	E B 14	E B 16

OCT. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2011 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	13	12	12	B	24	16	19	B	23	B	24	20	B	B	B	55	40	36	27	26	20	12	12	24
2	B	24	19	46	18	B	17	B	B	B	B	B	B	B	B	B	38	B	26	B	B	B	18	12
3	24	25	19	14	12	12	12	13	12	14	21	35	24	54	57	B	B	26	20	B	B	B	13	12
4	17	13	19	15	B	22	16	18	13	12	13	14	36	51	18	B	B	25	39	19	15	12	13	12
5	12	18	19	16	31	12	14	18	19	B	55	58	19	B	B	B	B	13	B	21	14	12	13	12
6	18	30	17	14	13	14	17	18	13	14	14	B	14	15	18	16	14	13	12	13	12	13	12	14
7	11	12	12	12	11	11	12	14	19	B	19	B	B	B	55	B	55	20	26	33	21	20	B	20
8	12	13	18	17	19	164	14	16	16	18	20	16	15	14	24	19	19	16	19	13	13	13	12	13
9	12	B	19	B	13	13	19	24	B	B	B	28	B	B	33	33	B	B	26	18	12	19	12	13
10	24	18	24	15	14	18	19	14	12	17	13	26	B	24	B	17	17	13	12	13	13	13	12	13
11	12	12	12	12	12	13	12	12	15	29	31	18	19	19	18	17	16	13	14	12	12	12	12	12
12	12	13	12	12	13	13	16	19	21	21	19	20	20	B	52	B	B	B	18	23	16	17	12	12
13	16	15	14	12	12	B	24	18	B	19	22	24	40	18	17	19	16	16	24	25	17	14	13	13
14	12	13	12	13	12	13	13	14	19	18	18	18	18	15	20	16	14	25	12	13	12	13	13	13
15	14	13	12	12	14	26	B	24	17	14	13	15	12	14	13	14	13	13	12	12	B	23	13	12
16	12	12	12	14	20	19	23	23	B	16	16	15	17	18	14	14	13	13	20	17	B	16	13	12
17	12	22	22	24	20	B	16	12	14	15	14	15	17	19	18	20	16	14	13	12	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	16	14	12	14	12	13
19	13	13	12	13	12	B	25	21	B	51	18	19	19	18	18	14	15	14	39	24	12	13	11	14
20	14	13	12	13	26	20	22	14	14	13	14	16	20	14	13	12	15	12	13	13	12	13	12	12
21	12	13	12	16	24	B	B	B	B	24	39	40	39	23	21	19	22	15	24	25	18	16	13	12
22	13	12	16	B	19	16	14	12	15	16	18	19	24	18	B	23	14	14	20	17	14	14	12	14
23	14	14	16	16	20	24	33	57	32	37	24	24	25	23	22	31	29	25	58	65	42	28	23	20
24	19	18	27	34	B	B	B	B	31	21	21	17	23	23	21	18	16	16	28	24	26	B	B	B
25	36	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	28	B	34	38	20	18	16
26	13	14	14	18	22	20	19	20	B	40	26	17	22	22	22	36	34	27	21	17	15	18	14	12
27	12	15	14	15	20	23	16	18	B	25	30	B	B	B	37	50	55	B	32	31	25	B	24	22
28	18	13	13	13	12	13	13	14	13	13	14	14	17	15	19	12	17	12	12	24	35	24	14	13
29	13	14	14	15	12	25	28	14	20	C	C	C	C	C	C	C	C	C	C	C	C	14	13	12
30	13	13	12	23	14	12	16	15	15	14	14	16	14	15	19	14	13	13	13	12	19	13	13	12
31	12	12	25	14	16	B	19	16	15	14	16	25	15	18	23	21	19	18	23	17	16	12	16	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	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	30	30	29	30	30	30
MED	13	13	14	15	17	20	18	18	19	19	19	20	22	22	22	20	19	16	20	18	16	14	13	13
U Q	17	18	19	23	22	B	24	B 24	B	B 46	28	B 38	B	B	B 56	B	B 55	26	27	25	30	20	14	14
L Q	12	13	12	13	12	13	14	14	15	14	14	16	17	16	18	16	15	13	13	13	12	13	12	12

OCT. 2011 fmin (0.1MHz)

IONOSPHERIC DATA STATION SHOWA-ST.

OCT. 2011 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	A	A	194	B	A	E A 248	A	B	A	B	E A 244	A 228	B	B	B	B 256	228	228	228	220	E B 266	Y	A	A
2	B	A	A	B	A	B	A	B	B	B	B	B	B	B	B	B	E B 278	B	E B 264	B	B	B	E B 286	E A 244
3	R	A	A	A	A	E A 284	242	224	224	224	212	226	Y	E B 288	E B 290	B	B	222	216	B	B	B	A	A
4	A	A	A		B	A	A	A	204	200	200	A 252	242	316	E A 244	B	B	244	224	224	262		A	A	A
5	224		A	A	A	A	A	Y 256	196		B	B	B	226	B	B	B	B	A 240	B	A	270	E A 320	206	A
6	A	224	208	A 228	A	A	212	194	224	224	A 220	B	220	232	214	E A 232	226	Q 232	Q 222	226	282		A	A	A
7	A	A	A	A	A	A	262	238	244	B	222	B	B	B	E B 298	B	278	220	228	222	230	E B 292	B	B
8	A	234		A	A	A	A	286	248	216	230	B 234	210	210	210	200	204	208	202	208	208	248		A	A	A
9	E A 322	B	A	B	A	A	A	A	B	B	B	B 250	B	B	238	238	B	B	238	246	246		A	A	A
10	A	A	A	A	A	A	A	A	234	222	204	198	B	242	B	214	210	216	Q 222	198	204	206	218	292
11	A	E A 268	A	A	A 238	A 254	216	206	212	214	206	206	210	202	218	224	216	218	204	Q 200	Q 200	256	A 288	224
12	256	A	A	222	A 228	A	A	A	A	A	228	204	226	B	258	B	B	B	214	208	208	222	248	A
13	A	A	A	A	A	B	A	A	B	A	E A 268	E Y 262	272	E Y 224	E Y 232	232	228	222	222	222	216	226	Q 226	234
14	Q 262	Q 282	A	A	E A 330	E A 282	258	226	222	208	218	224	232	218	222	214	214	214	212	212	Q 202	208	Q 212	Q 230
15	Q 246	296	A	A	A	A	B	A	E A 276	210	208	214	214	214	214	214	218	Q 224	Q 224	Q 246	B	220	Q 228	Q 270
16	A 286	A 354	A	Q 280	A	A	A	200	B	202	228	228	216	206	E A 252	A 224	214	Q 216	226	218	B	232	Q 232	Q 226
17	A 262	A	A	A	E A 282	B	A	258	224	218	236	224	206	212	230	210	210	216	216	216	C	C	C	C
18	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	220	216	202	210	216	224
19	Q 234	256	Q 274	Q 298	E A 290	B	A	A	B	B	226	214	214	222	198	216	226	216	216	216	Q 216	Q 212	Q 212	Q 250
20	Q 256	A	A	A	A	A	A	236	206	210	210	A 220	214	202	212	212	216	216	Q 216	216	Q 206	Q 224	A	A
21	E A 284	E B 258	E A 292	A	A	B	B	B	B	E Y 274	238	232	232	222	204	220	238	234	226	216	216	208	222	228
22	A	A	A	B	A	E A 270	256	230	216	216	232	210	Y	210	B	Y	E Y 244	234	226	216	210	220	220	Q 240
23	Q 240	Q 266	Q 270	292	278	242	256	E B 344	E B 240	228	Y	Y	Y	E A 222	222	226	Y	E Y 260	E B 272	E B 306	E B 238	226	228	244
24	E B 298	256	B	A	B	B	B	B	208	E Y 252	Y 222	222	206	Y	Y	214	208	220	220	220	228	B	B	B
25	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E B 256	B	298	B	B 268	256	266
26	E A 302	E A 346	A	Q 268	282	218	224	220	B	E B 268	Y	212	208	222	200	216	232	224	224	216	216	232	242	Q 266
27	A 244	A	A	224	A	A	A	A	B	Y	E A 248	B	B	B	E B 240	E B 310	E B 294	B	E B 242	222	222	B	254	268
28	Q 268	Q 268	Q 272	A 310	E A 308	250	220	220	206	206	206	208	216	212	222	200	208	218	220	216	228	222	218	234
29	Q 240	Q 266	270	Q 284	262	246	236	A 224	212	C	C	C	C	C	C	C	C	C	C	C	C	202	212	218
30	228	Q 248	Q 254	B	A	A	A	Y	196	196	210	210	218	Y	222	222	210	222	218	218	A	246	Q 252	A
31	226	228	A	A	A	B	A	E A 250	226	A 250	202	Y	200	202	208	224	212	218	212	234	226	Q 222	A	238
	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	15	8	9	9	9	11	16	19	19	23	21	19	19	22	21	22	25	28	27	23	21	20	18
MED	248	261	266	280	U 260	A 246	242	226	214	214	217	217	216	215	216	218	216	221	221	217	219	222	226	238
U Q	E A 284	282	Q 273	295	E A 299	E A 276	258	249	226	E 230	234	228	226	224	E 240	229	232	233	226	224	246	239	250	266
L Q	240	248	231	226	A 250	244	220	220	206	208	208	210	210	210	212	214	210	216	216	216	208	211	217	228

OCT. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2011 fxI (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	88	A	70	R	B	O X 46	B	R	R	B	R	B	B	B	B	B	R	R	R	X 62	R	R	X 41	42
2	X 50	O X 44	A	B	B	O X 48	X 50	X 56	R	B	B	B	B	B	O X 78	O X 77	X 58	X 48	O X 46	X 50	X 50	O X 48	X 38	A
3	R	B	B	O X 47	B	R	R	R	X 66	O X 74	X 74	X 67	O X 67	B	B	O X 67	O X 66	X 62	O X 66	X 60	X 59	56	X 48	42
4	47	59	67	64	X 67	X 69	X 69	O X 75	X 88	X 89	X 89	B	R	O X 76	O X 72	O X 76	B	O X 73	O X 75	X 60	X 56	X 56	O X 42	X 47
5	R	R	58	R	B	R	R	B	R	R	B	O X 69	O X 70	O X 74	O X 76	X 72	X 72	O X 66	X 66	O X 64	X 64	X 64	X 56	X 52
6	57	51	O X 48	R	X 58	X 69	X 75	O X 74	X 87	X 83	X 86	X 86	X 86	O X 84	X 82	O X 80	X 80	O X 72	X 68	68	68	X 62	68	66
7	69	69	X 66	X 70	71	81	92	O X 88	O X 97	B	B	X 82	O X 84	X 91	X 92	O X 86	X 81	X 72	X 69	X 72	X 66	O X 63	X 67	X 66
8	X 69	X 71	66	X 56	R	X 53	R	R	O X 66	X 72	X 77	O X 78	X 80	B	O X 84	O X 78	X 77	O X 73	O X 65	X 59	O X 52	X 52	X 52	X 48
9	X 51	X 51	X 53	X 58	X 71	O X 75	O X 76	X 90	R	O X 83	X 91	X 88	O X 88	X 86	X 86	X 82	X 83	X 80	X 81	X 76	X 75	X 74	X 74	72
10	70	74	79	82	X 87	X 90	X 96	106	X 105	X 105	X 103	X 104	X 104	X 103	O X 99	X 81	X 80	X 80	X 72	X 72	X 70	X 70	O X 45	X 49
11	52	X 54	X 54	X 57	X 70	80	X 87	X 93	X 93	X 90	R	X 93	O X 94	R	R	X 79	X 78	X 78	X 74	X 73	X 69	X 67	X 60	X 50
12	O X 60	X 62	X 70	X 68	O X 74	O X 78	O X 84	O X 87	X 92	X 93	X 96	O X 96	X 96	O X 90	O X 87	O X 83	X 82	X 80	O X 74	X 71	X 70	58	X 58	66
13	66	66	68	X 70	O X 74	X 78	X 88	X 93	X 96	X 98	X 99	X 94	X 92	X 85	O X 81	X 78	X 76	X 72	X 72	X 71	X 69	X 69	X 70	67
14	70	X 72	77	X 82	O X 84	X 95	X 95	X 98	X 97	O X 110	O X 109	O X 105	O X 104	X 95	O X 94	X 94	X 90	X 81	X 80	X 74	69	X 69	69	X 69
15	71	73	79	X 86	O X 94	O X 98	O X 98	O X 100	O X 102	O X 103	B	B	B	B	B	X 82	X 81	X 91	X 70	X 62	X 60	X 63	65	66
16	X 59	57	X 54	X 58	X 63	O X 63	R	A	X 72	X 81	X 76	X 75	X 76	R	X 66	R	X 61	X 66	O X 68	X 67	X 67	O X 66	O X 63	O X 61
17	X 46	X 58	O X 63	67	72	O X 78	O X 82	X 88	X 95	X 92	O X 93	O X 91	O X 83	O X 80	R	X 73	X 72	X 70	X 67	X 64	X 58	X 63	O X 59	X 59
18	40	57	61	X 66	X 57	X 72	X 74	X 80	O X 86	X 90	X 90	X 92	X 92	R	R	O X 85	X 80	X 80	X 72	X 72	X 71	X 66	X 66	O X 62
19	O X 65	X 72	O X 77	69	68	X 76	O X 87	X 93	X 102	X 101	O X 99	O X 93	O X 95	X 89	X 84	O X 78	X 76	X 72	X 67	X 66	X 68	X 68	70	68
20	72	80	81	X 86	O X 97	X 98	X 98	O X 105	X 99	X 102	O X 104	O X 105	A	X 99	X 90	O X 84	R	X 80	O X 78	X 72	X 71	70	X 70	70
21	X 62	X 53	66	X 58	X 56	R	O X 74	R	R	Y	B	B	R	Y	X 82	X 82	X 81	O X 74	O X 67	R	X 57	64	O X 62	63
22	O X 62	O X 59	A	R	65	X 71	O X 66	O X 62	O X 86	B	B	X 81	O X 89	B	B	Y	B	B	B	R	Y	B	R	B
23	B	R	B	B	R	B	R	R	R	B	B	O X 66	O X 68	O X 66	O X 70	O X 67	O X 66	R	B	O X 68	X 59	X 60	X 56	X 54
24	X 63	Y	R	O X 59	X 49	R	R	R	O X 68	O X 77	O X 69	O X 72	R	X 67	Y	R	R	O X 72	X 61	X 64	X 59	X 53	X 46	O X 48
25	R	52	R	B	B	B	Y	A	B	B	B	B	B	Y	B	B	B	B	R	B	B	R	B	R
26	O X 51	O X 61	B	O X 48	X 58	B	72	X 73	X 82	X 85	R	B	X 77	B	X 76	B	B	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	R	B
29	B	B	B	B	B	B	B	B	B	B	B	B	X 71	B	B	B	O X 62	O X 66	O X 63	R	X 63	O X 59	X 41	B
30	O X 46	R	X 54	O X 54	Y	B	O X 62	B	B	R	Y	X 74	A	X 78	X 78	X 80	R	R	R	Y	X 54	81	R	X 47
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	23	21	20	20	19	19	19	17	19	18	15	20	19	15	18	21	20	22	22	22	24	24	24	23
MED	X 62	X 59	66	X 65	X 70	X 76	X 82	X 88	X 92	X 90	X 91	X 87	O X 86	X 85	X 82	O X 80	X 78	X 72	X 68	X 68	X 65	X 64	X 60	X 61
U Q	69	72	74	X 70	O X 74	X 81	X 92	X 96	X 97	X 101	O X 99	O X 94	O X 94	X 91	O X 87	O X 82	X 81	X 80	X 74	X 72	X 69	X 68	X 68	66
L Q	X 51	X 54	X 56	X 58	X 58	O X 69	X 72	O X 74	X 82	X 83	X 77	X 74	O X 76	O X 76	O X 76	O X 76	X 69	X 70	O X 66	X 62	X 58	X 58	X 47	X 48

NOV. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2011 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

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	39	A	29	A	B	R 40	B	R	R	B	R	B	B	B	B	B	R	R	R	J R 56	R	R	35	F 31
2	J R 44	R 38	A	B	B	R 42	44	J R 50	R	B	B	B	B	B	R 72	R 71	J R 52	42	R 40	44	44	42	32	A
3	R	B	B	R 41	B	R	R	R	60	68	68	R 61	R 61	B	B	61	60	56	60	54	53	F 45	42	F 30
4	F 38	F 48	F 56	F 54	J R 61	63	63	R 69	82	J R 83	J R 83	B	D R 66	R 70	R 66	R 70	B	R 67	69	J R 54	J R 50	50	36	41
5	R	A	F 48	R	B	R	R	B	R	R	B	63	R 64	68	70	66	66	60	60	58	58	58	50	46
6	31	F 40	R 42	R	52	63	69	68	J R 81	J R 77	J R 80	R 80	X R 86	78	J R 76	U R 74	J R 74	66	62	F 58	F 58	56	F 57	F 56
7	F 58	F 58	57	64	F 59	F 71	82	R 82	U R 91	B	B	J R 76	R 78	J R 85	J R 86	U R 80	J R 75	R 66	63	66	60	57	61	60
8	63	65	F 53	J R 50	R	47	R	R	R 60	66	71	R 72	J R 74	B	78	U R 72	J R 71	R 67	59	53	46	46	46	42
9	45	45	47	52	65	69	R 70	J R 84	R	R 77	J R 85	82	R 82	80	80	J R 76	77	74	75	70	69	69	68	F 63
10	64	F 64	F 69	F 72	81	84	90	F 96	99	99	97	J R 98	U R 98	J R 97	R 93	75	J R 74	J R 74	66	66	64	64	39	43
11	F 42	48	48	51	64	F 68	81	87	J R 87	84	R	J R 87	U R 88	R	R	J R 73	J R 72	J R 72	68	67	63	J R 61	54	44
12	54	56	64	62	R 68	72	78	80	86	J R 87	90	U R 90	J R 90	R 84	81	77	76	R 74	68	65	J R 64	F 47	52	F 56
13	F 56	F 56	F 58	64	68	72	J R 82	J R 87	J R 90	92	J R 93	88	J R 86	78	R 75	J R 72	J R 70	66	66	65	63	J R 63	J S 65	F 56
14	F 59	66	F 67	76	78	89	89	92	J R 91	U R 104	103	99	98	89	88	J R 88	J R 84	75	J R 74	68	F 58	63	F 58	63
15	F 64	F 64	F 70	80	88	U S 92	92	94	96	U R 97	B	B	B	B	B	J R 76	J R 75	J R 85	J R 64	56	54	57	F 56	F 56
16	53	F 47	48	52	57	R 57	R	A	66	J R 75	J R 70	69	J R 70	R	60	R	J R 55	60	62	61	61	60	57	55
17	40	52	R 57	F 56	F 62	72	76	J R 82	89	J R 86	87	U R 85	U R 77	U R 74	D R 60	67	66	J R 64	61	58	J R 53	57	R 53	53
18	F 28	F 42	F 51	60	J R 51	66	68	J R 74	80	J R 84	J R 84	J R 85	86	R	D R 81	R 79	J R 74	J R 74	66	66	65	60	60	56
19	59	66	71	F 58	F 58	69	J R 81	J R 87	102	J R 95	93	U R 87	R 89	J R 83	78	J R 72	J R 70	J R 66	61	60	J R 62	J R 62	F 59	F 58
20	F 64	F 68	F 70	80	R 91	J R 92	J R 92	99	93	J R 96	R 98	U R 99	A	J R 93	J R 84	R 78	R	74	R 72	J R 66	J R 65	F 58	64	F 58
21	56	47	F 56	J R 52	50	R	R 68	R	R	Y	B	B	R	Y	J R 76	J R 76	J R 75	R 68	61	R	J R 51	F 54	56	F 53
22	56	53	A	R	F 58	65	R 60	56	R 80	B	B	J R 75	R 83	B	B	Y	B	B	B	R	Y	B	R	B
23	B	R	B	B	R	B	R	R	R	B	B	R 60	R 62	U R 60	U R 64	U R 61	R 60	R	B	R 62	J R 53	54	J R 50	48
24	57	Y	R	R 53	R 43	R	R	R	R 62	U R 71	63	R 66	R	R 61	Y	R	R	R 66	J R 55	58	J R 53	J R 47	39	42
25	A	F 41	R	B	B	B	Y	A	B	B	B	B	B	Y	B	B	B	B	R	B	B	R	B	R
26	R 45	U R 55	B	R 42	52	B	F 62	67	J R 76	79	R	B	71	B	J R 70	B	B	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	Y	R	B
29	B	B	B	B	B	B	B	B	B	B	B	B	65	B	B	B	R 56	R 60	R 57	R	57	53	J R 35	B
30	40	R	J R 48	U R 48	Y	B	56	B	B	R	Y	R 68	A	J R 72	J R 72	J R 74	R	R	R	Y	U R 48	A	R	41
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	23	21	20	20	19	19	19	17	19	18	15	20	20	15	20	21	20	22	22	22	24	23	24	23
MED	54	53	56	55	61	69	76	82	86	R 84	85	R 81	R 81	R 78	R 76	R 74	J R 72	R 66	62	60	58	57	54	53
U Q	59	64	F 66	64	68	72	82	90	91	R 95	93	R 88	R 87	J R 85	R 81	R 76	J R 75	R 74	68	66	63	61	58	F 56
L Q	40	46	48	R 52	52	R 63	63	68	R 76	R 77	71	R 68	R 68	R 70	R 70	70	R 63	64	60	56	R 53	50	40	42

NOV. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2011 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	42	70	32	42	B	40	B	24	28	B	39	B	B	B	B	B	29	28	39	42	49	37	32	31
2	32	38	69	B	B	32	32	37	36	B	B	B	B	B	E B 59	E B 55	33	32	32	38	35	35	33	K 35
3	34	B	B	30	B	34	39	42	33	28	G	26	G	B	B	E B 56	G 20	G 18	G	23	23	24	E B 17	E B 18
4	19	25	26	36	G	G	G	34	G	G	G	B	E B 59	E B 50	E B 56	E B 34	B	E B 57	E B 33	G	E B 22	G	33	K 34
5	33	32	54	42	B	G	37	B	48	39	B	G	G 28	G	E B 56	G	G 27	E B 34	E B 40	25	23	G	17	34
6	34	33	E B 31	K 31	32	G	32	32	33	G	33	36	G	G	G	32	G	G	G	26	G	20	17	E B 15
7	E B 14	24	34	34	30	31	33	G	E B 57	B	B	G	G	33	G	35	G	E B 34	G	G	G	19	E B 13	E B 14
8	E B 14	E B 14	24	42	37	38	42	39	G	G 25	G	G	33	B	G 26	G	G	G	G 22	35	35	31	37	31
9	28	26	K 32	31	30	28	56	34	G 24	41	39	36	36	44	34	33	44	42	37	34	24	24	16	E B 13
10	E B 14	E B 15	16	30	G	G	31	34	36	36	37	36	44	45	42	37	33	36	32	25	28	24	K 36	25
11	31	43	40	42	33	30	32	32	34	G	G	G	38	37	34	34	35	32	G	27	24	24	G	E B 14
12	E B 14	E B 14	K 15	E B 24	E B 36	28	31	G	33	33	38	38	37	39	38	G	32	32	32	27	E B 63	E B 20	E B 23	E B 16
13	16	14	29	26	29	28	30	40	34	38	35	36	G 28	G 26	G 27	36	37	G 25	33	31	28	34	24	36
14	24	28	G	G	26	G	32	32	34	34	38	44	42	72	36	37	47	42	34	31	31	25	24	16
15	21	E B 15	G	25	29	33	34	33	33	G 27	B	B	B	B	B	E B 56	E B 56	G 23	G	34	33	28	28	32
16	34	43	41	40	36	48	38	62	G 24	G	37	41	56	66	37	40	34	34	31	35	31	40	40	16
17	27	27	33	39	27	33	36	33	G	31	36	G 34	G	G	36	76	65	G	35	49	30	28	G	K 16
18	27	28	29	32	37	40	38	G 20	G 27	G	G 28	G	G	39	G 28	39	32	G	31	24	27	G	25	17
19	29	31	40	32	G 20	28	30	35	41	32	35	25	G	G	G 25	28	33	36	36	28	22	25	22	17
20	15	E B 14	17	24	30	32	28	35	33	38	62	57	92	48	37	39	39	36	32	38	39	24	32	23
21	26	23	G	G 23	34	44	G 28	49	41	G 25	B	B	G	G 30	G 37	34	32	43	G 20	E B 29	42	44	38	29
22	33	44	64	41	40	28	G	32	32	B	B	33	G 28	B	B	G 30	B	B	B	G	G 30	B	32	B
23	B	33	B	B	34	B	26	27	37	B	B	G 28	G	G	G 28	39	34	33	B	26	26	23	24	31
24	G	G	39	40	40	36	33	G	G 24	G 23	36	36	36	G 26	36	G 28	E B 33	E B 31	32	28	27	32	K 38	K 32
25	43	41	38	B	B	B	G 25	55	B	B	B	B	B	G	B	B	B	B	E B 32	B	B	E B 29	B	33
26	G	E B 29	B	K 37	E B 36	B	27	28	G 19	35	40	B	40	B	41	B	B	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	E B 25	B
29	B	B	B	B	B	B	B	B	B	B	B	B	33	B	B	B	G	E B 31	E B 32	E B 28	E B 26	40	52	B
30	32	32	49	E B 32	G 31	B	G	B	B	G 24	G	G 28	66	34	33	32	31	G 25	G	G	36	34	39	39
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	26	24	24	22	23	26	25	25	21	19	20	24	20	22	24	24	25	25	26	26	27	27	25
MED	27	28	32	32	G	31	32	33	33	28	36	G	E G 33	E G 34	36	34	32	32	32	28	G	24	25	25
U Q	33	33	40	40	36	36	36	38	36	36	38	36	41	44	38	39	36	36	34	34	35	34	36	32
L Q	E B 15	E B 15	20	28	30	G 28	G	G 28	G	G	G	34	G	G	G 33	G	G	G	G	G 25	26	G 20	17	E B 16

NOV. 2011 ftEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2011 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	18	16	23	B	14	B	20	20	B	24	B	B	B	B	B	19	13	12	16	15	13	13	13
2	22	12	38	B	B	15	22	21	22	B	B	B	B	B	59	55	12	12	12	12	14	12	13	14
3	21	B	B	20	B	22	24	20	17	17	19	12	26	B	B	56	12	14	18	13	15	12	17	18
4	12	12	12	13	25	19	19	22	18	20	22	B	59	50	56	34	B	57	33	16	22	14	13	14
5	22	21	18	29	B	26	19	B	20	20	B	20	18	19	56	23	20	34	40	16	15	14	12	12
6	12	12	31	19	16	17	14	18	15	19	20	16	19	24	17	14	14	13	14	12	13	11	12	15
7	14	11	13	13	12	15	12	22	58	B	B	27	26	22	13	18	22	34	22	19	14	11	13	14
8	14	14	12	19	17	14	18	14	14	13	17	20	20	B	20	20	17	22	14	12	14	12	13	12
9	12	12	14	12	12	13	12	13	17	16	17	15	14	20	15	15	15	19	15	12	12	12	13	13
10	14	15	12	12	13	14	12	13	14	14	14	15	19	20	23	19	16	14	14	12	13	14	13	12
11	12	18	17	16	15	13	13	12	14	17	19	23	19	14	14	20	23	19	15	16	12	13	11	14
12	14	14	12	24	36	14	12	12	14	15	14	20	20	21	18	15	14	15	13	12	63	20	23	16
13	13	11	12	13	13	13	12	15	15	12	16	13	16	15	16	16	15	13	14	13	13	12	12	12
14	11	13	12	13	12	14	14	12	14	17	19	16	18	14	19	15	13	13	14	11	12	12	12	11
15	13	15	12	13	12	13	13	14	14	16	B	B	B	B	B	56	56	19	20	13	14	19	12	12
16	12	14	12	14	13	13	16	12	19	15	19	19	17	15	18	20	17	14	15	13	13	12	12	14
17	12	12	13	13	13	12	13	13	13	12	16	30	18	14	19	18	13	14	19	12	12	12	12	12
18	12	12	11	20	18	15	13	13	16	16	18	13	14	24	21	15	13	20	13	12	13	12	11	12
19	12	13	12	14	13	12	16	12	13	14	16	15	18	15	17	13	15	13	14	13	12	12	11	12
20	12	14	12	12	12	12	12	13	12	13	18	21	19	18	15	15	13	13	20	18	12	12	11	12
21	13	13	13	19	28	24	20	28	20	23	B	B	28	26	32	20	15	17	14	29	16	20	15	13
22	13	15	18	23	12	12	18	24	12	B	B	16	19	B	B	28	B	B	B	29	28	B	23	B
23	B	30	B	B	27	B	13	14	24	B	B	18	14	18	14	13	13	26	B	13	12	15	12	11
24	13	23	16	18	14	23	13	14	12	14	15	24	14	16	19	16	33	31	16	12	14	12	13	15
25	15	13	33	B	B	B	20	16	B	B	B	B	B	22	B	B	B	B	32	B	B	29	B	15
26	13	29	B	30	36	B	13	13	13	14	16	B	16	B	16	B	B	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	26	25	B
29	B	B	B	B	B	B	B	B	B	B	B	B	25	B	B	B	21	31	32	28	26	14	16	B
30	20	21	16	32	27	B	30	B	B	18	28	20	20	14	14	18	18	17	13	13	14	24	14	14
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	13	14	15	19	18	15	15	14	16	17	20	20	19	22	20	20	17	19	16	13	14	13	13	14
U Q	20	21	B 33	B 30	B	B 26	20	B 22	B 22	B	B	B	B 28	B	B	B 56	B 33	B 34	B 32	19	22	20	16	B 15
L Q	12	12	12	13	13	13	13	13	14	14	17	16	18	16	16	15	14	14	14	12	13	12	12	12

NOV. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

NOV. 2011 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	198	A	A	A	B	A	B	A	A	B	A	B	B	B	B	B	A	A	A	A	A	A	266	240
2	A	A	A	B	B	218	A	A	A	B	B	B	B	B	B	B	220	A 242	A	254	A 252	E A 264	A	A
3	A	B	B	A	B	A	A	A	216	220	Y	202	Y	B	B	B	202	204	234	Q 218	Q 218	238	246	270
4	E A 302	Q 266	Q 294	208	Y	Y	Y	E A 240	206	206	218	B	B	B	B	216	B	E B 310	236	228	234	252	340	284
5	A	A	A	A	B	A	A	B	A	A	B	204	Y	Y	B	E Y 232	226	230	260	232	240	240	234	A
6		E A 302	B	A	A	A 242	210	210	210	210	224	210	Y	Y	222	206	194	206	222	200	Q 236	216	Q 232	Q 234
7	Q 246	Q 258	A	A	Q 262	224	226	226	B	B	B	Y	Y	206	210	240	206	222	222	230	232	Q 232	220	Q 238
8	Q 260	Q 266	Q 290	A	A	A	A	A	212	A 212	204	Y	220	B	220	Y	208	232	210	228	A	228	234	A
9	258	284	E A 318	E A 328	A 244	254	238	A 240	224	A	224	224	212	234	202	206	226	200	230	222	Q 210	Q 218	Q 226	Q 220
10	Q 248	Q 260	Q 264	204	Q 252	Q 234	220	196	202	220	210	202	A	222	226	218	218	200	A 212	224	224	Q 228	228	258
11	246	A	E A 372	A	E A 300	256	228	220	216	220	Y	Y	Y	Y	202	212	212	224	214	222	230	238	A 236	Q 258
12	Q 254	Q 272	Q 274	E B 282	B	242	236	216	216	208	E A 232	202	212	A	210	218	214	222	214	220	B	232	238	Q 238
13	Q 242	Q 260	Q 260	Q 284	250	232	232	226	208	216	216	198	224	222	196	208	208	214	204	224	224	228	234	Q 220
14	Q 246	Q 262	Q 270	Q 264	264	242	216	224	216	216	216	A	194	220	220	220	198	A 208	202	222	Q 222	228	Q 234	Q 234
15	Q 246	Q 266	Q 276	Q 264	254	238	230	216	216	206	B	B	B	B	B	B	E B 304	226	218	218	240	240	Q 232	Q 242
16	276	A	196	A	254	242	A	A	Y	Y	E A 256	A	A	A	204	200	198	A 218	228	234	238	240	230	256
17	278	Q 294	E A 278	E A 276	252	258	230	216	216	216	210	Y	Y	Y	Y	196	A	218	E A 240	254	232	234	238	Q 238
18	Q 306	Q 308	218	314	A	A	254	Y	E A 250	Y	Y	Y	250	Y	Y	202	208	218	218	222	224	226	240	230
19	256	256	276	276	E A 244	E A 242	230	208	208	210	204	216	Y	Y	204	212	200	214	212	214	232	Q 232	Q 232	Q 232
20	Q 248	Q 254	Q 236	210	238	244	208	228	210	220	A	E A 246	A	E A 302	216	258	196	214	208	222	224	224	234	228
21	256	Q 246	Q 288	208	E A 280	268	Y	A	A	Y	B	B	A	Y	Y	Y	Y	E A 250	216	224	A	236	A 234	E A 266
22	220	A	A	A	E A 252	E A 240	Y	192	206	B	B	A	Y	B	B	Y	B	B	B	A	Y	B	A	B
23	B	A	B	B	A	B	A	A	A	B	B	194	Y	196	Y	196	196	A	B	E A 238	230	228	230	A
24	256	Y	A	188	A	A	A	222	208	194	E A 226	E A 244	E A 234	Y	Y	206	214	214	214	222	232	198	230	A
25	A	A 228	A	B	B	B	Y	A	B	B	B	B	B	Y	B	B	B	B	220	B	B	228	B	E A 242
26	242	E B 276	B	A	B	B	194	198	198	202	E A 236	B	200	B	A	B	B	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	E Y 250	250	B
29	B	B	B	B	B	B	B	B	B	B	B	B	A 236	B	B	B	230	232	236	224	240	A	A	B
30	A	A	A	274	Y	B	Y	B	B	A	Y	Y	A	208	226	224	A	A	A	Y	E A 258	A	A	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	20	17	15	14	13	16	14	16	18	15	13	11	9	8	13	18	20	22	22	23	21	24	23	19
MED	250	Q 263	Q 270	U 239	252	242	229	217	210	212	214	203	216	218	210	211	208	217	218	223	232	230	234	238
U Q	259	280	290	282	263	249	232	226	216	220	E A 229	E A 224	A 235	228	221	220	219	230	230	230	239	239	238	258
L Q	246	Q 257	260	208	247	236	216	209	208	206	210	202	206	207	203	206	199	214	212	222	224	228	230	Q 232

NOV. 2011 h′F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2011 fxI (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	X 55	R	A	R	R	R	R	R	R	R	R	O X 71	O X 72	R	R	X 69	X 68	B	62	X 60	X 64	X 62	X 58	O X 49
2	X 56	X 57	O X 61	X 61	R	X 64	O X 71	X 81	O X 84	O X 86	O X 88	O X 88	O X 88	O X 86	R	R	O X 73	O X 66	X 65	O X 66	O X 61	R	X 56	O X 48
3	R	R	68	72	75	59	R	Y	X 79	O X 80	O X 84	O X 86	B	B	B	O X 85	B	X 80	O X 63	X 63	X 55	B	O X 52	O X 55
4	B	52	A	B	B	O X 56	X 63	O X 66	X 74	X 80	X 78	O X 79	Y	B	B	B	O X 69	O X 65	X 65	X 65	O X 62	X 62	O X 62	O X 61
5	X 64	X 70	X 72	X 72	75	X 70	X 76	X 81	X 93	X 94	B	O X 88	O X 83	X 81	R	O X 74	O X 73	O X 70	O X 70	O X 70	X 71	X 71	X 66	X 66
6	X 58	70	68	70	78	O X 85	X 95	X 99	X 104	X 105	R	X 97	X 103	X 91	X 86	X 81	X 73	X 70	X 72	X 70	X 70	X 68	X 62	X 59
7	X 58	66	C	X 78	X 87	X 78	R	X 82	X 83	X 90	A	O X 86	O X 92	O X 89	R	X 82	O X 74	O X 71	O X 67	O X 68	O X 67	X 69	O X 63	X 62
8	X 64	X 65	O X 70	X 71	71	X 83	O X 96	X 98	R	O X 102	R	O X 100	R	O X 94	O X 92	X 84	76	X 73	X 72	X 66	X 66	X 63	X 55	O X 61
9	66	64	X 70	X 73	X 70	X 68	O X 85	R	O X 98	O X 98	O X 98	R	O X 100	R	O X 91	R	R	B	X 72	B	O X 68	O X 66	X 64	O X 60
10	O X 60	O X 60	O X 63	B	X 57	R	O X 66	O X 73	X 82	X 82	R	B	B	B	R	O X 66	B	B	B	X 60	X 68	O X 63	O X 63	O X 61
11	X 57	R	R	O X 51	R	R	O X 48	X 59	O X 65	R	R	O X 71	Y	R	O X 72	O X 68	R	B	B	O X 52	X 52	O X 51	O X 50	X 49
12	O X 49	O X 50	Y	B	R	R	Y	Y	B	X 83	B	B	B	B	B	B	B	B	B	B	B	X 48	O X 47	O X 47
13	X 57	X 57	R	R	B	R	X 64	A	X 73	X 82	X 91	O X 92	X 101	B	O X 86	X 82	B	B	B	X 68	O X 68	O X 64	X 62	X 57
14	X 56	X 56	X 53	X 55	O X 46	O X 48	R	Y	B	O X 76	X 80	O X 86	X 80	X 77	B	X 77	O X 73	O X 66	B	R	B	X 60	X 59	X 57
15	X 57	X 58	O X 63	Y	68	X 68	X 84	Y	B	X 101	X 101	X 102	X 94	O X 87	Y	X 75	X 74	O X 74	X 65	X 65	X 65	X 65	65	65
16	X 63	X 68	X 70	X 76	X 71	X 72	X 86	R	O X 87	X 90	R	R	B	B	Y	X 72	O X 73	B	R	X 68	X 65	S	O X 67	X 66
17	X 66	O X 70	X 77	R	X 89	X 92	X 90	X 91	O X 102	A	R	R	R	O X 98	O X 88	O X 73	O X 72	O X 72	O X 72	O X 68	X 68	A	64	O X 63
18	O X 58	X 67	X 64	O X 52	X 70	X 82	O X 98	O X 99	X 103	X 103	O X 100	O X 101	O X 102	R	O X 90	X 82	X 76	O X 74	X 72	O X 71	70	X 68	71	O X 64
19	65	67	X 72	A	68	X 71	X 90	X 100	102	X 106	O X 106	X 102	O X 102	X 90	X 83	X 79	X 71	X 74	X 68	X 70	X 67	X 57	X 47	X 48
20	R	O X 65	X 63	80	R	R	O X 67	X 72	X 80	O X 86	X 91	X 93	O X 90	O X 81	O X 76	X 71	X 70	X 60	X 59	X 59	X 58	X 50	X 46	X 55
21	O X 48	56	X 58	X 58	O X 58	A	A	Y	R	O X 72	O X 73	O X 74	X 77	R	X 73	X 72	O X 71	X 76	X 66	X 62	X 66	X 51	X 46	X 50
22	X 43	58	A	R	X 56	O X 64	O X 64	X 63	X 68	X 74	X 78	O X 72	O X 74	R	O X 64	R	O X 64	X 58	O X 63	X 62	O X 64	X 58	X 56	X 51
23	O X 53	X 56	O X 61	X 62	R	R	R	R	X 71	R	77	X 77	O X 77	R	O X 72	O X 70	O X 67	O X 64	R	X 62	X 62	X 62	X 62	O X 62
24	X 63	O X 64	R	X 80	X 83	X 94	X 94	X 96	O X 99	R	X 99	R	R	O X 98	R	Y	O X 77	Y	O X 70	O X 68	O X 66	O X 64	X 68	O X 62
25	X 52	X 58	O X 60	X 69	O X 63	R	R	A	X 71	X 79	O X 87	O X 86	O X 86	X 80	X 76	R	O X 70	X 68	X 66	X 66	X 65	A	X 66	X 64
26	O X 64	O X 64	O X 71	X 81	O X 86	X 91	R	O X 92	R	O X 94	O X 96	O X 98	R	Y	R	R	R	O X 72	O X 70	O X 69	O X 69	R	O X 64	A
27	X 64	O X 63	X 70	82	82	86	X 95	X 96	X 106	O X 107	X 101	X 98	O X 93	O X 80	X 80	X 70	X 72	X 75	O X 72	X 67	X 64	X 64	X 68	O X 68
28	O X 63	O X 69	O X 74	X 80	X 93	X 101	O X 100	X 98	X 103	R	O X 110	O X 100	O X 99	O X 87	O X 85	X 82	X 81	X 79	X 79	O X 75	X 66	X 68	X 73	X 66
29	X 49	68	X 64	69	X 68	70	O X 81	81	O X 81	79	X 80	X 81	X 82	X 90	B	B	O X 74	B	X 69	X 69	O X 62	X 59	X 59	71
30	72	A	R	51	O X 57	R	O X 76	R	R	74	O X 77	O X 78	O X 70	O X 72	Y	O X 66	A	O X 66	O X 66	X 64	X 57	X 56	X 50	O X 51
31	O X 51	57	X 56	69	R	R	R	O X 66	O X 75	O X 81	O X 75	O X 71	O X 72	R	R	O X 69	X 68	X 66	X 70	X 71	X 68	X 58	O X 53	50
	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	27	22	22	22	20	21	19	23	25	21	25	21	16	15	22	23	22	24	28	29	25	31	30
MED	X 58	X 64	X 66	X 70	X 70	X 72	O X 84	X 82	X 83	X 86	O X 88	O X 86	O X 88	O X 87	O X 83	X 74	O X 73	X 70	X 68	X 66	X 66	X 62	X 62	X 60
U Q	X 64	X 67	X 70	X 78	X 82	X 86	X 94	X 98	X 102	X 100	X 100	O X 98	O X 100	O X 90	O X 88	X 82	X 74	X 74	X 72	X 69	X 68	X 66	X 65	X 64
L Q	X 54	X 57	X 61	X 61	O X 63	X 66	O X 66	X 72	X 74	X 80	X 78	O X 78	O X 77	X 80	O X 73	O X 70	X 70	X 66	X 65	X 62	X 62	X 58	X 53	X 51

DEC. 2011 fxI (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2011 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

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	49	R	A	R	R	R	R	R	R	R	R	65	R 67	R	R	J R 63	62	B	J R 57	J R 54	58	56	52	43
2	50	J R 51	55	55	R	58	65	75	R 78	R 80	U R 82	R 82	U R 82	U R 80	R	R	U R 67	R 60	59	60	U R 55	R	50	R 42
3	R	R	F 58	F 62	F 65	F 49	R	Y	J R 73	U R 74	R 78	R 80	B	B	B	79	B	J R 74	57	57	49	B	U R 46	49
4	B	F 42	A	B	B	R 50	57	R 60	68	J R 74	J R 72	U R 73	Y	B	B	B	R 63	59	59	59	R 56	56	56	55
5	58	64	66	66	F 66	64	J R 70	J R 75	J R 87	J R 88	B	R 82	R 77	J R 75	R	68	67	64	64	64	65	65	J R 60	J R 60
6	52	F 54	F 58	F 64	F 68	79	J R 89	J R 93	J R 98	99	R	J R 91	97	J R 85	80	75	J R 67	J R 64	66	64	J R 64	62	56	53
7	52	F 56	C	J R 72	J R 81	J R 72	R	J R 76	J R 77	J R 84	A	R 80	R 86	R 83	R	J R 76	R 68	U R 65	R 61	R 62	61	63	S 57	56
8	58	J R 59	64	65	F 59	J R 77	R 90	J R 92	D R 81	R 96	D R 81	R 94	D R 81	R 88	R 86	78	J R 70	67	66	60	60	57	J R 49	55
9	F 57	R 58	64	67	64	J R 62	79	D R 68	92	92	92	R	94	R	U R 85	R	R	B	J R 66	B	R 62	R 60	58	R 54
10	R 54	R 54	R 57	B	J R 51	R	R 60	67	J R 76	R 76	R	B	B	B	R	R 60	B	B	B	J R 54	62	57	R 57	55
11	J R 51	R	R	R 45	R	R	R 42	J R 53	R 59	R	R	U R 65	Y	D R 60	66	62	R	B	B	U R 46	46	R 45	44	43
12	R 43	44	Y	B	R	R	Y	Y	B	J R 77	B	B	B	B	B	B	B	B	B	B	B	42	41	41
13	51	J R 51	R	R	B	R	J R 58	R	67	J R 76	J R 85	U R 86	J R 95	B	U R 80	J R 76	B	B	B	62	R 62	R 58	56	51
14	50	J R 50	47	49	R 40	U R 42	R	Y	B	70	J R 74	U R 80	J R 74	J R 71	B	J R 71	67	R 60	B	R	B	54	53	51
15	J R 51	52	S 57	Y	F 58	62	78	Y	B	95	J R 95	J R 96	J R 88	81	Y	69	68	68	R 59	J R 59	J R 59	59	F 56	F 56
16	57	J R 62	64	J R 70	J R 65	66	80	R	R 81	J R 84	R	D R 61	B	B	Y	66	U R 67	B	R	62	59	S	R 61	J R 60
17	J R 60	64	71	R	J R 83	J R 86	J R 84	J R 85	R 96	A	D R 81	D R 78	R	R 92	R 82	R 67	U R 66	R 66	66	62	62	A	J R 58	56
18	52	J R 61	58	R 46	J R 64	J R 76	92	R 93	97	R 97	R 94	R 95	R 96	R	R 84	76	J R 70	R 68	66	R 65	F 60	62	F 60	S 58
19	F 55	F 56	66	A	F 58	65	J R 84	94	F 92	100	R 100	96	96	J R 85	77	73	65	68	62	64	61	51	41	J R 42
20	R	S 59	57	R	R	R	R 61	66	J R 74	80	J R 85	J R 87	U R 84	U R 75	R 70	65	65	J R 54	J R 53	J R 53	J R 52	44	40	J R 49
21	42	F 47	52	52	R 52	A	A 54	Y	R	66	R 67	R 68	71	R	67	R 66	R 65	J R 70	60	56	60	45	40	44
22	J R 37	F 48	A	R	50	R 58	R 58	57	62	68	J R 72	U R 66	U R 68	R	R 58	R	R 58	J R 52	R 57	56	58	J R 52	J R 50	45
23	47	50	55	J R 56	R	R	R	R	65	R	F 66	J R 71	R 71	R	66	R 64	61	58	R	56	56	56	56	56
24	57	S 58	D R 44	J R 74	J R 77	88	J R 88	J R 90	R 93	D R 80	J R 93	R	R	R 92	R	Y	U R 71	Y	R 64	R 62	60	58	J R 62	56
25	46	52	54	63	57	R	R	A	J R 65	J R 73	R 81	80	80	J R 74	J R 70	R	64	62	60	60	59	A	J R 60	58
26	58	S 58	R 65	J R 75	80	J R 85	R	U R 86	R	J R 88	90	R 92	R	Y	R	R	R	U R 66	U R 64	63	63	D R 42	58	A
27	58	57	64	F 71	F 71	R 81	89	J R 90	100	101	95	R 92	R 87	U R 74	J R 74	J R 64	66	J R 69	66	61	58	58	J R 62	R 62
28	R 57	R 63	68	J R 74	87	95	R 94	92	J R 97	R	R 104	R 94	R 93	81	R 79	76	J R 75	J R 73	J R 73	R 69	60	J R 62	67	J R 60
29	43	F 55	58	F 59	62	F 60	R 75	F 68	U R 75	66	J R 74	J R 75	J R 76	J R 84	B	B	R 68	B	63	63	56	53	J R 53	F 52
30	F 57	A	R	F 42	R 51	R	R 70	R	R	F 65	R 71	U R 72	R 64	R 66	Y	R 60	A	R 60	R 60	58	J R 51	50	J R 44	R 45
31	45	F 41	J R 50	F 52	R	R	R	R 60	69	R 75	R 69	65	R 66	R	R	R 63	J R 62	60	64	65	J R 62	J R 52	47	F 39
	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	27	23	21	22	20	22	20	24	26	23	27	22	17	15	22	23	22	24	28	29	26	31	30
MED	52	55	58	63	64	66	R 76	R 78	R 78	R 80	R 81	R 81	R 82	81	R 77	68	R 67	R 64	62	60	60	56	56	54
U Q	57	R 59	64	J R 70	71	80	R 88	R 91	R 92	92	R 93	R 92	93	R 85	R 82	76	R 68	J R 68	66	63	62	59	J R 58	56
L Q	48	F 50	55	52	R 57	59	R 60	66	68	74	R 72	R 71	R 71	R 74	67	R 64	64	60	R 59	56	56	51	47	45

DEC. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC.2011 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	37	42	56	40	36	G	44	49	50	50	50	G	G 26	G	33	G	G	B	31	E B 29	34	32	G	G 19
2	G	G	G	32	38	G	G	32	34	33	36	32	G	G	36	30	G	G 24	32	37	31	27	25	32
3	38	45	35	34	32	32	33	G	32	32	33	31	B	B	B	G	B	G	33	32	G 26	B	32	37
4	B	41	58	B	B	33	36	34	G	G	G	G	G	B	B	B	G	30	G	G	E B 30	G	G	18
5	G	20	34	31	32	38	34	G	G	G	B	E B 56	36	43	42	58	39	42	42	28	G	34	33	29
6	30	26	22	22	25	26	29	32	34	36	34	37	38	36	41	36	32	36	43	32	26	39	G	G
7	21	29	C	40	42	32	33	32	34	G	73	G	41	46	43	56	42	35	30	E B 30	30	43	G	24
8	G	24	E B 26	32	32	38	38	32	35	36	38	G	G	38	35	G 27	39	42	35	32	32	29	39	20
9	29	26	27	27	27	29	31	31	G 26	G	G 26	40	79	66	42	40	38	B	G 22	B	E B 29	E B 30	32	30
10	21	E B 25	E B 40	B	E B 30	37	32	40	32	42	32	B	B	B	31	41	B	B	B	29	27	G	E B 36	22
11	39	42	34	32	32	41	32	34	G	32	32	E B 56	G	38	40	37	30	B	B	28	27	E B 34	33	27
12	23	24	G	B	G	G	G 23	G	B	36	B	B	B	B	B	B	B	B	B	B	B	32	25	G
13	32	36	42	G	B	43	E B 57	36	G 25	32	G 28	G	G	B	E B 54	36	B	B	B	E B 39	E B 31	E B 36	29	G
14	36	32	34	37	32	34	41	Y	B	E B 35	G 26	E B 55	G 26	G 33	B	G 28	35	35	B	33	B	22	27	E B 20
15	E B 21	G	28	G	27	31	30	G 22	B	32	32	34	32	39	G	36	34	E B 34	G	28	G 20	G	36	58
16	32	25	28	31	92	70	57	40	32	38	36	G 26	B	B	G	36	32	B	32	51	61	S	46	40
17	51	71	71	E B 27	35	35	50	47	61	61	42	42	48	89	57	32	36	32	30	35	37	67	33	22
18	32	32	41	28	27	31	33	41	41	41	33	30	37	36	G	G 28	G 22	G	G 25	30	26	36	36	33
19	34	27	31	71	41	32	36	34	36	36	G 23	32	36	33	38	38	35	32	38	G	27	31	31	22
20	27	E B 25	24	36	51	37	40	34	G 24	G 24	35	37	33	31	G	G	G	28	34	30	G	24	40	34
21	41	39	39	42	37	70	61	G 28	G 32	37	37	G 28	38	38	33	34	35	G 25	35	31	28	43	42	45
22	38	34	58	34	35	33	34	42	35	G 24	35	G 22	33	38	G	34	33	46	G	28	27	27	24	33
23	33	32	34	46	41	46	38	50	32	34	G 27	G	32	34	36	33	32	G 21	G 21	32	32	41	32	22
24	27	43	42	32	34	36	38	46	52	59	65	36	34	34	42	26	G 25	G	G	32	30	40	35	G 16
25	28	31	81	42	42	42	41	63	31	G	35	39	G	39	36	32	G	36	G	28	41	91	80	37
26	29	28	56	43	26	G 25	34	38	58	43	37	G	39	G	36	32	31	G 27	G	44	69	66	77	81
27	41	41	42	28	28	G	G 22	31	G	38	36	39	39	35	37	G 24	32	G	G 22	G	33	28	22	22
28	20	24	G	28	28	28	34	G	G 24	G	38	44	44	40	59	39	42	33	26	41	30	23	23	33
29	38	42	40	40	75	38	50	36	32	G	G	G	34	32	B	B	E B 60	B	G 20	30	G	34	34	36
30	59	58	38	33	31	41	41	42	42	G	G 24	37	G 27	G	G	35	67	50	82	G	27	41	46	70
31	42	33	42	33	44	41	36	31	43	G	30	63	G	G 22	33	G	G 32	30	31	33	34	34	34	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	30	31	30	28	29	31	31	30	28	31	29	29	27	25	26	28	27	23	26	29	29	29	31	31
MED	32	32	35	32	32	34	35	34	32	32	34	31	33	36	36	34	32	31	30	30	30	33	32	28
U Q	38	41	42	40	41	41	41	41	38	38	37	40	38	39	42	36	38	36	34	33	32	40	36	36
L Q	23	25	28	28	28	G 29	32	G 31	G	G	G	G	G	G	G 31	G	G	G	G	28	G 26	27	25	G 20

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2011 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	12	14	13	14	13	14	14	13	14	14	14	13	14	14	14	15	14	B	14	28	16	13	14	12
2	13	14	12	13	14	13	14	14	16	15	14	14	14	16	30	23	20	16	14	14	15	14	13	19
3	14	15	14	17	12	15	15	22	20	19	14	21	B	B	B	15	B	16	29	14	22	B	14	14
4	B	13	20	B	B	15	14	19	16	16	16	16	16	B	B	B	19	14	18	15	30	16	12	12
5	12	13	12	21	15	12	16	14	18	29	B	56	28	28	27	20	19	18	13	13	13	21	18	15
6	13	14	14	14	13	12	13	13	14	15	12	18	20	16	18	18	20	14	15	14	14	13	13	13
7	13	12	C	13	13	12	14	13	19	19	15	24	14	18	20	17	15	18	19	30	14	12	12	12
8	12	12	26	12	13	12	12	15	17	15	20	18	15	19	13	13	14	13	14	13	14	12	14	14
9	14	13	13	13	12	14	13	14	13	15	14	15	14	23	28	22	14	B	14	B	29	30	25	14
10	15	25	40	B	30	13	14	13	12	14	16	B	B	B	23	18	B	B	B	19	16	13	36	14
11	19	15	18	17	24	26	14	13	13	13	19	56	18	18	19	15	20	B	B	11	12	34	13	14
12	13	13	14	B	23	20	17	20	B	14	B	B	B	B	B	B	B	B	B	B	B	19	17	12
13	13	13	13	24	B	28	57	18	15	14	15	18	14	B	54	15	B	B	B	39	31	36	13	13
14	14	18	15	16	16	18	21	29	B	35	18	55	19	23	B	18	16	16	B	29	B	13	11	20
15	21	13	14	18	13	13	13	12	B	15	17	18	18	21	28	22	14	34	14	13	13	24	12	12
16	13	12	12	13	13	13	12	13	13	26	15	18	B	B	13	13	15	B	13	12	12	S	26	12
17	12	24	12	27	13	12	14	12	13	22	14	14	20	14	18	16	15	12	13	13	14	28	12	14
18	28	15	16	16	12	14	14	14	12	14	13	13	15	18	19	18	15	18	14	13	14	12	14	14
19	13	12	13	24	14	14	12	12	13	15	16	13	15	13	13	15	15	13	12	12	13	13	12	15
20	17	25	21	22	18	20	14	13	13	14	13	14	16	19	25	24	16	14	12	14	18	12	13	12
21	20	16	13	14	12	12	16	19	15	14	19	13	13	14	15	13	14	13	20	13	12	12	14	14
22	17	12	12	20	14	12	16	14	12	14	13	13	13	14	19	18	17	18	13	14	12	12	14	14
23	12	12	18	15	14	14	14	12	15	15	14	14	15	13	14	15	13	13	13	13	13	13	11	12
24	12	12	12	12	12	12	13	13	14	14	13	17	14	15	15	14	15	14	15	15	15	12	13	11
25	14	12	18	14	15	13	17	16	14	17	14	14	20	16	19	19	18	14	15	14	13	15	13	13
26	13	13	13	15	18	13	15	13	15	14	14	13	13	14	14	14	14	14	12	13	13	12	12	13
27	12	11	13	12	12	12	12	14	14	14	14	13	14	12	13	14	13	12	13	13	14	11	14	12
28	12	12	13	12	12	13	14	13	14	14	14	13	16	18	14	13	17	13	13	14	13	12	12	13
29	14	14	13	15	13	13	12	14	18	15	15	15	15	15	B	B	60	B	13	15	18	13	14	14
30	16	24	14	11	12	14	13	13	18	13	13	15	16	16	19	18	18	12	12	12	12	12	14	14
31	14	13	14	13	18	16	14	16	23	23	14	14	16	13	15	27	19	18	15	19	18	13	13	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	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	31	31
MED	13	13	14	15	13	13	14	14	15	15	14	15	16	18	19	18	16	16	14	14	14	13	13	13
U Q	16	15	16	21	18	15	15	16	18	17	16	18	20	B 23	B 28	22	20	B	B 19	19	18	19	14	14
L Q	12	12	13	13	12	12	13	13	13	14	14	13	14	14	14	15	14	13	13	13	13	12	12	12

DEC. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION SHOWA-ST.

DEC. 2011 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	A	A	A	A	A	A	A	A 226	A	A	A	A	226	226	A	216	216	B	216	230	A 234	242	260	A
2	240	238	260	A	A	E A 260	222	208	216	216	200	204	Y	Y	R	222	210	200	212	A 228	226	222	Q 236	A
3	A	A	244	204	206	206	208	Y	208	206	206	Y	B	B	B	210	B	E Y 210	A 236	236	204	B	A	A 226
4	B	E A 268	A	B	B	A	E A 276	224	202	202	Y	Y	Y	B	B	B	202	210	210	236	250	238	248	244
5	266	256	E A 244	Y	E A 280	266	A 242	226	Y	Y	B	B	Y	Y	248	A	218	218	226	226	226	226	234	242
6	A	Q 266	196	256	252	206	200	208	208	220	210	Y	Y	184	204	198	206	206	212	220	230	230	230	Q 230
7	Q 242	244	C	E A 268	236	220	220	206	204	204	A	204	218	A	218	198	198	226	218	224	224	224	234	240
8	240	A 214	266	248	230	A 216	208	206	214	Y	Y	Y	208	Y	208	200	194	198	200	206	232	232	234	248
9	230	Q 246	Q 256	E A 290	262	240	240	220	212	202	202	A	A	A	Y	204	204	B 216	B	228	240	240	244
10	256	284	284	B	E B 246	A	E A 252	196	234	A 234	234	B	B	B	A	A	B	B	B 234	242	Y	276	252
11	A	A	A	E A 258	A	A	E A 282	204	198	196	A	B	Y	E A 266	Y	210	A	B	B 222	236	270	E A 276	A 210
12	A 210	E A 312	Y	B	A	A	Y	Y	B	210	B	B	B	B	B	B	B	B	B	B	B	202	E A 258	236
13	A	210	A	A	B	A	B	A	210	200	E A 234	Y	Y	B	B	214	B	B	B	E B 278	B 234	240	240	E A 246
14	240	A	A	A	A	E A 260	A	G	B	198	Y	B	Y	Y	B	Y	198	204	B 204	B	208	230	244
15	238	228	204	Y	228	228	214	Y	B	206	206	200	Y	A	Y	200	200	210	Y 210	E Y 230	240	230	232
16	244	238	244	244	A 238	E A 258	230	196	208	208	A	Y	B	B	Y	198	196	B	A	E A 262	A 226	S	A 238	242
17	272	A 264	A	254	E A 246	220	A	A	A	A	A	204	A	A	A	E Y 266	196	214	214	214	232	A	236	224
18	252	234	288	224	254	216	A 238	192	194	202	194	Y	194	A	Y	204	202	202	214	224	Q 212	A 210	226	Q 238
19	254	256	256	A	A	206	196	196	198	194	Y	214	214	214	190	200	200	206	206	212	202	210	Q 234	226
20	202	240	252	216	A	A	A	E A 240	194	Y	Y	194	194	196	Y	Y	202	214	218	208	222	204	222	188
21	A	A	254	238	E A 242	A		Y	240	196	200	Y	200	E A 222	222	206	206	200	A 238	230	226	218	A	A 218
22	A	194	A	A	A	A	A	A	A	194	194	204	Y	204	Y 196	206	206	202	202	222	222	244	232	A
23	A 210	A 260	A	A	A	A	A	A	Y	A	196	186	Y	222	204	202	202	202	202	204	224	224	224	234
24	234	E A 264	E A 250	242	E A 248	218	218	E A 286	A 238	A	A	200	A	220	A	Y	Y	Y	202	218	234	238	238	238
25	Q 242	200	A	A	200	A	A	A	Y	216	196	196	Y	Y	202	208	200	210	220	212	218	A	222	222
26	240	246	A	A	E A 248	A	220	E A 240	A	A	200	Y	200	Y	A	A	A	A	214	E A 238	A	A	A 246	A
27	206	238	254	Q 238	Q 224	214	196	198	196	214	210	198	198	198	200	200	196	196	206	206	206	206	230	214
28	Q 228	242	250	234	236	224	206	198	200	212	212	212	A	202	202	202	200	204	212	A 212	224	224	Q 224	220
29	E A 288	254	206	214	198	192	E A 234	204	H 174	188	206	216	204	E Y 242	B	B	B	B	230	224	224	230	248	Q 248
30	Q 206	A	A	236	A 236	A	A	A	E A 262	192	Y	Y	210	198	Y	198	A	A	A	212	234	A	260	A
31	E A 248	A	A	A	A	A	A	208	A	Y	H 188	A	Y	210	214	214	Y	220	220	234	A 234	230	A 240	Q 240
	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	24	17	16	19	17	19	20	20	22	17	13	11	14	12	22	21	20	23	29	28	24	29	26
MED	240	242	252	238	231	218	214	206	207	203	201	204	204	206	204	204	202	206	214	220	226	228	235	236
U Q	252	A 262	258	E A 255	248	E A 249	E A 240	A 225	215	212	210	208	214	222	216	210	206	212	220	232	234	239	247	244
L Q	228	236	244	229	228	210	208	198	198	196	196	197	198	198	201	200	198	202	206	212	223	214	230	224

DEC. 2011 h′F (KM)

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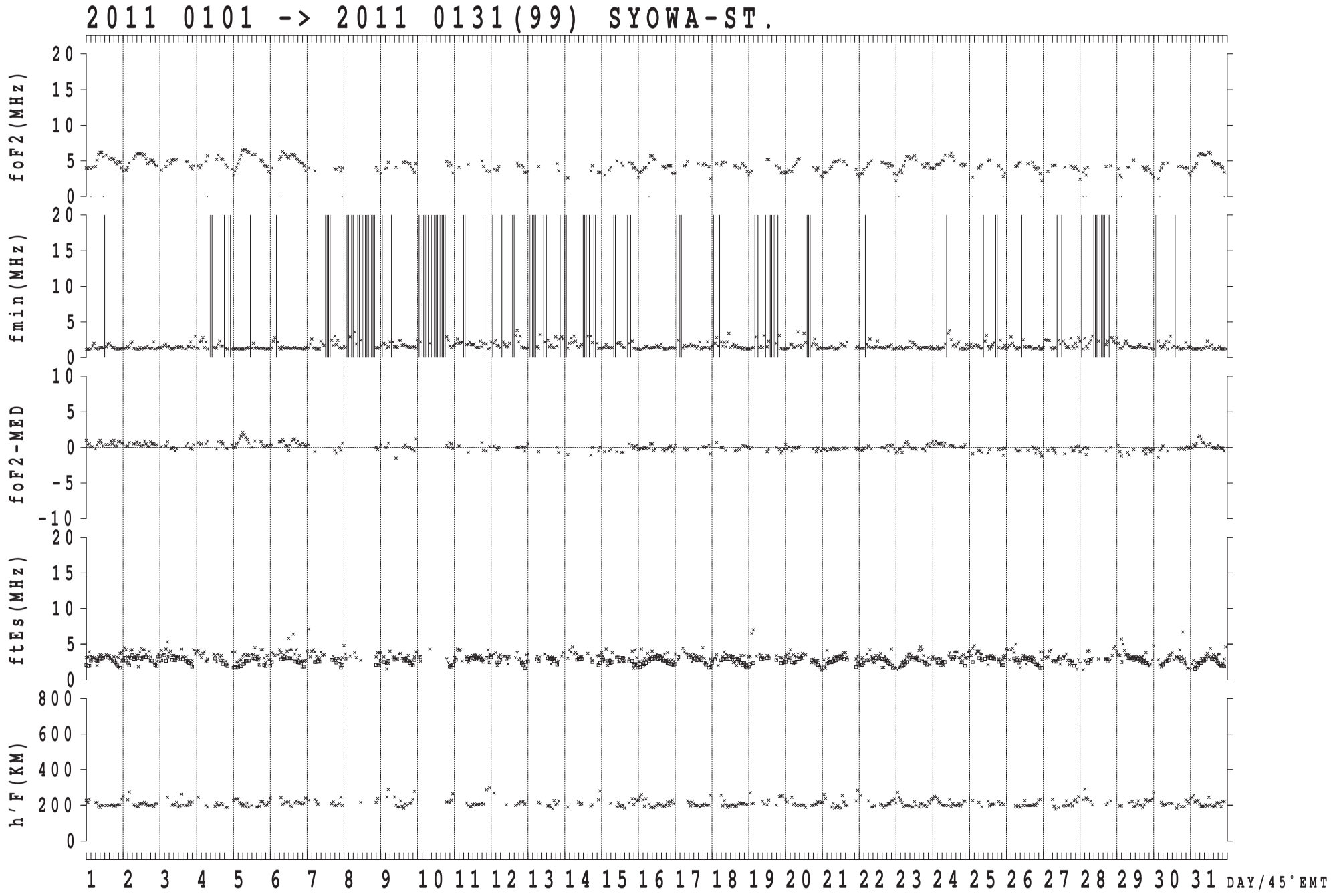
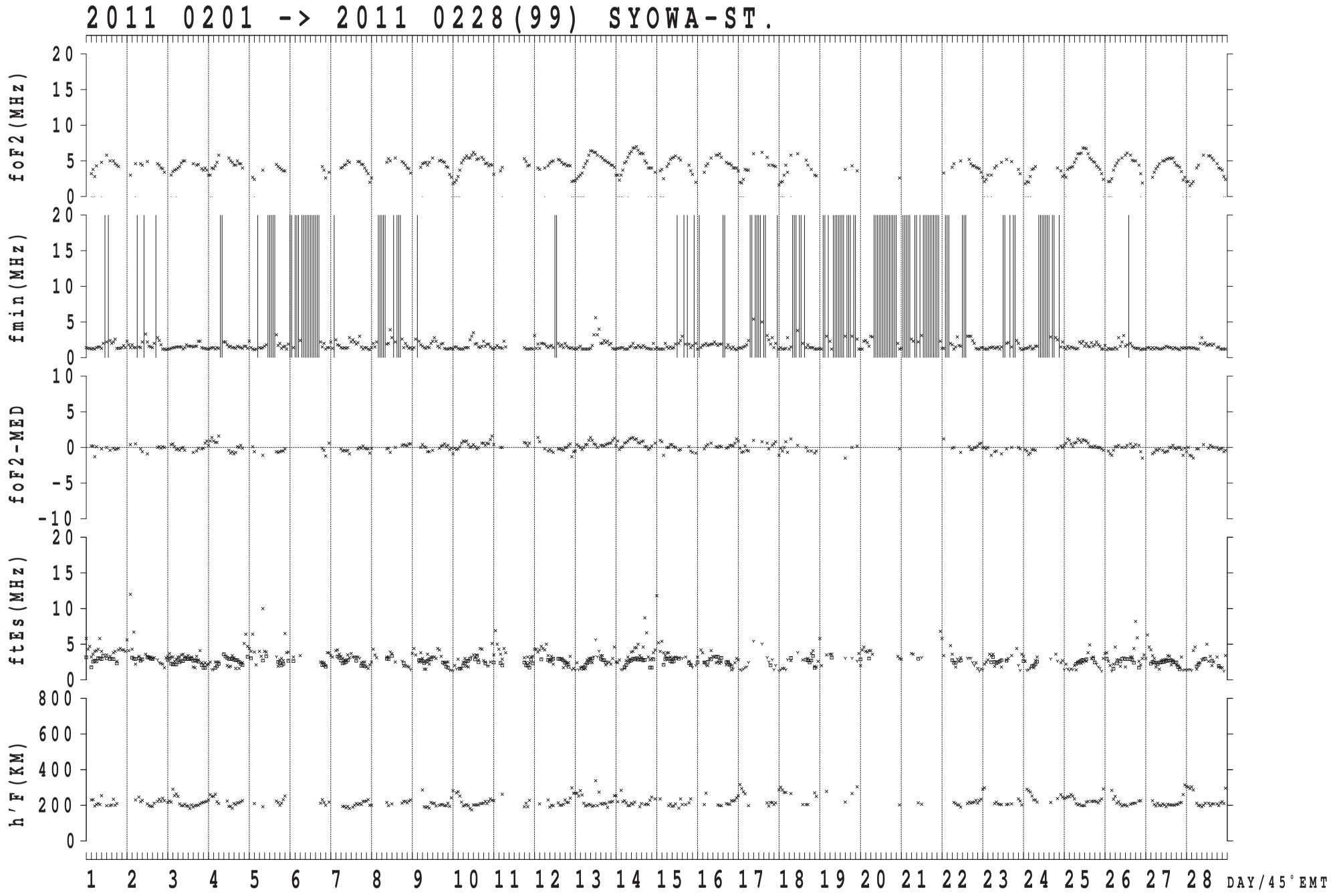
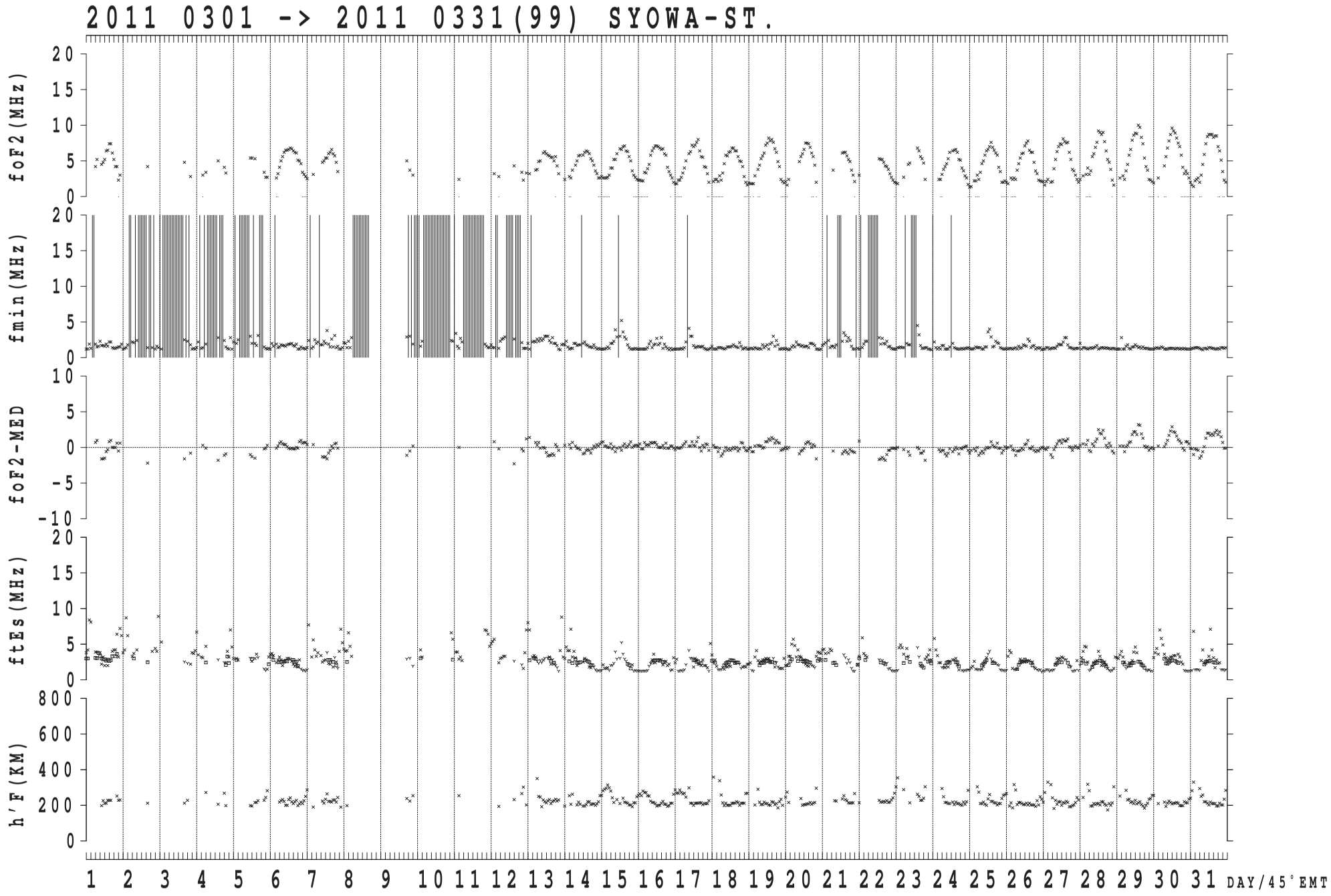
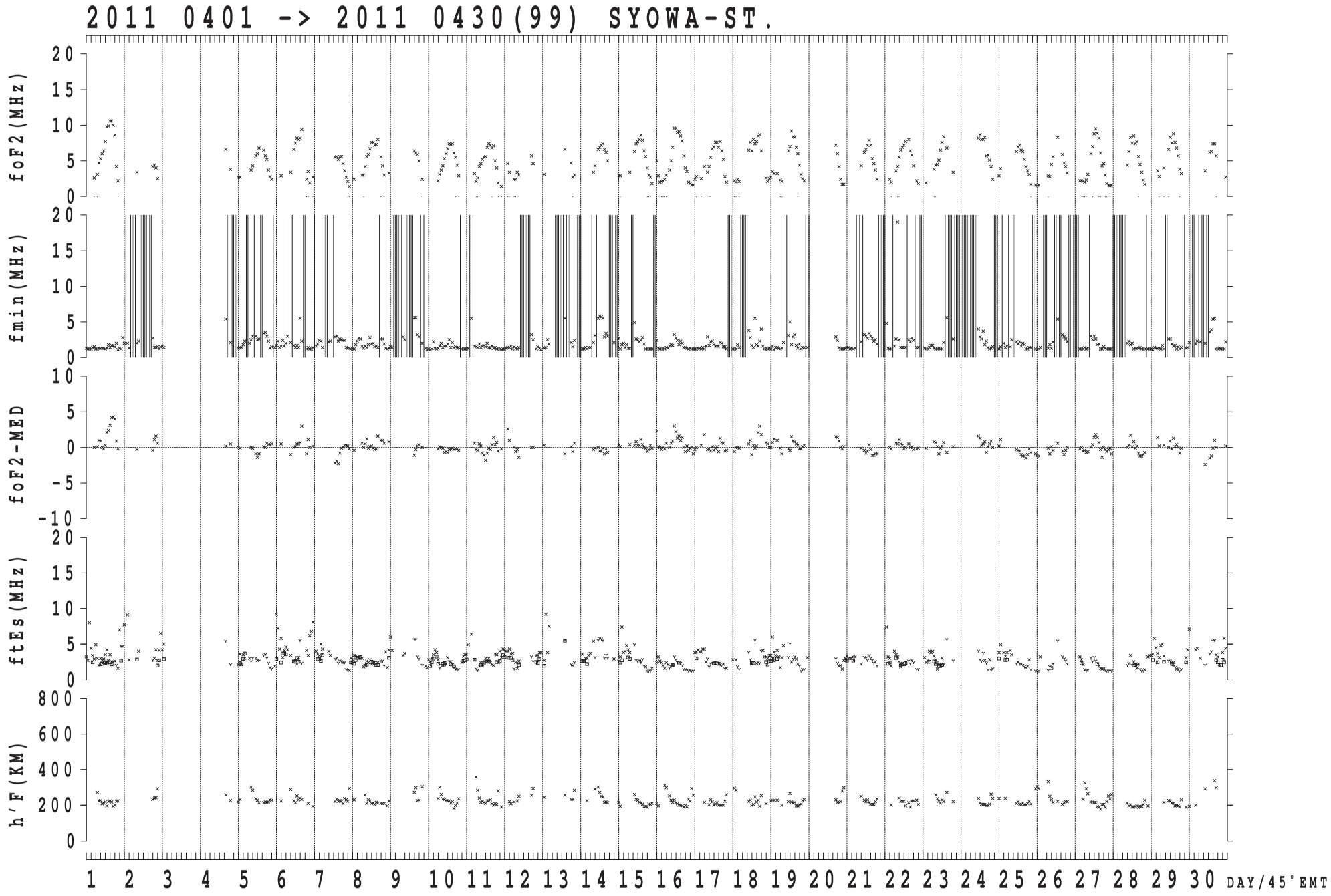
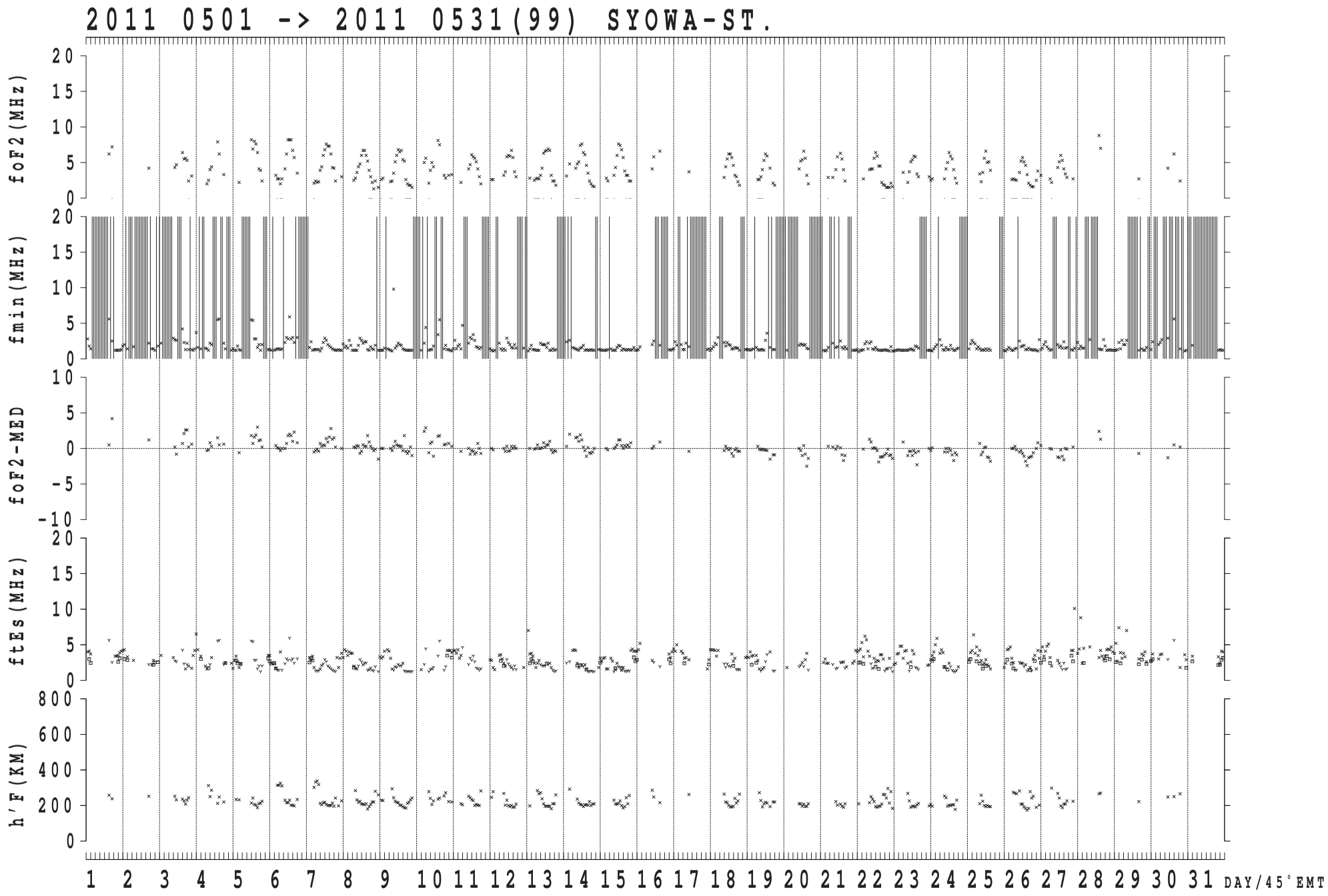
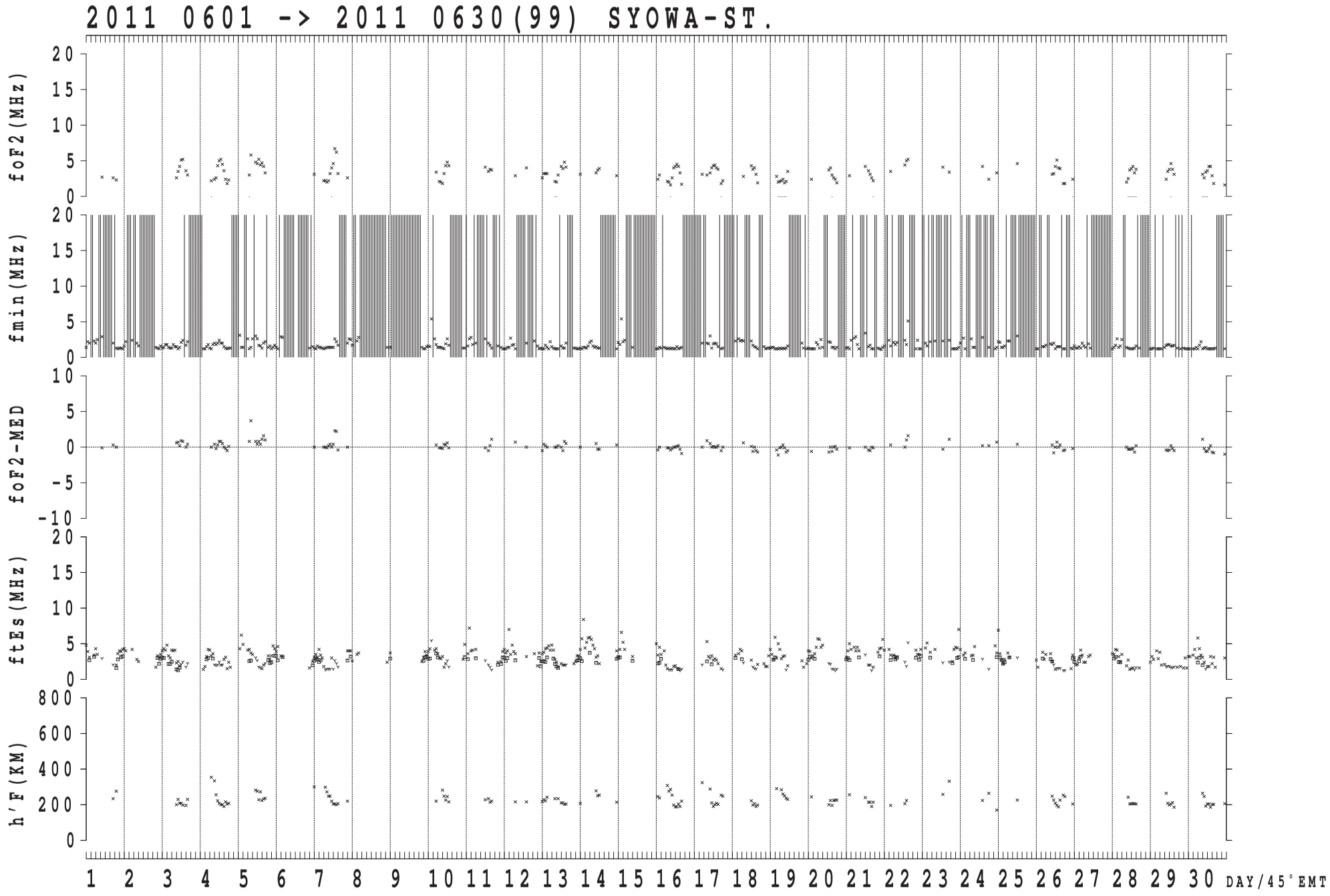

2011 0101 -> 2011 0131(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

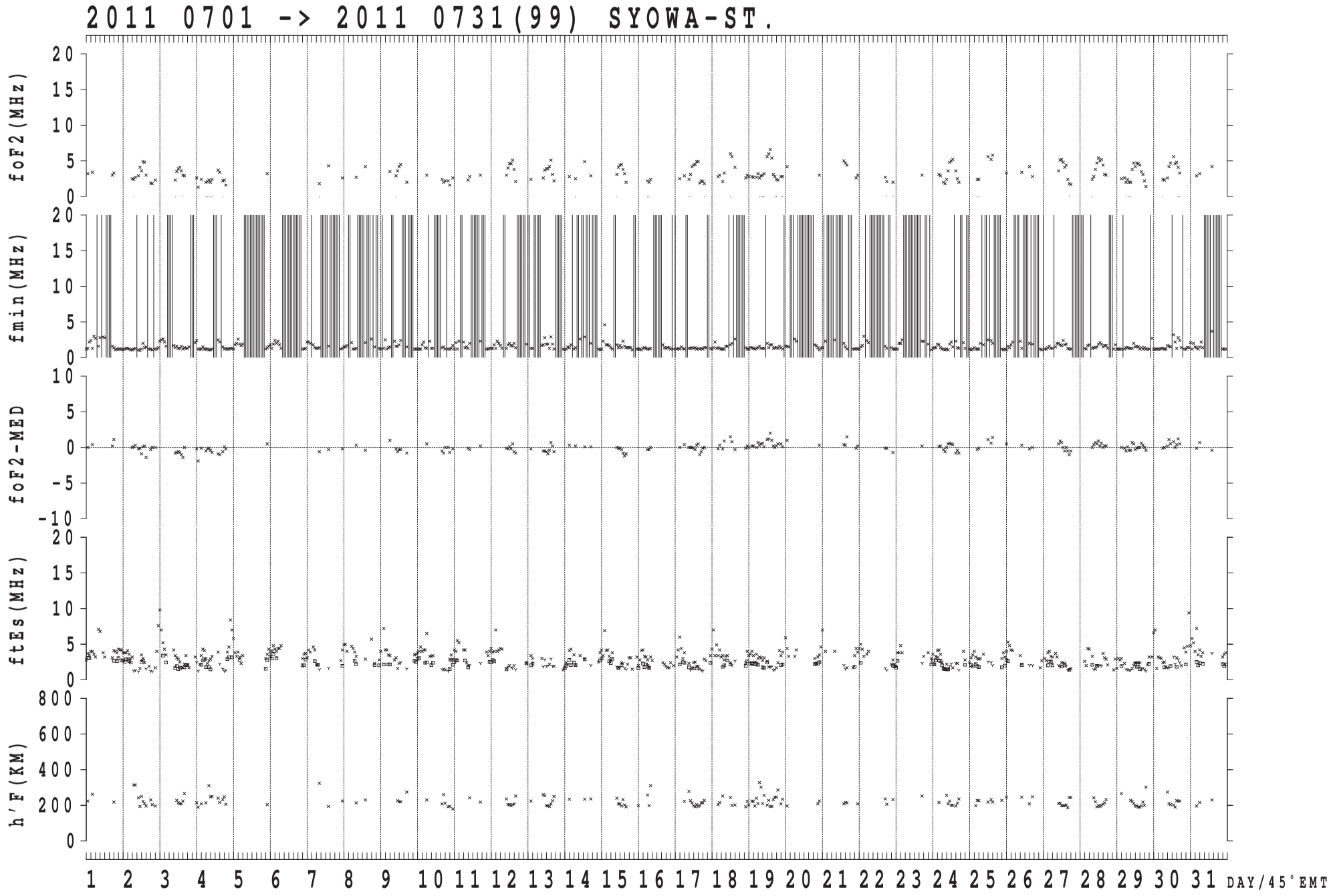

2011 0201 -> 2011 0228(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

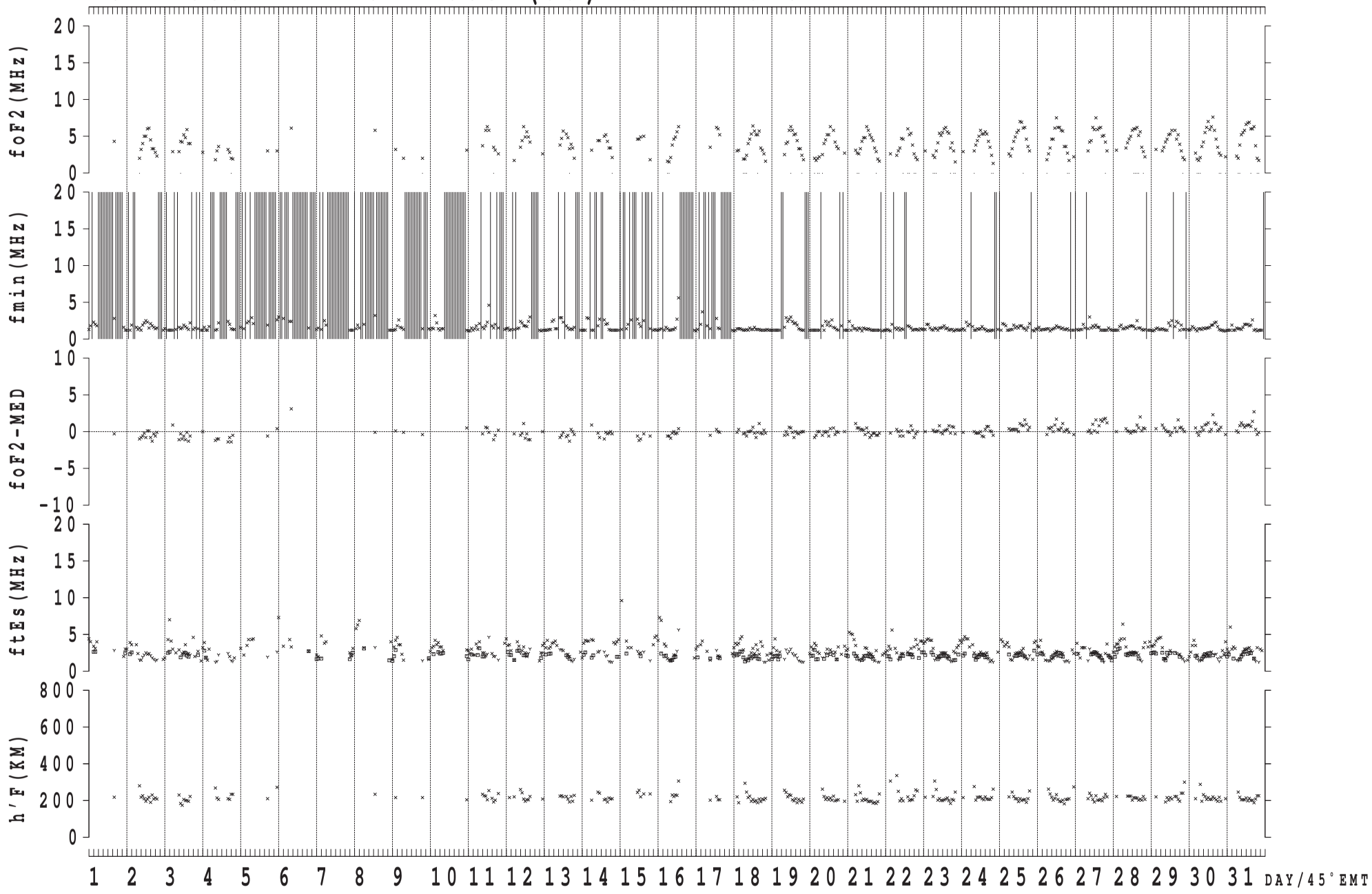

2011 0301 -> 2011 0331(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

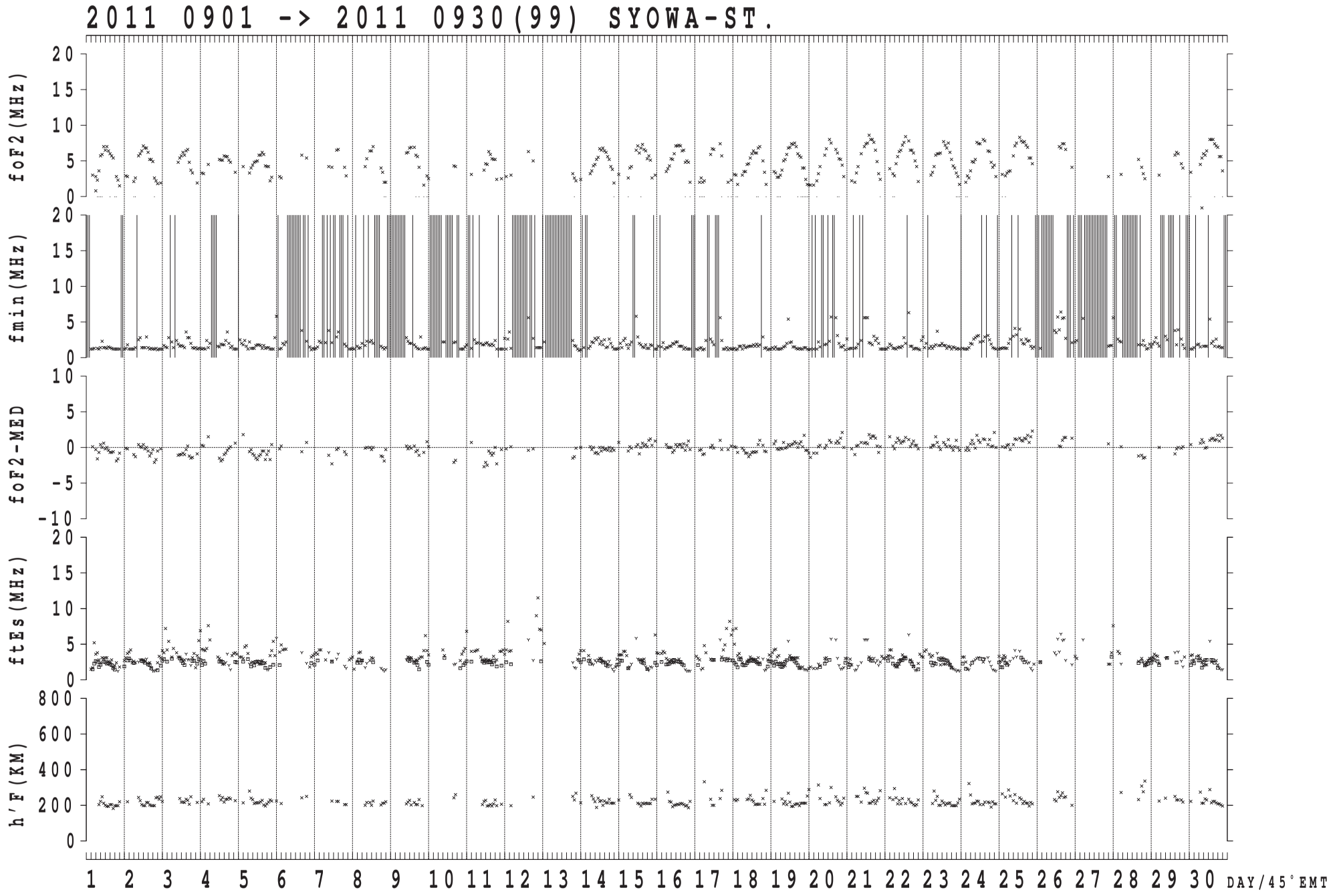

2011 0401 -> 2011 0430(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

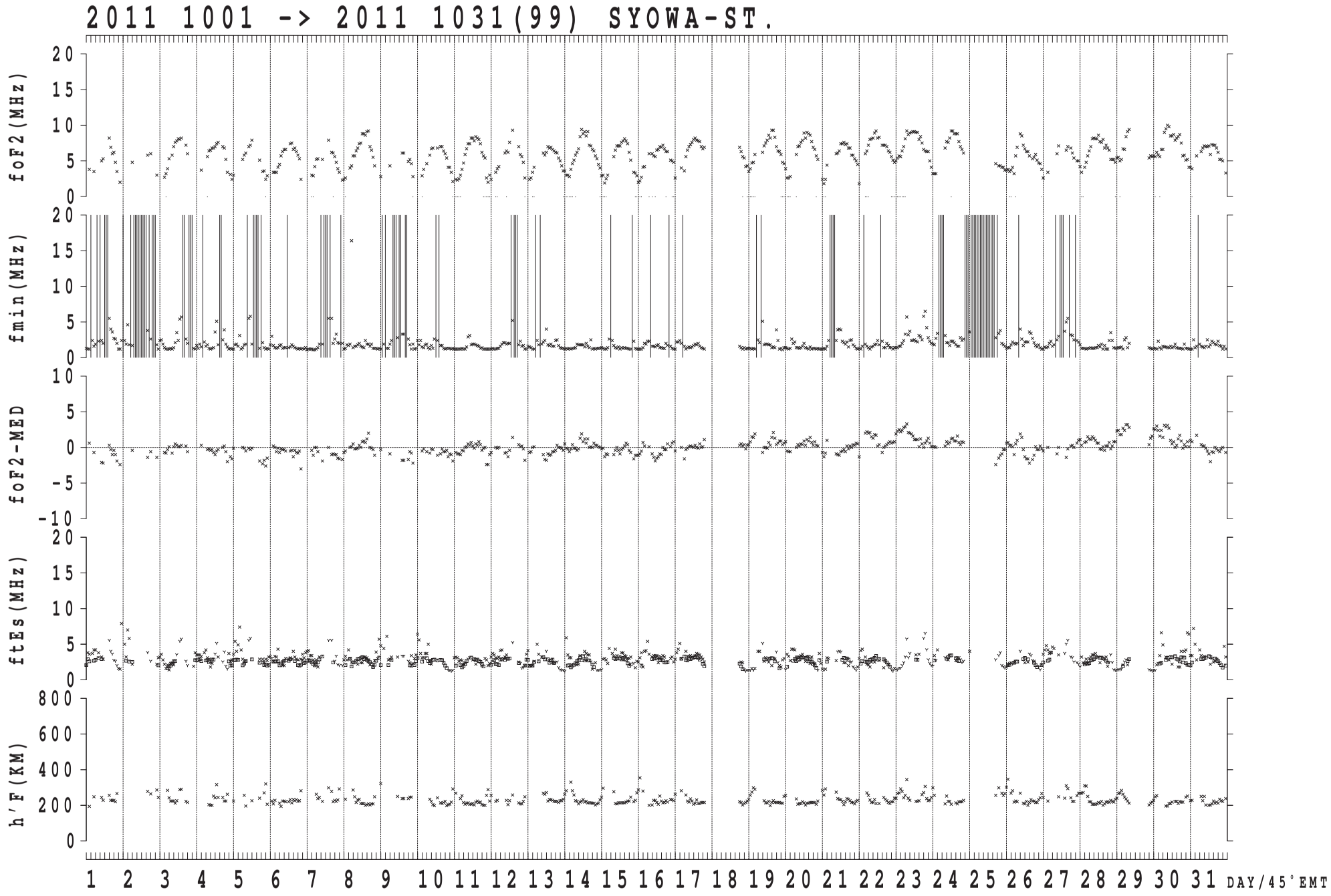

2011 0501 -> 2011 0531(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

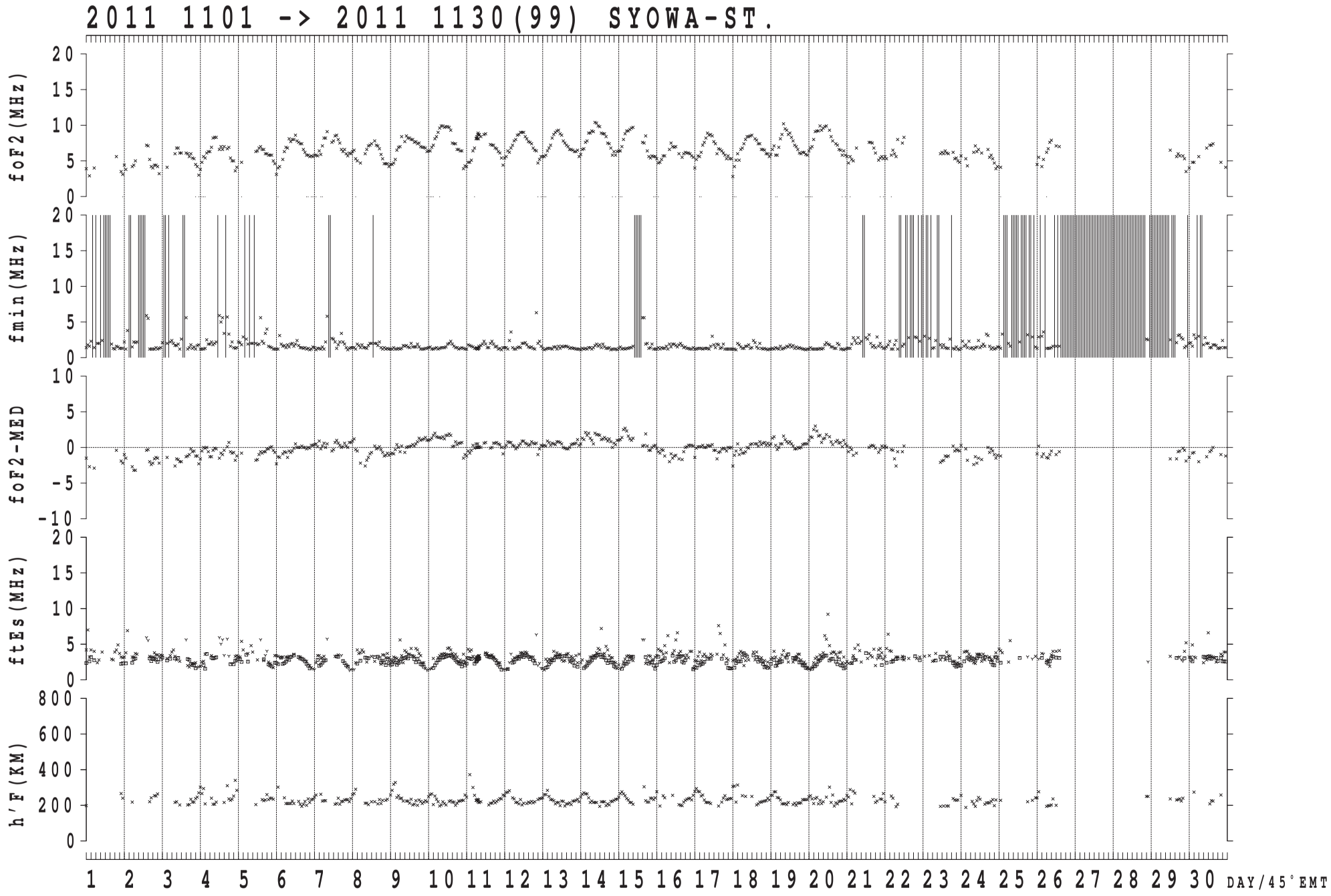

2011 0601 -> 2011 0630(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

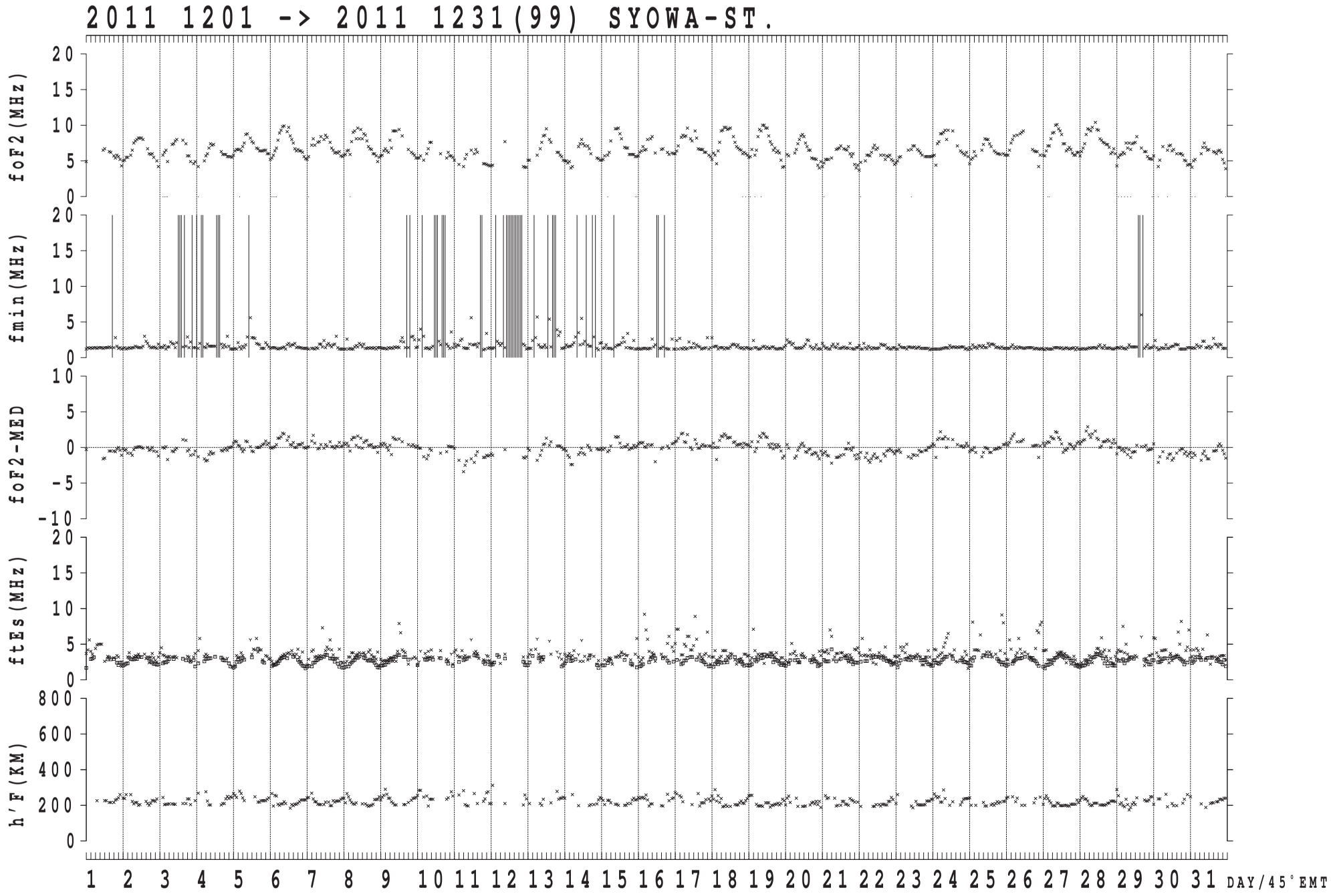

2011 0701 -> 2011 0731(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2011 0801 -> 2011 0831(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2011 0901 -> 2011 0930(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

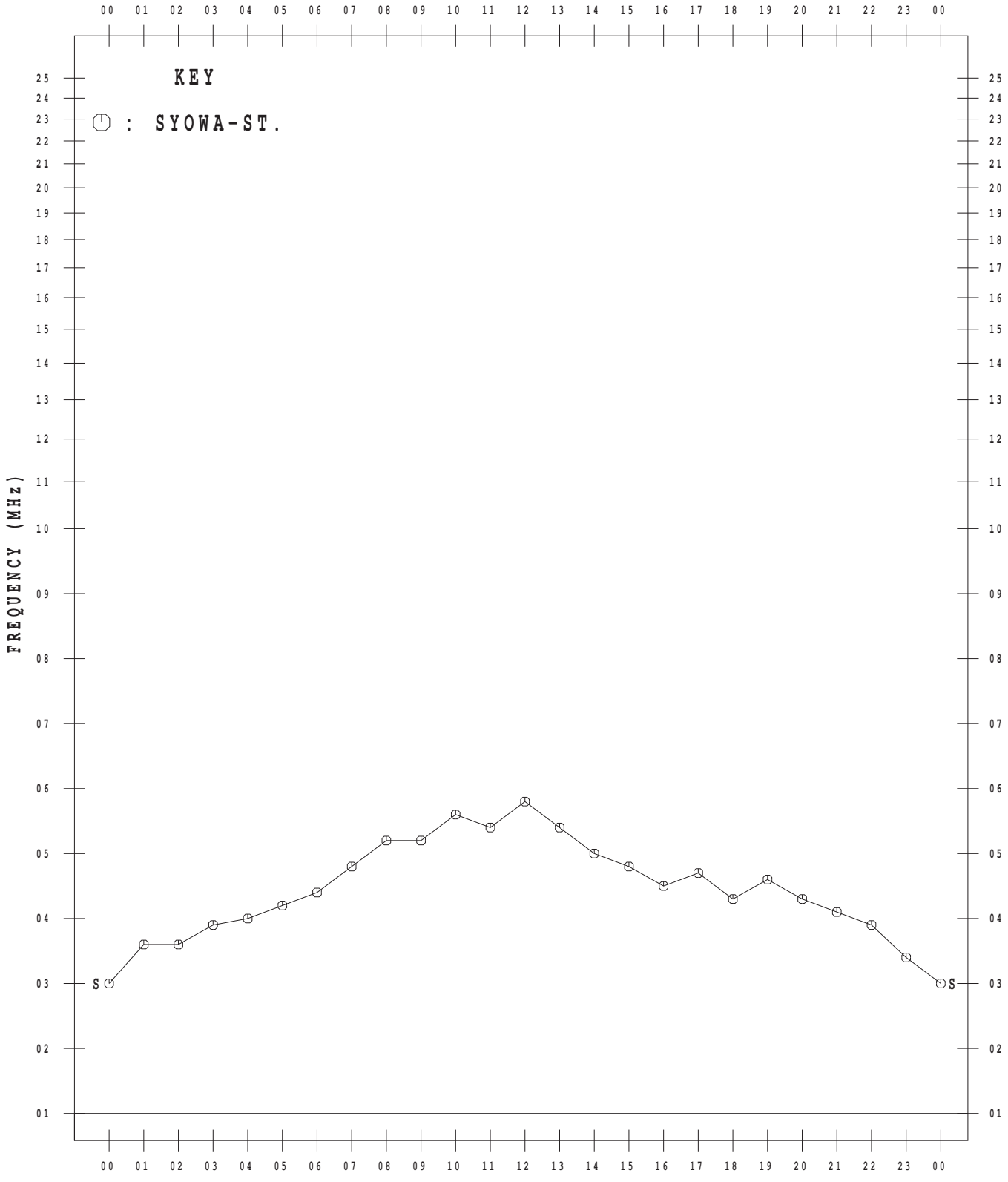

2011 1001 -> 2011 1031(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2011 1101 -> 2011 1130(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT


2011 1201 -> 2011 1231(99) SYOWA-ST.
foF2(MHz)
fmin(MHz)
foF2-MED
ftEs(MHz)
h'F(KM)
DAY/45°EMT

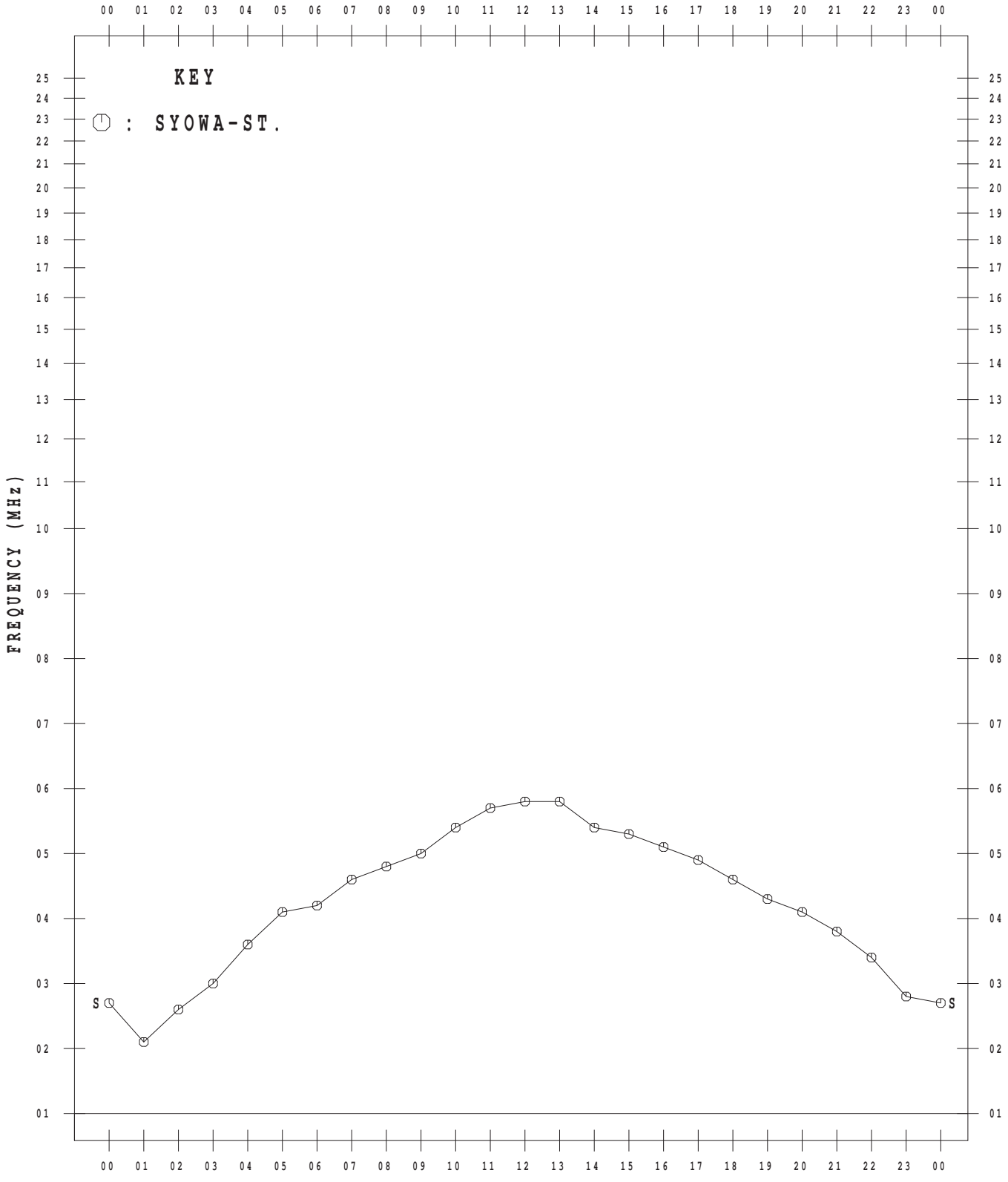
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JAN. 2011



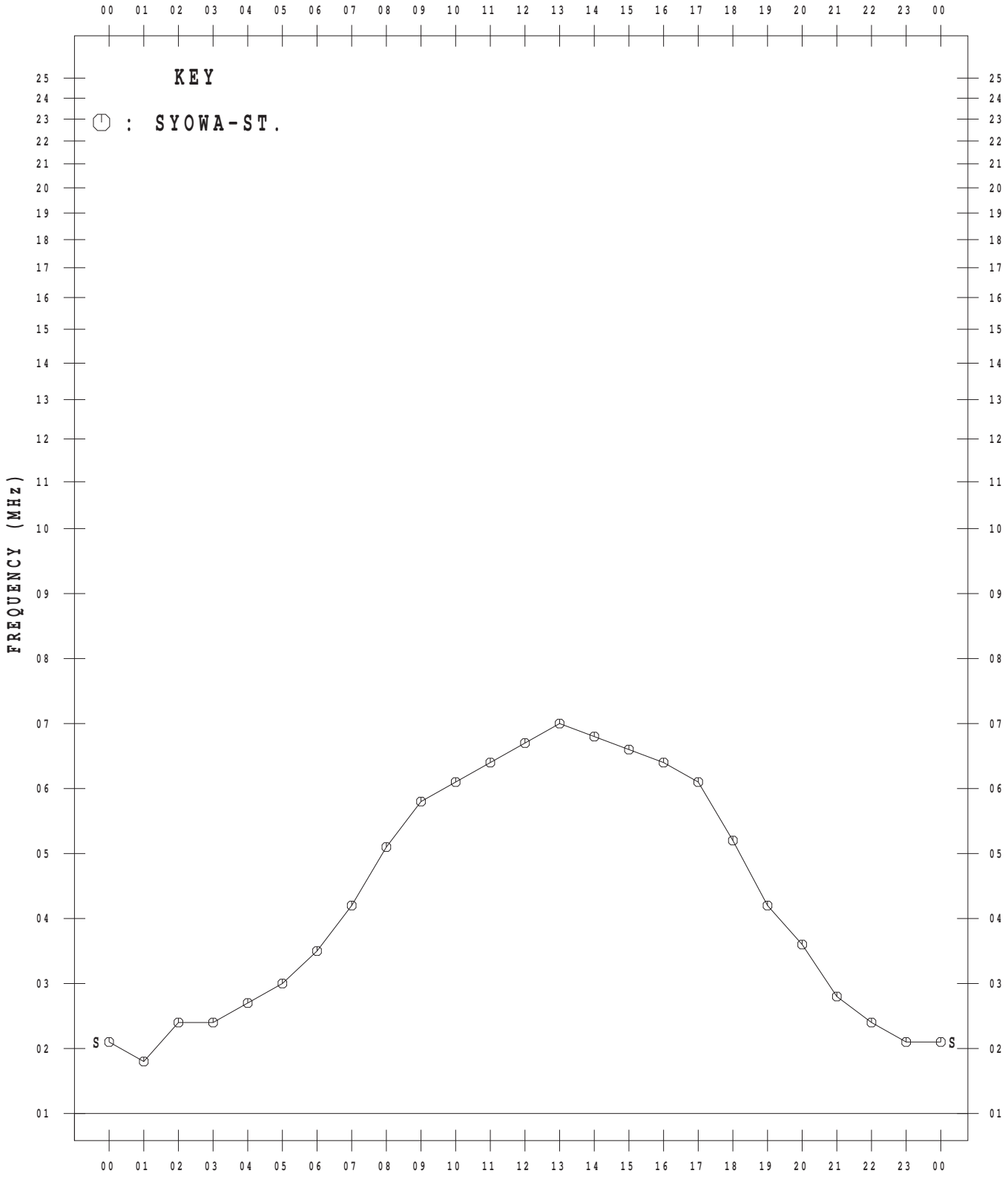
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME FEB. 2011



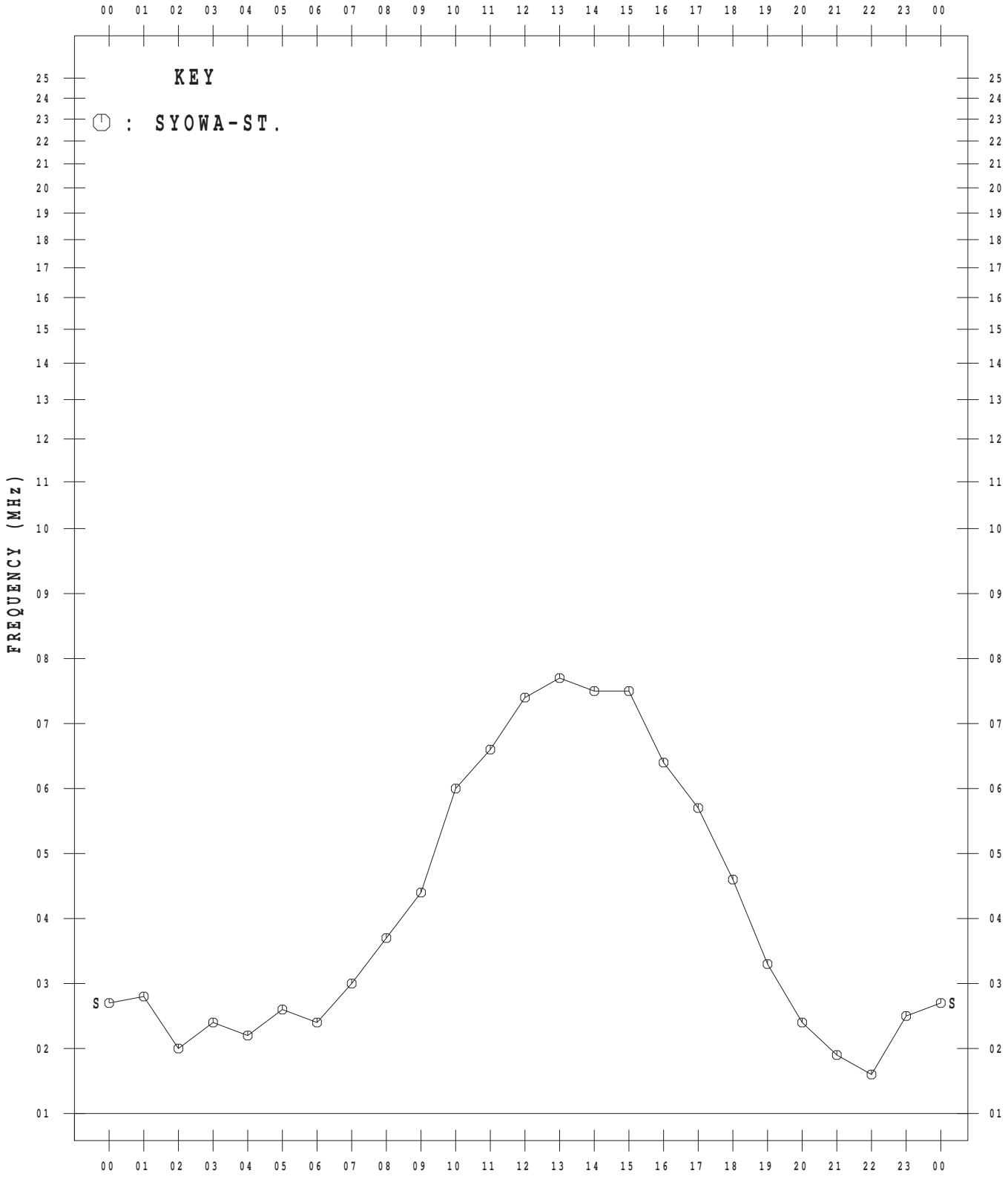
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAR. 2011



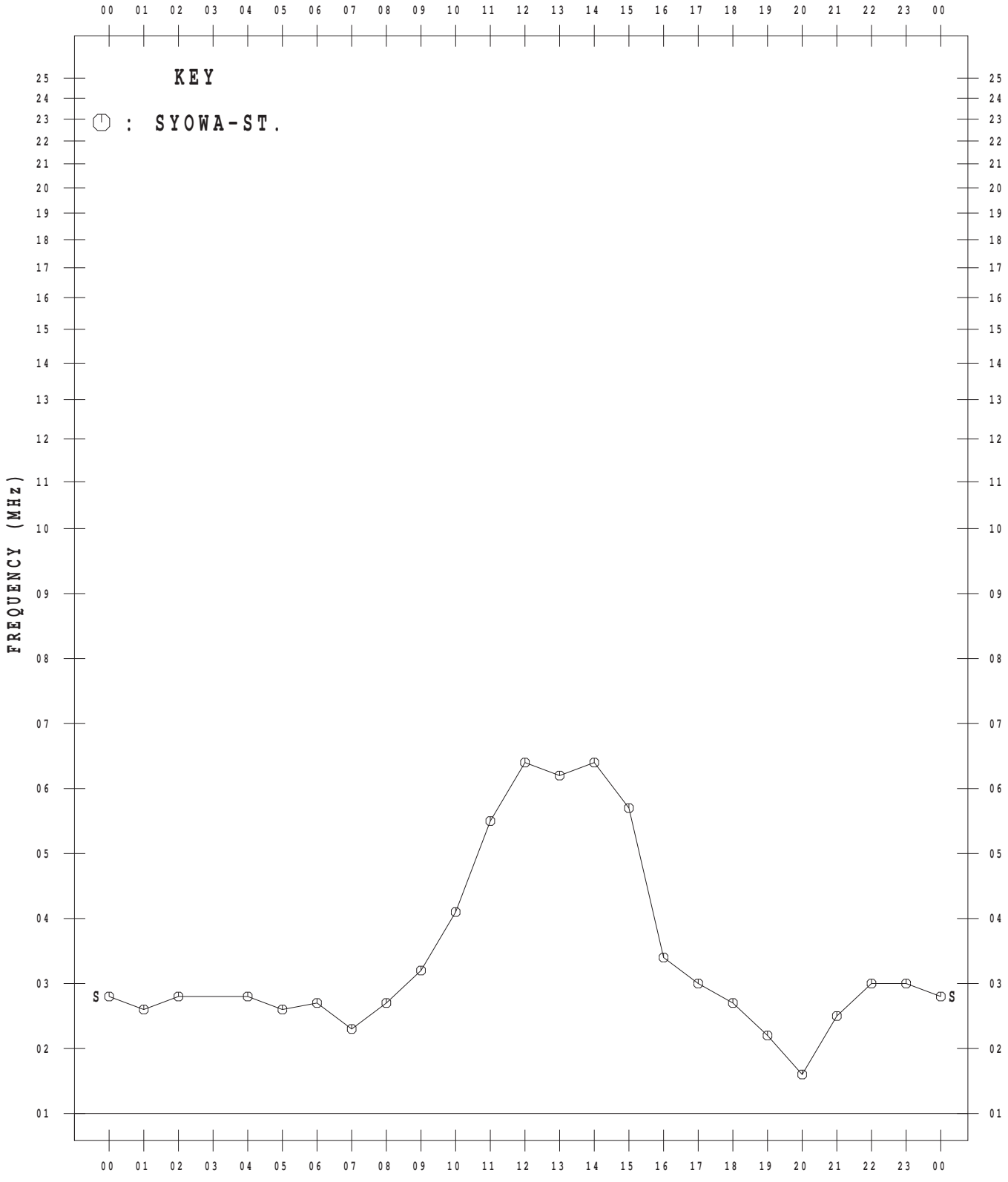
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME APR. 2011



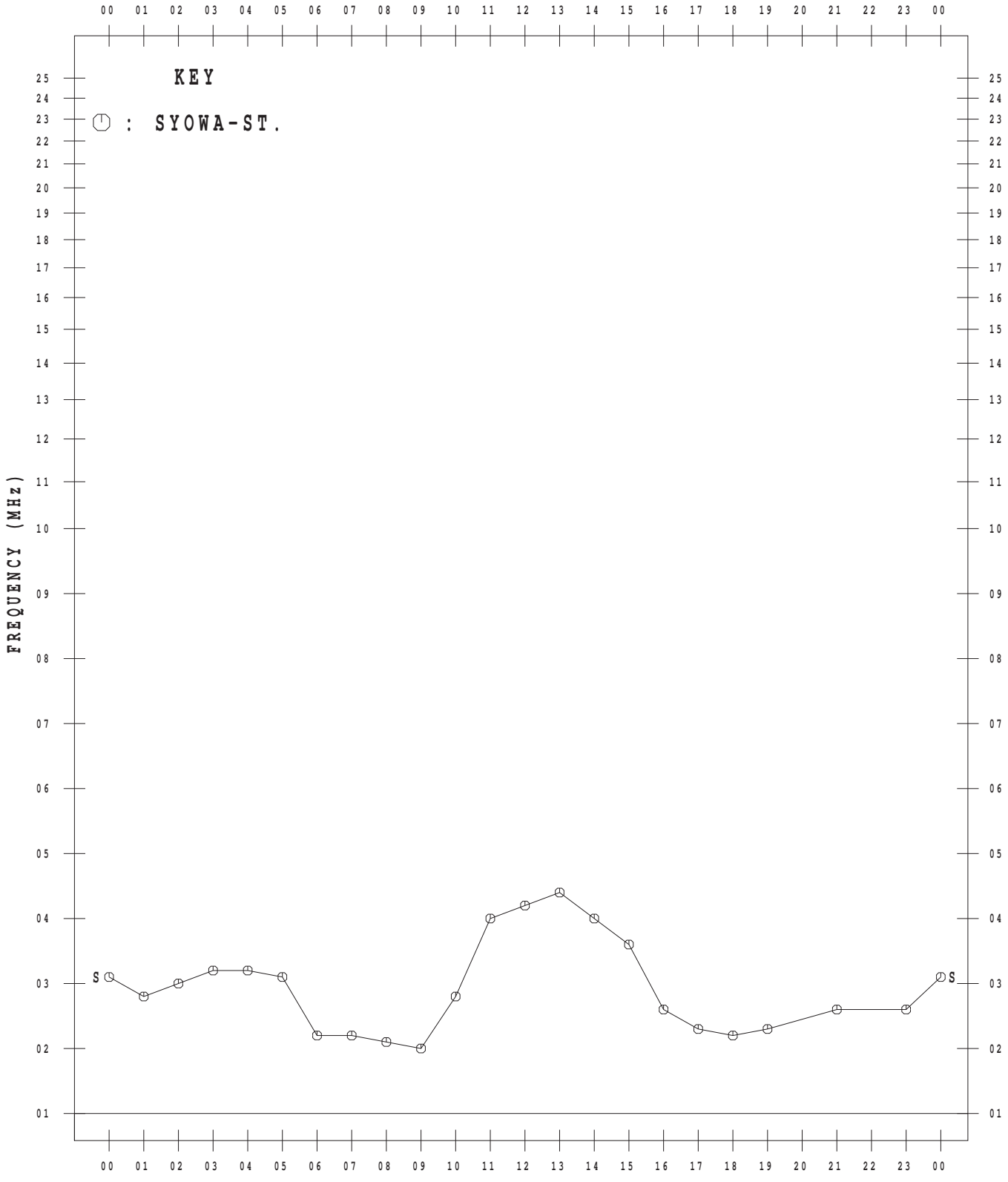
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME MAY 2011



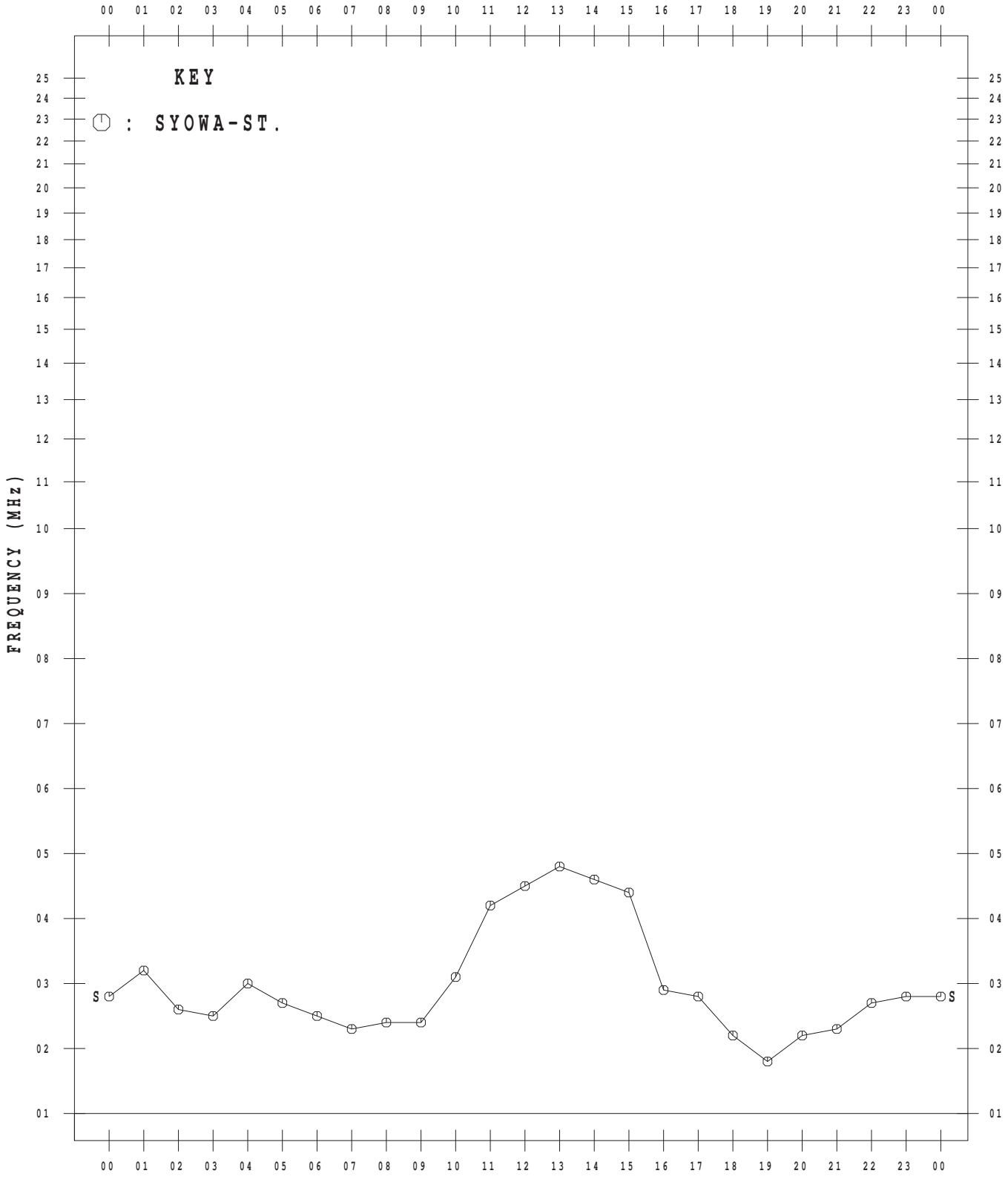
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUN. 2011



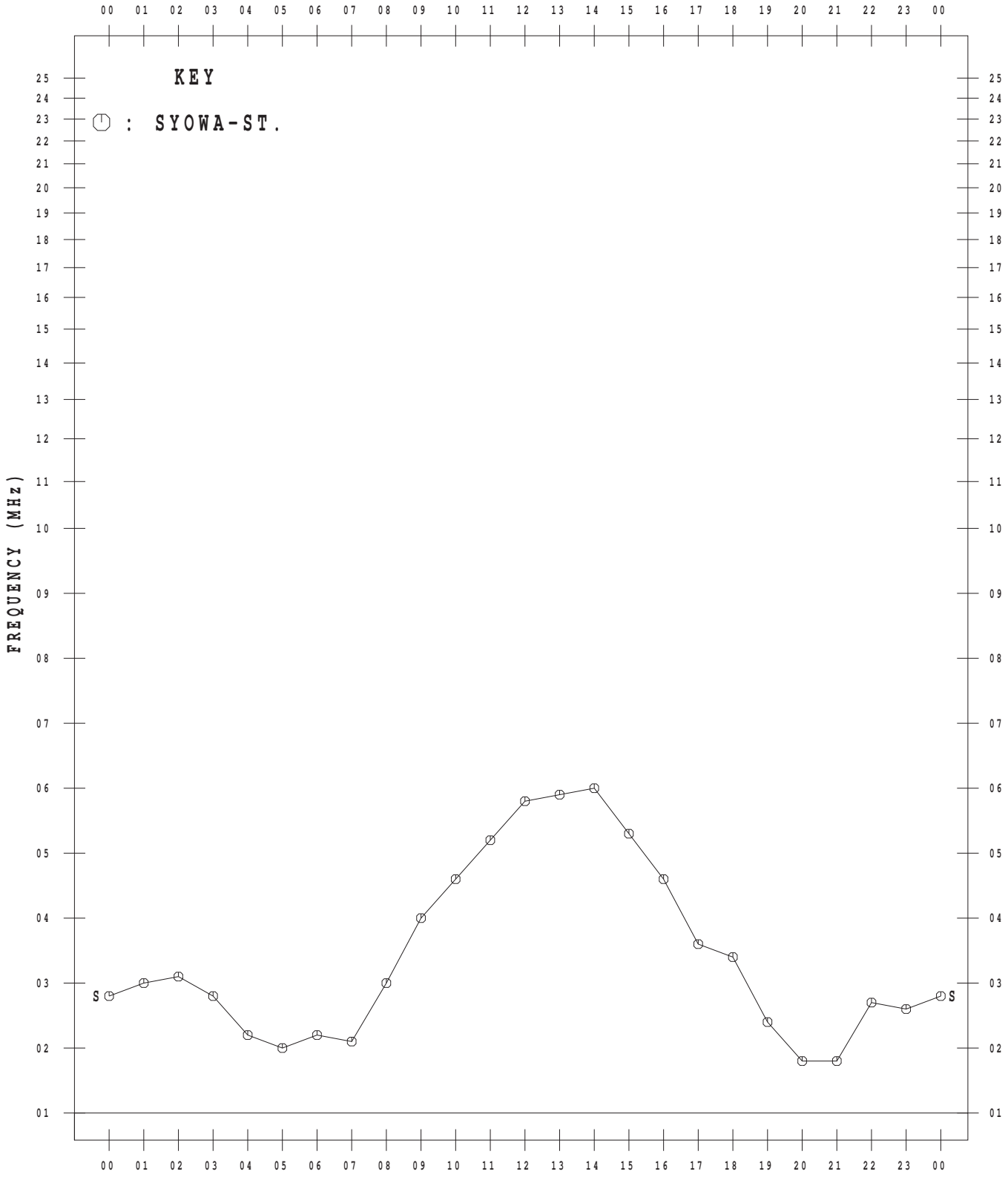
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME JUL. 2011



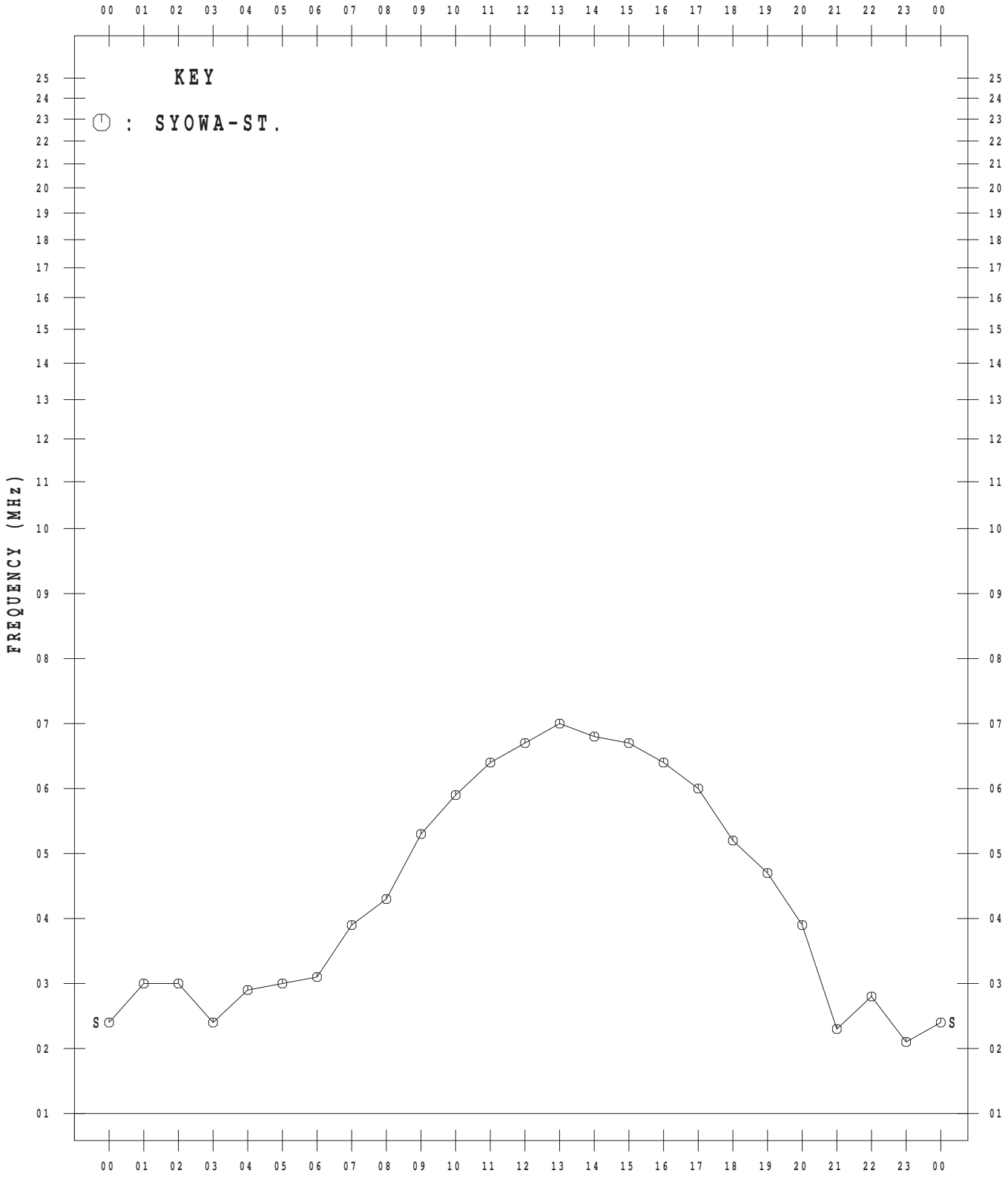
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME AUG. 2011



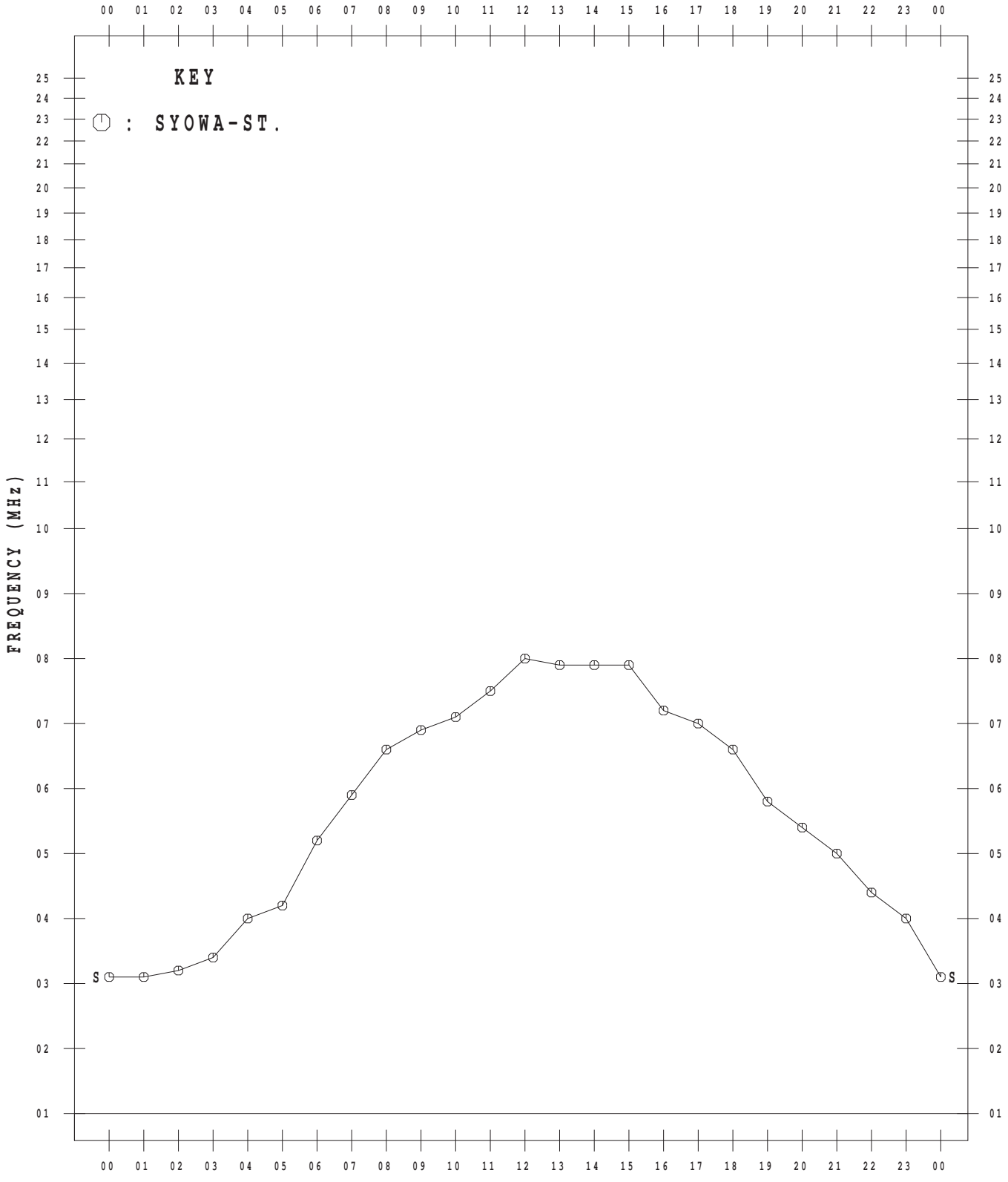
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME SEP. 2011



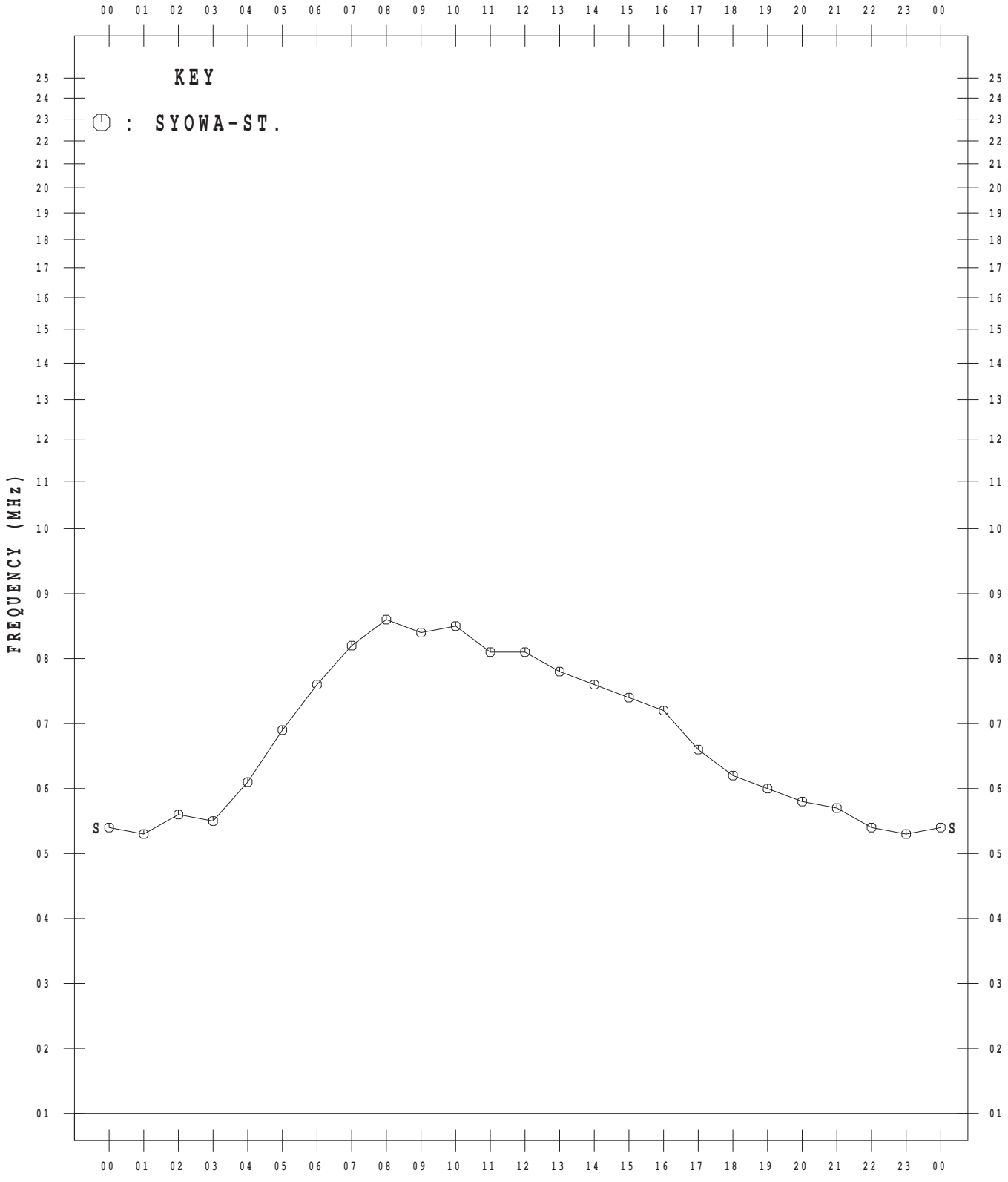
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME OCT. 2011



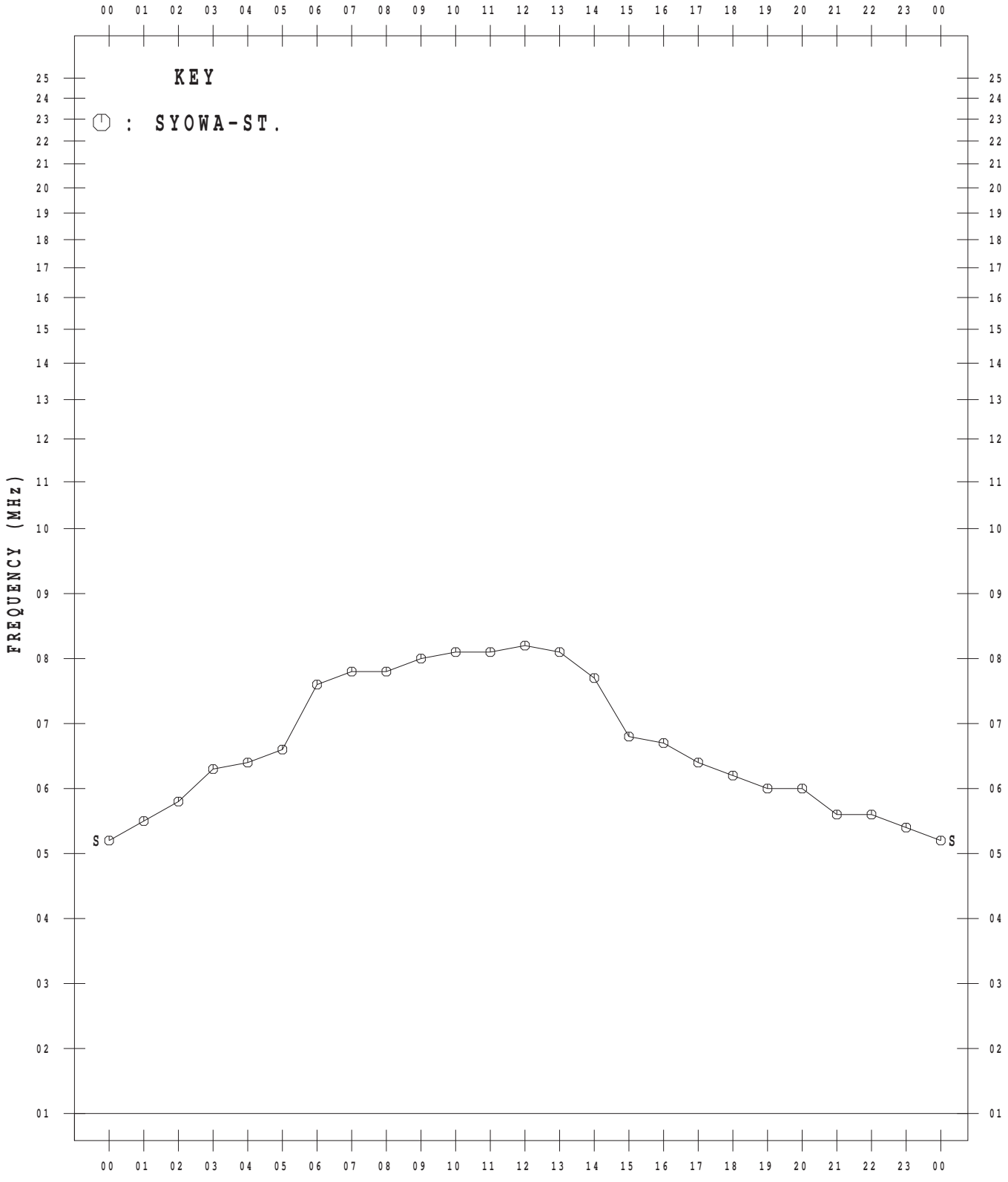
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME NOV. 2011



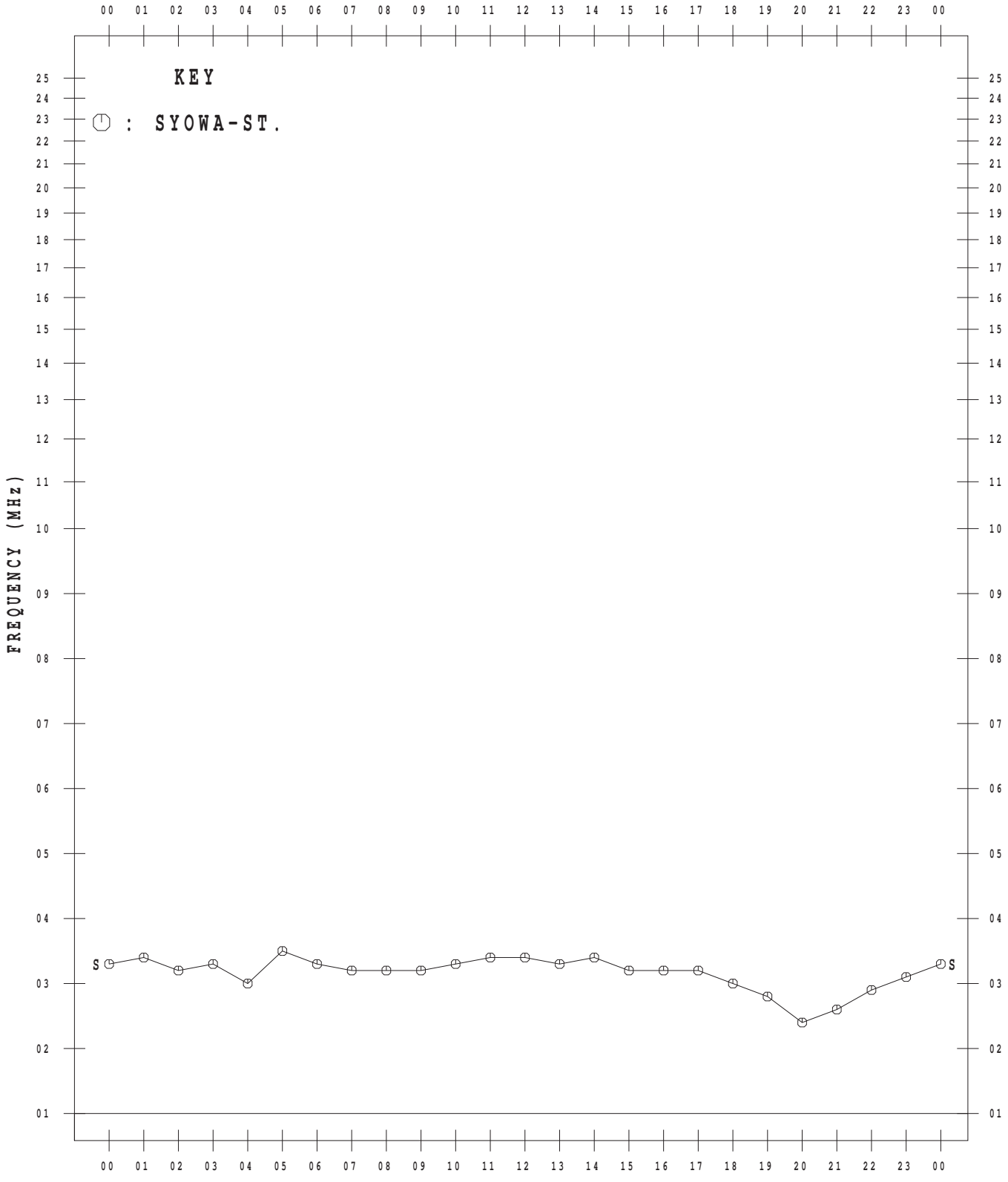
MONTHLY MEDIAN VALUES OF foF2

45°E MEAN TIME DEC. 2011



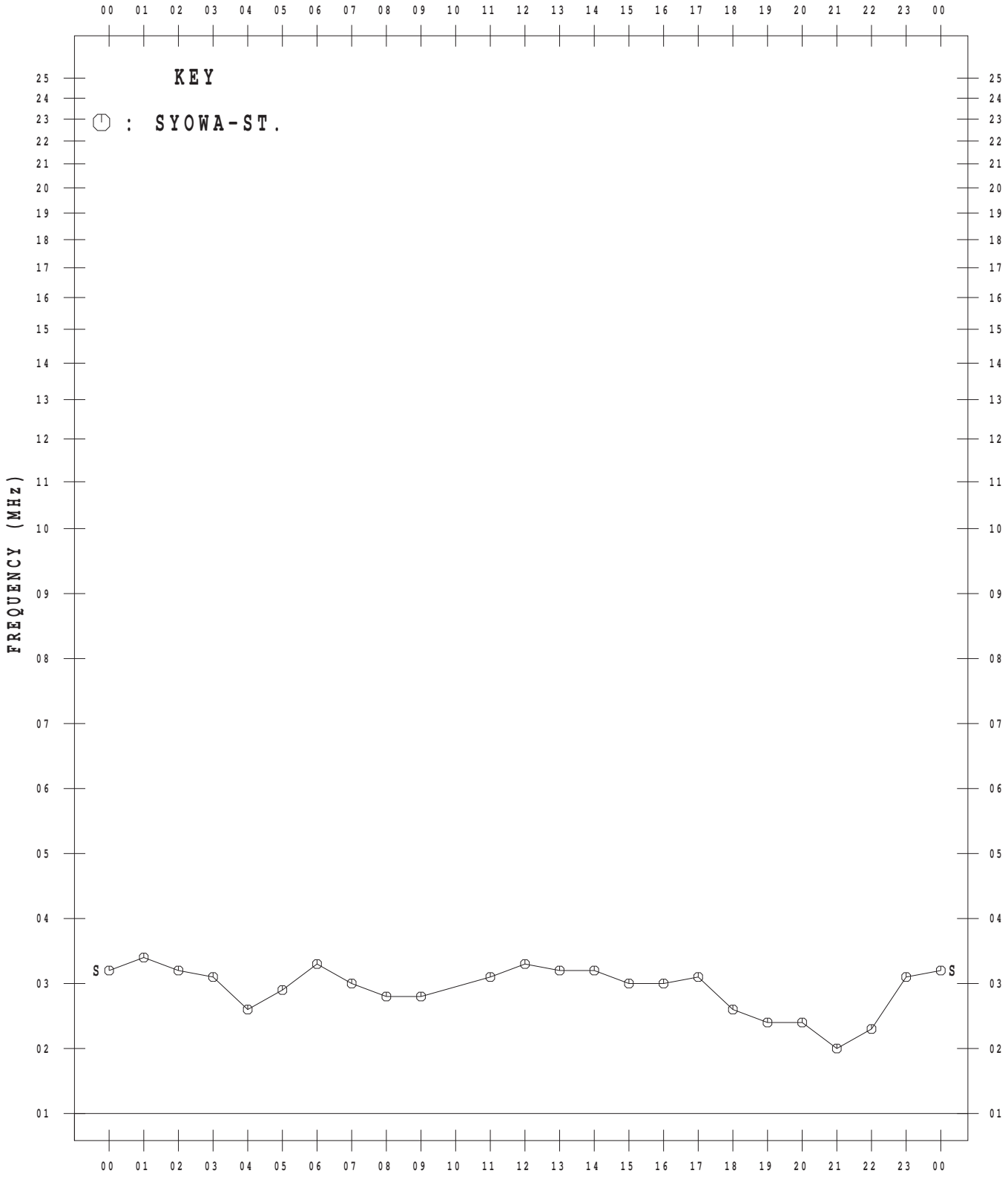
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JAN. 2011



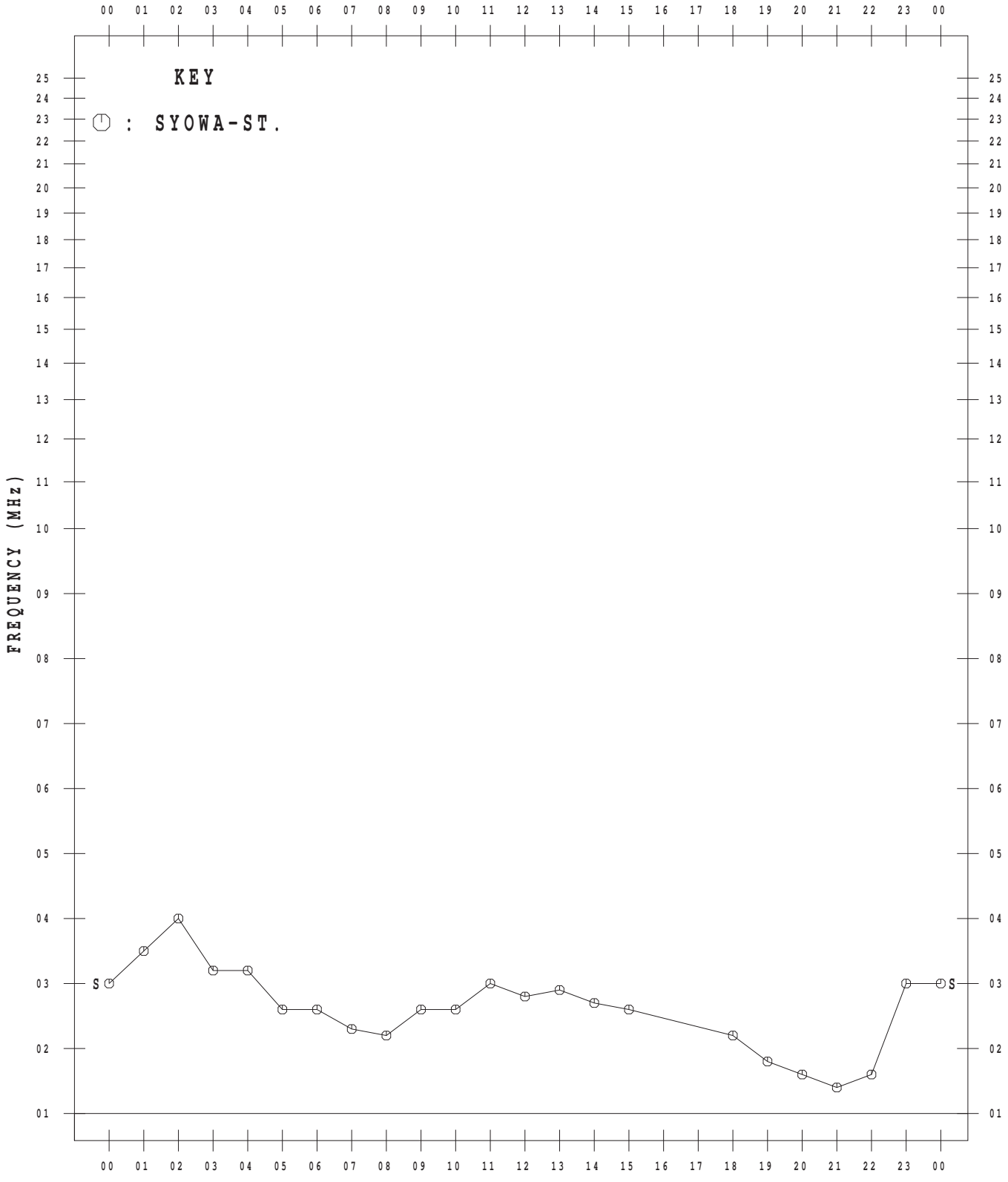
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME FEB. 2011



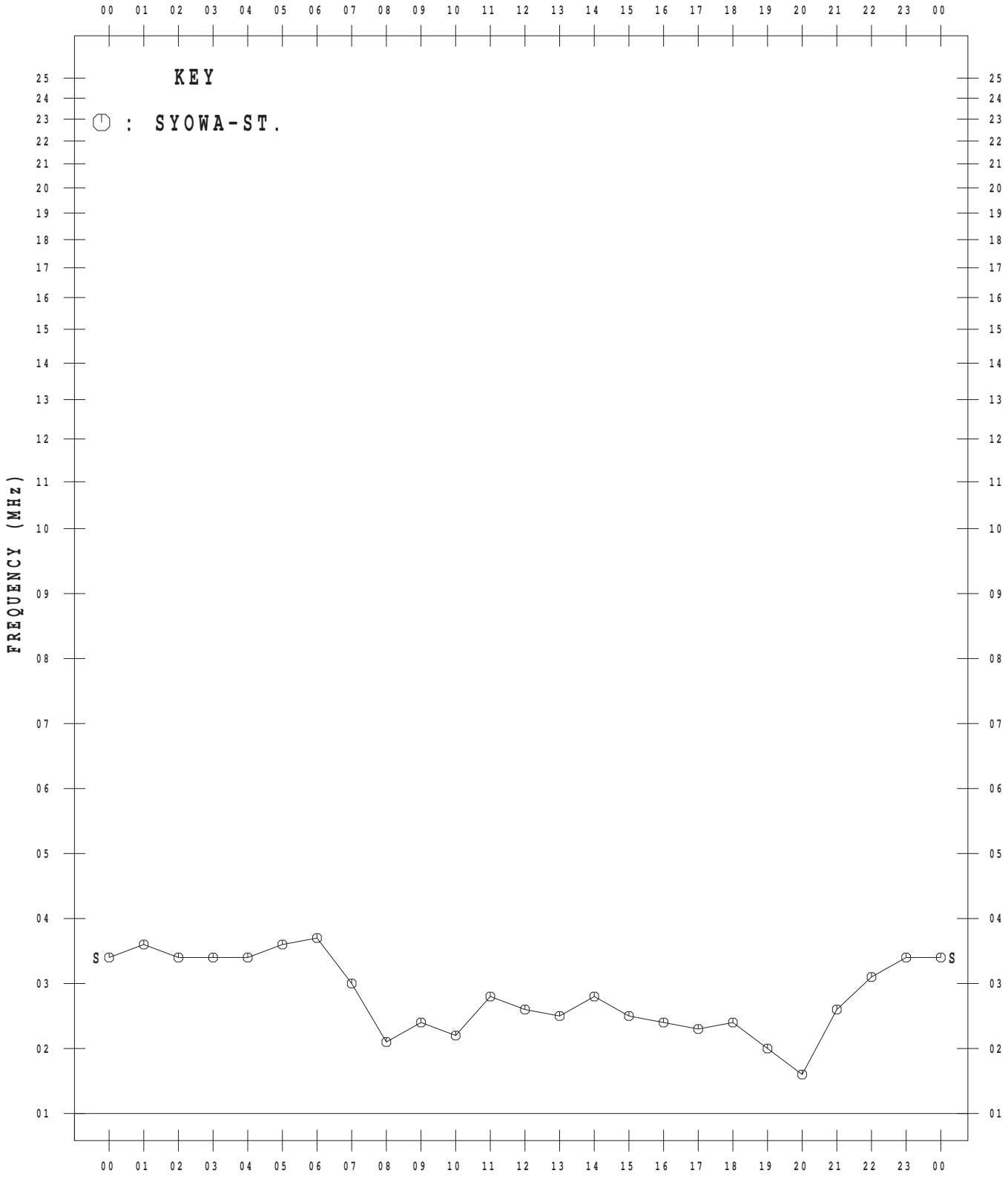
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAR. 2011



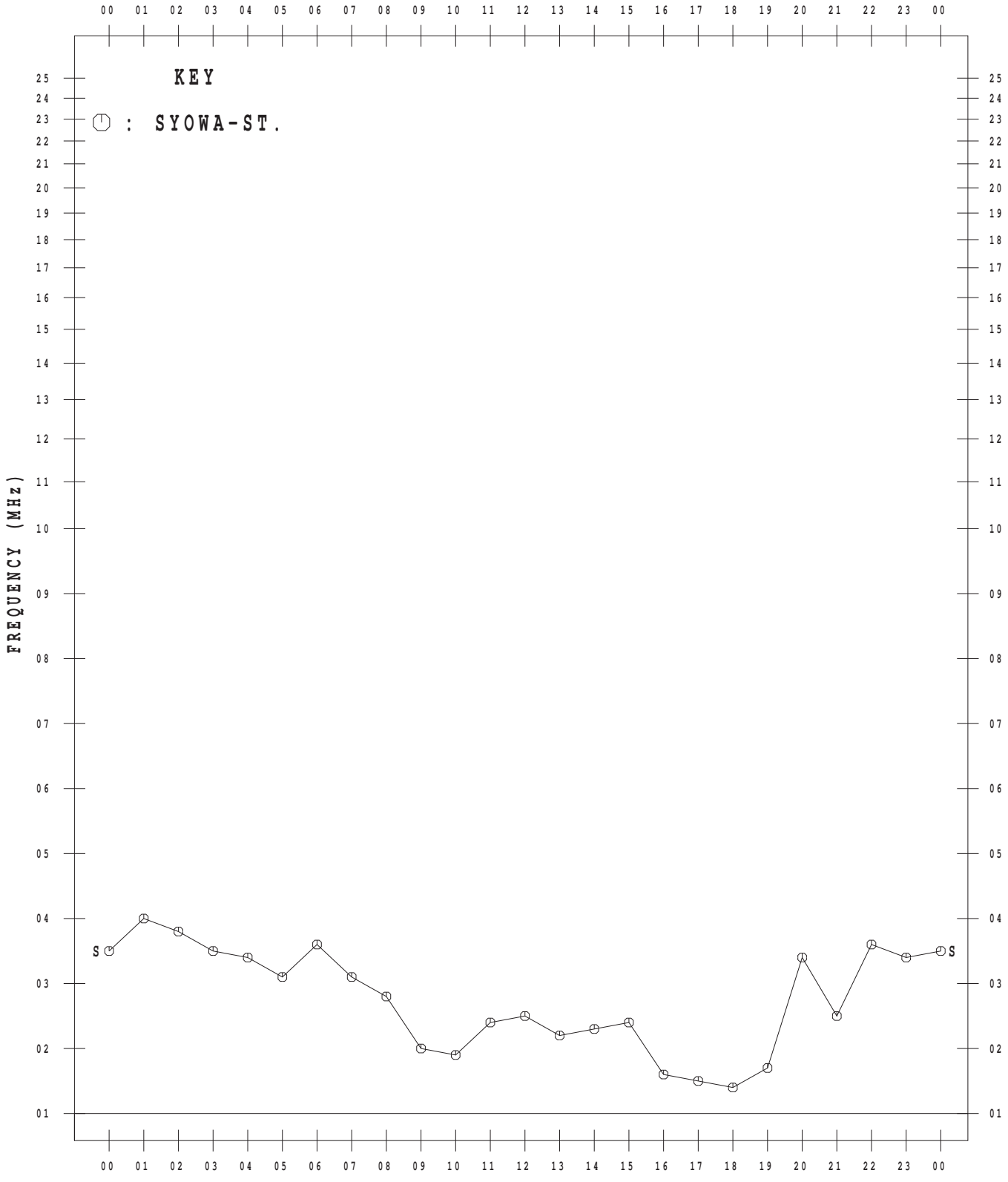
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME APR. 2011



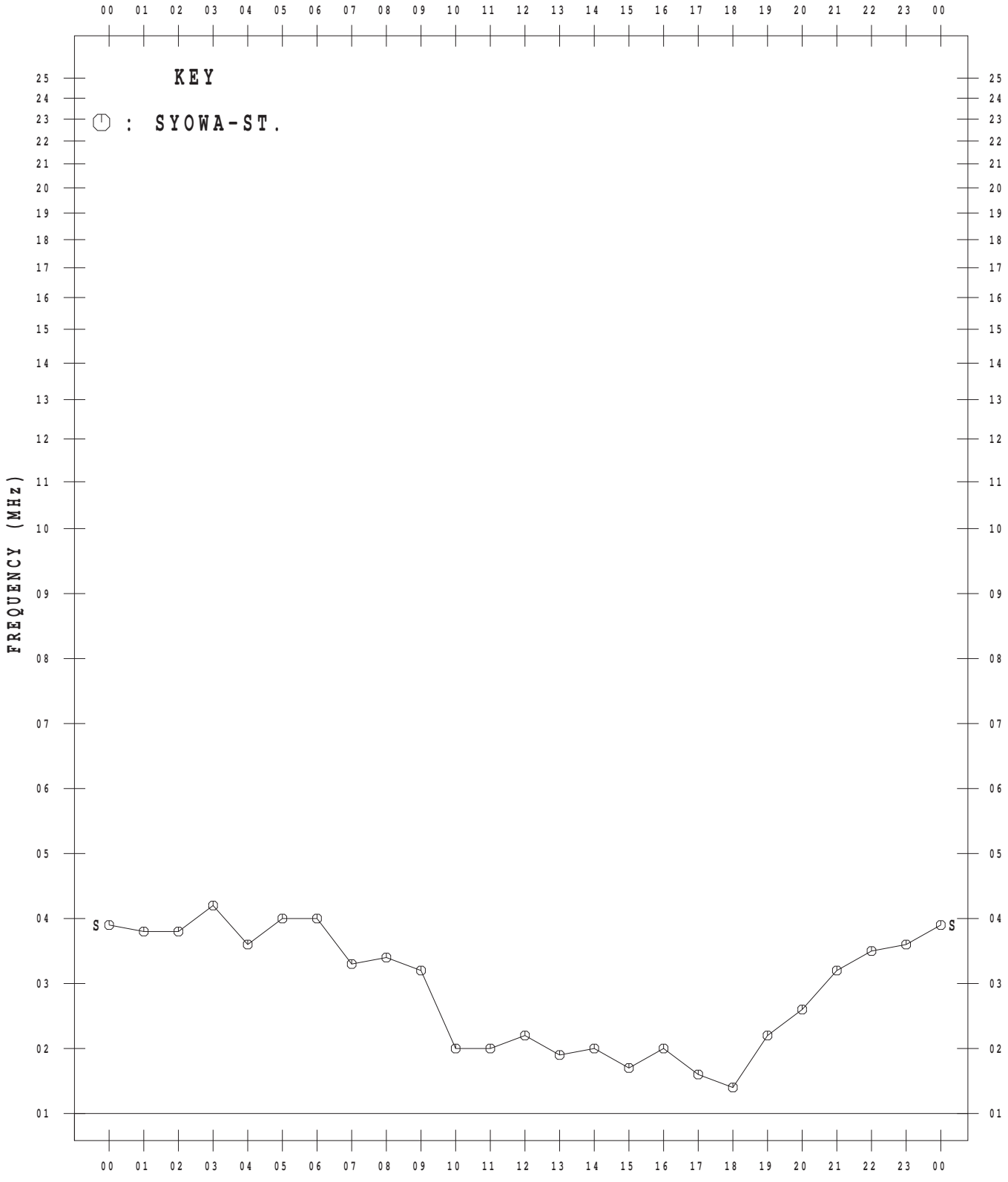
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME MAY 2011



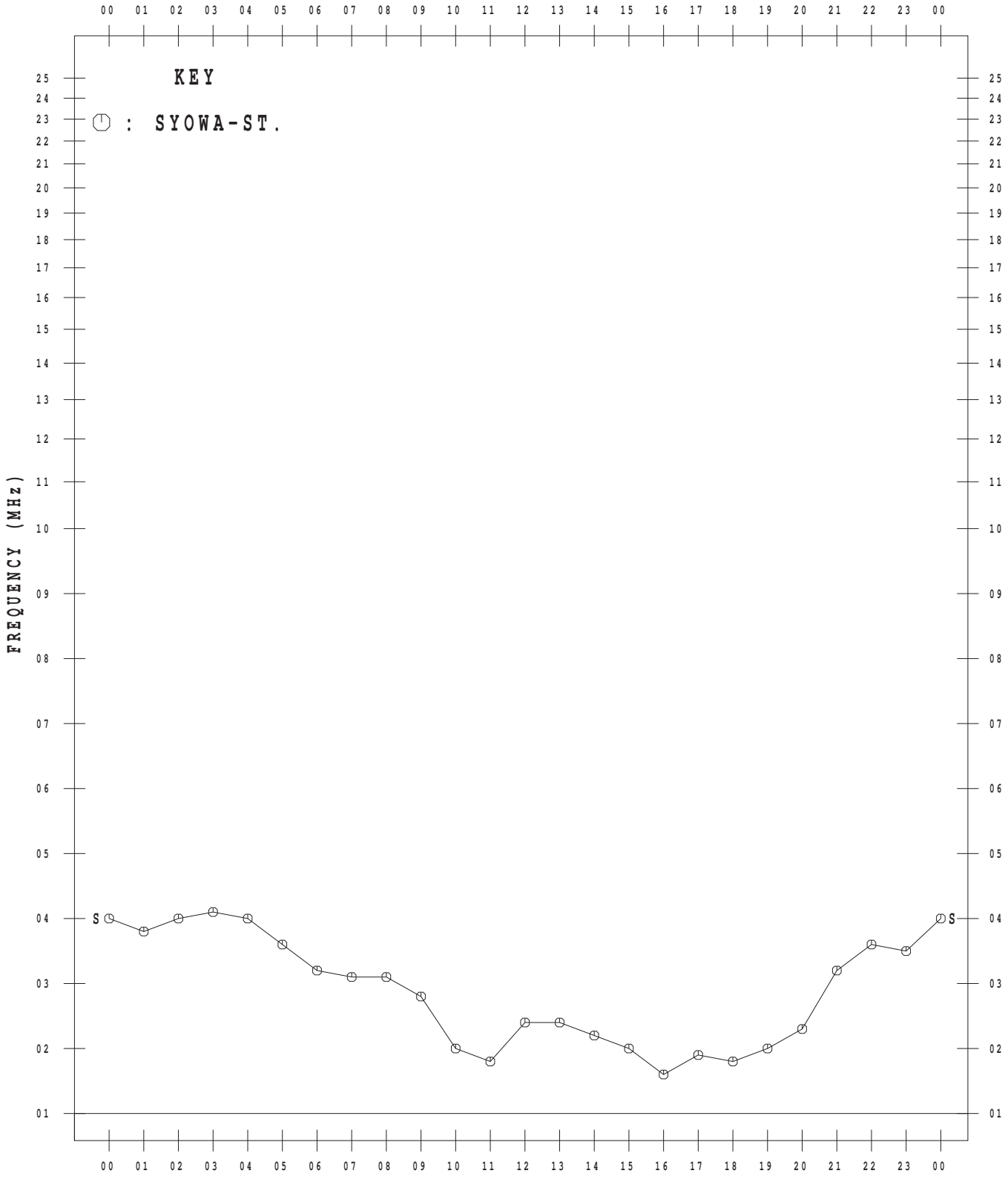
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUN. 2011



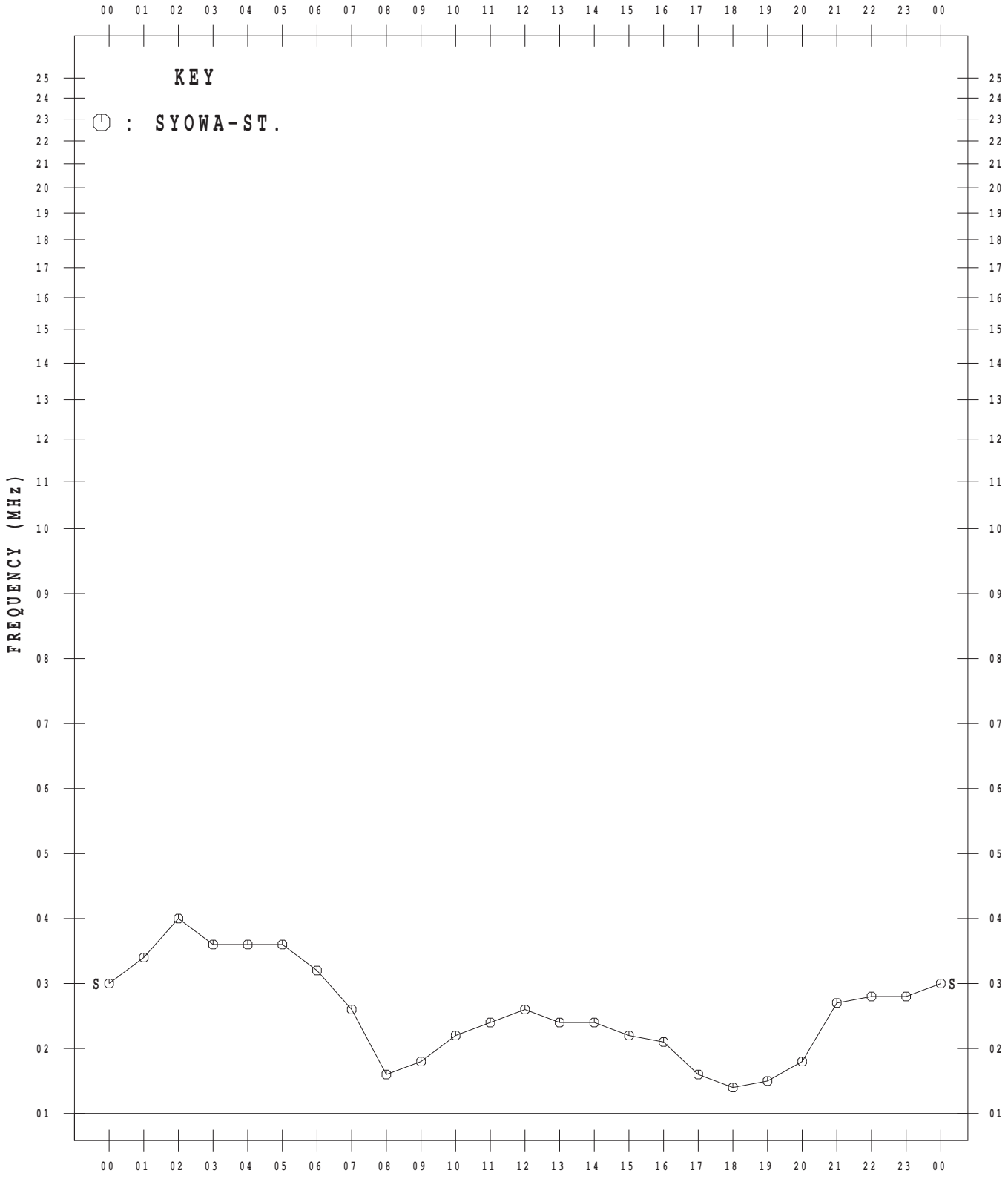
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME JUL. 2011



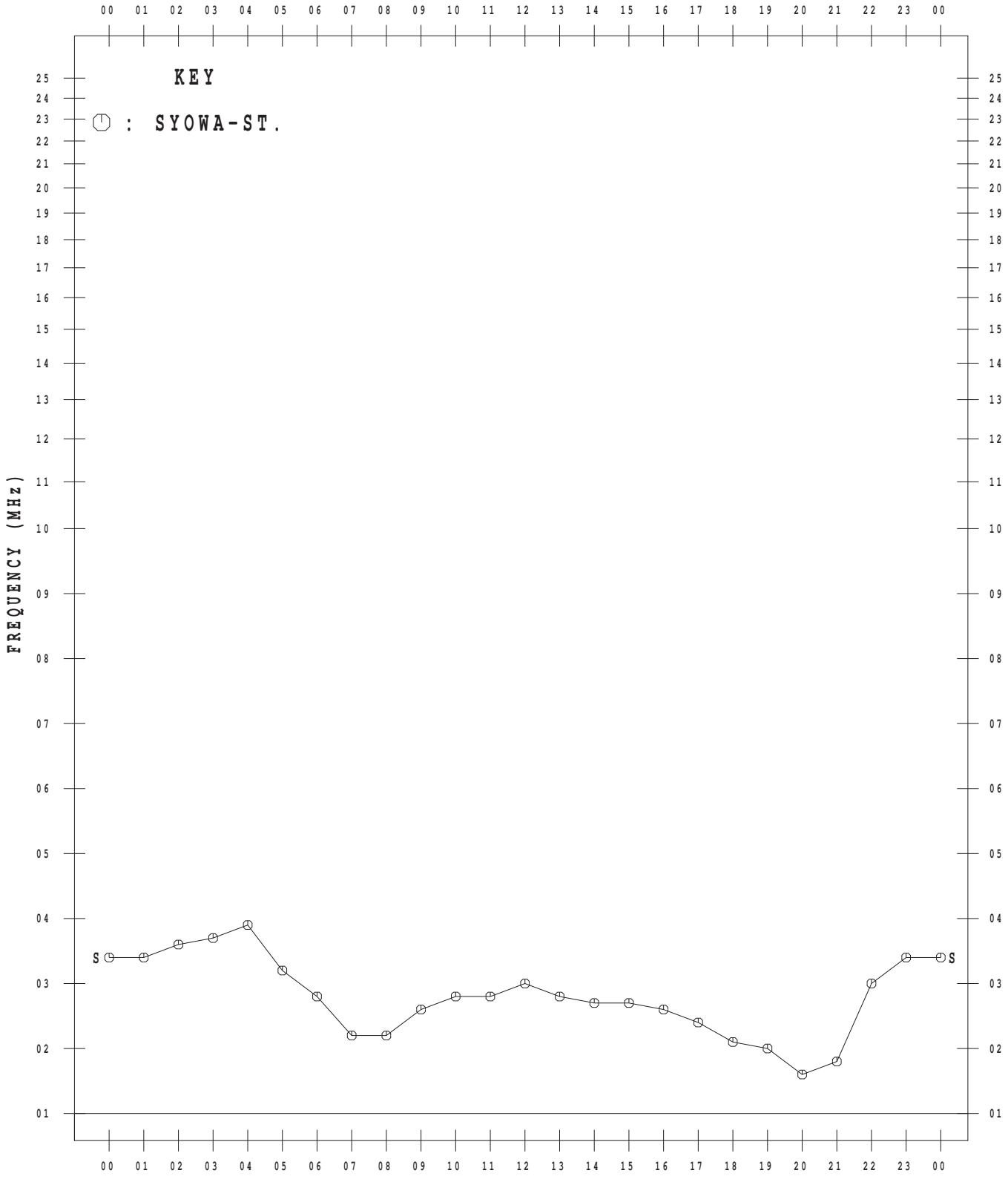
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME AUG. 2011



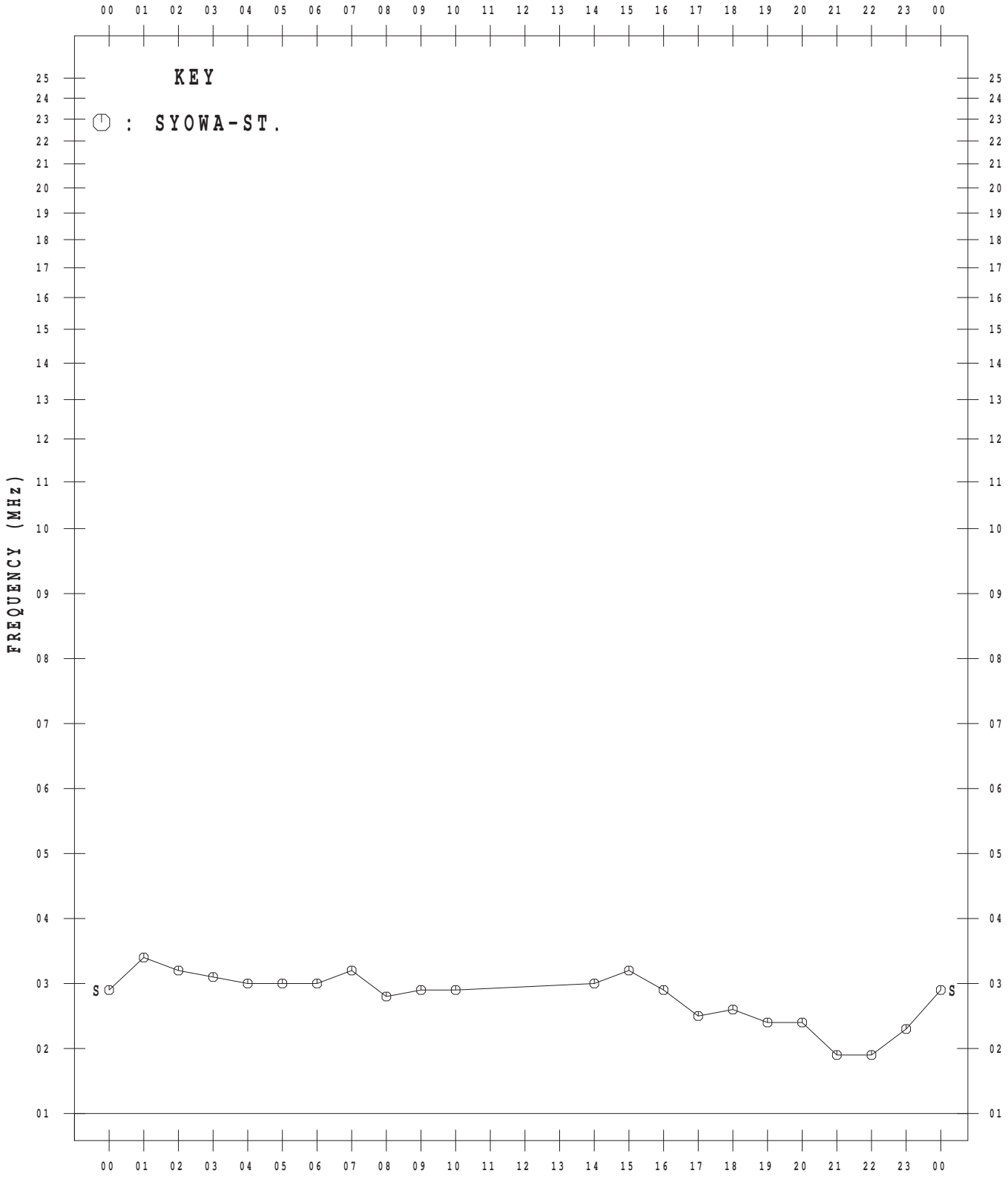
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME SEP. 2011



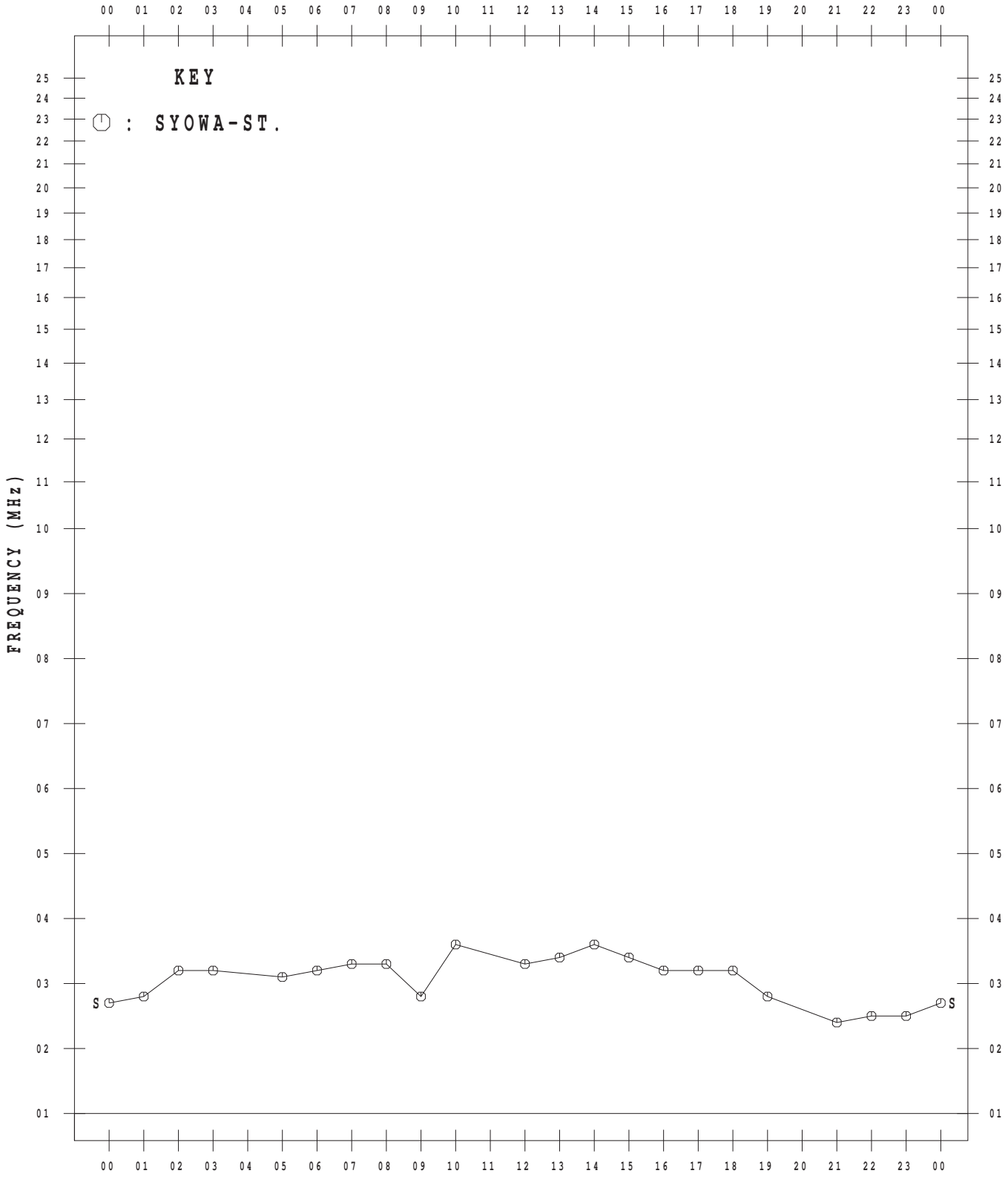
MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME OCT. 2011



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME NOV. 2011



MONTHLY MEDIAN VALUES OF ftEs

45°E MEAN TIME DEC. 2011